PNNL-27449

Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

FY18 Leading Indicator Phase 2 Report

April 2018

EC Golovich
LF Pease
MS Taubman
LA Mahoney
J Irvahn
SK Cooley
KK Anderson
MJ Minette

U.S. DEPARTMENT OF ENERGY

Prepared for the U.S. Department of Energy
under Contract DE-AC05-76RL01830

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor Battelle Memorial Institute, nor any of their employees, makes **any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights**. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or Battelle Memorial Institute. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

PACIFIC NORTHWEST NATIONAL LABORATORY
operated by
BATTELLE
for the
UNITED STATES DEPARTMENT OF ENERGY
under Contract DE-AC05-76RL01830

Printed in the United States of America

Available to DOE and DOE contractors from the
Office of Scientific and Technical Information,
P.O. Box 62, Oak Ridge, TN 37831-0062;
ph: (865) 576-8401
fax: (865) 576-5728
email: reports@adonis.osti.gov

Available to the public from the National Technical Information Service
5301 Shawnee Rd., Alexandria, VA 22312
ph: (800) 553-NTIS (6847)
email: orders@ntis.gov <http://www.ntis.gov/about/form.aspx>
Online ordering: http://www.ntis.gov


This document was printed on recycled paper.
(8/2010)

PNNL-27449

FY18 Leading Indicator Phase 2 Report

EC Golovich
LF Pease
MS Taubman
LA Mahoney
J Irvahn
SK Cooley
KK Anderson
MJ Minette

April 2018

Prepared for
the U.S. Department of Energy
under Contract DE-AC05-76RL01830

Pacific Northwest National Laboratory
Richland, Washington 99352

Executive Summary

Pacific Northwest National Laboratory is supporting efforts by Washington River Protection Solutions (WRPS) to improve their chemical vapors hazard management program[1] with research, analysis, development, testing, and technical support focused on better identification and understanding of the vapor hazards. The effort described in this report is one part of an overall vapors program managed by WRPS, specifically addressing the identification of chemical vapor leading indicators (LIs). The results presented in this report will be part of the toolbox and technical basis used by the WRPS Industrial Hygiene group to devise processes and procedures used to limit worker exposure.

In Phase I of the project, a process was developed to evaluate chemical species known to be in tank farm emissions for their suitability as a LI.[2] Results from the Phase I process evaluation identified ammonia and nitrous oxide as strong candidates, based on the data population available and observations of their co-existing presence with other chemicals of potential concern (COPCs) during the same sampling events. The focus for Phase II of the project was to validate the LI process and update as necessary using new data from vapor data collection efforts in fiscal years 2016 and 2017. Another outcome of the Phase II effort was identification of LIs with associated action thresholds. The information presented in this report will be part of the toolbox and technical basis used by the WRPS Industrial Hygiene group to incorporate into processes and procedures used to limit worker exposure.

The Phase II LI evaluation drew on a larger data set than was previously available for the Phase I evaluation. Data sources included updates from the Site-Wide Industrial Hygiene Database and Tank Waste Information Network System Industrial Hygiene databases. Results from the RJ Lee Group mobile laboratory taken at the AP exhauster during waste-disturbing operations and at the A-103 breather filter under static conditions were also incorporated, after averaging the 2-second data to 4-hour intervals. Lastly, the data population added inlet results from 11 respirator cartridge tests performed on headspace vapors from six tanks (SY-102, BY-108, A-101, AX-101, SX-101, and SX-104) and four exhausters (AP, 702-AZ, AW, and AN) during static, non-waste-disturbing conditions, and an additional test at the 702-AZ exhauster performed during waste-disturbing activities. Combined, these results provided a new data source for 13 of the 25 COPCs found to be lacking data in the Phase I report.[2] This increased total number to 45 COPCs with sufficient data for the LI evaluation.

The second phase of the LI project has updated the process to use a dilution projection to transform source data into possible concentrations [1/2 of the occupational exposure limit (OEL), OEL, and an excursion limit[3]] at receptor locations. This concept is based on the idea that workers will encounter potential exposure to COPCs not at the source itself, but at locations downstream of a breather filter or other physical exhaust diluting headspace vapors into the local atmosphere. The dilution projection covers

[1] WRPS. 2015. *Implementation Plan for Hanford Tank Vapor Assessment Report Recommendations*. Washington River Protection Solutions, Richland, Washington. http://wrpstoc.com/wp-content/uploads/2015/02/WRPS-1500142-Enclosure.pdf.

[2] Golovich EC, MS Taubman, DS Daly, LA Mahoney, SK Cooley, J Bao, and TM Brouns. 2016. *Leading Indicator Process Development Report*. PNNL-2533, Rev. 0, Pacific Northwest National Laboratory, Richland, Washington.

[3] The American Conference of Governmental Industrial Hygienists 3x OEL excursion or ceiling rule used within the analysis is a "rule of thumb and a pragmatic precautionary approach" implemented as deemed prudent by qualified WRPS Industrial Hygiene personnel.

a range of distances from source to receptor, as the analysis focuses on the concentration of the LI, not a specific distance from the source. Since much of the available data were obtained from the tank headspace and few paired data above detection or reporting limits are available from the area database, this idea provides a more realistic depiction of likely chemical concentrations upon exposure than would be obtained using unprojected source data. These projections were used to calculate 90/90 and 95/95 tolerance limits with results given in tabular form as well as within a number line plot for a given indicator. The updated process also includes a method for including the data with less than detection limit or reporting limit values.

Within this report, an indicator is chemical whose presence provides useful information about the concentrations of one or more COPCs. A LI is one for which a measurable[1] concentration indicates a concentration of interest for the given COPC. A lagging indicator is one for which any measurable concentration indicates possible concentrations of the given COPC that are higher than the preferable indication of the concentration of interest. Given these definitions, an indicator is leading for all COPCs for which the tolerance limit falls above the nominal detection limit for current direct-reading field instruments. An indicator is lagging for all those COPCs for which the tolerance limit falls below the nominal detection limit.

Ammonia, nitrous oxide, and mercury were found to be potential LIs for multiple COPCs. Table ES.1 identifies the number of COPCs that fall into three categories where the indicator would be leading, lagging, or there are insufficient data (NSD in the table) to calculate a tolerance limit. Tank Vapor Information Sheet (TVIS)-specific COPC numbers are shown in parentheses. From an individual indicator basis, ammonia has the most COPCs with a LI relationship (36 – 43 COPCs) at 90/90 tolerance limits depending on the concentration of interest. Ammonia has a lagging indicator relationship with 2 – 9 COPCs depending on the action limit concentration and has the fewest COPCs with insufficient data (15) at 90/90 tolerance limits. Focusing on the 24 COPCs on TVIS lists, ammonia has a LI relationship with 16 – 19 COPCs, a lagging indicator relationship with 2 – 5 COPCs, and only 3 COPCs with insufficient data at the 90/90 tolerance limits. Overall, both nitrous oxide and mercury have more COPCs with insufficient data.

Using multiple LIs increases the overall range of COPCs that can be indicated, compared to an individual LI. If ammonia, nitrous oxide, and mercury are used together, up to 21 of the 24 TVIS COPCs and 42 of all[2] COPCs are addressed at the COPC's OEL concentration with a 90/90 tolerance limit. At the COPC's excursion limit with a 90/90 tolerance limit, 21 of the 24 TVIS COPCs and 45 of all COPCs are addressed.

One of the major gaps that remains is the need for a data population for all COPCs that better represents the sources, operating conditions, and meteorological conditions in proportion to their frequency of occurrence. Additional data from upcoming sampling campaigns, future cartridge tests, and mobile lab characterization campaigns will increase the data populations to allow calculation of 95/95

[1] Measureable is not specifically defined in this report, but is preliminarily estimated using nominal lower limits of detection. Measureable may be defined quantitatively and statistically in a future phase that considers operational application of the results presented in this report.
[2] The current list of 61 COPCs, dated 9/21/2017, is maintained on the WRPS Industrial Hygiene website. Of these, 60 are evaluated herein because polychlorinated biphenyls are a family of chemicals for which a unique molecular weight, essential to this analysis, remains unclear.

tolerance limits that are currently data limited. These new data sets will help close data gaps for the COPCs that are data limited for 90/90 tolerance limit calculations. The vapor sampling data quality objectives document[1] may identify the requirements for consistency in future sampling campaigns.

Table ES.1. Number of COPCs covered by individual and combined leading indicators.

Indicator	Category	1/2 OEL 90/90	OEL 90/90	Excursion 90/90	1/2 OEL 95/95	OEL 95/95	Excursion 95/95
Ammonia	Leading	36 (16)	36 (16)	43 (19)	21 (8)	23 (10)	26 (13)
	Lagging	9 (5)	9 (5)	2 (2)	9 (9)	7 (7)	4 (4)
	NSD	15 (3)	15 (3)	15 (3)	30 (7)	30 (7)	30 (7)
Nitrous Oxide	Leading	21 (9)	22 (10)	22 (10)	13 (6)	13 (6)	13 (6)
	Lagging	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	NSD	38 (14)	38 (14)	38 (14)	47 (18)	47 (18)	47 (18)
Mercury	Leading	24 (14)	25 (15)	26 (16)	18 (10)	18 (10)	18 (10)
	Lagging	4 (4)	3 (3)	2 (2)	2 (2)	2 (2)	2 (2)
	NSD	32 (6)	32 (6)	32 (6)	40 (12)	40 (12)	40 (12)
Combined	Leading	40 (19)	42 (21)	45 (21)	28 (15)	28 (15)	29 (16)
	Lagging	5 (2)	3 (0)	0 (0)	2 (2	2 (2)	1 (1)
	NSD	15 (3)	15 (3)	15 (3)	30 (7)	30 (7)	30 (7)

NSD = not sufficient data
Leading also includes auto indication (i.e., ammonia indicates ammonia)
TVIS COPC count in parentheses
Nominal detection limits used to determine leading and lagging categories were 1 ppm for ammonia, 0.04 ppm for nitrous oxide, and 1.6×10^{-6} ppm for mercury.

Another major gap is determining the actual detection limits for direct reading instruments to be used in-field that correspond to this analysis. Nominal detection limits corresponding to analytical laboratory measurements were used in this report, which do not account for in-field instrument and laboratory uncertainties, temporal variations, and uncertainties in the dilution projection;[2] and a nominal detection limit estimated from instrument readability may differ from the actual detection limits that correspond to the same levels of confidence asserted by this analysis. Additional data collection and further effort to apply these findings on site are necessary. A field demonstration activity for handheld ammonia detectors is commencing that will collect and analyze sensitivity and accuracy for each of the instruments in a field (tank farm) environment that will help to close this data gap.[3] However, there are specific statistical requirements for joining data from that activity to information from this report. Simply measuring the

[1] Nguyen DM. 2018. *Data Quality Objectives for Integrated Tank Vapors Sampling*. RPP-RPT-60598, DRAFT, Washington River Protection Solutions, Richland, Washington.
[2] Projection uncertainties may include unusual weather conditions, surface interactions and adsorption, fast chemical reactions, and uncertainty in the concentration as a function of position for both COPC and LI.
[3] Morrey EV and GW Weeks. 2018. *Test Plan for Field Demonstration of the Wearable Ammonia Monitors (C2Sense and Alternative Devices)*. RPP-PLAN-62130, Rev. 0, Washington River Protection Solutions, Richland, Washington.

sensitivity and accuracy of in-field instruments is insufficient to move from nominal detection limits to actualized detection limits as used in this report.

Acknowledgments

The authors gratefully acknowledge Courtney Bottenus, Arich Fuher, and Judith Bamberger for their thorough reviews. The authors would also like to recognize Robert Frank, Steve Killoy, Joe Meacham, Eugene Morrey, and George Weeks for their technical input throughout the project assisting in the direction and refinement of the approach.

Acronyms and Abbreviations

CAS	Chemical Abstracts Service
COPC	chemical of potential concern
DL	detection limit
DRI	direct reading instrument
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
GPS	Global Positioning System
HS	headspace characterization
ID	identification
IH	industrial hygiene
LI	leading indicator
LLD	lower limit of detection
MDL	method detection limit
NDMA	N-nitrosodimethylamine
NIH	National Institutes of Health
NIST	National Institute of Standards and Technology
NSD	not sufficient data
OEL	occupational exposure limit
PNNL	Pacific Northwest National Laboratory
PTR-MS	proton transfer reaction mass spectroscopy
QA	quality assurance
RL	reporting limit
SST	single-shell tank
SWIHD	Site-Wide Industrial Hygiene Database
TVAT	Tank Vapor Assessment Team
TVIS	Tank Vapor Information Sheet
TWINS	Tank Waste Information Network System
VOC	volatile organic compound
WRPS	Washington River Protection Solutions

Contents

Executive Summary iii
Acknowledgments vii
Acronyms and Abbreviations viii
1.0 Introduction 1.1
1.1 Content and Organization 1.2
1.2 Definitions 1.2
2.0 Quality Assurance 2.1
3.0 Source Data 3.1
3.1 TWINS HS 3.1
3.2 SWIHD HS 3.2
3.3 TWINS IH 3.2
3.4 Mobile Laboratory 3.3
3.5 Cartridge Tests 3.4
4.0 Analysis Process 4.1
4.1 Pre-Processing Steps 4.2
4.1.1 Remove Quality-Flagged Data 4.2
4.1.2 Distinguish Censoring Data 4.2
4.1.3 Identify Data Pairs 4.2
4.1.4 Sampled Population 4.3
4.2 Scatterplot 4.5
4.3 Dilution Projection and Histograms 4.6
4.3.1 Vertical Projection 4.7
4.3.2 Horizontal Projection 4.10
4.4 Tolerance Limit Estimation 4.13
4.5 Number Lines 4.14
4.6 Candidate Assessment 4.15
5.0 Site-Wide Evaluation 5.1
5.1 Ammonia 5.3
5.2 Nitrous Oxide 5.9
5.3 Mercury 5.16
5.4 Combined Use of Leading Indicators 5.21
5.5 Other Leading Indicator Candidates 5.22
5.6 Field Instrumentation Uncertainty 5.24
6.0 Conclusions 6.1
7.0 References 7.1
Appendix A Tank Physics and Dilution A.1

Appendix B Data Processing B.1
Appendix C Scatterplots and Histograms C.1
Appendix D Tolerance Limit Tables D.1
Appendix E Number Lines E.1

Figures

Figure 4.1. Candidate leading indicator search process. 4.4
Figure 4.2. NDMA concentrations plotted against ammonia concentrations on log scale. OEL (black lines) and half-OEL (grey lines) are shown for ammonia (vertical) and NDMA (horizontal) 4.6
Figure 4.3. NDMA versus ammonia concentrations projected along a 1:1 dilution line to 1 ppm ammonia 4.9
Figure 4.4. Histogram of the 1:1 dilution projection of NDMA versus ammonia data points to a vertical line located at 1 ppm of ammonia. 4.10
Figure 4.5. NDMA versus ammonia concentrations projected along a 1:1 dilution line to NDMA's OEL 4.12
Figure 4.6. Histogram of the 1:1 dilution projection to a horizontal line at NDMA's OEL. 4.13
Figure 4.7. Number line of the 90/90 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL. 4.15
Figure 5.1. Number line of the 90/90 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL. 5.6
Figure 5.2. Number line of the 95/95 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL. 5.7
Figure 5.3. Number line of the 90/90 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL. 5.7
Figure 5.4. Number line of the 95/95 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL. 5.8
Figure 5.5. Number line of the 90/90 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit. 5.8
Figure 5.6. Number line of the 95/95 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit. 5.9
Figure 5.7. Number line of the 90/90 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL. 5.13
Figure 5.8. Number line of the 95/95 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL. 5.13
Figure 5.9. Number line of the 90/90 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL. 5.14
Figure 5.10. Number line of the 95/95 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL. 5.14
Figure 5.11. Number line of the 90/90 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit 5.15
Figure 5.12. Number line of the 95/95 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit 5.15
Figure 5.13. Number line of the 90/90 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL. 5.18
Figure 5.14. Number line of the 95/95 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL. 5.19

Figure 5.15. Number line of the 90/90 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL. 5.19
Figure 5.16. Number line of the 95/95 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL. 5.20
Figure 5.17. Number line of the 90/90 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit. 5.20
Figure 5.18. Number line of the 95/95 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit. 5.21
Figure 5.19. Number line of the 90/90 methanol concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit. 5.23
Figure 5.20. Number line of the 90/90 acetaldehyde concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit..... 5.23

Tables

Table ES.1. Number of COPCs covered by individual and combined leading indicators. v
Table 5.1. COPC concentrations used in leading indicator evaluation. 5.1
Table 5.2. Summary of ammonia as a site-wide leading indicator using a 1-ppm nominal detection limit. 5.4
Table 5.3. Summary of nitrous oxide as a site-wide leading indicator using a 0.04 ppm nominal detection limit. 5.11
Table 5.4. Summary of mercury as a site-wide leading indicator using a 1.6×10^{-6} ppm nominal detection limit. 5.16
Table 5.5. Number of COPCs covered by individual and combined leading indicators. 5.22

1.0 Introduction

The Hanford tank farms have 177 underground tanks distributed across 18 tank farms that contain radioactive and chemical wastes from World War II and Cold War era plutonium production. These tank farms consist of either single-shell tanks principally equipped with passive breather filters on 1.0- to 1.5-m stacks or single- and double-shell tanks that are actively ventilated through 6- to 12-m tall stacks. Chemical vapor emissions from these tanks have been an ongoing concern at the tank farms despite efforts to understand and manage potential worker exposure to these vapor emissions. An increase in reported symptoms in early 2014, suspected to be related to chemical vapor exposures, led to a focused revitalization of the chemical vapors hazard management program to account for evolving conditions in the tank farms. The chemical vapors hazard management program is administered and implemented by Washington River Protection Solutions (WRPS), the U.S. Department of Energy's (DOE's) Tank Operations Contractor. WRPS-led revitalization efforts included establishment of an independent Hanford Tank Vapor Assessment Team (TVAT) to examine hazardous chemical vapors management, related worker protection measures, and recommended actions. The recommendations of the TVAT (Wilmarth et al. 2014), as well as other vapor control improvements, are being implemented in a phased approach within WRPS' chemical vapors hazard management program (WRPS 2015) and include a series of projects and activities being executed by multi-disciplinary and multi-organization teams.

Pacific Northwest National Laboratory (PNNL) is supporting efforts by WRPS to improve their chemical vapors hazard management program with research, analysis, development, testing, and technical support each focused on better identification and understanding of the vapor hazards. The effort described in this report is one part of an overall vapors program managed by WRPS, specifically addressing the identification of chemical vapor leading indicators (LIs).

In 2006, the Industrial Hygiene Technical Basis team evaluated volatile chemicals for potential workplace risk and identified a set of chemicals of potential concern (COPCs) with corresponding occupational exposure limits (OELs) that provide guidance for monitoring vapor emissions within the tank farms (Meacham et al. 2006). In 2017, the list was updated to include two additional COPCs (Way 2017).[1] Many of these chemicals are difficult to measure, especially with available direct reading instruments (DRIs) that can provide real-time or near-real-time detection. Using relationships between difficult-to-measure and easier-to-measure COPCs (or non-COPC chemicals) may provide a means to infer more information about the difficult-to-detect COPCs. If chemical species can be readily detected in near-real time at concentrations below their OELs or exposure action levels and indicate a concentration of interest for the COPC, the easily measured species would be considered a good LI.

In Phase I of the project, a process was developed to evaluate chemical species known to be in tank farm emissions (including COPCs and non-COPCs) for their suitability as a LI. Results from the Phase I process evaluation identified ammonia and nitrous oxide as strong candidates, based on the data population available and observations of their co-existing presence with other COPCs during the same sampling events. The focus for Phase II of the project was to validate the LI process and update as necessary using new data from vapor data collection efforts in fiscal years 2016 and 2017. Another

[1] The current list of 61 COPCs, dated 9/21/2017, is maintained on the WRPS Industrial Hygiene website. Of these, 60 are evaluated herein because polychlorinated biphenyls are a family of chemicals for which a unique molecular weight, essential to this analysis, remains unclear.

outcome of the Phase II effort was identification of LIs with associated action thresholds. The results presented in this report will be part of the toolbox and technical basis used by the WRPS Industrial Hygiene (IH) group to devise processes and procedures used to limit worker exposure.

1.1 Content and Organization

This report is organized as follows. Section 1.0 provides introductory material, including definitions of key terms within the report. Section 2.0 states the quality requirements associated with the project. The data set used in this analysis process is described in Section 3.0. Update of the process from Phase I is explained in Section 4.0. A high-level site-wide evaluation of LIs is addressed in Section 5.0. Conclusions are summarized in Section 6.0, and references are listed in Section 7.0.

There are five appendices included with the report. Appendix A provides the technical basis for the use of the dilution projection described in Section 4.3 along with a description of the source data. A more detailed description of pre-processing steps used for each data source is given in Appendix B. Also included in Appendix B is documentation supporting validation of the process using data from A and AP farms and a preliminary analysis of data from DRIs used in cartridge tests. The three remaining appendices provide the results from the analysis discussed in Section 4.0. Appendix C contains scatterplots for all possible LI-COPC pairs and associated dilution projection histograms at the three COPC action levels. Appendix D contains tables of calculated tolerance limit values to evaluate each COPC as a possible LI. Appendix E contains number lines for each COPC to graphically illustrate tolerance limit values provided in Appendix D and to evaluate COPCs as possible LIs.

1.2 Definitions

The following definitions are important to understand for terms frequently used in this document.

- An **Indicator** is a chemical whose presence provides useful information about the concentrations of one or more COPCs.
- A **Threshold** is a statistically defined concentration of an indicator that, when measured, provides useful information about the concentrations of one or more COPCs.
- A **Leading Indicator** is an indicator for which a measurable[2] concentration indicates a concentration of interest for the given COPC.
- A **Lagging Indicator** is an indicator for which any measurable concentration indicates possible concentrations of the given COPC that are higher than the preferable indication of the concentration of interest.
- An **Auto Indicator** is one whose concentration rises to a level of interest (because of its own presence) before indicating a concentration of interest for the given COPC. Auto indicators are still considered ***leading*** for all COPCs whose LI thresholds are above the LI's auto indication threshold.

[2] Measureable is not specifically defined in this report, but is preliminarily estimated using nominal lower limits of detection. Measureable may be defined quantitatively and statistically in a future phase that considers operational application of the results presented in this report.

- An **Easily Measured** chemical refers to chemical species that are measured by instrumentation used by staff in the tank farms.

2.0 Quality Assurance

The PNNL Quality Assurance (QA) Program is based upon the requirements defined in the DOE Order 414.1D, *Quality Assurance*, and 10 CFR 830, *Energy/Nuclear Safety Management*, Subpart A—Quality Assurance Requirements. PNNL has chosen to implement the following consensus standards in a graded approach:

- ASME NQA-1-2000, *Quality Assurance Requirements for Nuclear Facility Applications*, Part I, Requirements for Quality Assurance Programs for Nuclear Facilities.
- ASME NQA-1-2000, Part II, Subpart 2.7, Quality Assurance Requirements for Computer Software for Nuclear Facility Applications.
- ASME NQA-1-2000, Part IV, Subpart 4.2, Graded Approach Application of Quality Assurance Requirements for Research and Development.

The procedures necessary to implement the requirements are documented through PNNL's "How Do I…?" (HDI), a system for managing the delivery of laboratory-level policies, requirements, and procedures.

The project implements applicable quality requirements indicated in the statement of work through WRPS_CVST_02, *Project Specific Approach to Quality for Chemical Vapor Solutions Team Sub-Team Support Project*. The work described in this report was conducted following the requirements in WRPS_CVST_02. PNNL addressed internal verification and validation activities by conducting an independent technical review of the final data included in the report in accordance with WRPS_CVST_02. This review verified that the reported results are traceable, and that inferences and conclusions are soundly based.

3.0 Source Data

The tank vapor concentrations used in this study came from samples taken at a variety of source locations, some in tank headspaces (the points closest to releases from tank wastes), others at or near tank penetrations, and the remainder in stacks or headers for active tank exhaust systems. Few, if any, of the samples were taken at receptors, i.e., locations where personnel might be present to breathe the vapors. See Appendix A, Section A.1, for more information on sample types and locations.

Historical headspace-characterization (HS) data and industrial-hygiene (IH) data—hereafter referred to as Tank Waste Information Network System (TWINS) HS and TWINS IH—were obtained from the Tank Characterization Database via TWINS. They include about 1400 chemicals, and many of the TWINS IH data were taken during waste-disturbing tank operations. More recent historical headspace data were obtained from the Site-Wide Industrial-Hygiene Database (SWIHD) and are referred to as SWIHD HS. These three data sets are discussed in Sections 3.1 through 3.3.

Special-purpose concentration data have also been drawn upon for this study. These two data sets were (a) concentration data taken over several days in May 2017 at the A-103 breather filter by the mobile laboratory, while A-103 was inactive, and over a few days in July 2017 at the AP stack while a waste-disturbing tank operation was occurring; and (b) concentration data at the inlets of respirator cartridges tested in 2016 and 2017. The special-purpose data include analysis for most of the COPCs, but few non-COPCs. These two data sets are discussed in Sections 3.4 and 3.5.

3.1 TWINS HS

The TWINS HS data set contains no recent data — the most recent sampling date is from March 6, 2005, based on a July 19, 2017 download.[1] Some pre-processing of the data was required prior to analysis; complete detail can be found in Appendix B, Section B.1.1. Briefly, these pre-processing steps included:

- Removal of blanks, laboratory control sample standards, upwind measurements, matrix spikes, and quality control results from the database
- Correction of Chemical Abstracts Service (CAS) Registry Numbers due to known import issues with Microsoft Excel
- Conversion of units into ppm, as necessary
- Removal of blank data rows
- Removal of three data points with concentrations that exceeded 1,000,000 ppm (one each for N_2O, CO_2, and H_2)
- Exclusion of select quality-flagged data

[1] Downloaded from https://twins.labworks.org/twinsdata/Forms/BuildQuery.aspx?SourceName=vapor.dbo.sp_WEB_TVD_analysis_results&whatsnew=Vapor.

All the sample sources included in the TWINS HS database were kept for analysis, including non-farm sources — 241-C-301, 241-ER-311, and 241-Z-361.

Some TWINS HS data included measurements of a chemical in a tank that were repeated over a period of a few hours. In these cases, all the above-report measurements made within the same calendar day were averaged together arithmetically. If all of the data for the chemical, tank, and date were below-report, the minimum of the set was used for analysis. Specific means of identification are listed in Appendix B, Section B.1.1.

3.2 SWIHD HS

The SWIHD HS data, downloaded on July 19, 2017, comprise a standard full-detail download from the SWIHD database application for headspace samples from all tank farms. Some pre-processing of the data was required prior to analysis; complete detail can be found in Appendix B, Section B.1.2. Briefly, these pre-processing steps included:

- Correction of CAS Registry Numbers due to known import issues with Microsoft Excel
- Conversion of units into ppm, as necessary
- Removal of blank data rows
- Changes to the location of two data points to match with other samples in the survey
- Combining results for samples collected in series
- Exclusion of select quality-flagged data

Some of the SWIHD HS data were for samples whose QA review had not been completed. These data, which are denoted by survey numbers with asterisks, were retained in the analysis data set.

Some SWIHD HS data included measurements of a chemical in a tank that were repeated within the same day, whether measured by the same method or by different methods. In these cases, all the above-report measurements made within the same calendar day were averaged together (arithmetic average). If all of the data for the chemical, tank, and date were below-report, the minimum of the set was used for analysis. Specific means of identification as are listed in Appendix B, Section B.1.2.

3.3 TWINS IH

The TWINS IH data were downloaded on July 19, 2017, for this study. Some pre-processing of the data was required prior to analysis; complete detail can be found in Appendix B, Section B.1.3. Briefly, these pre-processing steps included:

- Removal of quality control samples
- Correction of CAS Registry Numbers due to known import issues with Microsoft Excel
- Conversion of units into ppm, as necessary
- Removal of blank data rows
- Changing the location of five data points to match with other samples in the survey

- Combining results for samples collected in series
- Exclusion of select quality-flagged data

All the sample sources included in the TWINS IH database were kept for analysis.

Some TWINS IH data included measurements of a chemical at a location that were repeated within the same day, whether measured by the same method or by different methods. In these cases, all the above-report measurements made within the same calendar day were averaged together (arithmetic average). If all of the data for the chemical, tank, and date were below-report, the minimum of the set was used for analysis. Specific means of identification as are listed in Appendix B, Section B.1.3.

3.4 Mobile Laboratory

The van-based mobile laboratory, which included proton transfer reaction mass spectroscopy (PTR-MS) instrumentation to measure a range of organic chemicals and a Picarro ammonia analyzer[2] to measure ammonia, provided data measured at 2-second intervals. The mobile laboratory was operated by RJ Lee Group, Inc. for WRPS. The van was deployed twice in 2017 to collect Hanford source data.

On May 23, 2017 through May 25, 2017, the airstream at the passive breather filter of A-103 was sampled; no waste-disturbing activity was being carried out in the A Farm tanks during this time. The data set included Global Positioning System (GPS) data for the van location, meteorological data at the van location, and water vapor and CO_2 measurements as well as PTR-MS and ammonia measurements. The RJ Lee team completed a quality review of the data. They had removed portions that were not of sufficient quality, or that were taken when an instrument was down, prior to delivery to WRPS for this analysis.

The AP exhauster stack was sampled from July 2, 2017 through July 8, 2017. This data set contained PTR-MS, ammonia, and water vapor measurements, but did not include GPS data for the van location, meteorological data at the van location, or CO_2 measurements. There were numerous gaps in data collection because of data quality issues and instrument shutdowns.[3]

Although the data sets received from RJ Lee had been edited to remove poor-quality data, a further need for editing was defined by RJ Lee after that data were received due to a problem with the auto-dilution factor, the Picarro ammonia instrument tended to flat line even when ammonia increased. The data-correction approach recommended by RJ Lee was to test for cases where the reported ammonia concentration was identical for three or more successive time-steps and remove all but the first data point.[4] Since concentrations were reported to four or more significant figures and normally showed variation in the last or next-to-last figure during constant-concentration periods, the presence of identical values was a reasonable diagnostic.

[2] Picarro G2103 ammonia monitor, ambient, obtained from Picarro, Inc., Santa Clara, CA.
[3] pp. 53-59, pp. A-138 through A-150, Monthly Report 9 – PBI Rev. 00 (9/21/2017), as supplied by RJ Lee Group, Inc.
[4] Email communication between George Weeks (WRPS) and Elizabeth Golovich (PNNL) with the subject "Confirmation on removal of bad ammonia data" on September 28, 2017 at 2:10 p.m.

Mobile laboratory data were identified as being below-detection if the concentration was less than the method detection limit (MDL) for the chemical. Data were considered to be below the reporting level if the concentration was less than three times the MDL.[5] For analysis purposes, the as-received 2-second data that were above the reporting limit were converted to 4-hour averages (boxcar arithmetic average instead of rolling average). The 4-hour averaging period was chosen because half or more of the data in the TWINS IH database had sample collection durations of between 1 and 6 hours, and a 4-hour average put the mobile laboratory data on a similar basis. If the 4-hour period contained only below-report data, the minimum of the set was used to represent the period in analysis.

Additional detail about the mobile laboratory data set and conditions during testing can be found in Appendix B, Section B.1.4.

3.5 Cartridge Tests

During 2016 and 2017, 11 respirator cartridge tests were performed on headspace vapors from six tanks (SY-102, BY-108, A-101, AX-101, SX-101, and SX-104) and four exhausters (AP, 702-AZ, AW, and AN) during static, non-waste-disturbing conditions (Freeman et al. 2017; Nune et al. 2016a,b, 2017a-g, 2018a-c). An additional test at 702-AZ exhauster was performed during waste-disturbing activities.

Vapor concentrations used in this analysis were measured using an array of sorbent tubes placed upstream of the air-purifying respirator cartridge material after vapors flowed through radioactive particulate filters and past temperature, pressure, and relative humidity monitors. The inlet tube is positioned within the headspace of the tank or within the exhausters. Initial tests measured inlet (upstream) concentrations using a 2-hour sampling duration at the beginning and end of the nominal 16 hours of cartridge testing. Later tests began measuring influent concentrations in 2-hour increments throughout the entire test period. Some pre-processing of the data was required prior to analysis; complete detail can be found in Appendix B, Section B.1.5.

Pre-processing steps included:

- Removal of effluent data, both laboratory and field quality control samples, duplicative rows, and rows without quantitative information
- Removal of analytical methods not presented in cartridge testing reports in contrast to data sets described in prior sections that may retain more than one method for each species
- Addition of CAS Registry Numbers that were missing
- Conversion of units into ppm, as necessary
- Designation of RL (reporting limit) or DL (detection limit)
- Combining results for samples collected in series or multiple measurements of the same tube
- Addition of data quality flags for analytical laboratory results, dubious flowrates, and data of indeterminate quality

[5] Table 4-10, p. 34, Monthly Report 9 – PBI Rev. 00 (9/21/2017), as supplied by RJ Lee Group, Inc.

- Exclusion of select quality-flagged data

Correlation between each measurement was achieved by aligning the time stamps for each 2-hour period. In this manner, each data point may include tens of concentration measurements. Additional detail about the cartridge test data set can be found in Appendix B, Section B.1.5.

4.0 Analysis Process

The differences between the Phase I and Phase II analysis approaches are extensive, leading to a substantially revised LI candidate search processes. In Phase I, the process may be characterized as searching for potential LIs and accepting them or ruling them out in a semi-automated way, based on (1) a view of an adequate relationship between candidate LI and COPC, which was assumed to be a power law relationship; (2) an arbitrarily chosen OEL ratio threshold, which demanded that the candidate LI present less of a concern than the COPC by some factor; and (3) the reporting limit of the candidate being low enough as to not interfere with its operation as a LI. Data in Phase I was visualized in scatterplots, including both actual and statistically simulated data, with quadrants that characterized the likelihoods of false positives and negatives, as well as true positives and negatives, based on 10% OEL action levels. Another concept of the Phase I process was that there were multiple criteria upon which LI candidates could be deemed unsuitable, the idea being that the process would identify successful candidate LIs that exhibited the "right" characteristics, or else it would be understood that there were no such suitable LIs.

Many of these approaches have evolved during Phase II of the project. The OEL ratio threshold, which if not attained caused the candidate to be deemed unsuitable, was dispensed with. If the LI is itself of interest, its indication of one or multiple COPCs at levels above its own (auto) action level may still be useful. For example, concentration levels at 1/2 OEL do not immediately trigger actions such as evacuation, but rather, monitoring of the situation. It is clear, then, that a LI can be indicating on multiple COPCs including itself, over some range, and may do so for a period of time before definitive action may be warranted. Therefore, to dismiss a candidate LI because the action level is lower than the indicated COPC's no longer makes sense in the context of how LIs will be used.

The Phase II process allows comparison of the effectiveness of multiple potential LI candidates and allows the user to make the final choice based on need and the evolving effectiveness of instrumentation. In this way, the process is no longer culling candidates as unsuitable based on many different levels and criteria. Furthermore, the fact that the available data do not generally conform to log-normal distributions was accepted (skew was often significant in logarithmic coordinates), because it could be misleading to use the parametric approach of trying to fit log-normal distributions to the data and setting tolerance limits based on these parametric models. The data distributions used now are empirical (i.e., non-parametric). The advantage of this change is that actual tolerance limit behavior of such data is not distorted, and hence the data are more acceptable. The disadvantage is that if data are sparse, then the final results (tolerance limit values) are rather data-dependent, and may change meaningfully with the addition of even one more data point. With this being said, the 2D scatterplot is still drawn for examination purposes and to understand what the distribution of points might say about the availability of data for pairing of chemicals, although a decision to remove a potential LI is not made at this stage.

Another major difference in the Phase II process, compared to Phase I, is the use of a dilution projection to transform source data into possible concentrations at receptor locations. This concept is based on the idea that workers will encounter potential exposure to COPCs not at the source itself, but at some location downstream of a breather filter or exhauster diluting headspace vapors into the local atmosphere. The dilution projection covers a range of distances from source to receptor, as the analysis focuses on the concentration of the LI, not a specific distance from the source. Since much of the available data were obtained from the tank headspace and few paired data above detection or reporting

limits are available from the area database, this idea provides a more realistic depiction of likely chemical concentrations upon exposure than would be obtained using unprojected source data.

The Phase II candidate LI search process is shown in Figure 4.1. Similar to Phase I, the process retains a do-loop structure for the current COPC list. The process "Start" moves on to data pre-processing, and then to a nested do-loop for LIs and COPCs. The nested loop structure looks at all COPCs against each potential LI in turn until the list is exhausted, at which point the potential LIs are sorted against a set of metrics, after which "End" is reached.

4.1 Pre-Processing Steps

The initial steps of the process involve further preparation of the data set by removing flagged data and distinguishing censored data as described in the following sections.

4.1.1 Remove Quality-Flagged Data

This step was not called out separately in the Phase I process flow chart (Golovich et al. 2016), but was considered part of the pre-processing step. It was decided that the importance of these decisions meant they should be identified as a separate step. A detailed discussion of the data quality flags accepted as reasons to remove data from the analysis can be found in Appendix B, Section B.1. The rules are defined for each database.

4.1.2 Distinguish Censoring Data

Some of the data in the data set were reported as less than the detection limit or reporting limit. This means that it is only known that the concentration was below the specified amount (i.e., detection limit or reporting limit), but it is unknown how far below. In statistical terms, this type of data are referred to as "censored" and require special handling within the process. The term censored is not used in the negative sense of suppressing, banning, or excluding information.

The reporting limit is used as the censoring criterion for data from the TWINS HS, TWINS IH, SWIHD HS, and mobile laboratory databases. The reporting limit or the detection limit was used for cartridge inlet data, depending on the test and chemical. Details are given in Section 3.5 and Appendix B.

Censored data are important within the LI process because they illustrate risk by identifying events where the concentration of a potential LI was low while the COPC had a measurable concentration above the detection or reporting limit.

4.1.3 Identify Data Pairs

The following rules were applied to determine which concentration data points, for each combination of candidate indicator and COPC, qualified as pairs:

- Location and timestamp had to be the same for both data points.
- Location was defined as the tank for TWINS HS and SWIHD HS, and as the combination of farm and specific location for TWINS IH. Mobile laboratory data locations were fixed over each

testing period. The provided data also included transit to test locations, so GPS coordinates were used to determine which data corresponded to which test locations. Cartridge tests were also conducted at fixed locations, identified as the stack or tank being tested.

- The timestamp was the date for TWINS HS, TWINS IH, and SWIHD HS data. For mobile laboratory data, the concentrations were automatically measured and averaged at the same times, so matching of timestamp was unnecessary. The timestamp was set by the sample date and nominal elapsed time for inlet concentration data from cartridge tests. The combination of location and nominal time uniquely identified each cartridge test sample.
- In any case where a pair had censored data for both chemicals, the point was removed from analysis because the data were considered too indefinite for use.

4.1.4 Sampled Population

There are a variety of LI-COPC concentration relationships given the diverse set of variables across the Hanford Site (different tanks, farms, tank farm activities, meteorological effects on releases, etc.). Given enough data, each situation could be analyzed separately to estimate a relationship between COPC concentrations and LI concentrations and deliver an action threshold that is specific to each particular circumstance. When data are limited for a specific situation, the analysis must use a general approach (i.e., whole Hanford Site). While practical, there are scenarios where this approach can produce misleading results because multiple relationships have been combined and the action threshold produced depends on what situations were included and in what proportions. Therefore, the results presented below may be sensitive to the data available. There is no guarantee that the next samples collected will necessarily concur with the results obtained using the currently available data set because the available data are a small fraction of the locations, tank farm activities, and meteorological conditions. Because the available data do not inherently conform to ideal monomodal distributions (lending confidence to assumptions of standard distributions, e.g., log normal), a non-parametric analysis (i.e., one that does not assume a distribution) is pursued below.

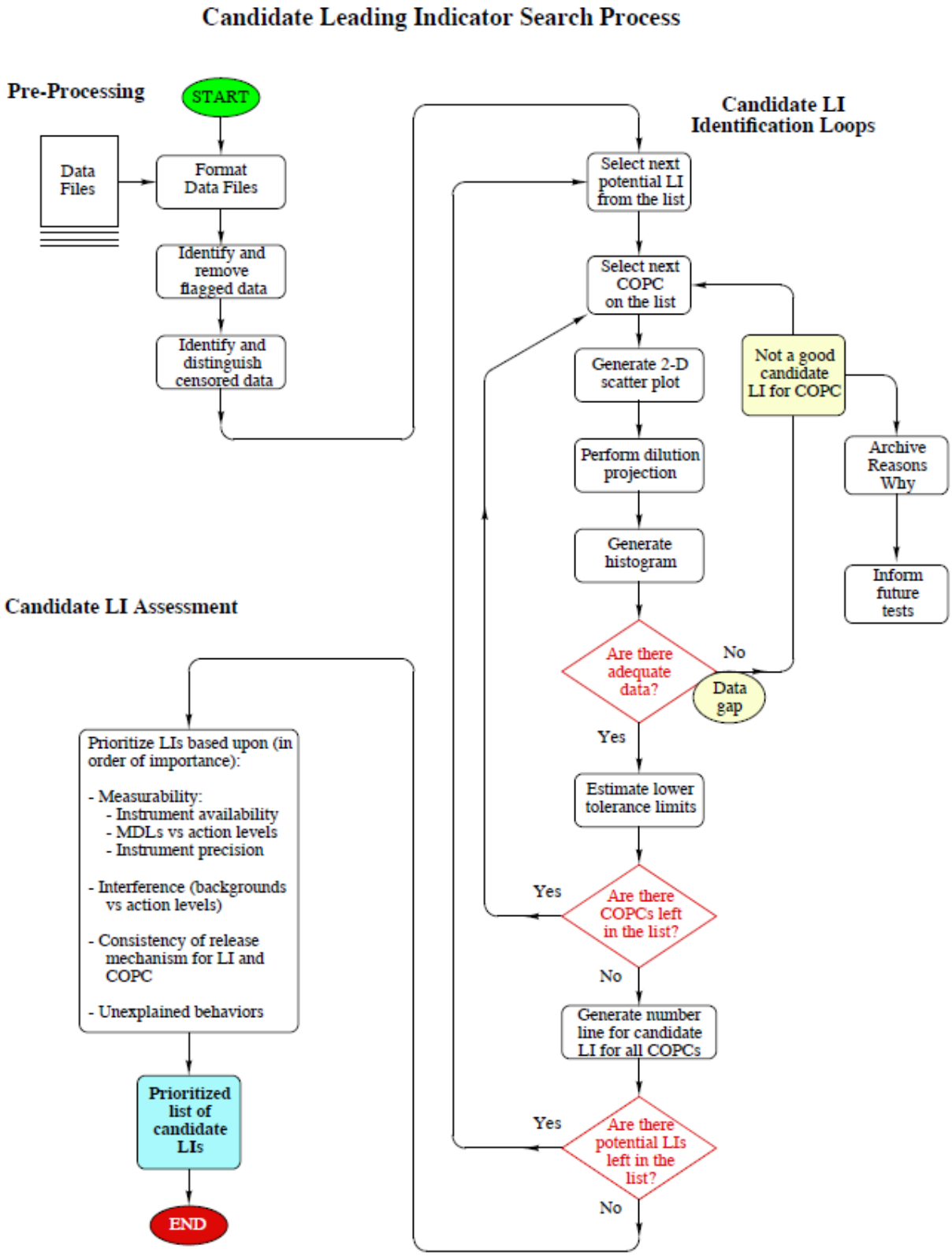


Figure 4.1. Candidate leading indicator search process.

4.2 Scatterplot

Scatterplots were created for all possible LI-COPC pairs using concentration measurements where the two gases were measured at the same place and at the same time as defined in Section 4.1.3. Figure 4.2 shows an example scatterplot for N-nitrosodimethylamine (NDMA) concentrations as a function of ammonia concentrations. Here, ammonia is treated as the potential LI candidate on the x-axis and NDMA is the indicated COPC on the y-axis. Log scales are used for both axes due to the large range in observed concentrations.

Solid grey lines and solid black lines indicate the 1/2 OEL and OEL, respectively, for the potential LI (vertical lines) and the COPC (horizontal lines). Data points are colored to indicate the type of sampling, test campaign, or database used. Cartridge test results are shown as red points. Data from the mobile lab (PTR-MS and Picarro) are green. Headspace data from SWIHD and TWINS downloads are identified by yellow points and blue points, respectively. Finally, data from TWINS IH are shown in orange.

Paired data points, where both measurements were reported above their detection or reporting limits, are indicated by solid circles. Paired results where concentrations of the potential LI were reported as less than a detection or reporting limit (x-censored) are indicated by stars. Paired points where COPC concentrations were reported as less than the detection or reporting limit (y-censored) are indicated by open circles. In both the x-censored and y-censored cases, data points are plotted at their detection or reporting limit. The actual concentration is likely to the left of each x-censored data point and below each y-censored data point. Data pairs where both concentrations were censored were not used in the analysis. Scatterplots for all COPC and potential LI pairs are shown in Appendix C.

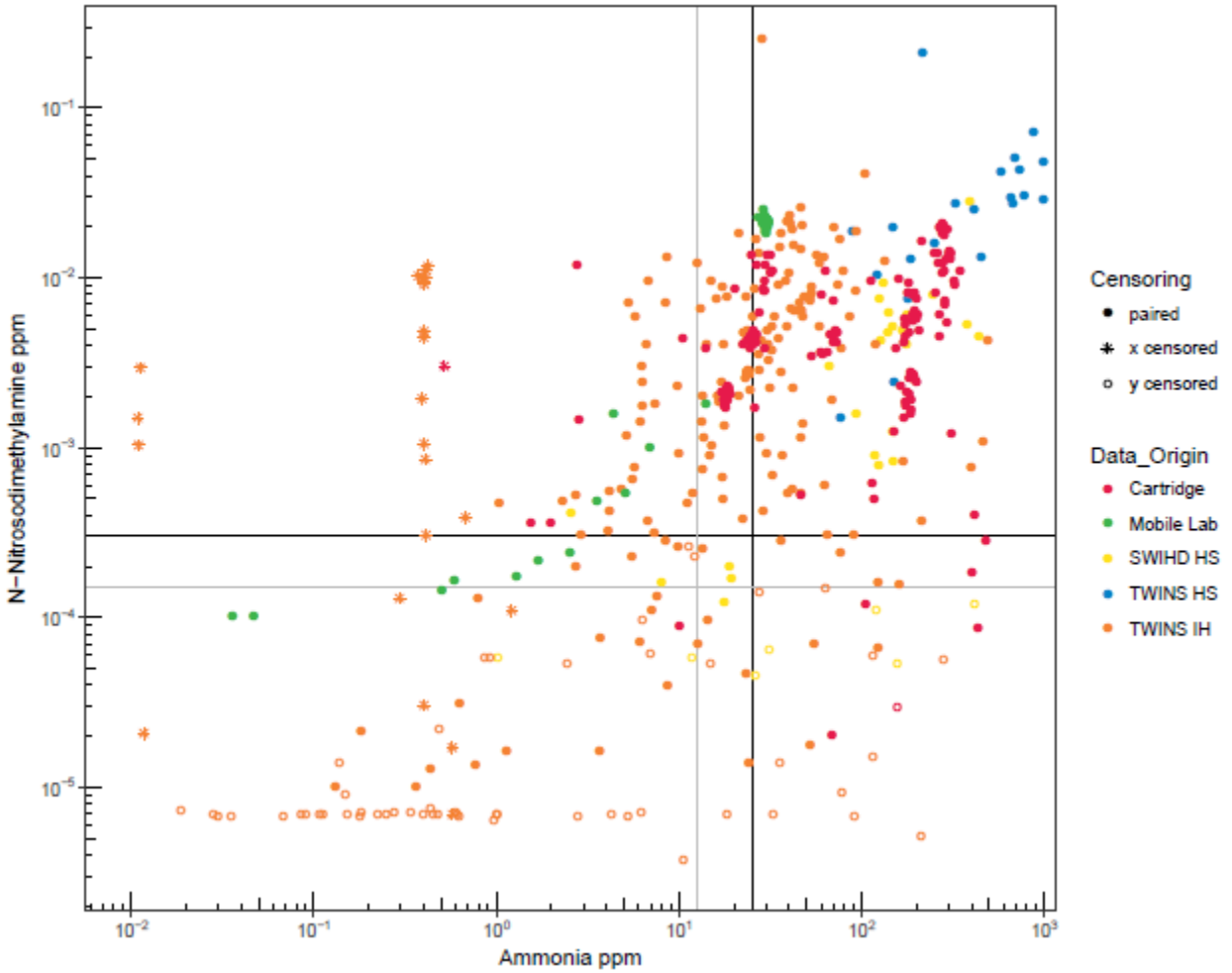


Figure 4.2. NDMA concentrations plotted against ammonia concentrations on log scale. OEL (black lines) and half-OEL (grey lines) are shown for ammonia (vertical) and NDMA (horizontal).

4.3 Dilution Projection and Histograms

Another major difference in the Phase II process, compared to Phase I, is the use of a dilution projection to transform source data into possible concentrations at receptors. All points on the scatterplot are projected to a concentration of significance to the analysis along a 45-degree line, consistent with 1:1 dilution of both candidate LI (x-axis) and COPC (y-axis). This concept is based on the idea that workers will encounter potential exposure to COPCs not at the source itself, but at some location downstream of a breather filter or other physical exhaust diluting headspace vapors into the local atmosphere. The dilution projection covers a range of distances from source to receptor, as the analysis focuses on the concentration of the LI, not a specific distance from the source. Since much of the available data were obtained from the tank headspace and few paired data above detection or reporting limits are available from the area database, this idea provides a more realistic depiction of likely chemical concentrations upon exposure than would be obtained using unprojected source data. Possible reactions and surface effects may also occur between the locations of source and receptor, but are not included in the analysis. The technical basis for using only dilution effects in the analysis is discussed in Appendix A.

Dilution projections may be handled by one of two operations: project to a desired candidate LI concentration (vertical) or project to a desired COPC concentration (horizontal). Fixing one leads to distributions in the other. Both operations and the histograms that provide a visual representation of the resulting concentration distribution are discussed in the following sections (Sections 4.3.1 and 4.3.2, respectively). The vertical projection is preferred for most applications because it provides the best sense of in-field risk and should be used to evaluate questions about consequences and methods. The horizontal projection provides a more convenient means of comparing COPCs for a LI and is used hereafter for that specific purpose.

4.3.1 Vertical Projection

In the vertical projection approach, the data points are projected along a 1:1 dilution line to a vertical line that corresponds to a particular candidate LI concentration. Physically, this projection may correspond to stepping away from the source by an unspecified distance until the candidate LI concentration falls to a particular level (an instrument LLD, for example), and then asking what the probable COPC concentration is at that location. Because there is a distribution of initial LI concentrations, there is a distribution of corresponding distances (see Appendix A, Section A.3) to inform this probability. Although the precise knowledge of these distances is unimportant to LI processes, the distribution of COPC concentrations is important to establishing the breather/receptor risk for a candidate LI LLD.

An example of the vertical projection is shown in Figure 4.3. For this example, ammonia is treated as the potential LI candidate on the x-axis, NDMA is the indicated COPC on the y-axis, and both axes are on a log scale. Solid black lines indicate 1/2 OEL for the potential LI (vertical lines) and OEL for the indicated COPC (horizontal lines). As described for Figure 4.2, data points are colored to represent the type of sampling or test campaign and use symbols to indicate whether a value is presented at or above its reporting or detection limit. The black lines in this example figure project NDMA and ammonia concentrations to a grey vertical line at 1 ppm, a nominal[1] detection limit for ammonia for current direct-reading instruments.

The projection results in a distribution of COPC concentrations. Figure 4.4 shows a histogram that provides a binned density depiction of the distribution of dilution projected data points along a single concentration for the LI (vertical line).[2]. The green columns represent the paired data points where both

[1] Current calibration and data processing protocols used to determine the nominal detection limits may be insufficient for this analysis.

[2] It is tempting to interpret a projection to a vertical line as a sample from the conditional distribution of all existing COPC concentrations for a given LI concentration. There are at least two reasons to be cautious of this interpretation. First, the population of sampled source concentrations is a small selection of the population of all concentrations, and the sampled population cannot be demonstrated conclusively to be representative of concentrations. The population of (past, present, future) source concentrations were produced by a range of tank wastes, forced-ventilation conditions, tank operations, and meteorologically driven release conditions that may not have been sampled in proportion to their frequency of occurrence. To the degree available data provide a representative sample, this concern is relieved. The second reason to be cautious stems from the potential to project data points up to or past concentrations that are physically feasible. Were data points projected farther than appropriate, the univariate distribution may be affected, shifting the lower tolerance limit towards larger concentrations.

concentrations were measured above the detection or reporting limit. The blue and red columns represent the y-censored and x-censored data, respectively, where the concentration of NDMA or ammonia, also respectively, was reported as less than the detection or reporting limit.

The markings at 1/2 OEL, OEL, and the excursion limit show which portion of the data lies to the right of each limit and establish a probability of observing an action level concentration. For example, when the breather/receptor measures ammonia at the approximate nominal detection limit of 1 ppm, there is an approximately 21% chance that the breather/receptor is breathing a concentration above the OEL and ~79% chance that the breather/receptor is breathing a concentration below the OEL. Similarly, there is a ~7% chance that the breather/receptor is breathing a concentration above the excursion limit and a ~93% chance that the breather/receptor is breathing a concentration below the excursion level. WRPS IH may use this information to assess breather/receptor risk and determine acceptable and unacceptable levels of risk to the breather/receptor proximal to a measured location. Statistically the extent of acceptable risk is given by an upper tolerance limit. A tolerance limit specifies both a quantile of interest and the confidence that the quantile is correct. This tolerance limit is an upper tolerance limit since the quantile of interest lies above the mean/median.

Because of the importance of assessing breather/receptor risk, each time the authors faced complicated decisions with multiple options or considered a challenging scenario, the decision on how to proceed or resolve the concern rested on the vertical projection approach. This approach is presented here because decision makers, industrial hygienists, engineers, and workers need to assess the use of a leading indicator information from this perspective.

In contrast, the horizontal projection presented in the next section does not assess worker risk (when WRPS IH measures 8 ppm, the probable concentration of NDMA and potential risk to breathers/workers is not determined by the horizontal projections), but the horizontal projection is a convenient means of summarizing select upper tolerance limits. For example, horizontal projections do not answer what is the probability or risk that NDMA will exceed its OEL at intermediate concentrations. The horizontal projections do provide a convenient means of scanning through the range of potential LI concentrations and comparing LI concentrations necessary for each COPC (necessary for the number line representations in Sections 4.5 and Appendix E). Fortunately, there is a mapping between the two projections from a statistical perspective. Section 4.4 discusses the use of order statistics to obtain tolerance limits. Because the order of the points after projection has a symmetry between the two projections, the resulting order statistics are similar. The upper tolerance limits in one projection become the lower tolerance limits in the other, although addressed to the concentration of interest. See Appendix B, Section B.3 for detail. Put succinctly, the horizontal projection approach trades a continuum of risk values at a particular indicator concentration for fixed levels of risk across a continuum of indicator concentrations.

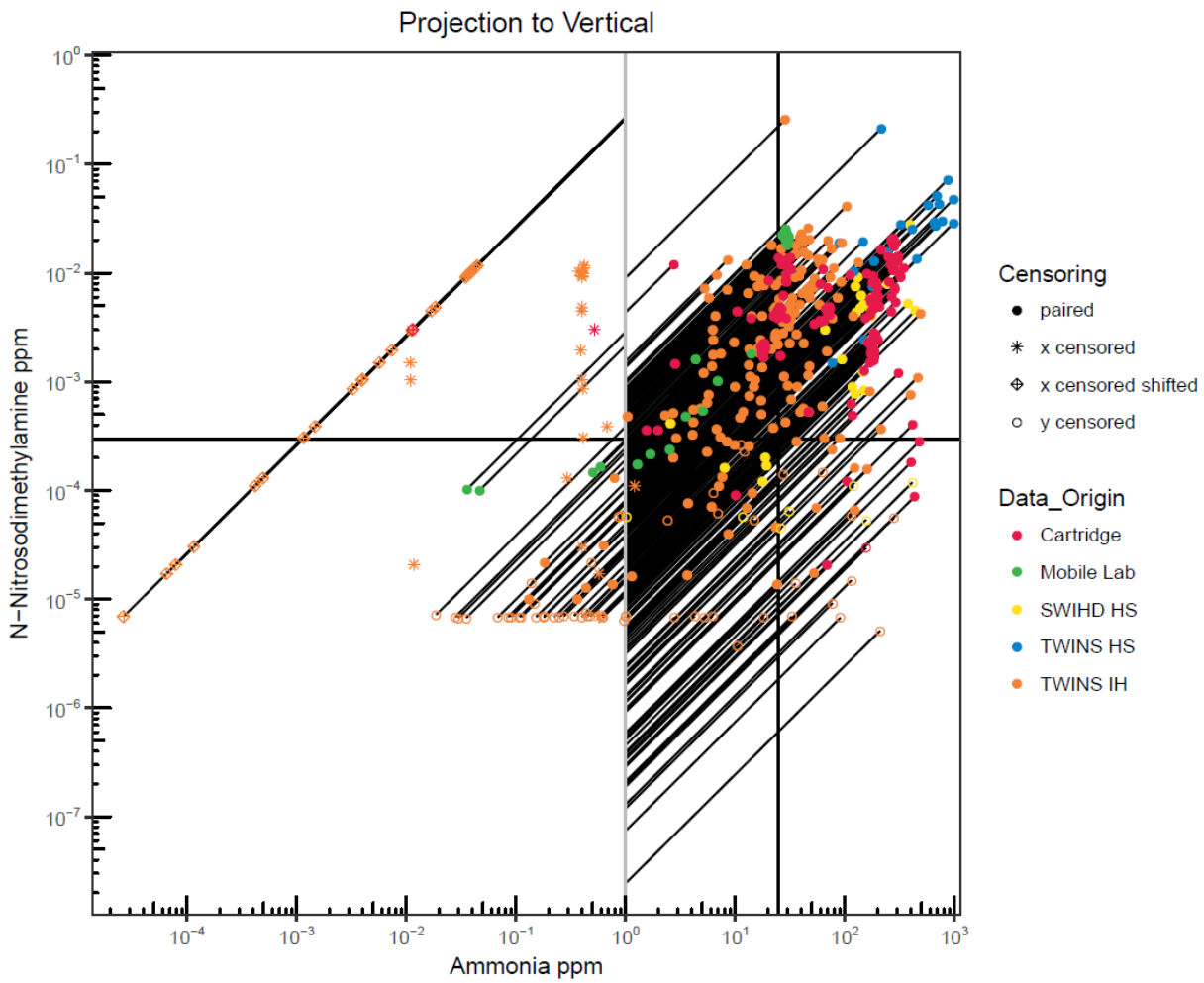


Figure 4.3. NDMA versus ammonia concentrations projected along a 1:1 dilution line to 1 ppm ammonia.

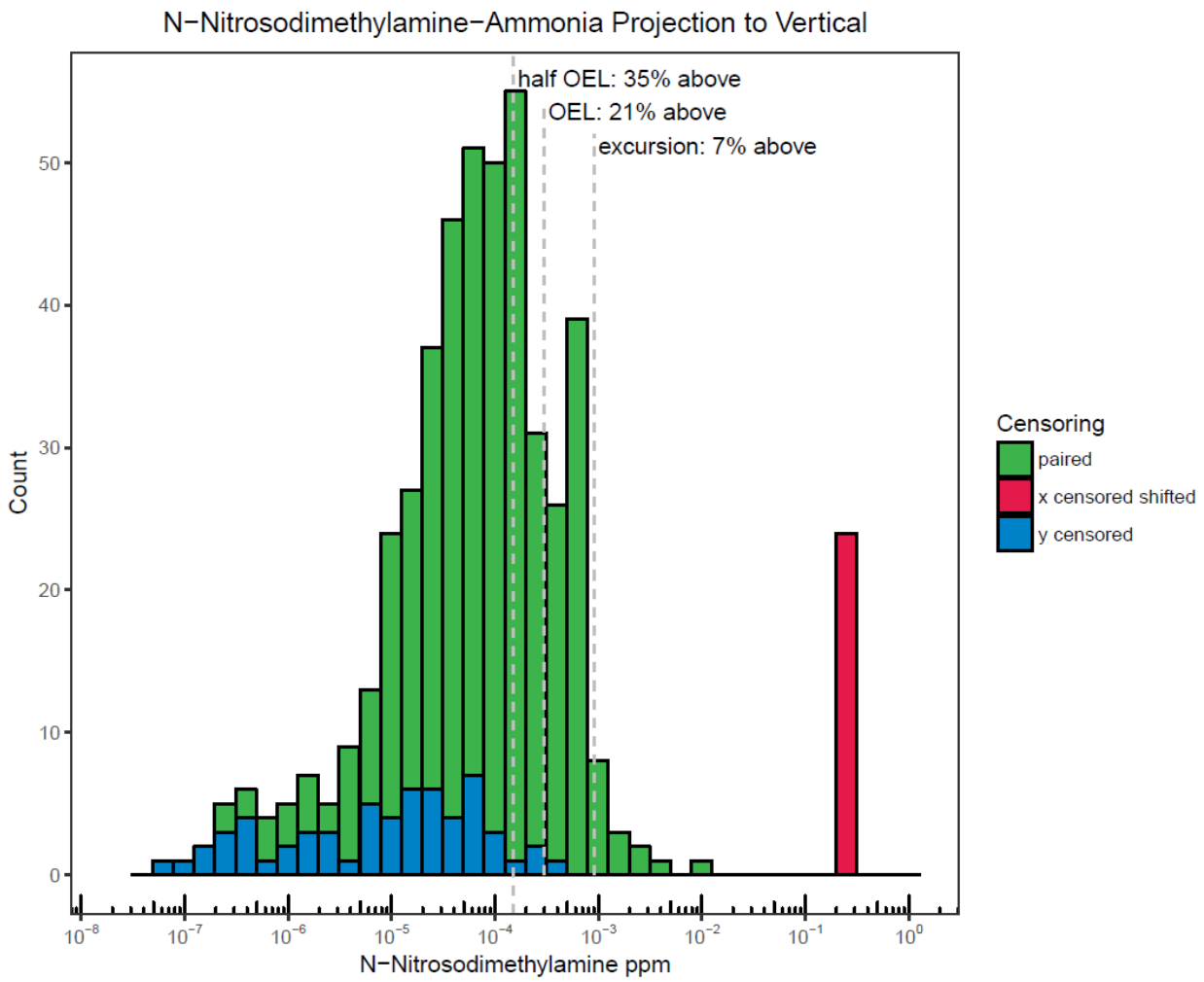


Figure 4.4. Histogram of the 1:1 dilution projection of NDMA versus ammonia data points to a vertical line located at 1 ppm of ammonia.

4.3.2 Horizontal Projection

In the remainder of this report, only the horizontal projection method is used. In the horizontal projection approach, the data points are projected along a 1:1 dilution line to a horizontal line that corresponds to a particular action level (for example, the COPC's OEL). Physically, this projection may correspond to stepping away from the source by an unspecified distance until the COPC concentration falls to its OEL (for example), and then asking what the LI concentration is at that location. Because there is a distribution of initial COPC concentrations, there is a distribution of corresponding distances (see Appendix A, Section A.3). Although the precise knowledge of these distances is unimportant to the LI process, the distribution of indicator concentrations is important and is used to estimate a tolerance limit as described below.

An example of the horizontal projection is shown in Figure 4.5. As above, ammonia is treated as the LI candidate on the x-axis, NDMA is the indicated COPC on the y-axis, and both axes are on a log scale. A solid black line indicates the OEL for the indicated COPC (horizontal lines), respectively. As described

for Figure 4.2, data points are colored to represent the type of sampling or test campaign and use symbols to indicate whether a value is presented at or above its reporting or detection limit. In both the x-censored and y-censored cases, data points are plotted at their detection or reporting limits. The x-censored data points are projected first from their censoring values and then also shifted to the minimum (leftmost) paired point of the projected values. Shifted censored values are shown as diamonds in Figure 4.5.

The dilution projections also result in a distribution of concentrations, here of the indicator instead of the COPC. This distribution (an empirical univariate distribution) may be used directly to calculate statistically representative values (e.g., upper or lower tolerance limits) as described below. Histograms may also be generated, as shown in Figure 4.6, simply to visualize the resulting indicator distribution. The green columns represent the paired data points where both concentrations were measured above the detection or reporting limit. The blue columns represent the y-censored data where the concentration of NDMA was reported as less than the detection or reporting limit. The red column on the left represents the shifted x-censored data points. Vertical dashed lines represent the 90/90 and 95/95 tolerance limits and are discussed in further detail in Section 4.4.

If the data points in the red column had been uncensored ammonia concentrations (i.e., instruments could have detected these concentrations), it is expected that the red column would have been distributed more widely among the low concentration values. Figure 4.6 suggests what ammonia concentrations would have been observed under conditions where the same set of chemicals was being produced, but the dilution was such that NDMA was at its OEL. Histograms for all COPC and potential LI pairs are shown in Appendix C for data projected to 1/2 OEL, OEL, and either the acute ceiling limit (i.e., short-term exposure limits where appropriate) or the 3x excursion limit for the COPC. Specific concentrations for each COPC are defined as part of the site-wide evaluation in Section 5.0.

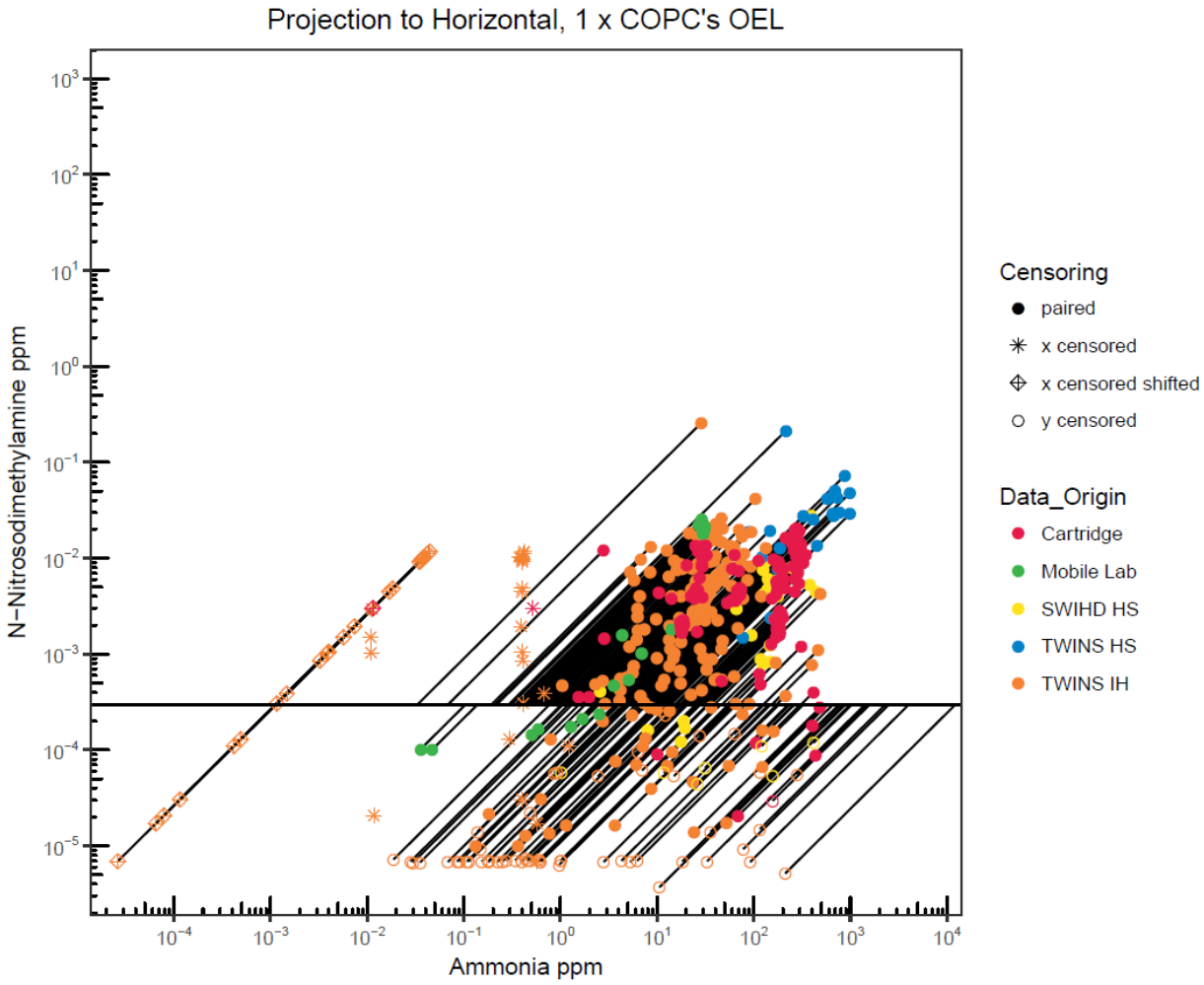


Figure 4.5. NDMA versus ammonia concentrations projected along a 1:1 dilution line to NDMA's OEL.

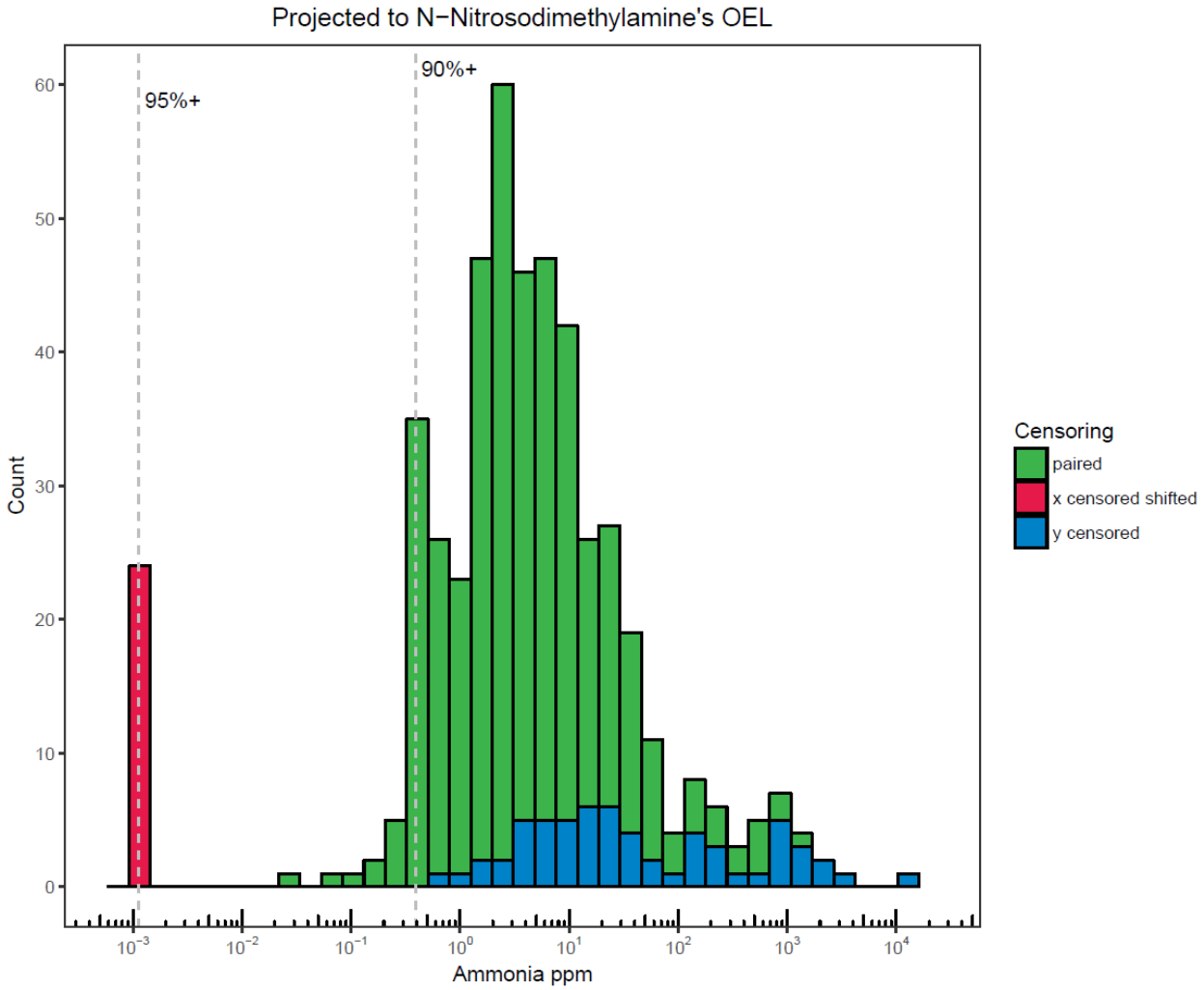


Figure 4.6. Histogram of the 1:1 dilution projection to a horizontal line at NDMA's OEL.

4.4 Tolerance Limit Estimation

The horizontal projection histogram (Figure 4.6) shows that the candidate LI can take on a range of concentration values under the condition that the COPC concentration is at the OEL. A quantile estimation approach provides a good estimate of a threshold that splits the empirical univariate distribution into the bottom 10% and the top 90%, as an example. However, this is an estimate and the true threshold may be higher or lower. To account for this uncertainty, tolerance limit estimation may be used to find a threshold for which one may be 90% confident that at least 90% of the distribution lies above the threshold, as an example. To attain such confidence, one needs to investigate thresholds that are below the 10% quantile estimate.

These tolerance limits are based on nonparametric order statistics. Let n denote the number of points in the univariate distribution. Let p be the probability that an observation, x, is found below the first q^{th} quantile. Let c be the desired confidence level, for example, if the desired confidence level is 90%, then $c = 0.90$. The nonparametric estimate of the lower tolerance limit for the first q-quantile with confidence c is the k^{th} order statistic, where k is the largest integer such that the cumulative distribution function of a

binomial distribution evaluated at $k-1$ with parameters n and p is less than or equal to $1-c$. This means the largest k that satisfies $\sum_{i=0}^{k-1}\binom{n}{i}p^i(1-p)^{n-i} \leq 1-c$ is selected. Order statistics do not depend on the binning used to visually represent the data.

It may be the case that k is zero. This means there are not enough data points available to estimate the desired tolerance limit. Tolerance limits are only calculated if a sufficient number of paired, uncensored data points are available. Note that censored data points are used when calculating the tolerance limits.

The formula above may be derived by noting that each data point has a p% chance of falling within the first q-quantile. The probability that exactly x data points out of n are found in the first q-quantile has a binomial distribution with parameters n and p. The probability that at least k data points out of n are found in the first q-quantile is $\sum_{i=k}^{n}\binom{n}{i}p^i(1-p)^{n-i}$, which can be rewritten as $1-\sum_{i=0}^{k-1}\binom{n}{i}p^i(1-p)^{n-i}$. Our non-parametric tolerance limit is $x_{[k]}$, where k is the largest integer that satisfies, $1-\sum_{i=0}^{nk-1}\binom{n}{i}p^i(1-p)^{n-i} \geq c$ or equivalently $\sum_{i=0}^{k-1}\binom{n}{i}p^i(1-p)^{n-i} \leq 1-c$.

Two different tolerance limits were calculated for this report: a 90/90 limit and a 95/95 limit, requiring respectively 22 and 59 uncensored data points. The 90/90 limit represents a threshold for which there is 90% confidence that at least 90% of the distribution lies above the threshold. The 95/95 limit represents a threshold for which there is 95% confidence that at least 95% of the distribution lies above the threshold. The distinction between 90/90 and 95/95 tolerance intervals is important because the data requirements for the high tolerance level are elevated. The decision to select a 90/90 or 95/95 tolerance interval depends on the tolerance for risk and uncertainty. A 90% confidence level suggests that up to 1 in 10 occurrences could be missed. A 95% confidence level suggests that up to 1 in 20 occurrences could be missed. Calculation of 99/99 tolerance limits was considered, but the current data set is insufficient to do so. Tables in Appendix D list the 90/90 and 95/95 tolerance limits for all COPCs at each of the three concentrations of interest (1/2 OEL, OEL, and either the acute ceiling limit or the 3x excursion limit) for a given potential LI. For some COPCs, the calculated tolerance limit fell within the censored data region of the distribution. There is more uncertainty associated with those numbers due to the uncertainty of the censored measurements. Parentheses are used in the tables in Section 5.0 and Appendix D to identify tolerance limit values within the censored data region.

4.5 Number Lines

Once tolerance limits for each COPC are calculated, a number line is generated for a single LI. An example with ammonia as the LI and calculated 90/90 tolerance limits from projections to the OEL for each COPC can be seen in Figure 4.7. The 1/2 OEL and OEL of the candidate LI are indicated by dashed grey and black lines, respectively. COPCs have been segregated into groups based on relative importance. There were nine COPCs (big 9) identified as being of most interest to WRPS, indicated by red circles: ammonia, nitrous oxide, mercury, 1,3-butadiene, acetonitrile, formaldehyde, furan, NDMA, and nitrosomethylethylamine. The COPCs that are listed on the A Farm and AP Farm Tank Vapor Information Sheet (TVIS) lists, but are not included in the big 9, are shown as blue triangles. These are 2,3-dihydrofuran, 2,5-dihydrofuran, 2-heptylfuran, 2-pentylfuran, ethylamine, nitrosodiethylamine, and nitrosomorpholine. The TVIS group, indicated by burgundy squares, includes all COPCs on the other 15 TVIS lists not already covered. All remaining COPCs not already listed are represented by crosses. Symbols are solid when the tolerance limit falls within the x-censored data (red column) on the horizontal

projection histogram to identify increased uncertainty with the LI tolerance limit. Number lines[3] for all candidate LIs are shown in Appendix E. COPCs without sufficient data to calculate the tolerance limit with the selected confidence are not presented on the number line.

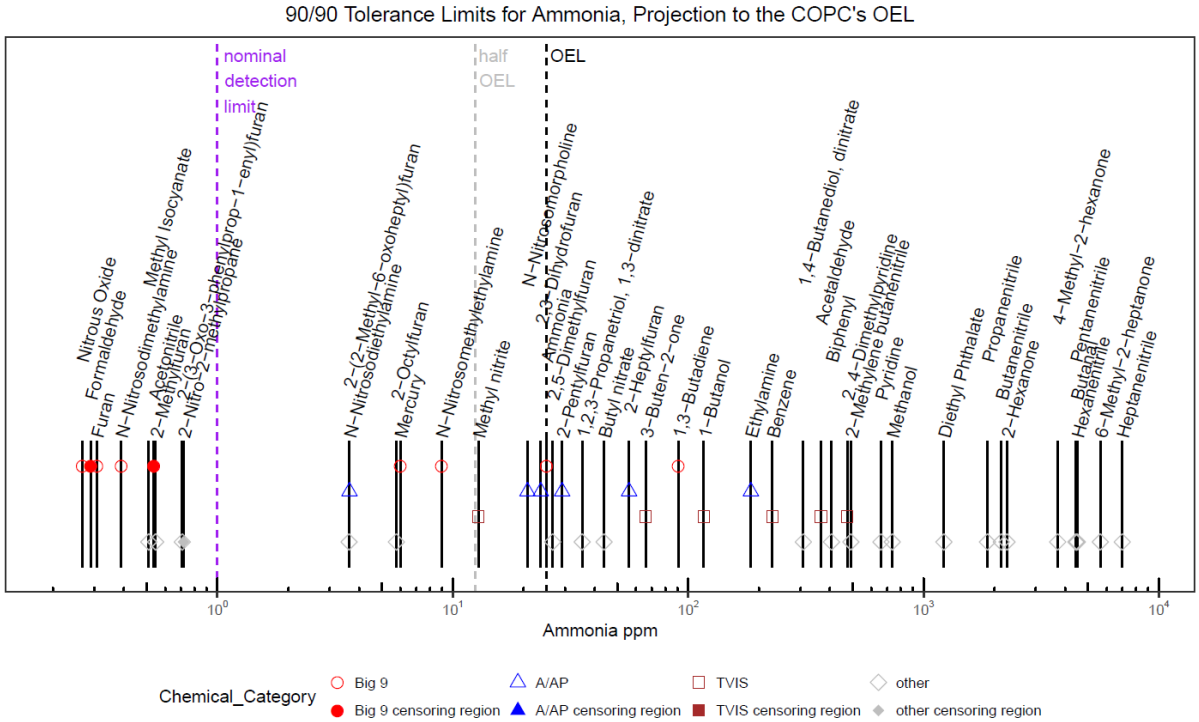


Figure 4.7. Number line of the 90/90 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL.

Number line figures like Figure 4.7 combine lower tolerance limit information for all COPCs (all with enough data to include in the analysis) with a particular LI. For each COPC, the lower tolerance limit is derived from the distribution of LI concentrations corresponding to a specified COPC concentration (i.e., dilutions projected to a horizontal line such as the COPC's OEL). Because these lower tolerance limits correspond to upper tolerance limits (see Section 4.3.1) associated with distributions of COPC concentrations that result from dilution projections to specified LI concentrations (vertical lines), the number line figures convey the COPC exposure risk mentioned in Section 4.3, and therefore are very informative.

4.6 Candidate Assessment

At this point, tolerance limits and number lines exist for candidate LIs and COPCs that can be used to compare candidate LIs. Additionally, LIs can be prioritized based on measurability (such as instrument

[3] Although number lines were generated without reference to a specific instrument, uncertainty in the laboratory data used to generate the number lines and uncertainties associated with in-field operation of the DRIs must be included in evaluation of DRI detection ranges when using these number lines. References to DRI ranges in this report are labeled as nominal to indicate that this analysis has not been performed for any particular instrument.

availability, detection limits), interference due to atmospheric background, consistency of release mechanisms (including known chemical and/or physical properties), and other unexplained behaviors.

Following our definitions for leading and lagging, in Figure 4.7, ammonia is a *leading* indicator for all COPCs for which the 90/90 tolerance limit falls to the right of 1 ppm ammonia (the nominal detection limit for current direct-reading field instruments); ammonia is a *lagging* indicator for all those COPCs for which the 90/90 tolerance limit falls to the left of the nominal ammonia detection limit.

5.0 Site-Wide Evaluation

Focusing a LI evaluation on specific regions (i.e., A and AP farms as discussed in Appendix B, Section B.4) does not take into account tank-to-tank transfers and the associated changes to tank headspace composition. Therefore, the use of site-wide data is recommended. The use of data from all tank farms also provides the largest possible data population for calculation of tolerance limits. The three action limits and associated COPC concentrations chosen for this evaluation are shown in Table 5.1. COPCs that appear on the TVIS lists are shown in bold.

In this section of the report, the evaluation is primarily focused on the three chemicals that have DRIs: ammonia (Section 5.1), nitrous oxide (Section 5.2), and mercury (Section 5.3). Use of multiple indicators is discussed in Section 5.4. Results for other COPCs to determine the potential use as a LI are briefly discussed in Section 5.5; data for all COPCs can be found in the appendices of this report. Scatterplots and histograms for all possible LI-COPC pairings are shown in Appendix C. Tables with calculated tolerance limits at projections to the three COPC concentrations for each candidate LI are show in Appendix D. Number lines for each COPC as a possible LI are shown in Appendix E.

A preliminary evaluation was completed to understand the effect of the censored data in the analysis. This evaluation was initiated due to observation of ammonia measurements that were less than the reporting limit at exhauster locations in the TWINS IH database. When all of the censored data were removed from the analysis, tolerance limits were found to increase for some indicator-COPC pairs and decrease for others. No trends were observed to understand or predict the increase or decrease in calculated tolerance limit values. The recommendation is to retain these measurements because instances where the indicator is found at reporting or detection limits while the COPC has measureable concentrations pose the highest risk for using a LI and should be included in the analysis.

Table 5.1. COPC concentrations used in leading indicator evaluation.

Agent List	1/2 OEL	OEL	Excursion Limit		Units[(b)]	Reference[(c)]
			Acute Ceiling	3x OEL[(a)]		
Ammonia	12.5	25	25	-	ppm	Yu et al. 2017[1]
Nitrous Oxide	25	50	-	150	ppm	
Mercury	12.5	25	50	-	$\mu g/m^3$	Yu et al. 2017
1,3-Butadiene	0.5	1	5	-	ppm	Yu et al. 2017
Benzene	0.25	0.5	2.5	-	ppm	Yu et al. 2017
Biphenyl	0.1	0.2	-	0.6	ppm	
1-Butanol	10	20	200	-	ppm	Yao et al. 2017[2]

[1] Yu XY, TM Brouns, and J Yao. 2017. *Proposed Acute Exposure Concentration Limits for COPCs with Regulatory Guidelines*. PNNL-26850, Rev. A, Pacific Northwest National Laboratory, Richland, Washington. Unpublished.
[2] Yao J, XY Yu, TM Brouns, JG Teeguarden, and TJ Weber. 2017. *Assessing the Potential for Chronic or Acute Health Effects from Exposure to COPC Mixtures*. PNNL-27089, Rev. A, Pacific Northwest National Laboratory, Richland, Washington. Unpublished.

Agent List	1/2 OEL	OEL	Excursion Limit		Units[(b)]	Reference[(c)]
Methanol	100	200	250	-	ppm	Yu et al. 2017
2-Hexanone	2.5	5	10	-	ppm	ACGIH 2001
3-Methyl-3-butene-2-one	0.01	0.02	-	0.06	ppm	
4-Methyl-2-hexanone	0.25	0.5	-	1.5	ppm	
6-Methyl-2-heptanone	4	8	-	24	ppm	
3-Buten-2-one	0.1	0.2	0.2	-	ppm	Yu et al. 2017
Formaldehyde	0.15	0.3	0.3	-	ppm	Yu et al. 2017
Acetaldehyde	12.5	25	25	-	ppm	Yu et al. 2017
Butanal	12.5	25	230	-	ppm	Yao et al. 2017
2-Methyl-2-butenal	0.015	0.03	-	0.09	ppm	
2-Ethyl-hex-2-enal	0.05	0.1	-	0.3	ppm	
2-Propenal	0.05	0.1	0.1	-	ppm	Yu et al. 2017
Furan	0.5	1	180	-	ppb	Yao et al. 2017
2,3-Dihydrofuran	0.5	1	-	3	ppb	
2,5-Dihydrofuran	0.5	1	-	3	ppb	
2-Methylfuran	0.5	1	-	3	ppb	
2,5-Dimethylfuran	0.5	1	-	3	ppb	
2-Ethyl-5-methylfuran	0.5	1	-	3	ppb	
4-(1-Methylpropyl)-2,3-dihydrofuran	0.5	1	-	3	ppb	
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	0.5	1	-	3	ppb	
2-Pentylfuran	0.5	1	-	3	ppb	
2-Heptylfuran	0.5	1	-	3	ppb	
2-Propylfuran	0.5	1	-	3	ppb	
2-Octylfuran	0.5	1	-	3	ppb	
2-(3-Oxo-3-phenylprop-1-enyl)furan	0.5	1	-	3	ppb	
2-(2-Methyl-6-oxoheptyl)furan	0.5	1	-	3	ppb	
Diethyl Phthalate	2.5	5	10	-	mg/m^3	Yao et al. 2017
Acetonitrile	10	20	60	-	ppm	Yao et al. 2017
Propanenitrile	3	6	-	18	ppm	
Butanenitrile	4	8	-	24	ppm	
Pentanenitrile	3	6	-	18	ppm	
Hexanenitrile	3	6	-	18	ppm	
Heptanenitrile	3	6	-	18	ppm	
2-Methylene butanenitrile	0.15	0.3	-	0.9	ppm	
2,4-Pentadienenitrile	0.15	0.3	-	0.9	ppm	
Ethylamine	2.5	5	15	-	ppm	Yu et al. 2017
N-Nitrosodimethylamine	0.15	0.3	-	0.9	ppb	

Agent List	1/2 OEL	OEL	Excursion Limit		Units[(b)]	Reference[(c)]
N-Nitrosodiethylamine	0.05	0.1	-	0.3	ppb	
N-Nitrosomethylethylamine	0.15	0.3	-	0.9	ppb	
N-Nitrosomorpholine	0.3	0.6	-	1.8	ppb	
Tributylphosphate	0.1	0.2	0.46	-	ppm	Yao et al. 2017
Dibutylbutylphosphonate	0.0035	0.007	-	0.021	ppm	
2-Fluoropropene	0.05	0.1	-	0.3	ppm	
Pyridine	0.5	1	10	-	ppm	Yao et al. 2017
2, 4-Dimethylpyridine	0.25	0.5	-	1.5	ppm	
Methyl nitrite	0.05	0.1	-	0.3	ppm	
Butyl nitrite	0.05	0.1	-	0.3	ppm	
Butyl nitrate	1.25	2.5	-	7.5	ppm	
1,4-Butanediol, dinitrate	0.025	0.05	-	0.15	ppm	
2-Nitro-2-methylpropane	0.15	0.3	-	0.9	ppm	
1,2,3-Propanetriol, 1,3-dinitrate	0.025	0.05	-	0.15	ppm	
Methyl Isocyanate	10	20	60	-	ppb	Yu et al. 2017
Dimethyl Mercury	0.005	0.01	-	0.03	mg/m^3	

(a) The American Conference of Governmental Industrial Hygienists (ACGIH) 3x OEL excursion or ceiling rule used within the analysis is a "rule of thumb and a pragmatic precautionary approach" implemented as deemed prudent by qualified WRPS IH personnel.
(b) All other units in report are ppm. A standard temperature and pressure (STP) of 1 atm and 25.00°C was used to convert to ppm. See Appendix B for source data selection of STP.
(c) ACGIH Excursion Rule unless reference listed (ACGIH 2016).
Bold COPCs are identified on TVIS lists.

5.1 Ammonia

Table 5.2 lists the tolerance limit values calculated for the COPCs (TVIS COPCs in bold) evaluated indicating 36 COPCs where ammonia could be a valid LI for dilution projections to the COPC 1/2 OEL and OEL with 90/90 tolerance limits using current direct reading technology, shown as green in the table. This number increases to 43 at the COPC excursion limit. This includes 16 of the 24 COPCs on the TVIS at the COPC 1/2 OEL and OEL for the 90/90 tolerance limits and 19 of the 24 at the COPC excursion limit for the 90/90 tolerance limits. Yellow cells in the table indicate COPCs where the tolerance limit value could be calculated, but it fell below the current 1 ppm nominal detection limit for ammonia. In these cases, ammonia would be a lagging indicator.

Table 5.2 also shows the number of paired data points available for analysis. Fifteen COPCs were found to have insufficient data (<22 data points) for the 90/90 tolerance limit calculations for data projected to all three COPC concentration levels as indicated by NSD and red coloring in the table. At 95/95 tolerance limits, the number of COPCs with insufficient data (<59 paired data points) increases to 30 COPCs for the three concentration levels. Additional data collection efforts can help to close this gap.

Table 5.2. Summary of ammonia as a site-wide leading indicator using a 1-ppm nominal detection limit.

COPC Species	Number of Data Points	1/2 OEL 90/90	OEL 90/90	Excursion 90/90	1/2 OEL 95/95	OEL 95/95	Excursion 95/95
Ammonia	674	1.3E+1	2.5E+1	2.5E+1	1.3E+1	2.5E+1	2.5E+1
1,3-Butadiene	80	4.5E+1	9.1E+1	4.5E+2	1.3E+1	2.5E+1	1.3E+2
Benzene	318	1.1E+2	2.3E+2	1.1E+3	2.3E+1	4.6E+1	2.3E+2
Methanol	175	3.7E+2	7.4E+2	9.2E+2	1.7E+1	3.3E+1	4.1E+1
2-Hexanone	302	1.1E+3	2.3E+3	4.5E+3	1.7E+2	3.5E+2	6.9E+2
4-Methyl-2-hexanone	125	1.9E+3	3.7E+3	1.1E+4	3.2E+2	6.4E+2	1.9E+3
6-Methyl-2-heptanone	80	2.8E+3	5.6E+3	1.7E+4	(8.2E+2)	(1.6E+3)	(4.9E+3)
3-Buten-2-one	192	3.3E+1	6.6E+1	6.6E+1	4.0E+0	7.9E+0	7.9E+0
Acetaldehyde	302	1.8E+2	3.7E+2	3.7E+2	9.0E+0	1.8E+1	1.8E+1
Butanal	392	2.2E+3	4.5E+3	4.1E+4	1.8E+2	3.5E+2	3.2E+3
2-Pentylfuran	68	1.5E+1	2.9E+1	8.7E+1	2.8E+0	5.6E+0	1.7E+1
Diethyl Phthalate	88	6.1E+2	1.2E+3	2.4E+3	1.5E+1	3.1E+1	6.2E+1
Propanenitrile	327	9.3E+2	1.9E+3	5.6E+3	2.9E+2	5.8E+2	1.7E+3
Butanenitrile	313	1.1E+3	2.1E+3	6.4E+3	8.3E+1	1.7E+2	5.0E+2
Pentanenitrile	238	2.2E+3	4.4E+3	1.3E+4	4.9E+2	9.8E+2	2.9E+3
Hexanenitrile	221	2.3E+3	4.5E+3	1.4E+4	4.6E+2	9.3E+2	2.8E+3
Heptanenitrile	92	3.5E+3	7.0E+3	2.1E+4	1.3E+3	2.6E+3	7.8E+3
Ethylamine	91	9.2E+1	1.8E+2	5.5E+2	2.2E+1	4.4E+1	1.3E+2
N-Nitrosomorpholine	184	1.0E+1	2.1E+1	6.2E+1	2.1E+0	4.2E+0	1.3E+1
Pyridine	179	3.3E+2	6.6E+2	6.6E+3	4.2E+1	8.5E+1	8.5E+2
Butyl nitrate	69	2.2E+1	4.4E+1	1.3E+2	(8.2E+0)	(1.6E+1)	(4.9E+1)
N-Nitrosodiethylamine	132	1.8E+0	3.6E+0	1.1E+1	6.5E-1	1.3E+0	3.9E+0
N-Nitrosomethylethylamine	227	4.5E+0	8.9E+0	2.7E+1	7.3E-1	1.5E+0	4.4E+0
1-Butanol	390	5.8E+1	1.2E+2	1.2E+3	(2.5E-1)	(5.0E-1)	(5.0E+0)
Mercury	299	3.0E+0	6.0E+0	1.2E+1	(7.0E-2)	(1.4E-1)	(2.8E-1)
Biphenyl	53	2.0E+2	4.1E+2	1.2E+3	NSD	NSD	NSD
2,3-Dihydrofuran	54	1.2E+1	2.4E+1	7.1E+1	NSD	NSD	NSD
2,5-Dimethylfuran	47	1.3E+1	2.7E+1	8.0E+1	NSD	NSD	NSD
2-Heptylfuran	52	2.8E+1	5.6E+1	1.7E+2	NSD	NSD	NSD
2-Octylfuran	43	2.9E+0	5.8E+0	1.7E+1	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	43	1.8E+0	3.6E+0	1.1E+1	NSD	NSD	NSD
2-Methylene butanenitrile	42	2.5E+2	4.9E+2	1.5E+3	NSD	NSD	NSD
2,4-Dimethylpyridine	58	2.4E+2	4.7E+2	1.4E+3	NSD	NSD	NSD
Methyl nitrite	55	6.4E+0	1.3E+1	3.9E+1	NSD	NSD	NSD
1,4-Butanediol, dinitrate	45	1.5E+2	3.1E+2	9.3E+2	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	37	1.8E+1	3.5E+1	1.1E+2	NSD	NSD	NSD

COPC Species	Number of Data Points	1/2 OEL 90/90	OEL 90/90	Excursion 90/90	1/2 OEL 95/95	OEL 95/95	Excursion 95/95
Furan	108	1.5E-1	3.1E-1	5.5E+1	4.0E-2	8.0E-2	1.4E+1
Acetonitrile	469	(2.7E-1)	(5.4E-1)	(1.6E+0)	(2.7E-1)	(5.4E-1)	(1.6E+0)
N-Nitrosodimethylamine	399	1.9E-1	3.9E-1	1.2E+0	(5.7E-4)	(1.1E-3)	(3.4E-3)
2-Methylfuran	52	2.7E-1	5.5E-1	1.6E+0	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	35	3.5E-1	7.1E-1	2.1E+0	NSD	NSD	NSD
2-Nitro-2-methylpropane	31	(3.6E-1)	(7.2E-1)	(2.2E+0)	NSD	NSD	NSD
Methyl Isocyanate	41	2.6E-1	5.1E-1	1.5E+0	NSD	NSD	NSD
Nitrous Oxide	160	1.3E-1	2.7E-1	8.0E-1	(6.8E-3)	(1.4E-2)	(4.1E-2)
Formaldehyde	338	(1.4E-1)	(2.9E-1)	(2.9E-1)	(1.4E-1)	(2.9E-1)	(2.9E-1)
3-Methyl-3-butene-2-one	2	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	1	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	1	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	15	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	1	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	1	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	5	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	21	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	8	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	4	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	5	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	10	NSD	NSD	NSD	NSD	NSD	NSD

NSD = not sufficient data
Green = leading indicator
Yellow = lagging indicator
Tolerance limit values in parentheses are within the censored data region
Bold COPCs are identified on TVIS lists

Another way to visualize the results in Table 5.2 is as six number lines generated from dilution projections. The six lines come from combining each of the three COPC concentration levels with each of the two tolerance limits, 90/90 and 95/95, as shown in Figure 5.1 through Figure 5.6. In each figure, the 1/2 OEL and OEL for ammonia are indicated by dashed vertical grey and black lines, respectively. Open symbols represent calculated tolerance limits that fell within the paired region of data on the histograms. Solid symbols represent calculated tolerance limits that fell within the x-censored region of data on the histogram and have larger uncertainty associated with the value. In these figures, COPC lines that fall to

the right of the nominal 1 ppm ammonia detection limit on the x-axis are represented as green cells in Table 5.2 and could be represented by ammonia as a LI. Yellow cells from Table 5.2 are represented by lines to the left of the nominal 1-ppm detection limit for ammonia where ammonia would be a lagging indicator. At the excursion limit with 90/90 tolerance limits, only 2 of the 45 COPCs [formaldehyde and nitrous oxide] fall to the left of 1 ppm on the x-axis.

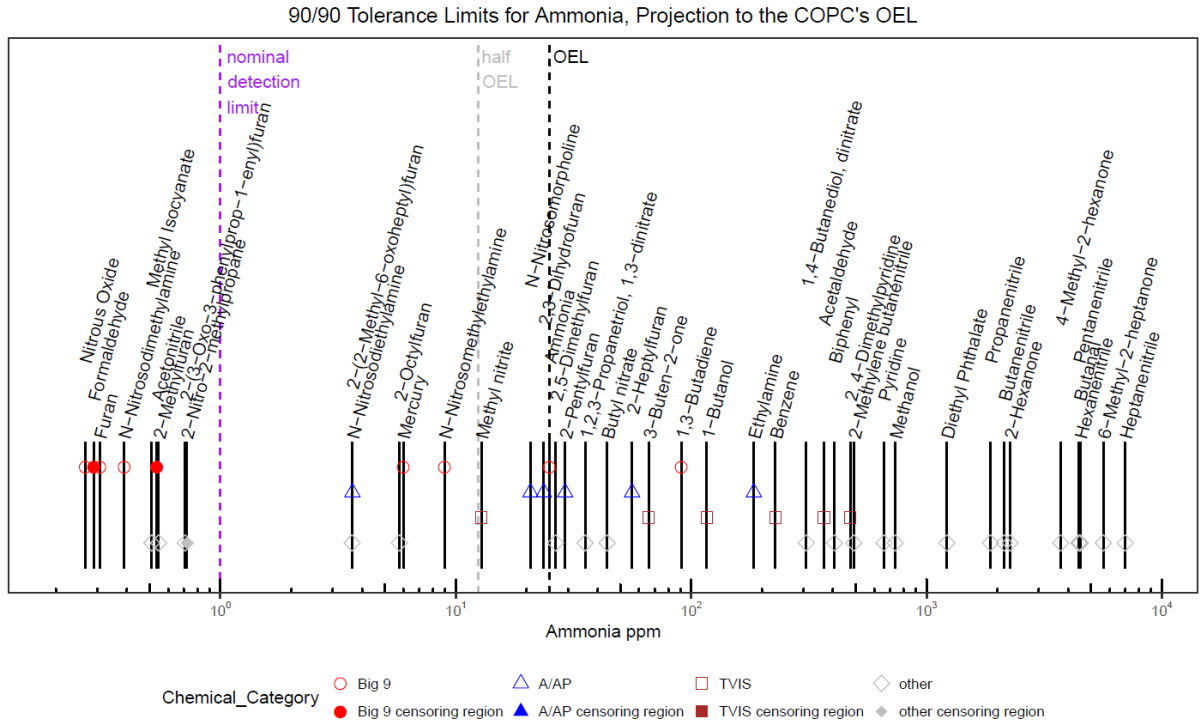


Figure 5.1. Number line of the 90/90 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL.

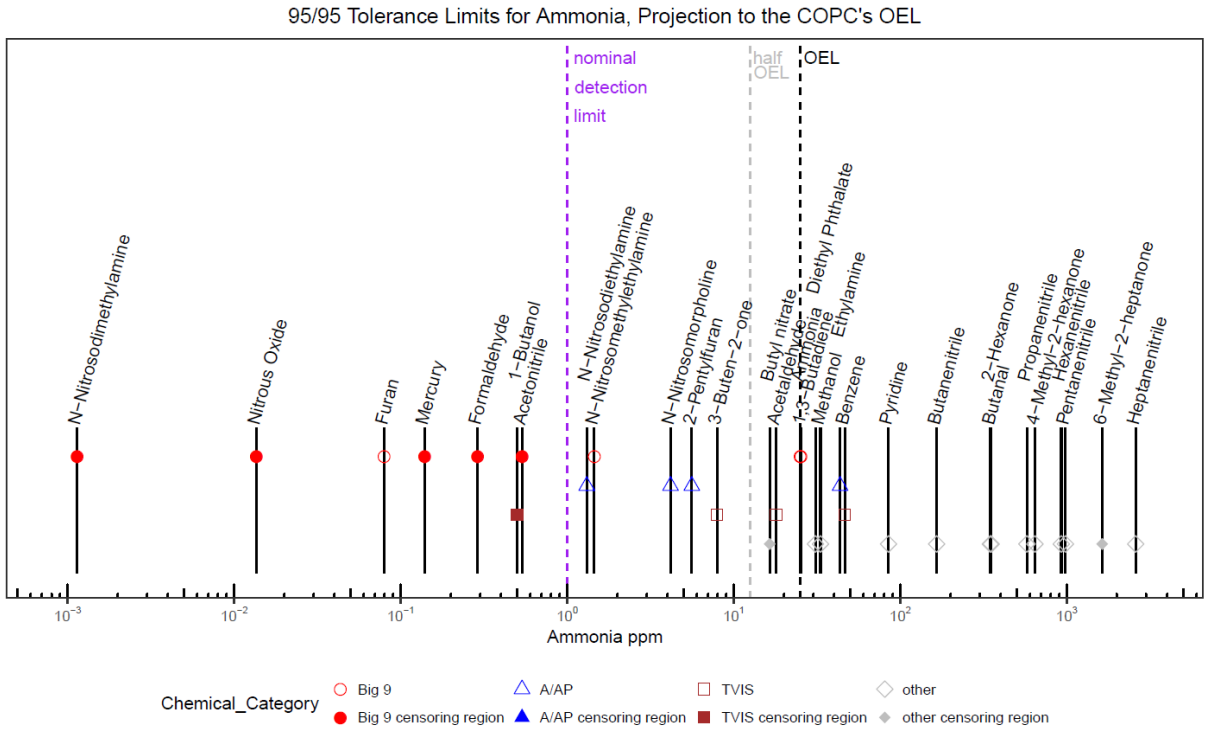


Figure 5.2. Number line of the 95/95 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL.

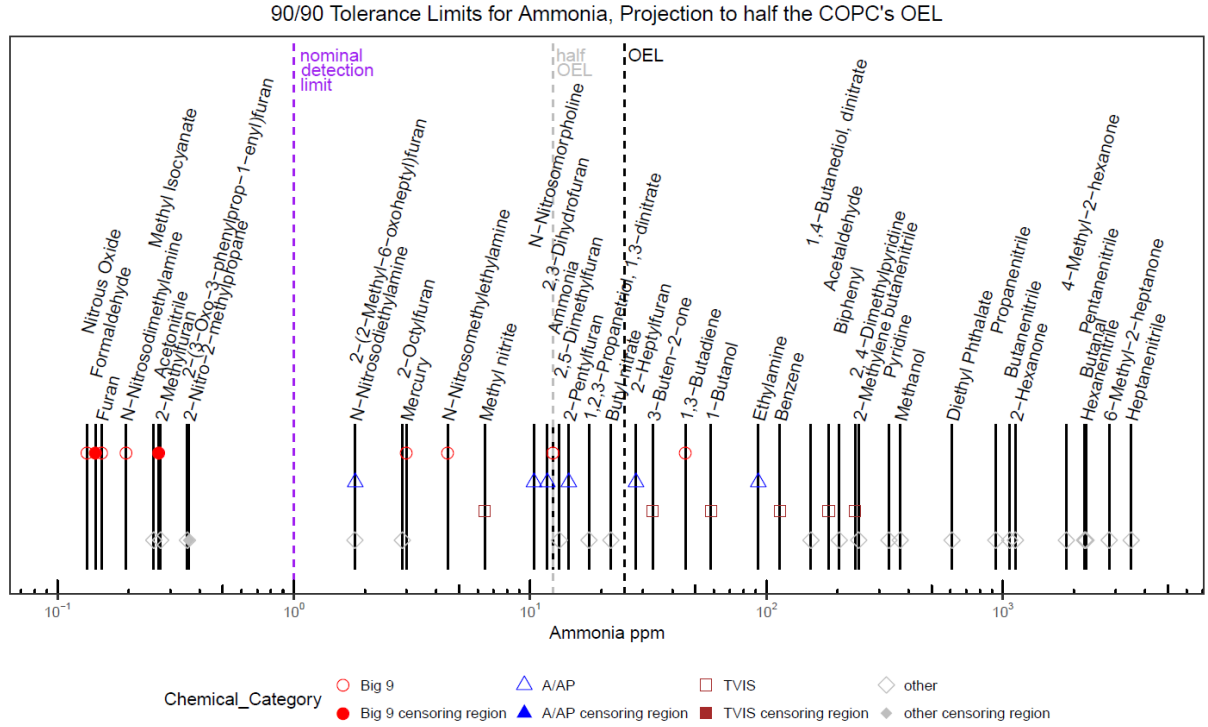


Figure 5.3. Number line of the 90/90 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL.

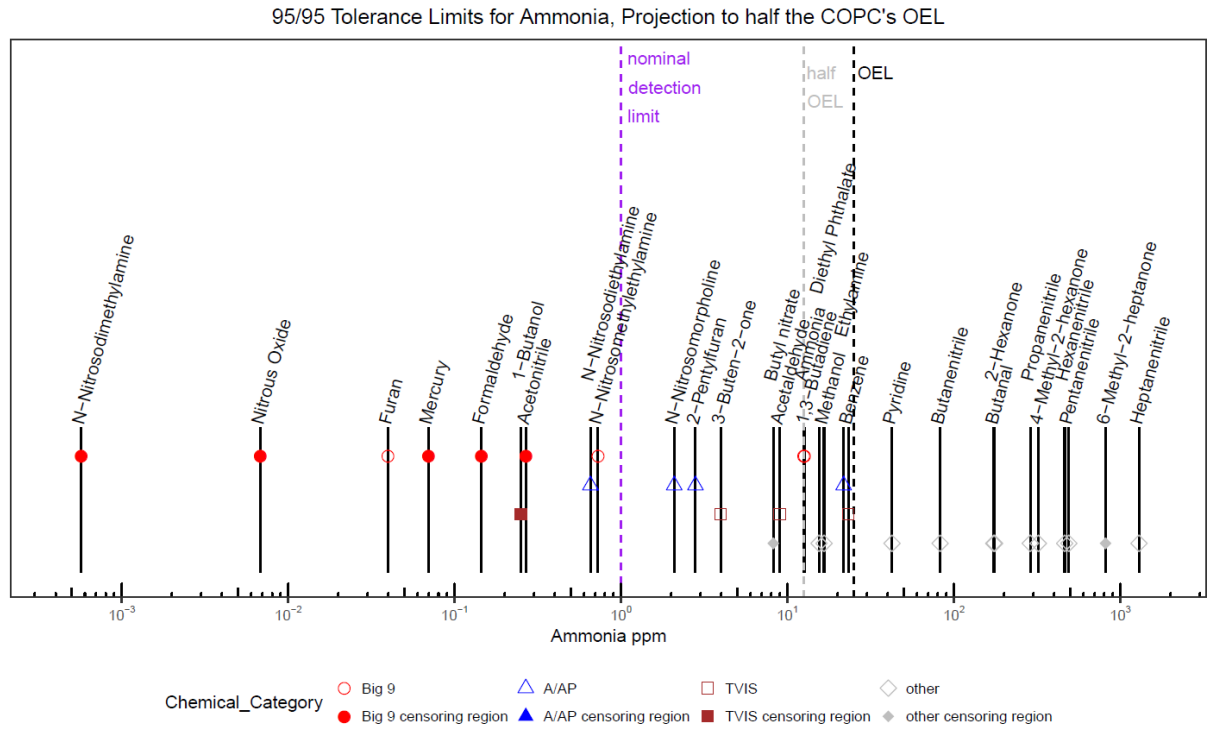


Figure 5.4. Number line of the 95/95 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL.

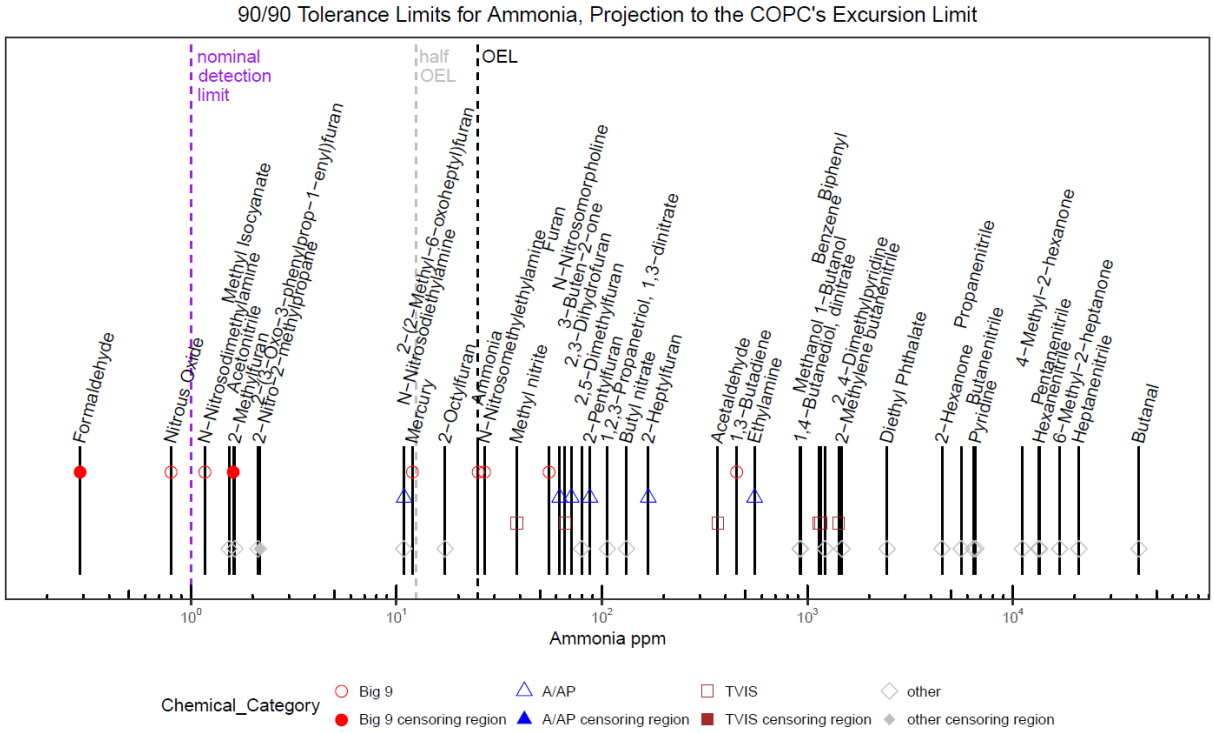


Figure 5.5. Number line of the 90/90 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit.

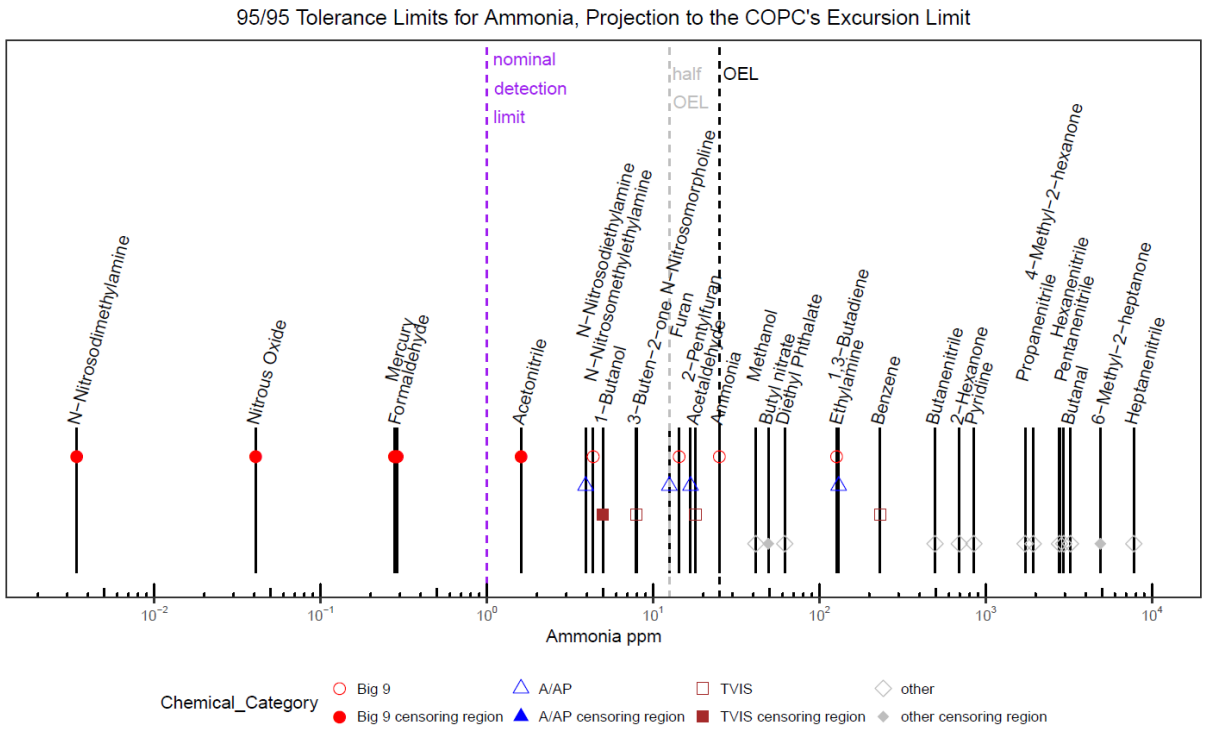


Figure 5.6. Number line of the 95/95 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit.

5.2 Nitrous Oxide

Table 5.3 lists the tolerance limit values calculated for the COPCs (TVIS COPCs in bold) evaluated indicating 21 COPCs (9 TVIS COPCs) where nitrous oxide may be a valid LI for dilution projections to the COPC 1/2 OEL with 90/90 tolerance limits using current direct reading technology with a nominal detection limit of 0.04 ppm for nitrous oxide as indicated by green in the table. This number increases to 22 (10 TVIS COPCs) at the COPC OEL and the COPC excursion limit. The one yellow cell in the table indicates that the tolerance limit could be calculated for NDMA, but the value fell below the current nominal detection limit for nitrous oxide.

Table 5.3 also shows the number of paired data points available for analysis. Thirty-eight COPCs (14 TVIS COPCs) were found to have insufficient data (<22 data points) for the 90/90 tolerance limit calculations for data projected to all three COPC concentration levels as indicated by NSD and red coloring in the table. This number increases to 47 COPCs (18 TVIS COPCs) with insufficient data (<59 data points) to calculate the 95/95 tolerance limits for the three COPC concentration levels. Additional data collection efforts can help to close this gap.

The following six number lines shown in Figure 5.7 through Figure 5.12 are generated from the 90/90 and 95/95 tolerance limits found in Table 5.3 for dilution projections to each of the three COPC concentration levels (1/2 OEL, OEL, and excursion limit). In each figure, the 1/2 OEL and OEL for nitrous oxide are indicated by dashed vertical grey and black lines, respectively. Open symbols represent calculated tolerance limits that fell within the paired region of data on the histograms. Solid symbols represent calculated tolerance limits that fell within the x-censored region of data on the histogram and

have larger uncertainty associated with the value. In these figures, COPC lines that fall to the right of the nominal 0.04-ppm nitrous oxide detection limit on the x-axis are represented as green cells in Table 5.3 and could be represented by nitrous oxide as a LI. Background levels of nitrous oxide are typically observed at 0.25 ppm (Calmus et al. 2017), well above the nominal detection limit; this possible limitation has not been considered in the coloring in Table 5.3. The only yellow cell from Table 5.3 is represented by a line to the left of the nominal 0.04 ppm nitrous oxide detection limit. Only NDMA appears to have calculated tolerance limits below the background concentration of nitrous oxide.

Table 5.3. Summary of nitrous oxide as a site-wide leading indicator using a 0.04 ppm nominal detection limit.

COPC Species	Number of Data Points	1/2 OEL 90/90	OEL 90/90	Excursion 90/90	1/2 OEL 95/95	OEL 95/95	Excursion 95/95
Nitrous Oxide	501	2.5E+1	5.0E+1	1.5E+2	2.5E+1	5.0E+1	1.5E+2
Ammonia	160	(5.5E-1)	(1.1E+0)	(1.1E+0)	(5.5E-1)	(1.1E+0)	(1.1E+0)
Benzene	97	(5.0E-1)	(1.0E+0)	(5.0E+0)	(5.0E-1)	(1.0E+0)	(5.0E+0)
1-Butanol	147	(4.7E-1)	(9.4E-1)	(9.4E+0)	(4.7E-1)	(9.4E-1)	(9.4E+0)
Methanol	99	(9.5E-1)	(1.9E+0)	(2.4E+0)	(9.5E-1)	(1.9E+0)	(2.4E+0)
2-Hexanone	82	(6.5E+0)	(1.3E+1)	(2.6E+1)	(6.5E+0)	(1.3E+1)	(2.6E+1)
Acetaldehyde	62	(3.9E-1)	(7.7E-1)	(7.7E-1)	(3.9E-1)	(7.7E-1)	(7.7E-1)
Butanal	104	(7.3E-1)	(1.5E+0)	(1.3E+1)	(7.3E-1)	(1.5E+0)	(1.3E+1)
Acetonitrile	133	(1.3E+0)	(2.6E+0)	(7.8E+0)	(1.3E+0)	(2.6E+0)	(7.8E+0)
Propanenitrile	102	(1.2E+0)	(2.4E+0)	(7.3E+0)	(1.2E+0)	(2.4E+0)	(7.3E+0)
Butanenitrile	95	(2.8E+0)	(5.7E+0)	(1.7E+1)	(2.8E+0)	(5.7E+0)	(1.7E+1)
Pentanenitrile	80	(1.1E+1)	(2.1E+1)	(6.4E+1)	(1.1E+1)	(2.1E+1)	(6.4E+1)
Hexanenitrile	80	(1.2E+1)	(2.4E+1)	(7.2E+1)	(1.2E+1)	(2.4E+1)	(7.2E+1)
Mercury	40	(5.9E-1)	(1.2E+0)	(2.4E+0)	NSD	NSD	NSD
6-Methyl-2-heptanone	33	(2.0E+3)	(4.1E+3)	(1.2E+4)	NSD	NSD	NSD
3-Buten-2-one	25	(8.5E+0)	(1.7E+1)	(1.7E+1)	NSD	NSD	NSD
Formaldehyde	57	(6.1E+0)	(1.2E+1)	(1.2E+1)	NSD	NSD	NSD
Heptanenitrile	50	(1.7E+1)	(3.3E+1)	(1.0E+2)	NSD	NSD	NSD
Pyridine	45	(3.7E+1)	(7.5E+1)	(7.5E+2)	NSD	NSD	NSD
Butyl nitrate	30	(2.0E+0)	(4.0E+0)	(1.2E+1)	NSD	NSD	NSD
2-Nitro-2-methylpropane	28	(1.9E+1)	(3.9E+1)	(1.2E+2)	NSD	NSD	NSD
N-Nitrosodimethylamine	52	(3.5E-2)	(7.0E-2)	(2.1E-1)	NSD	NSD	NSD
1,3-Butadiene	17	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	8	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	3	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	1	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	1	NSD	NSD	NSD	NSD	NSD	NSD
Furan	8	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	5	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	4	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	1	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	1	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2	NSD	NSD	NSD	NSD	NSD	NSD

COPC Species	Number of Data Points	1/2 OEL 90/90	OEL 90/90	Excursion 90/90	1/2 OEL 95/95	OEL 95/95	Excursion 95/95
4-(1-Methylpropyl)-2,3-dihydrofuran	1	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	1	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	0	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	1	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	1	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	1	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	1	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	1	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	12	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	0	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	1	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	3	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	9	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	11	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	18	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	8	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	3	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Dimethylpyridine	3	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	14	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	5	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	3	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	0	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	1	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	13	NSD	NSD	NSD	NSD	NSD	NSD

NSD = not sufficient data
Green = leading indicator
Yellow = lagging indicator
Tolerance limit values in parentheses are within the censored data region
Bold COPCs are identified on TVIS lists

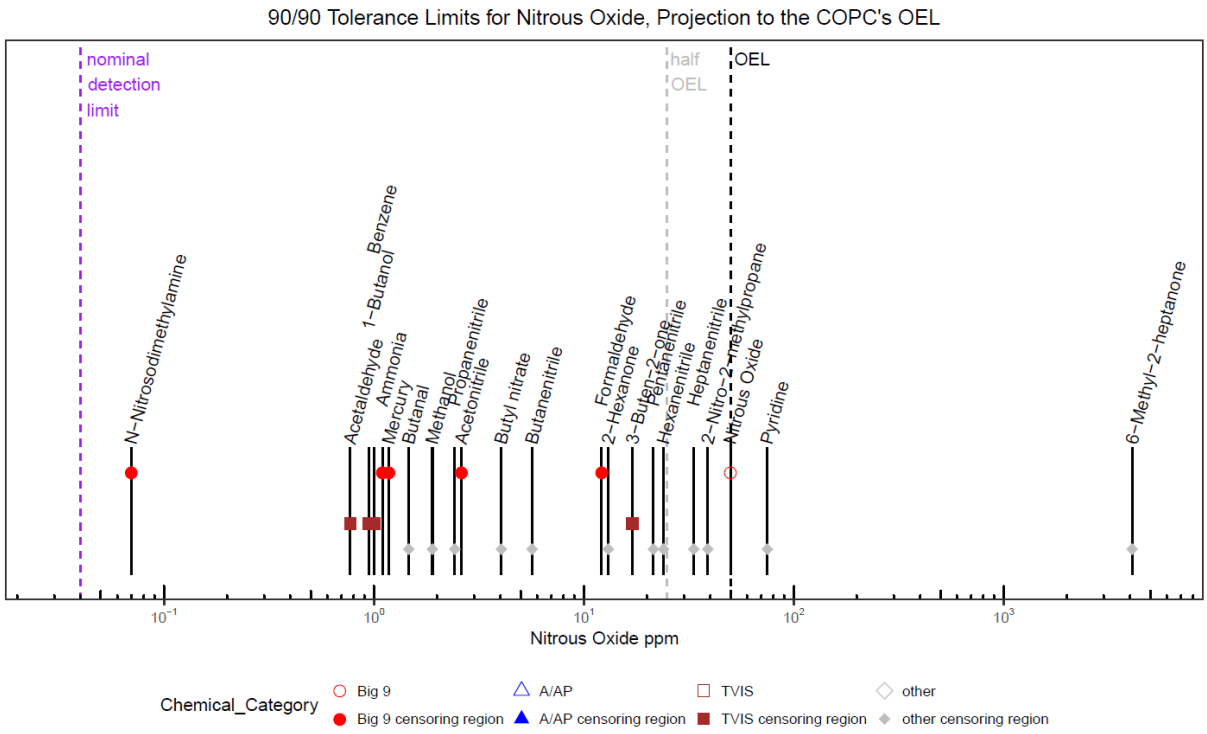


Figure 5.7. Number line of the 90/90 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL.

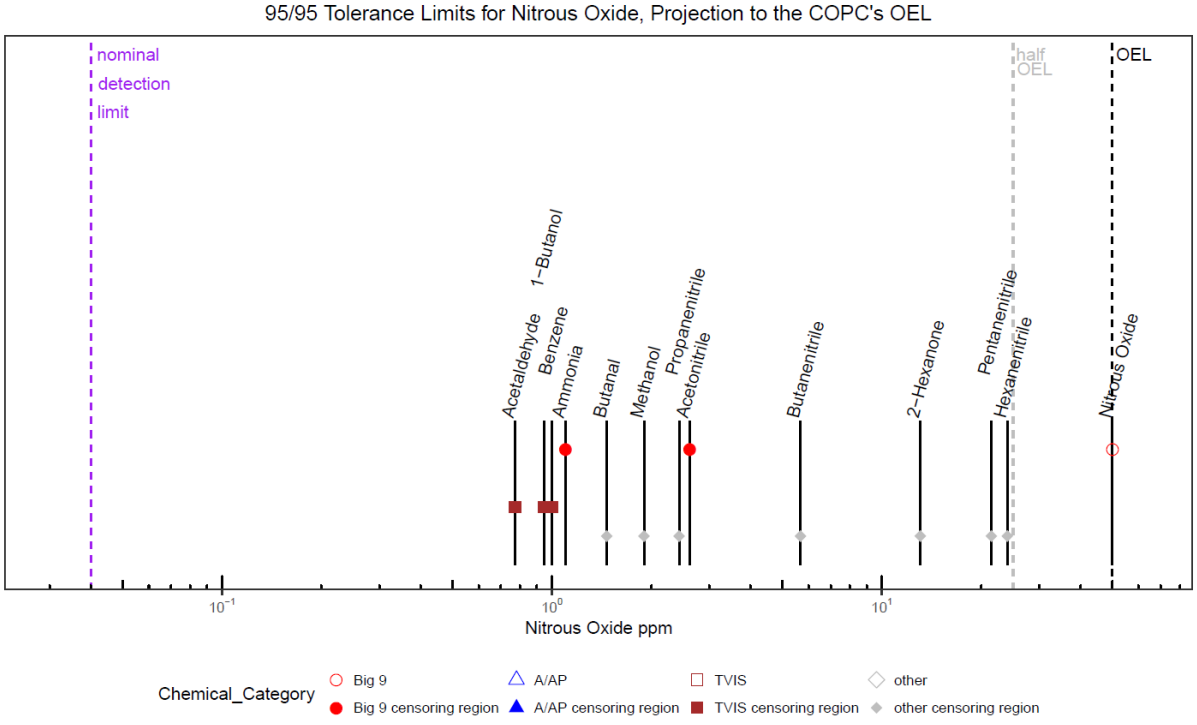


Figure 5.8. Number line of the 95/95 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL.

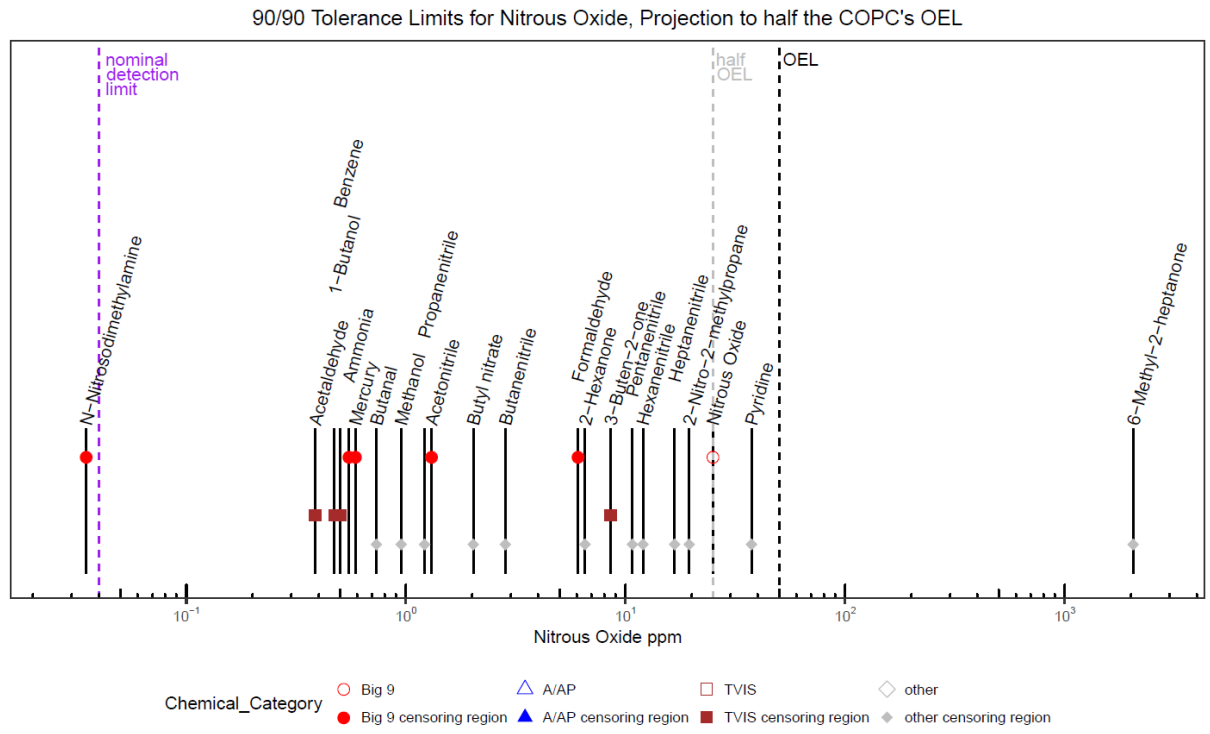


Figure 5.9. Number line of the 90/90 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL.

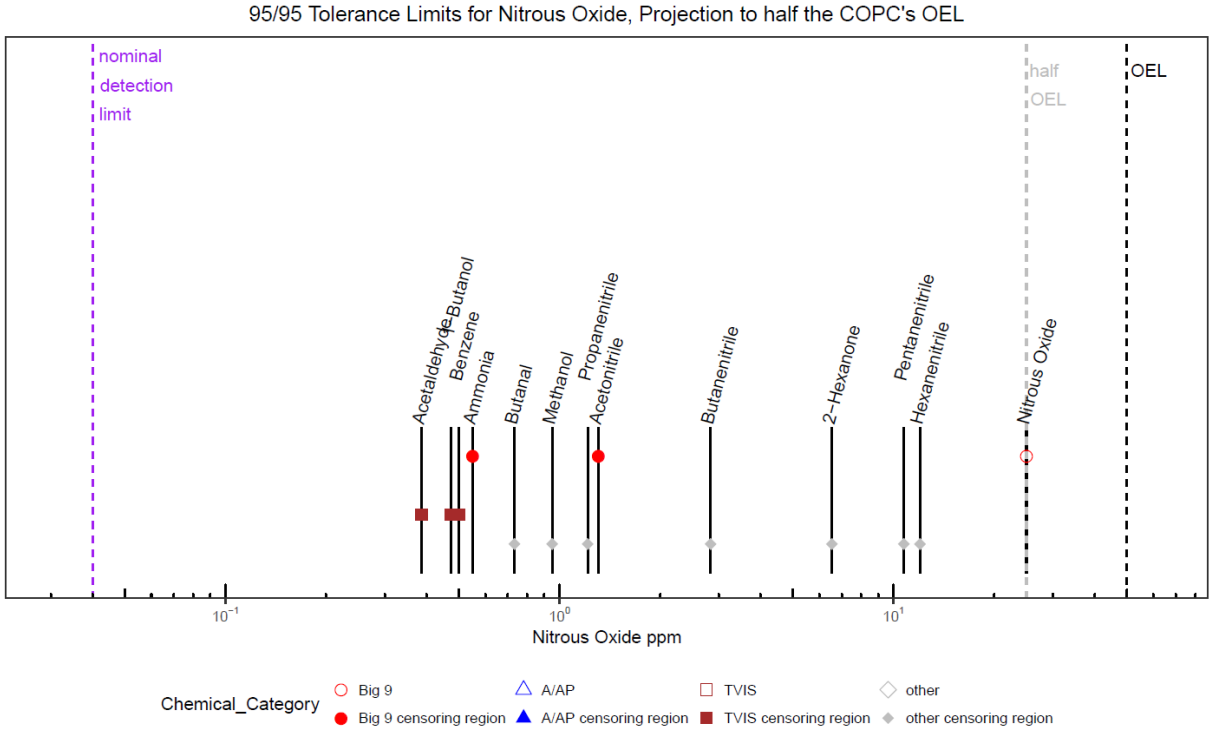


Figure 5.10. Number line of the 95/95 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL.

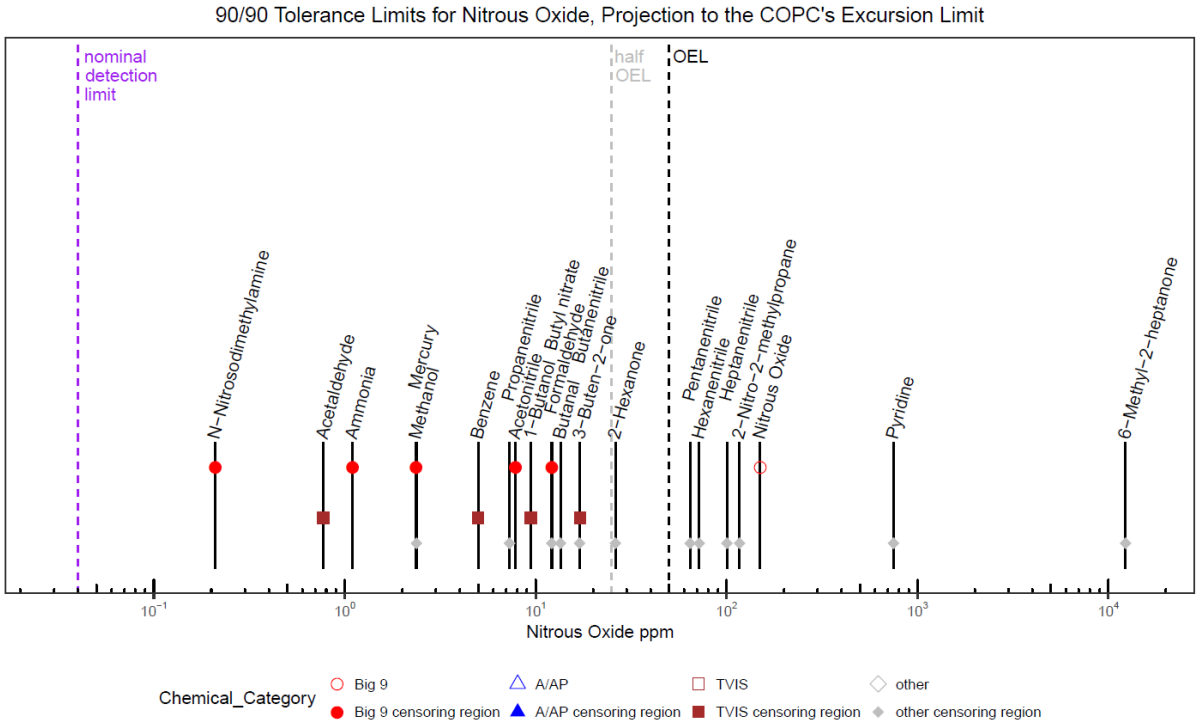


Figure 5.11. Number line of the 90/90 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit.

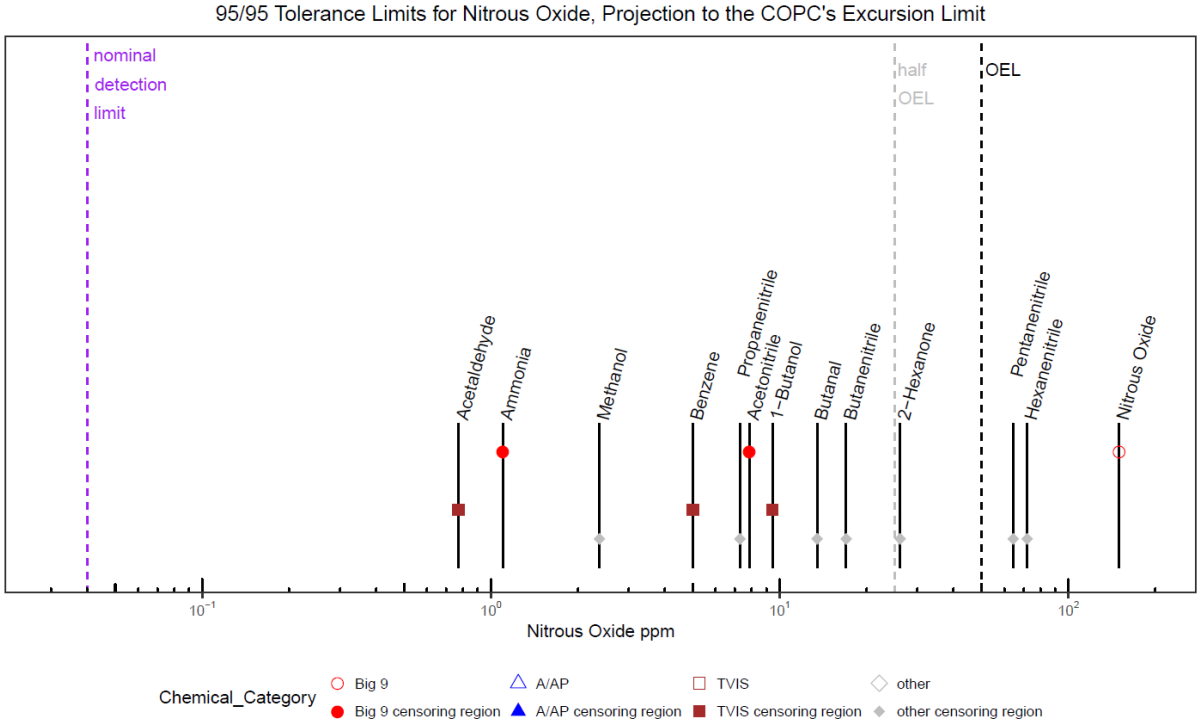


Figure 5.12. Number line of the 95/95 nitrous oxide concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit.

5.3 Mercury

Table 5.4 lists the tolerance limit values calculated for the COPCs (TVIS COPCs in bold) evaluated indicating 24 COPCs (14 TVIS COPCs) where mercury may be a valid LI for dilution projections to the COPC 1/2 OEL and 25 COPCs (15 TVIS COPCs) at OEL with 90/90 tolerance limits using current direct reading technology with a nominal detection limit of 1.6 x 10^{-6} ppm for mercury, as indicated by green in the table. This number increases to 26 (16 TVIS COPCs) at the COPC excursion limit for 90/90. The yellow cells in the table indicate that the tolerance limit was calculated for these COPCs, but the value fell below the current nominal detection limit for mercury, meaning that mercury would be a lagging indicator. Table 5.4 also shows the number of paired data points available for analysis. Thirty-two COPCs (6 TVIS COPCs) were found to have insufficient data (<22 data points) for the 90/90 tolerance limit calculations for data projected to all three COPC concentration levels, as indicated by NSD and red coloring in the table. This number increases to 40 COPCs (12 TVIS COPCs) with insufficient data (<59 data points) to calculate the 95/95 tolerance limits for the three COPC concentration levels. Additional data collection efforts can help to close this gap.

Table 5.4. Summary of mercury as a site-wide leading indicator using a 1.6 x 10^{-6} ppm nominal detection limit.

COPC Species	Number of Data Points	1/2 OEL 90/90	OEL 90/90	Excursion 90/90	1/2 OEL 95/95	OEL 95/95	Excursion 95/95
Mercury	341	1.5E-3	3.0E-3	6.1E-3	1.5E-3	3.0E-3	6.1E-3
Benzene	148	(6.0E-5)	(1.2E-4)	(6.0E-4)	(6.0E-5)	(1.2E-4)	(6.0E-4)
1-Butanol	190	(9.1E-5)	(1.8E-4)	(1.8E-3)	(9.1E-5)	(1.8E-4)	(1.8E-3)
2-Hexanone	161	(6.0E-4)	(1.2E-3)	(2.4E-3)	(6.0E-4)	(1.2E-3)	(2.4E-3)
4-Methyl-2-hexanone	76	1.2E-1	2.5E-1	7.4E-1	(1.8E-2)	(3.7E-2)	(1.1E-1)
3-Buten-2-one	143	(1.1E-4)	(2.1E-4)	(2.1E-4)	(1.1E-4)	(2.1E-4)	(2.1E-4)
Formaldehyde	223	(1.3E-5)	(2.6E-5)	(2.6E-5)	(1.3E-5)	(2.6E-5)	(2.6E-5)
Acetaldehyde	174	(3.0E-3)	(6.0E-3)	(6.0E-3)	(3.0E-3)	(6.0E-3)	(6.0E-3)
Butanal	218	(8.9E-4)	(1.8E-3)	(1.6E-2)	(8.9E-4)	(1.8E-3)	(1.6E-2)
Acetonitrile	227	(1.5E-4)	(3.1E-4)	(9.2E-4)	(1.5E-4)	(3.1E-4)	(9.2E-4)
Propanenitrile	158	(2.1E-4)	(4.2E-4)	(1.3E-3)	(2.1E-4)	(4.2E-4)	(1.3E-3)
Butanenitrile	165	(2.0E-4)	(4.1E-4)	(1.2E-3)	(2.0E-4)	(4.1E-4)	(1.2E-3)
Pentanenitrile	100	8.1E-2	1.6E-1	4.9E-1	(2.8E-3)	(5.6E-3)	(1.7E-2)
Hexanenitrile	91	8.2E-2	1.6E-1	4.9E-1	(1.9E-3)	(3.8E-3)	(1.1E-2)
N-Nitrosodiethylamine	86	1.3E-4	2.6E-4	7.8E-4	(2.6E-5)	(5.1E-5)	(1.5E-4)
N-Nitrosomethylethylamine	142	(6.4E-6)	(1.3E-5)	(3.8E-5)	(6.4E-6)	(1.3E-5)	(3.8E-5)
N-Nitrosomorpholine	115	(1.6E-5)	(3.1E-5)	(9.3E-5)	(1.6E-5)	(3.1E-5)	(9.3E-5)
Pyridine	114	1.7E-2	3.3E-2	3.3E-1	(1.1E-3)	(2.2E-3)	(2.2E-2)
1,3-Butadiene	27	1.0E-3	2.1E-3	1.0E-2	NSD	NSD	NSD
Methanol	26	(1.0E-3)	(2.1E-3)	(2.6E-3)	NSD	NSD	NSD
2,3-Dihydrofuran	42	9.1E-4	1.8E-3	5.5E-3	NSD	NSD	NSD
2-Pentylfuran	22	1.8E-3	3.6E-3	1.1E-2	NSD	NSD	NSD
Diethyl Phthalate	28	9.9E-3	2.0E-2	4.0E-2	NSD	NSD	NSD
Ethylamine	47	8.1E-3	1.6E-2	4.9E-2	NSD	NSD	NSD
Furan	40	1.0E-6	2.1E-6	3.8E-4	NSD	NSD	NSD

COPC Species	Number of Data Points	1/2 OEL 90/90	OEL 90/90	Excursion 90/90	1/2 OEL 95/95	OEL 95/95	Excursion 95/95
Nitrous Oxide	40	(5.4E-7)	(1.1E-6)	(3.2E-6)	NSD	NSD	NSD
Ammonia	299	(2.8E-7)	(5.6E-7)	(5.6E-7)	(2.8E-7)	(5.6E-7)	(5.6E-7)
N-Nitrosodimethylamine	257	(8.1E-8)	(1.6E-7)	(4.9E-7)	(8.1E-8)	(1.6E-7)	(4.9E-7)
Biphenyl	1	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	0	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	3	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	0	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	1	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	1	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	11	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	9	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	4	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	0	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	0	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	0	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	6	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	0	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	0	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	0	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	2	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	0	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	0	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	7	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	0	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Dimethylpyridine	13	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	0	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	0	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	3	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	0	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	7	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	0	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	0	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	15	NSD	NSD	NSD	NSD	NSD	NSD

NSD = not sufficient data
Green = leading indicator
Yellow = lagging indicator
Tolerance limit values in parentheses are within the censored data region
Bold COPCs are identified on TVIS lists

The six number lines (Figure 5.13 through Figure 5.18) represent the 90/90 and 95/95 tolerance limits calculated from the dilution projections to each of the three COPC concentration levels, as shown in Table 5.4. In each figure, the 1/2 OEL and OEL for mercury are indicated by dashed vertical grey and black lines, respectively. Open symbols represent calculated tolerance limits that fell within the paired region of data on the histograms. Solid symbols represent calculated tolerance limits that fell within the x-censored region of data on the histogram and have larger uncertainty associated with the value. In these figures, COPC lines that fall to the right of the nominal 1.6 x 10^{-6} ppm mercury detection limit on the x-axis are represented as green cells in Table 5.2 and could be represented by mercury as a LI. Yellow cells from Table 5.4 are represented by lines to the left of the nominal 1.6 x 10^{-6} ppm detection limit for mercury. At either the OEL or the excursion limit with 90/90 tolerance limits, mercury would be a lagging indicator for only 2 of 28 COPCs (ammonia and NDMA) that fall to the left of 1.6 x 10^{-6} ppm on the x-axis.

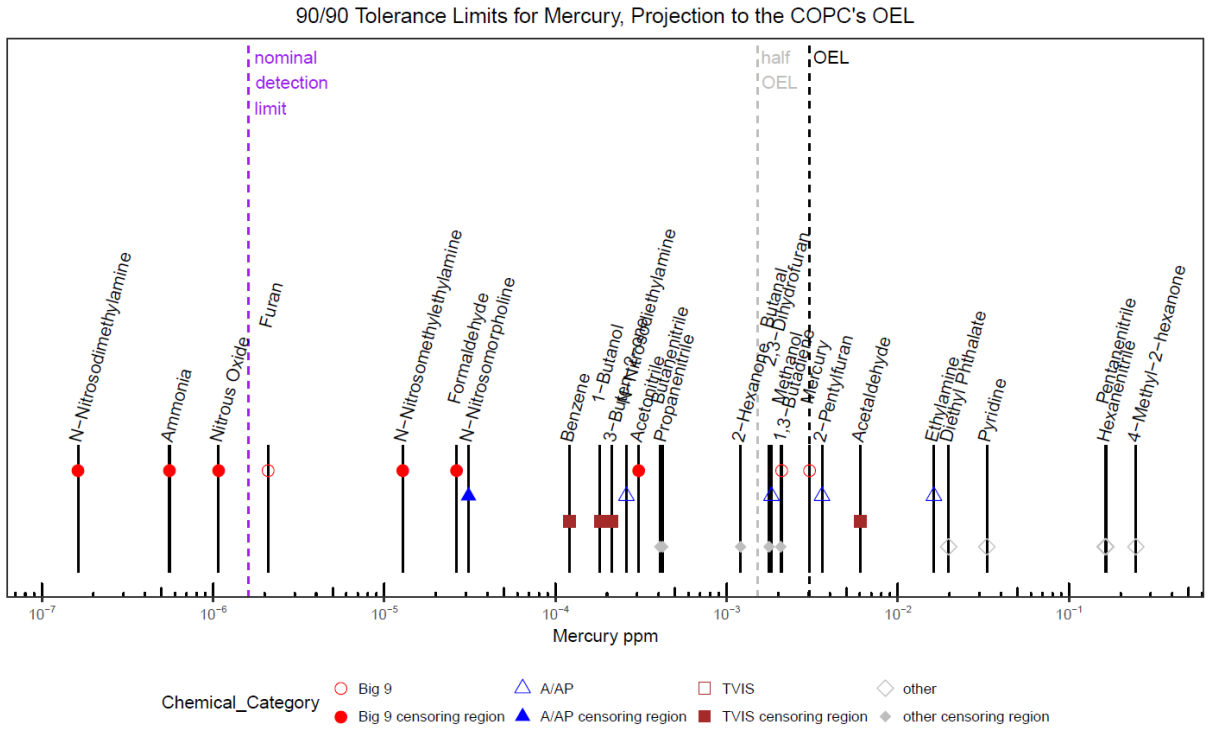


Figure 5.13. Number line of the 90/90 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL.

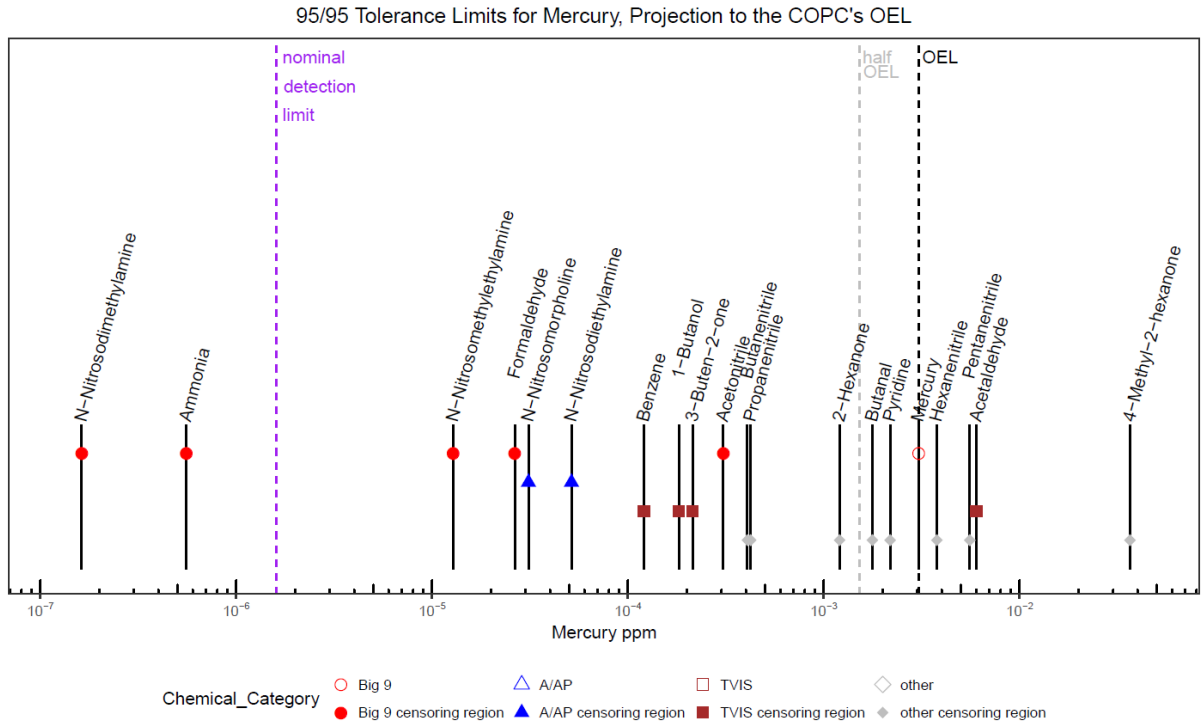


Figure 5.14. Number line of the 95/95 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL.

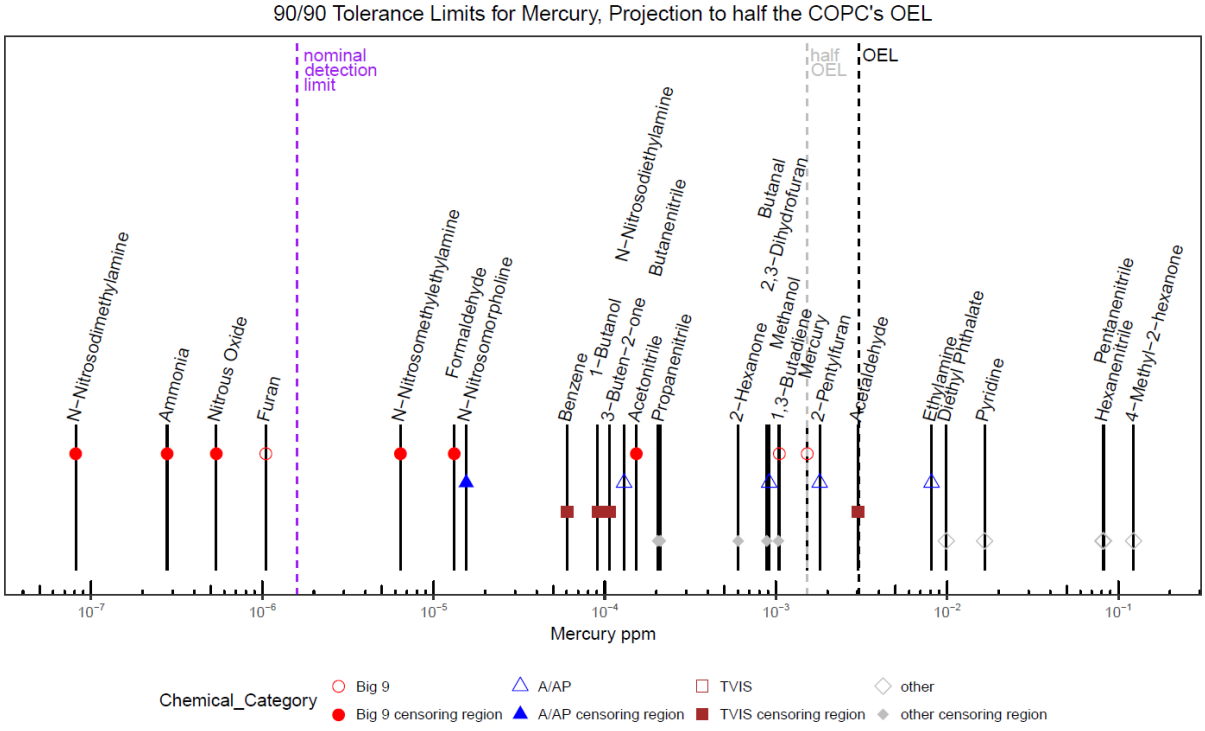


Figure 5.15. Number line of the 90/90 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL.

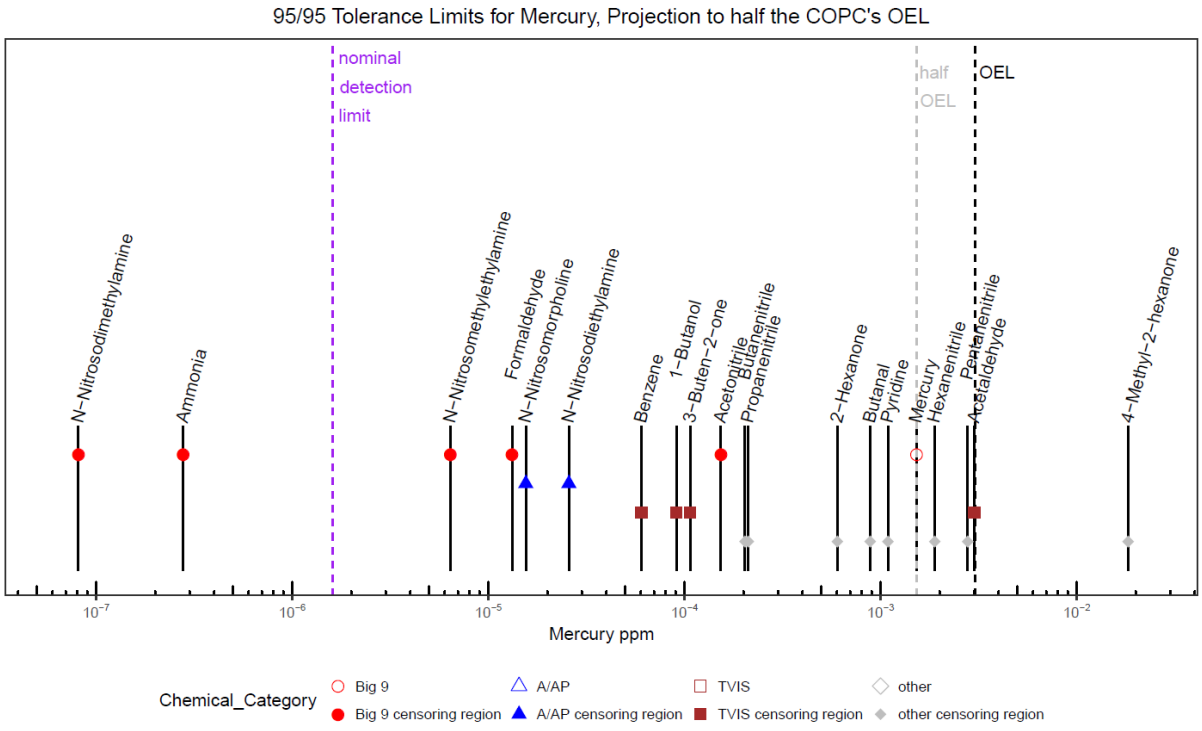


Figure 5.16. Number line of the 95/95 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's 1/2 OEL.

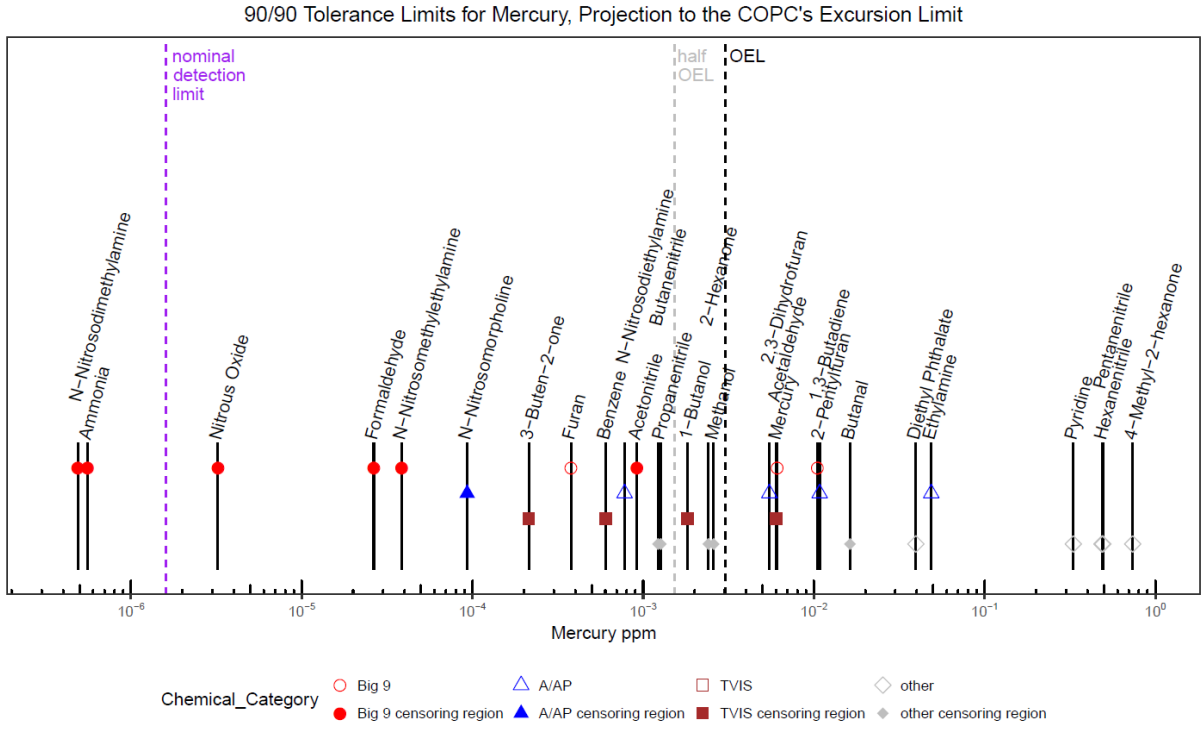


Figure 5.17. Number line of the 90/90 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit.

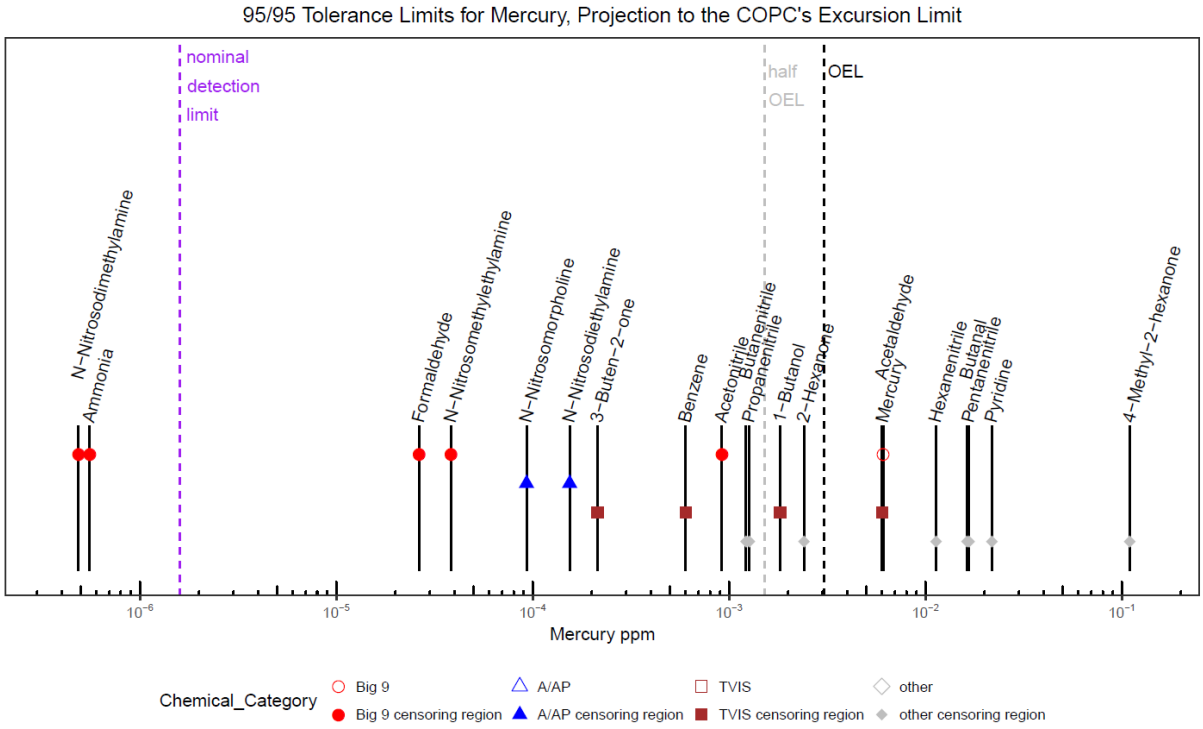


Figure 5.18. Number line of the 95/95 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit.

5.4 Combined Use of Leading Indicators

Using a combination of LIs can provide additional indication of COPCs compared to the use of a single indicator. For each indicator (ammonia, nitrous oxide, and mercury), Table 5.5 shows the number of COPCs that fall into three categories where the indicator would be leading, lagging, or there are insufficient data (NSD in the table) to calculate tolerance limits. TVIS-specific COPC numbers are shown in parentheses. From an individual indicator basis, ammonia has the most COPCs with a LI relationship (36 – 43 of the COPCs evaluated) at 90/90 tolerance limits depending on the action level concentration of interest. Ammonia has a lagging indicator relationship with 2 – 9 COPCs depending on the action level concentration of interest and has the fewest COPCs with insufficient data (15) at 90/90 tolerance limits. Focusing on the 24 COPCs on TVIS lists, ammonia has a LI relationship with 16 – 19 COPCs, a lagging indicator relationship with 2 – 5 COPCs, and only has 3 COPCs with insufficient data at the 90/90 tolerance limits. When using a multiple indicator approach, 40 – 45 COPCs can be covered by a LI relationship depending on the action level concentration at the 90/90 tolerance limit. A combined indicator approach covers from 19 – 21 TVIS COPCs at the 90/90 tolerance limit, depending on the COPC concentration of interest.

Table 5.5. Number of COPCs covered by individual and combined leading indicators.

Indicator	Category	1/2 OEL 90/90	OEL 90/90	Excursion 90/90	1/2 OEL 95/95	OEL 95/95	Excursion 95/95
Ammonia	Leading	36 (16)	36 (16)	43 (19)	21 (8)	23 (10)	26 (13)
	Lagging	9 (5)	9 (5)	2 (2)	9 (9)	7 (7)	4 (4)
	NSD	15 (3)	15 (3)	15 (3)	30 (7)	30 (7)	30 (7)
Nitrous Oxide	Leading	21 (9)	22 (10)	22 (10)	13 (6)	13 (6)	13 (6)
	Lagging	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	NSD	38 (14)	38 (14)	38 (14)	47 (18)	47 (18)	47 (18)
Mercury	Leading	24 (14)	25 (15)	26 (16)	18 (10)	18 (10)	18 (10)
	Lagging	4 (4)	3 (3)	2 (2)	2 (2)	2 (2)	2 (2)
	NSD	32 (6)	32 (6)	32 (6)	40 (12)	40 (12)	40 (12)
Combined	Leading	40 (19)	42 (21)	45 (21)	28 (15)	28 (15)	29 (16)
	Lagging	5 (2)	3 (0)	0 (0)	2 (2)	2 (2)	1 (1)
	NSD	15 (3)	15 (3)	15 (3)	30 (7)	30 (7)	30 (7)

NSD = not sufficient data
Leading also includes auto indication (i.e., ammonia indicates ammonia)
TVIS COPC count in parentheses
Nominal detection limits used to determine leading and lagging categories:

- Ammonia: 1 ppm
- Nitrous oxide: 0.04 ppm
- Mercury: 1.6×10^{-6} ppm

5.5 Other Leading Indicator Candidates

The results provided in Appendix D and Appendix E can be used to evaluate other COPCs as potential indicators as new instrumentation becomes available for field use. If other COPCs were to be used as an indicator, an important consideration would be the extremely low concentrations [≤ ppt (parts per trillion)] that NDMA requires for indication, making it the most challenging species in the current COPC list. The two other species that may warrant additional investigation are methanol and acetaldehyde. There are enough data for methanol to calculate 90/90 tolerance limits at the COPC excursion limit for 43 COPCs. Figure 5.19 shows the number line for methanol with 90/90 tolerance limits for dilution projections to the COPC's excursion limit. In this case, the concentration of methanol necessary to measure and indicate on all 43 COPCs is ~1 ppb. There is also enough data for acetaldehyde to calculate 90/90 tolerance limits at the COPC excursion limit for 44 COPCs. Figure 5.20 shows the number line for acetaldehyde with 90/90 tolerance limits for dilution projections to the COPC's excursion limit. In this case, the concentrations of acetaldehyde necessary to measure and indicate on all 44 COPCs is ~0.2 ppb.

Concentrations needed for indication by both methanol and acetaldehyde are lower than those needed for ammonia or nitrous oxide, but these species and potentially others may become options as new technology is evaluated in the future. The tables of tolerance limits provided in Appendix D and the number lines provided in Appendix E can be used to reevaluate current indicators as new technology with lower detection limits become available.

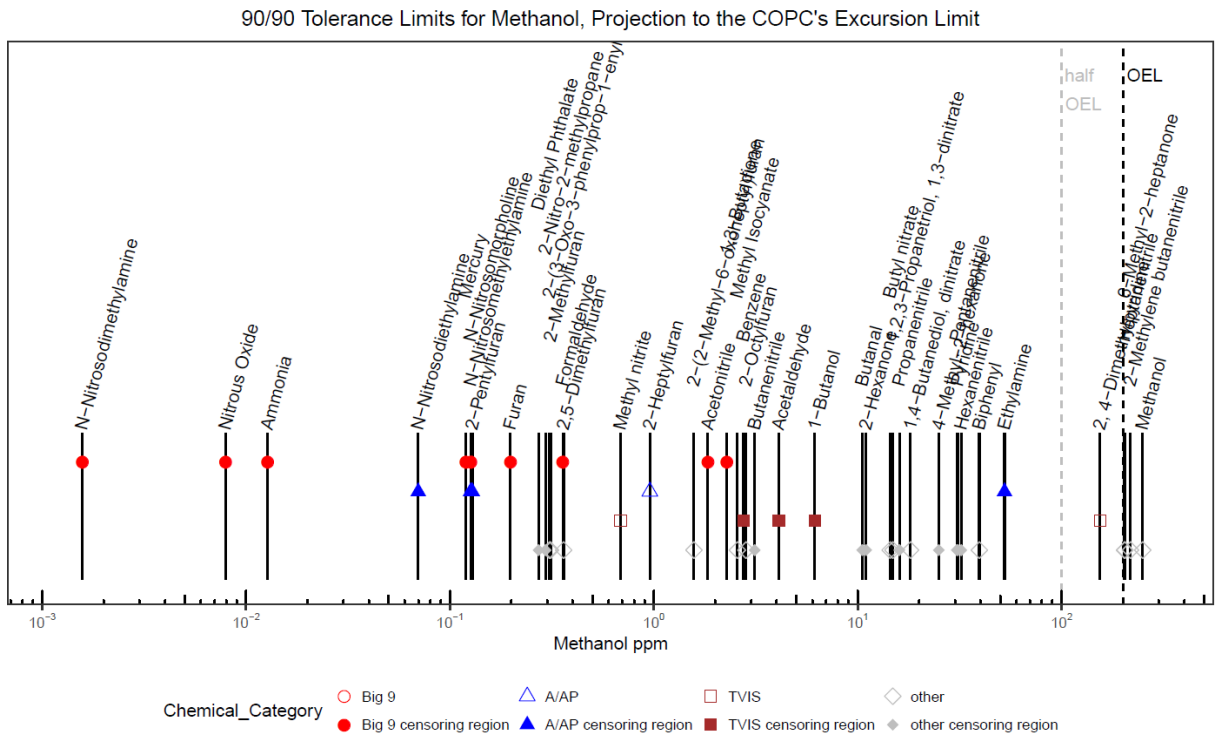


Figure 5.19. Number line of the 90/90 methanol concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit.

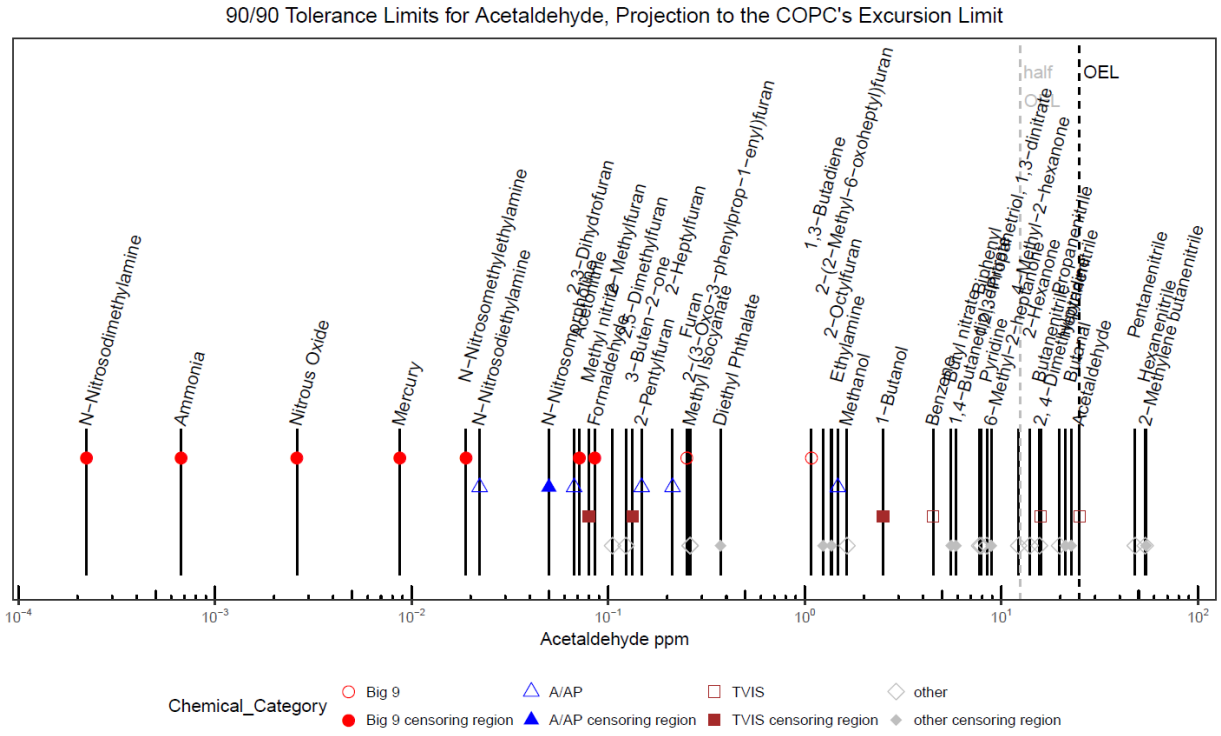


Figure 5.20. Number line of the 90/90 acetaldehyde concentration tolerance limits for the 1:1 dilution projection to a COPC's excursion limit.

5.6 Field Instrumentation Uncertainty

The calculated tolerance limits and evaluation of ammonia, nitrous oxide, and mercury as LIs in the sections above have not taken into account the uncertainty associated with the instrument detection limits. Nominal detection limits corresponding to analytical laboratory measurements were used in this report, which do not account for in-field instrument and laboratory uncertainties (including biases), temporal variations, and uncertainties in the dilution projection[3]; and a nominal 1-ppm detection limit estimated from instrument readability may differ significantly from the actual detection limits that correspond to the same levels of confidence asserted by this analysis. Additional data collection and further effort to apply these findings on site are necessary. Additional conservatism should be applied when using tolerance limits within the lower end of instrument detection range. A field demonstration activity for handheld ammonia detectors is commencing that will collect and analyze sensitivity and accuracy for each of the instruments in a field (tank farm) environment[4] that will help to close this gap. However, there are specific statistical requirements for joining data from that activity to information from this report. Simply measuring the sensitivity and accuracy of in-field instruments is insufficient to move from nominal detection limits to actualized detection limits as used in this report.

[3] Projection uncertainties may include unusual weather conditions (e.g., cold weather inversions), surface interactions and adsorption, fast chemical reactions (e.g., reaction time scales on the order of minutes or seconds, not hours), and uncertainty in the concentration as a function of position for both COPC and LI.

[4] RPP-PLAN-62130, Rev. 0, *Test Plan for Field Demonstration of the Wearable Ammonia Monitors (C2Sense and Alternative Devices)*. Washington River Protection Solutions, Richland, Washington.

6.0 Conclusions

The Phase II LI evaluation included additional data sources since the Phase I evaluation. These included (1) updates from the TWINS IH and SWIHD HS databases; (2) results from the RJ Lee mobile laboratory taken at the AP exhauster and A-101 breather filter; and (3) inlet results from 11 respirator cartridge tests performed on headspace vapors from six tanks (SY-102, BY-108, A-101, AX-101, SX-101, and SX-104) and four exhausters (AP, 702-AZ, AW, and AN) during static, non-waste-disturbing activities, and an additional test at 702-AZ exhauster performed during waste-disturbing activities. Results provided new data for 13 of the 25 COPCs found to be lacking data previously in the Phase I report (Golovich et al. 2016), increasing the total number COPCs with sufficient data for the LI evaluation to 45 COPCs.

This second phase of the LI project has updated and improved the process by which to use data obtained from source locations (headspaces, exhausters, breather filters, etc.) with a 1:1 dilution projection to calculate the range of LI concentrations necessary to indicate at multiple concentrations of interest for the COPCs with tolerance limits of 90/90 and 95/95. These results can be visualized in tabular form as well as a number line plot for a given indicator. The updated process also includes a method for including the data with less-than-detection-limit and less-than-reporting-limit values.

Ammonia was found to be a potential LI for 36 COPCs when projected to 1/2 OEL and OEL for the COPCs using 90/90 tolerance limits and a nominal detection limit of current direct reading technology of 1 ppm. Sixteen of these COPCs are on the TVIS lists. This number increases to 43 at the COPC's excursion limit, where 19 of the COPCs are on the TVIS lists. Fifteen COPCs were found to have insufficient data for the 90/90 tolerance limit calculations for data projected to all three COPC concentration levels and only 3 of these are on TVIS lists. The numbers of COPCs indicated by ammonia decrease for 95/95 tolerance limits, as there are 30 COPCs found to have insufficient data to calculate the 95/95 tolerance limits for the three COPC concentration levels.

Nitrous oxide was found to be a potential LI for 21 COPCs when projected to 1/2 of the OEL for the COPCs using 90/90 tolerance limits and a nominal detection limit of current direct reading technology of 0.04 ppm. Nine of these COPCs are on the TVIS lists. This number increases to 22 at the COPC's OEL and excursion limit; of these, 10 are COPCs on the TVIS lists. Thirty-eight COPCs were found to have insufficient data for the 90/90 tolerance limit calculations for data projected to all three COPC concentration levels and 14 of these are on the TVIS lists. The number of COPCs indicated by nitrous oxide decreases for 95/95 tolerance limits, as there are 47 COPCs with insufficient data to calculate the 95/95 tolerance limits for the three COPC concentration levels.

Mercury was found to be a potential LI for 24 COPCs when projected to 1/2 of the OEL for the COPCs using 90/90 tolerance limits and a nominal detection limit of current direct reading technology of 1.6×10^{-6} ppm. Of these COPCs, 14 are on the TVIS lists. This number increases to 25 at the COPC OEL and 26 at the COPC excursion limit for 90/90, with 15 and 16 being on the TVIS lists, respectively. Thirty-two COPCs were found to have insufficient data for the 90/90 tolerance limit calculations for data projected to all three COPC concentration levels, and 6 of these are on the TVIS lists. The number of COPCs indicated by mercury decreases for 95/95 tolerance limits, as there are 40 COPCs with insufficient data to calculate the 95/95 tolerance limits for the three COPC concentration levels.

Using multiple LIs increases the overall range of COPCs that can be indicated, compared to an individual LI. If ammonia, nitrous oxide, and mercury are used together, 21 of 24 TVIS COPCs and 42 of 60 COPCs overall are addressed at the COPC's OEL concentration with a 90/90 tolerance limit. At the COPC's excursion limit with a 90/90 tolerance limit, 21 of 24 TVIS COPCs and 45 of 60 COPCs are addressed.

One of the major gaps that remains is the need for a data population for all COPCs that better represents the sources, operating conditions, and meteorological conditions in proportion to their frequency of occurrence. Additional data from upcoming sampling campaigns, future cartridge tests, and mobile lab characterization campaigns will increase the data populations to allow calculation of 95/95 tolerance limits that are currently data limited. These new data sets will help close data gaps for the COPCs that are data limited for 90/90 tolerance limit calculations. The vapor sampling data quality objectives document[1] may identify the requirements for consistency in future sampling campaigns.

Another major gap is determining the actual detection limits for direct reading instrumentation to be used in-field that correspond to this analysis. Nominal detection limits corresponding to analytical laboratory measurements were used in this report, which do not account for in-field instrument and laboratory uncertainties (including biases), temporal variations, and uncertainties in the dilution projection[2]; and a nominal 1-ppm detection limit estimated from instrument readability may differ significantly from the actual detection limits that correspond to the same levels of confidence asserted by this analysis. Additional data collection and further effort to apply these findings on site are necessary. A field demonstration activity for handheld ammonia detectors is commencing that will collect and analyze sensitivity and accuracy for each of the instruments in a field (tank farm) environment[3] that will help to close this gap. However, there are specific statistical requirements for joining data from that activity to information from this report. Simply measuring the sensitivity and accuracy of in-field instruments is insufficient to move from nominal detection limits to actualized detection limits as used in this report.

The information presented in this report will be part of the toolbox and technical basis used by the WRPS IH group to incorporate into processes and procedures used to limit worker exposure.

[1] Nguyen DM. 2018. *Data Quality Objectives for Integrated Tank Vapors Sampling*. RPP-RPT-60598, DRAFT, Washington River Protection Solutions, Richland, Washington.

[2] Projection uncertainties may include unusual weather conditions (e.g., cold weather inversions), surface interactions and adsorption, fast chemical reactions (e.g., reaction time scales on the order of minutes or seconds, not hours), and uncertainty in the concentration as a function of position for both COPC and LI.

[3] Morrey EV and GW Weeks. 2018. *Test Plan for Field Demonstration of the Wearable Ammonia Monitors (C2Sense and Alternative Devices)*. RPP-PLAN-62130, Rev. 0, Washington River Protection Solutions, Richland, Washington.

7.0 References

10 CFR 830, *Energy/Nuclear Safety Management*, Subpart A—Quality Assurance Requirements. Code of Federal Regulations.

ACGIH. 2001. *Documentation of the Threshold Limit Values and Biological Exposure Indices*. American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio.

ACGIH. 2016. *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*. American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio. www.acgih.org.

ASME NQA-1-2000, *Quality Assurance Requirements for Nuclear Facility Applications.* American Society of Mechanical Engineers, New York.

Calmus RB, CD Carlson, JL Downs, SA Bailey, TM Brouns, MJ Burch, JE Flaherty, EC Golovich, DT Heimberger, SE Kelly, JK McCoskey, JE Meacham, DM Nguyen, A Potter, RE Schroeder, JM Schwantes, JN Thomle, BE Wells SD Wolfe, and LB Worthington. 2017. *Vapor Monitoring and Detection System Pilot-Scale Test Phase 2 Report (FY2017).* RPP-RPT-60386, Rev. 0, Washington River Protection Solutions, Richland, Washington.

DOE Order 414.1D, *Quality Assurance*. U.S. Department of Energy, Washington, D.C.

Freeman CJ, J Liu, C Clayton, SK Nune, LA Mahoney, CL Bottenus, TM Brouns, and P Humble. 2017. *Overview of 2016 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspaces and Exhausters*. PNNL-26821, Pacific Northwest National Laboratory, Richland, Washington.

Golovich EC, MS Taubman, DS Daly, LA Mahoney, SK Cooley, J Bao, and TM Brouns. 2016. *Leading Indicator Process Development Report*. PNNL-2533, Rev. 0, Pacific Northwest National Laboratory, Richland, Washington.

Meacham JE, JO Honeyman, TJ Anderson, ML Zabel, and JL Huckaby. 2006. *Industrial Hygiene Chemical Vapor Technical Basis*. RPP-22491, Rev. 1, CH2M Hill Hanford Group, Inc., Richland, Washington.

Nune SK, J Liu, CJ Freeman, and TM Brouns. 2016a. *Analysis of Respirator Cartridge Performance Testing on a Hanford AP Tank Farm Primary Exhauster Slipstream*. PNNL-25860, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2016b. *Analysis of Respirator Cartridge Performance Testing on Hanford Tank SY-102*. PNNL-26041, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017a. *Analysis of Respirator Cartridge Performance Testing on Hanford Tank A-101*. PNNL-26131, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017b. *Analysis of Respirator Cartridge Performance Testing on Hanford Tank BY-108*. PNNL-26180, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017c. *Analysis of Respirator Cartridge Performance Testing on the 702-AZ Primary Exhauster for the Hanford AY/AZ Tank Farms*. PNNL-26243, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017d. *Analysis of Respirator Cartridge Performance Testing on Hanford Tank AX-101*. PNNL-26254, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017e. *Analysis of Respirator Cartridge Performance Testing on a Hanford AN Tank Farm Exhauster Slipstream*. PNNL-26317, Rev. A, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017f. *Analysis of Respirator Cartridge Performance Testing on a Hanford AW Tank Farm Exhauster Slipstream*. PNNL-26337, Rev. A, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017g. *Analysis of Respirator Cartridge Performance Testing on the 702-AZ Primary Exhauster for the Hanford AY/AZ Tank Farms during a Waste-Disturbing Event*. PNNL-26863, Rev. A, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2018a. *Analysis of Respirator Cartridge Performance Testing on a Hanford AP Tank Farm Primary Exhauster Slipstream*. PNNL-25860, Rev. 1 DRAFT, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2018b. *Analysis of Air-Purifying Respirator (APR) Cartridge Performance Testing on Hanford Tanks SX-101 and SX-104*. DRAFT, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2018c. *Analysis of Powered Air-Purifying Respirator (PAPR) Cartridge Performance Testing on Hanford Tanks SX-101 and SX-104*. DRAFT, Pacific Northwest National Laboratory, Richland, Washington.

Way KJ. 2017. *Tank Operations Contractor – Chemicals of Potential Concern Rev. 1*. WRPS-1604188.1, Washington River Protection Solutions, Richland, Washington.

Wilmarth WR, MA Maier, TW Armstrong, RL Ferry, JL Henshaw, RA Holland, MA Jayjock, MH Le, JC Rock, and C Timchalk. 2014. *Hanford Tank Vapor Assessment Report*. SRNL-RP-2014-00791, Savannah River National Laboratory, Aiken, South Carolina.

WRPS. 2015. *Implementation Plan for Hanford Tank Vapor Assessment Report Recommendations. Washington River Protection Solutions*. Richland, Washington. http://wrpstoc.com/wp-content/uploads/2015/02/WRPS-1500142-Enclosure.pdf.

Appendix A

Tank Physics and Dilution

Appendix A

Tank Physics and Dilution

This appendix gives a very brief summary of the mechanisms for release from tank wastes and the mechanisms that operate upon those releases between the waste surface and the possible sampling points in Sections A.1 and A.2. Section A.3 describes the basis for using dilution as the primary mechanism that affects vapor concentrations between the sampling point and potential receptors. Exceptions to this technical basis are described in Section A.4.

A.1 Connected Tanks, Sample Types, and Sampling Locations

The information in this section is largely derived from PNNL-14831 (Huckaby et al. 2004), where these topics are covered in greater detail.

A.1.1 Releases from Waste

The origin of waste vapors is effectively at the surface of the waste, which is the immediate point of release from the waste. Gas releases from the waste to the headspace are a combination of releases of gas phase retained as bubbles in solids layers at the bottom of the tank and vapors whose source is evaporation from liquid phase.

Retained gases are released from the waste every day at small release rates. These are termed “background” releases; they are related to variations in barometric pressure and tank waste temperature that cause accumulated gas to expand, such that a fraction of it escapes through the pores of the solids. Much less frequently, larger retained gas releases occur when the solids layers are mechanically disturbed by some operation, such as mixing or liquid removal or addition, or when some part of the solids layer accumulates enough gas to become buoyant, rise spontaneously to the surface, and release its gas.

Evaporative releases can also be divided into background and disturbance releases. Evaporation can come from the surface of a supernatant liquid layer or from the residual liquid in the pores of a region of solids from which some liquid has been (mostly) drained. Here again, waste disturbances tend to lead to releases that are larger than background releases.

Both gas and evaporative releases may have different compositions depending on what part of the waste they come from, since many solids layers are composed of material from different feed streams. In some tanks, possibly in all, the pore liquid is composed of two intermingled phases. The larger part of the liquid is a more-or-less salty aqueous solution containing most of the tank inventory of ammonia and other water-soluble chemicals. The rest of the liquid contains most of the tank inventory of organic chemicals that are poorly soluble in water. If a waste disturbance event exposes a region of the solids where the organic liquid phase is present, the resulting release is higher in the non-water-soluble vapors than in the background releases, which come predominantly from the aqueous liquid.

A.1.2 Ventilation Paths between Tanks

Most tank headspaces are interconnected with headspaces of two or more other tanks in their farm, and sometimes of tanks in other farms. The possible connections include ventilation headers and liquid overflow lines that are still open to gas (although some lines that were originally open have been closed by waste plugging or by being sealed off). As a result, gas releases in one tank can affect concentrations in a set of other tank headspaces. Which tanks in the set are affected depends on the direction of ventilation.

A.1.3 Passively Ventilated Tanks

As of 2018, most single-shell tanks (SSTs) are passively ventilated. Air flow through the headspace is driven by weather conditions: barometric pressure changes, wind, and temperature differences between the headspace and the outside air. The interaction between these drivers of ventilation is complex and has not yet been predicted, all the more so because of the interconnections between tank headspaces. Past tests, summarized by Huckaby et al. (2004), have indicated that multi-day average passive ventilation rates can differ by a factor of 3 or more between different tanks, and that daily-average rates for a single tank may vary by up to a factor of 7 from day to day.

Exhalation from the headspace is most likely to occur when barometric pressure is decreasing. During a period of exhalation, the vapor at the penetration may be close to headspace concentration if the decline in pressure is not accompanied by diluting effects from the wind or from buoyancy-driven flow. Possible penetrations include the tank breather filters, access ports, instrumentation mounted on risers, and valve or riser pits that are open to headspace and (for operational purposes) are incompletely sealed from atmosphere. By contrast, buoyancy-driven flows (when headspace temperature exceeds outside temperature) and wind-driven flows bring ambient air into the tank and cause dilution in the headspace, or in risers, as well as expelling some headspace gas from the tank. Wind may increase releases from the headspace, depending on the number of penetrations, and on the wind direction and which tank penetrations lie upwind or downwind. The ventilation rate caused by wind increases as a function of wind speed (see Appendix B, Figure B.4).

A.1.4 Actively Ventilated Tanks

As of 2018, double-shell tanks and some SSTs are actively ventilated. These ventilation rates are close to constant and are only slightly dependent on weather conditions. Some SSTs also are given temporary active ventilation during retrieval or other operations. Exhauster fans create a vacuum that draws air into the tanks through inlet filters and other penetrations that may be present; the air is then released through a stack. Tanks that normally are actively ventilated may have ventilation shutdowns, during which the tanks revert to passive ventilation and the headspace vapor concentrations increase.

A.1.5 Sampling Point Locations

In net, the range of sampling points represented by the data include:

- Headspace: This sampling point is the nearest to the release from the tank waste and the furthest from the receptor (that is, the most subject to change by downstream mechanisms). Headspace concentrations in passively ventilated tanks may vary significantly as the ventilation rate varies.

- Risers: Some samples are taken inside the risers, but not below them in the headspace proper. There may be some losses (or gains) from interactions with the riser surface (condensation or evaporation), and some dilution through the penetration at the top of the riser.
- Penetrations near or above ground level: These include passive breather filters, active-ventilation inlet filters during ventilation shutdowns, riser and valve pits, among others. These samples would be expected to be more dilute than riser or headspace samples, and possibly very dilute if the particular penetration happened to be inhaling rather than exhaling during sampling. Some degree of surface interaction could affect them.
- Ventilation system: These sampling points can be at the stack or further upstream in the system. The sampling point may include temporary ventilation for only one SST, or may include a whole tank farm of SSTs or double-shell tanks. The further from the point, the more effect there can be from surface interactions.
- Area sampling locations: These are located further from tanks, sometimes at the fence line. There are few, if any, such samples in the database used in this study. In these cases, downstream reaction could affect concentrations.

A.2 Headspace Vapor Compositions from Liquid Concentrations

Within the headspace, at least three processes drive concentration profiles: local equilibration at the liquid-gas interface, unimolecular diffusion from the interface into the bulk headspace vapor, and bulk mass transfer. A fourth process of buoyant release is possible, for example, during waste-disturbing events, but is not a focus of this appendix. Gas generation or destruction in the liquid phase due to radiolysis may also contribute to species mass balances. This section and the next address two of these processes: local equilibrium at the liquid-gas interface within the tank and bulk mass transfer when the vapors leave the tank.

At equilibrium, the chemical potential of the species in the gas phase is equal to the chemical potential in the liquid phase at the gas-liquid interface. The chemical potential of the gas, μ_i^g, is written as

$$\mu_i^{\,g} = \mu_{i_o}^{\,g} + RT \ln \phi_i y_i P \,, \tag{A.2.1}$$

where μ_o^g is the standard state for the gas, R is the ideal gas constant, T is the temperature, ϕ_i is the mixture fugacity coefficient for the vapor, y_i is the mole fraction in the gas at the interface, and P is the local pressure. The fugacity coefficient also depends on the temperature, pressure, and various gas phase mole fractions, making this relationship more intricate than may be assumed from the functional form alone. The chemical potential of the liquid, μ^l, is

$$\mu_i^{\,l} = \mu_{i_o}^{\,l} + RT \ln \gamma_i x_i \phi_i^{sat} P_i^{sat} \wp \,, \tag{A.2.2}$$

where μ_o^l is the standard state for the liquid, γ_i is the activity coefficient, x_i is the mole fraction of the species of interest in the liquid, ϕ_i^{sat} is the fugacity coefficient of species i at saturation, P_i^{sat} is the saturation pressure, and the script P represents the Poyning factor, which is often very close to unity. The standard state for the liquid does not necessarily equate to the standard state for the salt solution of the liquid; therefore, the standard state variables do not necessarily vanish. In this way, tank waste is more

intricate than simple gas-liquid interfaces. Equating the two chemical potentials without eliminating the standard states with algebraic rearrangement finds

$$\frac{y_i}{x_i} = \frac{\gamma_i \phi_i^{sat} P_i^{sat} \wp}{\phi_i P} Exp\left(\frac{\mu_{i_o}^{\ l} - \mu_{i_o}^{\ g}}{RT} \right) \equiv H_i , \tag{A.2.3}$$

where H_i is the Henry's law constant for species i. Some define H_i as $1/H_i$ but the premise of a "simple" relationship between gas and liquid compositions remains the same. Please note that because $H_i=H_i(x_i,y_i)$ implementation of this equation is iterative and this "constant" is often not inherently constant against even modest changes to temperature, pressure, and composition, though it may be sufficiently constant for some engineering processes.

In the absence of other transport processes (i.e., in the absence of flow in or out of the tank and in the absence of rapid temperature variations), this relationship determines the concentration throughout the headspace. When temperatures are dynamic or gas is exchanged between the headspace and the exterior, this relationship only determines the gas concentration at the interface. The premise of a uniformly mixed headspace has not been evaluated in this report. Were the headspace not well mixed, additional processes would need to be evaluated to connect liquid phase concentrations to gas phase concentrations downstream at a breather/receptor location.

In establishing relationships between gas species, please note that because each tank has a different liquid composition, one should expect that each tank has a different gas phase composition. The gas phase compositions determine the concentrations that are the diluted downstream of the tank to where the breather/receptor stands. Therefore, the composition of the liquid coupled with the flows out the breather/exhauster govern the flux of material out the control volume surrounding the tank.

A.3 Why One-to-One Dilution Holds Generally

In general, the flux of one species is not independent of the flux of another species as given by the Maxwell-Stephan equations. However, when each species is fairly dilute such that the pseudo-binary approximation holds, species fluxes become independent. This is likely (but not confirmed) for most vapors in and downstream of the headspace. Species conservation may then be expressed in Fickian form as

$$\frac{\partial y_i}{\partial t} + \boldsymbol{u} \cdot \nabla y_i = \nabla \cdot \left(D_i \nabla y_i \right) + R_{vi} , \tag{A.3.1}$$

where t is time, $\boldsymbol{u}$ is the local velocity vector, D_i is the molecular diffusion coefficient of species i in the mixture, and R_{vi} is the volumetric reaction rate of species i in the gas with generation positive and destruction negative. For the arguments below, the molecular diffusion coefficient is assumed to be isotropic, and the reaction rate is assumed to be destructive with first order kinetics [if a chemical of potential concern (COPC) is generated by reaction or with other order kinetics, different expressions apply; first order kinetics is a convenient and common starting assumption]. Then,

$$\frac{\partial y_i}{\partial t} + \boldsymbol{u} \cdot \nabla y_i = D_i \nabla^2 y_i - k_i y_i , \tag{A.3.2}$$

where k_i is a first order rate constant. In this equation, time scales on an as yet undefined time scale τ, velocity scales on the external wind velocity of U, and length scales on L as the diameter of the breather filter or exhauster port. This length scale has been selected because the diameter of an orifice is the traditional length scale in plume/jet modeling, though plume/jet diameters do expand with distance. Then,

$$\frac{1}{\tau}\frac{\partial y_i}{\partial \bar{t}} + \frac{U}{L}\bar{\boldsymbol{u}} \cdot \bar{\nabla} y_i = \frac{D_i}{L^2}\bar{\nabla}^2 y_i - k_i y_i \,, \tag{A.3.3}$$

where the overbars indicate a scaled quantity. The mole fractions do not require scaling because any scaling would cancel from both sides, leaving the answer below unaffected. Algebraic rearrangement finds

$$\frac{L}{\tau U}\frac{\partial y_i}{\partial \bar{t}} + \bar{\boldsymbol{u}} \cdot \bar{\nabla} y_i = \frac{D_i}{UL}\bar{\nabla}^2 y_i - \frac{Lk_i}{U} y_i \,. \tag{A.3.4}$$

Because the mole fractions and scaled quantities are assumed to remain order one quantities, the ratio preceding each term determines the magnitude of the term. The ratio for the first term on the right hand side of the equation is related to the species Peclet number, $\mathrm{Pe}_i = UL/D_i$. For winds that vary from say 1 to 20 mph (0.4 to 9.0 m/s), a breather filter length scale of say 4 inches (0.1 m), and molecular diffusion coefficients on the order of 10^{-5} m^2/s, $1/\mathrm{Pe}_i \sim 10^{-3}$-$10^{-5}$, which remains sufficiently small that in all cases the first term on the right may be neglected (except perhaps within a fraction of an inch of a surface) with negligible uncertainty. This implies that the appropriate time scale is the convection time scale of $\tau = L/U$ and that

$$\frac{\partial y_i}{\partial \bar{t}} + \bar{\boldsymbol{u}} \cdot \bar{\nabla} y_i = -\frac{Lk_i}{U} y_i \,. \tag{A.3.5}$$

Therefore, transport is not governed by molecular diffusion but by convection. This is a critically important observation because in the absence of reaction (i.e., when the right-hand side resolves to zero), the terms on the left-hand side of the equation are not species dependent but hold equally for all species. In other words, all species will convect together except perhaps in the presence of reactions as discussed below.

The consequences of Eq. A.3.5, which holds generally for dilute gasses, are compelling because this equation and the dilution rule it supports permit the use of data at or near the headspace instead of at the breather/worker location. Paired data downstream of the worker location are sparse, even though large numbers of individual observations have been collected. Therefore, projecting the headspace data to the location of the breather/worker is vital to assessing possible risks to the breather/receptor.

This equation also has specific consequences for COPCs and leading indicators (LIs) as a function of position. The dilution rule is based on the premise that the concentration of a chemical species dilutes as a function of position. Eq. A.3.5 limits the functional form of the equation for the concentration versus position. For example, approximating steady breather filter or stack release using the heat and mass transfer analogy suggests that the concentration in the wake downstream of the cylinder filter or stack as defined by the wind direction decays with the inverse of the square root of position (Abrahamovich 1963). In contrast, Droppo (2004, Figures 14-33) suggests a much faster decay with the concentration

falling as approximately the inverse of the square of the downwind distance. In either case, projecting a specific dilution factor from the source concentration to an action limit corresponds to a specific distance. Therefore, a distribution of source concentrations corresponds to a distribution of distances, which may be compared to vapor control zone and vapor reduction zone perimeters (Flaherty 2016).

Please also note that the uncertainties associated with projection have not been evaluated in this effort. Quantifying these uncertainties is important in converting nominal detection limits relative to analytical laboratory measurements into actual detection limits of direct reading instruments with confidence.

A.4 Technical Gaps in the One-to-One Dilution Rule

Given the importance of the dilution rule to the analysis in the main body of this report, a brief discussion of possible exceptions to this rule (i.e., that all species dilute equally on average) is appropriate. The derivation of Eq. A.3.5 suggests four exceptions: highly concentrated gases, bulk reactions, surface absorption, and negatively buoyant pooling. These are addressed in order.

First, highly concentrated gases are not relevant to the LIs effort because an individual gas would need to comprise 1-10% (10^4-10^5 ppm) of the total volume for these effects to become important. Such concentrations are well above any occupational exposure limit (OEL) and would lead to immediate evacuation for that gas alone without regard to the concentrations of other species. Also, because of the heterogeneity of the gas compositions, the premise that one species alone would reach this concentration (outside of a buoyant displacement gas release event) seems unlikely.

Second, some chemicals are subject to downstream chemical reaction, particularly to photochemical reaction in the atmosphere. Reactions may transform COPCs to less toxic chemicals, or vice versa (e.g., butadienes may become formaldehyde, acrolein, furan, and organic nitrates). Formaldehyde is subject to photodissociation (see Jimenez 2005), but also is produced by atmospheric oxidation of methane and other volatile organic compounds (Jones et al. 2009). Acetaldehyde is subject to photodissociation (see Jimenez 2005). The importance of bulk reactions may be assessed by the leading ratio in front of the term on the right of Eq. A.3.5. Where the chemical kinetic rate constants are known, they should be used. Alternatively, the lifetime or half-life, $t_{1/2}$, may be used. For first order reaction rates, the rate constant is inversely proportional to the half-life through $k=\ln 2/t_{1/2}$. The following is a short (not exhaustive) list of some of the atmospheric reactions that may affect the concentration of COPCs, which in turn may challenge the one-to-one dilution rule.

- Nitrosamines may react with O_2 with atmospheric lifetimes of approximately 30 min (Lee and Wexler 2013). If the half-life is approximated as half the reported lifetime, then $k=\ln(2)/900\ s^{-1}$, from which $kL/U=\ln(2)/9000<<1$ for characteristic values of U=1 m/s (a low wind speed) and L=0.1 (a characteristic length of a tank outlet diameter). Therefore, reactions of these species with such a lifetime are unlikely to affect the dilution rule. Reaction rates on the order of a few inverse seconds or lifetimes of a few seconds (Lee and Wexler 2013) would be important.
- 1,3-butadiene photodissociates with a tropospheric lifetime of 4 hours in the daytime but longer at night (Berndt and Böge 2007). If the half-life is approximated as half the reported lifetime, then $k=\ln(2)/7200\ s^{-1}$, from which $kL/U=\ln(2)/72000<<1$ for characteristic values of U=1 m/s and L=0.1. Therefore, these reactions are unlikely to affect the dilution rule.

- The lifetime of methyl nitrite is nearly independent of altitude and is approximately 2 min (Taylor et al. 1980). If the half-life is approximated as half the reported lifetime, then $k=\ln(2)/60$ s^{-1}, from which $kL/U=\ln(2)/600<1$ for characteristic values of U=1 m/s and L=0.1. Therefore, reactions of these species with such a lifetime are unlikely to affect the dilution rule.
- From 0 to 50 km, the lifetime of methyl nitrate changes from 5.3 to 0.09 days, respectively (Taylor et al. 1980). If the half-life is approximated as half the reported lifetime, then $k=\ln(2)/(3.9\cdot10^3)$ s^{-1} to $\ln(2)/(2.3\cdot10^5)$ s^{-1}, from which $kL/U=\ln(2)/(3.9\cdot10^4)$ to $\ln(2)/(2.3\cdot10^6)$, both of which remain much less than one, indicating that photodissociation for this species is likely unimportant.

The above discussion of the importance of reaction compared to dilution by convection assumed the length scale of the outlet diameter in order to address steady near-source conditions. As the release travels, its effective plume diameter increases marginally, implying a larger length scale and, potentially, increased significance of reaction. However, the increase in diameter also implies that the at-source COPC concentrations may decrease to be below OELs. Consequently, the near-source analysis is considered the more pertinent approach.

Were chemical reactions important, there is an opportunity to show the presented analysis to be conservative. For example, if both the COPC and LI dilute to an action limit and the COPC reacts but the LI does not, then the results presented may be conservative. In net, unless the reaction rate of an emitted chemical is on the order of minutes, rather than hours, the reactions undergone by emissions are unlikely to affect the ratio between the concentrations of two chemicals. This summary should not be considered conclusive or final.

Third, surface interactions depend on the amount of surface area available in ventilation pathways. Outside the tank, some of the emissions may deposit on the ground. Surface mechanisms include direct condensation or adsorption of vapors on surfaces and uptake of vapors by water or low-volatility organic liquid that has condensed on surfaces. When the conditions (concentration spikes, temperature, or humidity) that promoted surface uptake of a chemical in the ventilation system are no longer present, the chemical will evaporate, or desorb, into the air stream. The inventory of liquid in the ventilation systems is limited, since condensate drains back into the tanks; therefore, the effect of surface interactions may be limited. However, the strength of this mechanism cannot be quantitatively ascertained or qualitatively asserted at this time. Tests are currently underway to evaluate the extent of surface interactions as part of the cartridge testing effort. Results from those tests may then be used to suggest the importance of this mechanism.

A fourth possibility is enrichment of a particular species relative to another due to pooling of negatively buoyant air. This option is not analyzed here in greater detail because it occurs only intermittently during part of the year. Equations that balance convection and buoyancy are known and may be analyzed in greater detail to determine whether one species may selectively separate from another or enrich in such a way that the dilution rule would not necessarily hold. This is not a concern for a majority of the year, when inversions do not occur. Further analysis would be necessary to evaluate the projection rule during quiescent inversions.

A.5 References

Abramovich GN. 1963. *The Theory of Turbulent Jets*. The M.I.T. Press, Cambridge, Massachusetts.

Berndt T and O Böge. 2007. "Atmospheric reaction of OH Radicals with 1,3-Butadiene and 4-Hydroxy-2-butenal." *Journal of Physical Chemistry A* 111(48): 12099–12105.

Droppo JG. 2004. *Characterization of the Near-Field Transport and Dispersion of Vapors Released from the Headspaces of Hanford Site Underground Storage Tanks*. PNNL-14767, Pacific Northwest National Laboratory, Richland, Washington.

Flaherty JE, JP Rishel, EI Mart, BG Fritz, J Bao, and JA Fort. 2016. *Atmospheric Dispersion Modeling Tools for Hanford Tank Farms Applications*. PNNL-25654, Rev. 0, Pacific Northwest National Laboratory, Richland, Washington.

Huckaby JL, LA Mahoney, JG Droppo, and JE Meacham. 2004. *Overview of Hanford Site High-Level Waste Tank Gas and Vapor Dynamics*. PNNL-14831, Rev. 0, Pacific Northwest National Laboratory, Richland, Washington.

Jimenez JL. "Lecture 7: Photochemistry of Important Atmospheric Species." Atmospheric Chemistry Course CHEM-5151, Spring 2005, University of Colorado Boulder, Boulder, Colorado. http://cires1.colorado.edu/jimenez/AtmChem/CHEM-5151_S05_L7.pdf

Jones NB, K Riedel, W Allan, S Wood, PI Palmer, K Chance, and J Notholt. 2009. "Long-term tropospheric formaldehyde concentrations deduced from ground-based Fourier transform solar infrared measurements." *Atmospheric Chemistry and Physics* 9: 7131–7142.

Lee DY and AS Wexler. 2013. "Atmospheric amines – Part III: Photochemistry and toxicity." *Atmospheric Environment* 71: 95–103.

Taylor WD, TD Allston, MJ Moscato, GB Fazekas, R Kozlowski, and GA Takacs. 1980. "Atmospheric Photodissociation Lifetimes for Nitromethane, Methyl Nitrite, and Methyl Nitrate." *International Journal of Chemical Kinetics* 12(4): 231–240.

Appendix B

Data Processing

Appendix B

Data Processing

This appendix provides more information on the pre-processing steps that were required prior to including source data in the analysis described in Section 4.0 and evaluated in Section 5.0. A comparative analysis of data available from cartridge tests using direct reading instruments (DRIs) and laboratory analyses is provided in Section B.2. Section B.3 provides a brief statistical basis establishing tolerance limits for the dilution approach. Finally, verification of the updated process is given in Section B.4.

B.1 Source Data Pre-Processing

This section provides more detail on the pre-processing steps than was covered in Sections 3.0 and 4.1 of the main body of the report.

B.1.1 TWINS HS

The Tank Waste Information Network System (TWINS) headspace-characterization (HS) data set contains no recent data—the final sampling date shown is March 6, 2005. The TWINS HS data were checked in 2017 to confirm that no new data had been added.[1]

Some of the TWINS HS data were for blanks, laboratory control sample standards, upwind measurements, matrix spikes, and quality control results. These were removed from the database; they were not used in analysis.

Some of the Chemical Abstracts Service (CAS) Registry Numbers in the TWINS HS database were interpreted by Excel as dates. Those numbers were edited to reflect the true CAS number.

The concentrations provided by TWINS HS data were uniformly converted into units of ppm. TWINS HS contained two sources of concentration data: the concentration in ppm and the concentration in mg/m^3 at 25°C. These two sources were not always both present for a given row of data, so different sources were used as available. The data source that was first in preference was the concentration in ppm, which could be used directly. However, in some cases, the value had to be stripped from a text string, while in other cases, a number was provided. The second-preferred source was the concentration in mg/m^3 at 25°C, which was converted to ppm by applying the ideal gas law and using the molecular weight. Here too, the concentration value sometimes had to be stripped from a text string.

As in the previous studies, TWINS HS results associated with chemicals that were ambiguously identified (e.g., alkane, unknown, and C6 ketone) were removed from further analysis unless the molecular weight of one of the chemicals could be unambiguously specified (e.g., octanenitrile and others was kept). These data had chemical IDs that started with M or U, followed by a CAS number or other

[1] Downloaded from https://twins.labworks.org/twinsdata/Forms/BuildQuery.aspx?SourceName=vapor.dbo.sp_WEB_TVD_analysis_results&whatsnew=Vapor.

code. These were mixtures in which no single chemical was implied to be dominant, or classes of chemicals, or unknowns.

In one subset of mixture cases, where the chemical ID consisted of a CAS number followed by M, the entire concentration was assumed to come from the identified chemical (octanenitrile, in the example). In these mixture cases, TWINS HS provided only the concentration in mg/m^3 at 25°C, so conversion to ppm was necessary. The concentration was assigned to the CAS number of the identified chemical, and the molecular weight of the identified chemical was used for unit conversion. In some cases, a molecular weight value was not found in TWINS and had to be acquired from the National Institutes of Health (NIH), National Institute of Standards and Technology (NIST), or the U.S. Environmental Protection Agency (EPA).[2] Data for total mercury (CAS number 7439-97-6T) were also kept.

TWINS HS concentration data were excluded from analysis if they met any of the following criteria:

- Quality assurance (QA) samples (blanks, laboratory control samples, or spikes)
- Marked as suspect (data qualifier flag S)
- Associated with a contaminant in a blank, trip blank, or field blank (data qualifier flags B, T, or F)
- A laboratory control sample that was out of range (data qualifier flag a)
- An excessive relative percent difference (data qualifier flag c)
- Less than the vapor program required quantitation limits (data qualifier flag Q)
- Marked with a laboratory-defined flag whose meaning was not generically defined and might indicate a serious data quality issue (data qualifier flags L or Y)

In addition, data with concentrations that exceeded 1,000,000 ppm were eliminated as physically impracticable. This step affected one row of N_2O data, one row of H_2 data, and one row of CO_2 data in the TWINS HS data set, and thus did not affect organic vapor data. The five rows of data (from phenol, nitrogen oxides, and nonanal) in which there were no concentration values (blanks) were also eliminated, because they could not be used.

All the sources that were included in the TWINS HS database were kept for analysis. The non-tank sources—241-C-301, 241-ER-311 (catch tank), and 241-Z-361 (Plutonium Finishing Plant effluent settling tank)—were not removed.

Finally, concentration data were tested to find out whether they were below the reporting limit. Several possible indications are listed below:

- A tentatively identified chemical not detected in the sample (data qualifier flag M)
- Below the analytical reporting limit (data qualifier flag U)
- Blanks provided for the concentration in ppm and for the concentration in mg/m^3 at 25°C

[2] https://chem.nlm.nih.gov, https://pubchem.ncbi.nlm.nih.gov, http://webbook.nist.gov, https://comptox.epa.gov/dashboard.

- Concentration in mg/m^3 at 25°C provided as a text string beginning with "<"

Some TWINS HS data included measurements of a chemical in a tank that were repeated over a period of a few hours. In these cases, all the measurements made within the same calendar day were averaged together (arithmetic average).

B.1.2 SWIHD HS

The Site-Wide Industrial Hygiene Database (SWIHD) HS data, downloaded on July 19, 2017, were a standard "full detail" download from the SWIHD database application for headspace samples from all tank farms.

The following changes were made to address apparent data set errors or data handling issues:

- Changed the location of two rows of data (sample 15-00186-1-02) from AX-101 to AX-103 because all other data in the survey were from AX-103 and the field sample IDs in the survey were more consistent if all were from the same tank. The sample head drawing for the survey shows only AX-103, not AX-101.
- Replaced the CAS number for sulfur dioxide with a text string in two rows because Excel misinterpreted the original ID number format as a date.
- Removed 26 rows of data where the air concentration was blank because these could not be used

Some of the SWIHD HS data were for samples whose QA review had not been completed. These data, which are denoted by survey numbers with asterisks, were retained in the analysis data set.

The concentrations provided by SWIHD HS data were converted into units of ppm from the units provided by SWIHD. As necessary, units of mass/volume (such as mg/m^3) were converted to ppm by applying the ideal gas law, assuming a temperature of 25°C, and using the chemical's molecular weight. The SWIHD HS data as downloaded did not include the molecular weights, so values were supplied from those found in TWINS databases or, when needed, from the NIH, the NIST, or the EPA.

Further processing[3] was required to combine data points to find the total concentration in each air stream sampled. Each row of data in the set represents a measurement made on the contents of a single sorbent tube (or other collector). It was frequently the case that a single sample air stream passed through a series of two or more collectors, which meant that the actual sample concentration was the sum of the contributions from all the collectors in the series. The intent of this sample collection method is that most or all of the vapor should be deposited in the first collector, with a relatively small amount of breakthrough into the second collector.

The 2016 study did not account for the use of collectors in series because the extent to which series collection was employed was not recognized. As a result, some SWIHD HS concentrations were underestimated in that study.

[3] This type of data combination was not needed for the TWINS HS data, according to JE Meacham, Washington River Projection Solutions, who was central to the 2006 IH Technical Basis effort.

The SWIHD currently does not contain explicit information to denote which data came from collectors in series or to identify which collectors belong in a set. Therefore, in this study, an approach was devised to make a plausible approximation that accounted for combining concentrations and thus would avoid some of the underestimation in the previous study. First, because samples taken with SUMMA canisters were never taken in series, these results were removed from consideration for combination. Next, it was assumed that, for any given combination of industrial hygiene (IH) survey, sampling location, analysis method, and chemical, any data rows that had field sample ID numbers in sequence (or nearly so) and also had exactly the same sample volume—for which SWIHD consistently provided 3, 4, or more significant figures—was part of a series set of collectors. It is physically reasonable to expect samples collected on the same line to have the same sample volume, calculated to the same number of significant figures. On the other hand, replicate samples or other types of samples taken on a different line would probably have visibly different (though perhaps nearly equal) sample volumes. The groupings suggested by equal sample volume were reviewed to find out whether their field sample ID numbers fell in sequence, as was generally the practice for collectors in series. If these criteria were met, all of the rows of data in the group were considered to have been part of a series.[4]

All of the 1,3-butadiene data in SWIHD HS that were not taken using SUMMA canisters fell into groups of four rows. Most of the other non-SUMMA data fell into pairs, and no three-row groups were found.

Of more than 20,000 rows of data in the initial SWIHD HS set, fewer than 500 rows did not appear to fall into a group. These were reviewed in detail. For 10 of these cases in which samples initially appeared to be unmatched, it was found that there were five sets of two samples each where the two samples had sequential sample ID numbers but slight differences in sample volumes.[5] In other words, the 10 cases appeared to be five pairs where a volume error made them appear to be unmatched. These cases were all checked against IH air sampling survey reports. For each of these five near-pairs, all other samples in the survey fell into identical-volume pairs, and the difference in sample volume for the affected pair came from a difference in start time, end time, initial flow rate, or post-use flow rate that might be explainable as a typo. Accordingly, they were treated as pairs and their concentrations were combined.

The remaining unmatched rows could be identified with a fair degree of certainty to be either from the first collector in a pair in series—the upstream collector, or from the second collector—the downstream collector that would capture only the amount of vapor that broke through from the first collector. The field sample ID was used to decide which position the single remaining collector had been on, taking the sample ID conventions for the rest of the survey as guidance. The data that appeared to come from first collectors were kept, flagged with an additional data-quality code, and not combined with any other data. The data that appeared to come from second collectors, and that had no available data from the first collector to supplement them, were removed from further analysis as giving misleading

[4] These criteria were discussed in conversations and e-mails with J Frye (222-S Laboratory, WRPS) and P Jones (Industrial Hygiene, WRPS), who concurred with the general approach, but did not review its detailed application or results.

[5] The samples that appeared to be unmatched because of slightly different sample volumes were 241-T-111 pyridines (15-03477-1-010A/B), A-101 VOCs (16-03725-1-006A/B), A-105 pyridines (15-09667-1-010A/B), A-106 NH_3 (16-02216-1-009A/B), and A-106 semi-volatile organic compounds (16-01353-1-004A/B). The surveys' sample head drawings provided evidence that the apparently unmatched samples were in fact in series and required combination.

information; this amounted to 190 rows of data. The rows of data for which there was no matching sample, and that could not be identified as either the first or second collector, were kept and not combined with any other data.

This approach is considered an approximation because the choices of combinations have not been compared to the survey reports and sample head configurations for all the SWIHD HS surveys, but only for a small subset of surveys. If there are cases where samples are inaccurately identified as a group to combine, these cases would produce overestimated concentrations. If there are cases where samples are inaccurately identified as singletons, these cases would produce underestimated concentrations.

The combination procedure included summing the concentrations in a group, assigning a range code to the combined result, and concatenating the data-quality flags so that this information would not be lost. The criteria for combining data are briefly described below:

- All of the concentrations in the group that were above the reporting limit were added together to give the combined measured concentration. The concentrations that were below the reporting limit were not included; effectively, they were treated as zeros.
- The range for the combined measurement was set to "<", indicating a value below the reporting limit, only if all the single-collector measurements in the group were below the reporting limit.
- Data-quality flags for all the collectors that were above the reporting limit and that had concentrations greater than 10% of the total concentration were concatenated into a combined data-quality flag. The flags for below-reports and low-contributing collectors were omitted because they did not relate to the major part of the concentration and thus might be misleading.

The sample names were concatenated into a combined-sample name. Other metadata were carried through without change, if they pertained to all samples in the group rather than being specific only to individual collectors.

The final step performed on the combined SWIHD HS data was to check data quality. Data-quality flags that were taken as reasons to exclude concentration data from analysis are listed below:

- Flag a – Having a laboratory control sample that was out of range
- Flags b or B – Associated with a contaminant in a blank
- Flags c or d – Having an excessive relative percent difference or relative standard deviation
- Flag e – Having an excessive difference between the sample result and its serial dilution
- Flag f – Having a failed mass spectrometer reading on the sample but not on its serial dilution
- Flags L or Y – Marked with a laboratory-defined flag whose meaning was not generically defined and might indicate a serious data-quality issue

Flags d, e, and f were not present in the data set, so they did not have any effect. The full set of data-quality flags used by SWIHD is defined in *Data Qualifiers for Vapor Samples* (Rev. A-7).[6] Flags

[6] ATS-GD-1048, Rev. A-7. *Data Qualifiers for Vapor Samples*. November 16, 2016. Washington River Protection Solutions, Richland, Washington.

excluded in the current study are not the same set used in the 2016 study for which a different document—*Data Qualifiers for Vapor Samples* (Rev. D-2)[7]—provided data flag information for the 2016 analyses. These documents provide internal guidance for assigning data qualifiers for vapor sample analyses conducted at the 222-S Laboratory, which is operated by Wastren Advantage, Inc., for Washington River Protection Solutions (WRPS).

The flag "U", for a concentration less than the minimum detection limit, and the range indicator, "<", were used to identify concentrations that were less than the reporting limits. These data were included in the analysis.

The SWIHD HS data set identified the dates when samples were taken but not the times, so there was no need to average samples by time-of-day bin, and no information to support time binning.

B.1.3 TWINS IH

The TWINS IH data were downloaded on July 19, 2017, for this study. The following changes were made to address apparent data set errors or data handling issues:

- Changed the location of four rows of NO and NO_2 data from C-103 to C-108 because all other data in the survey (#06-03480) were from C-108 and the survey title was for C-108 portable exhauster, with no mention of C-103.
- Changed the farm and location of one row of data (16-03244-1-010) from AP farm primary exhauster to 702-AZ stack because all other data in the survey were from 702-AZ, and the survey title was for 702-AZ, with no mention of the AP tank.
- Replaced the CAS number for sulfur dioxide with a text string, because Excel misinterpreted the original ID number format as a date.
- In hexavalent chromium rows, replaced blanks for the molecular weight with 51.996 (units g/mol).

Some of the TWINS IH data were for QA samples. These were removed from the database.

TWINS IH contained four sources of concentration data: (1) the concentration in ppm, (2) the concentration in mg/m^3 at 25°C, (3) the standard concentration, and (4) the reported value. All sources were not always present for a given row of data, so different sources were used as available. The data source that was first in preference was the concentration in ppm, which could be used directly and, if present, was always provided as a number. The second-preferred source was the concentration in mg/m^3 at 25°C, which was converted to ppm by applying the ideal gas law and using the molecular weight. Concentrations provided by TWINS IH data were converted into units of ppm from the units that were provided. As necessary, units of mass/volume (such as mg/m^3) were converted to ppm by applying the ideal gas law, assuming a temperature of 25°C, and using the chemical's molecular weight. The full set of all concentration units appearing in TWINS IH was checked to make sure the units-conversion logic

[7] ATS-GD-1048, Rev. D-2. *Data Qualifiers for Vapor Samples*. April 9, 2015. Washington River Protection Solutions, Richland, Washington.

would handle them properly. One row of data for airborne fibers was not handled properly, but these were not organic vapors and were not used in analysis.

A number of chemicals in the TWINS IH data set—primarily nitrosamines and furans—often had "needs conversion" text notes rather than numeric values in the two preferred concentration columns (concentration in ppm and concentration in mg/m^3 at 25°C). In these cases, or others where the first- and second-preferred concentration data sources were not usable, the standard concentration was almost always available as the third choice. It was necessary to resort to the fourth choice in fewer than 20 out of the more than 29,000 rows of data. The calculations used the reported value and its units. Logic was provided, but turned out not to be needed, to use the molecular weight and the ideal gas law at the reference temperature and 1 atm to convert mass/volume reported value units to ppm. Logic also was provided, and also was not needed, to convert reported value units of mass [nanograms (NG, NGS), etc.] to mass/volume by dividing the reported mass by the database entry for the sample volume and its units (which were always liters).

Like the SWIHD HS database, the TWINS IH database currently does not contain explicit information to denote which data came from sample collectors in series or to identify which collectors belong in a set. The general approach to combining concentrations used for TWINS IH data was the same as that used for SWIHD data, with modifications related to the types of data present in TWINS IH. First, because samples taken with SUMMA canisters, vacuum bottles, badges, or filters were never taken in series, these results were removed from consideration for combination. Next, it was assumed that, for any given combination of farm, location, chemical ID number, sample device, and sampling method, any rows of data that had sequential (or nearly sequential) field sample ID numbers and that also had exactly the same sample volume were part of a series set of collectors.

The process produced 27 sets of three rows (triplets) of dimethyl mercury data that had sample ID numbers of the form Survey-1-001A/B/C, Survey-2-001A/B/C, Survey-1-001A/002A/003A, or Survey-1-004B/005B/006B. In every case, the volumes within any triplet were equal to all the significant figures provided, which was considered to be a true distinguishing feature because the volumes were given to four or more significant figures. These were considered to be valid sets of three tubes in series.

Only a few hundred sets of two rows were found that met the criteria given above to define them as pairs. These were given a case-by-case review, based on whether the field sample ID numbers appeared to be in sequence, how many significant figures were present in the shared sample volumes, and whether the second row in the sample-number sequence had a lower concentration than the first. In general, if the field sample ID numbers were sequential or semi-sequential, samples were classified as pairs even if both rows had similar concentrations or the sample volume was only given to one significant figure (i.e., sample volumes were not a good distinguishing feature).[8]

One set of data initially appeared to contain four rows. However, in this case, the sample volume was given to only one significant figure (5 L) and the sample names were 08-02864-1-08-01A, 08-02864-1-

[8] "Semi-sequential" sample IDs were, for example, 021A/023B, 001A/001A3, 001B/001B3, 00n/00nB (where n is any number), 006/007B, and 011A/13B. As long as there were equal volumes and an A and a B, or a no-letter and a B, or two numbers in sequence, the samples were considered to be pairs rather than replicates. The pair ID numbers that stretched these criteria the furthest had identifiers ending in 000/010. This nomenclature appeared only in two pairs of 1,3-butadiene data in which all measurements were below the reporting limit.

08-01B, 08-02864-2-08-01DUPA, and 08-02864-2-08-01DUPB. “DUP” indicates duplicates that were judged to be replicates, in series only with each other, rather than being in a four-collector series with the non-DUPs (which likewise were considered a pair). A similar approach was taken for a few other pairs that had DUP in the sample ID number and also had sample volumes whose significant figures were few enough to make it hard to distinguish replicates from series pairs.[9]

Note that the decisions about whether sets of two rows were true pairs in series, or replicates, or true singletons were often judgment calls. Survey reports and sampling head information were not consulted for TWINS IH. Also, data initially classified as singlets were not reviewed line-by-line to check for possible pairs with sample volumes that might incorrectly be slightly unequal, in the same way as some cases in the SWIHD HS. There was only one exception to this level of review. One set of dimethyl mercury data in Survey 16-01504 had slightly different sample volumes. This was decided to be a pair based on the sequential field sample ID numbers and the concentration pattern, with one collector having a much higher concentration than the other.

In addition, it was not generally possible to be sure if a singleton that appeared (based on nomenclature) to be part of a pair, but whose mate was missing, was first collector data or second collector data. Therefore, the practice that was followed for SWIHD HS, of flagging unmated first collectors and culling unmated second collectors, was not employed for TWINS IH data.

Compared to the SWIHD HS, the TWINS IH database had a greater variety of field sample nomenclature and more frequent appearance of sample volumes with a small number of significant figures, so there was less information on which to base decisions on whether apparent singletons were actually pairs. That said, true singletons did seem to be more prevalent than pairs in the TWINS IH data set, compared to the SWIHD HS data set.

As for the SWIHD HS combination process, this approximate approach to identifying which TWINS IH samples to combine decreases the extent of underestimation of concentrations, compared to the 2016 study approach in which combination was not performed. If there are cases where samples are inaccurately identified as a group to combine, these cases would produce overestimated concentrations. If there are cases where samples are inaccurately identified as singletons, these cases would produce underestimated concentrations.

The combination procedure was the same as for SWIHD HS: that is, summing the concentrations in a group, assigning a range code to the combined result, and concatenating the data-quality flags so that this information would not be lost. See Section B.1.2 for more details.

All the sources that were included in the TWINS IH database were kept for analysis. The non-tank sources—the AR204 unloading station, the 222-S Laboratory, the 241-S-302A diversion box, the 241-UX-302A catch tank, and some sources described only as “Non-farm”—were not removed.

[9] One case, 08-02864-1-08-03A/B and 08-02864-2-08-03DUPA/B, was identified in which some of the measured chemicals were present in B and DUPB, and others were only present in A and DUPA. The four chemicals absent from B were propanenitrile, pentanenitrile, butanal, and 1-butanol. These four data entries were considered to be singletons.

The final step performed on the combined TWINS IH data was to check data quality. Data-quality flags that were taken as reasons to exclude concentration data from analysis were the same as those for SWIHD HS and are listed below:

- Flag a – Having a laboratory control sample that was out of range
- Flags b or B – Associated with a contaminant in a blank
- Flags c or d – Having an excessive relative percent difference or relative standard deviation
- Flag e – Having an excessive difference between the sample result and its serial dilution
- Flag f – Having a failed mass spectrometer reading on the sample but not on its serial dilution
- Flags L or Y – Marked with a laboratory-defined flag with a meaning that was not generically defined and might indicate a serious data-quality issue

The flag "U", for a concentration less than the minimum detection limit, and the range indicator "<", were used to identify concentrations that were less than the reporting limits. These data were included in the analysis.

The TWINS IH data set identified the dates when samples were taken but not the times, so there was no need to average samples by time-of-day bin, and no information to support time binning.

B.1.4 Mobile Laboratory

The van-based mobile laboratory, which included proton transfer reaction mass spectroscopy (PTR-MS) instrumentation to measure a range of organic chemicals and a Picarro ammonia analyzer[10] to measure ammonia, provided data measured at 2-second intervals. The mobile laboratory was operated by RJ Lee Group, Inc. for WRPS. The van was deployed twice in 2017 to collect Hanford source data.

From May 23, 2017 through May 25, 2017, the airstream at the passive breather filter of A-103 was sampled; no waste-disturbing activity was being carried out in the A Farm tanks at the time. (The A Farm tank headspaces are interconnected by overflow lines and ventilation headers, so activity in one tank may affect all.) This data set included Global Positioning System (GPS) data for the van location, meteorological data at the van location, and water vapor and CO_2 measurements as well as PTR-MS and ammonia measurements. There were data gaps for parts of the nominal 3-day period, where the RJ Lee team had decided that data were not of sufficiently good quality or when an instrument was down. Periods when some data were present, but were not considered to represent breather filter concentrations, were 12:21 p.m – 3:40 p.m. on May 23 (sample pump off) and 9:05 a.m. – 12:46 p.m. on May 24 (sample pump off). The sample flow and heat tracing on the sampling line were considered operational on May 23 at 9:43 a.m., and the instruments were disconnected from the breather filter at 1:32 p.m. on May 25.[11]

The AP exhauster stack was sampled from July 2, 2017 through July 8, 2017. The mobile laboratory was connected to the AP stack manifold at about 8:30 a.m. on July 2 and disconnected at about 8:15 a.m.

[10] Picarro G2103 ammonia analyzer, ambient, obtained from Picarro, Inc., Santa Clara, CA.
[11] Information given here is based on pp. 43-48 of the field notes and on p. 12 of Weekly Report 6.1 (6/27/2017), as supplied by RJ Lee Group, Inc.

on July 8. This data set contained PTR-MS, ammonia, and water vapor measurements, but did not include GPS data for the van location, meteorological data at the van location, or CO_2 measurements. There were numerous gaps in data collection because of data quality issues, instrument shutdowns, and a brief period when the laboratory switched from source data collection to area data collection.[12] Two segments of evaporator campaign EC-06, which sent slurry to AP-104, overlapped this period: (a) 8:19 p.m. on July 1 through 6:15 p.m. on July 2 (ending when a power spike caused an interlock trip), and (b) 11:26 p.m. on July 5 through 2:11 p.m. on July 13.[13]

In the July mobile laboratory data, background concentrations of some chemicals may have been affected for a few hours by a local fire. When the staff first arrived at 5:40 a.m. on July 3, they observed a grass fire that originated west of the Hanford Site along WA Highway 24. The fire was under control by about 1 p.m. on July 3. Data obtained from the 200-E Hanford meteorological station show wind direction from the west-northwest at 1 a.m. on July 3, changing to wind with a more variable direction, generally between west-northwest and northwest, starting at about 6 a.m. on July 3.

Although the data sets as received from RJ Lee had been edited to remove poor-quality data, a further need for editing was defined by RJ Lee after that data was received. Because of a problem with the auto-dilution factor, the Picarro ammonia instrument tended to flat line as a response to ammonia increases. The recommended data-correction approach, which was followed, was to test for cases where the reported ammonia concentration was identical for three or more successive time-steps and remove all but the first data point.[14] Since concentrations were reported to four or more significant figures and normally showed variation in the last or next-to-last figure during "constant-concentration periods," the presence of identical values was a reasonable distinguishing diagnostic.

For analysis purposes, the above-report as-received 2-second data were converted to boxcar arithmetic averages—not rolling averages, but non-overlapping—for 4-hour periods. The 4-hour averaging period was chosen because half or more of the data in the TWINS IH database had sample collection durations of between 1 and 6 hours, and a 4-hour average put the mobile laboratory data on a similar basis.

Mobile-laboratory data were censored, as being below-report, if the concentration was less than the reporting limit, taken to be three times the method detection limit for the chemical.[15] For each 4-hour averaging period, if any concentrations were present that were at least equal to the reporting limit for the chemical, those concentrations were averaged to provide a non-censored value for the period. If no concentrations in the period were above-report, then a censored value equal to the reporting limit was used for the period. In the case of non-chemicals of potential concern (COPCs) and the COPC diethylphthalate, no method detection limit was provided. For these chemicals, all measured concentrations (including zeros) were treated as above-reports.

[12] pp. 53-59, pp. A-138 through A-150, Monthly Report 9 – PBI Rev. 00 (9/21/2017), as supplied by RJ Lee Group, Inc.
[13] Personal communication from John M. Conner (WRPS) to L.A. Mahoney (PNNL), September 21, 2017.
[14] Email communication between George Weeks (WRPS) and Elizabeth Golovich (PNNL) with the subject "Confirmation on removal of bad ammonia data" on September 28, 2017 at 2:10 p.m.
[15] Table 4-10, p. 34, Monthly Report 9 – PBI Rev. 00 (9/21/2017), as supplied by RJ Lee Group, Inc.

In some cases, multiple COPCs overlapped and it was impossible to distinguish which was measured, and how much each was contributing. These concentrations were not used in analysis of mobile laboratory data because there was no way to assign them to a unique CAS number. They include the following:

- Butanol/butenes
- 3-buten-2-one/2,3-dihydrofuran/2,5-dihydrofuran
- Pyridine/2,4-pentadienenitrile
- 3-methyl-3-butene-2-one/2-methyl-2-butenal
- 2-ethyl-hex-2-enal/4-(1-methylpropyl)-2,3-dihydrofuran/3-(1,1-dimethylethyl)-2,3-dihydrofuran

B.1.5 Cartridge Tests

During 2016 and 2017, 11 respirator cartridge tests were performed on headspace vapors from six tanks (SY-102, BY-108, A-101, AX-101, SX-101, and SX-104) and four exhausters (AP, 702-AZ, AW, and AN) during static, non-waste-disturbing conditions (Freeman et al. 2017; Nune et al. 2016a,b, 2017a-g, 2018a-c). An additional test of the 702-AZ exhauster was performed during waste-disturbing activities.

Vapor concentrations used in this analysis were measured upstream of the air-purifying respirator cartridge material using an array of sorbent tubes after vapors flowed through radiation filters and past temperature, pressure, and relative humidity probes. The inlet tube is positioned within the headspace of the tank or within the exhausters. Initial tests measured inlet (upstream) concentrations using a sampling duration of 2 hours at the beginning and end of the 16-hour of cartridge testing. Later tests began measuring influent concentrations in increments of 2 hours throughout the entire test period. Some pre-processing of the data was required prior to analysis. Pre-processing steps included:

- Removal of effluent data, both laboratory and field quality control samples, duplicative rows, and rows without quantitative information
- Removal of analytical methods not presented in cartridge testing reports in contrast to data sets described in prior sections that may retain more than one method for each species
- Addition of CAS Registry Numbers that were missing
- Conversion of units into ppm, as necessary
- Designation of RL (reporting limit) or DL (detection limit)
- Combining results for samples collected in series or multiple measurements of the same tube
- Addition of data quality flags for analytical laboratory results, dubious flowrates, and data of indeterminate quality
- Exclusion of select flagged data (here a, b, B, c, d, e, f, L, Y, S, S*, and !)

Unique aspects of these steps are discussed in the remainder of this subsection.

Cartridge testing analysis team analyzed the data in two steps that output two types of files. The first set of files comprise the master files in which the raw data was imported, flow rates and times were converted to volumes of air, analytical laboratory data was converted from the various units used by the various laboratories into micrograms, the volume and mass information was correlated based on the laboratory customer sample ID numbers, the molecular weight of a COPC was determined from the customer sample ID number, the molar volume was determined from the ideal gas law at a standard temperature and pressure, and the concentration was calculated in ppm. The standard pressure was 1 atm for all data sets. The standard temperature was 70°F for SX-101 and SX-104 and 24.85°C for the other sources. The second set of files comprise the plot files in which the information in the master was converted into different units, exception handling was performed, and concentrations were plotted. Data used in this analysis was extracted from the master files not the plots files.

The information pulled from cartridge testing was current as of February 7, 2018. Although some source files had completed review by this date, others had not. Where the master and plots files were not in complete agreement, those rows of data were given a new flag of ! and, thence, removed from analysis. For example, data where the influent and effluent sorbent tubes may have been swapped were simply not used. Any data that was not identified as inlet data based on the customer sample ID number including blanks, bases, effluent, and laboratory control samples was removed. Entries with a division by zero error in the COPC concentration column were removed. Only COPC inlet information is of interest to leading indicators (LIs) and had a quality affecting pathway from cartridge testing.

For the purposes of cartridge testing, the customer sample ID number was used to identify the block of 2 hours in which the sorbent tubes were connected to the inlet to the cartridge testing apparatus. Concentrations were considered paired if they arose from the same 2-hour block for the same tank, in contrast to the measurements described above that may permit matching over longer periods. In this sense, aligning time and position is more straightforward with cartridge testing data than the databases discussed above. Correlation between each measurement was achieved by aligning the time stamps for each period of 2 hours. In this manner, each data point may include tens of concentration measurements.

Multiple entries for the same sorbent tube or set of sorbent tubes in series were only present for 1,3-butadiene and the nitrosamines. In the former case, serial tubes were identified by A and B in an otherwise identical customer sample ID (the line number may also have differed). Identical volumes were not required but typically occurred. For 1,3-butadiene, only pairs of tubes were used. For nitrosamines, only one sorbent tube was used, but multiple extractions may have been performed for a few of the data sets. For both the butadienes and the nitrosamines, the following rules were used to combine paired entries. If both entries were above the detection/reporting limit, the concentration was summed. If both entries were below the detection/reporting limit, the concentration of the first entry was retained. If only one of the entries was above the detection/reporting limit, only its concentration was preserved. Data quality flags were hyphenated where present. If one entry had less than 10% of the other's concentration, its flags were not included. If the first entry in a pair was missing, the pair was to be deleted, but this option was not encountered. If the second tube was missing (the only unpaired case is in the AW data set), it was retained with an added "?" flag. Data with this flag have been retained and not excluded.

Two more data quality flags have been added, in addition to the ! and ? flags described previously. These two were associated with the flow rates, which contribute the volume measurement to the concentration calculation. When a flow rate was marked by WRPS IH or the cartridge testing calculation author as being specifically specious, those concentration entries were marked with S*. Other flowrates

identified by the cartridge testing calculation author as questionable but without clarity regarding the cause were marked with #. In downstream processing, the S* flags were removed but the # flags were retained. Each of the four data quality flags specific to cartridge testing data (!, S*, #, and ?) was added after extraction from the master files. For AN and A-101, the data quality flags from RJ Lee were added individually because the data quality flags were not incorporated into the respective master files as of February 7, 2018. Please note that data with the U flag were retained for this data set in contrast to others.

Although multiple analytical methods may have been used to determine the mass of a specific analyte from the sorbent tubes, only one was selected for reporting by cartridge testing. The method selected for cartridge testing was preserved here due to the prior discussions between WRPS subject matter experts and the cartridge testing analysis team regarding the preferred analytical method as understood on February 7, 2018. Therefore, in contrast to the previous databases in which multiple methods may contribute to a value, in cartridge testing only one method contributed. The selected method along with the rejected methods are given in Table B.1.

A note on method selection for tentatively identified compounds (TICs) is in order. Where information is available for a COPC from both a standard analytical method (i.e., one that is specifically calibrated) and via a TIC identification, the standard analytical method takes precedence. The TIC information is marked with a ! flag and not analyzed further. If only a TIC identification is available then the TIC is included.

Table B.1. Table of selected and rejected methods.

Chemical	**Selected Methods**	**Rejected Methods**
Ammonia	Vapor for Total Ammonia	Vapor for Ammonia by IC, VAPOR-SUMMA VOA #2
Nitrous Oxide	Not Measured	
Mercury	Vapor for Total Mercury	Vapor for Mercury by CVAA, VAPOR-SUMMA VOA #2
1,3-Butadiene	NIOSH 1024	VAPOR-TDU VOA #2, VAPOR-SUMMA VOA #2
Benzene	VAPOR-TDU VOA #2	VAPOR-SUMMA VOA #2
Biphenyl	VAPOR-TDU SVOA #2	VAPOR-TDU VOA #2
1-Butanol	VAPOR-TDU VOA #2	VAPOR-SUMMA VOA #2
Methanol	Methanol in vapors by NIOSH 2000, VAPOR-SUMMA VOA #2	
2-Hexanone	VAPOR-TDU VOA #2	VAPOR-SUMMA VOA #2
3-Methyl-3-butene-2-one	Not Measured	
4-Methyl-2-hexanone	VAPOR-TDU VOA #2	VAPOR-TDU SVOA #2
6-Methyl-2-heptanone	VAPOR-TDU SVOA #2	VAPOR-TDU VOA #2
3-Buten-2-one	VAPOR-TDU VOA #2	VAPOR-SUMMA VOA #2
Formaldehyde	Aldehyde Screen Long List, EPA TO-11A	
Acetaldehyde	Aldehyde Screen Long List, EPA TO-11A	VAPOR-SUMMA VOA #2
Butanal/Butyraldehyde	Aldehyde Screen Long List, EPA TO-11A	VAPOR-TDU VOA #2,

Chemical	Selected Methods	Rejected Methods
	(except for BY, 702-AZ (2016), AX, AW, AN that do use VAPOR-TDU VOA #2)	VAPOR-SUMMA VOA #2
2-Methyl-2-butenal	Not Measured	
2-Ethyl-hex-2-enal	Not Measured	
2-Propenal/Acrolein	Aldehyde Screen Long List	
Furan	Furans in Vapor Samples by SIM	VAPOR-TDU VOA #2
2,3-Dihydrofuran	Furans in Vapor Samples by SIM	
2,5-Dihydrofuran	Furans in Vapor Samples by SIM	VAPOR-TDU VOA #2
2-Methylfuran	Furans in Vapor Samples by SIM	VAPOR-TDU VOA #2
2,5-Dimethylfuran	Furans in Vapor Samples by SIM	
2-Ethyl-5-methylfuran	Not Measured	
4-(1-Methylpropyl)-2,3-dihydrofuran	Not Measured	
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Not Measured	
2-Pentylfuran	Furans in Vapor Samples by SIM	
2-Heptylfuran	Furans in Vapor Samples by SIM	
2-Propylfuran	Furans in Vapor Samples by SIM	
2-Octylfuran	Not Measured	
2-(3-Oxo-3-phenylprop-1-enyl)furan	Not Measured	
2-(2-Methyl-6-oxoheptyl)furan	Not Measured	
Diethylphthalate	VAPOR-TDU SVOA #2	VAPOR-TDU VOA #2
Acetonitrile	VAPOR-TDU VOA #2	NIOSH 1606, VAPOR-SUMMA VOA #2
Propanenitrile	VAPOR-TDU VOA #2	
Butanenitrile	VAPOR-TDU VOA #2	
Pentanenitrile	VAPOR-TDU VOA #2	
Hexanenitrile	VAPOR-TDU VOA #2	VAPOR-TDU SVOA #2
Heptanenitrile	Not Measured	
2-Methylene Butanenitrile	Not Measured	
2,4-Pentadienenitrile	Not Measured	
Ethylamine	Vapor Samples for Amines (Amines-VOA Aliphatic VAA-1)	
N-Nitrosodimethylamine	RJ Lee (Vapor for Nitrosamines)	
N-Nitrosodiethylamine	RJ Lee (Vapor for Nitrosamines)	
N-Nitrosomethylethylamine	RJ Lee (Vapor for Nitrosamines)	
N-Nitrosomorpholine	RJ Lee (Vapor for Nitrosamines)	
Tributyl phosphate	VAPOR-TDU SVOA #2	
Dibutylbutylphosphonate	VAPOR-TDU SVOA #2	
Chlorinated Biphenyls	Not Measured	

Chemical	Selected Methods	Rejected Methods
2-Fluoropropene	Not Measured	
Pyridine	VAPOR-TDU VOA #2 (except for BY, 702-AZ (2016) that do use NIOSH 1613)	NIOSH 1613
2,4-Dimethylpyridine	VAPOR-TDU VOA #2 (except for BY, 702-AZ (2016) that do use NIOSH 1613)	NIOSH 1613
Methyl nitrite	Not Measured	
Butyl nitrite	Not Measured	
Butyl nitrate	Not Measured	
1,4-Butanediol, dinitrate	Not Measured	
2-Nitro-2-methylpropane	Not Measured	
1,2,3-Propanetriol, 1,3-dinitrate	Not Measured	
Methyl Isocyanate	Not Measured	
Dimethyl Mercury	Not Measured	

Reporting and detection limits for analytical measurements were distinguished when extracting cartridge testing data. The designation of RL or DL was determined from the analytical method. The use of RL may be confirmed in the documentation provided by ALS, WHL, and RJ Lee laboratories despite the designation of DL in some downstream documentation. The remaining methods were left as DL in the absence of competing information. Because different methods were selected for some of the COPCs at different times in testing, the designation of RL or DL is test and chemical specific (see Table B.2). For convenience, the < from the mass measured by the analytical laboratory (if present) was concatenated to RL or DL.

Reports issued prior to the addition of the two new COPCs do not include information for these two COPCs, but reports issued after October 1, 2017 do include the new COPCs (Way 2017). A brief scan of data from cartridge testing prior to October 1, 2017 turned up only a couple of entries for acrolein data not at or below reporting/detection limits. Therefore, earlier data for acrolein has not been included in this report.

Please note that only COPCs are included in this extraction for the LIs effort because only the COPCs were in the quality affecting path for cartridge testing and only COPCs have been used in the analysis introduced in the main body of this report. Other species were identified and quantified by WRPS during the cartridge testing experiments and may or may not remain in the data quality affecting pathway. Statistical information was not compiled, preventing assertion of comprehensive statements of statistical significance.

Table B.2. Table of reporting and detection limits.

Chemical	Cartridge Test Campaign										
	AP	**SY**	**A**	**BY**	**702-AZ (2016)**	**AX**	**AW**	**AN**	**702-AZ (2017)**	**SX-101**	**SX-104**
Ammonia	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL
Nitrous Oxide	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Mercury	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL
1,3-Butadiene	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL
Benzene	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Biphenyl	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
1-Butanol	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Methanol	NM	NM	NM	NM	NM	NM	NM	NM	DL	RL	RL
2-Hexanone	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
3-Methyl-3-butene-2-one	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
4-Methyl-2-hexanone	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
6-Methyl-2-heptanone	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	DL
3-Buten-2-one	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Formaldehyde	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL
Acetaldehyde	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL
Butanal/Butyraldehyde	RL	RL	RL	DL	DL	DL	DL	DL	RL	RL	RL
2-Methyl-2-butenal	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-Ethyl-hex-2-enal	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-Propenal/Acrolein	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RL	RL
Furan	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
2,3-Dihydrofuran	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
2,5-Dihydrofuran	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
2-Methylfuran	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
2,5-Dimethylfuran	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
2-Ethyl-5-methylfuran	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
4-(1-Methylpropyl)-2,3-dihydrofuran	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-Pentylfuran	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
2-Heptylfuran	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
2-Propylfuran	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
2-Octylfuran	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-(3-Oxo-3-phenylprop-1-enyl)furan	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-(2-Methyl-6-	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

Chemical	Cartridge Test Campaign										
	AP	**SY**	**A**	**BY**	**702-AZ (2016)**	**AX**	**AW**	**AN**	**702-AZ (2017)**	**SX-101**	**SX-104**
oxoheptyl)furan											
Diethylphthalate	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Acetonitrile	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Propanenitrile	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Butanenitrile	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Pentanenitrile	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Hexanenitrile	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Heptanenitrile	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-Methylene butanenitrile	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2,4-Pentadienenitrile	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Ethylamine	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL
N-Nitrosodimethylamine	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL
N-Nitrosodiethylamine	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL
N-Nitrosomethylethylamine	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL
N-Nitrosomorpholine	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL
Tributyl phosphate	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Dibutyl butylphosphonate	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
Chlorinated Biphenyls	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-Fluoropropene	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Pyridine	DL	DL	DL	RL	RL	DL	DL	DL	DL	DL	DL
2,4-Dimethylpyridine	DL	DL	DL	RL	RL	DL	DL	DL	DL	DL	DL
Methyl nitrite	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Butyl nitrite	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Butyl nitrate	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
1,4-Butanediol, dinitrate	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-Nitro-2-methylpropane	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
1,2,3-Propanetriol, 1,3-dinitrate	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Methyl Isocyanate	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Dimethyl mercury	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

For Information Only
Assignment of RL versus DL based on method with reference to raw data provided by WRPS.
NM stands for not measured (it may appear as a TIC).

B.2 DRI Analysis

Data from DRIs are available from cartridge testing. These data are valuable because they represent data available from actual operation campaigns. In cartridge testing, the gas phase ammonia concentration and total volatile organic compound (VOC) concentration were estimated using a Honeywell MultiRAE Pro instrument. The ammonia was detected using electrochemical detection, while a photoionization detector was used for total VOCs. Once a single concentration measurement with the DRI (MultiRAE) exceeds the maximum (99 ppm), remaining measurements cannot be trusted per IH protocol. Above 99 ppm, Drager tubes may be used and were implemented on the second day of BY-108 testing.

Data were collected relative to tanks or sets of tanks with exhausters or breather filters including the AP exhauster, SY-102, BY-108, A-101, AX-101, AN exhauster, AW exhauster, 702-AZ exhauster (2016 and 2017), SX-101, and SX-104. Vapor samples were collected from within the tank headspace at least 4 feet within the dome. Of the data sets available, the ammonia level exceeded 99 ppm for A-101, AX-101, AP exhauster, BY-108, SX-101, and SX-104. Excessive measurements occurred early in each of these campaigns so that none of the data for these six tanks may be used in the analysis here. Because ammonia biases the total VOC concentration, both ammonia and total VOC measurements from the DRI must be discarded. (Data from the AP exhauster was also dismissed because at least 1 hour intervened between sorbent tube and DRI measurements.) Total VOC information as projected by combination of analytical laboratory measurements is not available for 702-AZ (2017). This leaves data from the AN exhauster, AW exhauster, SY-102, and 702-AZ exhauster (2016 and 2017) for comparison for ammonia and the AN exhauster, AW exhauster, SY-102, and 702-AZ exhauster (2016) for total VOCs. Data were not collected at all time points, further reducing the available data. In net, 46 data points remain available for ammonia analysis and 34 data points remain available for total VOCs from these four or five cartridge testing campaigns.

For these tanks or sets of tanks, DRI concentrations and measurement times were extracted from the test field notes provided by WRPS. The analytical laboratory information was adopted from cartridge testing as described in the Section B.1.5. Please note that the analytical measurements are for intervals of 2 hours, in contrast to the DRI measurements, which remain relatively instantaneous. Both measurements include measurement uncertainty (and statistical biases), but the DRIs also include a temporal variability "averaged out" in the analytical laboratory measurements.

Pre-processing steps included:

- All of the pre-processing steps in Section B.1.5 so that if an analytical laboratory measurement is removed, so is its corresponding DRI measurement (except in temporal plots below)
- Removal of data outside the instrument range (e.g., <1 ppm or >99 ppm for ammonia)
- Conversion to ppm when measured in ppb
- Missing time stamps completed from the structure of the remaining data

The DRI and sorbent tube information were aligned by using the actual time measurements to the minute (instead of the time blocks of 2 hours used to align the rest of cartridge testing information). Per cartridge testing protocol, the DRI measurement is correlated to the sorbent measurement that typically immediately preceded it.

The total VOC estimates from the analytical laboratory are summation of all VOCs measured as reported in the multi-tank report from cartridge testing. No single measurement quantifying total VOCs was collected for analytical laboratory measurement, leaving the summation of individual species as a best available approximation instead of a definitive concentration.

The following figure compares analytical laboratory measurements to DRI measurements. Remarkably, all of the measurements except those for SY-102 exceed 1/2 occupational exposure limit (OEL) and most exceed the OEL for ammonia. The data generally fall along the 45-degree line. Exceptions to this generality include two points from the AN exhauster that have low analytical laboratory measurements. These points cannot be dismissed based on a statistical basis because they do not exceed three standard deviations from the mean (under the traditional but unverified assumption that the data may be normally distributed). Four points have low DRI measurements relative to the analytical laboratory measurements. However, each of these values has been confirmed as recorded on the field test notes and, therefore, the values are representative of field observations—the population of interest—even if they appear to be low. Neither statistical nor scientific reasons are available to dismiss these points with cause.

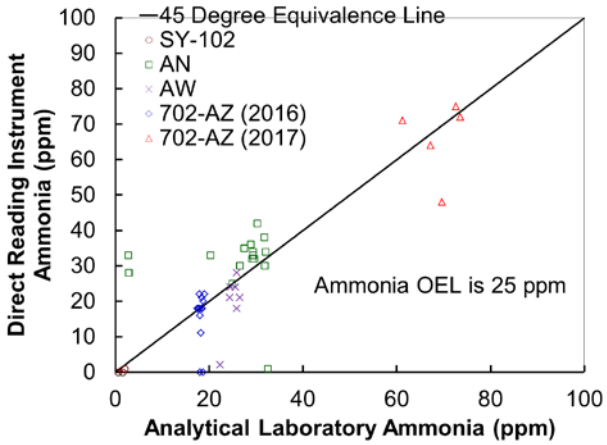


Figure B.1. Comparison of ammonia concentrations from the DRI and the sorbent tubes analyzed by the analytical laboratory.

The total VOC from the analytical laboratory and DRIs are compared in the following figure. In both cases, the agreement between analytical laboratory measurements and the DRIs can only be described as poor. Even when correcting for bias from ammonia (right panel), the agreement remains poor. The cause of the disagreement may be uncertainty or bias from either the DRI or analytical laboratory measurement, and uncertainty from summing the analytical laboratory concentrations of individual VOC species may be significant.

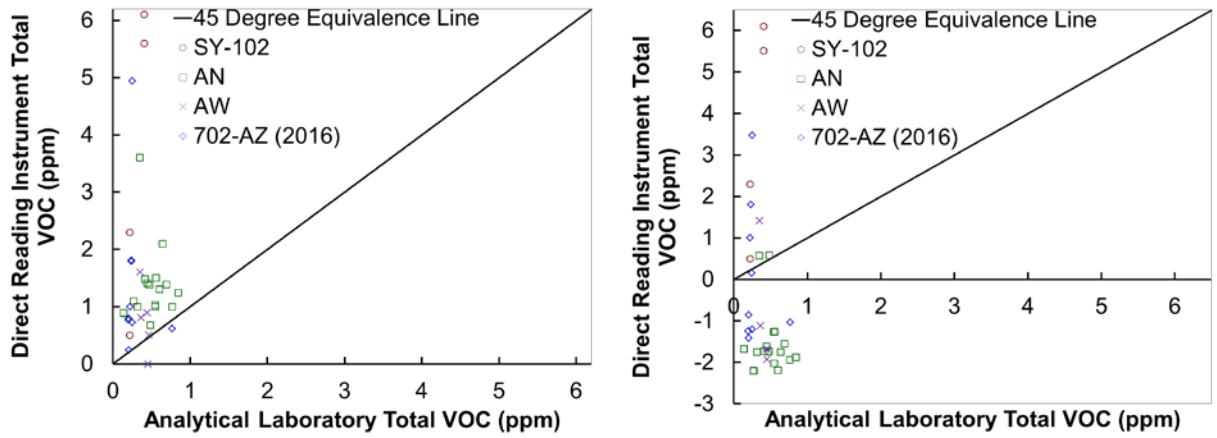


Figure B.2. Comparison of total VOC concentrations from the DRI and the sorbent tubes analyzed by the analytical laboratory. The panel on the left presents the total VOC concentration as recorded by the DRI. The panel on the right presents the total VOC concentration after correction for the bias introduced by the presence of ammonia (i.e., subtracting the ammonia concentration divided by 10.9, the calibration factor for isobutylene with a 10.6 eV lamp).

The following plots show the temporal development of the data summarized above. Clearly, the measured ammonia concentrations are dynamic and lower values occur with some regularity from both the DRI and sorbent tube measurements.

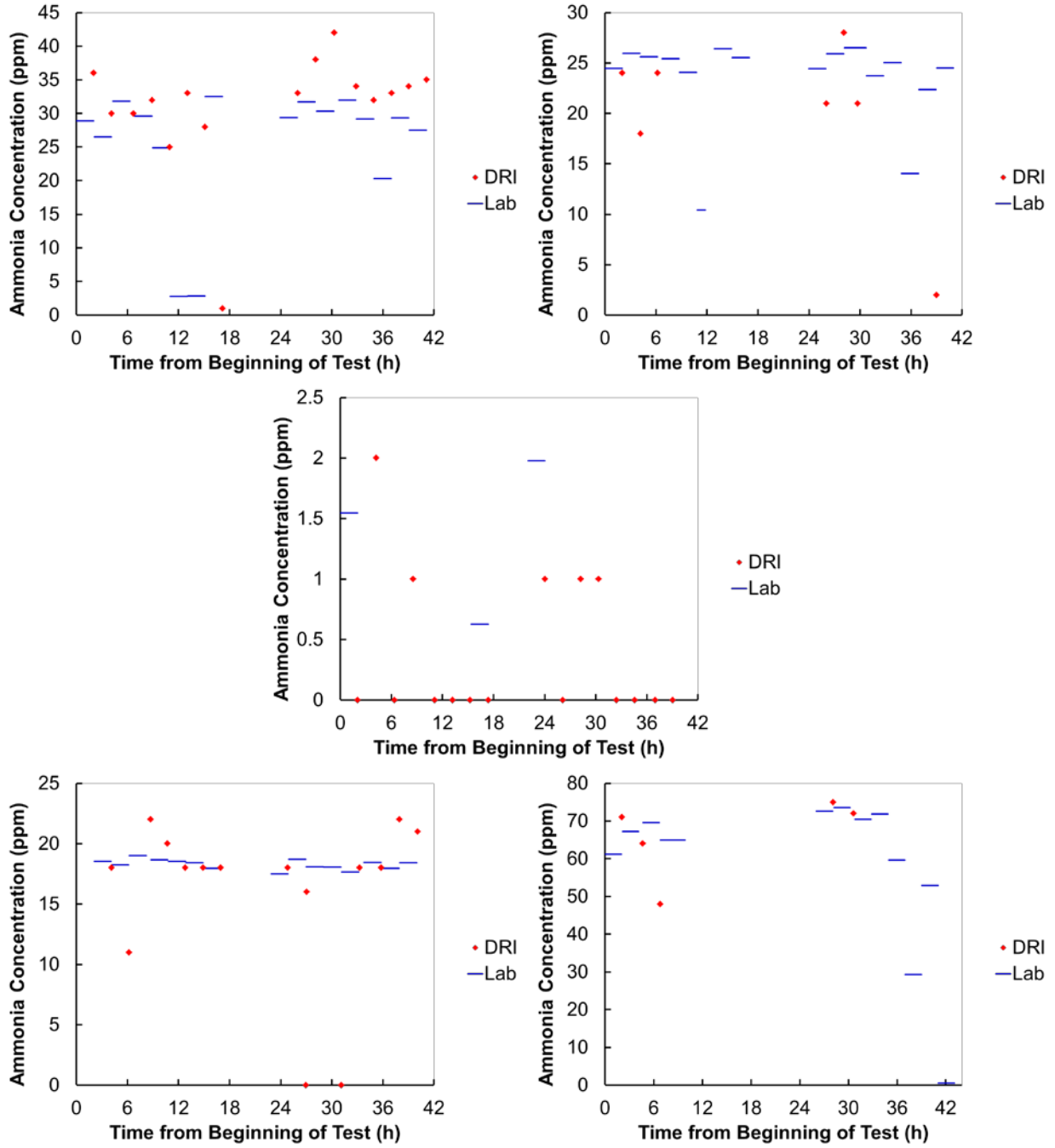


Figure B.3. Ammonia concentration as measured by DRI and sorbent tubes with analytical laboratory analysis versus time from the beginning of the test for (upper left) AN exhauster, (upper right) AW exhauster, (center) SY-102, (lower left) 702-AZ exhauster (2016), and (lower right) 702-AZ exhauster (2017). The latter was during a waste-disturbing event. Only recorded values presented.

In net, these plots are informative primarily as an indication of some of the uncertainties in the DRI measurement of ammonia relative to laboratory analyses *under in-field conditions*. This is important because the nominal detection limits in the main body of this report are formally detection limits as measured by the analytical laboratories. For example, if the detection or reporting limit of the analytical

laboratory were 1 ppm, then the designation of leadingly and laggingly indicated species in Section 5.0, for example, proceeds formally as described therein. Similarly, if one could demonstrate that the analytical laboratory measurements and the DRI were identical without bias or differing uncertainty and that the detection limit of the DRI were indeed 1 ppm, then one could begin to forge the link(s) necessary to use DRI measurements with the tables or number lines in this report. To signal that these are different, the term nominal has been used throughout the main body of the report. Please note that there are specific statistical requirements for joining data from that activity to information from this report. Simply measuring the sensitivity and accuracy of in-field instruments is insufficient to move from nominal detection limits to actualized detection limits as used in this report.

An indication of how different the DRI measurements are from analytical laboratory measurements is provided in Table B.3. This table presents the root mean squared error for each of the five tanks for which pair data are available as described above. Remarkably, the root mean square error between the two measurements ranges from 0.4 ppm to as high as 12.7 ppm in this data set, suggesting that the variation between the two measurements methods may be an order of magnitude. Please note that this root mean square error has not been multiplied by a coverage factor to establish confidence or tolerance intervals nor has the statistical distribution that would support such an analysis been established. Pooling of the root mean square errors has not been performed and may differ from the tank-specific root mean square errors.

Table B.3. Root mean square error of DRI versus analytical laboratory measurements for ammonia.

Tank(s)	Count	Root Mean Square Error
AN Exhauster	16	12.7 ppm
AW Exhauster	8	8.6 ppm
SY-102	4	0.4 ppm
702-AZ (2016)	16	6.7 ppm
702-AZ (2017)	5	10.4 ppm

In net, a technical basis for associating the nominal detection limits in the main body of the report with the detection limits of direct reading instrumentation does not exist. The root mean squared errors in this table present some of the difficulties in forging this link. Systematic data collection and statistical analysis would be required to overcome this disconnect and establish a meaningful technical basis. Factors to be considered would include (at minimum) measurement uncertainties (e.g., from instrument calibration), measurement biases, temporal variations between the two types of measurement methods (see Figure B.3 and Figure B.4) that demonstrate that in-field temporal variations may be significant), the statistical distributions of these measurements and their combination, and acceptable confidence levels for the measurement specifically (which may vary from the 90% and 95% selected in the main body), among others. Therefore, simply using the detection limits established during typical calibration exercises in laboratory or in-field environments alone is insufficient.

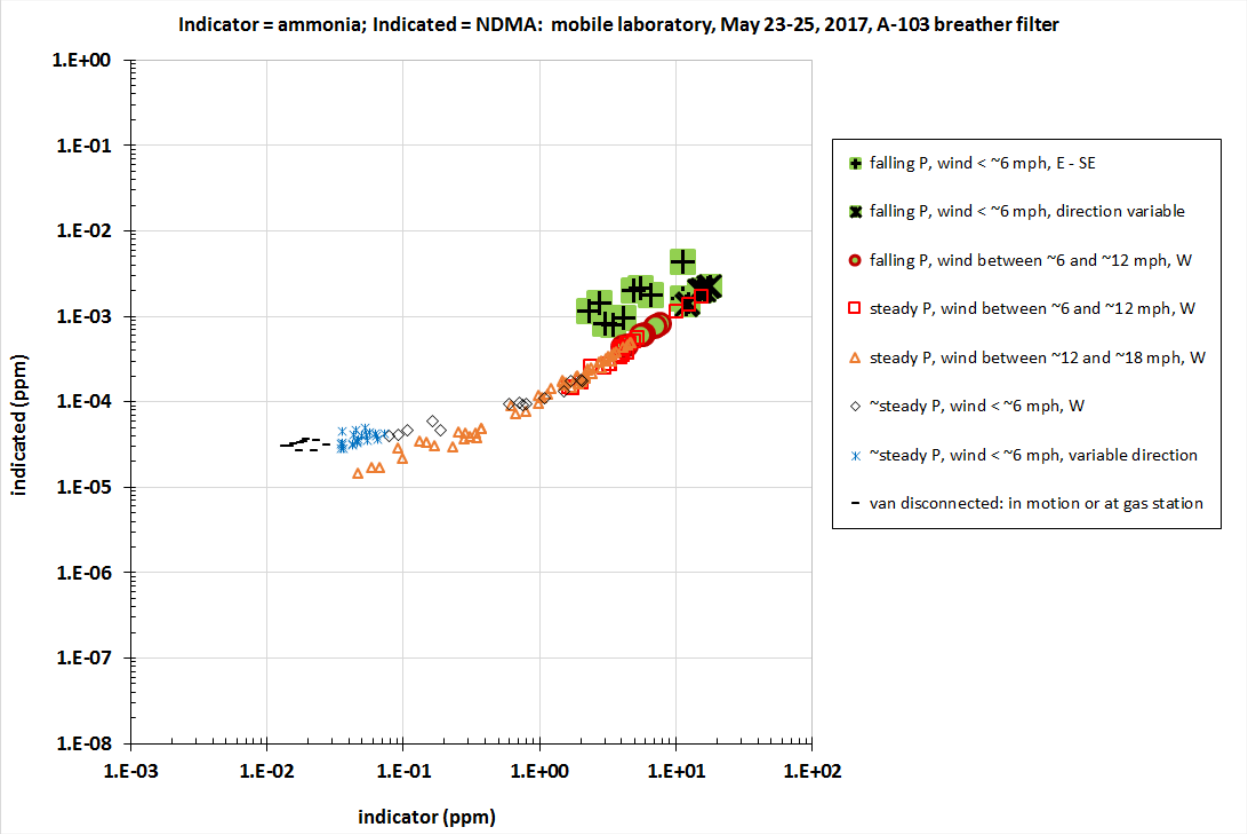


Figure B.4. Concentrations of ammonia and NDMA for various pressure and wind conditions over a 3-day period demonstrating that temporal variations in concentrations are to be expected.

B.3 Statistical Basis for the Dilution/Tolerance Limit Approach

This appendix contains the general mathematical and statistical basis for the dilution approach to determining the thresholds for the LI problem. The available gas concentration data set is described mathematically as

$$\mathcal{D} = \{(X_i, Y_i); i = 1, \cdots, n\}, \tag{B.3.1}$$

where (X_i, Y_i) represents paired measurements of the concentrations of a potential LI gas and a COPC, respectively. The vertical dilution data set for a LI concentration T is defined to be

$$\mathcal{D}_{VT} = \{Y_i^* = Y_i - X_i + T; i = 1, \cdots, n\}. \tag{B.3.2}$$

The goal of the data analysis is find the value of T so that a desired upper tolerance limit of the data set $\mathcal{D}_{VT}$ is equal to a specified concentration L of the COPC. (Generally, L is set at some fraction of the OEL of the COPC.) Associated with the upper tolerance limit is a desired statistical criterion, such as 95/90, with the assumed interpretation being: when the concentration of the LI is T, there is 95% confidence that 90% of the time the concentration of the COPC will be less than L. Represented mathematically, the goal is to find the LI concentration threshold value T such that

$$UTL(\mathcal{D}_{VT}) = L, \tag{B.3.3}$$

where $UTL(\cdot)$ represents a general statistical operator that returns a desired upper tolerance limit of a given data set. The statistical analysis could be parametric or nonparametric. Similarly, in what follows, $LTL(\cdot)$ represents a general statistical operator that returns a desired lower tolerance limit. The mathematically convenient way of finding such a value of T is to consider using the horizontal dilution data set defined as

$$\mathcal{D}_{HL} = \{X_i^* = X_i - Y_i + L; i = 1, \cdots, n\}. \tag{B.3.4}$$

in which case, for the given COPC concentration level L, one has

$$T = LTL(\mathcal{D}_{HL}). \tag{B.3.5}$$

The proof of the above is as follows. The definitions of two more data sets are required: $\mathcal{D}_{X-Y} = \{X_i - Y_i; i = 1, \cdots, n\}$ and $\mathcal{D}_{Y-X} = \{Y_i - X_i; i = 1, \cdots, n\}$. By general properties of the $UTL(\cdot)$ and the $LTL(\cdot)$ operators, one has

$$T = LTL(\mathcal{D}_{HL}) = LTL(\mathcal{D}_{X-Y}) + L = -UTL(\mathcal{D}_{Y-X}) + L, \tag{B.3.6}$$

so that $UTL(\mathcal{D}_{Y-X}) + T = L$ and, finally, $UTL(\mathcal{D}_{VT}) = L$, which establishes T as the desired LI threshold.

B.4 Process Validation

This section contains documentation supporting validation of the process using data from A and AP farms.

B.4.1 Validation using A and AP Farm Data

The analysis in this section is a narrow example of the more general analysis in Section 5.0 used to validate the process. The updated process described in Section 4.0 has been implemented for the A and AP farms, focusing on the three easily measured species (ammonia, nitrous oxide, and mercury). The COPCs of interest for this process validation were limited to the 16 COPCs identified on A and AP farm Tank Vapor Information Sheet (TVIS) lists.

Ammonia has the most data and the most leading and lagging indicator distinctions of the three easily measured indicators. Table B.4 categorizes the use of ammonia as a LI into four categories: auto (grey), leading (green), lagging (yellow), and not sufficient data (NSD, red) based on a nominal lower limit of detection (LLD) of 1 ppm. The first three categories are defined in Section 1.2, and NSD indicates COPCs where data population was insufficient to calculate tolerance limits. Only three of the species listed on the A and AP TVIS lists do not have sufficient data to be paired with ammonia at the 90/90 tolerance limit. These three include nitrous oxide and the two dihydrofurans. Six additional COPCs have insufficient data to calculate the 95/95 tolerance limit. The remaining COPCs were divided into leading and lagging indicators as shown in Table B.4.

Table B.4. Summary of ammonia as a leading indicator in A and AP farms using a 1-ppm lower limit of detection.

COPC Species	OEL 90/90	1/2 OEL 90/90	OEL 95/95	1/2 OEL 95/95
Ammonia	Auto	Auto	Auto	Auto
Nitrous Oxide	NSD	NSD	NSD	NSD
Mercury	Leading	Leading	NSD	NSD
1,3-Butadiene	Leading	Leading	NSD	NSD
Formaldehyde	Leading	Lagging	Leading	Lagging
Furan	Lagging	Lagging	Lagging	Lagging
2,3-Dihydrofuran	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	NSD	NSD	NSD	NSD
2-Pentylfuran	Leading	Leading	NSD	NSD
2-Heptylfuran	Leading	Leading	NSD	NSD
Acetonitrile	Leading	Leading	Leading	Leading
Ethylamine	Leading	Leading	NSD	NSD
N-Nitrosodimethylamine	Lagging	Lagging	Lagging	Lagging
N-Nitrosodiethylamine	Leading	Leading	NSD	NSD
N-Nitrosomethylethylamine	Lagging	Lagging	Lagging	Lagging
N-Nitrosomorpholine	Lagging	Lagging	Lagging	Lagging
NSD = not sufficient data				

For ammonia, the distinction between projections to OEL or to 1/2 OEL makes very little difference. At the 90/90 tolerance limit, only formaldehyde switches from a LI at OEL to a lagging indicator at 1/2 OEL. The other COPCs do not change. The difference between OEL and 1/2 OEL is a factor of two change in the calculated tolerance limit, where the OEL values are a factor of two larger than 1/2 OEL. This is more visible in the tables in Section 5.1 and Appendix D, where tolerance limit values are given. Actual tolerance limit values are not given here, as use of values calculated from a subset of the data is not recommended at this time. However, Figure B.5 shows the number line for ammonia as a LI with 90/90 tolerance limits for COPCs projected to the OEL that represents the data from the corresponding column in Table B.4.

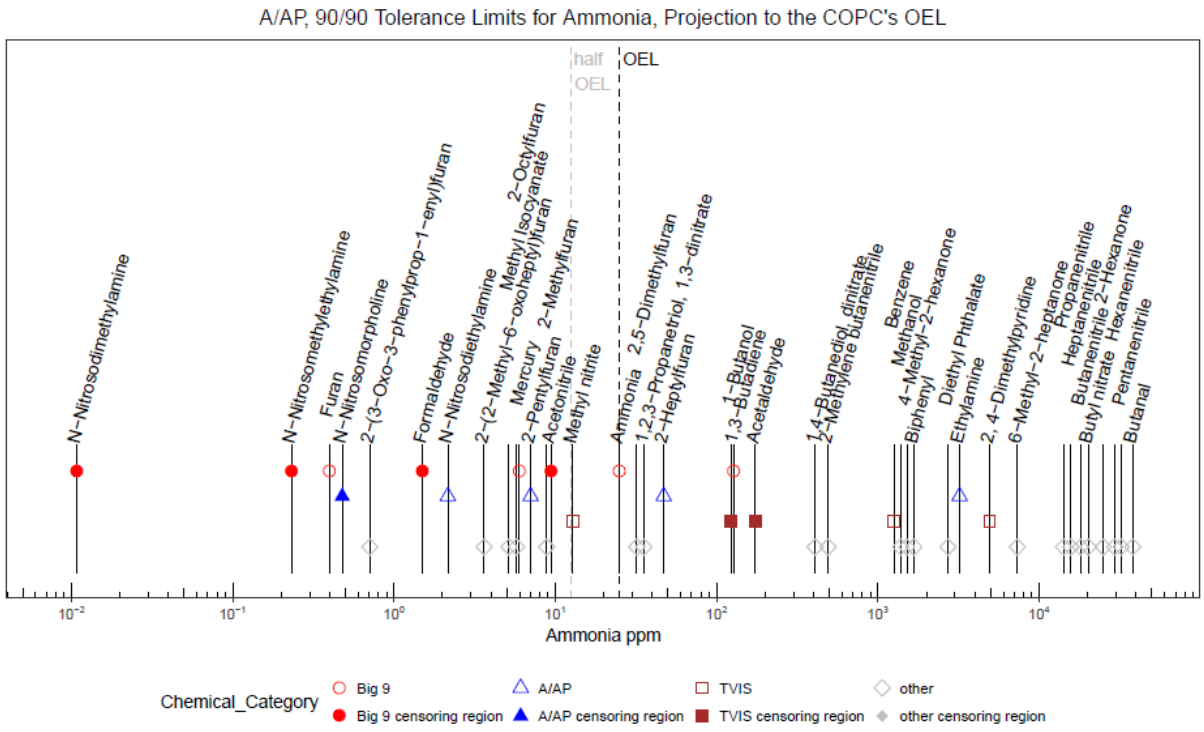


Figure B.5. Number line of the 90/90 ammonia concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL using data from A and AP farms.

Table B.5 shows that if the LLD for ammonia measurement reduces to 0.1 ppm, ammonia becomes a LI for several additional species. Including measurement uncertainty may require a lower LLD. For example, when taking field instrument uncertainty into account, a reading of 0.06 ppm may be required to be 90% confident (e.g.) that the true concentration is at or below 0.1 ppm. Establishing specific values requires further analysis outside the scope of this report.

Table B.5. Summary of ammonia as a leading indicator in A and AP farms using a nominal 0.1 ppm lower limit of detection.

COPC Species	OEL 90/90	1/2 OEL 90/90	OEL 95/95	1/2 OEL 95/95
Ammonia	Auto	Auto	Auto	Auto
Nitrous Oxide	NSD	NSD	NSD	NSD
Mercury	Leading	Leading	NSD	NSD
1,3-Butadiene	Leading	Leading	NSD	NSD
Formaldehyde	Leading	Leading	Leading	Leading
Furan	Leading	Leading	Leading	Lagging
2,3-Dihydrofuran	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	NSD	NSD	NSD	NSD
2-Pentylfuran	Leading	Leading	NSD	NSD
2-Heptylfuran	Leading	Leading	NSD	NSD
Acetonitrile	Leading	Leading	Leading	Leading
Ethylamine	Leading	Leading	NSD	NSD
N-Nitrosodimethylamine	Lagging	Lagging	Lagging	Lagging
N-Nitrosodiethylamine	Leading	Leading	NSD	NSD
N-Nitrosomethylethylamine	Leading	Leading	Leading	Leading
N-Nitrosomorpholine	Leading	Leading	Leading	Leading
NSD = not sufficient data				

While there are data for nitrous oxide, not enough data are available to make a statistical statement of tolerance limits at either 90/90 or 95/95 for any COPC. This deficit may be addressed by increasing the data population and evaluating nitrous oxide using the site-wide data set (see Section 5.2).

The mercury LLD used in this evaluation was nominally 1.6×10^{-6} ppm.[16] Mercury was found to be a LI for formaldehyde and acetonitrile and a lagging indicator for ammonia and NDMA as shown in Table B.6. The data set for A and AP farms alone is not sufficient to calculate tolerance limits for the remaining 11 species. The number line for mercury as a LI with 90/90 tolerance limits for COPCs projected to the OEL is shown in Figure B.6.

B.4.2 Validation Conclusions

An important feature of this data set is that it is specific for the A and AP farms. As discussed in Section 5.0, the tolerance bounds between the site-wide data set and the A- and AP-specific data set may differ by an order of magnitude. The site-wide data sets will have different determinations in part for two reasons. First, the site-wide analysis draws on a much larger data set. Larger data sets may increase the confidence. Second, the A and AP farms may legitimately differ from other farms because the chemical compositions of the tank wastes differ.

[16] Email communication between Eugene Morrey (PNNL staff embedded in WRPS) and Michael Gallagher (WRPS) with the subject “DRI minimum detection limits” on January 15, 2018 at 2:01 p.m.

Table B.6. Summary of mercury as a leading indicator in A and AP farms.

COPC Species	OEL 90/90	1/2 OEL 90/90	OEL 95/95	1/2 OEL 95/95
Ammonia	Lagging	Lagging	NSD	NSD
Nitrous Oxide	NSD	NSD	NSD	NSD
Mercury	Auto	Auto	Auto	Auto
1,3-Butadiene	NSD	NSD	NSD	NSD
Formaldehyde	Leading	Leading	NSD	NSD
Furan	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	NSD	NSD	NSD	NSD
2-Pentylfuran	NSD	NSD	NSD	NSD
2-Heptylfuran	NSD	NSD	NSD	NSD
Acetonitrile	Leading	Leading	NSD	NSD
Ethylamine	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	Lagging	Lagging	NSD	NSD
N-Nitrosodiethylamine	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	NSD	NSD	NSD	NSD
NSD = not sufficient data				

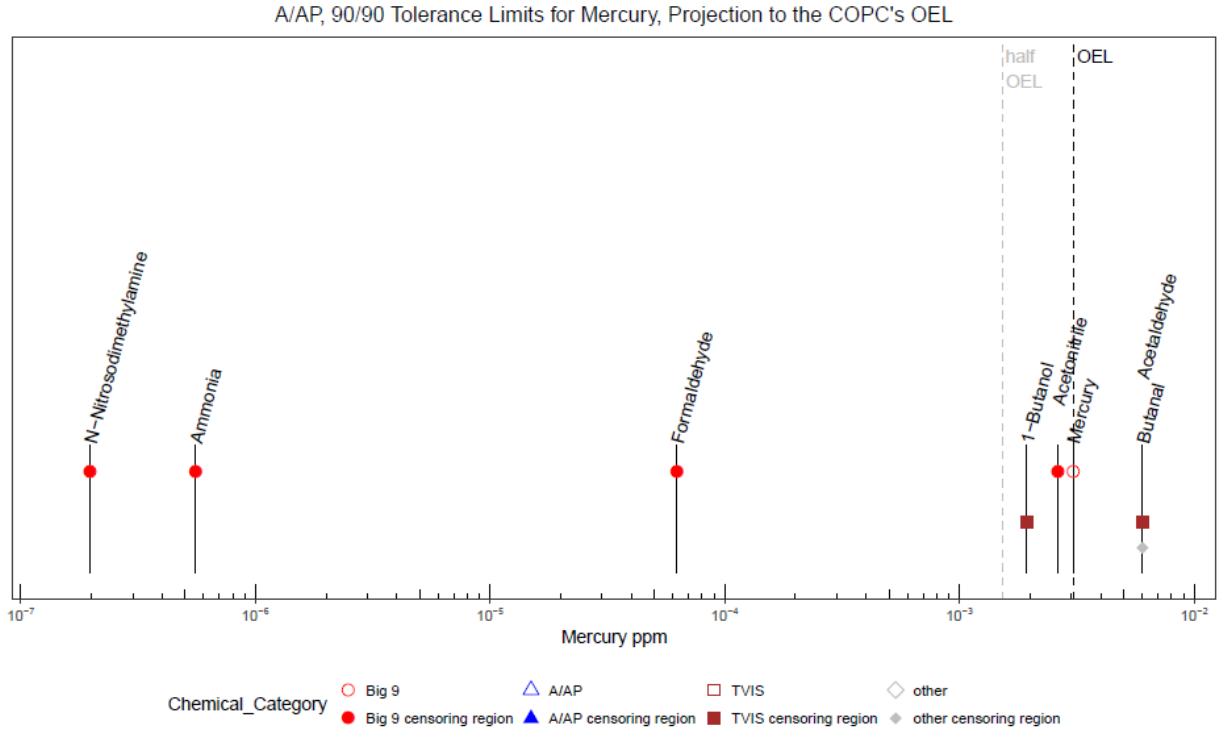


Figure B.6. Number line of the 90/90 mercury concentration tolerance limits for the 1:1 dilution projection to a COPC's OEL using data from A and AP farms.

B.5 References

RAE Systems. 2018. Technical Note 106: A Guideline for PID Instrument Response. Accessed December 1, 2017 at http://www.raesystems.com/customer-care/resource-center/tech-notes (last updated January 12, 2016).

Freeman CJ, J Liu, C Clayton, SK Nune, LA Mahoney, CL Bottenus, TM Brouns, and P Humble. 2017. *Overview of 2016 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspaces and Exhausters*. PNNL-26821, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, J Liu, CJ Freeman, and TM Brouns. 2016a. *Analysis of Respirator Cartridge Performance Testing on a Hanford AP Tank Farm Primary Exhauster Slipstream*. PNNL-25860, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2016b. *Analysis of Respirator Cartridge Performance Testing on Hanford Tank SY-102*. PNNL-26041, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017a. *Analysis of Respirator Cartridge Performance Testing on Hanford Tank A-101*. PNNL-26131, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017b. *Analysis of Respirator Cartridge Performance Testing on Hanford Tank BY-108*. PNNL-26180, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017c. *Analysis of Respirator Cartridge Performance Testing on the 702-AZ Primary Exhauster for the Hanford AY/AZ Tank Farms*. PNNL-26243, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017d. *Analysis of Respirator Cartridge Performance Testing on Hanford Tank AX-101*. PNNL-26254, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017e. *Analysis of Respirator Cartridge Performance Testing on a Hanford AN Tank Farm Exhauster Slipstream*. PNNL-26317, Rev. A, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017f. *Analysis of Respirator Cartridge Performance Testing on a Hanford AW Tank Farm Exhauster Slipstream*. PNNL-26337, Rev. A, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2017g. *Analysis of Respirator Cartridge Performance Testing on the 702-AZ Primary Exhauster for the Hanford AY/AZ Tank Farms during a Waste-Disturbing Event*. PNNL-26863, Rev. A, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2018a. *Analysis of Respirator Cartridge Performance Testing on a Hanford AP Tank Farm Primary Exhauster Slipstream*. PNNL-25860, Rev. 1 DRAFT, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2018b. *Analysis of Air-Purifying Respirator (APR) Cartridge Performance Testing on Hanford Tanks SX-101 and SX-104*. DRAFT, Pacific Northwest National Laboratory, Richland, Washington.

Nune SK, CK Clayton, J Liu, CJ Freeman, TM Brouns, and LA Mahoney. 2018c. *Analysis of Powered Air-Purifying Respirator (PAPR) Cartridge Performance Testing on Hanford Tanks SX-101 and SX-104*. DRAFT, Pacific Northwest National Laboratory, Richland, Washington.

Way KJ. 2017. *Tank Operations Contractor – Chemicals of Potential Concern Rev. 1*. WRPS-1604188.1, Washington River Protection Solutions, Richland, Washington.

Appendix C

Scatterplots and Histograms

Appendix C

Scatterplots and Histograms

This appendix includes scatterplots for all possible leading indicator (LI)-chemical of potential concern (COPC) pairs using concentration measurements, where the two gases were measured at the same place and at the same time. The potential LI candidate concentrations are given on the x-axis and the indicated COPC concentrations on the y-axis. Log scales are used for both axes due to the large range in observed concentrations. Solid grey lines and solid black lines indicate the 1/2 occupational exposure limit (OEL) and OEL, respectively, for the potential LI (vertical lines) and the COPC (horizontal lines). Data points are colored to indicate the type of sampling or test campaign. Cartridge test results are shown as red points. Data from the mobile lab are green. Headspace data from the Site-Wide Industrial Hygiene Database and the Tank Waste Information Network System (TWINS) downloads are identified by yellow points and blue points, respectively. Finally, data from the TWINS Industrial Hygiene data set are shown in orange. Paired data points, where both measurements were reported above the detection or reporting limit, are indicated by solid circles. Paired results where concentrations of the potential LI were reported as less than a detection or reporting limit (x-censored) are indicated by stars. Paired points where the COPC concentration was reported as less than the detection or reporting limit (y-censored) are indicated by open circles. In both the x-censored and y-censored cases, data points are plotted at their detection or reporting limit. The actual concentration is likely to the left of each x-censored data point and below each y-censored data point.

Included with each scatterplot are three histograms showing the 1:1 dilution projection for COPC concentrations projected to 1/2 OEL, OEL, and an excursion limit as listed in Table 5.1. The green columns represent the paired data points where both concentrations were measured above the detection or reporting limit. The blue columns represent the y-censored data where the concentration of the COPC was reported as less than the reporting limit. The red column on the left represents the x-censored data points where the concentration of the indicator was reported as less than the reporting limit. Vertical dashed lines represent the 90/90 and 95/95 tolerance limits.

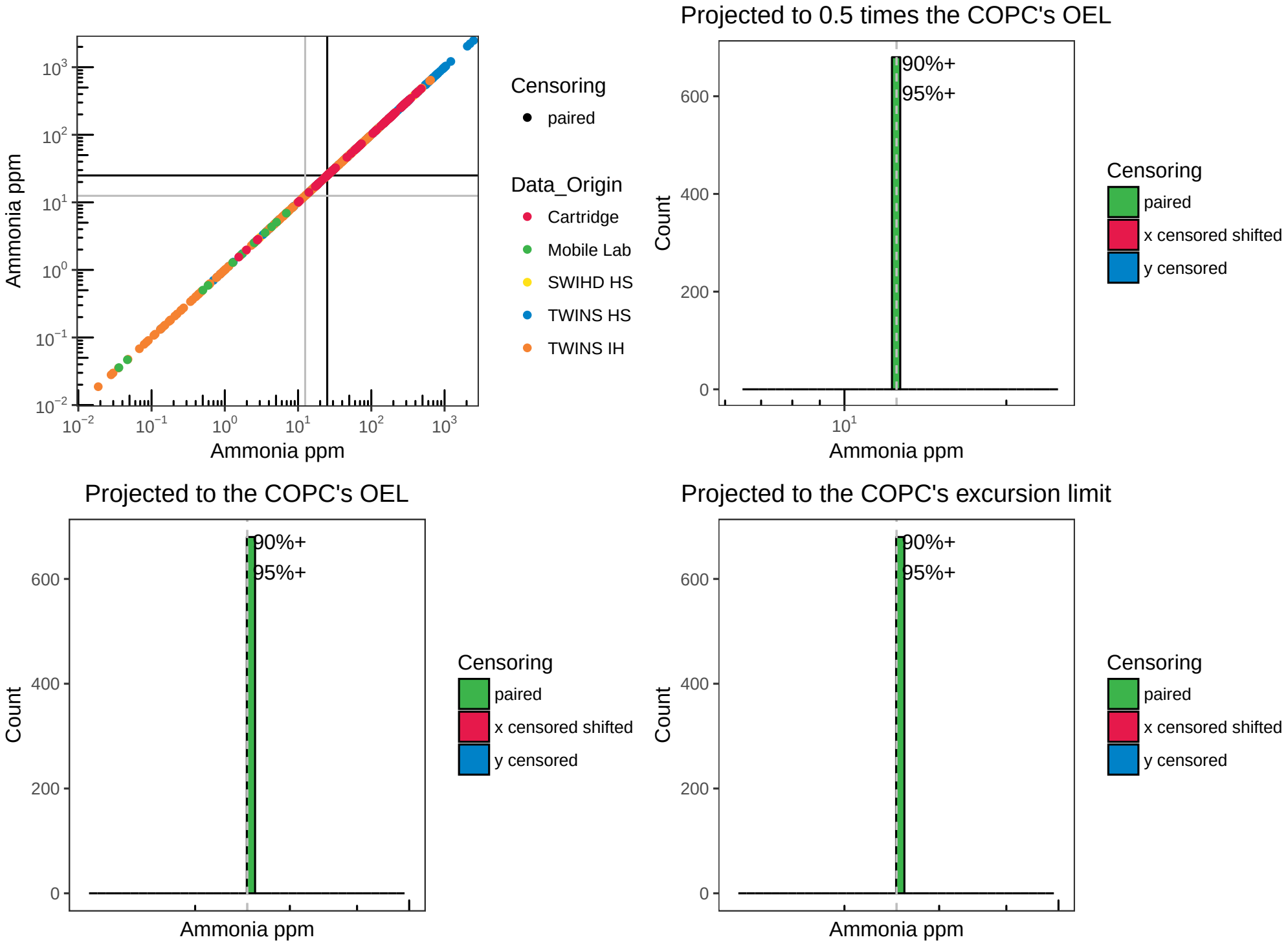


Figure C.1: Ammonia vs Ammonia

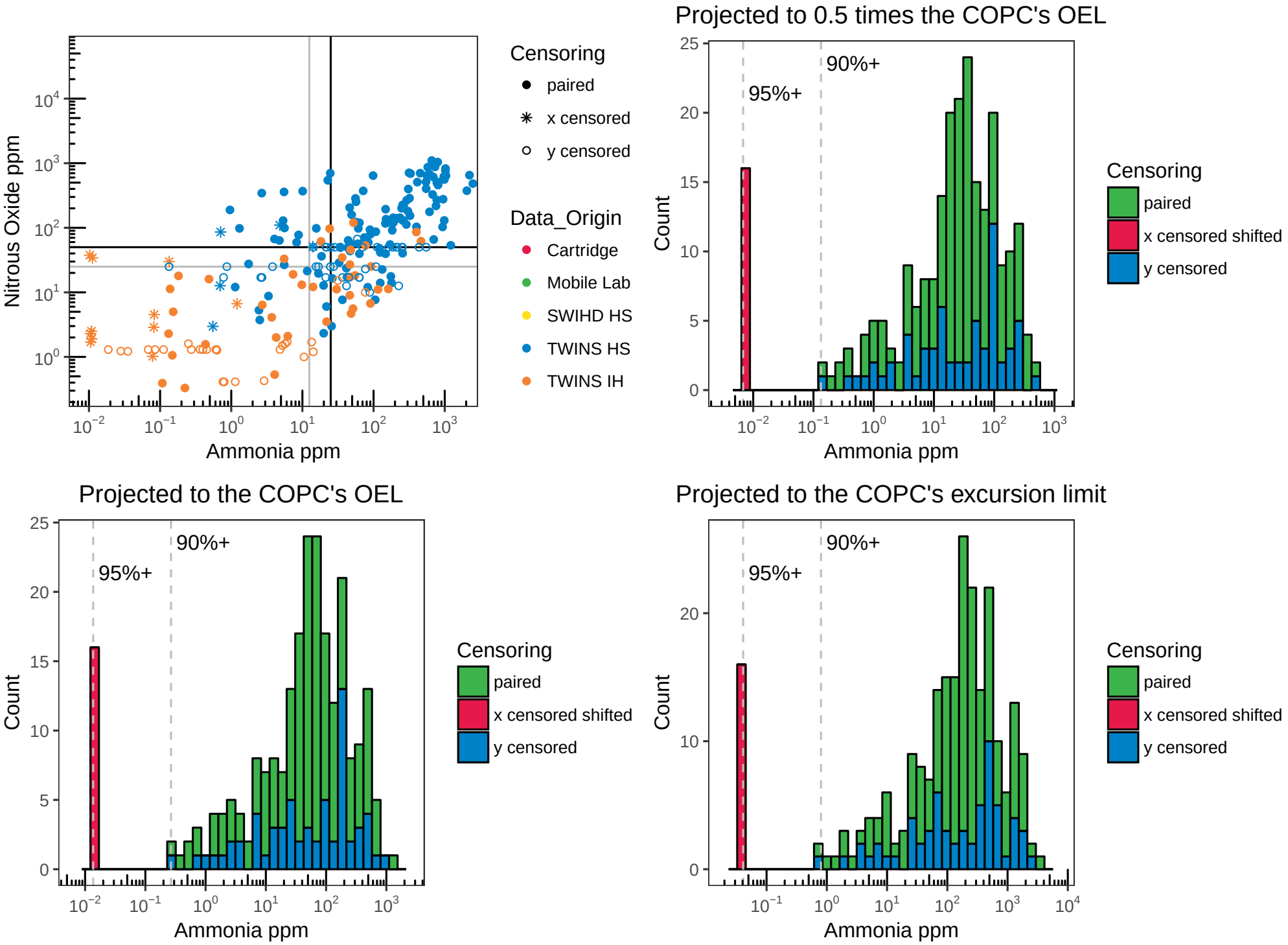


Figure C.2: Nitrous Oxide vs Ammonia

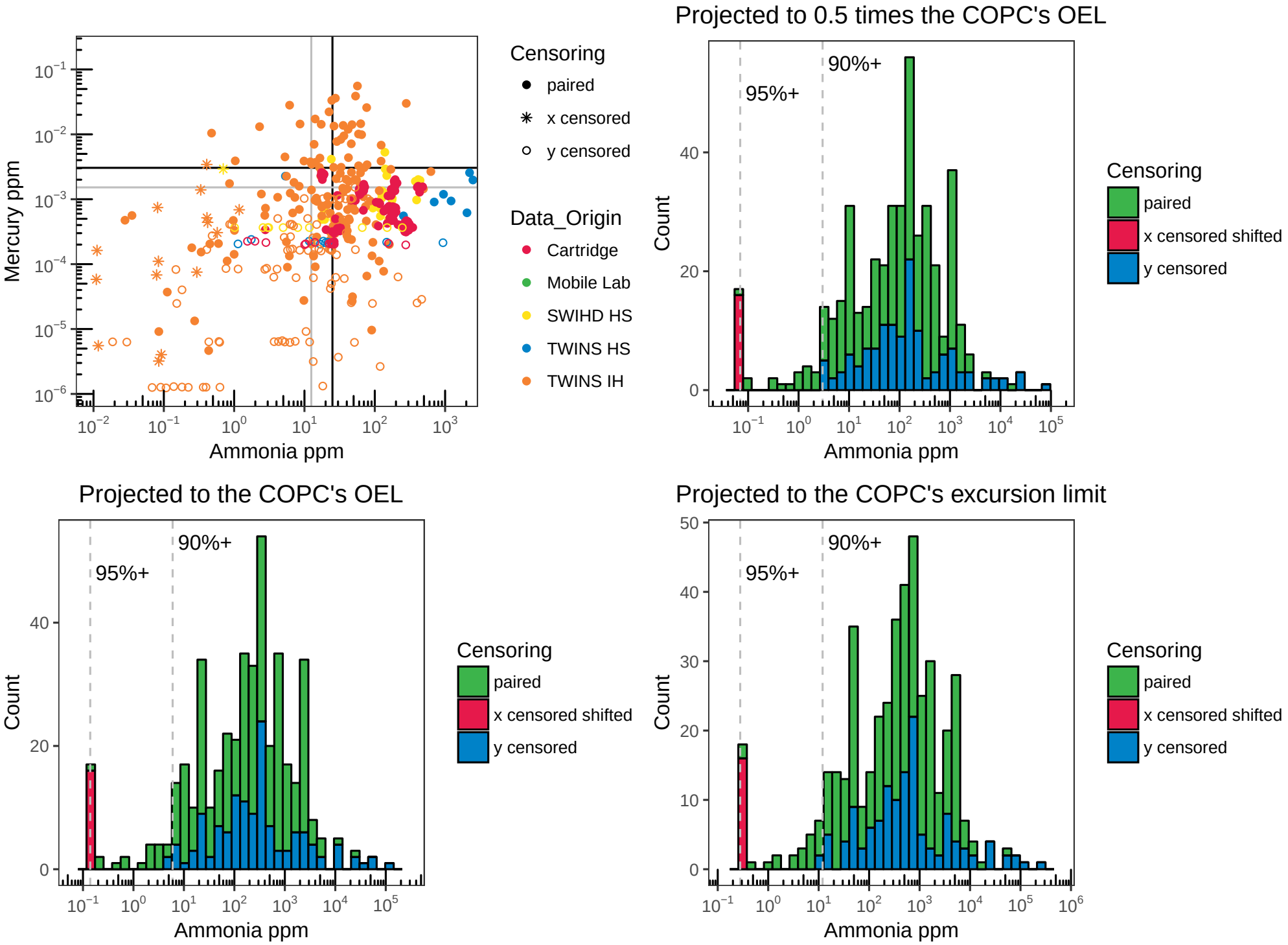


Figure C.3: Mercury vs Ammonia

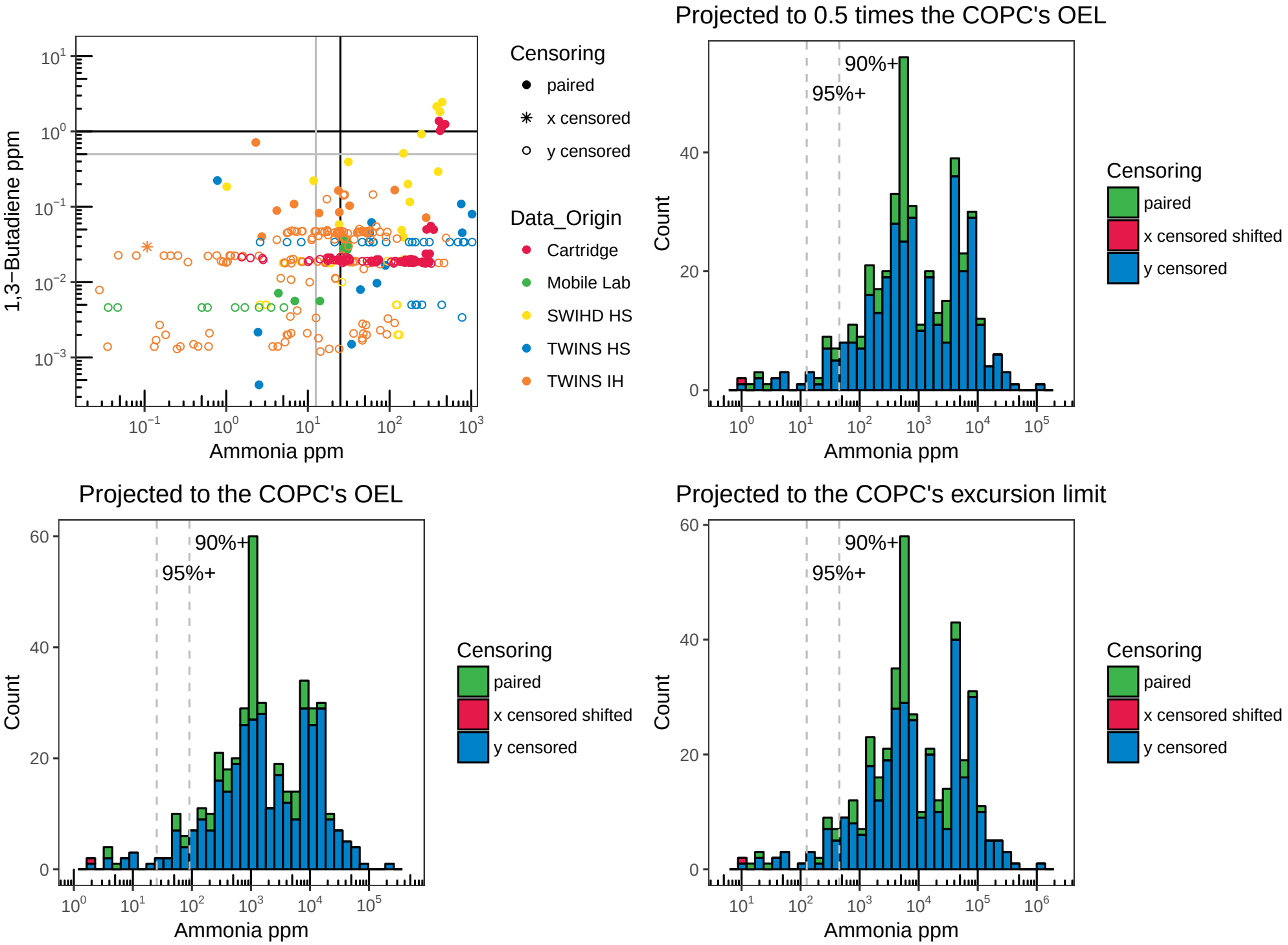


Figure C.4: 1,3-Butadiene vs Ammonia

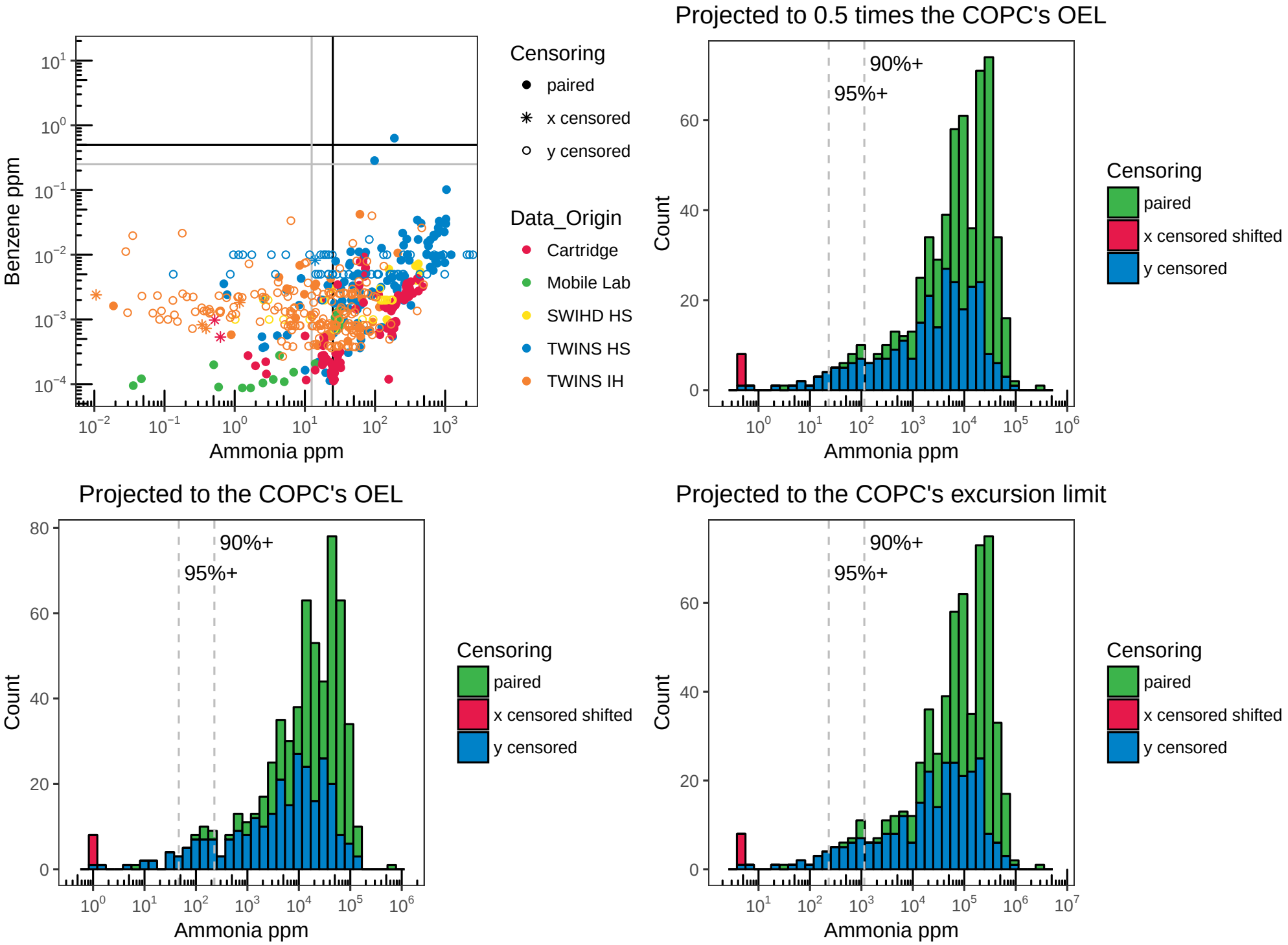


Figure C.5: Benzene vs Ammonia

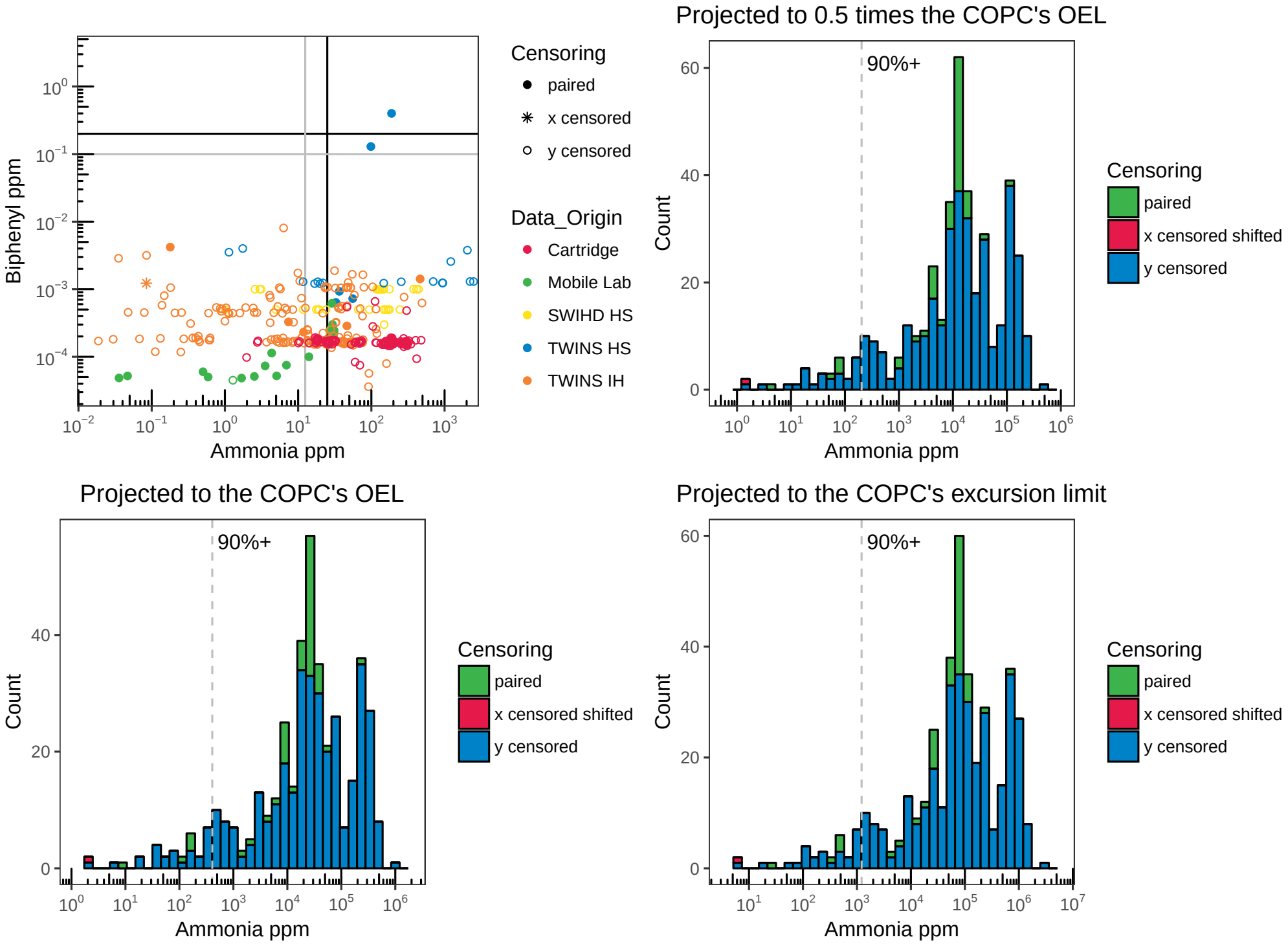


Figure C.6: Biphenyl vs Ammonia

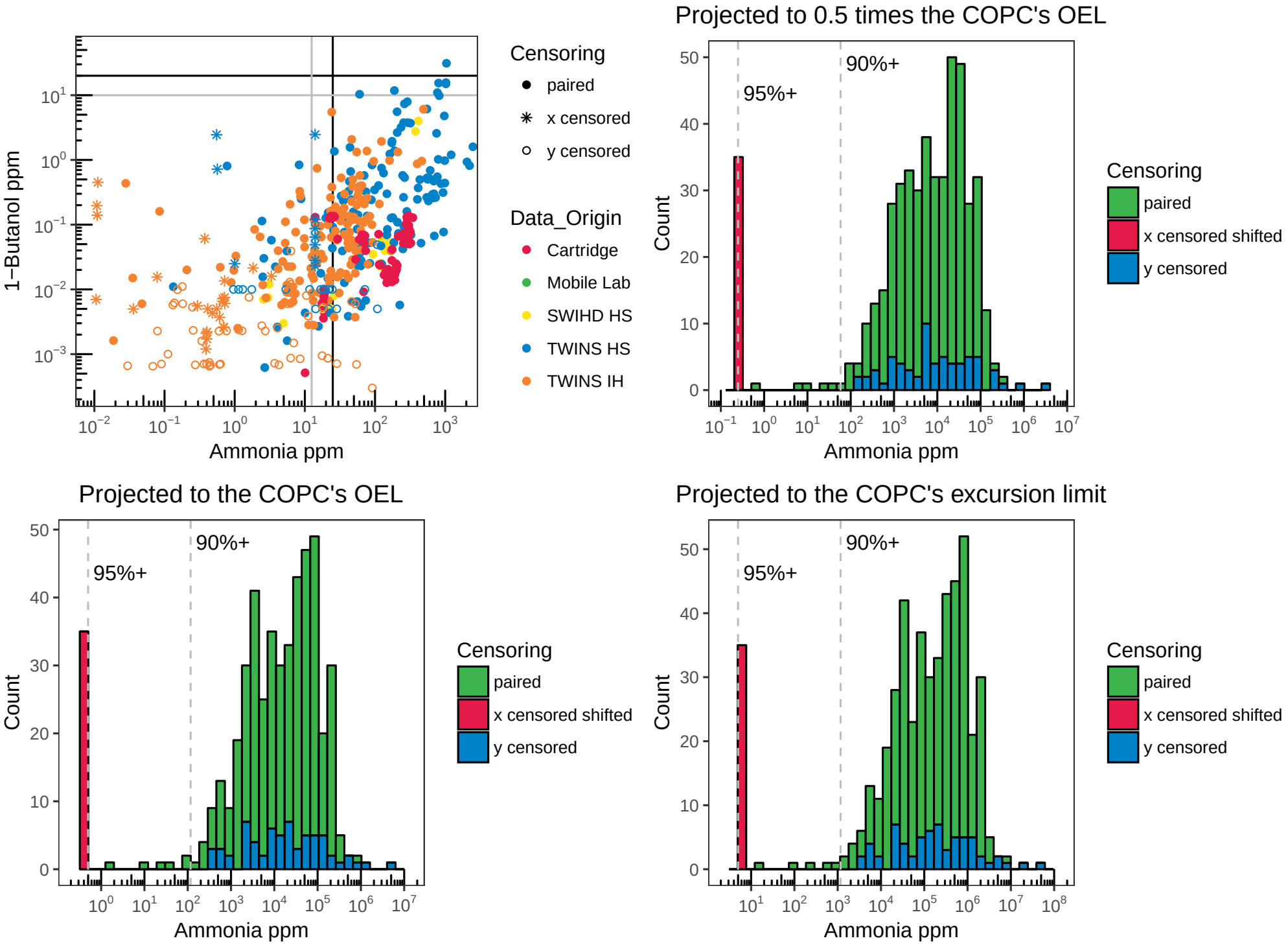


Figure C.7: 1-Butanol vs Ammonia

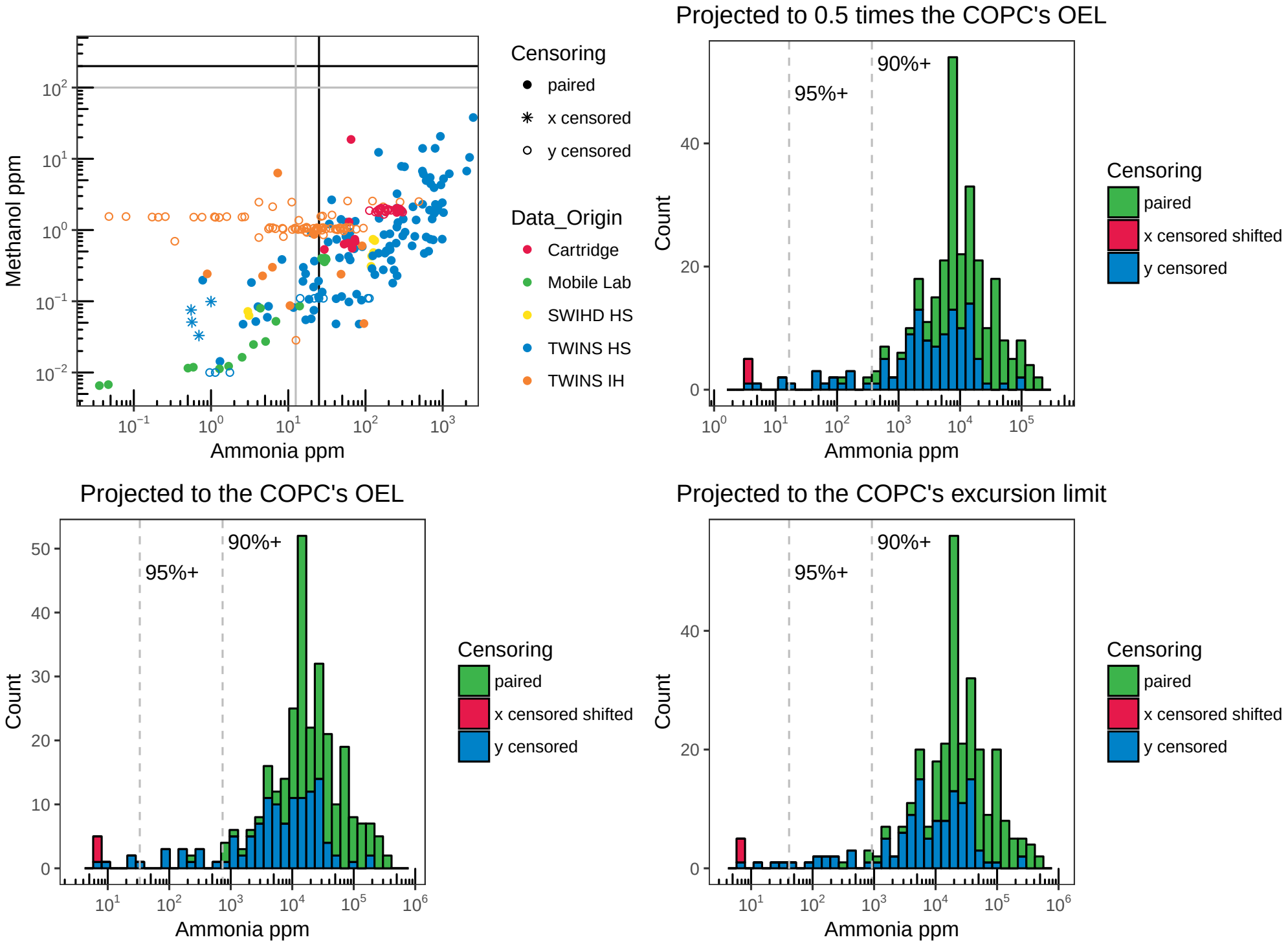


Figure C.8: Methanol vs Ammonia

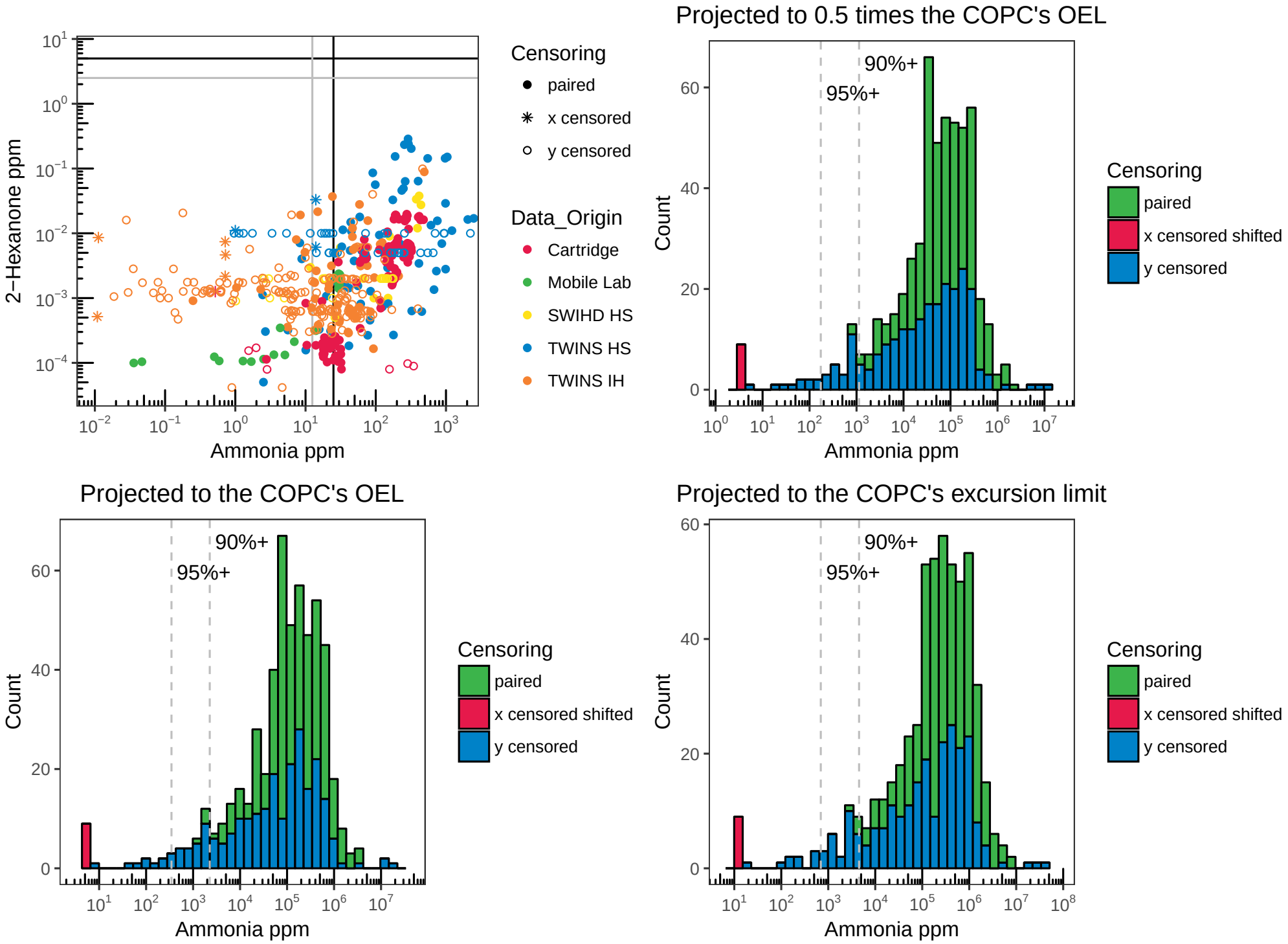


Figure C.9: 2-Hexanone vs Ammonia

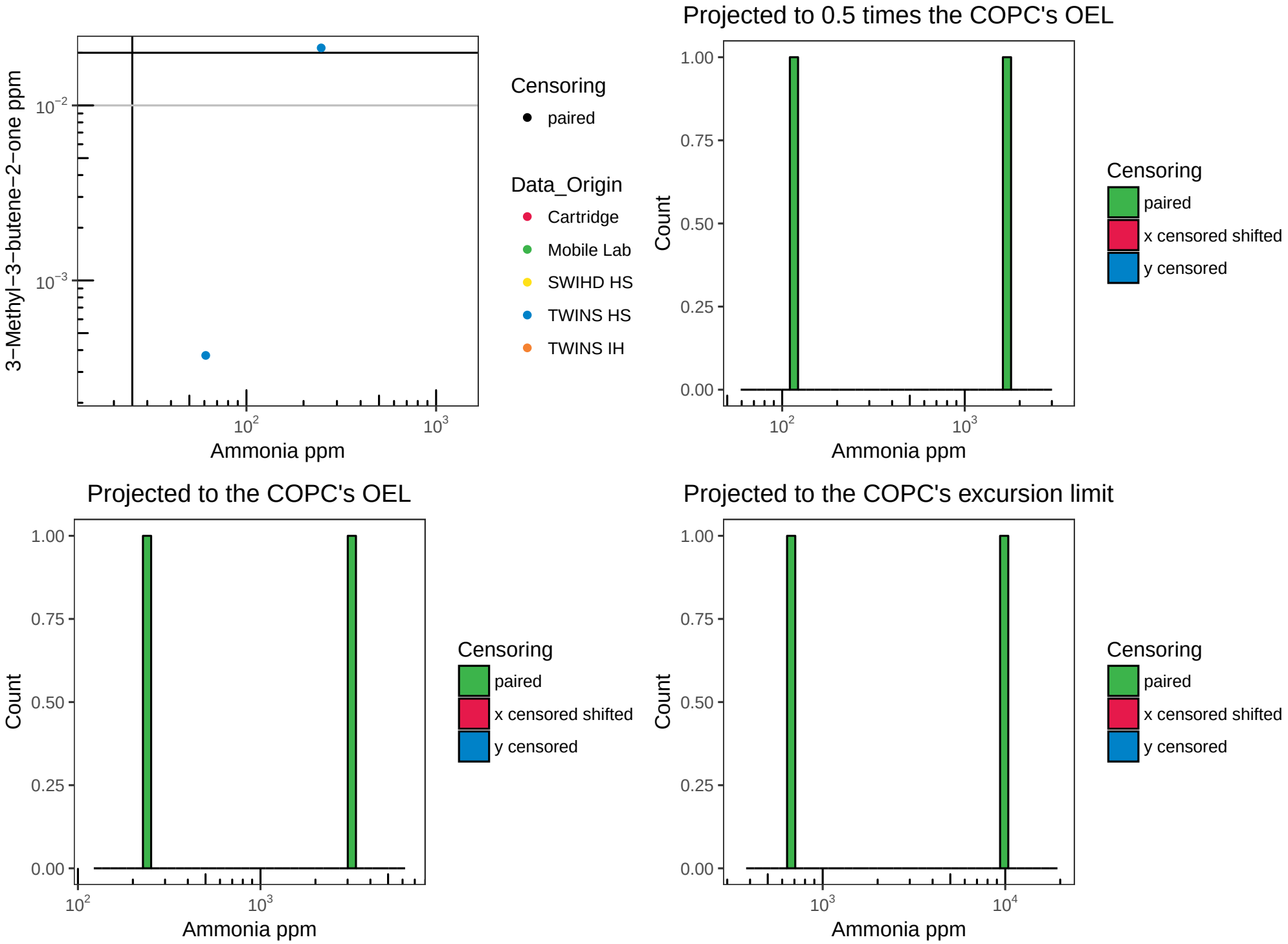


Figure C.10: 3-Methyl-3-butene-2-one vs Ammonia

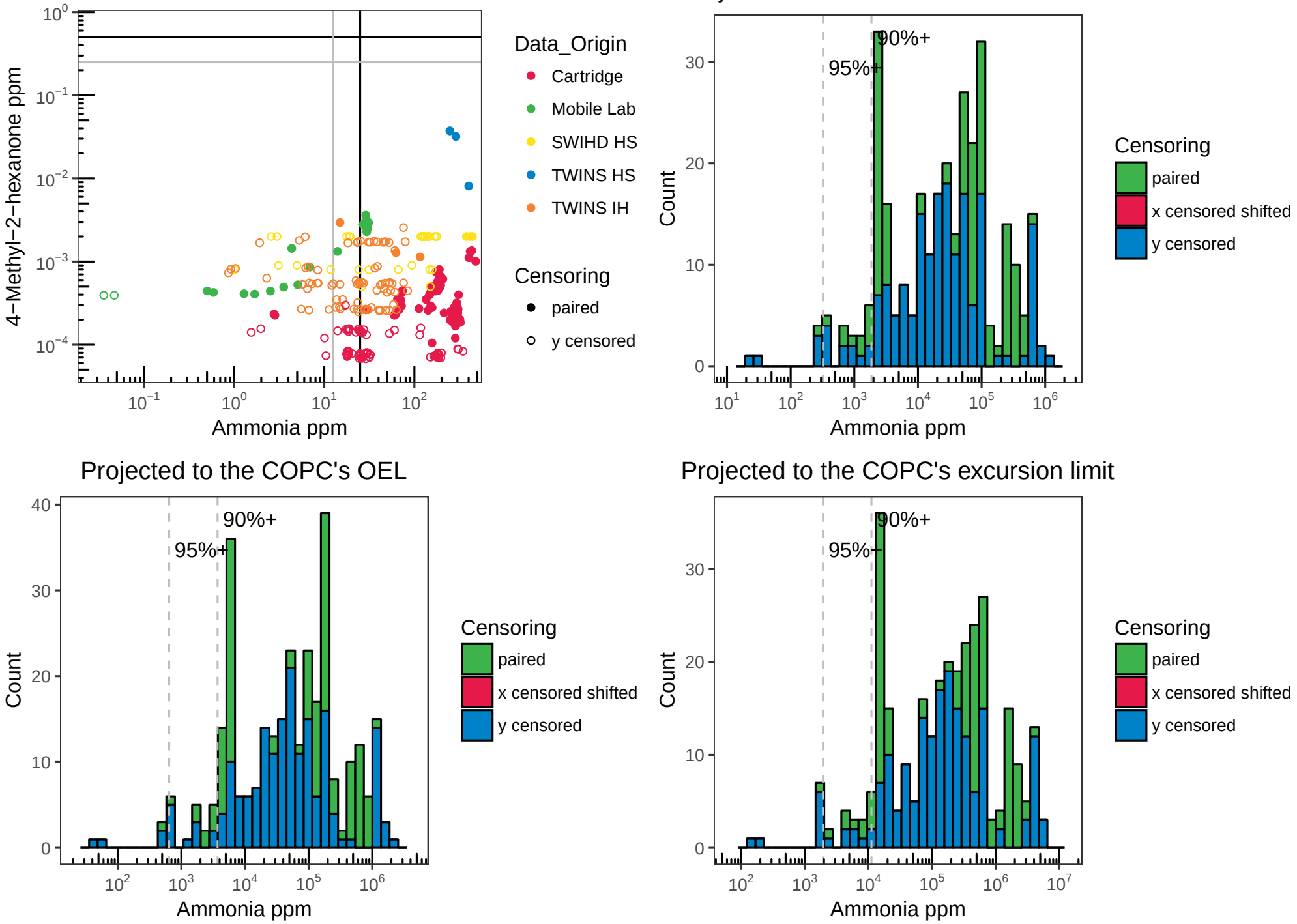


Figure C.11: 4-Methyl-2-hexanone vs Ammonia

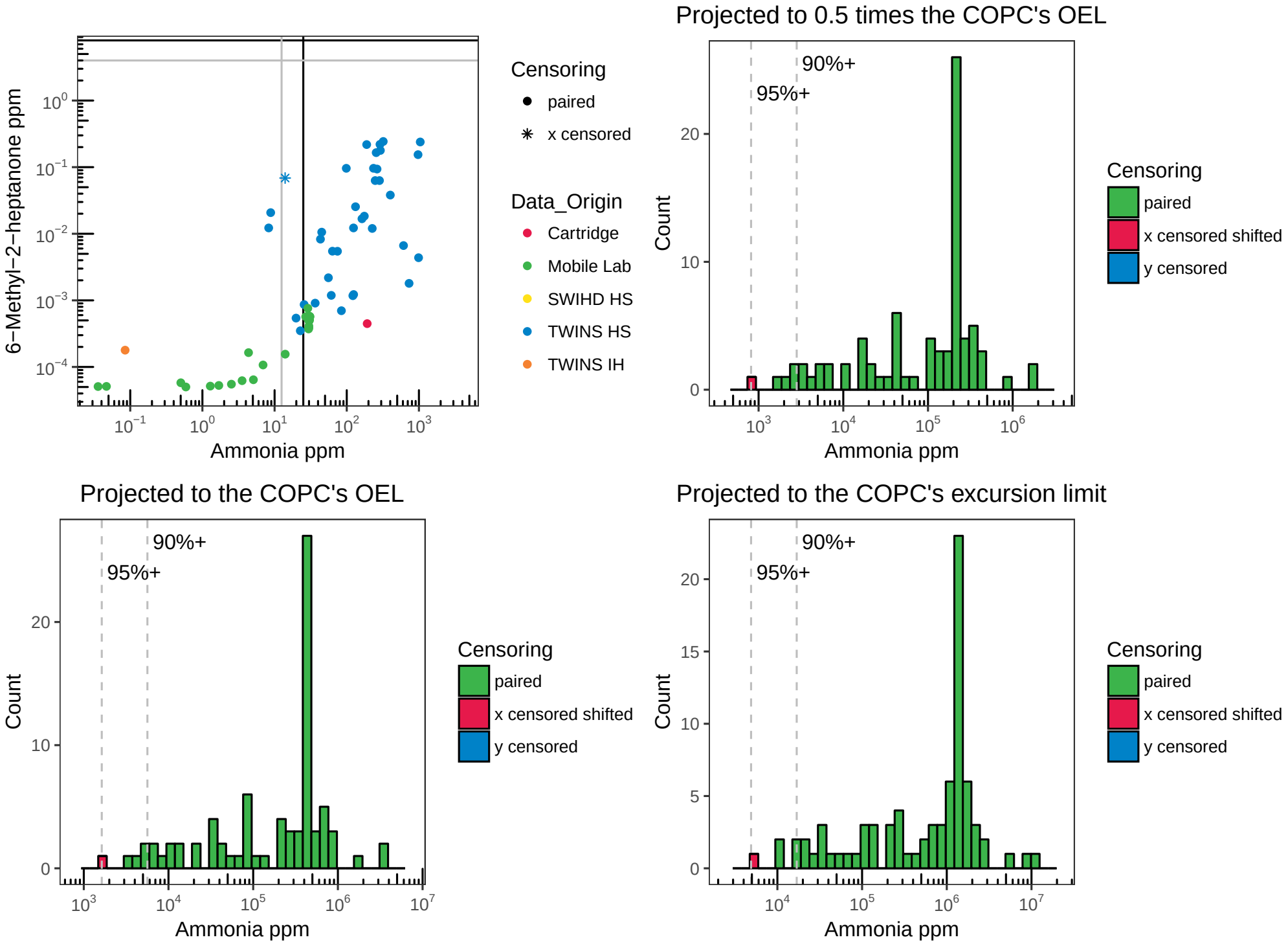


Figure C.12: 6-Methyl-2-heptanone vs Ammonia

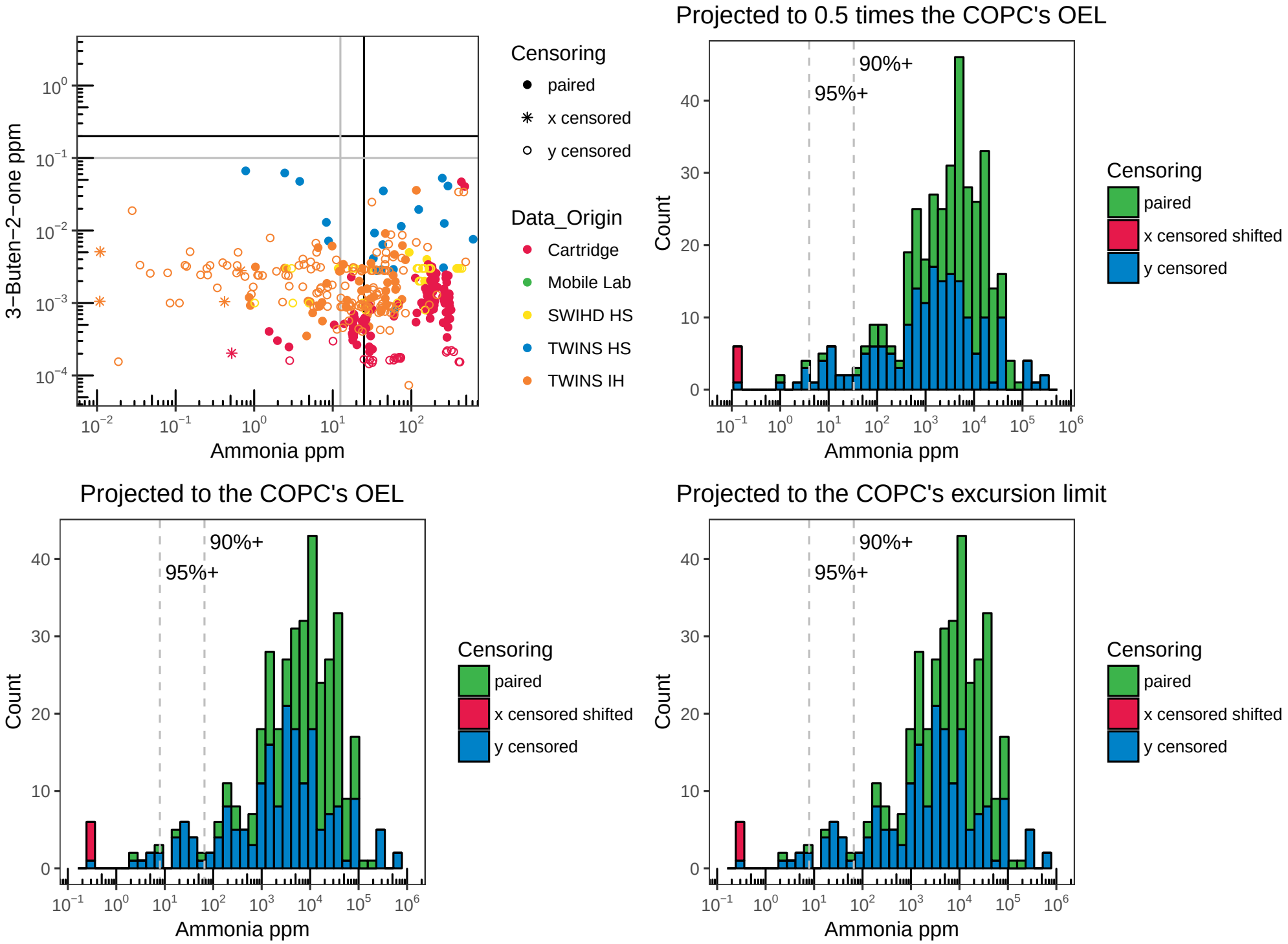


Figure C.13: 3-Buten-2-one vs Ammonia

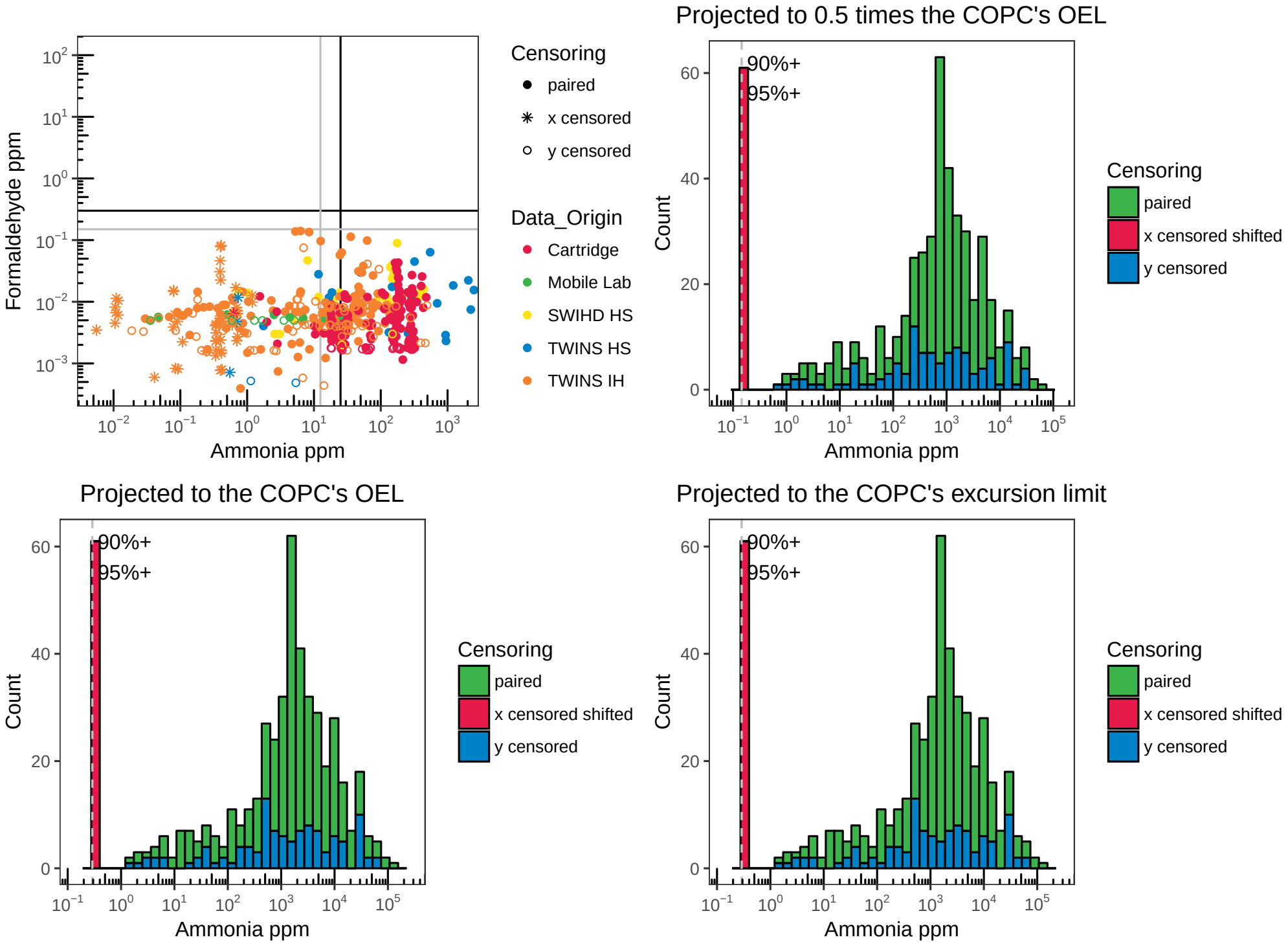


Figure C.14: Formaldehyde vs Ammonia

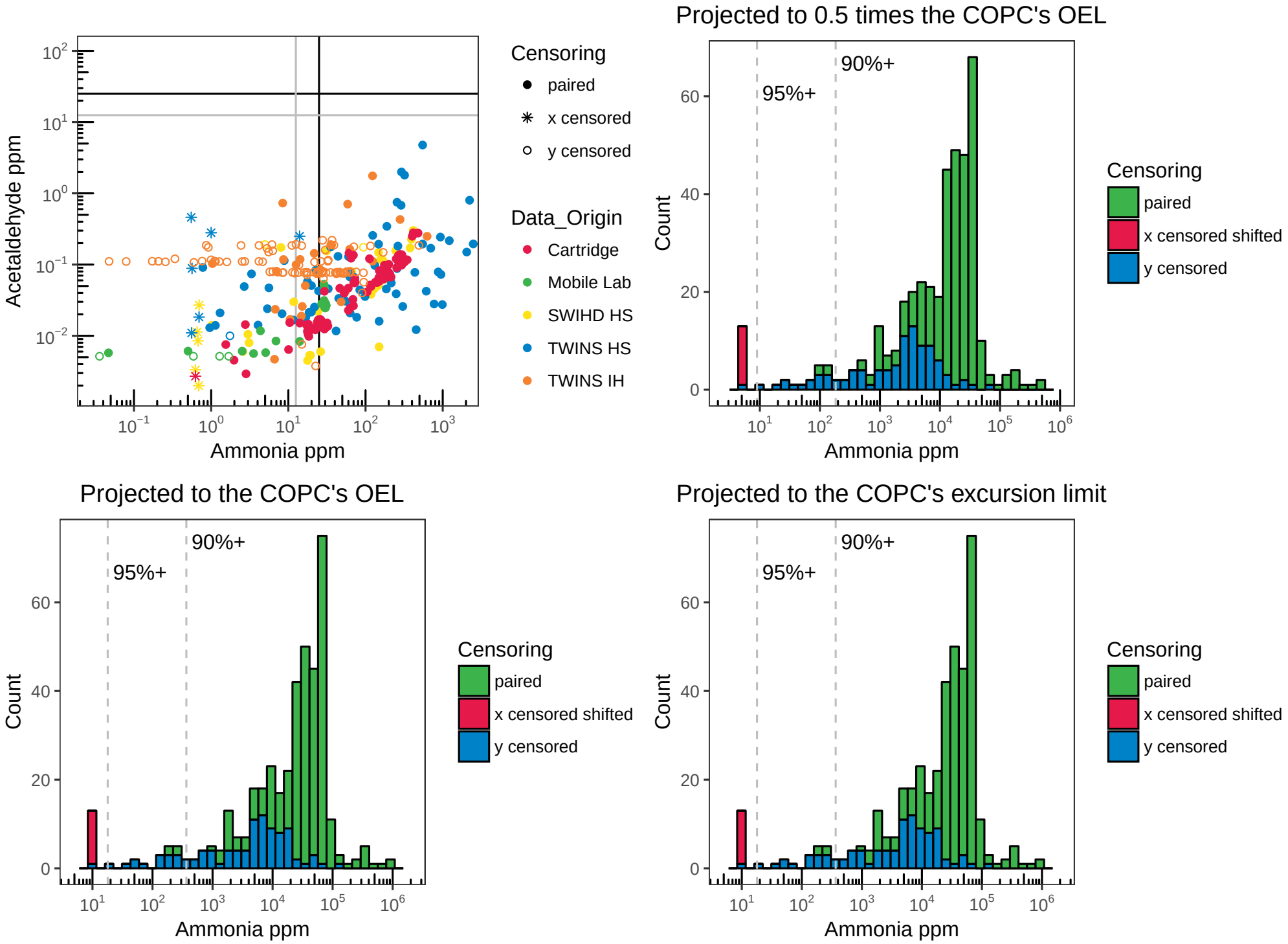


Figure C.15: Acetaldehyde vs Ammonia

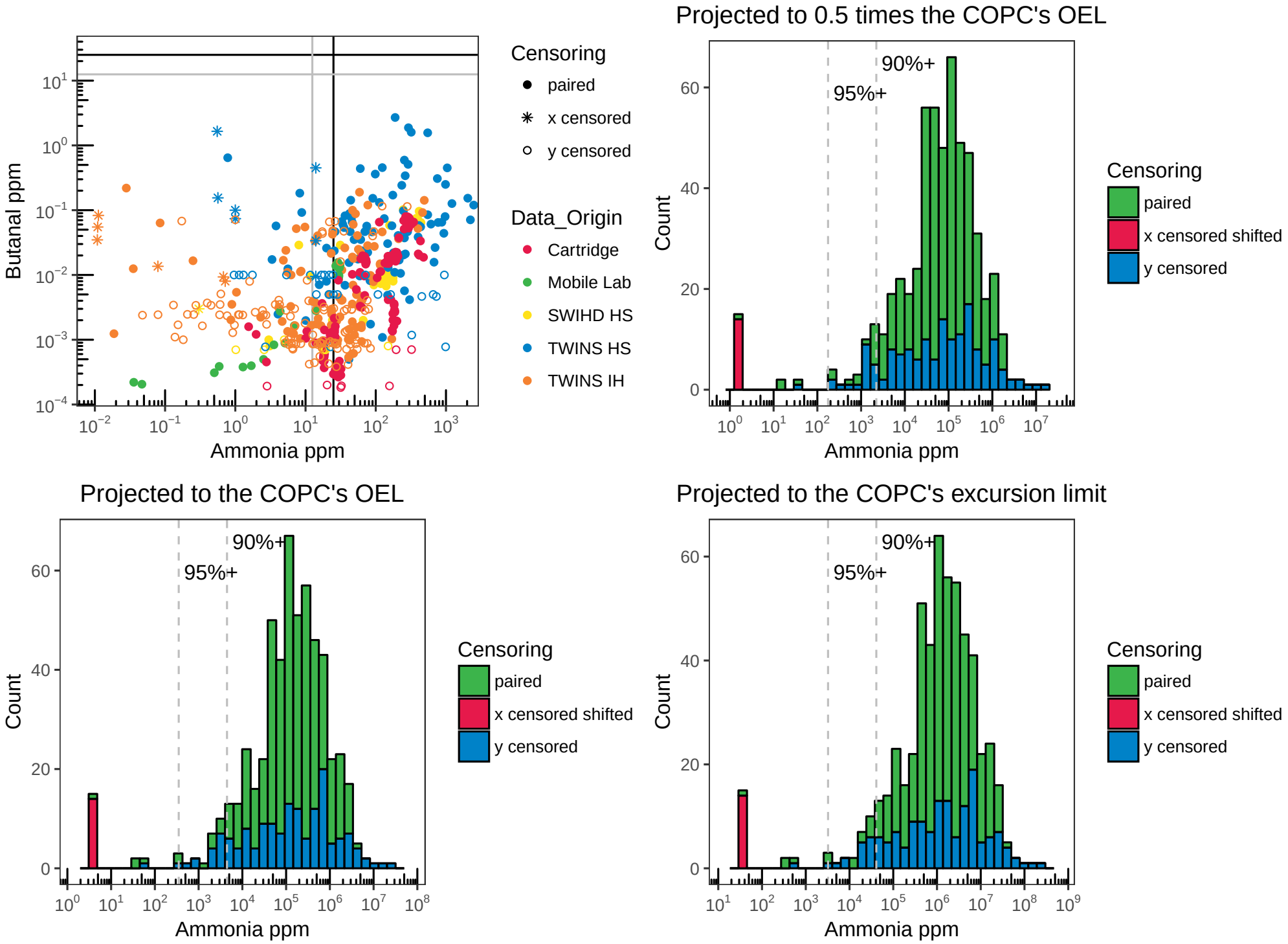


Figure C.16: Butanal vs Ammonia

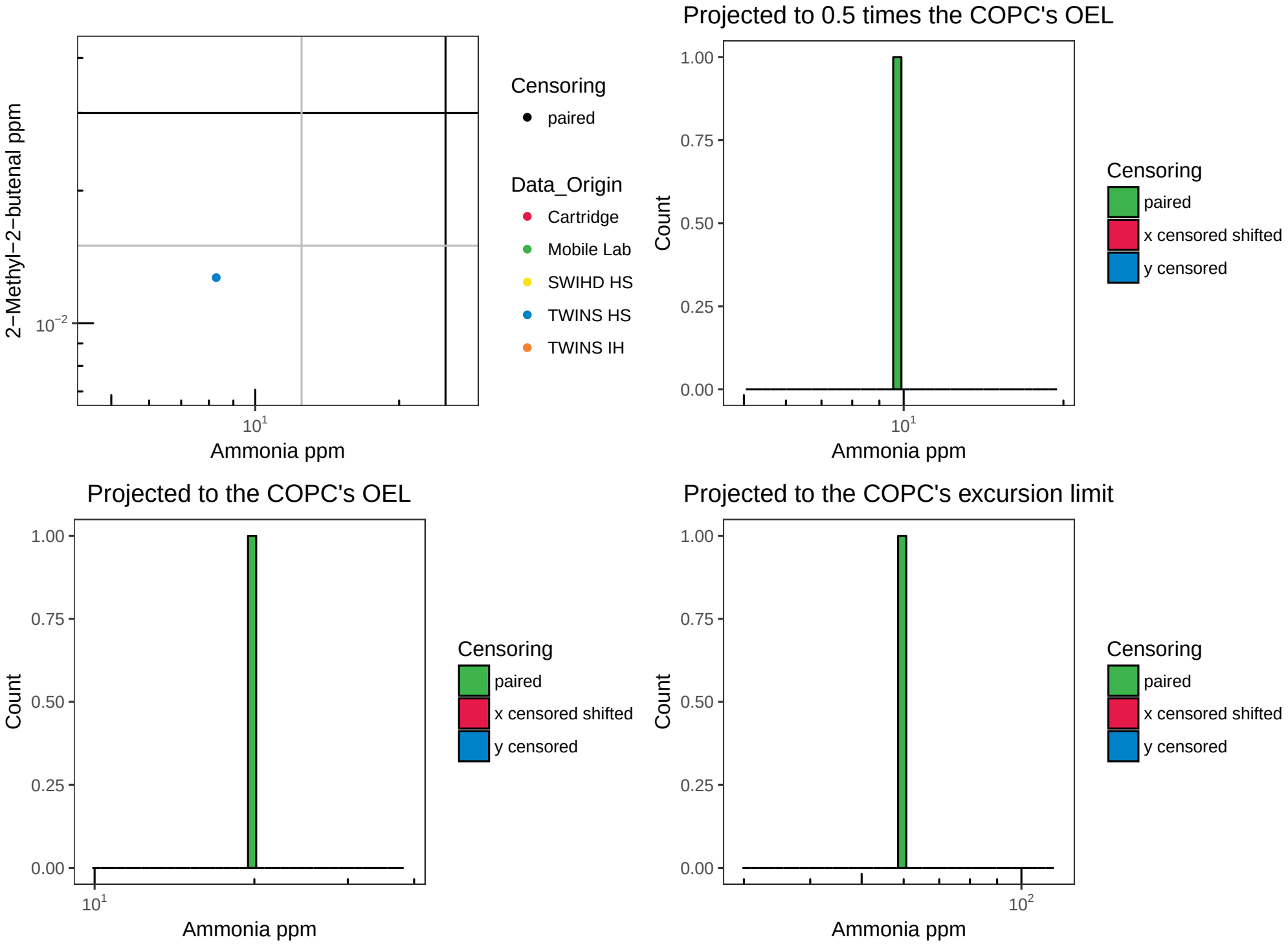


Figure C.17: 2-Methyl-2-butenal vs Ammonia

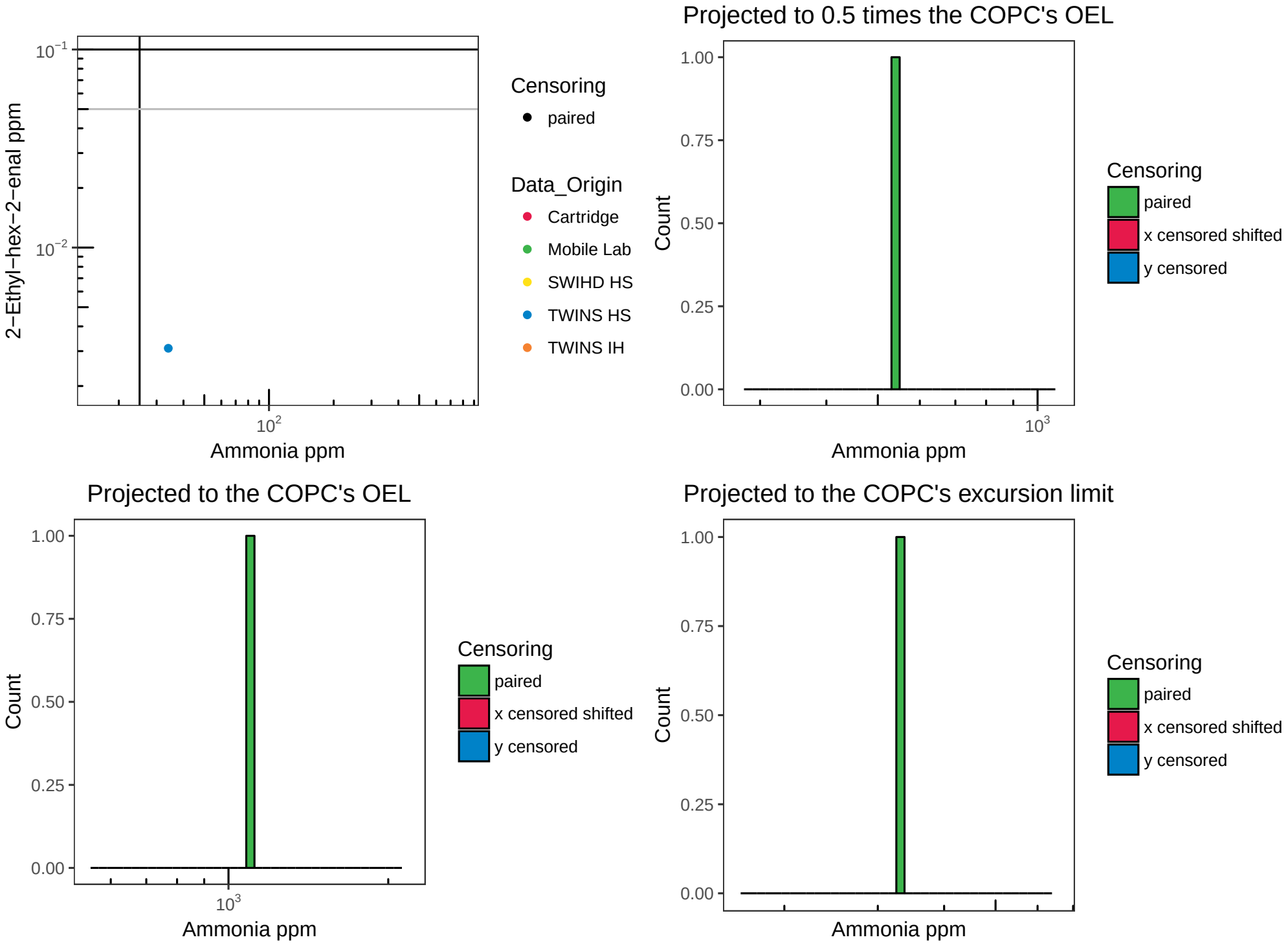


Figure C.18: 2-Ethyl-hex-2-enal vs Ammonia

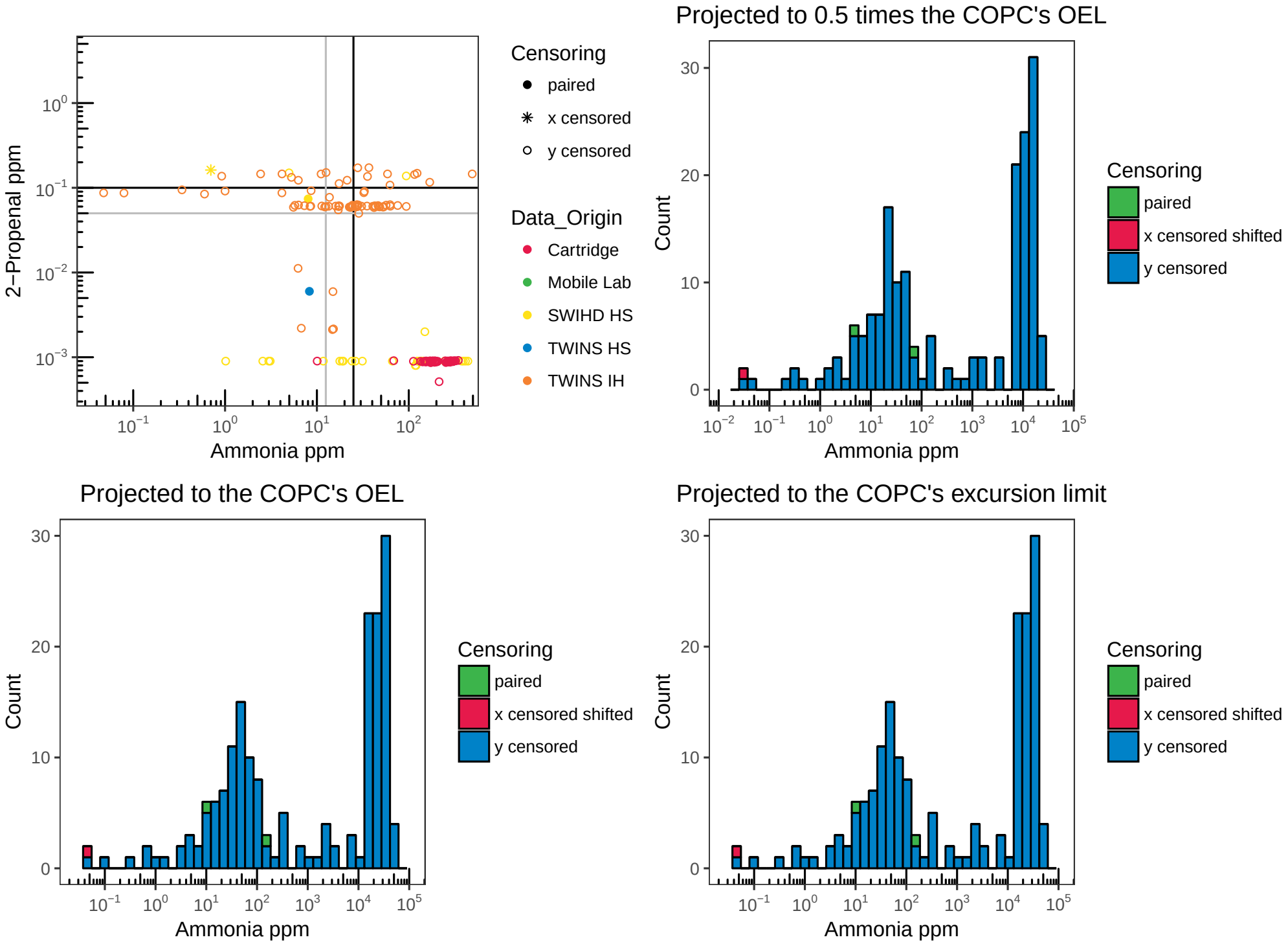


Figure C.19: 2-Propenal vs Ammonia

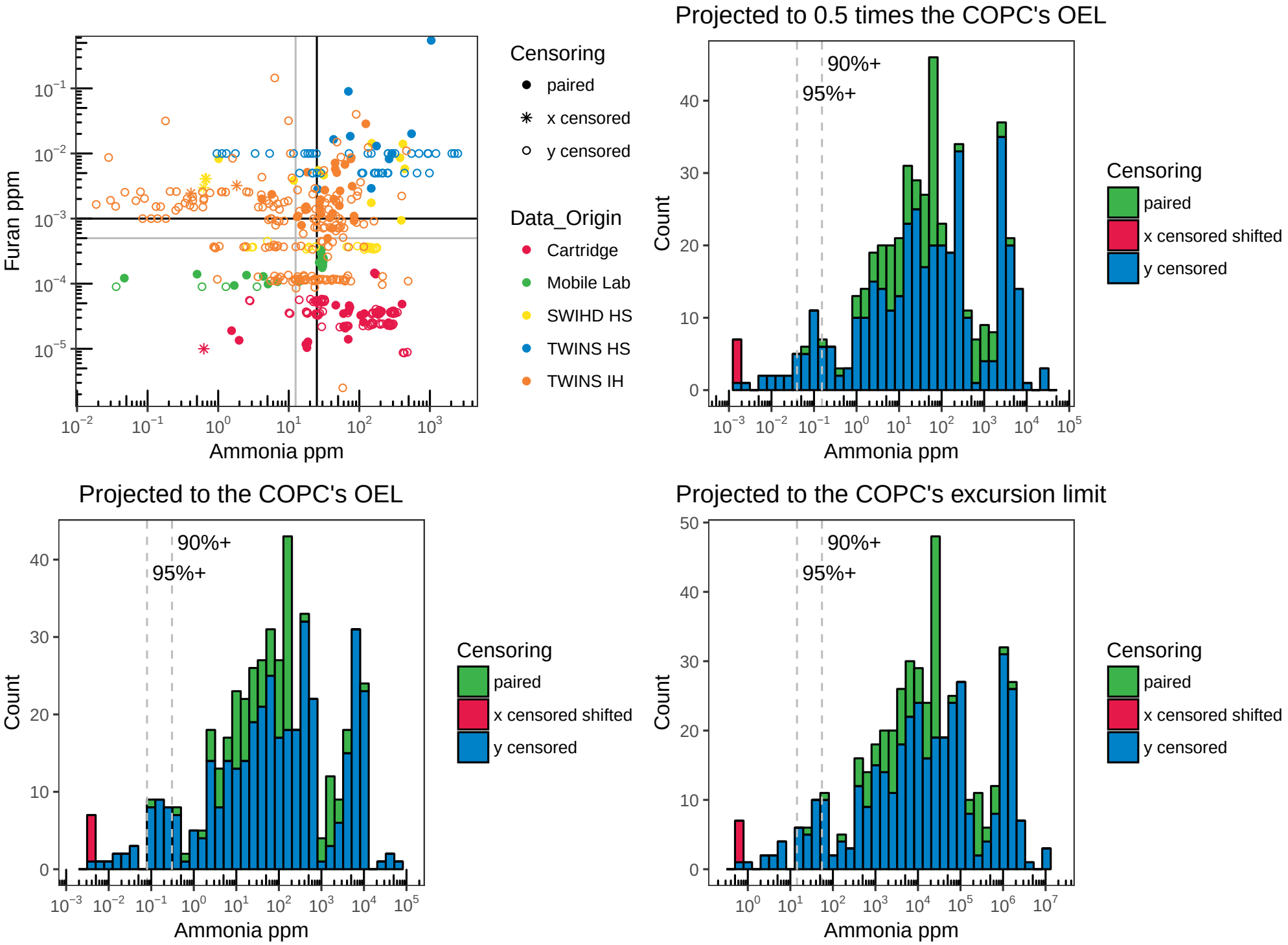


Figure C.20: Furan vs Ammonia

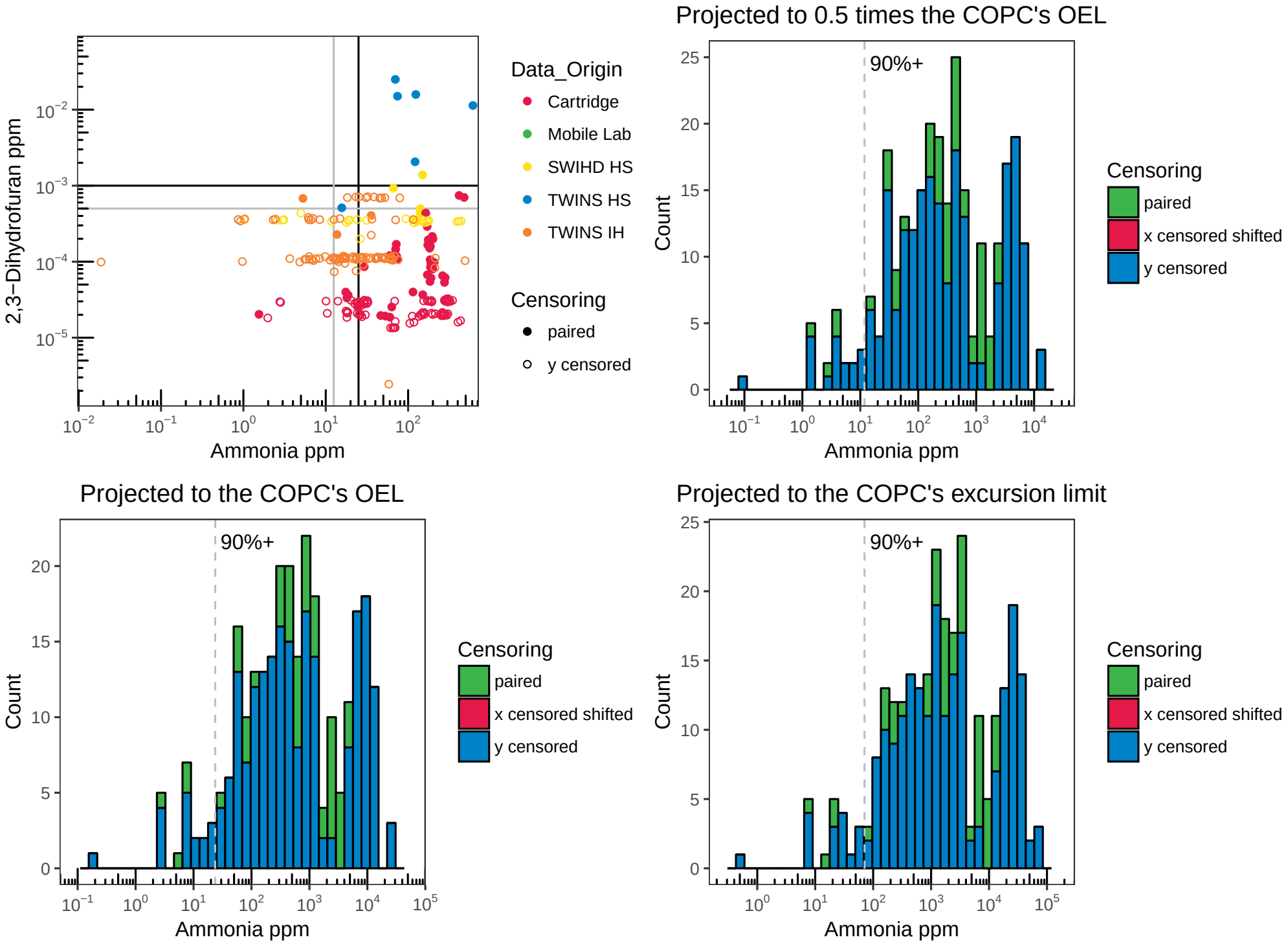


Figure C.21: 2,3-Dihydrofuran vs Ammonia

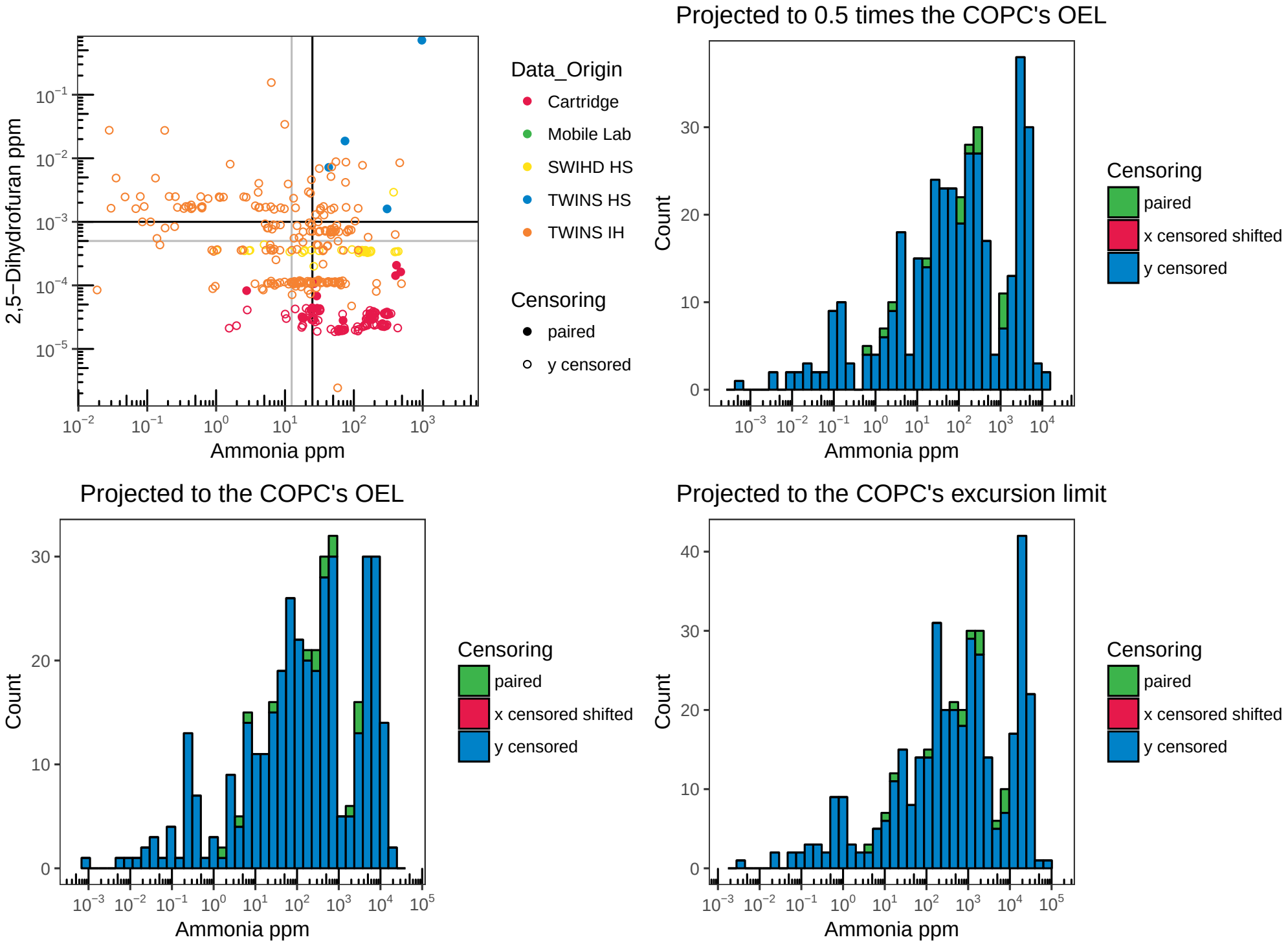


Figure C.22: 2,5-Dihydrofuran vs Ammonia

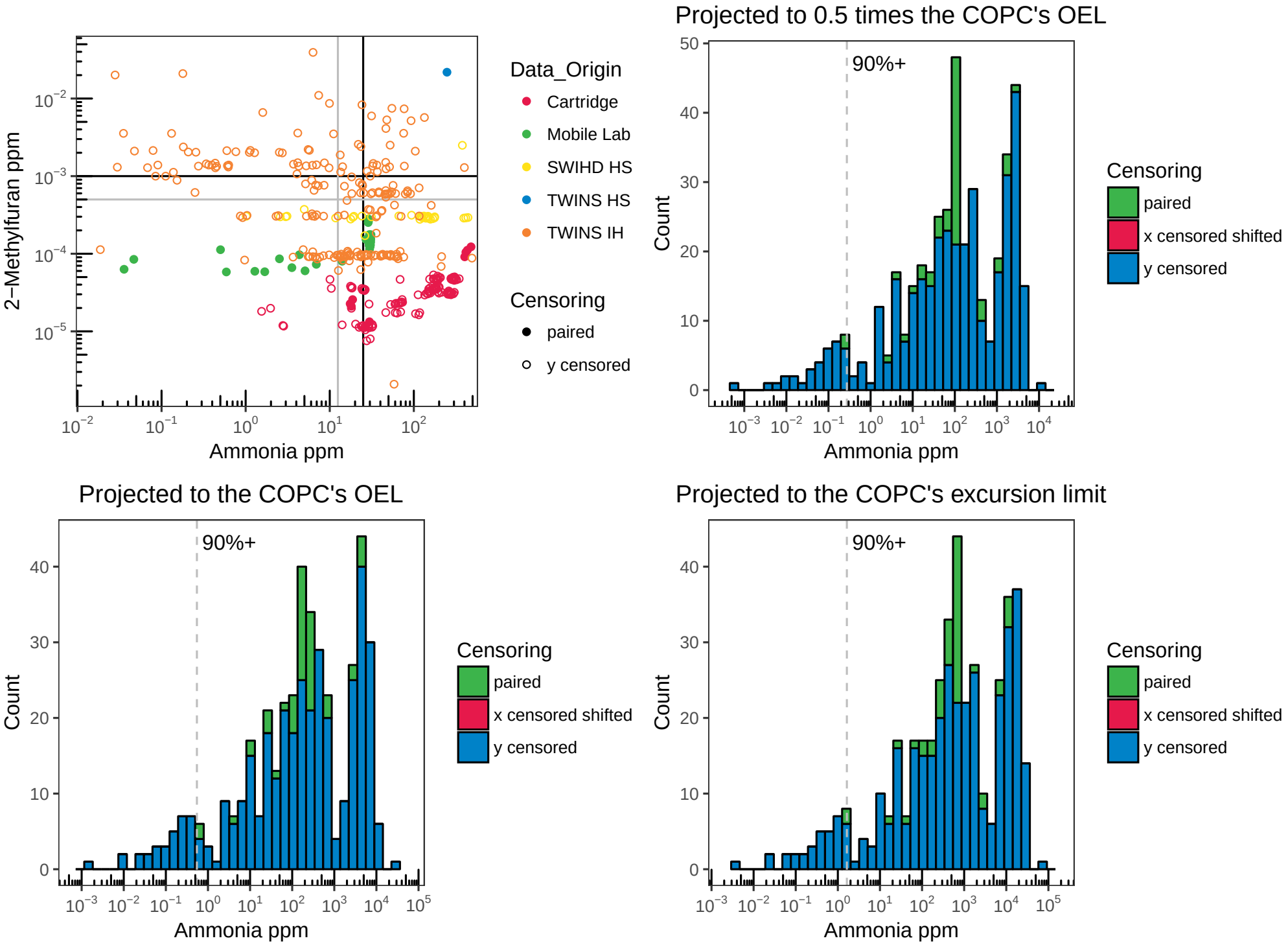


Figure C.23: 2-Methylfuran vs Ammonia

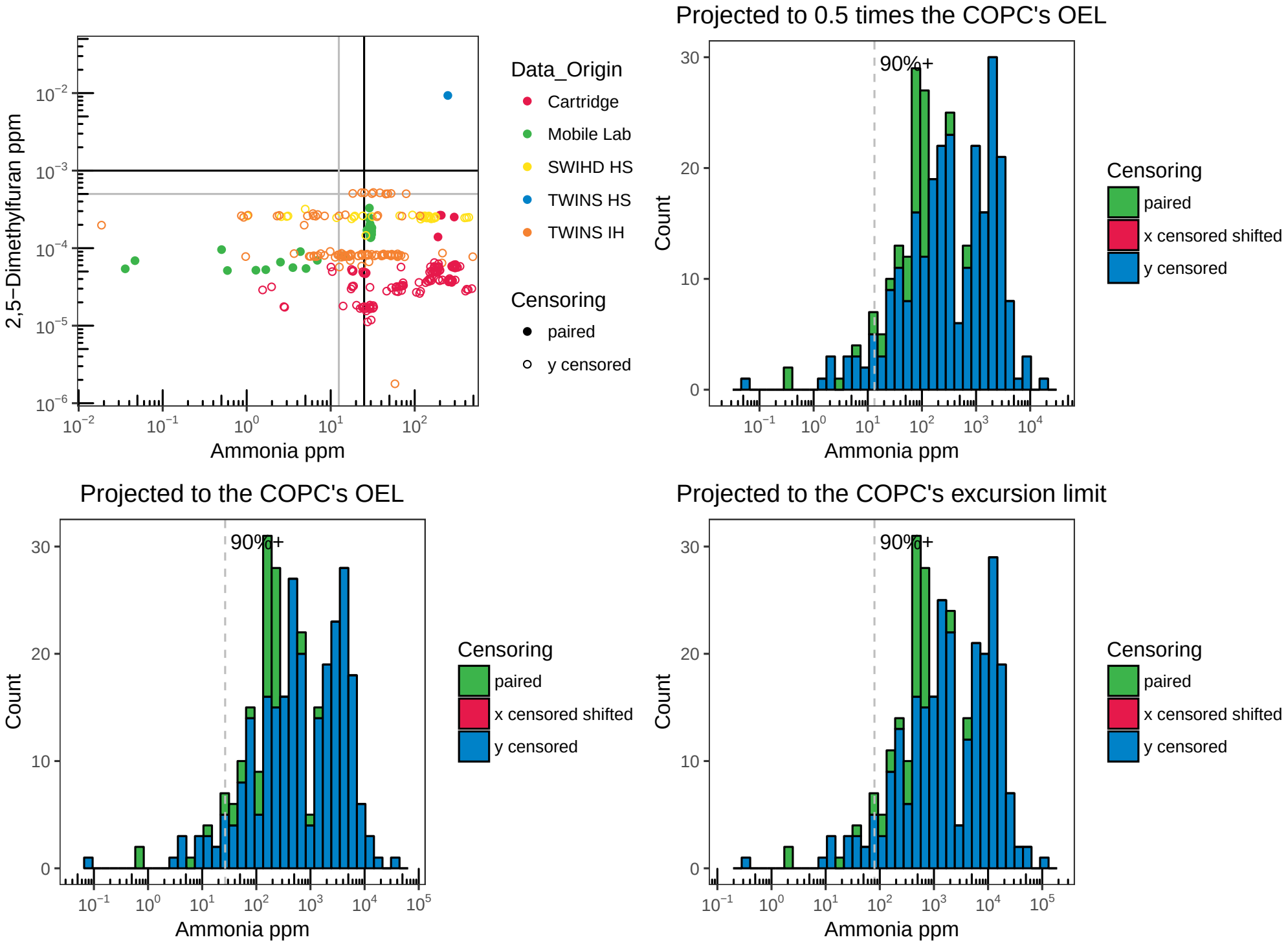


Figure C.24: 2,5-Dimethylfuran vs Ammonia

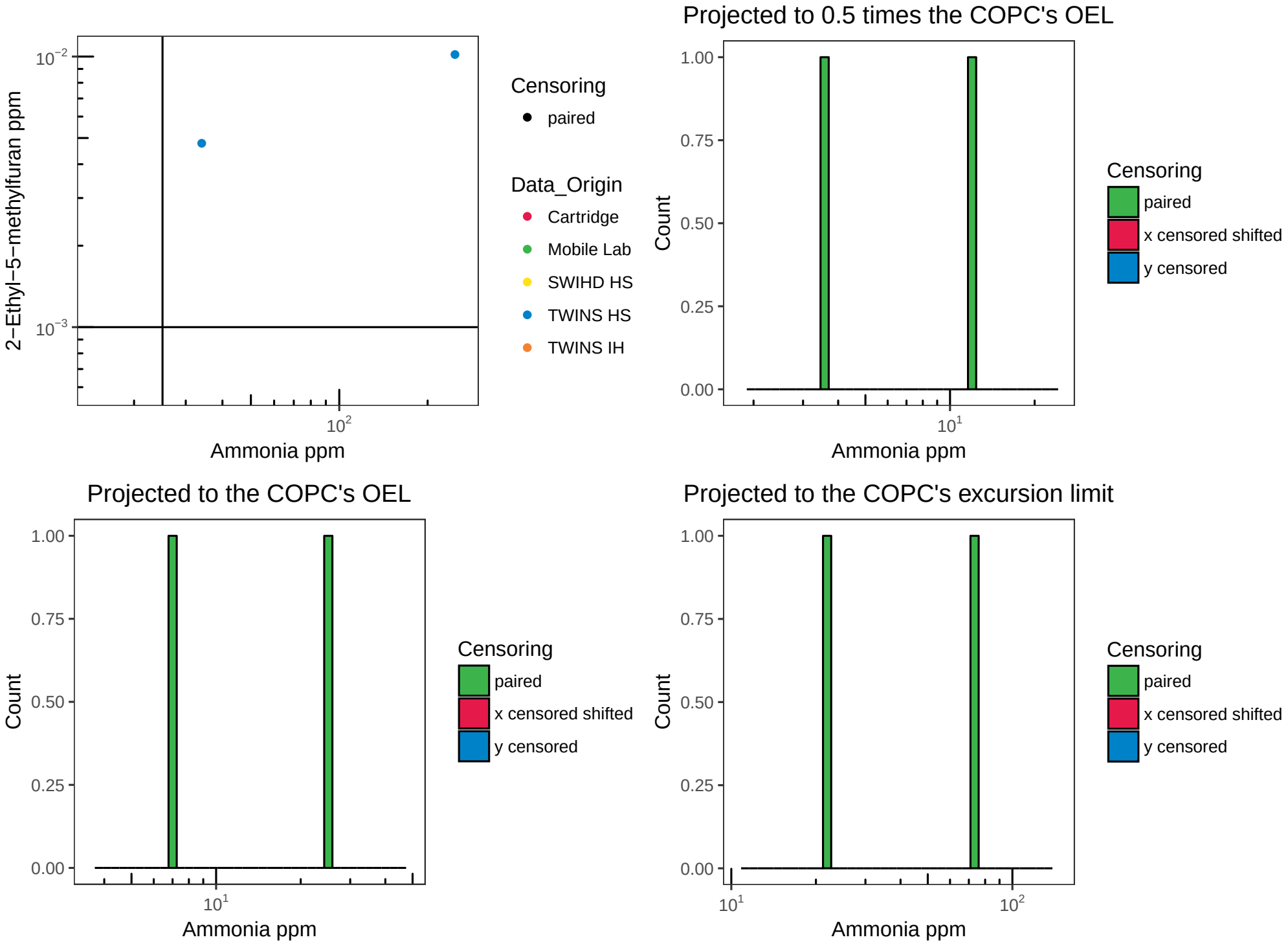


Figure C.25: 2-Ethyl-5-methylfuran vs Ammonia

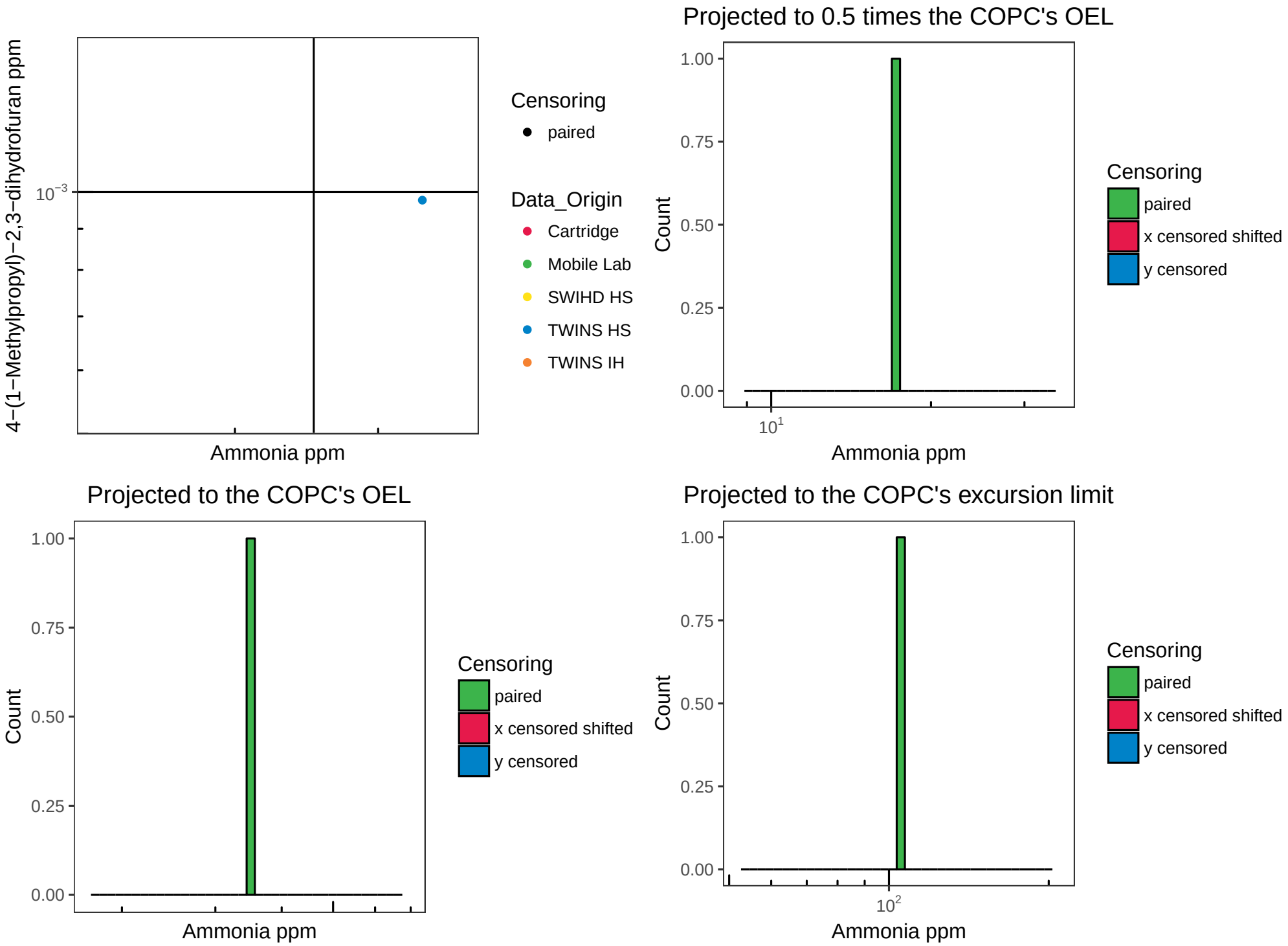


Figure C.26: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Ammonia

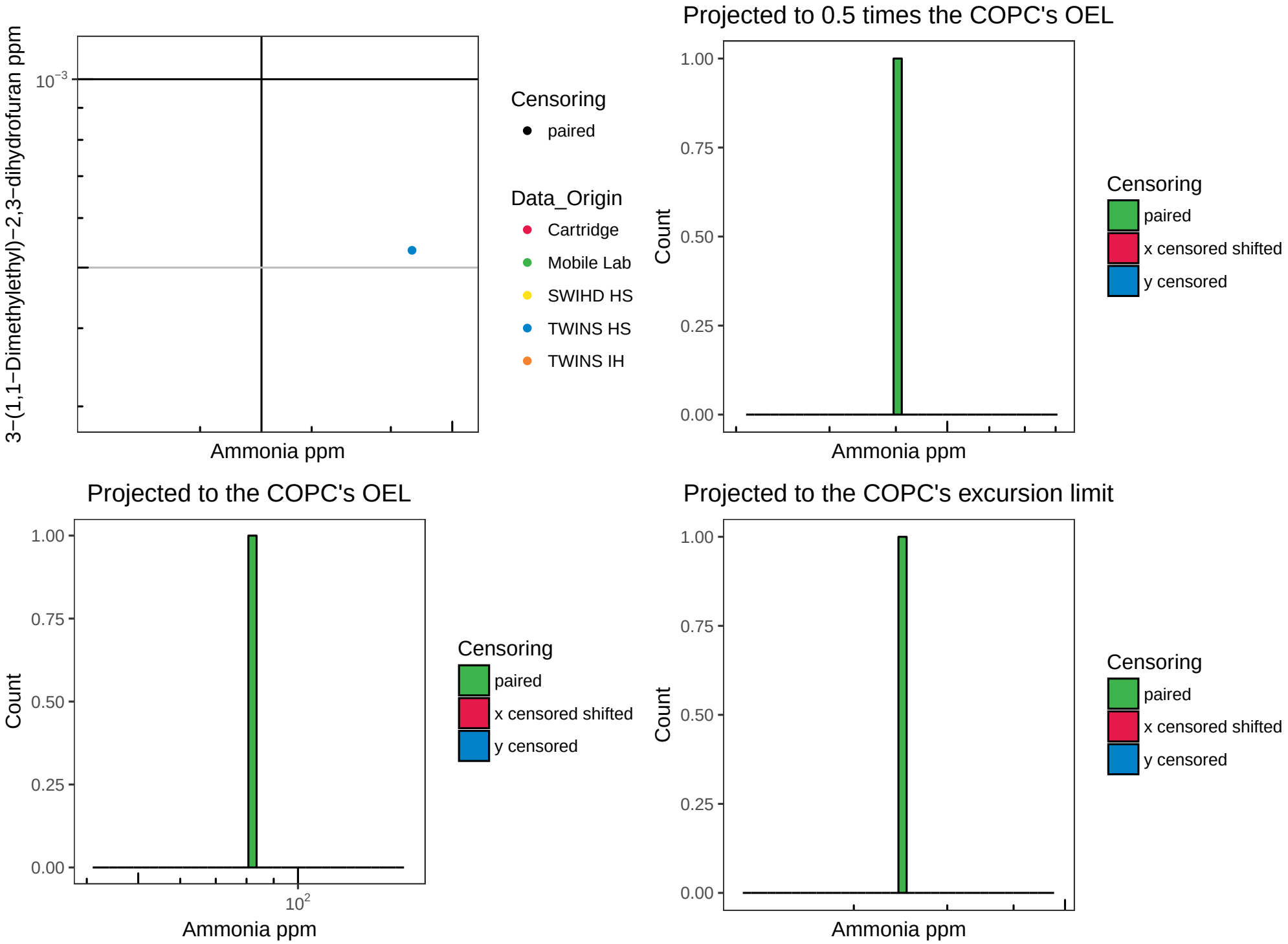


Figure C.27: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Ammonia

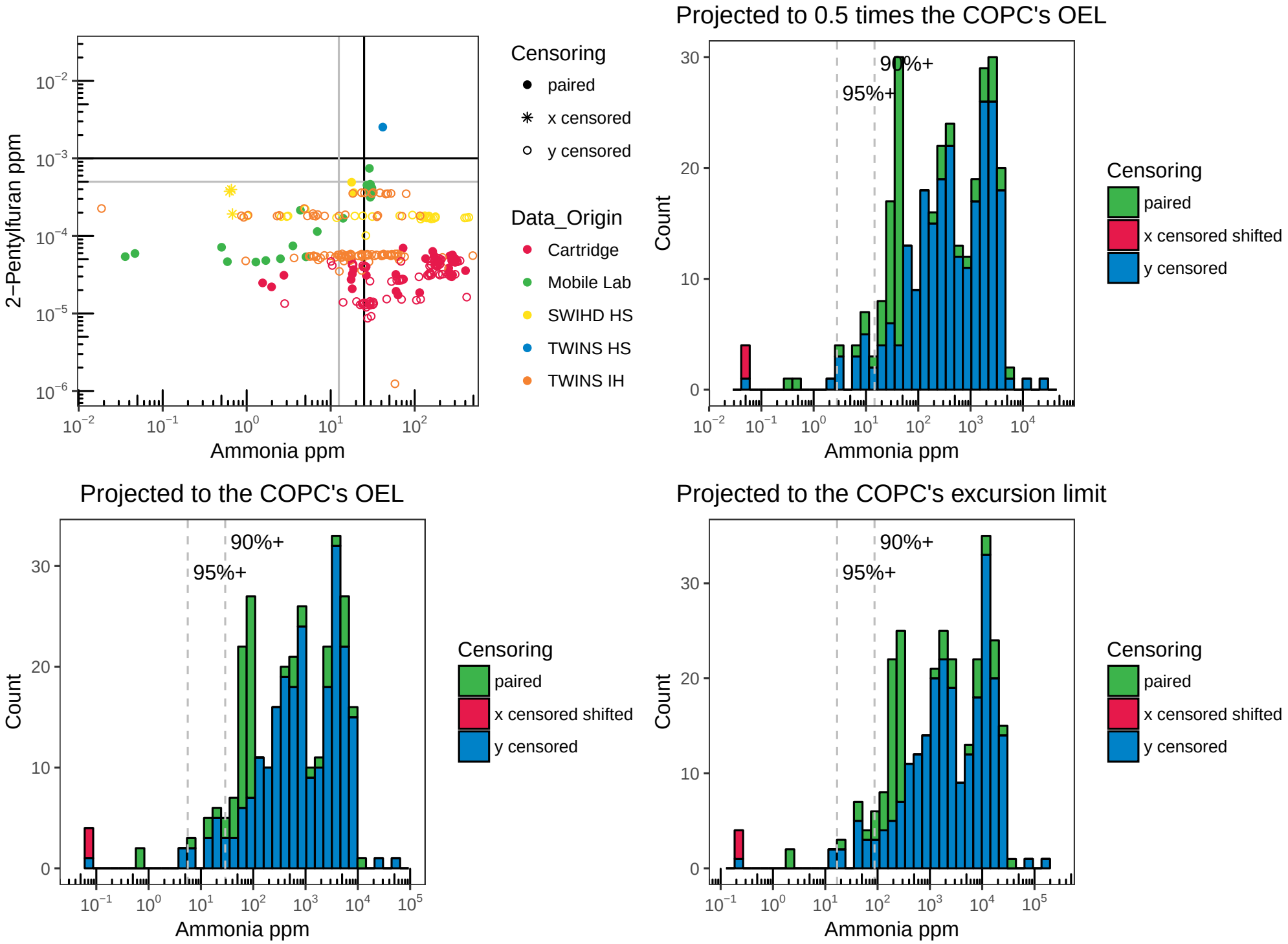


Figure C.28: 2-Pentylfuran vs Ammonia

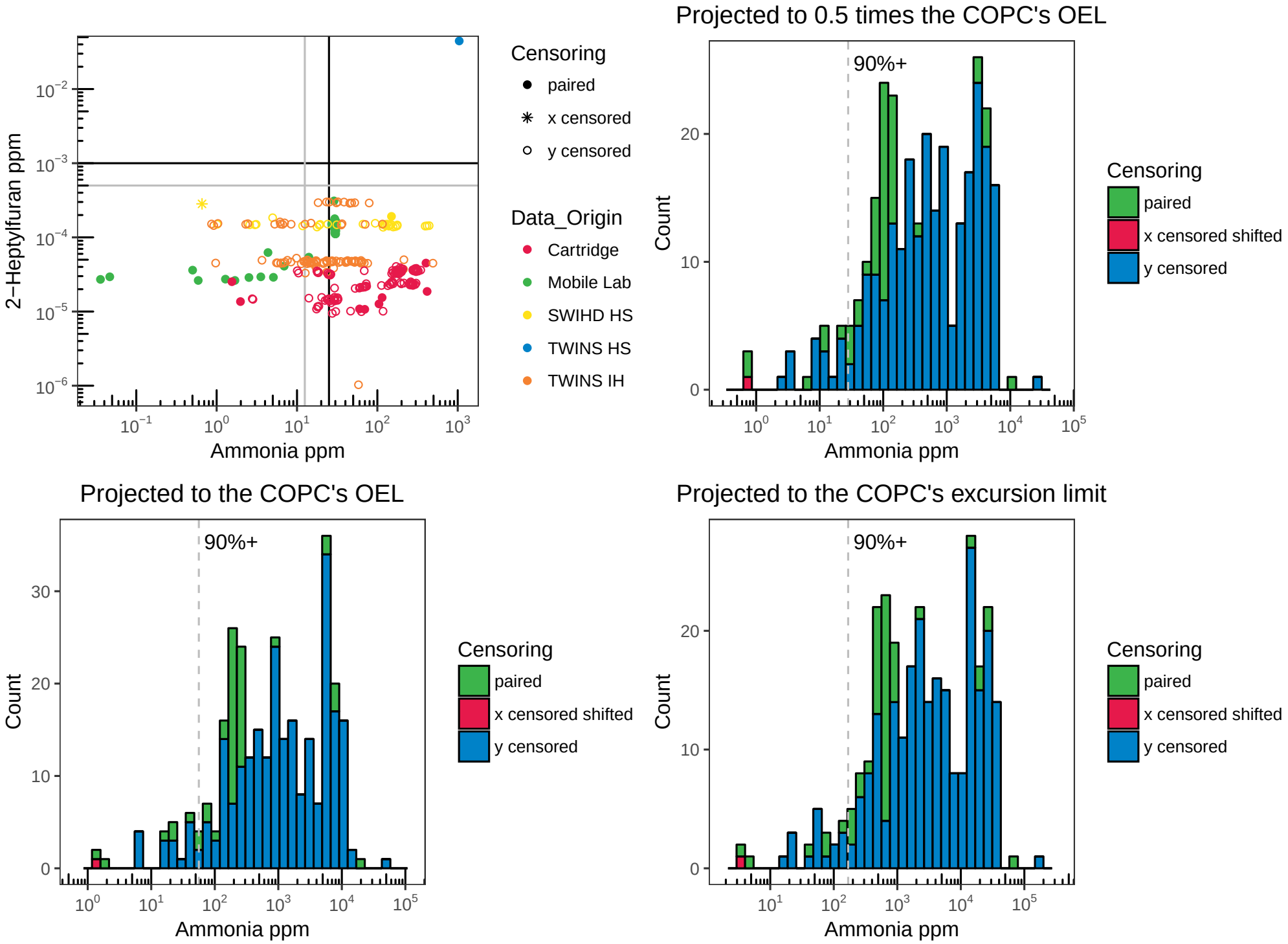


Figure C.29: 2-Heptylfuran vs Ammonia

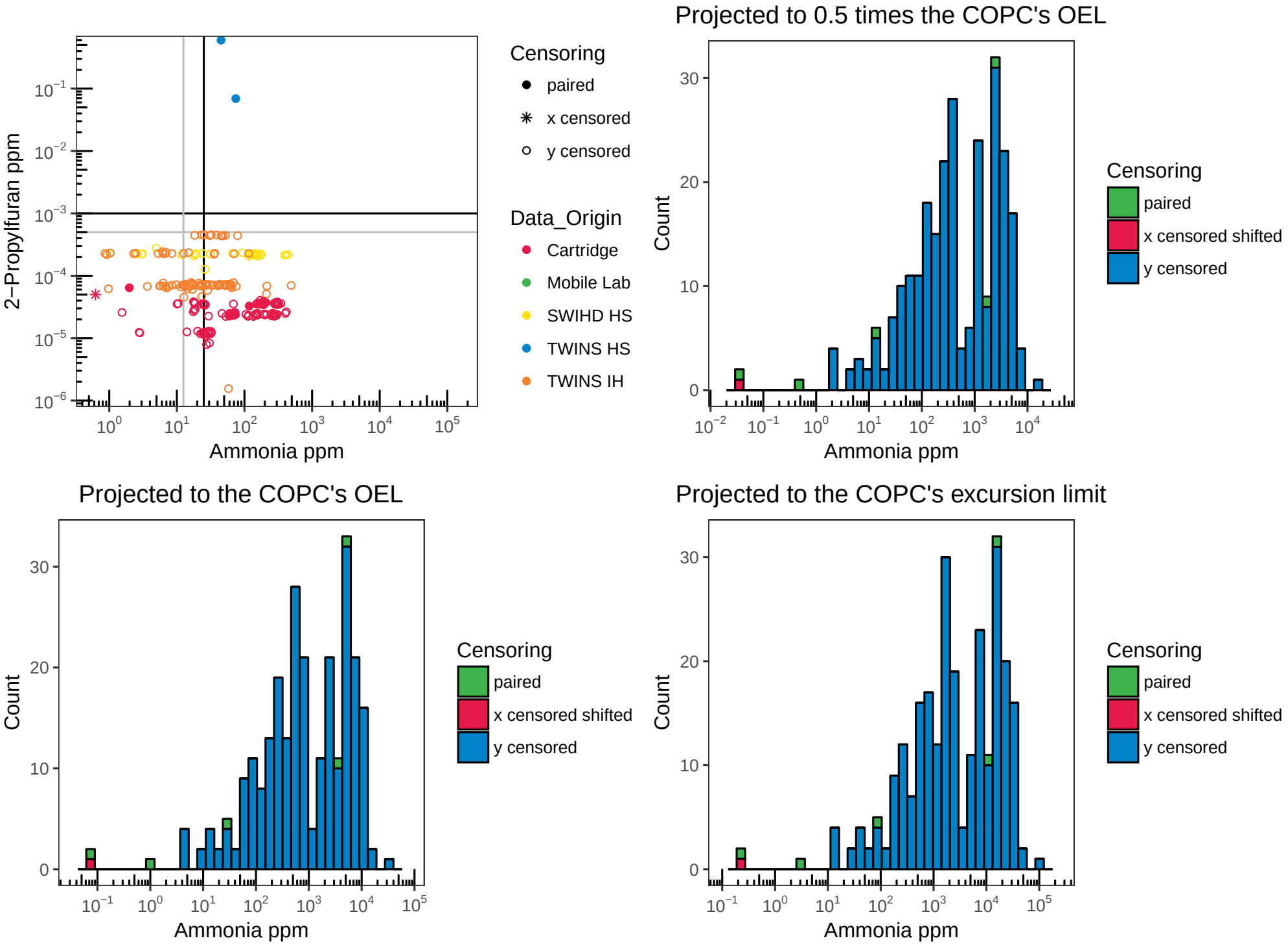


Figure C.30: 2-Propylfuran vs Ammonia

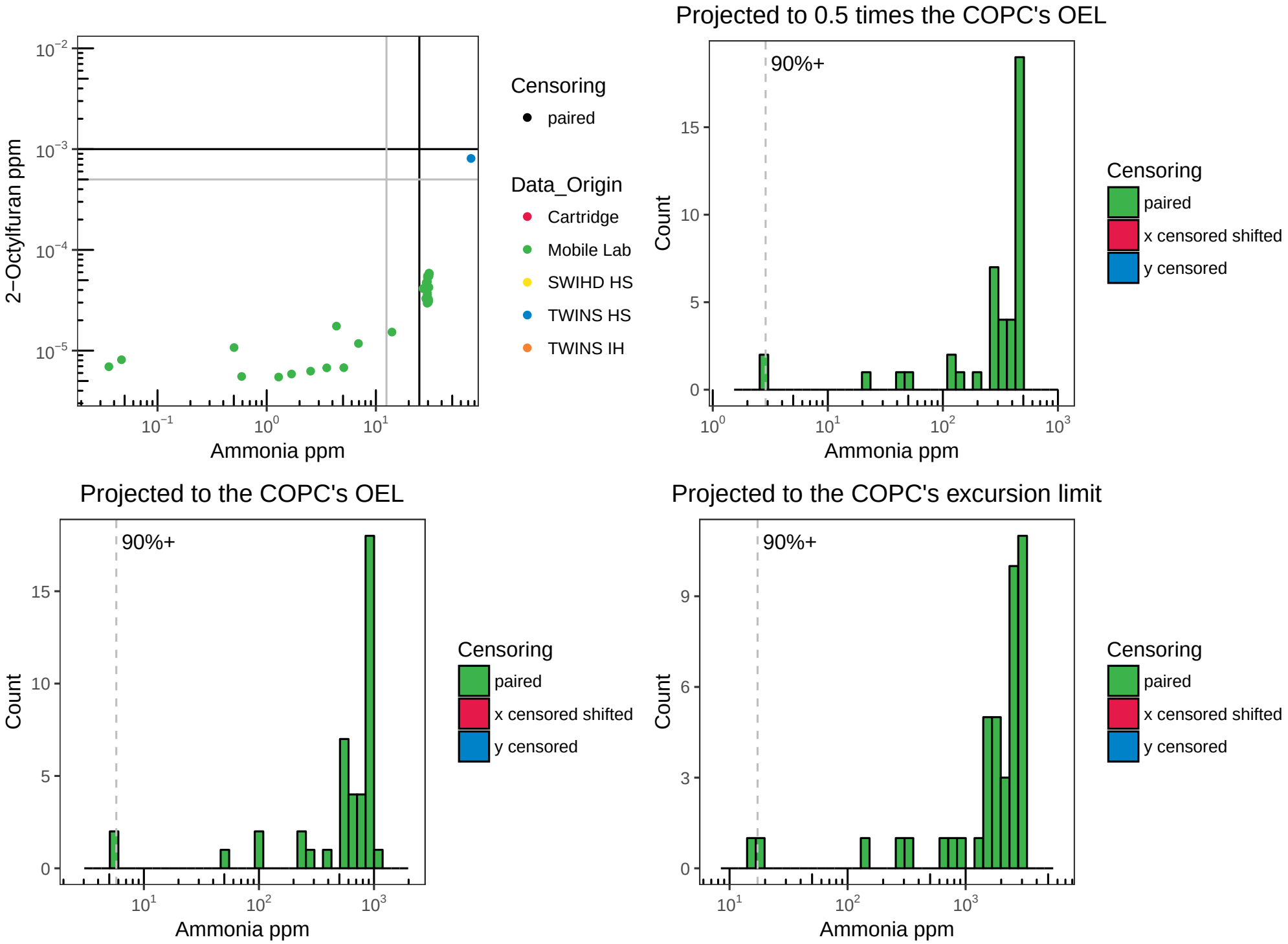


Figure C.31: 2-Octylfuran vs Ammonia

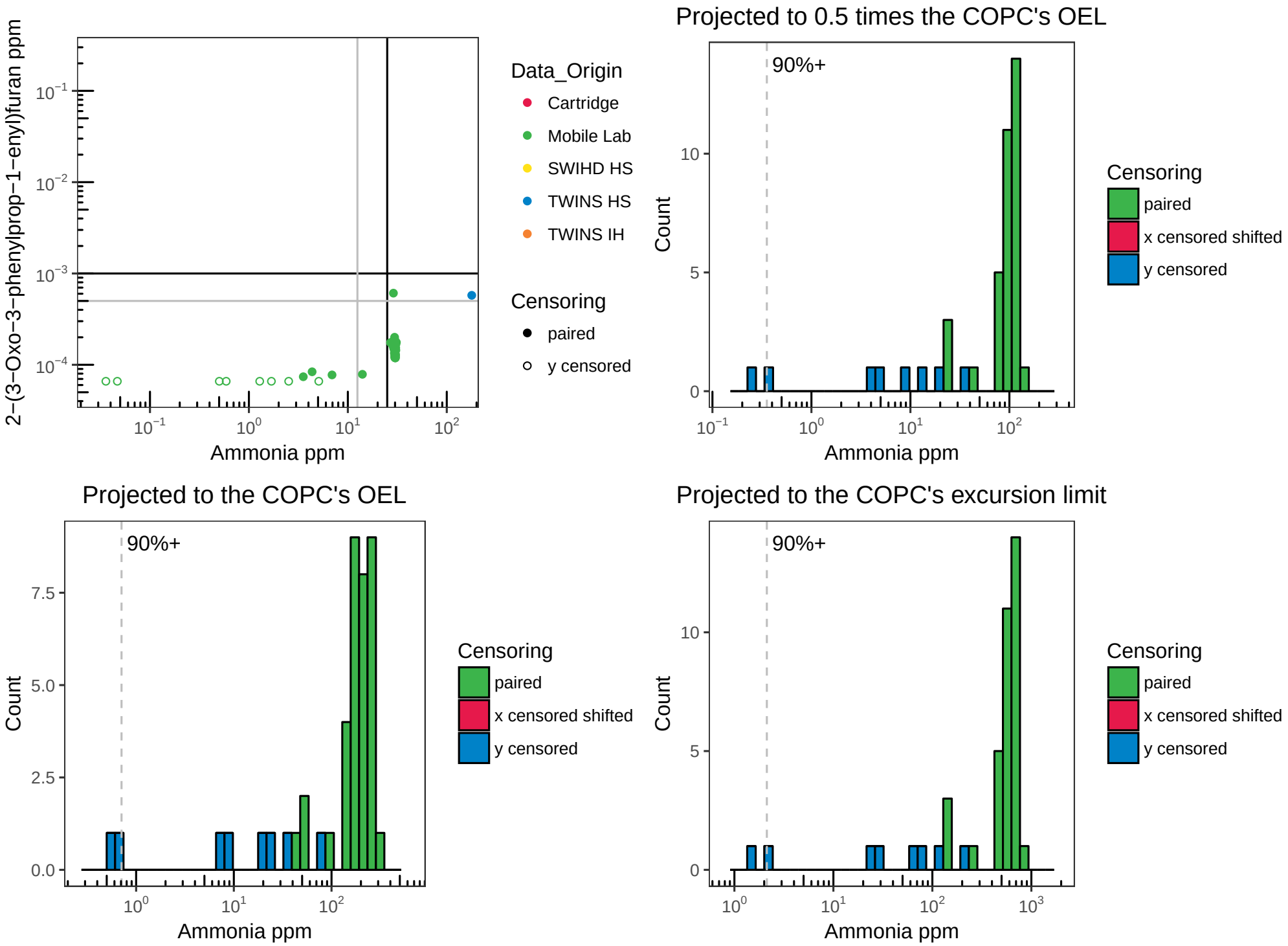


Figure C.32: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Ammonia

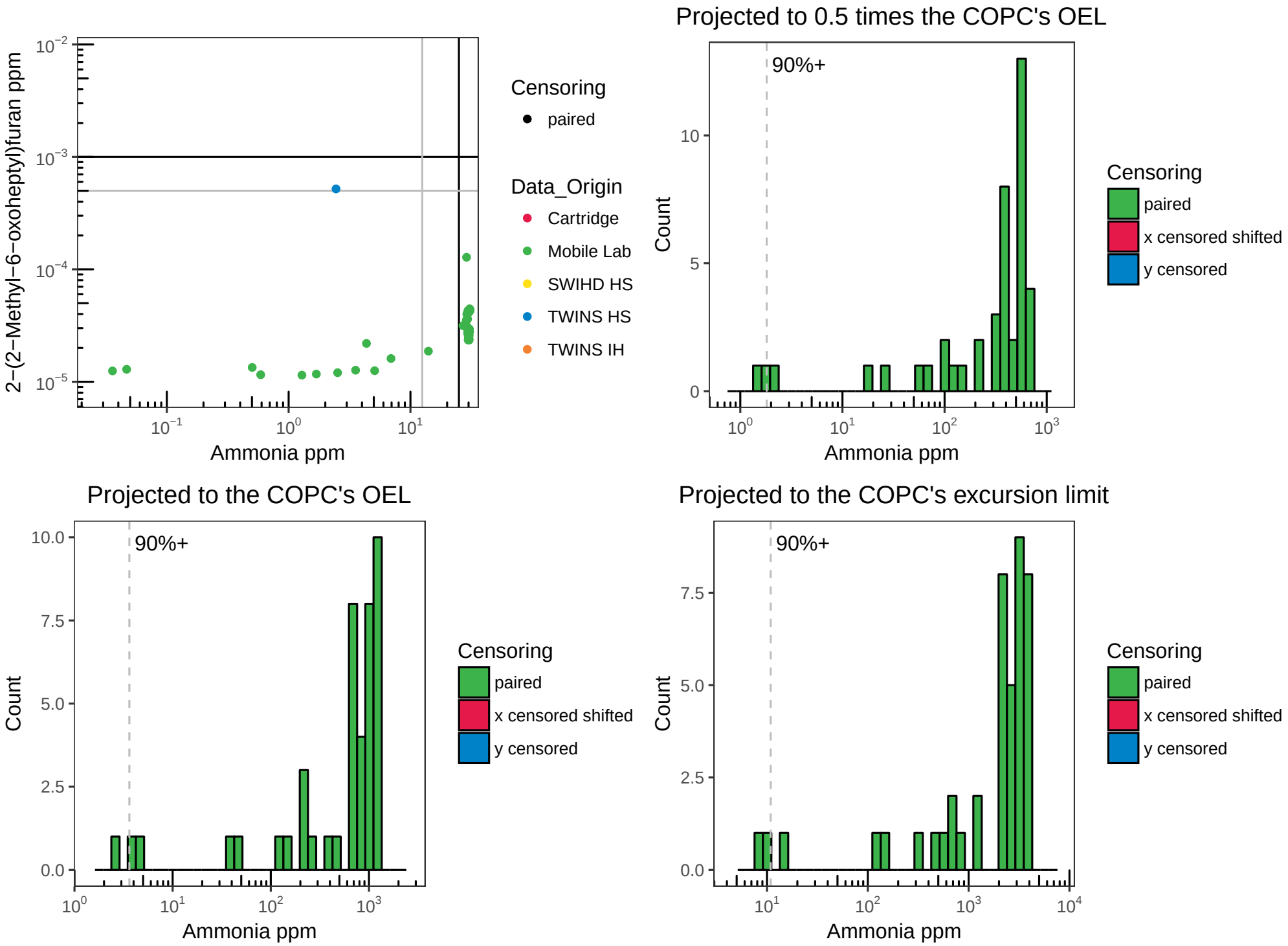


Figure C.33: 2-(2-Methyl-6-oxoheptyl)furan vs Ammonia

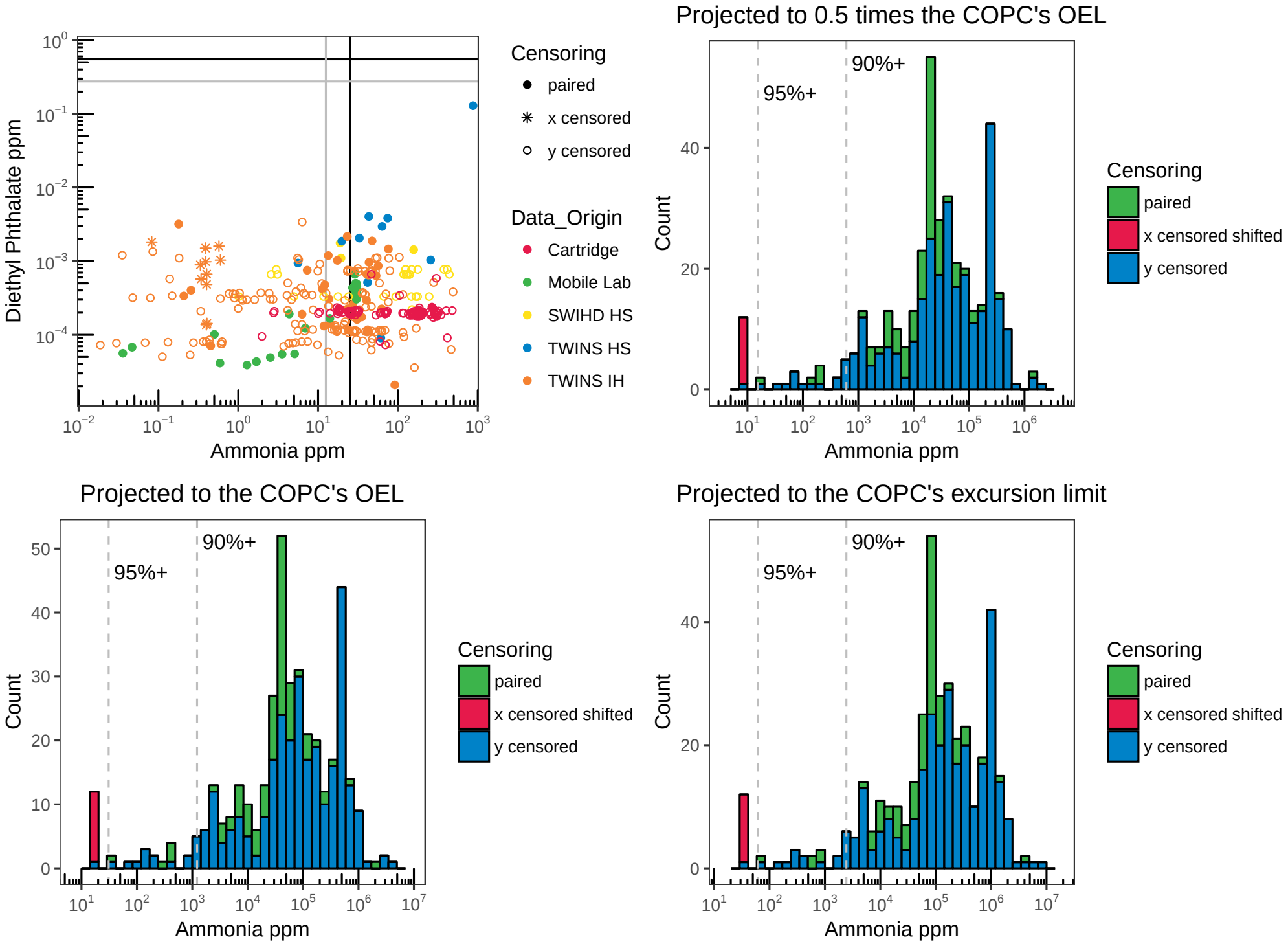


Figure C.34: Diethyl Phthalate vs Ammonia

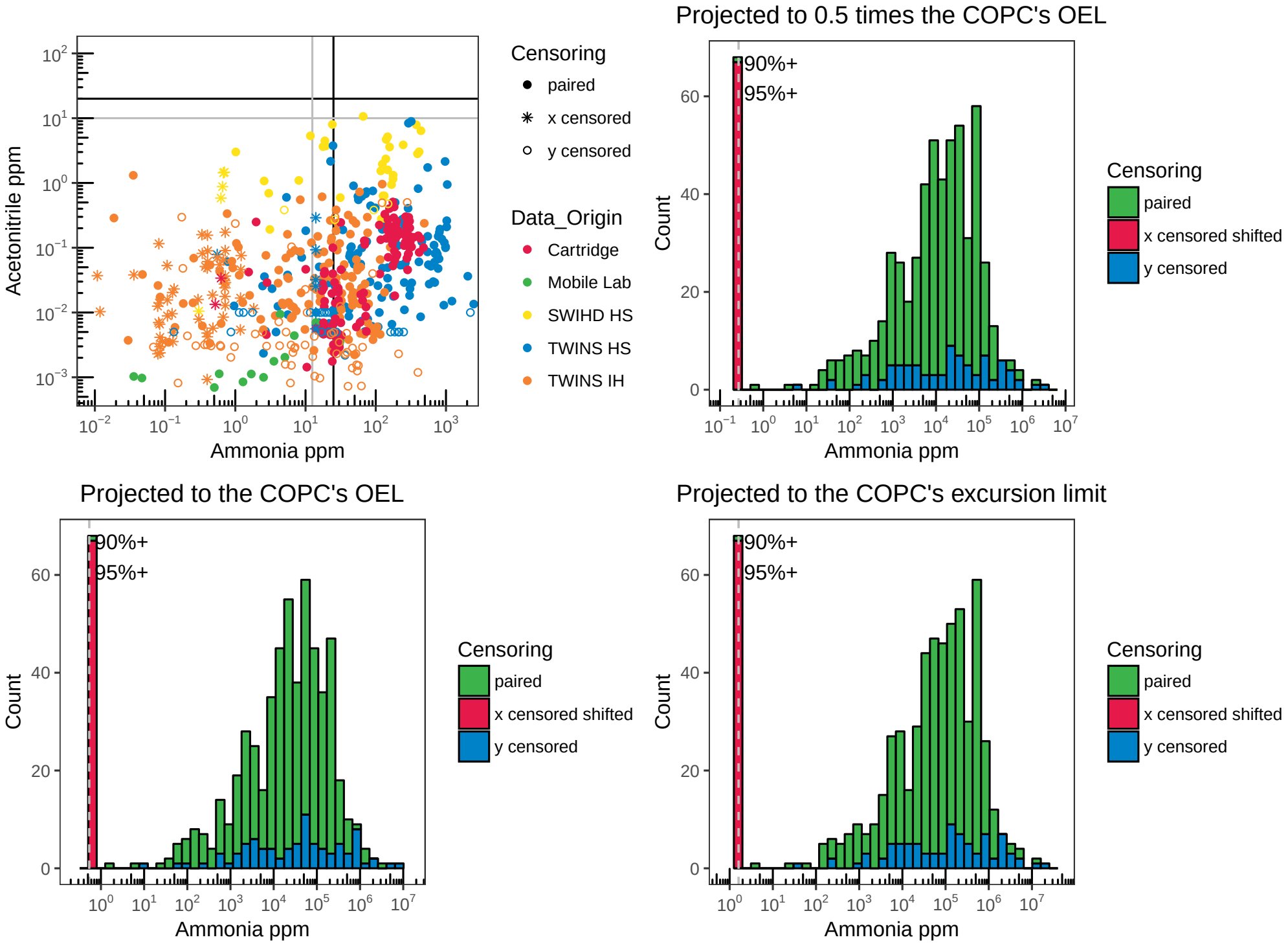


Figure C.35: Acetonitrile vs Ammonia

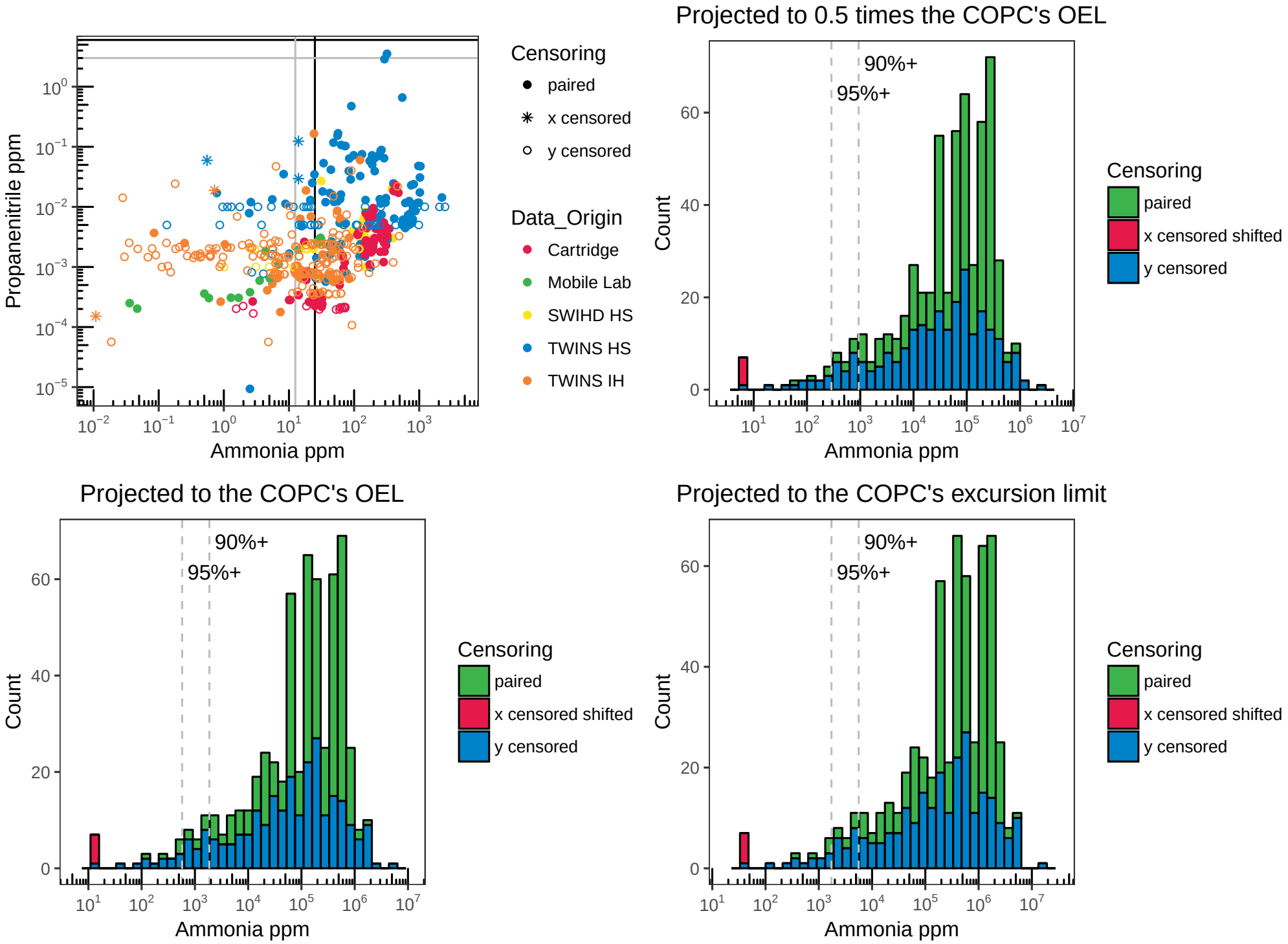


Figure C.36: Propanenitrile vs Ammonia

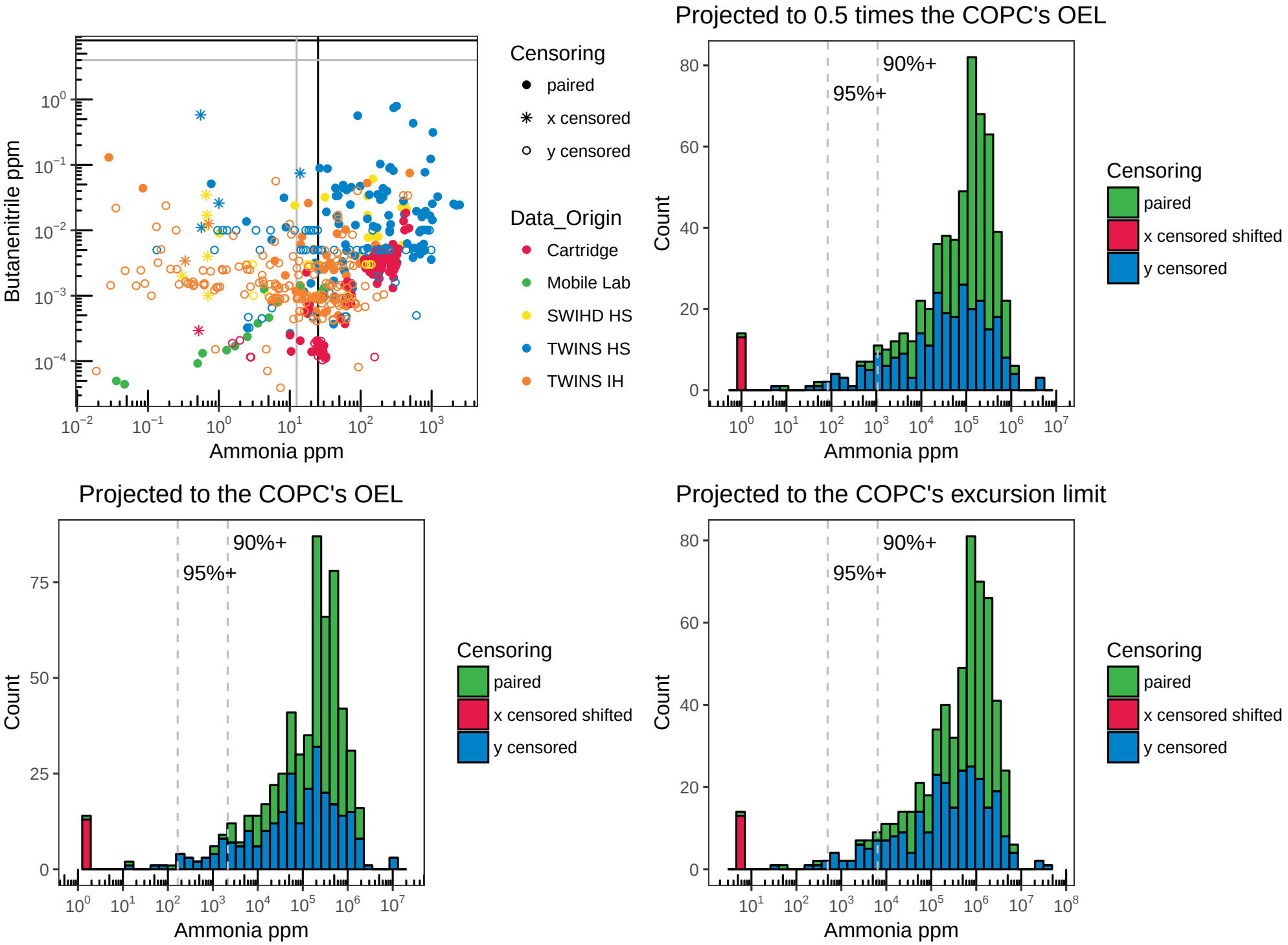


Figure C.37: Butanenitrile vs Ammonia

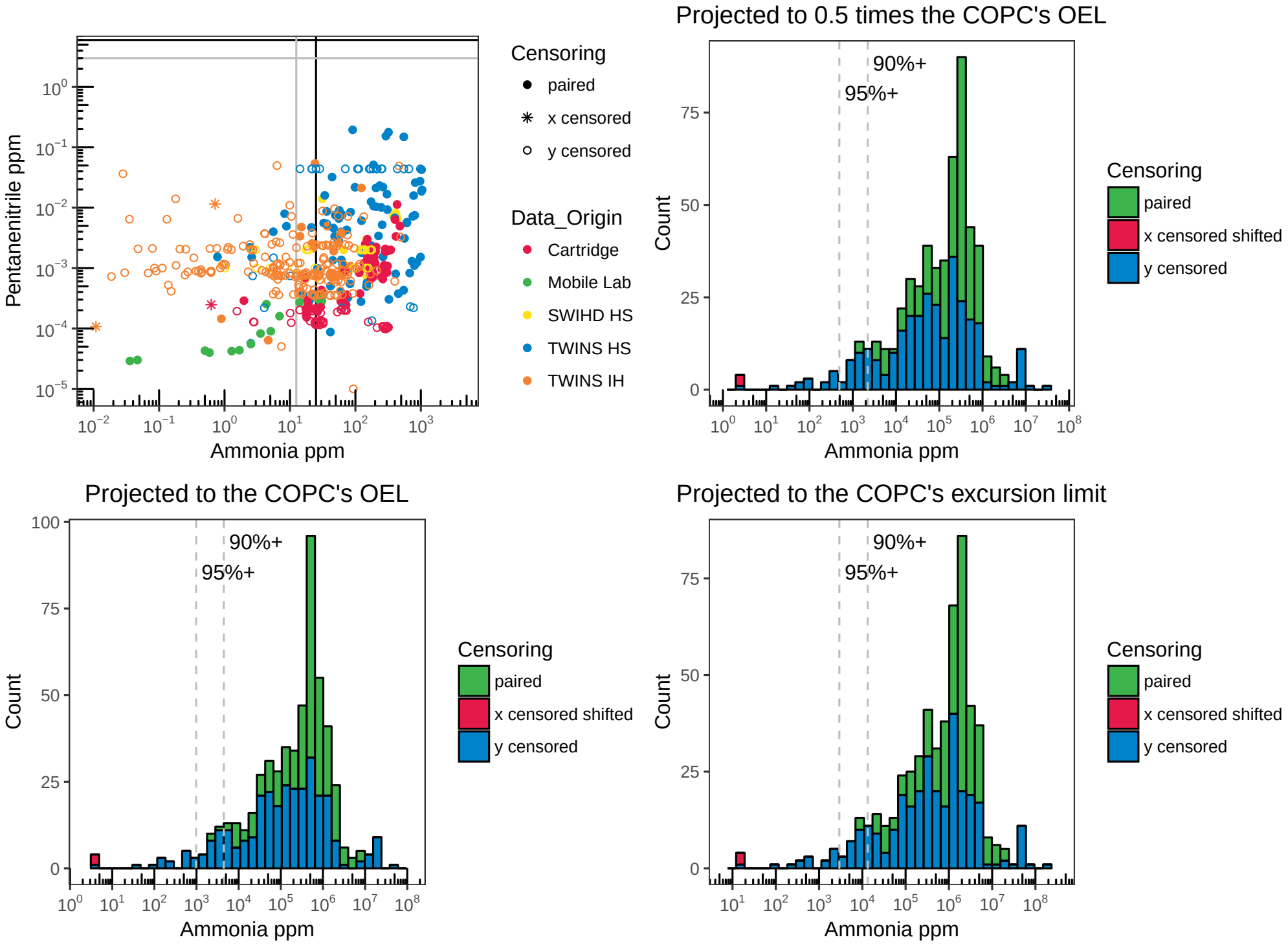


Figure C.38: Pentanenitrile vs Ammonia

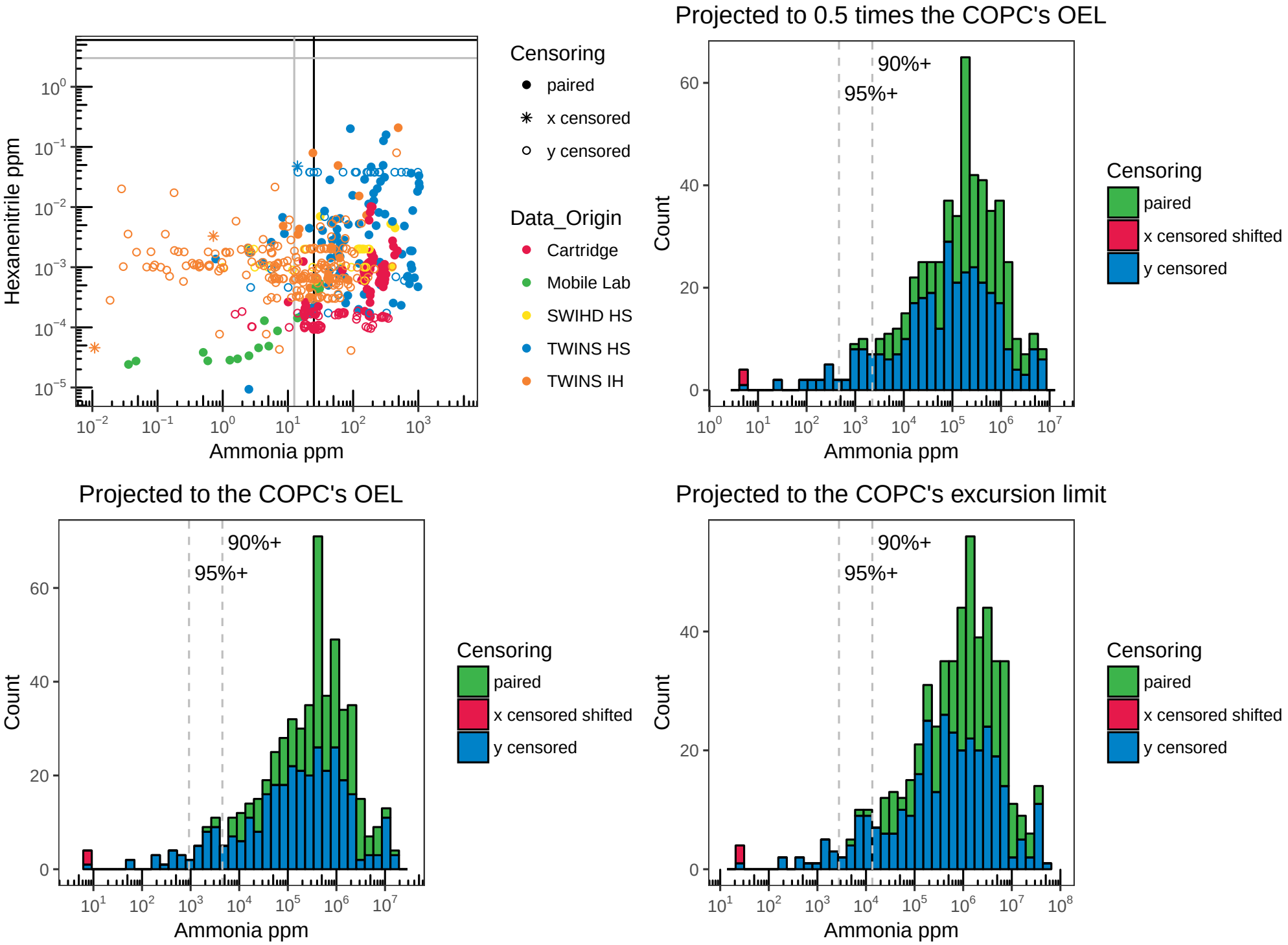


Figure C.39: Hexanenitrile vs Ammonia

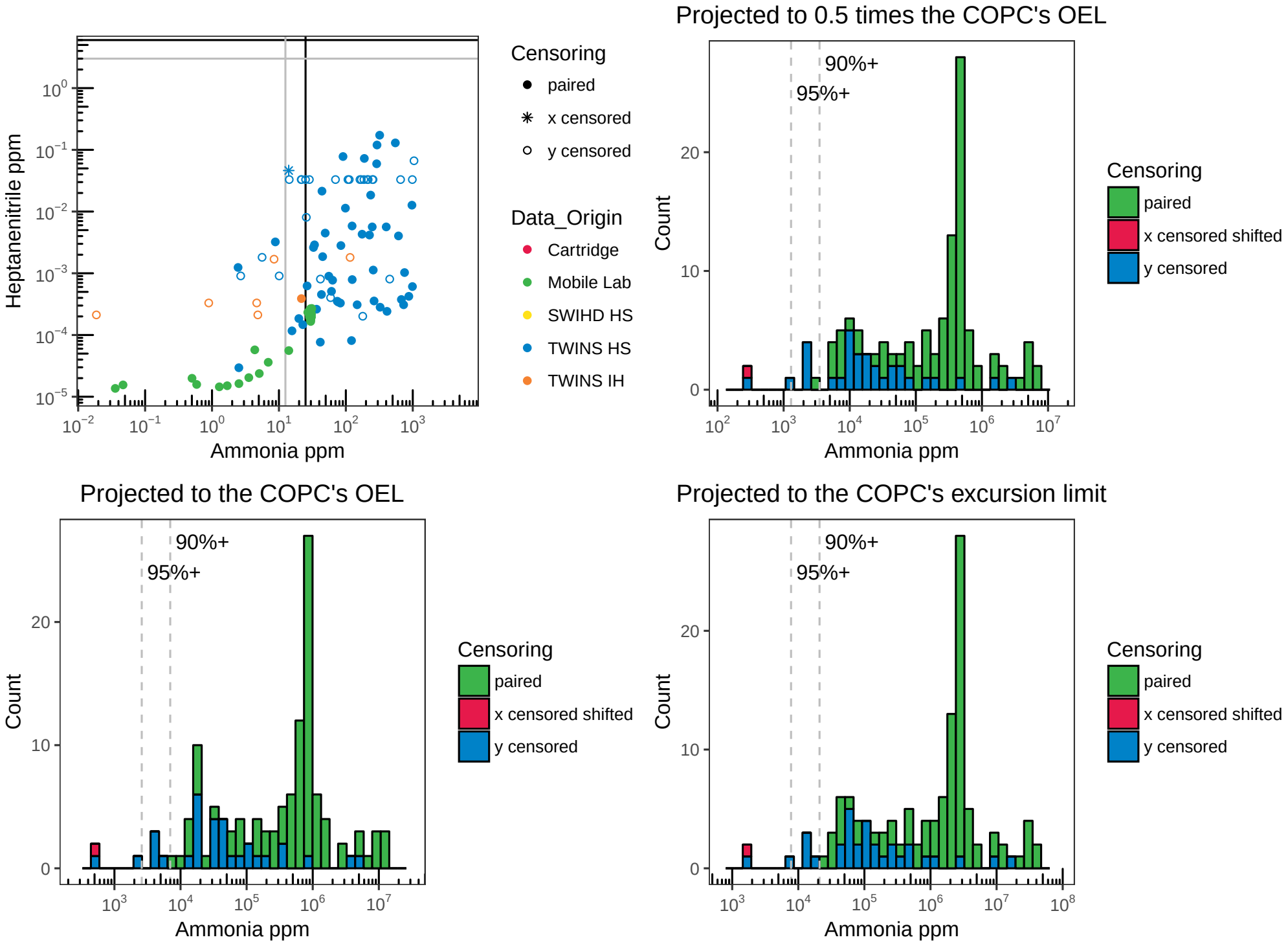


Figure C.40: Heptanenitrile vs Ammonia

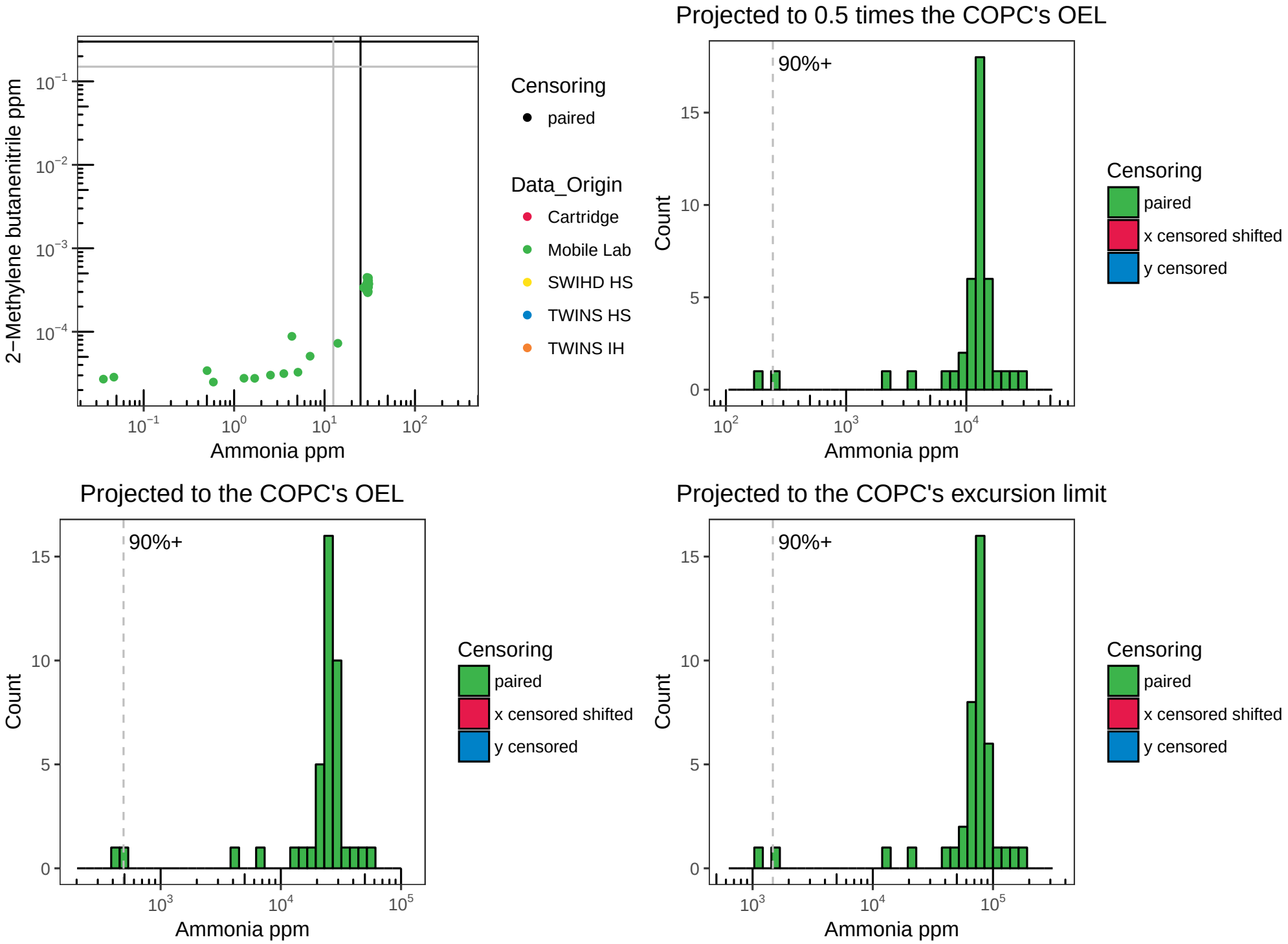


Figure C.41: 2-Methylene butanenitrile vs Ammonia

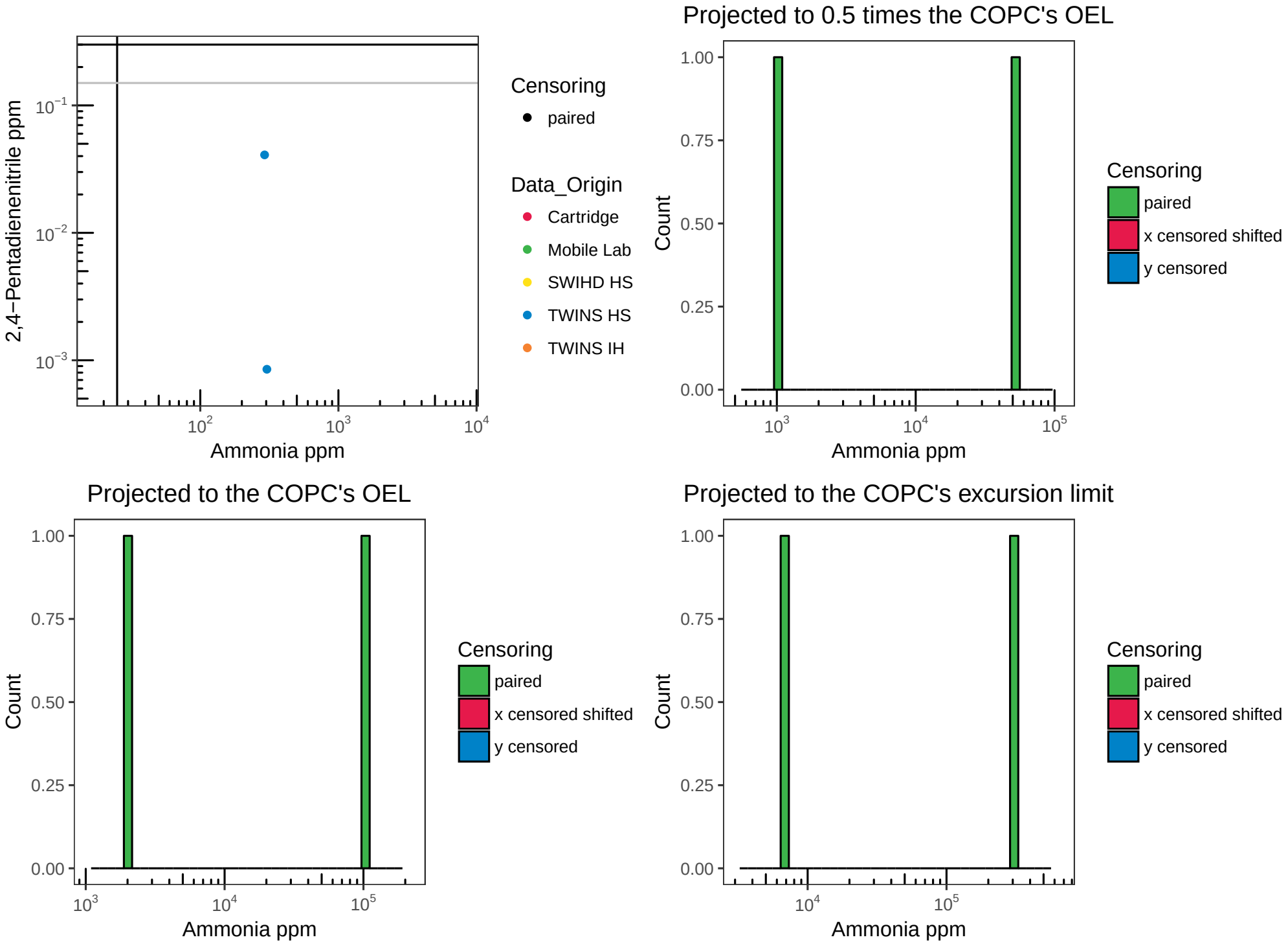


Figure C.42: 2,4-Pentadienenitrile vs Ammonia

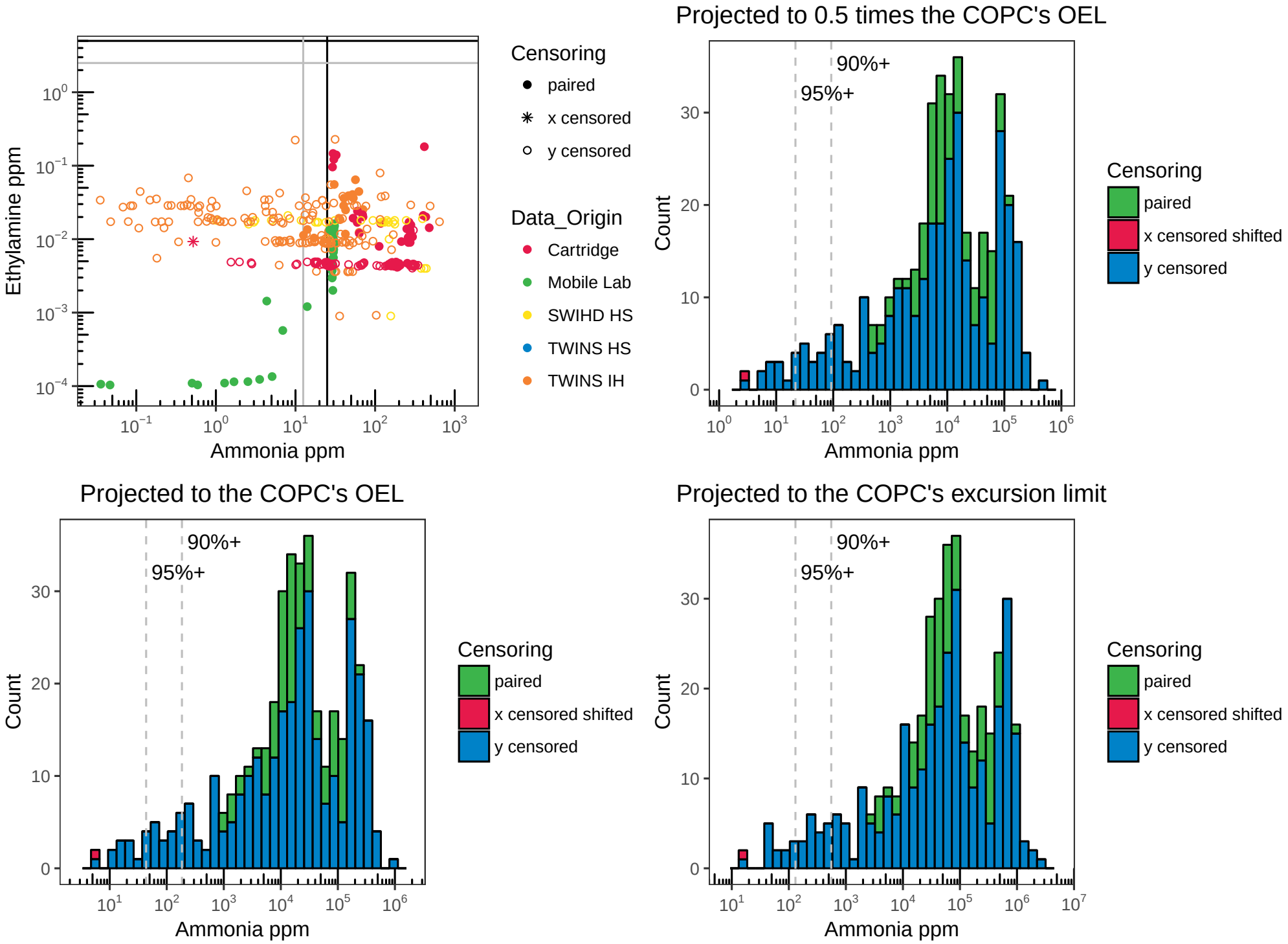


Figure C.43: Ethylamine vs Ammonia

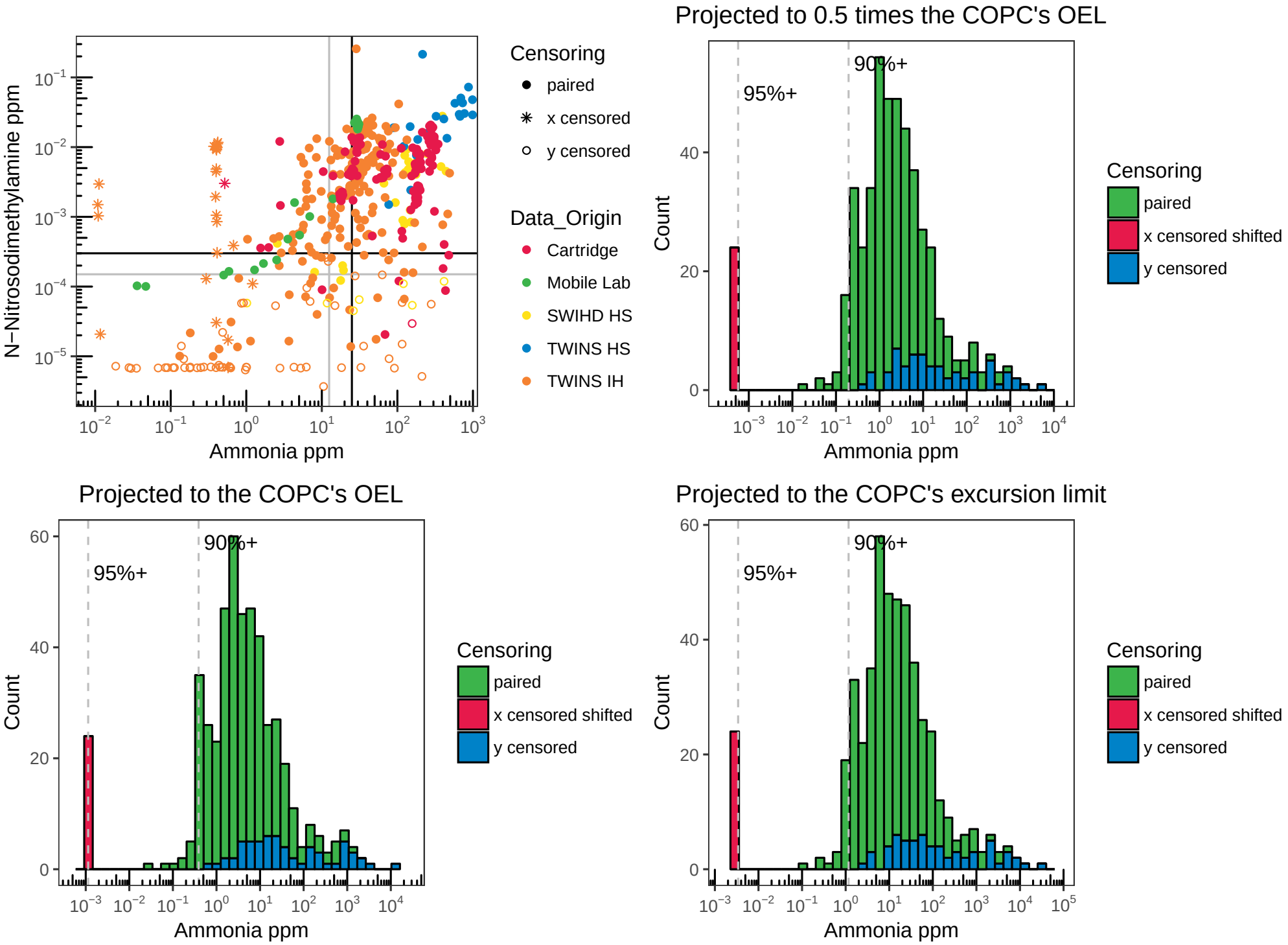


Figure C.44: N-Nitrosodimethylamine vs Ammonia

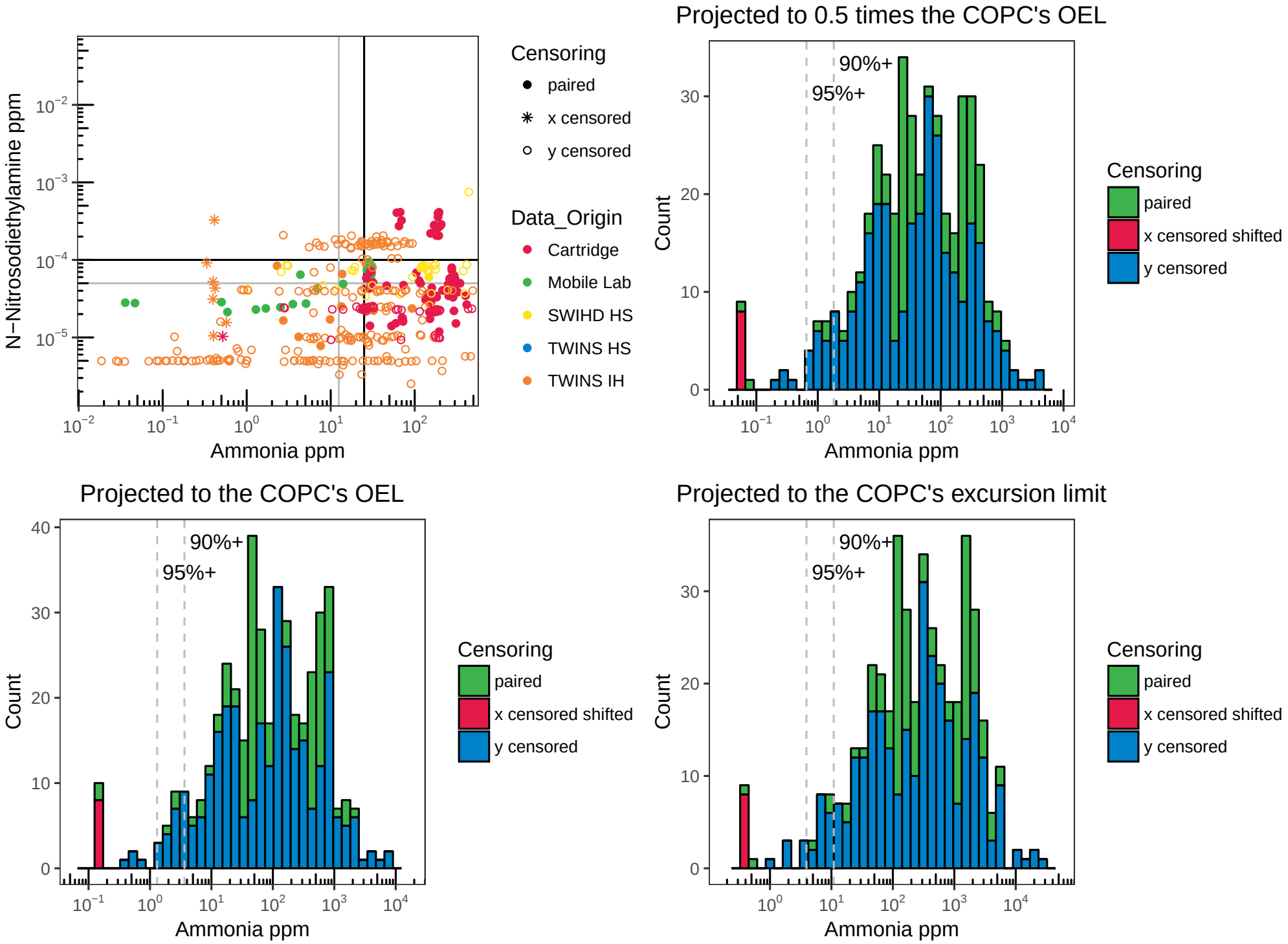


Figure C.45: N-Nitrosodiethylamine vs Ammonia

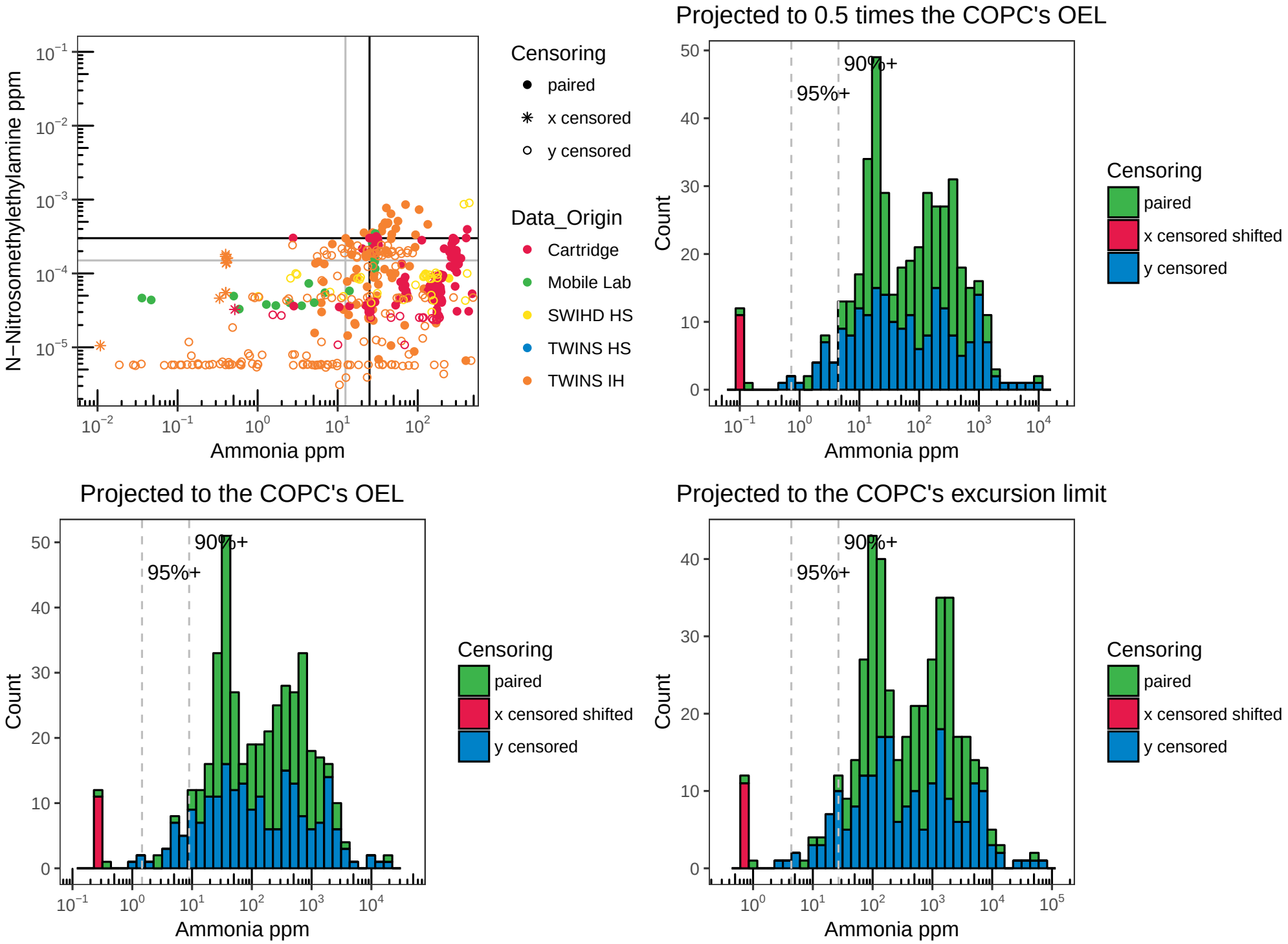


Figure C.46: N-Nitrosomethylethylamine vs Ammonia

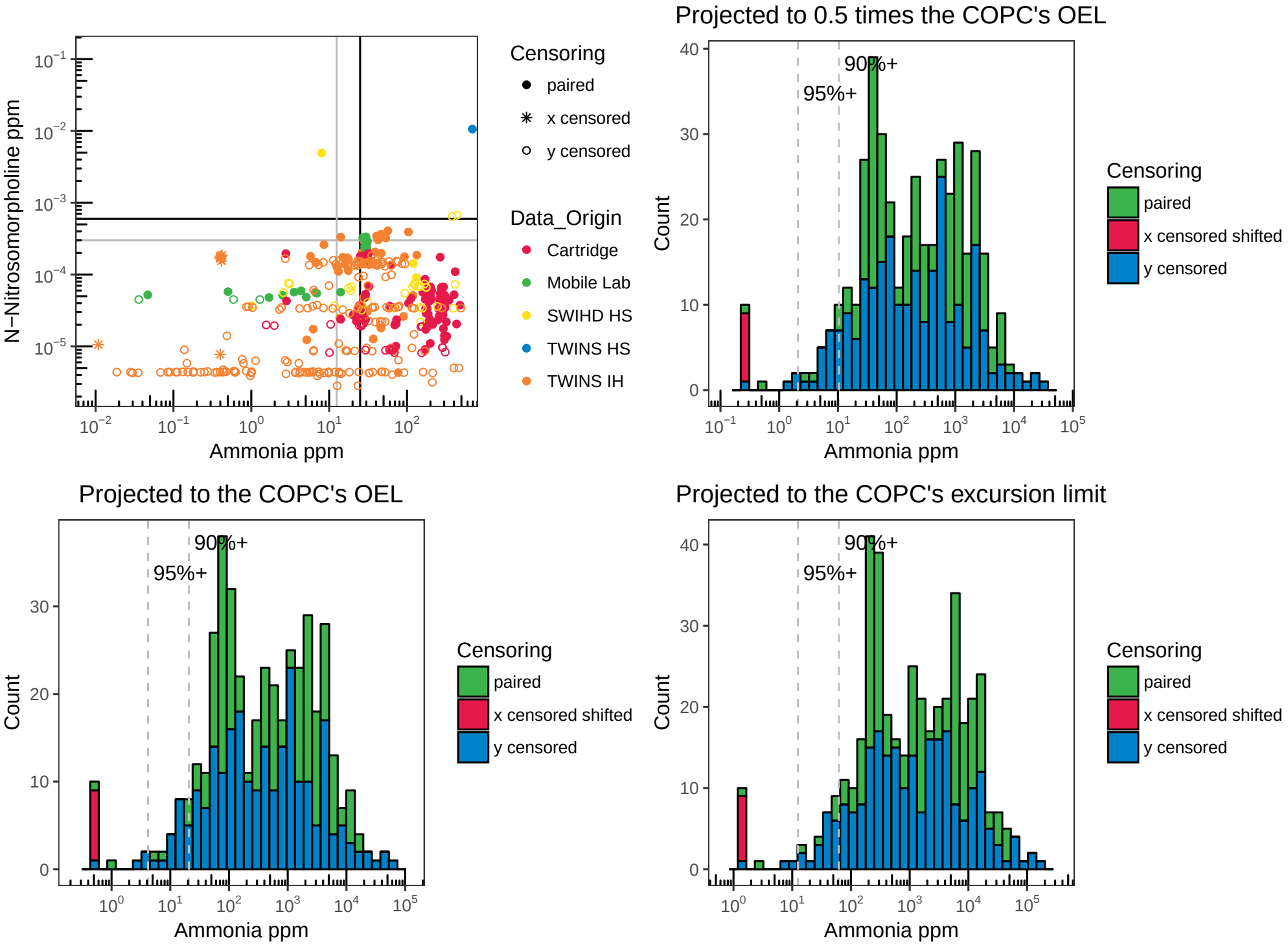


Figure C.47: N-Nitrosomorpholine vs Ammonia

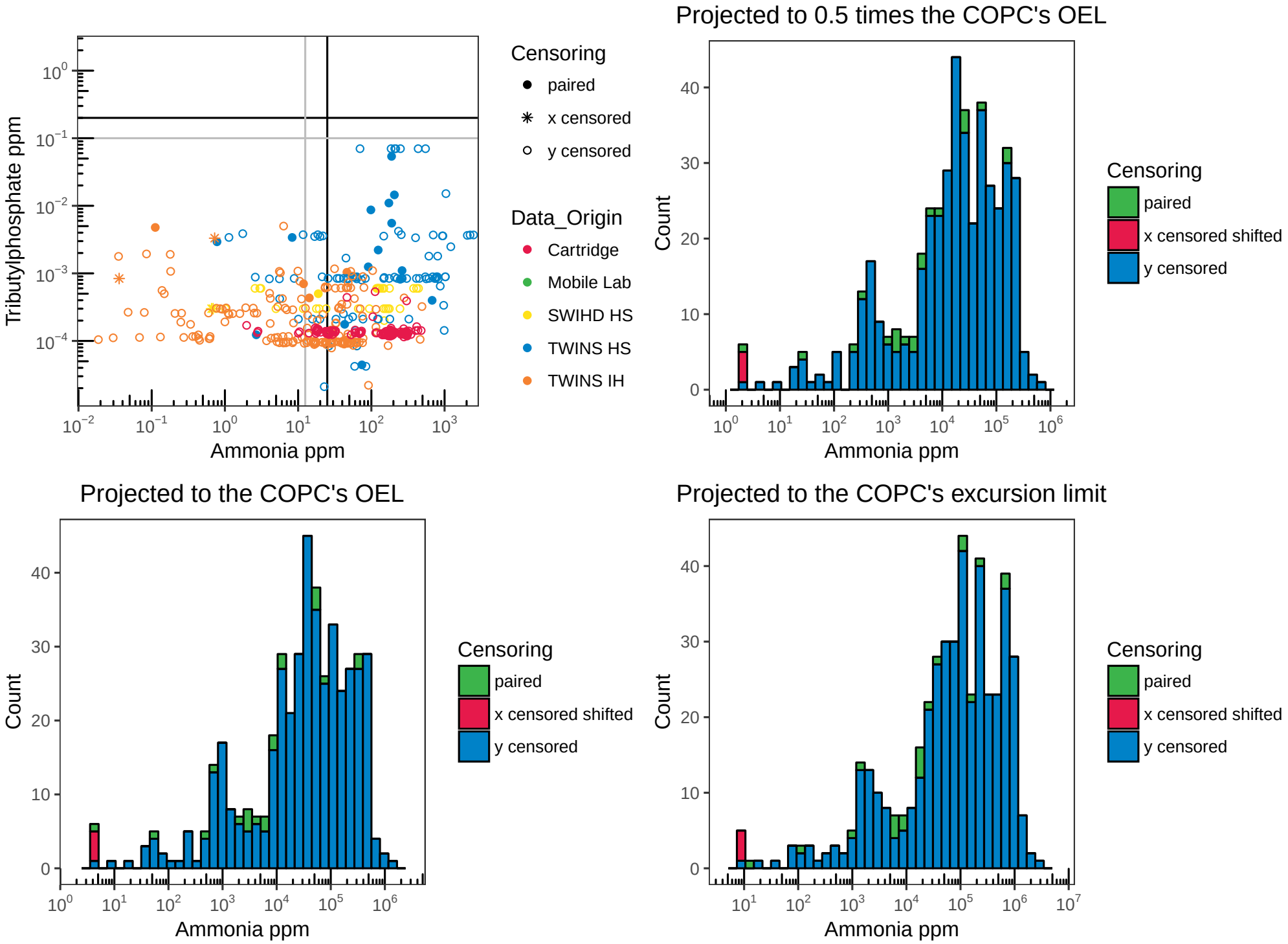


Figure C.48: Tributylphosphate vs Ammonia

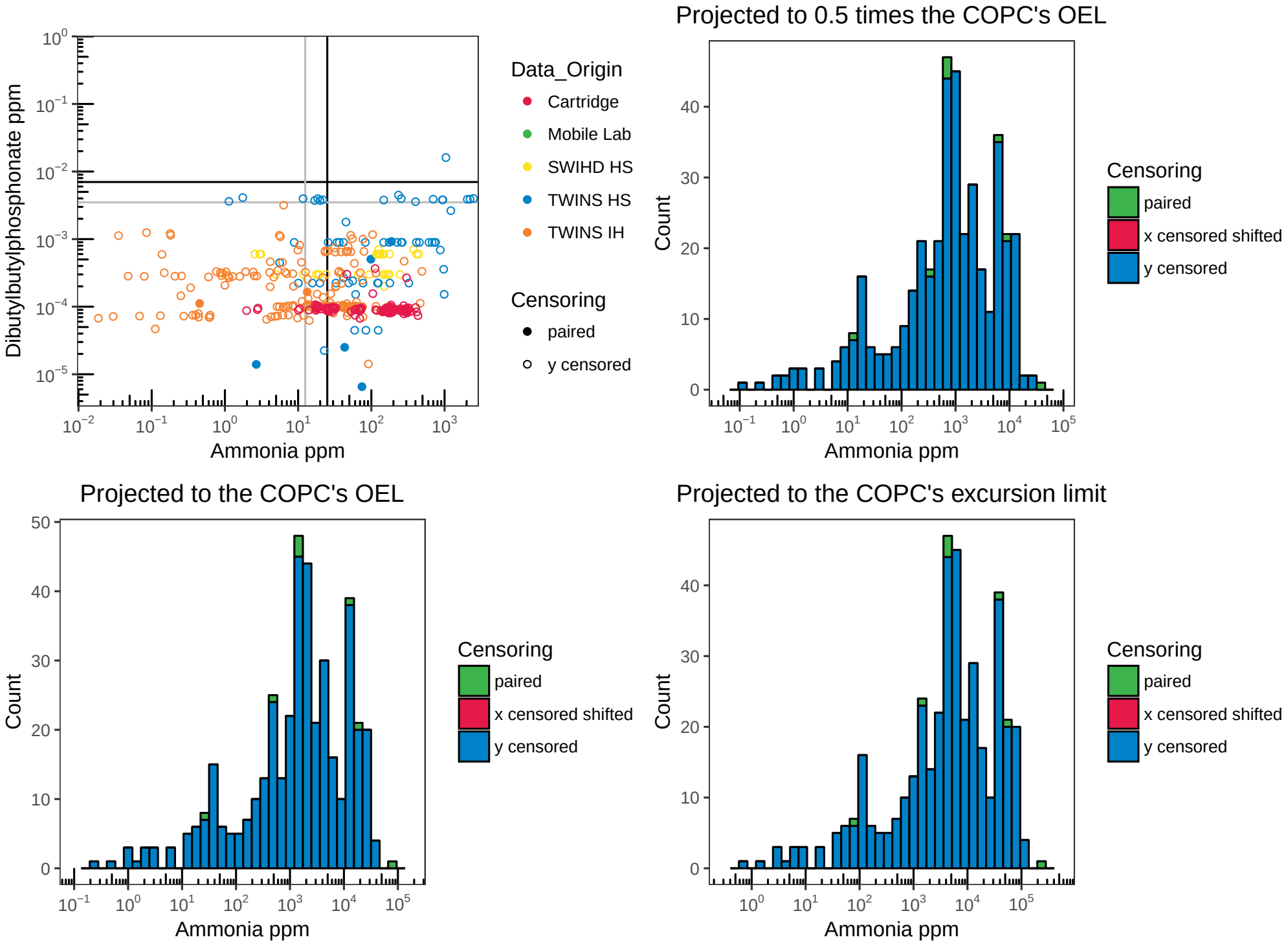


Figure C.49: Dibutylbutylphosphonate vs Ammonia

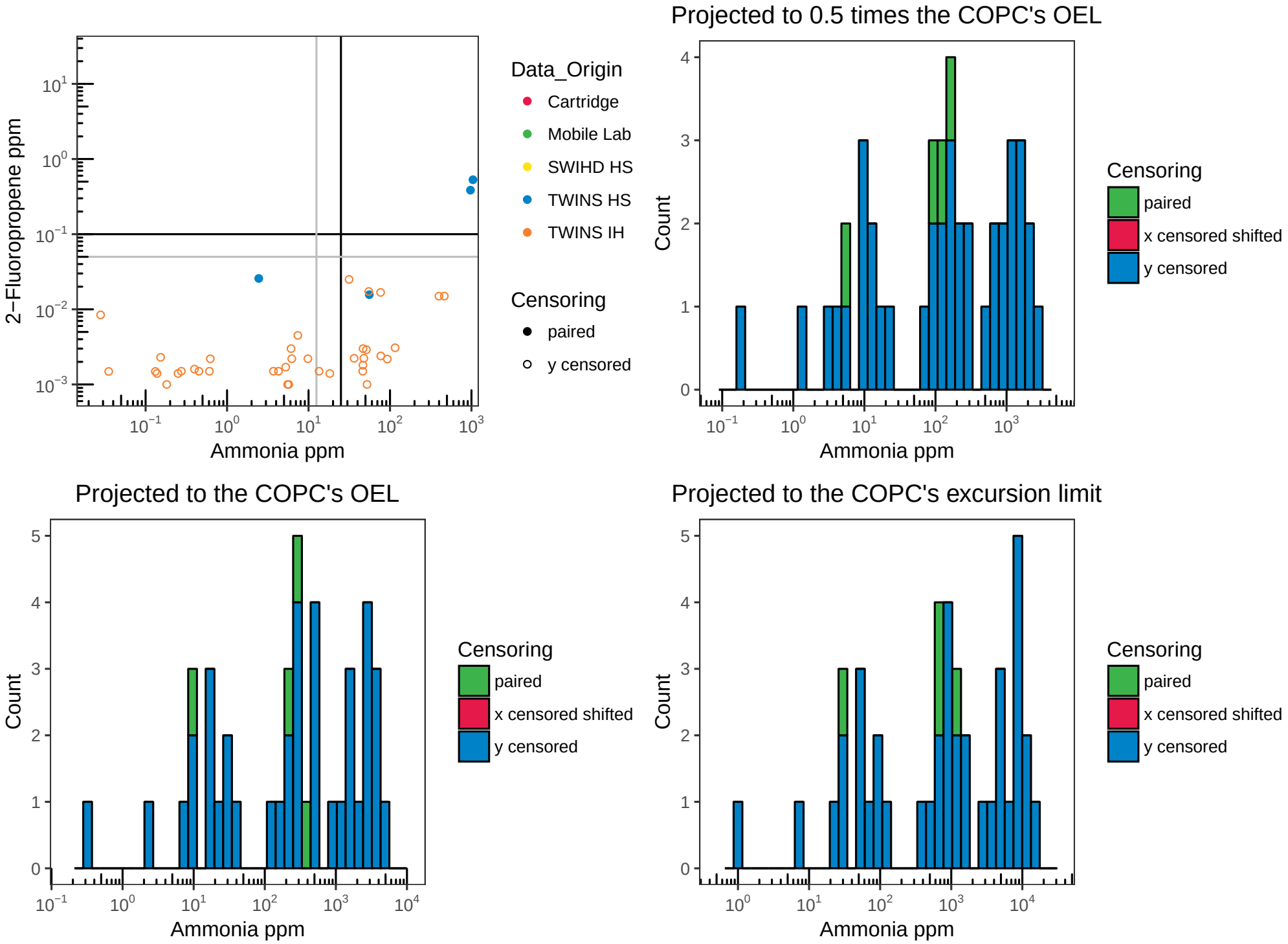


Figure C.50: 2-Fluoropropene vs Ammonia

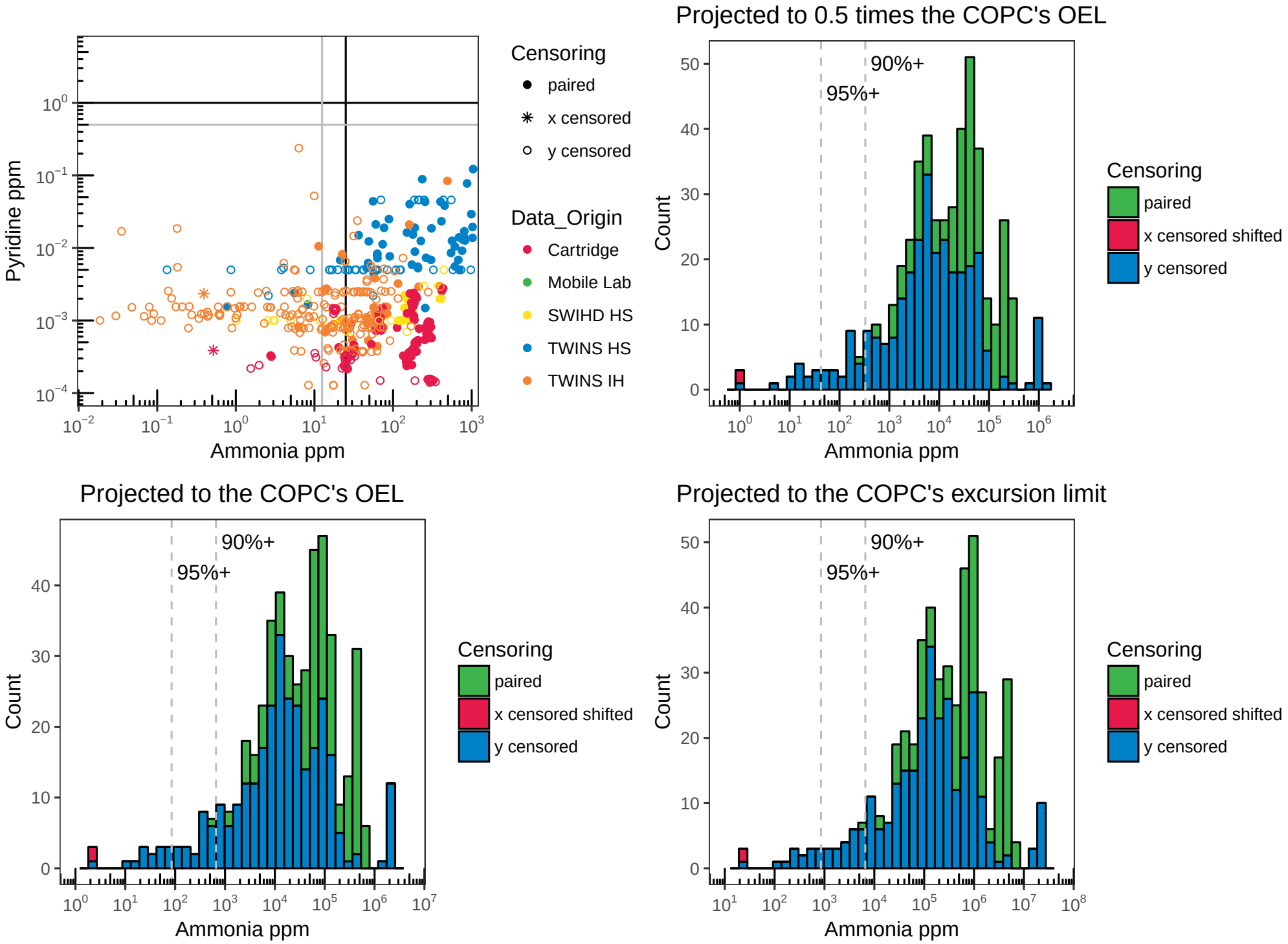


Figure C.51: Pyridine vs Ammonia

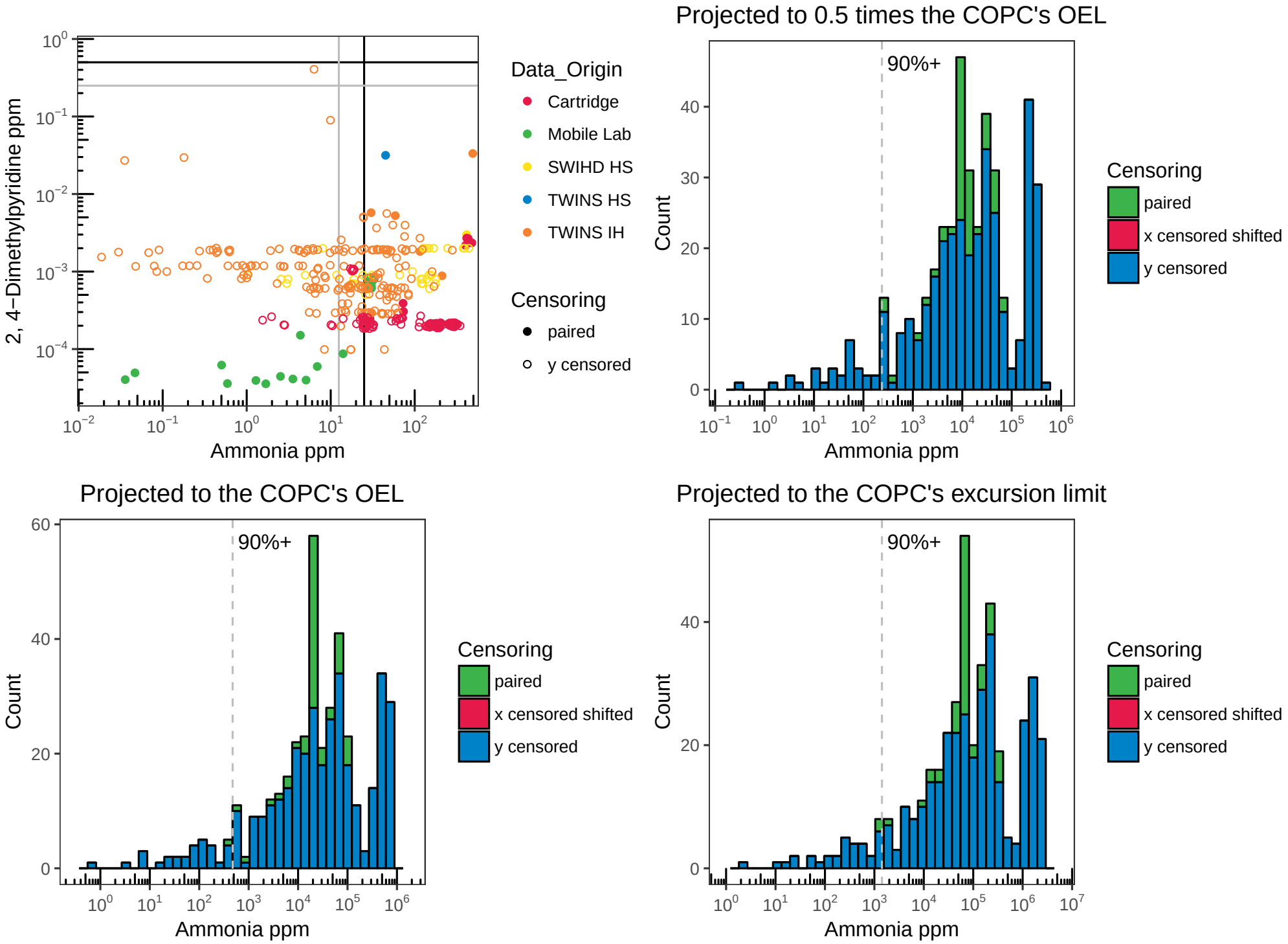


Figure C.52: 2, 4-Dimethylpyridine vs Ammonia

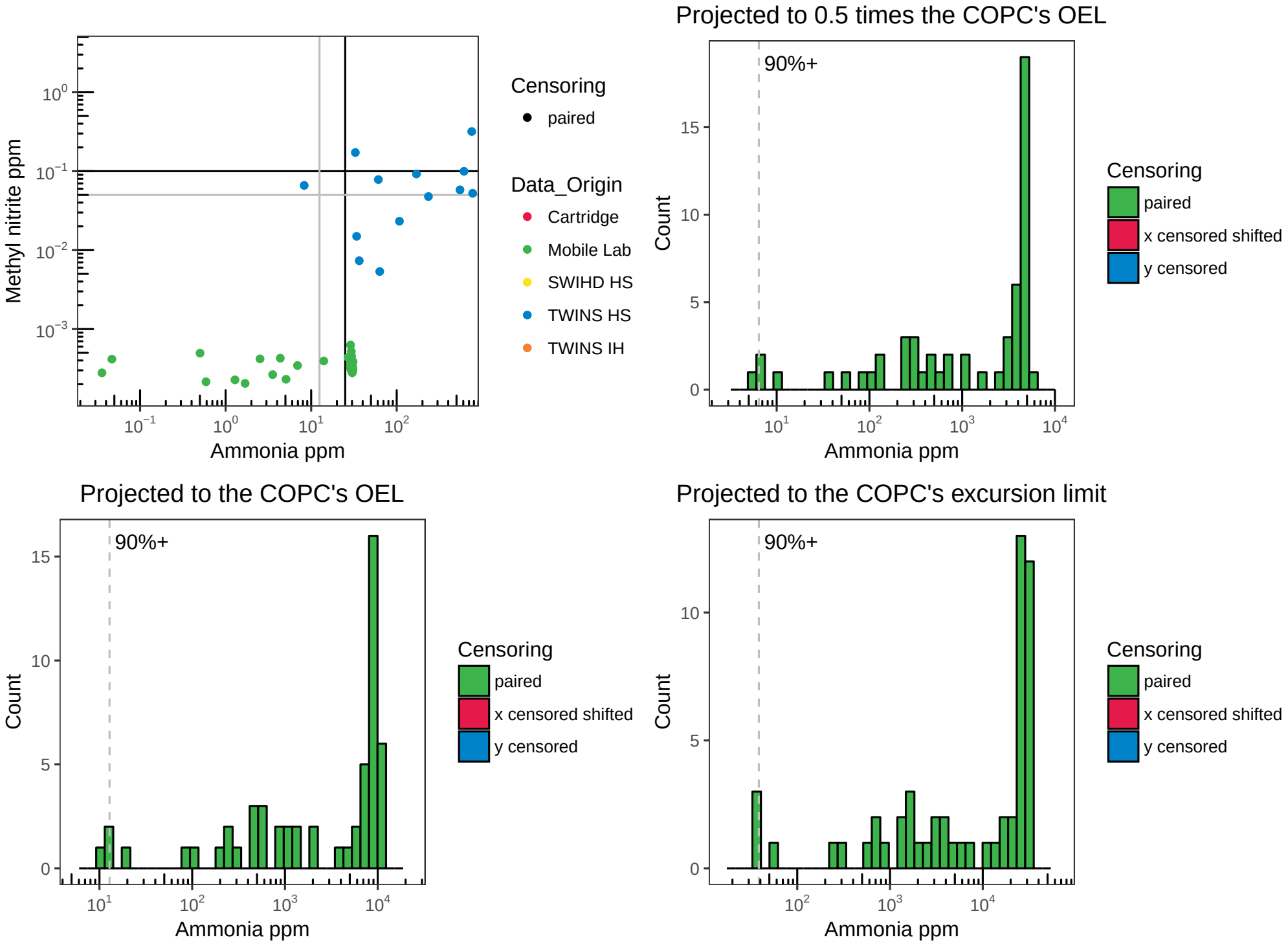


Figure C.53: Methyl nitrite vs Ammonia

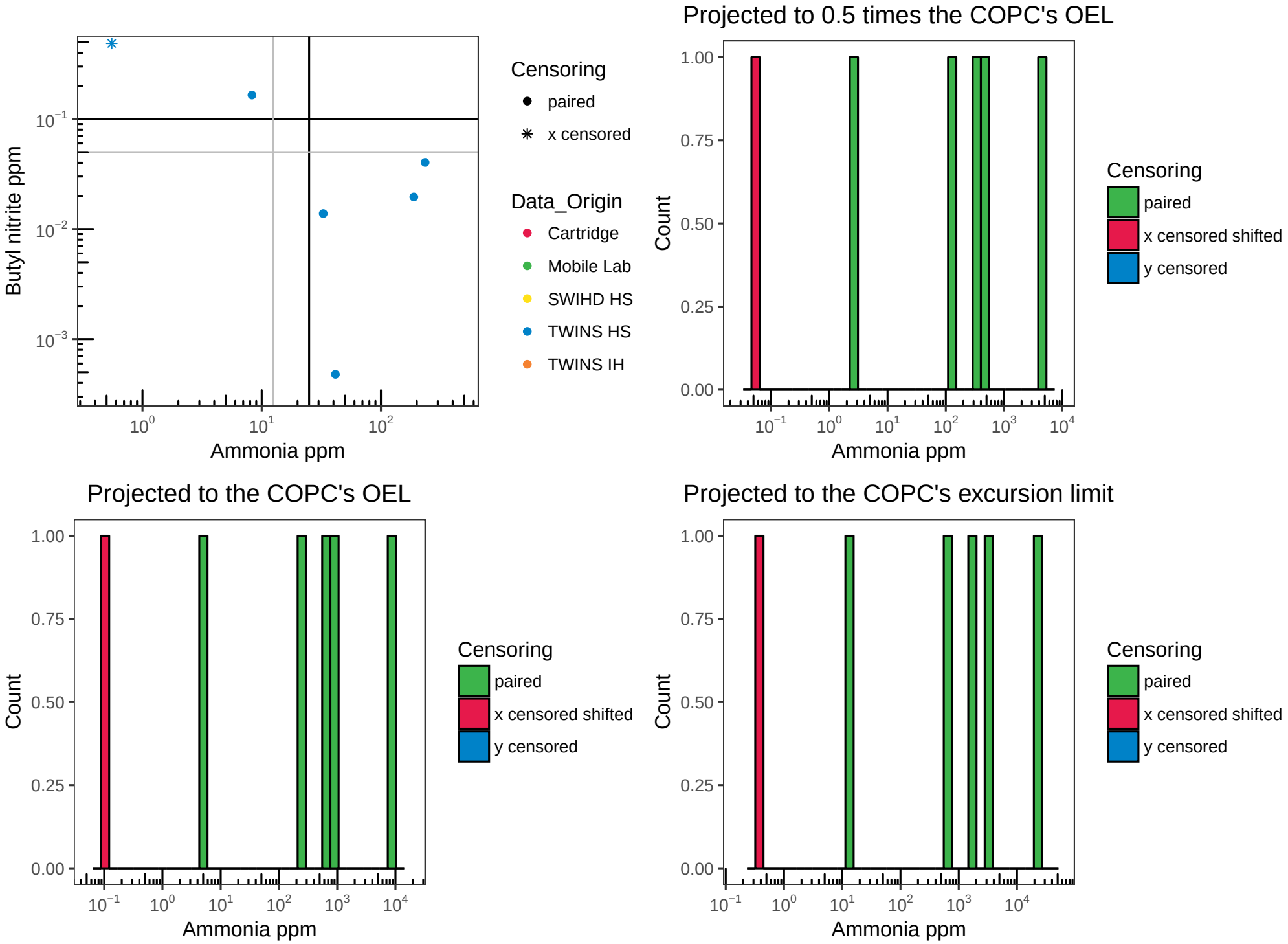


Figure C.54: Butyl nitrite vs Ammonia

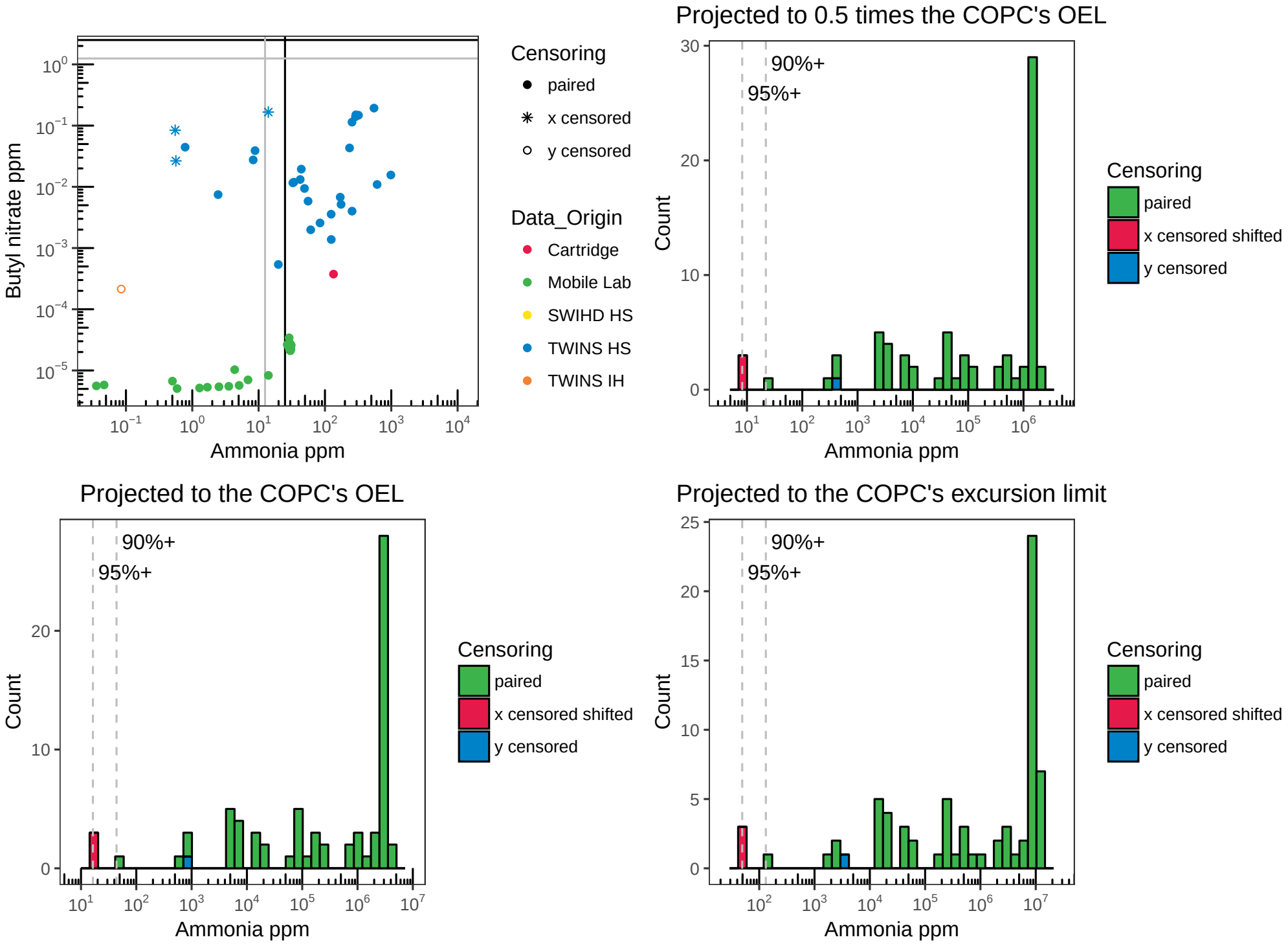


Figure C.55: Butyl nitrate vs Ammonia

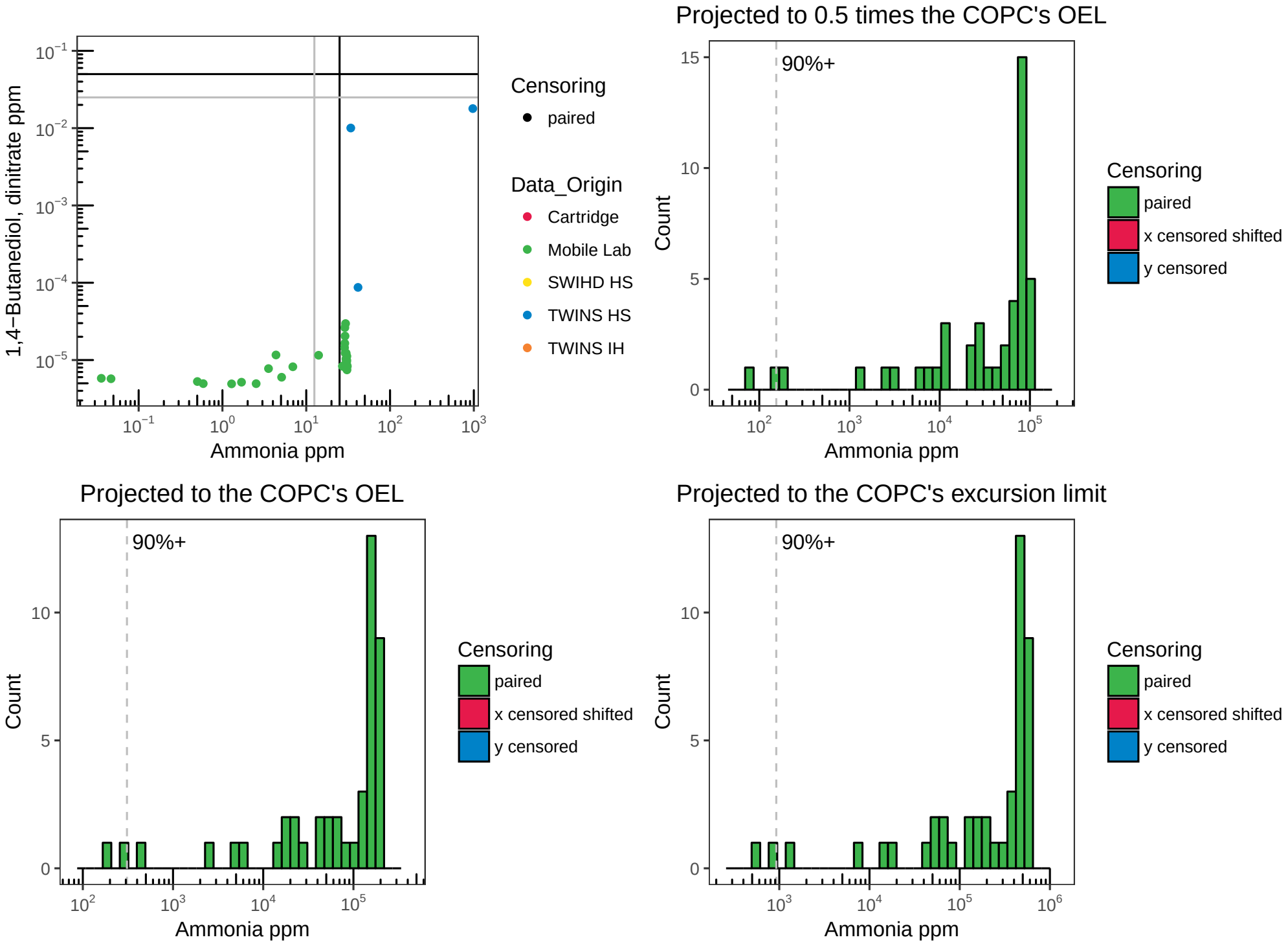


Figure C.56: 1,4-Butanediol, dinitrate vs Ammonia

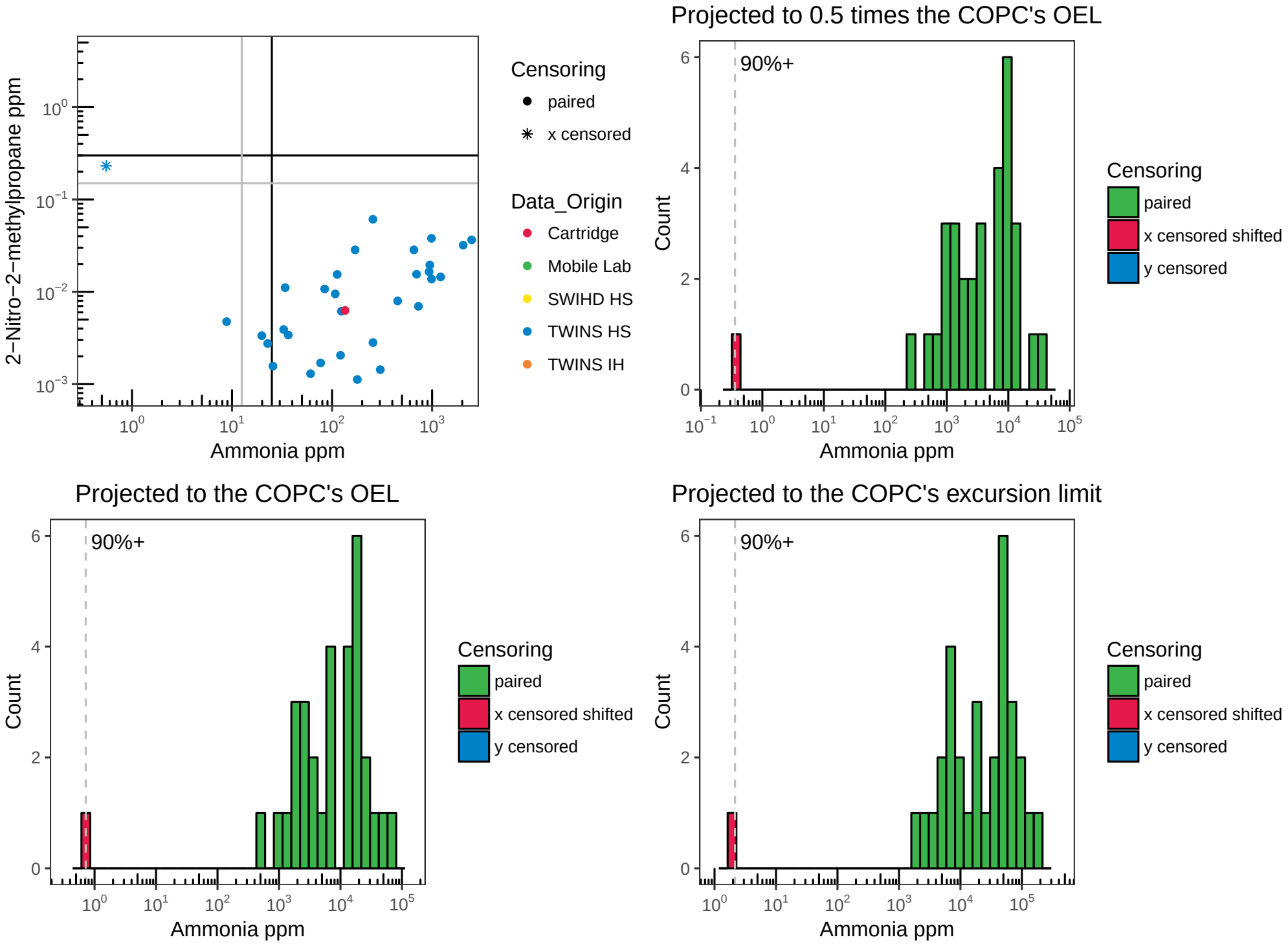


Figure C.57: 2-Nitro-2-methylpropane vs Ammonia

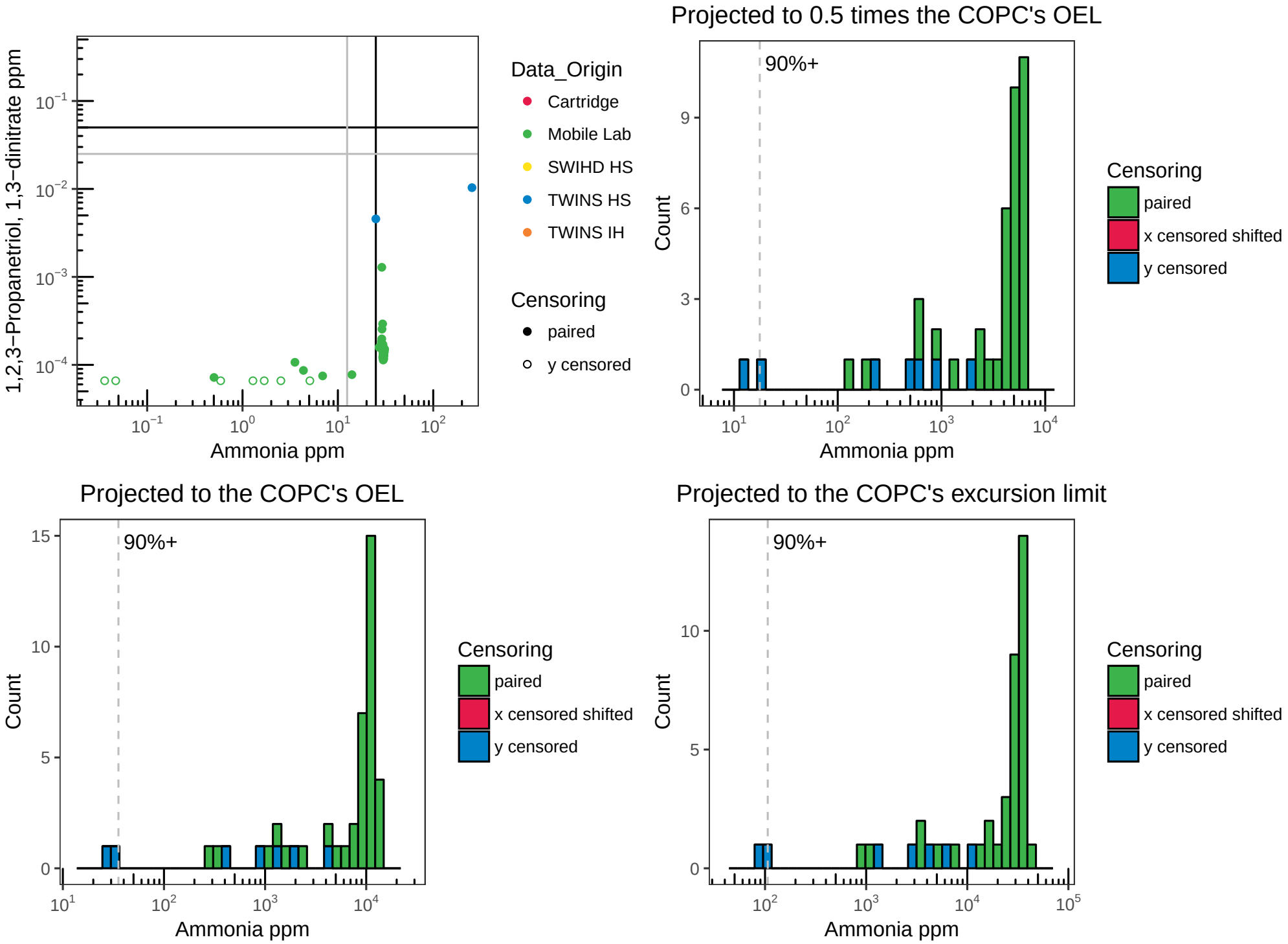


Figure C.58: 1,2,3-Propanetriol, 1,3-dinitrate vs Ammonia

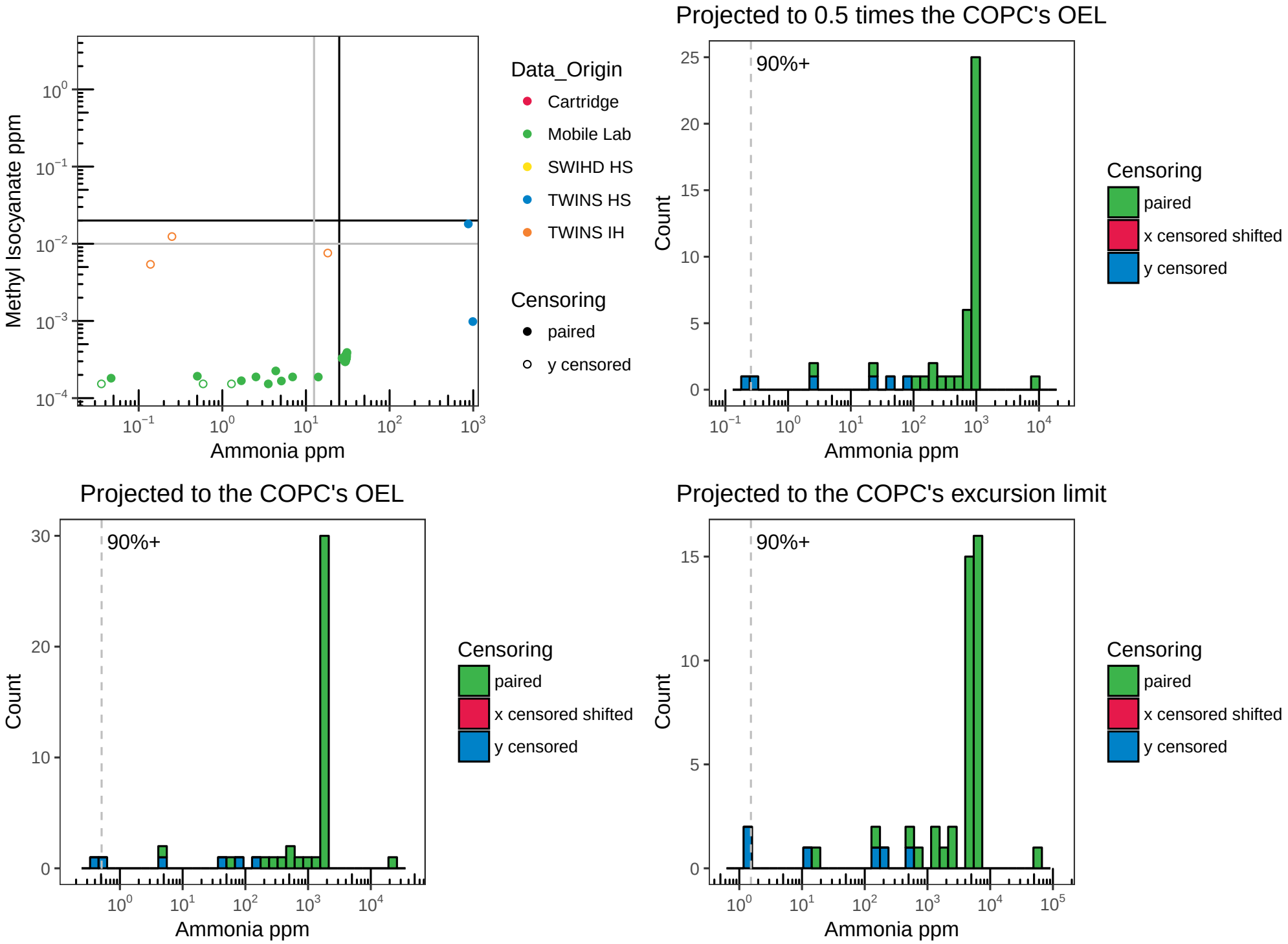


Figure C.59: Methyl Isocyanate vs Ammonia

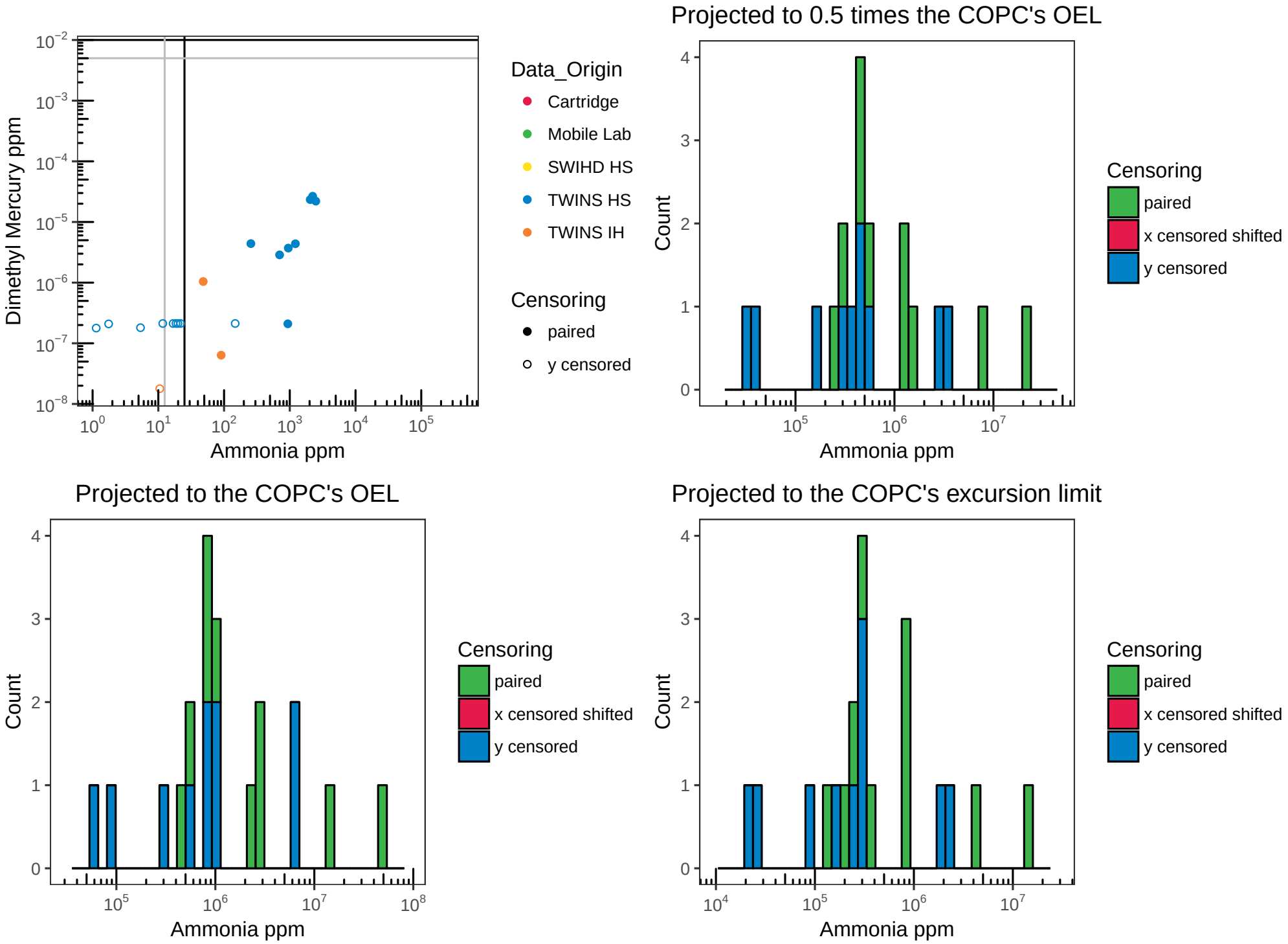


Figure C.60: Dimethyl Mercury vs Ammonia

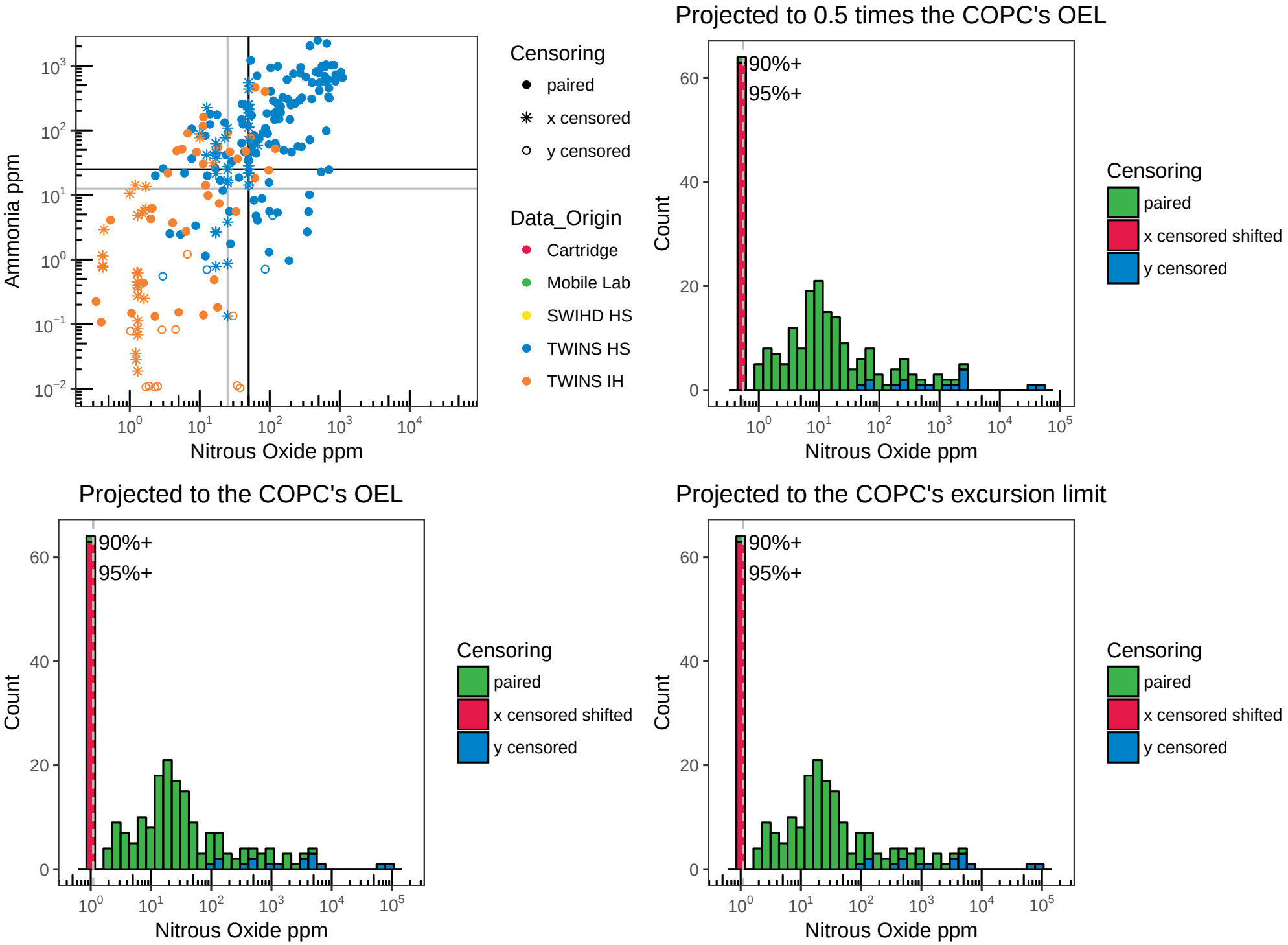


Figure C.61: Ammonia vs Nitrous Oxide

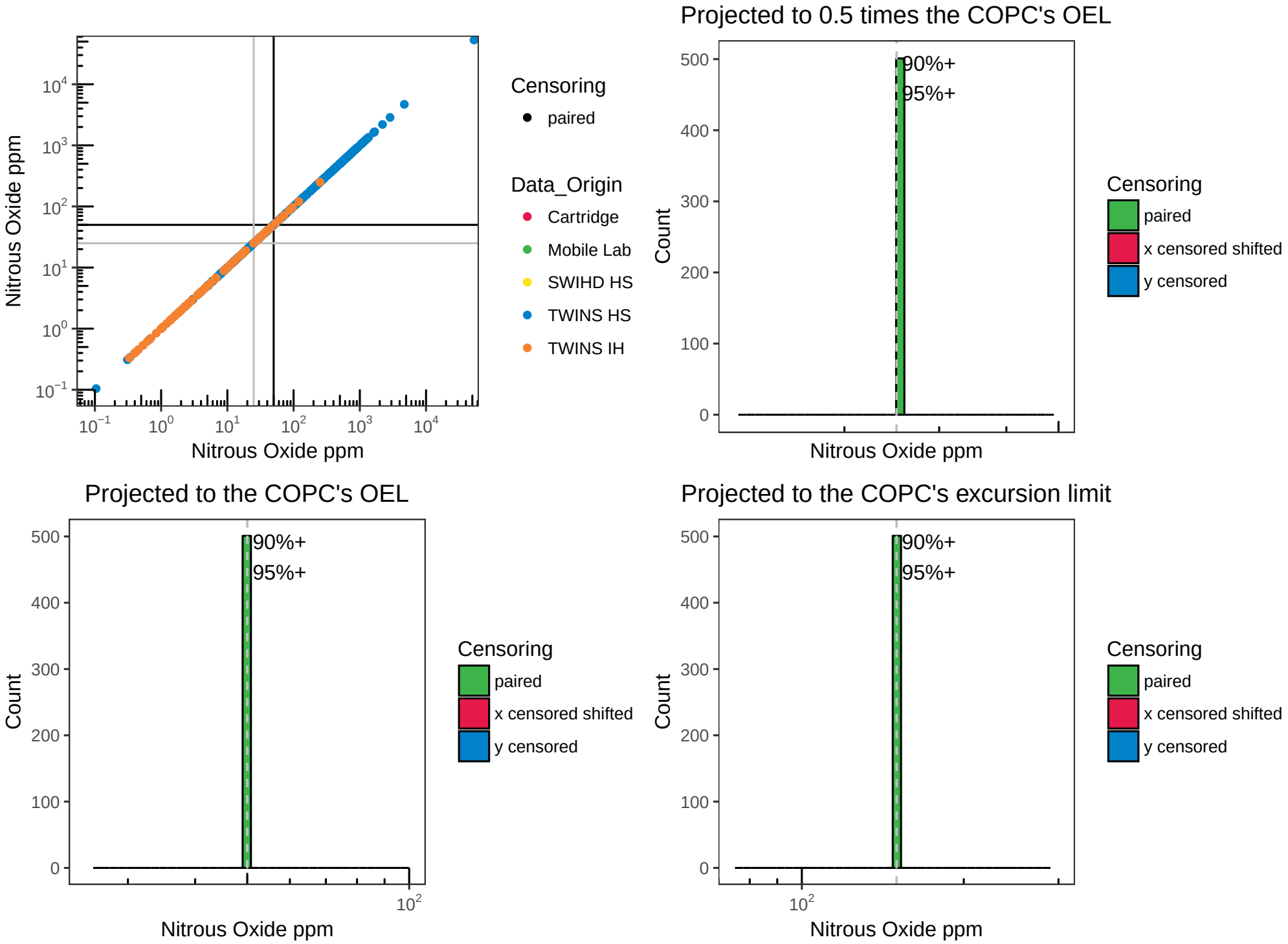


Figure C.62: Nitrous Oxide vs Nitrous Oxide

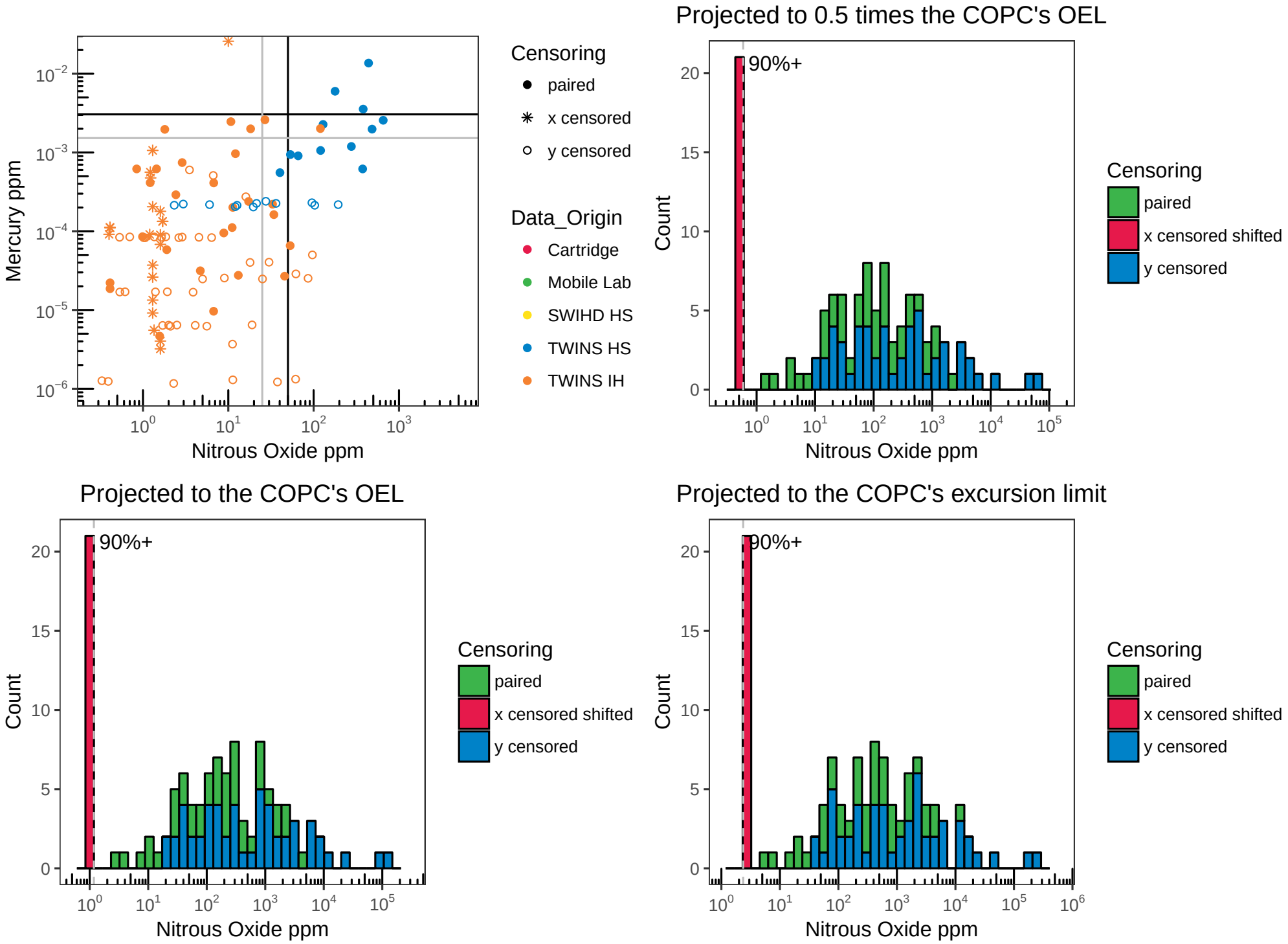


Figure C.63: Mercury vs Nitrous Oxide

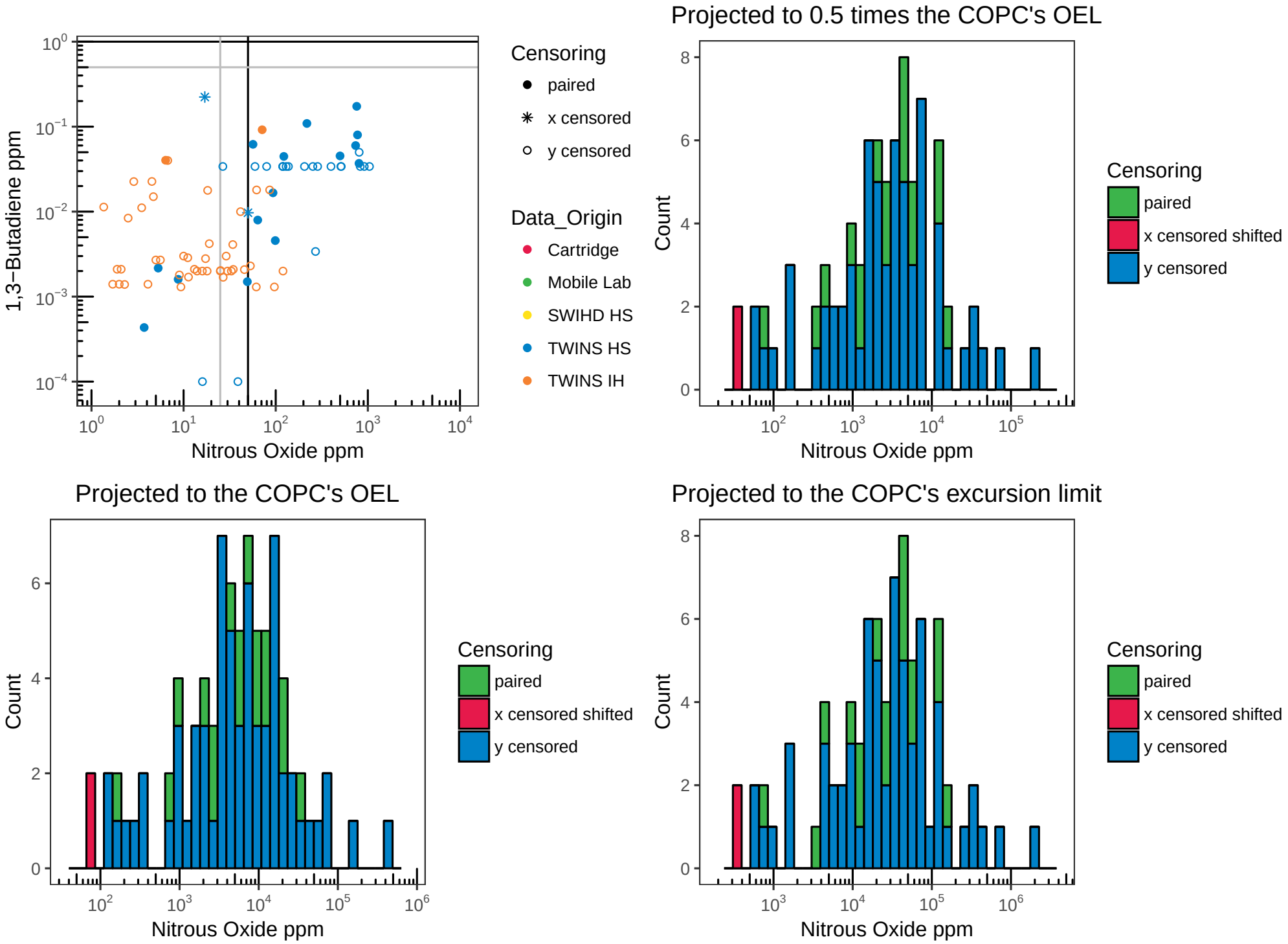


Figure C.64: 1,3-Butadiene vs Nitrous Oxide

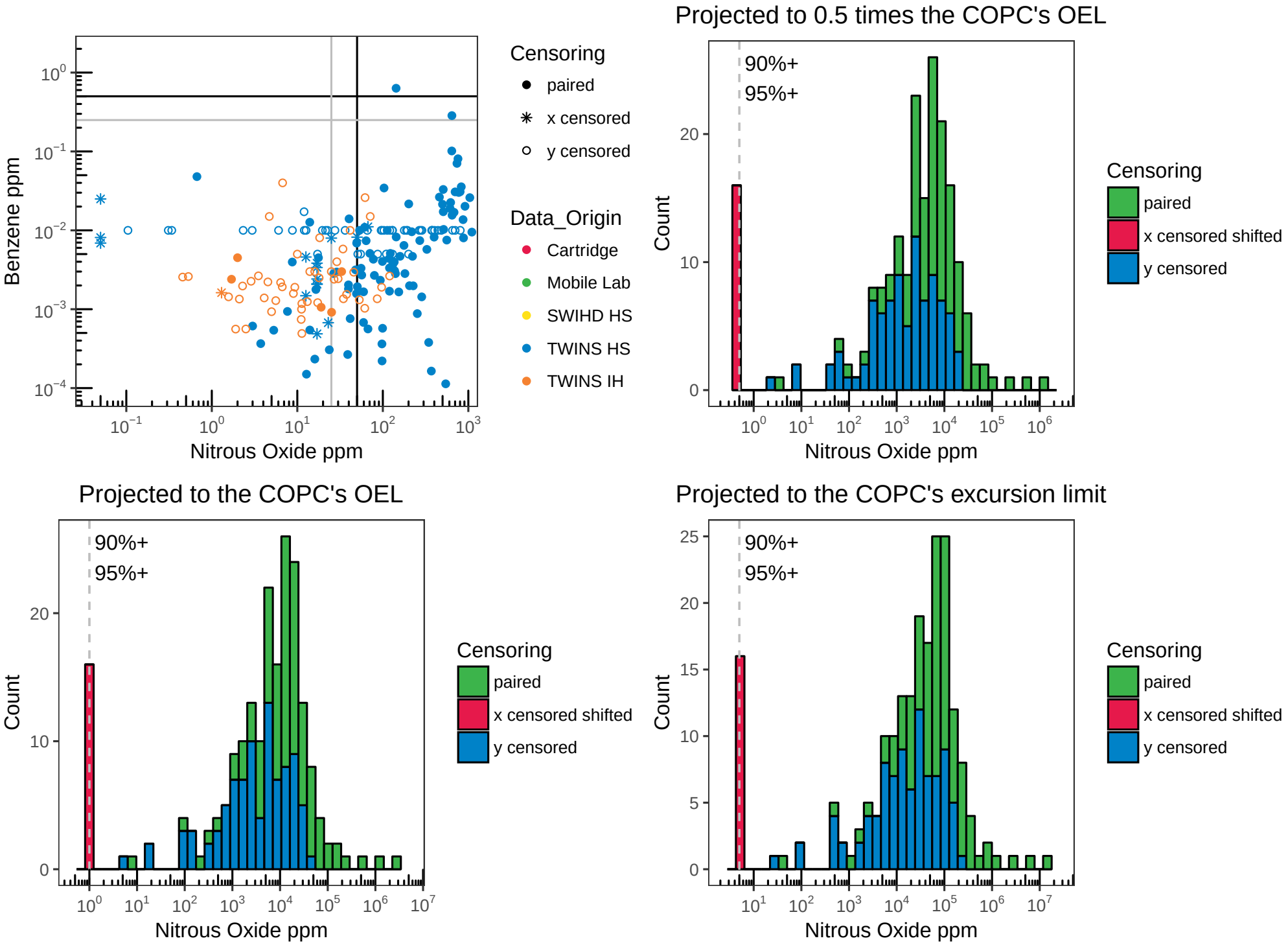


Figure C.65: Benzene vs Nitrous Oxide

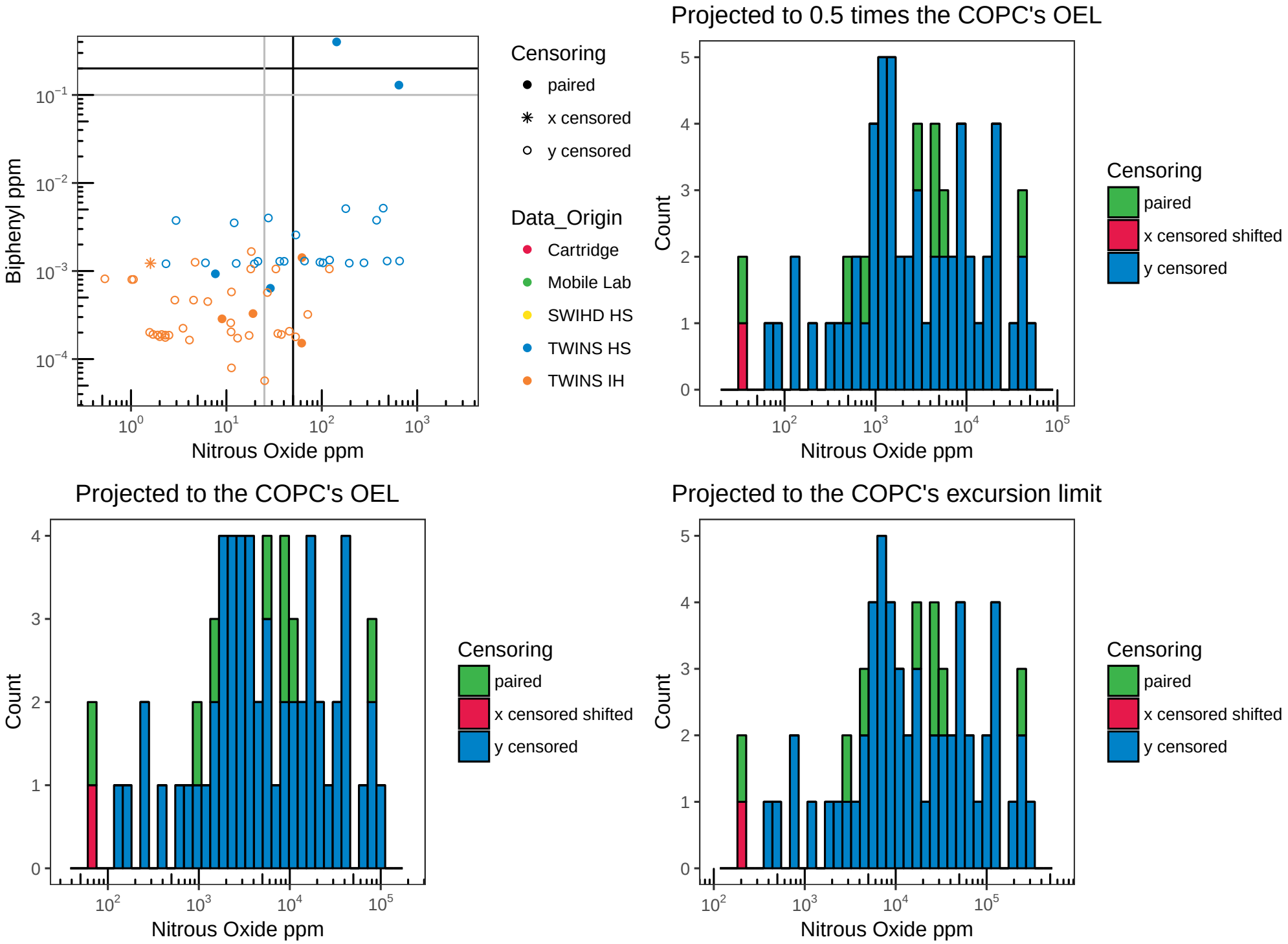


Figure C.66: Biphenyl vs Nitrous Oxide

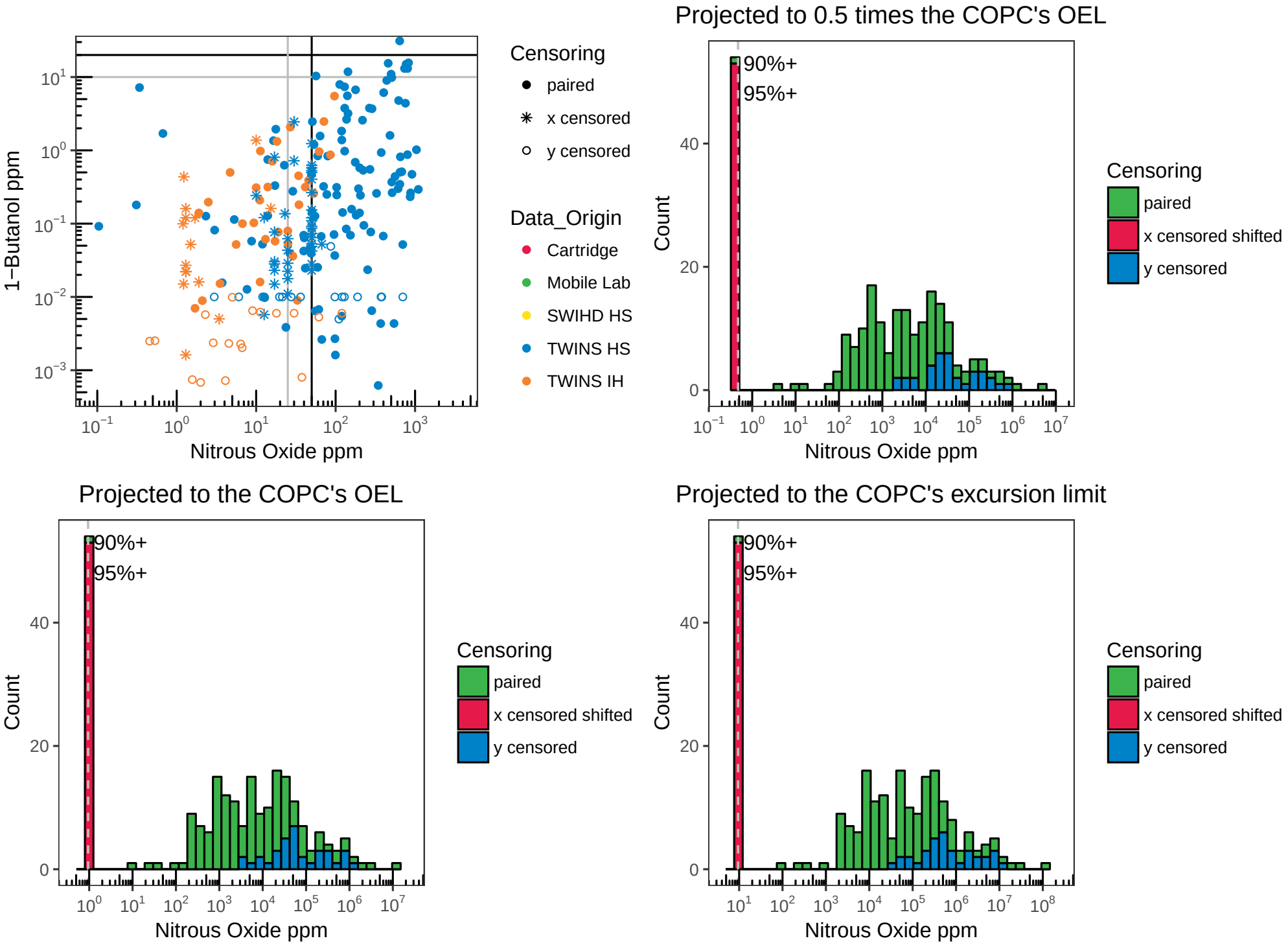


Figure C.67: 1-Butanol vs Nitrous Oxide

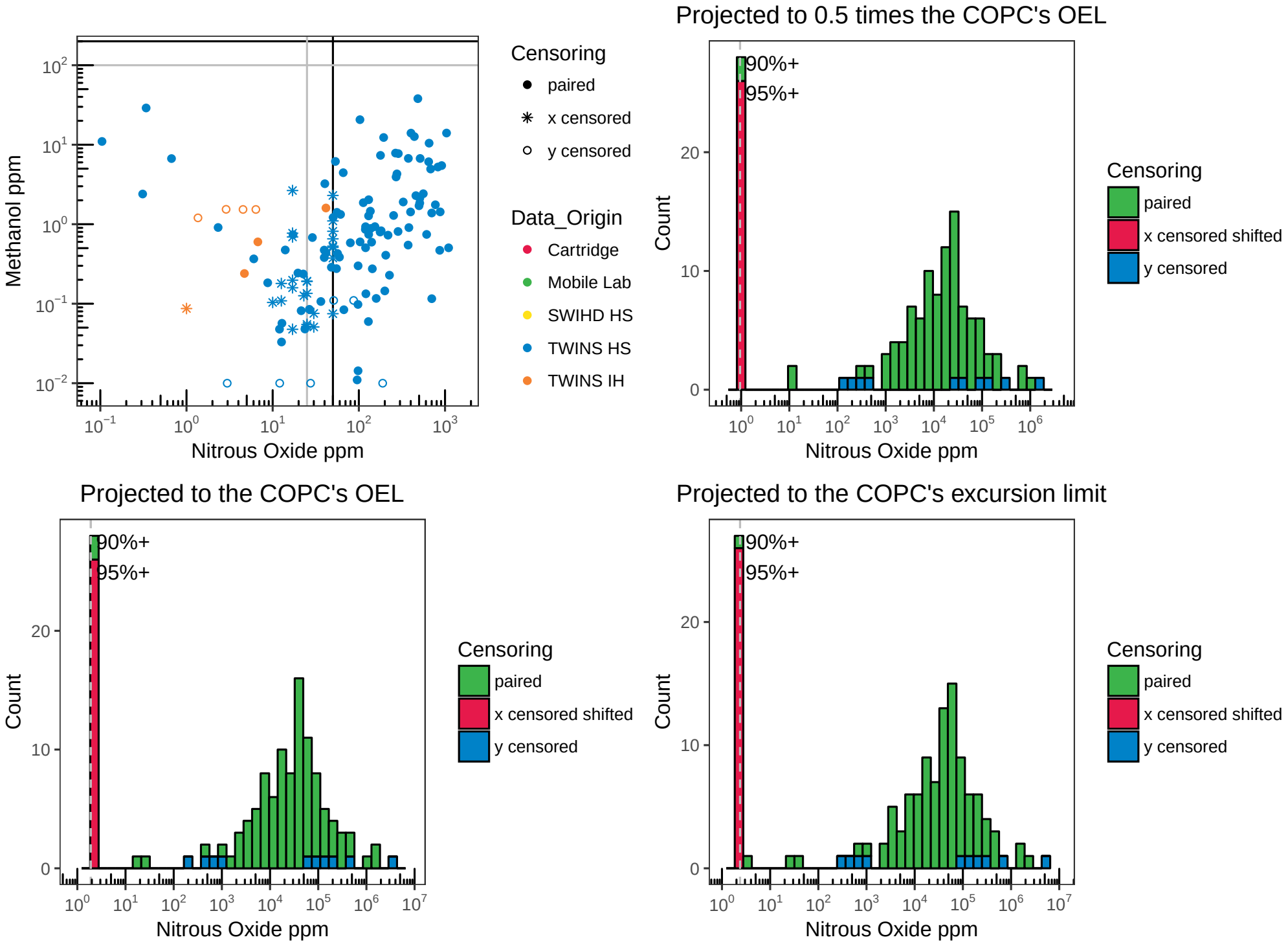


Figure C.68: Methanol vs Nitrous Oxide

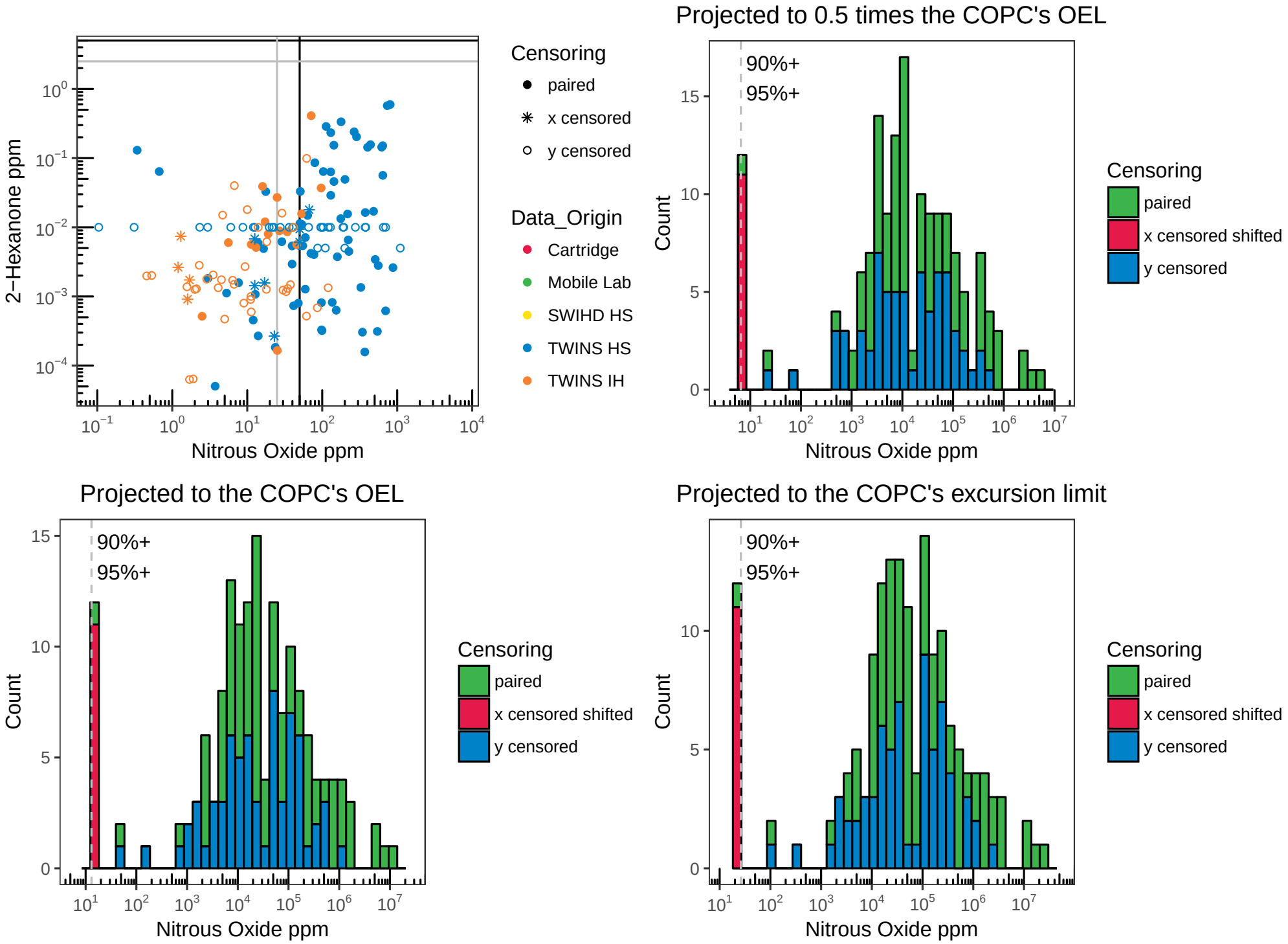


Figure C.69: 2-Hexanone vs Nitrous Oxide

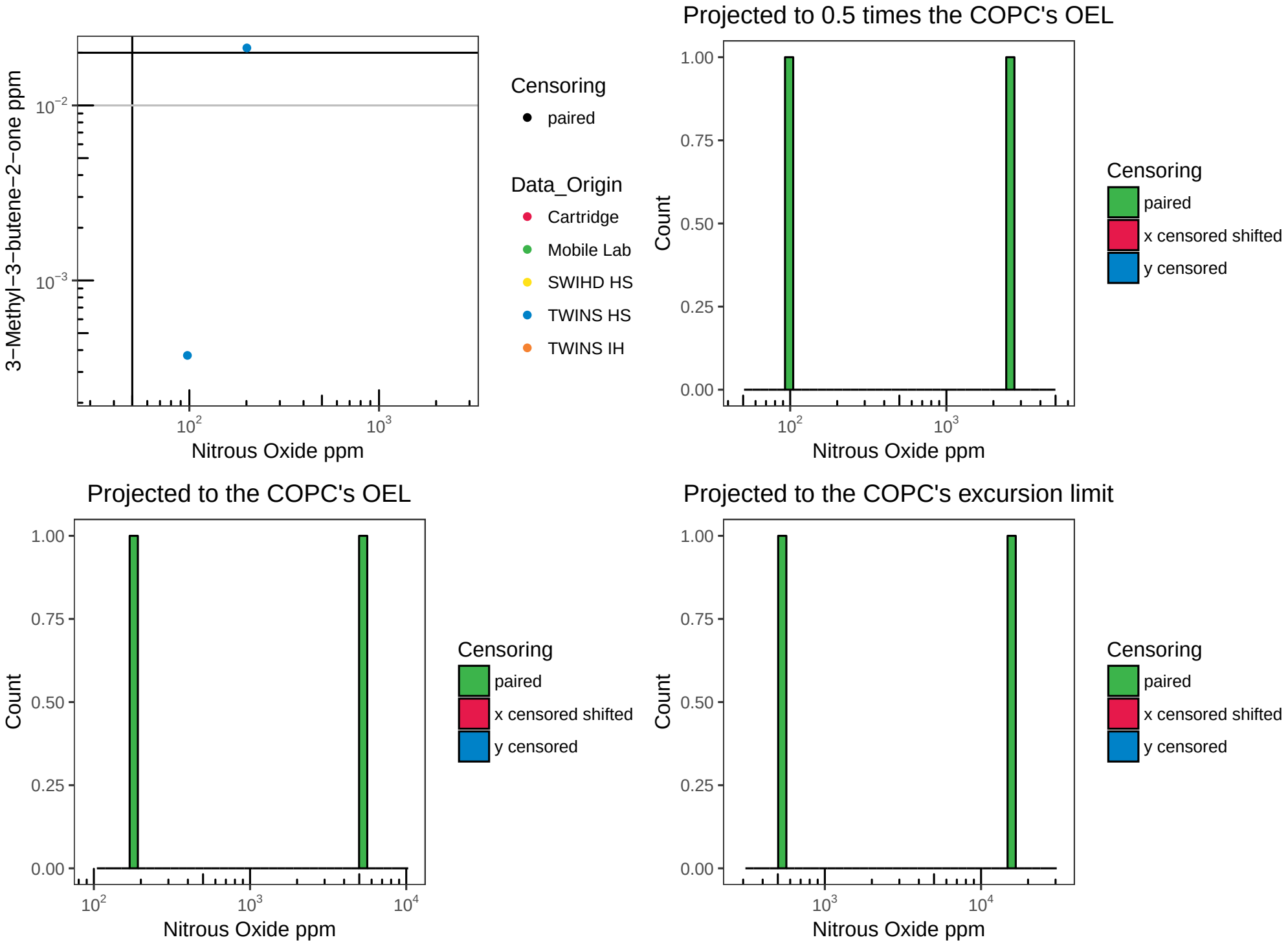


Figure C.70: 3-Methyl-3-butene-2-one vs Nitrous Oxide

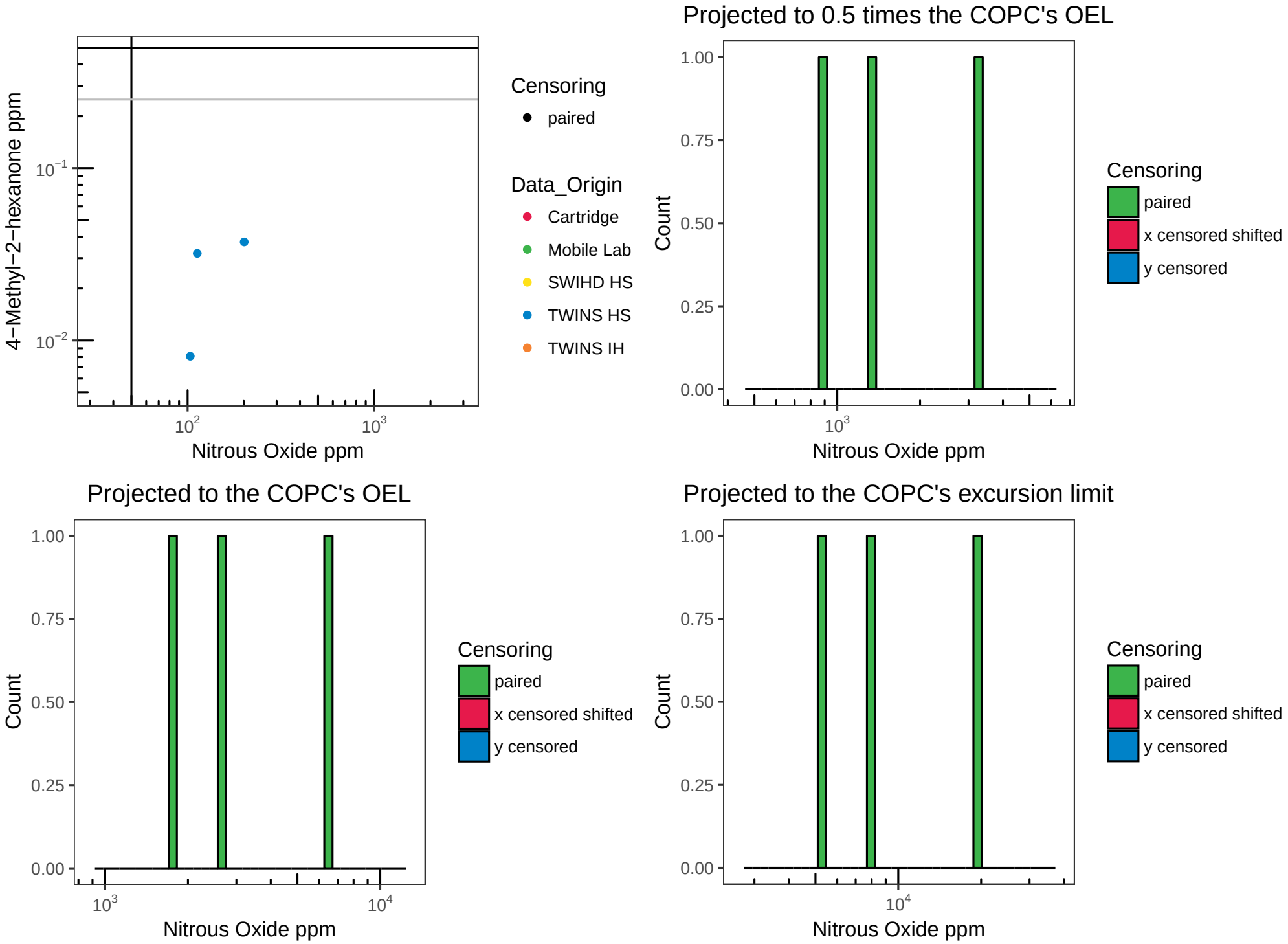


Figure C.71: 4-Methyl-2-hexanone vs Nitrous Oxide

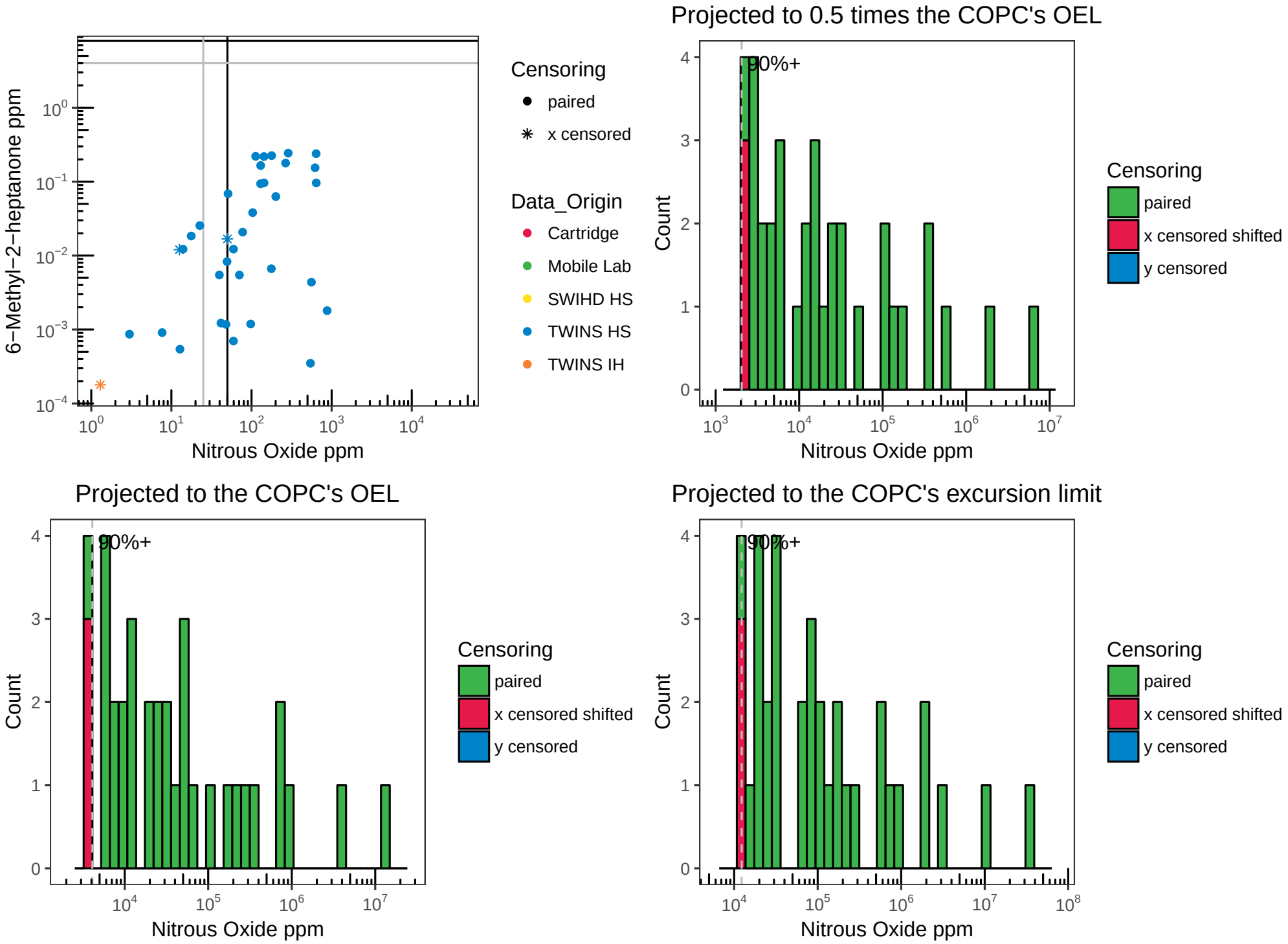


Figure C.72: 6-Methyl-2-heptanone vs Nitrous Oxide

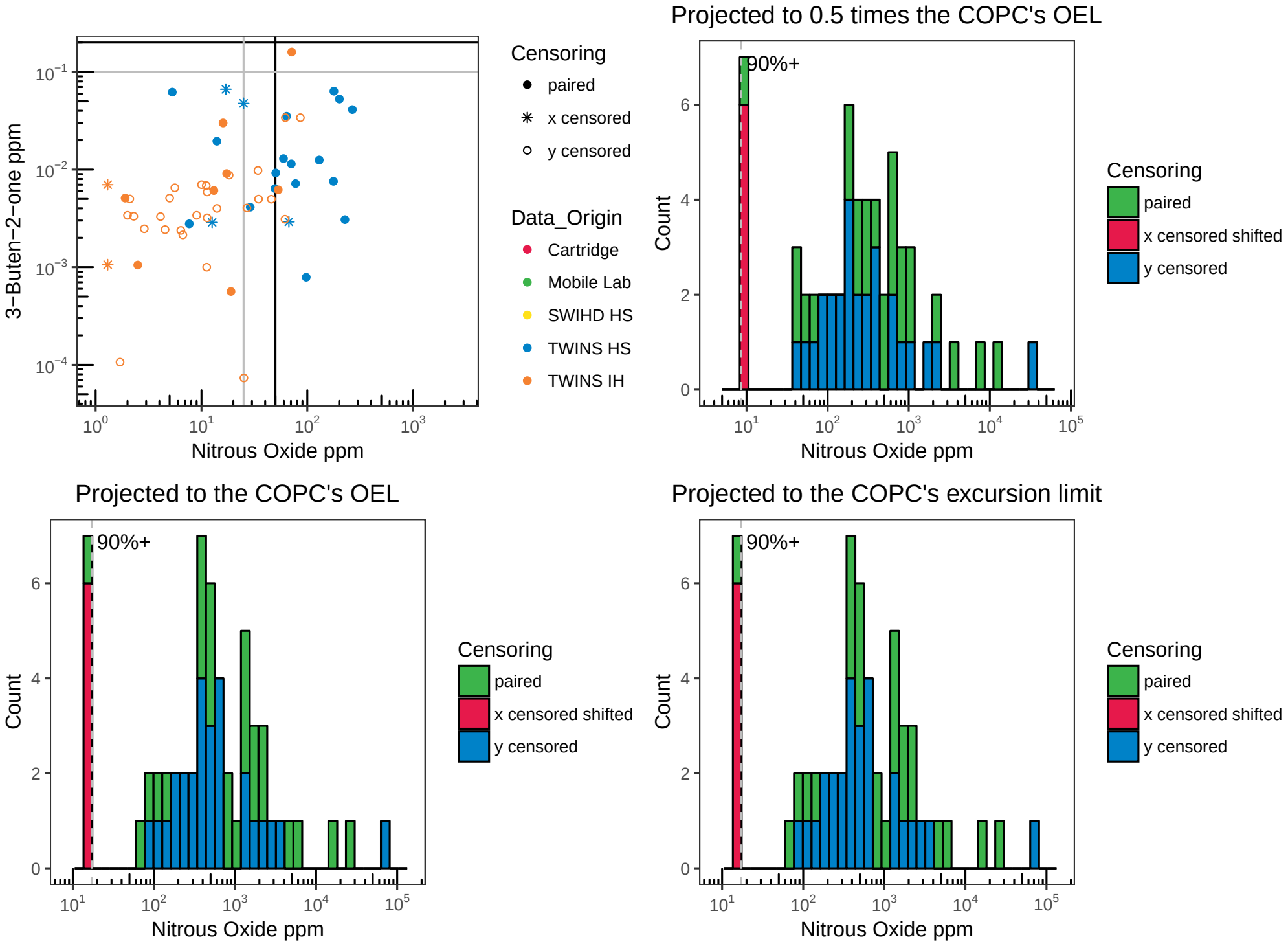


Figure C.73: 3-Buten-2-one vs Nitrous Oxide

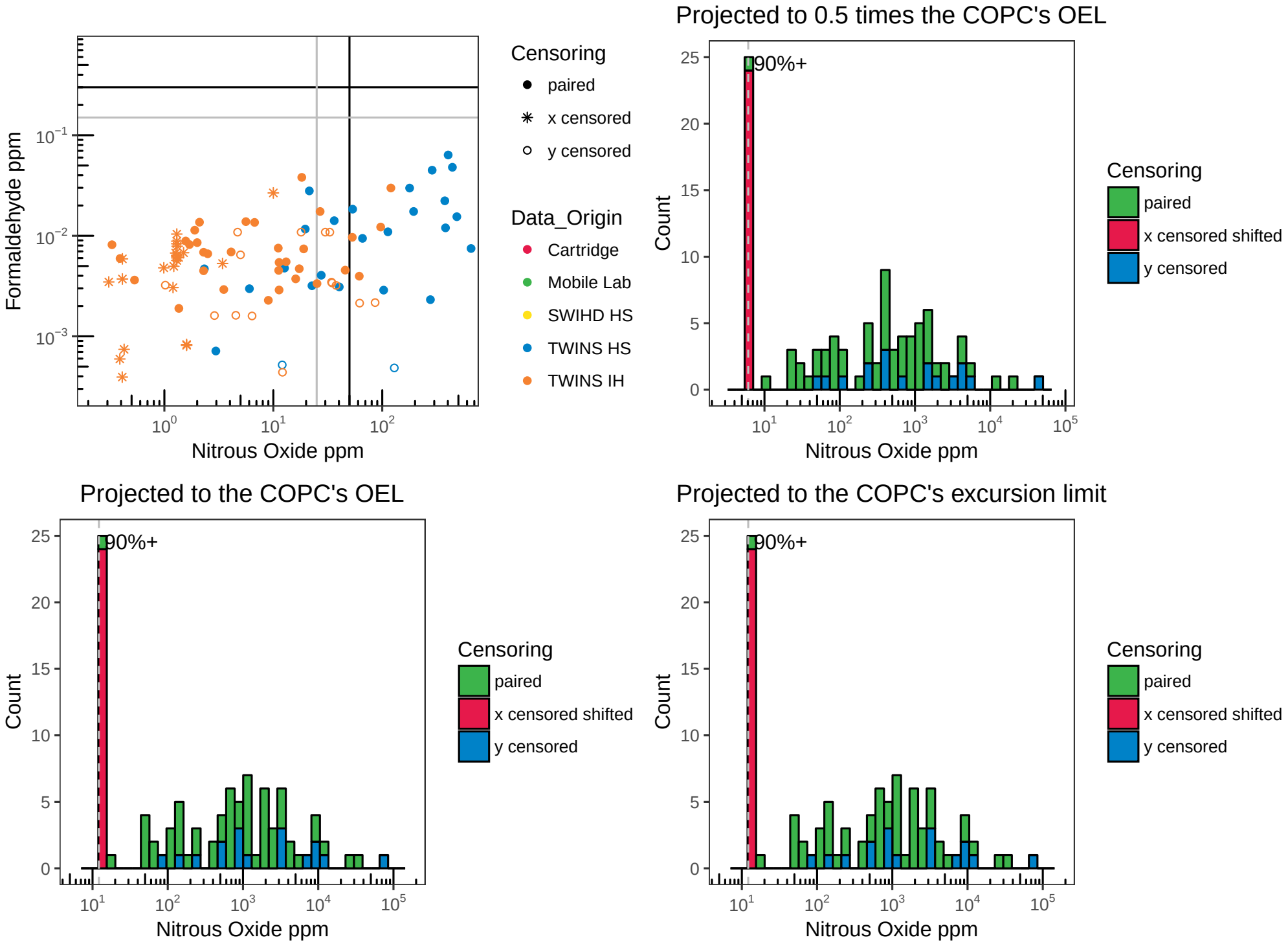


Figure C.74: Formaldehyde vs Nitrous Oxide

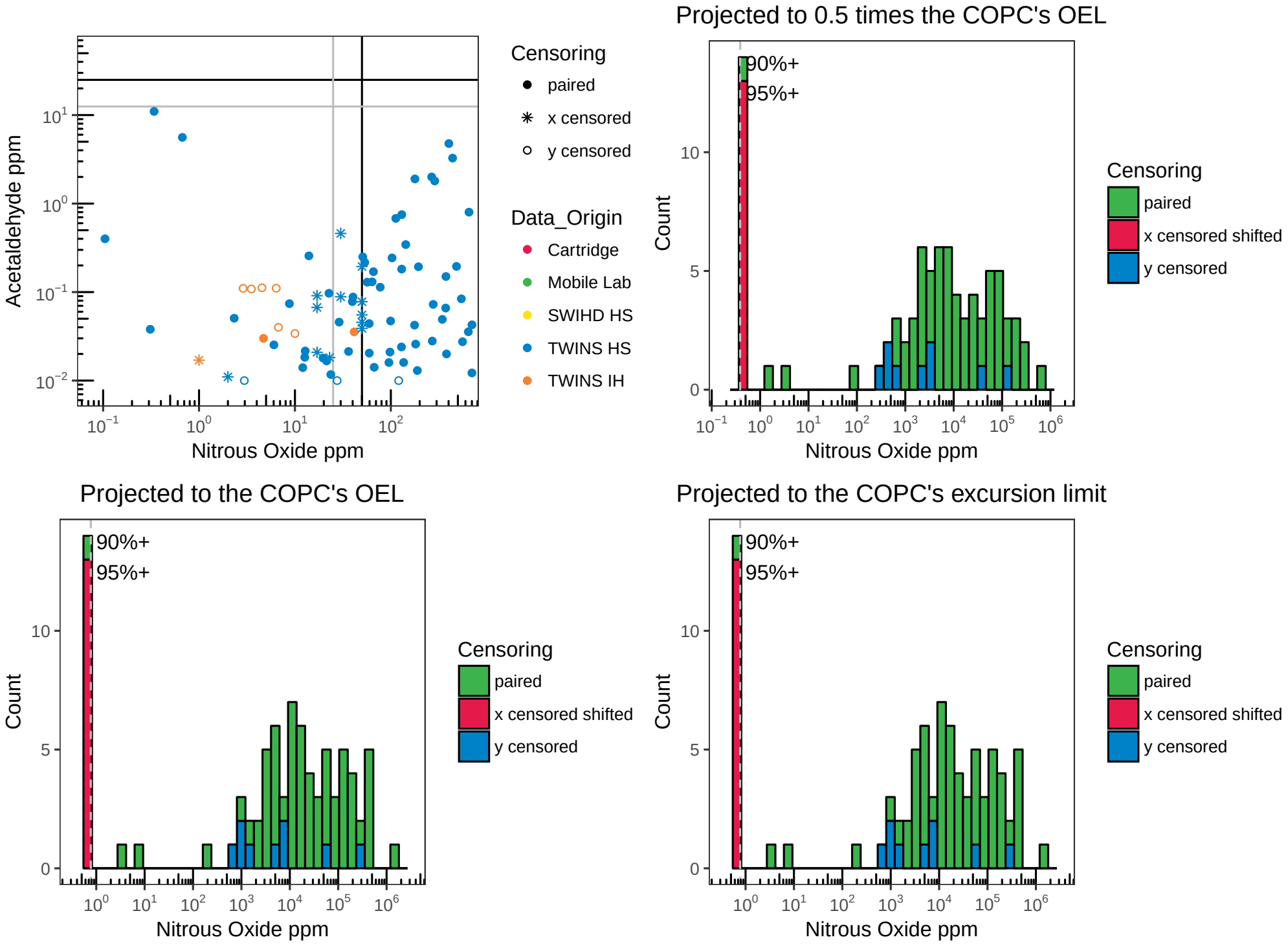


Figure C.75: Acetaldehyde vs Nitrous Oxide

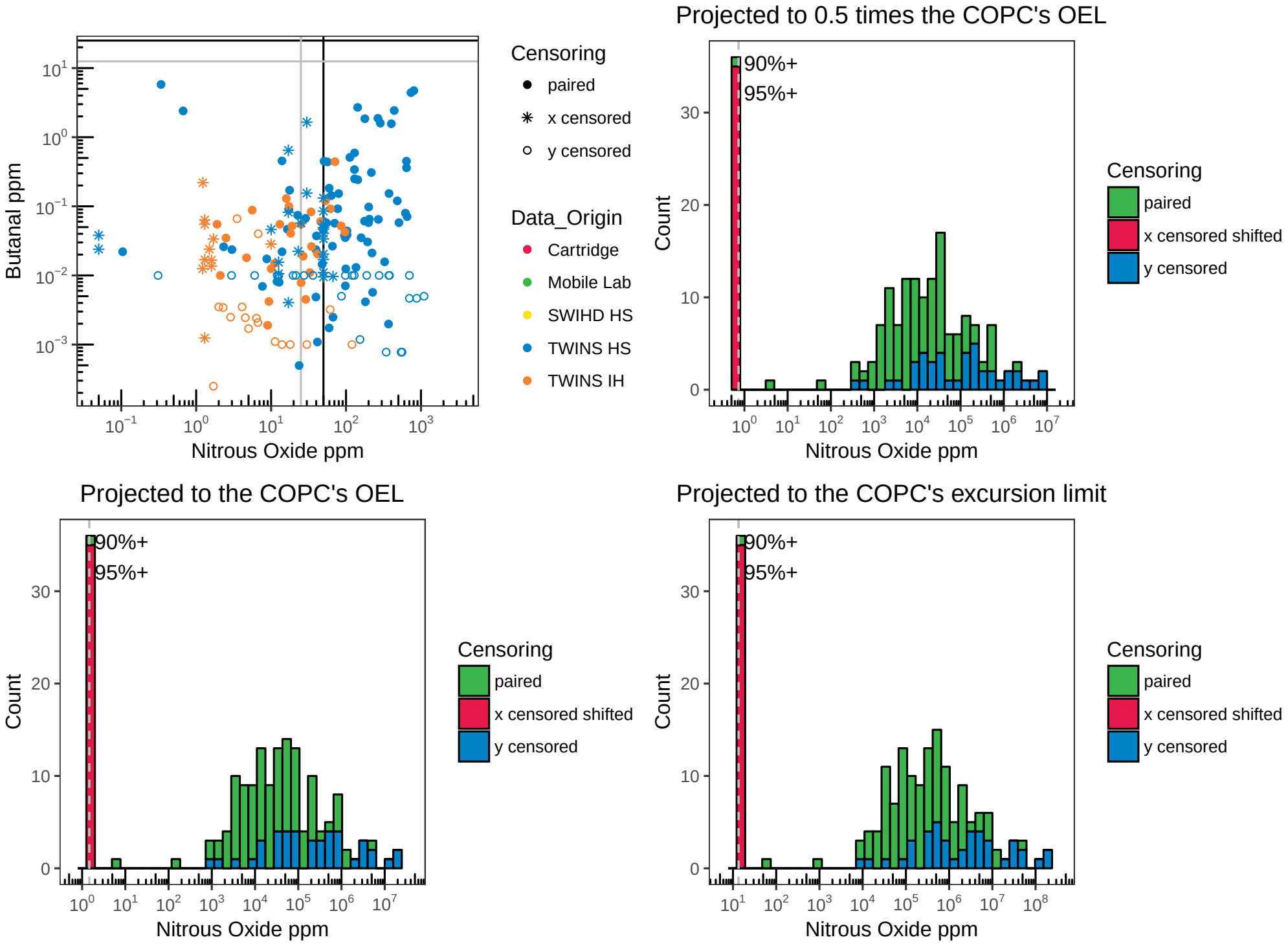


Figure C.76: Butanal vs Nitrous Oxide

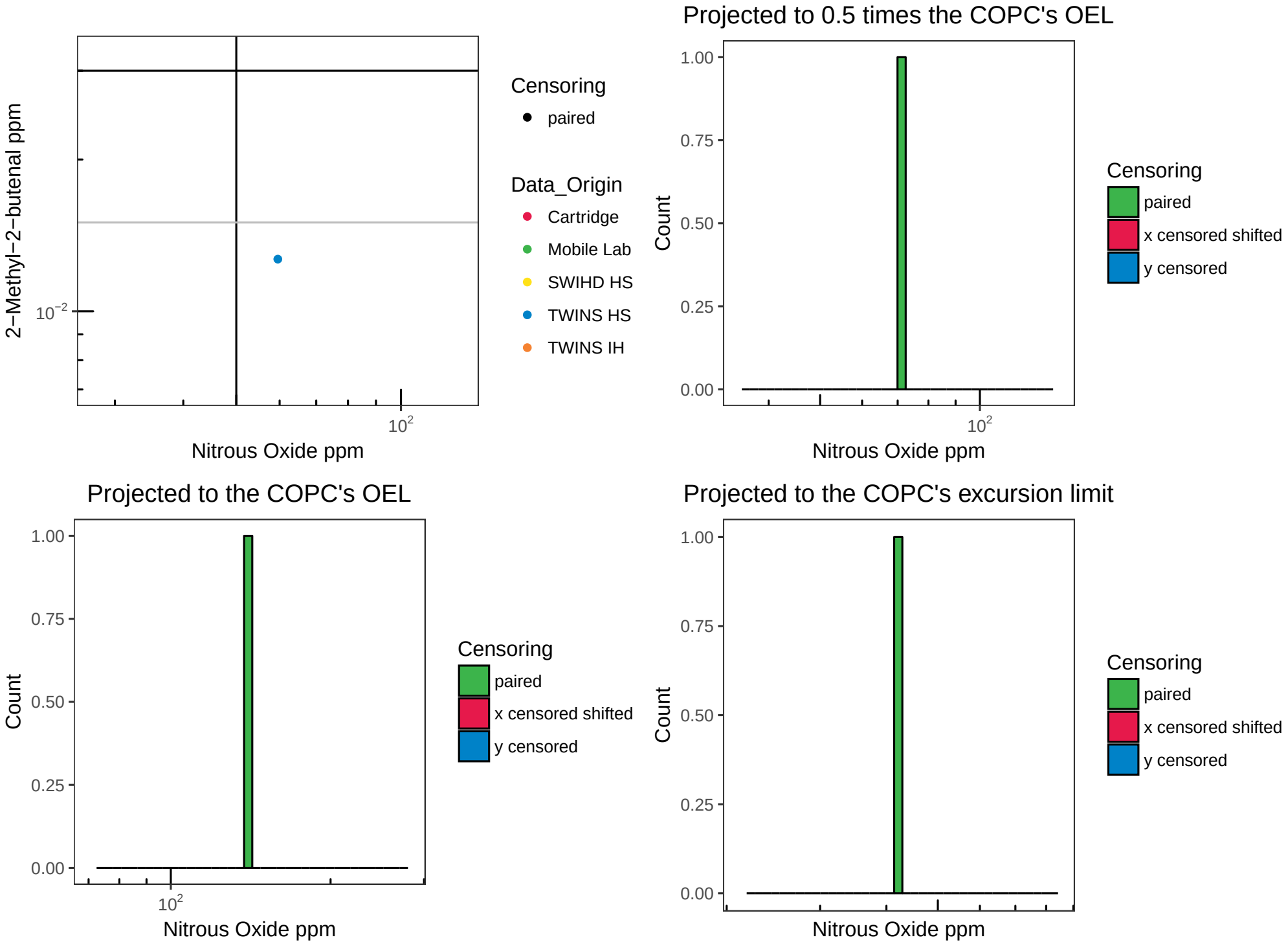


Figure C.77: 2-Methyl-2-butenal vs Nitrous Oxide

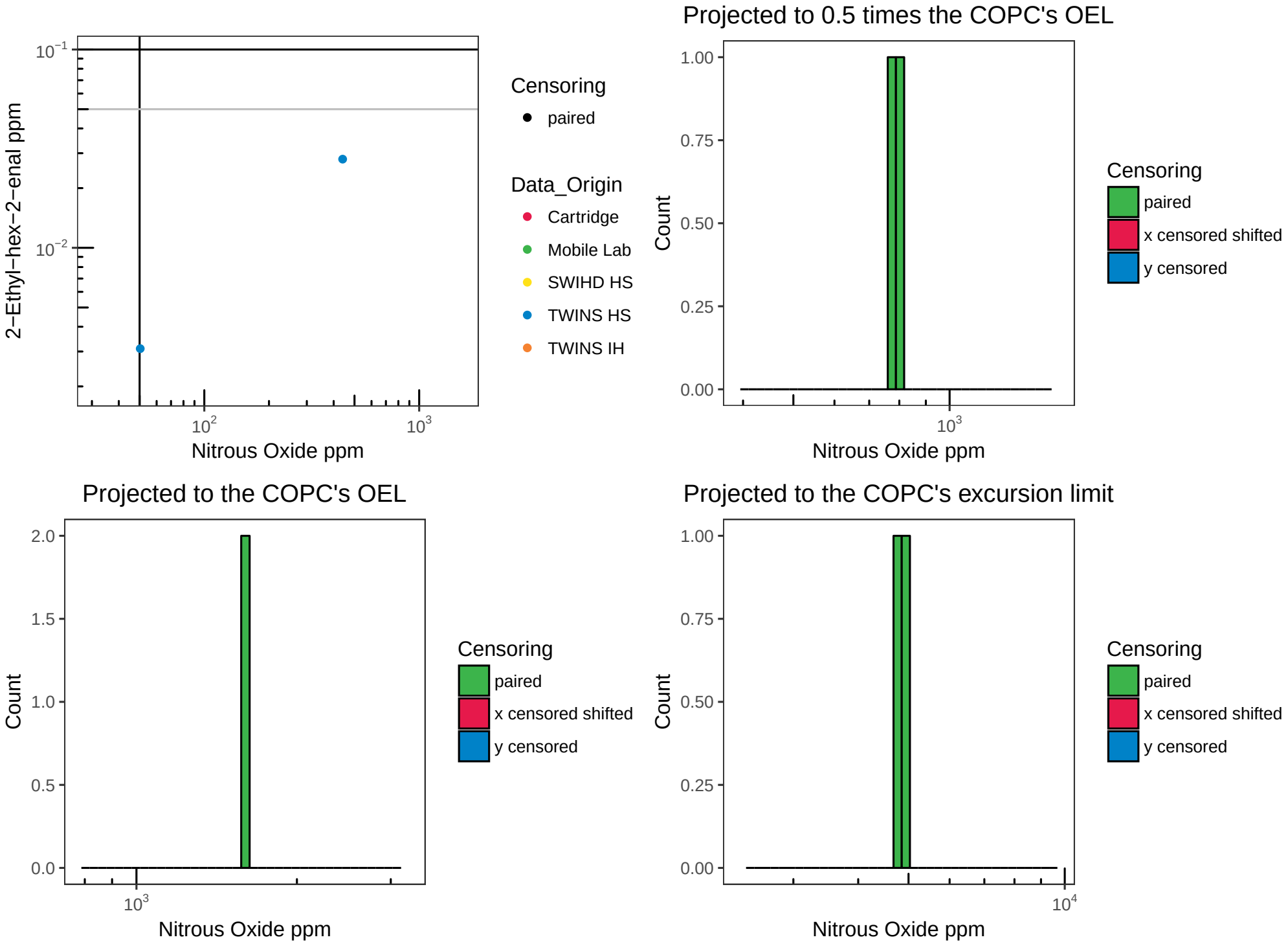


Figure C.78: 2-Ethyl-hex-2-enal vs Nitrous Oxide

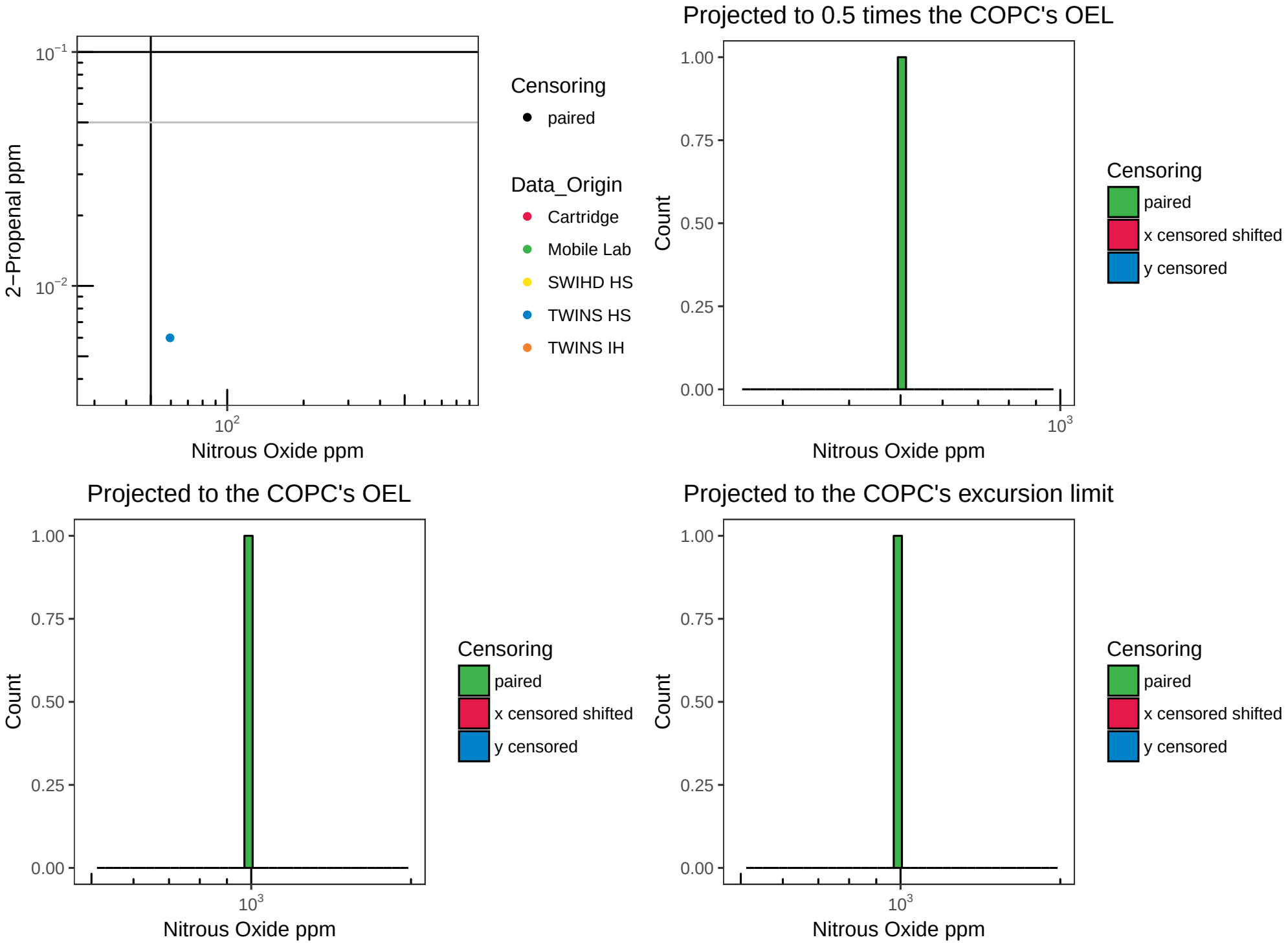


Figure C.79: 2-Propenal vs Nitrous Oxide

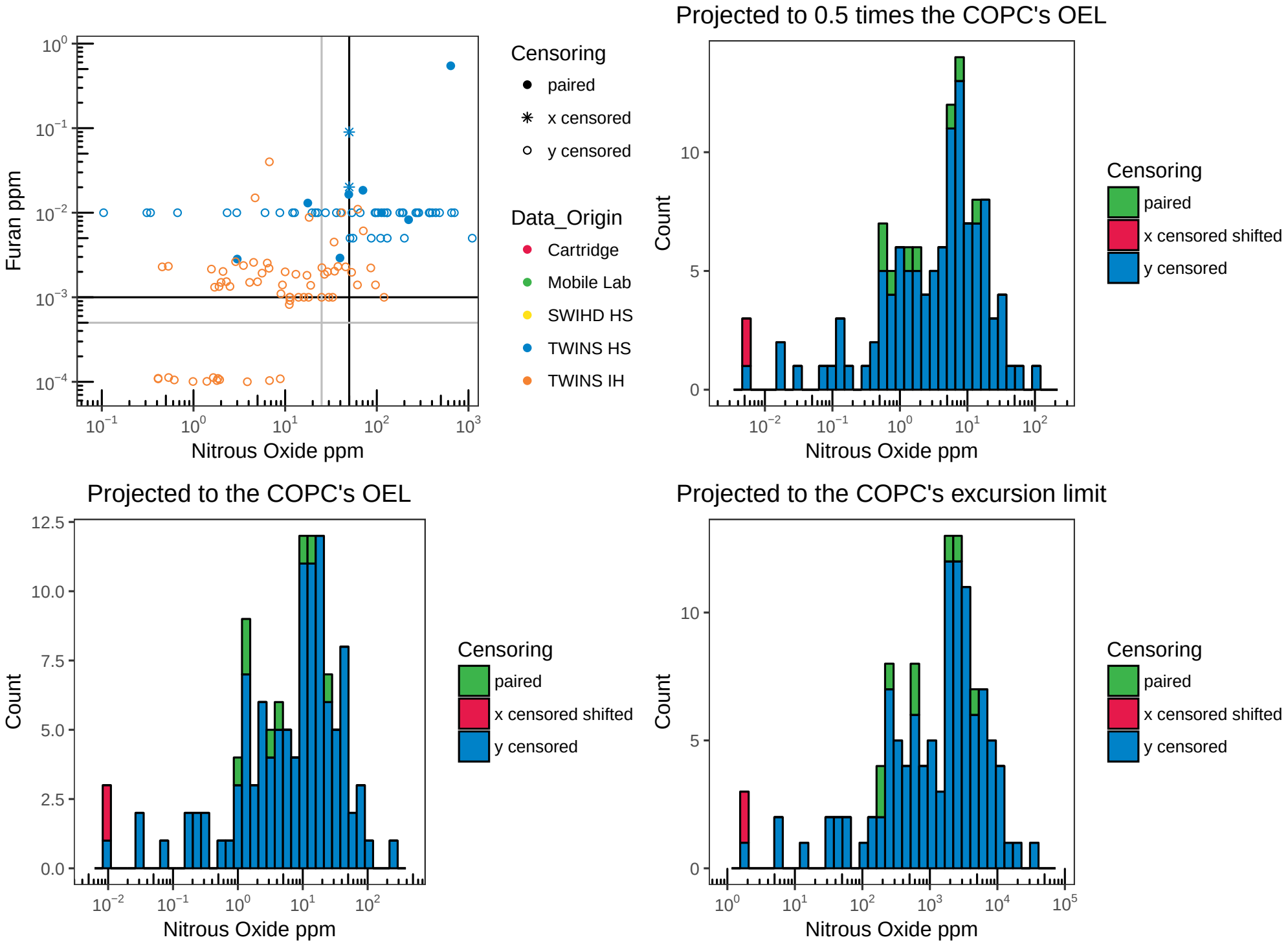


Figure C.80: Furan vs Nitrous Oxide

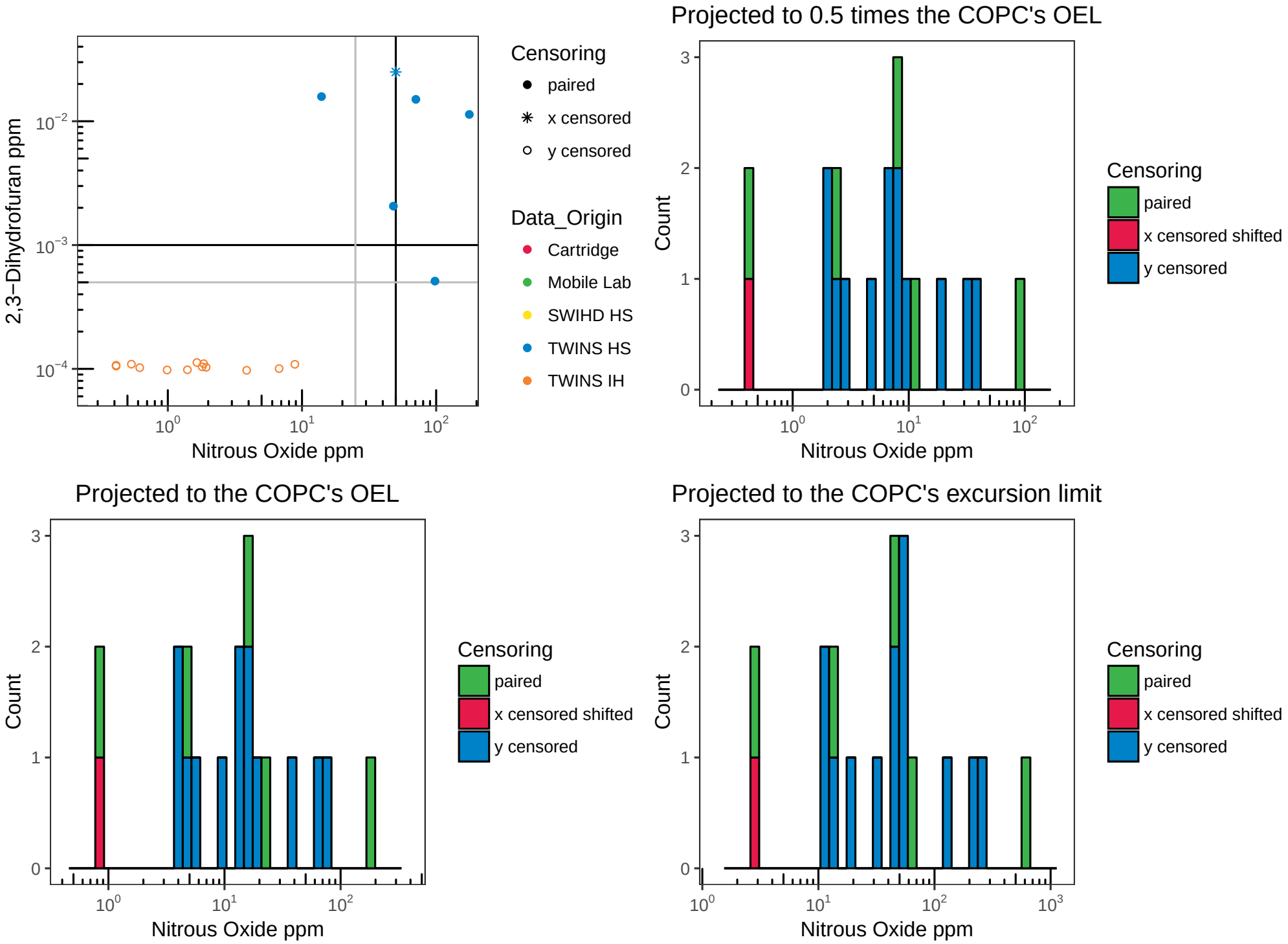


Figure C.81: 2,3-Dihydrofuran vs Nitrous Oxide

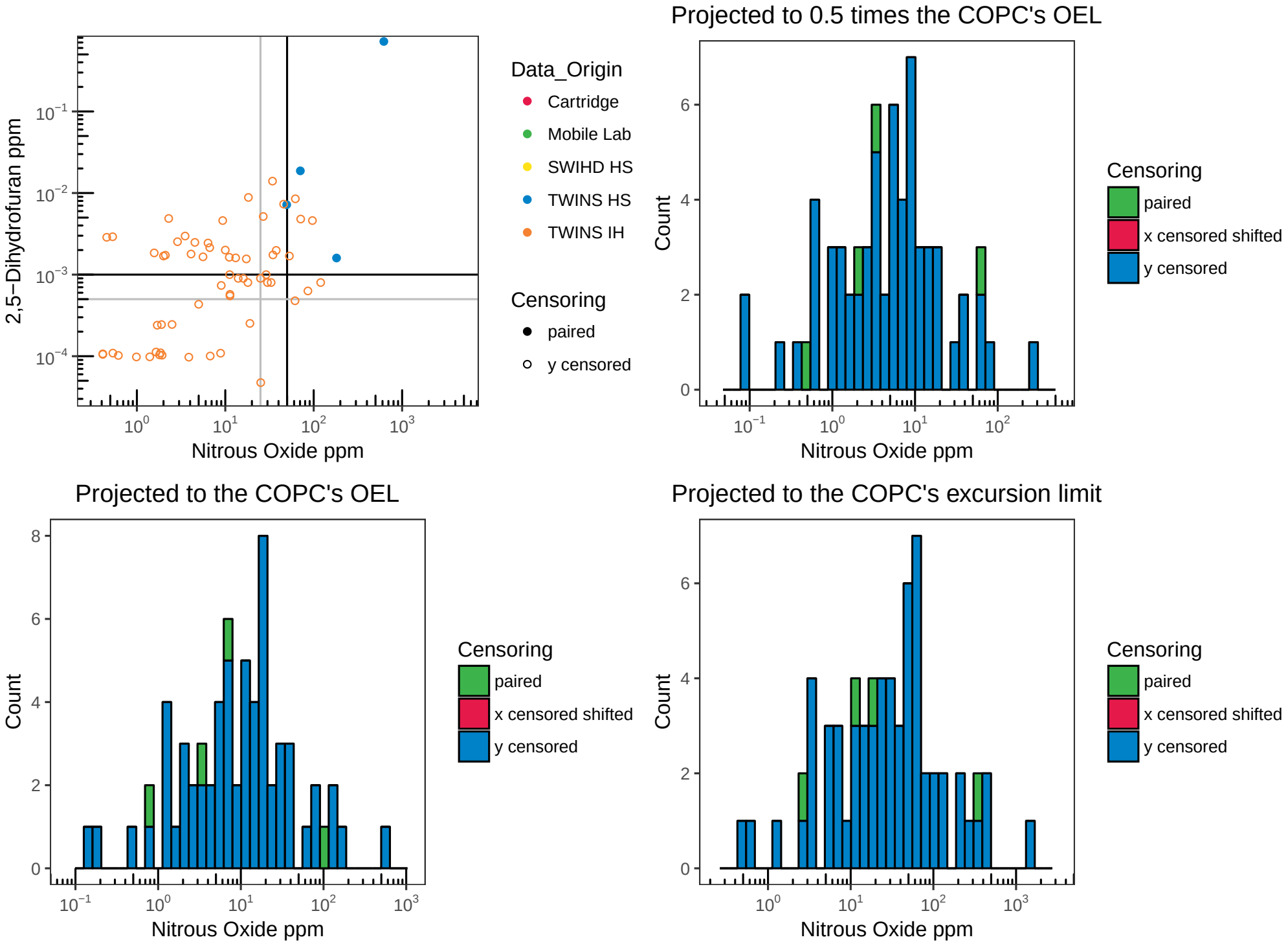


Figure C.82: 2,5-Dihydrofuran vs Nitrous Oxide

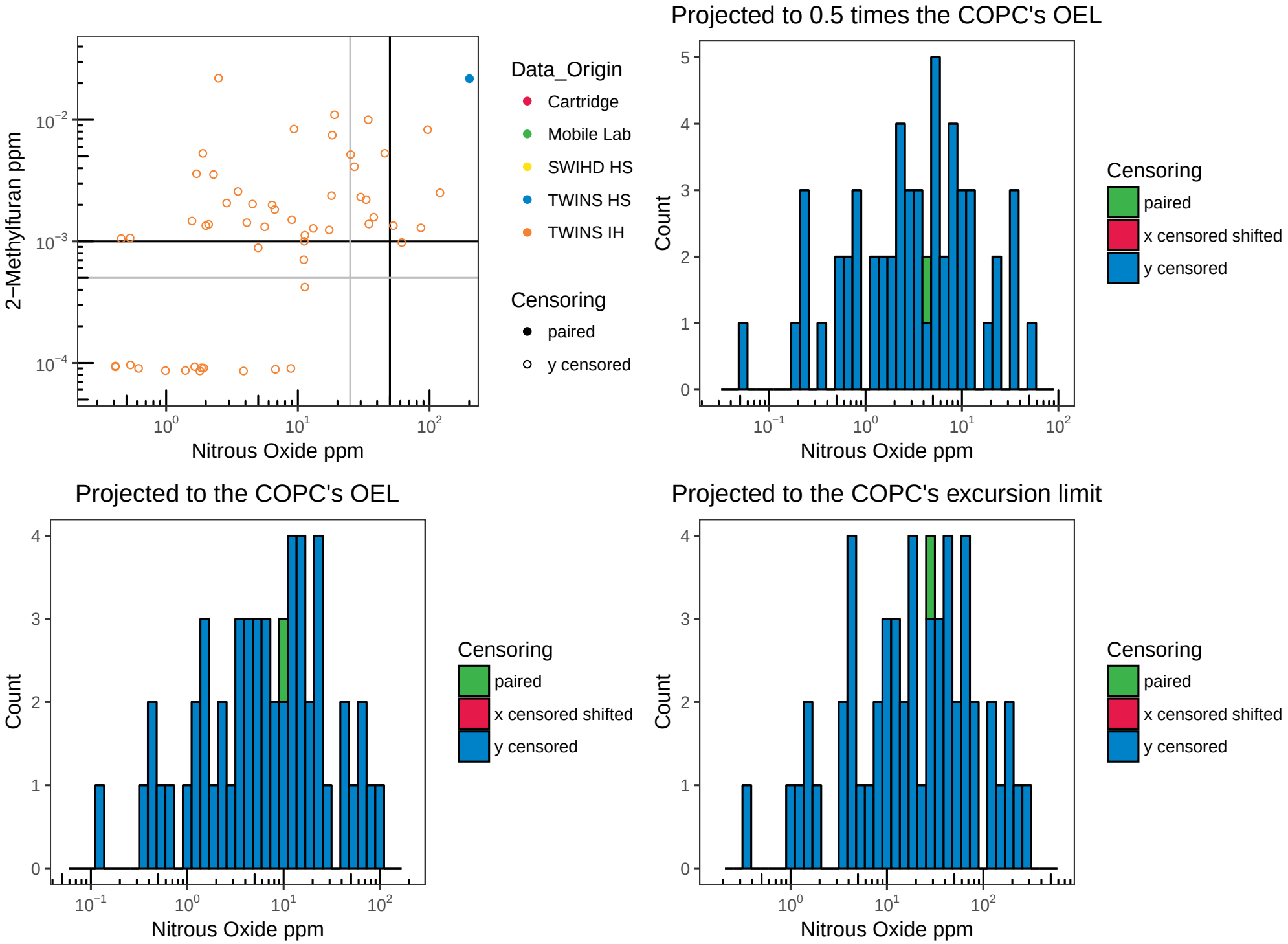


Figure C.83: 2-Methylfuran vs Nitrous Oxide

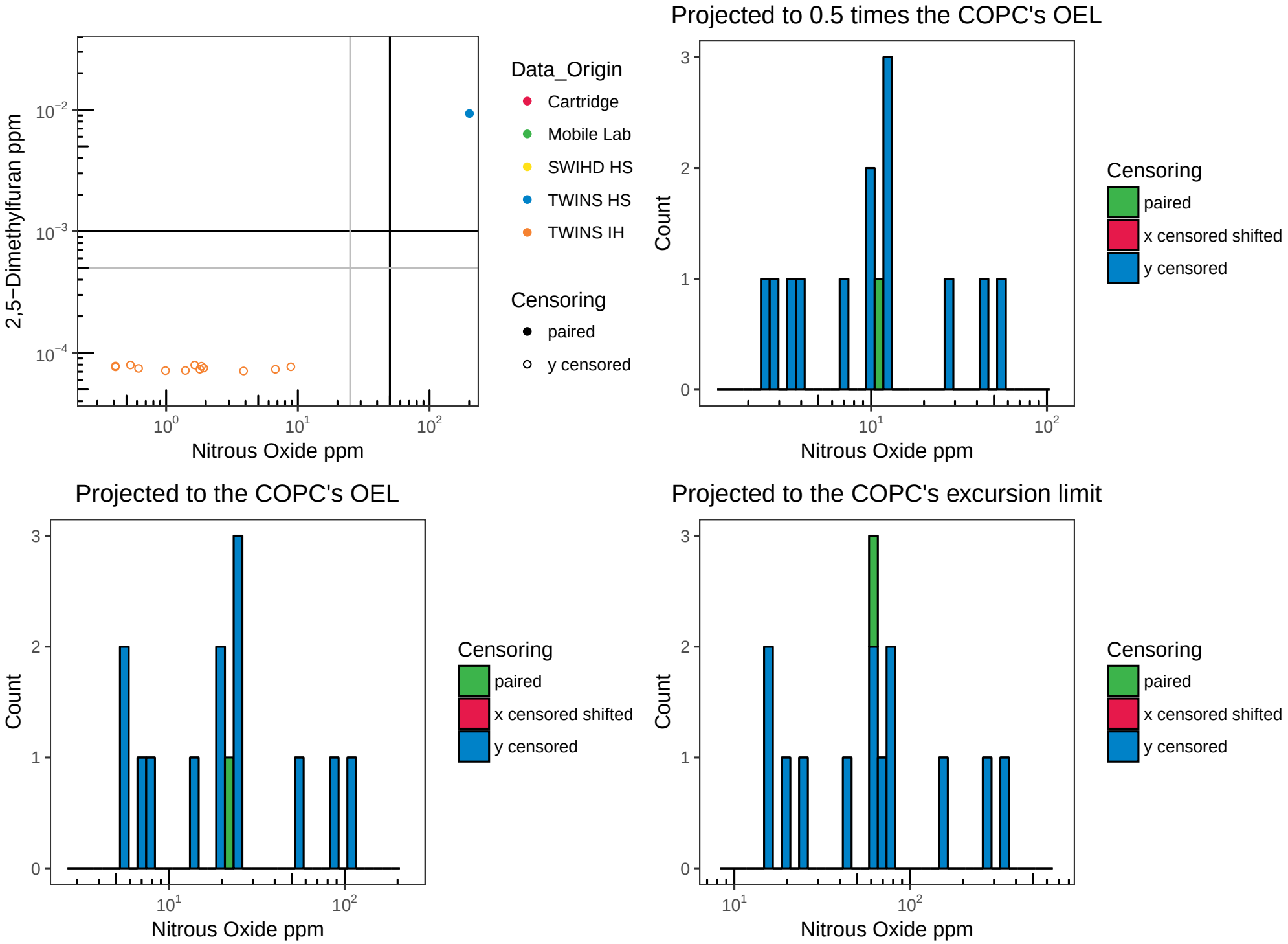


Figure C.84: 2,5-Dimethylfuran vs Nitrous Oxide

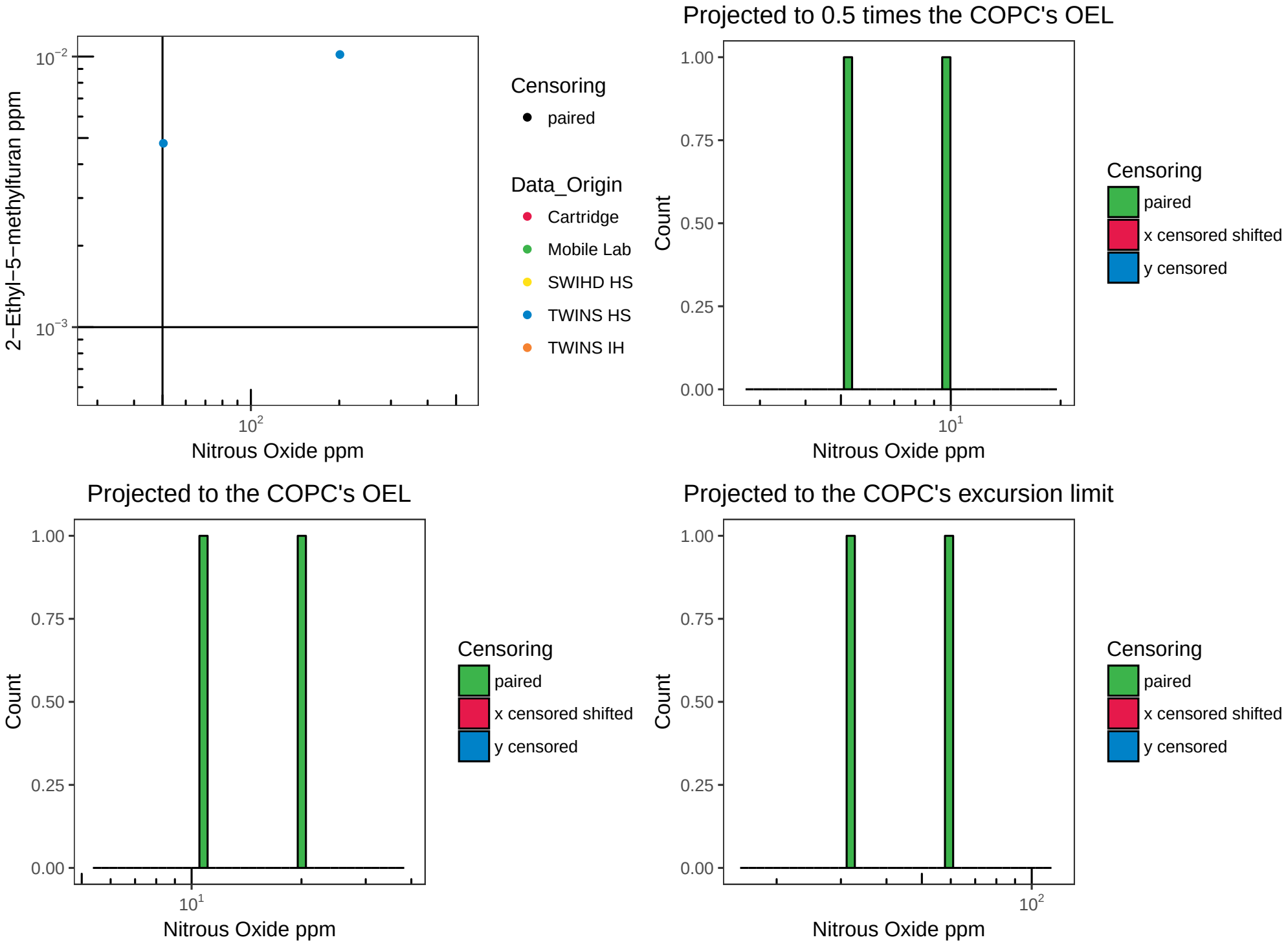


Figure C.85: 2-Ethyl-5-methylfuran vs Nitrous Oxide

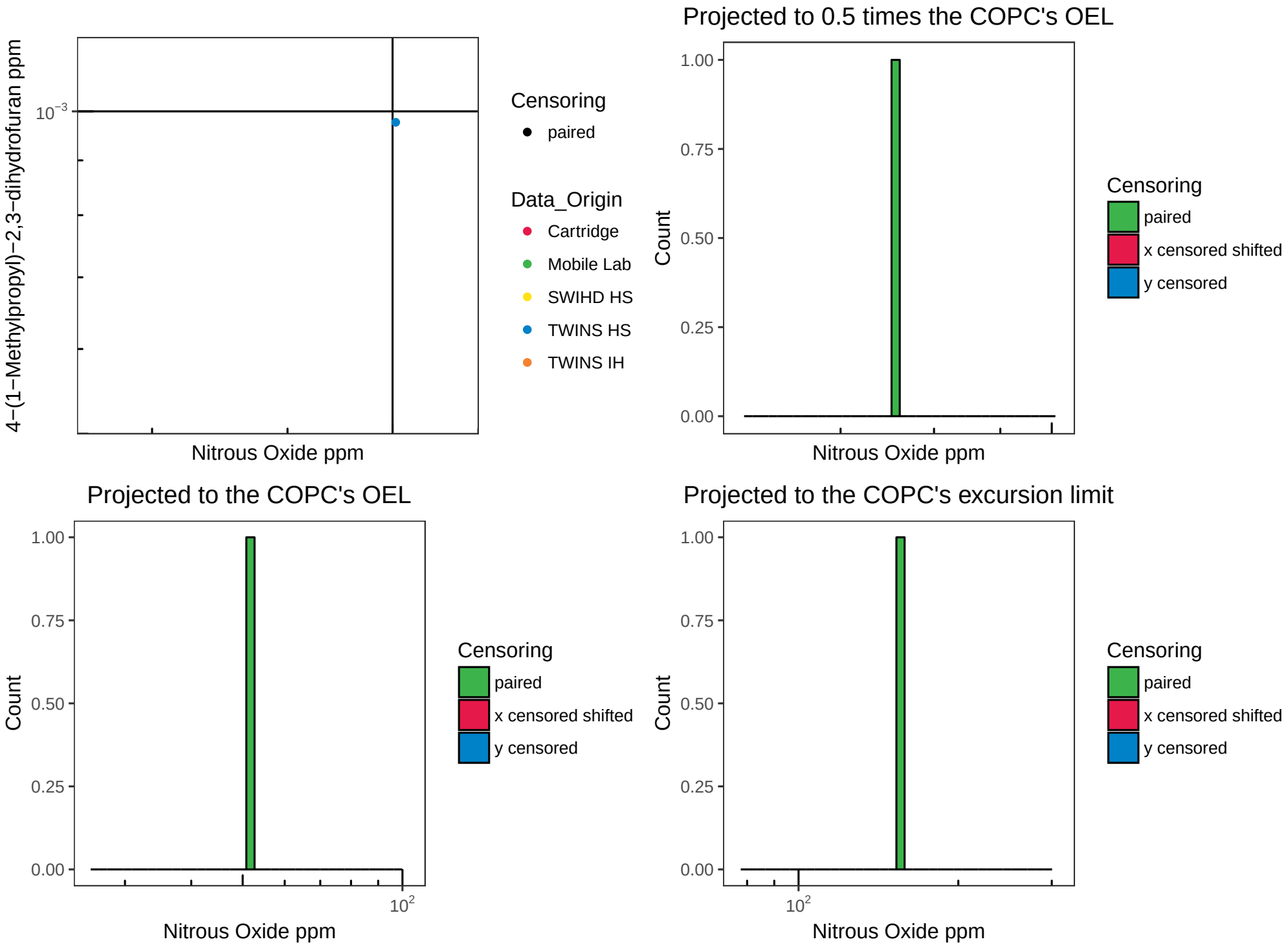


Figure C.86: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Nitrous Oxide

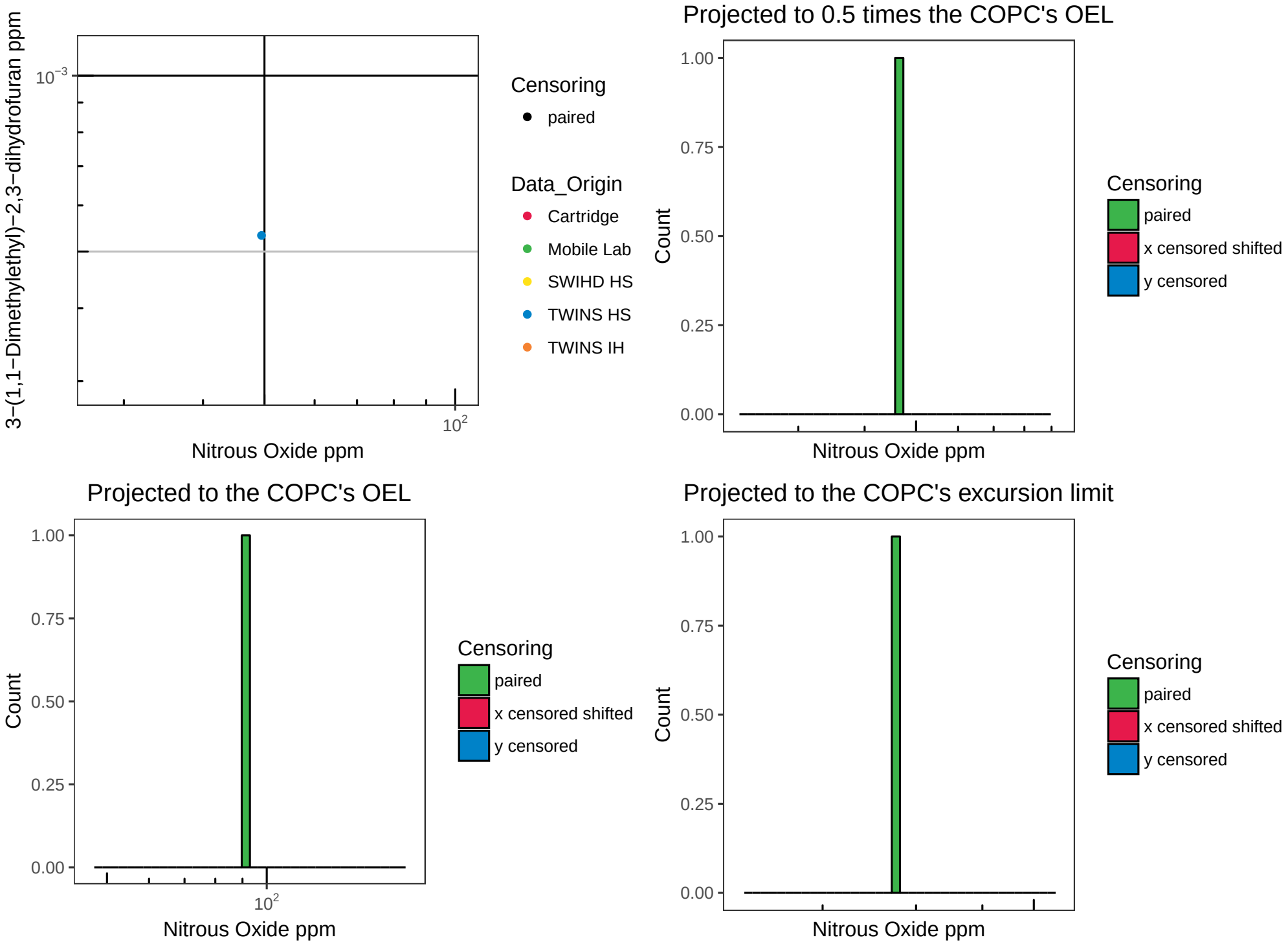


Figure C.87: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Nitrous Oxide

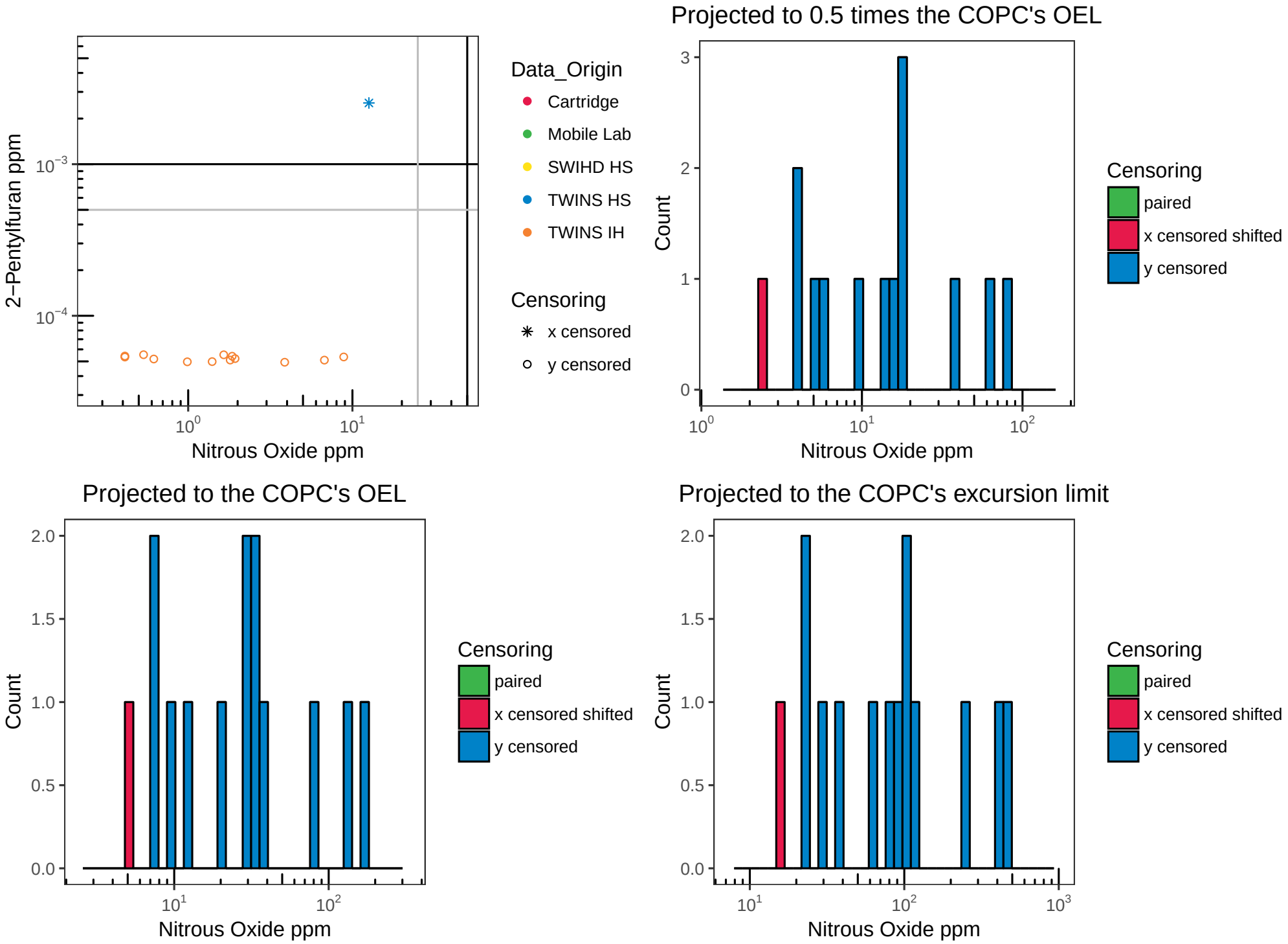


Figure C.88: 2-Pentylfuran vs Nitrous Oxide

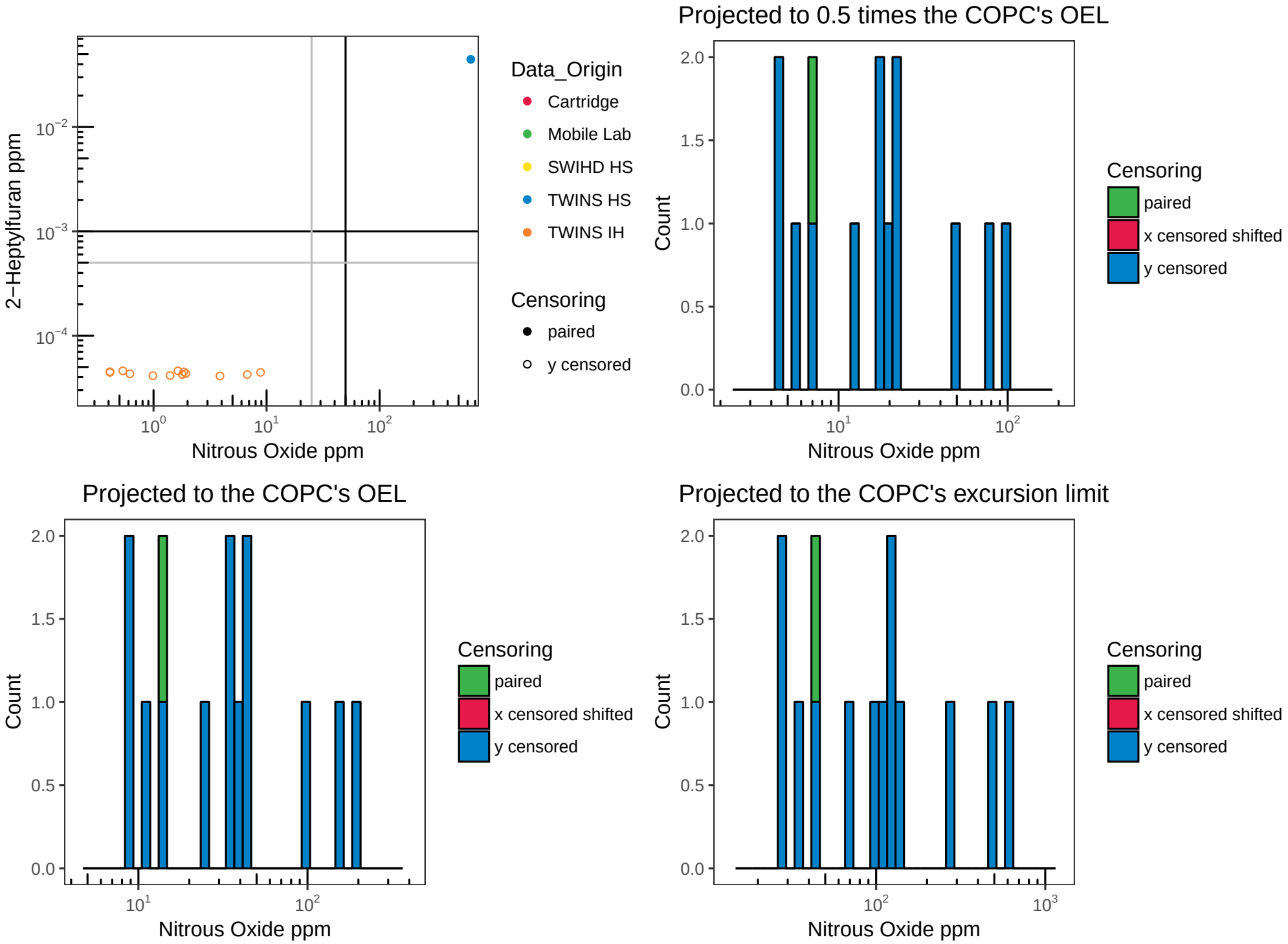


Figure C.89: 2-Heptylfuran vs Nitrous Oxide

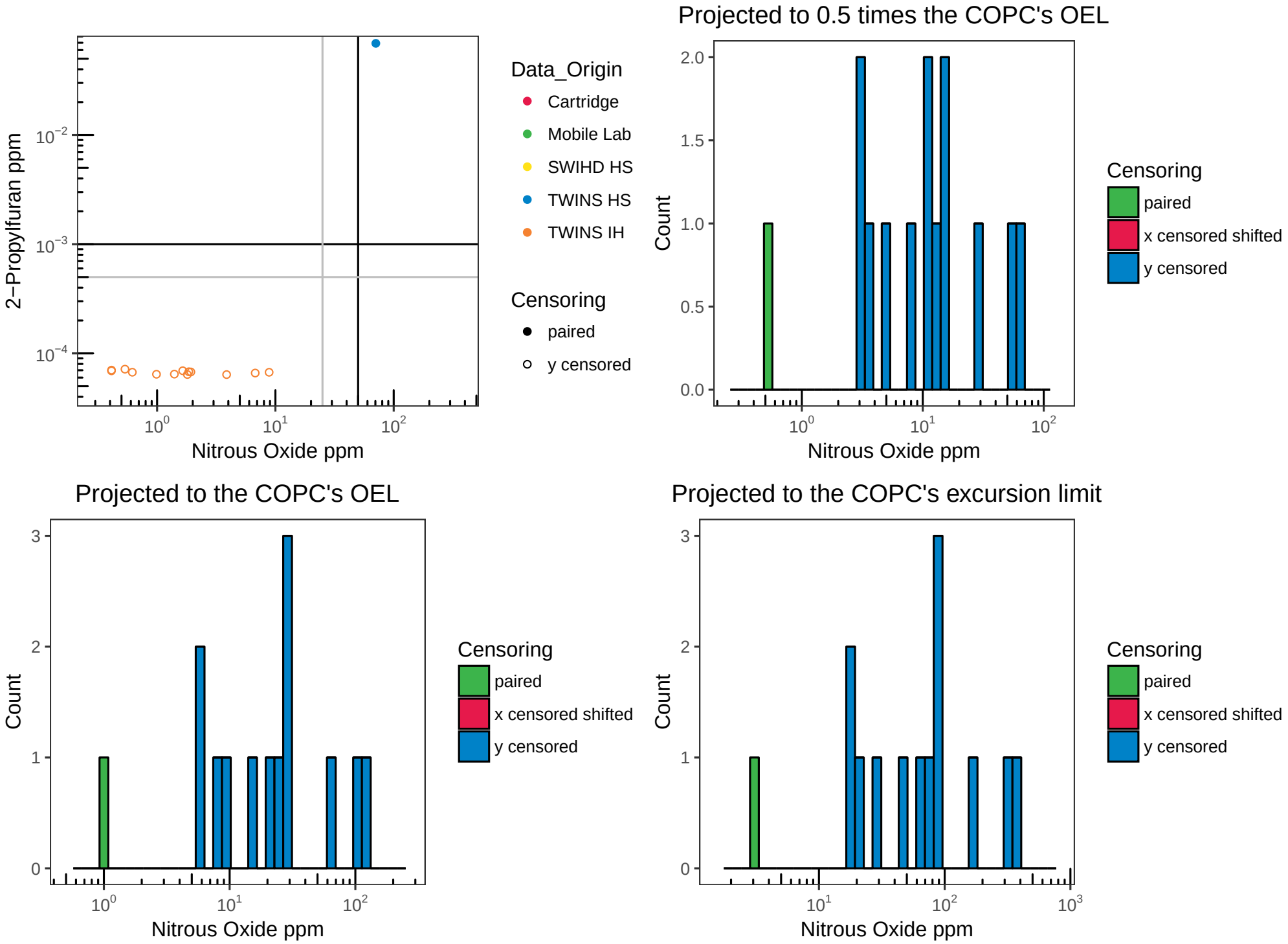


Figure C.90: 2-Propylfuran vs Nitrous Oxide

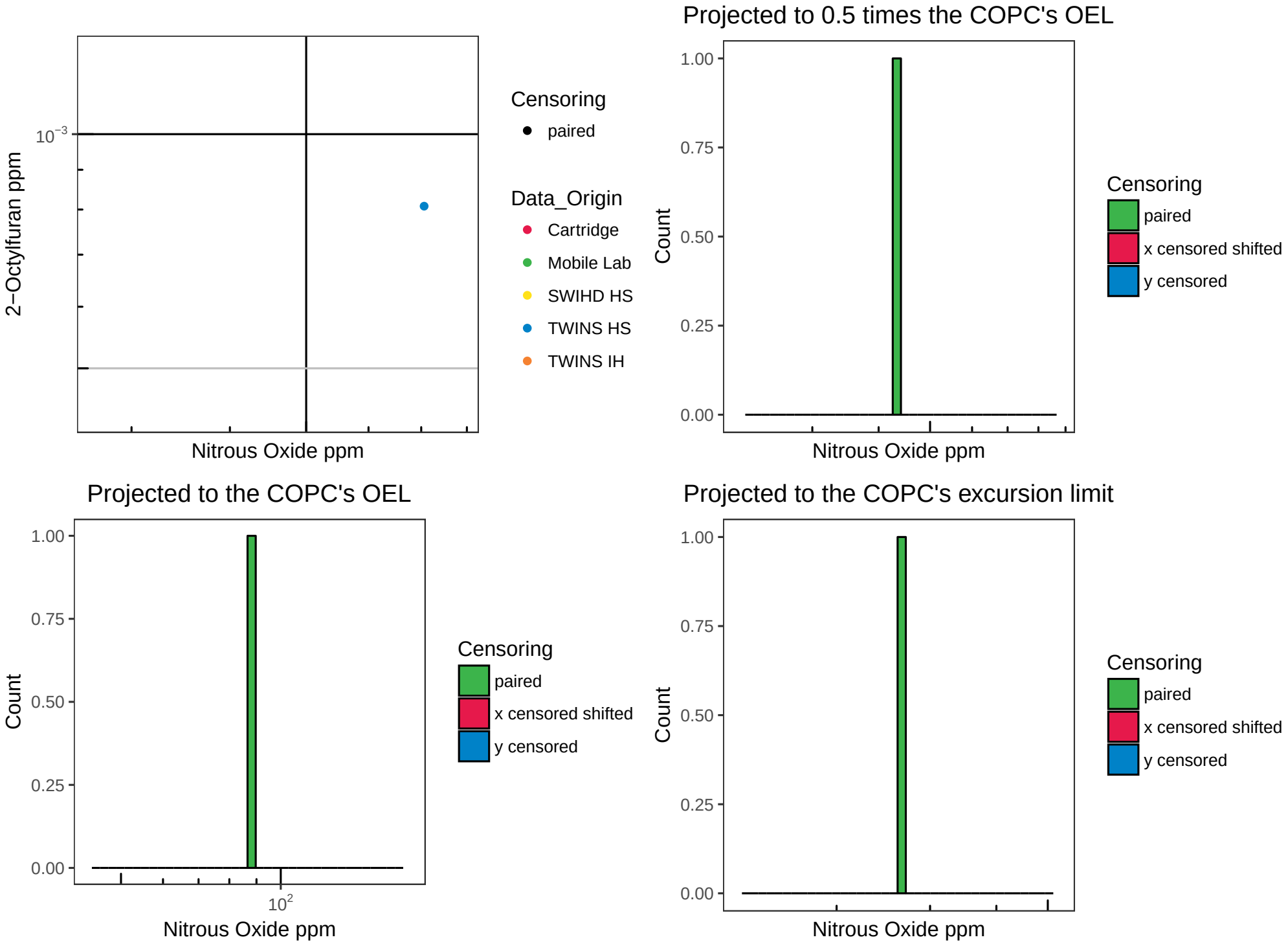


Figure C.91: 2-Octylfuran vs Nitrous Oxide

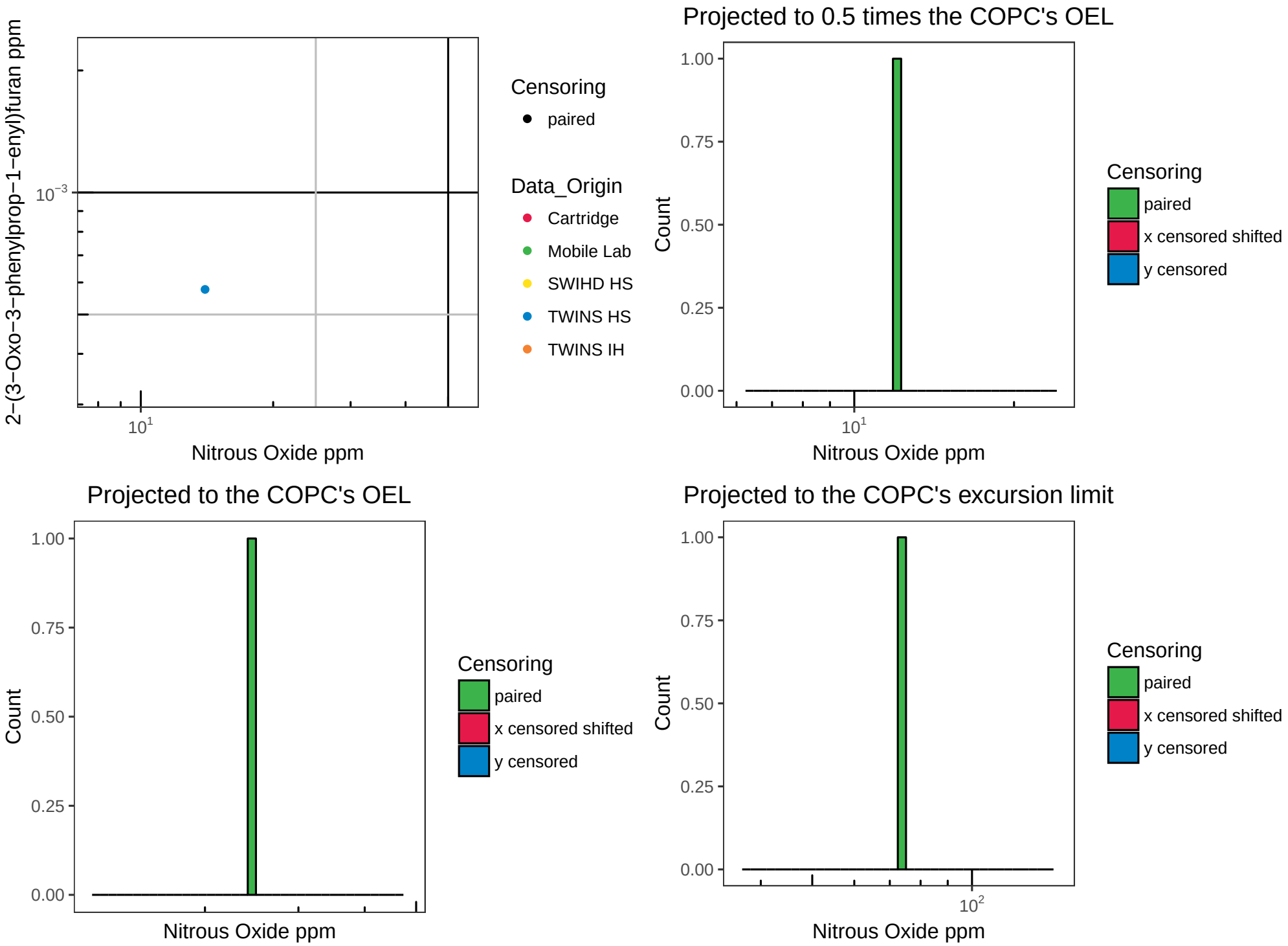


Figure C.92: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Nitrous Oxide

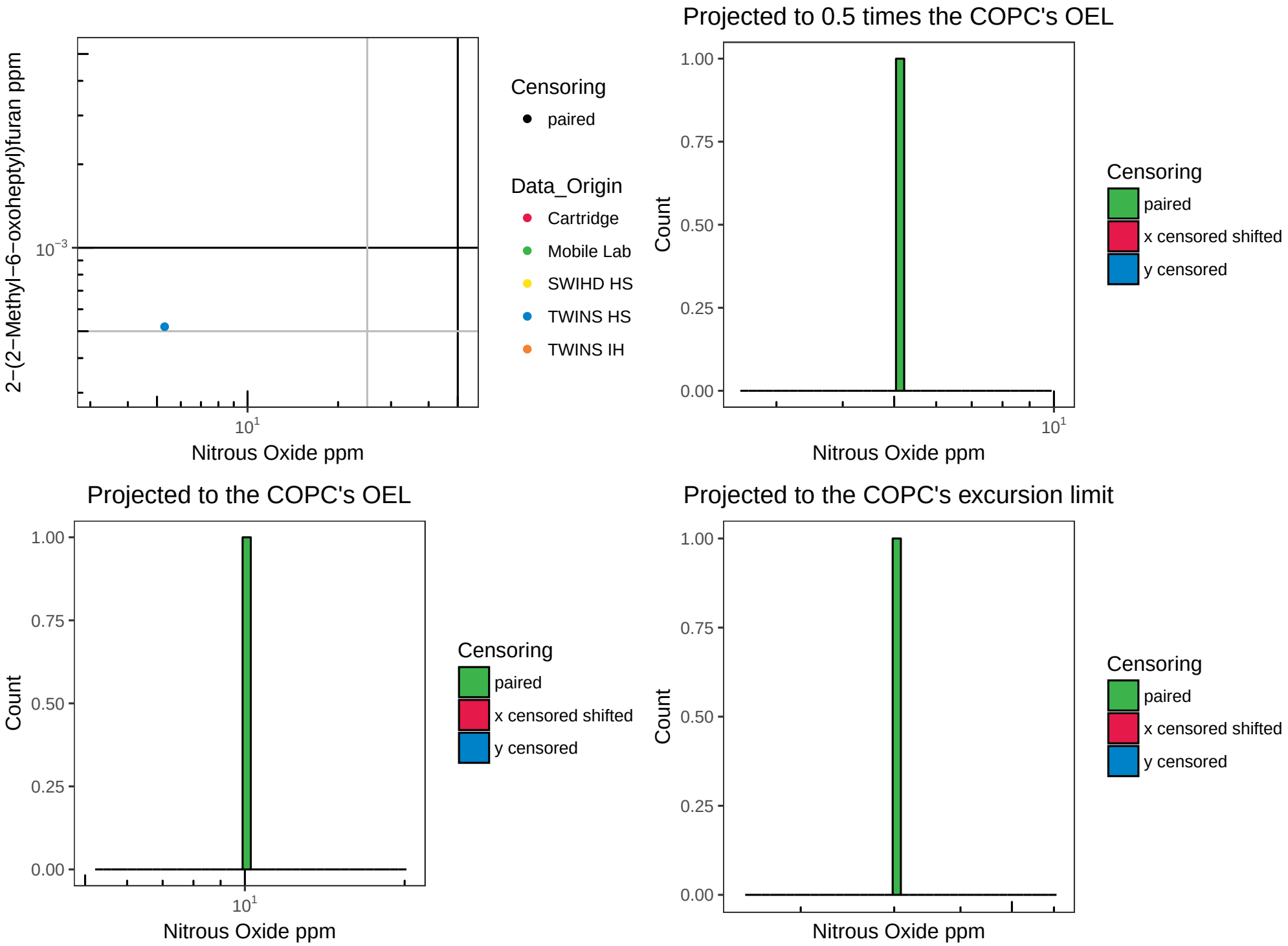


Figure C.93: 2-(2-Methyl-6-oxoheptyl)furan vs Nitrous Oxide

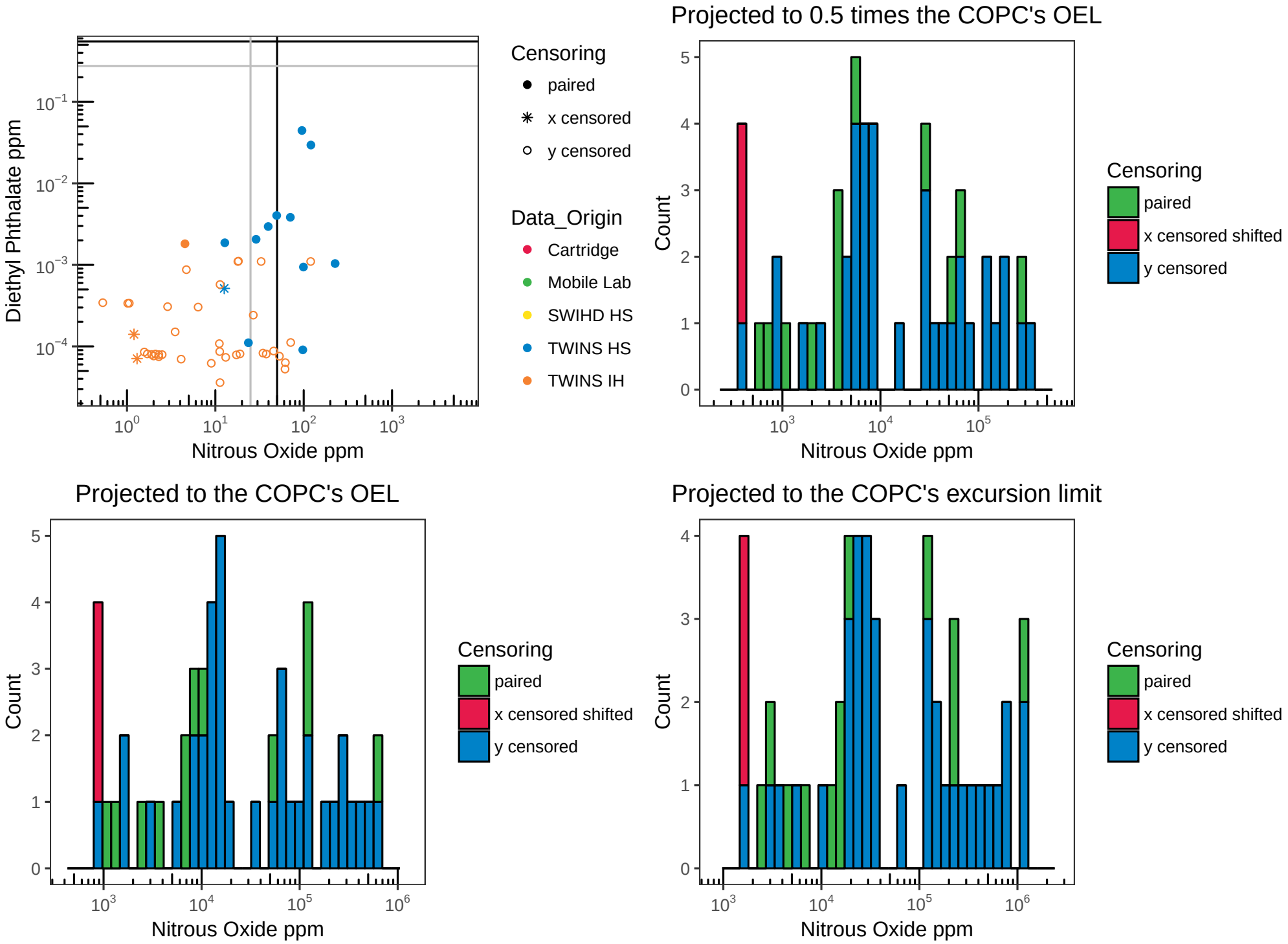


Figure C.94: Diethyl Phthalate vs Nitrous Oxide

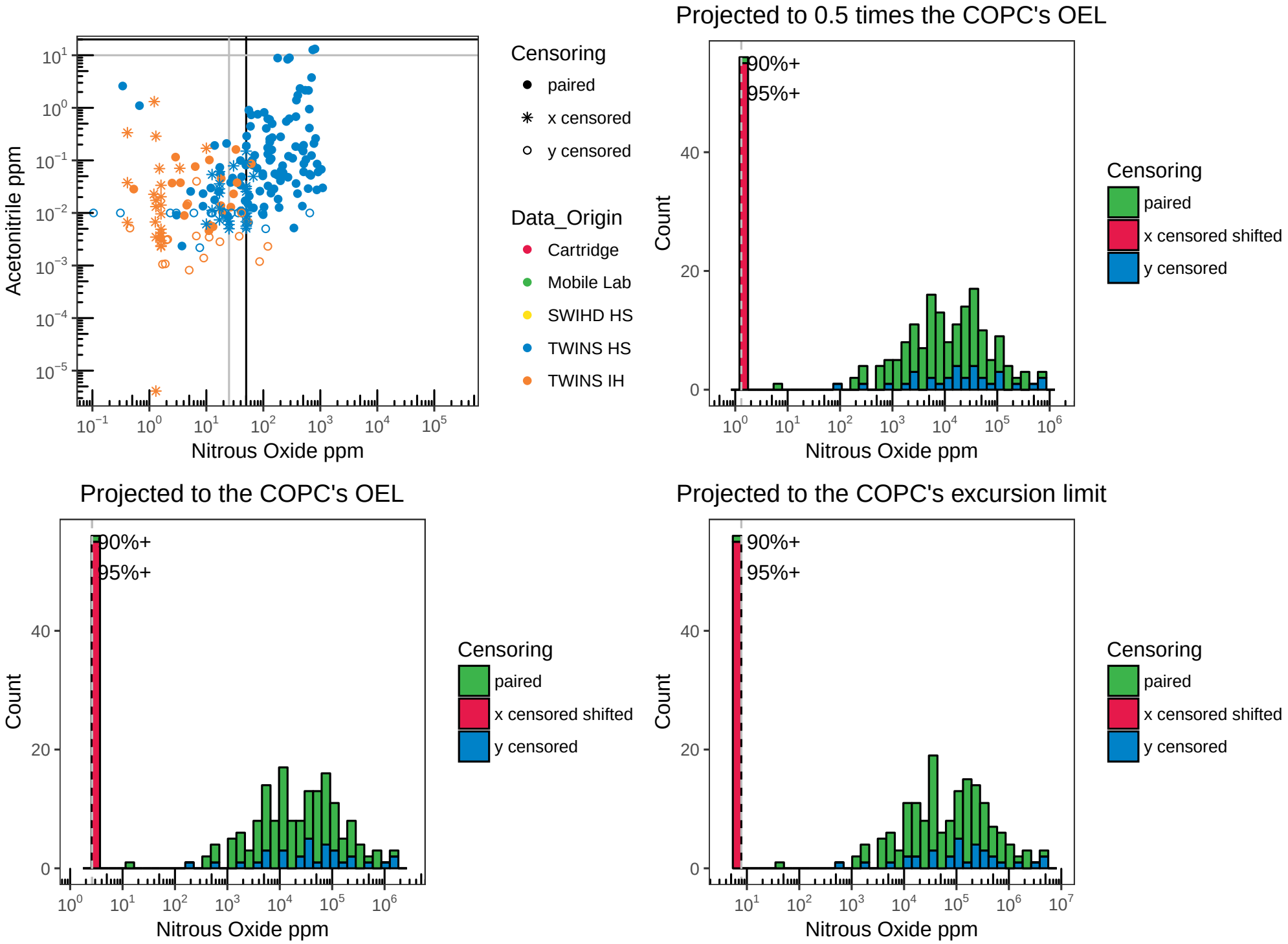


Figure C.95: Acetonitrile vs Nitrous Oxide

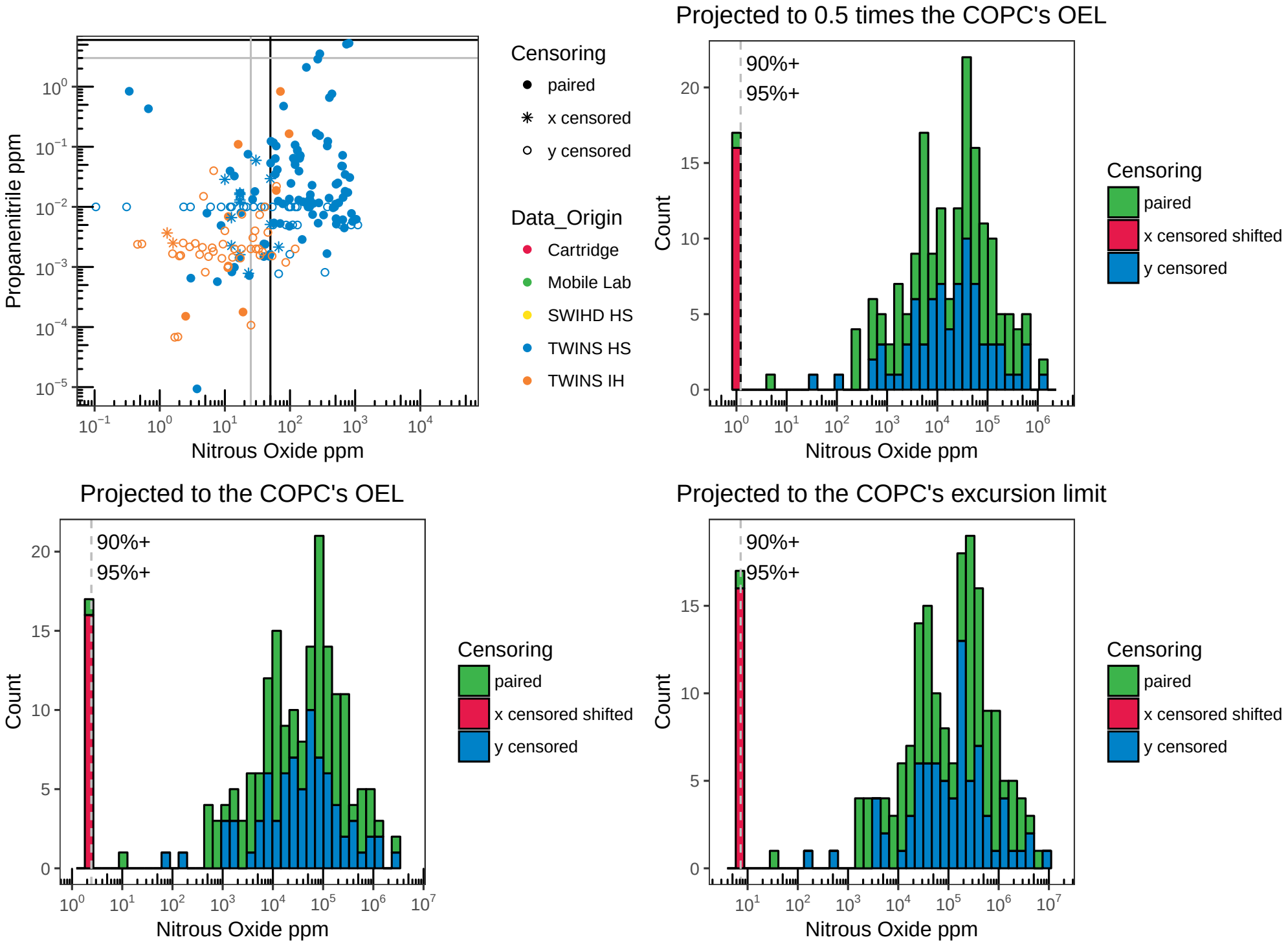


Figure C.96: Propanenitrile vs Nitrous Oxide

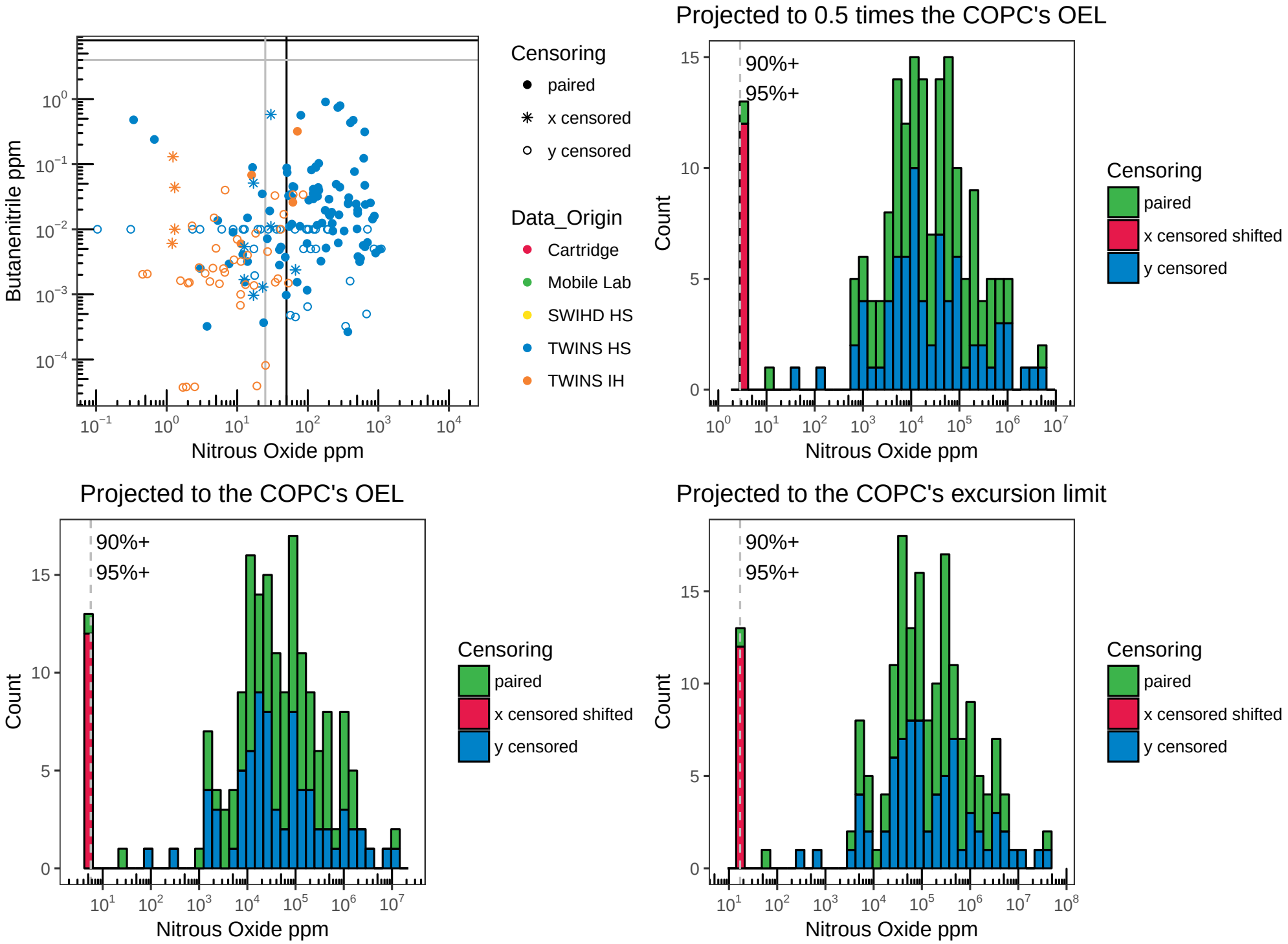


Figure C.97: Butanenitrile vs Nitrous Oxide

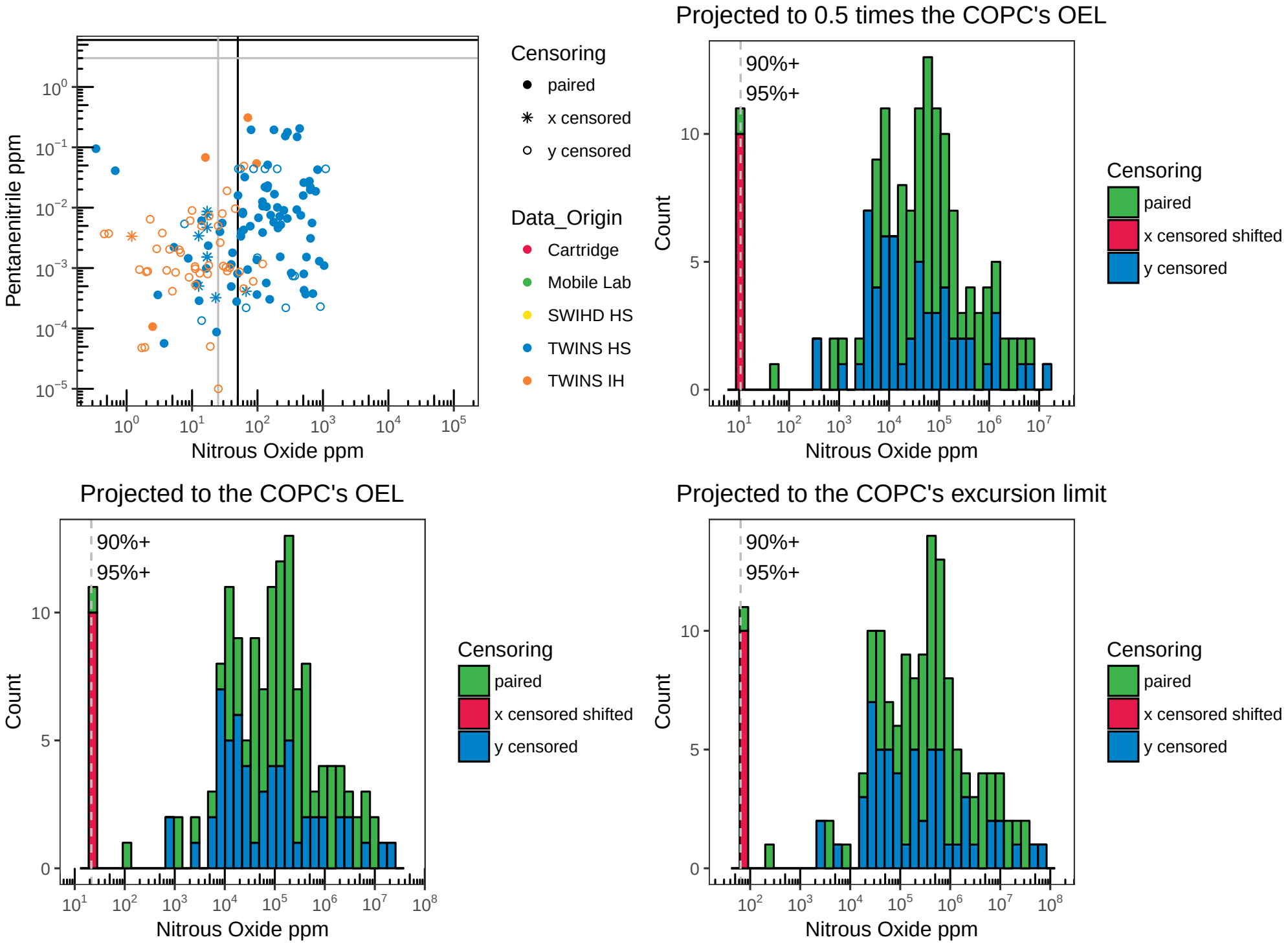


Figure C.98: Pentanenitrile vs Nitrous Oxide

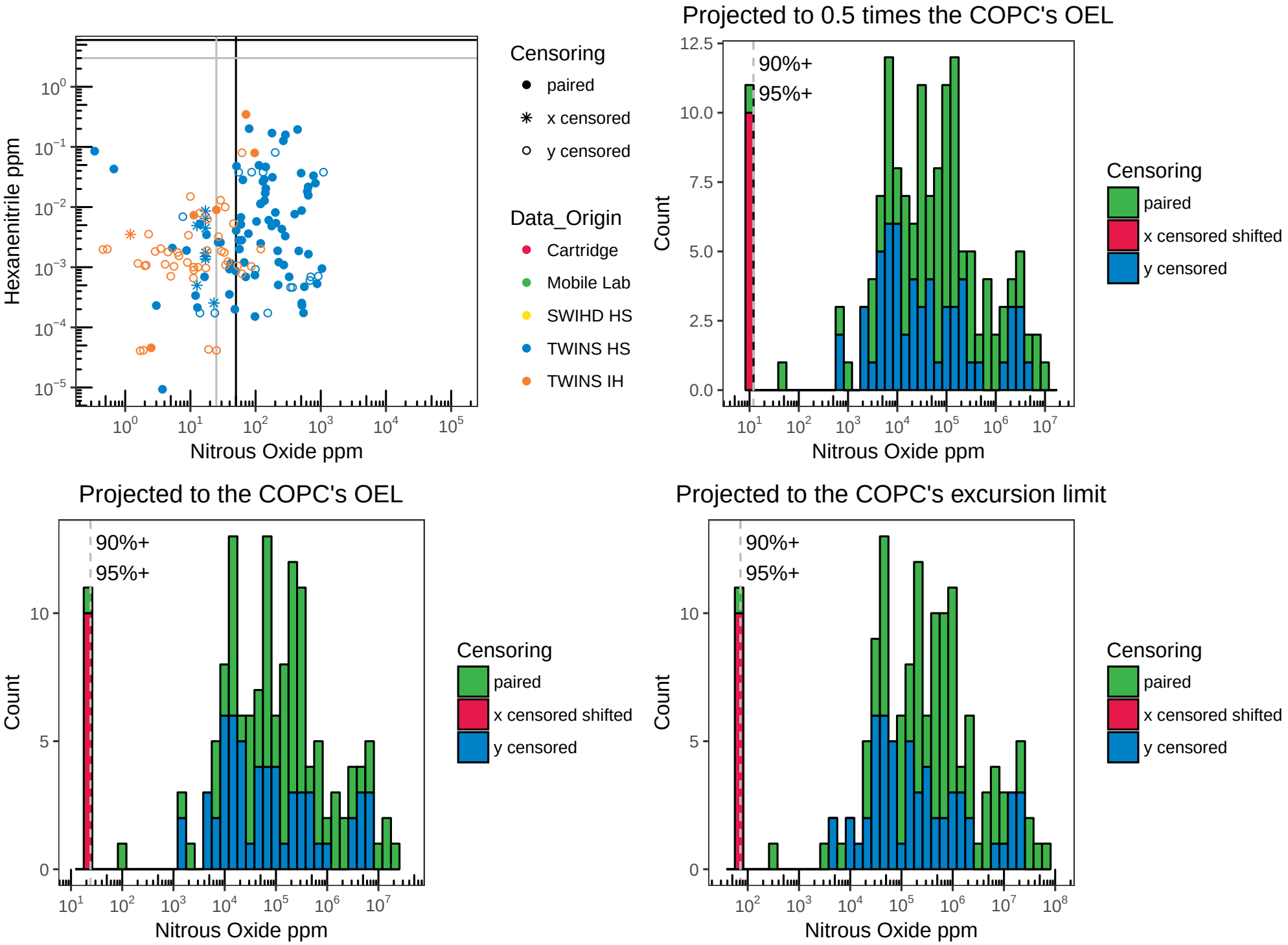


Figure C.99: Hexanenitrile vs Nitrous Oxide

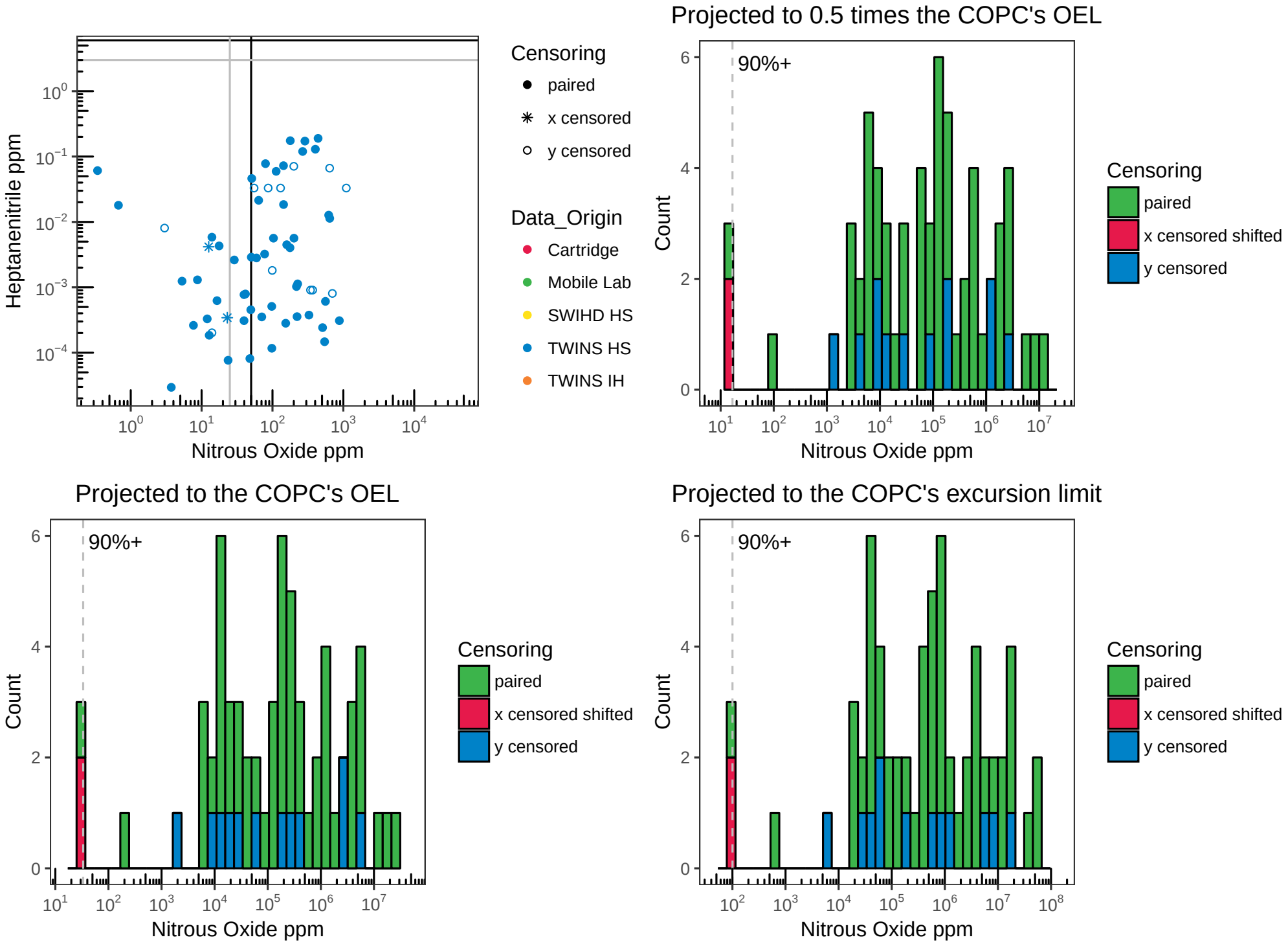


Figure C.100: Heptanenitrile vs Nitrous Oxide

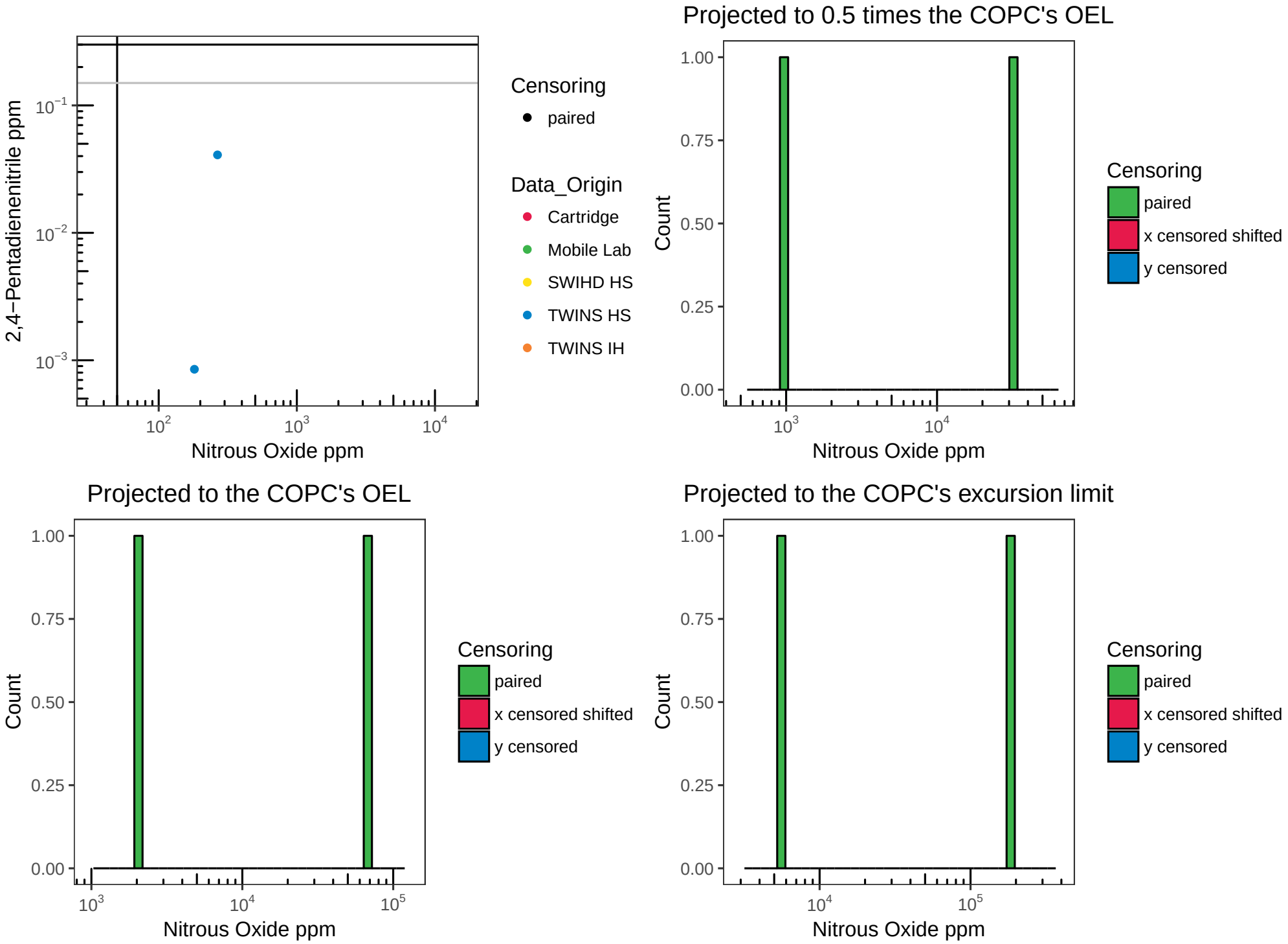


Figure C.101: 2,4-Pentadienenitrile vs Nitrous Oxide

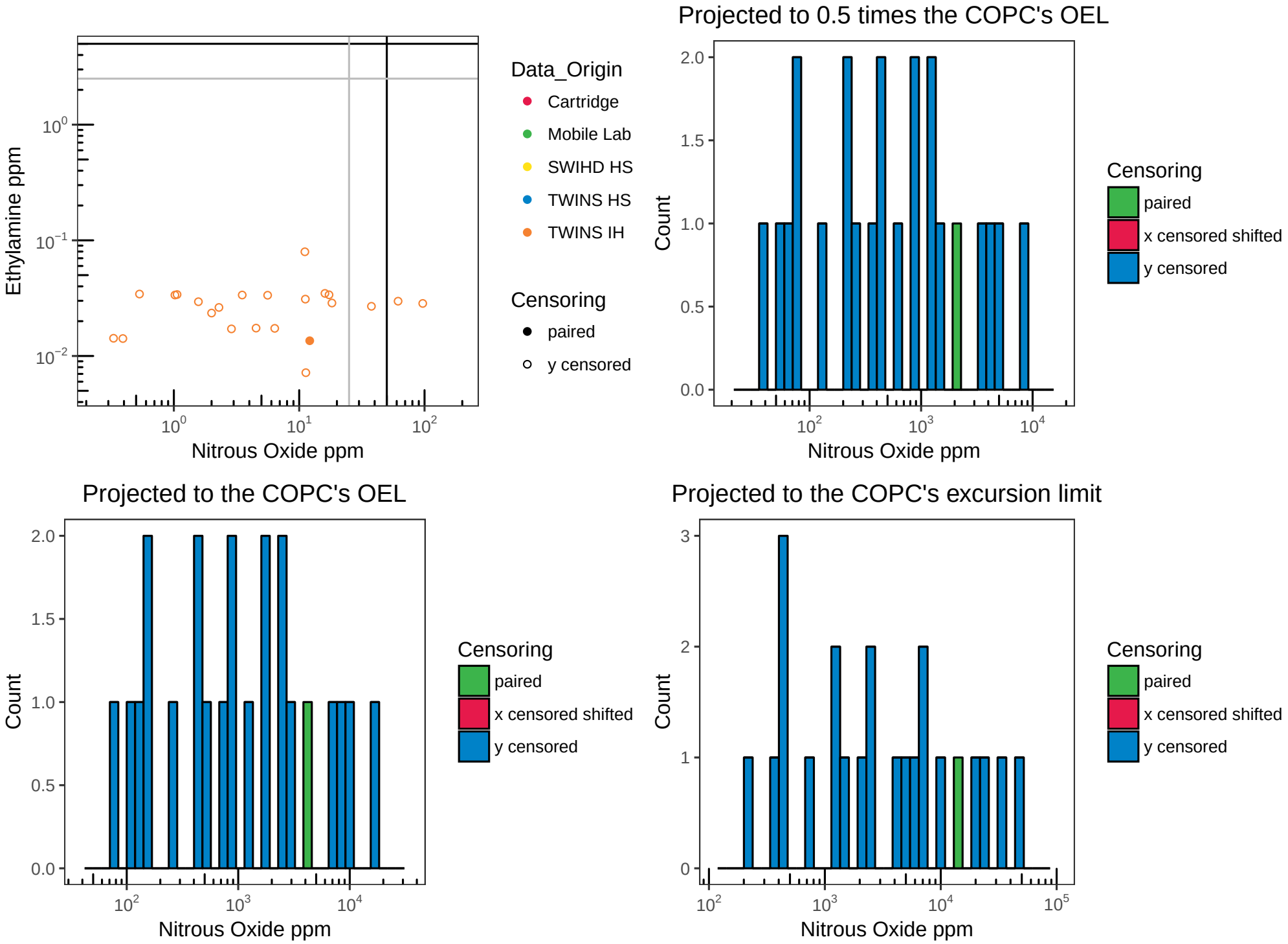


Figure C.102: Ethylamine vs Nitrous Oxide

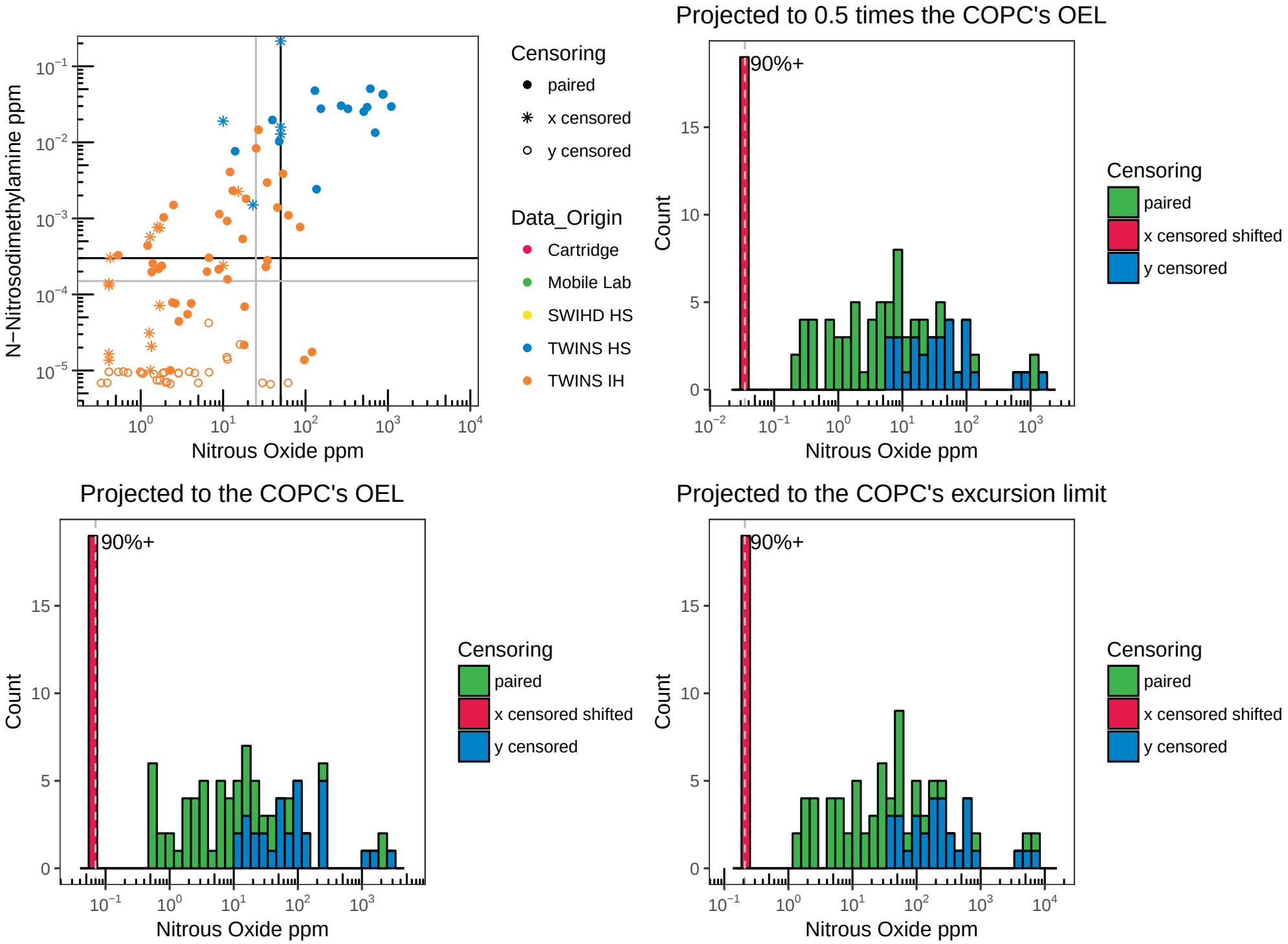


Figure C.103: N-Nitrosodimethylamine vs Nitrous Oxide

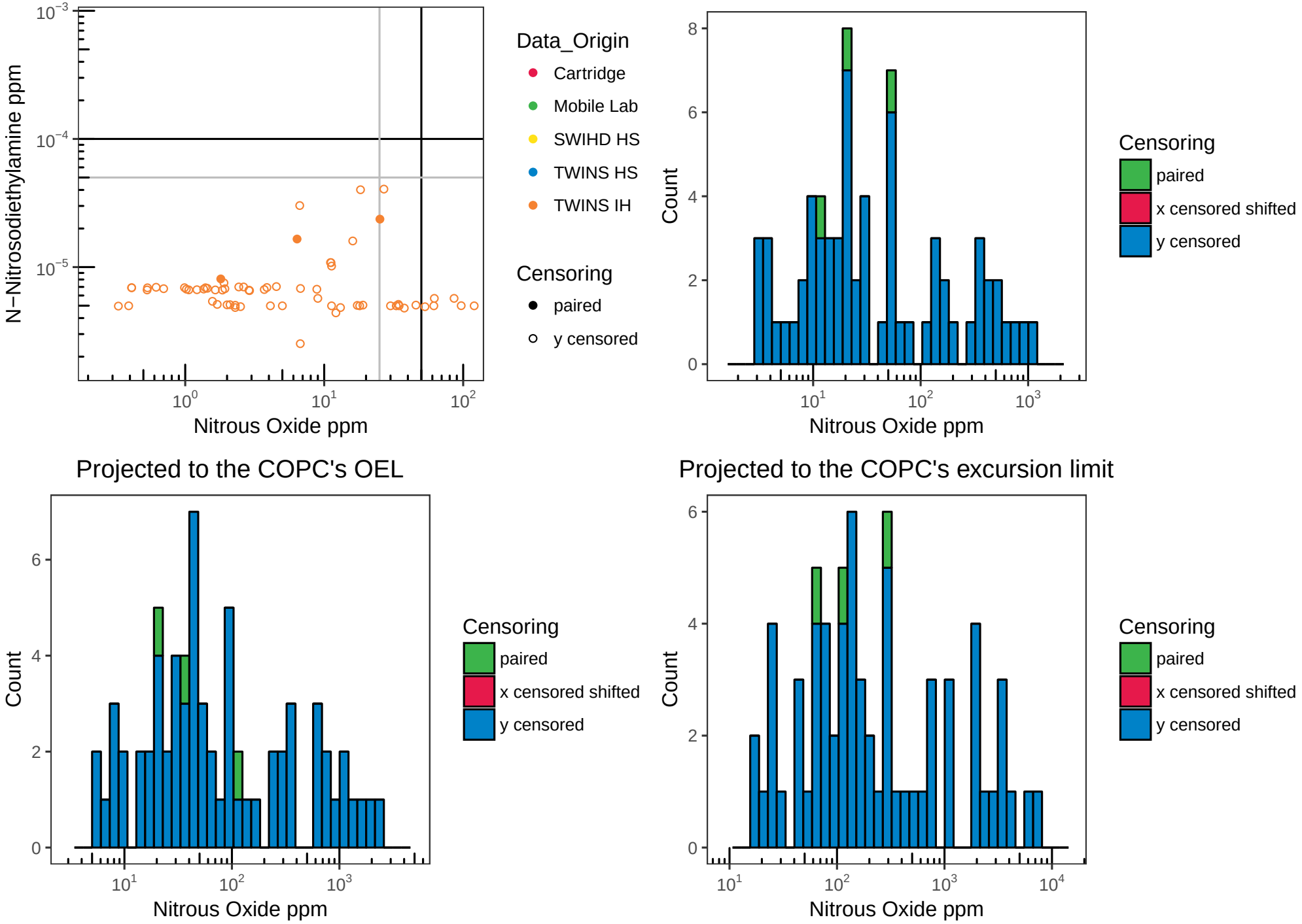


Figure C.104: N-Nitrosodiethylamine vs Nitrous Oxide

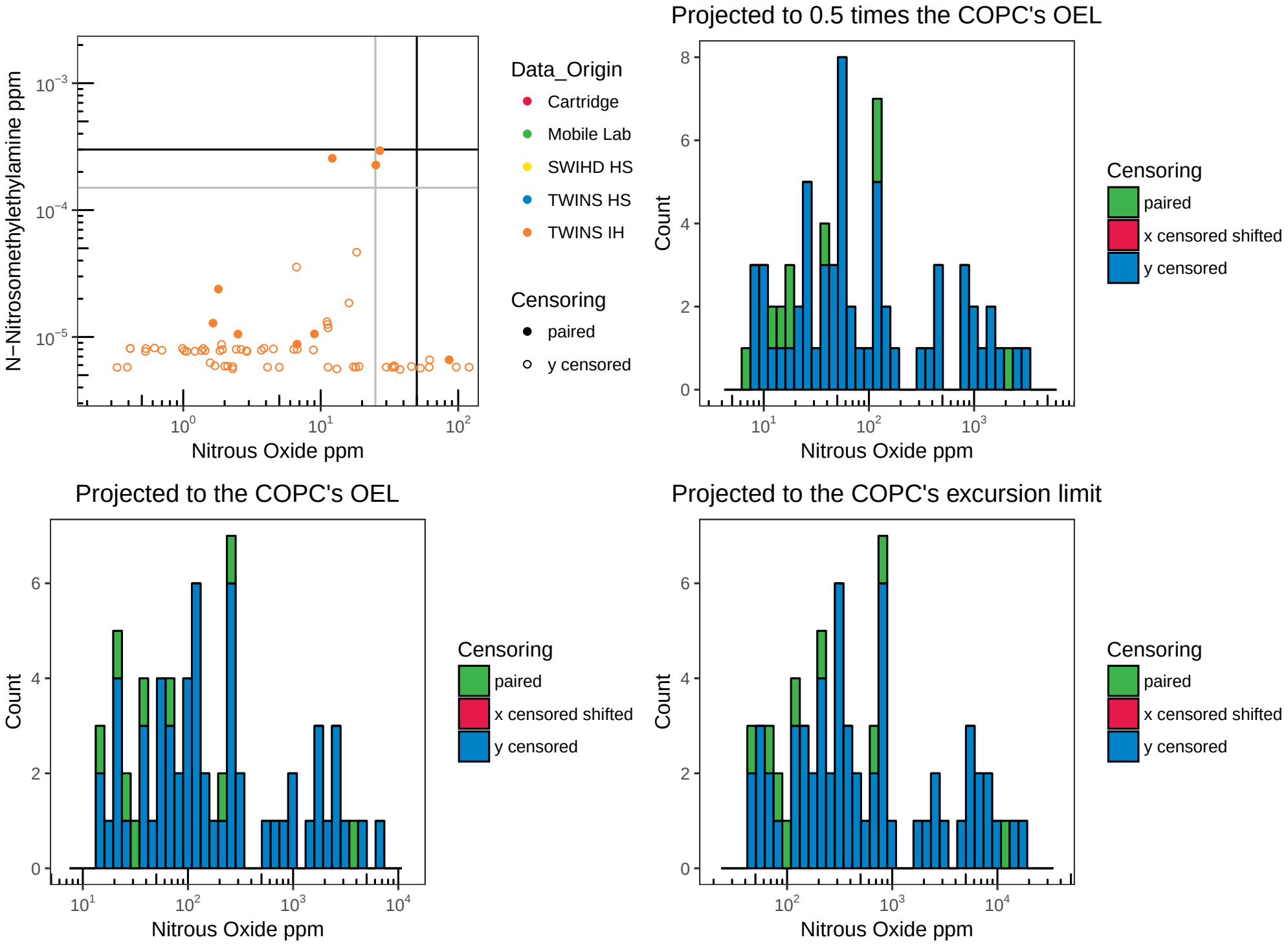


Figure C.105: N-Nitrosomethylethylamine vs Nitrous Oxide

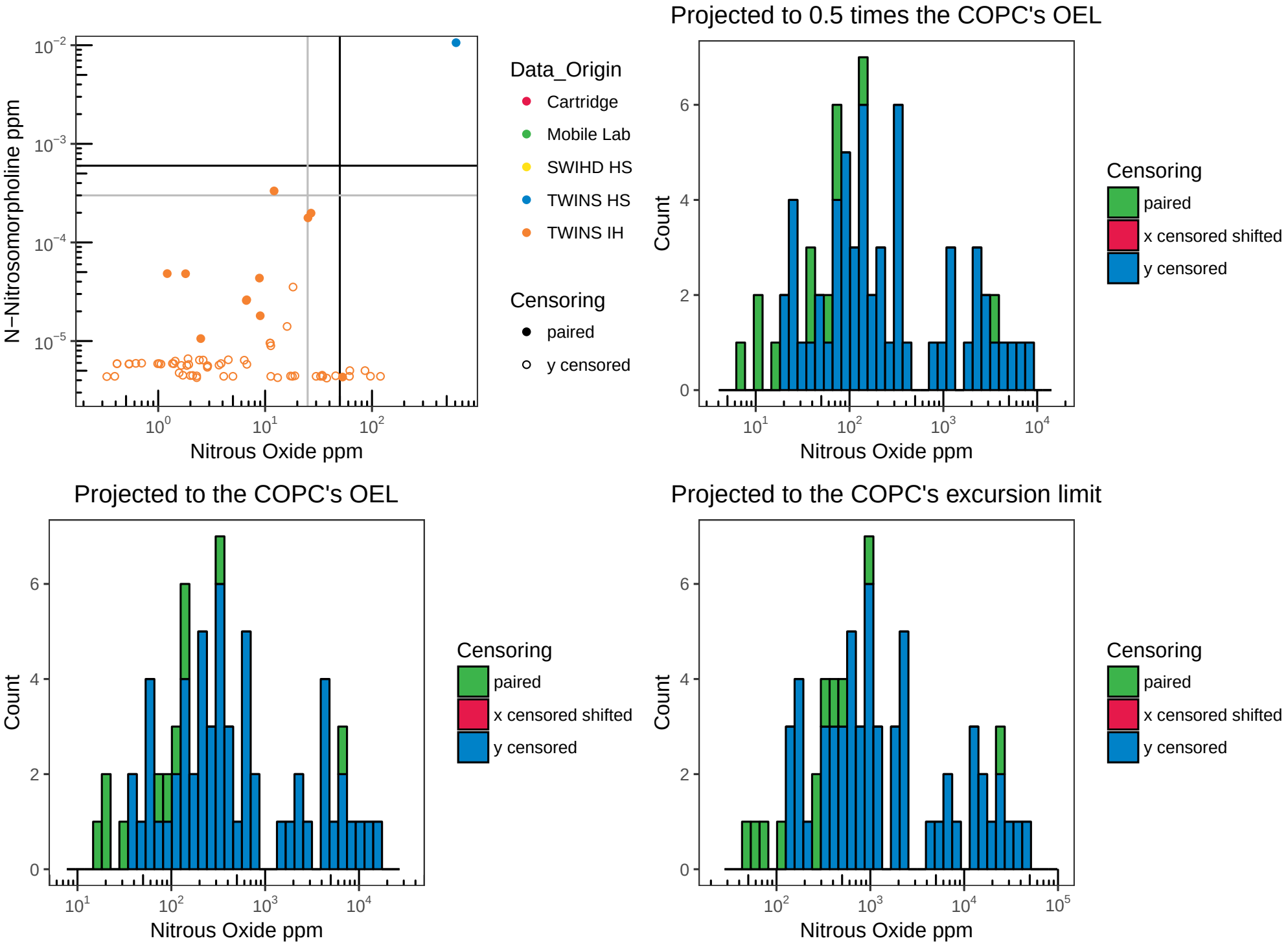


Figure C.106: N-Nitrosomorpholine vs Nitrous Oxide

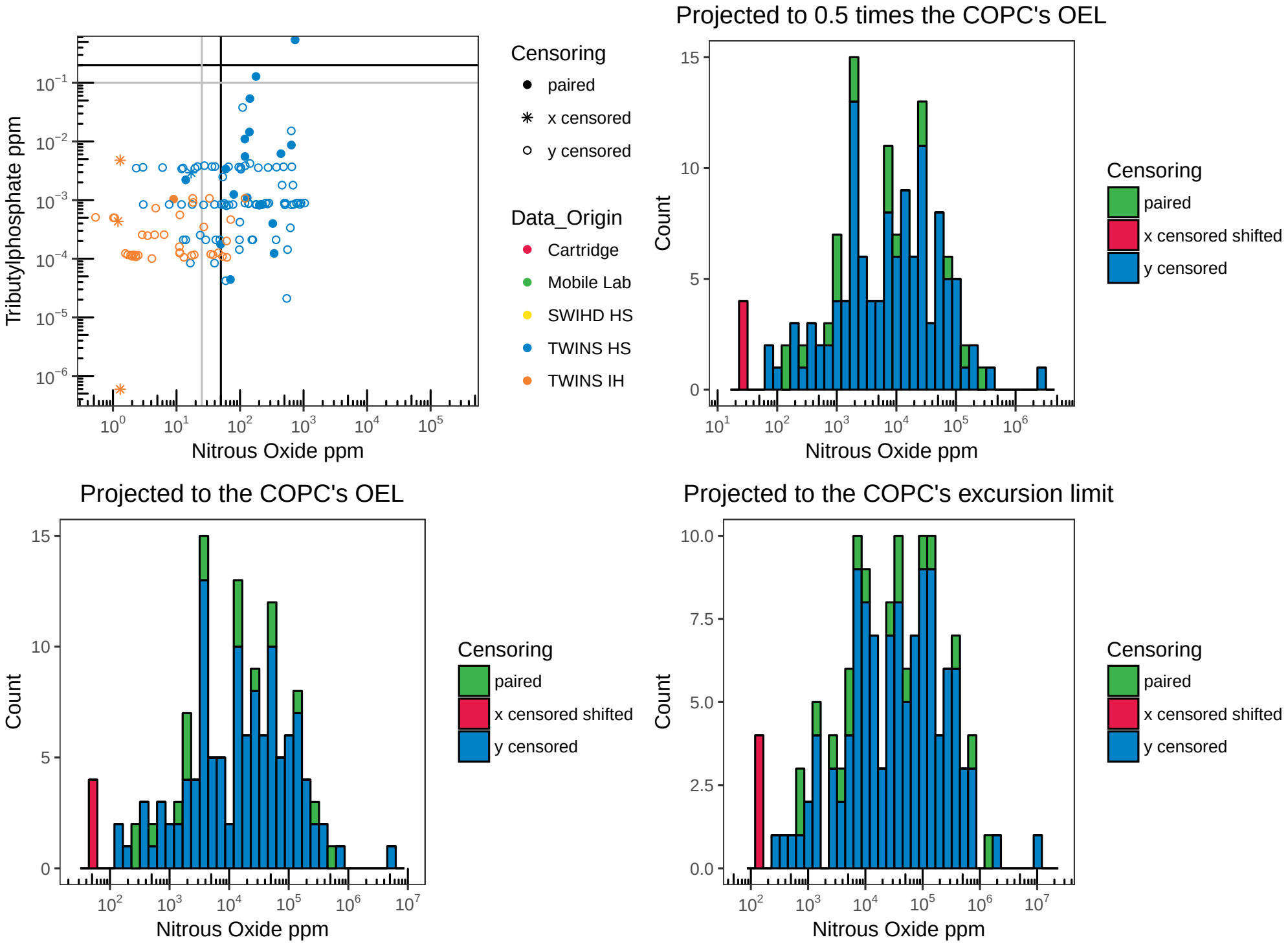


Figure C.107: Tributylphosphate vs Nitrous Oxide

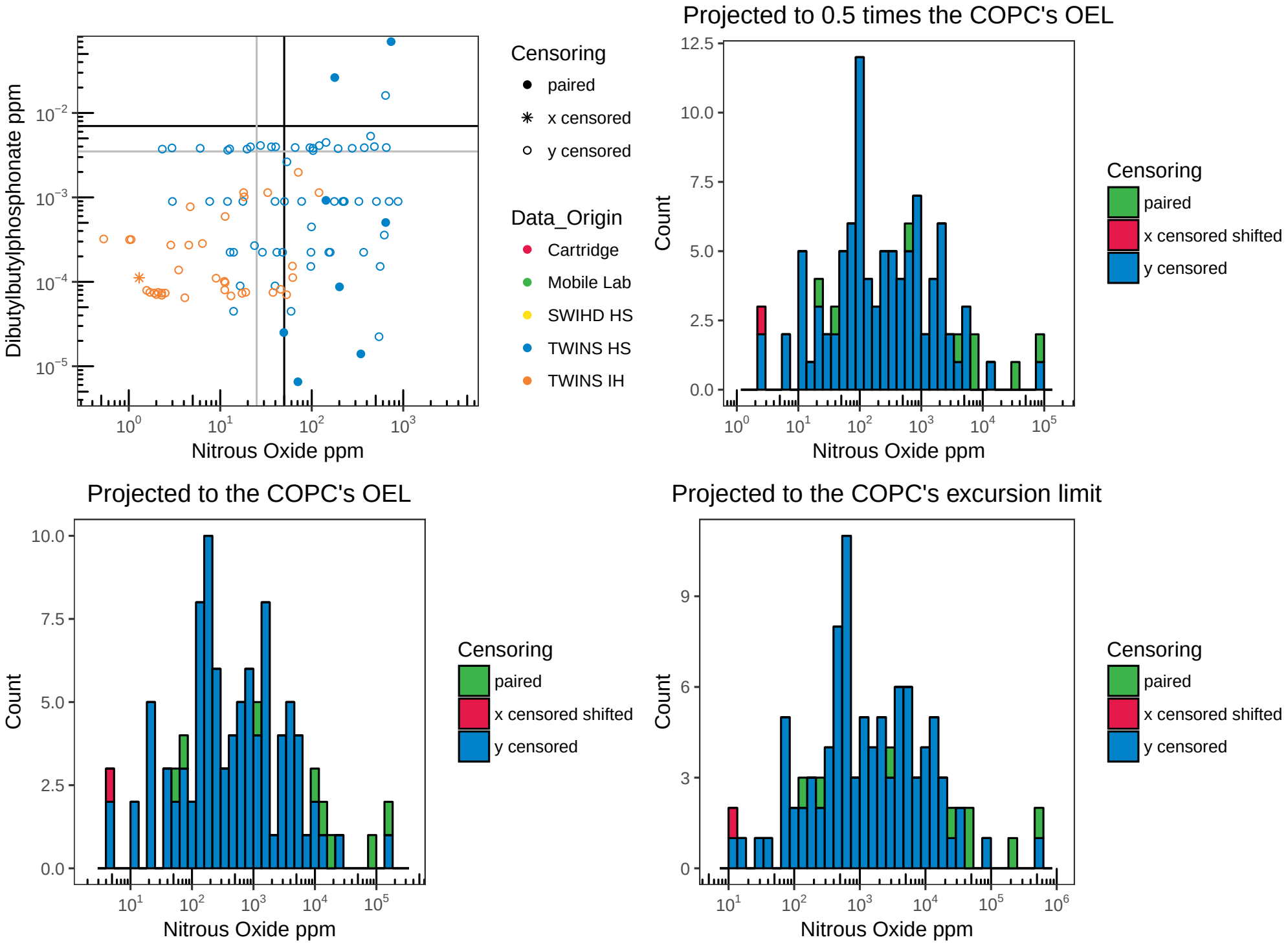


Figure C.108: Dibutylbutylphosphonate vs Nitrous Oxide

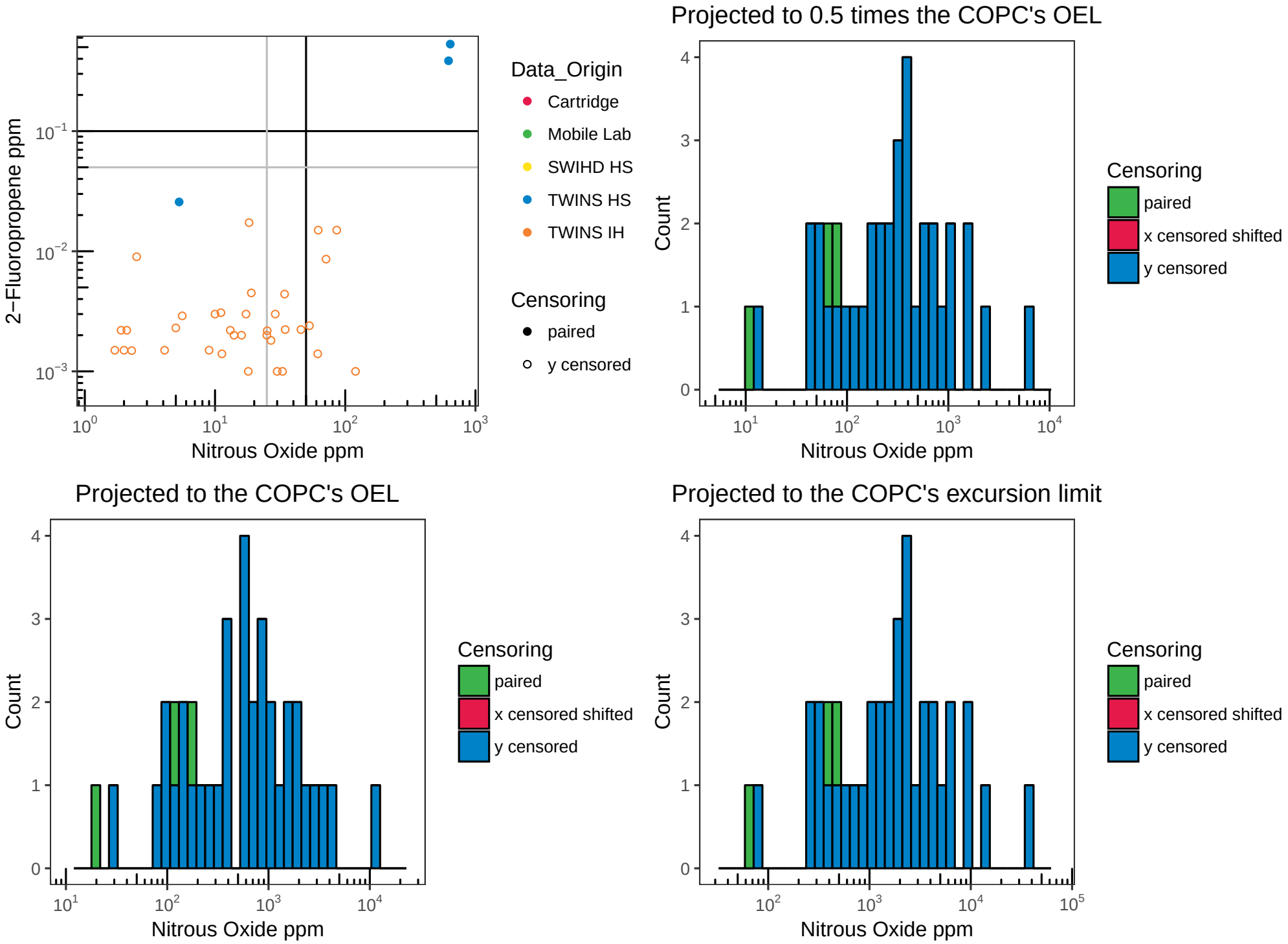


Figure C.109: 2-Fluoropropene vs Nitrous Oxide

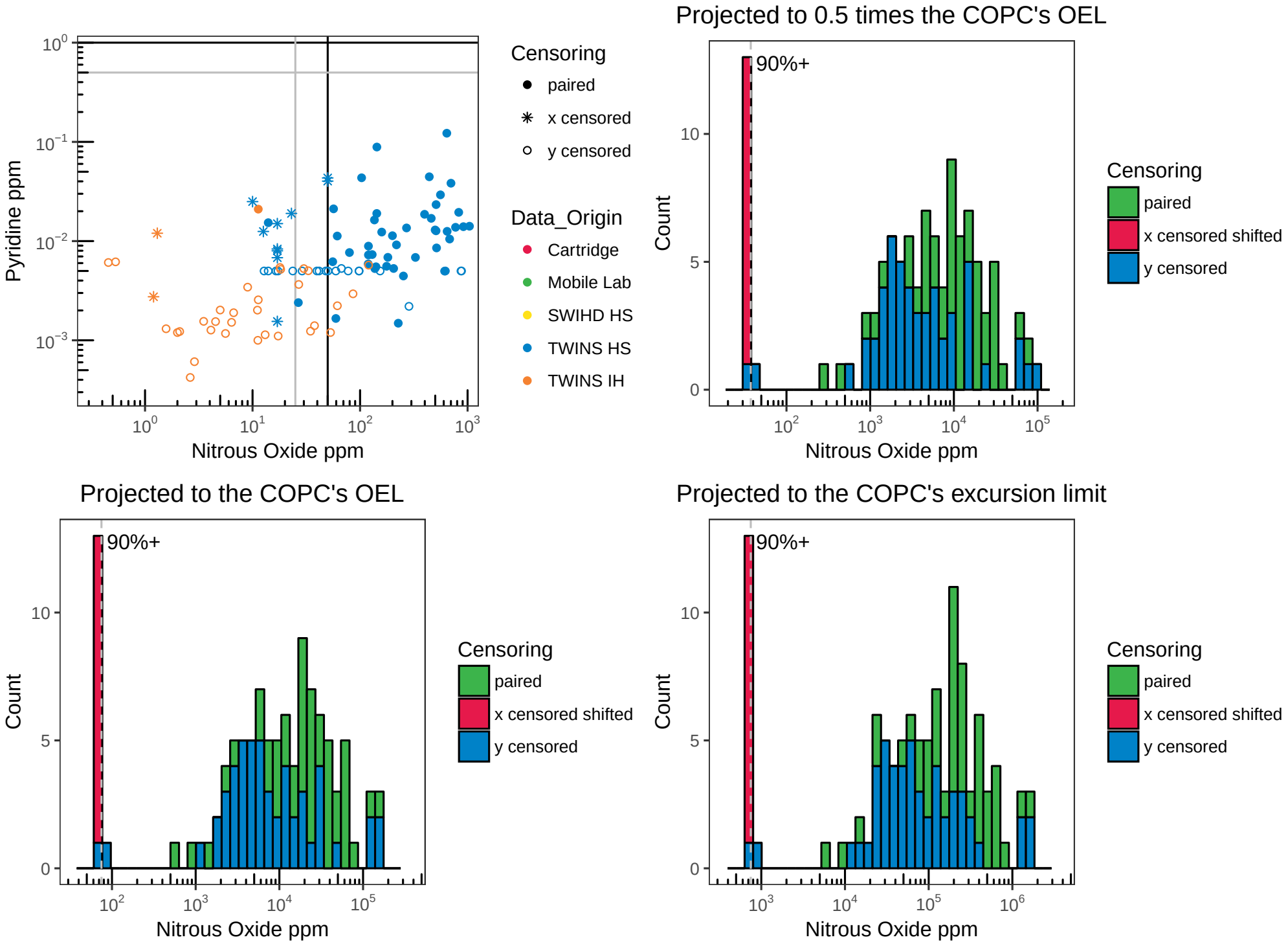


Figure C.110: Pyridine vs Nitrous Oxide

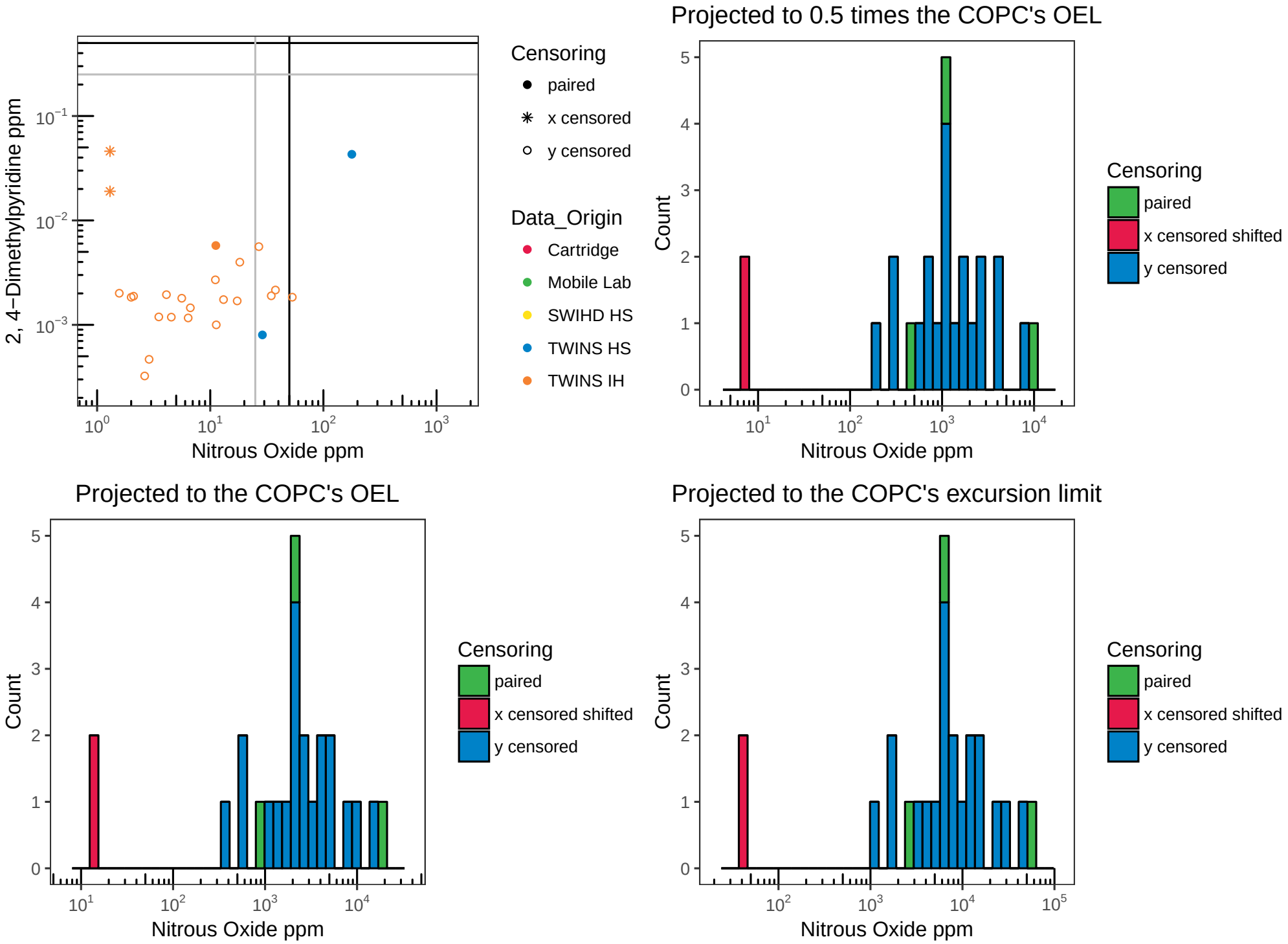


Figure C.111: 2, 4-Dimethylpyridine vs Nitrous Oxide

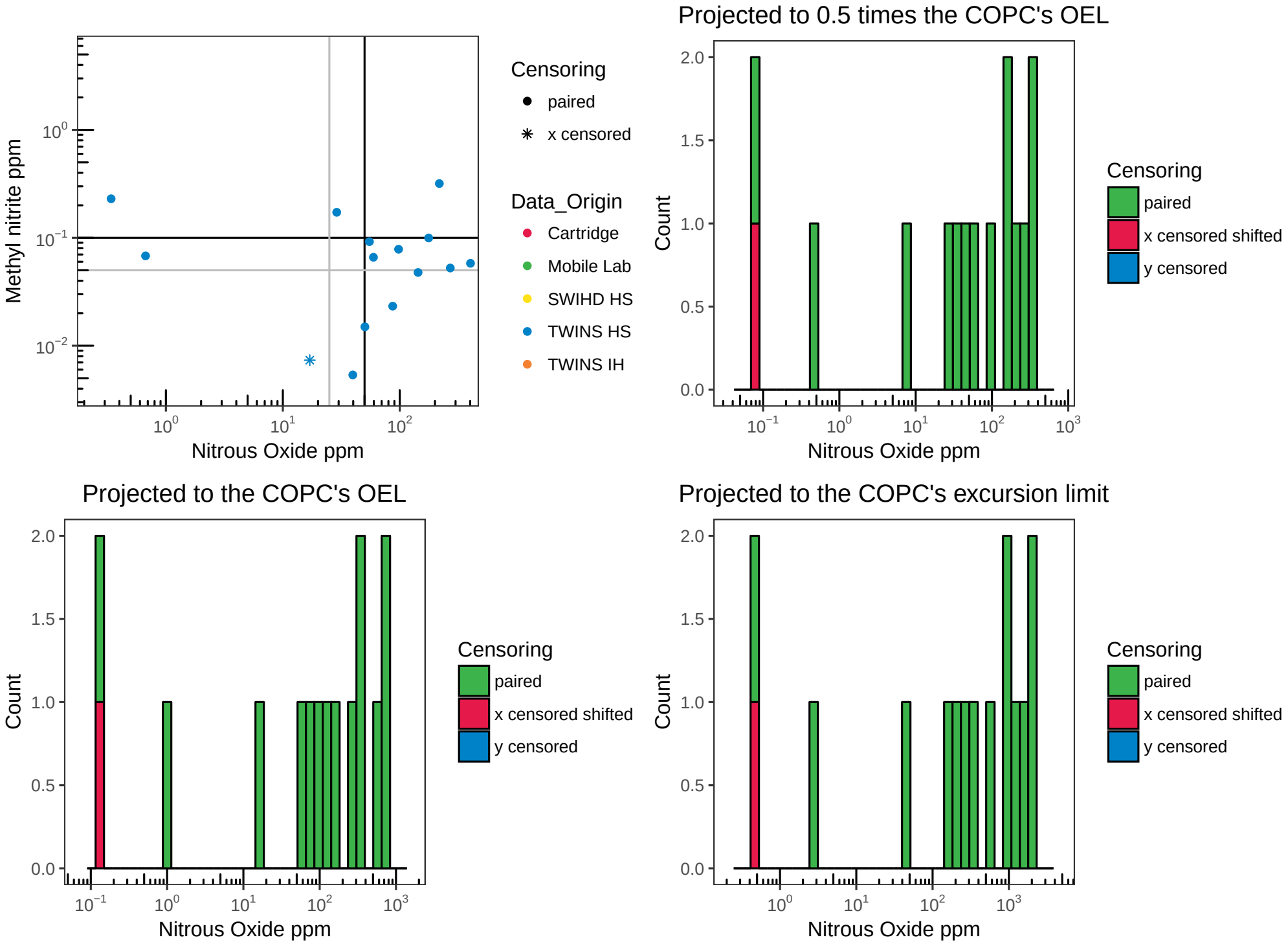


Figure C.112: Methyl nitrite vs Nitrous Oxide

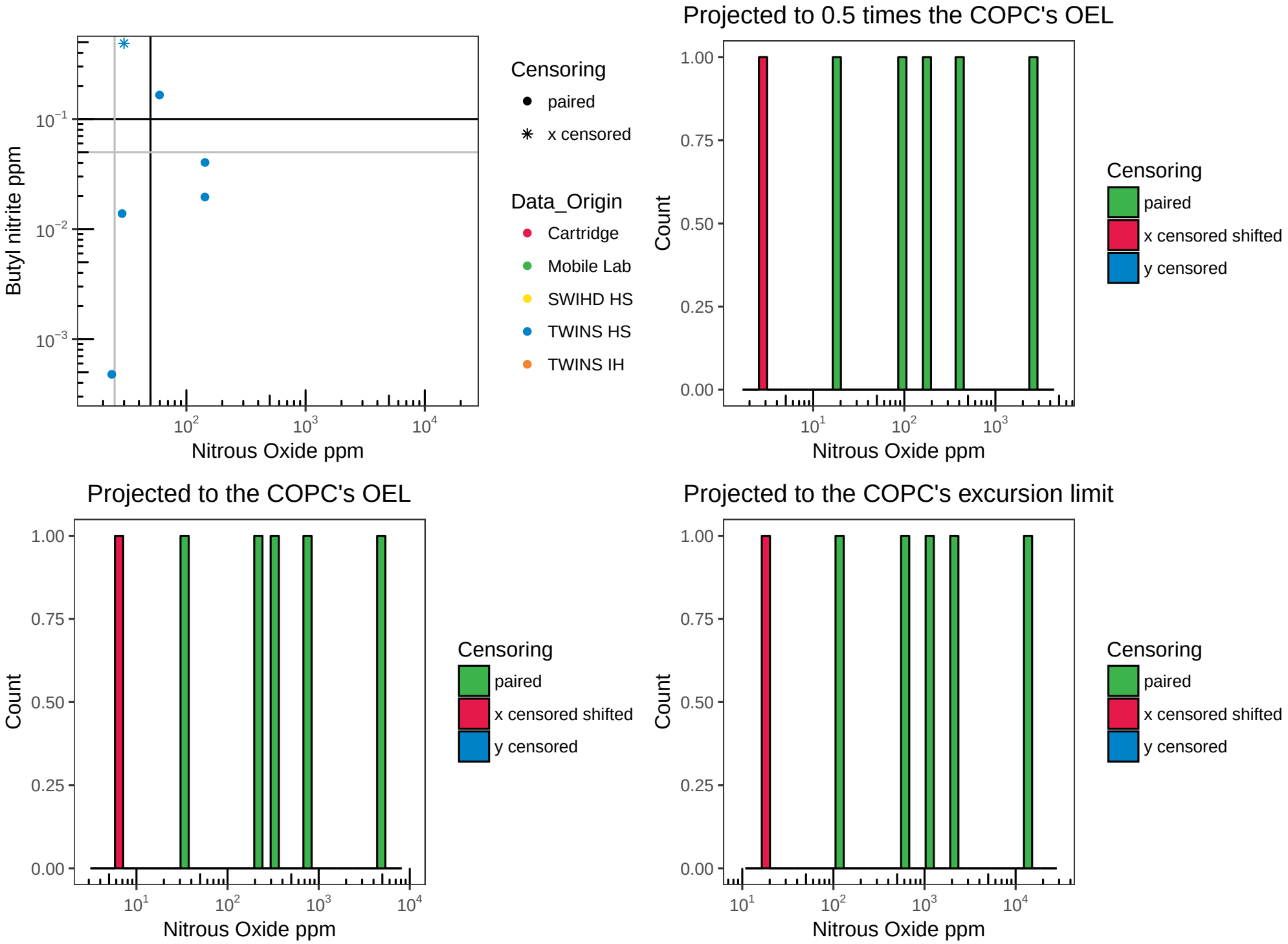


Figure C.113: Butyl nitrite vs Nitrous Oxide

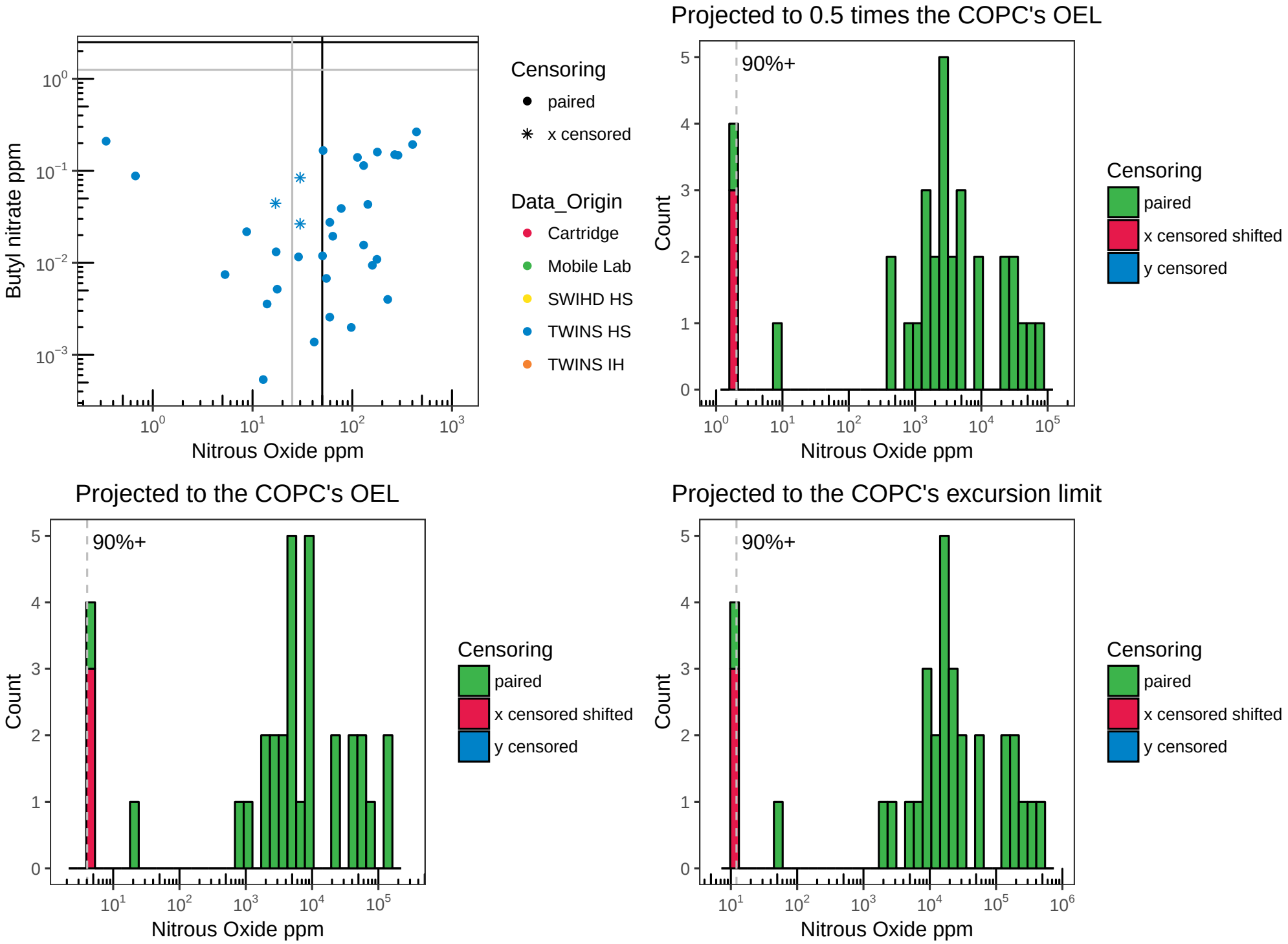


Figure C.114: Butyl nitrate vs Nitrous Oxide

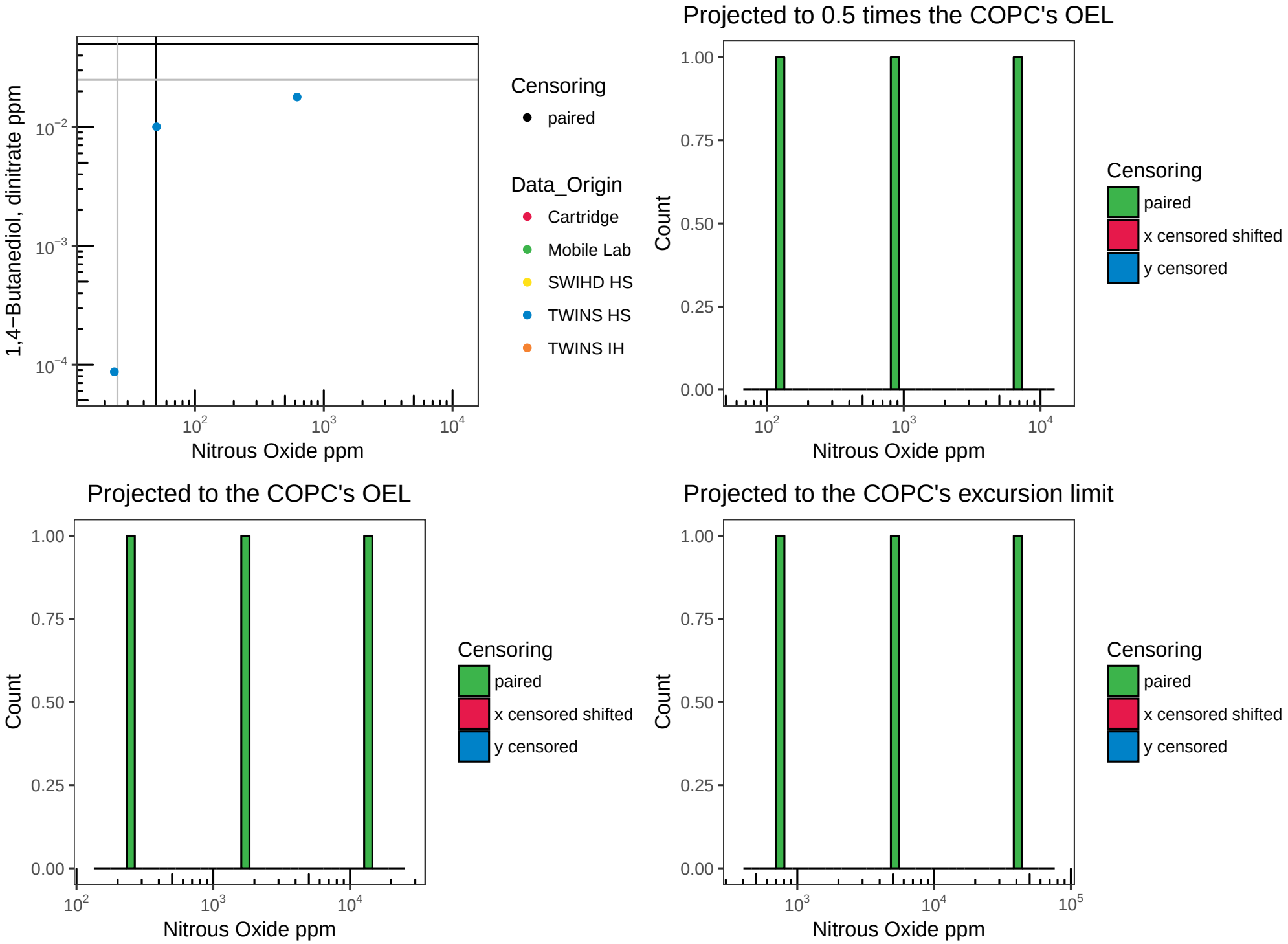


Figure C.115: 1,4-Butanediol, dinitrate vs Nitrous Oxide

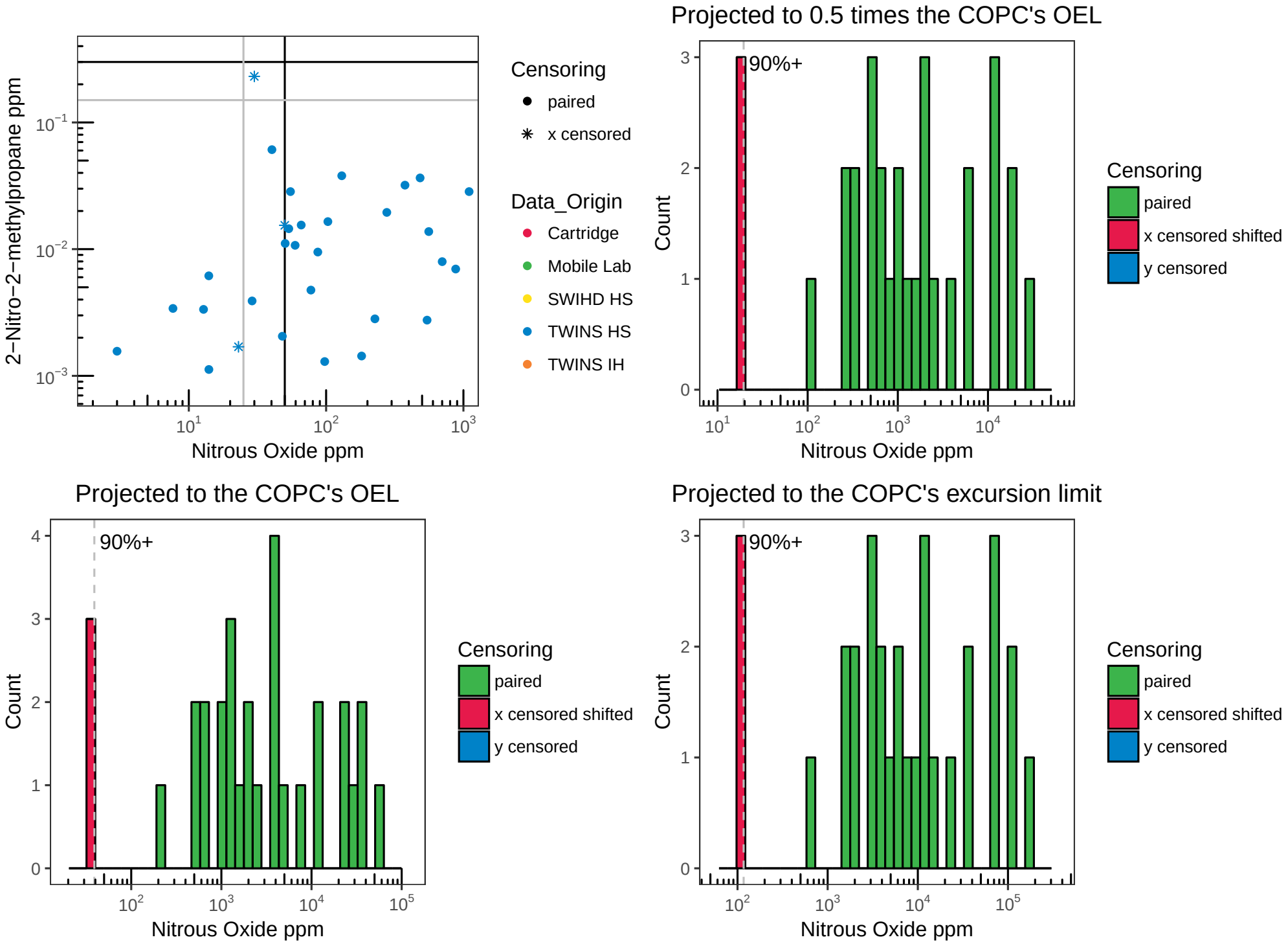


Figure C.116: 2-Nitro-2-methylpropane vs Nitrous Oxide

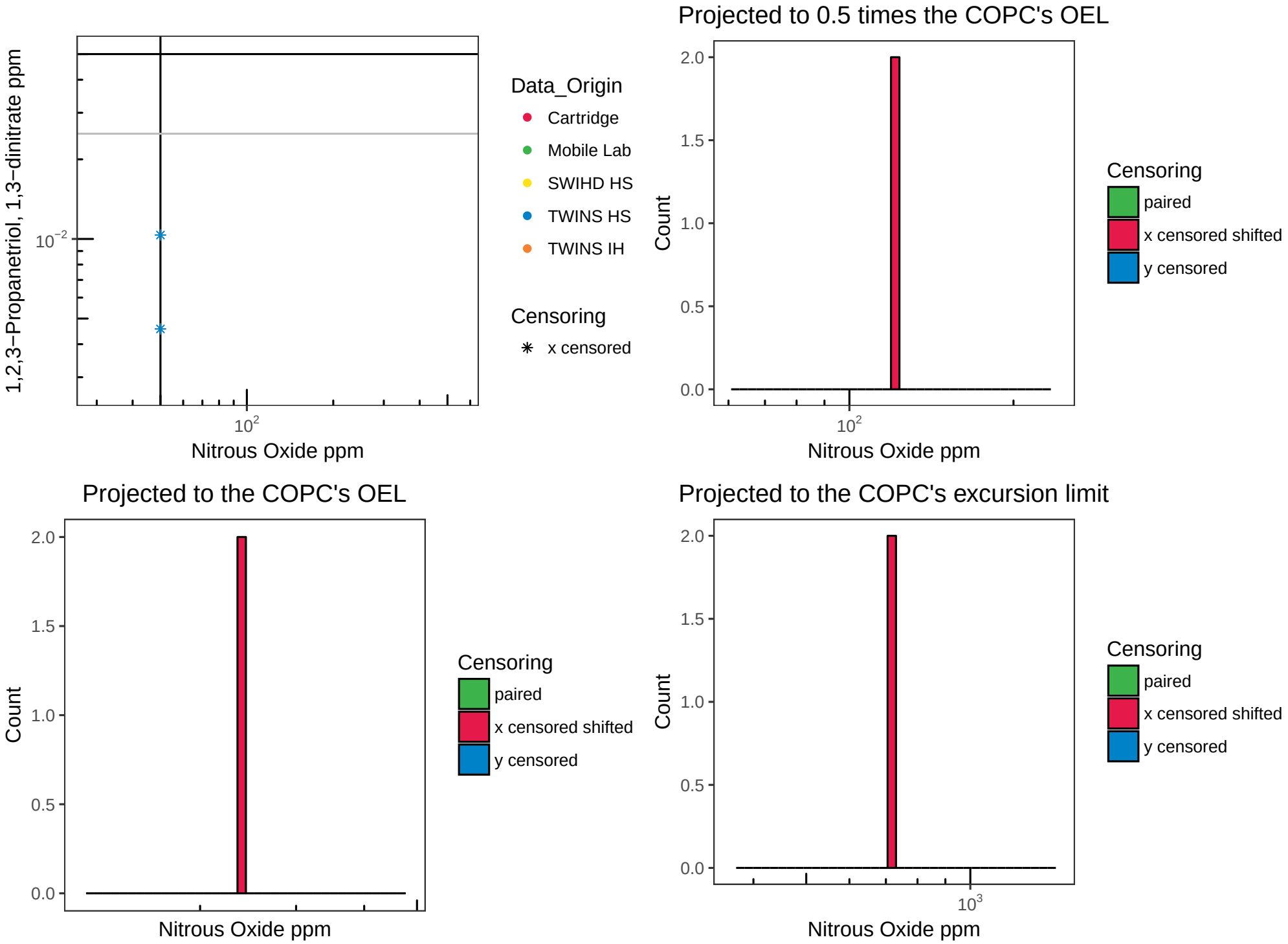


Figure C.117: 1,2,3-Propanetriol, 1,3-dinitrate vs Nitrous Oxide

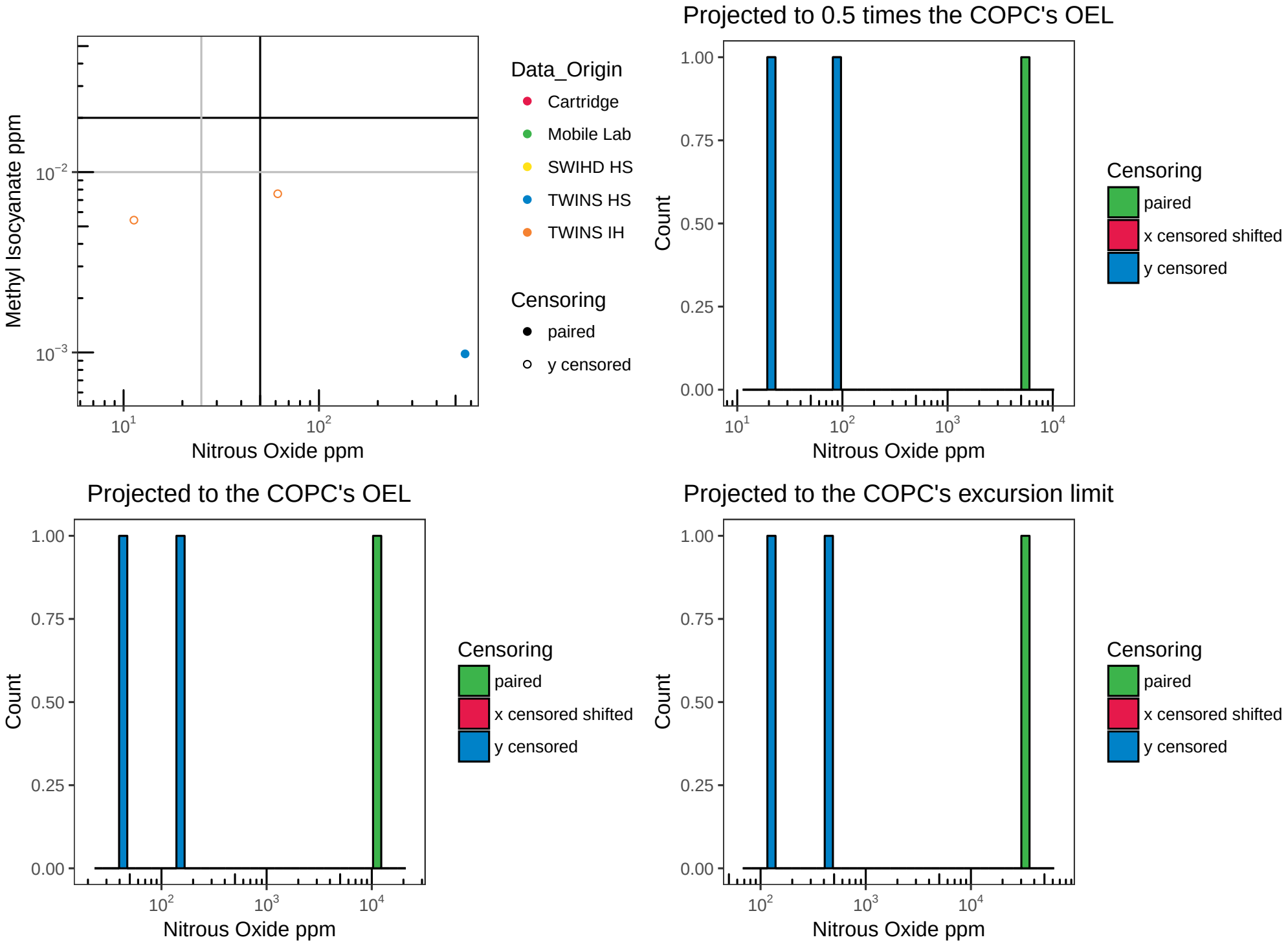


Figure C.118: Methyl Isocyanate vs Nitrous Oxide

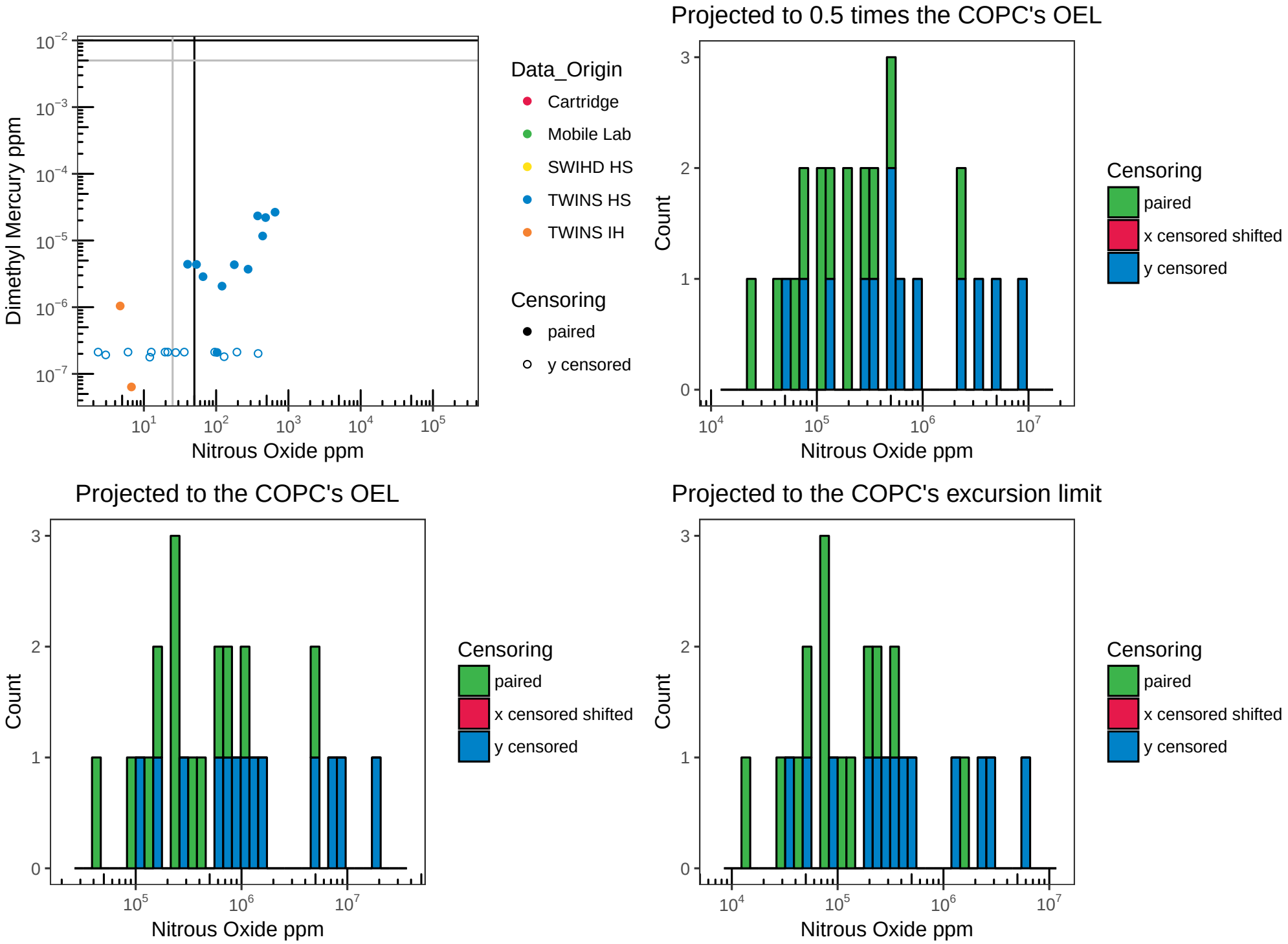


Figure C.119: Dimethyl Mercury vs Nitrous Oxide

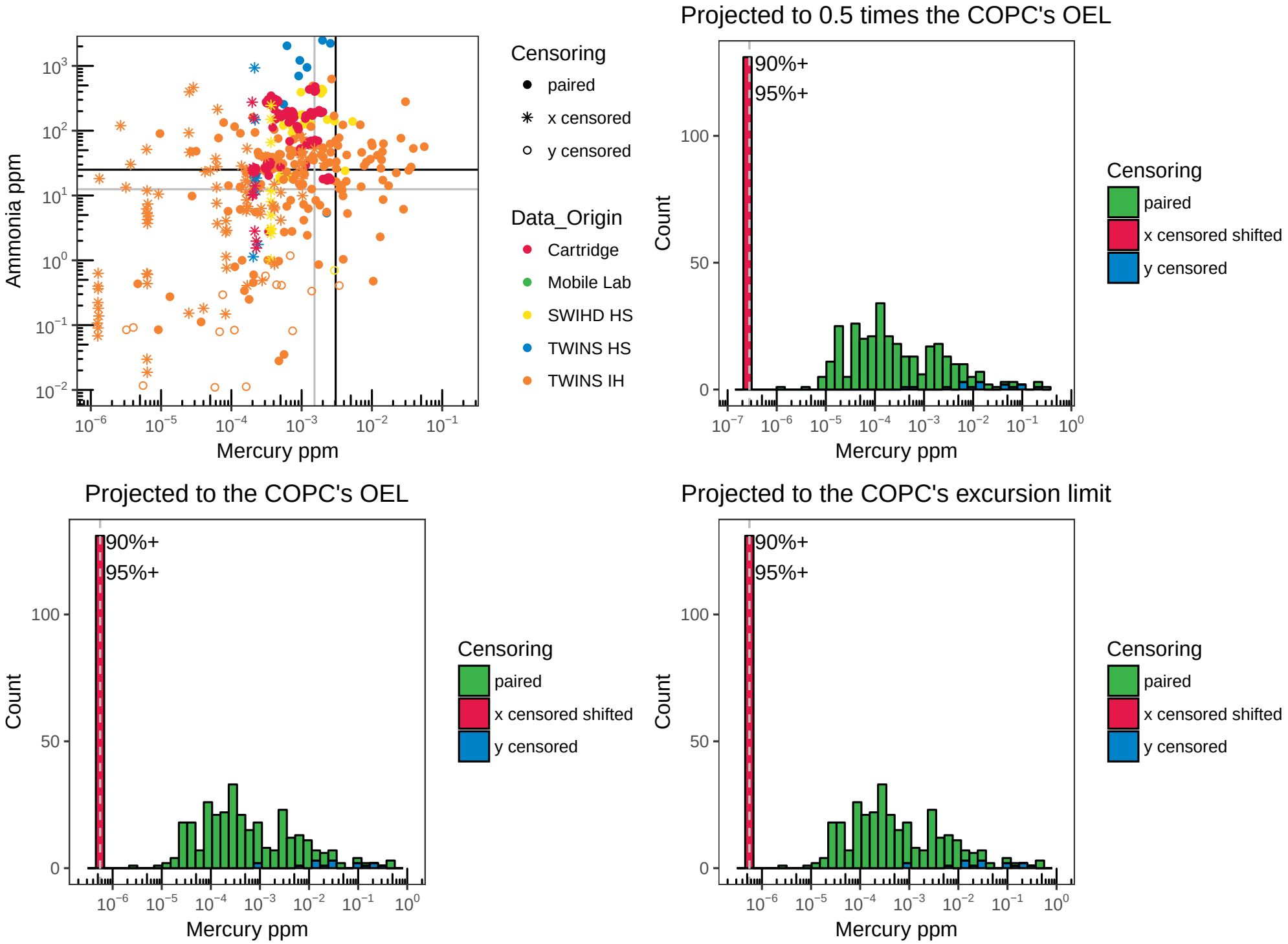


Figure C.120: Ammonia vs Mercury

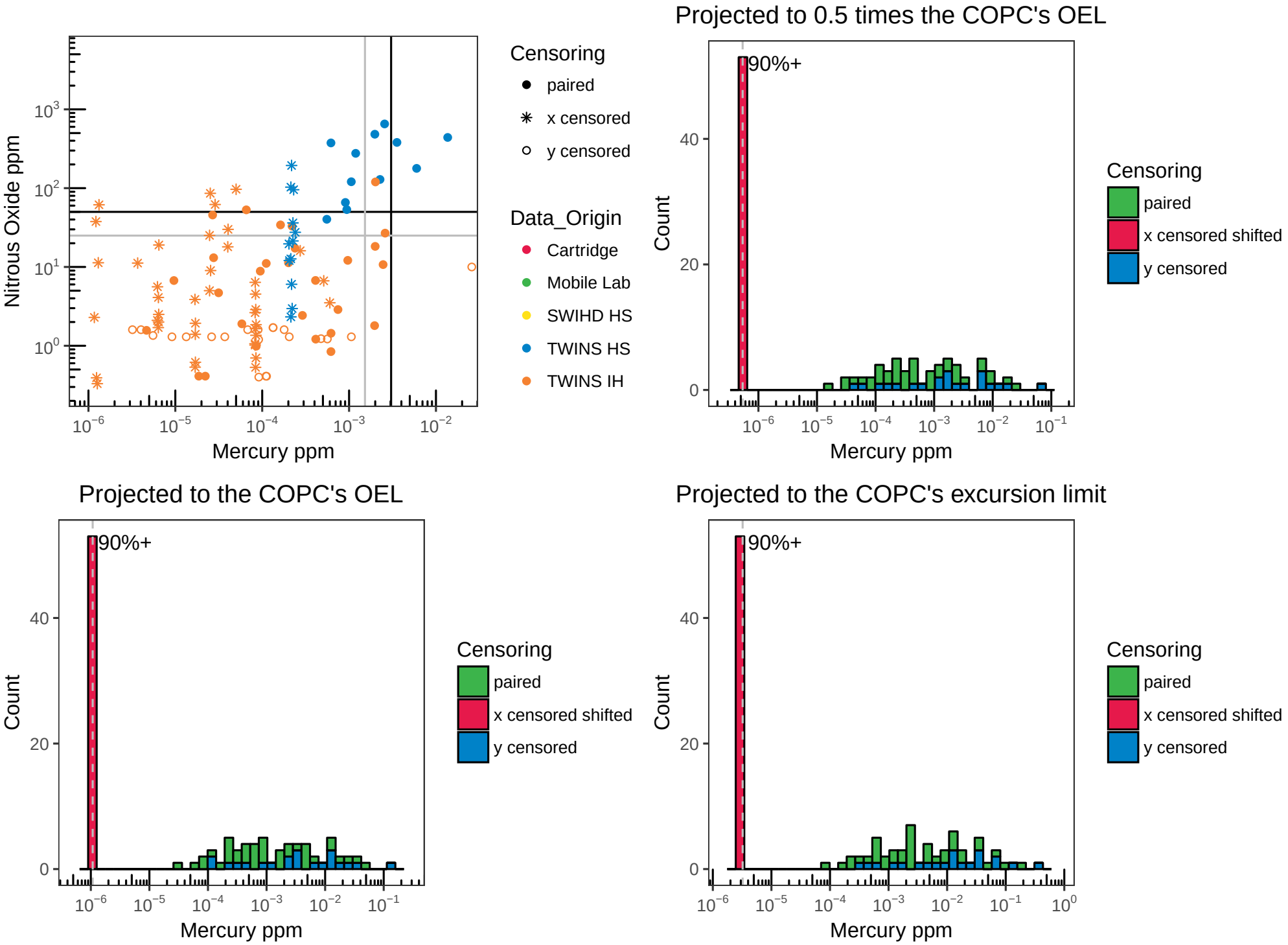


Figure C.121: Nitrous Oxide vs Mercury

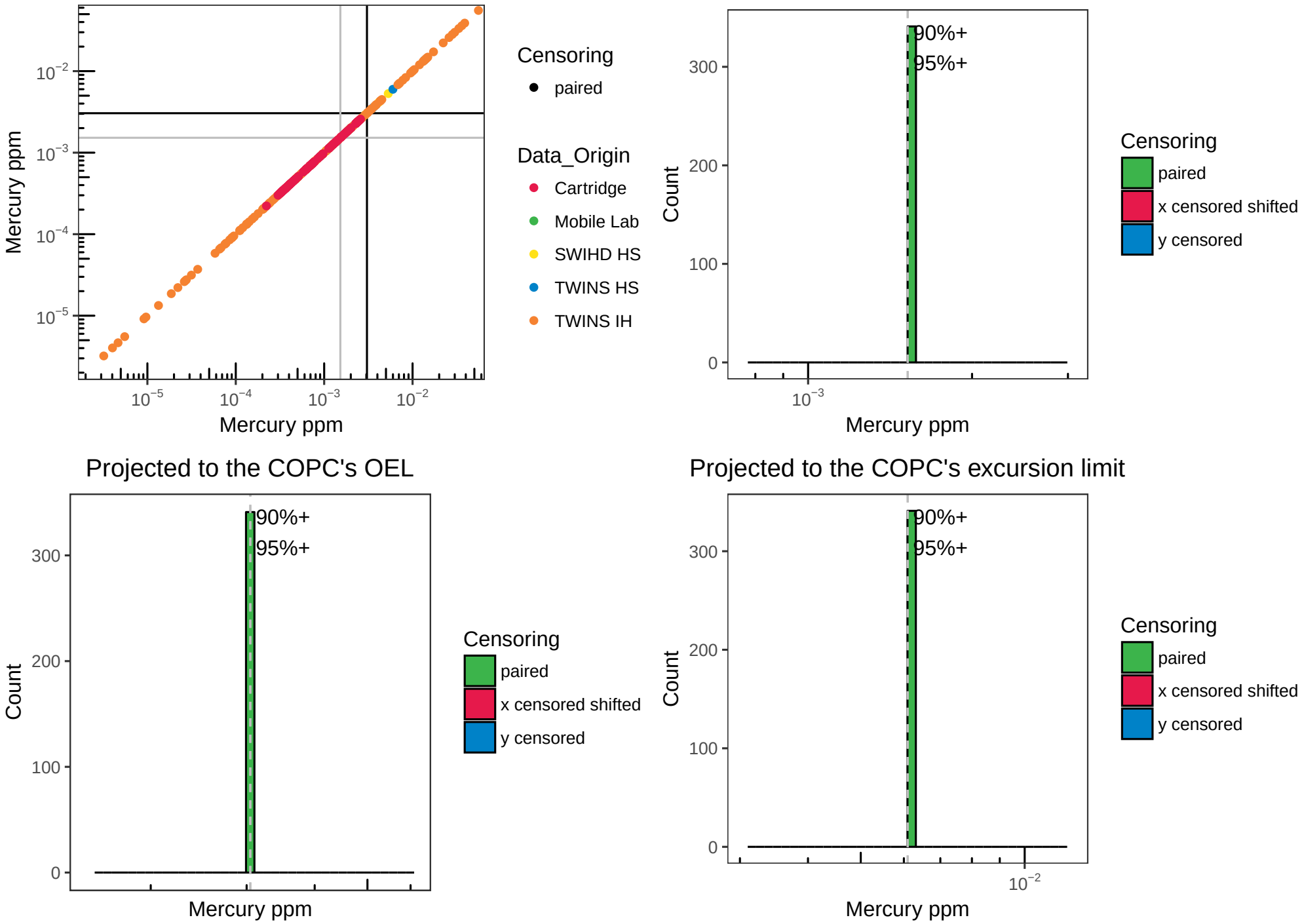


Figure C.122: Mercury vs Mercury

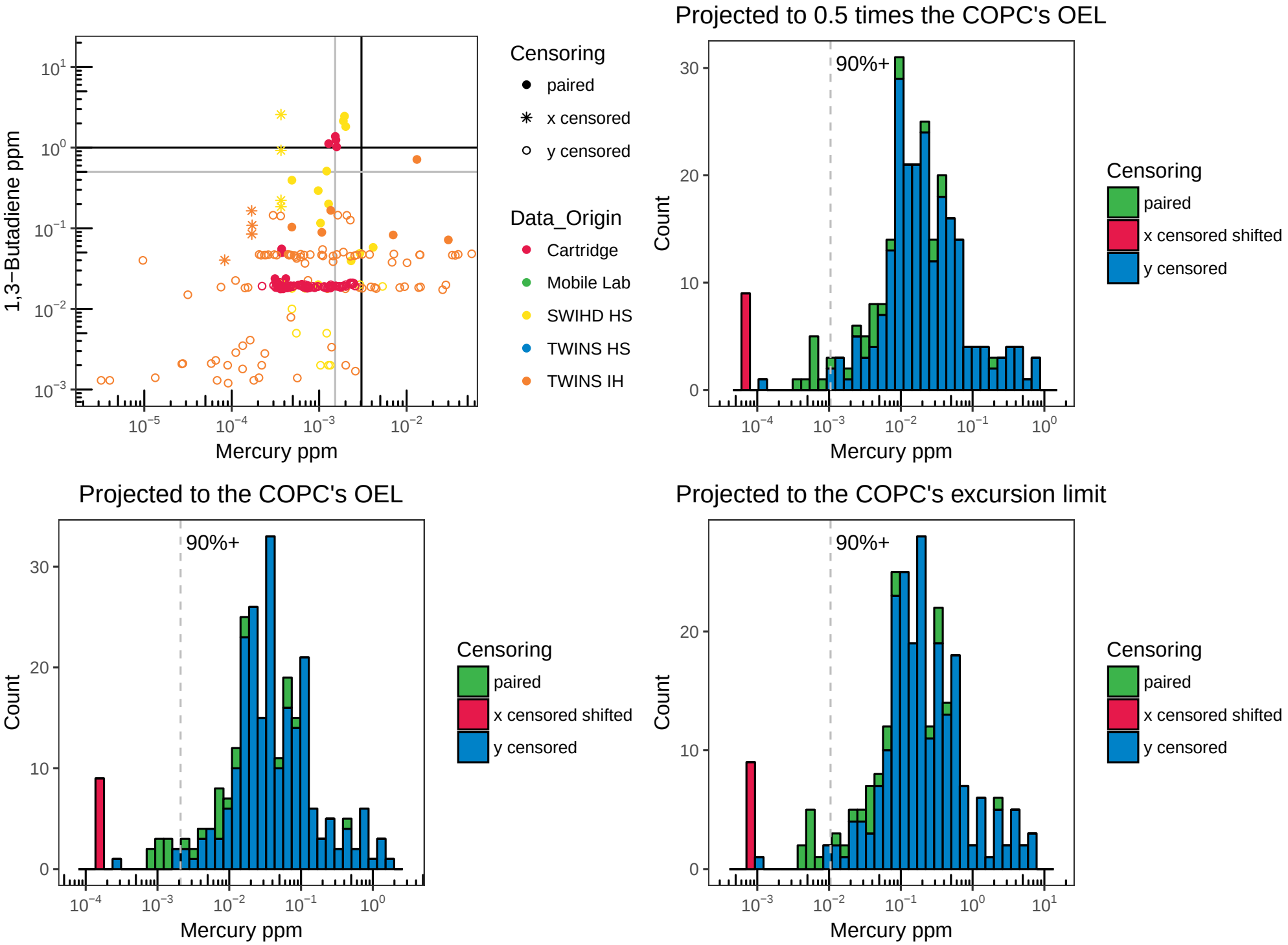


Figure C.123: 1,3-Butadiene vs Mercury

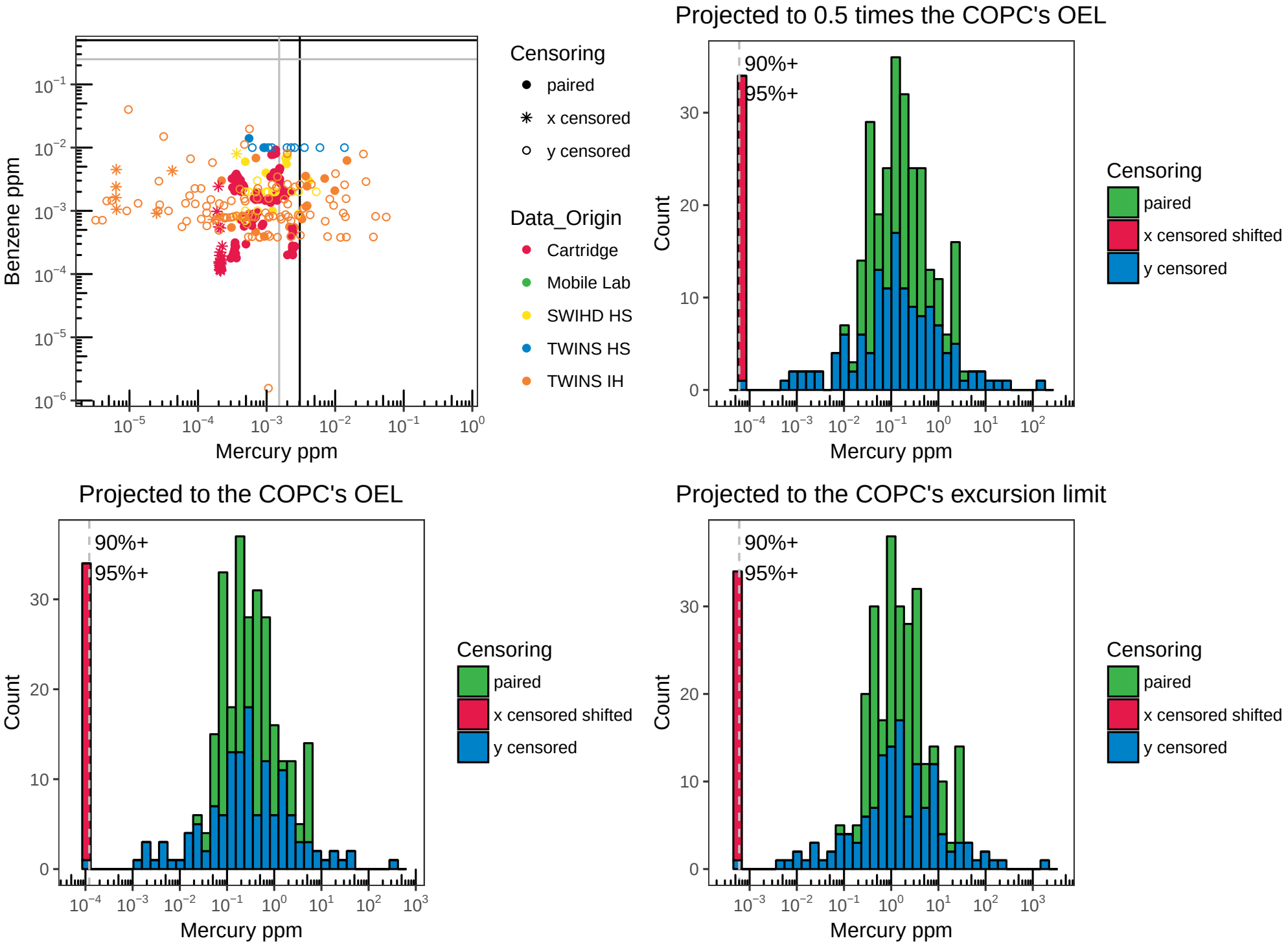


Figure C.124: Benzene vs Mercury

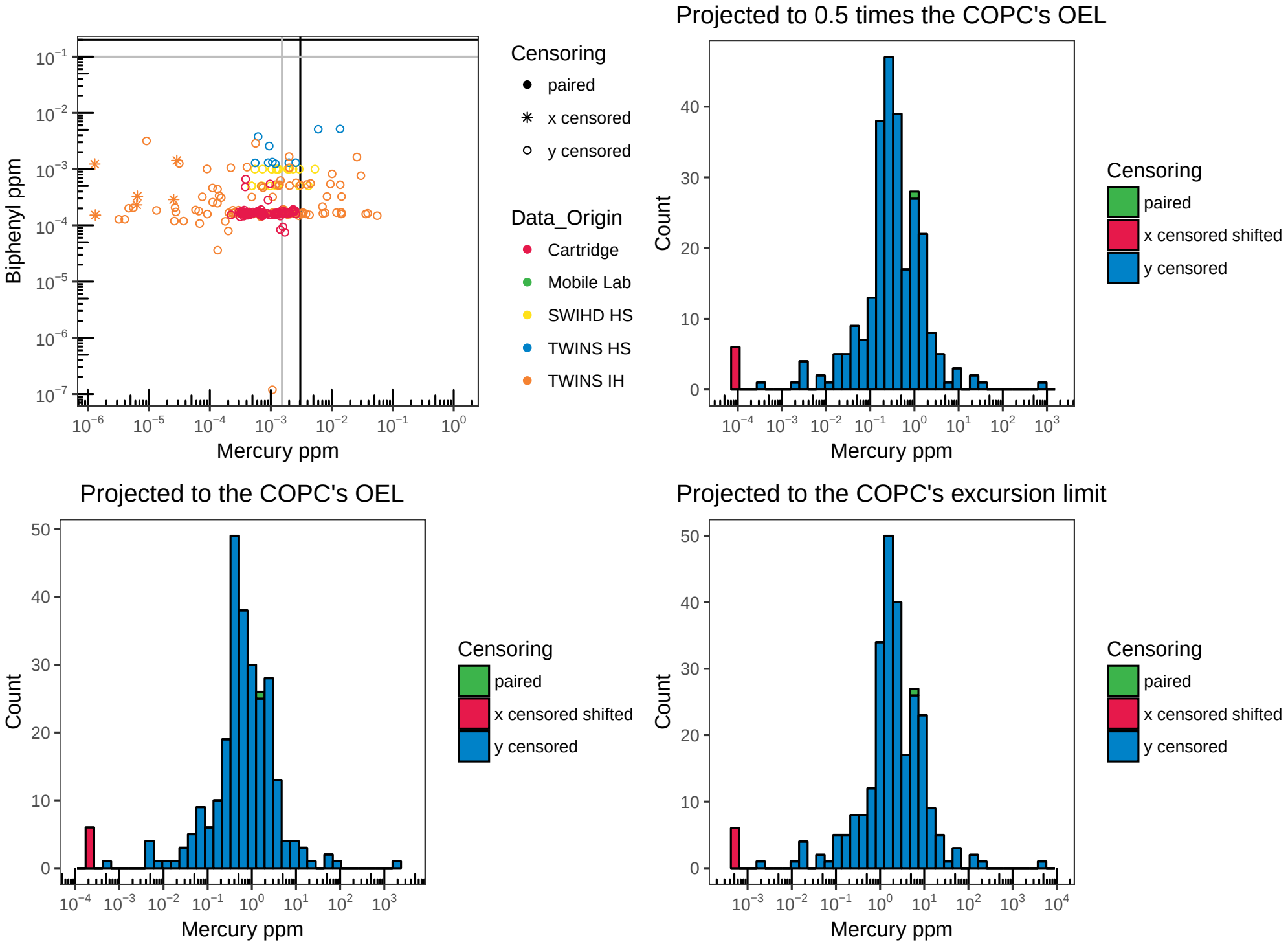


Figure C.125: Biphenyl vs Mercury

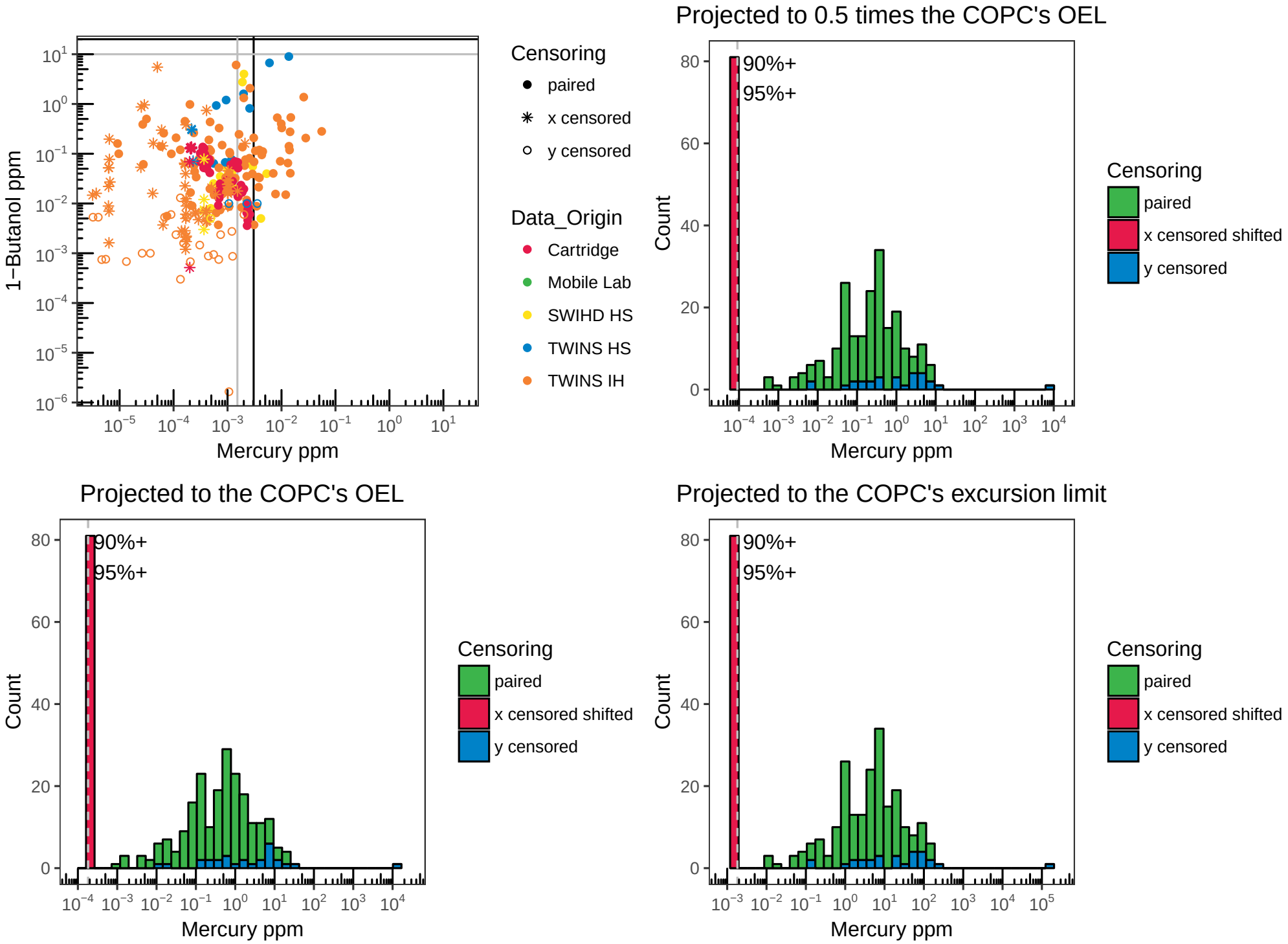


Figure C.126: 1-Butanol vs Mercury

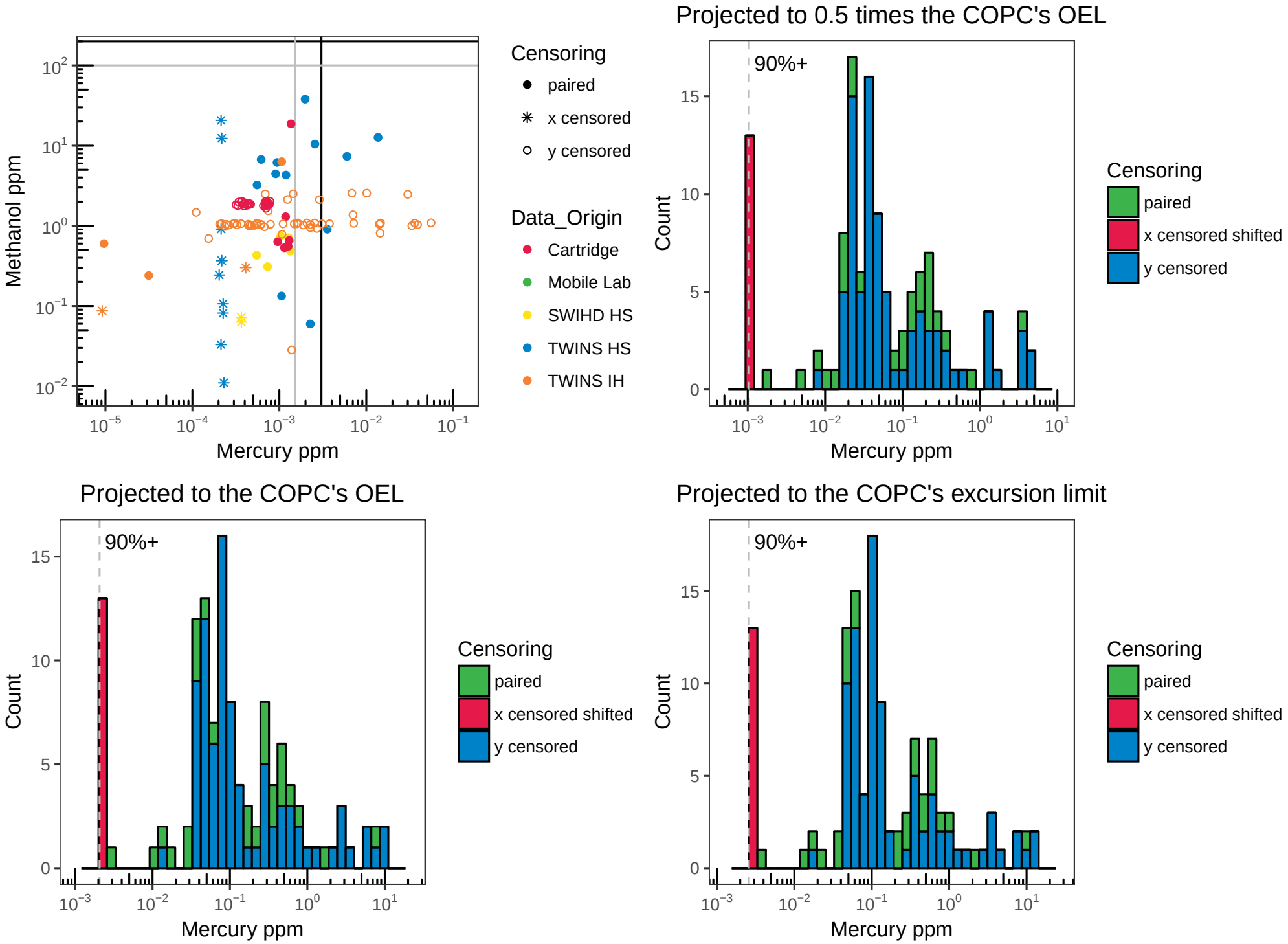


Figure C.127: Methanol vs Mercury

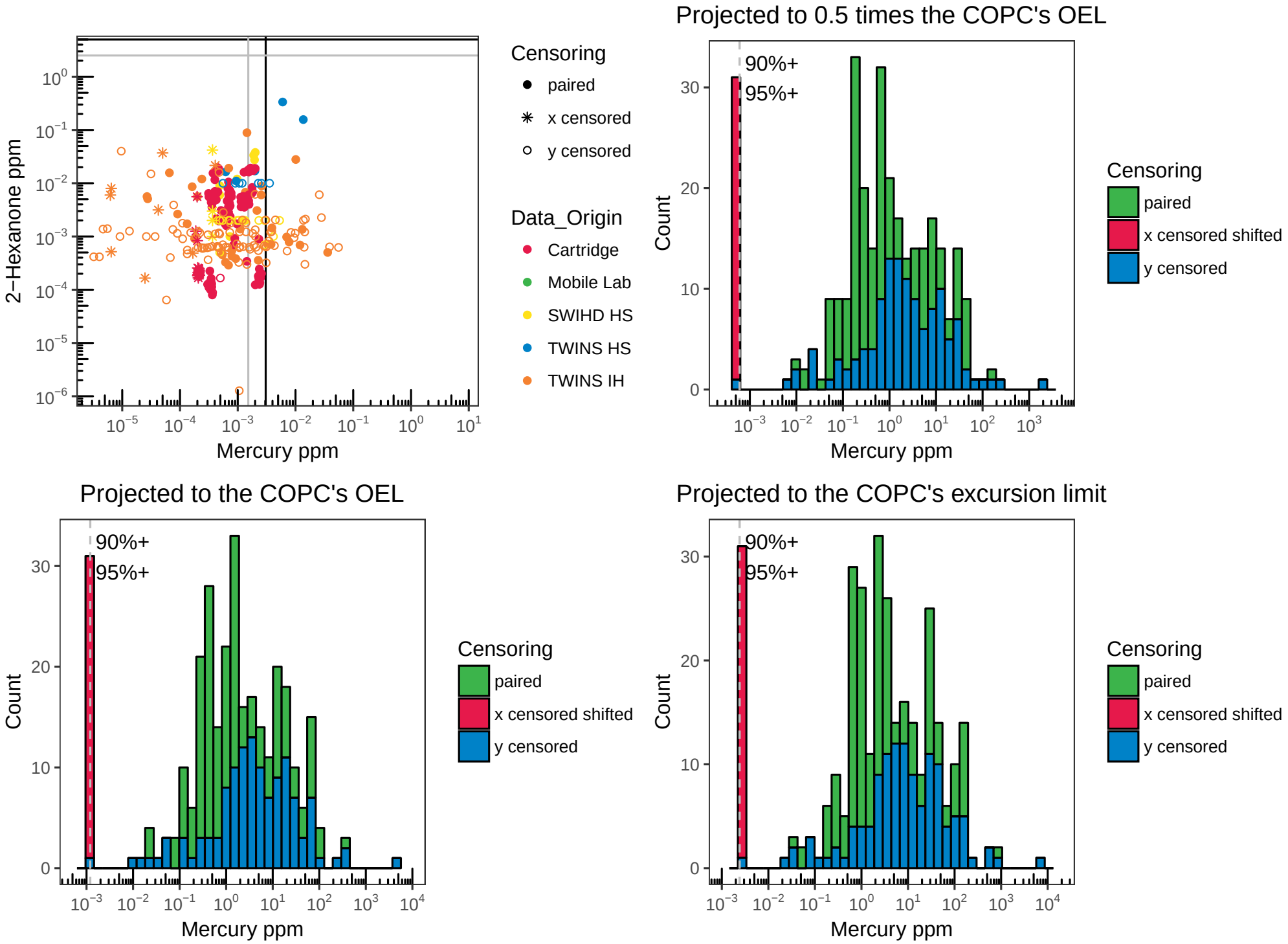


Figure C.128: 2-Hexanone vs Mercury

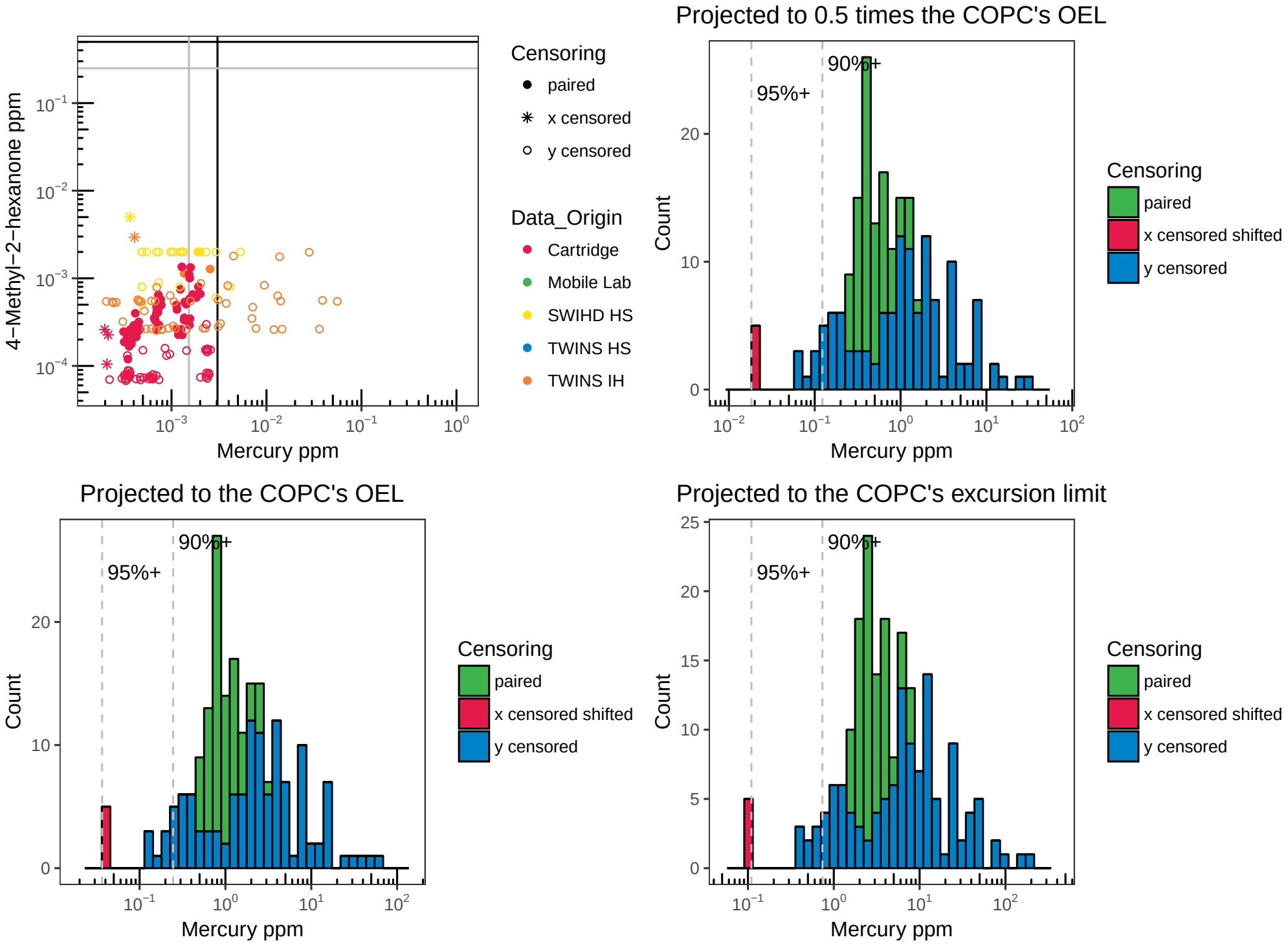


Figure C.129: 4-Methyl-2-hexanone vs Mercury

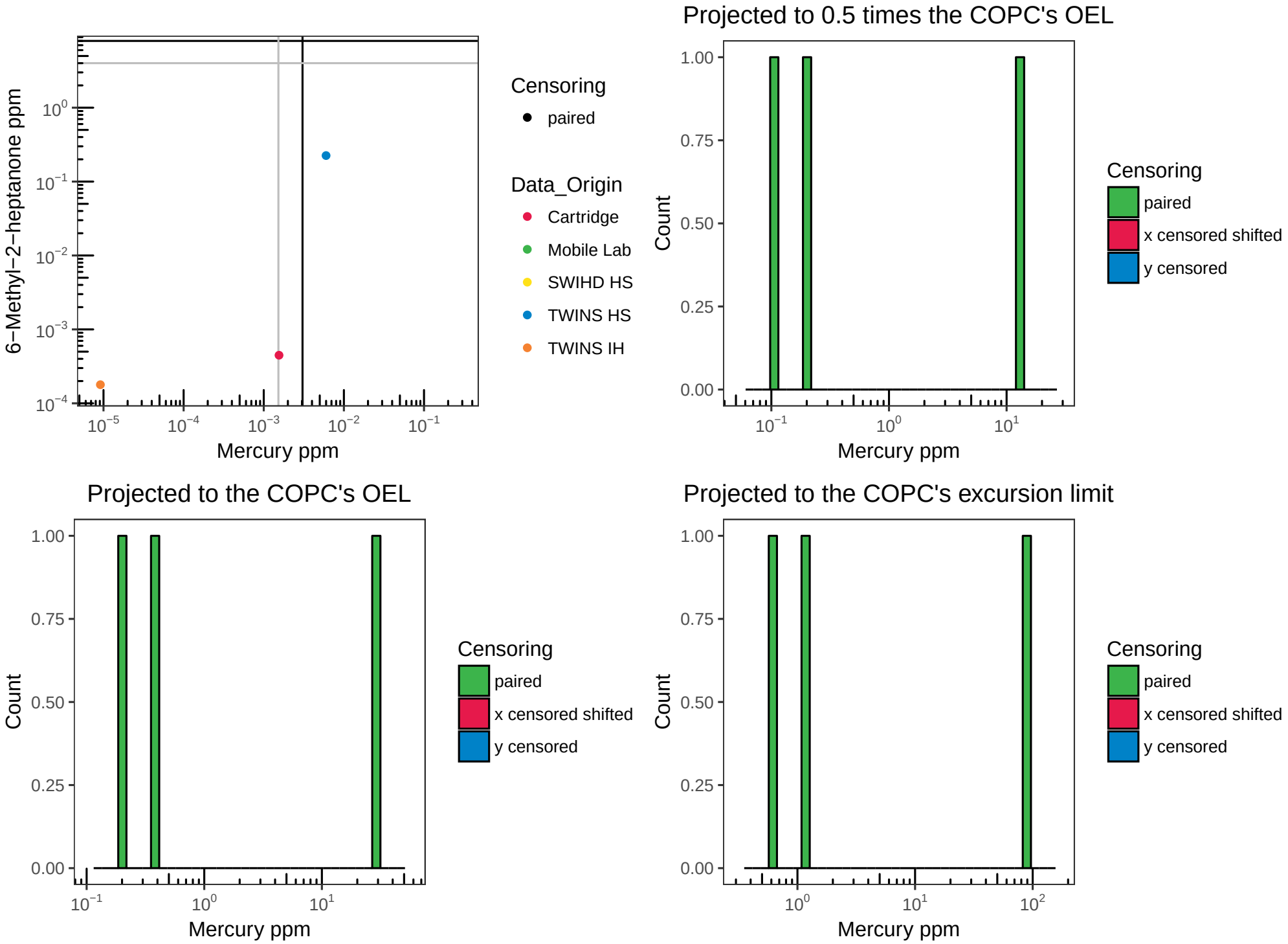


Figure C.130: 6-Methyl-2-heptanone vs Mercury

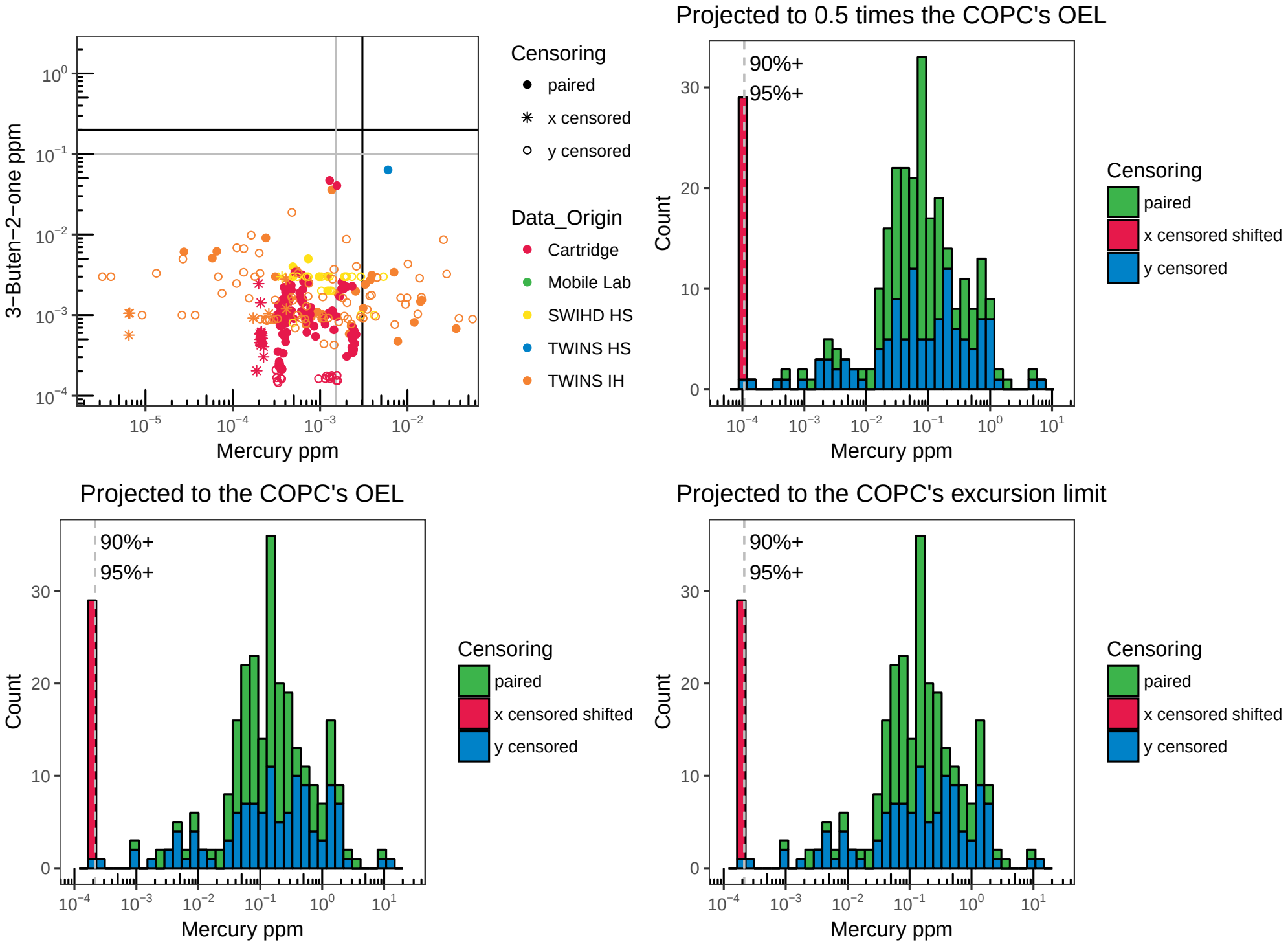


Figure C.131: 3-Buten-2-one vs Mercury

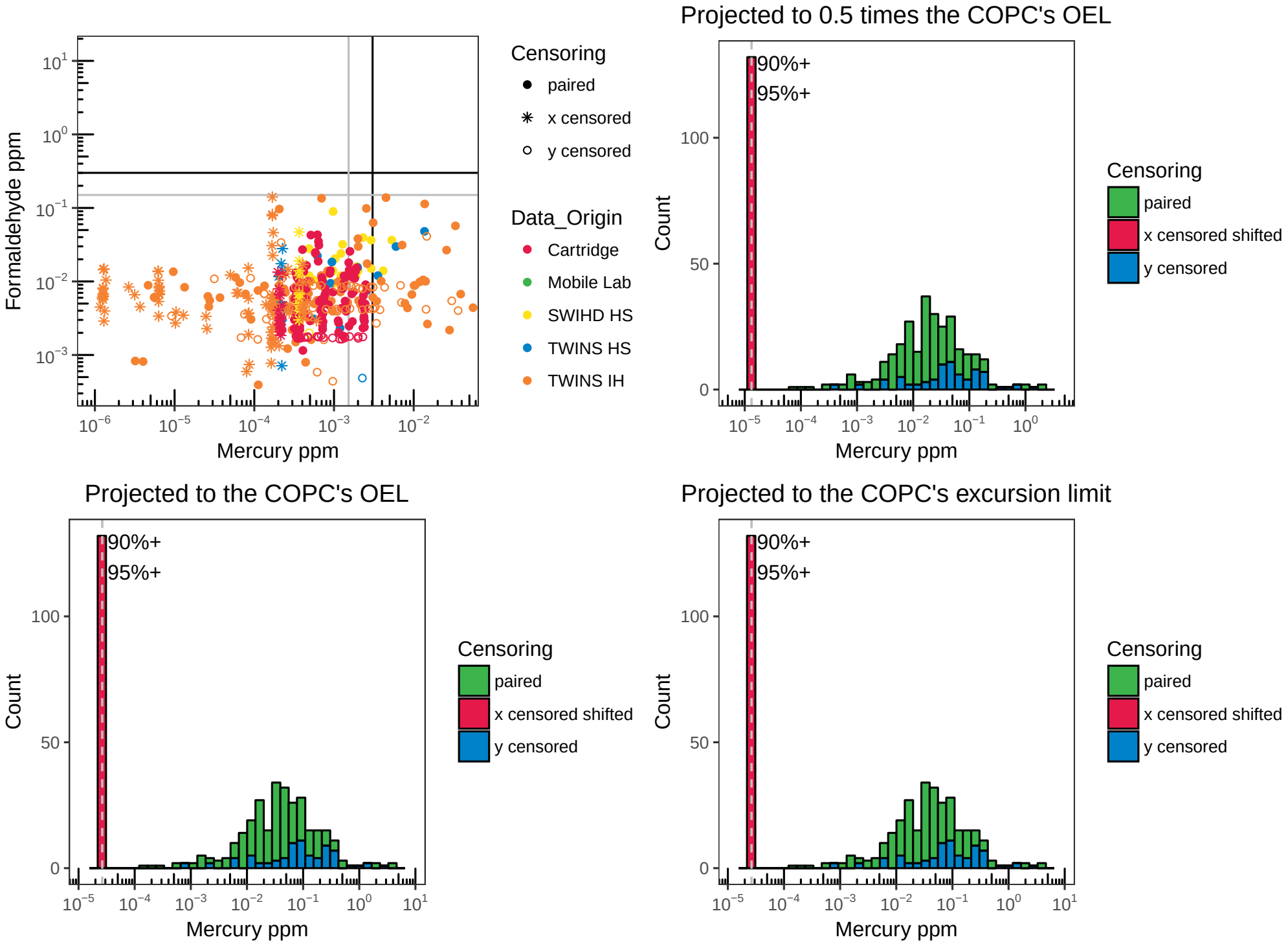


Figure C.132: Formaldehyde vs Mercury

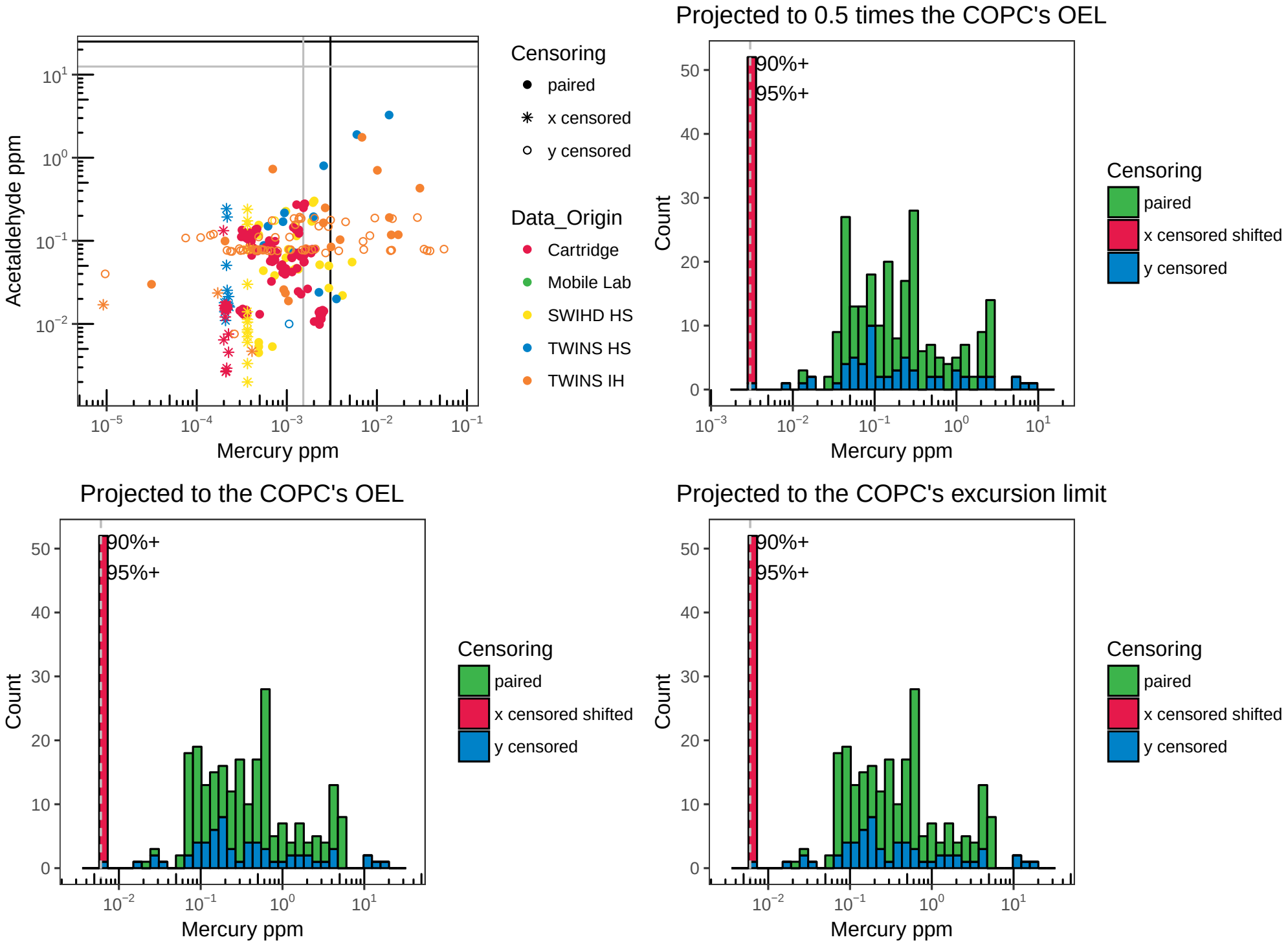


Figure C.133: Acetaldehyde vs Mercury

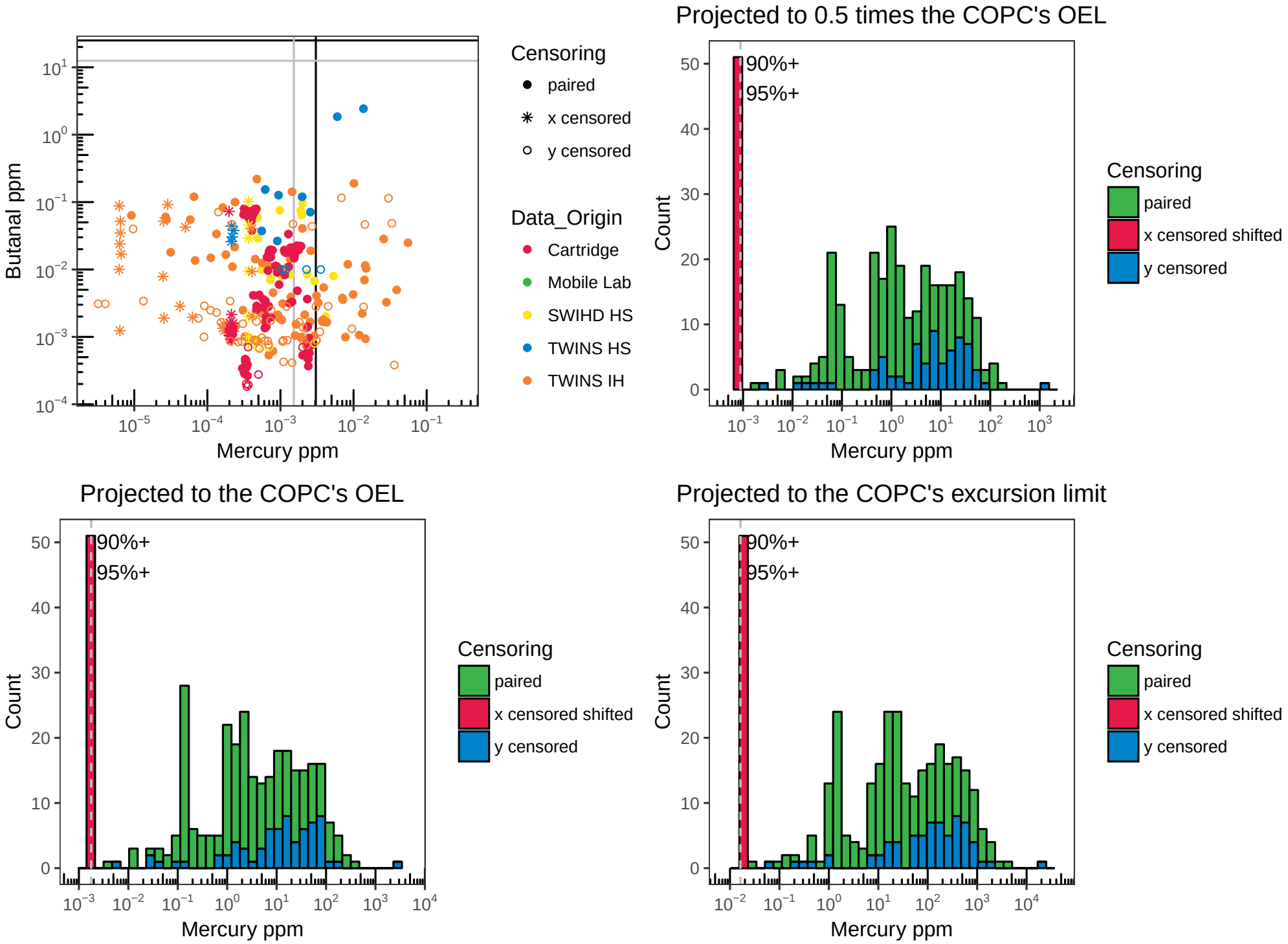


Figure C.134: Butanal vs Mercury

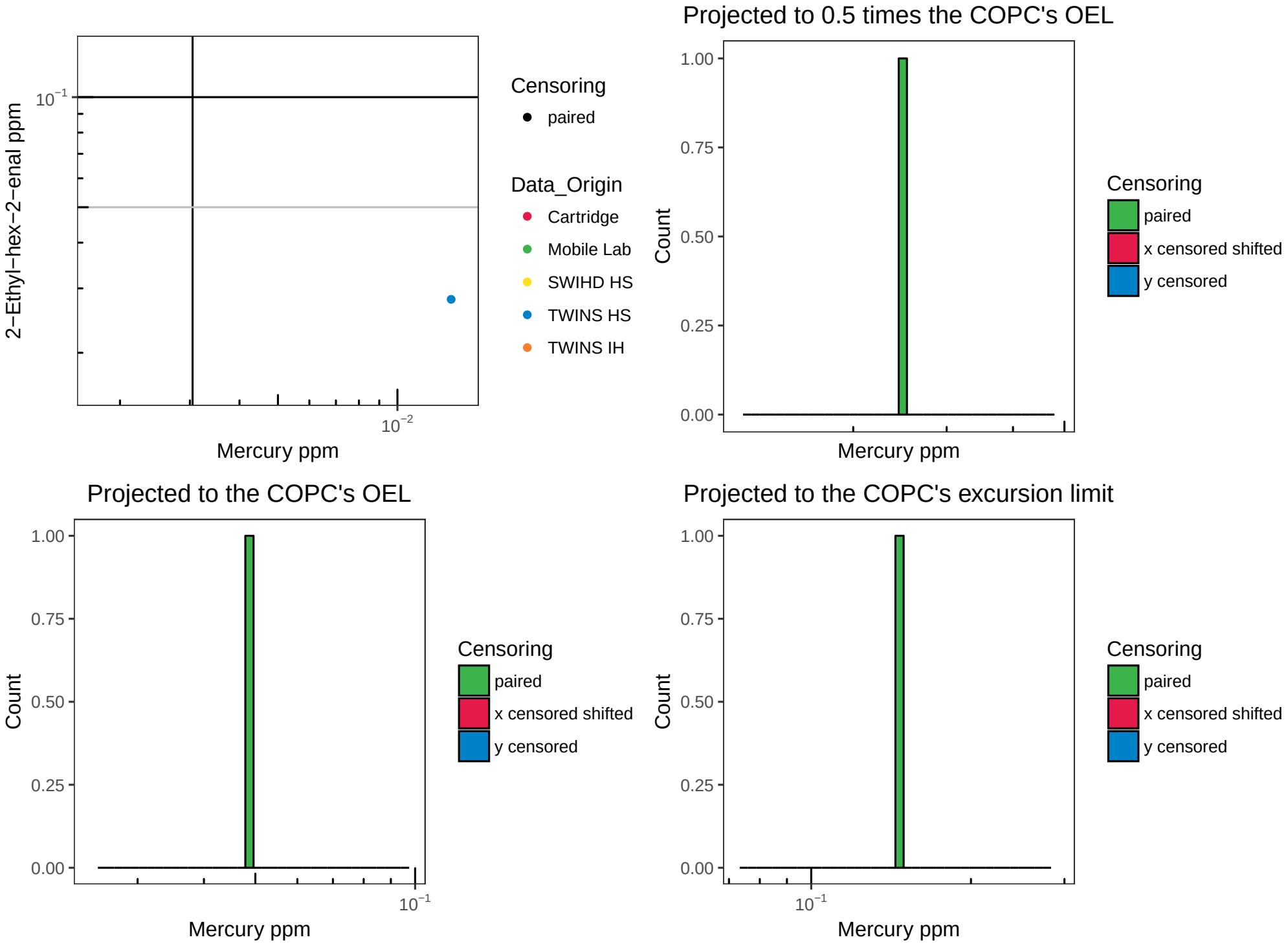


Figure C.135: 2-Ethyl-hex-2-enal vs Mercury

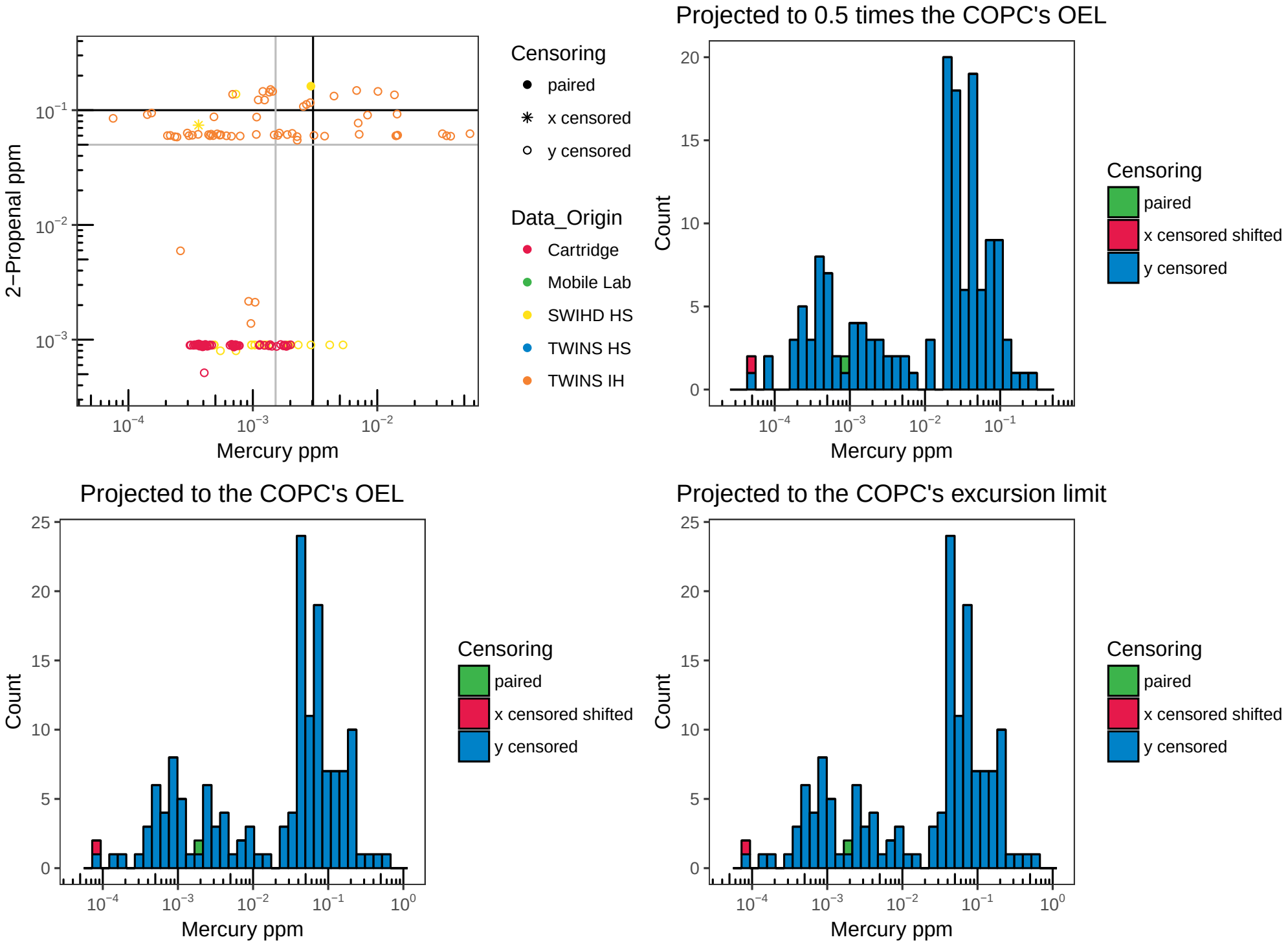


Figure C.136: 2-Propenal vs Mercury

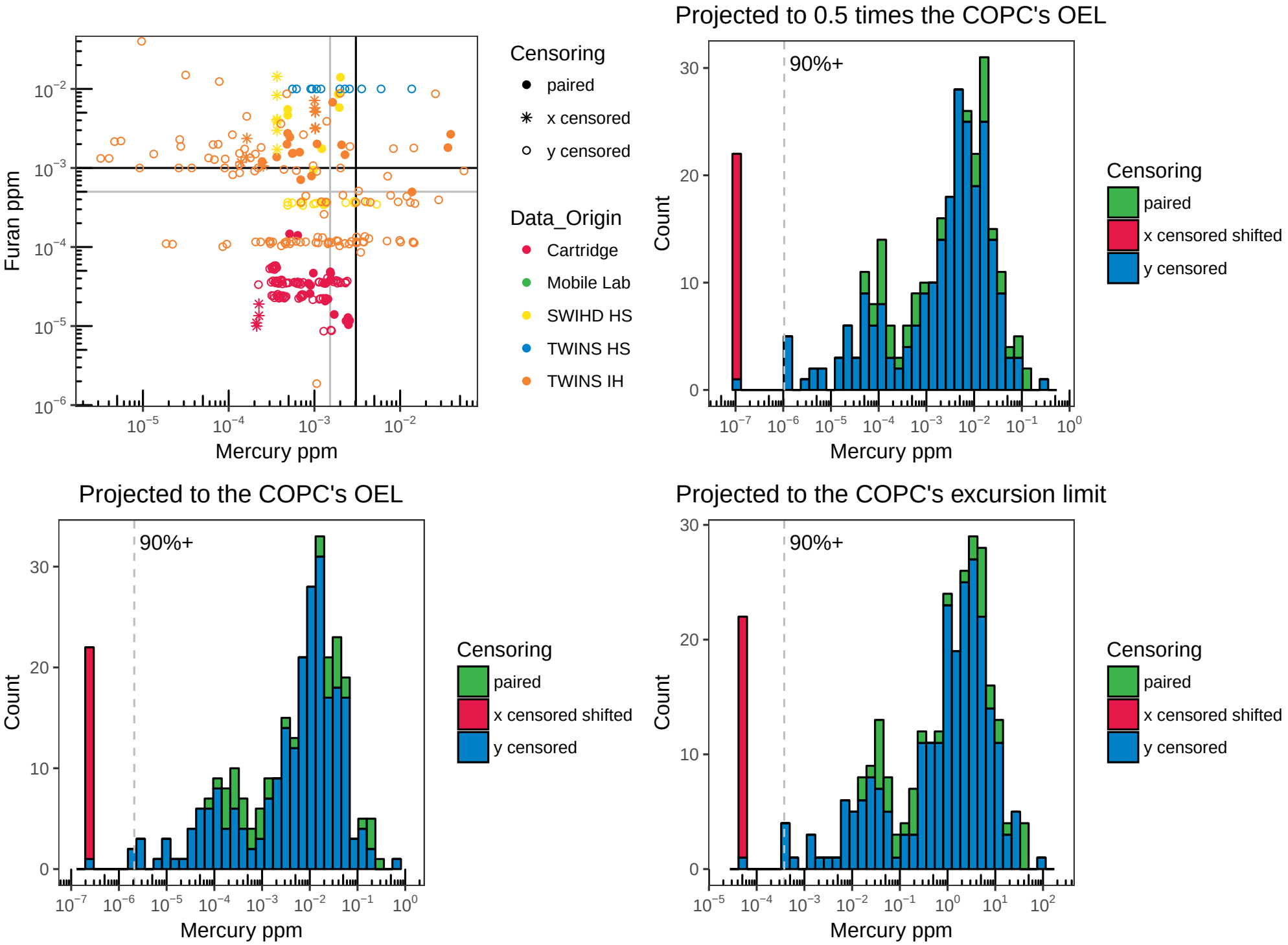


Figure C.137: Furan vs Mercury

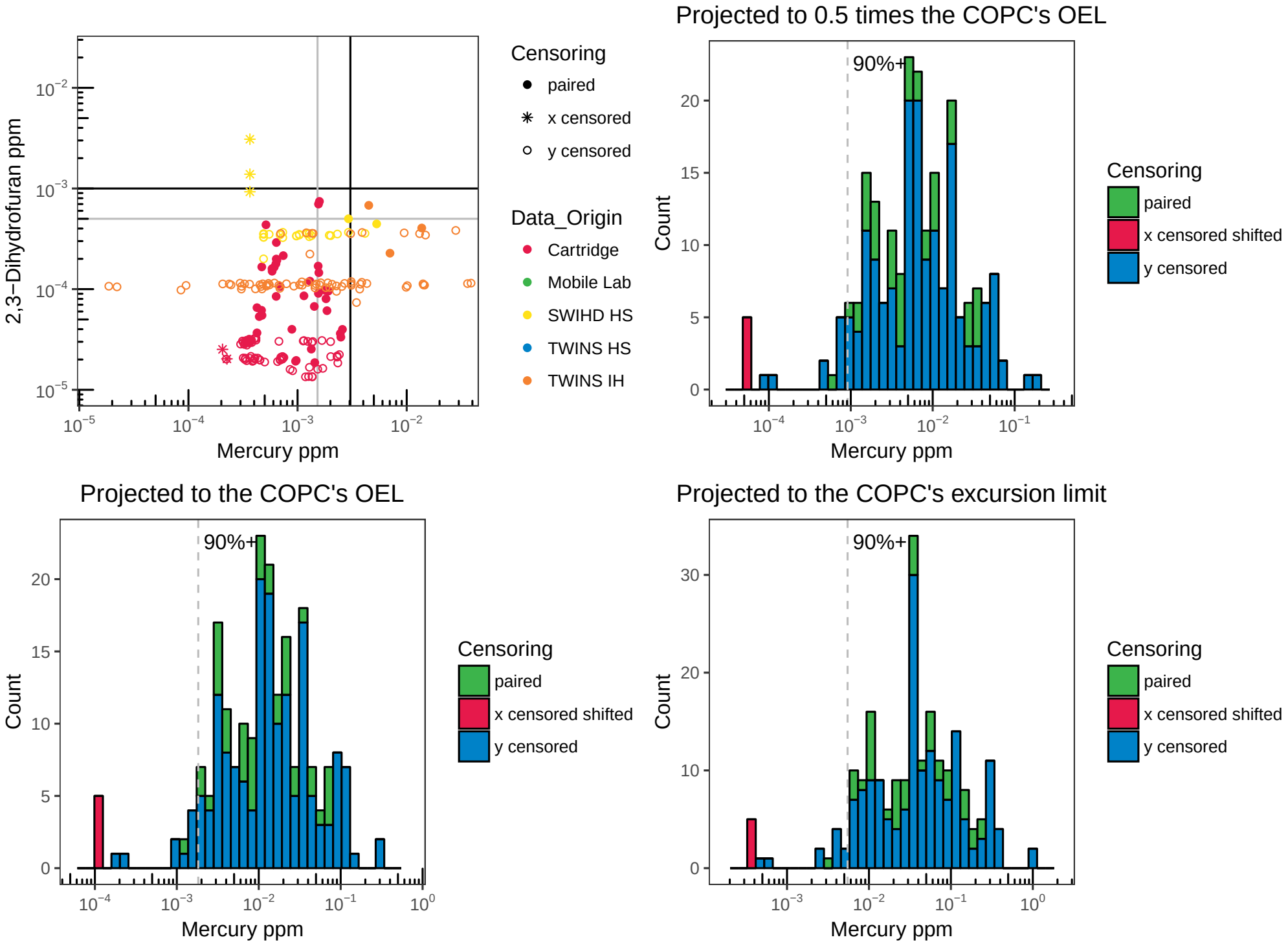


Figure C.138: 2,3-Dihydrofuran vs Mercury

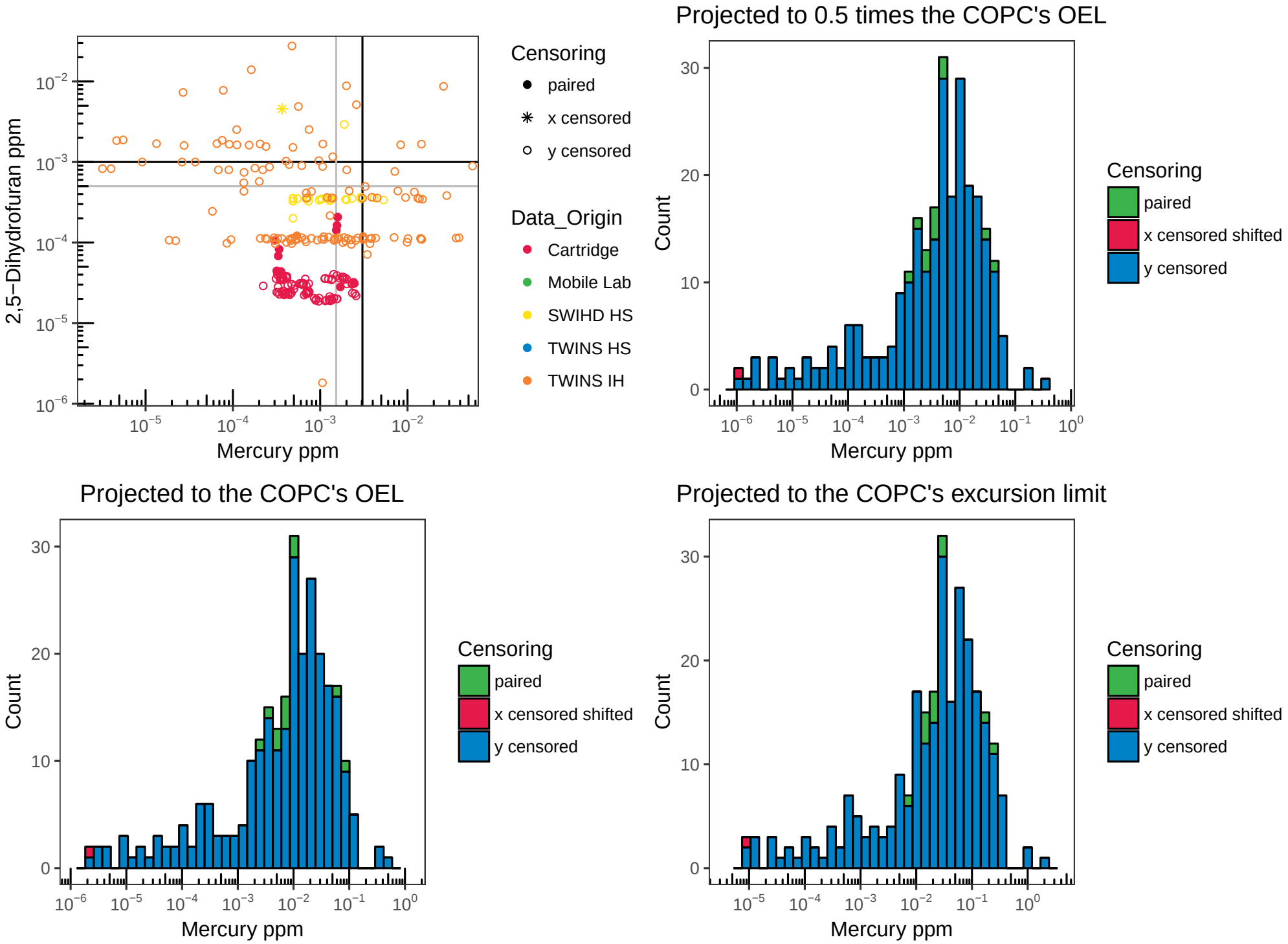


Figure C.139: 2,5-Dihydrofuran vs Mercury

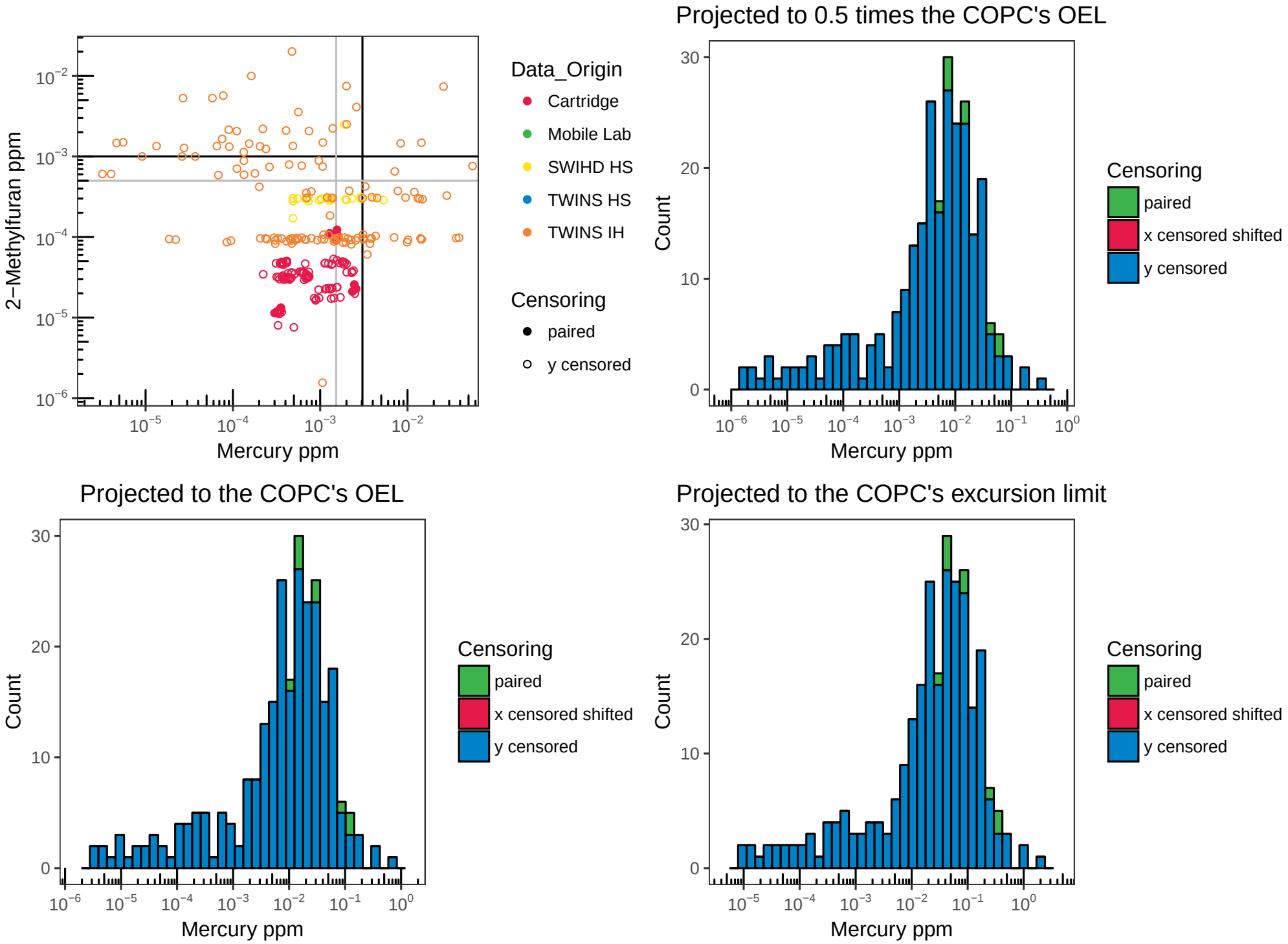


Figure C.140: 2-Methylfuran vs Mercury

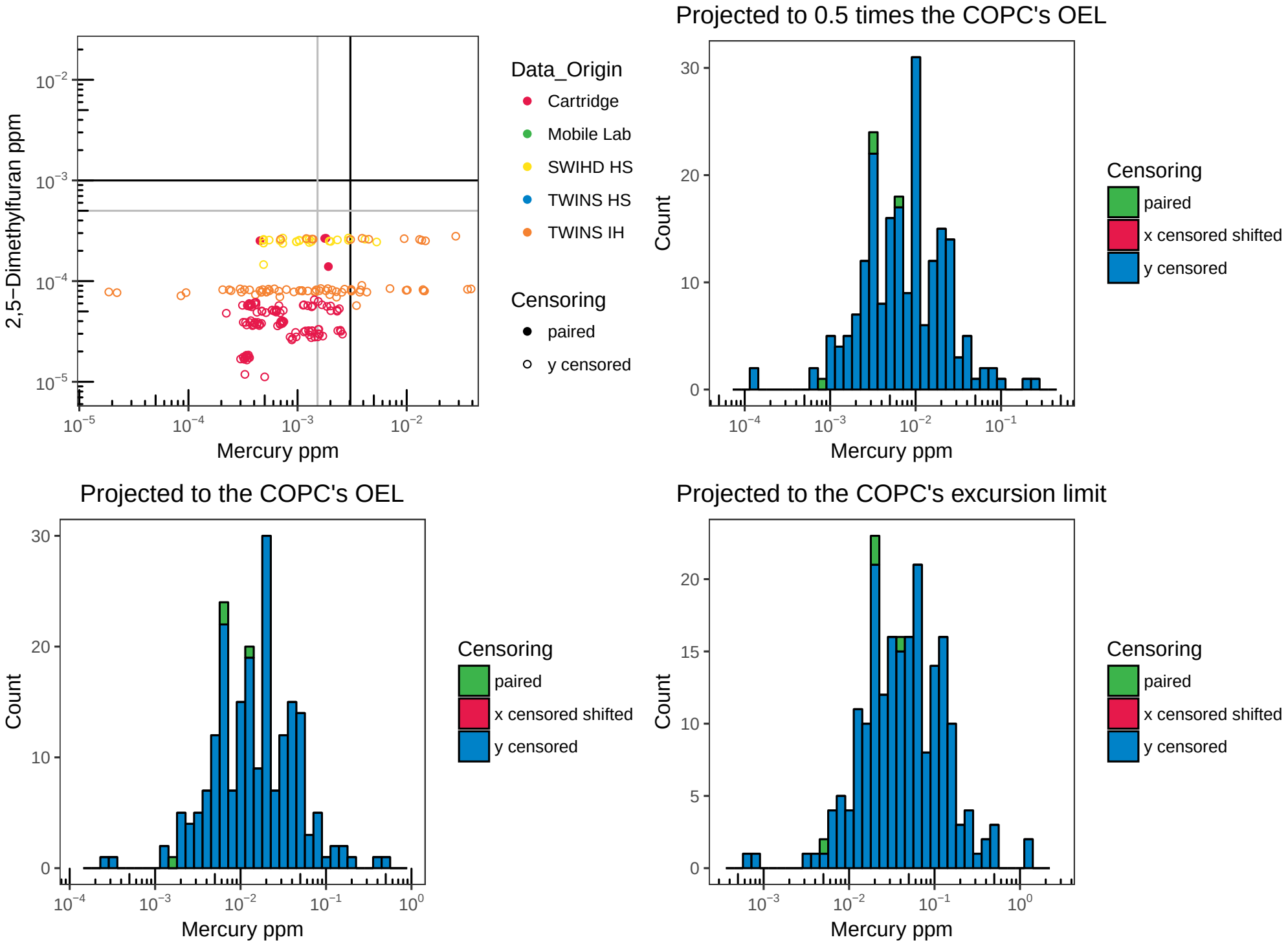


Figure C.141: 2,5-Dimethylfuran vs Mercury

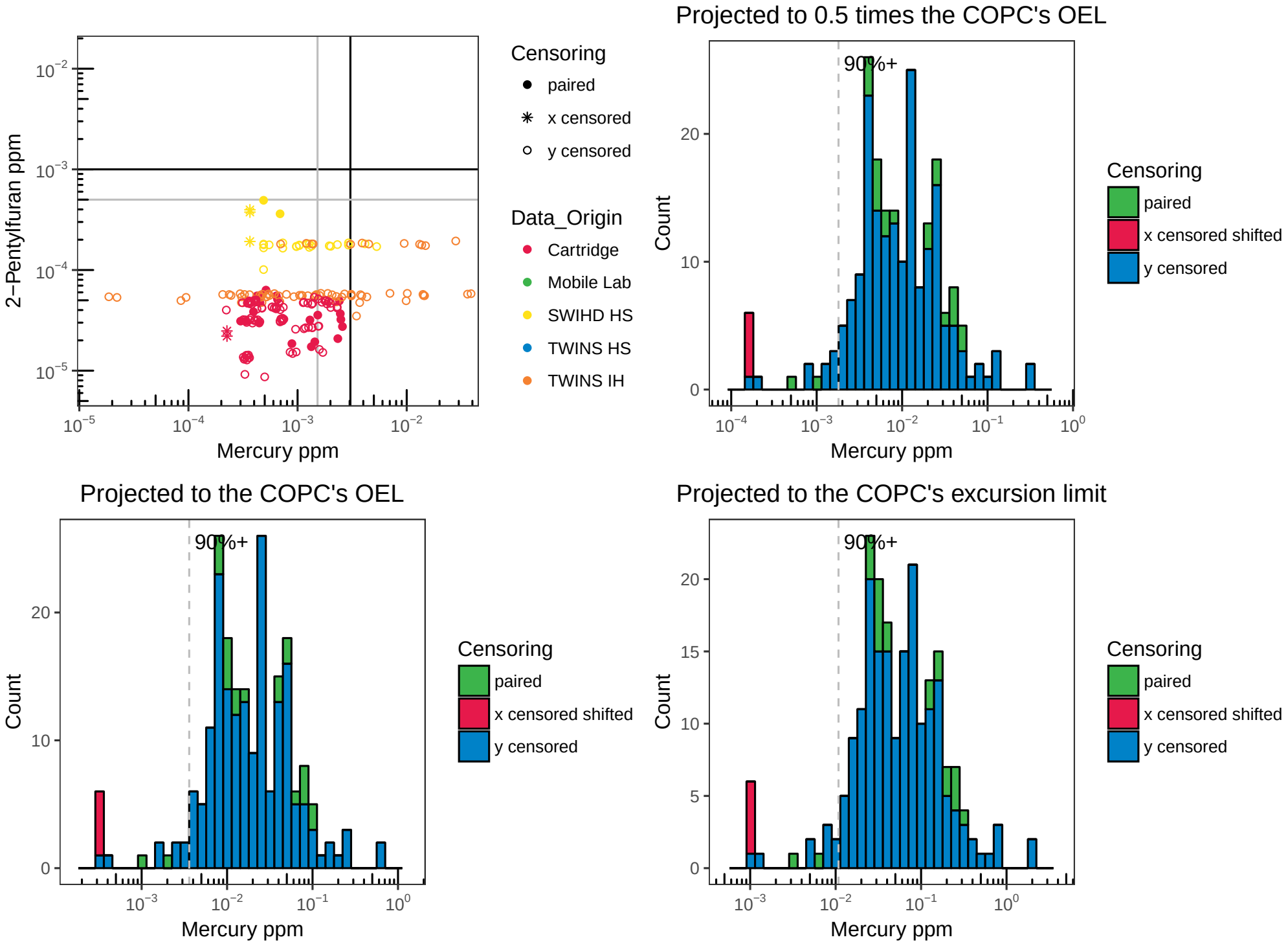


Figure C.142: 2-Pentylfuran vs Mercury

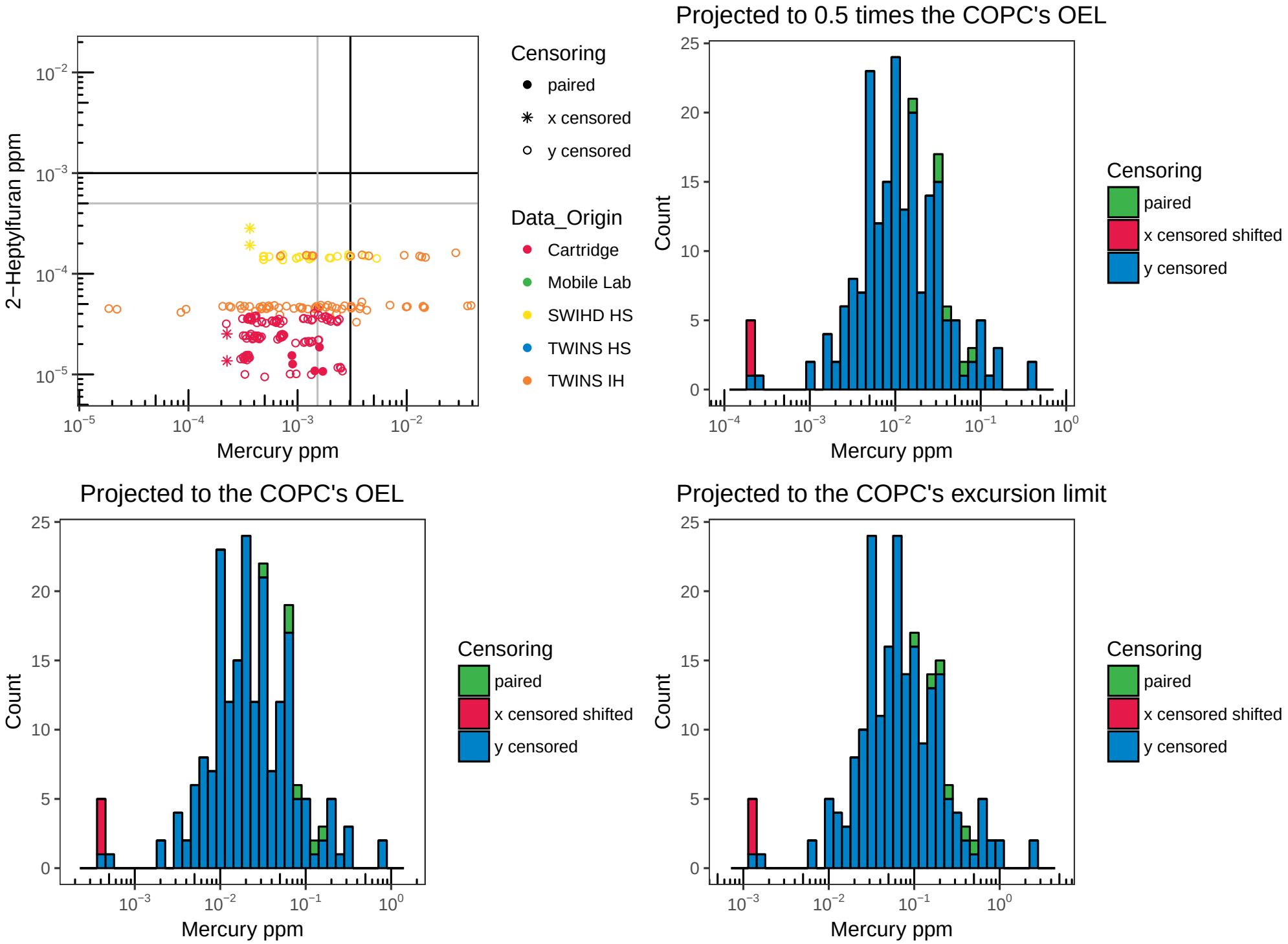


Figure C.143: 2-Heptylfuran vs Mercury

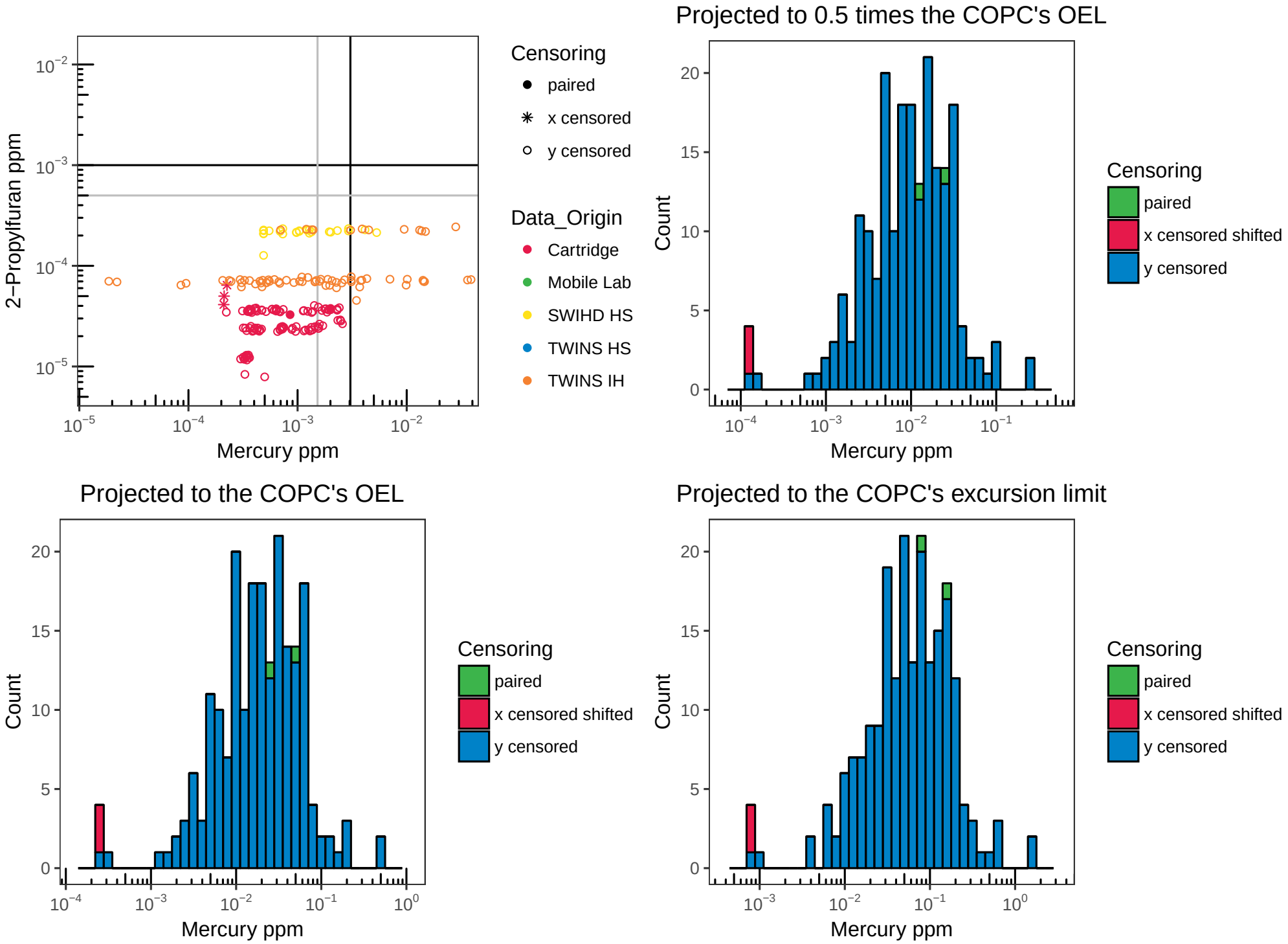


Figure C.144: 2-Propylfuran vs Mercury

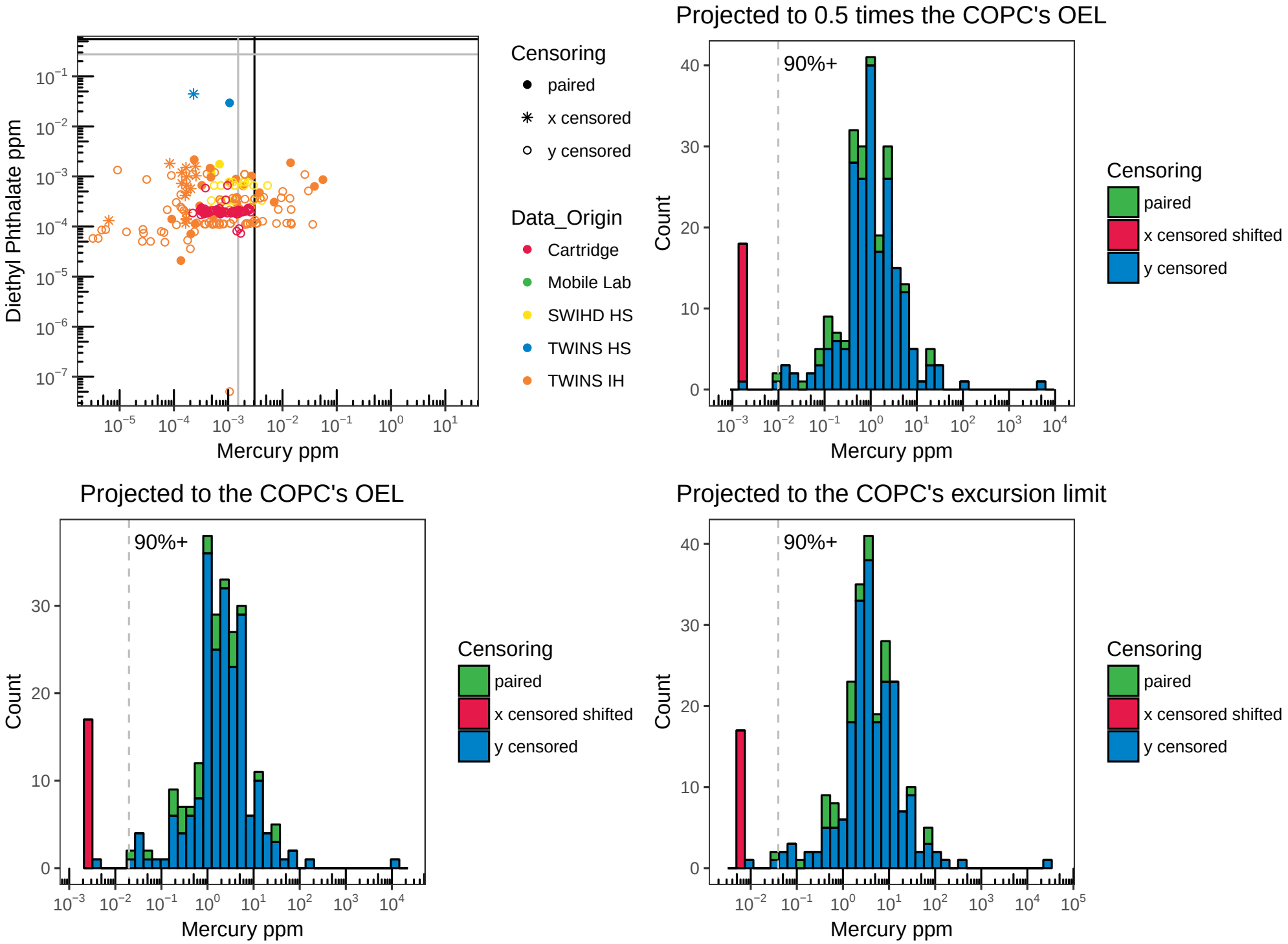


Figure C.145: Diethyl Phthalate vs Mercury

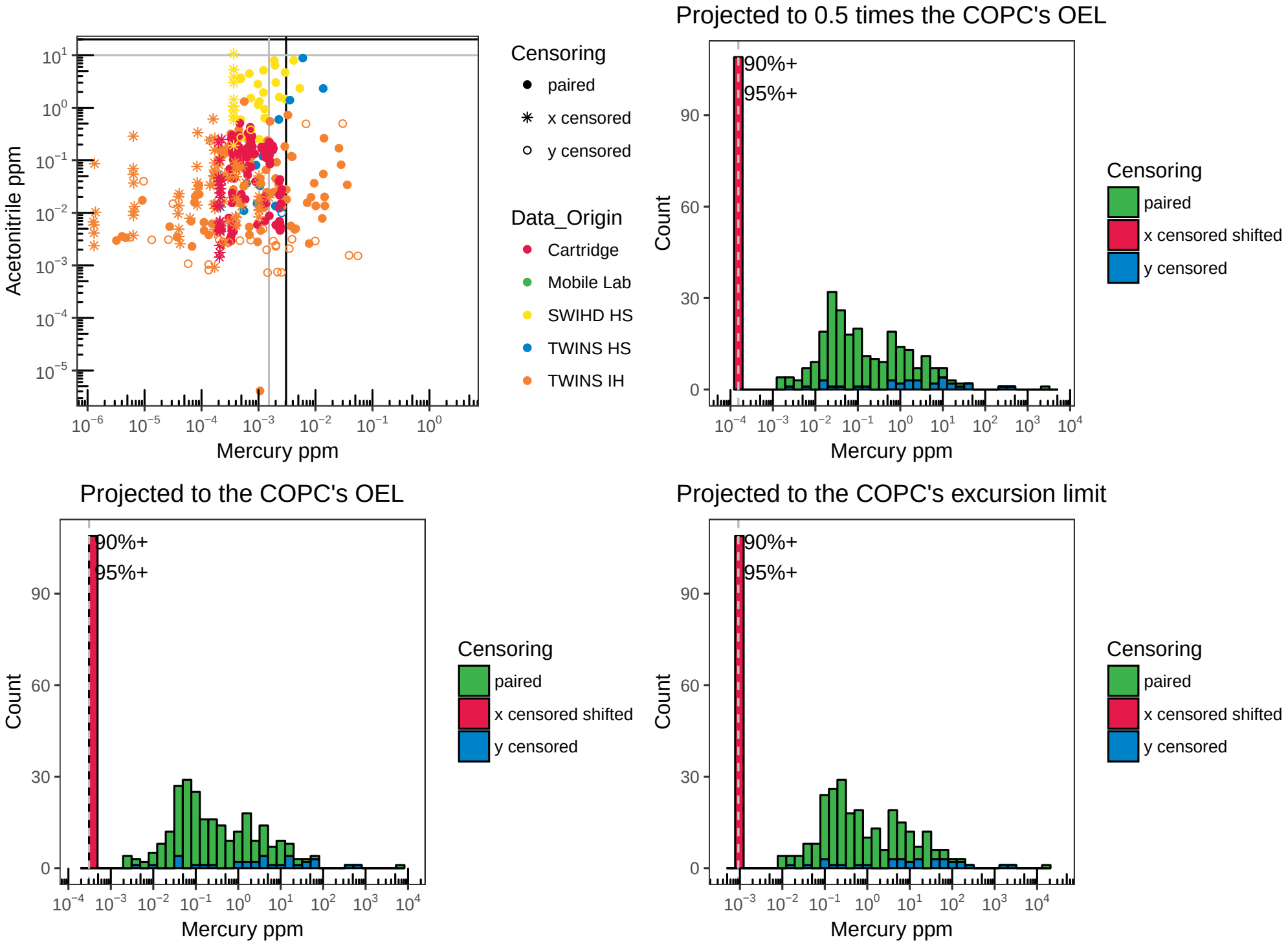


Figure C.146: Acetonitrile vs Mercury

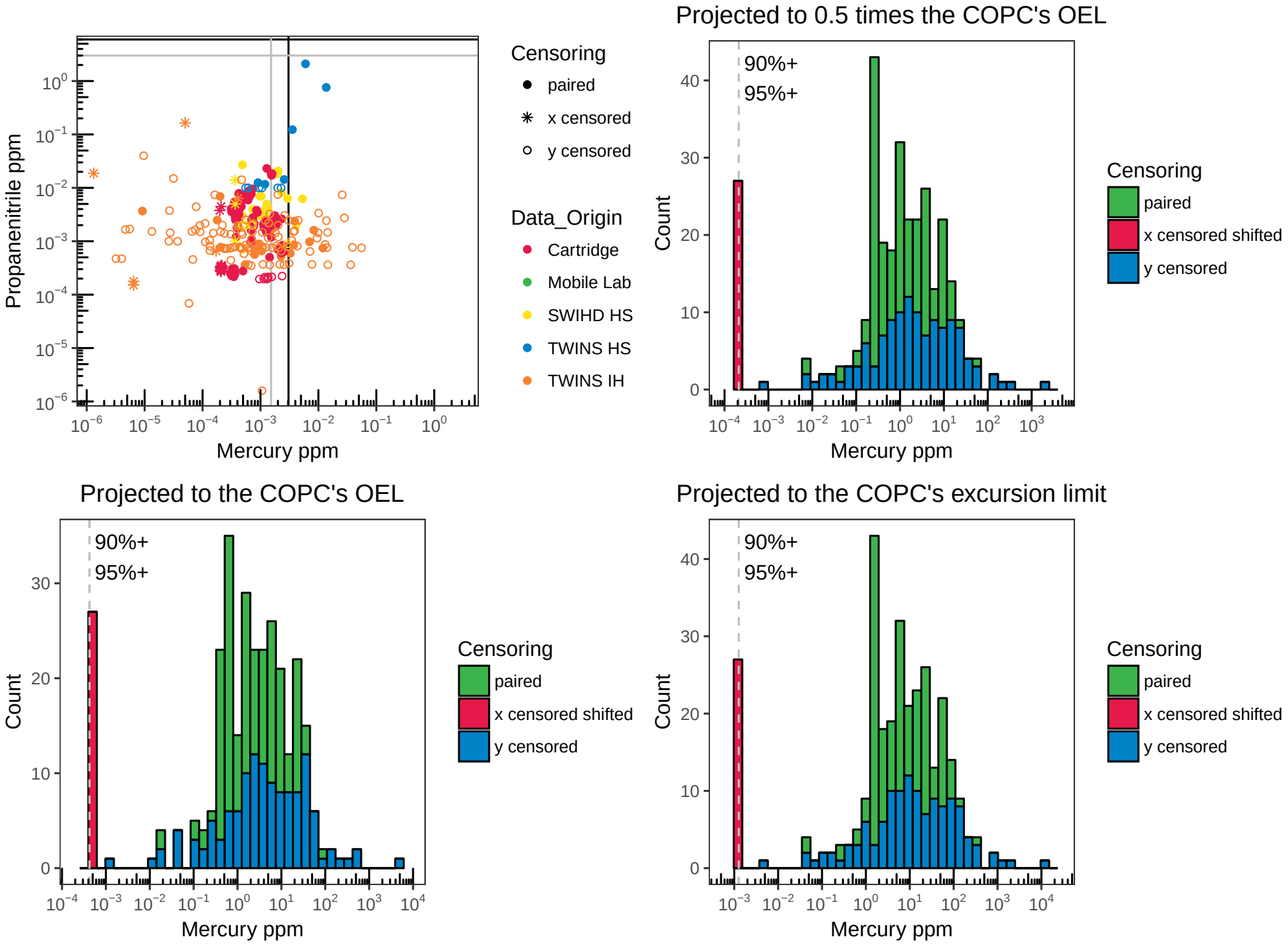


Figure C.147: Propanenitrile vs Mercury

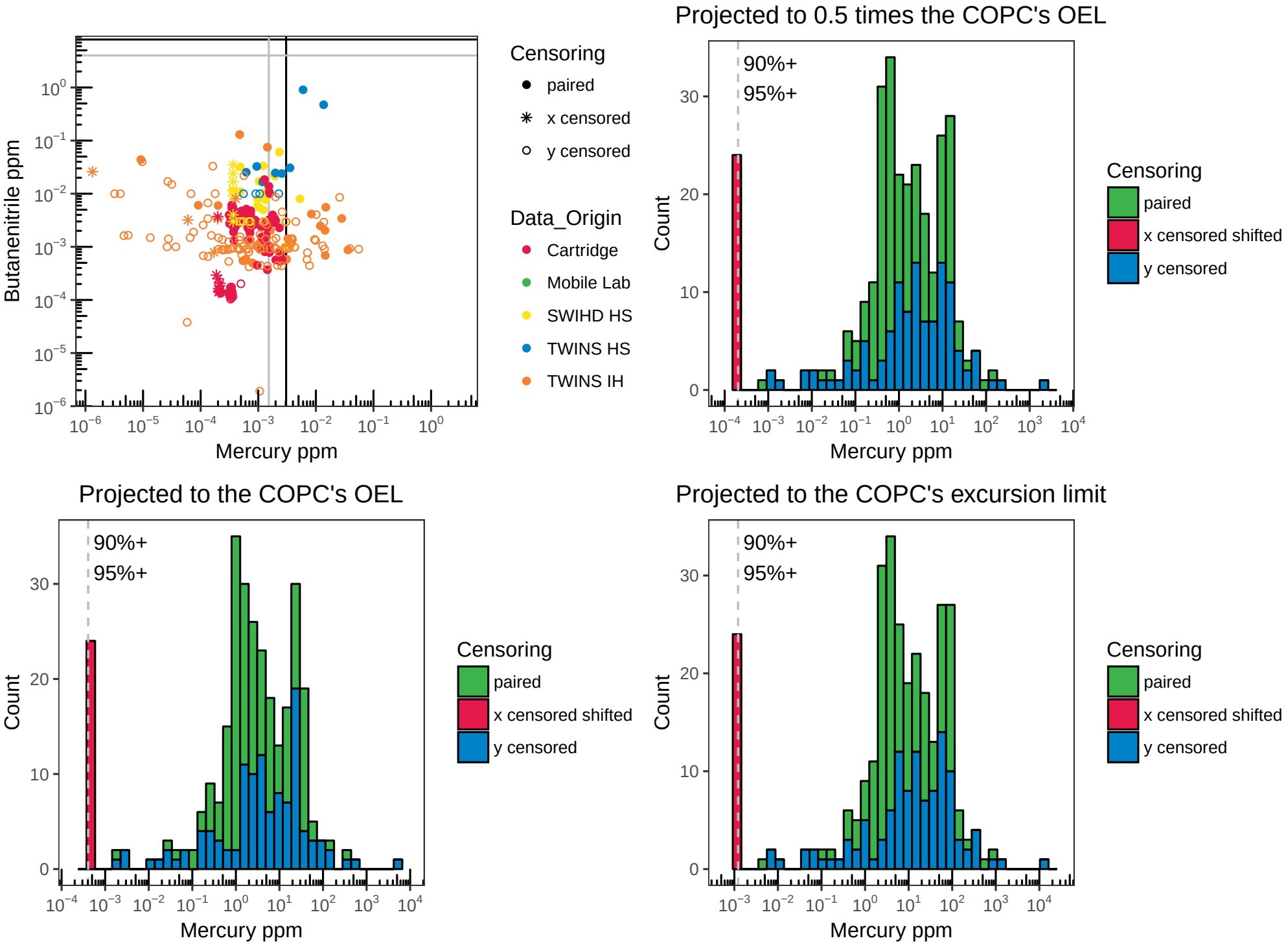


Figure C.148: Butanenitrile vs Mercury

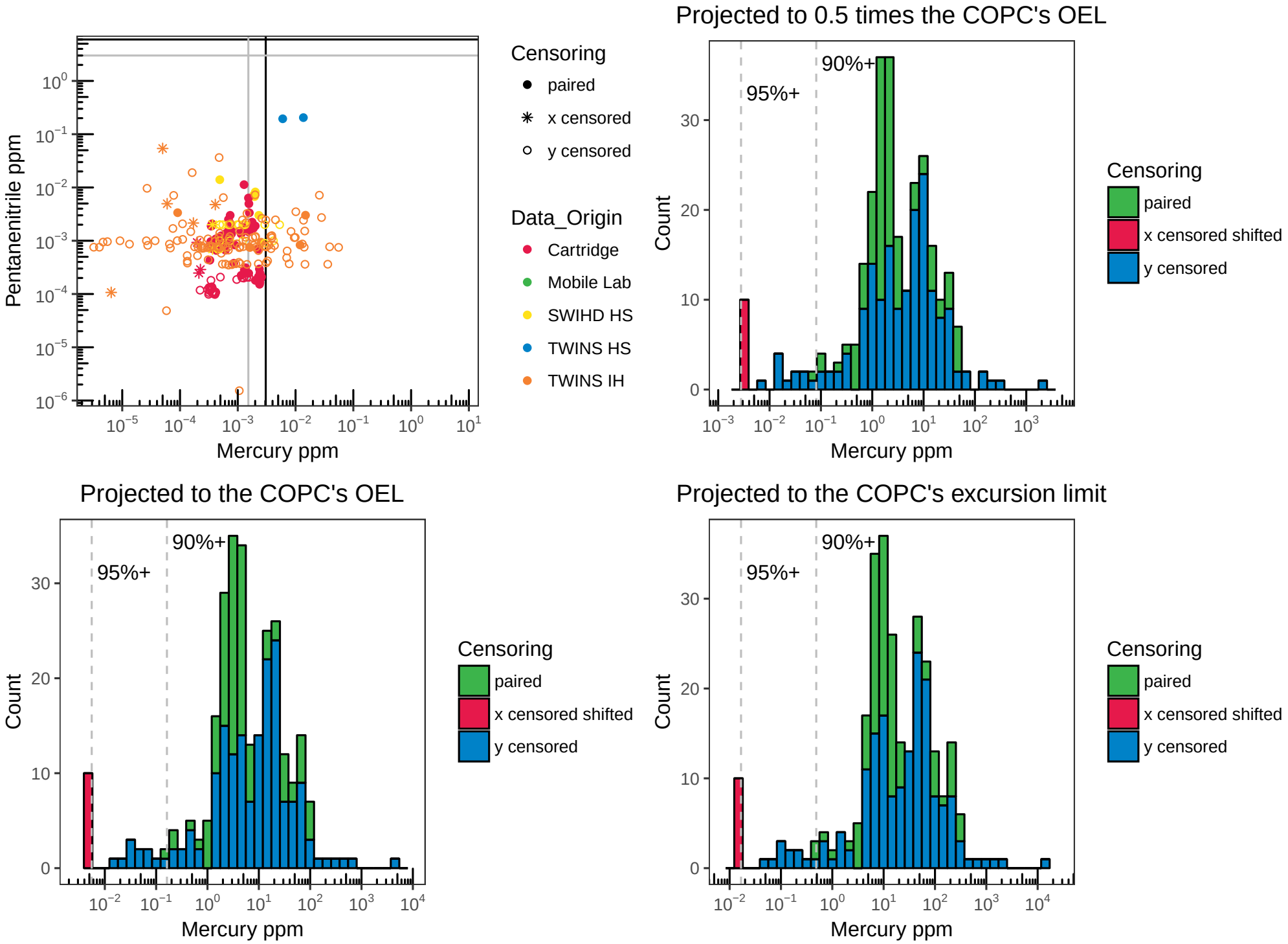


Figure C.149: Pentanenitrile vs Mercury

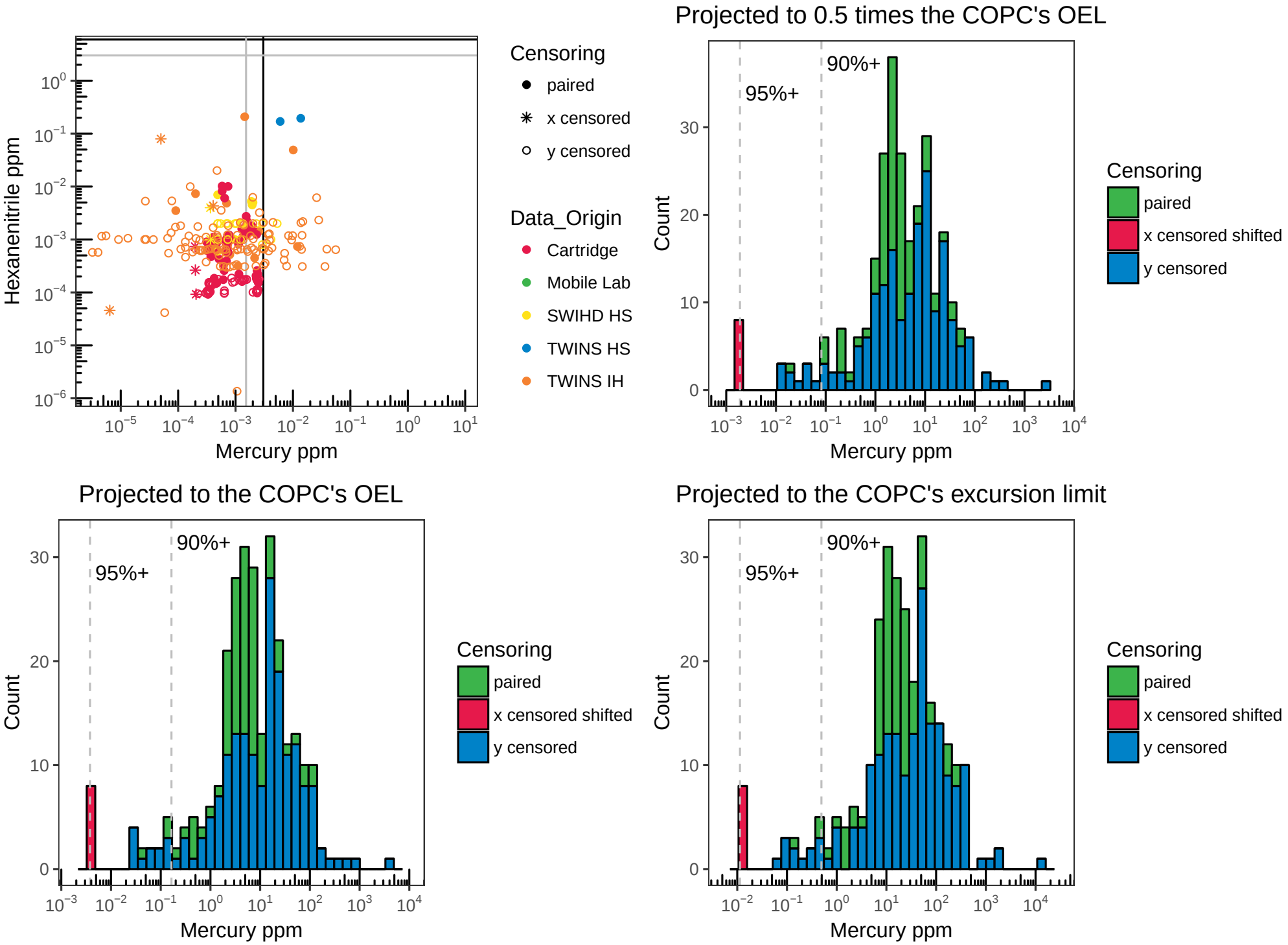


Figure C.150: Hexanenitrile vs Mercury

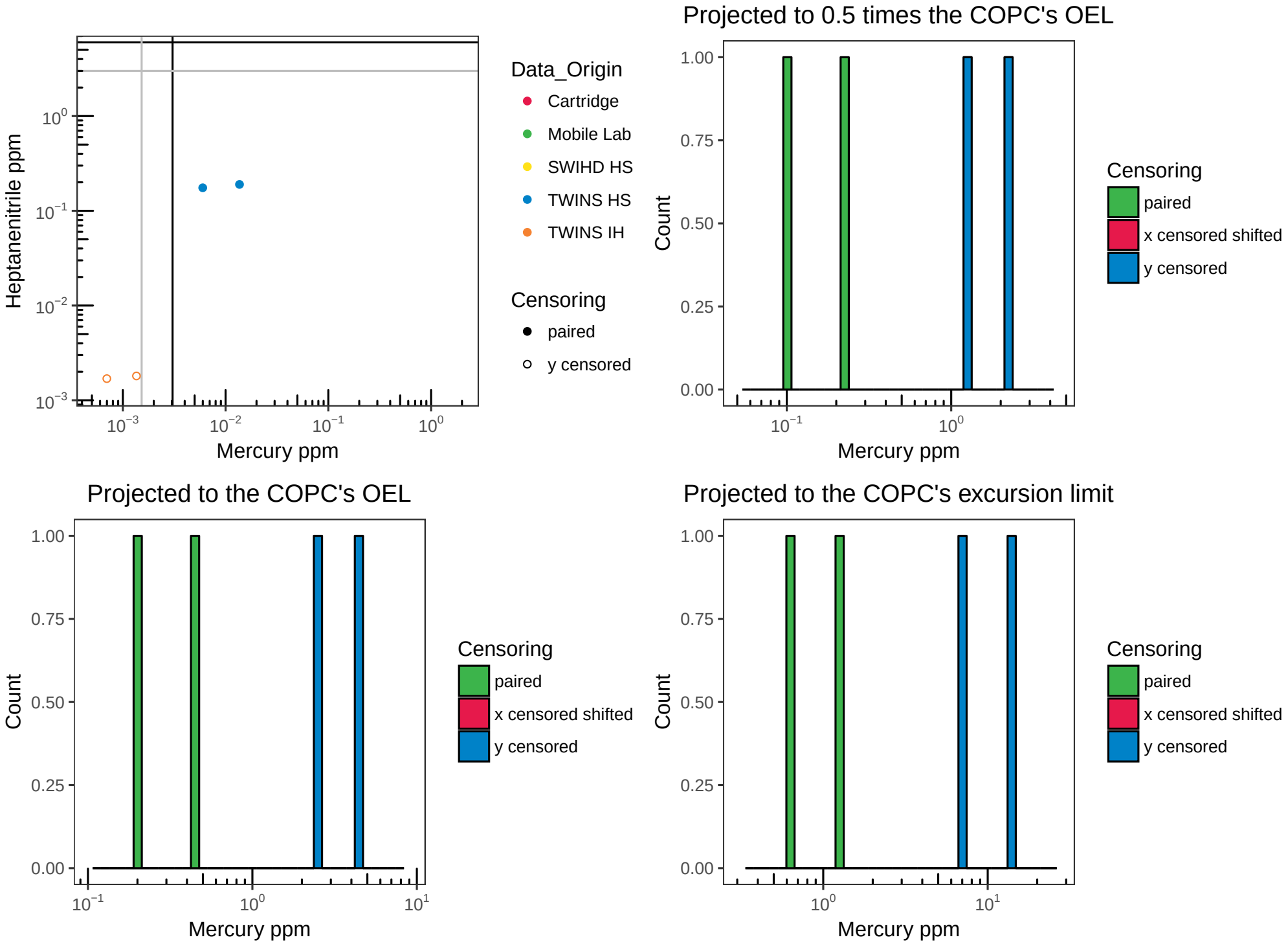


Figure C.151: Heptanenitrile vs Mercury

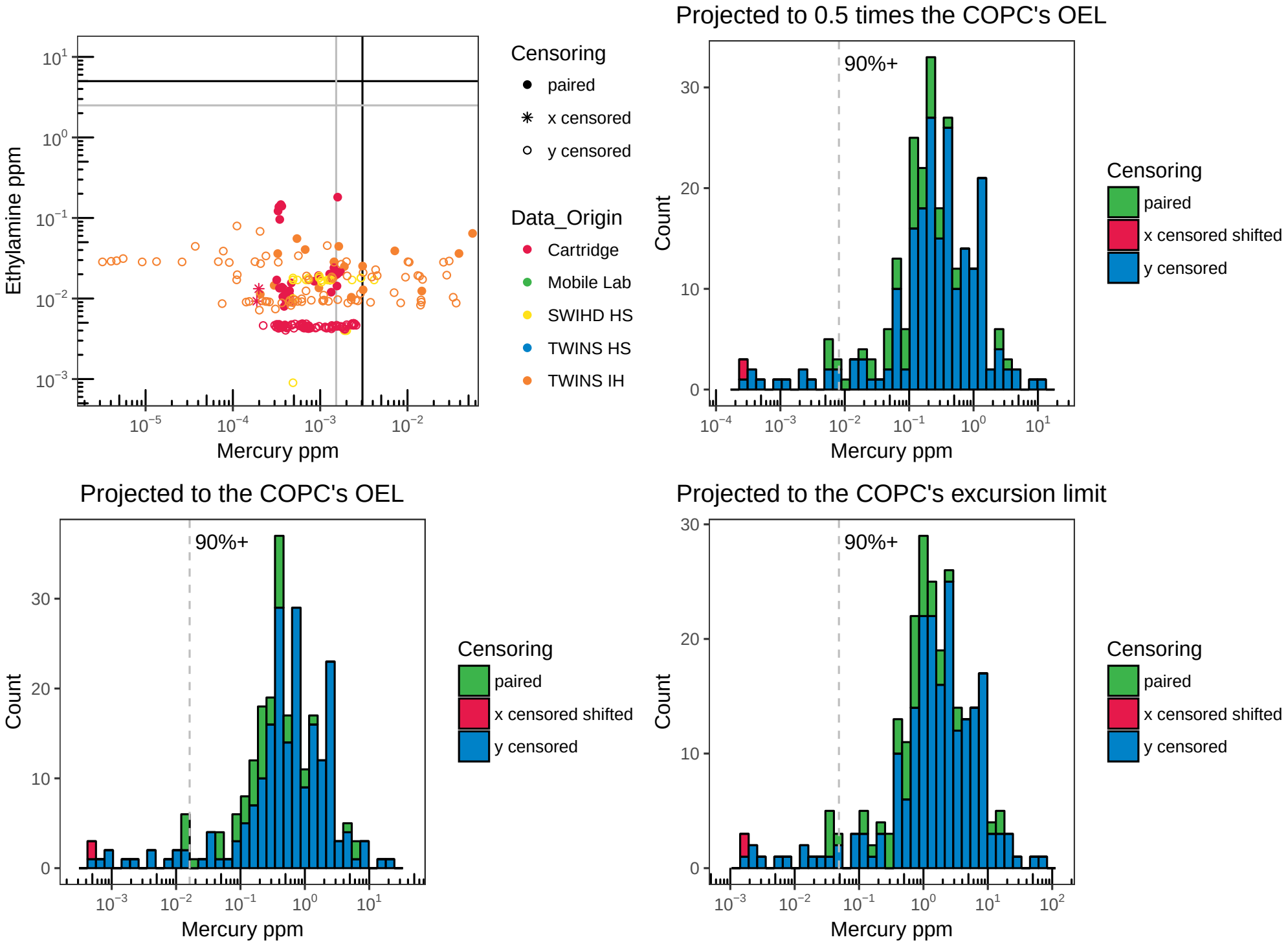


Figure C.152: Ethylamine vs Mercury

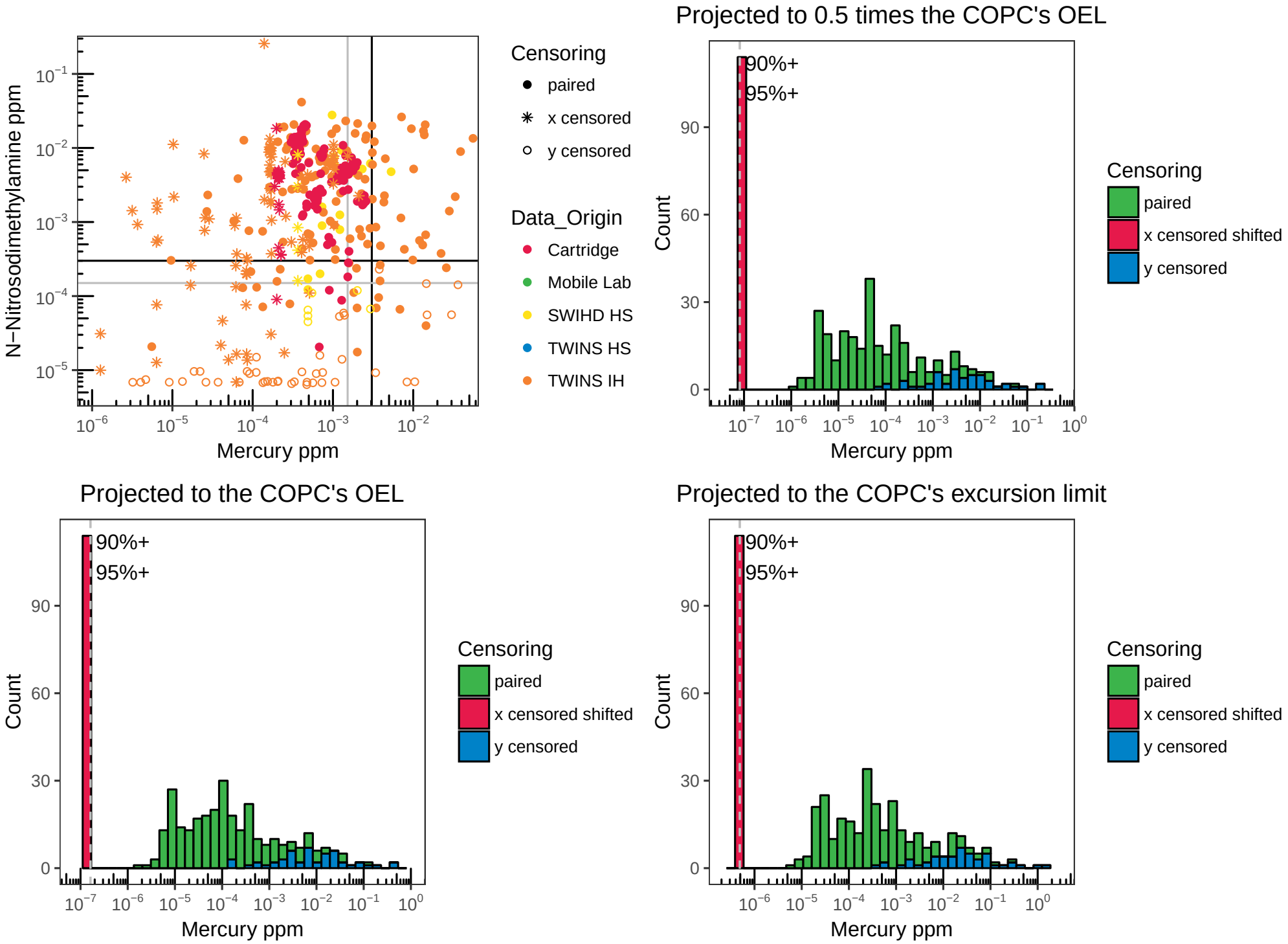


Figure C.153: N-Nitrosodimethylamine vs Mercury

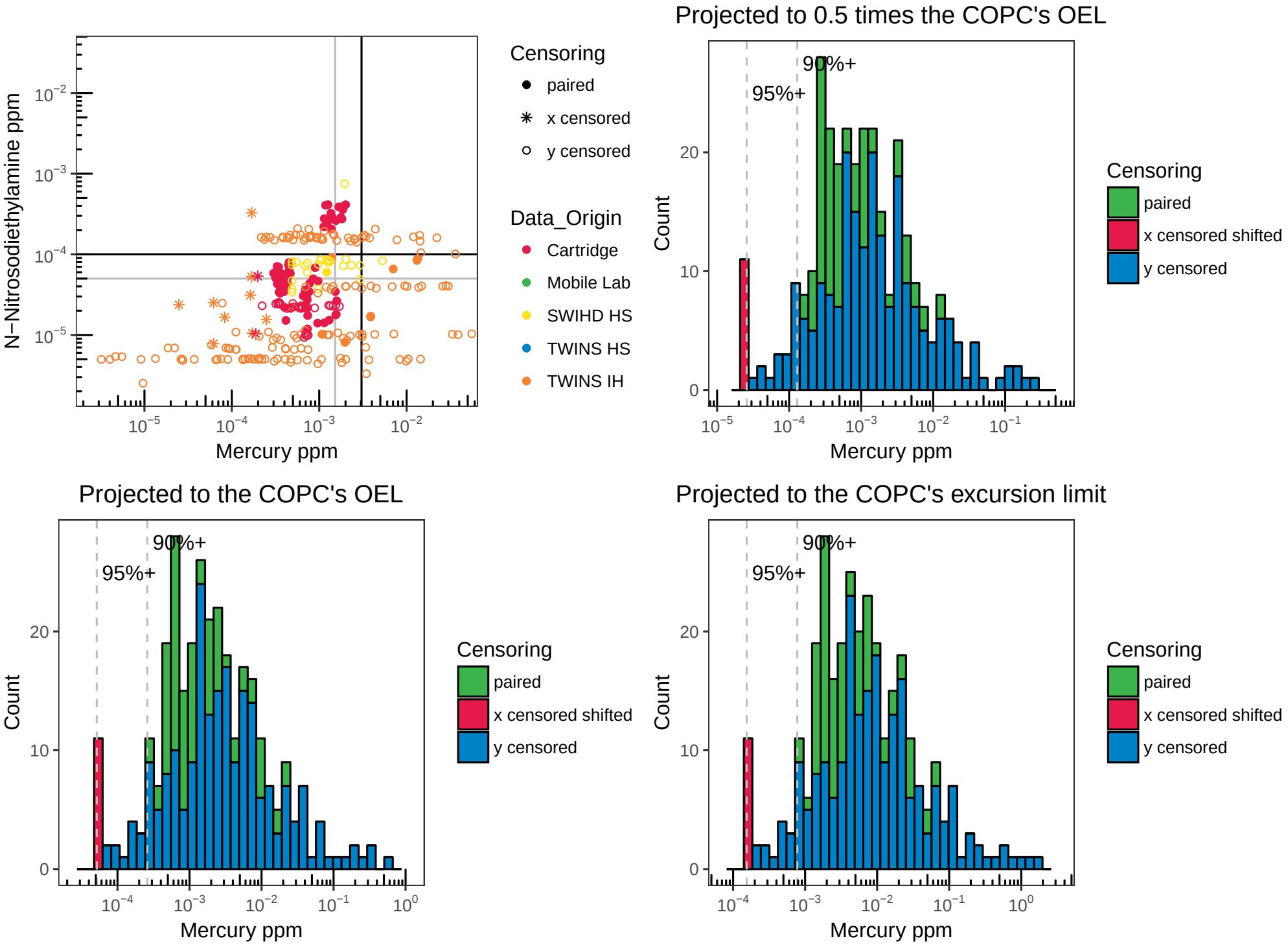


Figure C.154: N-Nitrosodiethylamine vs Mercury

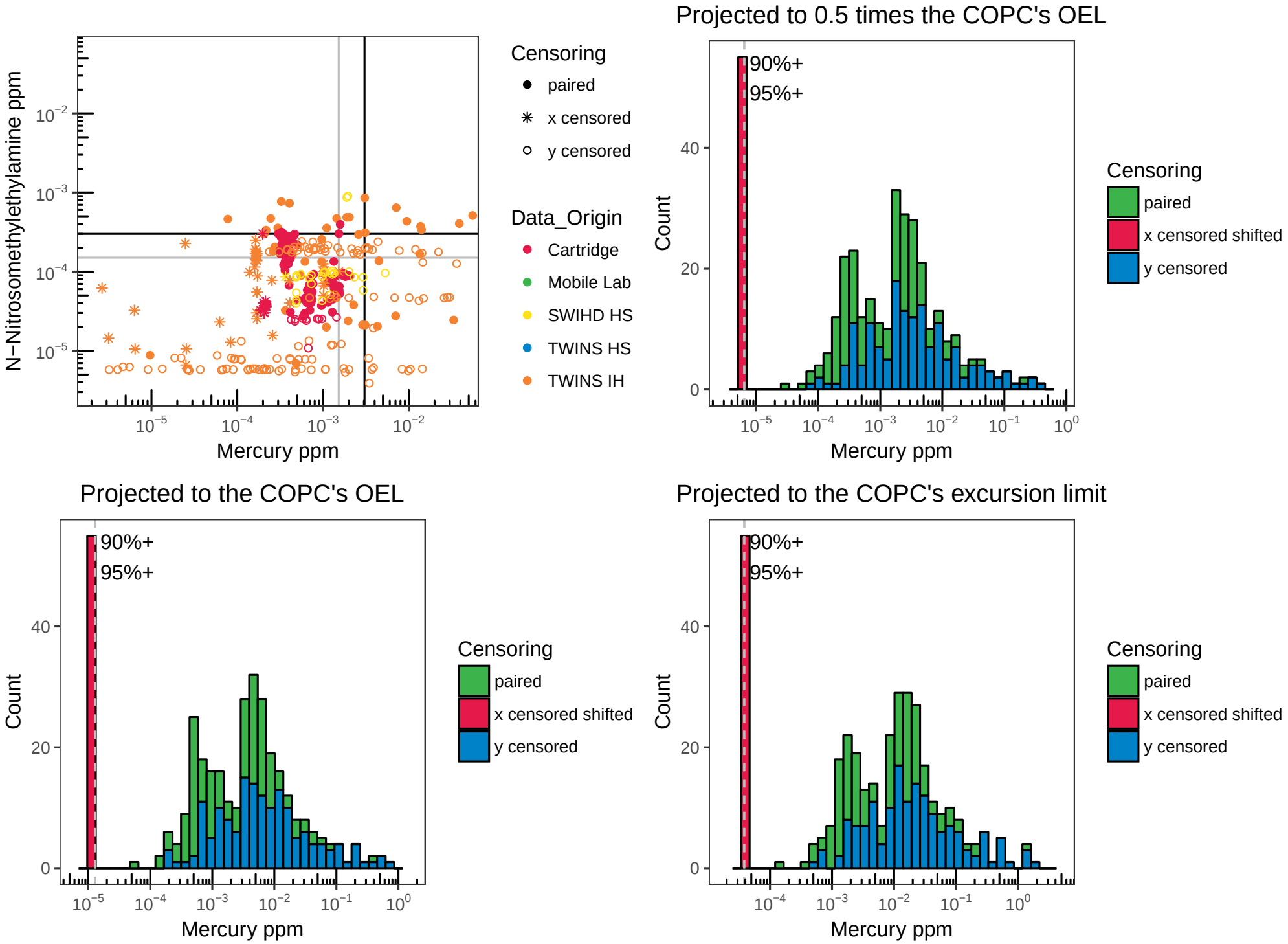


Figure C.155: N-Nitrosomethylethylamine vs Mercury

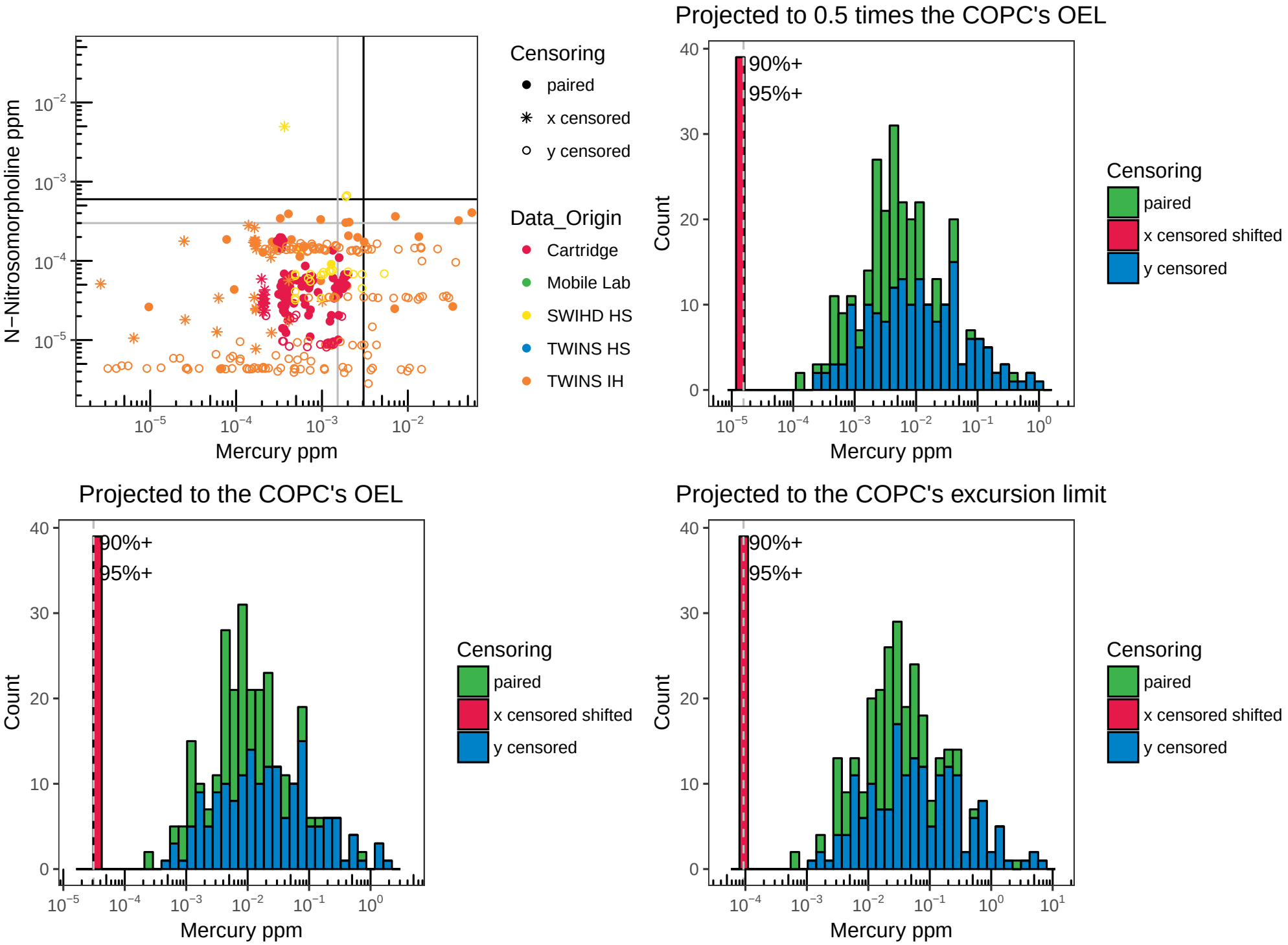


Figure C.156: N-Nitrosomorpholine vs Mercury

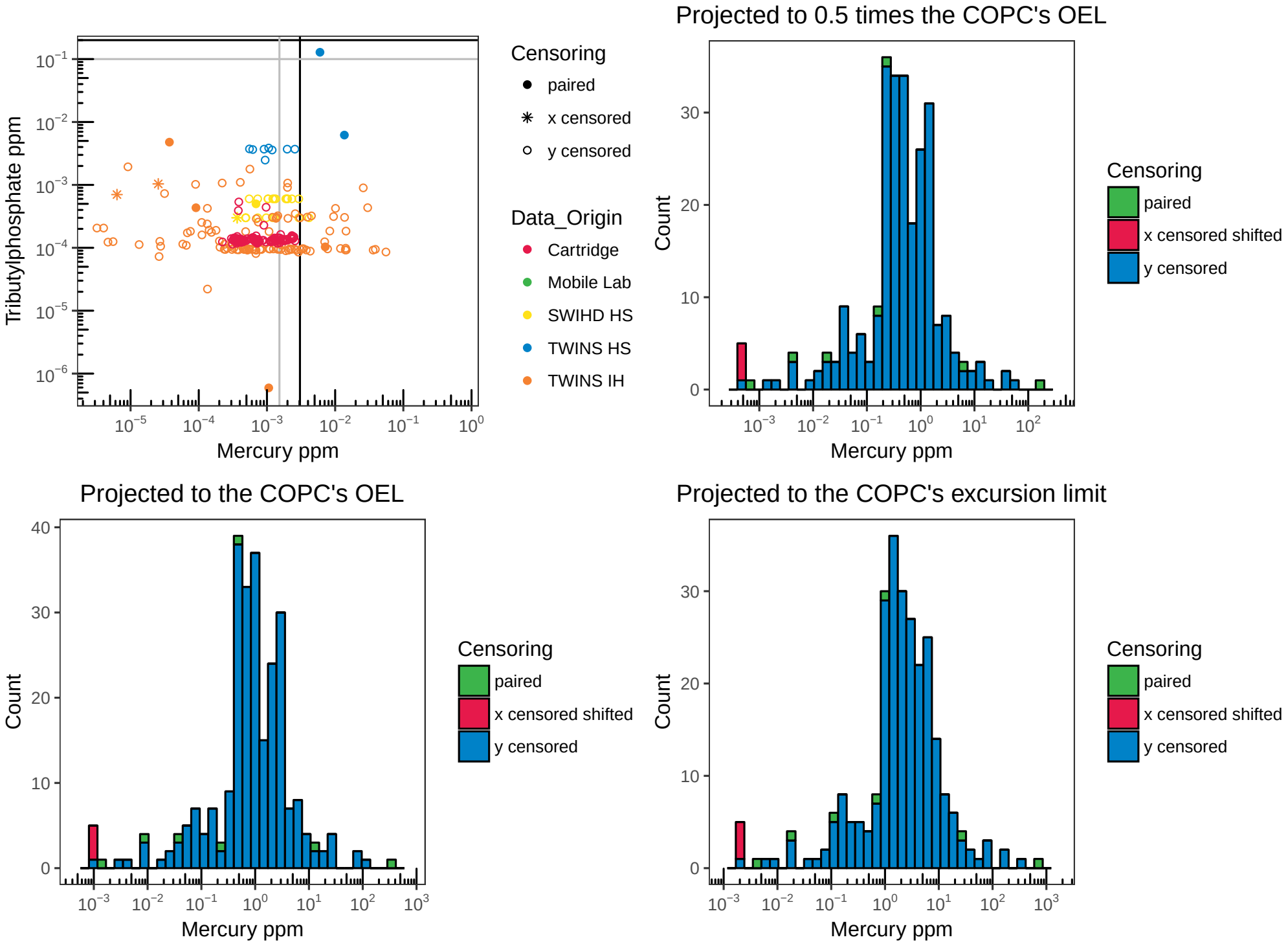


Figure C.157: Tributylphosphate vs Mercury

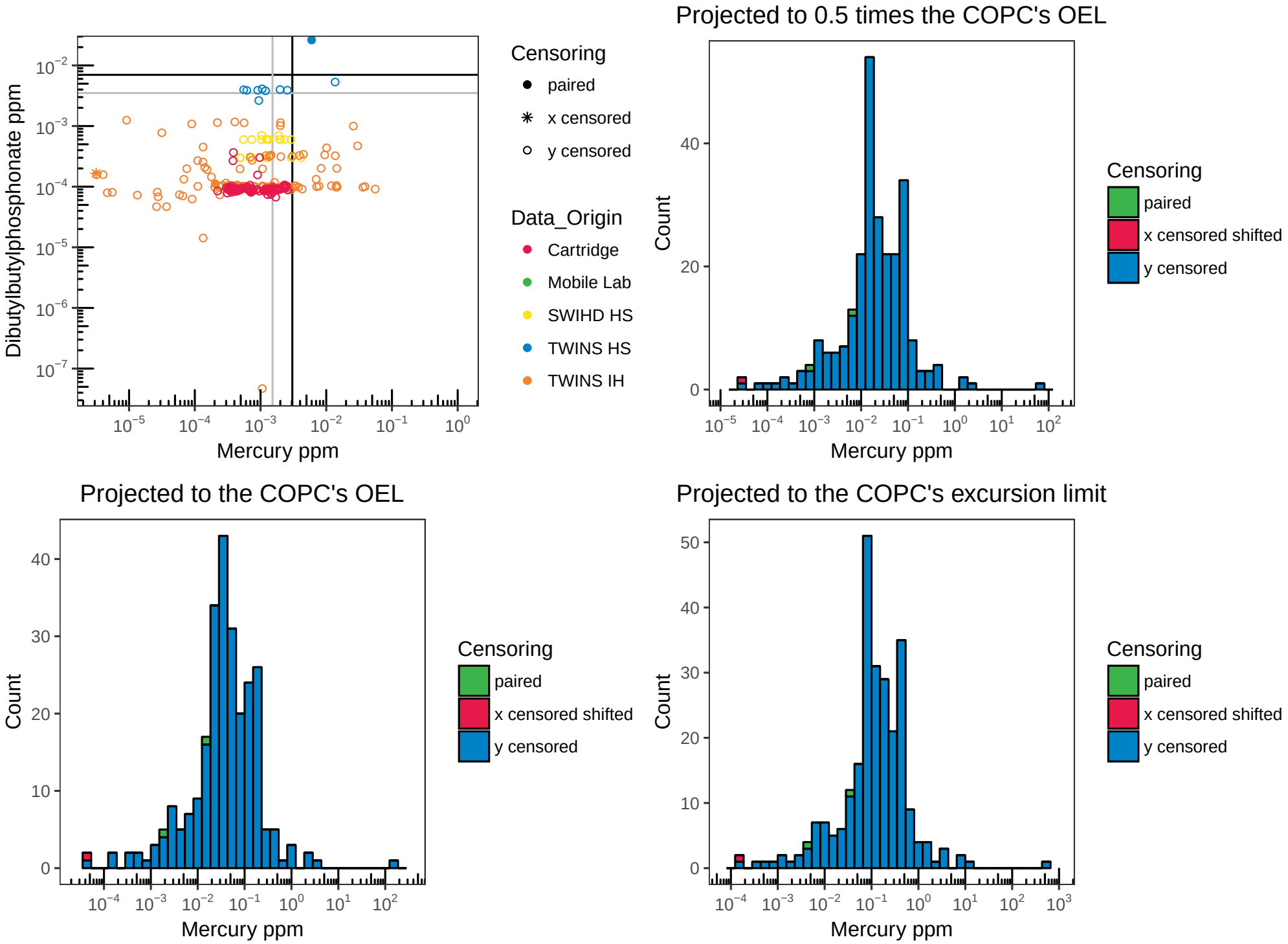


Figure C.158: Dibutylbutylphosphonate vs Mercury

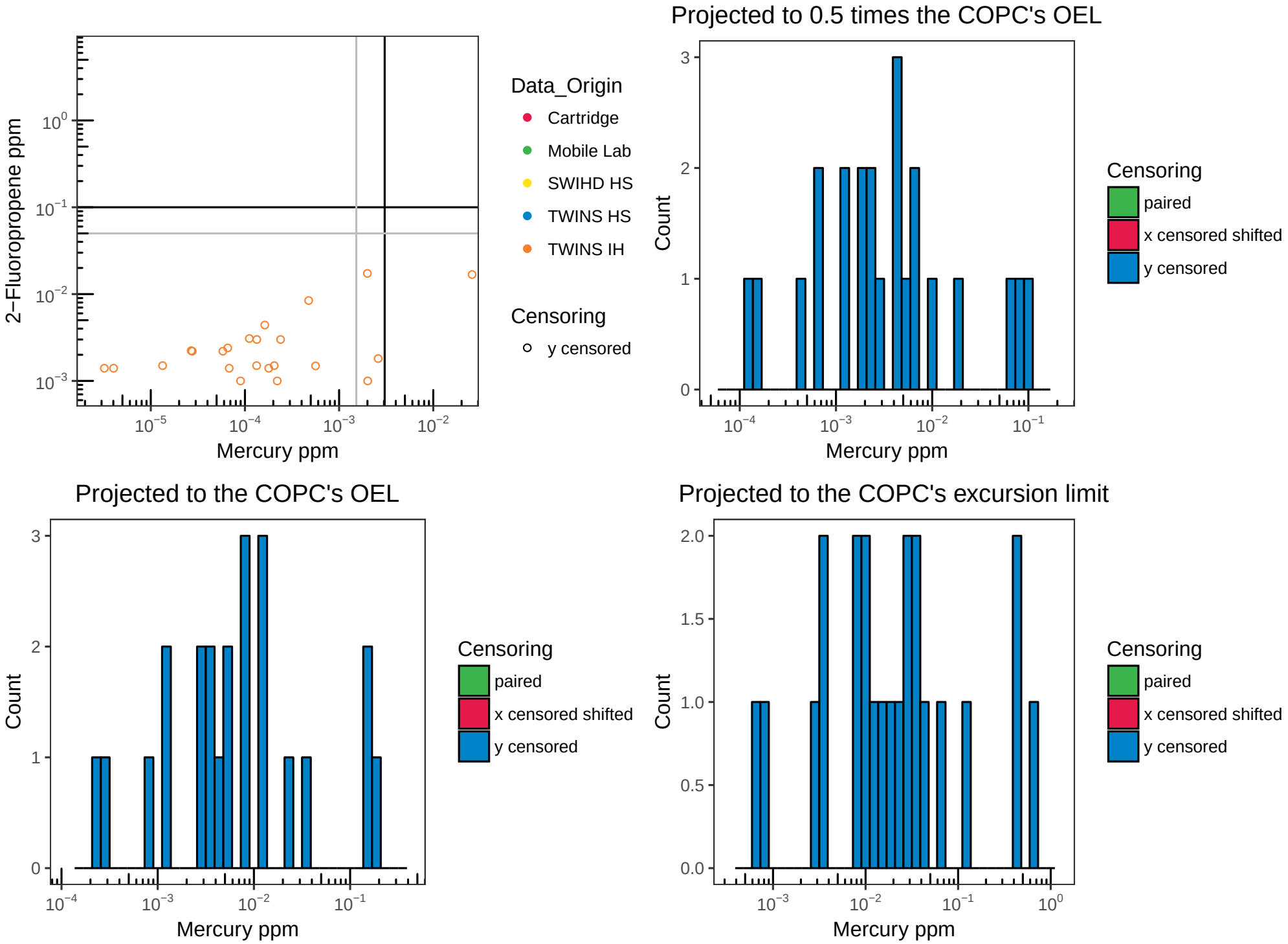


Figure C.159: 2-Fluoropropene vs Mercury

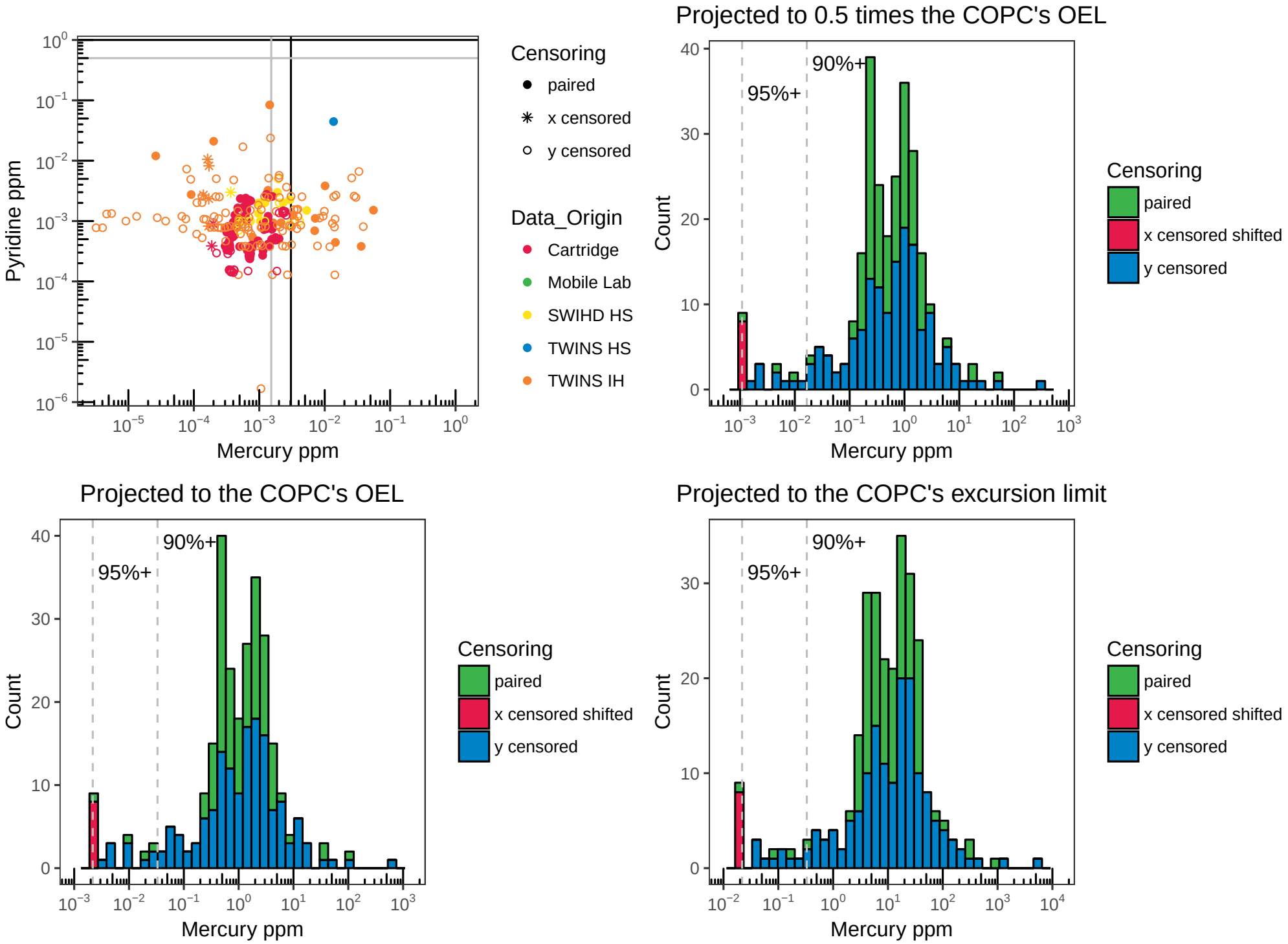


Figure C.160: Pyridine vs Mercury

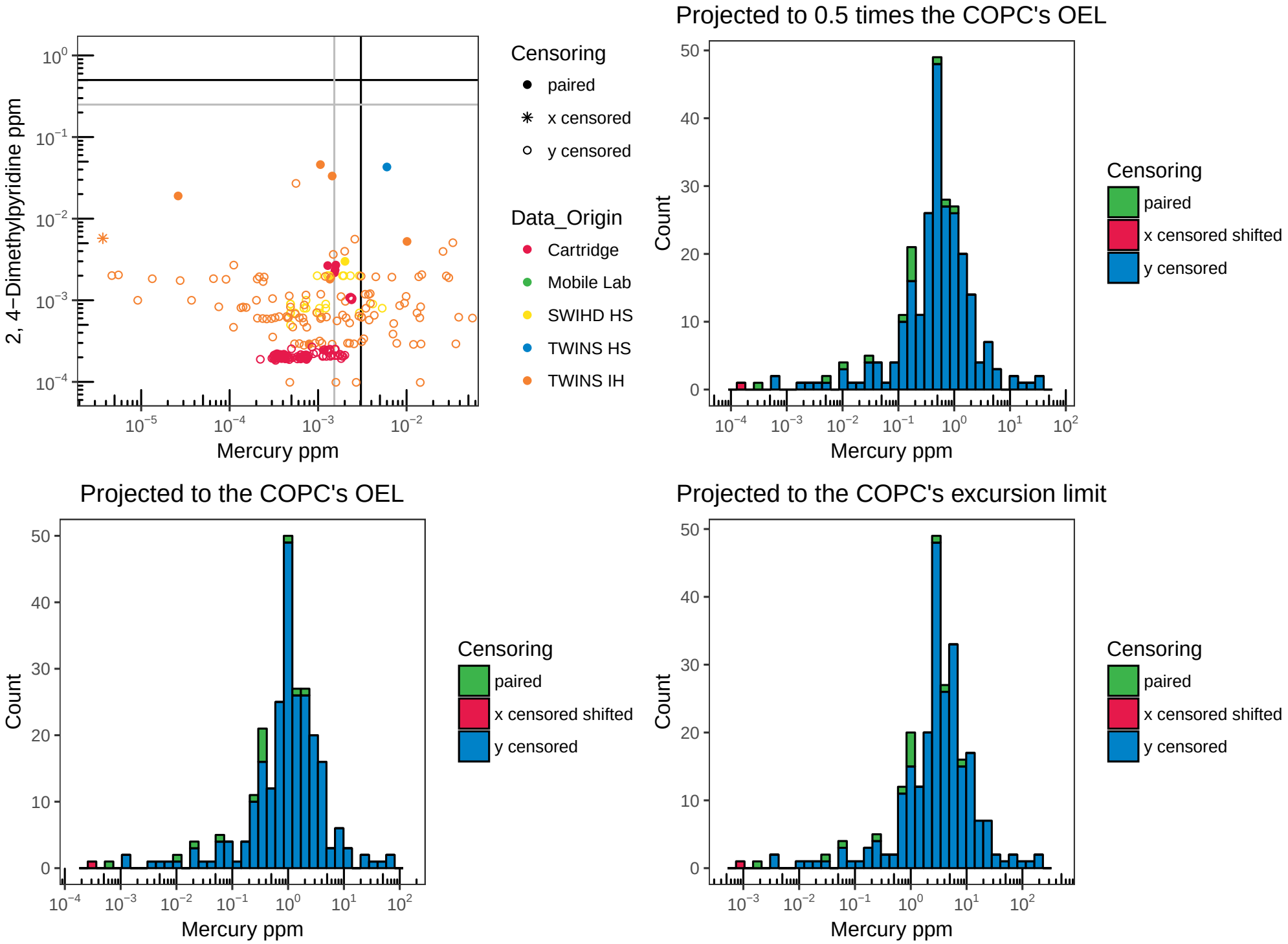


Figure C.161: 2, 4-Dimethylpyridine vs Mercury

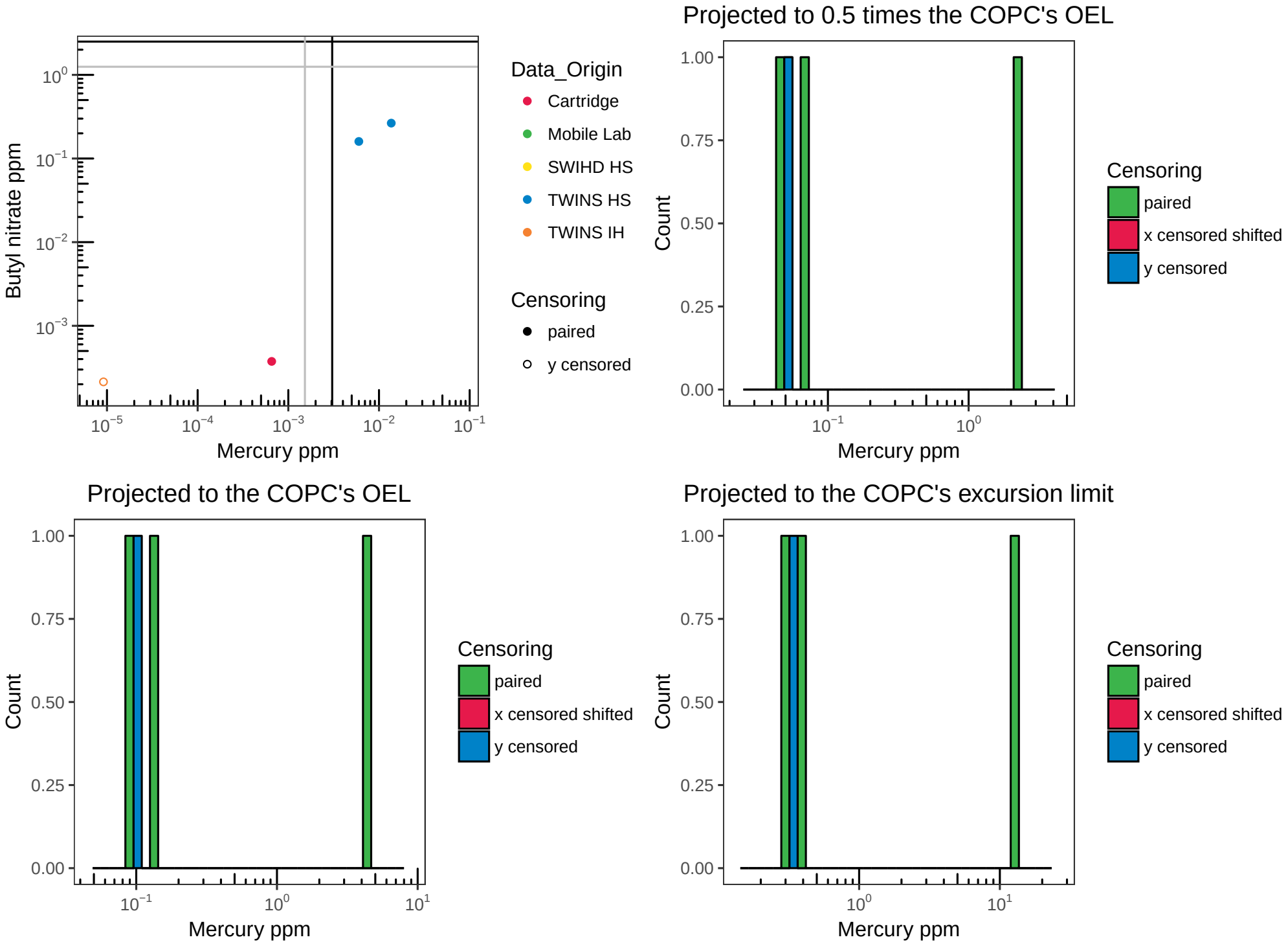


Figure C.162: Butyl nitrate vs Mercury

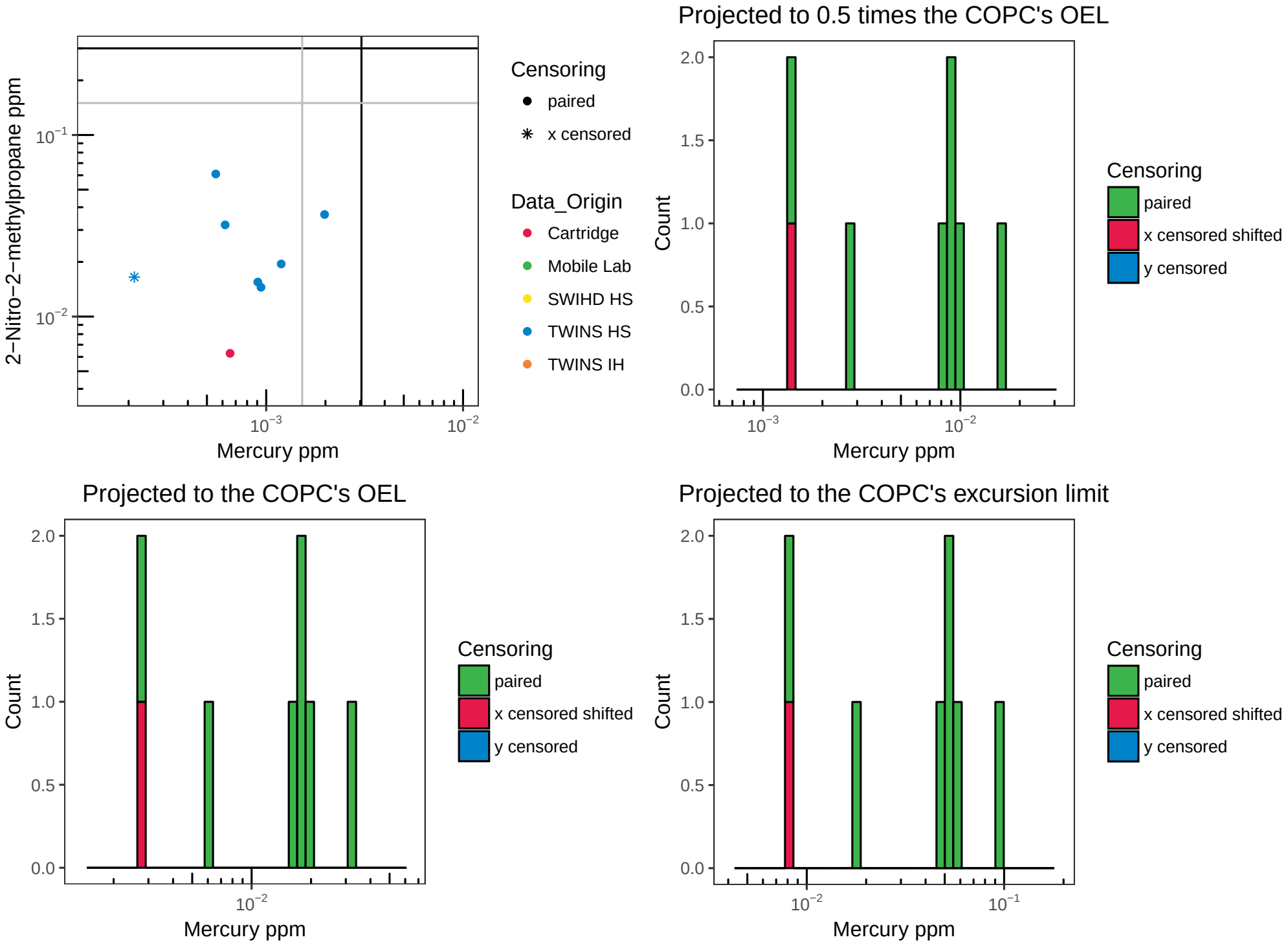


Figure C.163: 2-Nitro-2-methylpropane vs Mercury

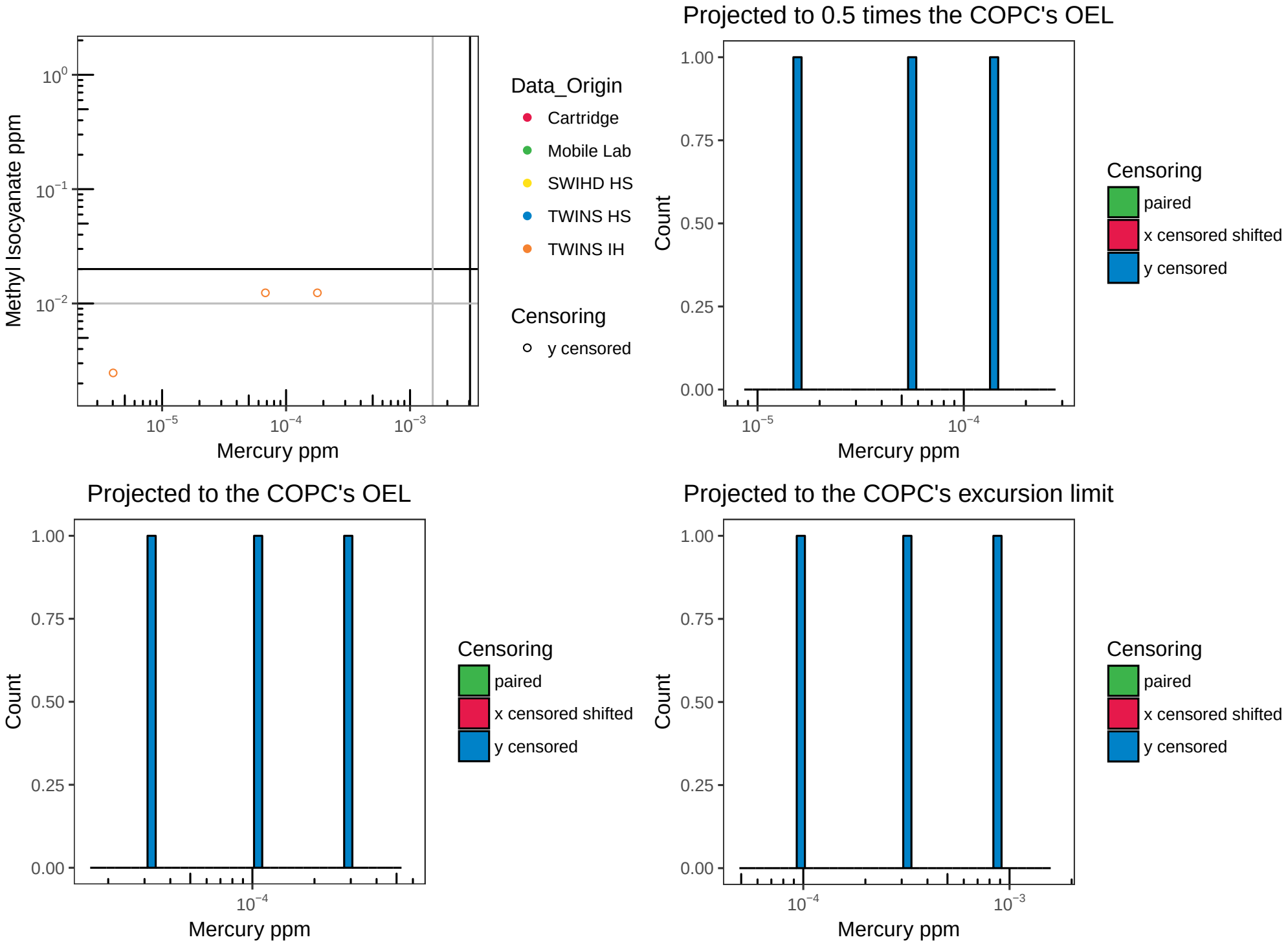


Figure C.164: Methyl Isocyanate vs Mercury

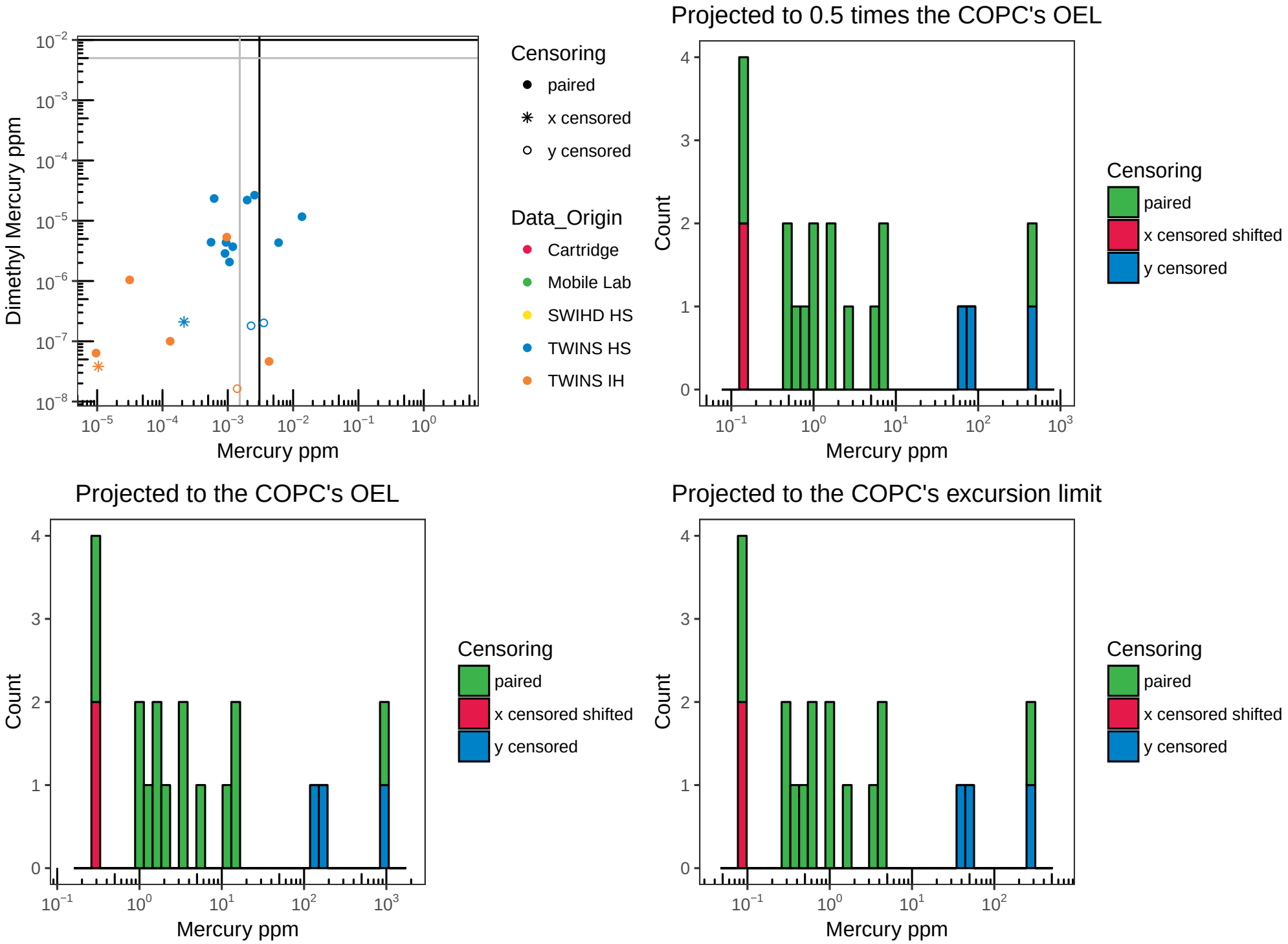


Figure C.165: Dimethyl Mercury vs Mercury

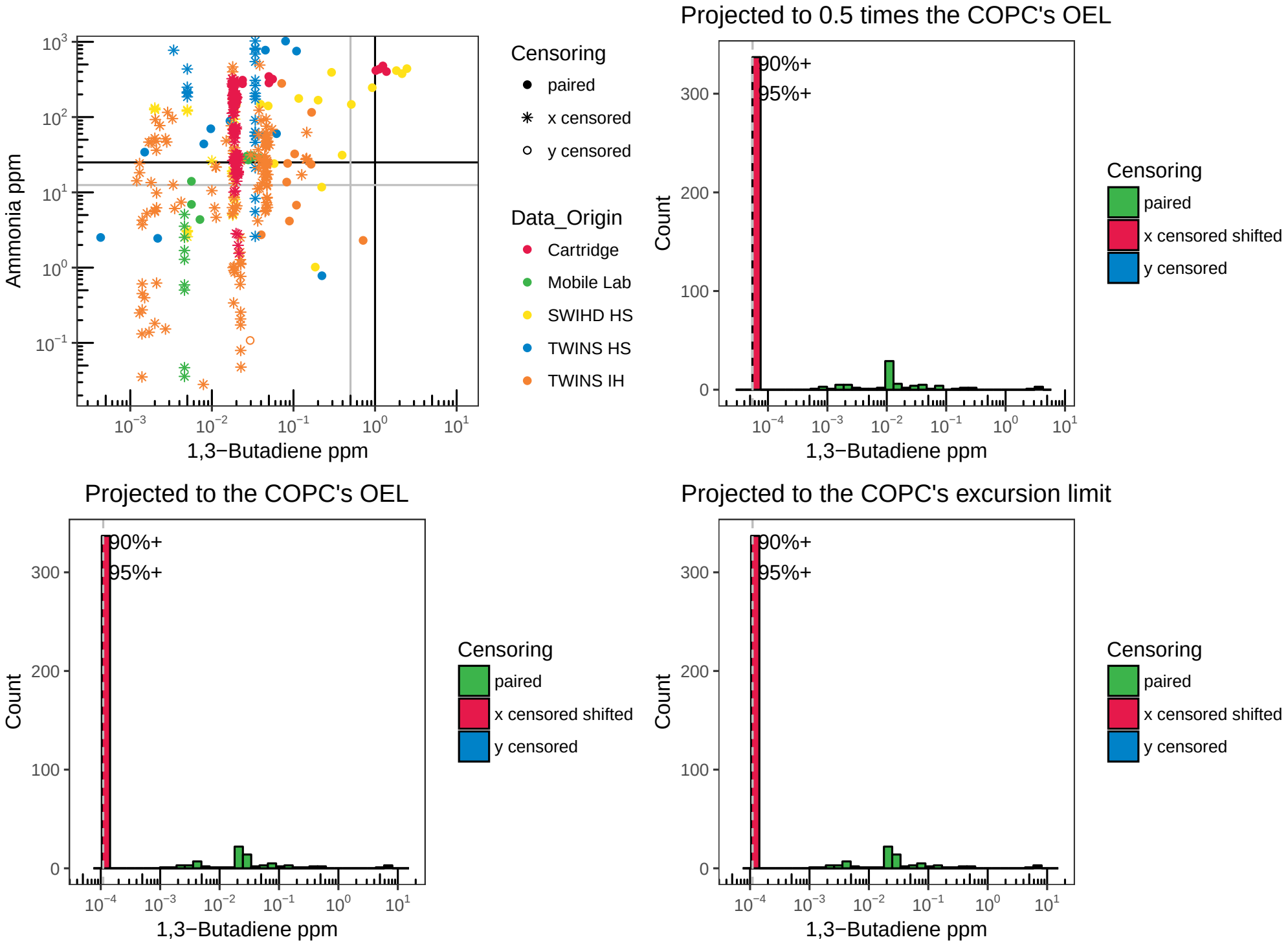


Figure C.166: Ammonia vs 1,3-Butadiene

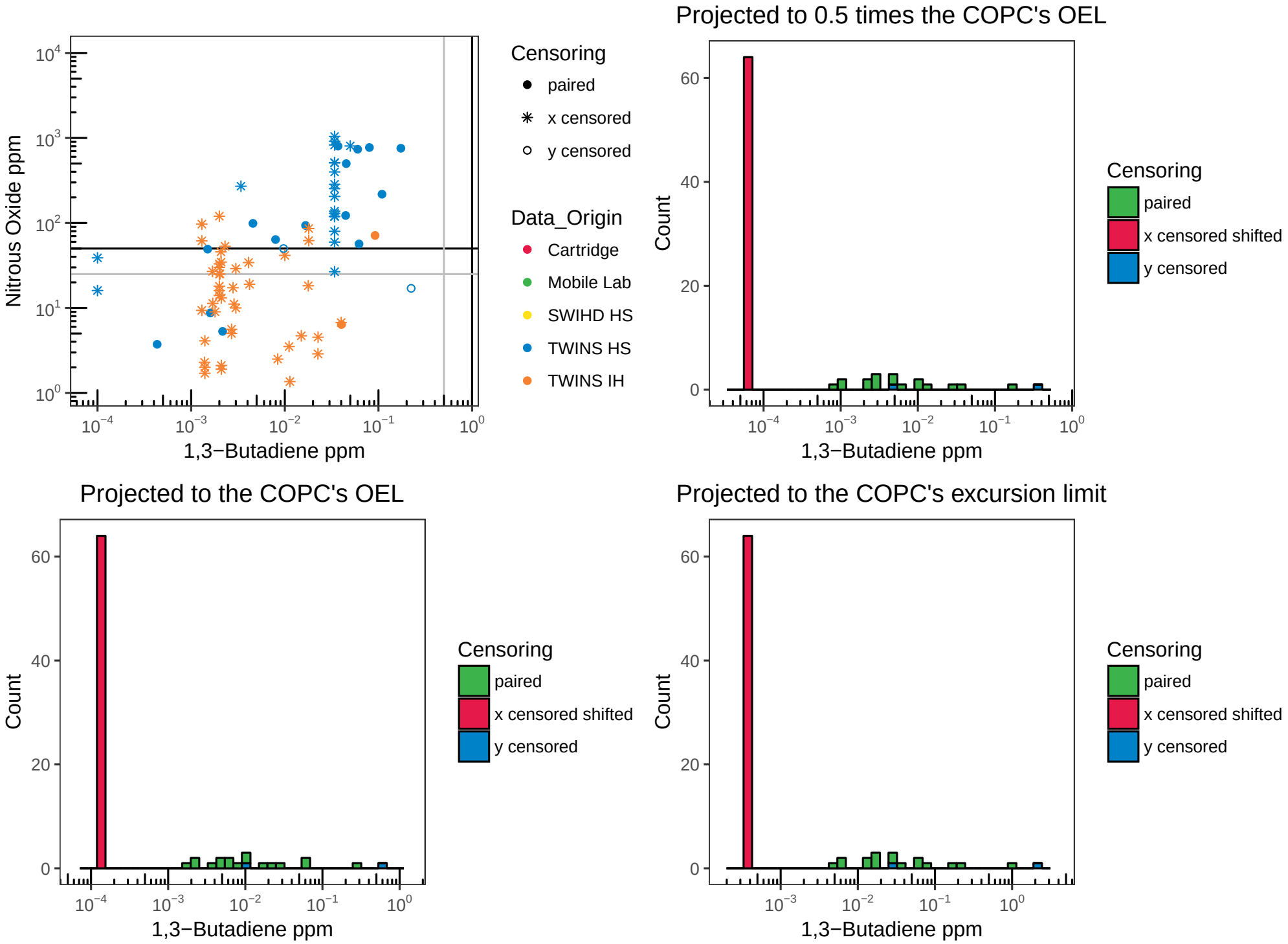


Figure C.167: Nitrous Oxide vs 1,3-Butadiene

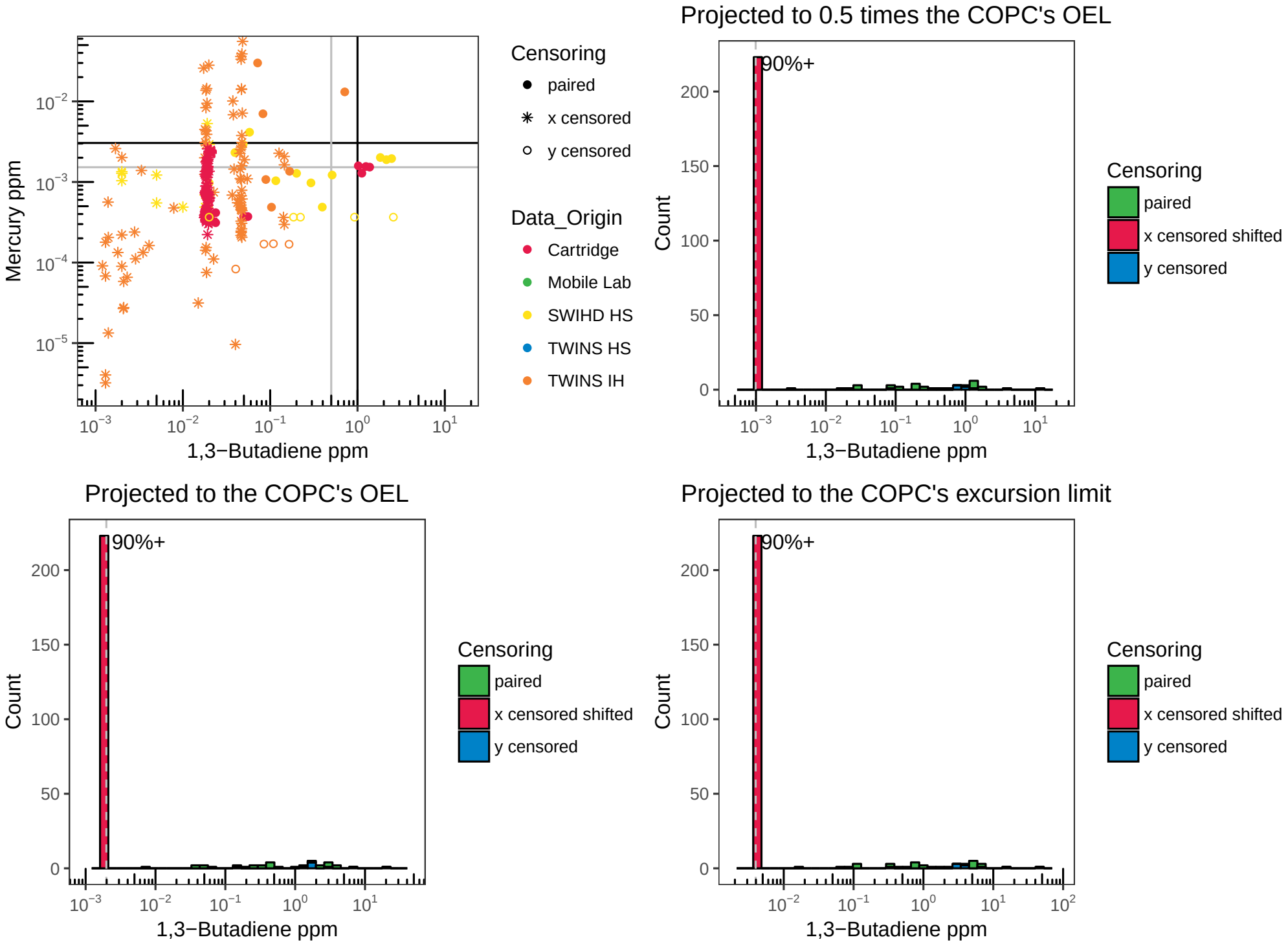


Figure C.168: Mercury vs 1,3-Butadiene

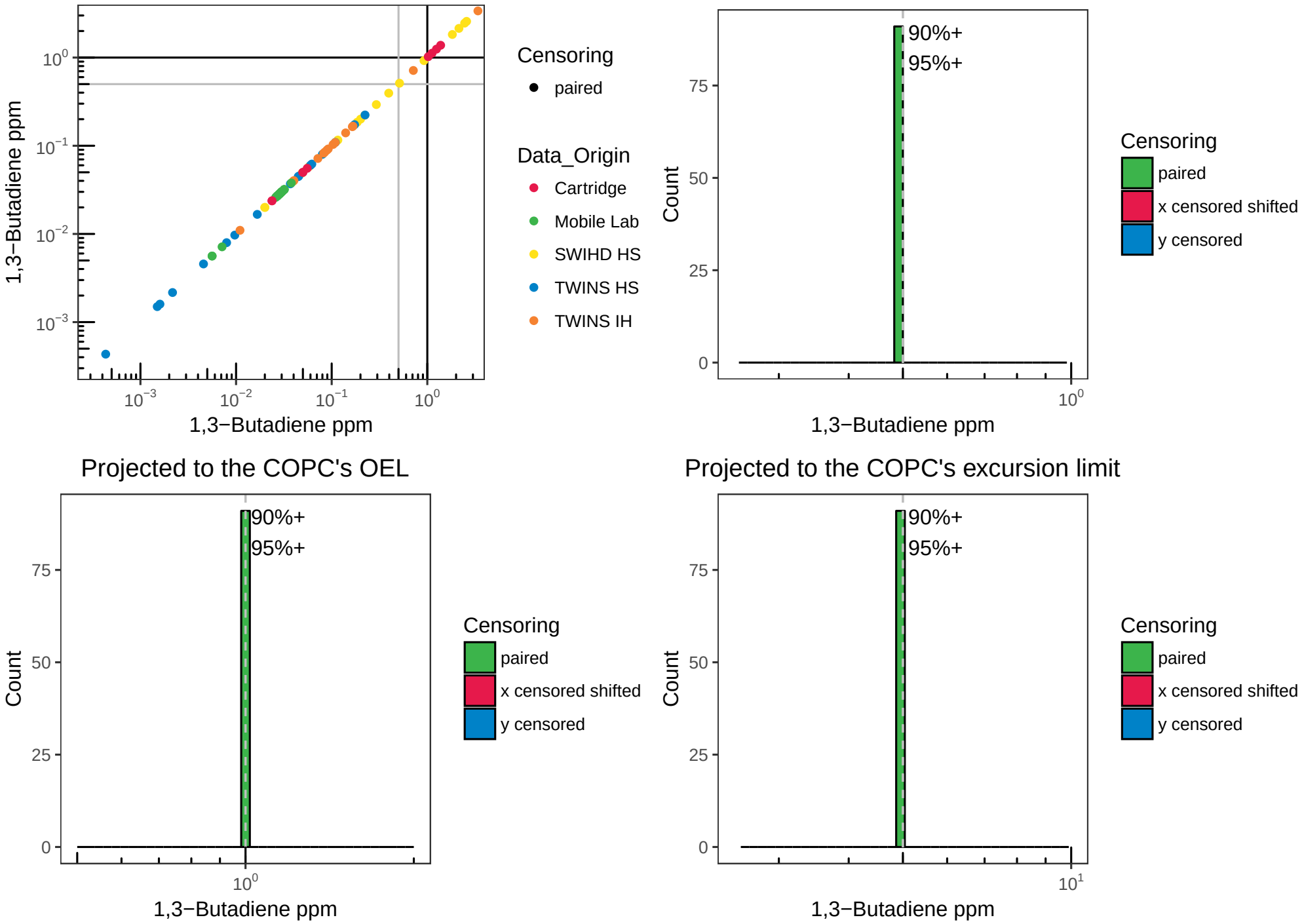


Figure C.169: 1,3-Butadiene vs 1,3-Butadiene

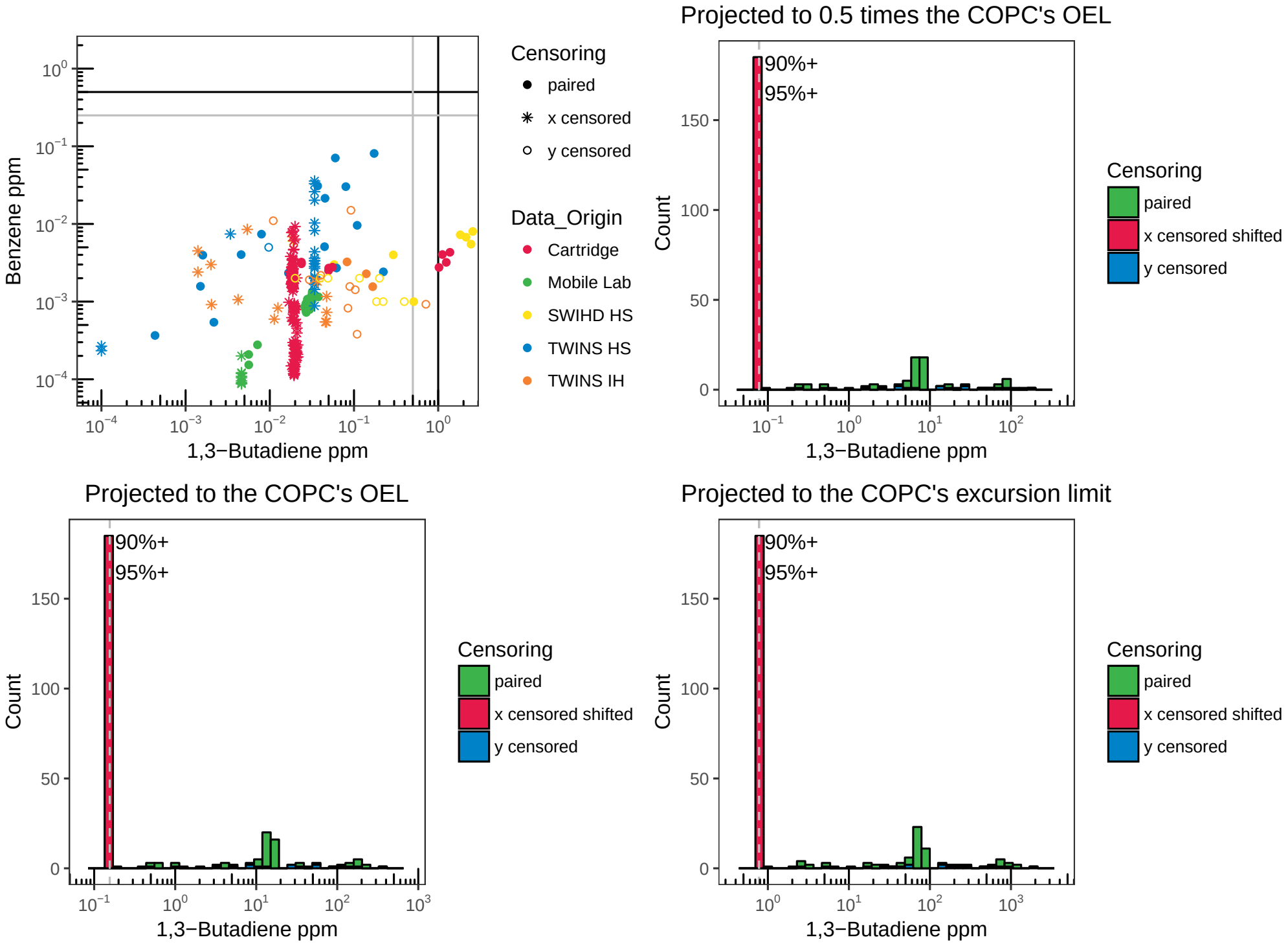


Figure C.170: Benzene vs 1,3-Butadiene

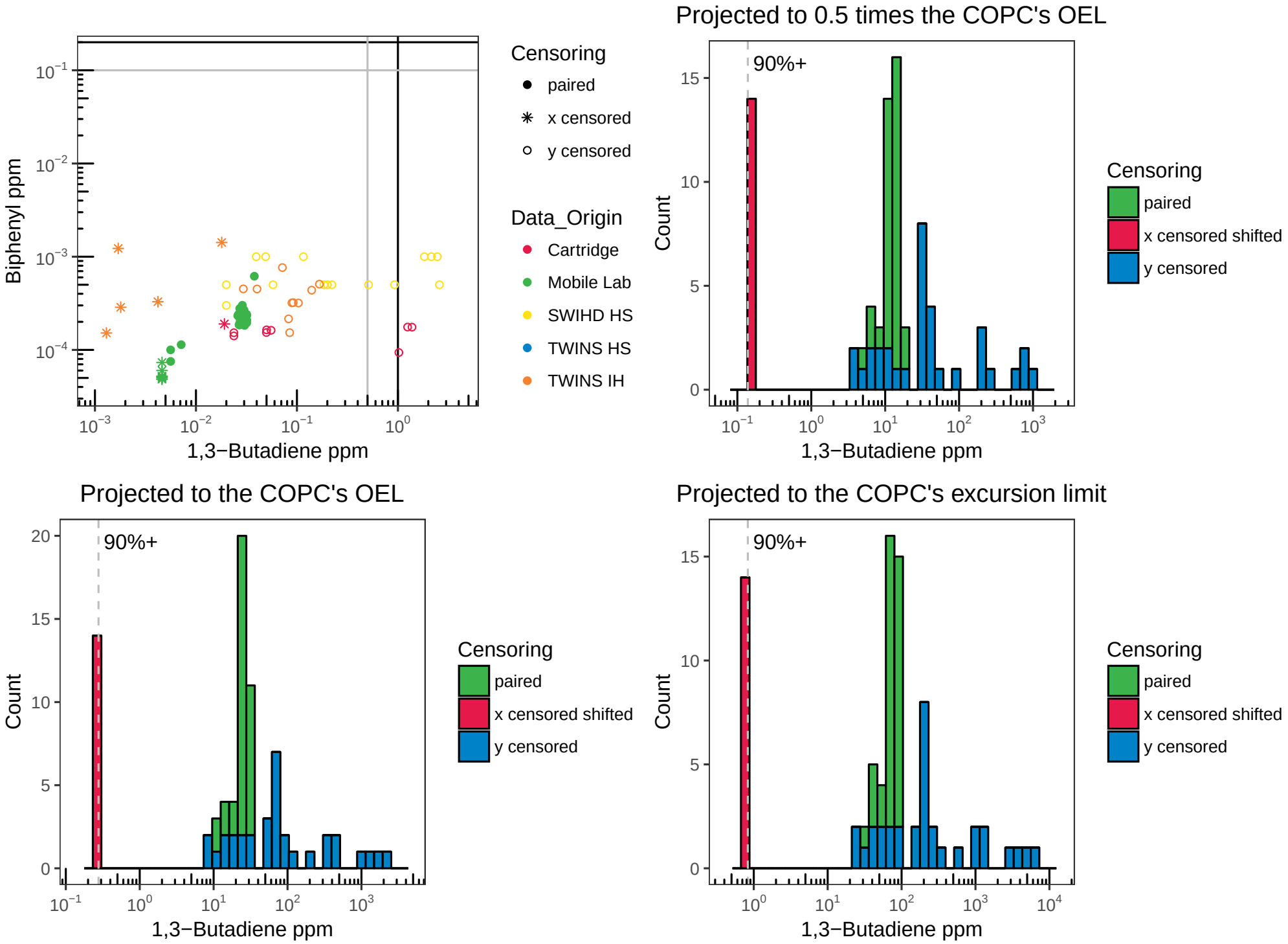


Figure C.171: Biphenyl vs 1,3-Butadiene

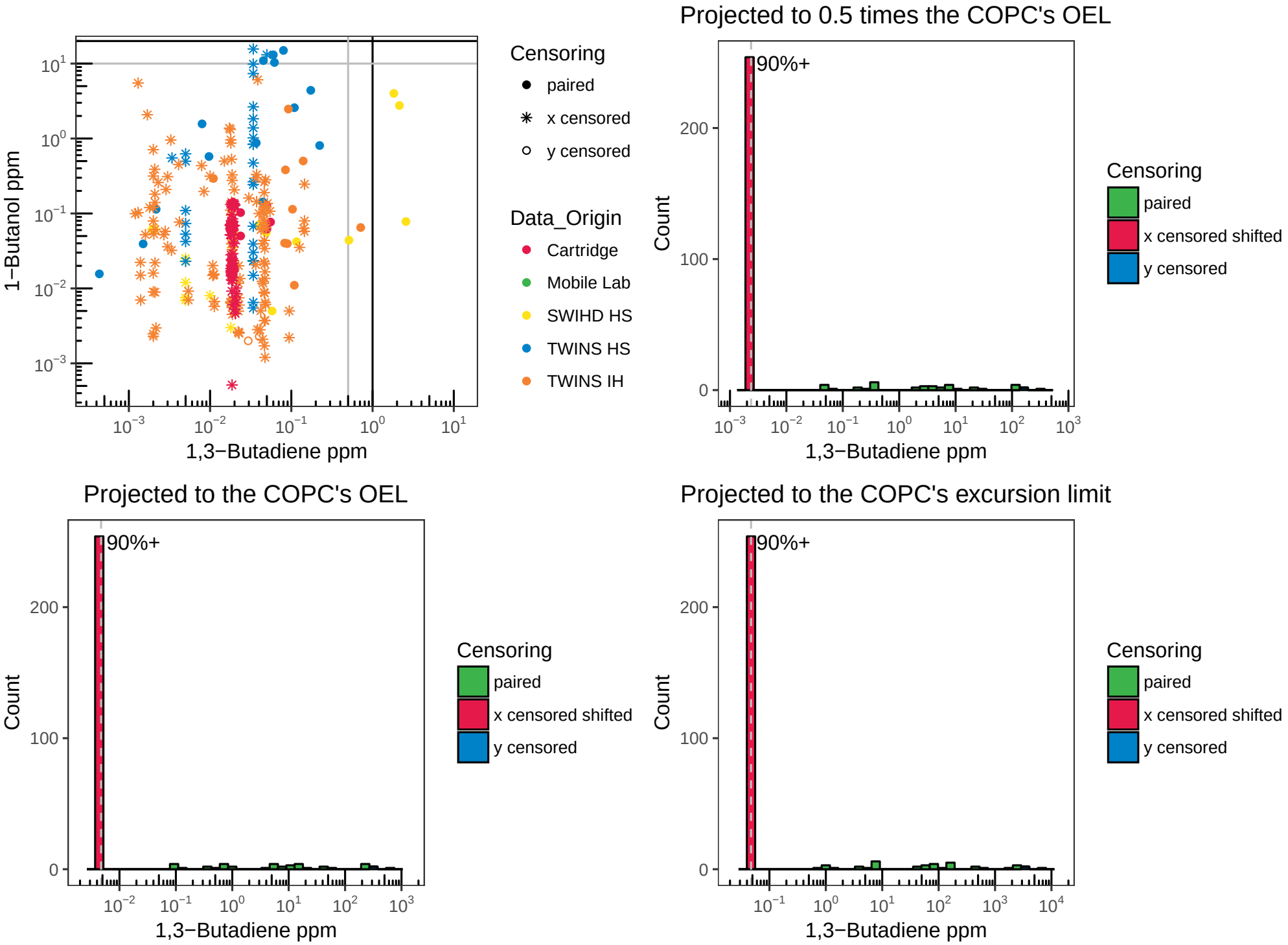


Figure C.172: 1-Butanol vs 1,3-Butadiene

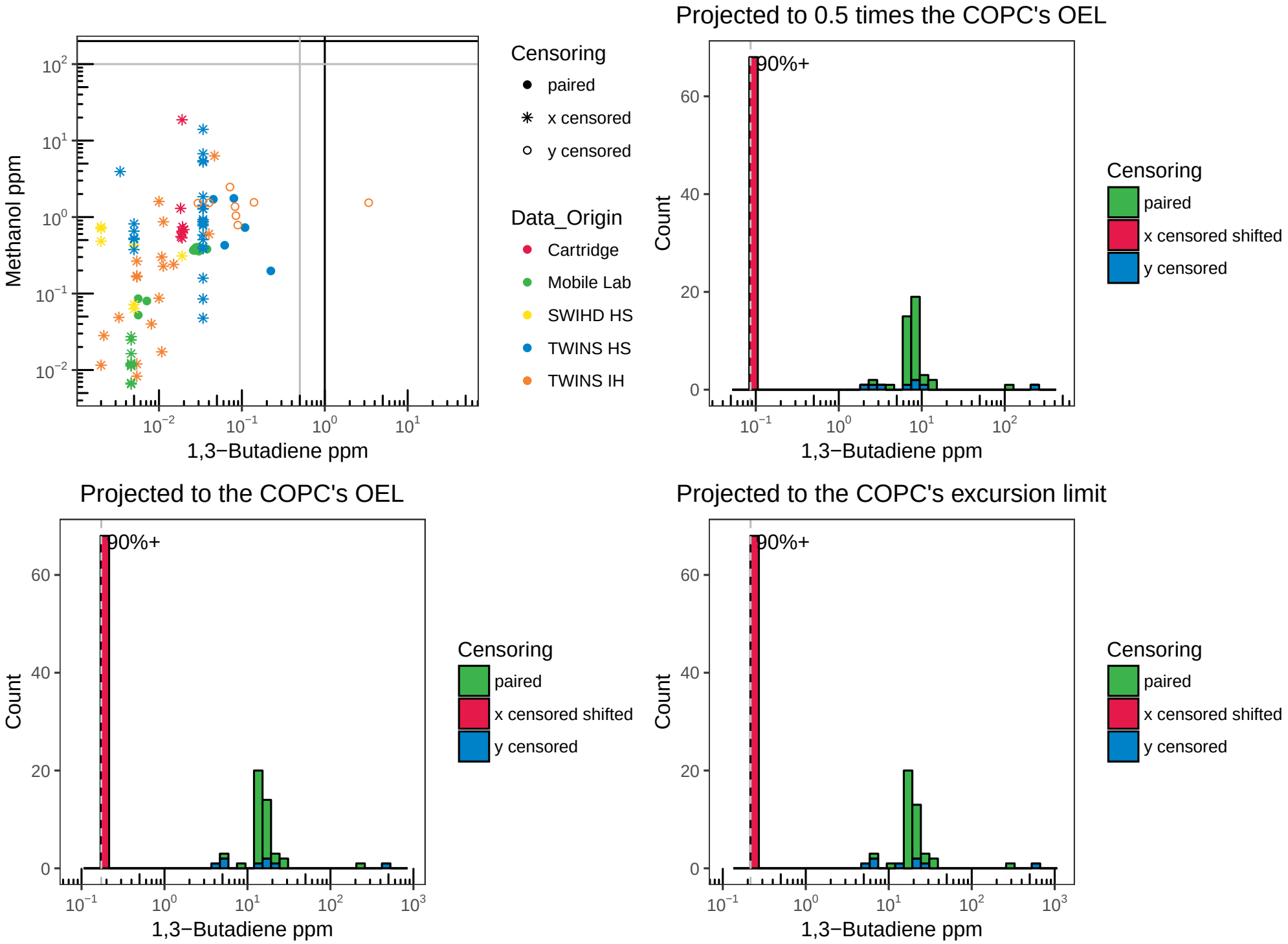


Figure C.173: Methanol vs 1,3-Butadiene

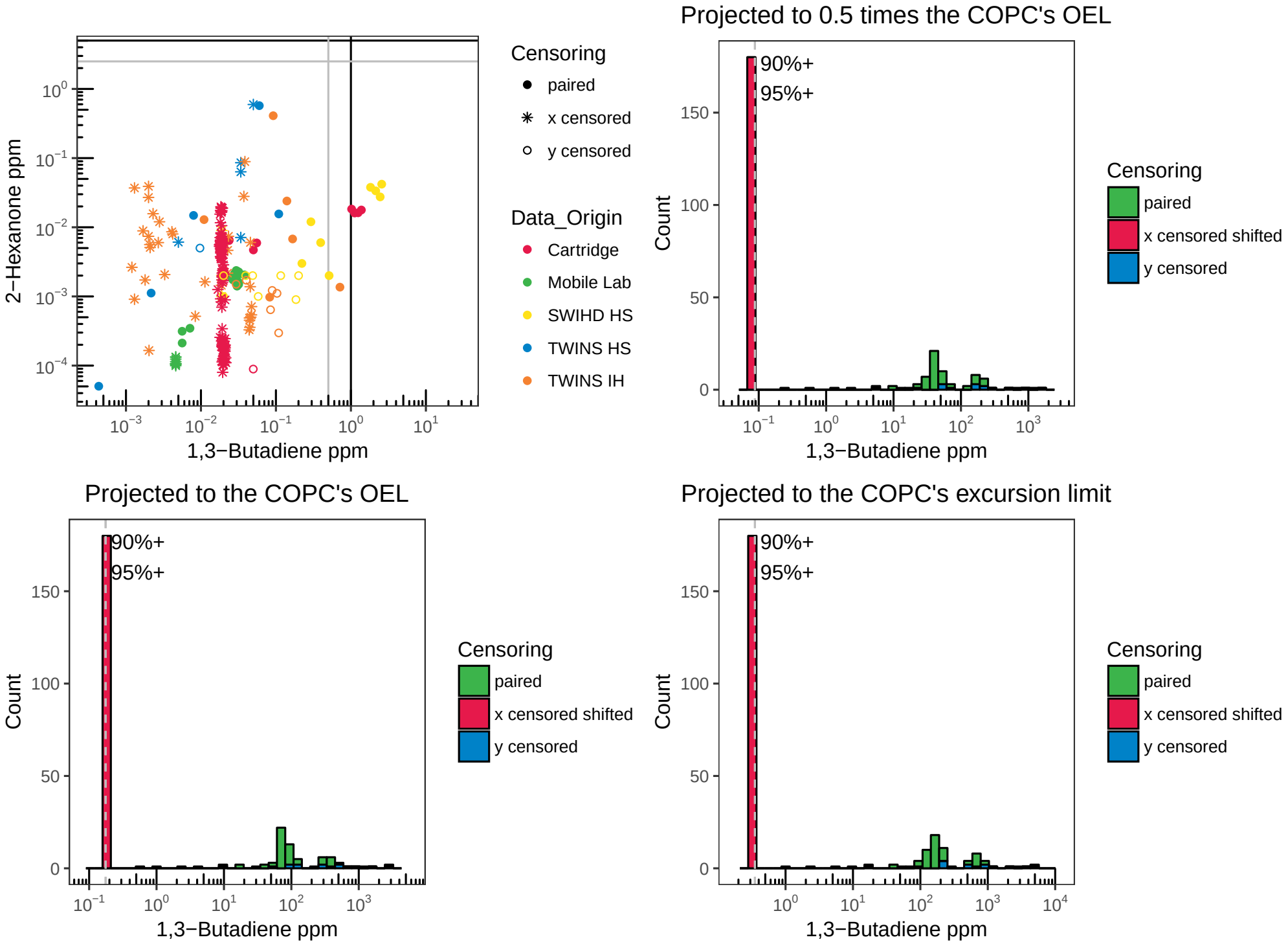


Figure C.174: 2-Hexanone vs 1,3-Butadiene

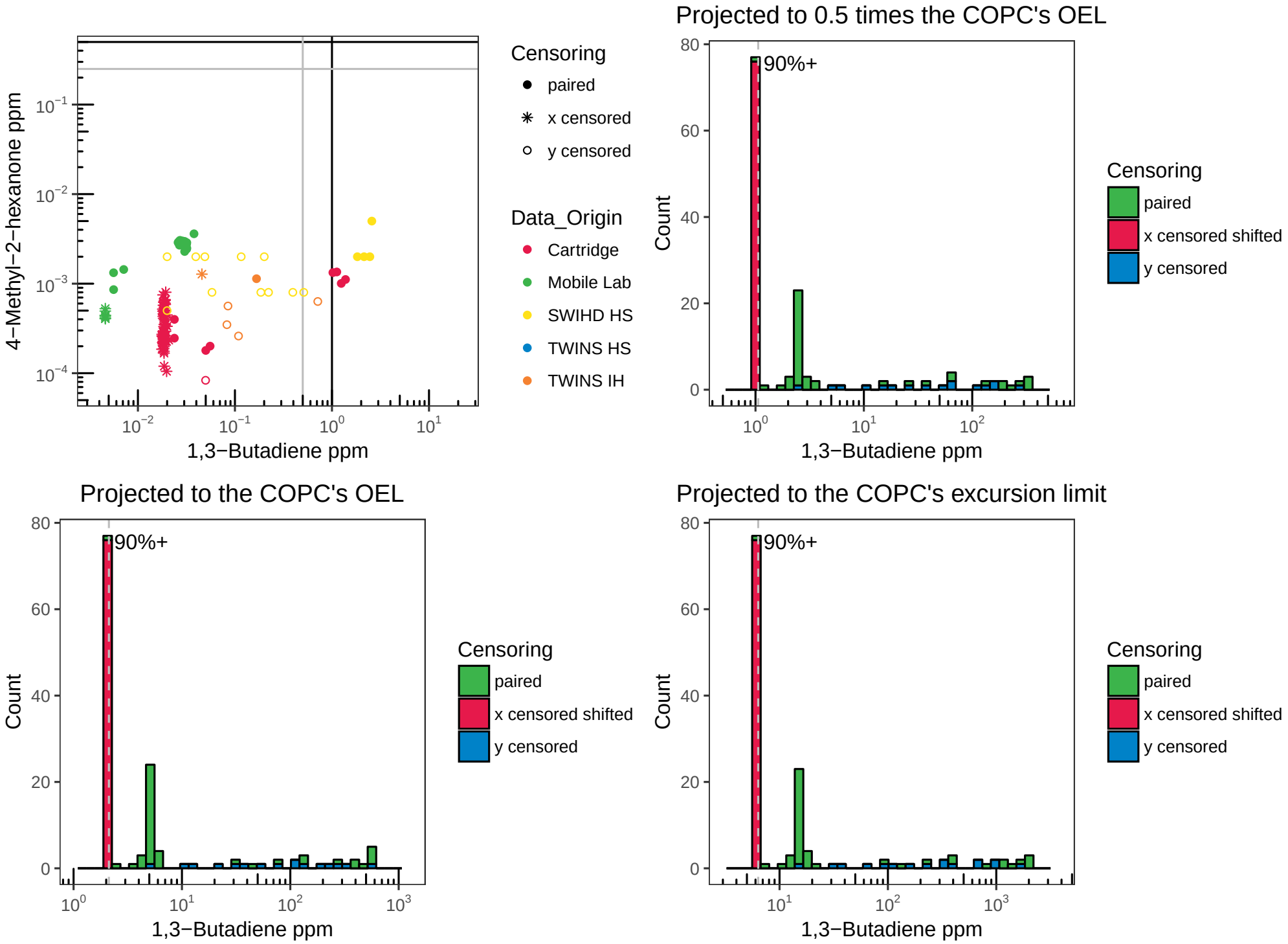


Figure C.175: 4-Methyl-2-hexanone vs 1,3-Butadiene

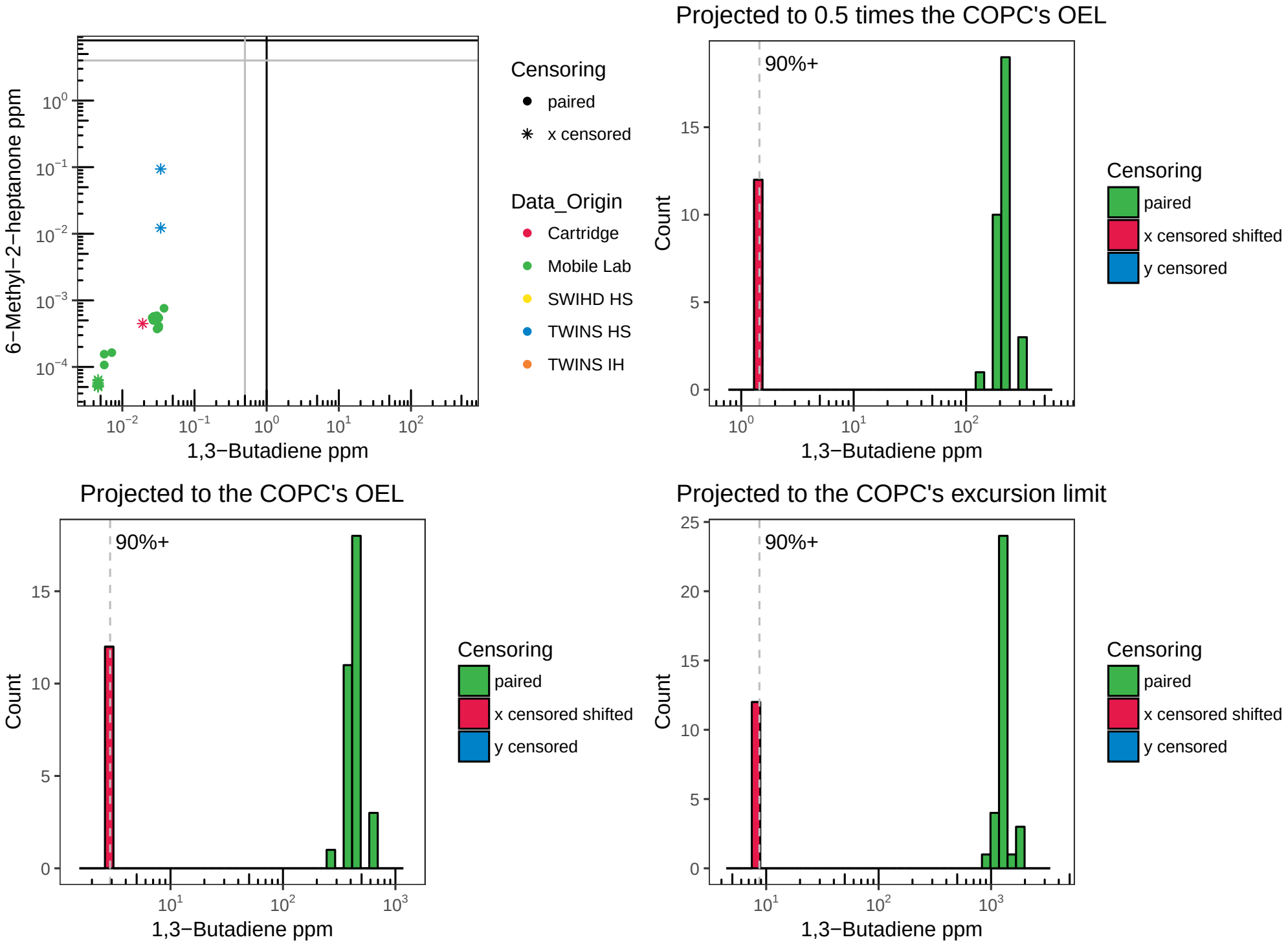


Figure C.176: 6-Methyl-2-heptanone vs 1,3-Butadiene

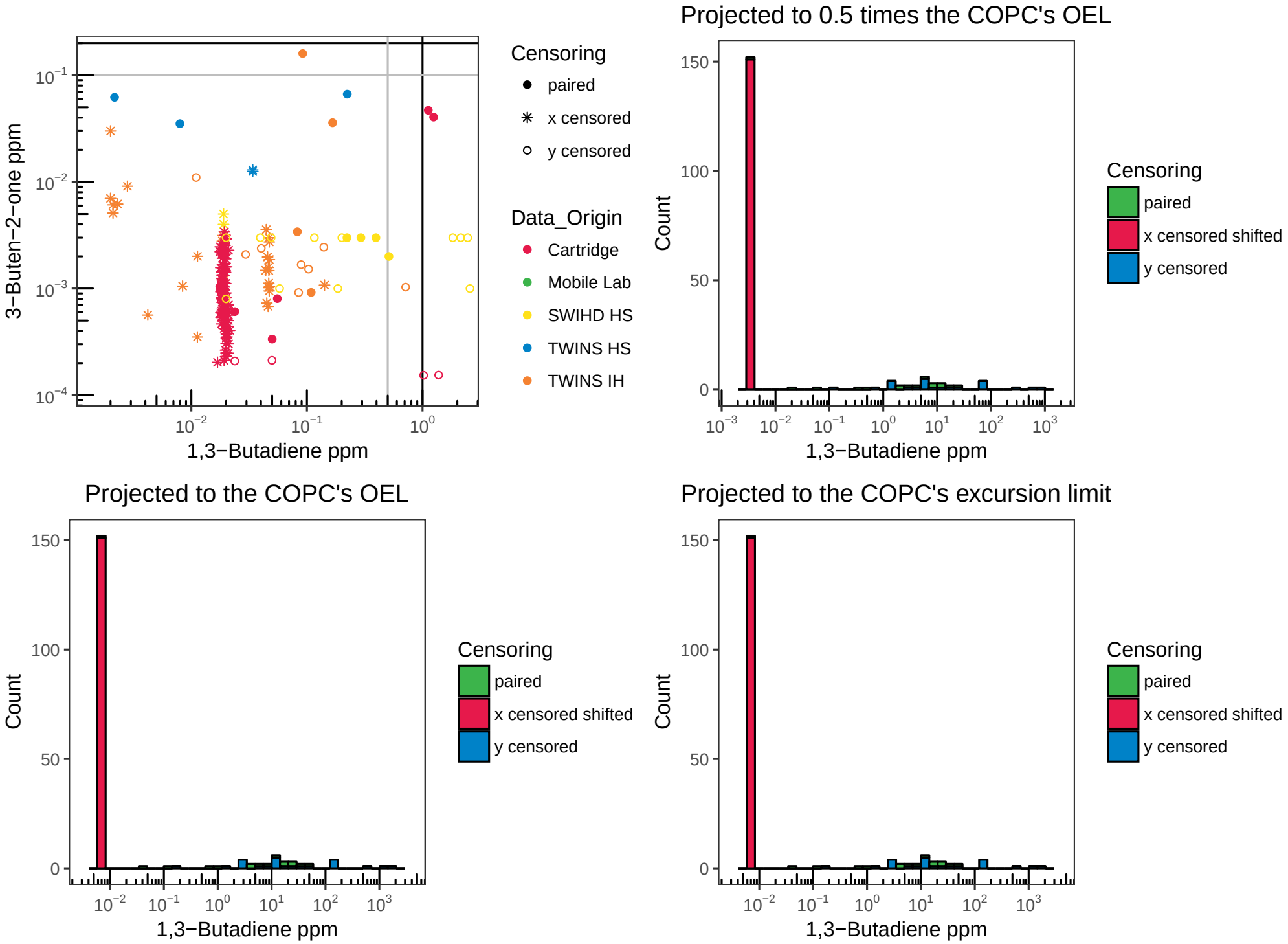


Figure C.177: 3-Buten-2-one vs 1,3-Butadiene

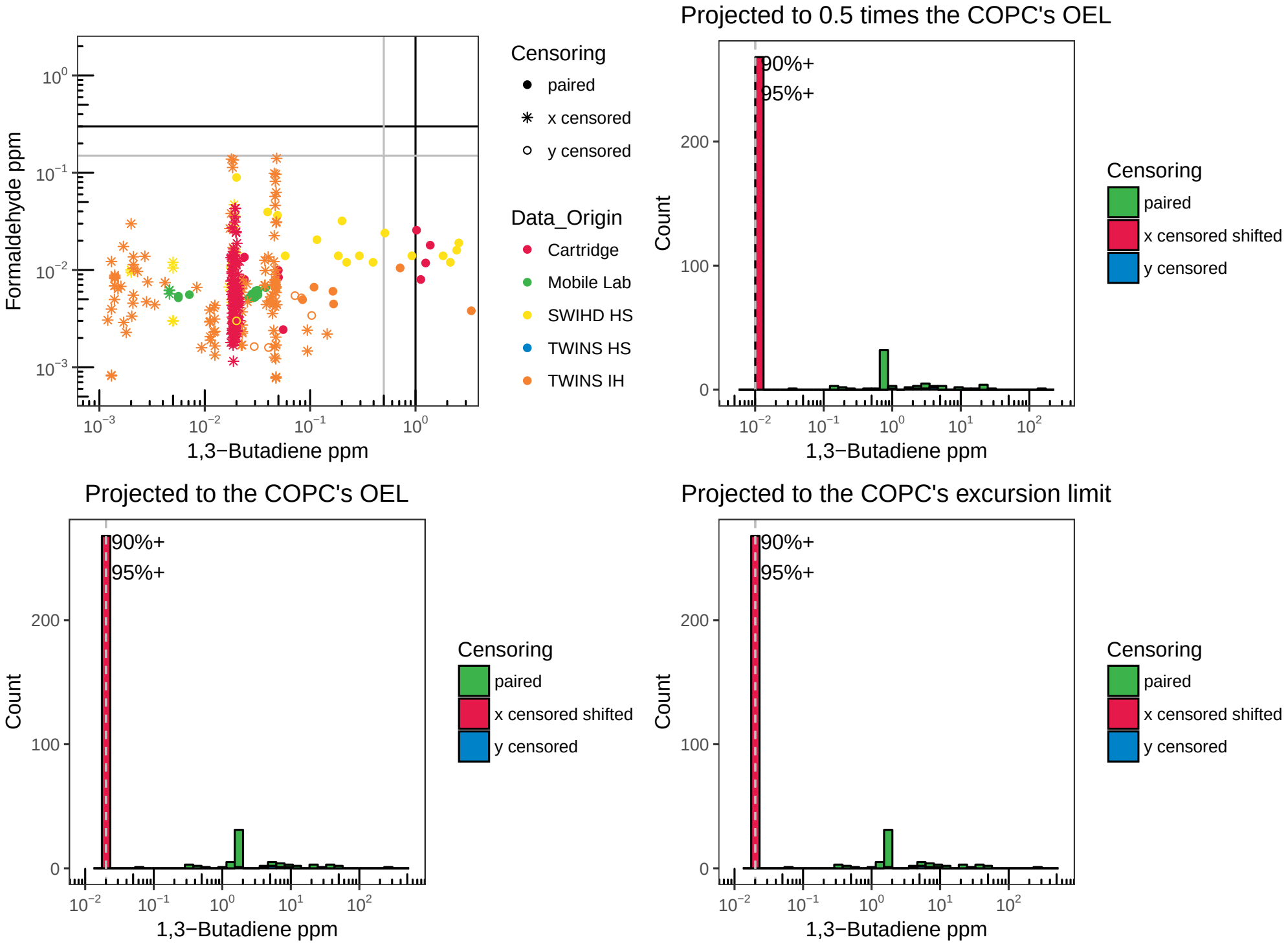


Figure C.178: Formaldehyde vs 1,3-Butadiene

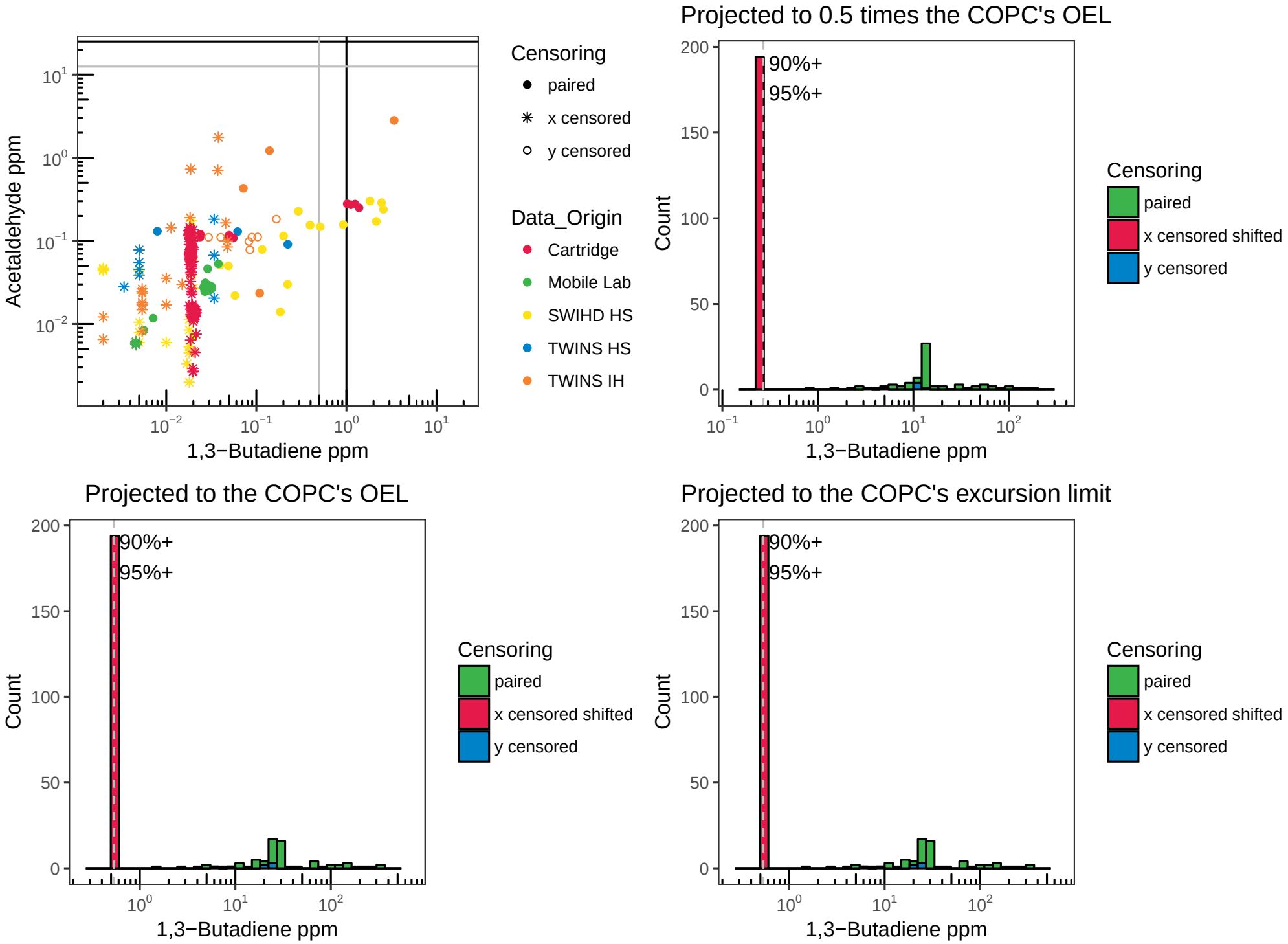


Figure C.179: Acetaldehyde vs 1,3-Butadiene

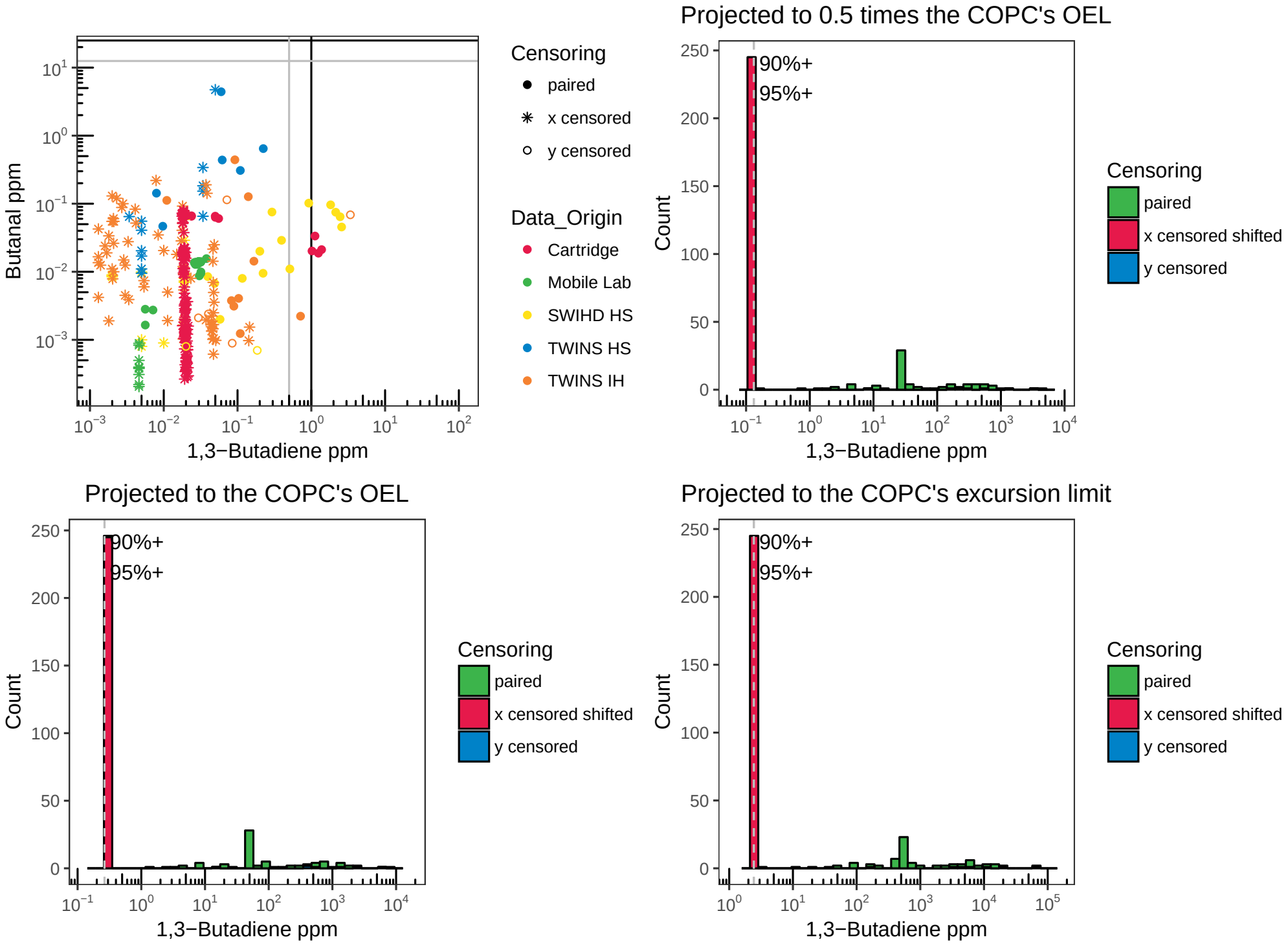


Figure C.180: Butanal vs 1,3-Butadiene

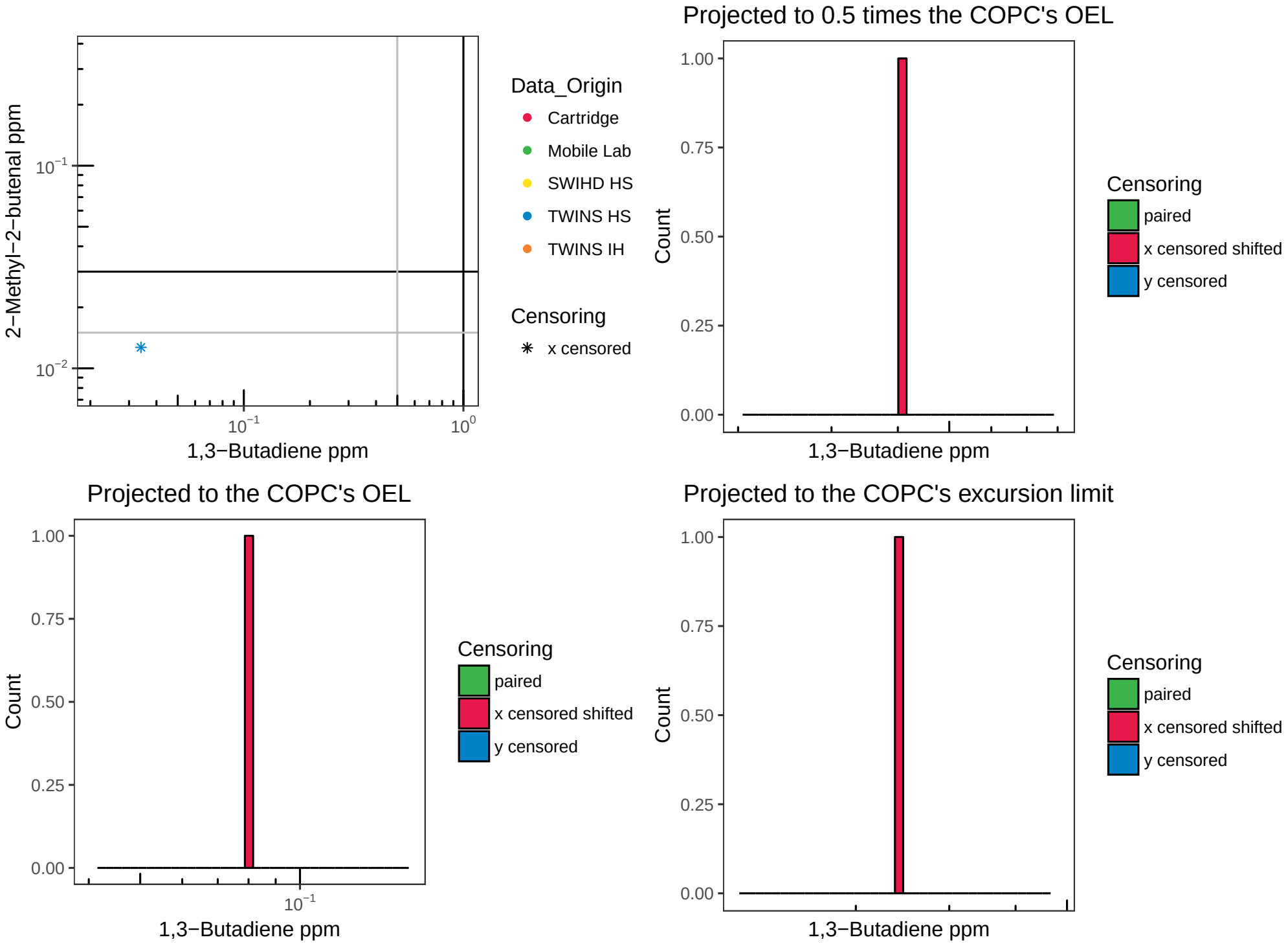


Figure C.181: 2-Methyl-2-butenal vs 1,3-Butadiene

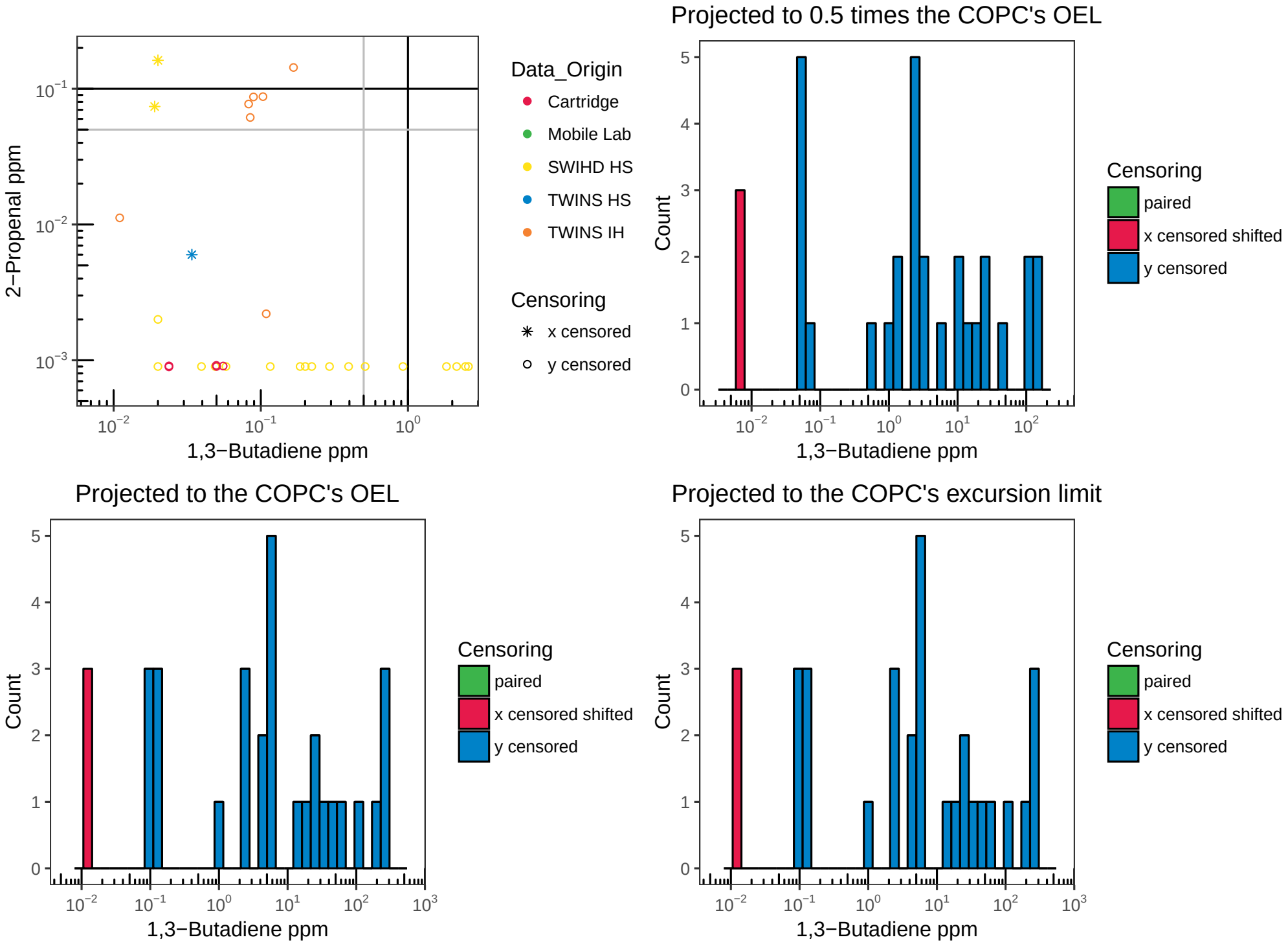


Figure C.182: 2-Propenal vs 1,3-Butadiene

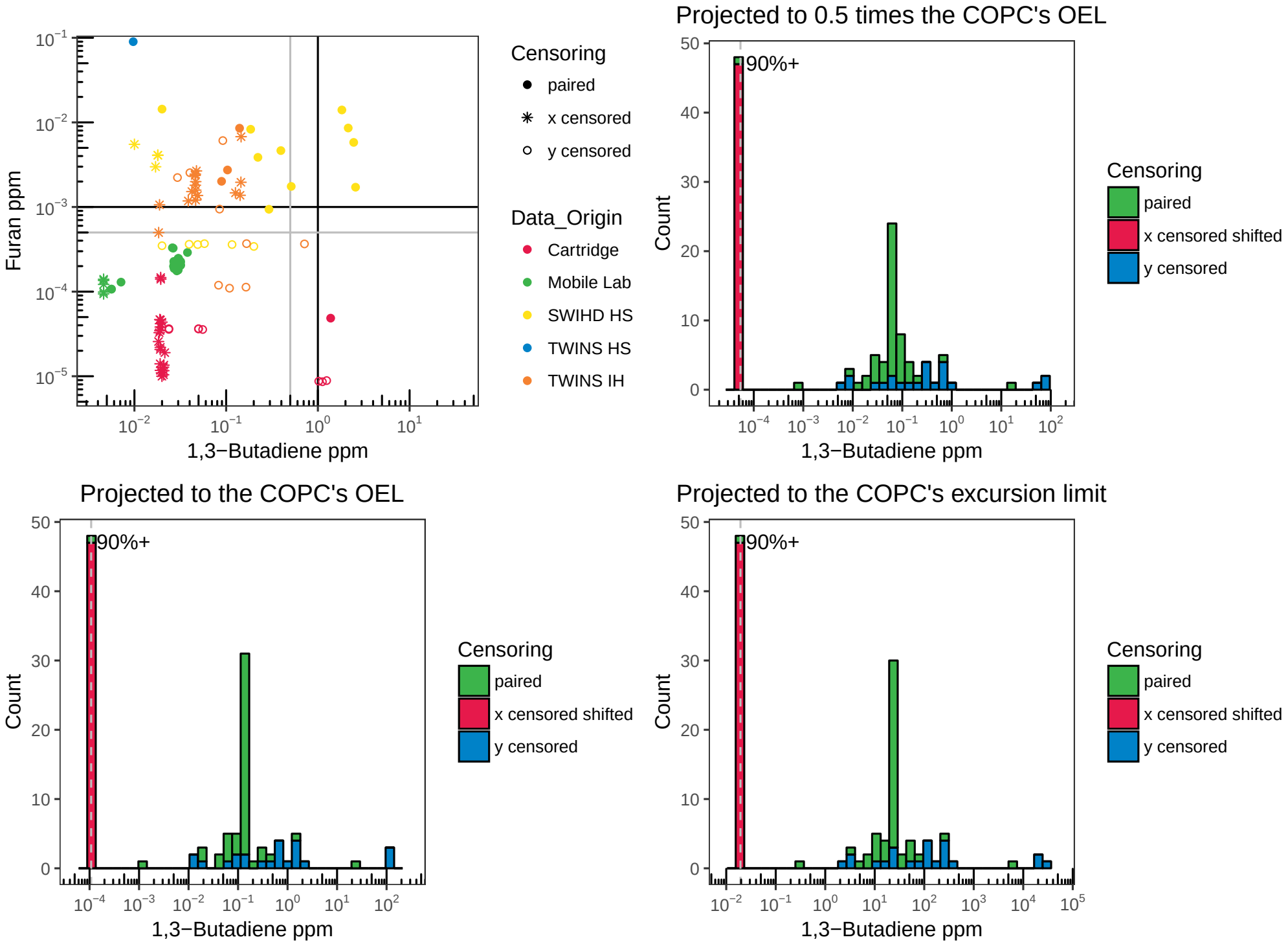


Figure C.183: Furan vs 1,3-Butadiene

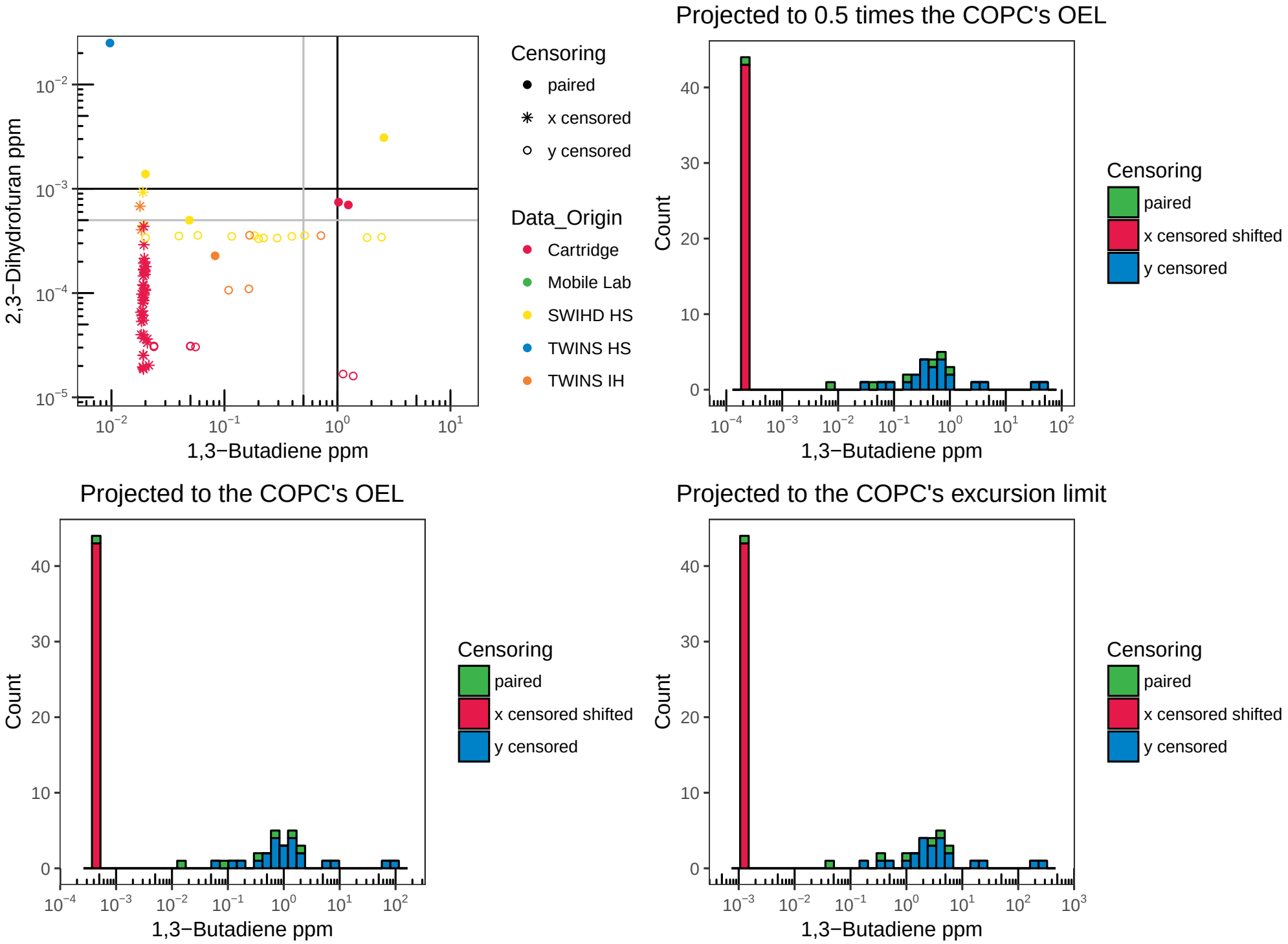


Figure C.184: 2,3-Dihydrofuran vs 1,3-Butadiene

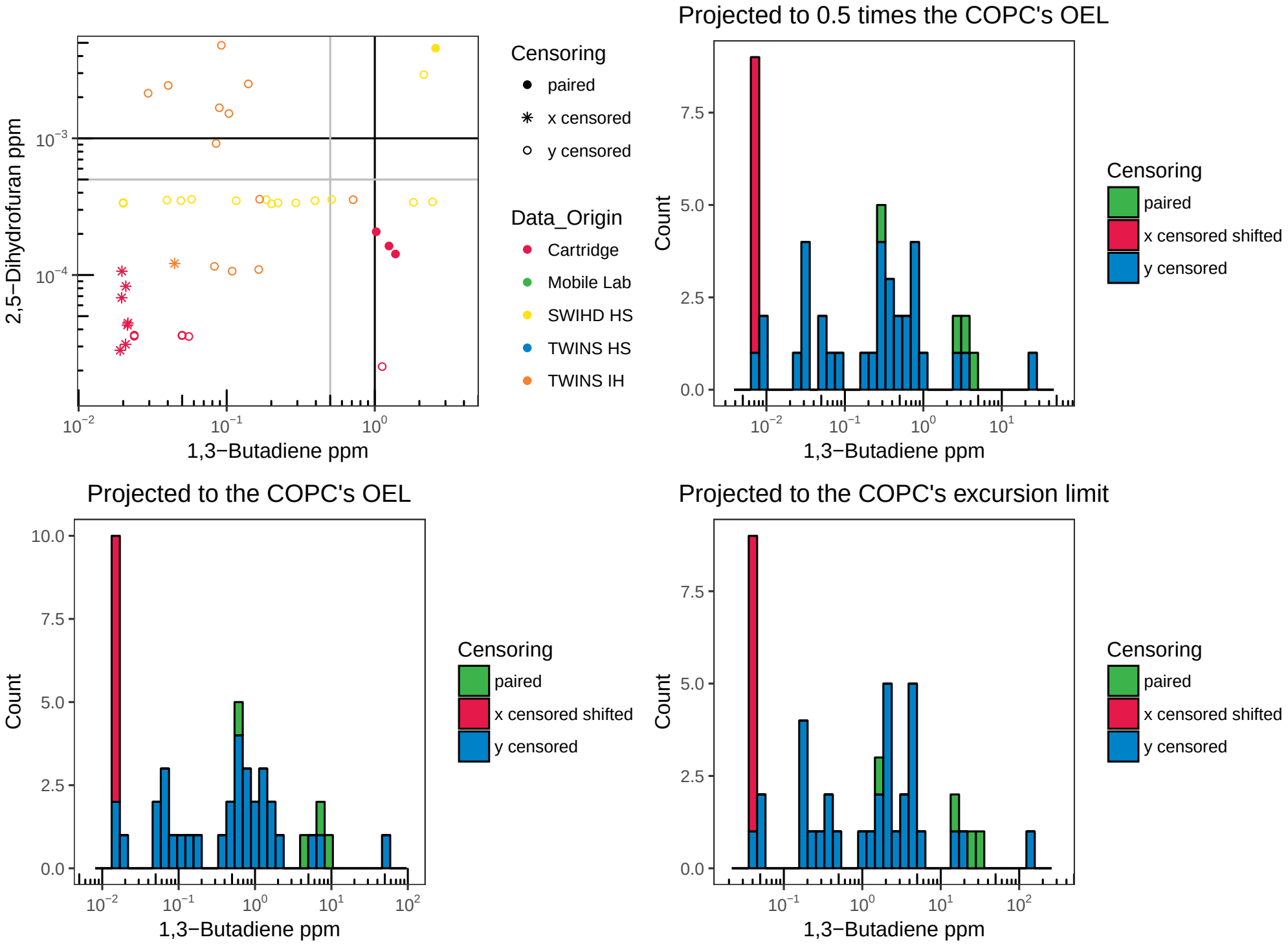


Figure C.185: 2,5-Dihydrofuran vs 1,3-Butadiene

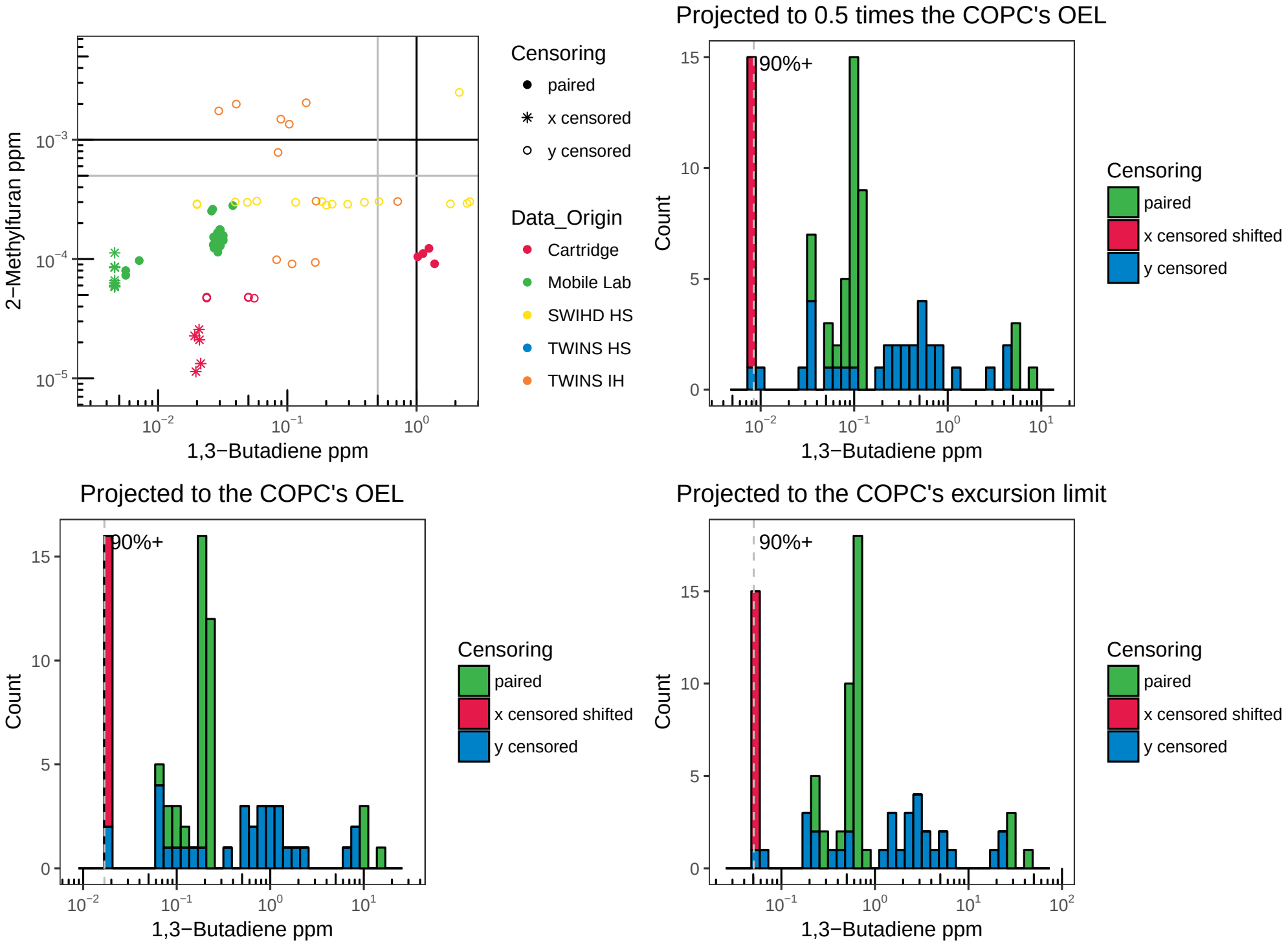


Figure C.186: 2-Methylfuran vs 1,3-Butadiene

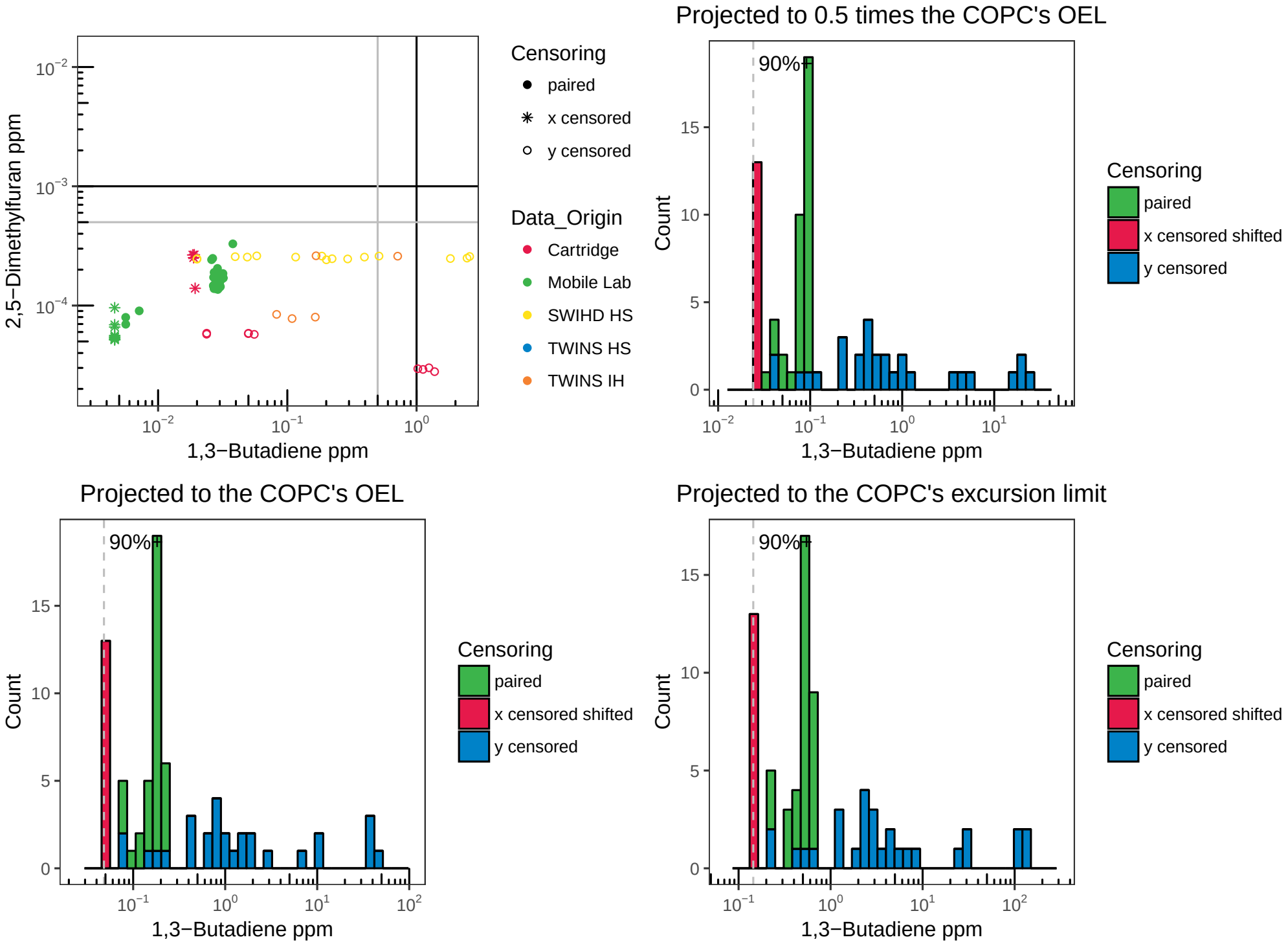


Figure C.187: 2,5-Dimethylfuran vs 1,3-Butadiene

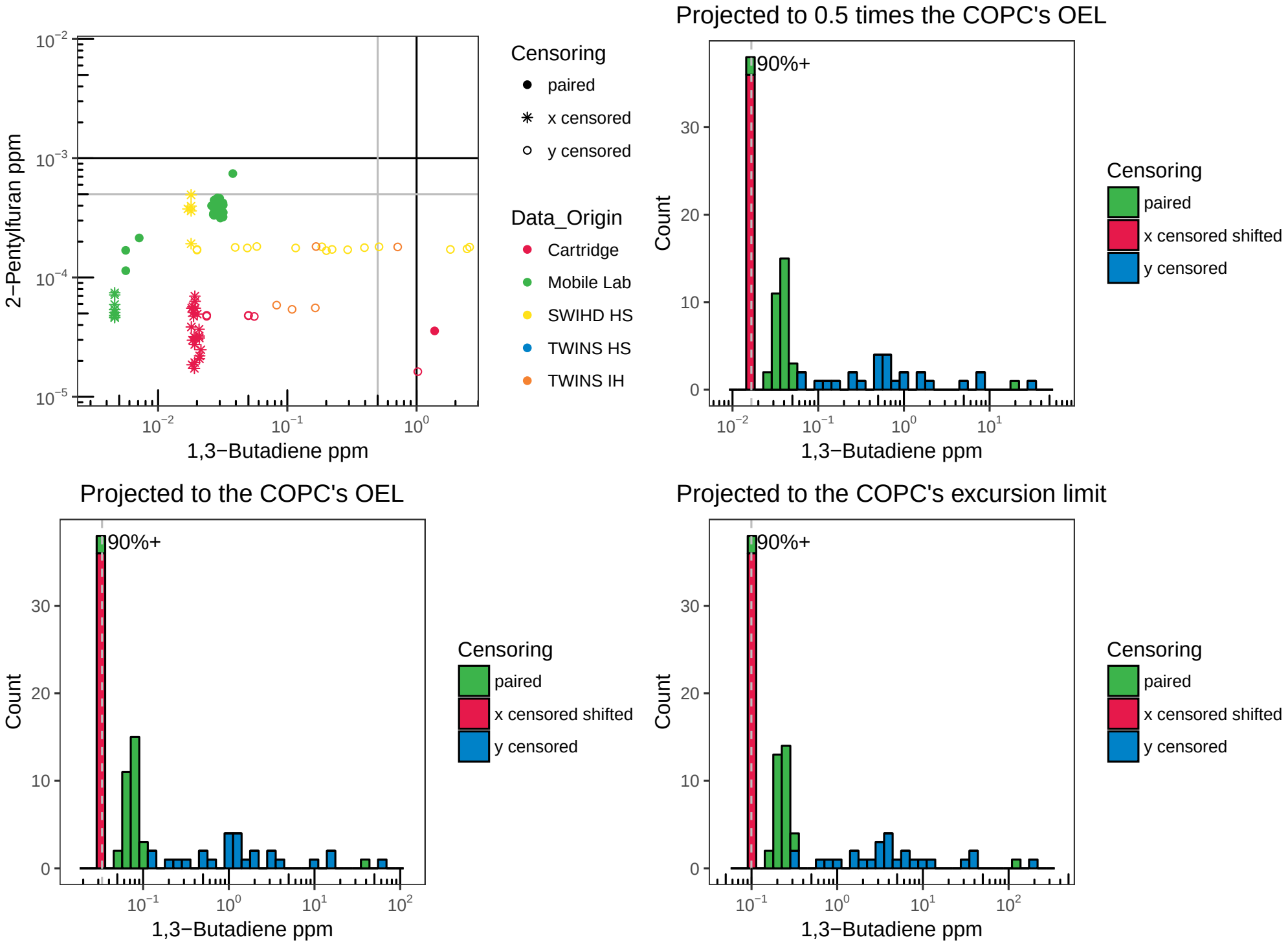


Figure C.188: 2-Pentylfuran vs 1,3-Butadiene

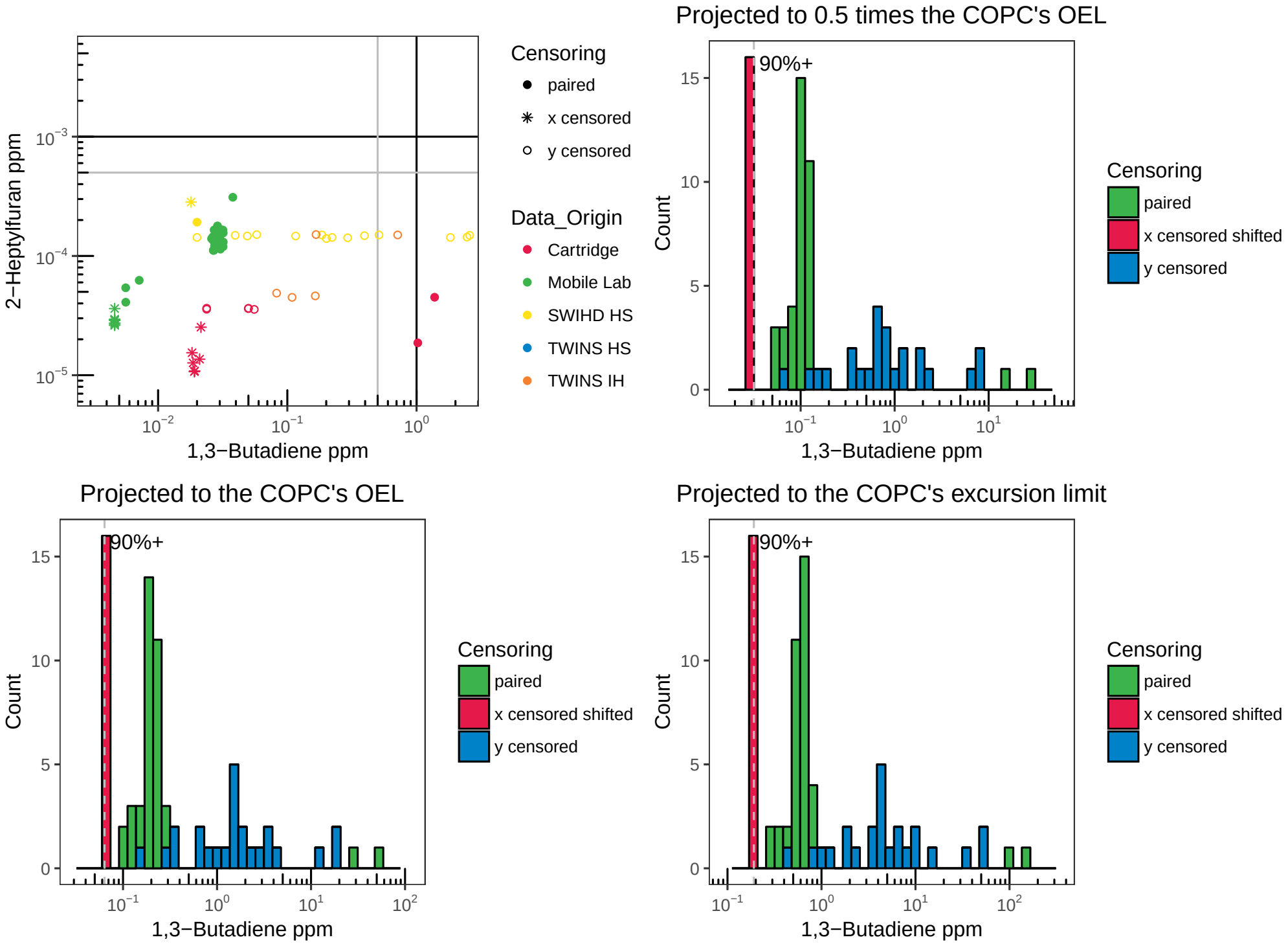


Figure C.189: 2-Heptylfuran vs 1,3-Butadiene

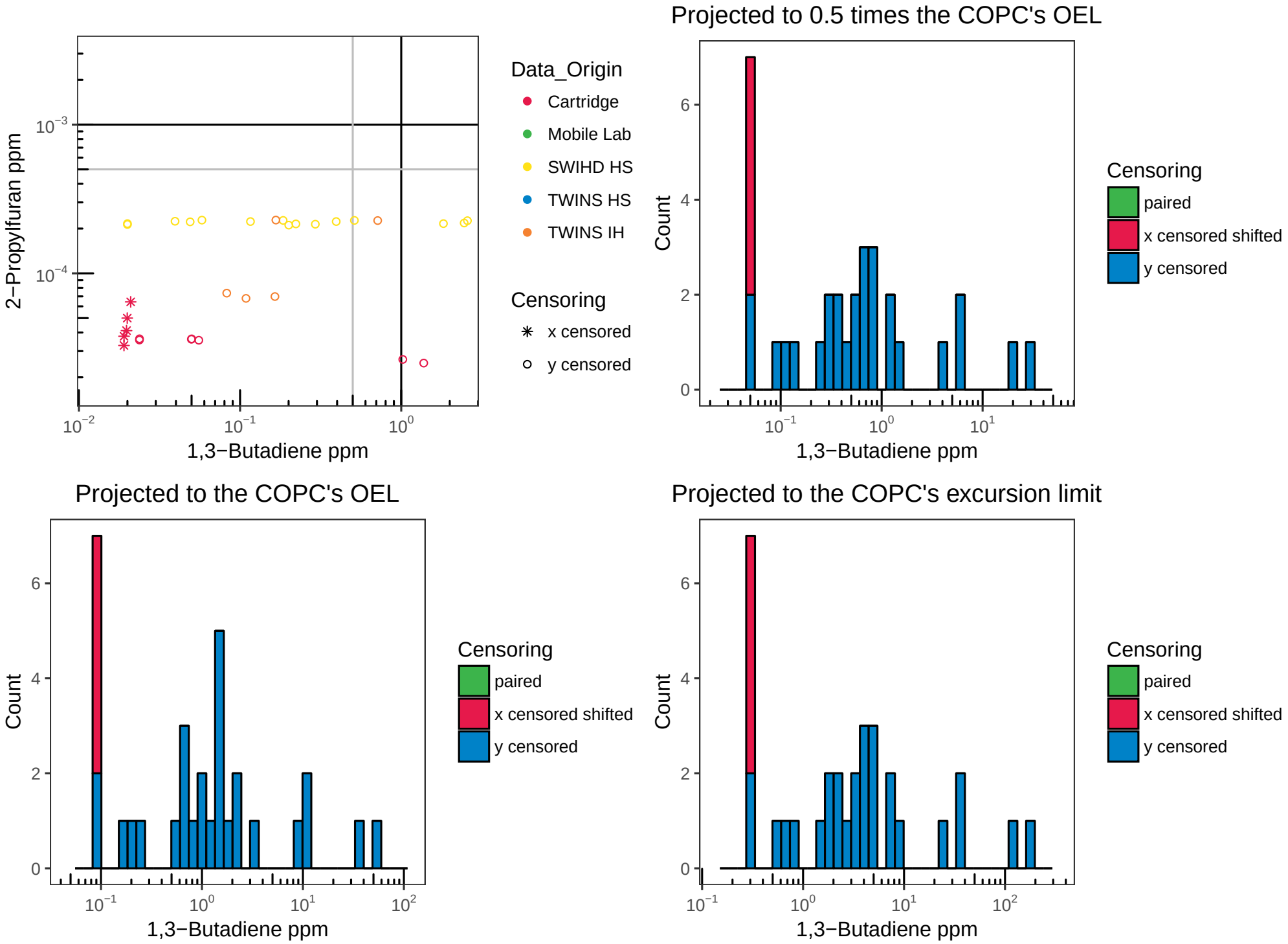


Figure C.190: 2-Propylfuran vs 1,3-Butadiene

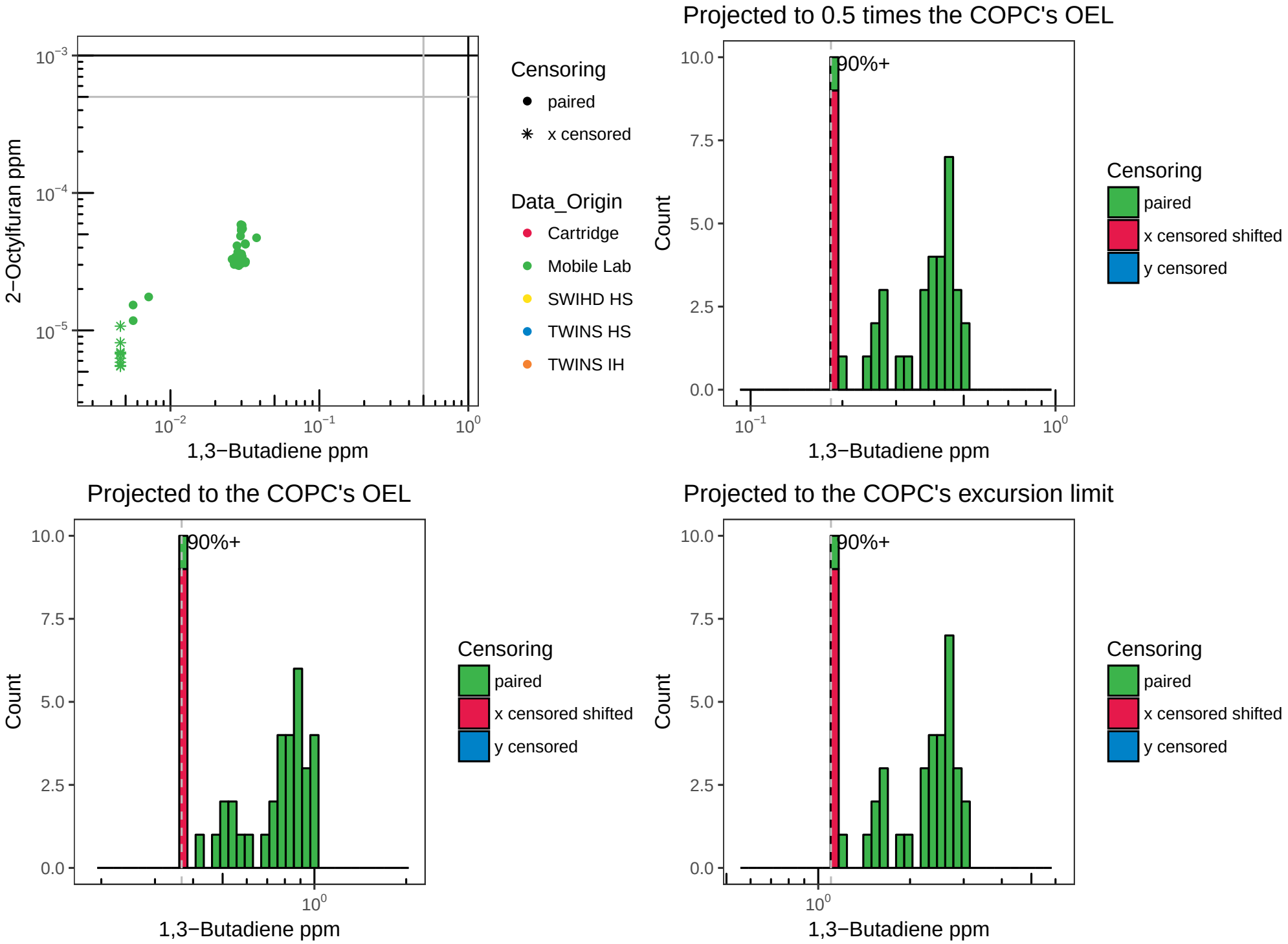


Figure C.191: 2-Octylfuran vs 1,3-Butadiene

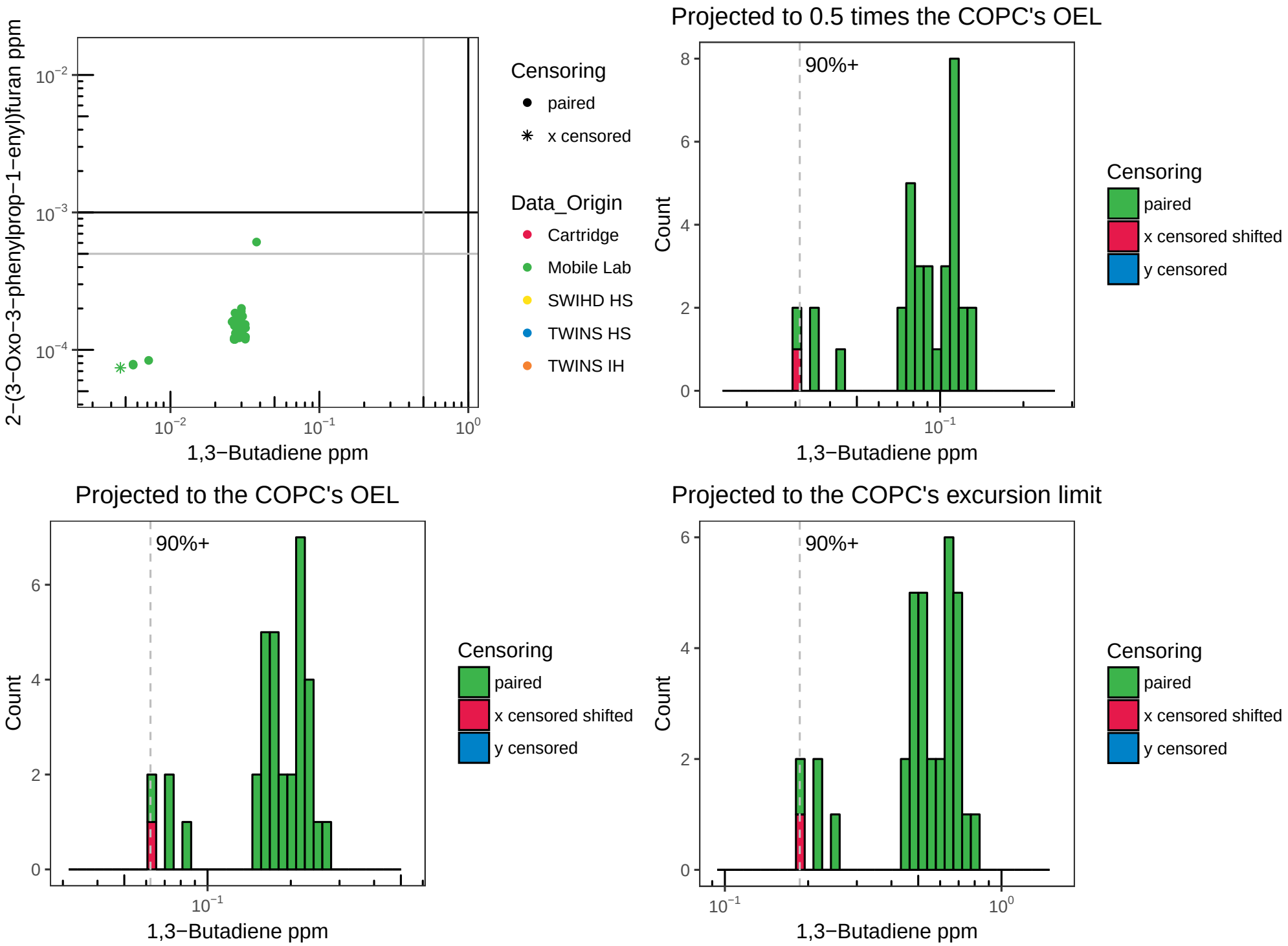


Figure C.192: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 1,3-Butadiene

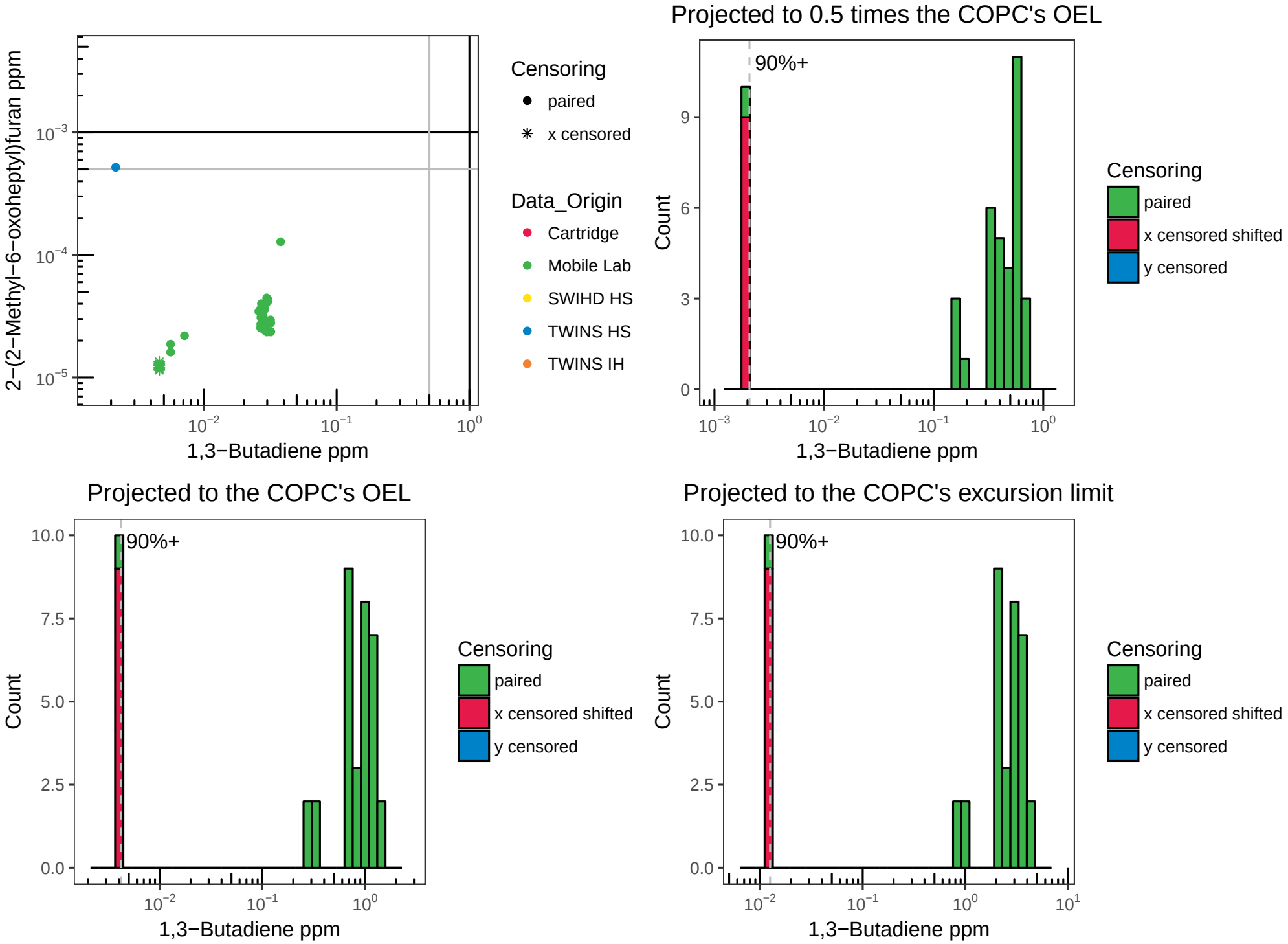


Figure C.193: 2-(2-Methyl-6-oxoheptyl)furan vs 1,3-Butadiene

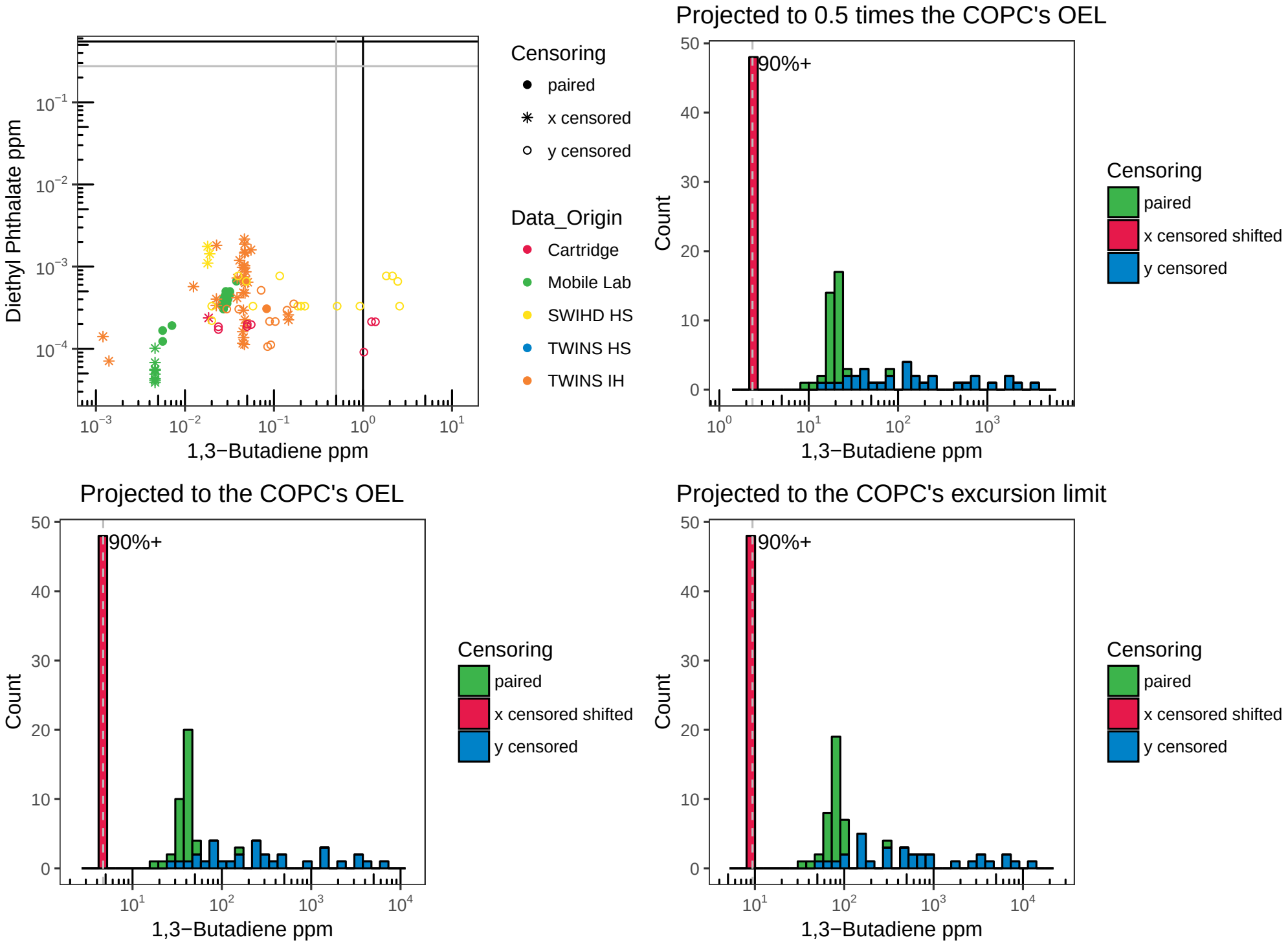


Figure C.194: Diethyl Phthalate vs 1,3-Butadiene

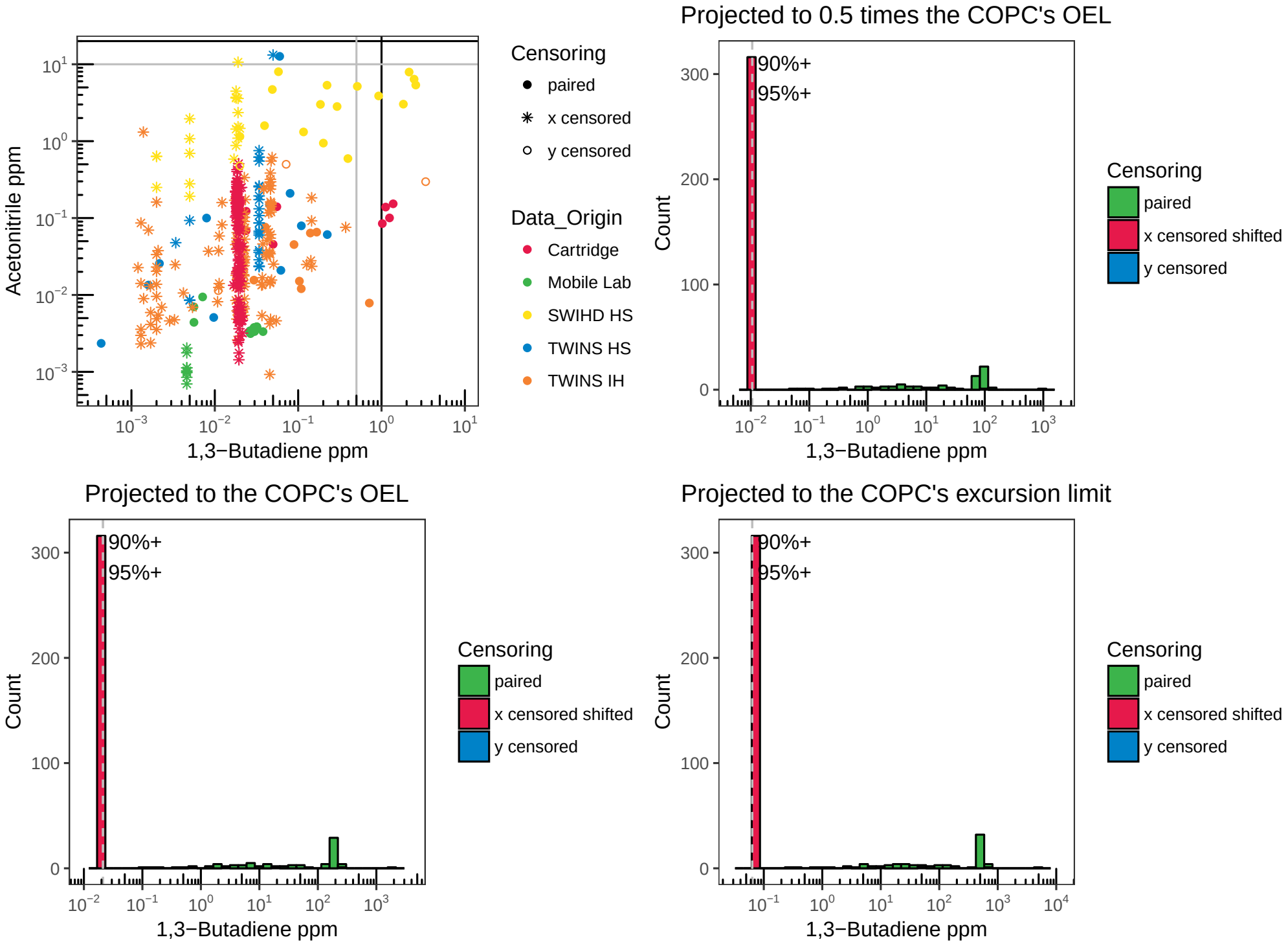


Figure C.195: Acetonitrile vs 1,3-Butadiene

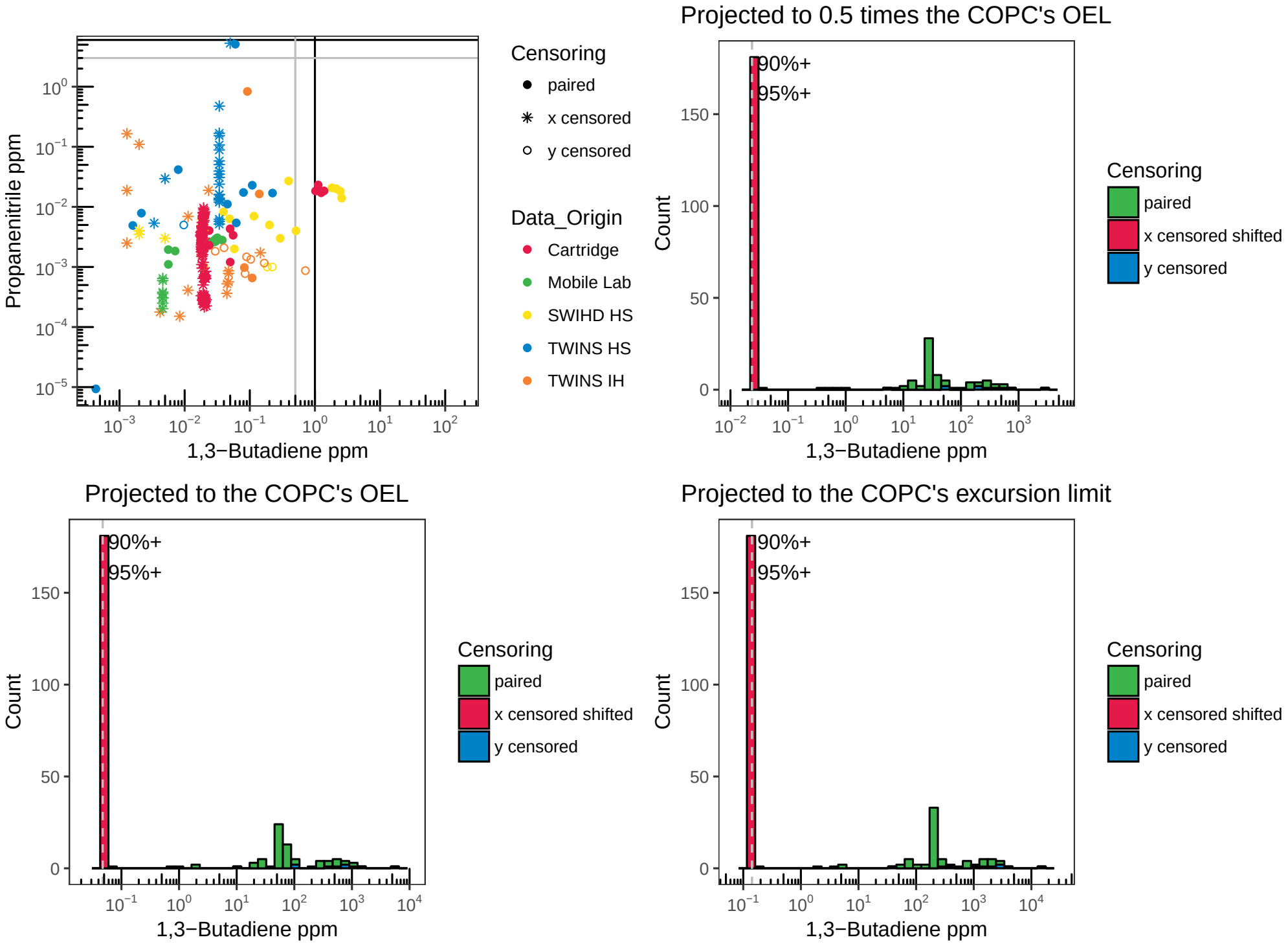


Figure C.196: Propanenitrile vs 1,3-Butadiene

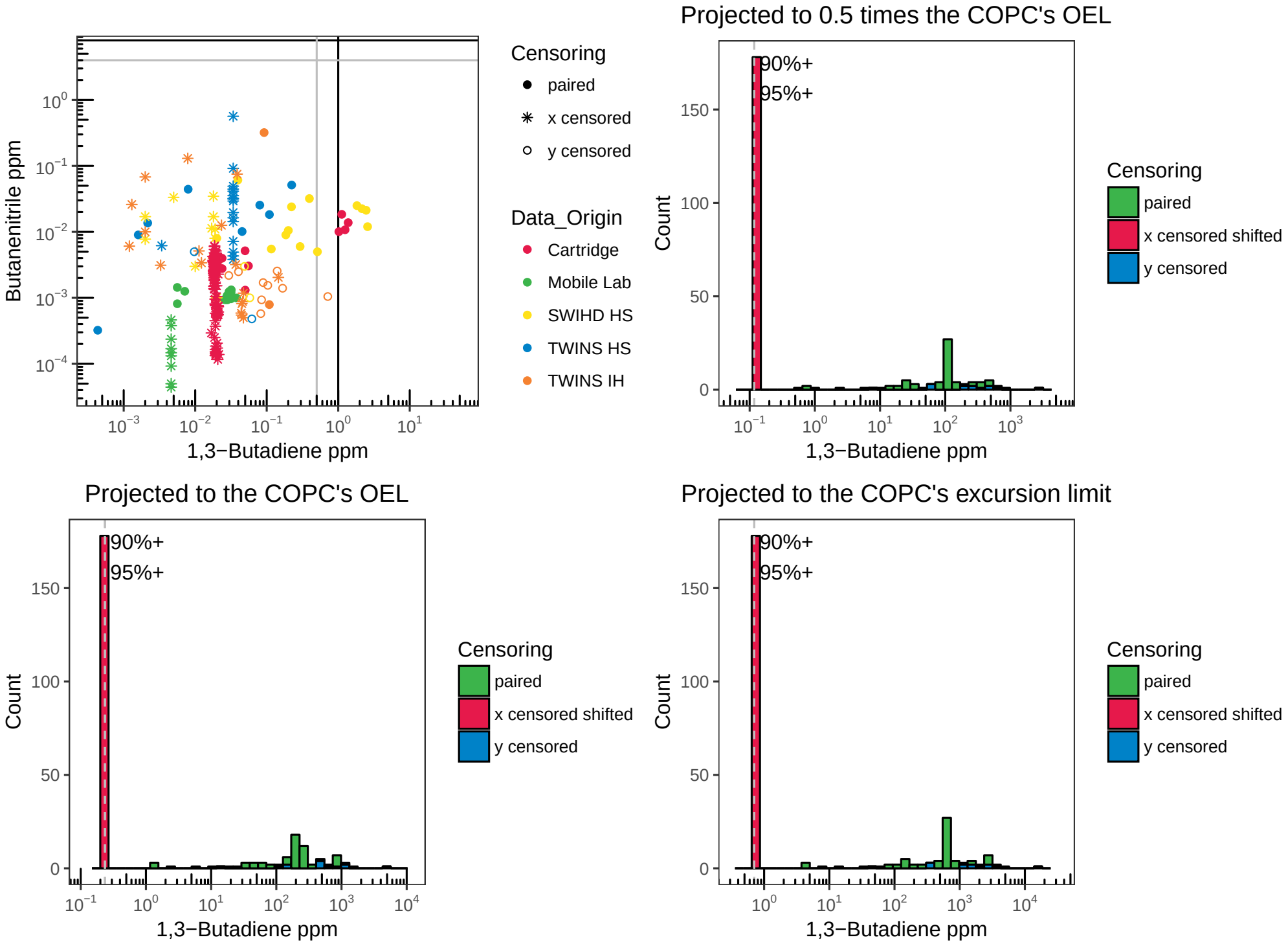


Figure C.197: Butanenitrile vs 1,3-Butadiene

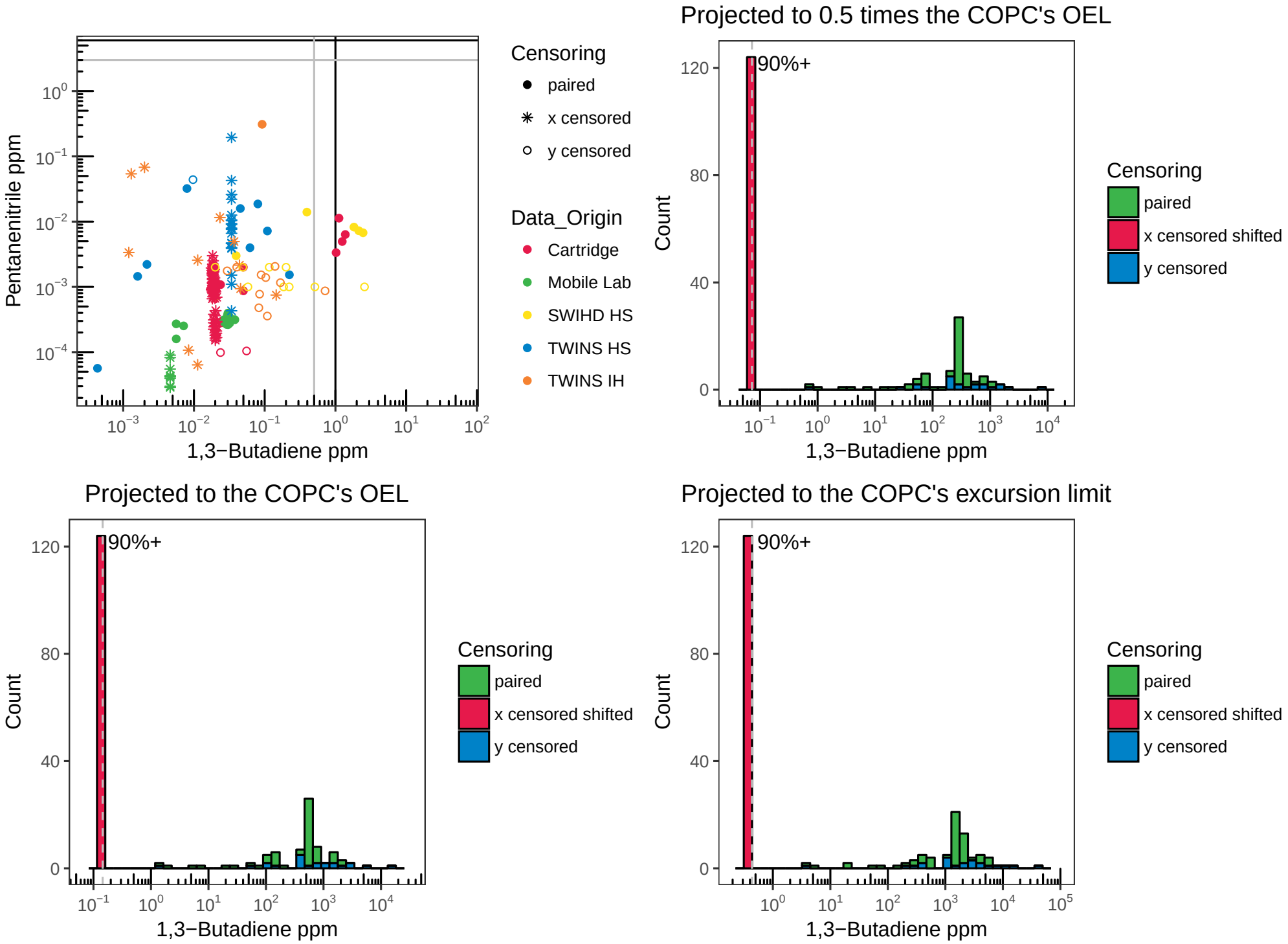


Figure C.198: Pentanenitrile vs 1,3-Butadiene

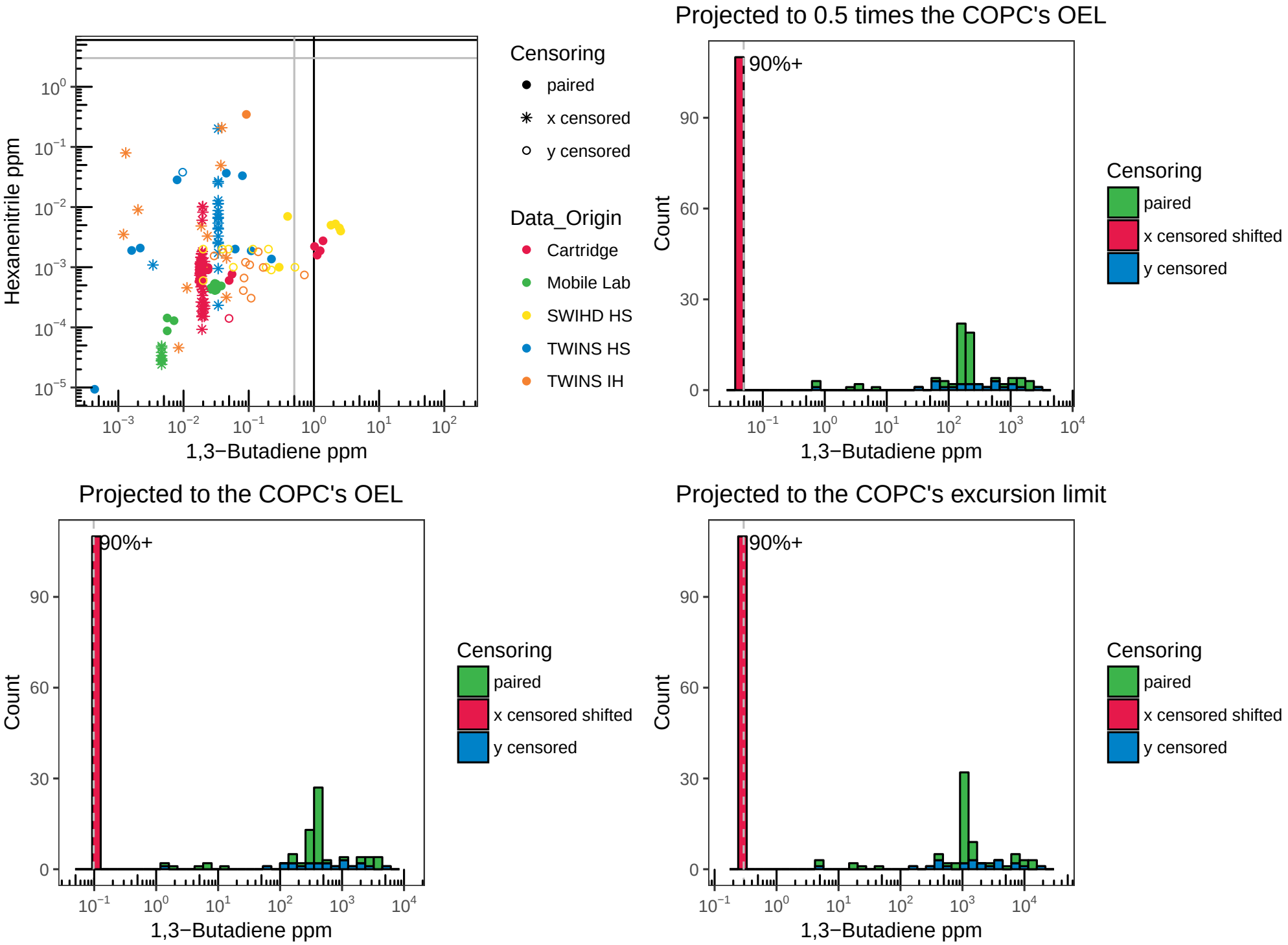


Figure C.199: Hexanenitrile vs 1,3-Butadiene

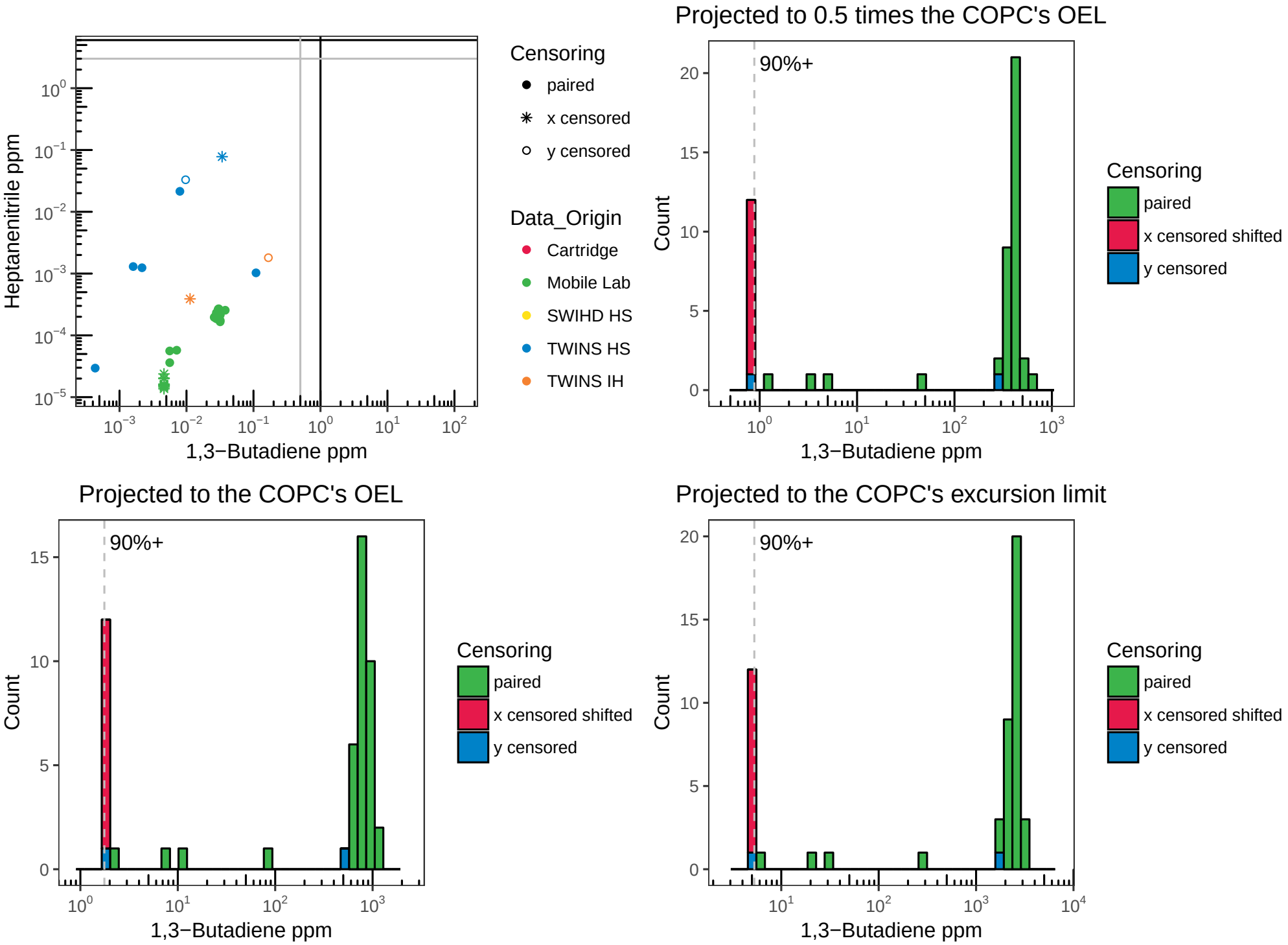


Figure C.200: Heptanenitrile vs 1,3-Butadiene

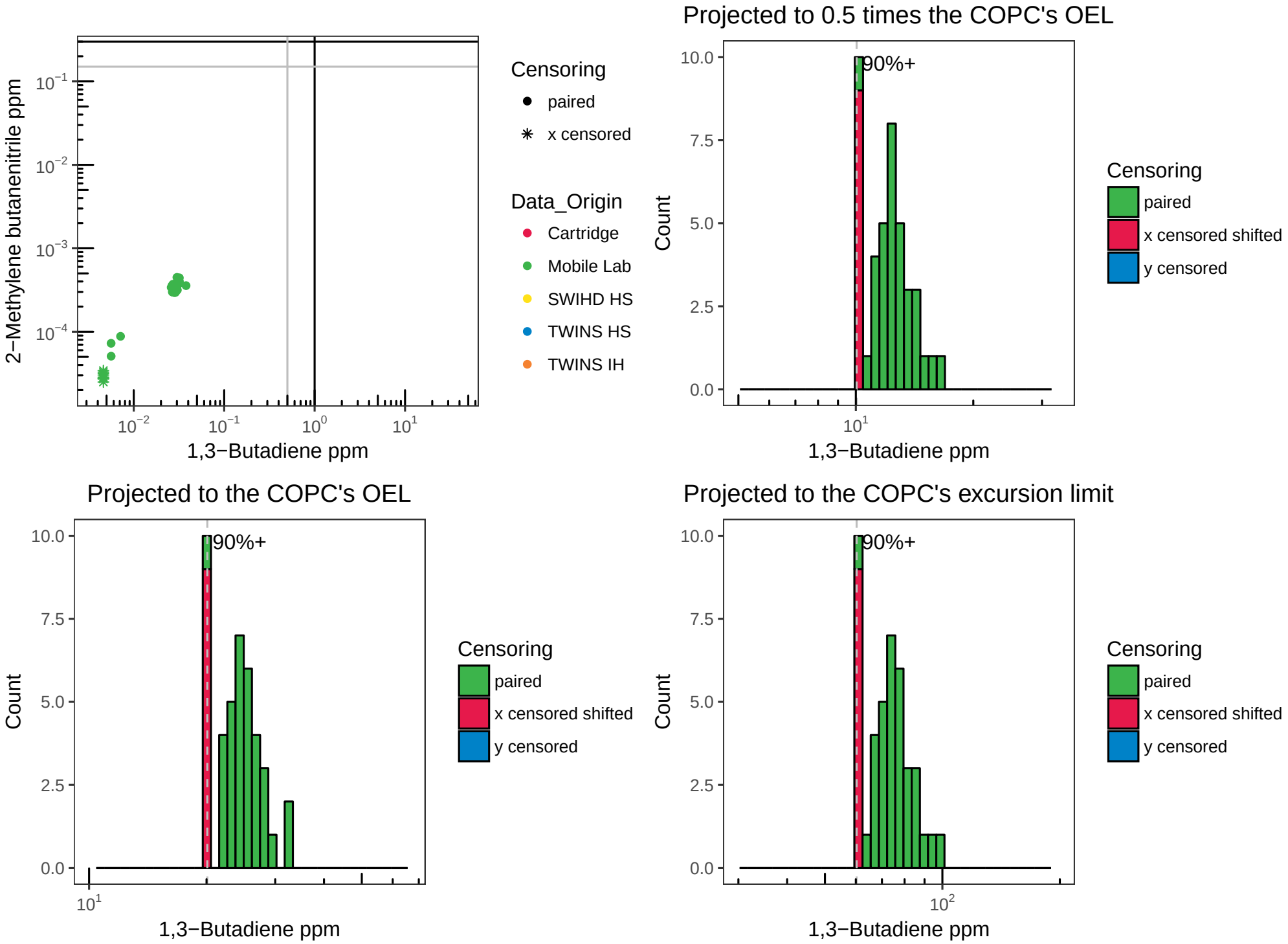


Figure C.201: 2-Methylene butanenitrile vs 1,3-Butadiene

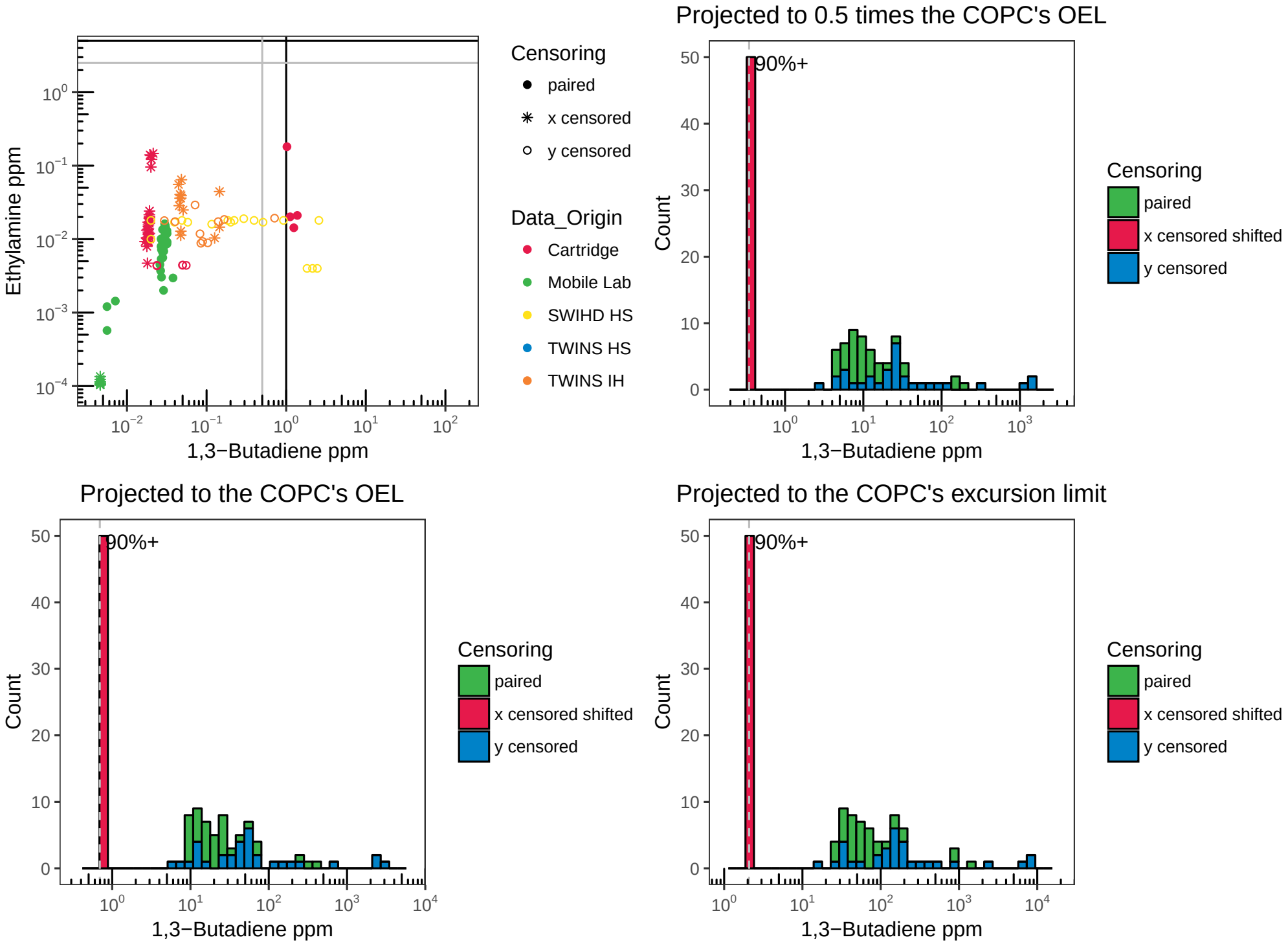


Figure C.202: Ethylamine vs 1,3-Butadiene

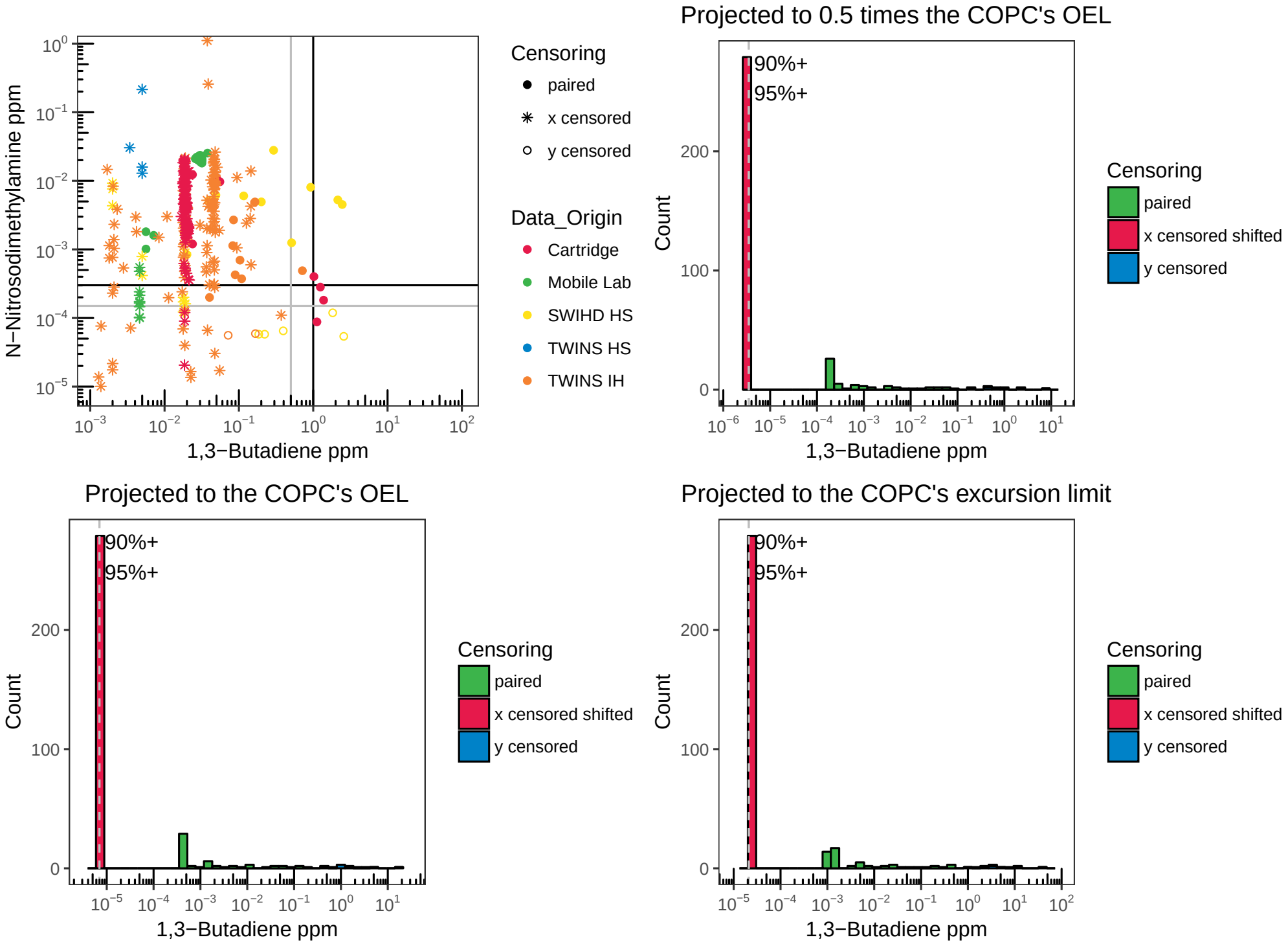


Figure C.203: N-Nitrosodimethylamine vs 1,3-Butadiene

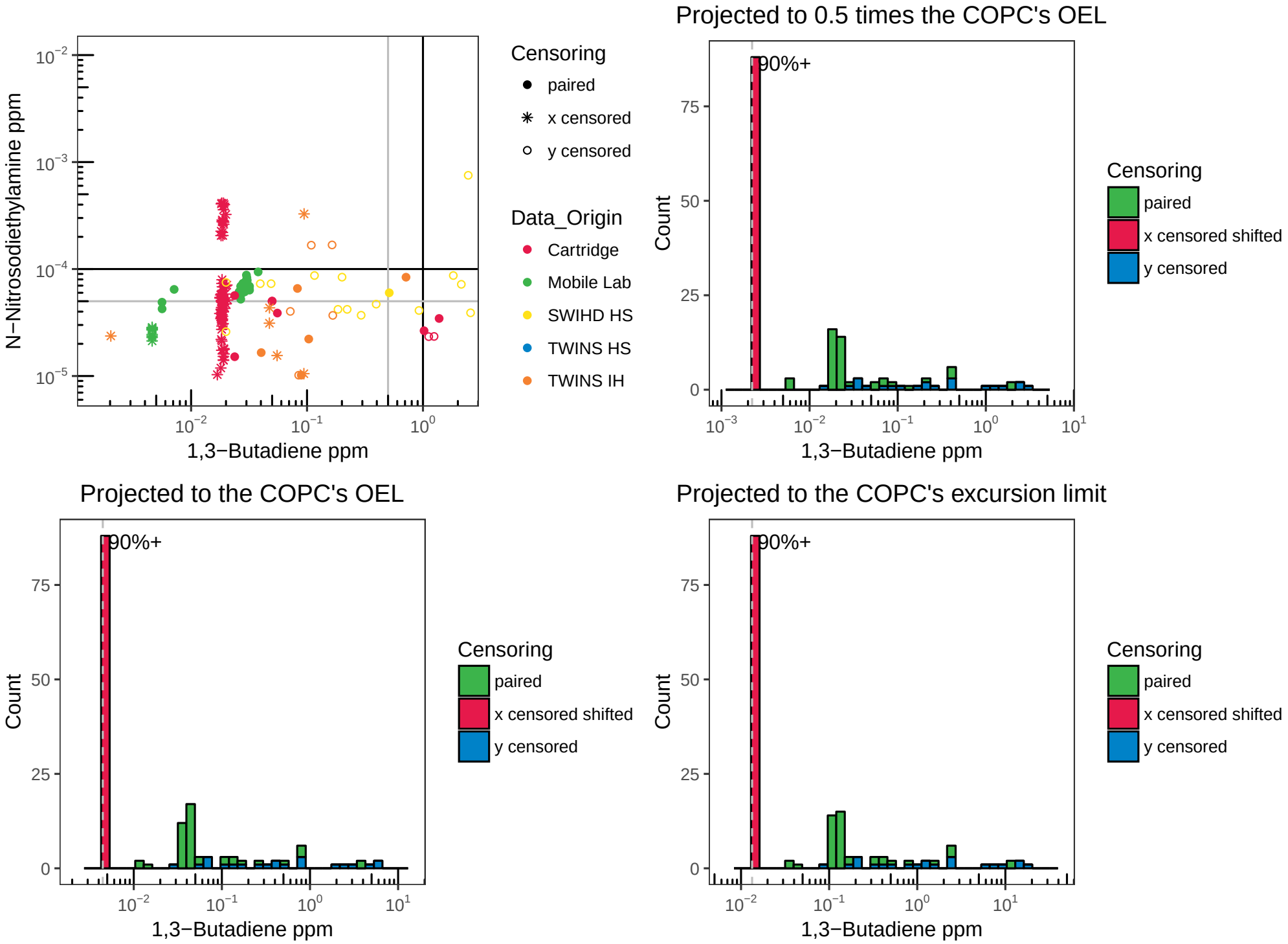


Figure C.204: N-Nitrosodiethylamine vs 1,3-Butadiene

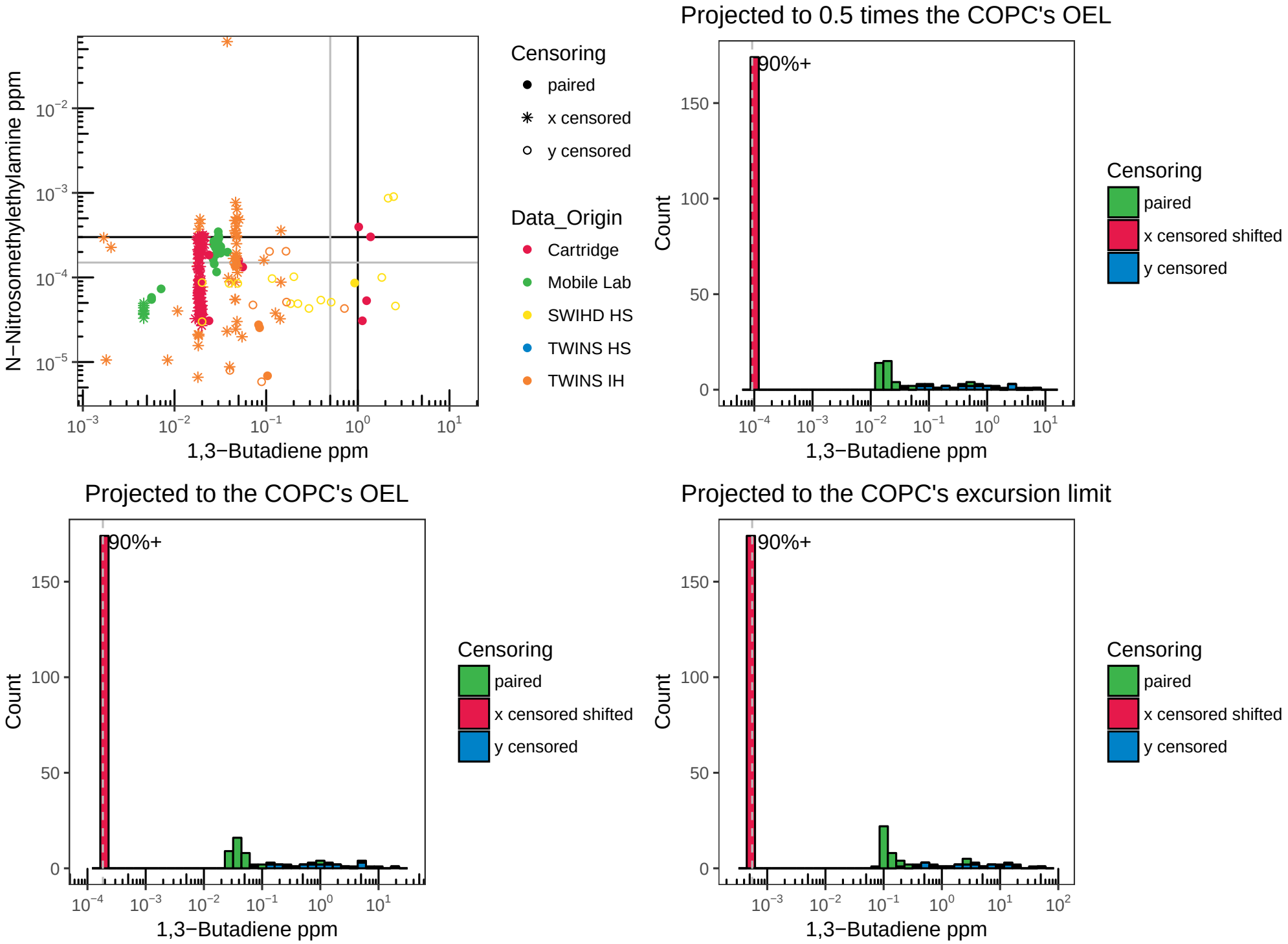


Figure C.205: N-Nitrosomethylethylamine vs 1,3-Butadiene

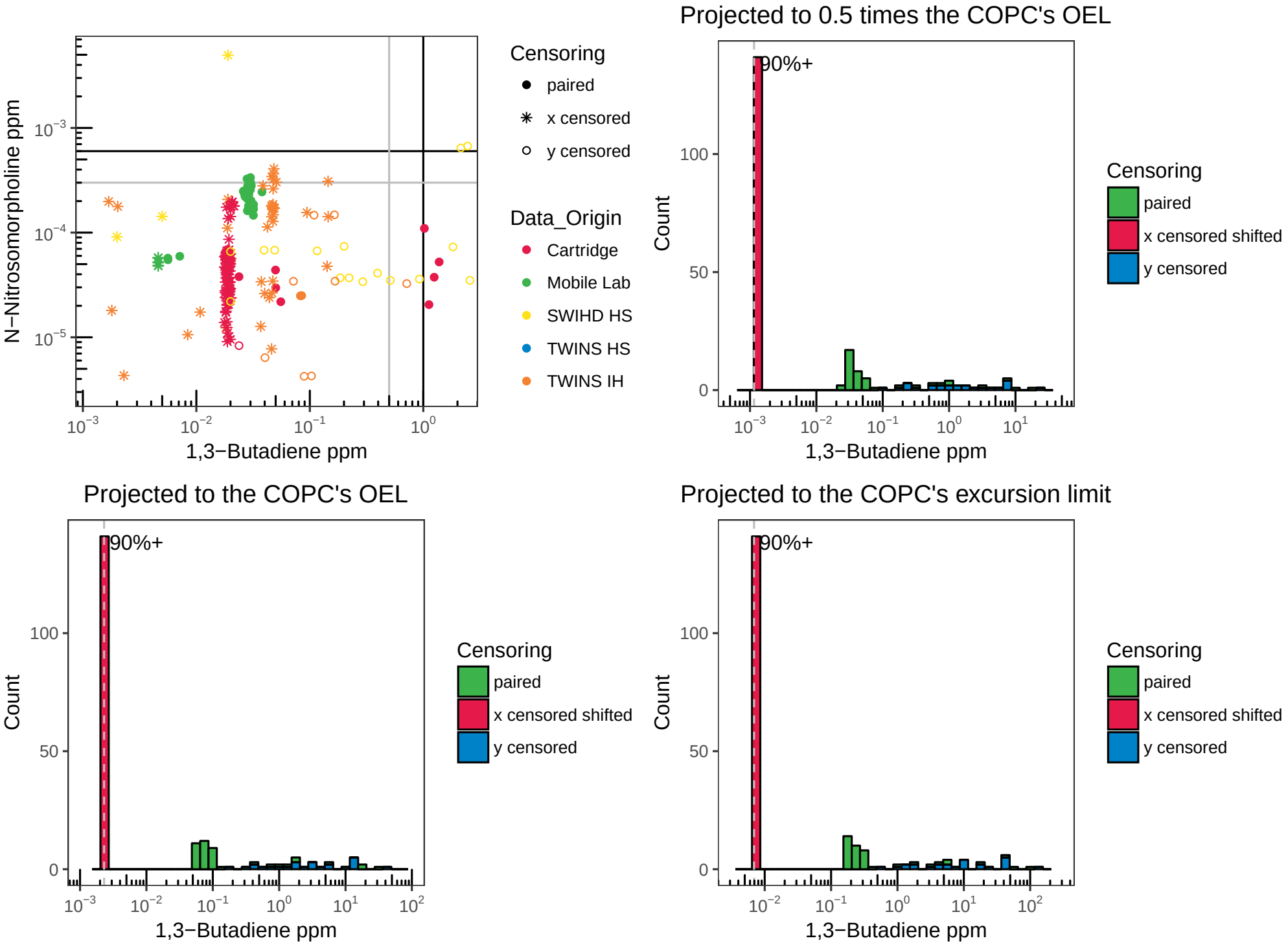


Figure C.206: N-Nitrosomorpholine vs 1,3-Butadiene

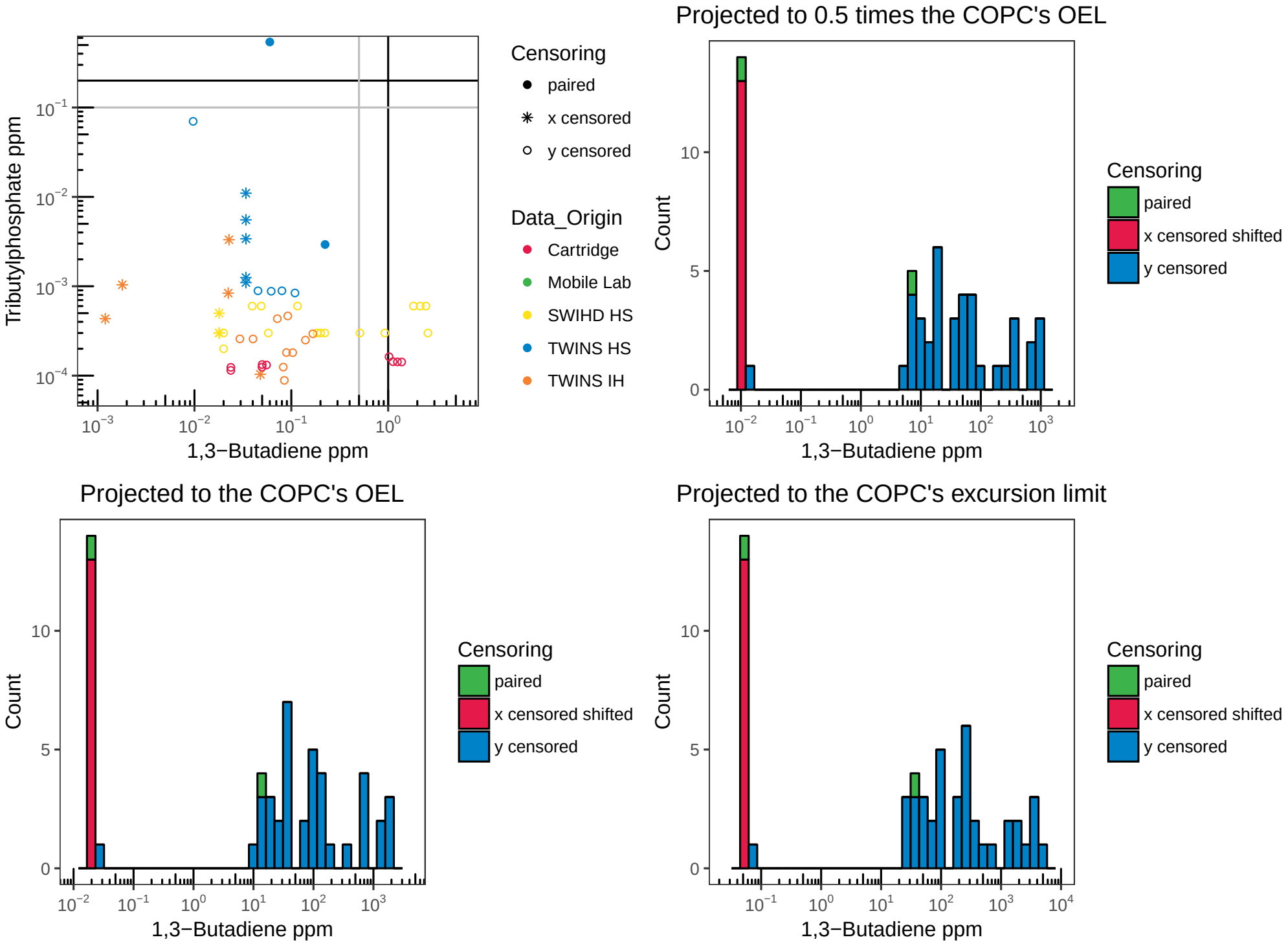


Figure C.207: Tributylphosphate vs 1,3-Butadiene

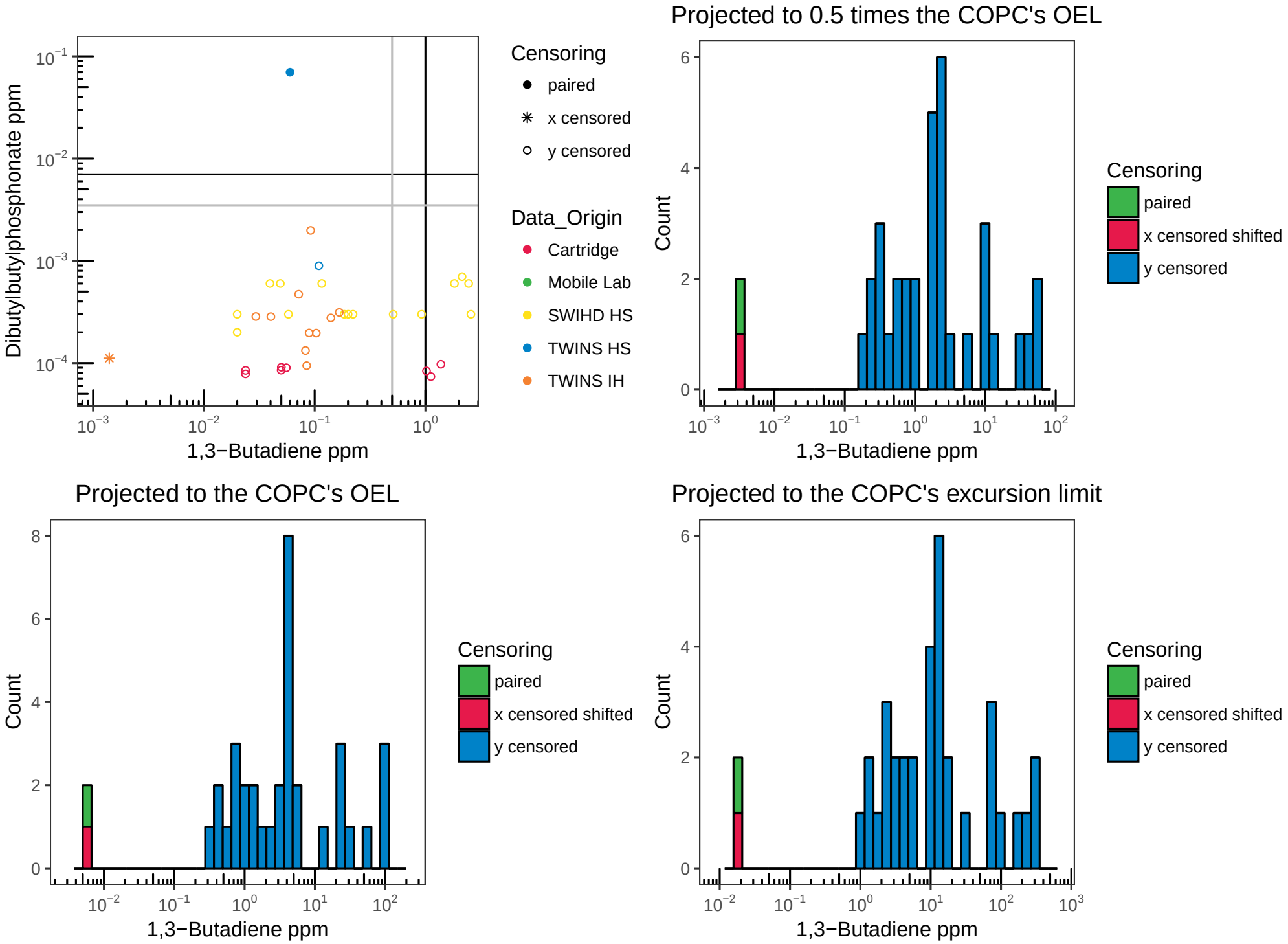


Figure C.208: Dibutylbutylphosphonate vs 1,3-Butadiene

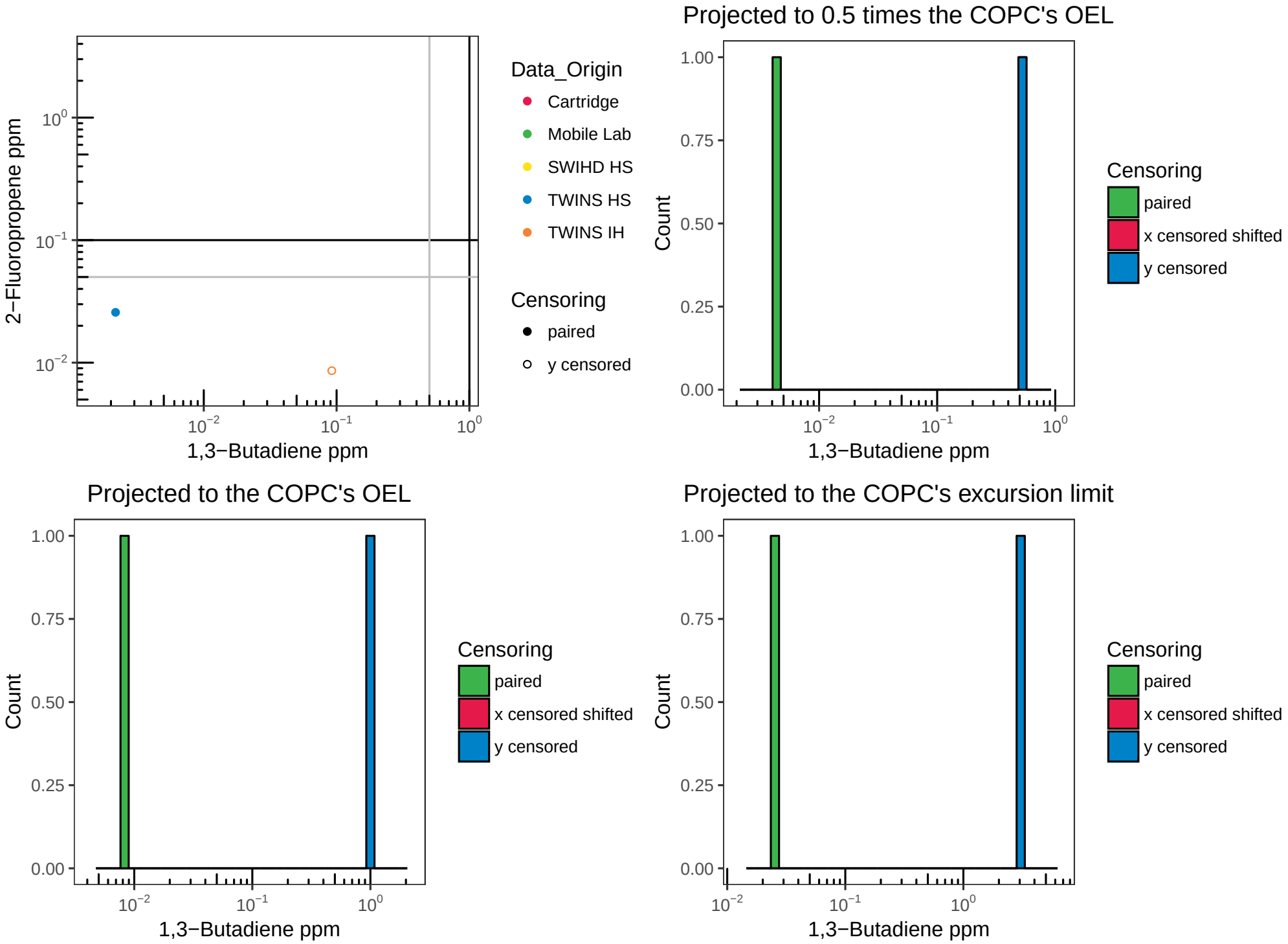


Figure C.209: 2-Fluoropropene vs 1,3-Butadiene

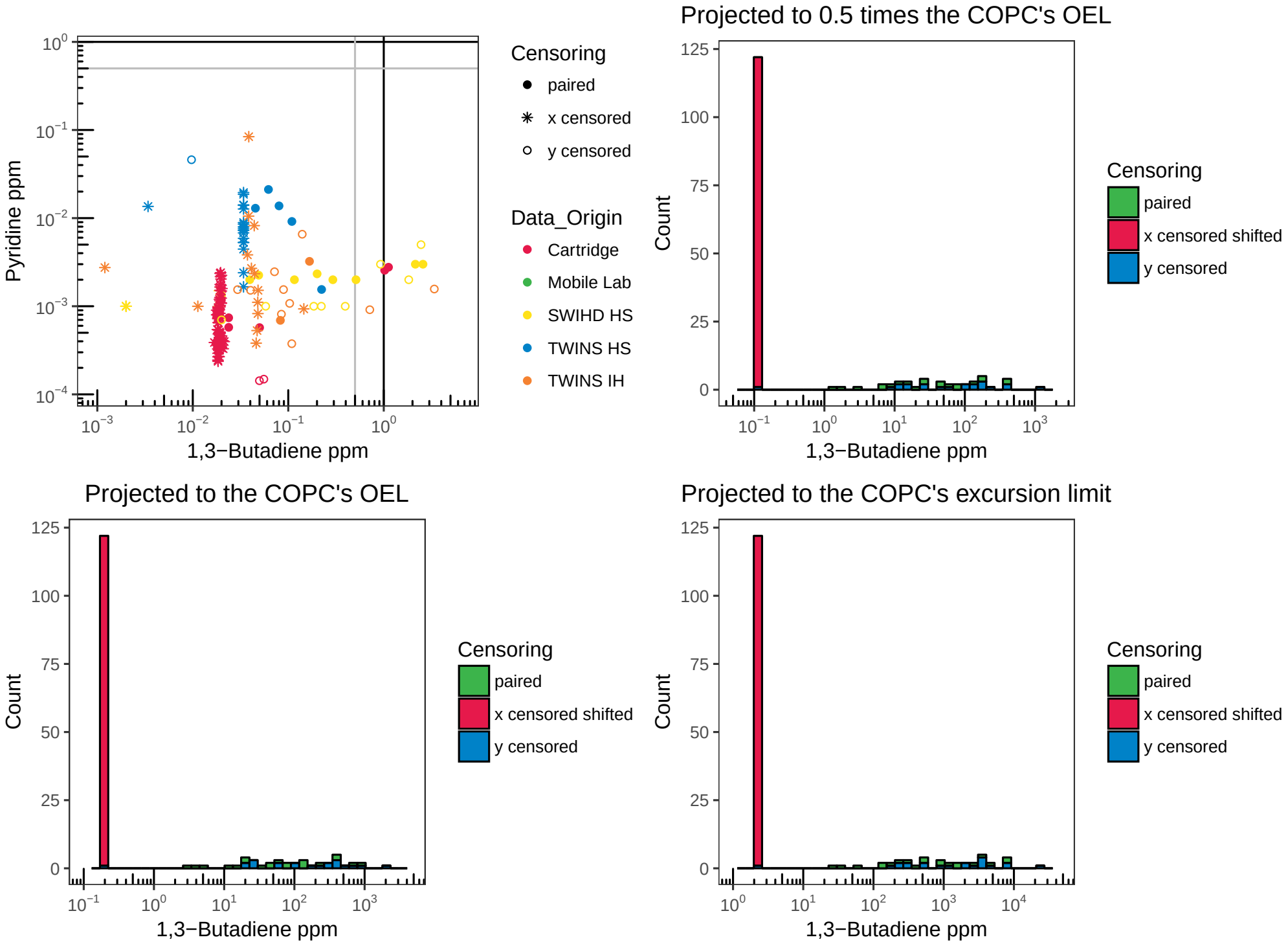


Figure C.210: Pyridine vs 1,3-Butadiene

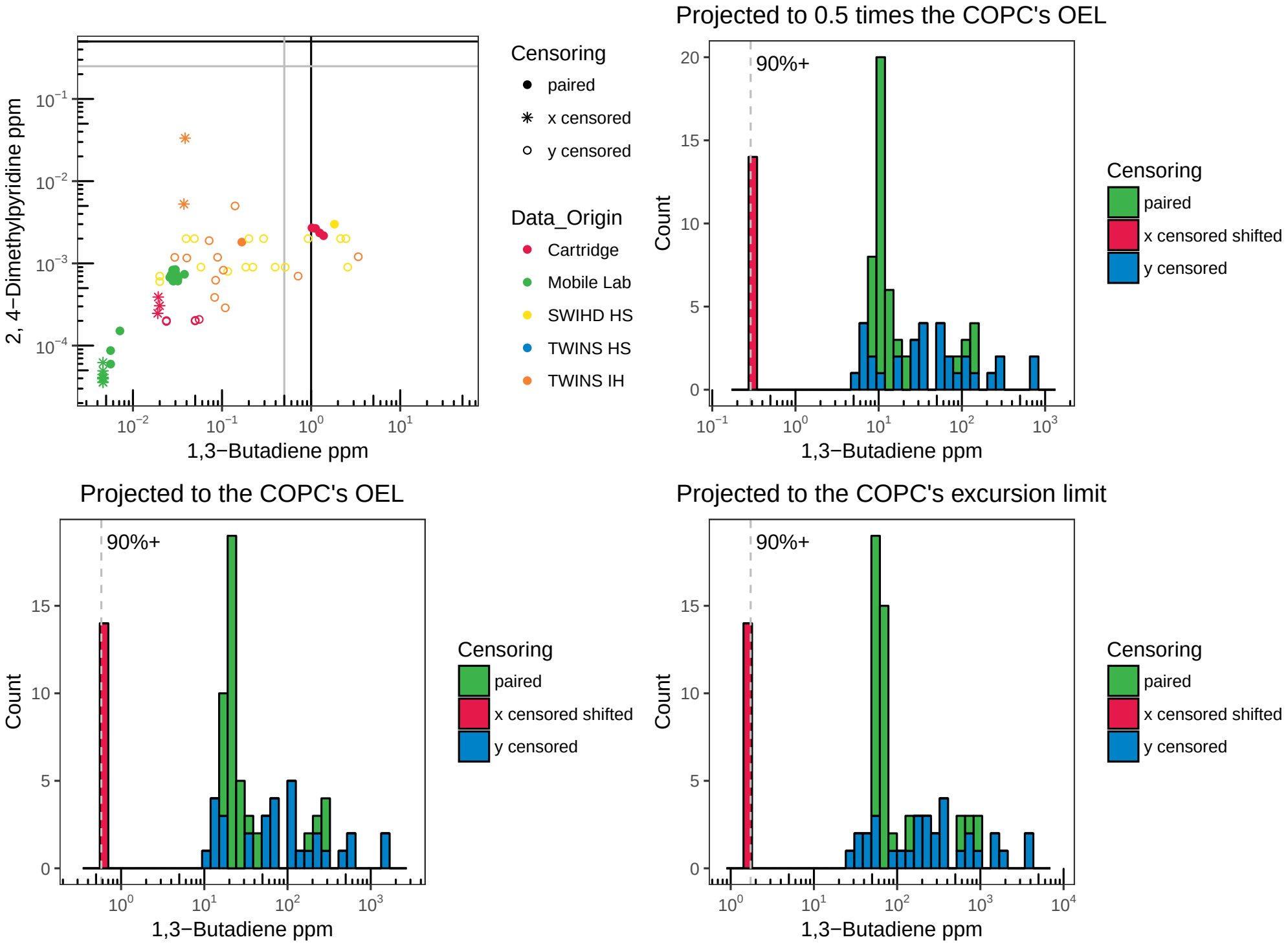


Figure C.211: 2, 4-Dimethylpyridine vs 1,3-Butadiene

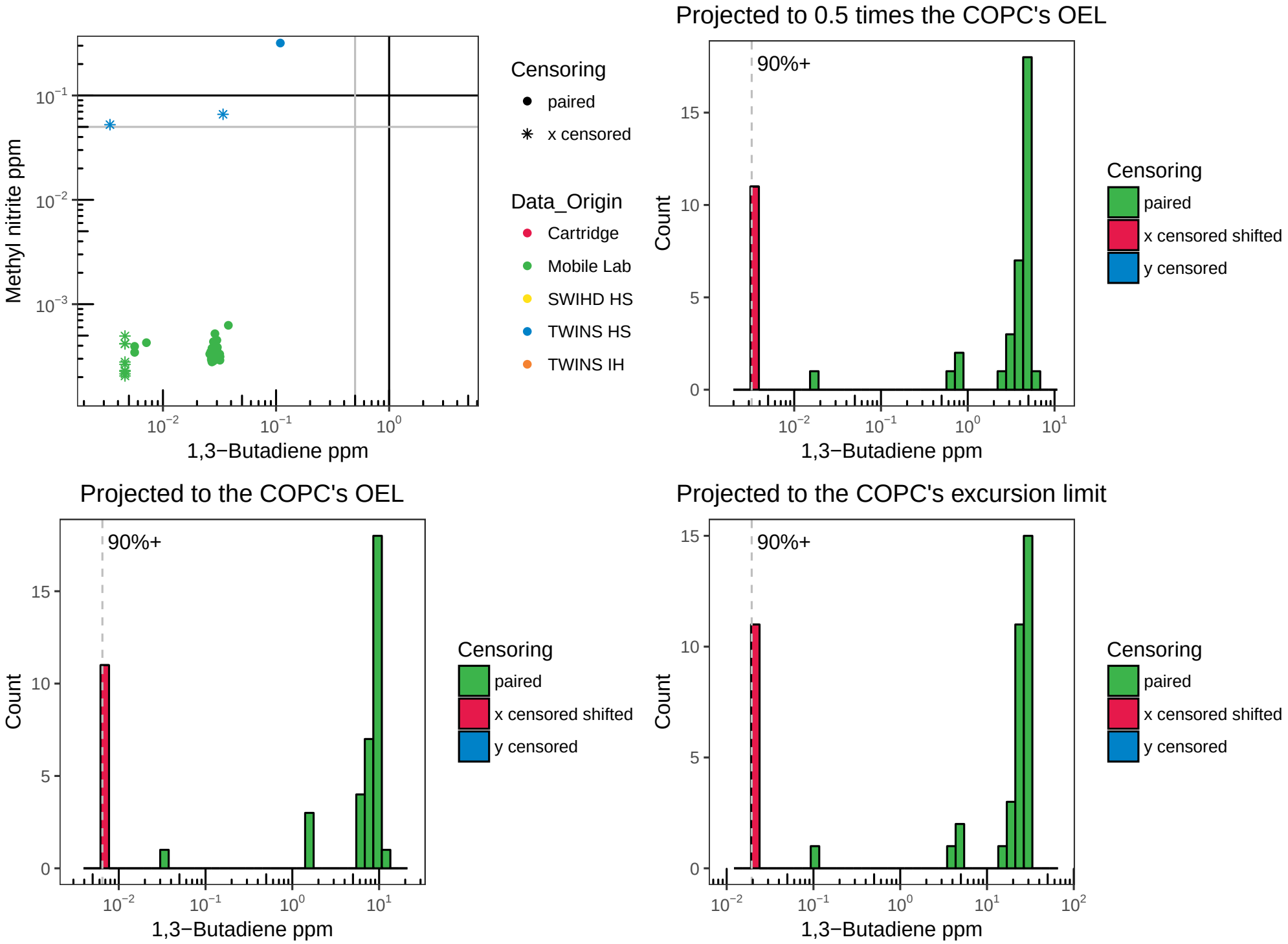


Figure C.212: Methyl nitrite vs 1,3-Butadiene

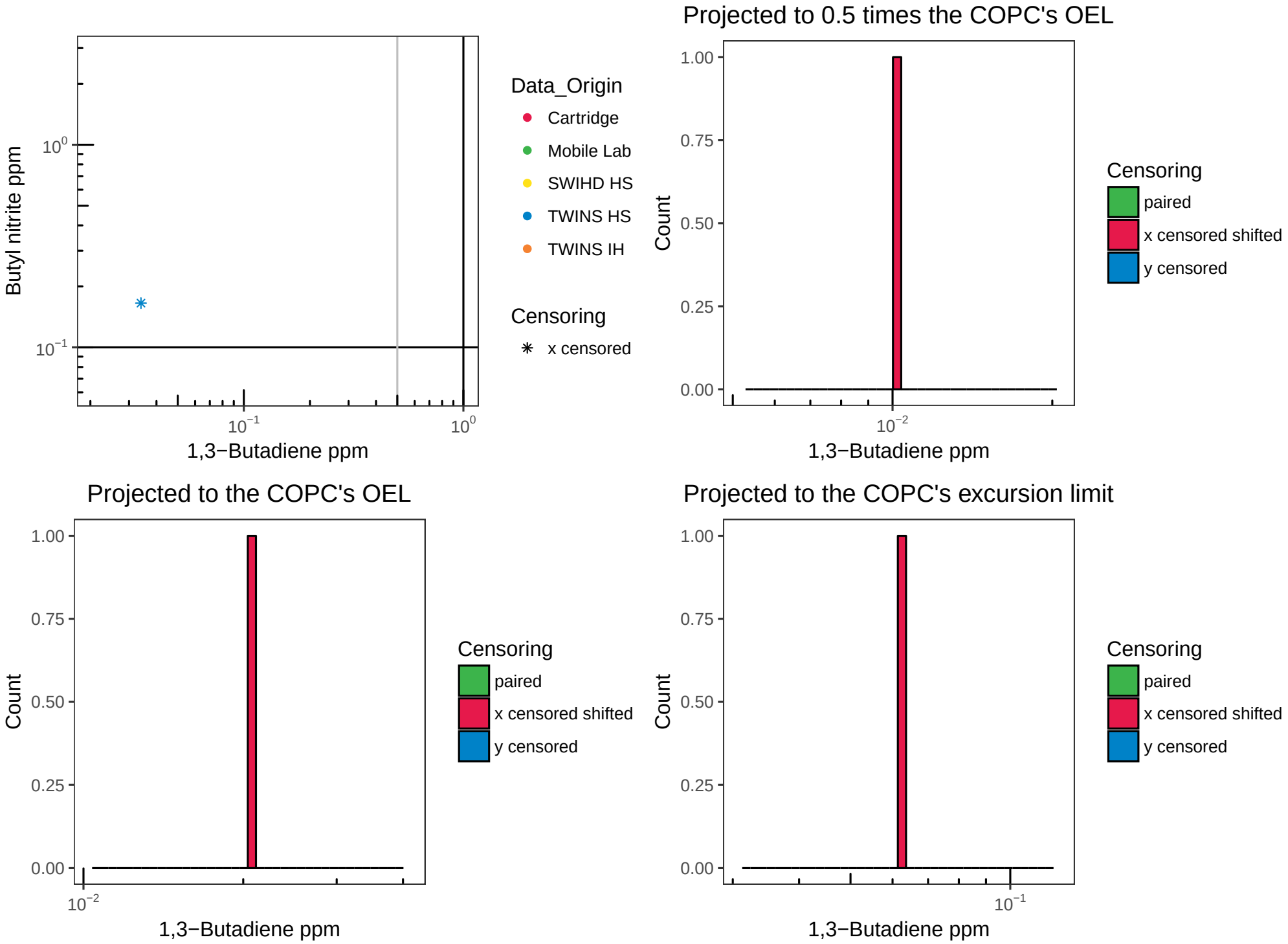


Figure C.213: Butyl nitrite vs 1,3-Butadiene

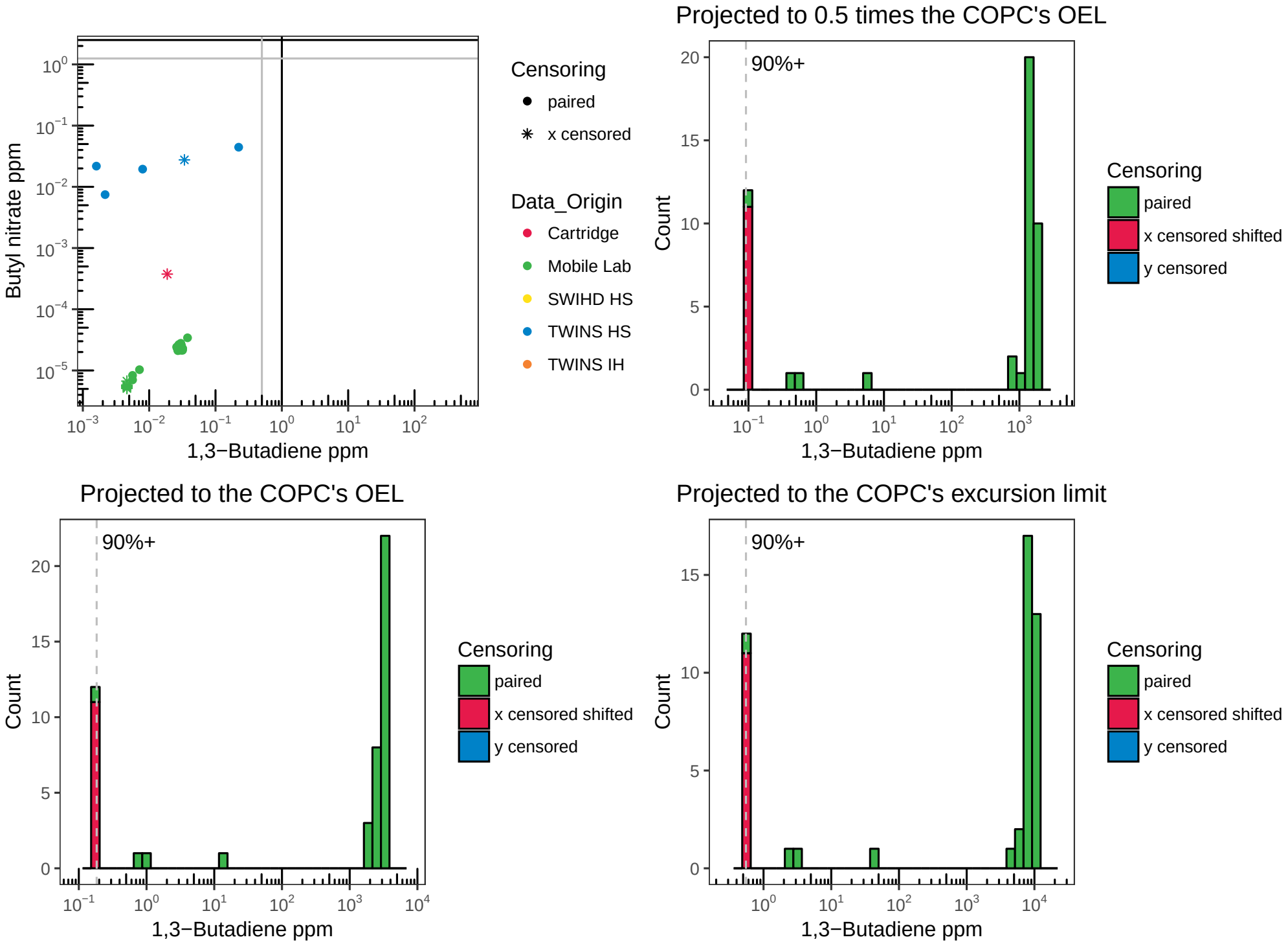


Figure C.214: Butyl nitrate vs 1,3-Butadiene

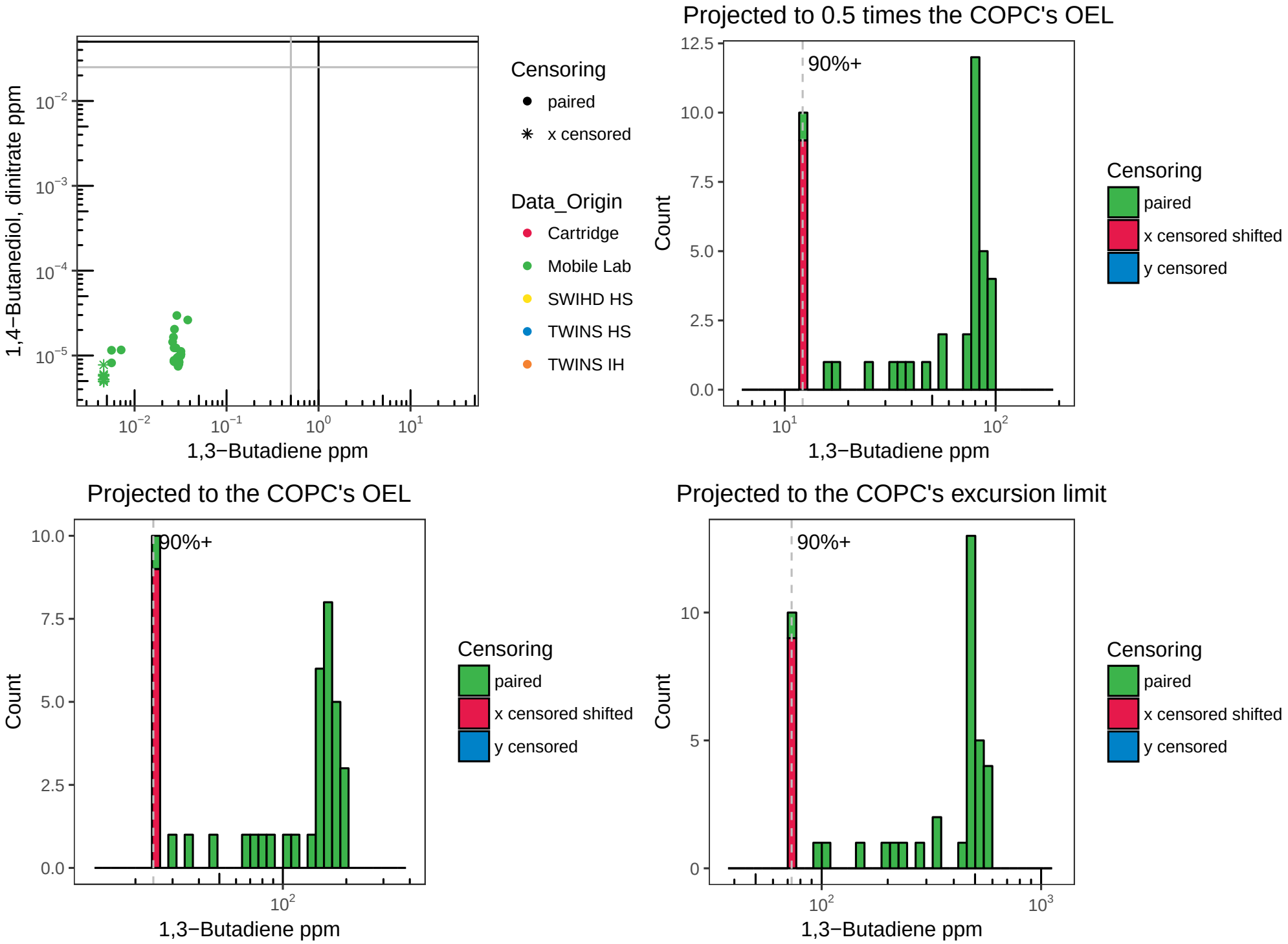


Figure C.215: 1,4-Butanediol, dinitrate vs 1,3-Butadiene

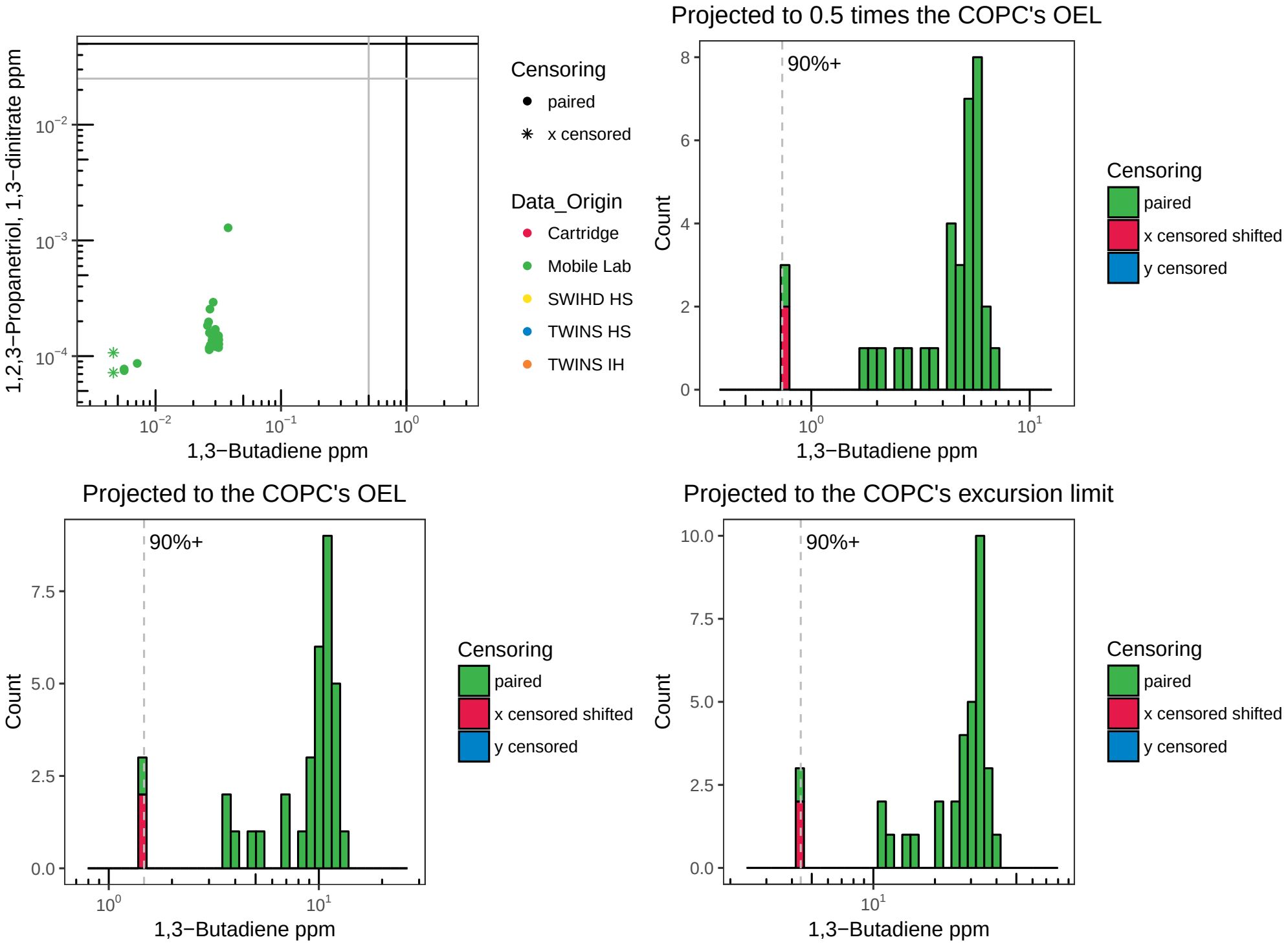


Figure C.216: 1,2,3-Propanetriol, 1,3-dinitrate vs 1,3-Butadiene

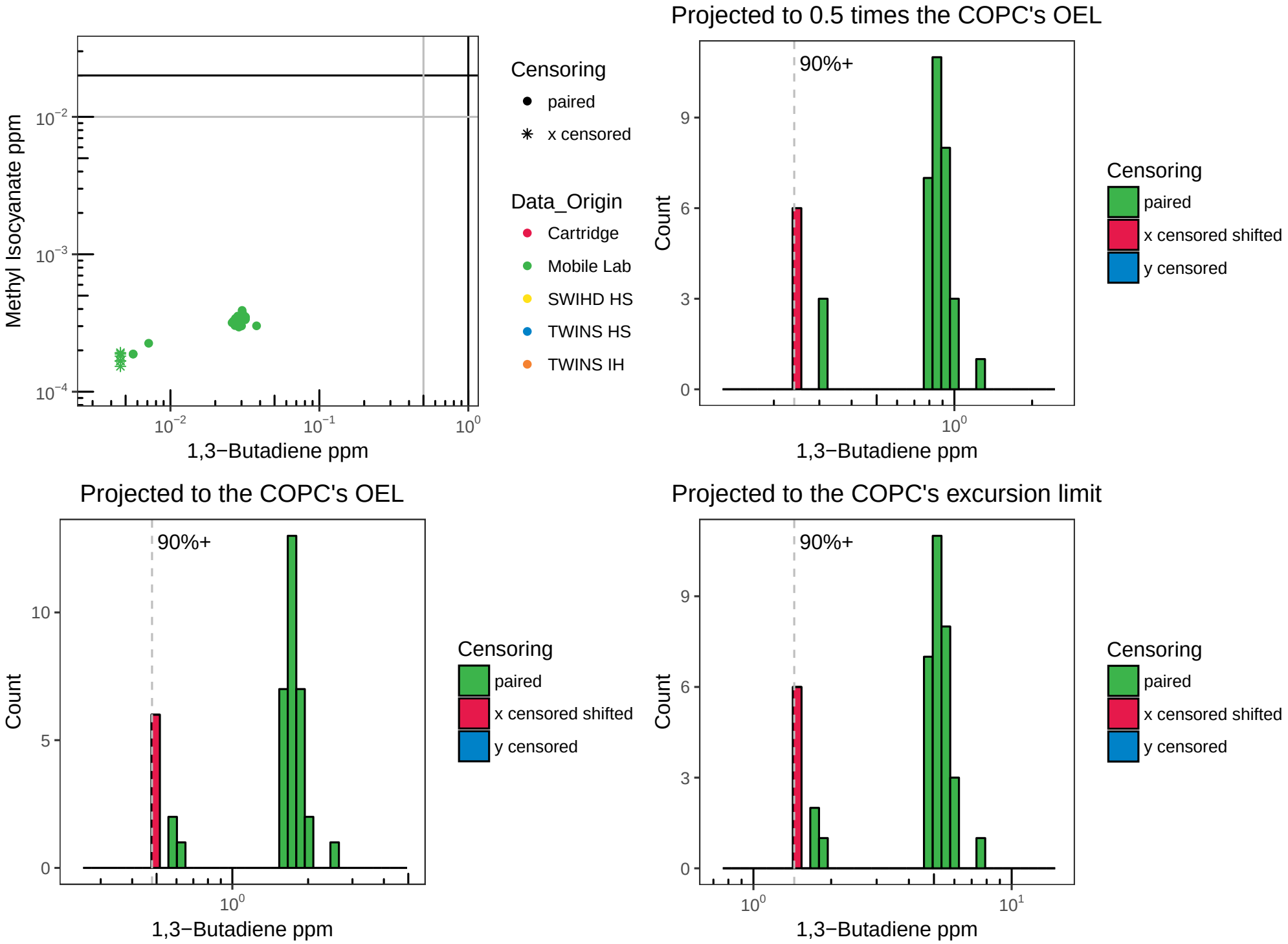


Figure C.217: Methyl Isocyanate vs 1,3-Butadiene

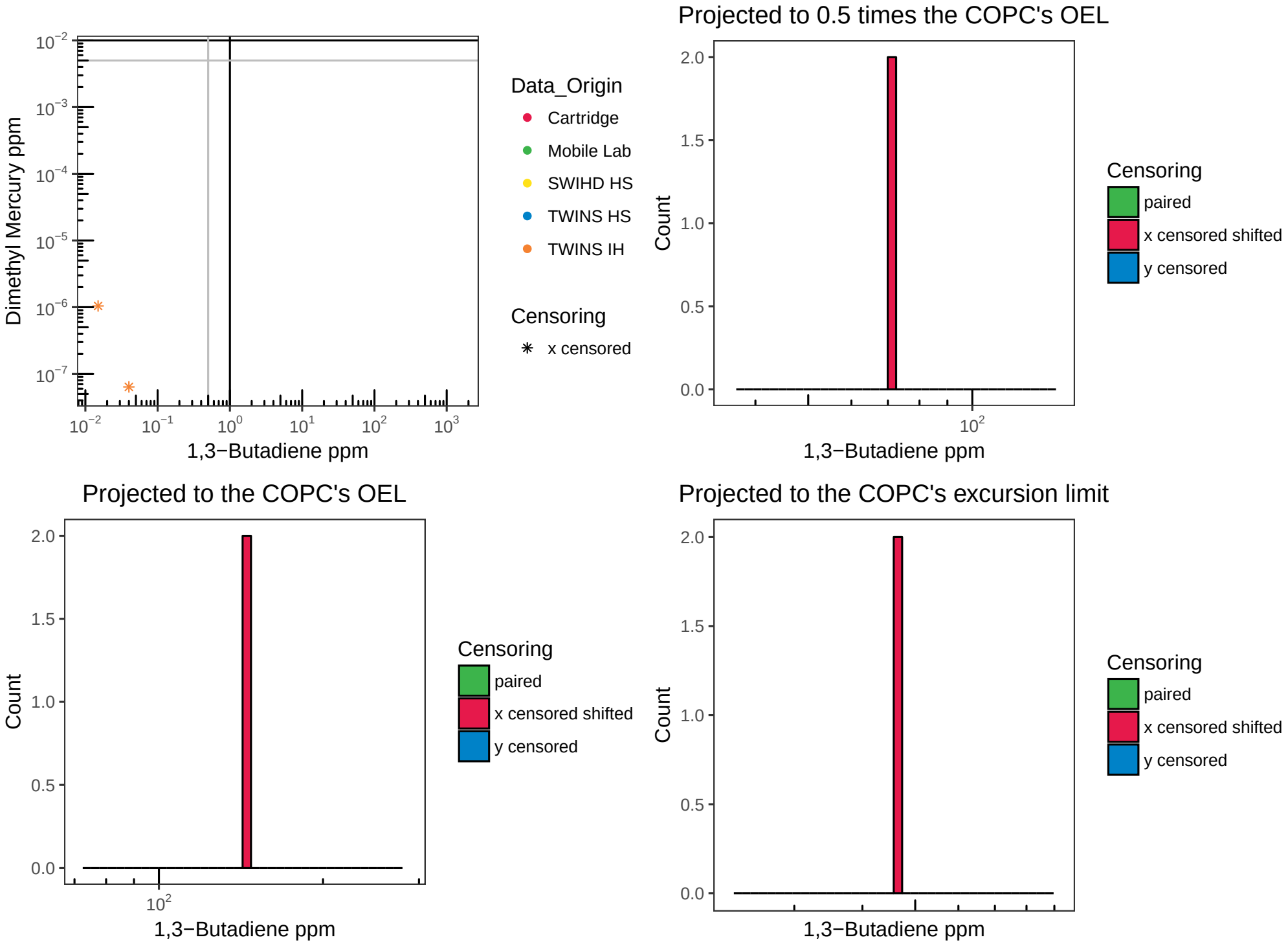


Figure C.218: Dimethyl Mercury vs 1,3-Butadiene

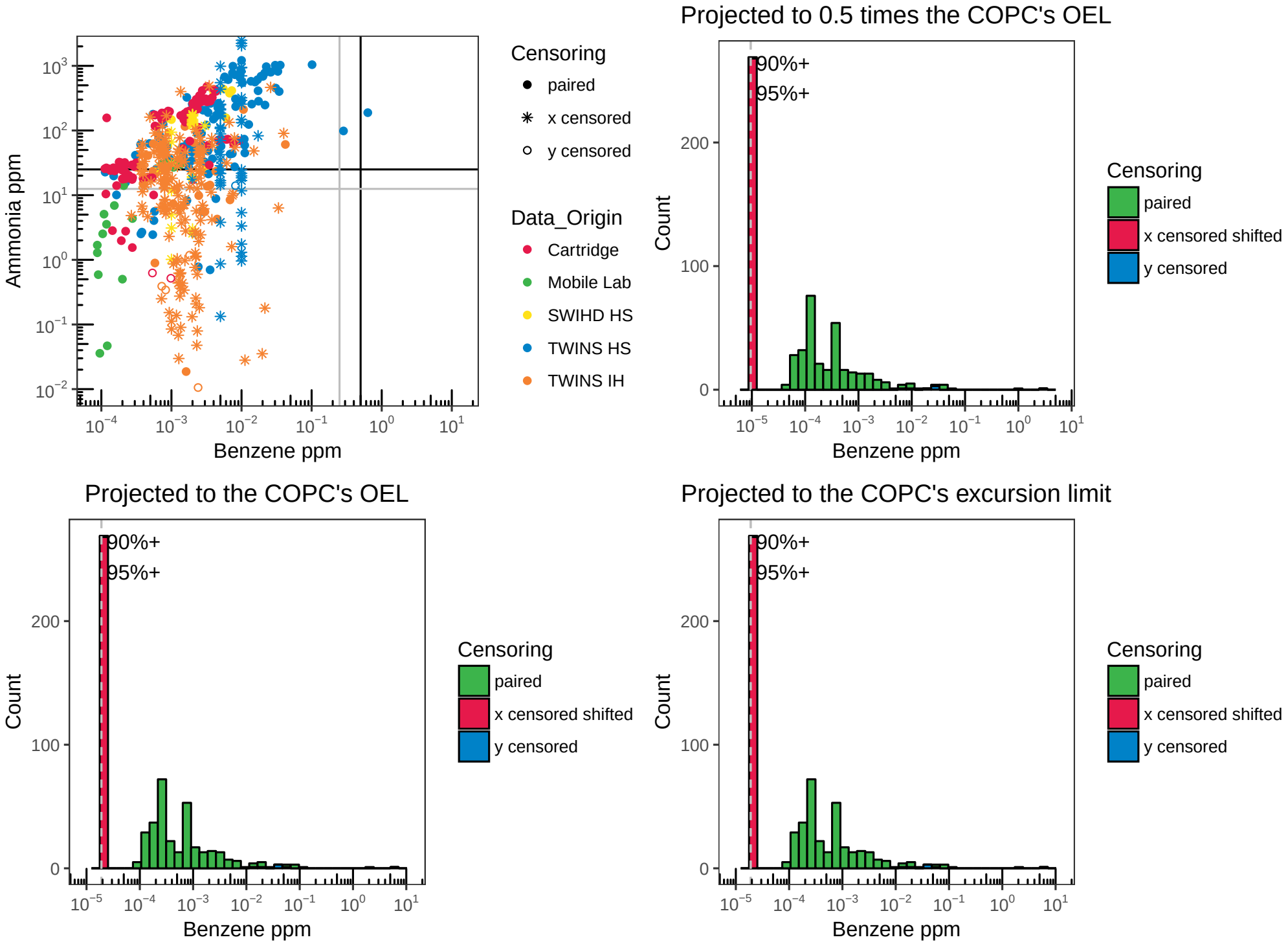


Figure C.219: Ammonia vs Benzene

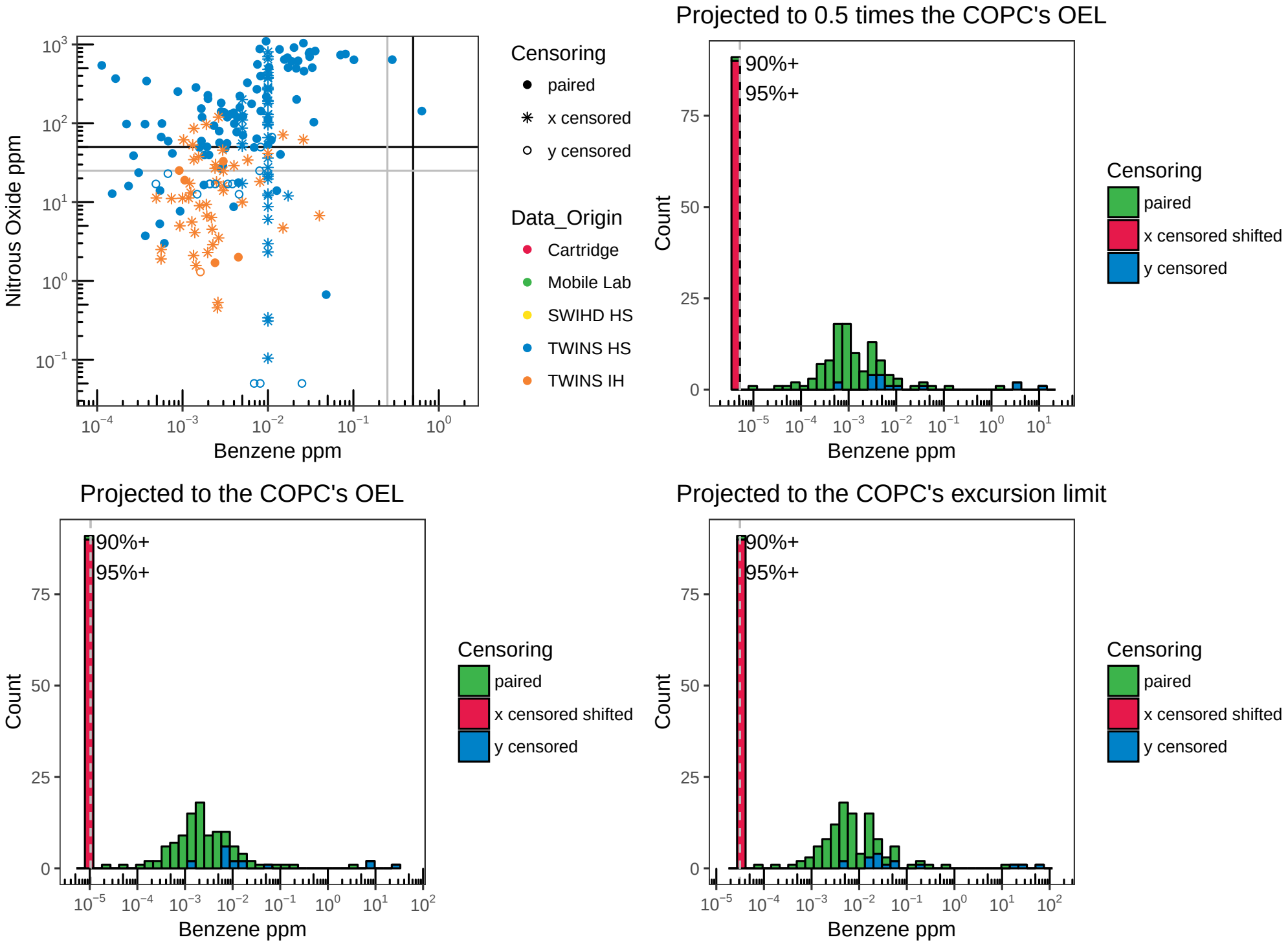


Figure C.220: Nitrous Oxide vs Benzene

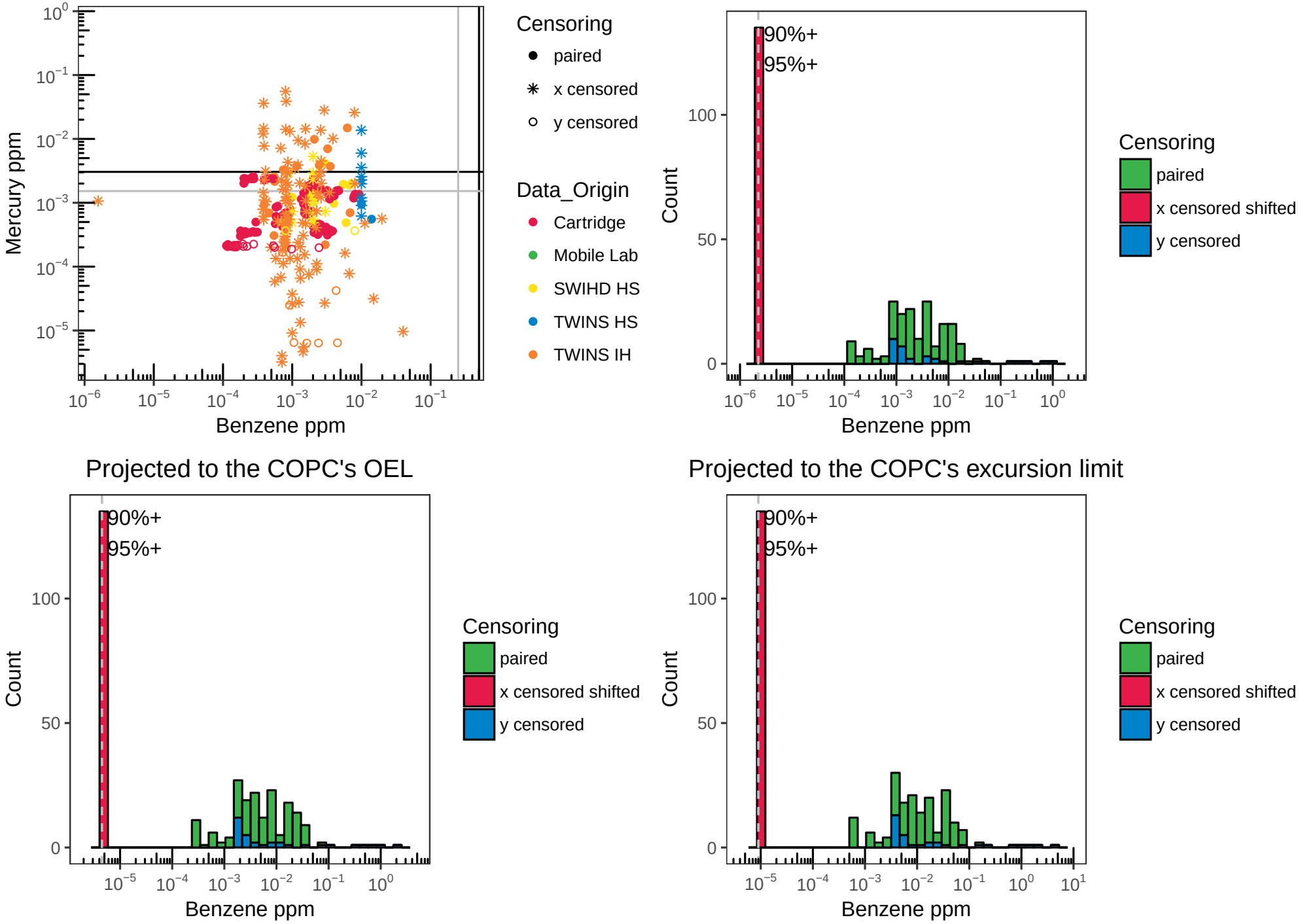


Figure C.221: Mercury vs Benzene

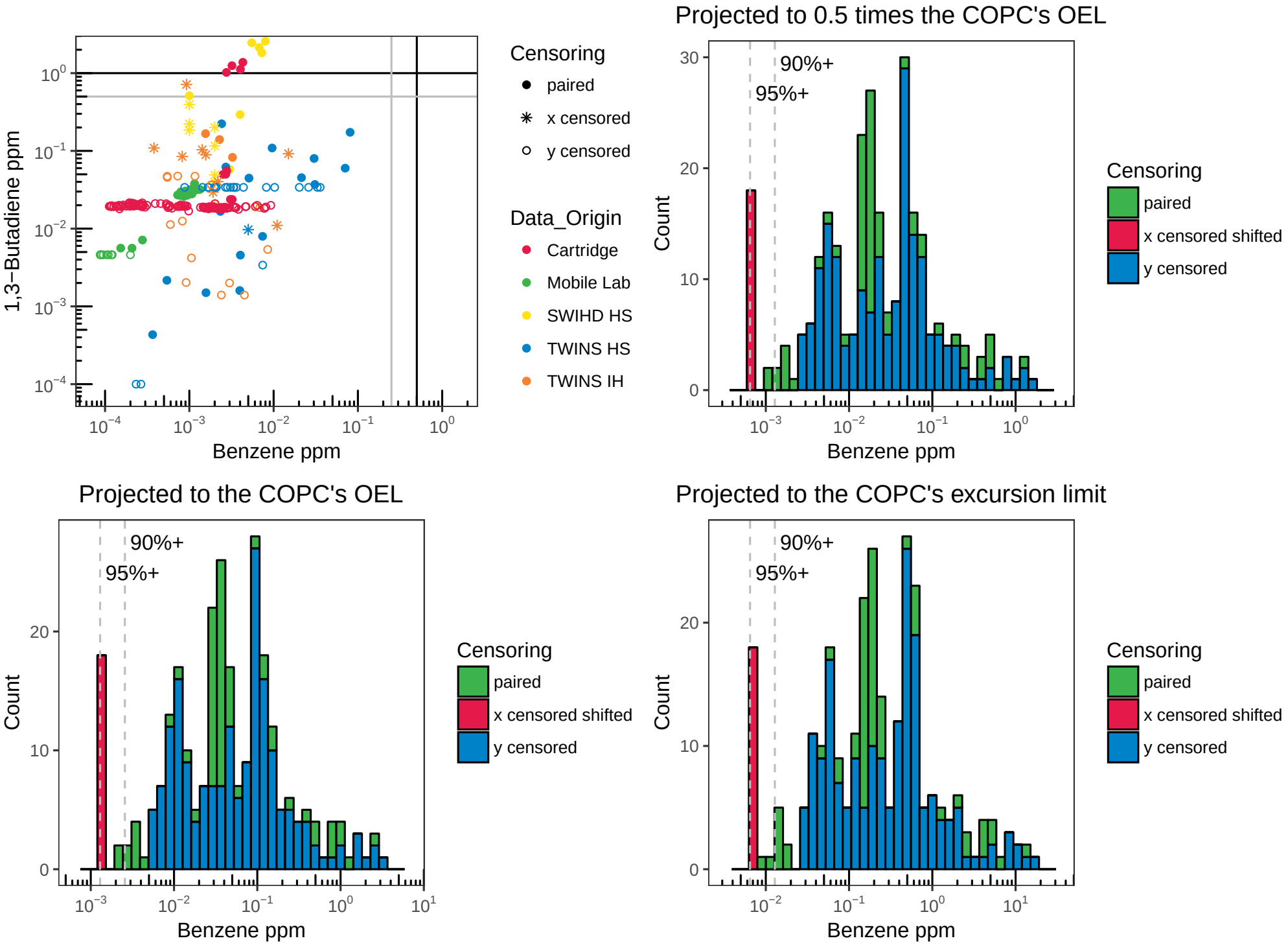


Figure C.222: 1,3-Butadiene vs Benzene

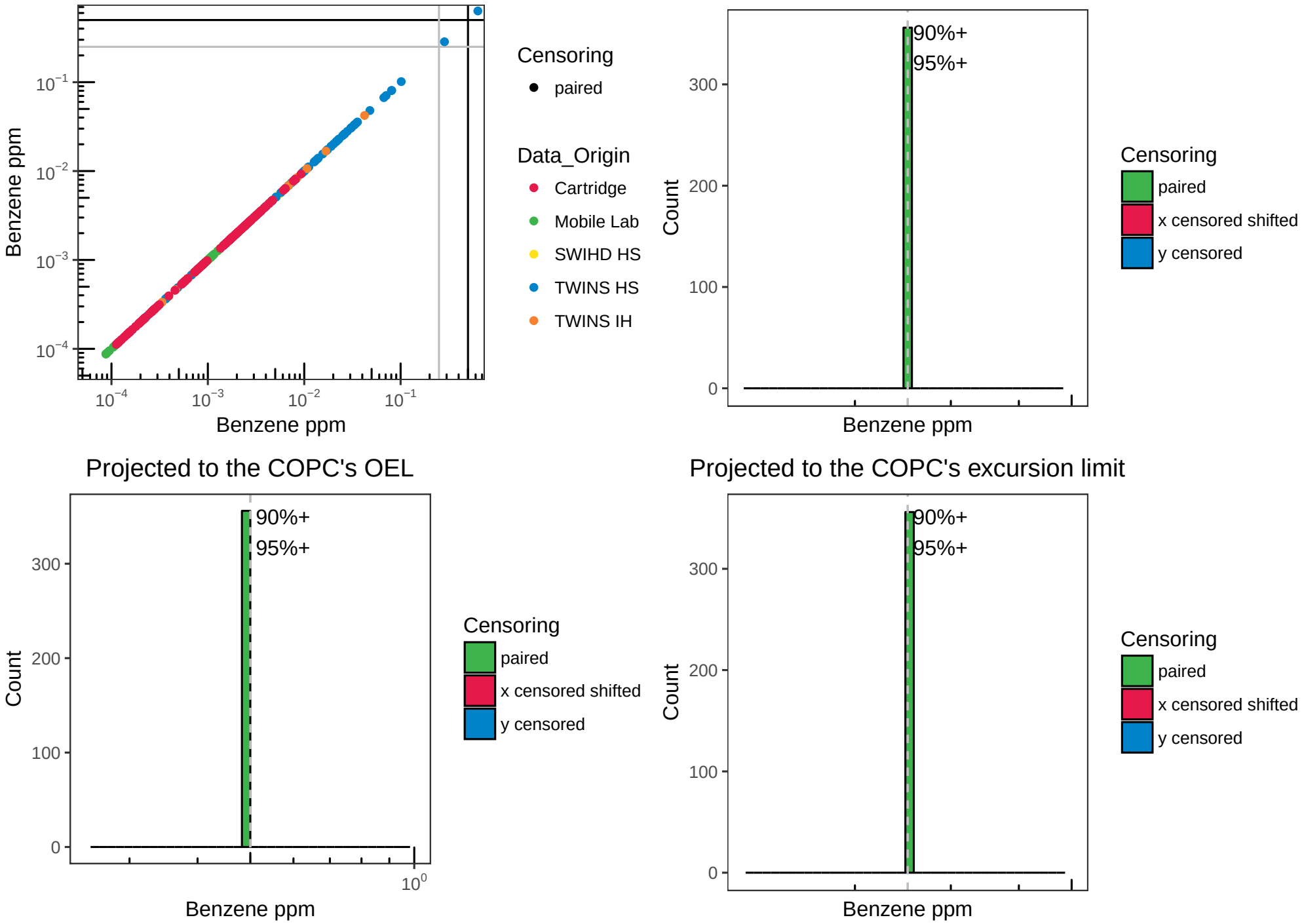


Figure C.223: Benzene vs Benzene

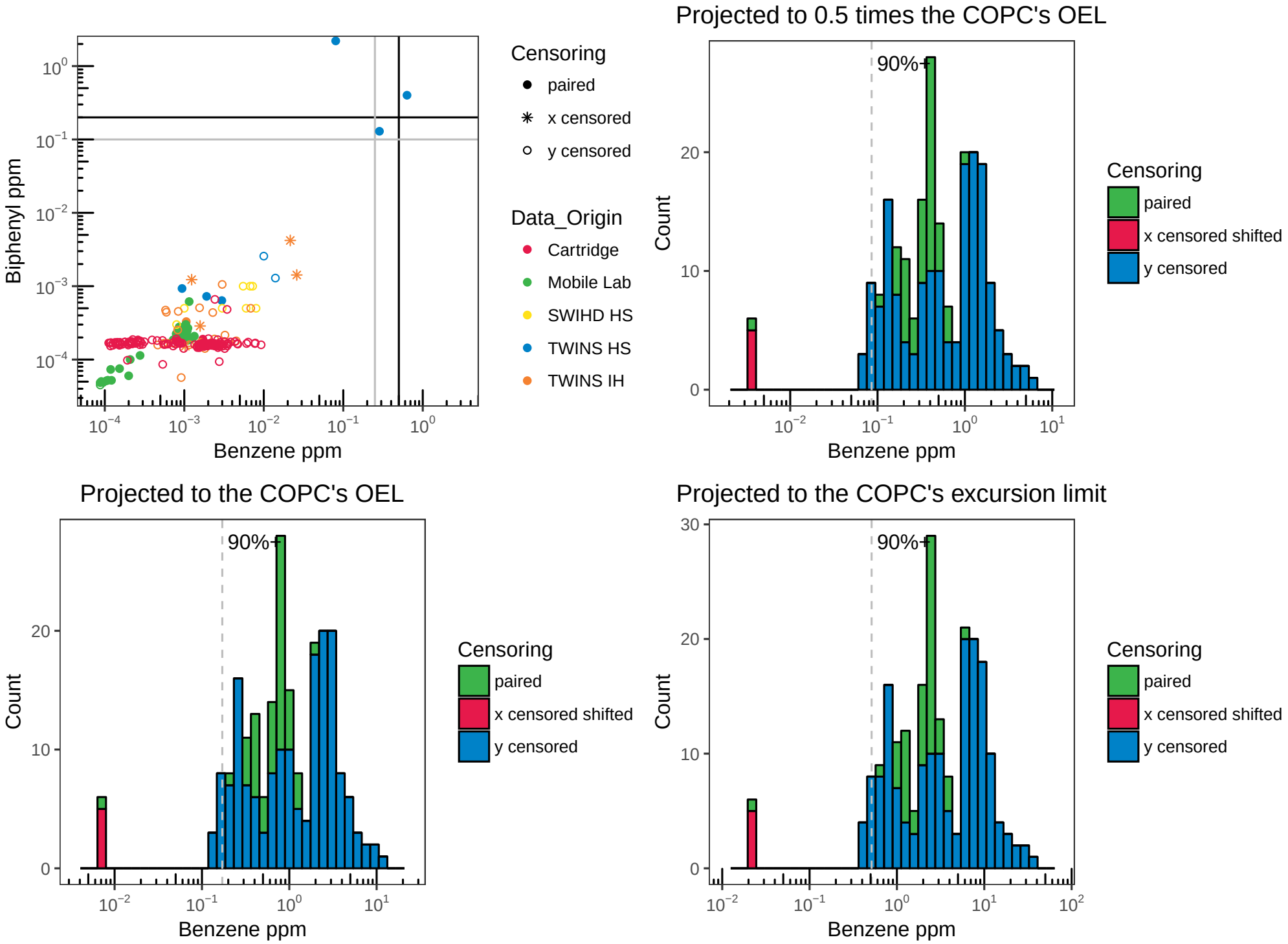


Figure C.224: Biphenyl vs Benzene

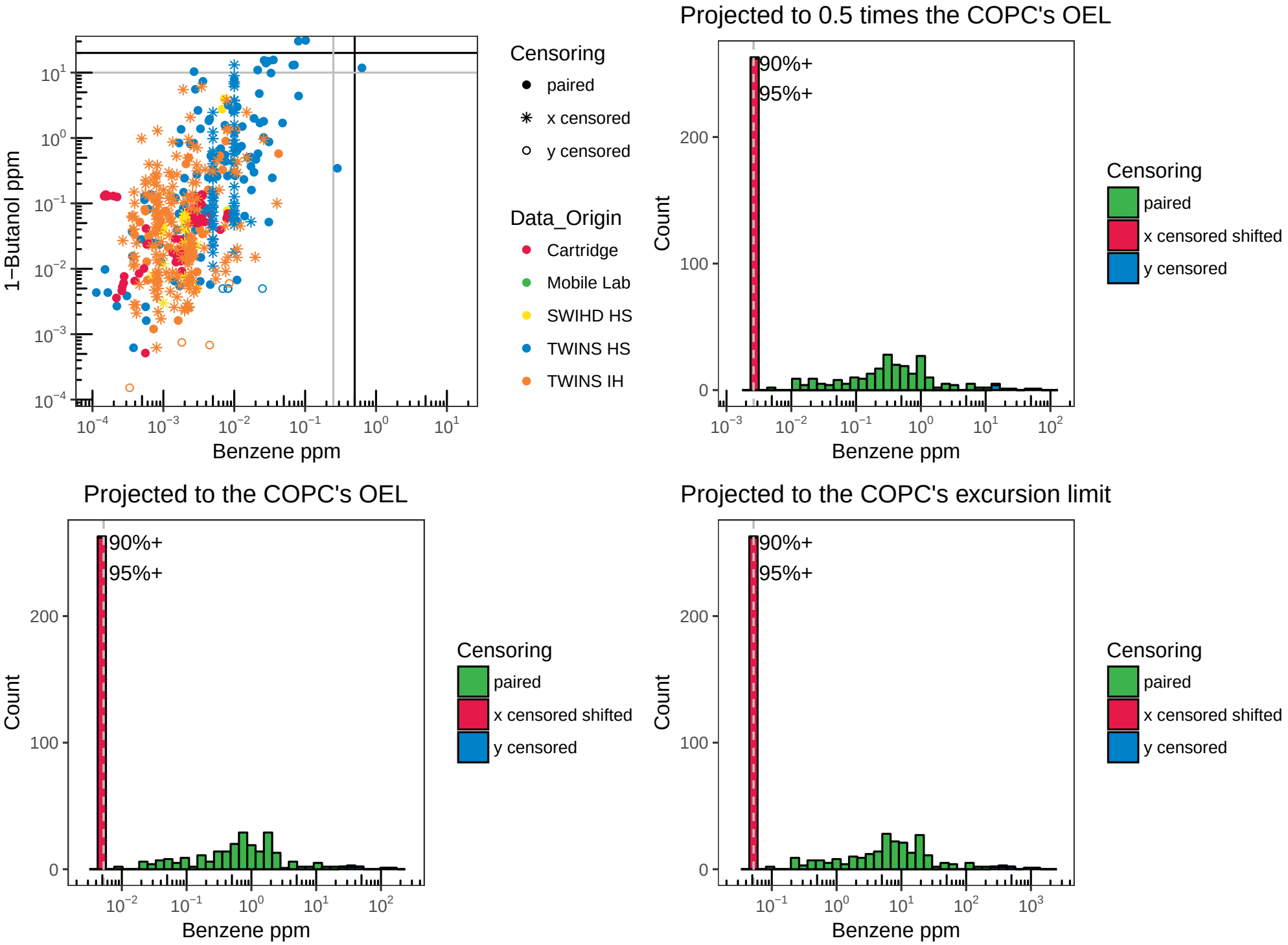


Figure C.225: 1-Butanol vs Benzene

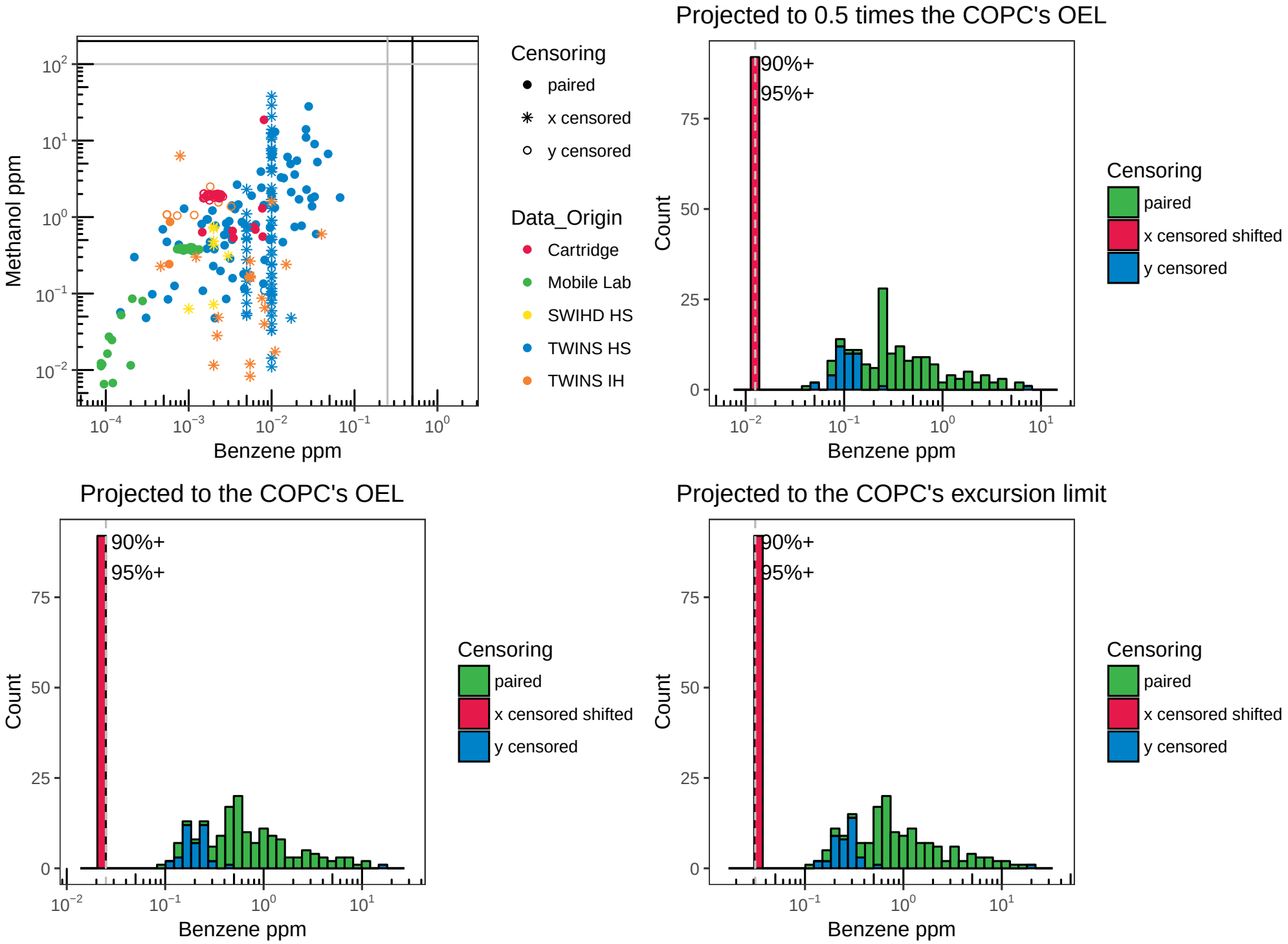


Figure C.226: Methanol vs Benzene

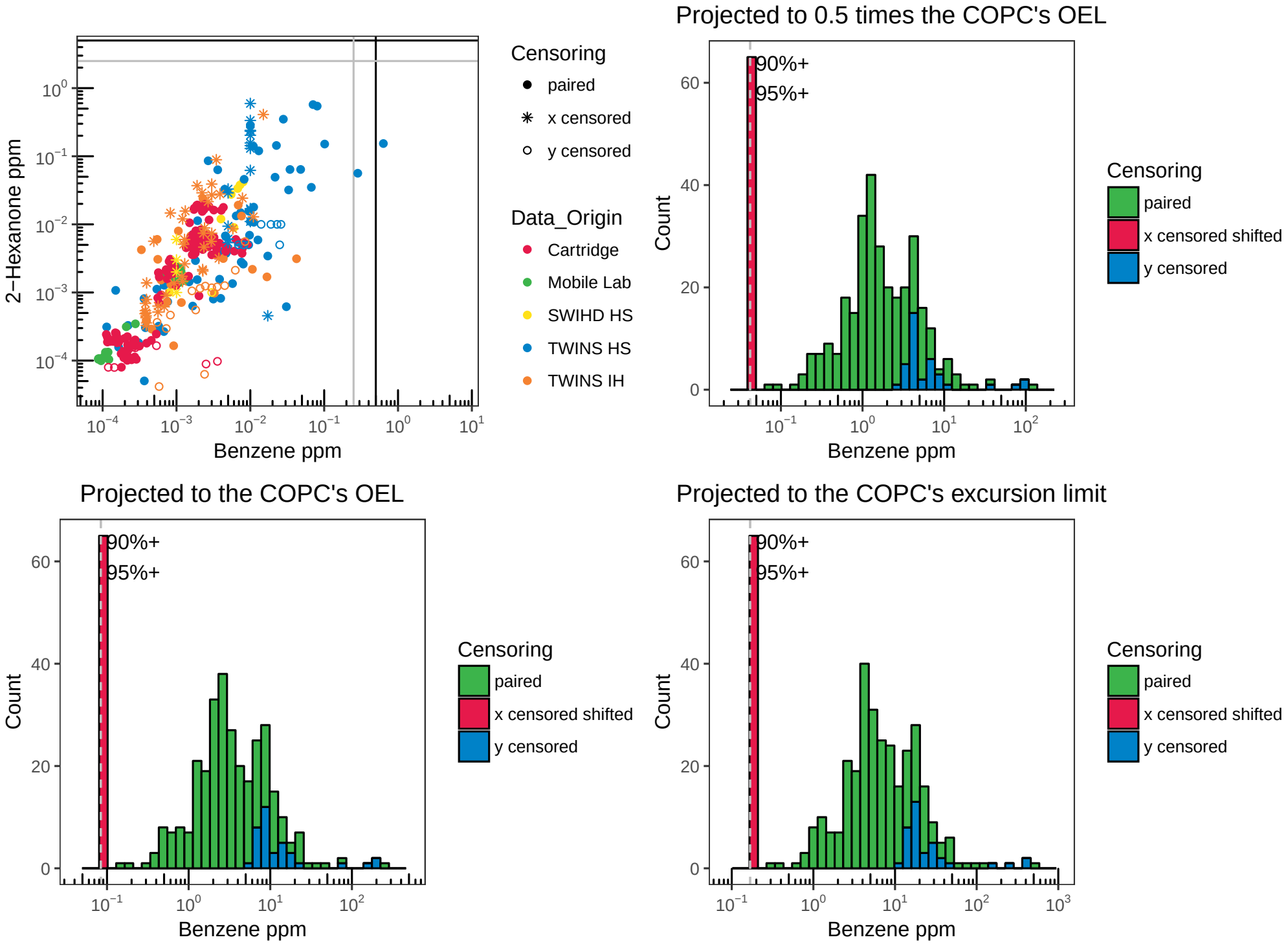


Figure C.227: 2-Hexanone vs Benzene

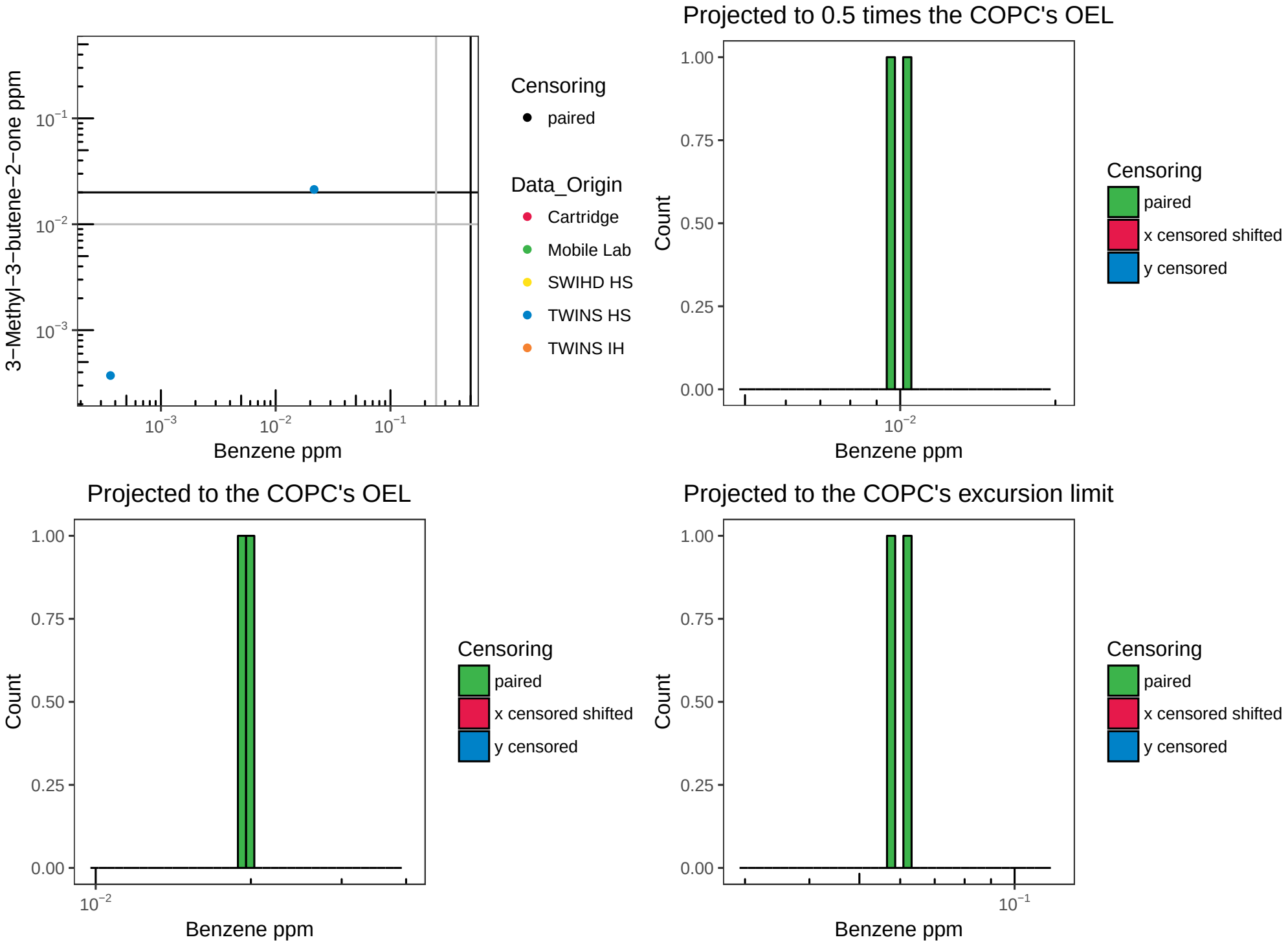


Figure C.228: 3-Methyl-3-butene-2-one vs Benzene

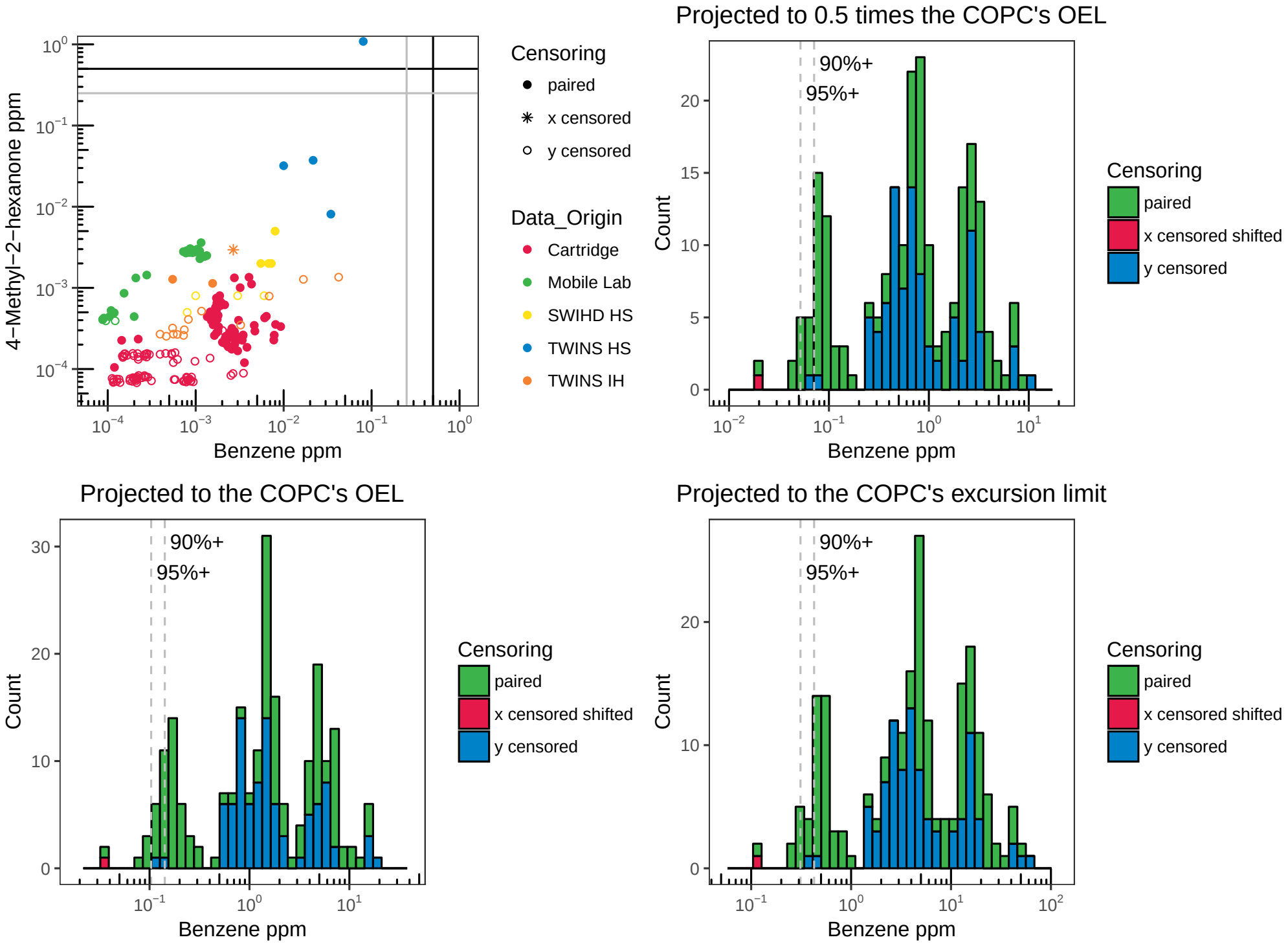


Figure C.229: 4-Methyl-2-hexanone vs Benzene

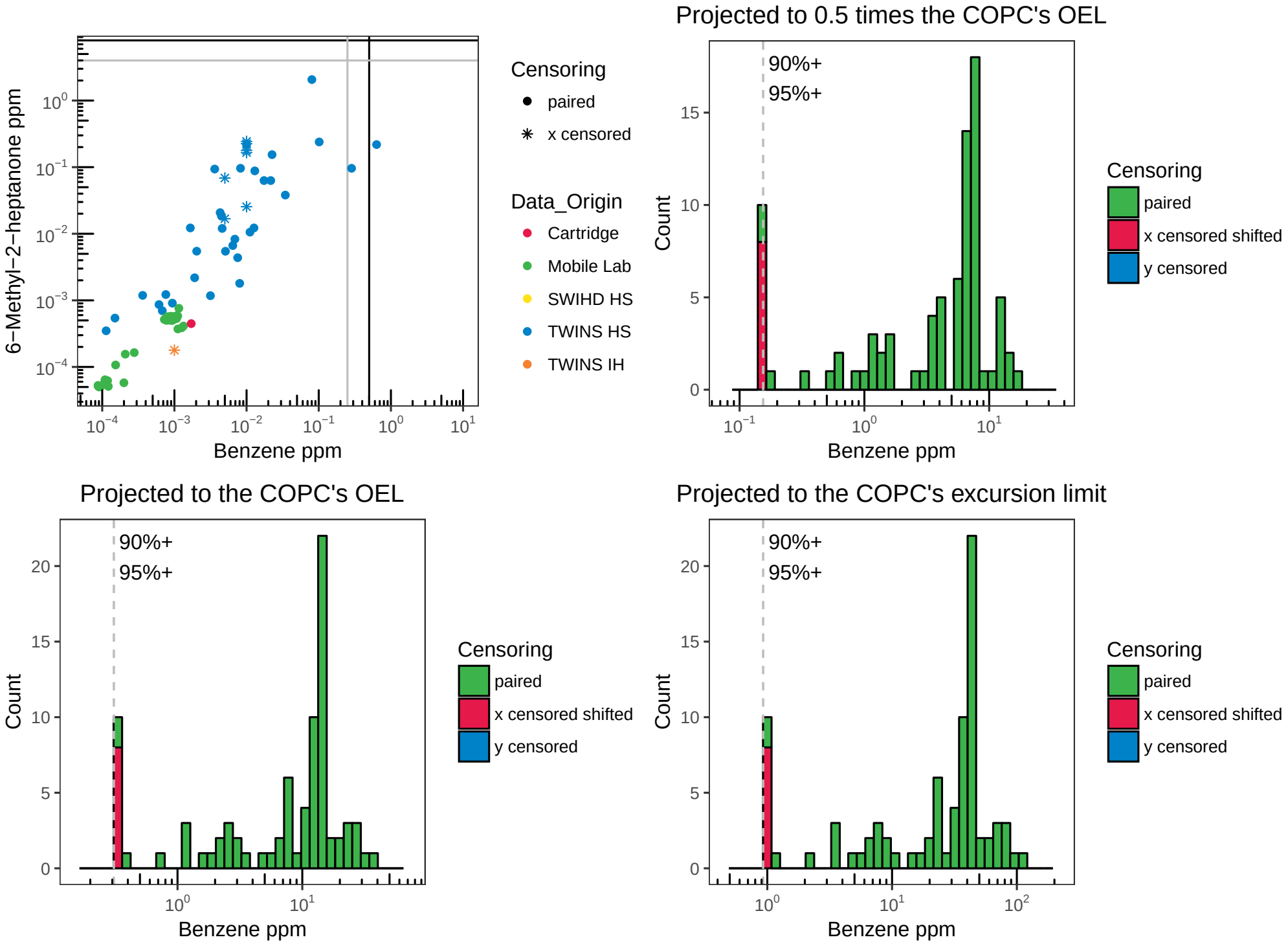


Figure C.230: 6-Methyl-2-heptanone vs Benzene

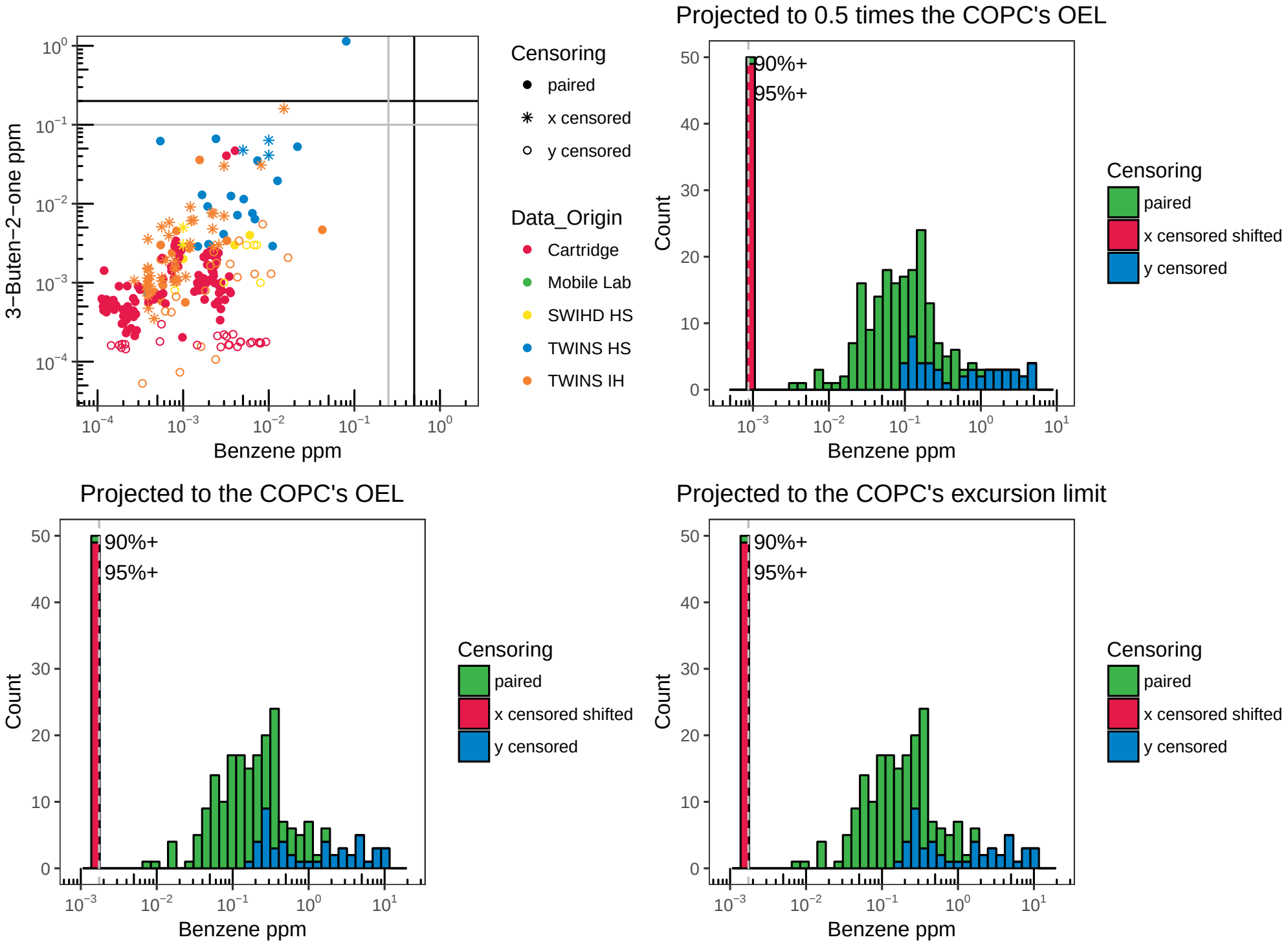


Figure C.231: 3-Buten-2-one vs Benzene

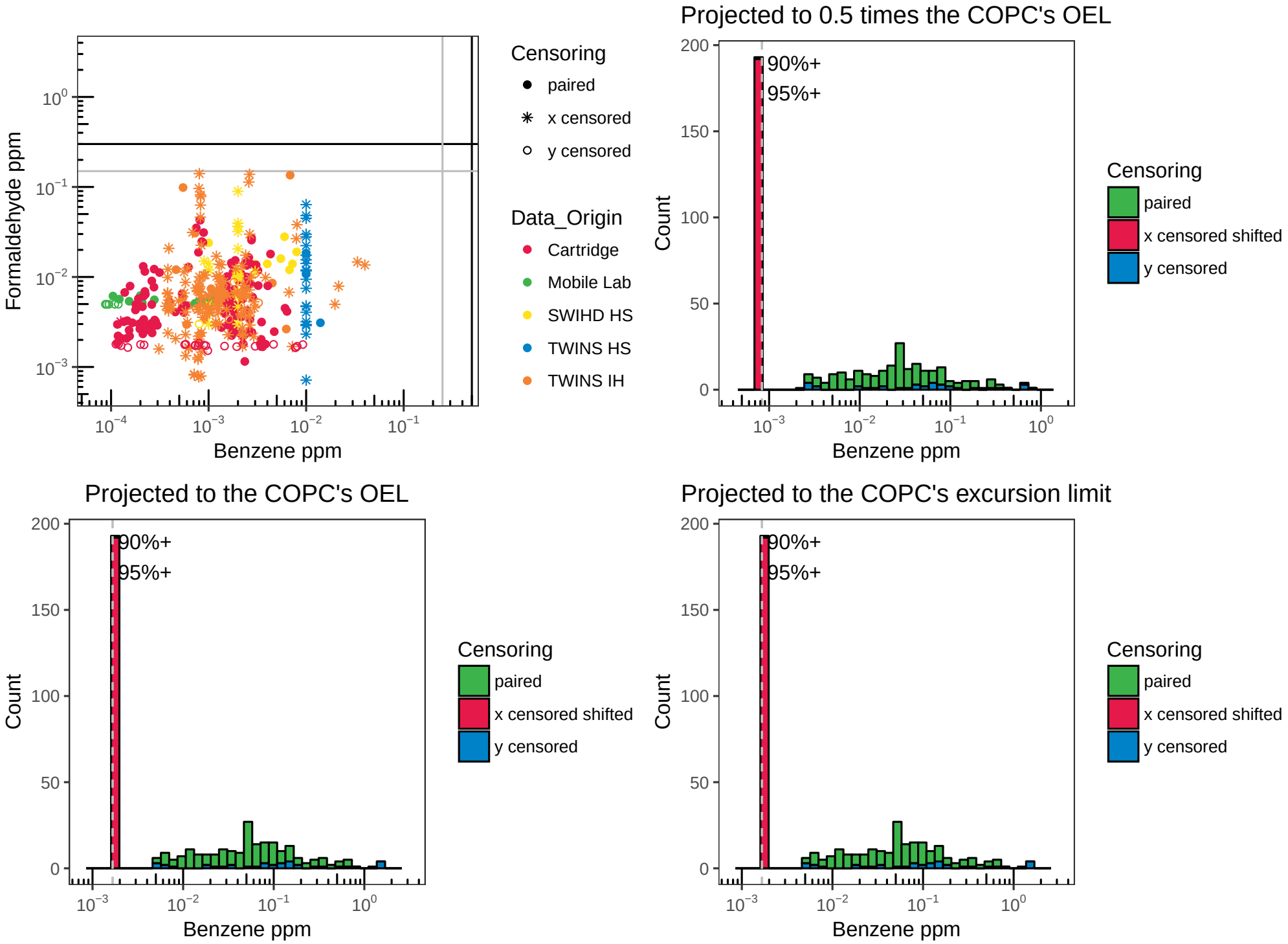


Figure C.232: Formaldehyde vs Benzene

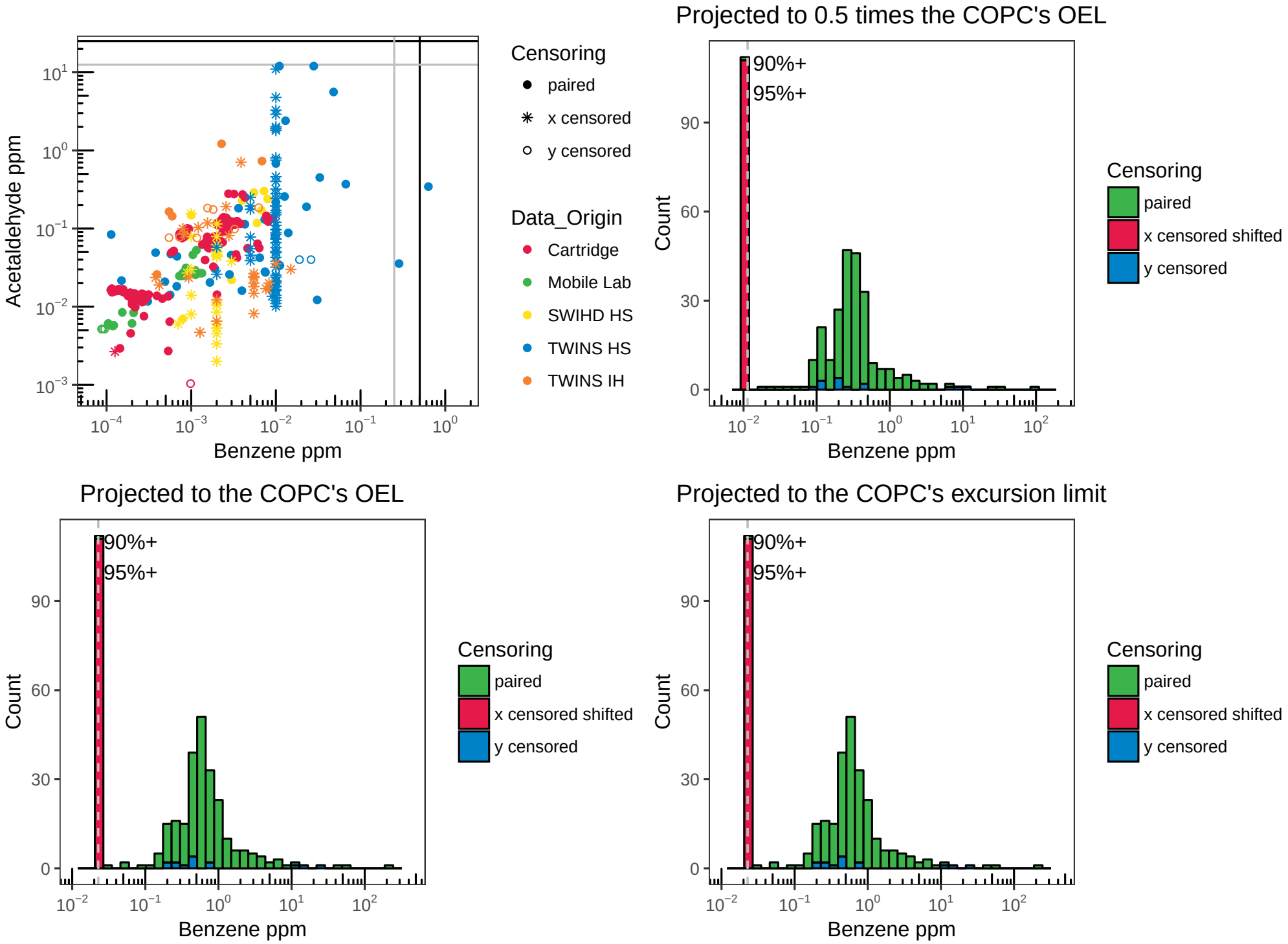


Figure C.233: Acetaldehyde vs Benzene

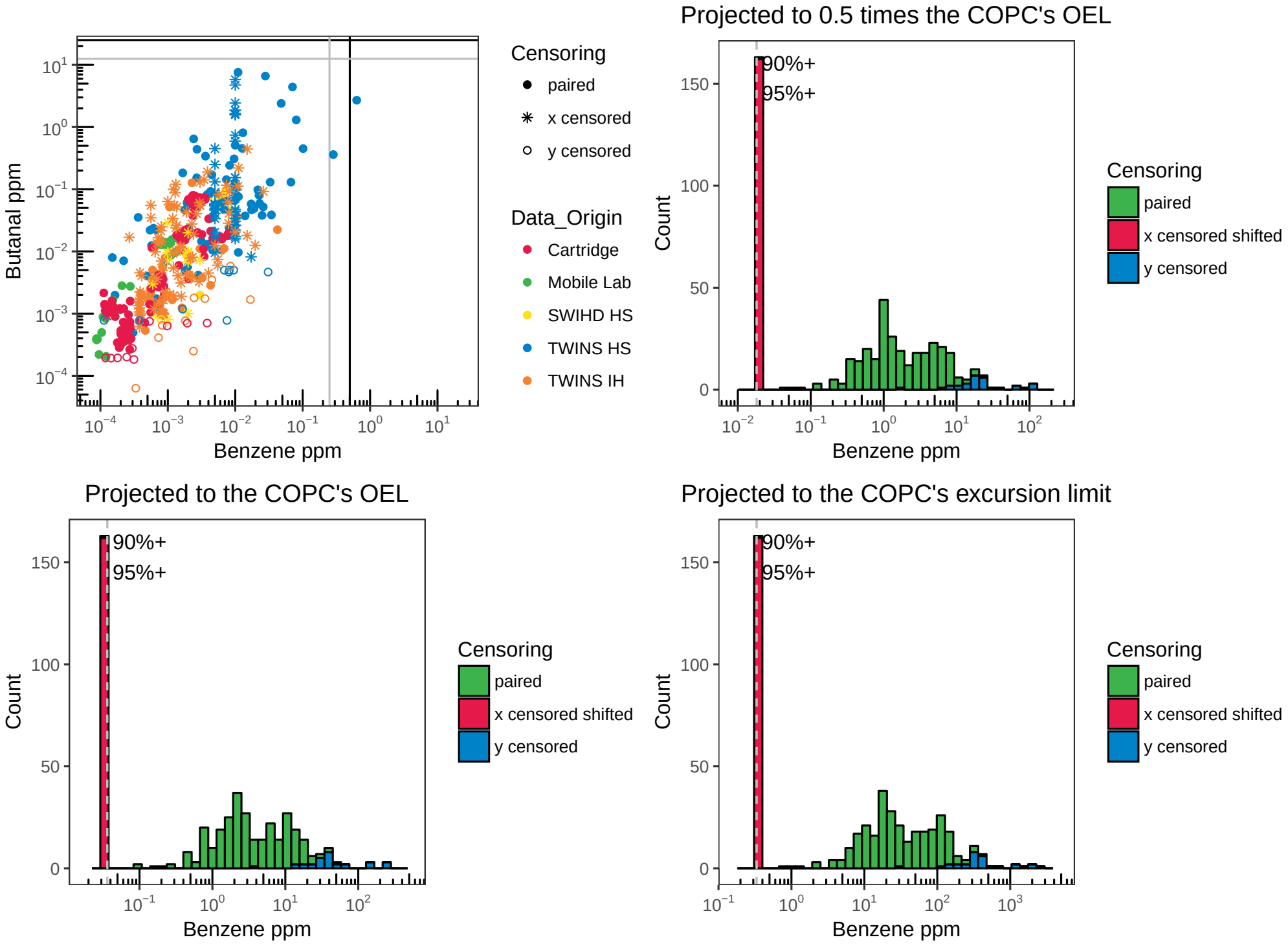


Figure C.234: Butanal vs Benzene

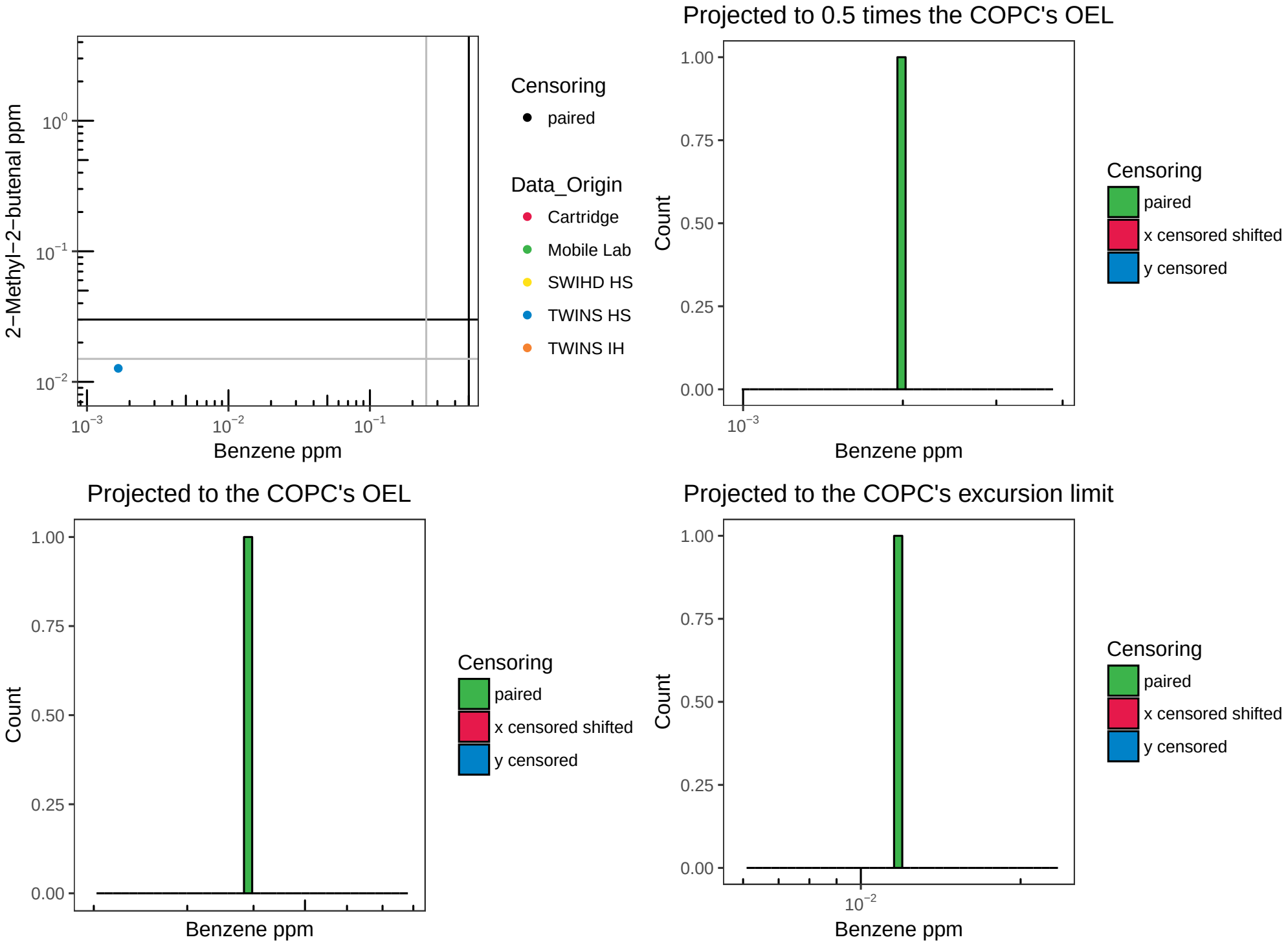


Figure C.235: 2-Methyl-2-butenal vs Benzene

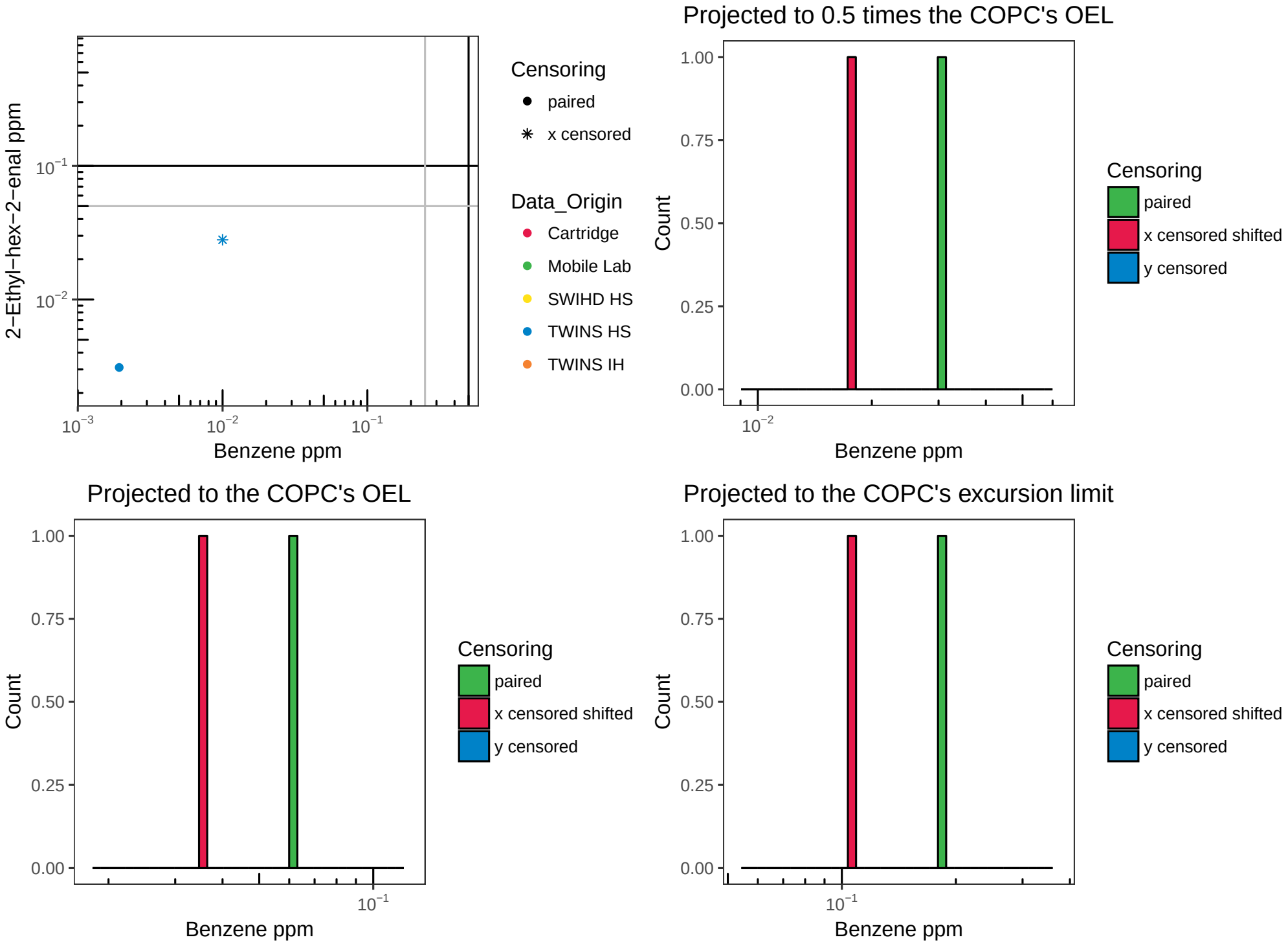


Figure C.236: 2-Ethyl-hex-2-enal vs Benzene

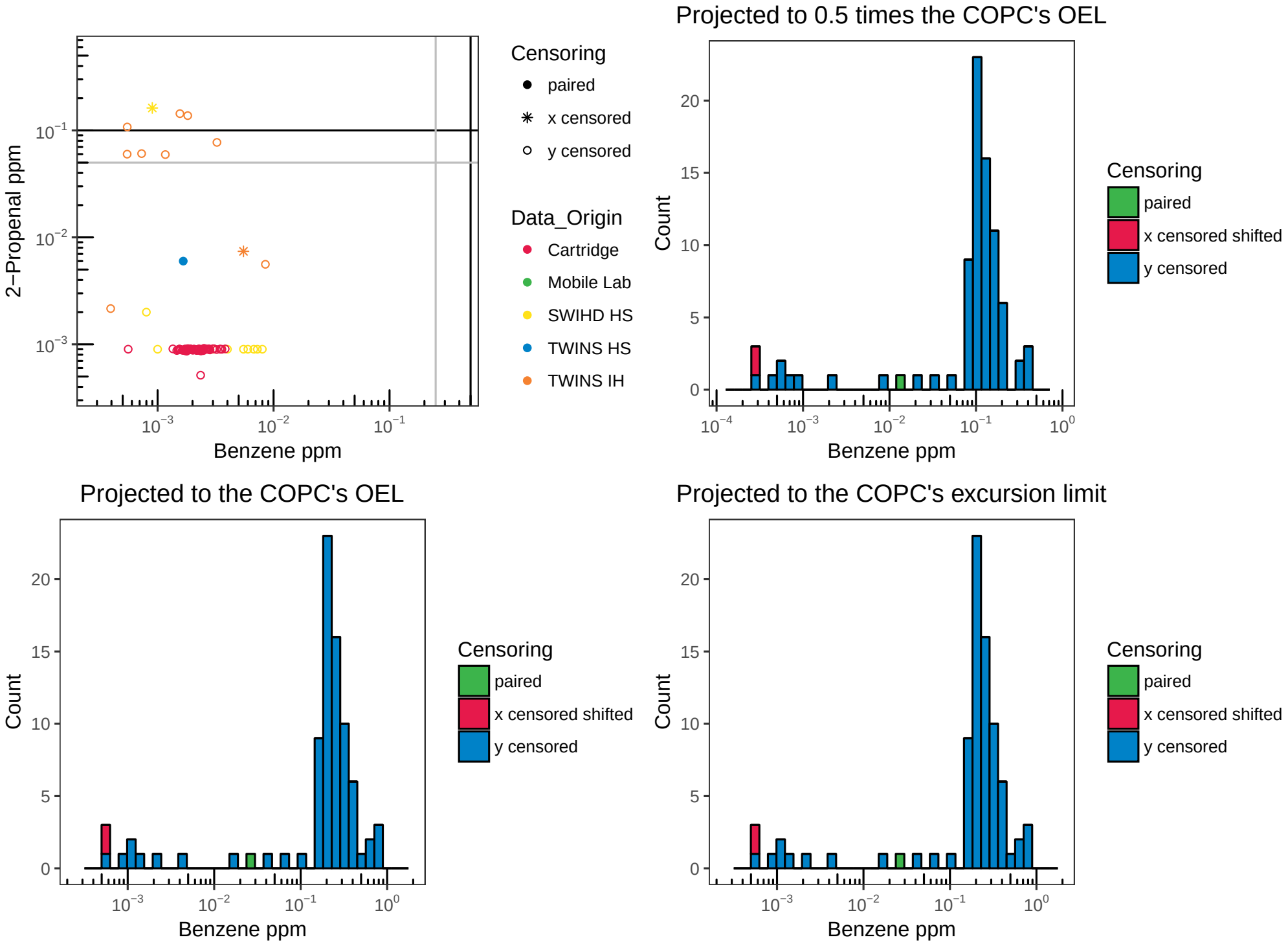


Figure C.237: 2-Propenal vs Benzene

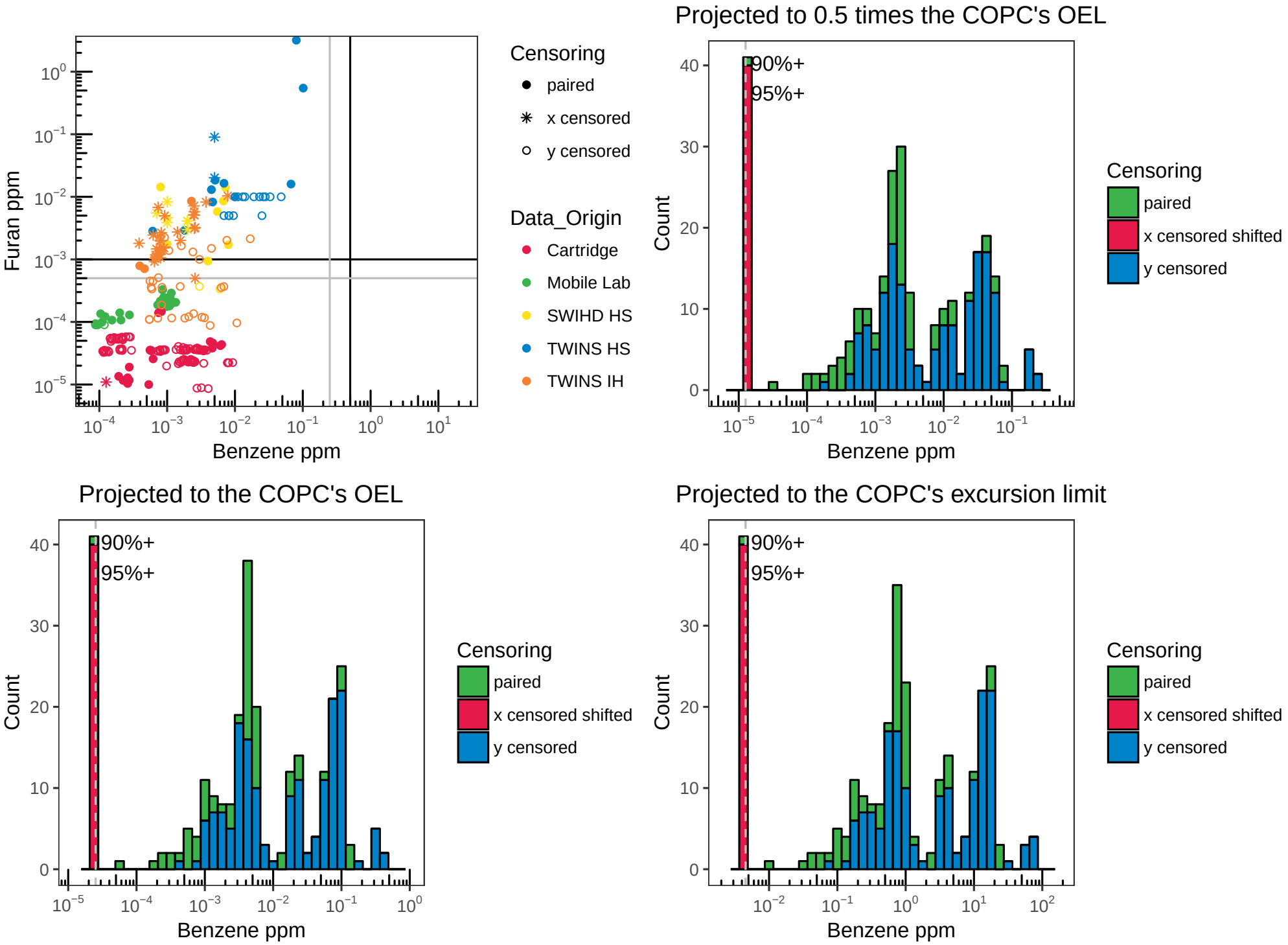


Figure C.238: Furan vs Benzene

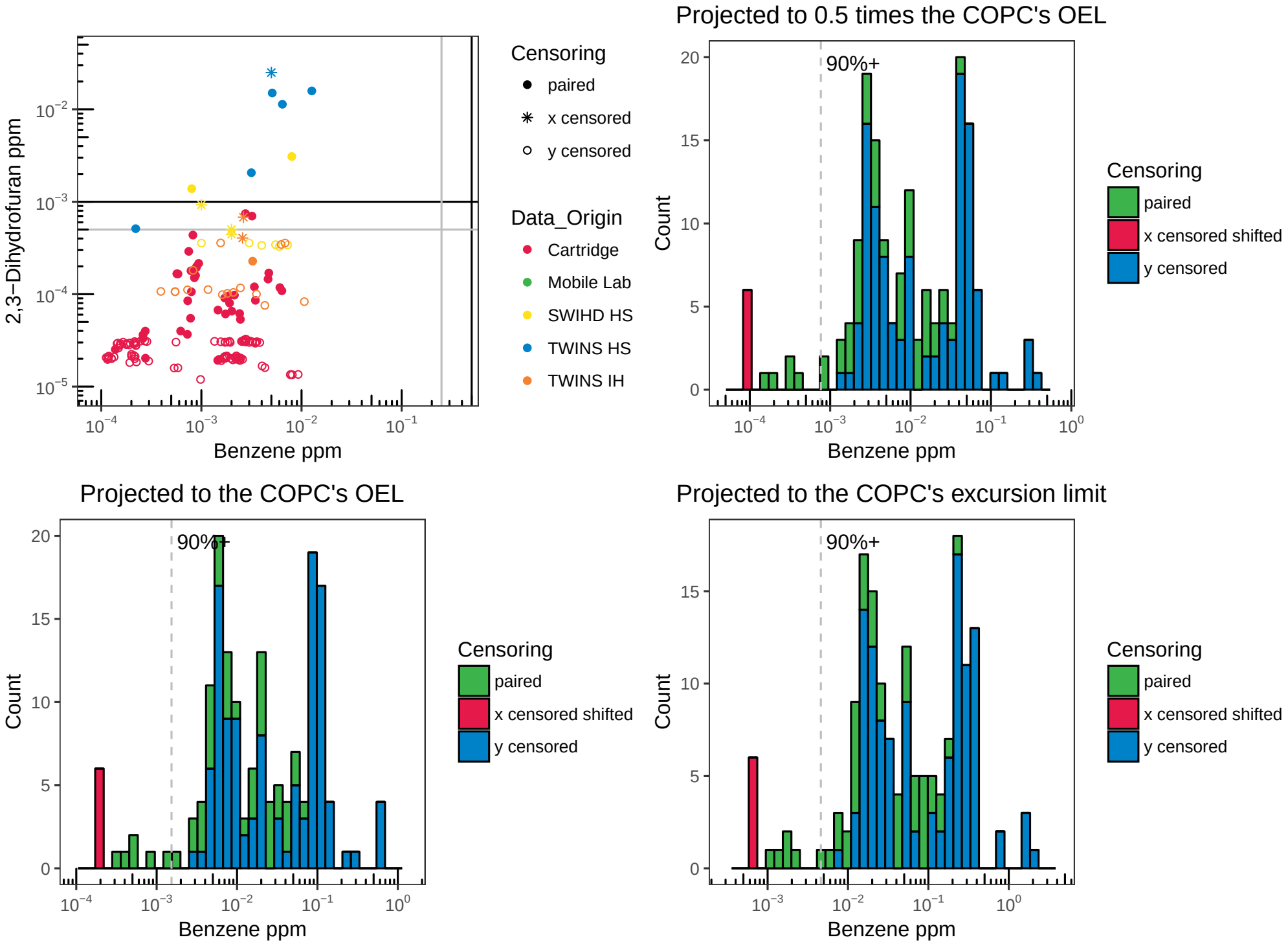


Figure C.239: 2,3-Dihydrofuran vs Benzene

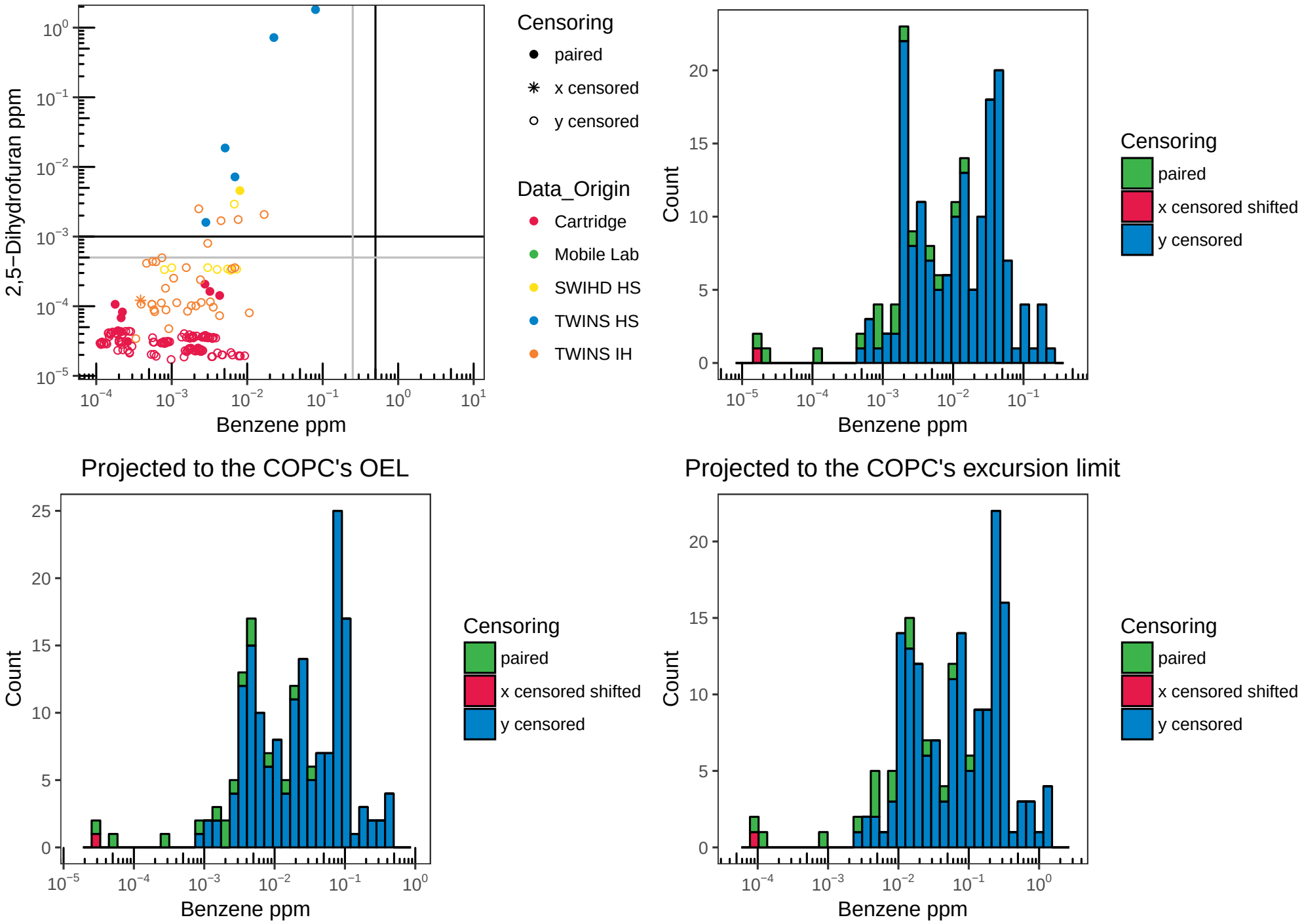


Figure C.240: 2,5-Dihydrofuran vs Benzene

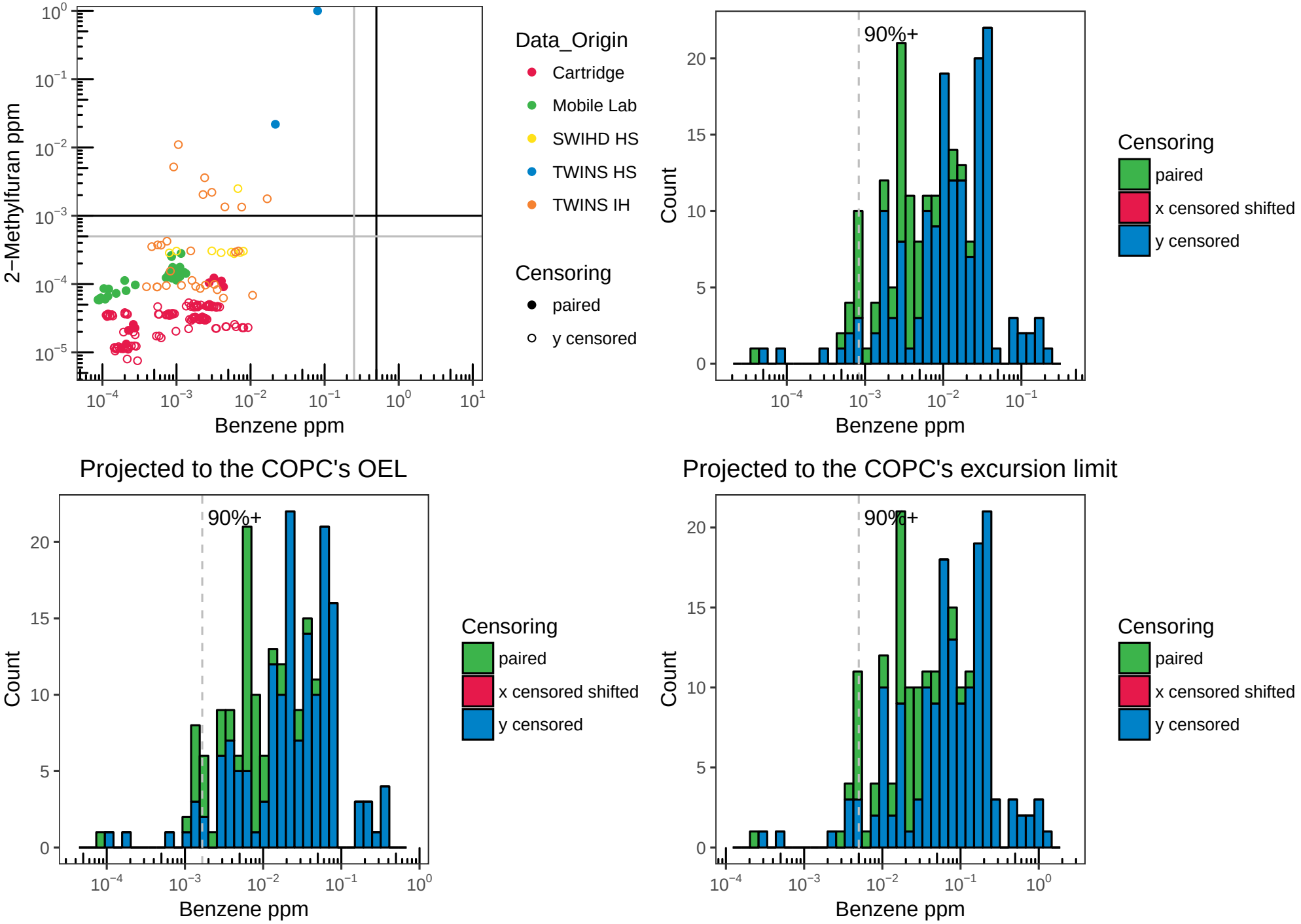


Figure C.241: 2-Methylfuran vs Benzene

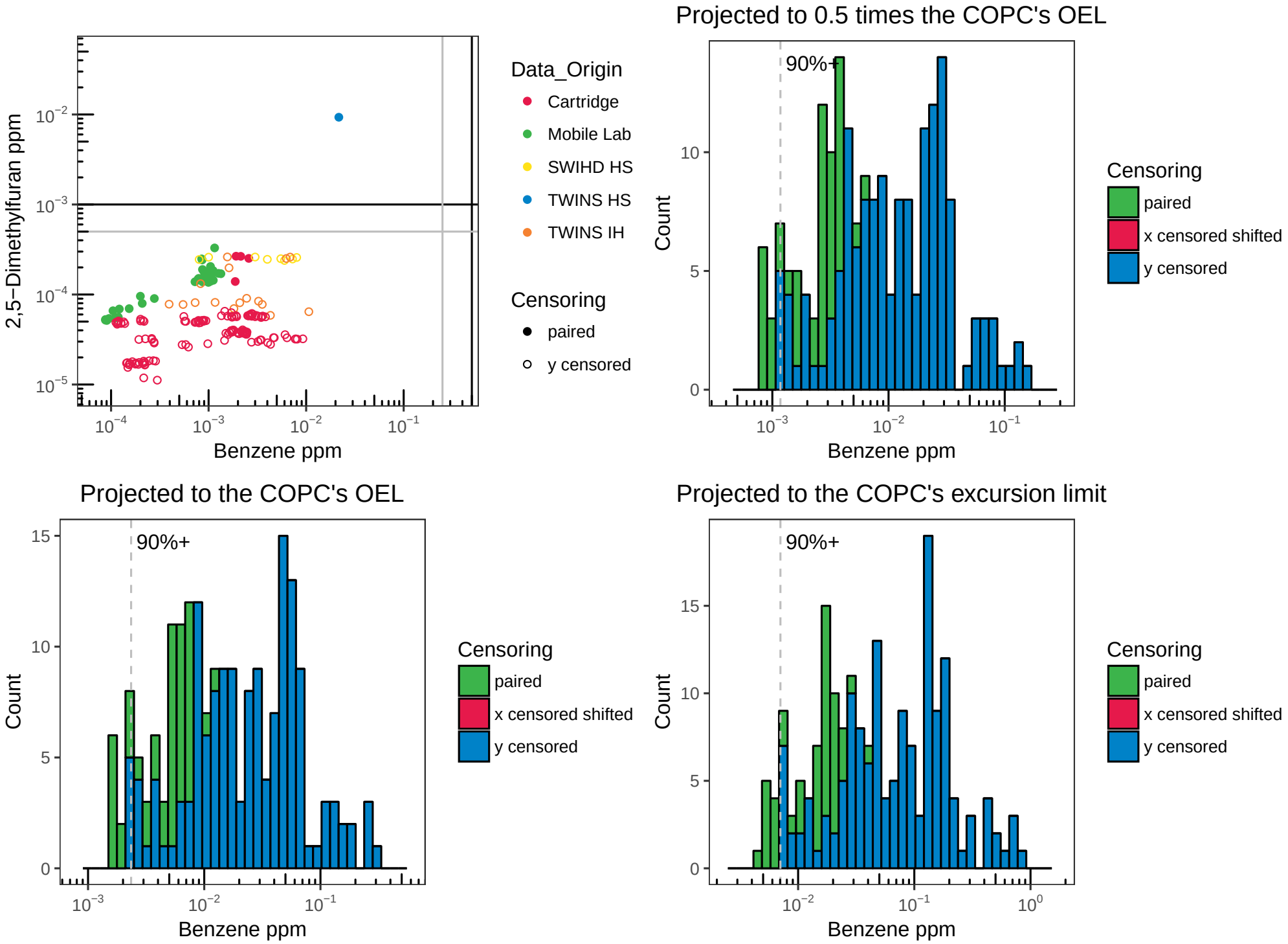


Figure C.242: 2,5-Dimethylfuran vs Benzene

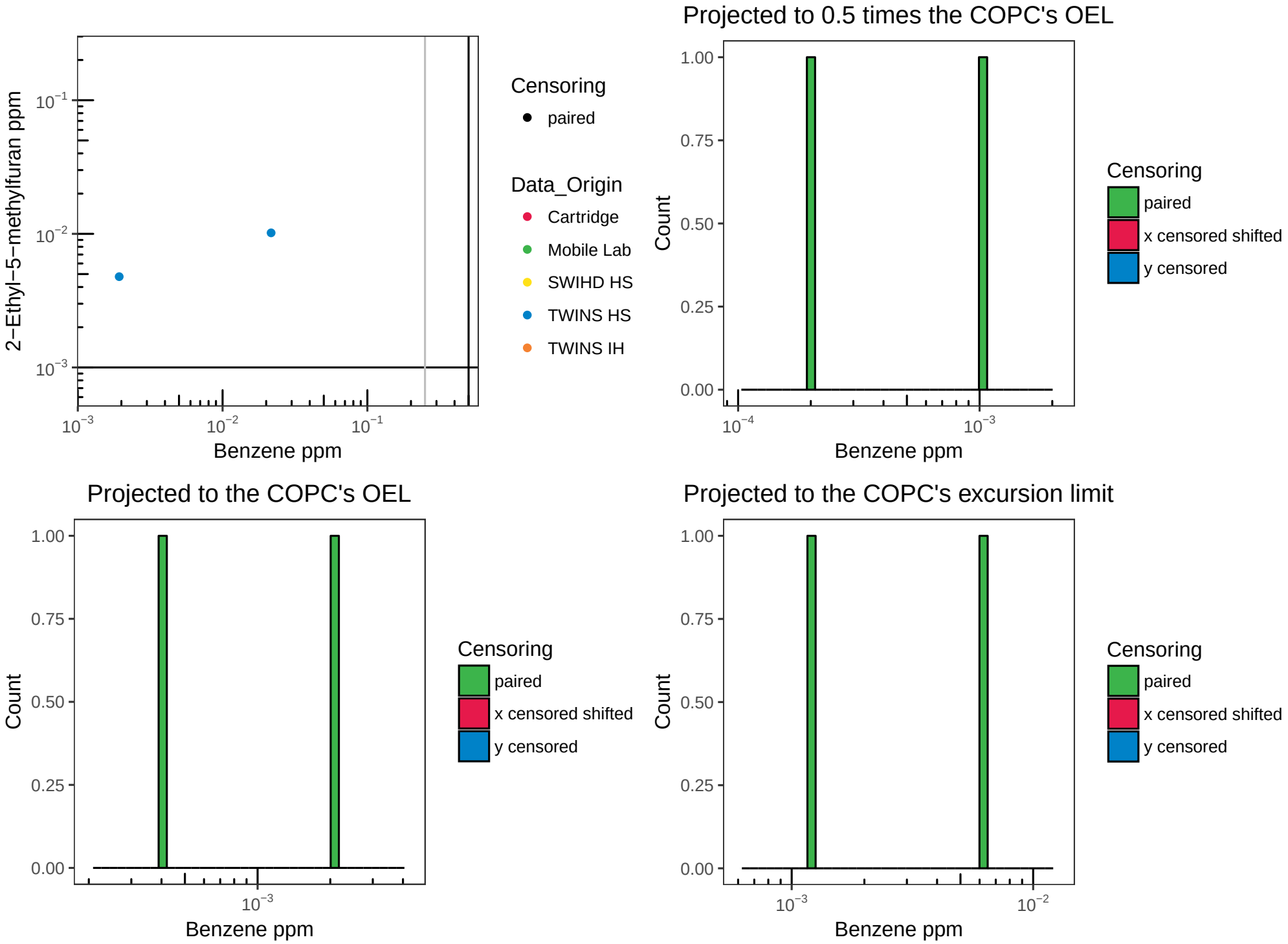


Figure C.243: 2-Ethyl-5-methylfuran vs Benzene

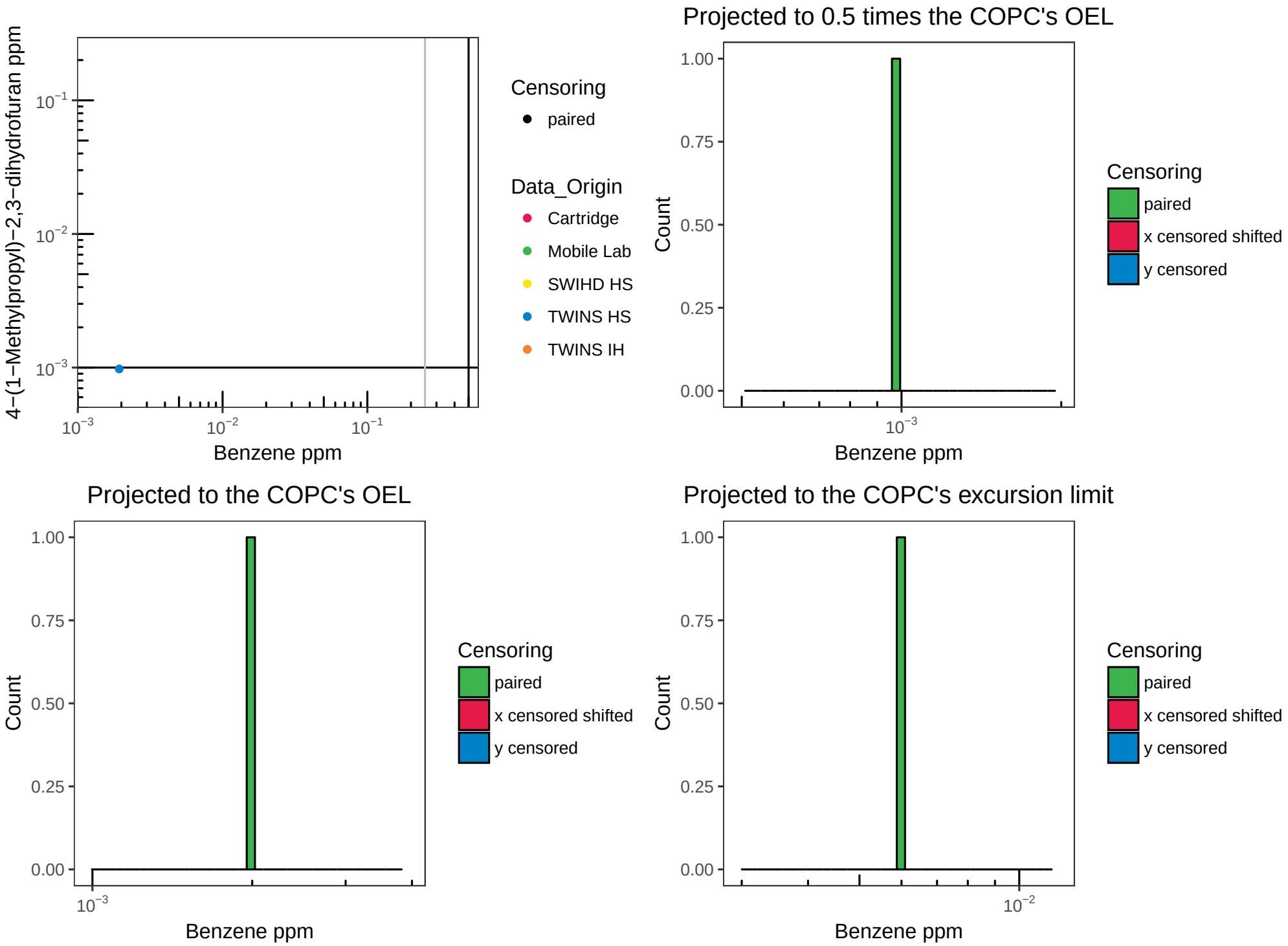


Figure C.244: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Benzene

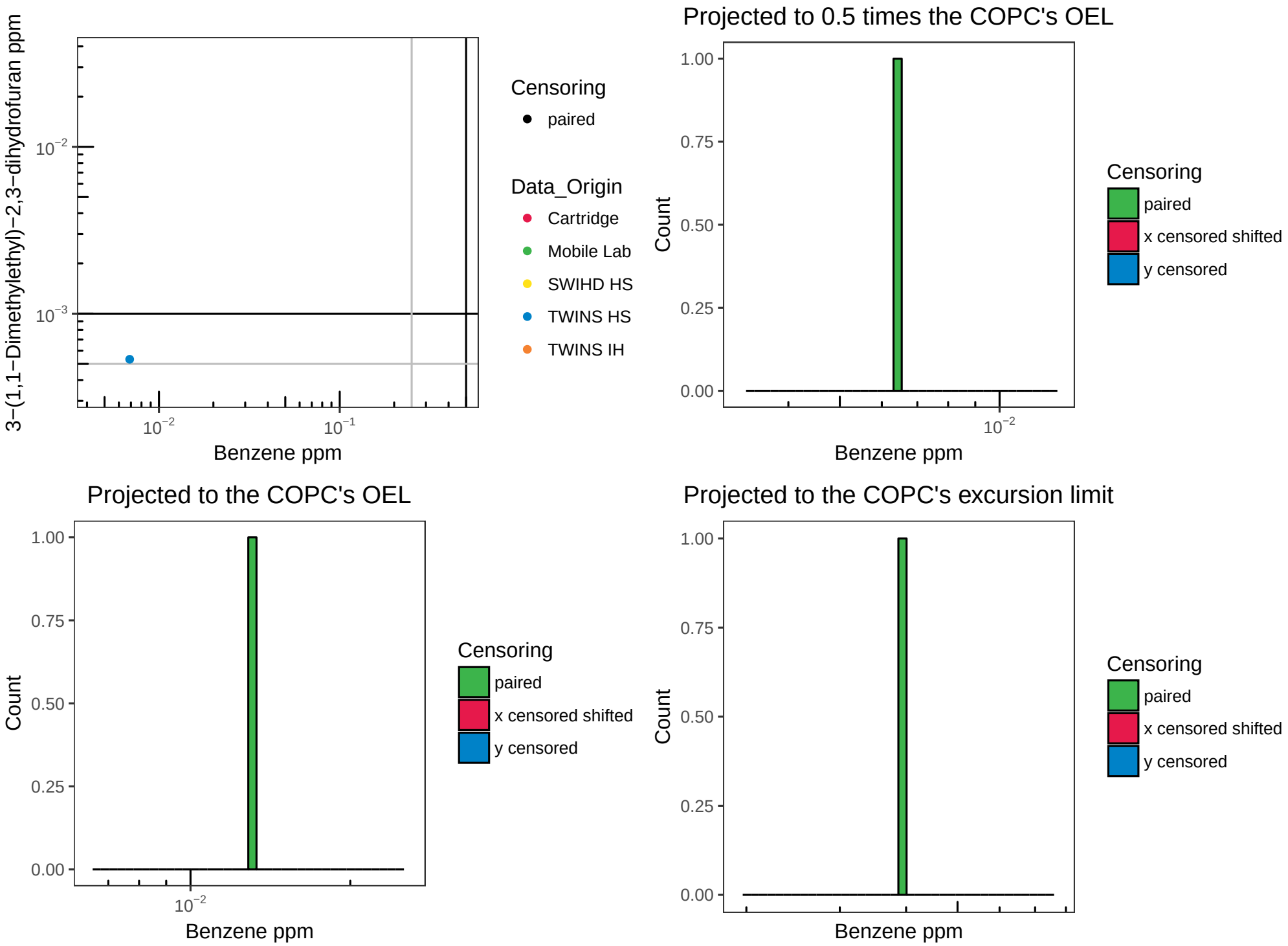


Figure C.245: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Benzene

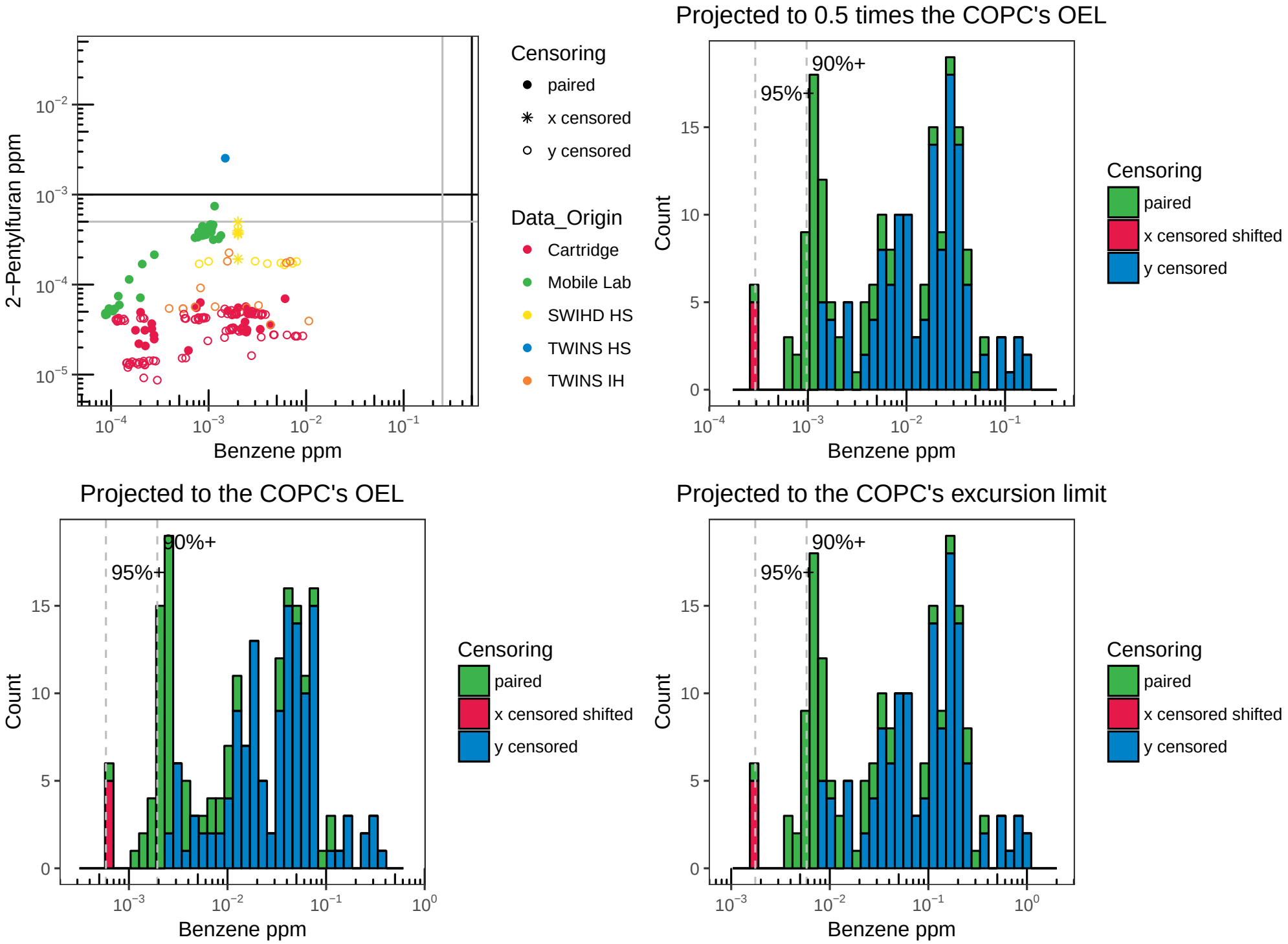


Figure C.246: 2-Pentylfuran vs Benzene

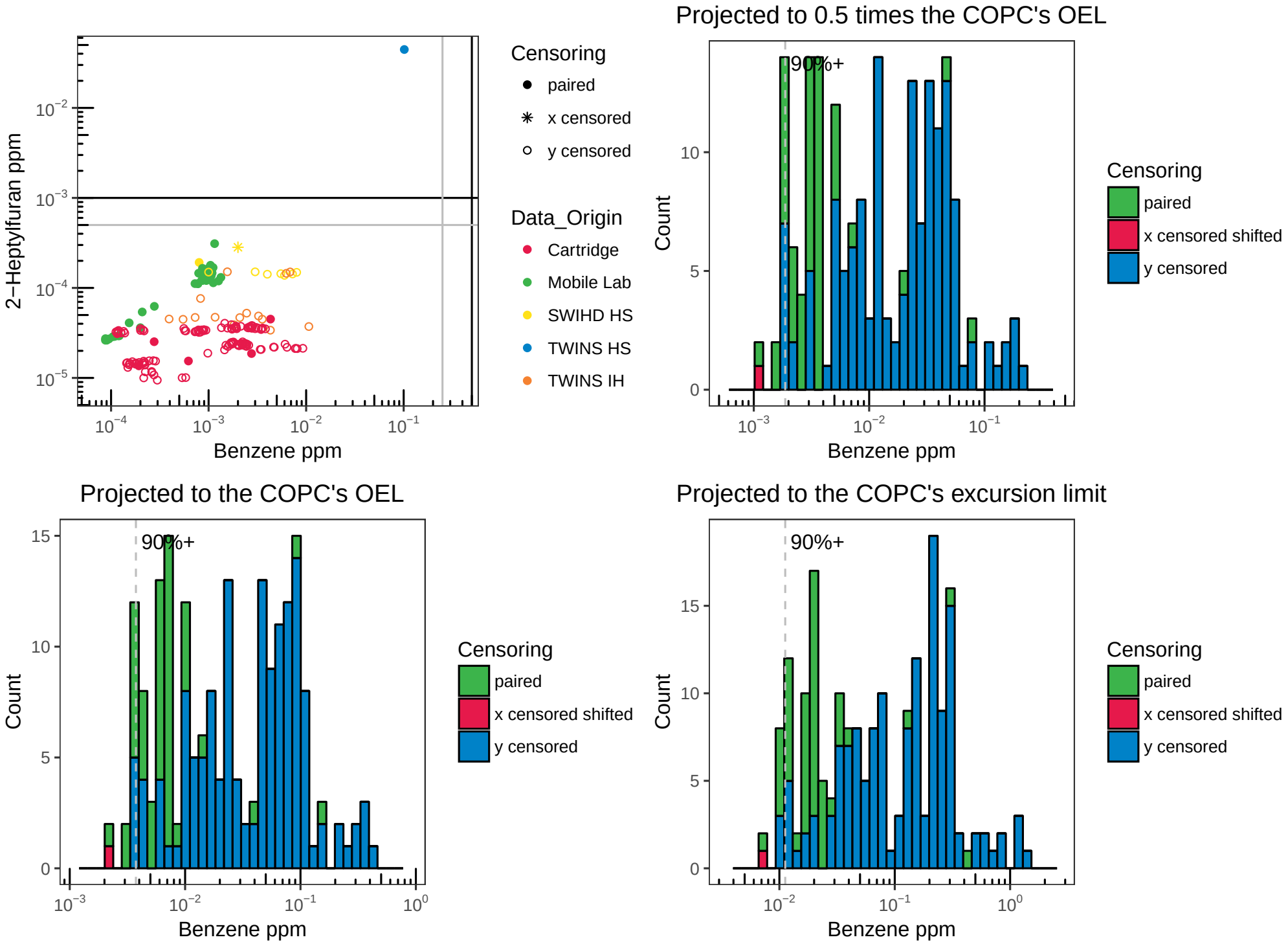


Figure C.247: 2-Heptylfuran vs Benzene

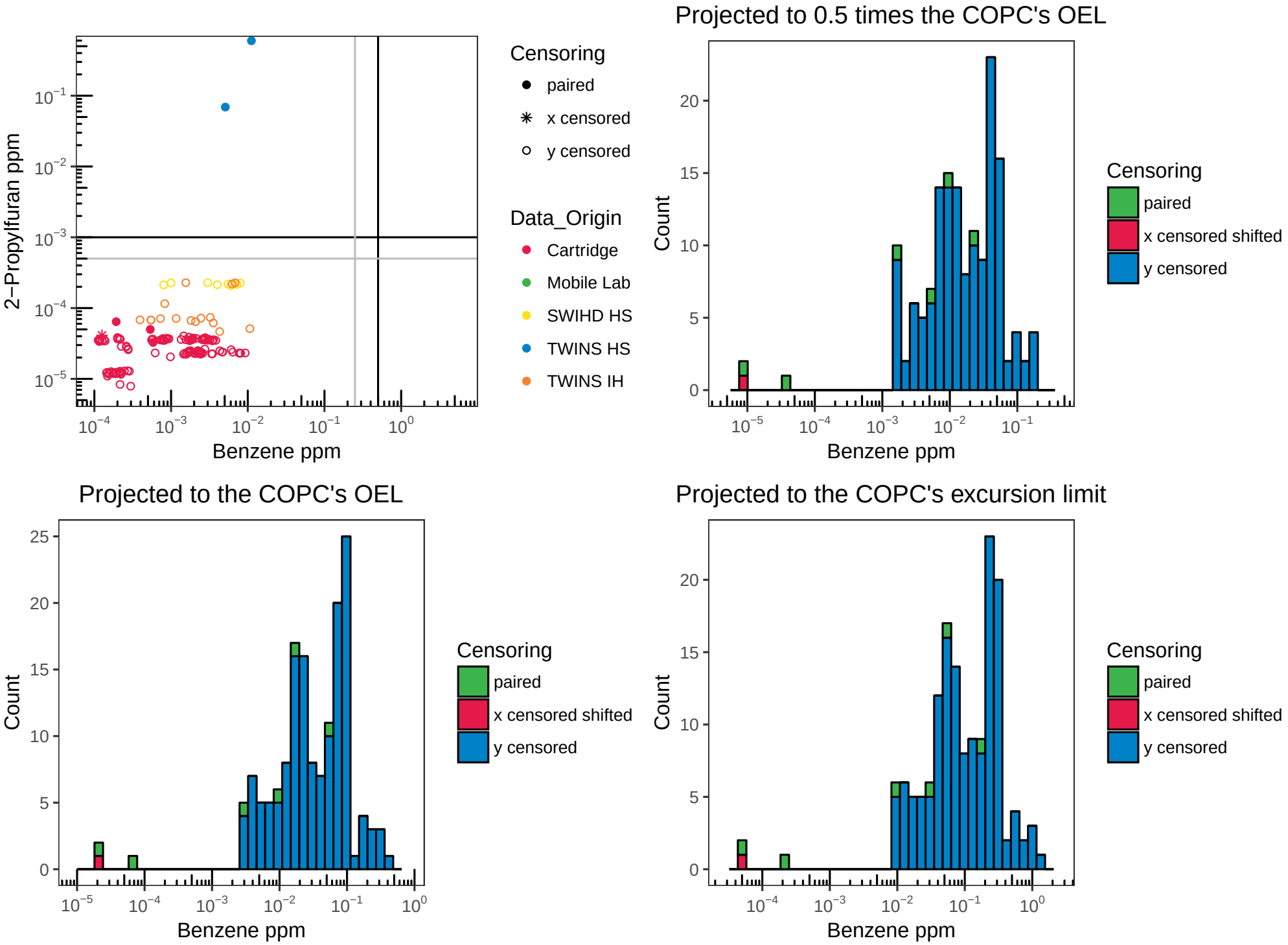


Figure C.248: 2-Propylfuran vs Benzene

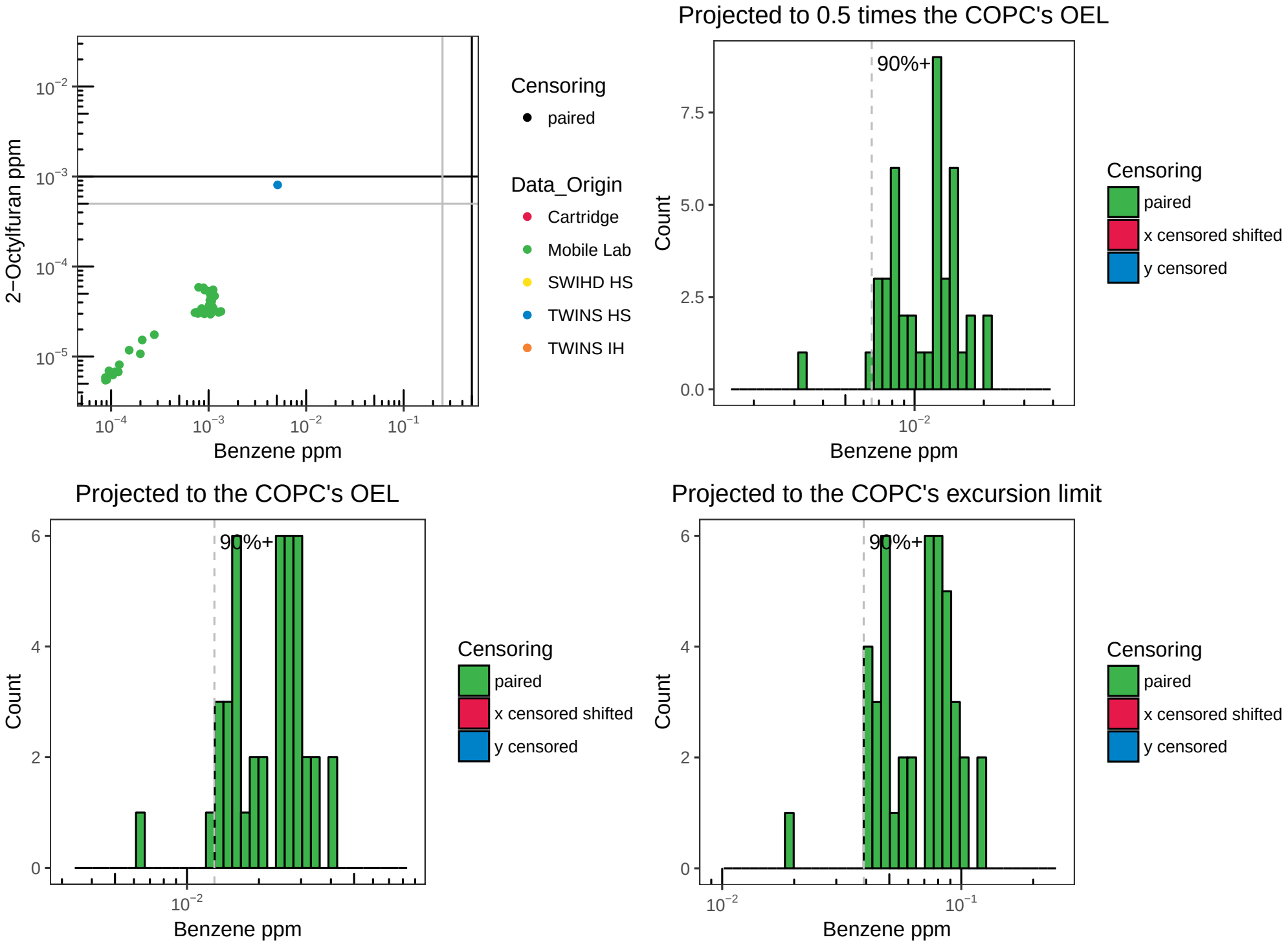


Figure C.249: 2-Octylfuran vs Benzene

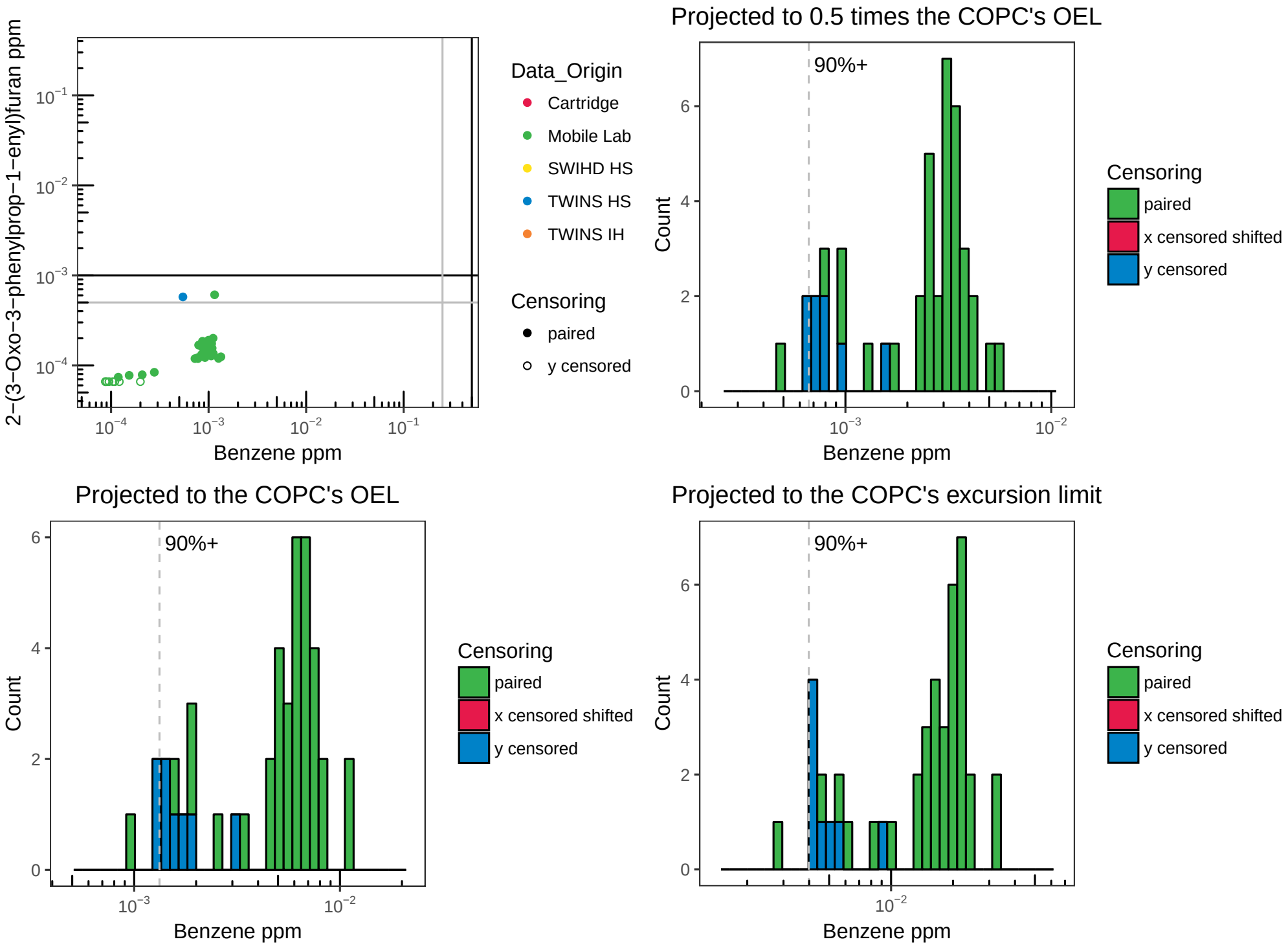


Figure C.250: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Benzene

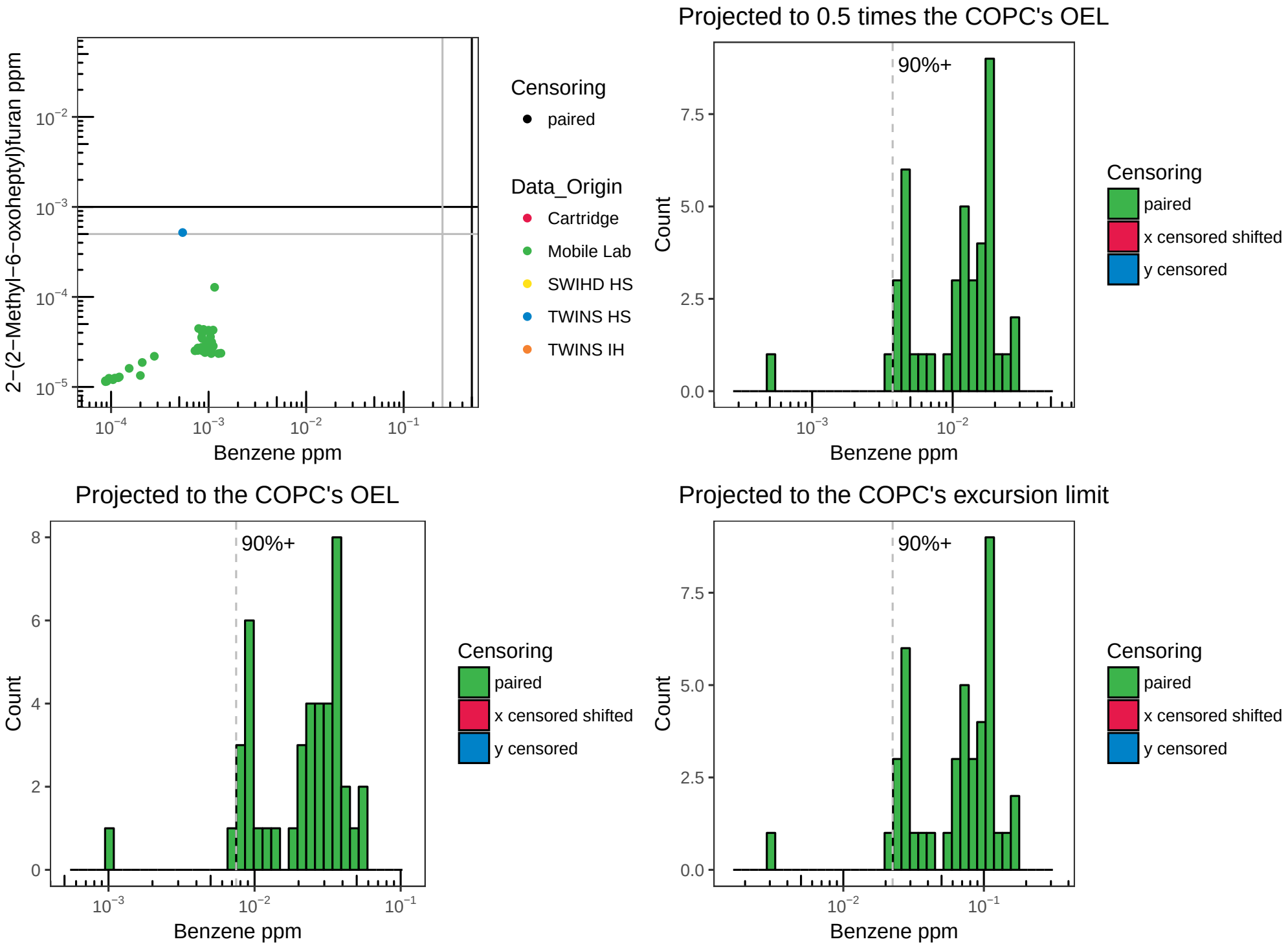


Figure C.251: 2-(2-Methyl-6-oxoheptyl)furan vs Benzene

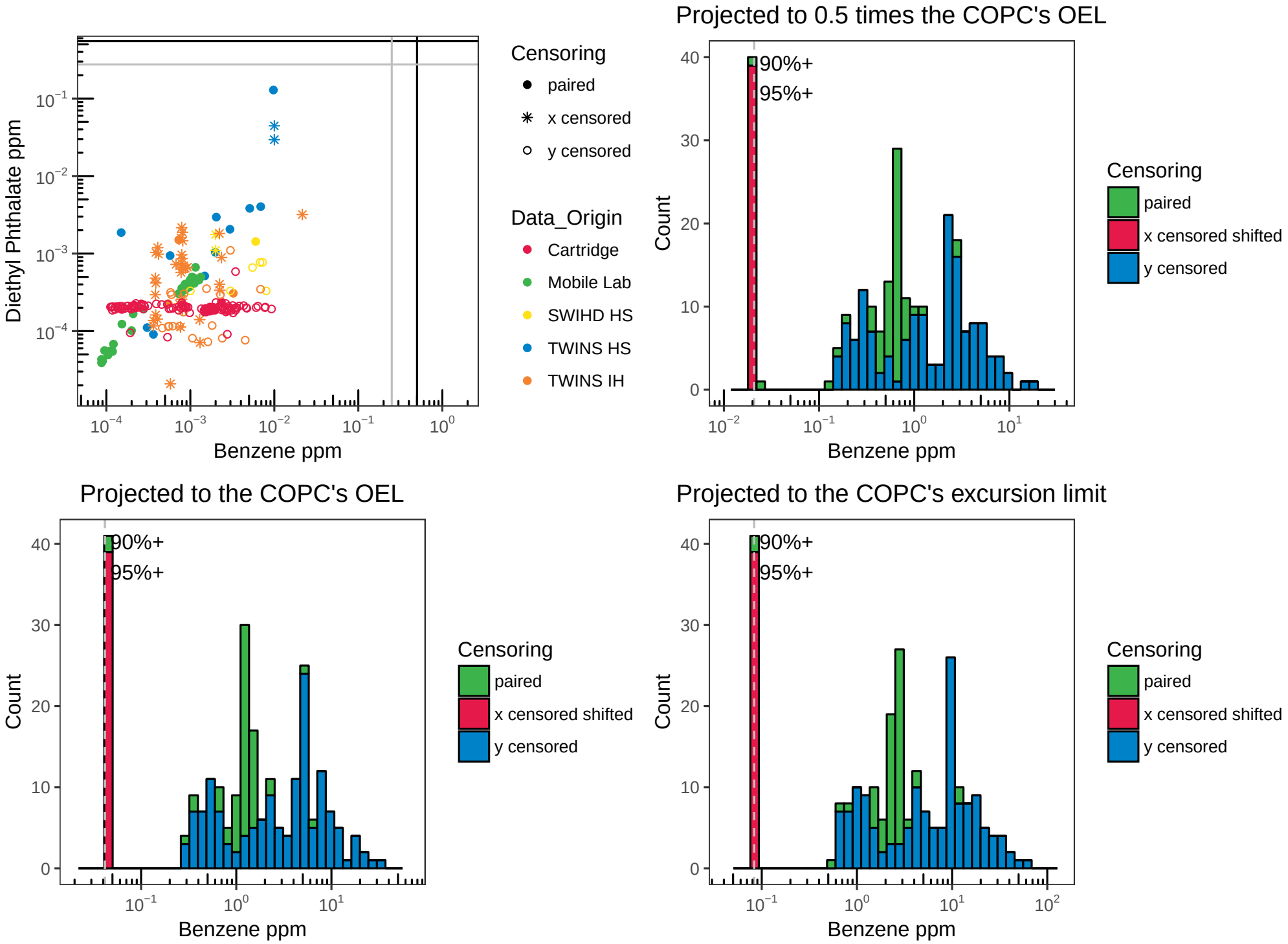


Figure C.252: Diethyl Phthalate vs Benzene

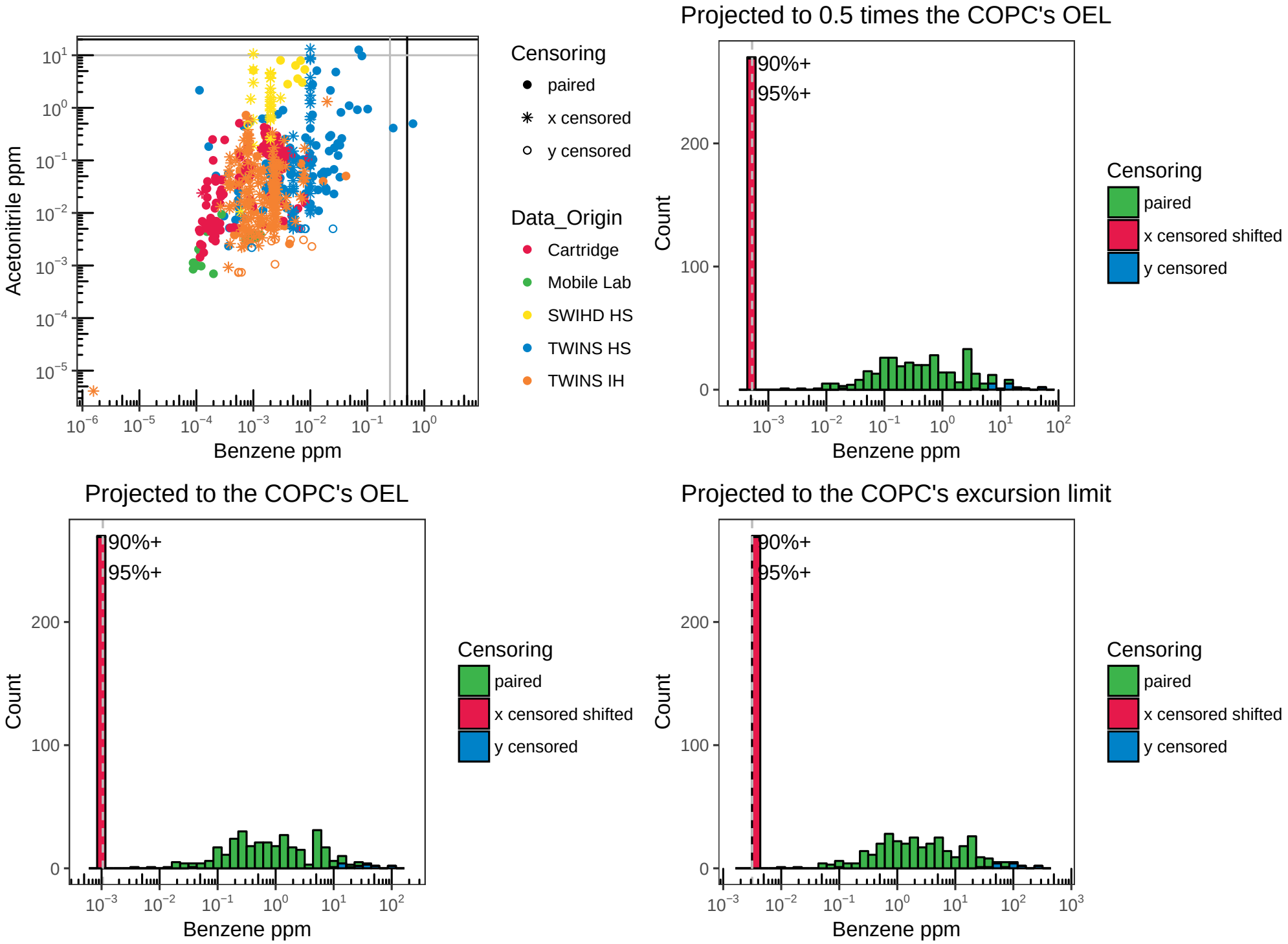


Figure C.253: Acetonitrile vs Benzene

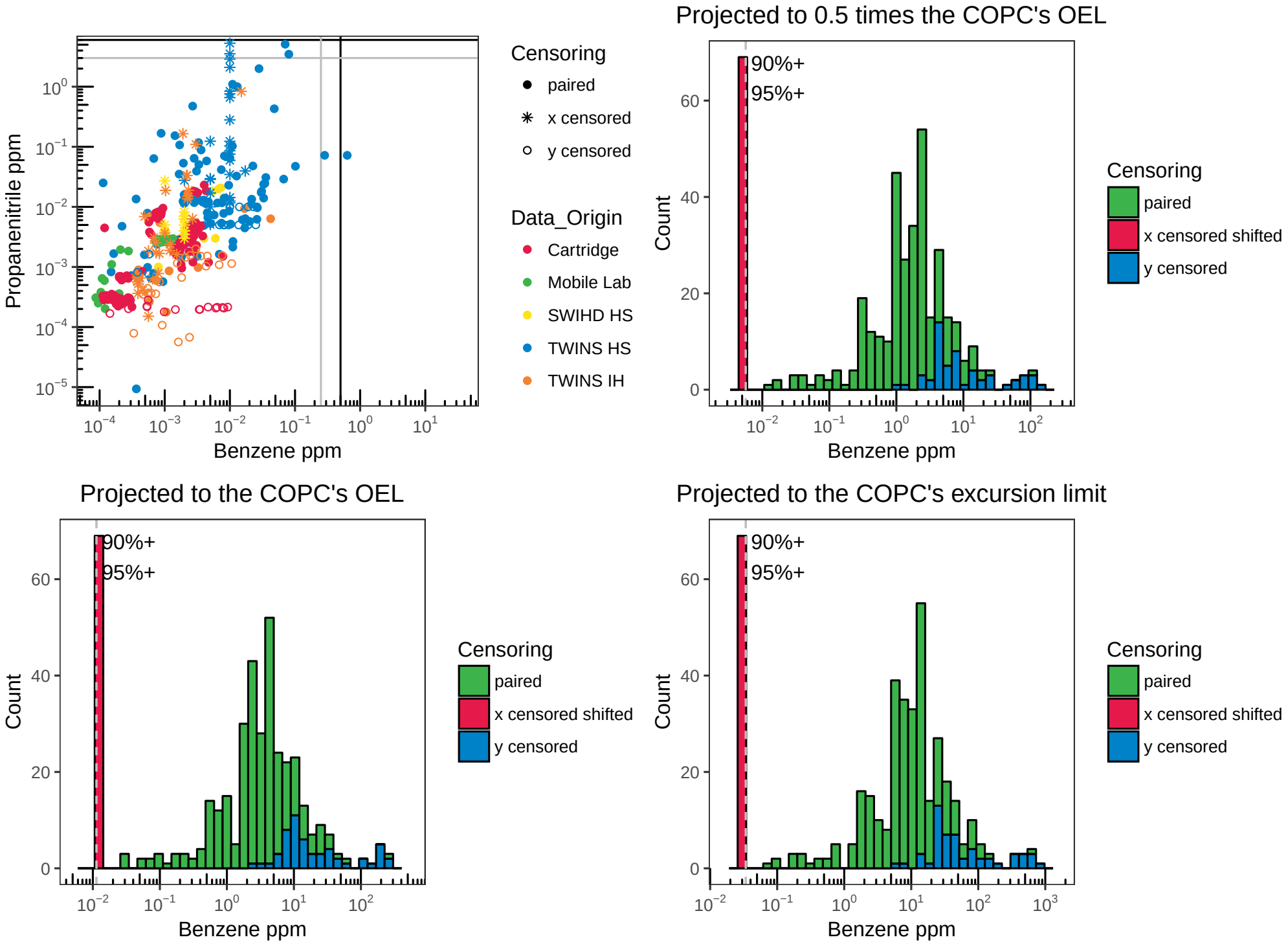


Figure C.254: Propanenitrile vs Benzene

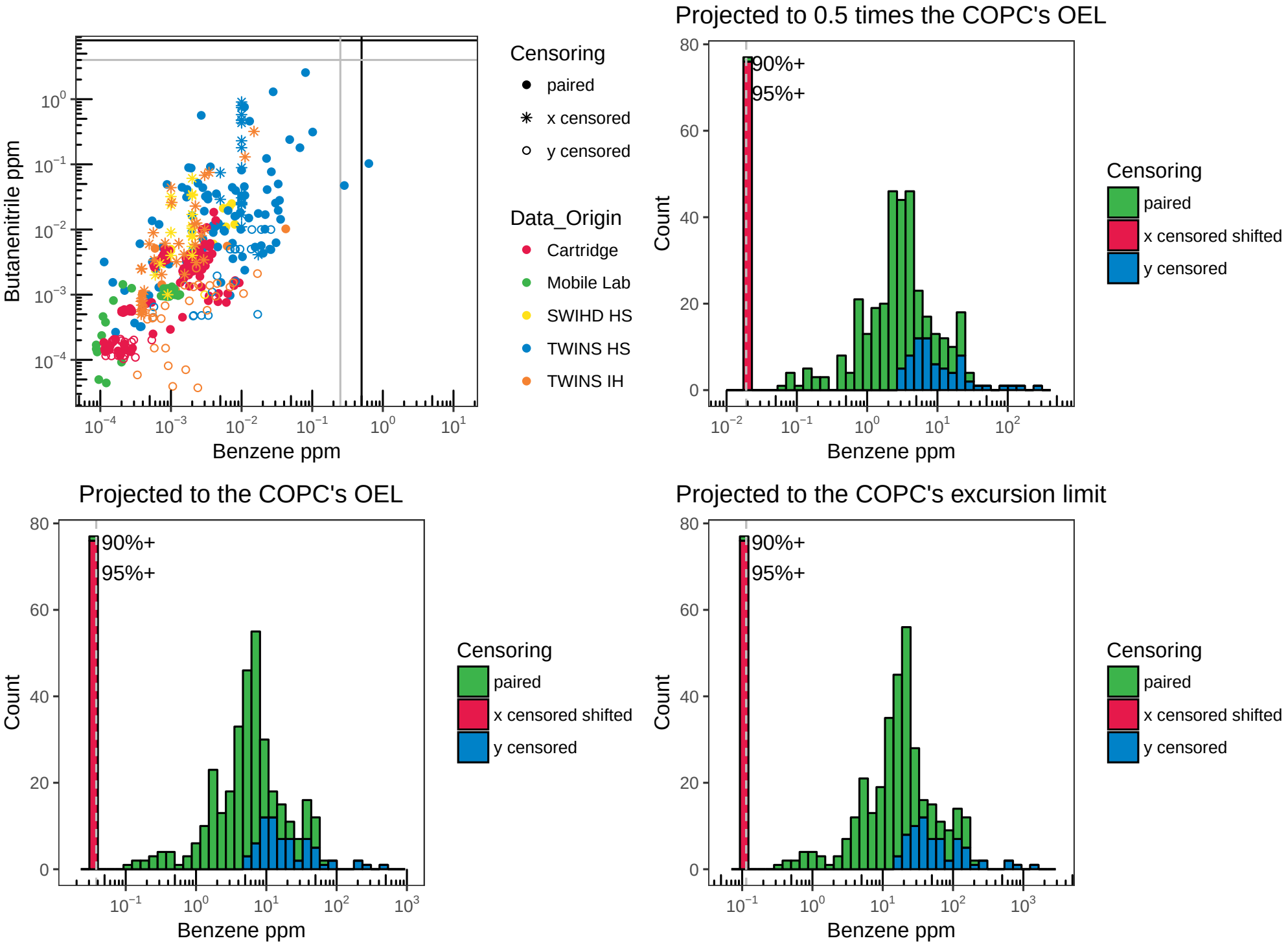


Figure C.255: Butanenitrile vs Benzene

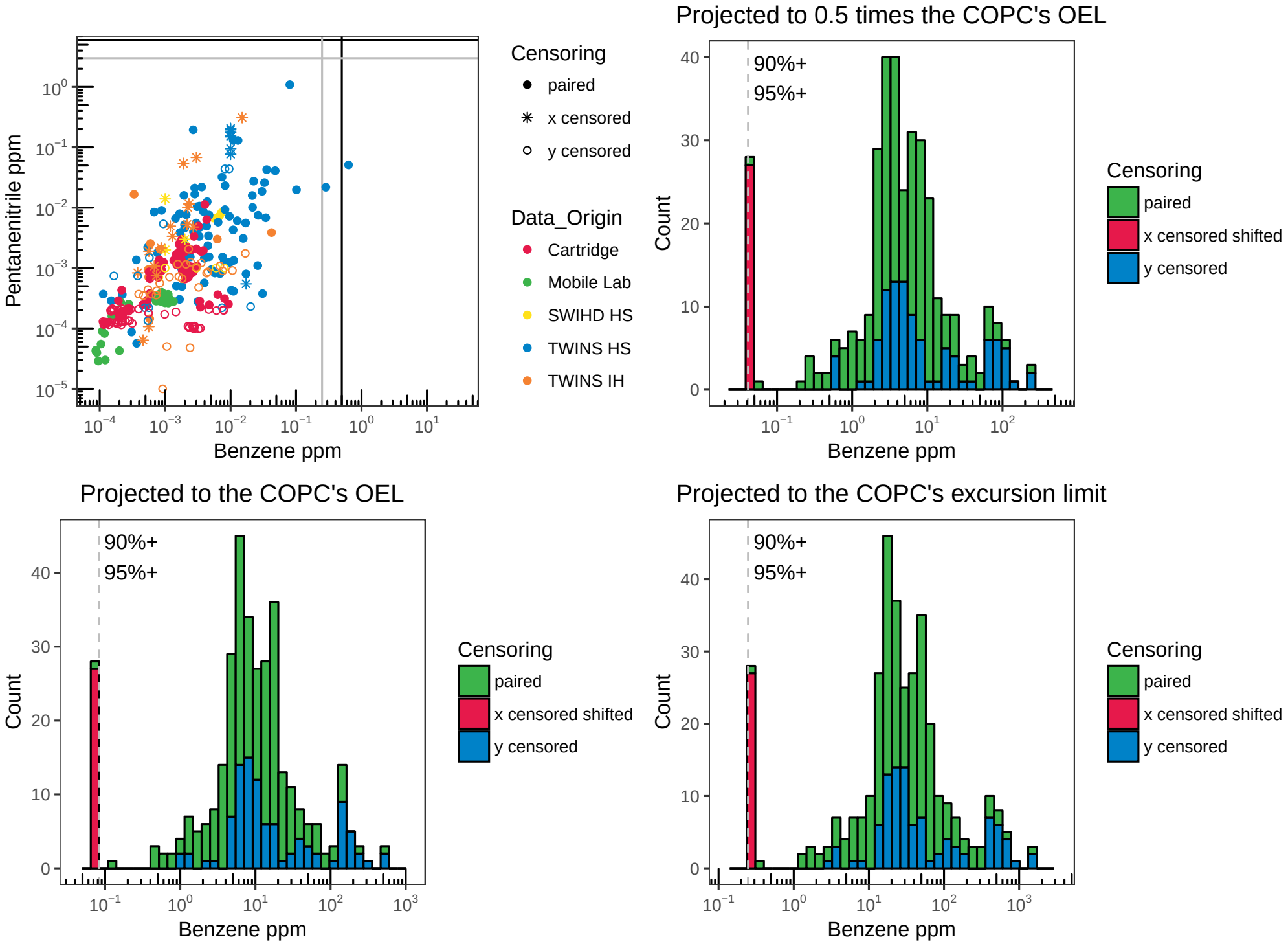


Figure C.256: Pentanenitrile vs Benzene

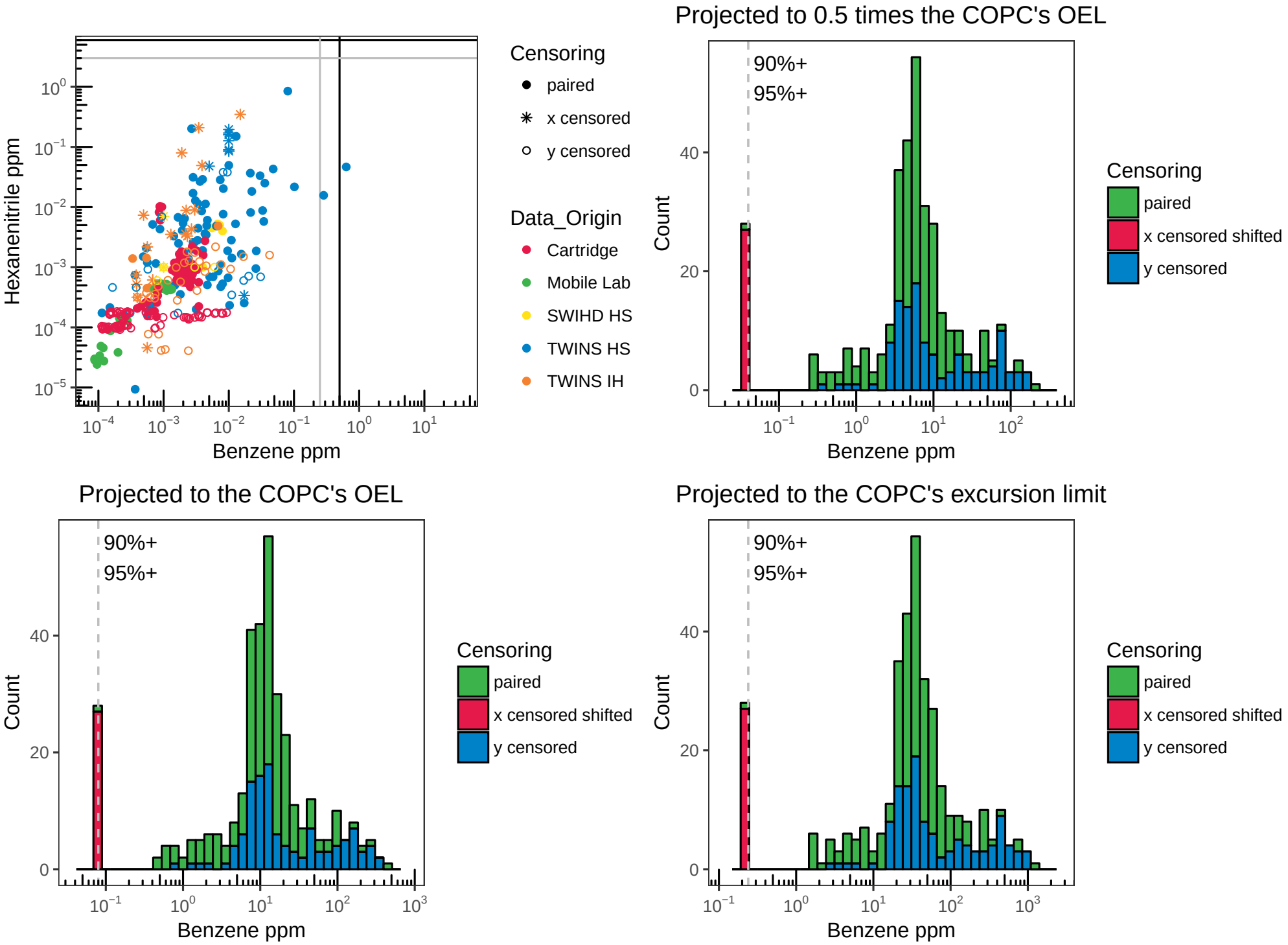


Figure C.257: Hexanenitrile vs Benzene

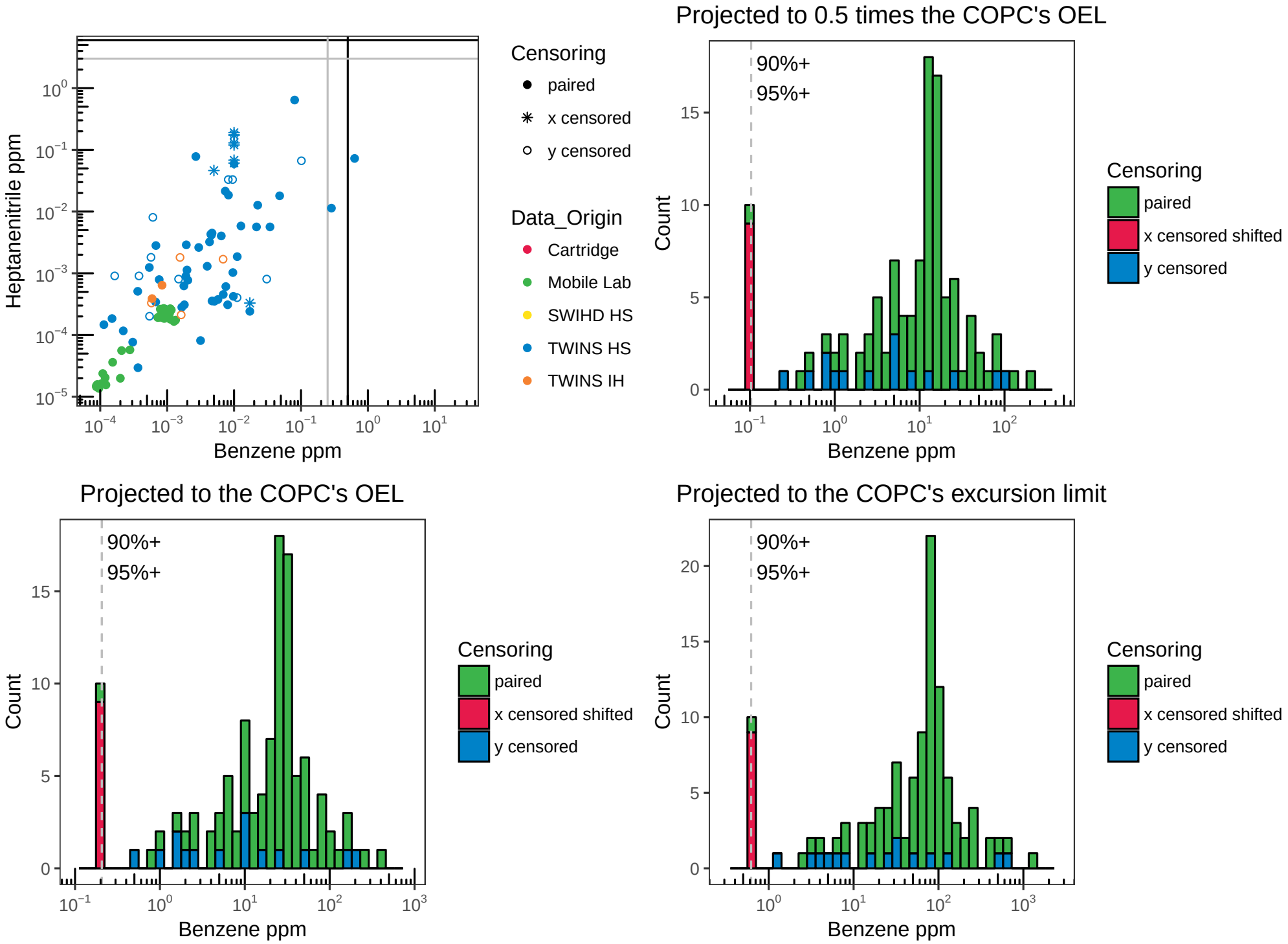


Figure C.258: Heptanenitrile vs Benzene

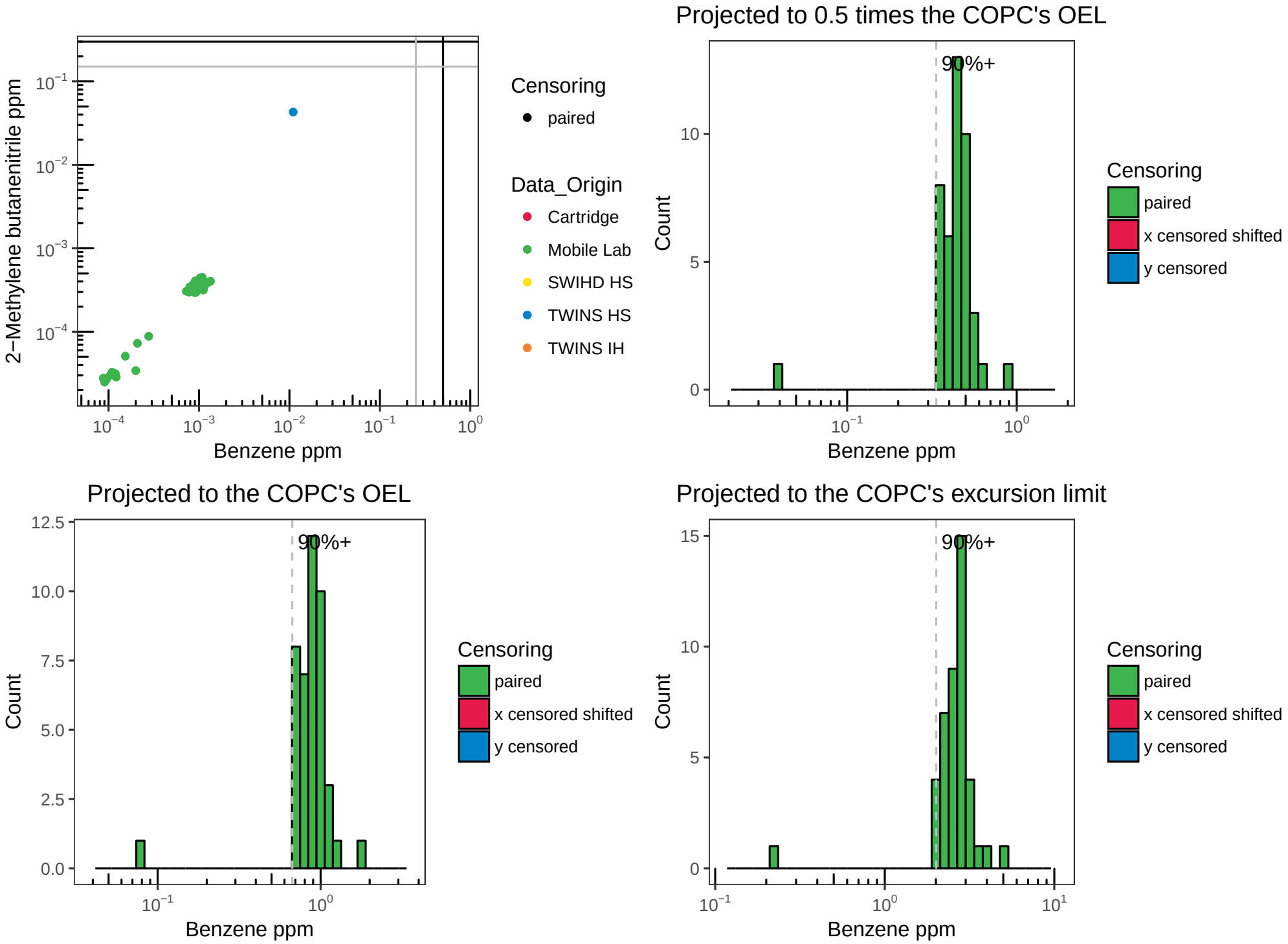


Figure C.259: 2-Methylene butanenitrile vs Benzene

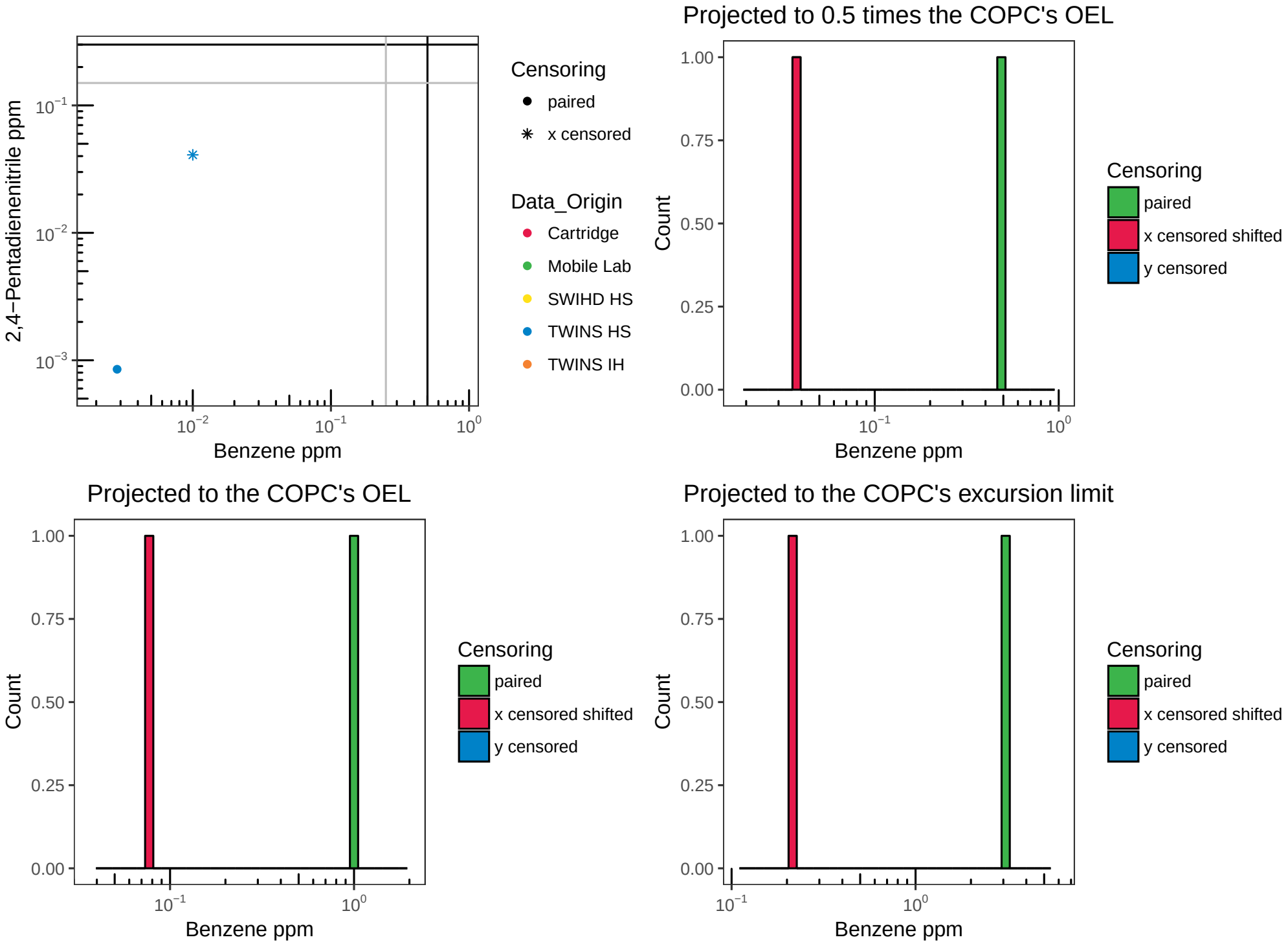


Figure C.260: 2,4-Pentadienenitrile vs Benzene

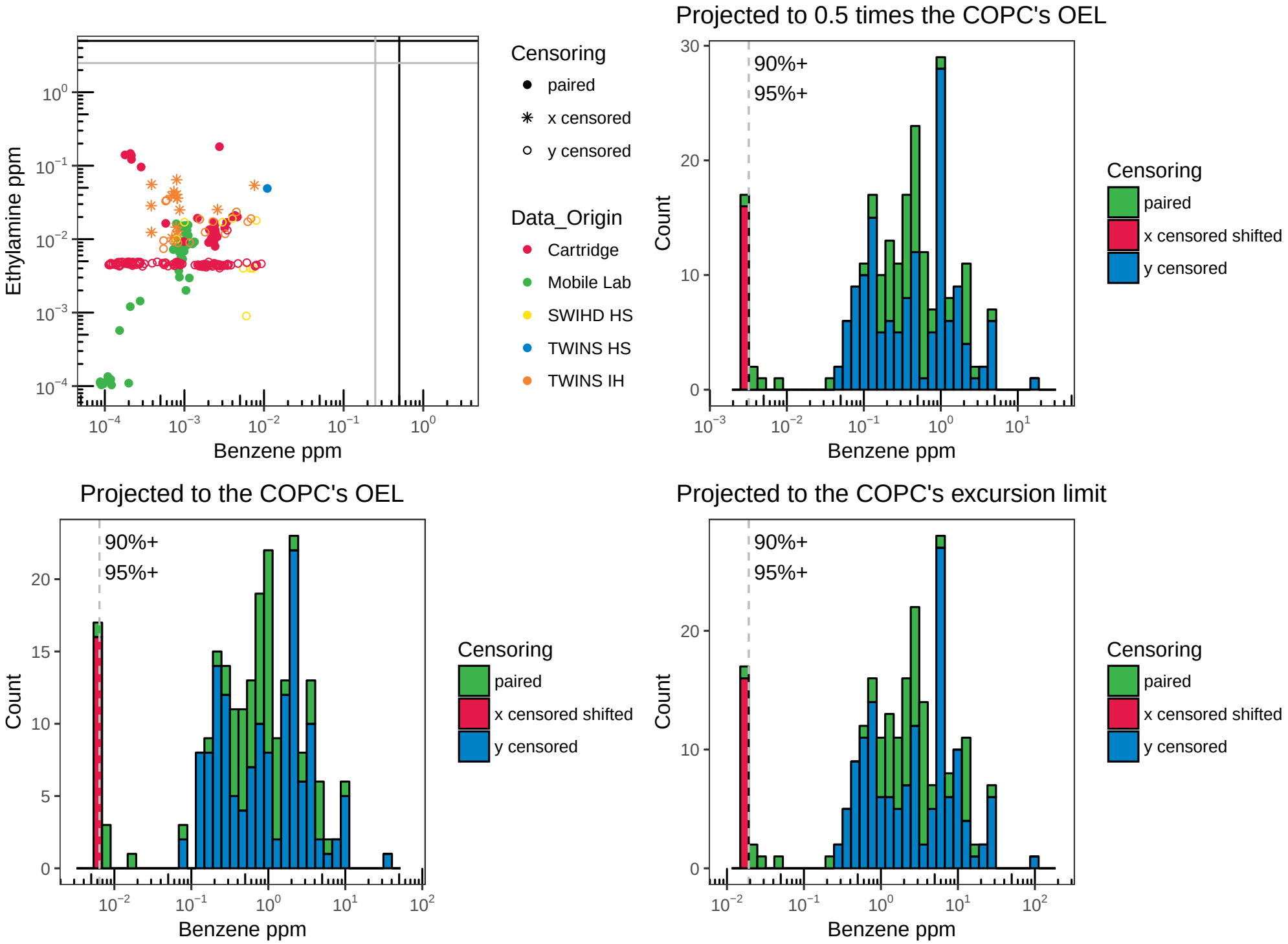


Figure C.261: Ethylamine vs Benzene

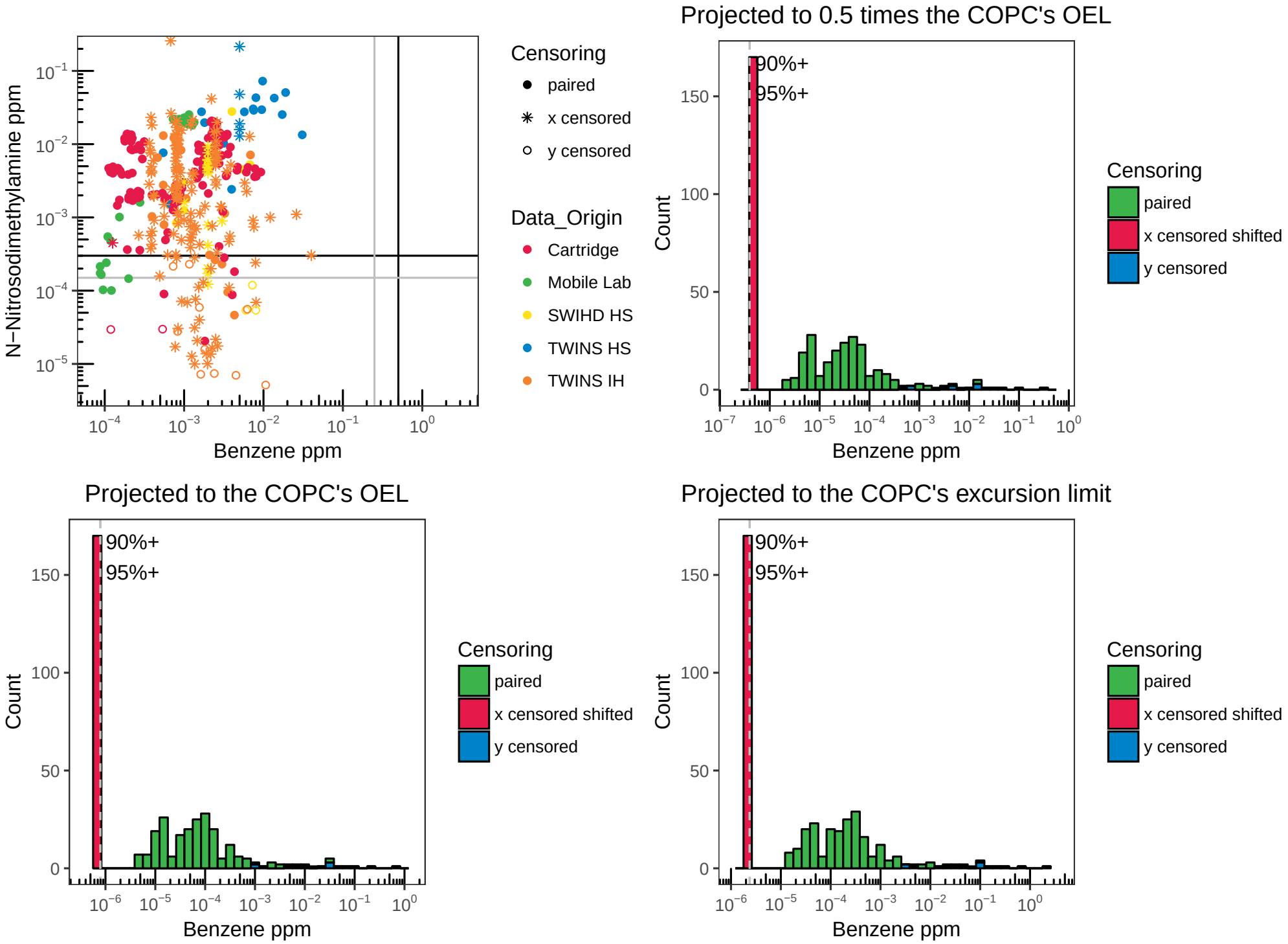


Figure C.262: N-Nitrosodimethylamine vs Benzene

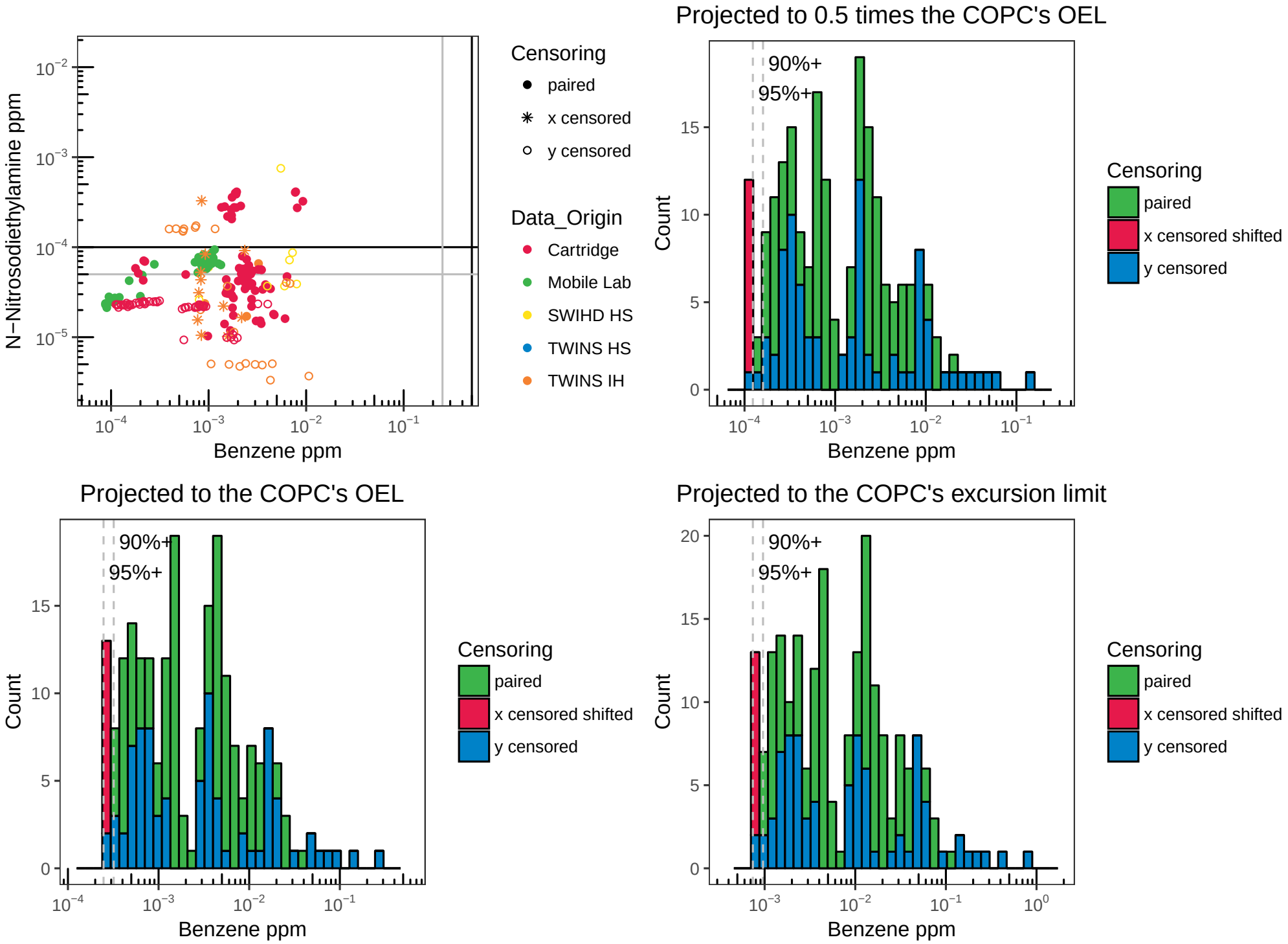


Figure C.263: N-Nitrosodiethylamine vs Benzene

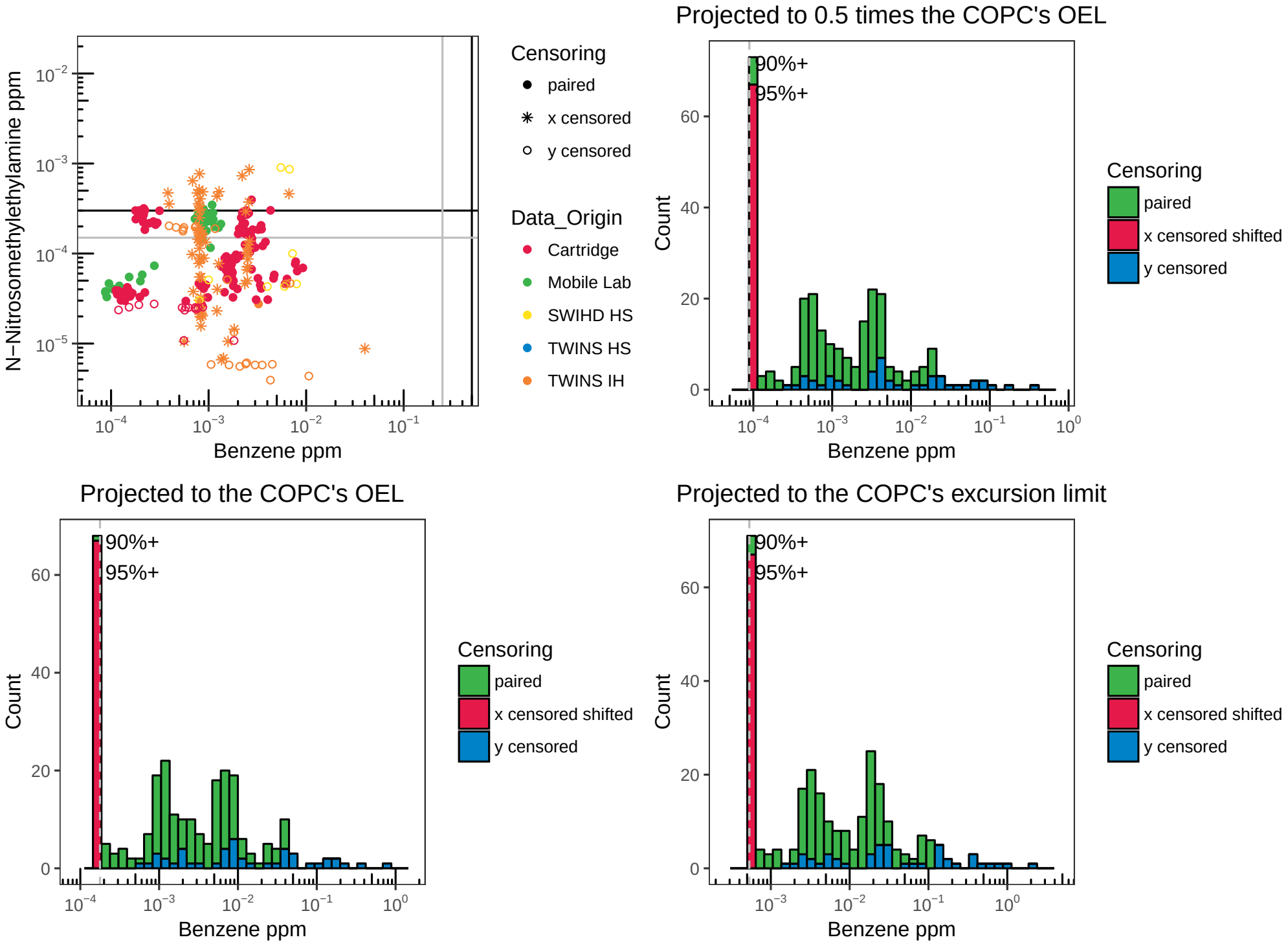


Figure C.264: N-Nitrosomethylethylamine vs Benzene

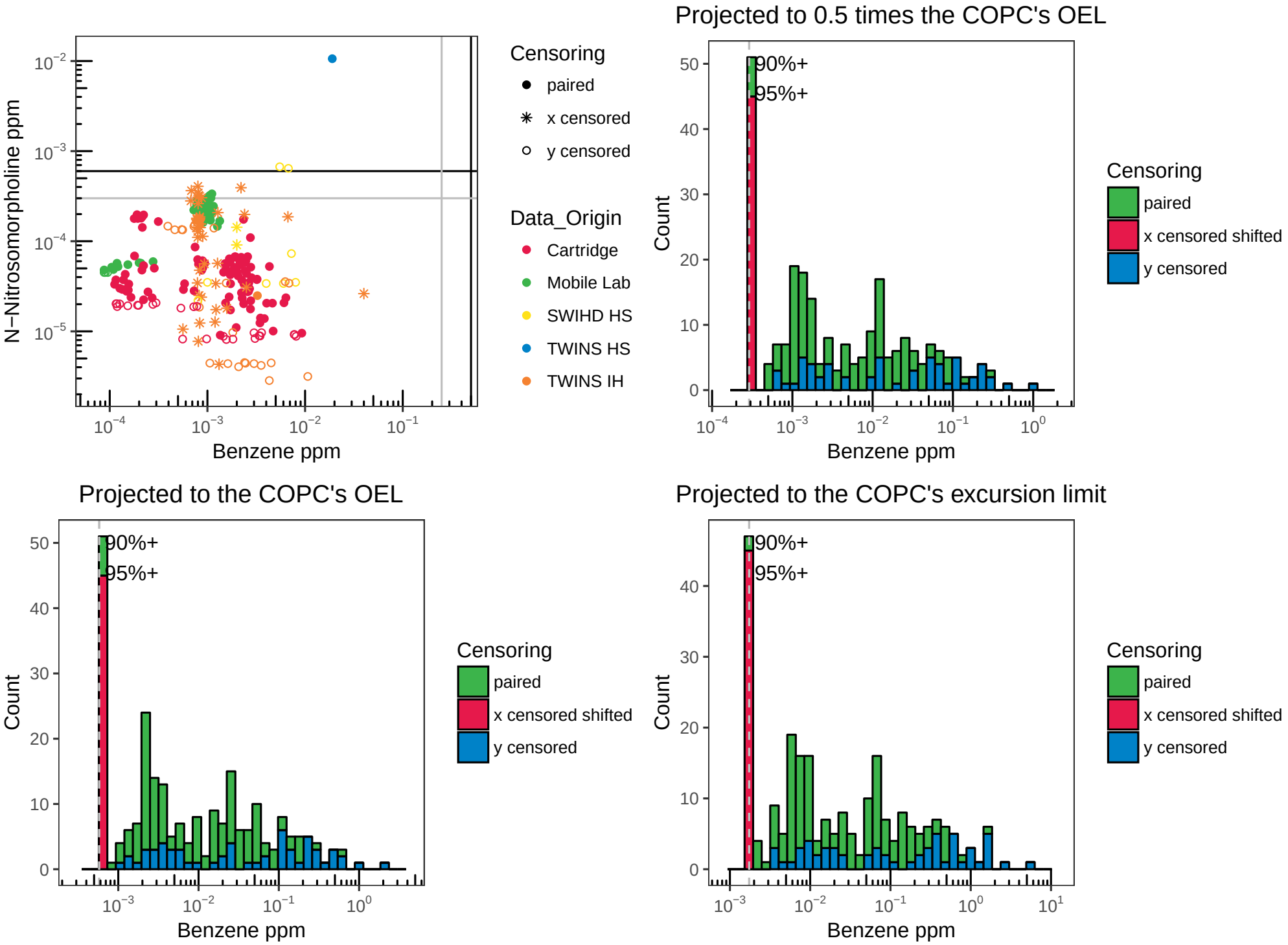


Figure C.265: N-Nitrosomorpholine vs Benzene

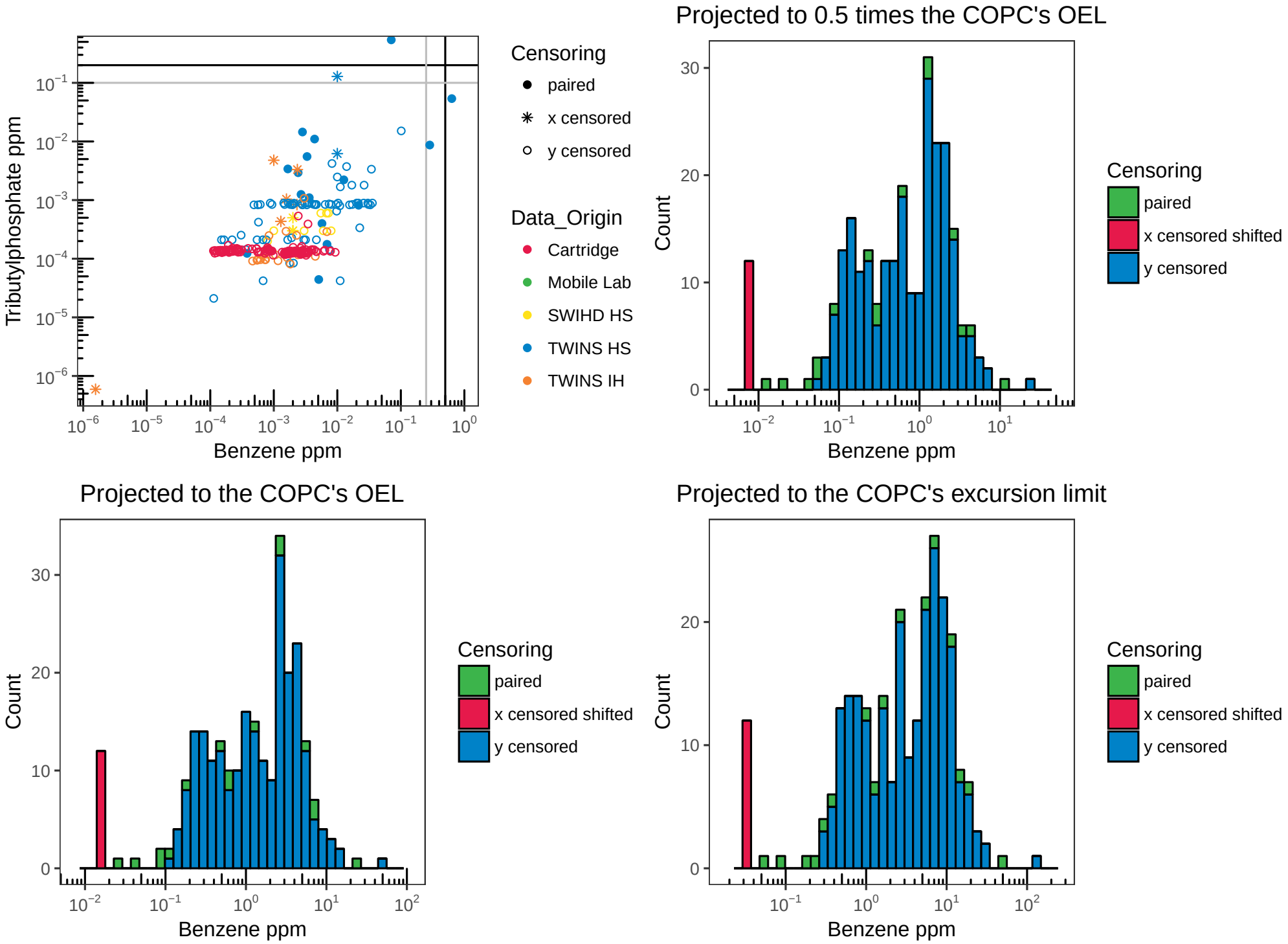


Figure C.266: Tributylphosphate vs Benzene

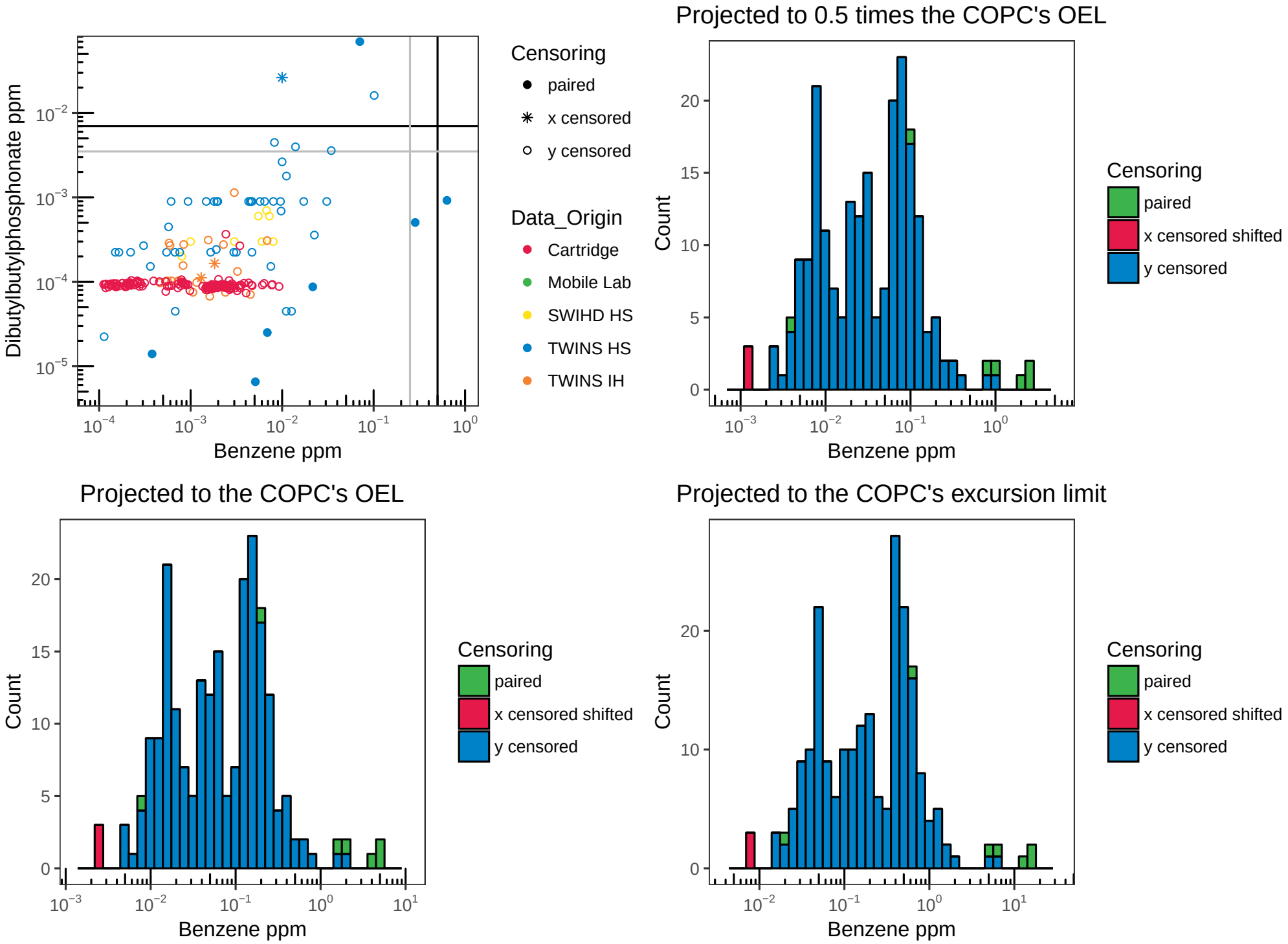


Figure C.267: Dibutylbutylphosphonate vs Benzene

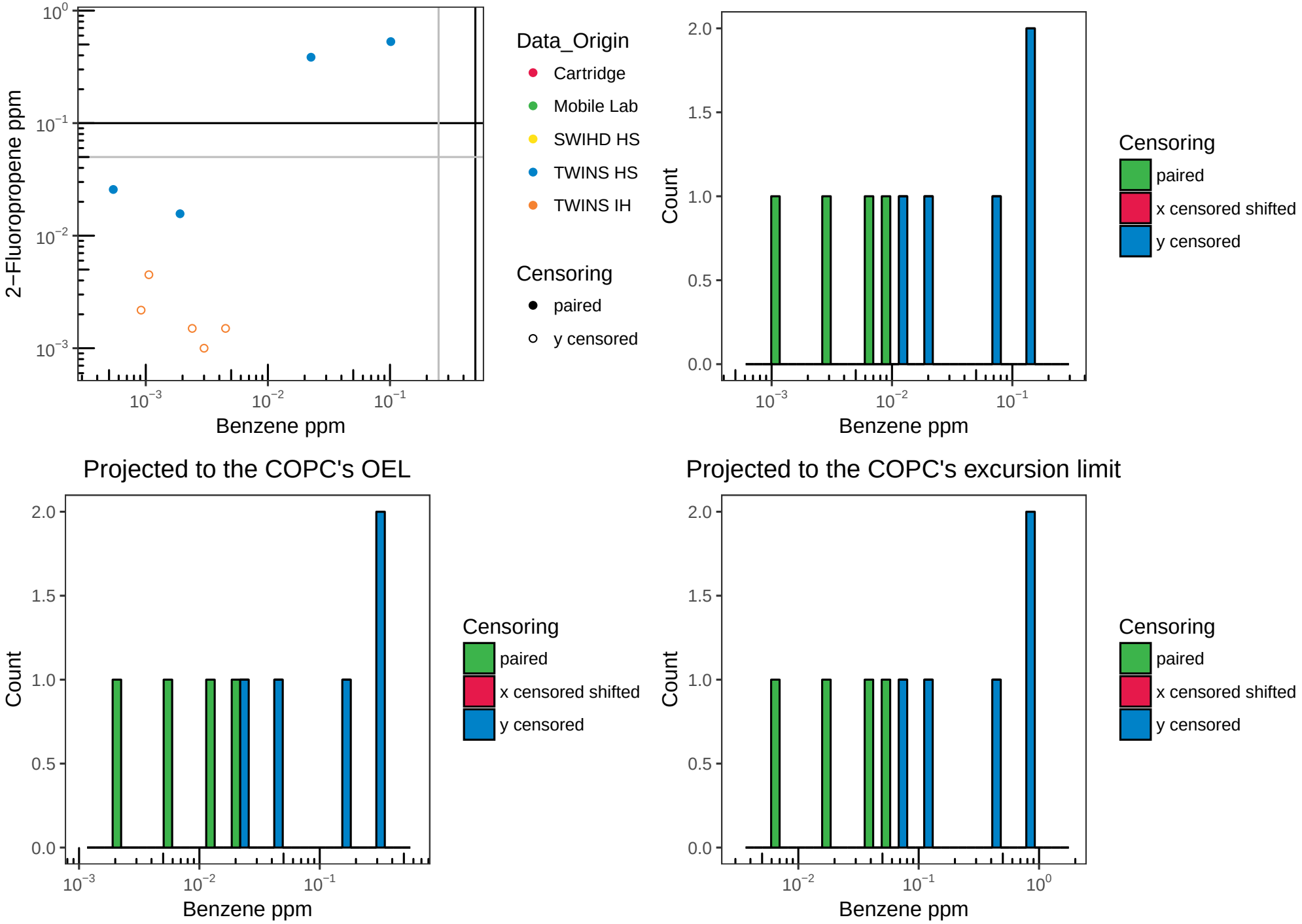


Figure C.268: 2-Fluoropropene vs Benzene

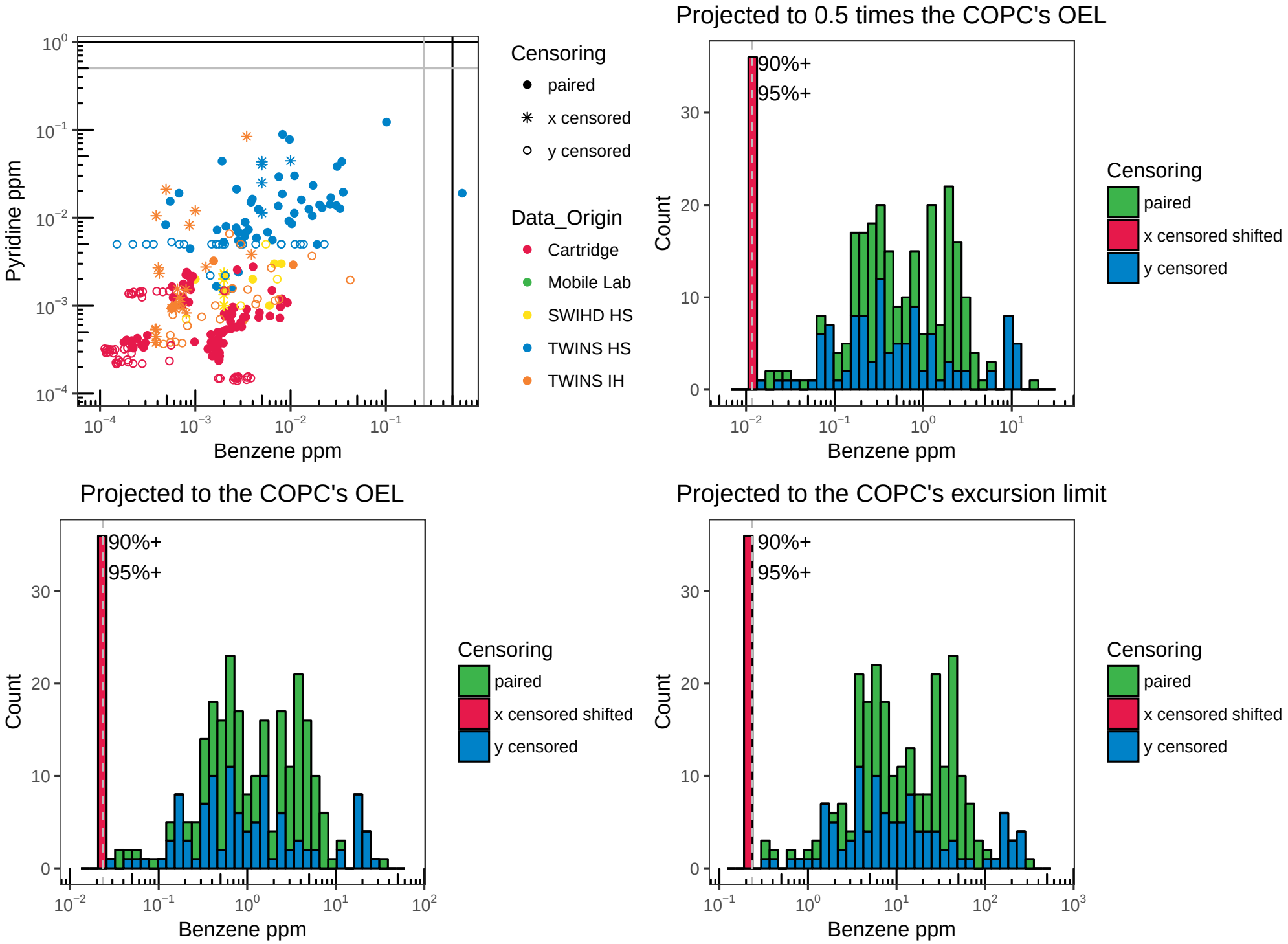


Figure C.269: Pyridine vs Benzene

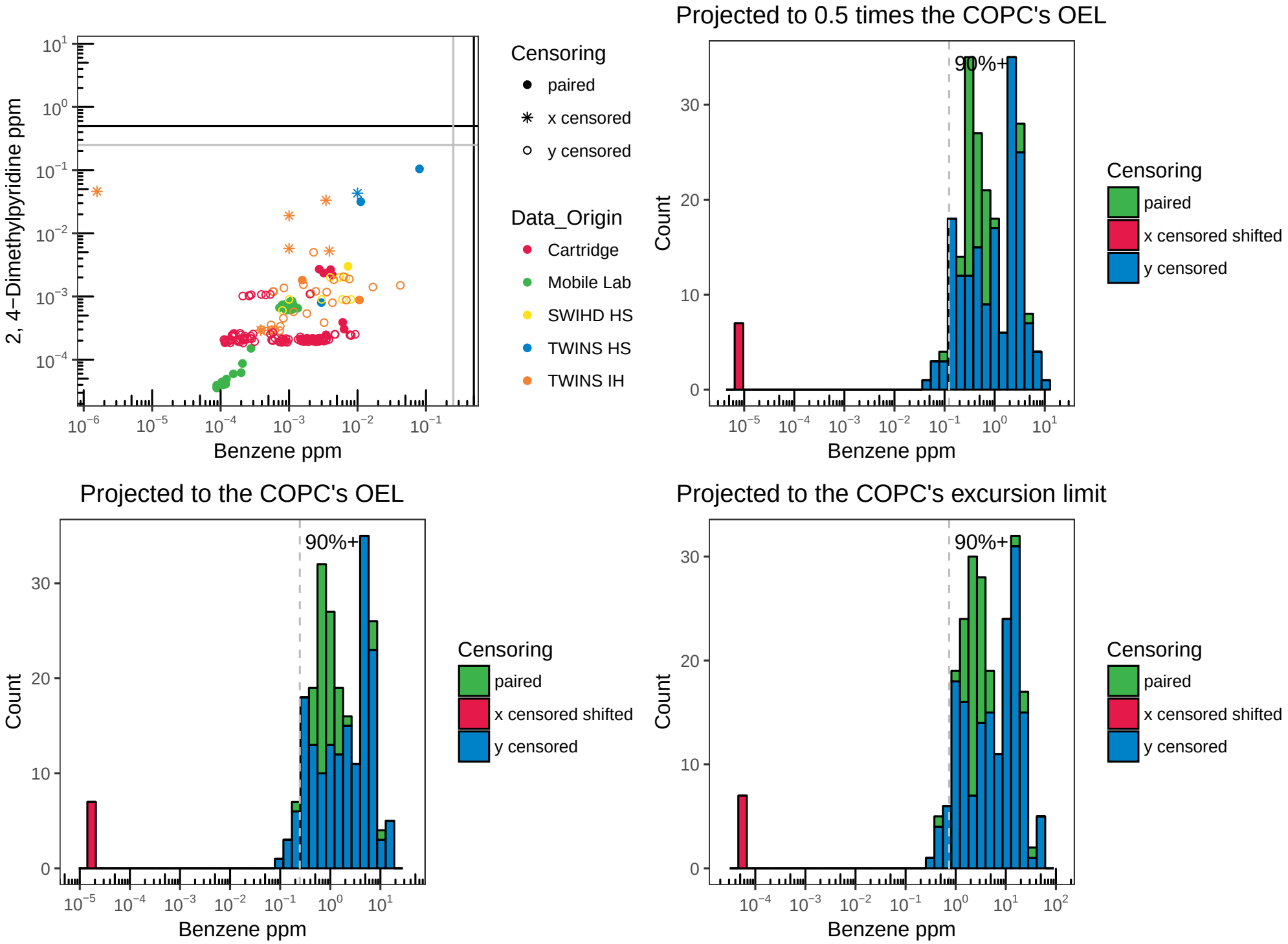


Figure C.270: 2, 4-Dimethylpyridine vs Benzene

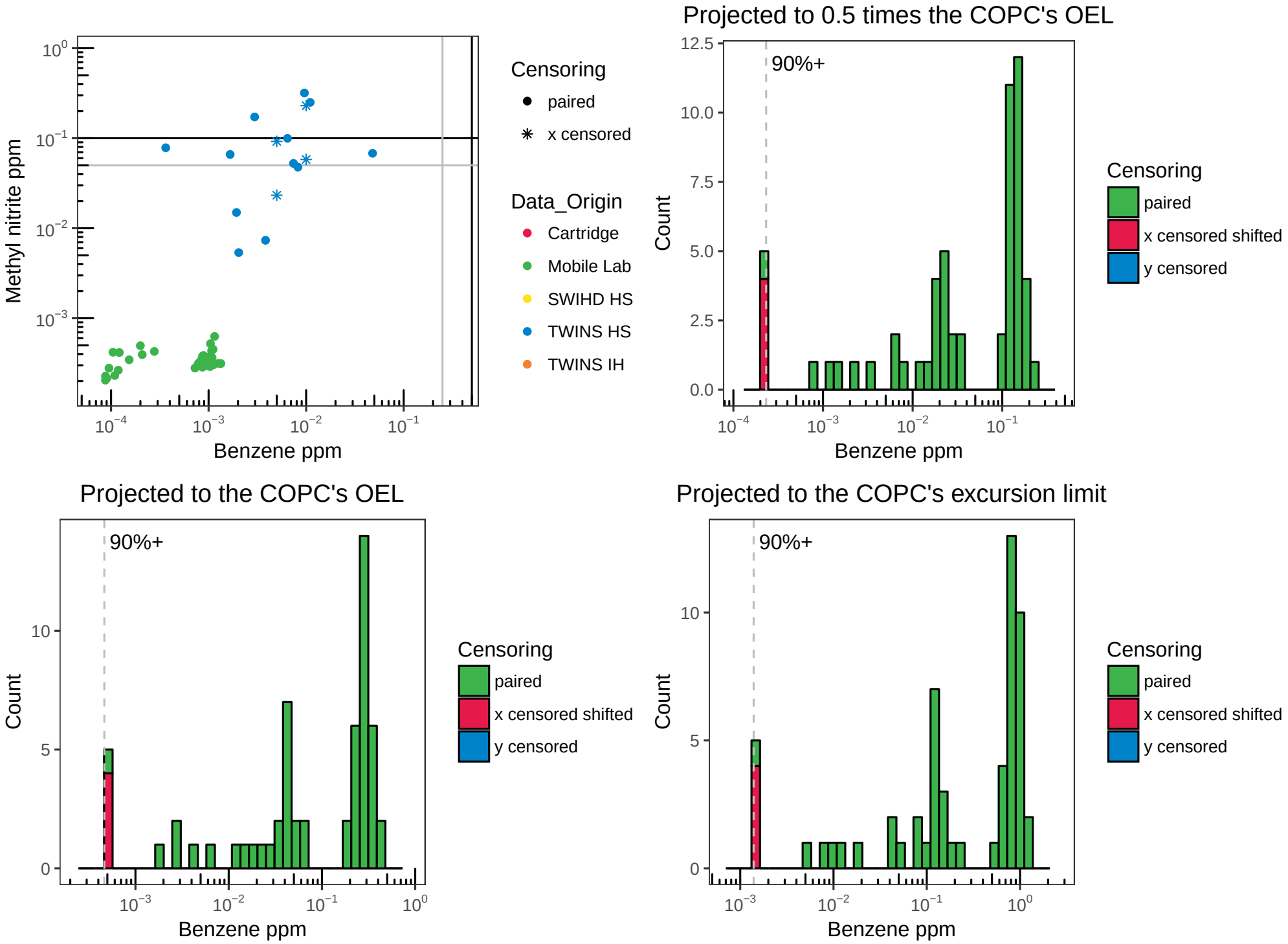


Figure C.271: Methyl nitrite vs Benzene

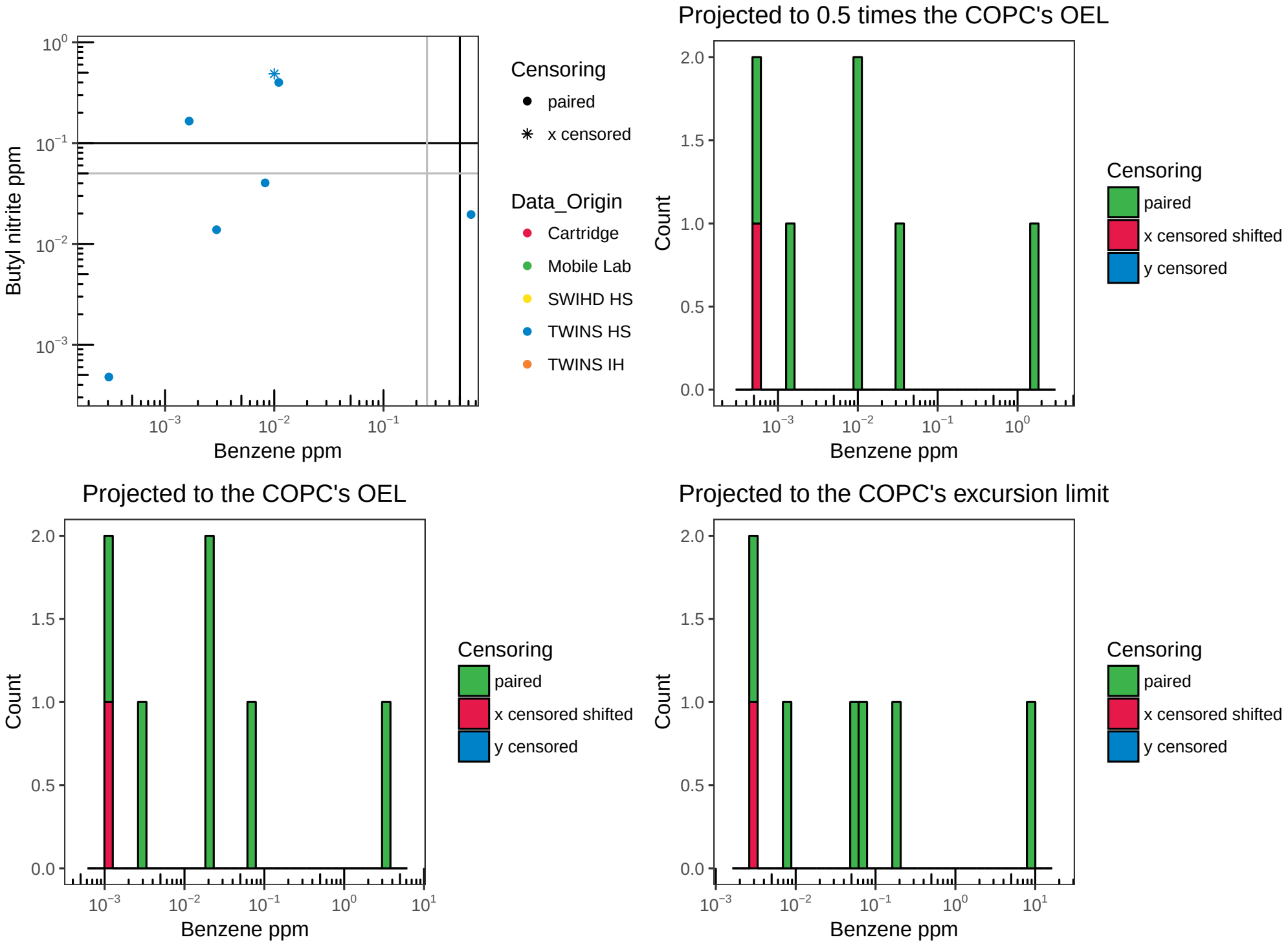


Figure C.272: Butyl nitrite vs Benzene

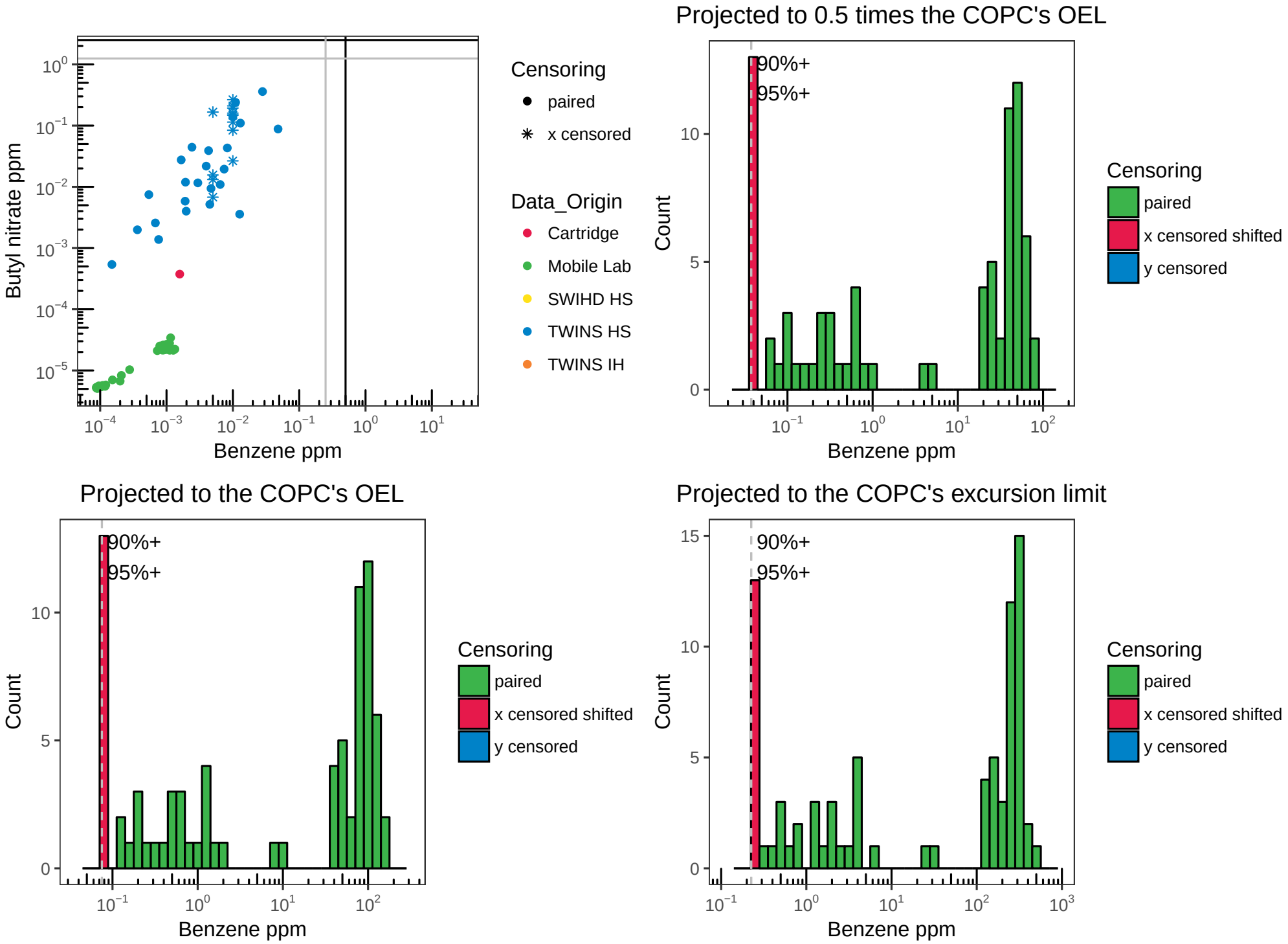


Figure C.273: Butyl nitrate vs Benzene

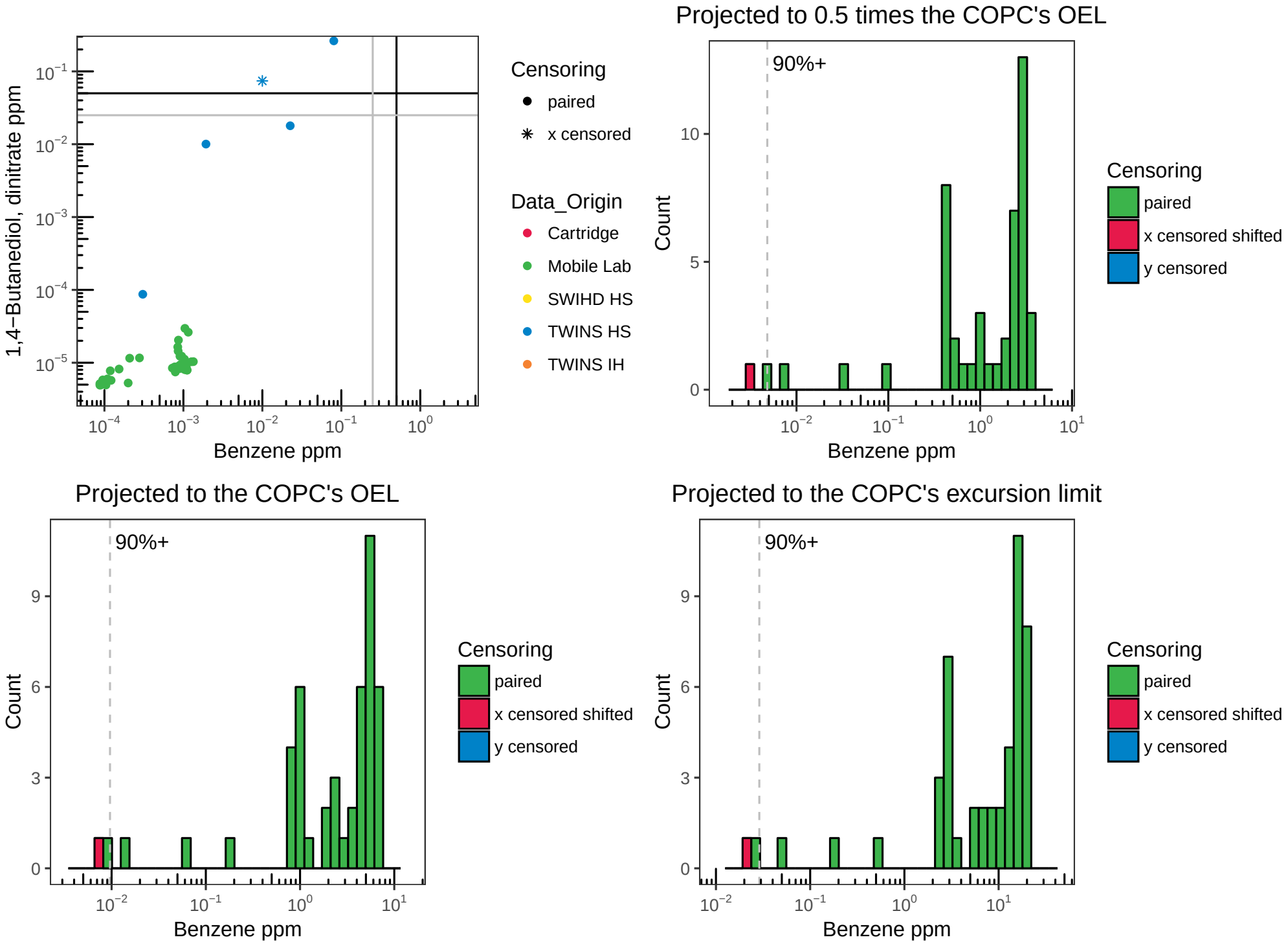


Figure C.274: 1,4-Butanediol, dinitrate vs Benzene

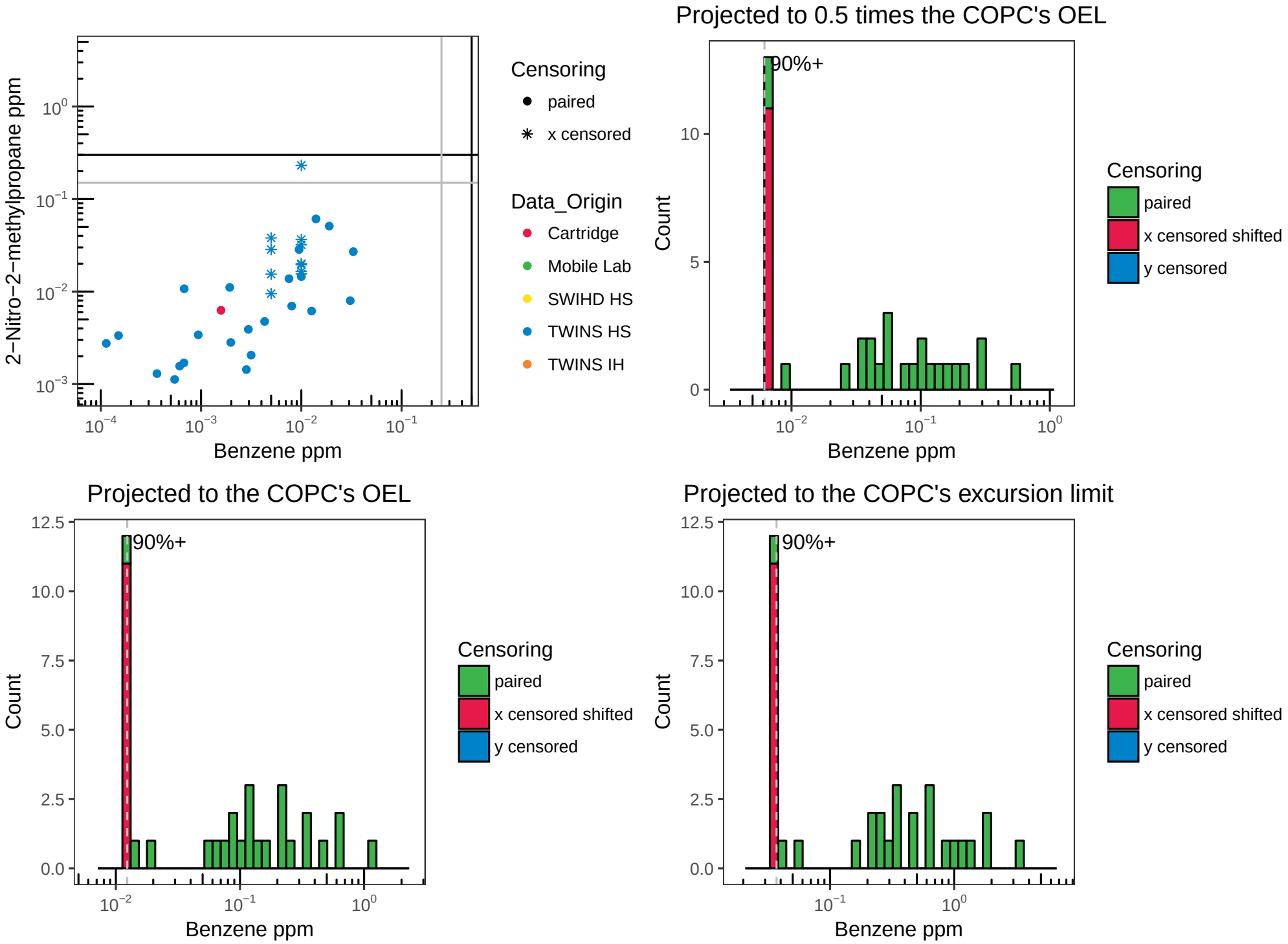


Figure C.275: 2-Nitro-2-methylpropane vs Benzene

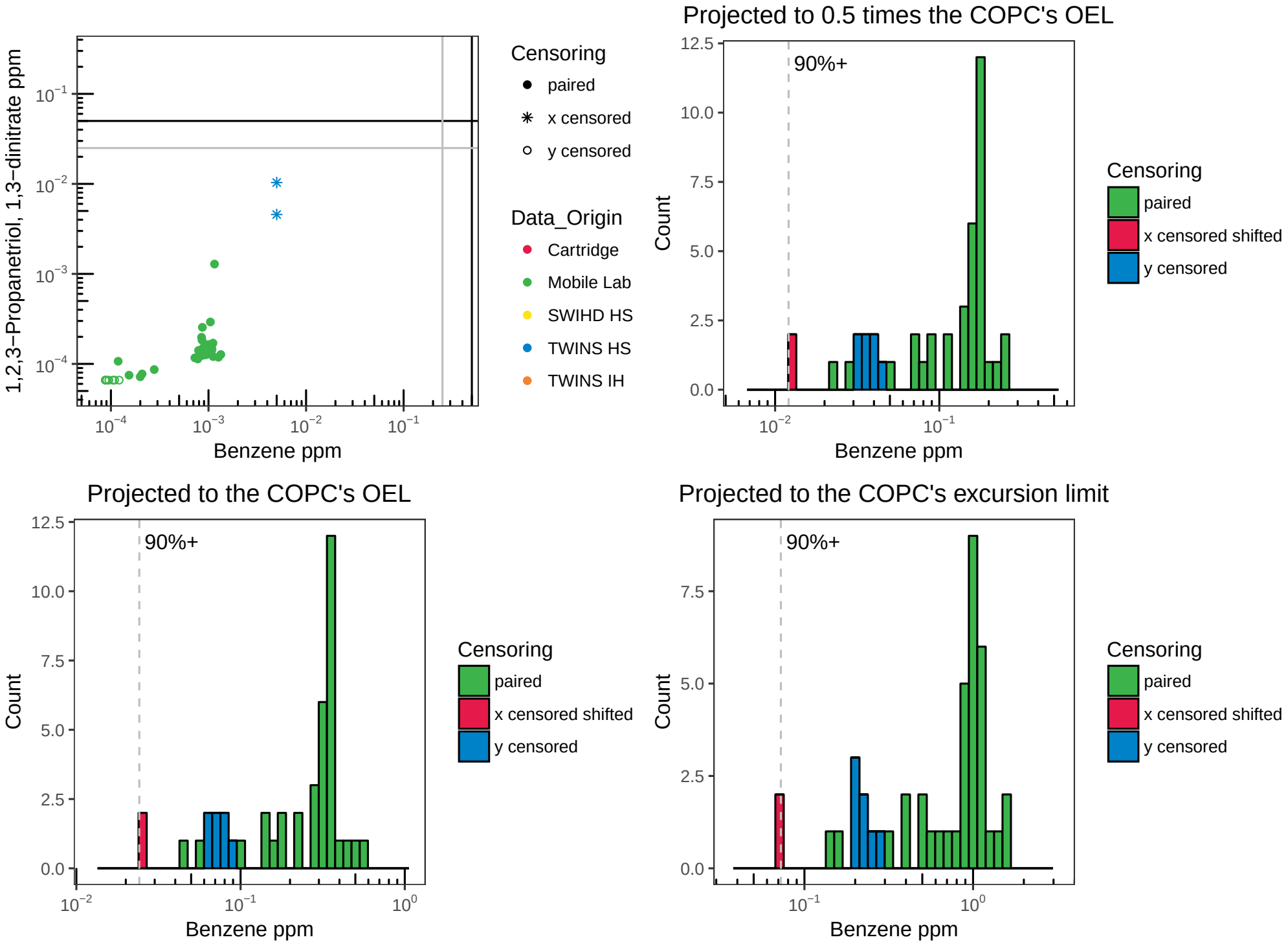


Figure C.276: 1,2,3-Propanetriol, 1,3-dinitrate vs Benzene

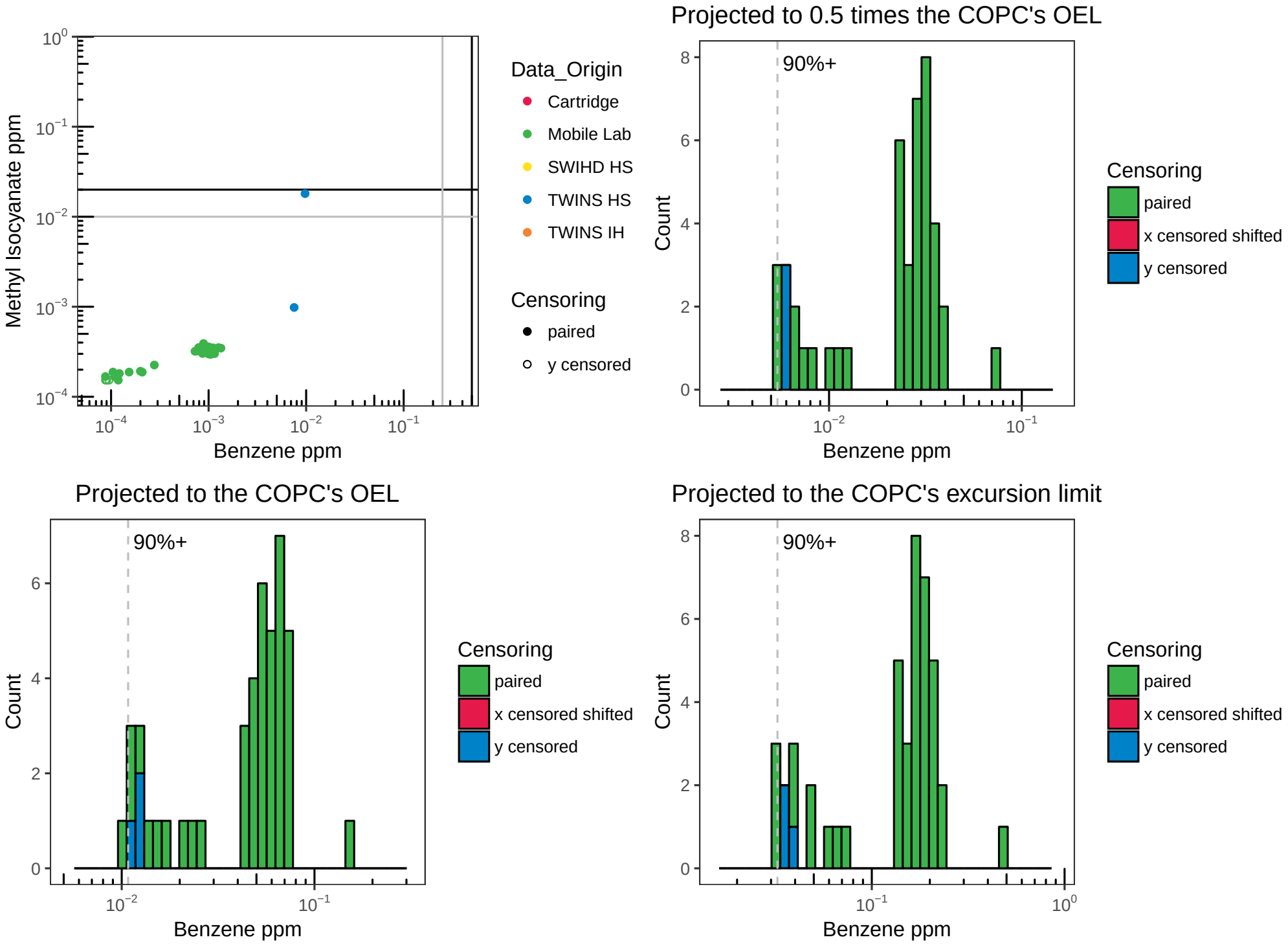


Figure C.277: Methyl Isocyanate vs Benzene

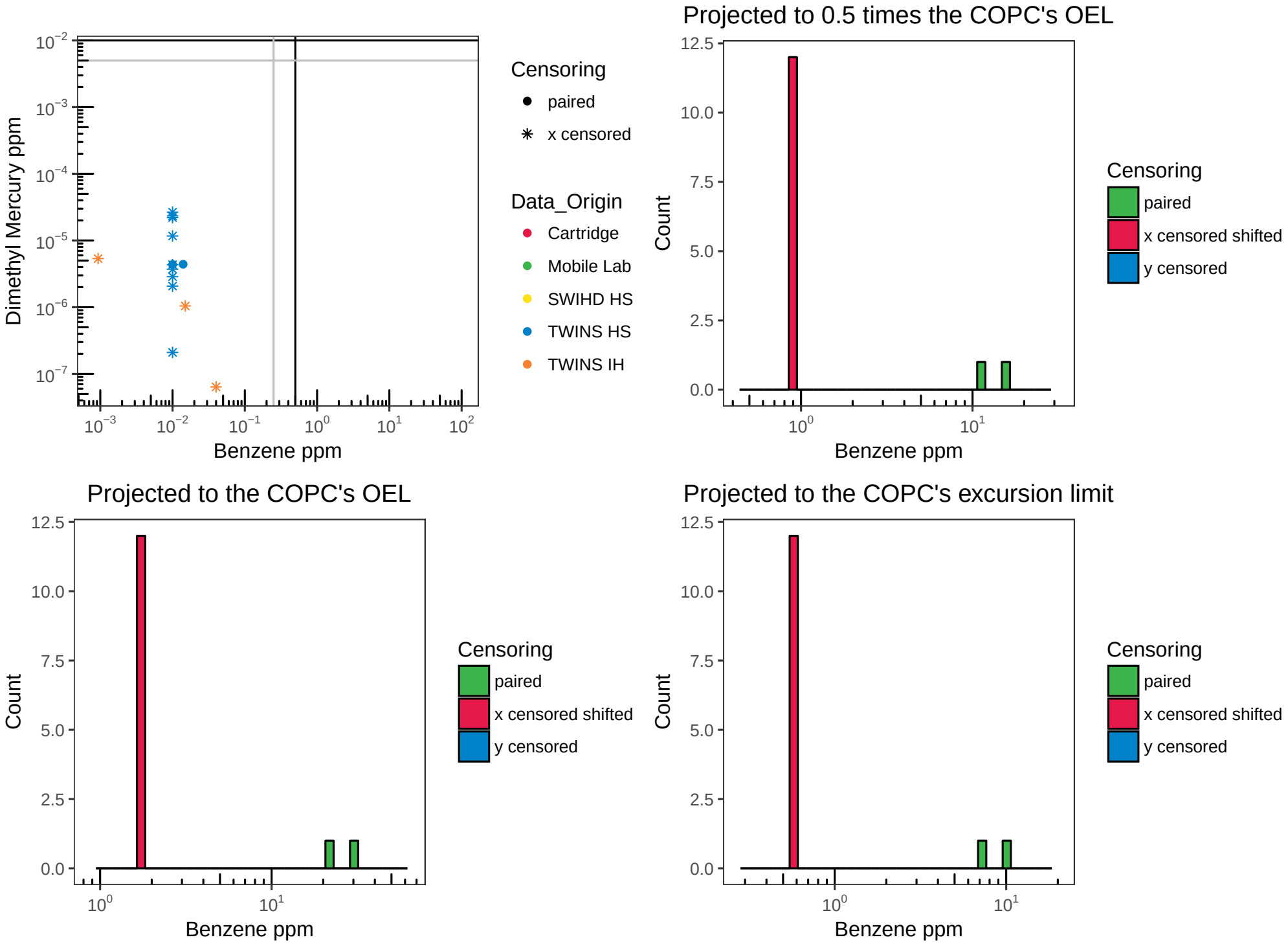


Figure C.278: Dimethyl Mercury vs Benzene

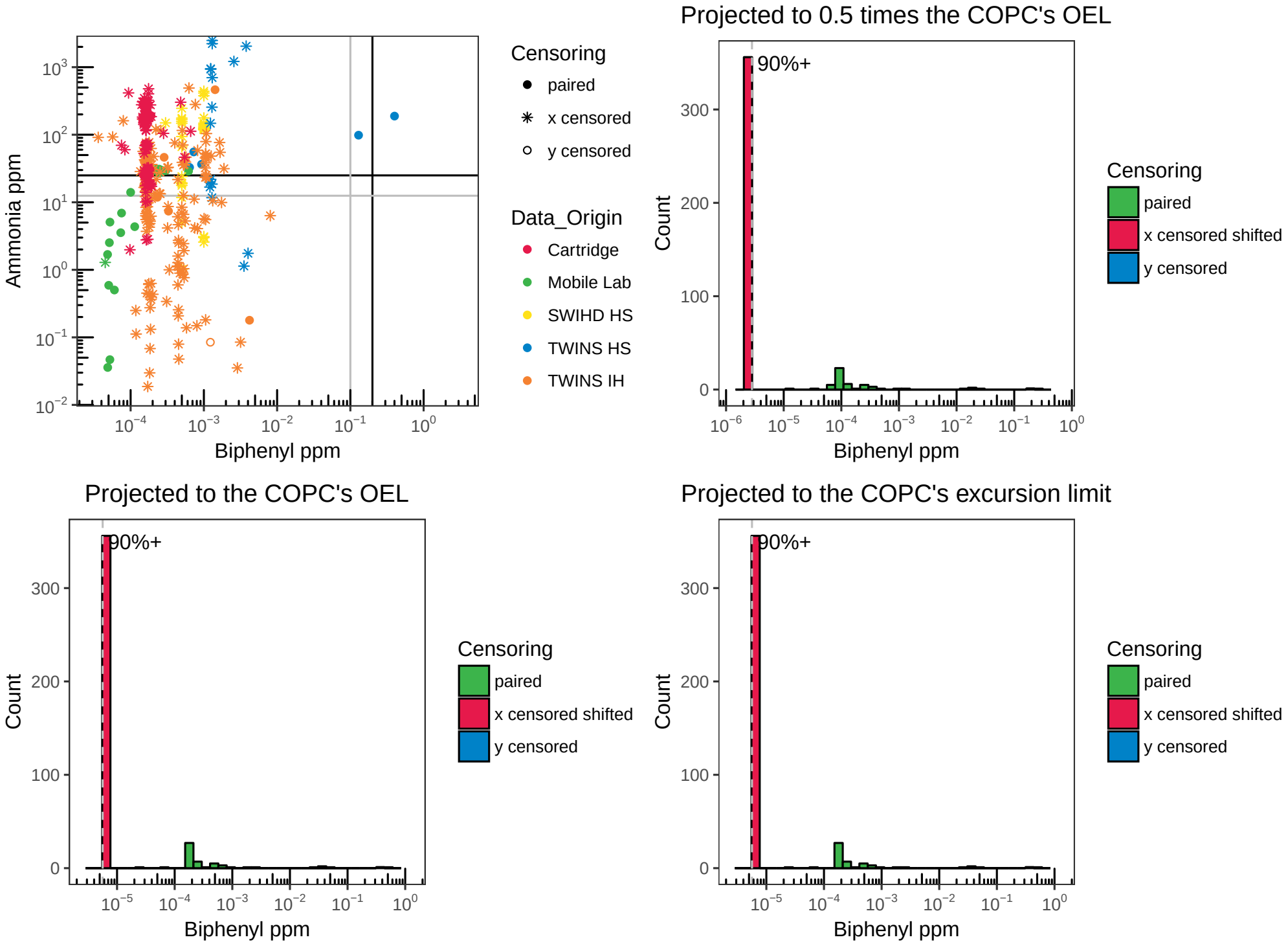


Figure C.279: Ammonia vs Biphenyl

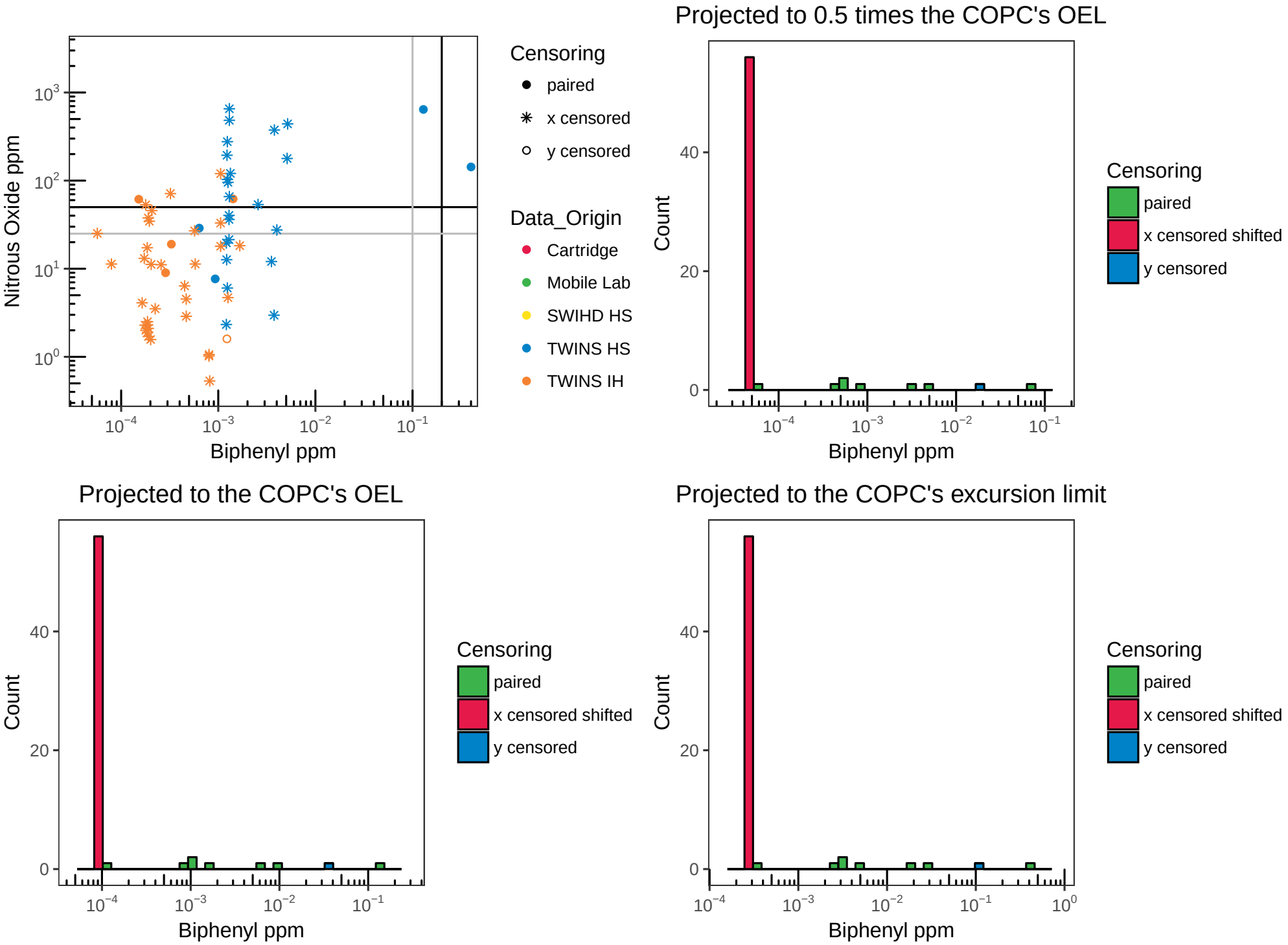


Figure C.280: Nitrous Oxide vs Biphenyl

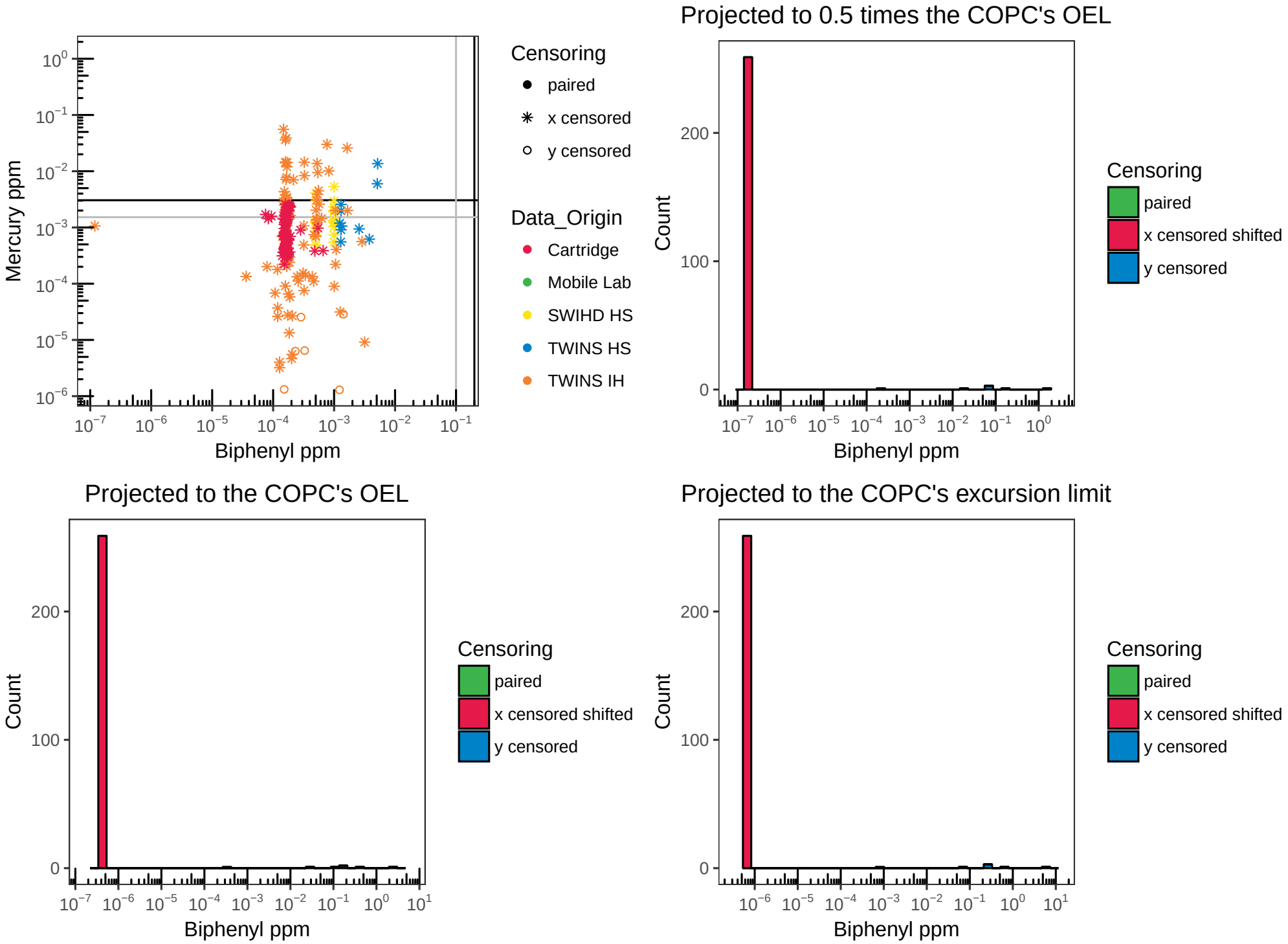


Figure C.281: Mercury vs Biphenyl

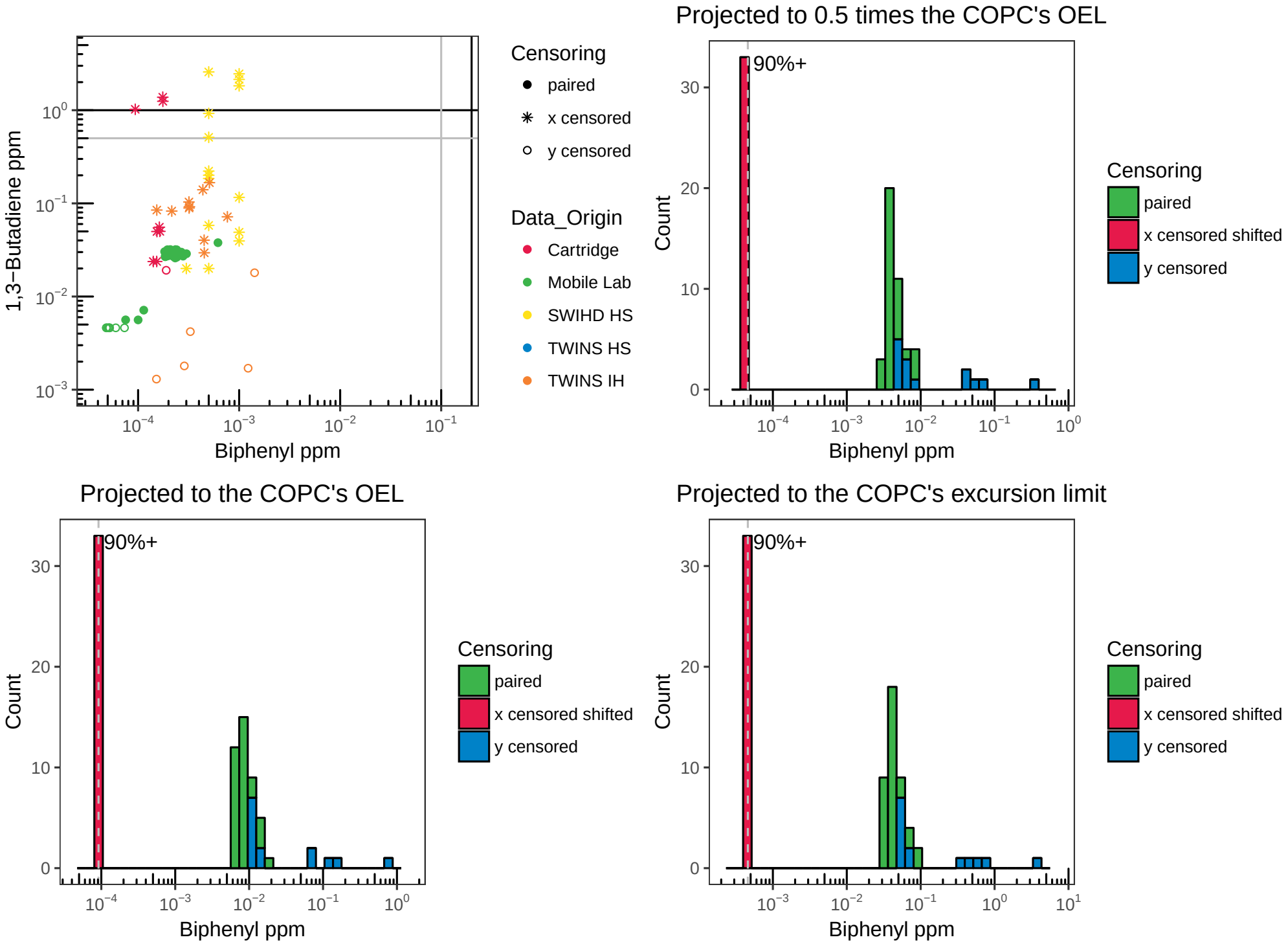


Figure C.282: 1,3-Butadiene vs Biphenyl

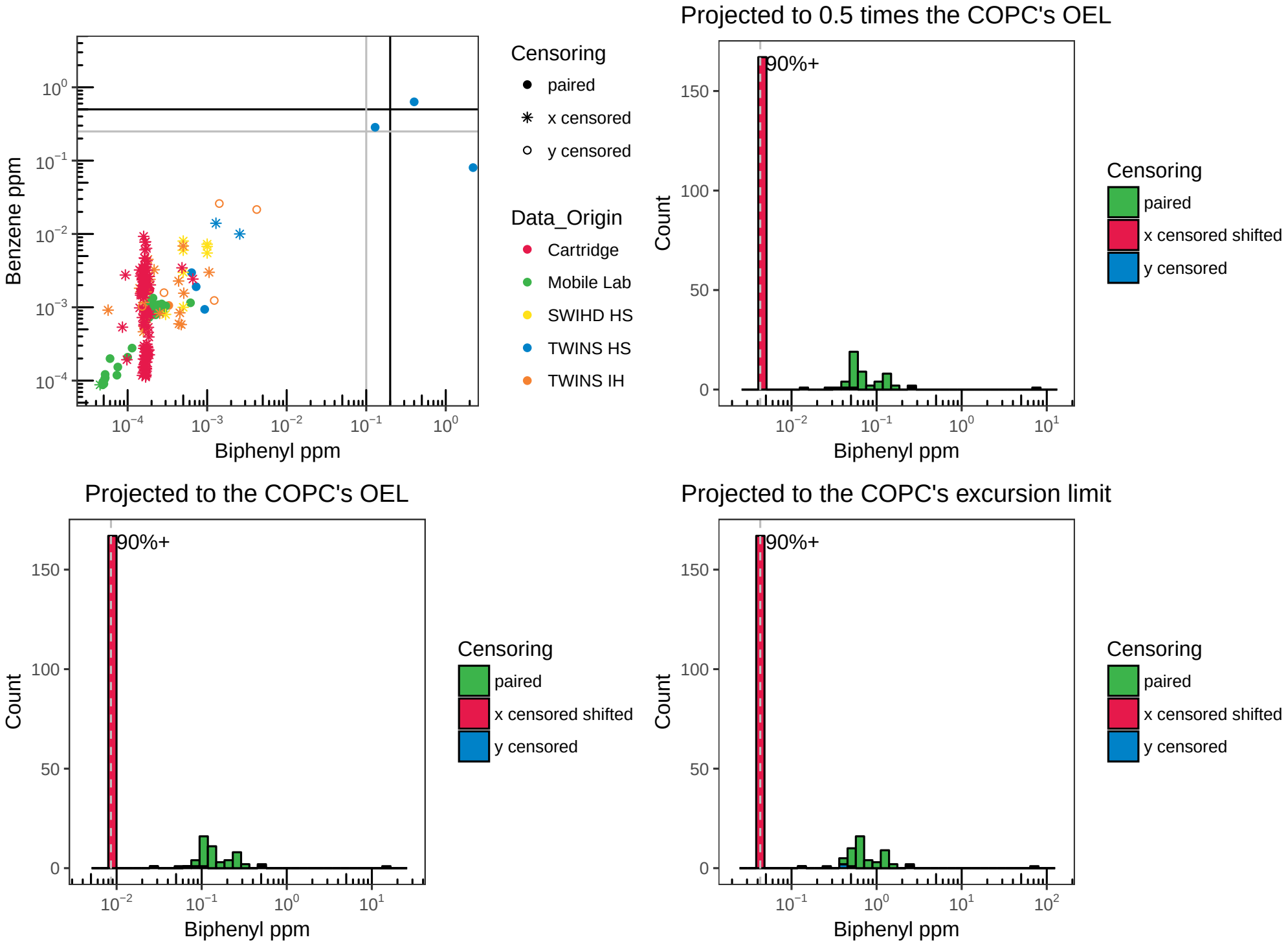


Figure C.283: Benzene vs Biphenyl

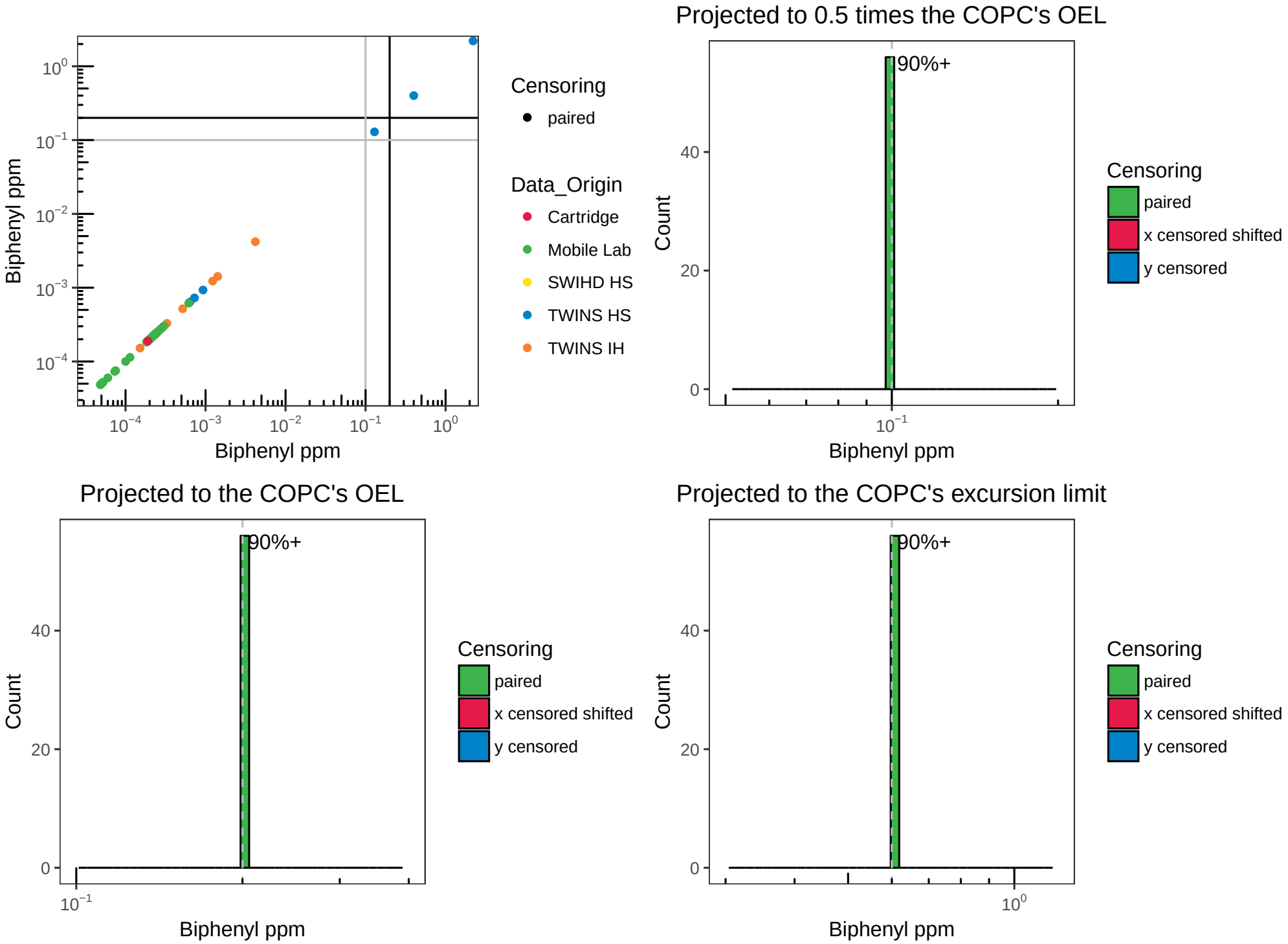


Figure C.284: Biphenyl vs Biphenyl

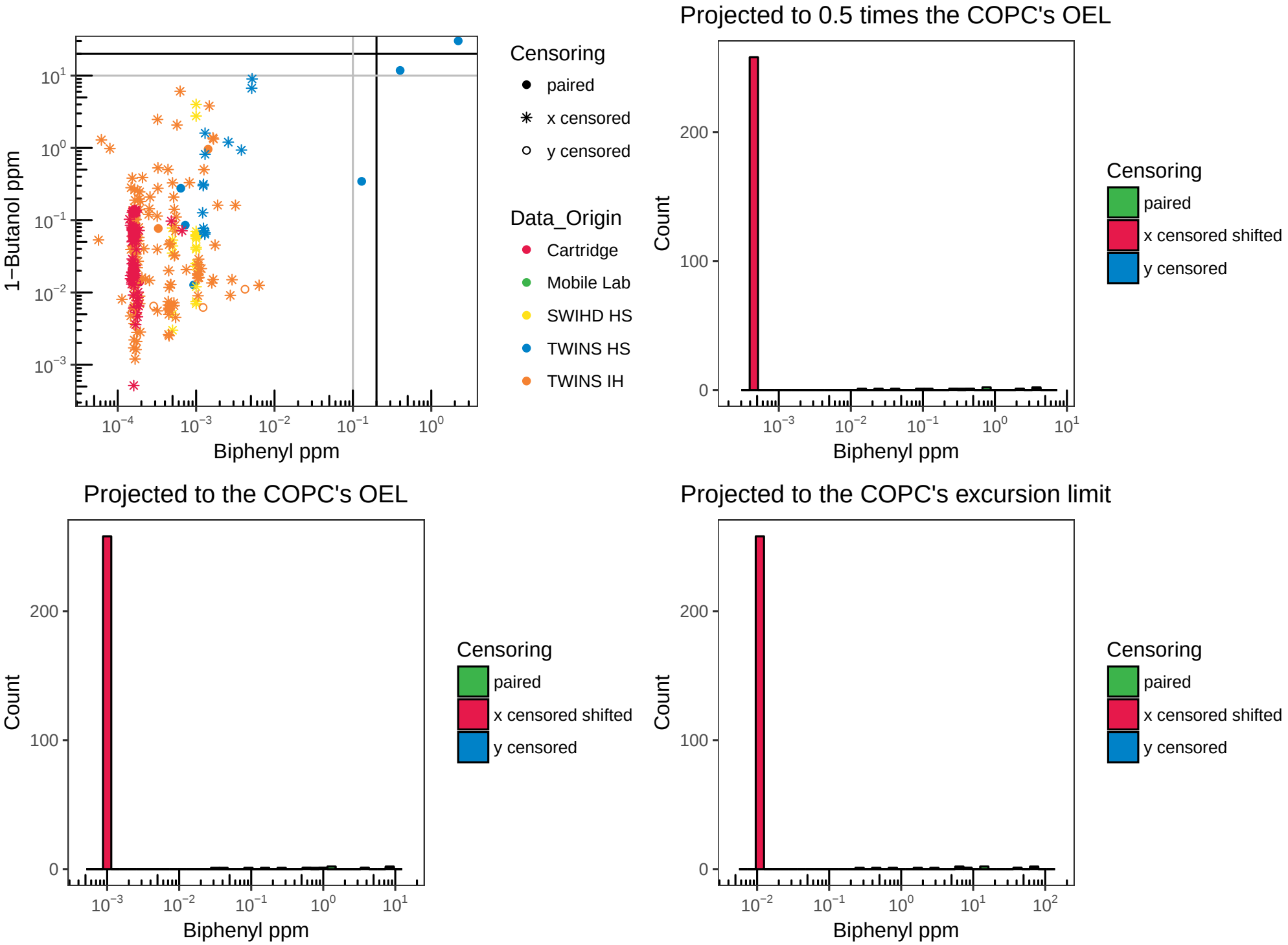


Figure C.285: 1-Butanol vs Biphenyl

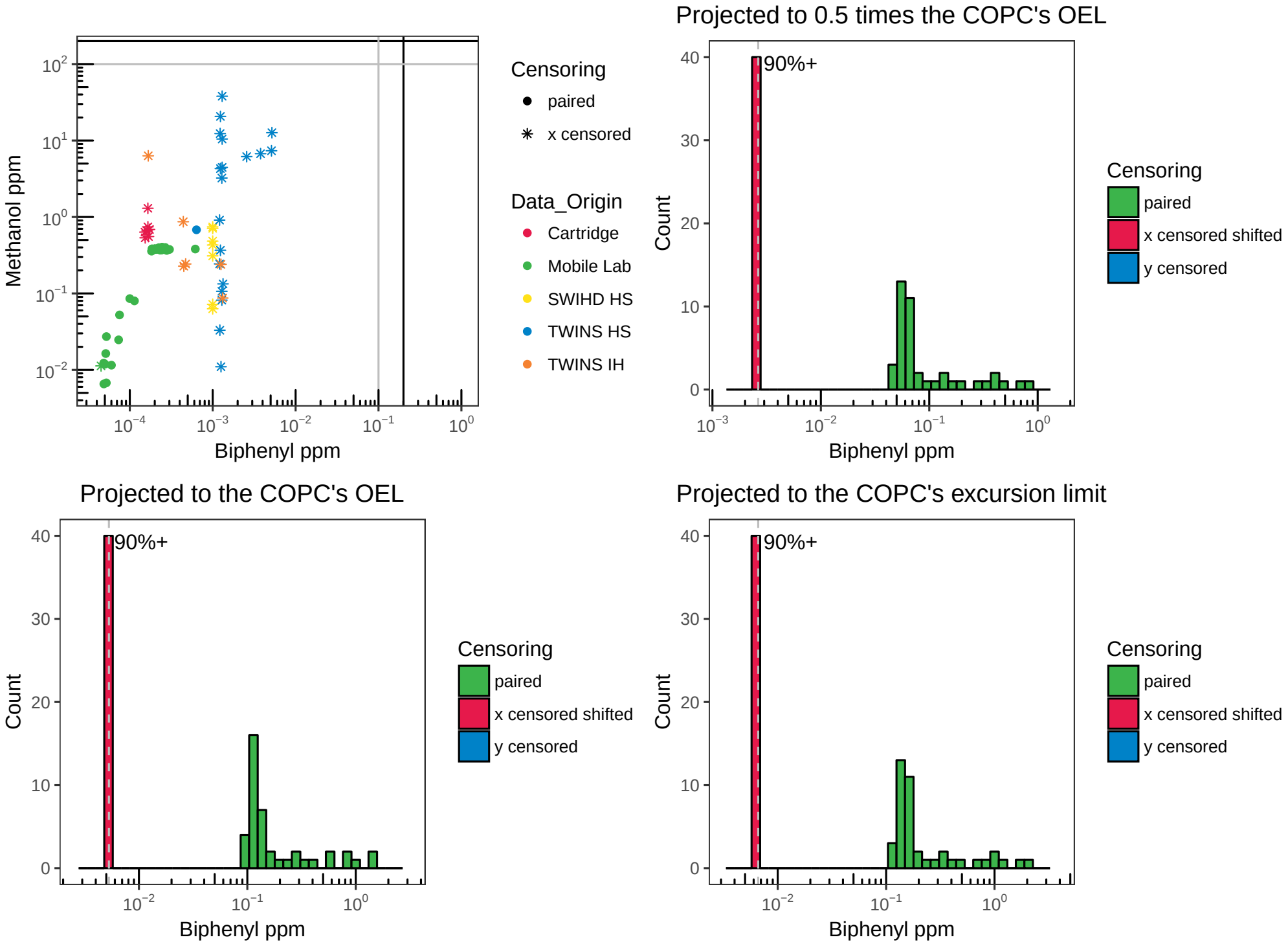


Figure C.286: Methanol vs Biphenyl

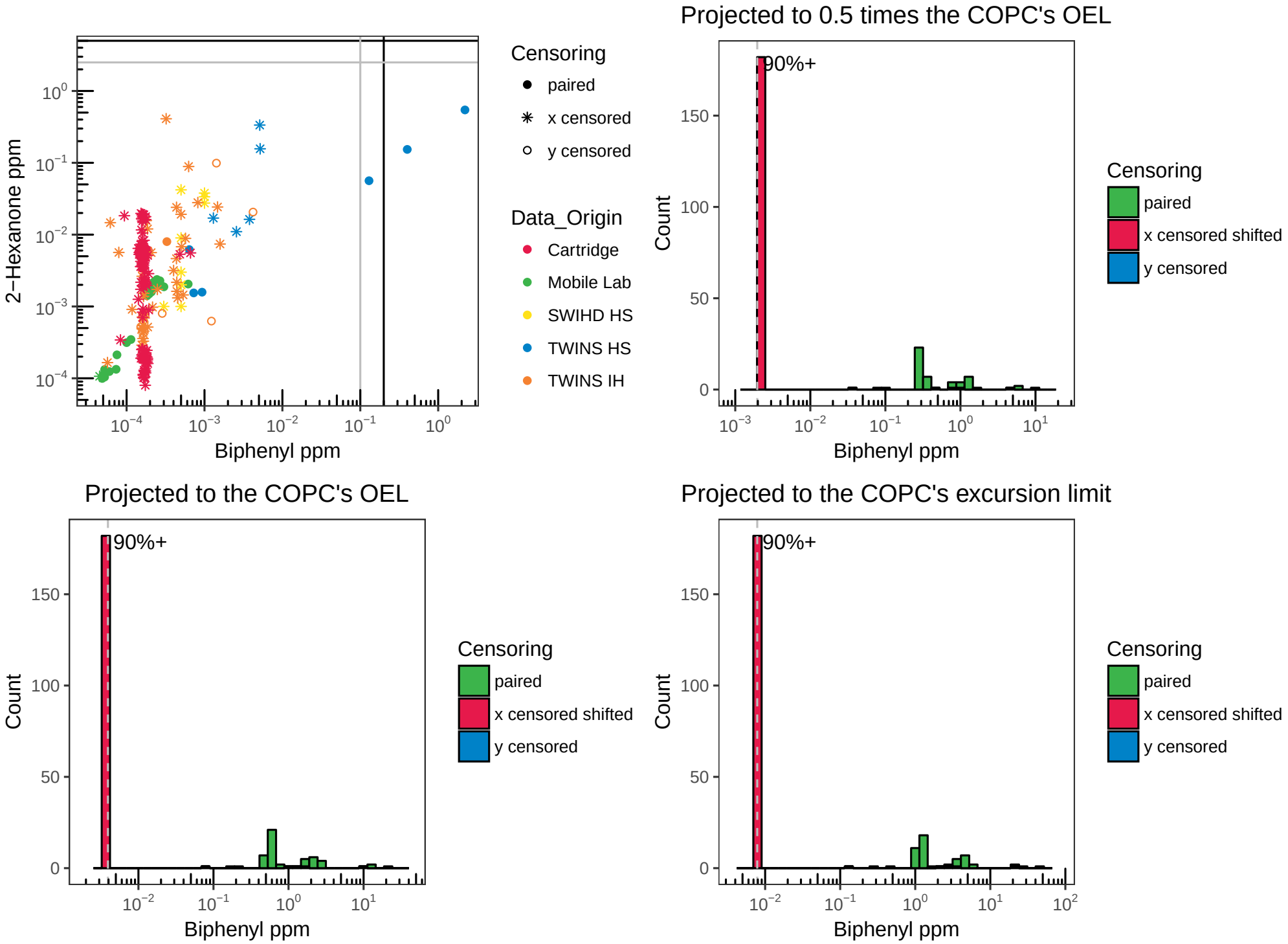


Figure C.287: 2-Hexanone vs Biphenyl

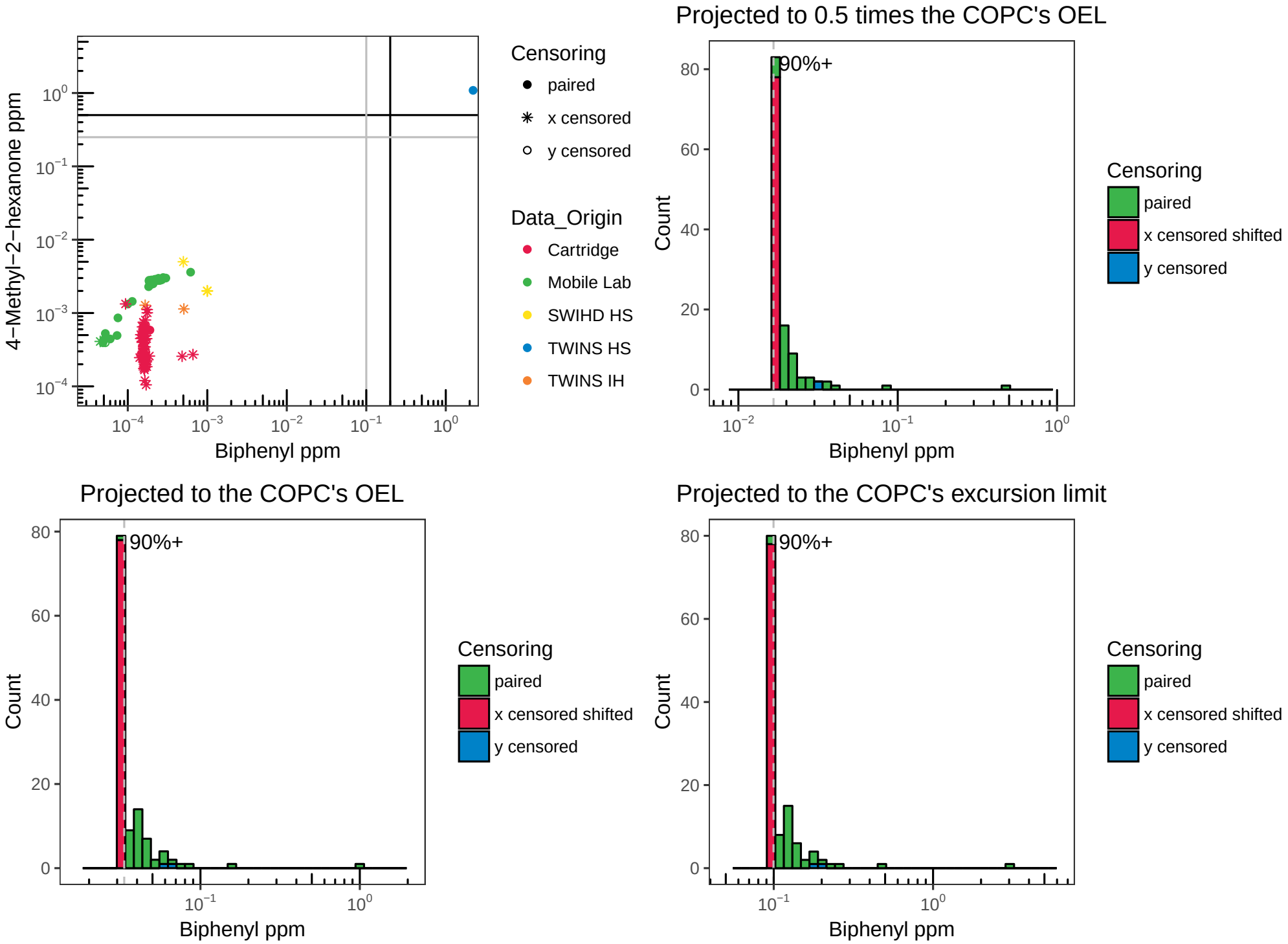


Figure C.288: 4-Methyl-2-hexanone vs Biphenyl

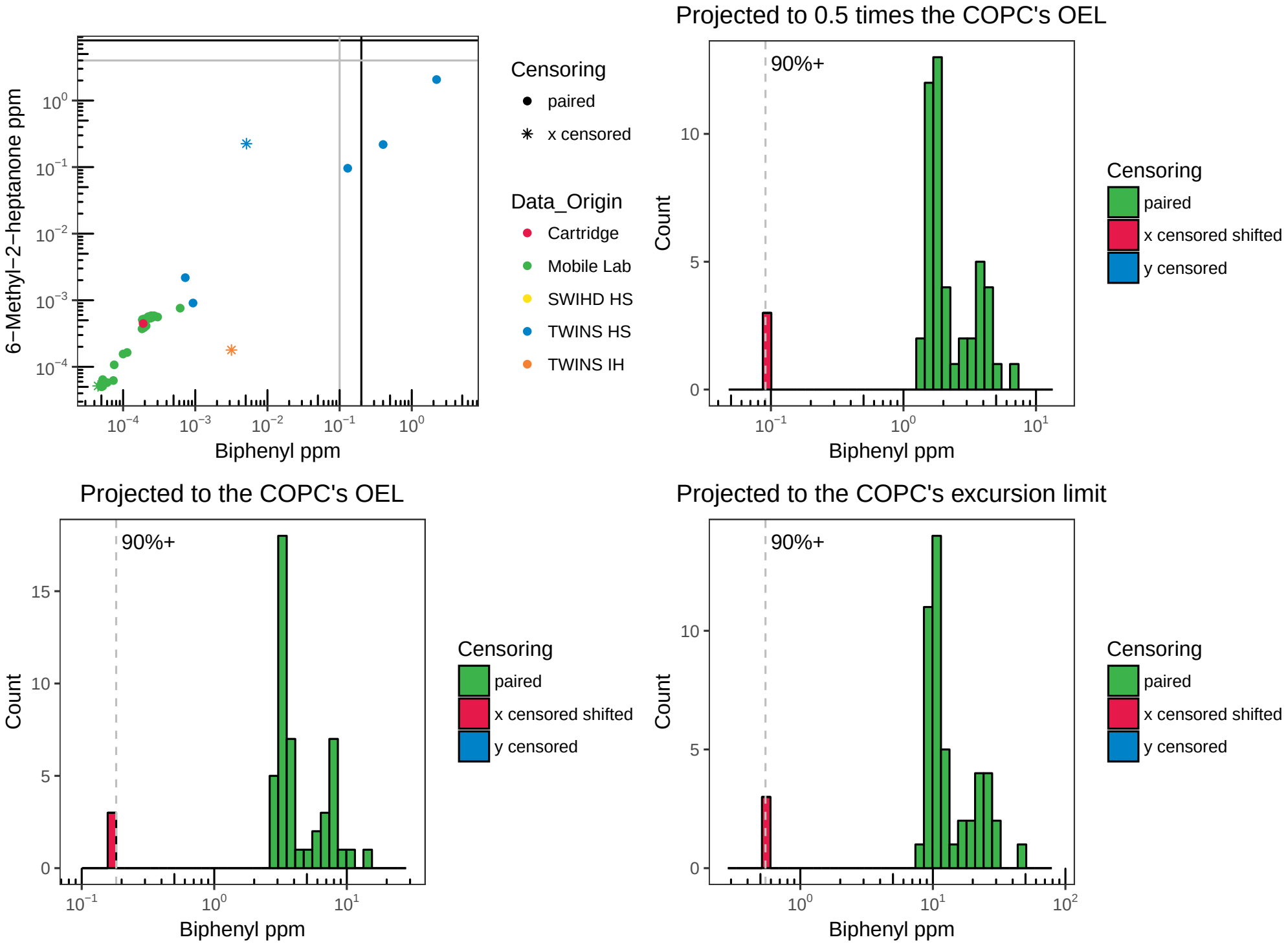


Figure C.289: 6-Methyl-2-heptanone vs Biphenyl

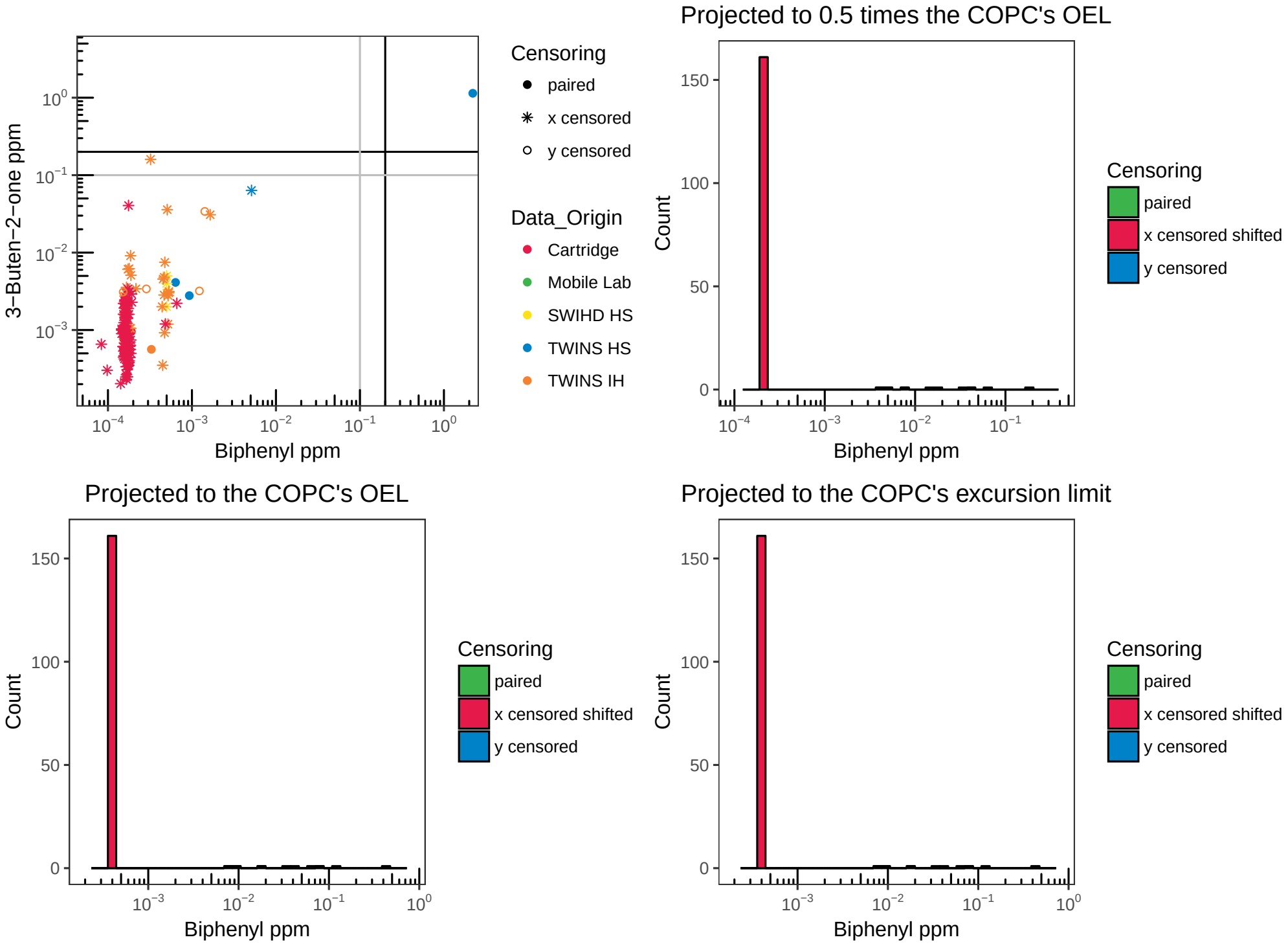


Figure C.290: 3-Buten-2-one vs Biphenyl

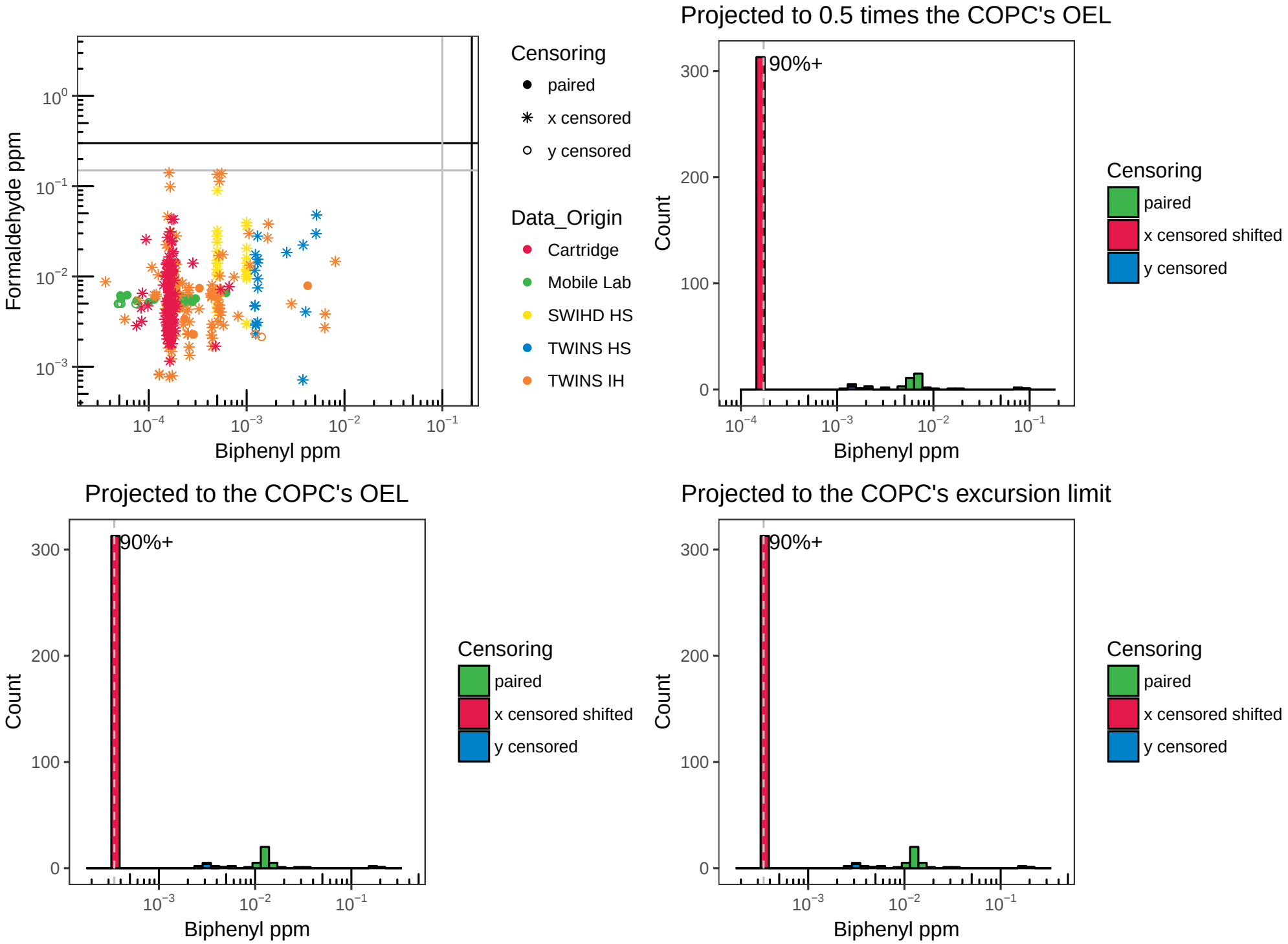


Figure C.291: Formaldehyde vs Biphenyl

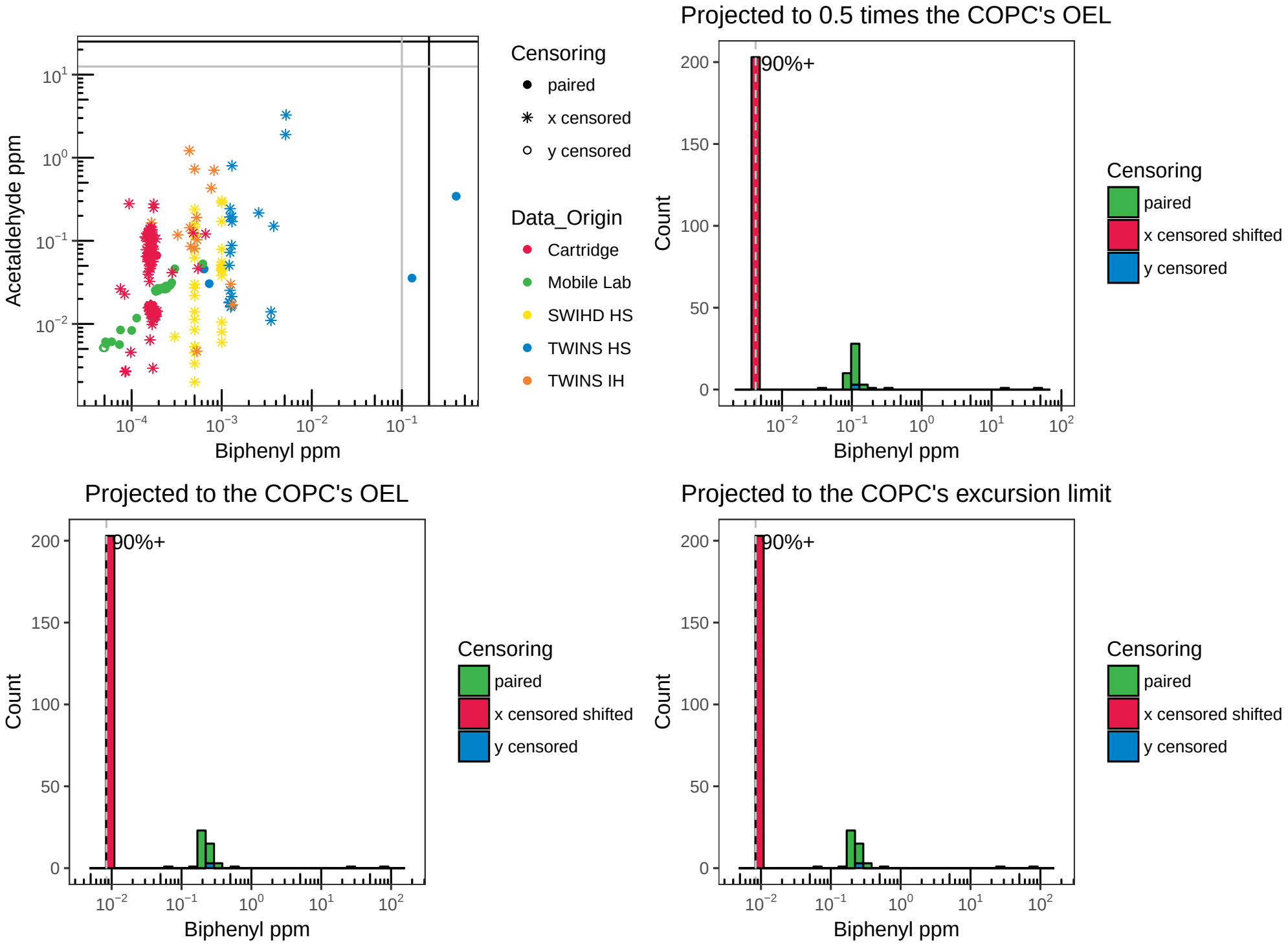


Figure C.292: Acetaldehyde vs Biphenyl

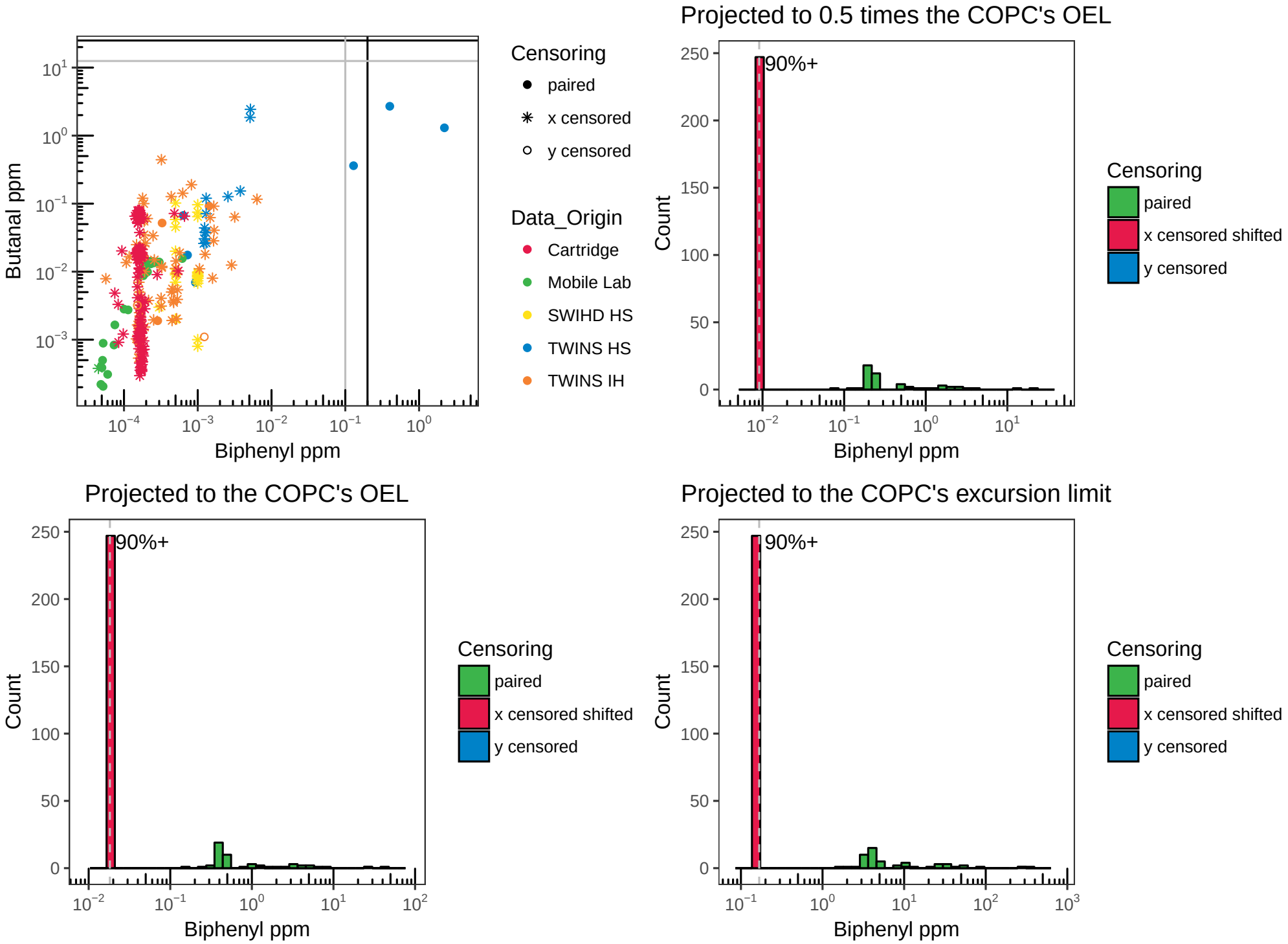


Figure C.293: Butanal vs Biphenyl

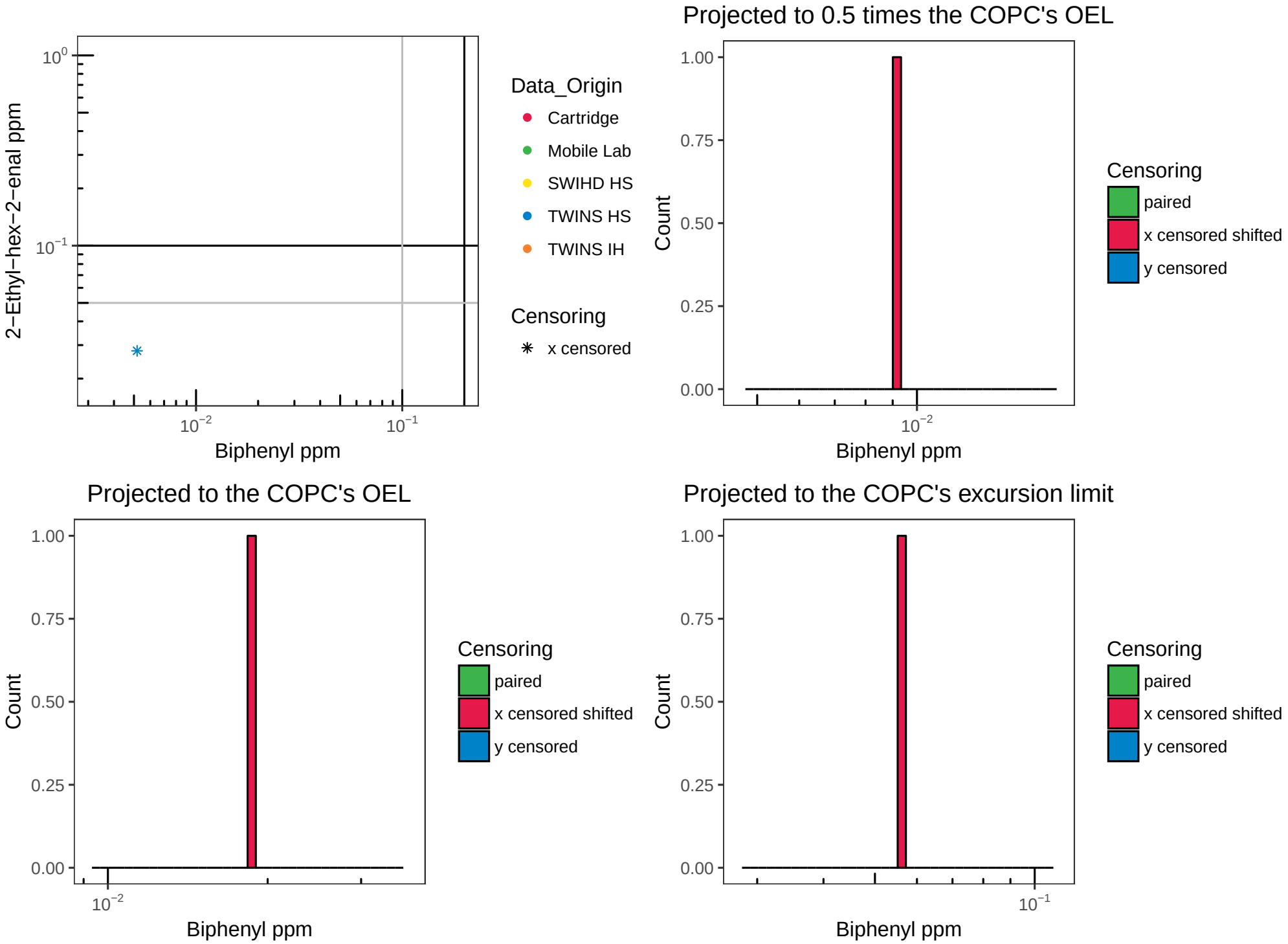


Figure C.294: 2-Ethyl-hex-2-enal vs Biphenyl

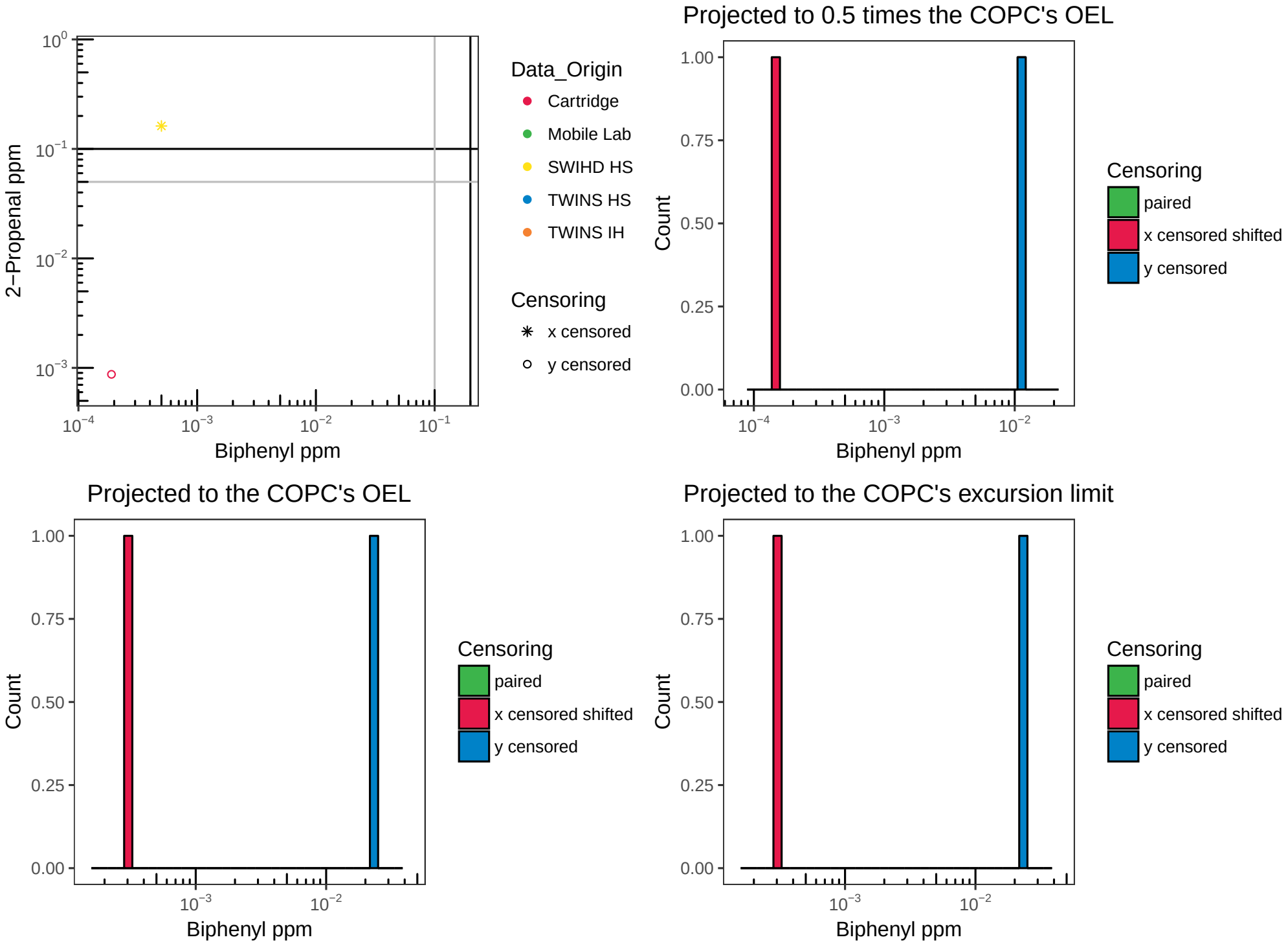


Figure C.295: 2-Propenal vs Biphenyl

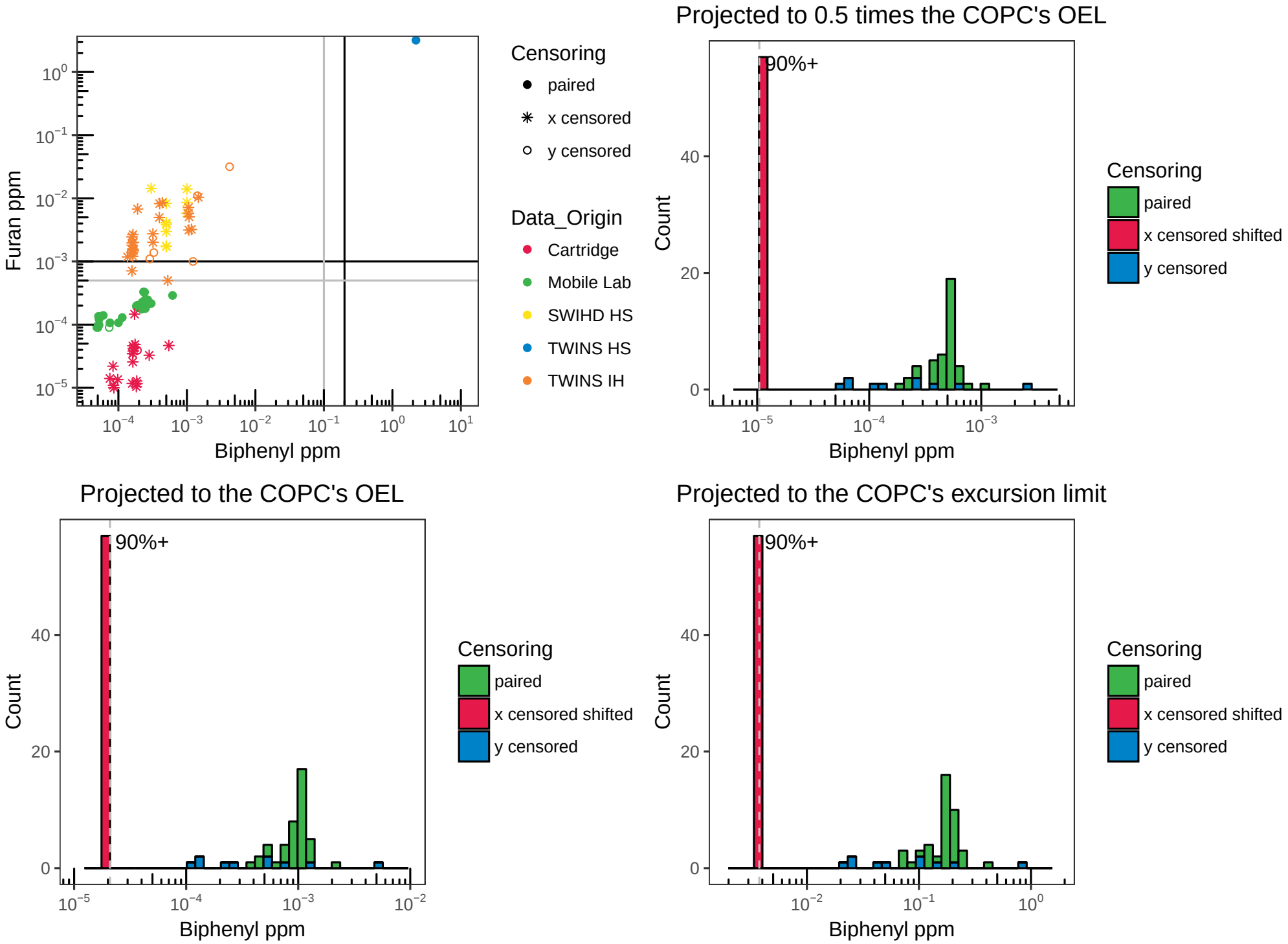


Figure C.296: Furan vs Biphenyl

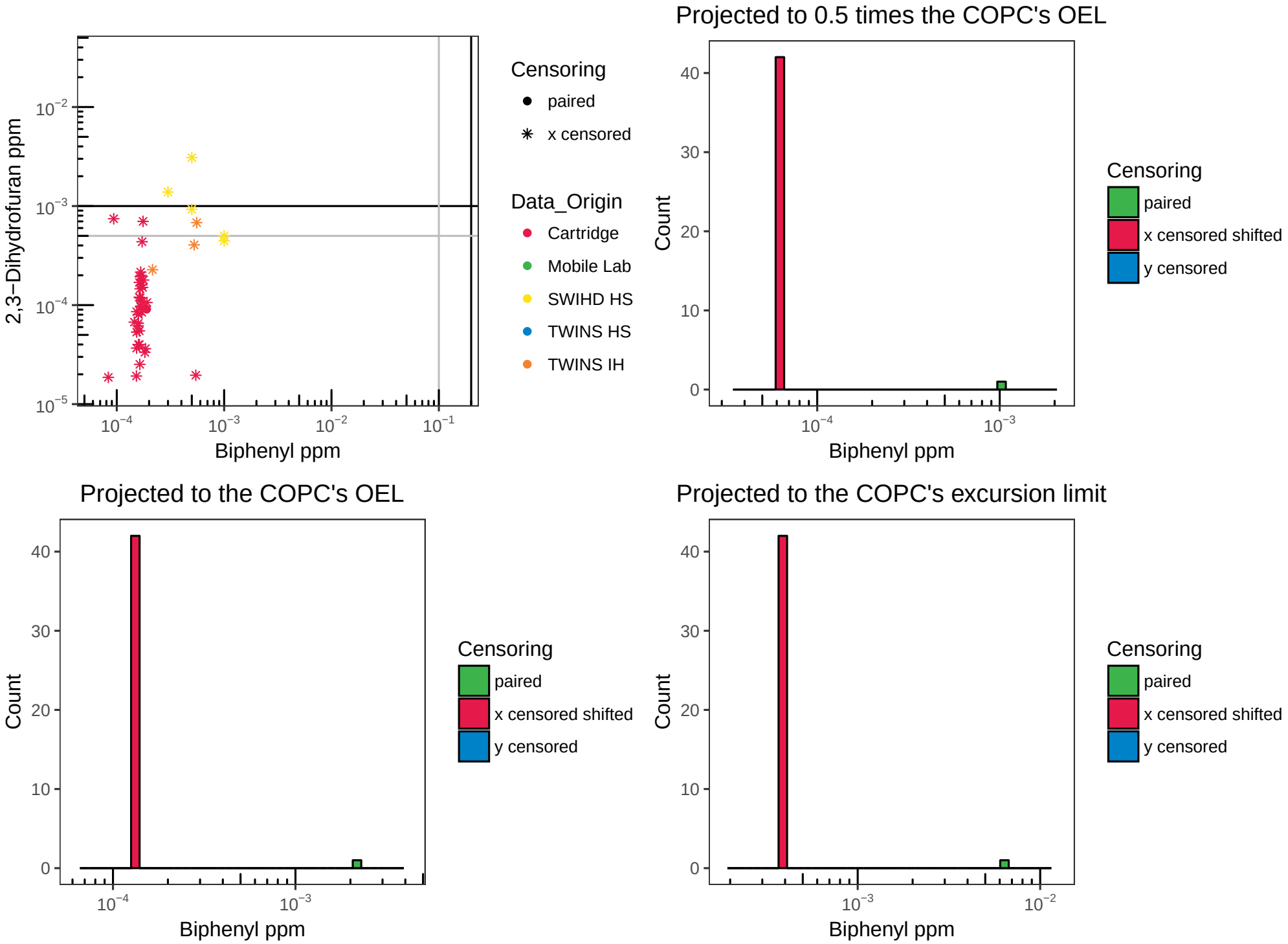


Figure C.297: 2,3-Dihydrofuran vs Biphenyl

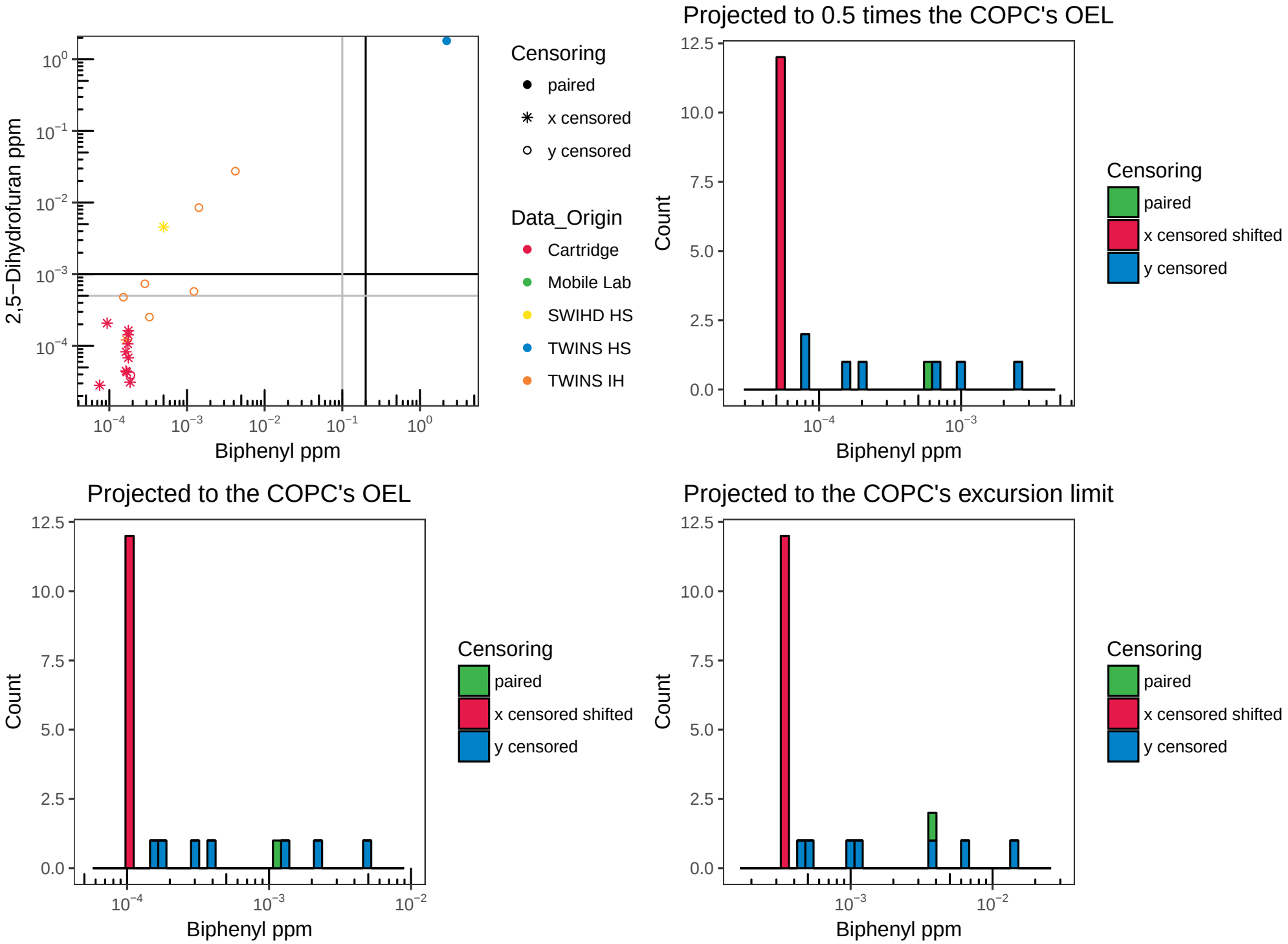


Figure C.298: 2,5-Dihydrofuran vs Biphenyl

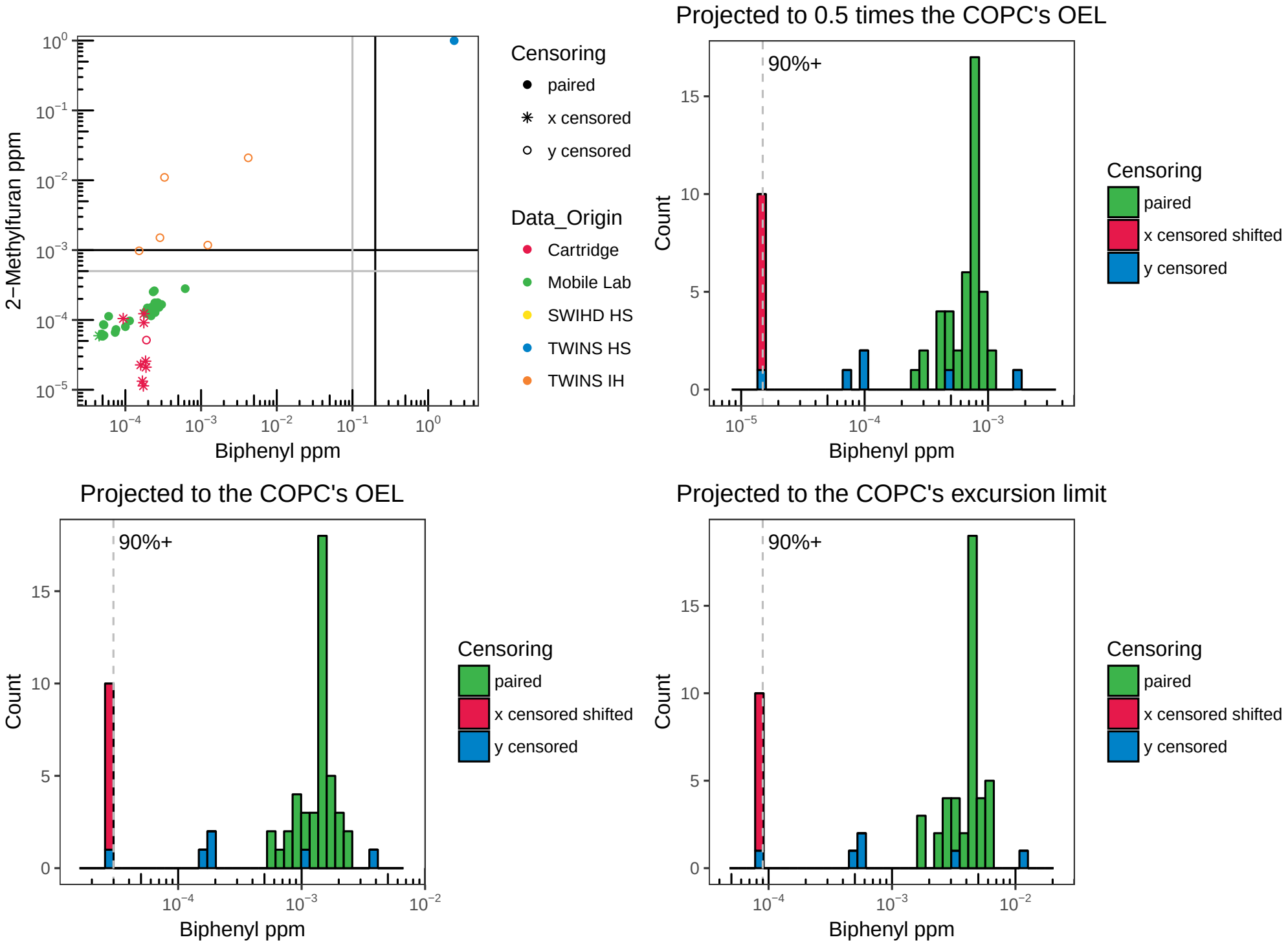


Figure C.299: 2-Methylfuran vs Biphenyl

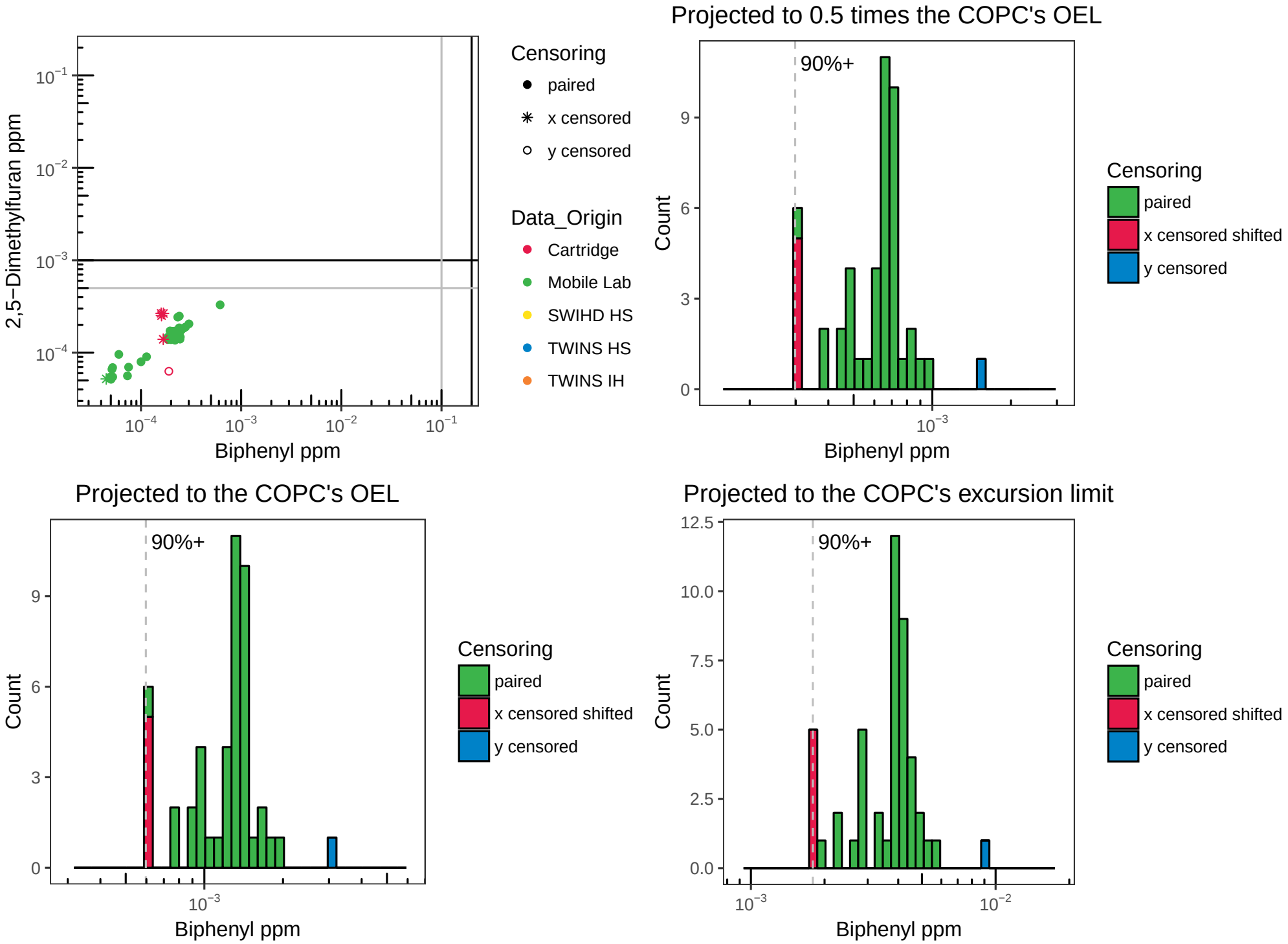


Figure C.300: 2,5-Dimethylfuran vs Biphenyl

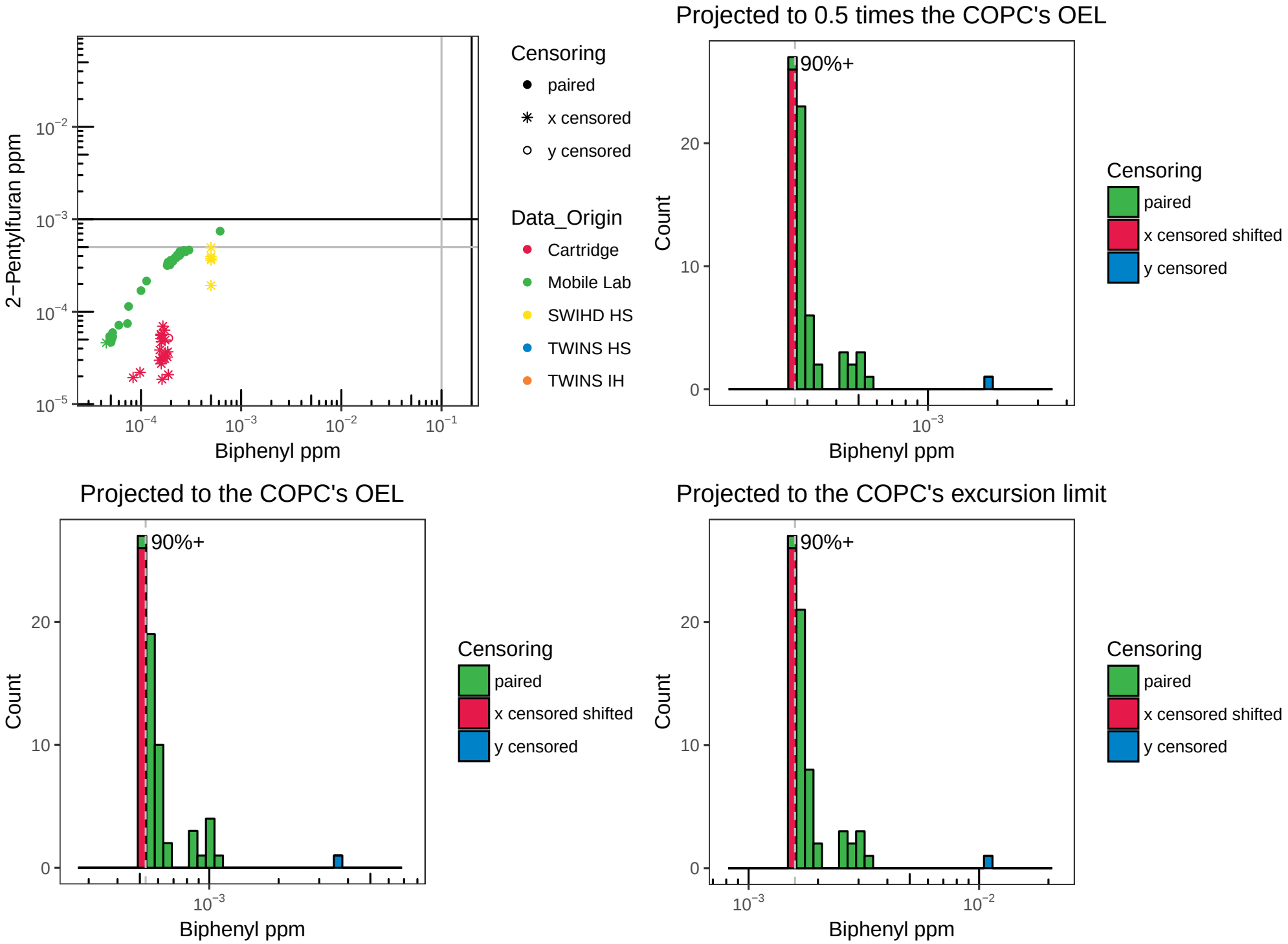


Figure C.301: 2-Pentylfuran vs Biphenyl

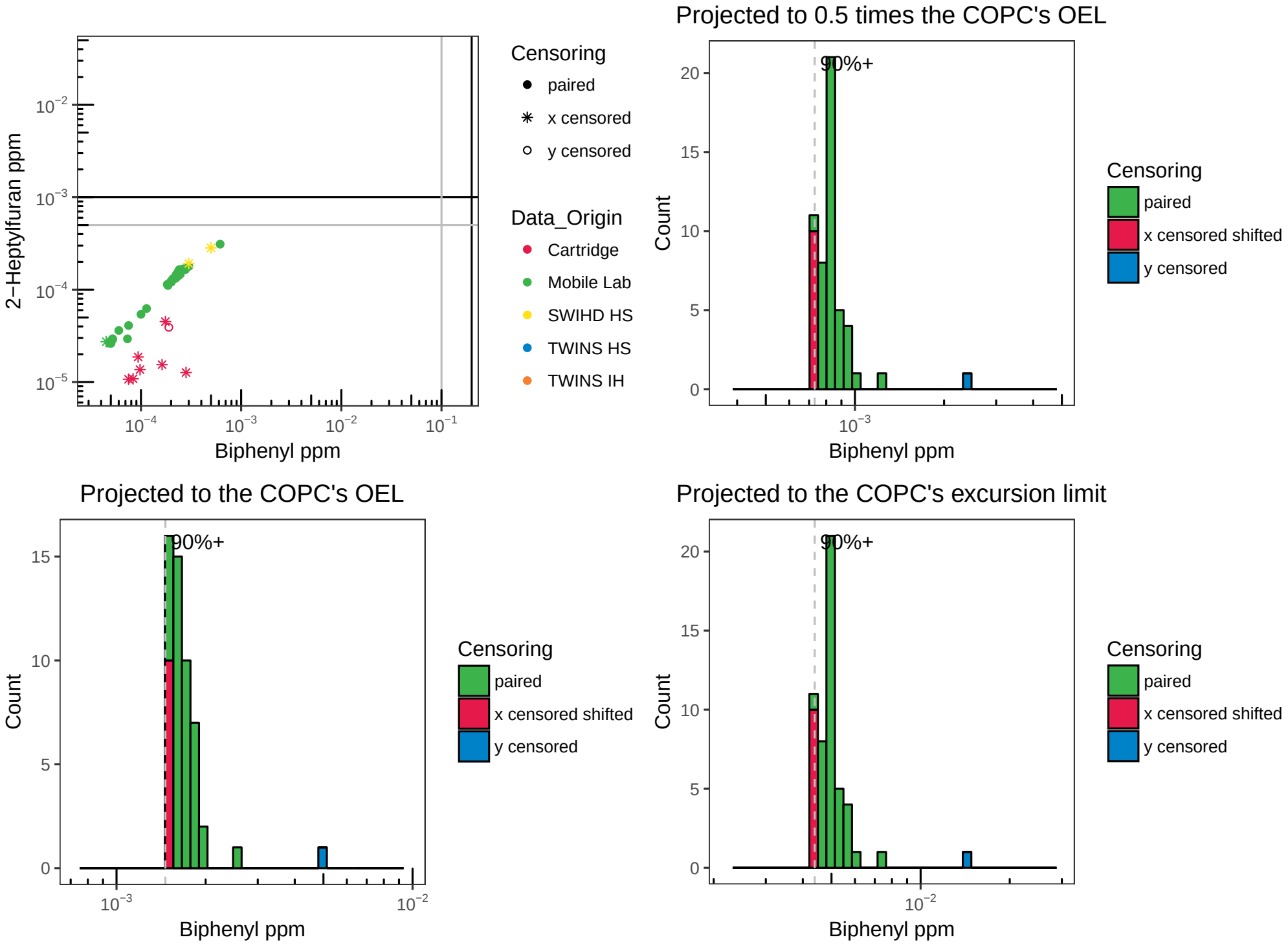


Figure C.302: 2-Heptylfuran vs Biphenyl

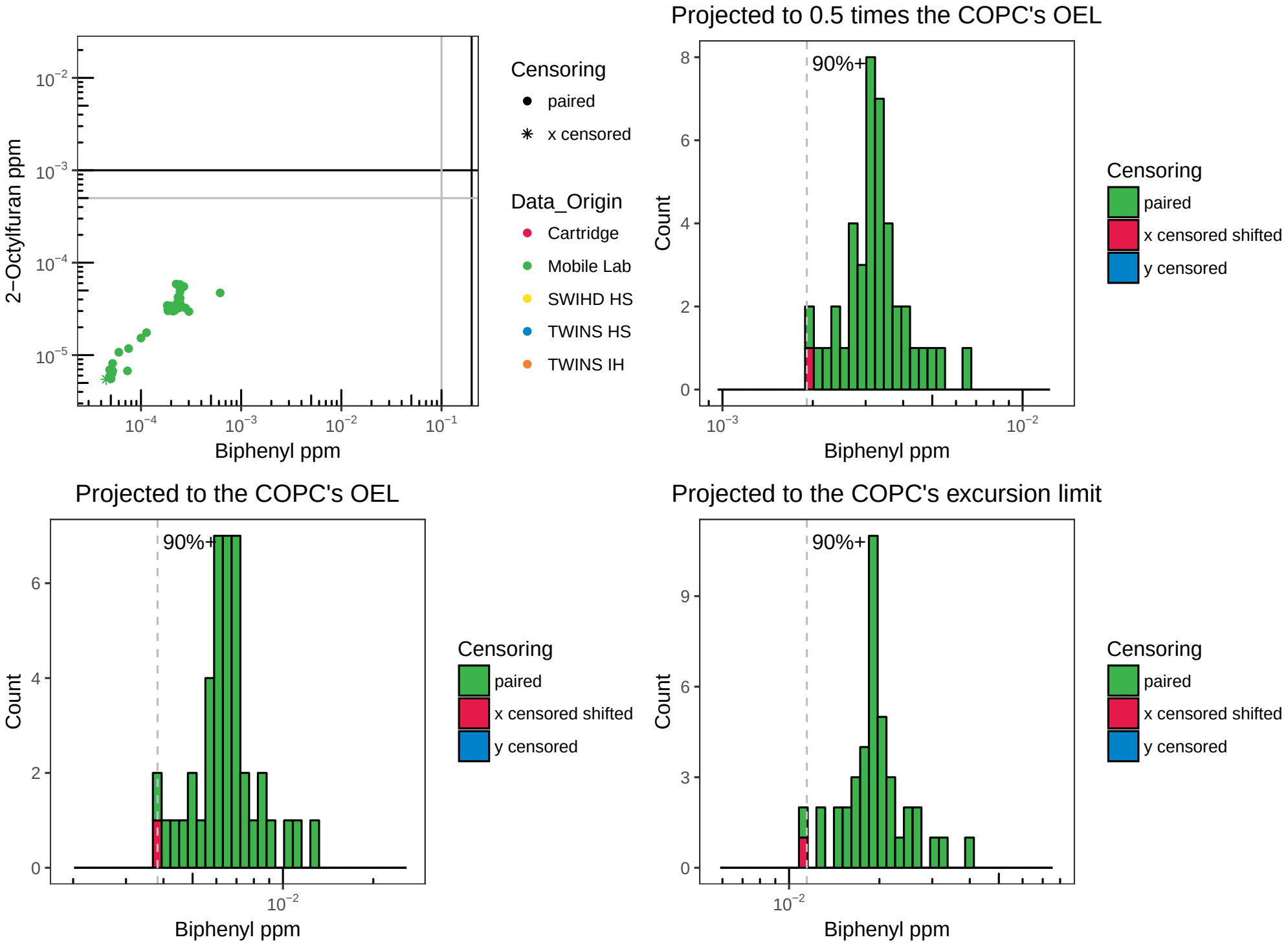


Figure C.303: 2-Octylfuran vs Biphenyl

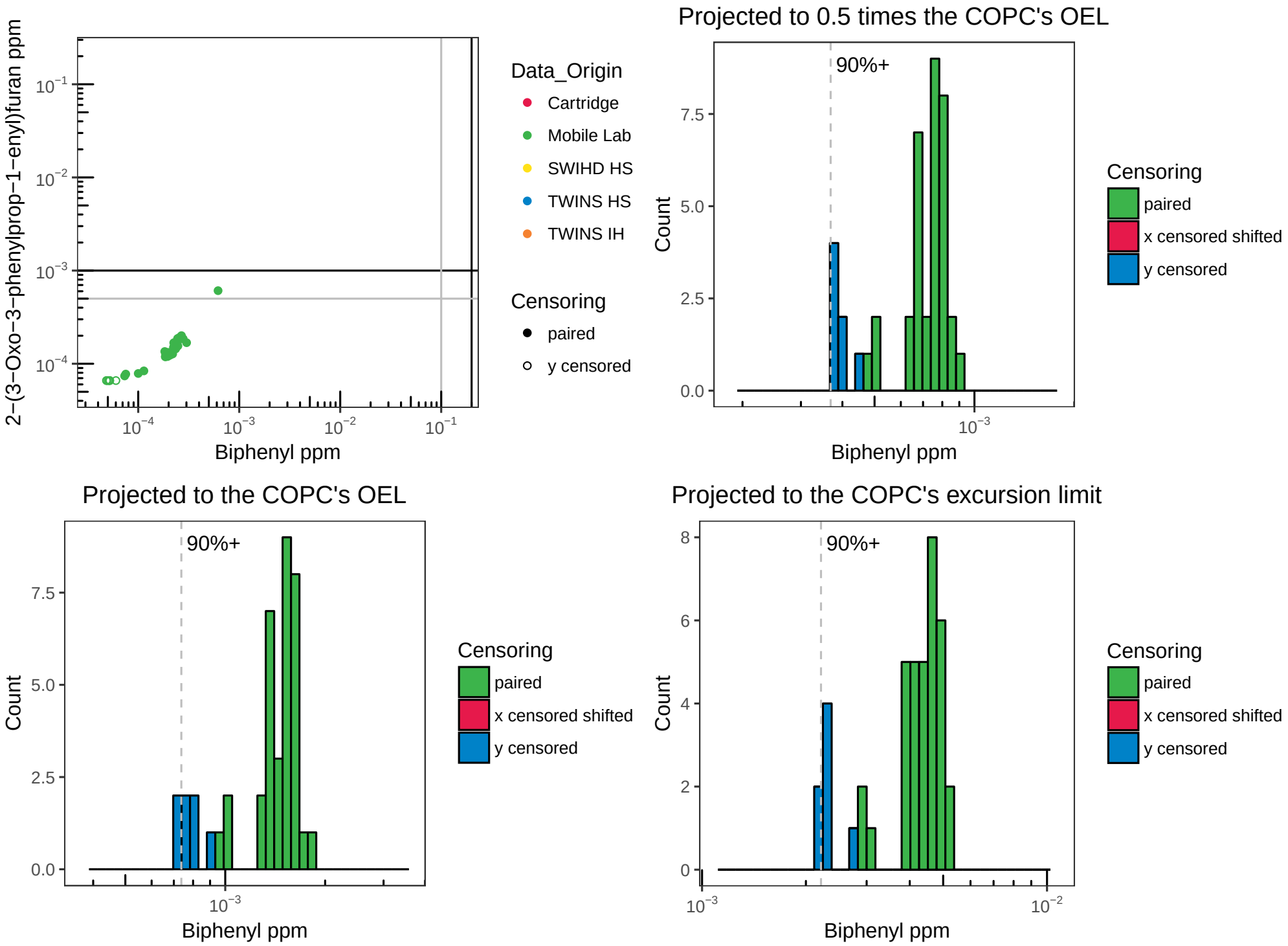


Figure C.304: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Biphenyl

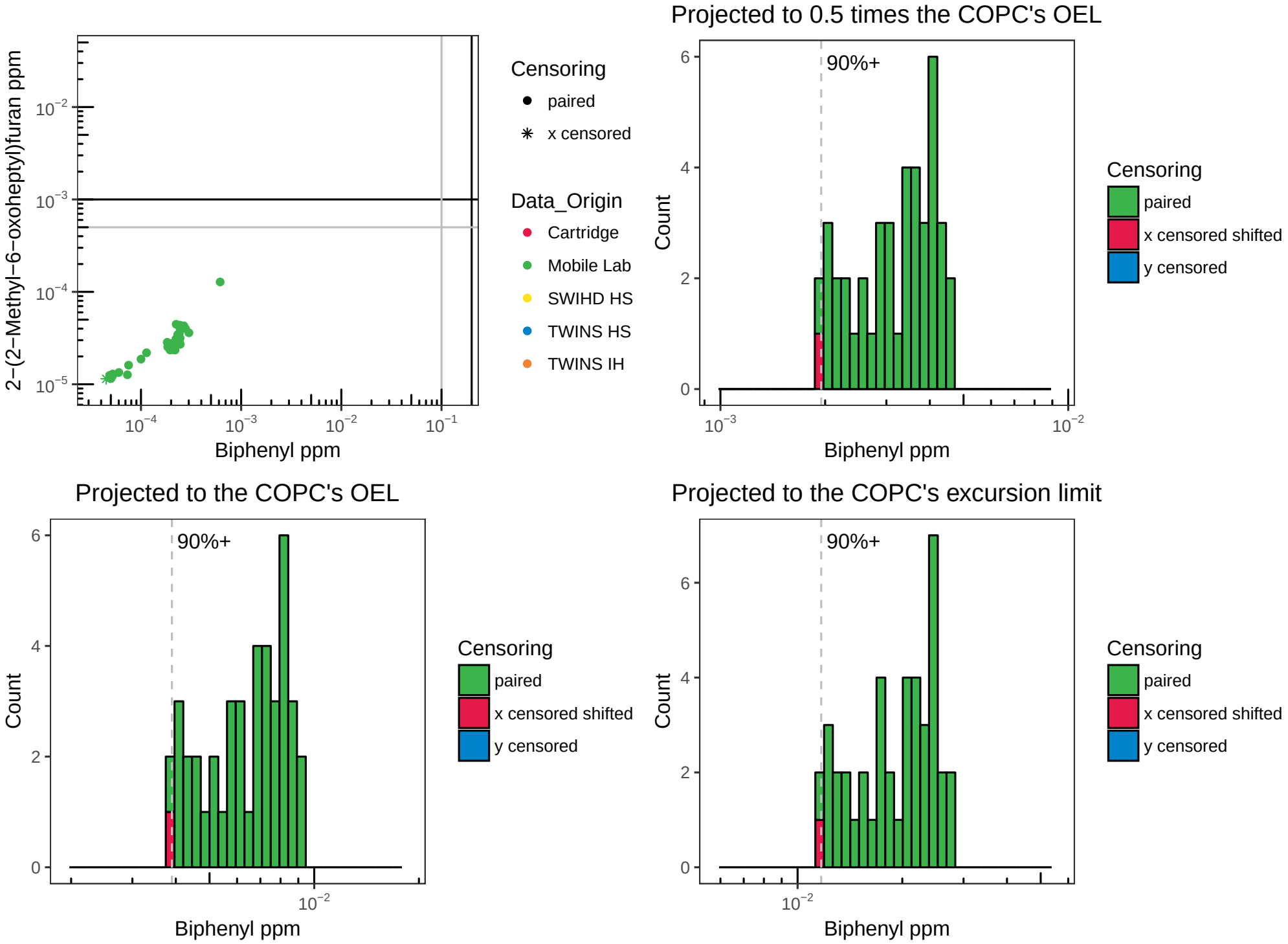


Figure C.305: 2-(2-Methyl-6-oxoheptyl)furan vs Biphenyl

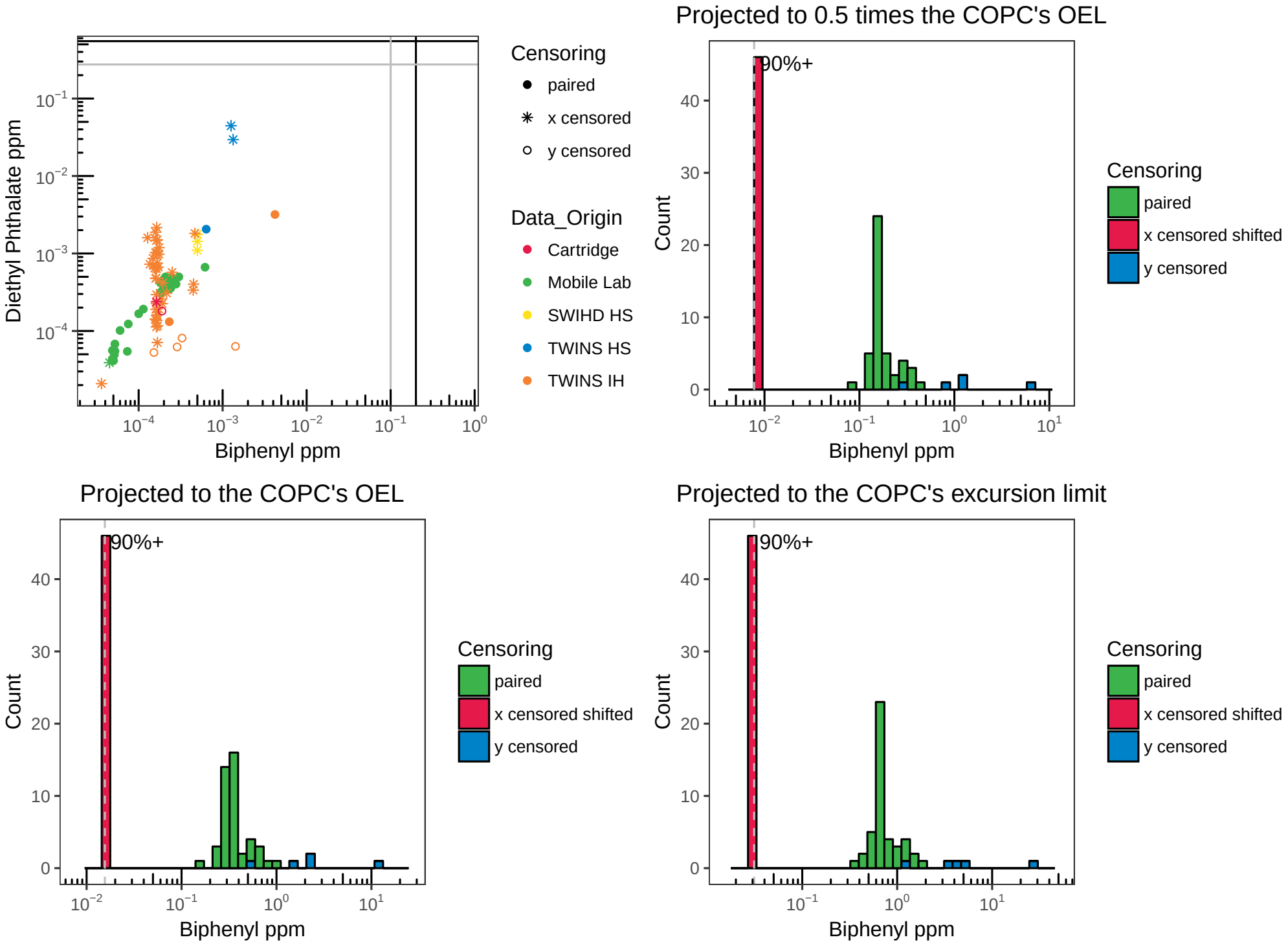


Figure C.306: Diethyl Phthalate vs Biphenyl

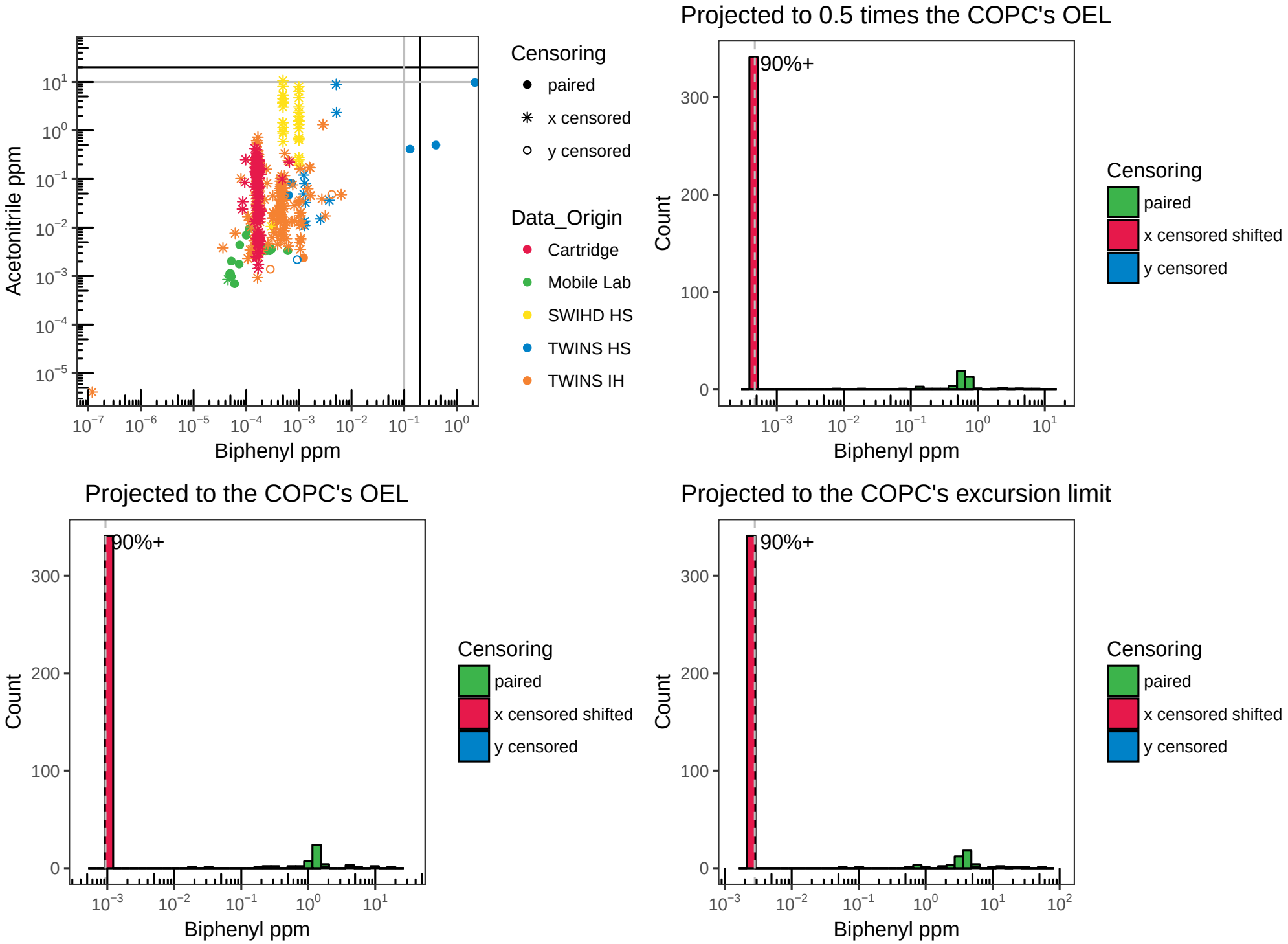


Figure C.307: Acetonitrile vs Biphenyl

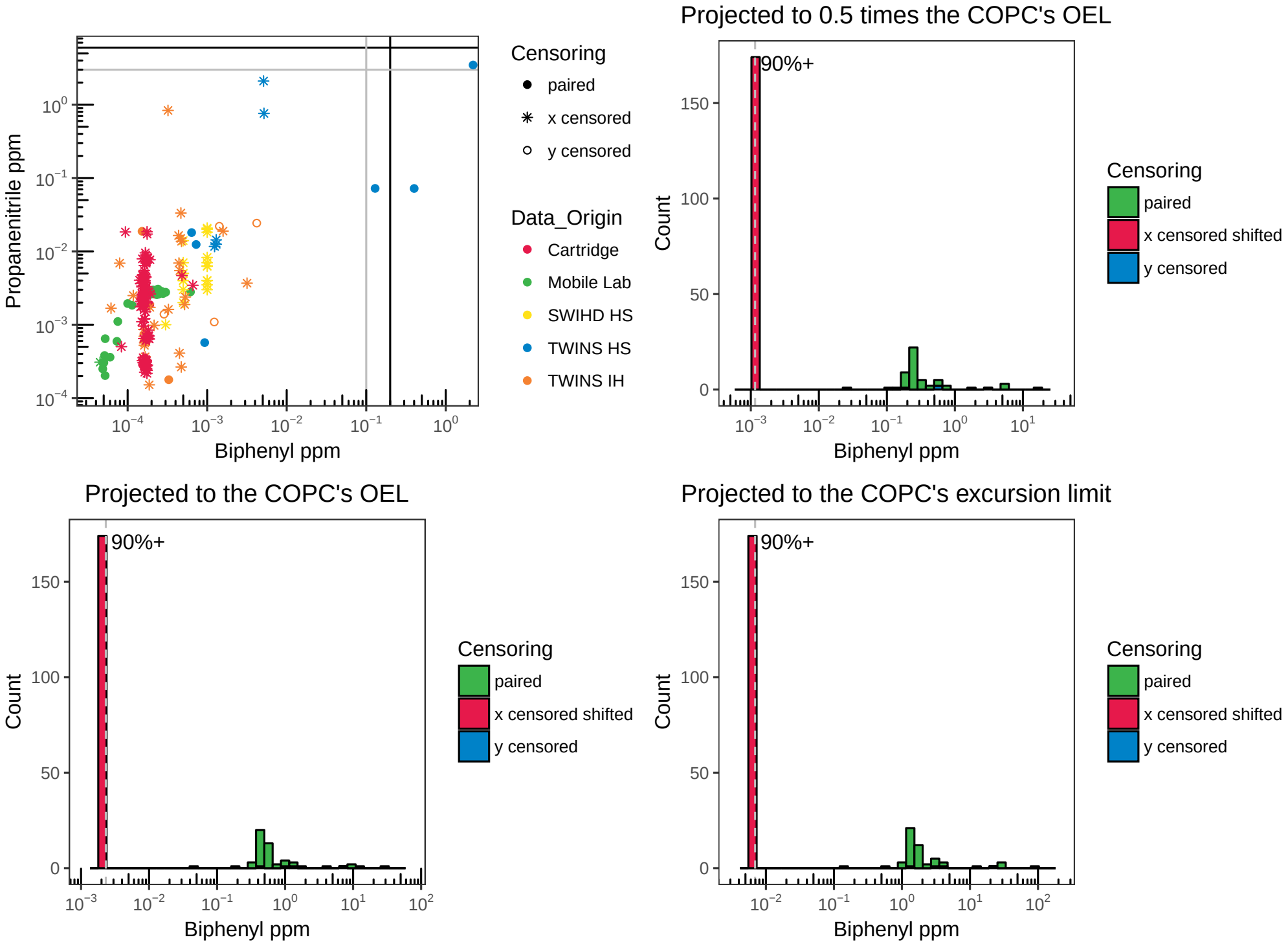


Figure C.308: Propanenitrile vs Biphenyl

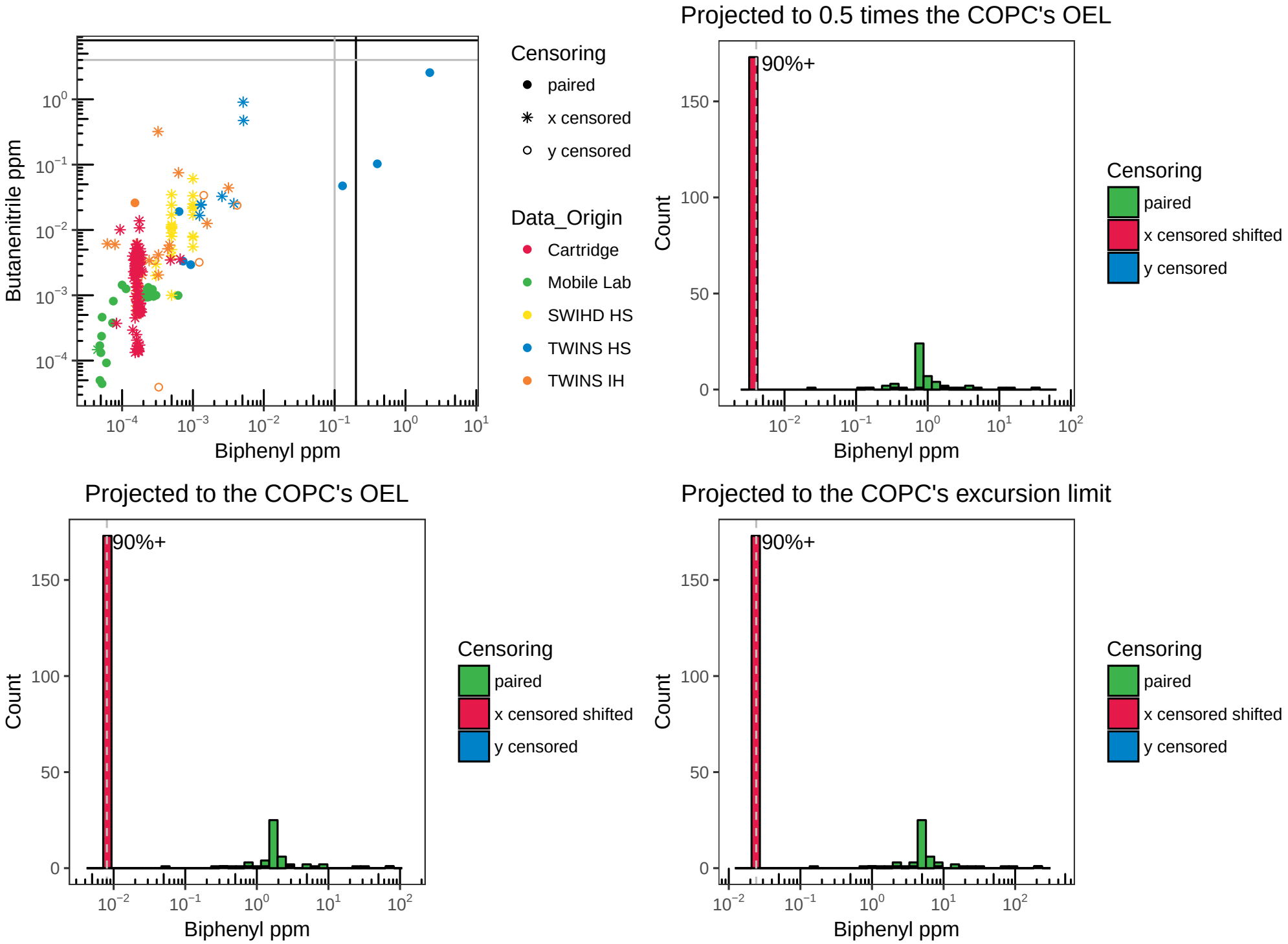


Figure C.309: Butanenitrile vs Biphenyl

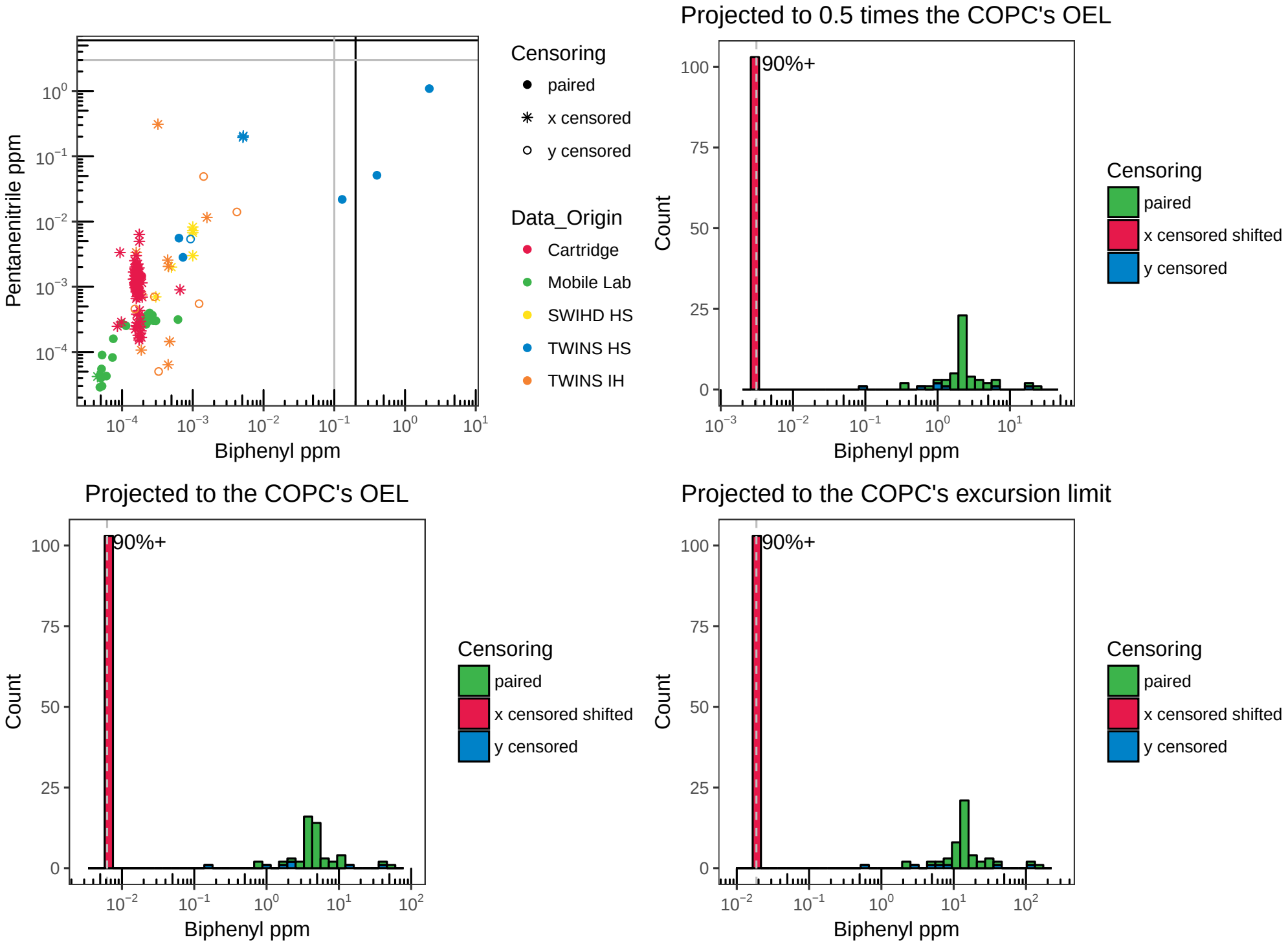


Figure C.310: Pentanenitrile vs Biphenyl

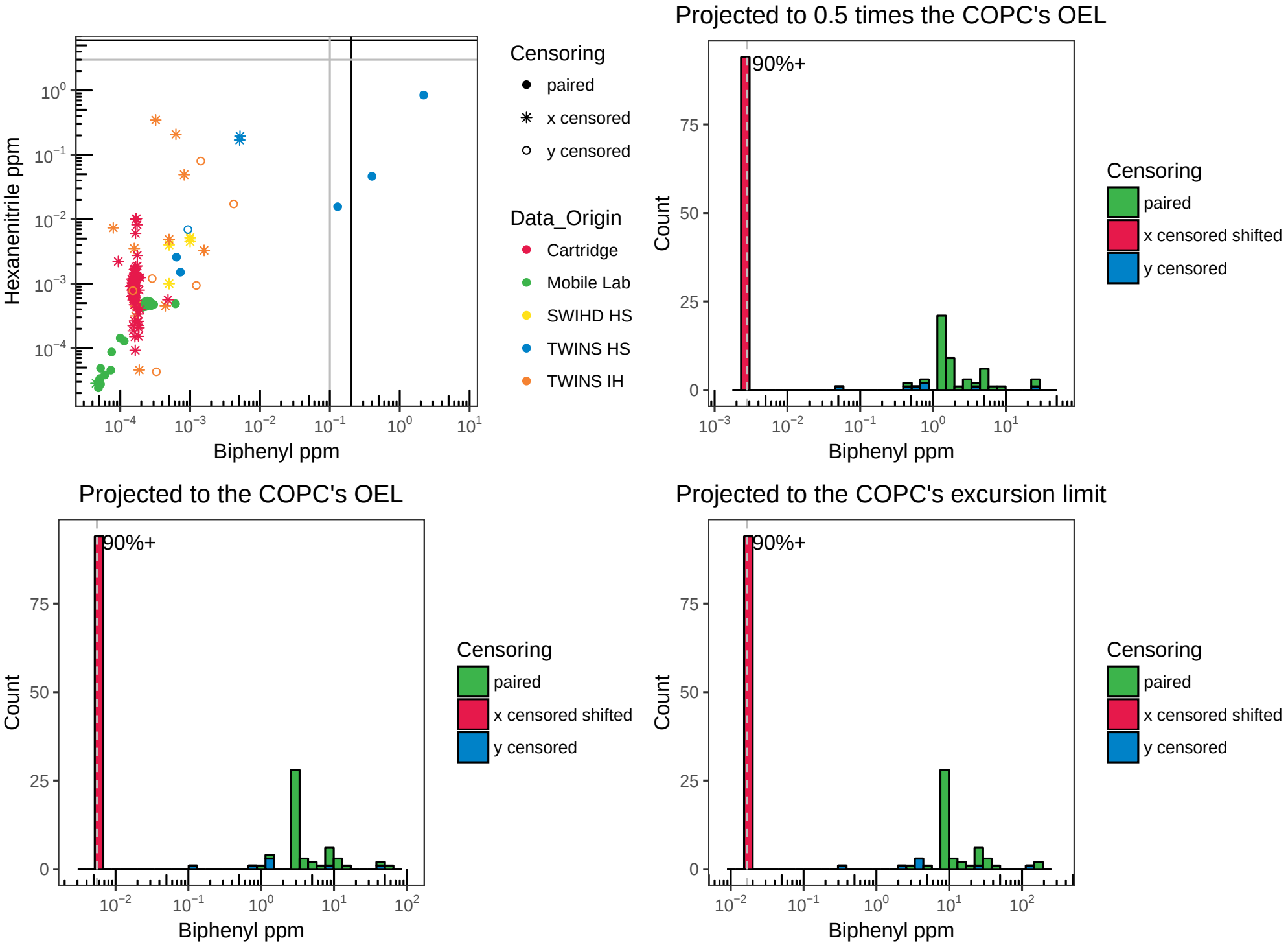


Figure C.311: Hexanenitrile vs Biphenyl

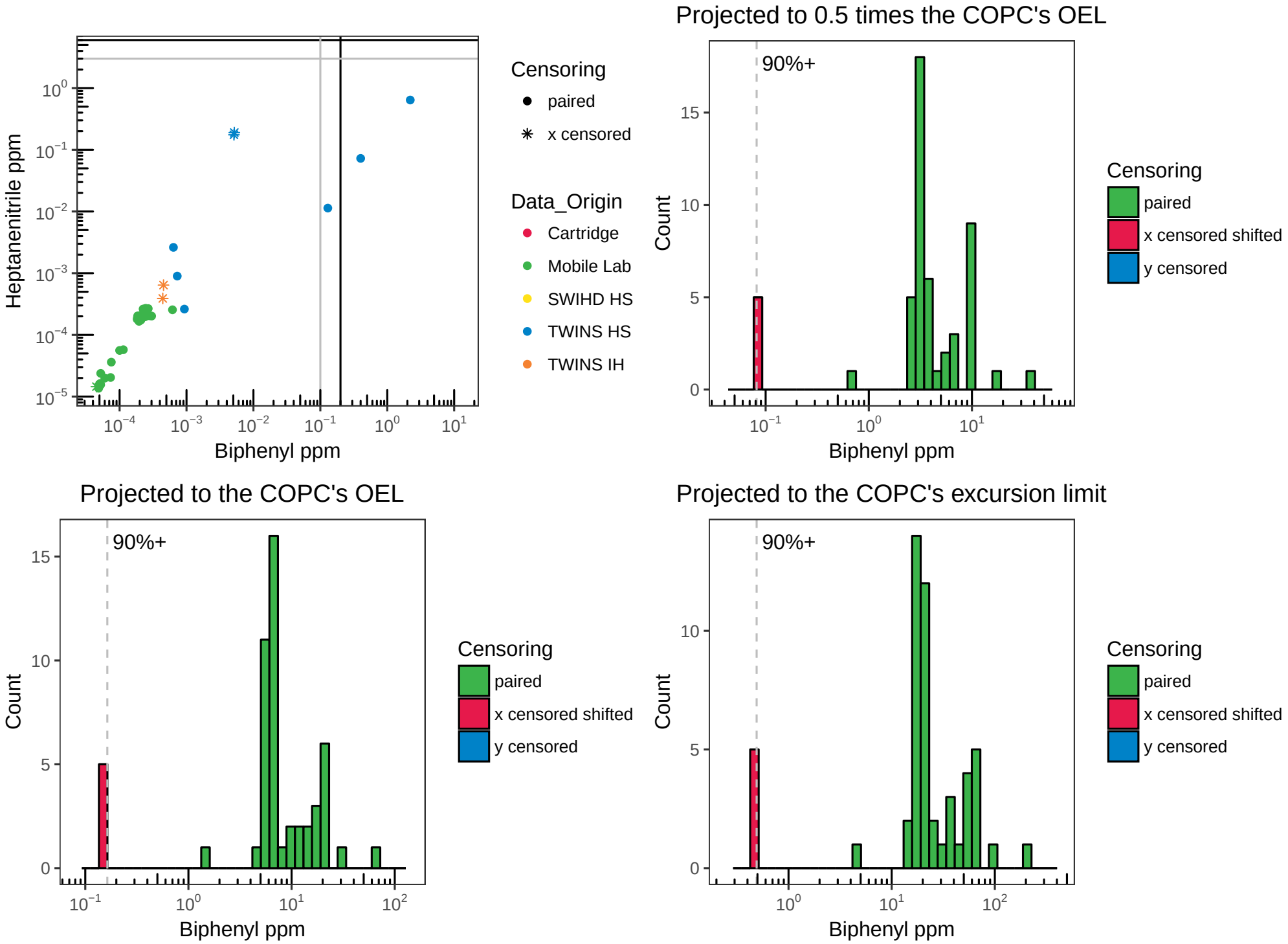


Figure C.312: Heptanenitrile vs Biphenyl

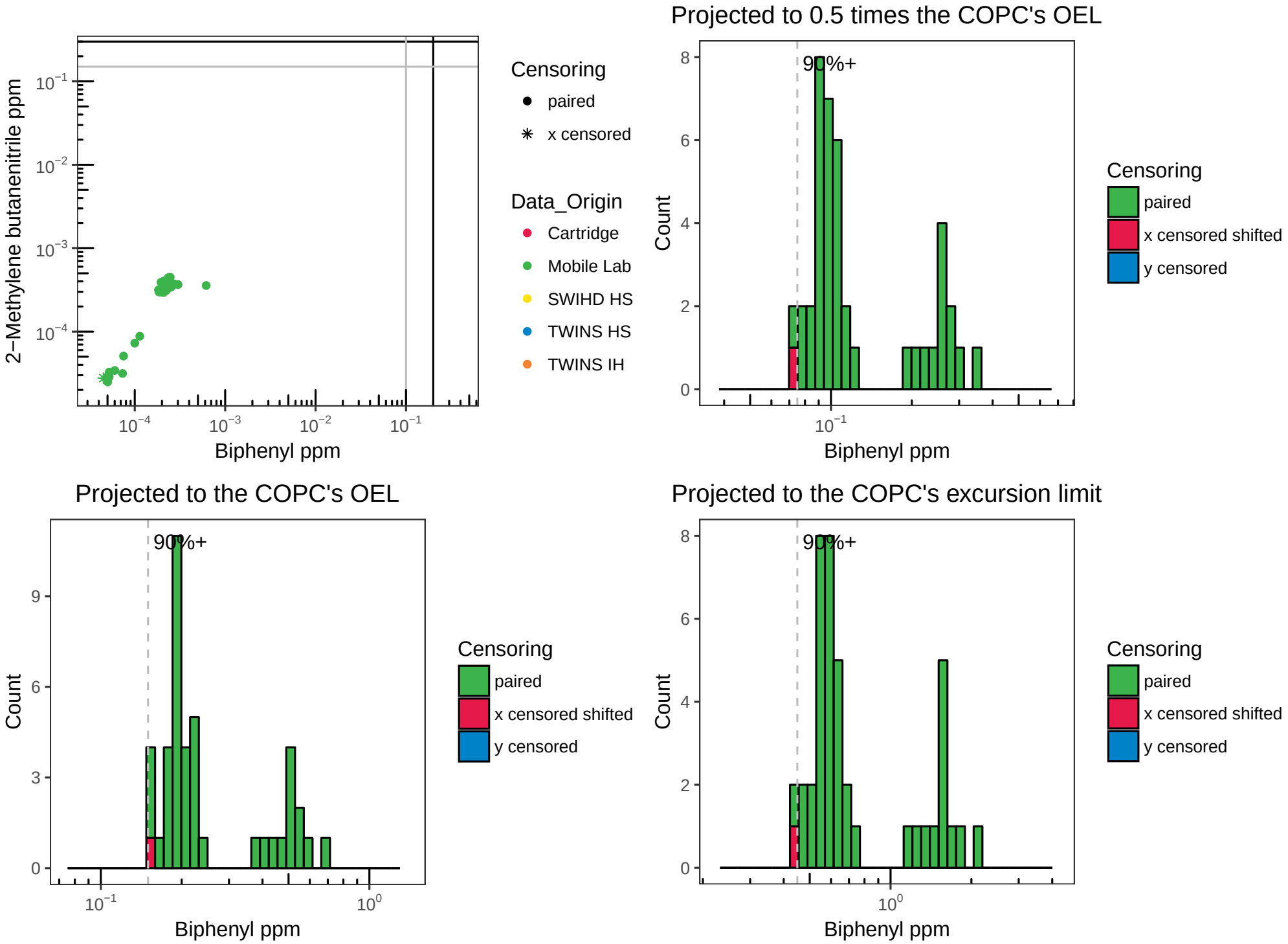


Figure C.313: 2-Methylene butanenitrile vs Biphenyl

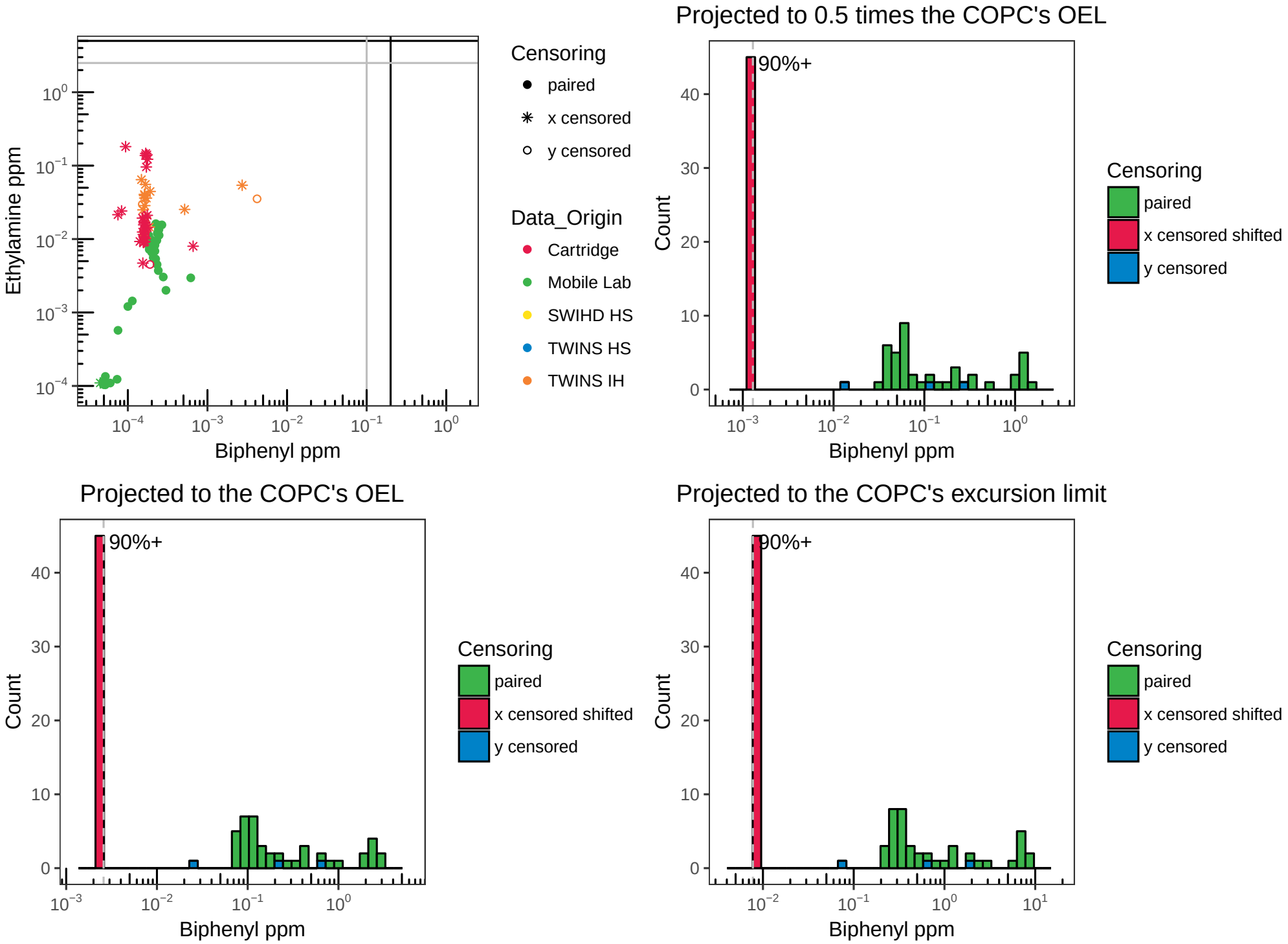


Figure C.314: Ethylamine vs Biphenyl

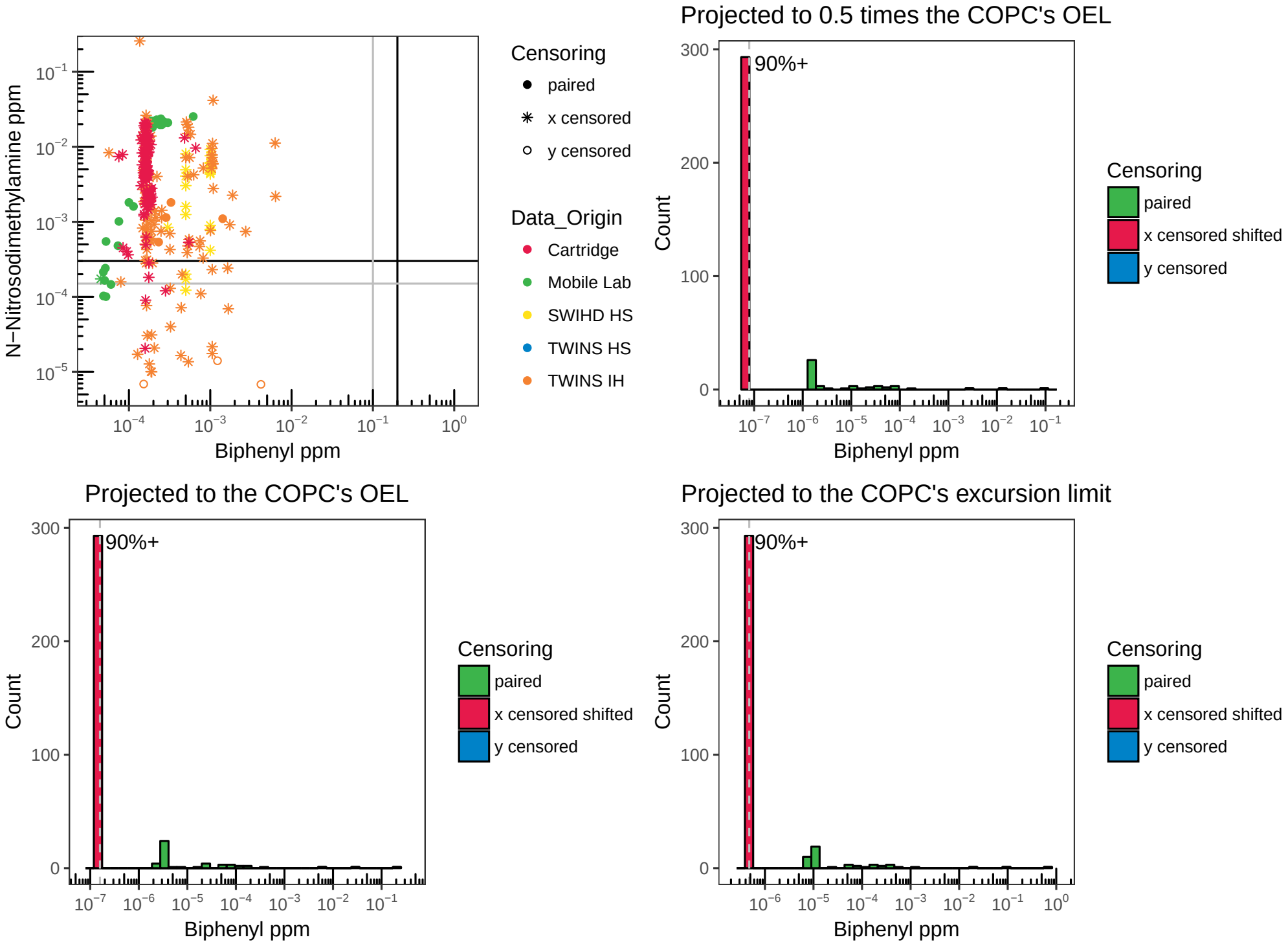


Figure C.315: N-Nitrosodimethylamine vs Biphenyl

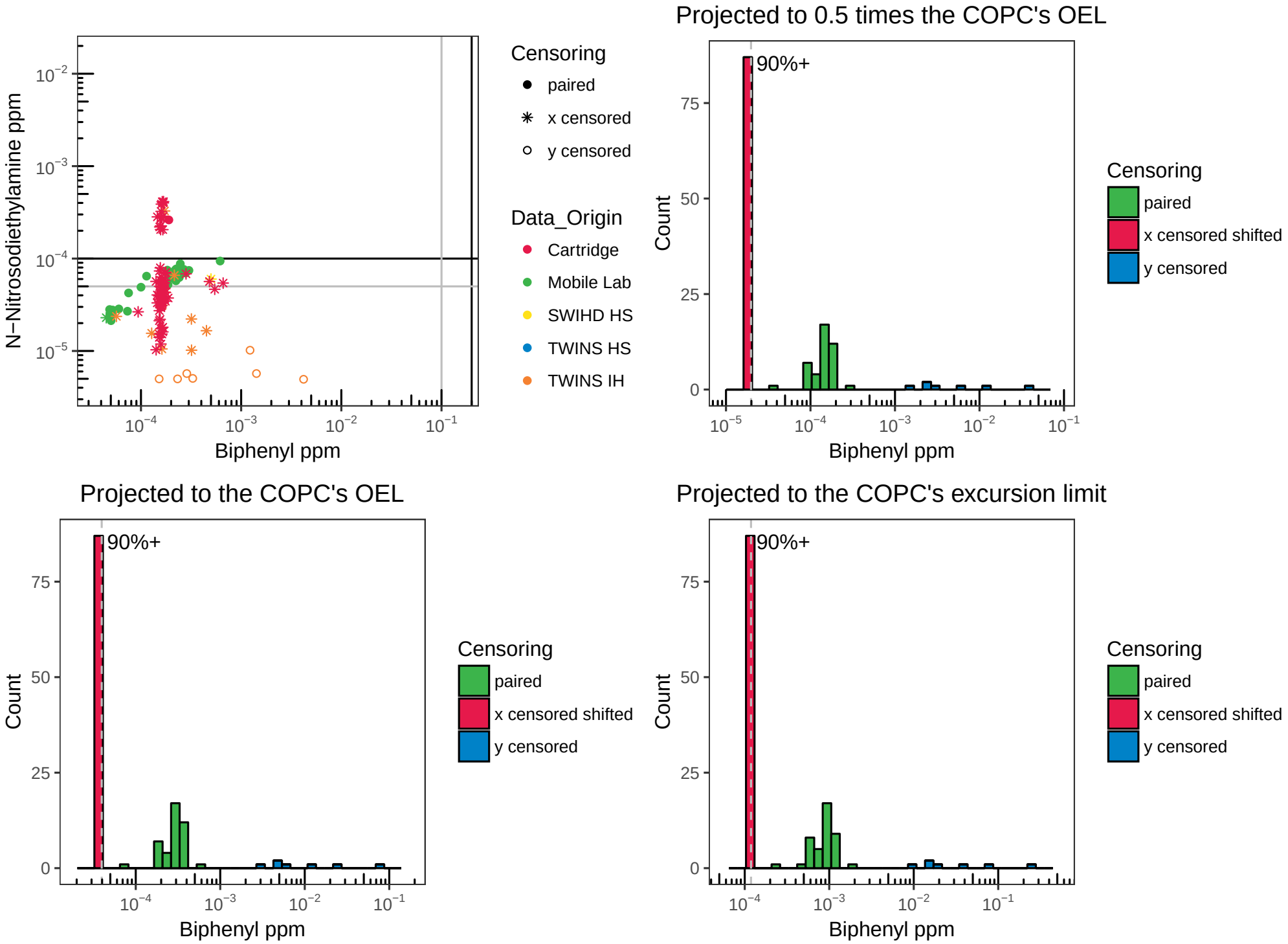


Figure C.316: N-Nitrosodiethylamine vs Biphenyl

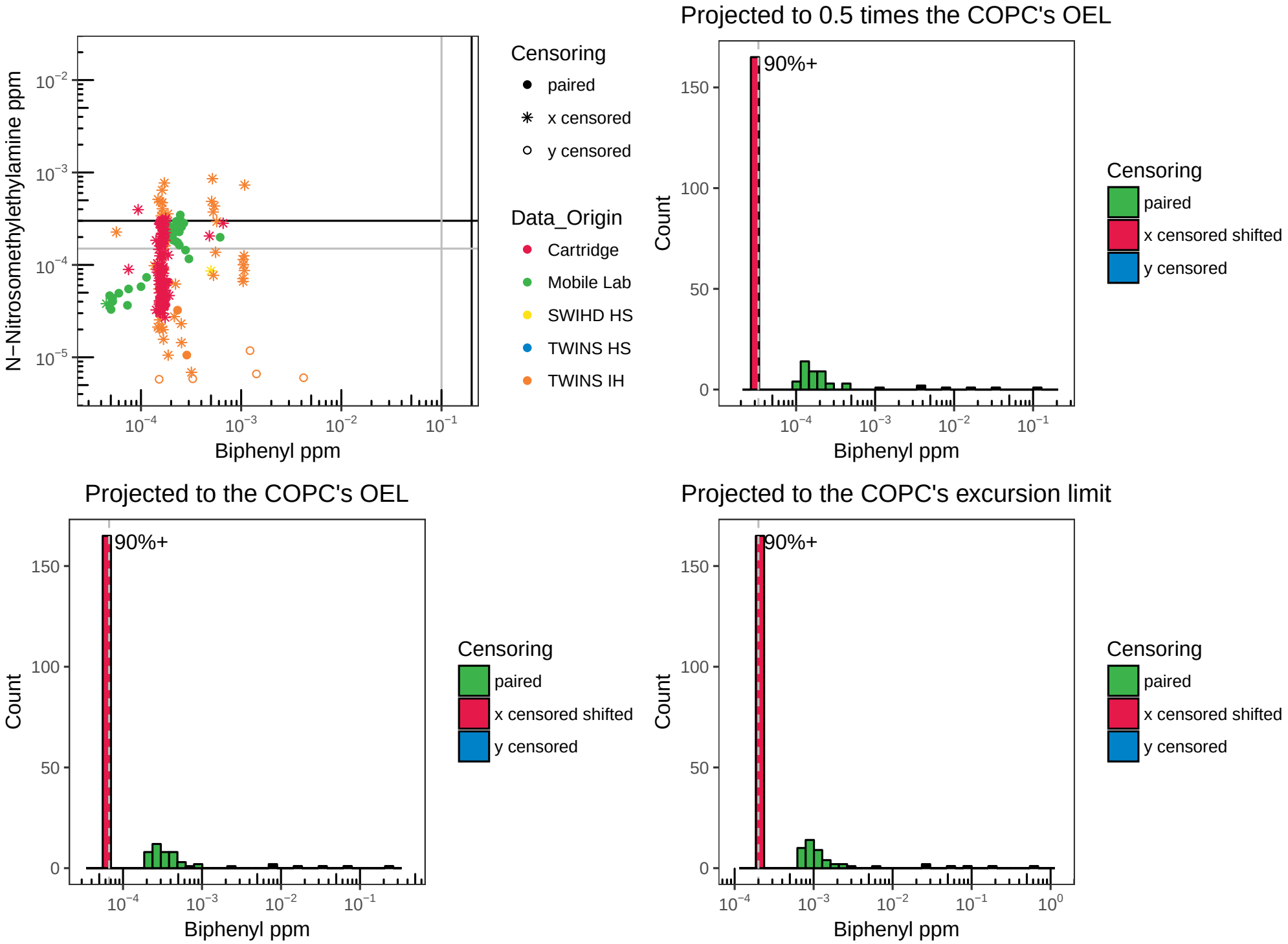


Figure C.317: N-Nitrosomethylethylamine vs Biphenyl

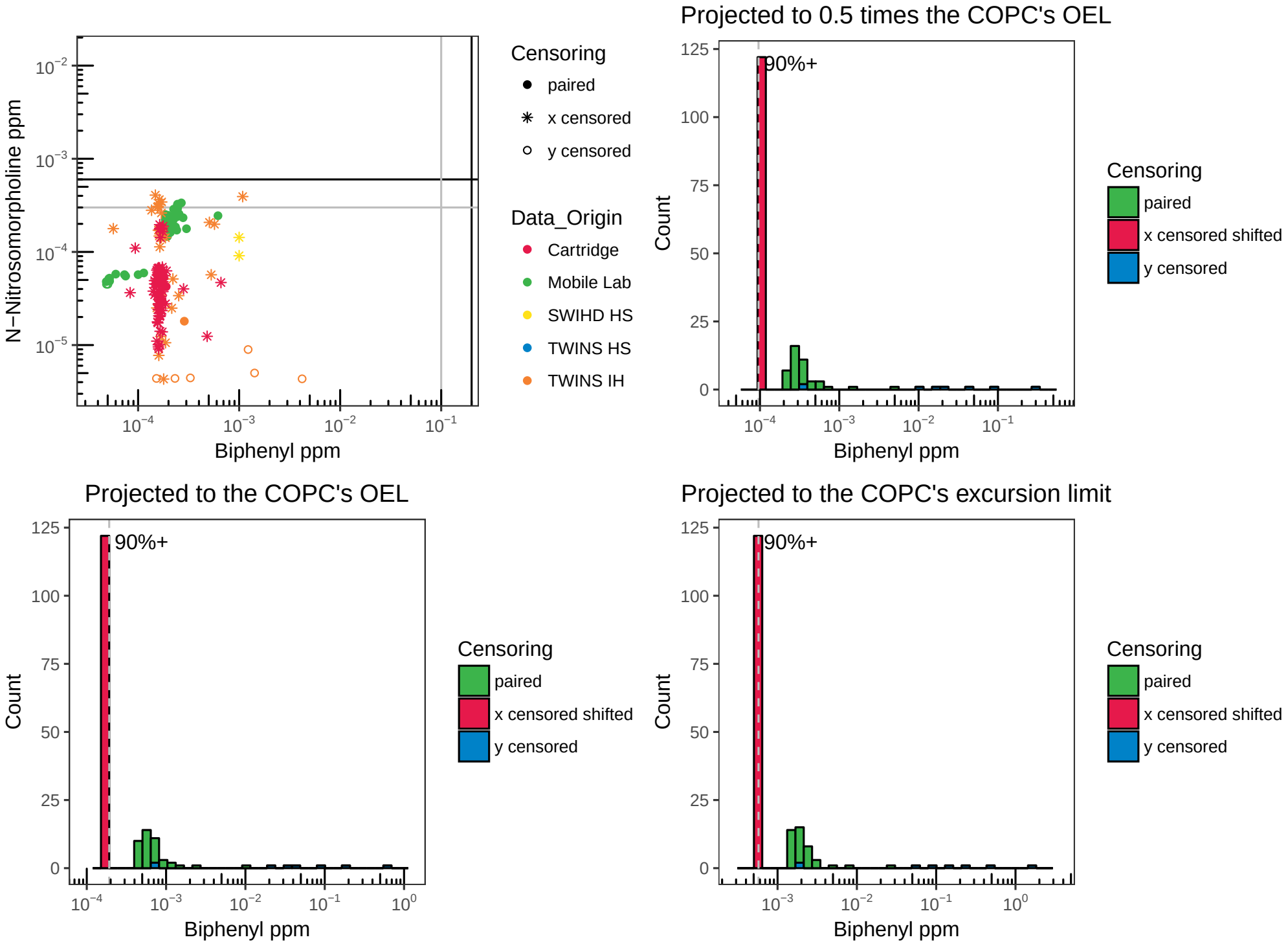


Figure C.318: N-Nitrosomorpholine vs Biphenyl

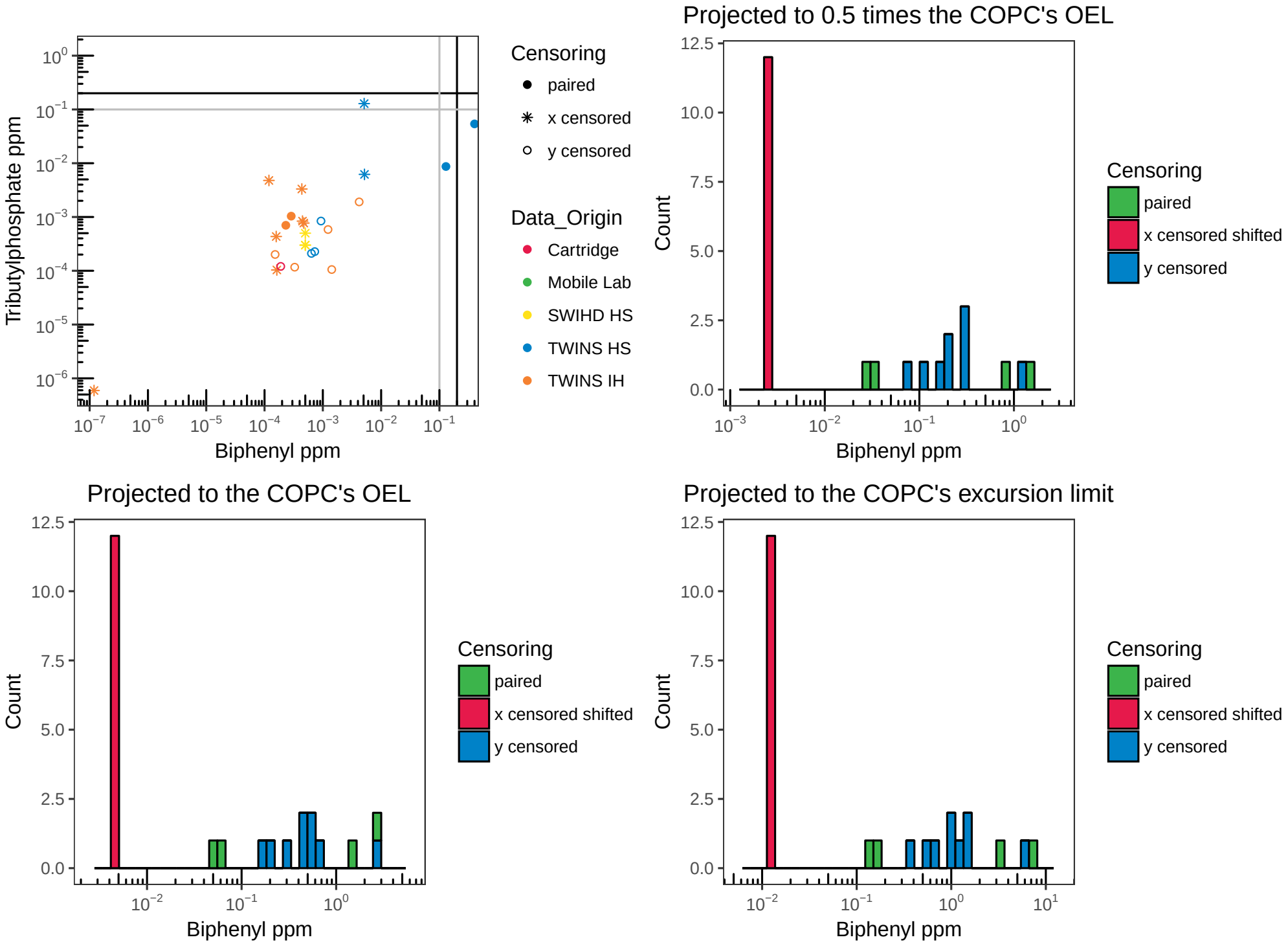


Figure C.319: Tributylphosphate vs Biphenyl

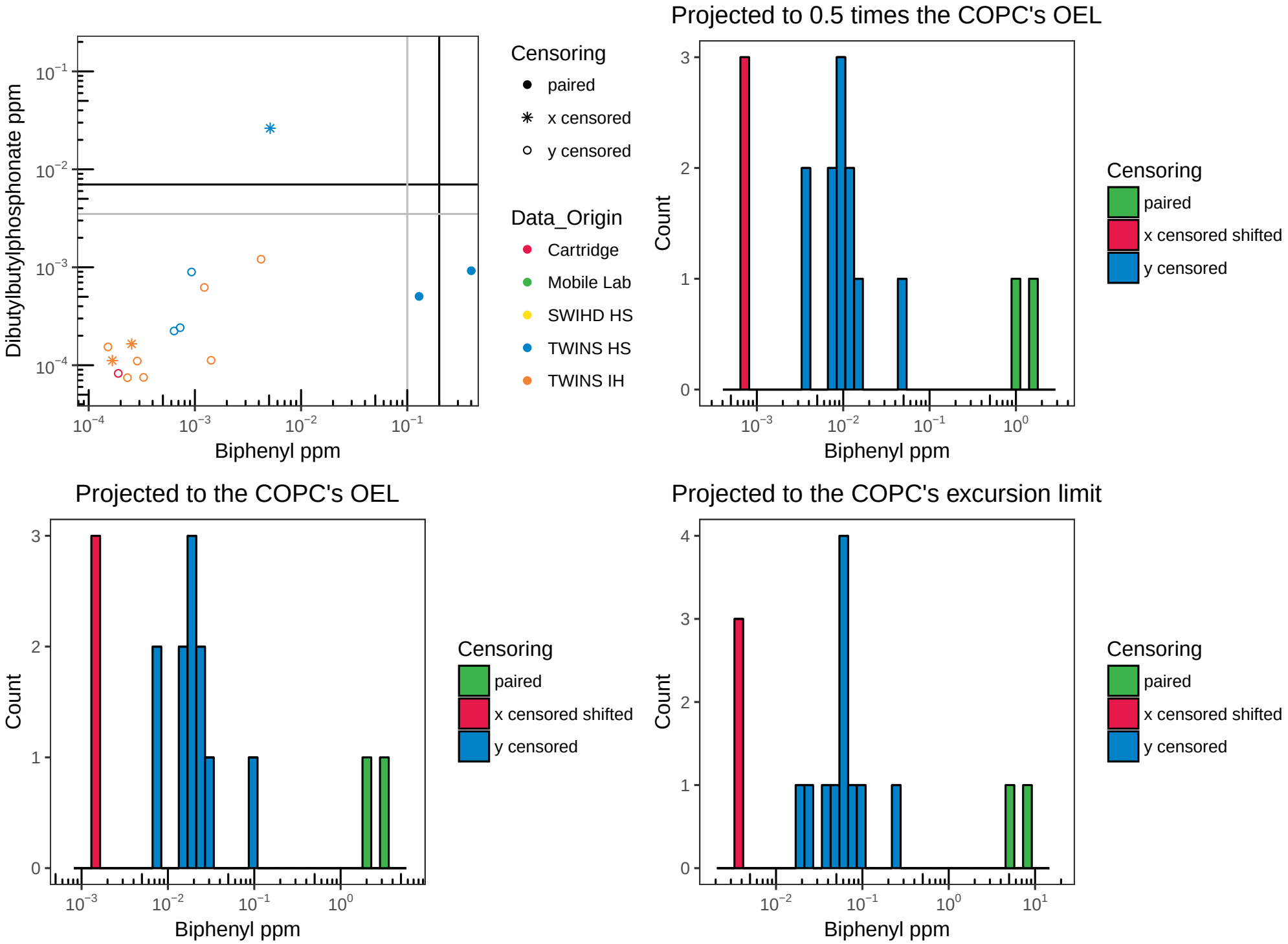


Figure C.320: Dibutylbutylphosphonate vs Biphenyl

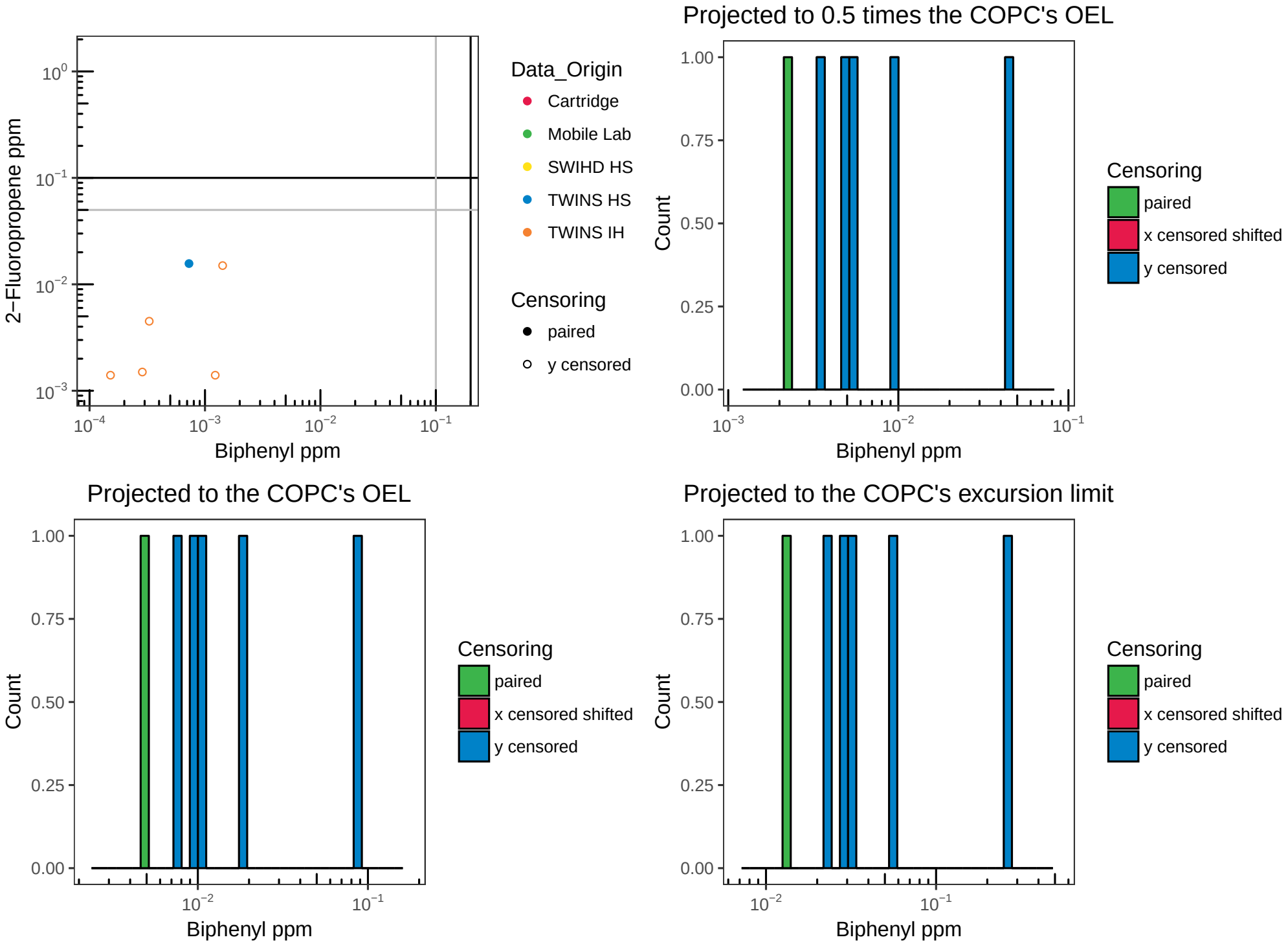


Figure C.321: 2-Fluoropropene vs Biphenyl

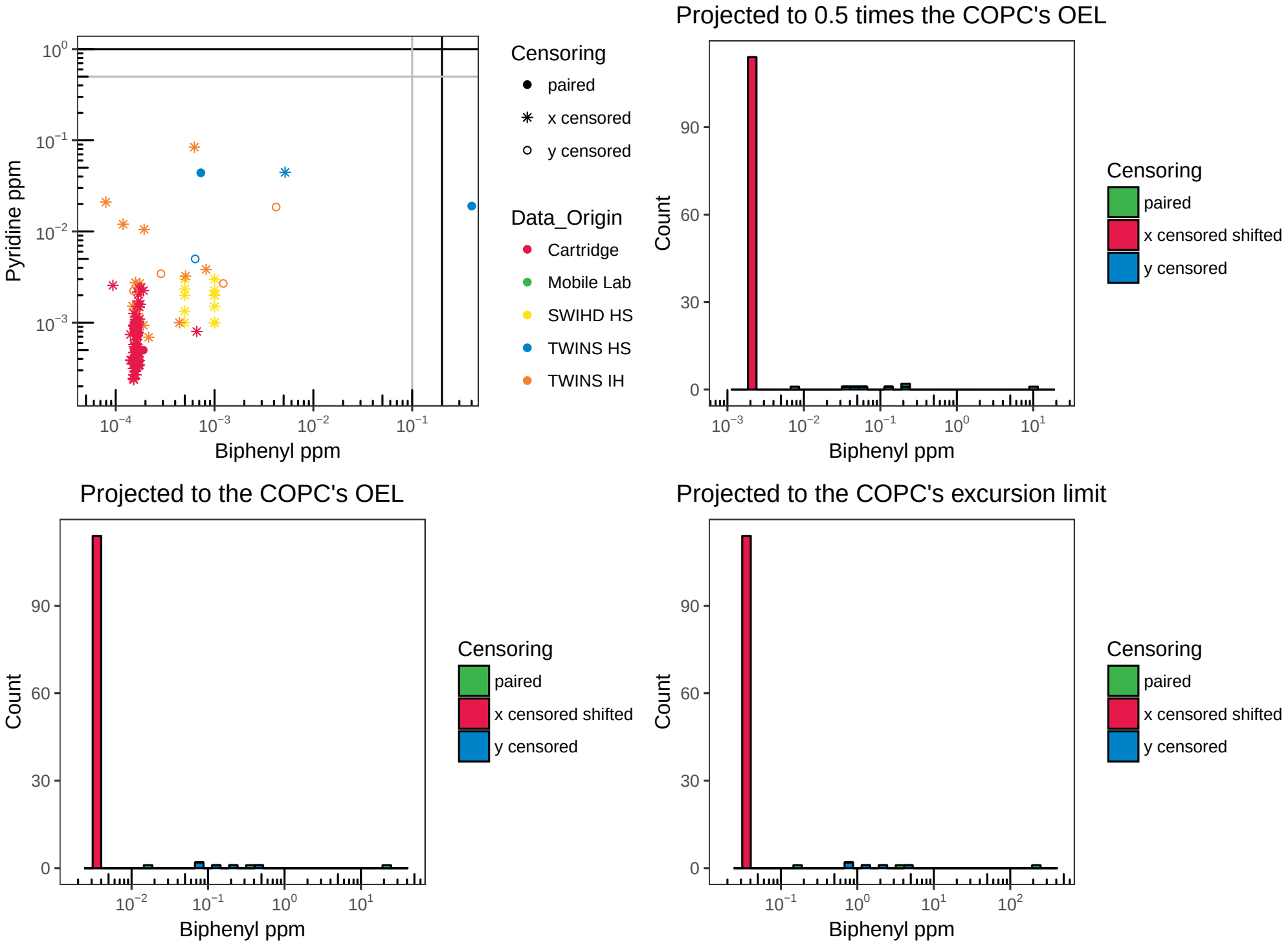


Figure C.322: Pyridine vs Biphenyl

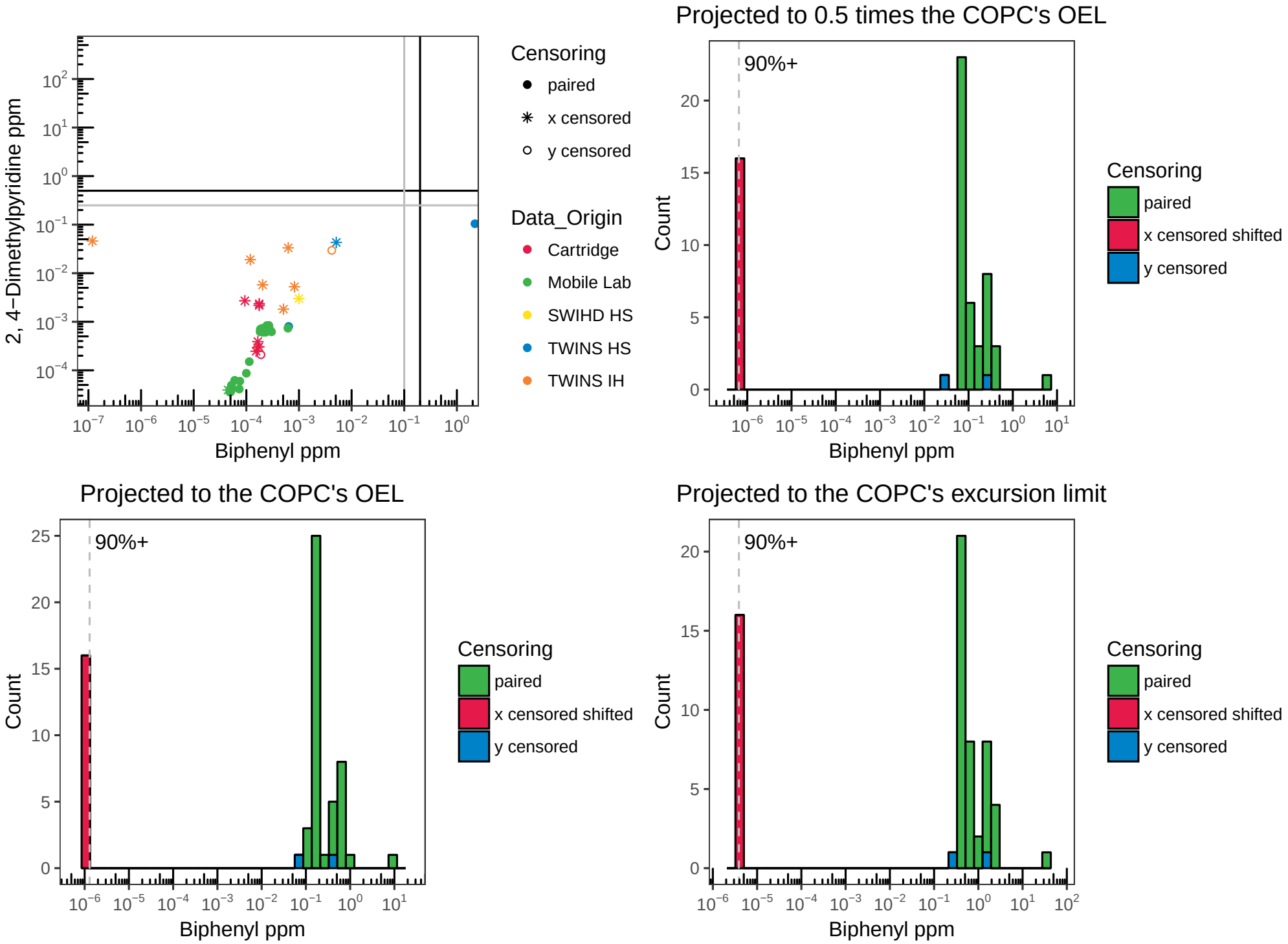


Figure C.323: 2, 4-Dimethylpyridine vs Biphenyl

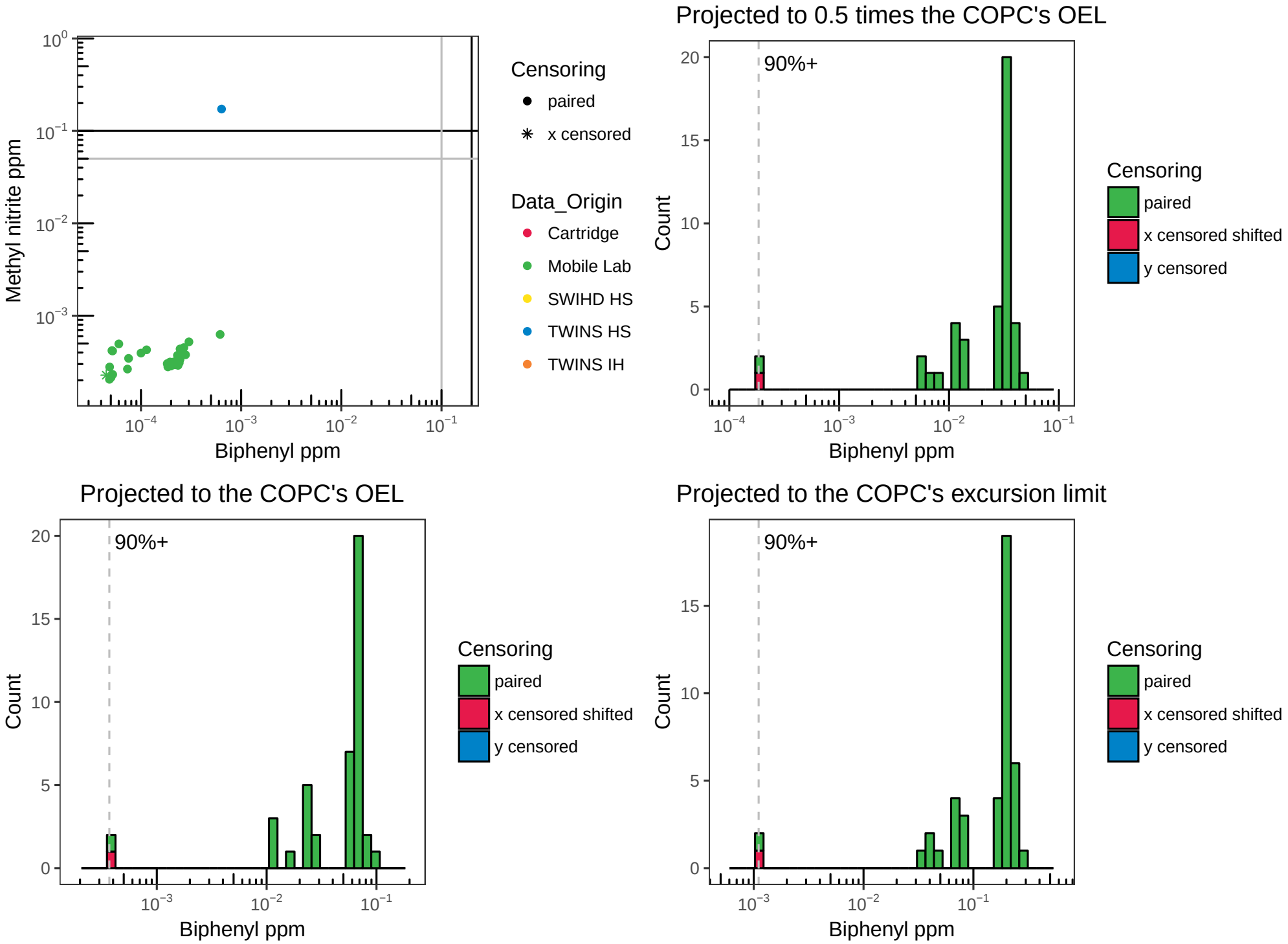


Figure C.324: Methyl nitrite vs Biphenyl

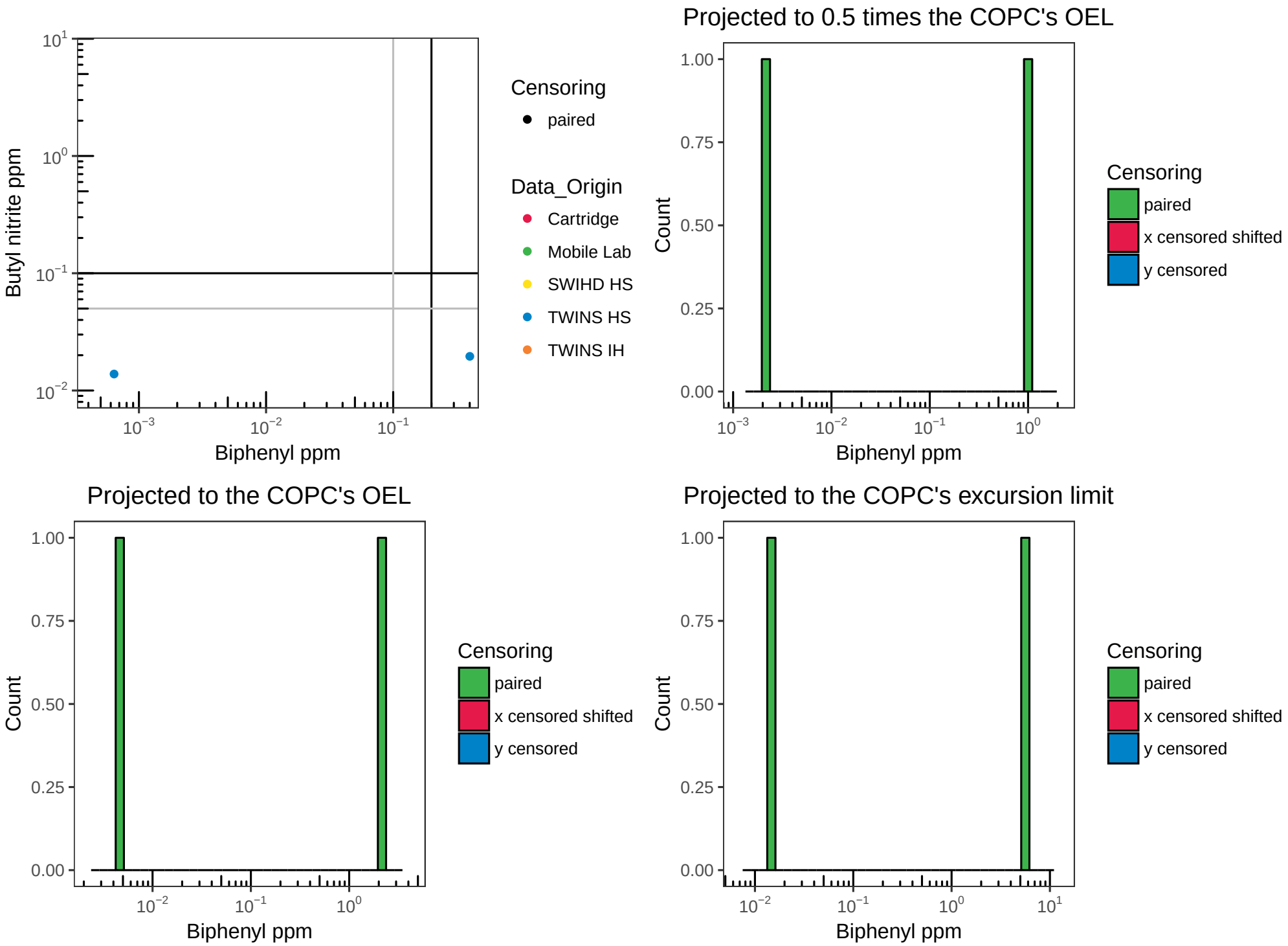


Figure C.325: Butyl nitrite vs Biphenyl

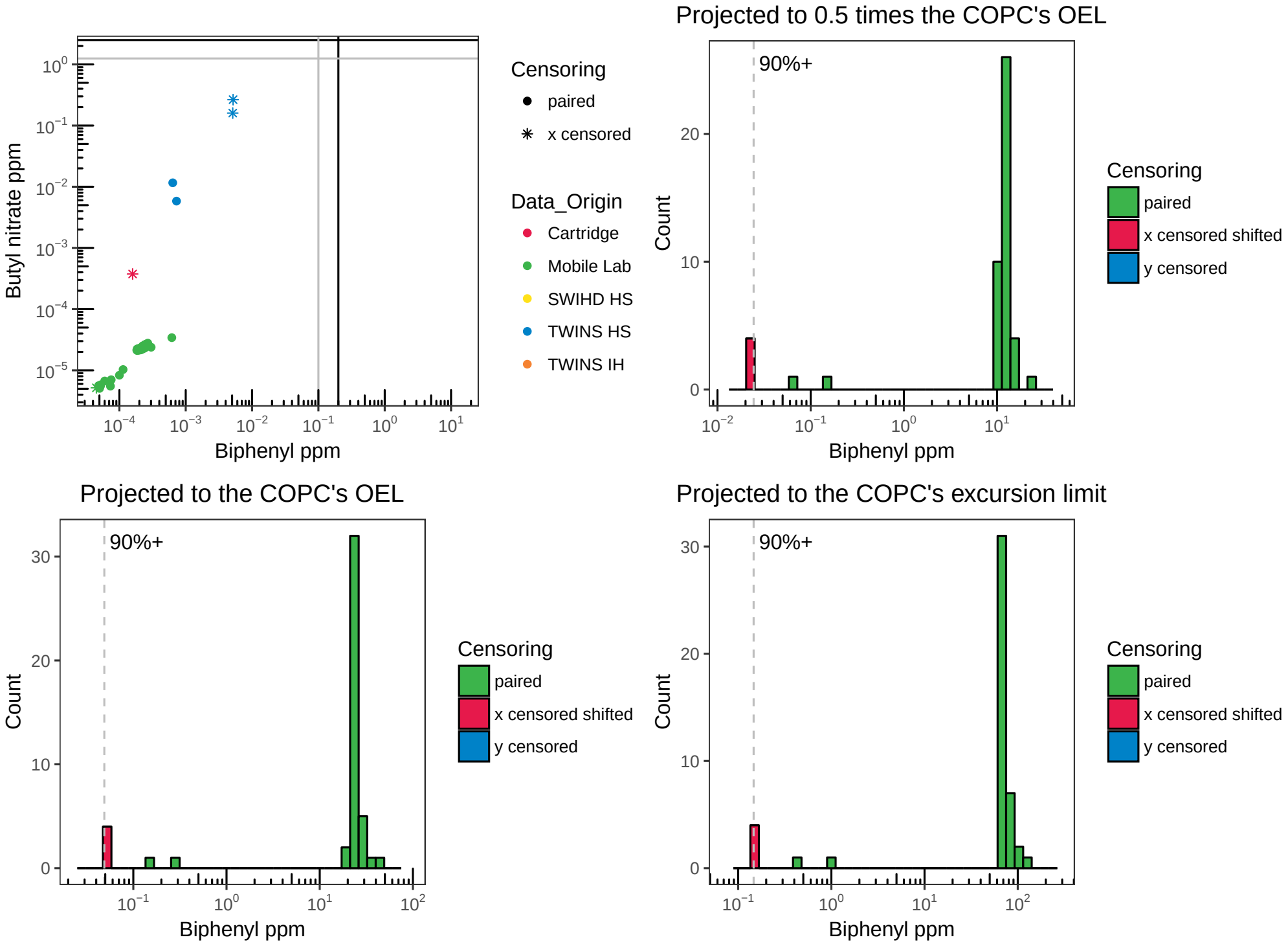


Figure C.326: Butyl nitrate vs Biphenyl

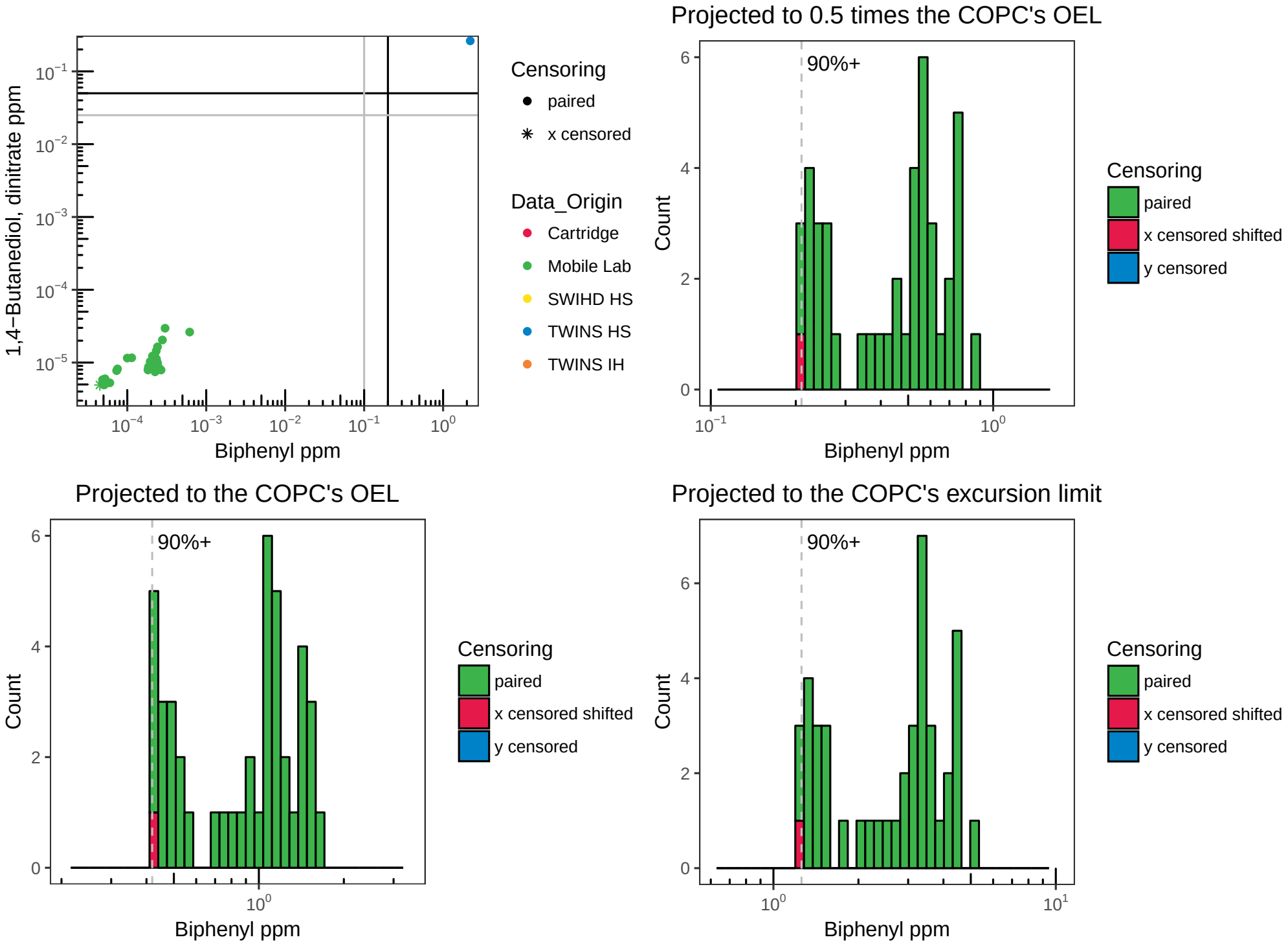


Figure C.327: 1,4-Butanediol, dinitrate vs Biphenyl

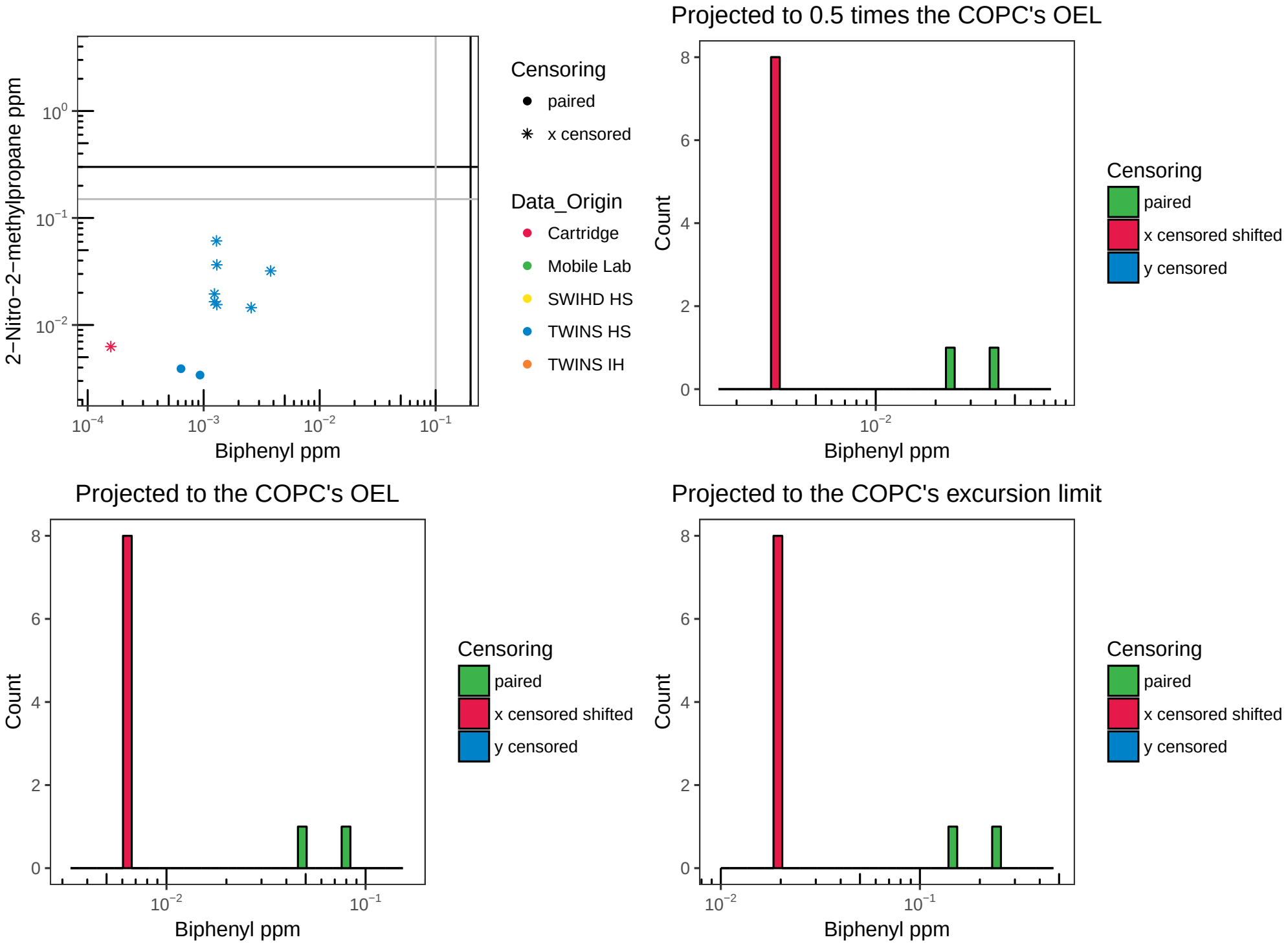


Figure C.328: 2-Nitro-2-methylpropane vs Biphenyl

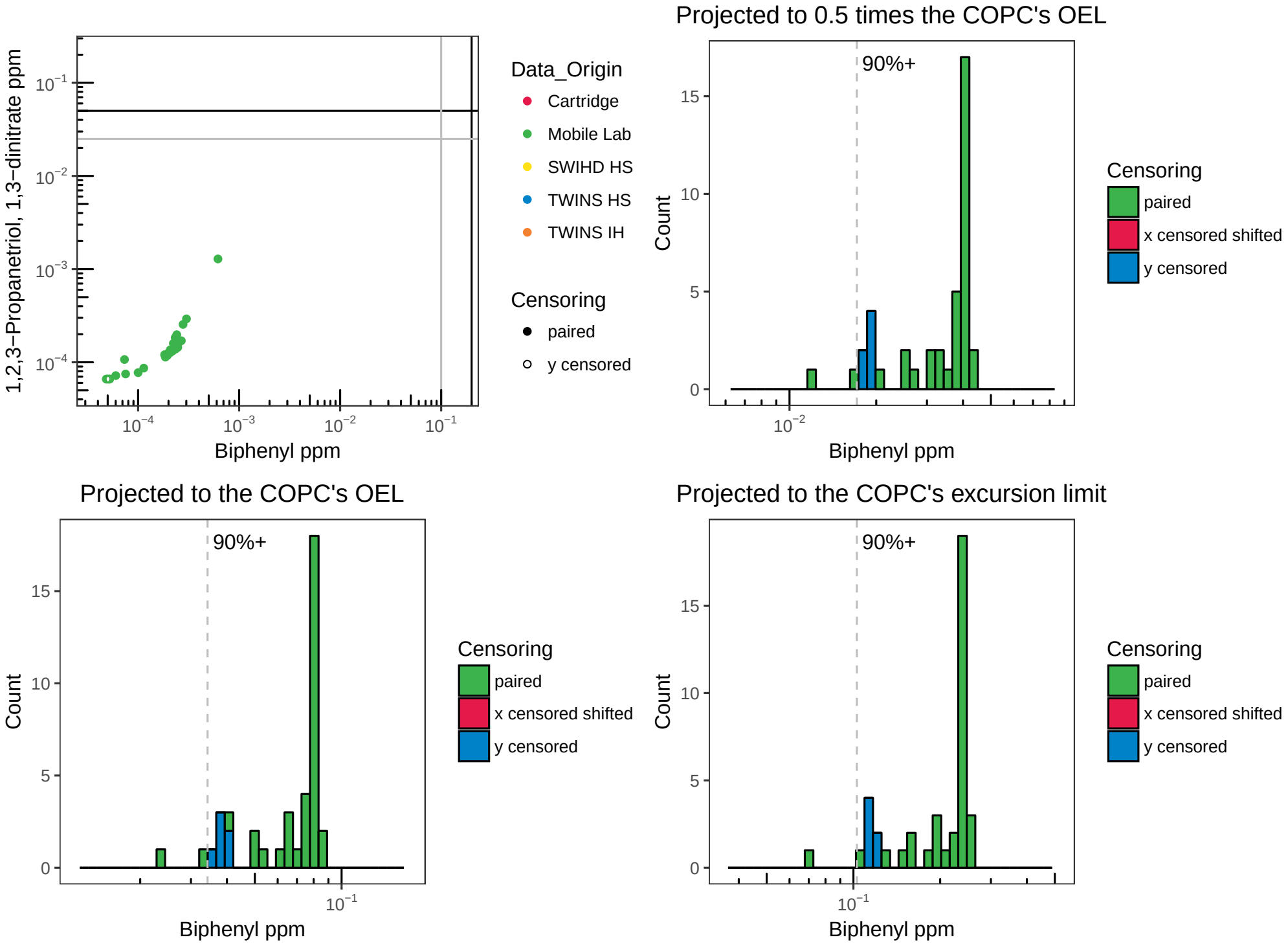


Figure C.329: 1,2,3-Propanetriol, 1,3-dinitrate vs Biphenyl

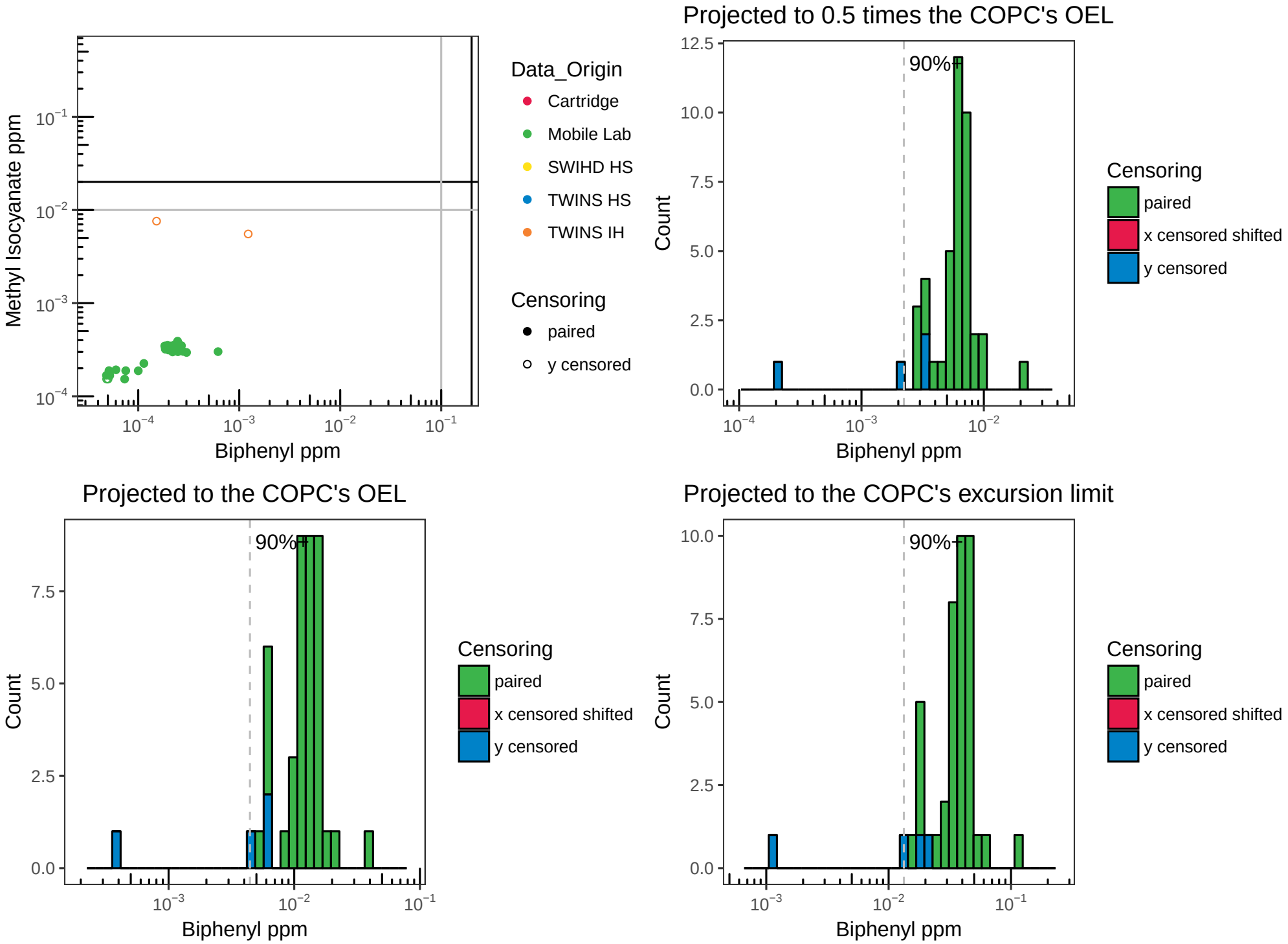


Figure C.330: Methyl Isocyanate vs Biphenyl

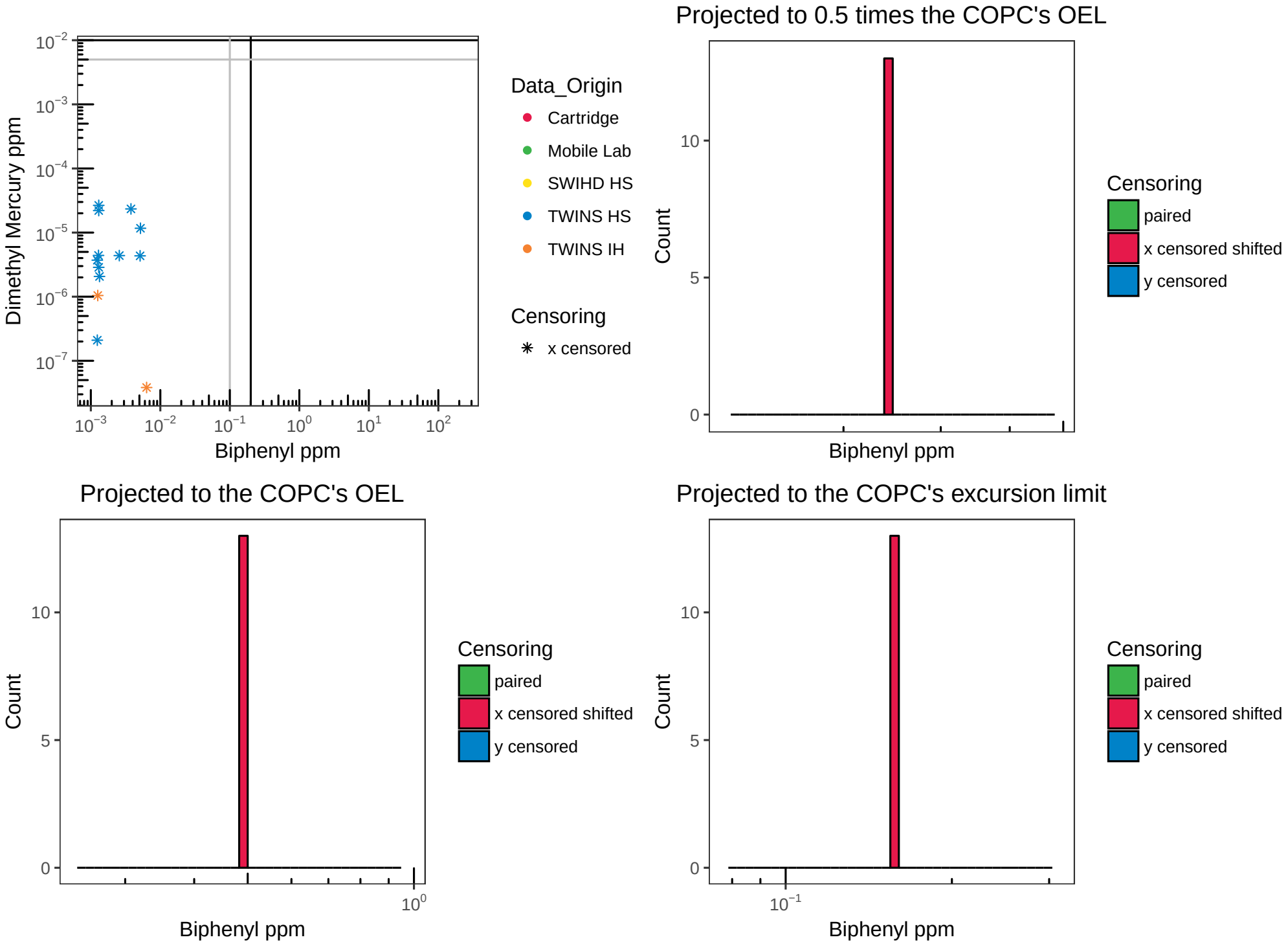


Figure C.331: Dimethyl Mercury vs Biphenyl

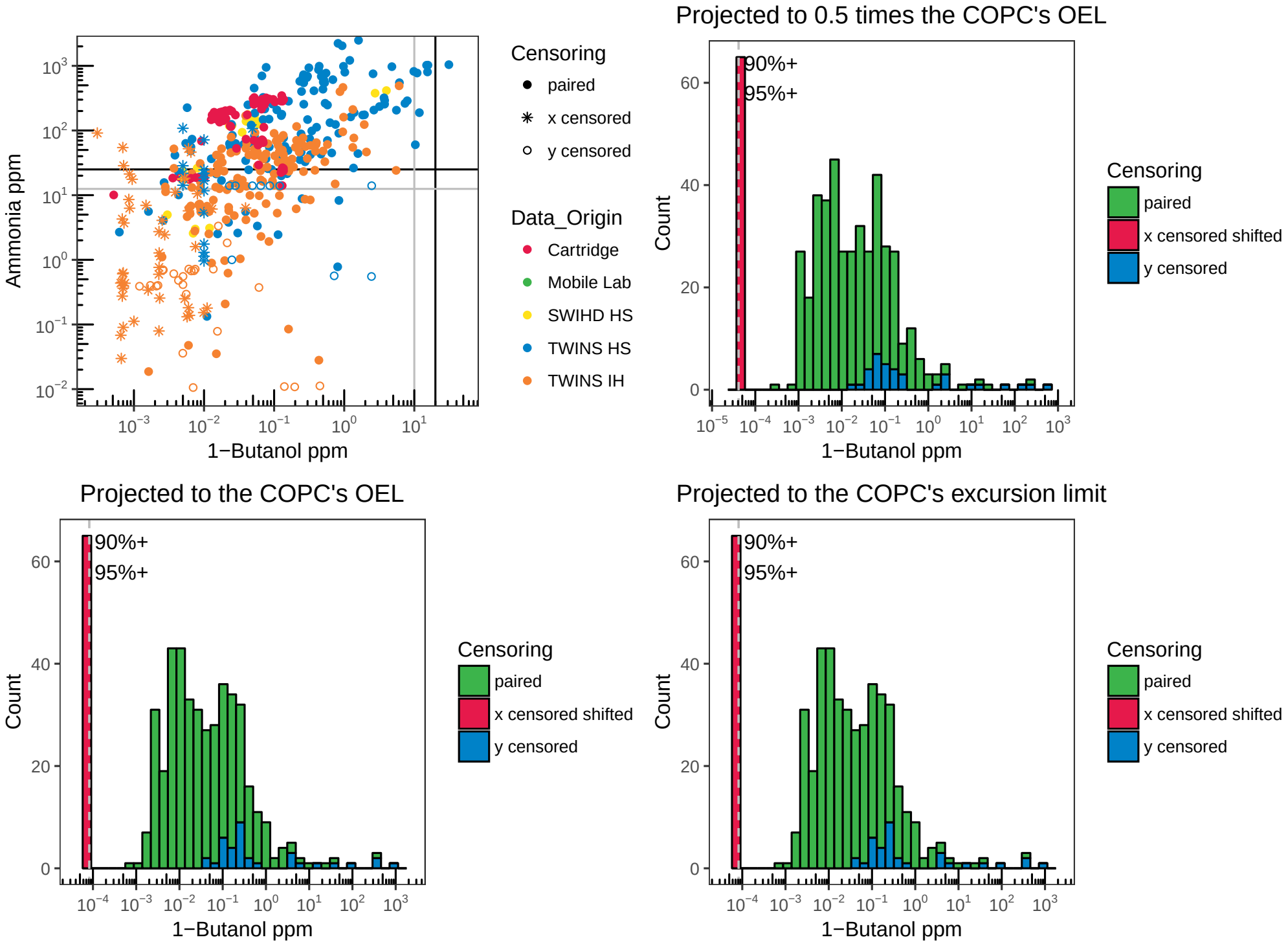


Figure C.332: Ammonia vs 1-Butanol

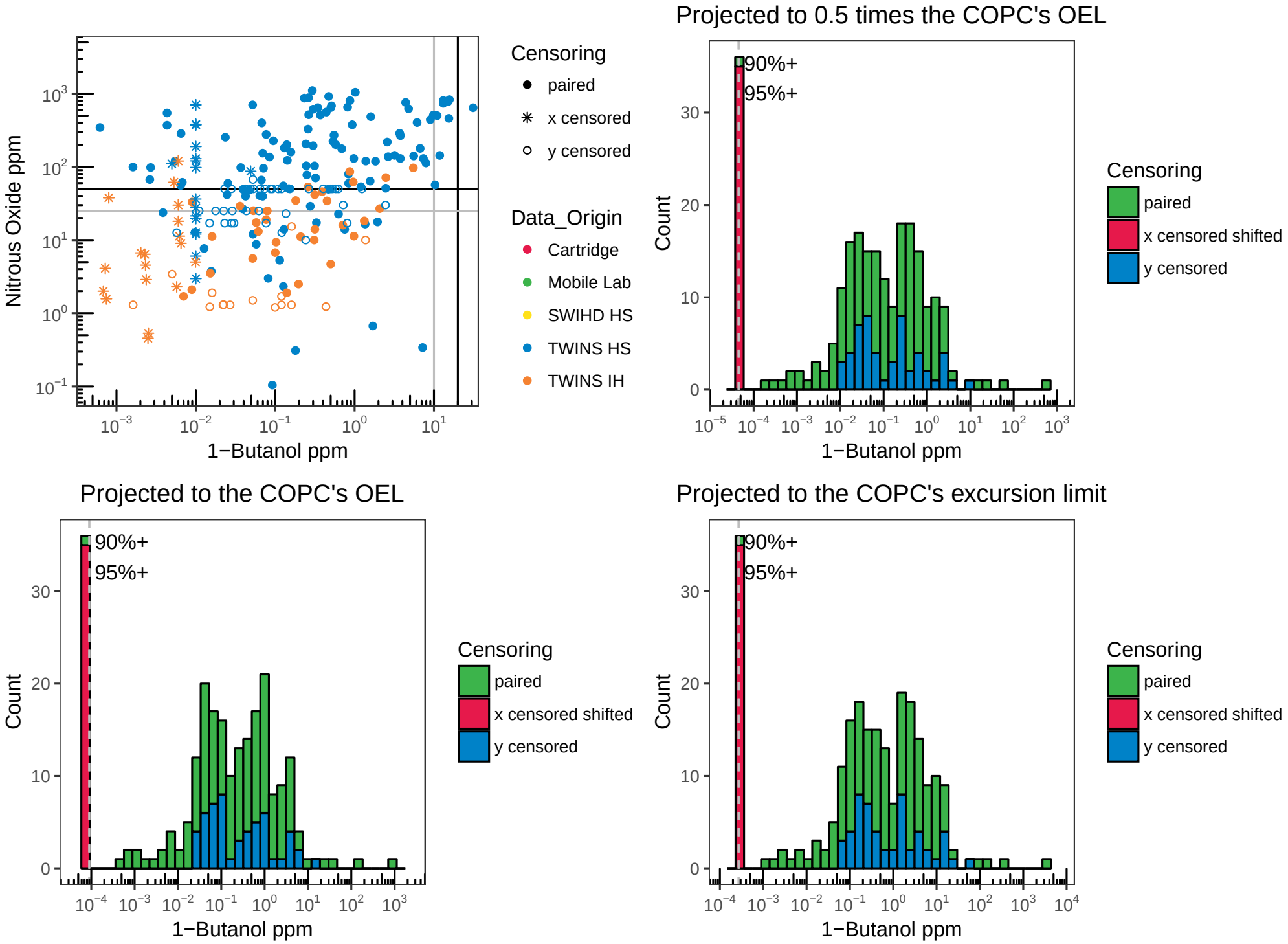


Figure C.333: Nitrous Oxide vs 1-Butanol

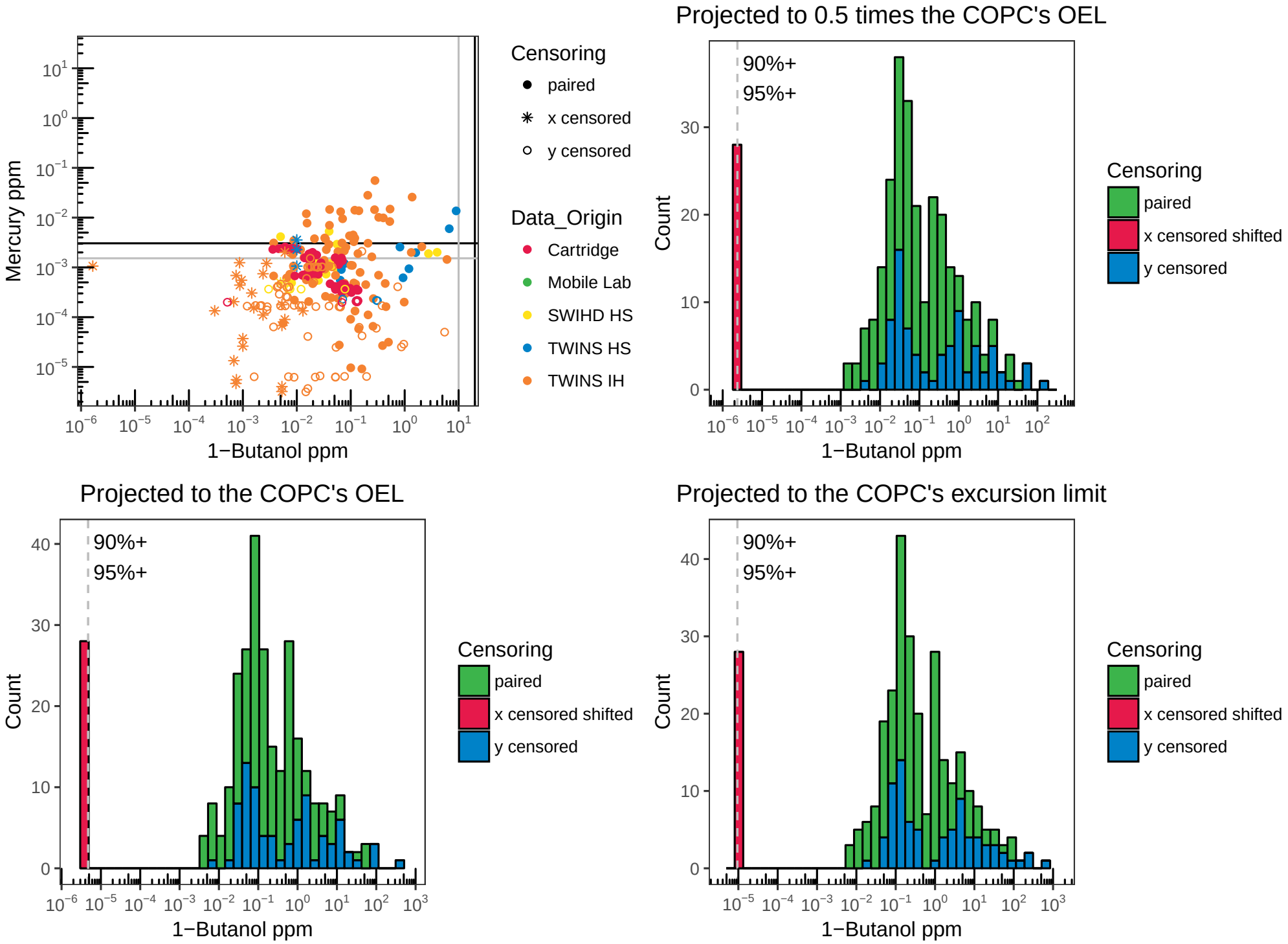


Figure C.334: Mercury vs 1-Butanol

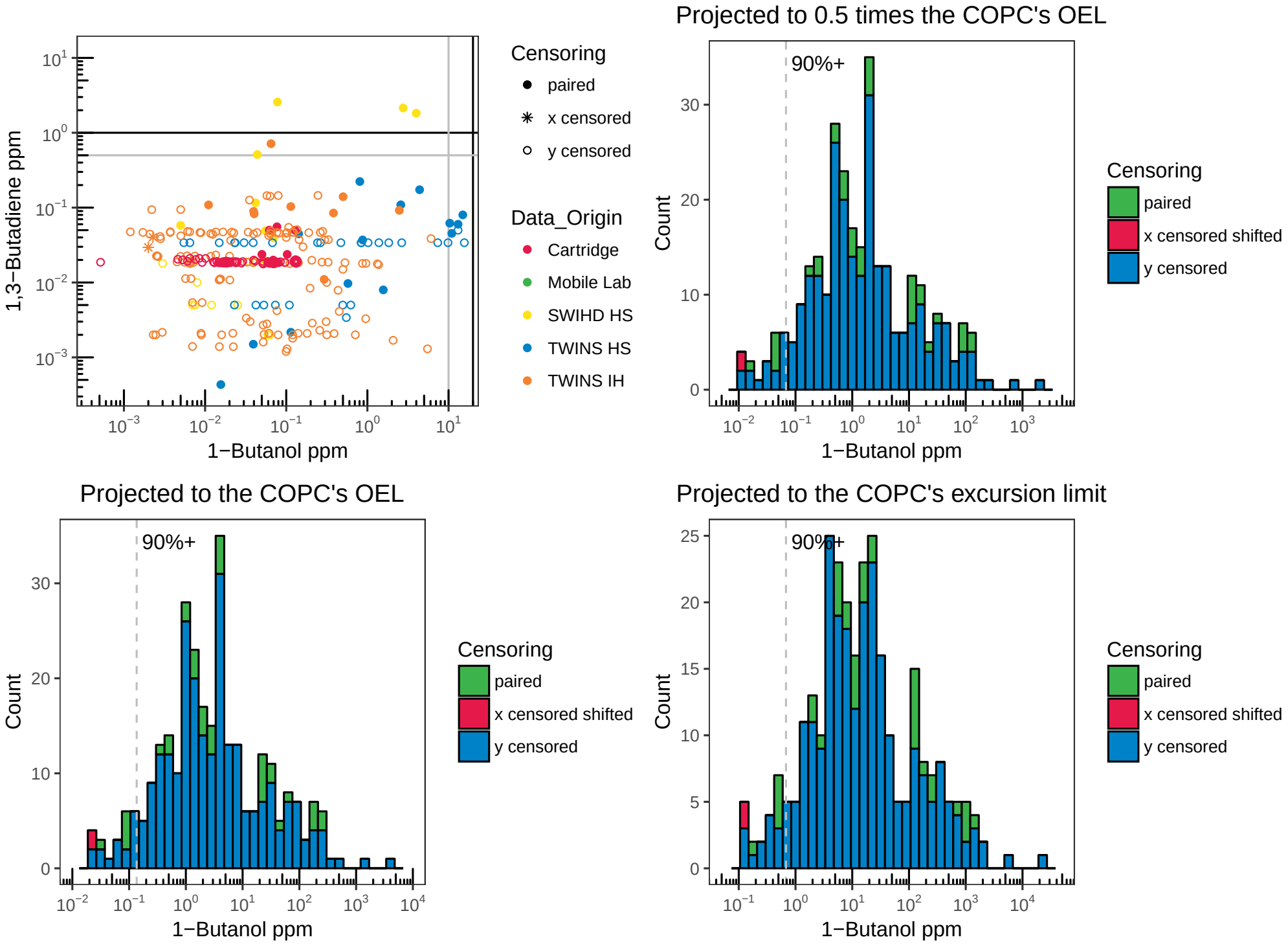


Figure C.335: 1,3-Butadiene vs 1-Butanol

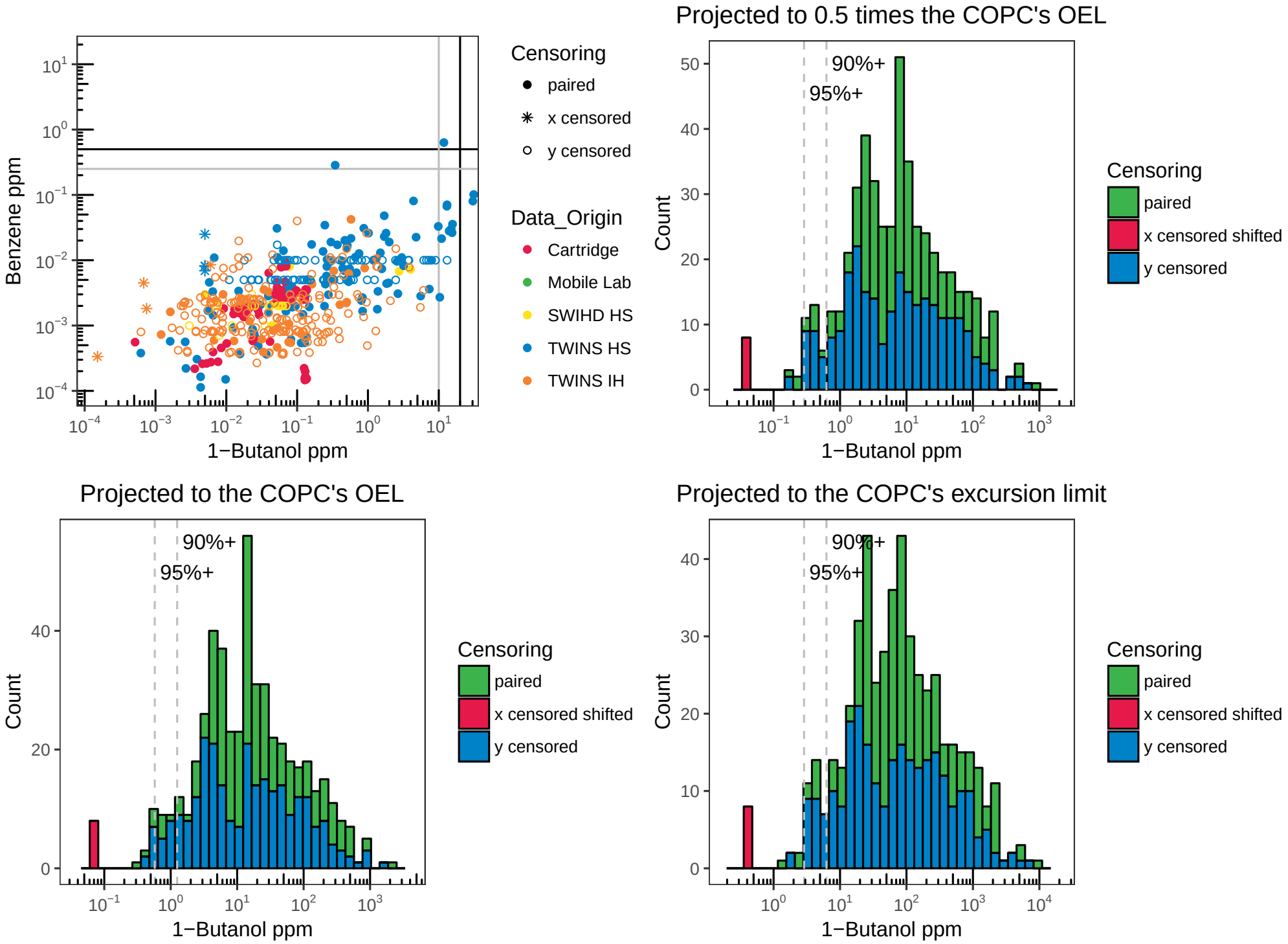


Figure C.336: Benzene vs 1-Butanol

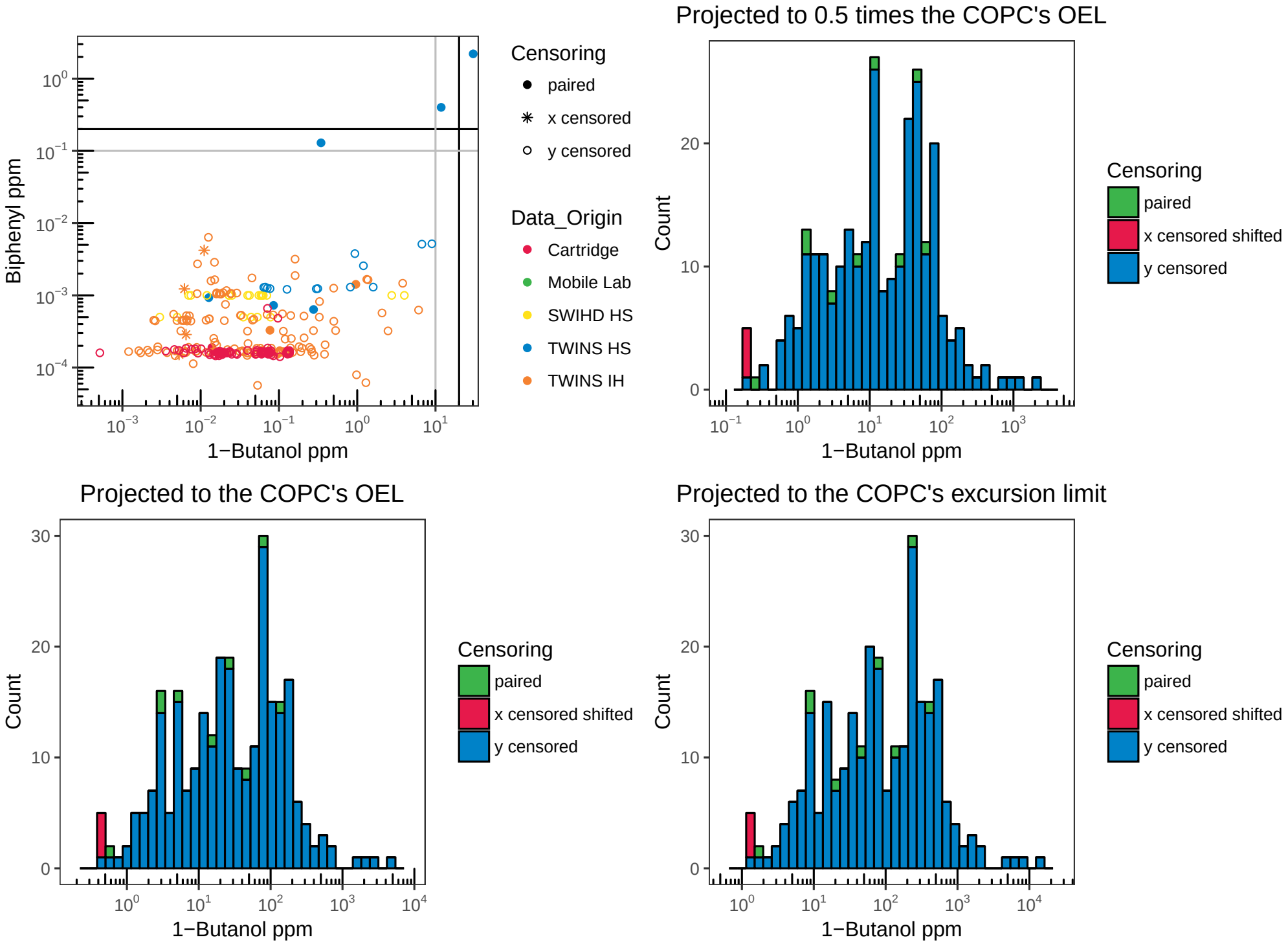


Figure C.337: Biphenyl vs 1-Butanol

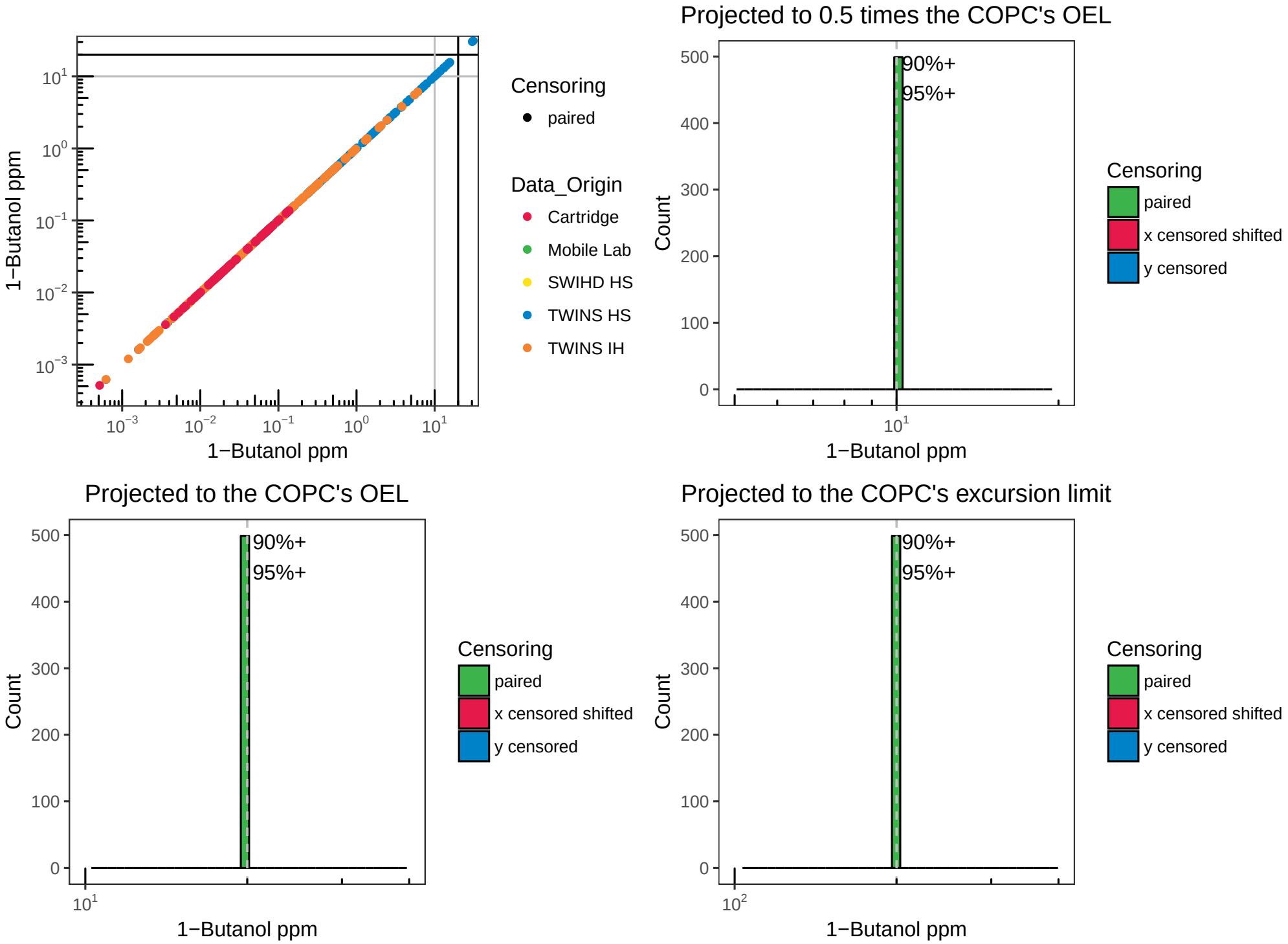


Figure C.338: 1-Butanol vs 1-Butanol

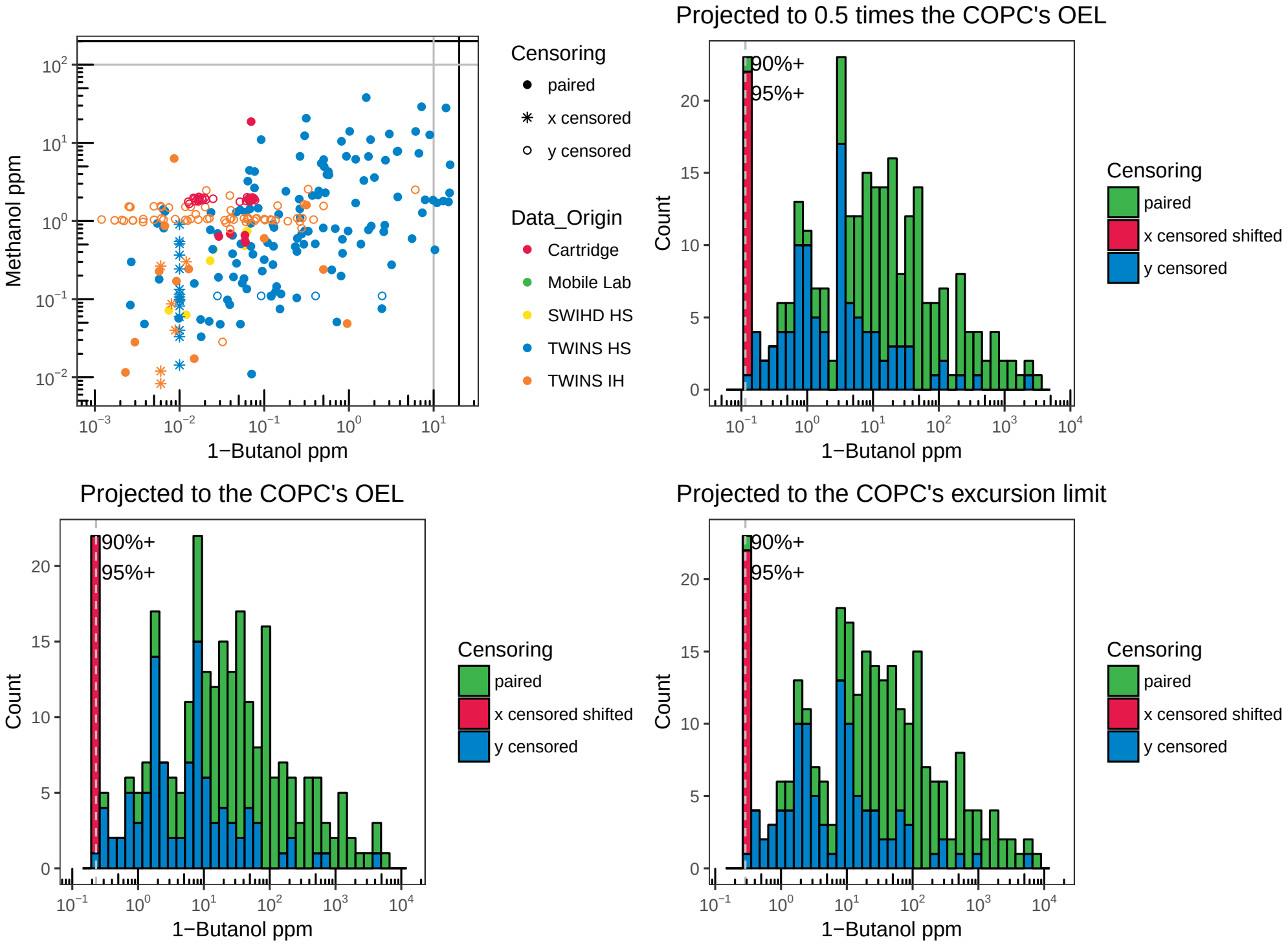


Figure C.339: Methanol vs 1-Butanol

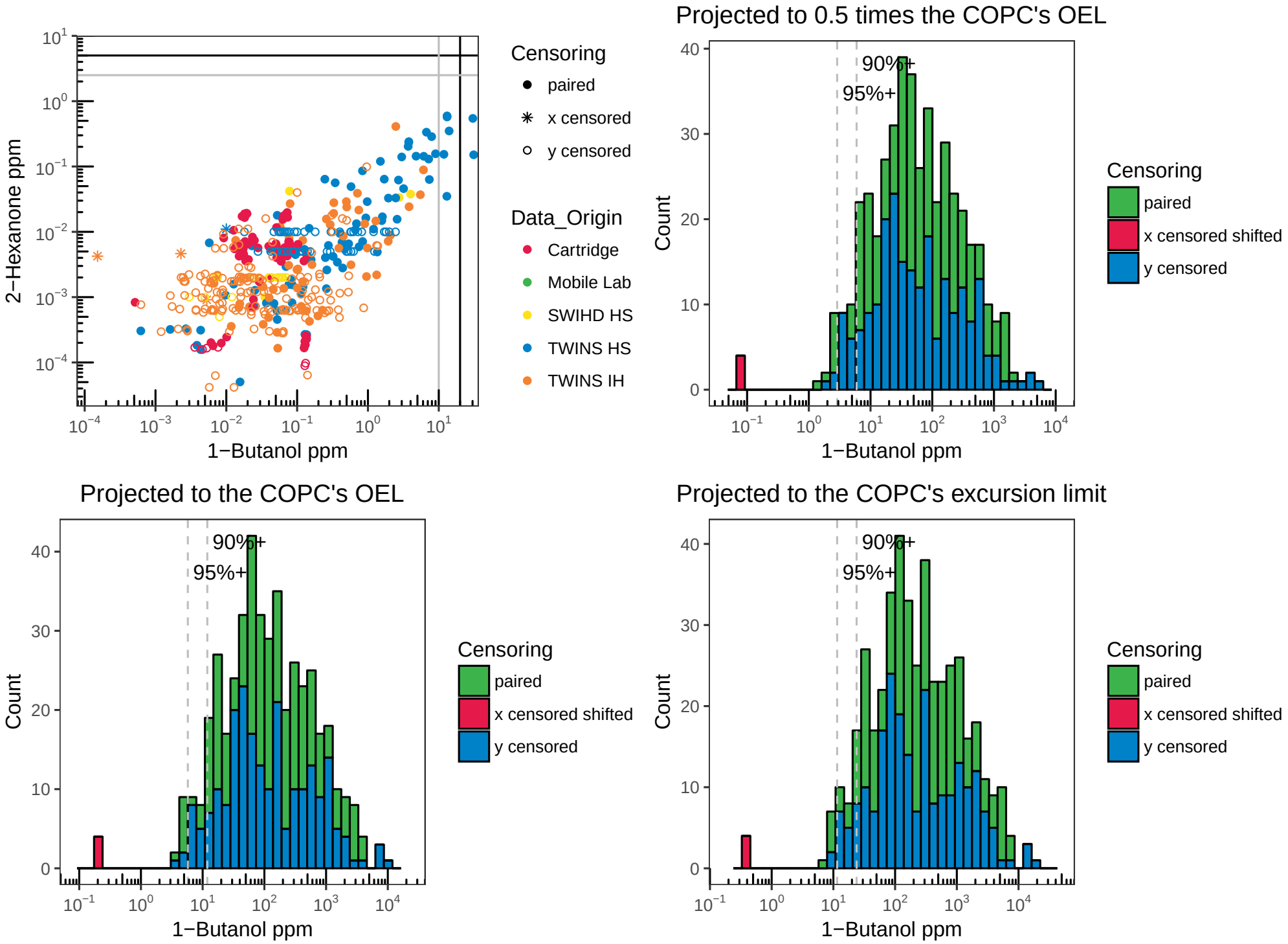


Figure C.340: 2-Hexanone vs 1-Butanol

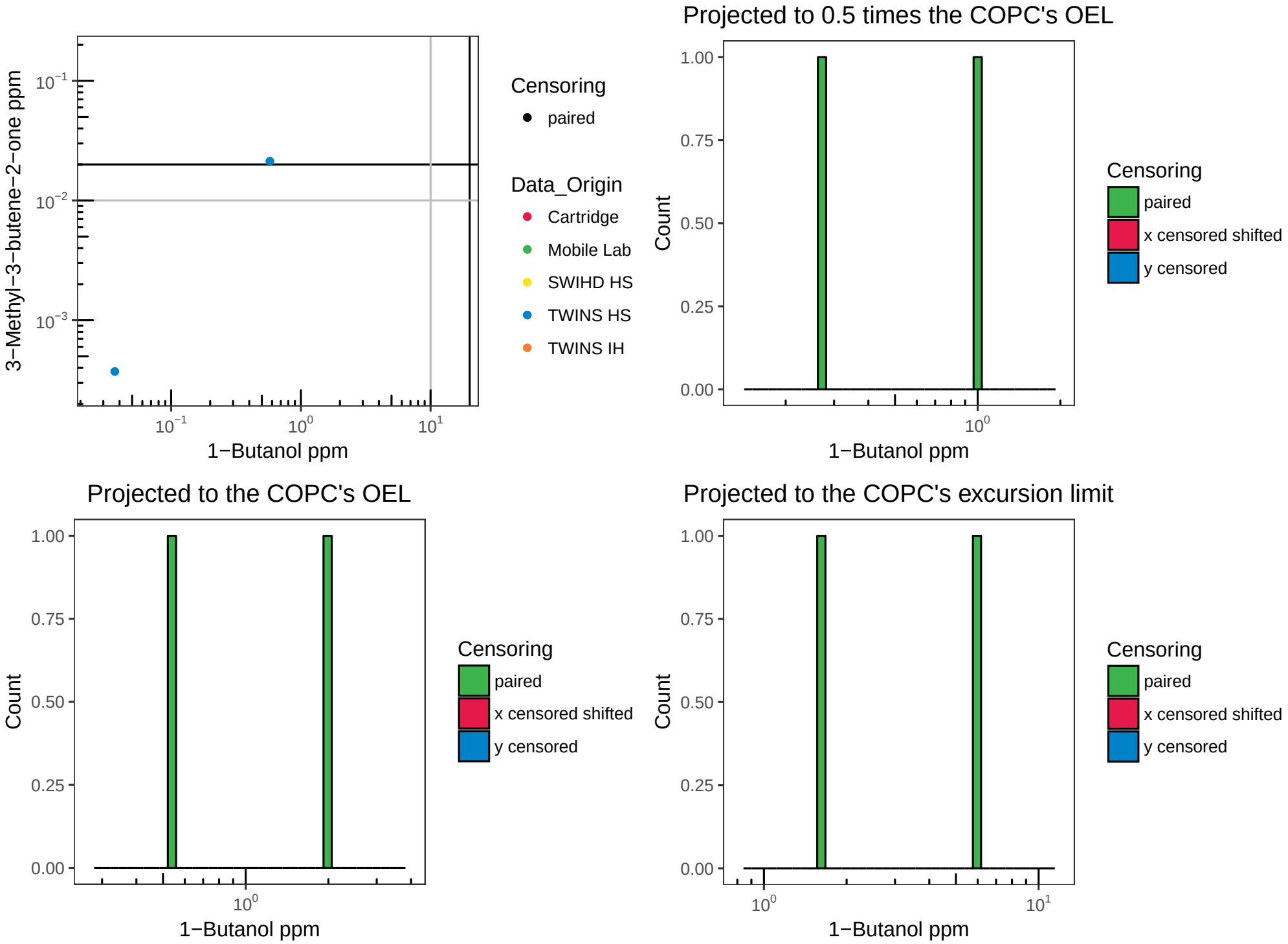


Figure C.341: 3-Methyl-3-butene-2-one vs 1-Butanol

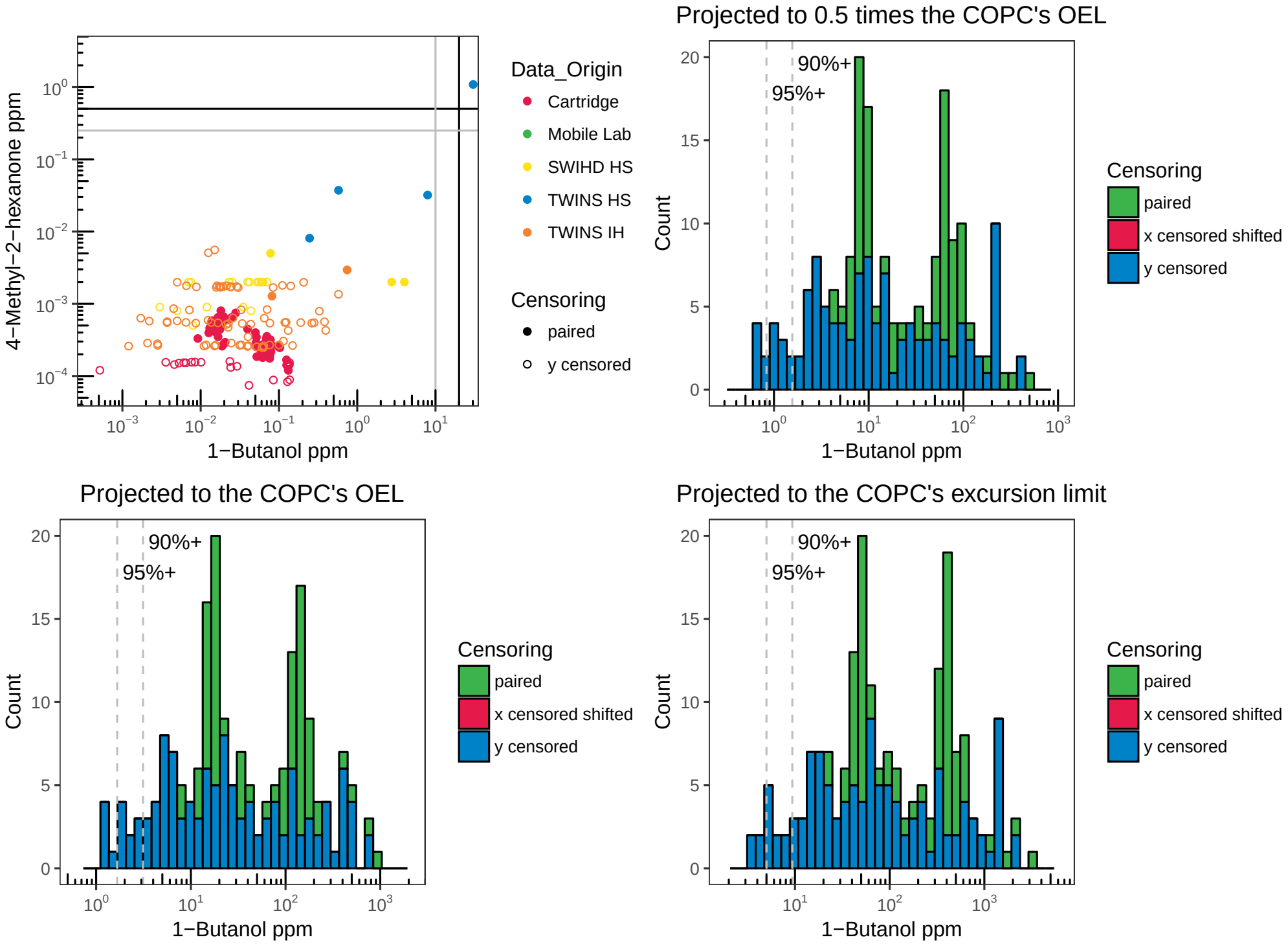


Figure C.342: 4-Methyl-2-hexanone vs 1-Butanol

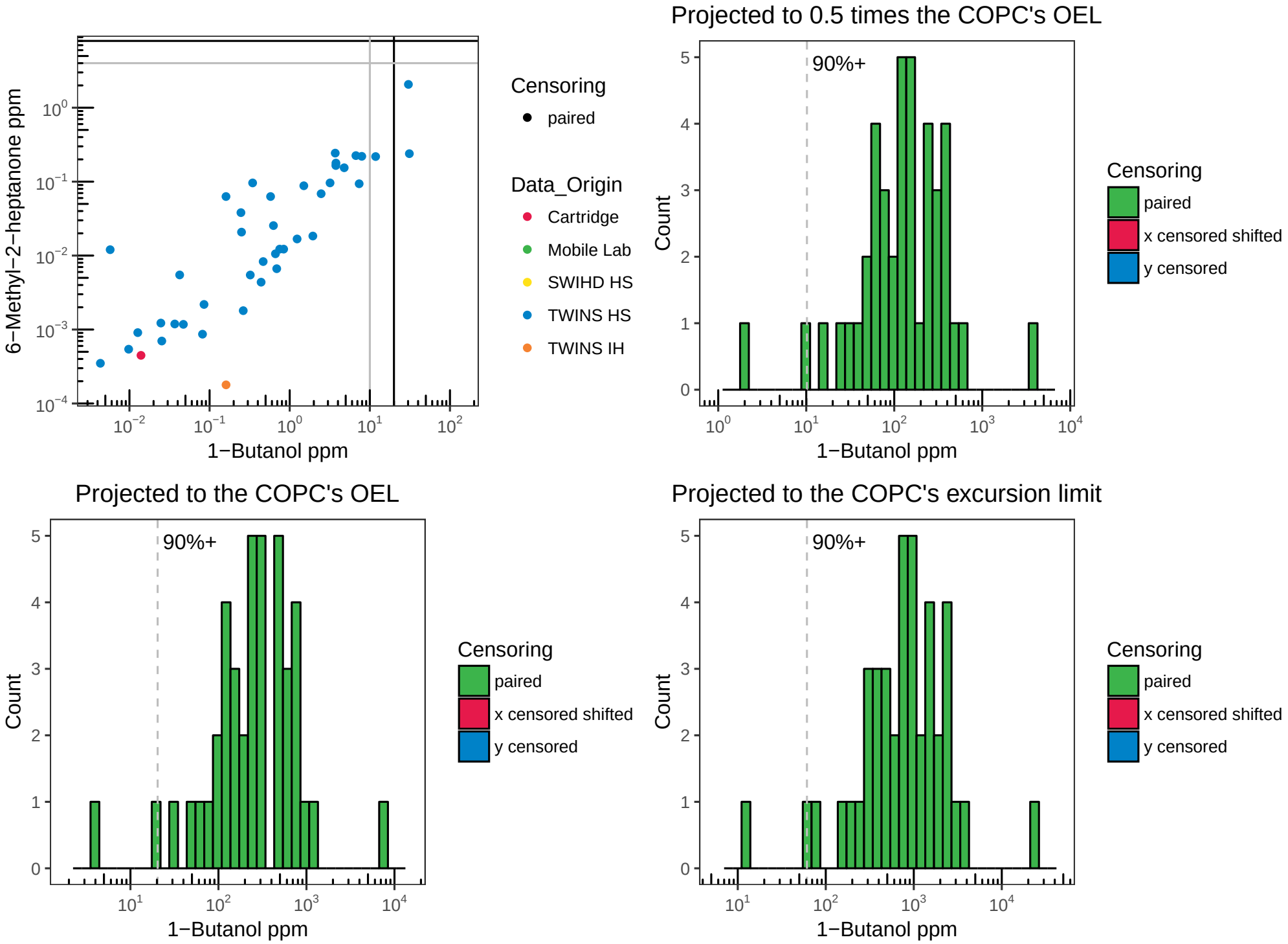


Figure C.343: 6-Methyl-2-heptanone vs 1-Butanol

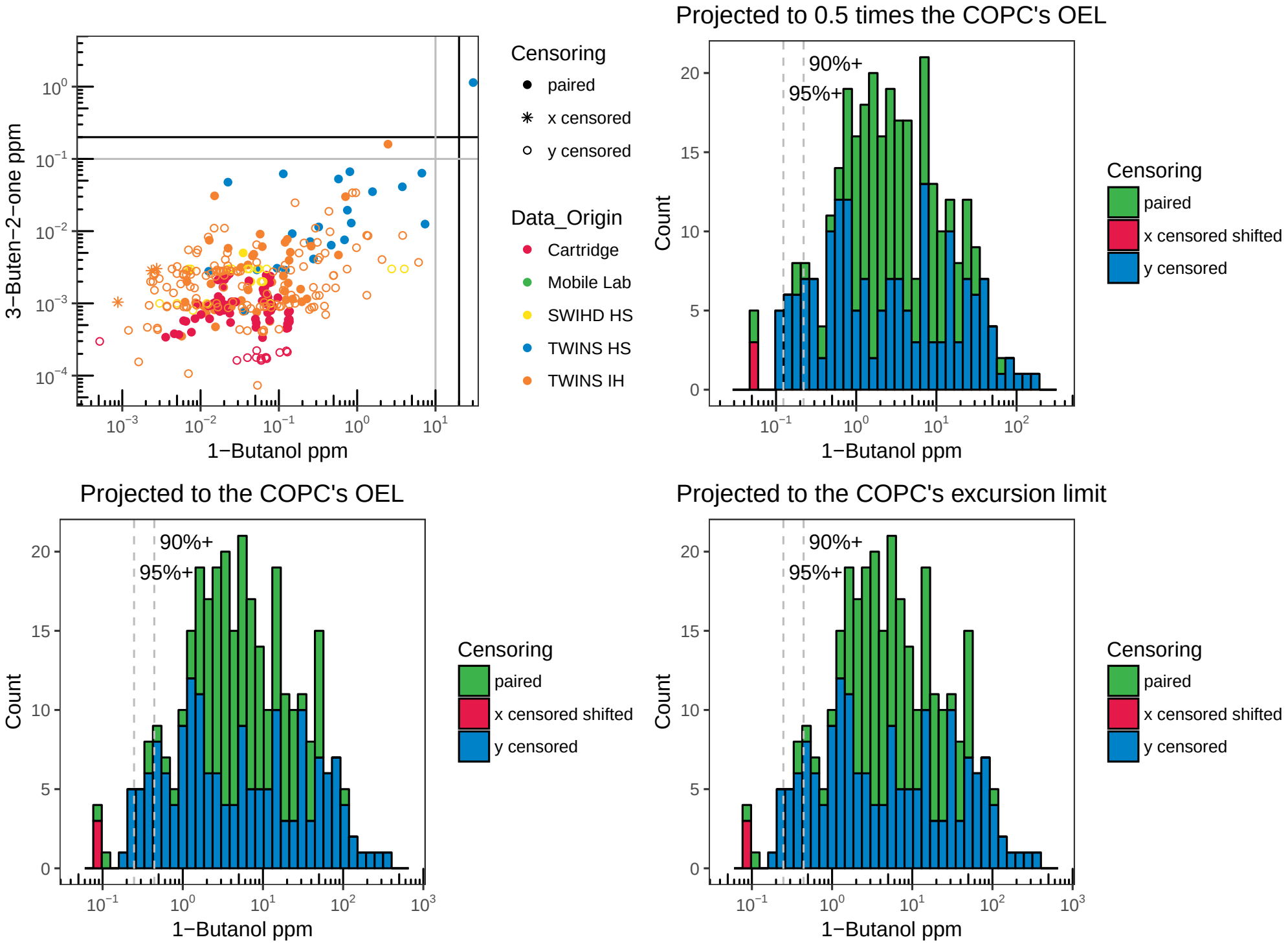


Figure C.344: 3-Buten-2-one vs 1-Butanol

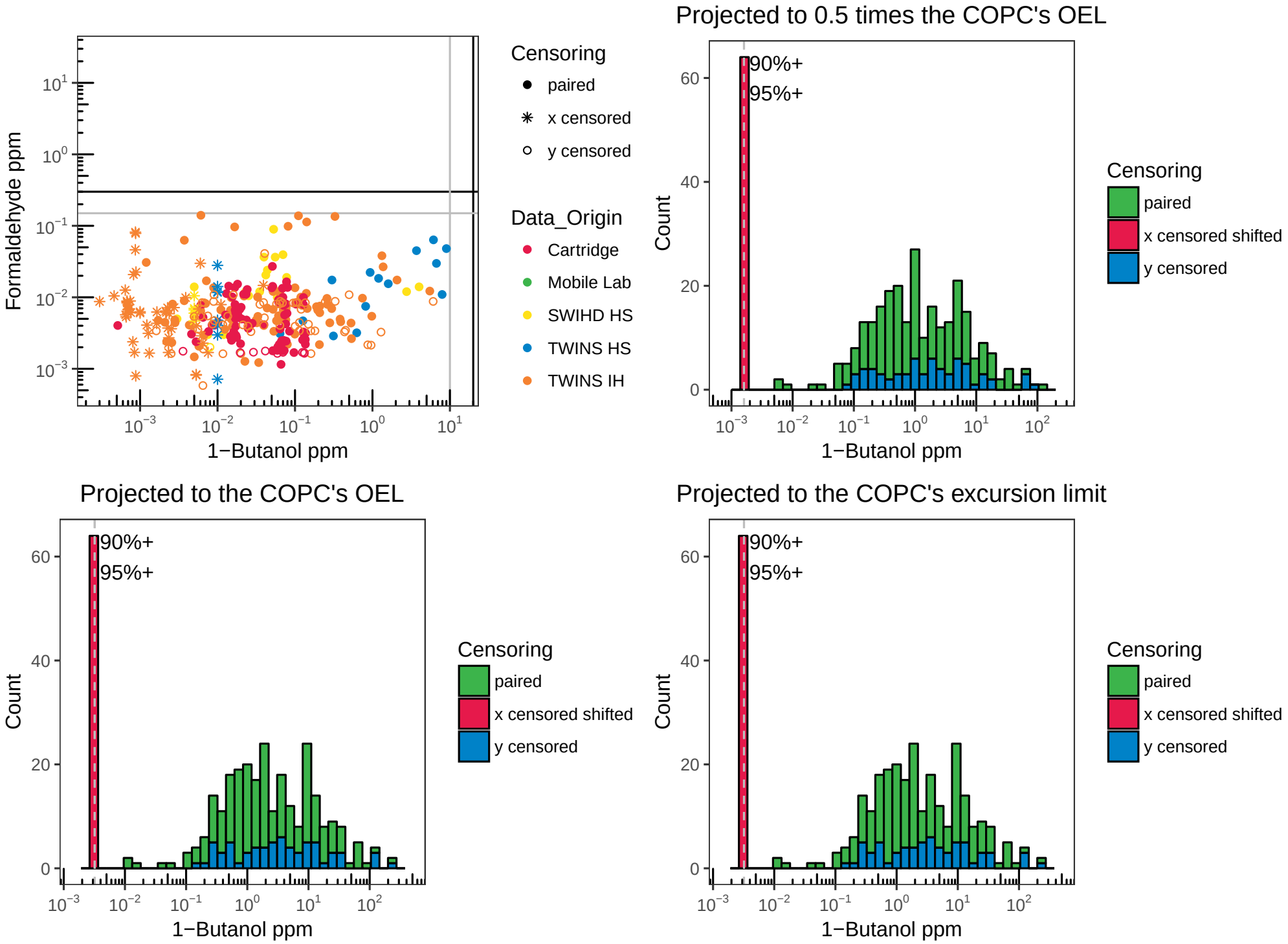


Figure C.345: Formaldehyde vs 1-Butanol

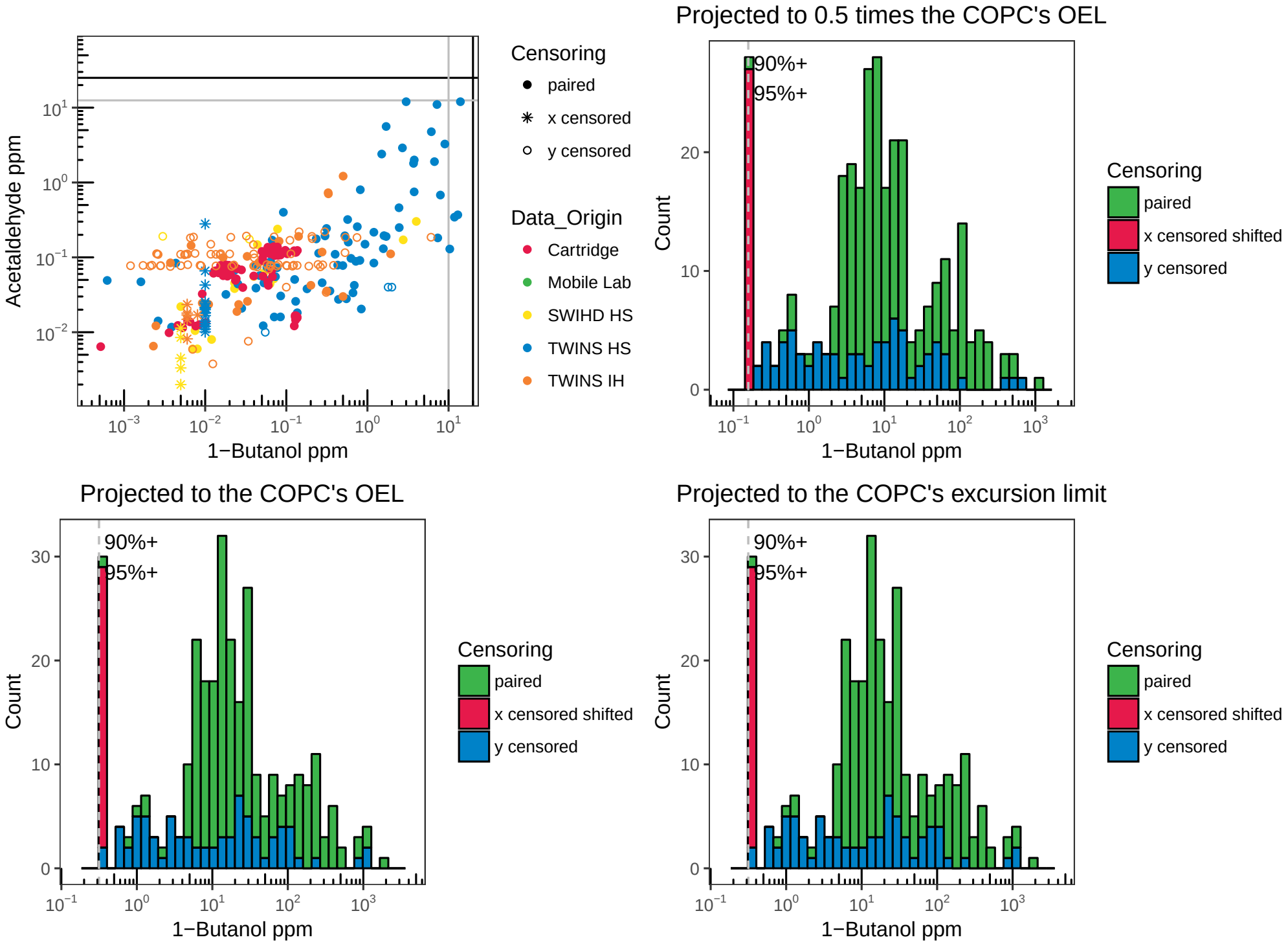


Figure C.346: Acetaldehyde vs 1-Butanol

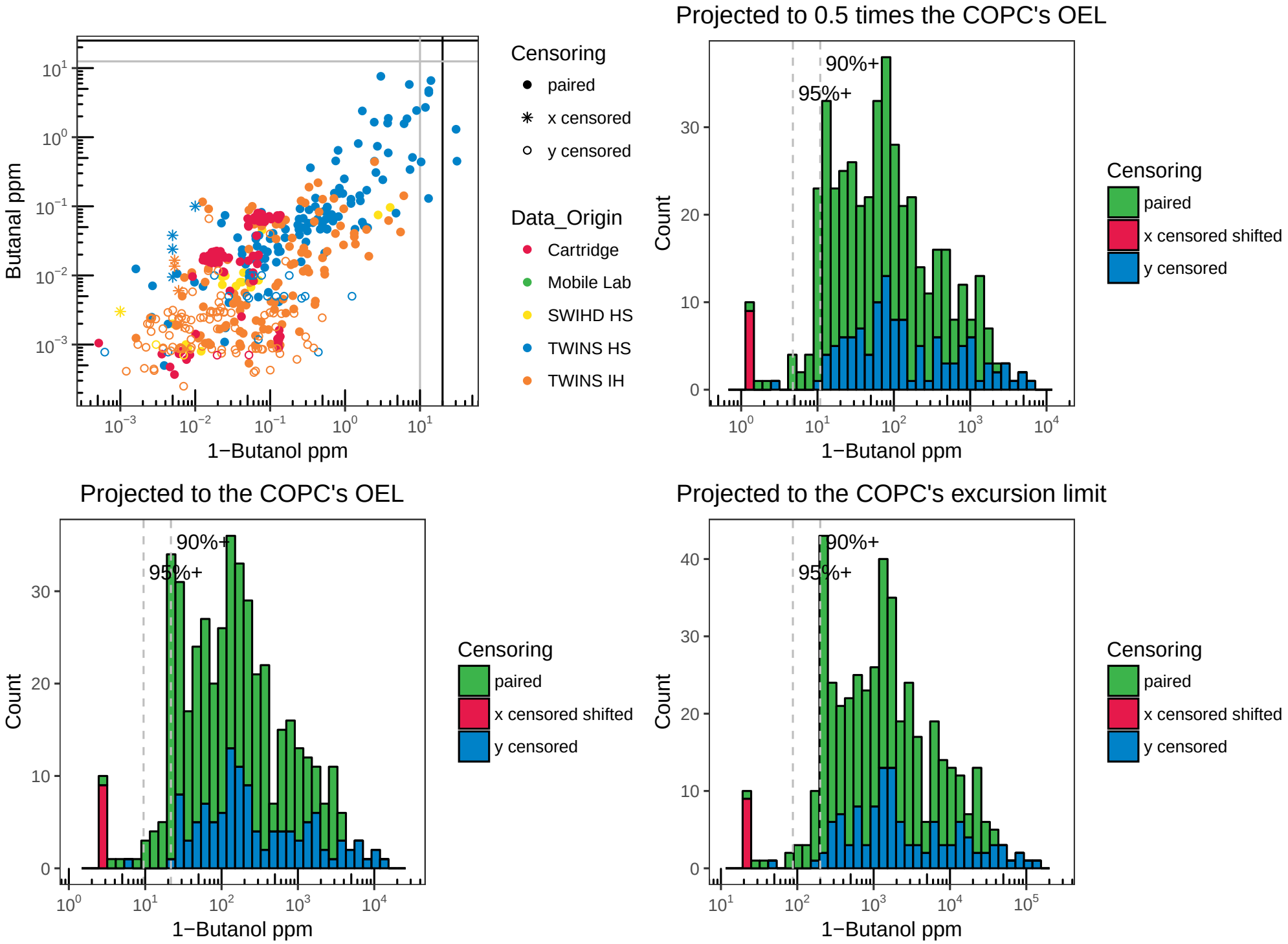


Figure C.347: Butanal vs 1-Butanol

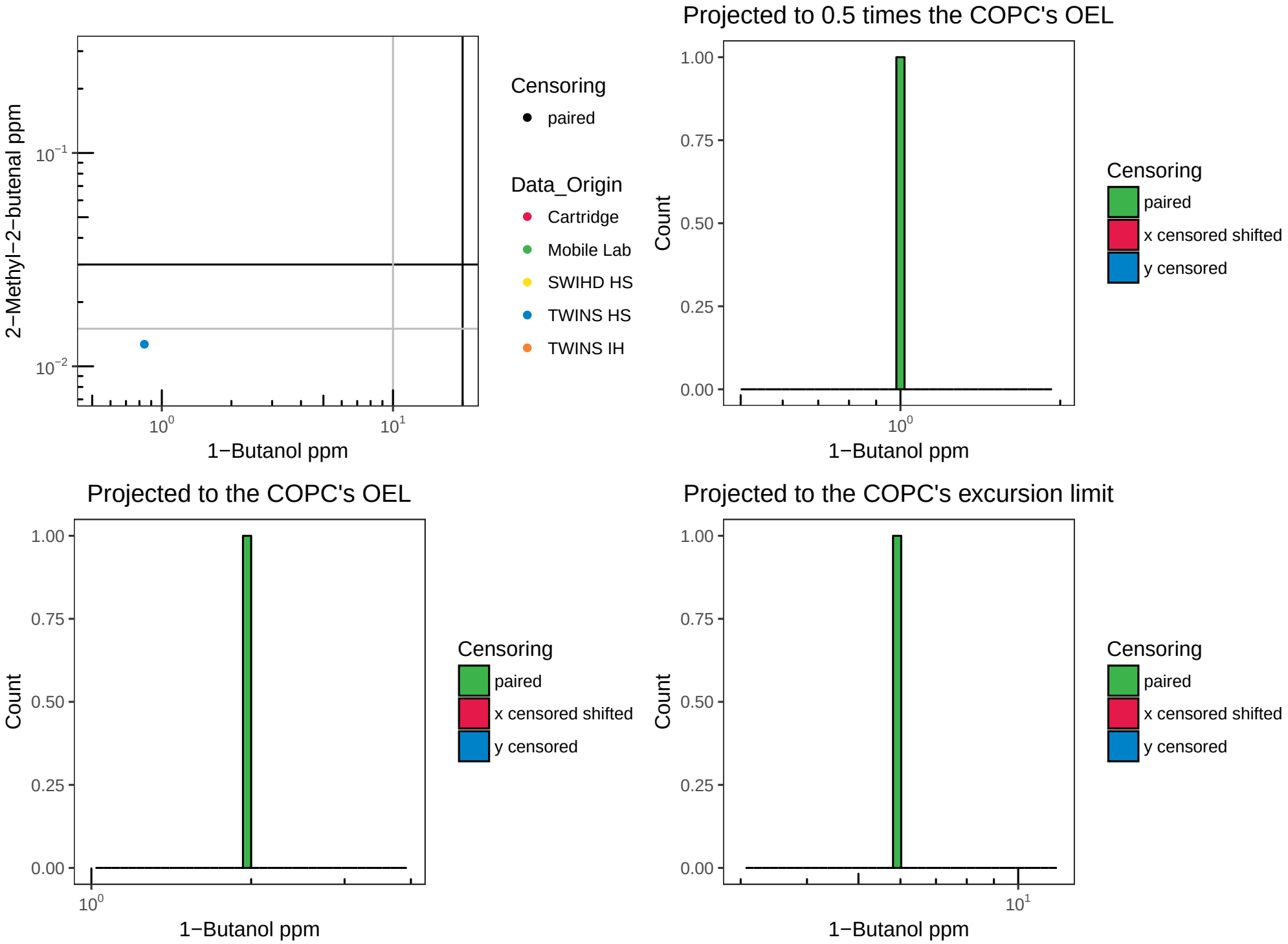


Figure C.348: 2-Methyl-2-butenal vs 1-Butanol

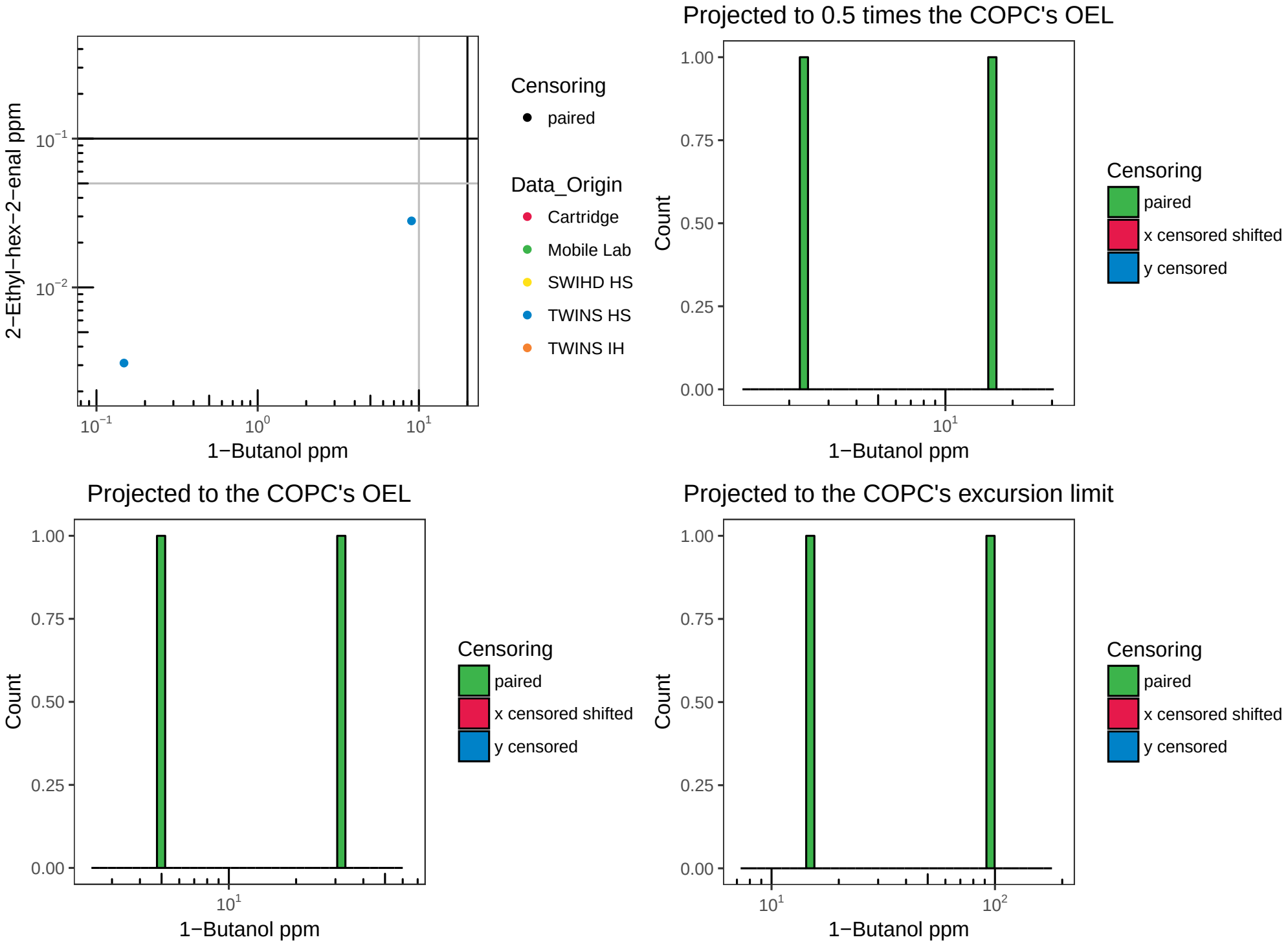


Figure C.349: 2-Ethyl-hex-2-enal vs 1-Butanol

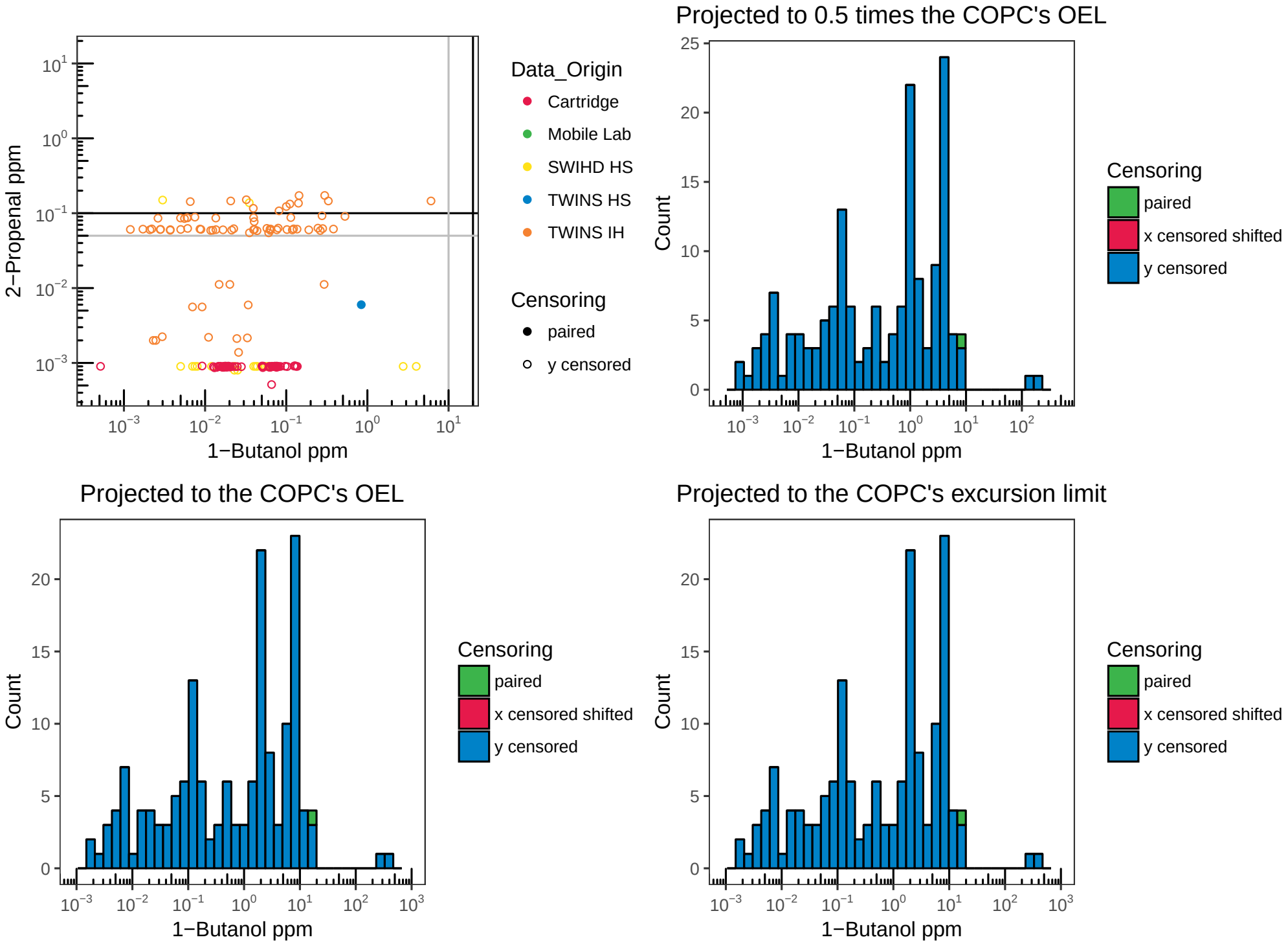


Figure C.350: 2-Propenal vs 1-Butanol

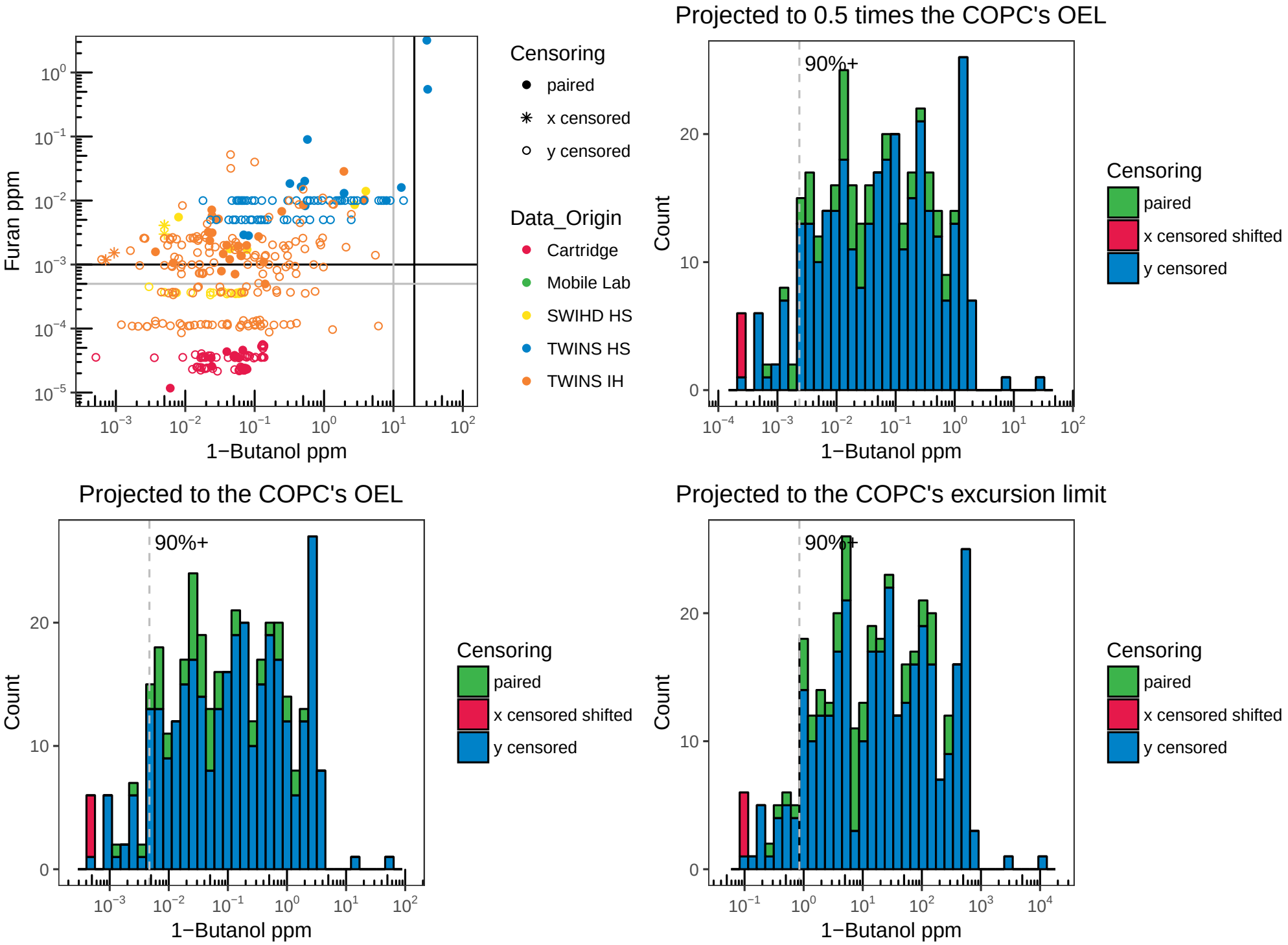


Figure C.351: Furan vs 1-Butanol

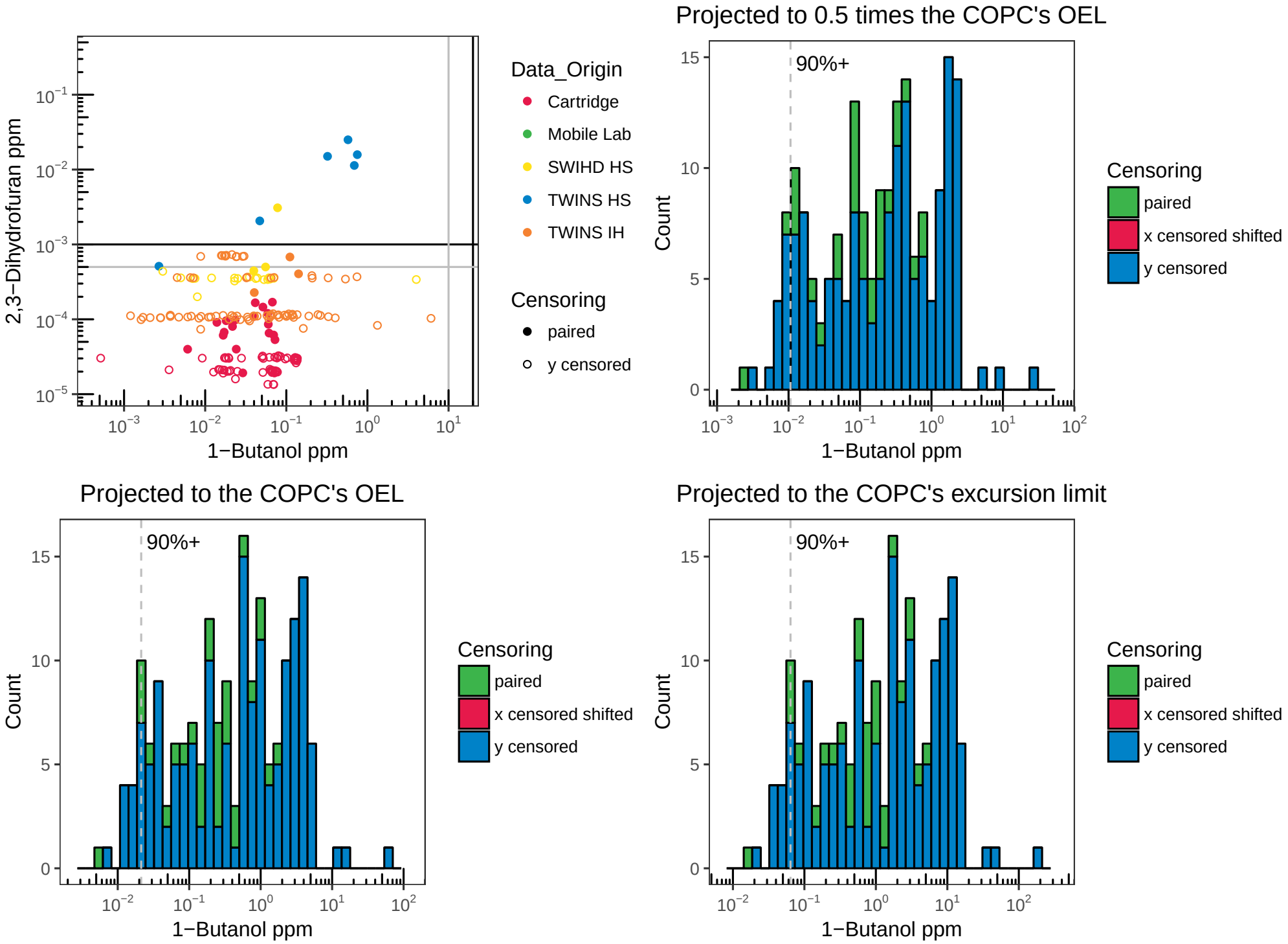


Figure C.352: 2,3-Dihydrofuran vs 1-Butanol

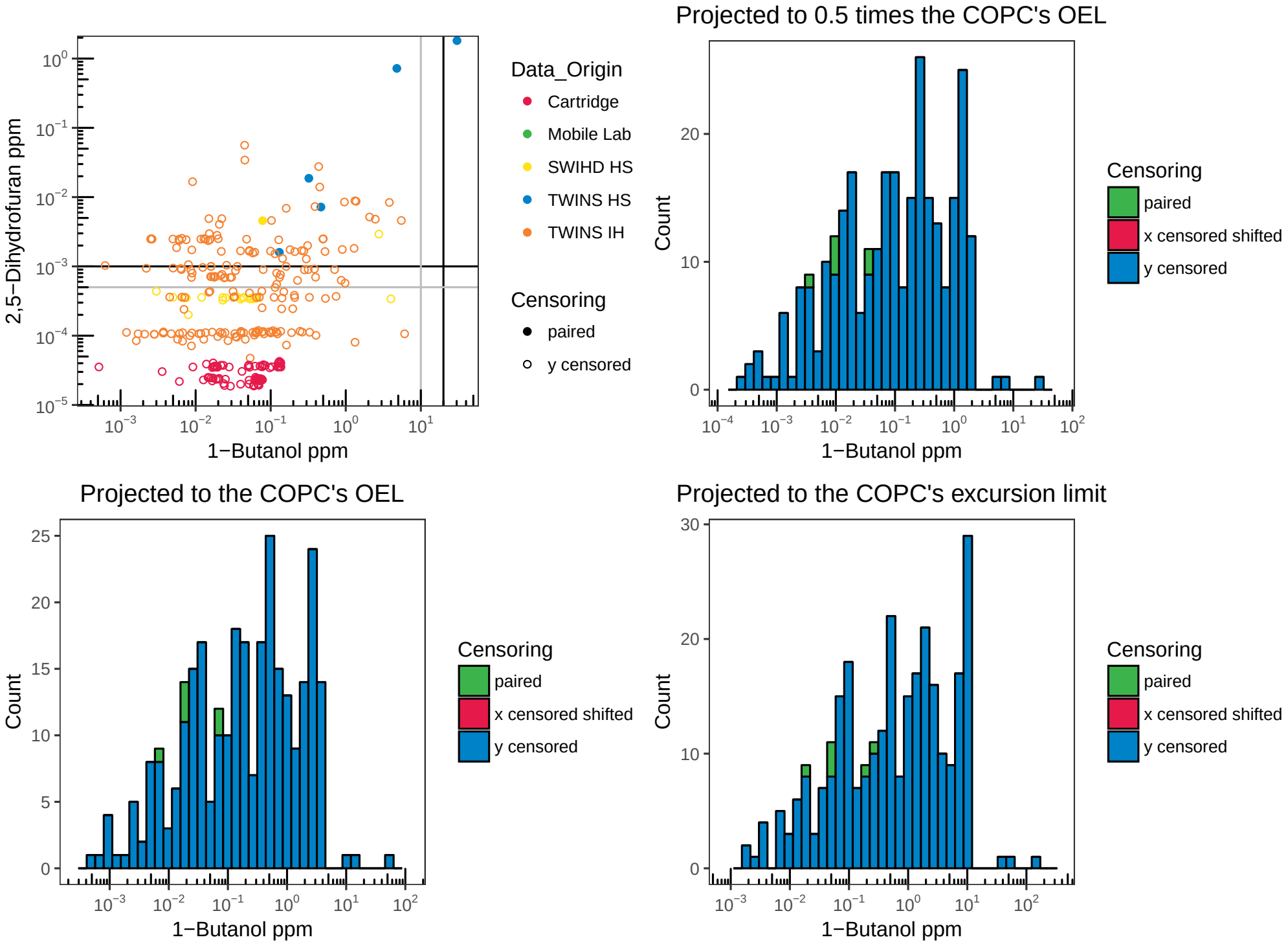


Figure C.353: 2,5-Dihydrofuran vs 1-Butanol

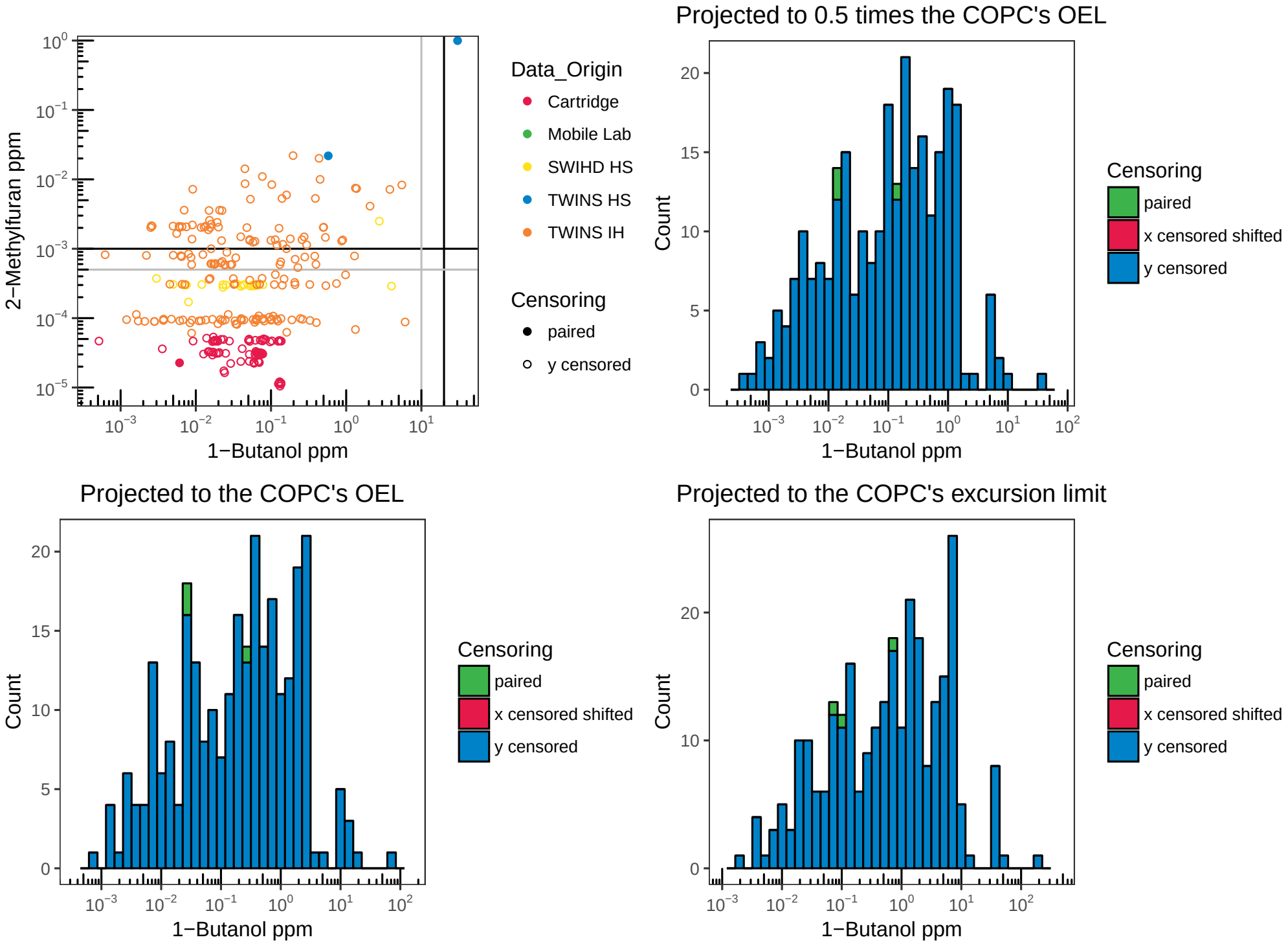


Figure C.354: 2-Methylfuran vs 1-Butanol

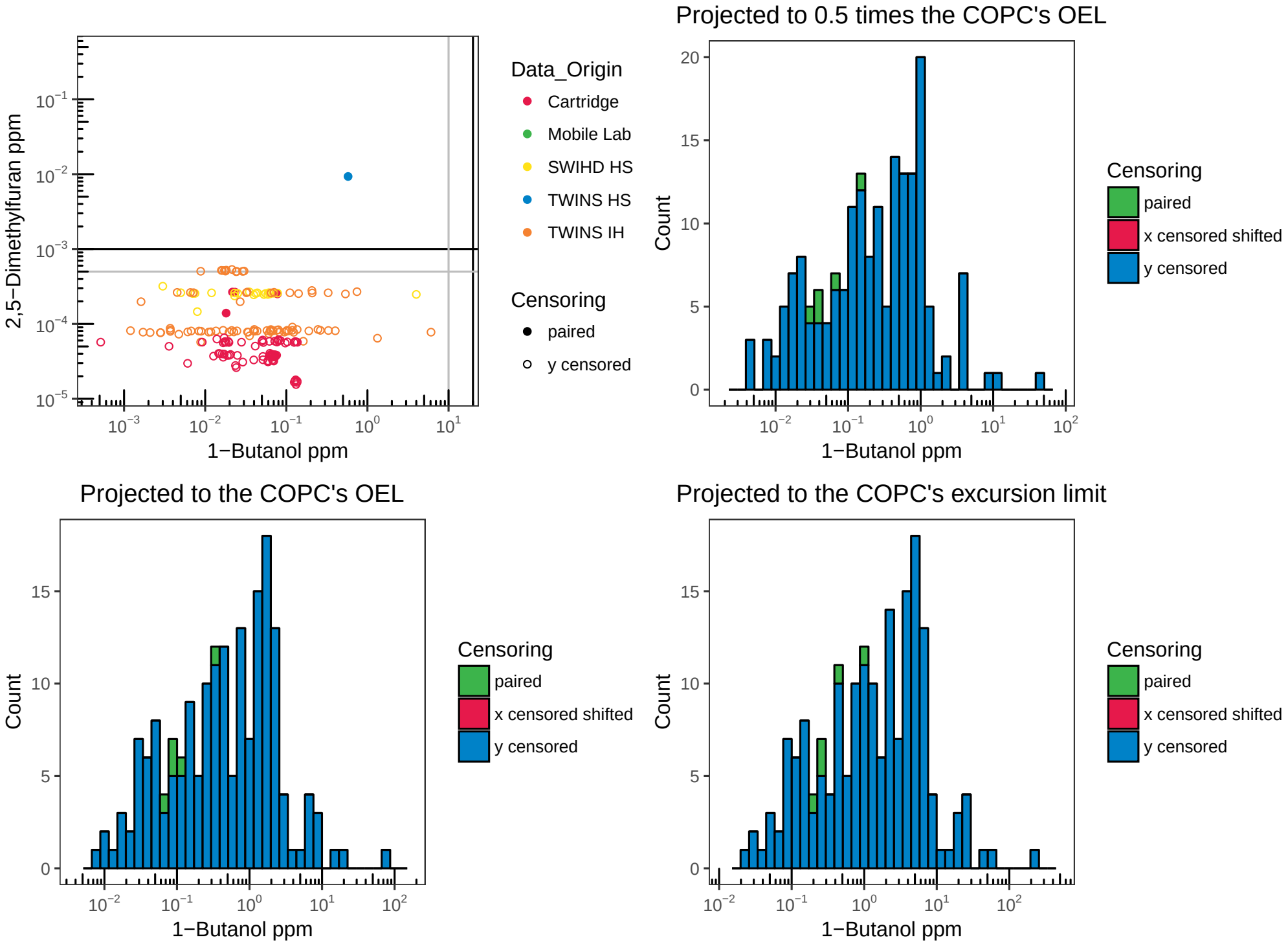


Figure C.355: 2,5-Dimethylfuran vs 1-Butanol

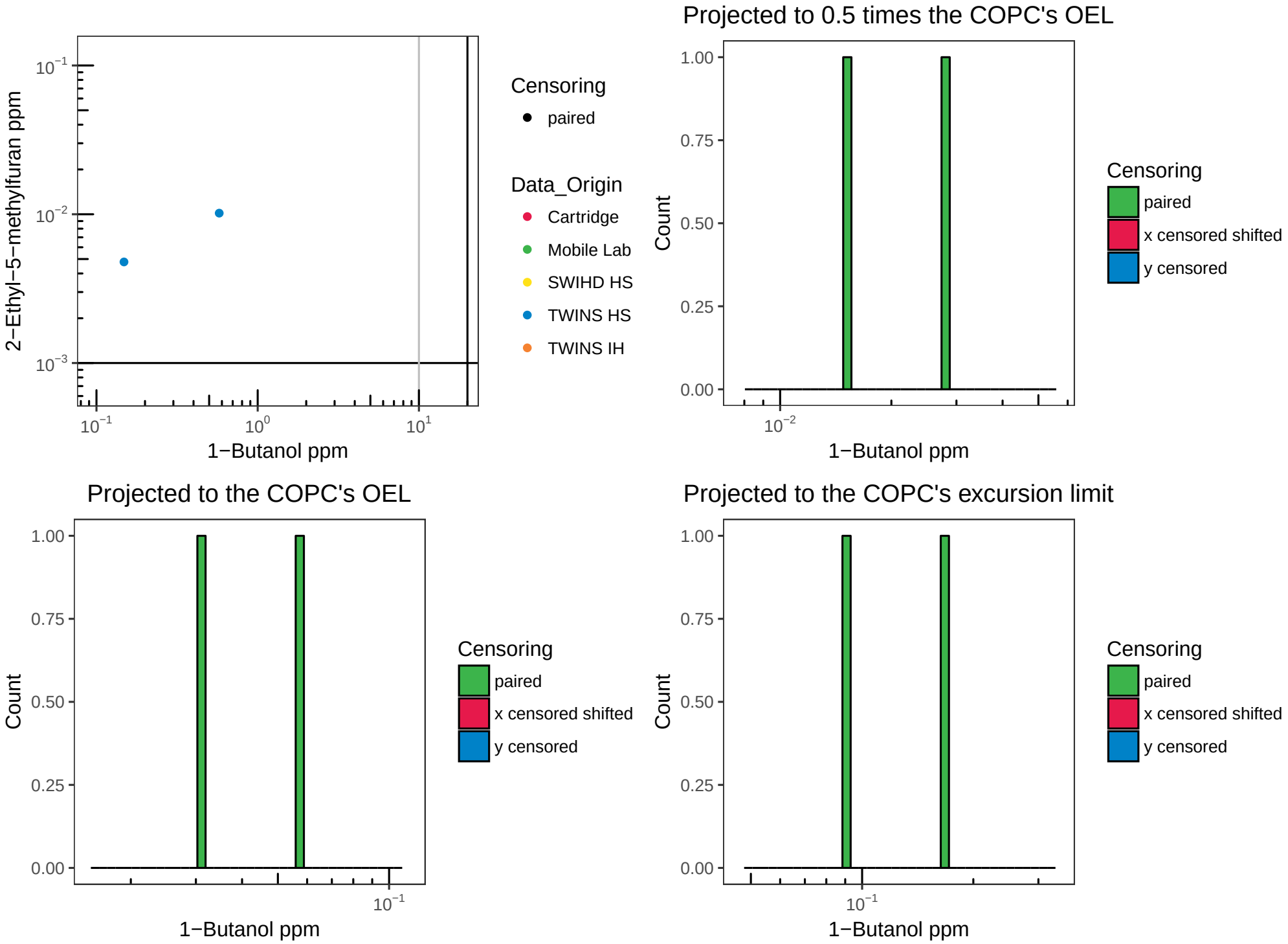


Figure C.356: 2-Ethyl-5-methylfuran vs 1-Butanol

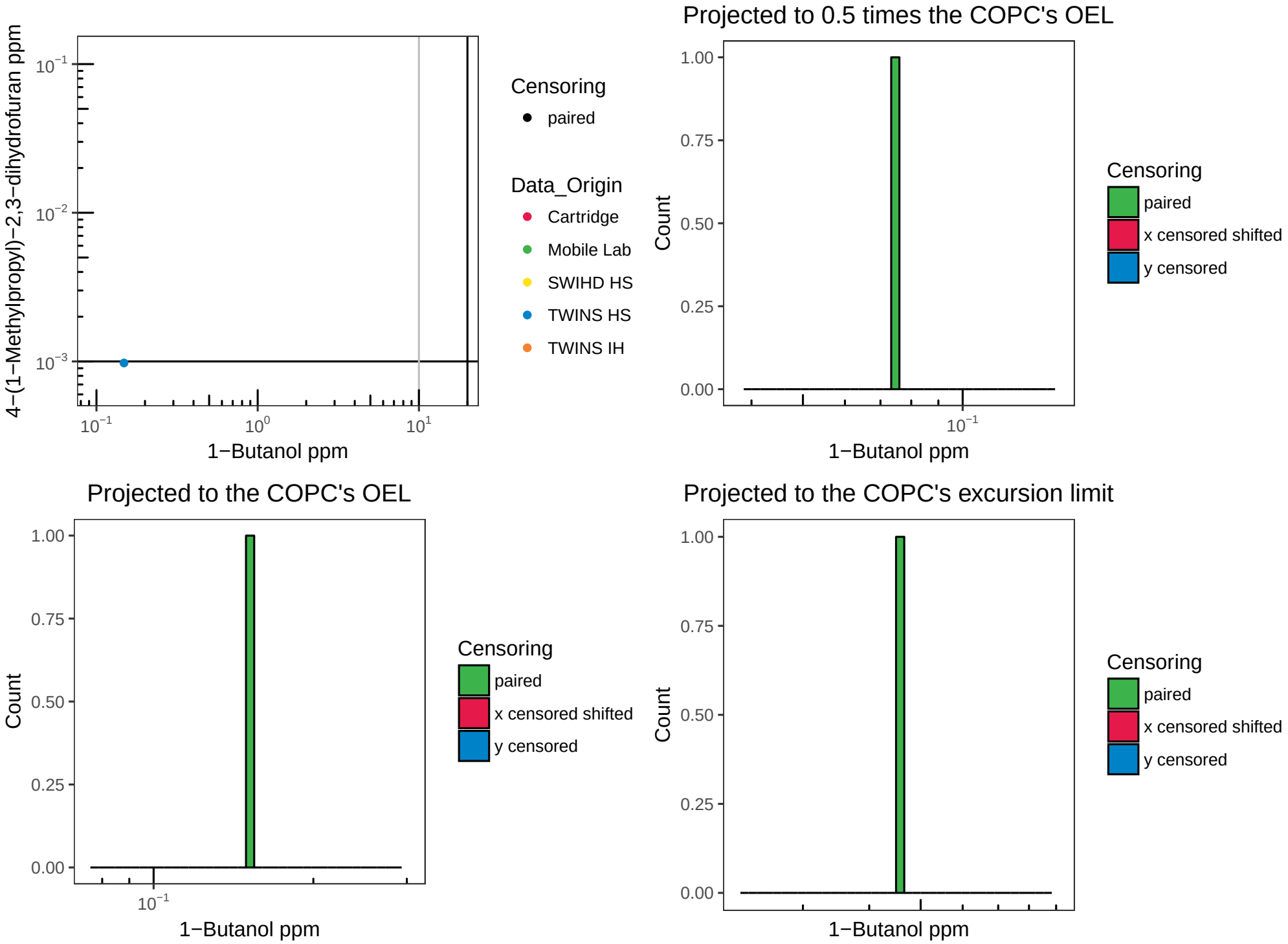


Figure C.357: 4-(1-Methylpropyl)-2,3-dihydrofuran vs 1-Butanol

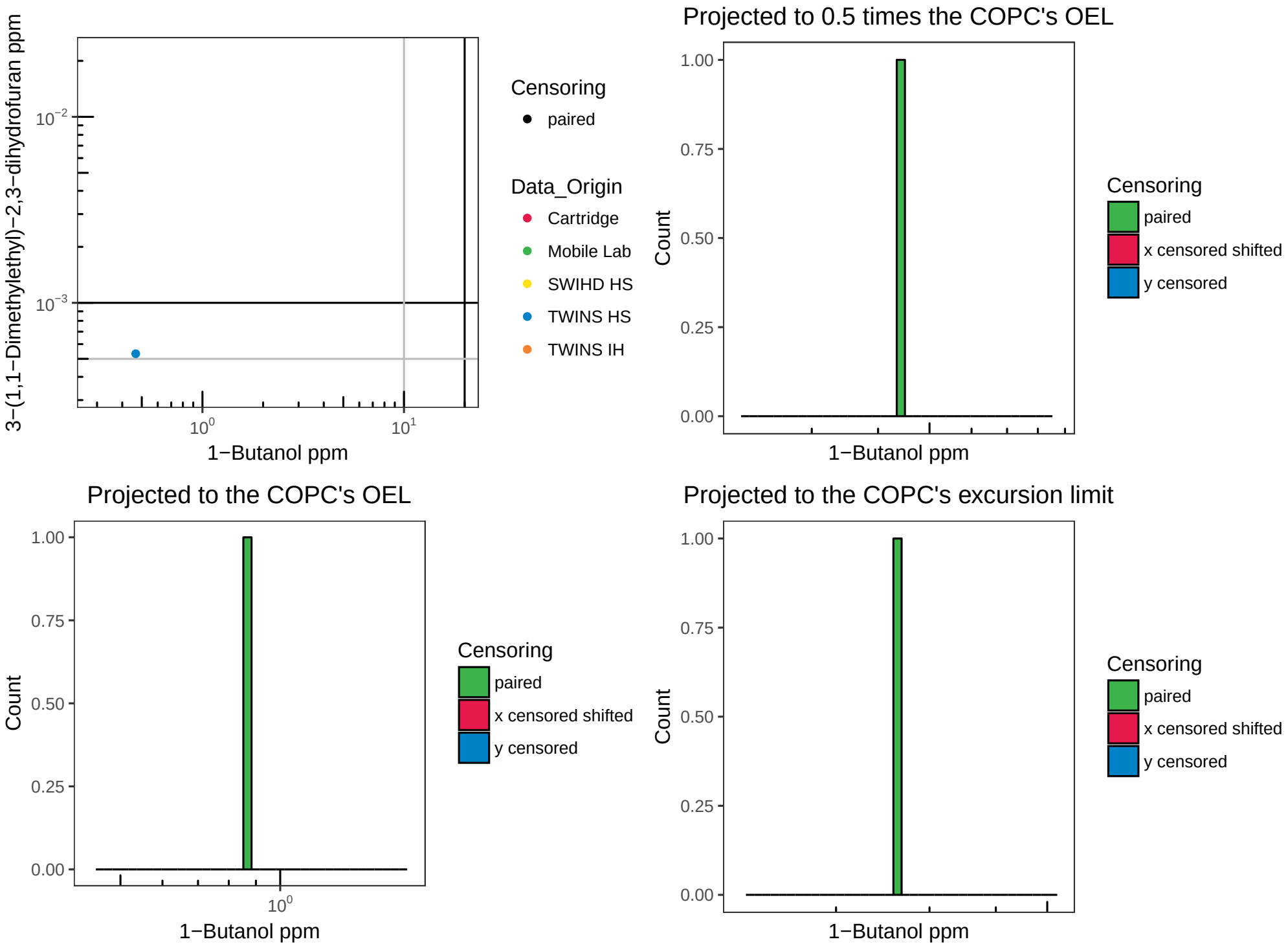


Figure C.358: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs 1-Butanol

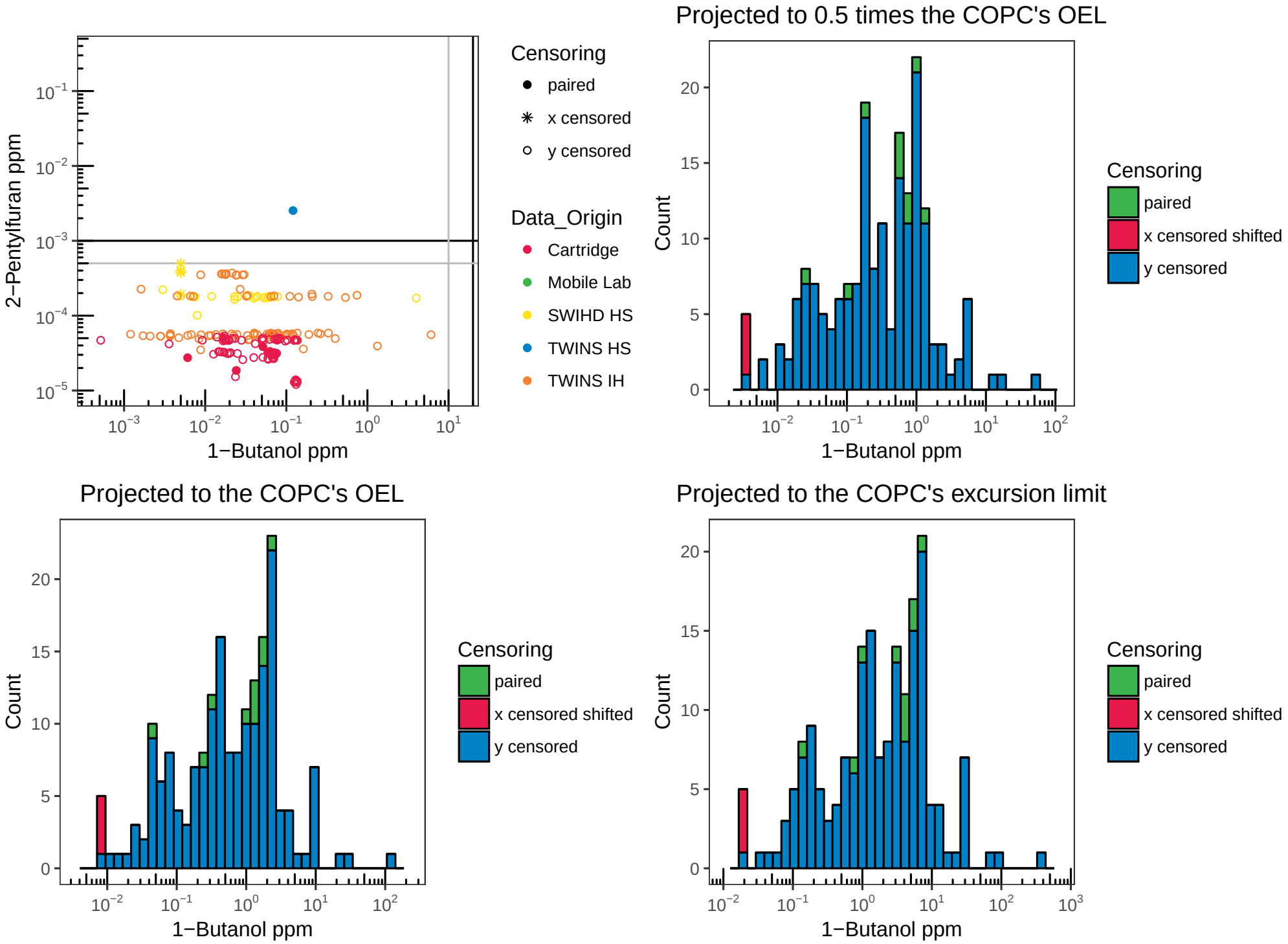


Figure C.359: 2-Pentylfuran vs 1-Butanol

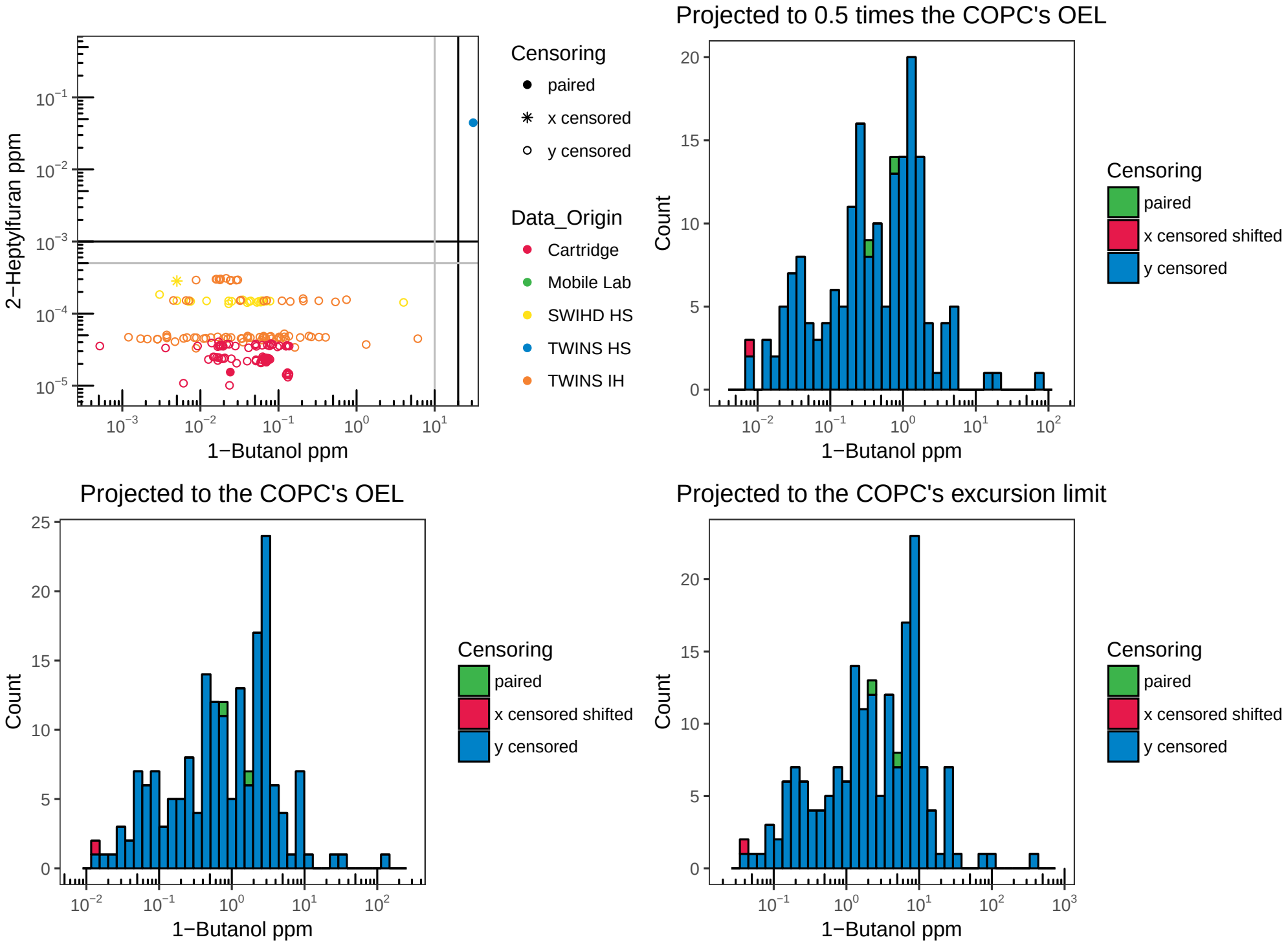


Figure C.360: 2-Heptylfuran vs 1-Butanol

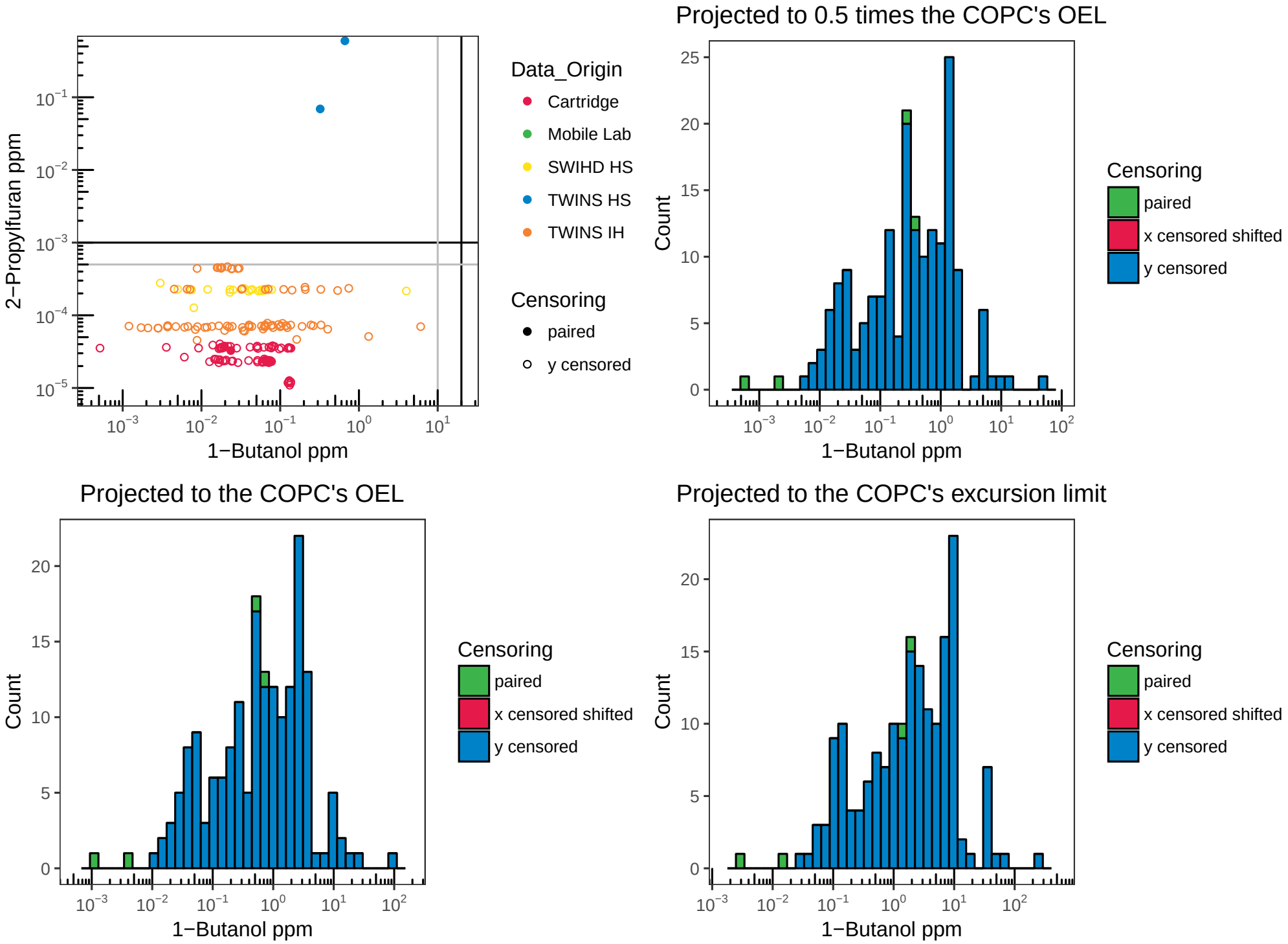


Figure C.361: 2-Propylfuran vs 1-Butanol

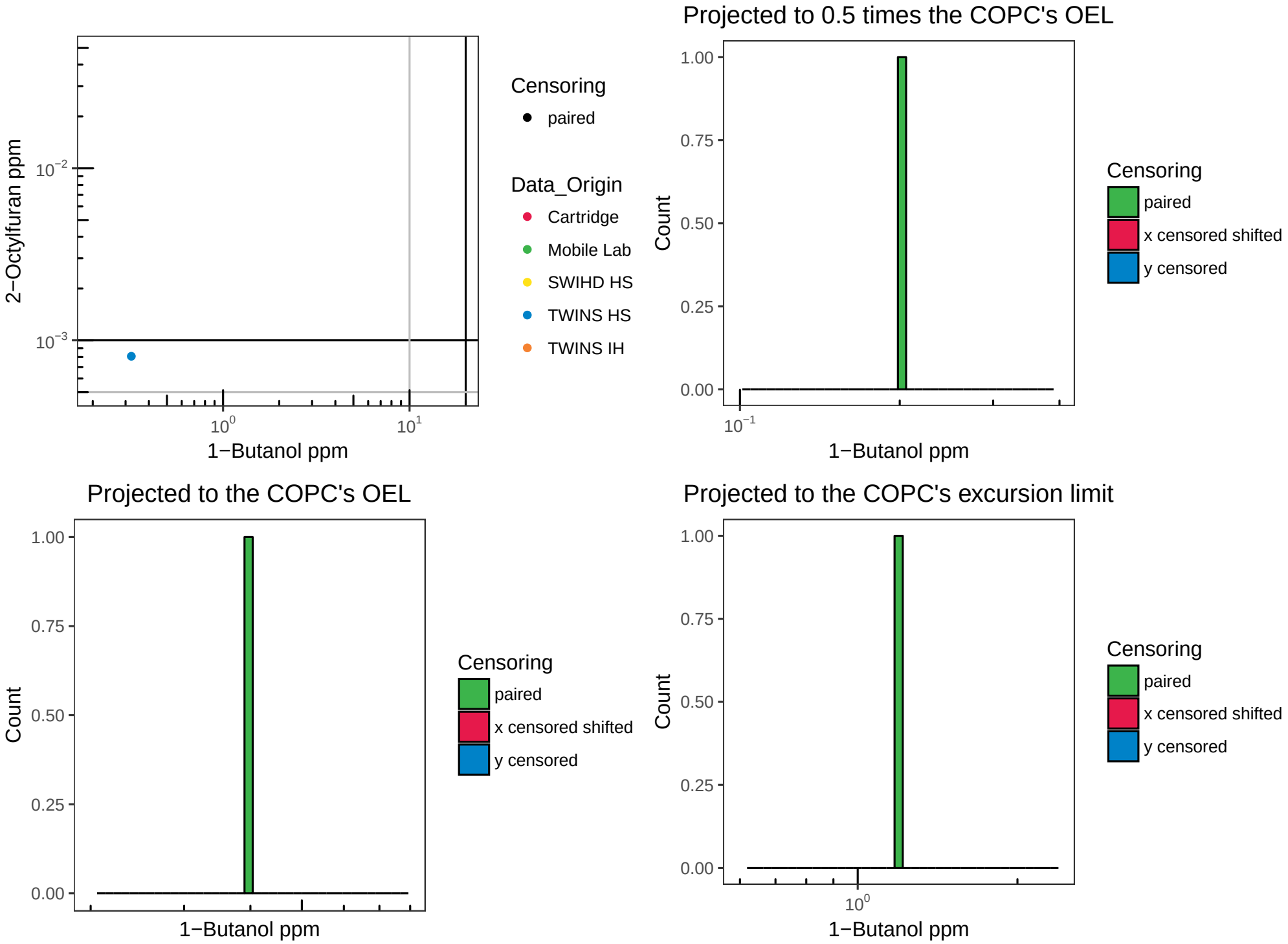


Figure C.362: 2-Octylfuran vs 1-Butanol

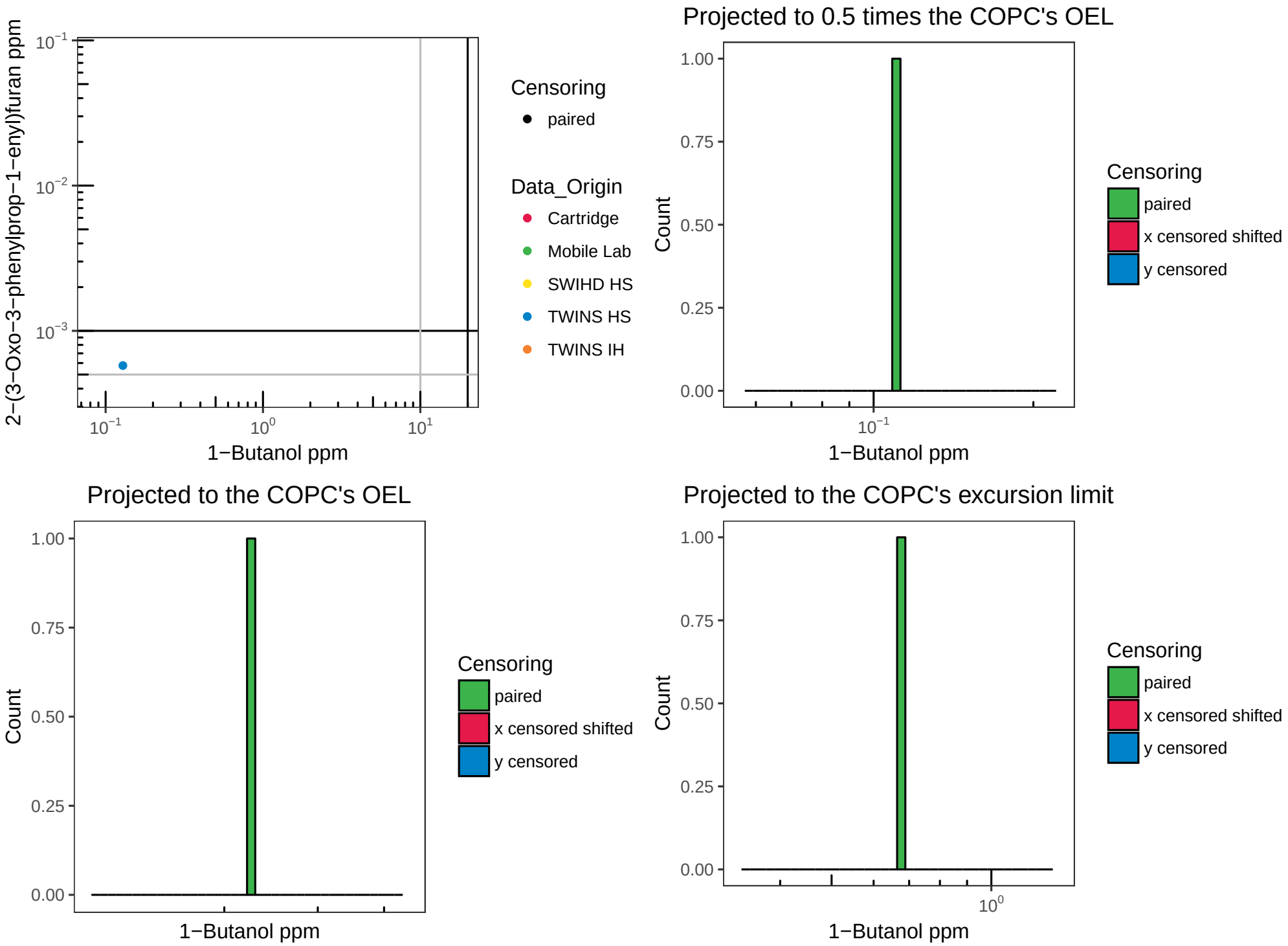


Figure C.363: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 1-Butanol

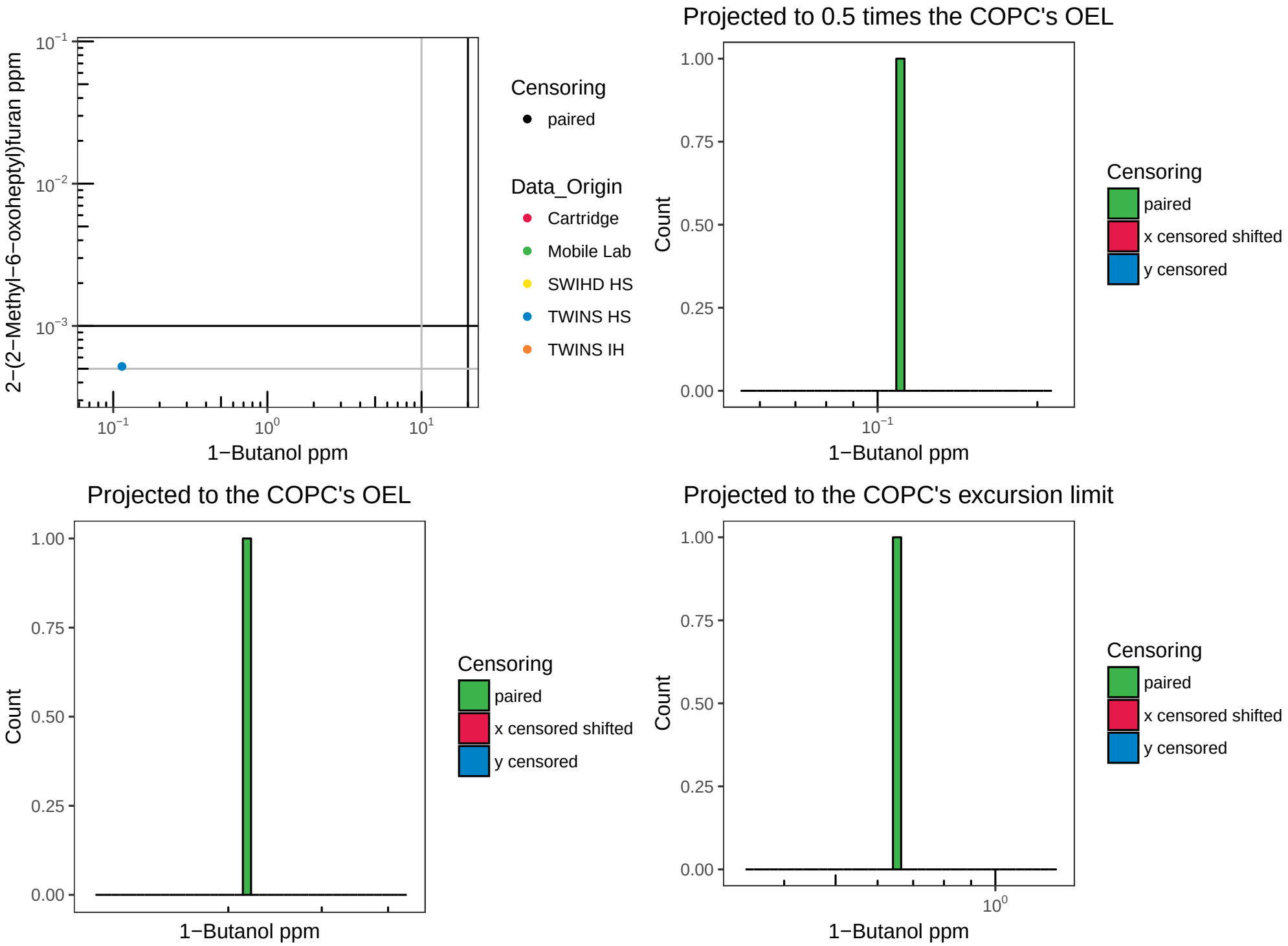


Figure C.364: 2-(2-Methyl-6-oxoheptyl)furan vs 1-Butanol

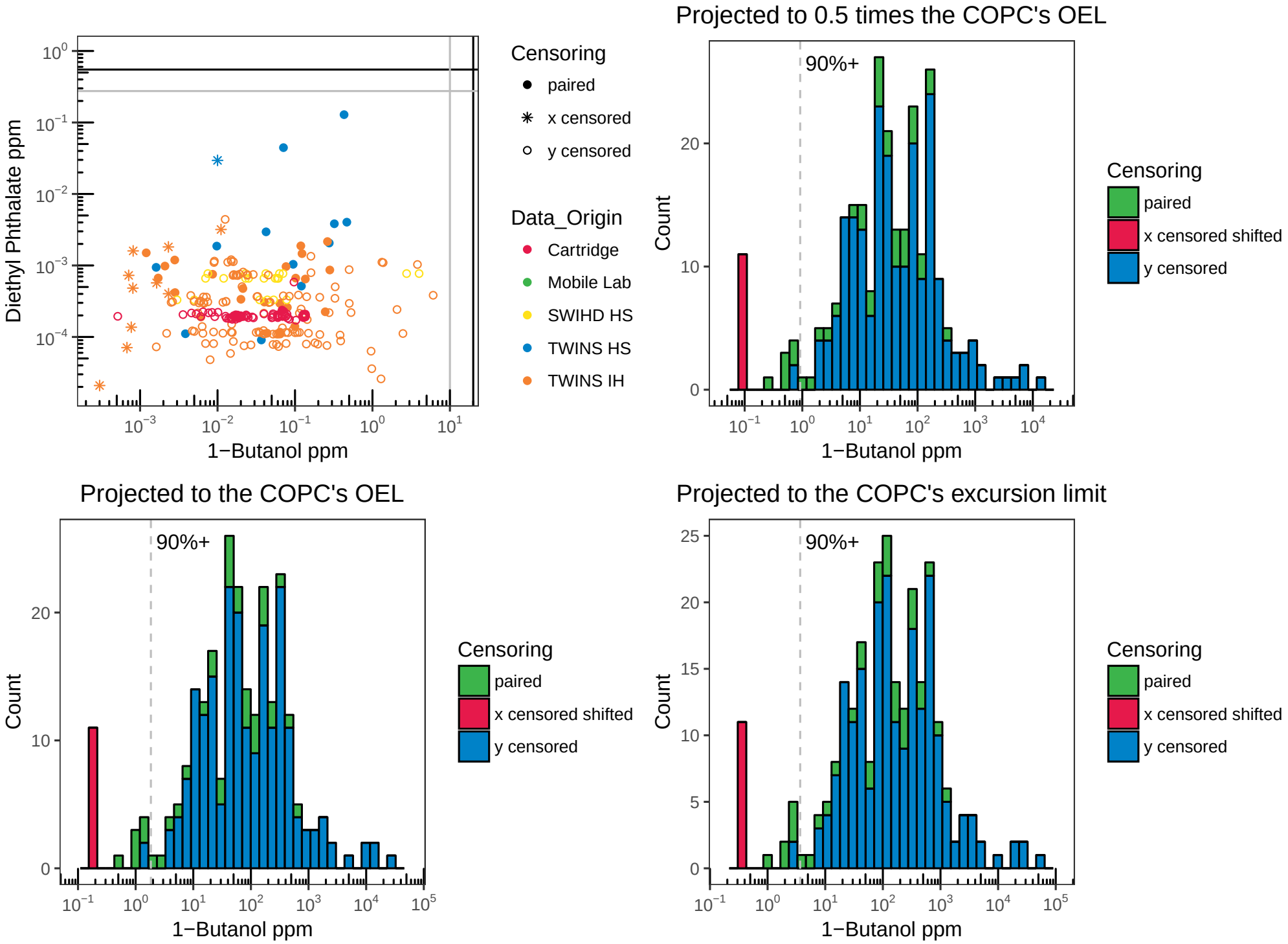


Figure C.365: Diethyl Phthalate vs 1-Butanol

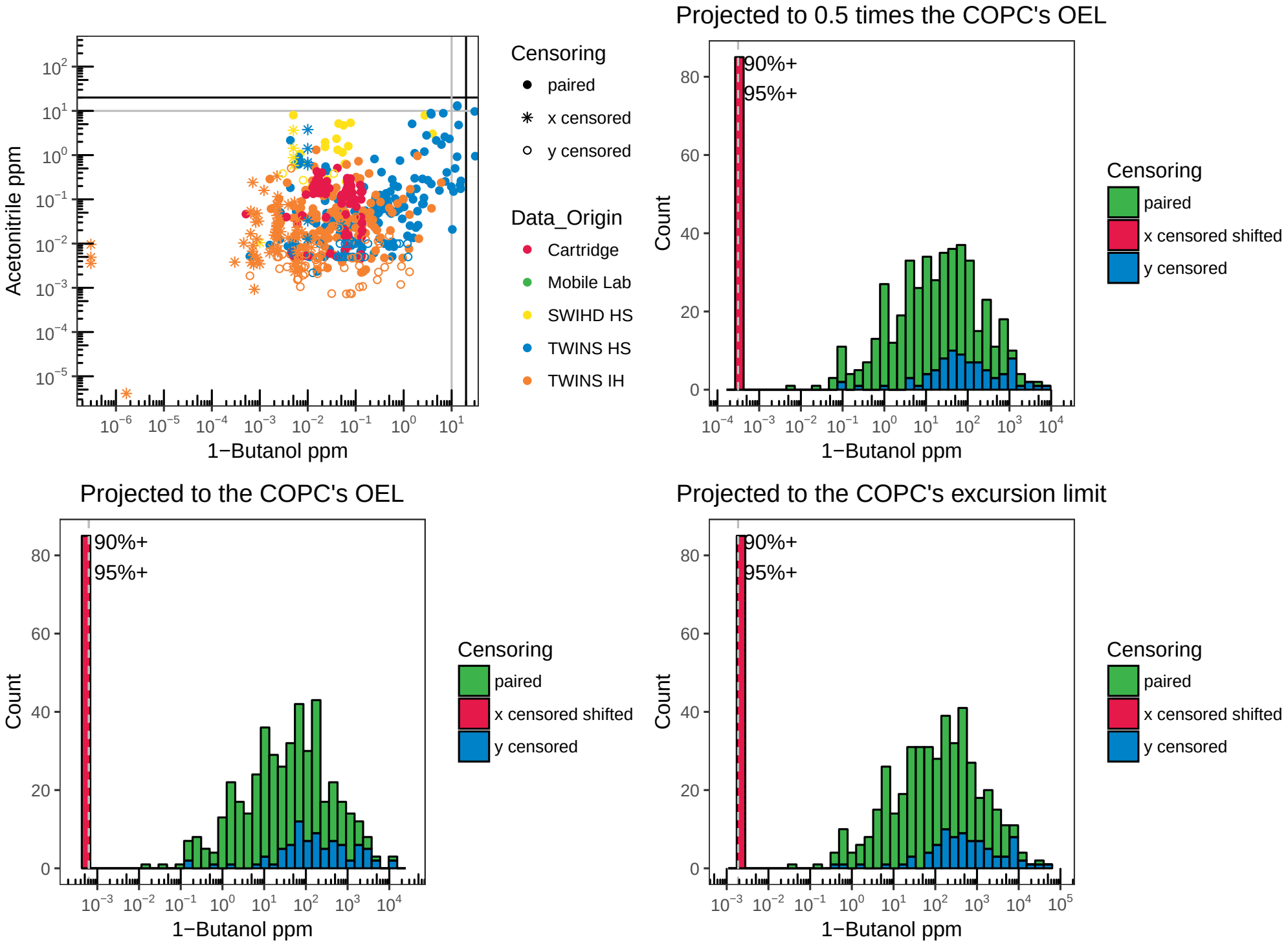


Figure C.366: Acetonitrile vs 1-Butanol

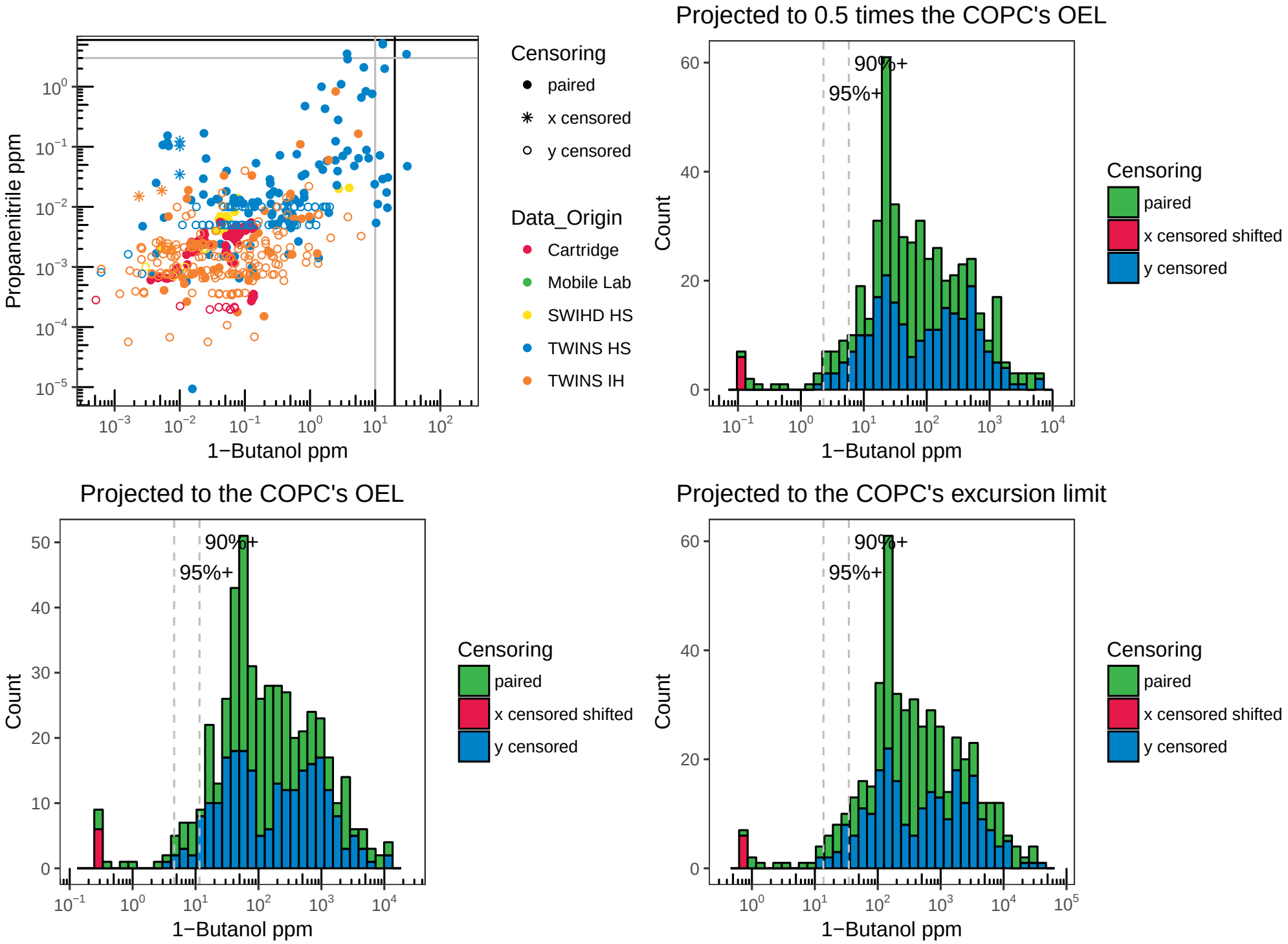


Figure C.367: Propanenitrile vs 1-Butanol

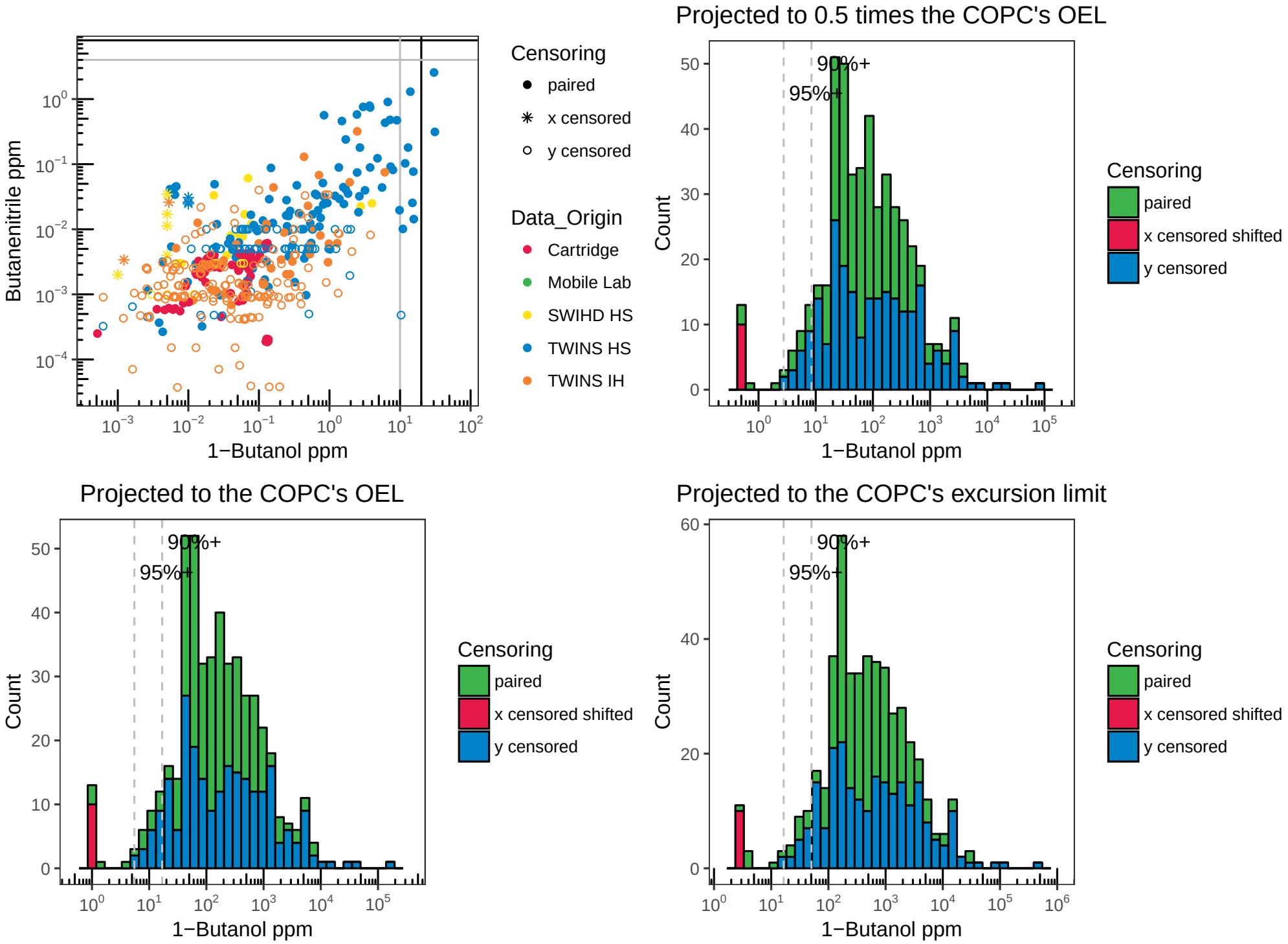


Figure C.368: Butanenitrile vs 1-Butanol

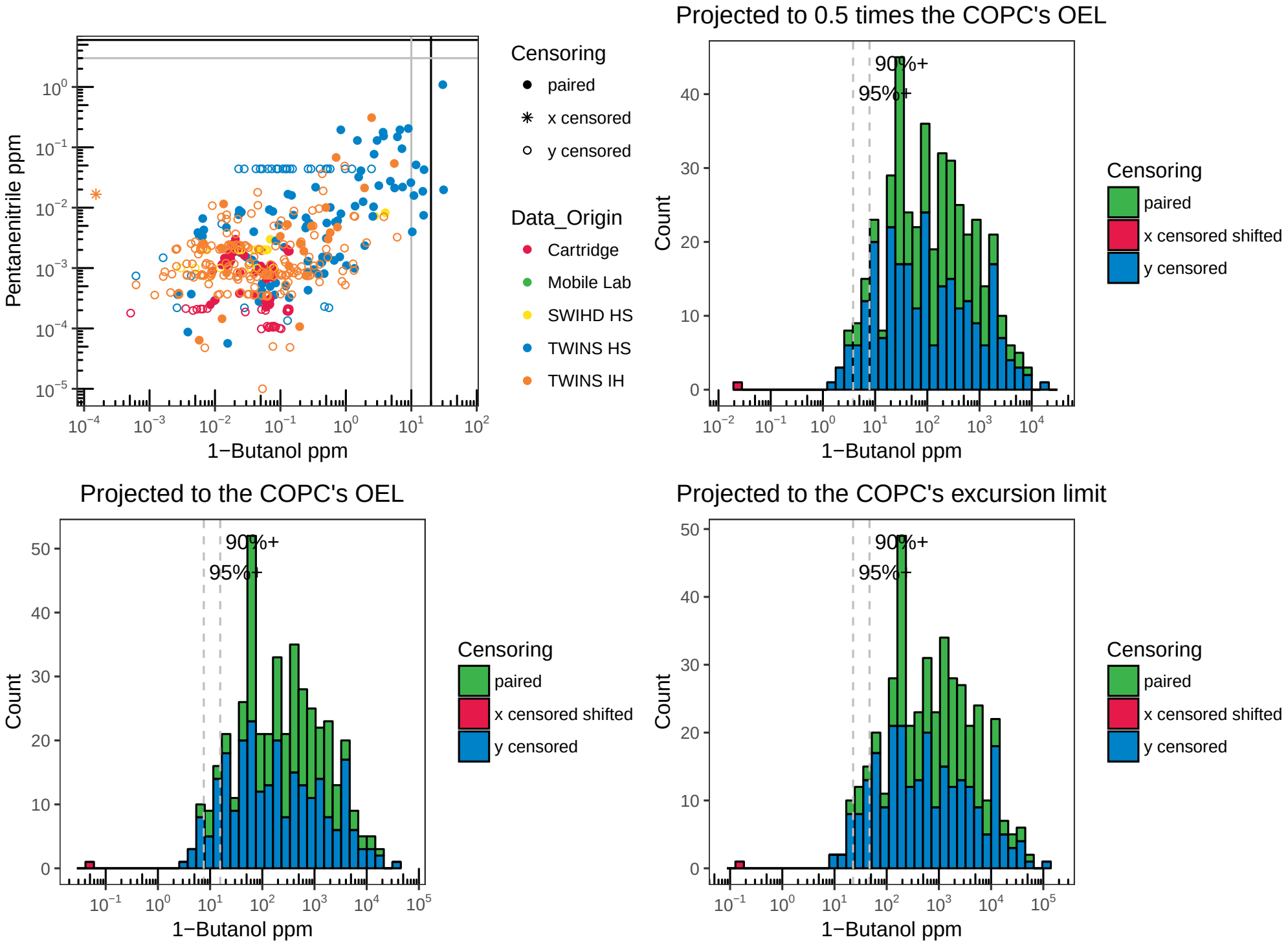


Figure C.369: Pentanenitrile vs 1-Butanol

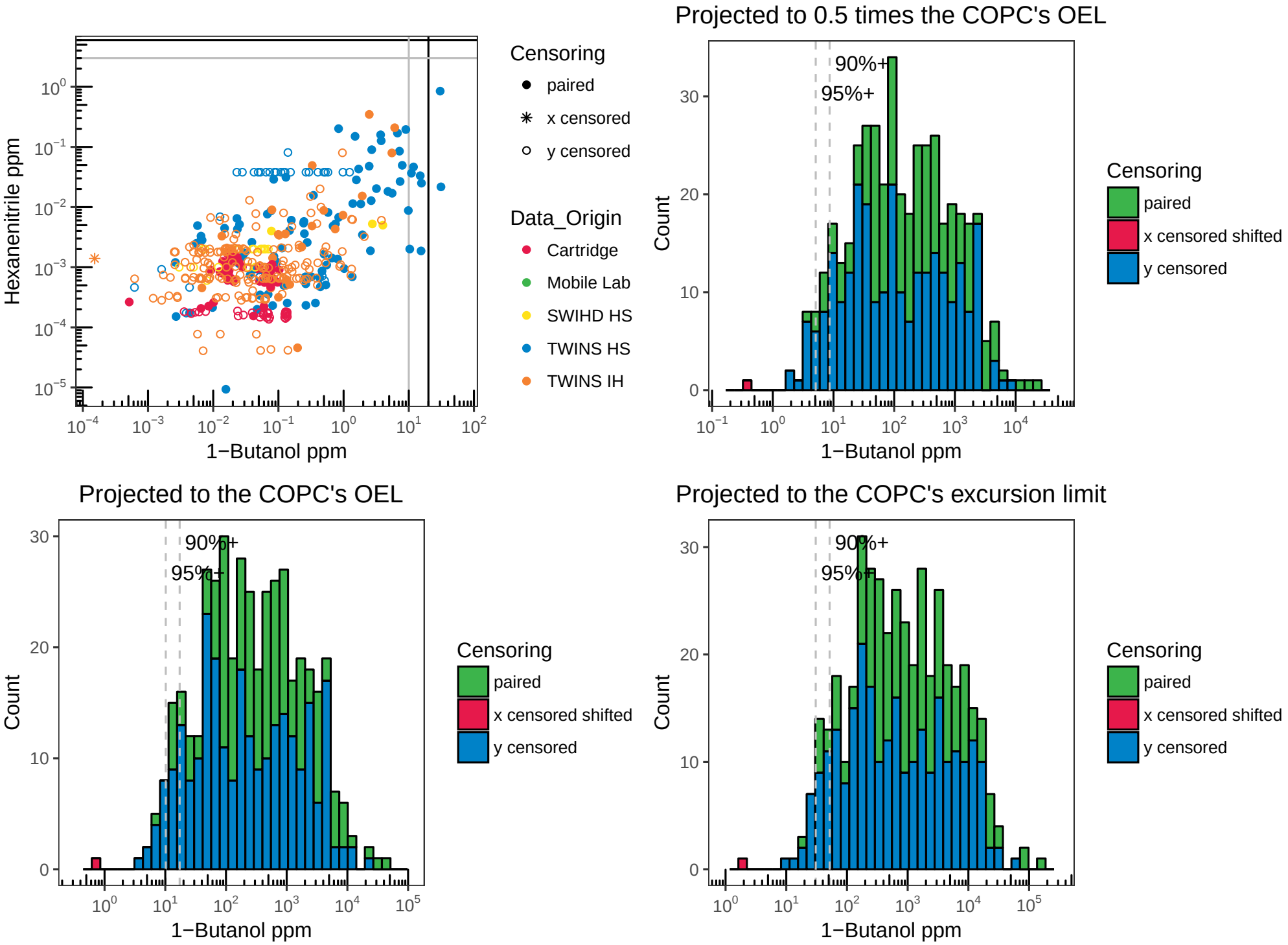


Figure C.370: Hexanenitrile vs 1-Butanol

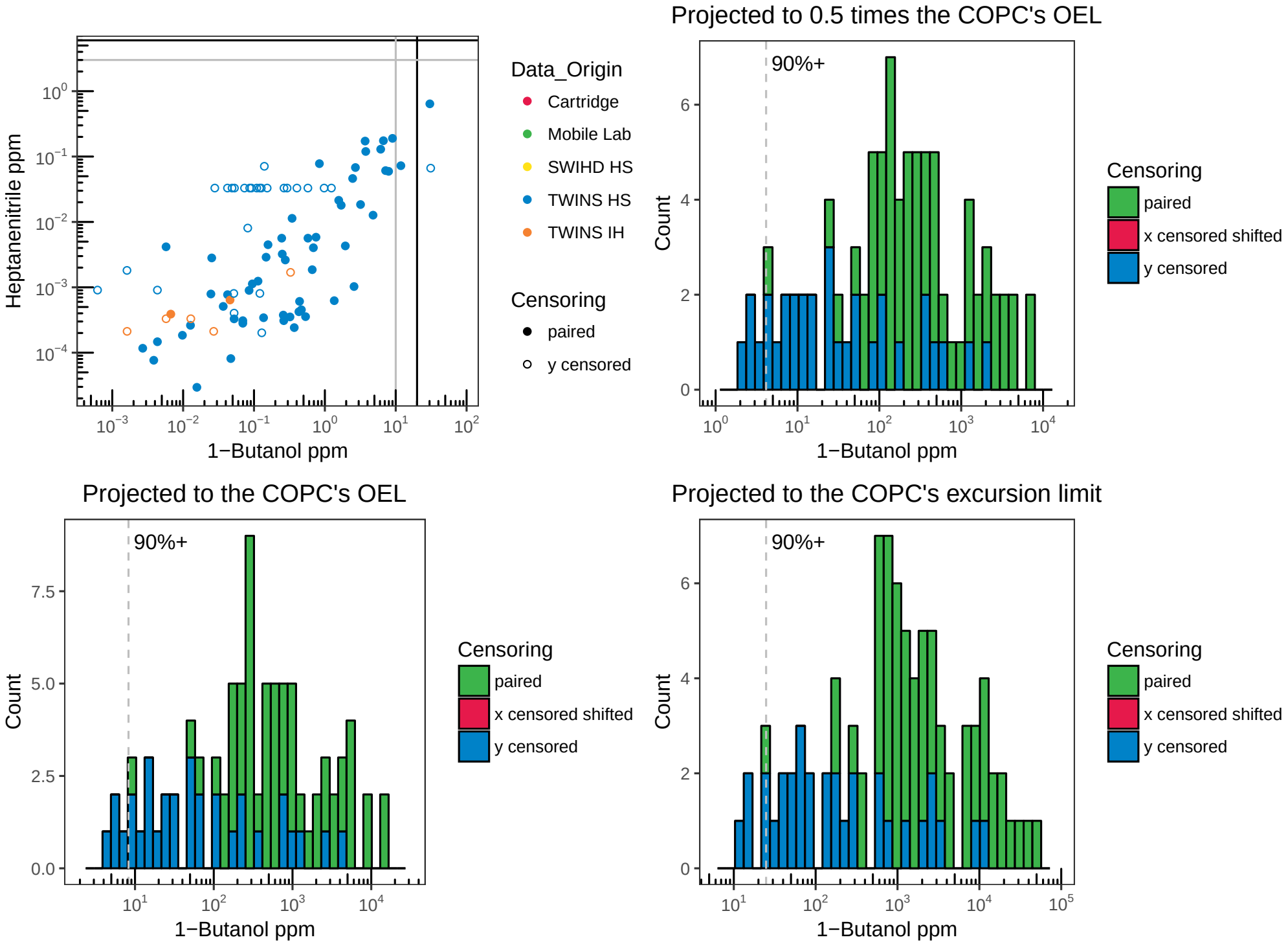


Figure C.371: Heptanenitrile vs 1-Butanol

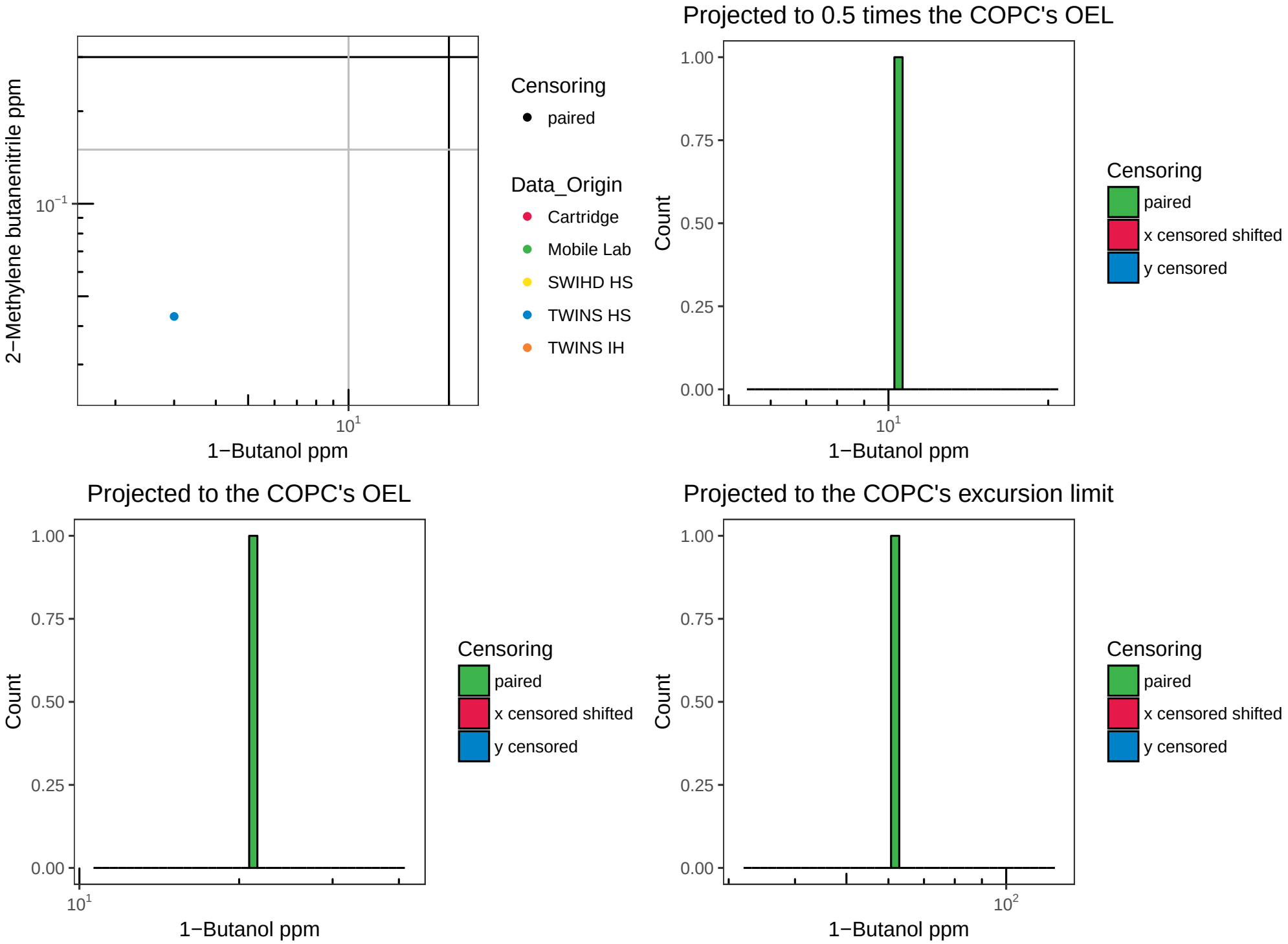


Figure C.372: 2-Methylene butanenitrile vs 1-Butanol

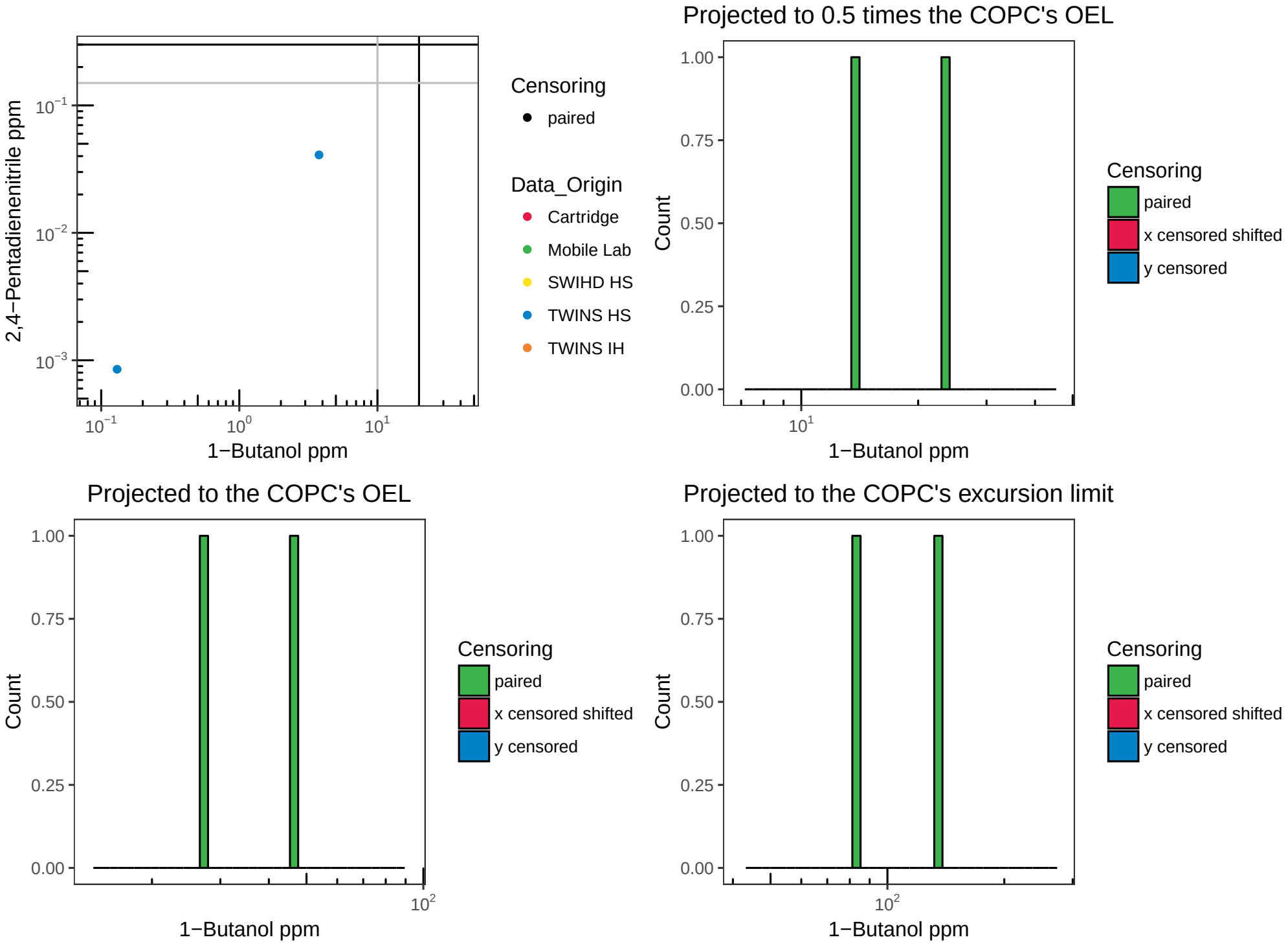


Figure C.373: 2,4-Pentadienenitrile vs 1-Butanol

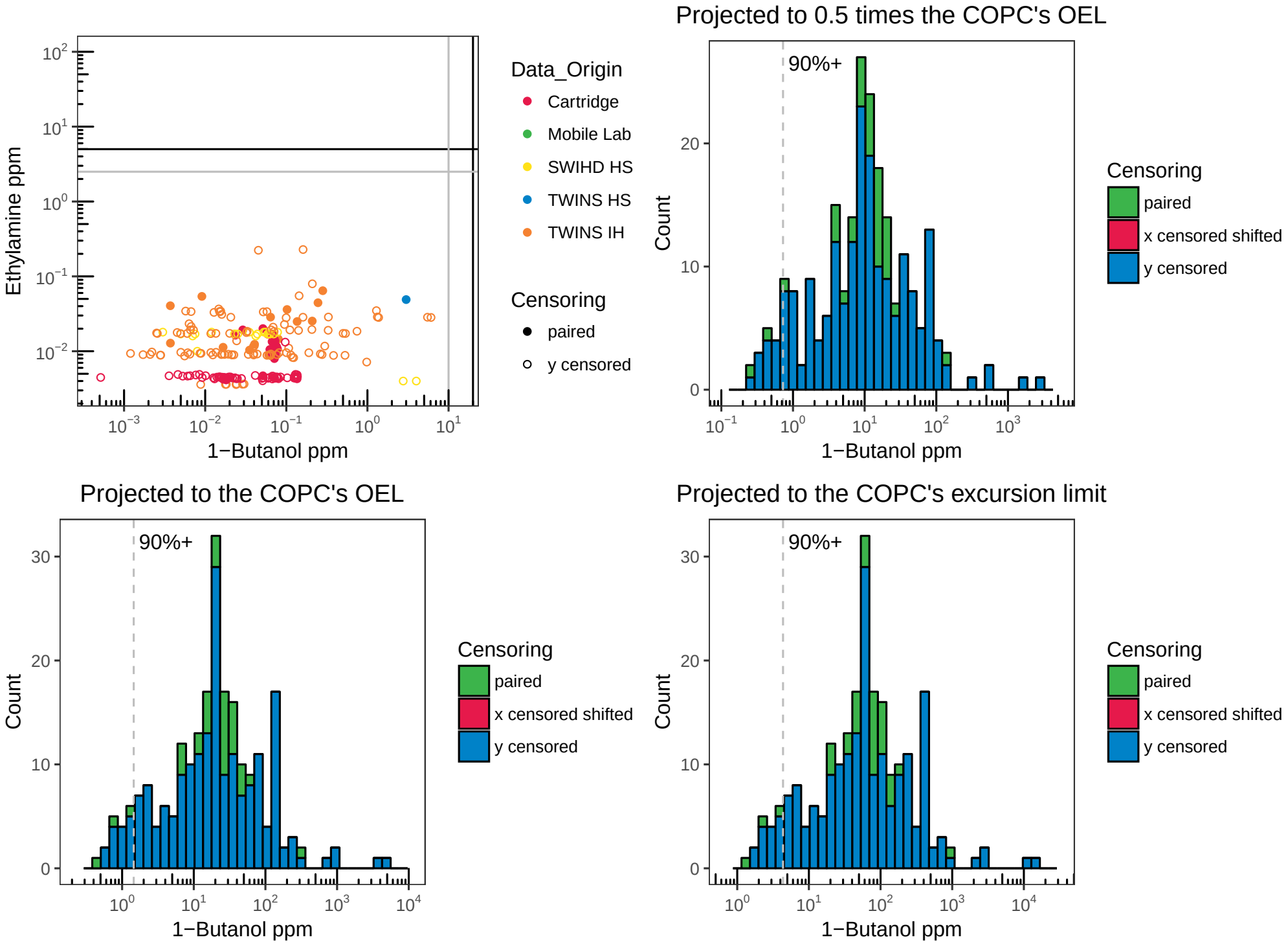


Figure C.374: Ethylamine vs 1-Butanol

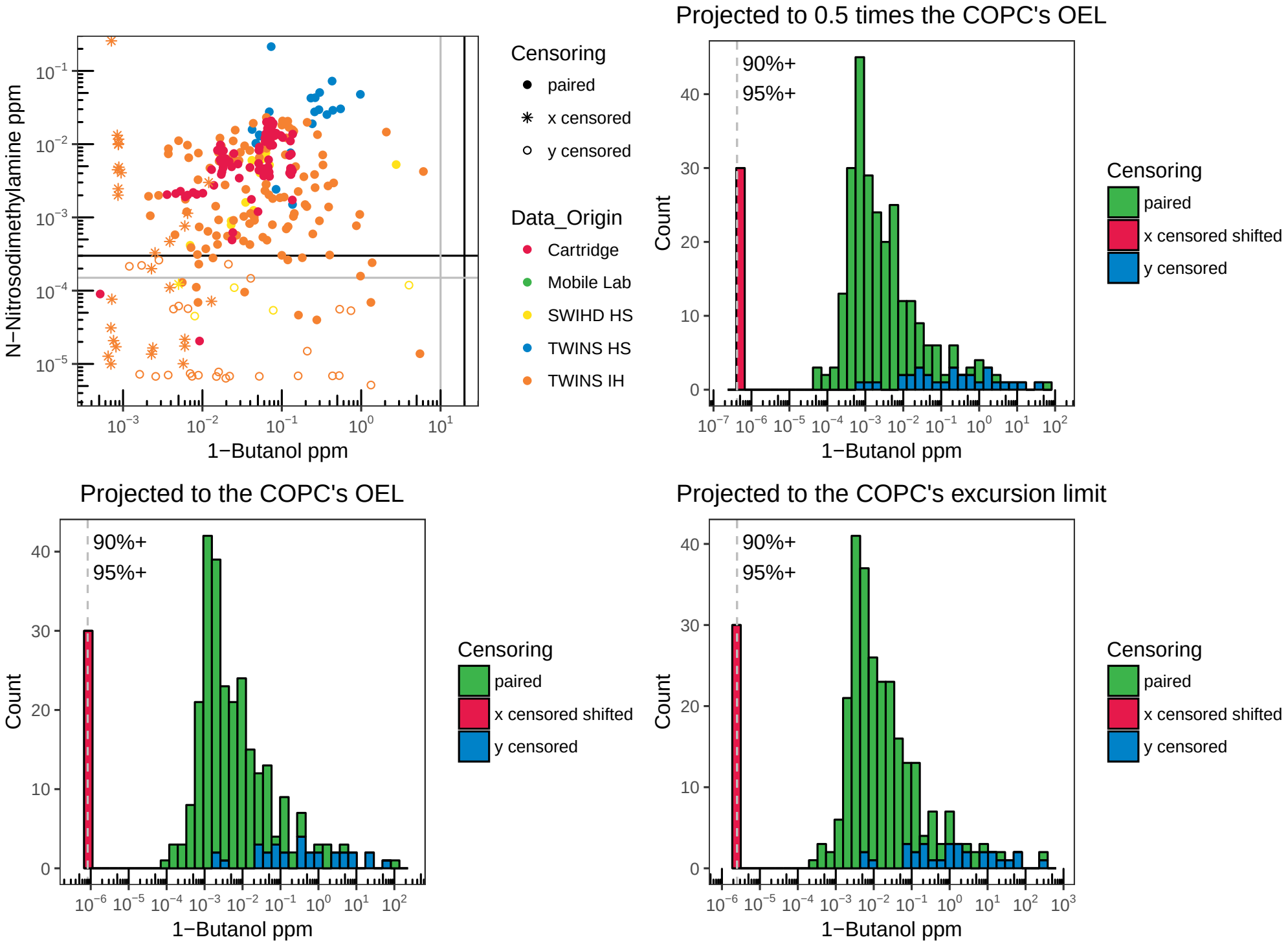


Figure C.375: N-Nitrosodimethylamine vs 1-Butanol

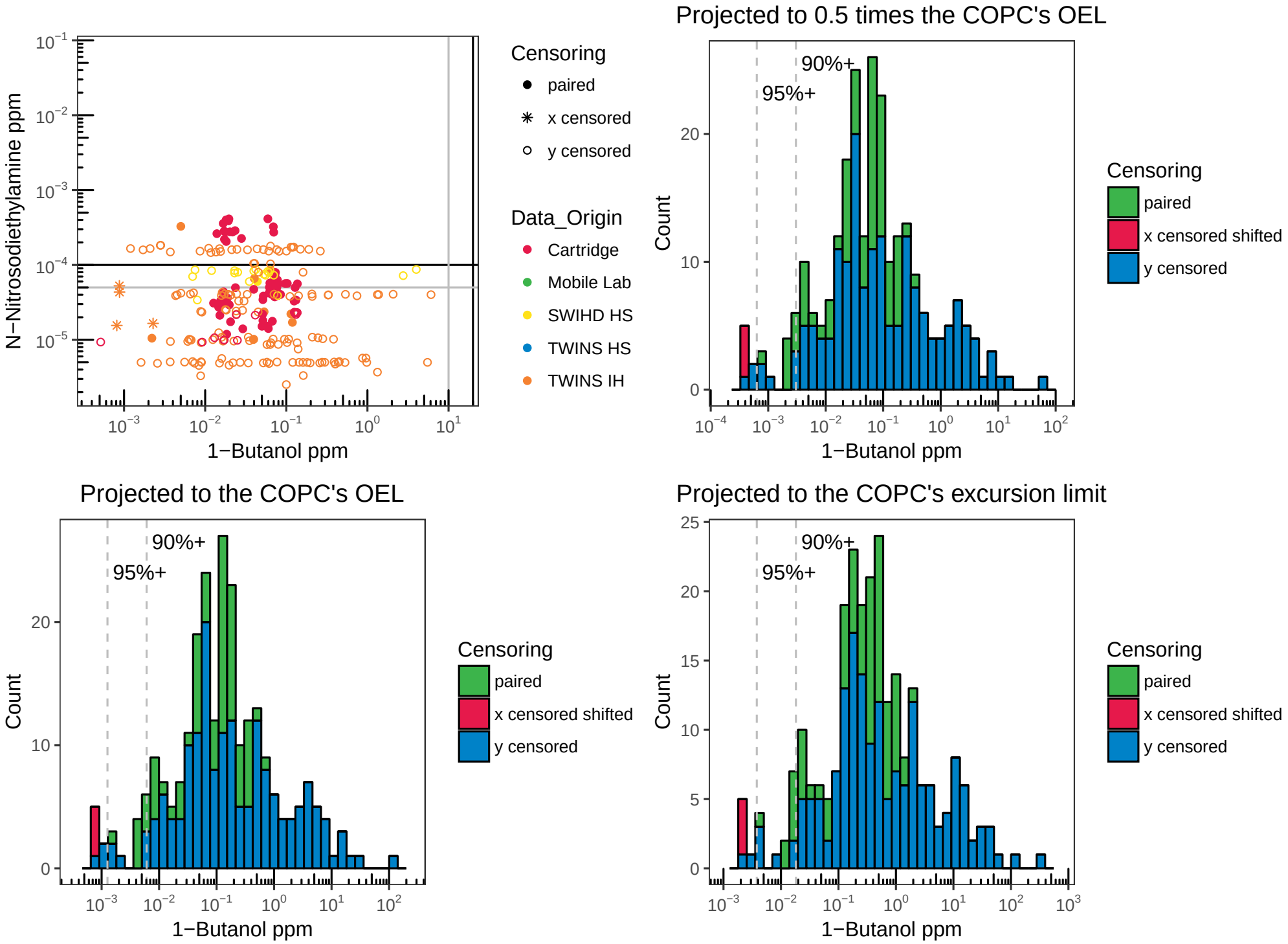


Figure C.376: N-Nitrosodiethylamine vs 1-Butanol

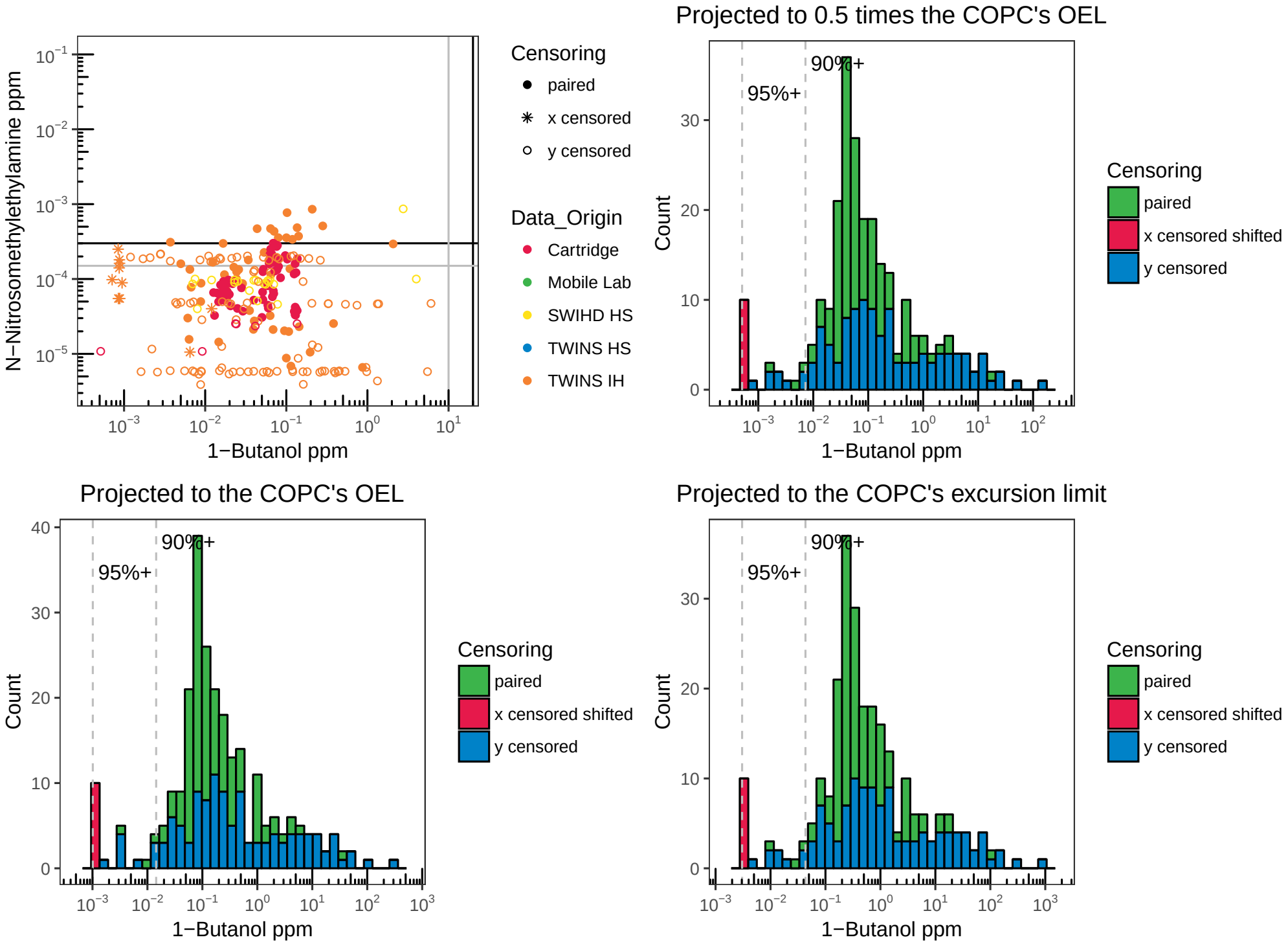


Figure C.377: N-Nitrosomethylethylamine vs 1-Butanol

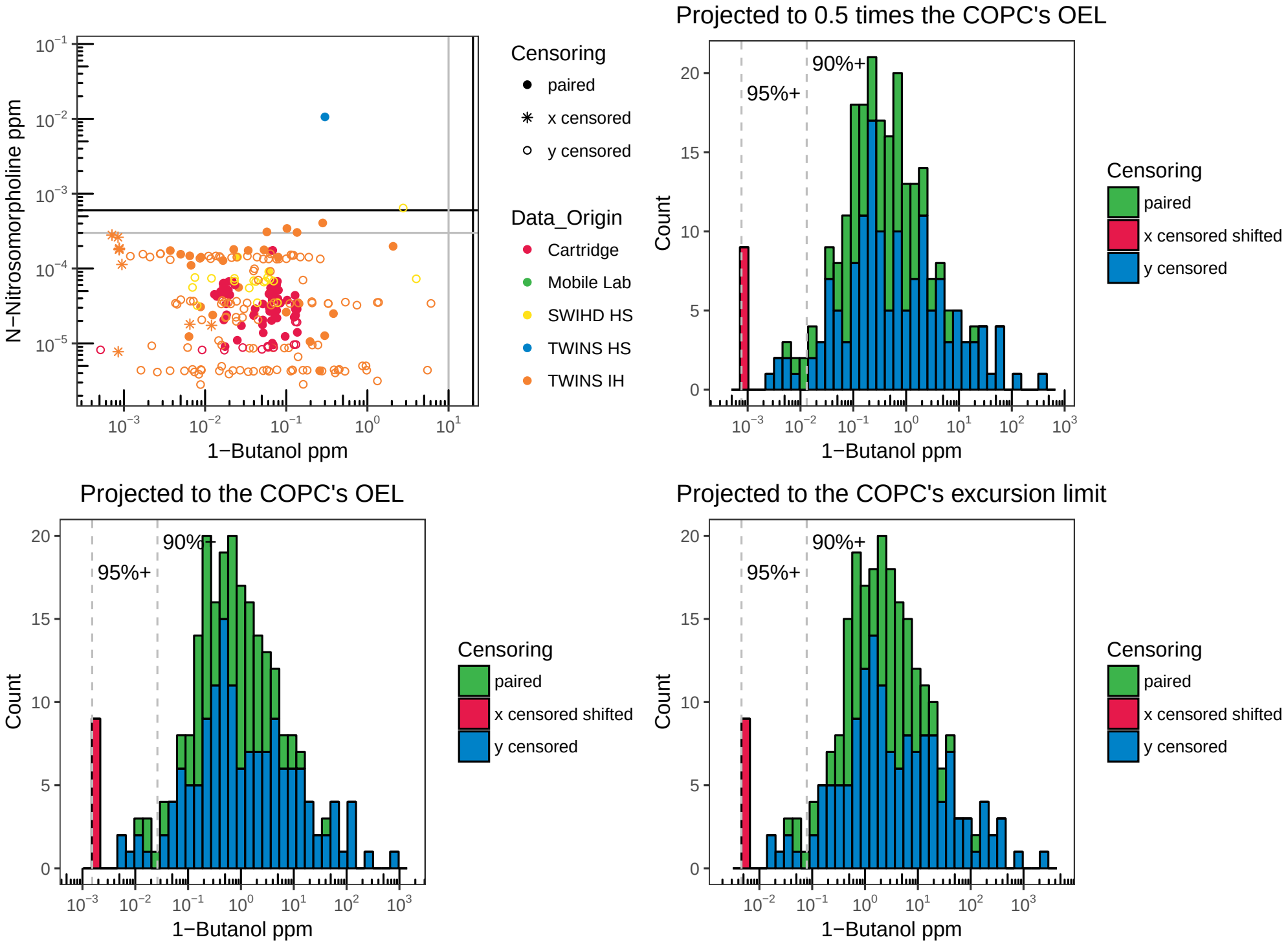


Figure C.378: N-Nitrosomorpholine vs 1-Butanol

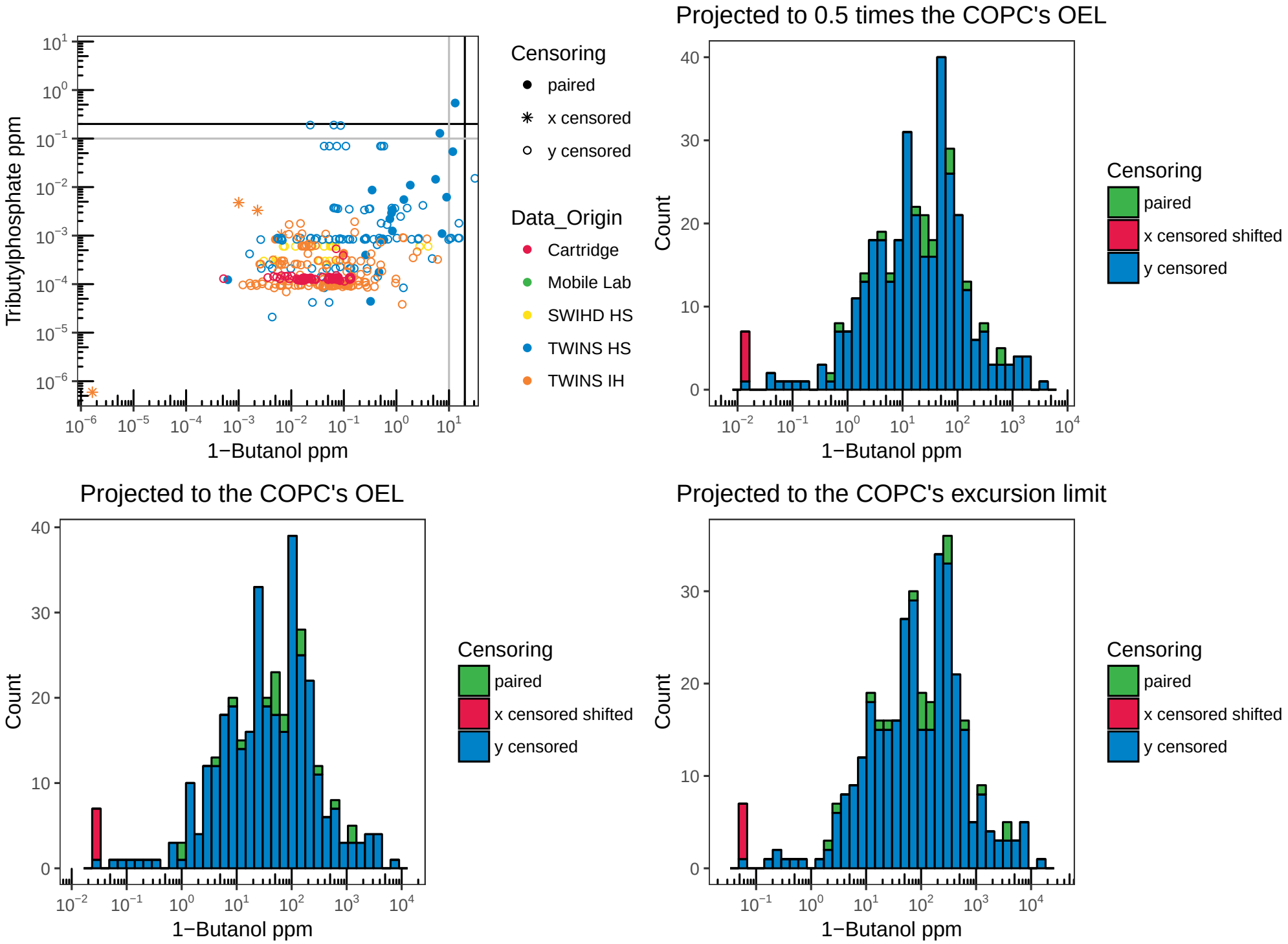


Figure C.379: Tributylphosphate vs 1-Butanol

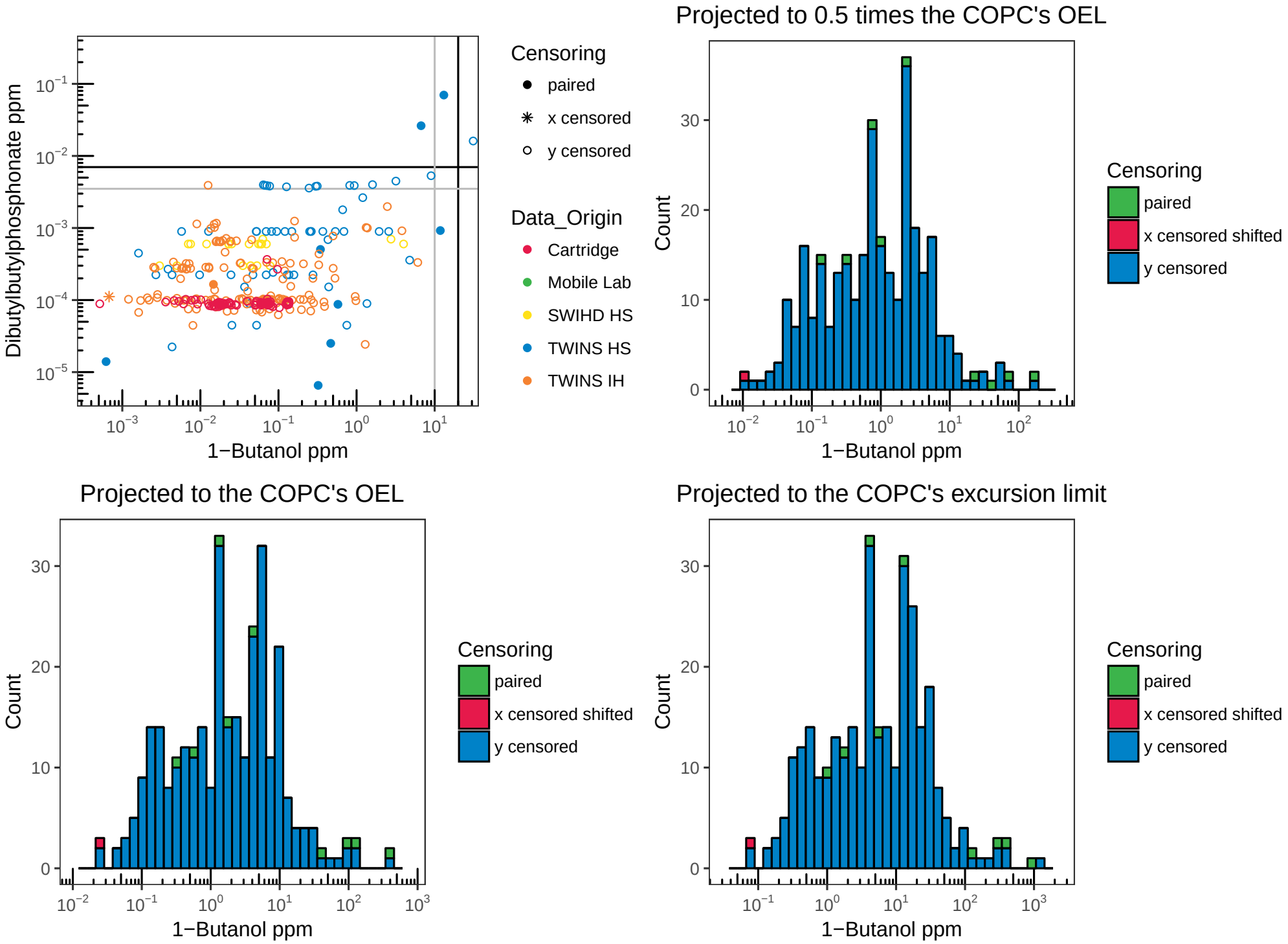


Figure C.380: Dibutylbutylphosphonate vs 1-Butanol

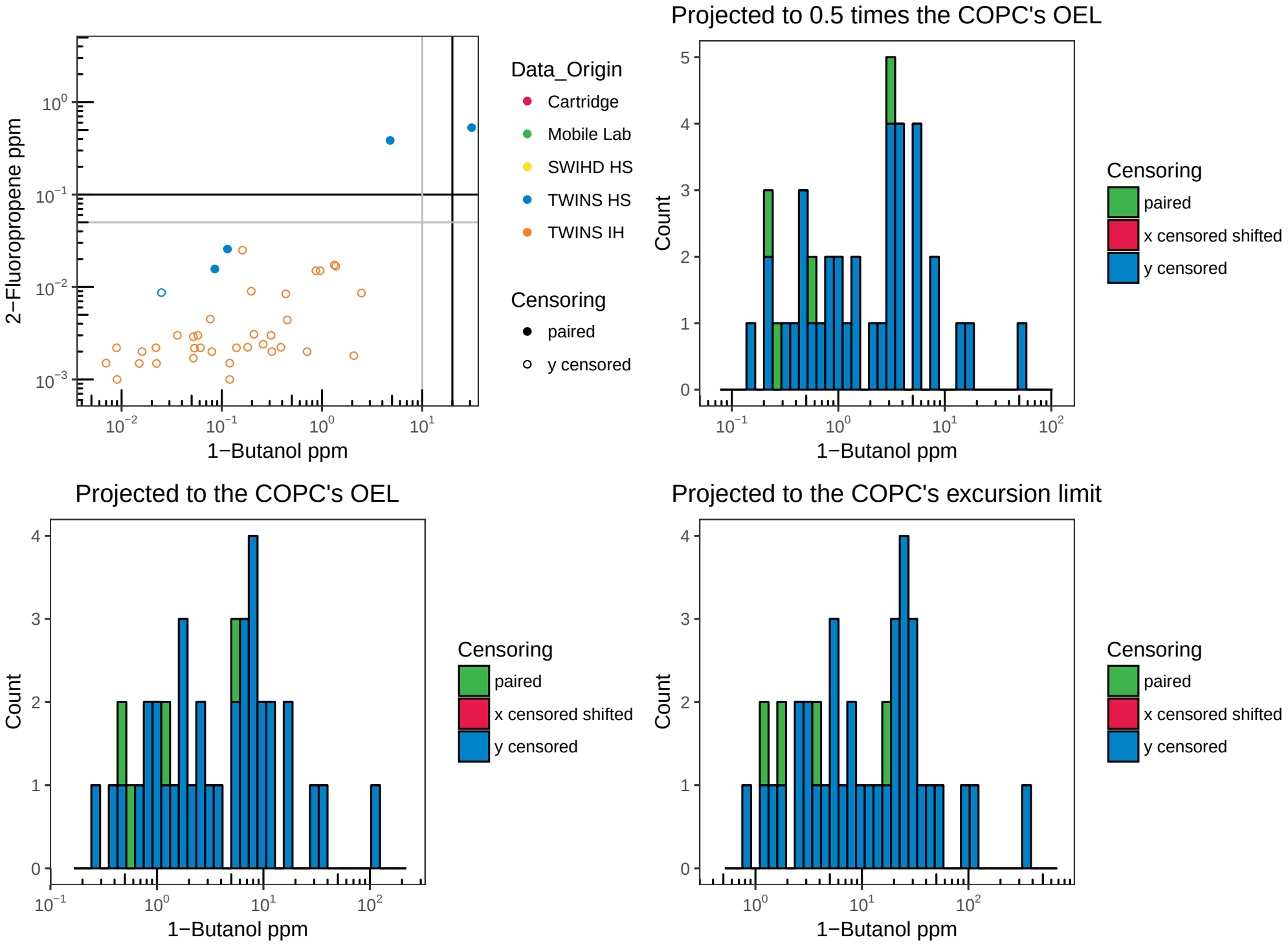


Figure C.381: 2-Fluoropropene vs 1-Butanol

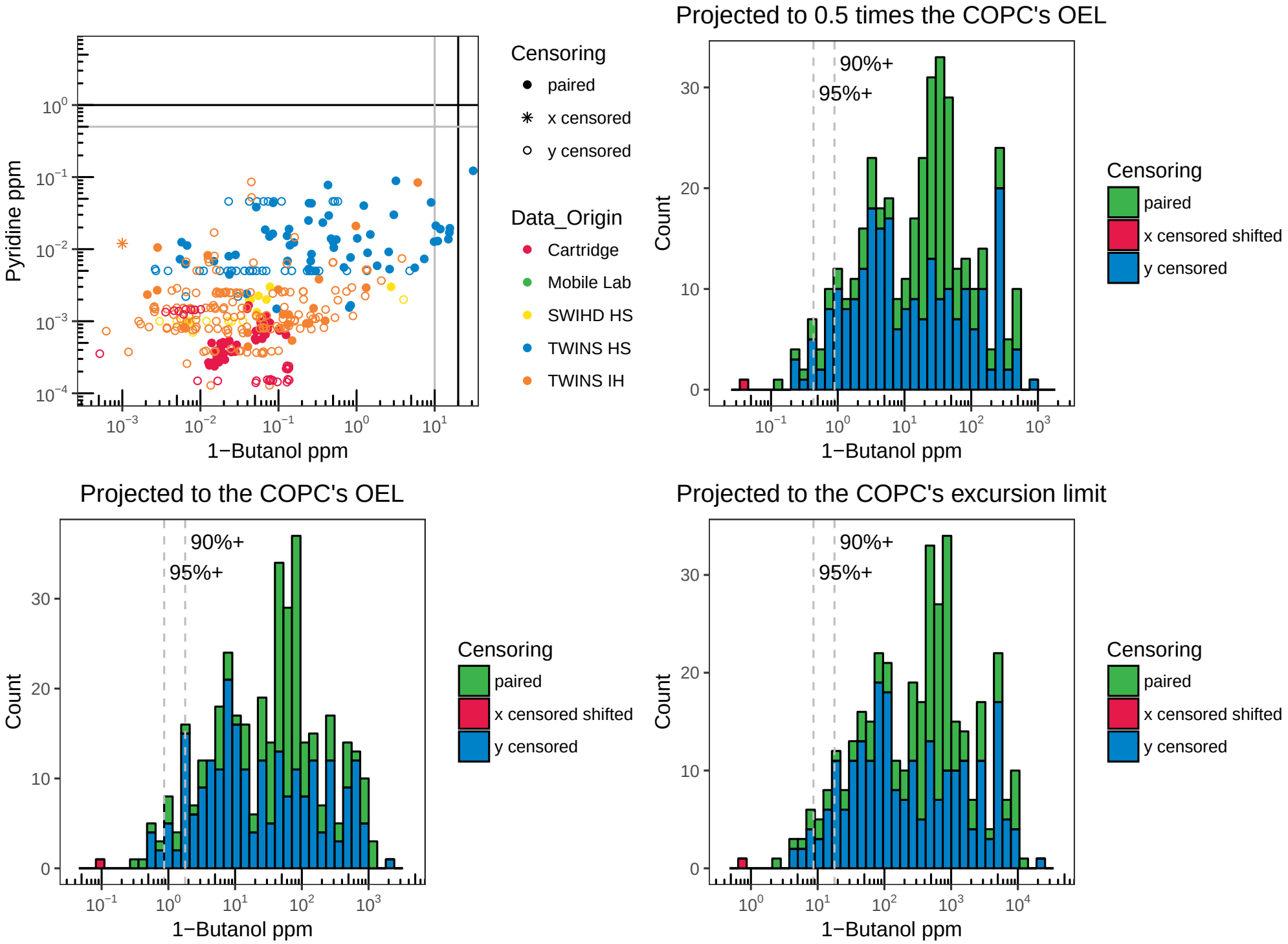


Figure C.382: Pyridine vs 1-Butanol

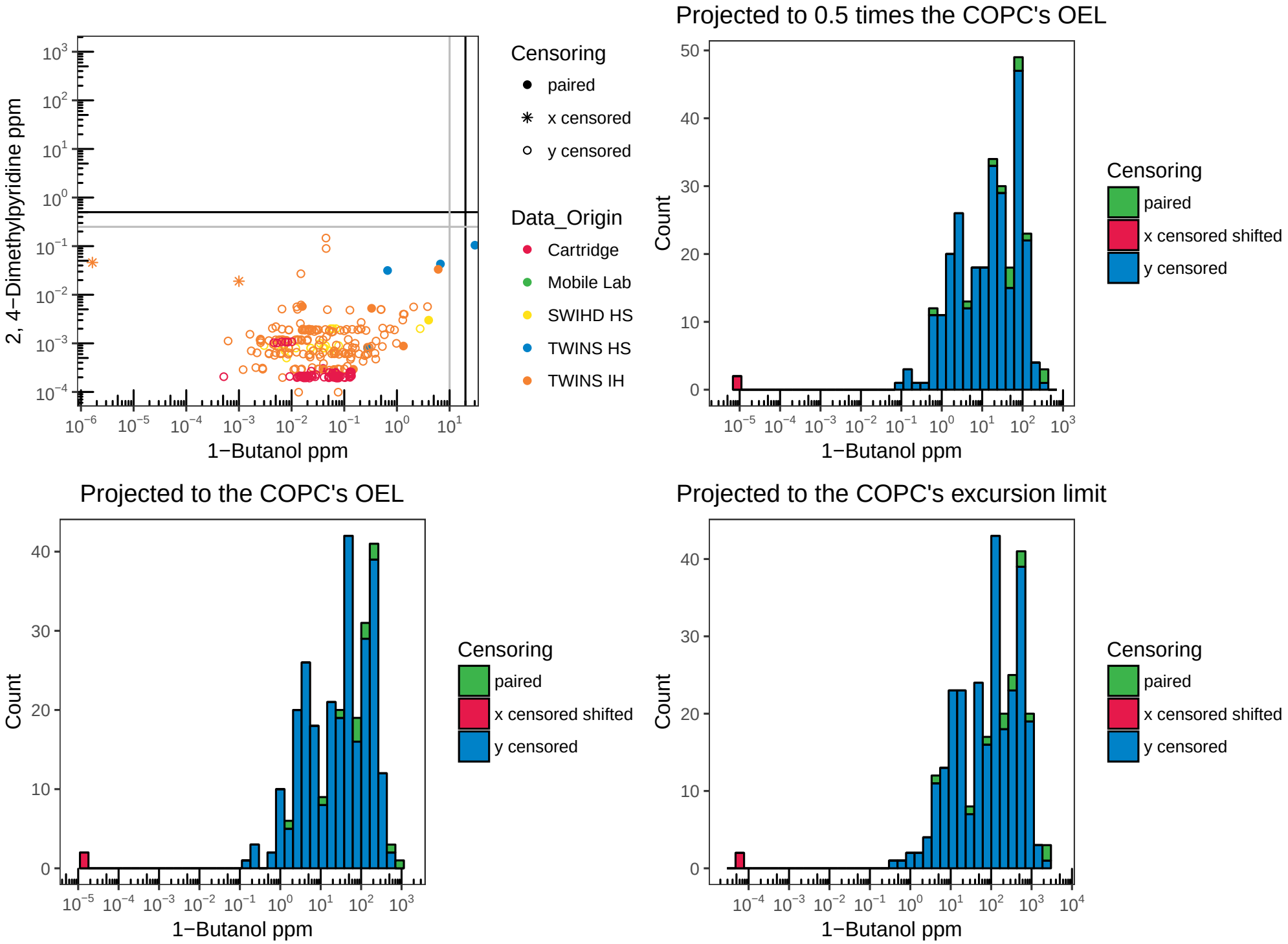


Figure C.383: 2, 4-Dimethylpyridine vs 1-Butanol

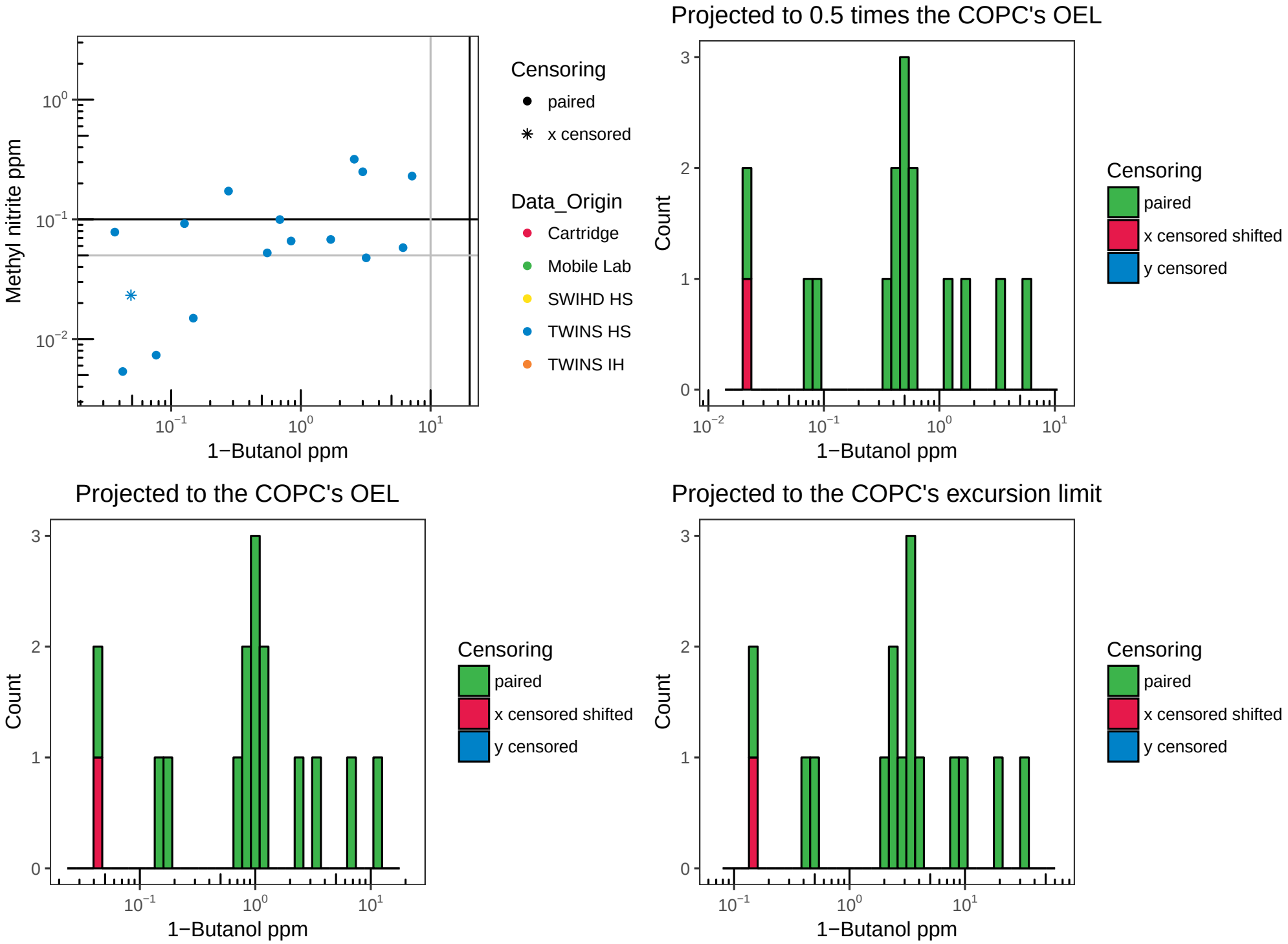


Figure C.384: Methyl nitrite vs 1-Butanol

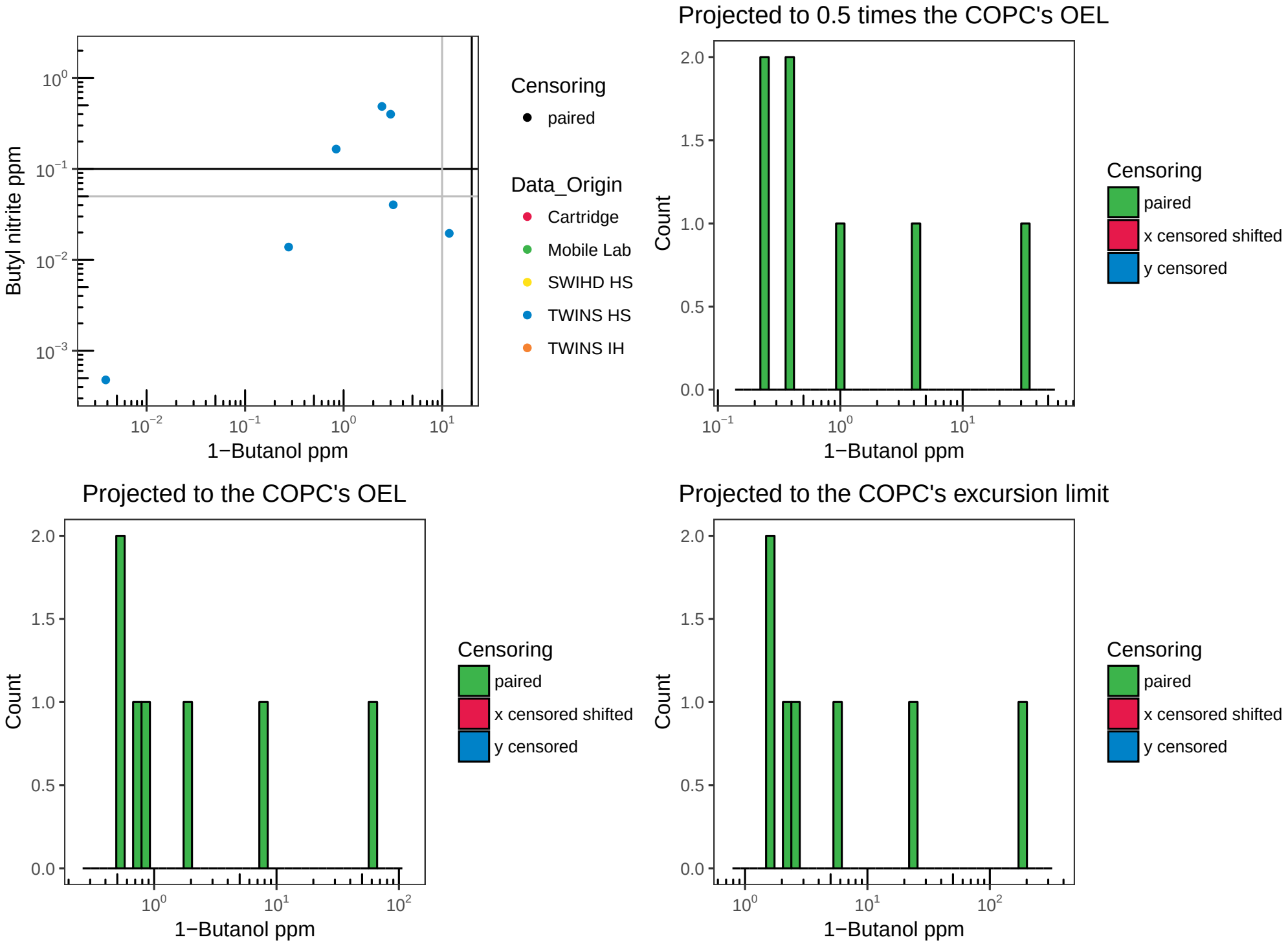


Figure C.385: Butyl nitrite vs 1-Butanol

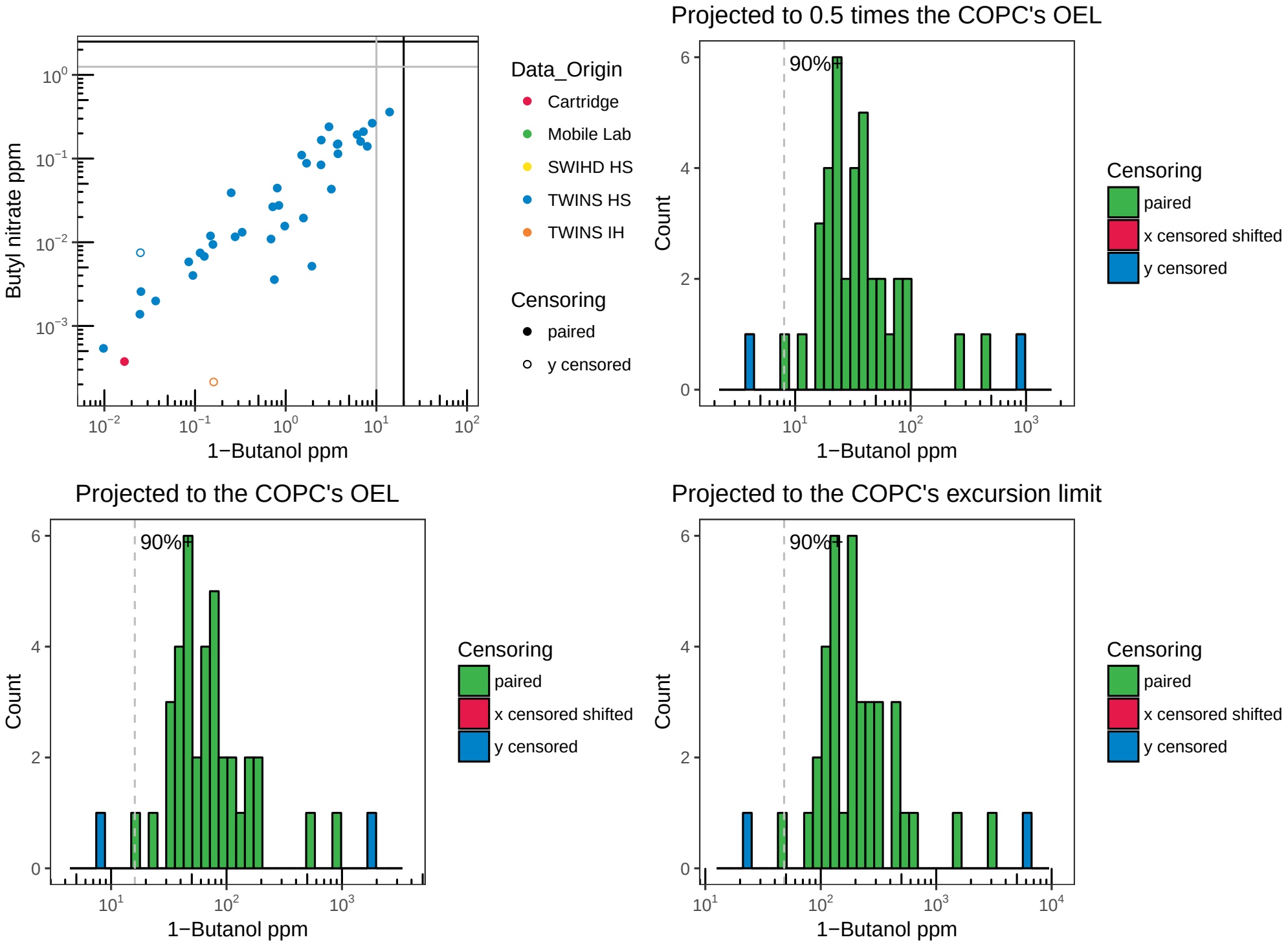


Figure C.386: Butyl nitrate vs 1-Butanol

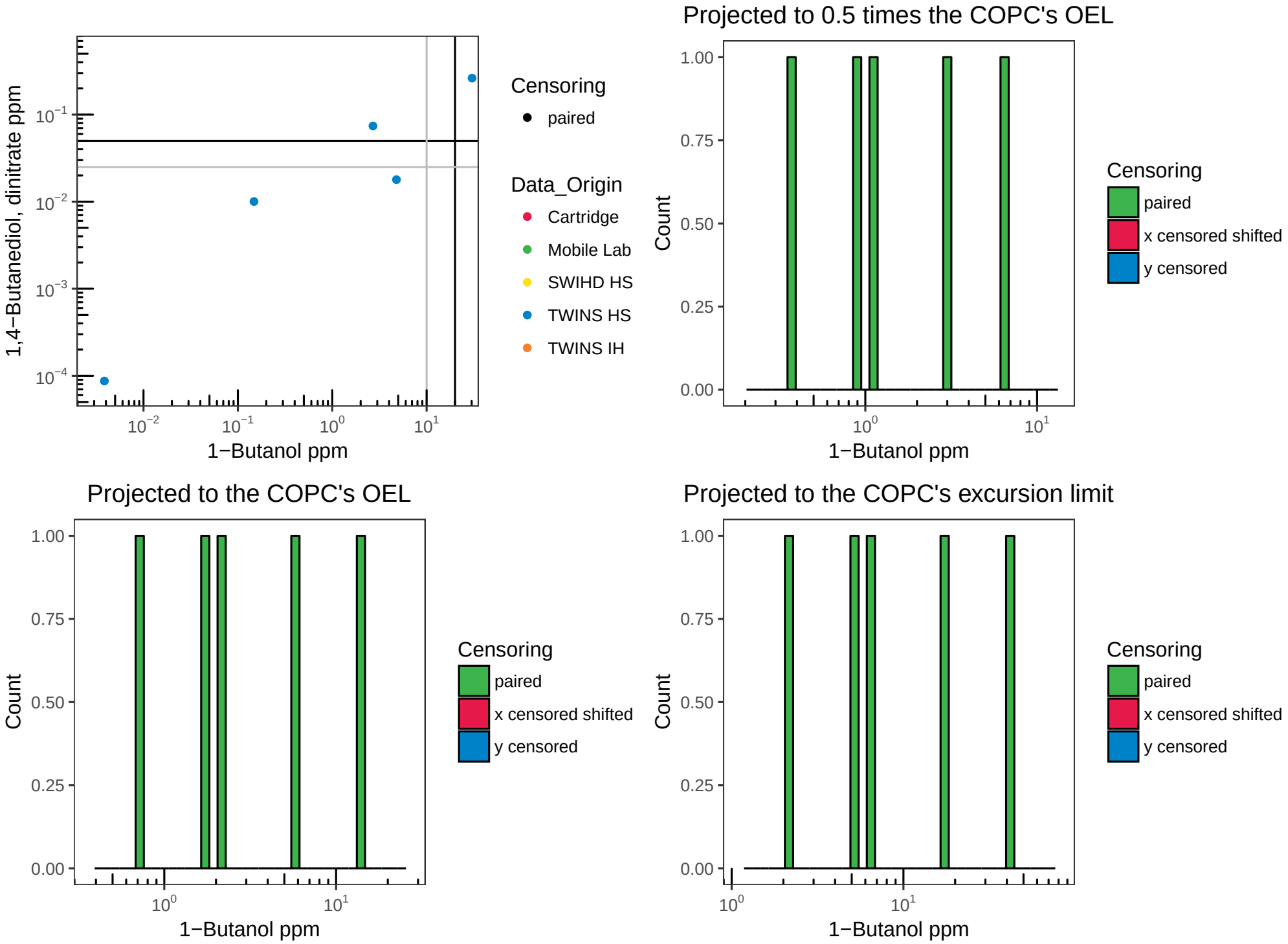


Figure C.387: 1,4-Butanediol, dinitrate vs 1-Butanol

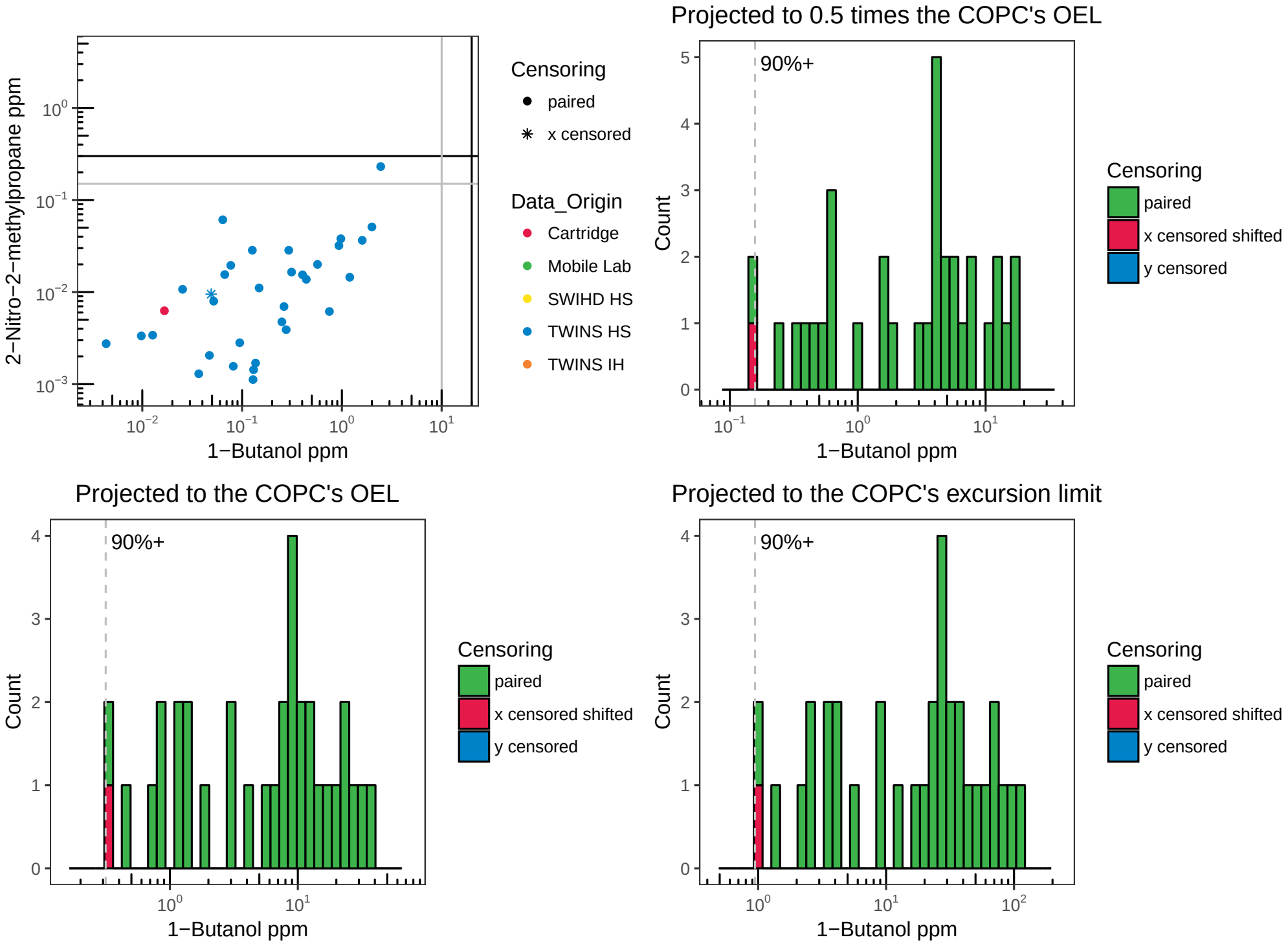


Figure C.388: 2-Nitro-2-methylpropane vs 1-Butanol

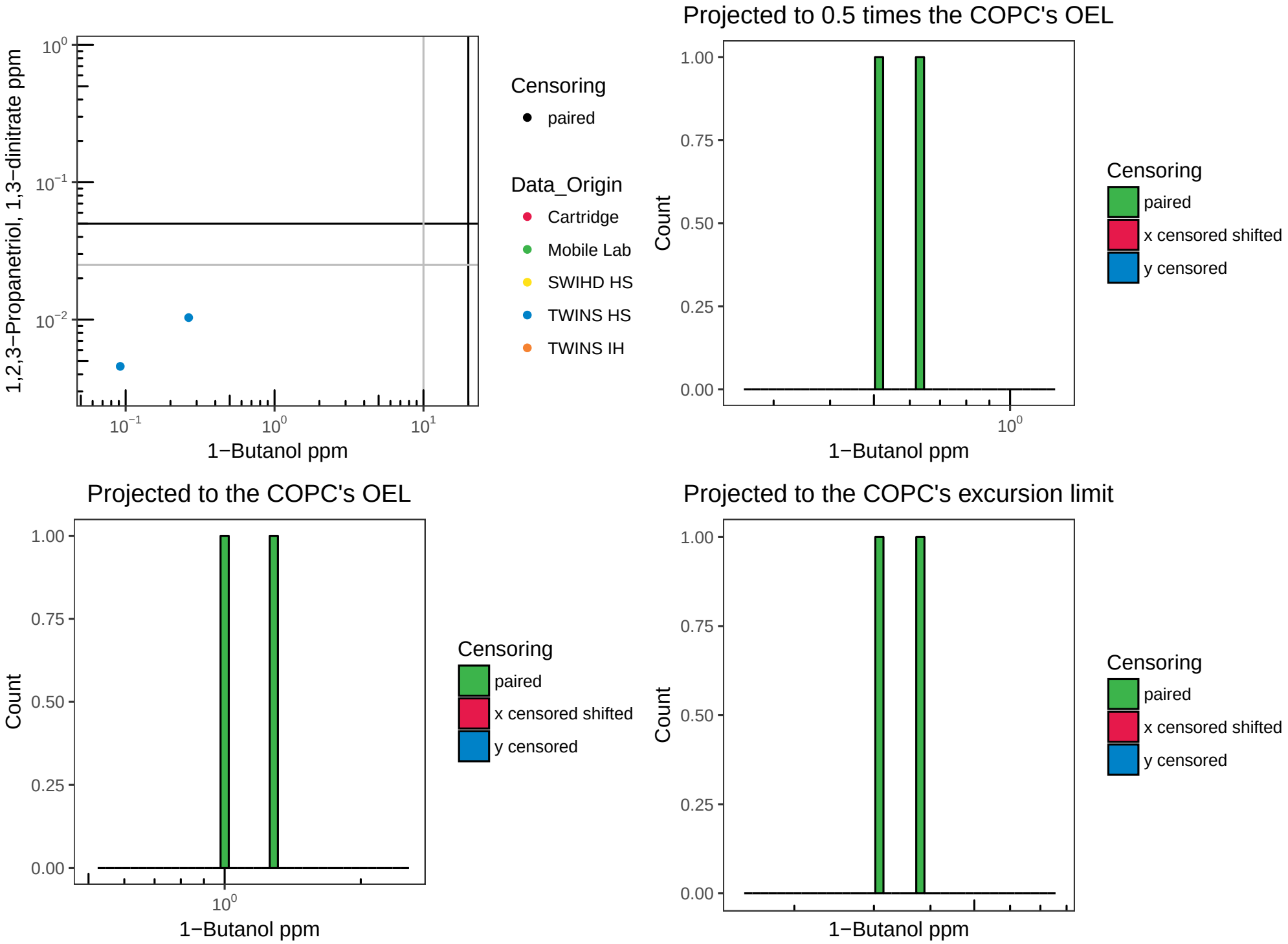


Figure C.389: 1,2,3-Propanetriol, 1,3-dinitrate vs 1-Butanol

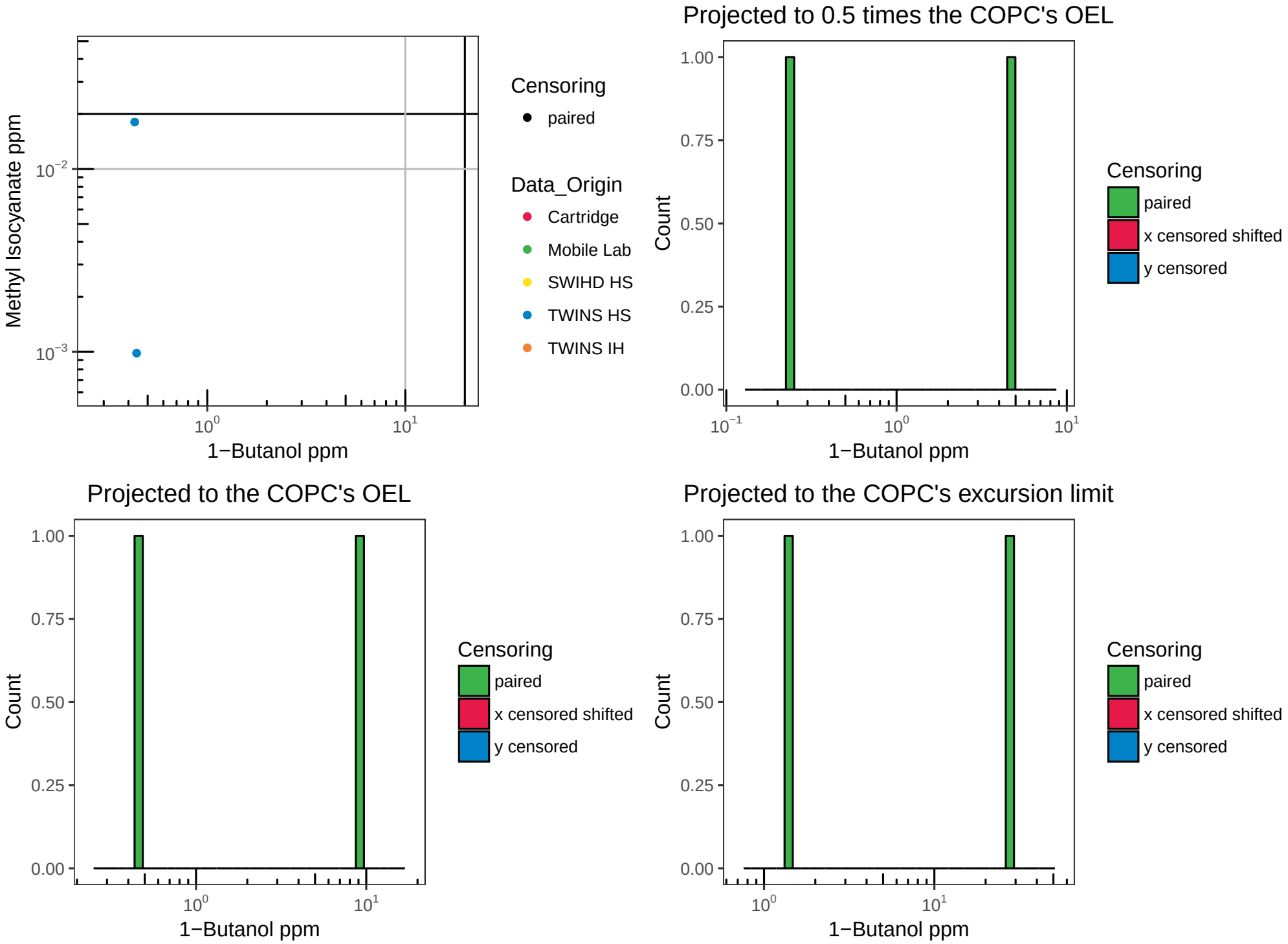


Figure C.390: Methyl Isocyanate vs 1-Butanol

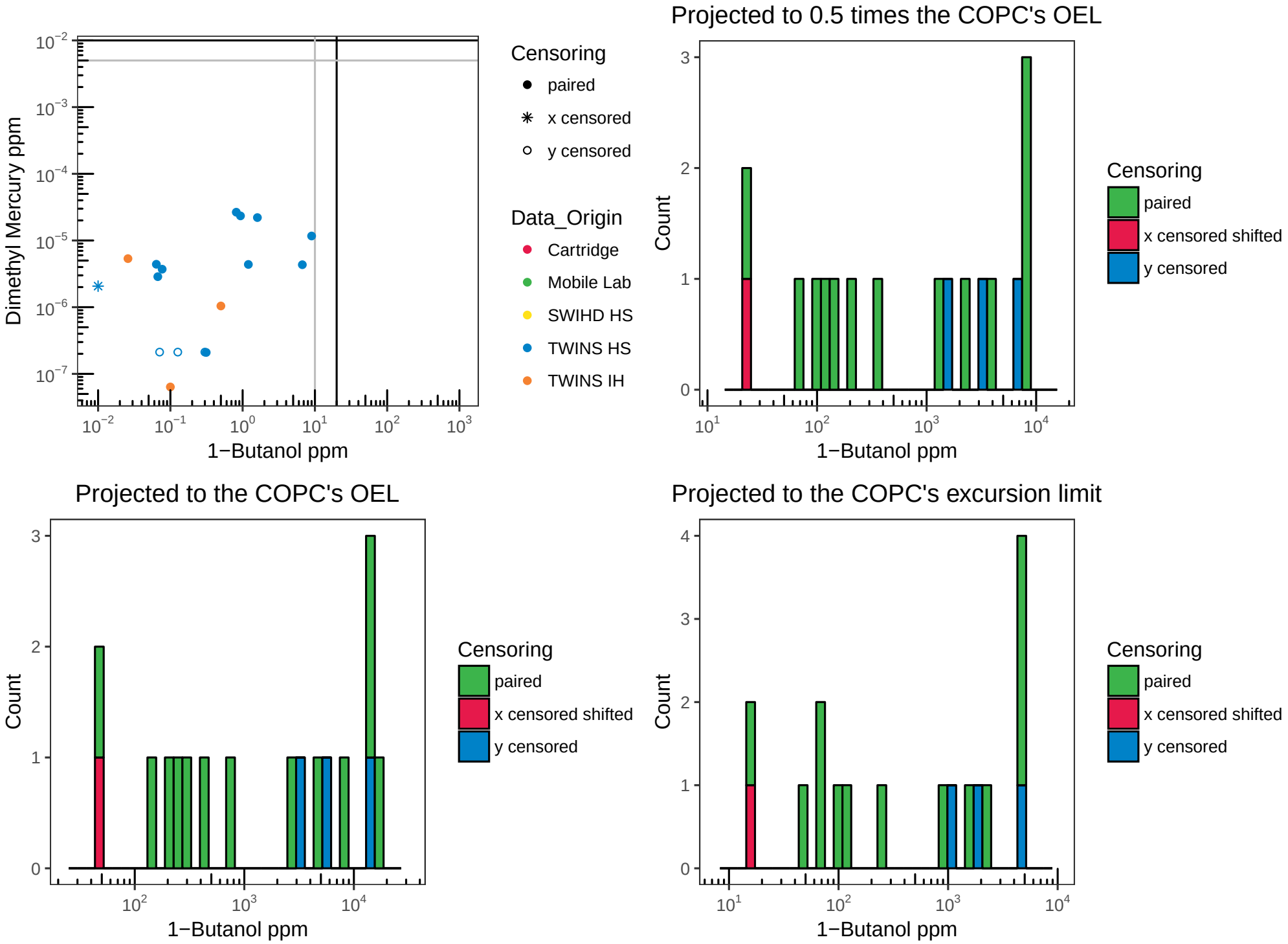


Figure C.391: Dimethyl Mercury vs 1-Butanol

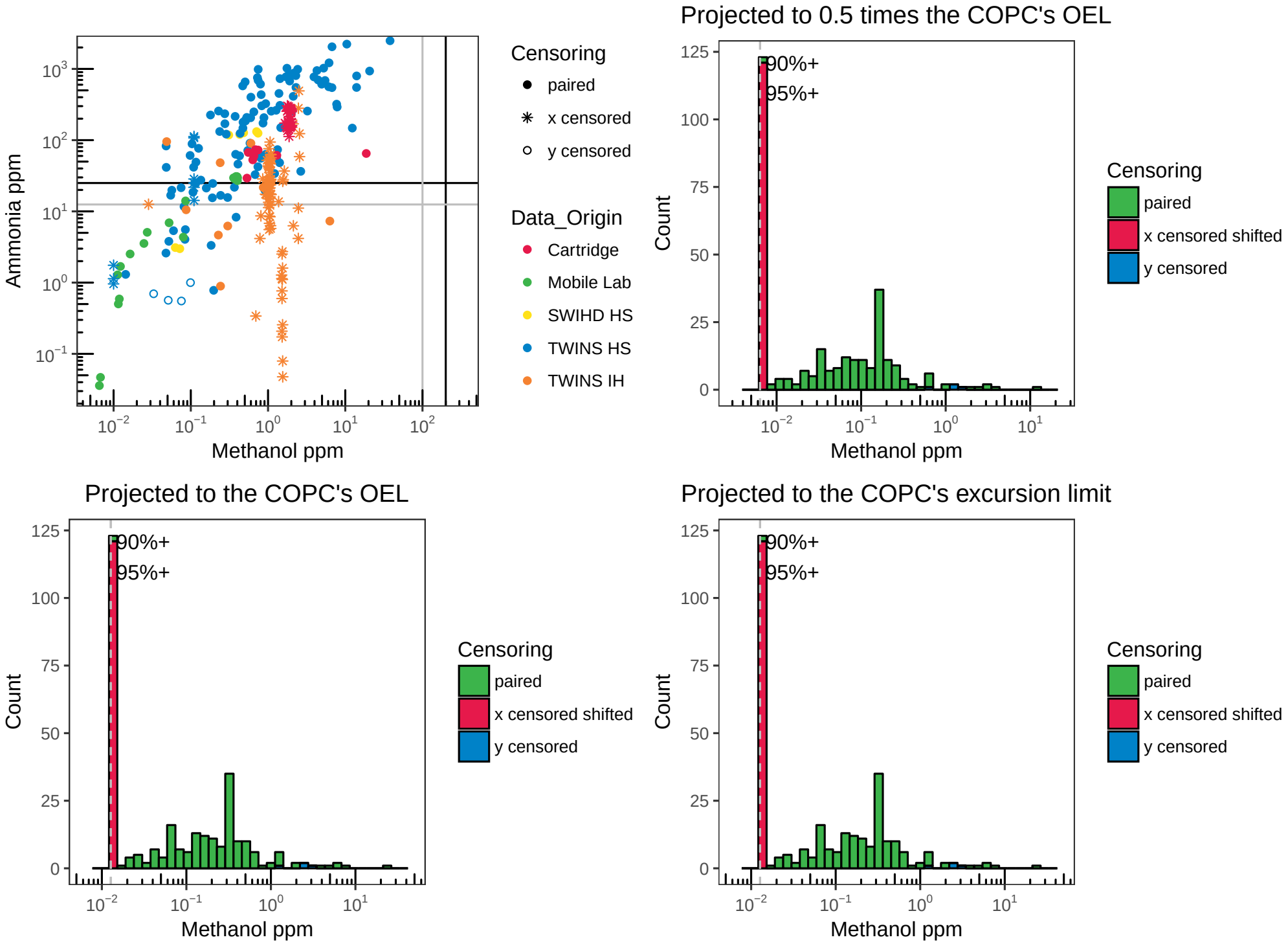


Figure C.392: Ammonia vs Methanol

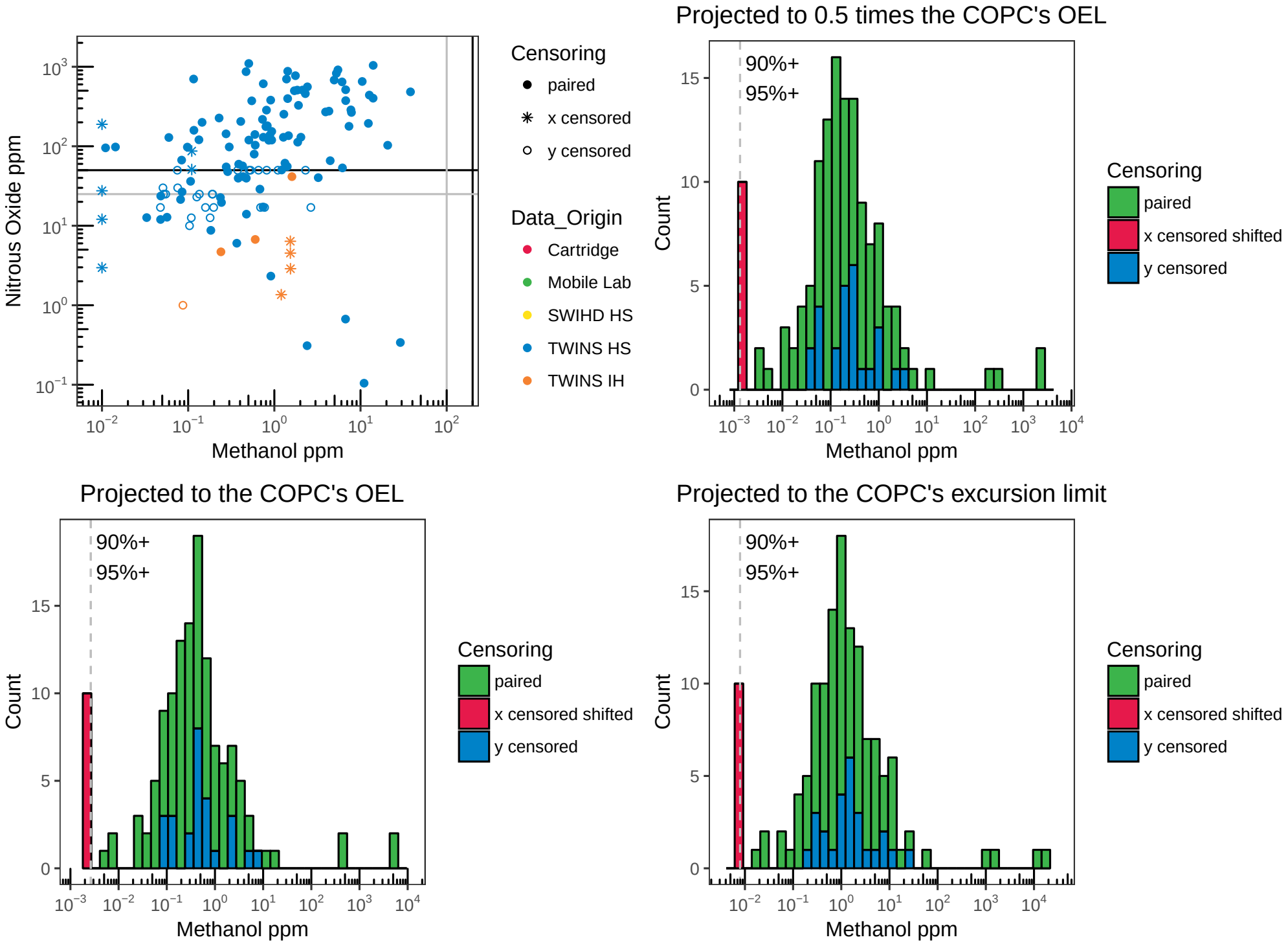


Figure C.393: Nitrous Oxide vs Methanol

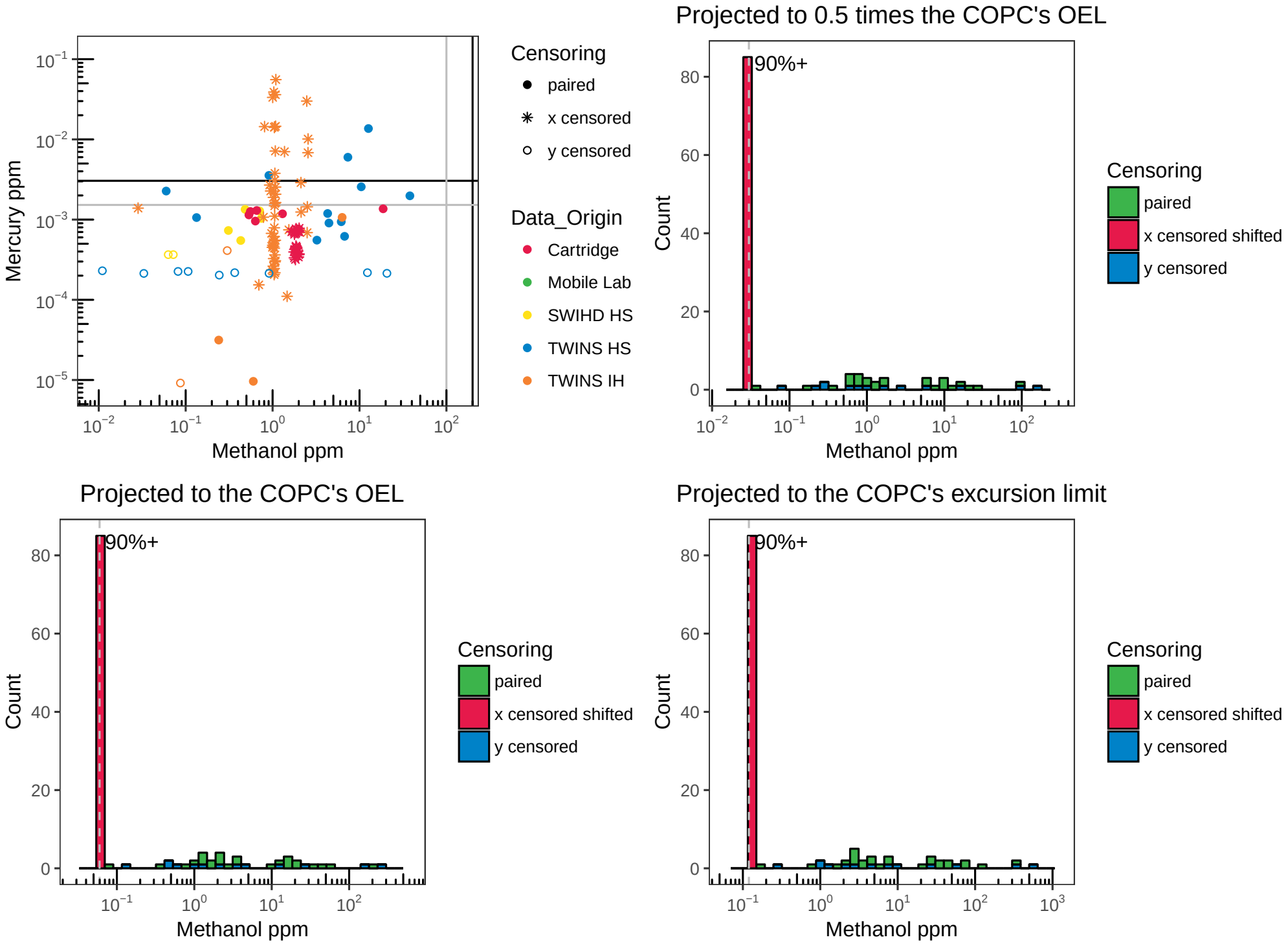


Figure C.394: Mercury vs Methanol

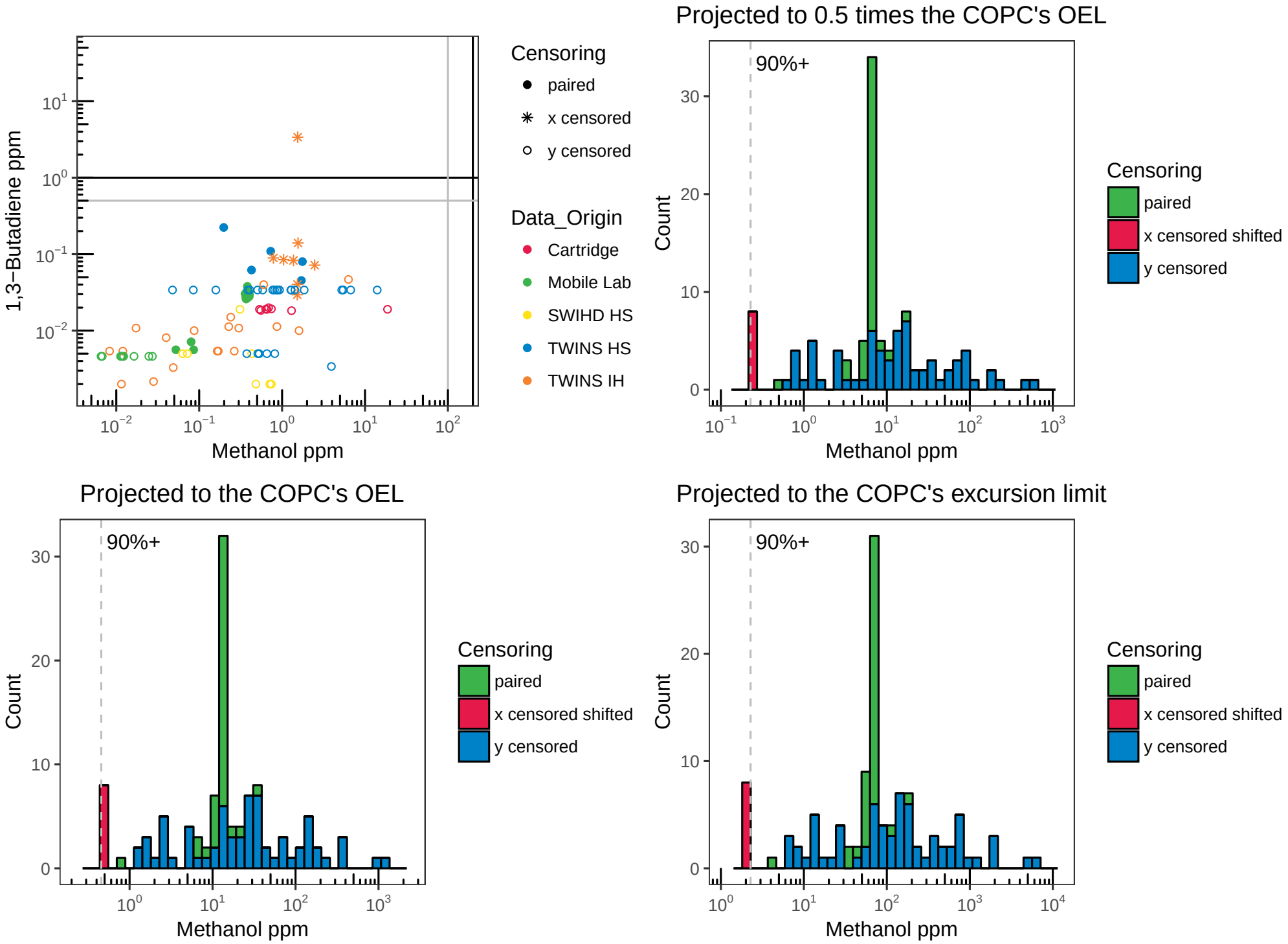


Figure C.395: 1,3-Butadiene vs Methanol

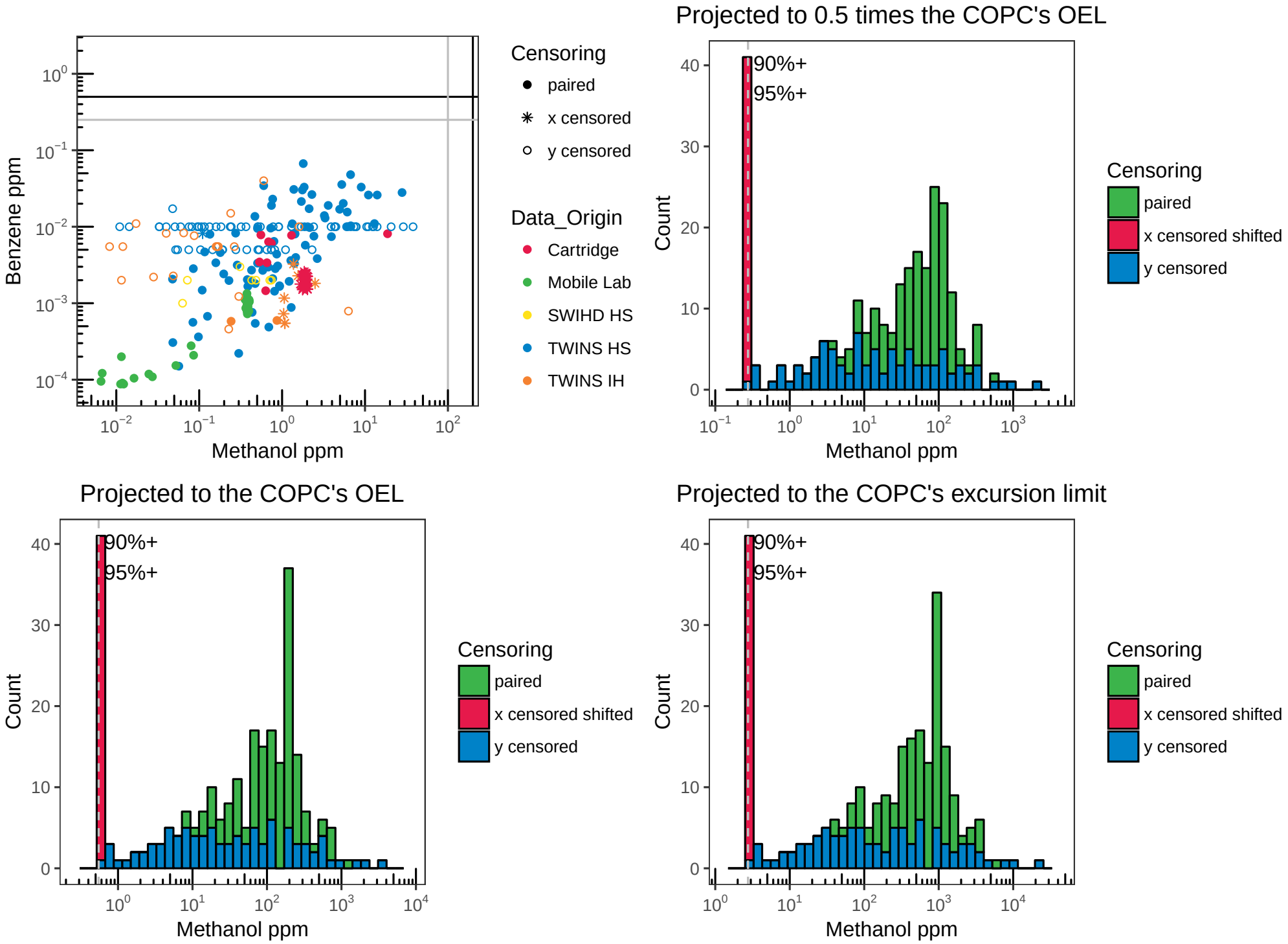


Figure C.396: Benzene vs Methanol

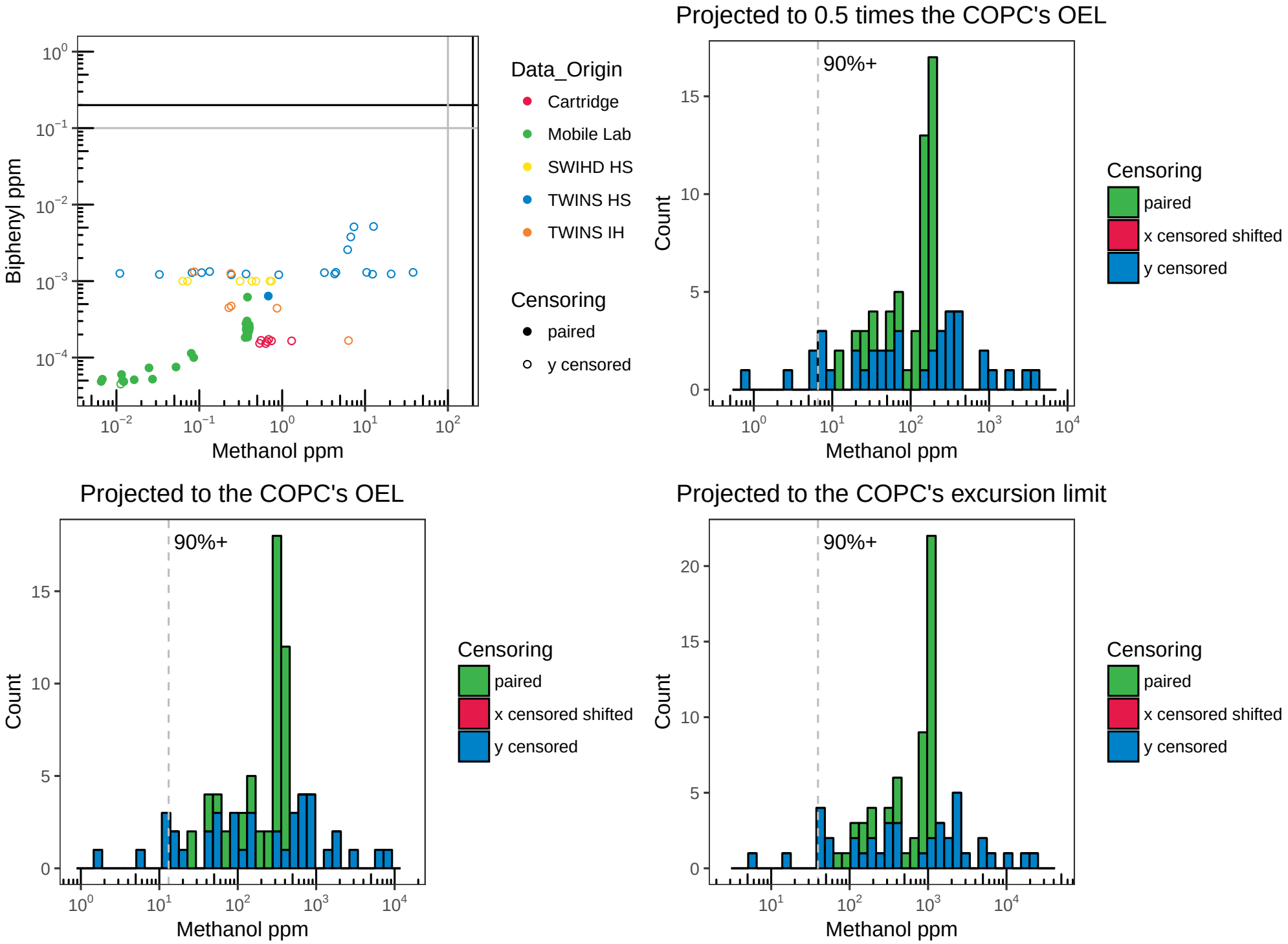


Figure C.397: Biphenyl vs Methanol

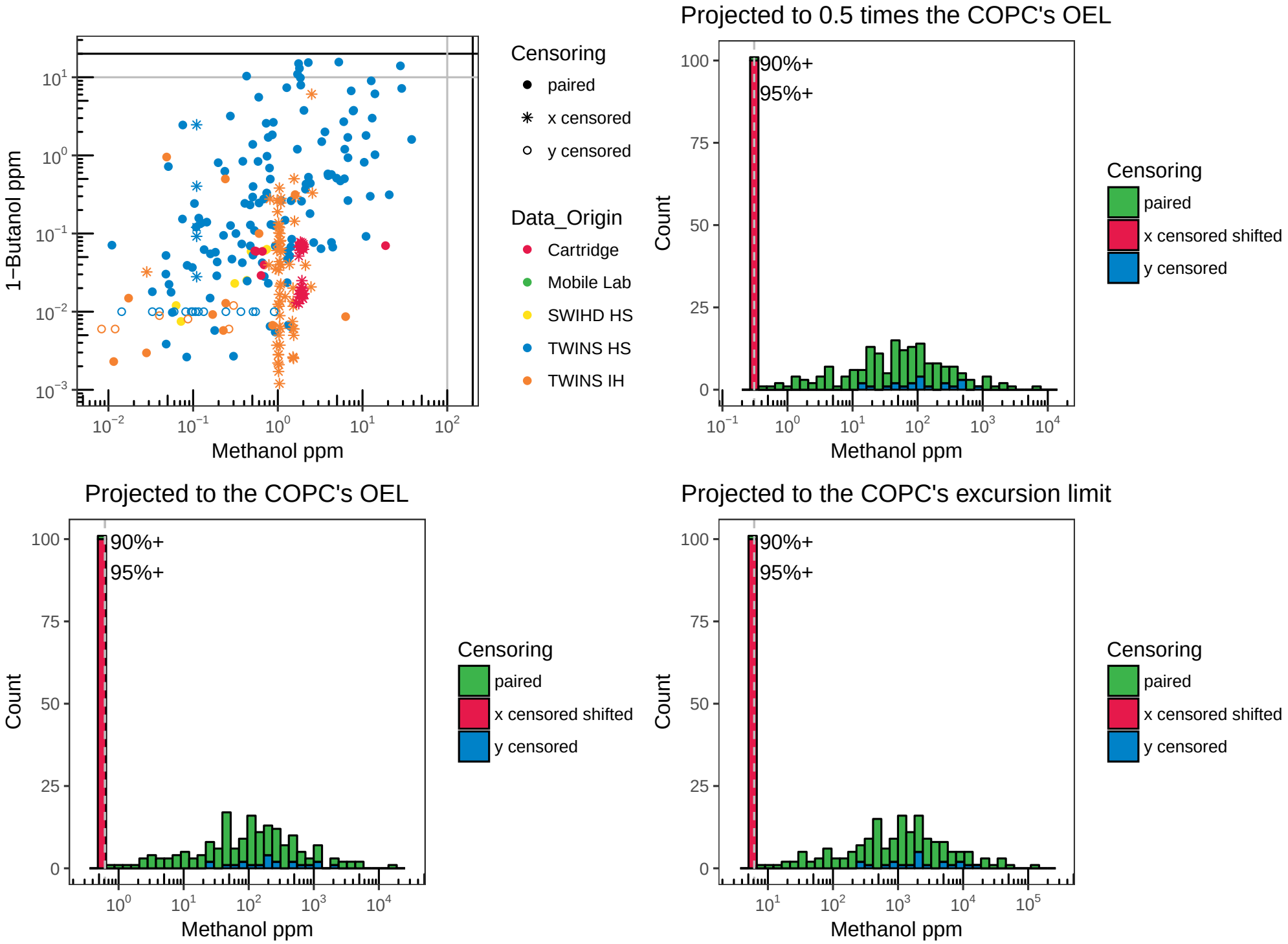


Figure C.398: 1-Butanol vs Methanol

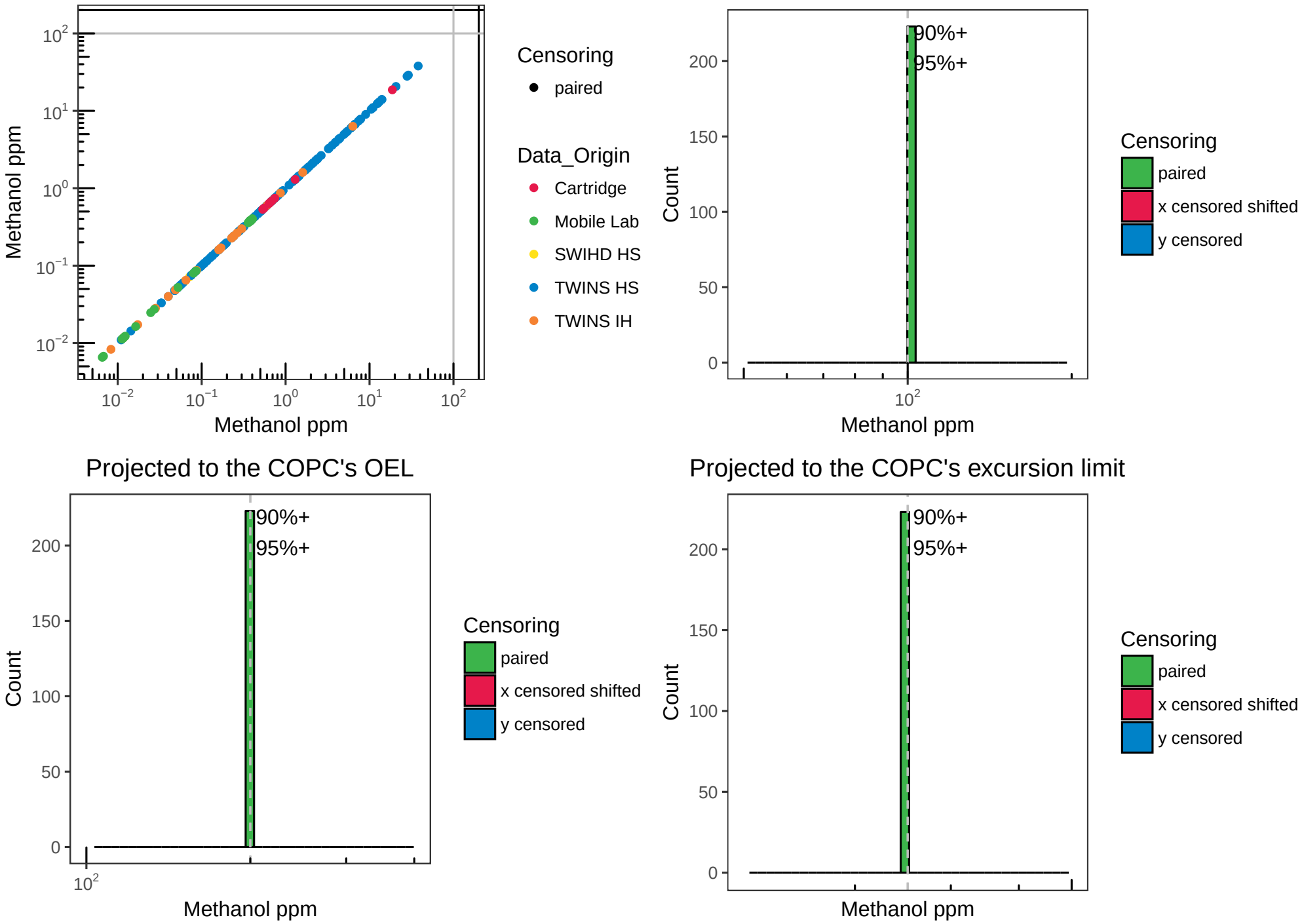


Figure C.399: Methanol vs Methanol

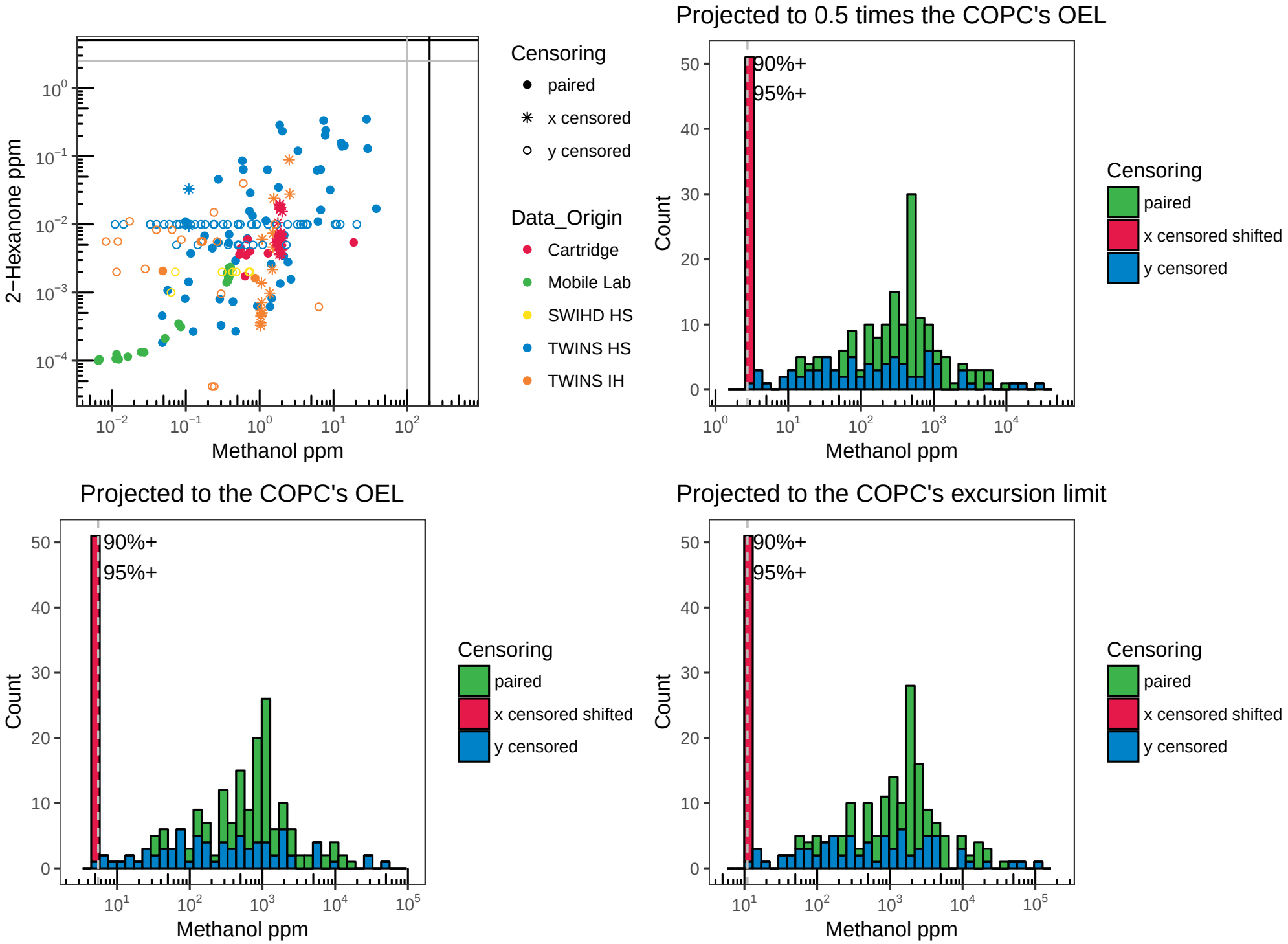


Figure C.400: 2-Hexanone vs Methanol

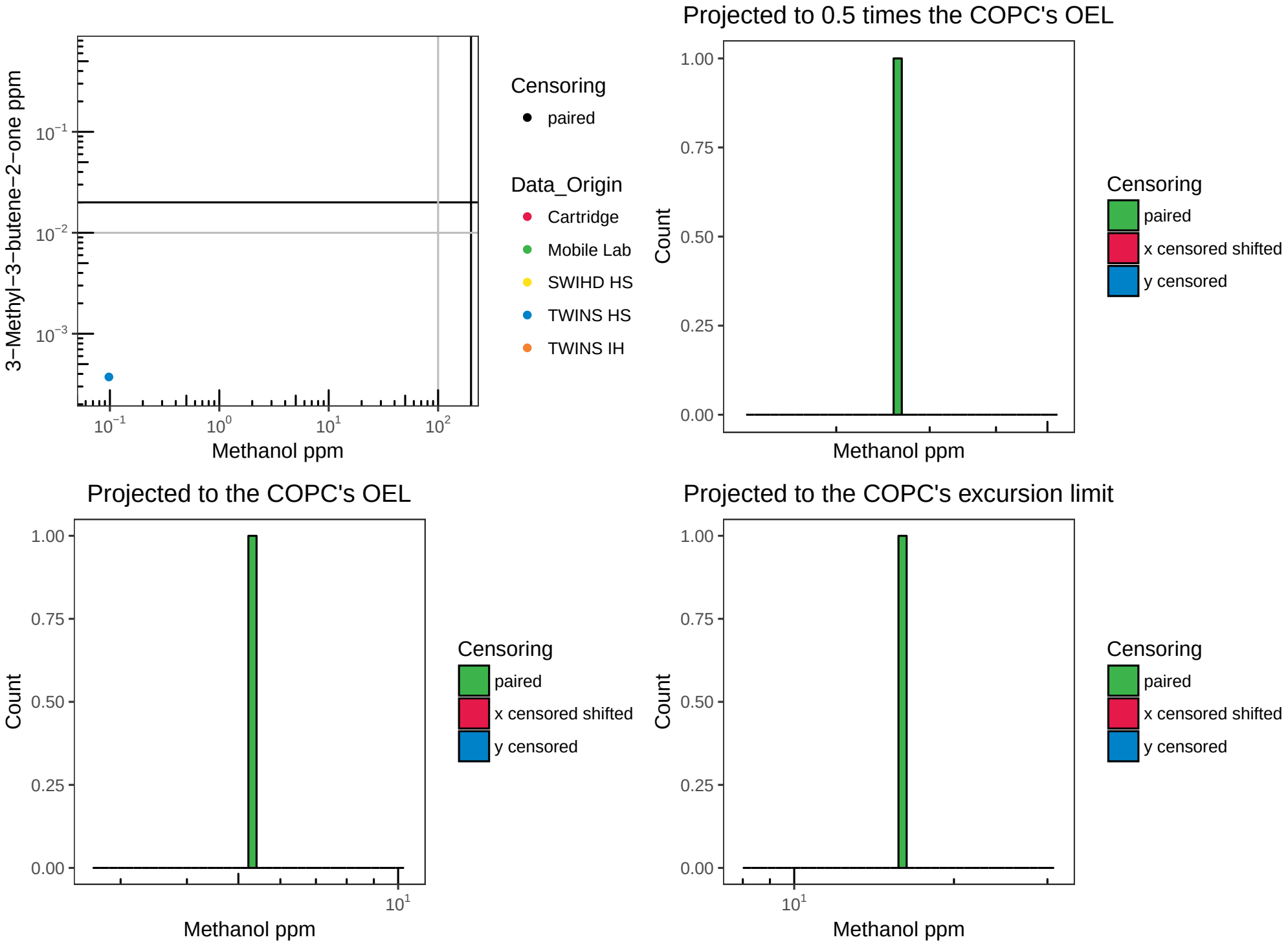


Figure C.401: 3-Methyl-3-butene-2-one vs Methanol

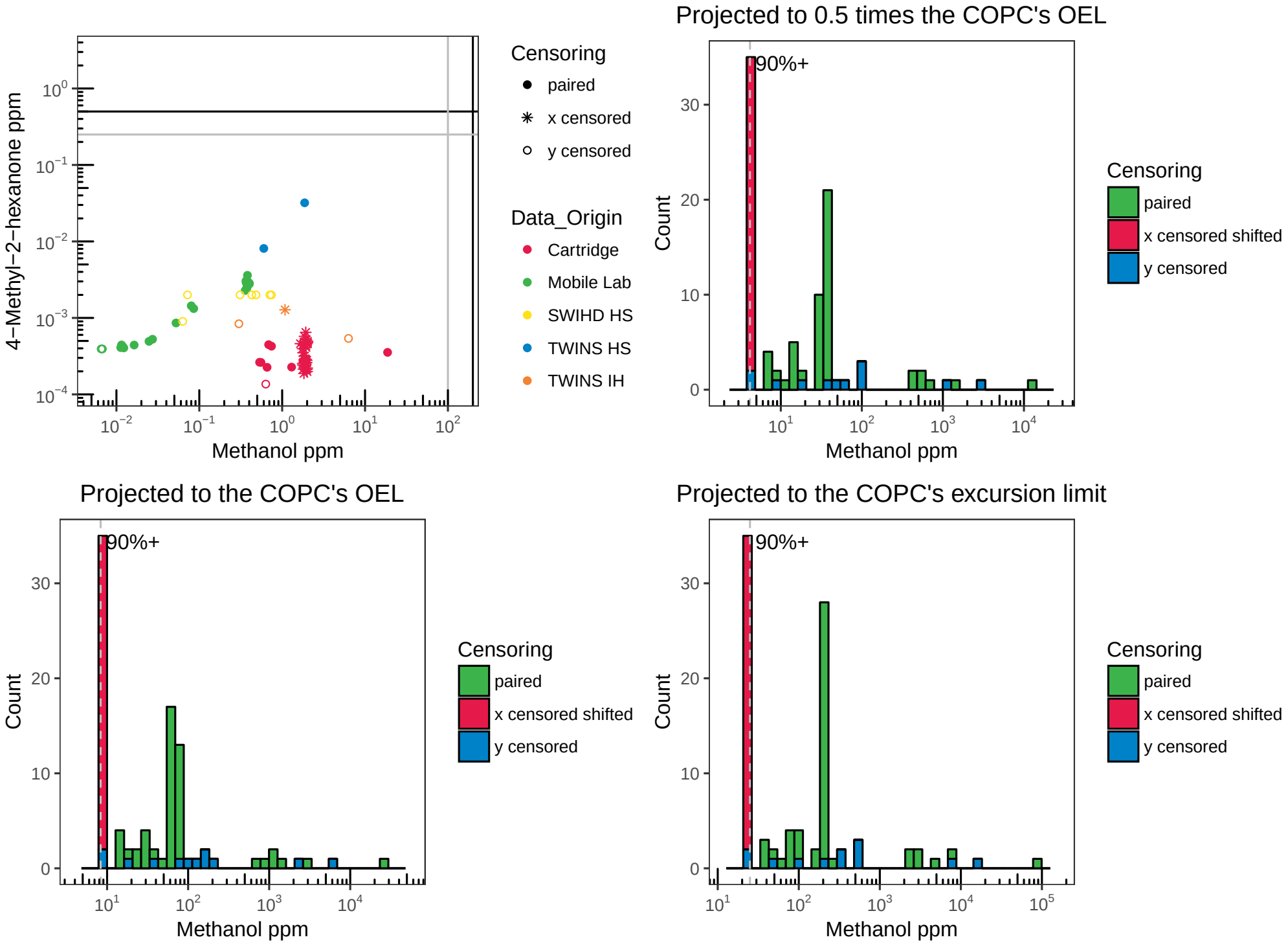


Figure C.402: 4-Methyl-2-hexanone vs Methanol

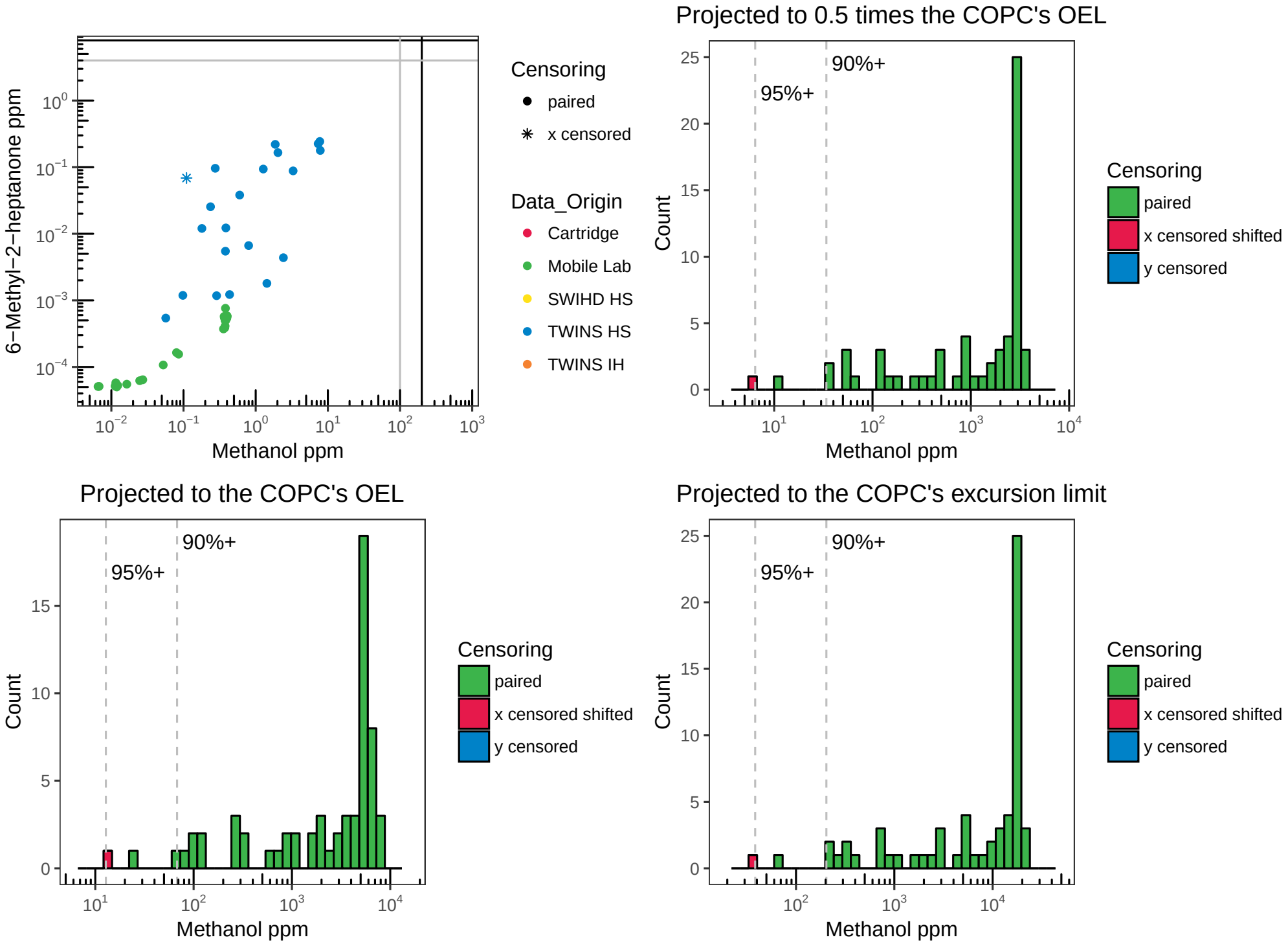


Figure C.403: 6-Methyl-2-heptanone vs Methanol

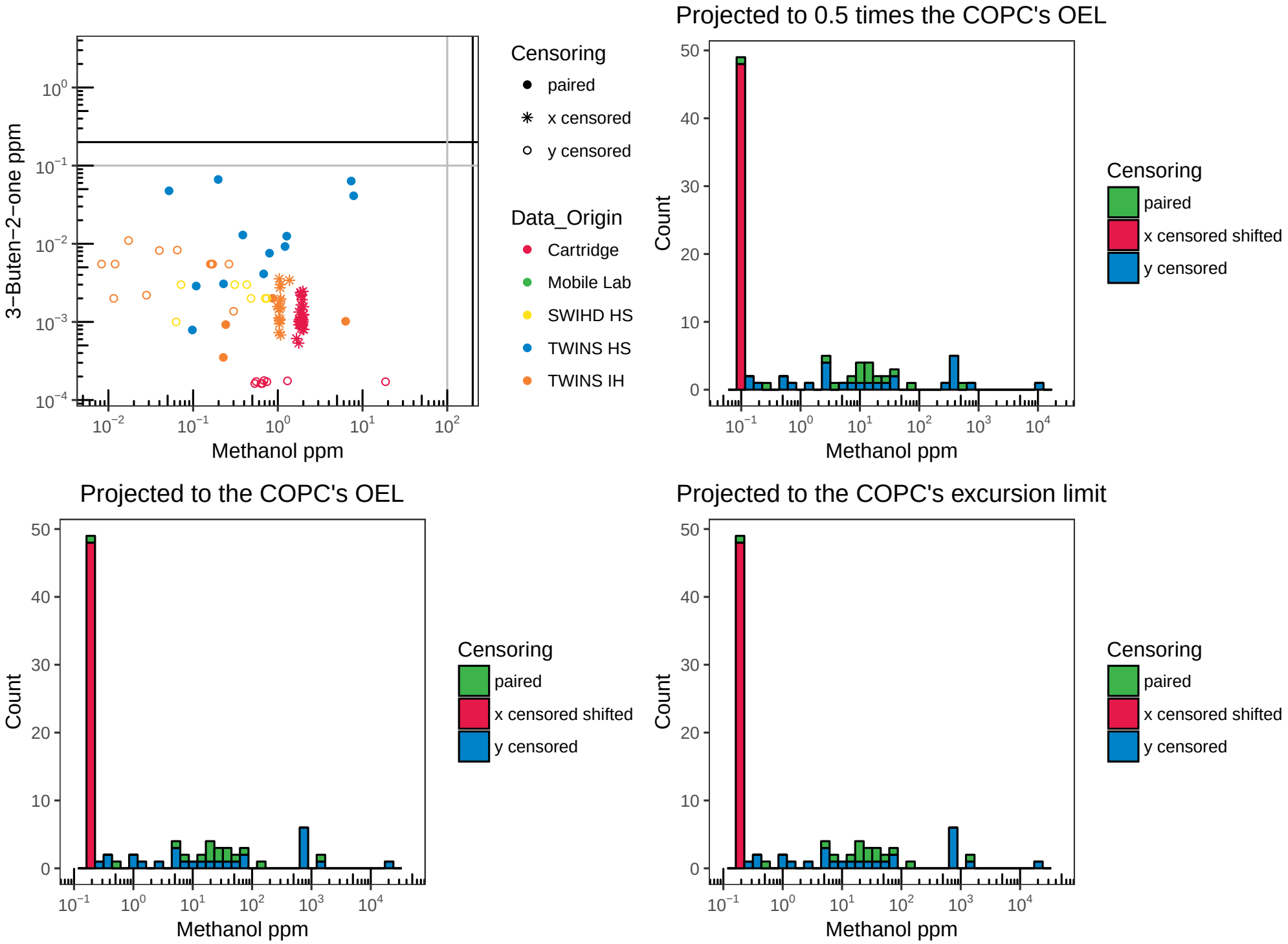


Figure C.404: 3-Buten-2-one vs Methanol

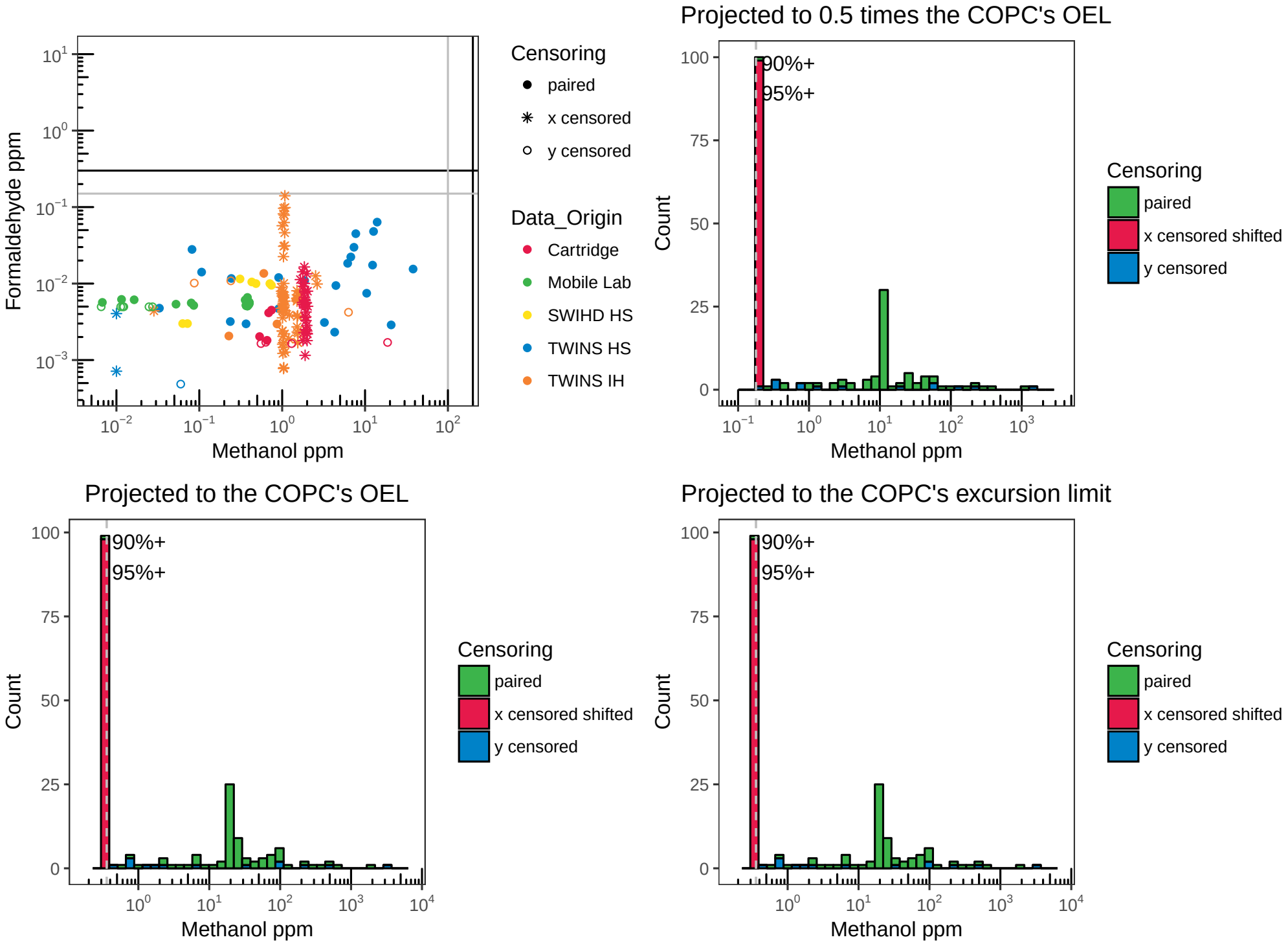


Figure C.405: Formaldehyde vs Methanol

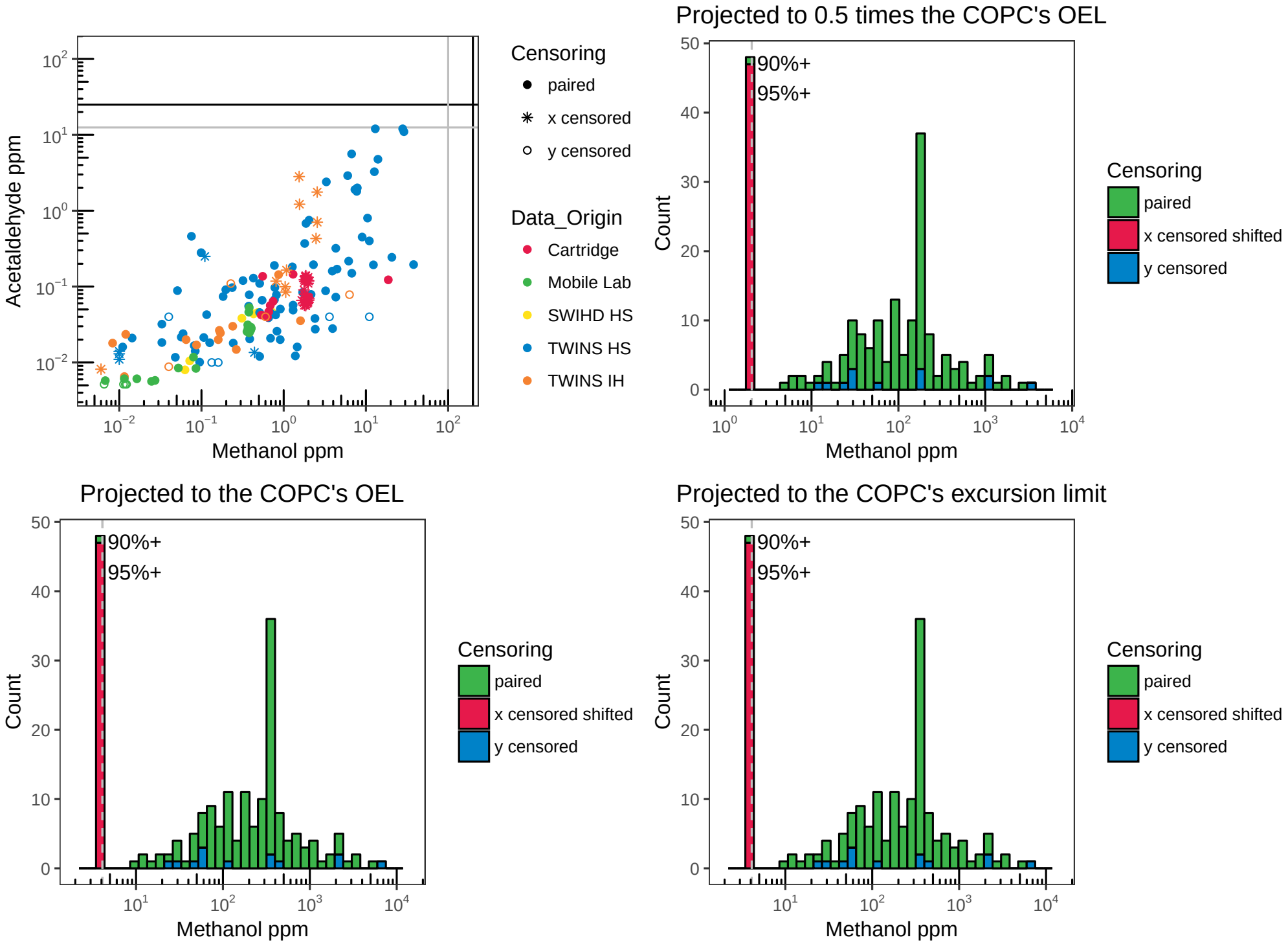


Figure C.406: Acetaldehyde vs Methanol

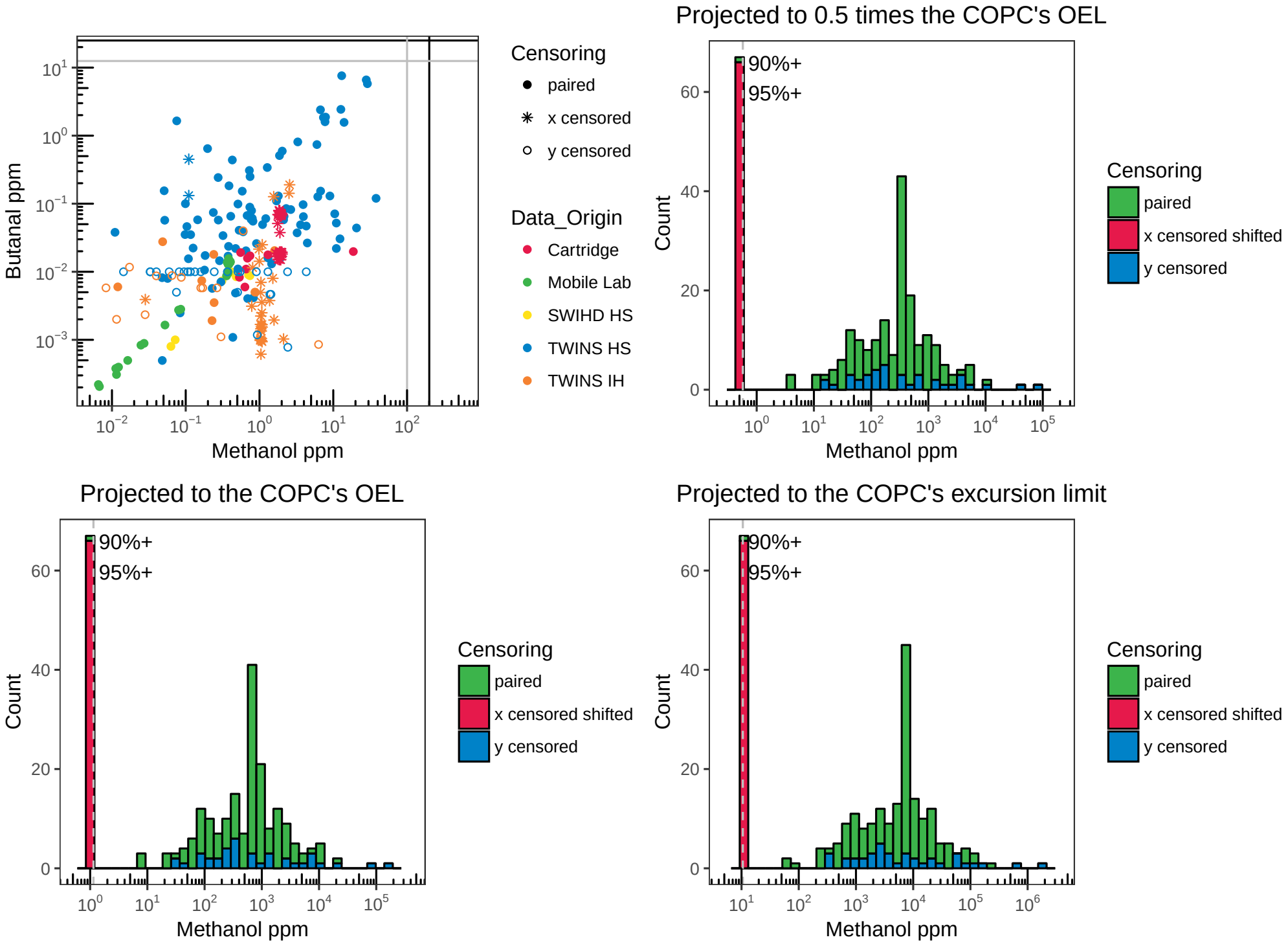


Figure C.407: Butanal vs Methanol

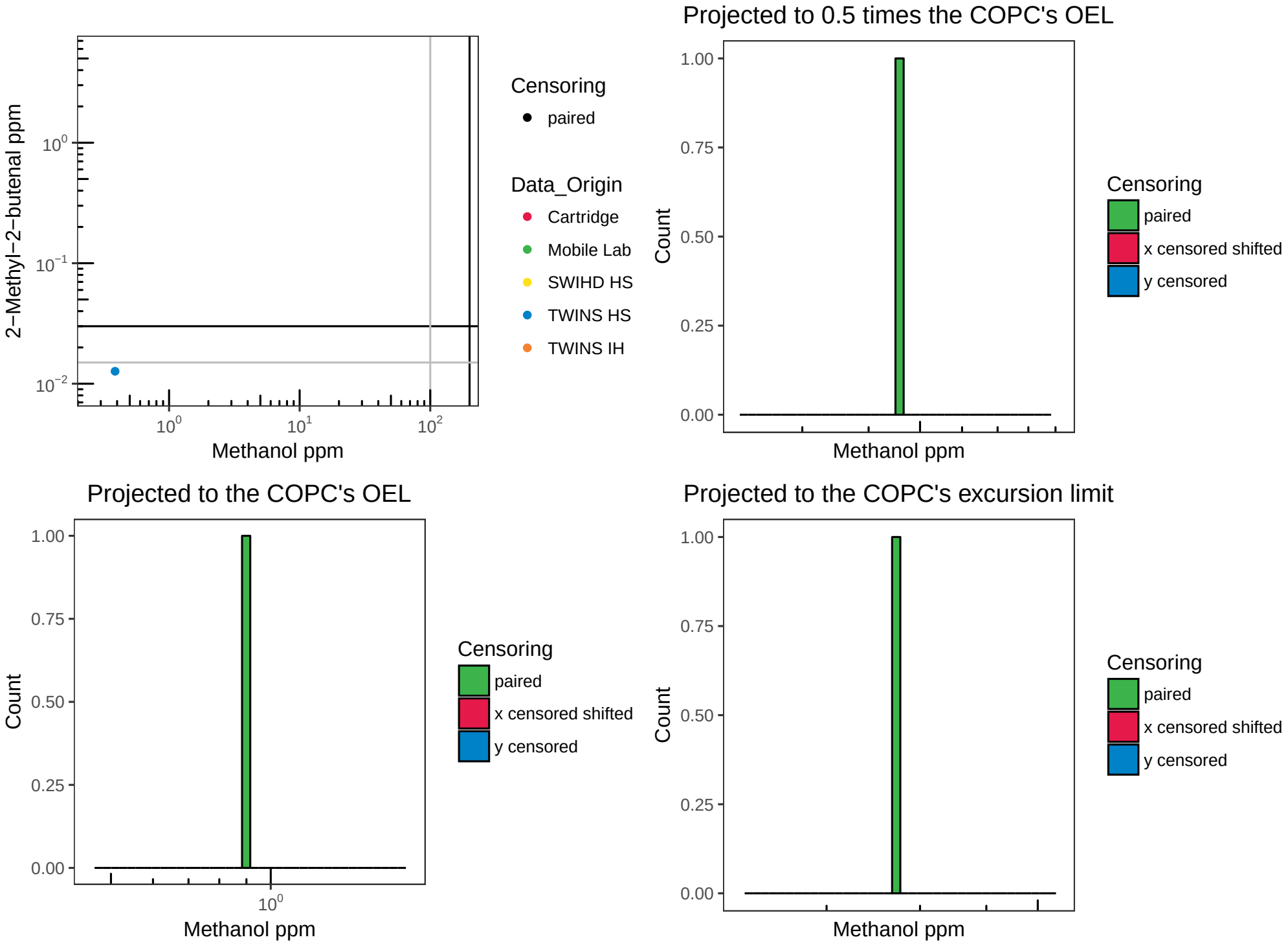


Figure C.408: 2-Methyl-2-butenal vs Methanol

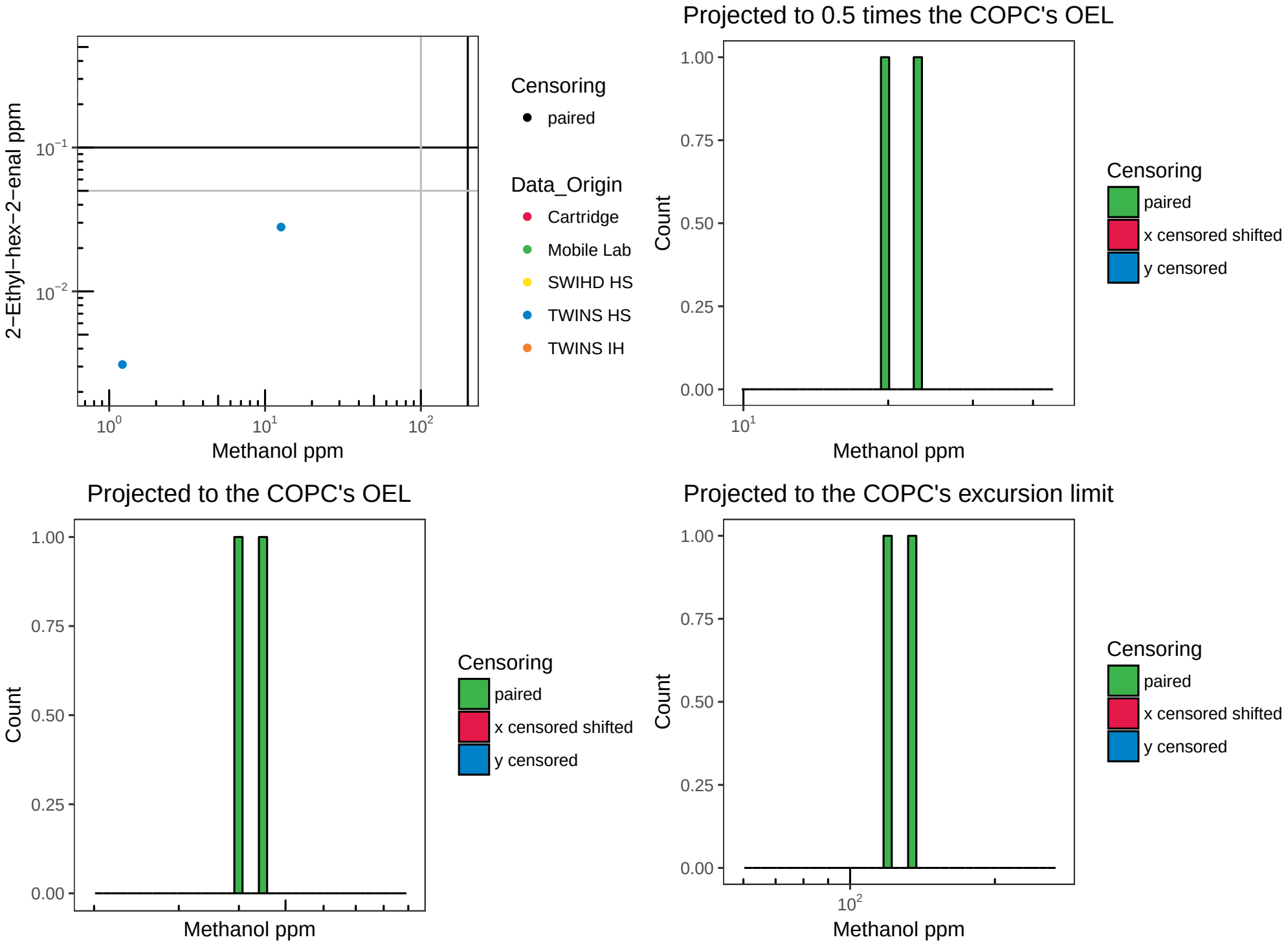


Figure C.409: 2-Ethyl-hex-2-enal vs Methanol

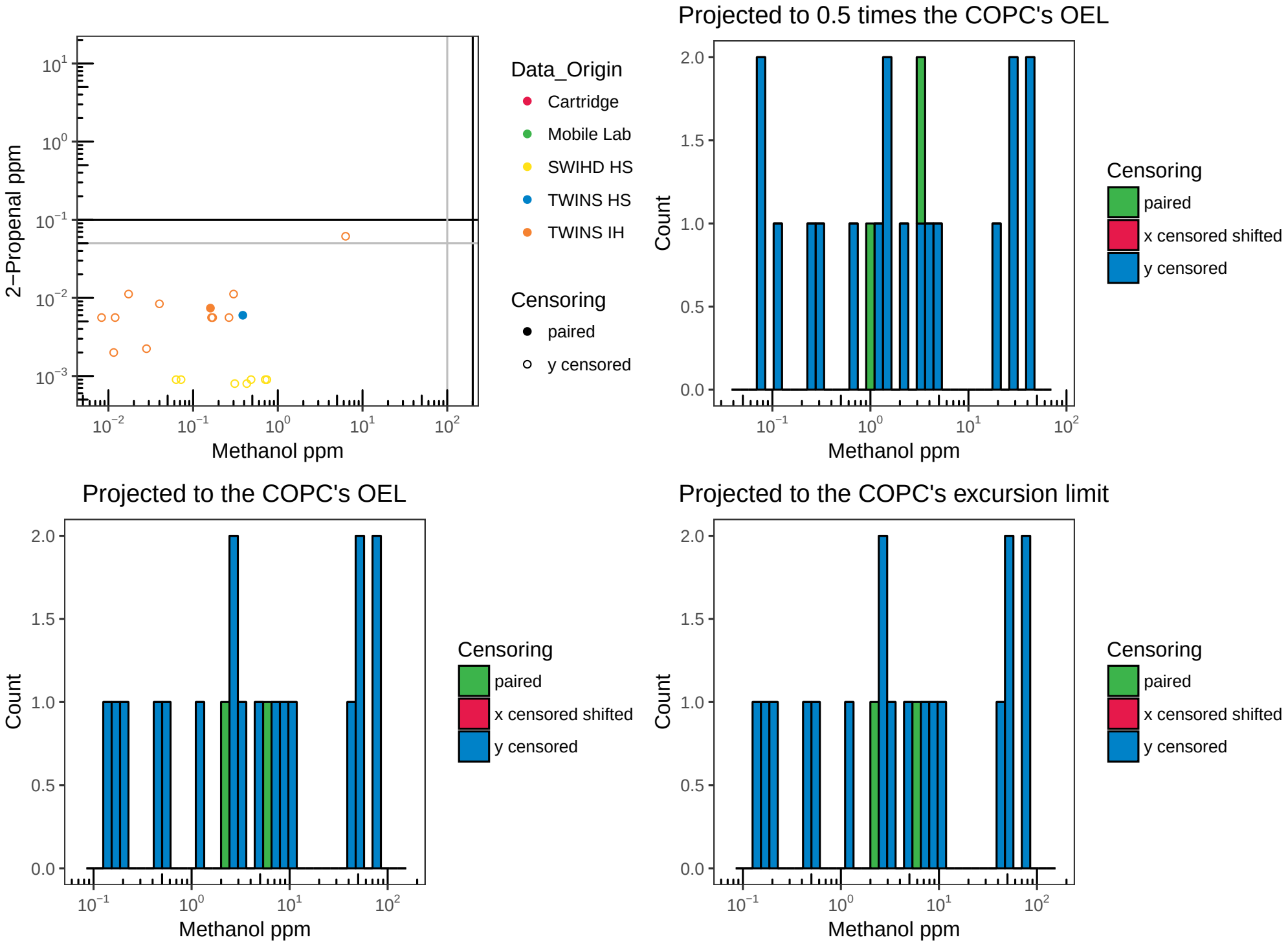


Figure C.410: 2-Propenal vs Methanol

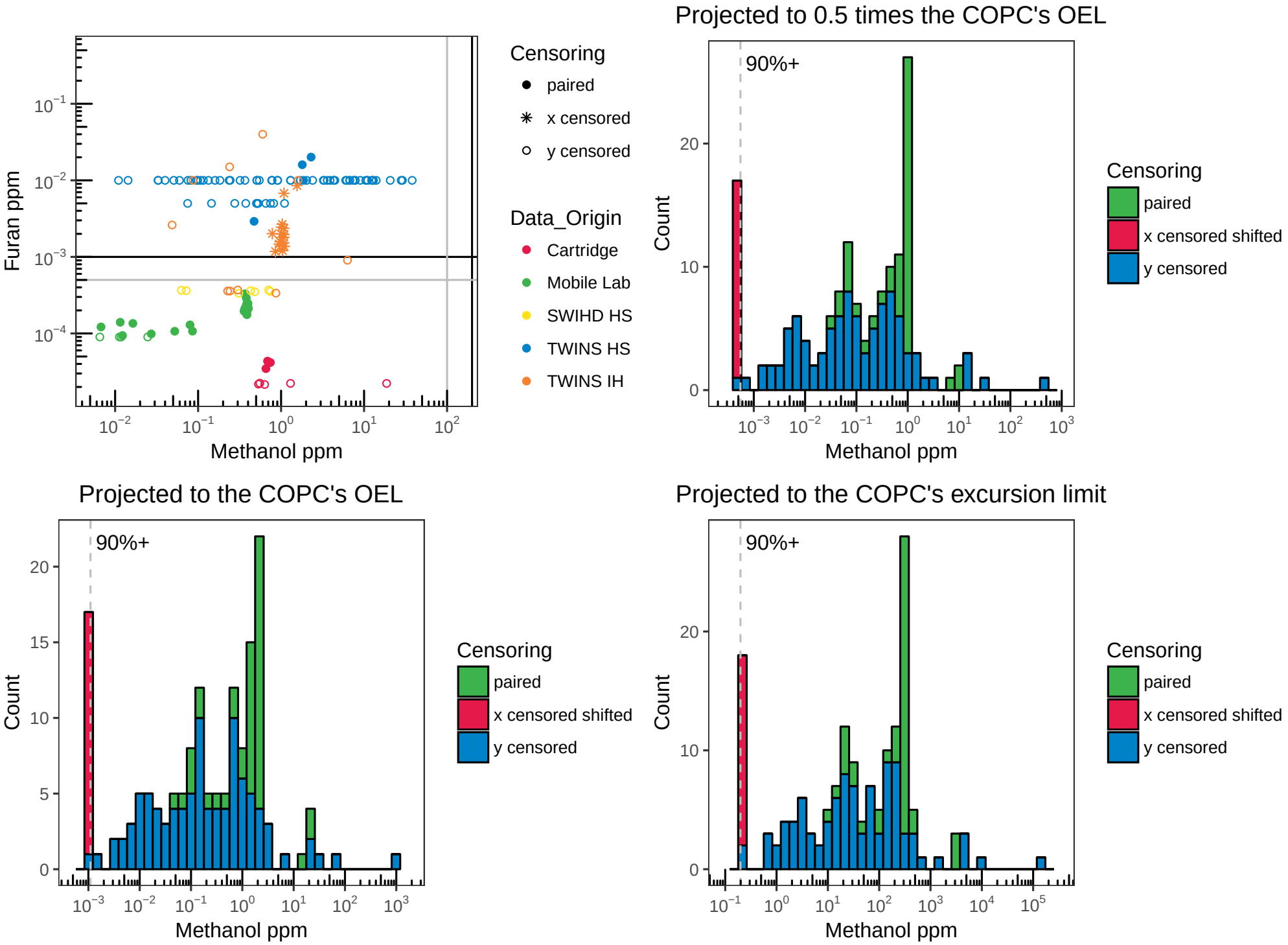


Figure C.411: Furan vs Methanol

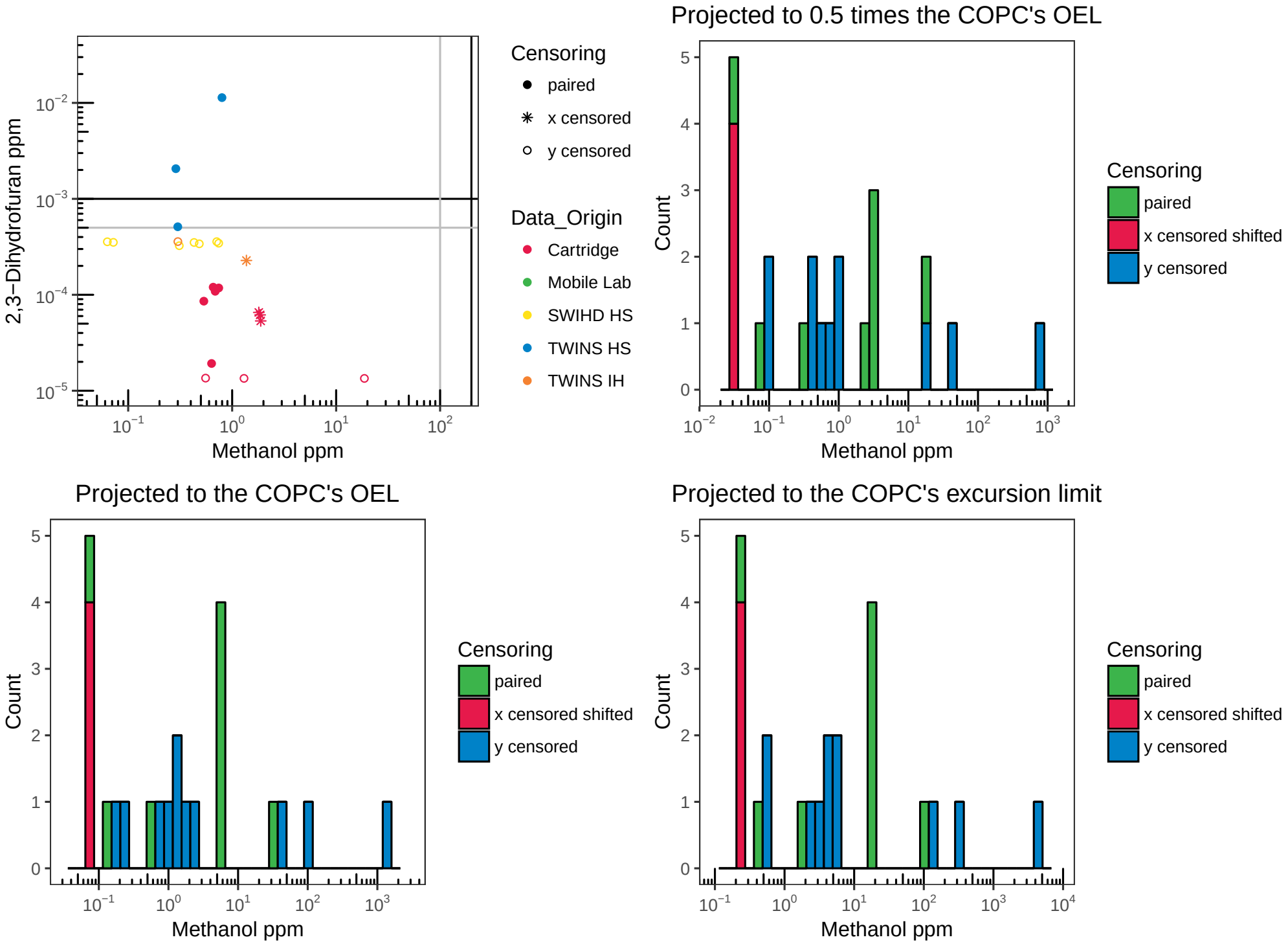


Figure C.412: 2,3-Dihydrofuran vs Methanol

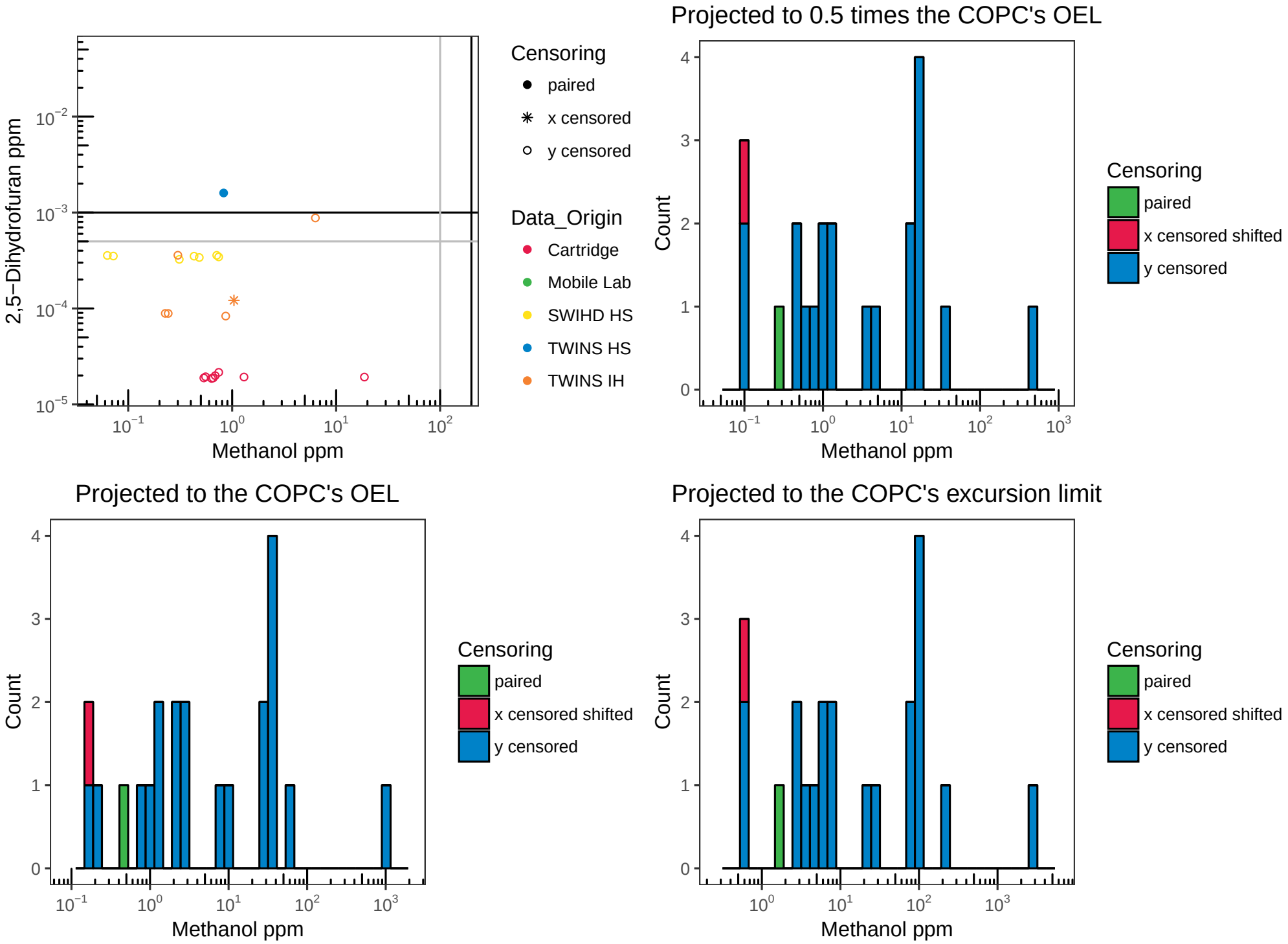


Figure C.413: 2,5-Dihydrofuran vs Methanol

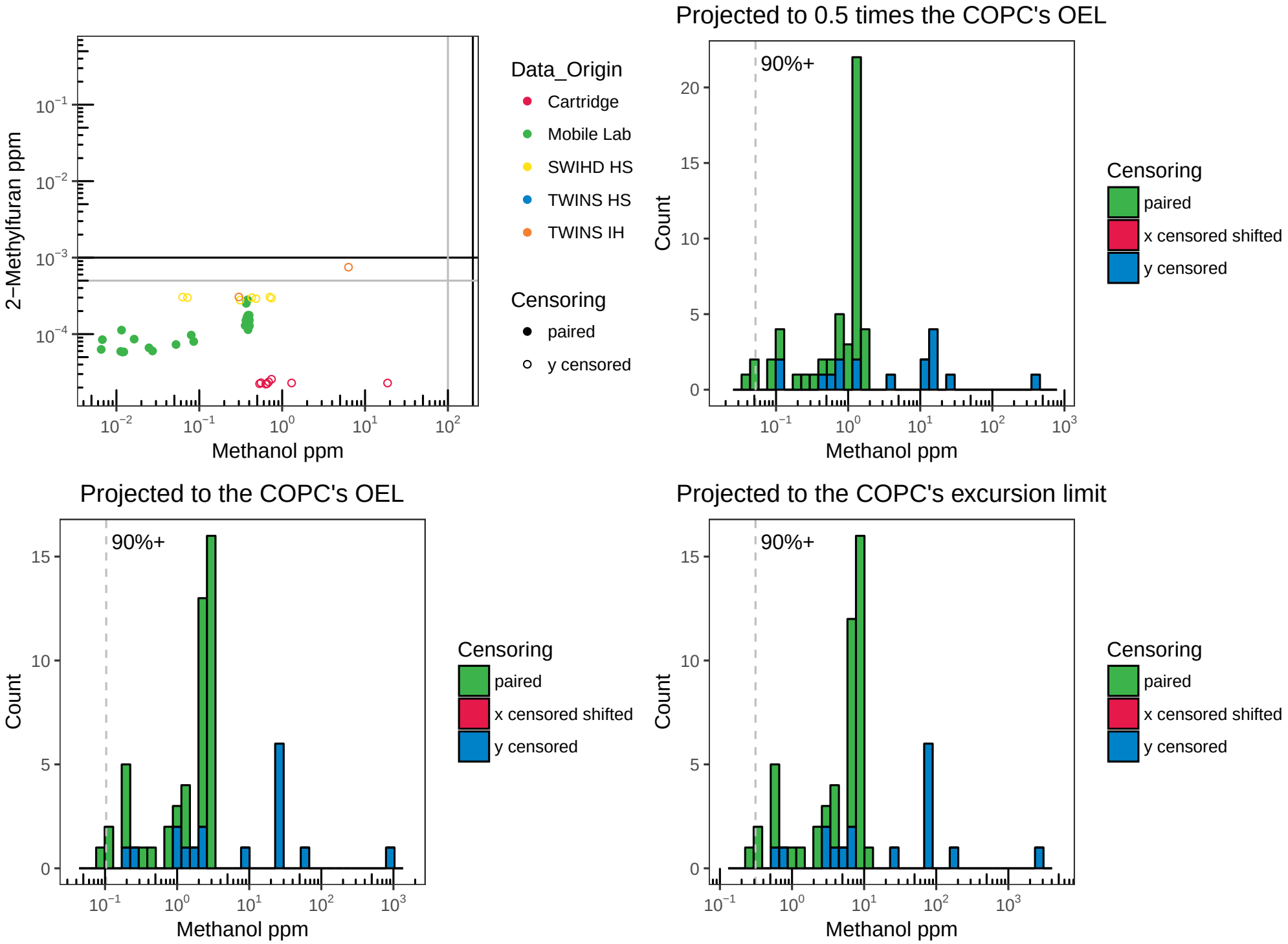


Figure C.414: 2-Methylfuran vs Methanol

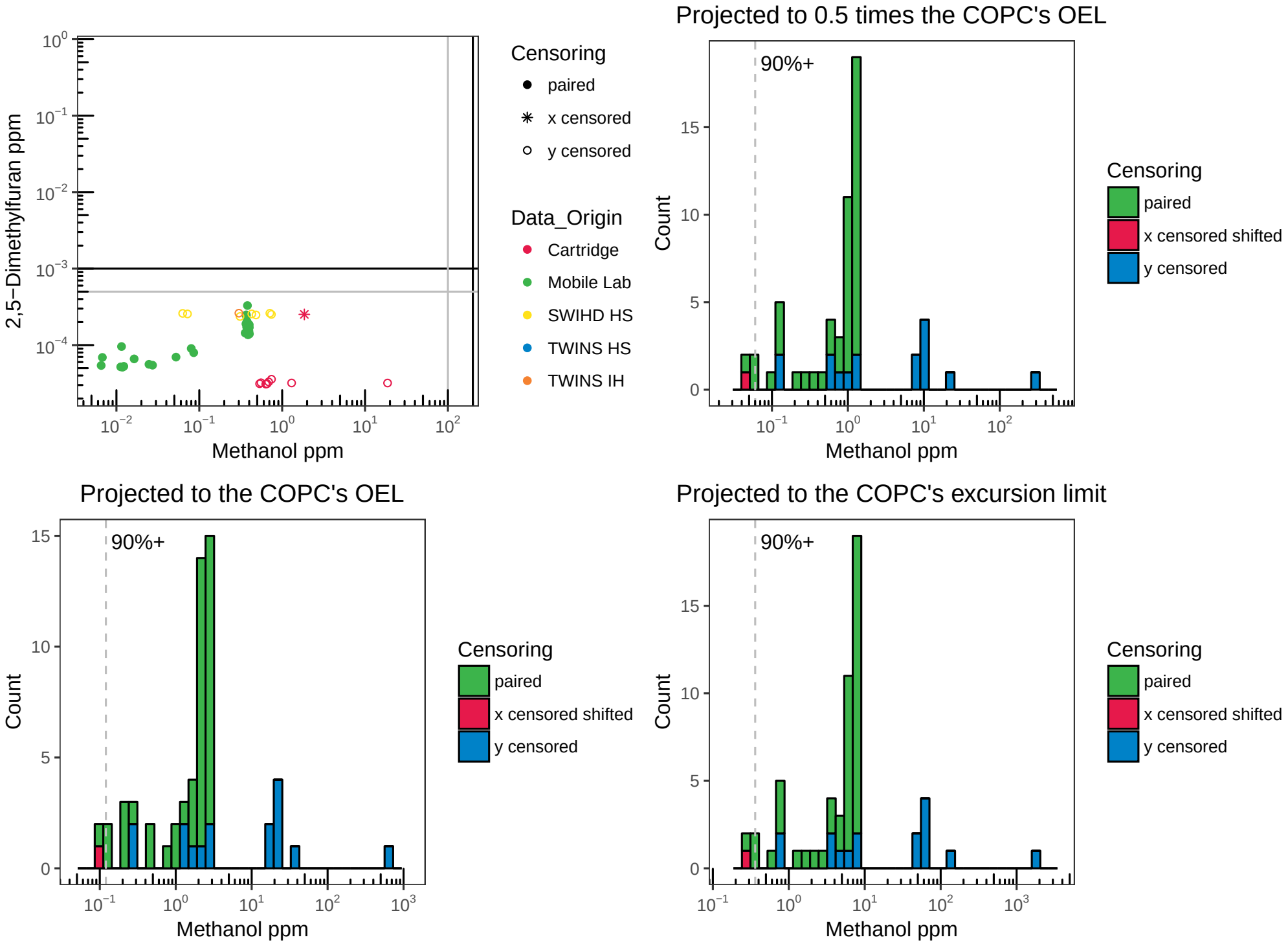


Figure C.415: 2,5-Dimethylfuran vs Methanol

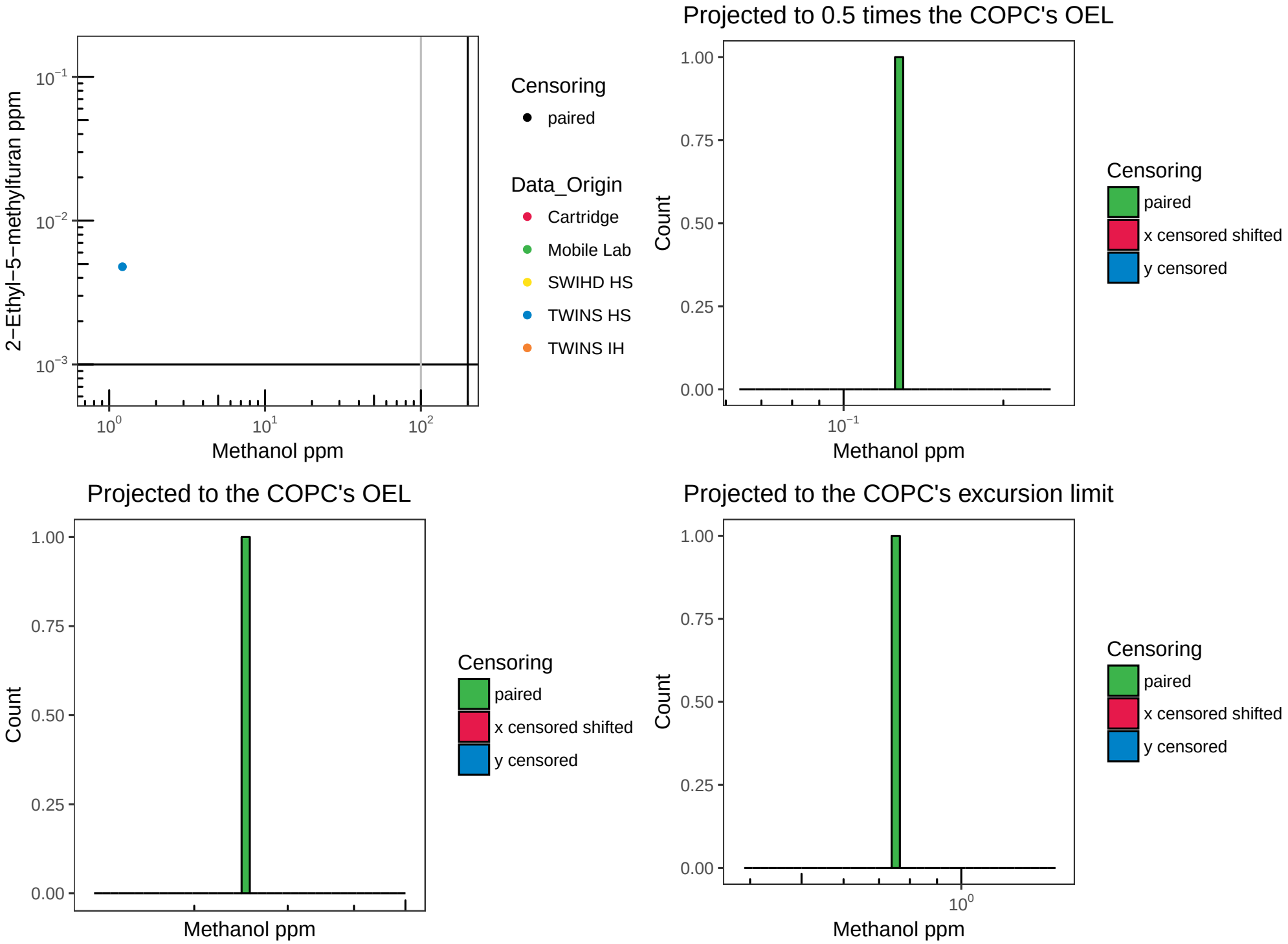


Figure C.416: 2-Ethyl-5-methylfuran vs Methanol

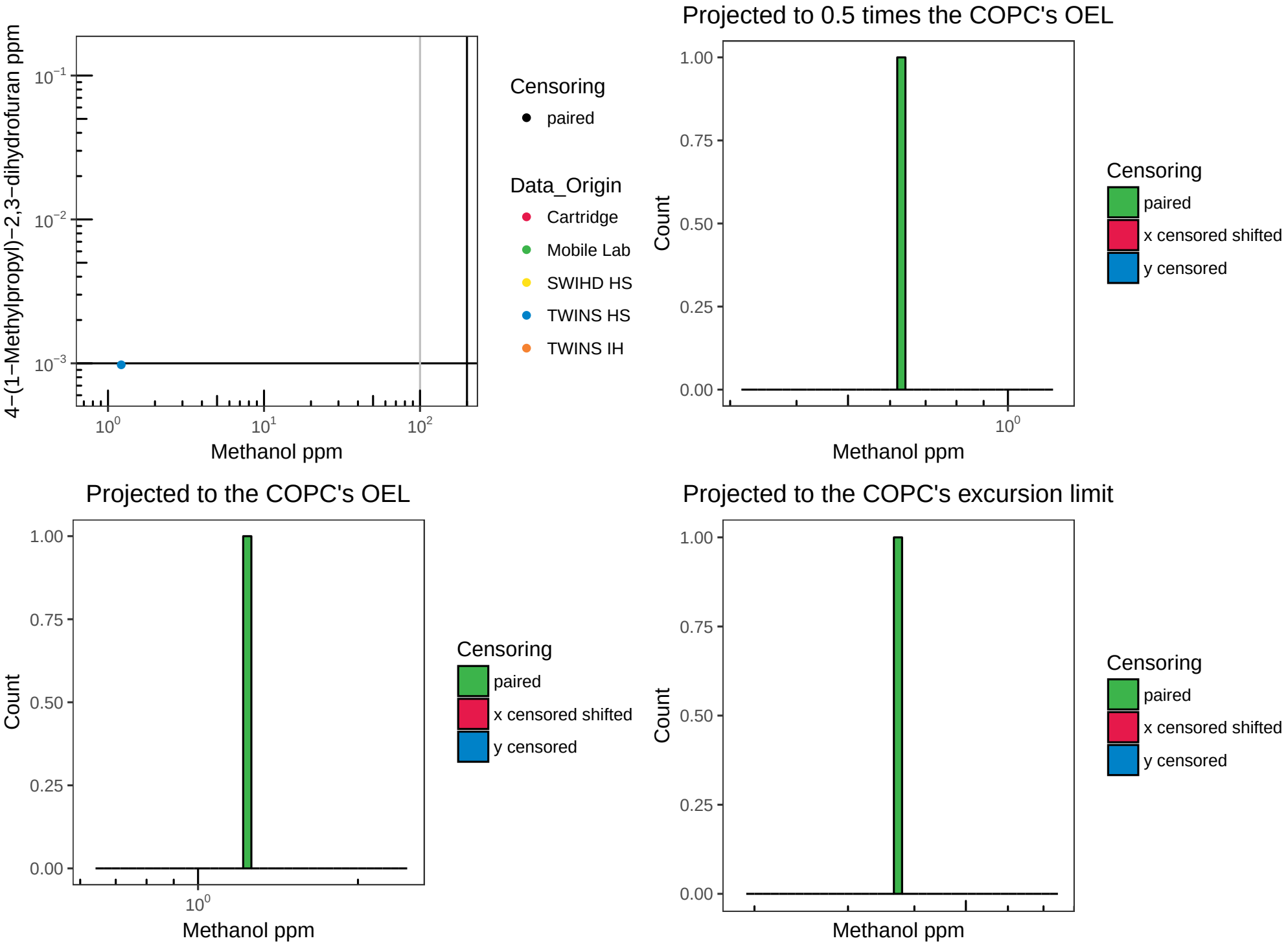


Figure C.417: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Methanol

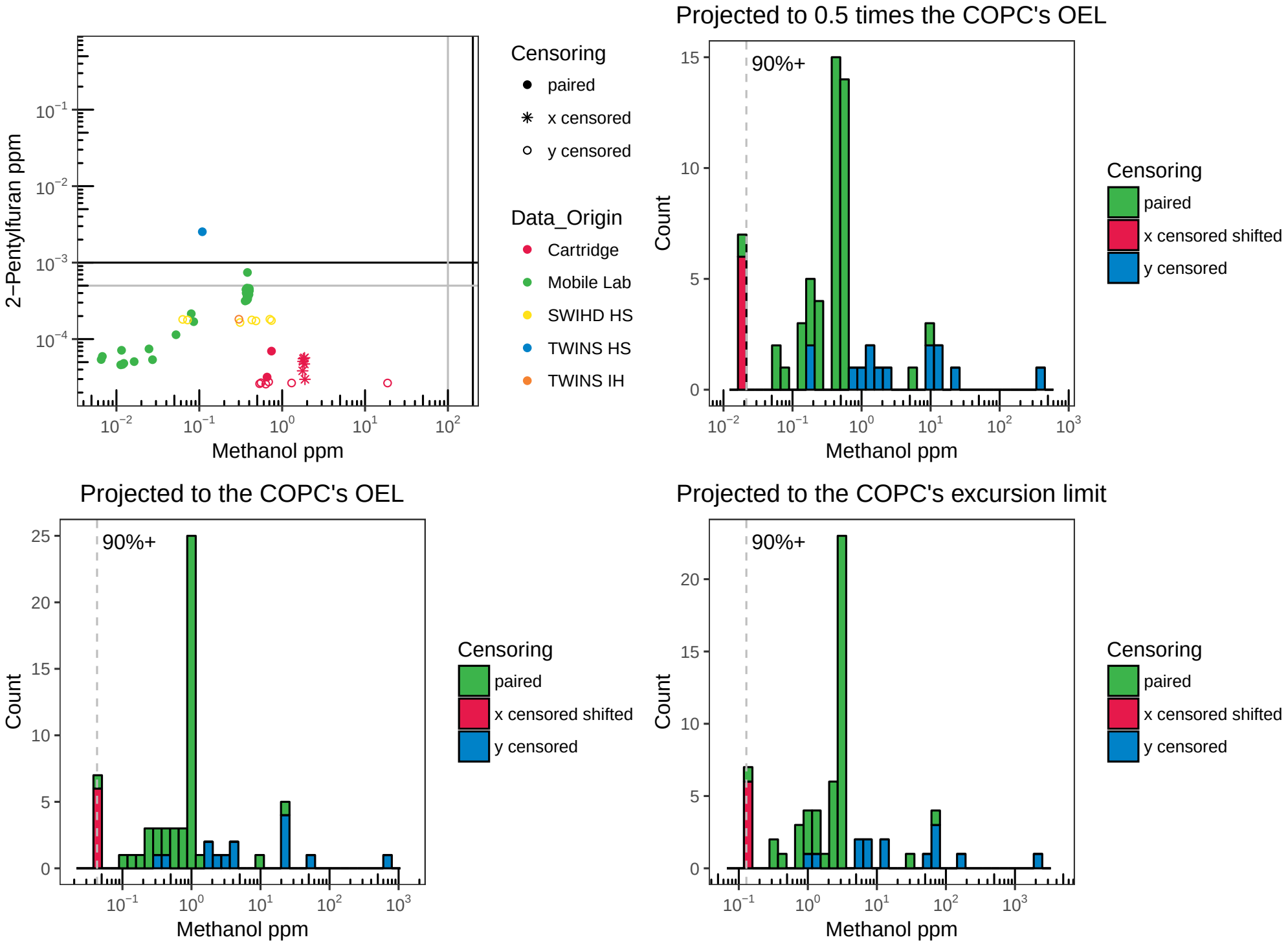


Figure C.418: 2-Pentylfuran vs Methanol

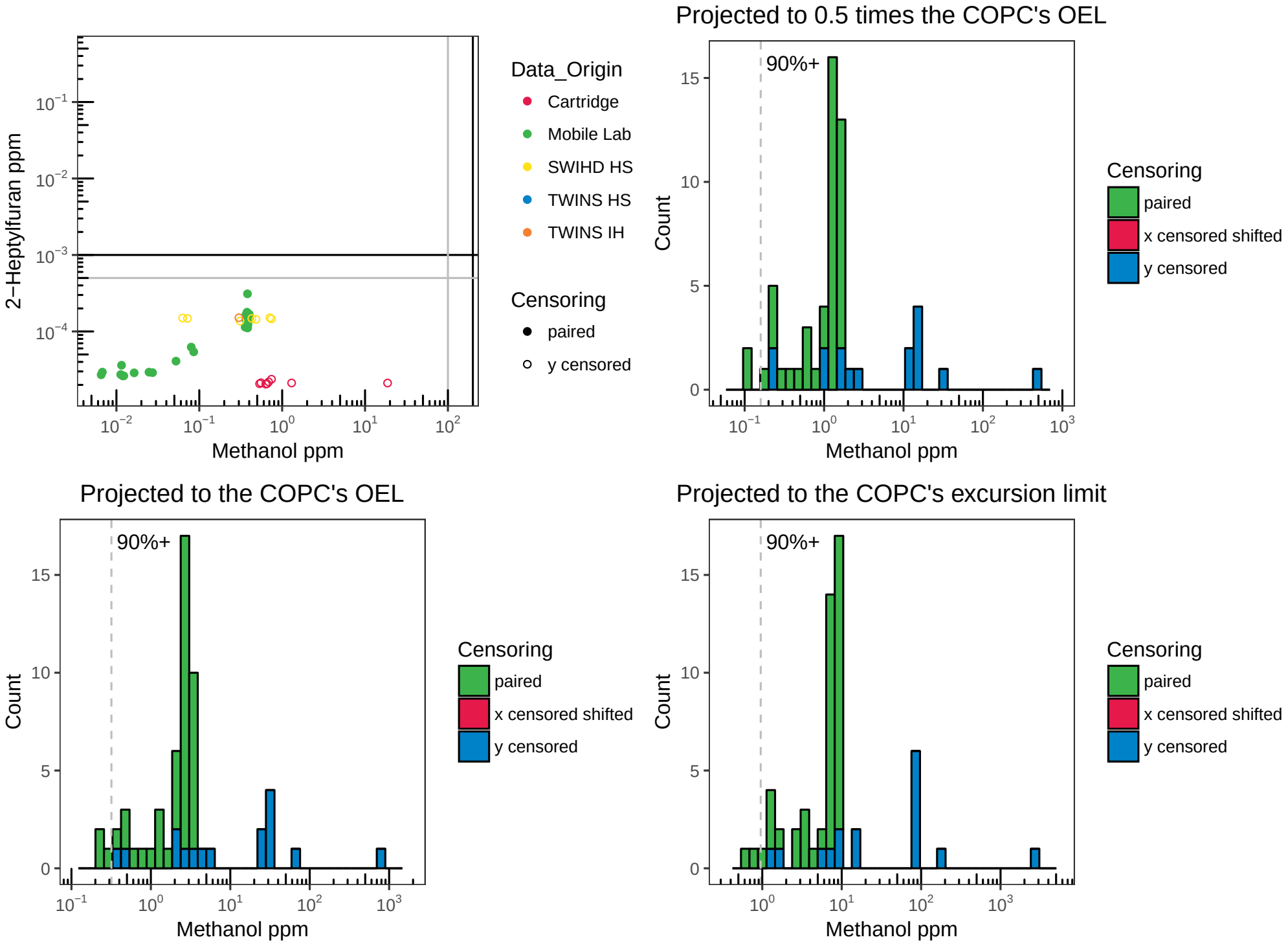


Figure C.419: 2-Heptylfuran vs Methanol

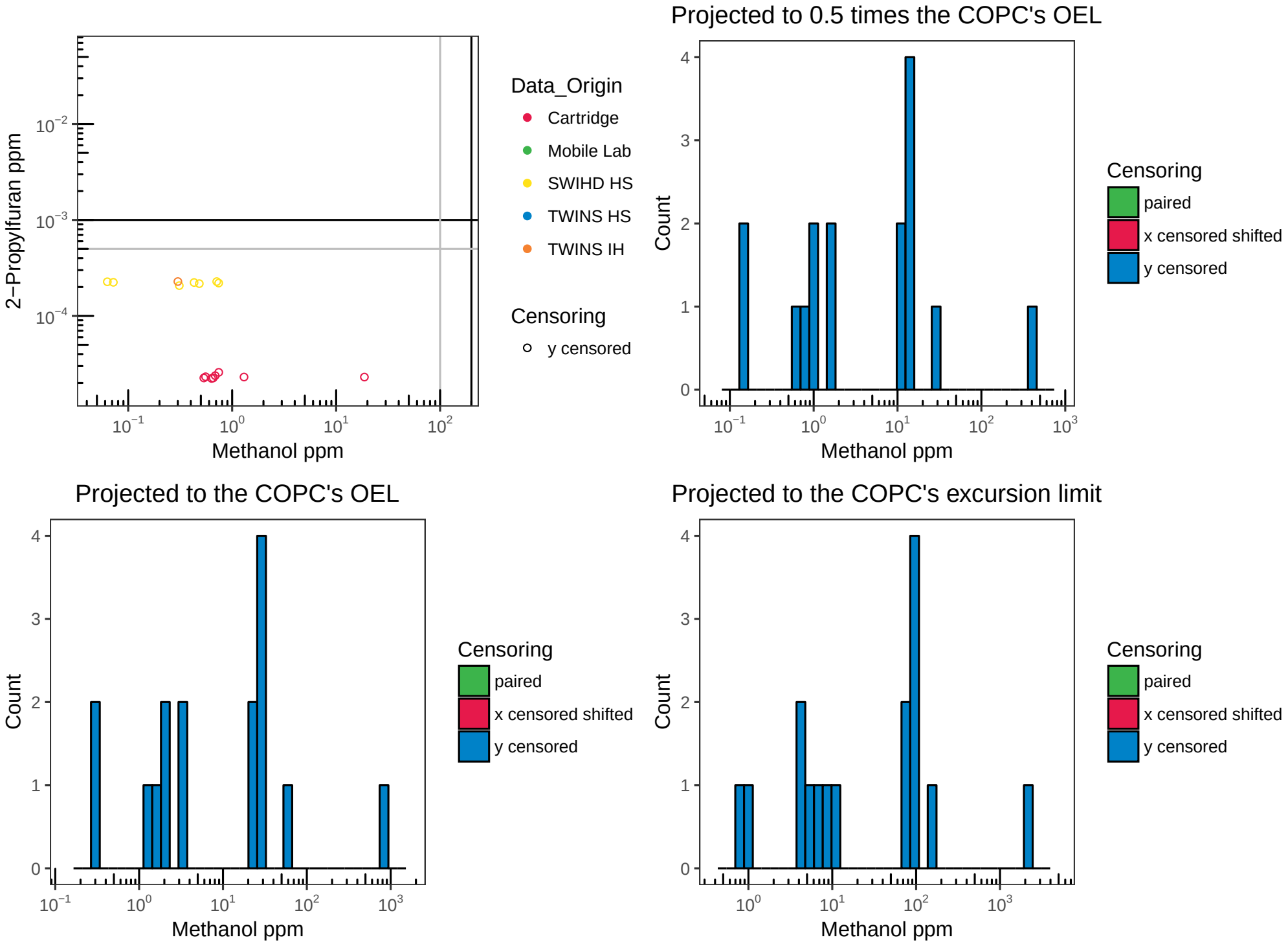


Figure C.420: 2-Propylfuran vs Methanol

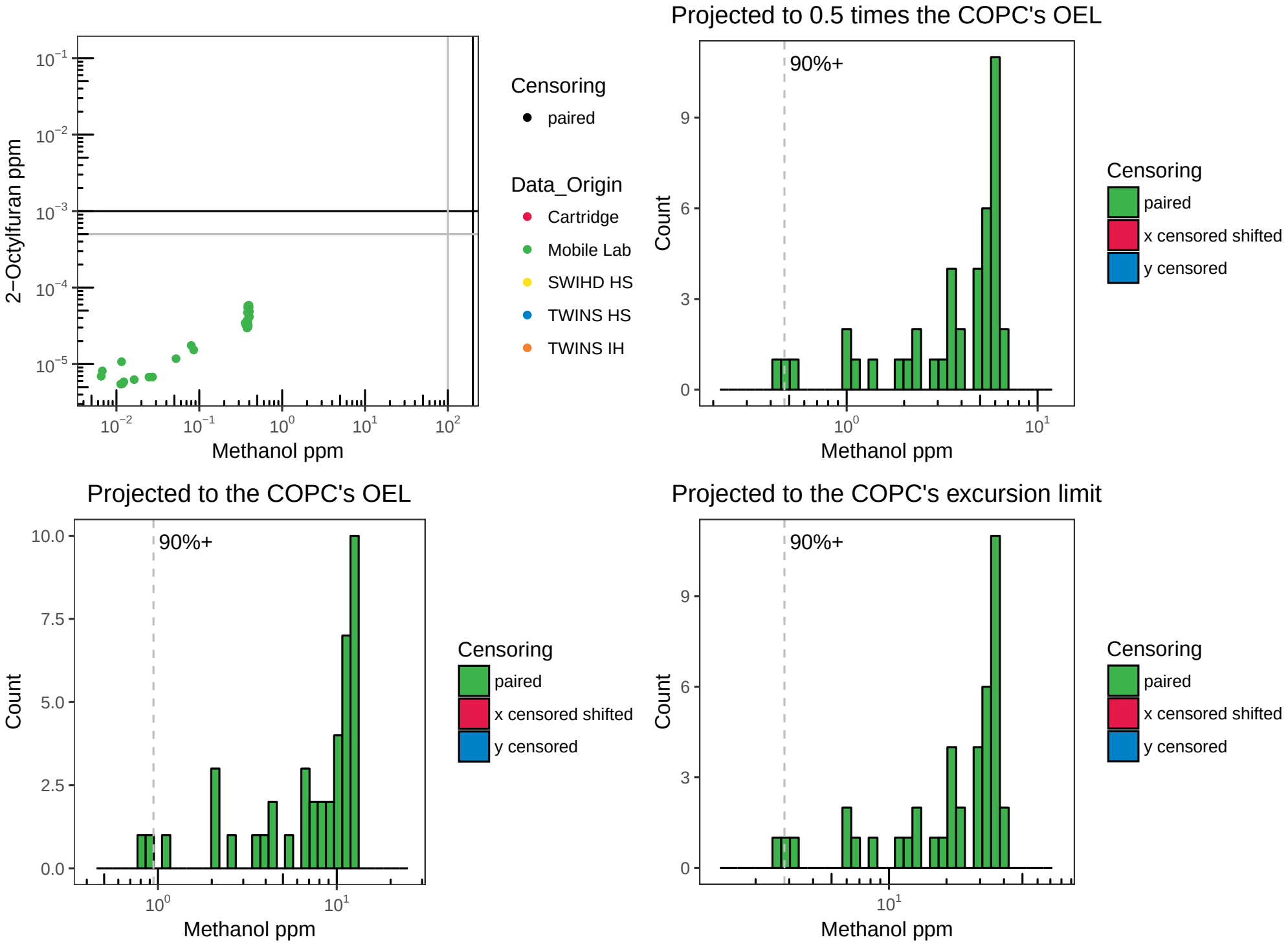


Figure C.421: 2-Octylfuran vs Methanol

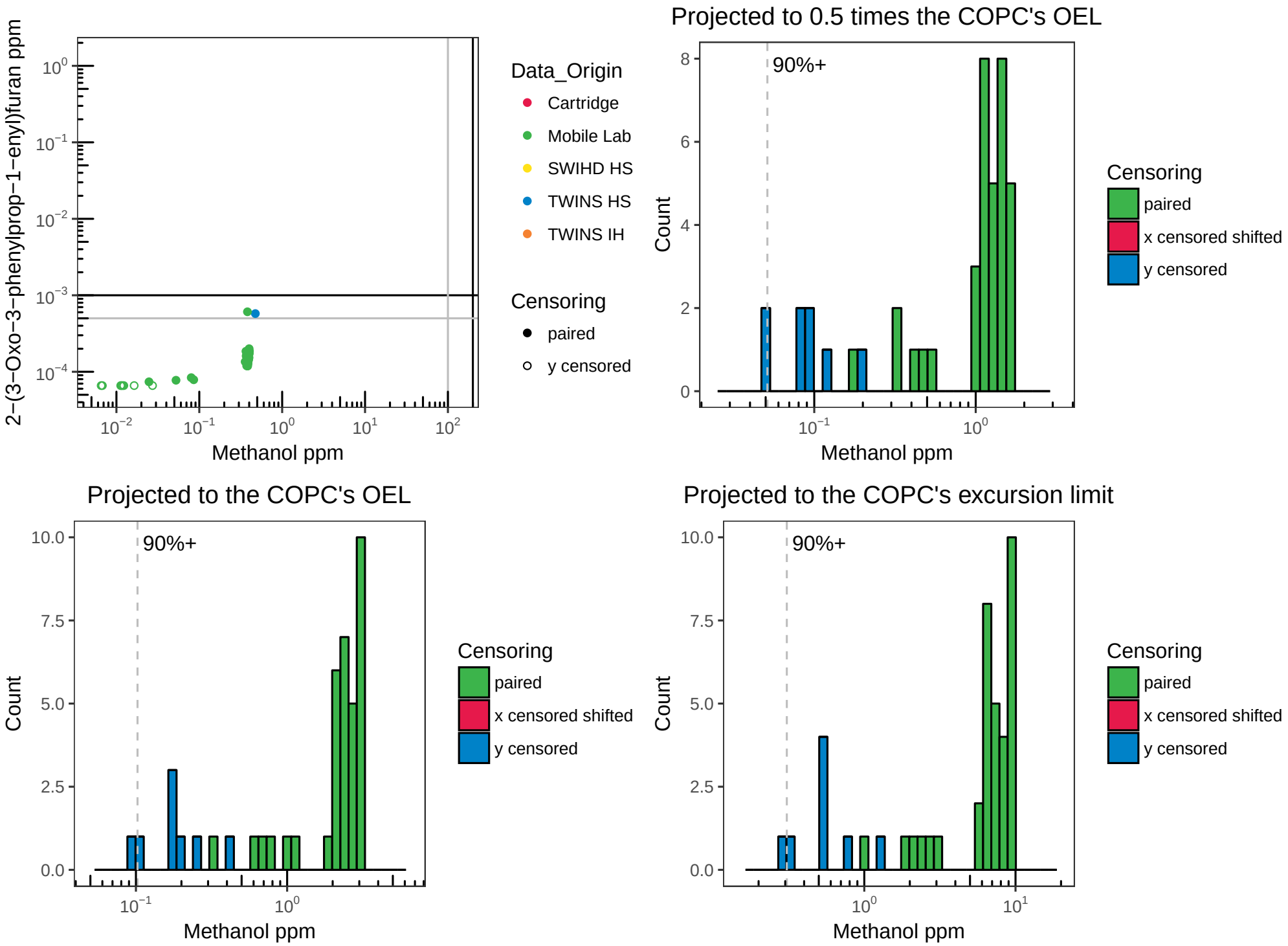


Figure C.422: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Methanol

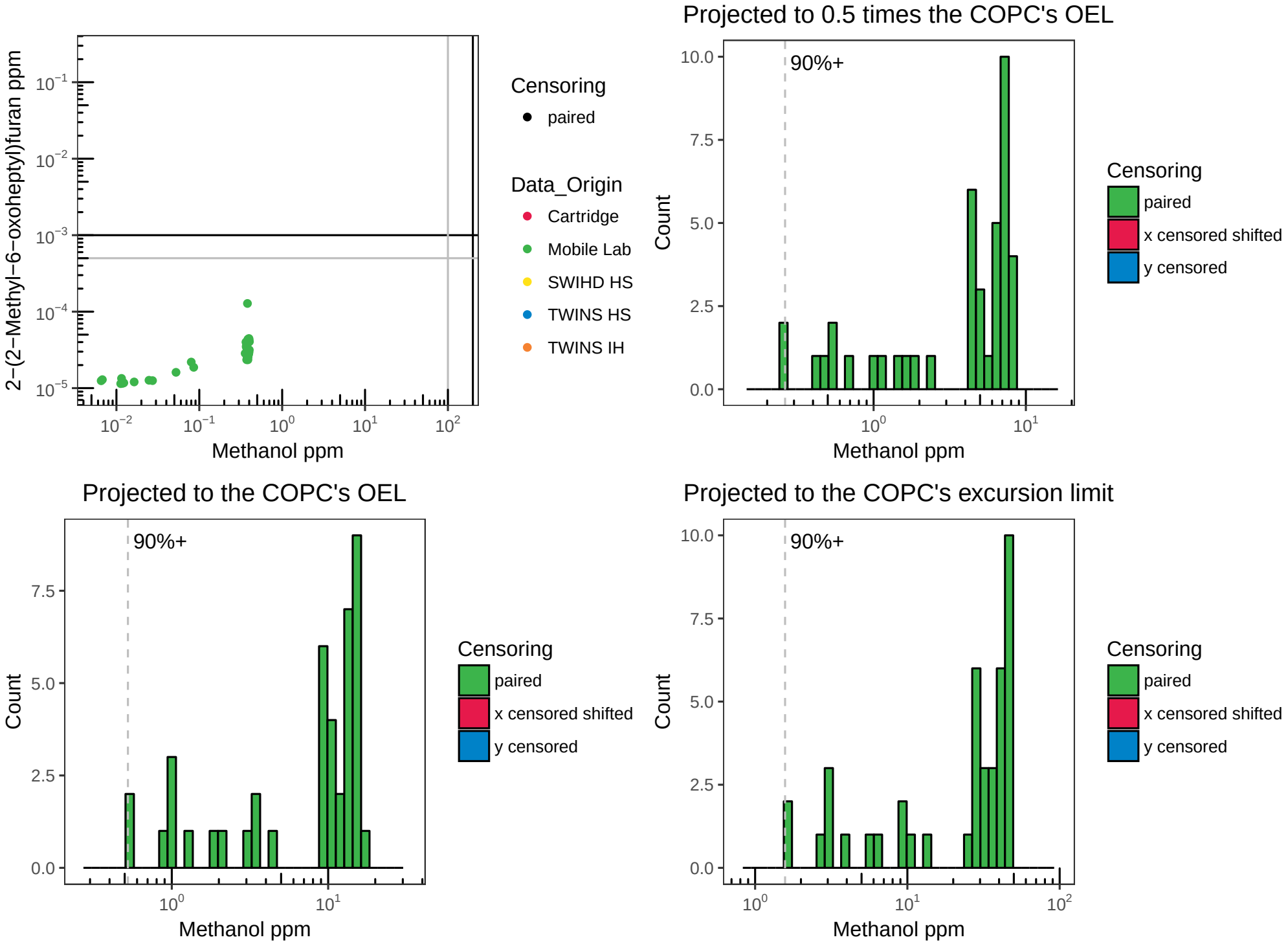


Figure C.423: 2-(2-Methyl-6-oxoheptyl)furan vs Methanol

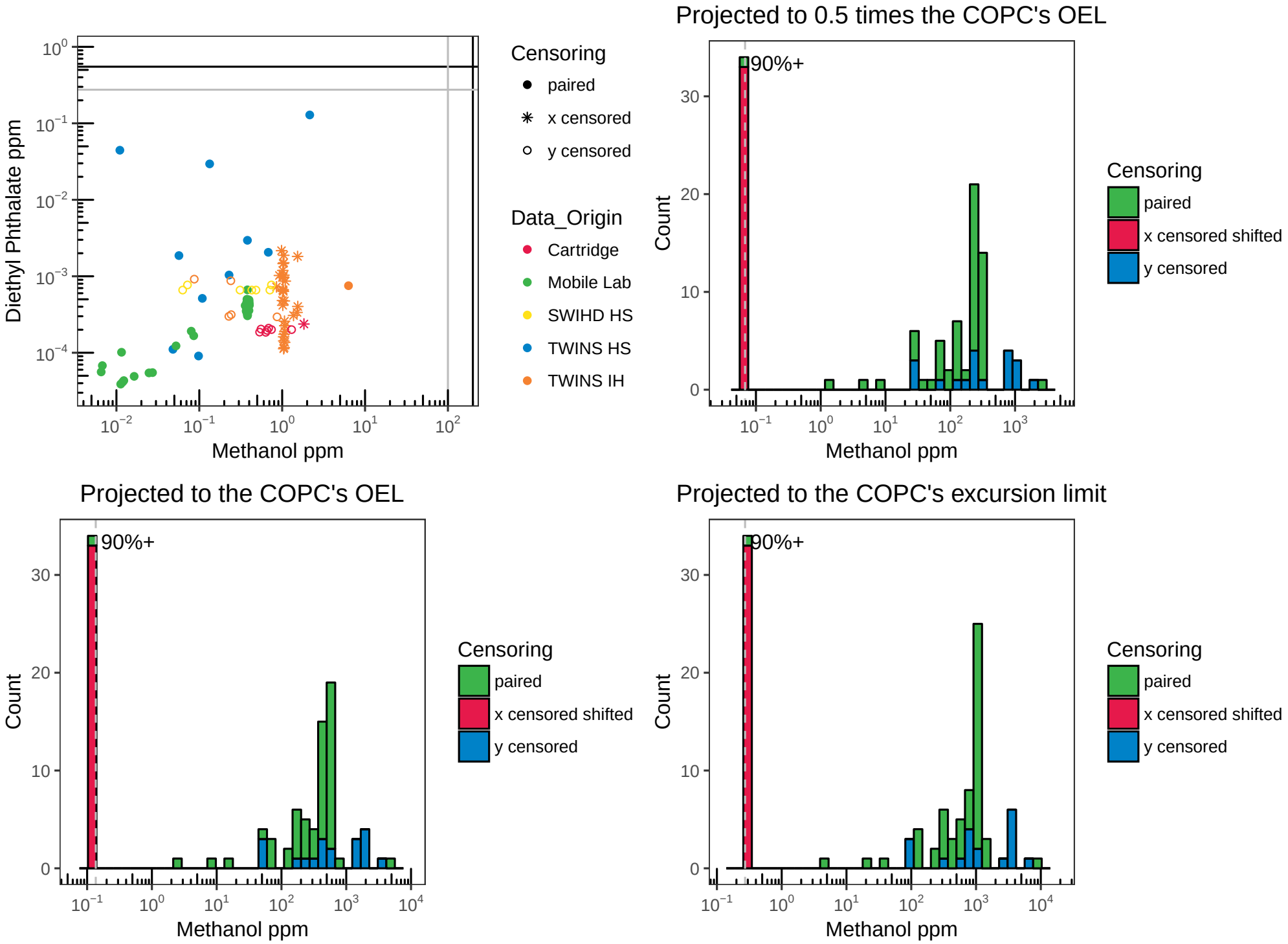


Figure C.424: Diethyl Phthalate vs Methanol

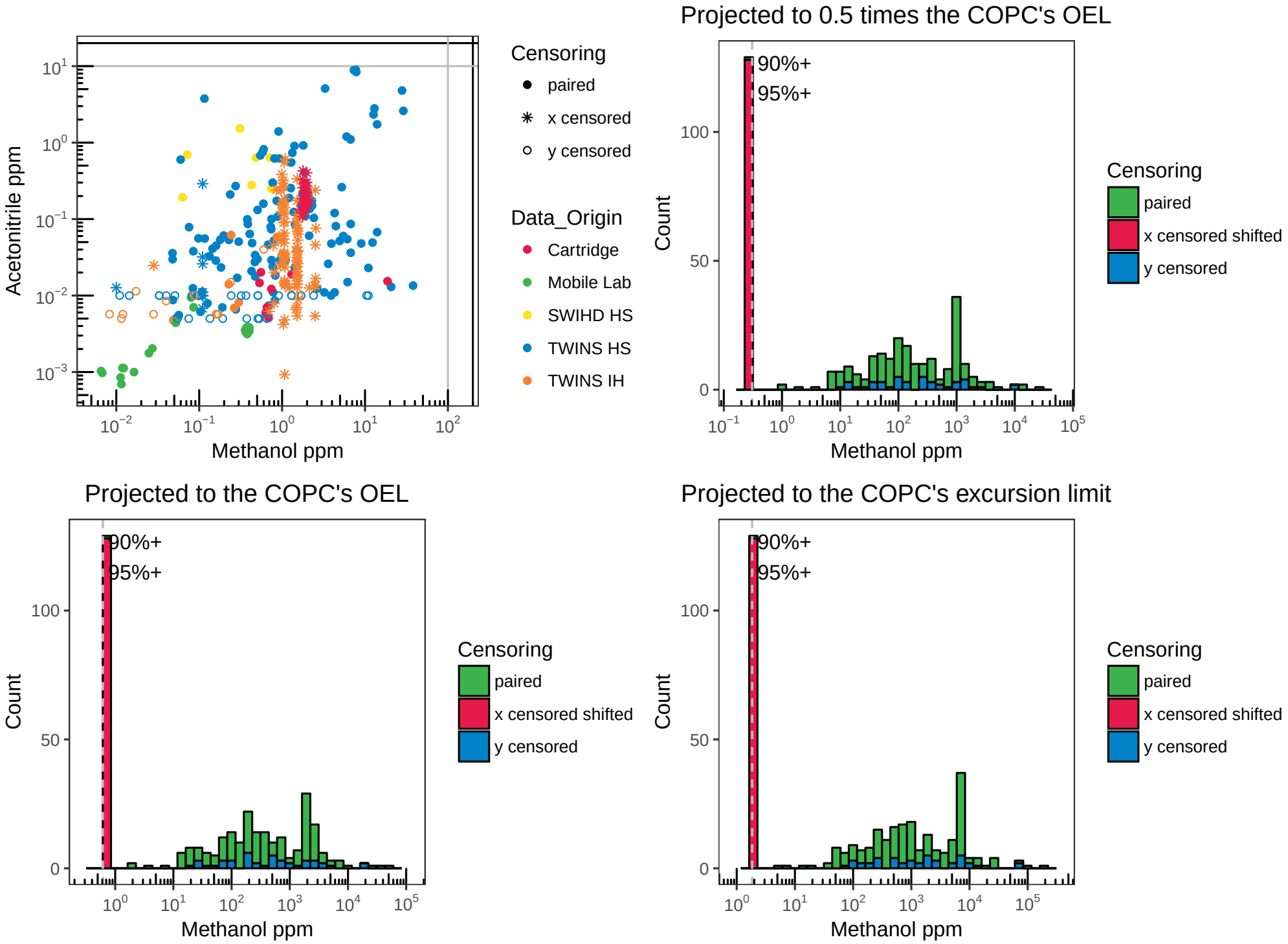


Figure C.425: Acetonitrile vs Methanol

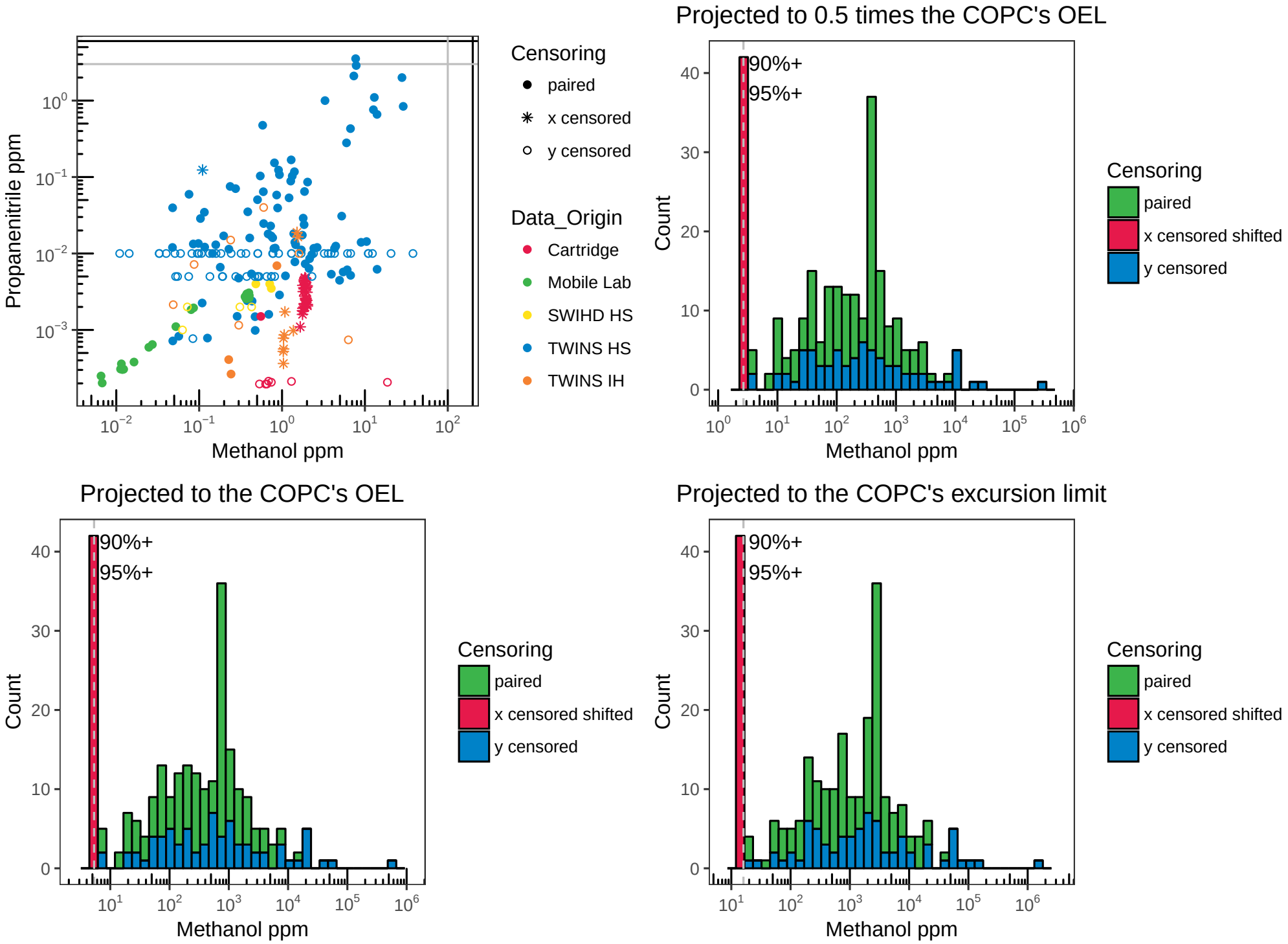


Figure C.426: Propanenitrile vs Methanol

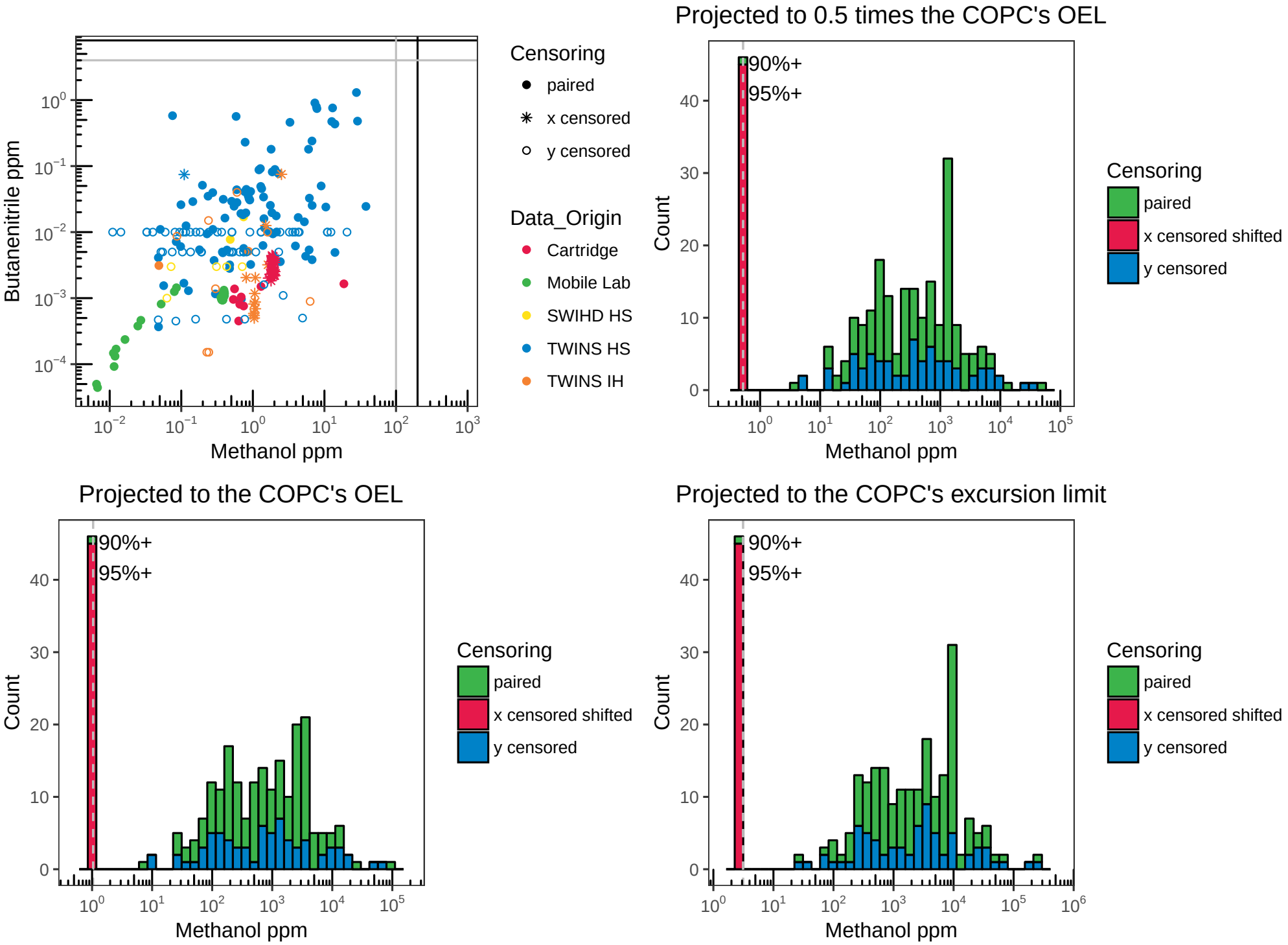


Figure C.427: Butanenitrile vs Methanol

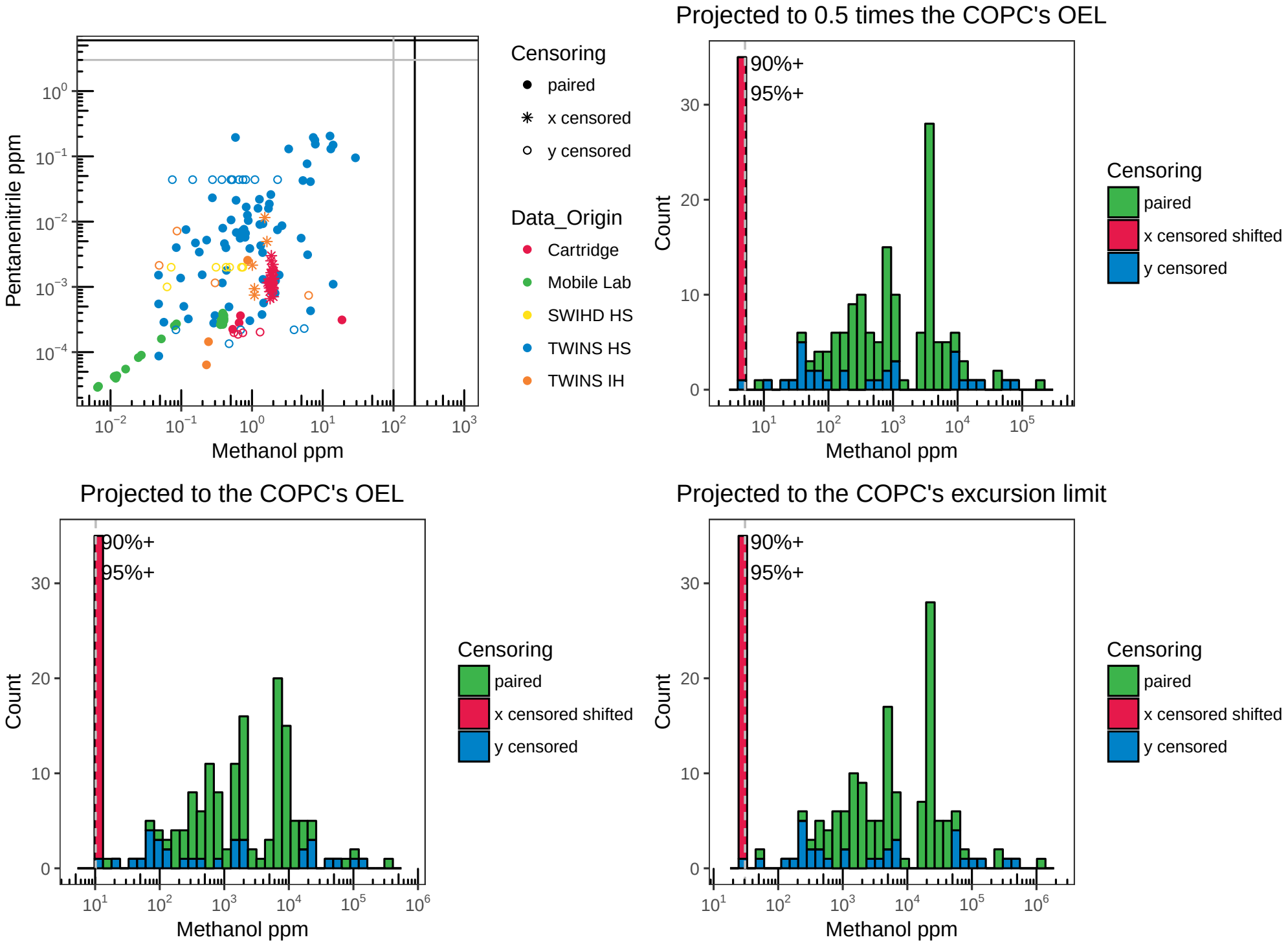


Figure C.428: Pentanenitrile vs Methanol

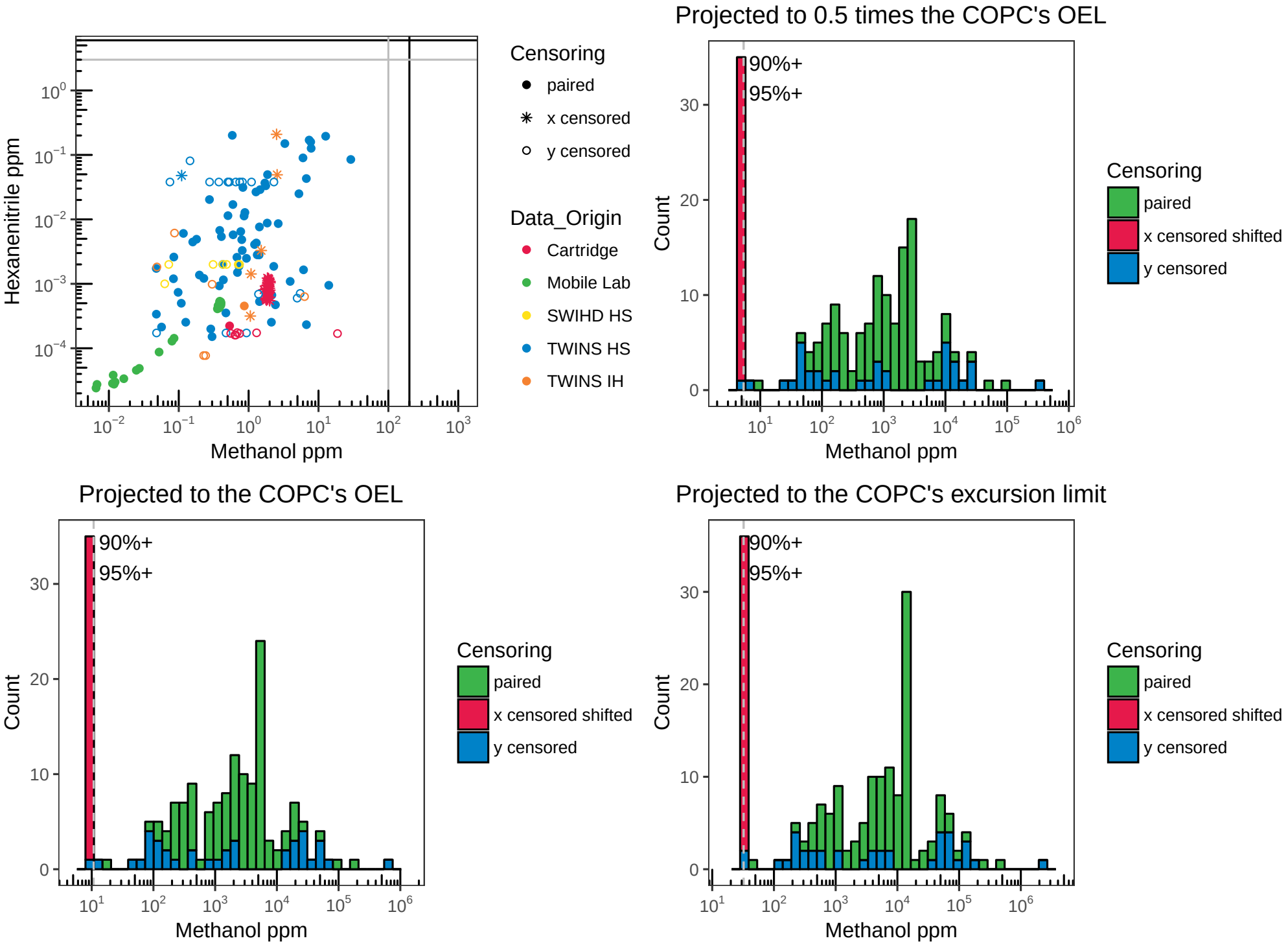


Figure C.429: Hexanenitrile vs Methanol

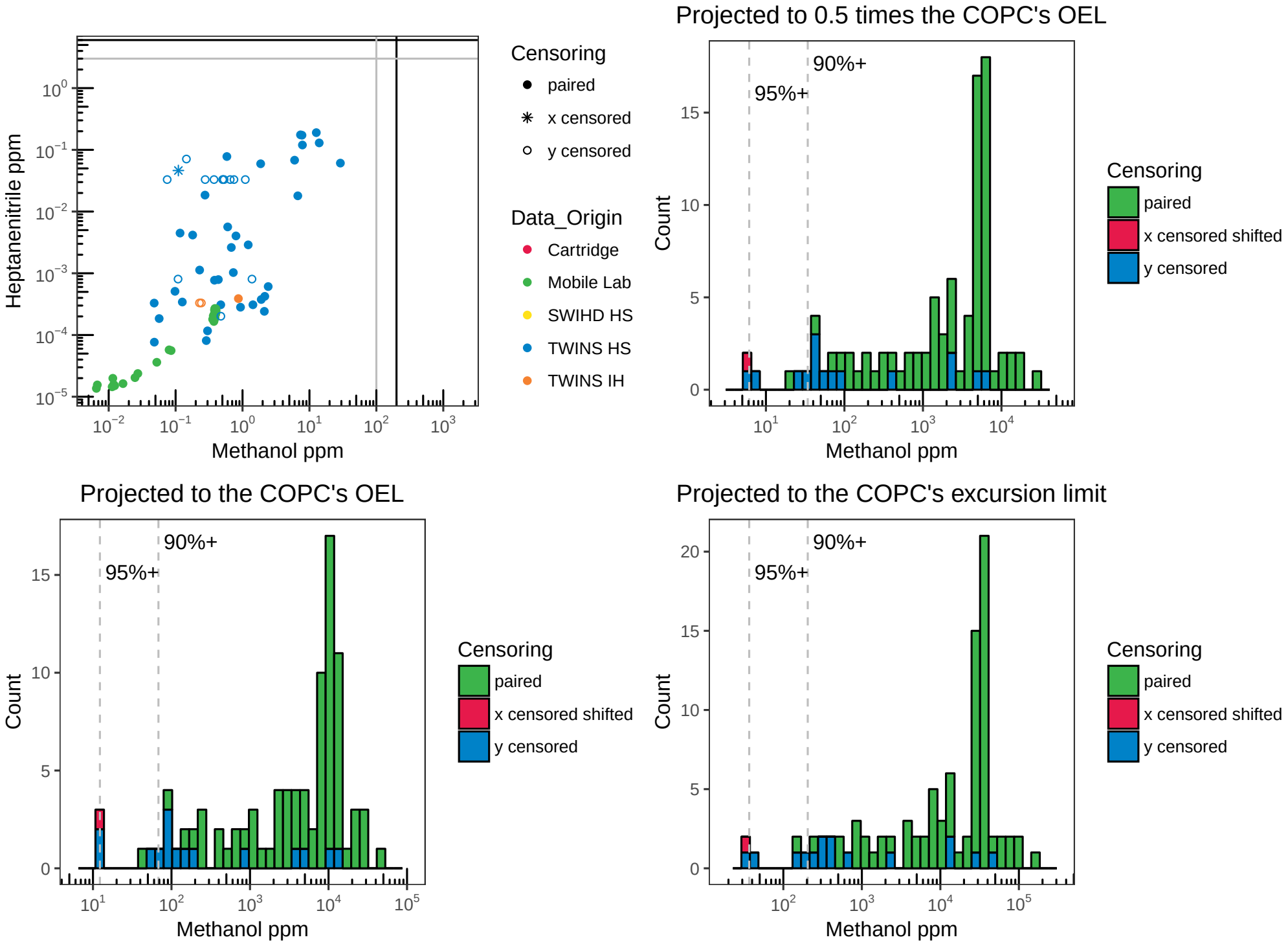


Figure C.430: Heptanenitrile vs Methanol

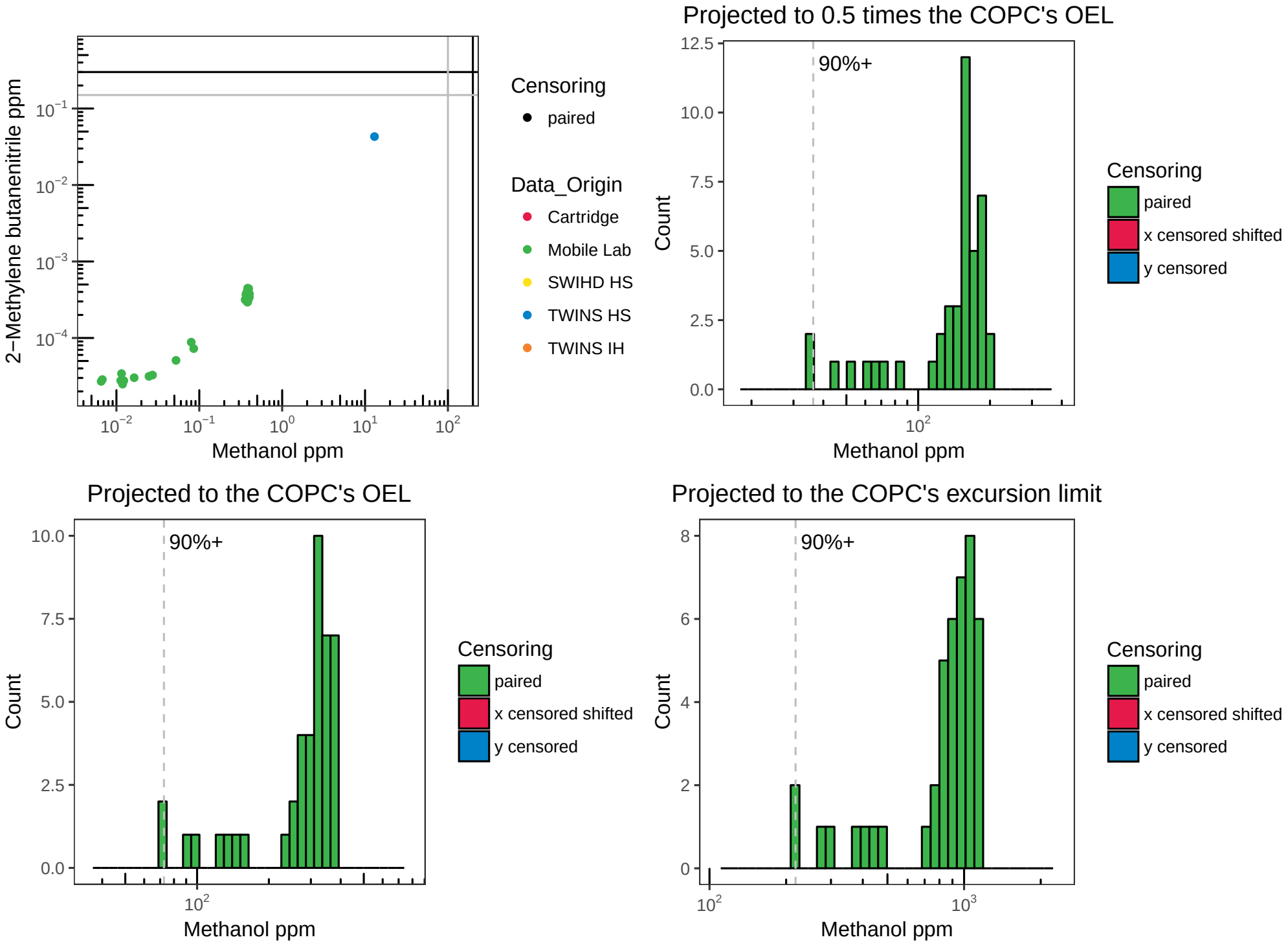


Figure C.431: 2-Methylene butanenitrile vs Methanol

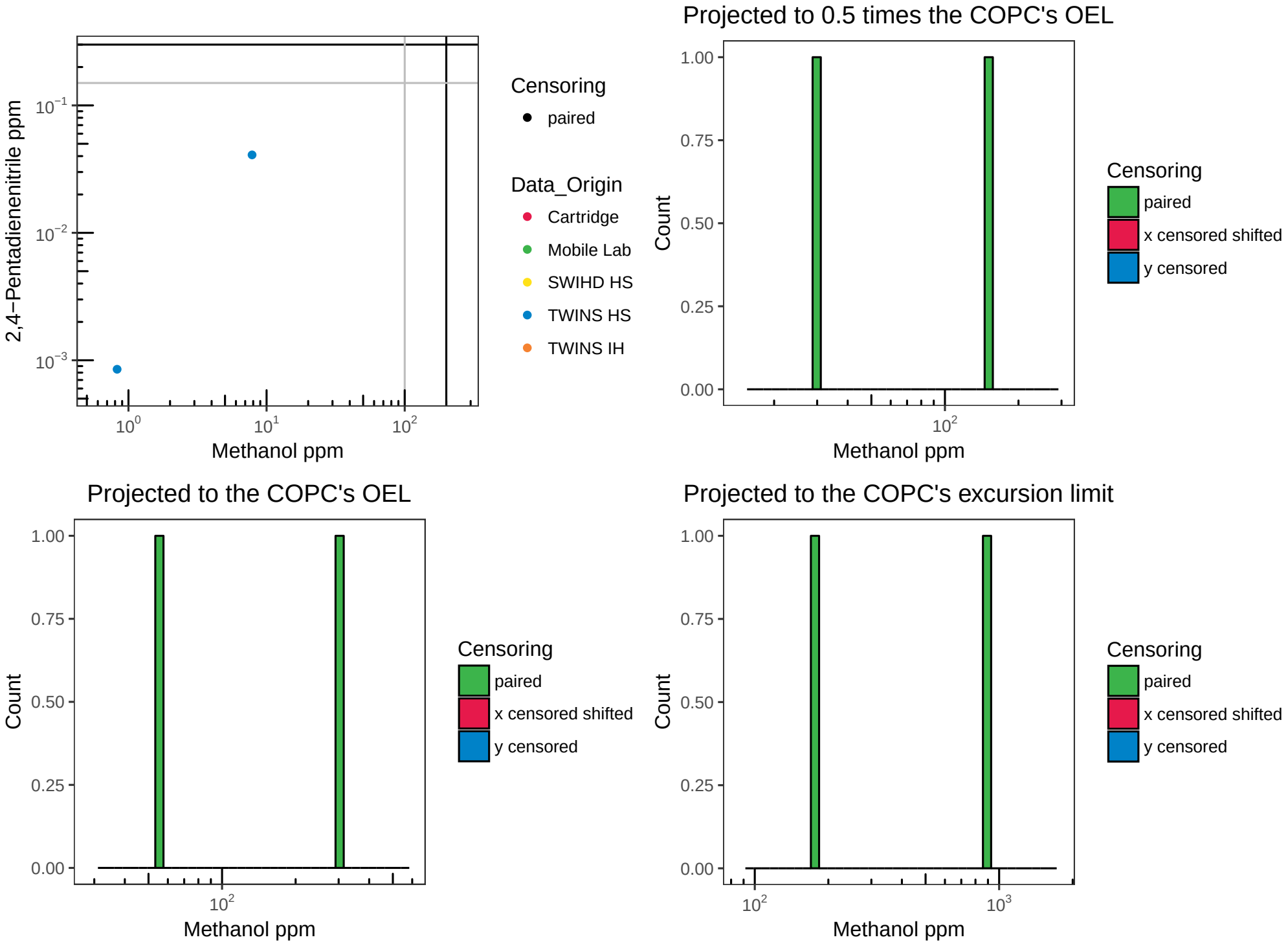


Figure C.432: 2,4-Pentadienenitrile vs Methanol

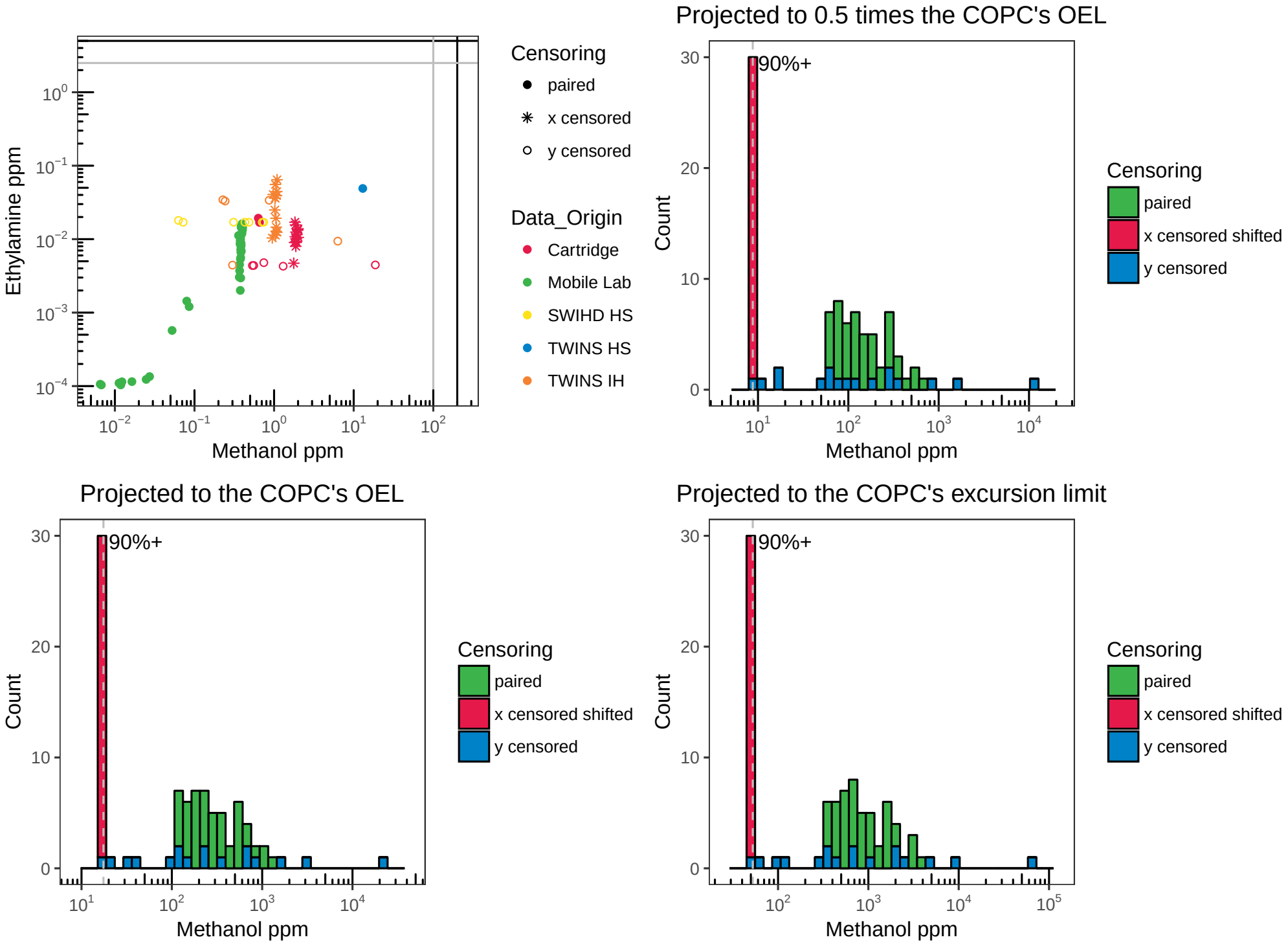


Figure C.433: Ethylamine vs Methanol

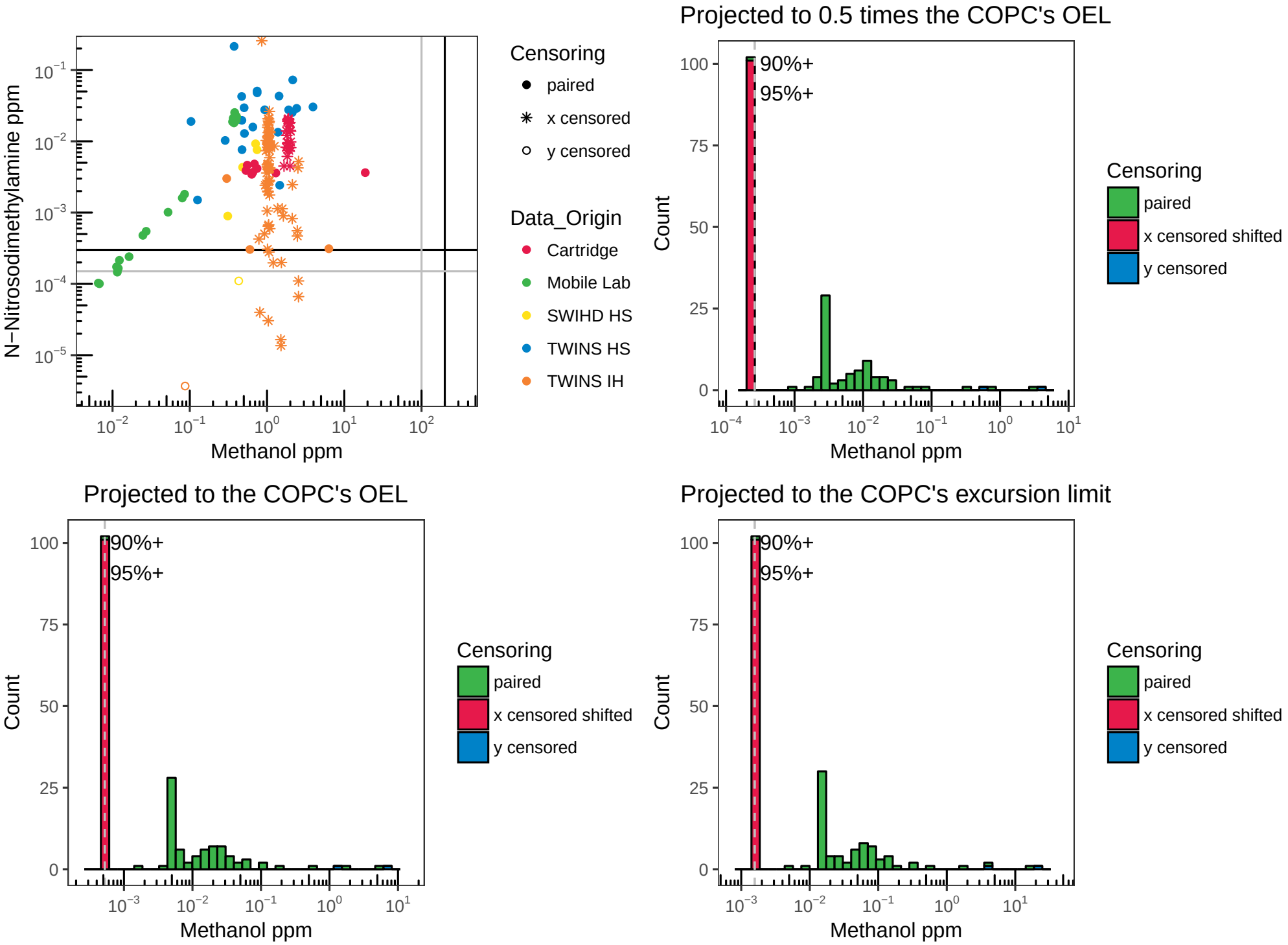


Figure C.434: N-Nitrosodimethylamine vs Methanol

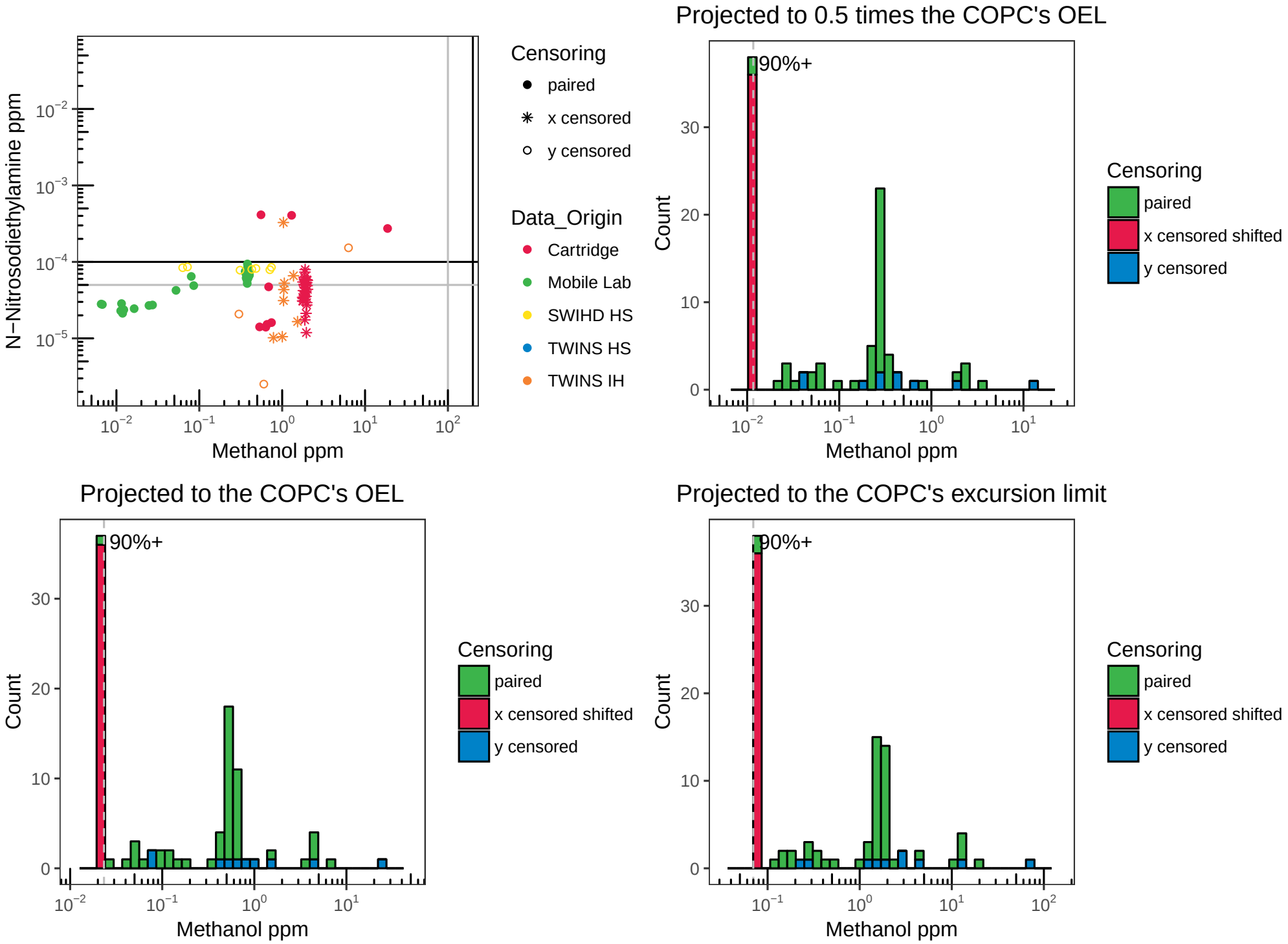


Figure C.435: N-Nitrosodiethylamine vs Methanol

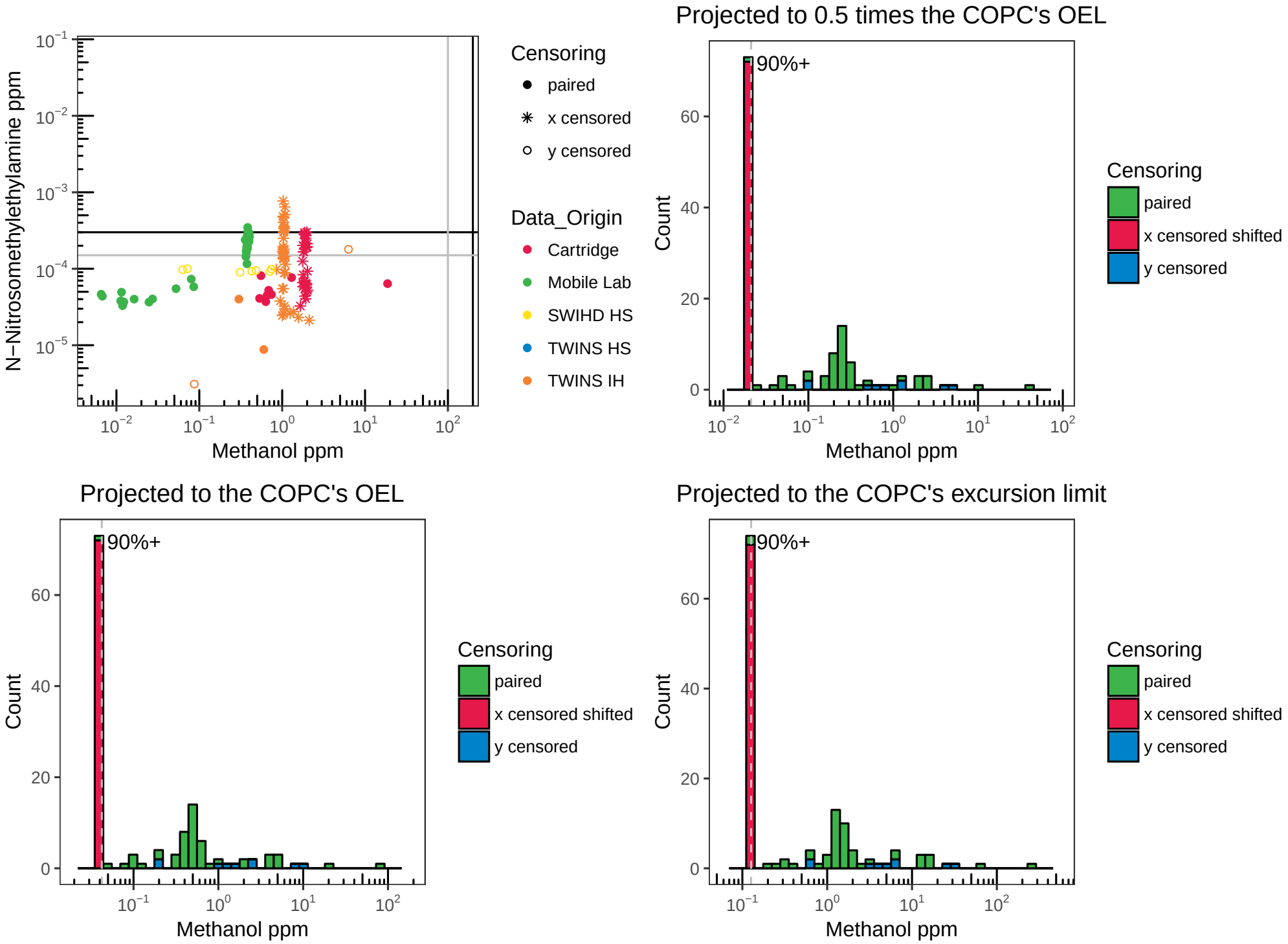


Figure C.436: N-Nitrosomethylethylamine vs Methanol

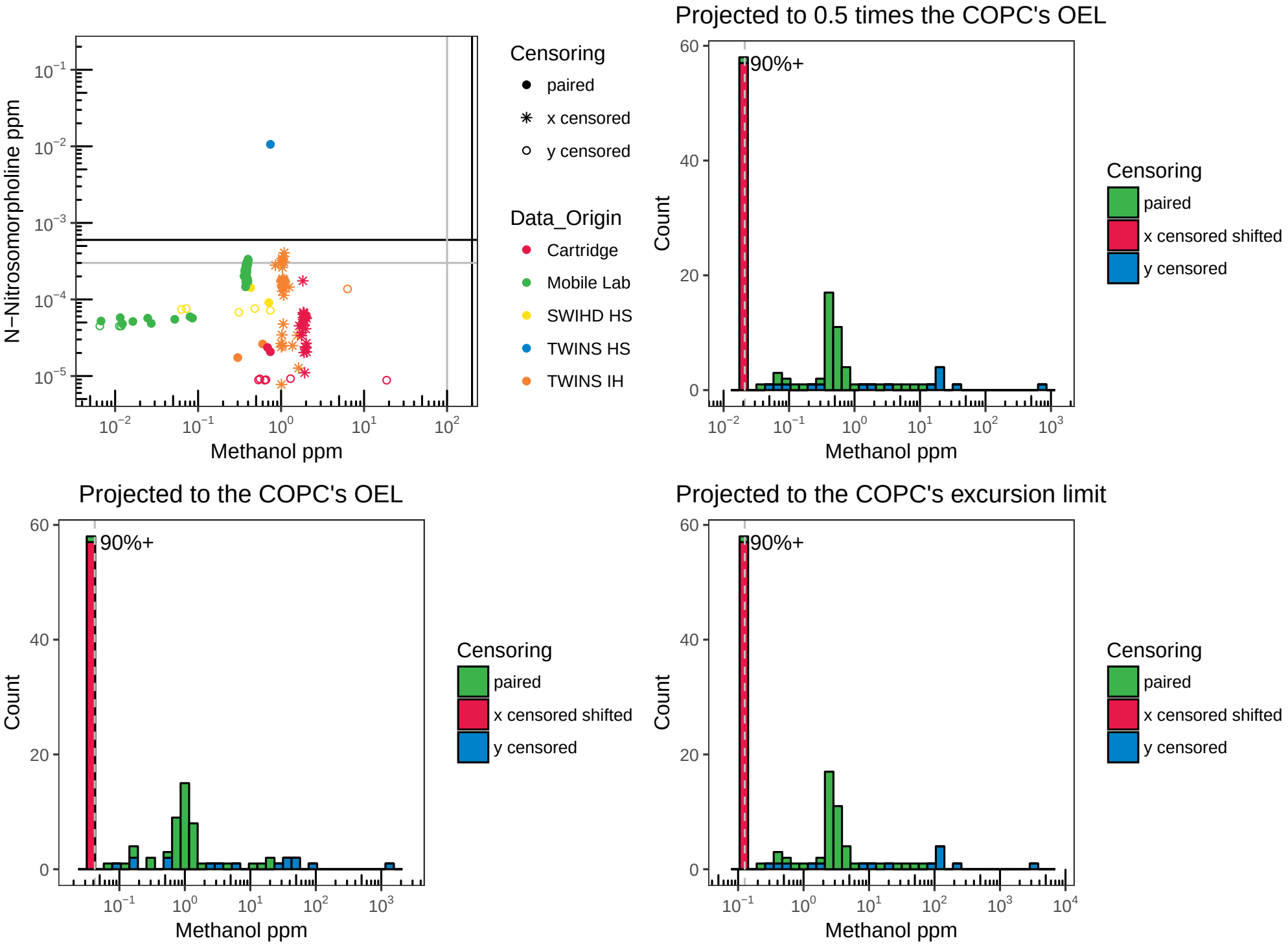


Figure C.437: N-Nitrosomorpholine vs Methanol

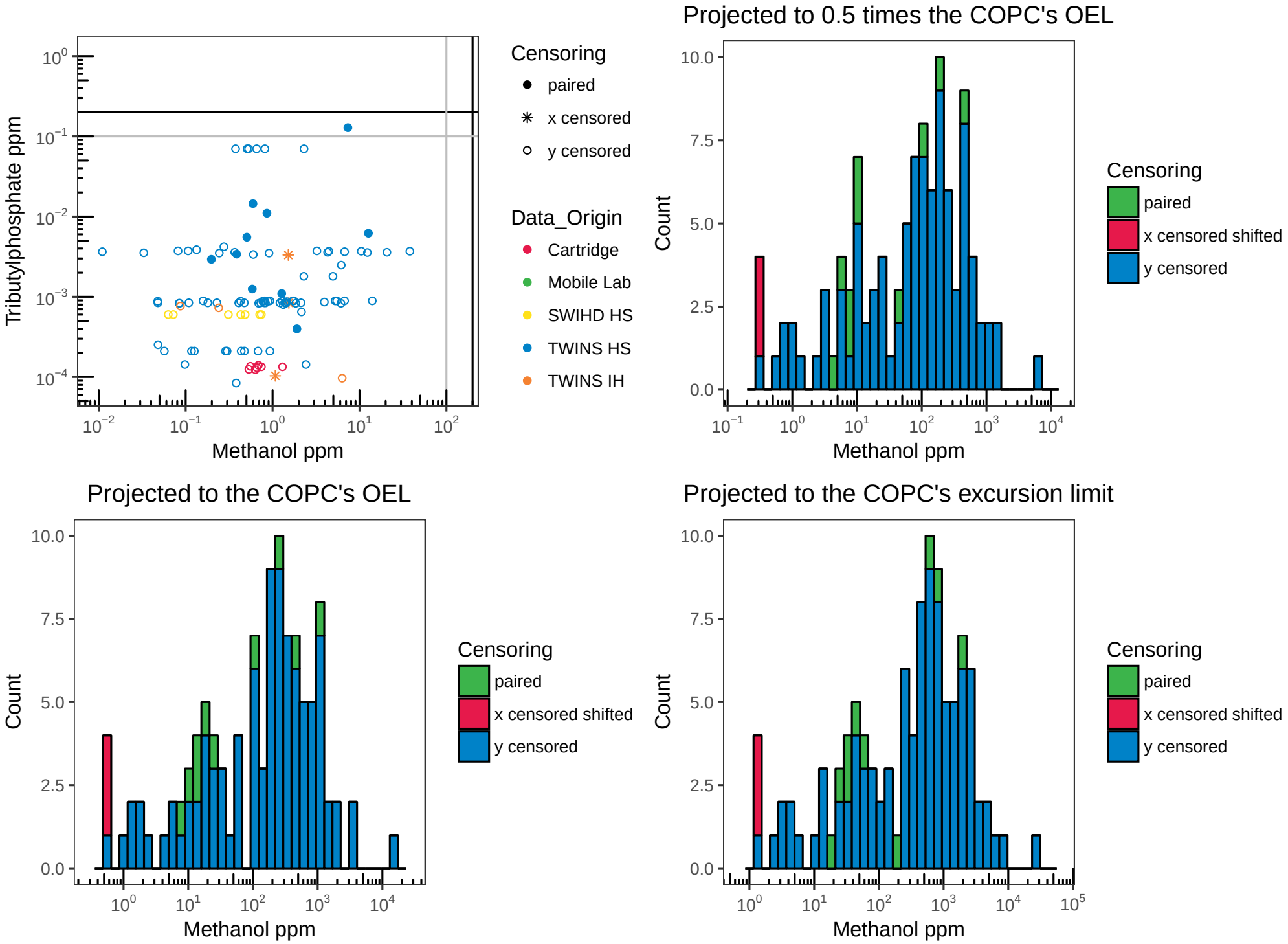


Figure C.438: Tributylphosphate vs Methanol

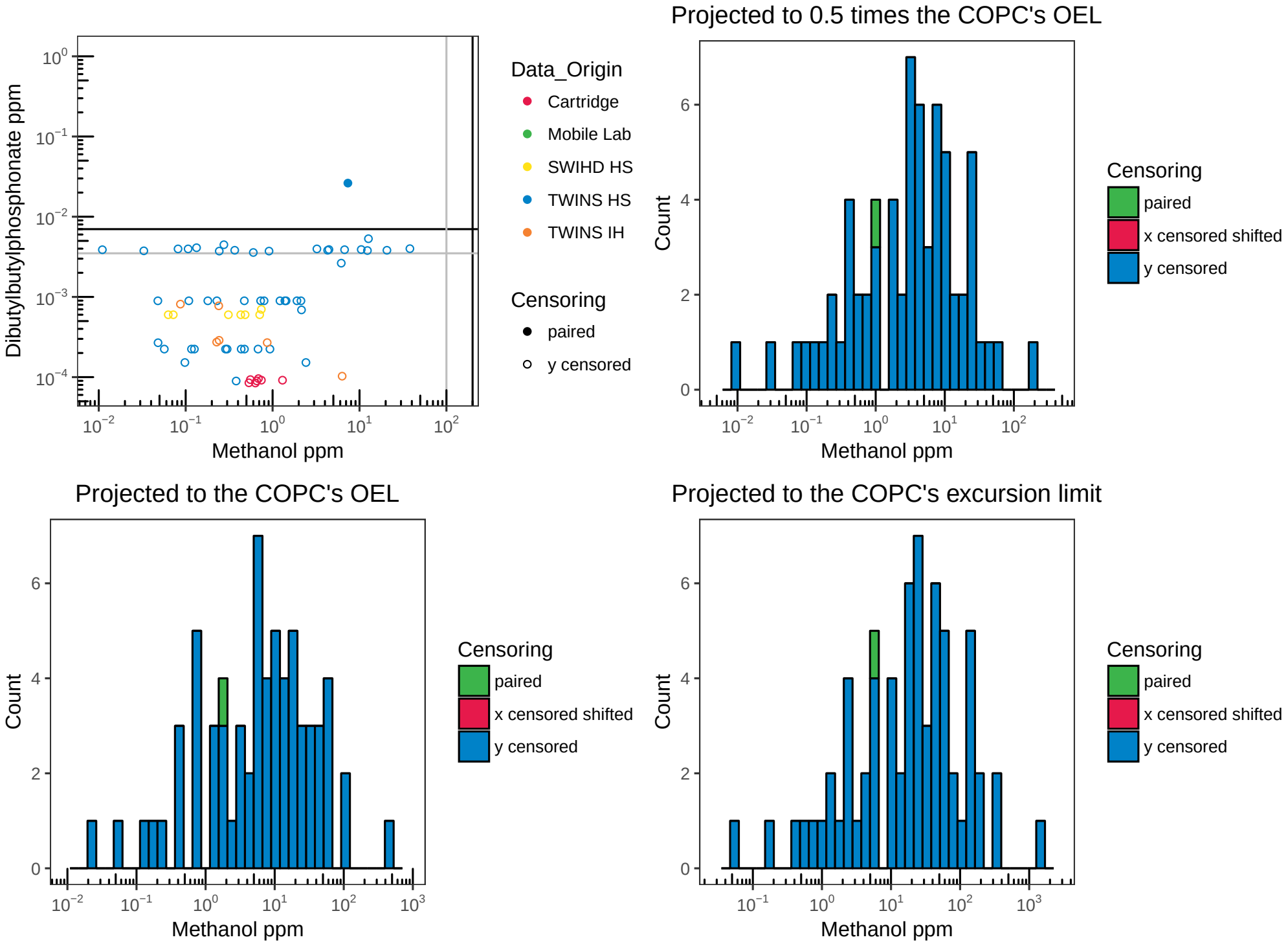


Figure C.439: Dibutylbutylphosphonate vs Methanol

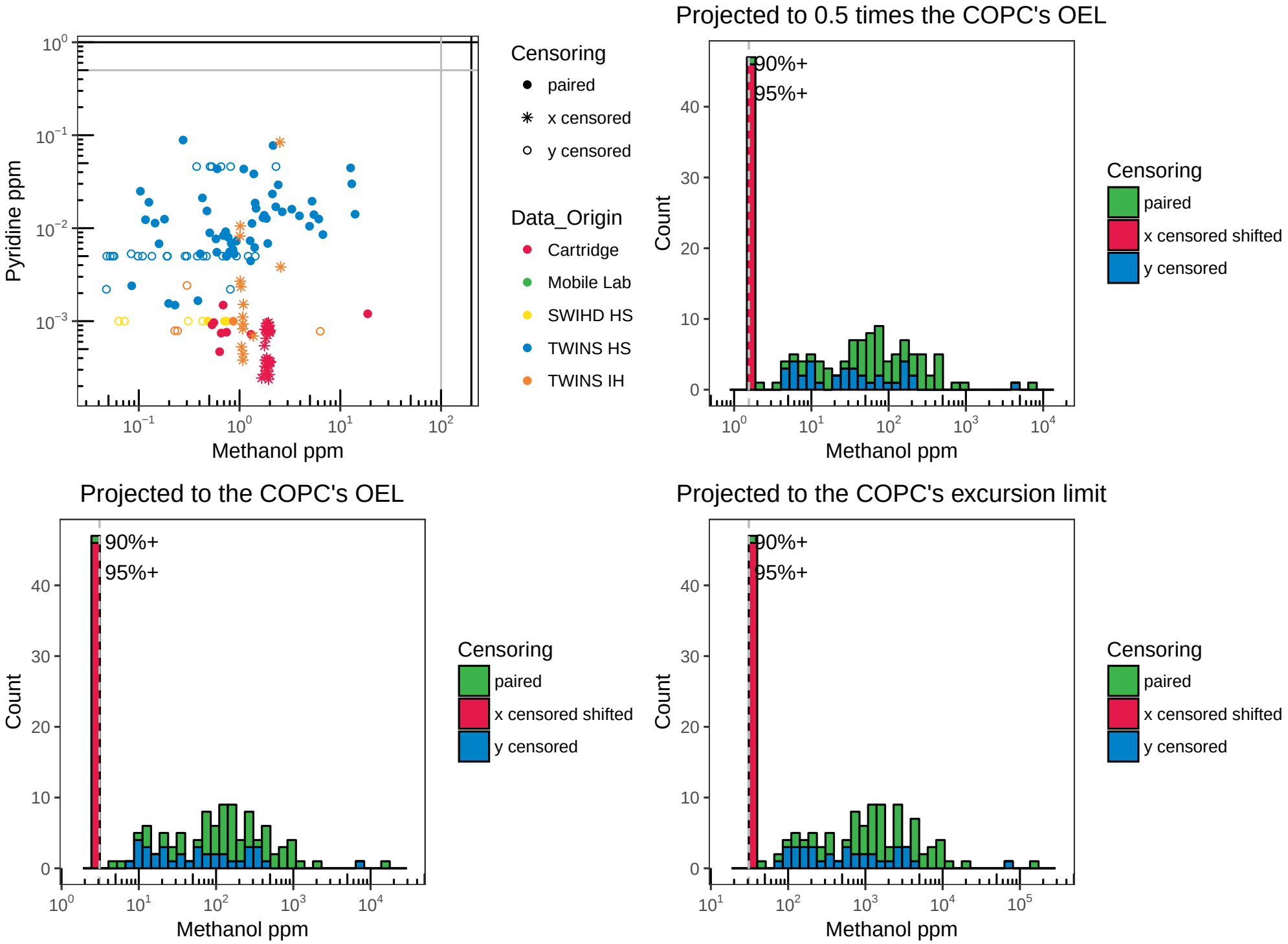


Figure C.440: Pyridine vs Methanol

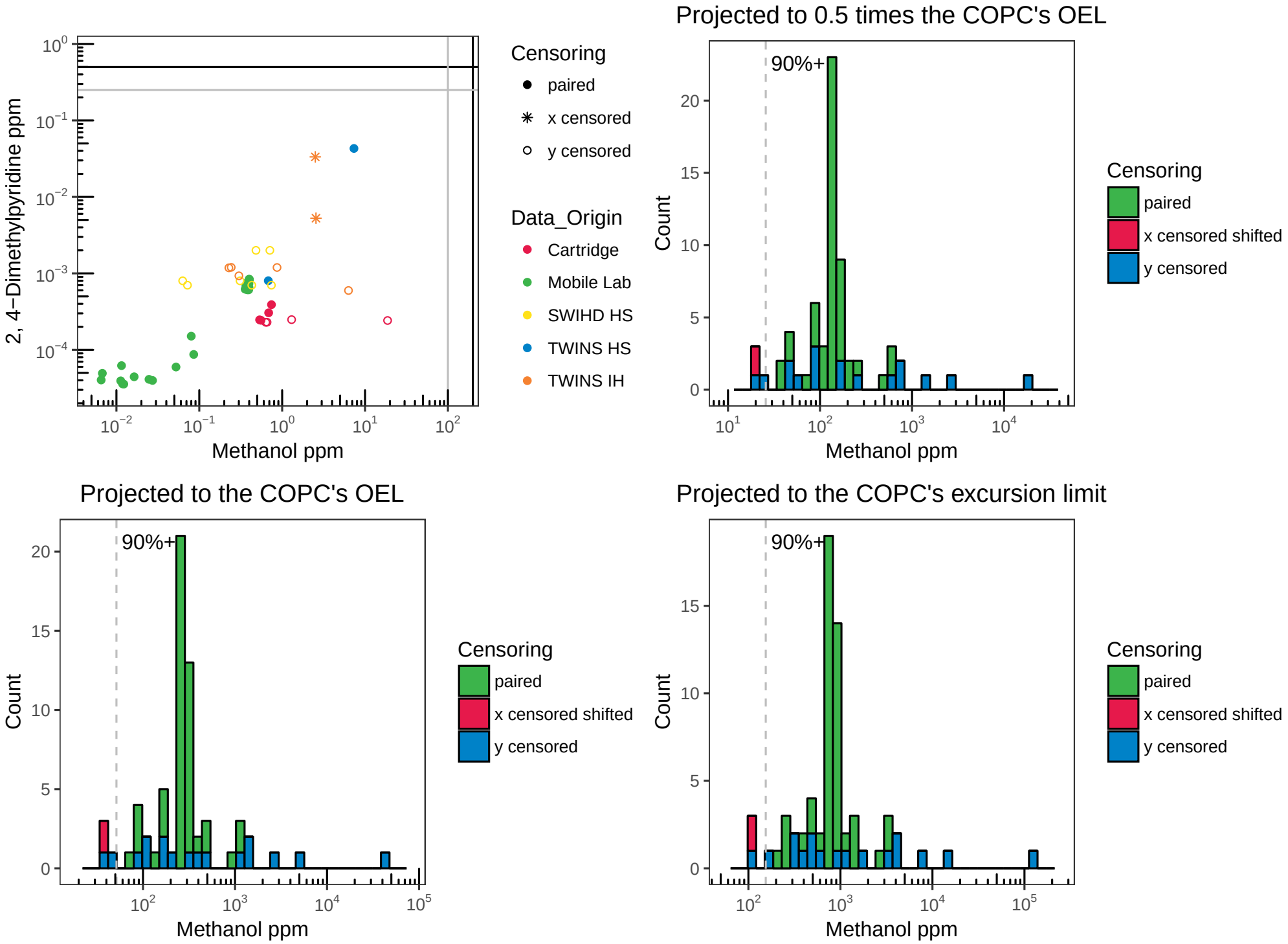


Figure C.441: 2, 4-Dimethylpyridine vs Methanol

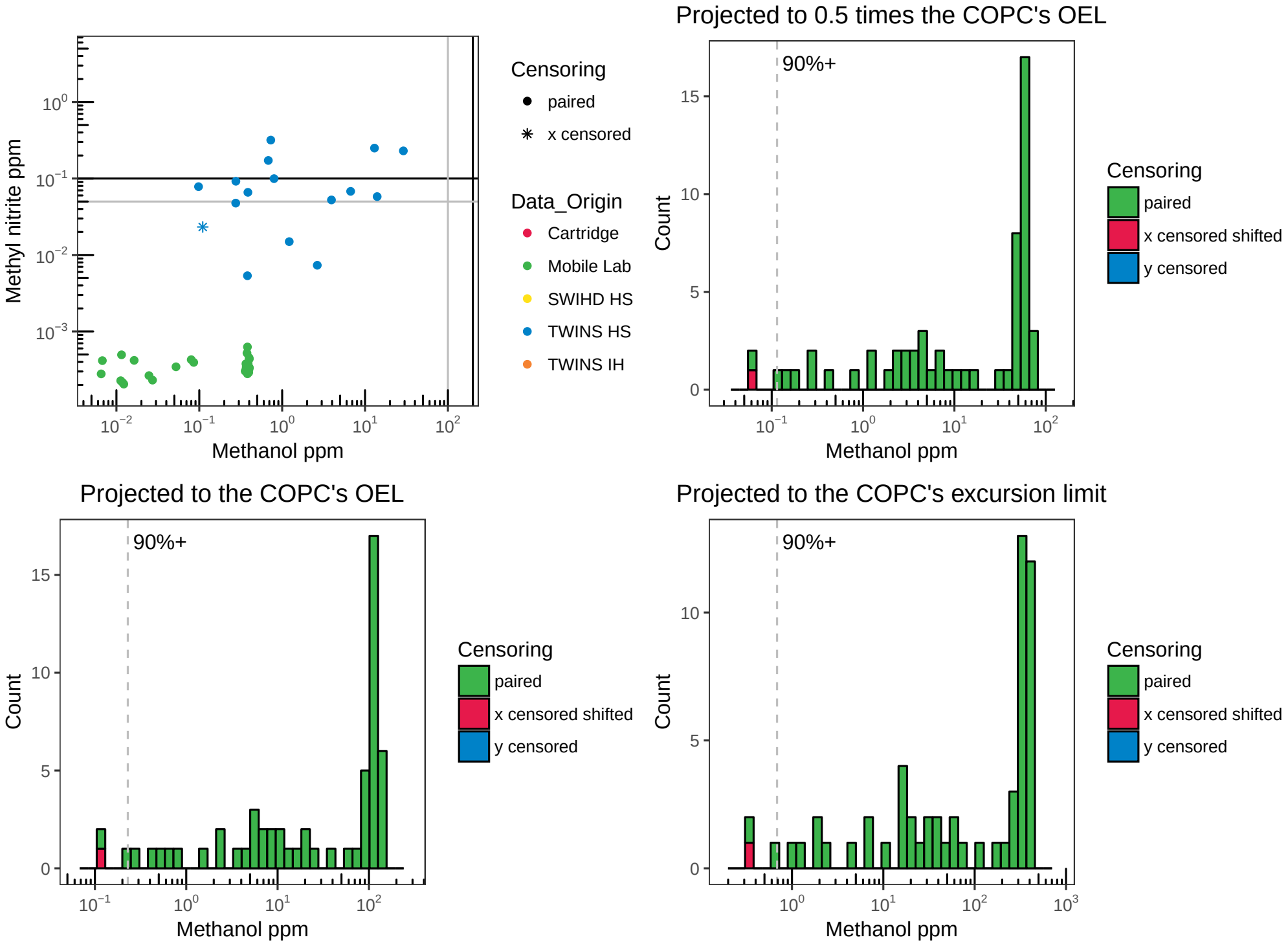


Figure C.442: Methyl nitrite vs Methanol

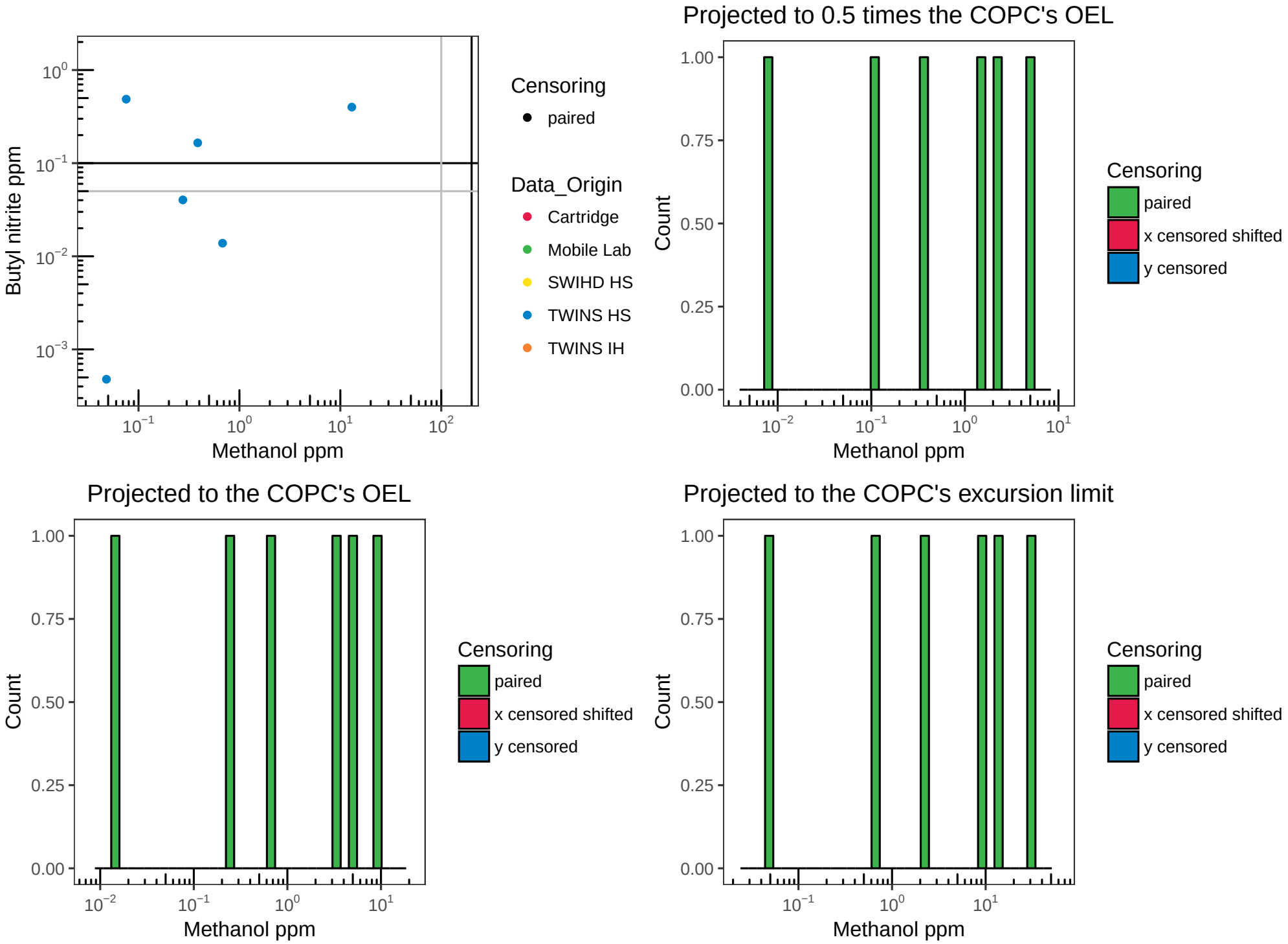


Figure C.443: Butyl nitrite vs Methanol

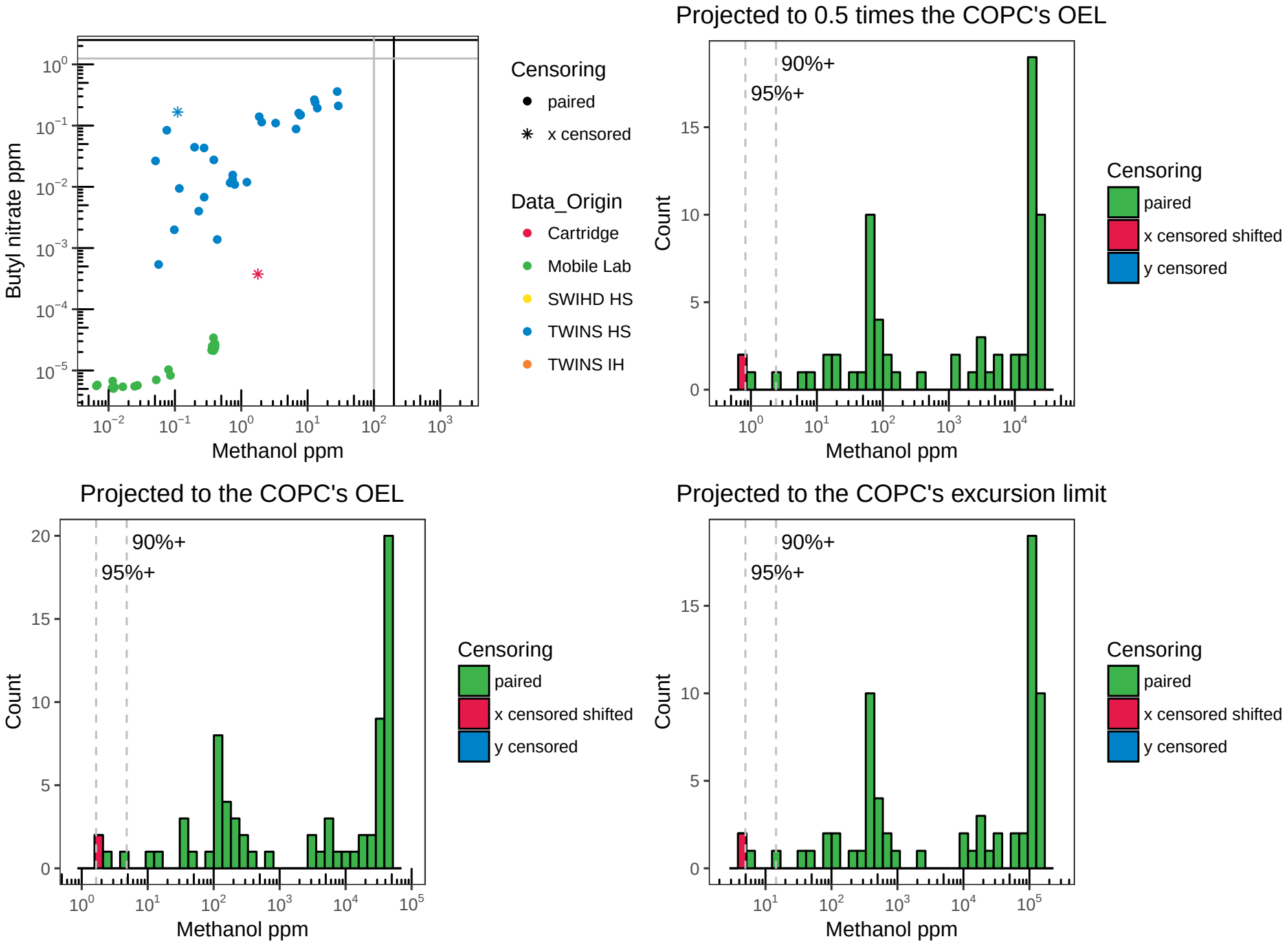


Figure C.444: Butyl nitrate vs Methanol

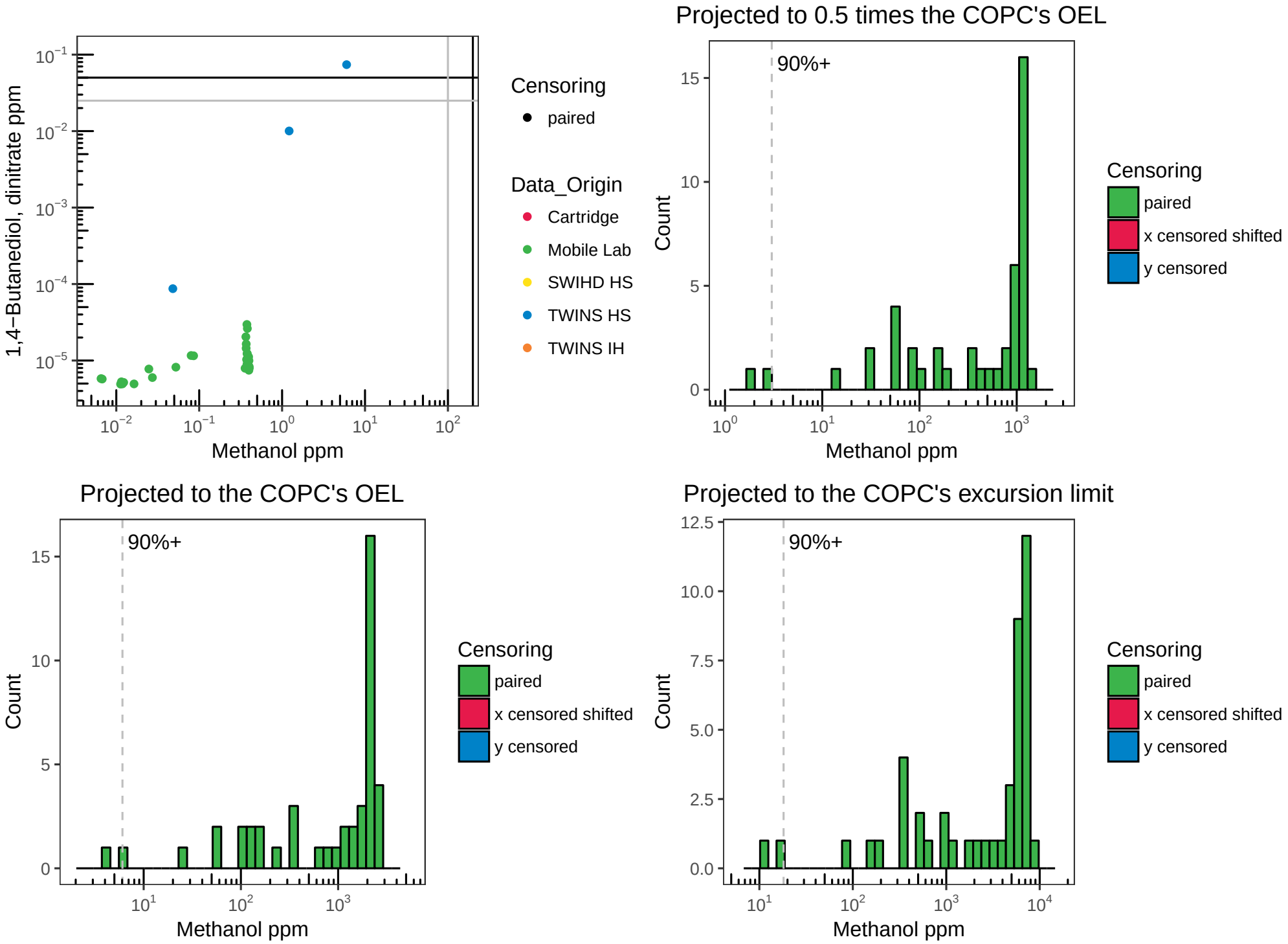


Figure C.445: 1,4-Butanediol, dinitrate vs Methanol

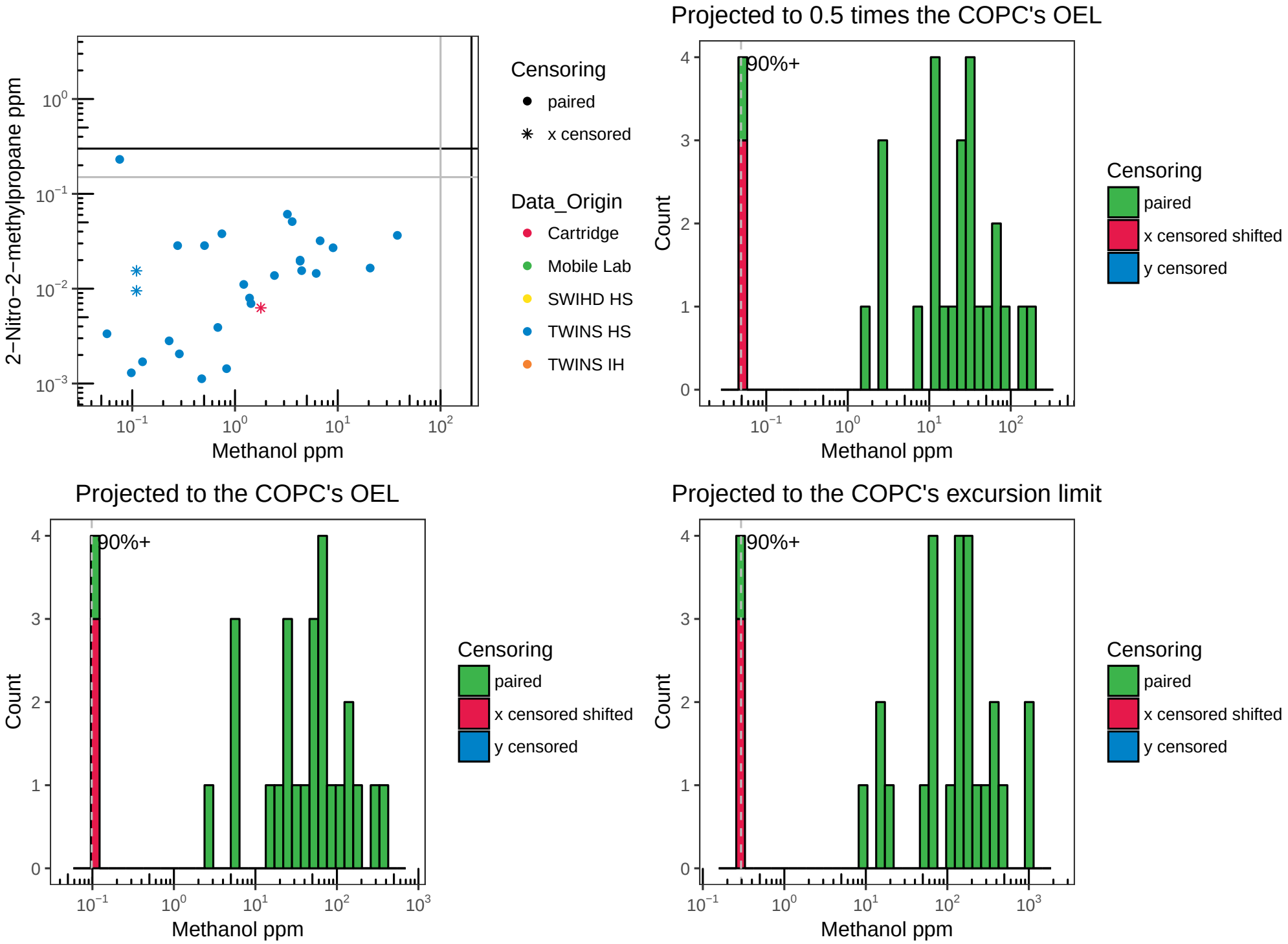


Figure C.446: 2-Nitro-2-methylpropane vs Methanol

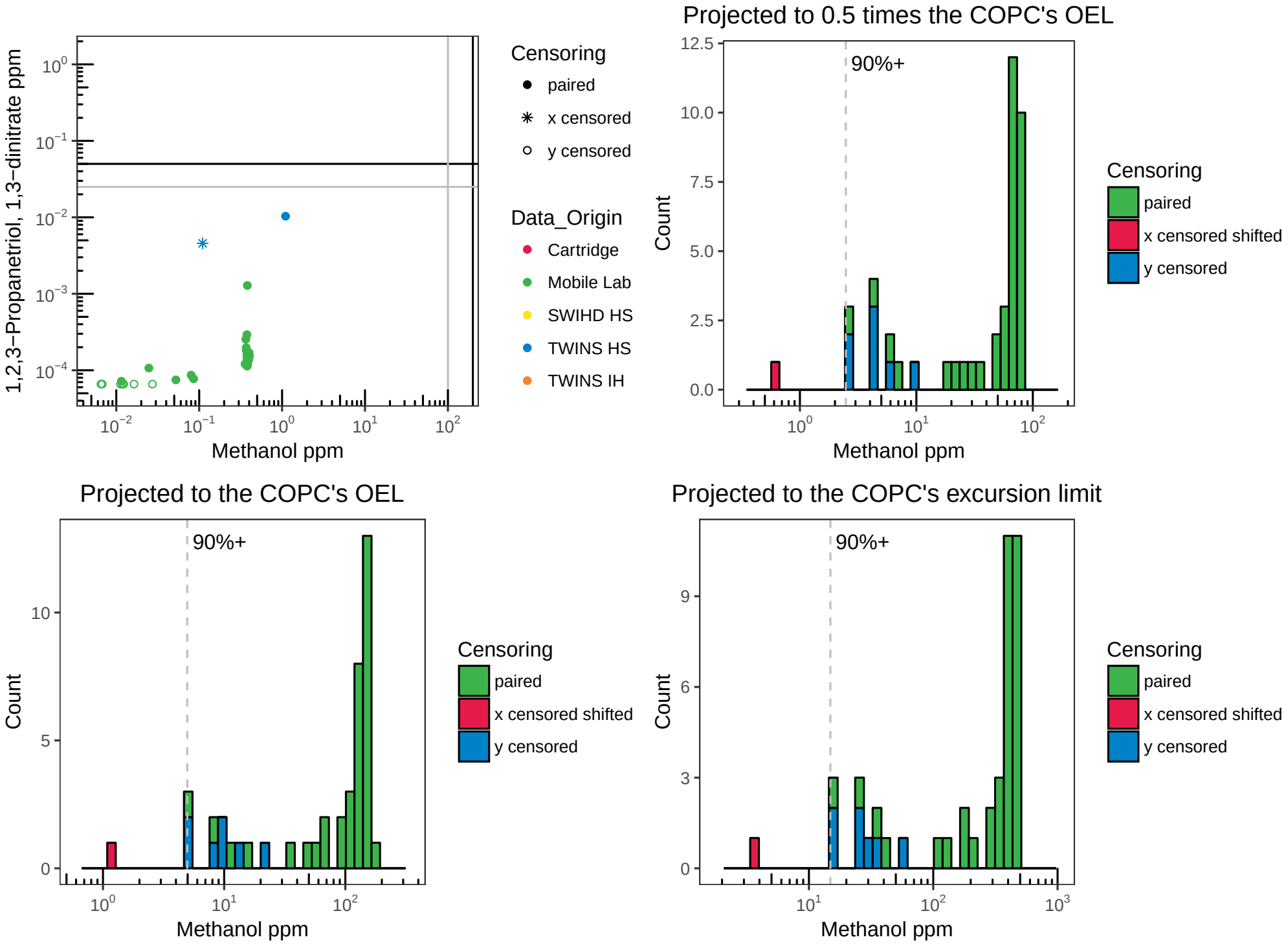


Figure C.447: 1,2,3-Propanetriol, 1,3-dinitrate vs Methanol

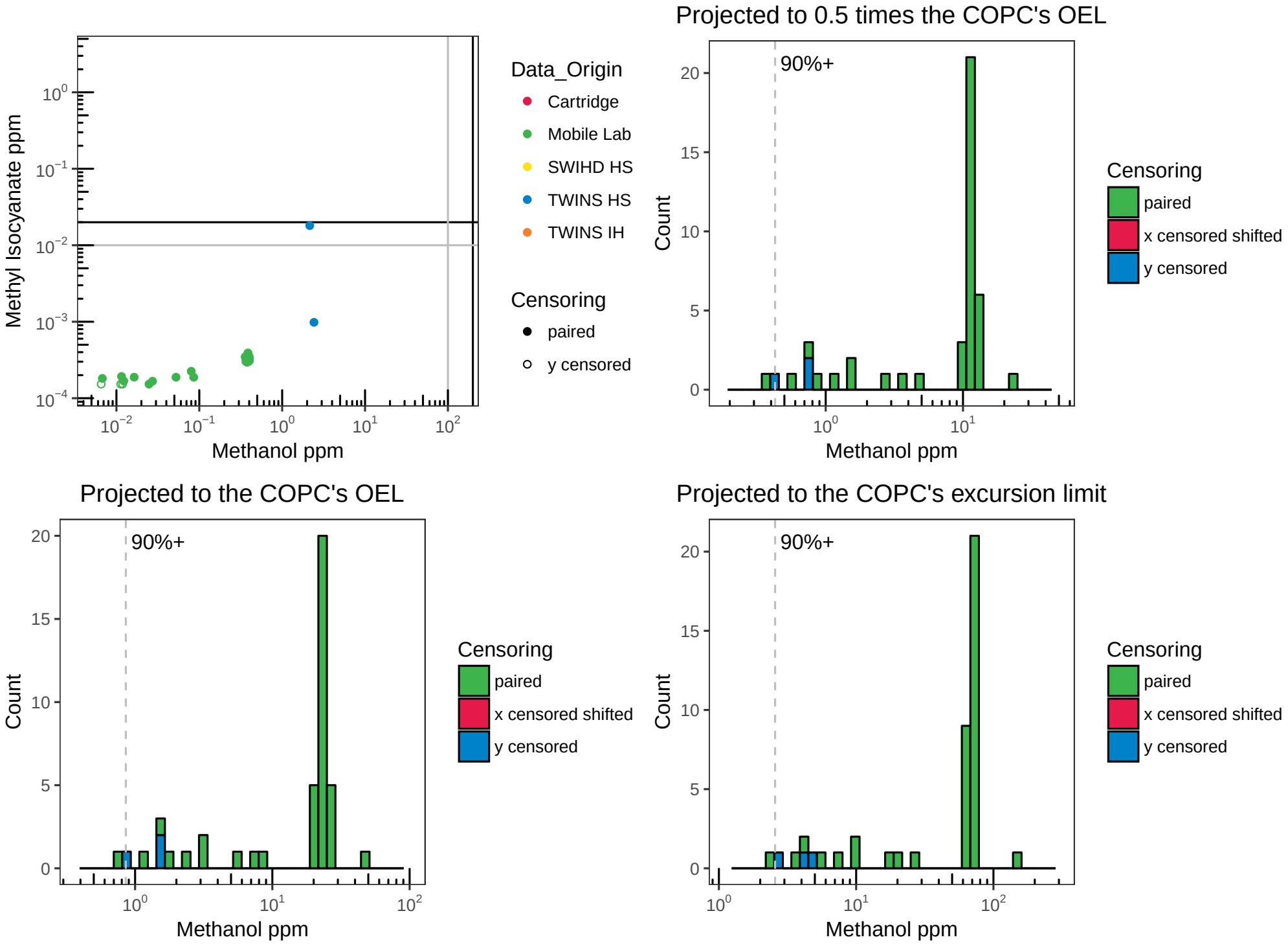


Figure C.448: Methyl Isocyanate vs Methanol

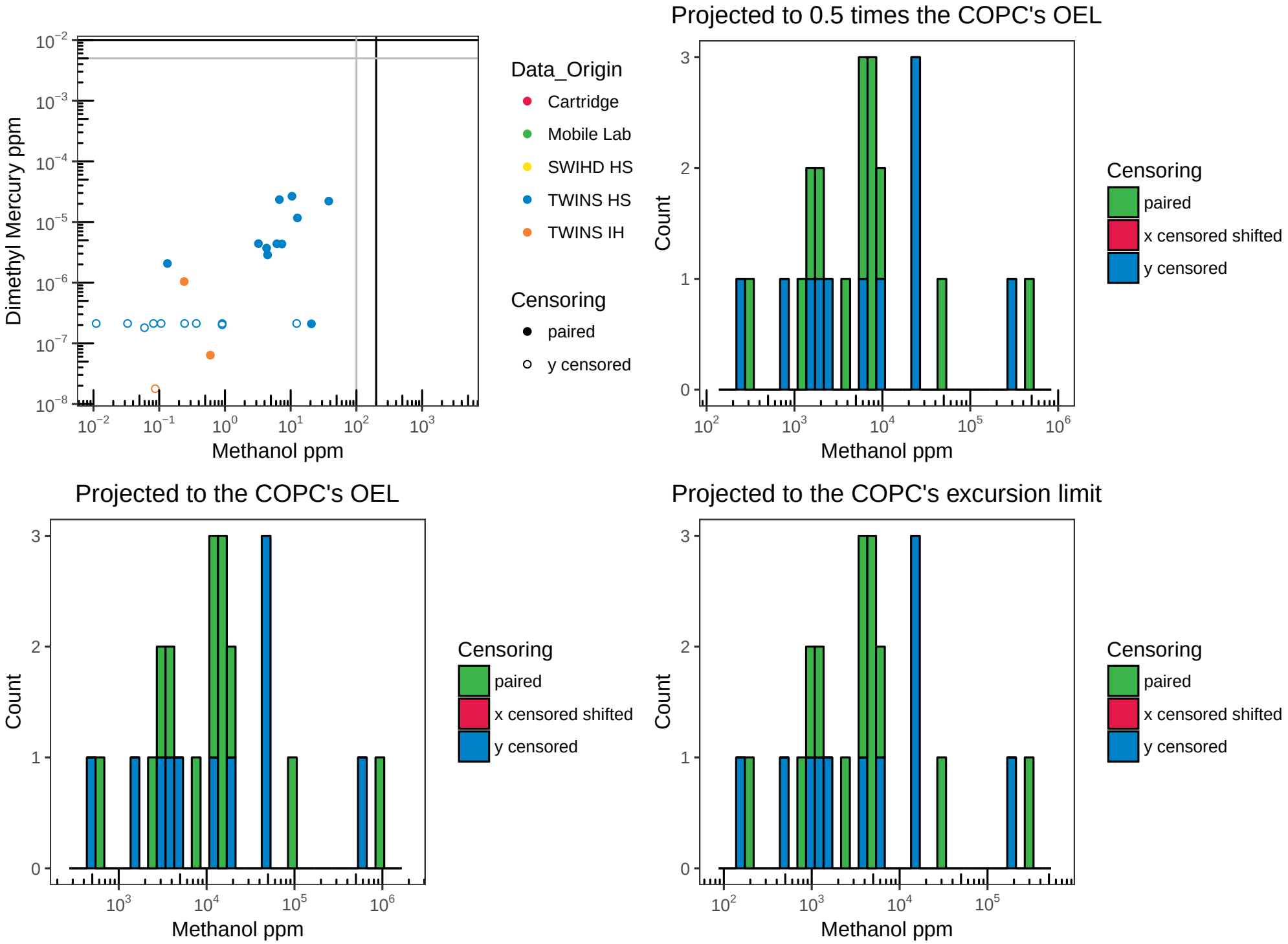


Figure C.449: Dimethyl Mercury vs Methanol

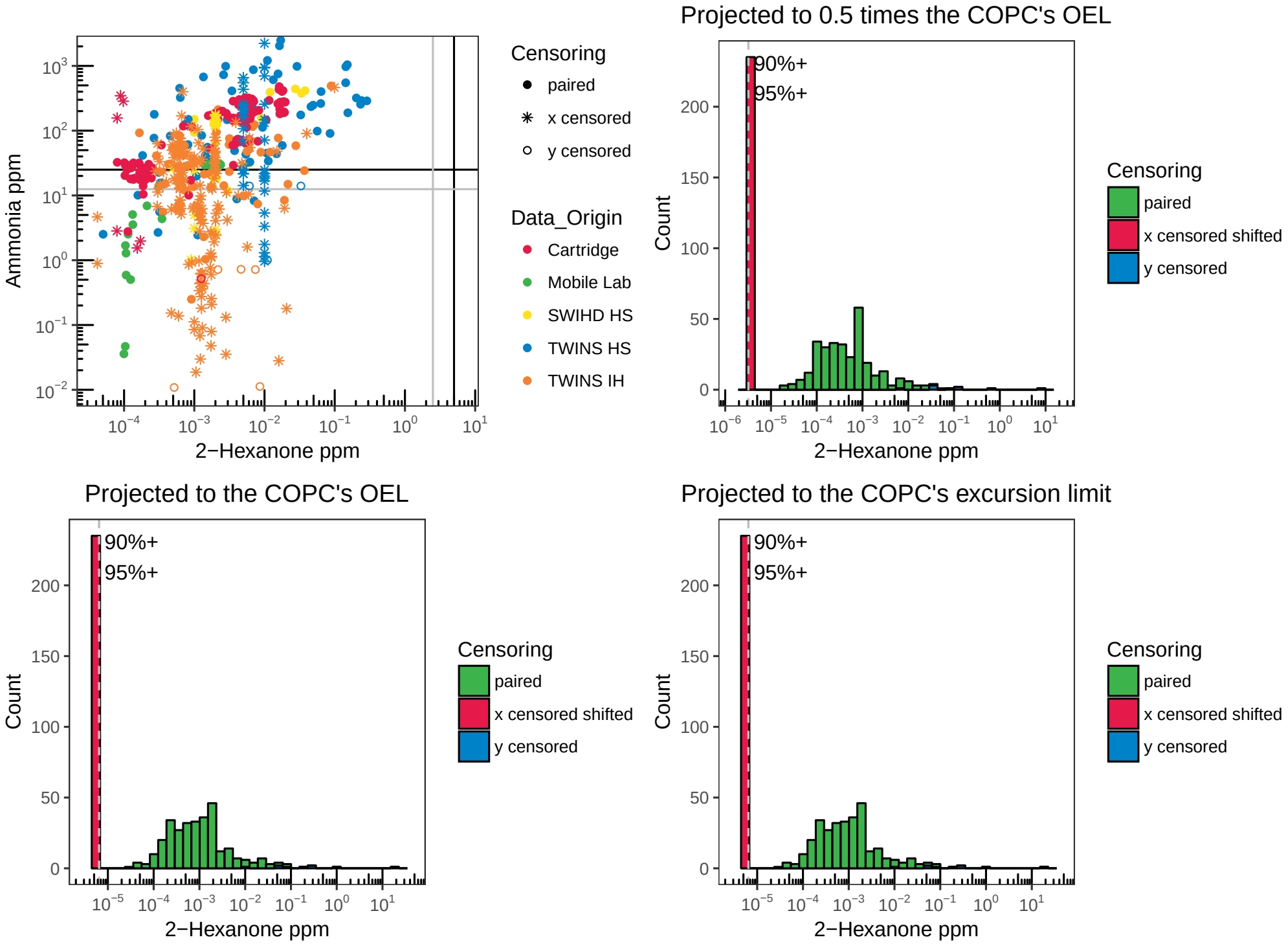


Figure C.450: Ammonia vs 2-Hexanone

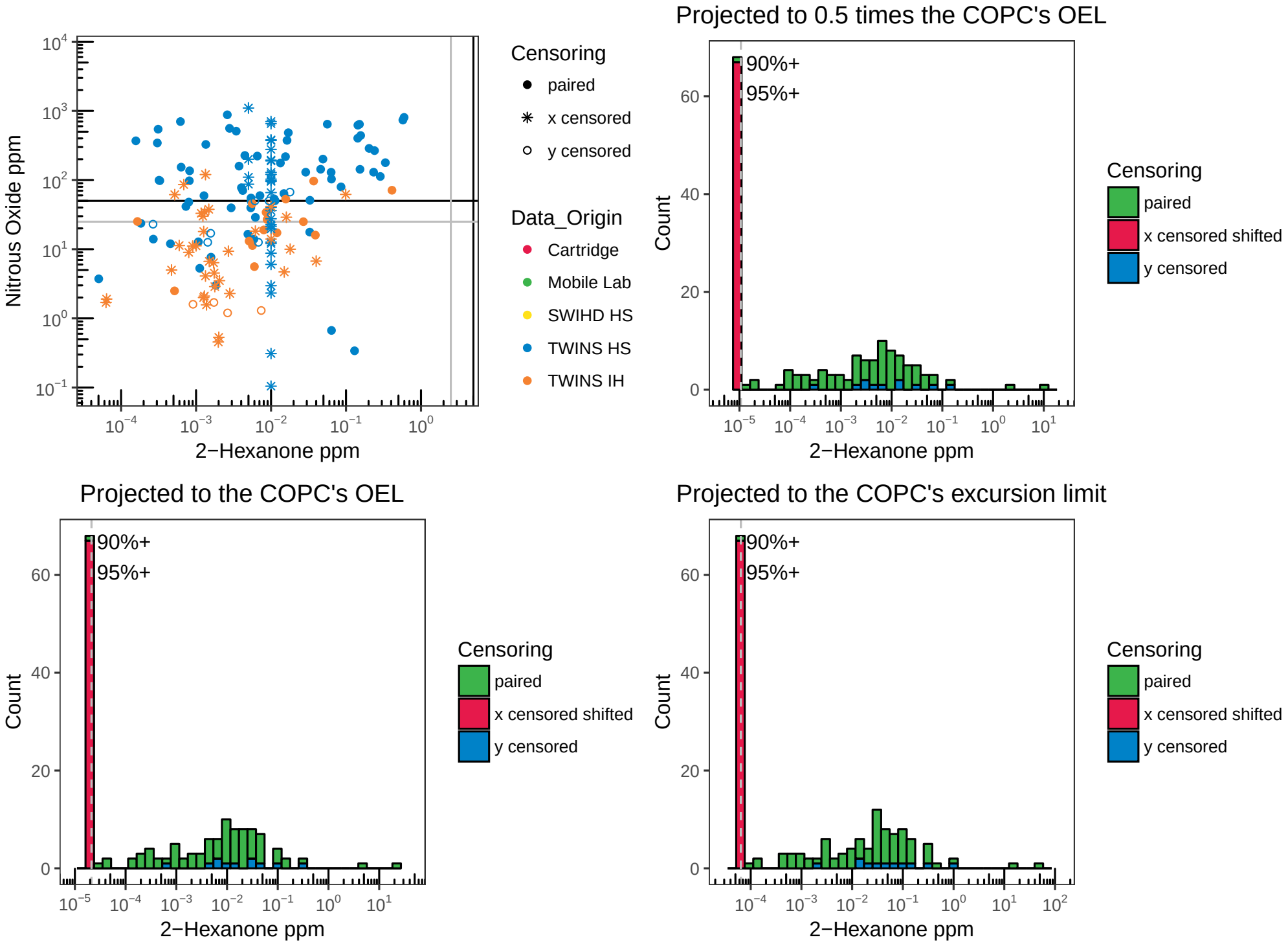


Figure C.451: Nitrous Oxide vs 2-Hexanone

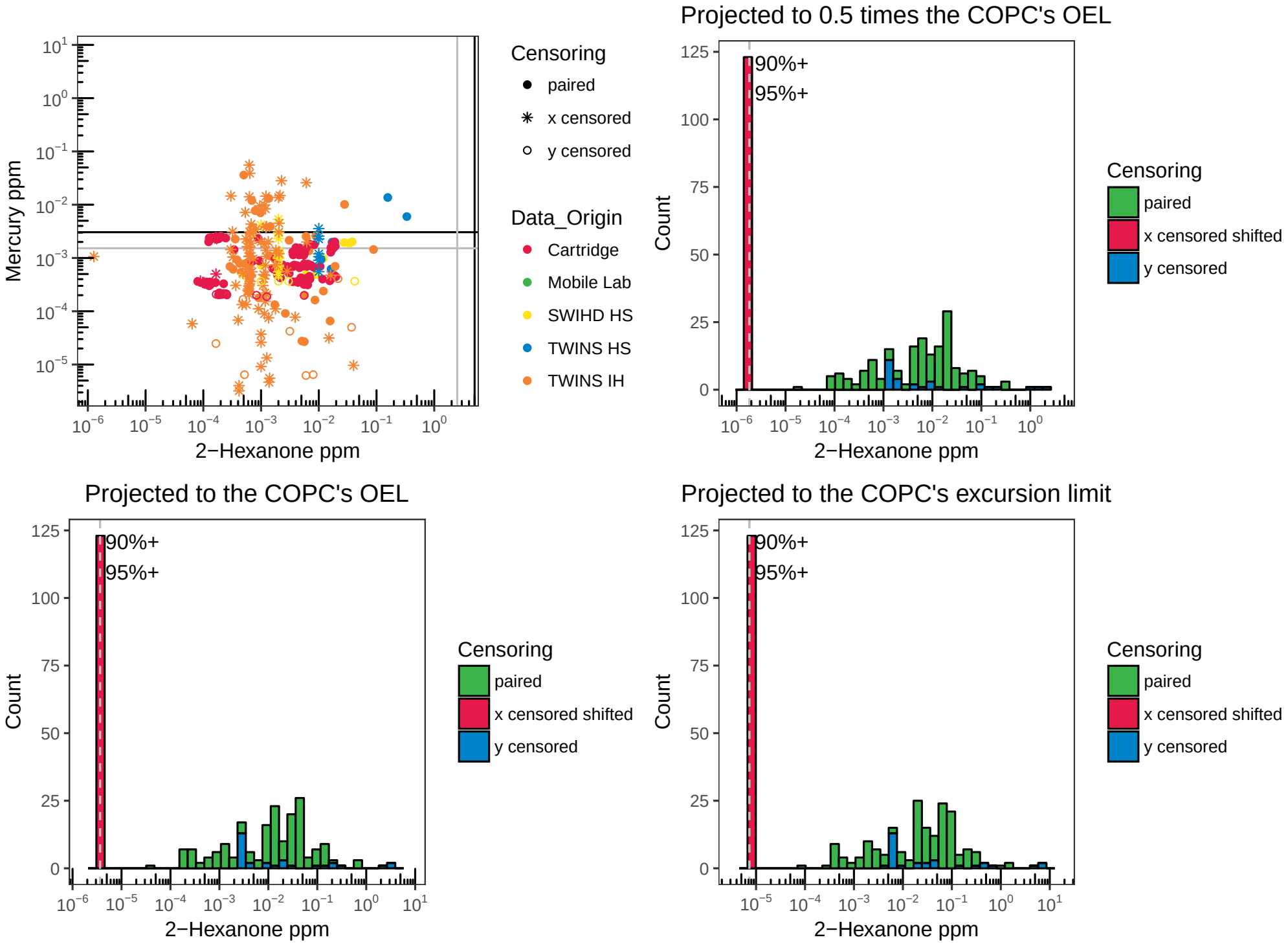


Figure C.452: Mercury vs 2-Hexanone

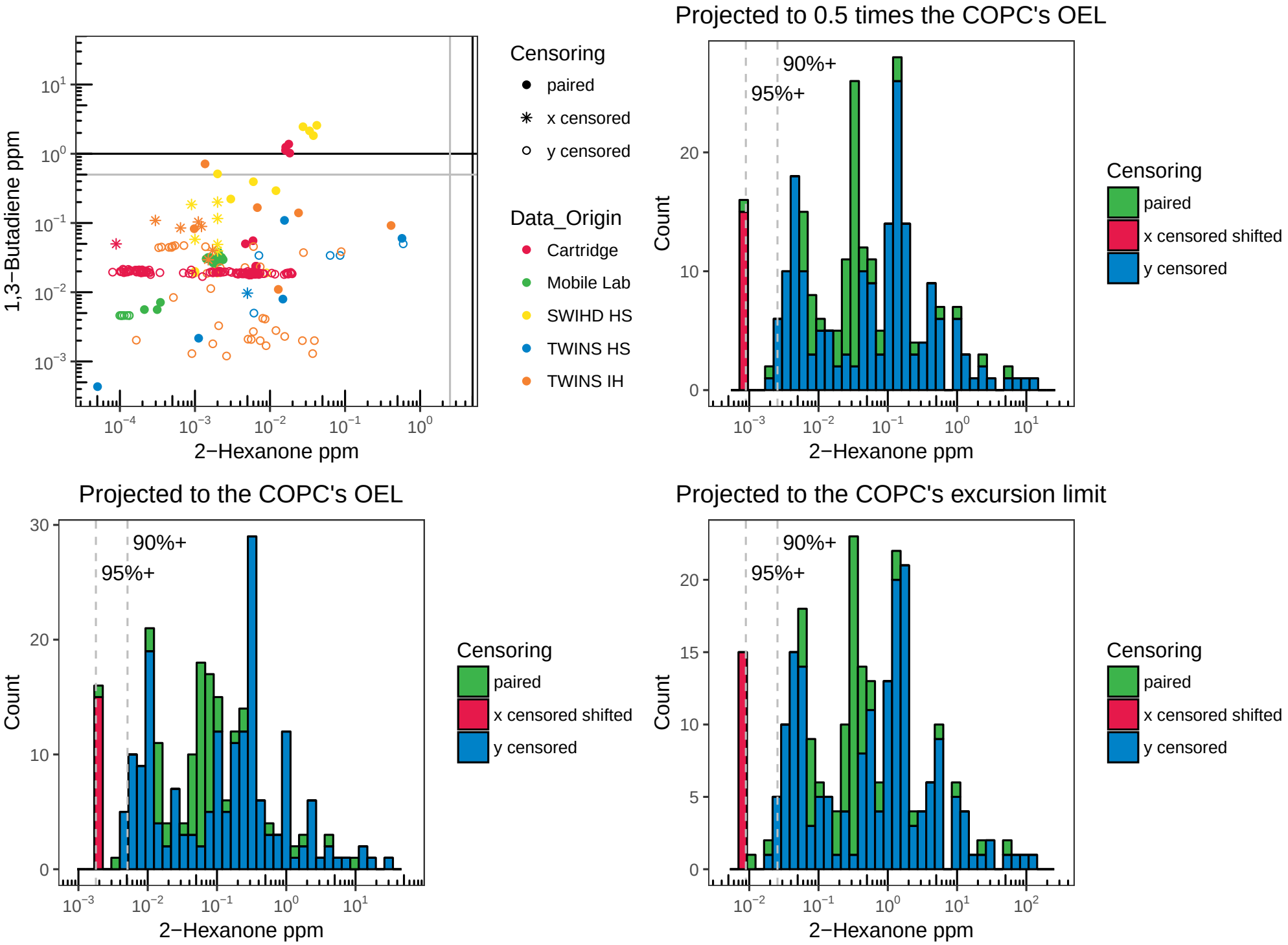


Figure C.453: 1,3-Butadiene vs 2-Hexanone

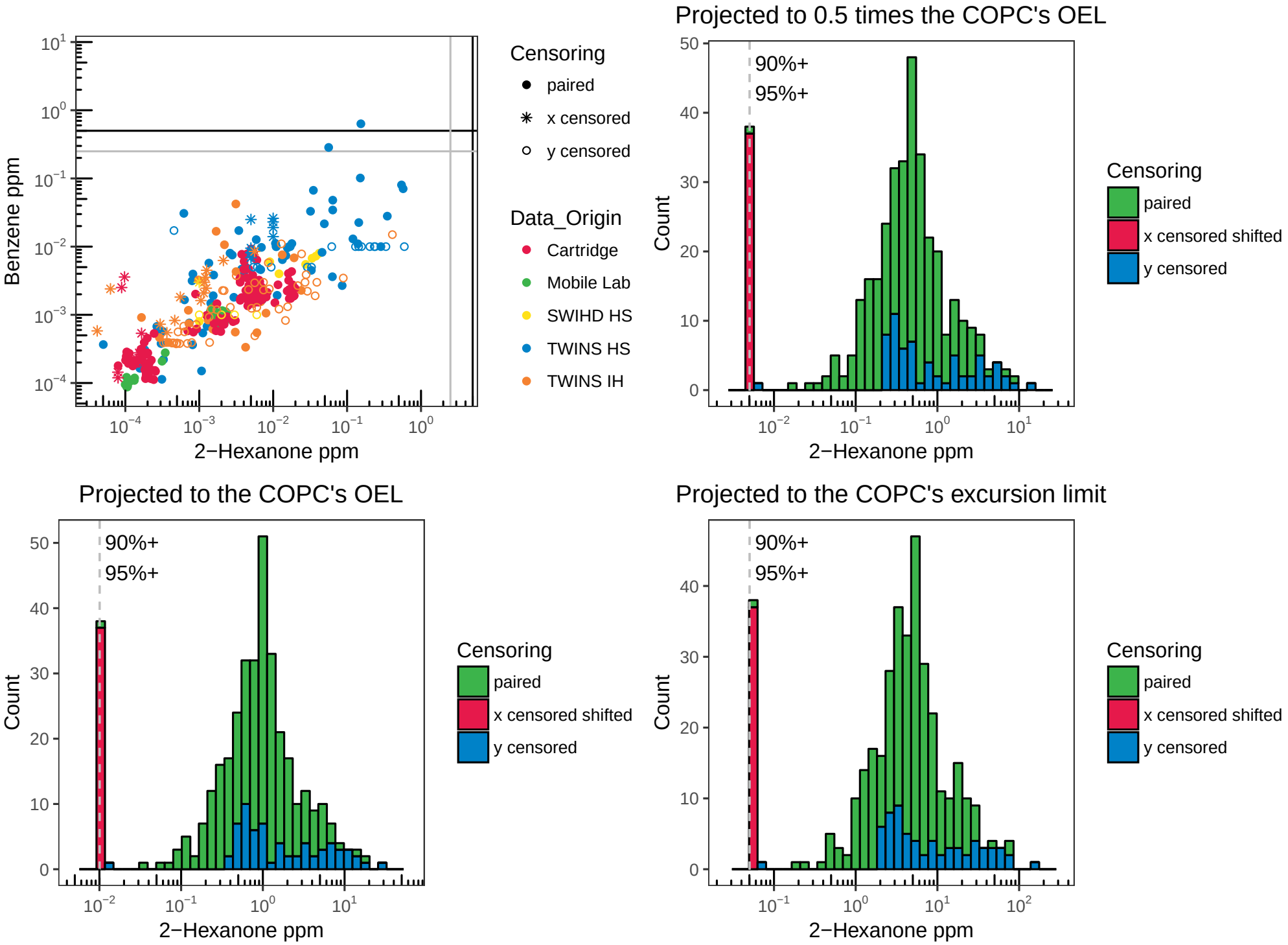


Figure C.454: Benzene vs 2-Hexanone

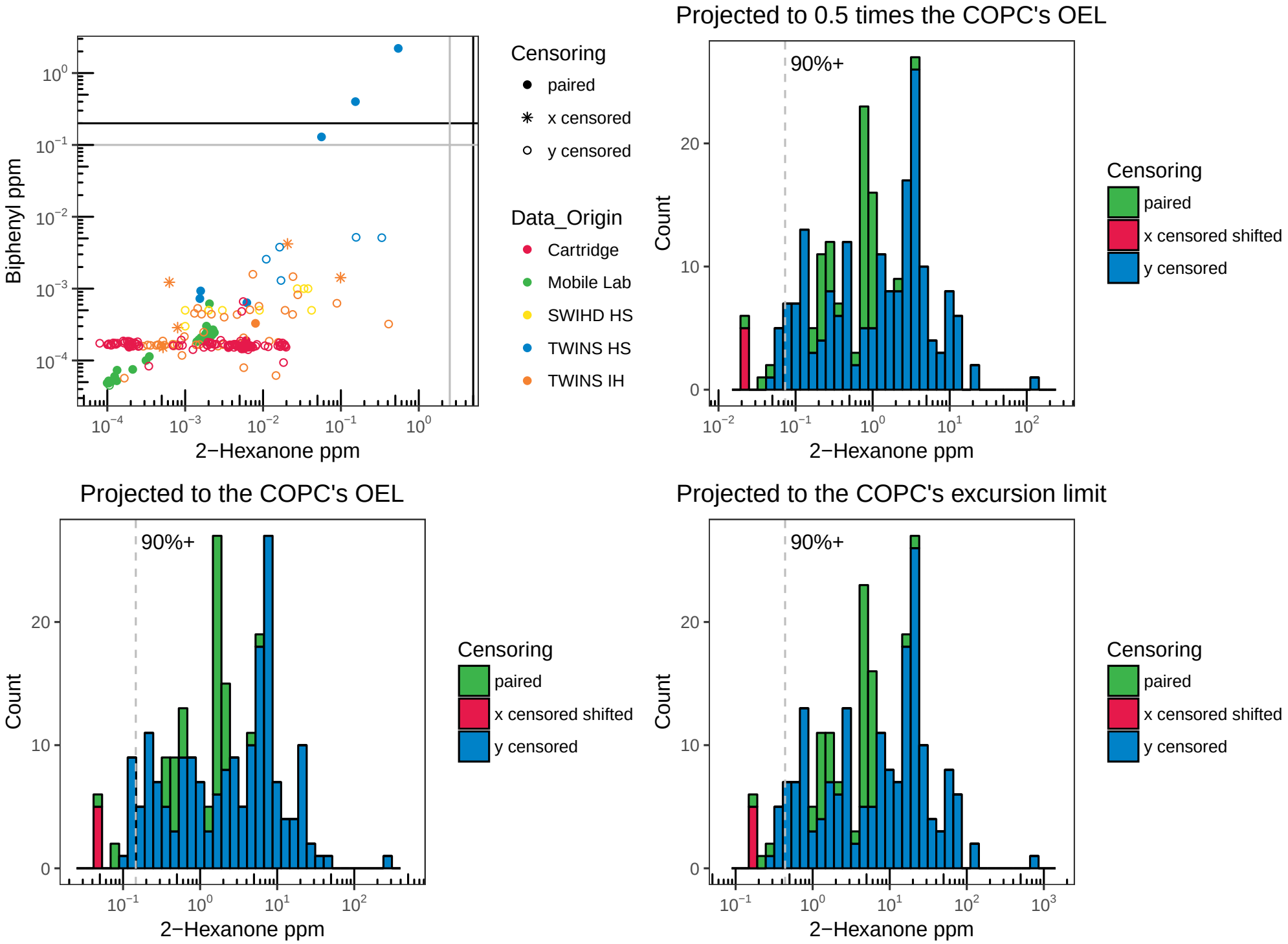


Figure C.455: Biphenyl vs 2-Hexanone

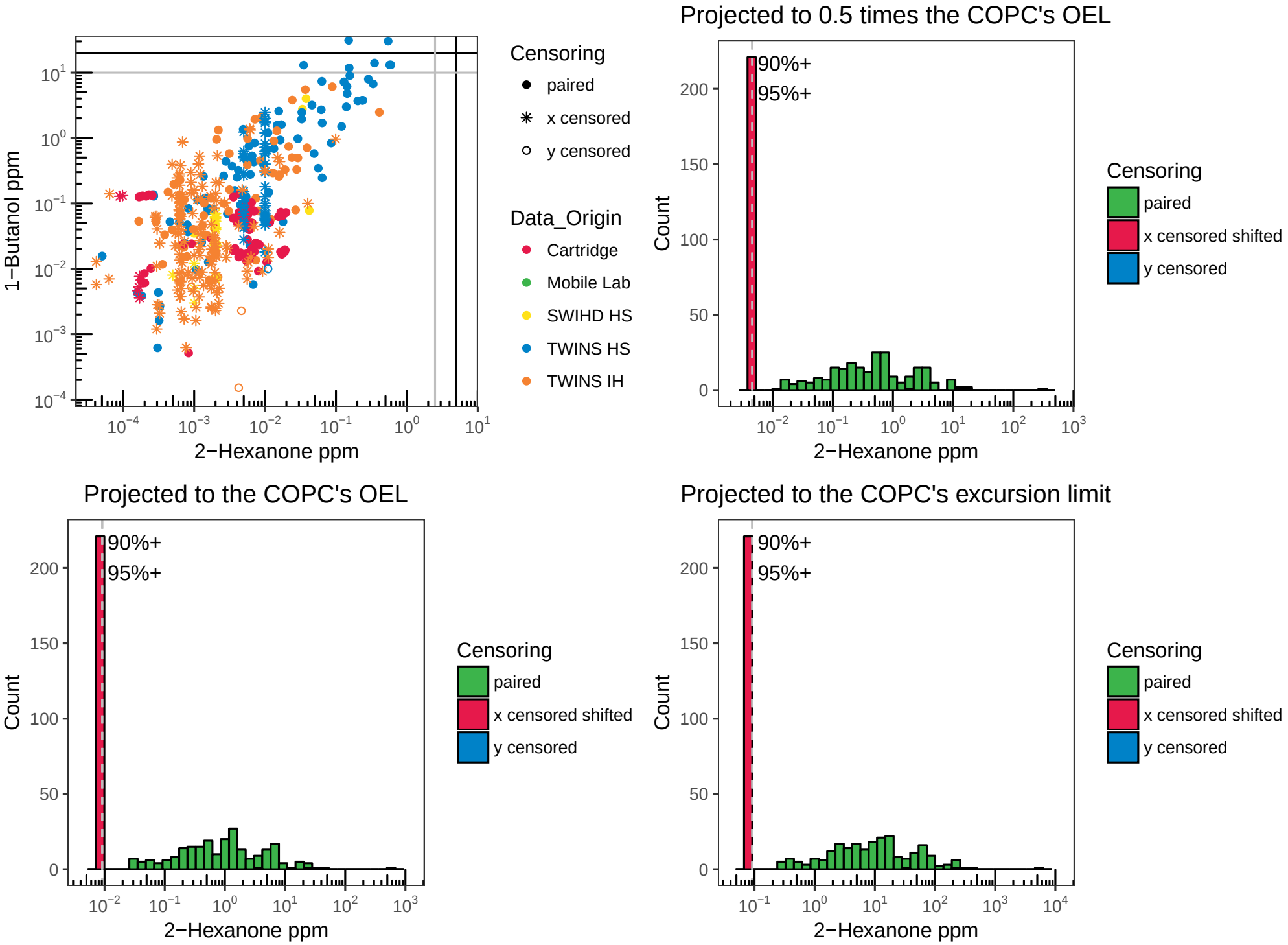


Figure C.456: 1-Butanol vs 2-Hexanone

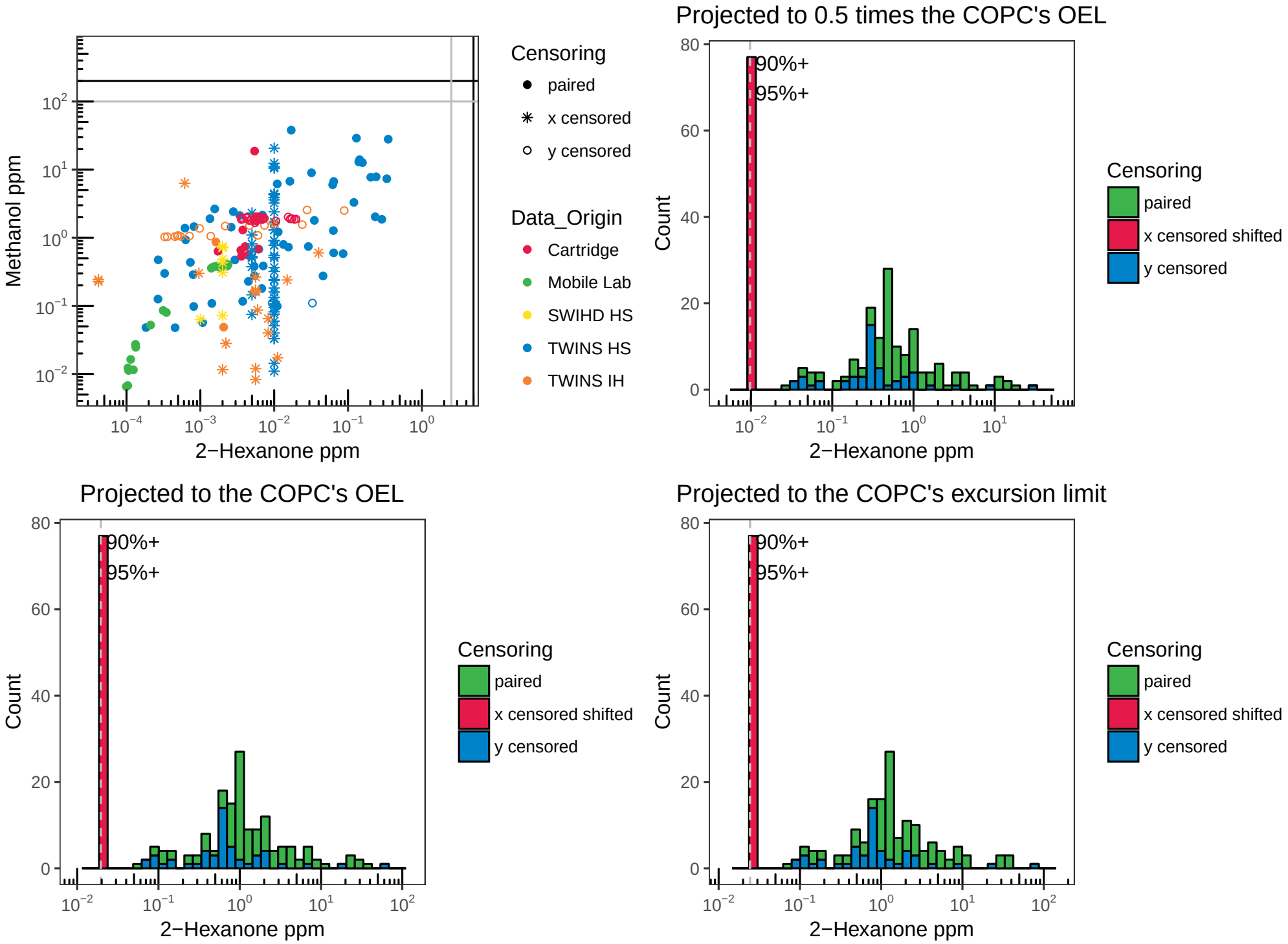


Figure C.457: Methanol vs 2-Hexanone

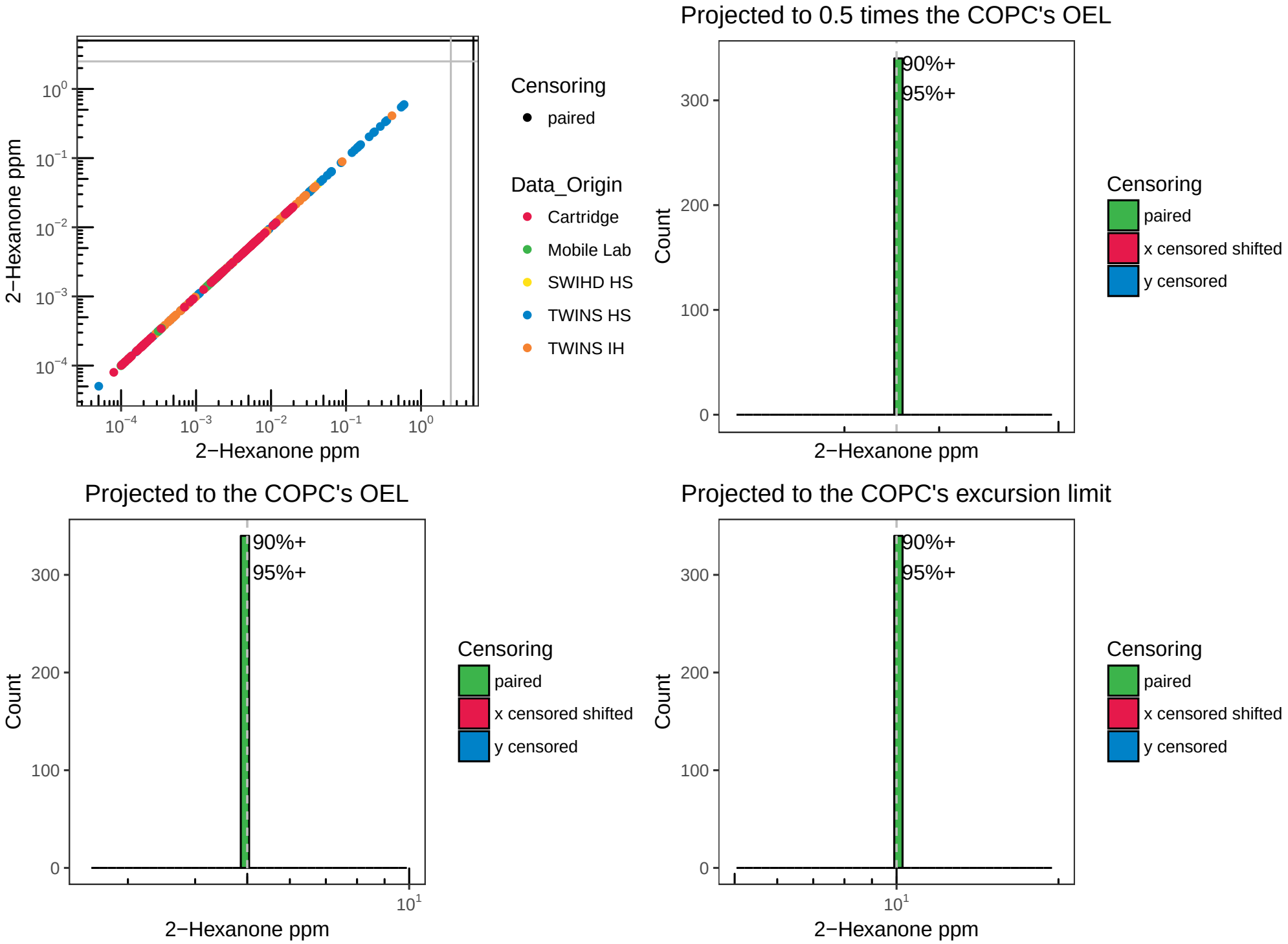


Figure C.458: 2-Hexanone vs 2-Hexanone

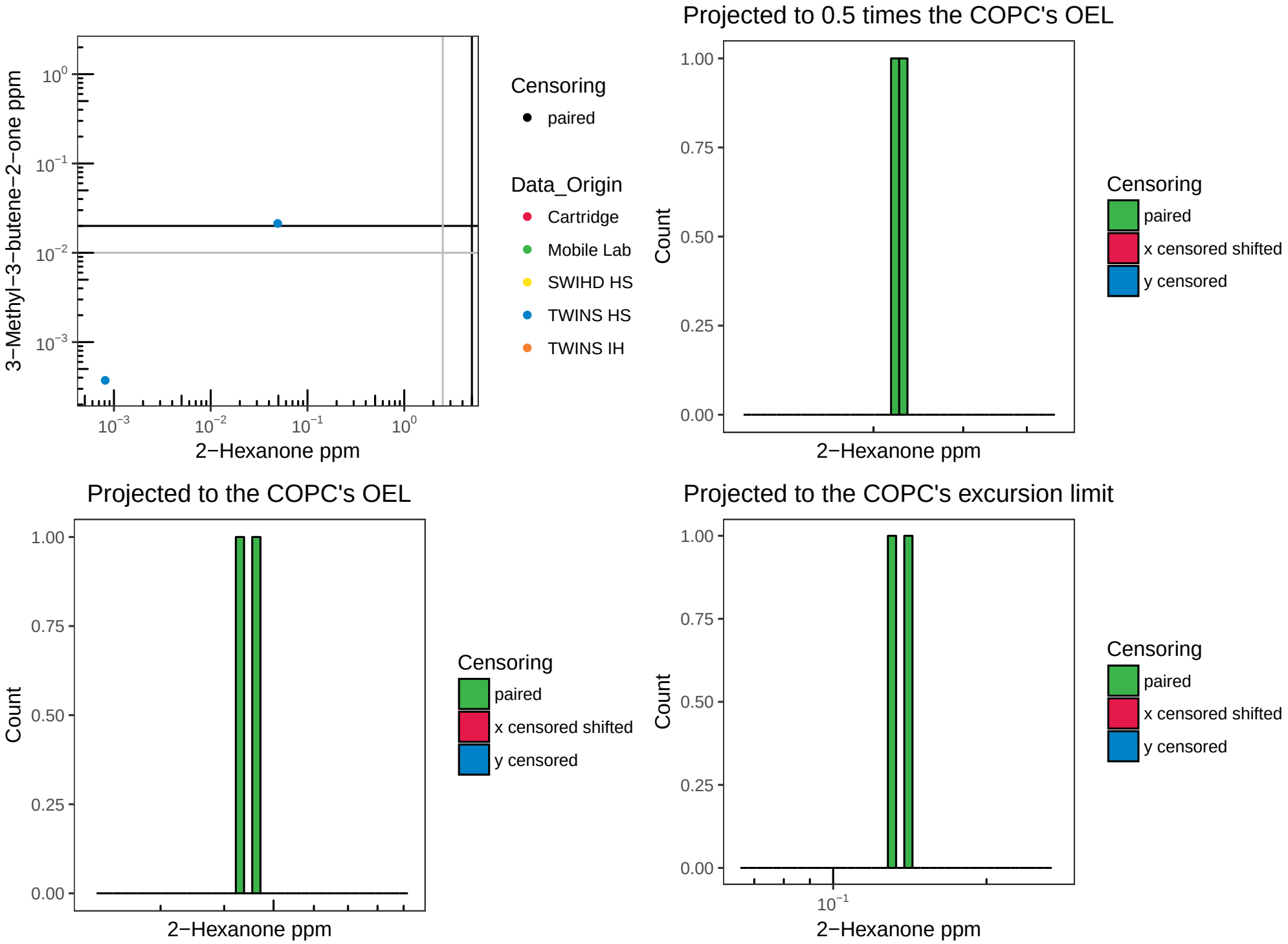


Figure C.459: 3-Methyl-3-butene-2-one vs 2-Hexanone

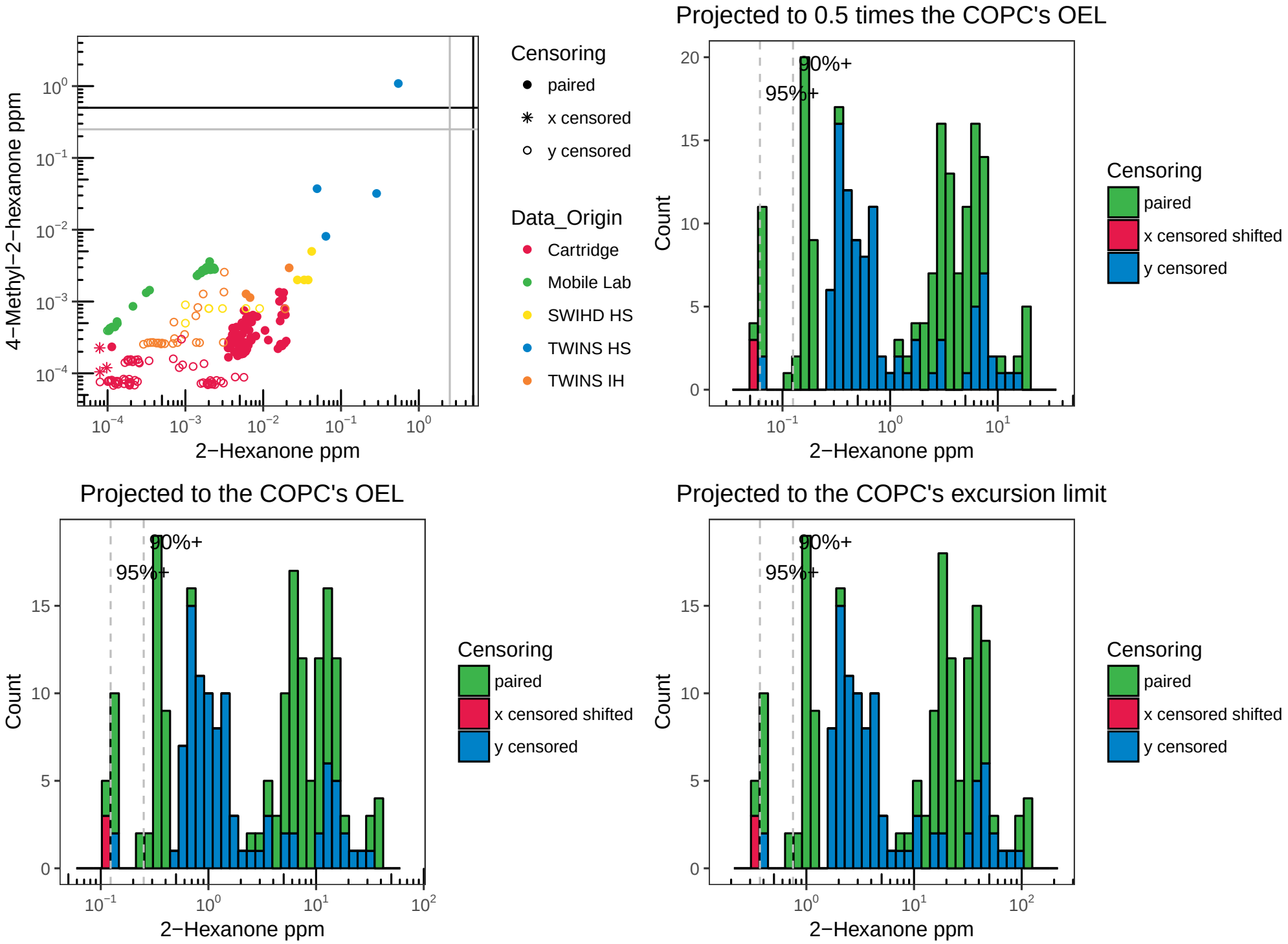


Figure C.460: 4-Methyl-2-hexanone vs 2-Hexanone

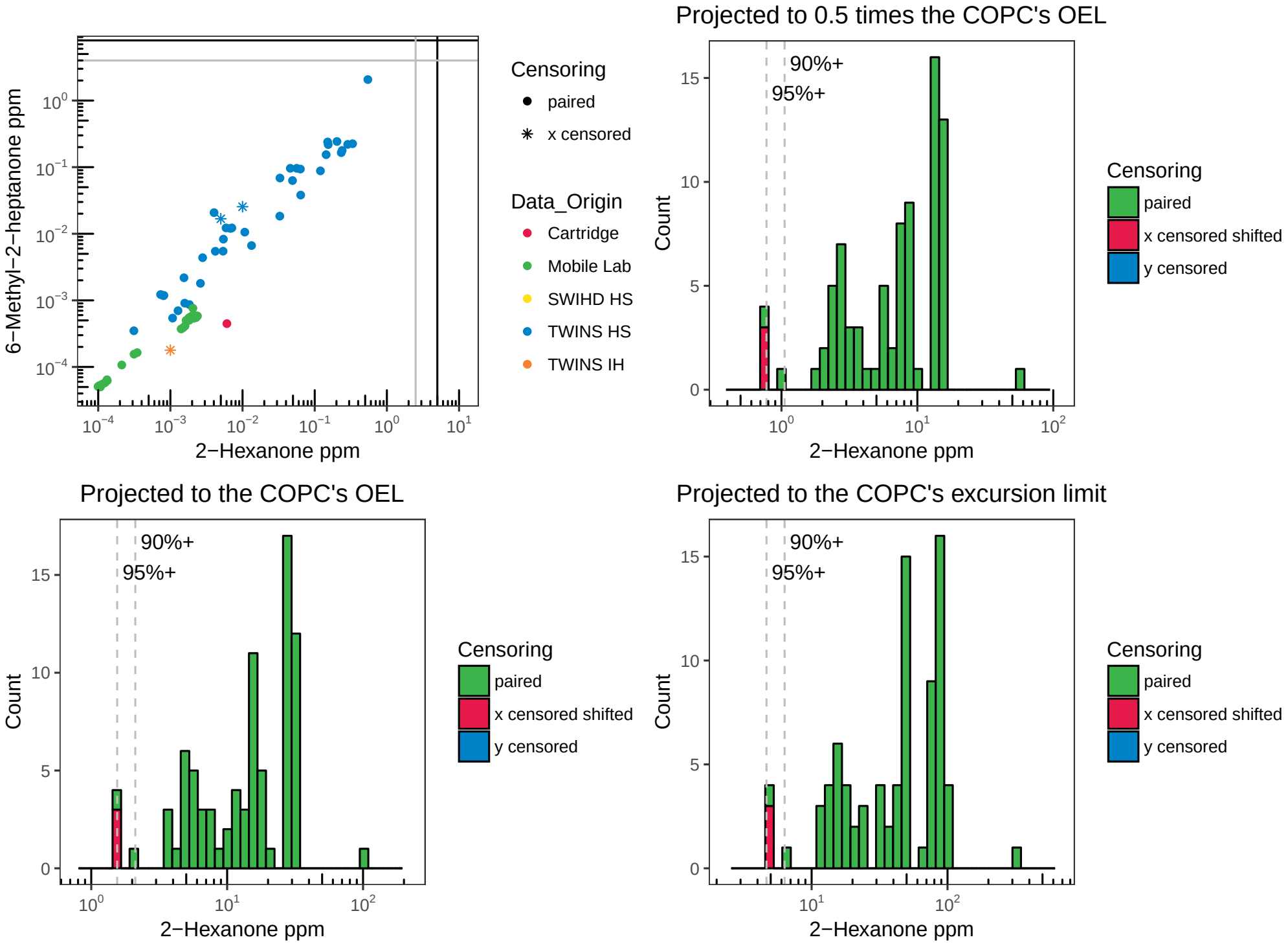


Figure C.461: 6-Methyl-2-heptanone vs 2-Hexanone

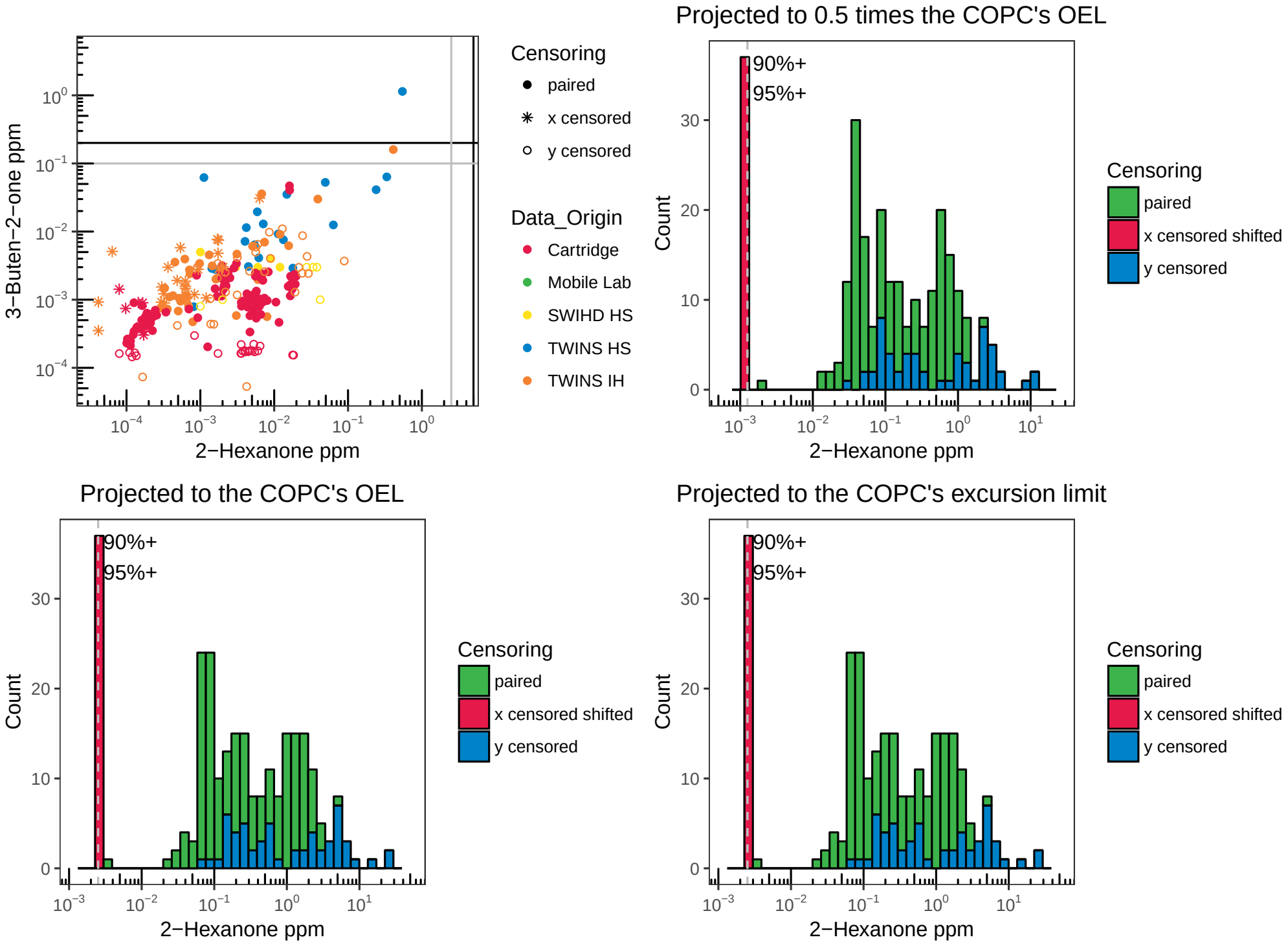


Figure C.462: 3-Buten-2-one vs 2-Hexanone

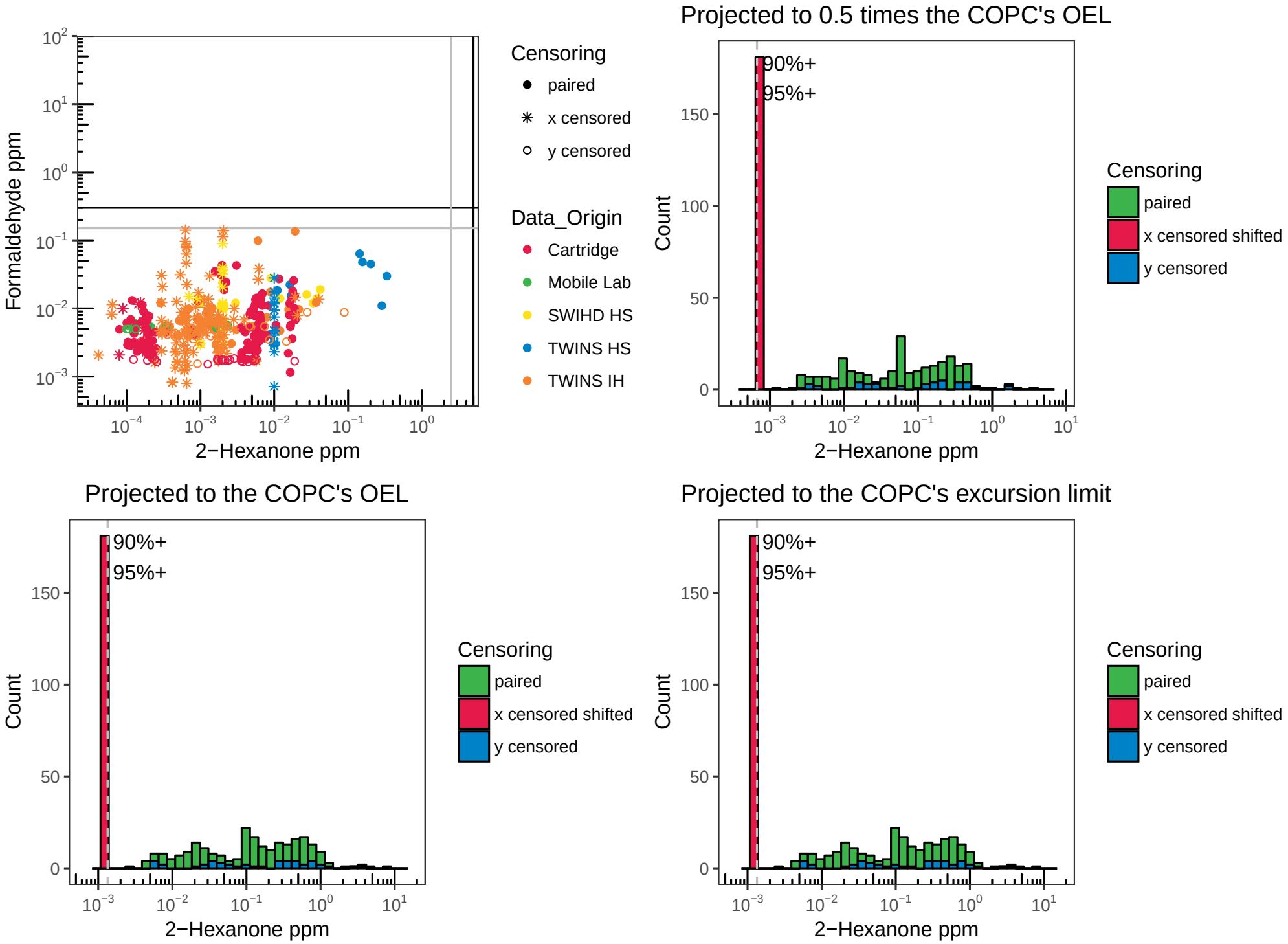


Figure C.463: Formaldehyde vs 2-Hexanone

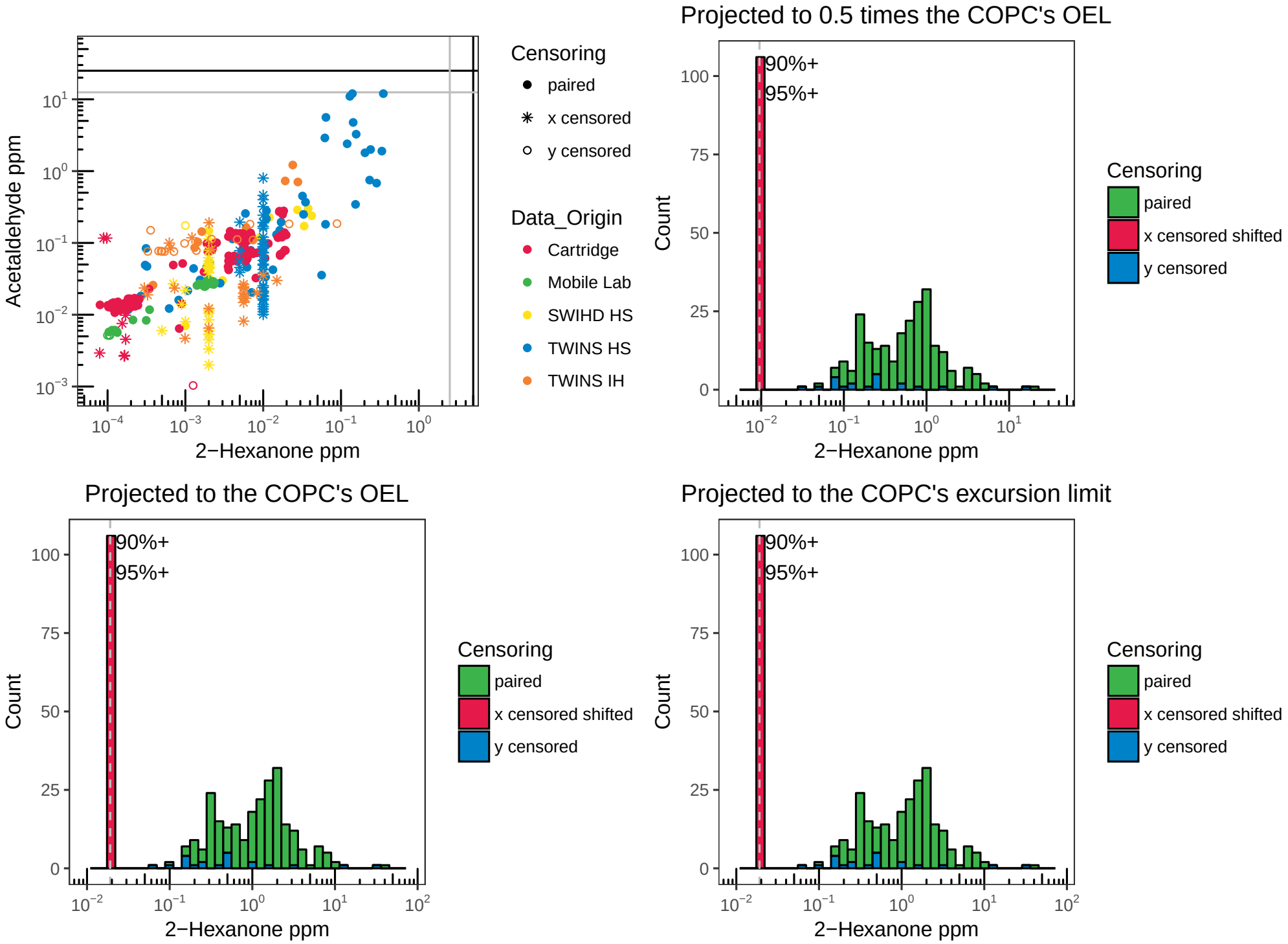


Figure C.464: Acetaldehyde vs 2-Hexanone

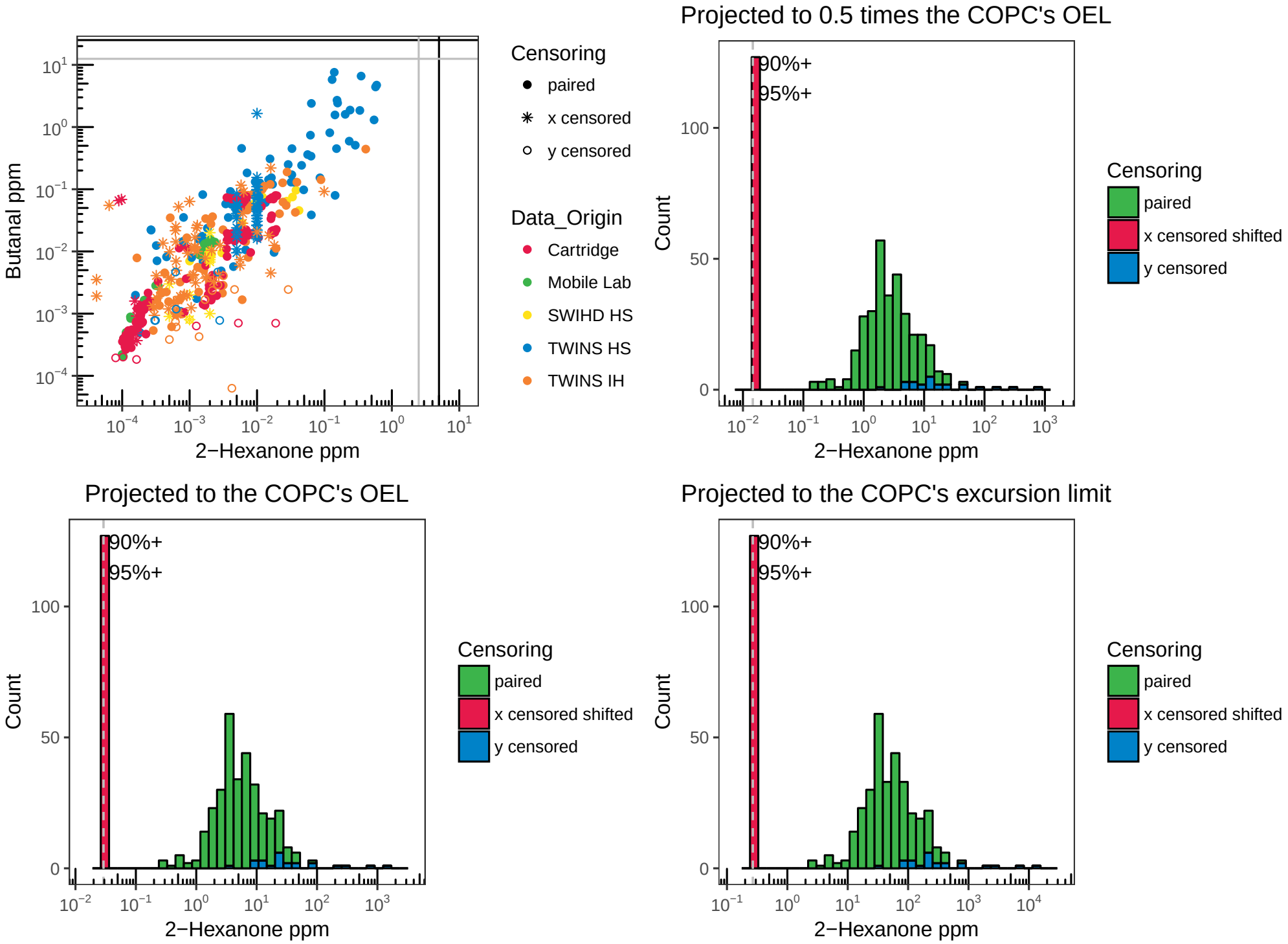


Figure C.465: Butanal vs 2-Hexanone

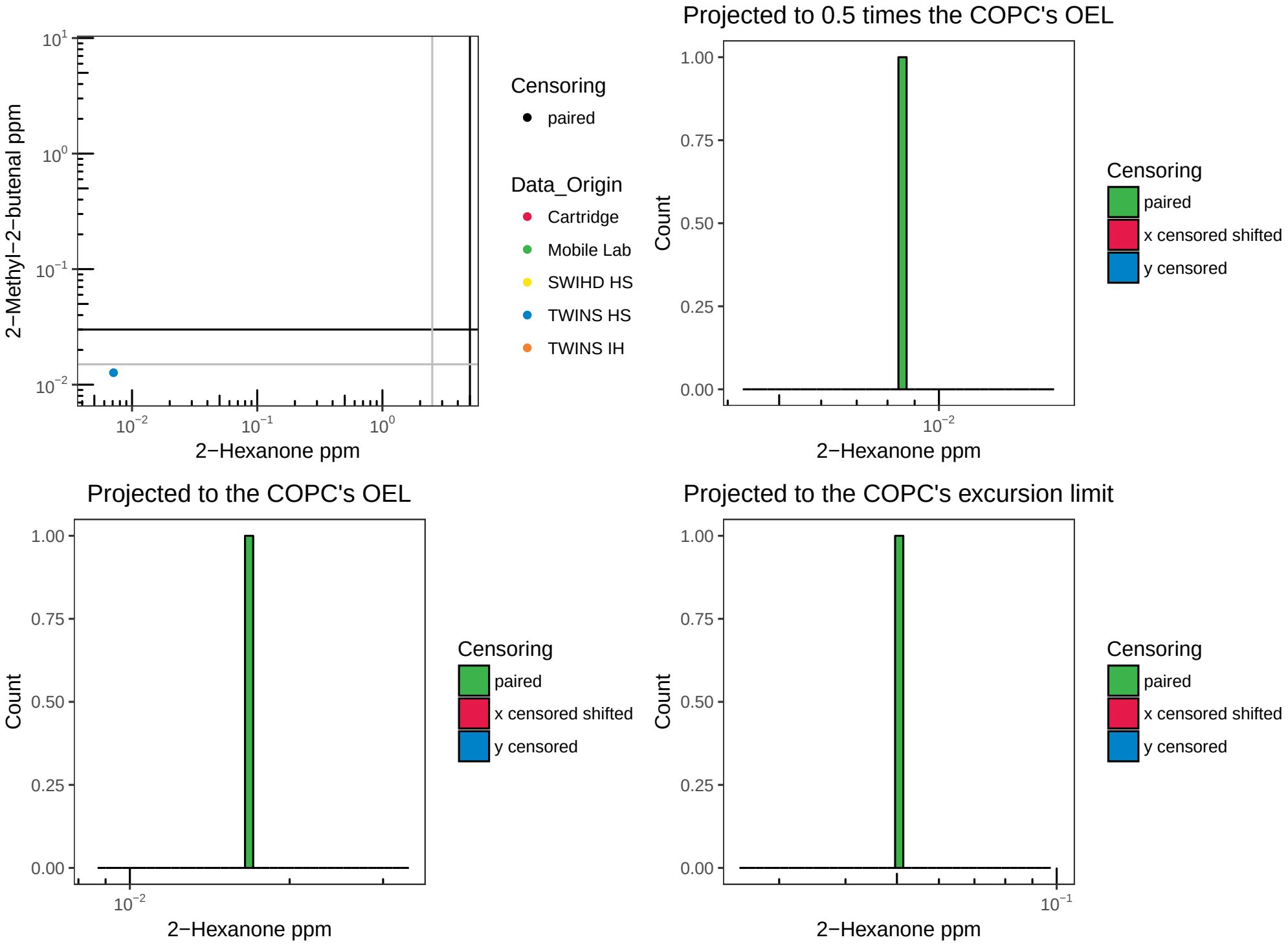


Figure C.466: 2-Methyl-2-butenal vs 2-Hexanone

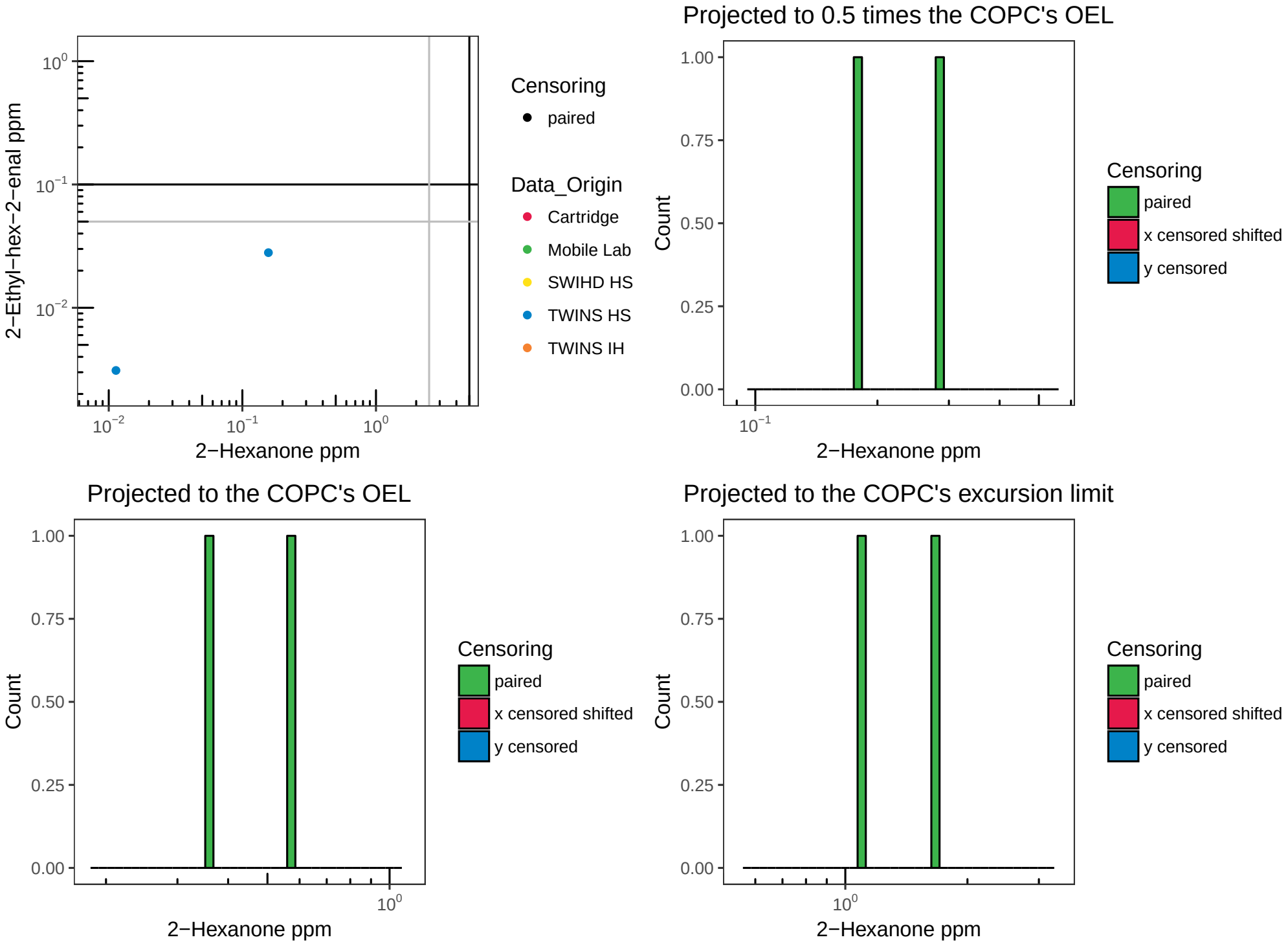


Figure C.467: 2-Ethyl-hex-2-enal vs 2-Hexanone

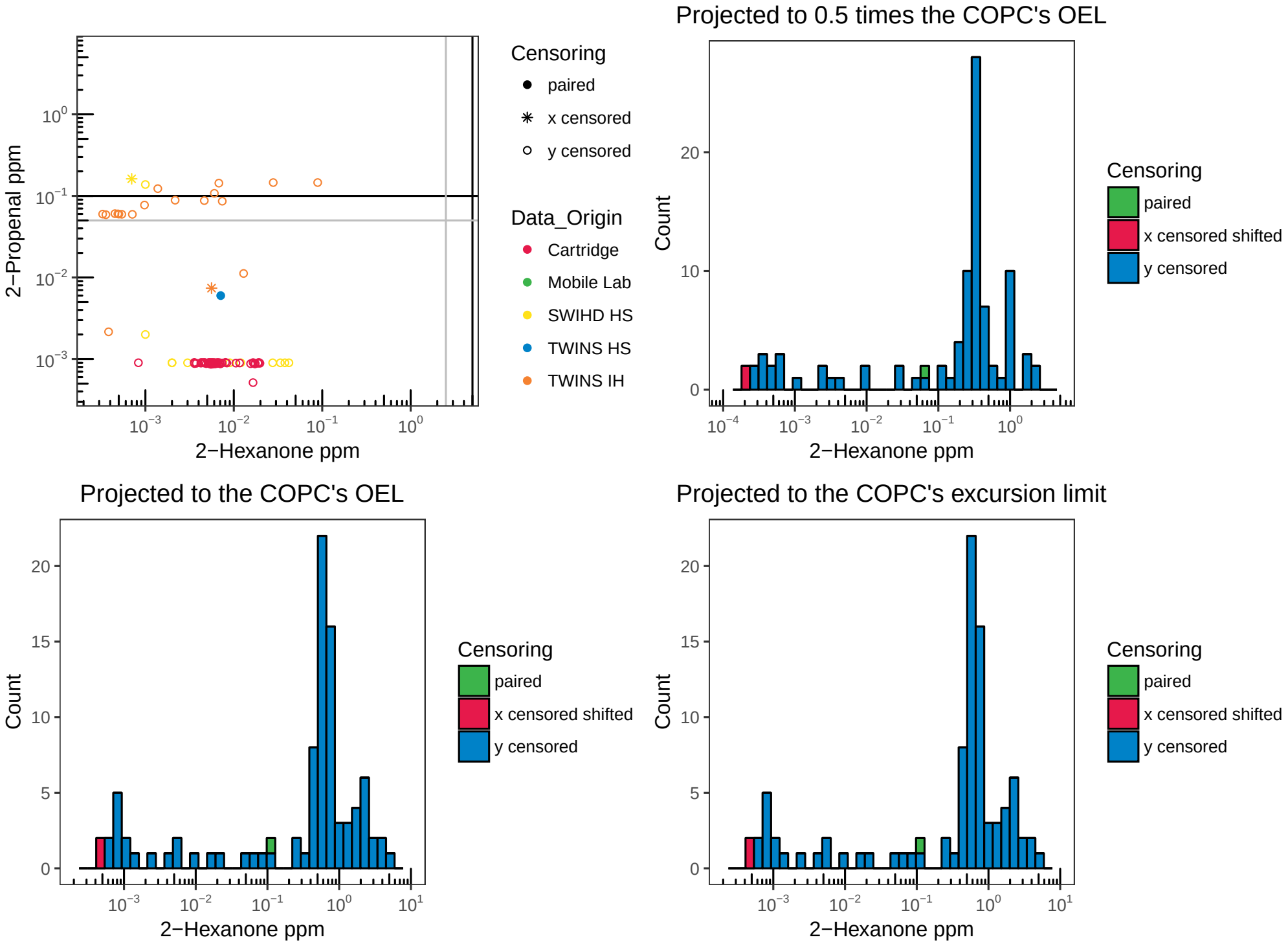


Figure C.468: 2-Propenal vs 2-Hexanone

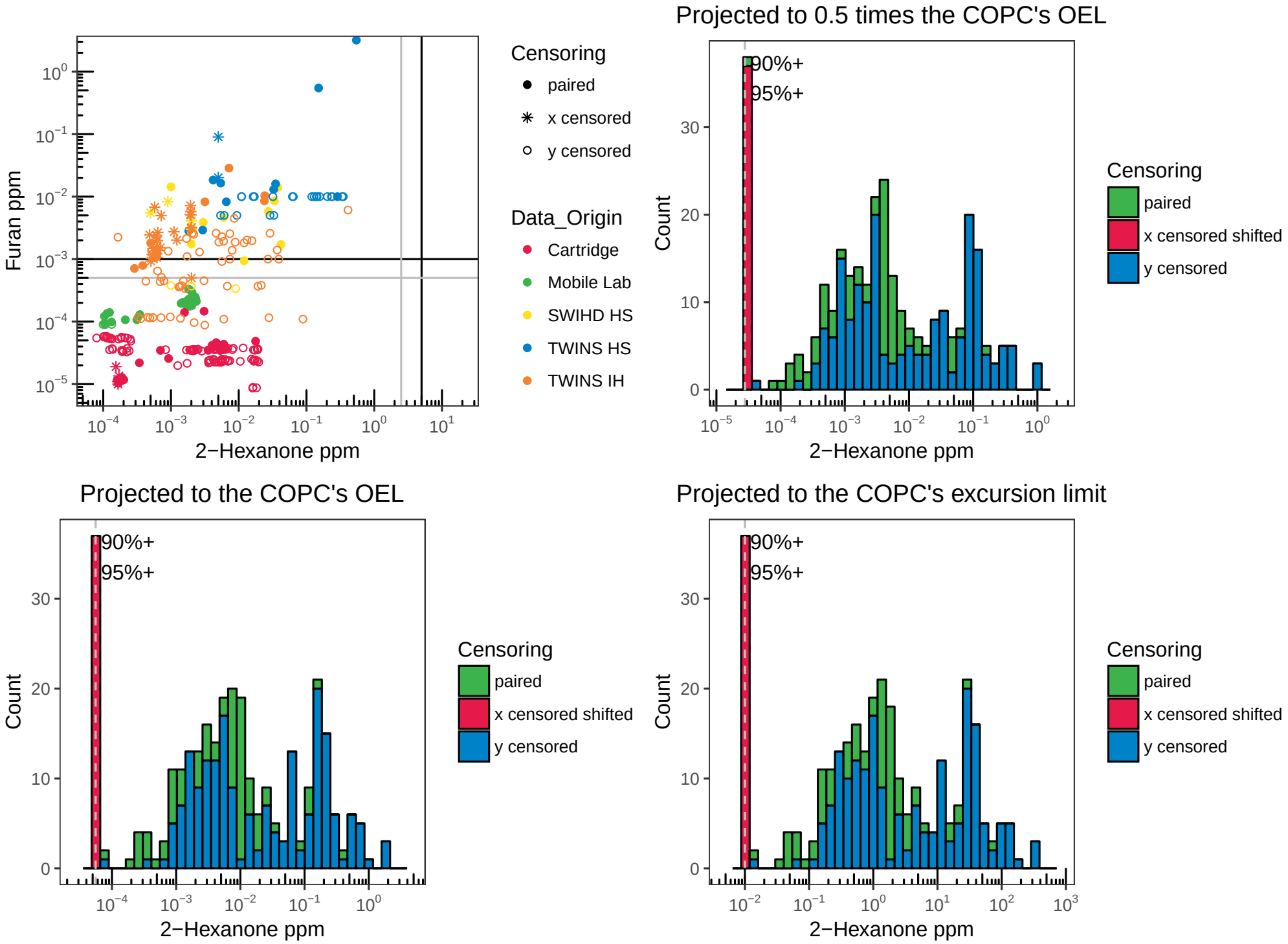


Figure C.469: Furan vs 2-Hexanone

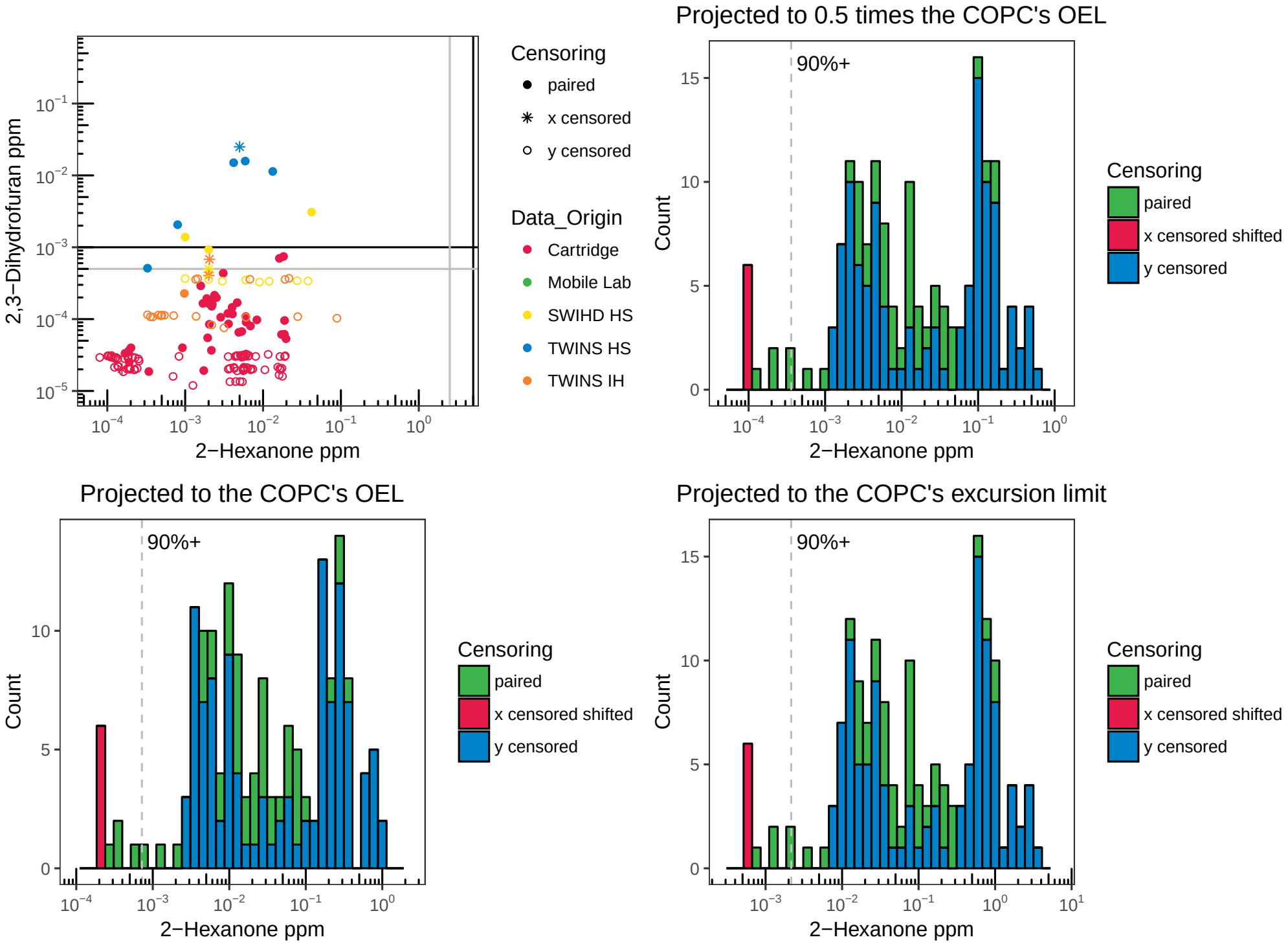


Figure C.470: 2,3-Dihydrofuran vs 2-Hexanone

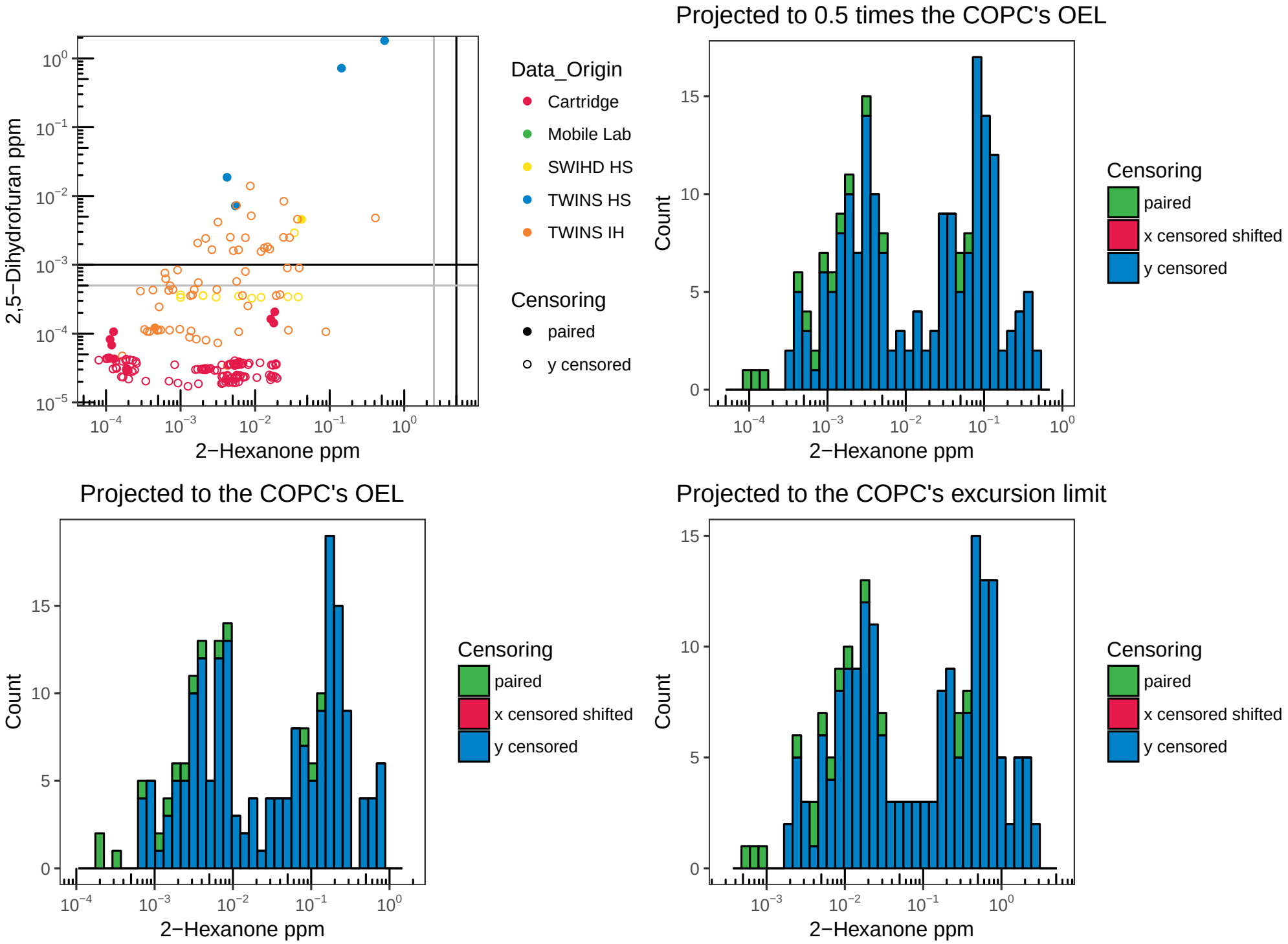


Figure C.471: 2,5-Dihydrofuran vs 2-Hexanone

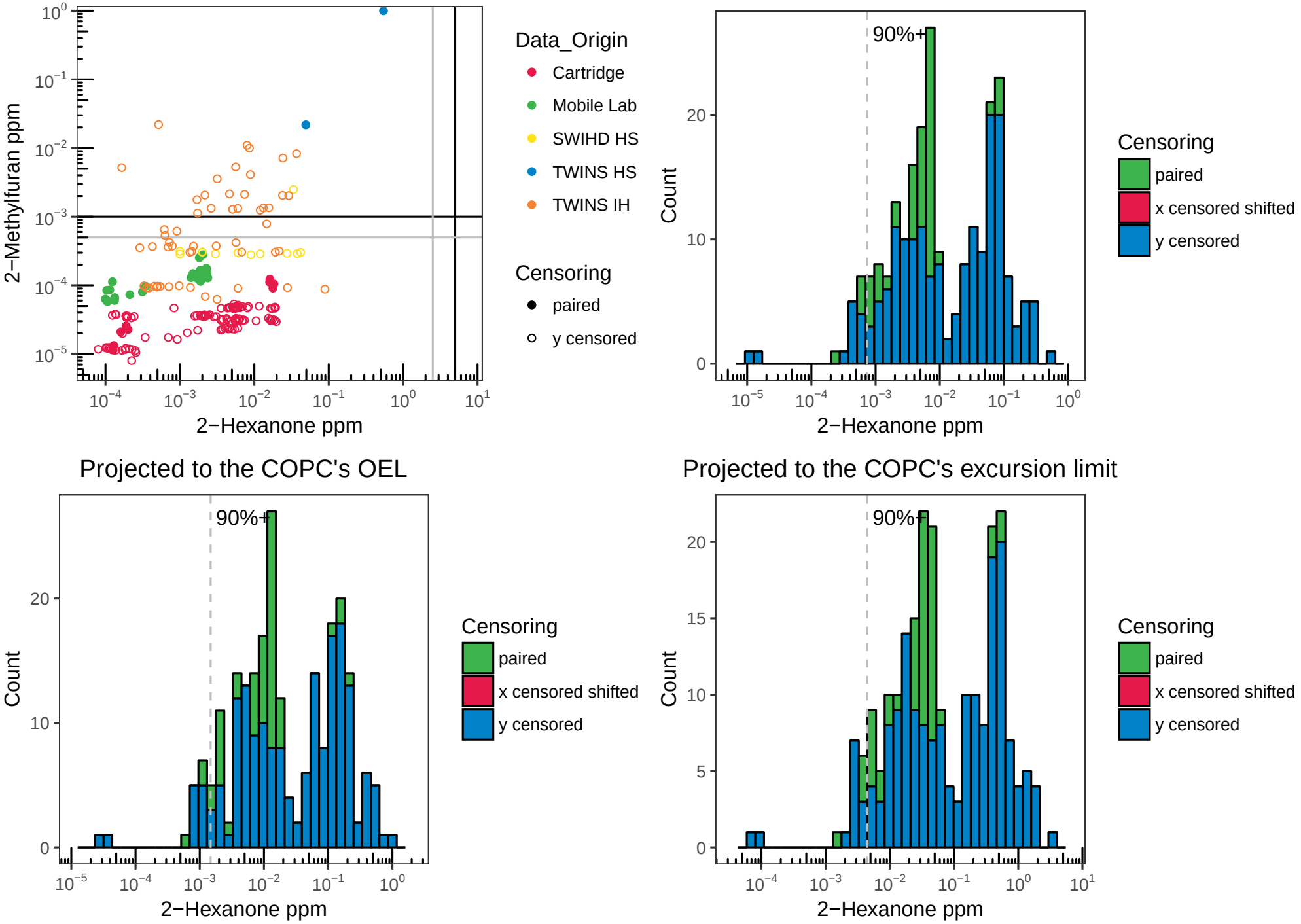


Figure C.472: 2-Methylfuran vs 2-Hexanone

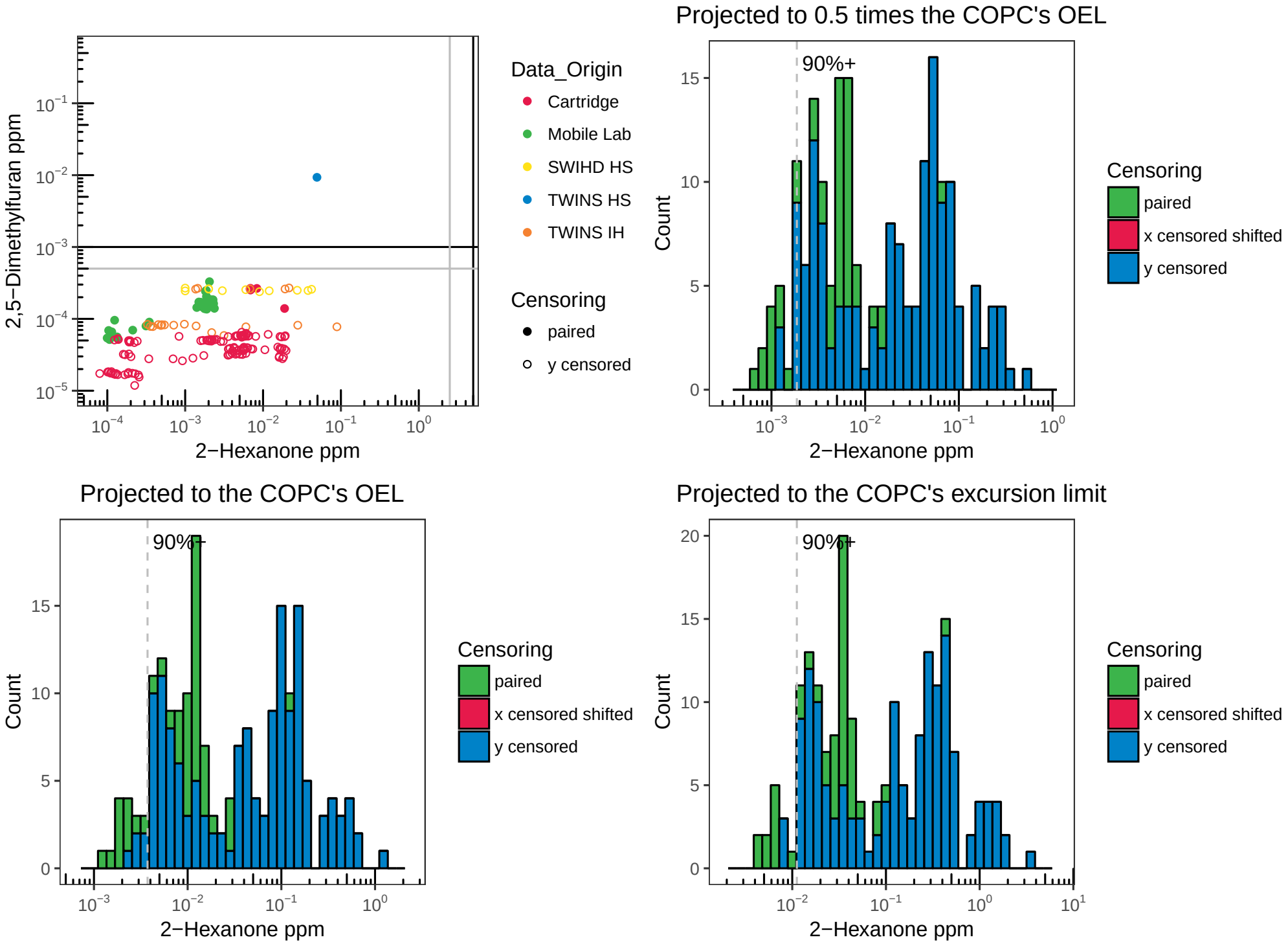


Figure C.473: 2,5-Dimethylfuran vs 2-Hexanone

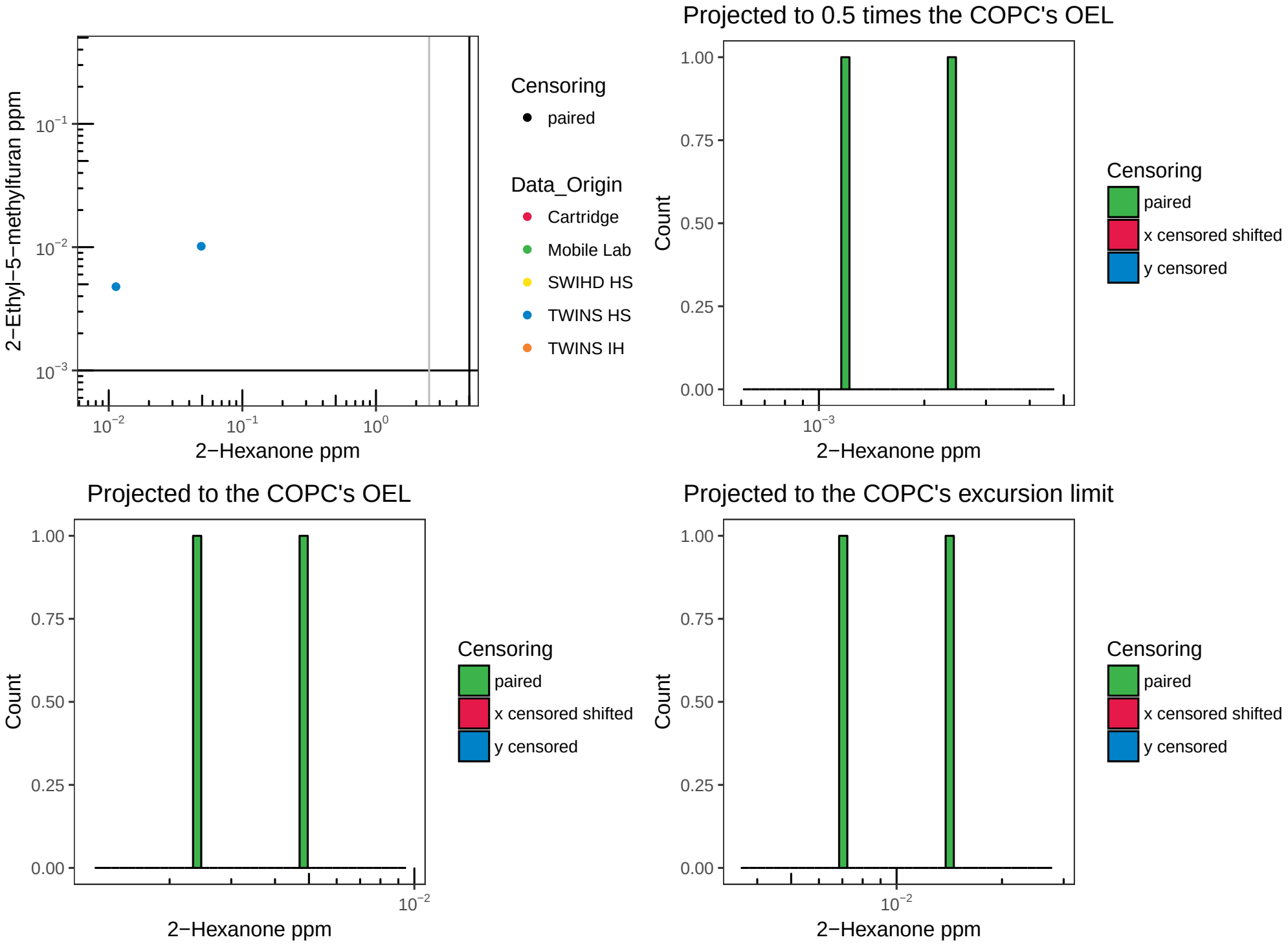


Figure C.474: 2-Ethyl-5-methylfuran vs 2-Hexanone

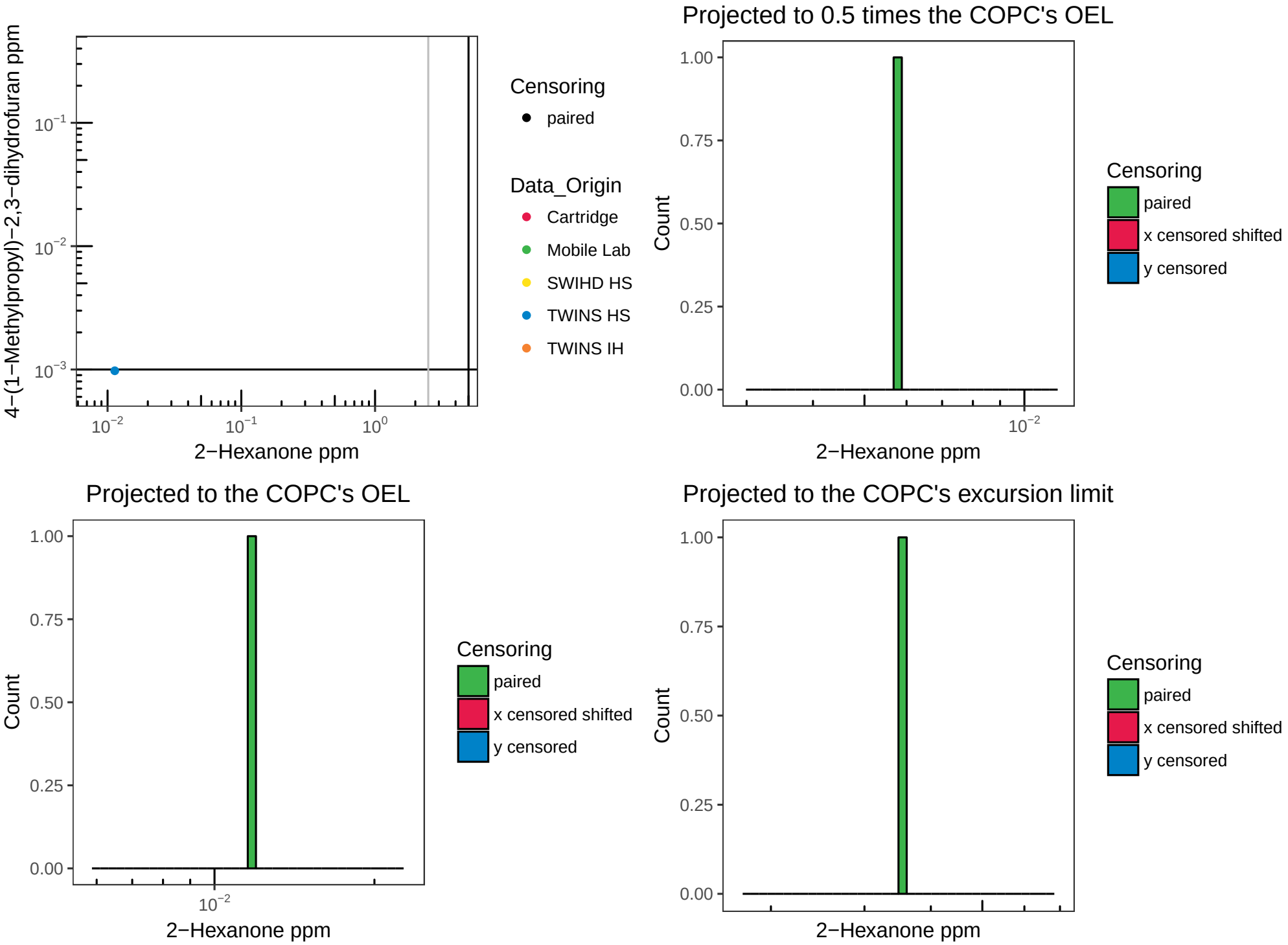


Figure C.475: 4-(1-Methylpropyl)-2,3-dihydrofuran vs 2-Hexanone

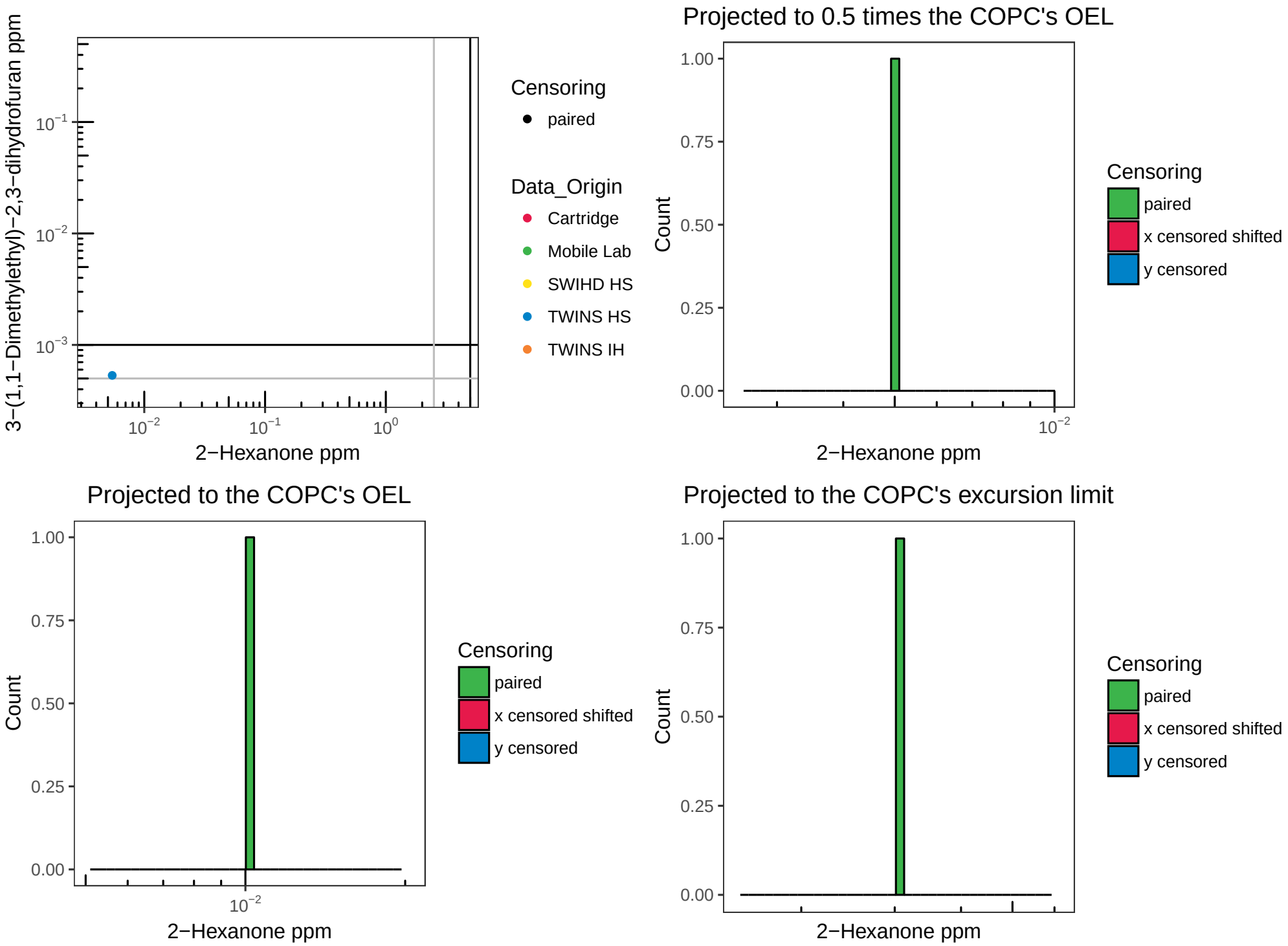


Figure C.476: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs 2-Hexanone

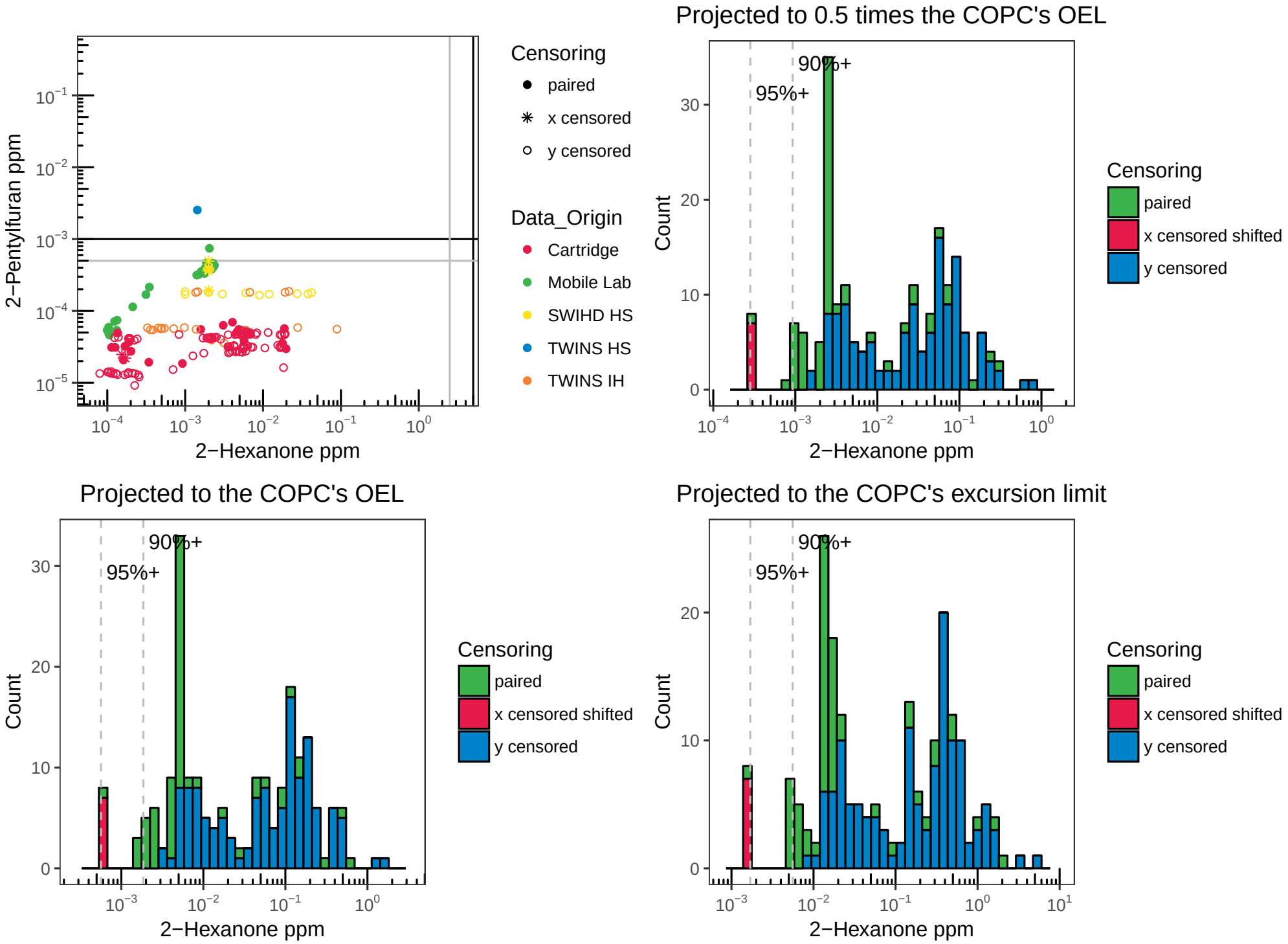


Figure C.477: 2-Pentylfuran vs 2-Hexanone

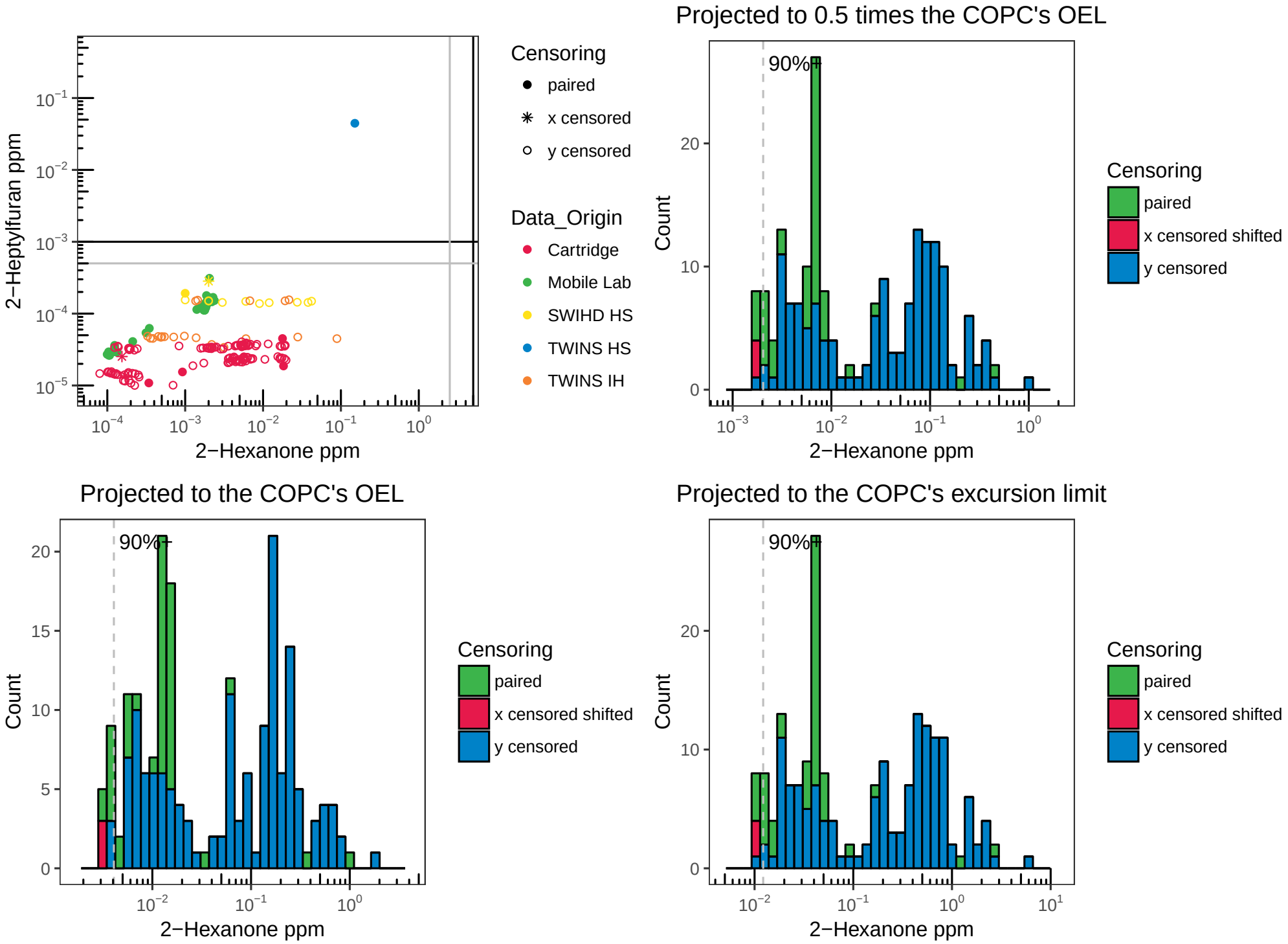


Figure C.478: 2-Heptylfuran vs 2-Hexanone

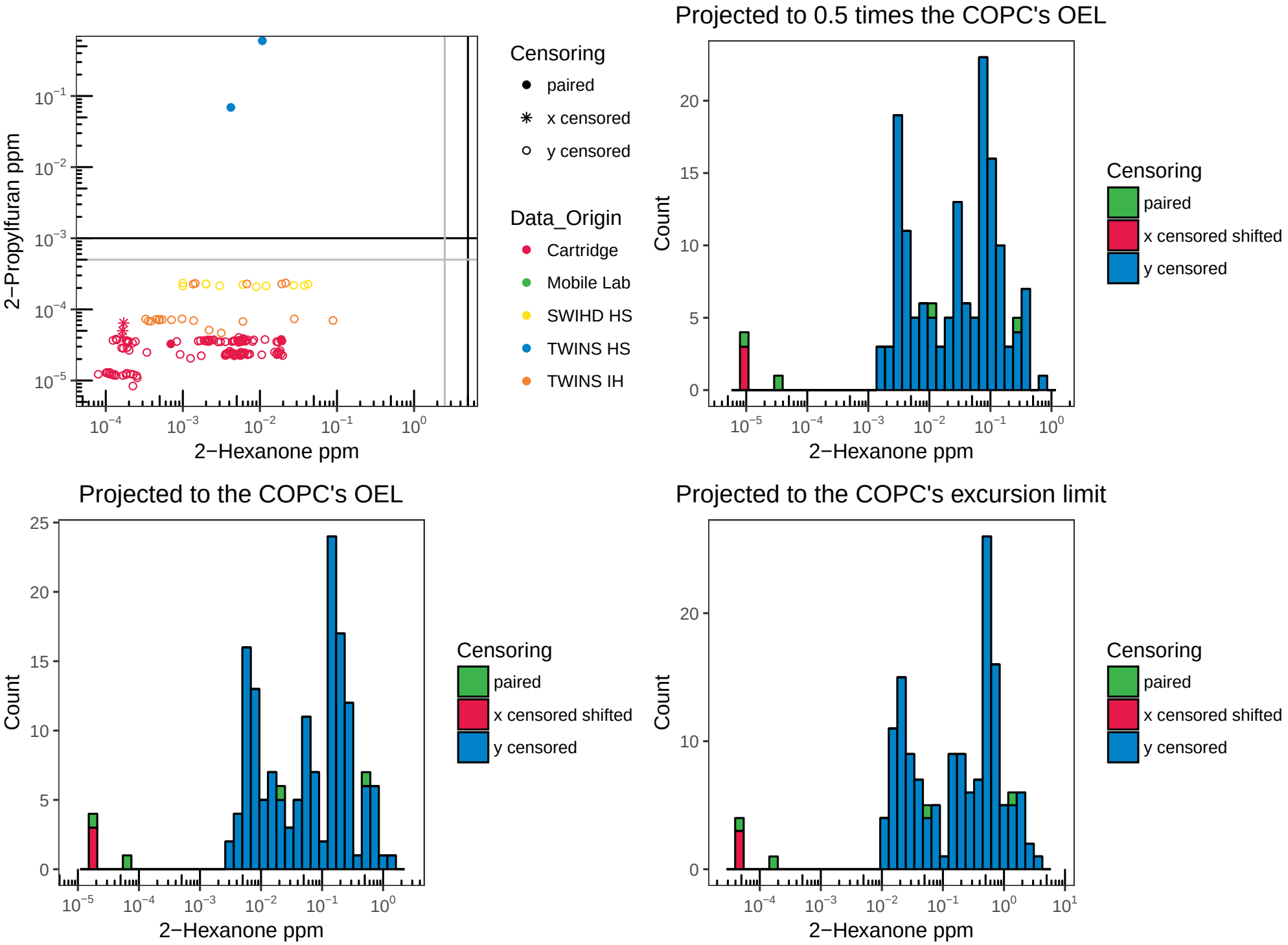


Figure C.479: 2-Propylfuran vs 2-Hexanone

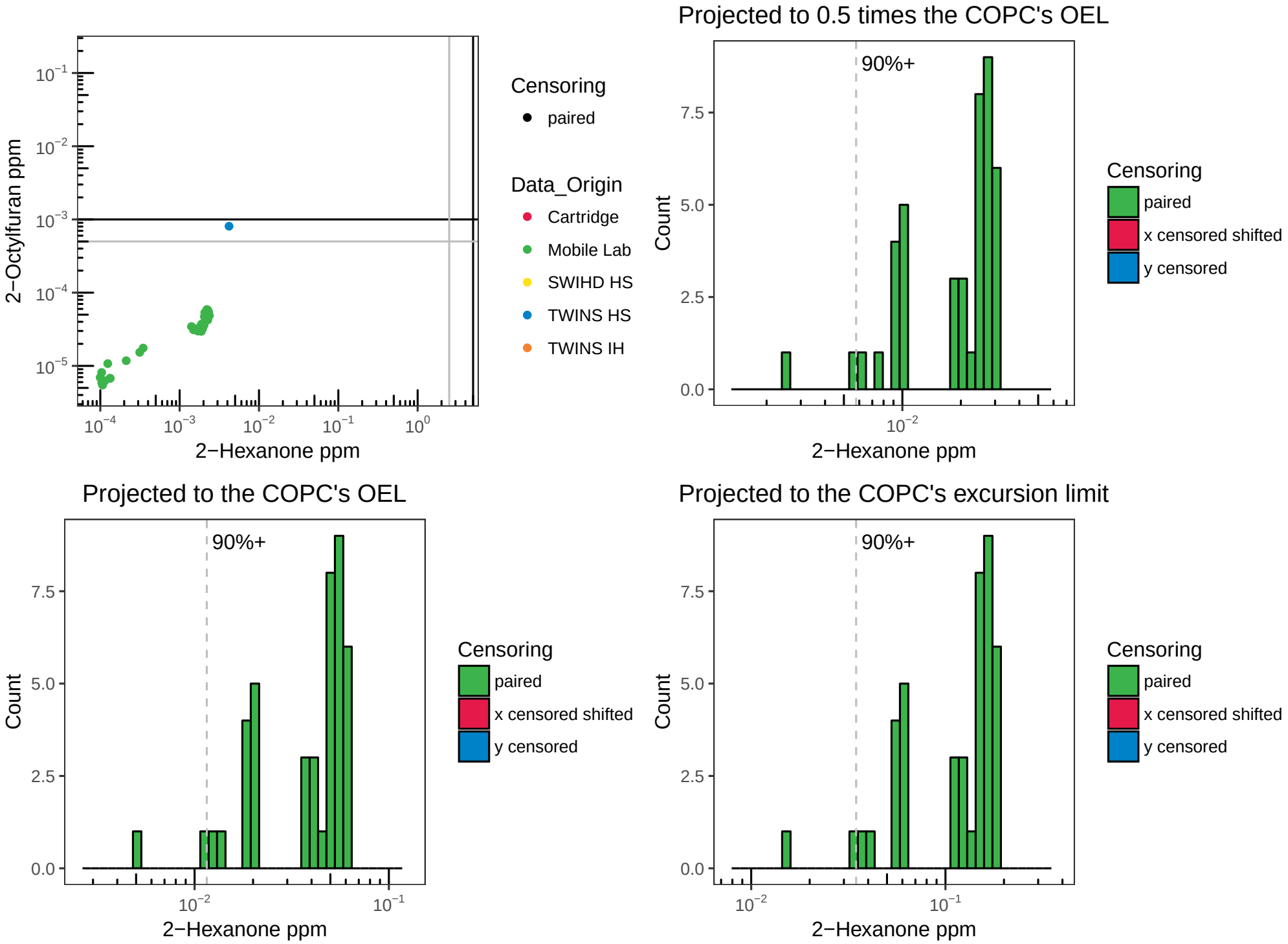


Figure C.480: 2-Octylfuran vs 2-Hexanone

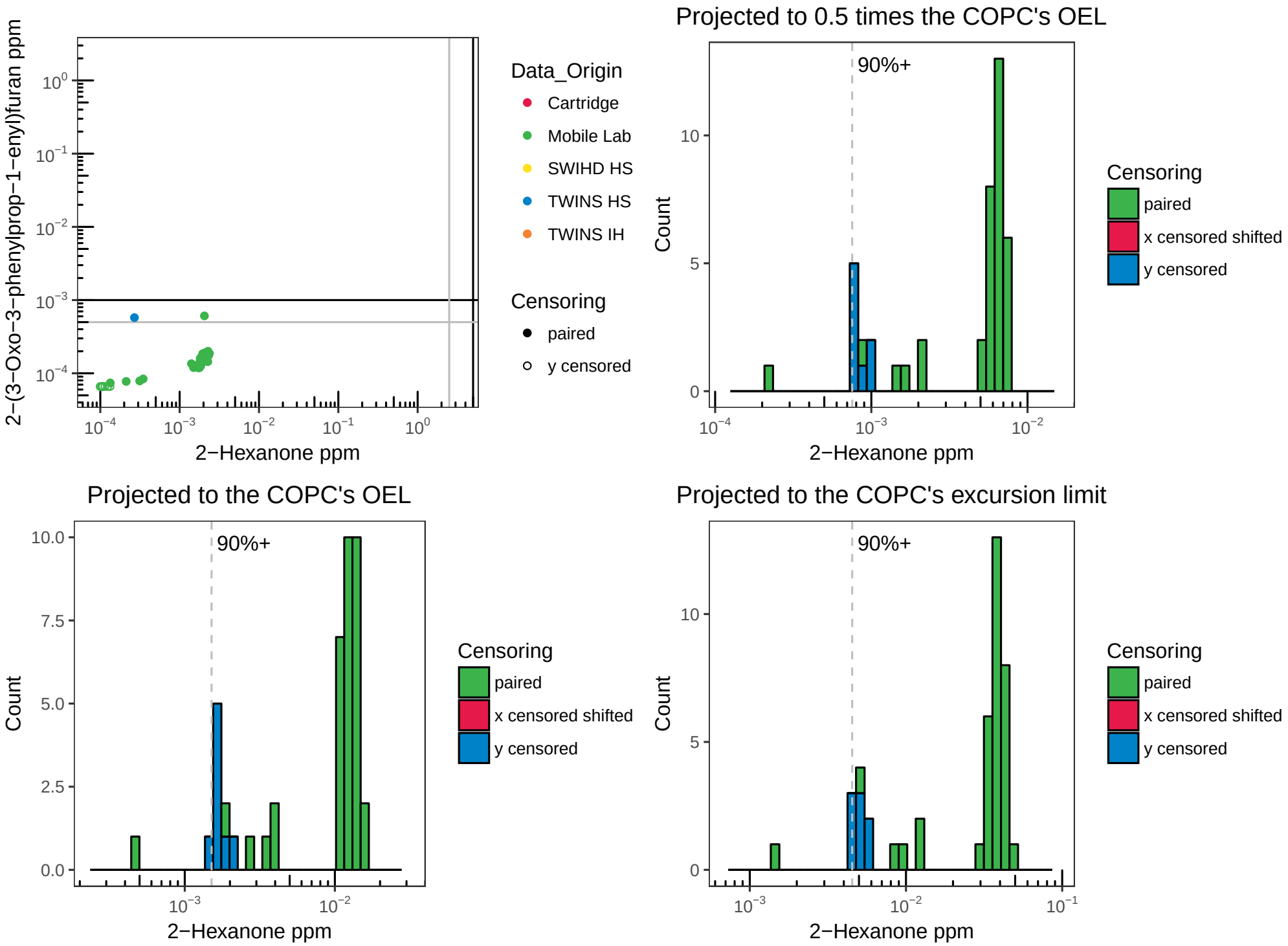


Figure C.481: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2-Hexanone

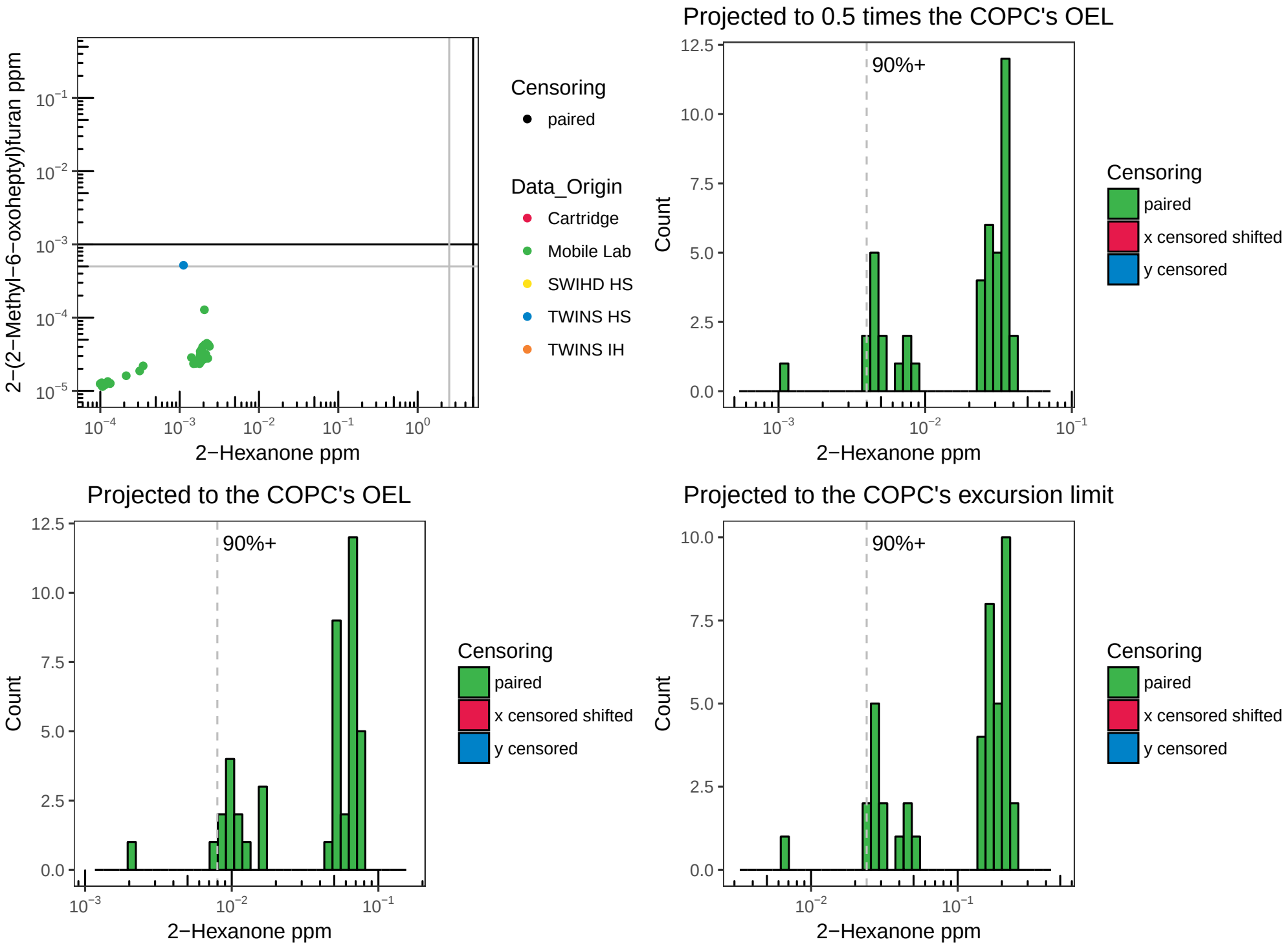


Figure C.482: 2-(2-Methyl-6-oxoheptyl)furan vs 2-Hexanone

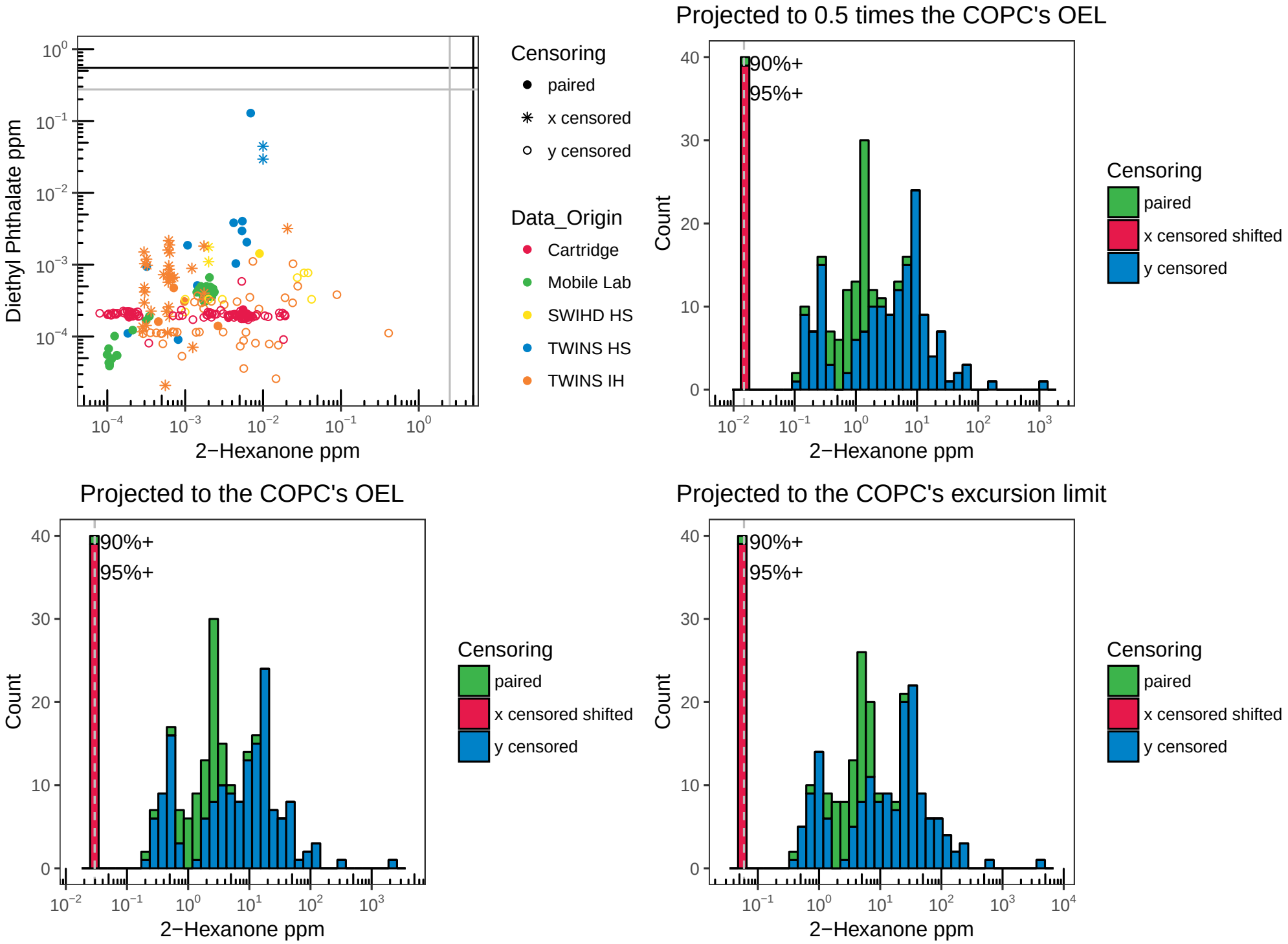


Figure C.483: Diethyl Phthalate vs 2-Hexanone

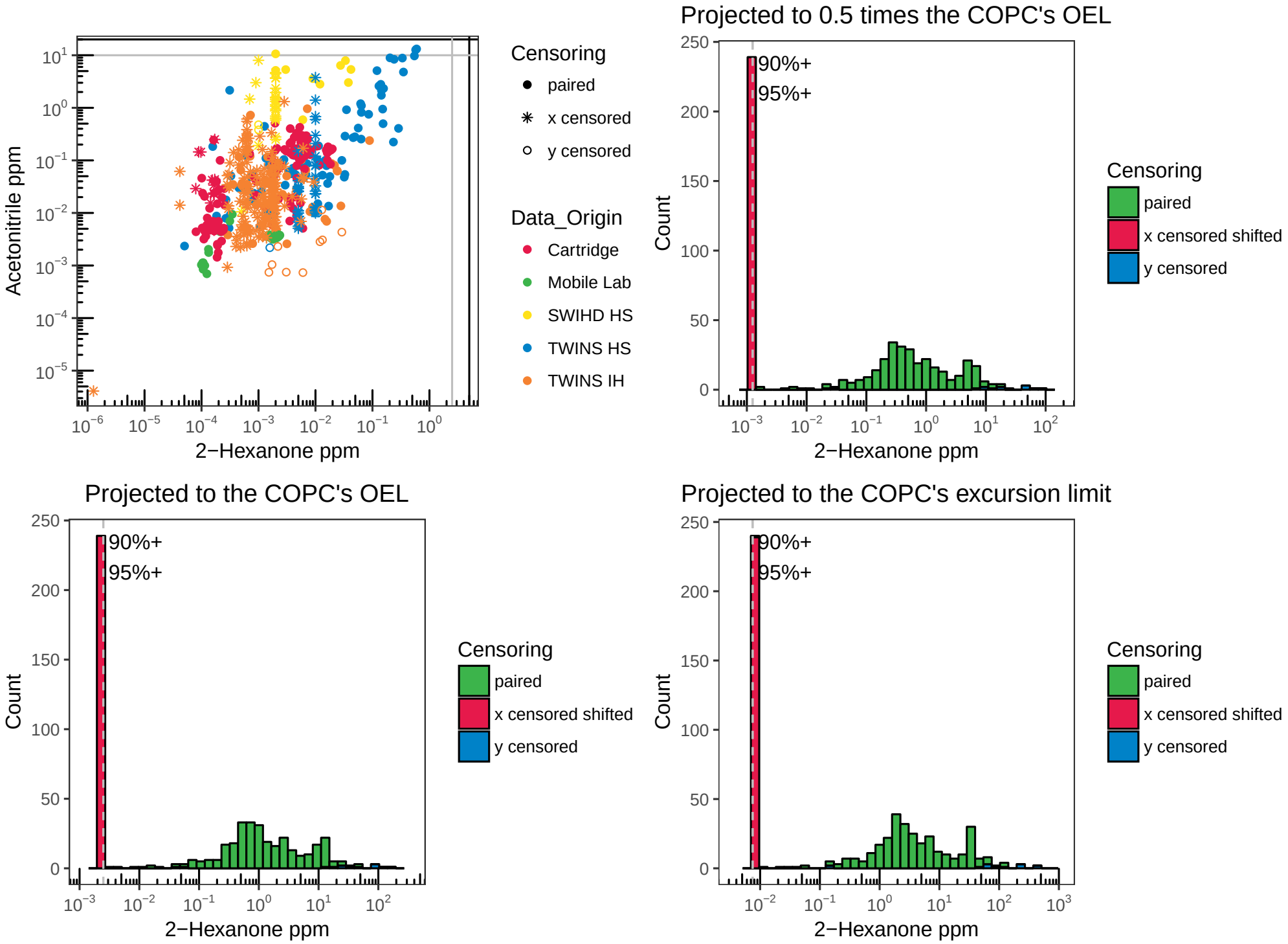


Figure C.484: Acetonitrile vs 2-Hexanone

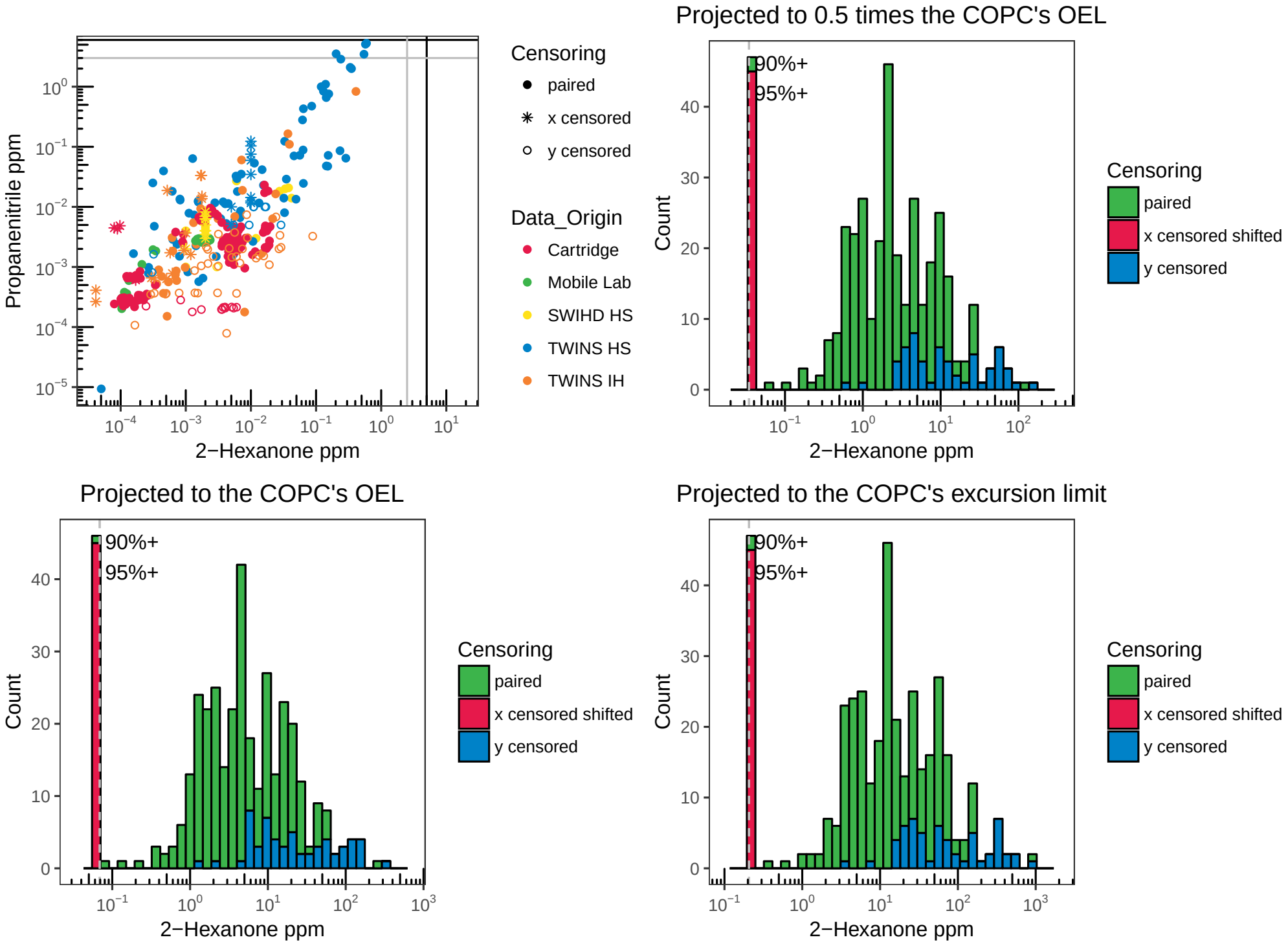


Figure C.485: Propanenitrile vs 2-Hexanone

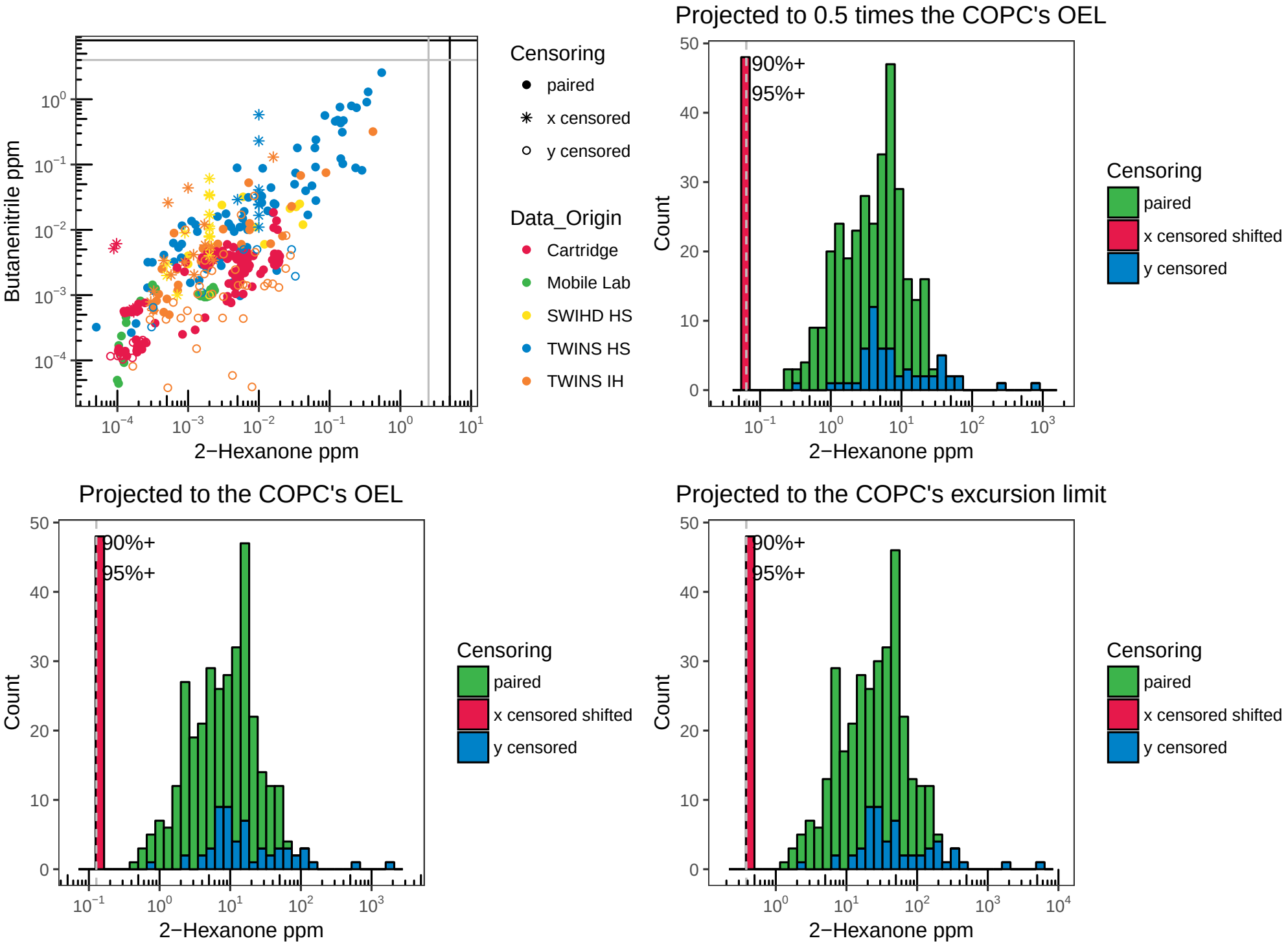


Figure C.486: Butanenitrile vs 2-Hexanone

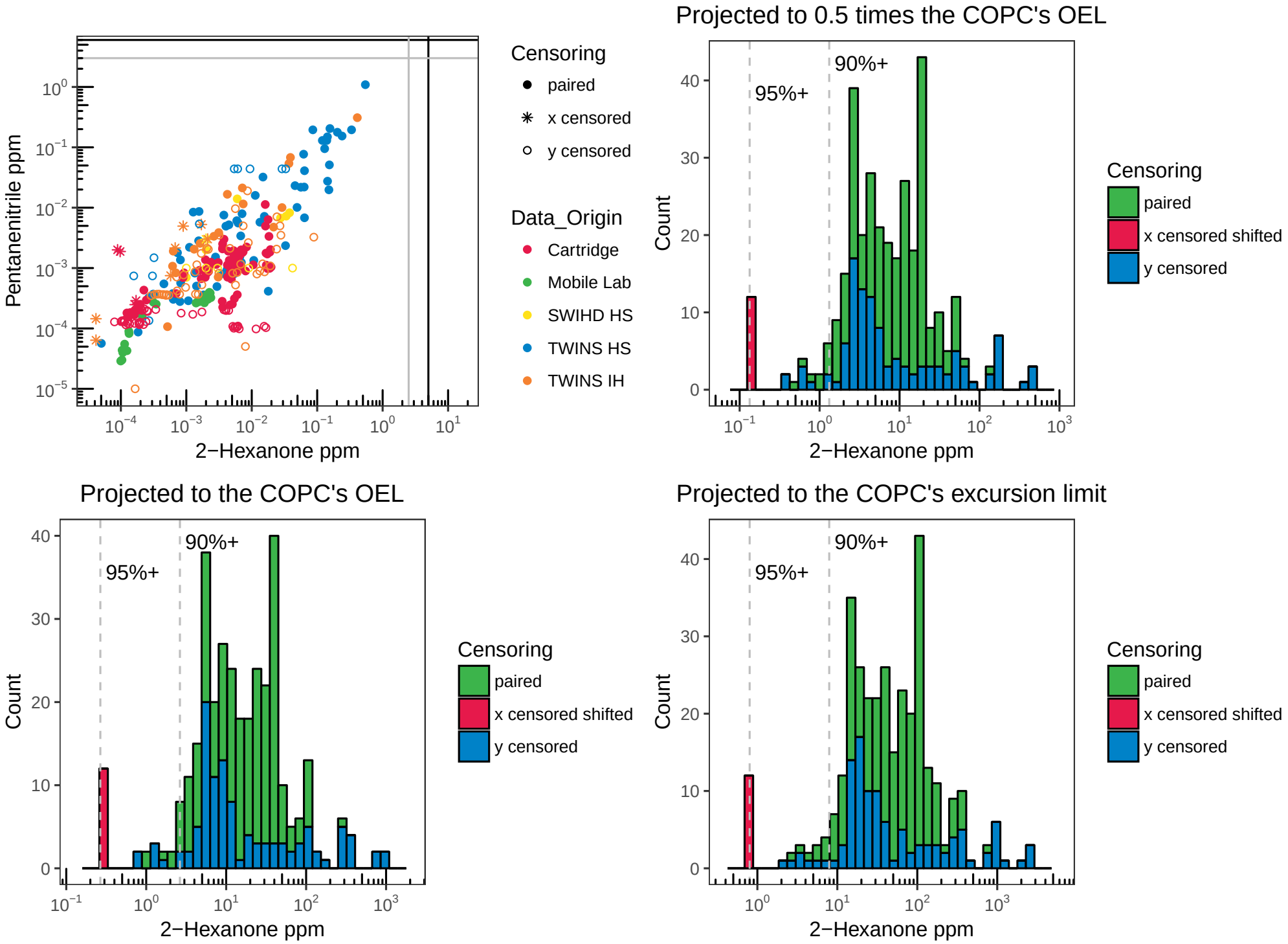


Figure C.487: Pentanenitrile vs 2-Hexanone

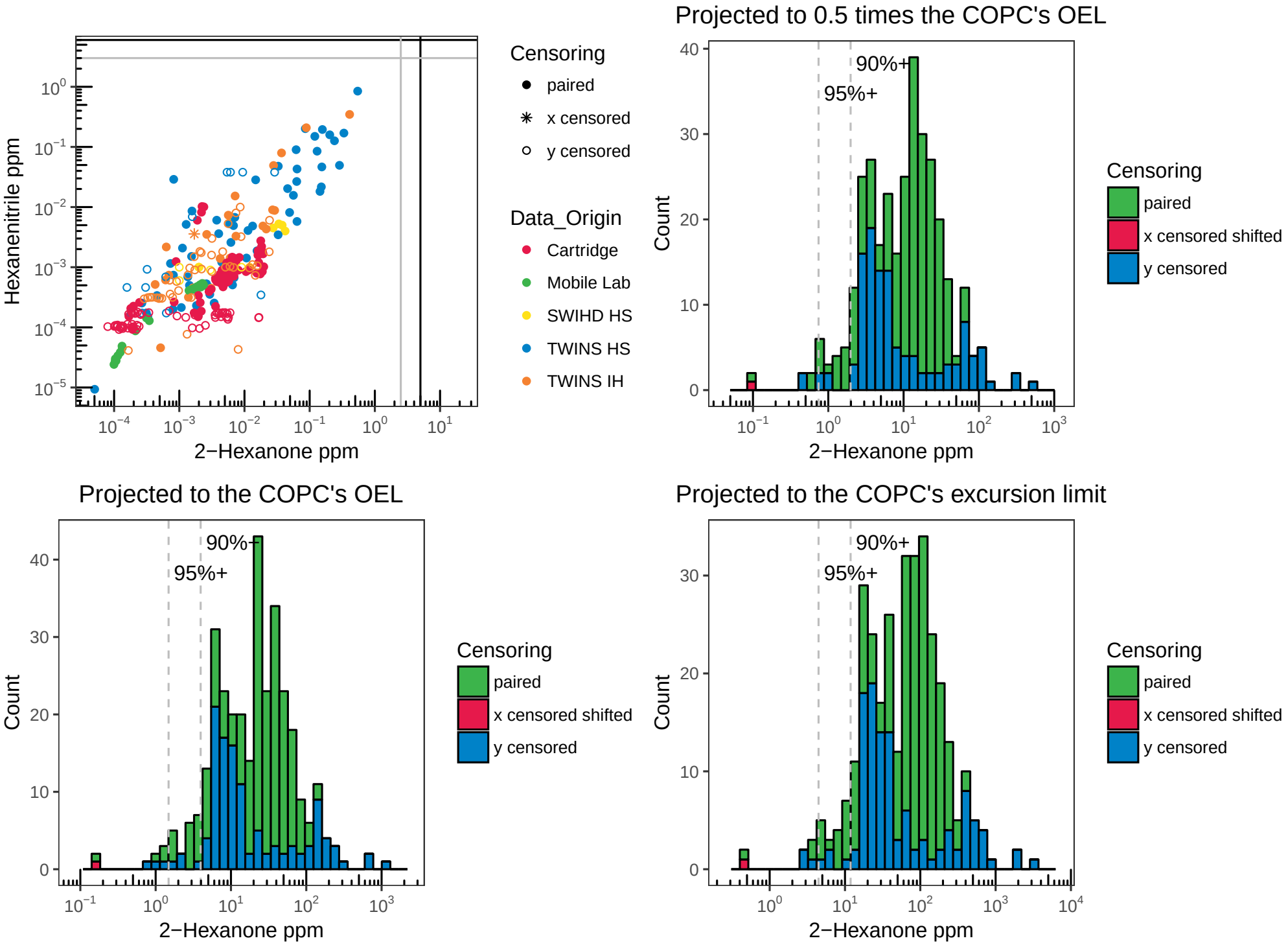


Figure C.488: Hexanenitrile vs 2-Hexanone

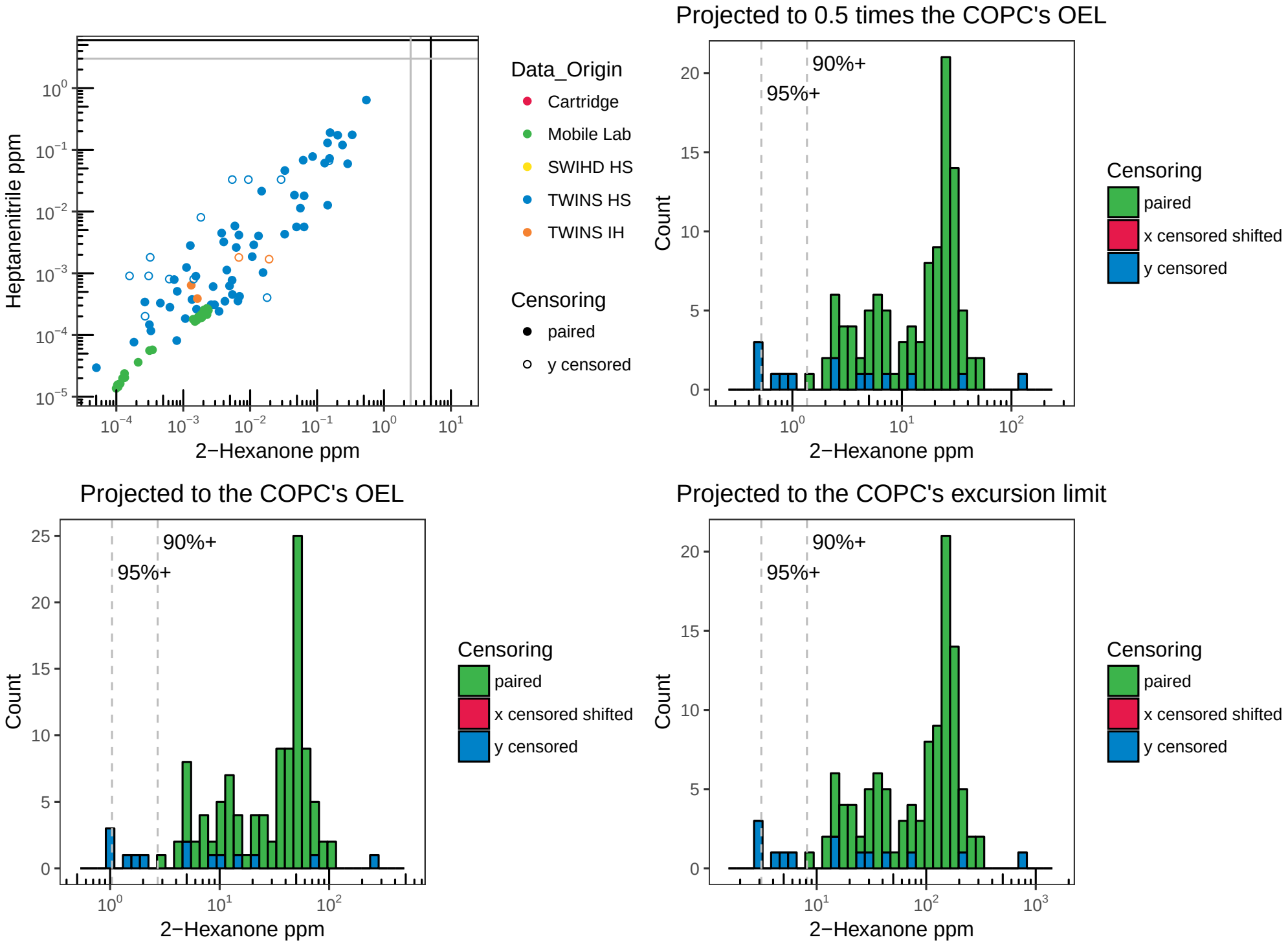


Figure C.489: Heptanenitrile vs 2-Hexanone

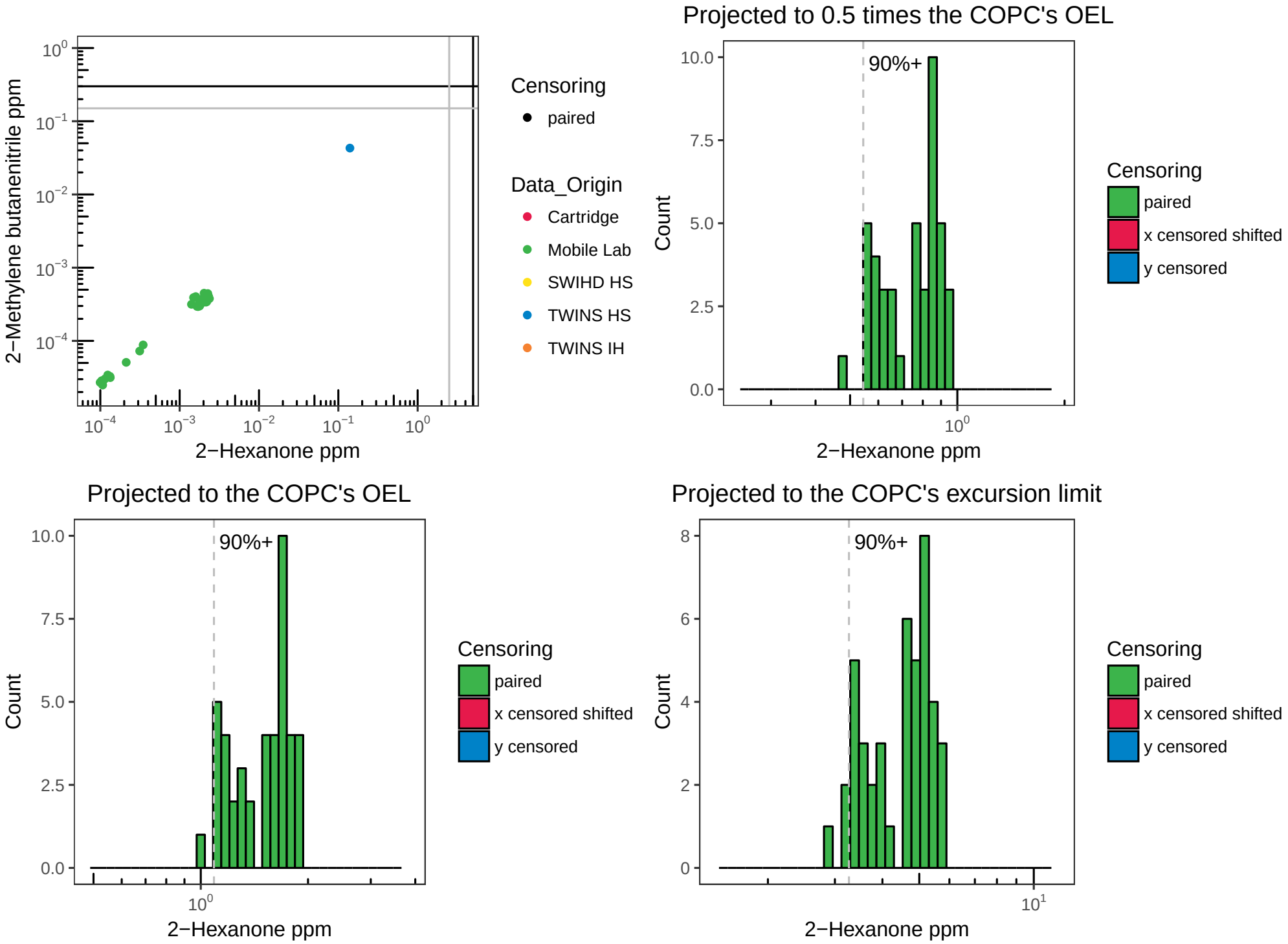


Figure C.490: 2-Methylene butanenitrile vs 2-Hexanone

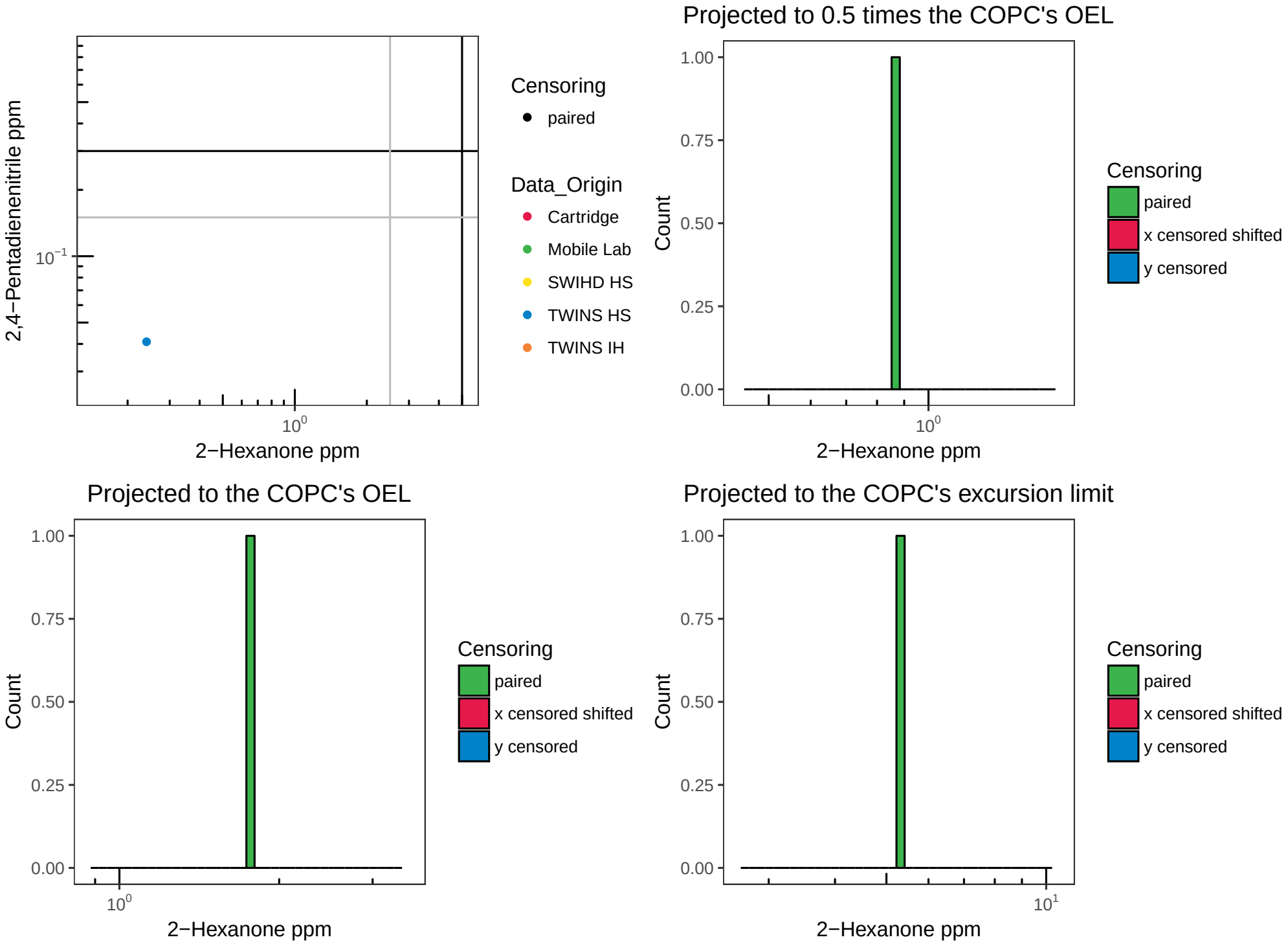


Figure C.491: 2,4-Pentadienenitrile vs 2-Hexanone

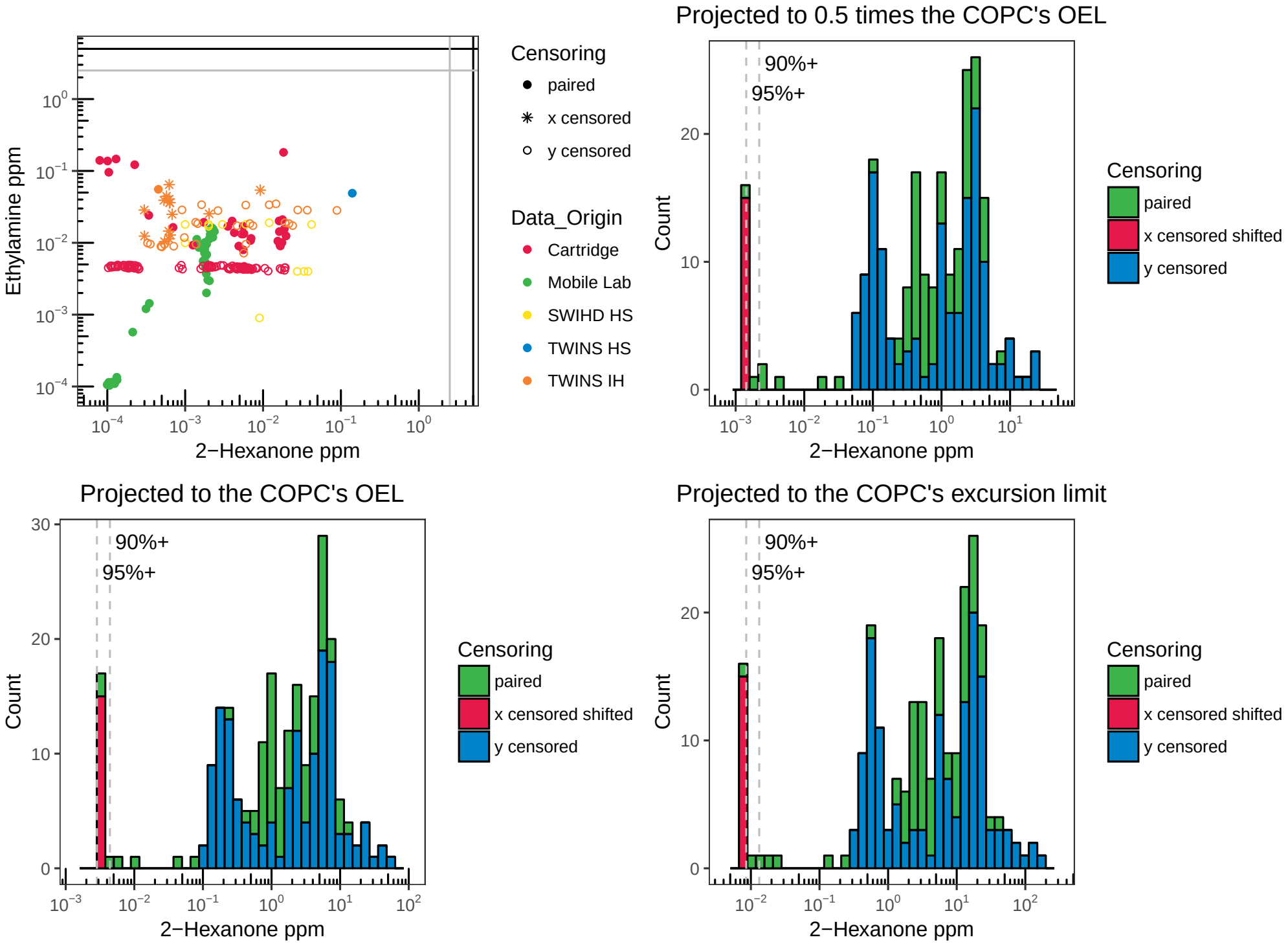


Figure C.492: Ethylamine vs 2-Hexanone

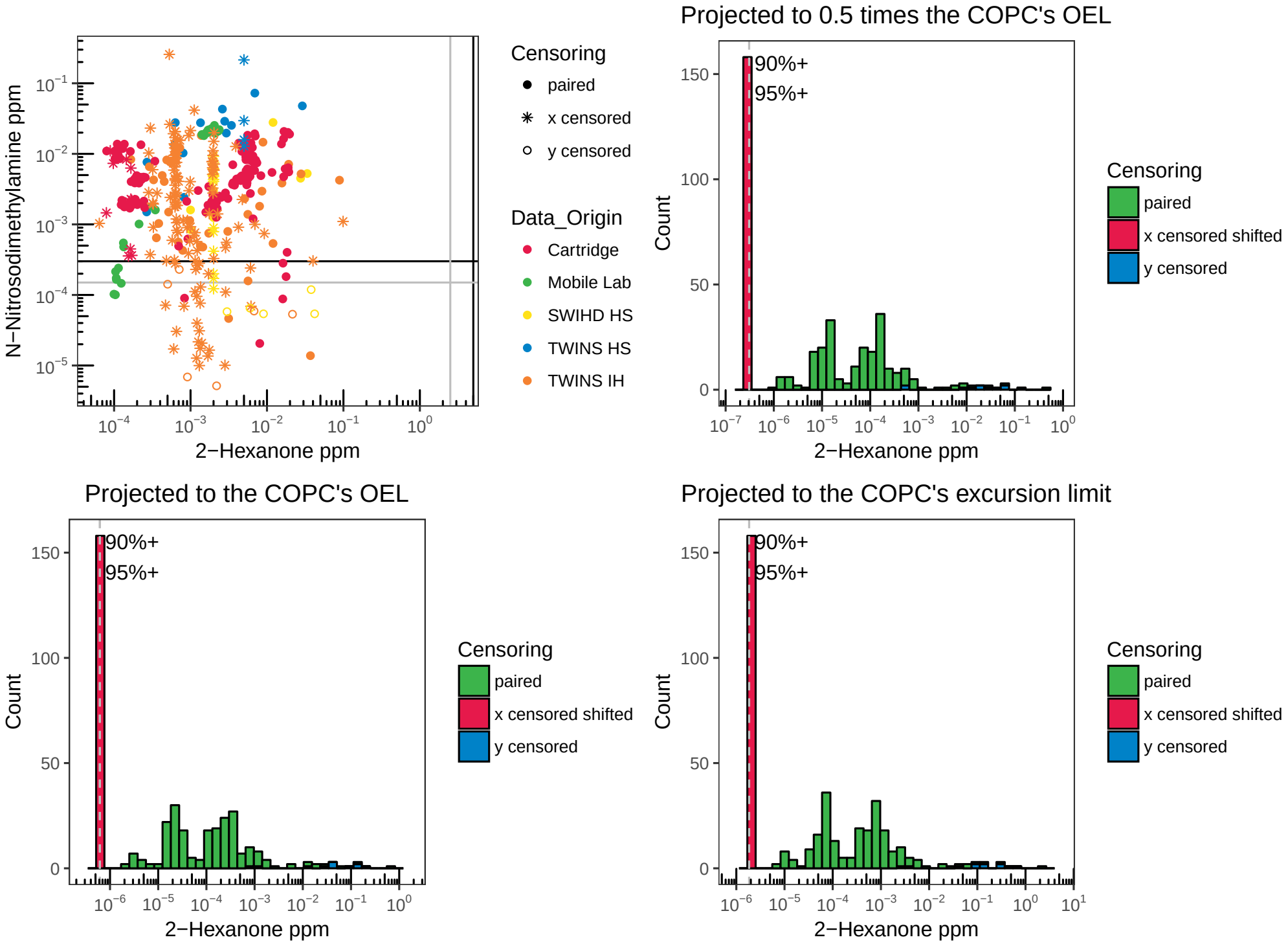


Figure C.493: N-Nitrosodimethylamine vs 2-Hexanone

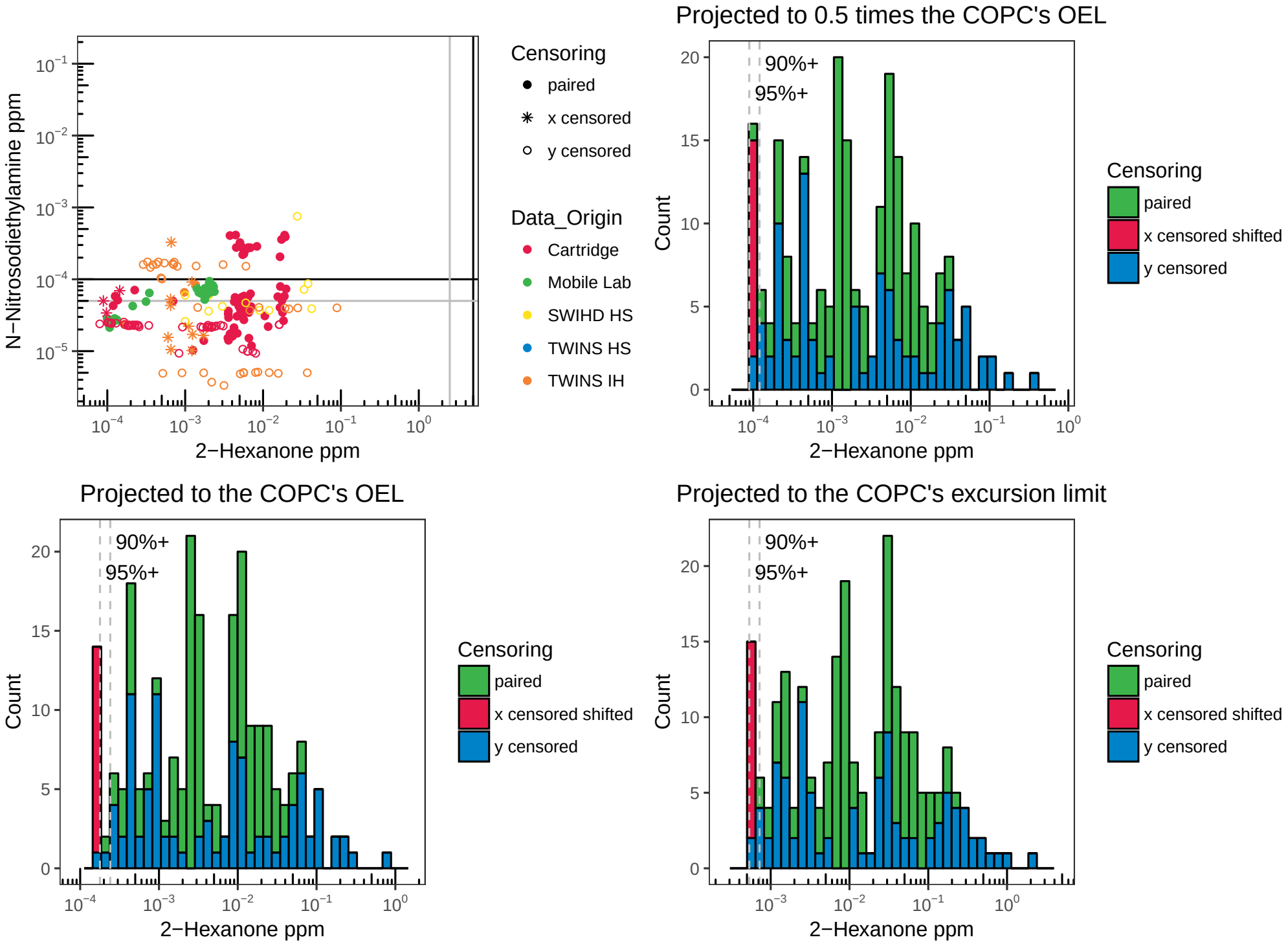


Figure C.494: N-Nitrosodiethylamine vs 2-Hexanone

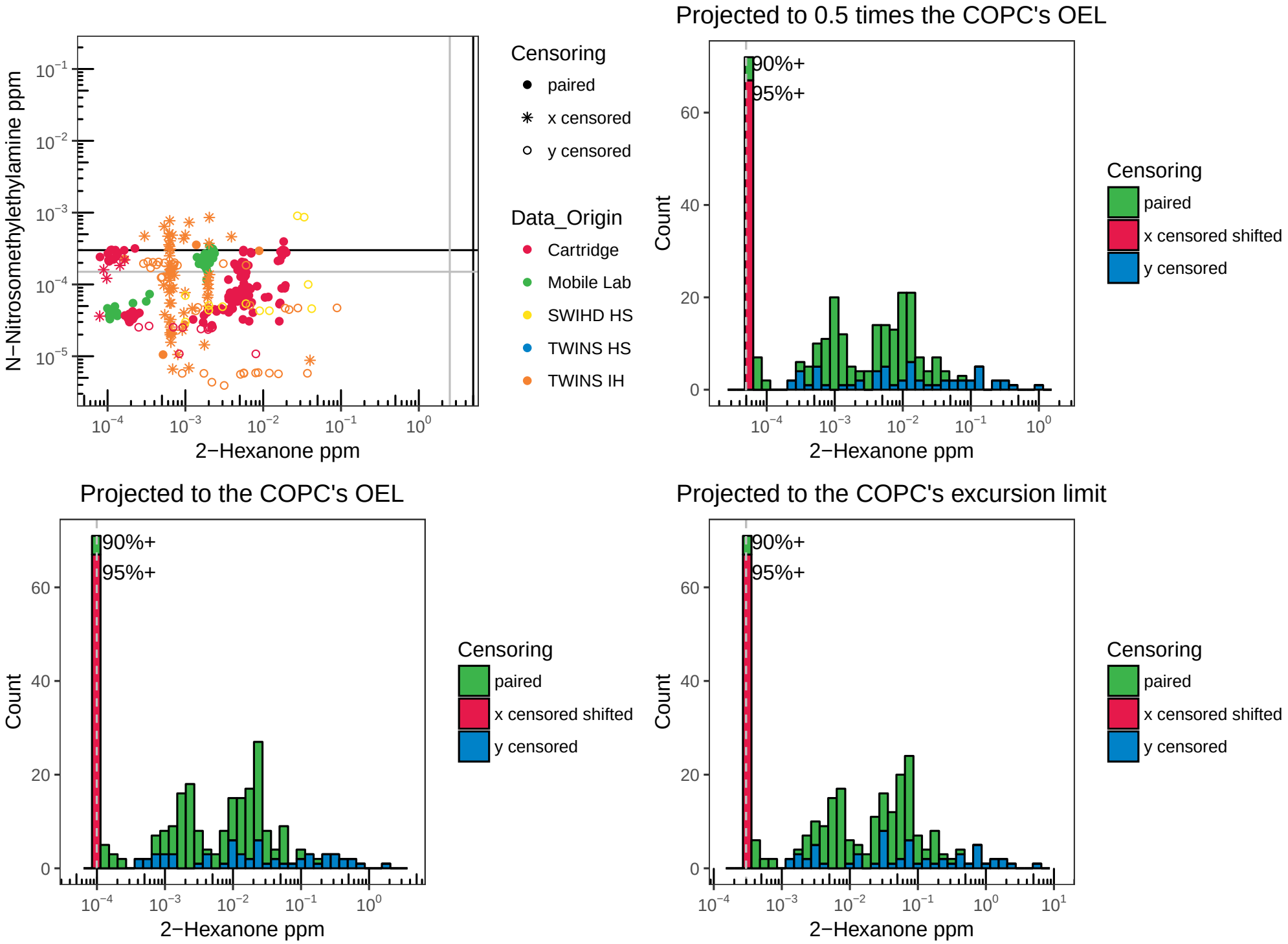


Figure C.495: N-Nitrosomethylethylamine vs 2-Hexanone

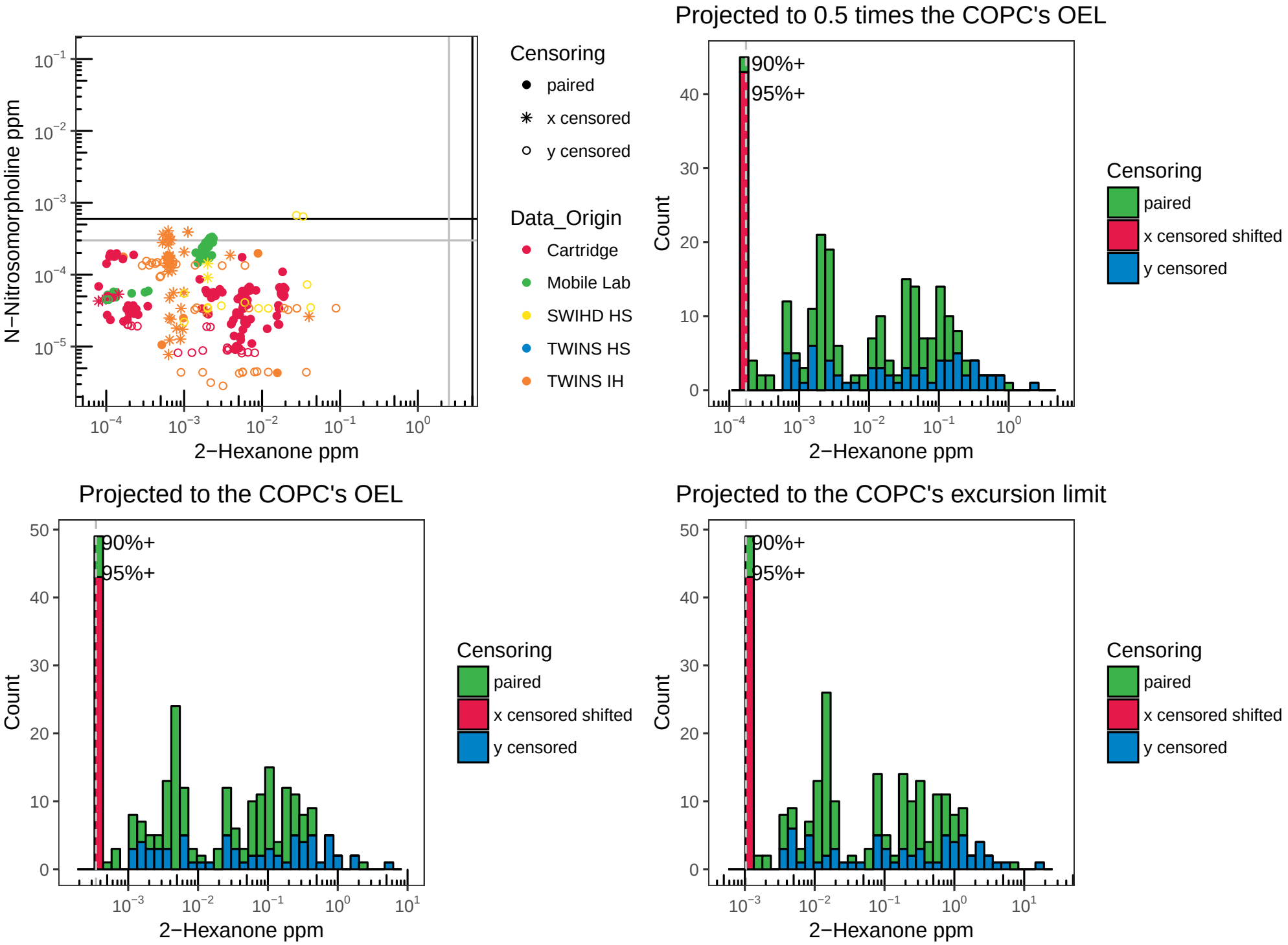


Figure C.496: N-Nitrosomorpholine vs 2-Hexanone

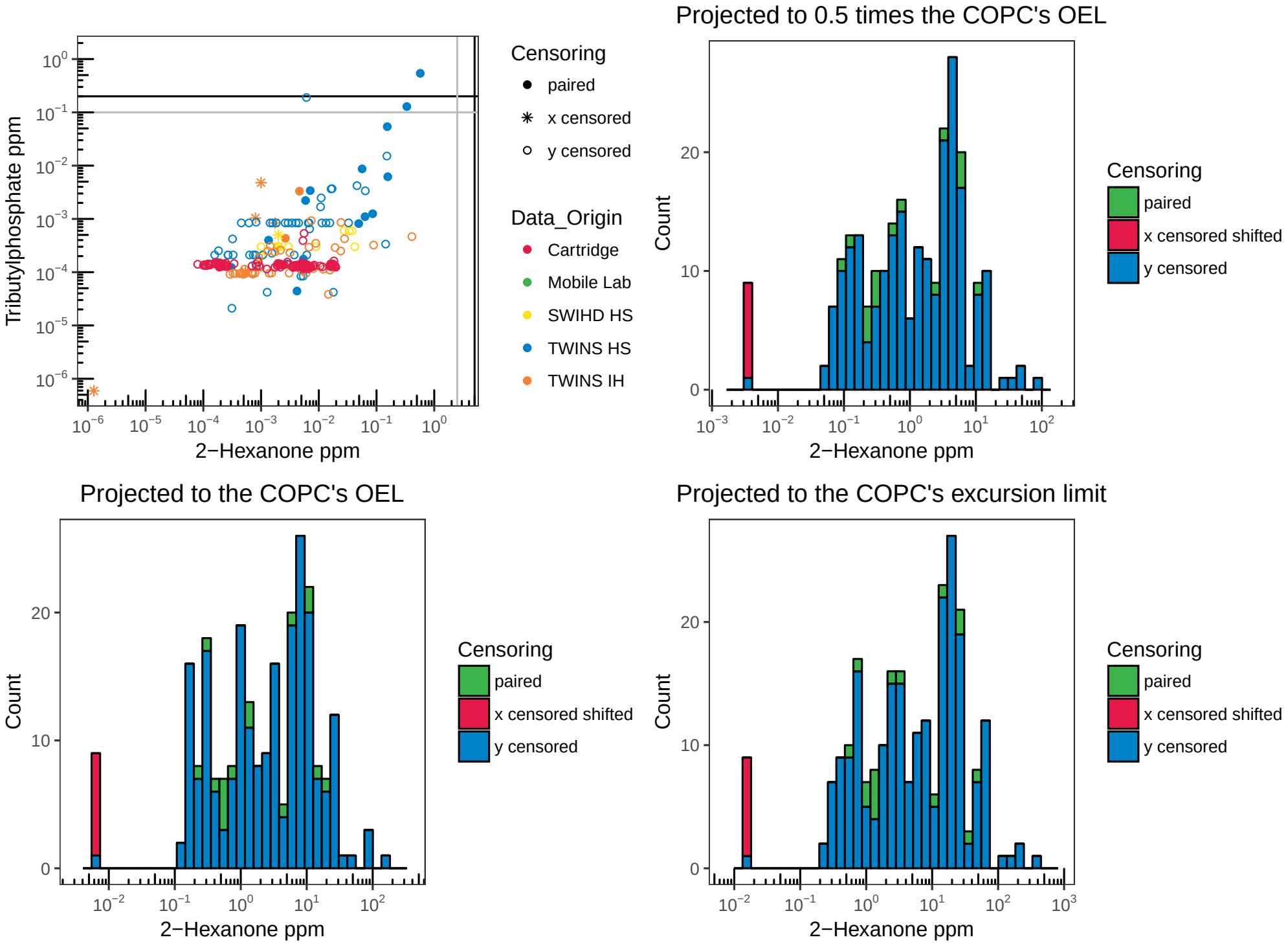


Figure C.497: Tributylphosphate vs 2-Hexanone

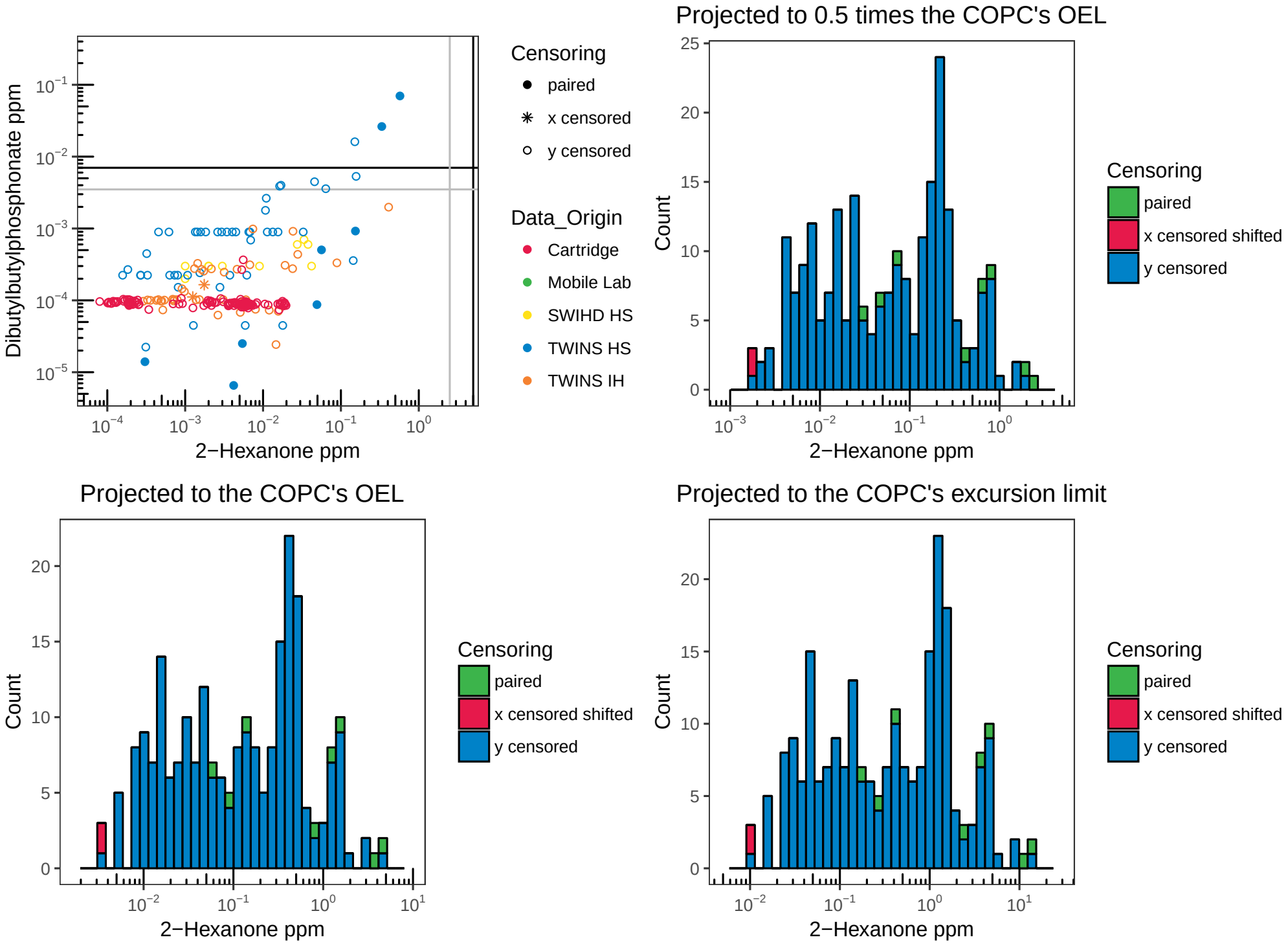


Figure C.498: Dibutylbutylphosphonate vs 2-Hexanone

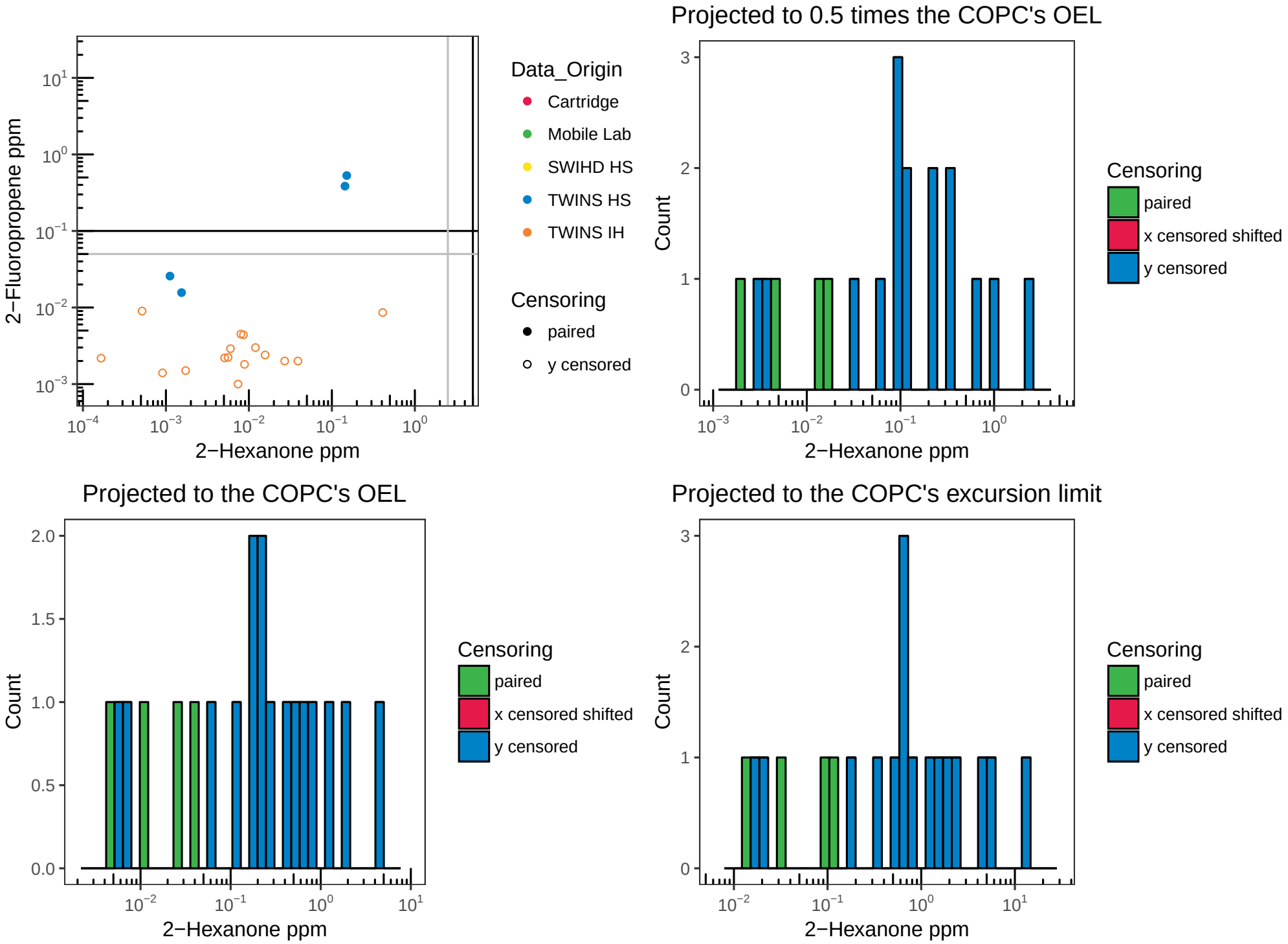


Figure C.499: 2-Fluoropropene vs 2-Hexanone

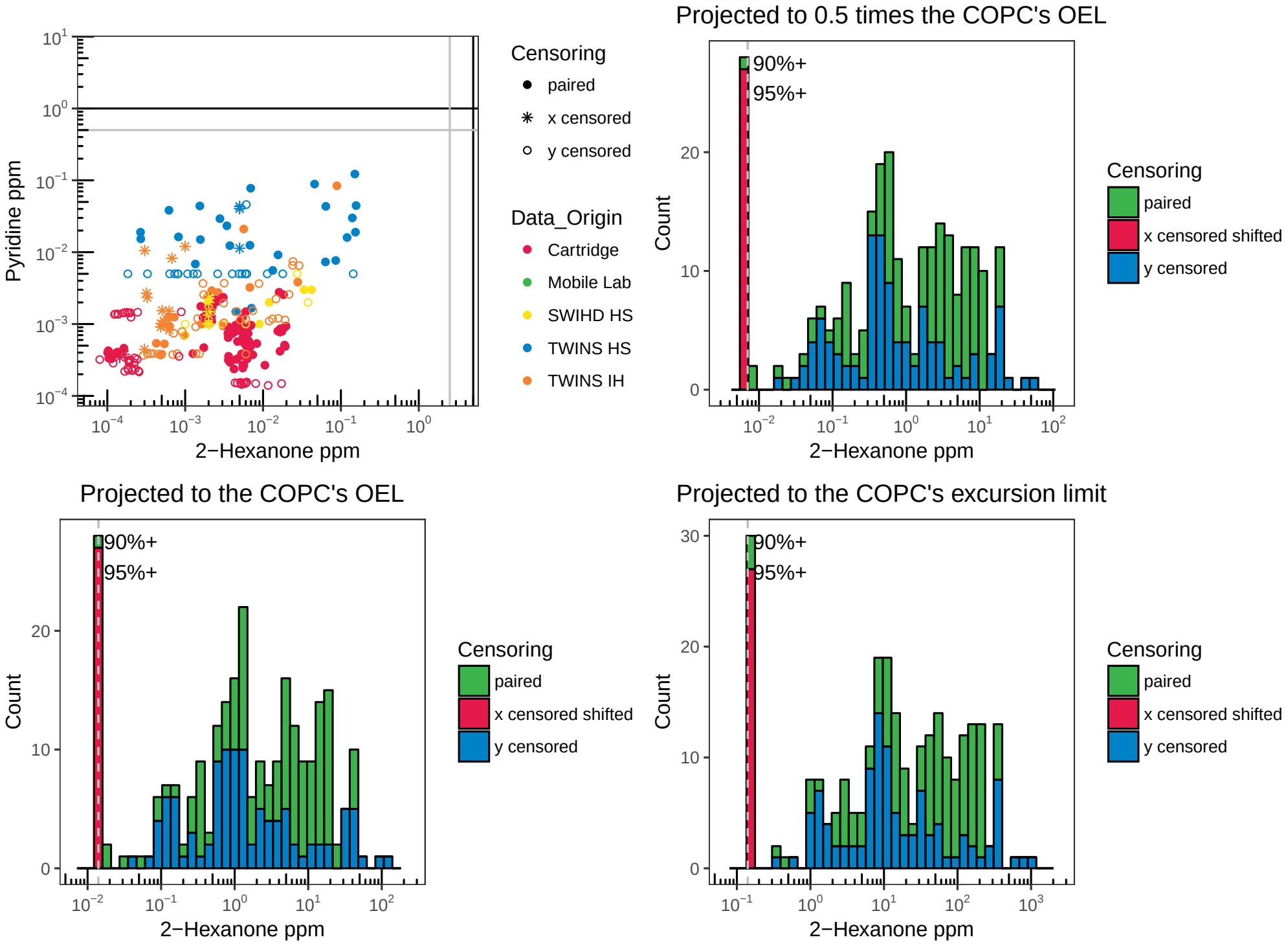


Figure C.500: Pyridine vs 2-Hexanone

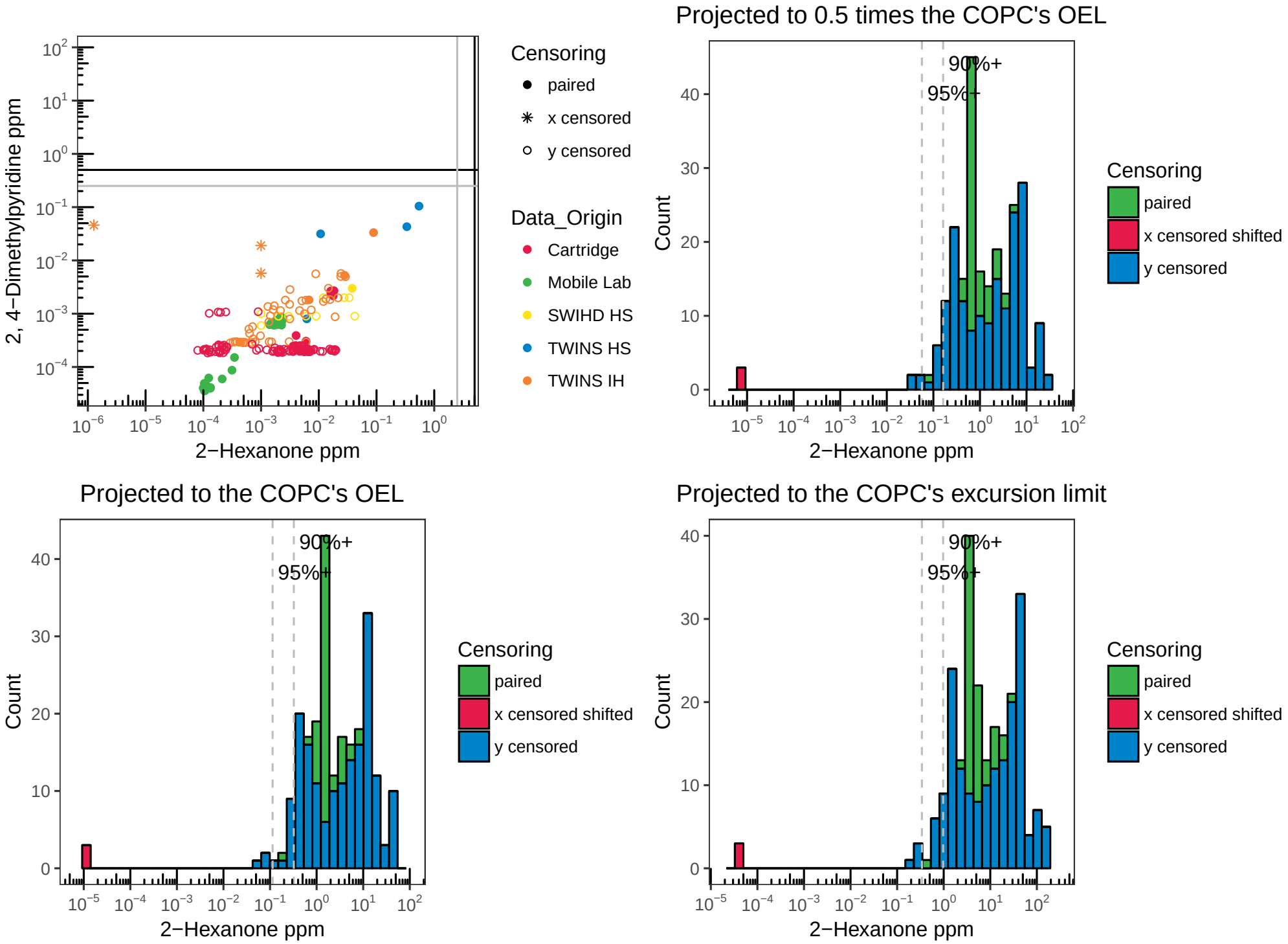


Figure C.501: 2, 4-Dimethylpyridine vs 2-Hexanone

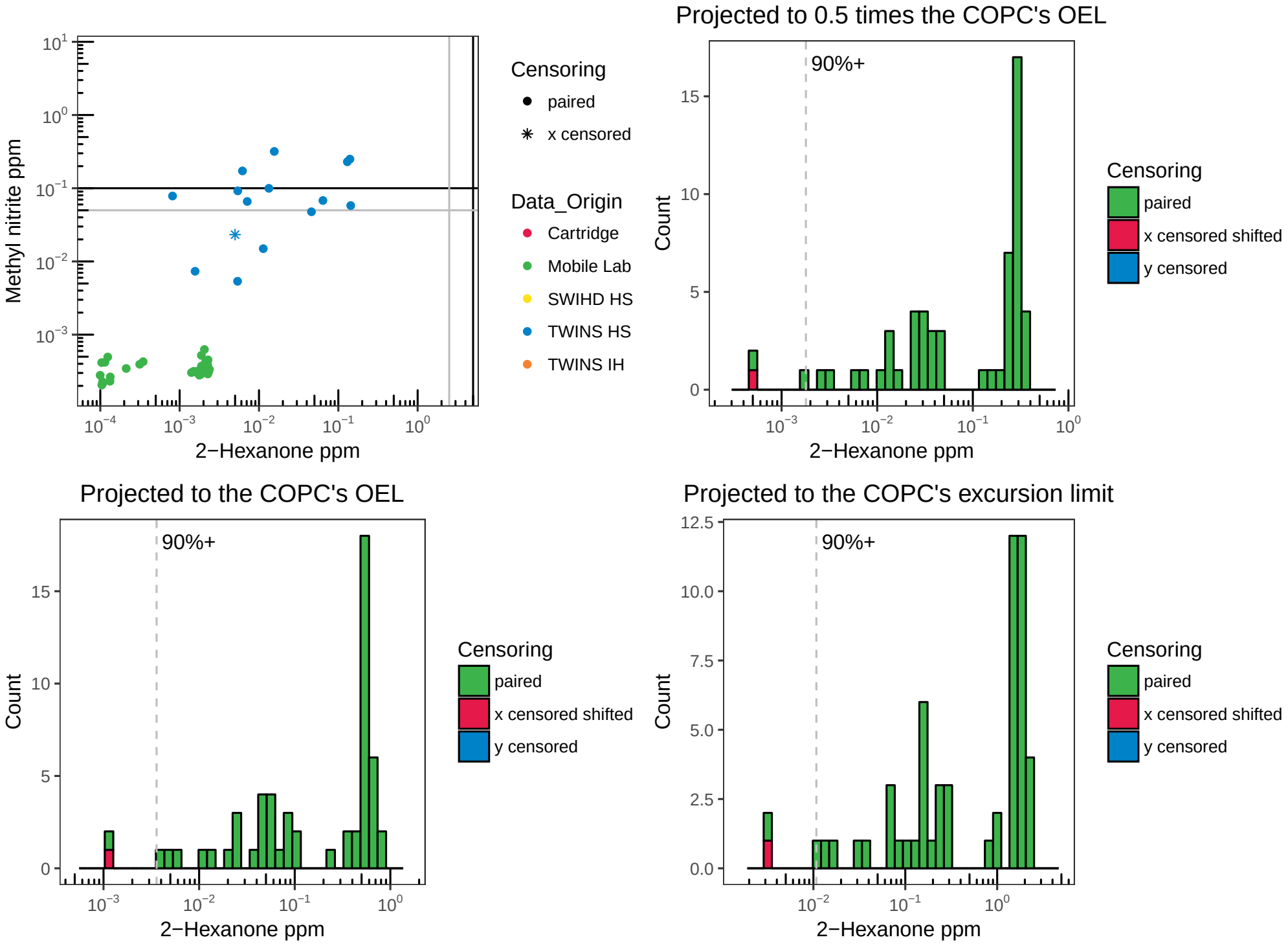


Figure C.502: Methyl nitrite vs 2-Hexanone

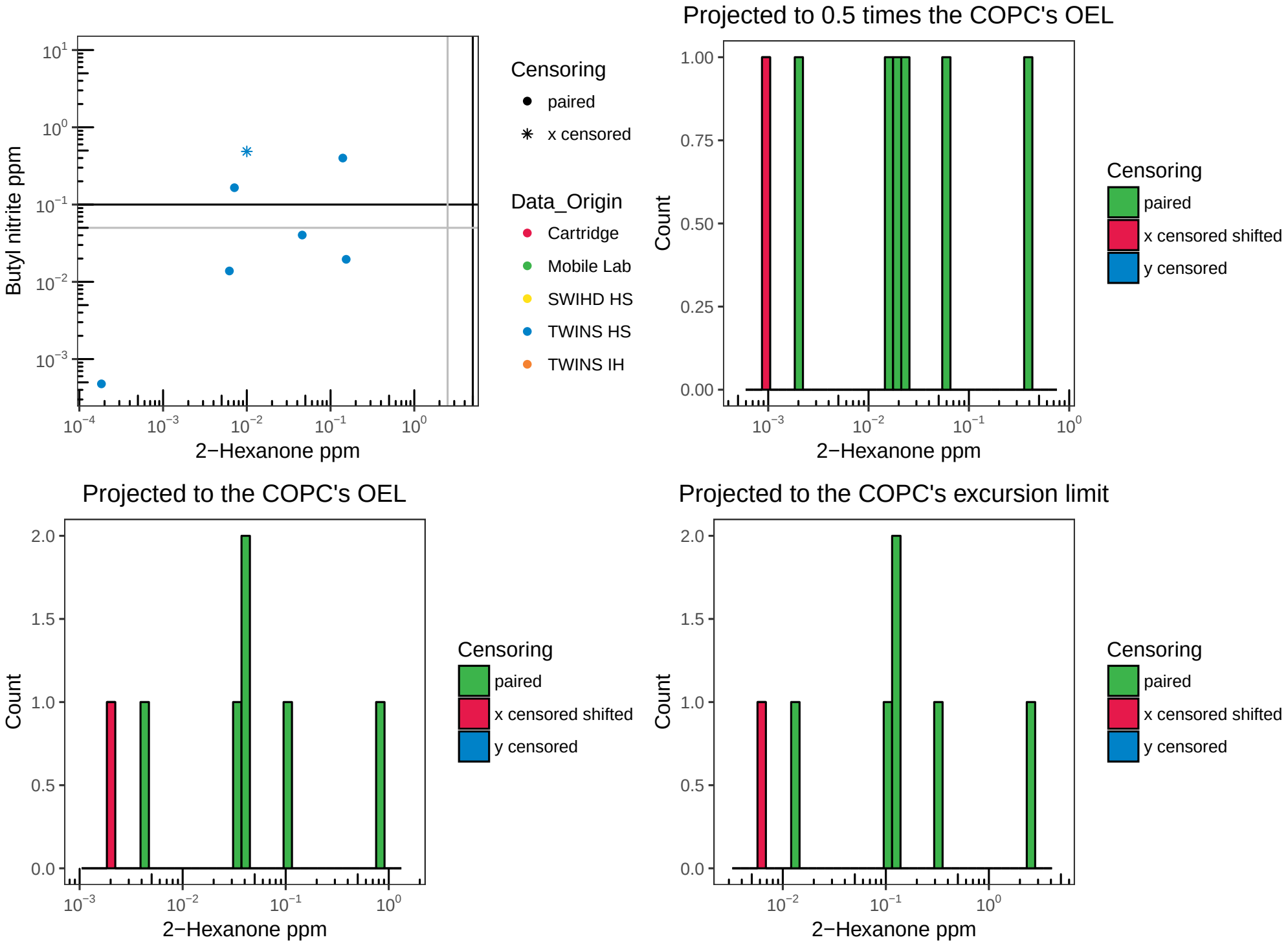


Figure C.503: Butyl nitrite vs 2-Hexanone

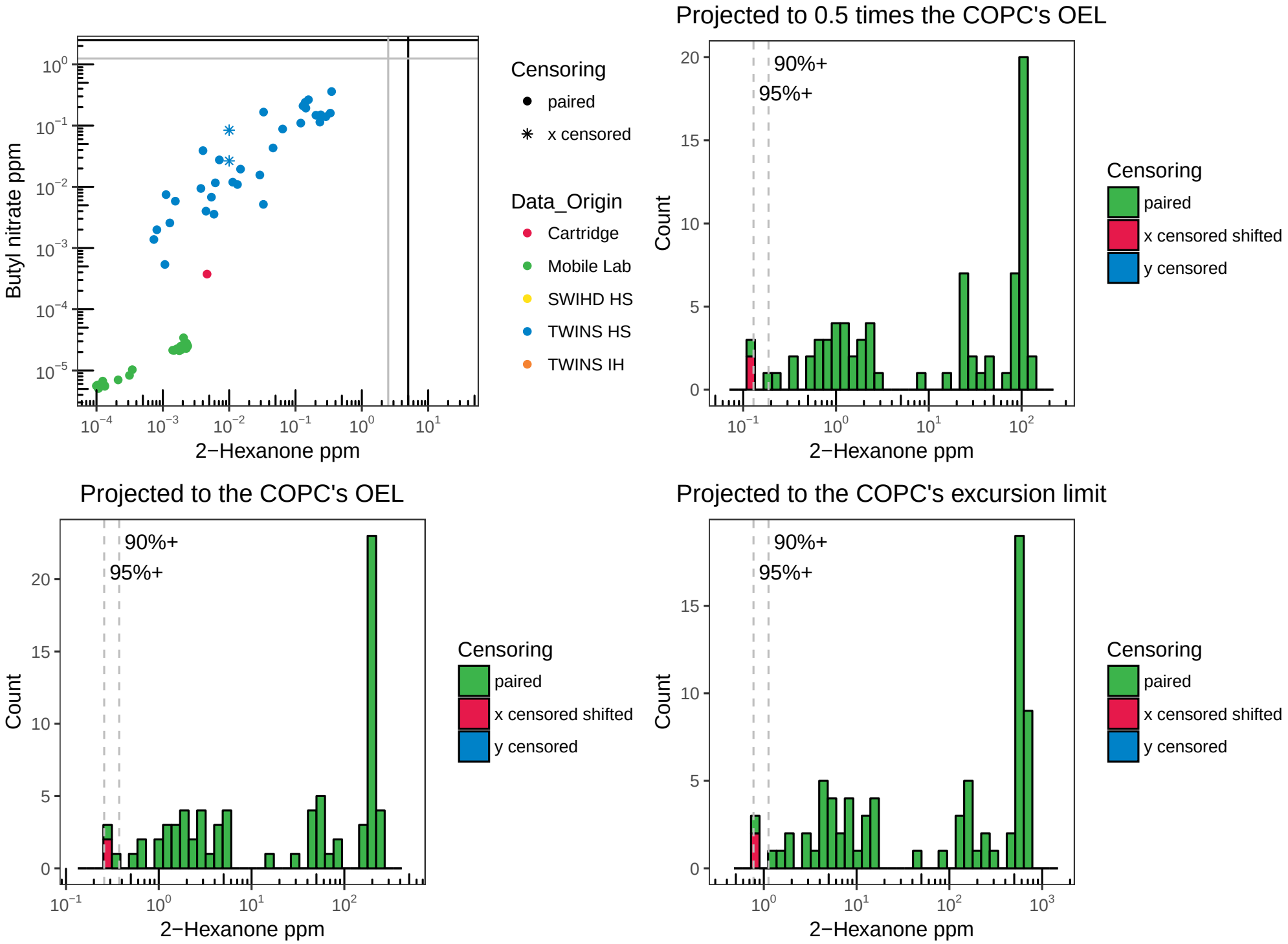


Figure C.504: Butyl nitrate vs 2-Hexanone

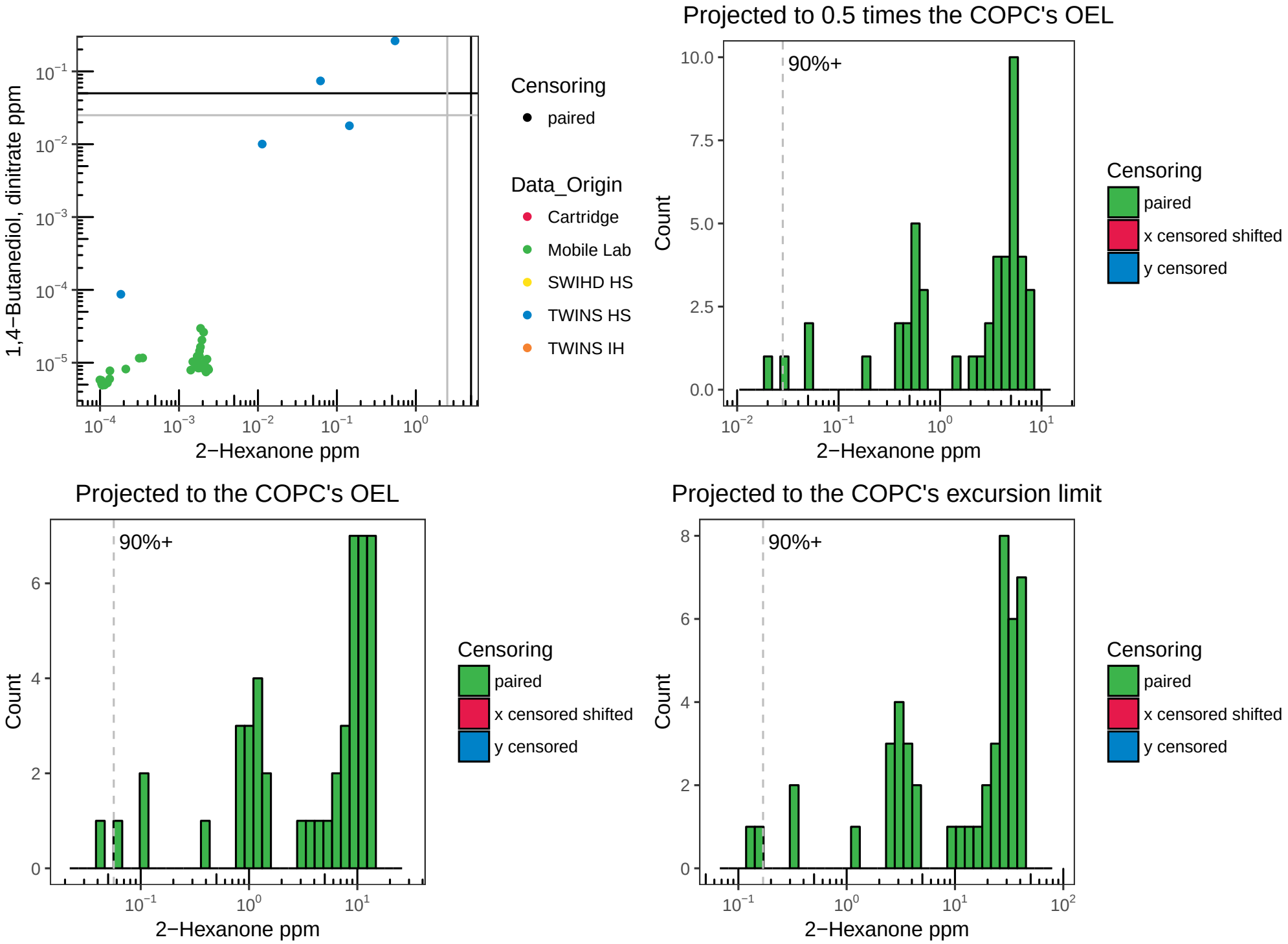


Figure C.505: 1,4-Butanediol, dinitrate vs 2-Hexanone

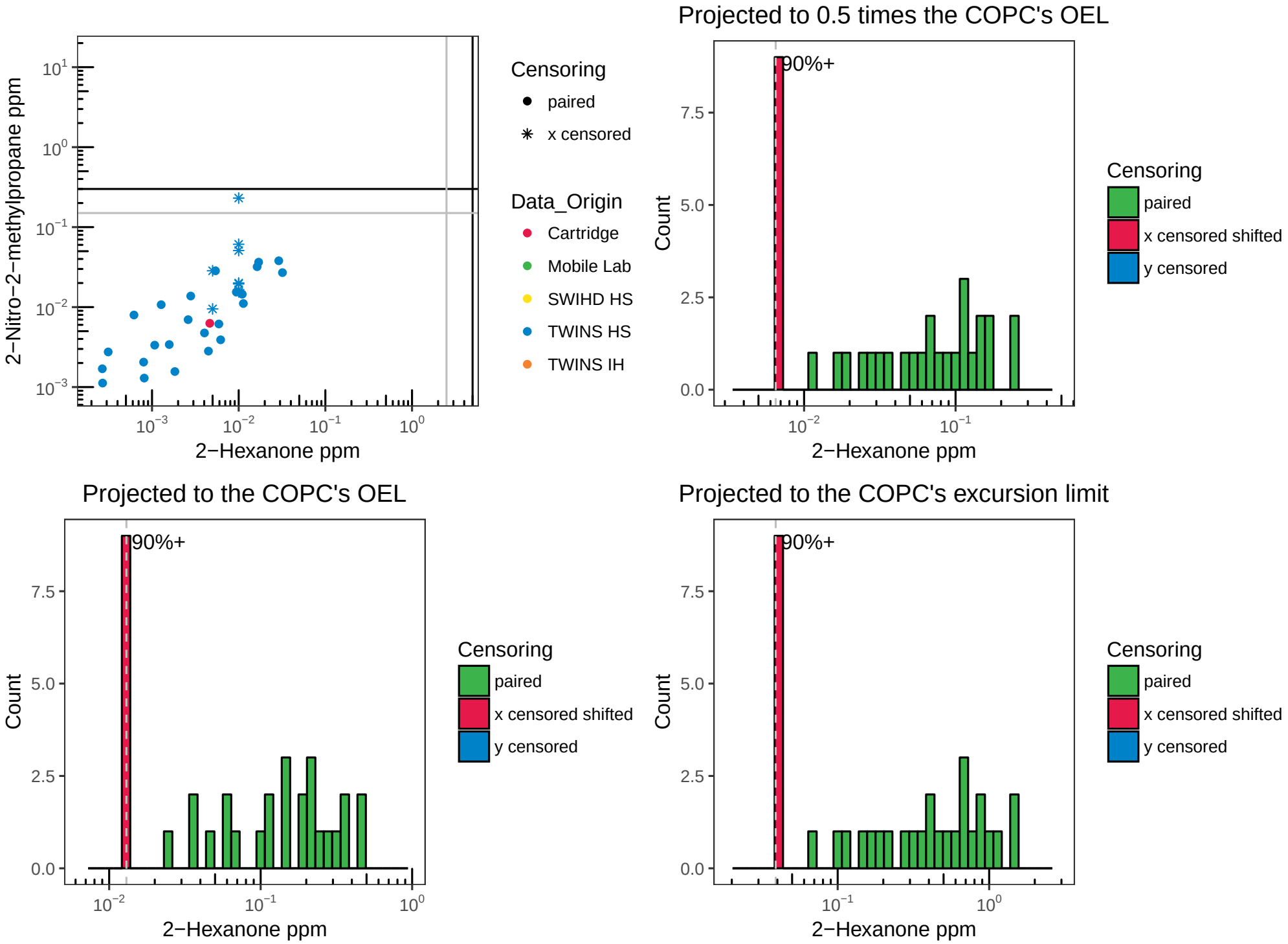


Figure C.506: 2-Nitro-2-methylpropane vs 2-Hexanone

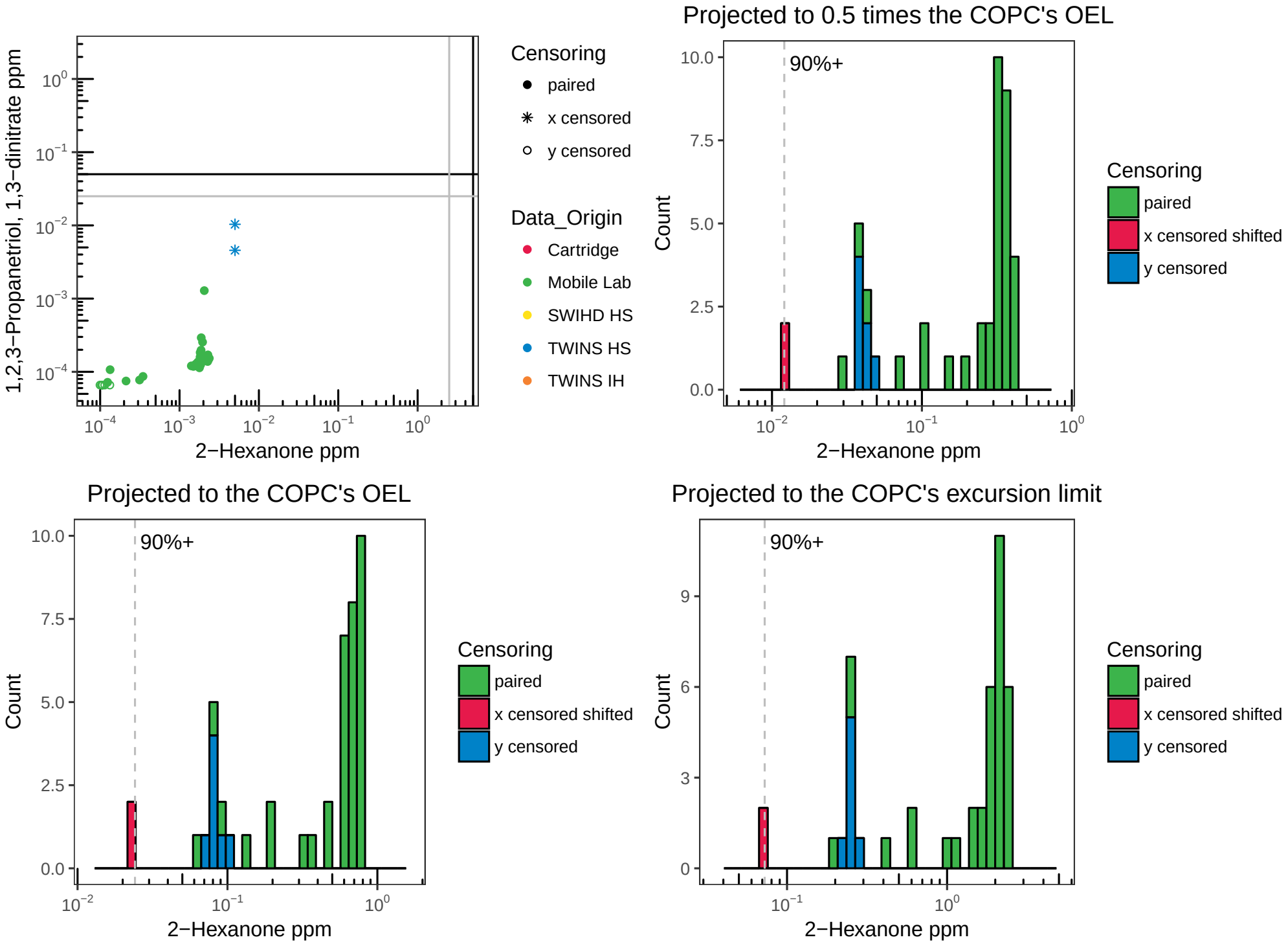


Figure C.507: 1,2,3-Propanetriol, 1,3-dinitrate vs 2-Hexanone

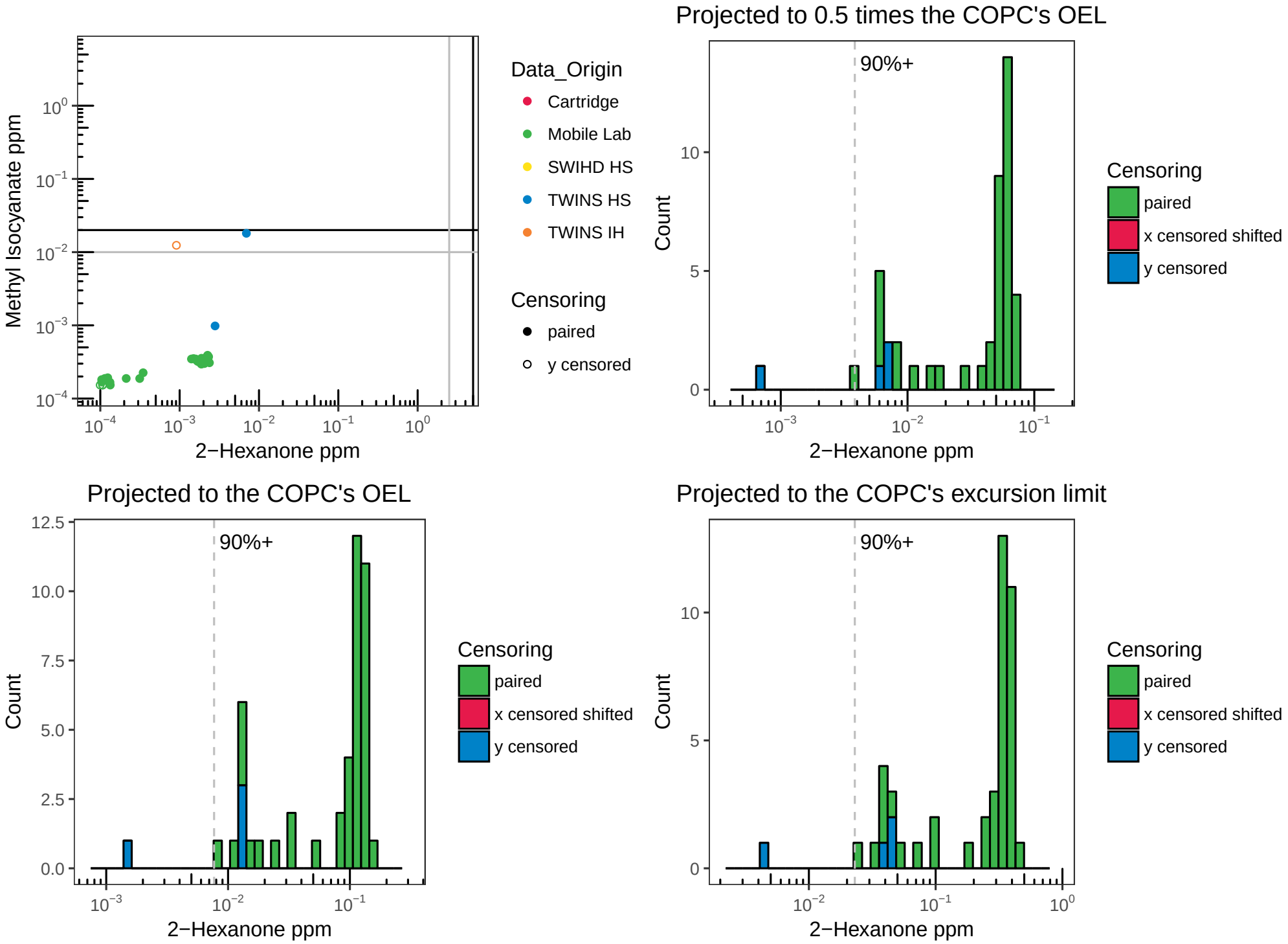


Figure C.508: Methyl Isocyanate vs 2-Hexanone

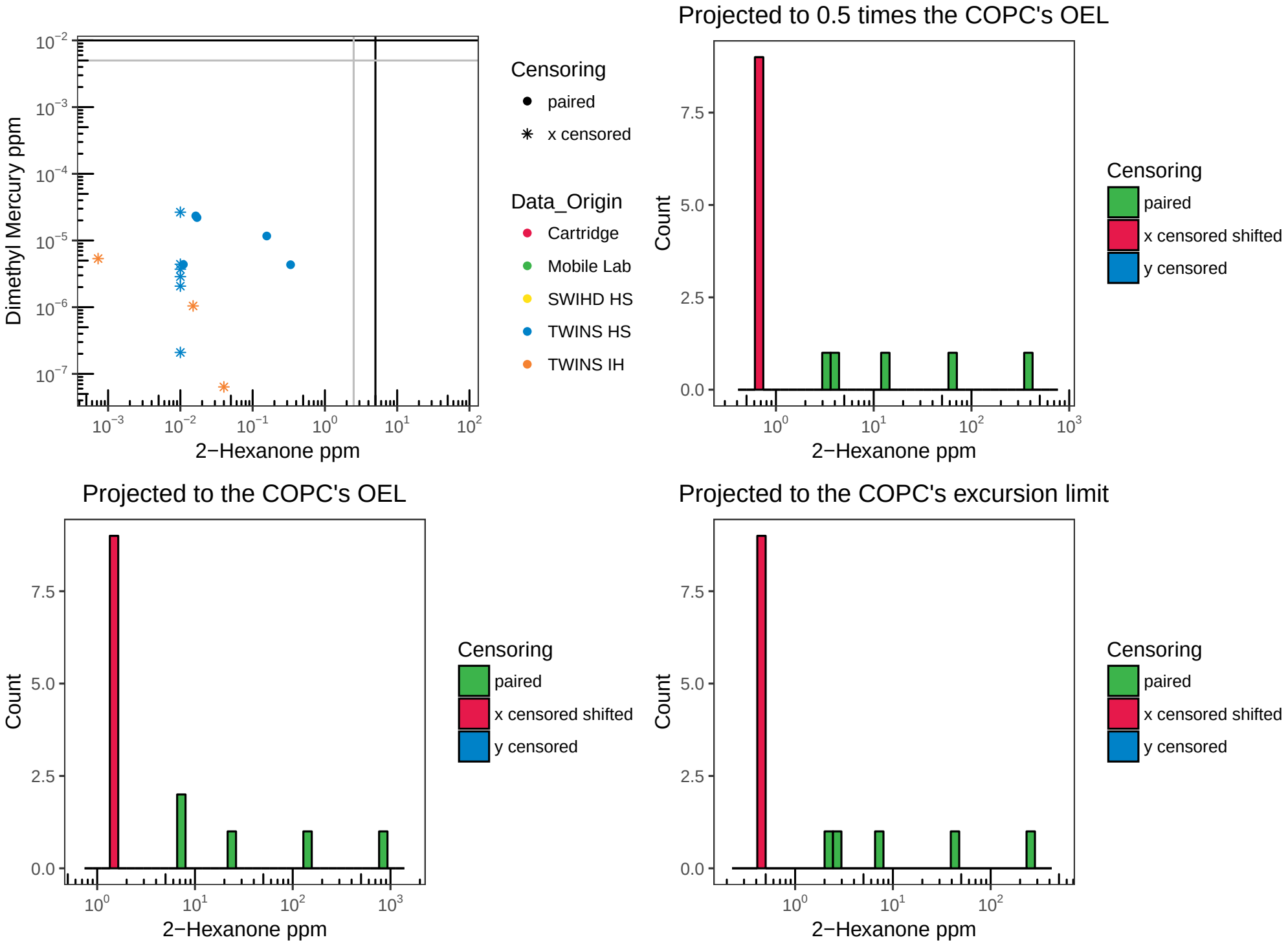


Figure C.509: Dimethyl Mercury vs 2-Hexanone

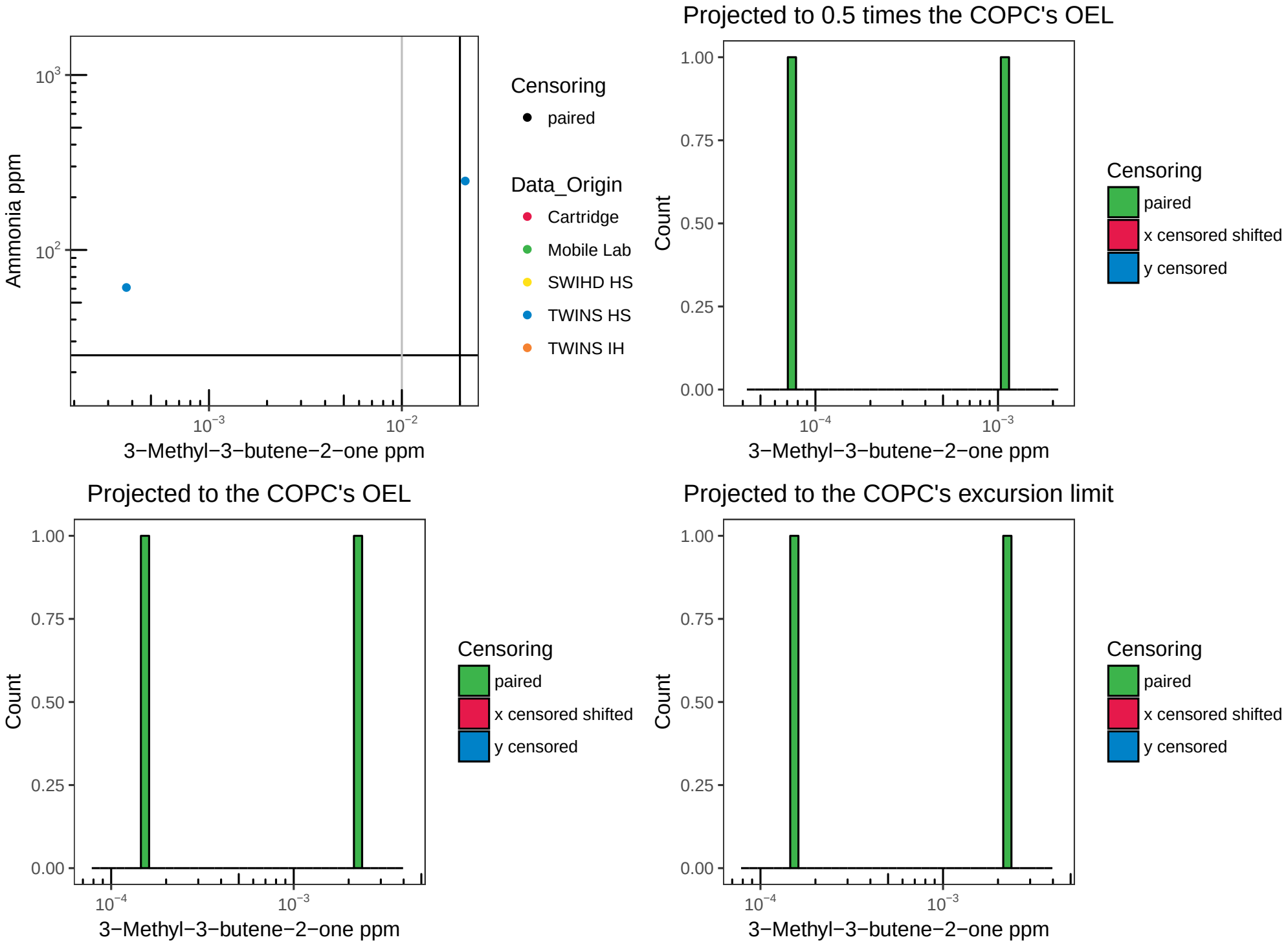


Figure C.510: Ammonia vs 3-Methyl-3-butene-2-one

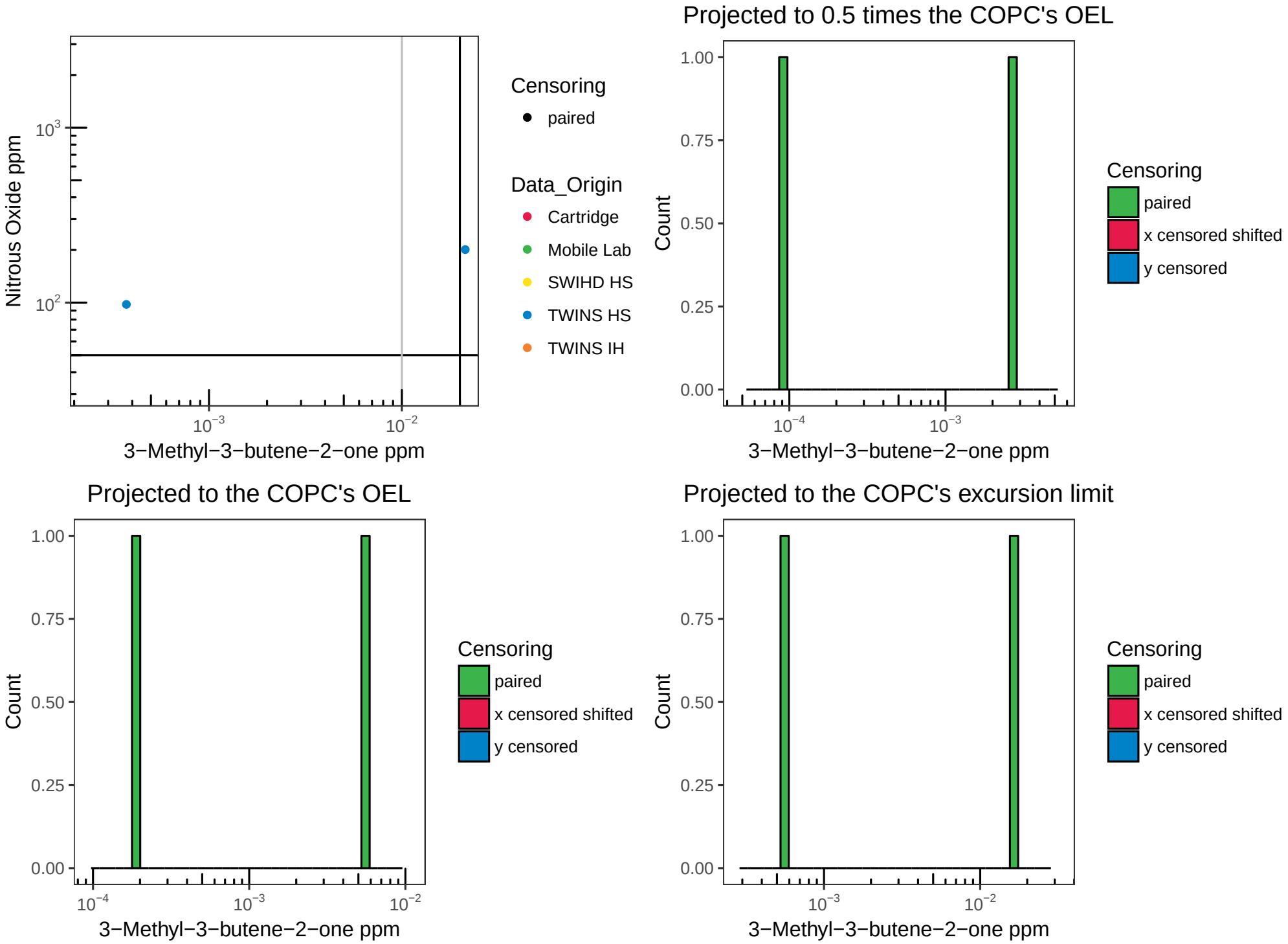


Figure C.511: Nitrous Oxide vs 3-Methyl-3-butene-2-one

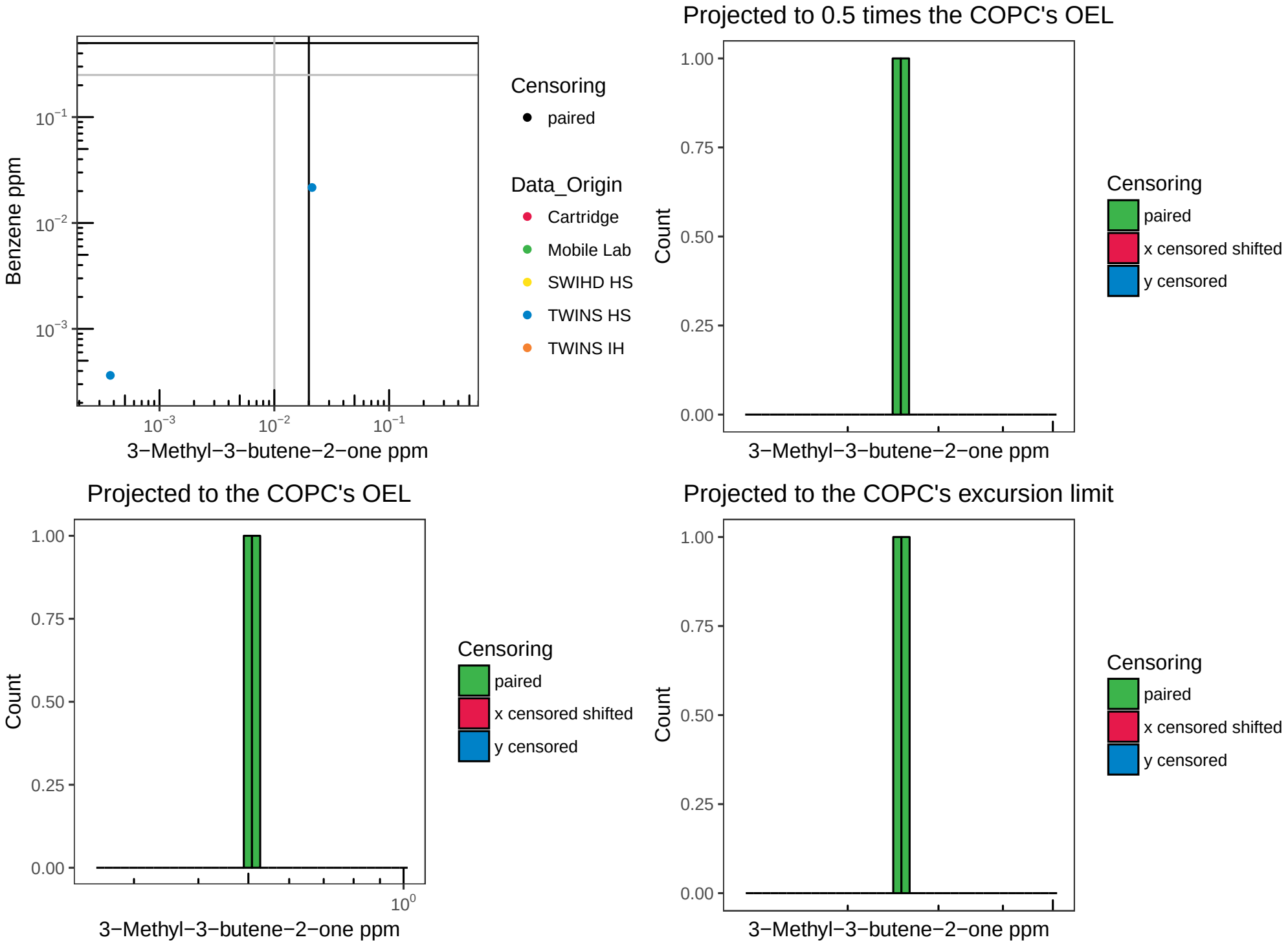


Figure C.512: Benzene vs 3-Methyl-3-butene-2-one

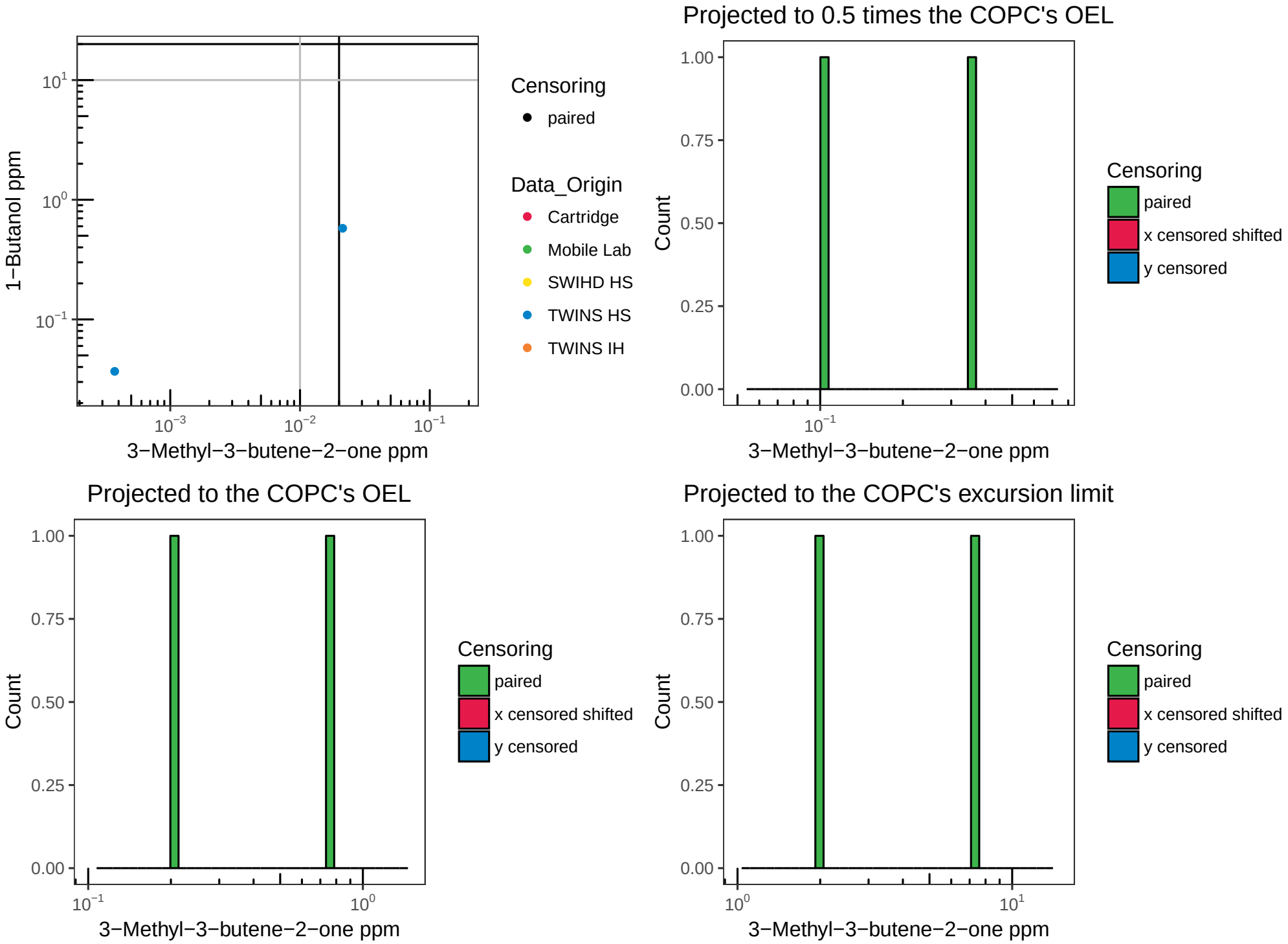


Figure C.513: 1-Butanol vs 3-Methyl-3-butene-2-one

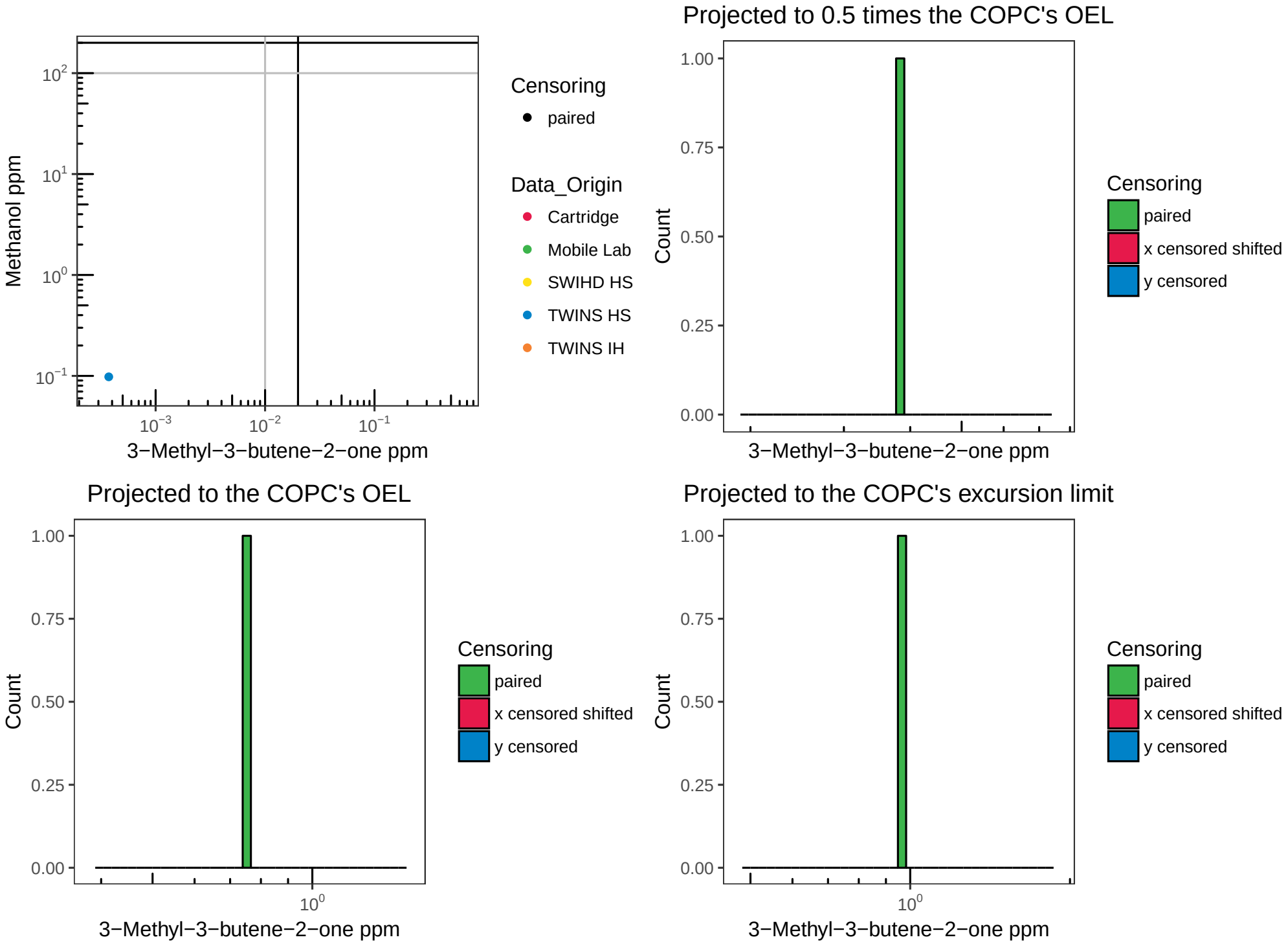


Figure C.514: Methanol vs 3-Methyl-3-butene-2-one

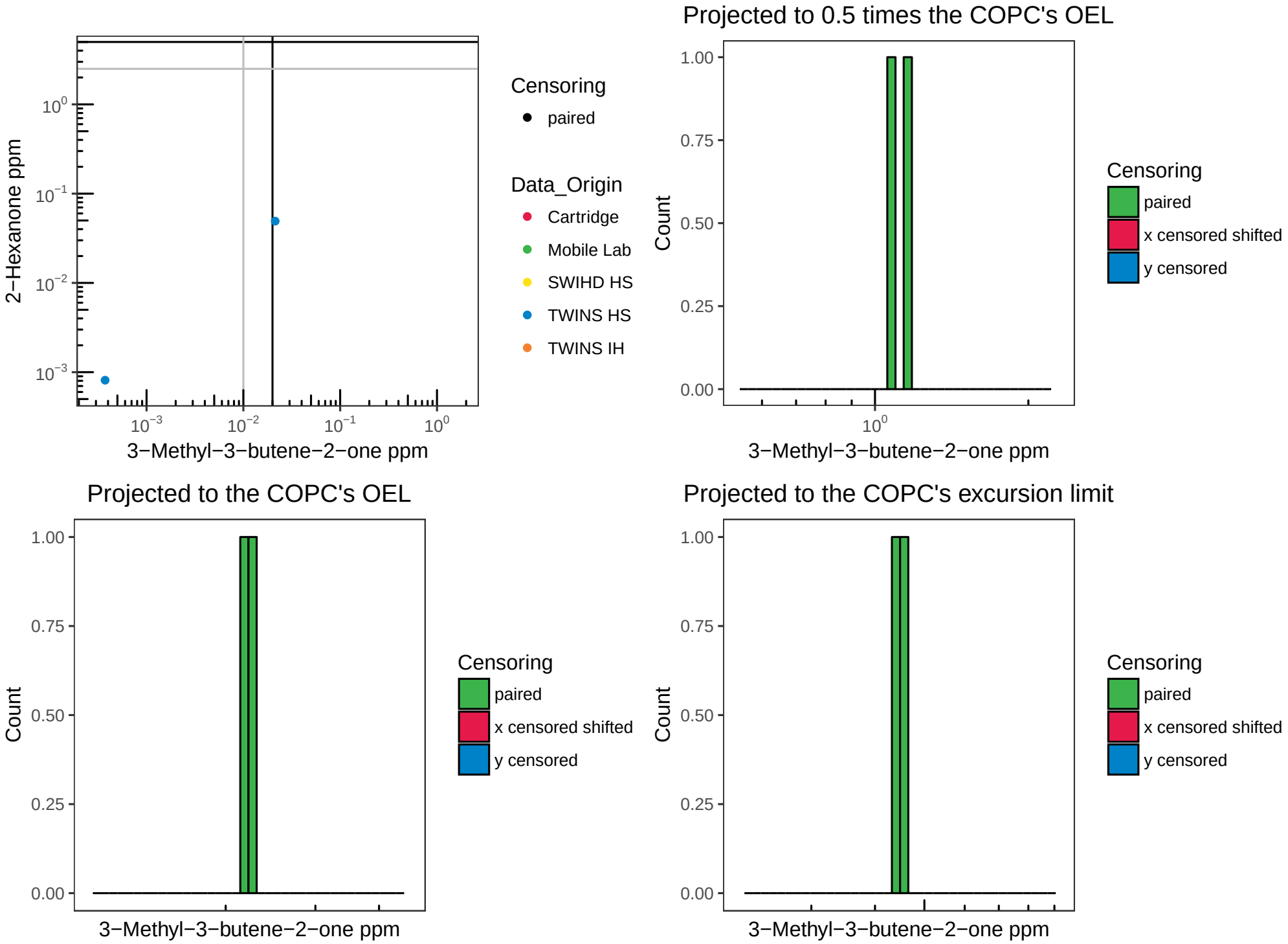


Figure C.515: 2-Hexanone vs 3-Methyl-3-butene-2-one

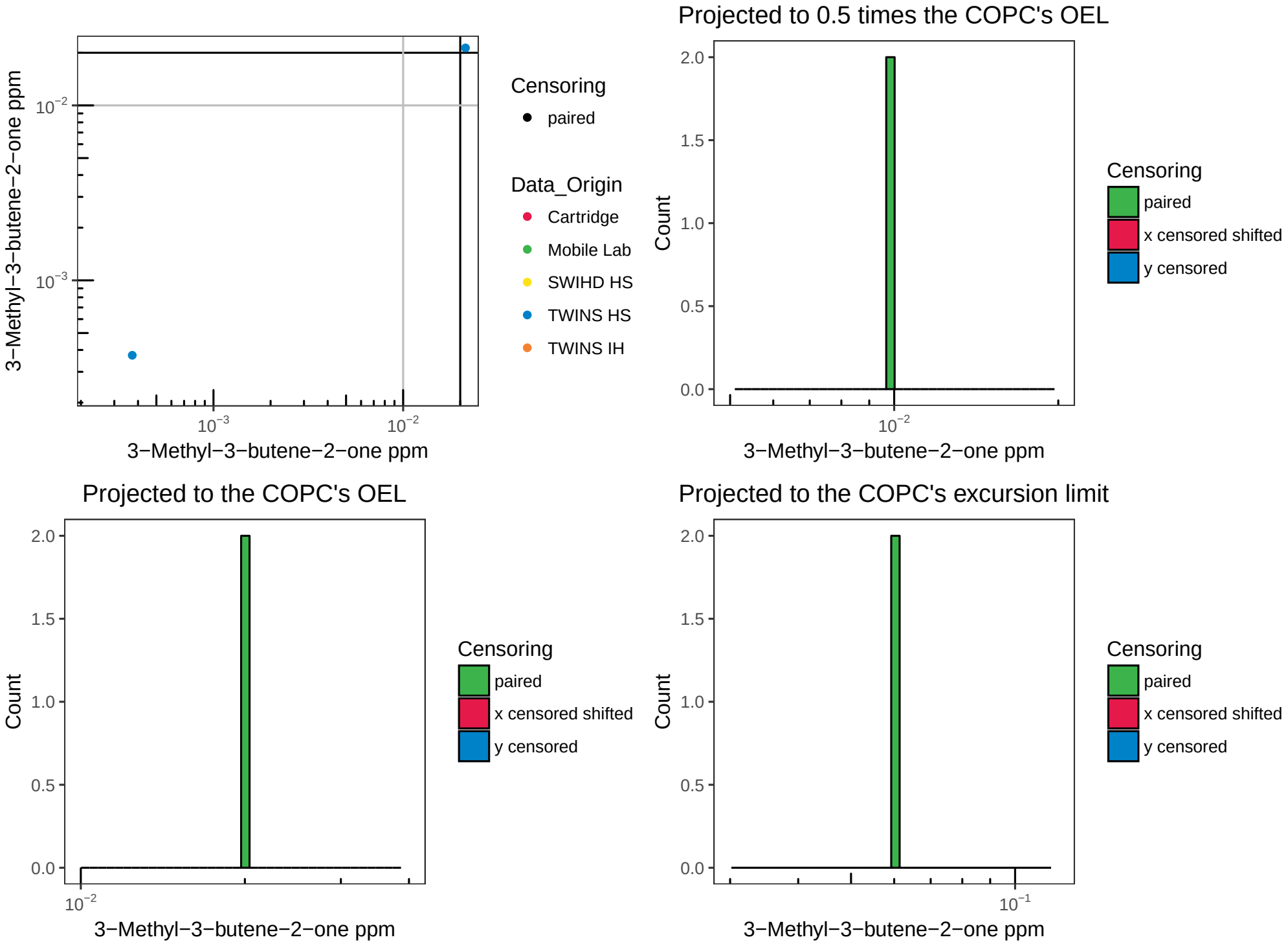


Figure C.516: 3-Methyl-3-butene-2-one vs 3-Methyl-3-butene-2-one

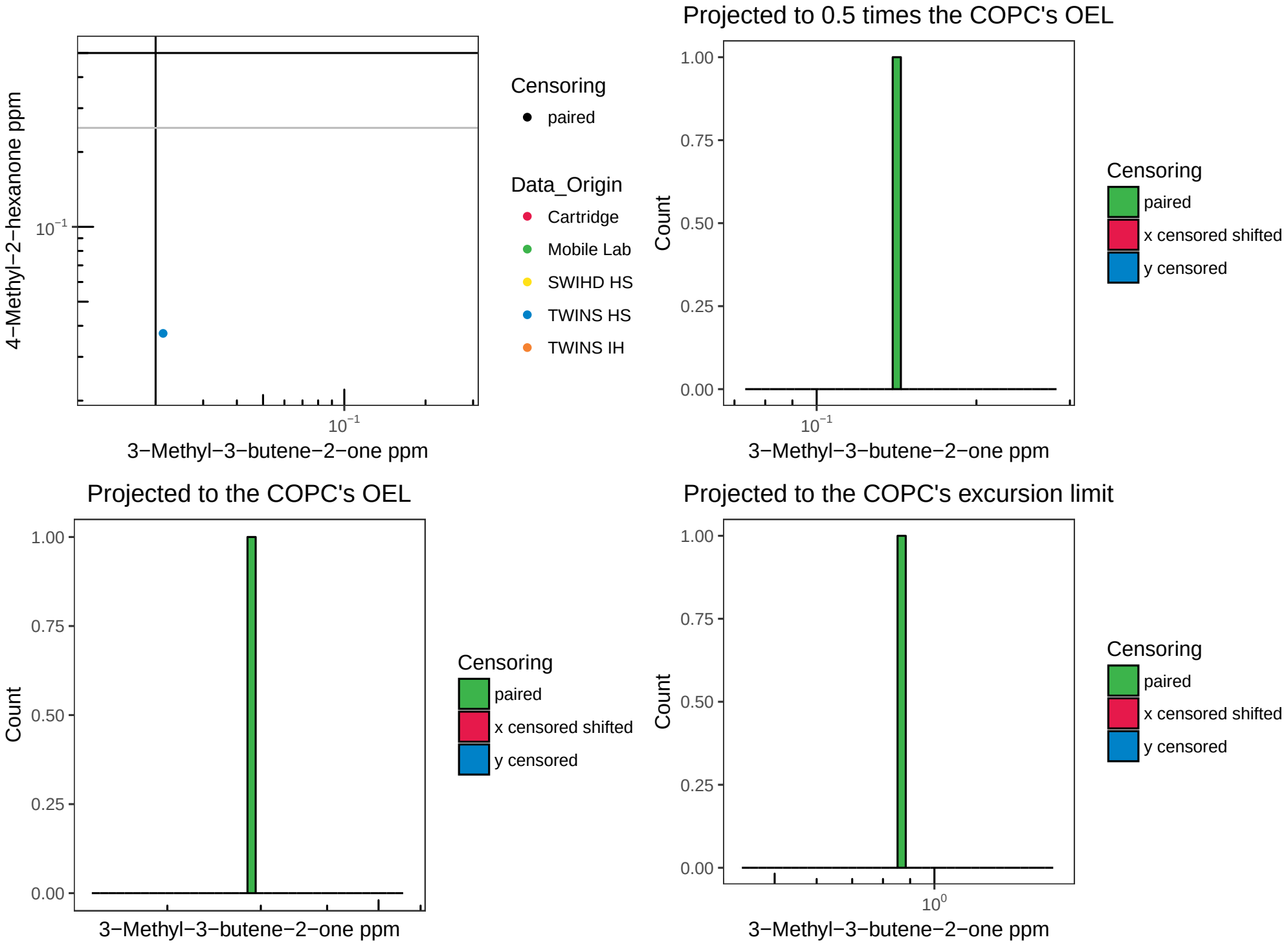


Figure C.517: 4-Methyl-2-hexanone vs 3-Methyl-3-butene-2-one

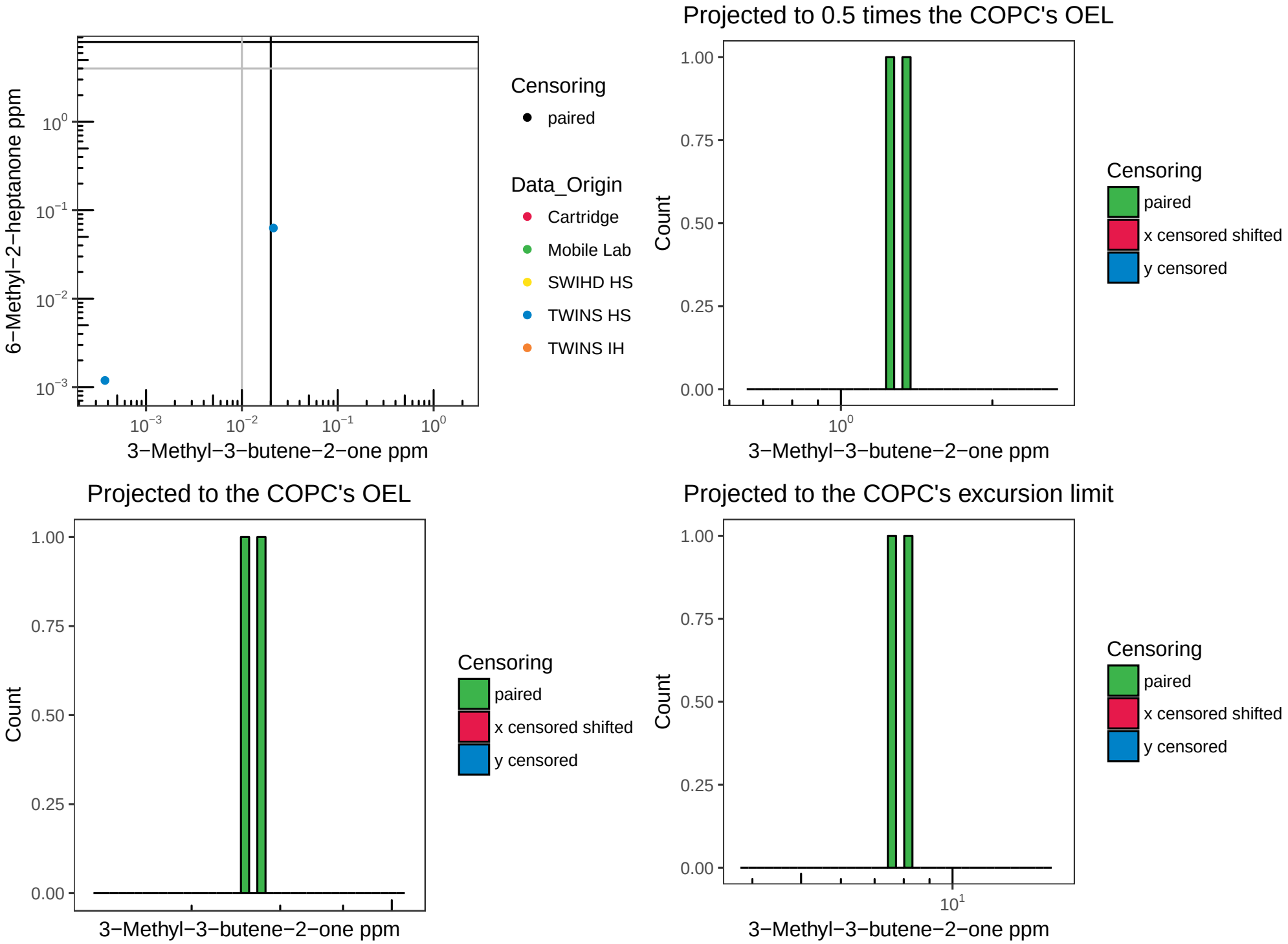


Figure C.518: 6-Methyl-2-heptanone vs 3-Methyl-3-butene-2-one

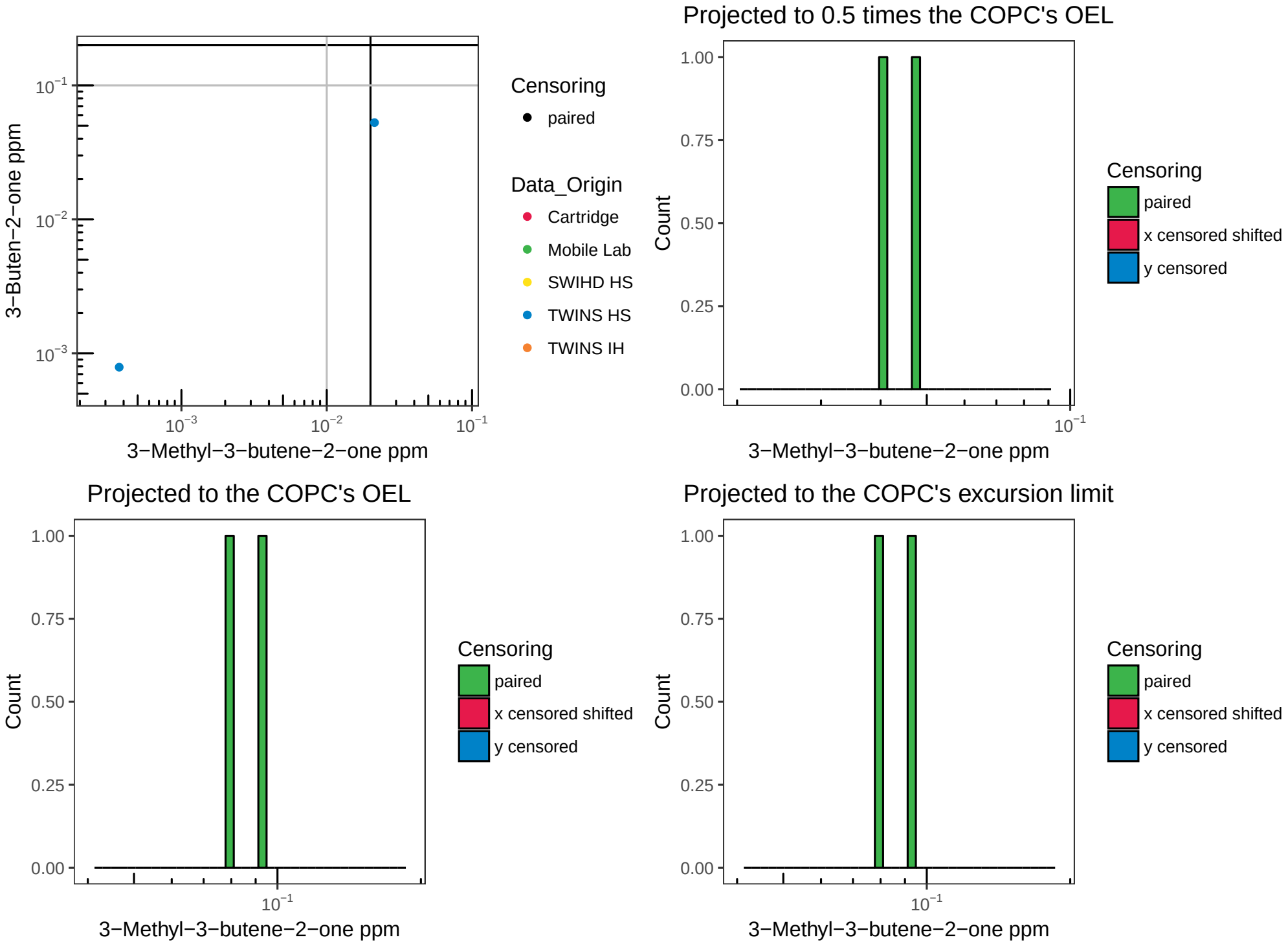


Figure C.519: 3-Buten-2-one vs 3-Methyl-3-butene-2-one

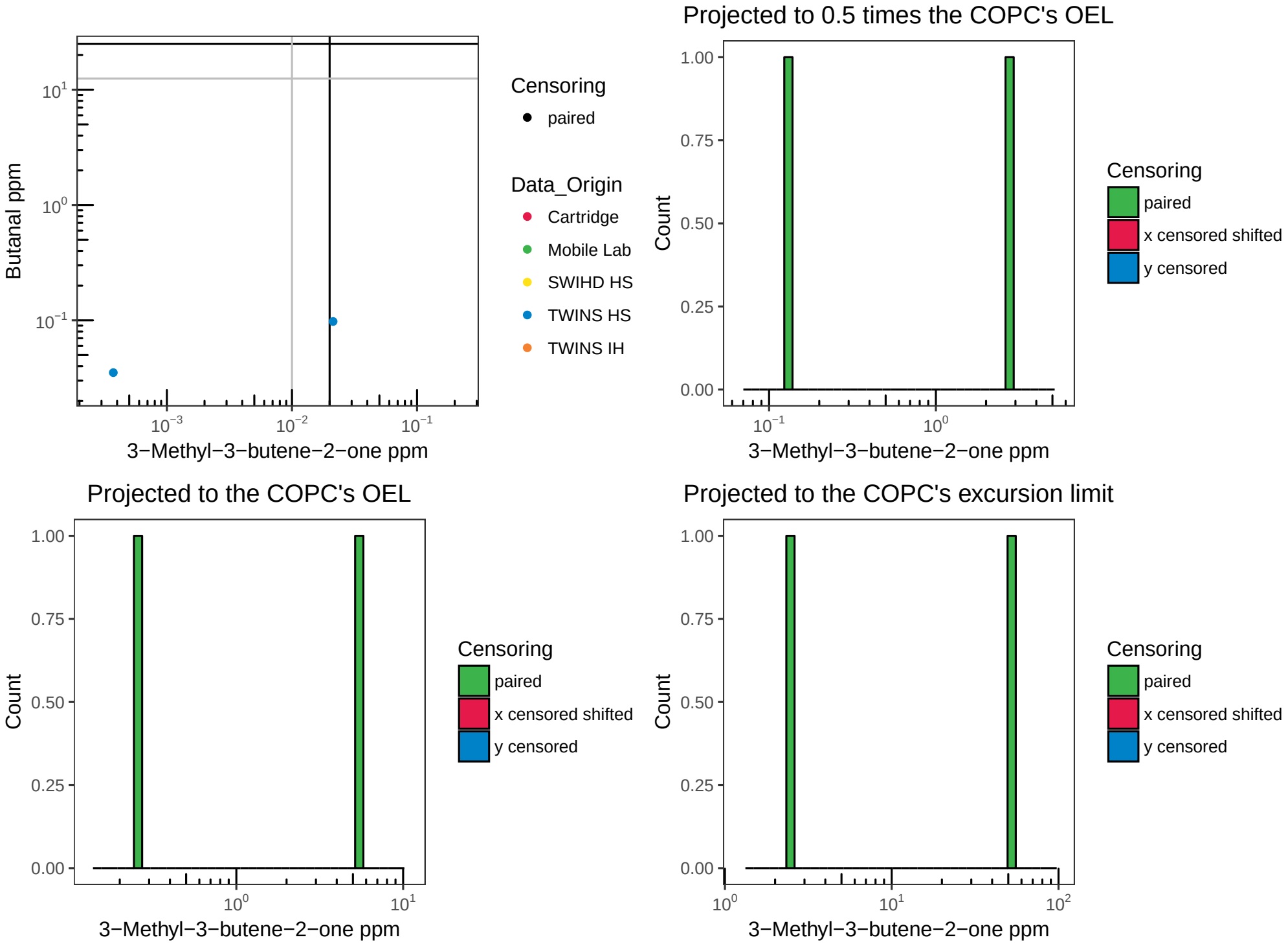


Figure C.520: Butanal vs 3-Methyl-3-butene-2-one

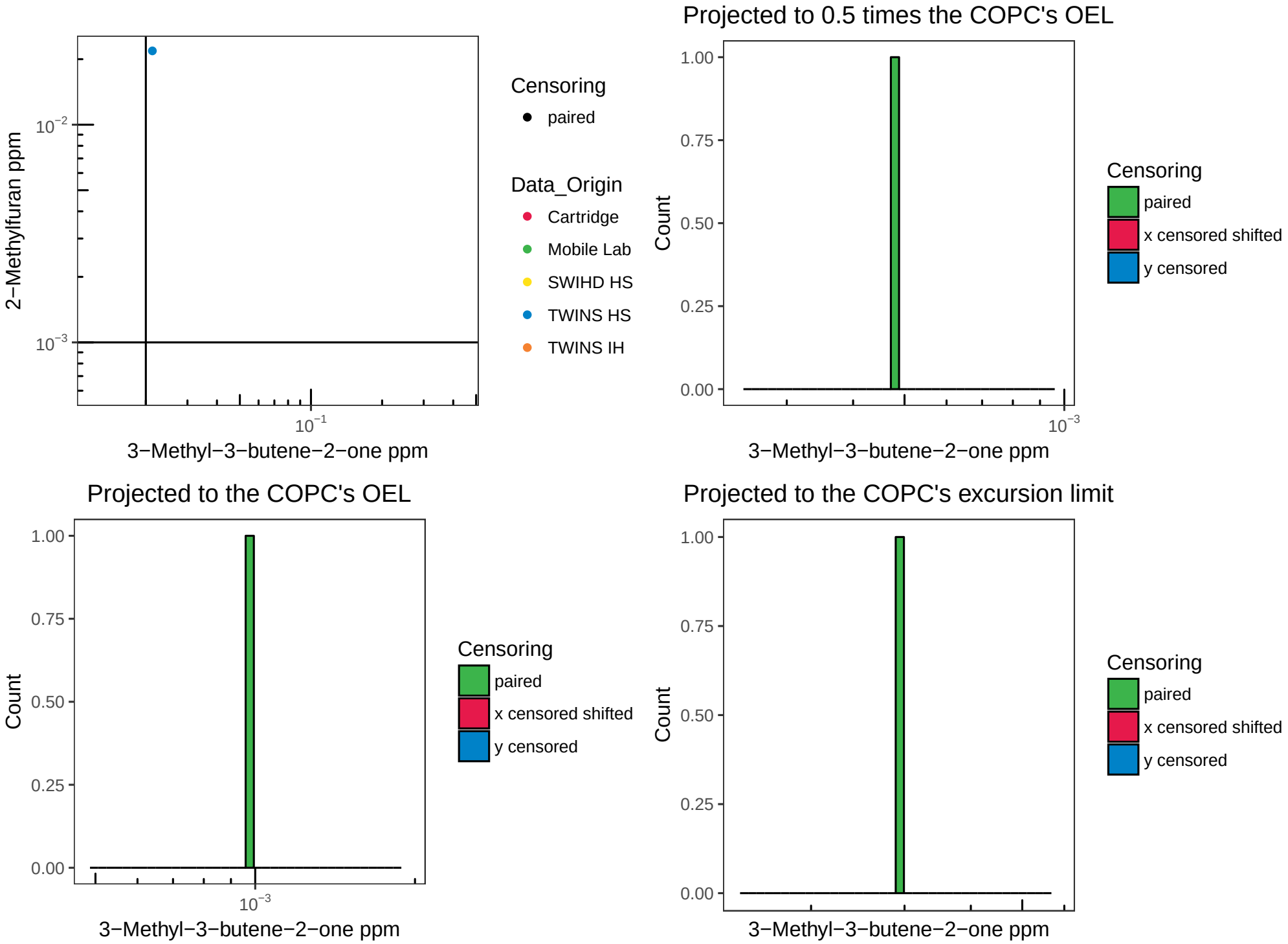


Figure C.521: 2-Methylfuran vs 3-Methyl-3-butene-2-one

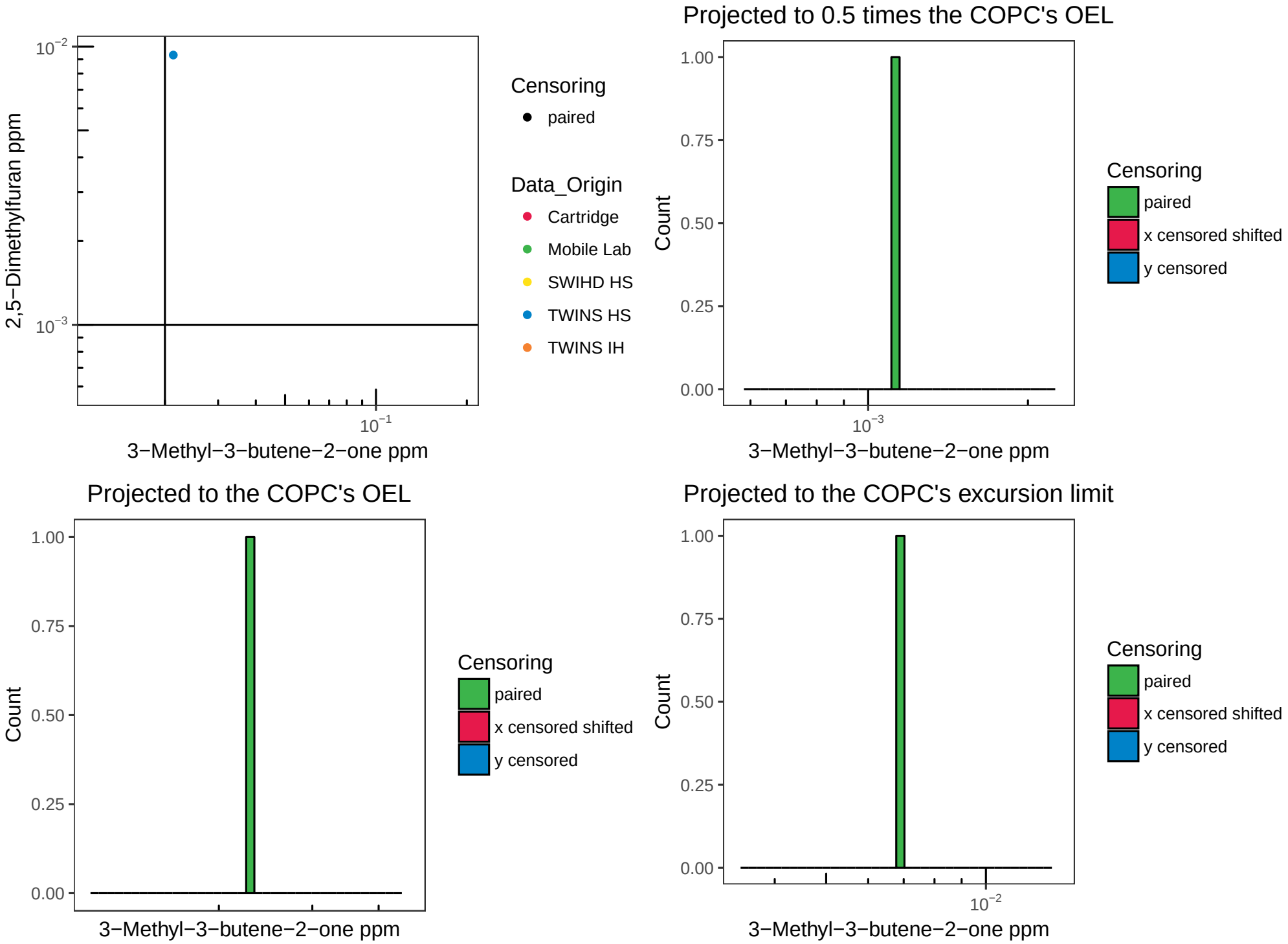


Figure C.522: 2,5-Dimethylfuran vs 3-Methyl-3-butene-2-one

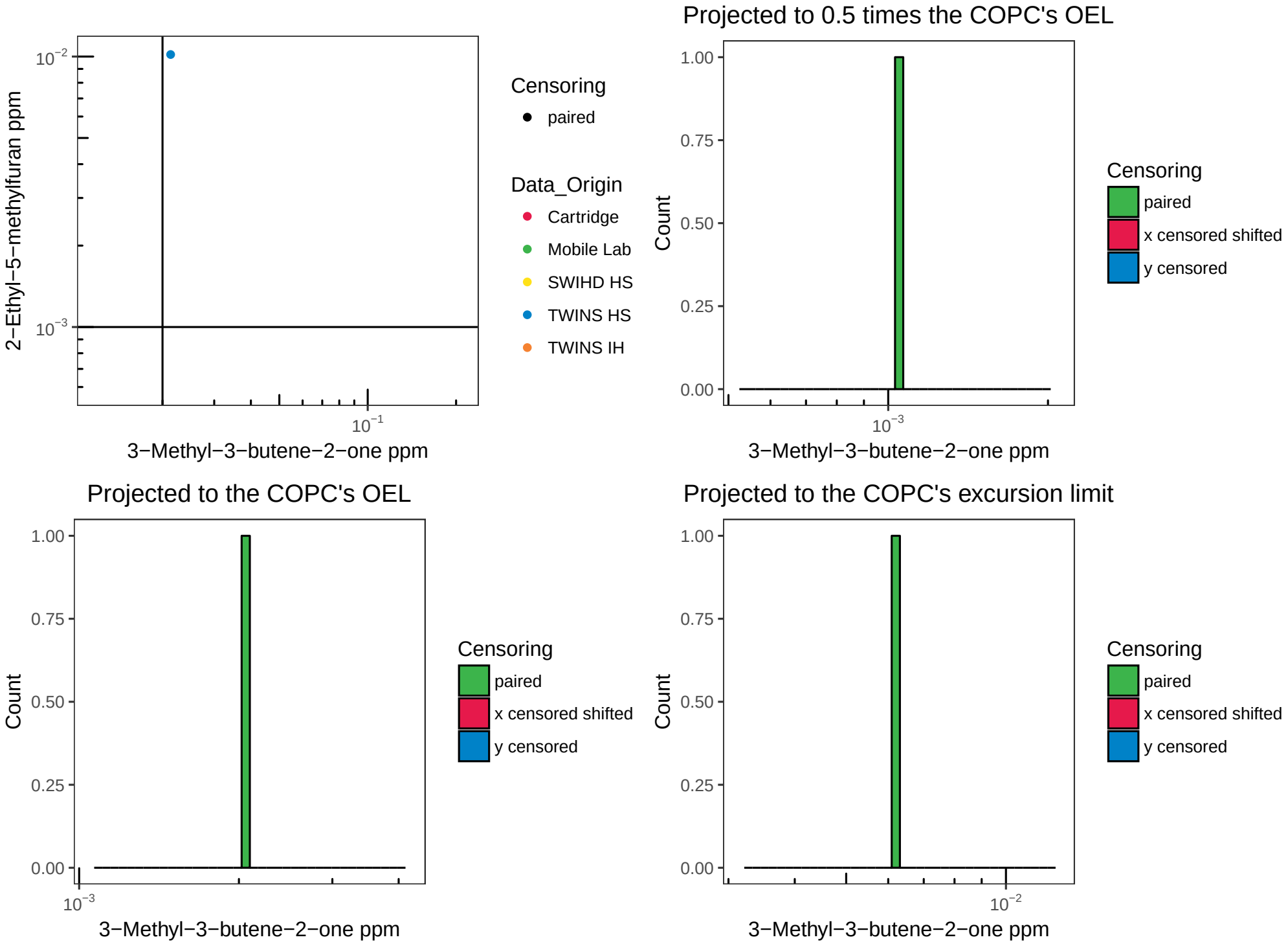


Figure C.523: 2-Ethyl-5-methylfuran vs 3-Methyl-3-butene-2-one

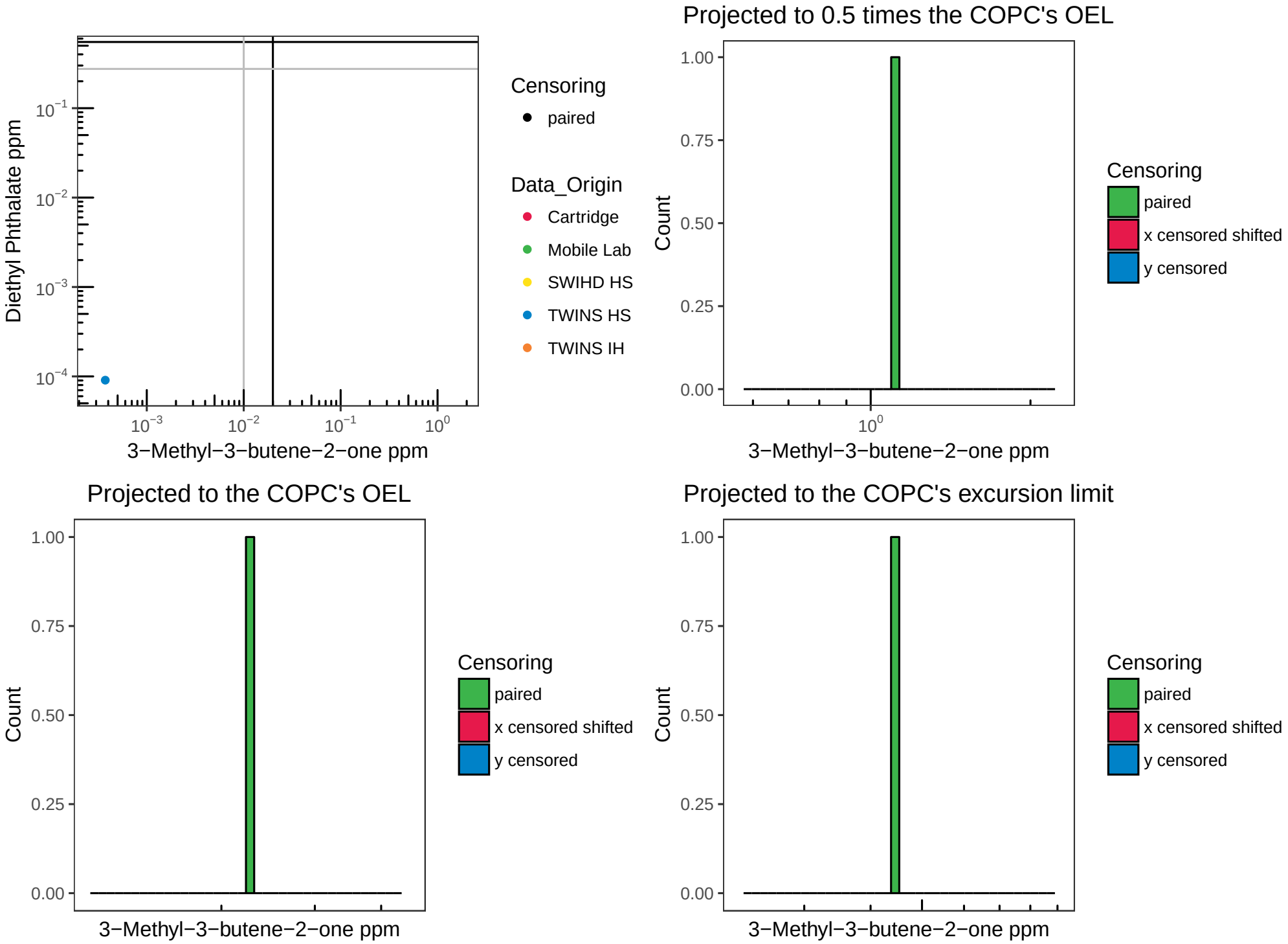


Figure C.524: Diethyl Phthalate vs 3-Methyl-3-butene-2-one

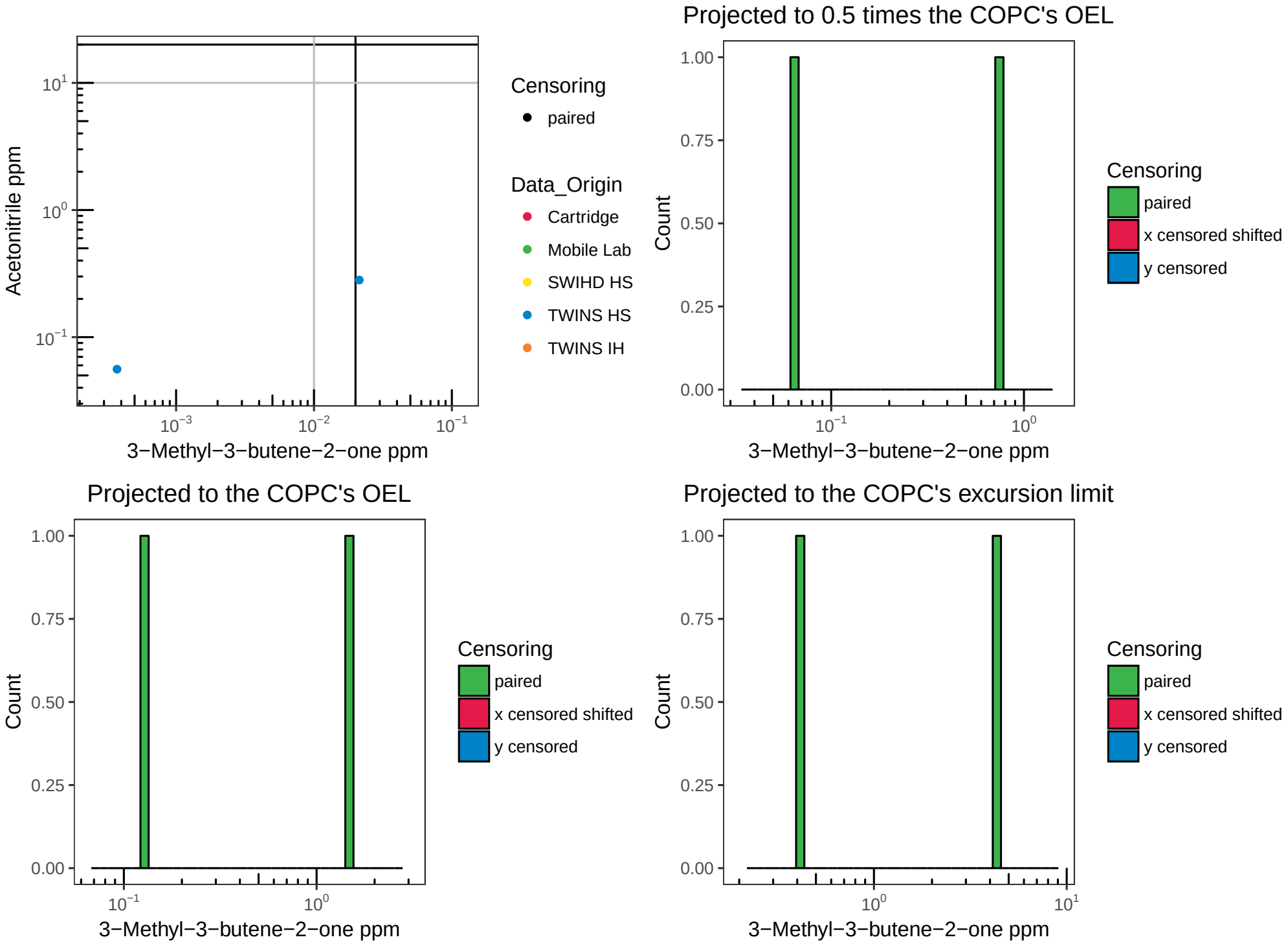


Figure C.525: Acetonitrile vs 3-Methyl-3-butene-2-one

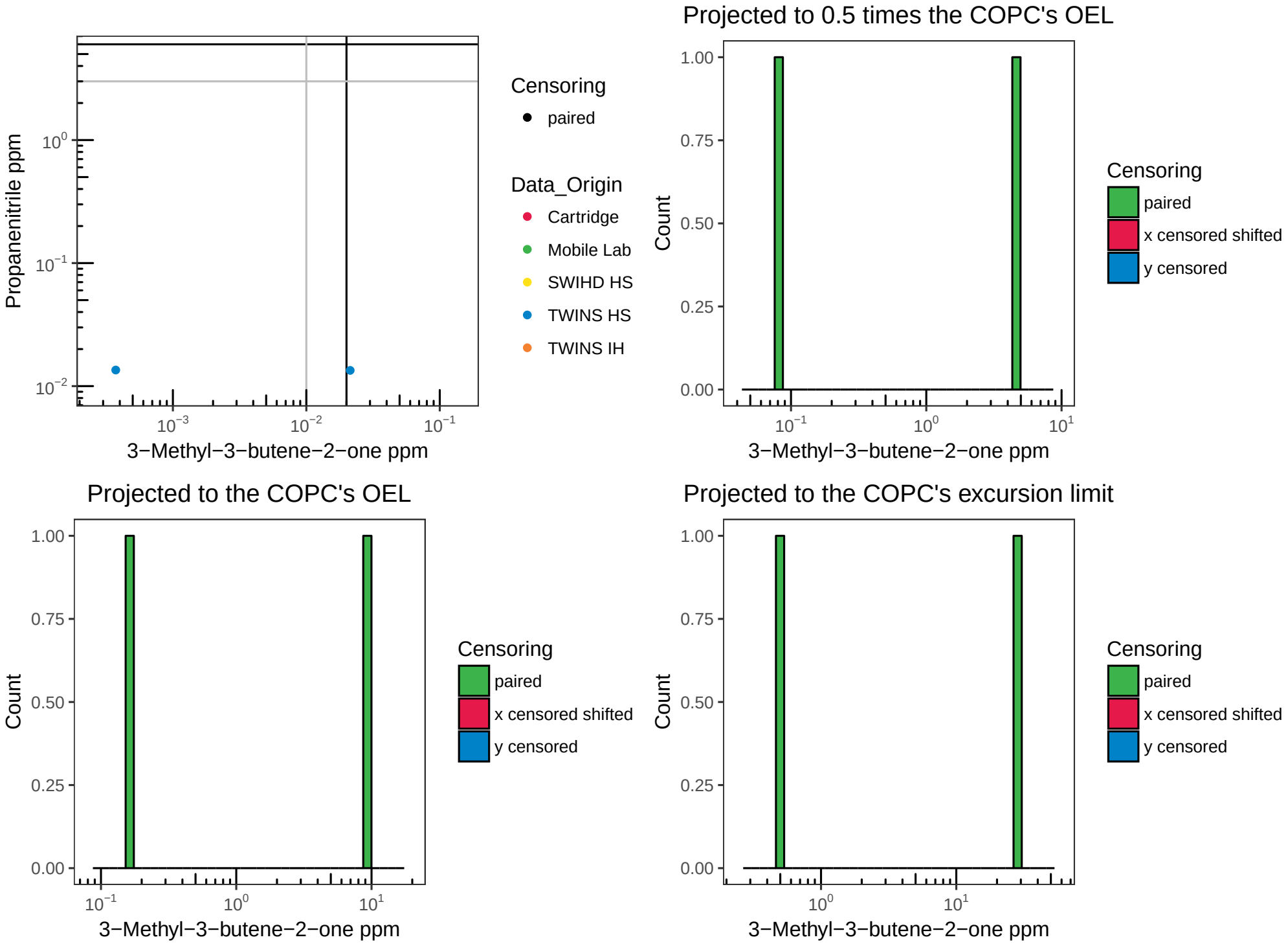


Figure C.526: Propanenitrile vs 3-Methyl-3-butene-2-one

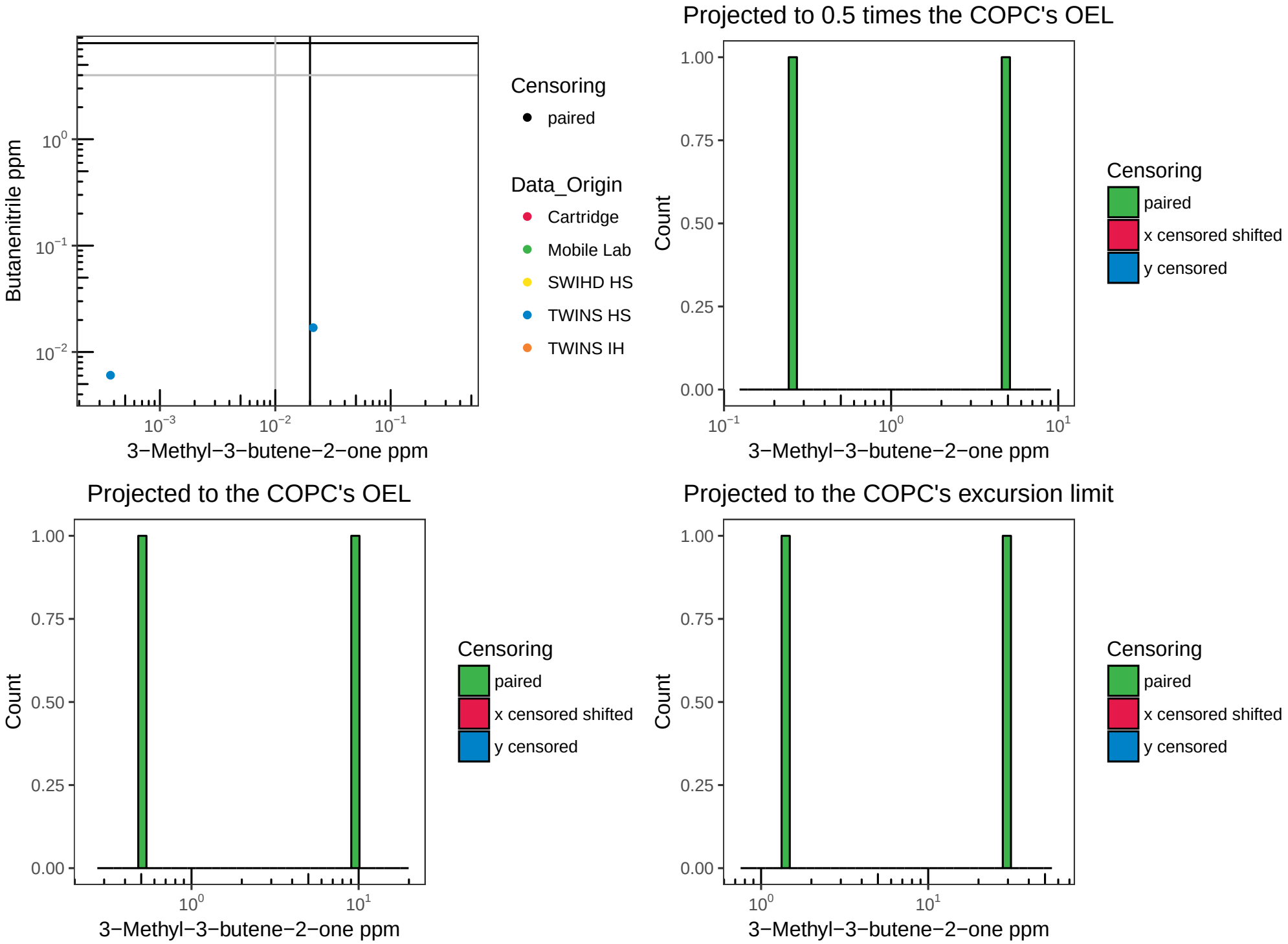


Figure C.527: Butanenitrile vs 3-Methyl-3-butene-2-one

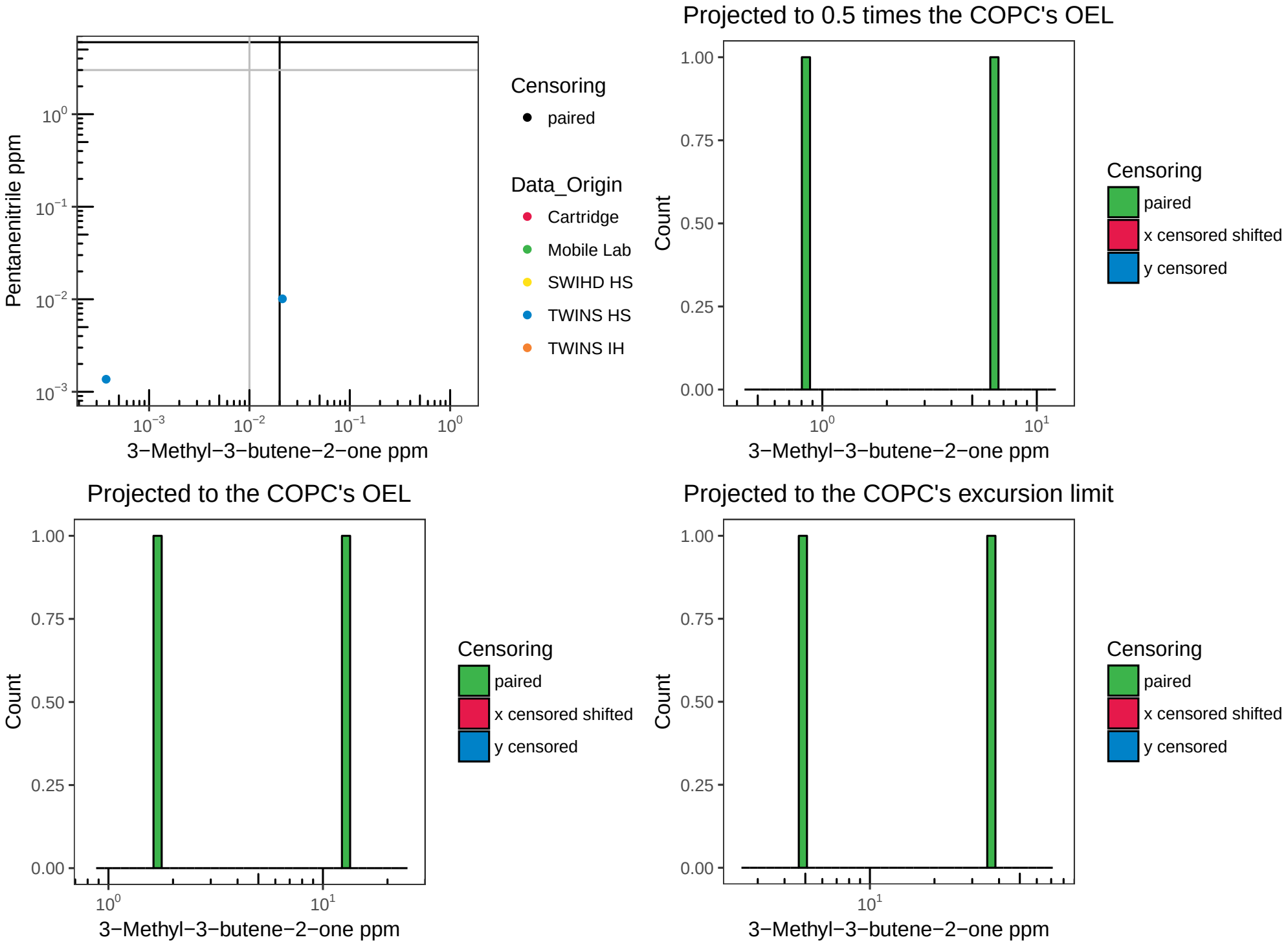


Figure C.528: Pentanenitrile vs 3-Methyl-3-butene-2-one

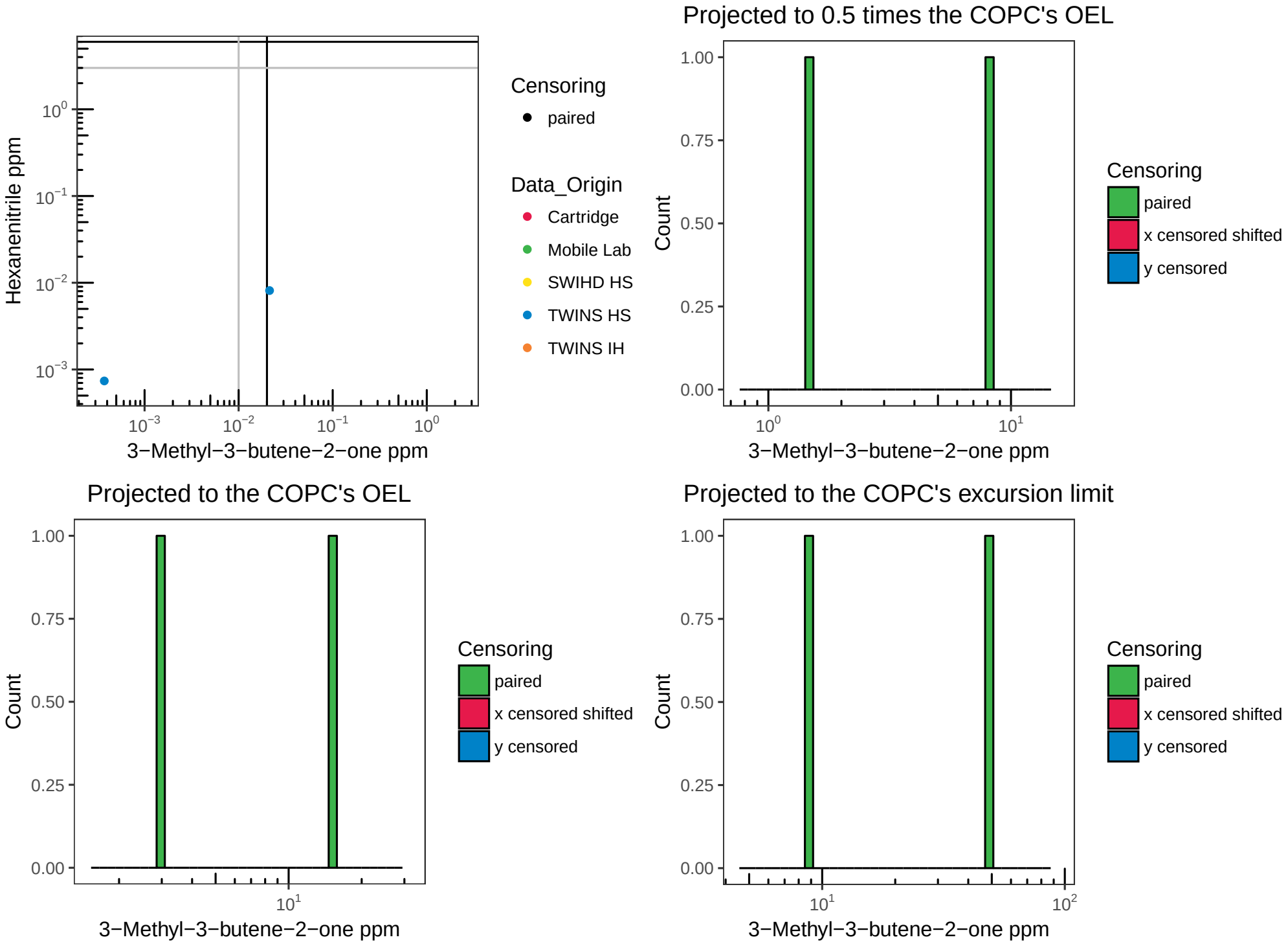


Figure C.529: Hexanenitrile vs 3-Methyl-3-butene-2-one

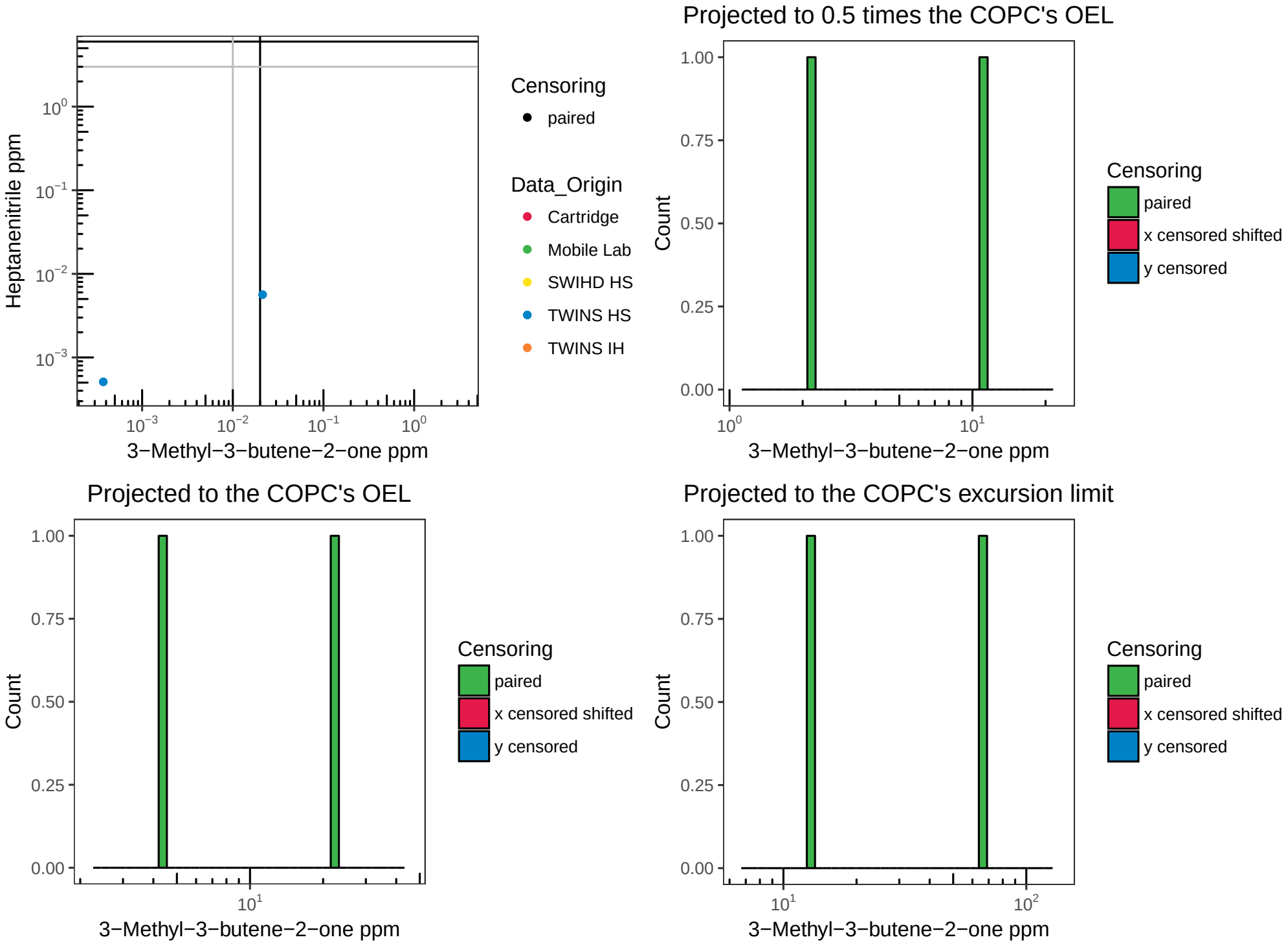


Figure C.530: Heptanenitrile vs 3-Methyl-3-butene-2-one

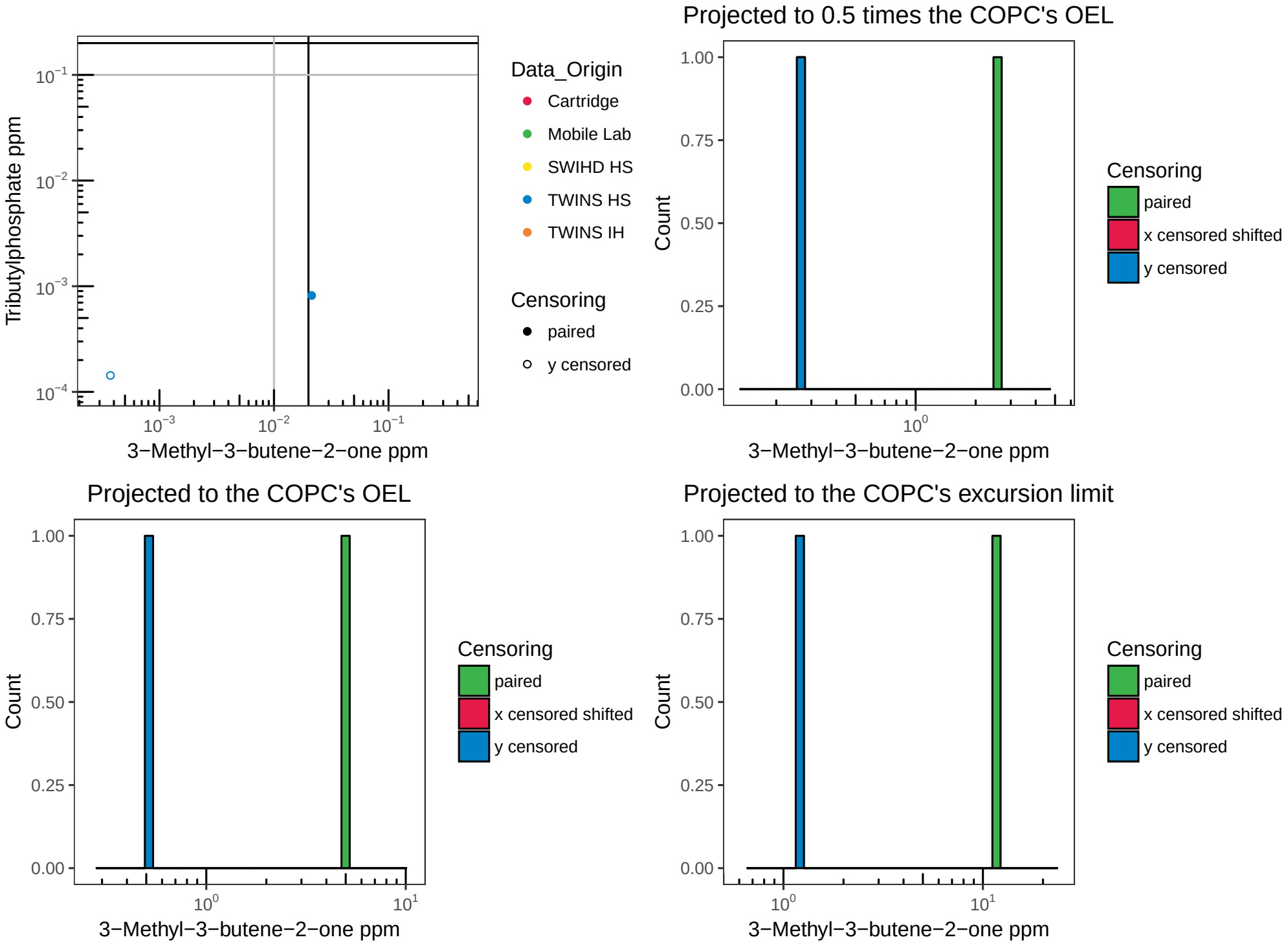


Figure C.531: Tributylphosphate vs 3-Methyl-3-butene-2-one

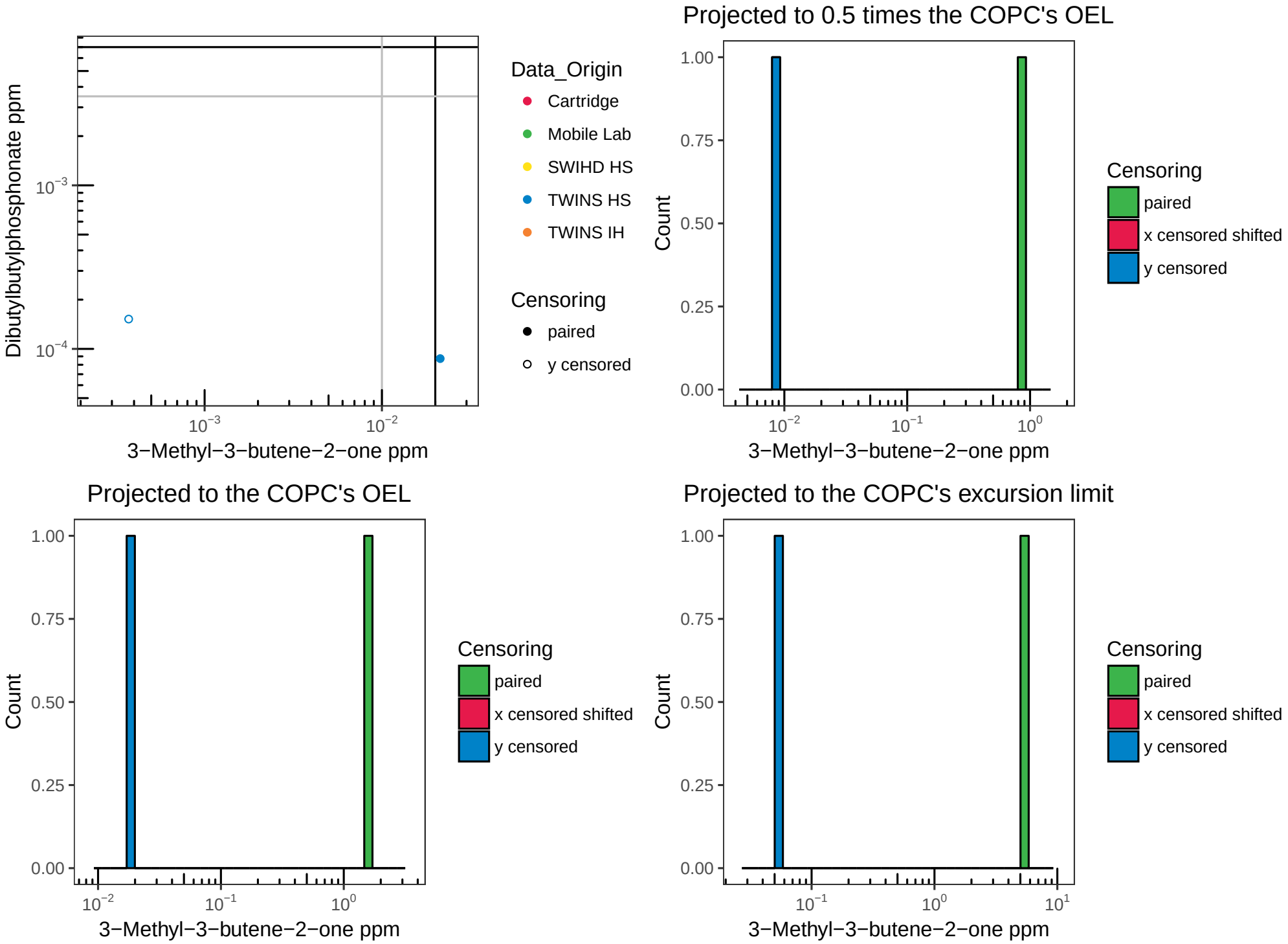


Figure C.532: Dibutylbutylphosphonate vs 3-Methyl-3-butene-2-one

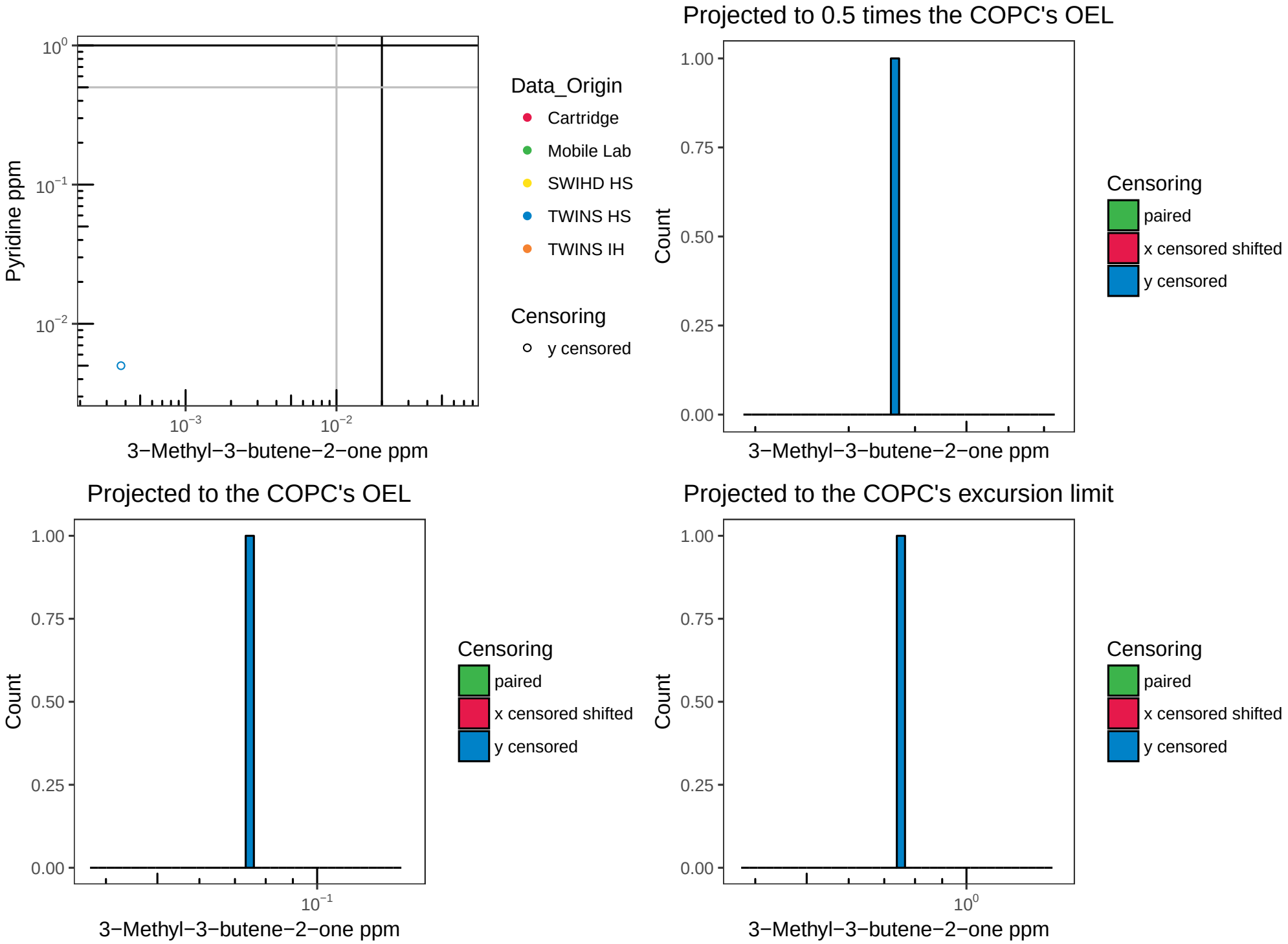


Figure C.533: Pyridine vs 3-Methyl-3-butene-2-one

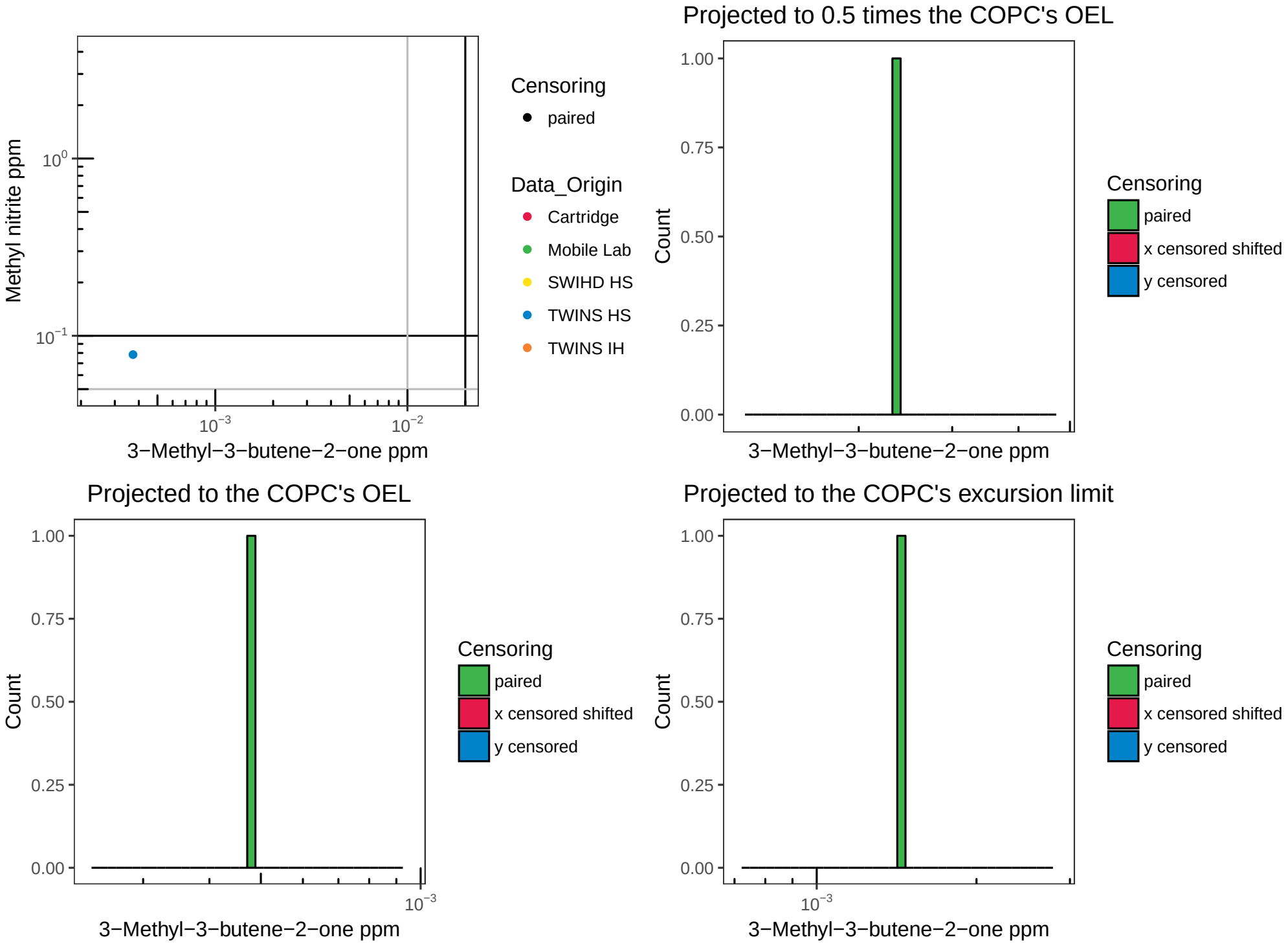


Figure C.534: Methyl nitrite vs 3-Methyl-3-butene-2-one

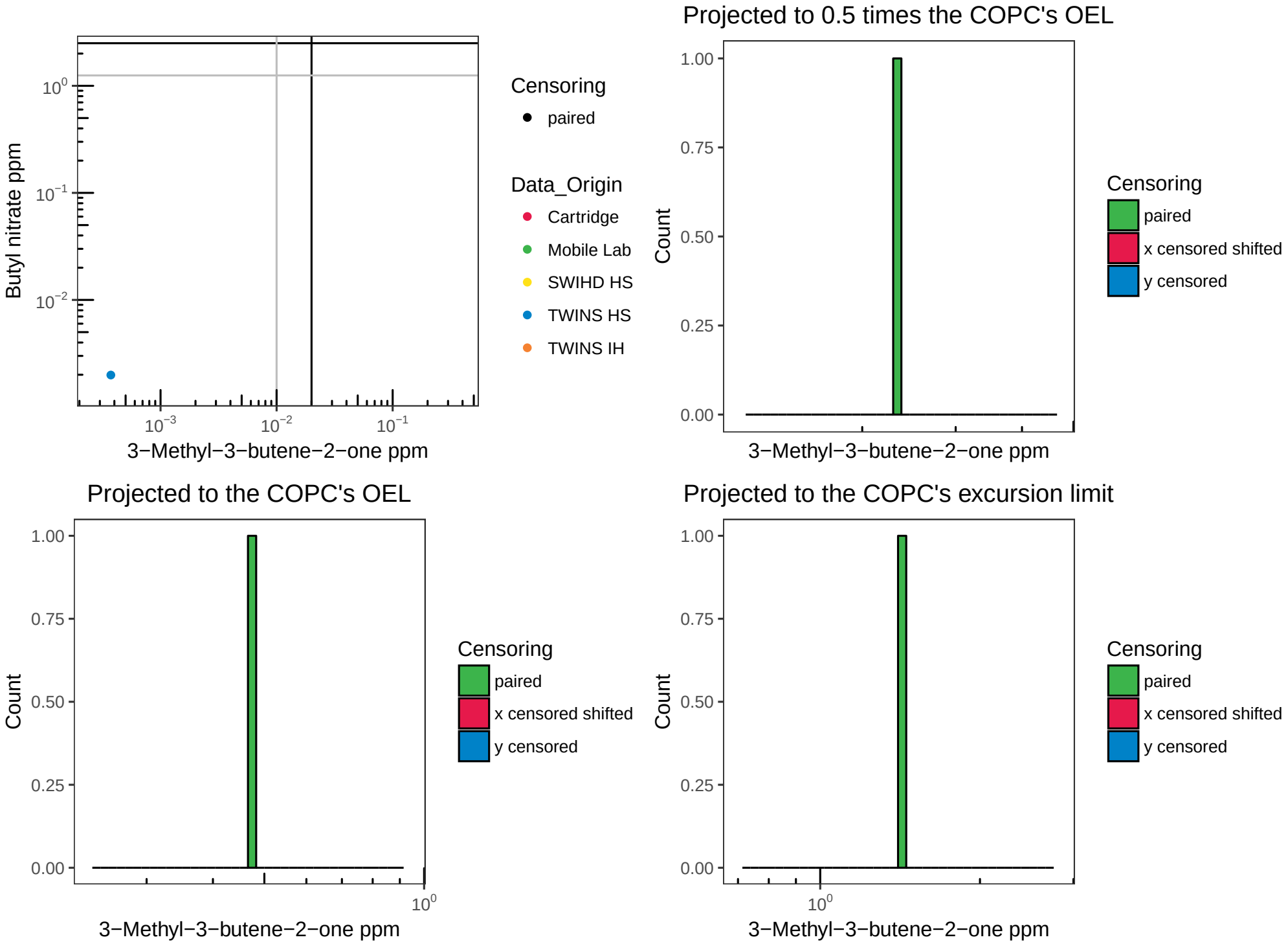


Figure C.535: Butyl nitrate vs 3-Methyl-3-butene-2-one

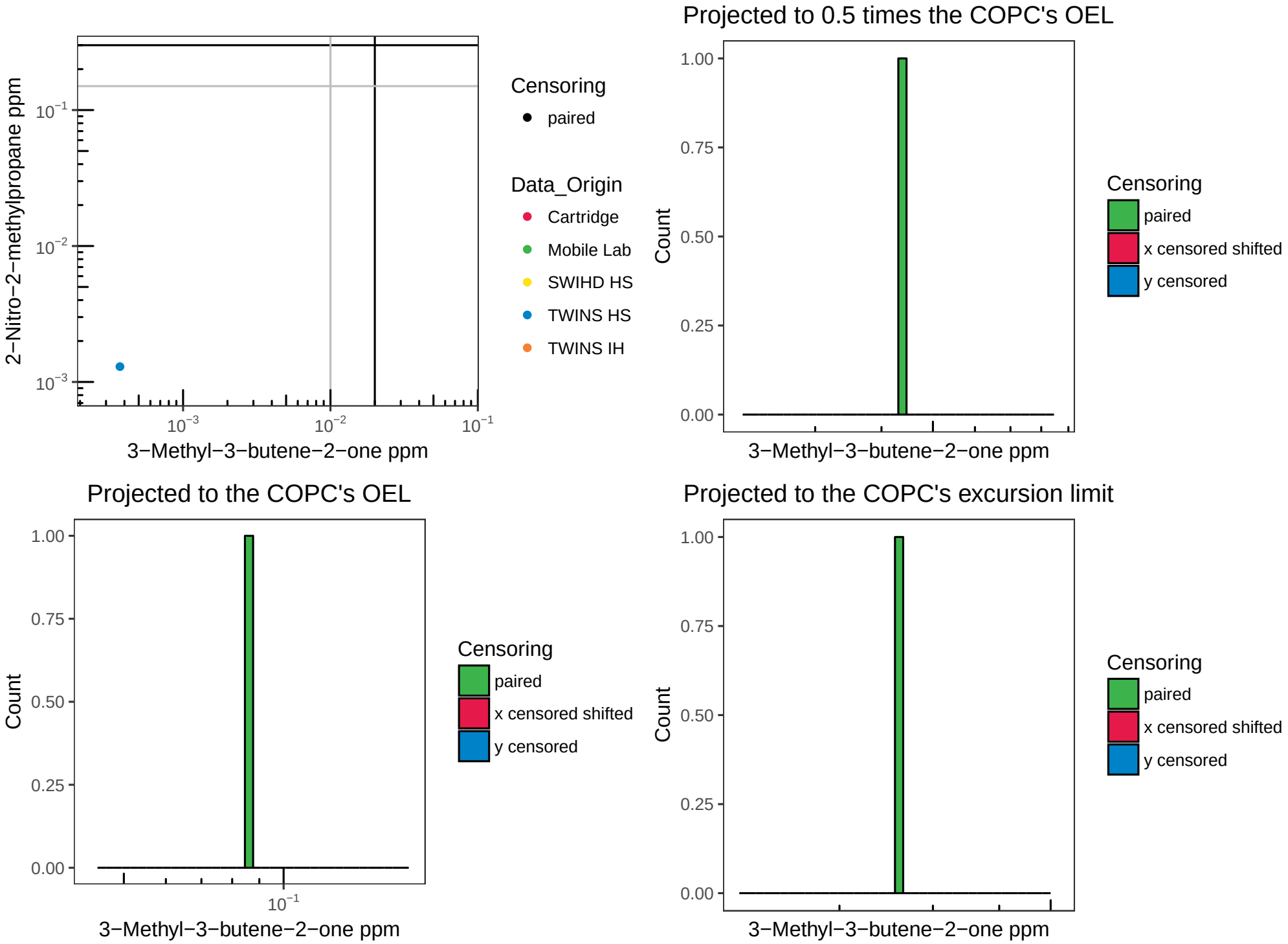


Figure C.536: 2-Nitro-2-methylpropane vs 3-Methyl-3-butene-2-one

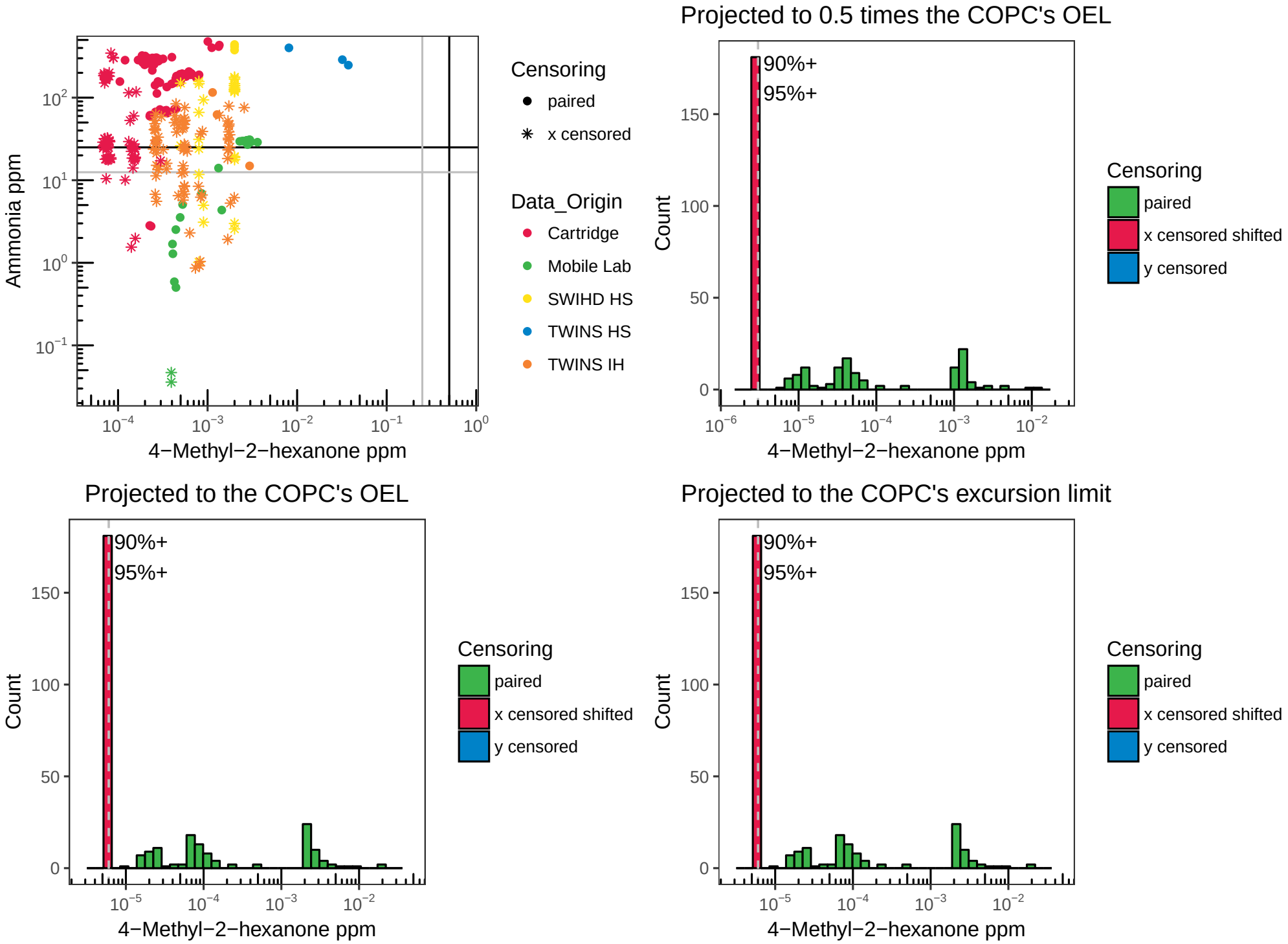


Figure C.537: Ammonia vs 4-Methyl-2-hexanone

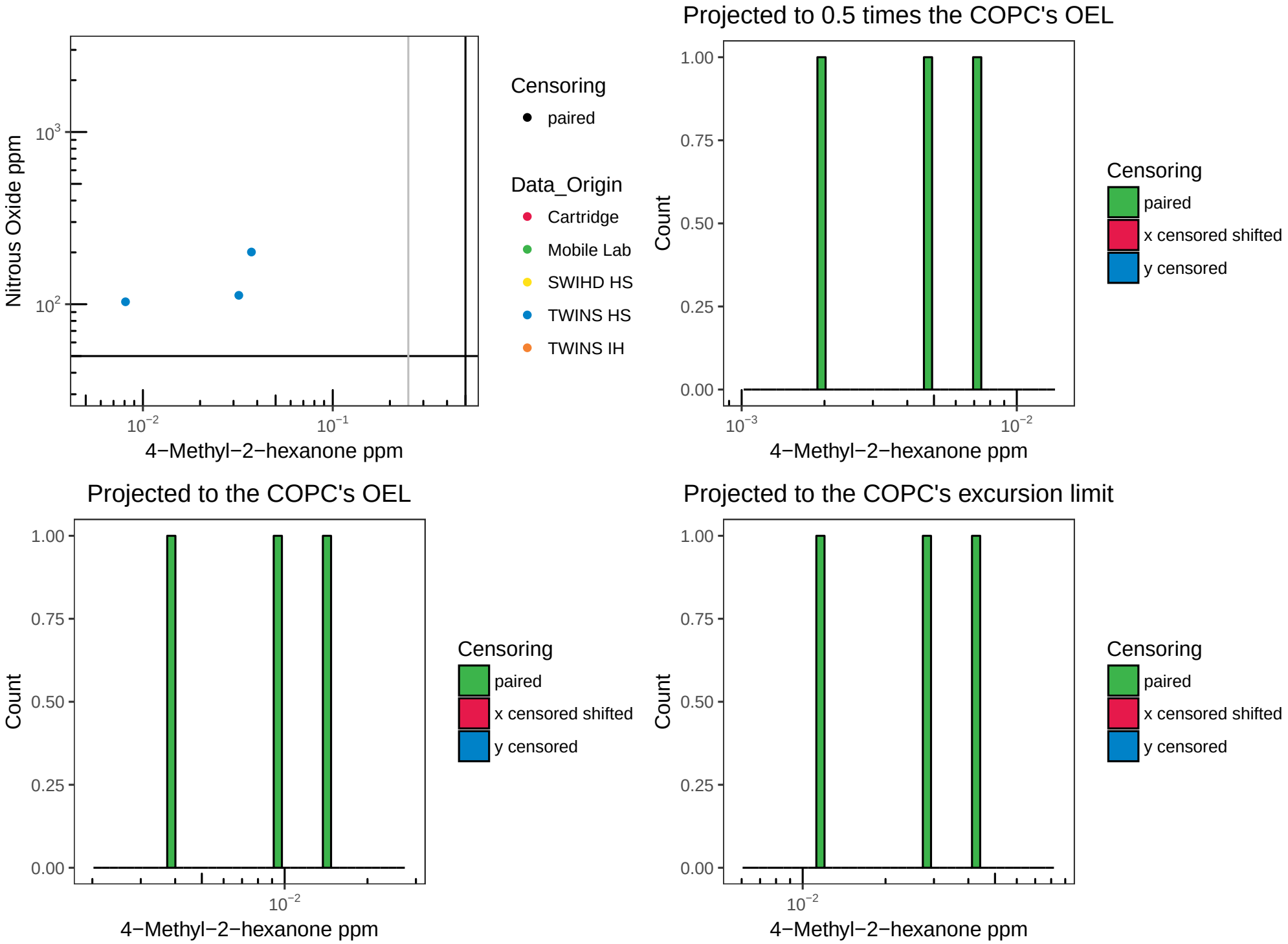


Figure C.538: Nitrous Oxide vs 4-Methyl-2-hexanone

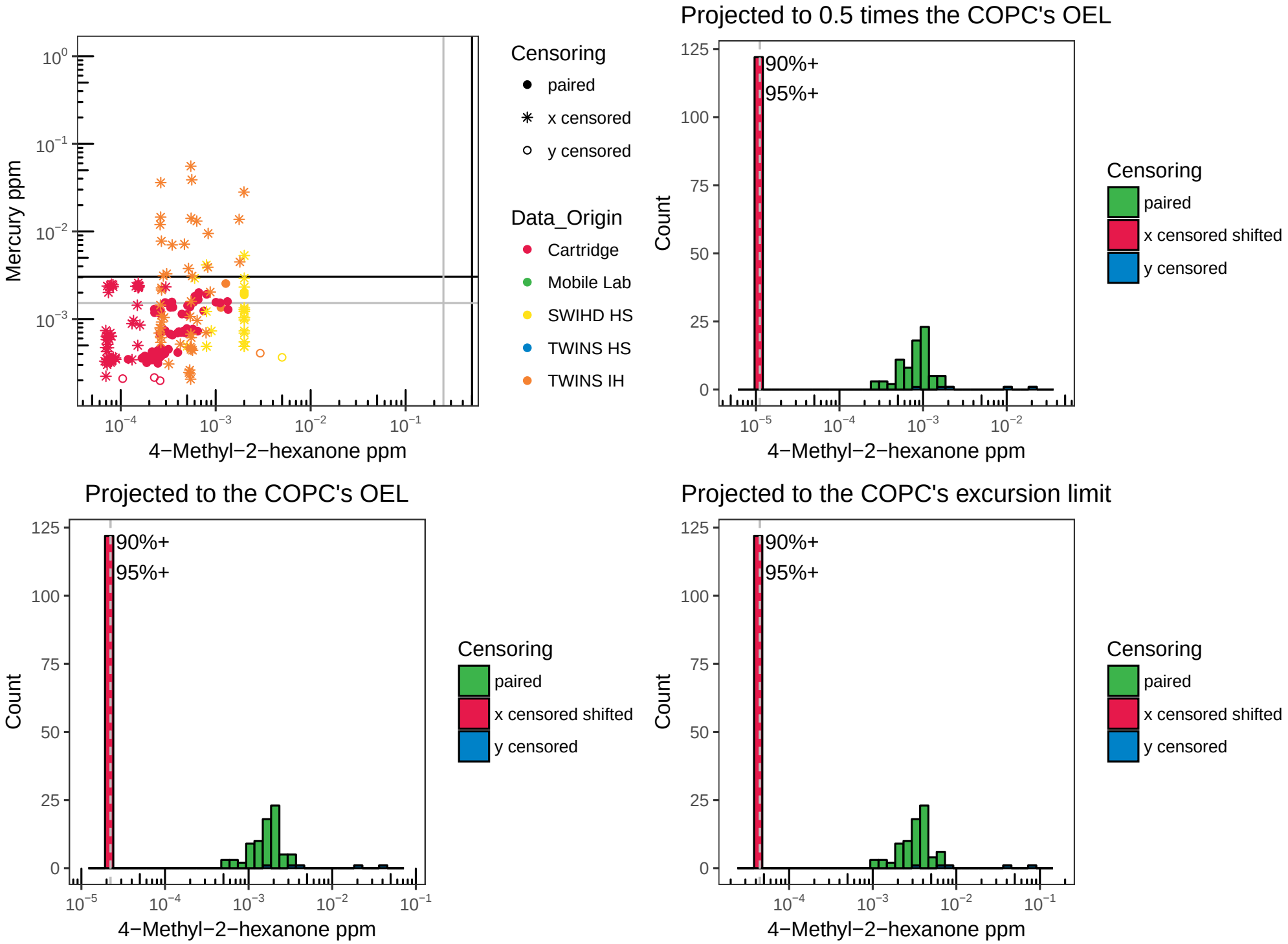


Figure C.539: Mercury vs 4-Methyl-2-hexanone

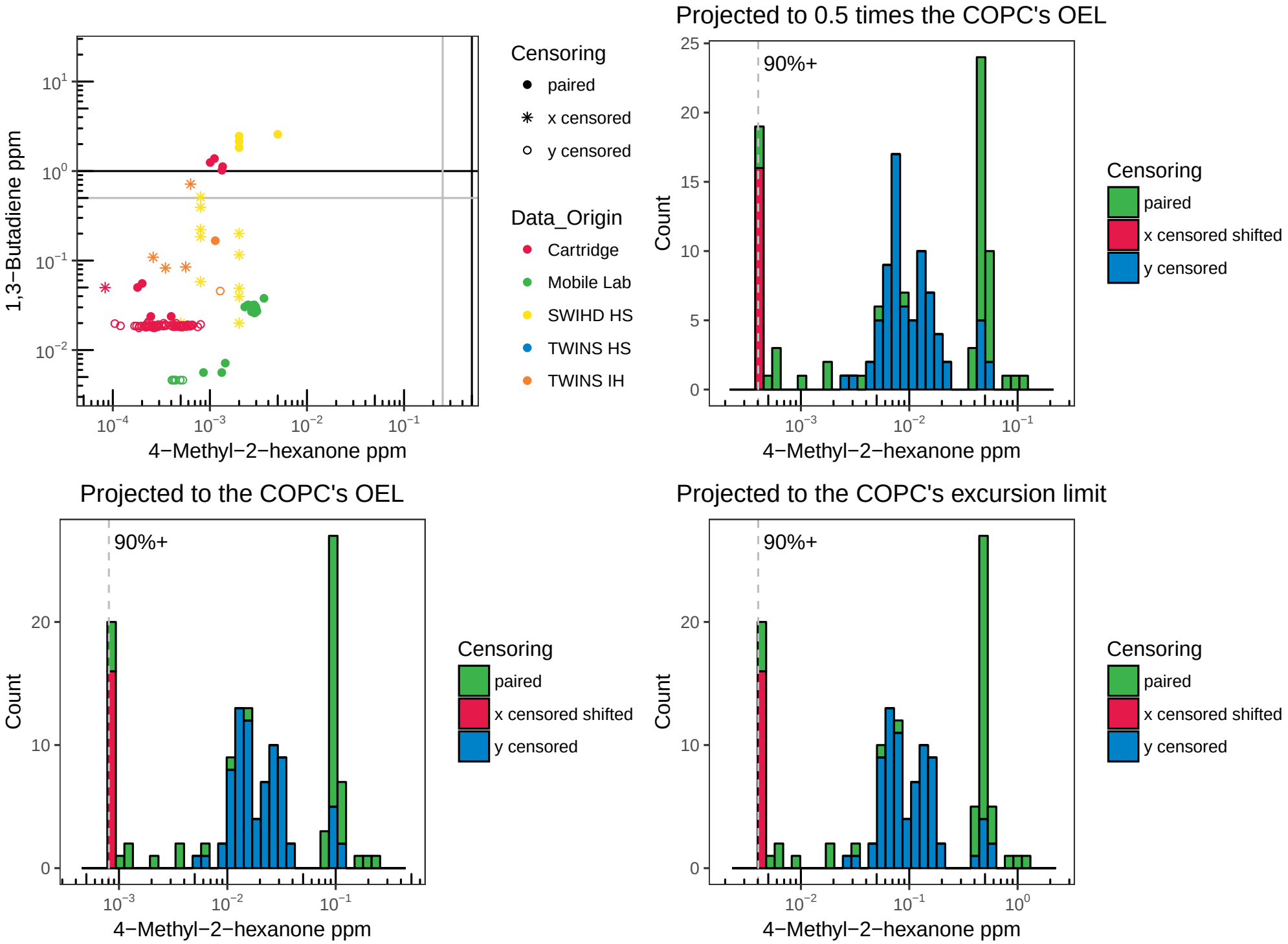


Figure C.540: 1,3-Butadiene vs 4-Methyl-2-hexanone

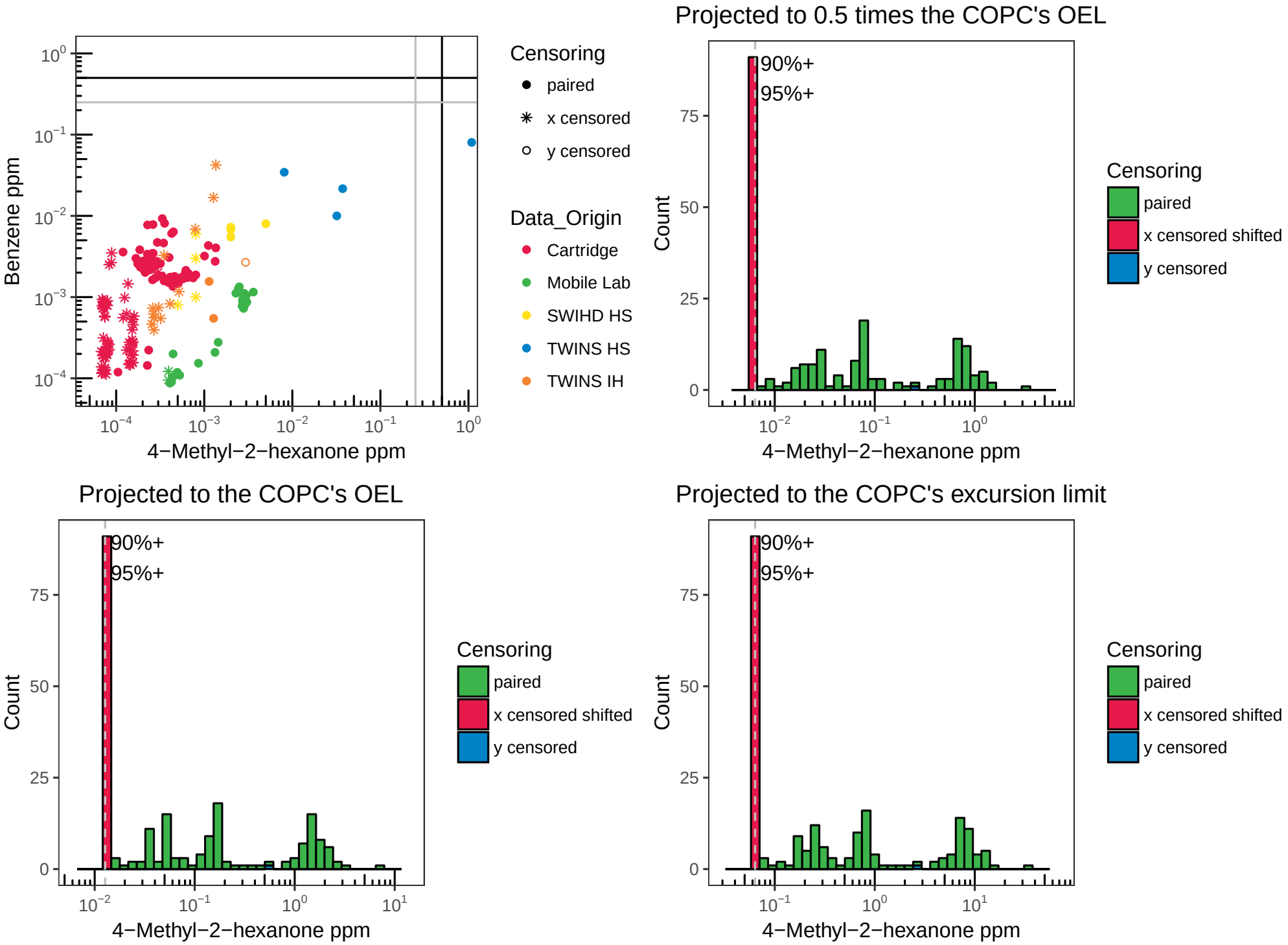


Figure C.541: Benzene vs 4-Methyl-2-hexanone

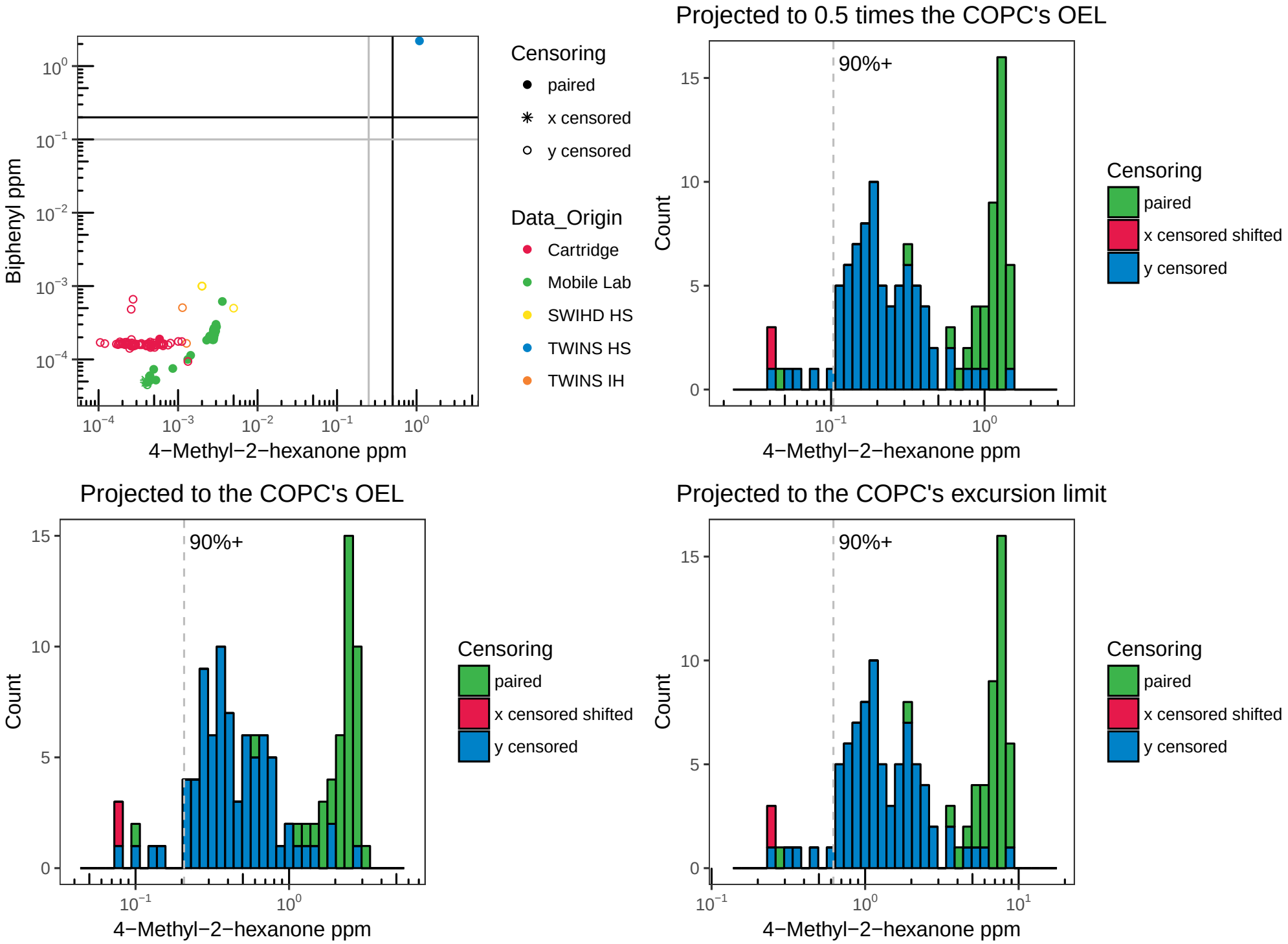


Figure C.542: Biphenyl vs 4-Methyl-2-hexanone

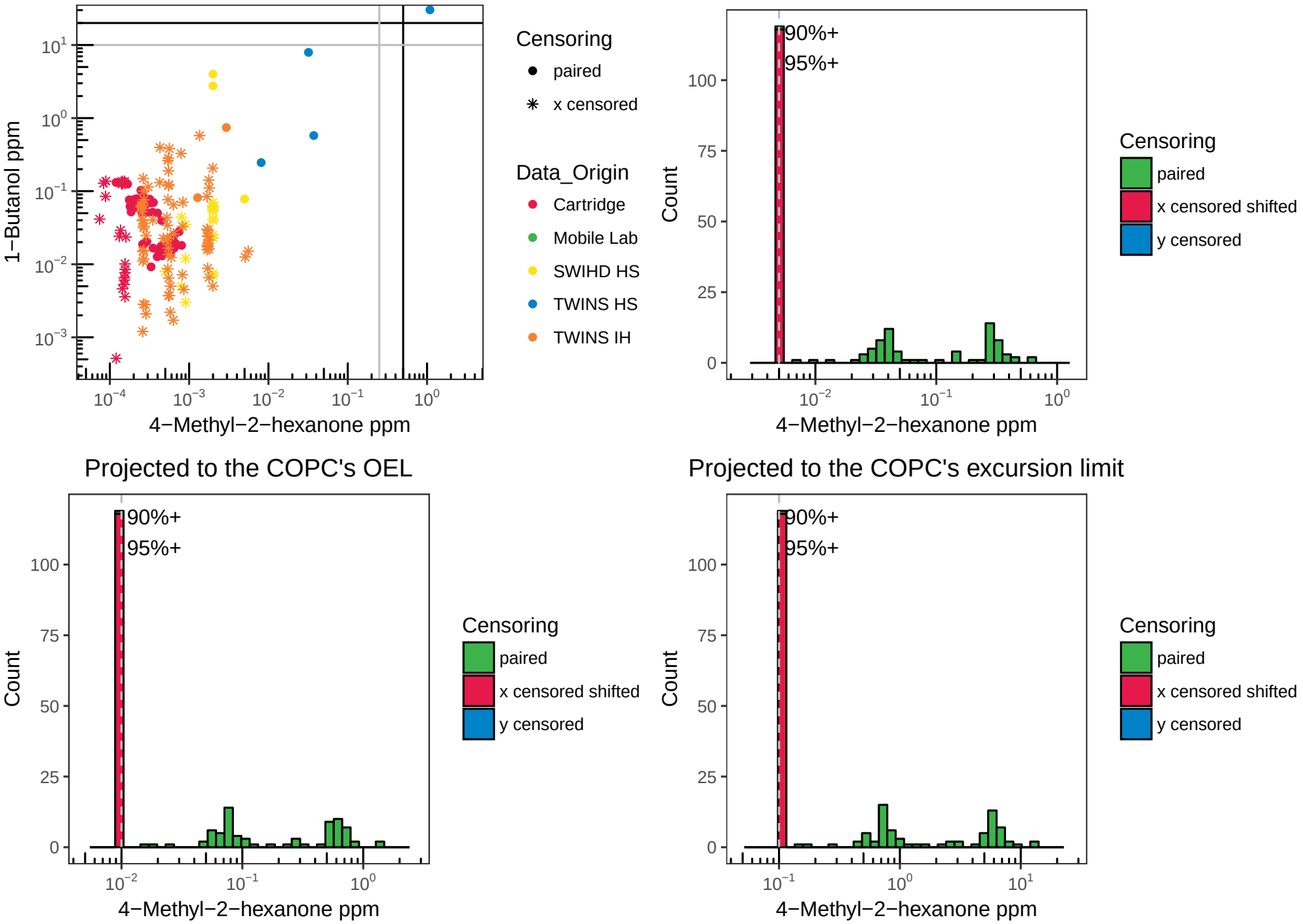


Figure C.543: 1-Butanol vs 4-Methyl-2-hexanone

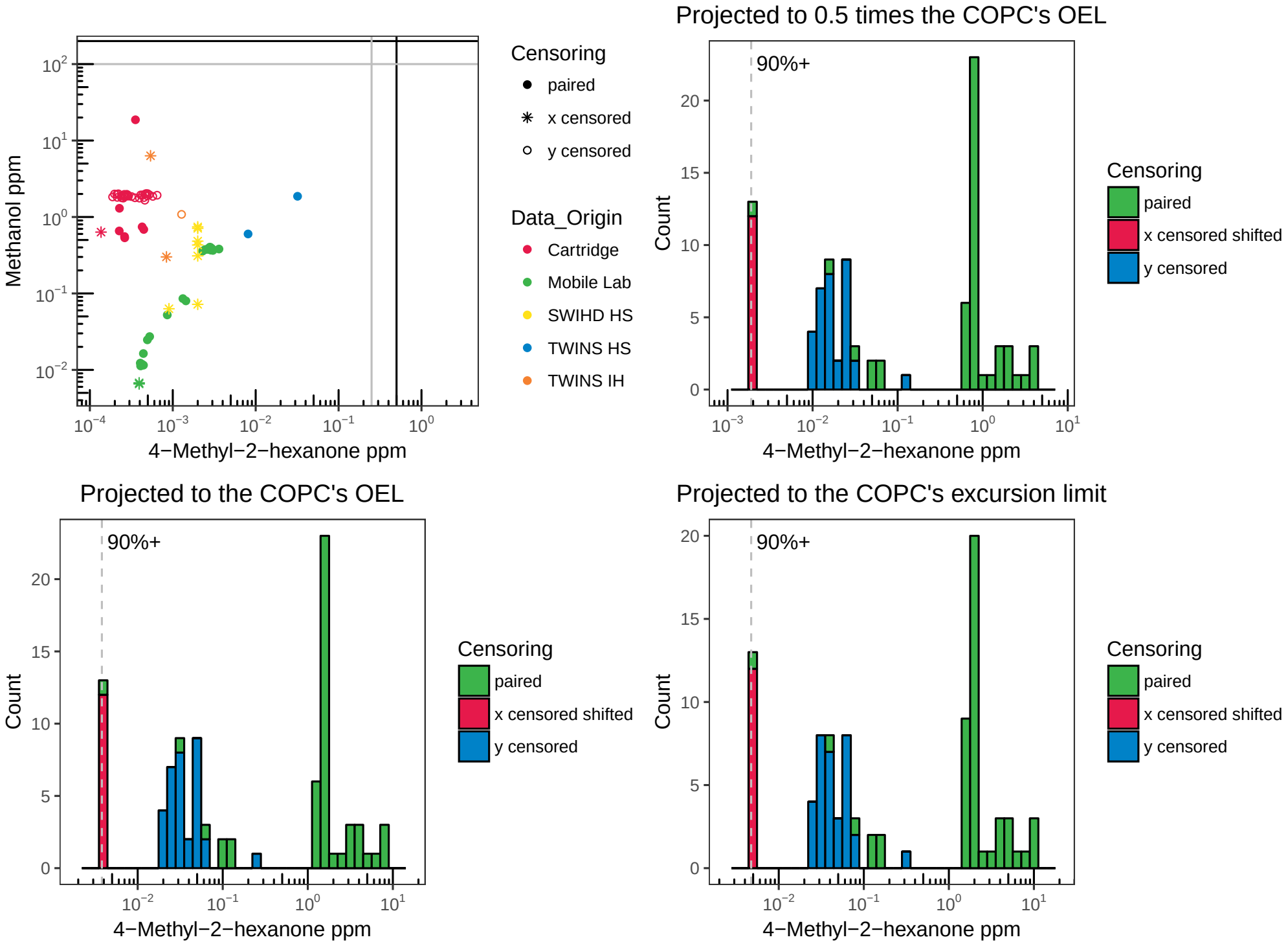


Figure C.544: Methanol vs 4-Methyl-2-hexanone

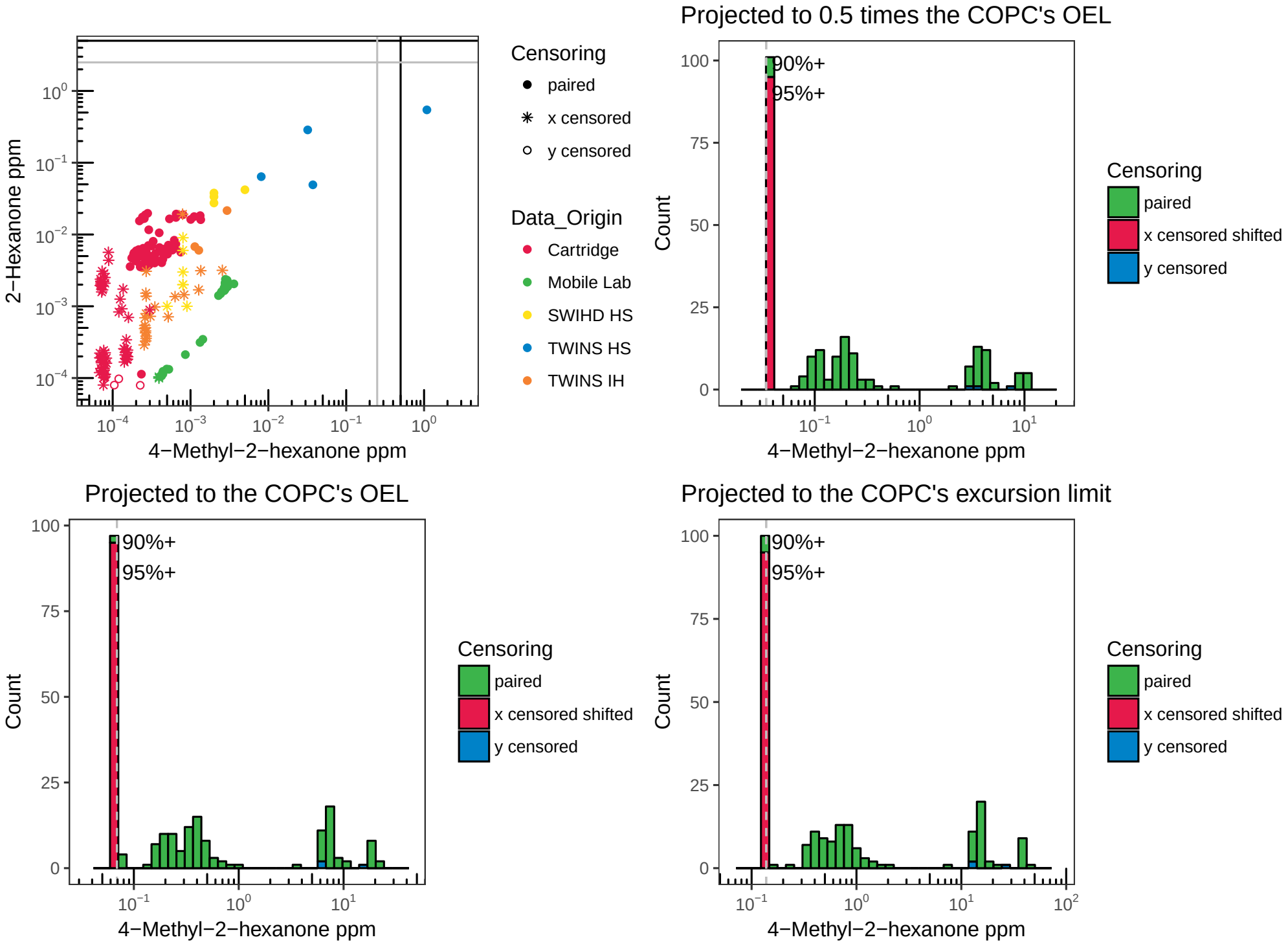


Figure C.545: 2-Hexanone vs 4-Methyl-2-hexanone

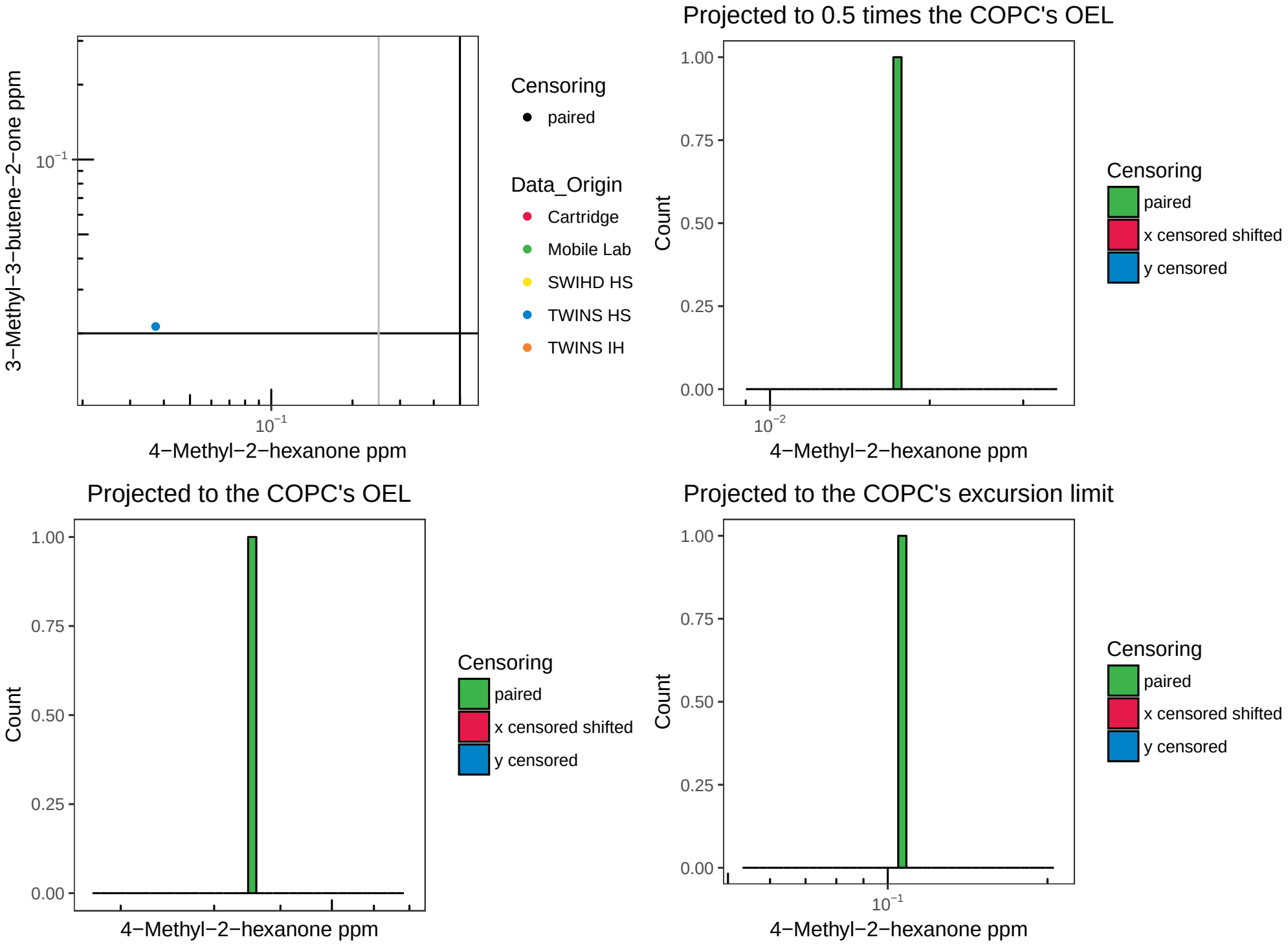


Figure C.546: 3-Methyl-3-butene-2-one vs 4-Methyl-2-hexanone

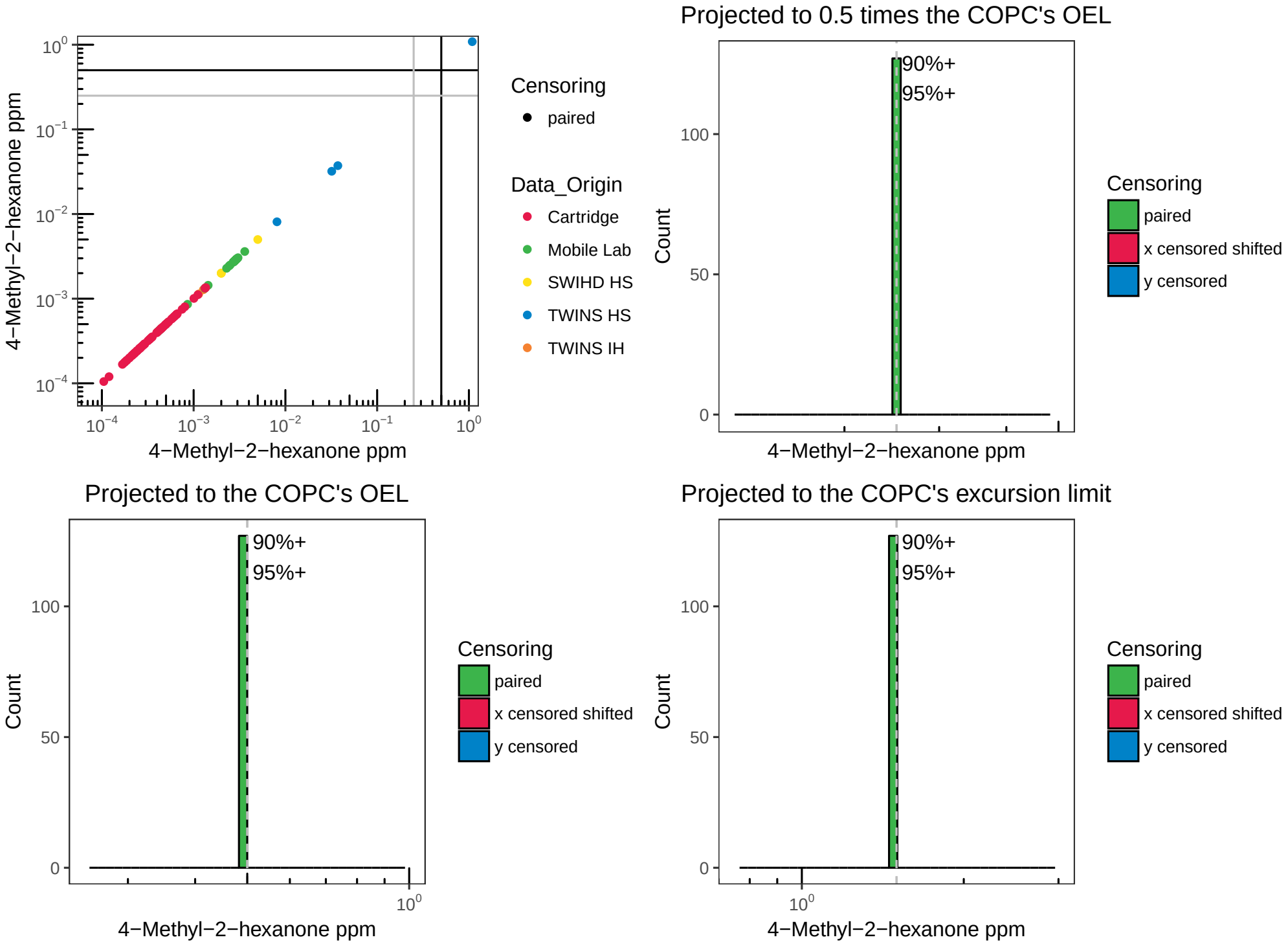


Figure C.547: 4-Methyl-2-hexanone vs 4-Methyl-2-hexanone

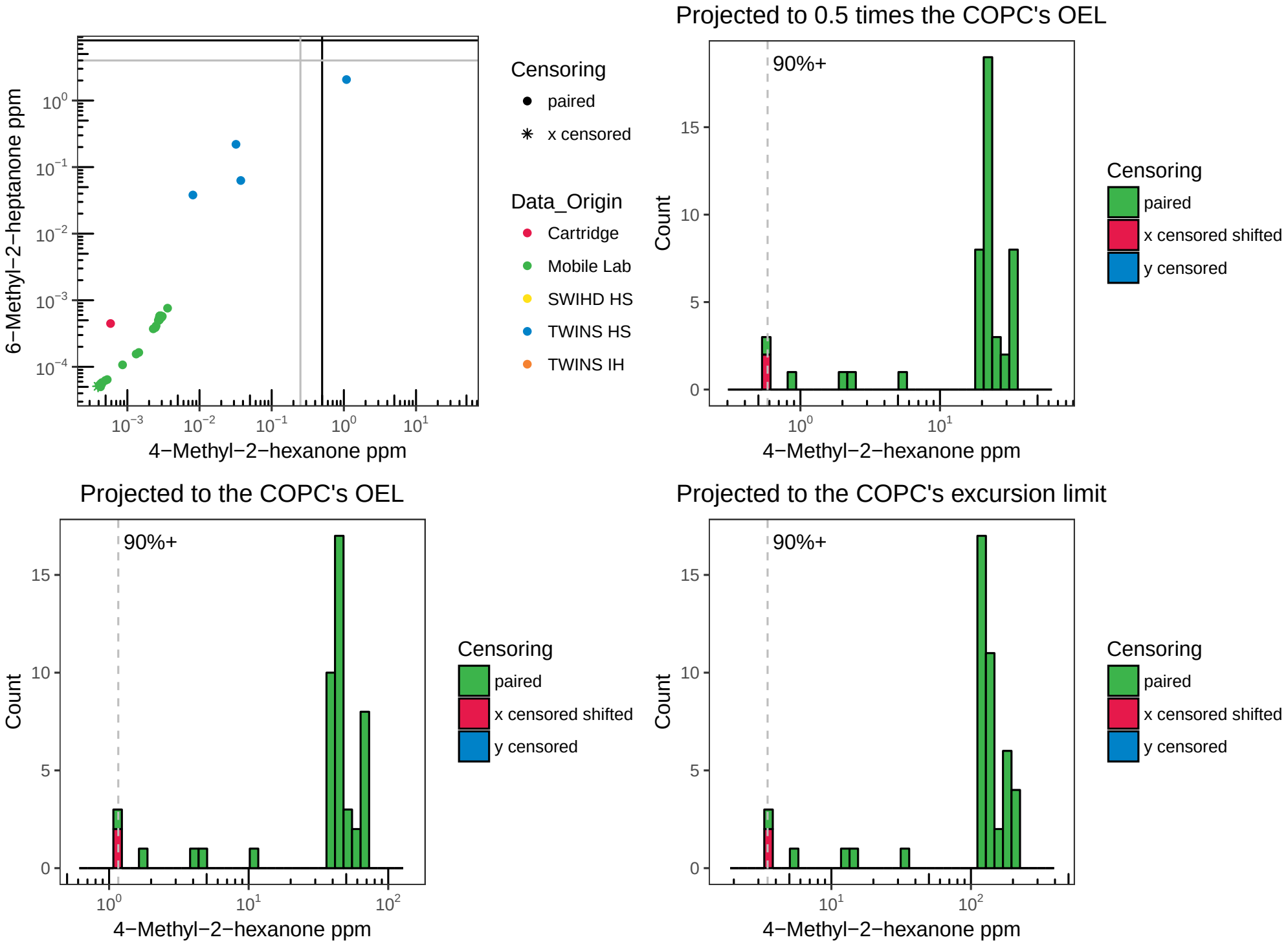


Figure C.548: 6-Methyl-2-heptanone vs 4-Methyl-2-hexanone

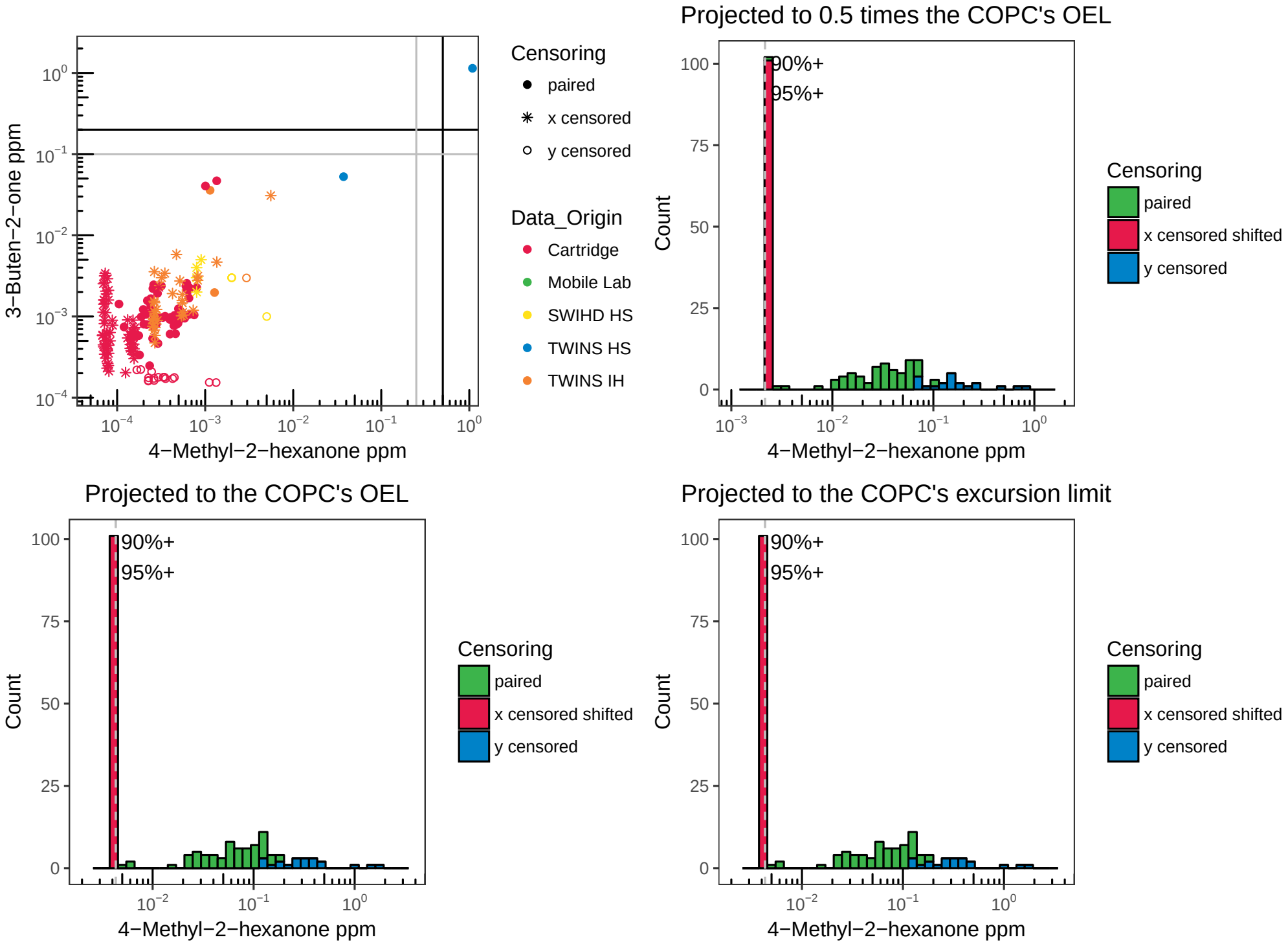


Figure C.549: 3-Buten-2-one vs 4-Methyl-2-hexanone

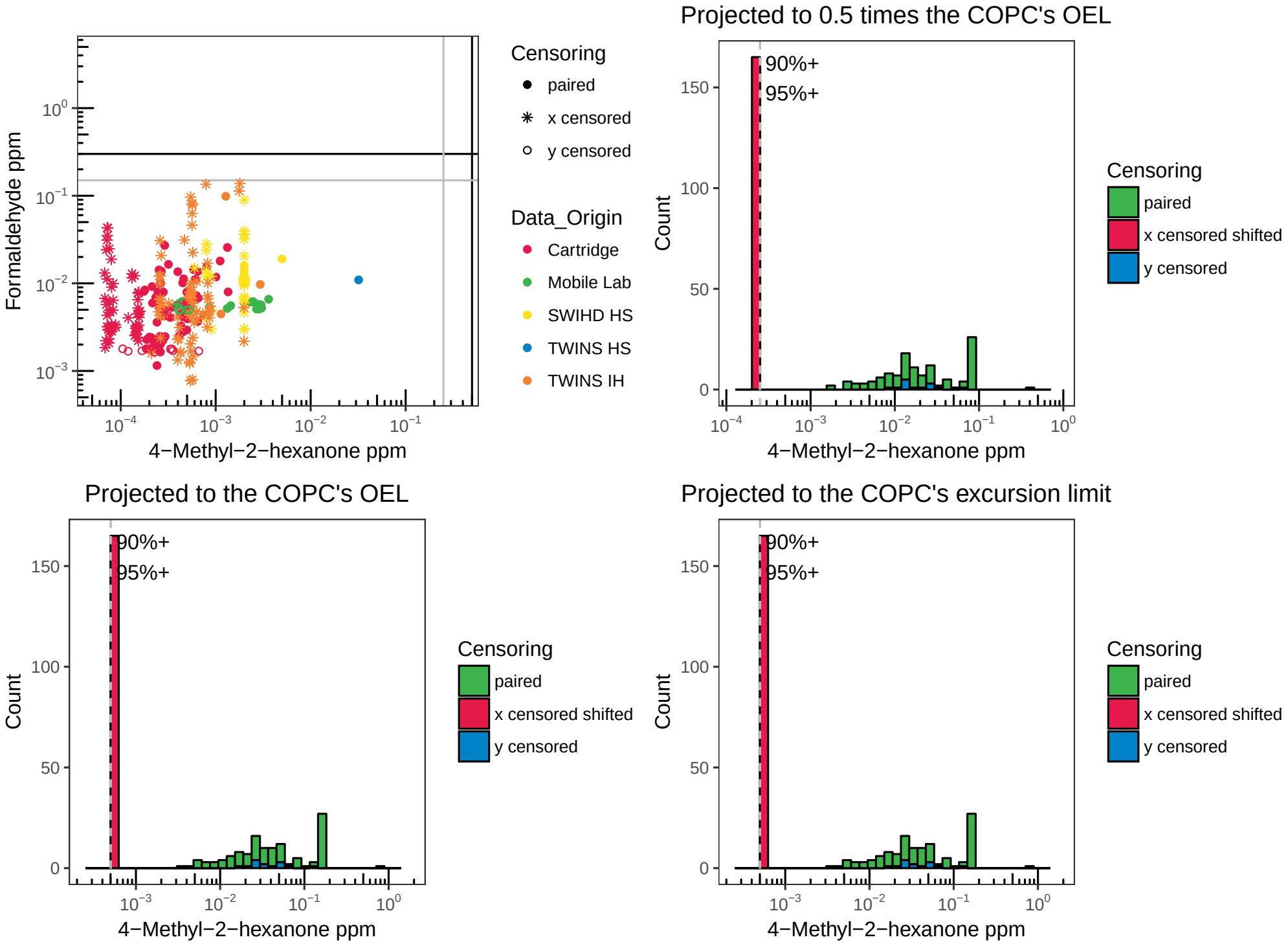


Figure C.550: Formaldehyde vs 4-Methyl-2-hexanone

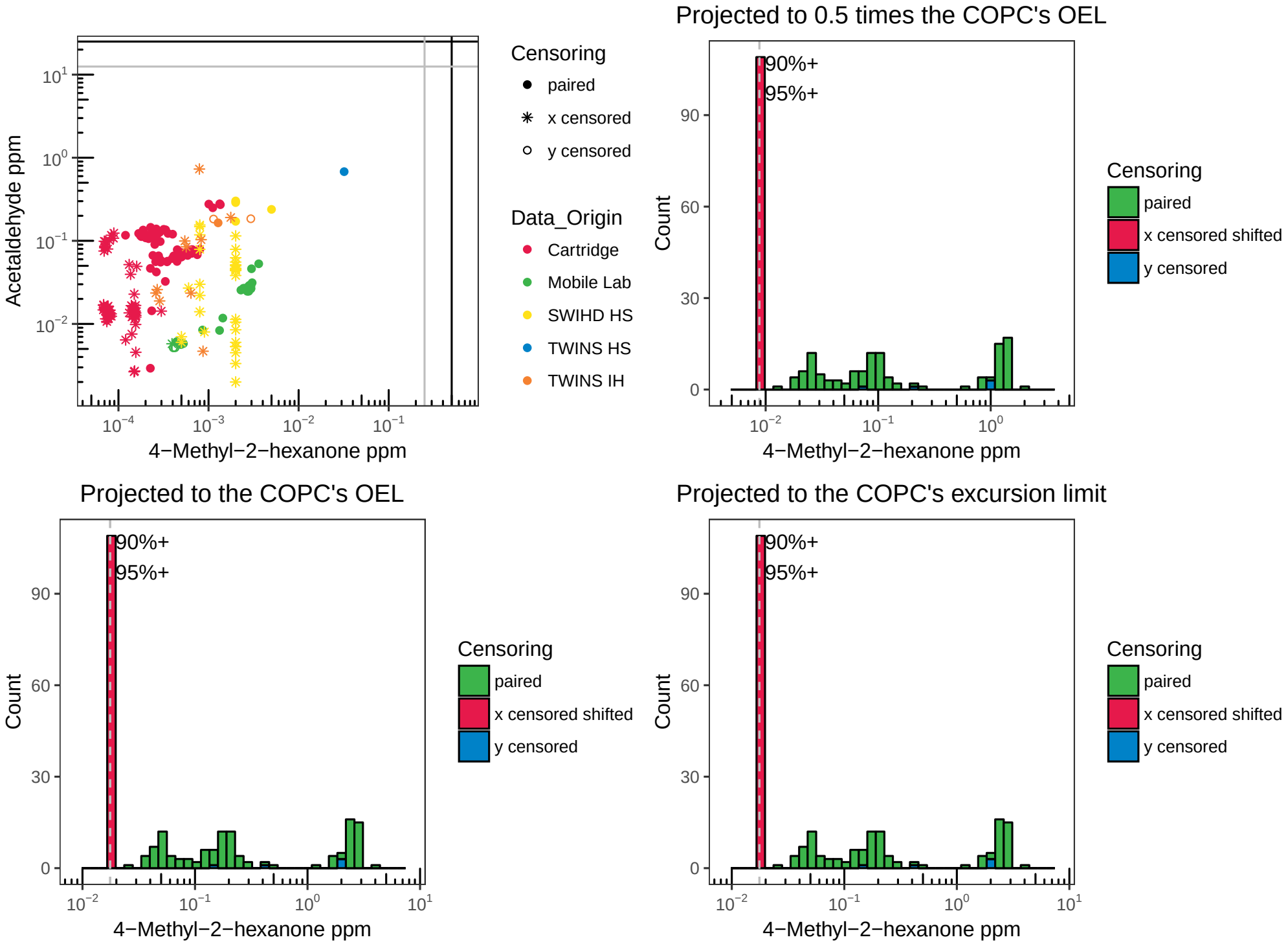


Figure C.551: Acetaldehyde vs 4-Methyl-2-hexanone

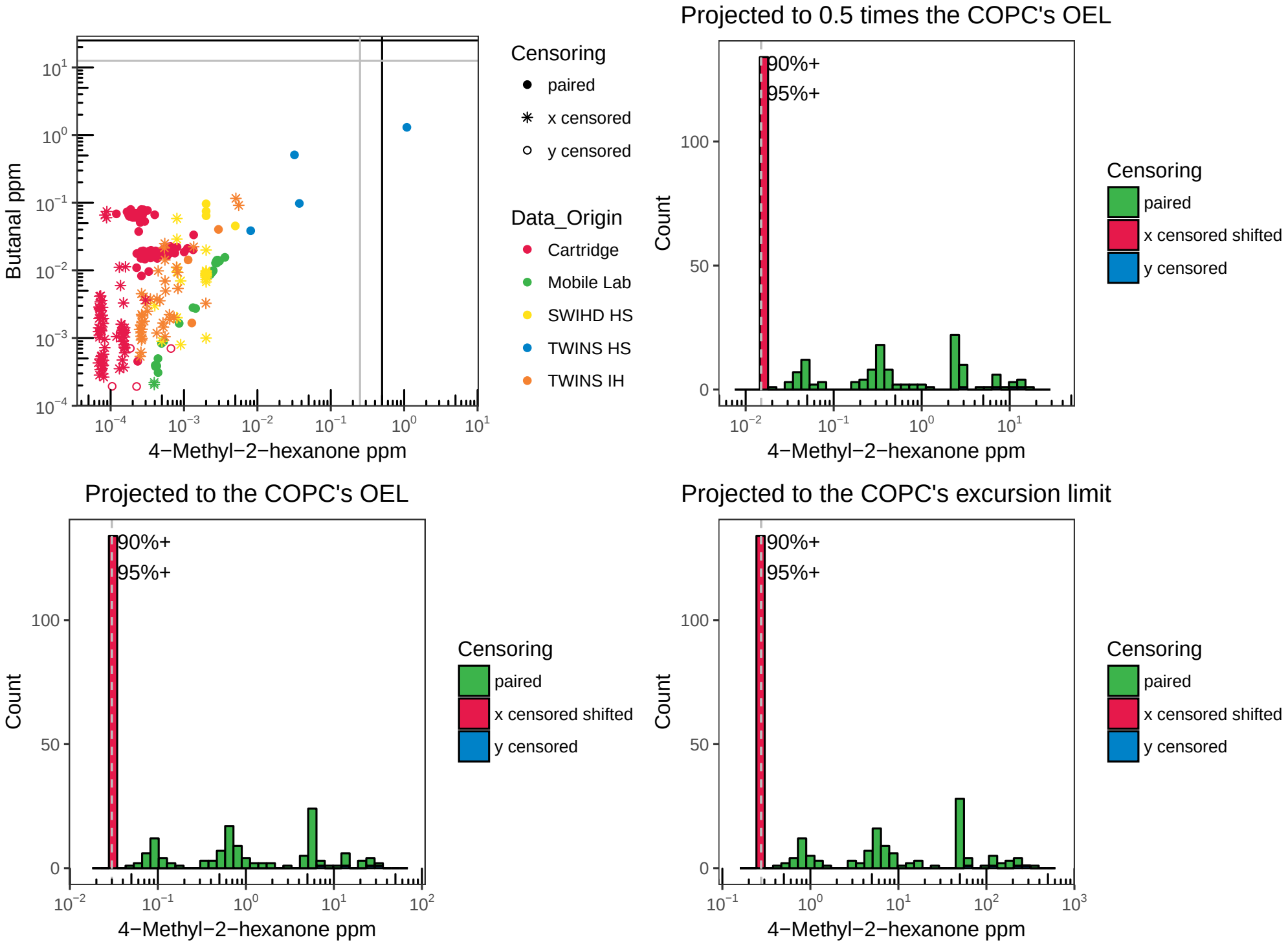


Figure C.552: Butanal vs 4-Methyl-2-hexanone

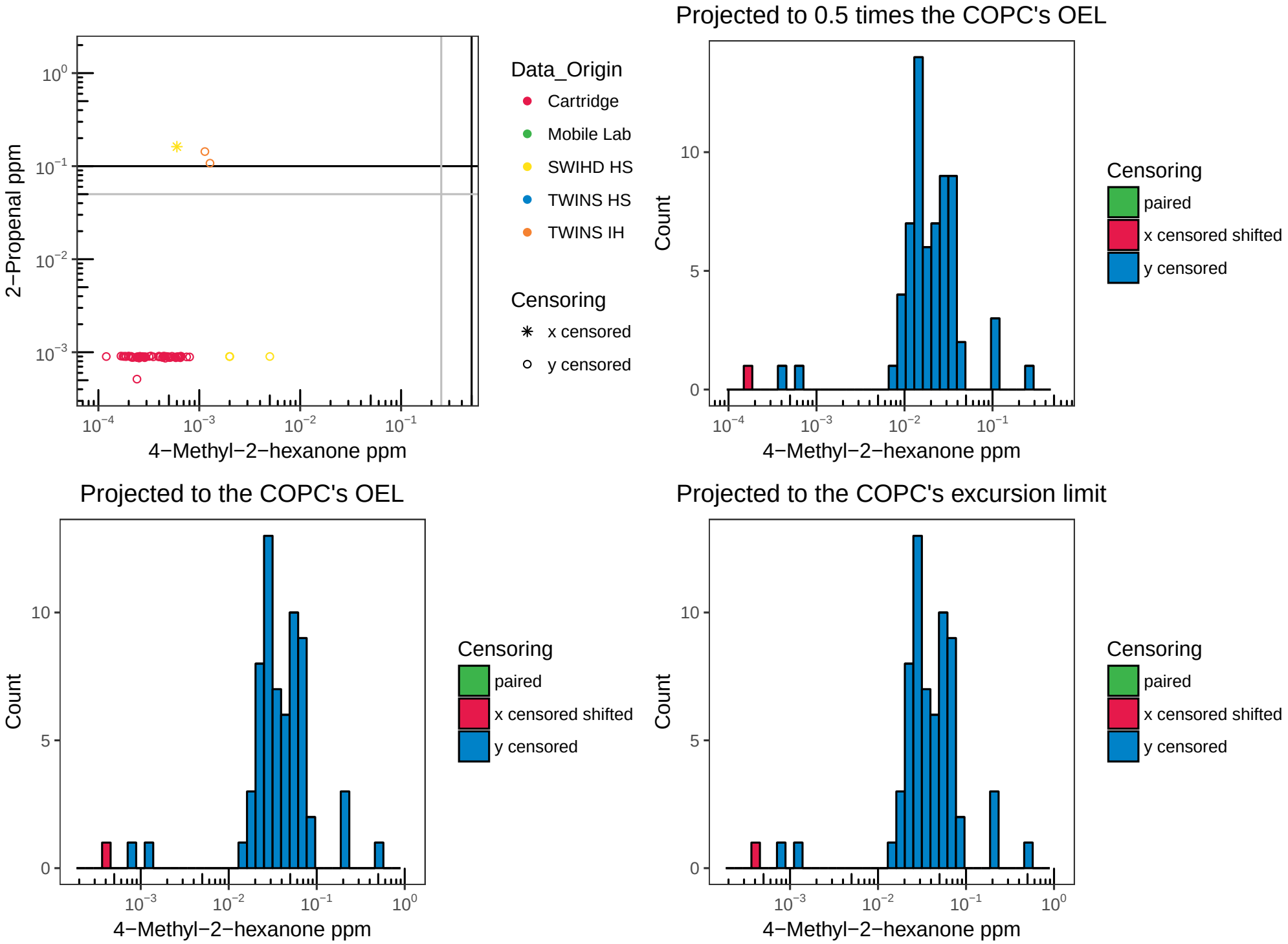


Figure C.553: 2-Propenal vs 4-Methyl-2-hexanone

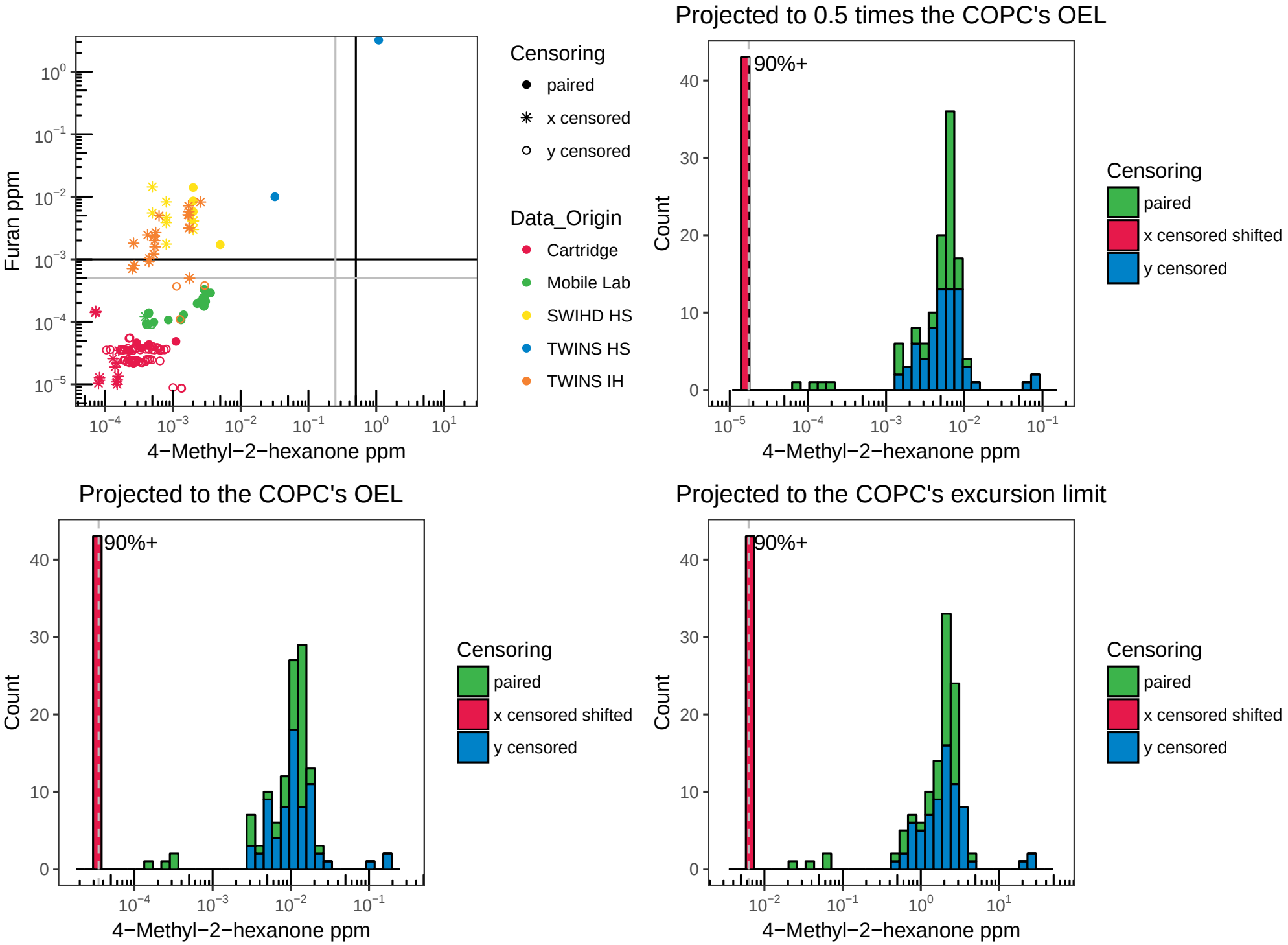


Figure C.554: Furan vs 4-Methyl-2-hexanone

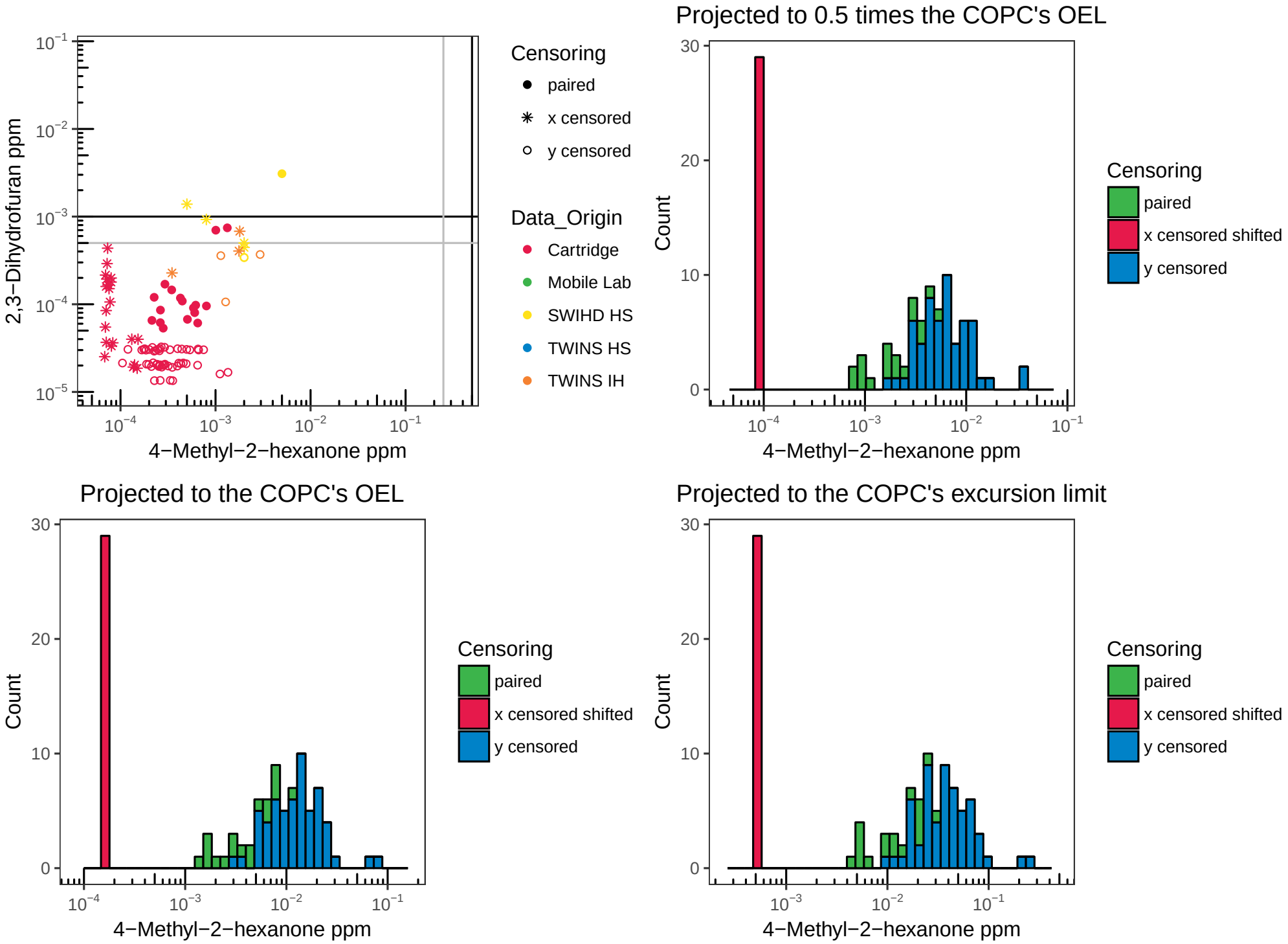


Figure C.555: 2,3-Dihydrofuran vs 4-Methyl-2-hexanone

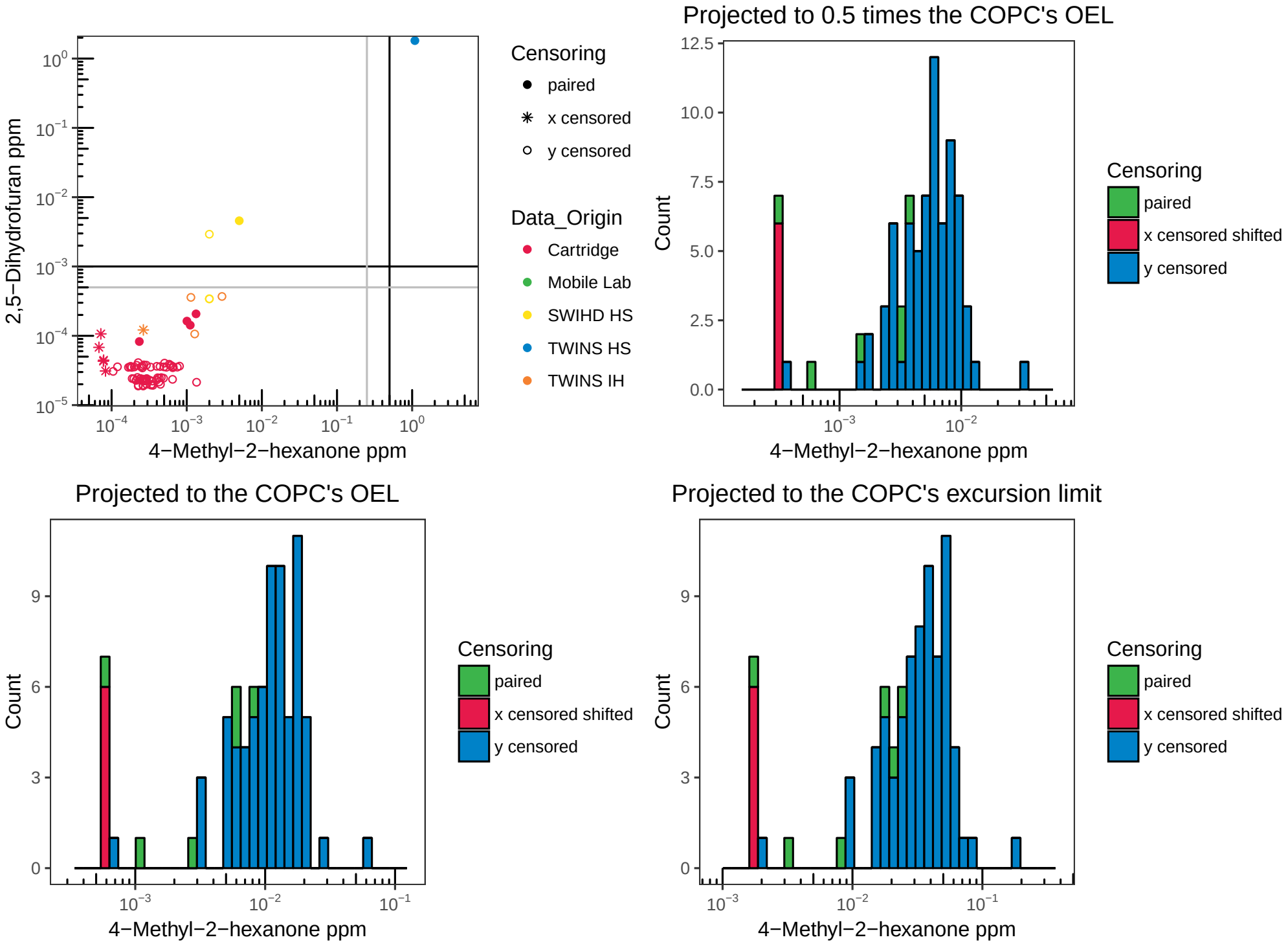


Figure C.556: 2,5-Dihydrofuran vs 4-Methyl-2-hexanone

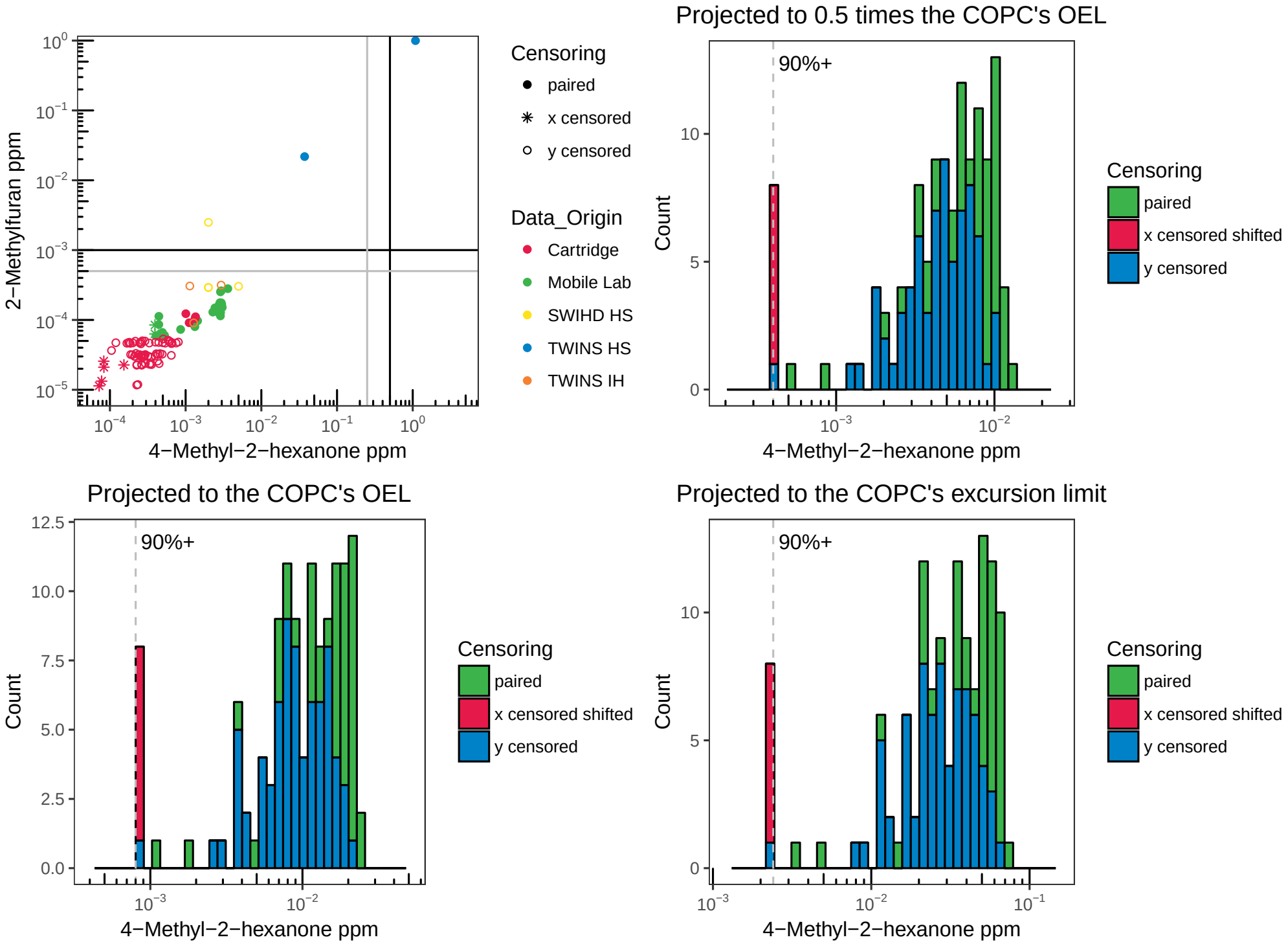


Figure C.557: 2-Methylfuran vs 4-Methyl-2-hexanone

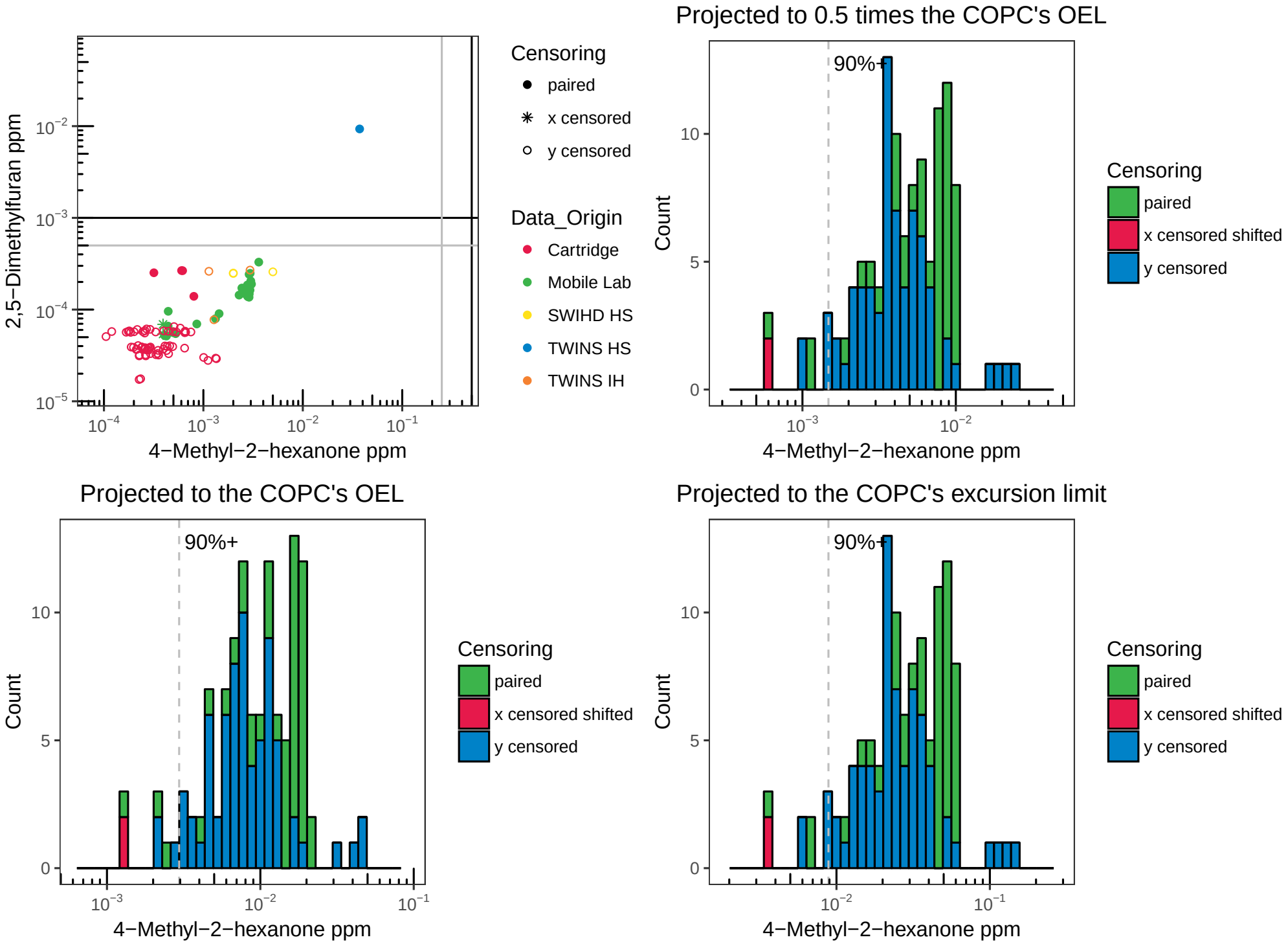


Figure C.558: 2,5-Dimethylfuran vs 4-Methyl-2-hexanone

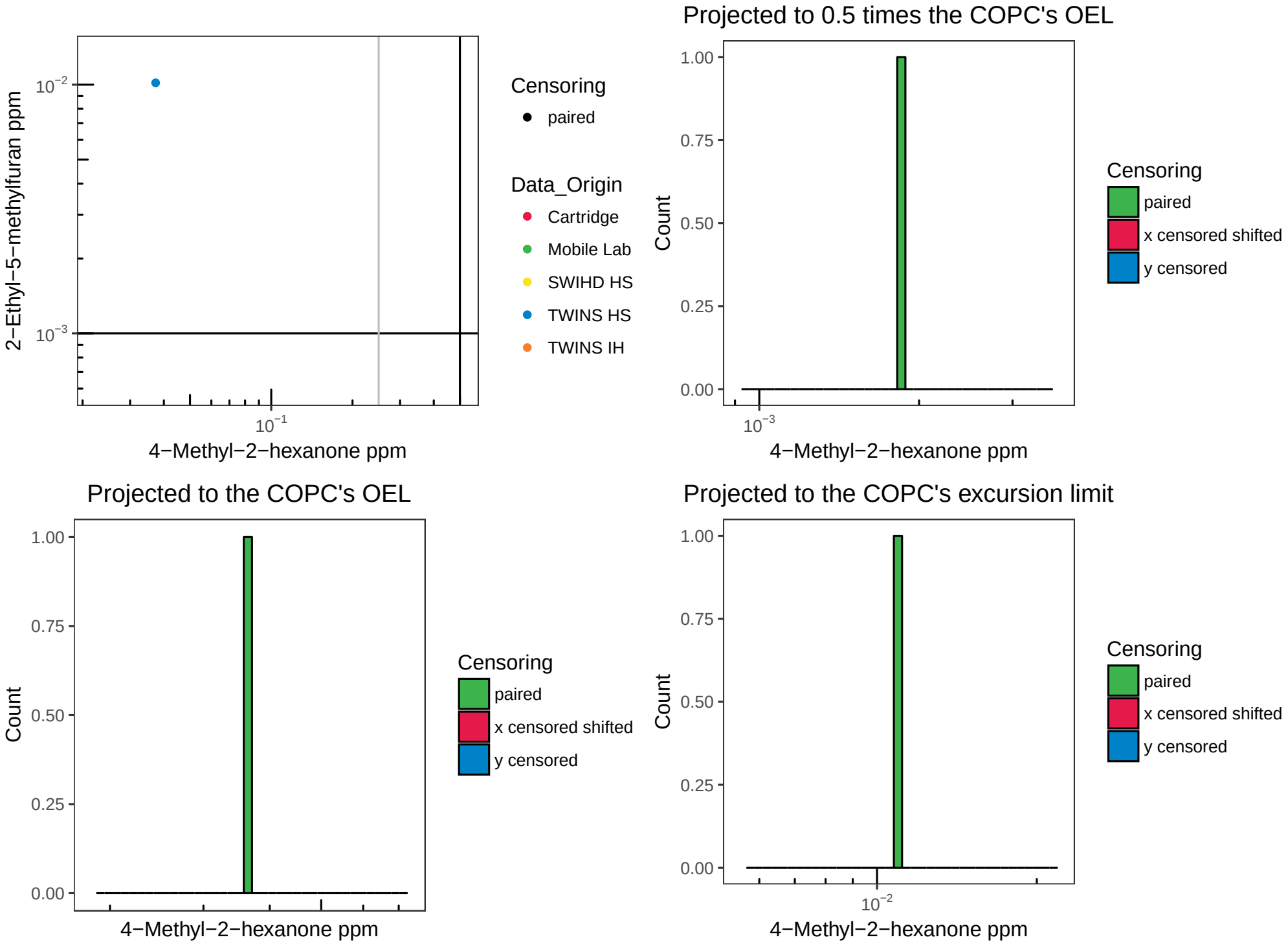


Figure C.559: 2-Ethyl-5-methylfuran vs 4-Methyl-2-hexanone

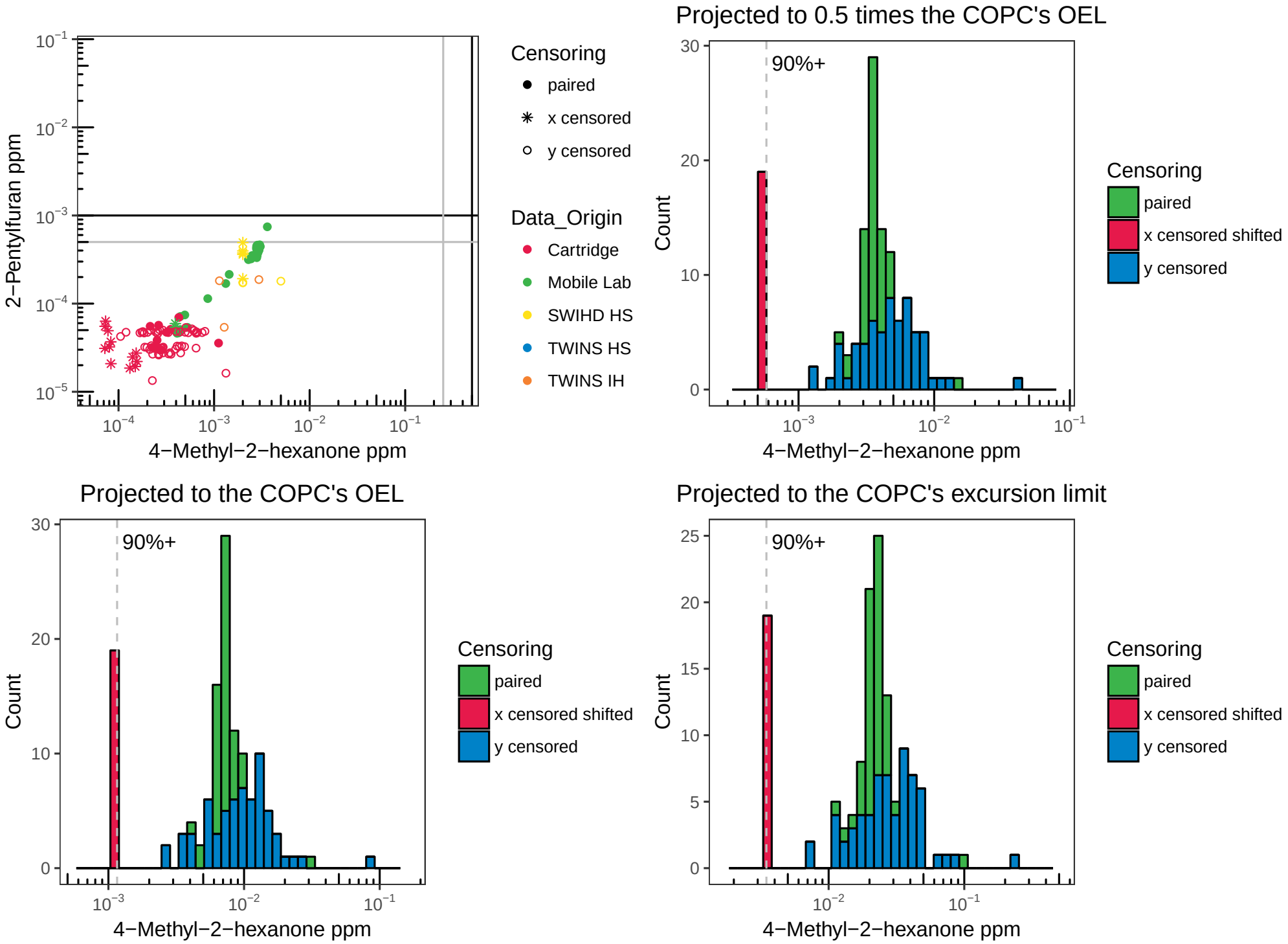


Figure C.560: 2-Pentylfuran vs 4-Methyl-2-hexanone

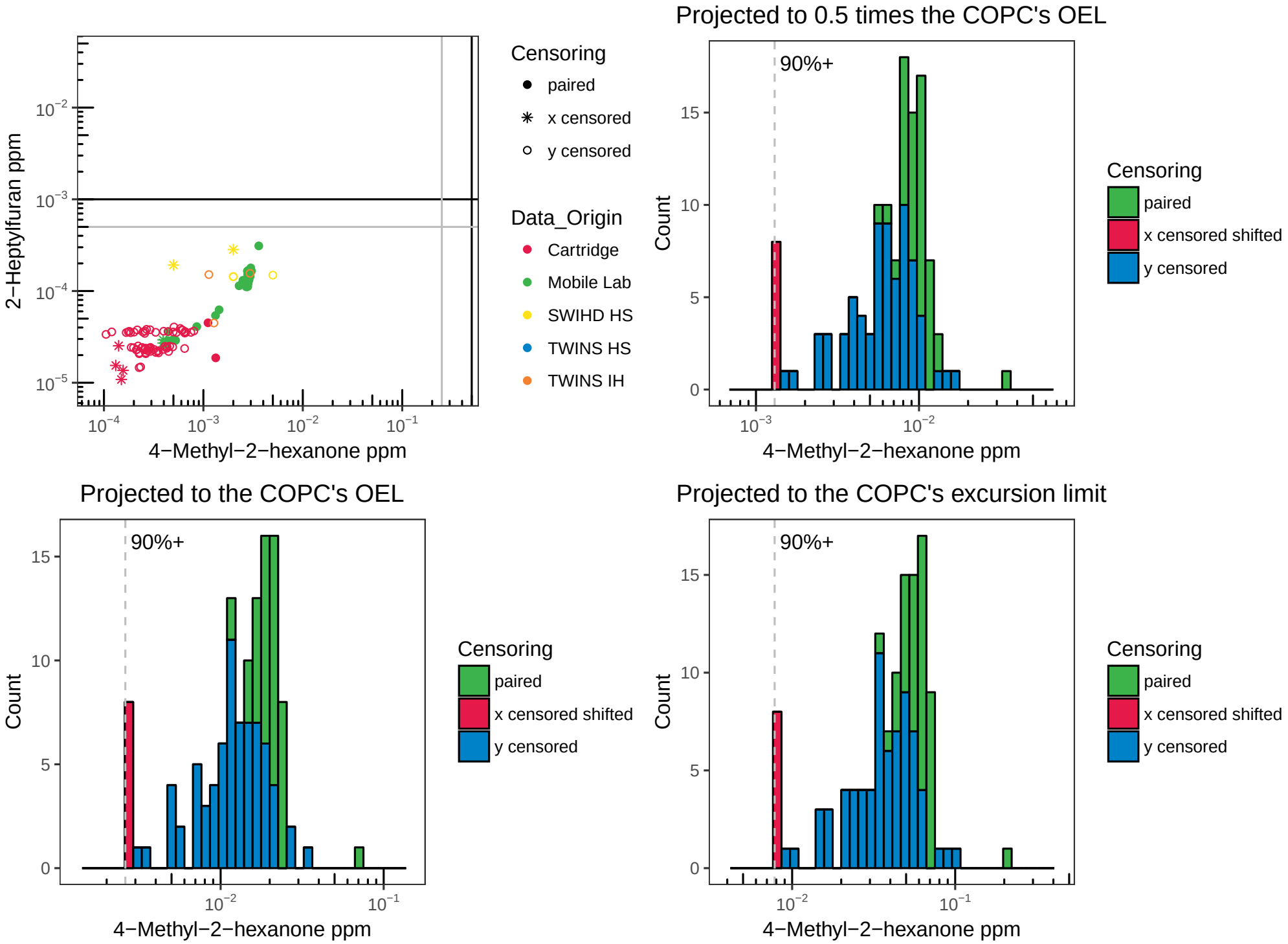


Figure C.561: 2-Heptylfuran vs 4-Methyl-2-hexanone

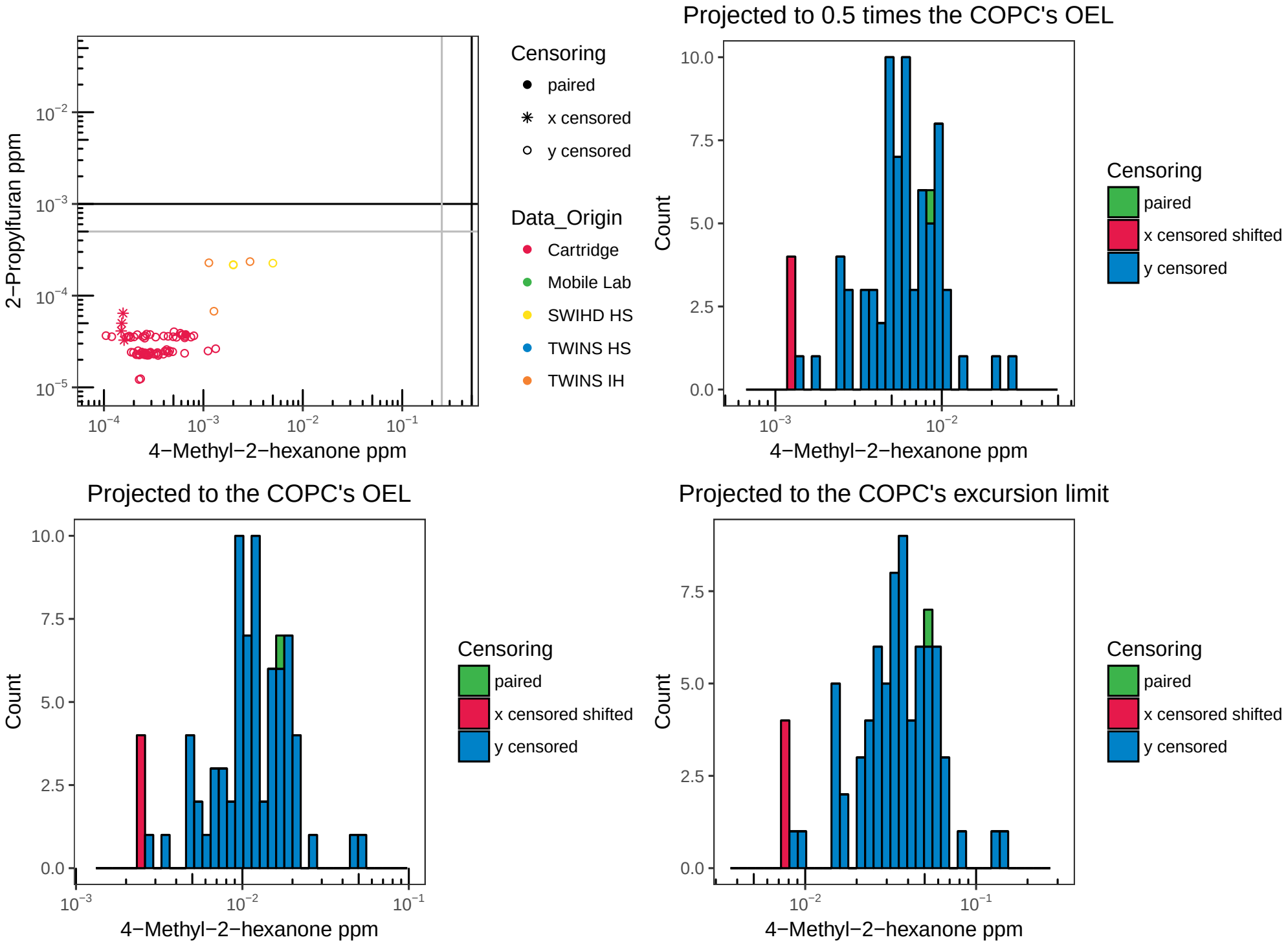


Figure C.562: 2-Propylfuran vs 4-Methyl-2-hexanone

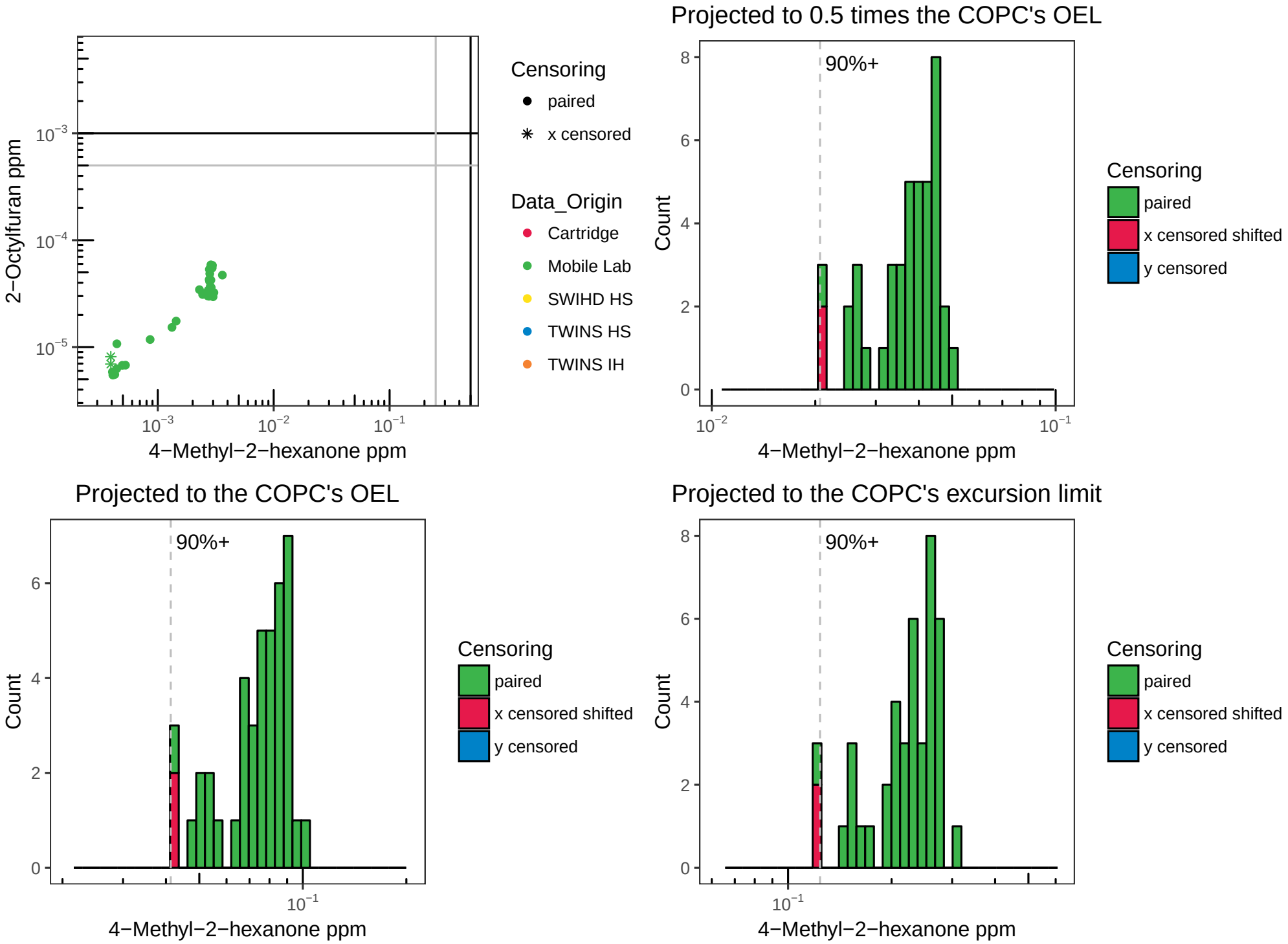


Figure C.563: 2-Octylfuran vs 4-Methyl-2-hexanone

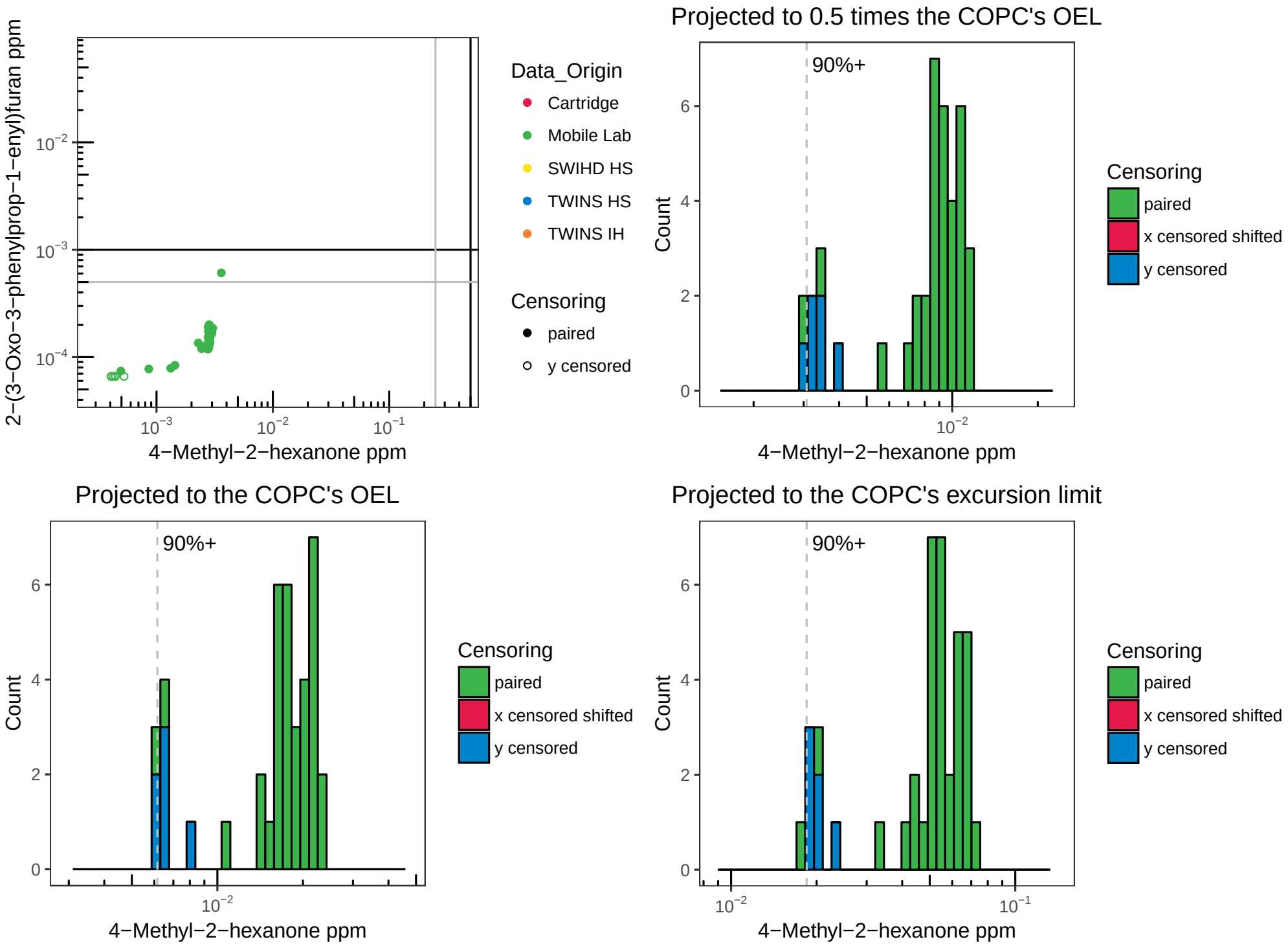


Figure C.564: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 4-Methyl-2-hexanone

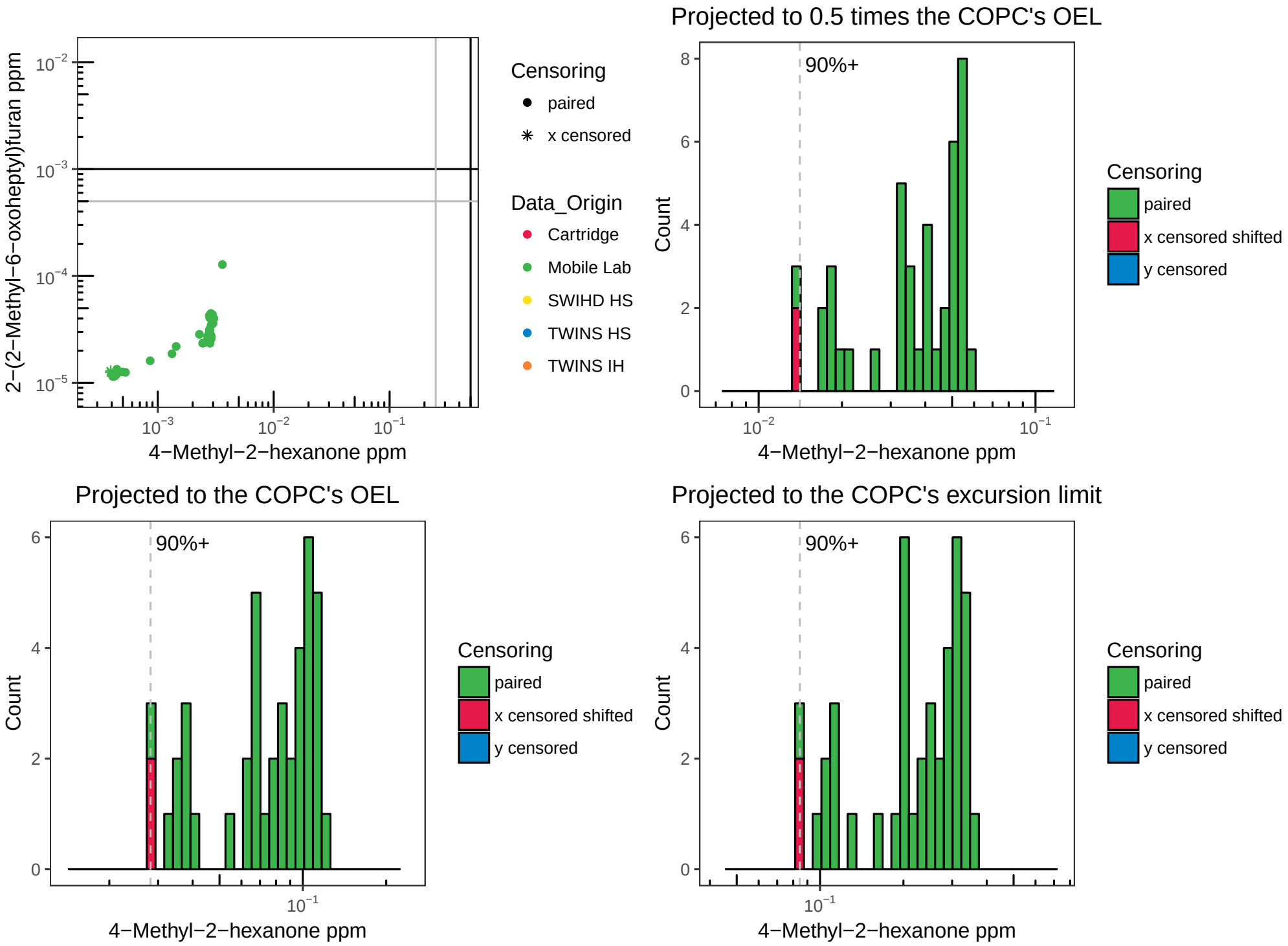


Figure C.565: 2-(2-Methyl-6-oxoheptyl)furan vs 4-Methyl-2-hexanone

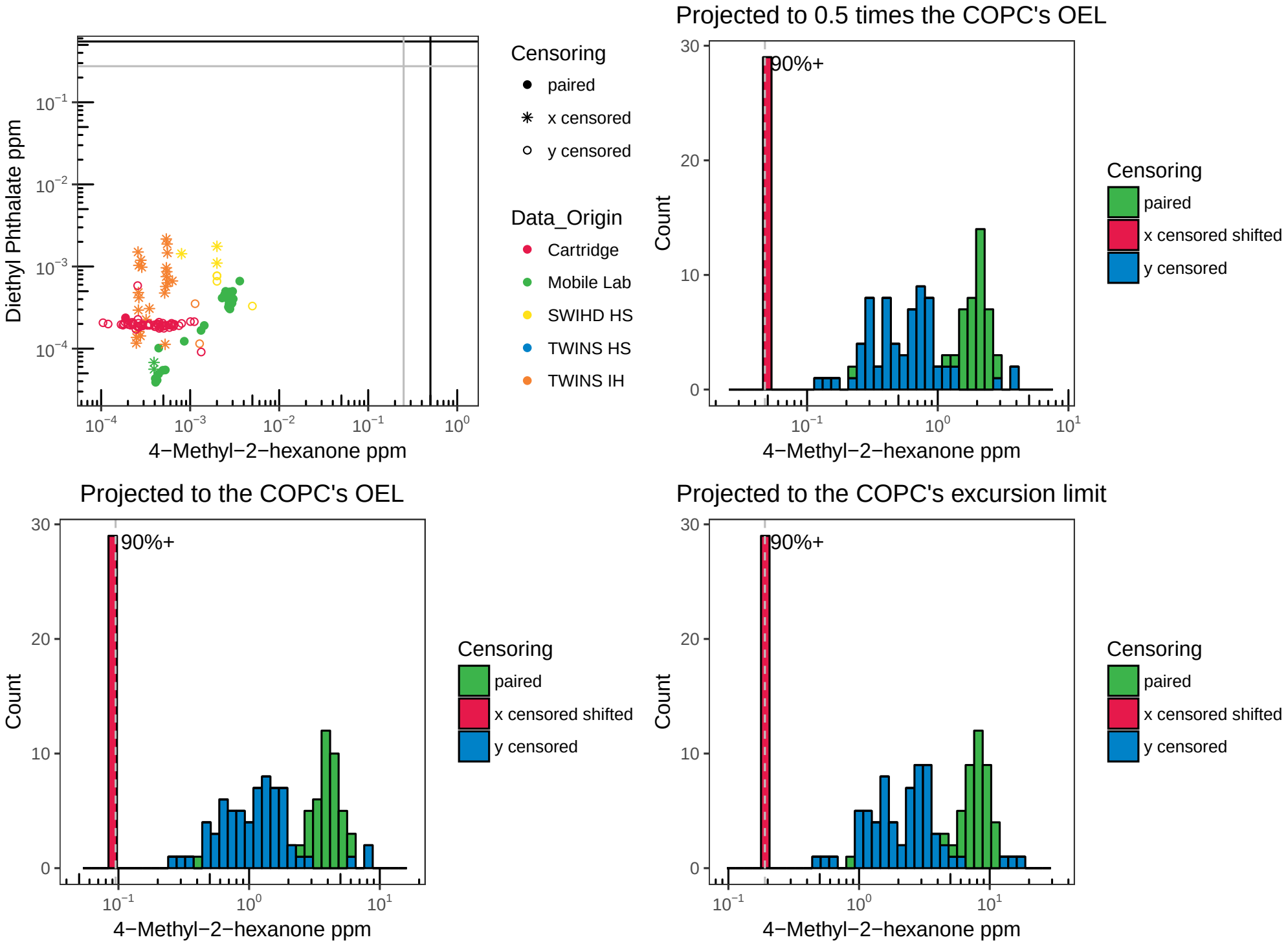


Figure C.566: Diethyl Phthalate vs 4-Methyl-2-hexanone

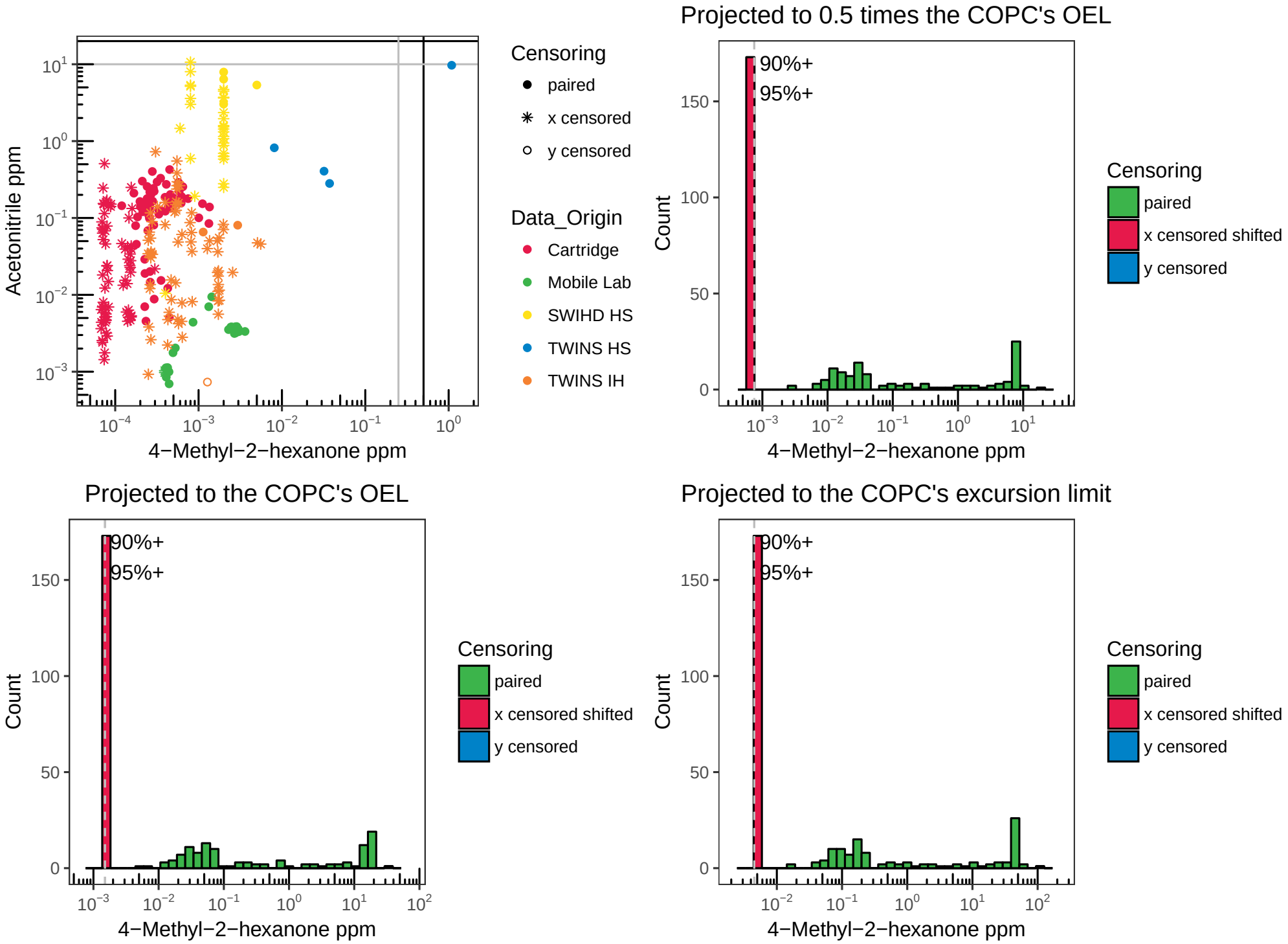


Figure C.567: Acetonitrile vs 4-Methyl-2-hexanone

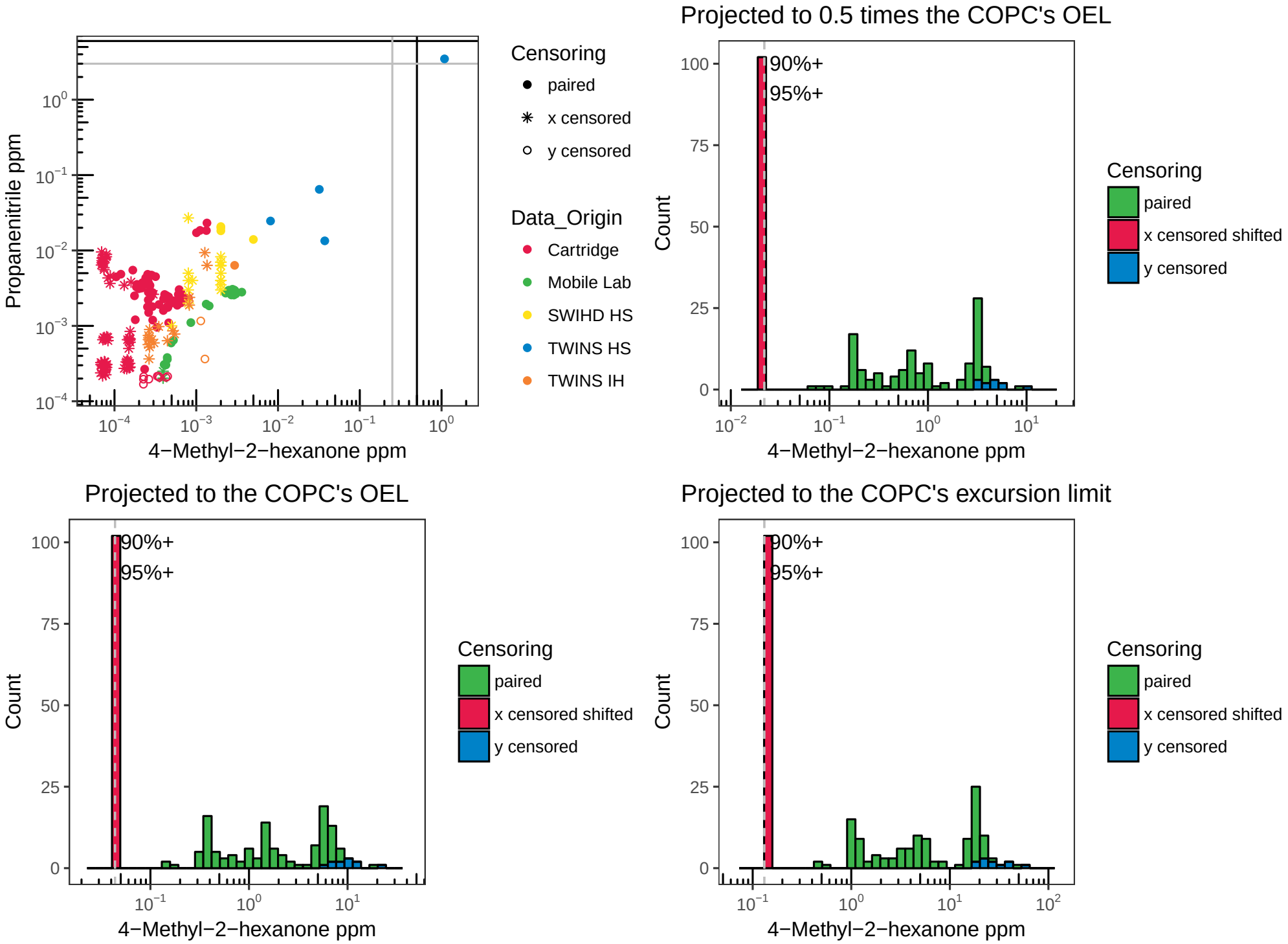


Figure C.568: Propanenitrile vs 4-Methyl-2-hexanone

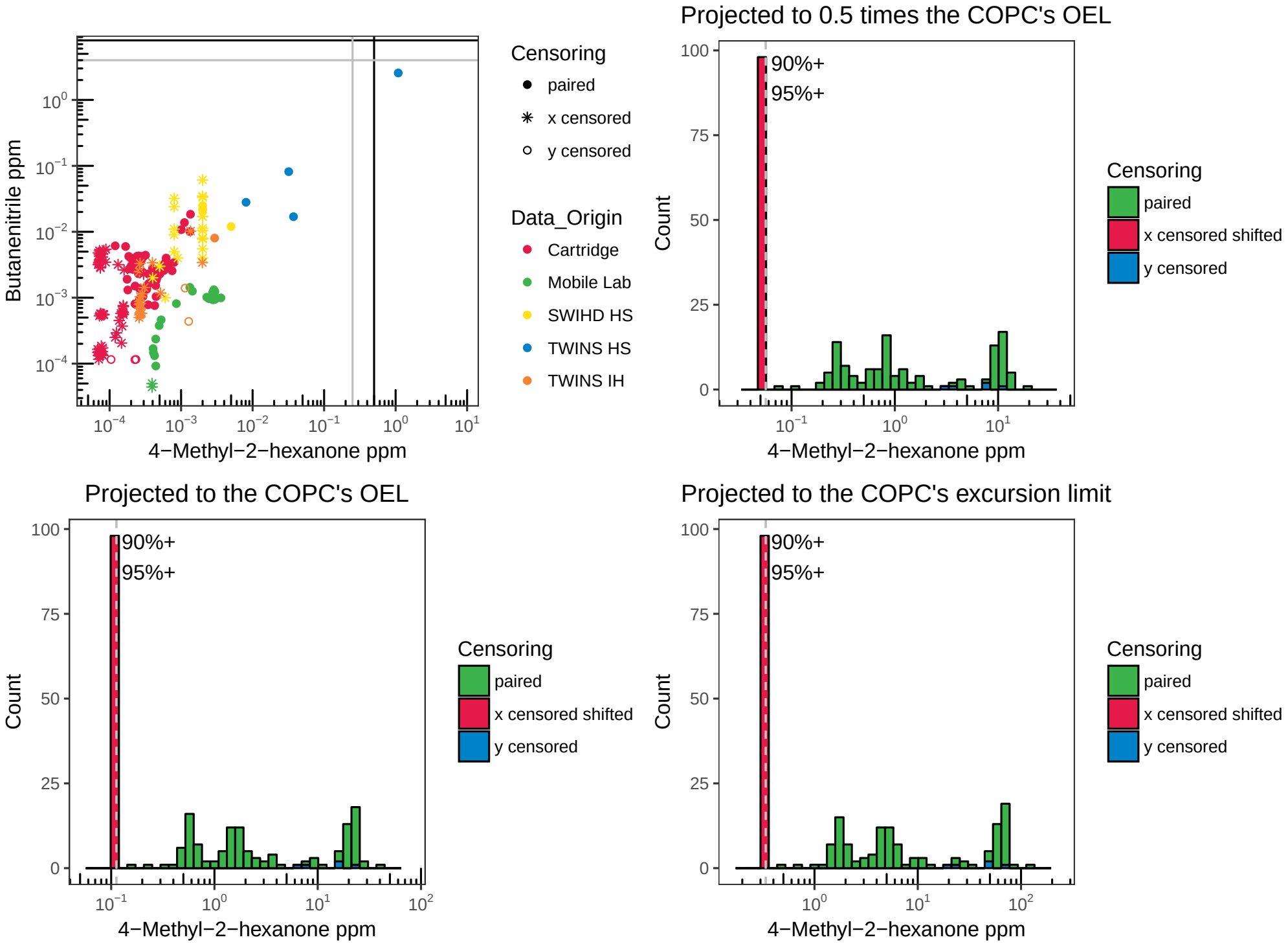


Figure C.569: Butanenitrile vs 4-Methyl-2-hexanone

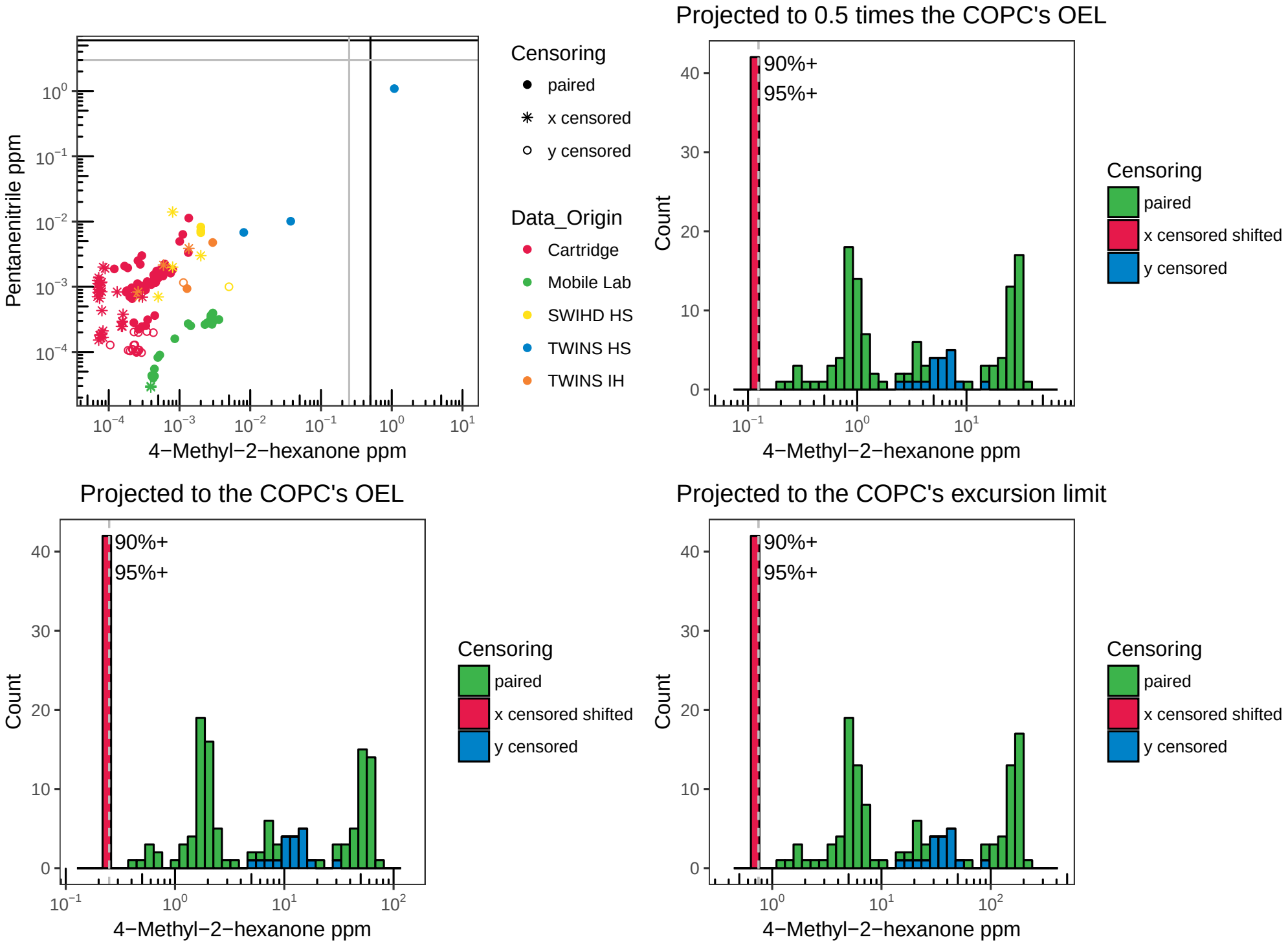


Figure C.570: Pentanenitrile vs 4-Methyl-2-hexanone

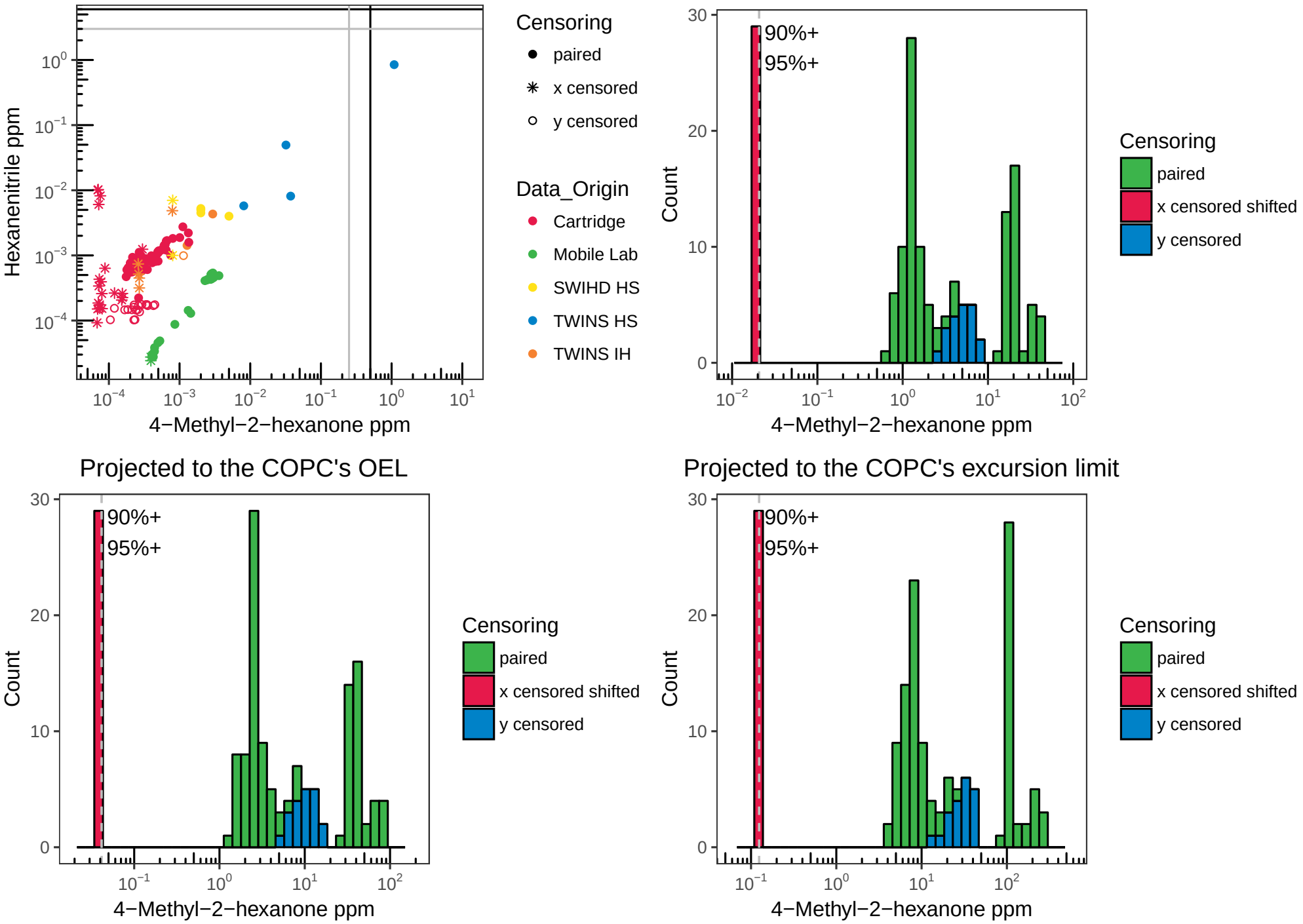


Figure C.571: Hexanenitrile vs 4-Methyl-2-hexanone

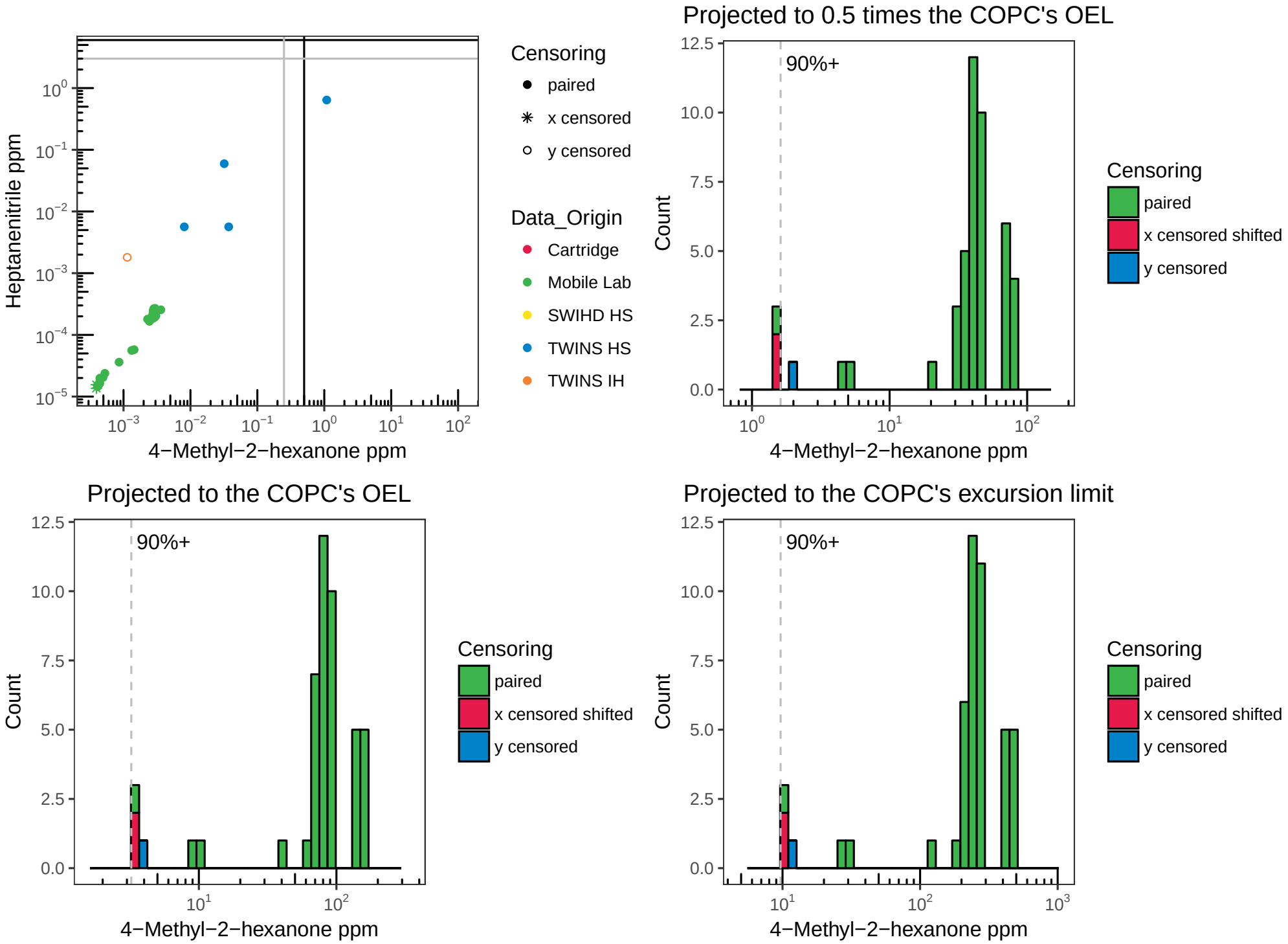


Figure C.572: Heptanenitrile vs 4-Methyl-2-hexanone

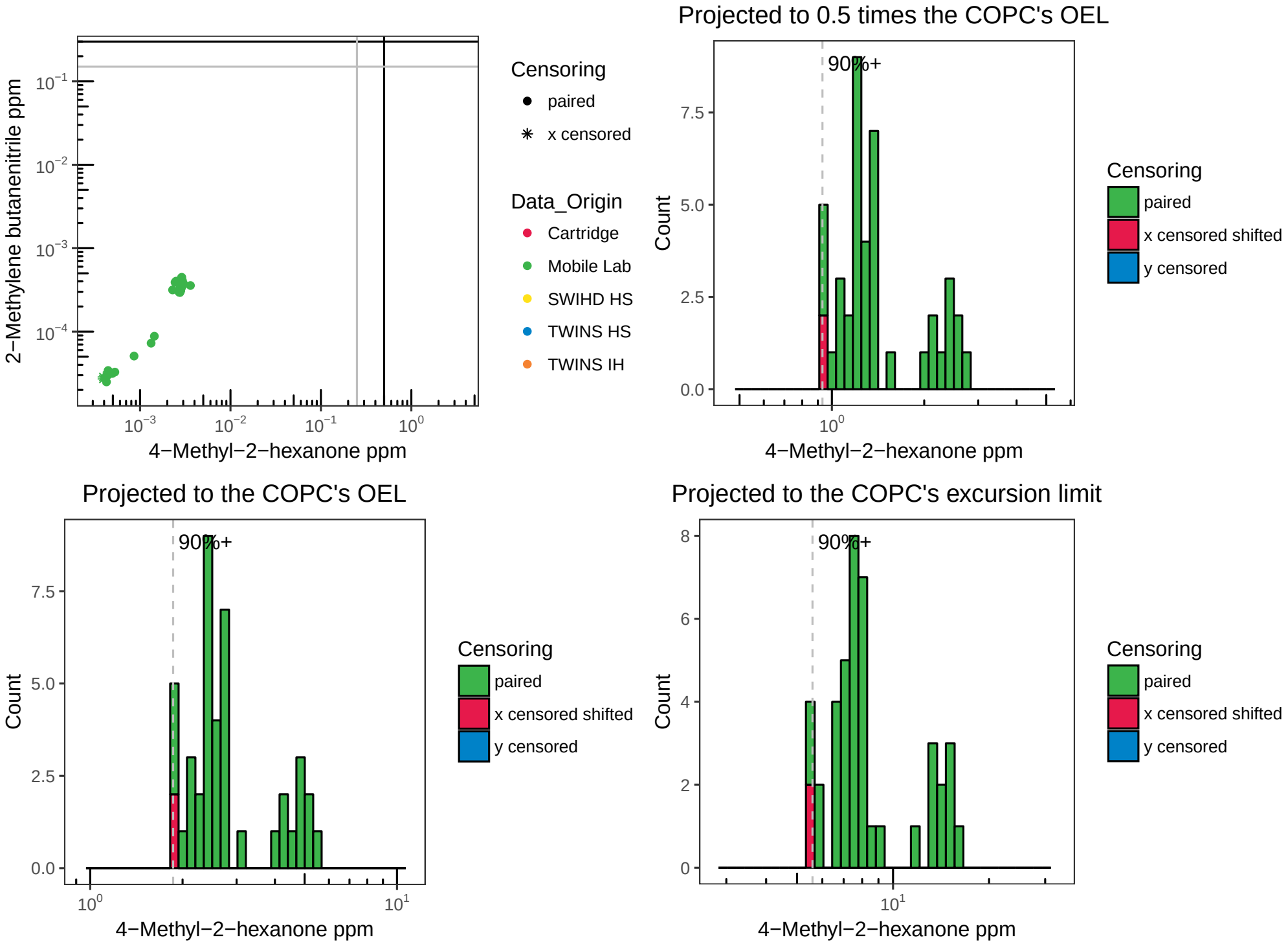


Figure C.573: 2-Methylene butanenitrile vs 4-Methyl-2-hexanone

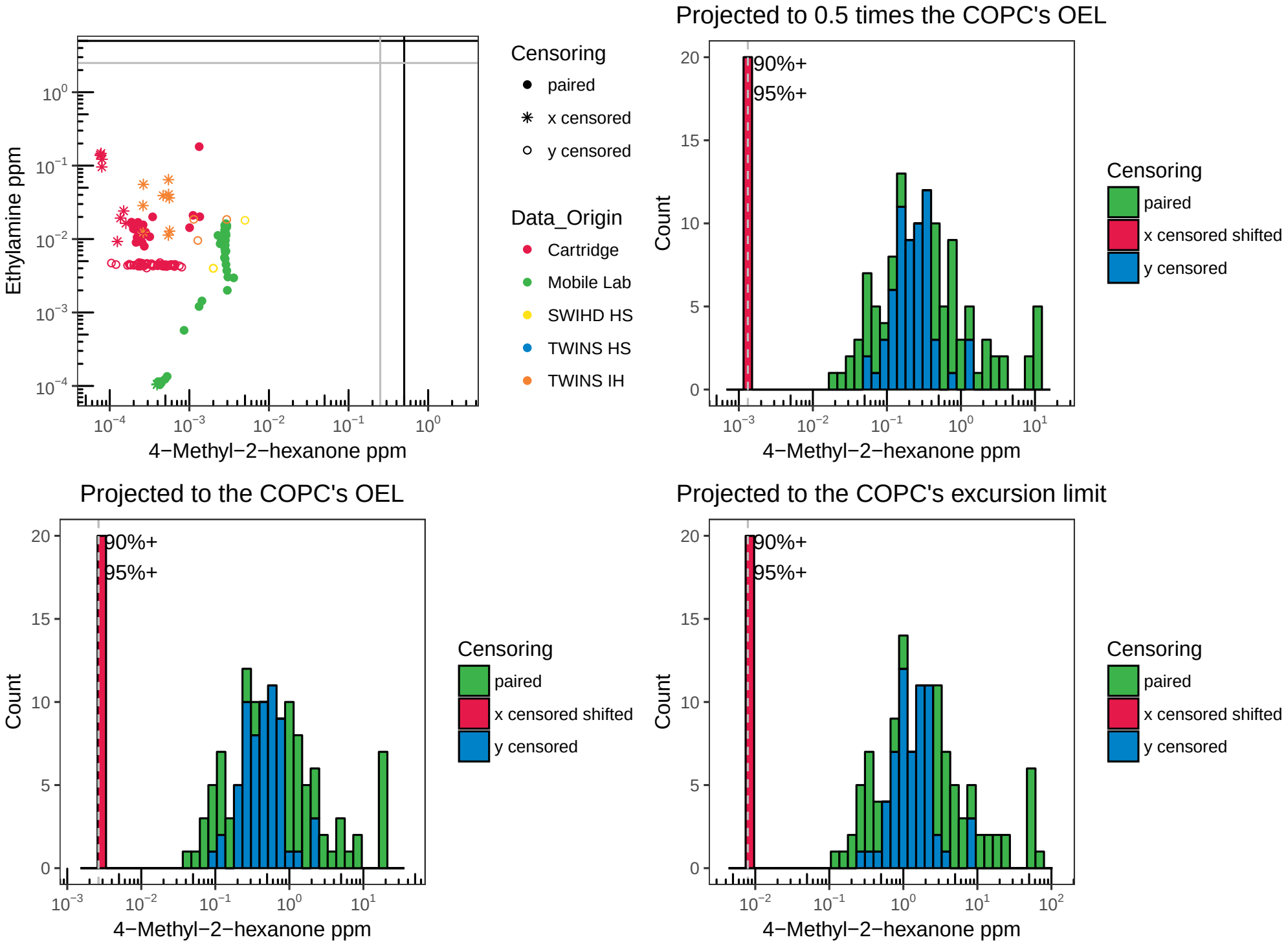


Figure C.574: Ethylamine vs 4-Methyl-2-hexanone

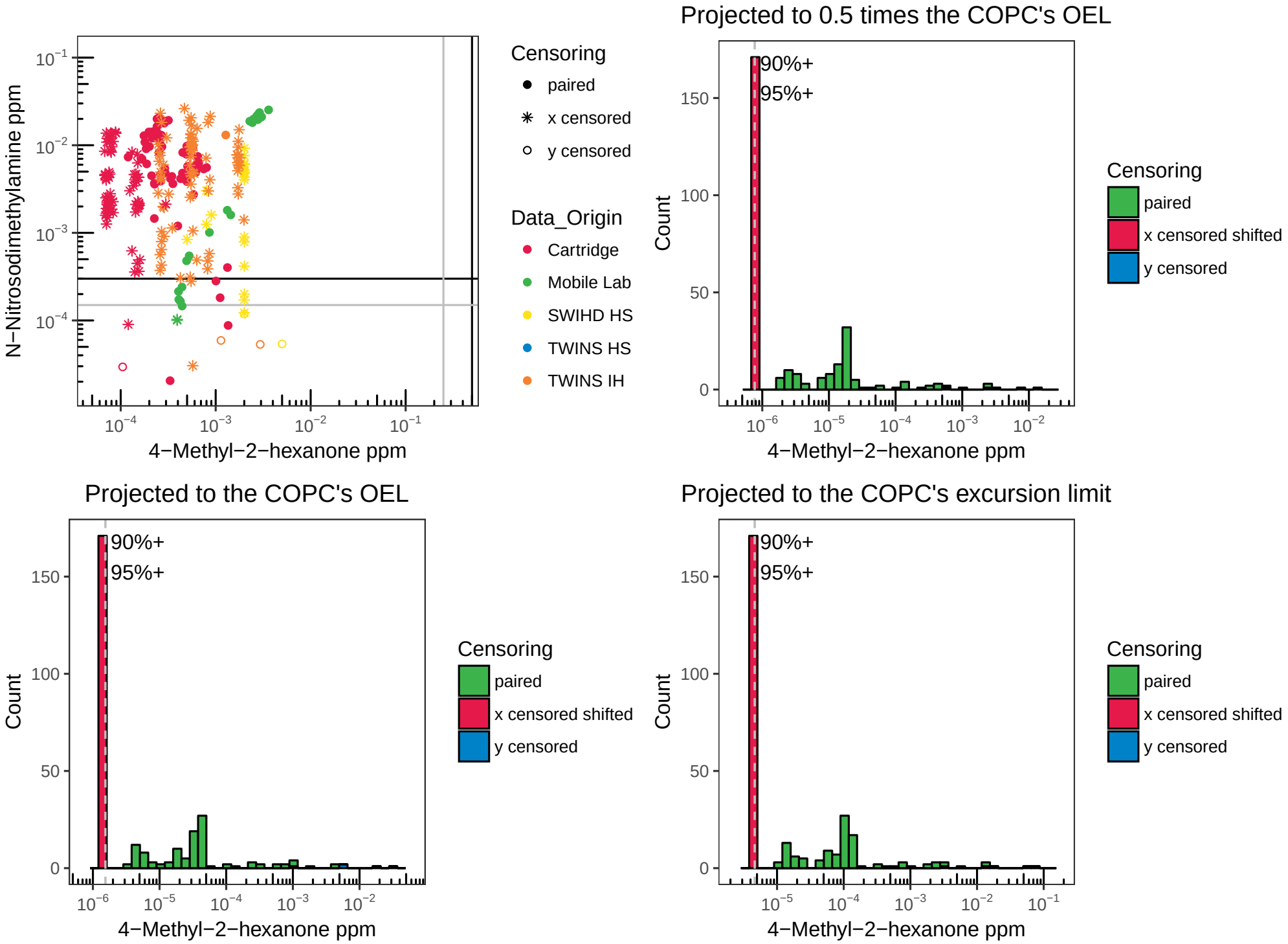


Figure C.575: N-Nitrosodimethylamine vs 4-Methyl-2-hexanone

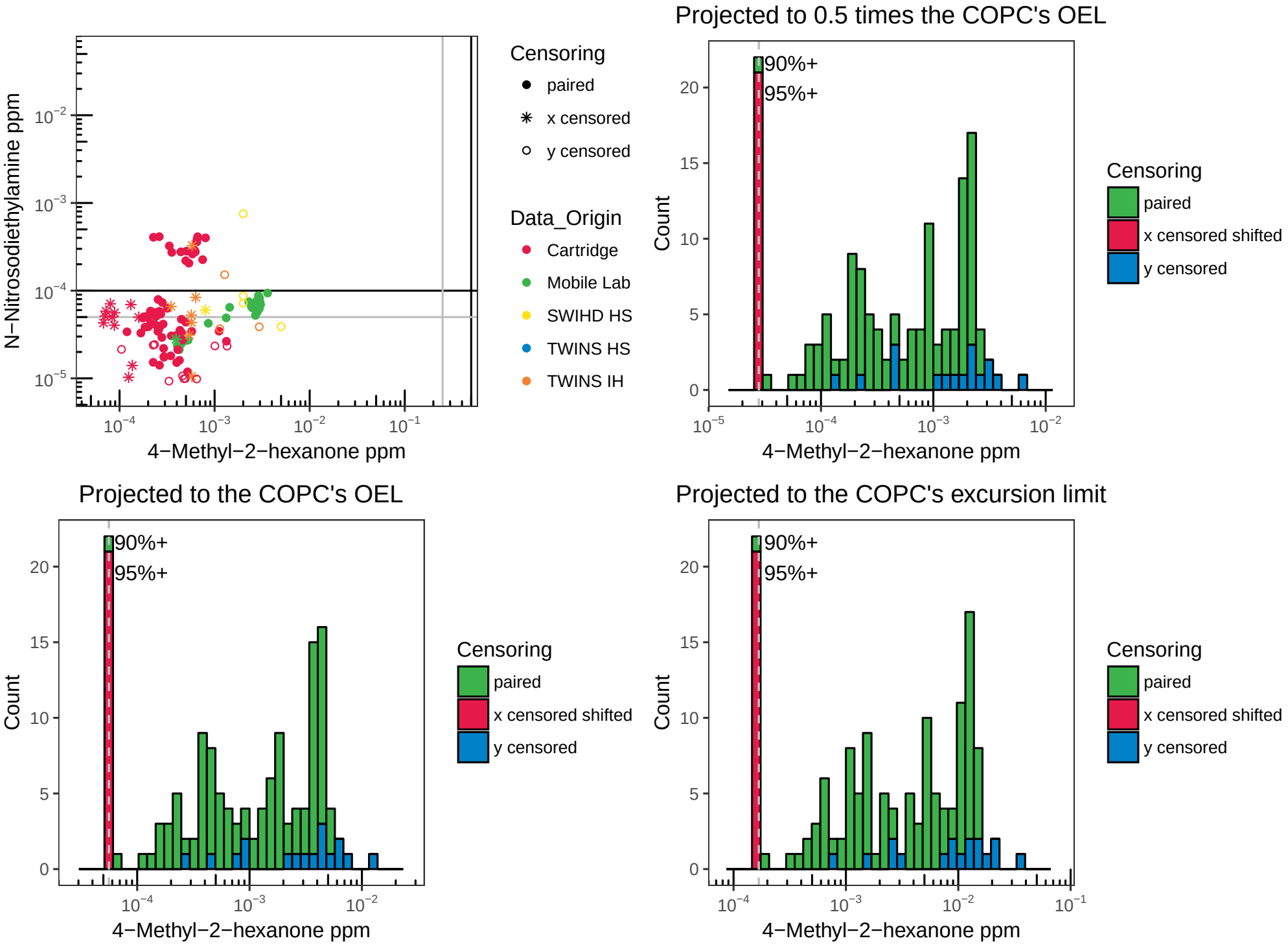


Figure C.576: N-Nitrosodiethylamine vs 4-Methyl-2-hexanone

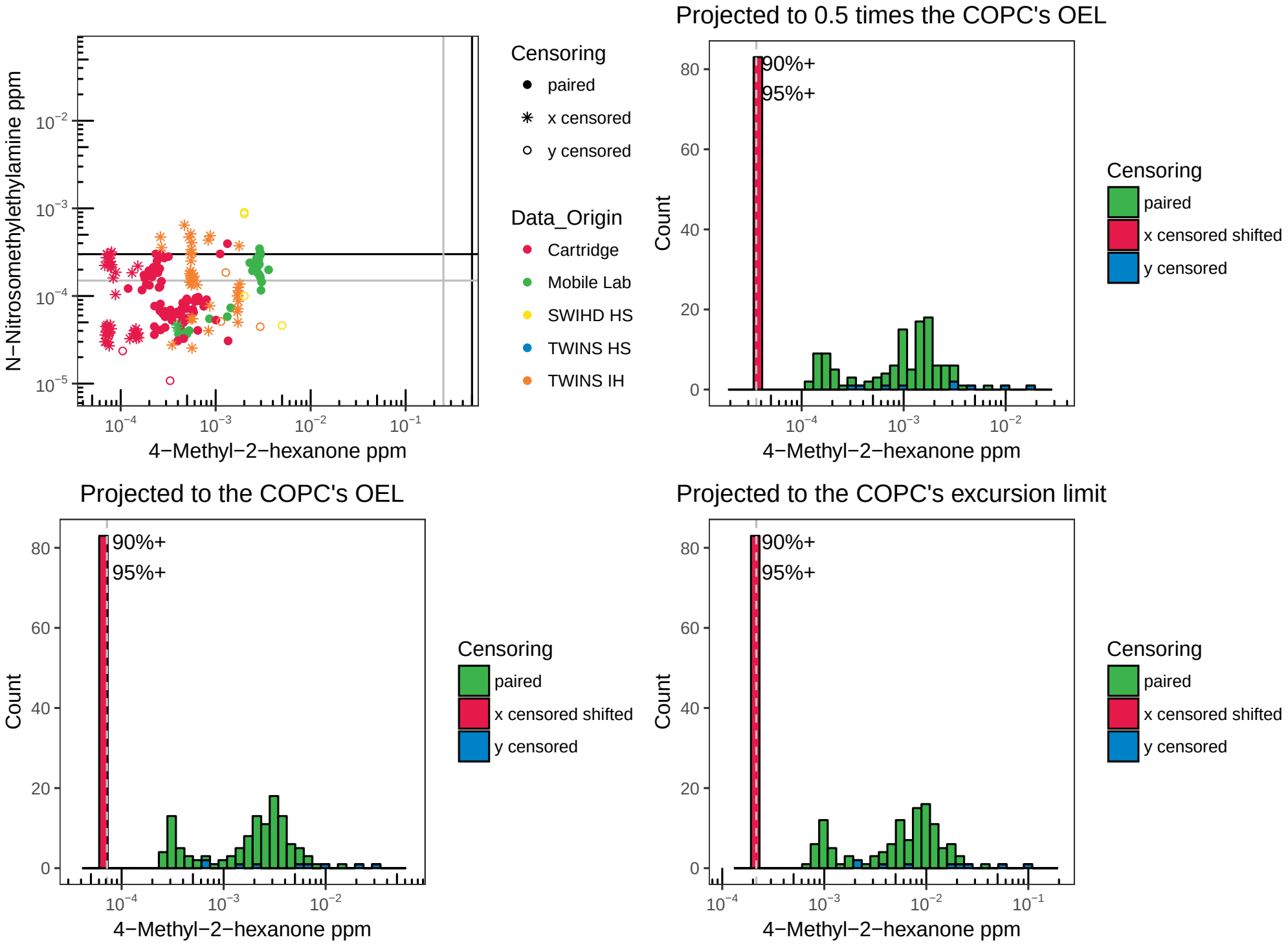


Figure C.577: N-Nitrosomethylethylamine vs 4-Methyl-2-hexanone

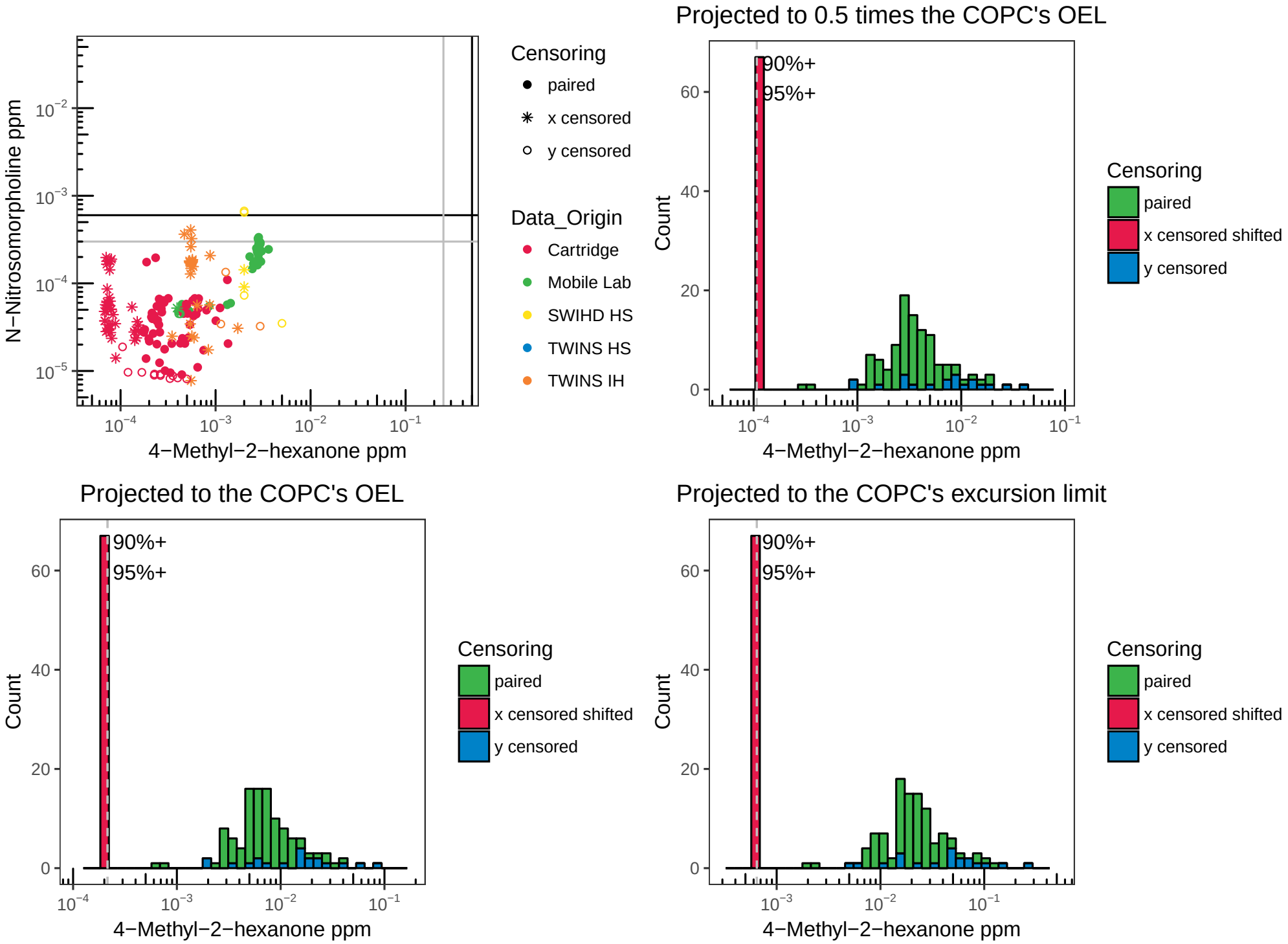


Figure C.578: N-Nitrosomorpholine vs 4-Methyl-2-hexanone

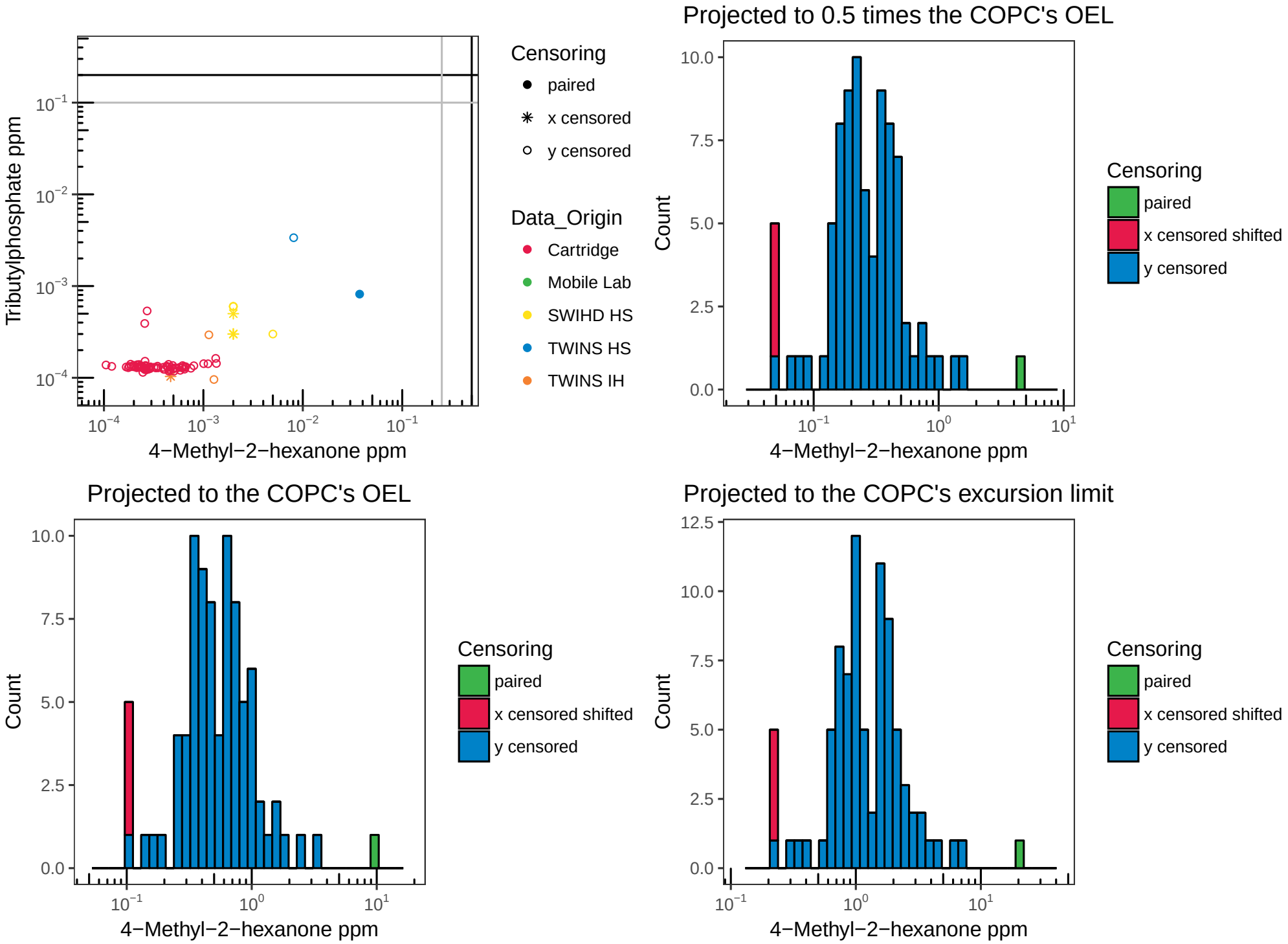


Figure C.579: Tributylphosphate vs 4-Methyl-2-hexanone

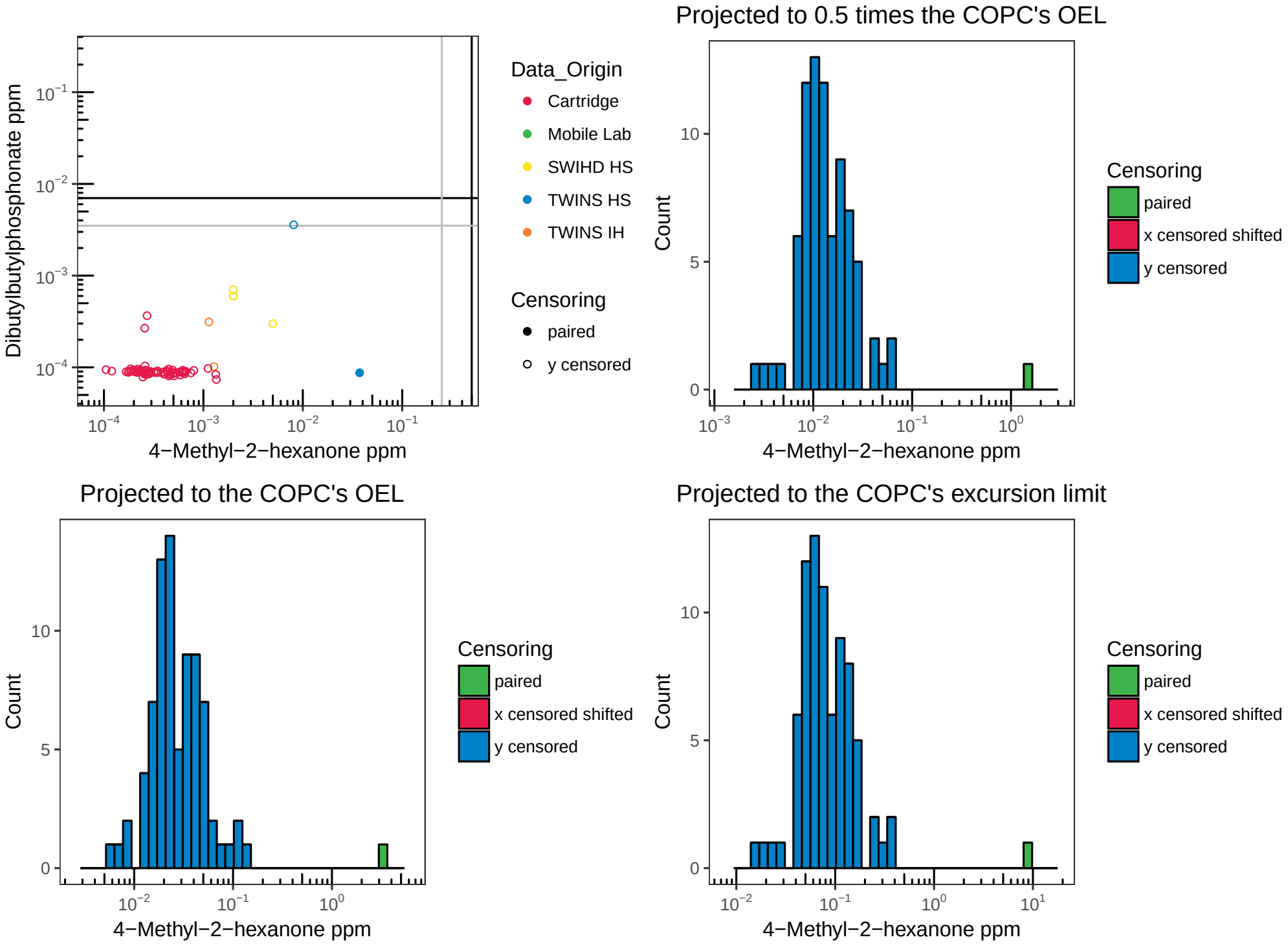


Figure C.580: Dibutylbutylphosphonate vs 4-Methyl-2-hexanone

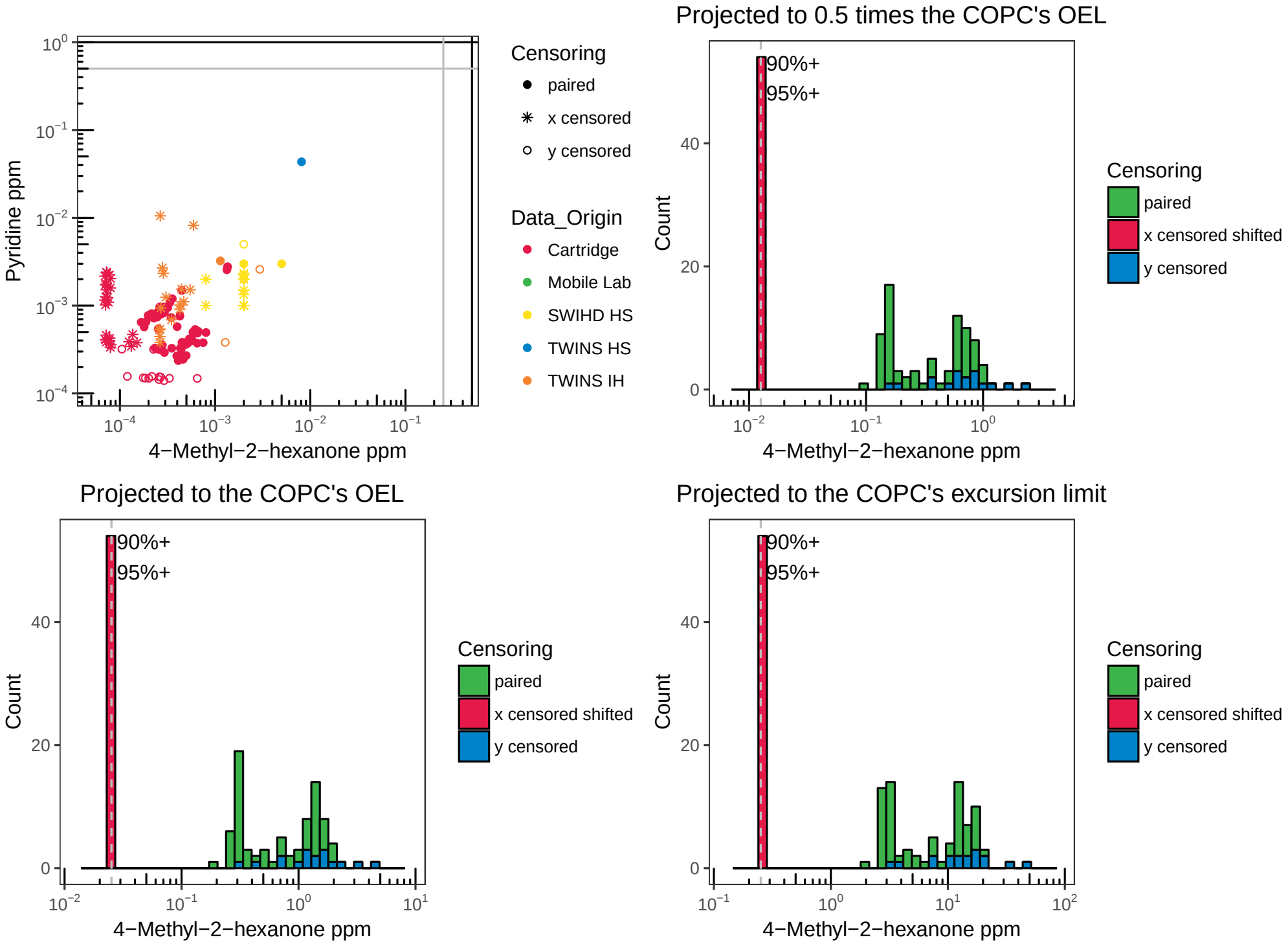


Figure C.581: Pyridine vs 4-Methyl-2-hexanone

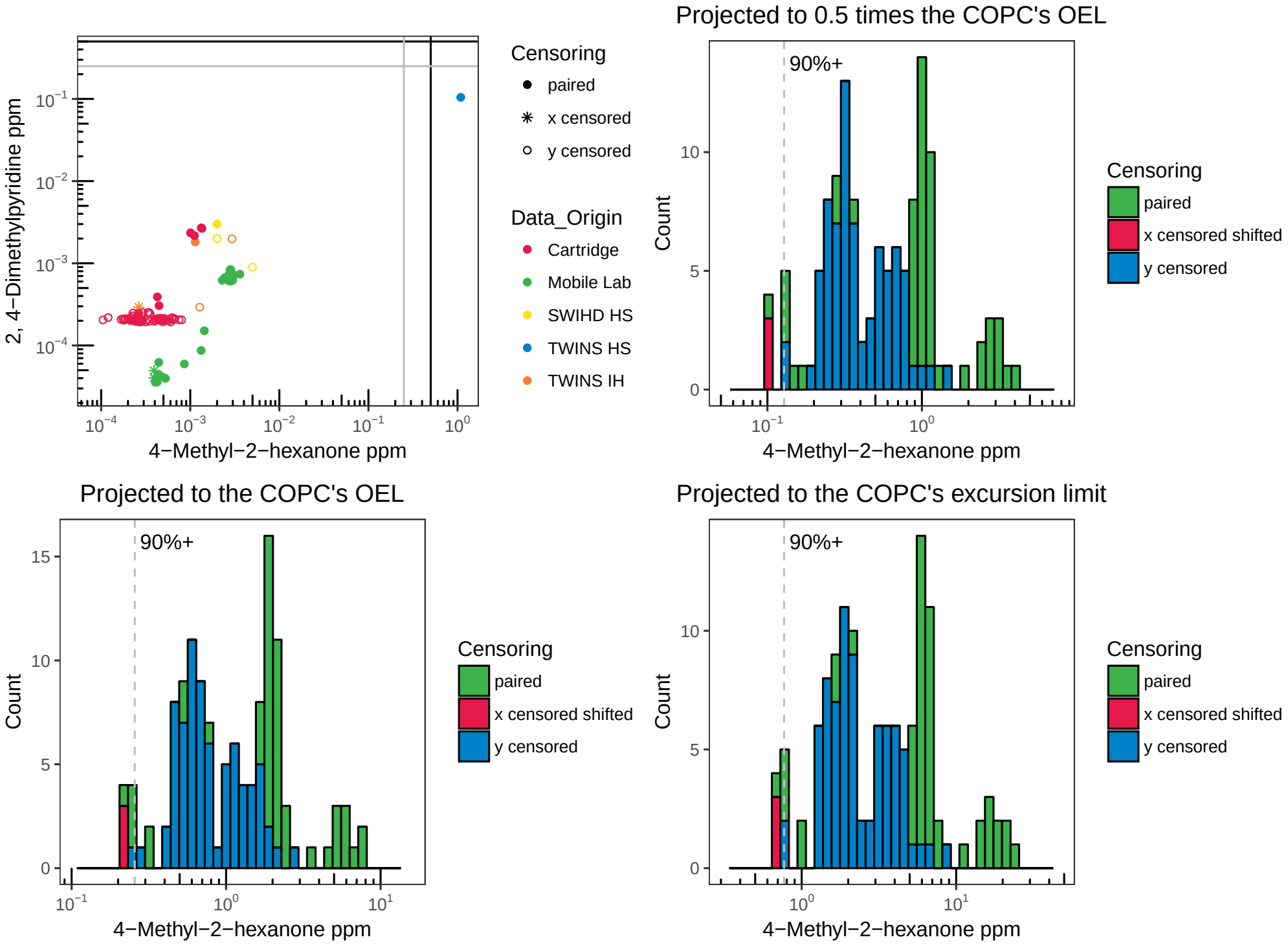


Figure C.582: 2, 4-Dimethylpyridine vs 4-Methyl-2-hexanone

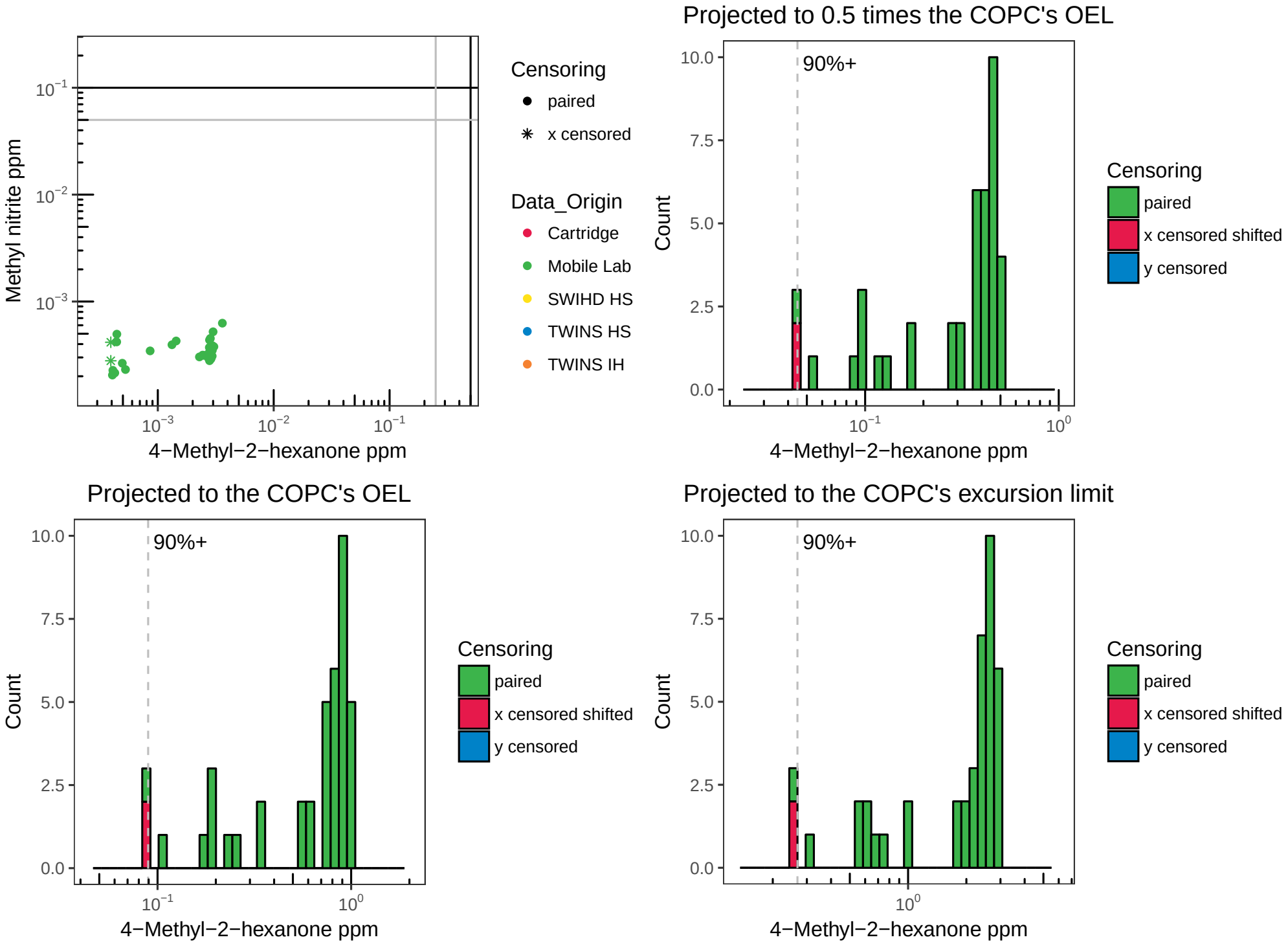


Figure C.583: Methyl nitrite vs 4-Methyl-2-hexanone

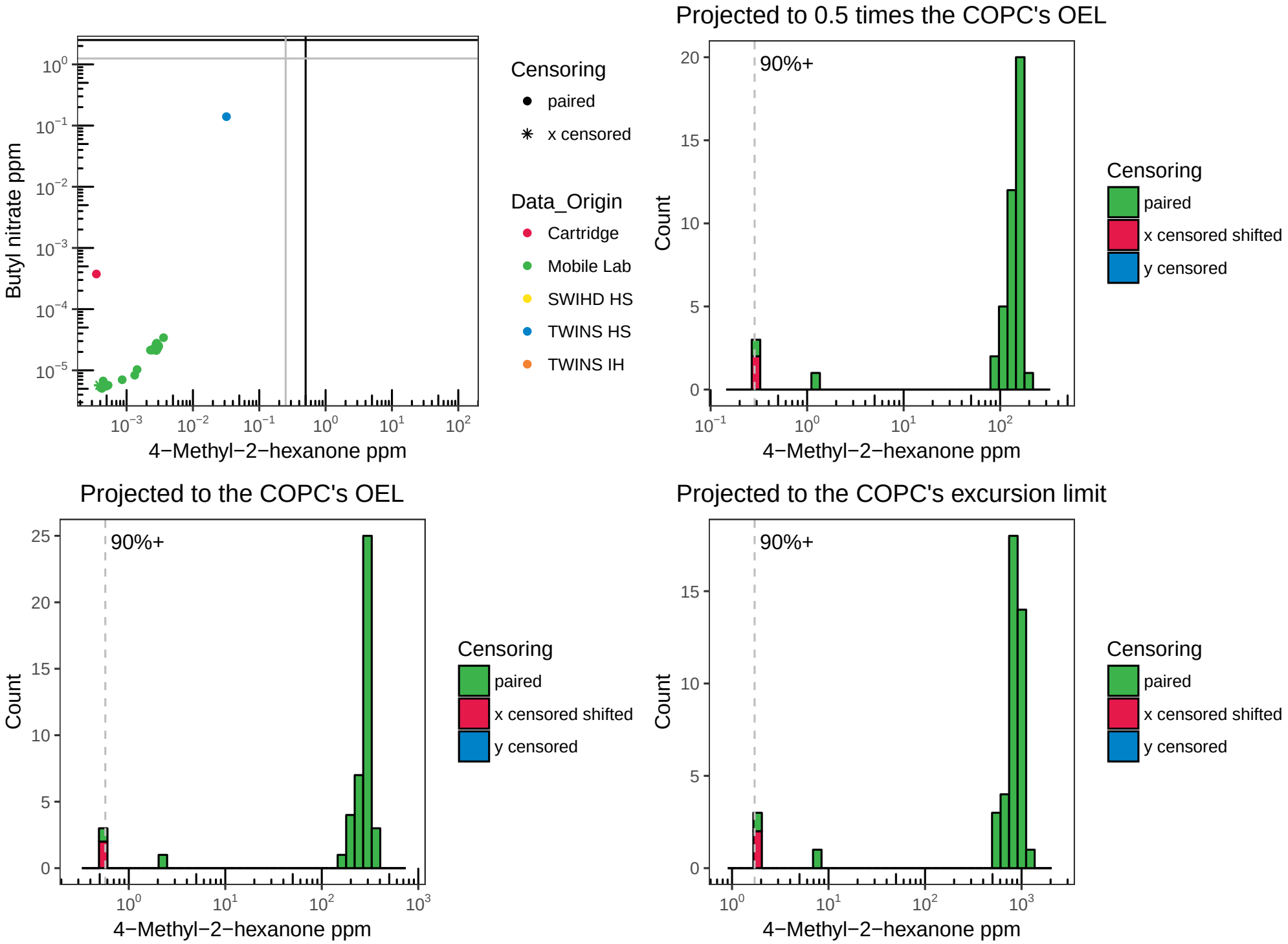


Figure C.584: Butyl nitrate vs 4-Methyl-2-hexanone

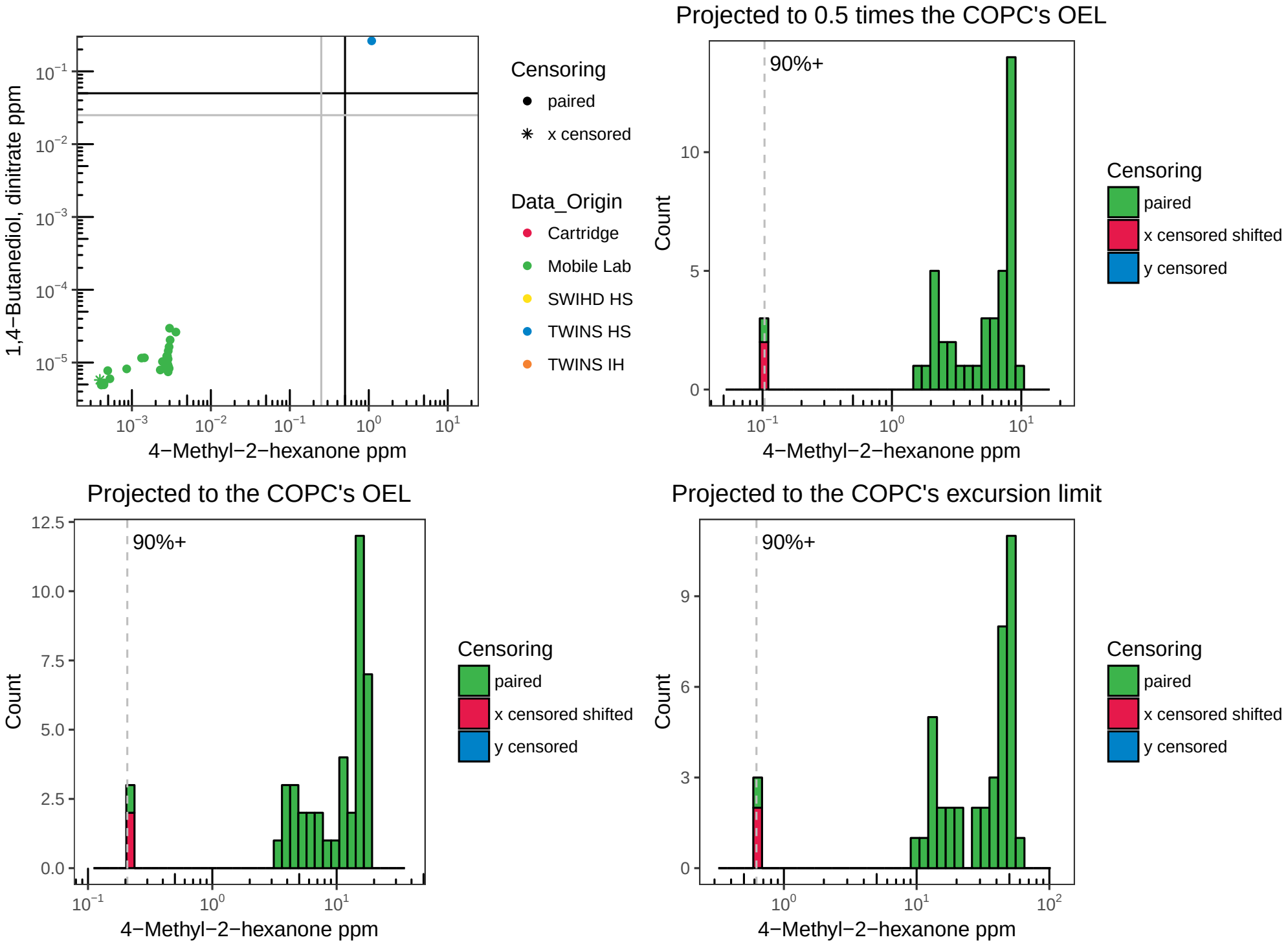


Figure C.585: 1,4-Butanediol, dinitrate vs 4-Methyl-2-hexanone

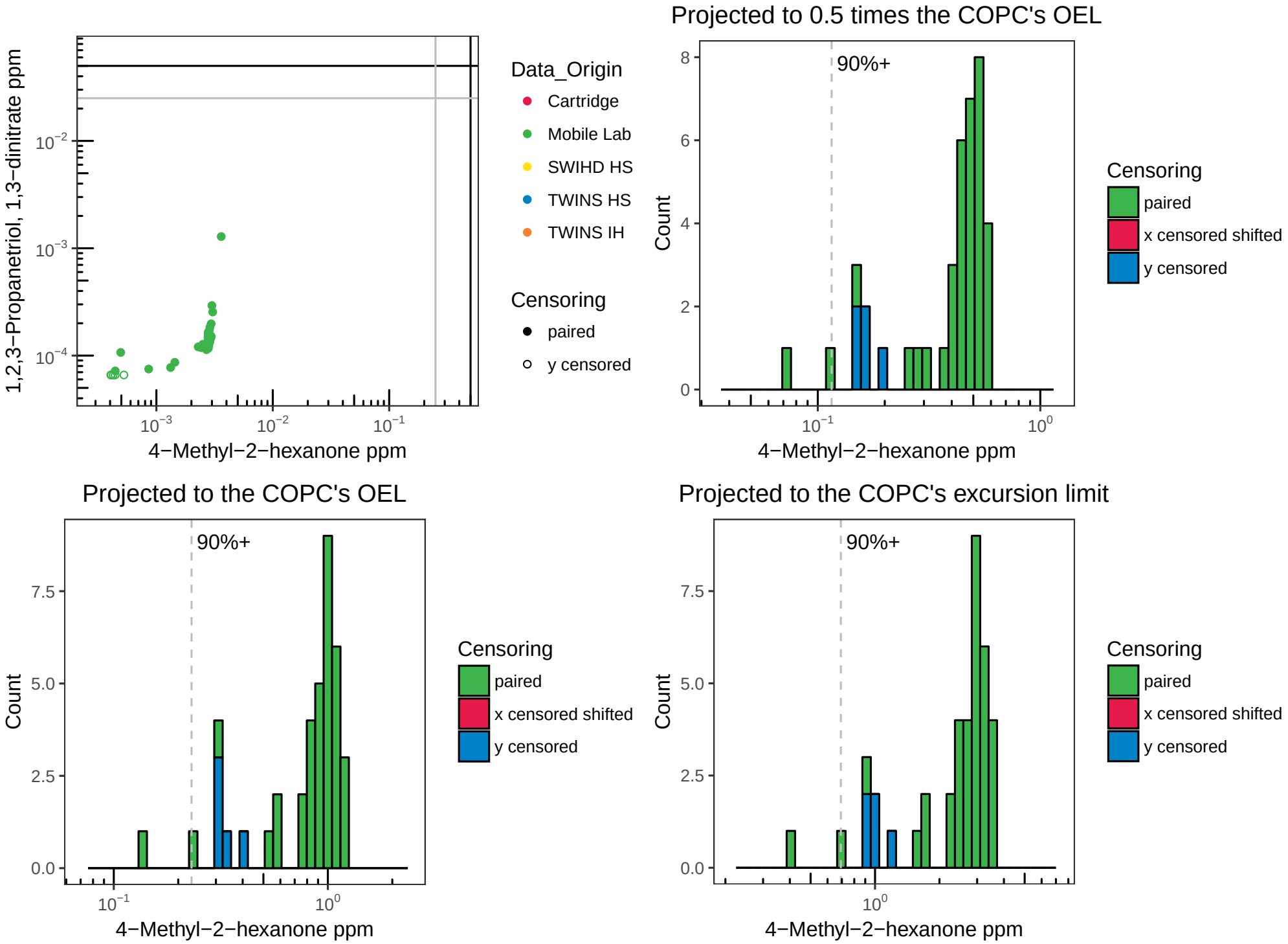


Figure C.586: 1,2,3-Propanetriol, 1,3-dinitrate vs 4-Methyl-2-hexanone

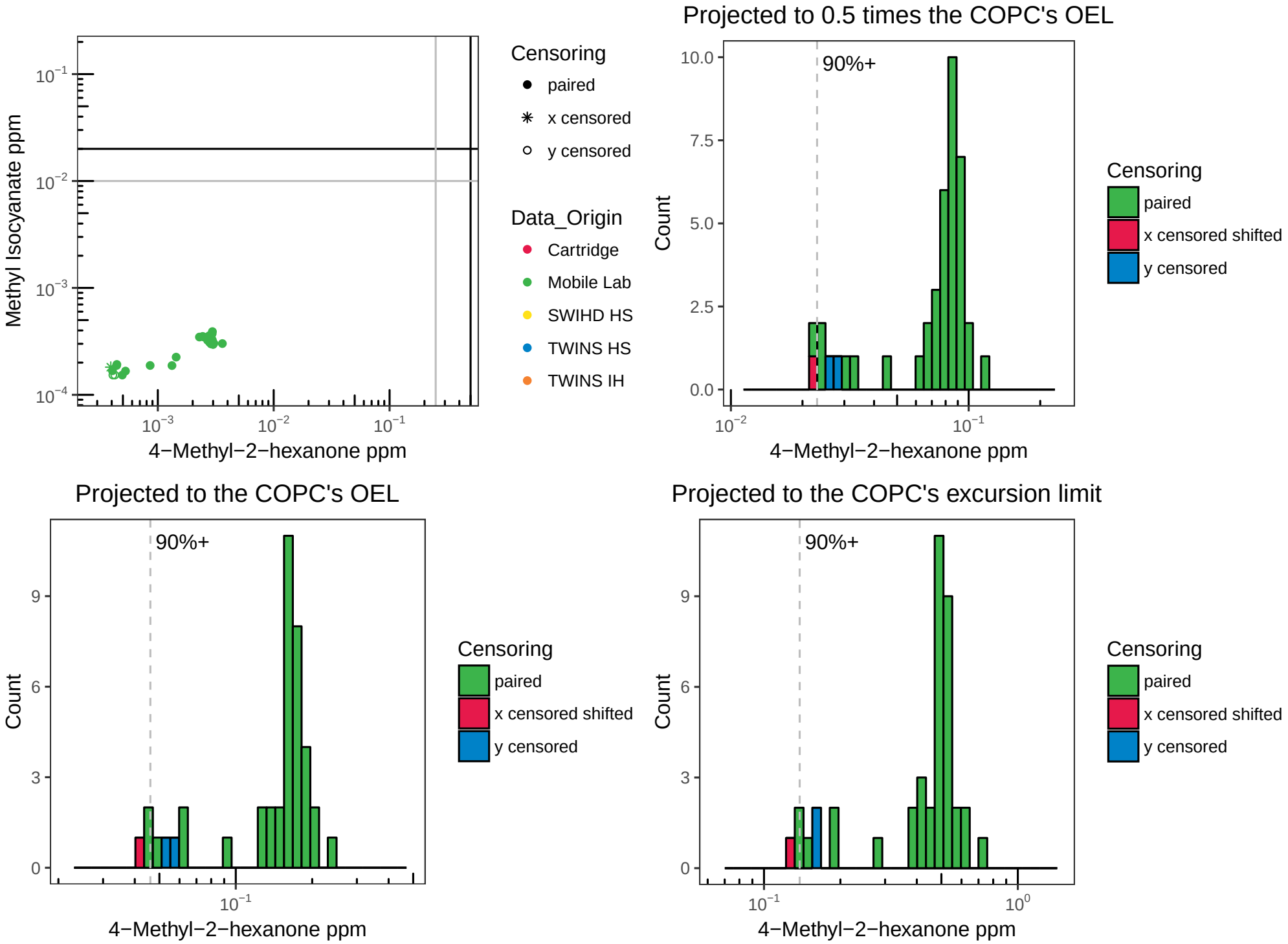


Figure C.587: Methyl Isocyanate vs 4-Methyl-2-hexanone

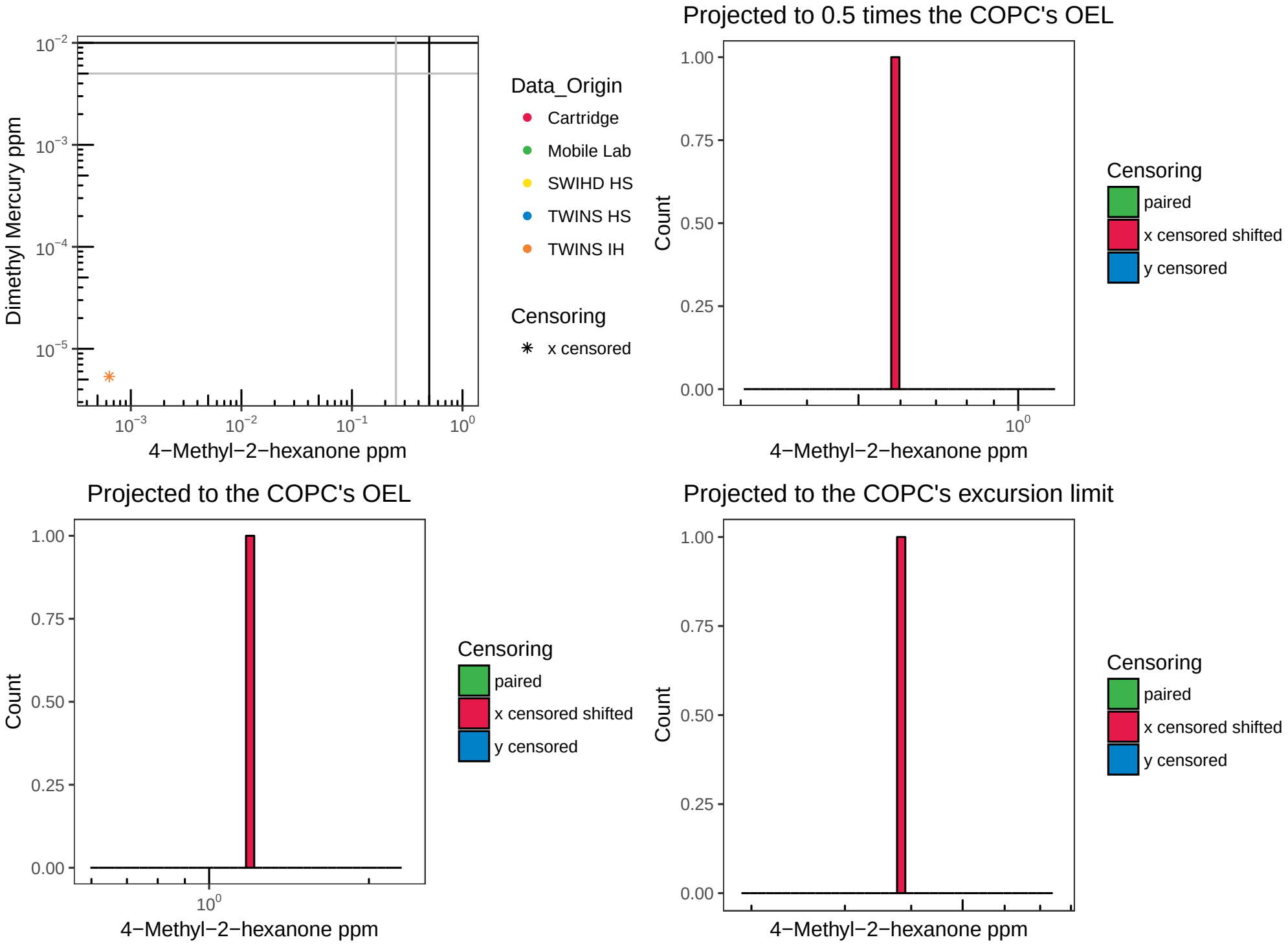


Figure C.588: Dimethyl Mercury vs 4-Methyl-2-hexanone

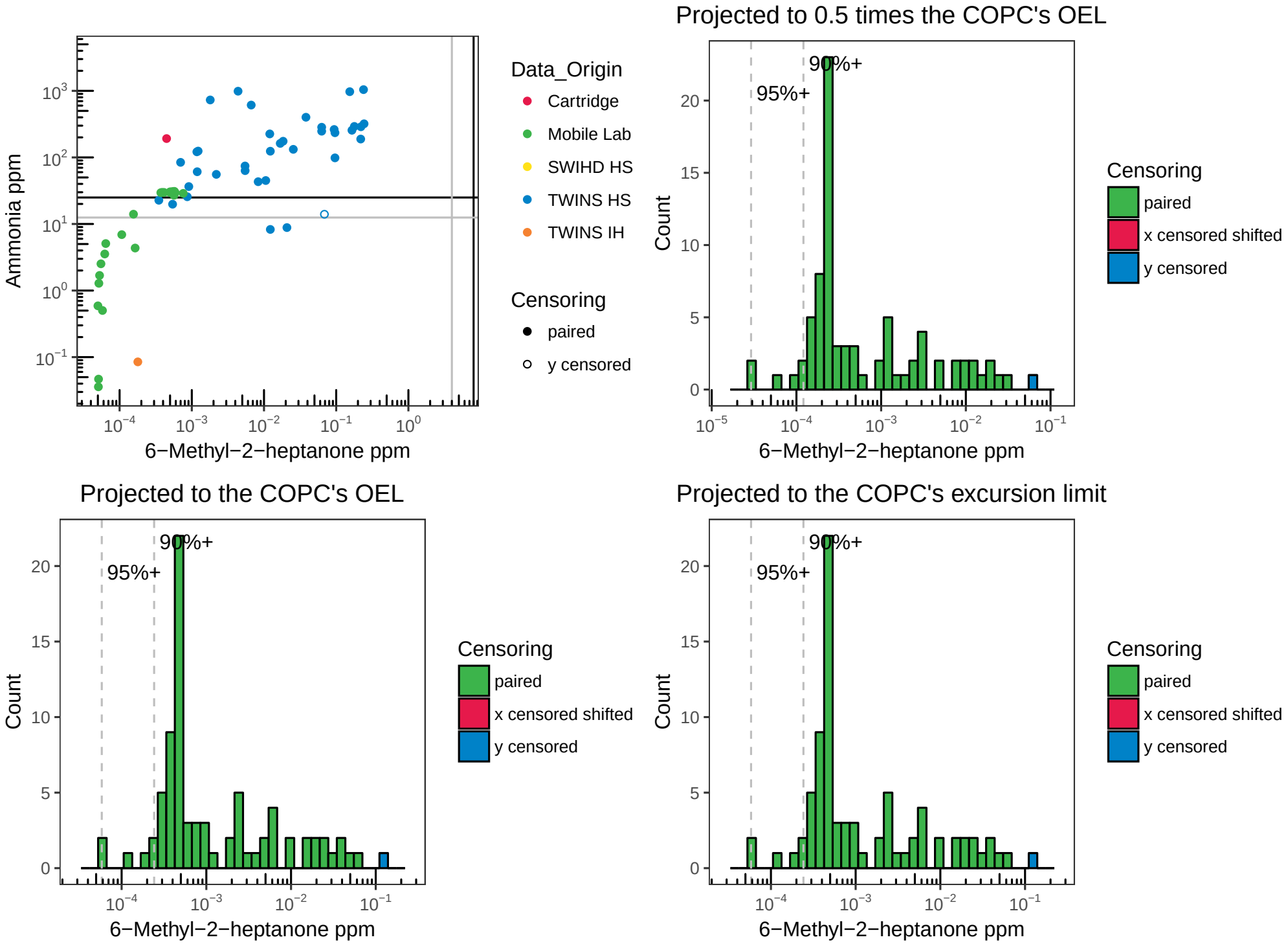


Figure C.589: Ammonia vs 6-Methyl-2-heptanone

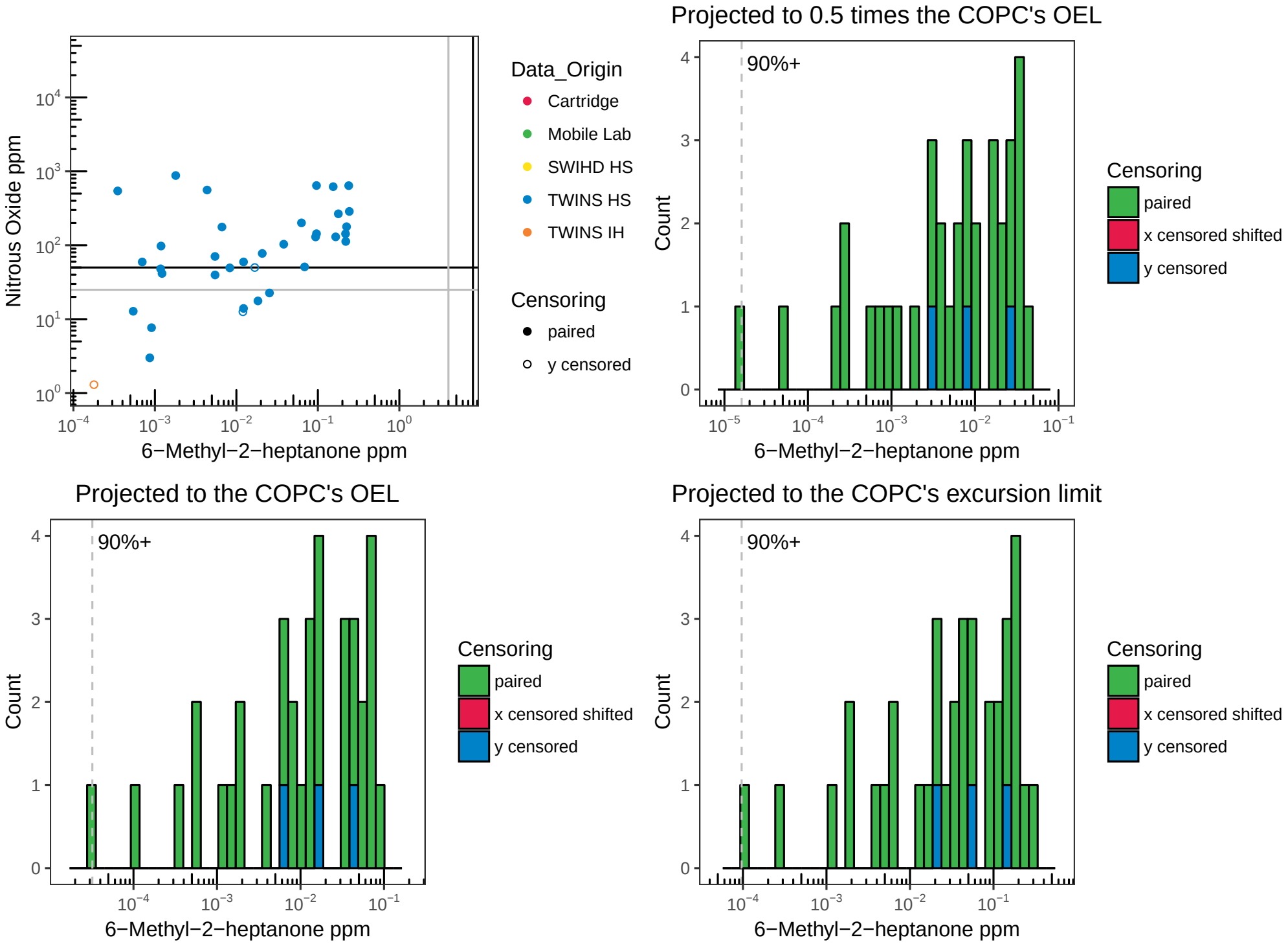


Figure C.590: Nitrous Oxide vs 6-Methyl-2-heptanone

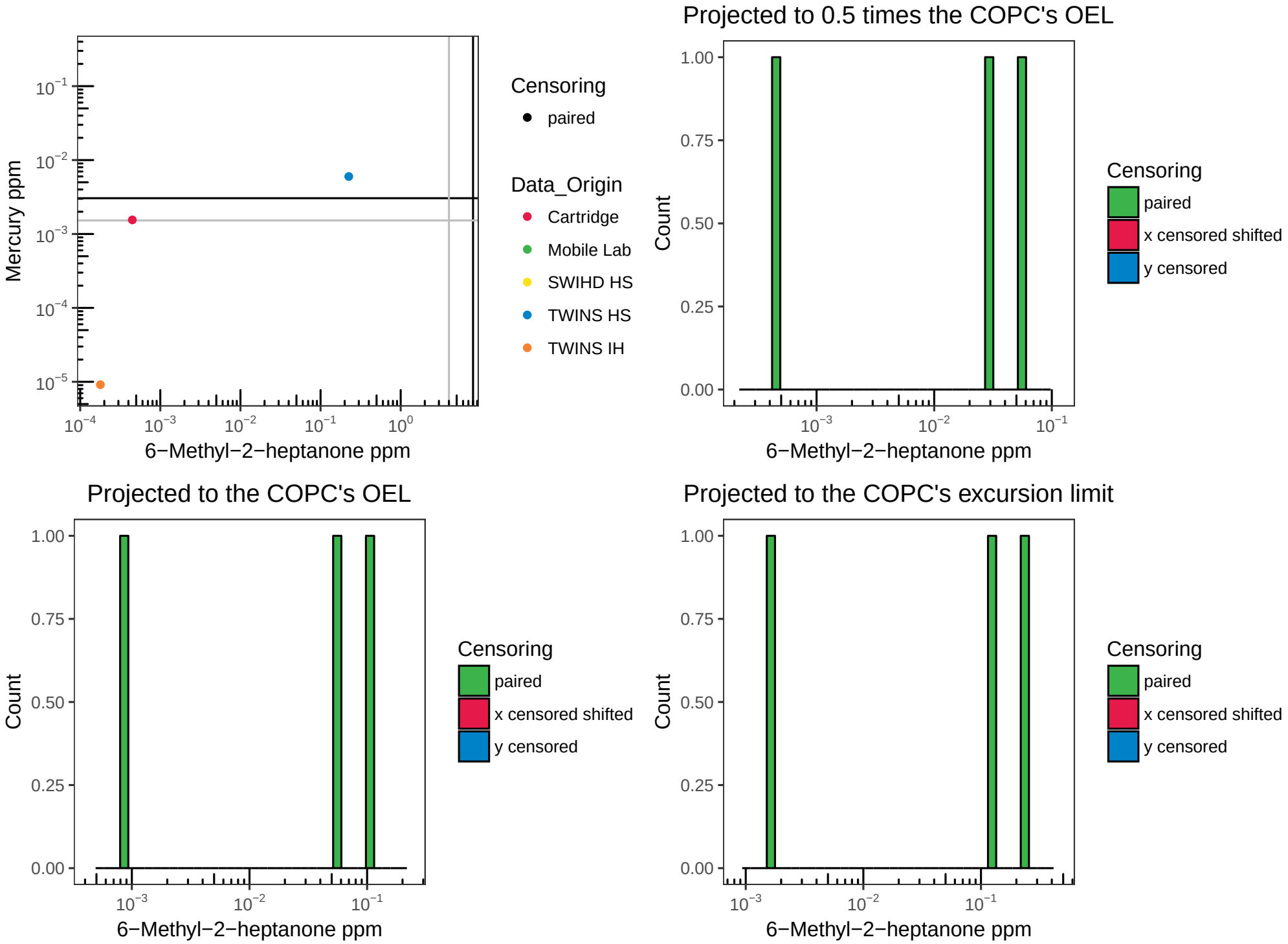


Figure C.591: Mercury vs 6-Methyl-2-heptanone

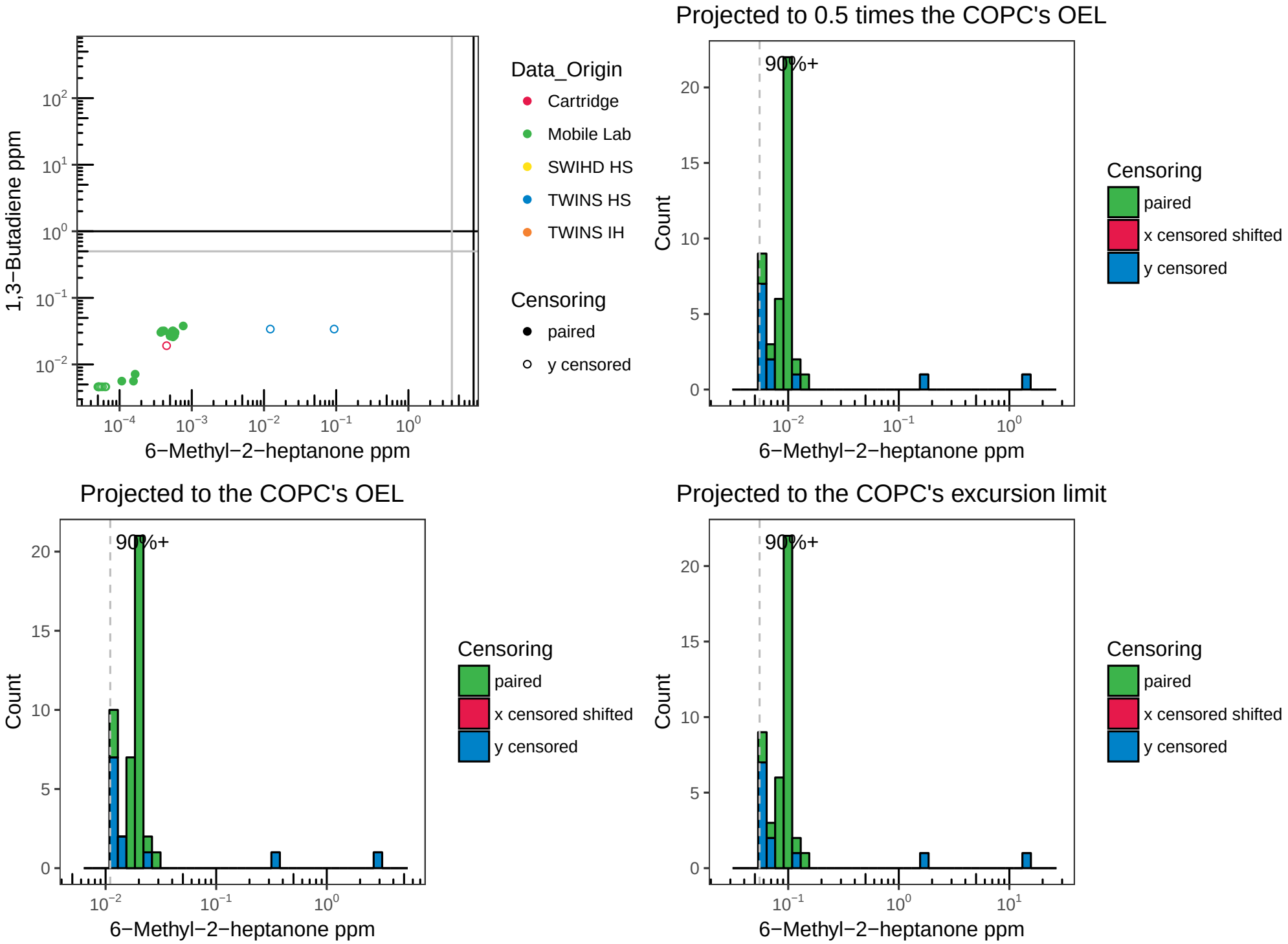


Figure C.592: 1,3-Butadiene vs 6-Methyl-2-heptanone

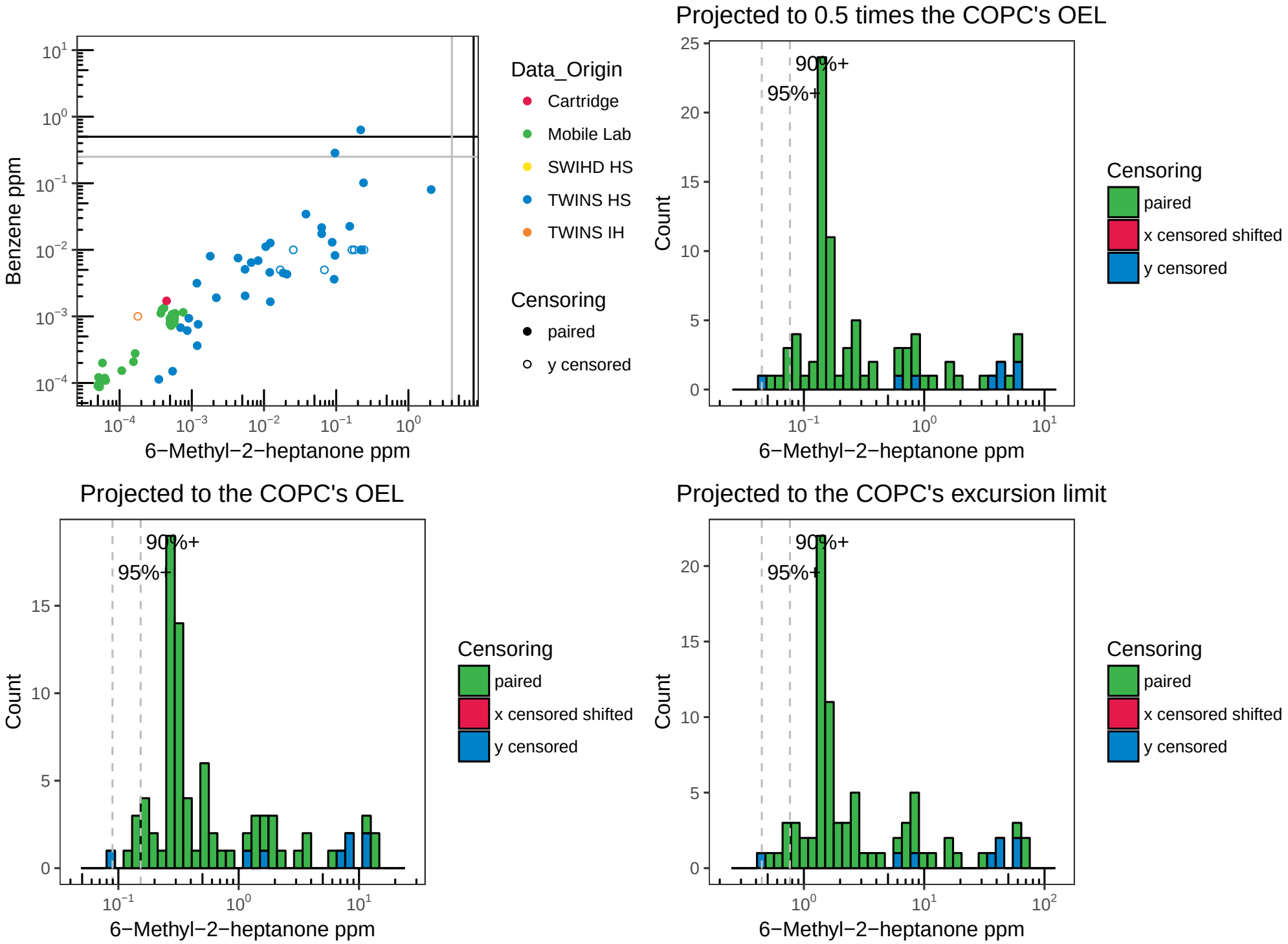


Figure C.593: Benzene vs 6-Methyl-2-heptanone

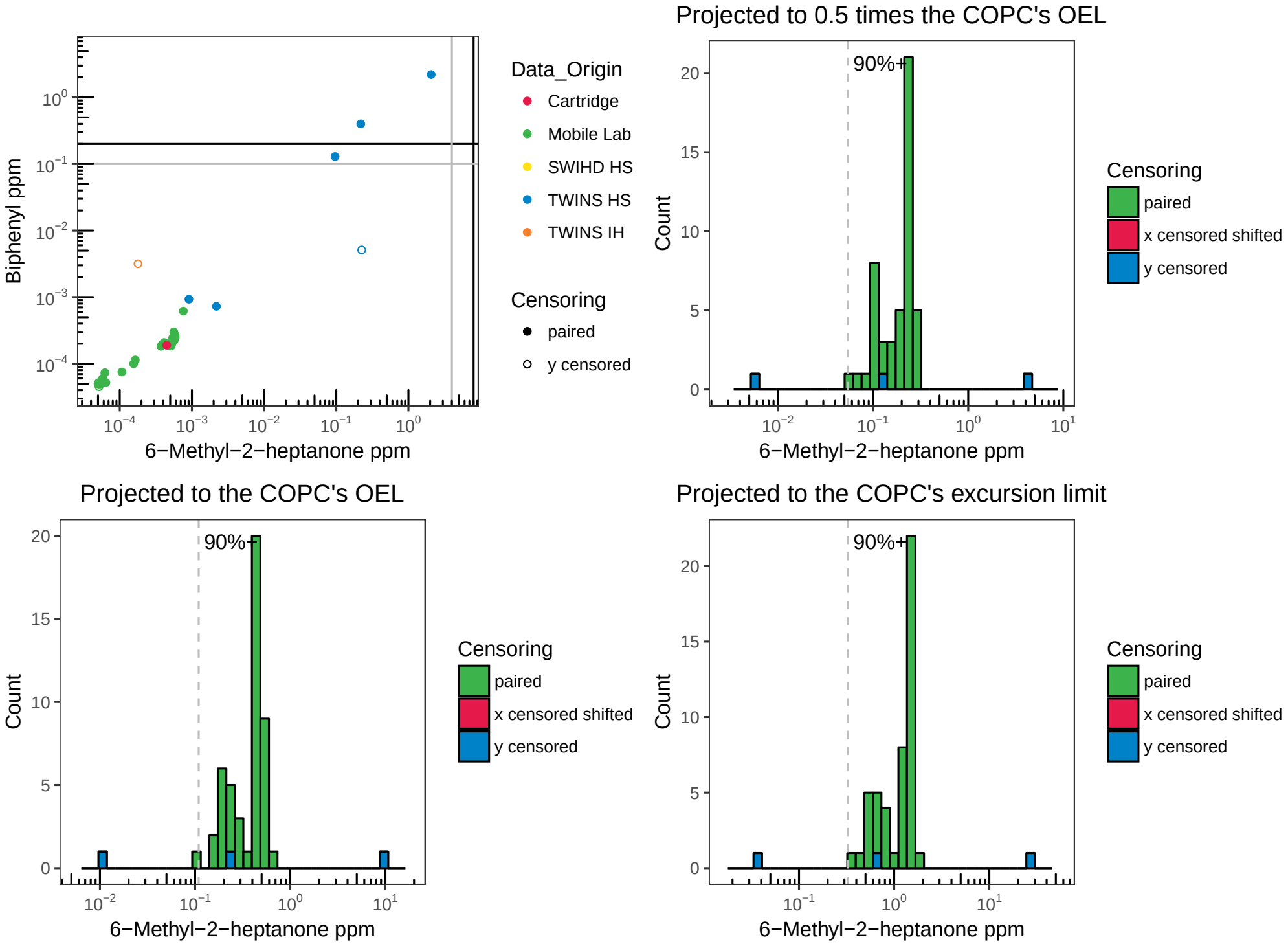


Figure C.594: Biphenyl vs 6-Methyl-2-heptanone

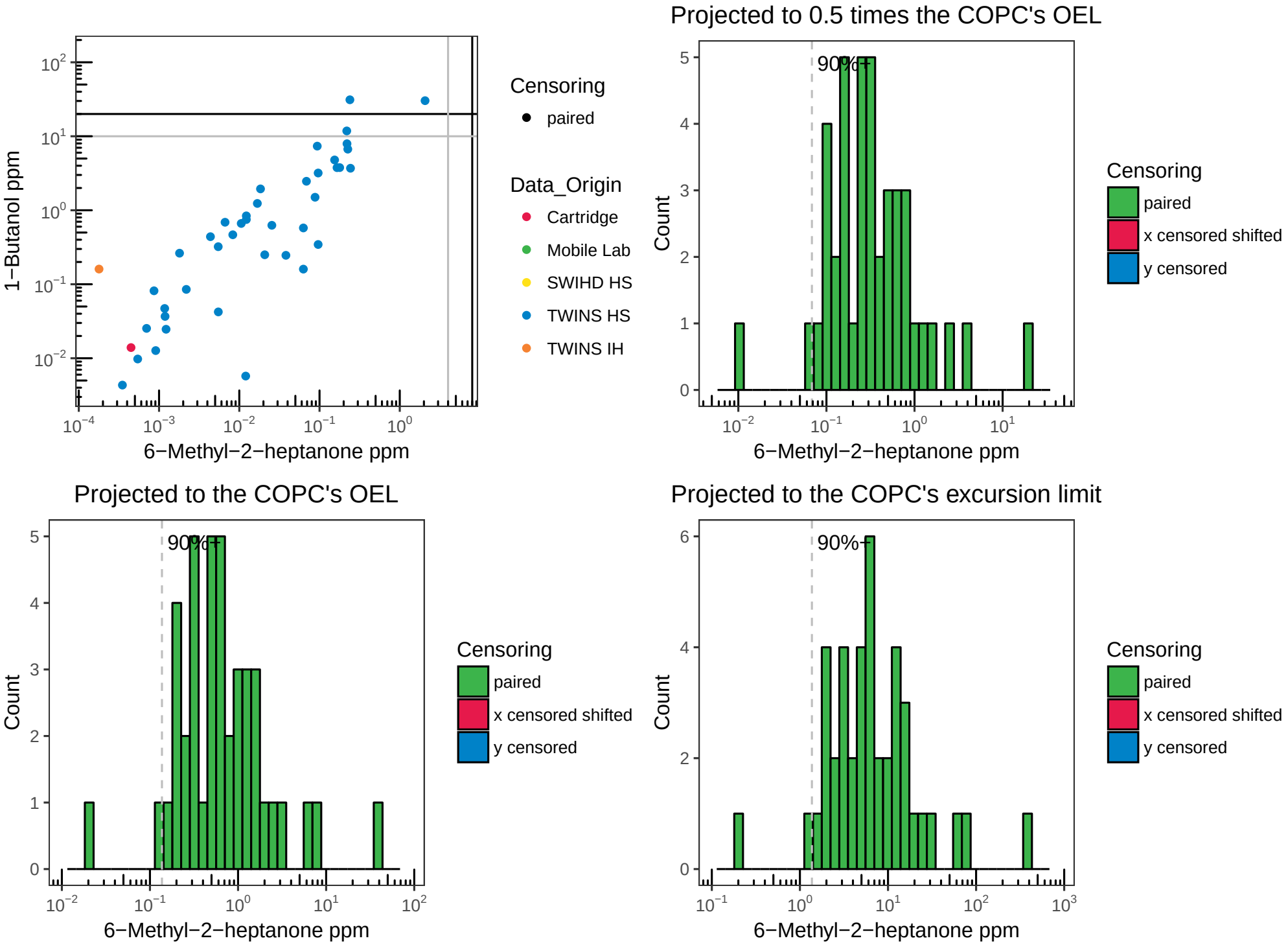


Figure C.595: 1-Butanol vs 6-Methyl-2-heptanone

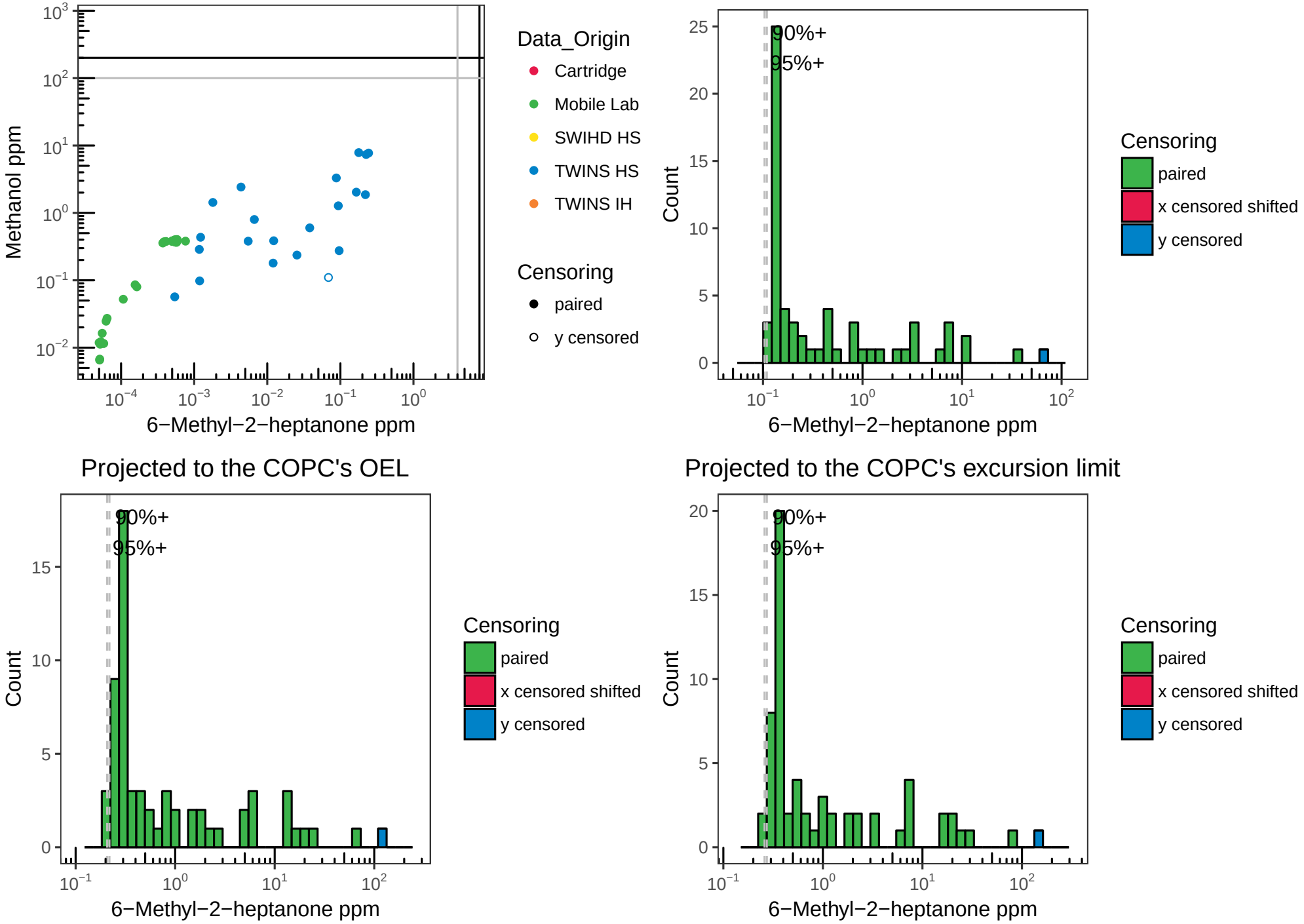


Figure C.596: Methanol vs 6-Methyl-2-heptanone

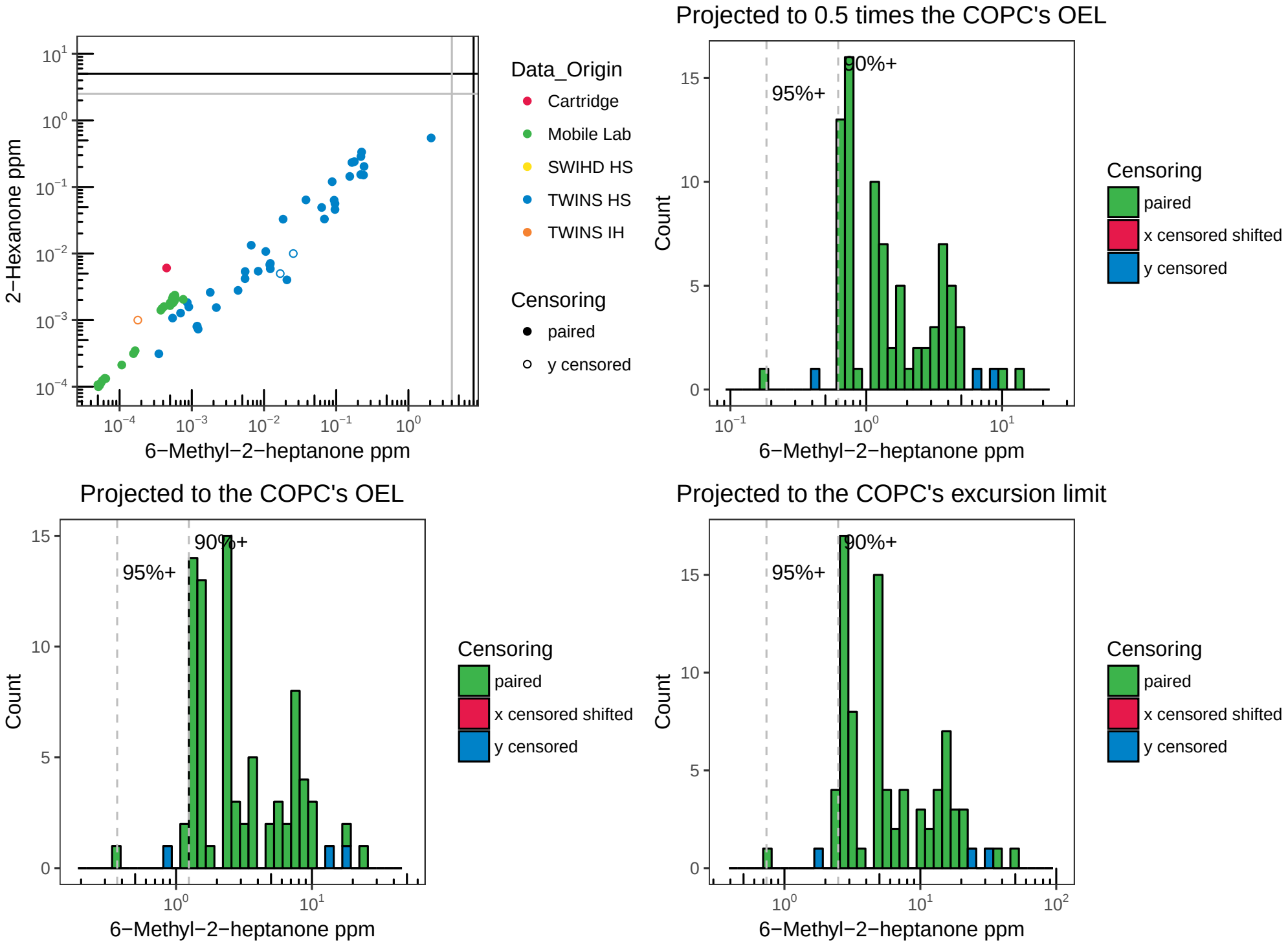


Figure C.597: 2-Hexanone vs 6-Methyl-2-heptanone

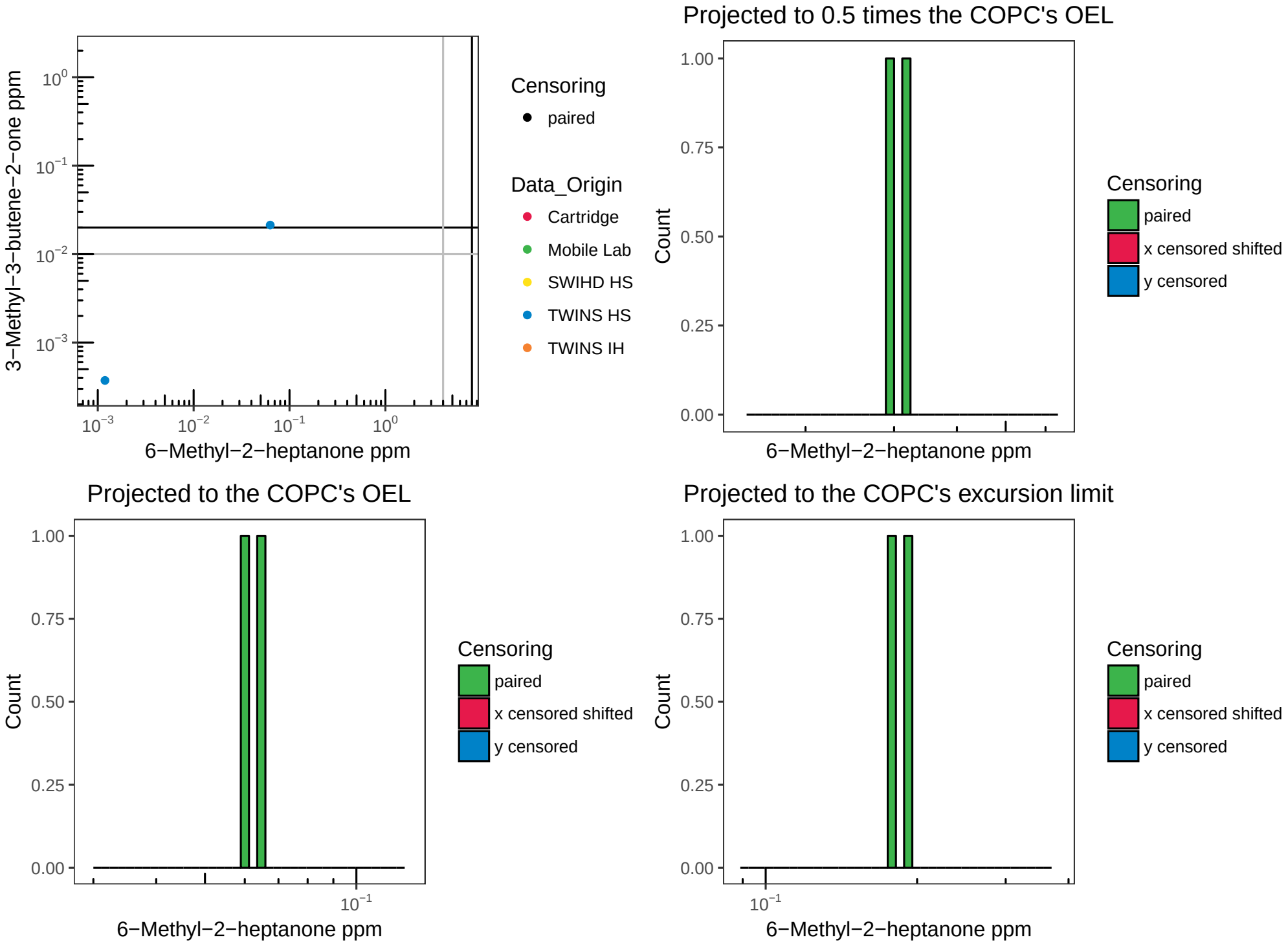


Figure C.598: 3-Methyl-3-butene-2-one vs 6-Methyl-2-heptanone

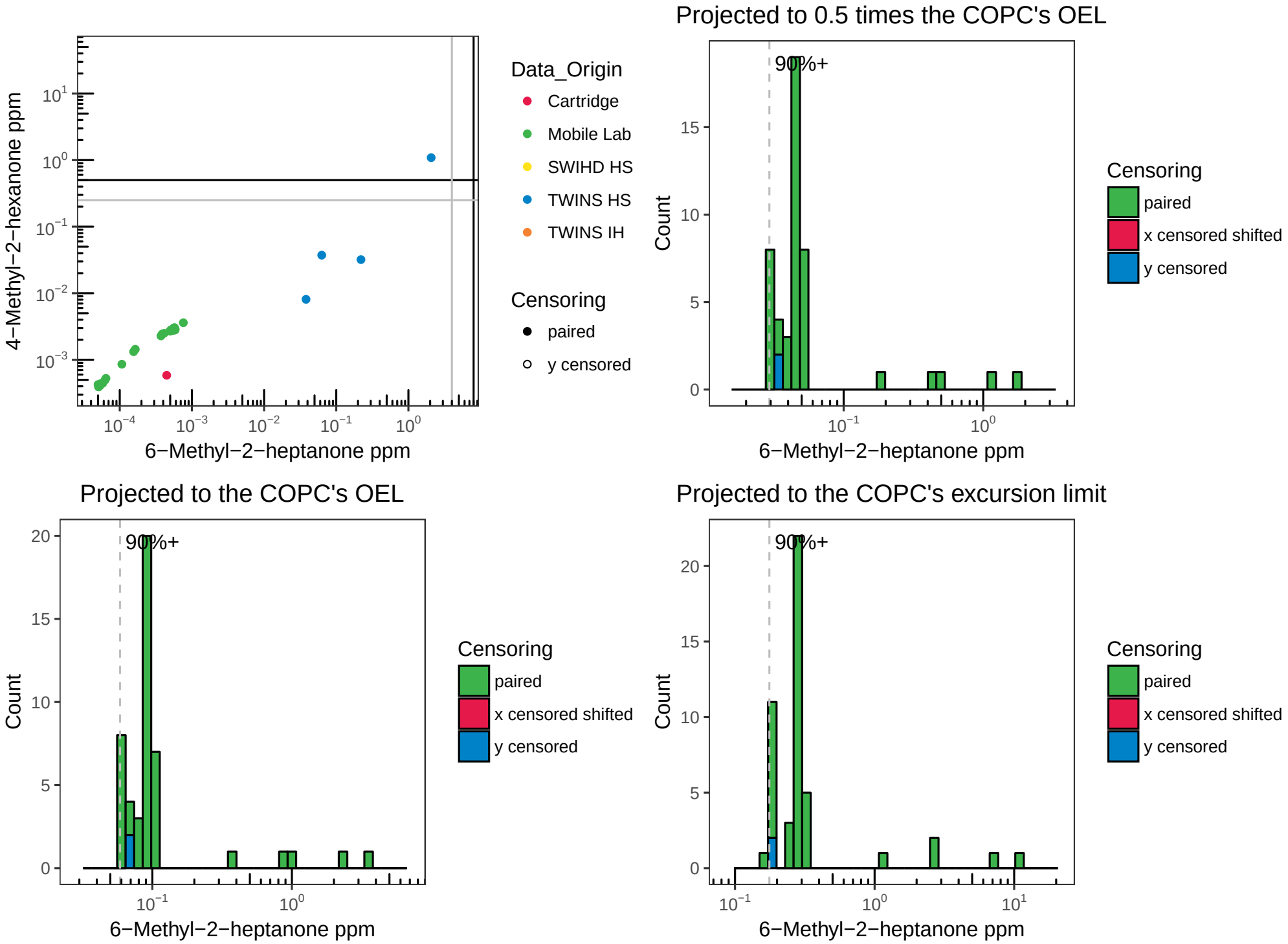


Figure C.599: 4-Methyl-2-hexanone vs 6-Methyl-2-heptanone

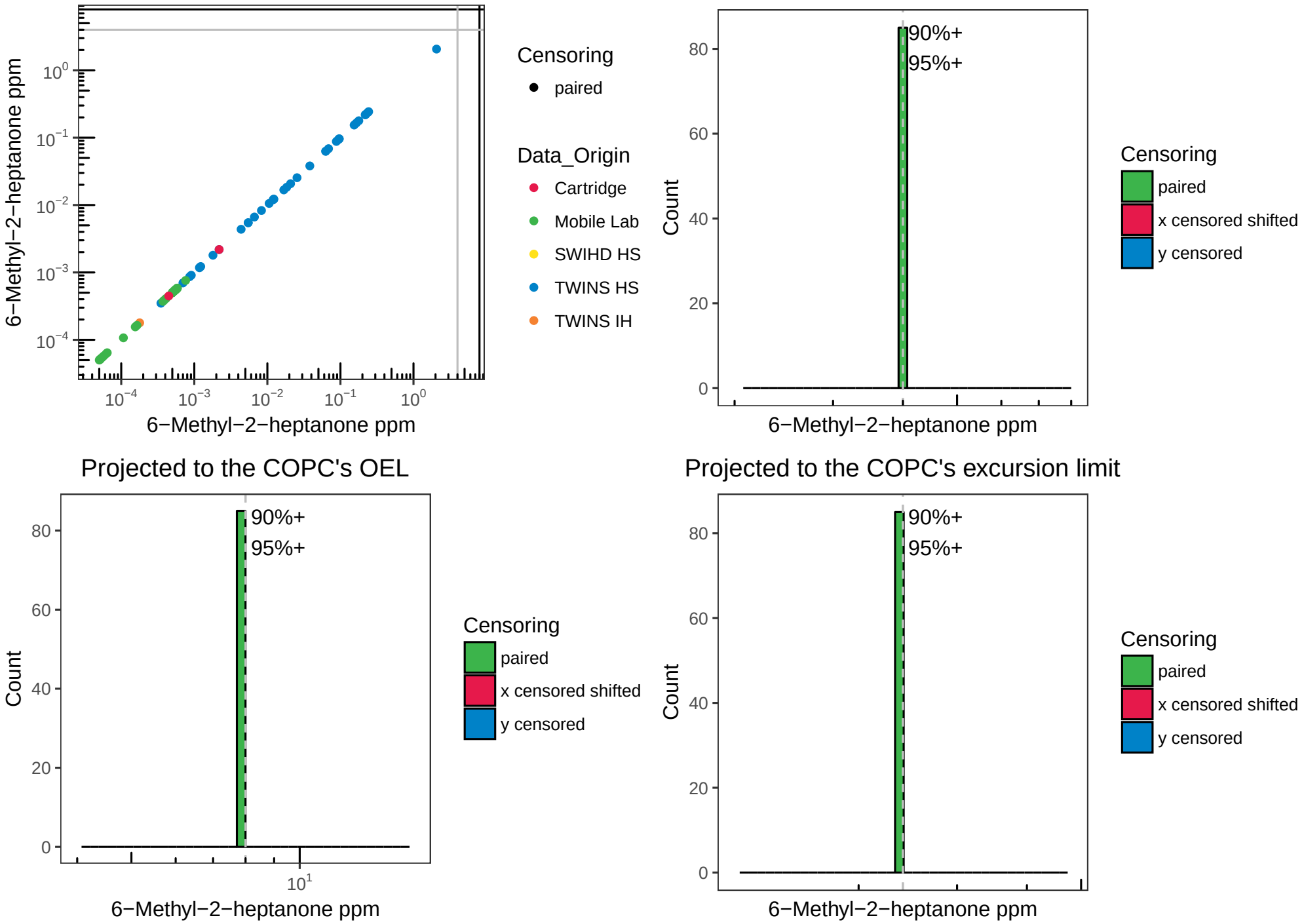


Figure C.600: 6-Methyl-2-heptanone vs 6-Methyl-2-heptanone

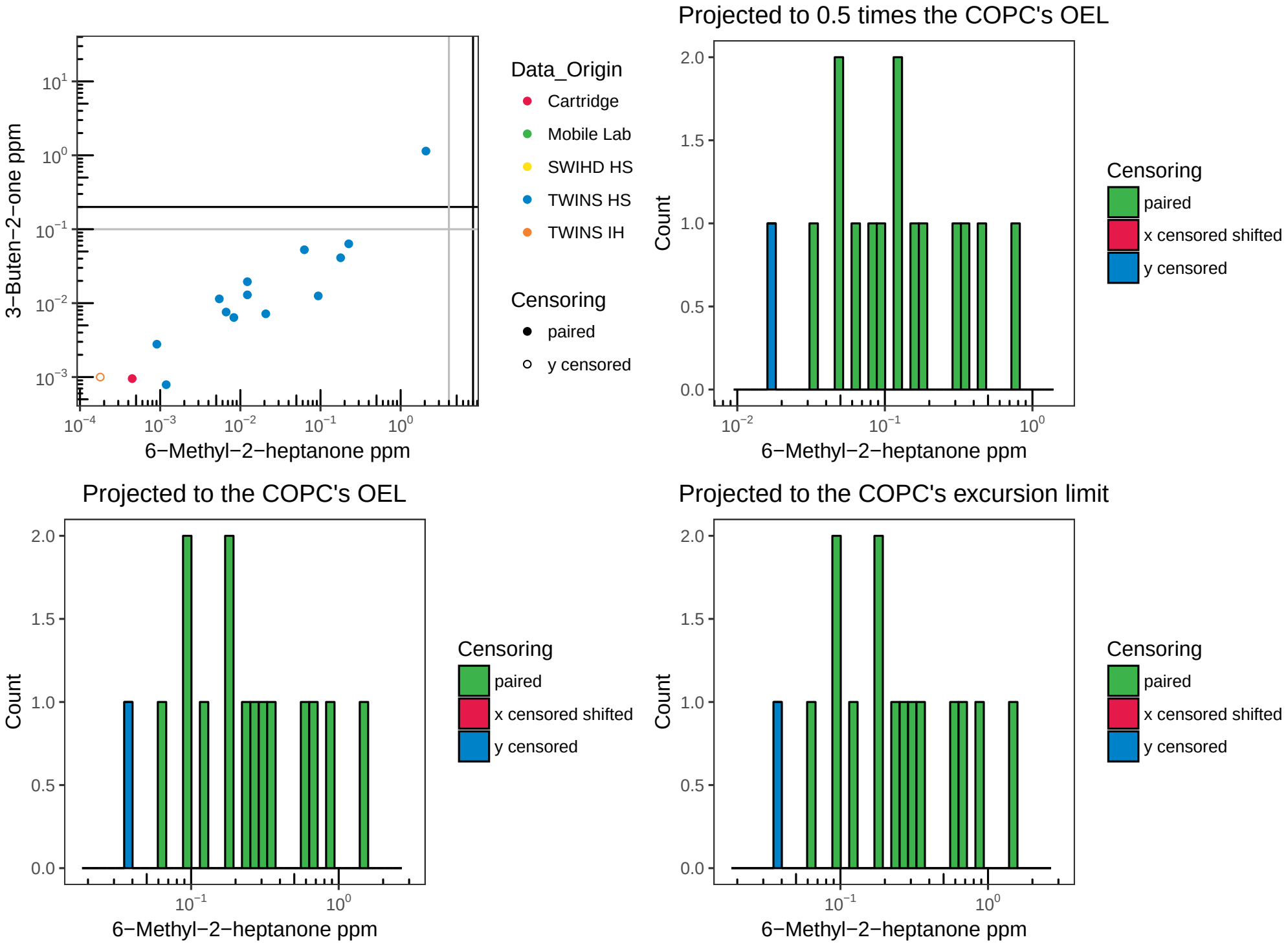


Figure C.601: 3-Buten-2-one vs 6-Methyl-2-heptanone

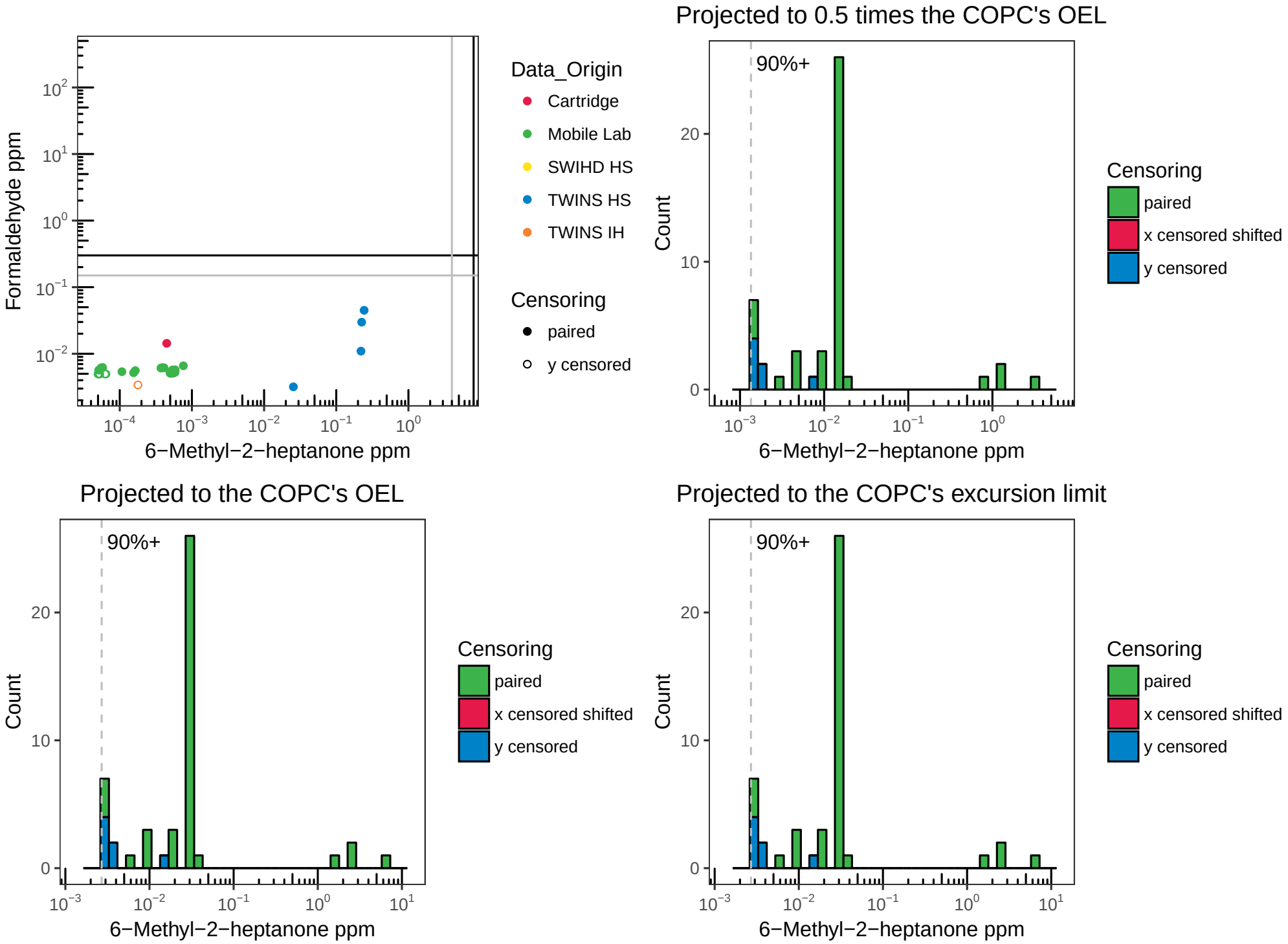


Figure C.602: Formaldehyde vs 6-Methyl-2-heptanone

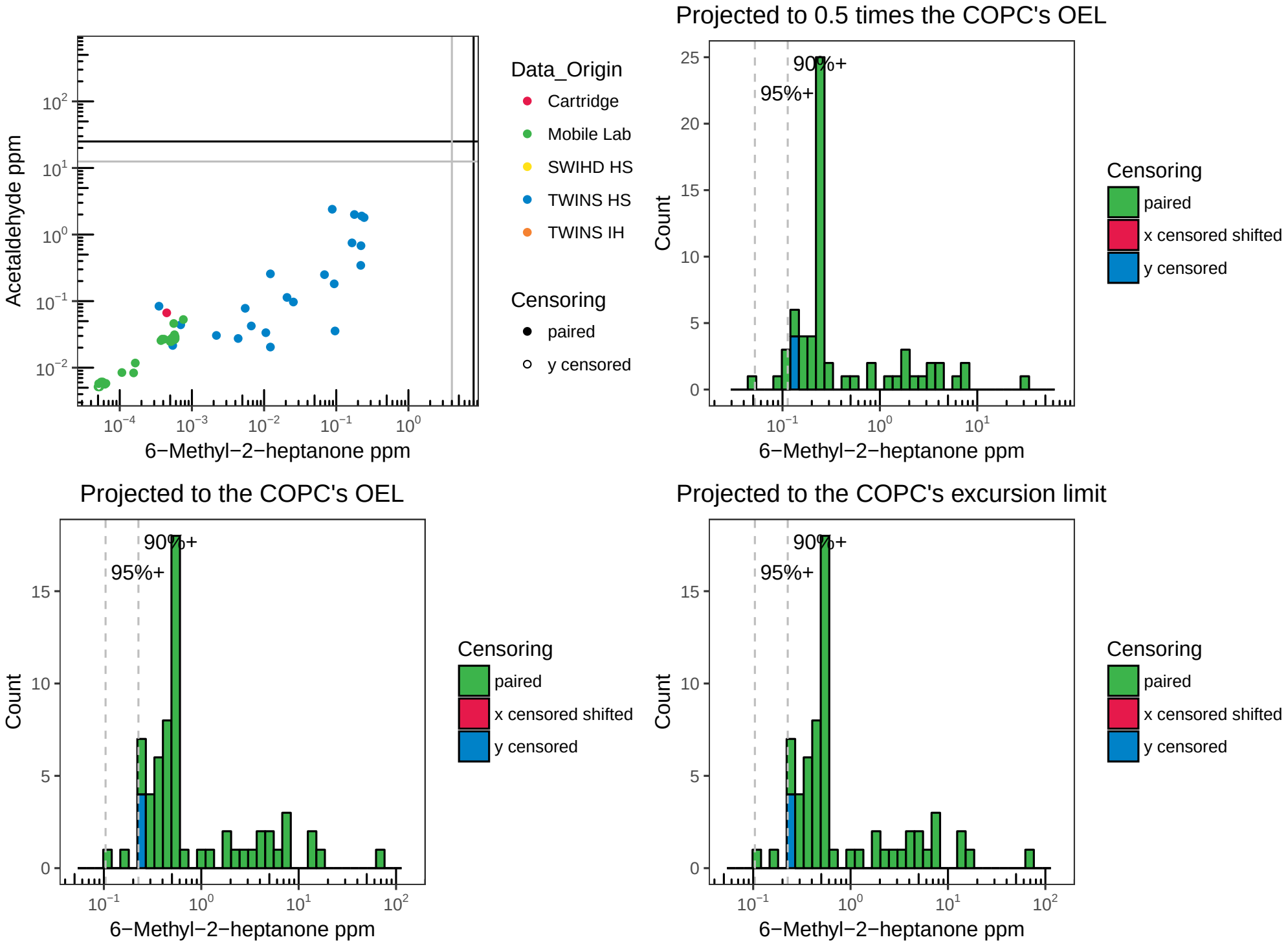


Figure C.603: Acetaldehyde vs 6-Methyl-2-heptanone

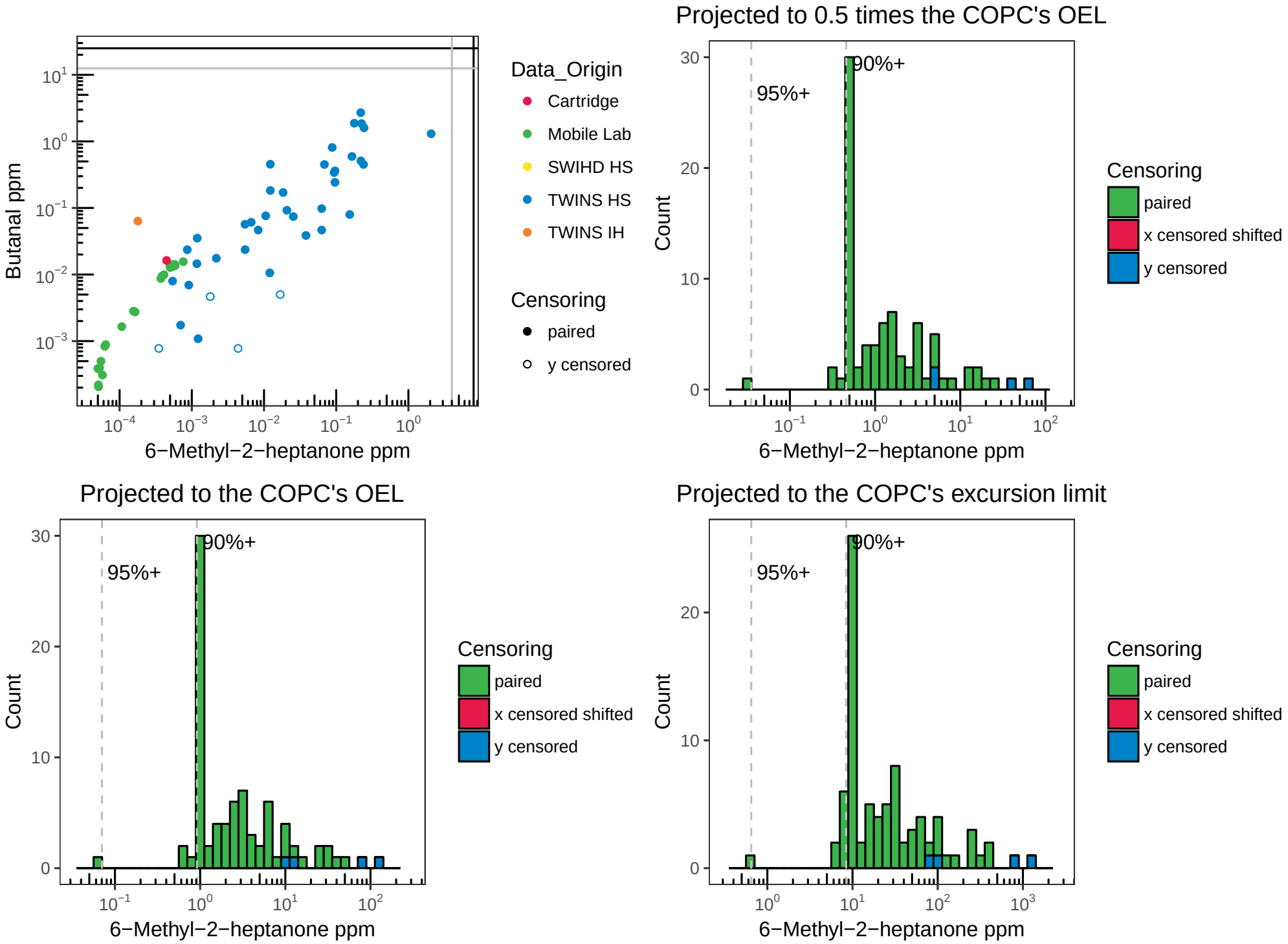


Figure C.604: Butanal vs 6-Methyl-2-heptanone

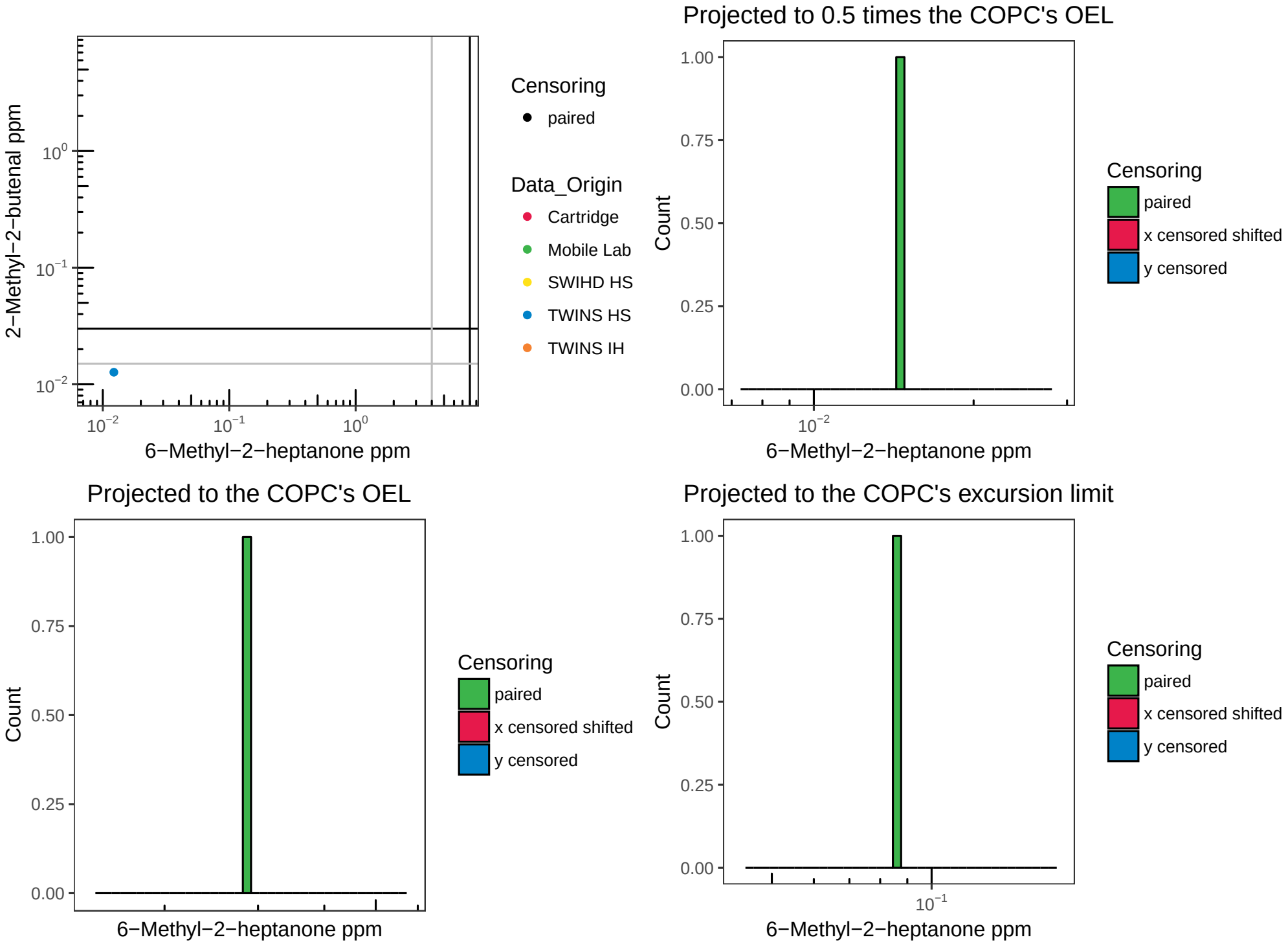


Figure C.605: 2-Methyl-2-butenal vs 6-Methyl-2-heptanone

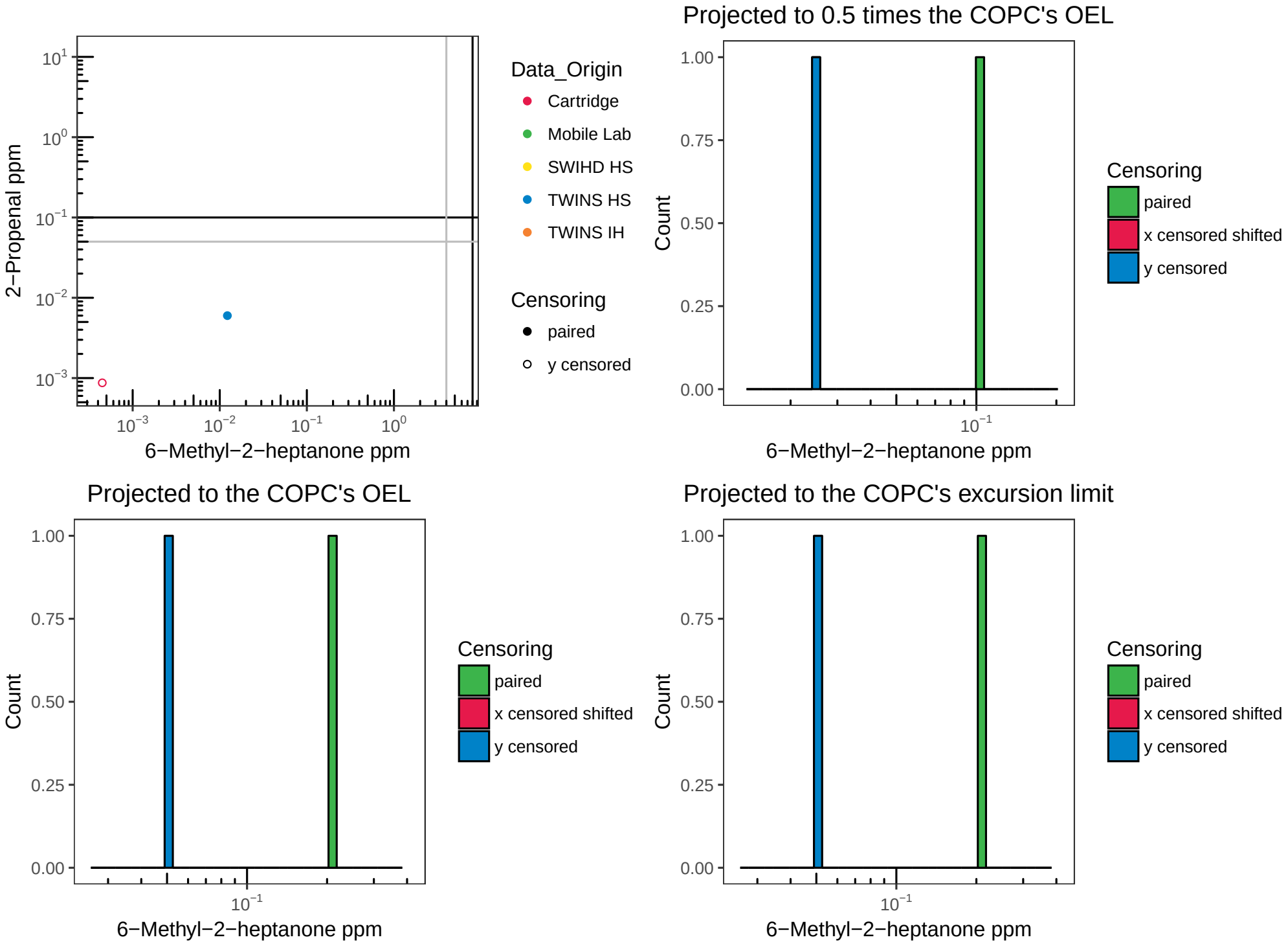


Figure C.606: 2-Propenal vs 6-Methyl-2-heptanone

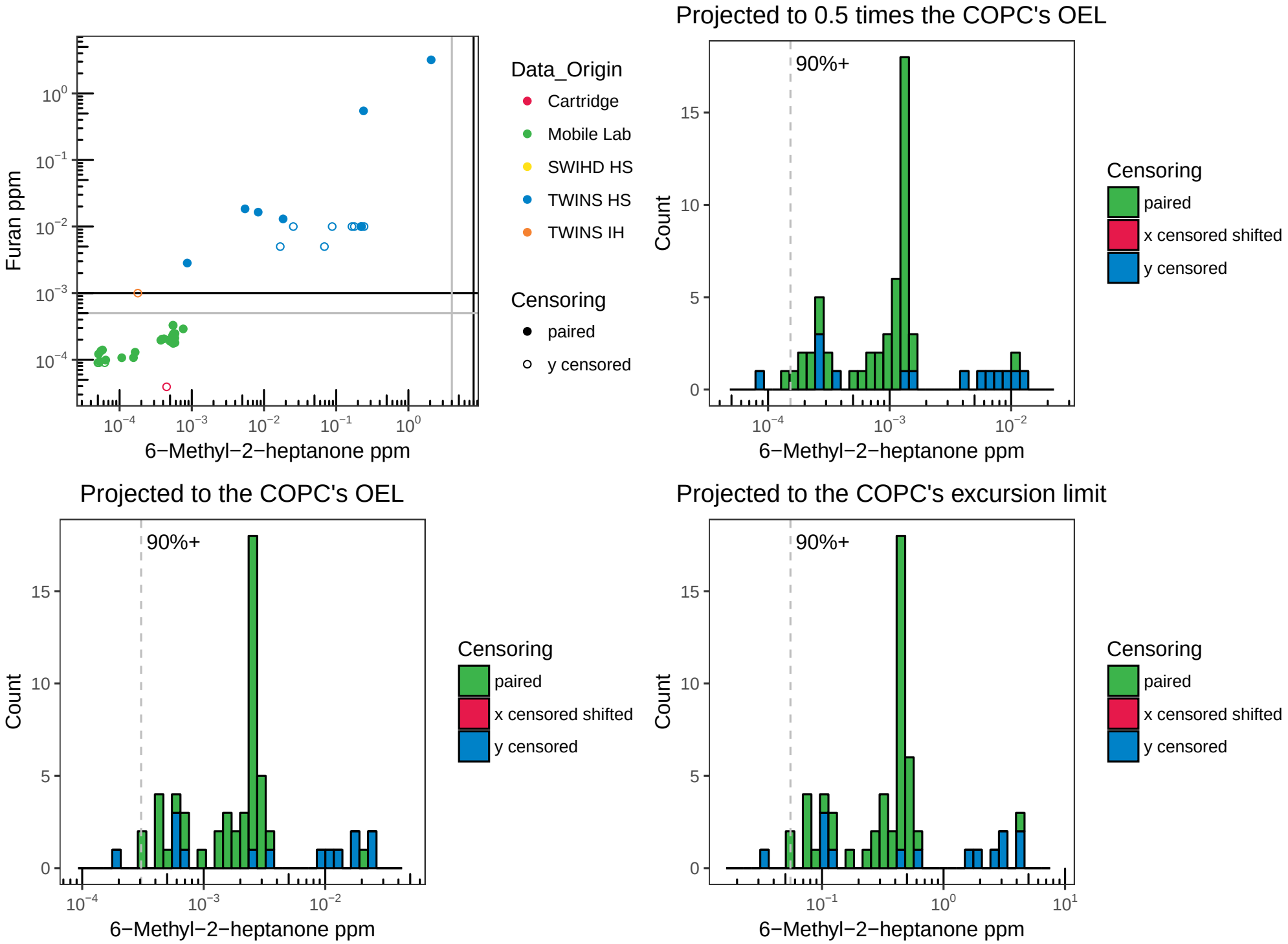


Figure C.607: Furan vs 6-Methyl-2-heptanone

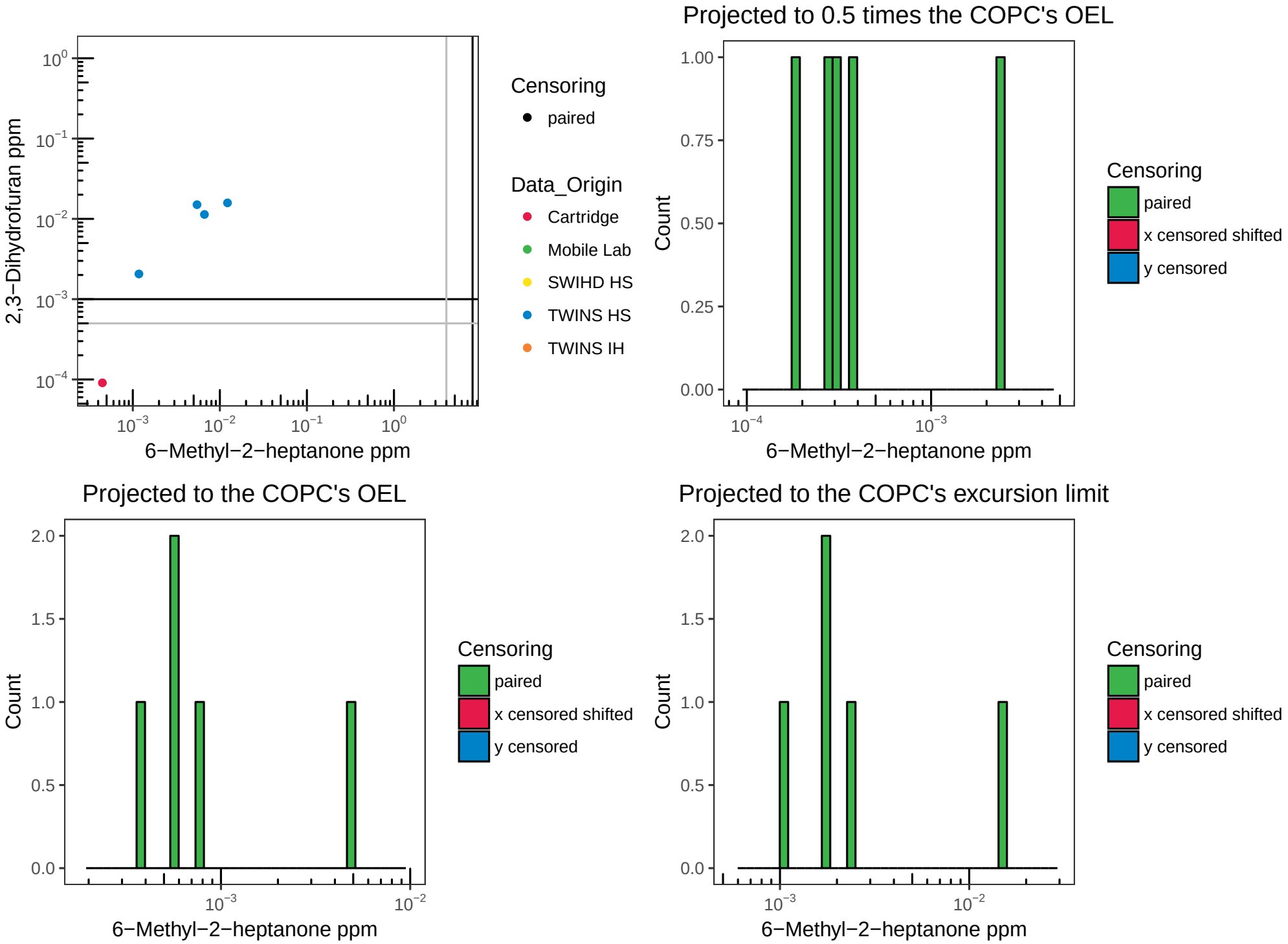


Figure C.608: 2,3-Dihydrofuran vs 6-Methyl-2-heptanone

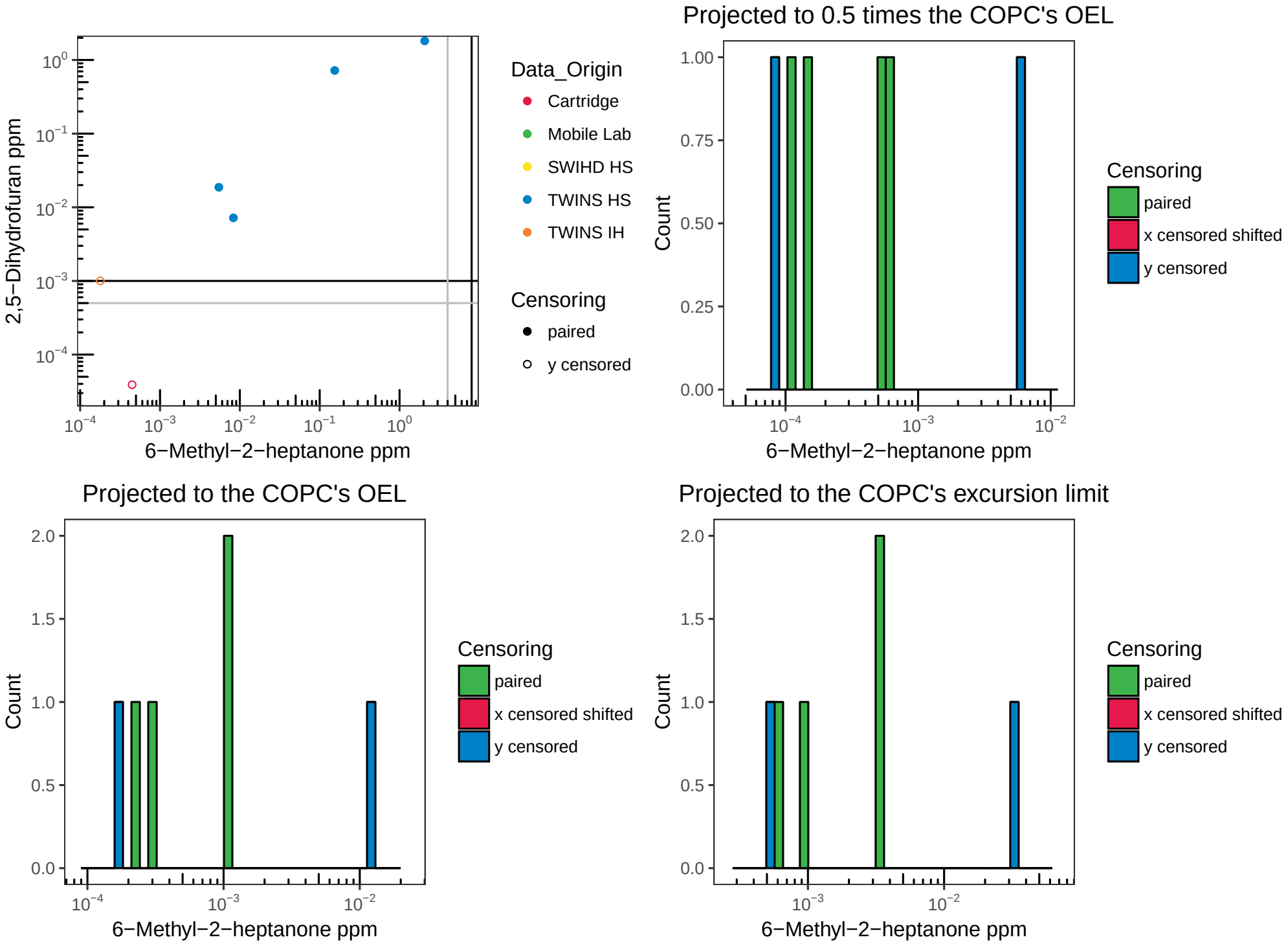


Figure C.609: 2,5-Dihydrofuran vs 6-Methyl-2-heptanone

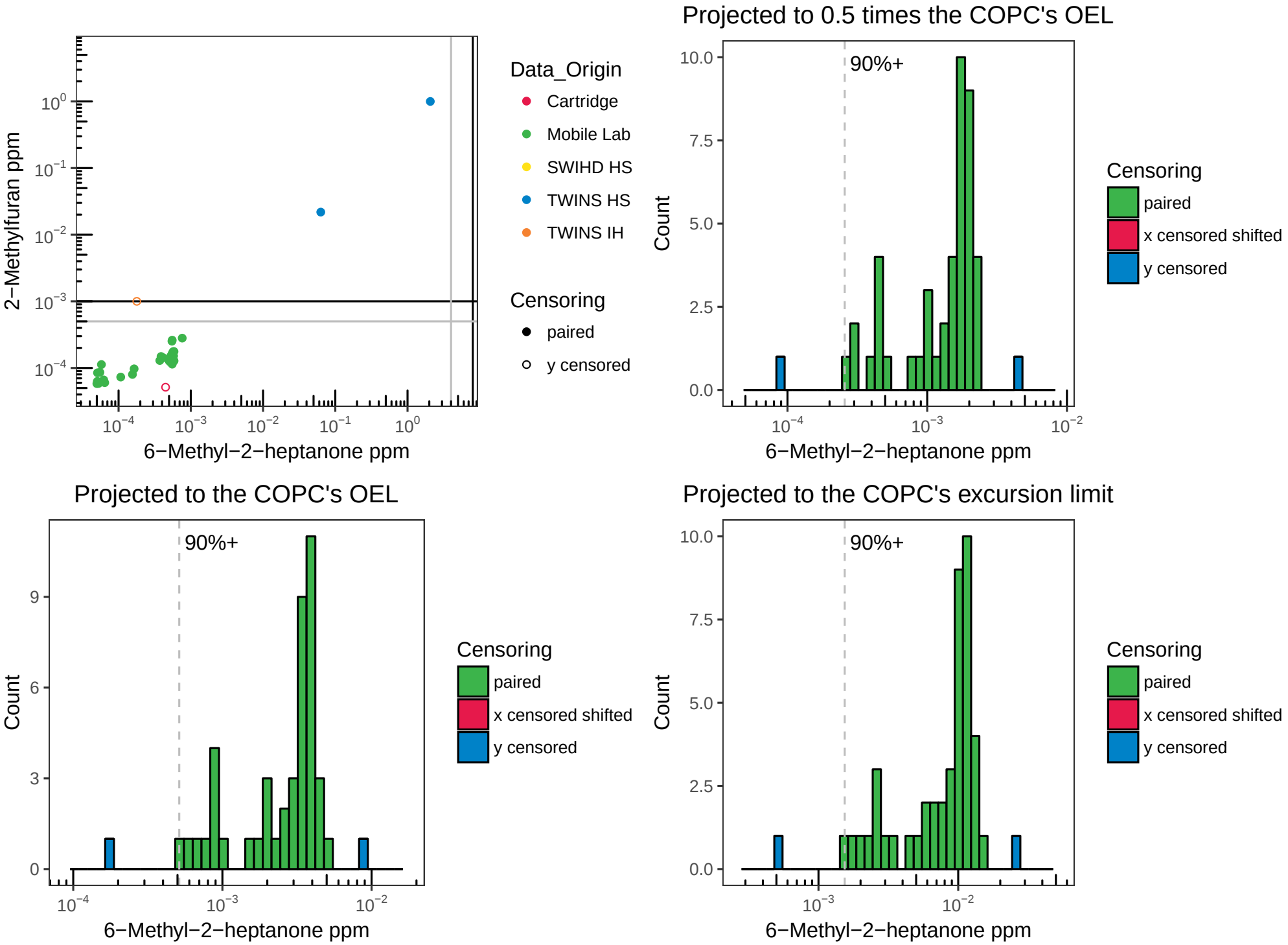


Figure C.610: 2-Methylfuran vs 6-Methyl-2-heptanone

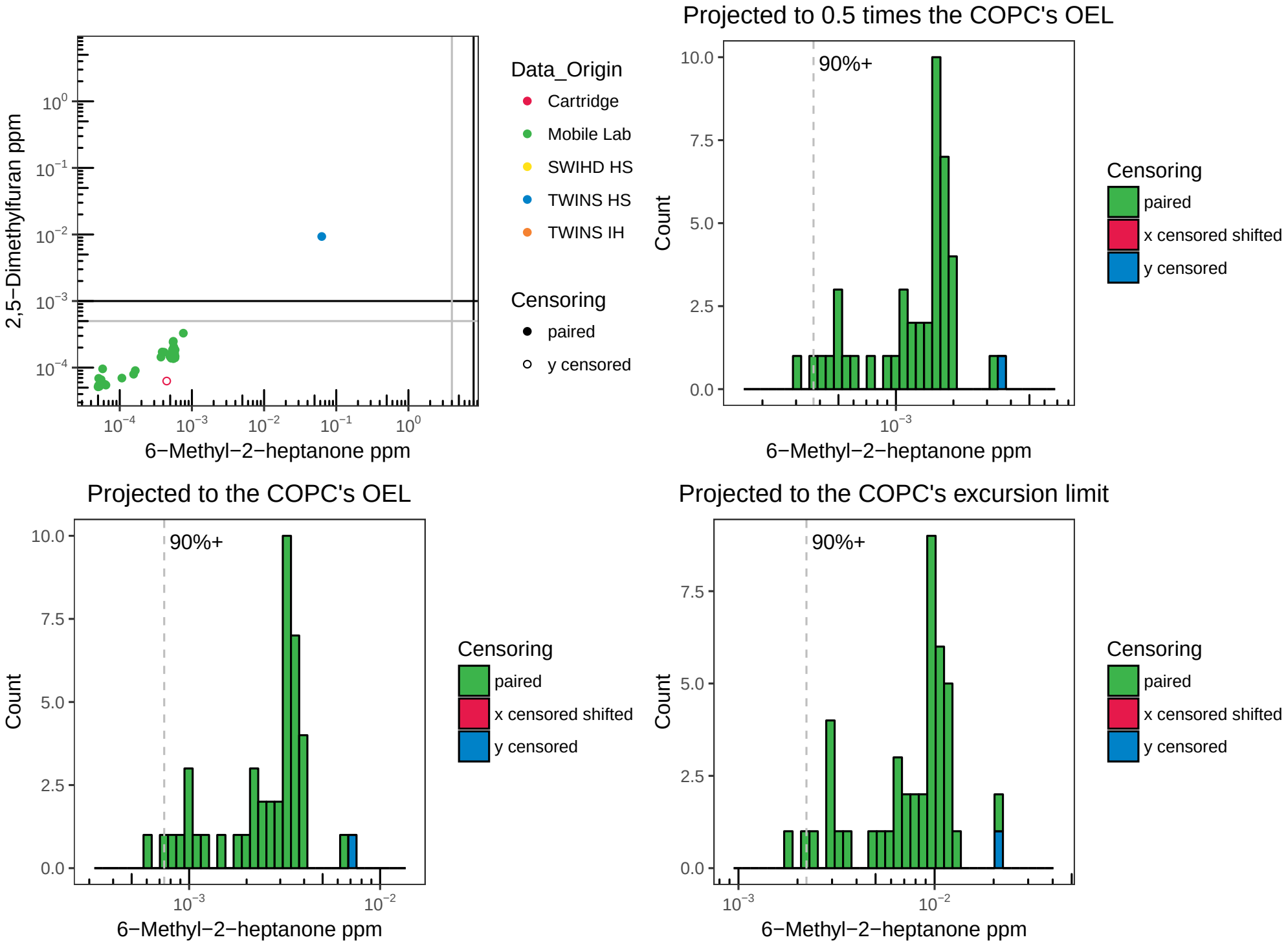


Figure C.611: 2,5-Dimethylfuran vs 6-Methyl-2-heptanone

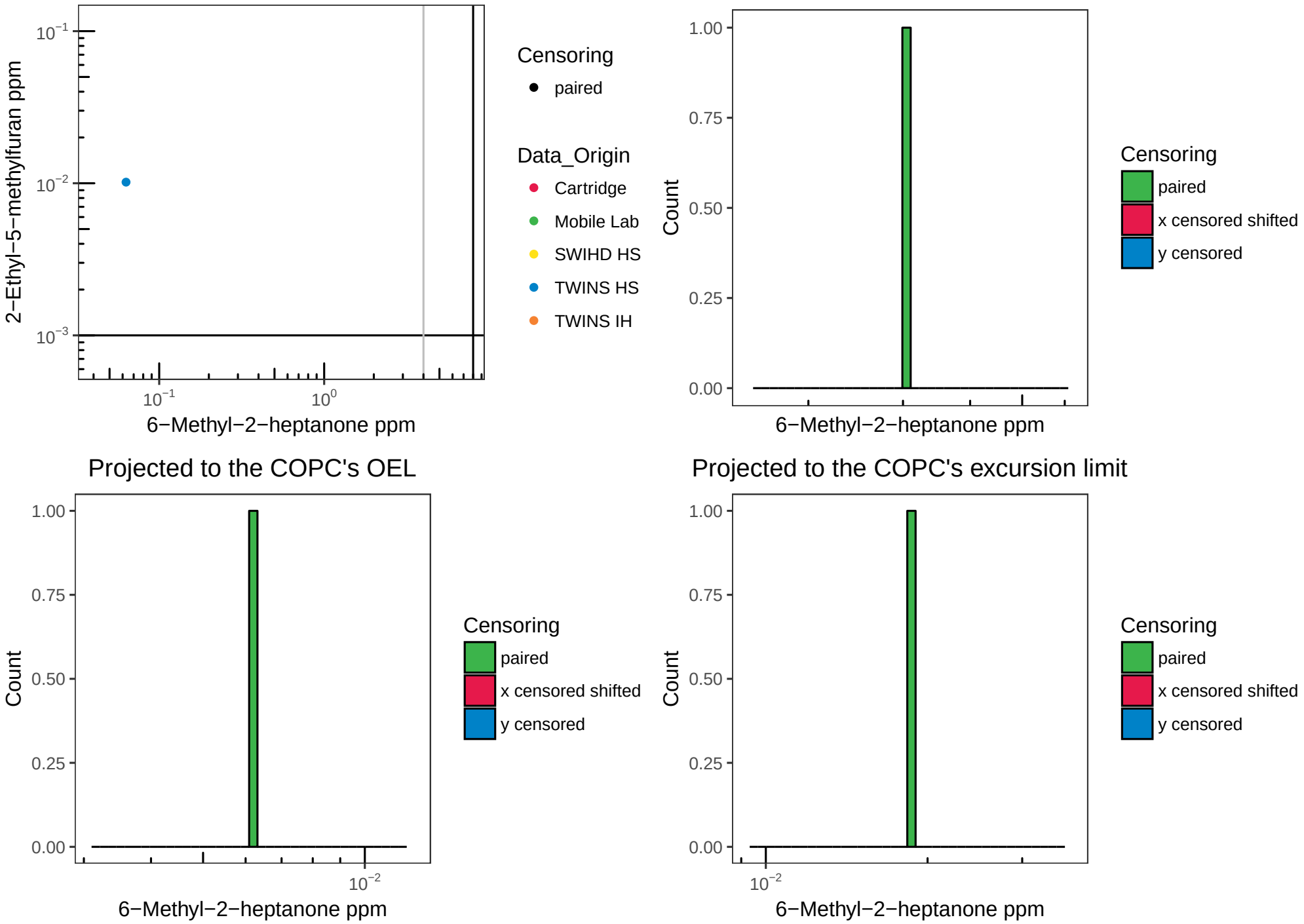


Figure C.612: 2-Ethyl-5-methylfuran vs 6-Methyl-2-heptanone

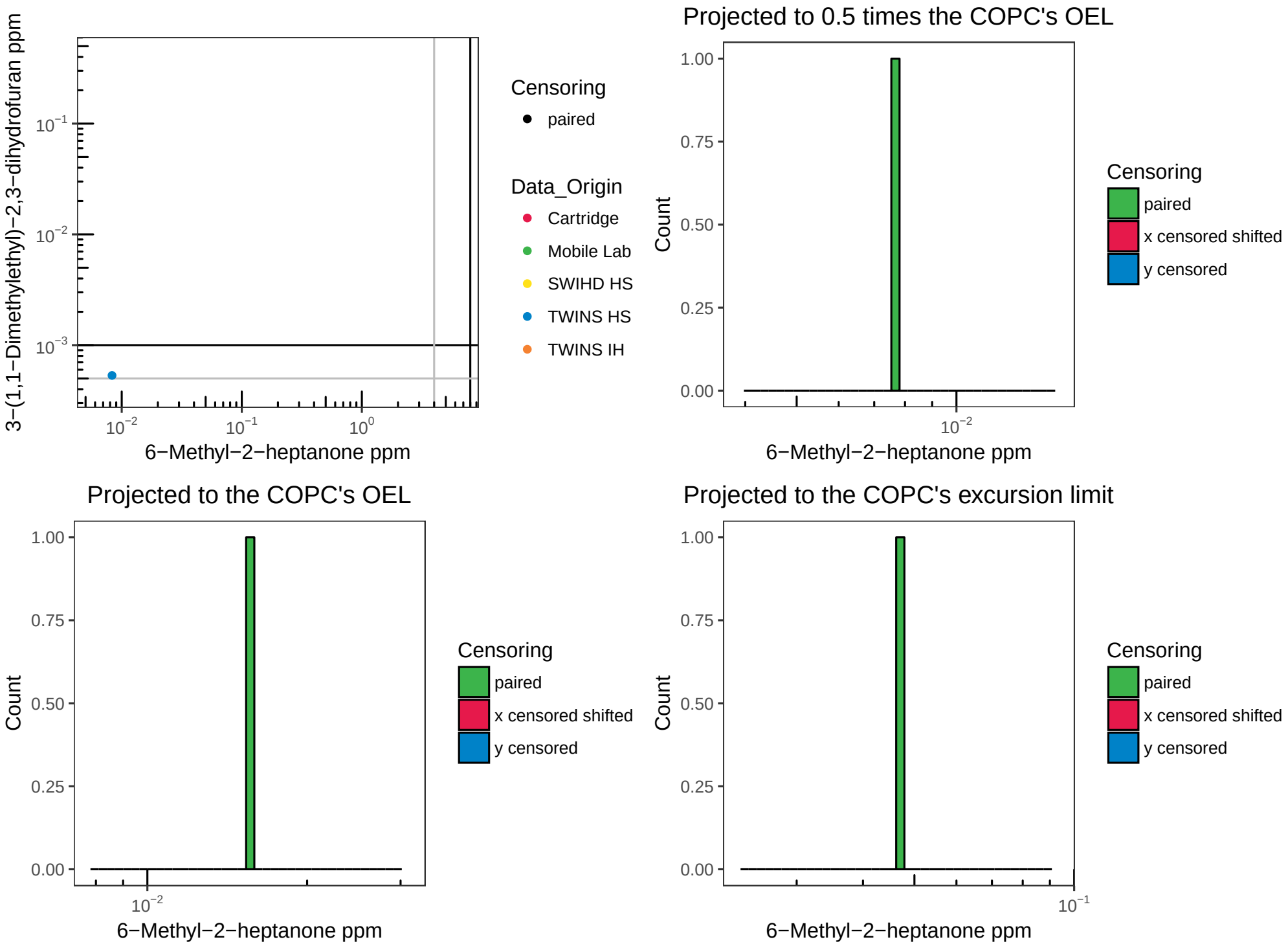


Figure C.613: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs 6-Methyl-2-heptanone

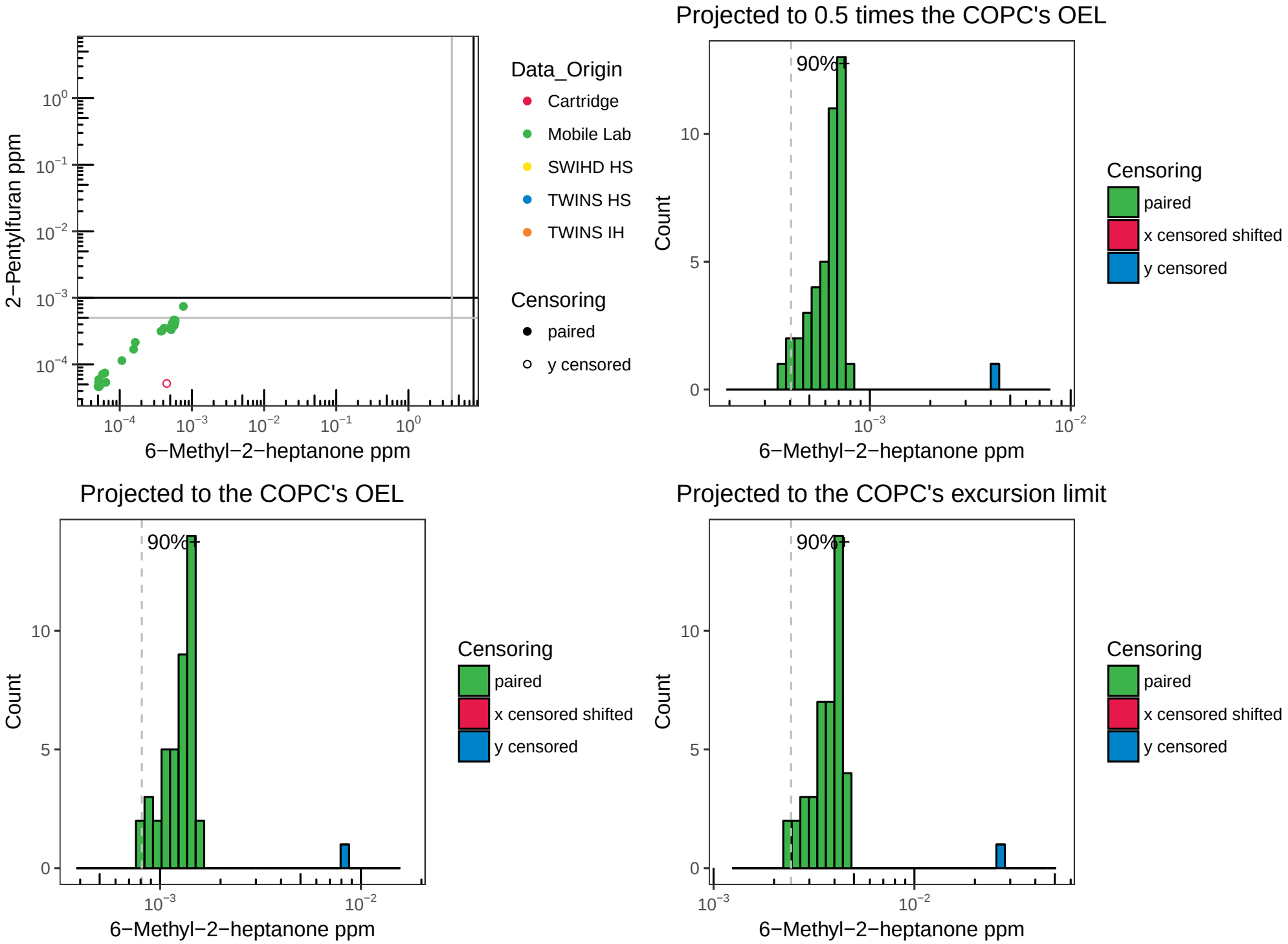


Figure C.614: 2-Pentylfuran vs 6-Methyl-2-heptanone

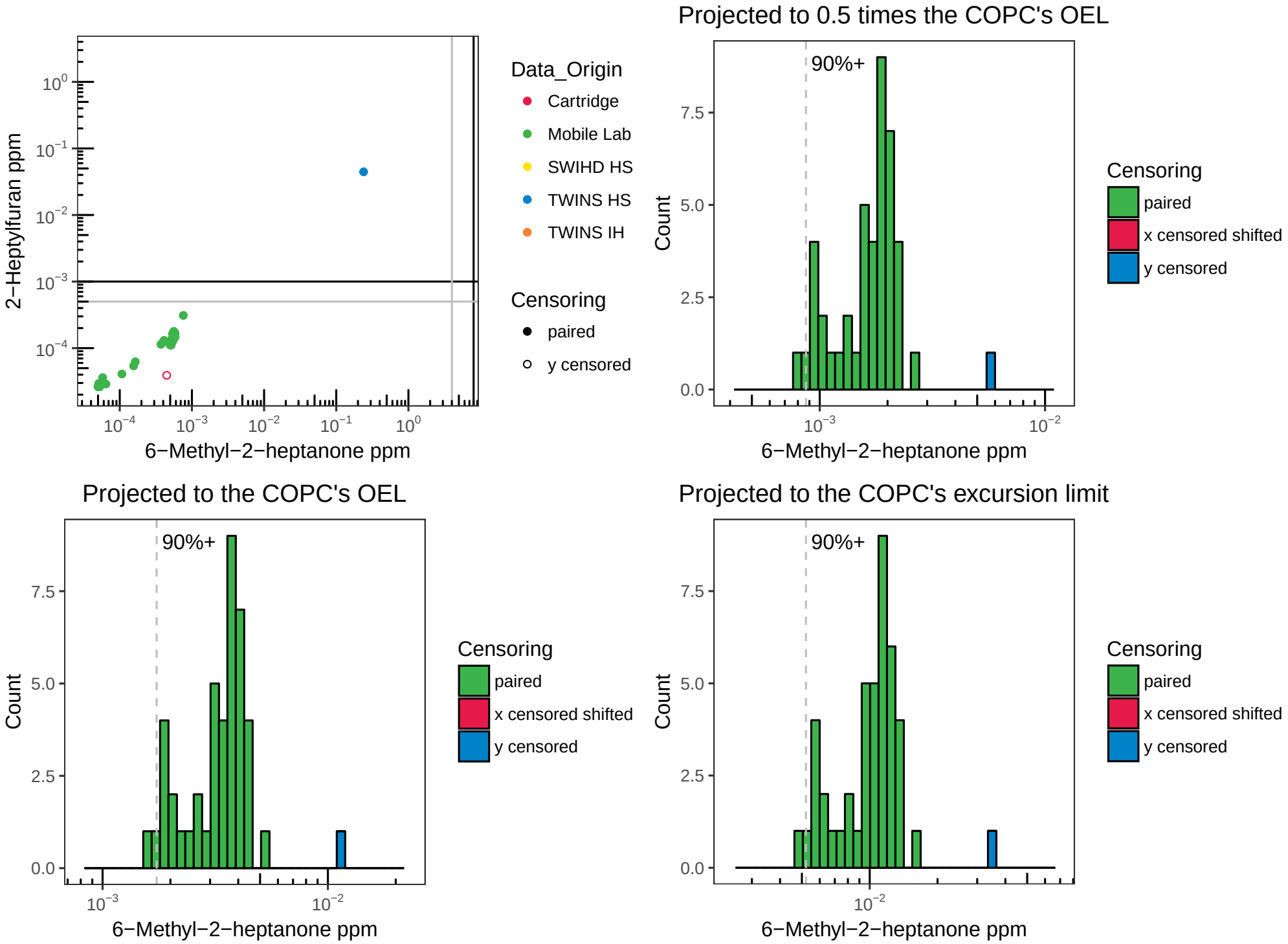


Figure C.615: 2-Heptylfuran vs 6-Methyl-2-heptanone

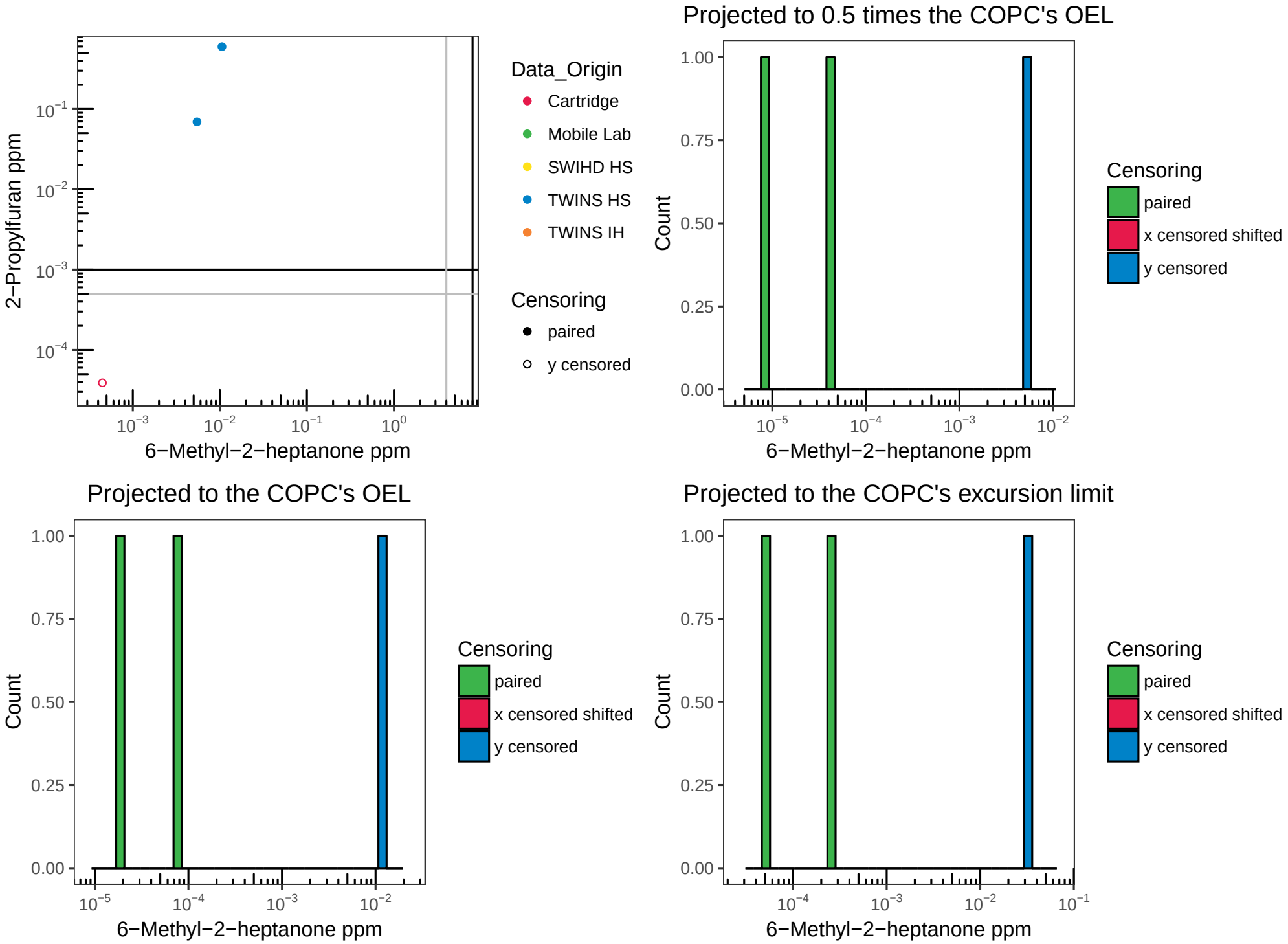


Figure C.616: 2-Propylfuran vs 6-Methyl-2-heptanone

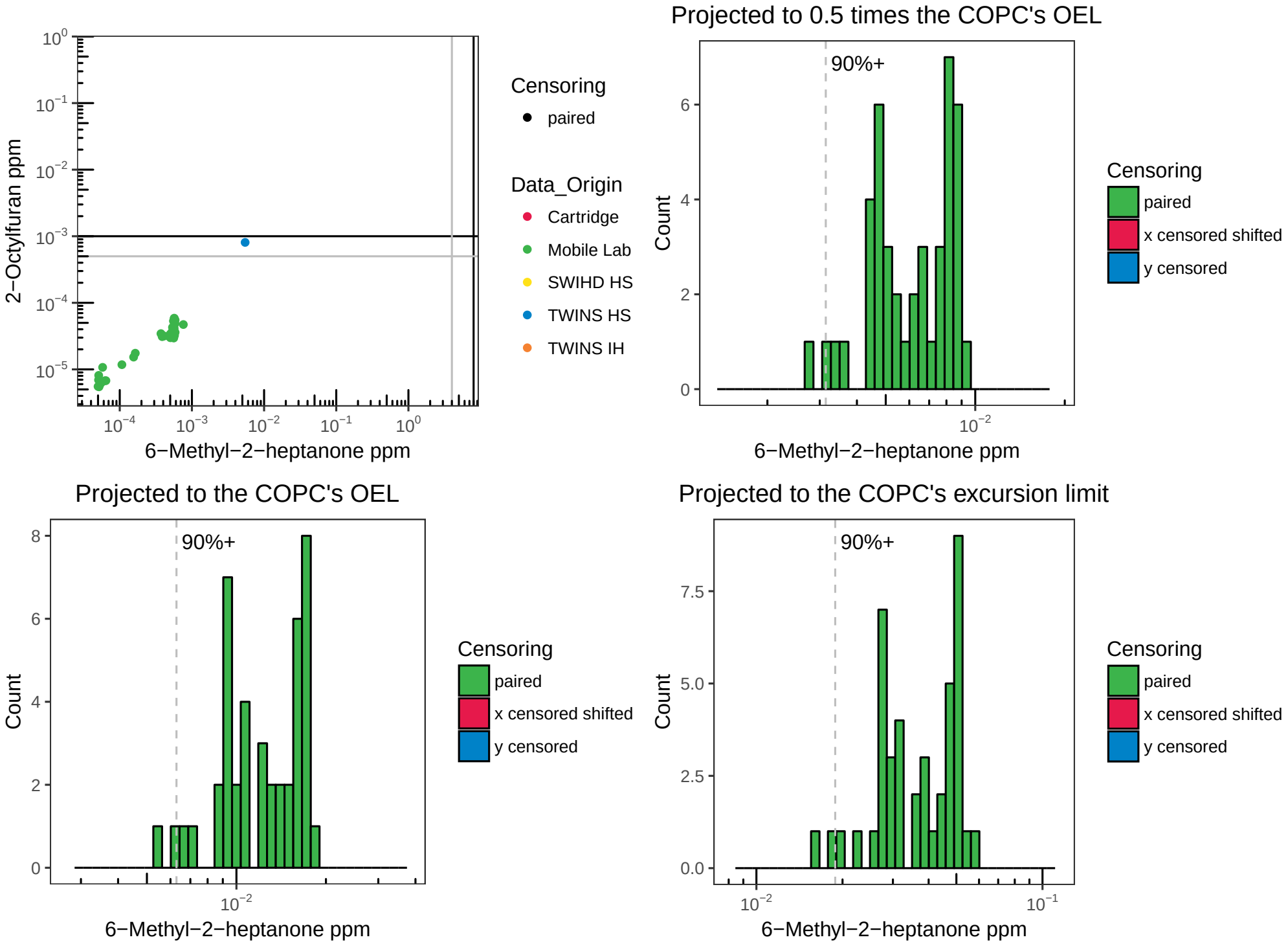


Figure C.617: 2-Octylfuran vs 6-Methyl-2-heptanone

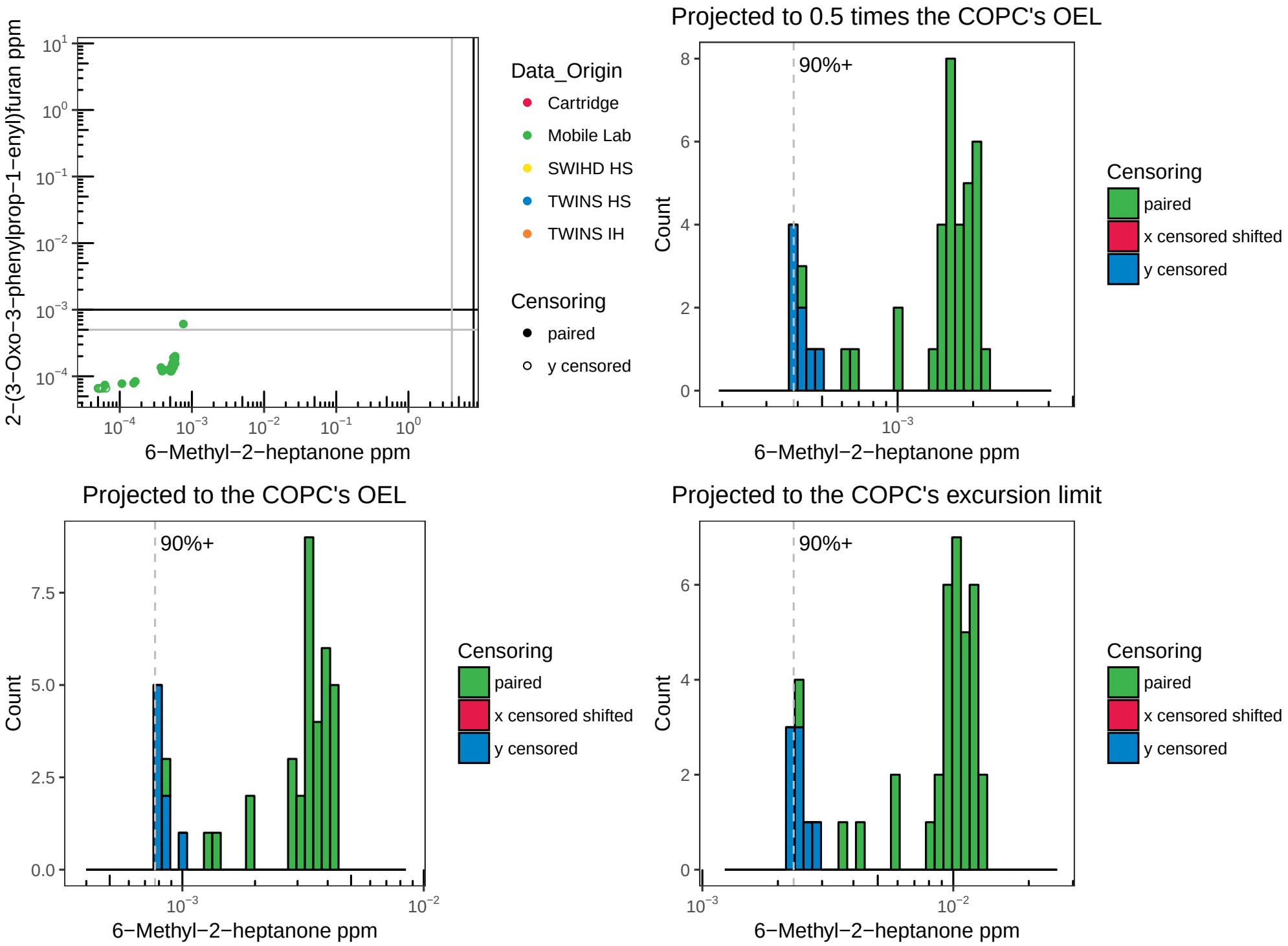


Figure C.618: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 6-Methyl-2-heptanone

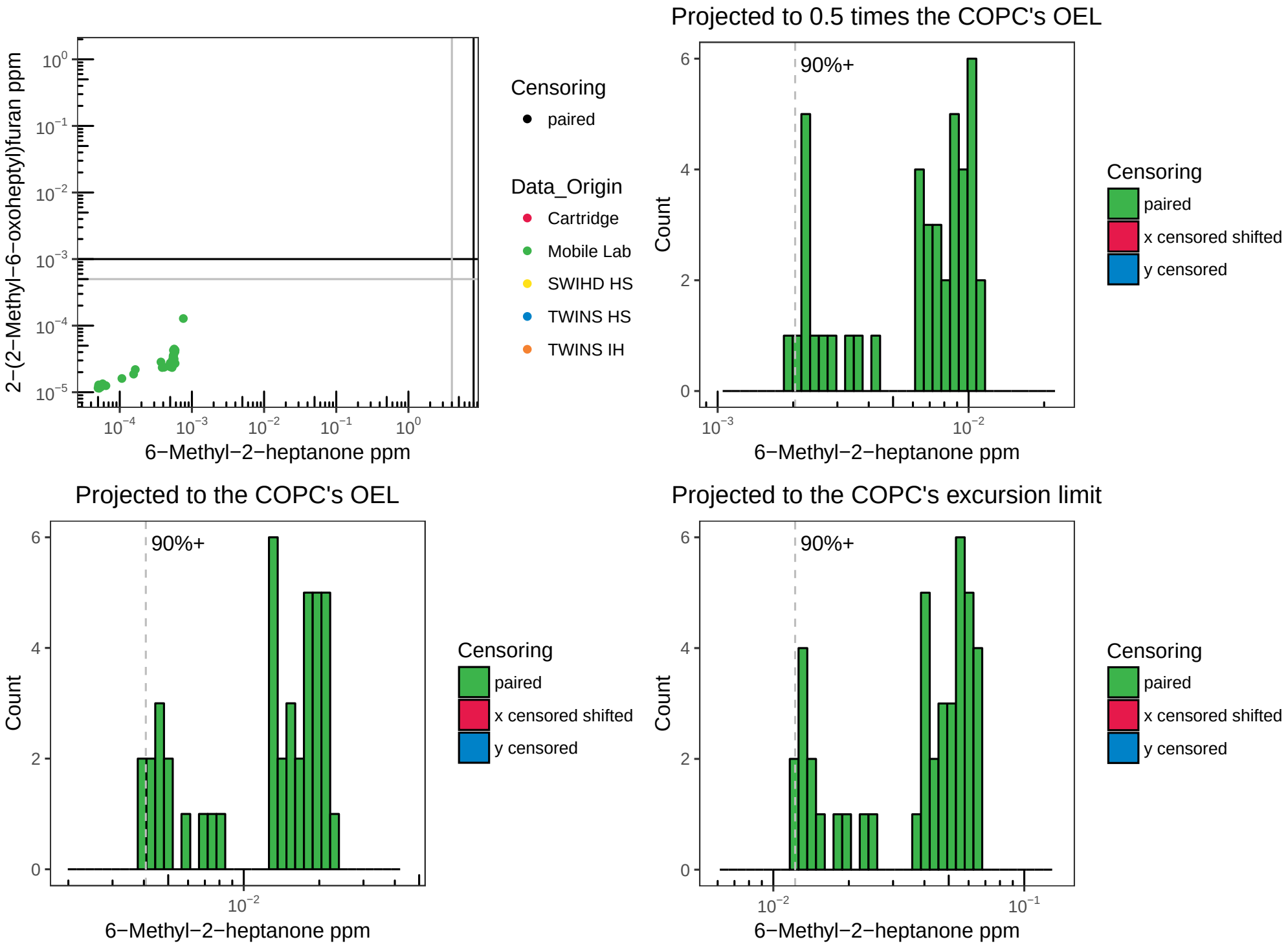


Figure C.619: 2-(2-Methyl-6-oxoheptyl)furan vs 6-Methyl-2-heptanone

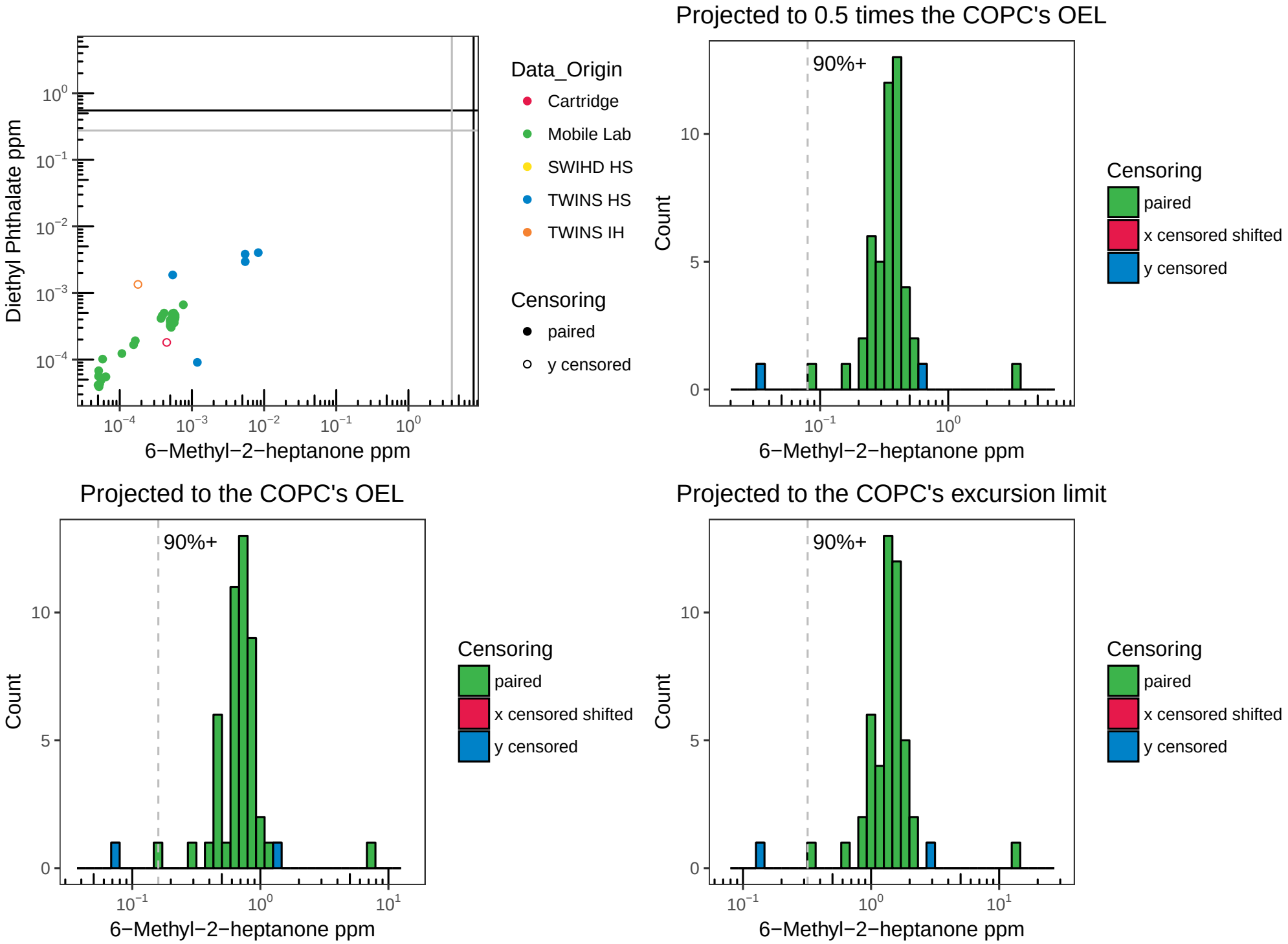


Figure C.620: Diethyl Phthalate vs 6-Methyl-2-heptanone

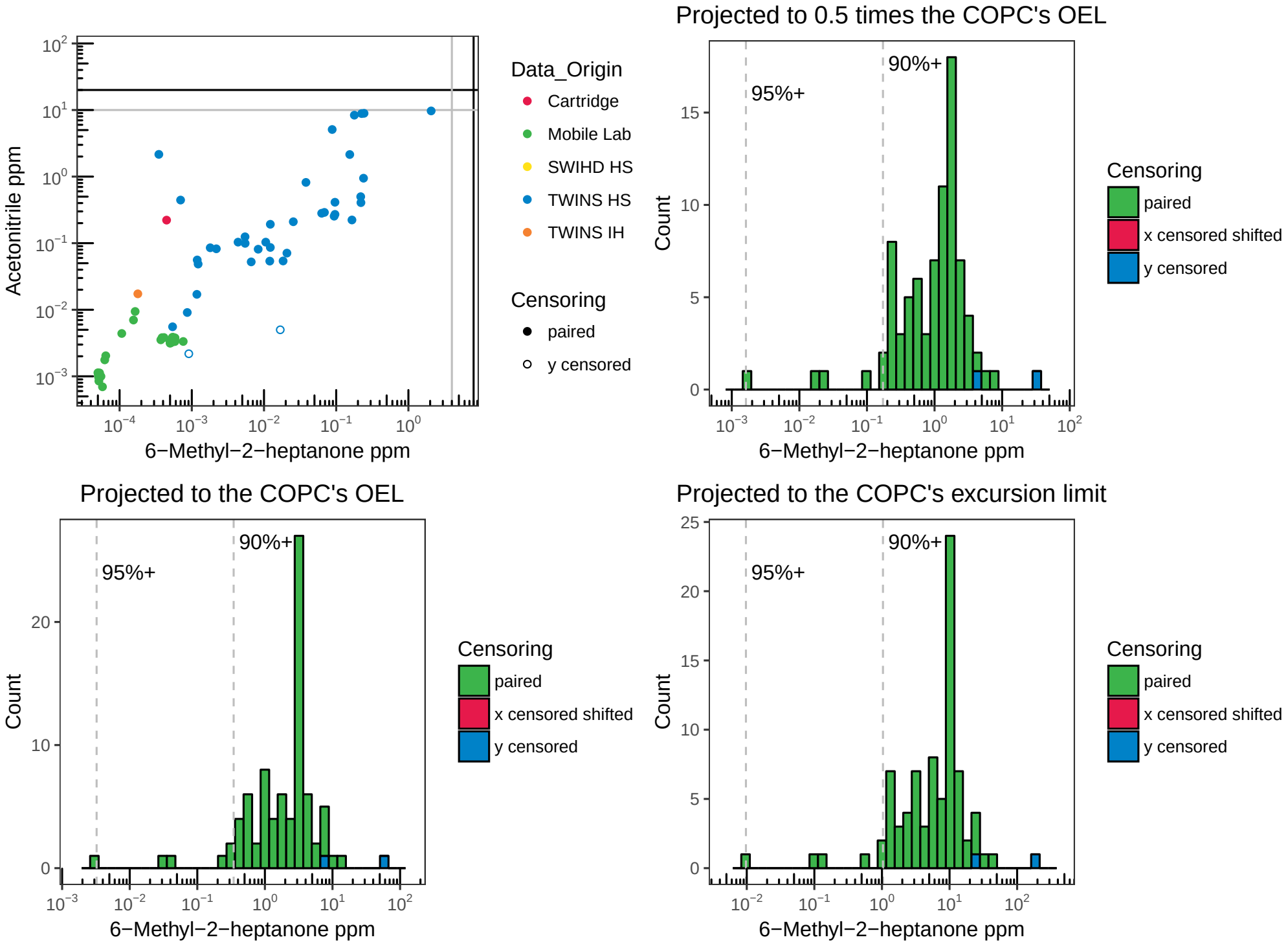


Figure C.621: Acetonitrile vs 6-Methyl-2-heptanone

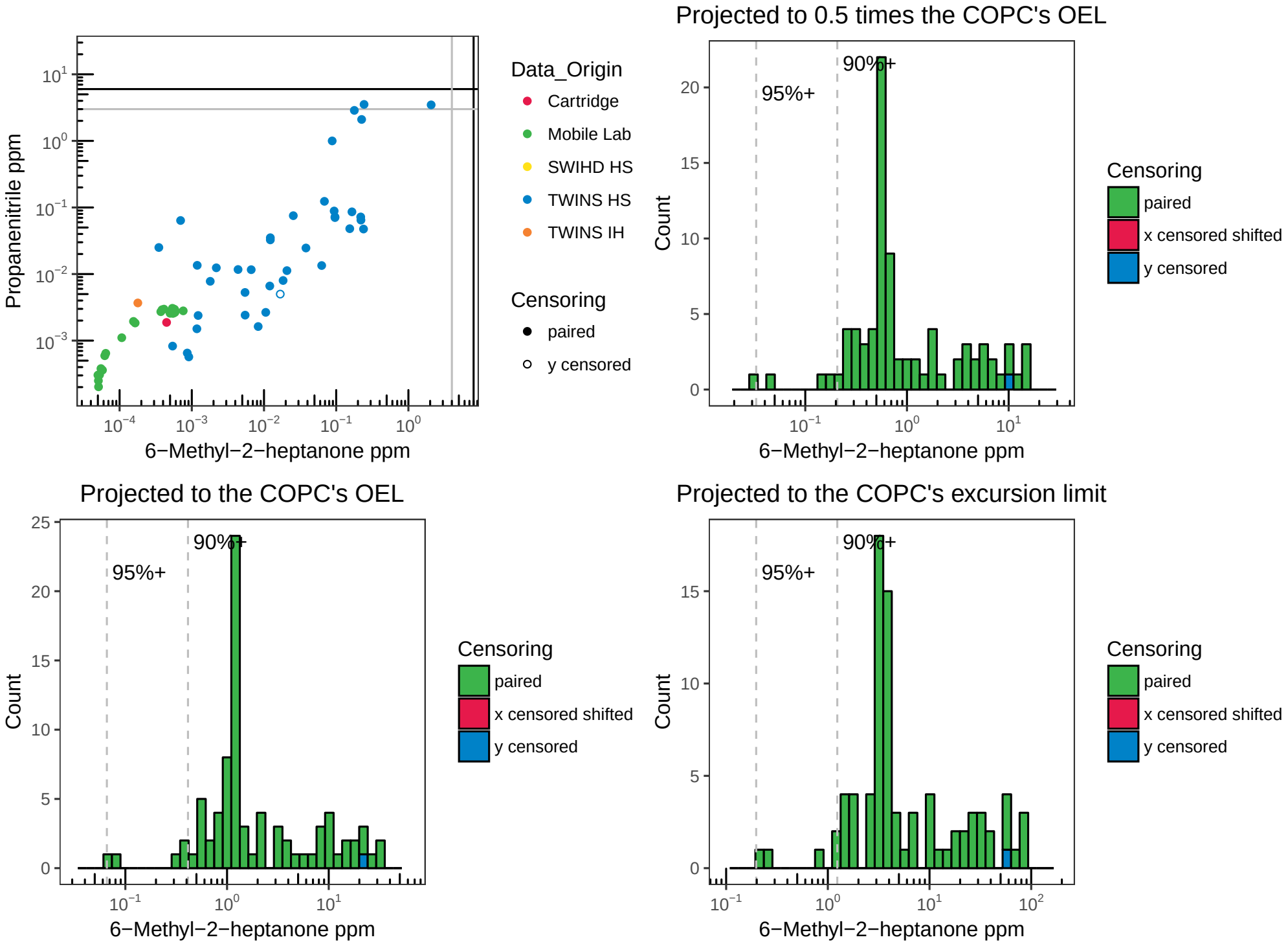


Figure C.622: Propanenitrile vs 6-Methyl-2-heptanone

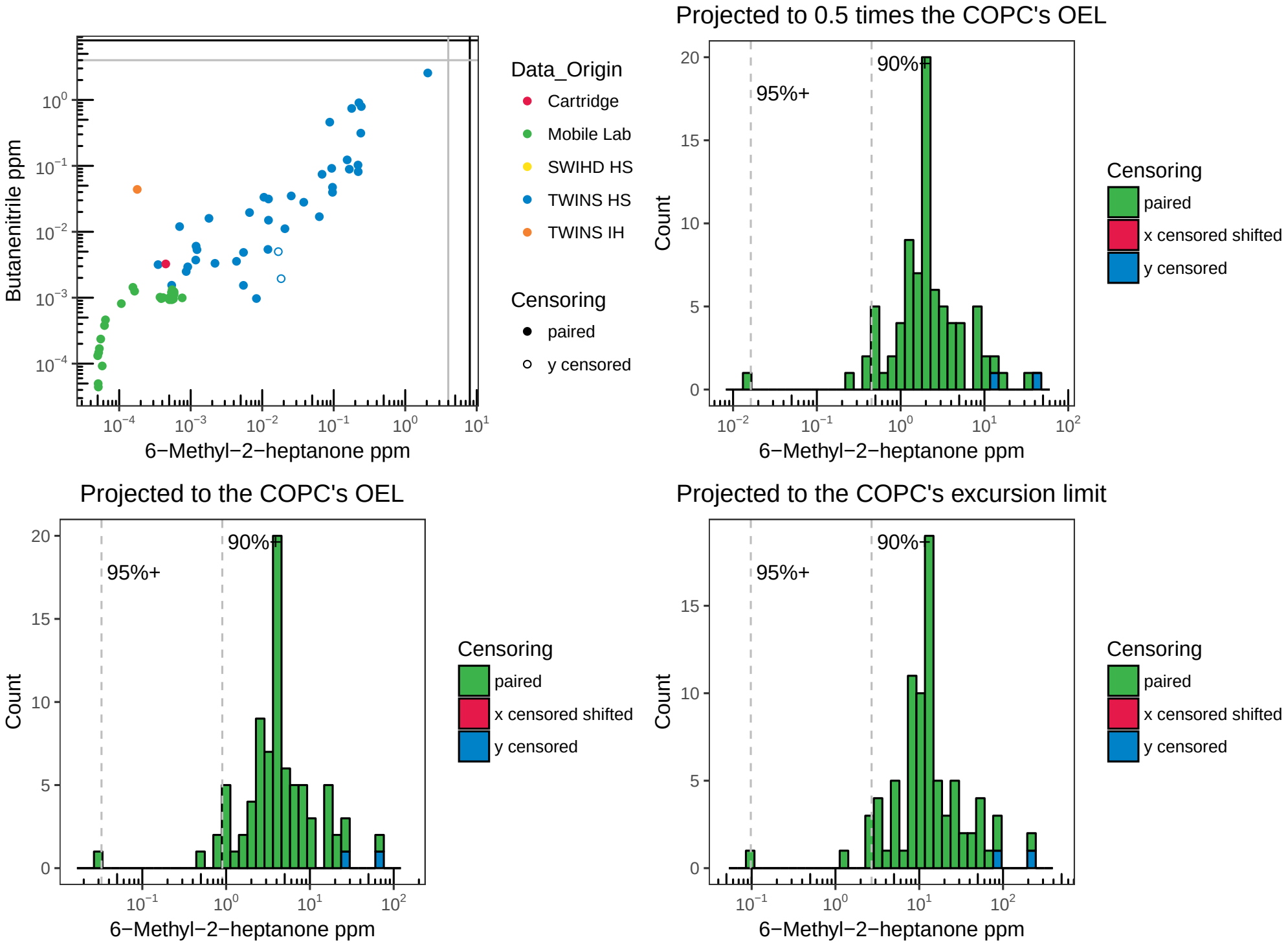


Figure C.623: Butanenitrile vs 6-Methyl-2-heptanone

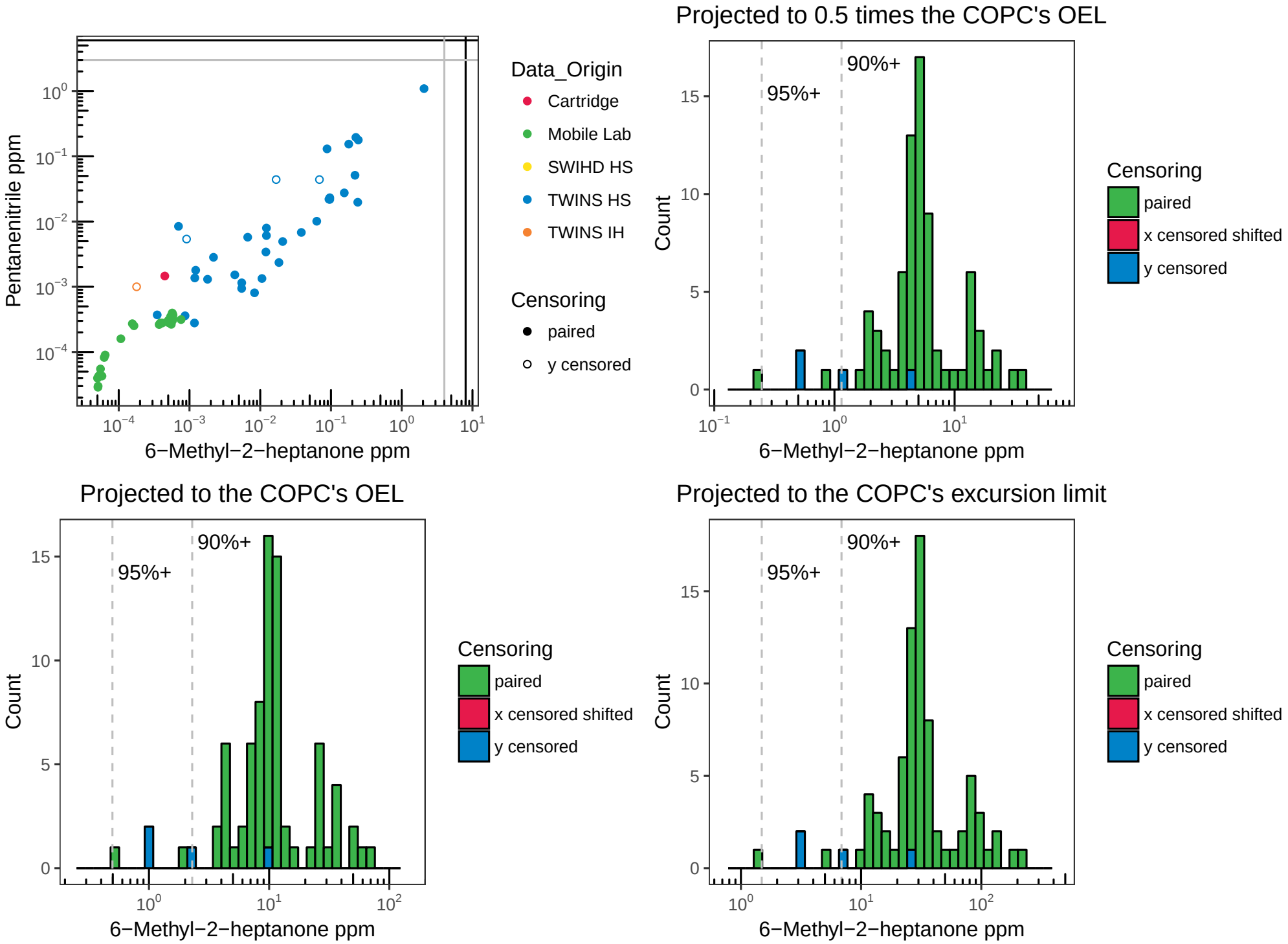


Figure C.624: Pentanenitrile vs 6-Methyl-2-heptanone

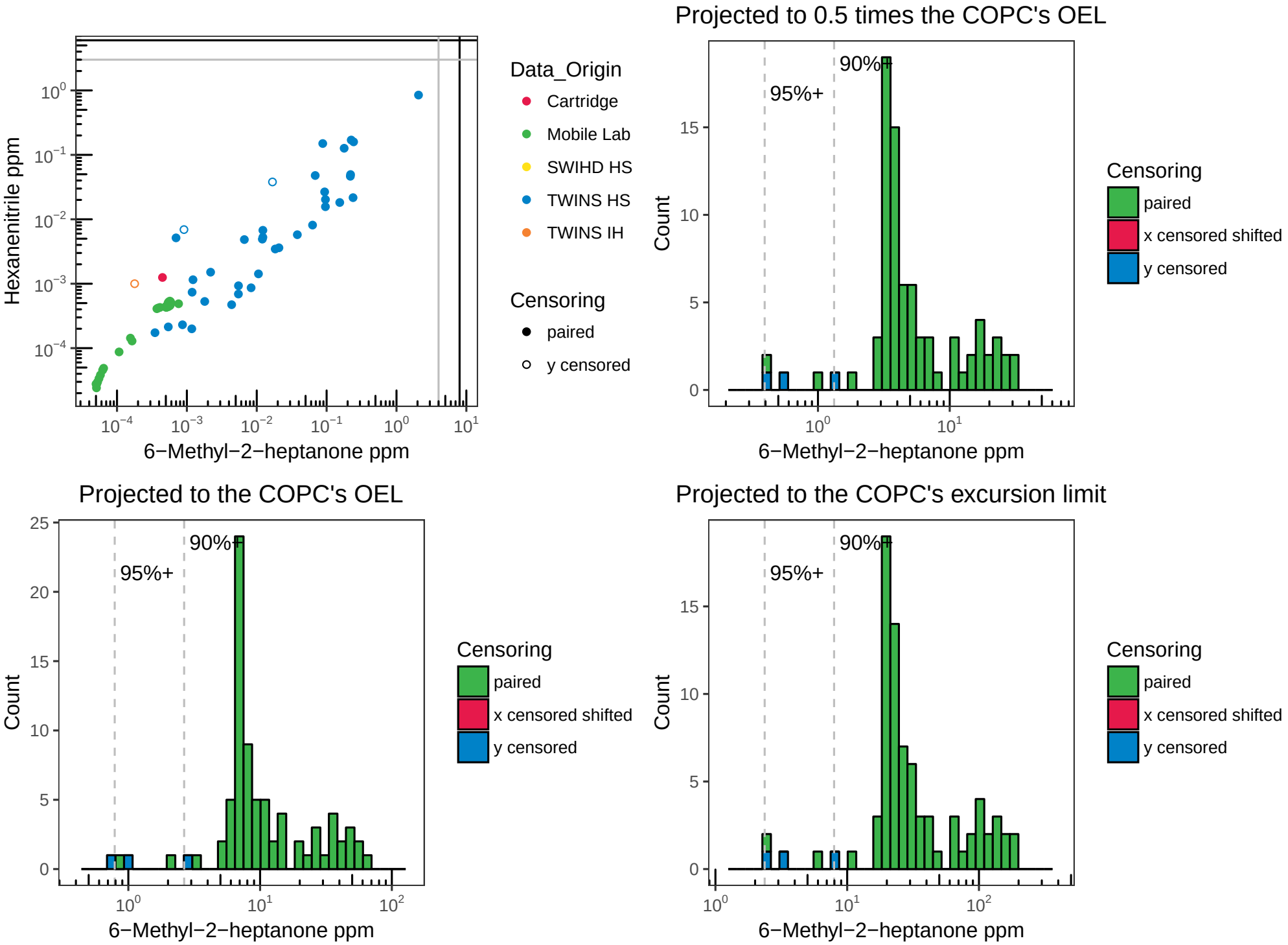


Figure C.625: Hexanenitrile vs 6-Methyl-2-heptanone

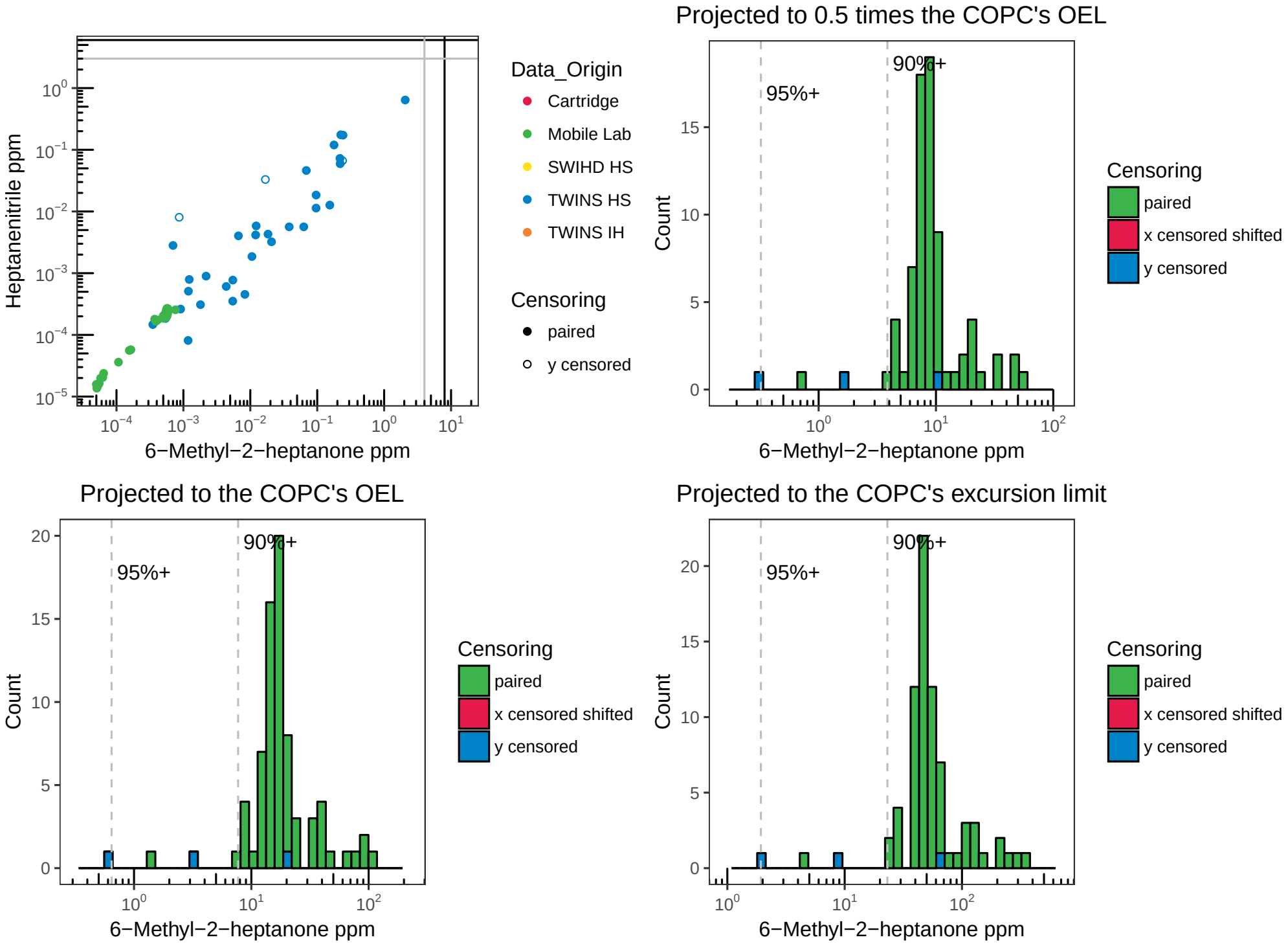


Figure C.626: Heptanenitrile vs 6-Methyl-2-heptanone

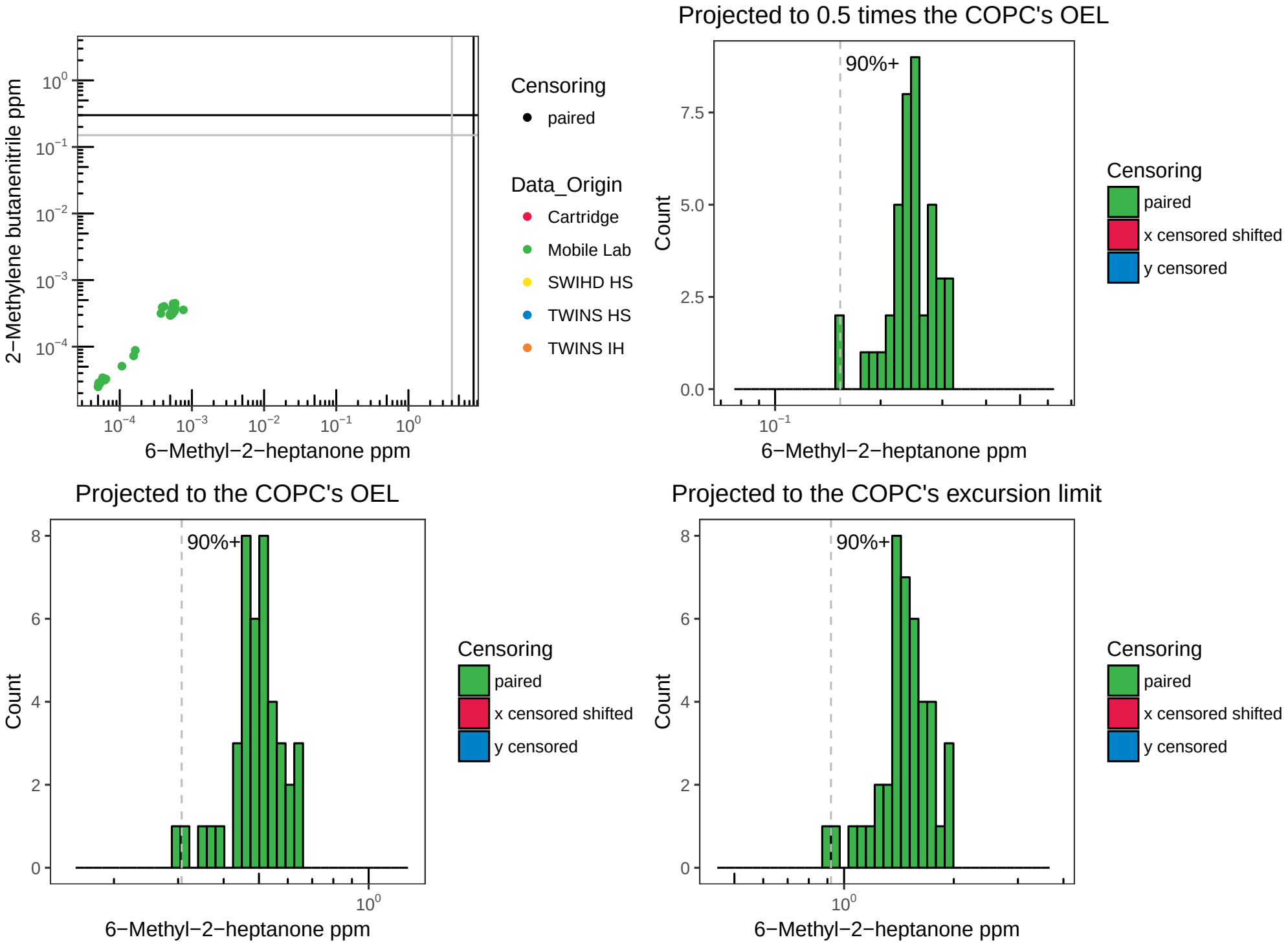


Figure C.627: 2-Methylene butanenitrile vs 6-Methyl-2-heptanone

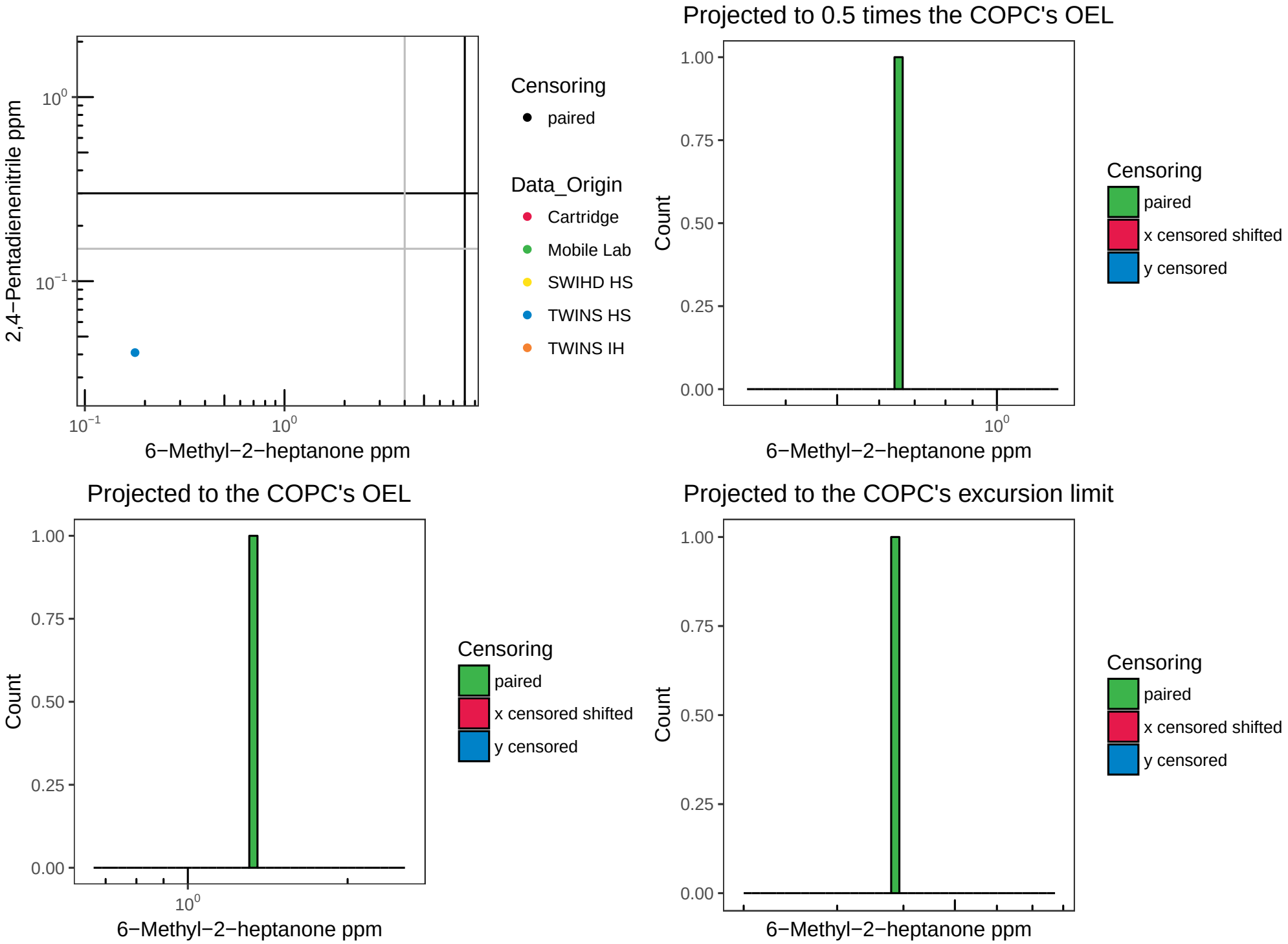


Figure C.628: 2,4-Pentadienenitrile vs 6-Methyl-2-heptanone

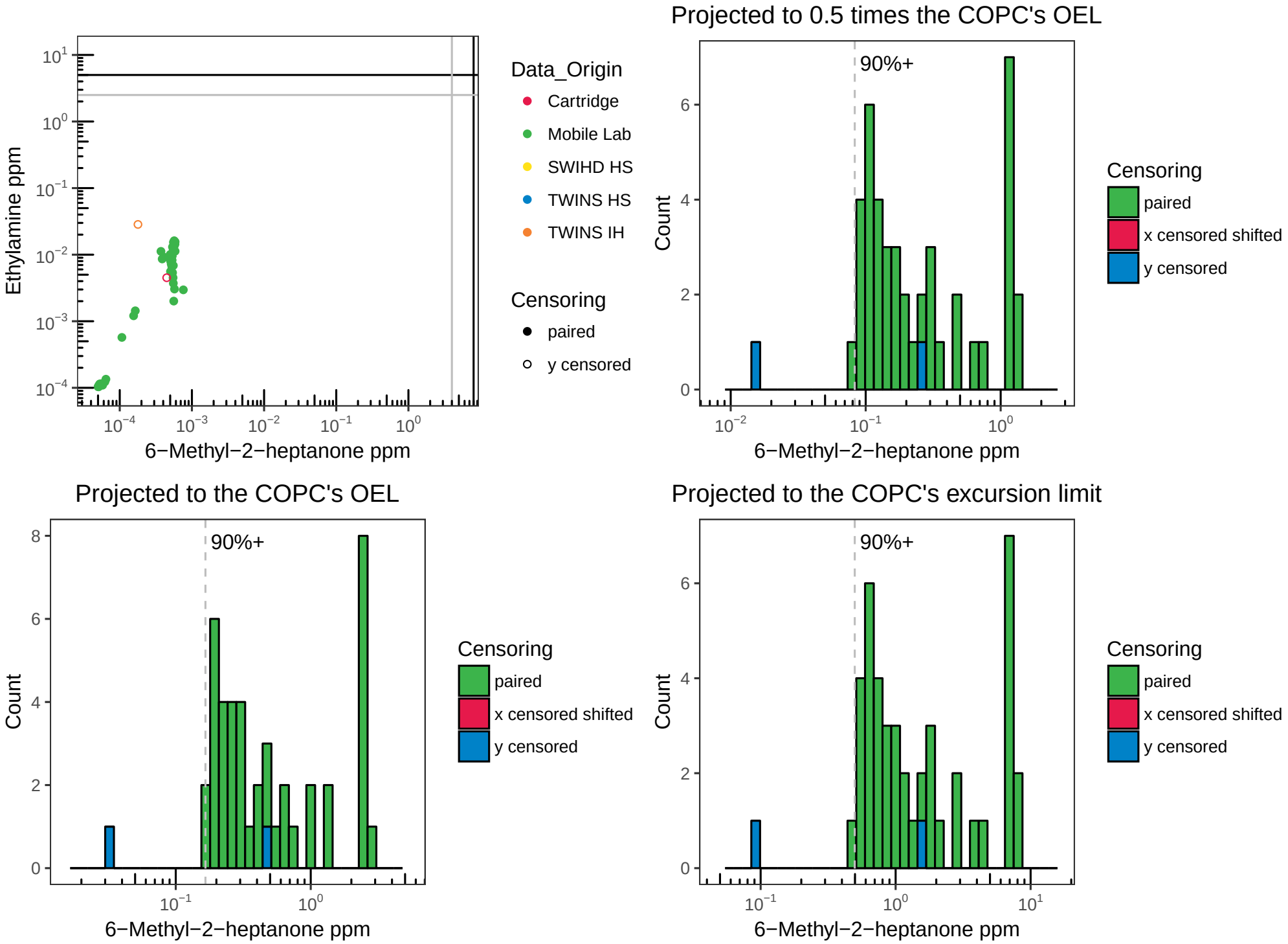


Figure C.629: Ethylamine vs 6-Methyl-2-heptanone

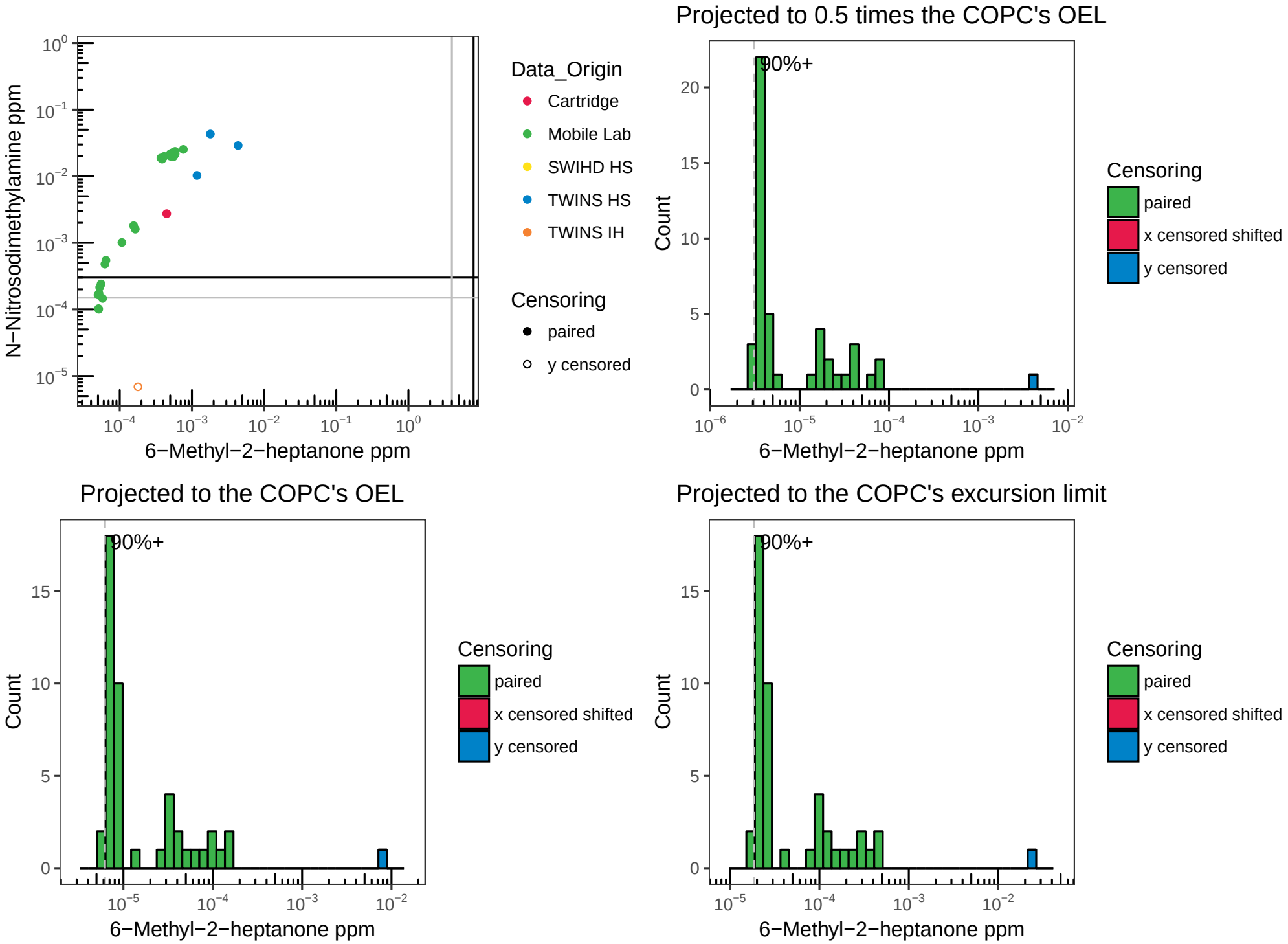


Figure C.630: N-Nitrosodimethylamine vs 6-Methyl-2-heptanone

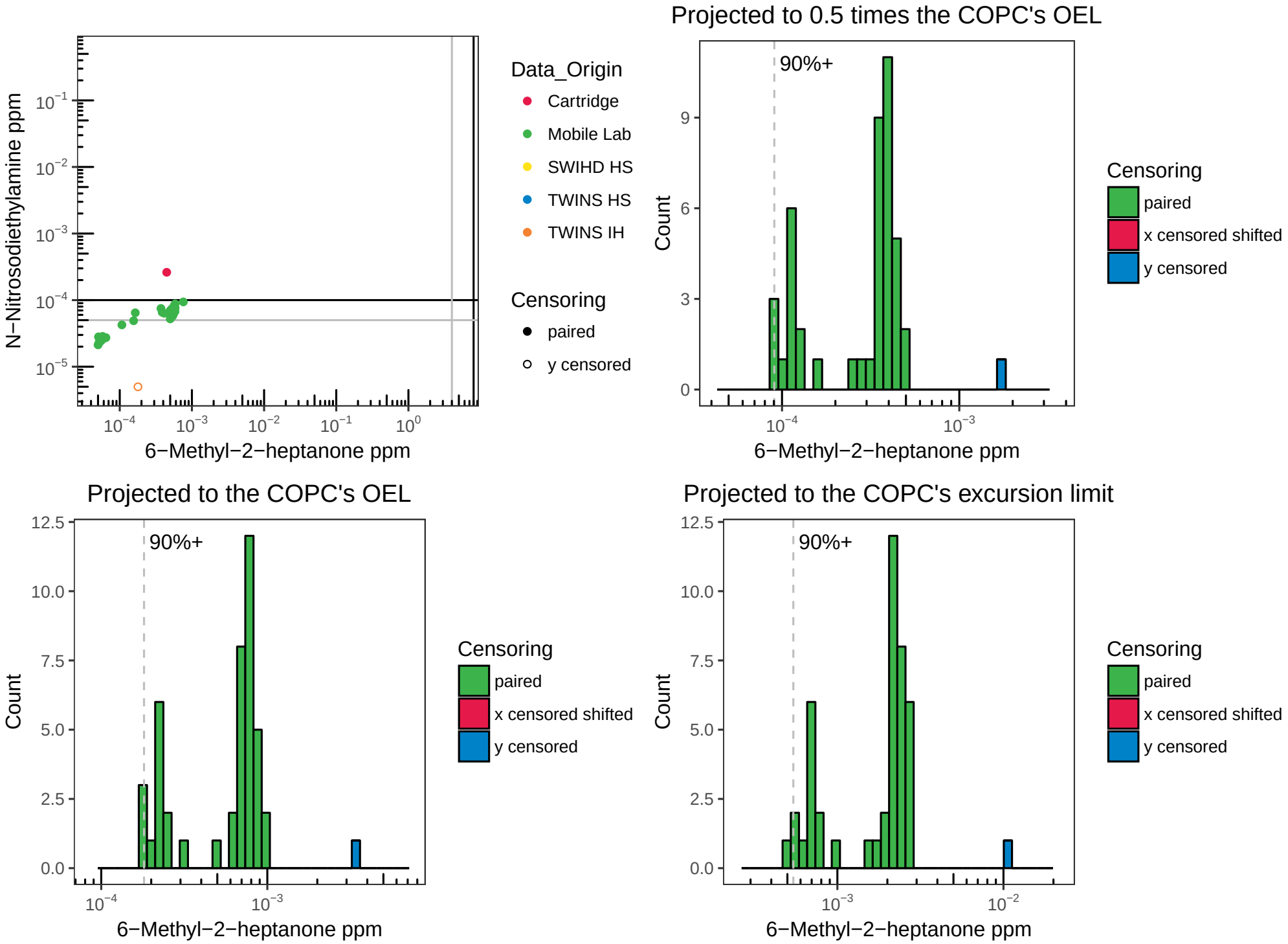


Figure C.631: N-Nitrosodiethylamine vs 6-Methyl-2-heptanone

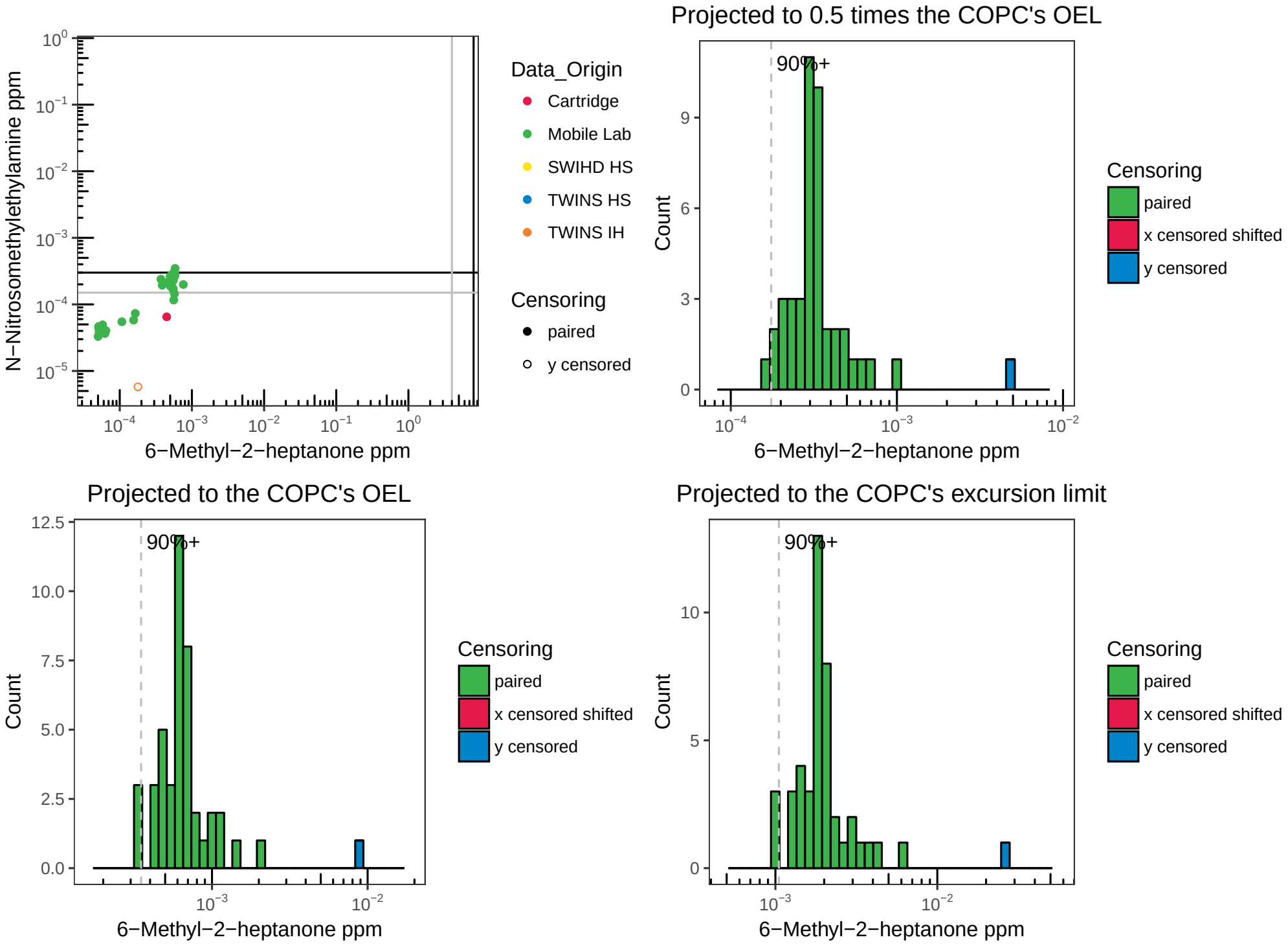


Figure C.632: N-Nitrosomethylethylamine vs 6-Methyl-2-heptanone

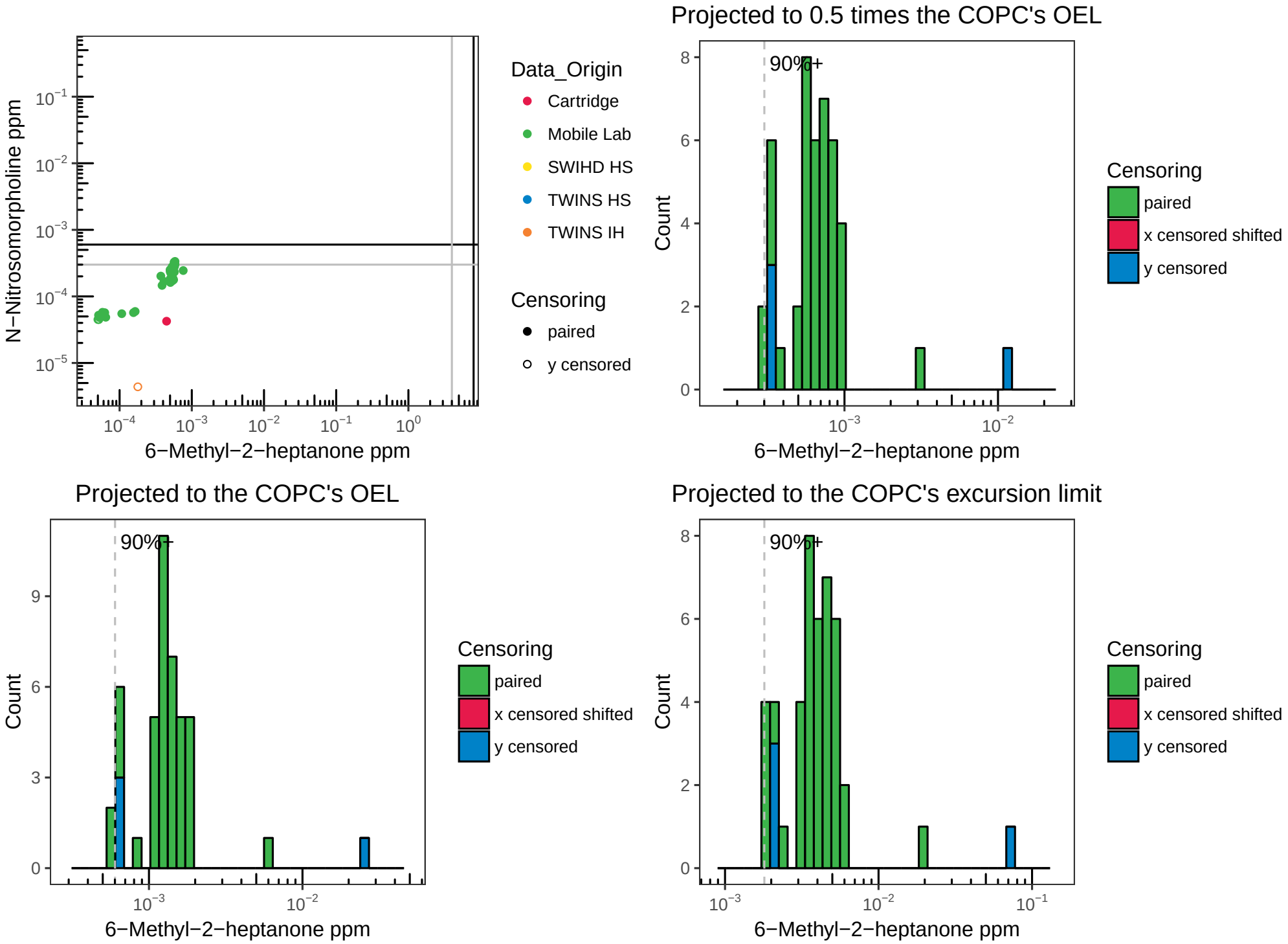


Figure C.633: N-Nitrosomorpholine vs 6-Methyl-2-heptanone

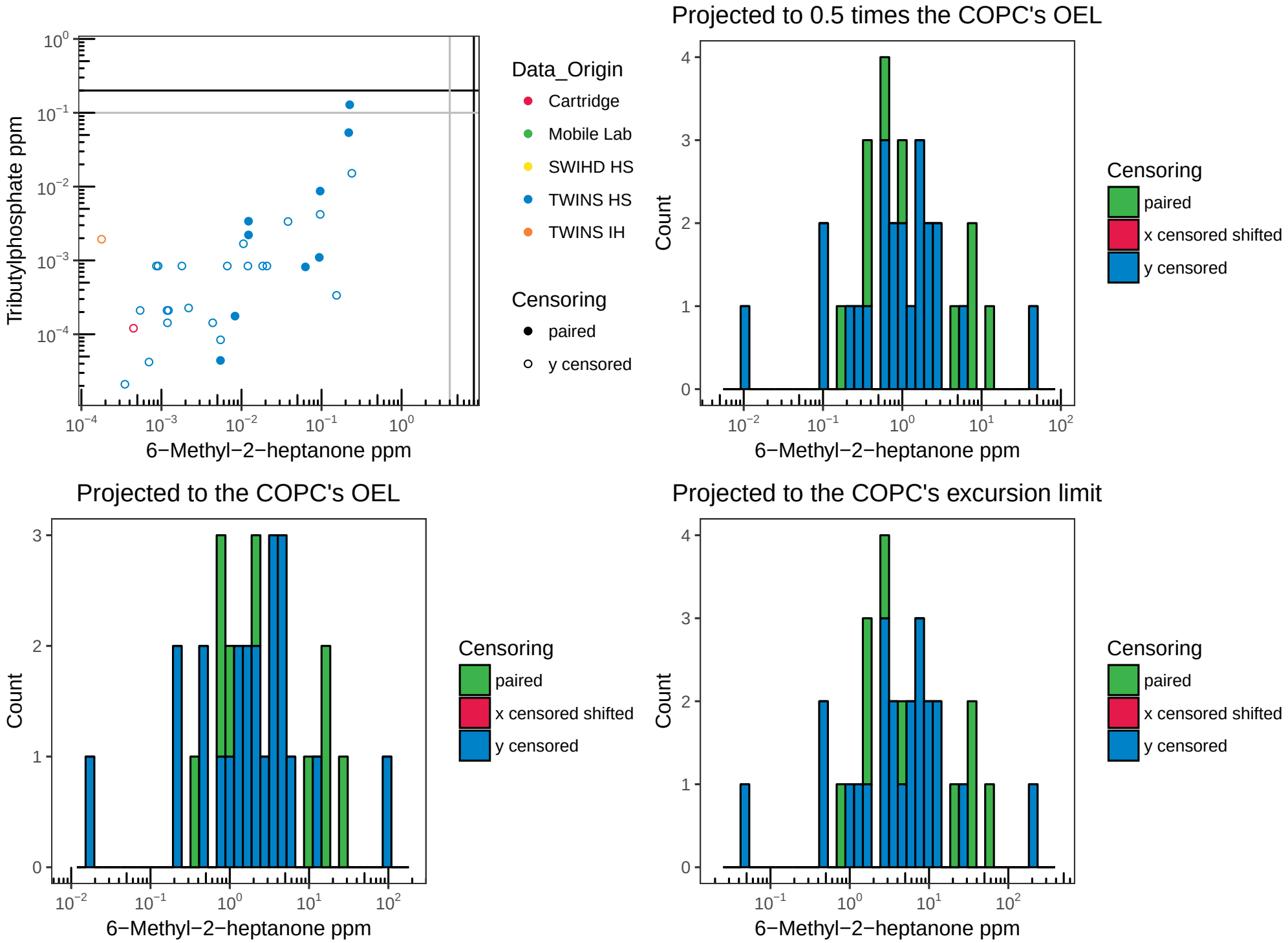


Figure C.634: Tributylphosphate vs 6-Methyl-2-heptanone

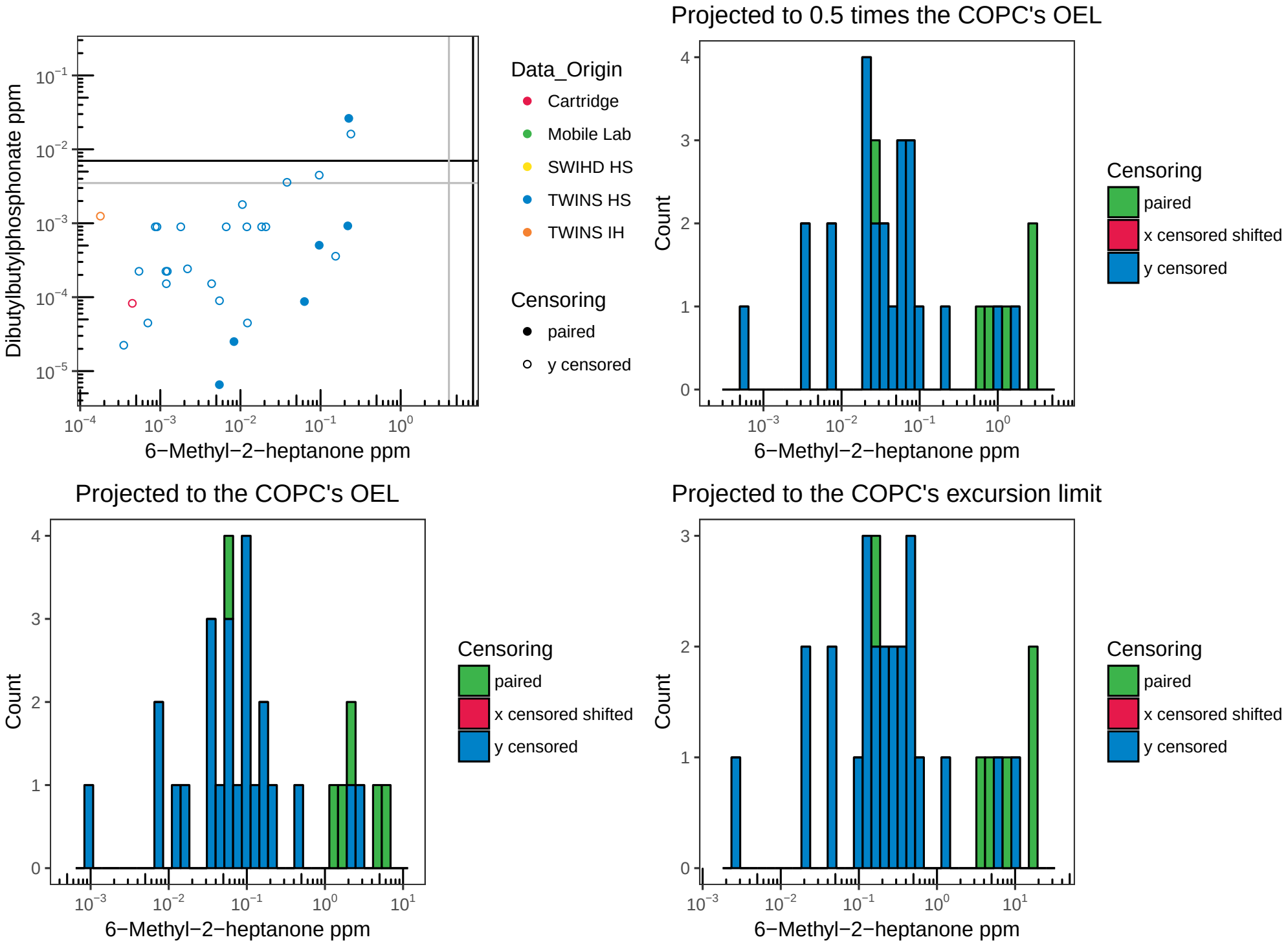


Figure C.635: Dibutylbutylphosphonate vs 6-Methyl-2-heptanone

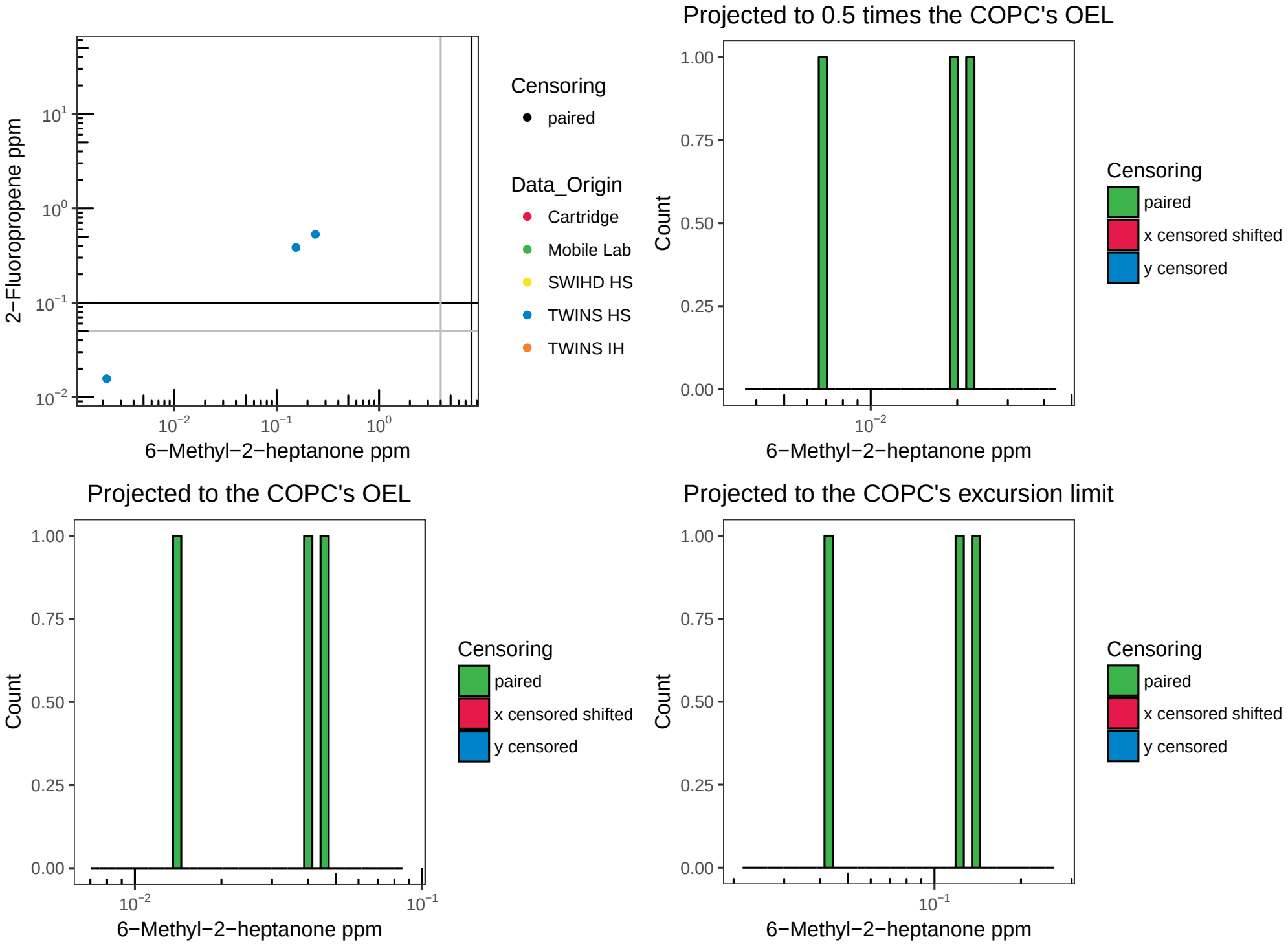


Figure C.636: 2-Fluoropropene vs 6-Methyl-2-heptanone

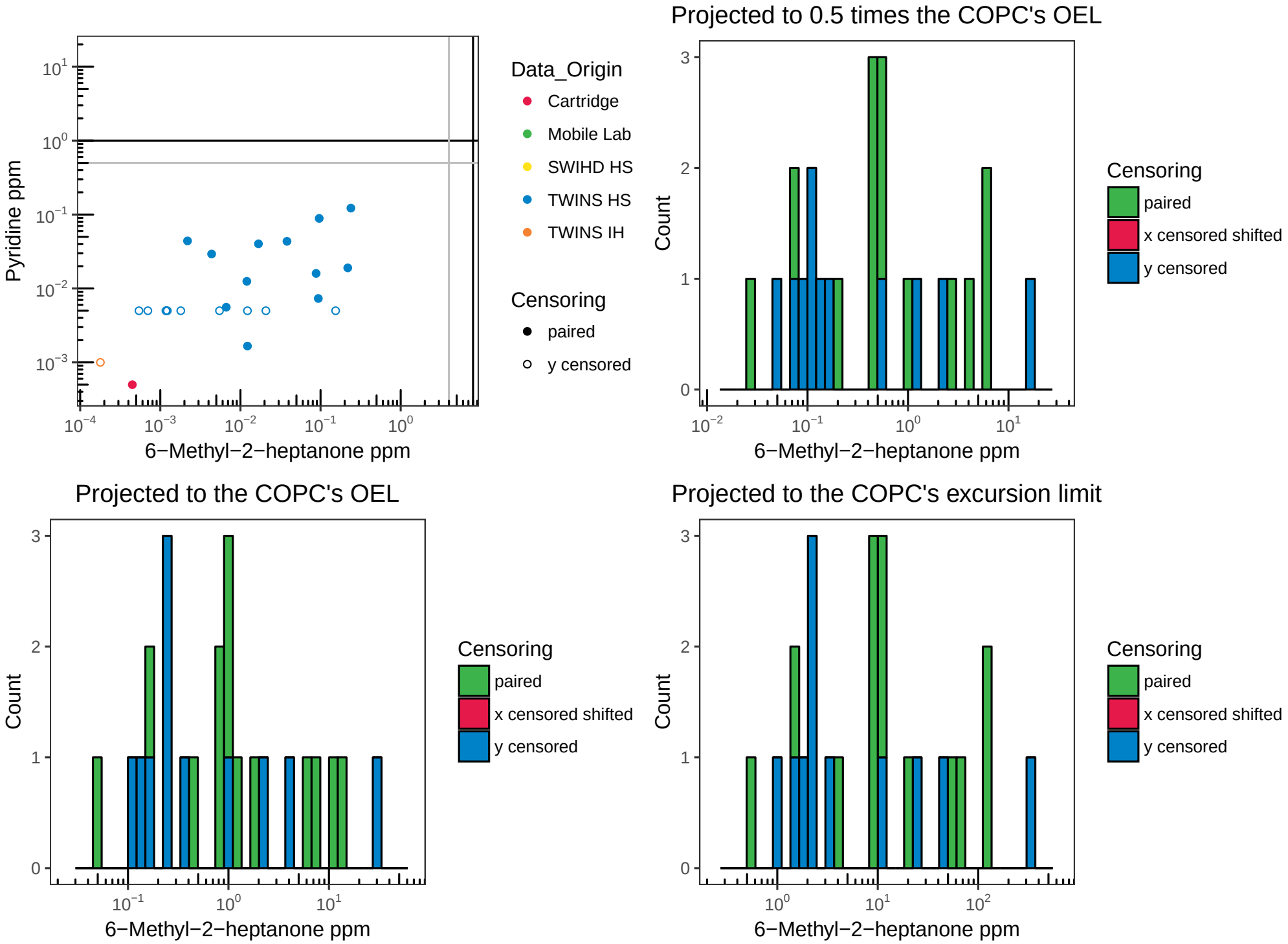


Figure C.637: Pyridine vs 6-Methyl-2-heptanone

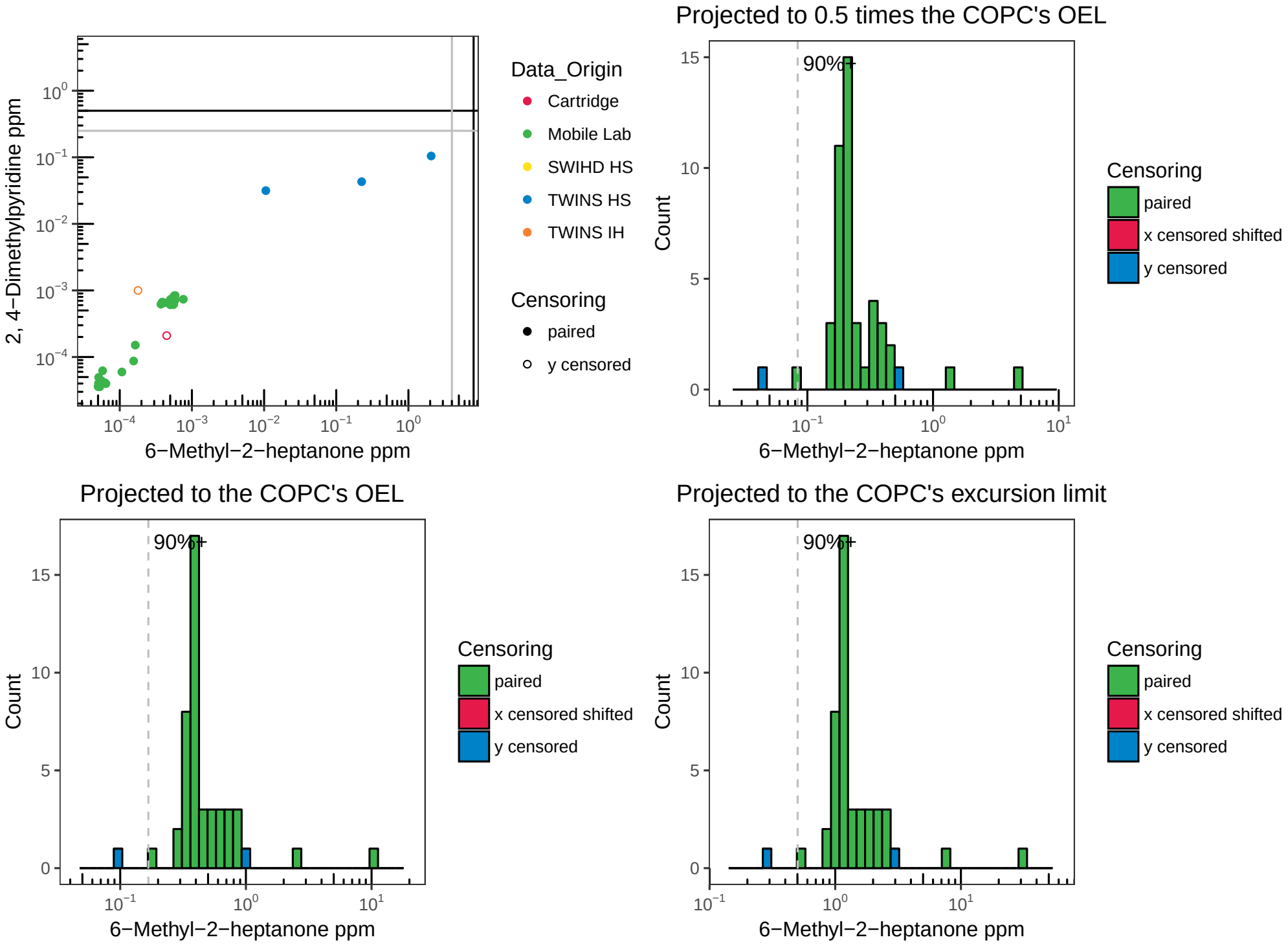


Figure C.638: 2, 4-Dimethylpyridine vs 6-Methyl-2-heptanone

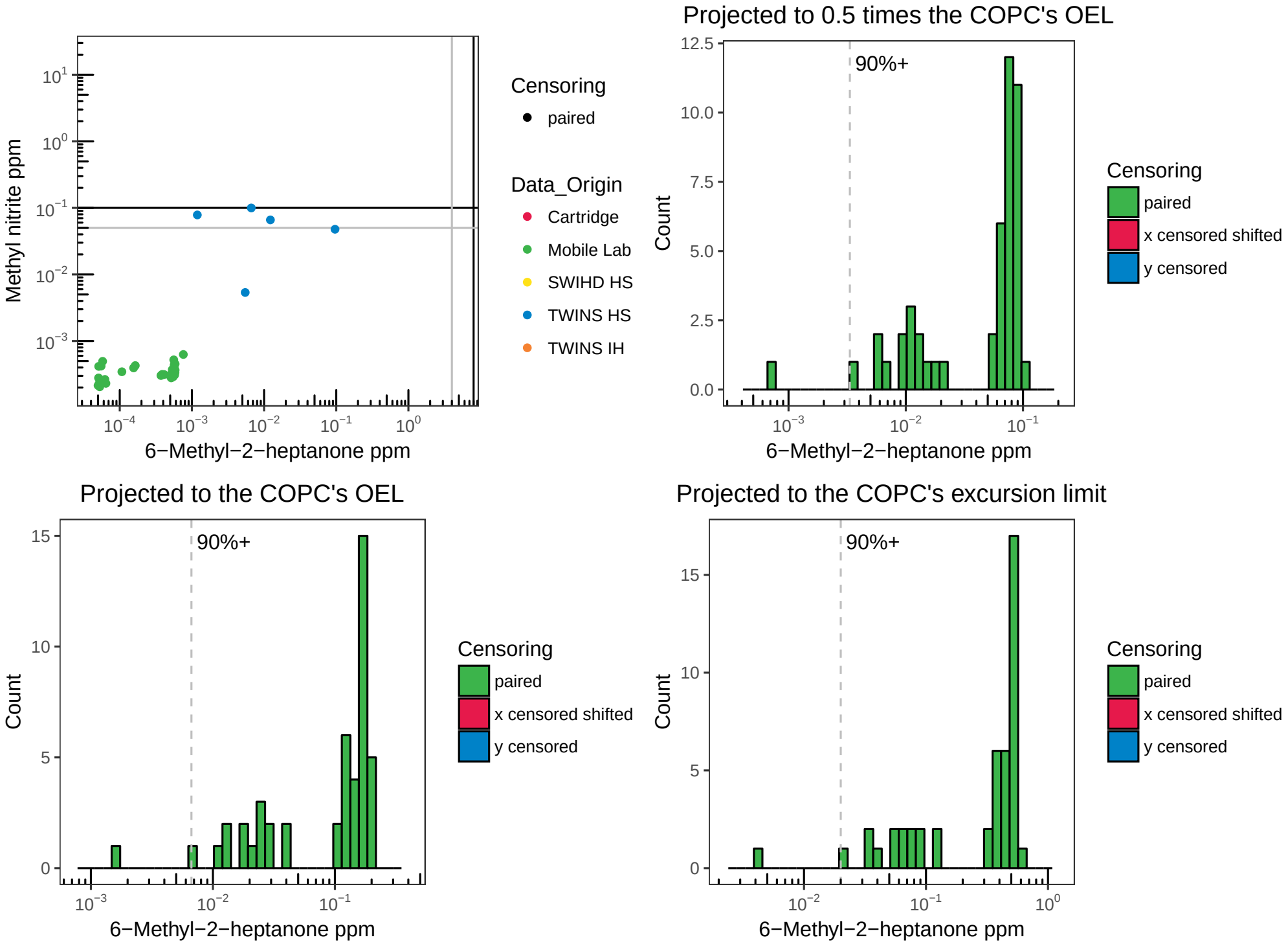


Figure C.639: Methyl nitrite vs 6-Methyl-2-heptanone

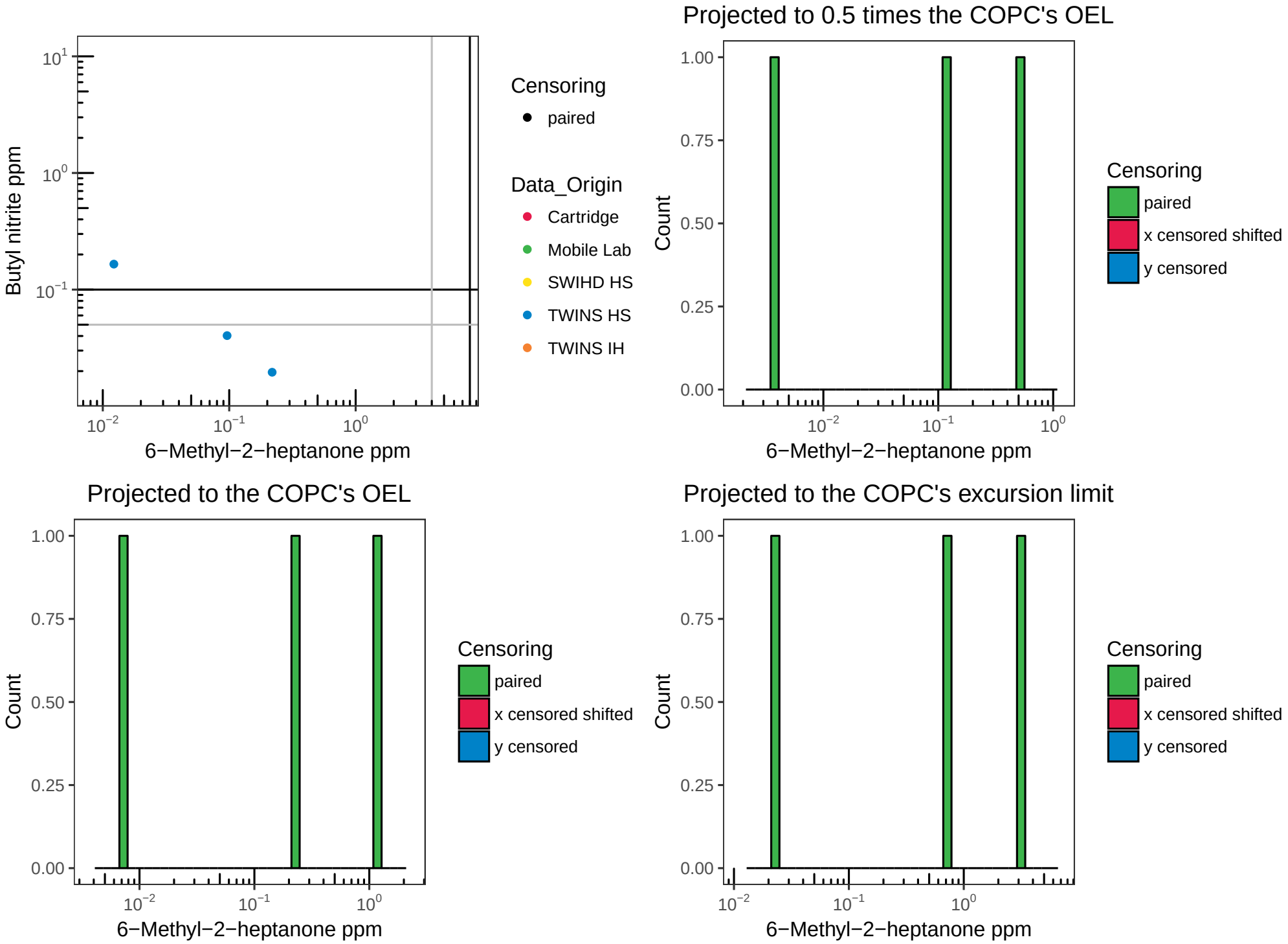


Figure C.640: Butyl nitrite vs 6-Methyl-2-heptanone

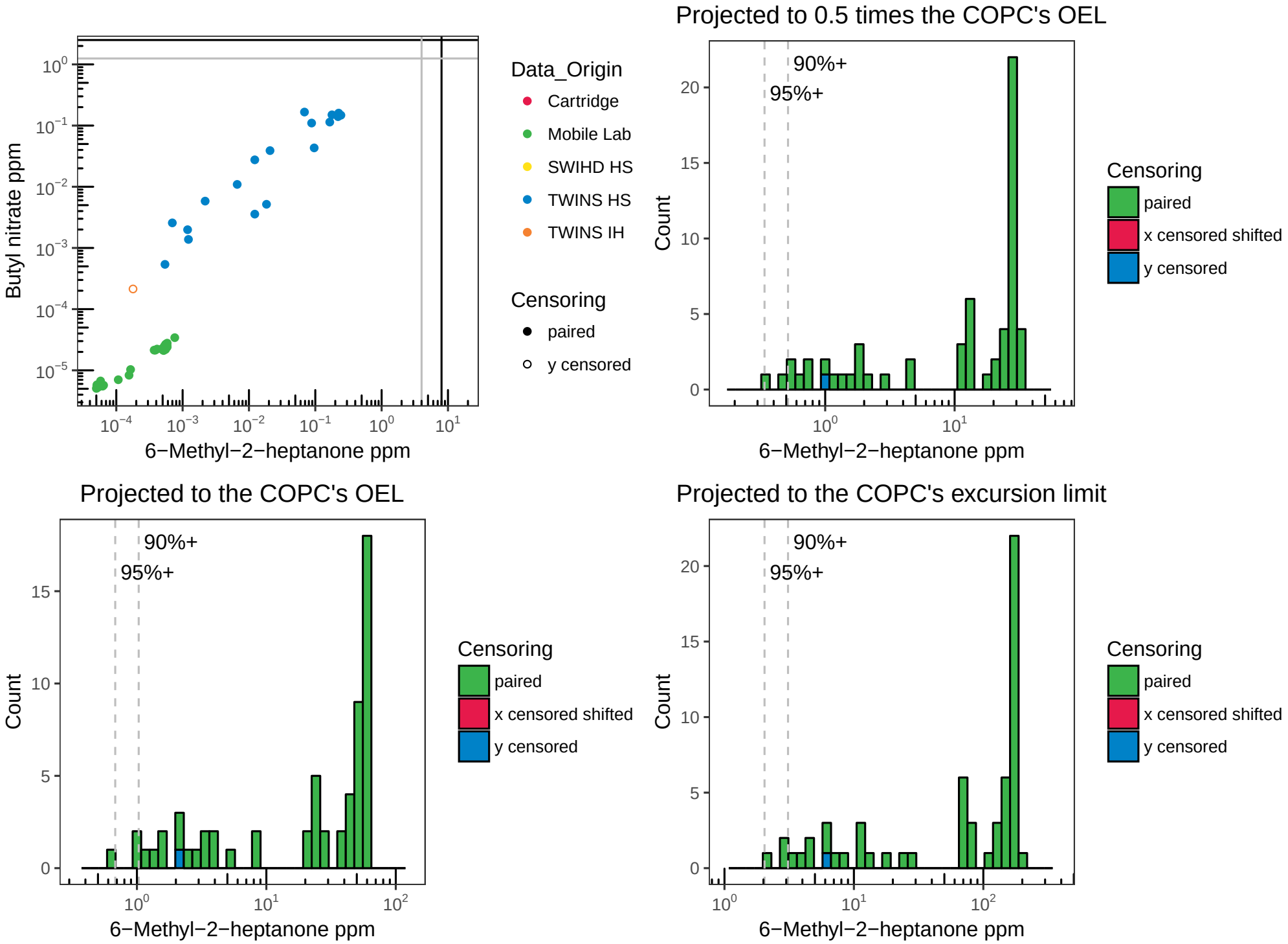


Figure C.641: Butyl nitrate vs 6-Methyl-2-heptanone

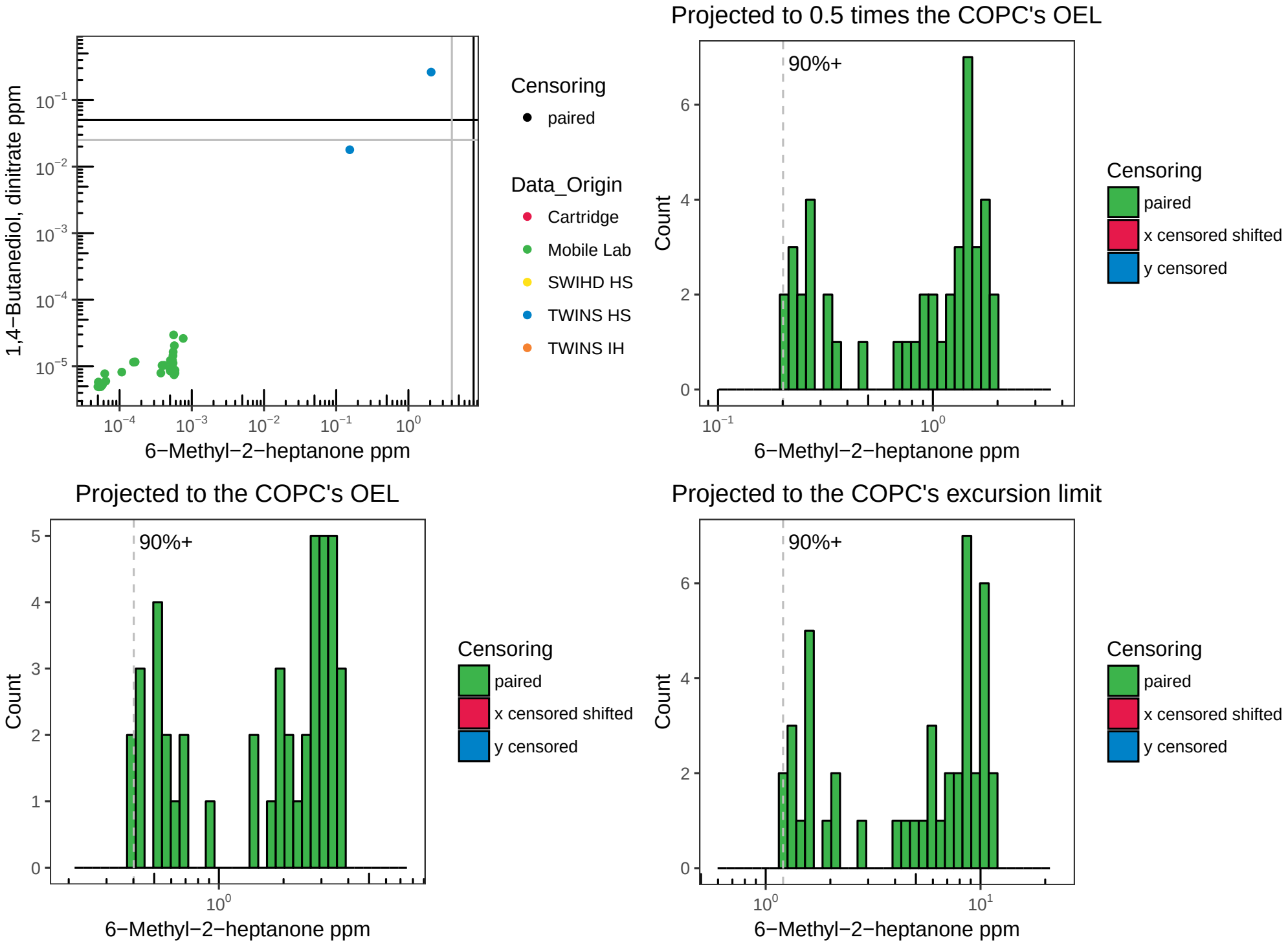


Figure C.642: 1,4-Butanediol, dinitrate vs 6-Methyl-2-heptanone

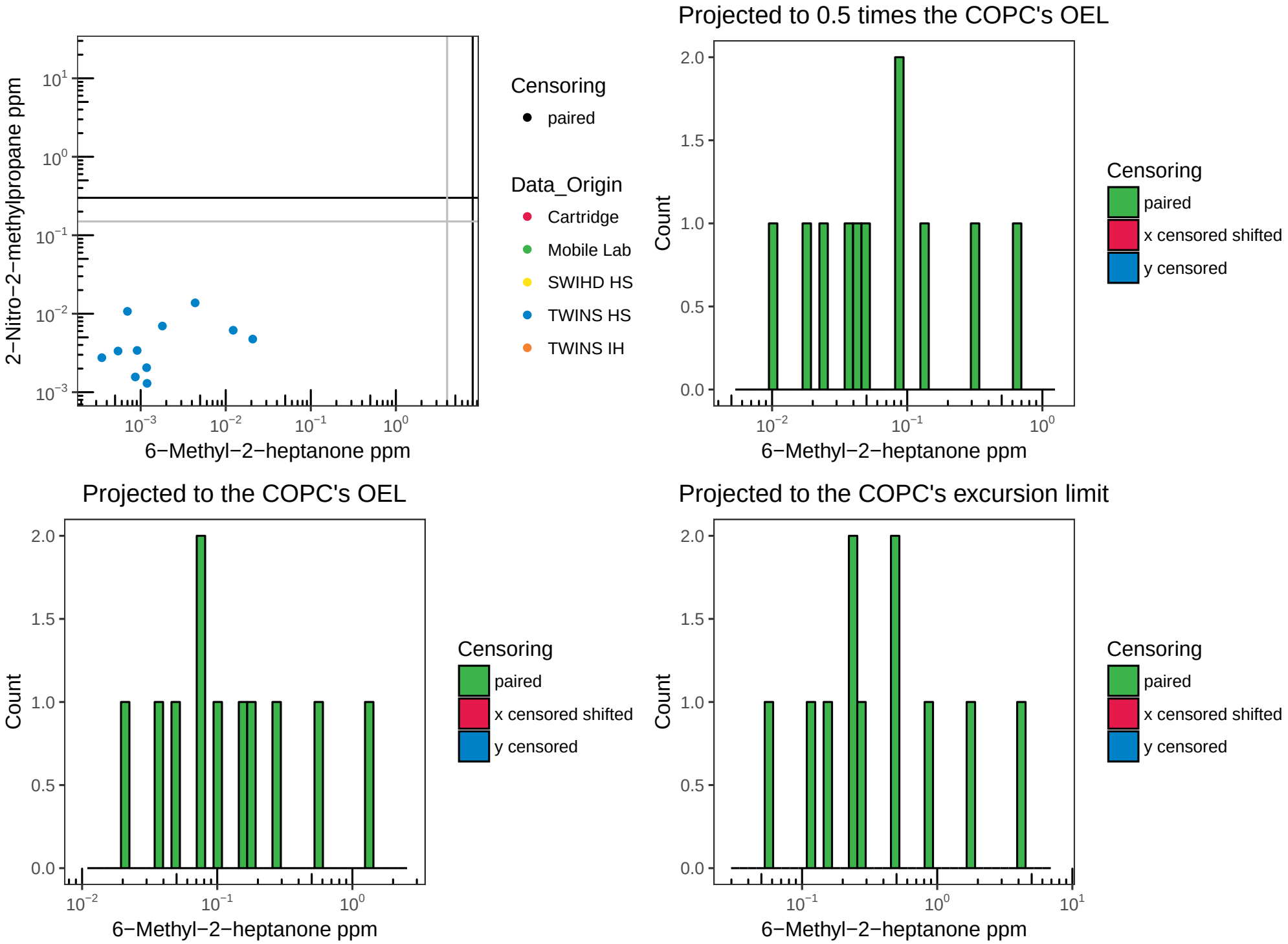


Figure C.643: 2-Nitro-2-methylpropane vs 6-Methyl-2-heptanone

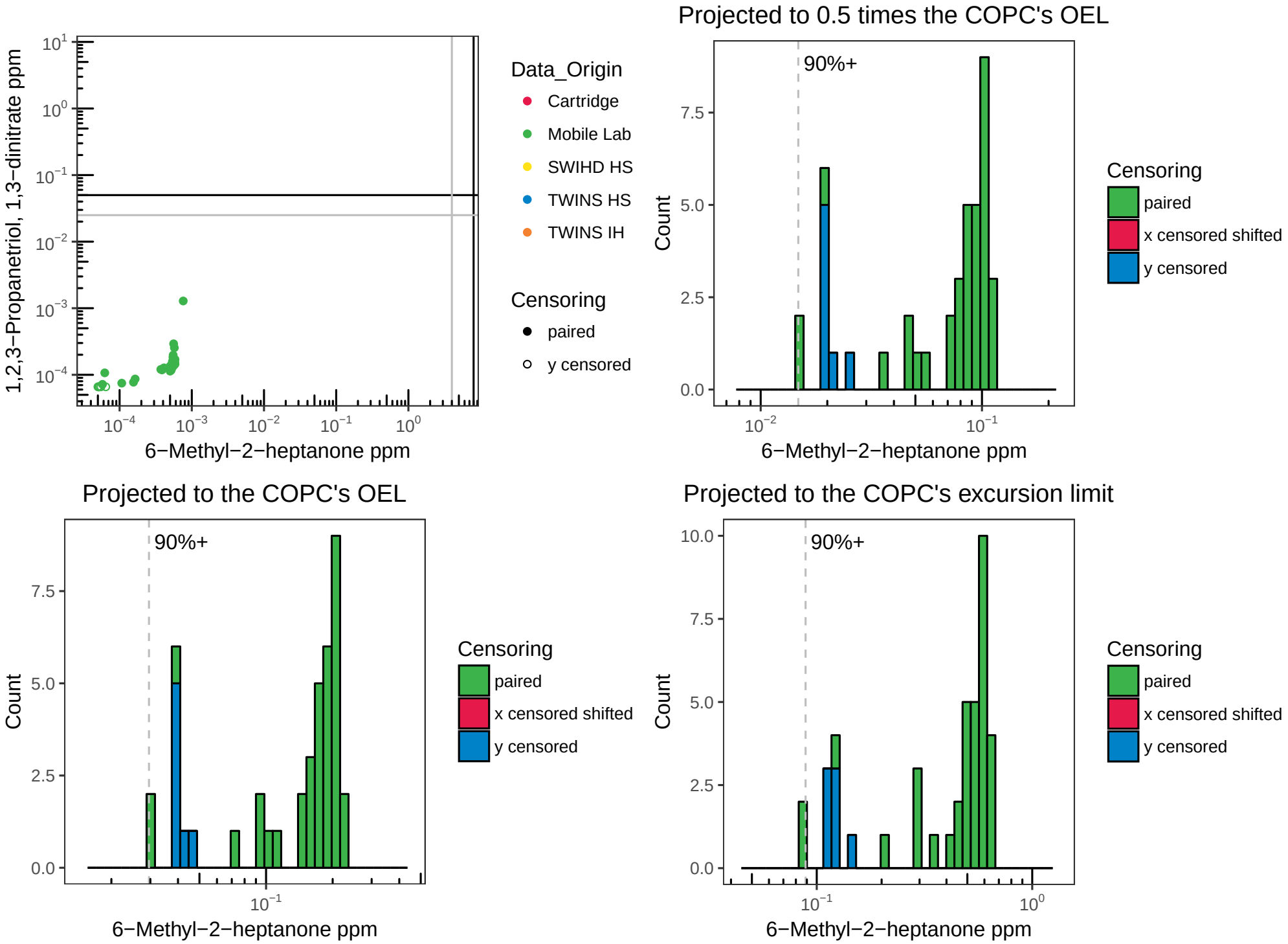


Figure C.644: 1,2,3-Propanetriol, 1,3-dinitrate vs 6-Methyl-2-heptanone

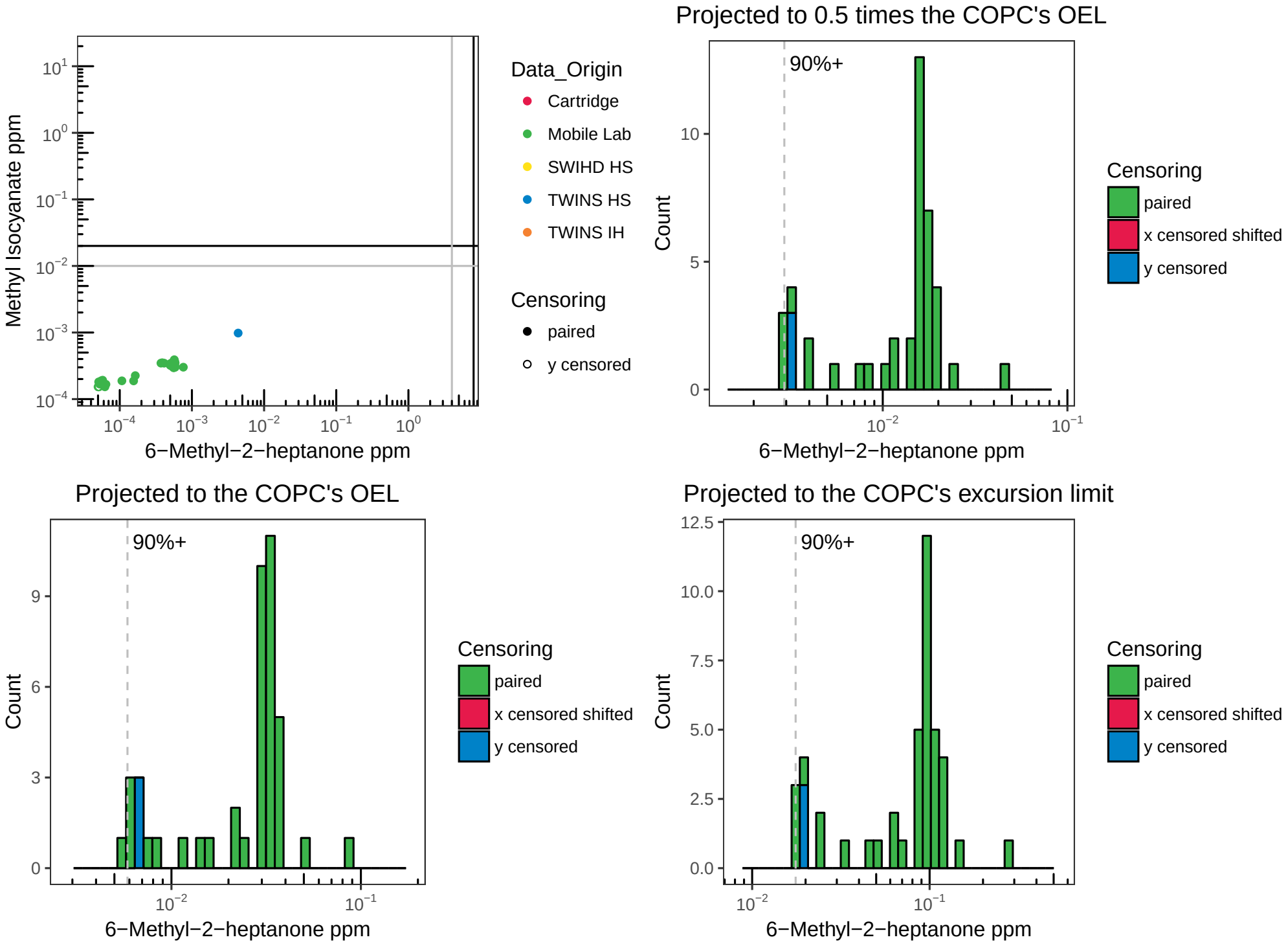


Figure C.645: Methyl Isocyanate vs 6-Methyl-2-heptanone

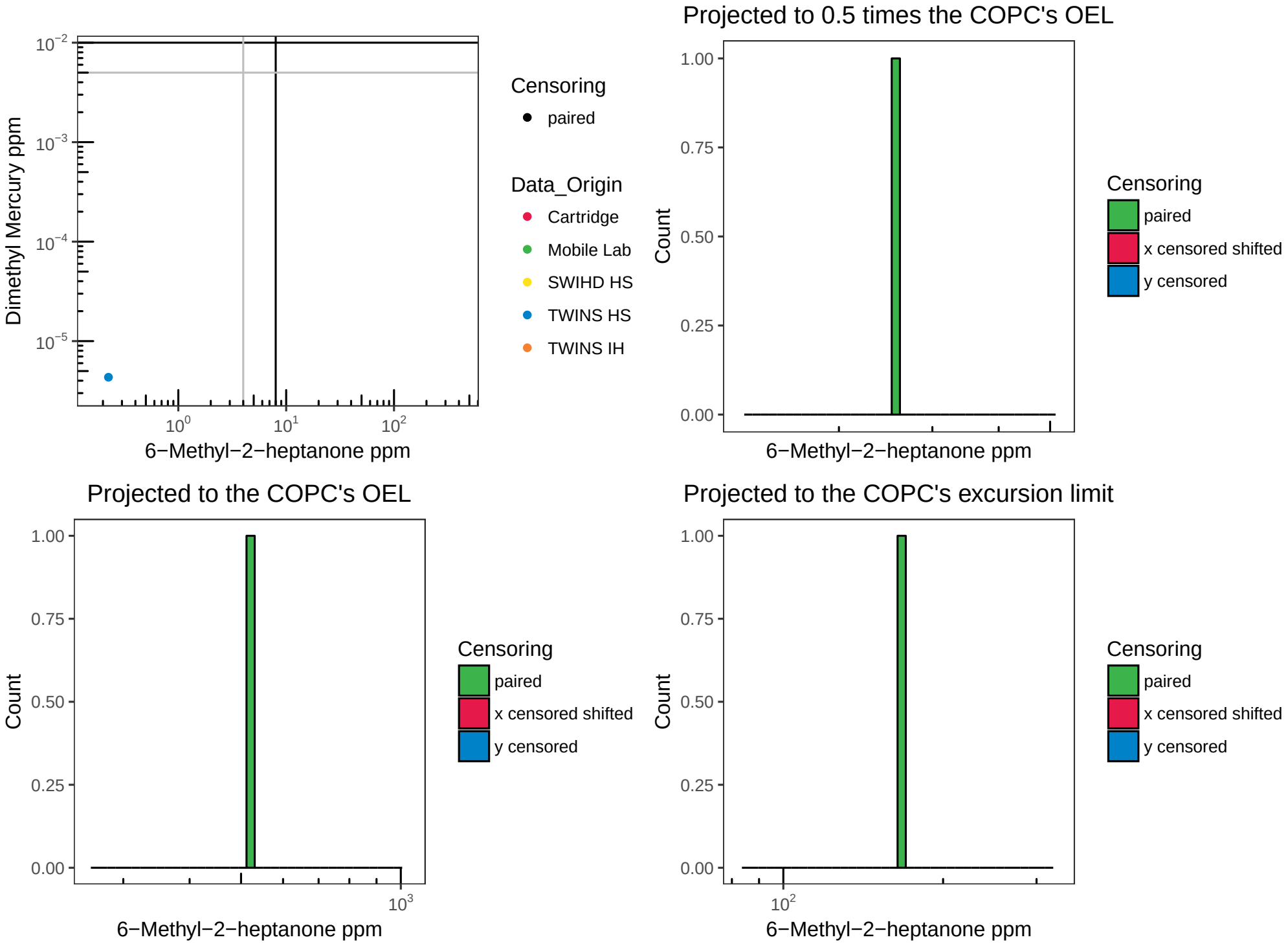


Figure C.646: Dimethyl Mercury vs 6-Methyl-2-heptanone

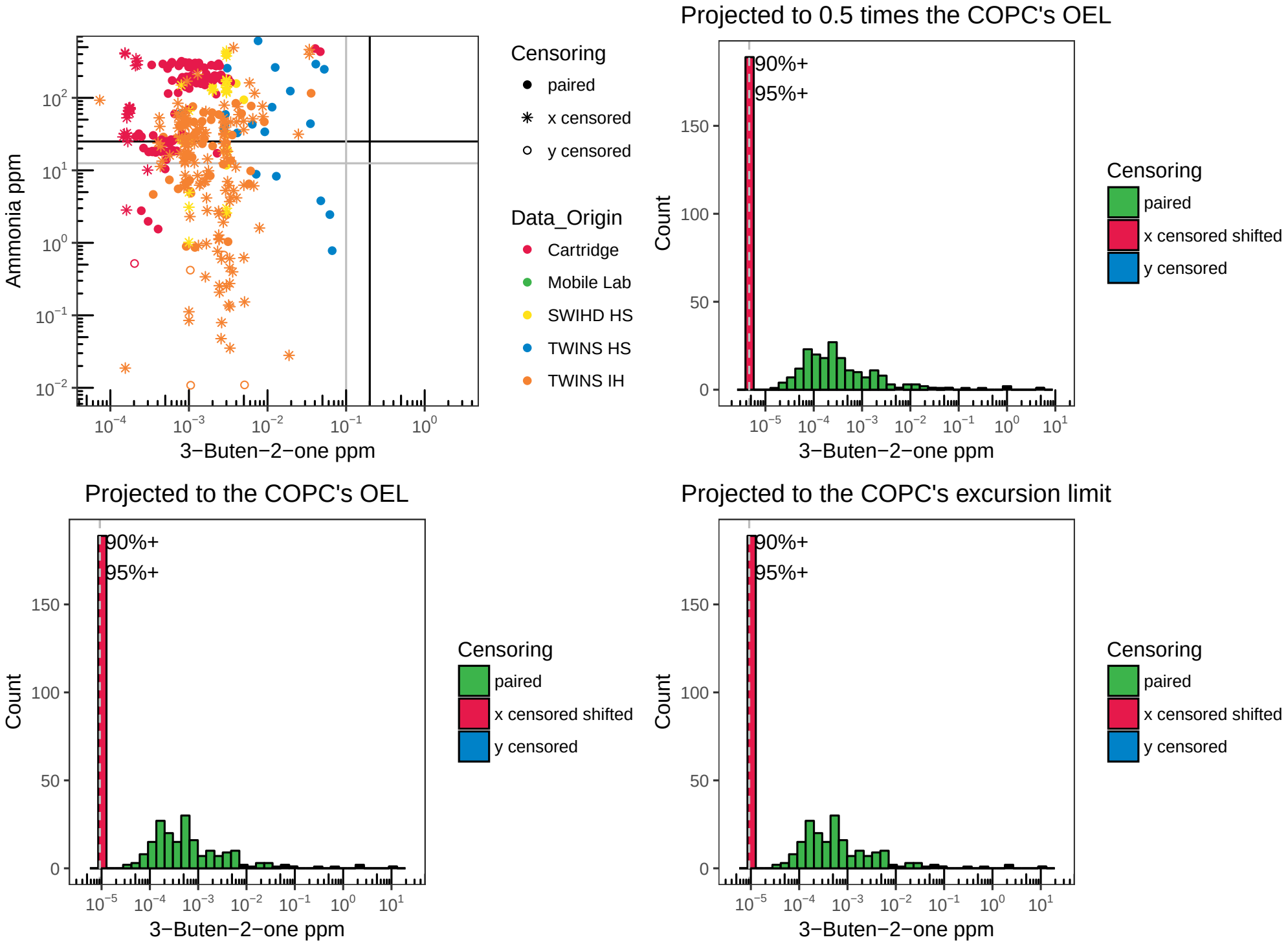


Figure C.647: Ammonia vs 3-Buten-2-one

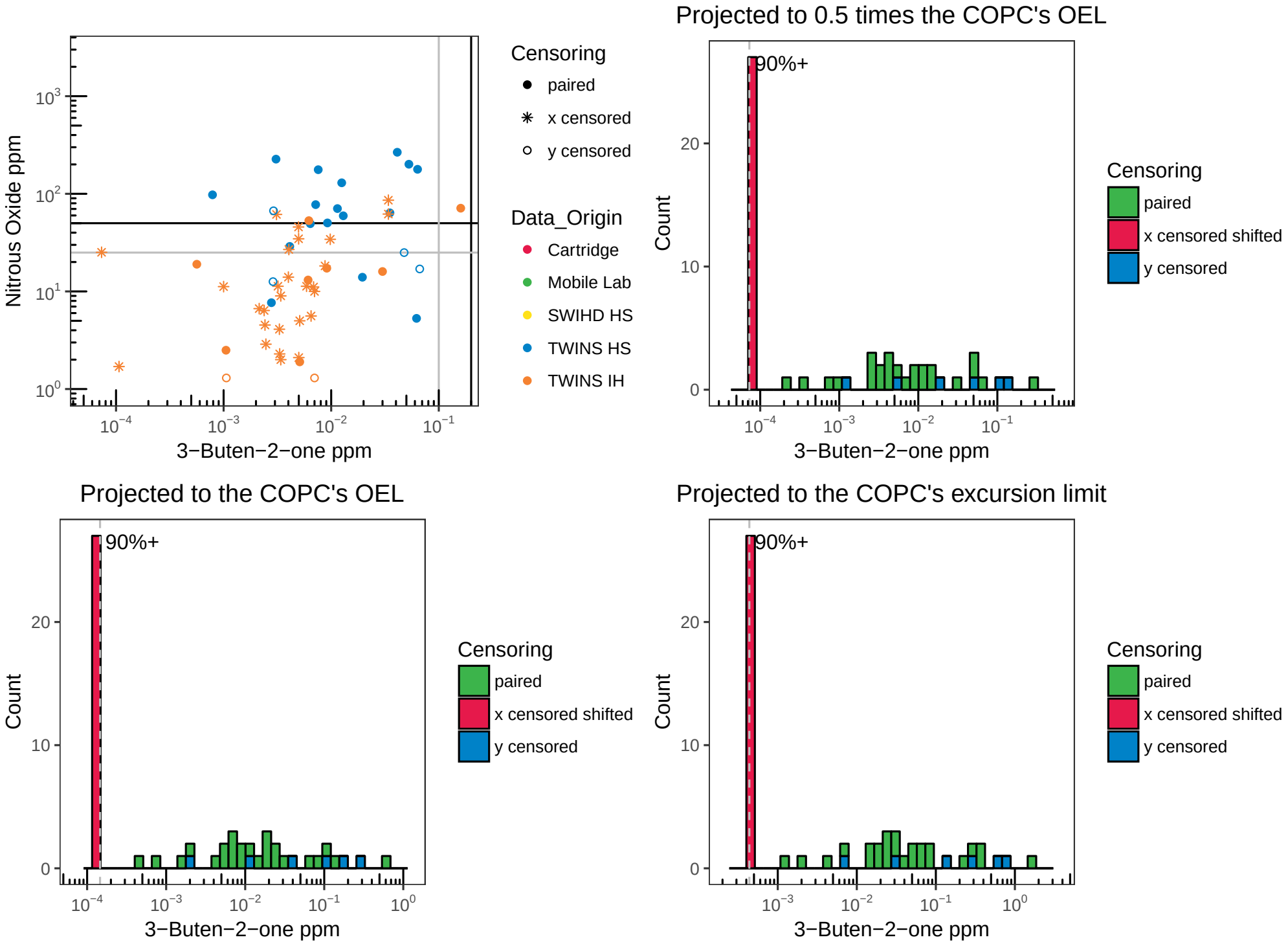


Figure C.648: Nitrous Oxide vs 3-Buten-2-one

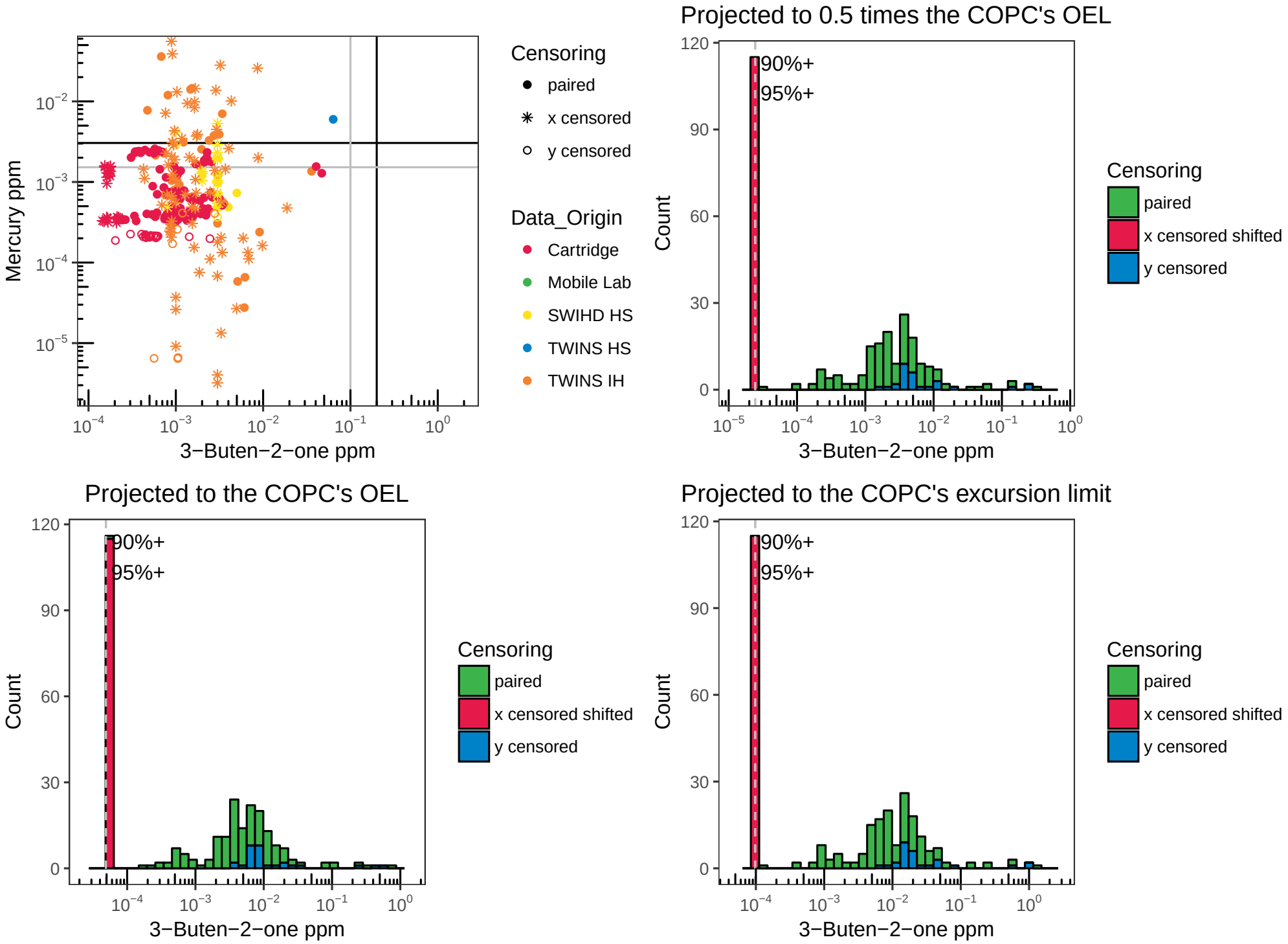


Figure C.649: Mercury vs 3-Buten-2-one

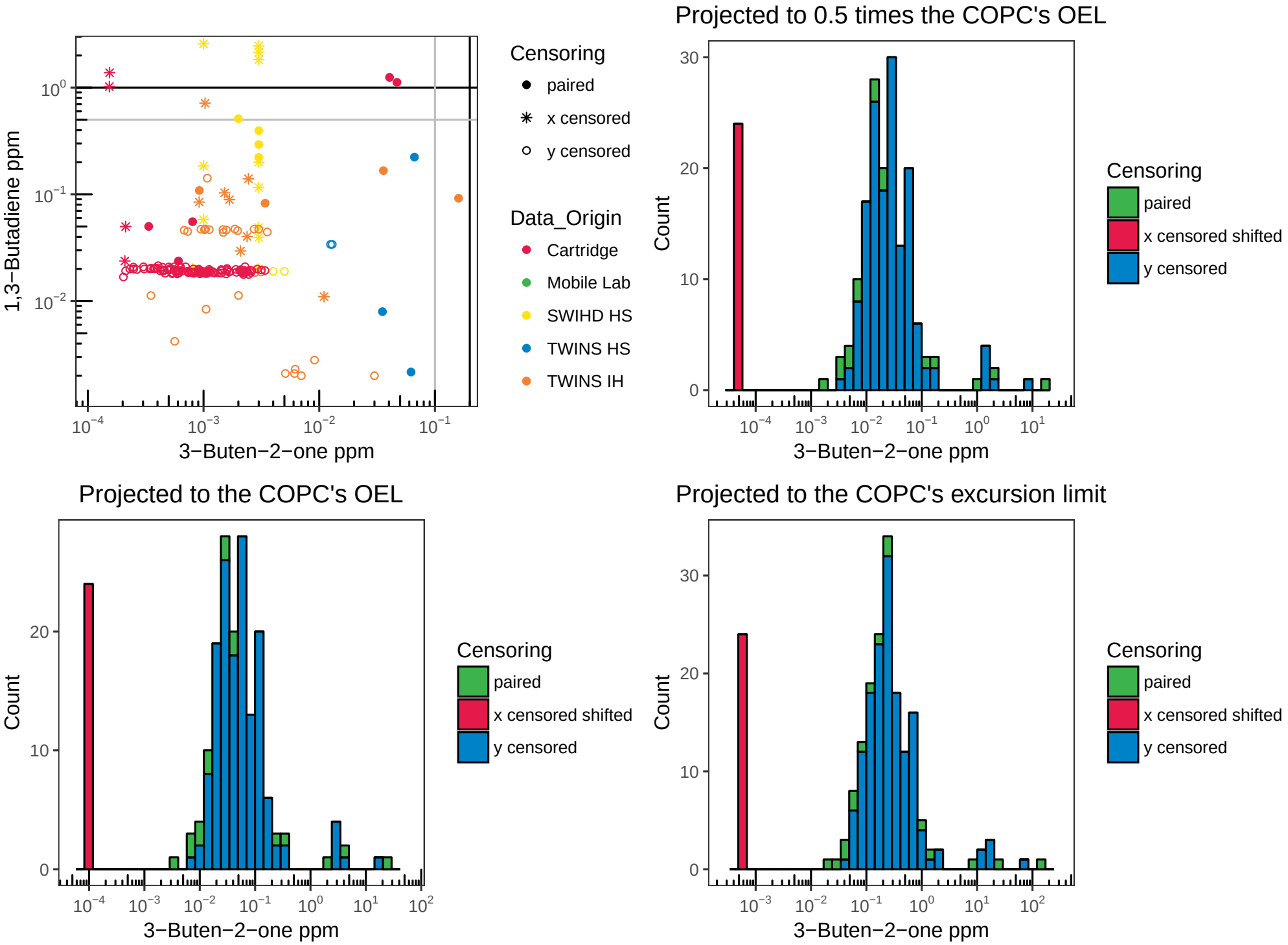


Figure C.650: 1,3-Butadiene vs 3-Buten-2-one

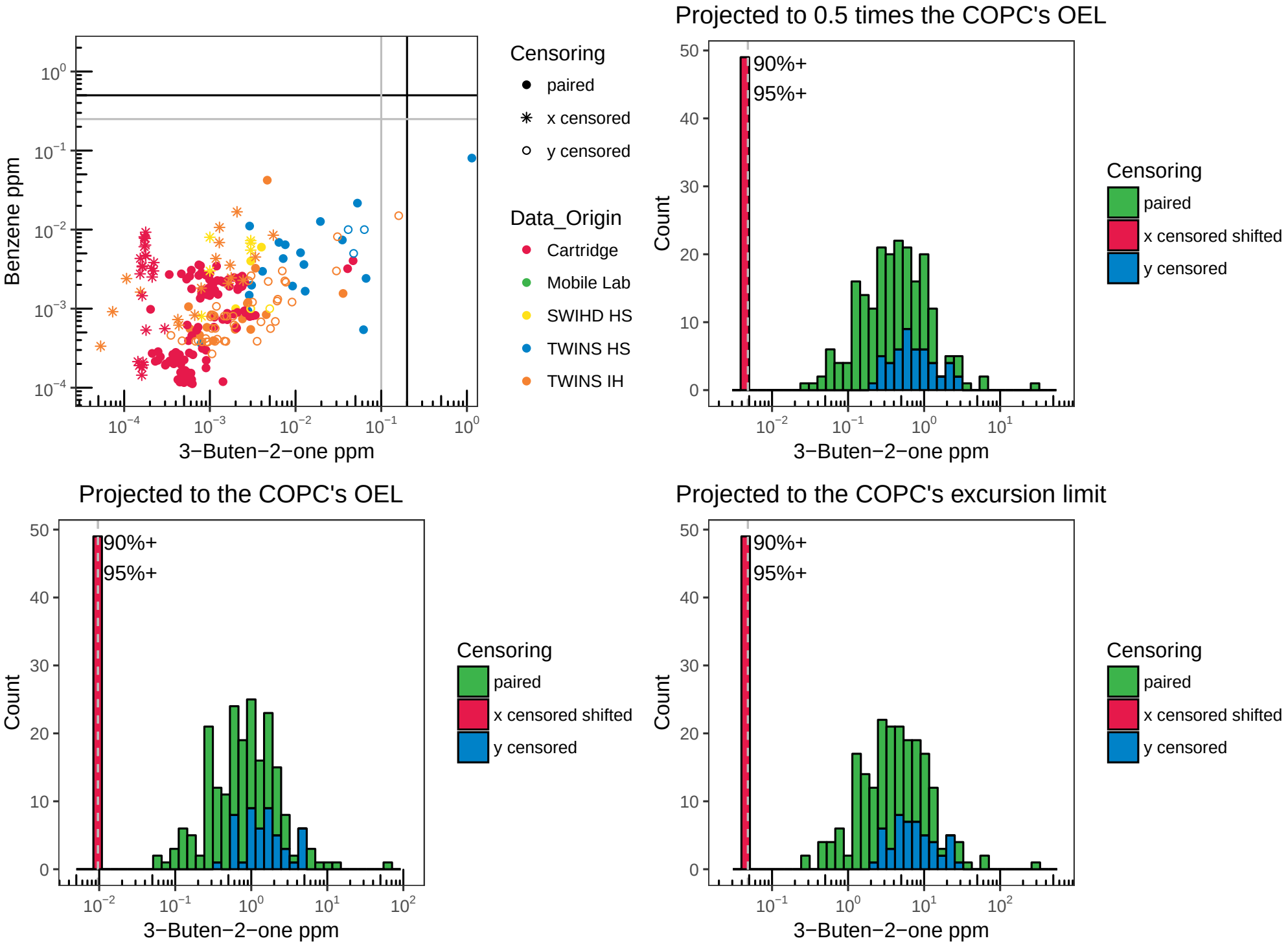


Figure C.651: Benzene vs 3-Buten-2-one

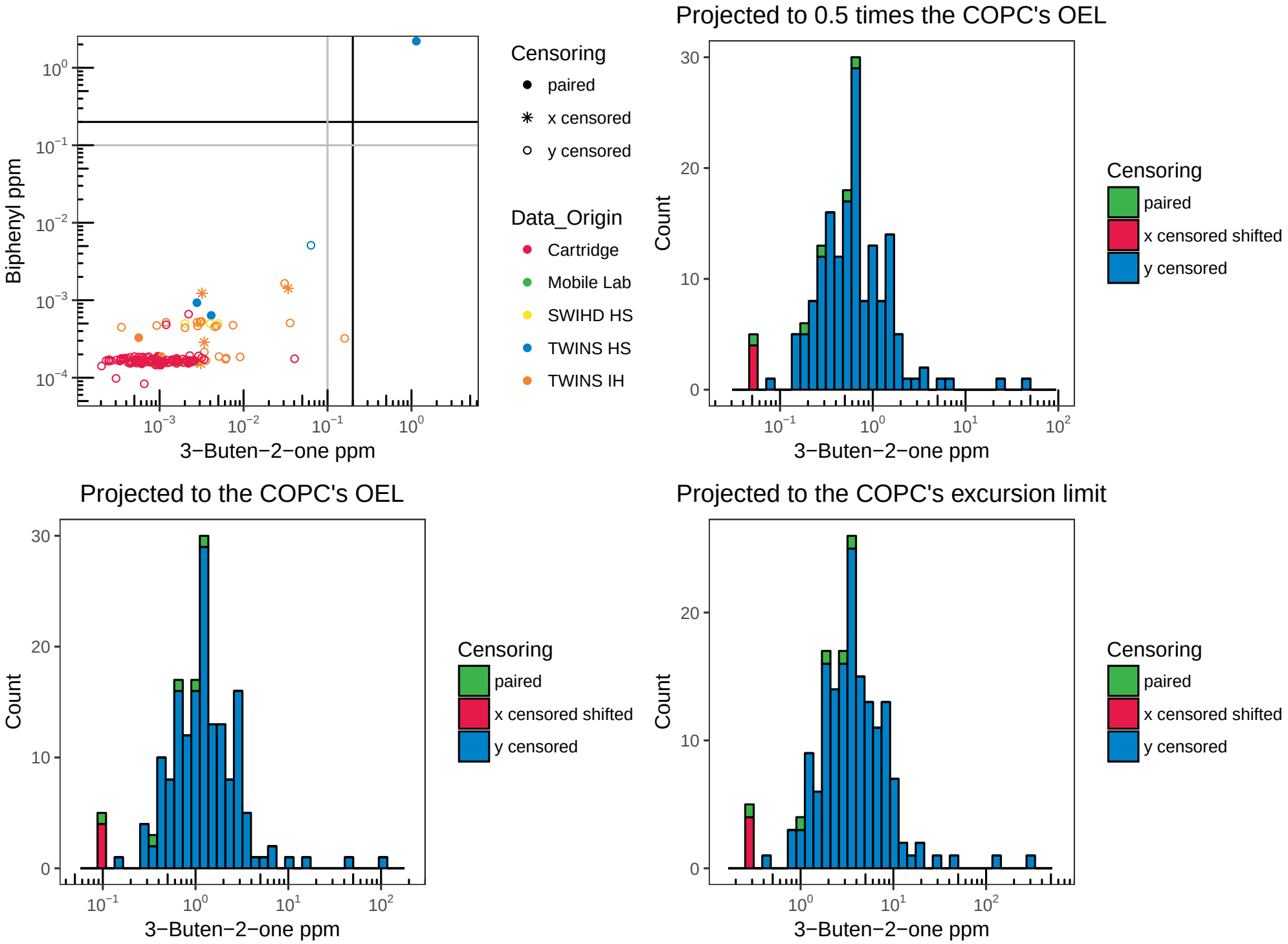


Figure C.652: Biphenyl vs 3-Buten-2-one

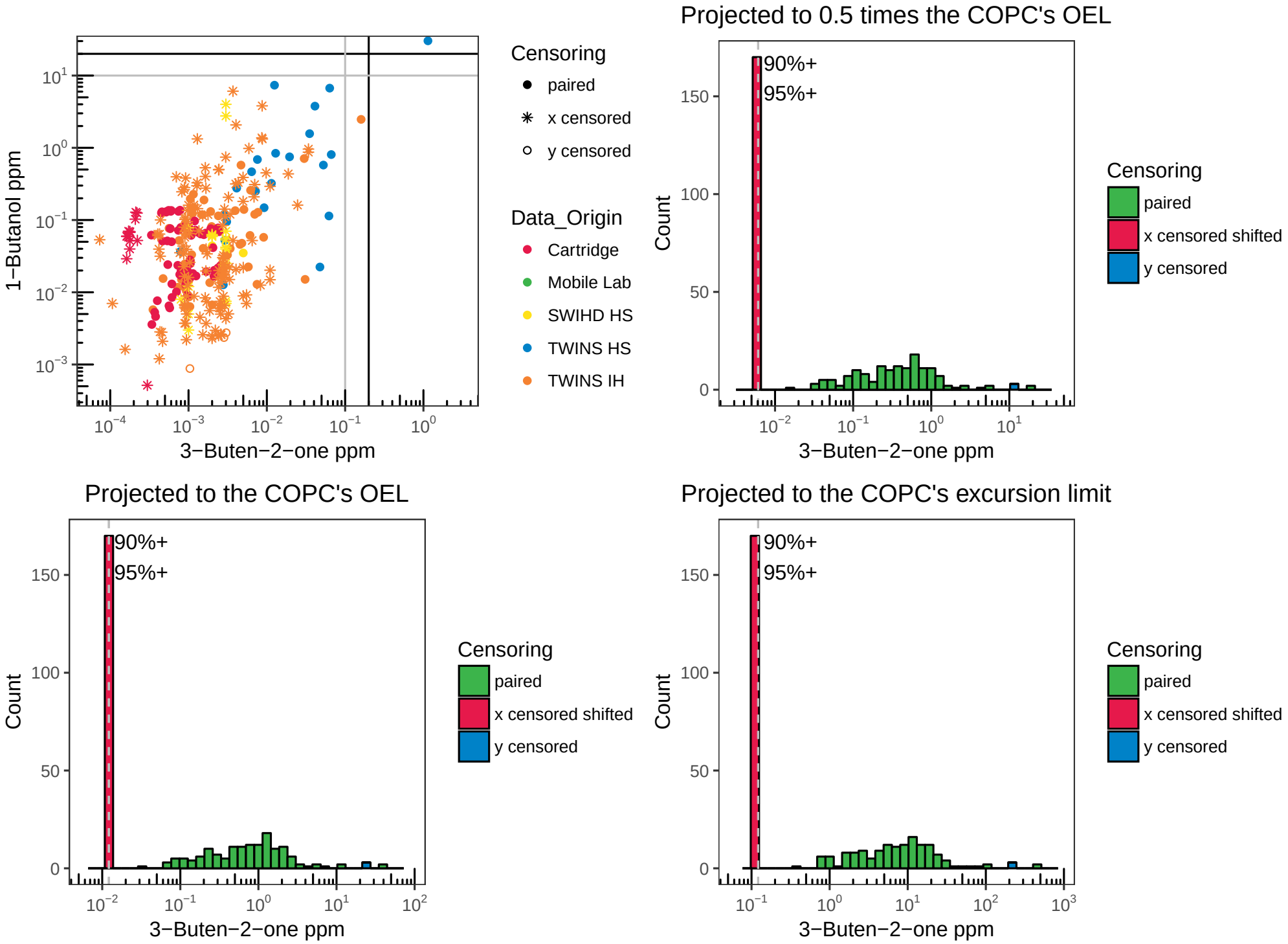


Figure C.653: 1-Butanol vs 3-Buten-2-one

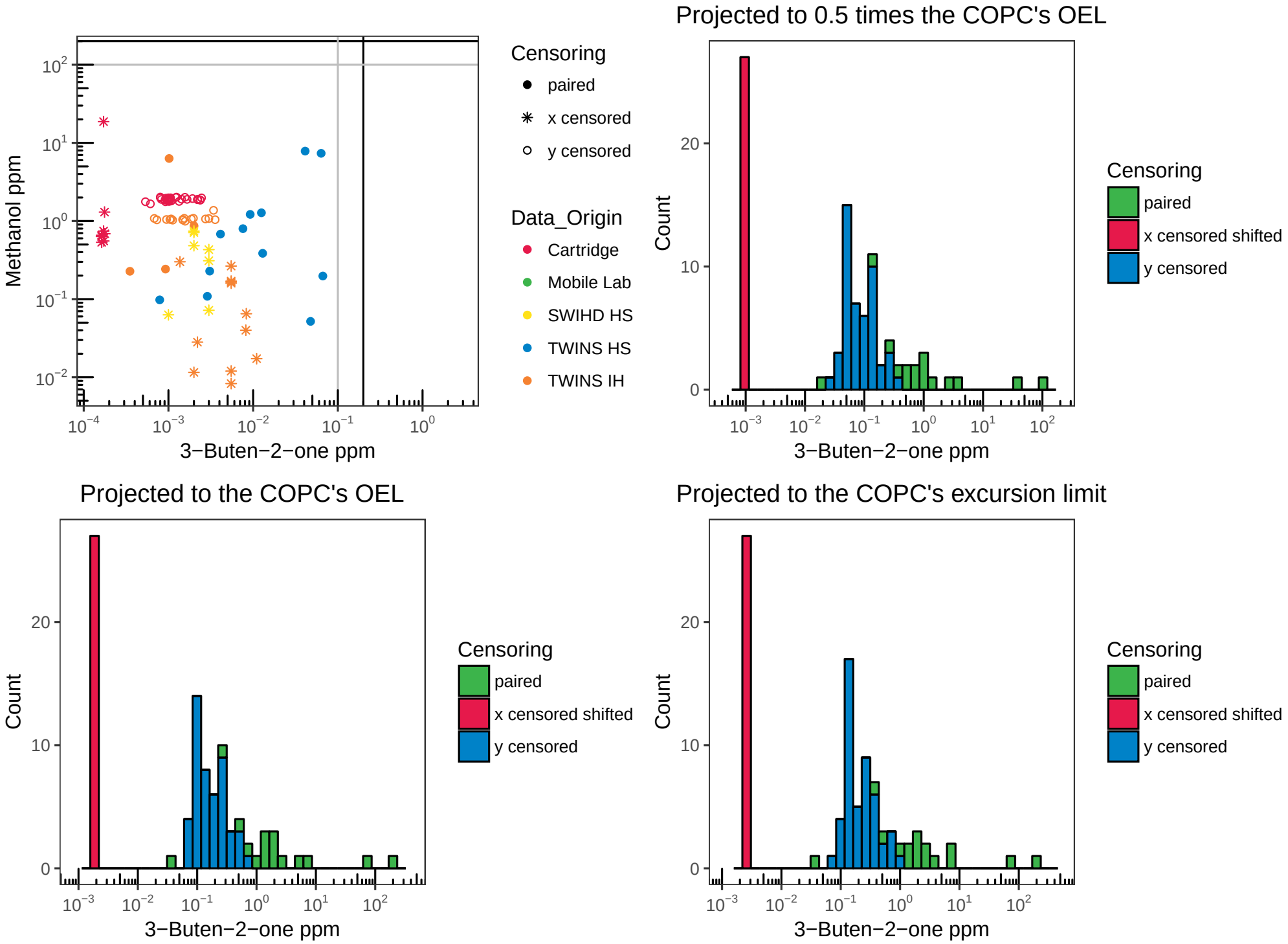


Figure C.654: Methanol vs 3-Buten-2-one

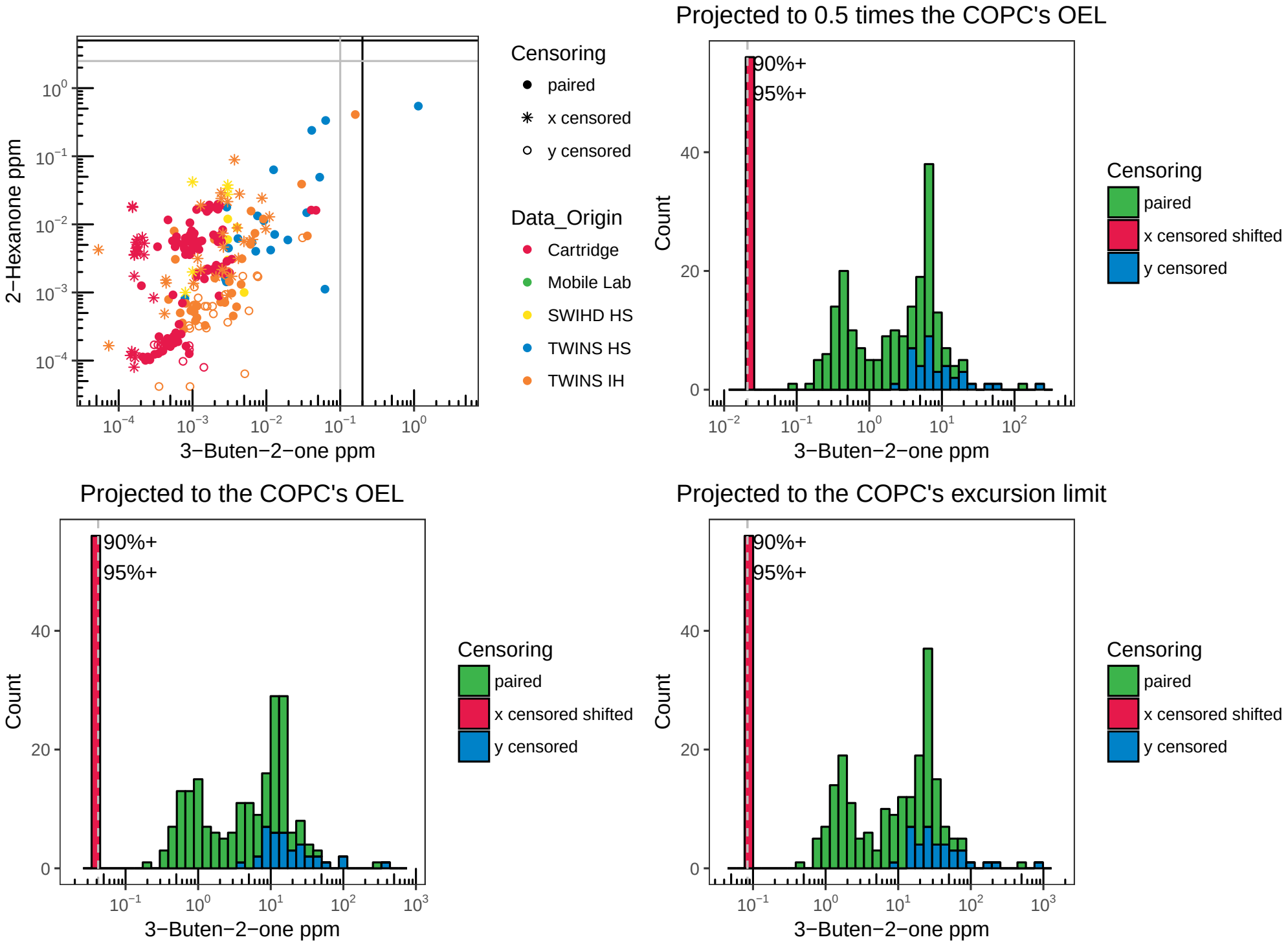


Figure C.655: 2-Hexanone vs 3-Buten-2-one

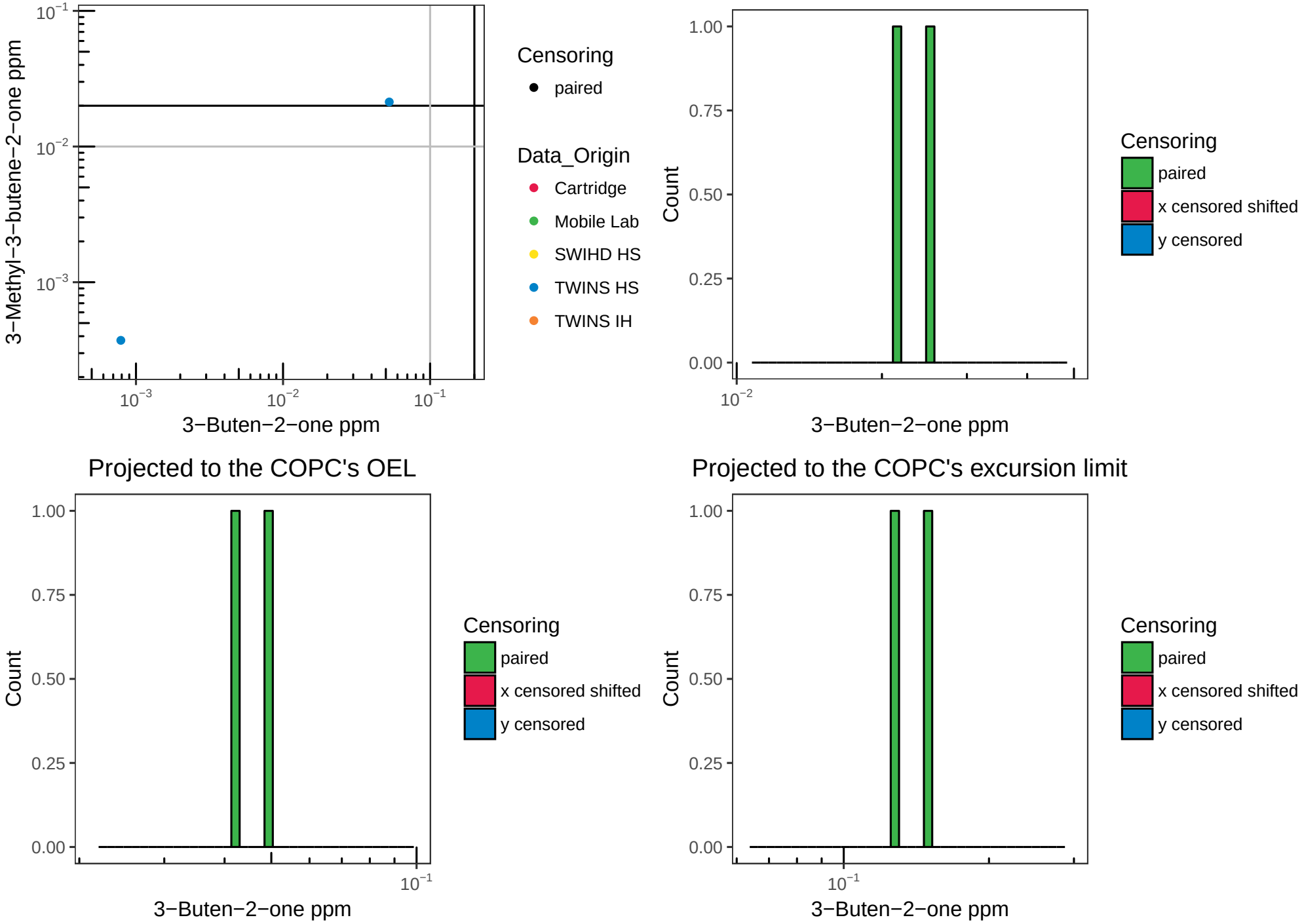


Figure C.656: 3-Methyl-3-butene-2-one vs 3-Buten-2-one

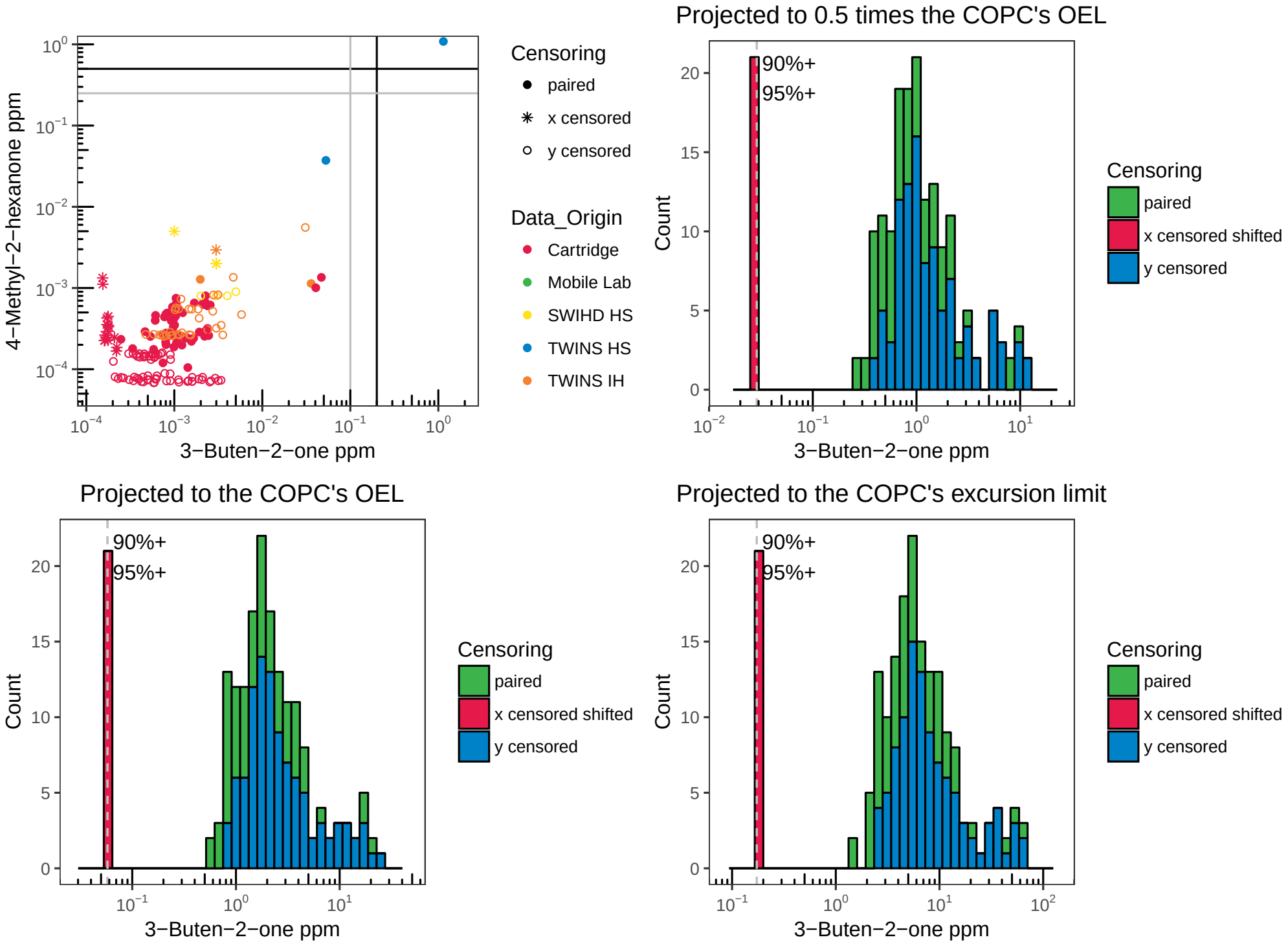


Figure C.657: 4-Methyl-2-hexanone vs 3-Buten-2-one

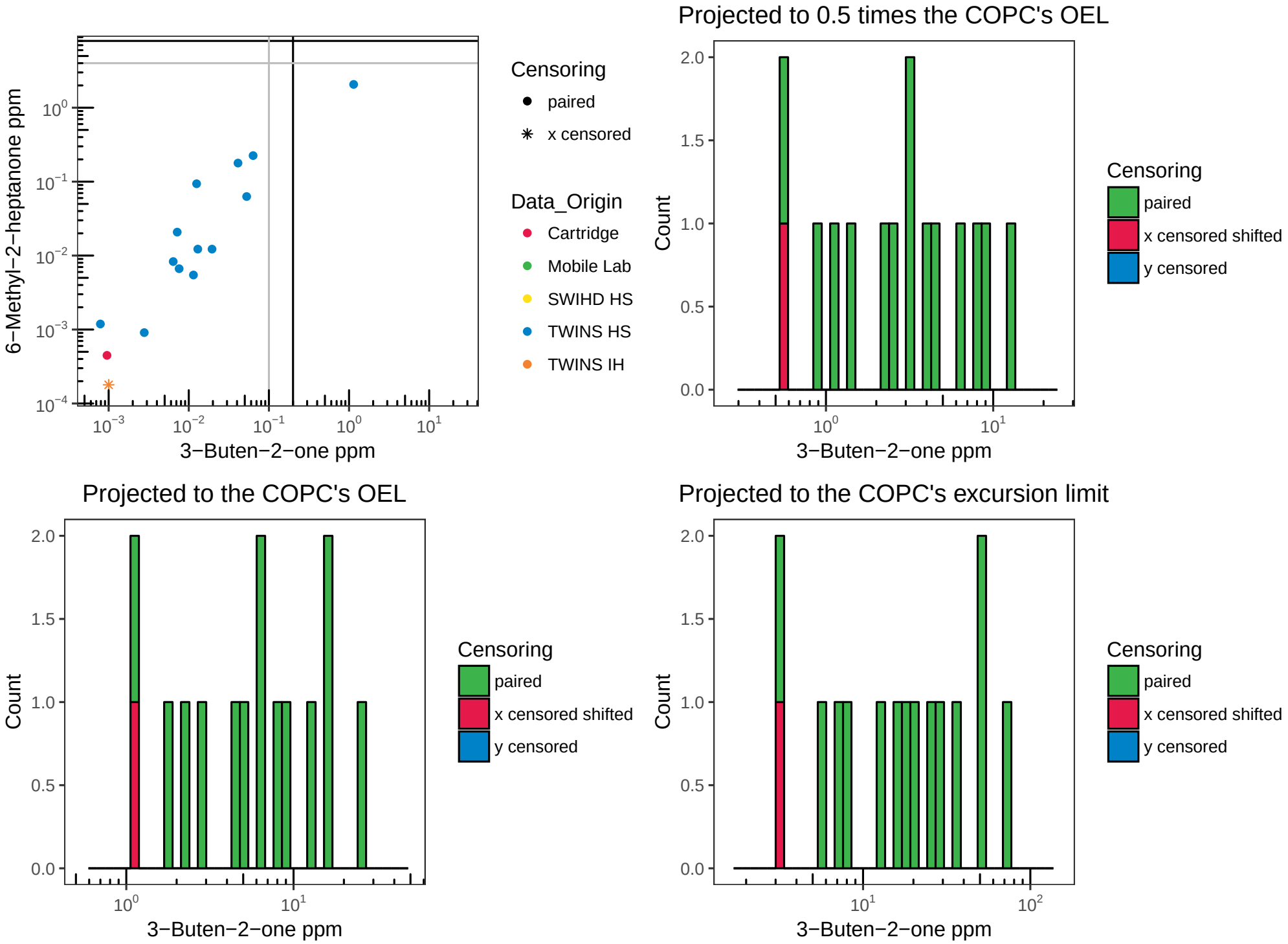


Figure C.658: 6-Methyl-2-heptanone vs 3-Buten-2-one

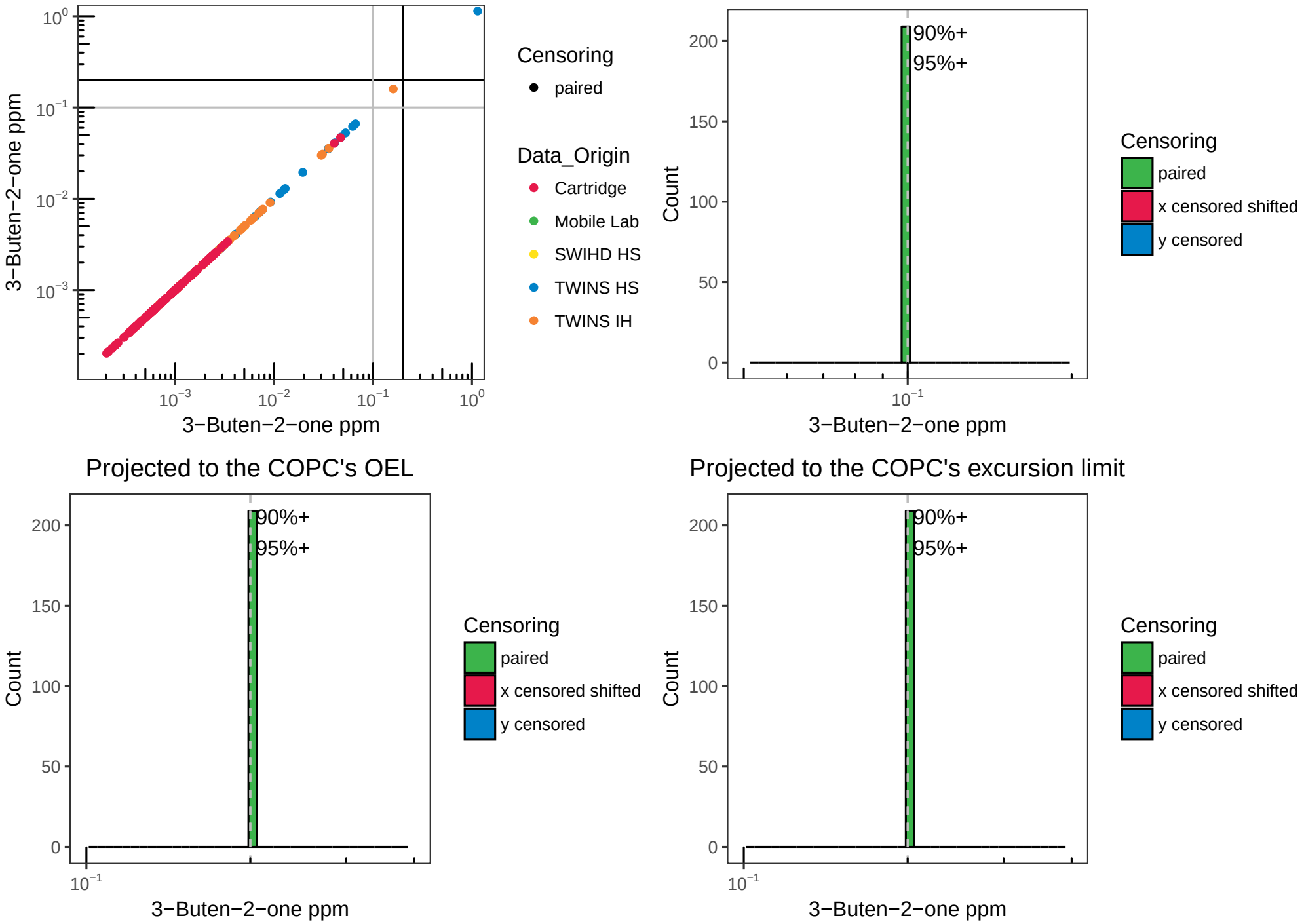


Figure C.659: 3-Buten-2-one vs 3-Buten-2-one

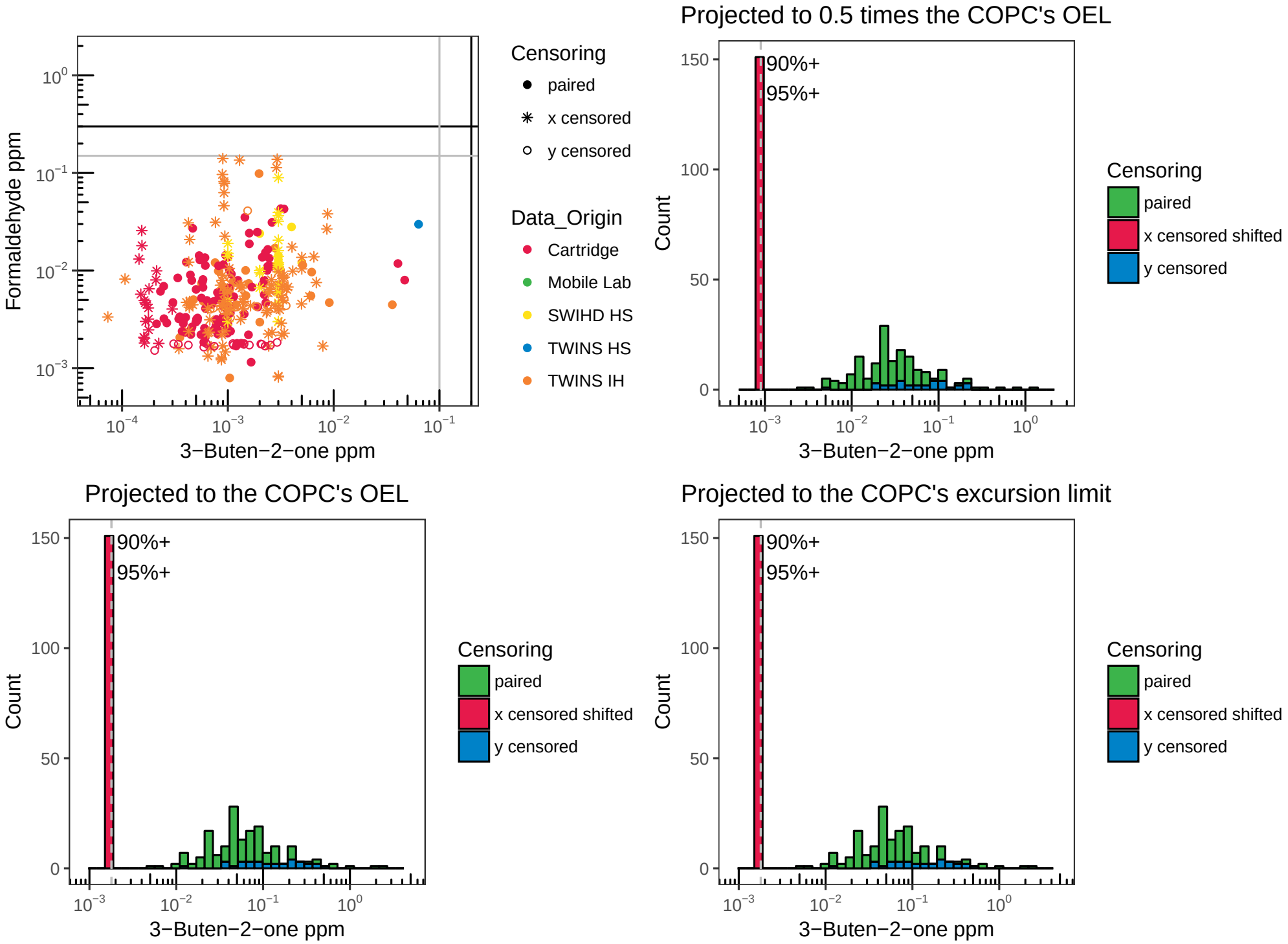


Figure C.660: Formaldehyde vs 3-Buten-2-one

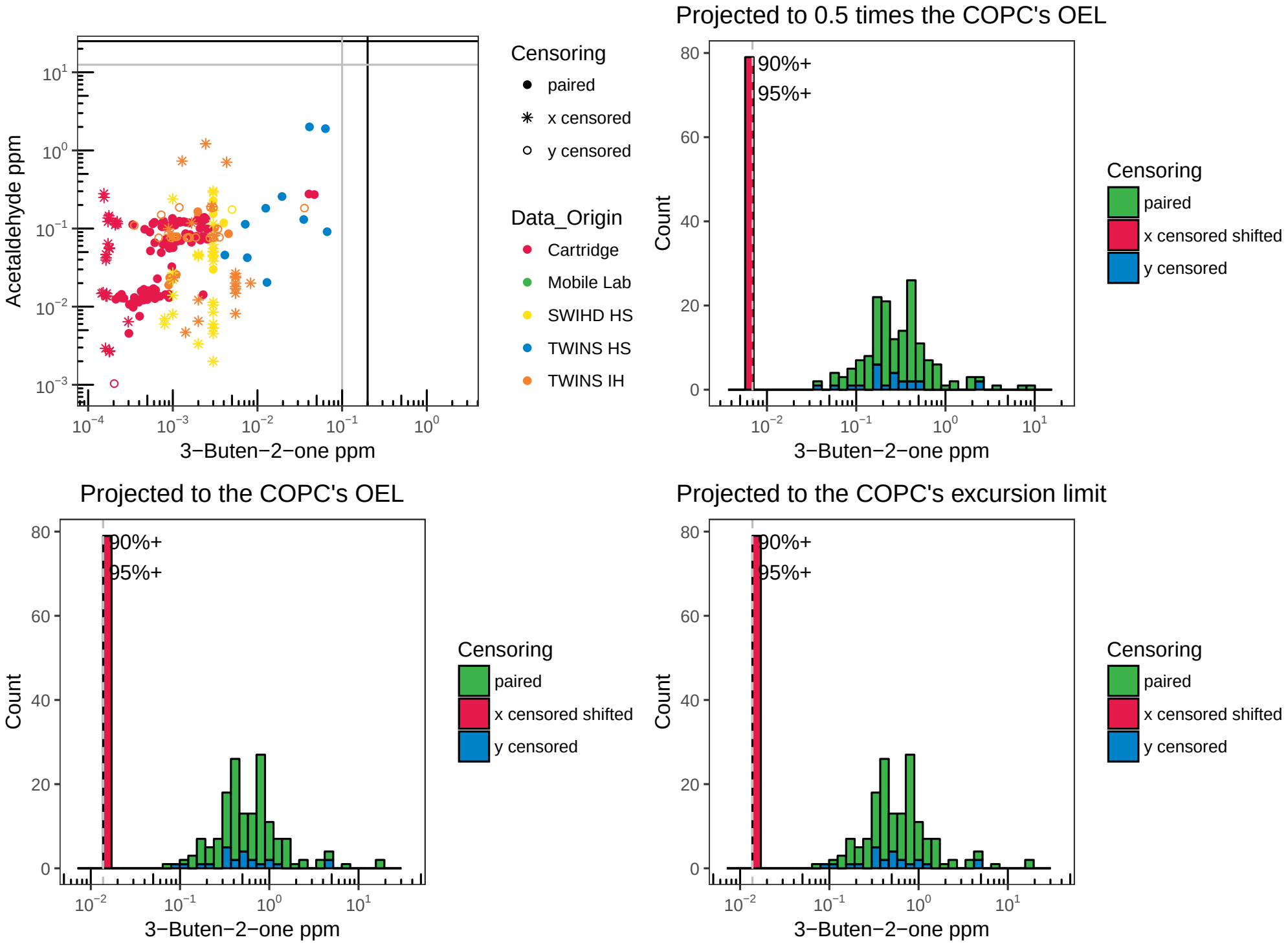


Figure C.661: Acetaldehyde vs 3-Buten-2-one

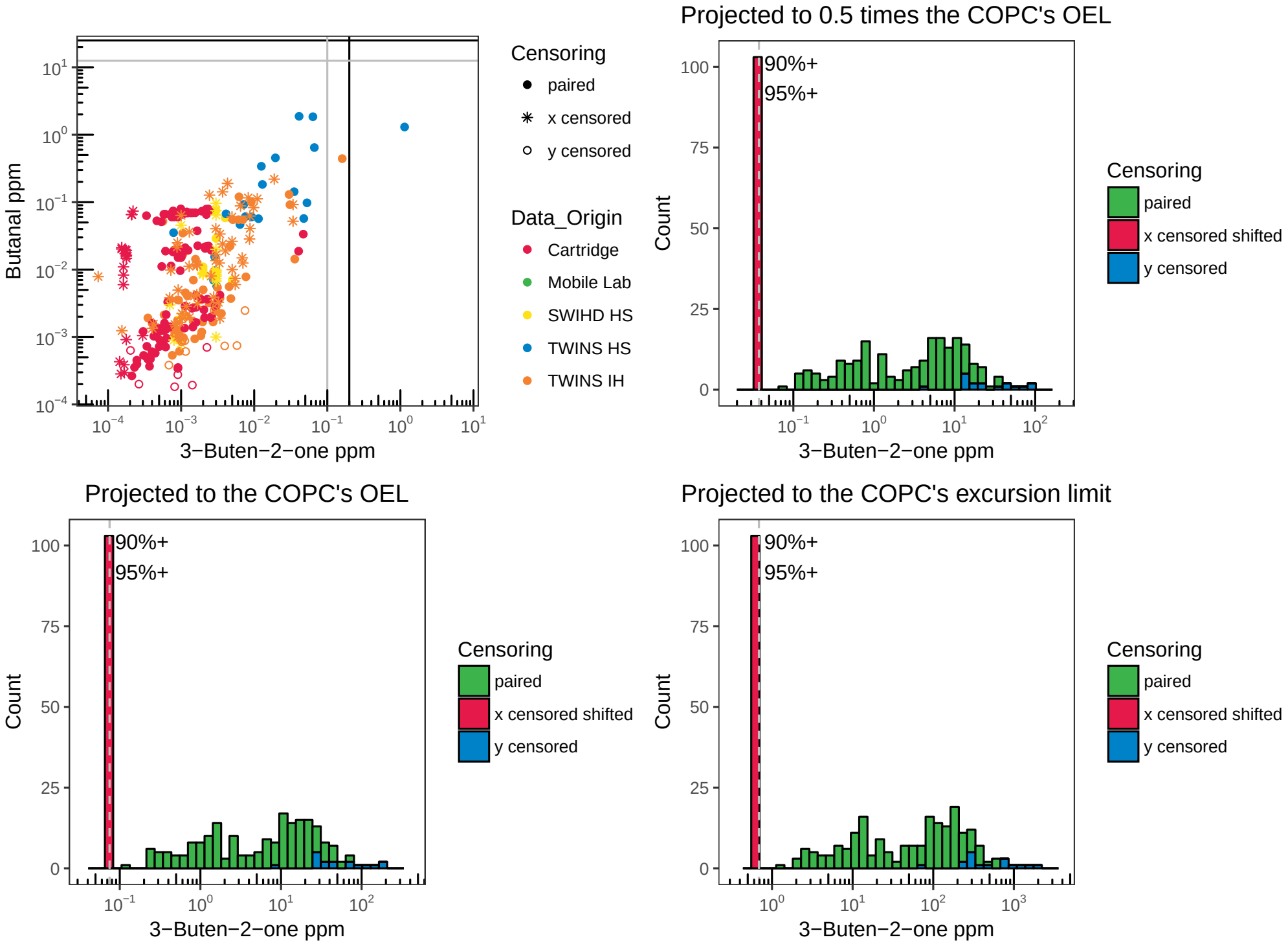


Figure C.662: Butanal vs 3-Buten-2-one

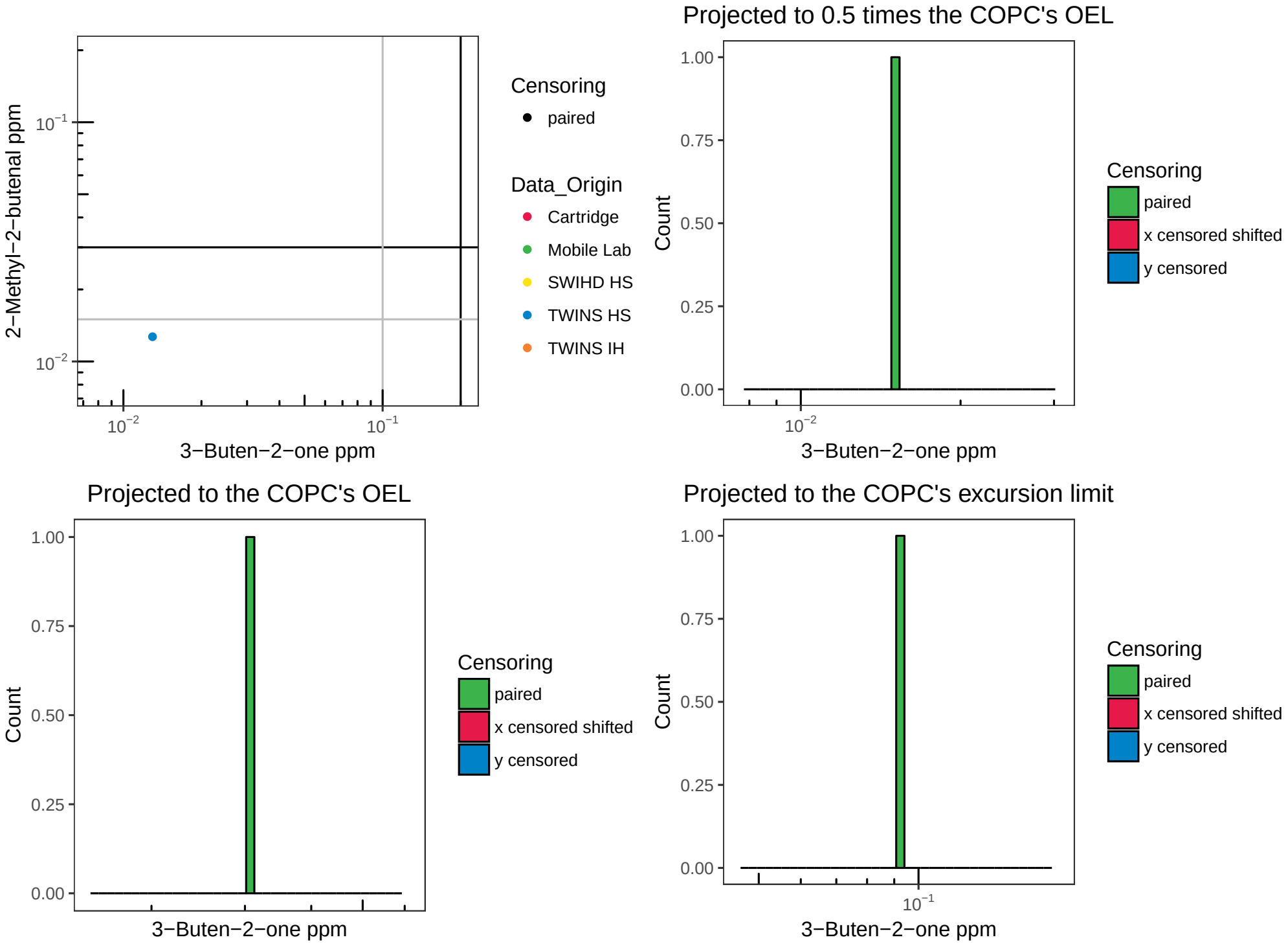


Figure C.663: 2-Methyl-2-butenal vs 3-Buten-2-one

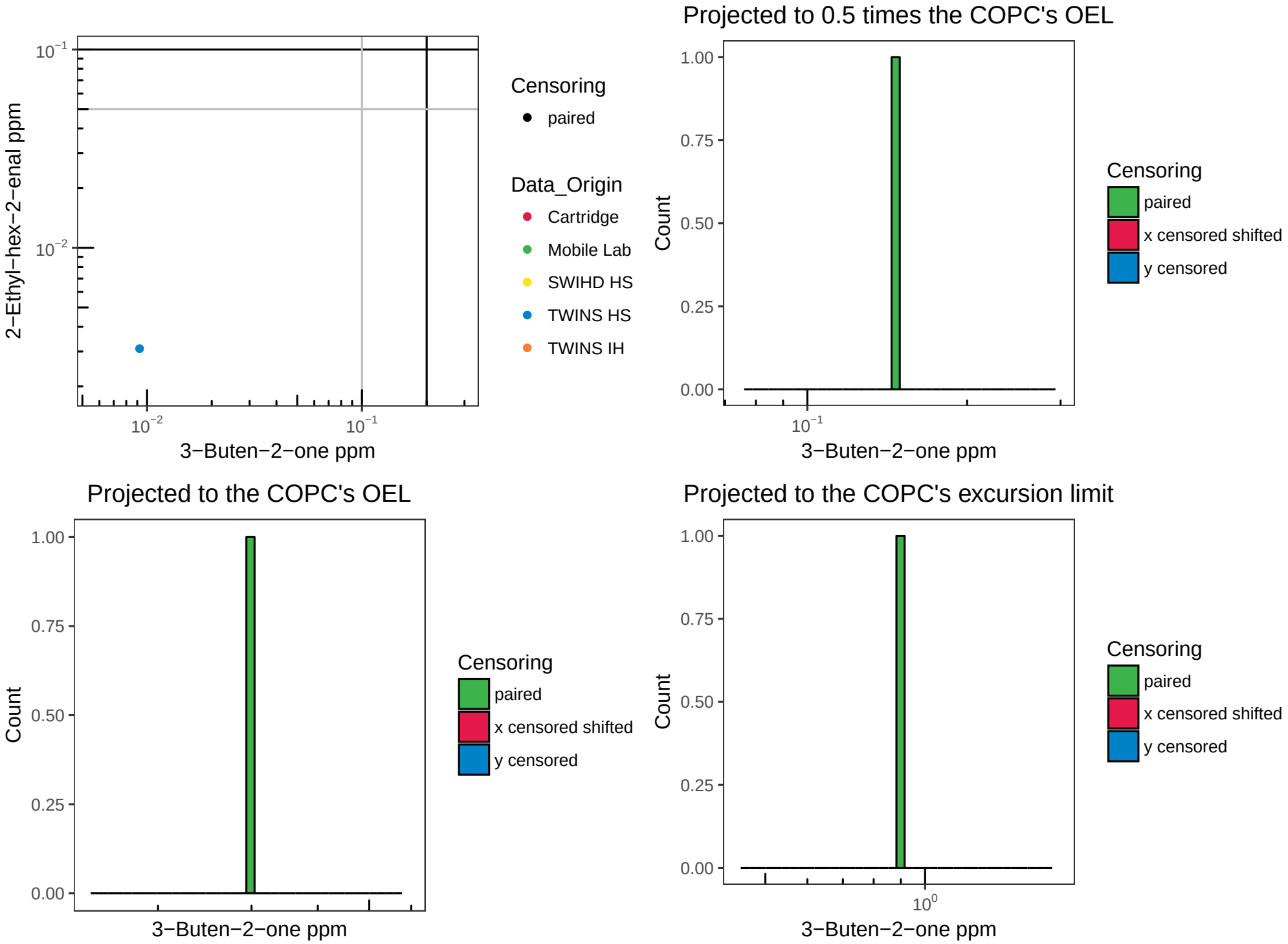


Figure C.664: 2-Ethyl-hex-2-enal vs 3-Buten-2-one

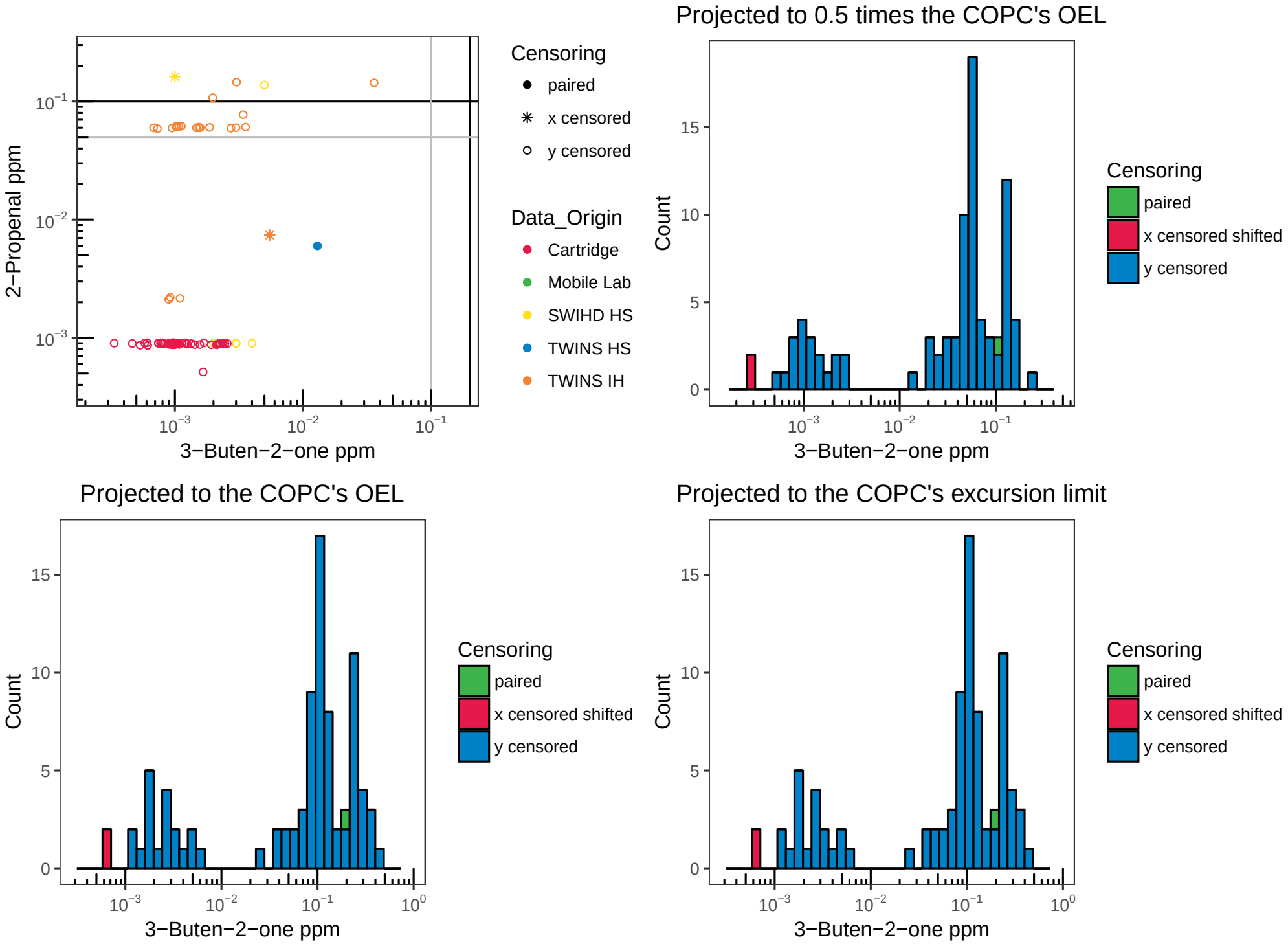


Figure C.665: 2-Propenal vs 3-Buten-2-one

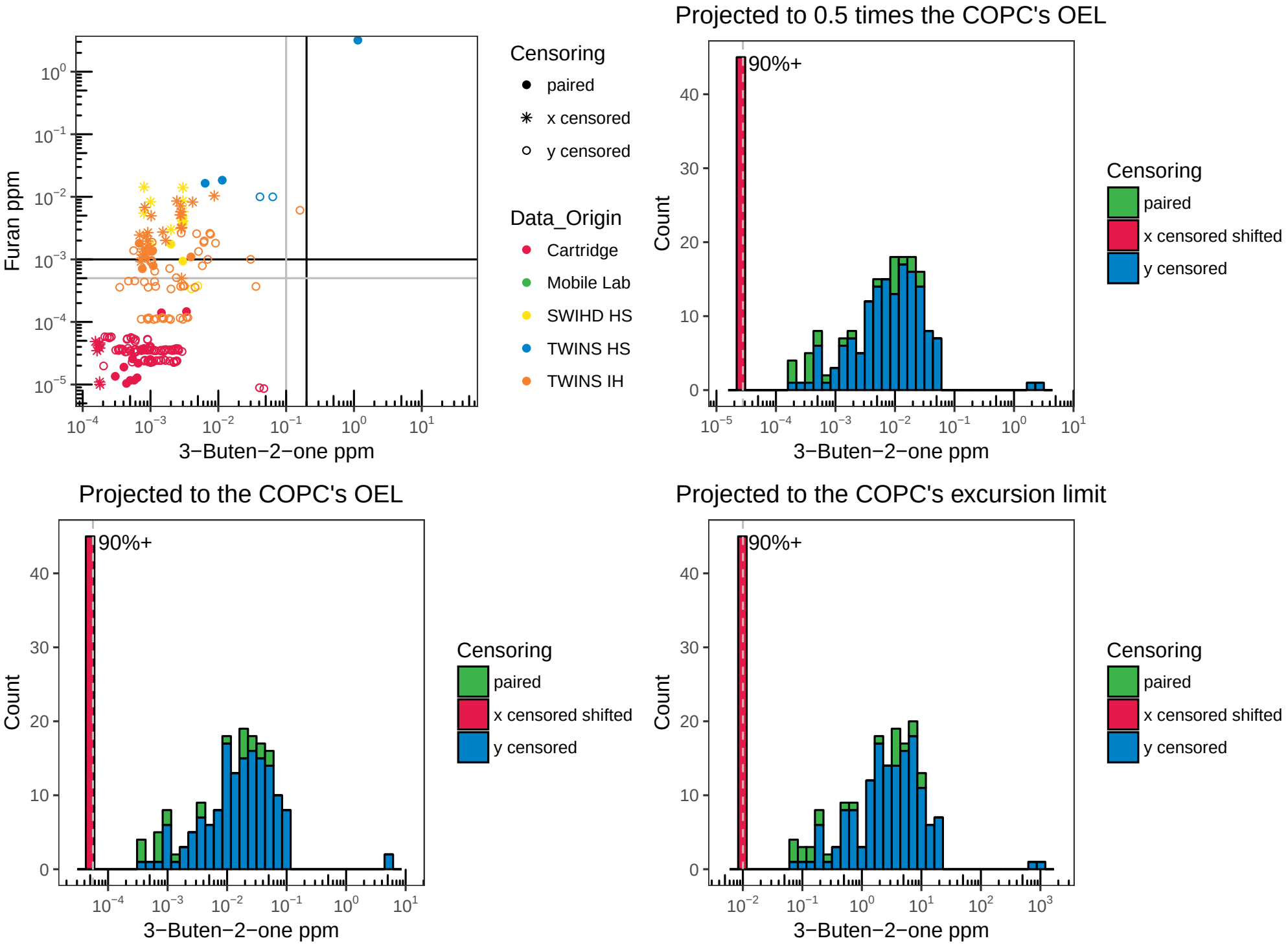


Figure C.666: Furan vs 3-Buten-2-one

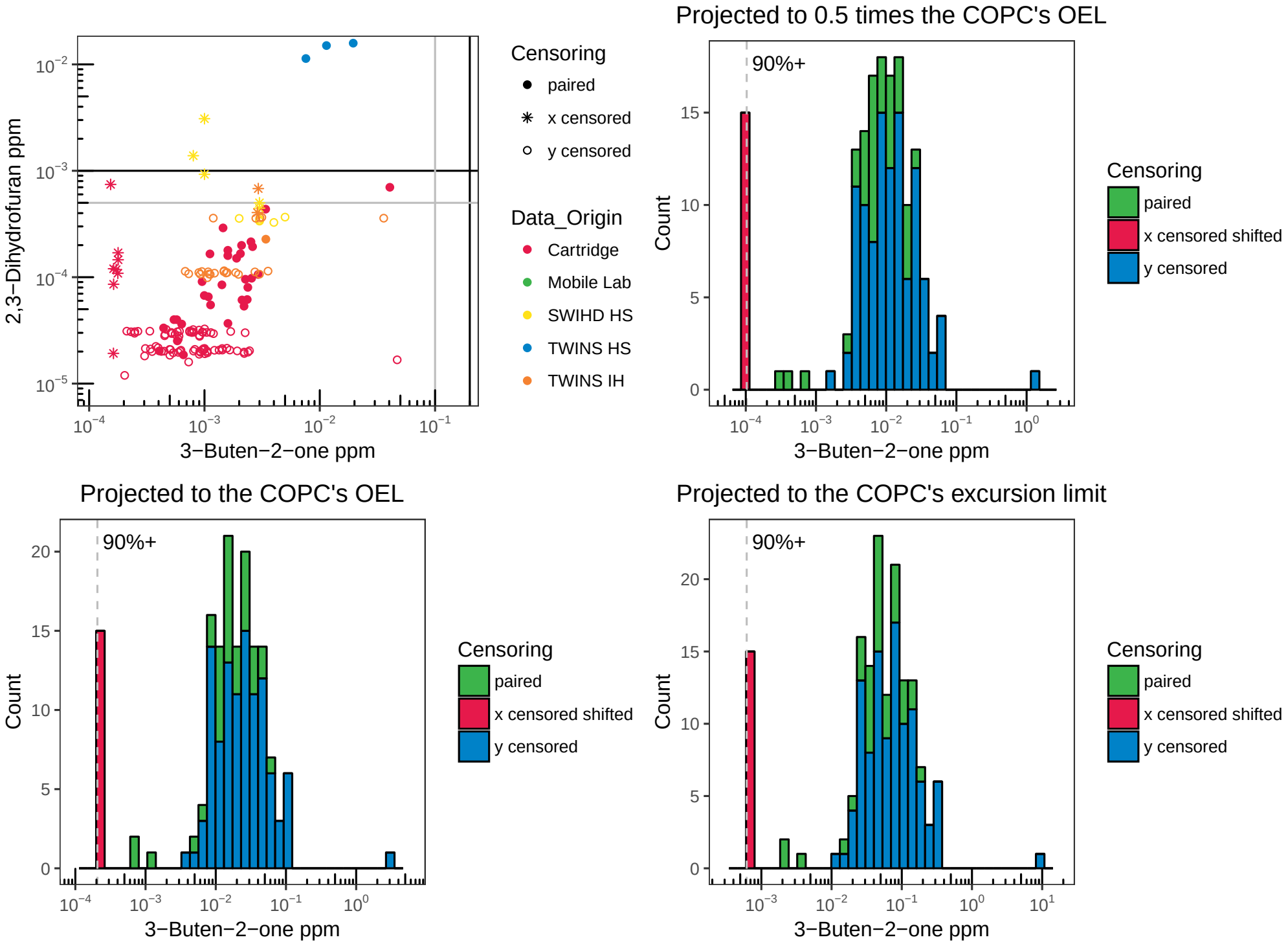


Figure C.667: 2,3-Dihydrofuran vs 3-Buten-2-one

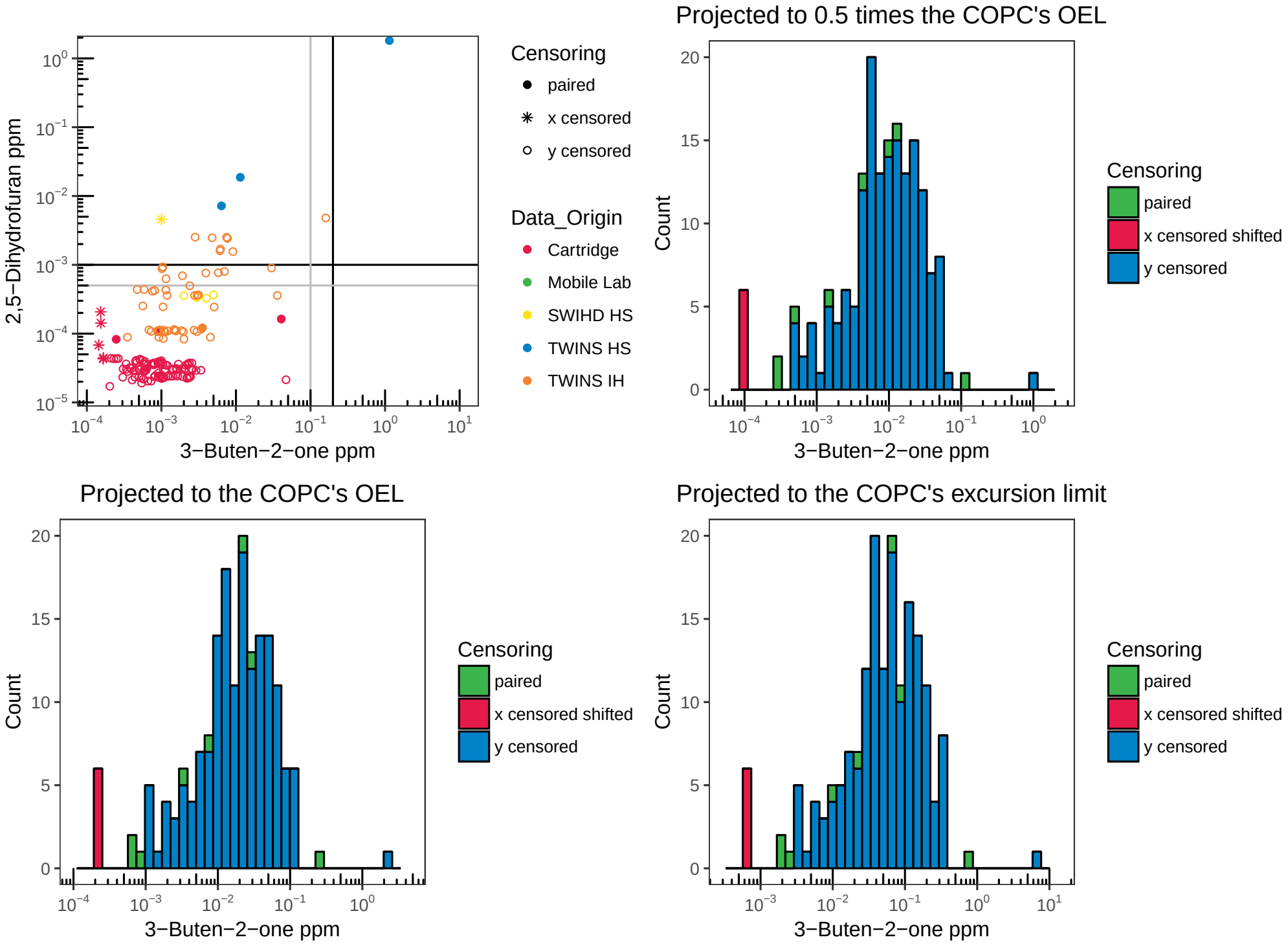


Figure C.668: 2,5-Dihydrofuran vs 3-Buten-2-one

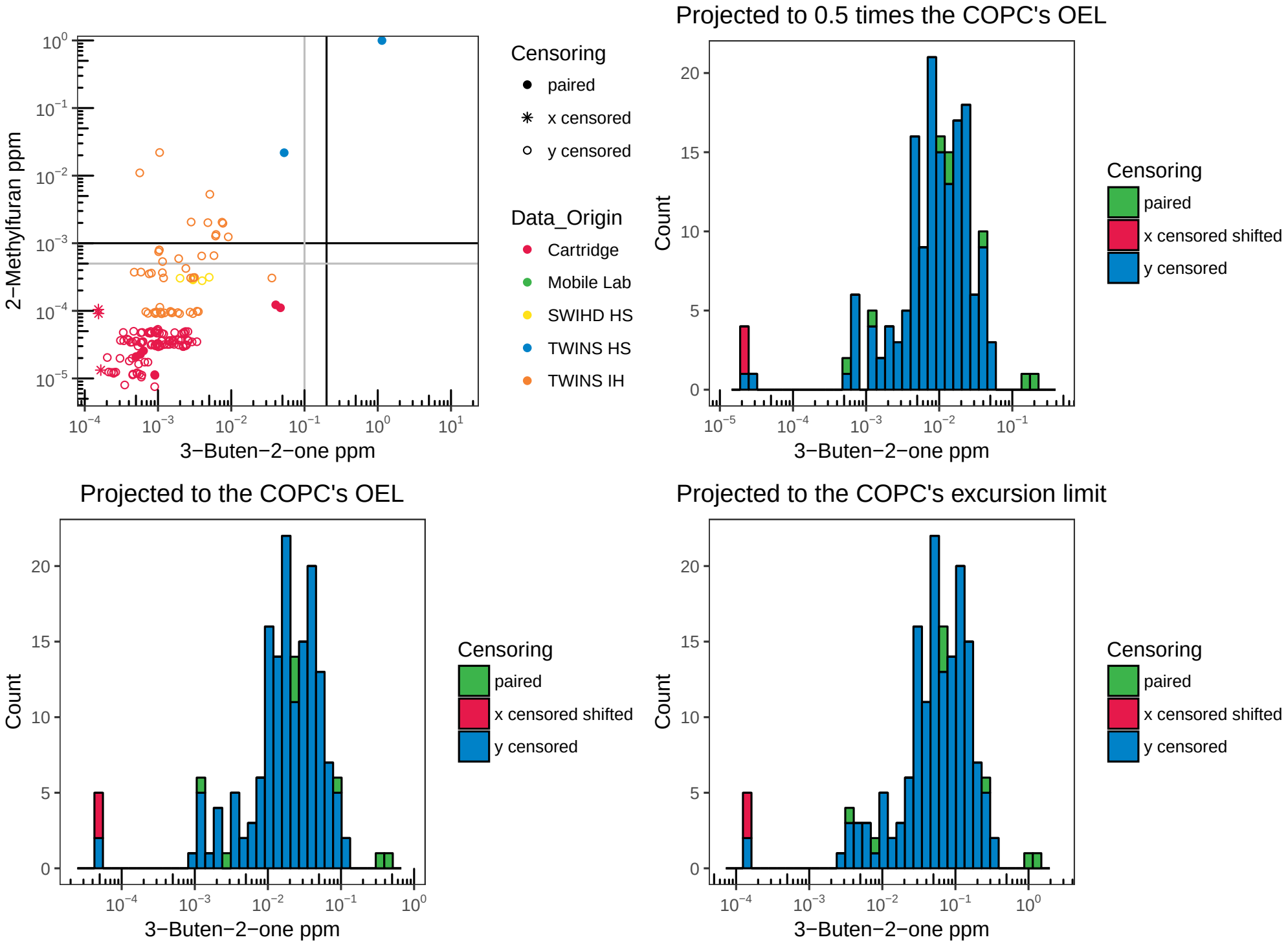


Figure C.669: 2-Methylfuran vs 3-Buten-2-one

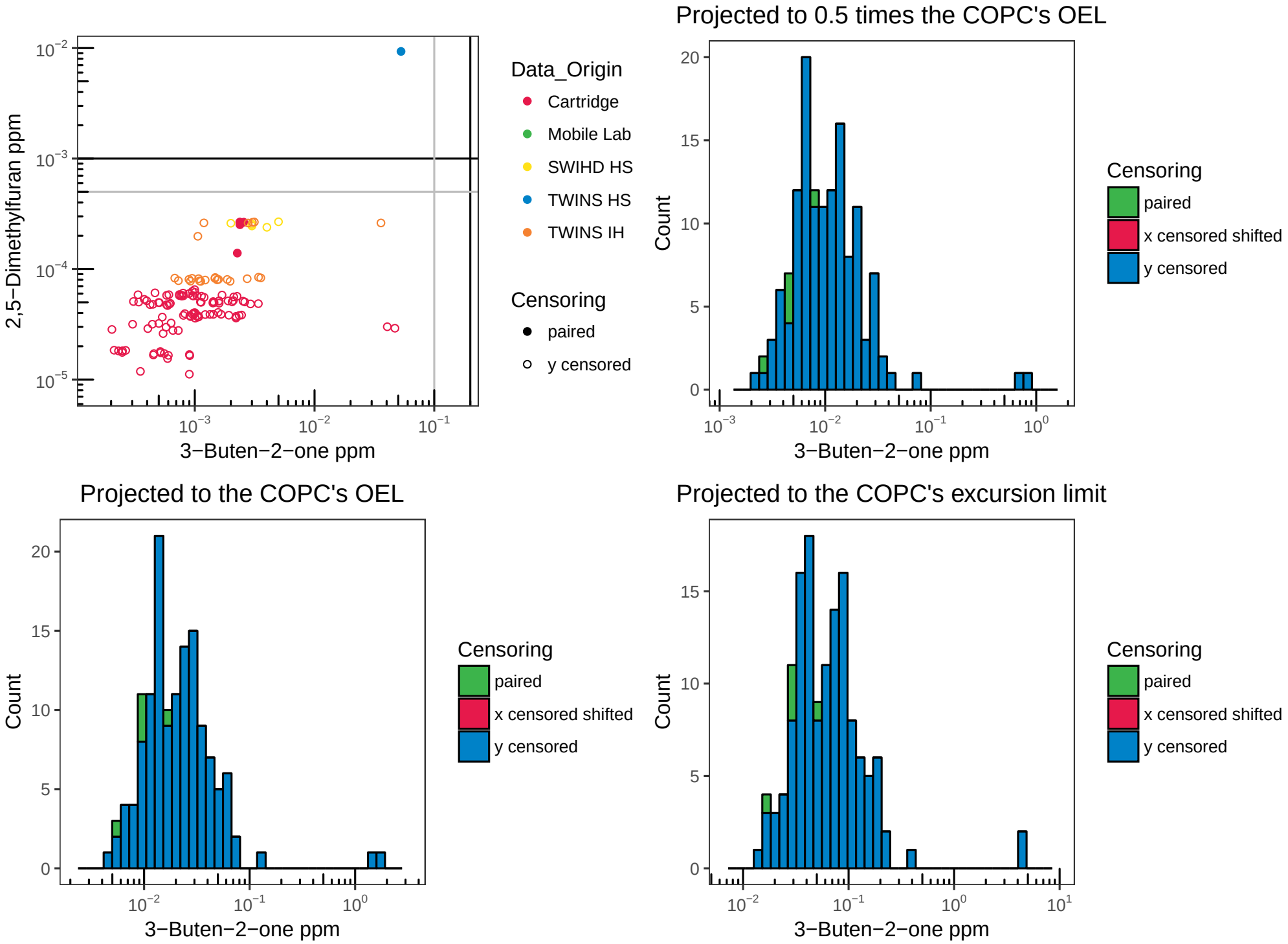


Figure C.670: 2,5-Dimethylfuran vs 3-Buten-2-one

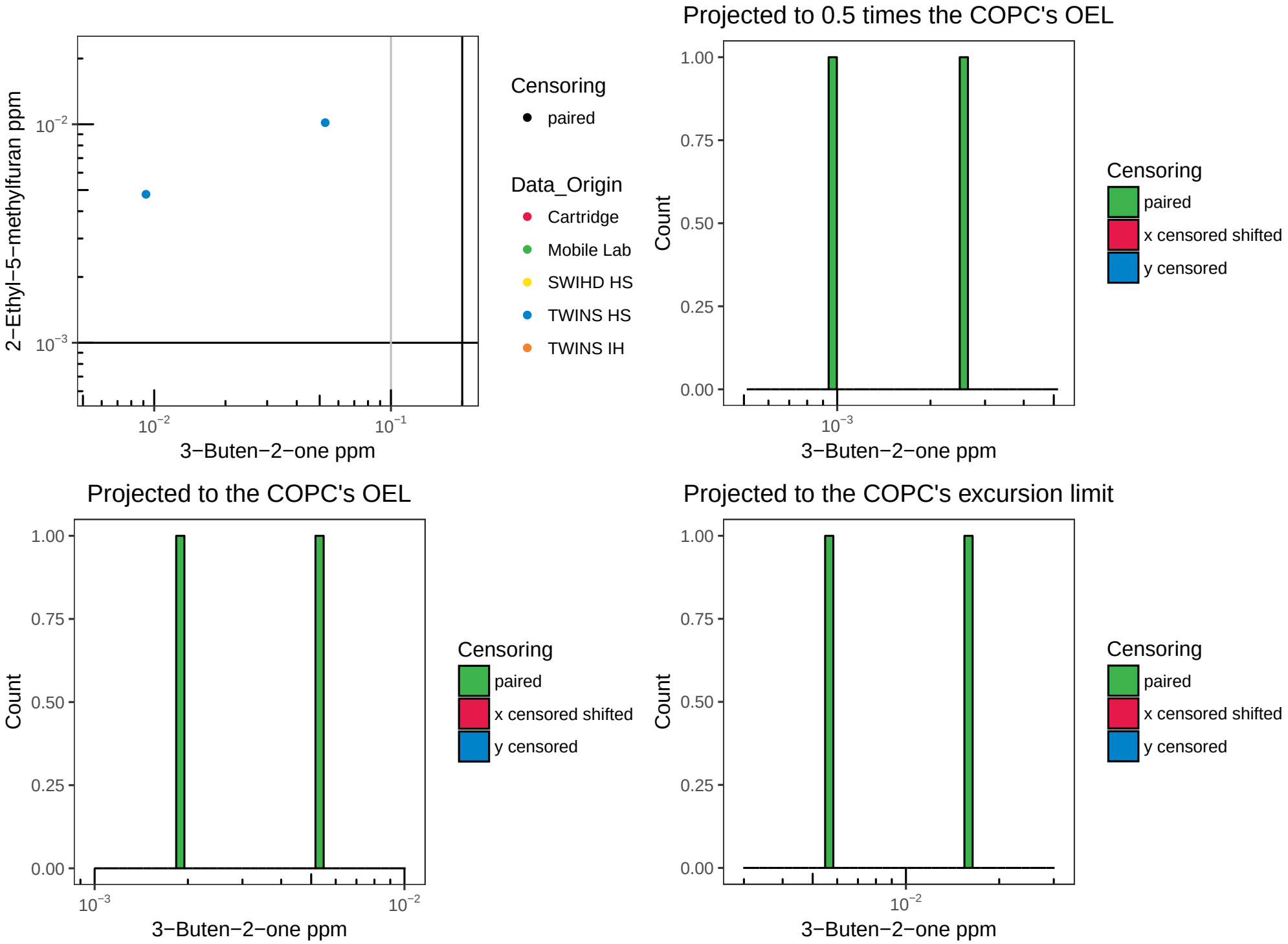


Figure C.671: 2-Ethyl-5-methylfuran vs 3-Buten-2-one

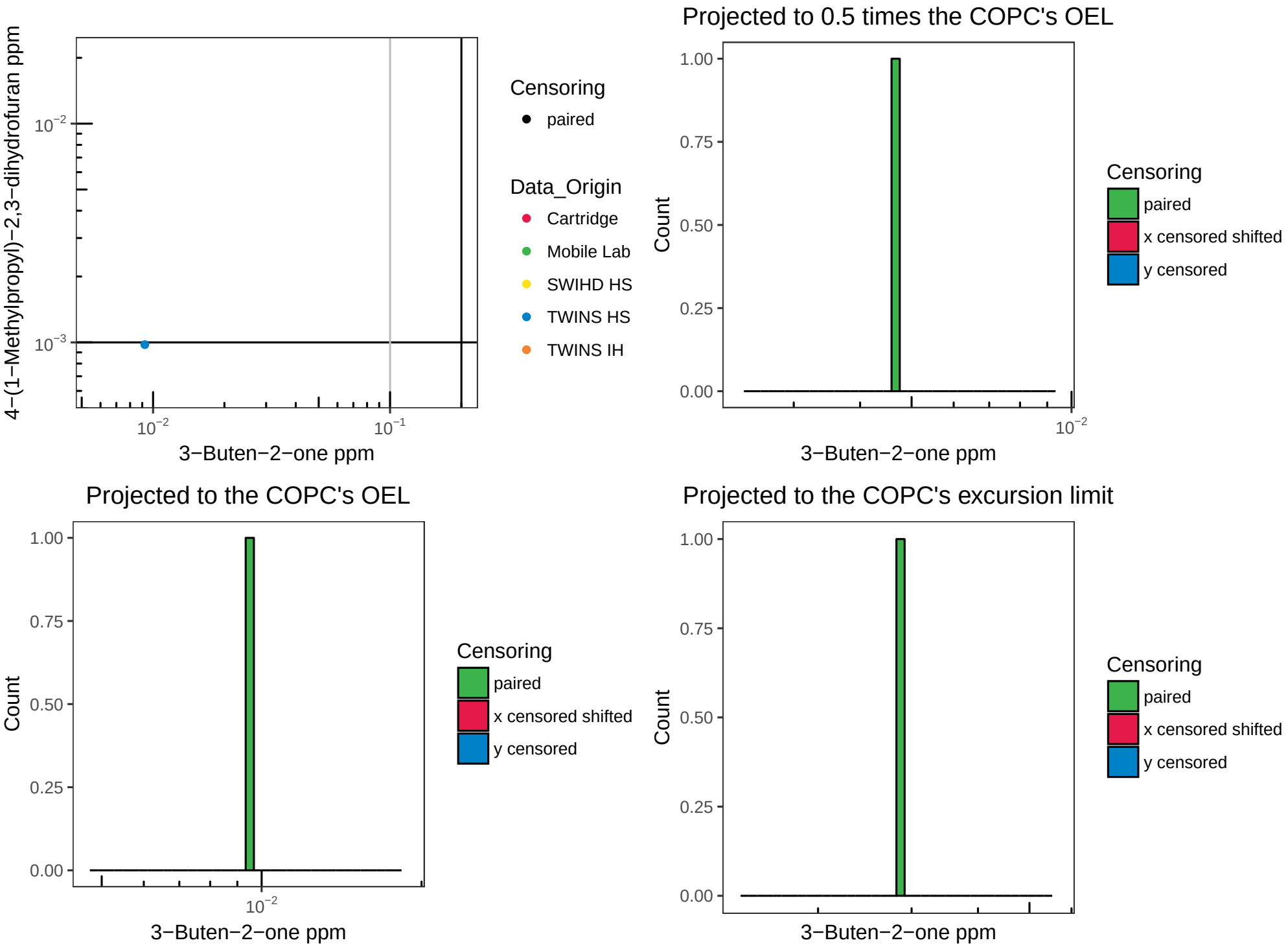


Figure C.672: 4-(1-Methylpropyl)-2,3-dihydrofuran vs 3-Buten-2-one

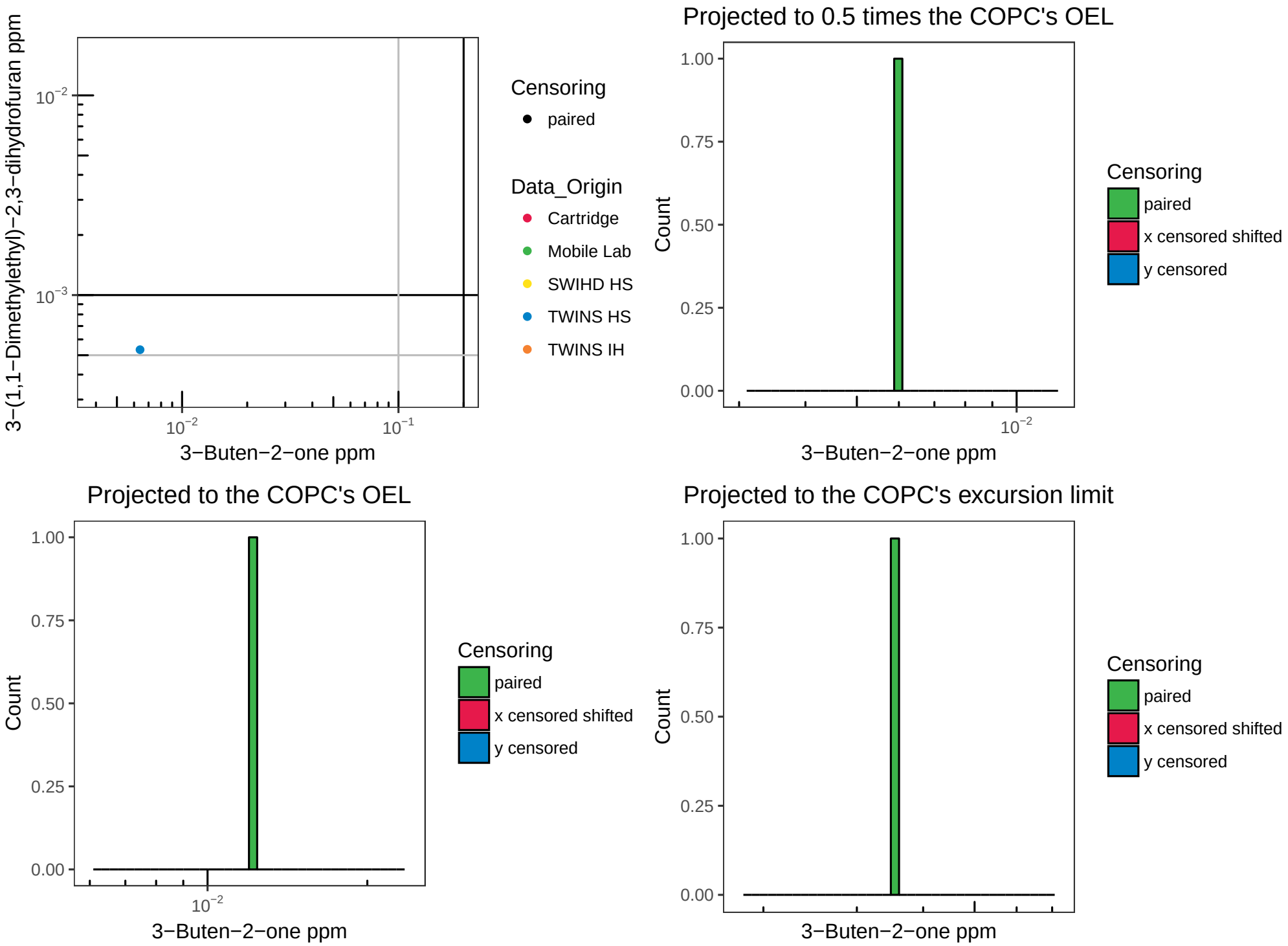


Figure C.673: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs 3-Buten-2-one

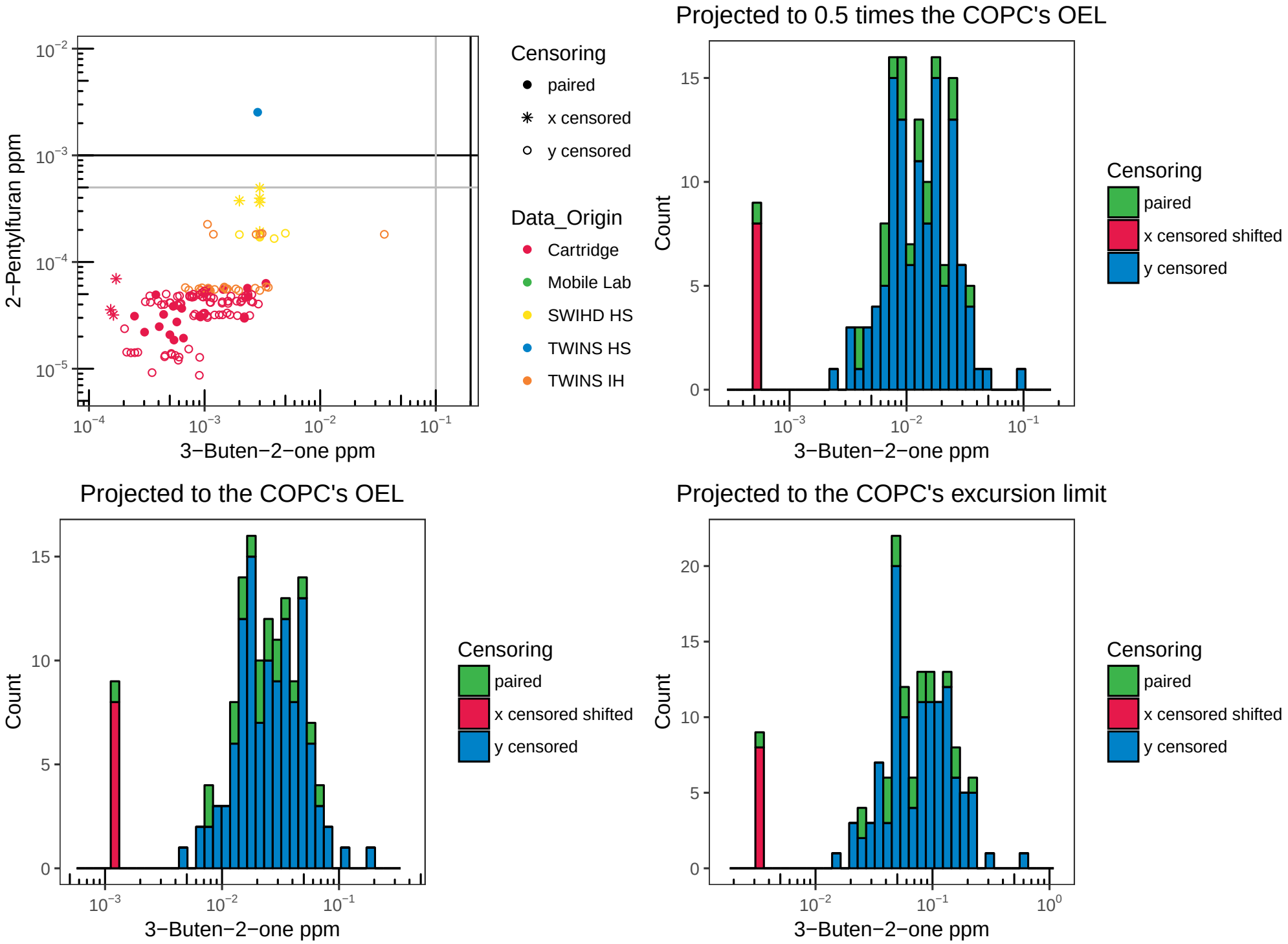


Figure C.674: 2-Pentylfuran vs 3-Buten-2-one

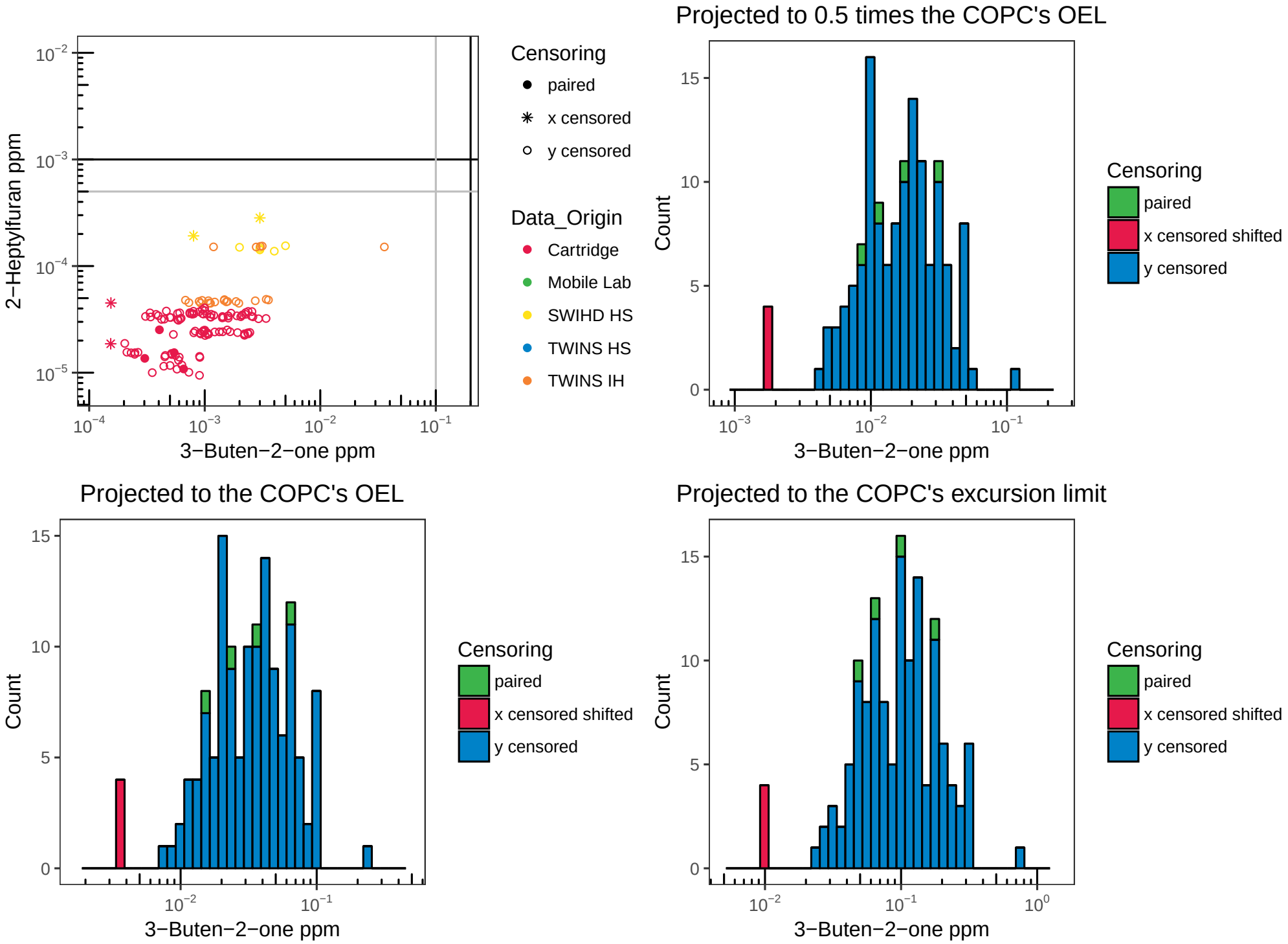


Figure C.675: 2-Heptylfuran vs 3-Buten-2-one

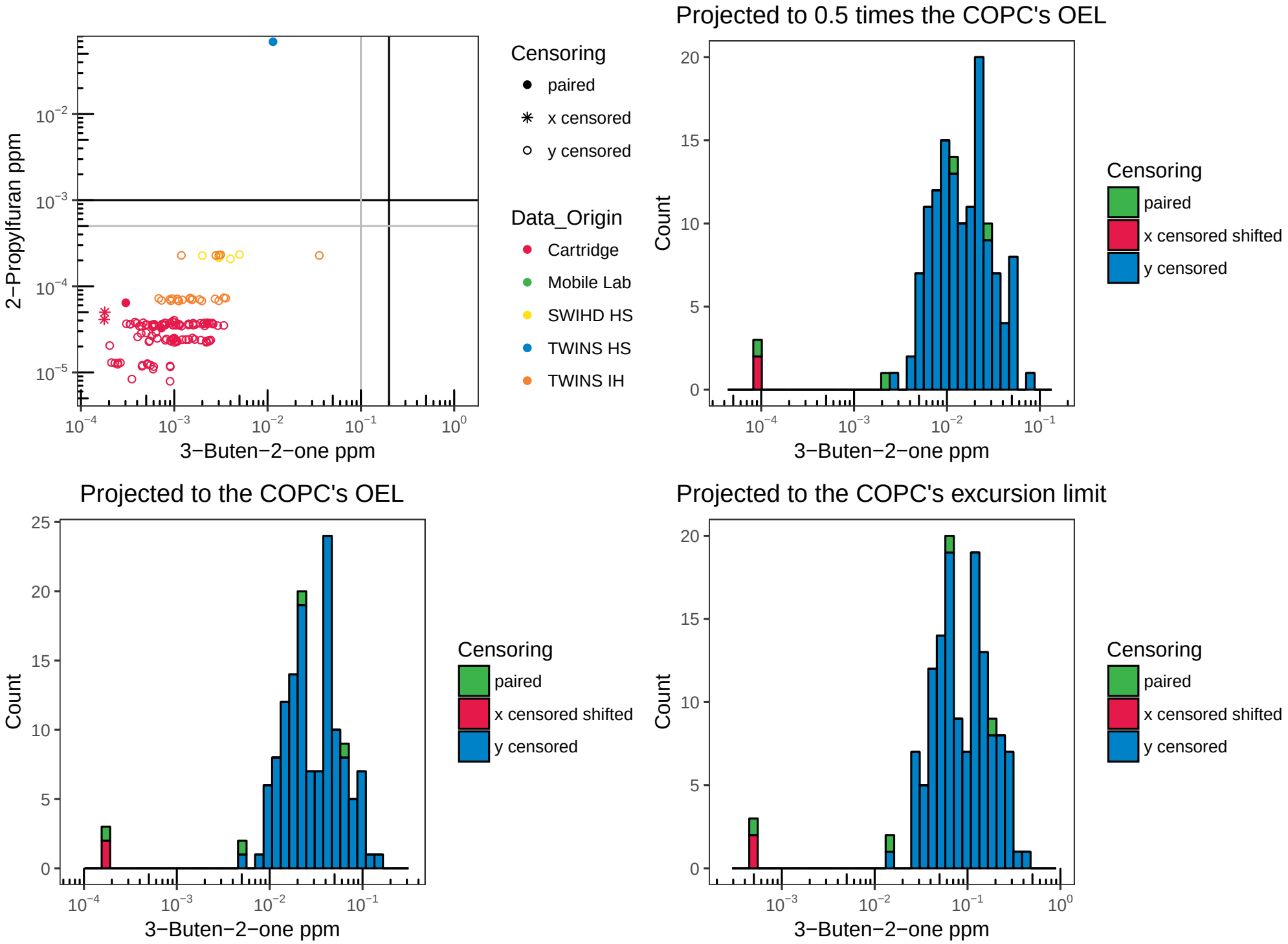


Figure C.676: 2-Propylfuran vs 3-Buten-2-one

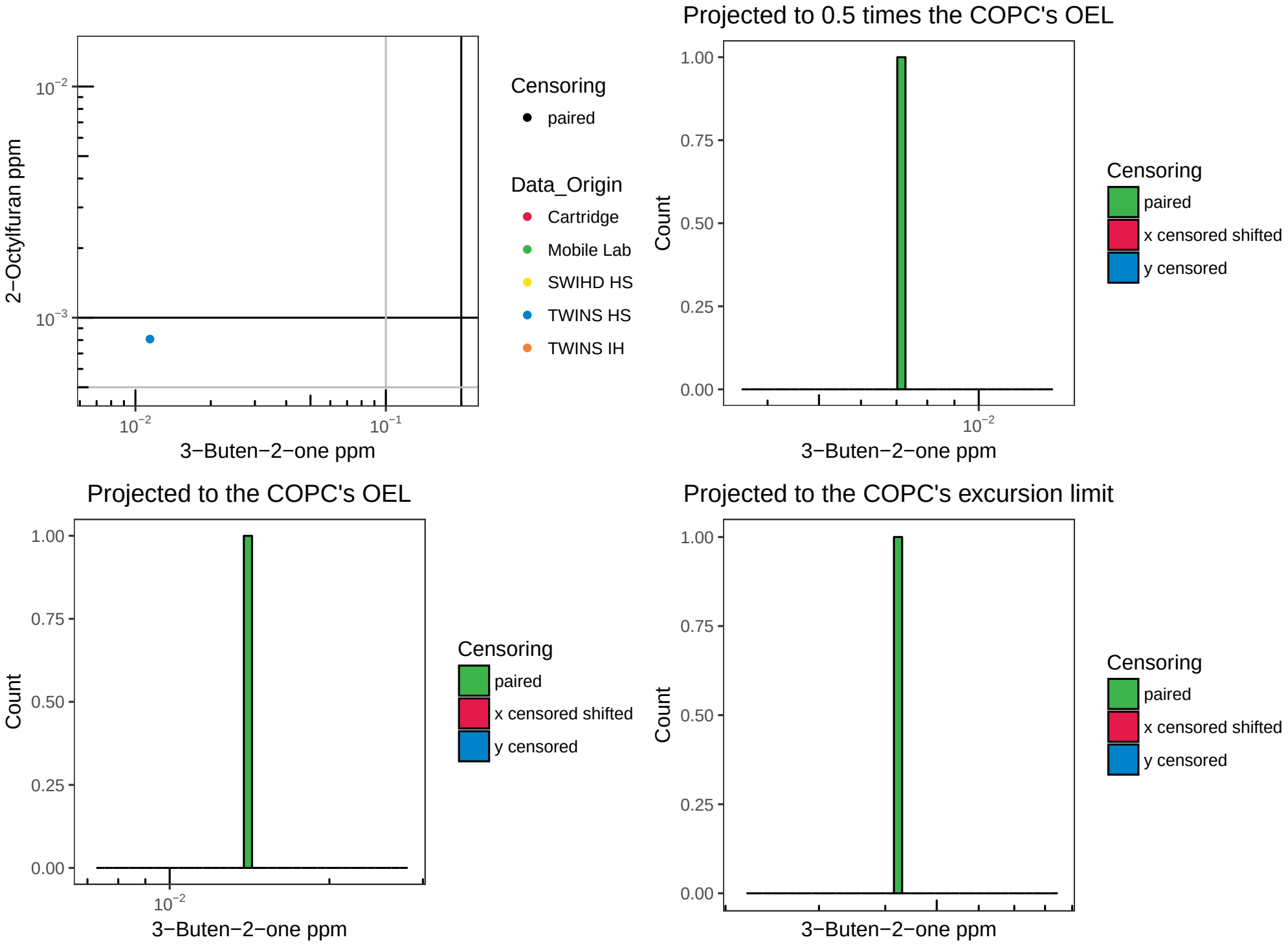


Figure C.677: 2-Octylfuran vs 3-Buten-2-one

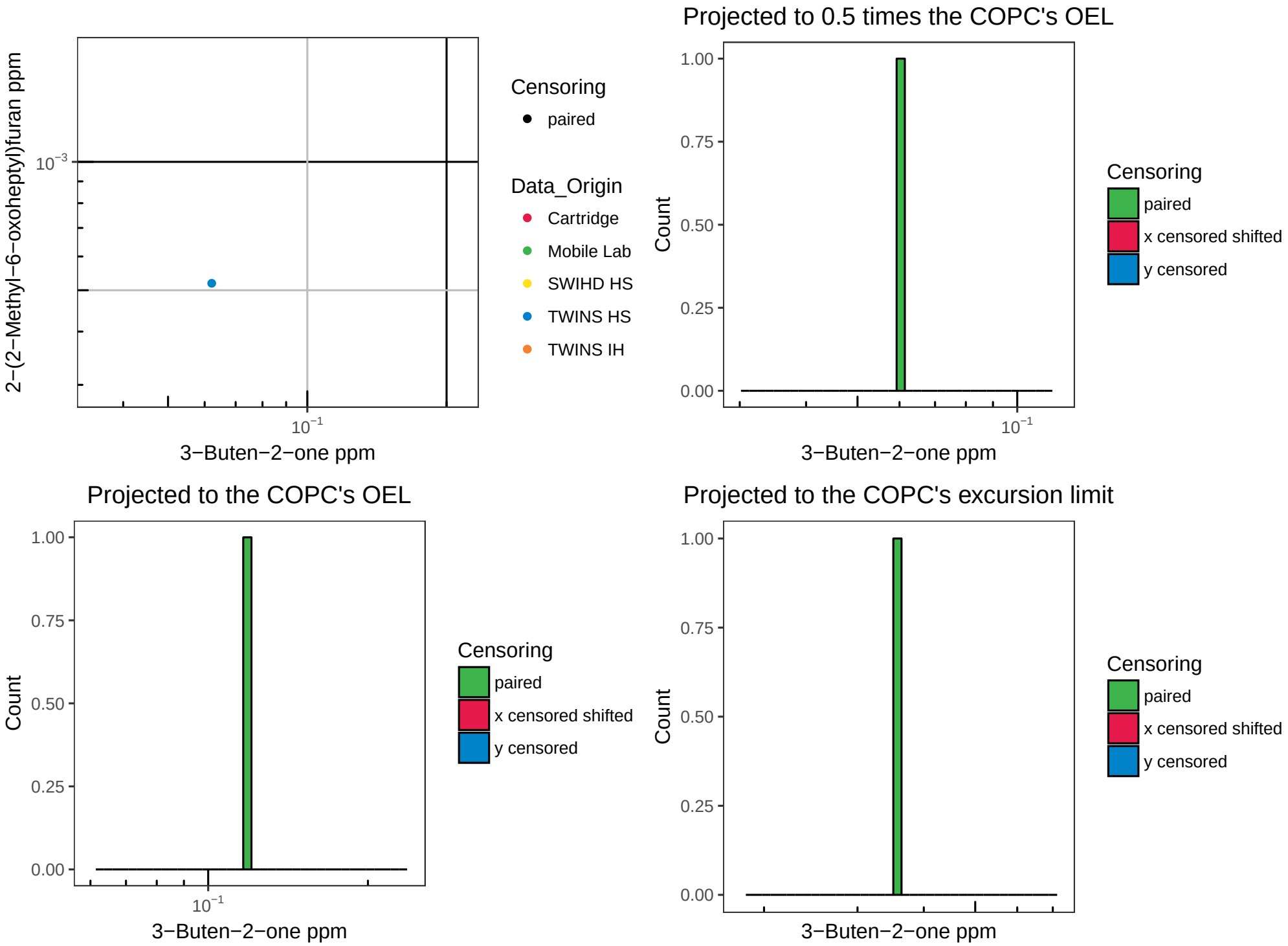


Figure C.678: 2-(2-Methyl-6-oxoheptyl)furan vs 3-Buten-2-one

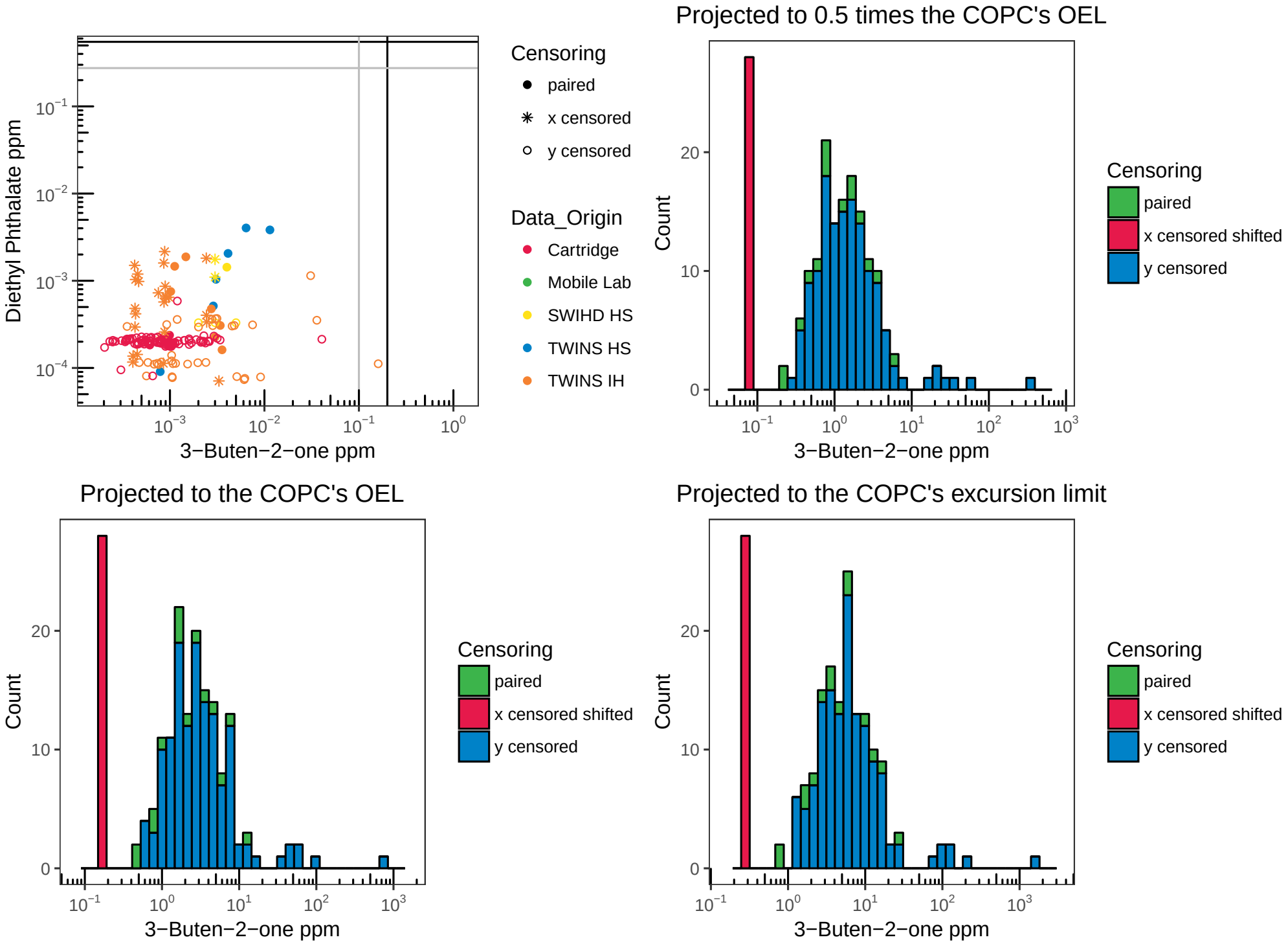


Figure C.679: Diethyl Phthalate vs 3-Buten-2-one

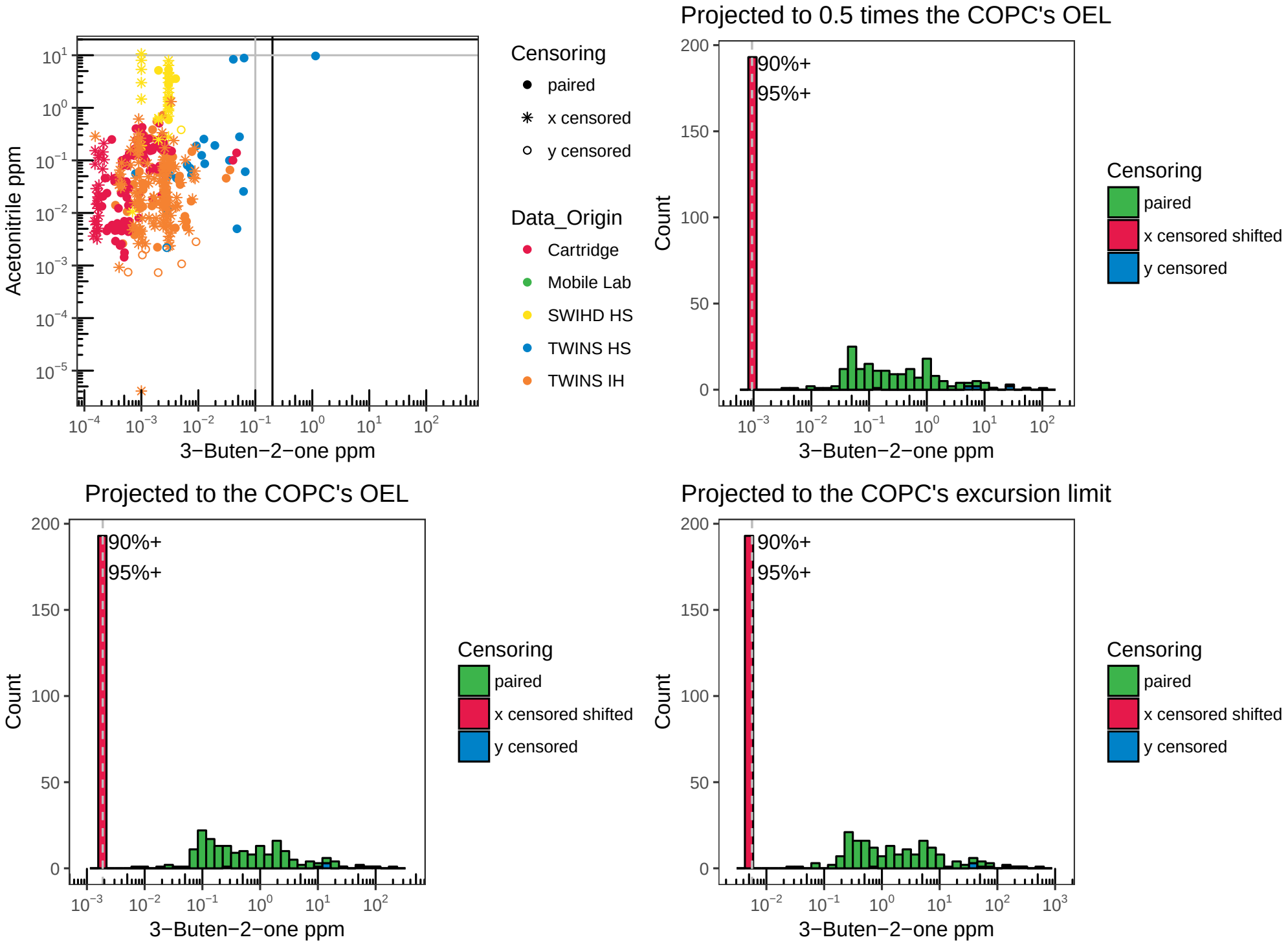


Figure C.680: Acetonitrile vs 3-Buten-2-one

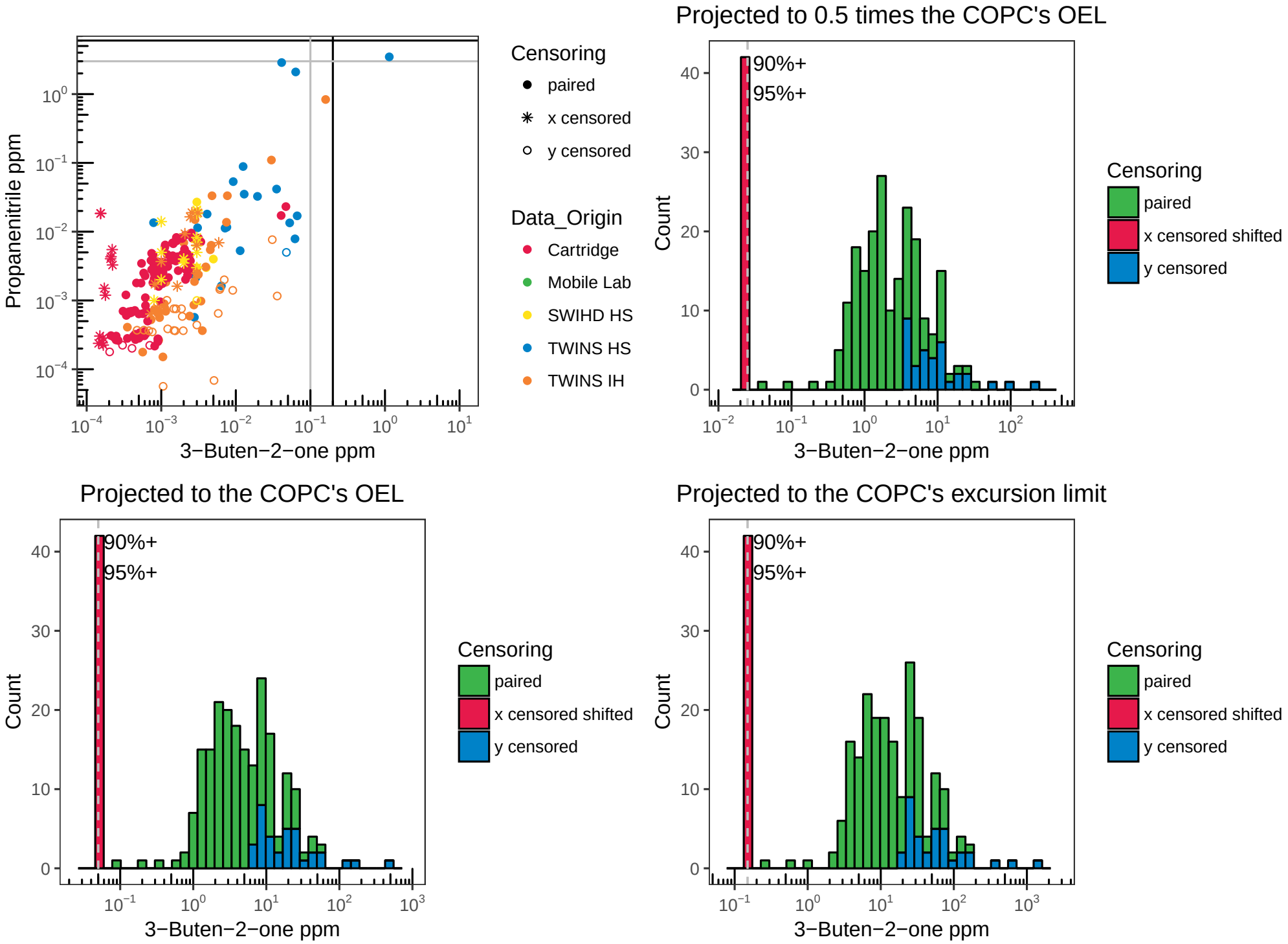


Figure C.681: Propanenitrile vs 3-Buten-2-one

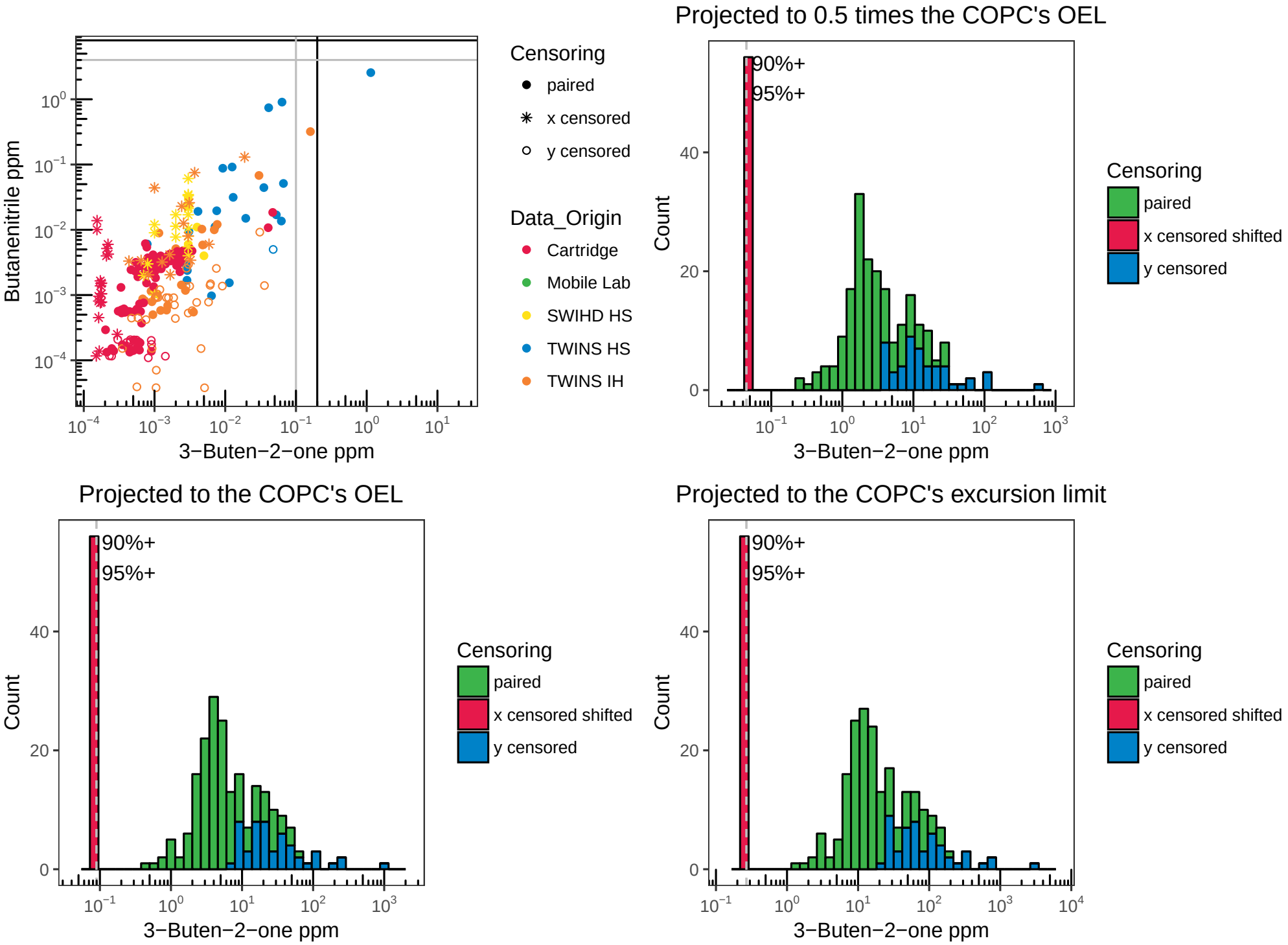


Figure C.682: Butanenitrile vs 3-Buten-2-one

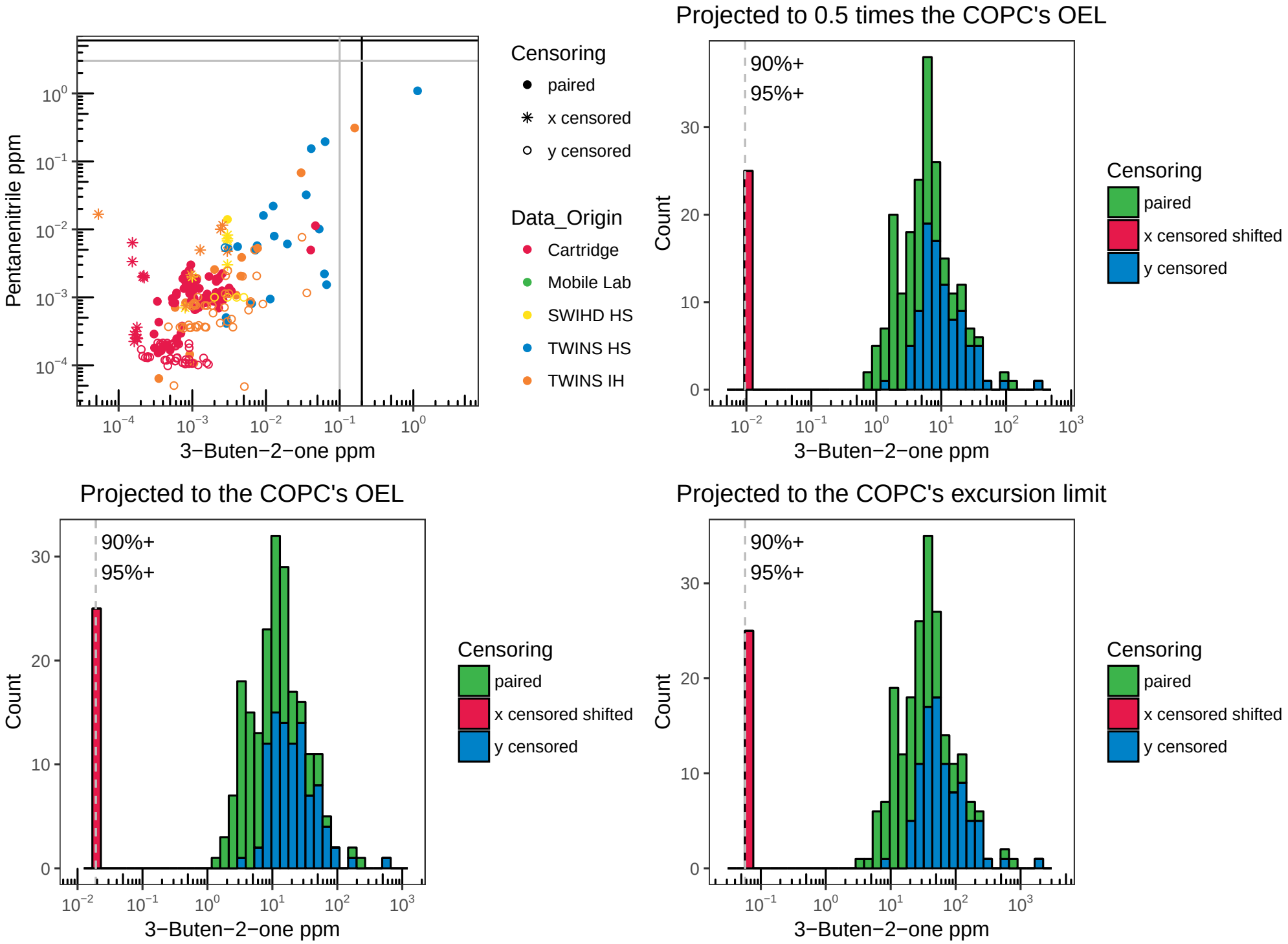


Figure C.683: Pentanenitrile vs 3-Buten-2-one

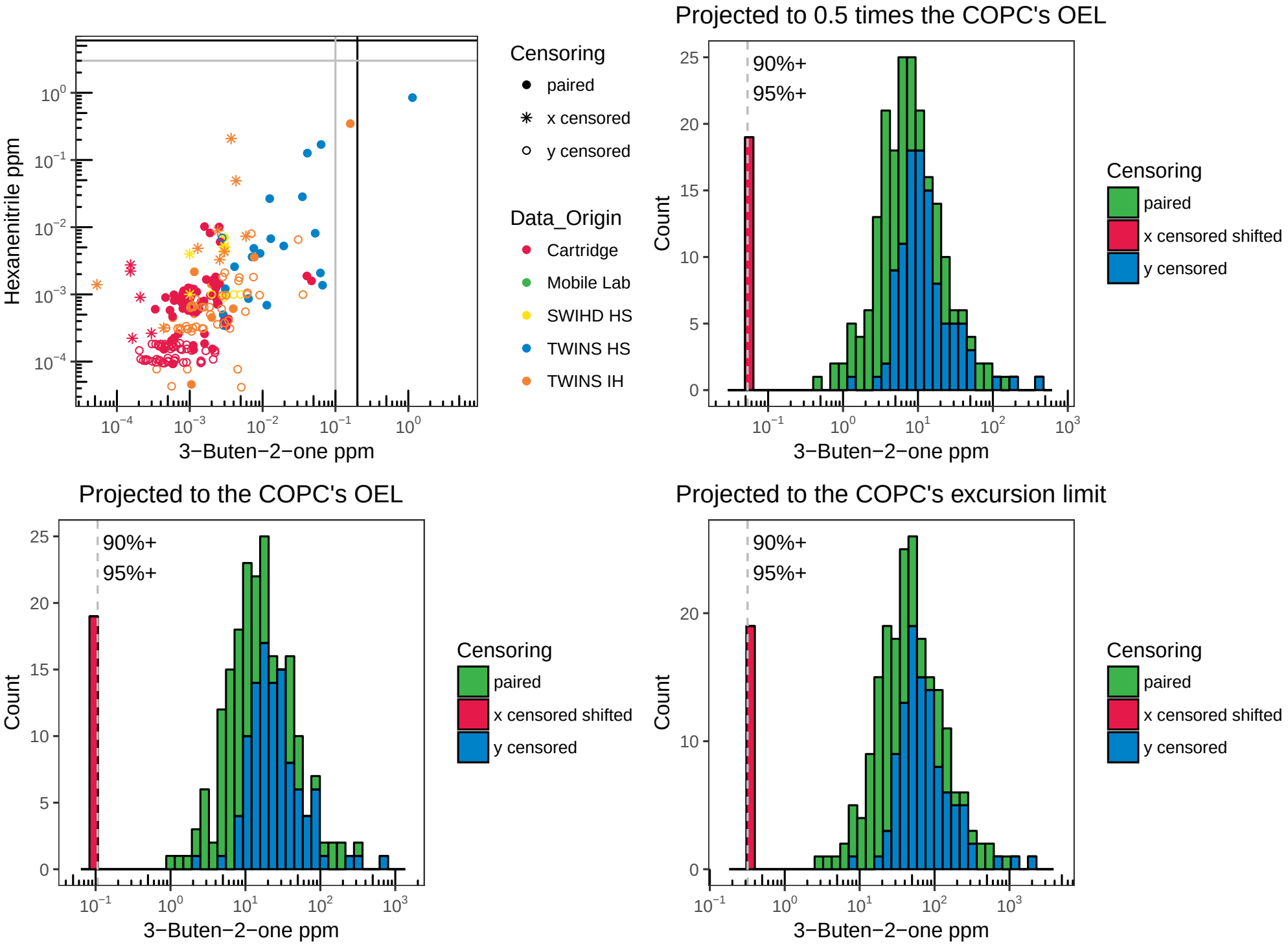


Figure C.684: Hexanenitrile vs 3-Buten-2-one

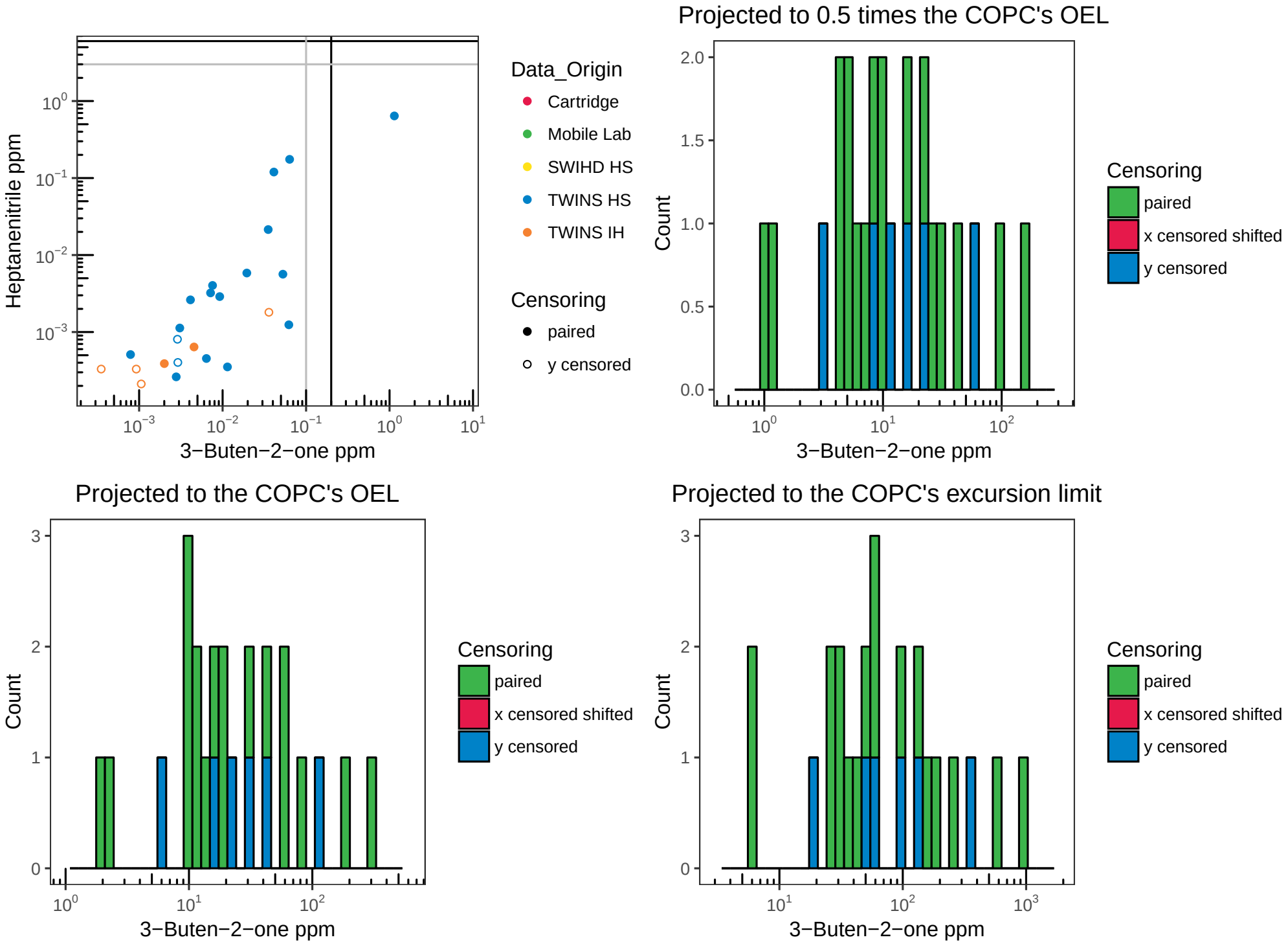


Figure C.685: Heptanenitrile vs 3-Buten-2-one

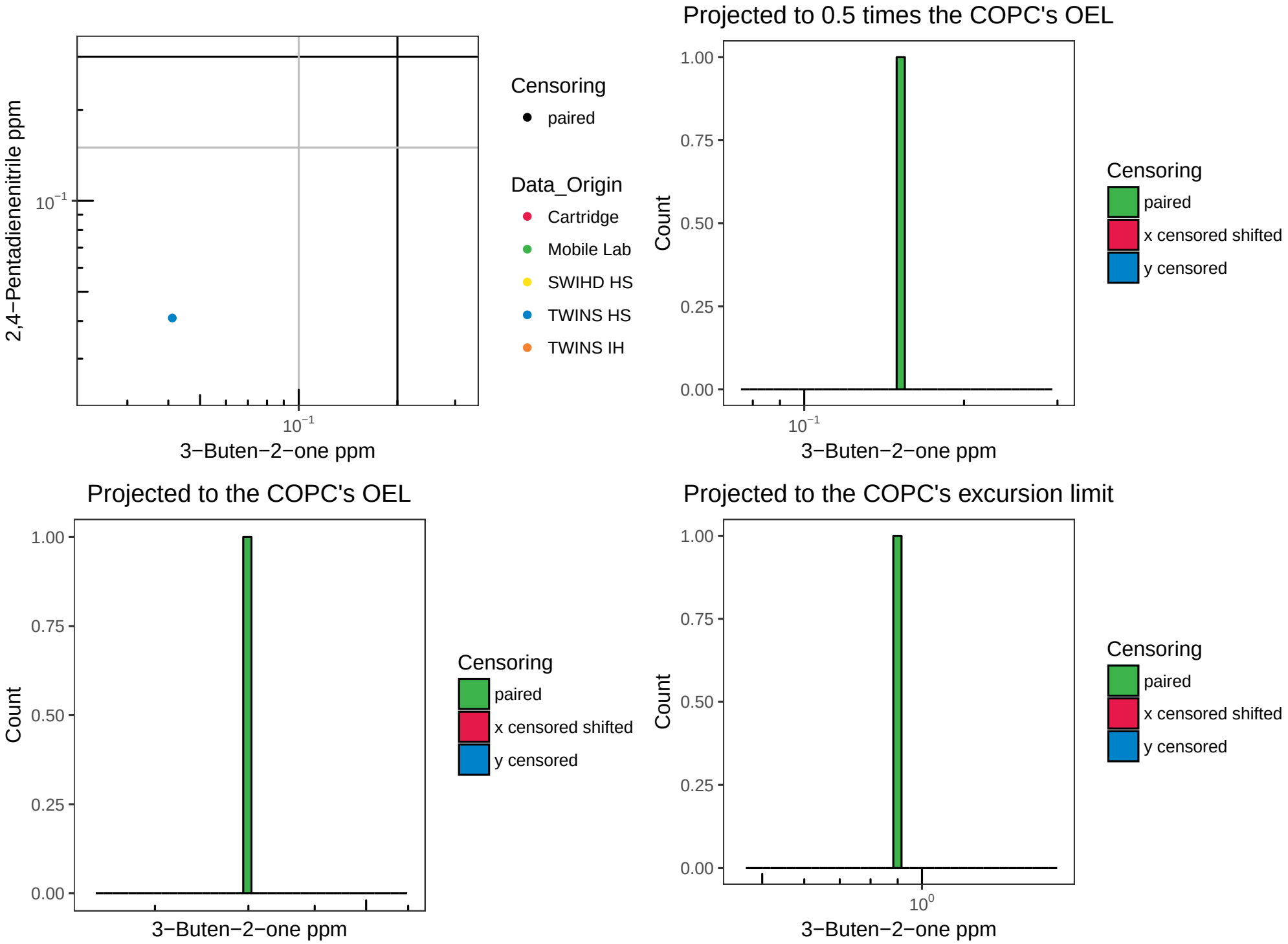


Figure C.686: 2,4-Pentadienenitrile vs 3-Buten-2-one

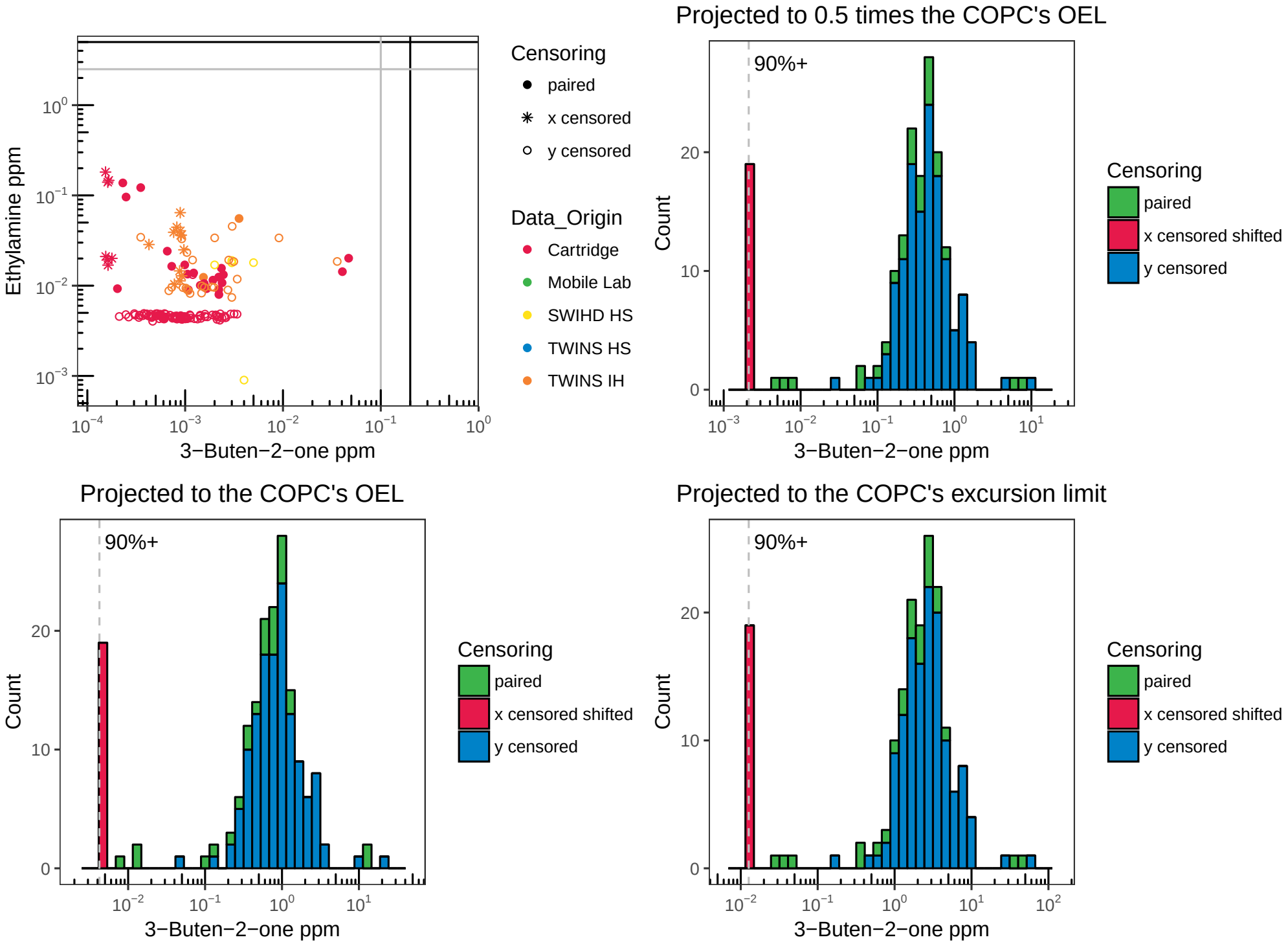


Figure C.687: Ethylamine vs 3-Buten-2-one

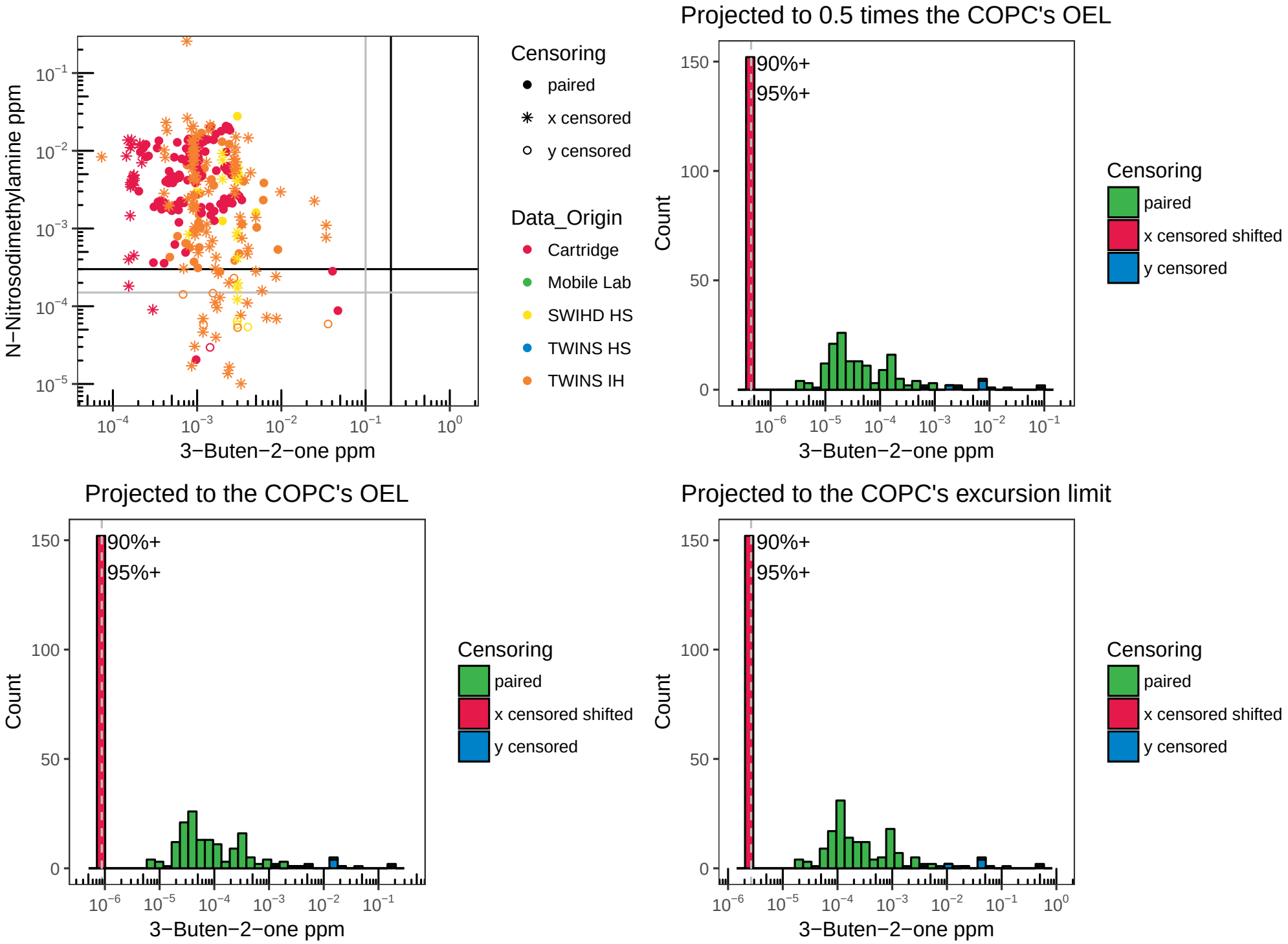


Figure C.688: N-Nitrosodimethylamine vs 3-Buten-2-one

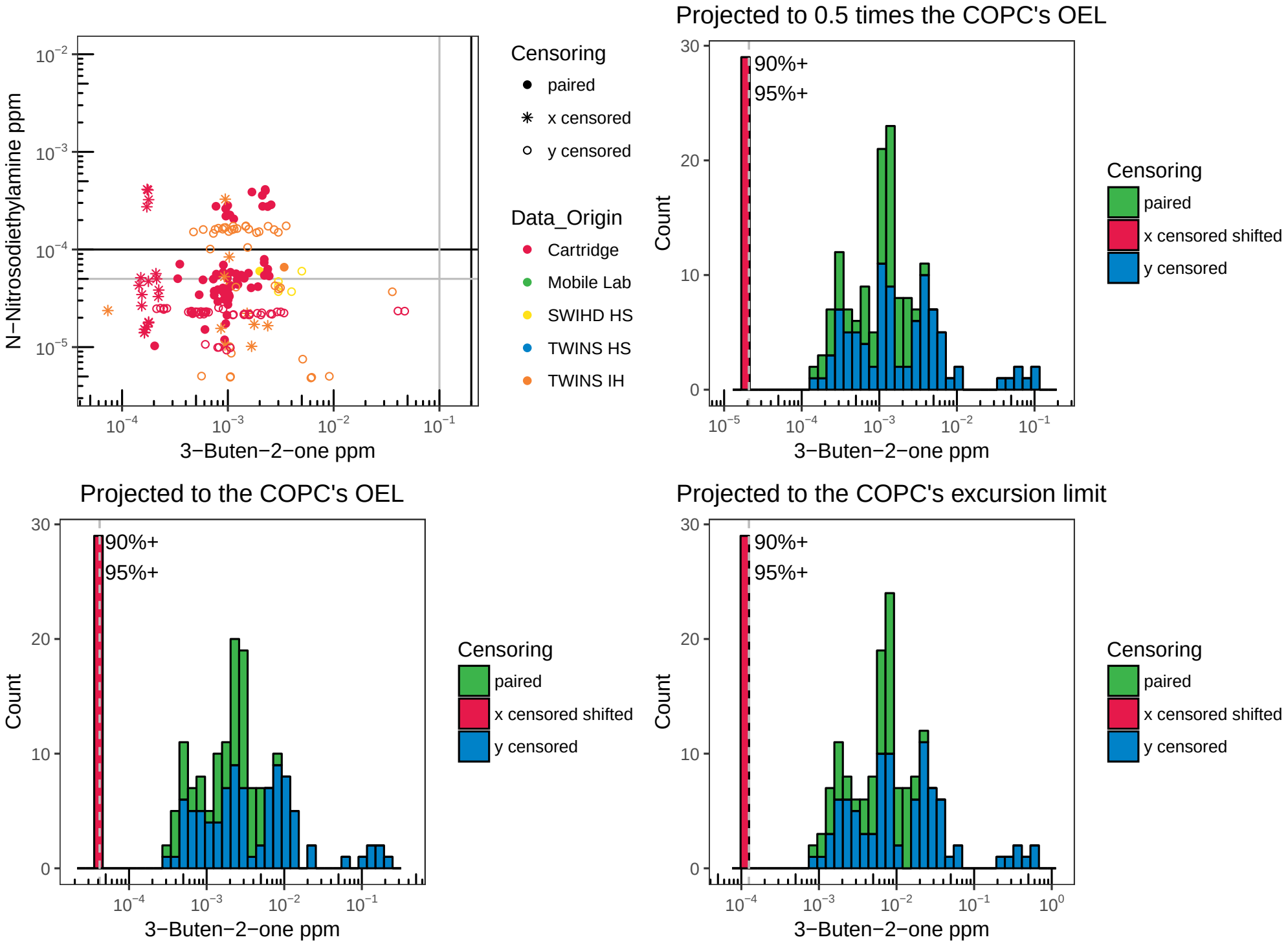


Figure C.689: N-Nitrosodiethylamine vs 3-Buten-2-one

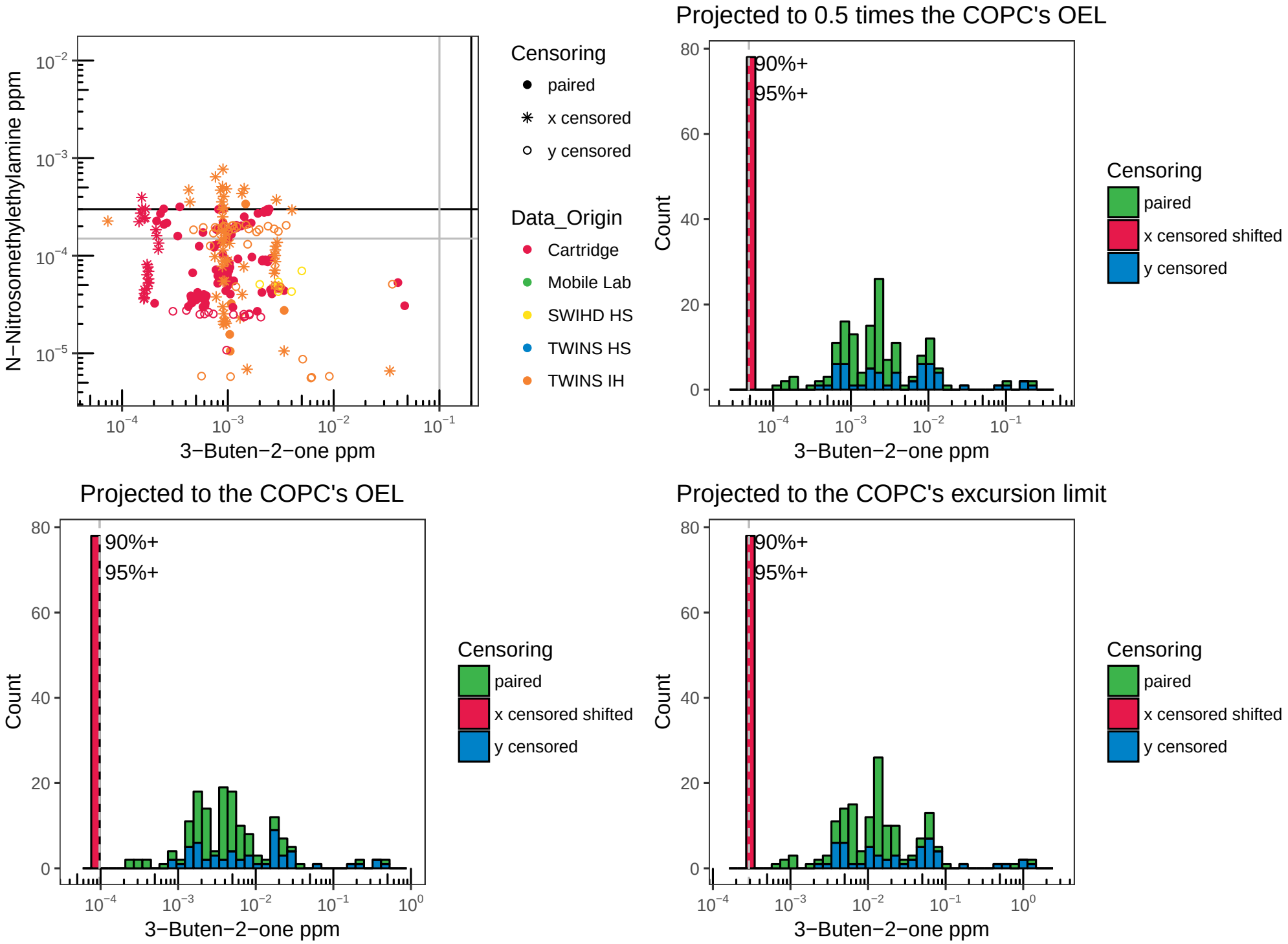


Figure C.690: N-Nitrosomethylethylamine vs 3-Buten-2-one

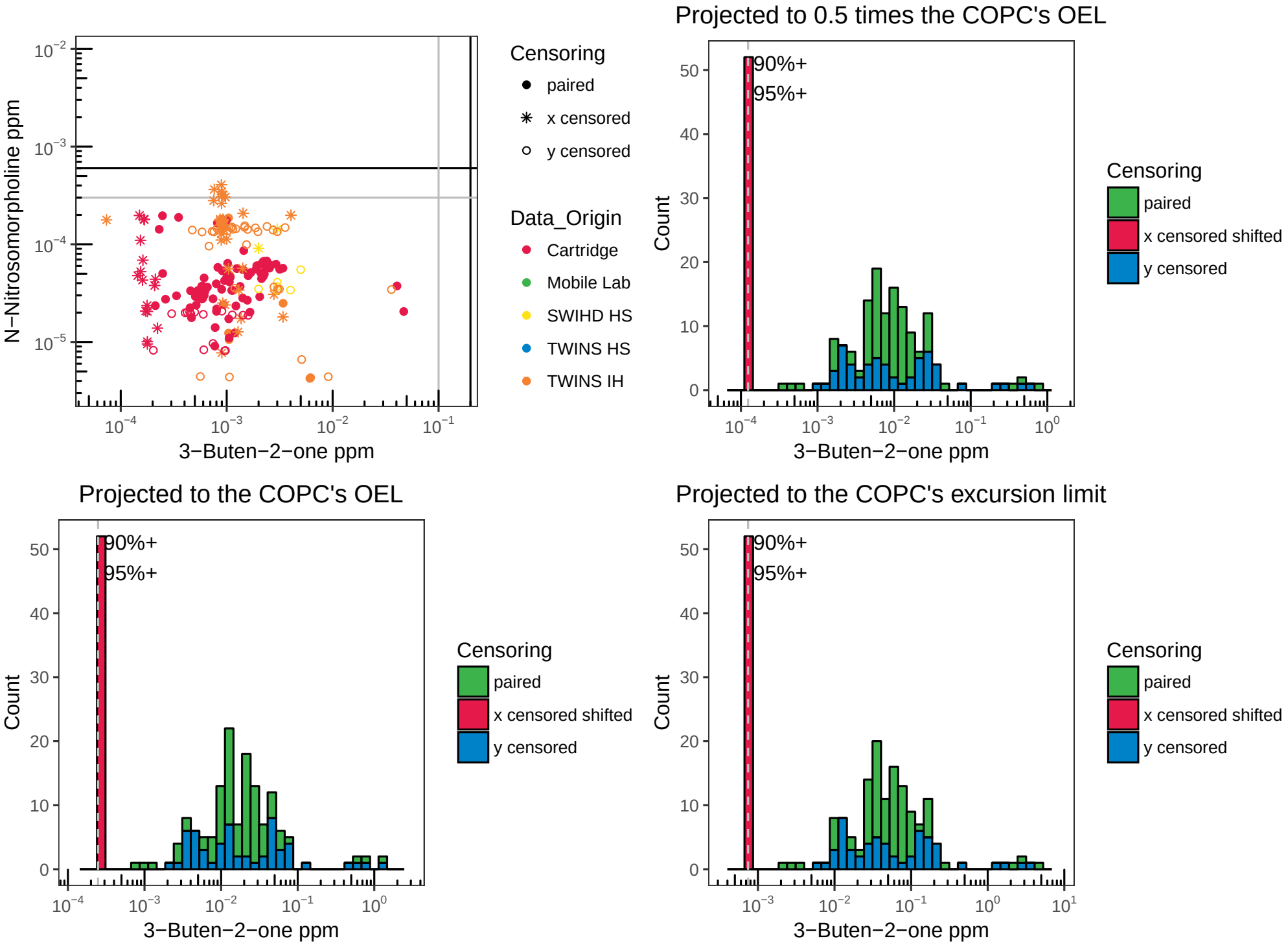


Figure C.691: N-Nitrosomorpholine vs 3-Buten-2-one

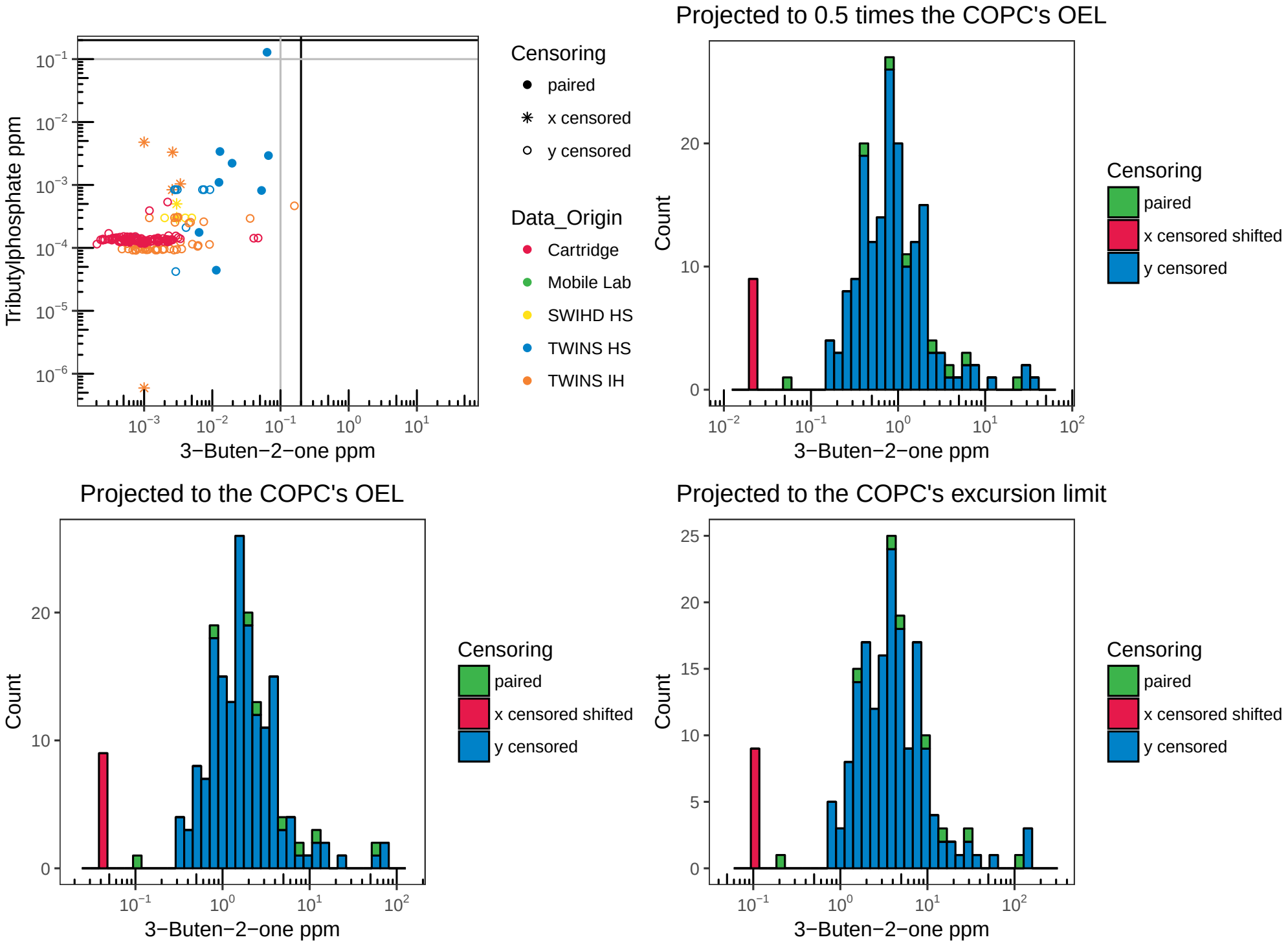


Figure C.692: Tributylphosphate vs 3-Buten-2-one

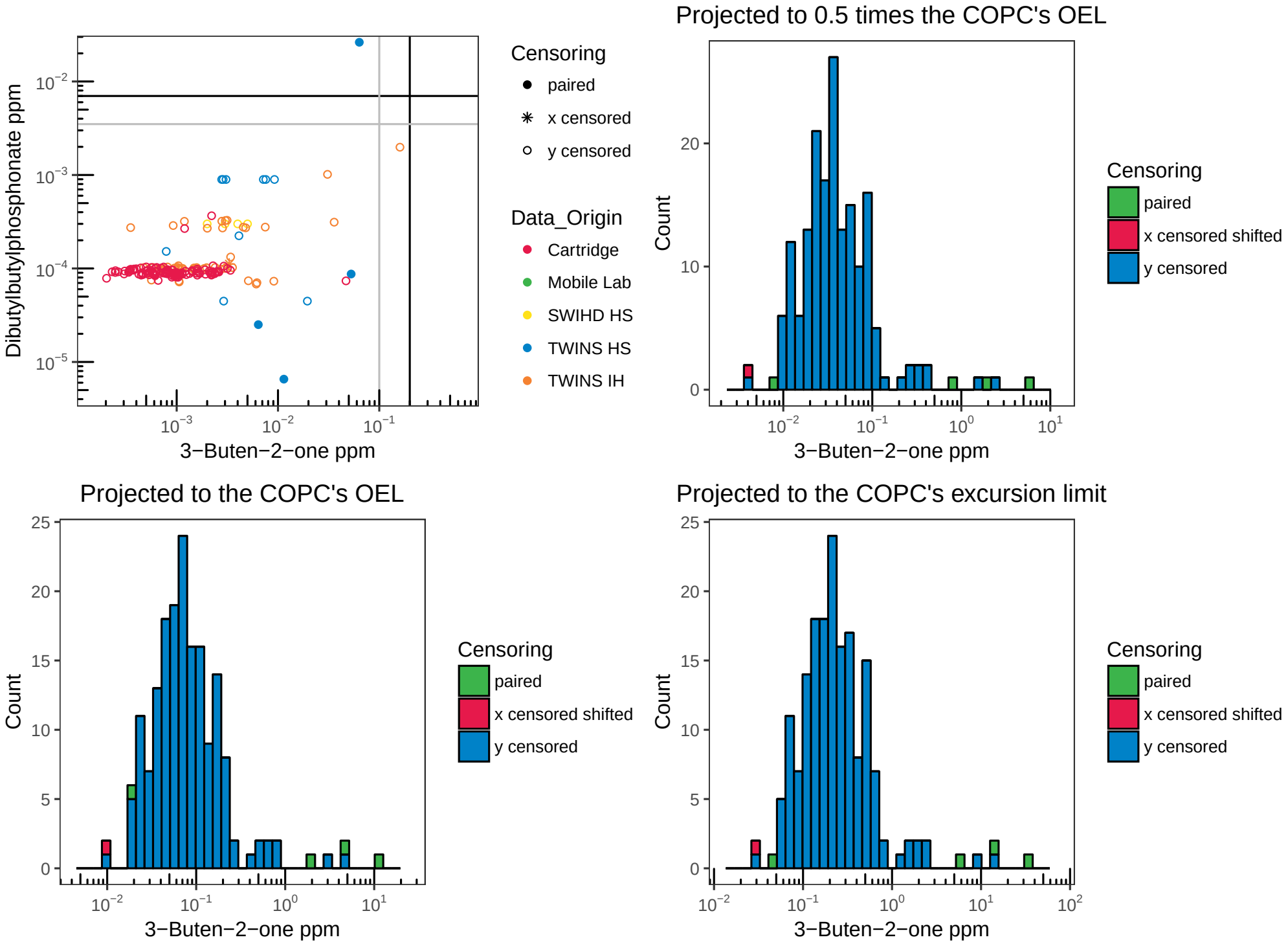


Figure C.693: Dibutylbutylphosphonate vs 3-Buten-2-one

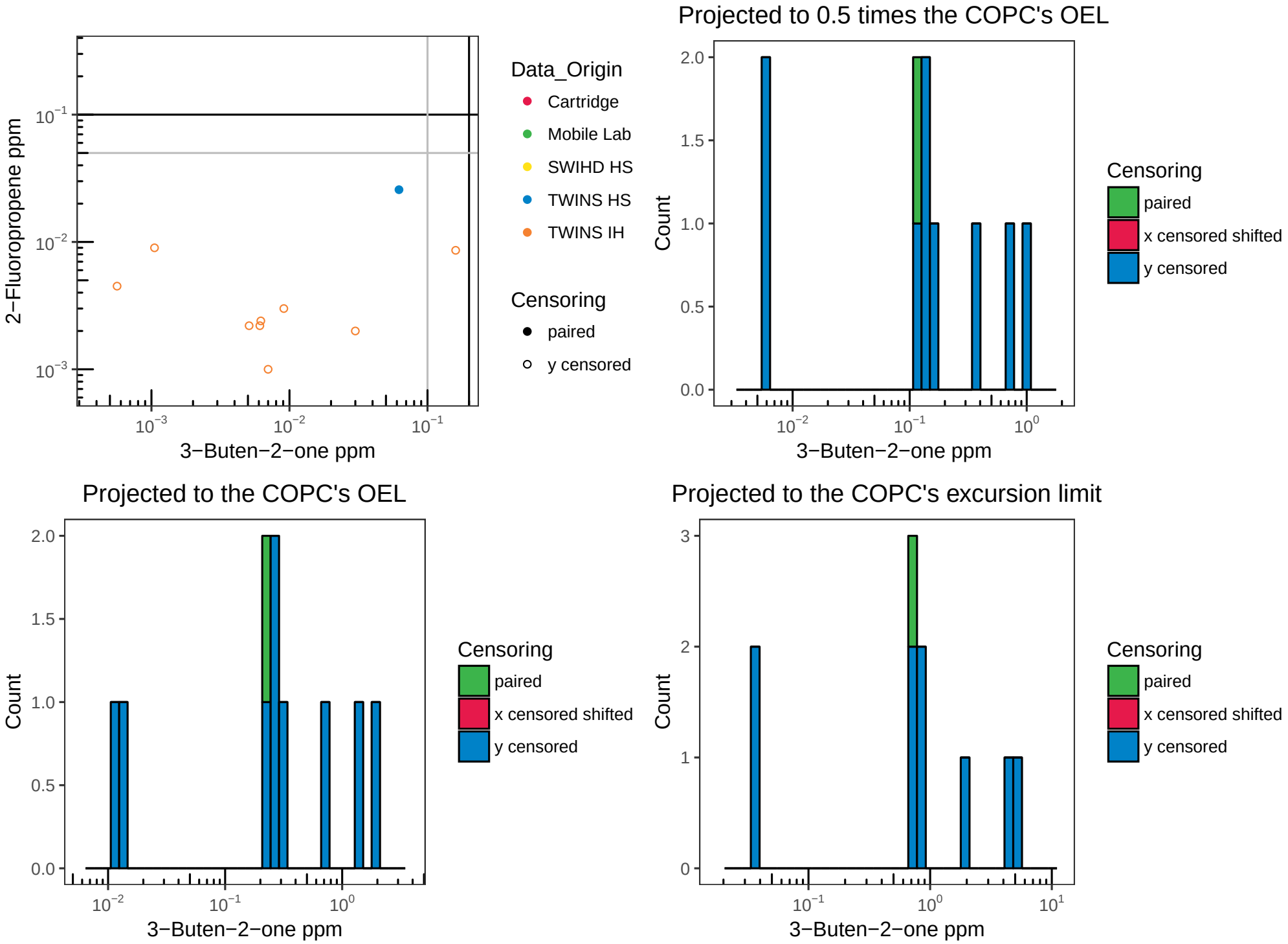


Figure C.694: 2-Fluoropropene vs 3-Buten-2-one

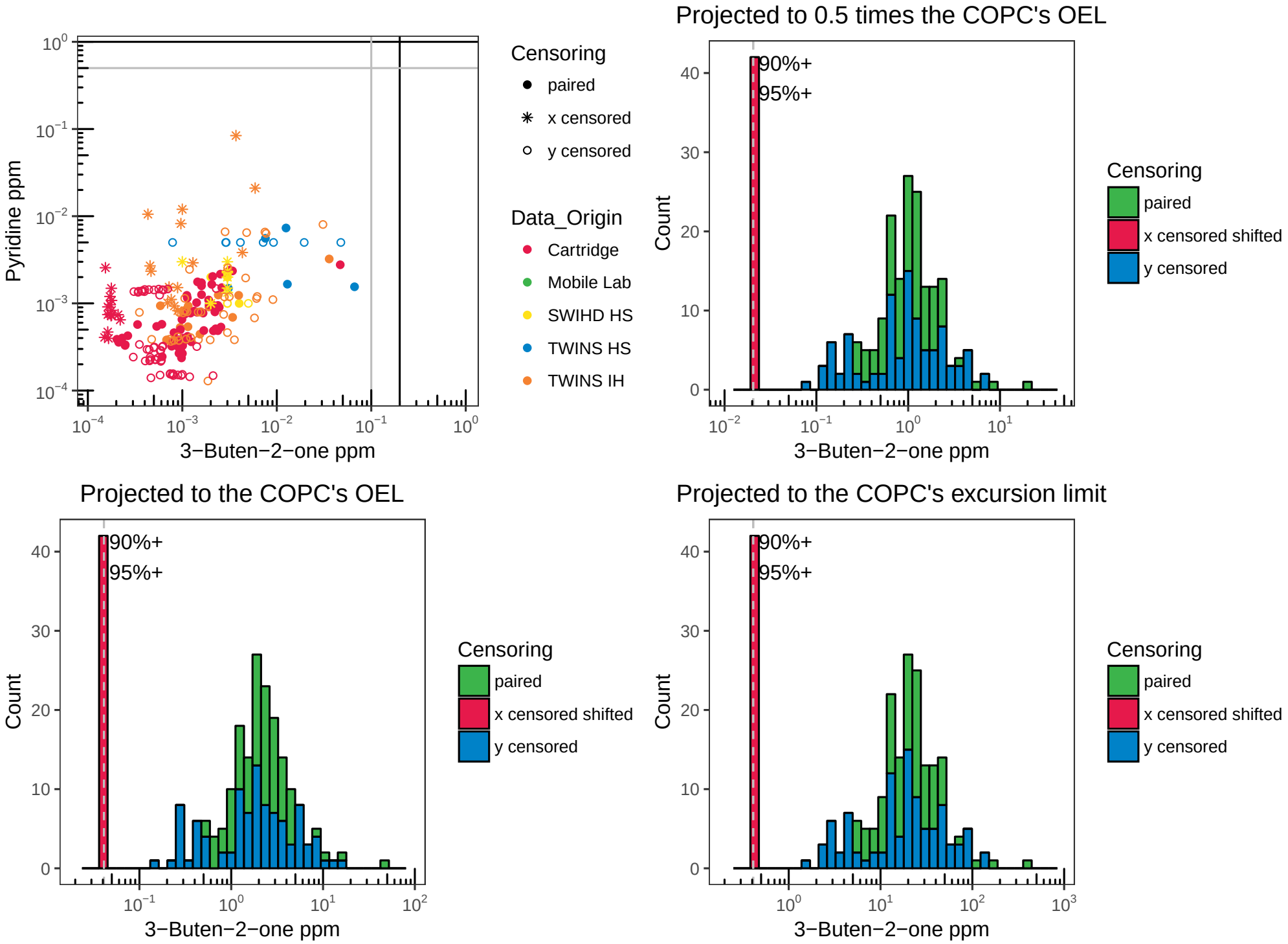


Figure C.695: Pyridine vs 3-Buten-2-one

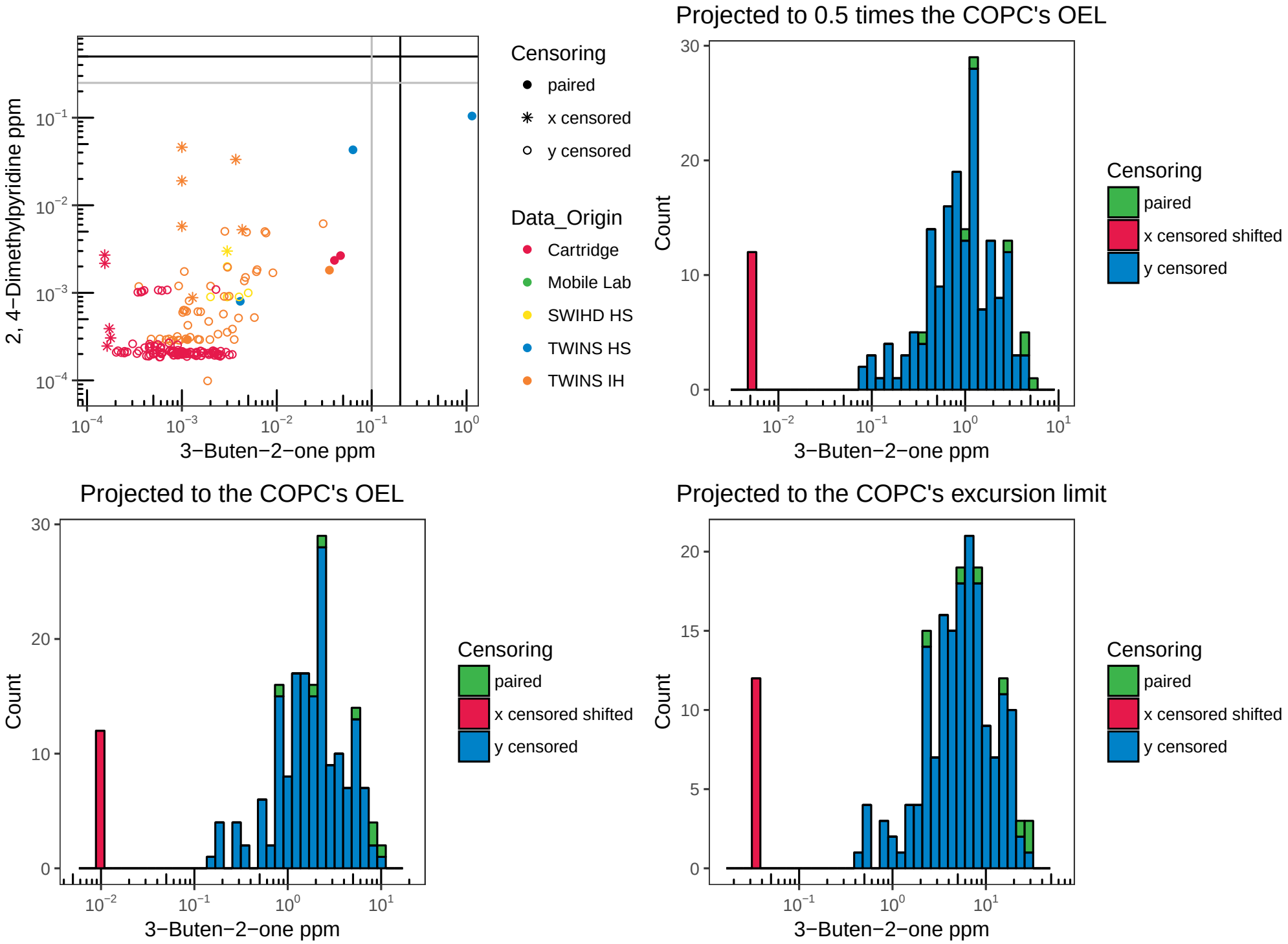


Figure C.696: 2, 4-Dimethylpyridine vs 3-Buten-2-one

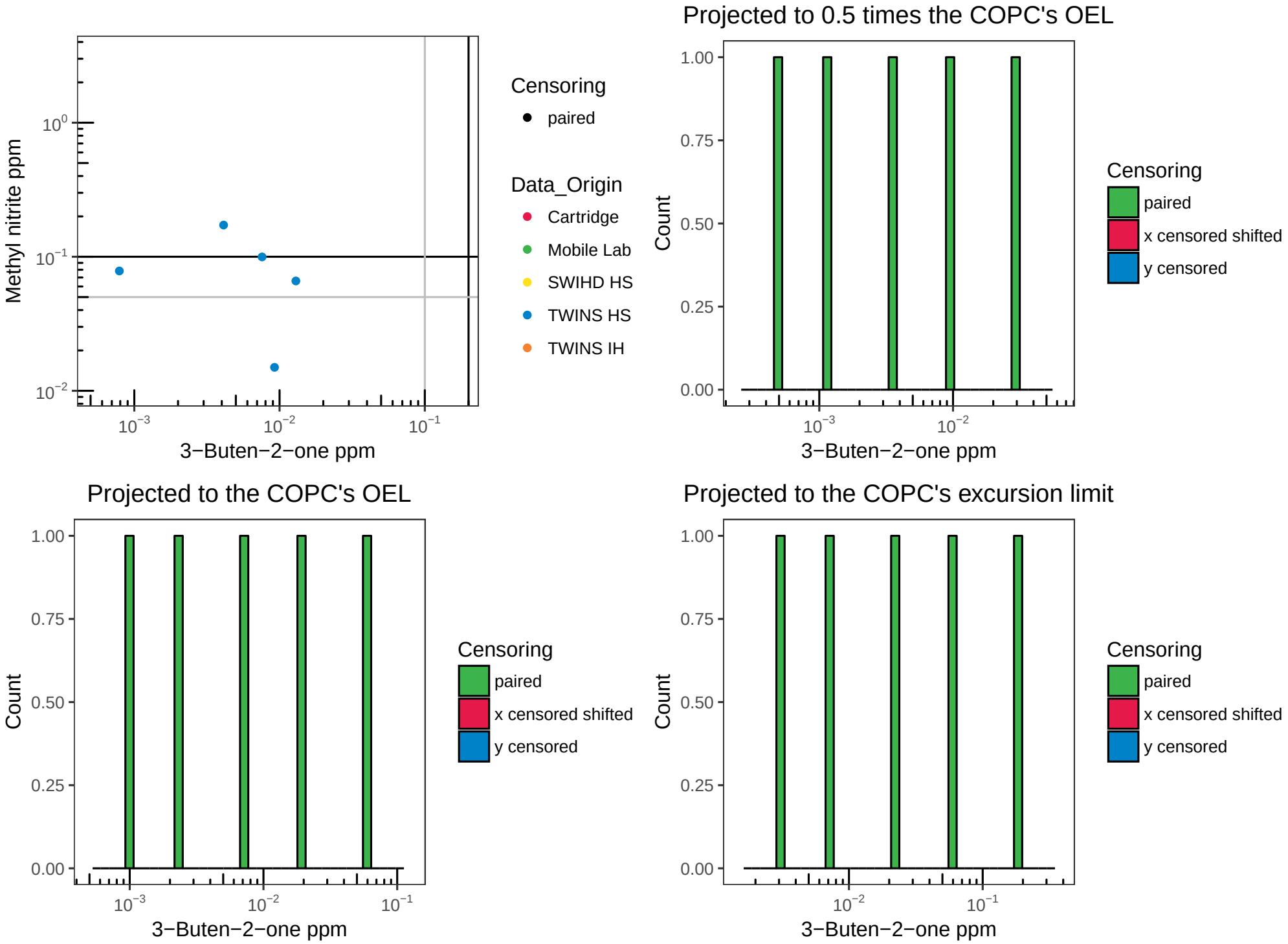


Figure C.697: Methyl nitrite vs 3-Buten-2-one

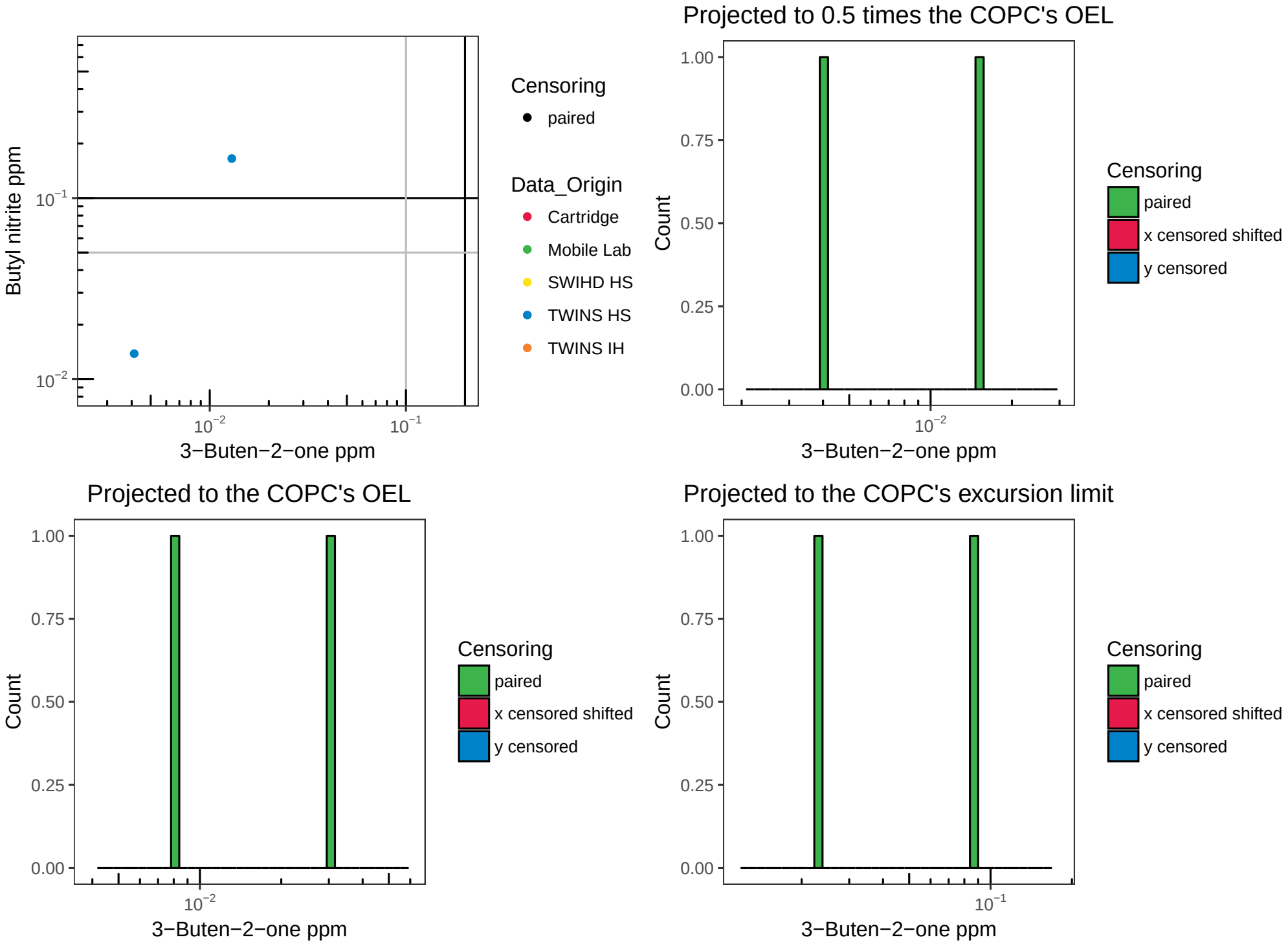


Figure C.698: Butyl nitrite vs 3-Buten-2-one

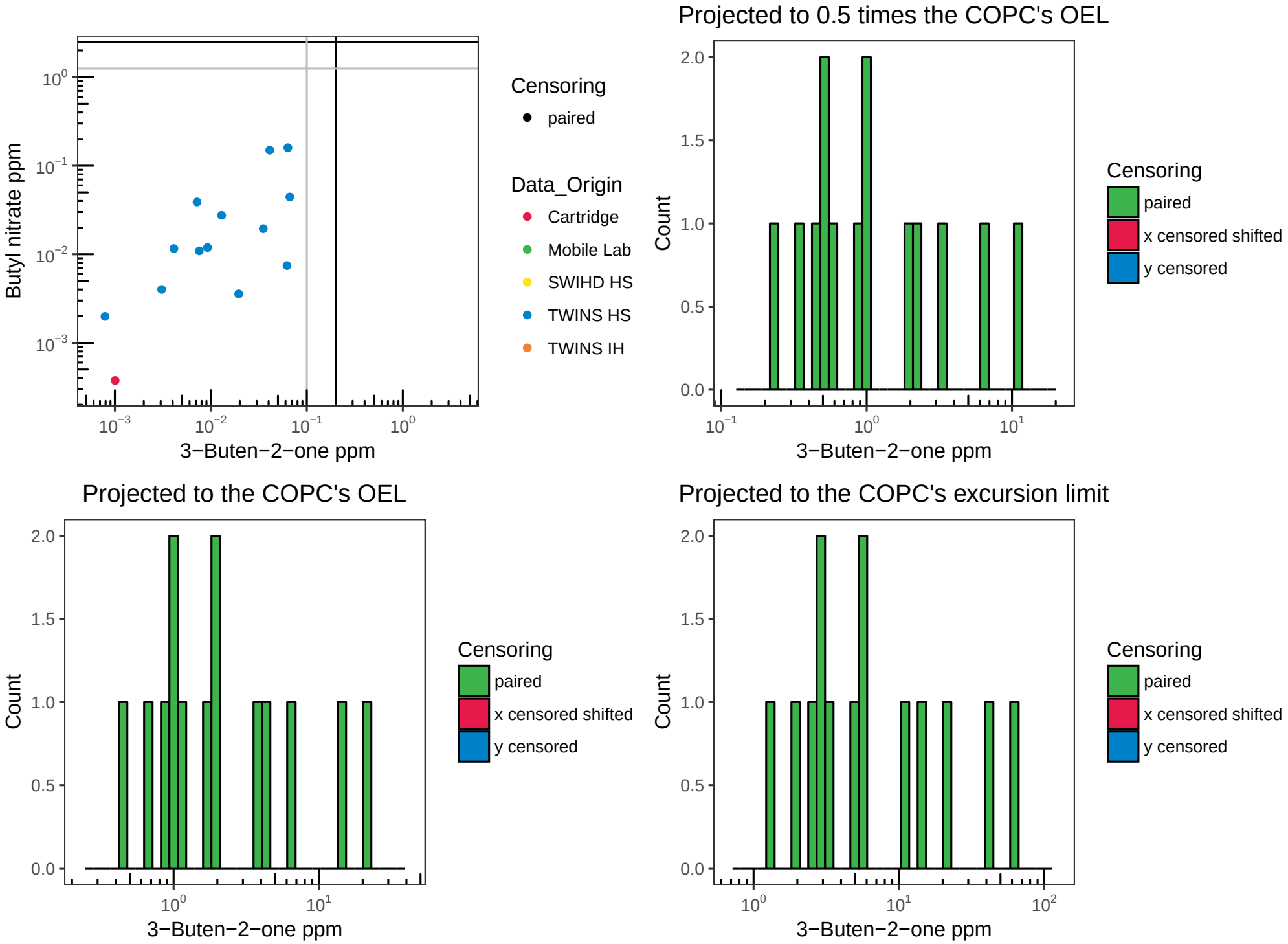


Figure C.699: Butyl nitrate vs 3-Buten-2-one

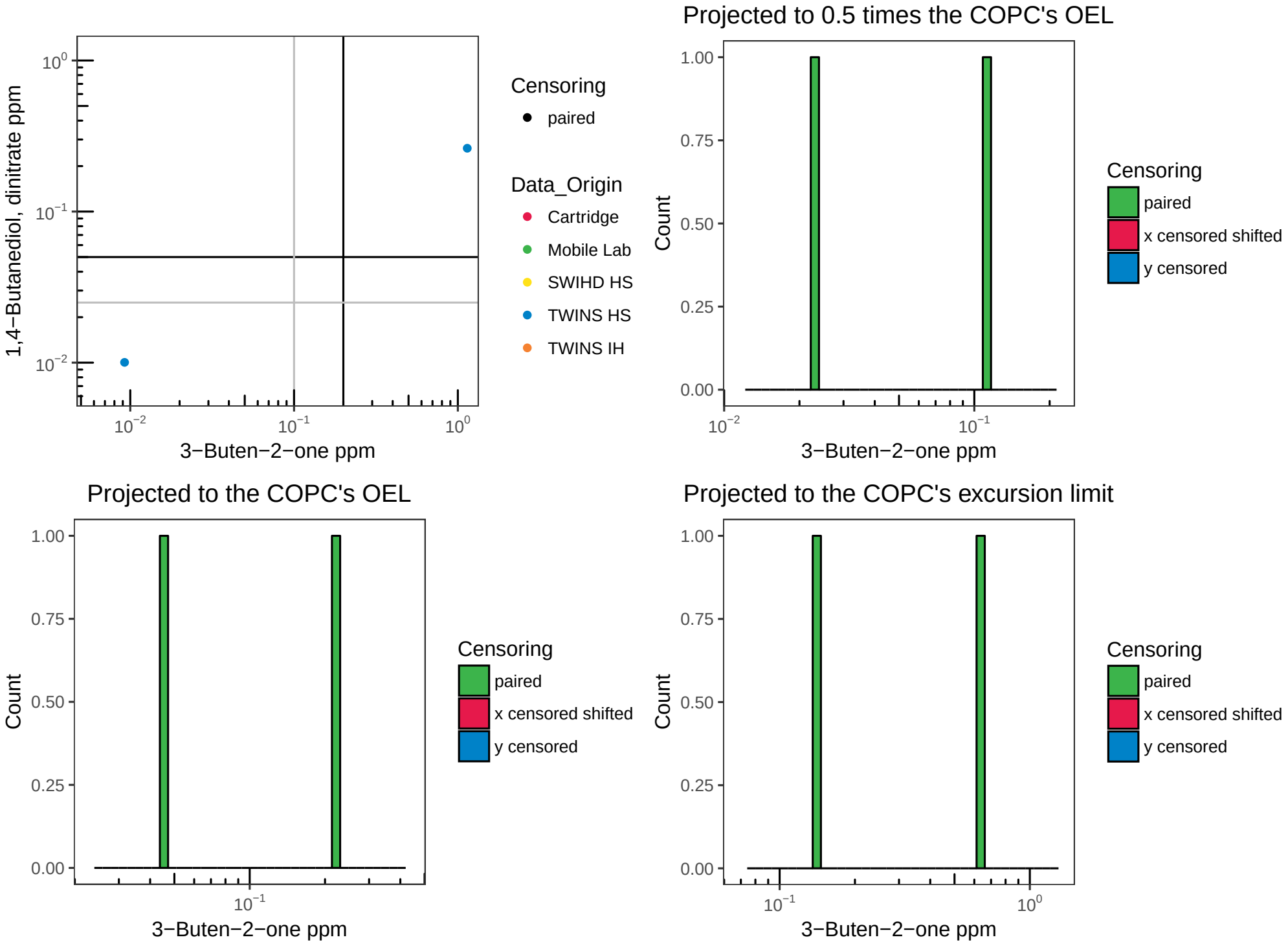


Figure C.700: 1,4-Butanediol, dinitrate vs 3-Buten-2-one

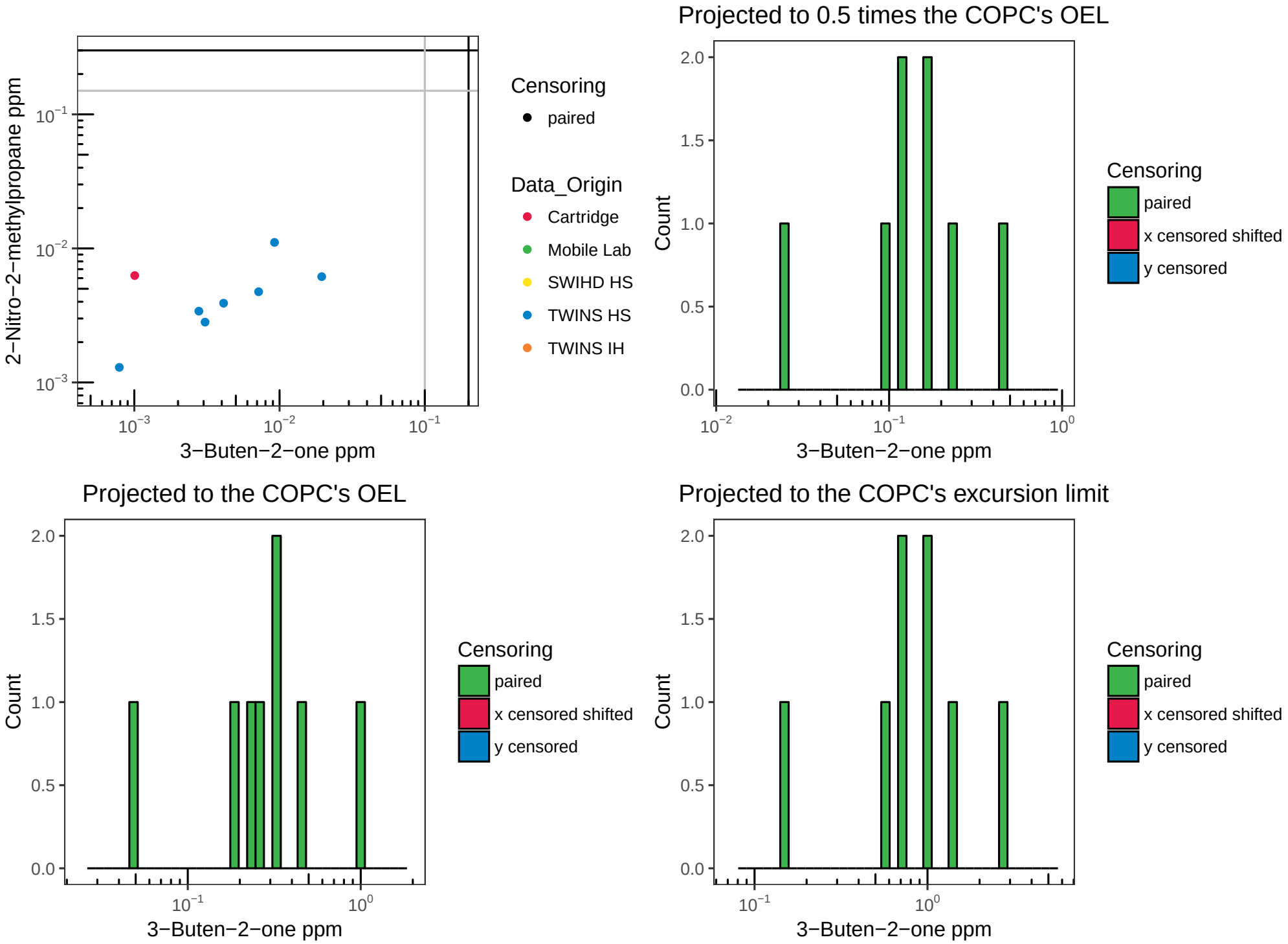


Figure C.701: 2-Nitro-2-methylpropane vs 3-Buten-2-one

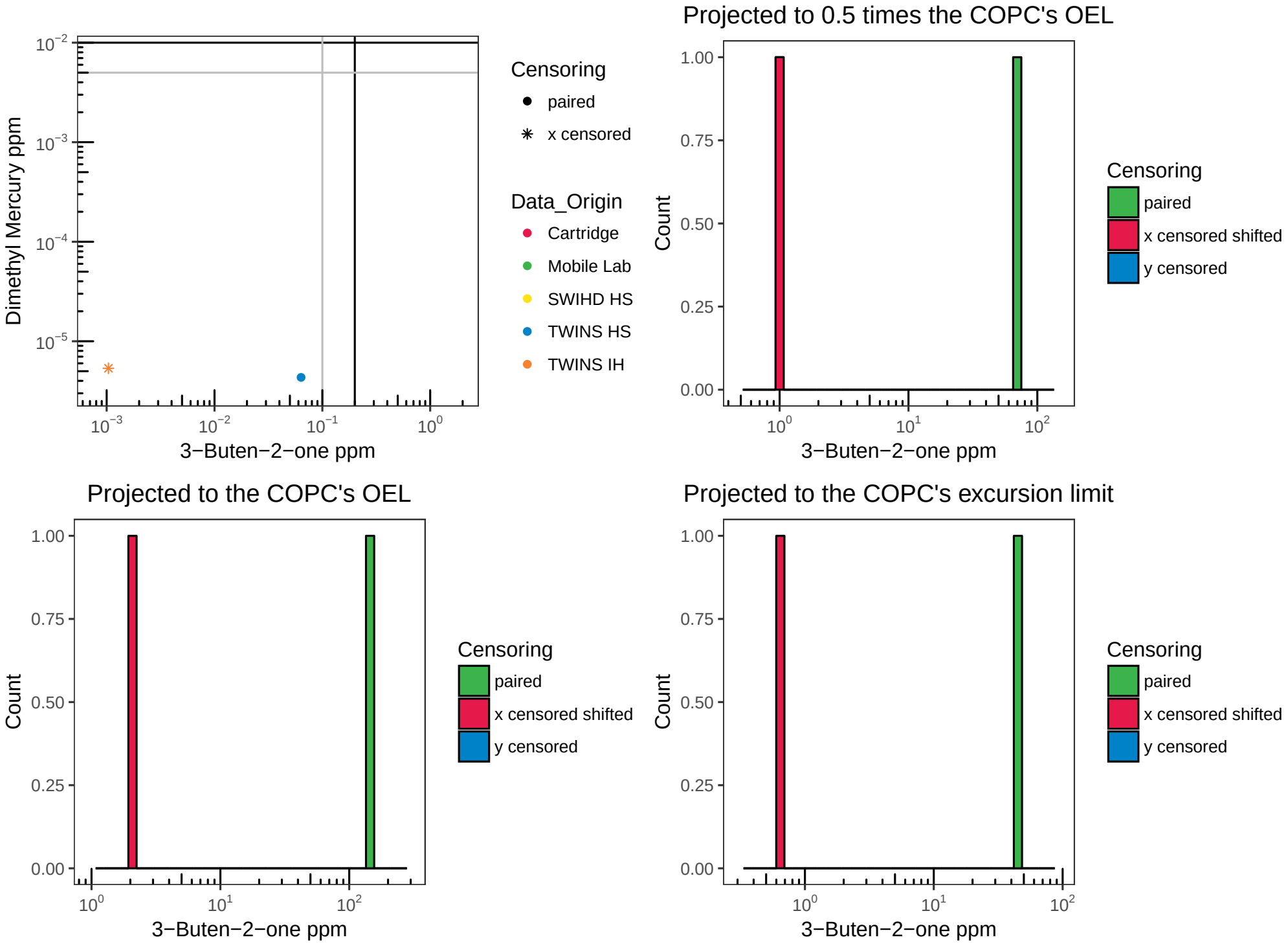


Figure C.702: Dimethyl Mercury vs 3-Buten-2-one

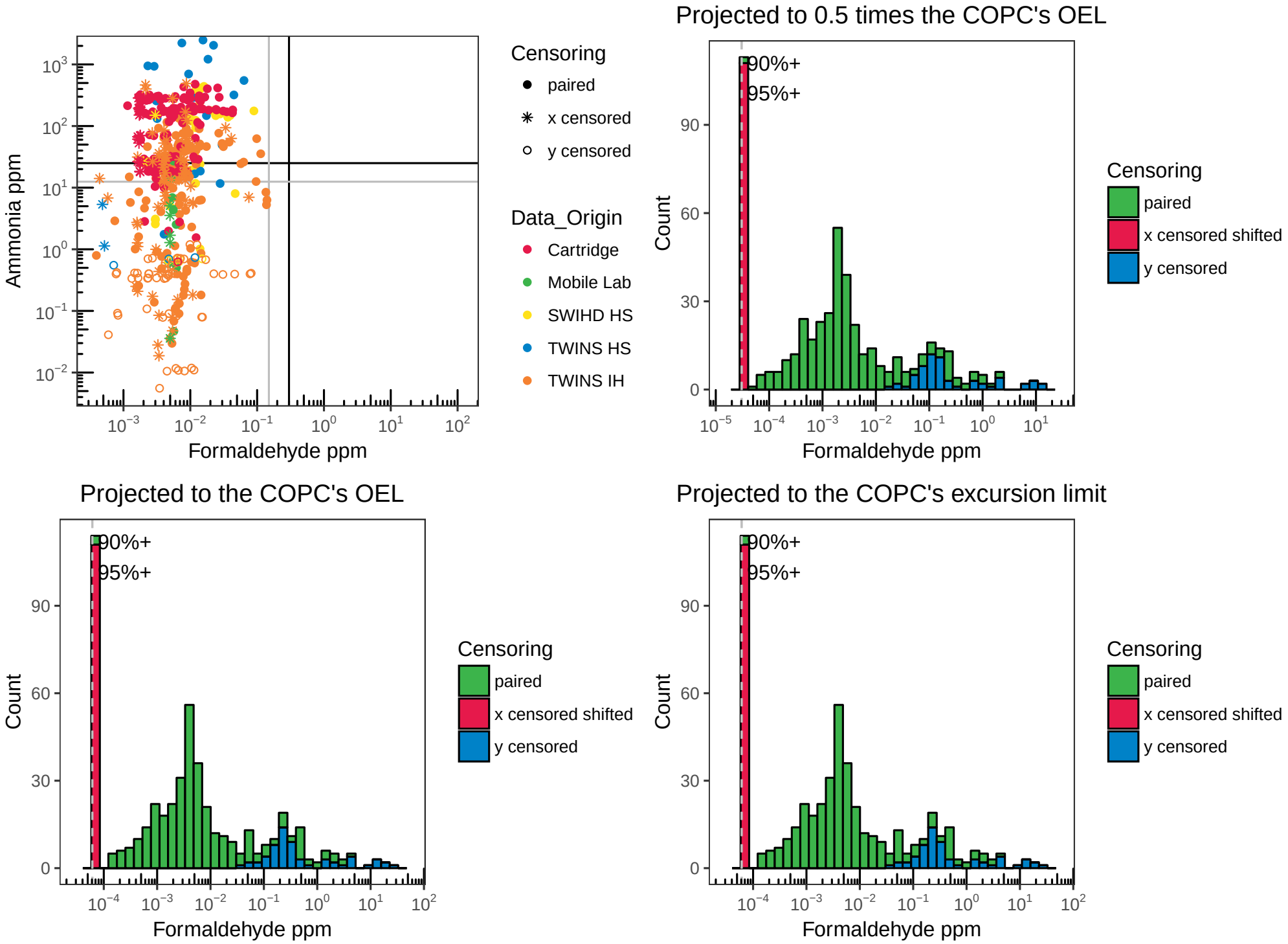


Figure C.703: Ammonia vs Formaldehyde

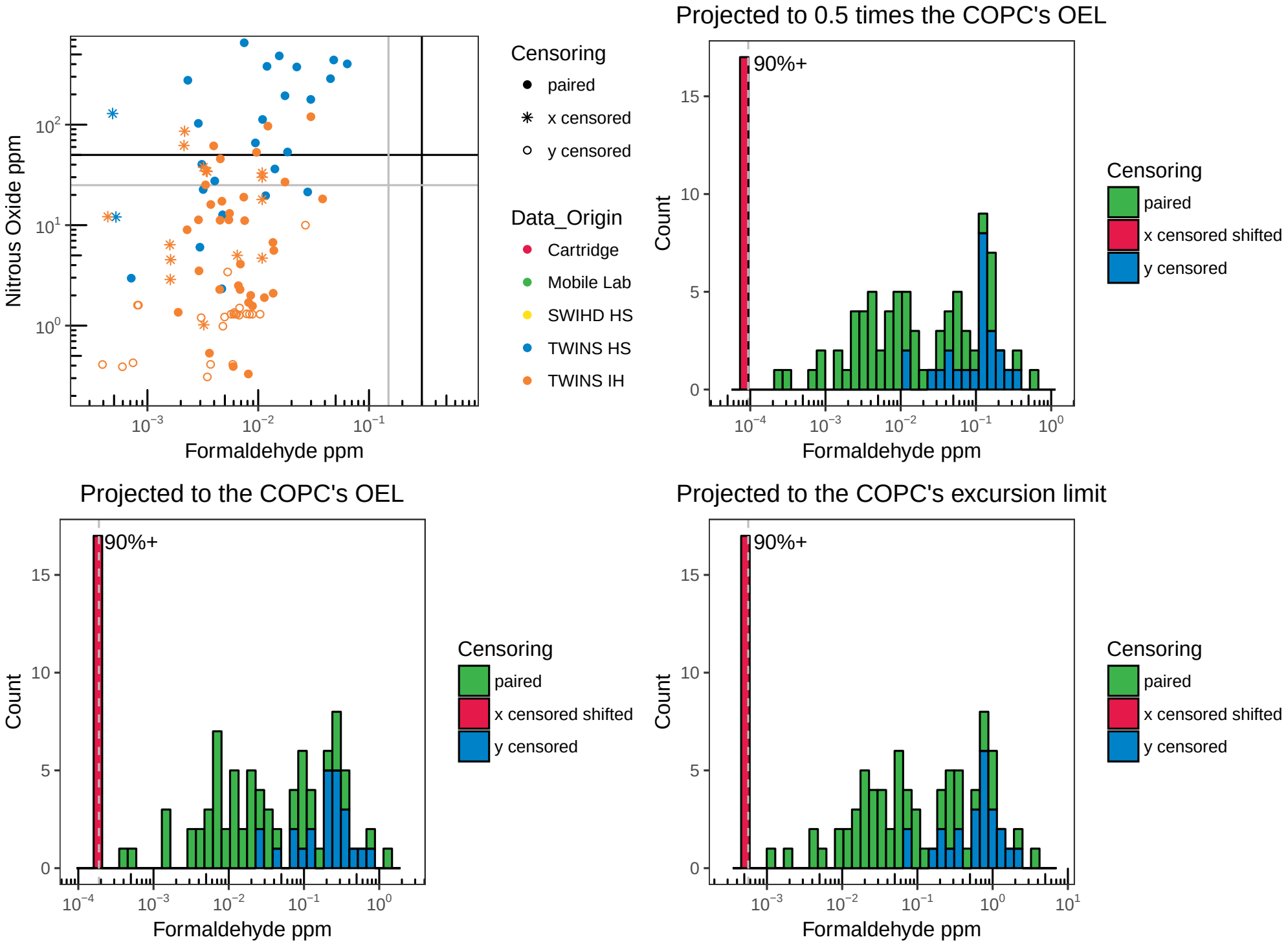


Figure C.704: Nitrous Oxide vs Formaldehyde

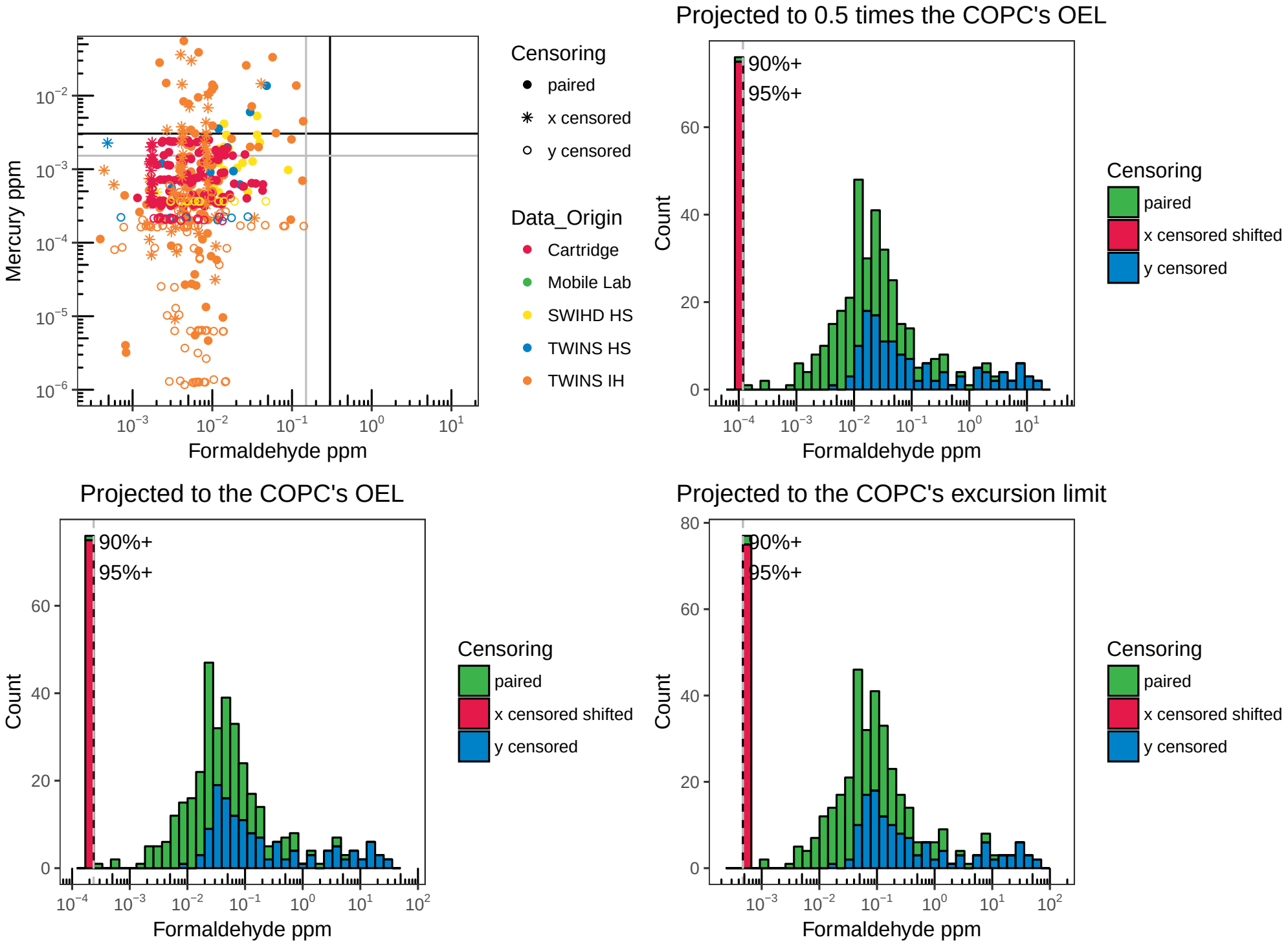


Figure C.705: Mercury vs Formaldehyde

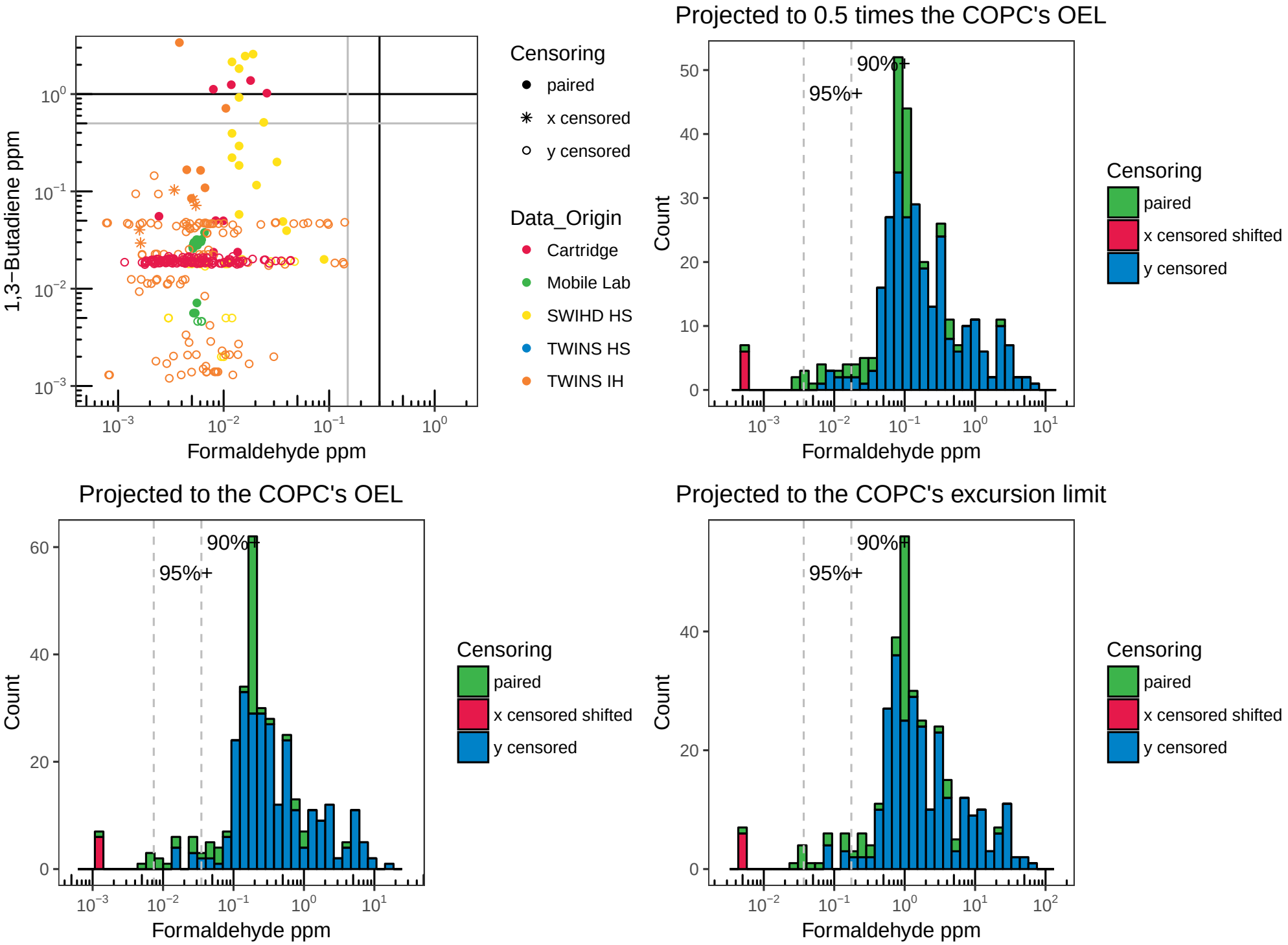


Figure C.706: 1,3-Butadiene vs Formaldehyde

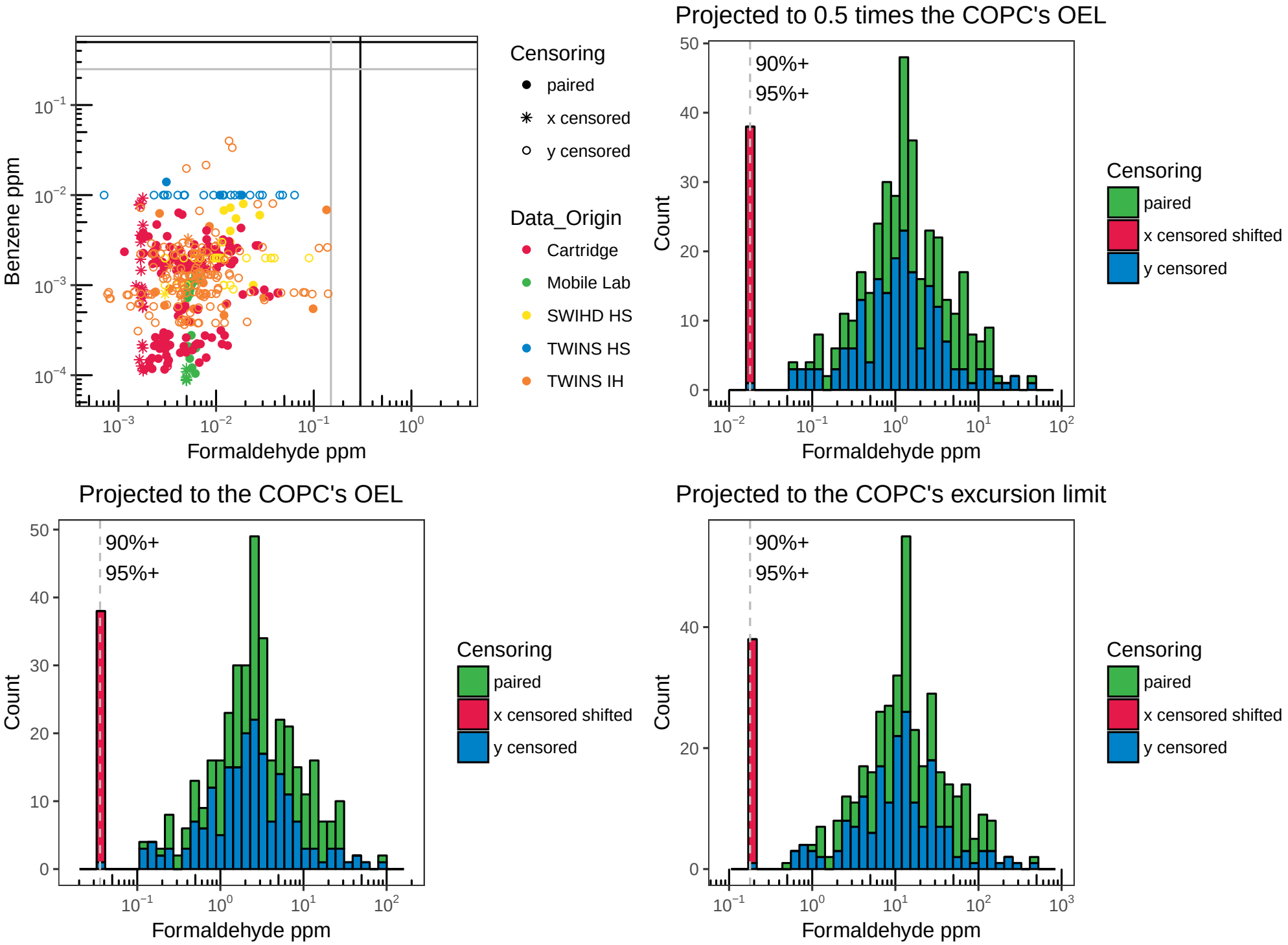


Figure C.707: Benzene vs Formaldehyde

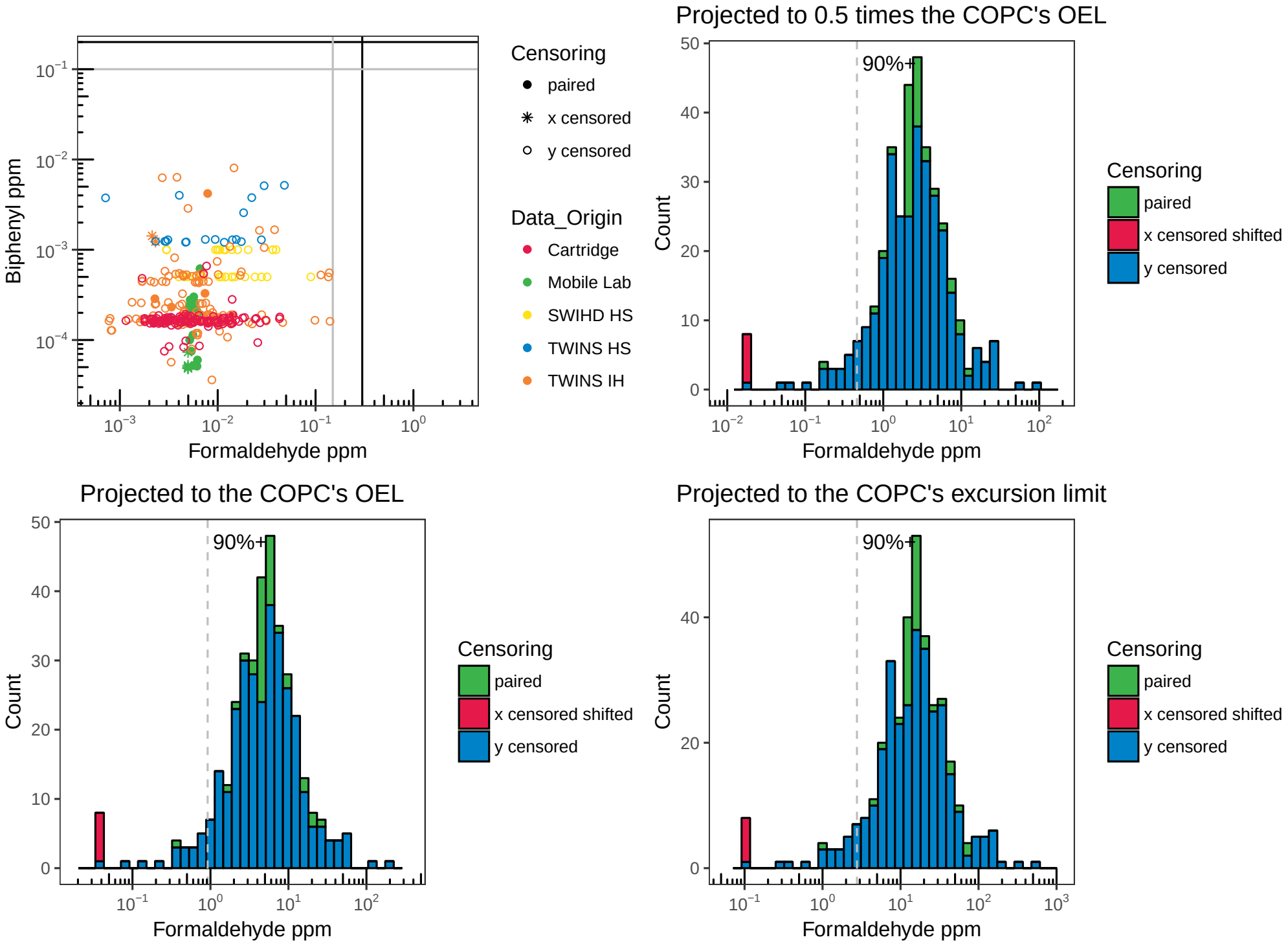


Figure C.708: Biphenyl vs Formaldehyde

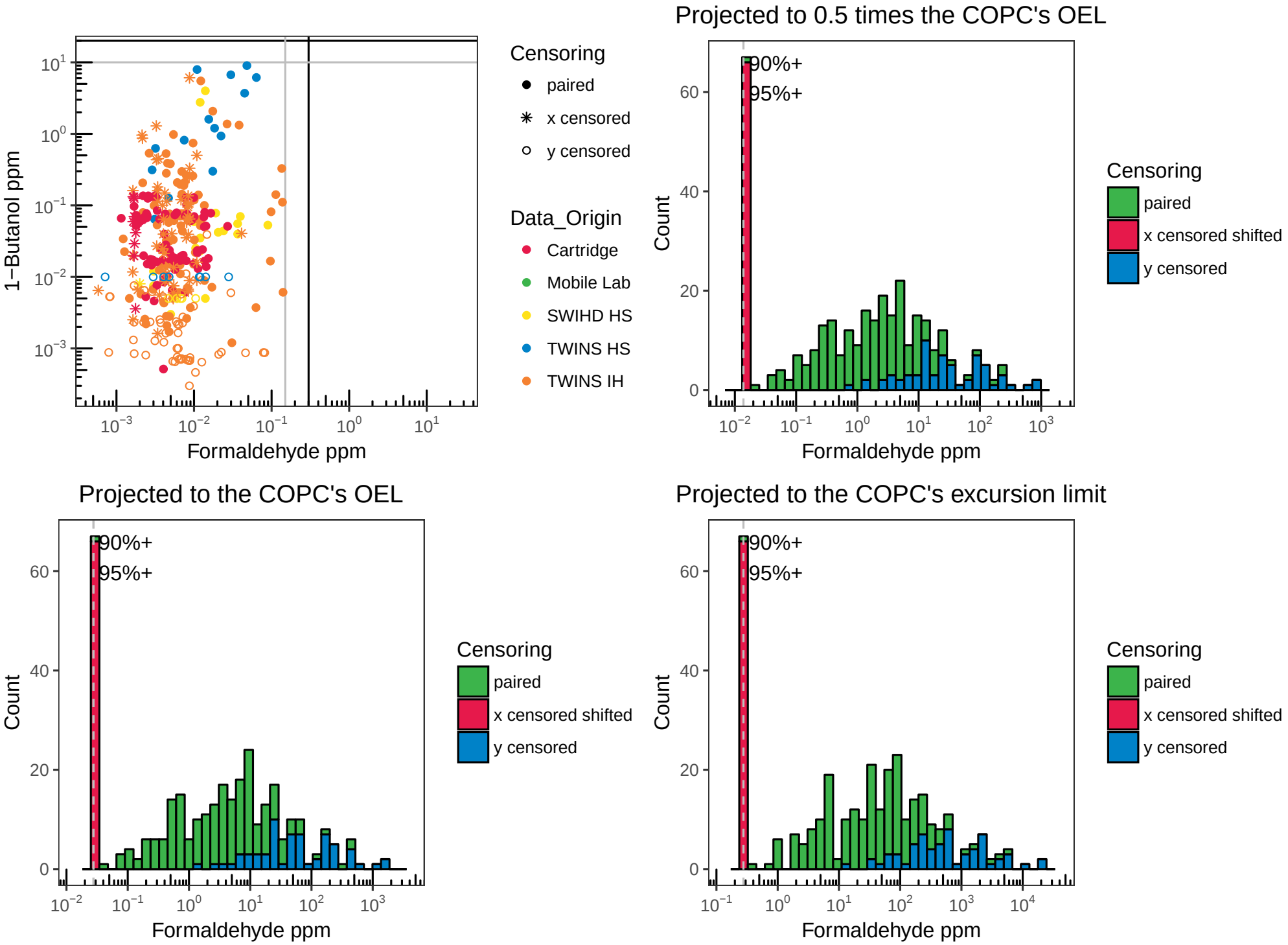


Figure C.709: 1-Butanol vs Formaldehyde

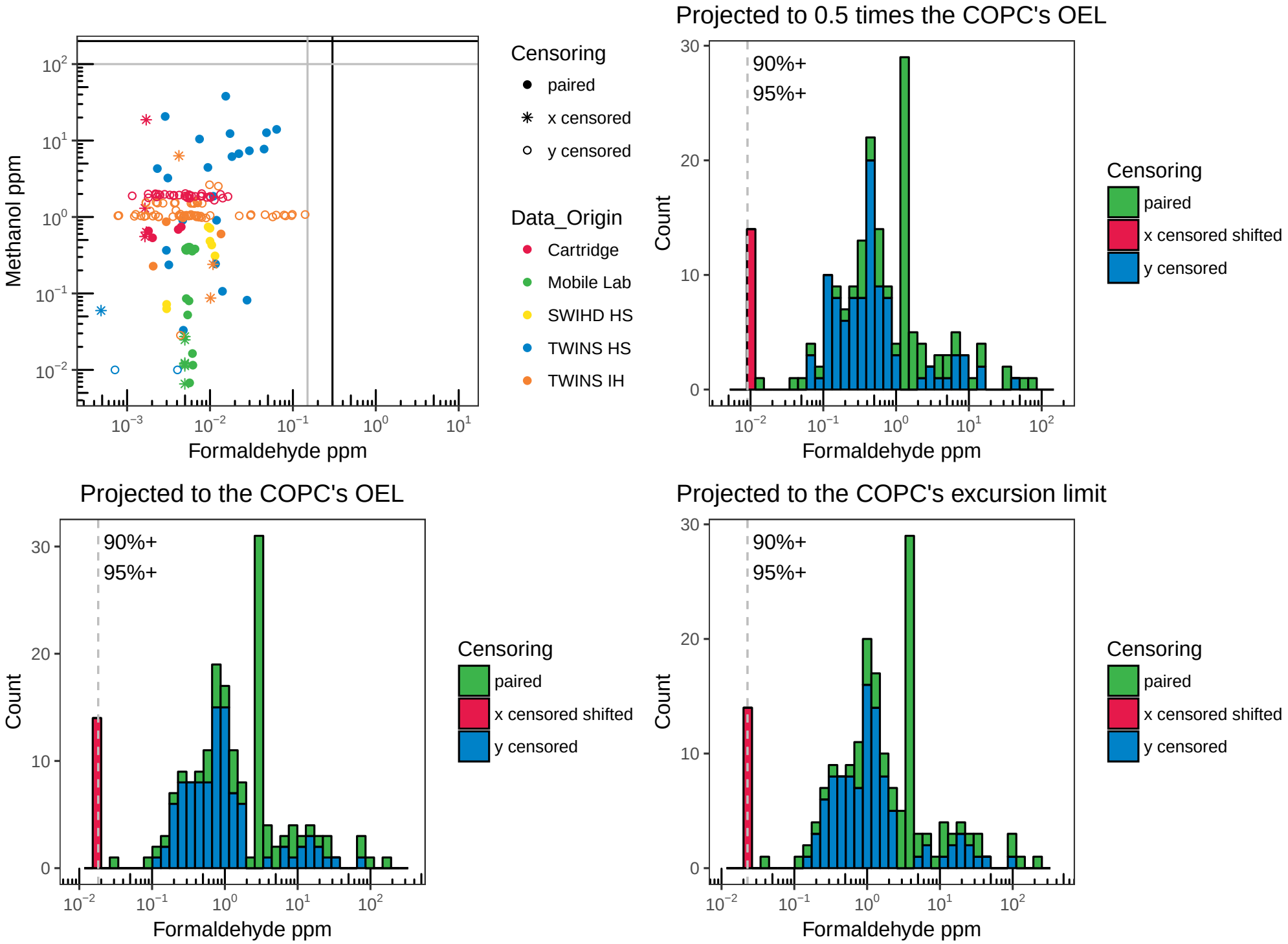


Figure C.710: Methanol vs Formaldehyde

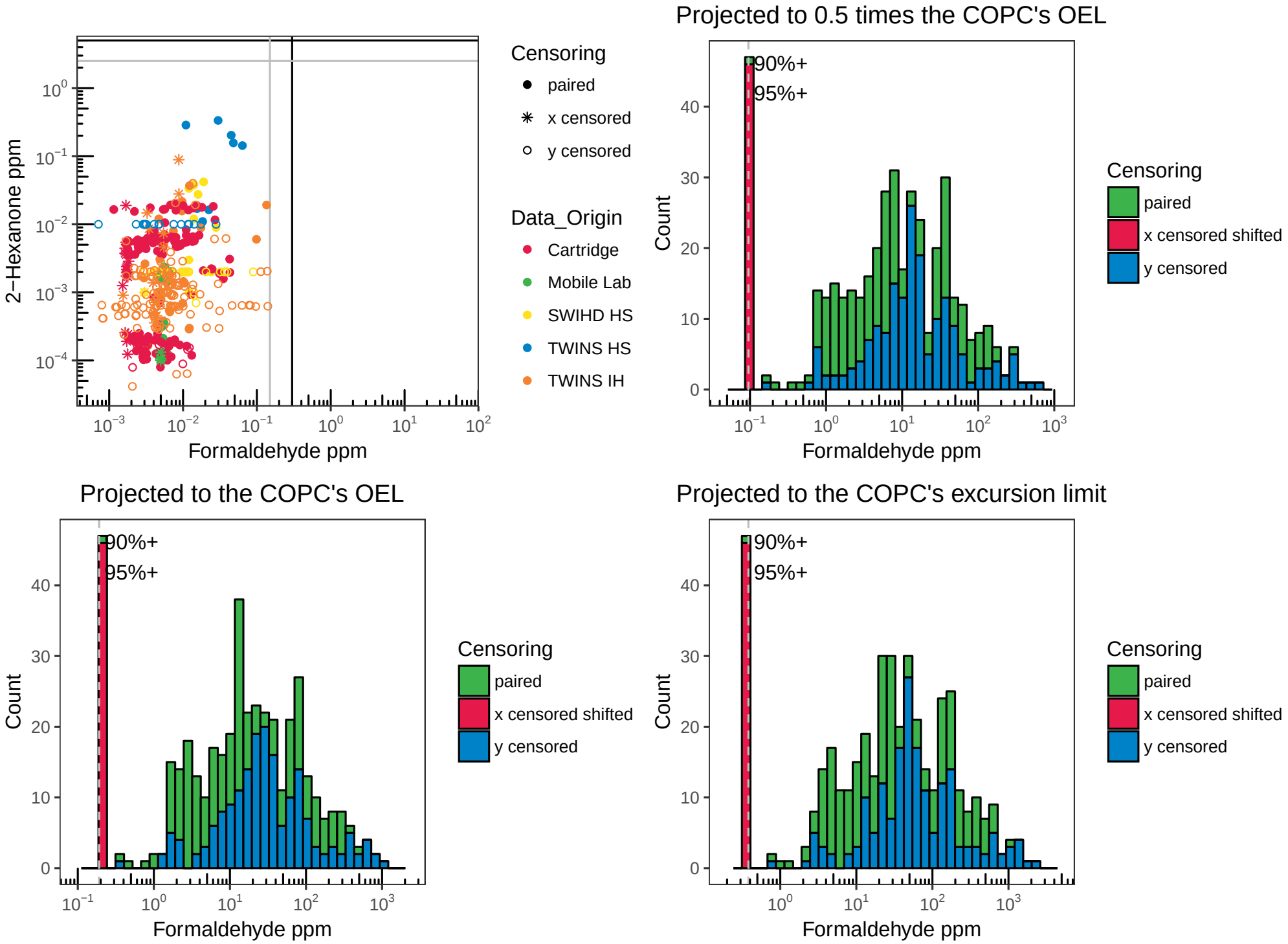


Figure C.711: 2-Hexanone vs Formaldehyde

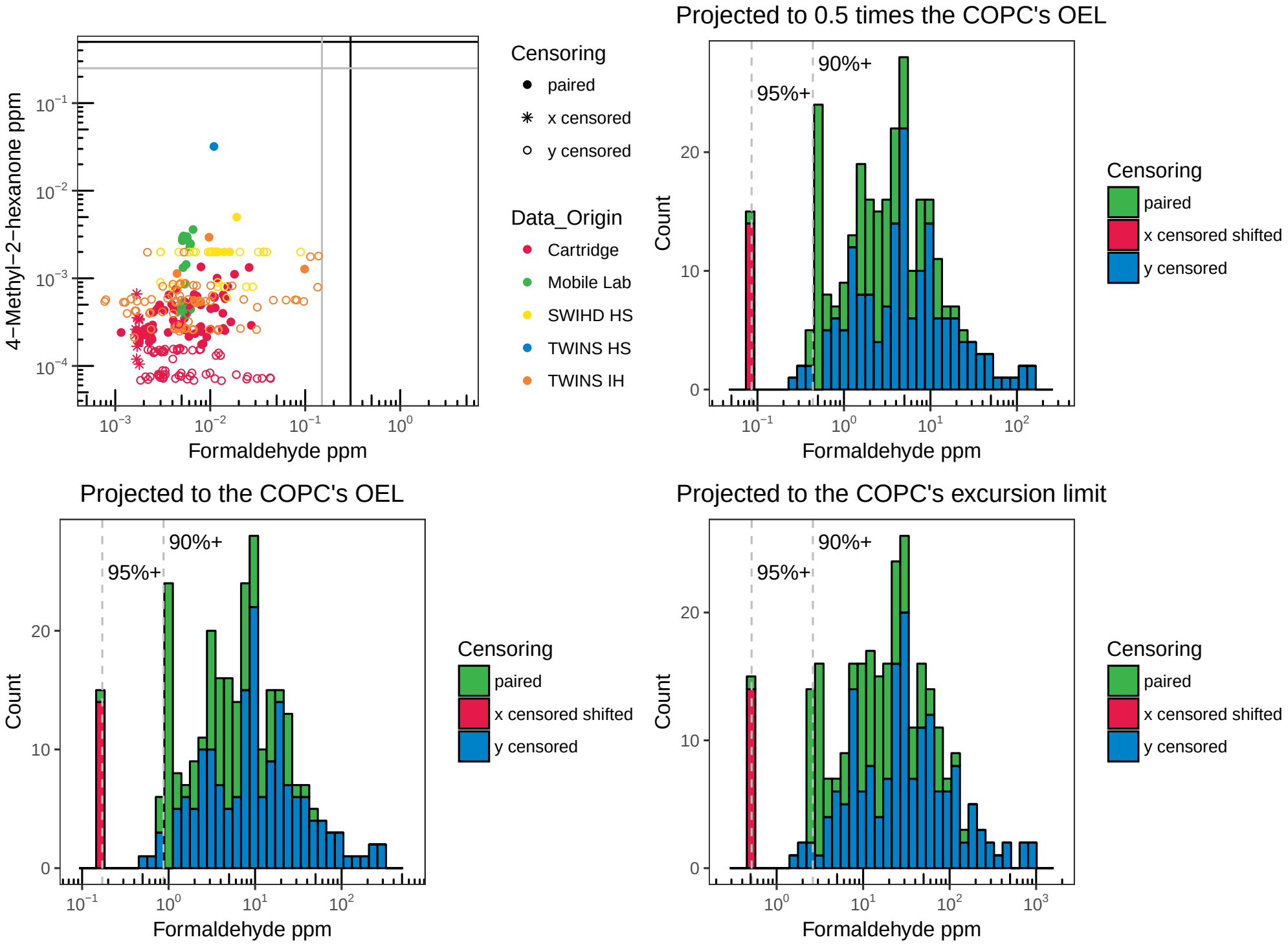


Figure C.712: 4-Methyl-2-hexanone vs Formaldehyde

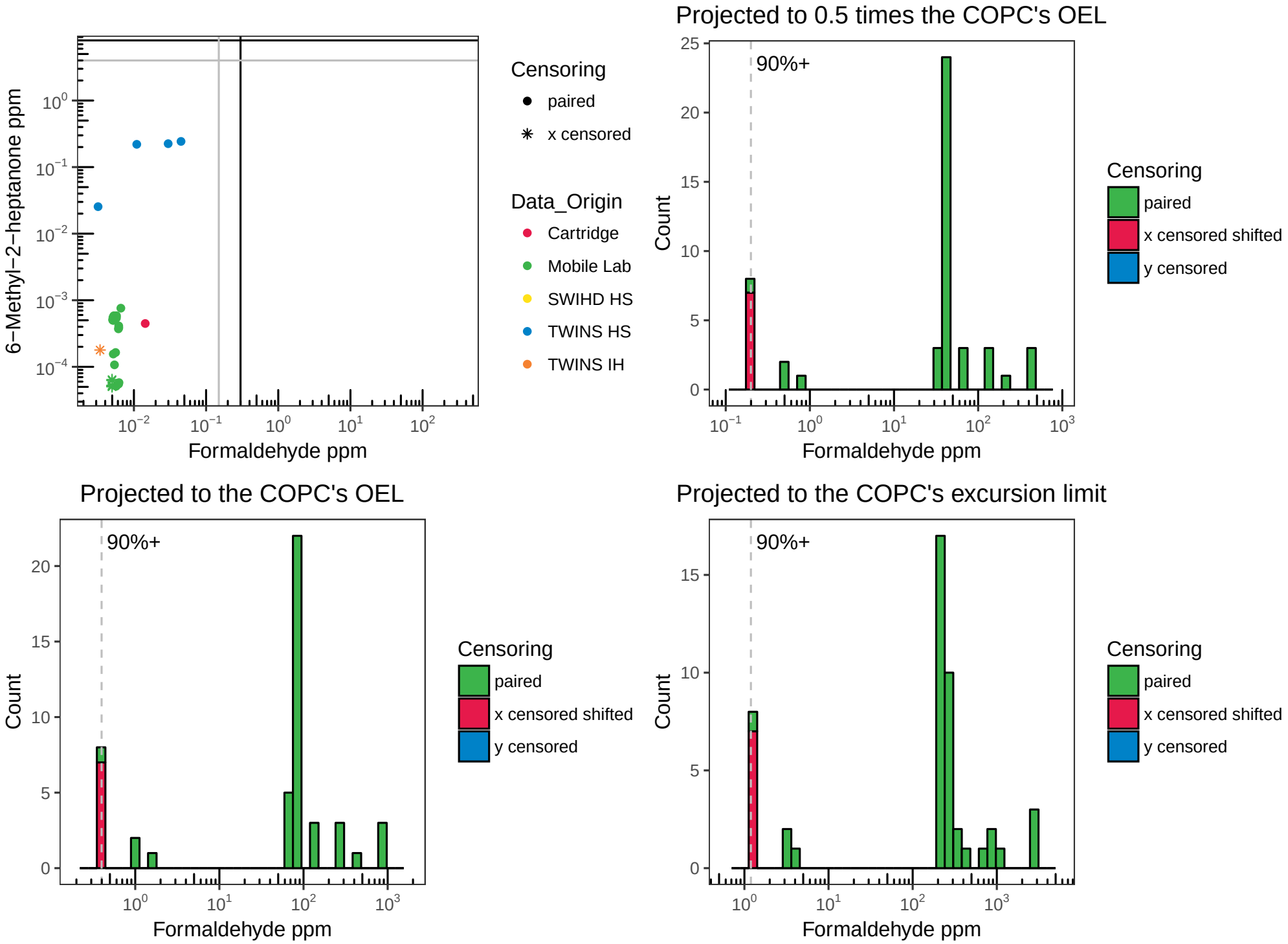


Figure C.713: 6-Methyl-2-heptanone vs Formaldehyde

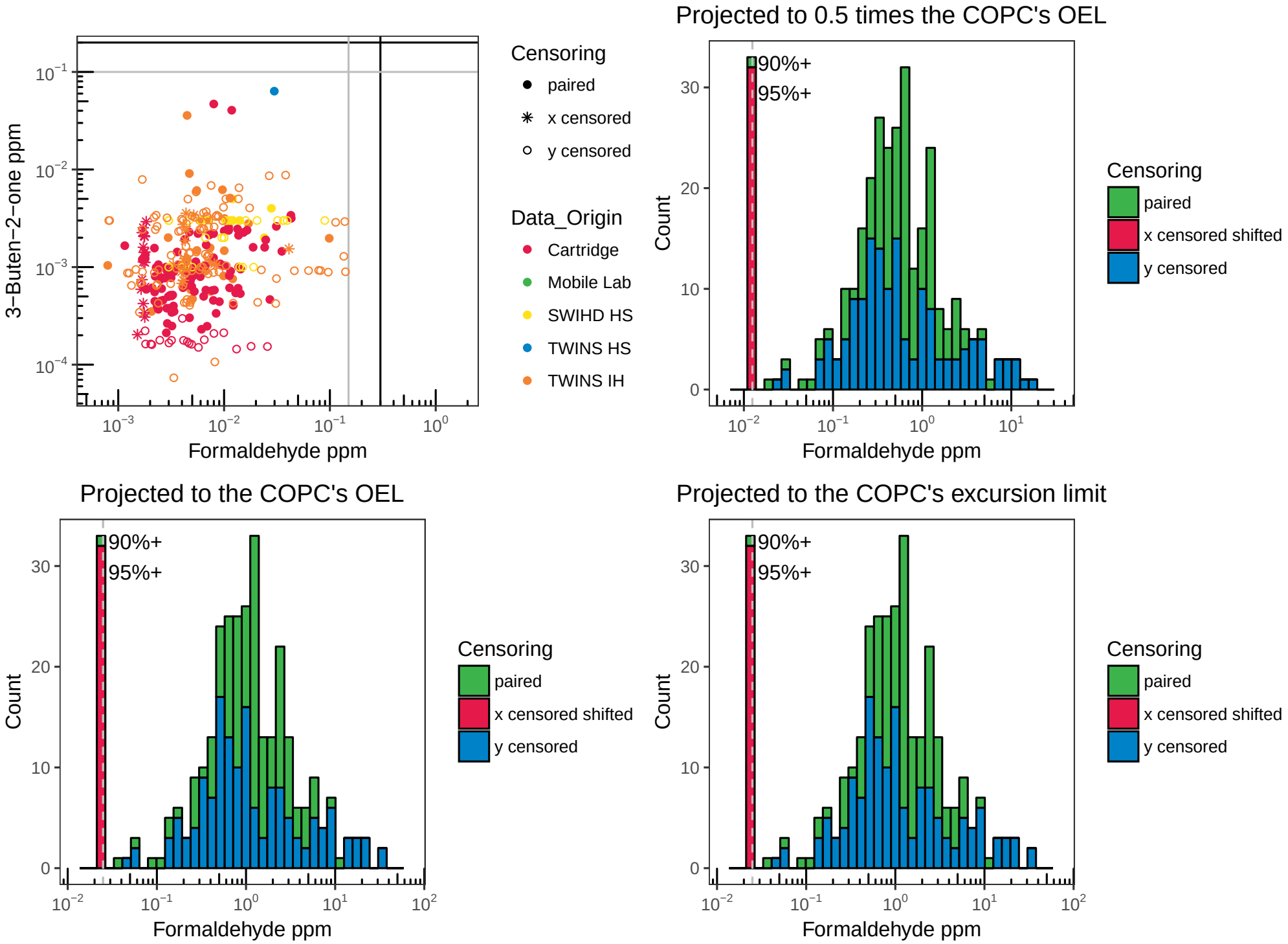


Figure C.714: 3-Buten-2-one vs Formaldehyde

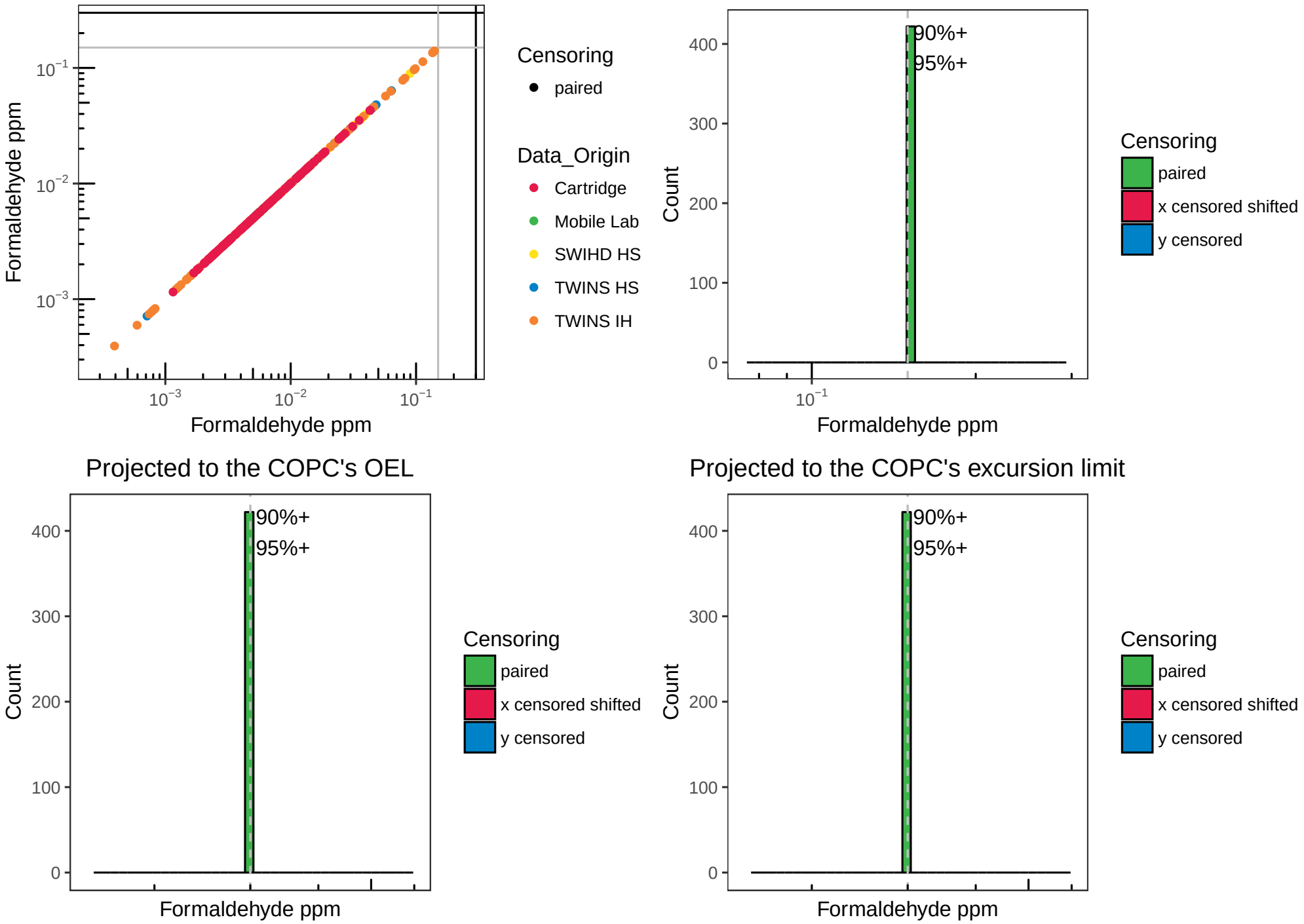


Figure C.715: Formaldehyde vs Formaldehyde

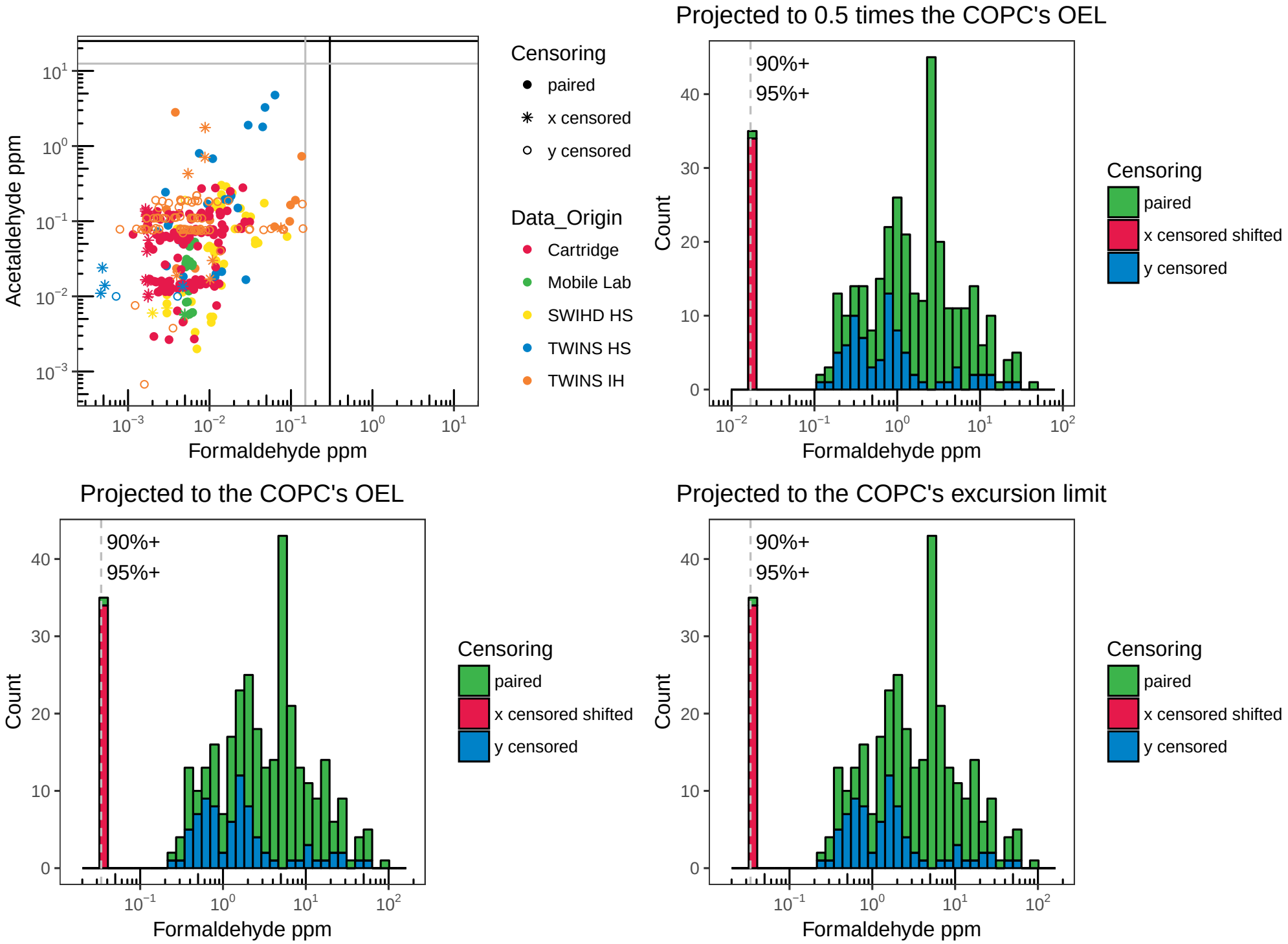


Figure C.716: Acetaldehyde vs Formaldehyde

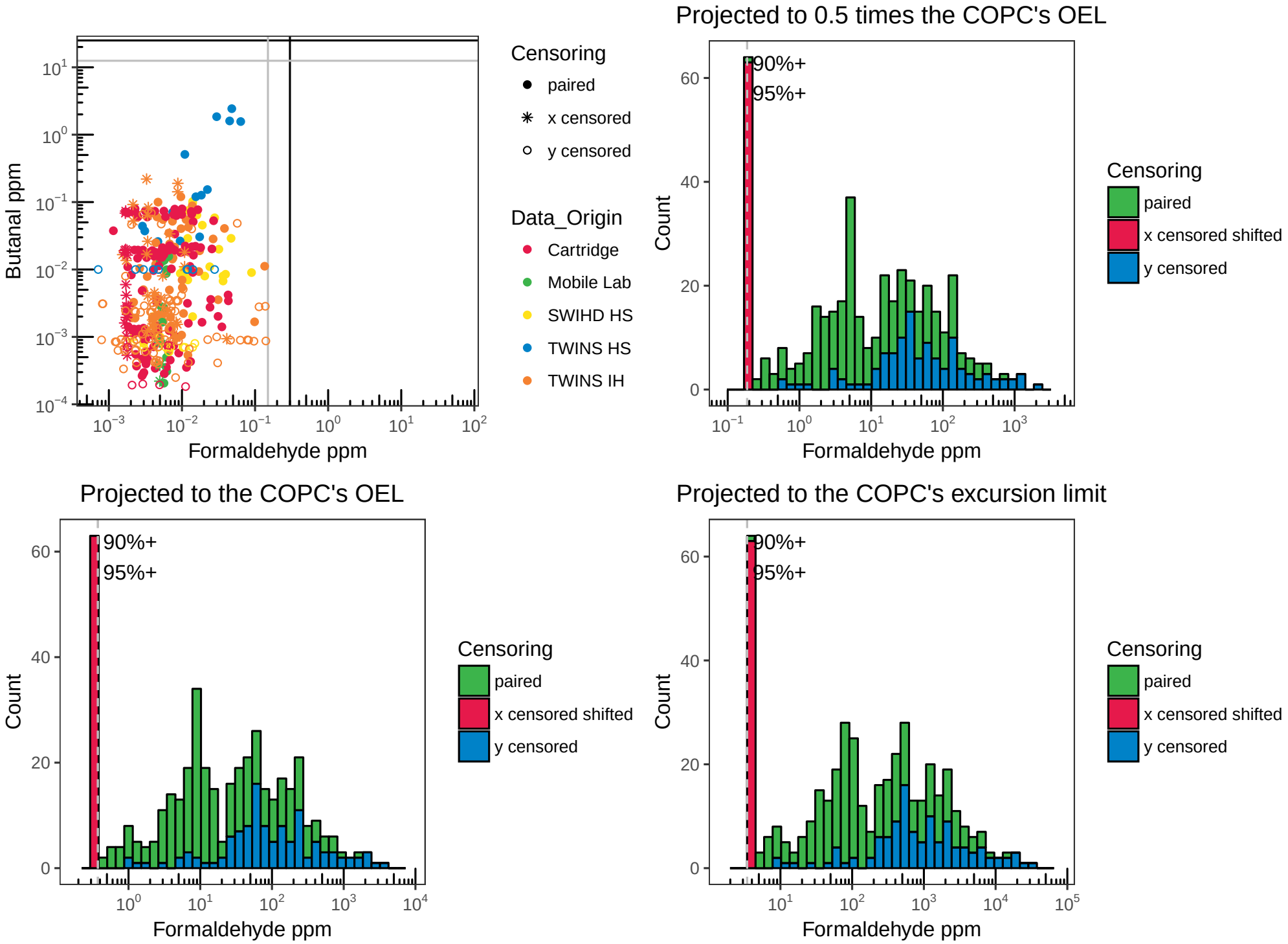


Figure C.717: Butanal vs Formaldehyde

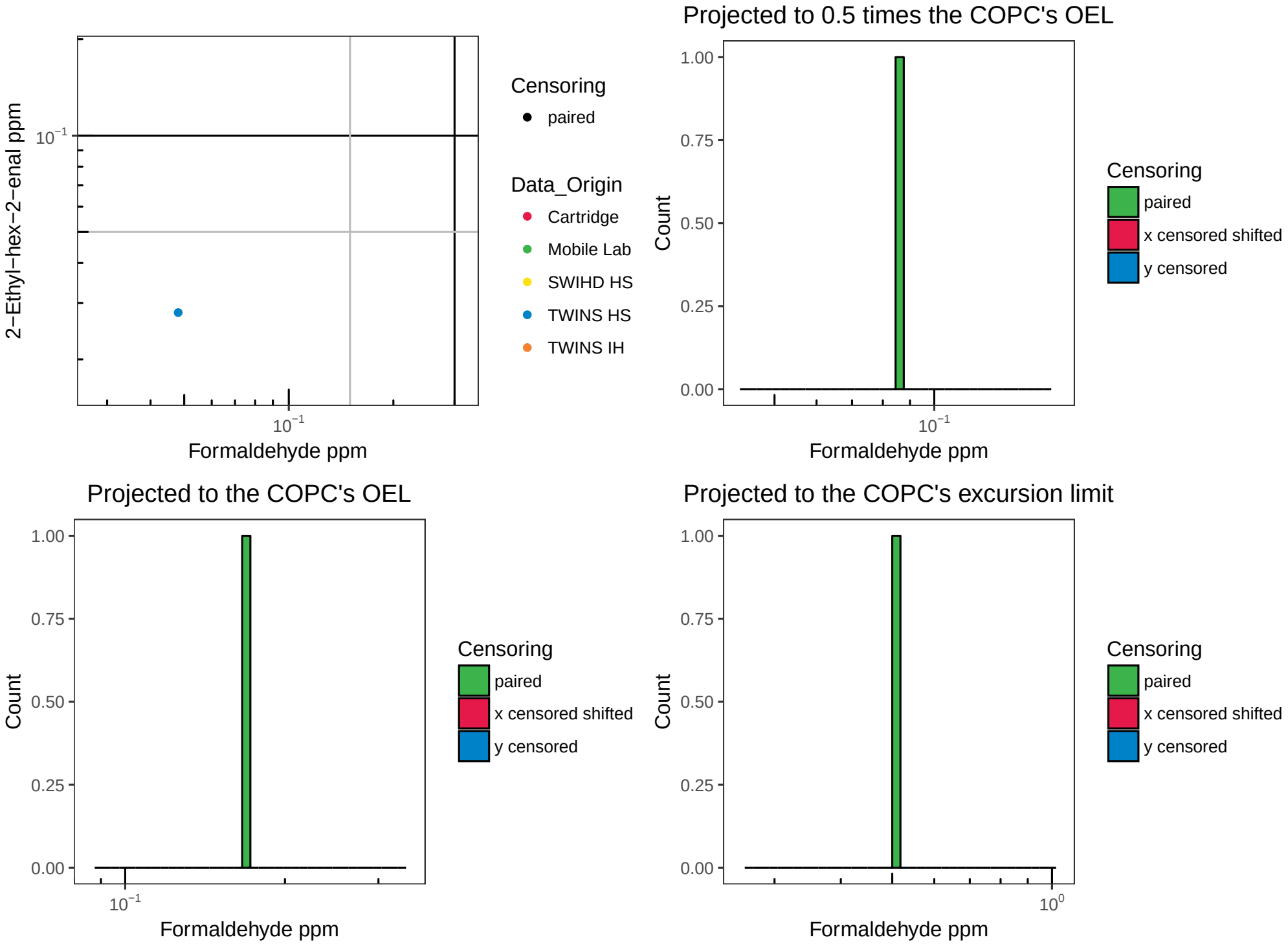


Figure C.718: 2-Ethyl-hex-2-enal vs Formaldehyde

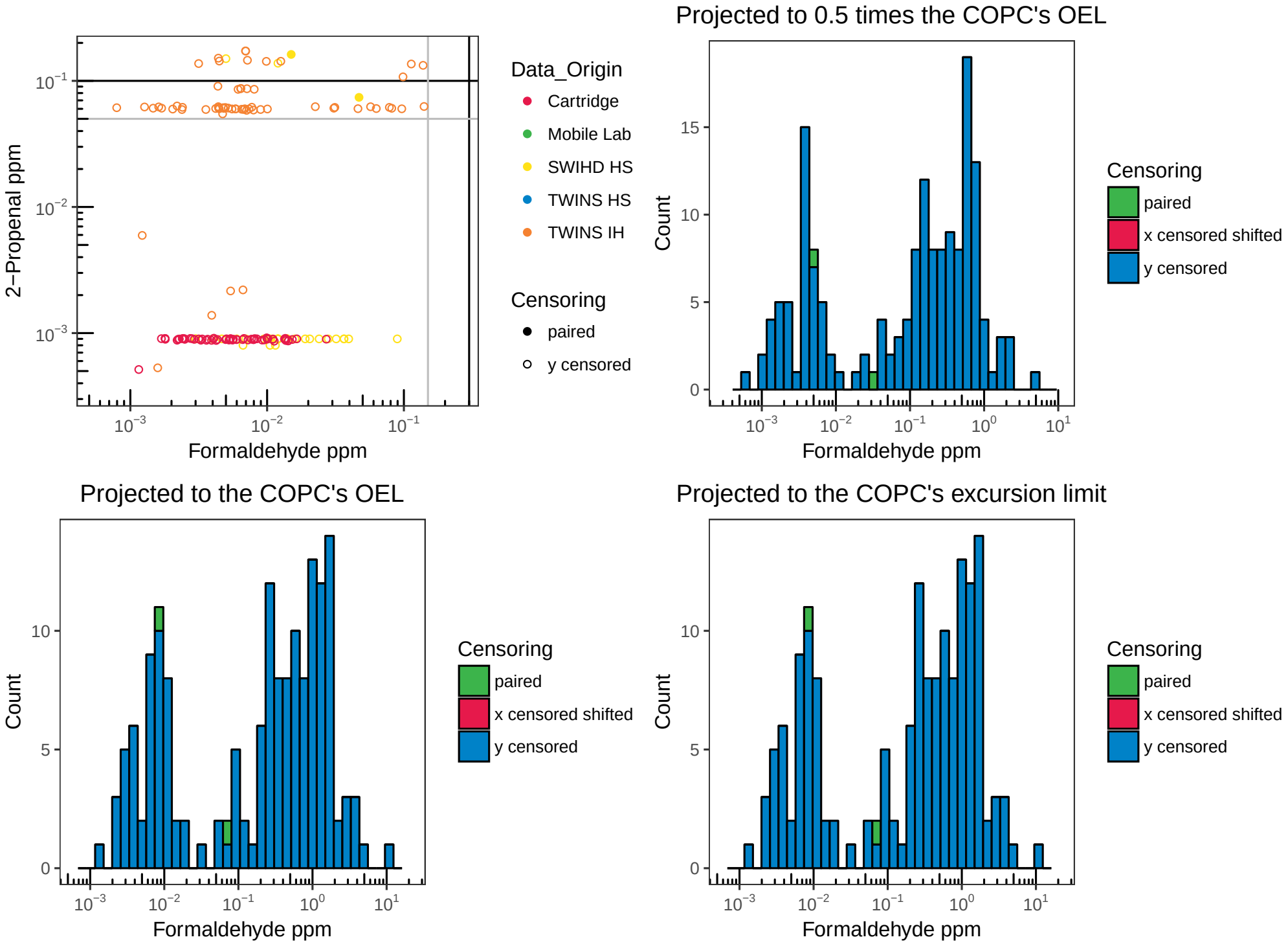


Figure C.719: 2-Propenal vs Formaldehyde

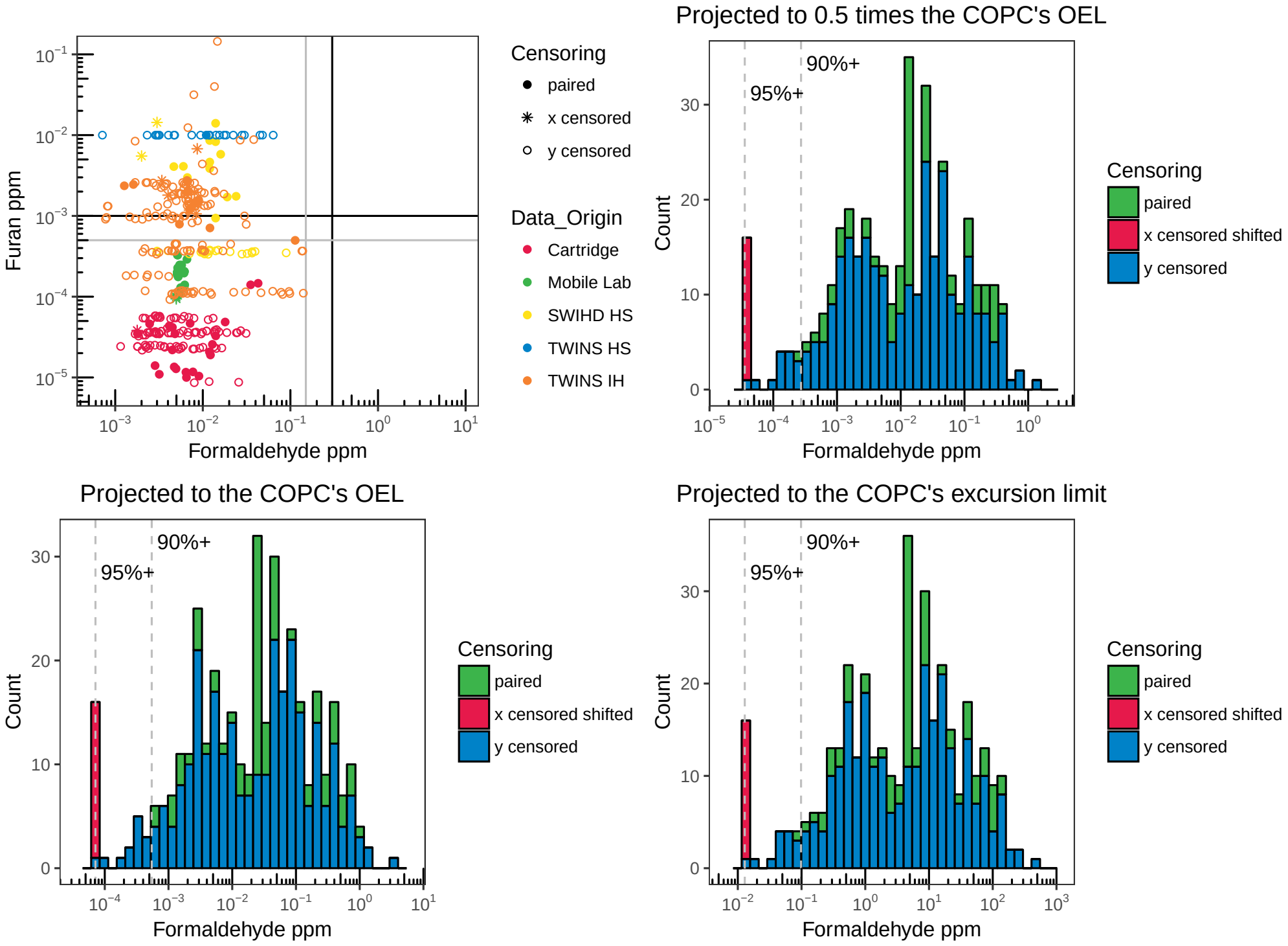


Figure C.720: Furan vs Formaldehyde

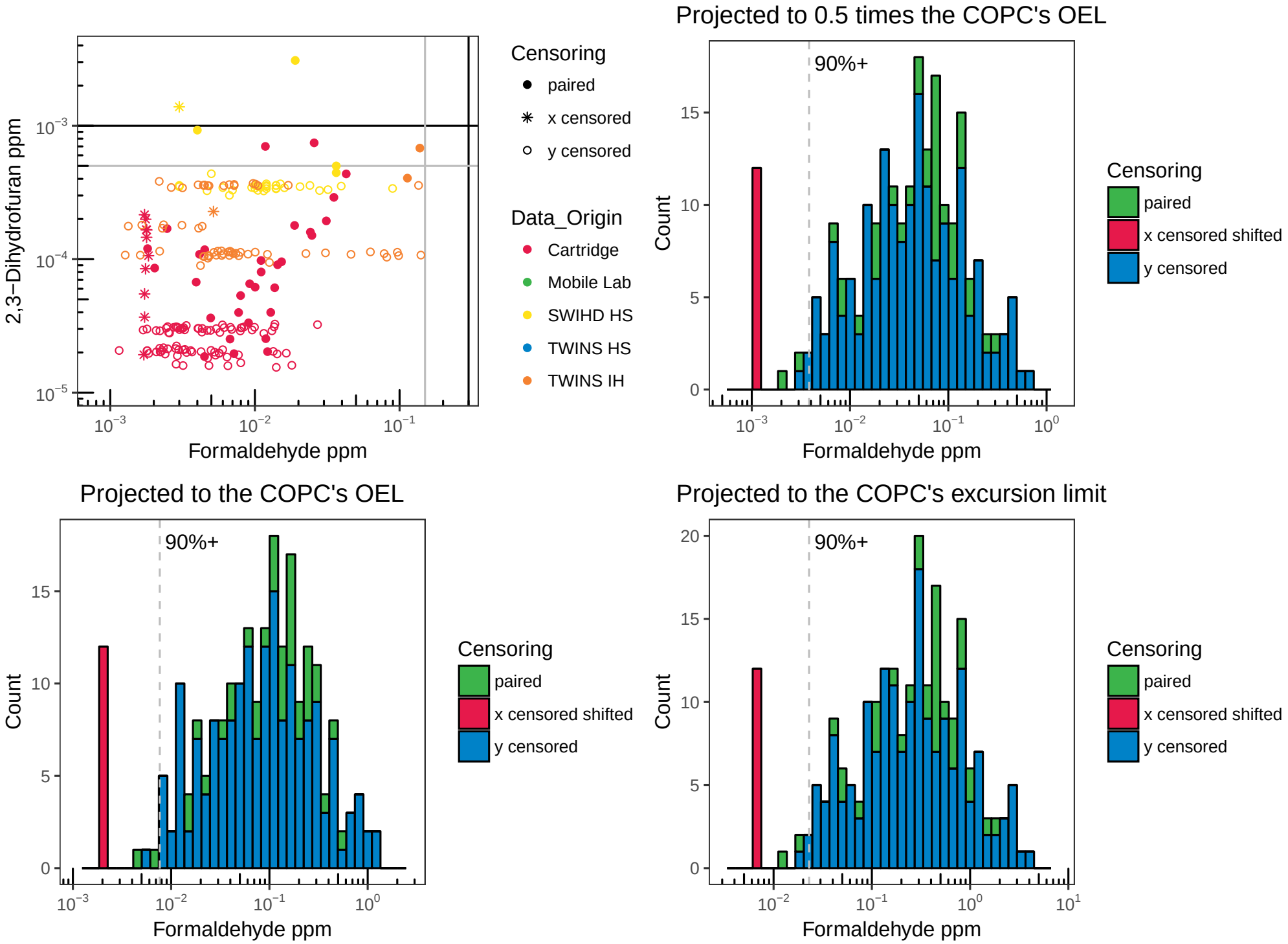


Figure C.721: 2,3-Dihydrofuran vs Formaldehyde

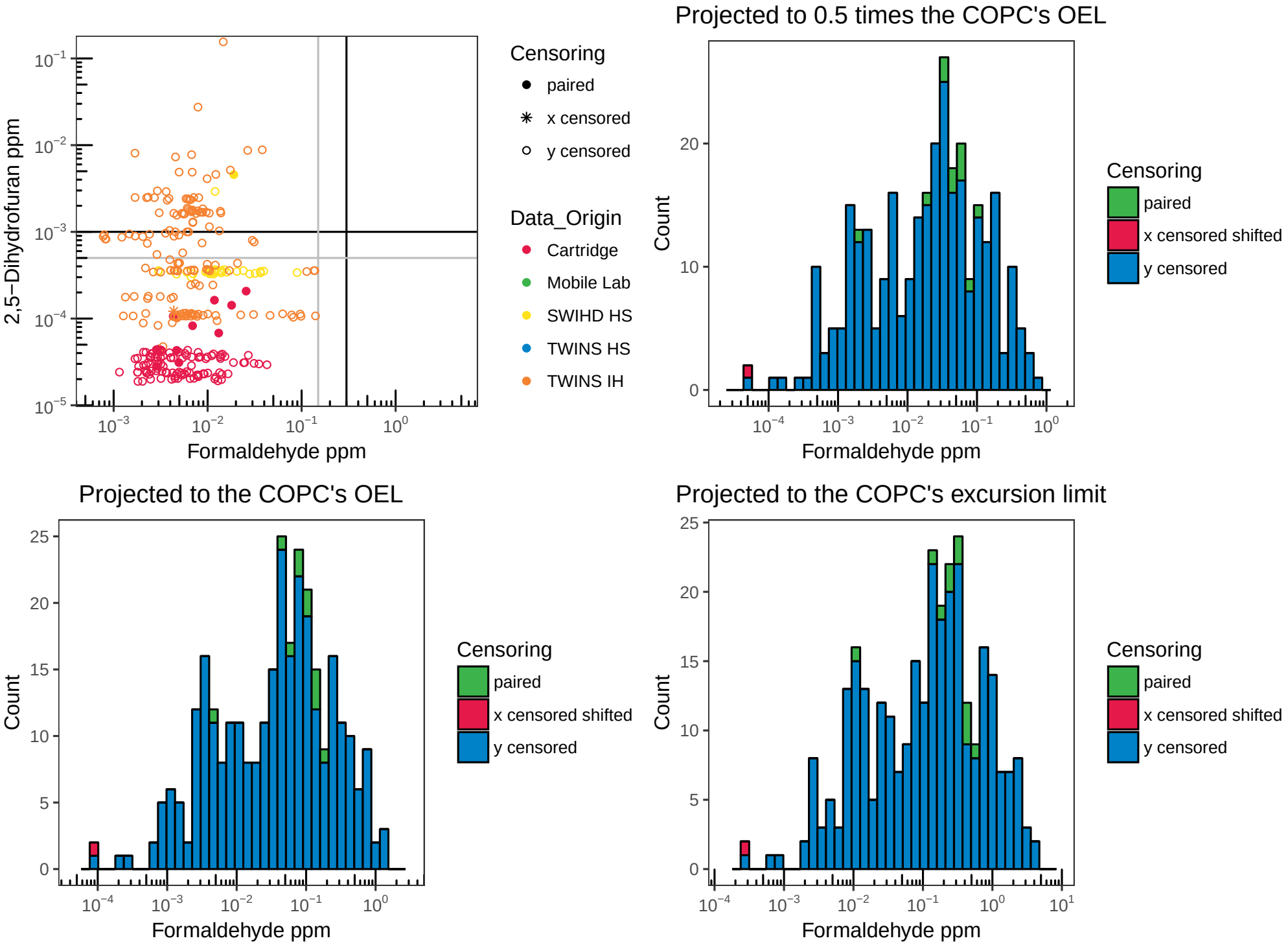


Figure C.722: 2,5-Dihydrofuran vs Formaldehyde

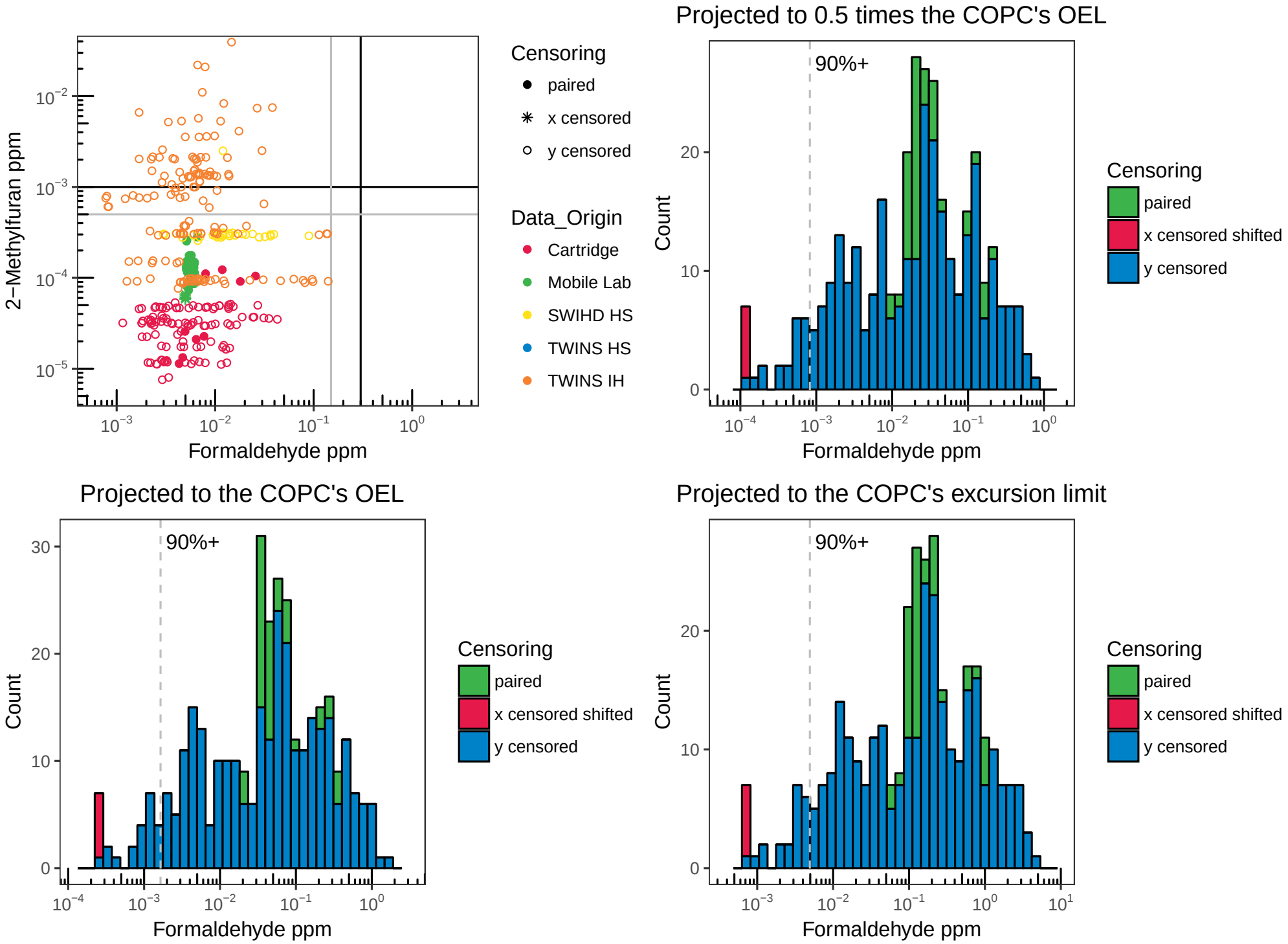


Figure C.723: 2-Methylfuran vs Formaldehyde

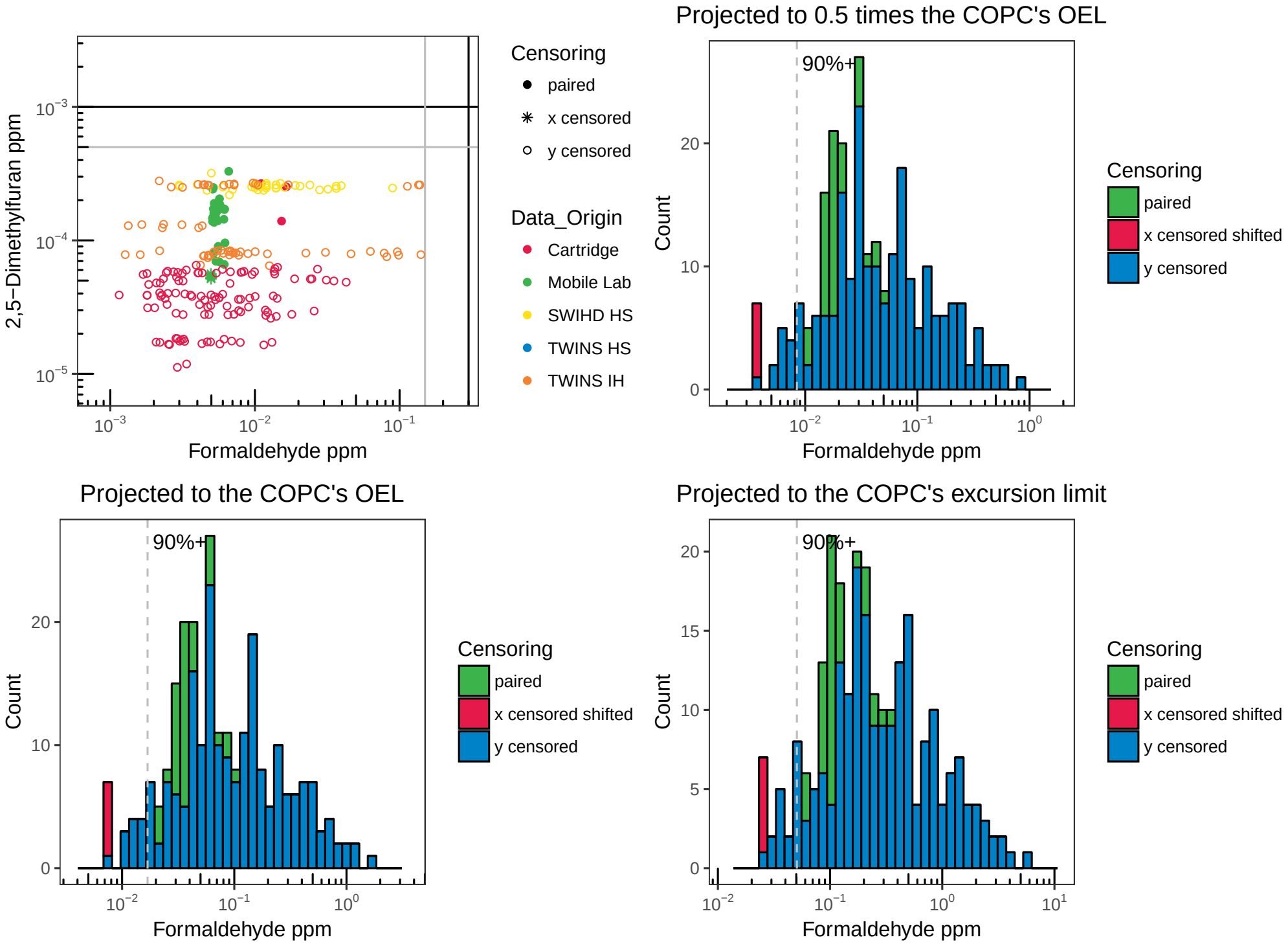


Figure C.724: 2,5-Dimethylfuran vs Formaldehyde

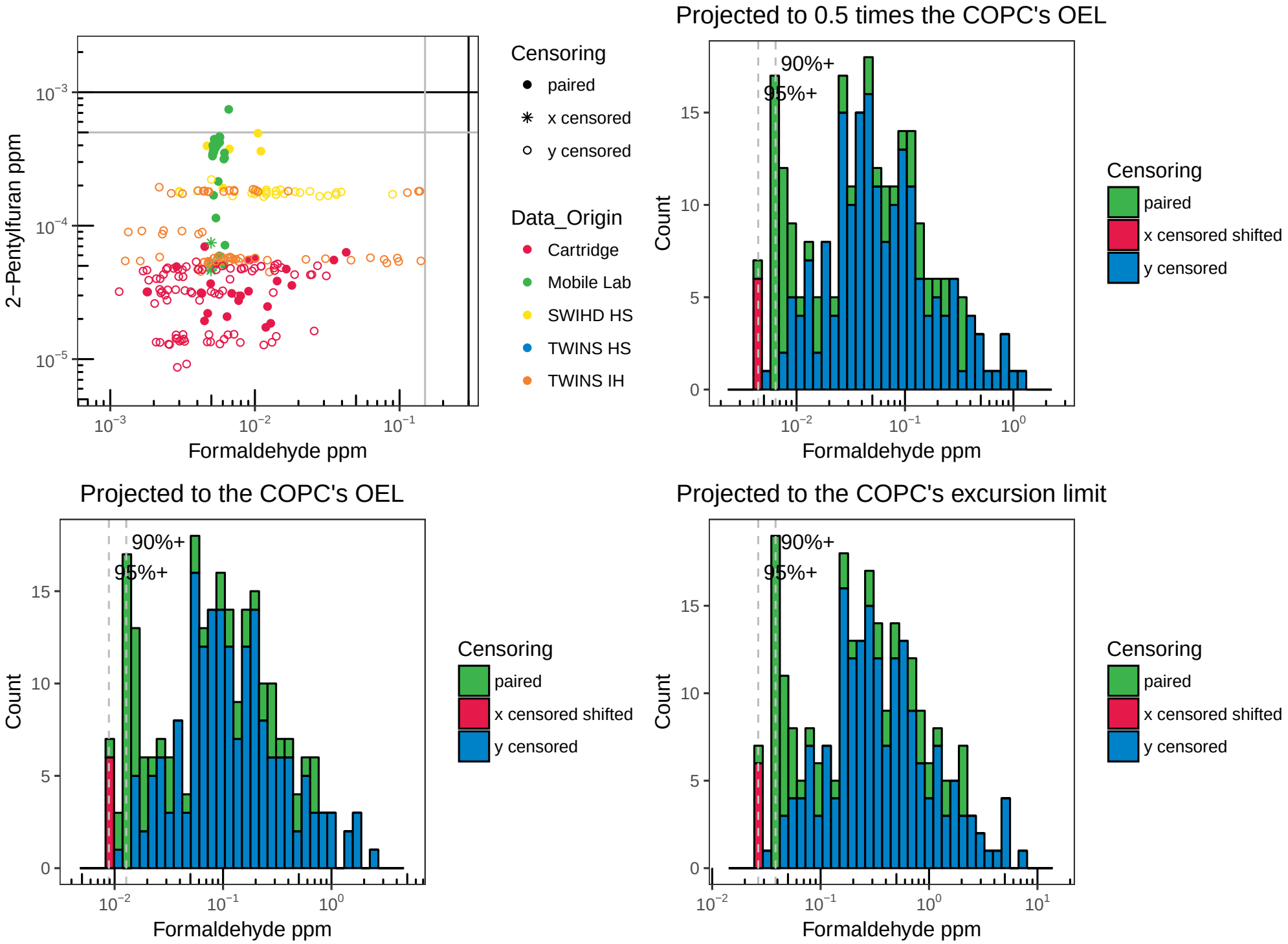


Figure C.725: 2-Pentylfuran vs Formaldehyde

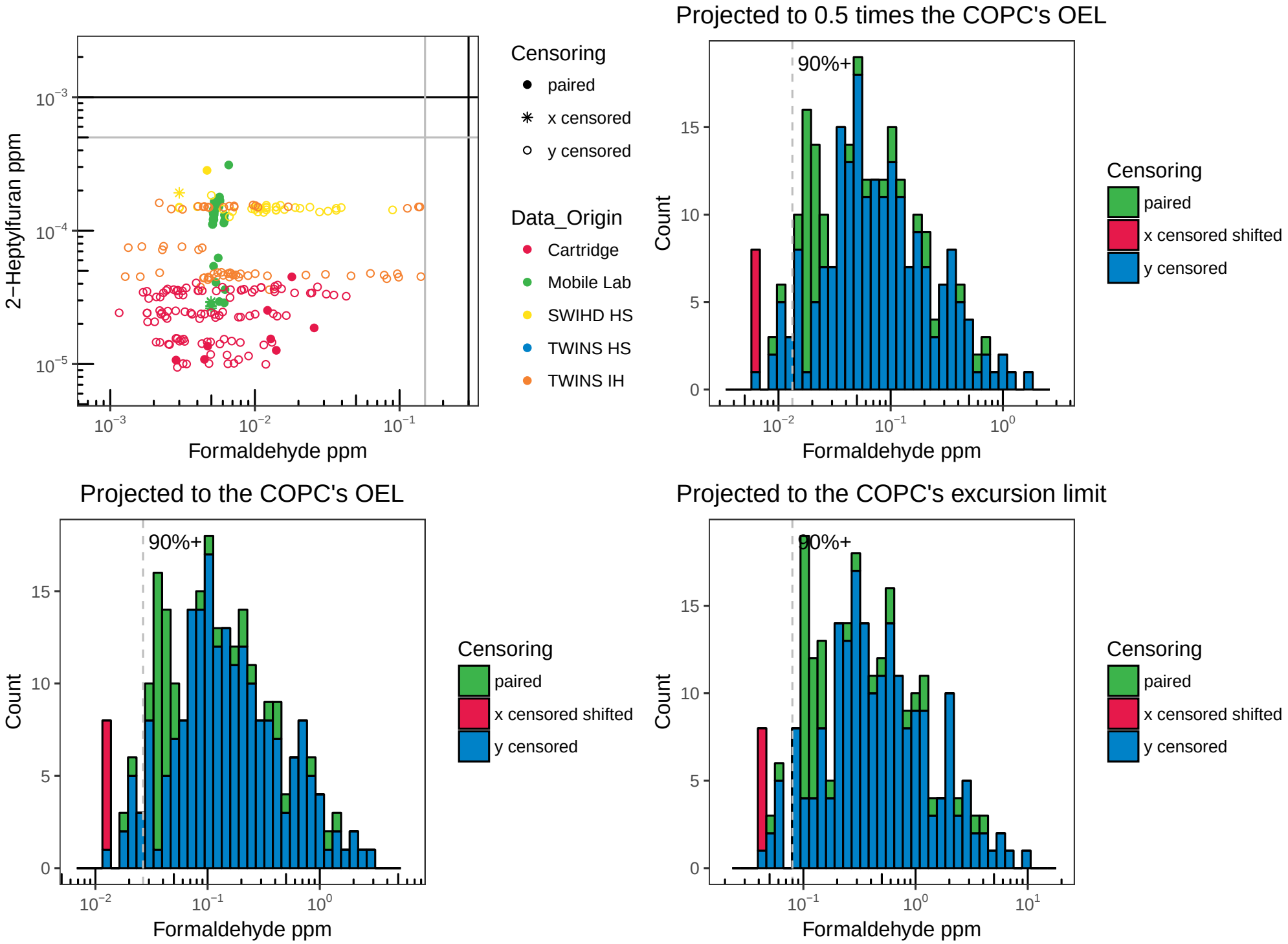


Figure C.726: 2-Heptylfuran vs Formaldehyde

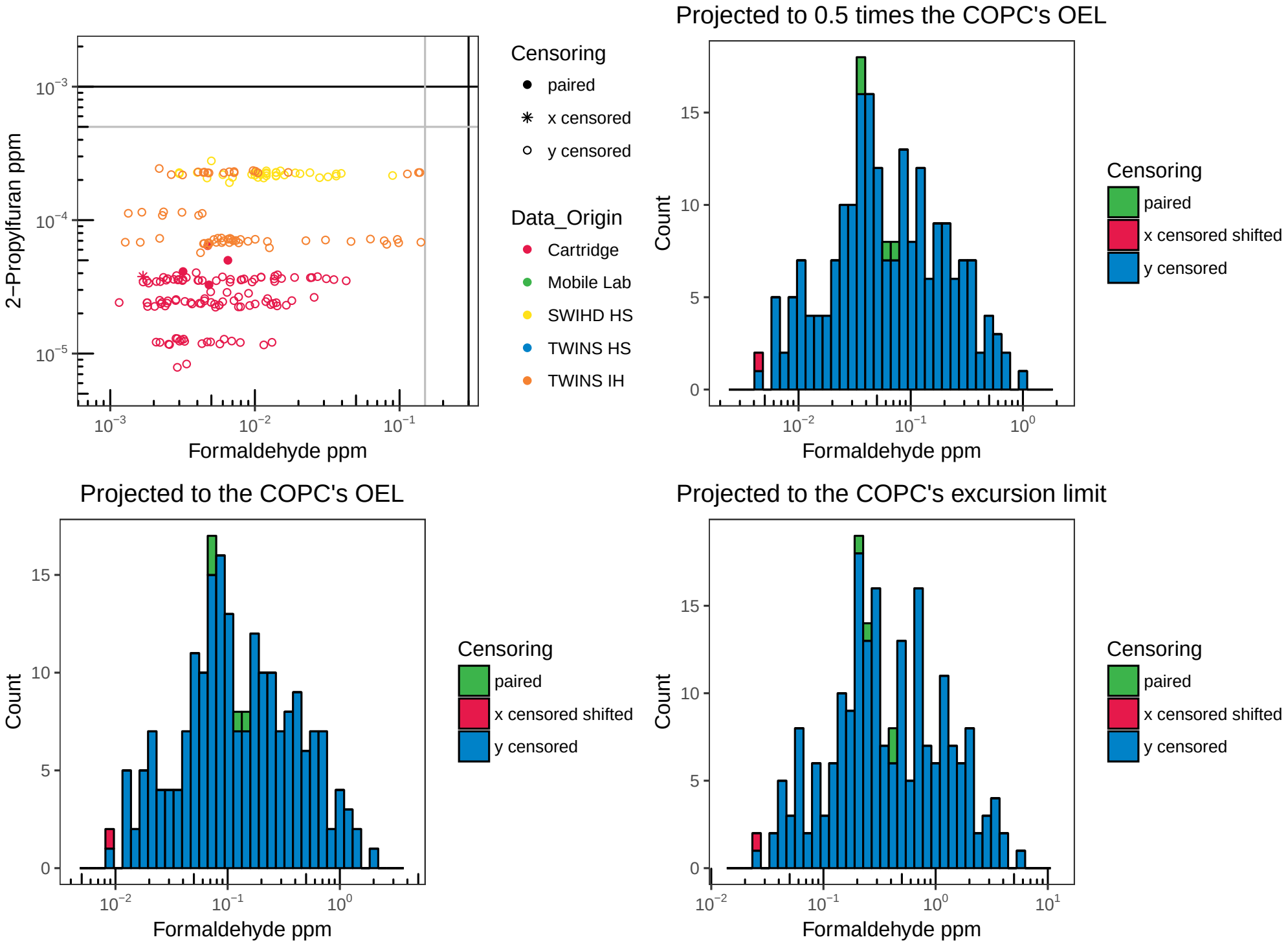


Figure C.727: 2-Propylfuran vs Formaldehyde

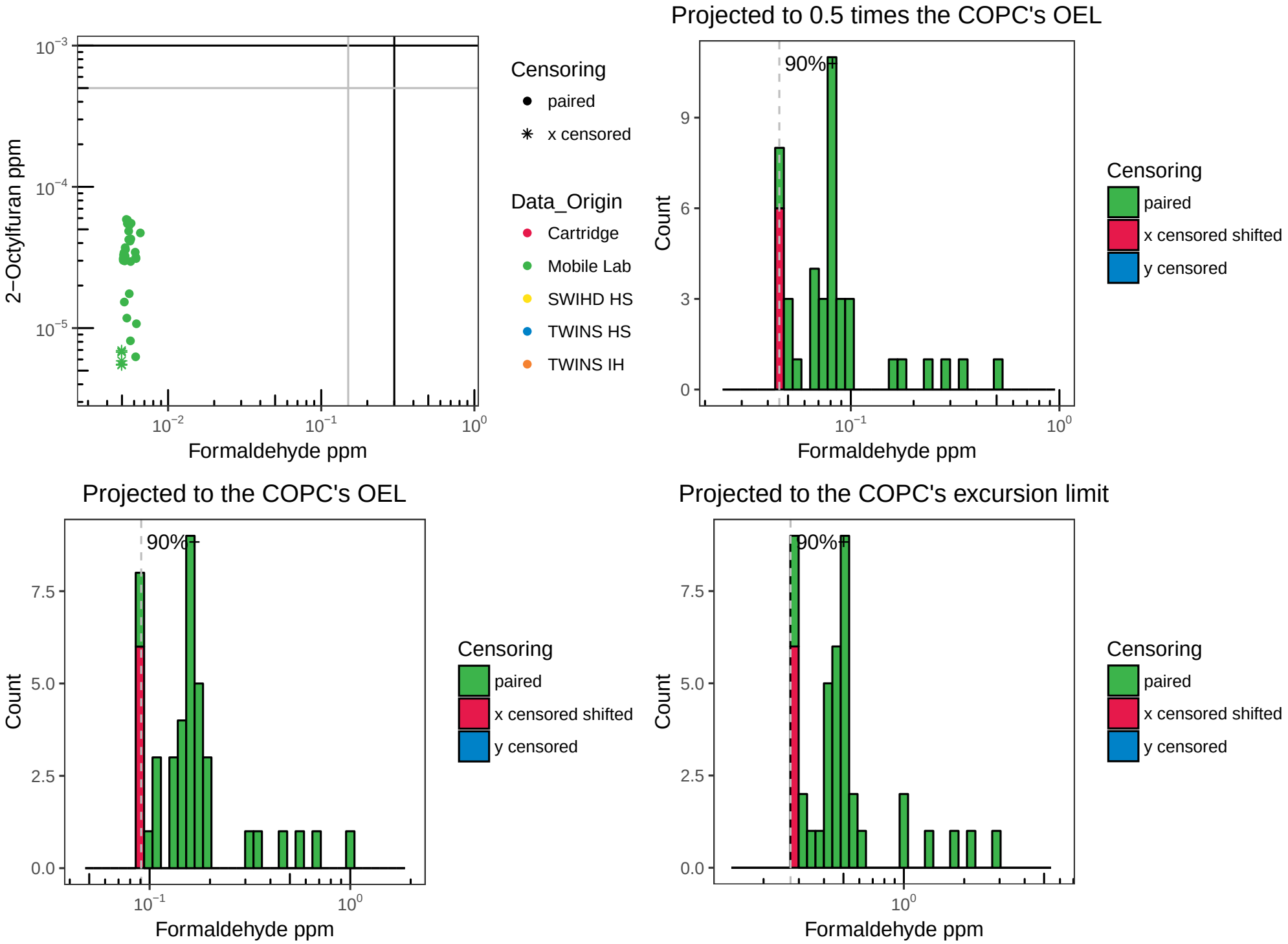


Figure C.728: 2-Octylfuran vs Formaldehyde

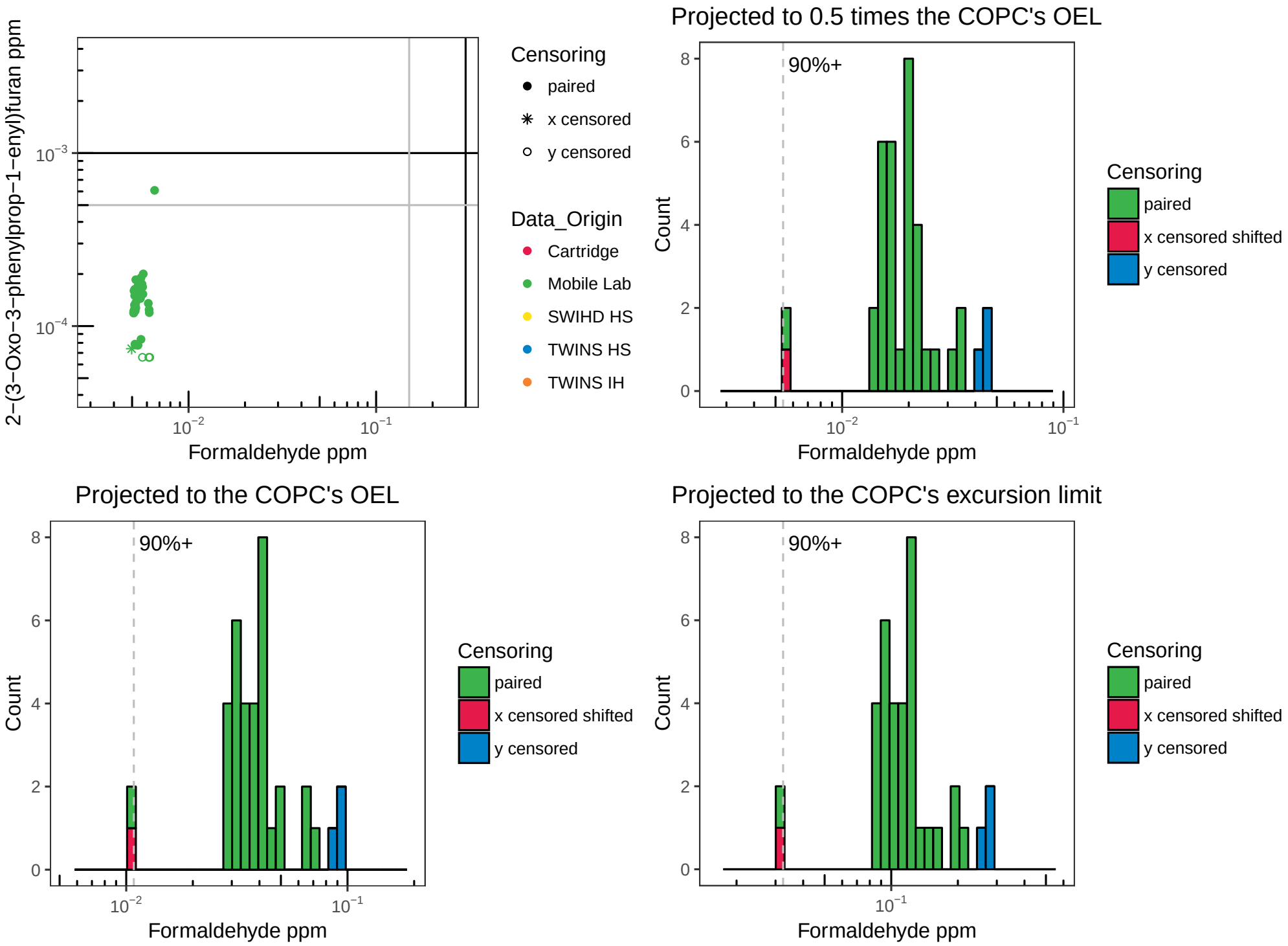


Figure C.729: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Formaldehyde

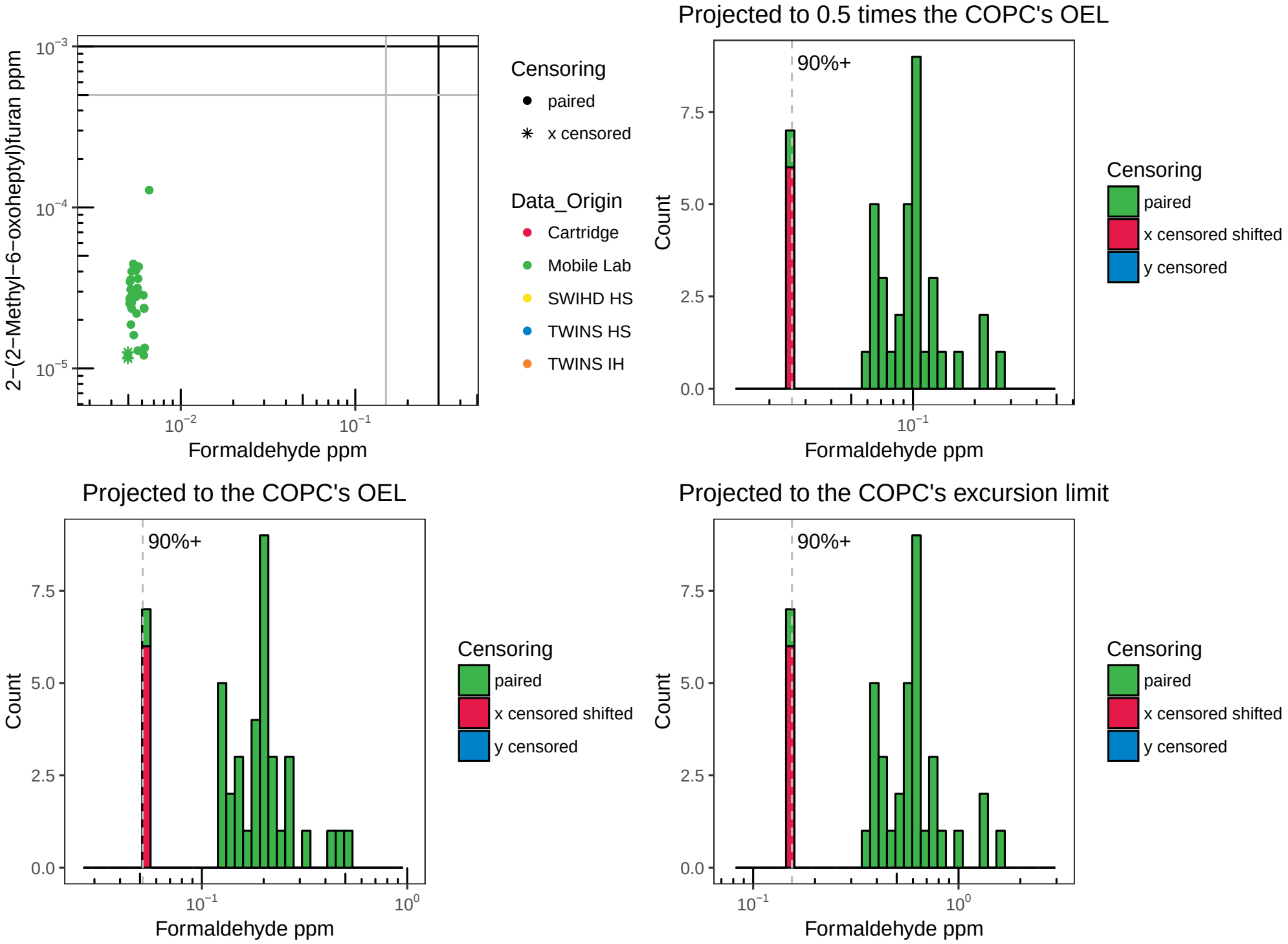


Figure C.730: 2-(2-Methyl-6-oxoheptyl)furan vs Formaldehyde

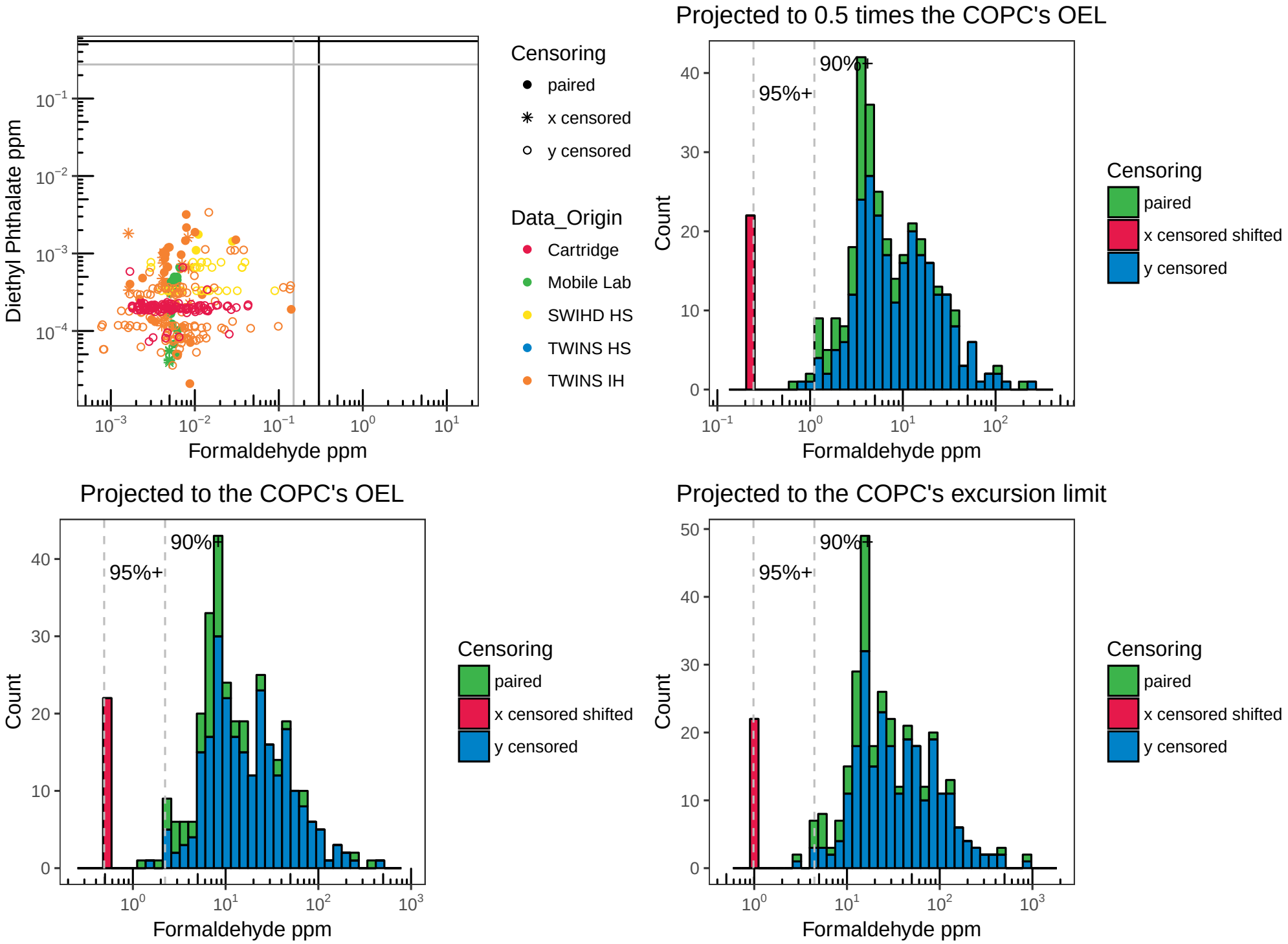


Figure C.731: Diethyl Phthalate vs Formaldehyde

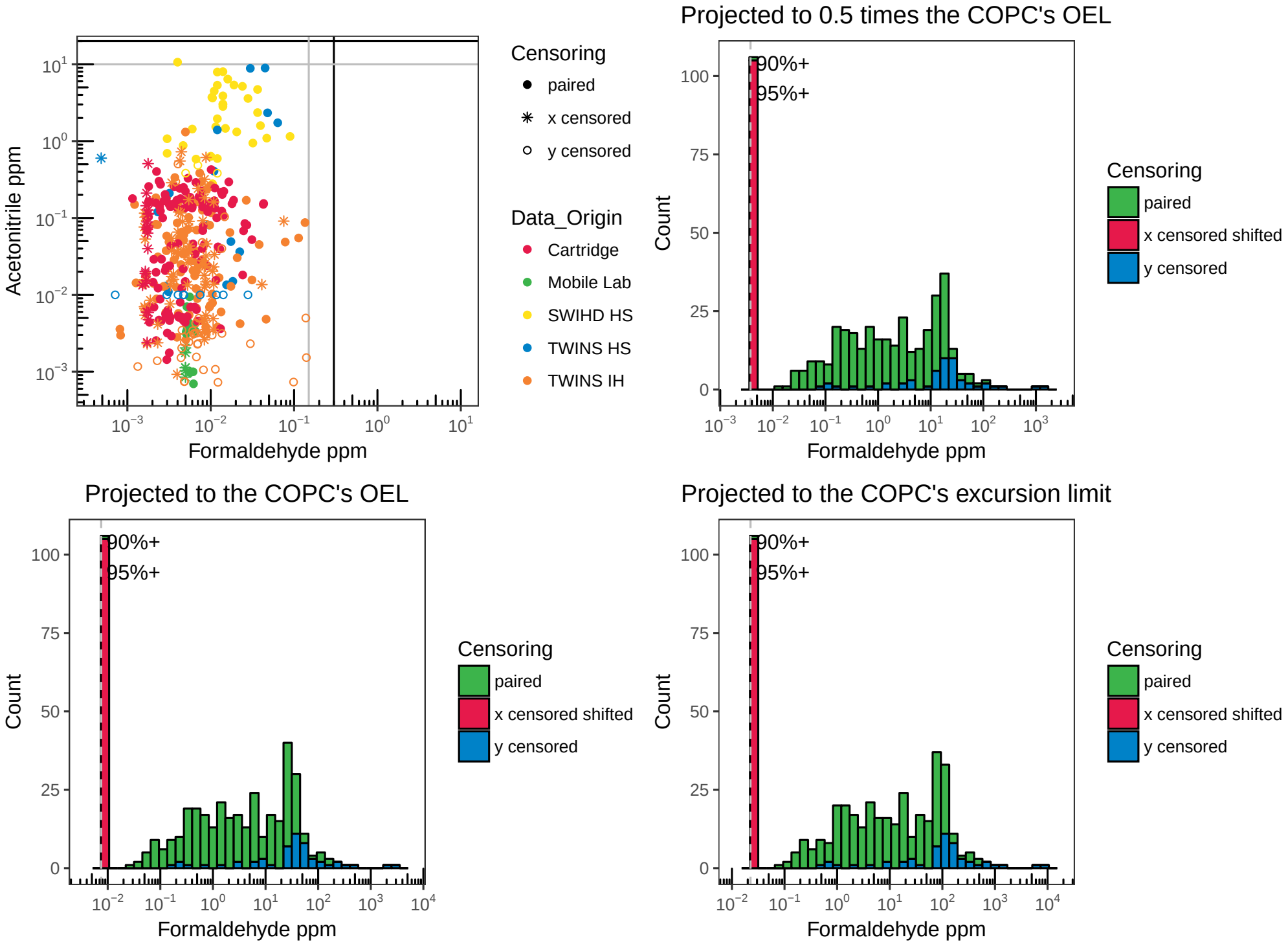


Figure C.732: Acetonitrile vs Formaldehyde

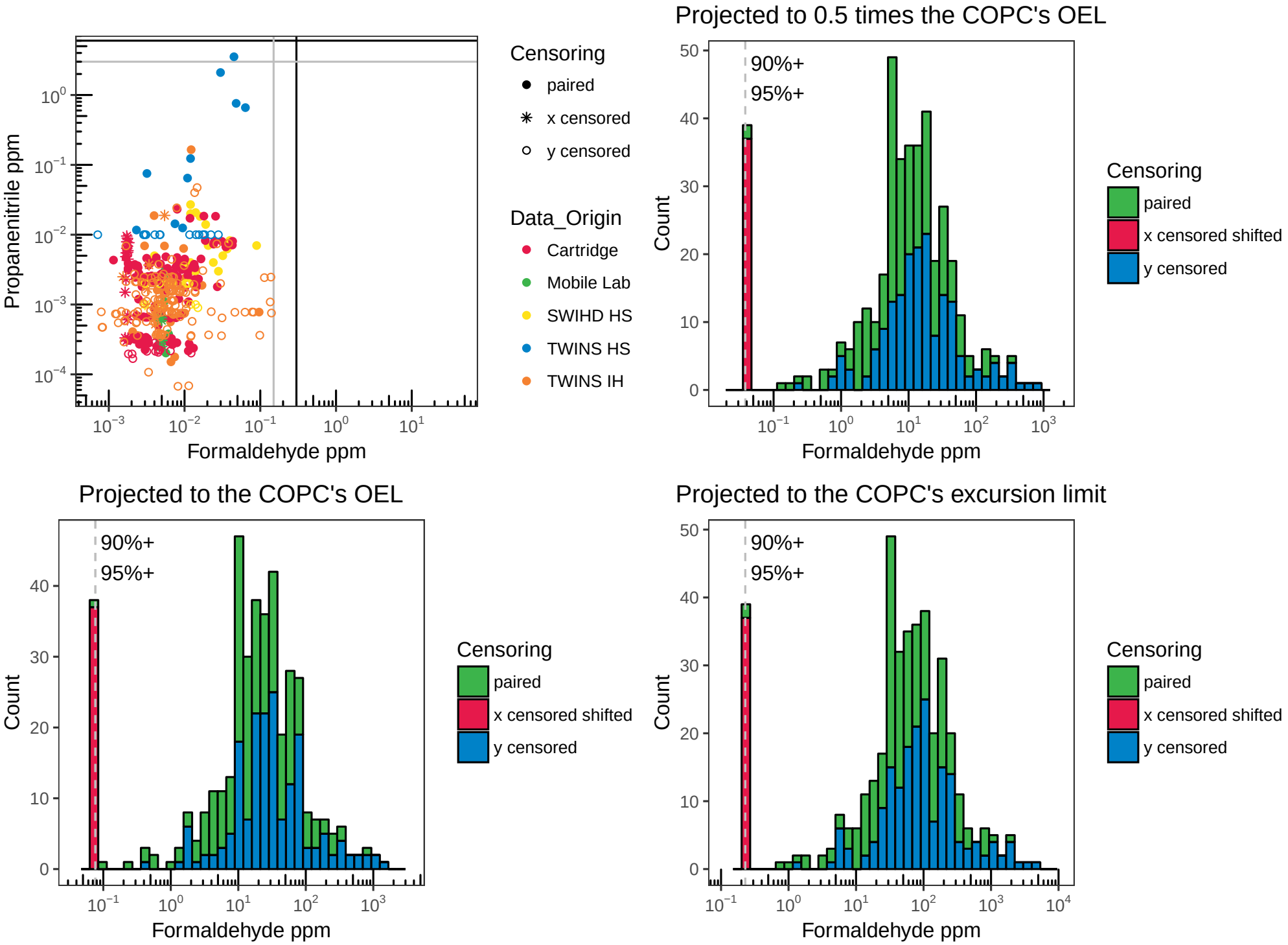


Figure C.733: Propanenitrile vs Formaldehyde

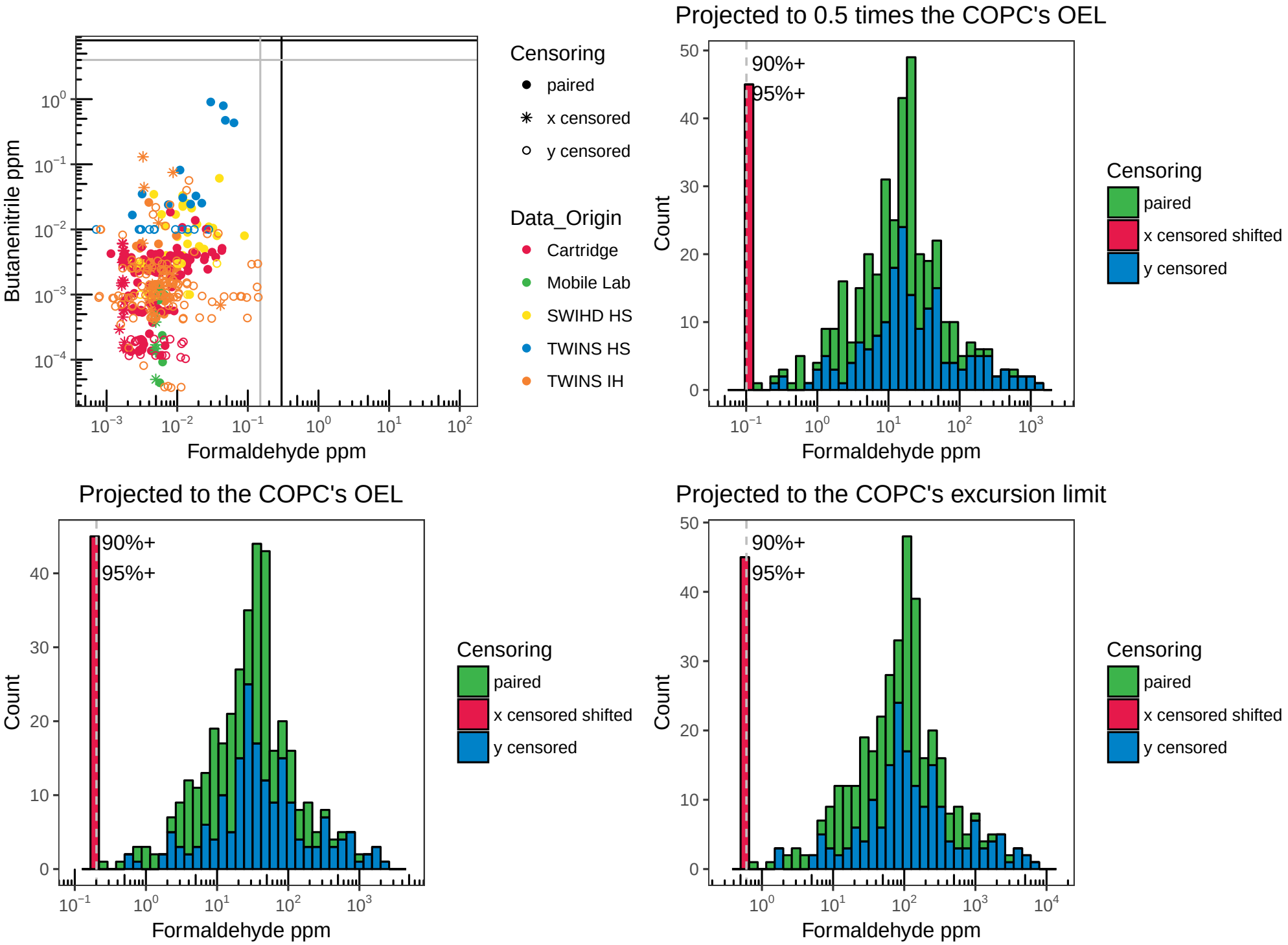


Figure C.734: Butanenitrile vs Formaldehyde

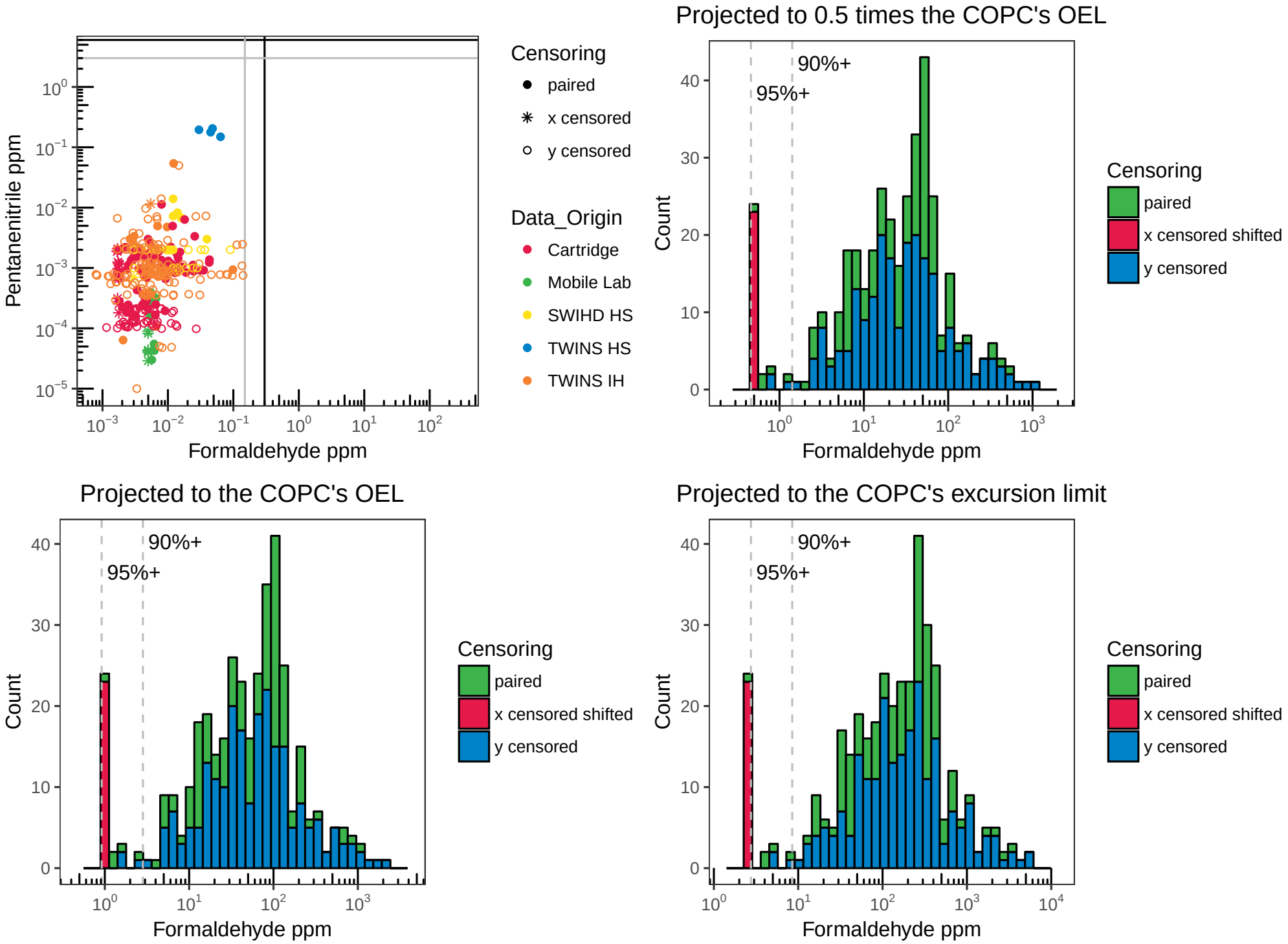


Figure C.735: Pentanenitrile vs Formaldehyde

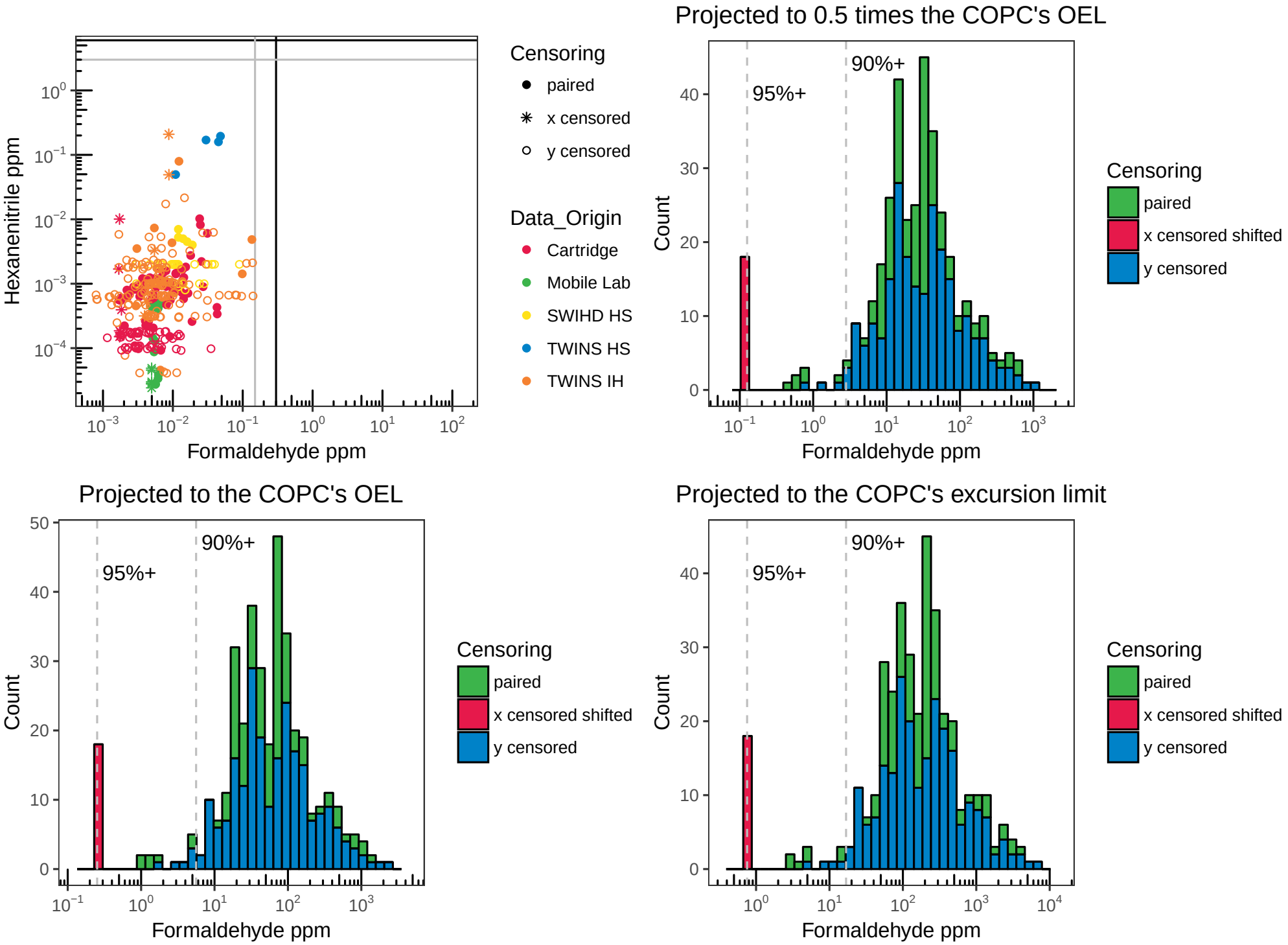


Figure C.736: Hexanenitrile vs Formaldehyde

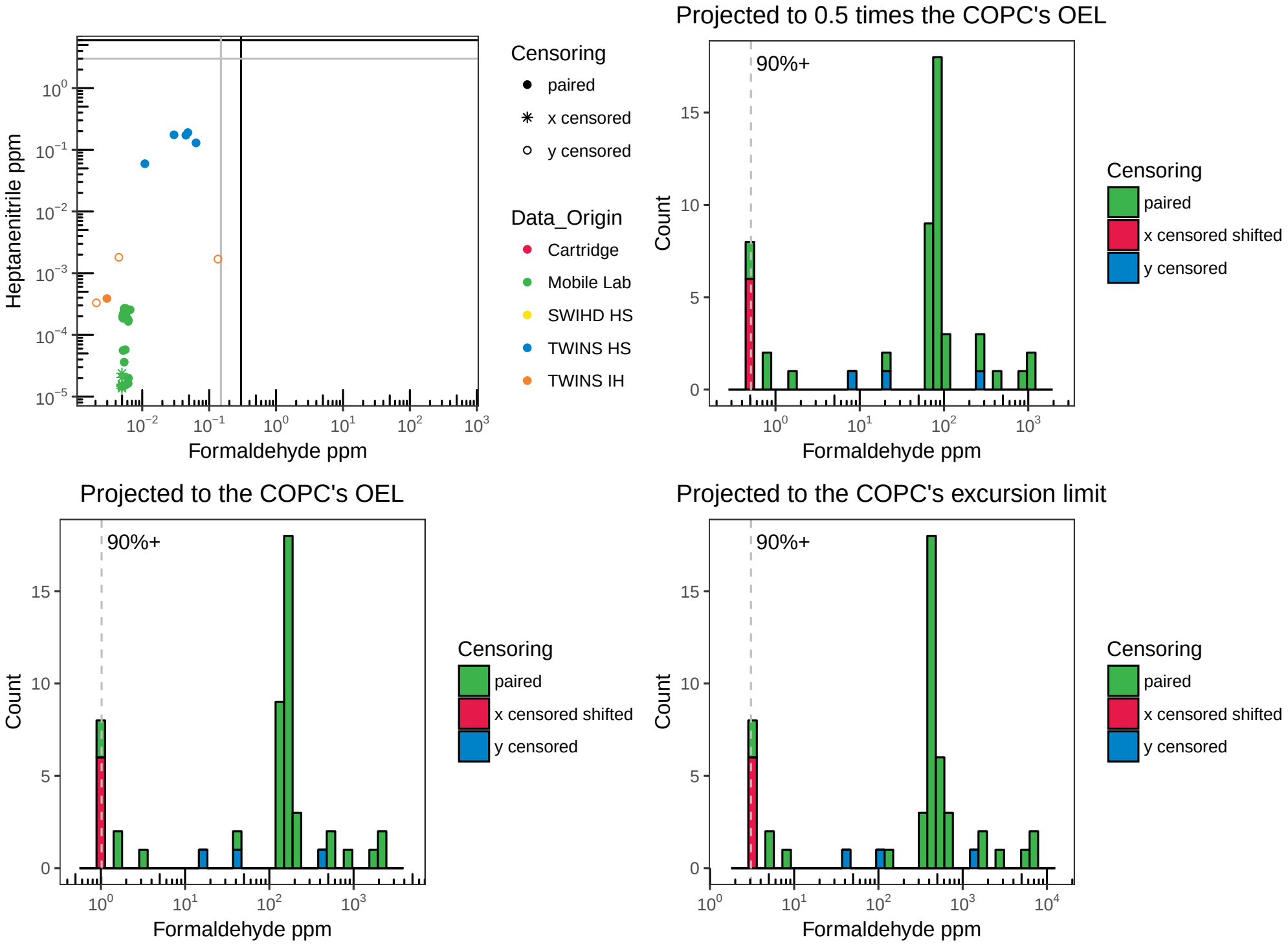


Figure C.737: Heptanenitrile vs Formaldehyde

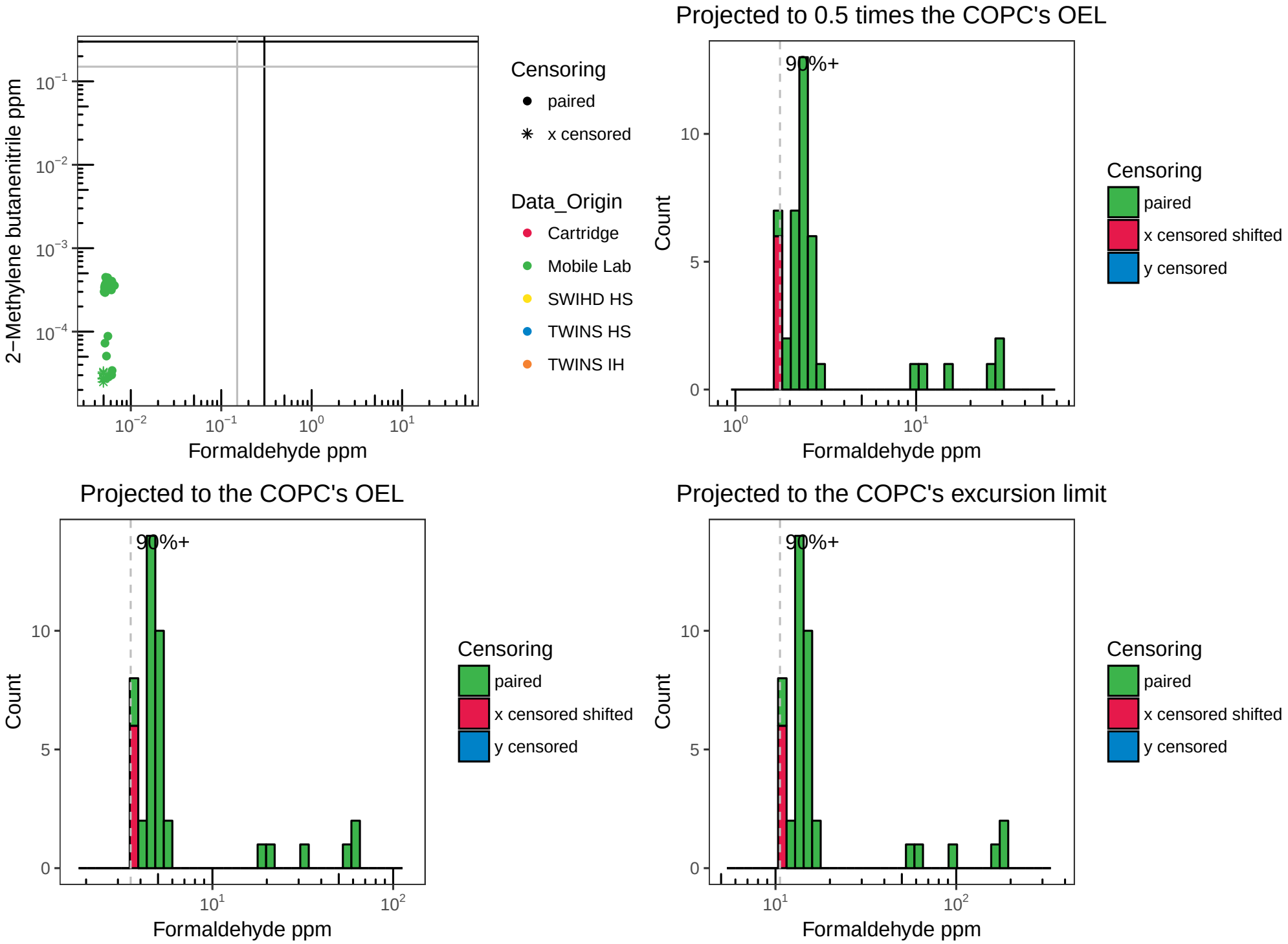


Figure C.738: 2-Methylene butanenitrile vs Formaldehyde

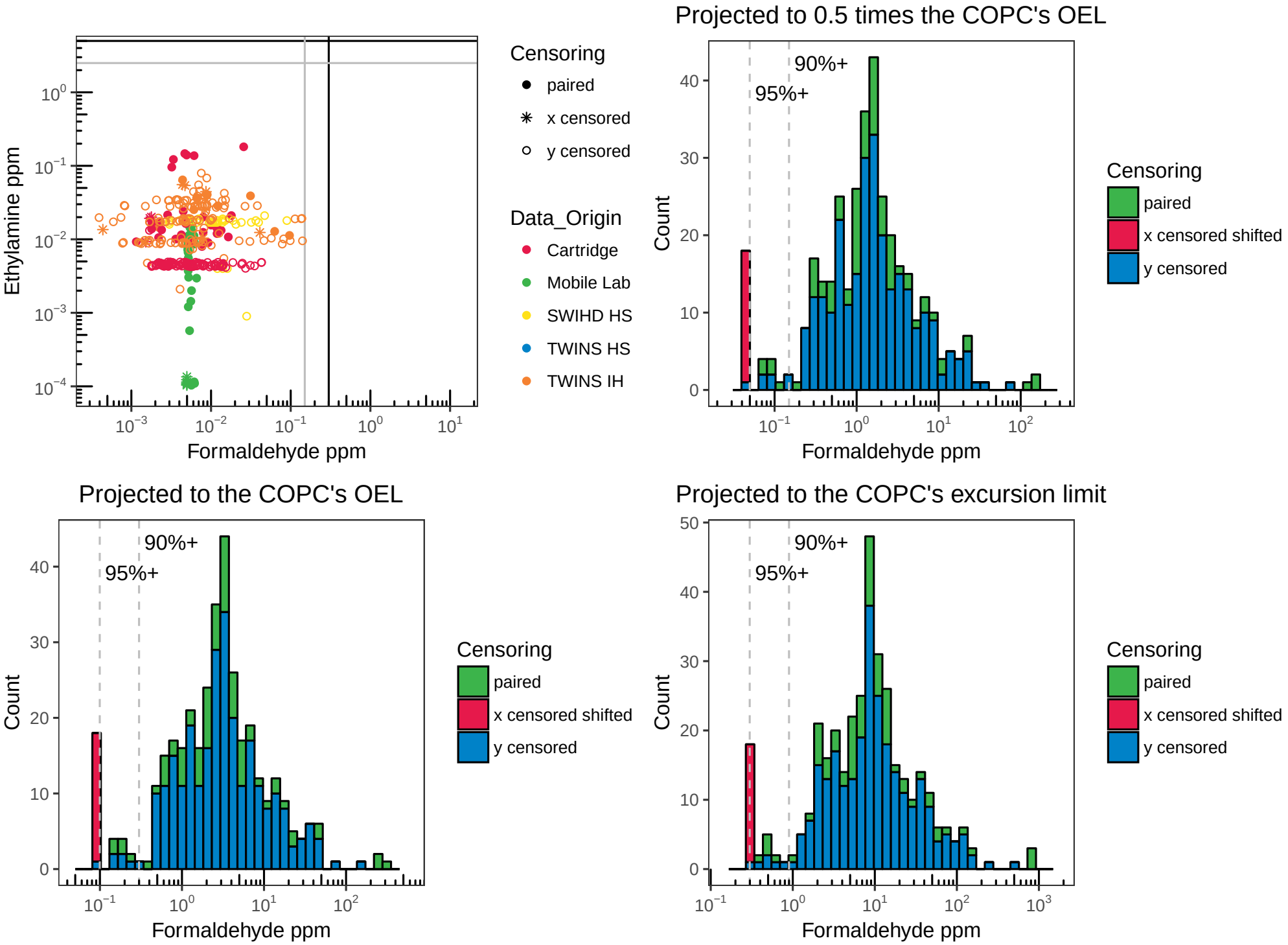


Figure C.739: Ethylamine vs Formaldehyde

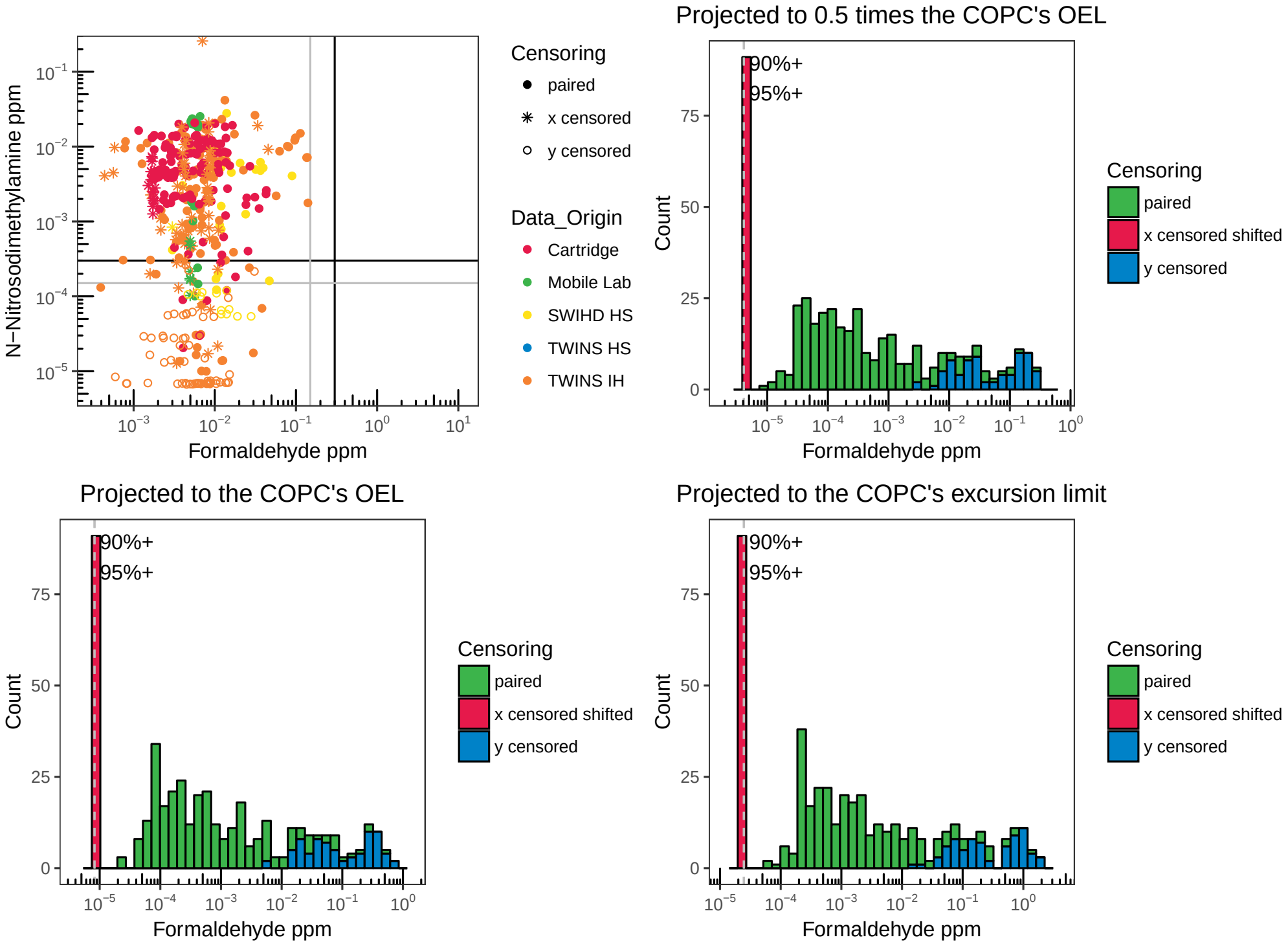


Figure C.740: N-Nitrosodimethylamine vs Formaldehyde

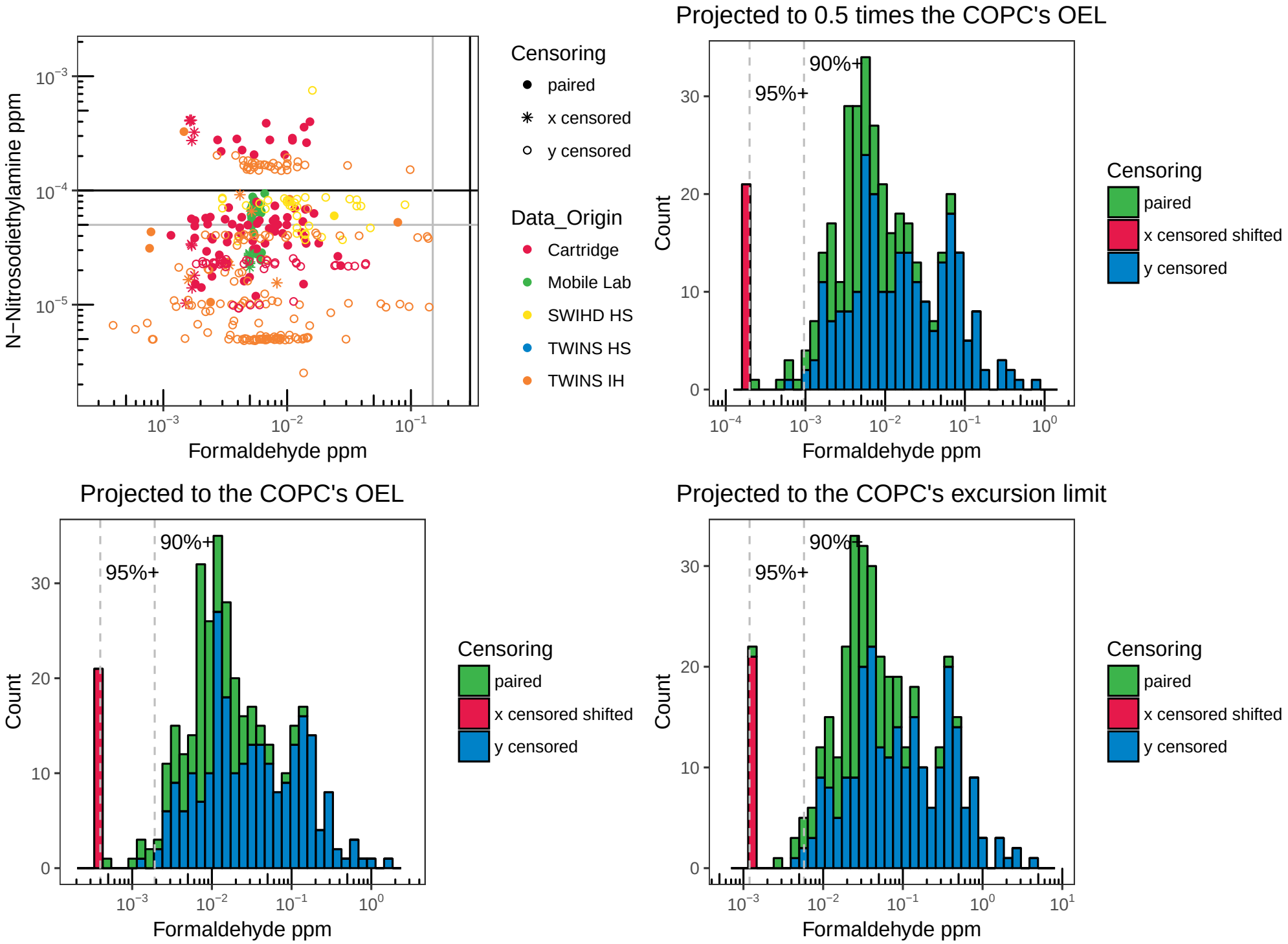


Figure C.741: N-Nitrosodiethylamine vs Formaldehyde

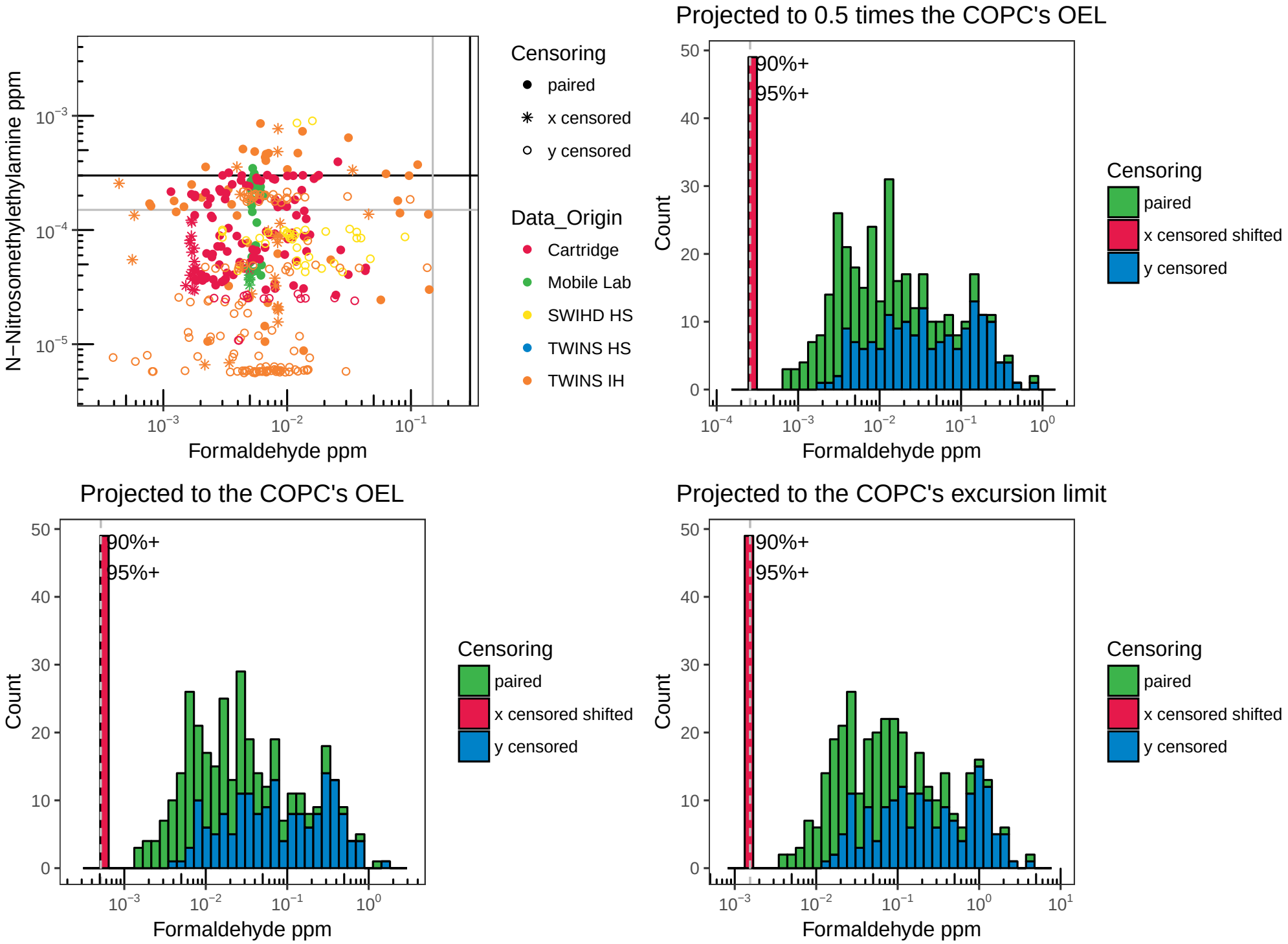


Figure C.742: N-Nitrosomethylethylamine vs Formaldehyde

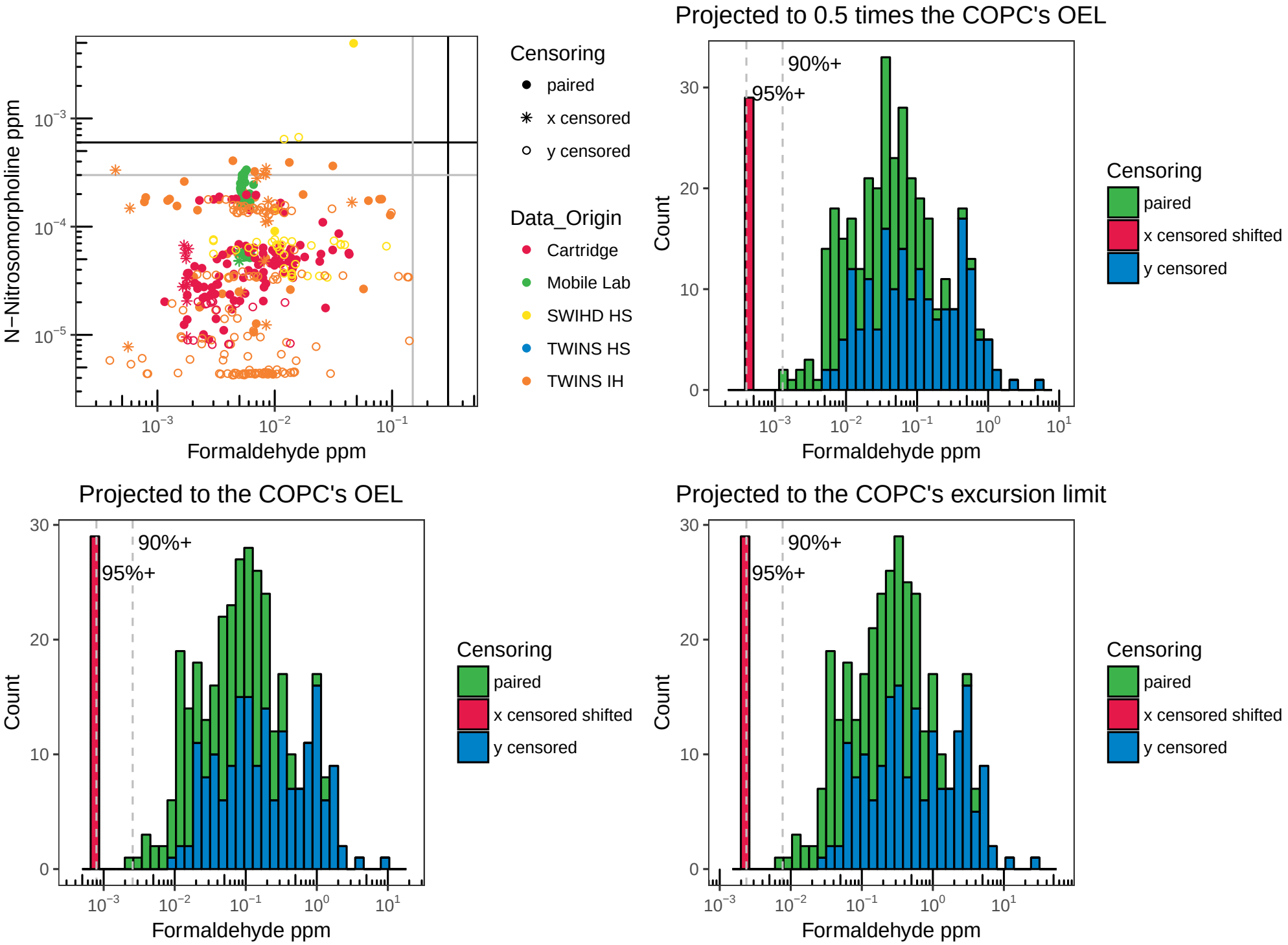


Figure C.743: N-Nitrosomorpholine vs Formaldehyde

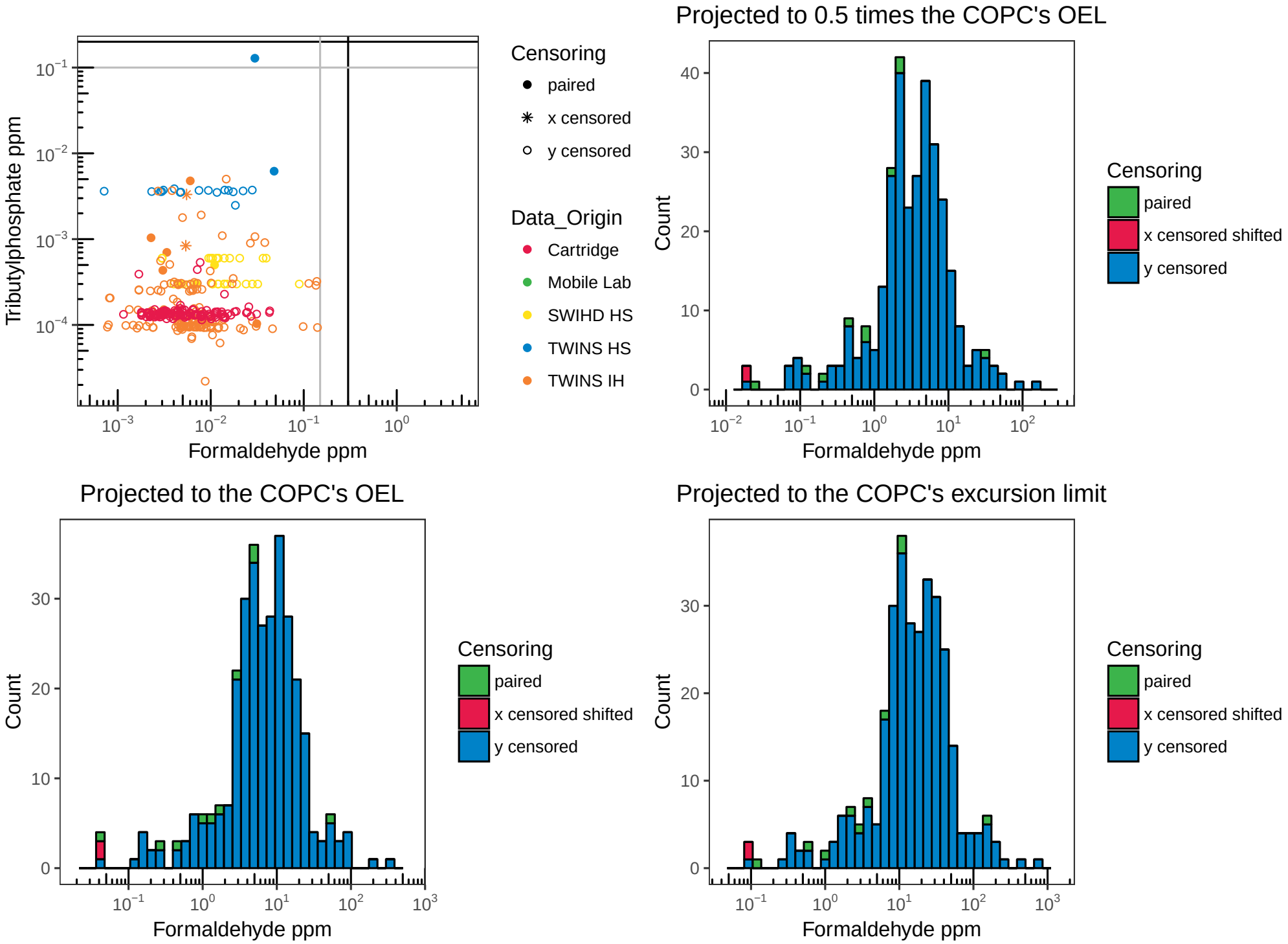


Figure C.744: Tributylphosphate vs Formaldehyde

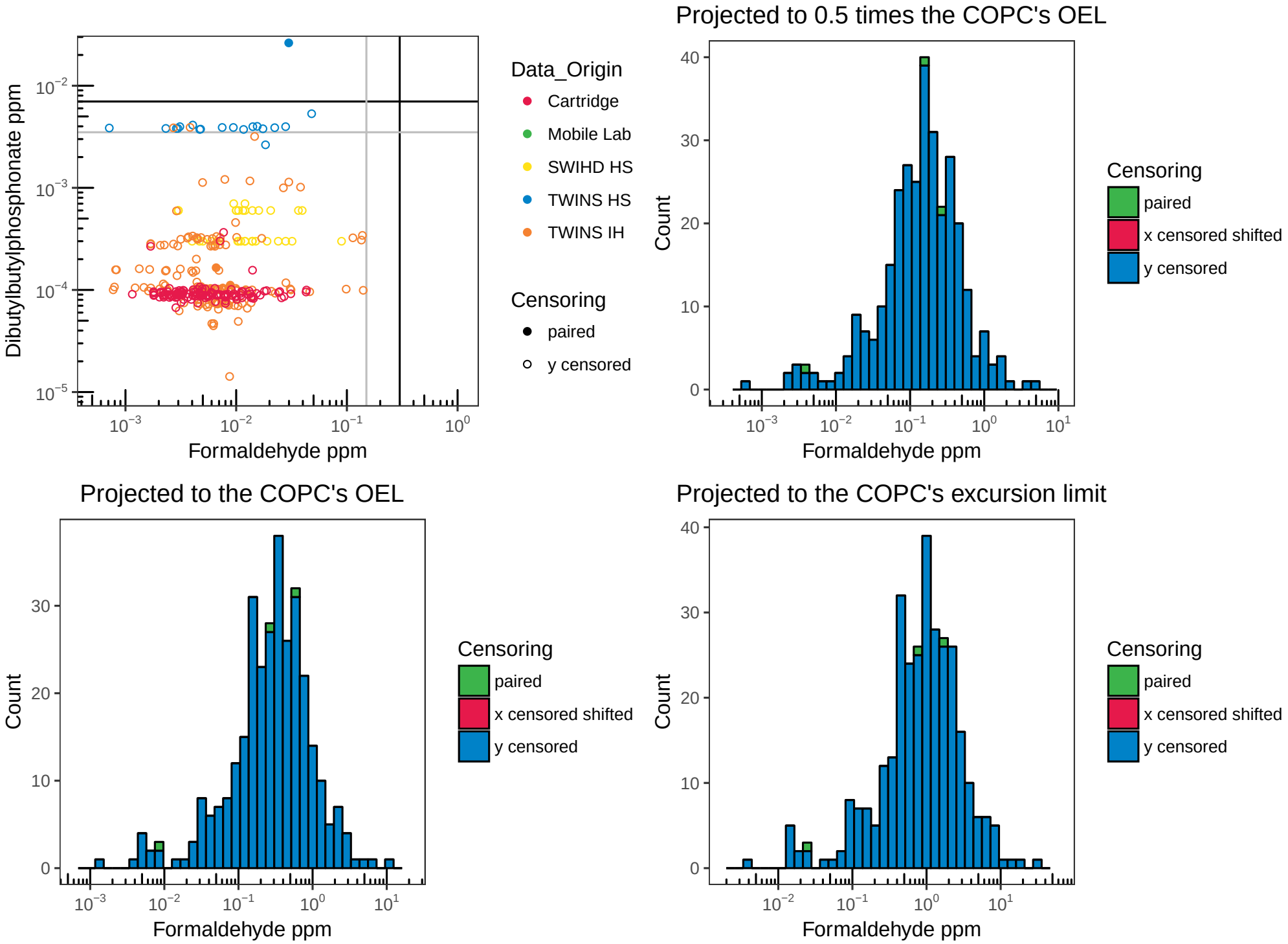


Figure C.745: Dibutylbutylphosphonate vs Formaldehyde

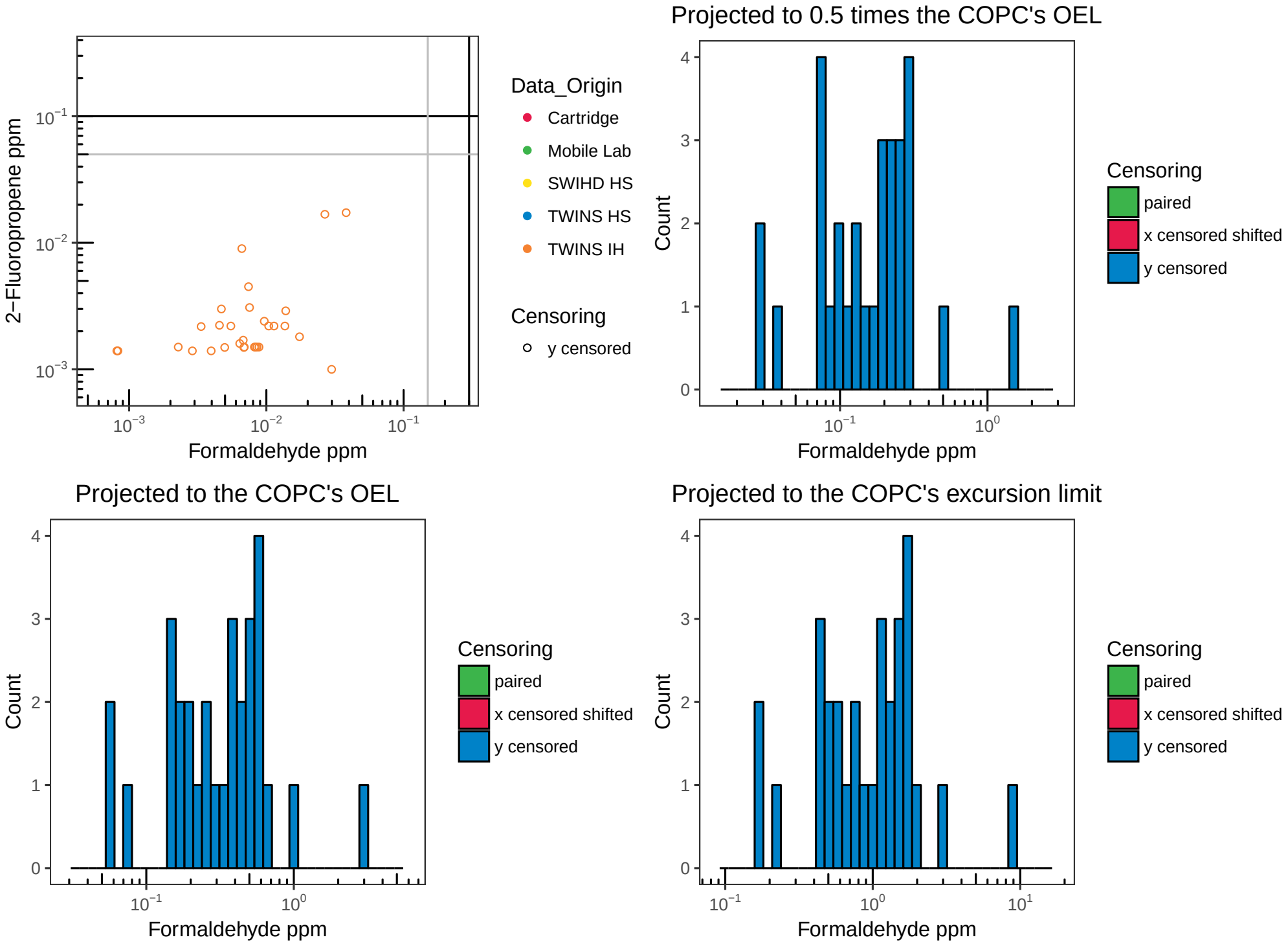


Figure C.746: 2-Fluoropropene vs Formaldehyde

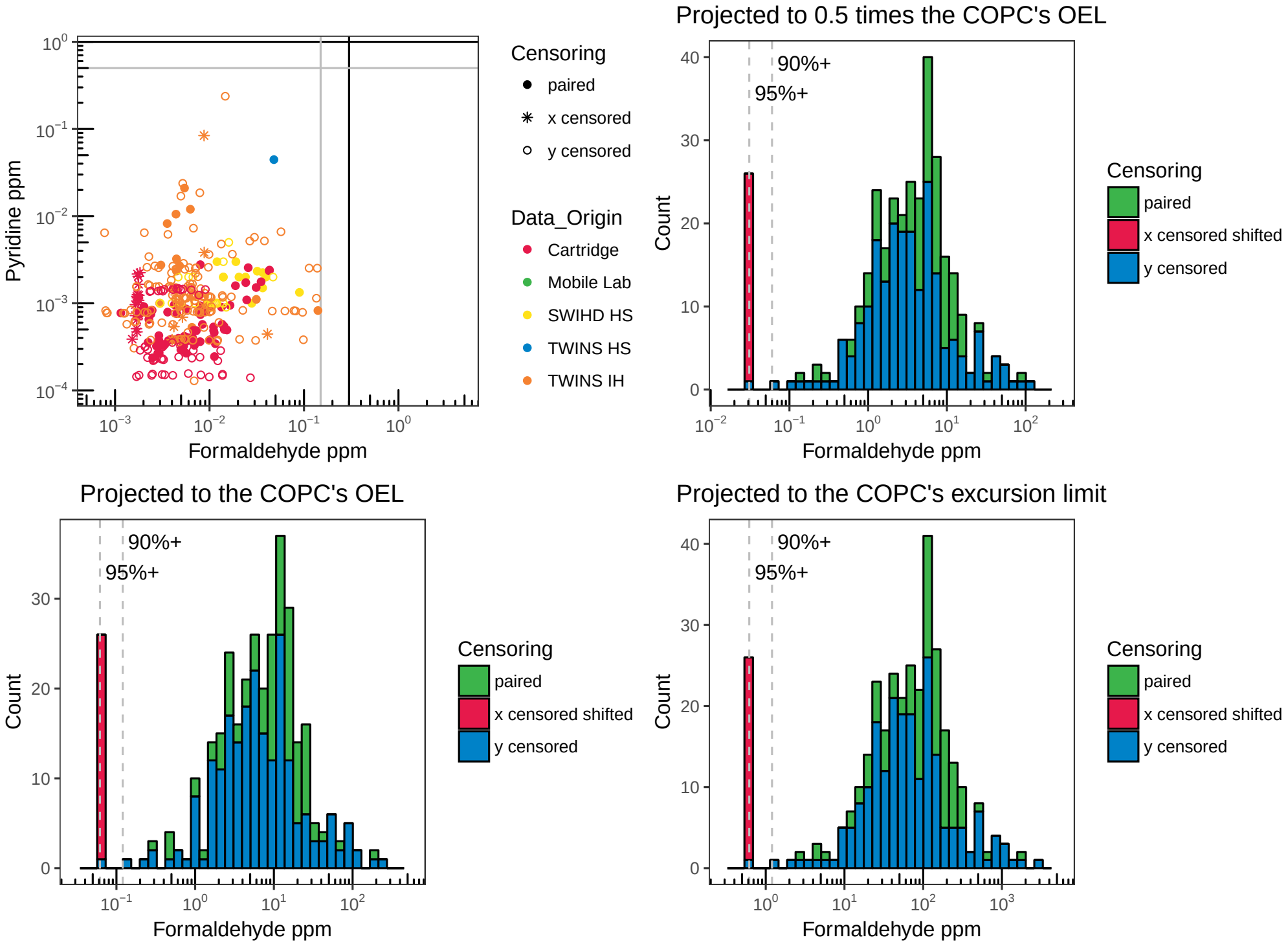


Figure C.747: Pyridine vs Formaldehyde

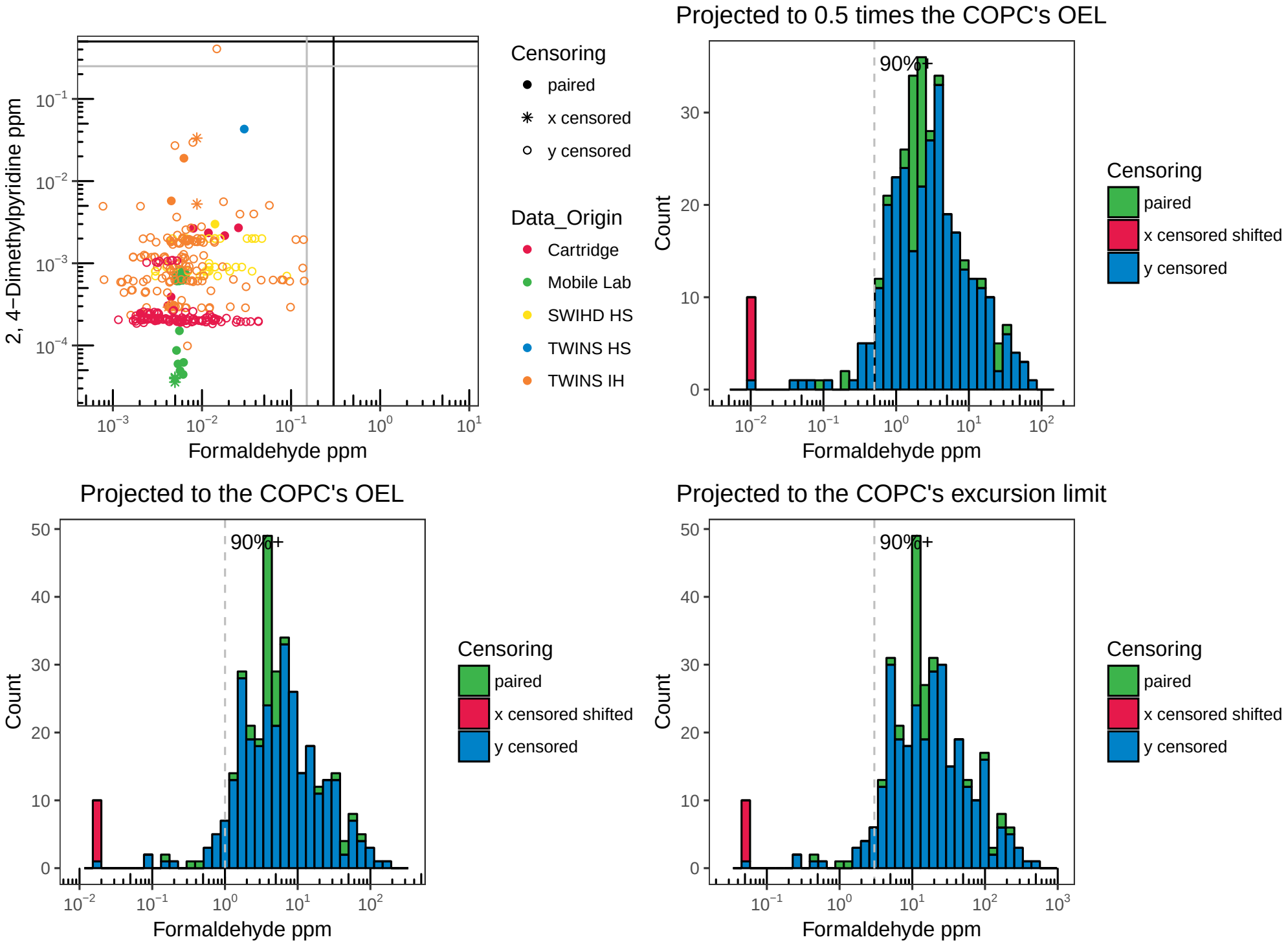


Figure C.748: 2, 4-Dimethylpyridine vs Formaldehyde

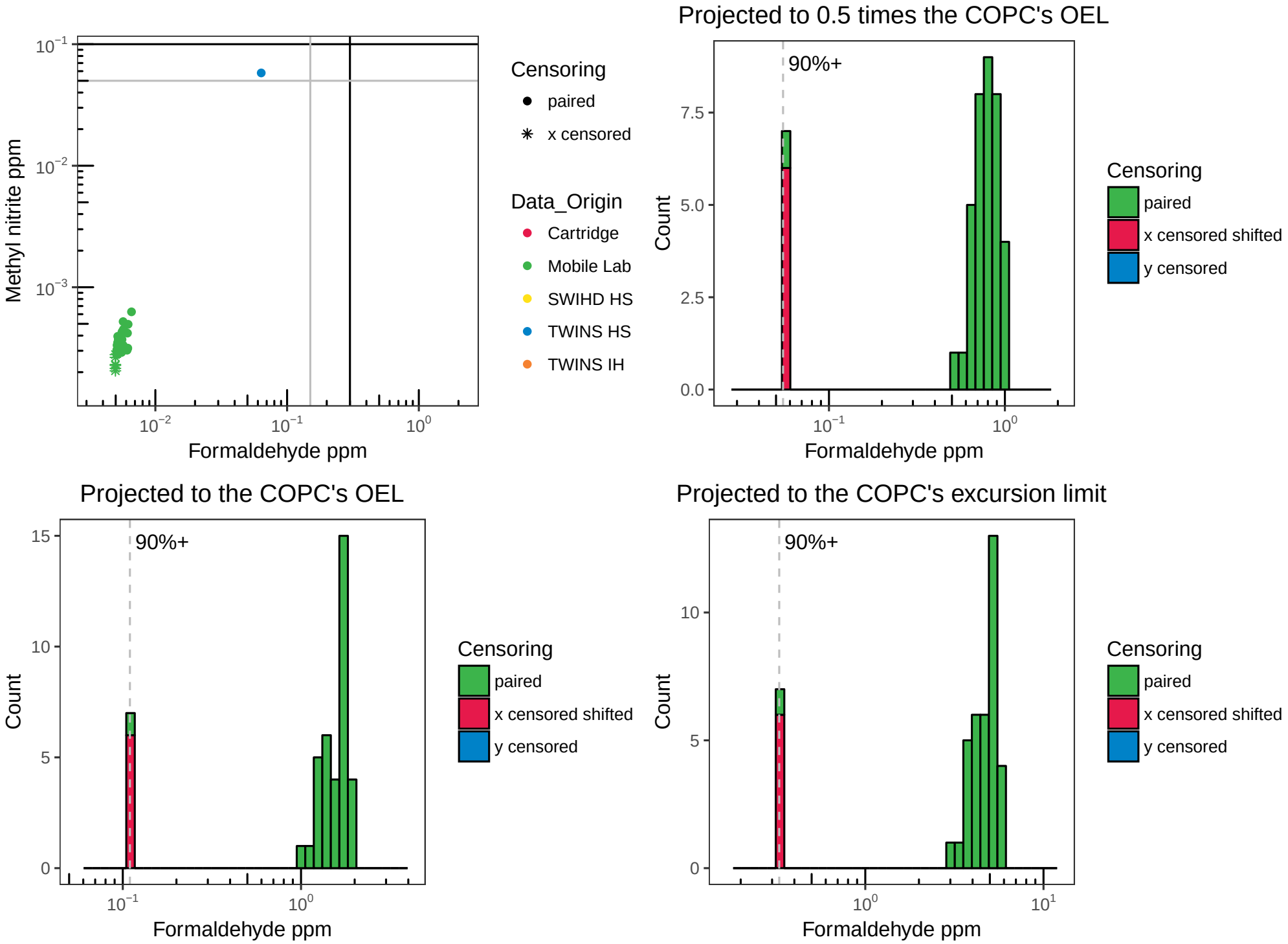


Figure C.749: Methyl nitrite vs Formaldehyde

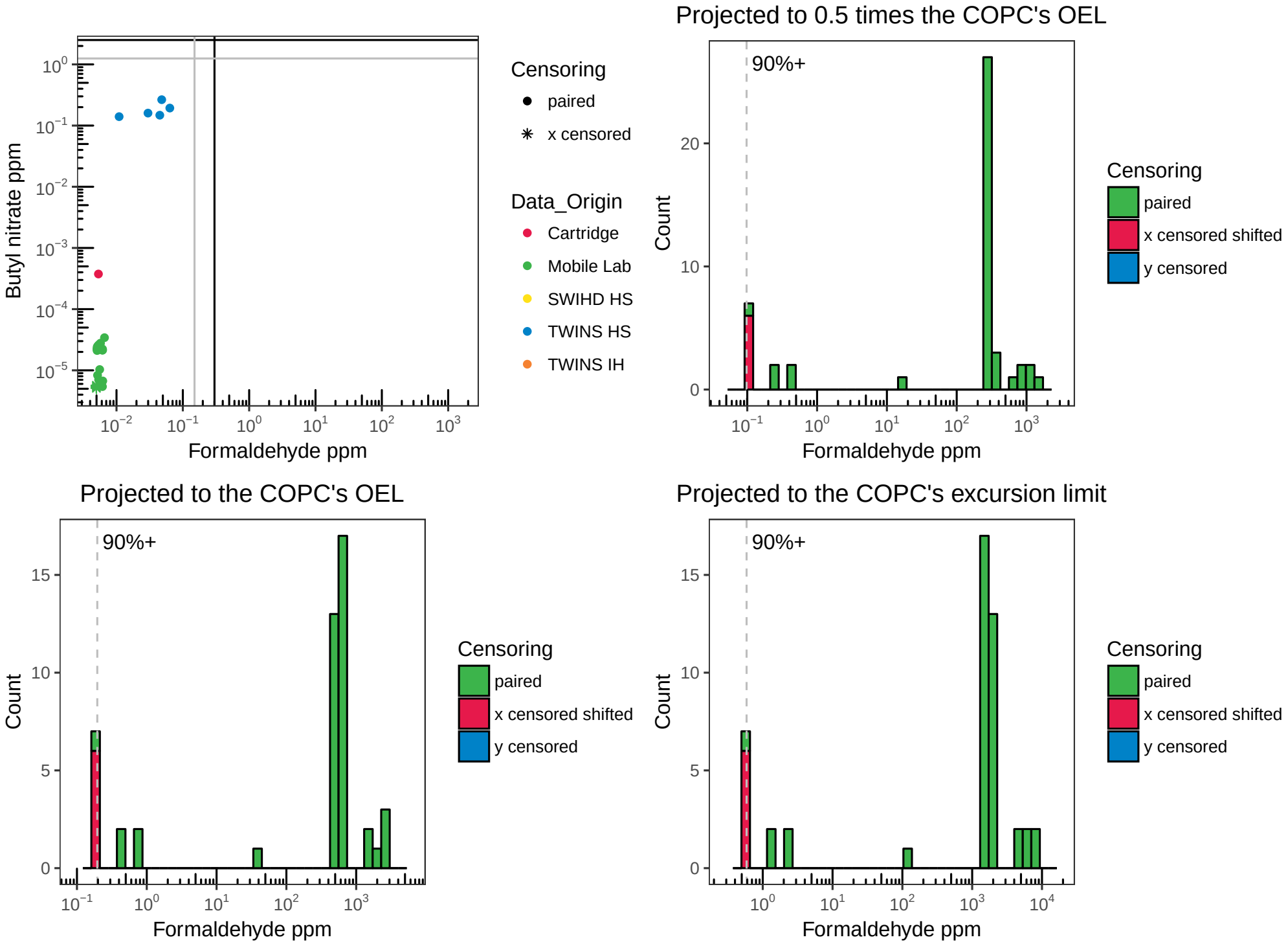


Figure C.750: Butyl nitrate vs Formaldehyde

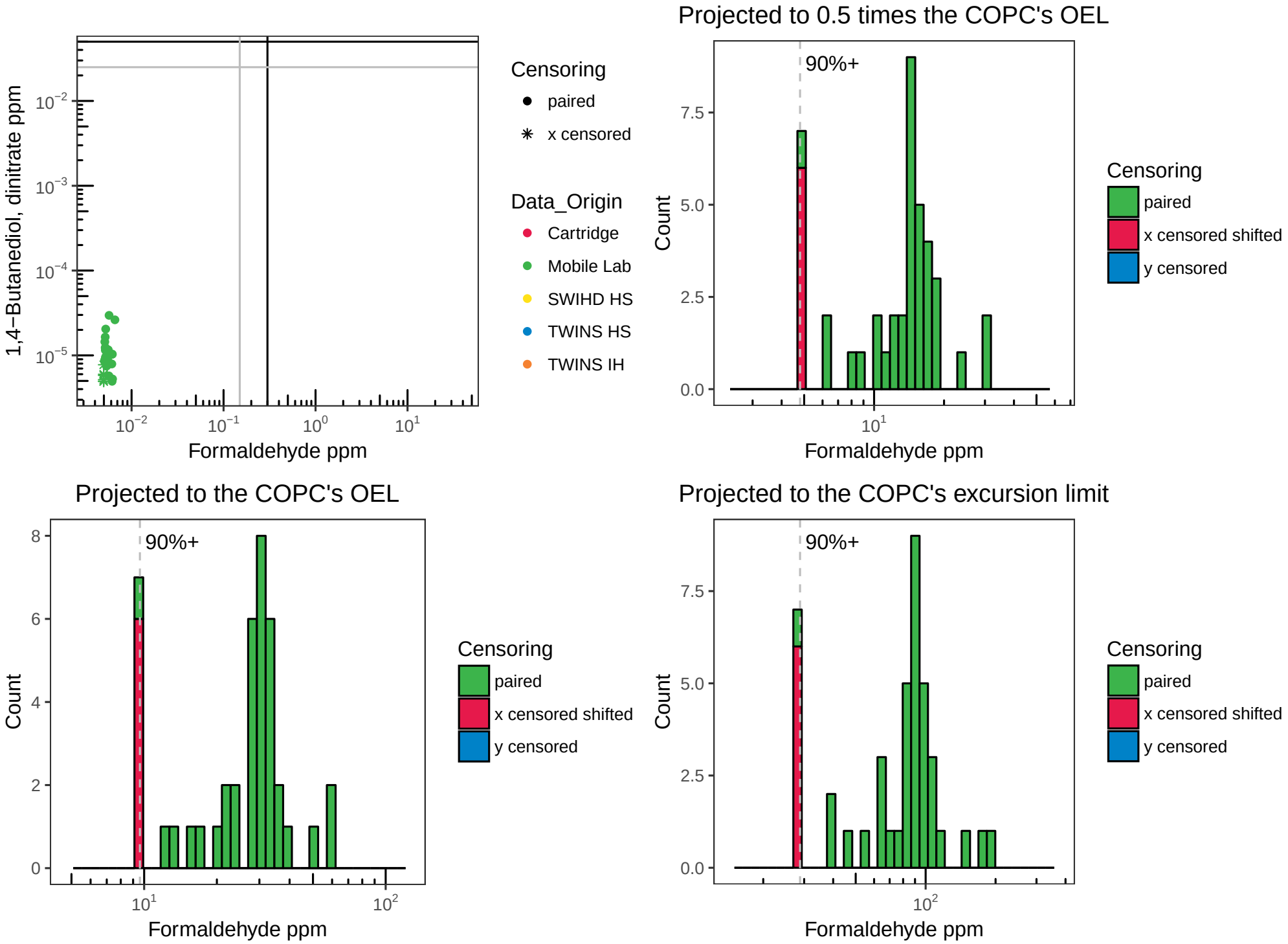


Figure C.751: 1,4-Butanediol, dinitrate vs Formaldehyde

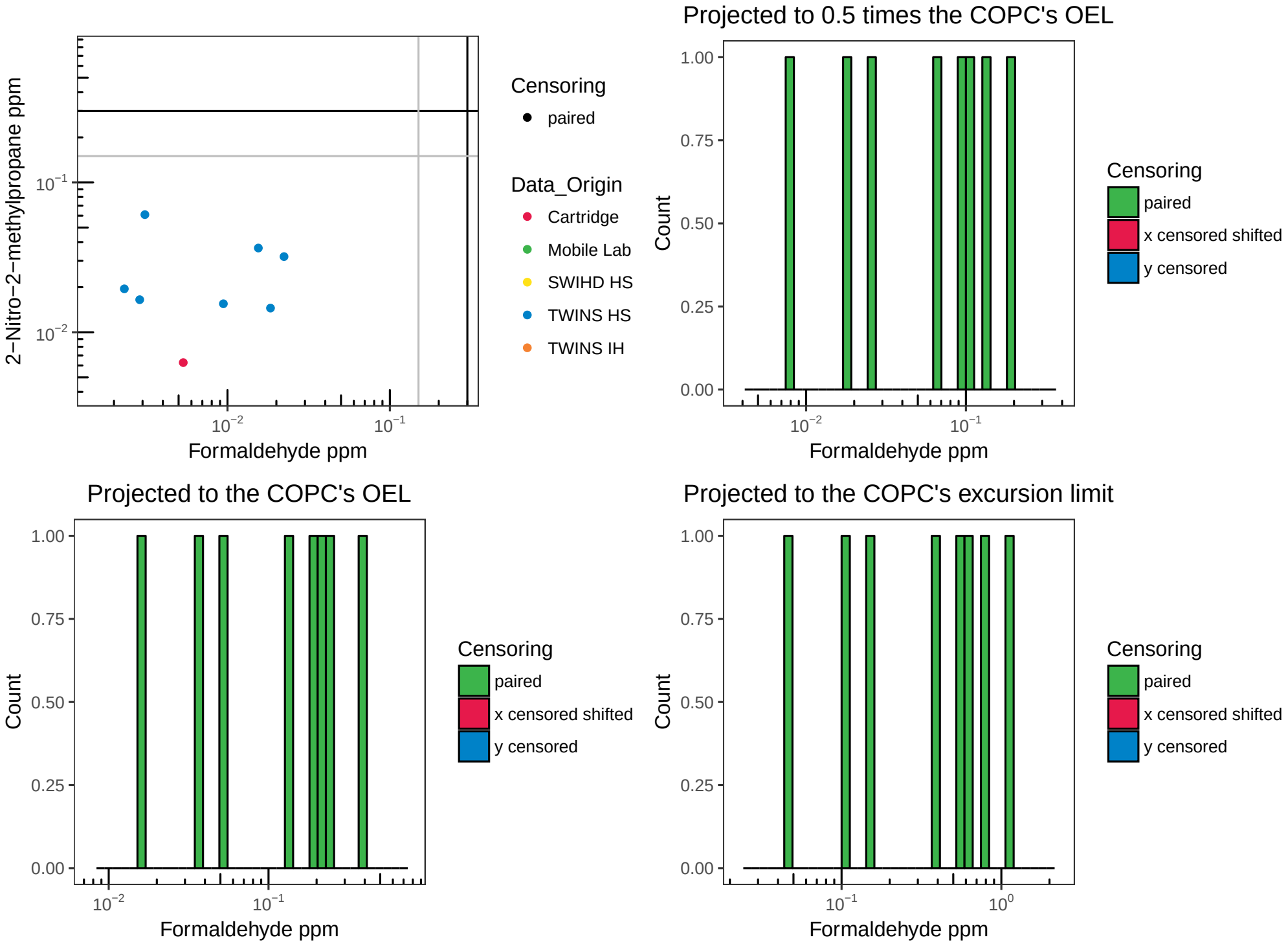


Figure C.752: 2-Nitro-2-methylpropane vs Formaldehyde

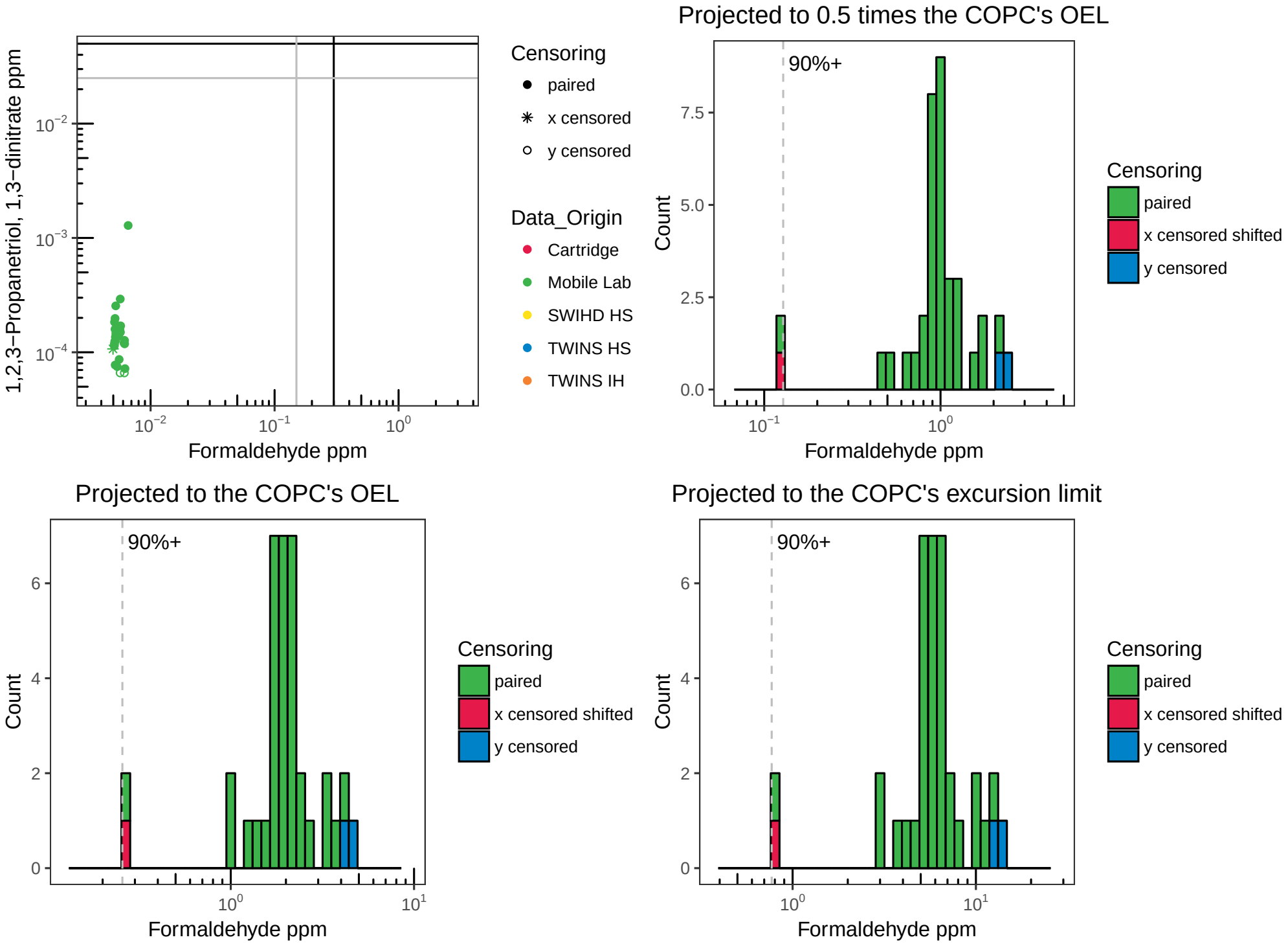


Figure C.753: 1,2,3-Propanetriol, 1,3-dinitrate vs Formaldehyde

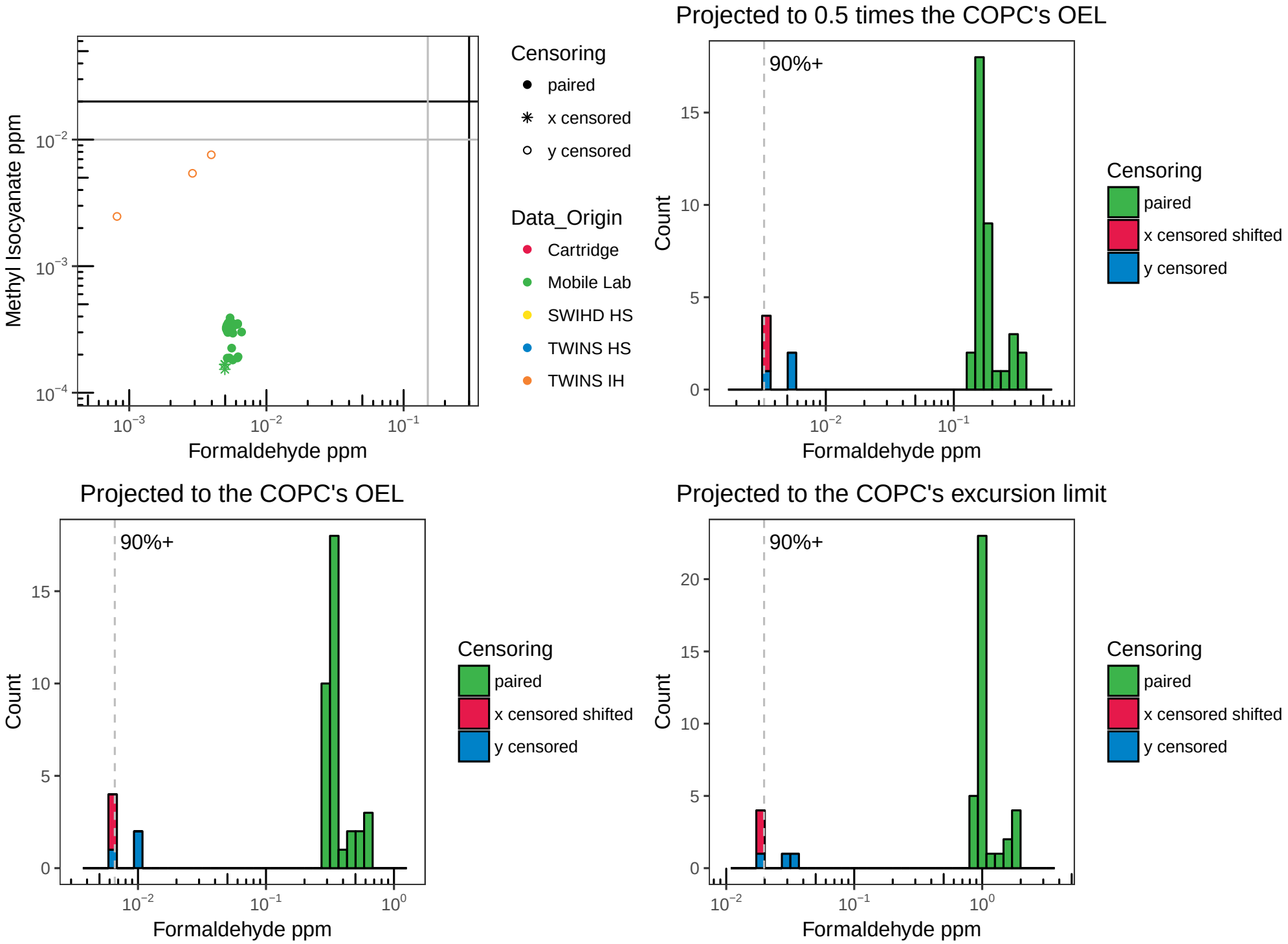


Figure C.754: Methyl Isocyanate vs Formaldehyde

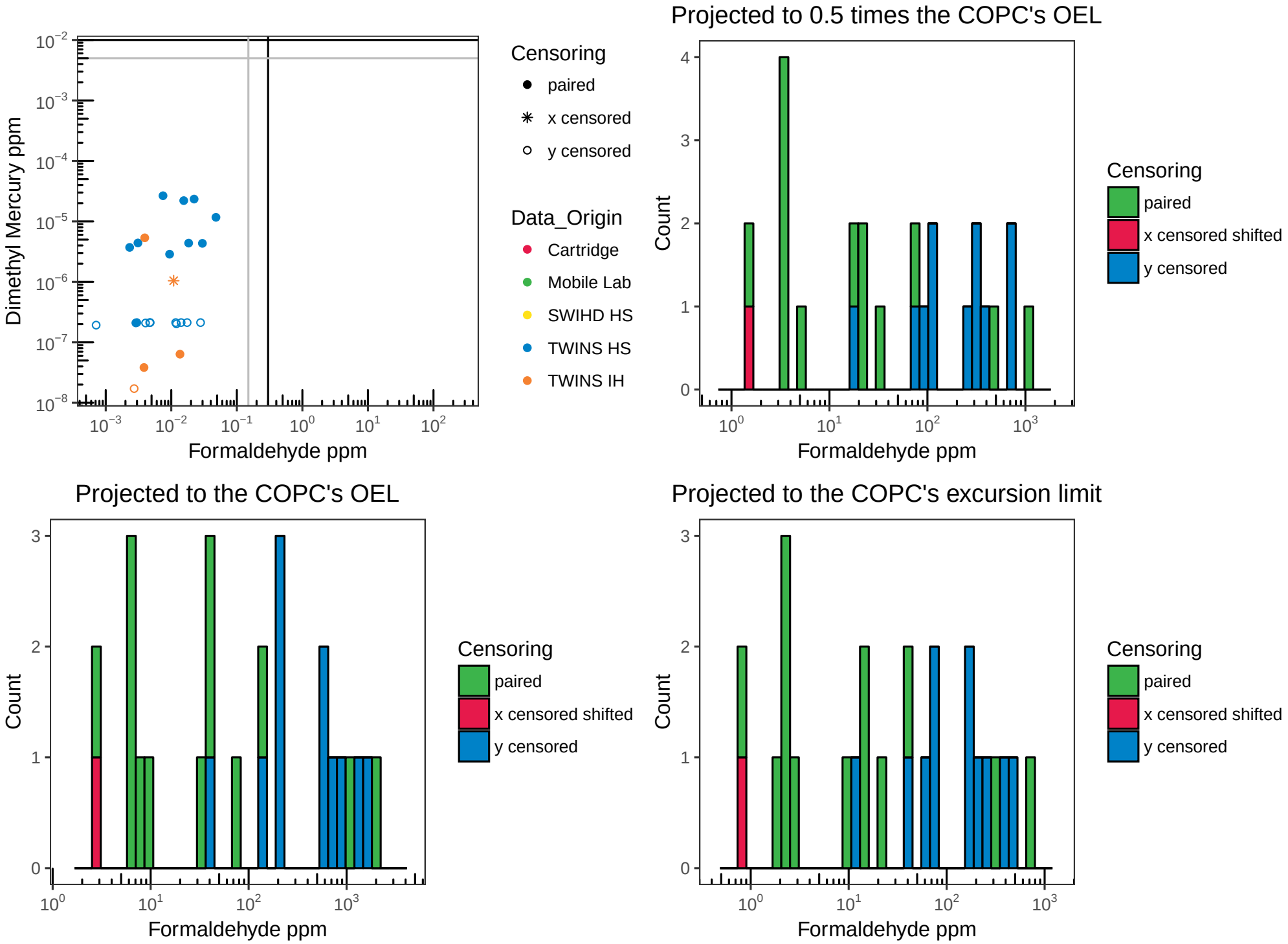


Figure C.755: Dimethyl Mercury vs Formaldehyde

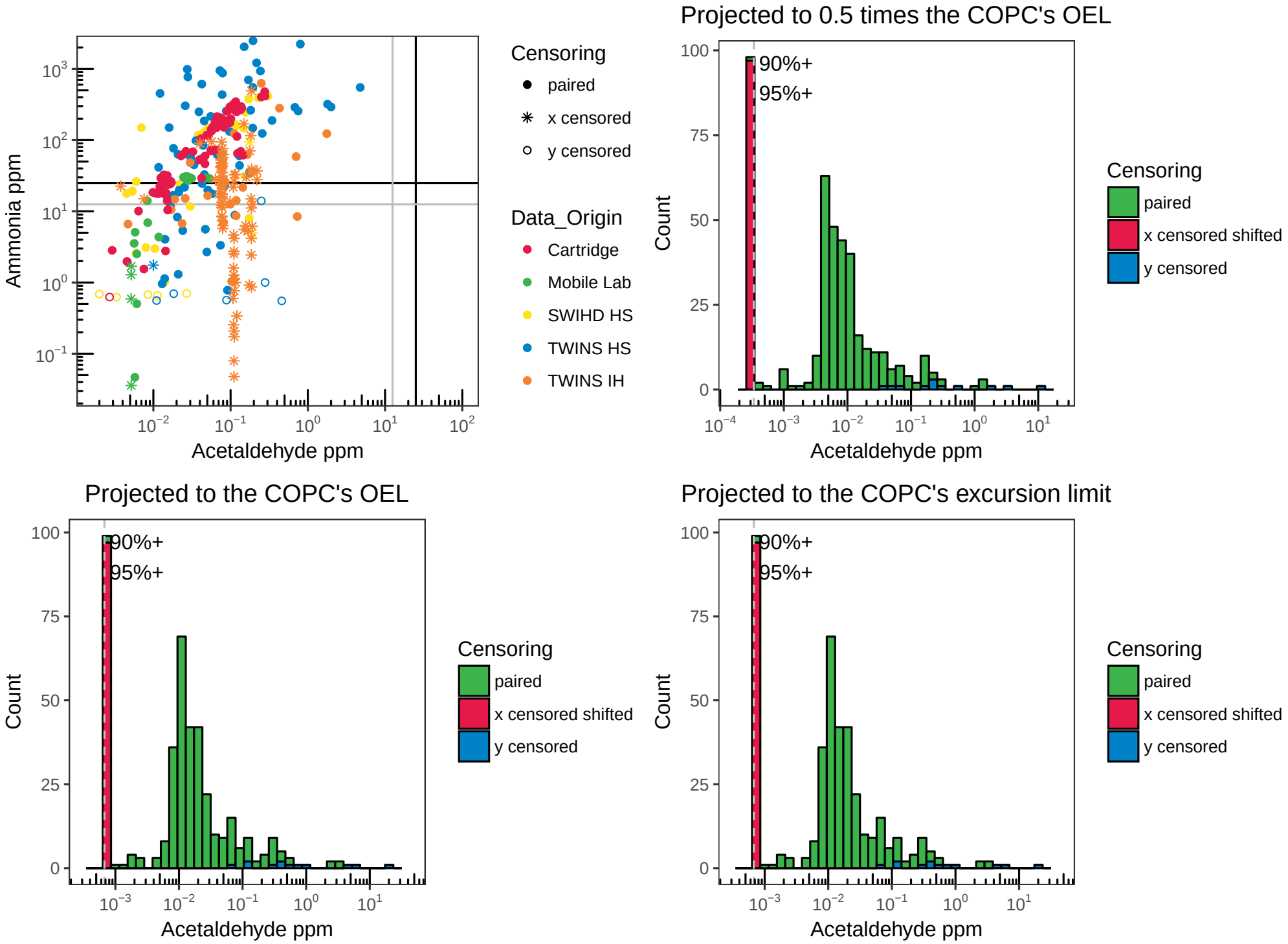


Figure C.756: Ammonia vs Acetaldehyde

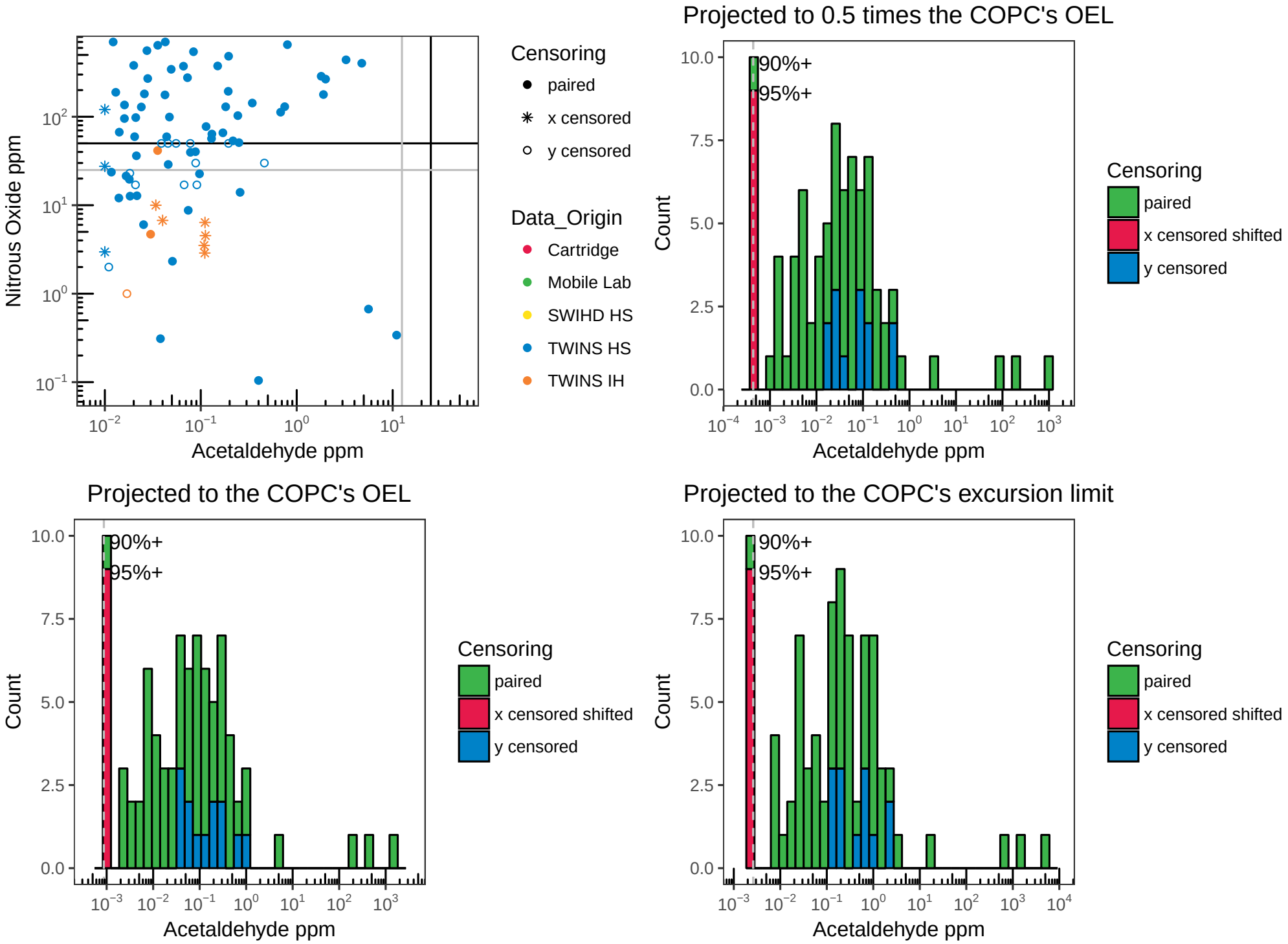


Figure C.757: Nitrous Oxide vs Acetaldehyde

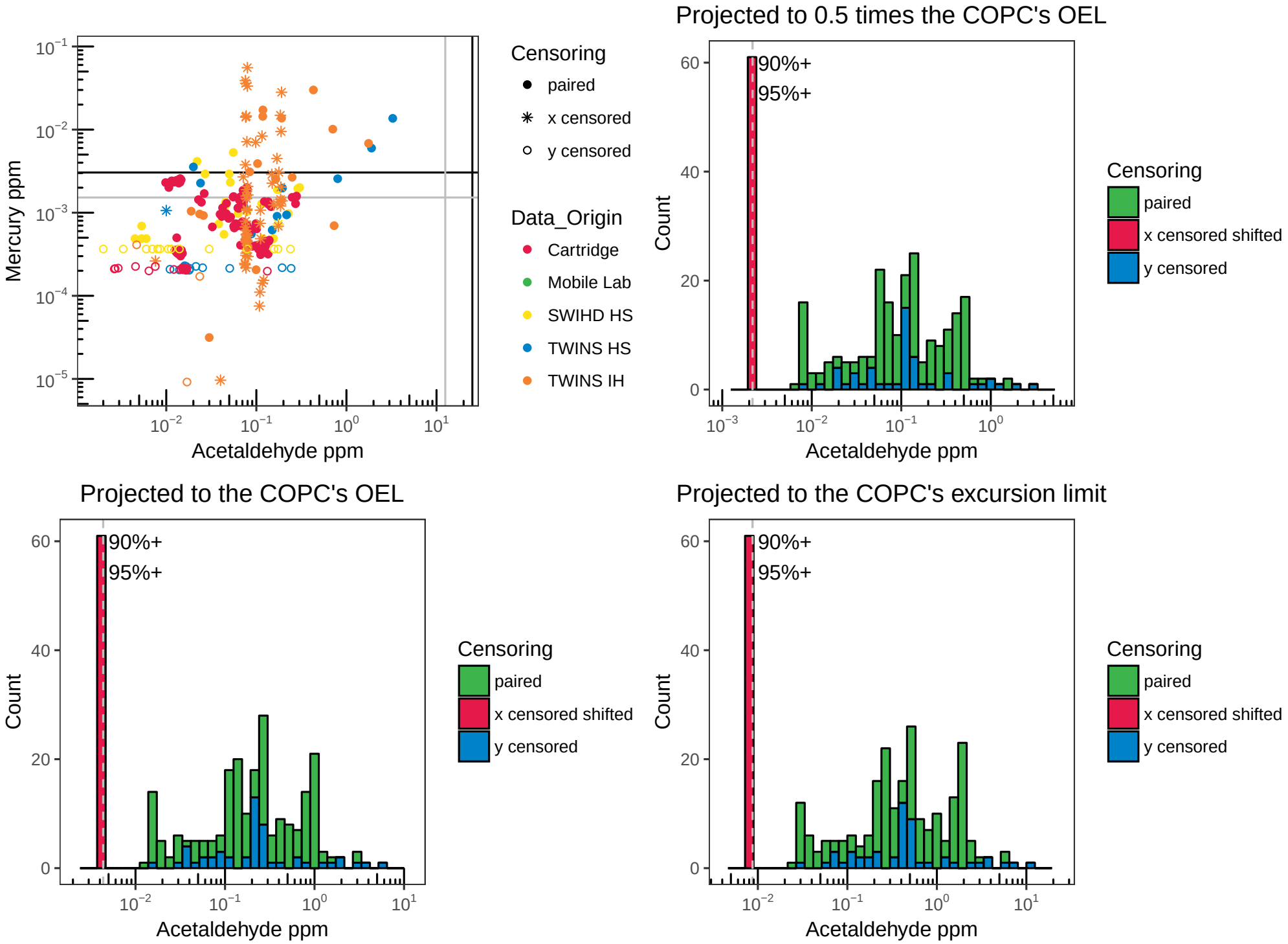


Figure C.758: Mercury vs Acetaldehyde

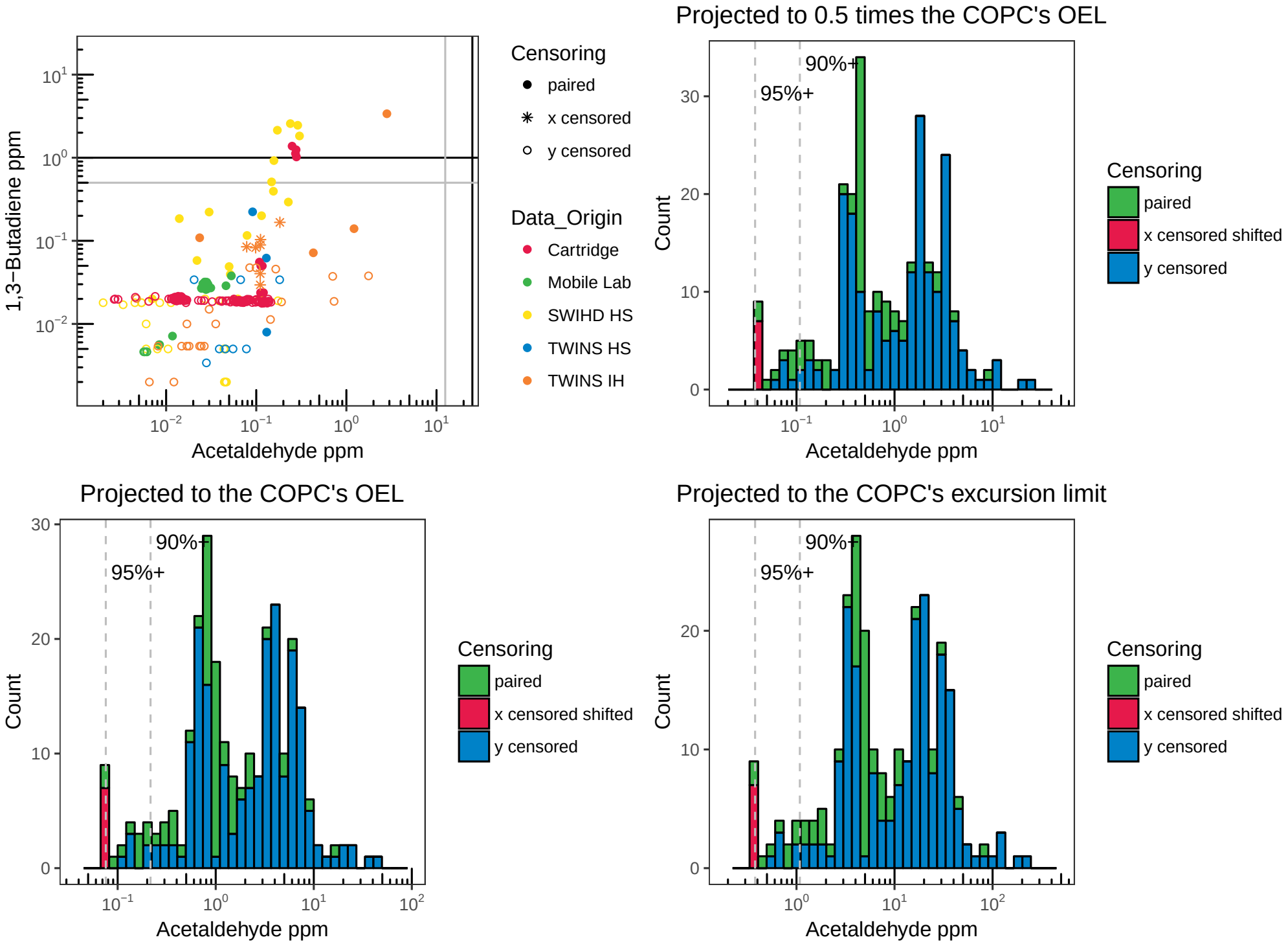


Figure C.759: 1,3-Butadiene vs Acetaldehyde

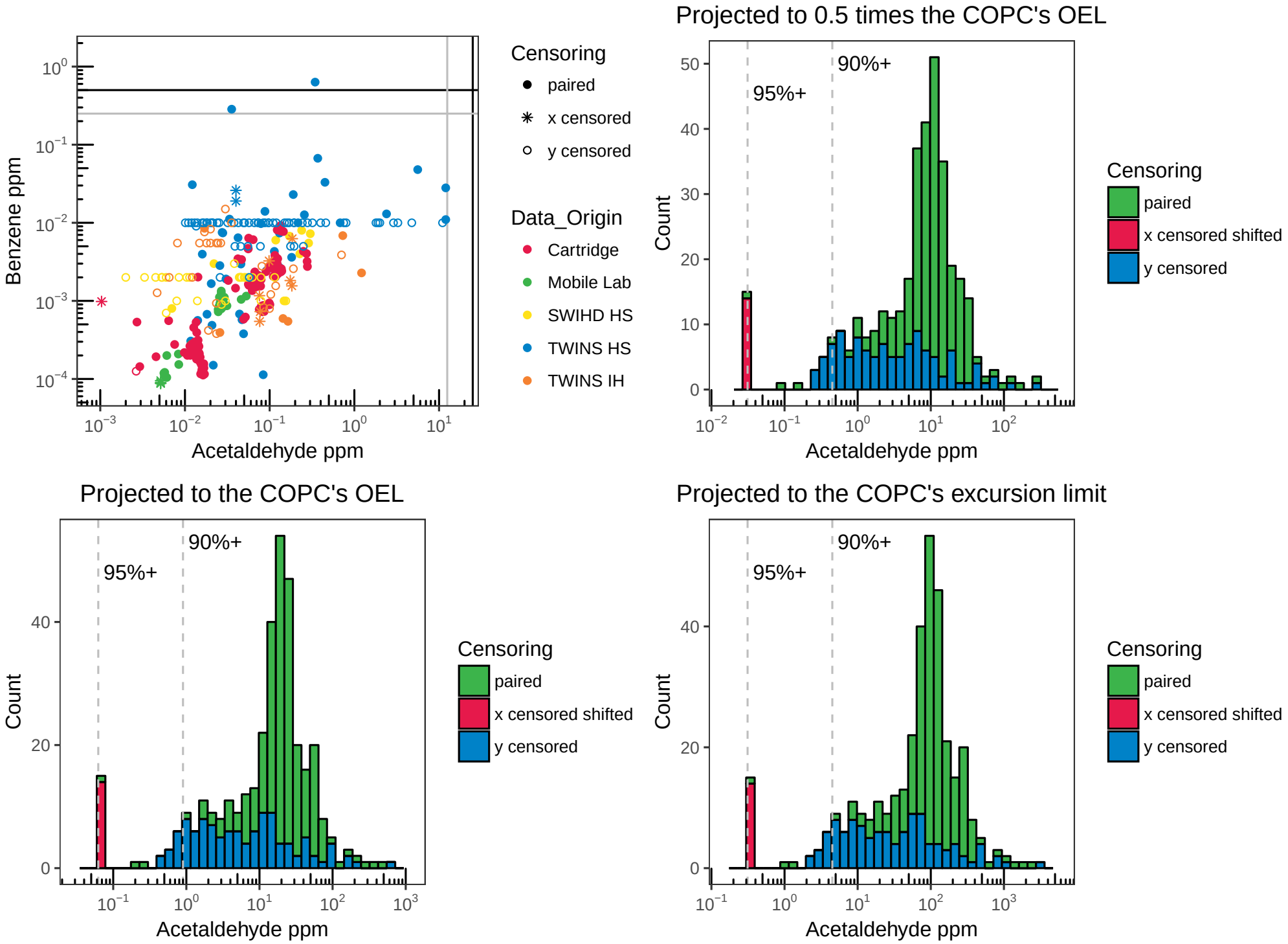


Figure C.760: Benzene vs Acetaldehyde

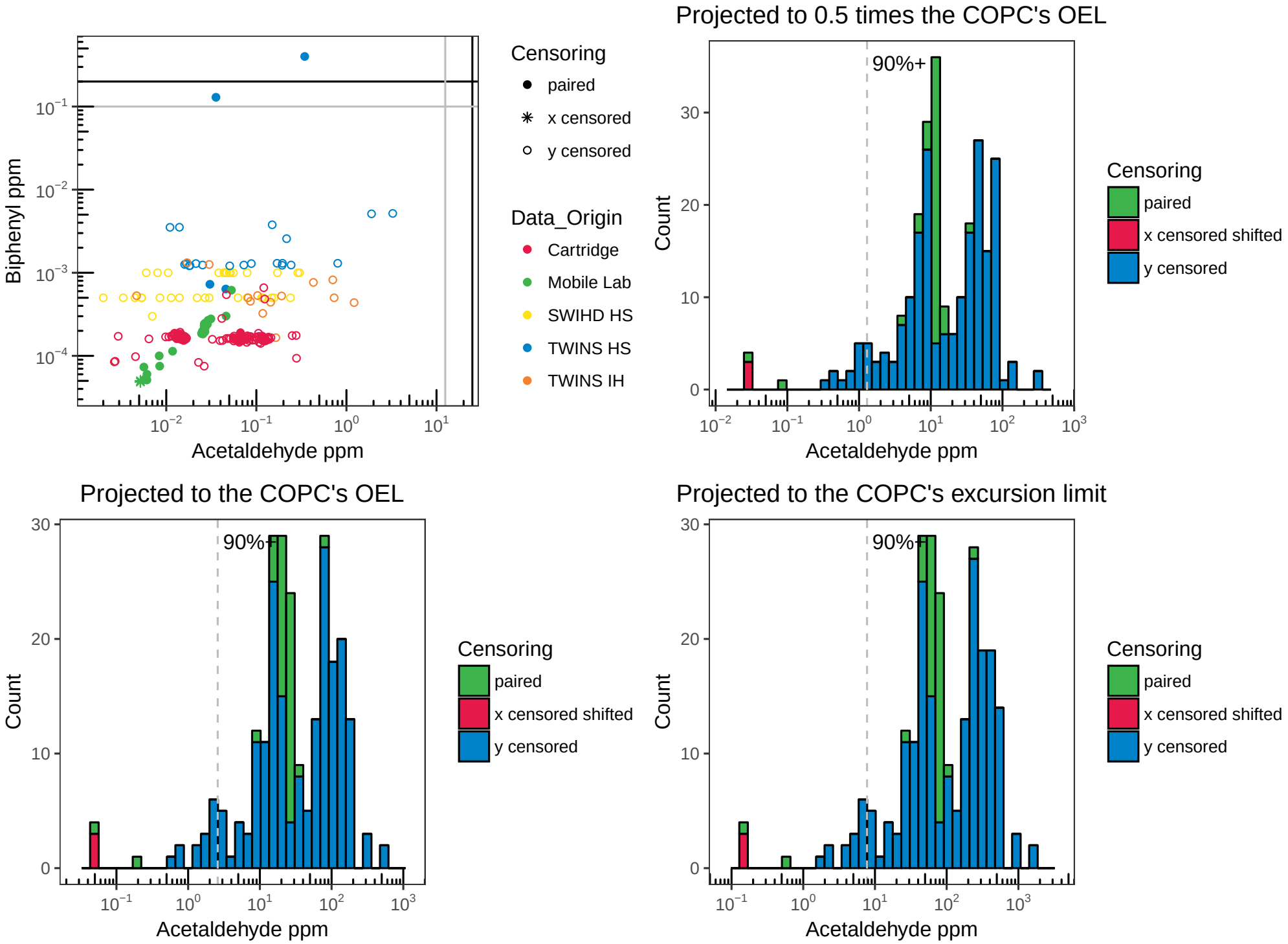


Figure C.761: Biphenyl vs Acetaldehyde

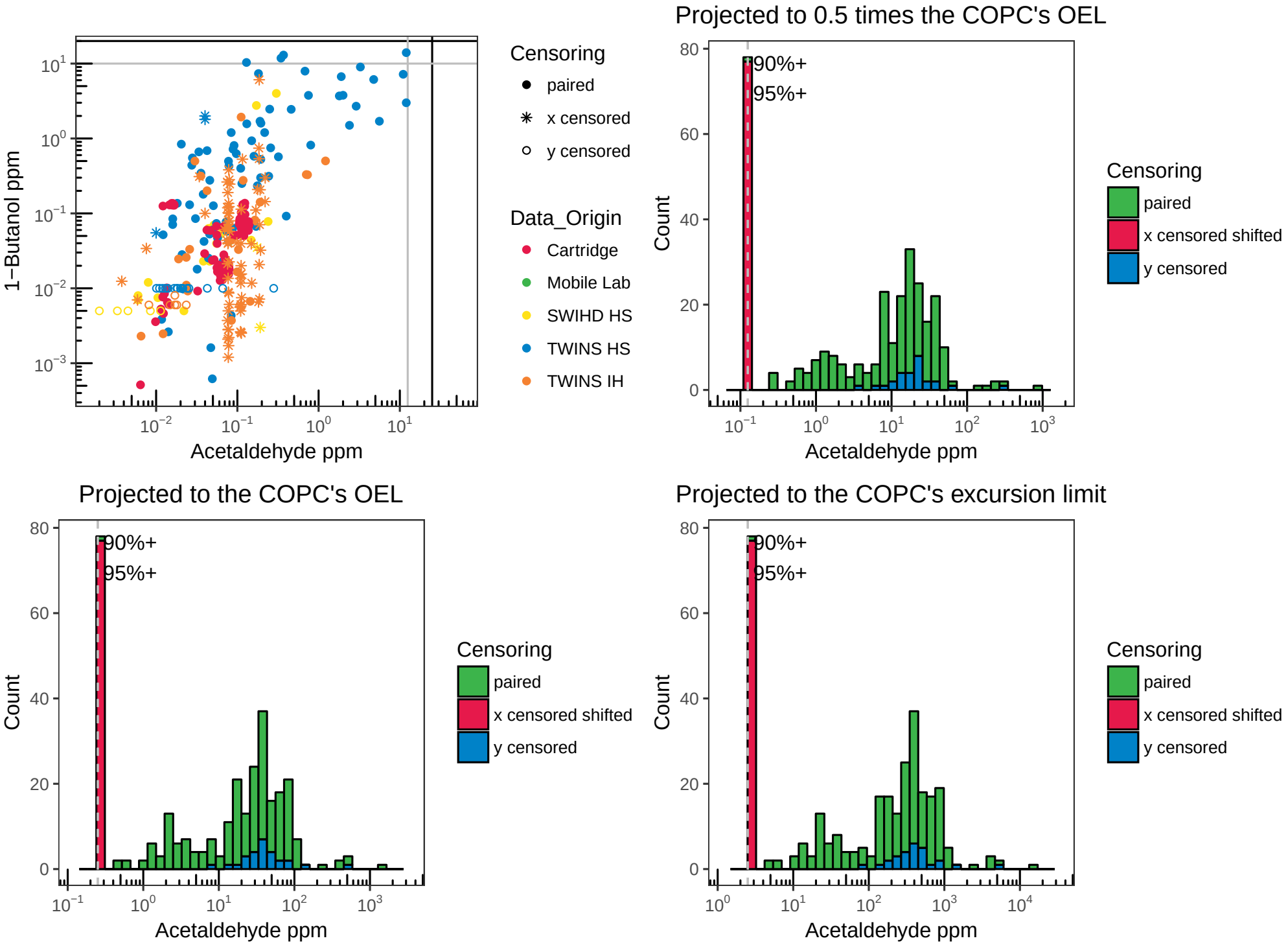


Figure C.762: 1-Butanol vs Acetaldehyde

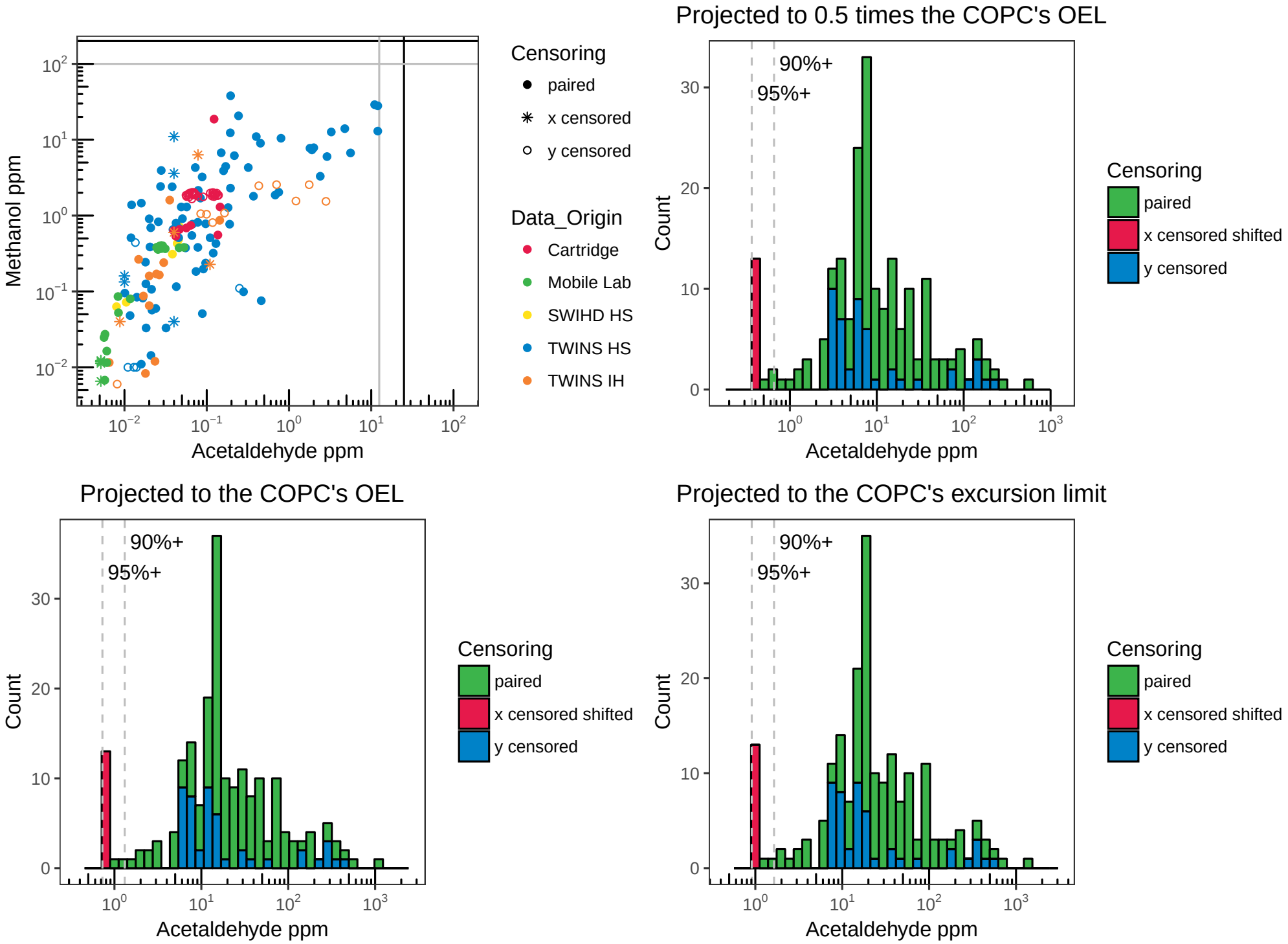


Figure C.763: Methanol vs Acetaldehyde

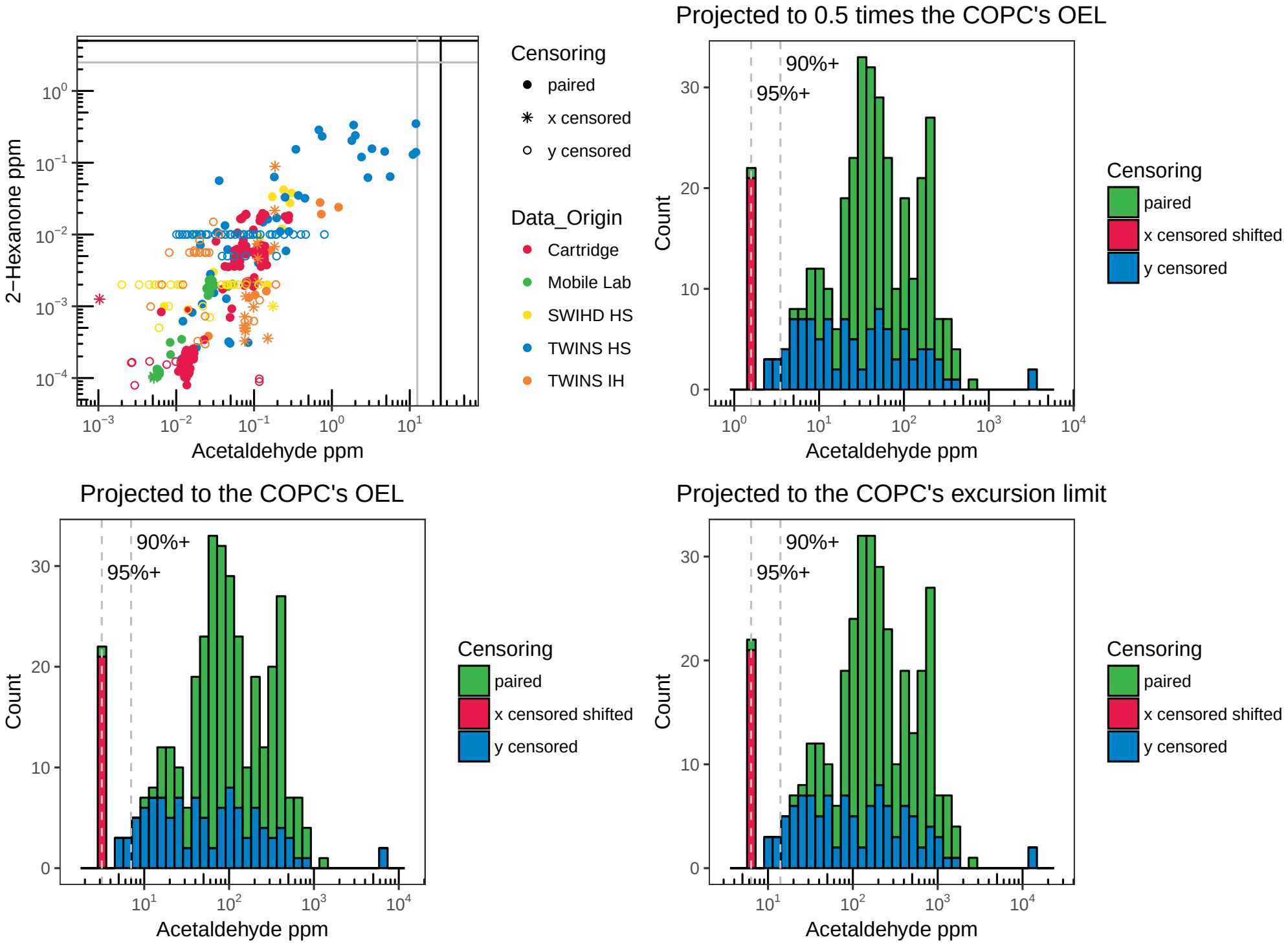


Figure C.764: 2-Hexanone vs Acetaldehyde

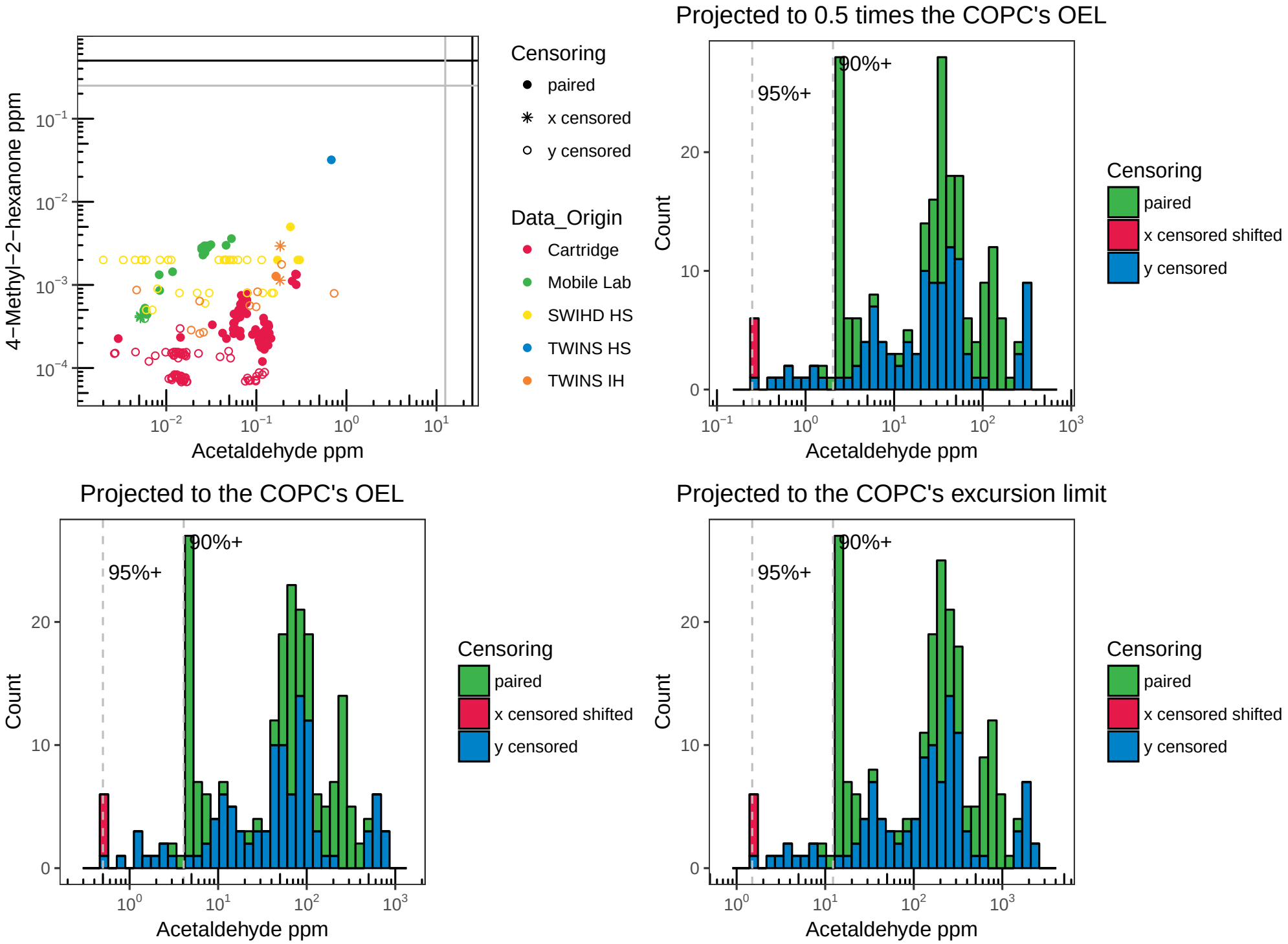


Figure C.765: 4-Methyl-2-hexanone vs Acetaldehyde

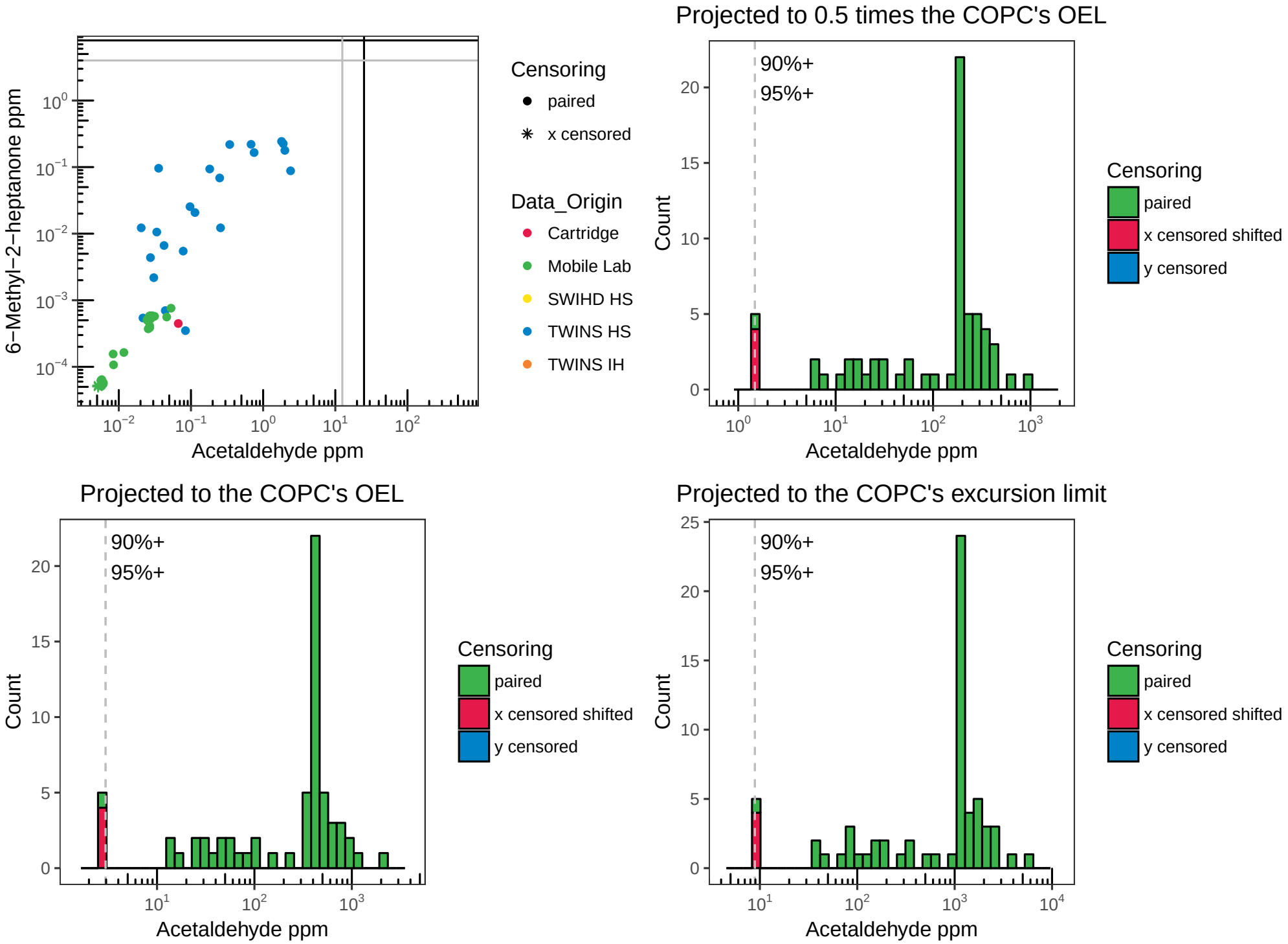


Figure C.766: 6-Methyl-2-heptanone vs Acetaldehyde

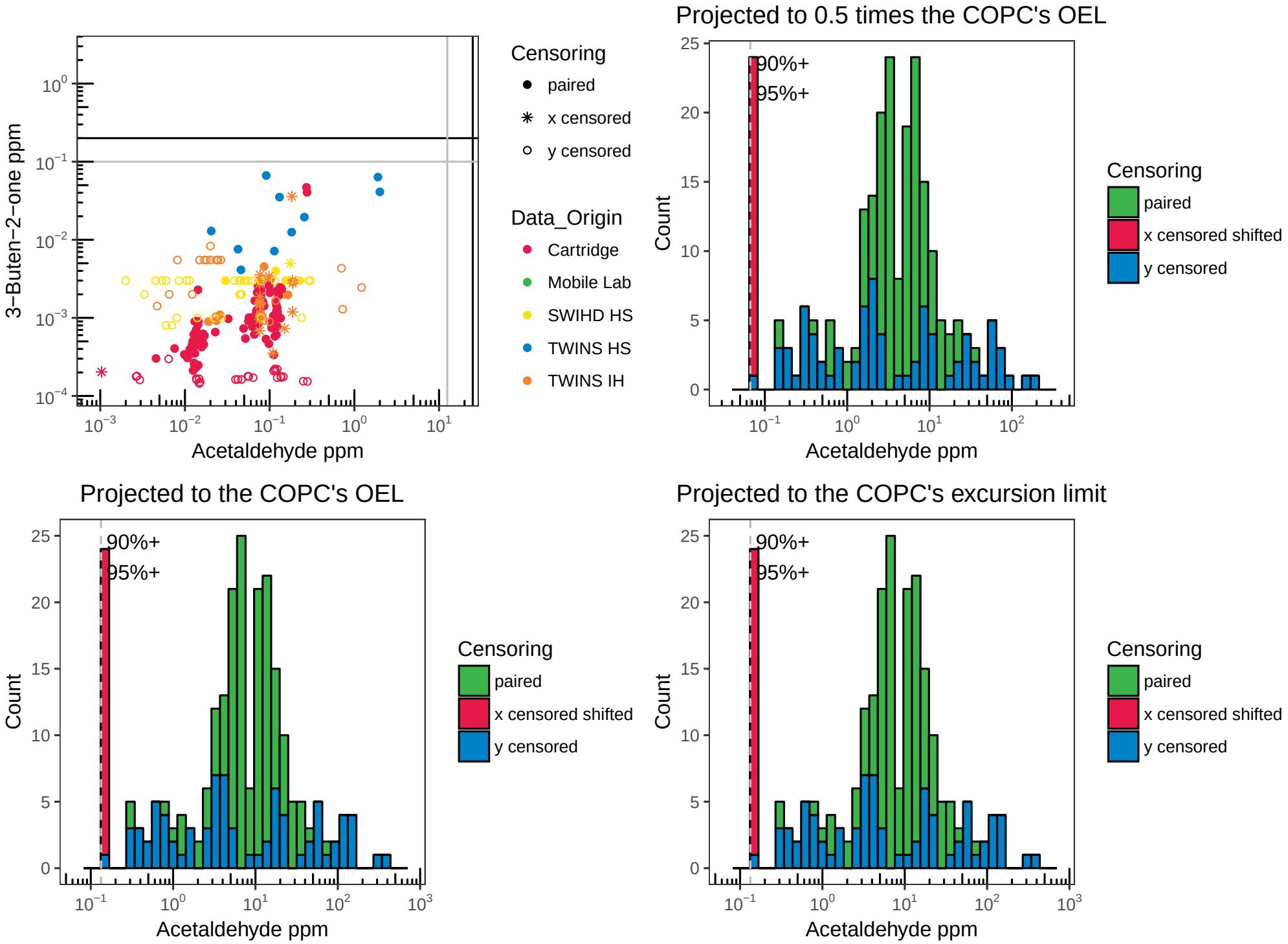


Figure C.767: 3-Buten-2-one vs Acetaldehyde

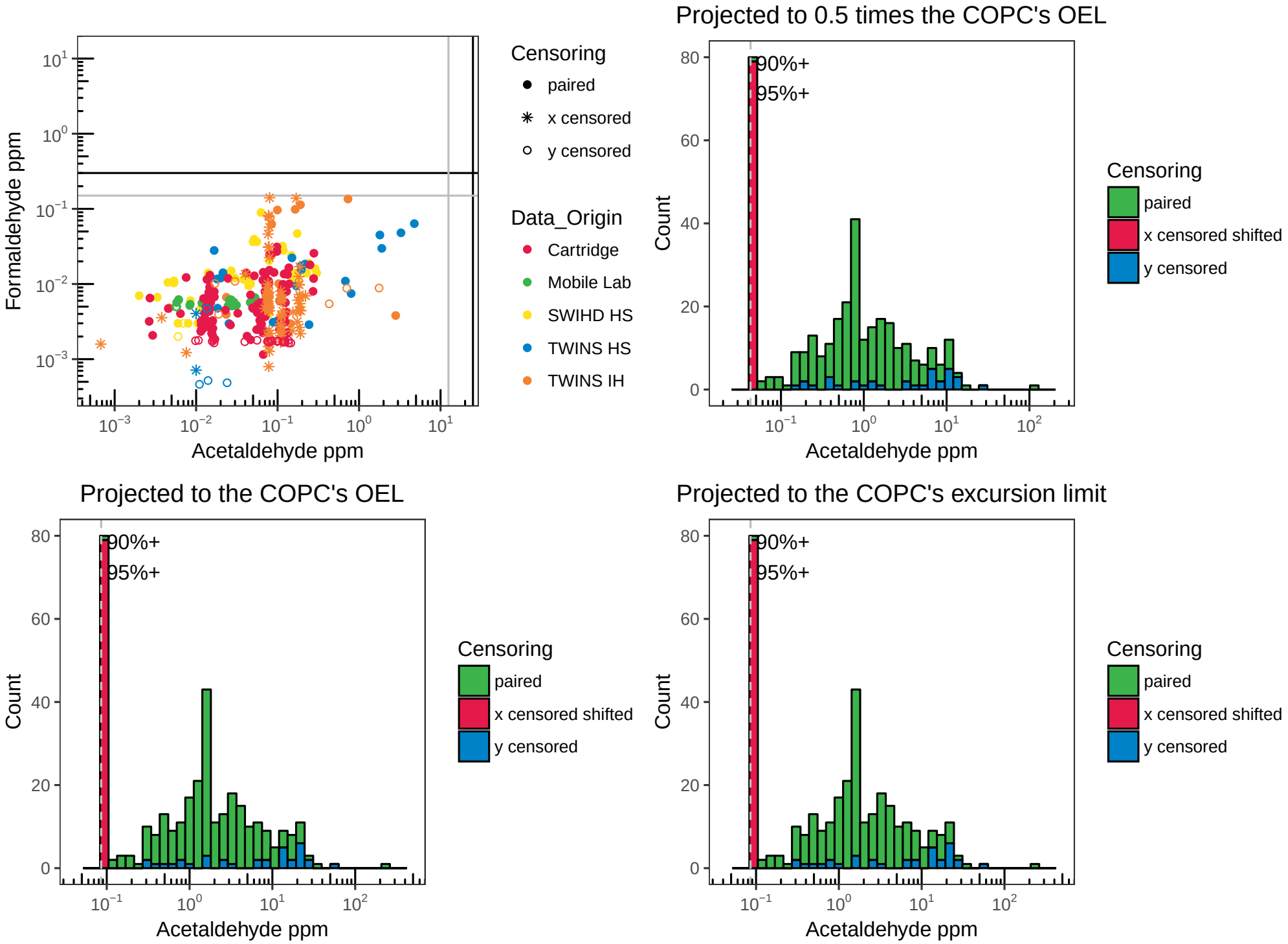


Figure C.768: Formaldehyde vs Acetaldehyde

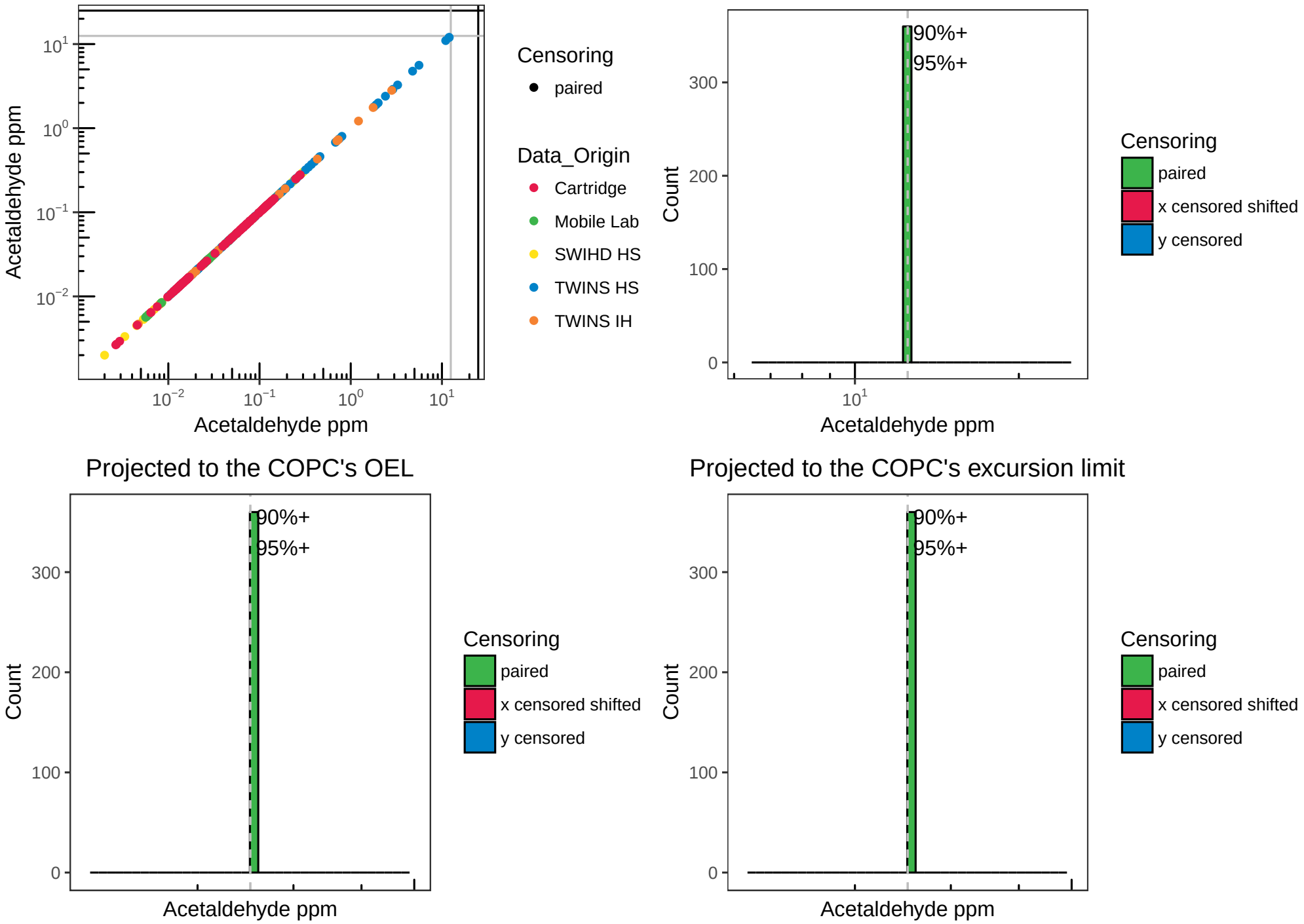


Figure C.769: Acetaldehyde vs Acetaldehyde

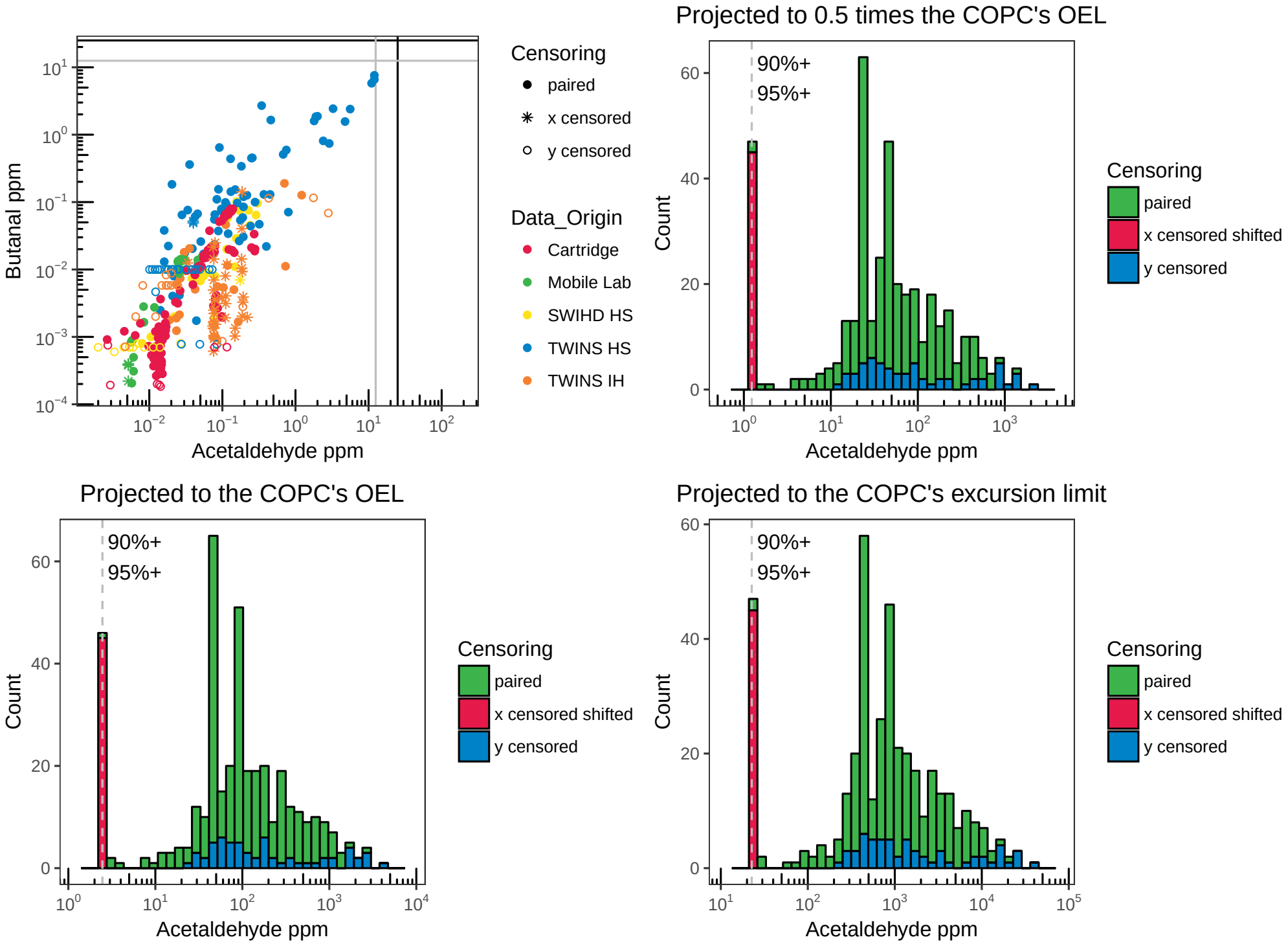


Figure C.770: Butanal vs Acetaldehyde

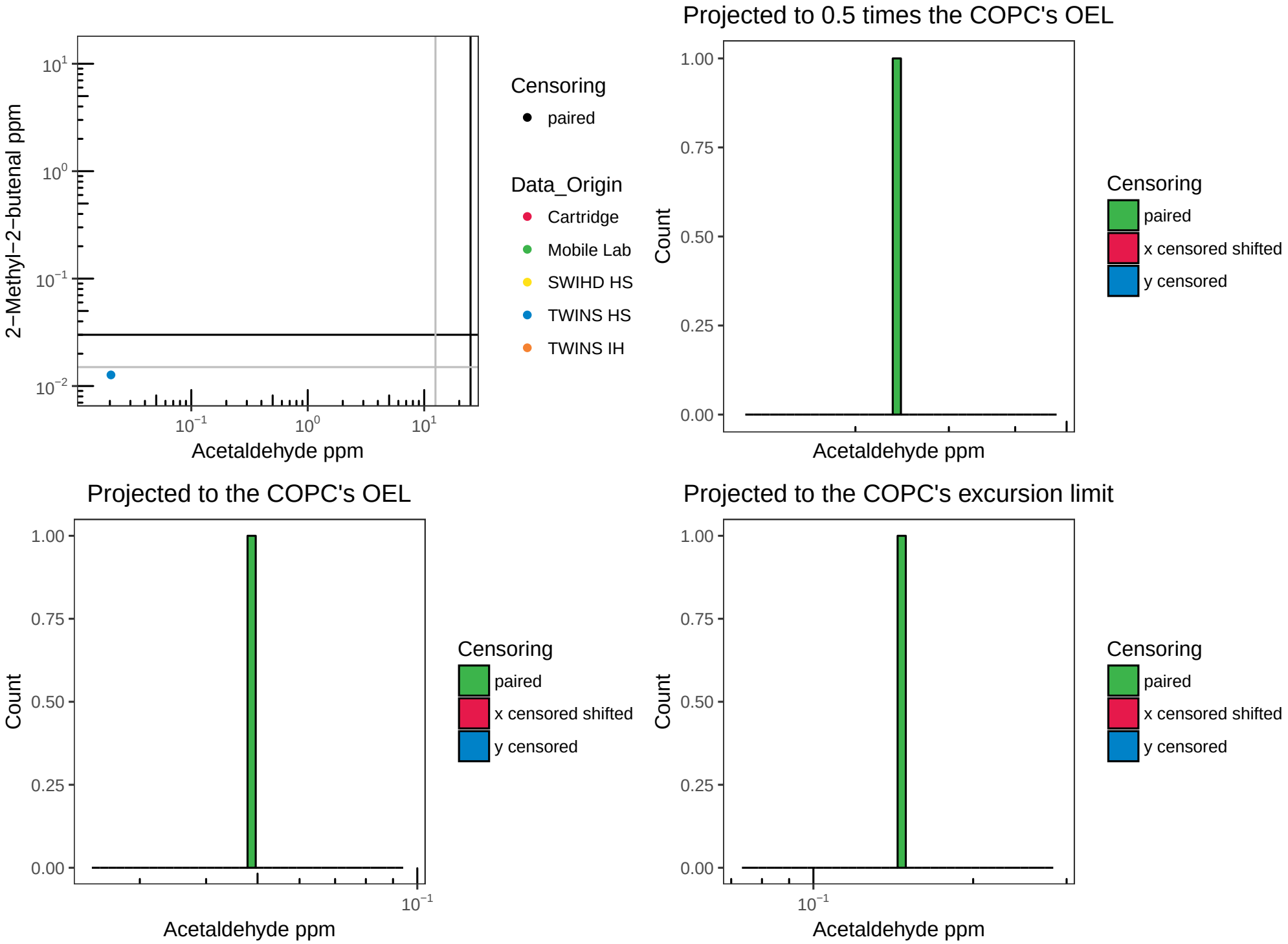


Figure C.771: 2-Methyl-2-butenal vs Acetaldehyde

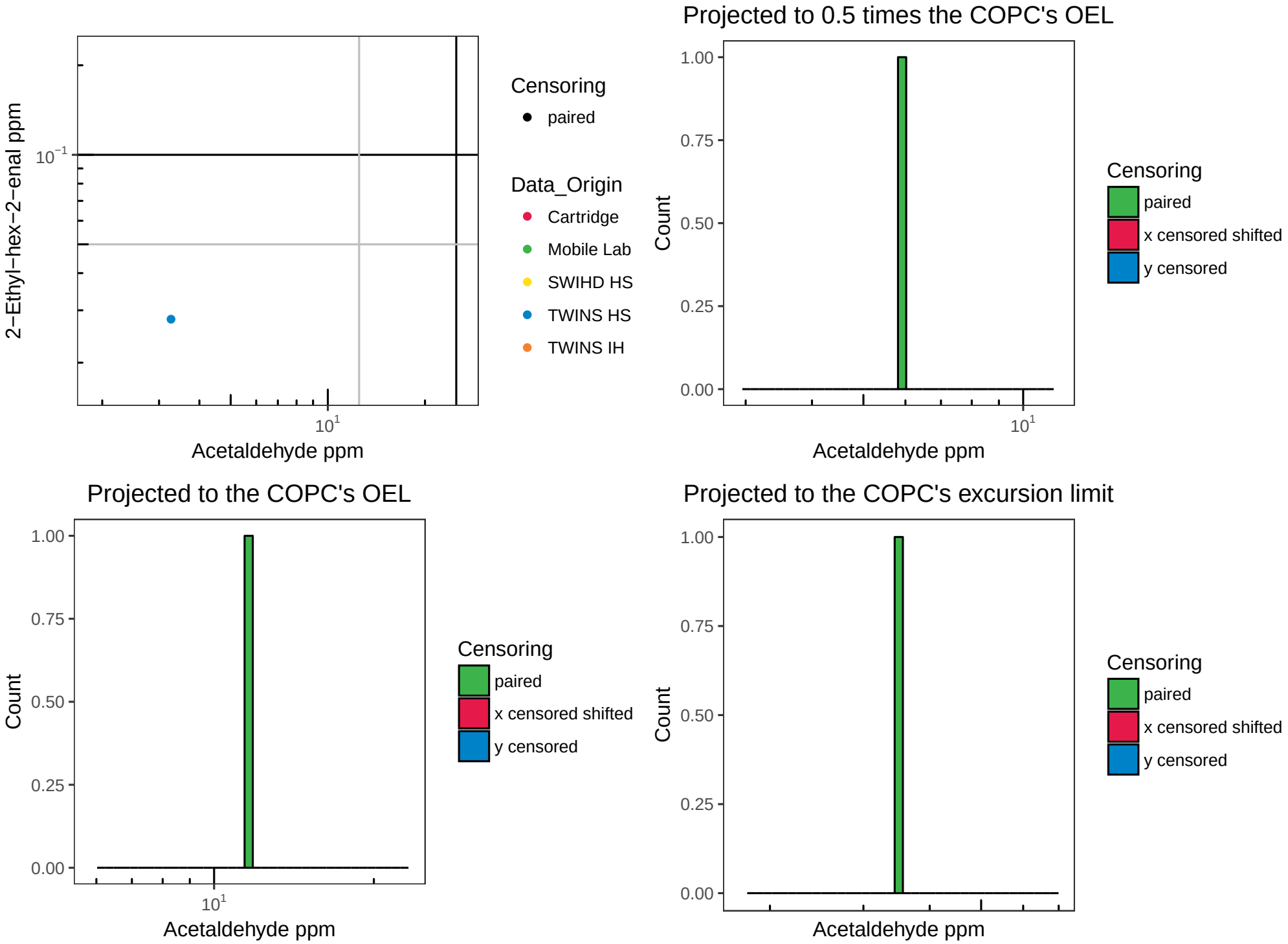


Figure C.772: 2-Ethyl-hex-2-enal vs Acetaldehyde

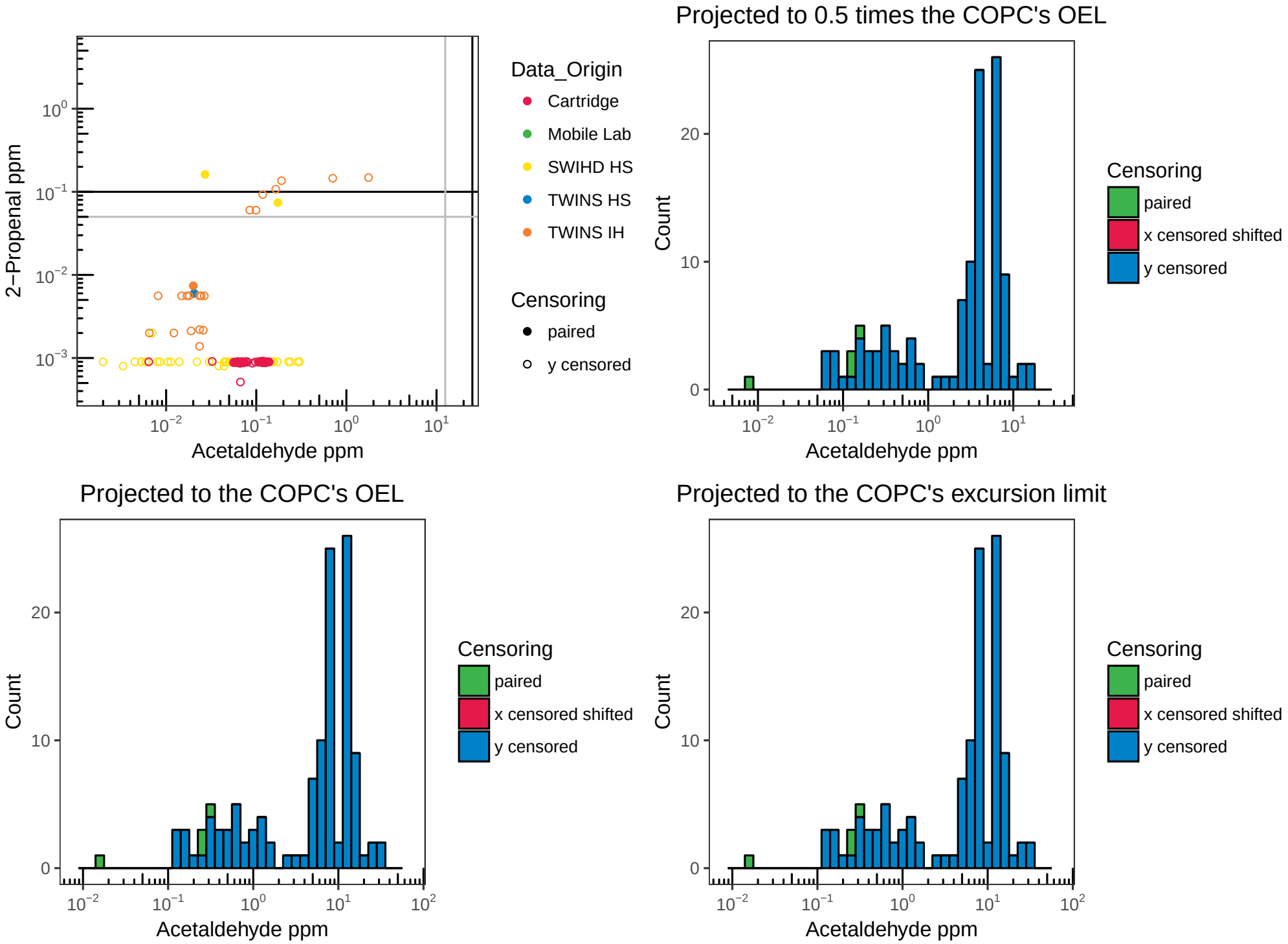


Figure C.773: 2-Propenal vs Acetaldehyde

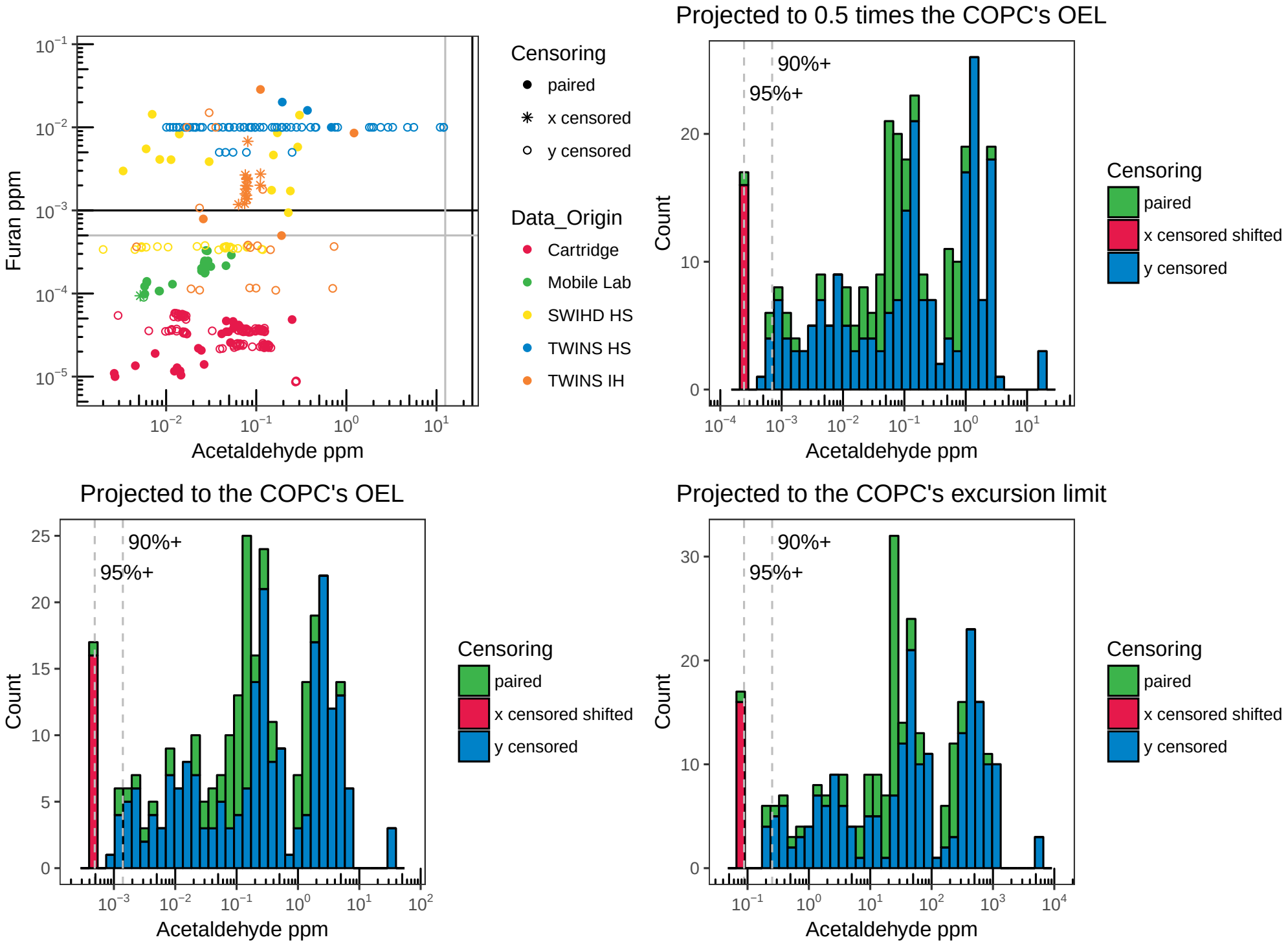


Figure C.774: Furan vs Acetaldehyde

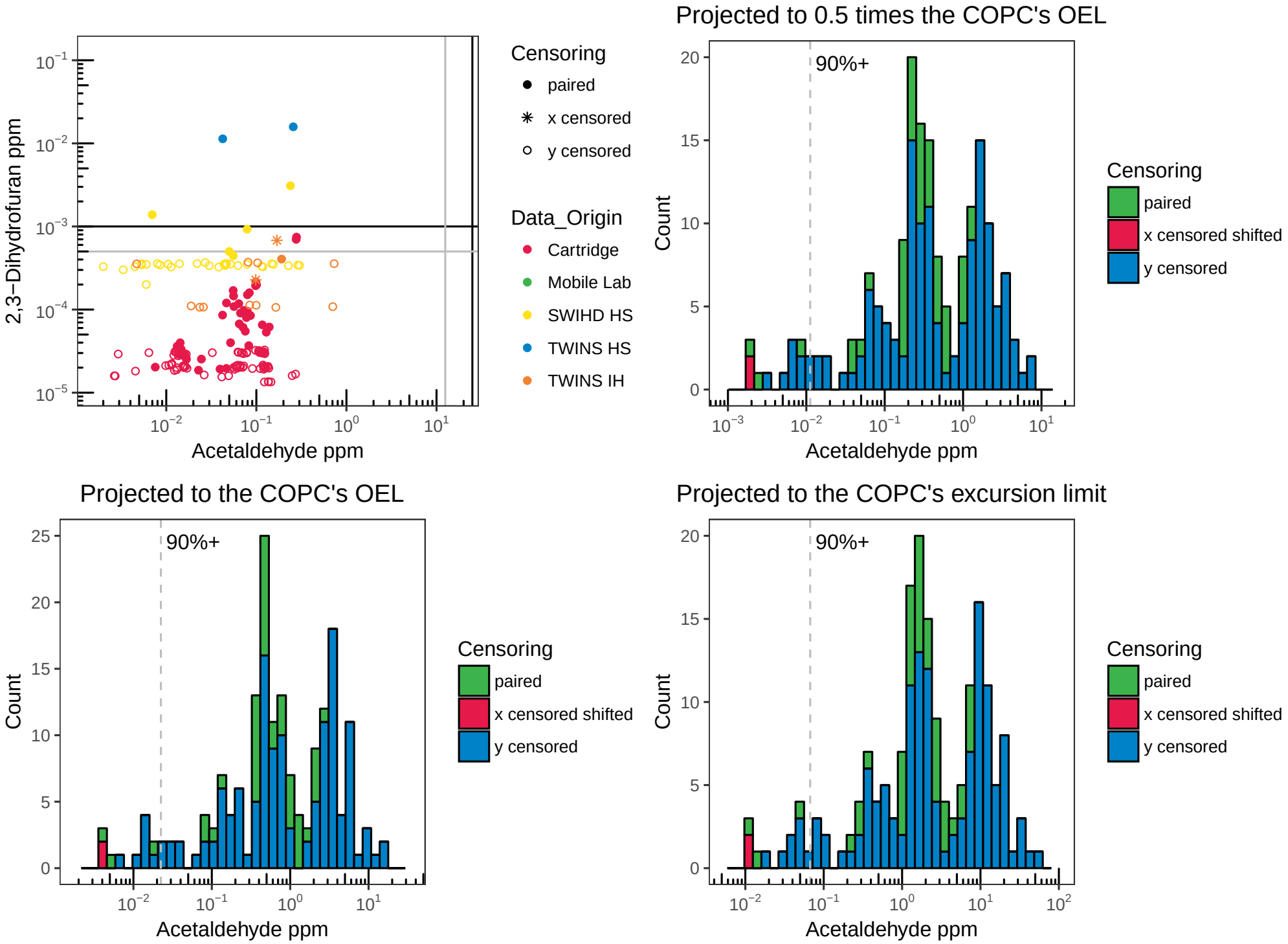


Figure C.775: 2,3-Dihydrofuran vs Acetaldehyde

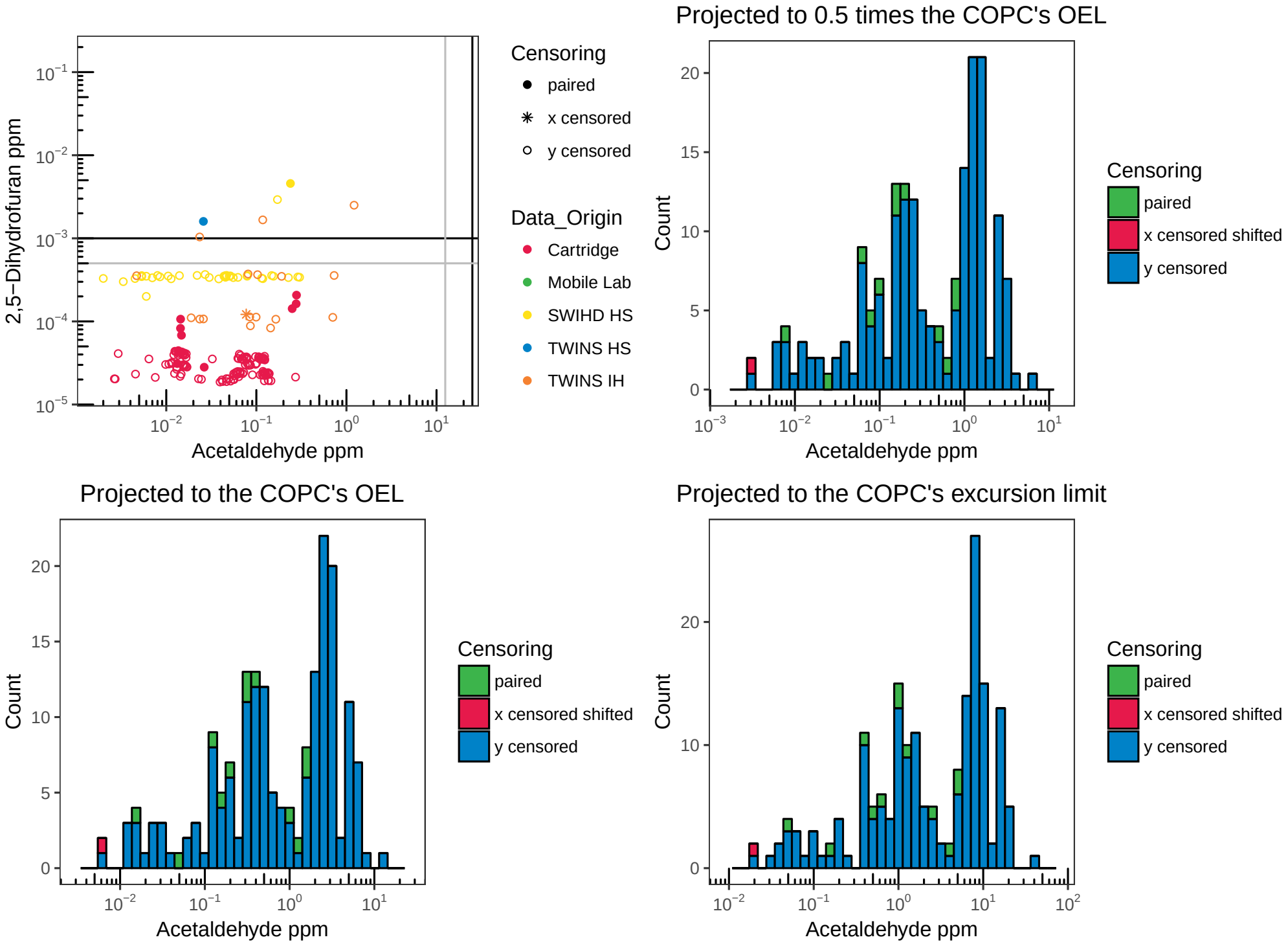


Figure C.776: 2,5-Dihydrofuran vs Acetaldehyde

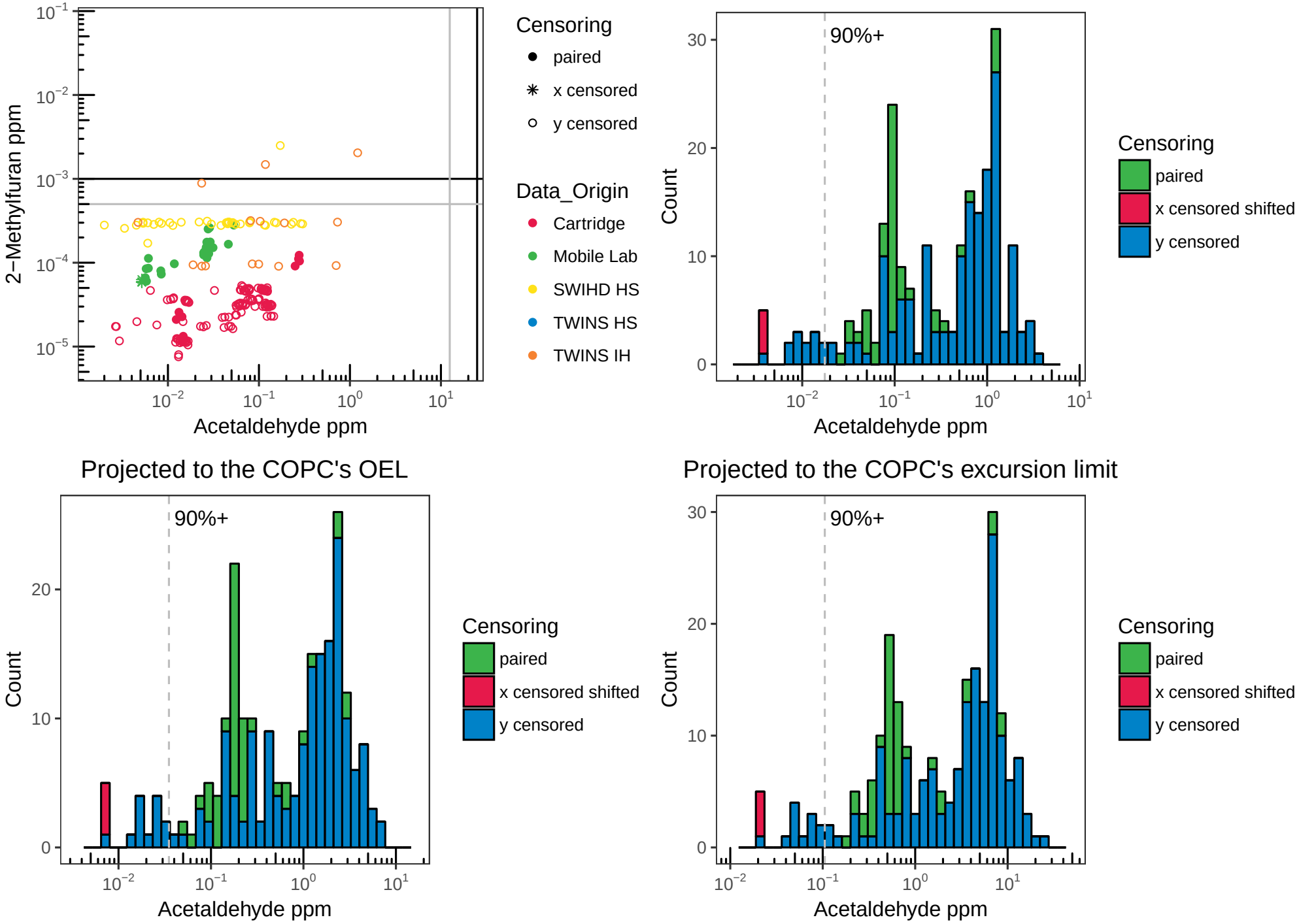


Figure C.777: 2-Methylfuran vs Acetaldehyde

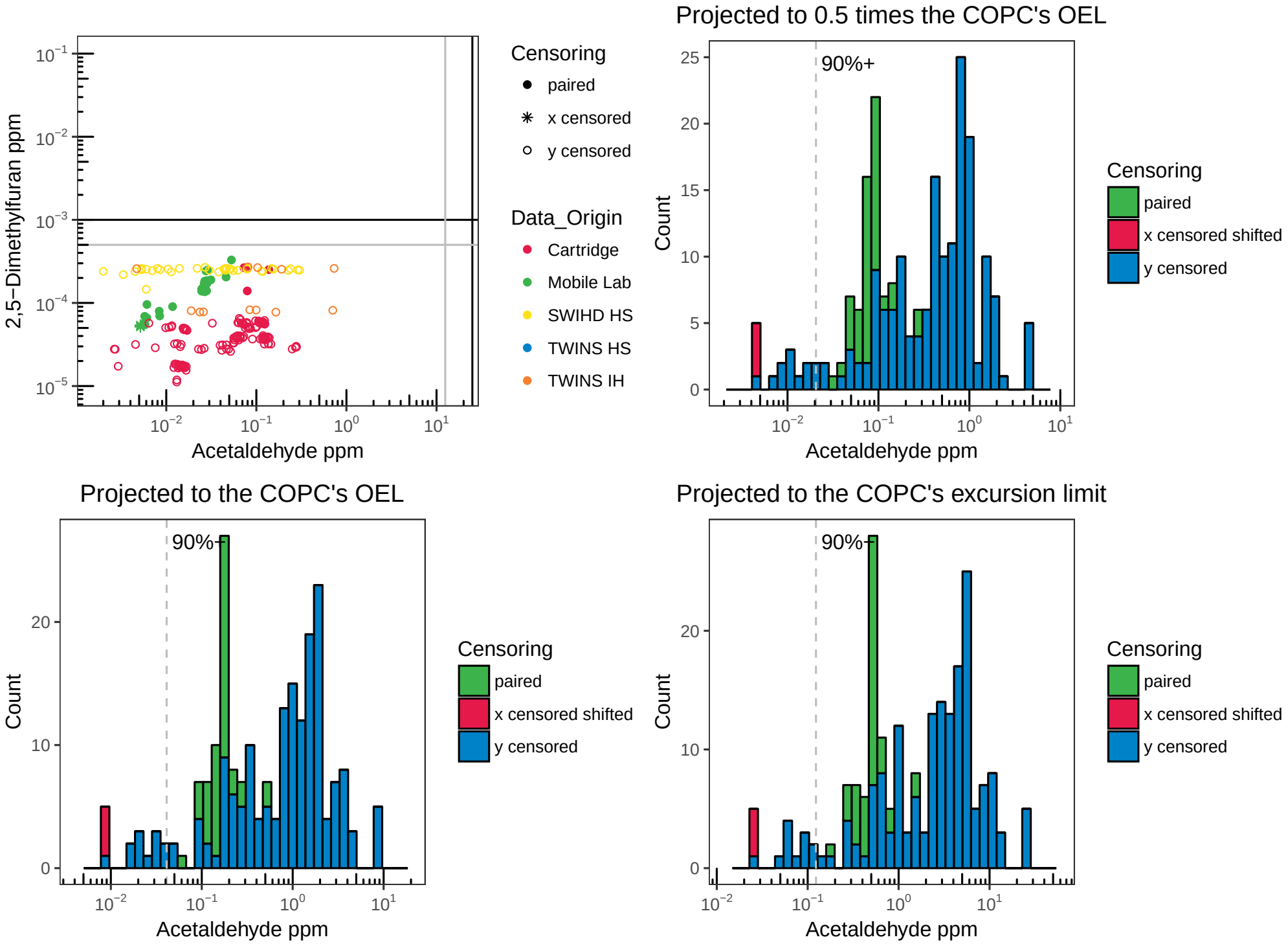


Figure C.778: 2,5-Dimethylfuran vs Acetaldehyde

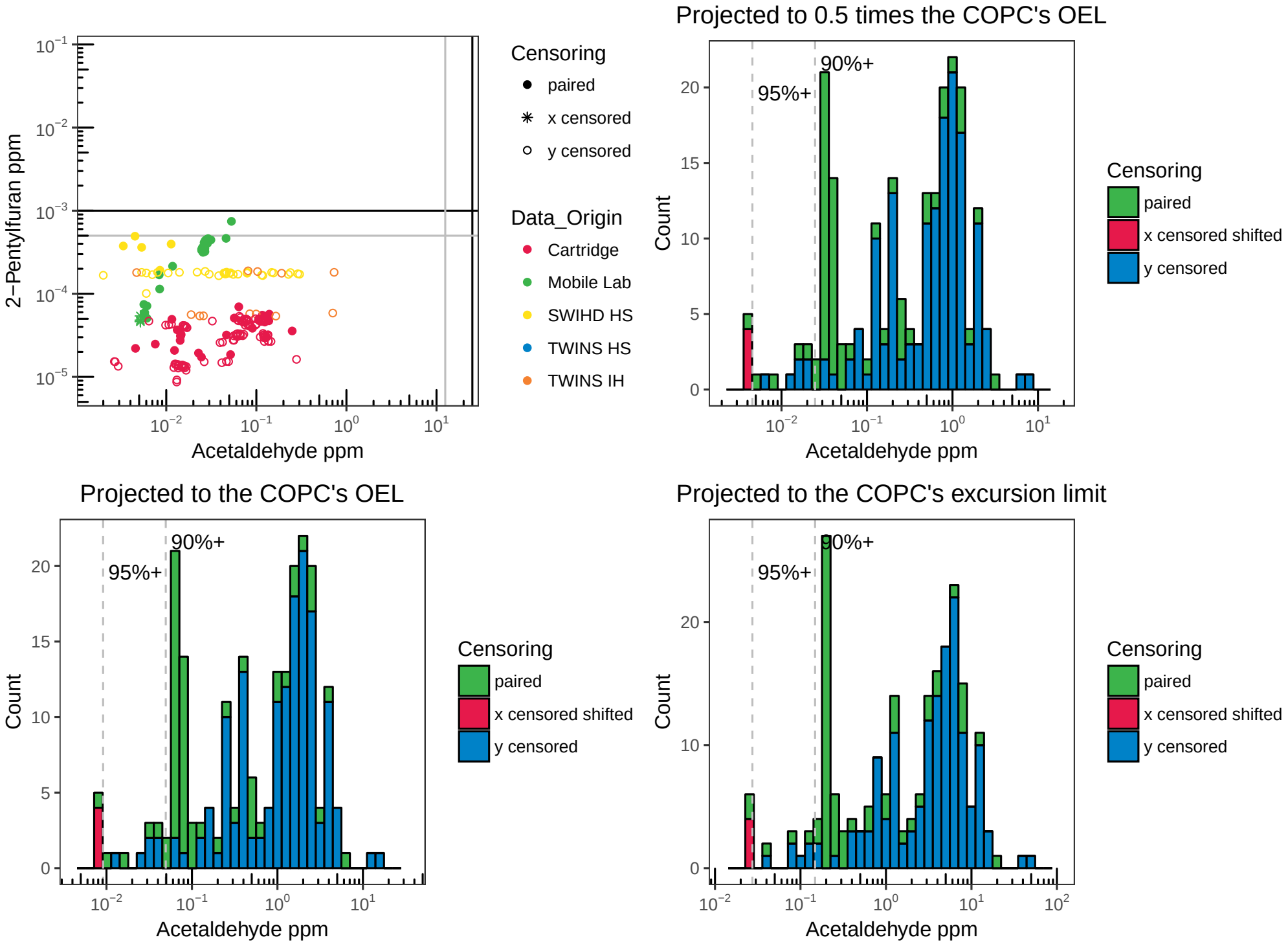


Figure C.779: 2-Pentylfuran vs Acetaldehyde

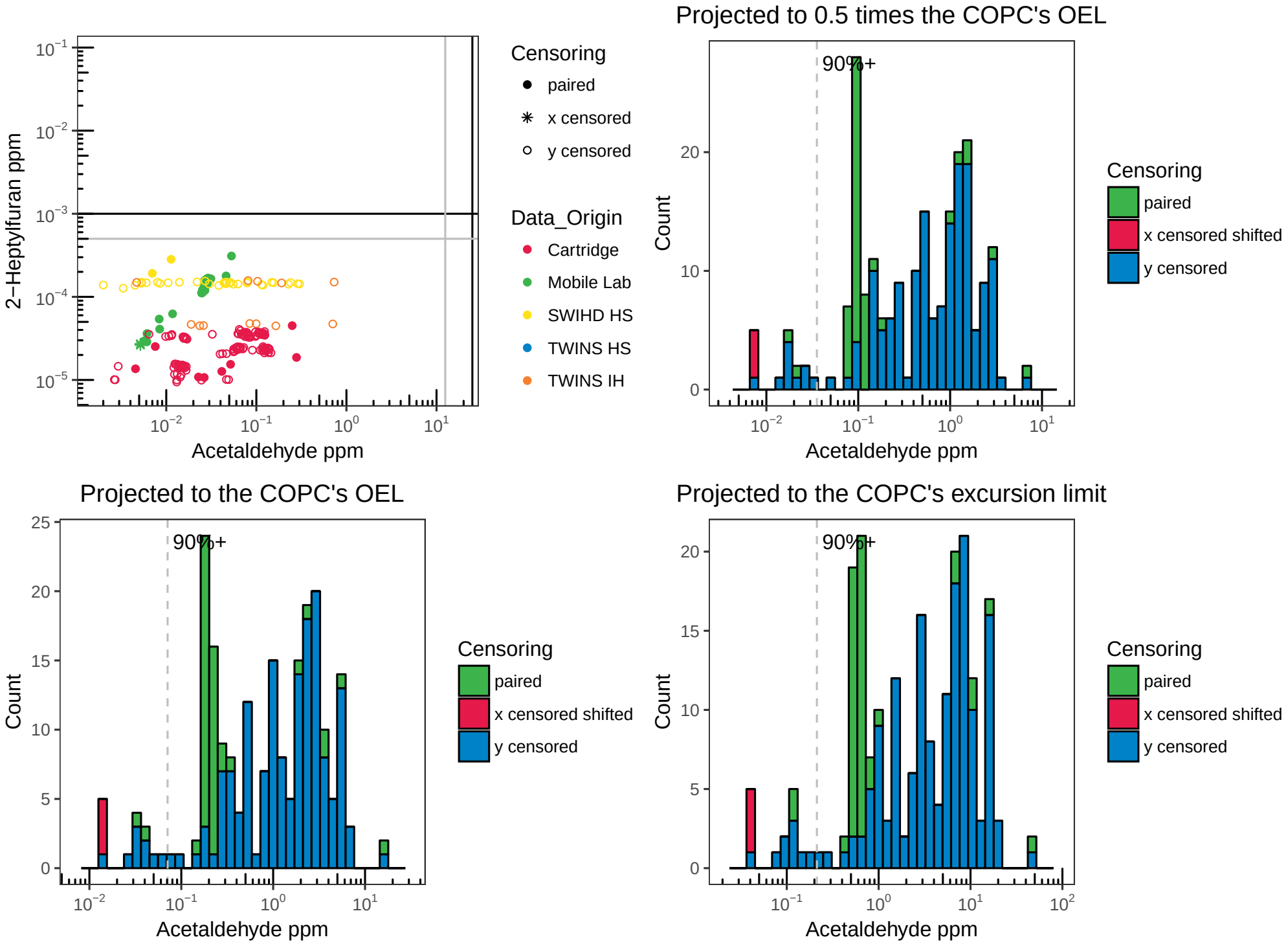


Figure C.780: 2-Heptylfuran vs Acetaldehyde

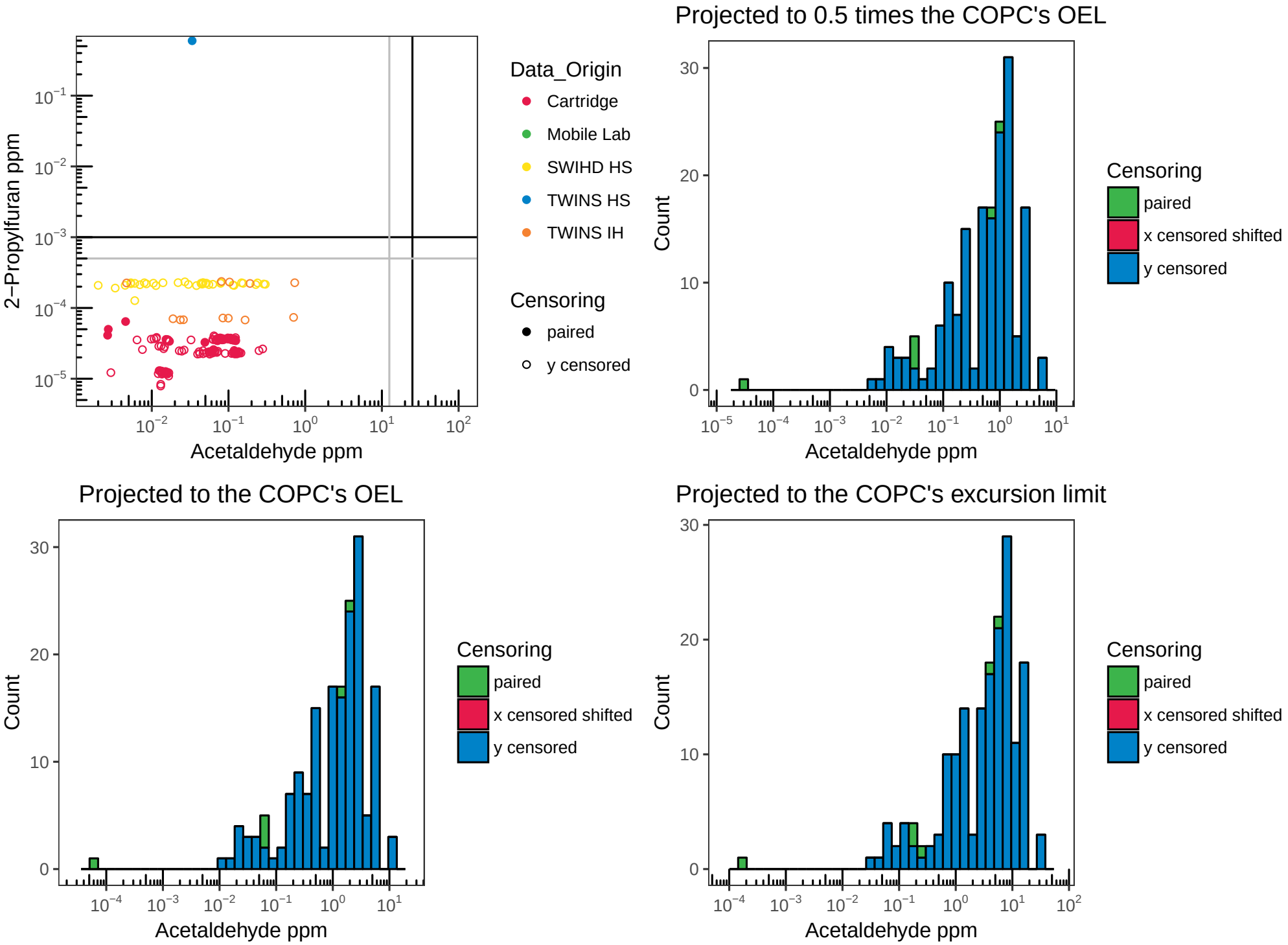


Figure C.781: 2-Propylfuran vs Acetaldehyde

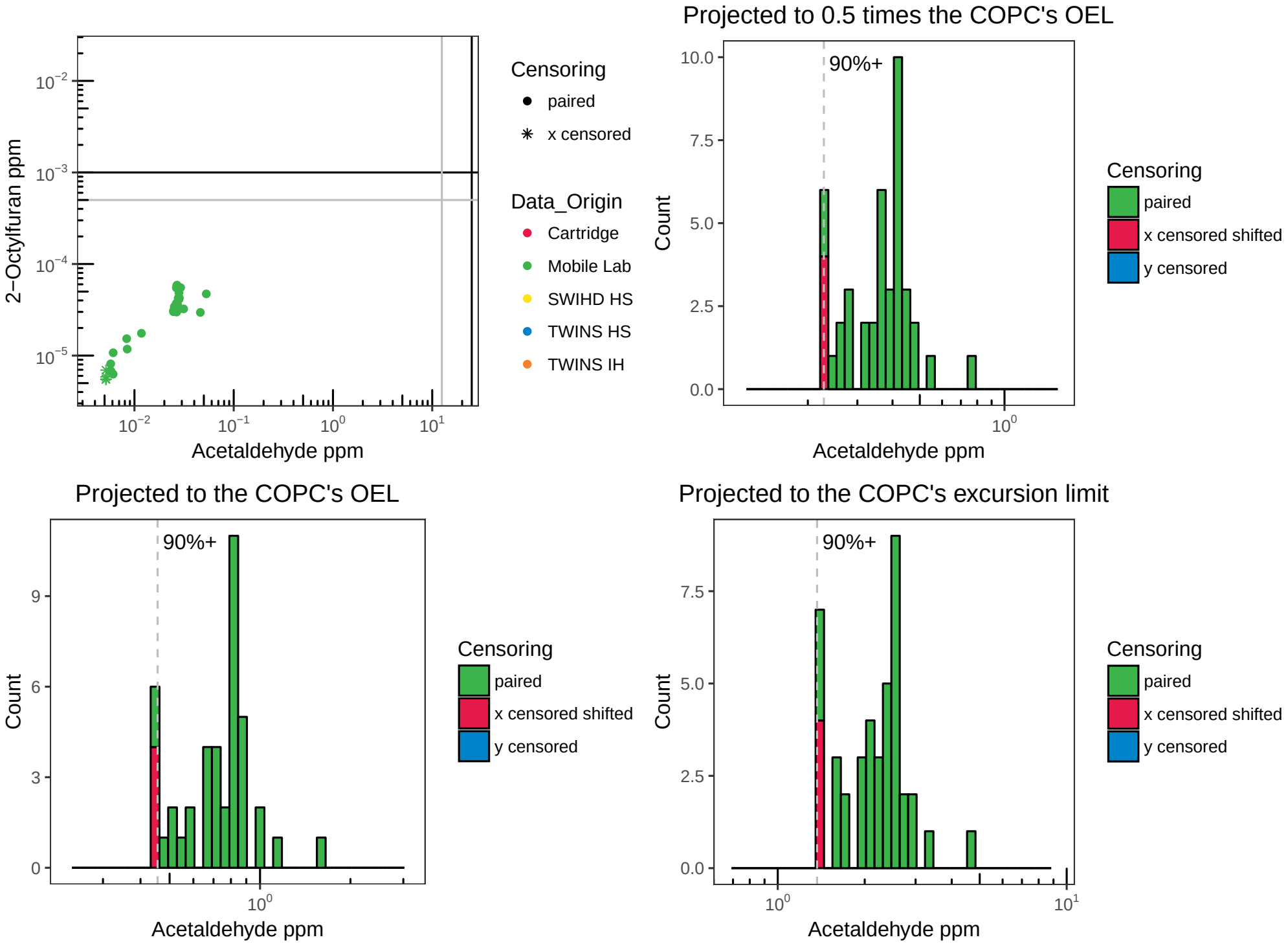


Figure C.782: 2-Octylfuran vs Acetaldehyde

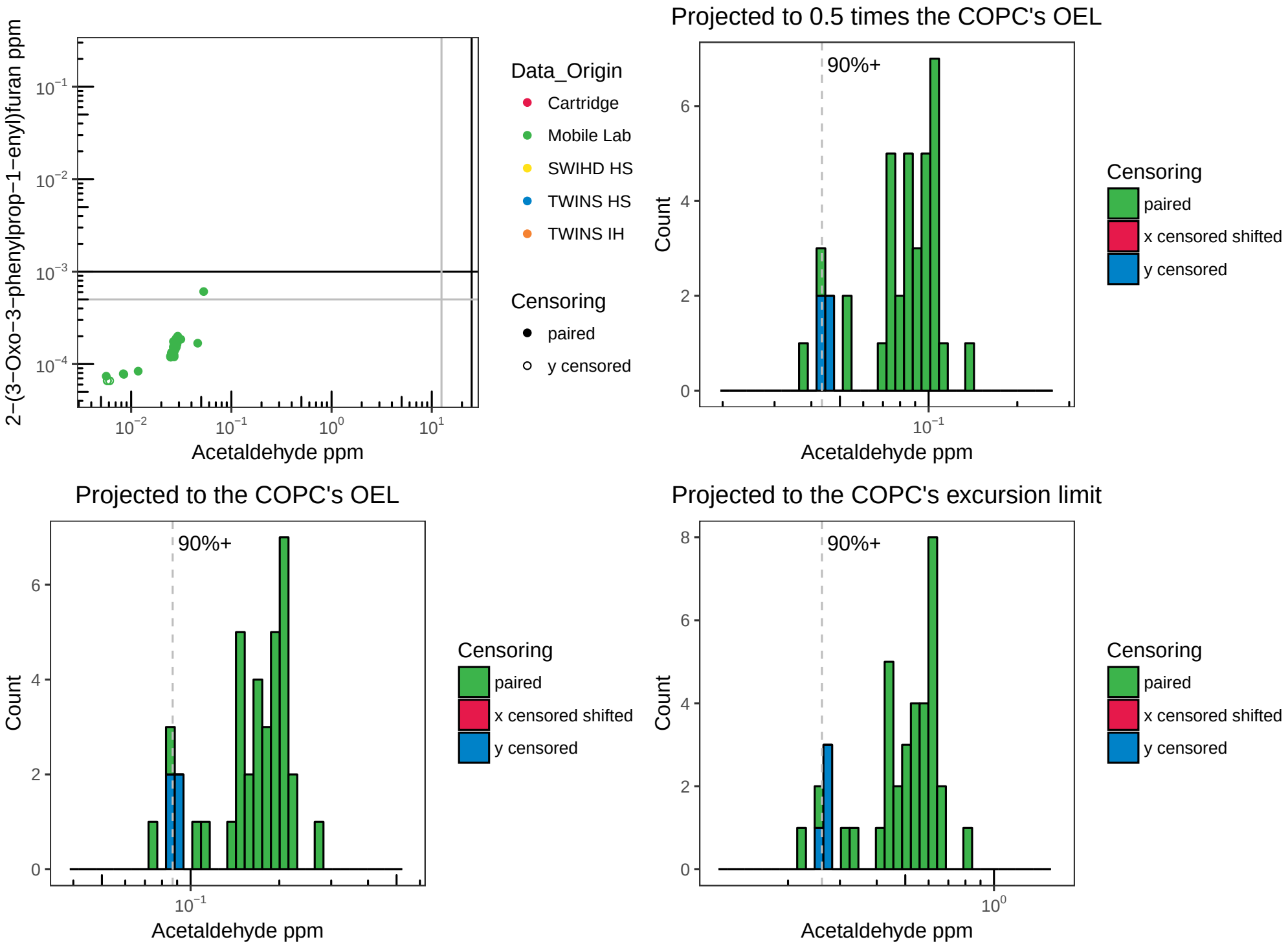


Figure C.783: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Acetaldehyde

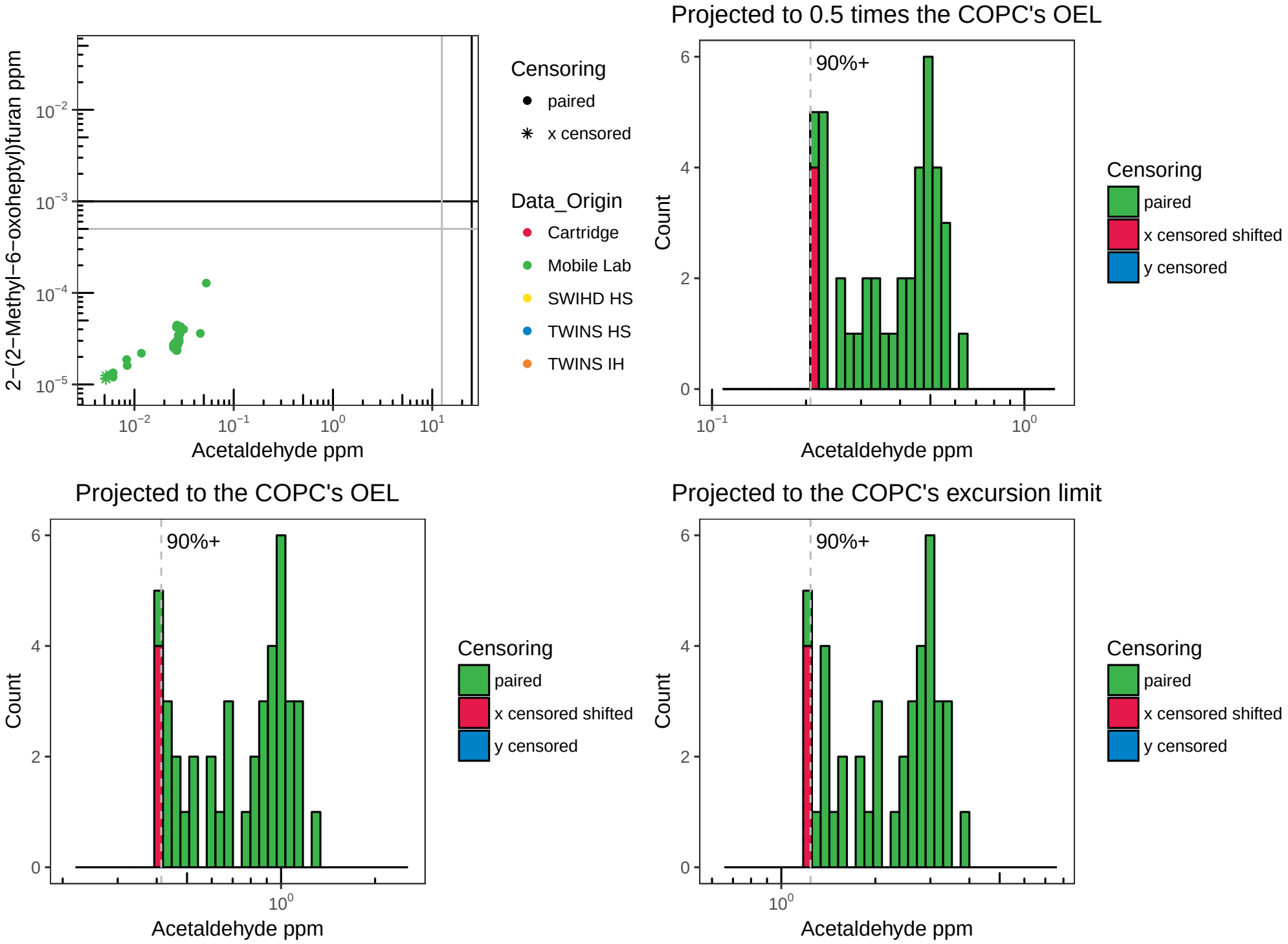


Figure C.784: 2-(2-Methyl-6-oxoheptyl)furan vs Acetaldehyde

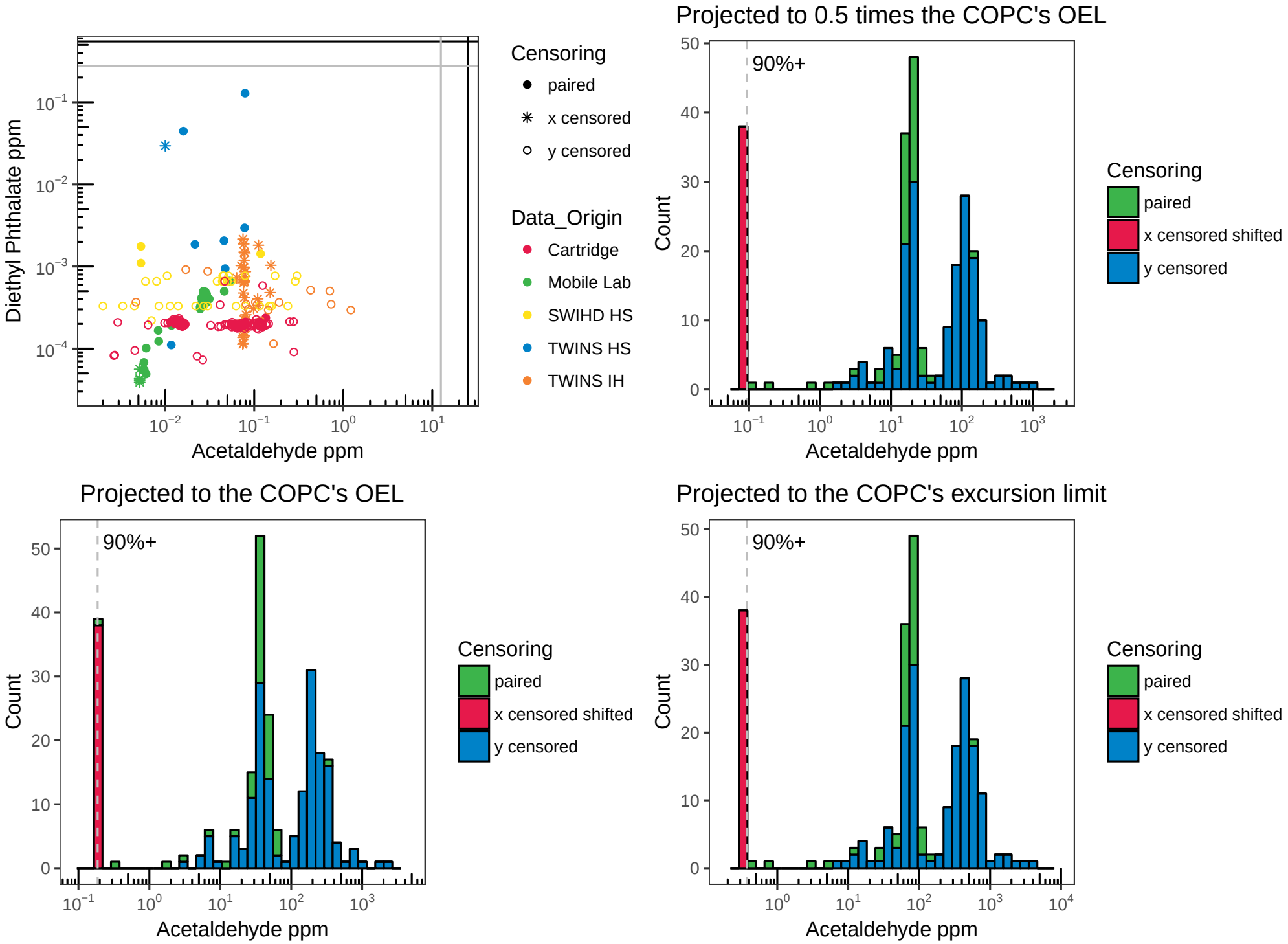


Figure C.785: Diethyl Phthalate vs Acetaldehyde

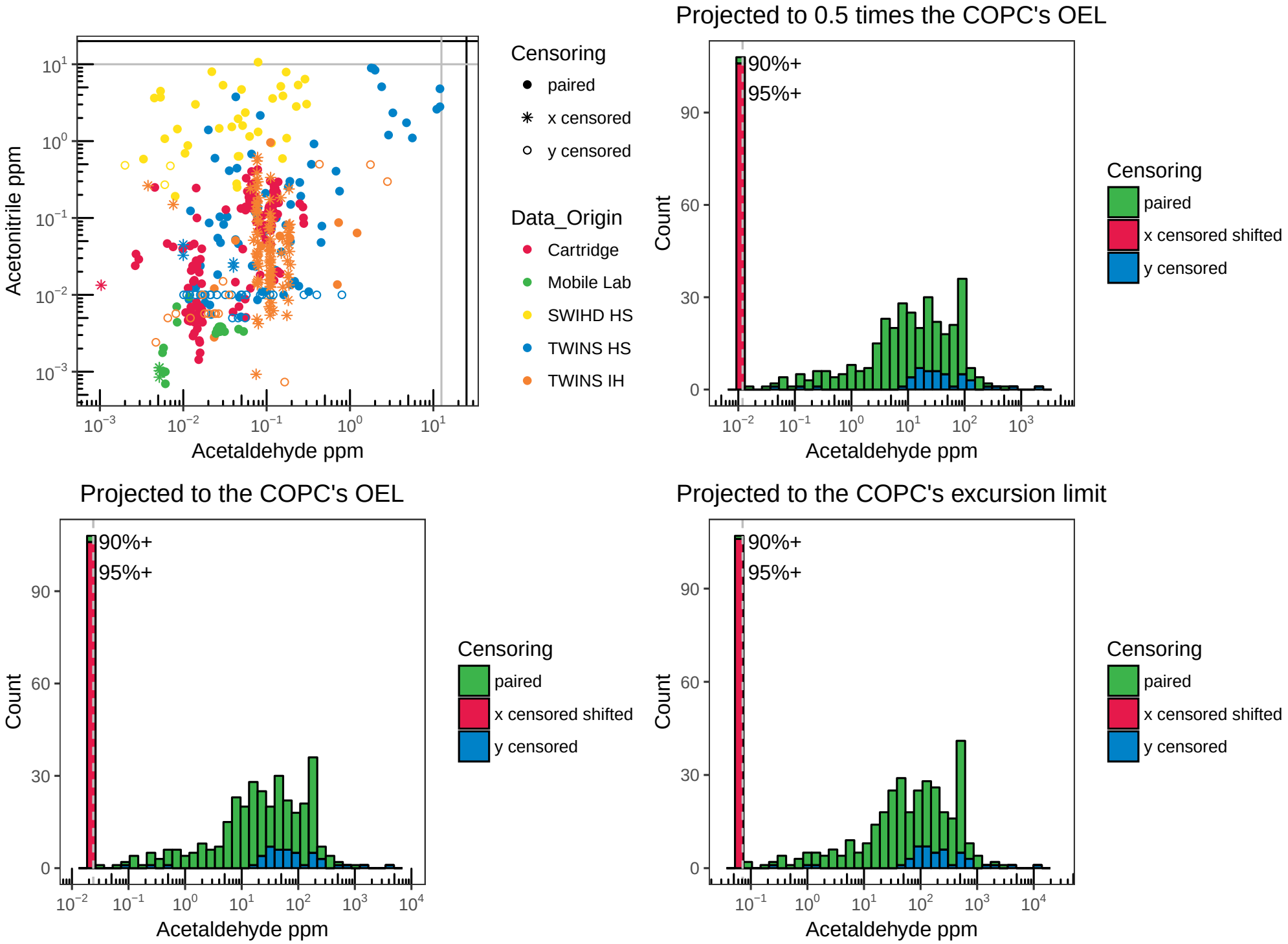


Figure C.786: Acetonitrile vs Acetaldehyde

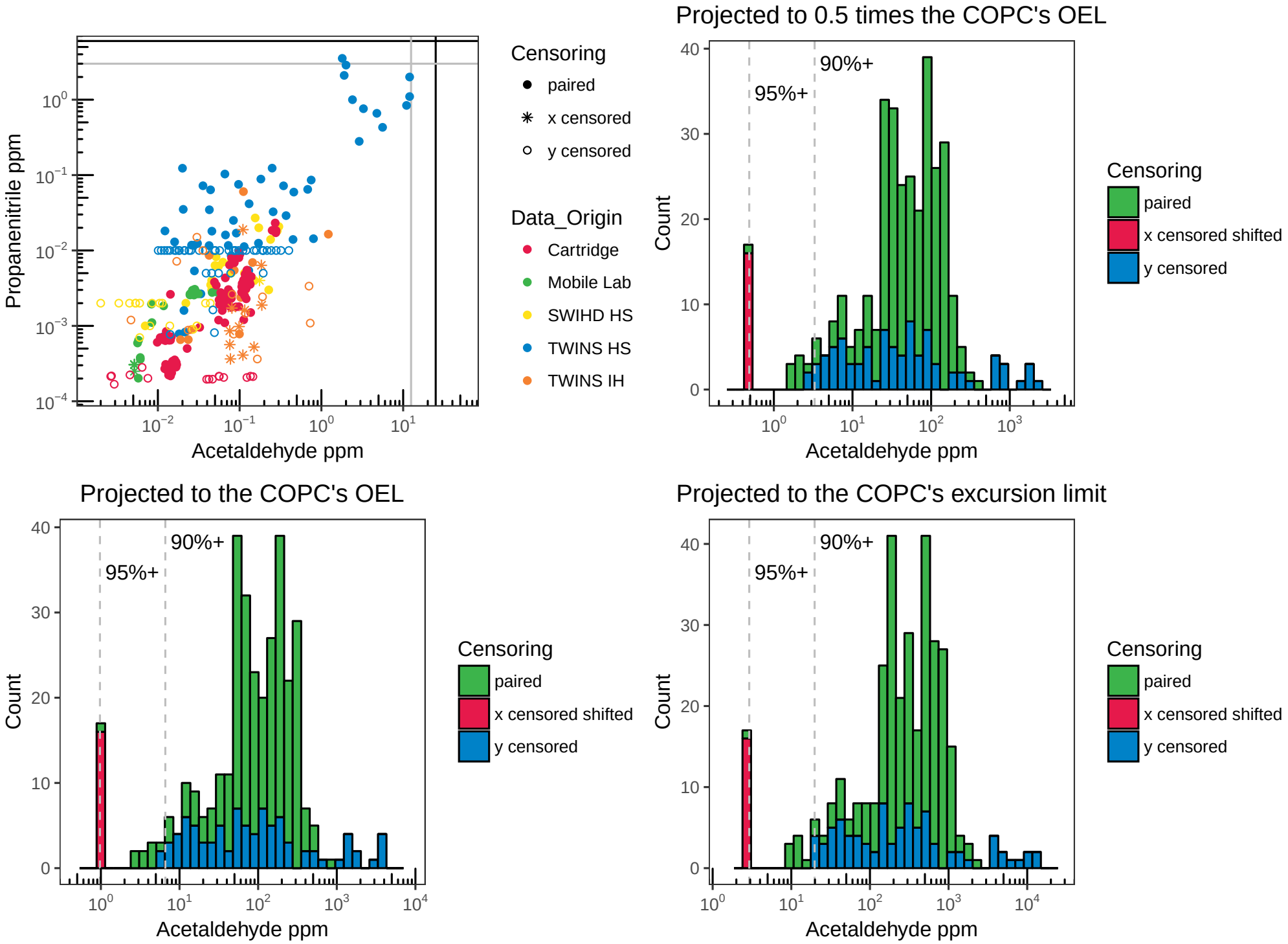


Figure C.787: Propanenitrile vs Acetaldehyde

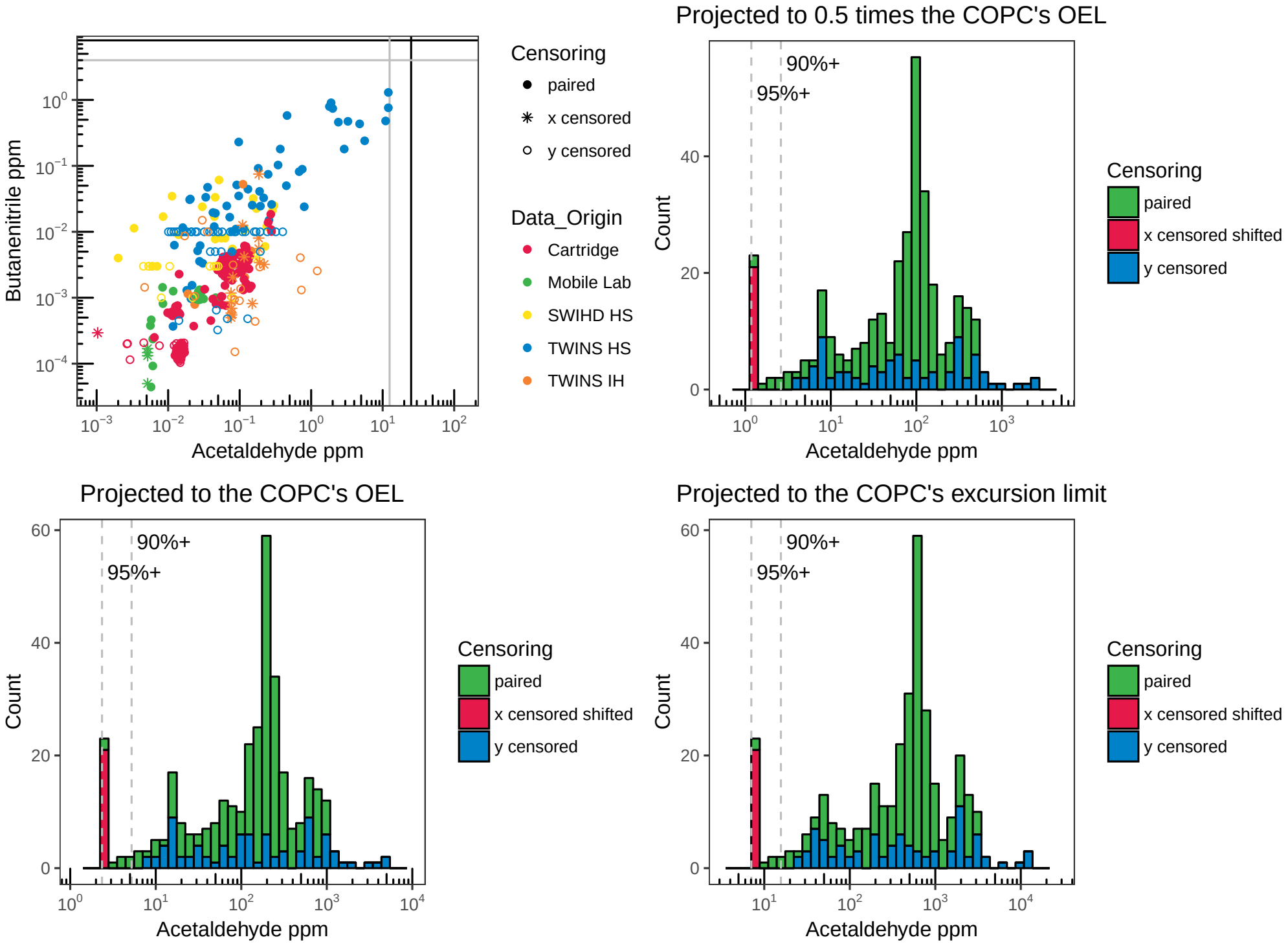


Figure C.788: Butanenitrile vs Acetaldehyde

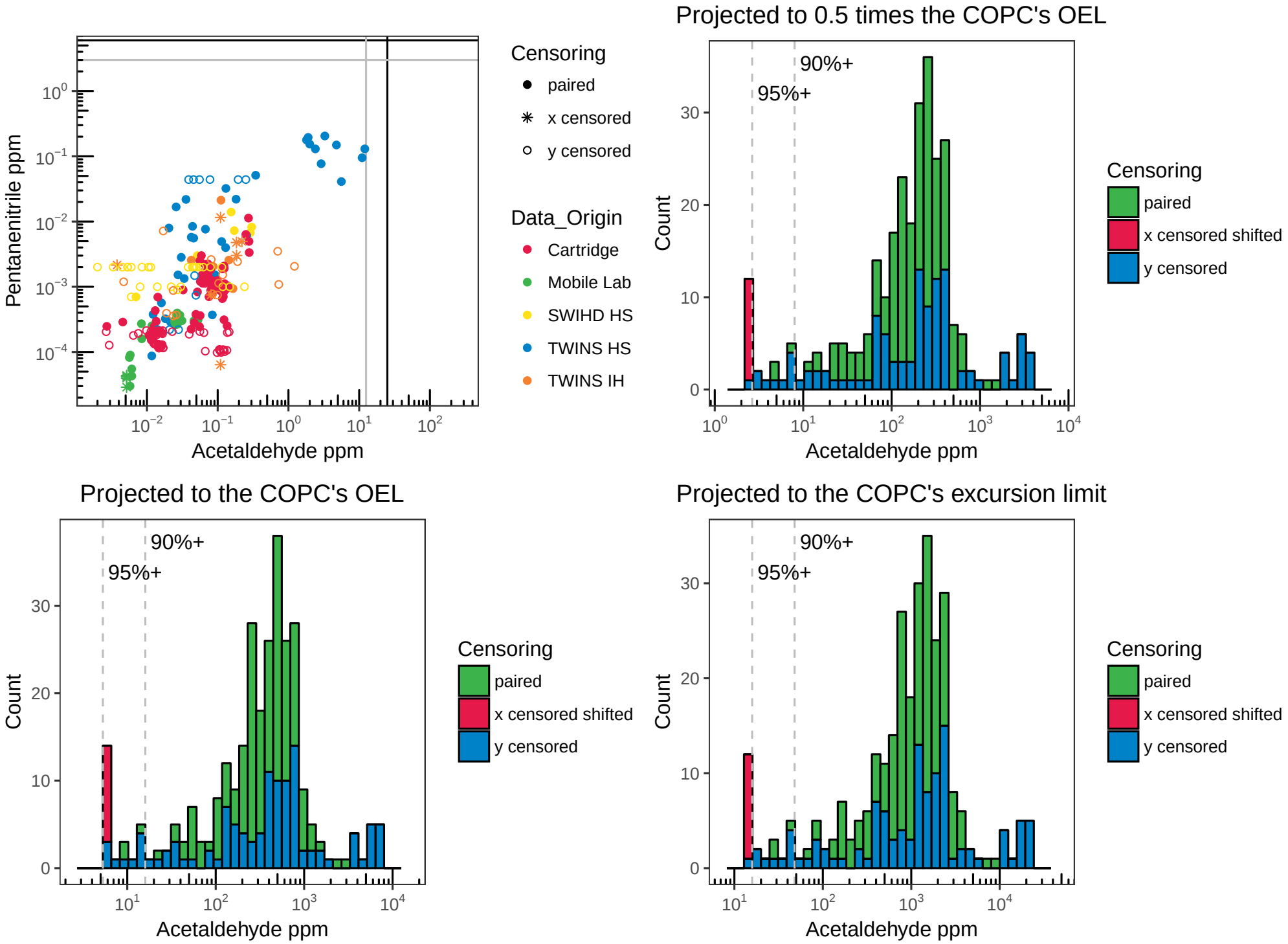


Figure C.789: Pentanenitrile vs Acetaldehyde

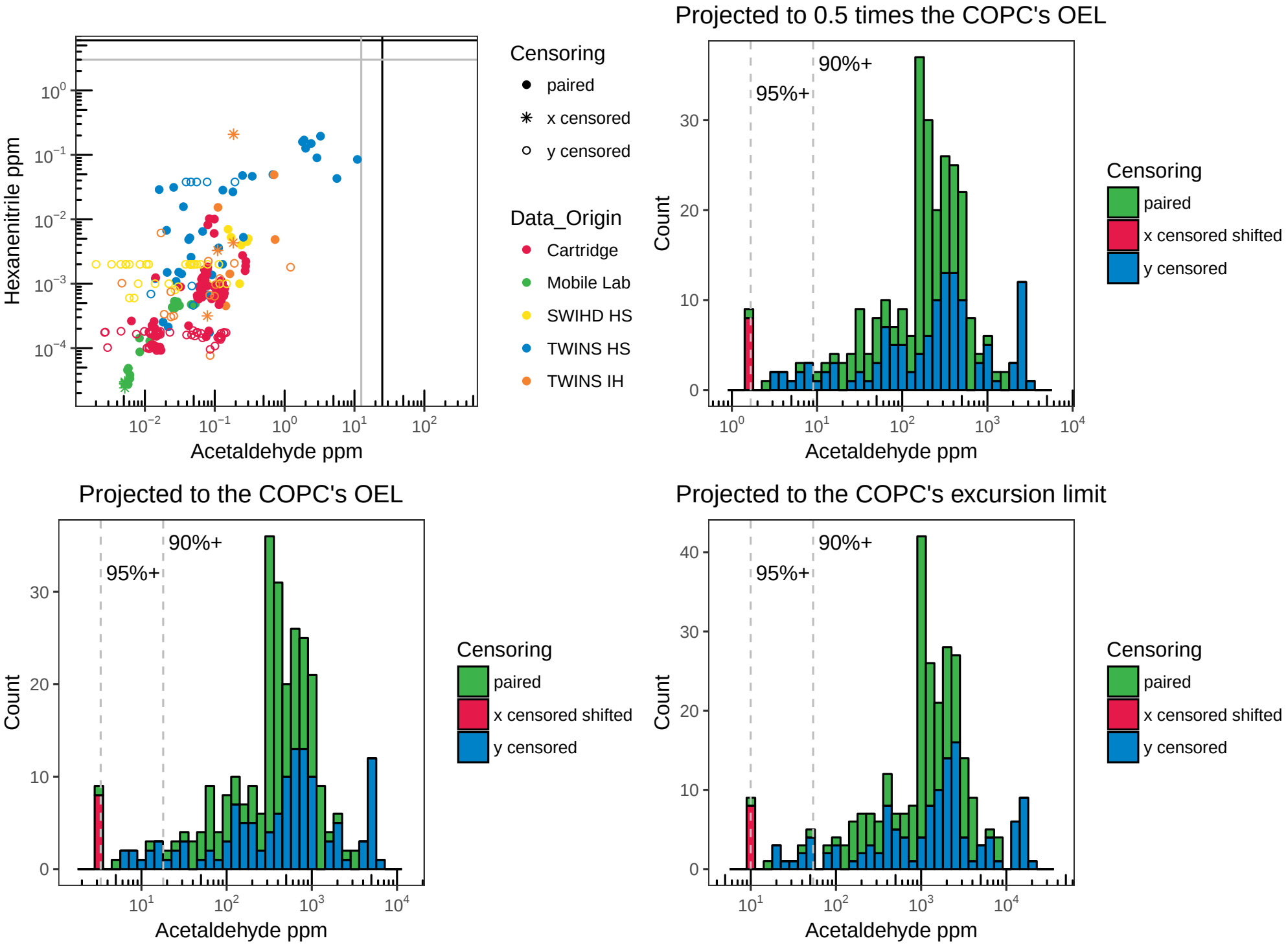


Figure C.790: Hexanenitrile vs Acetaldehyde

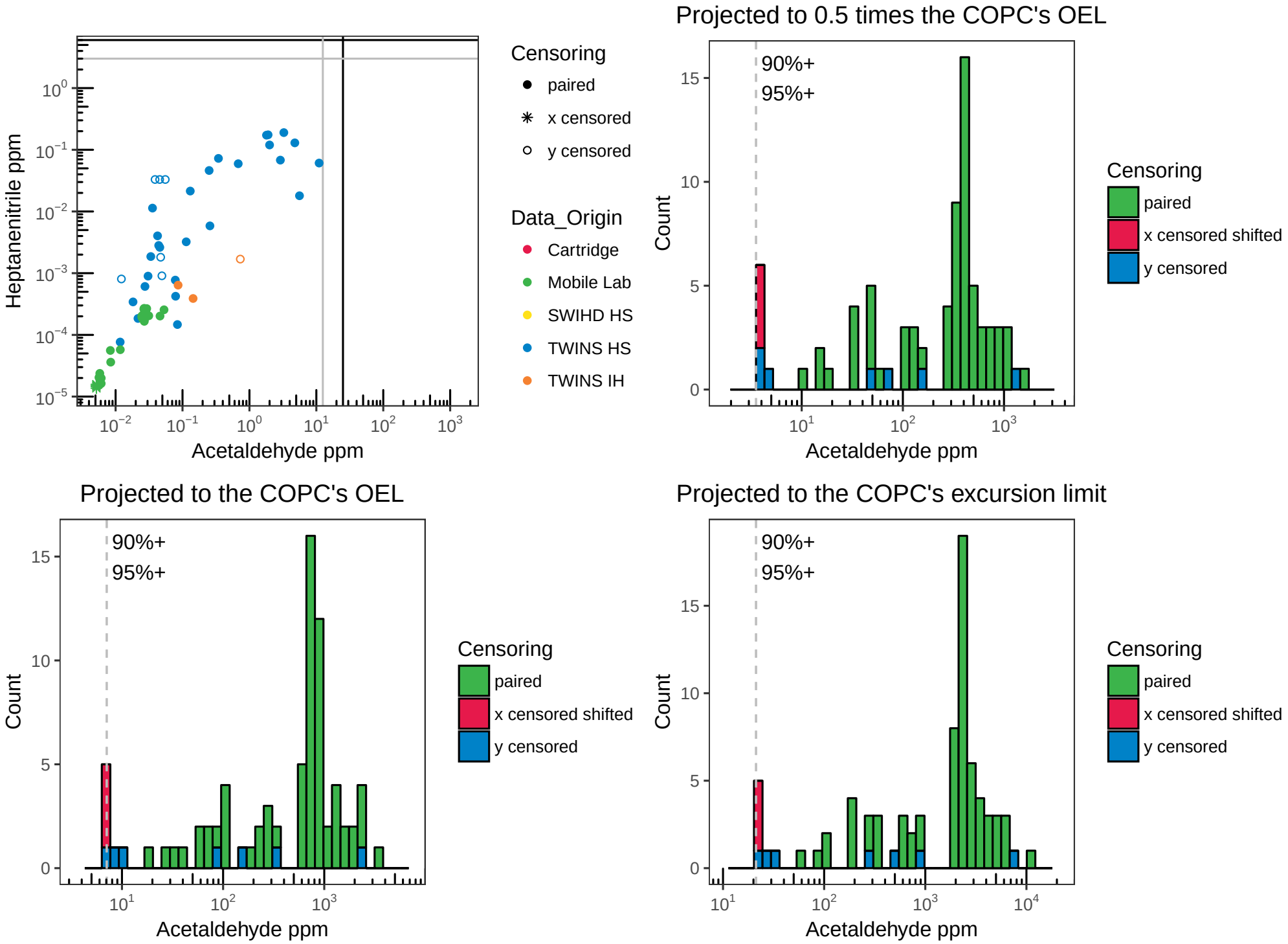


Figure C.791: Heptanenitrile vs Acetaldehyde

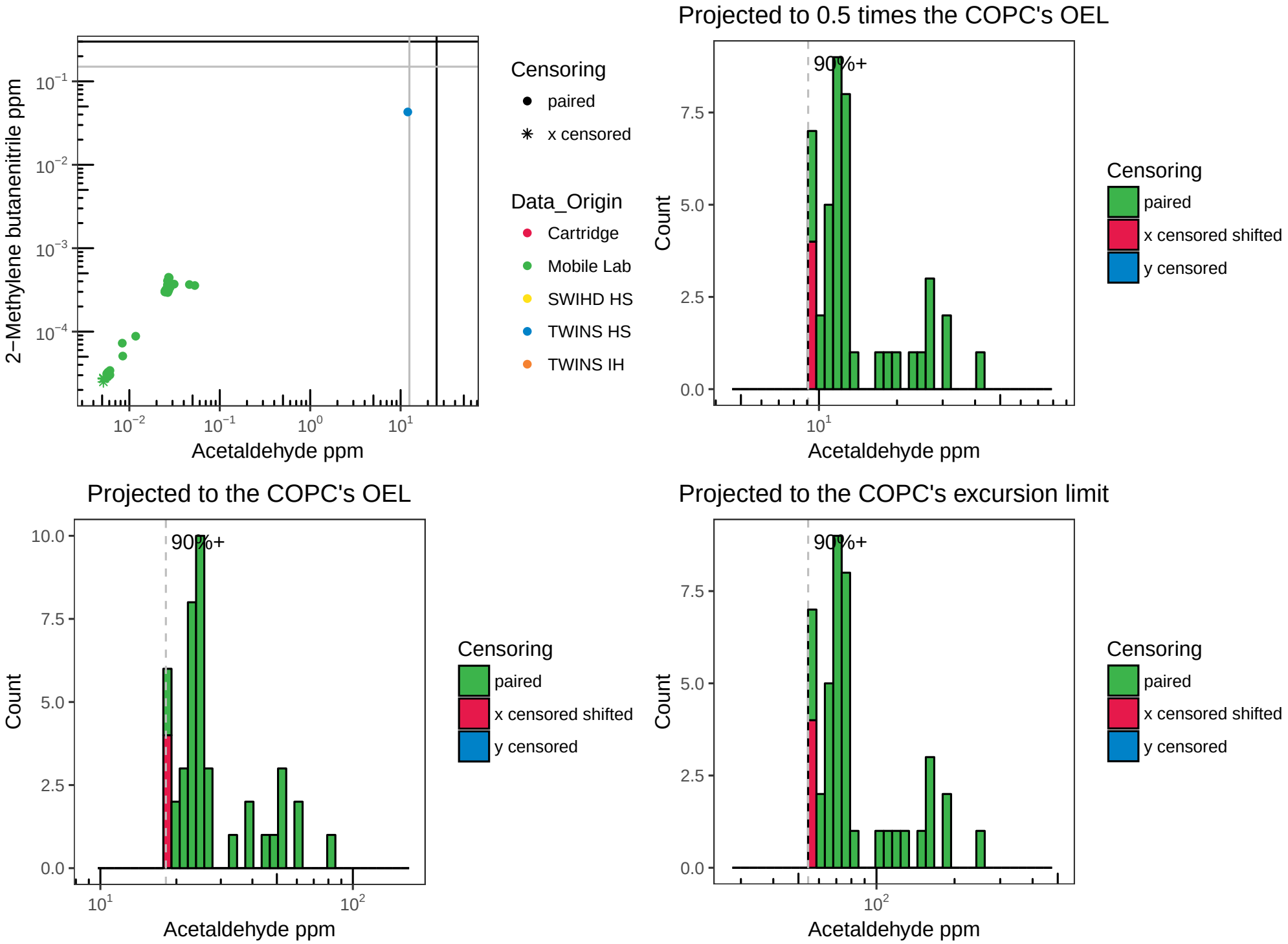


Figure C.792: 2-Methylene butanenitrile vs Acetaldehyde

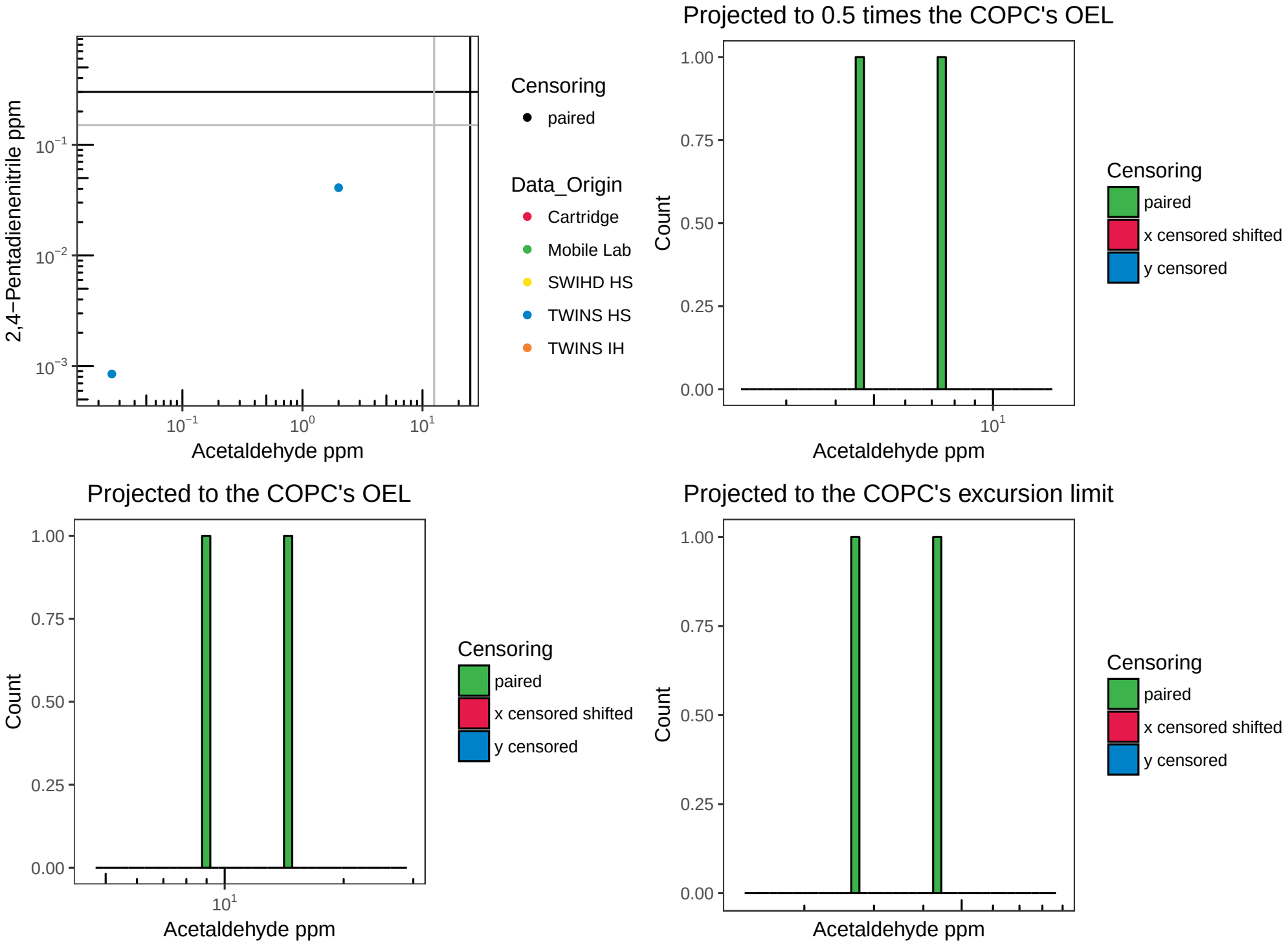


Figure C.793: 2,4-Pentadienenitrile vs Acetaldehyde

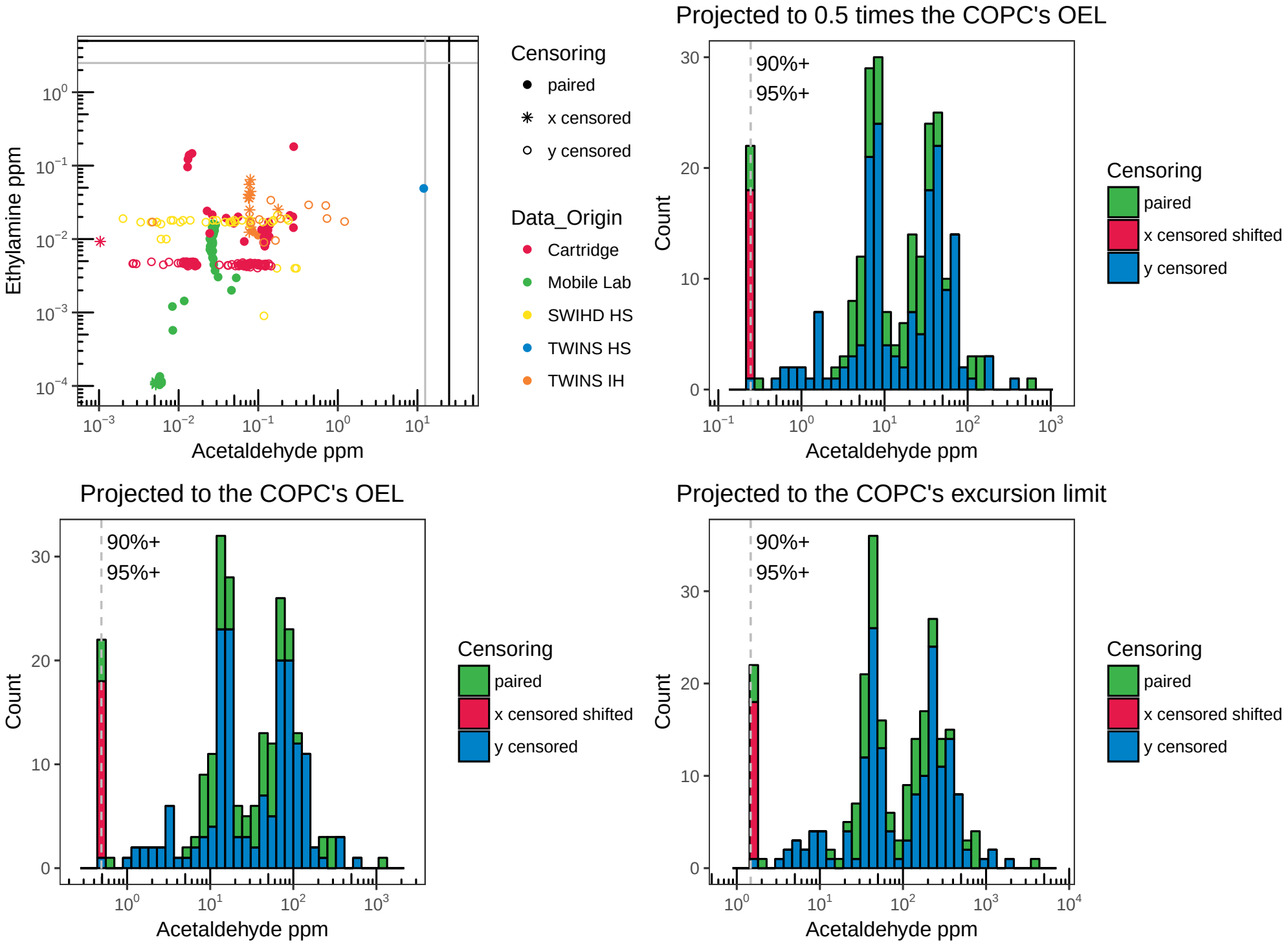


Figure C.794: Ethylamine vs Acetaldehyde

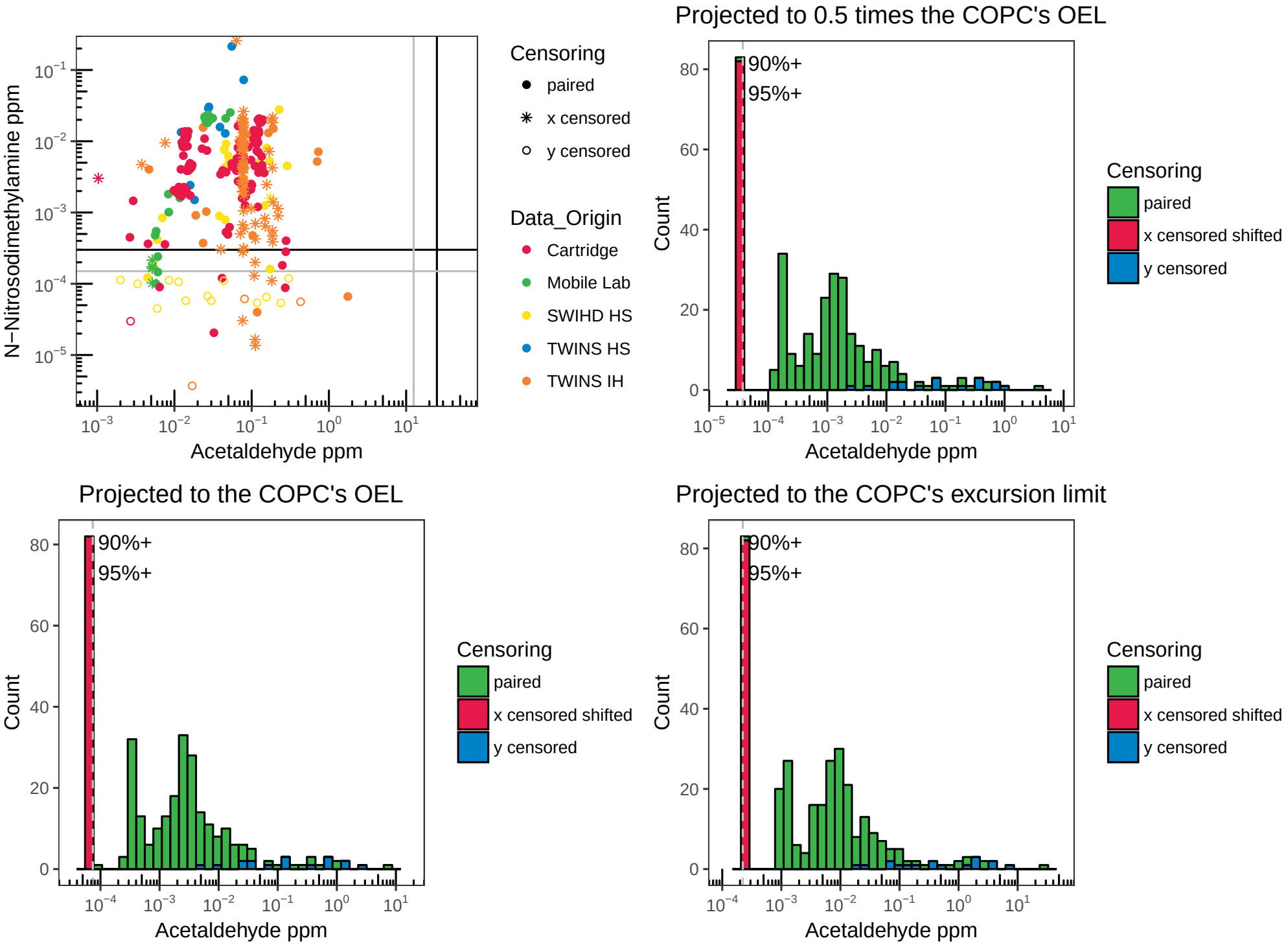


Figure C.795: N-Nitrosodimethylamine vs Acetaldehyde

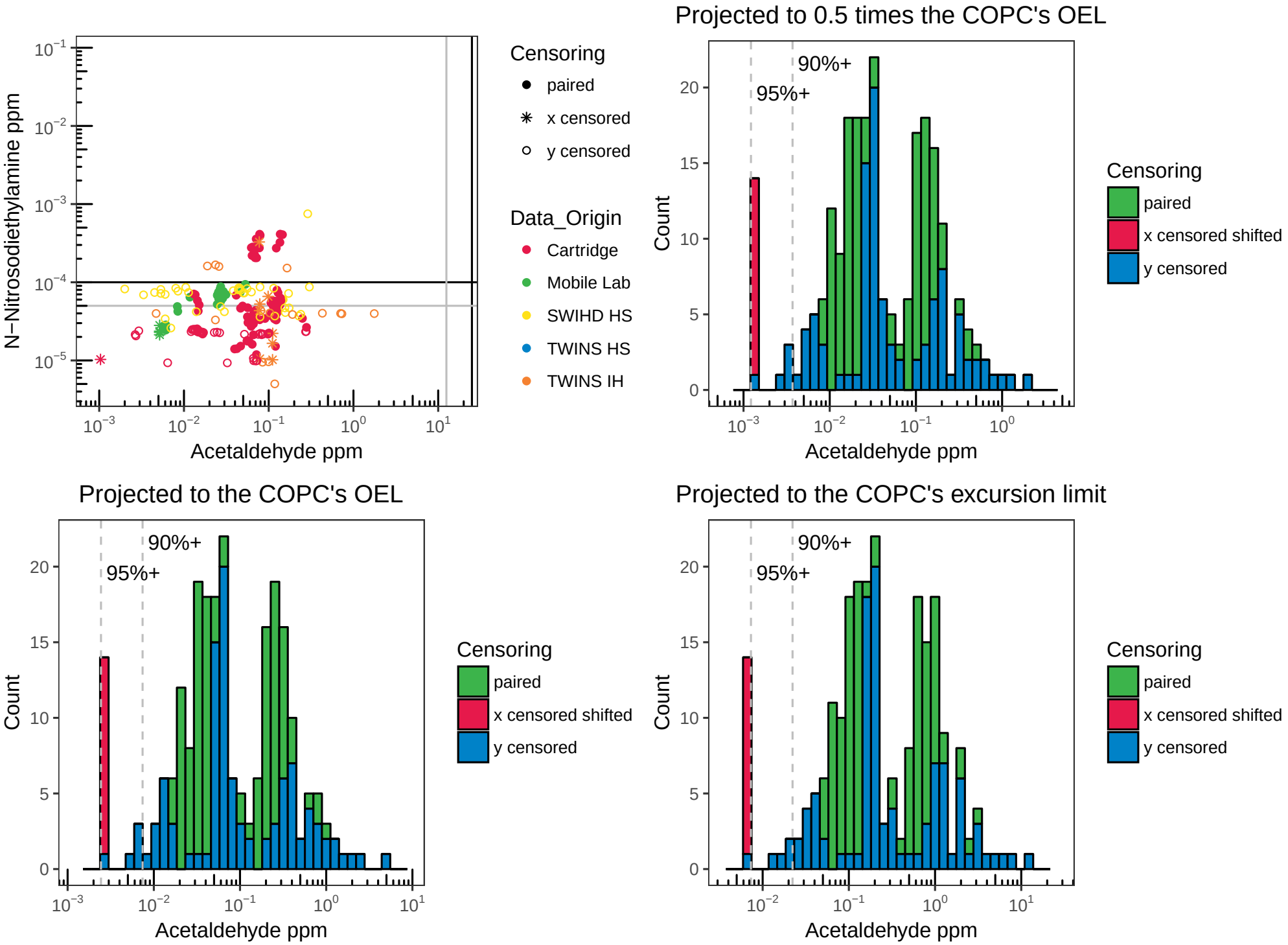


Figure C.796: N-Nitrosodiethylamine vs Acetaldehyde

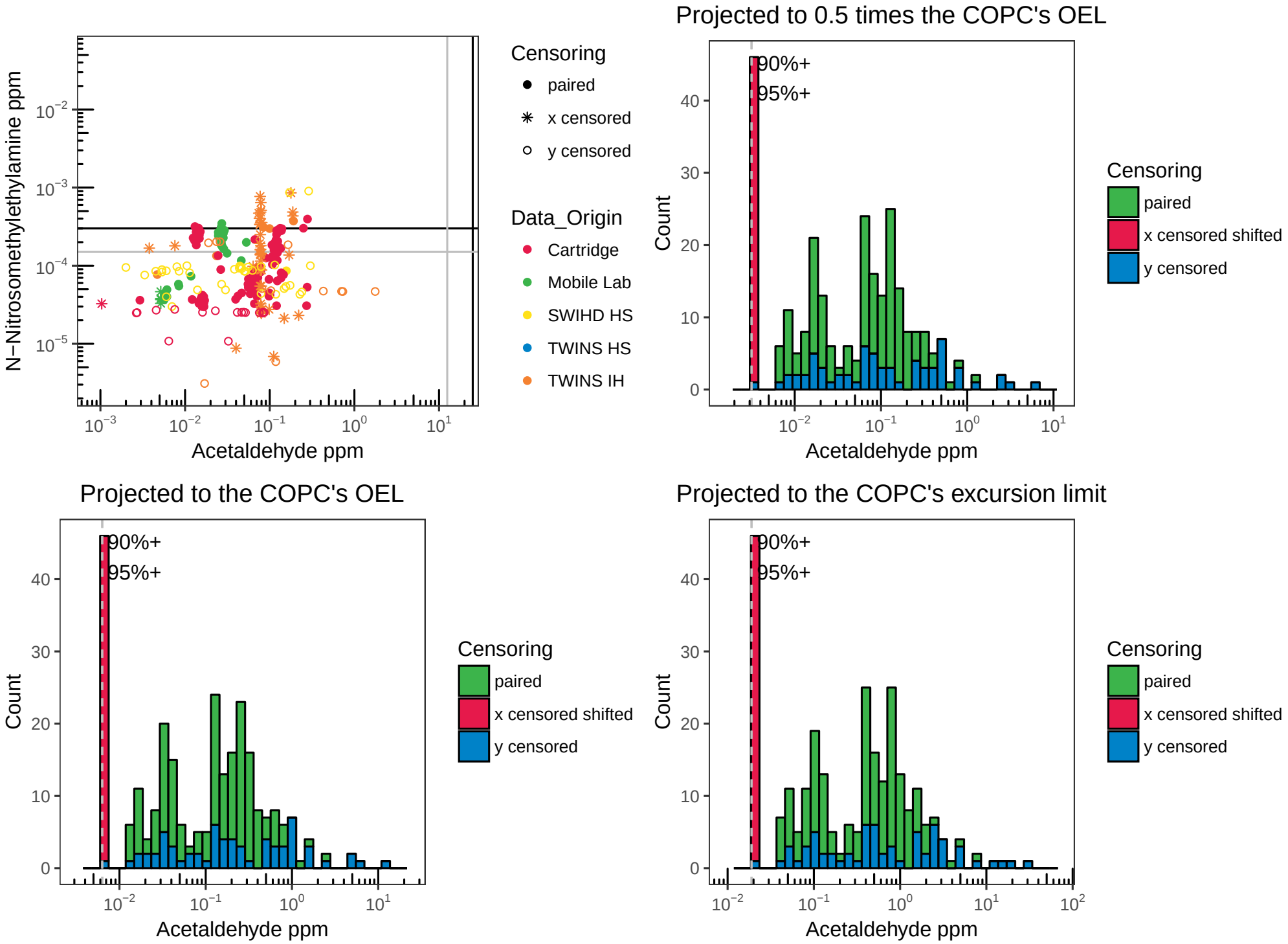


Figure C.797: N-Nitrosomethylethylamine vs Acetaldehyde

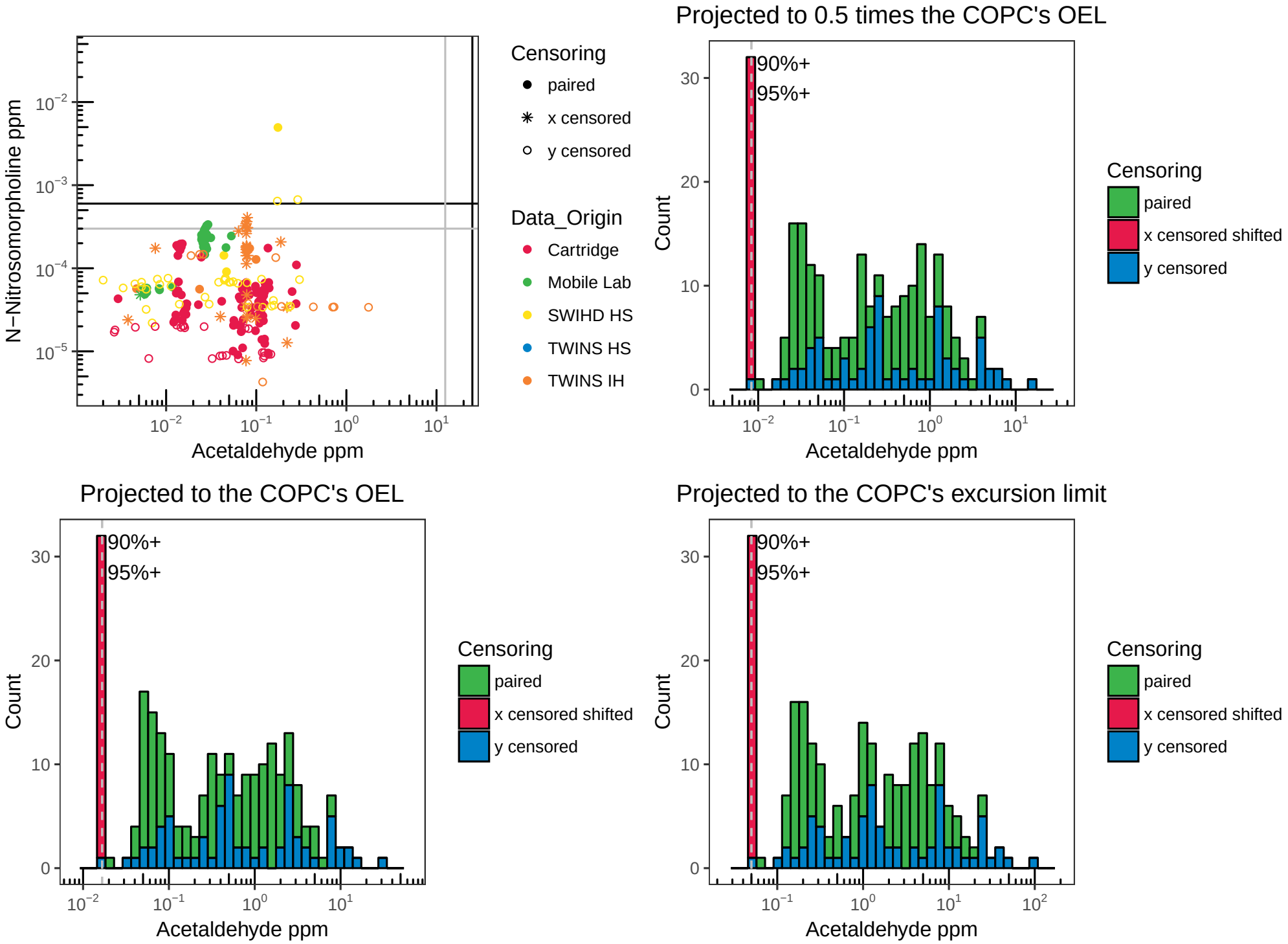


Figure C.798: N-Nitrosomorpholine vs Acetaldehyde

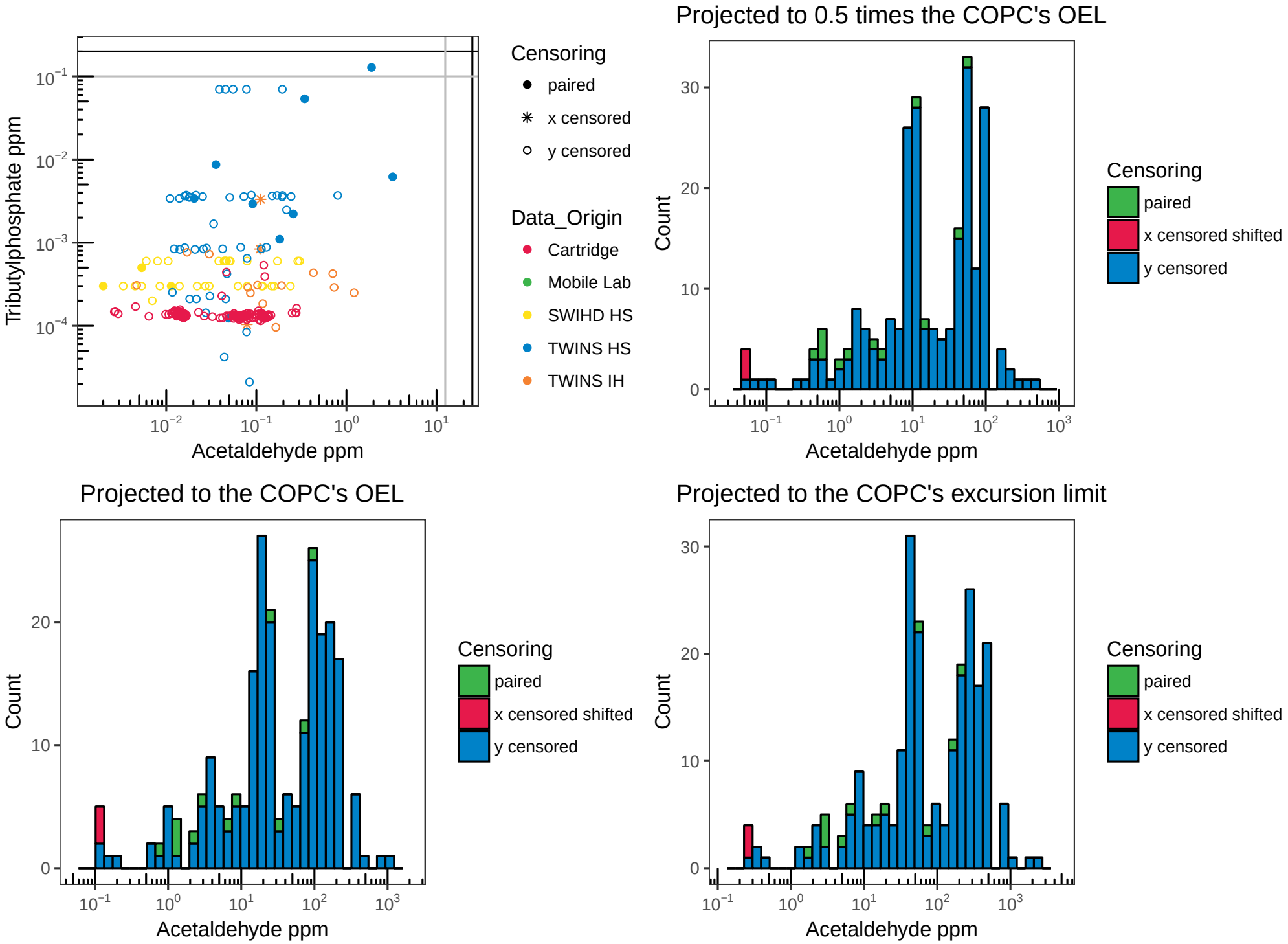


Figure C.799: Tributylphosphate vs Acetaldehyde

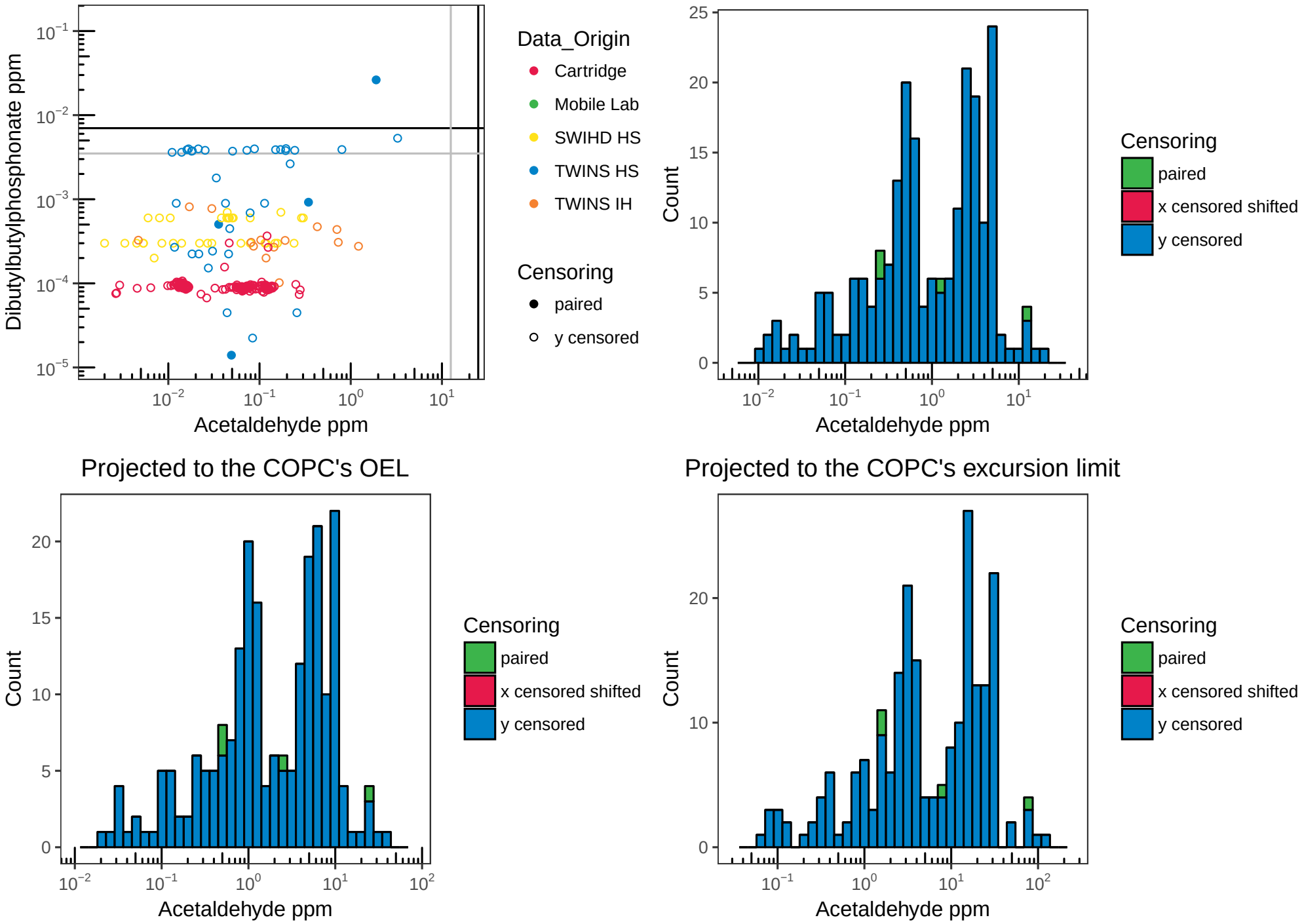


Figure C.800: Dibutylbutylphosphonate vs Acetaldehyde

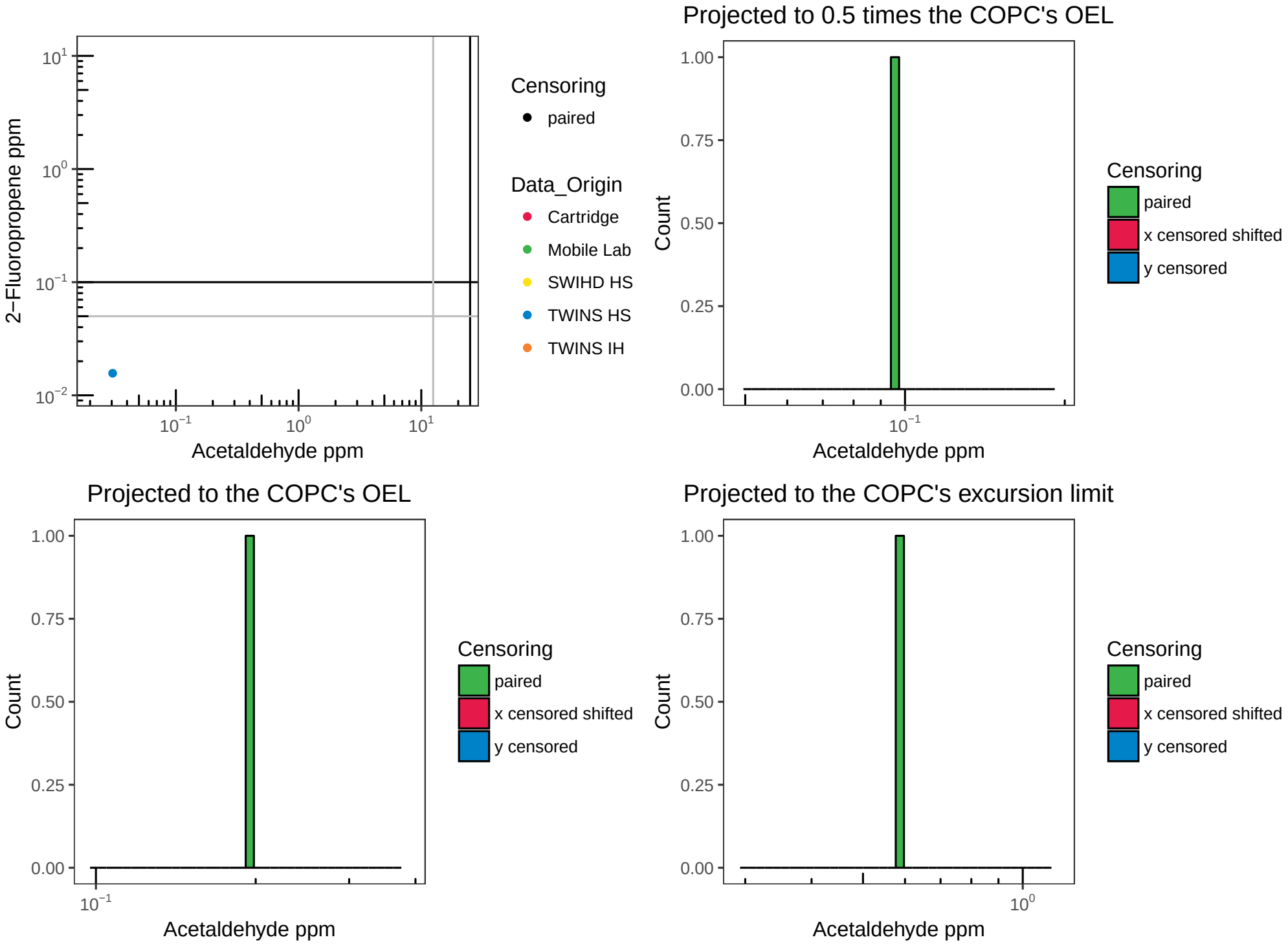


Figure C.801: 2-Fluoropropene vs Acetaldehyde

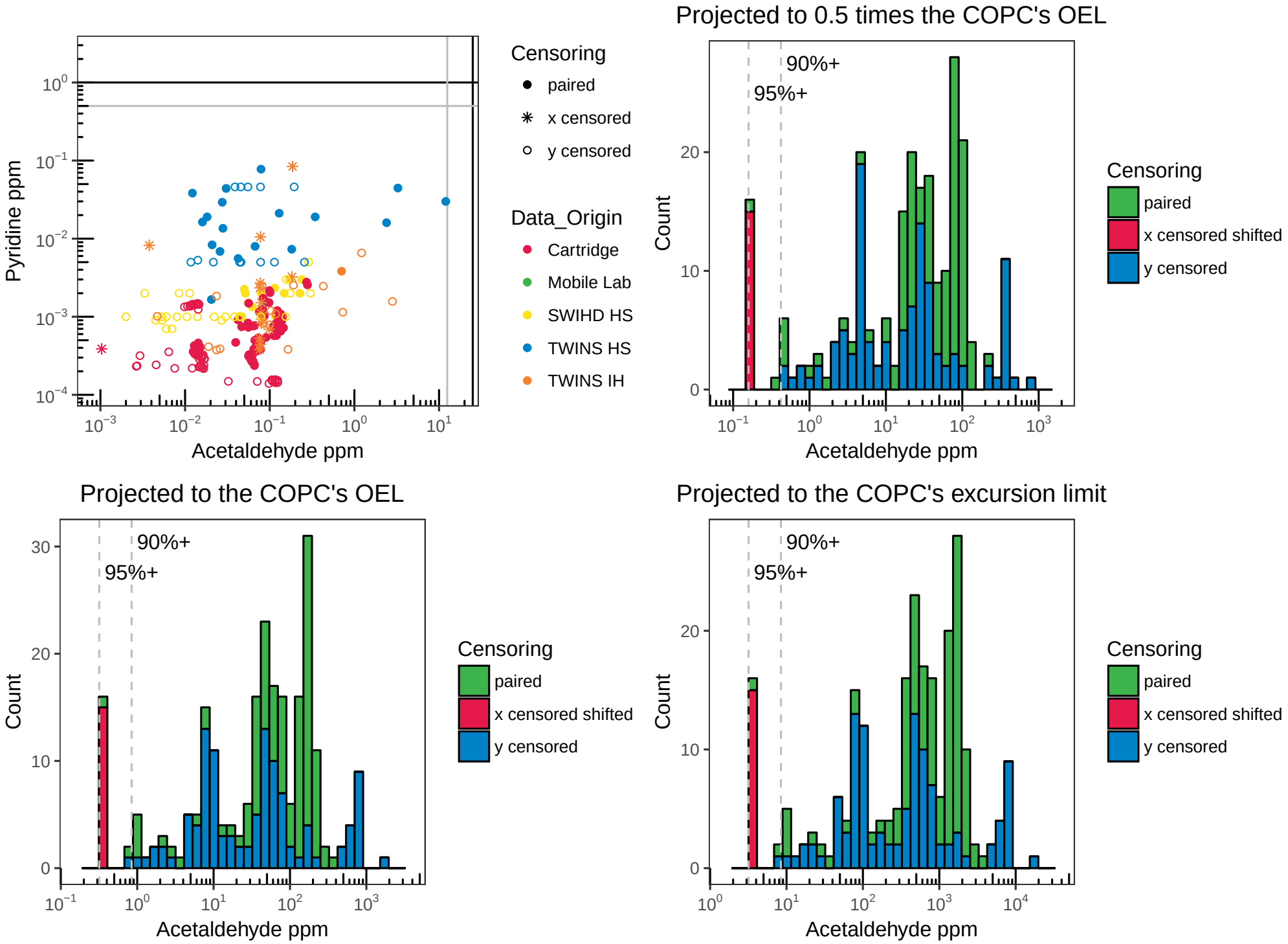


Figure C.802: Pyridine vs Acetaldehyde

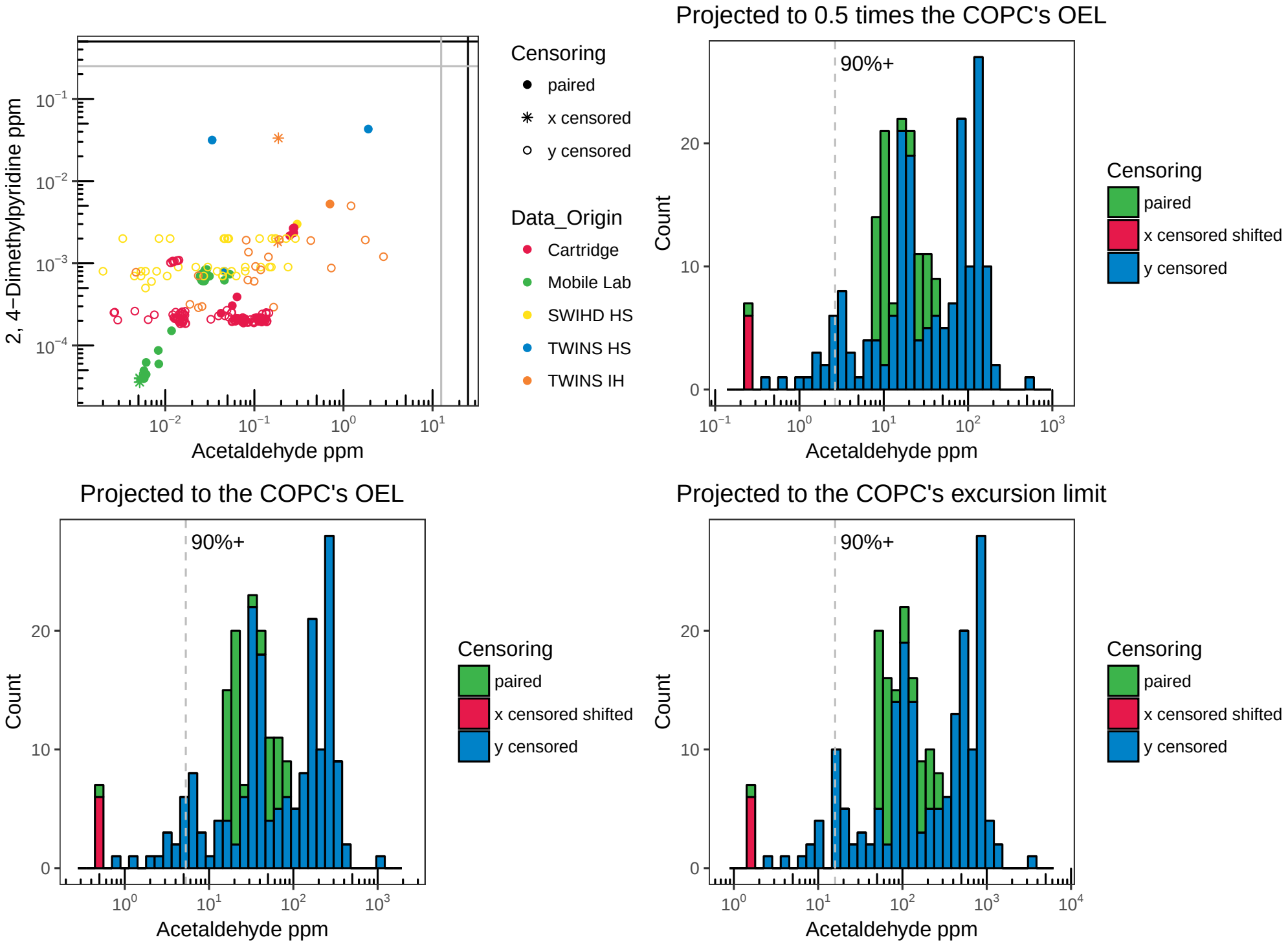


Figure C.803: 2, 4-Dimethylpyridine vs Acetaldehyde

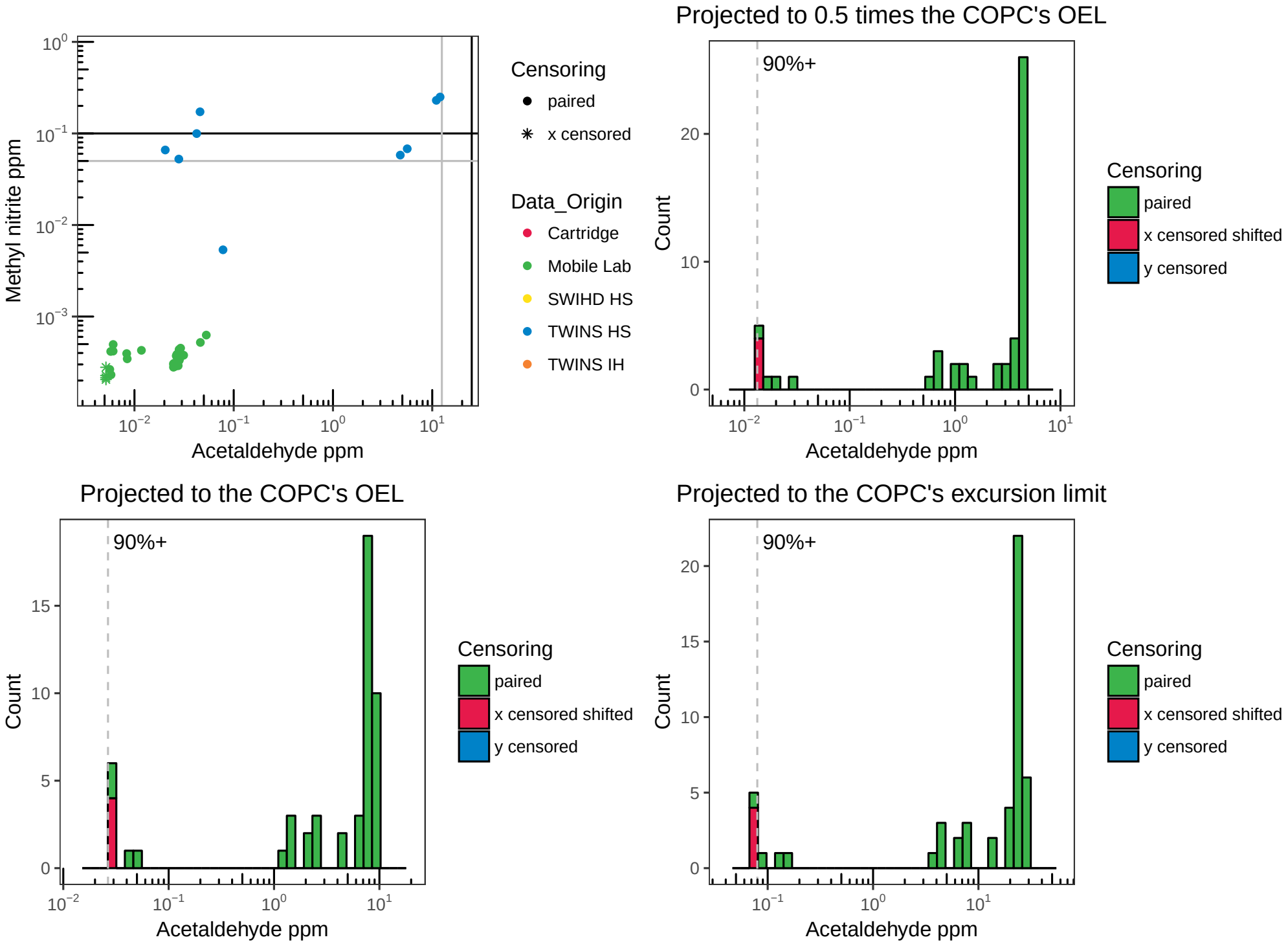


Figure C.804: Methyl nitrite vs Acetaldehyde

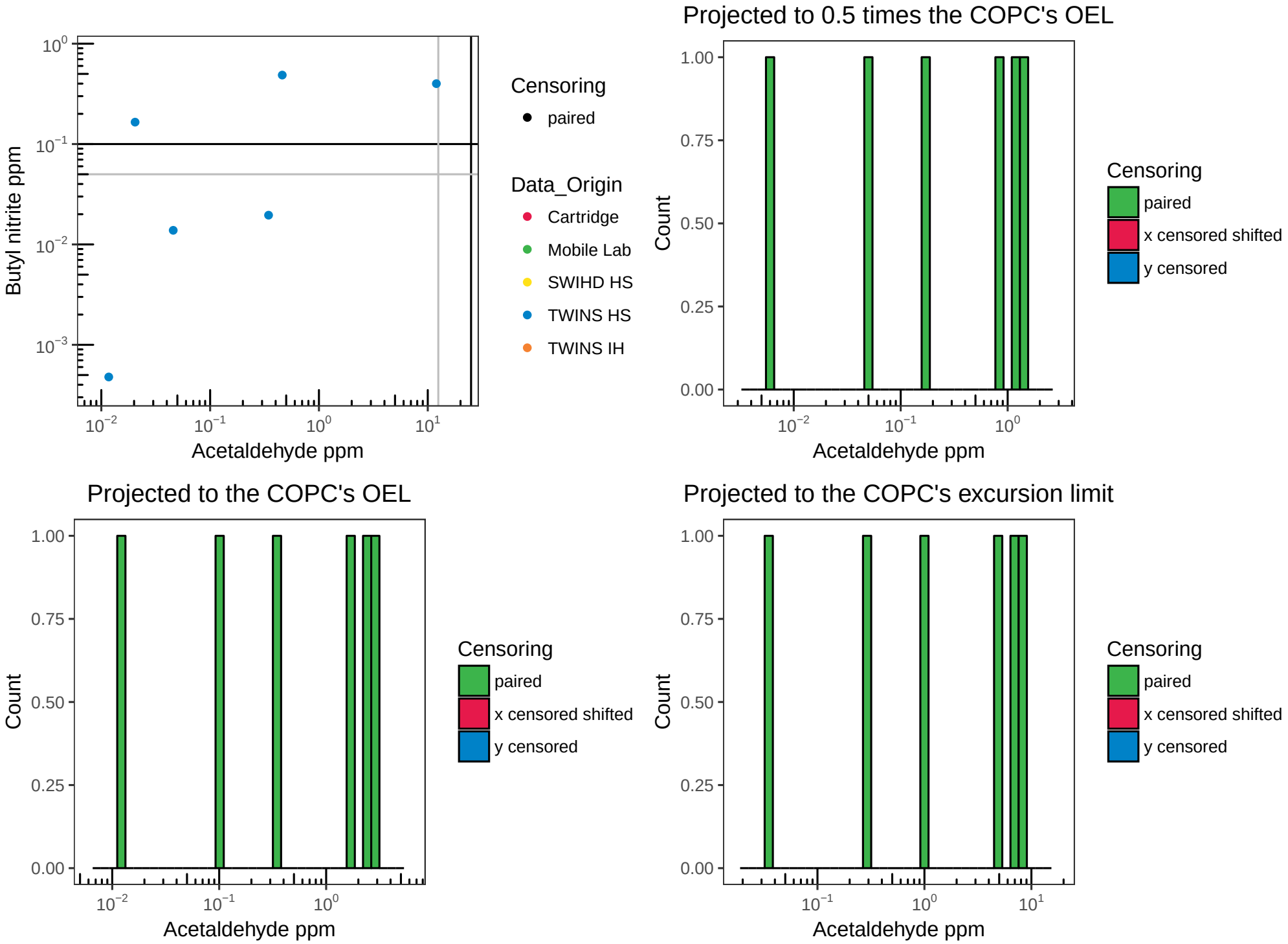


Figure C.805: Butyl nitrite vs Acetaldehyde

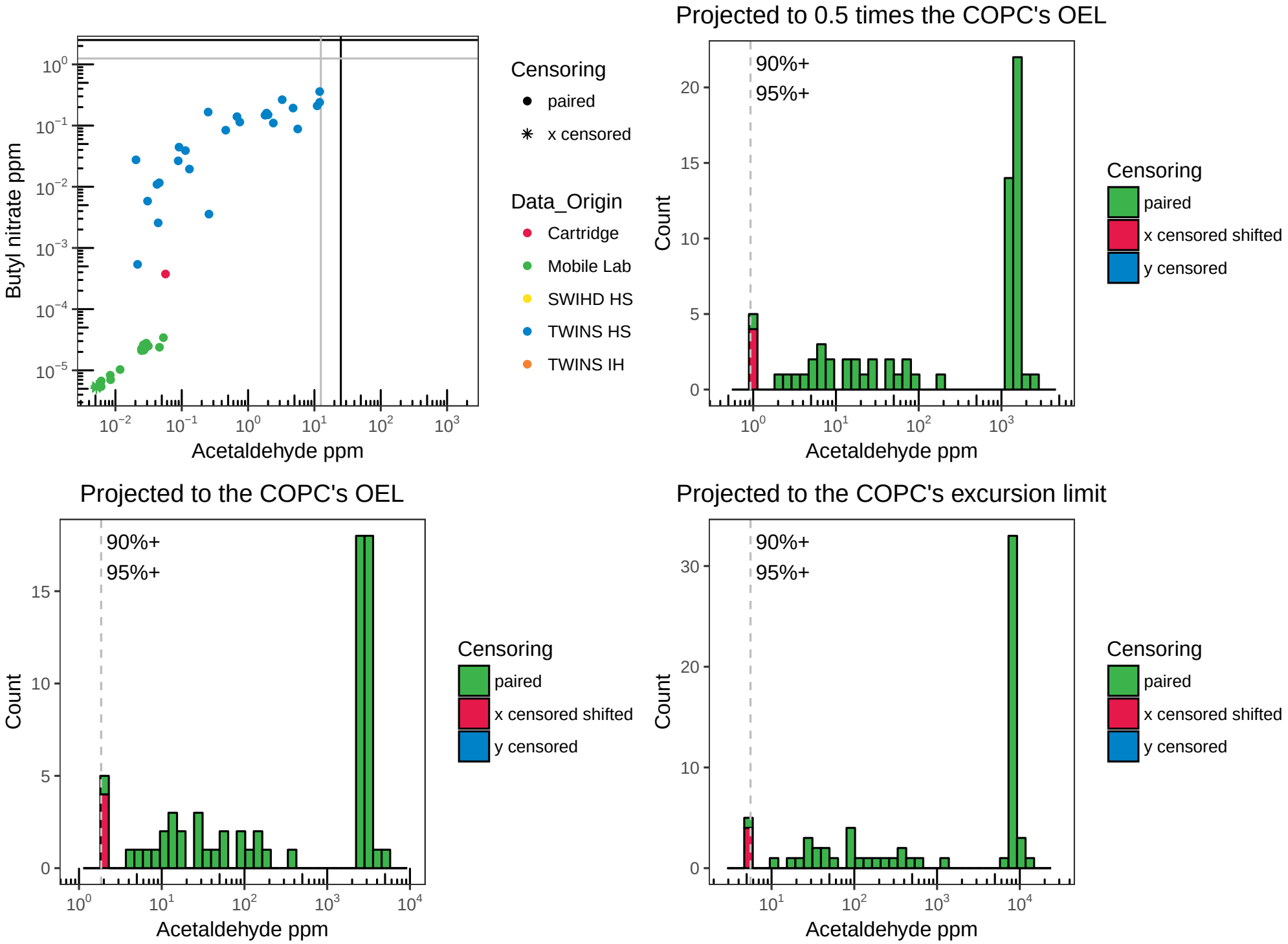


Figure C.806: Butyl nitrate vs Acetaldehyde

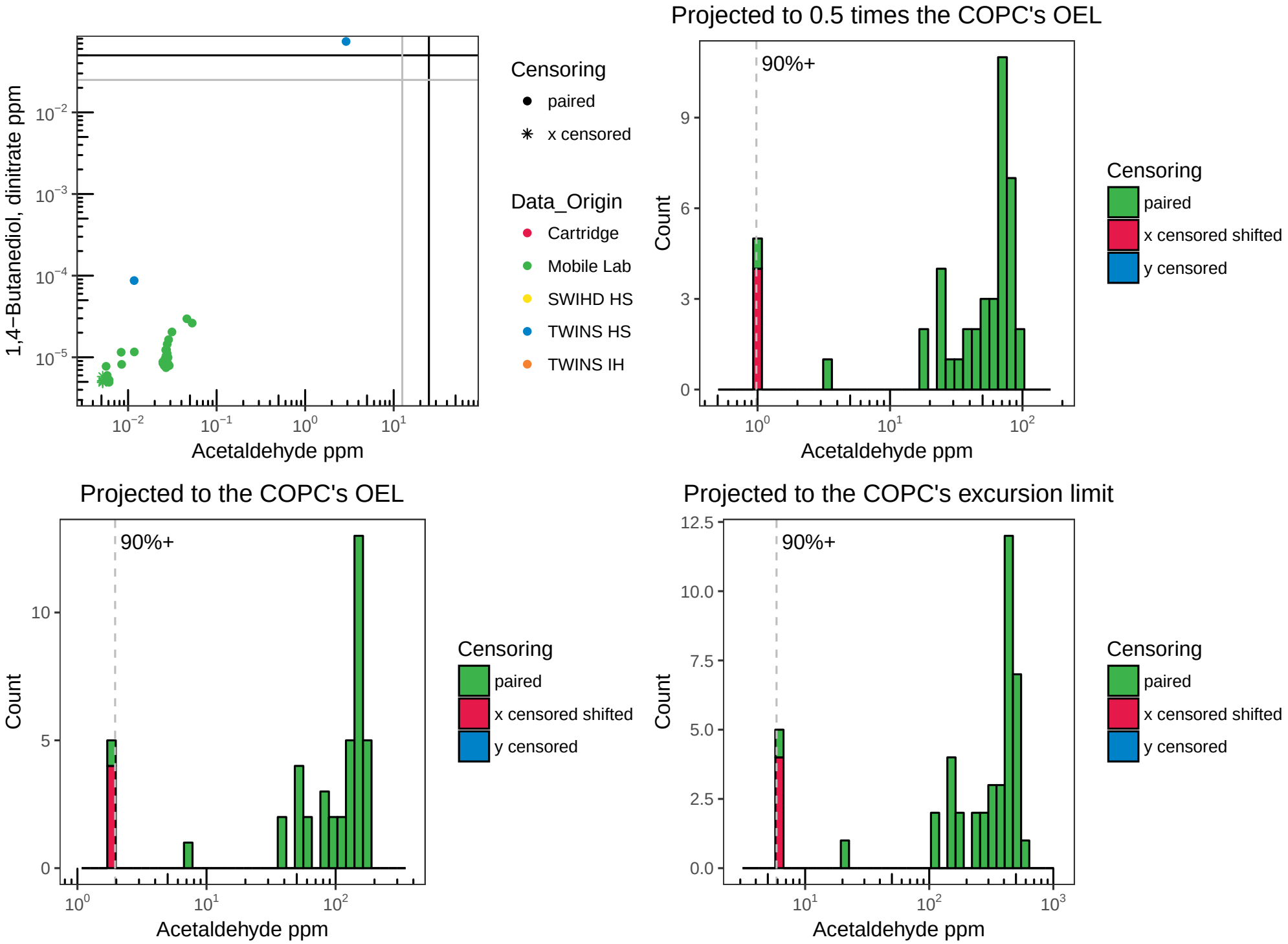


Figure C.807: 1,4-Butanediol, dinitrate vs Acetaldehyde

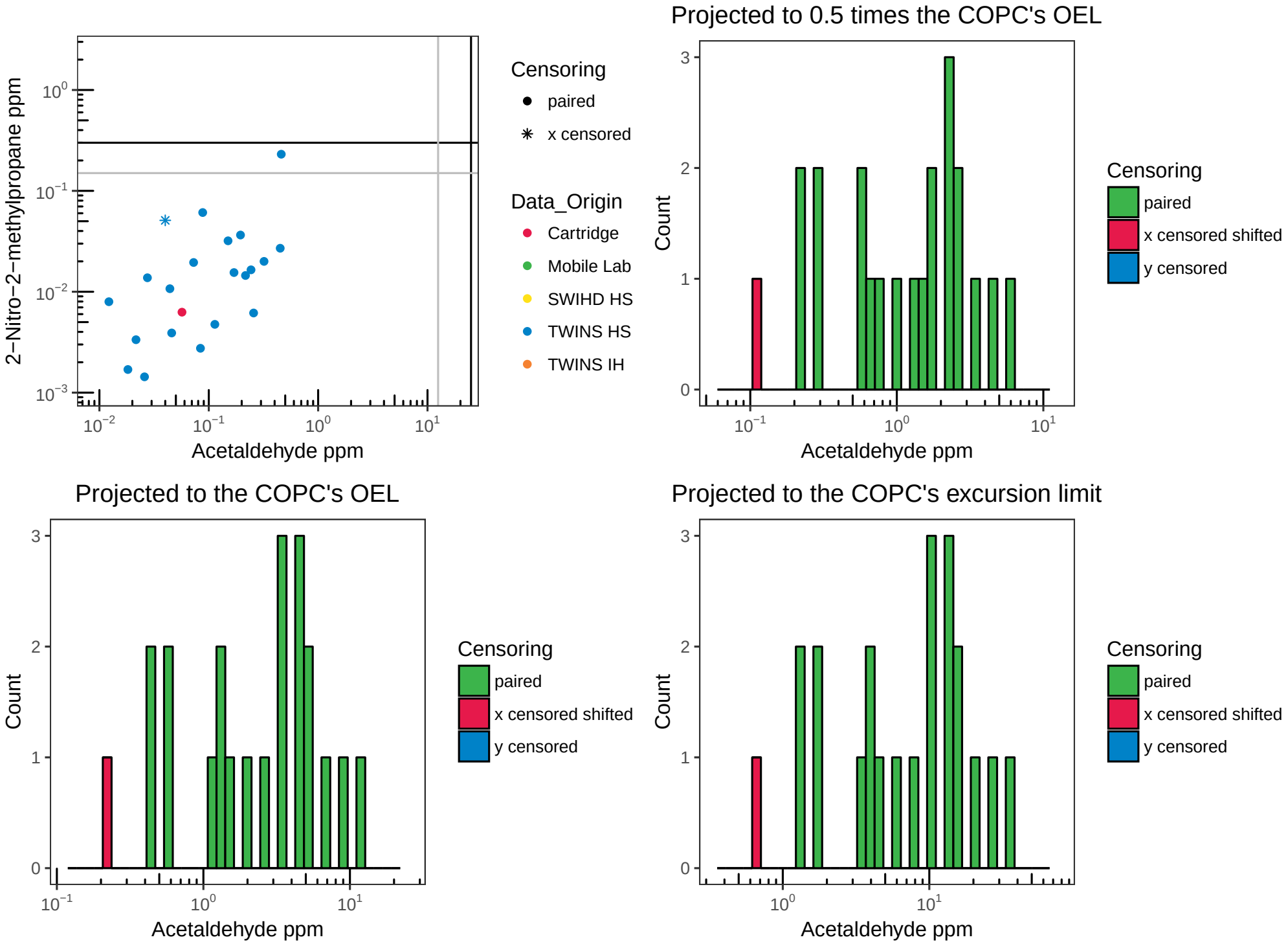


Figure C.808: 2-Nitro-2-methylpropane vs Acetaldehyde

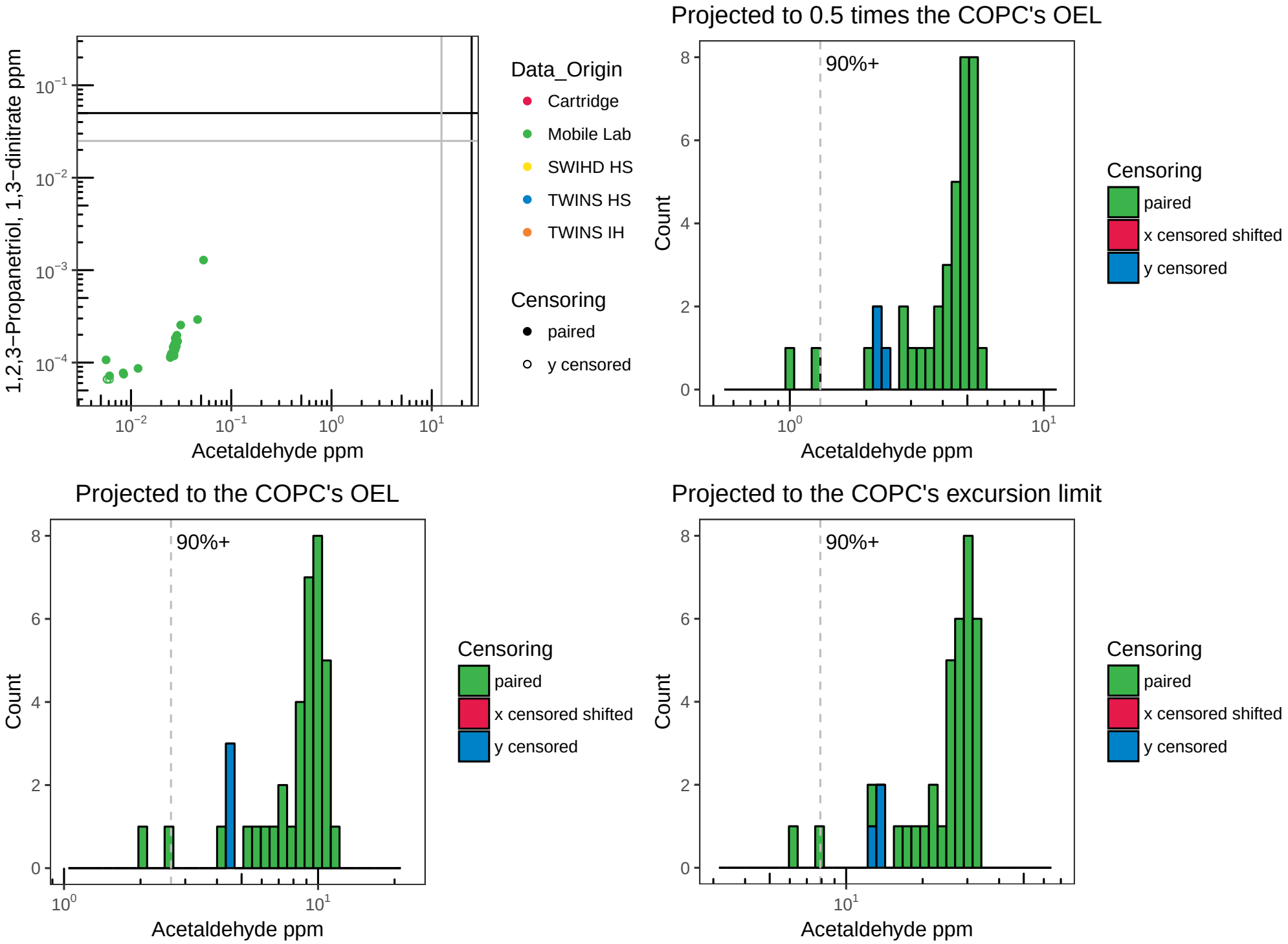


Figure C.809: 1,2,3-Propanetriol, 1,3-dinitrate vs Acetaldehyde

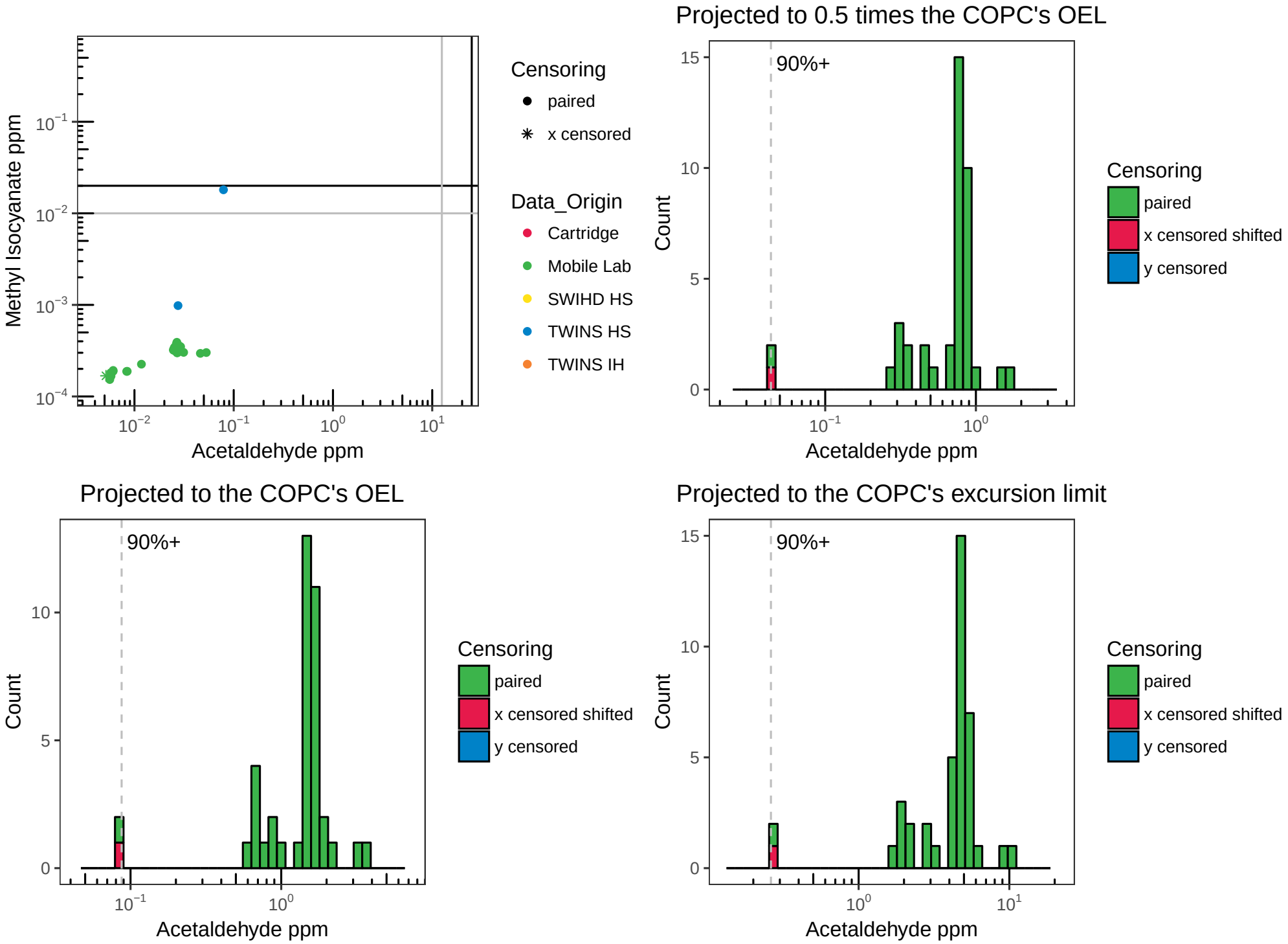


Figure C.810: Methyl Isocyanate vs Acetaldehyde

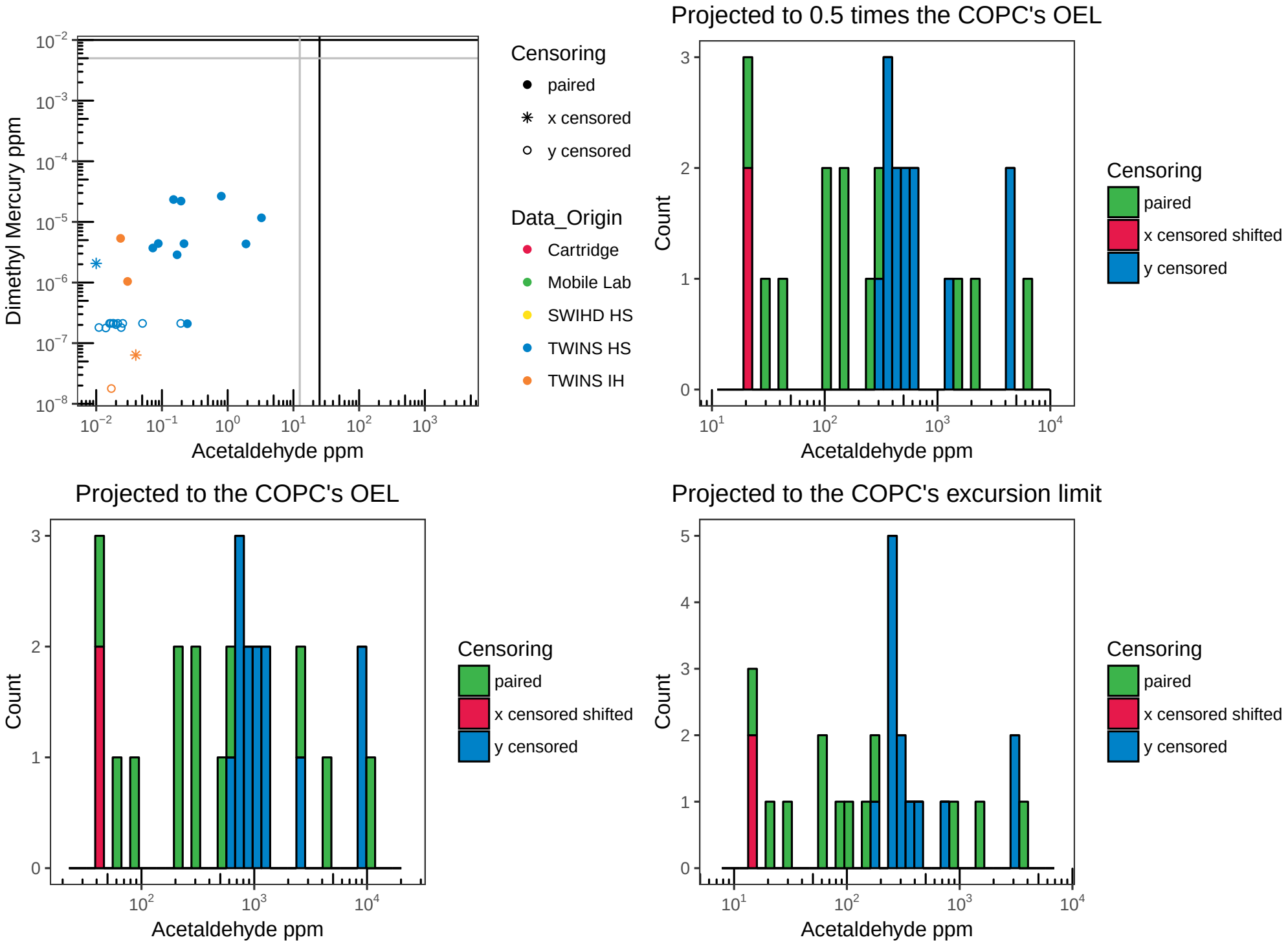


Figure C.811: Dimethyl Mercury vs Acetaldehyde

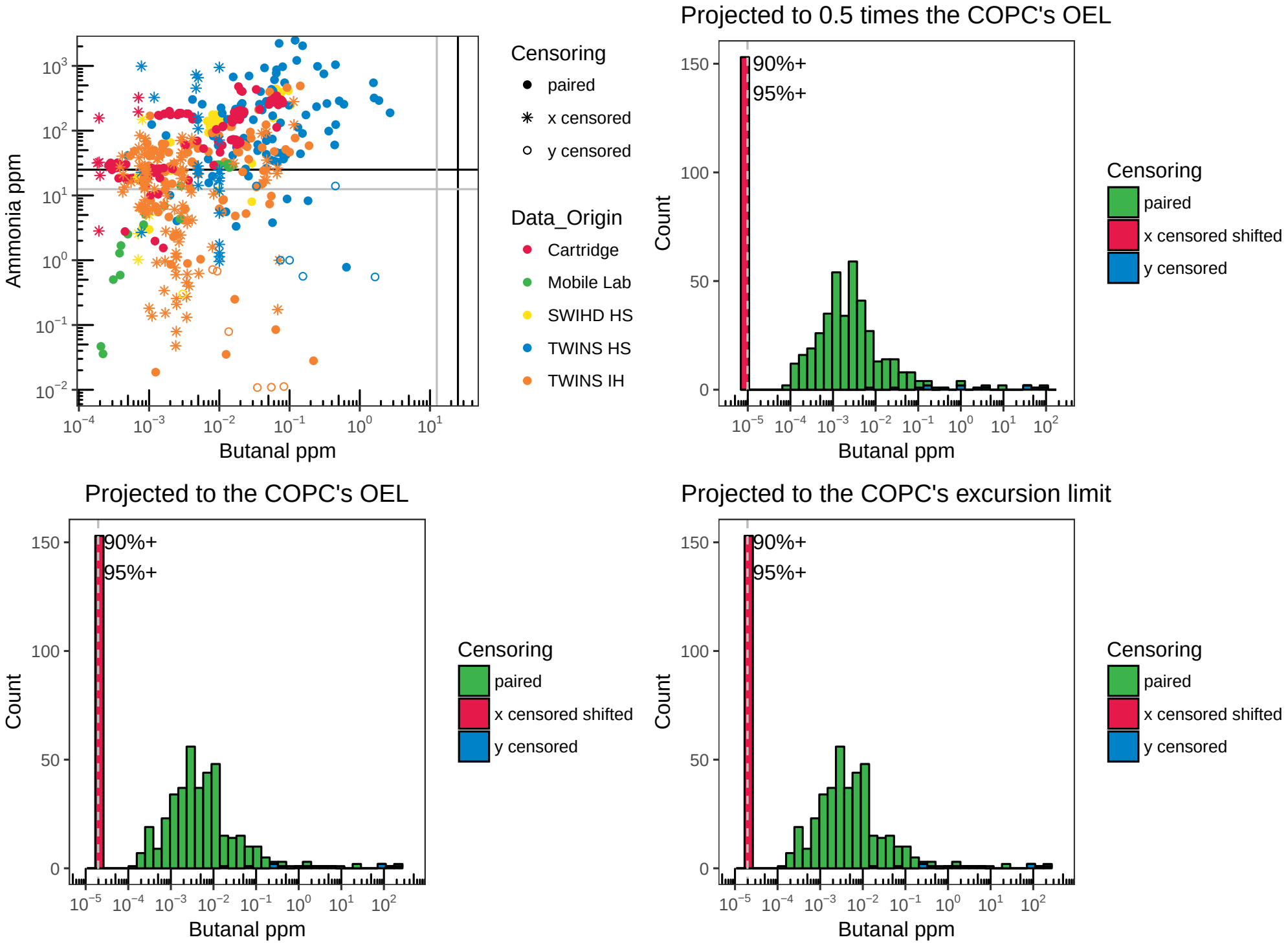


Figure C.812: Ammonia vs Butanal

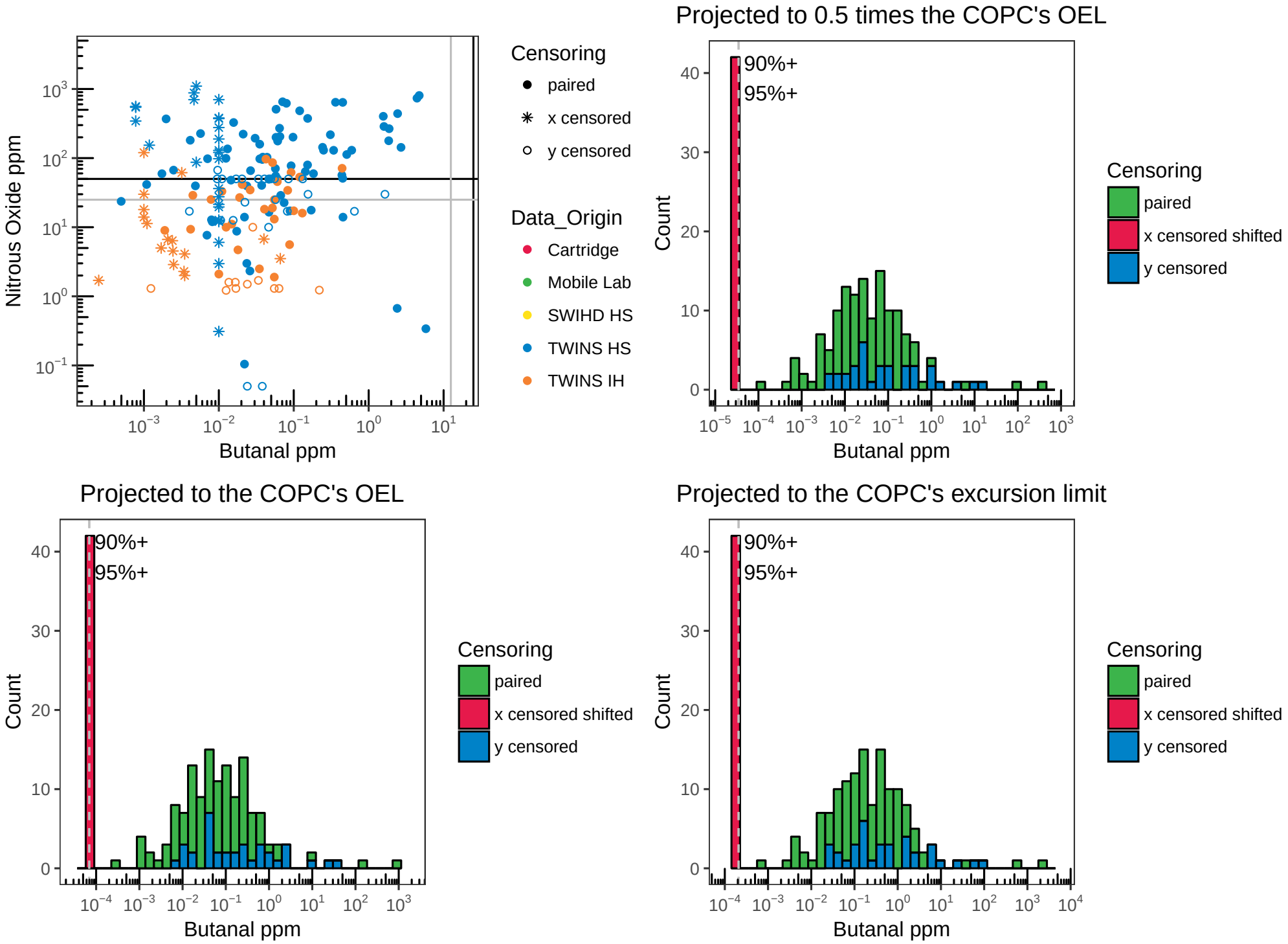


Figure C.813: Nitrous Oxide vs Butanal

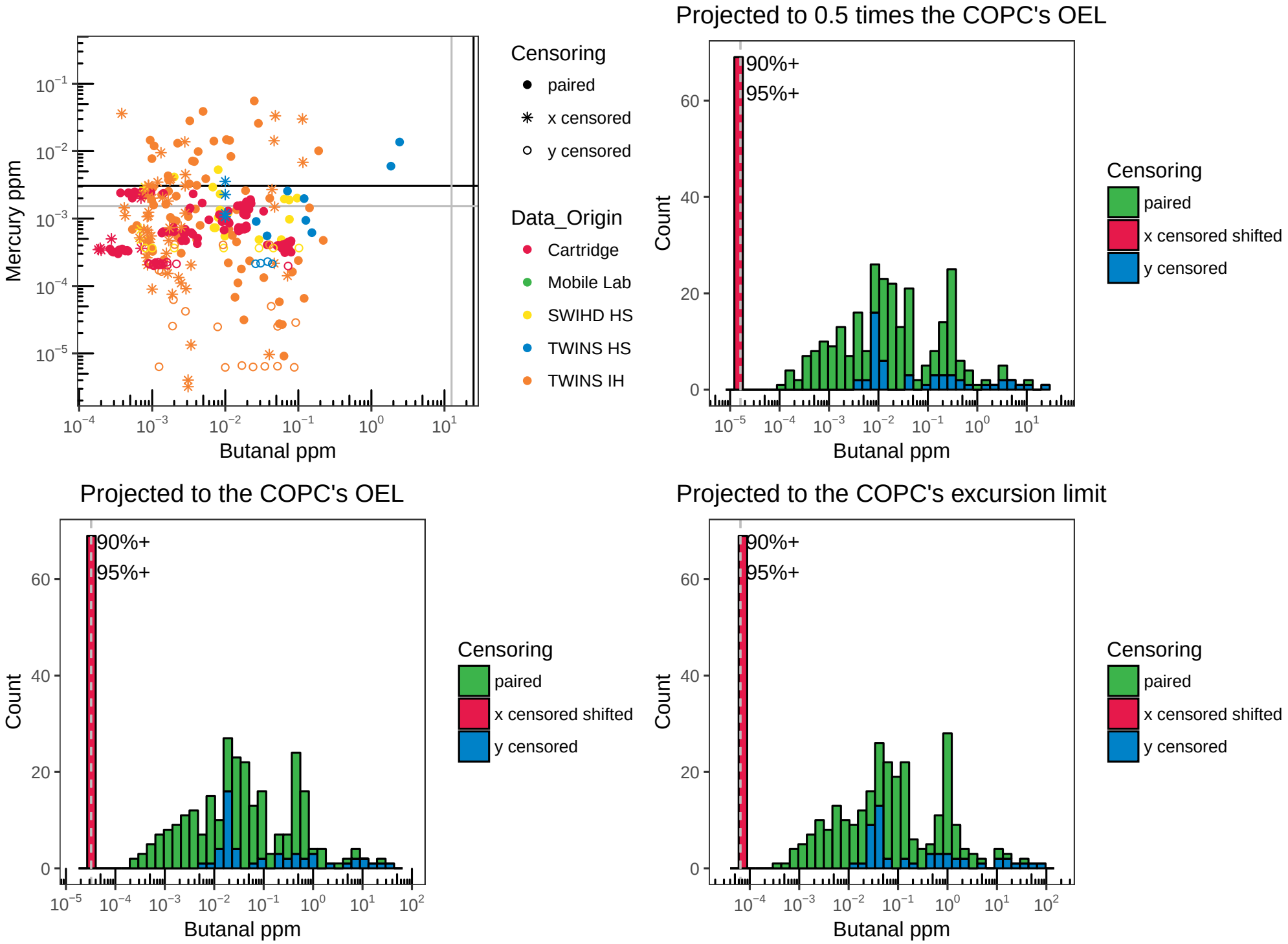


Figure C.814: Mercury vs Butanal

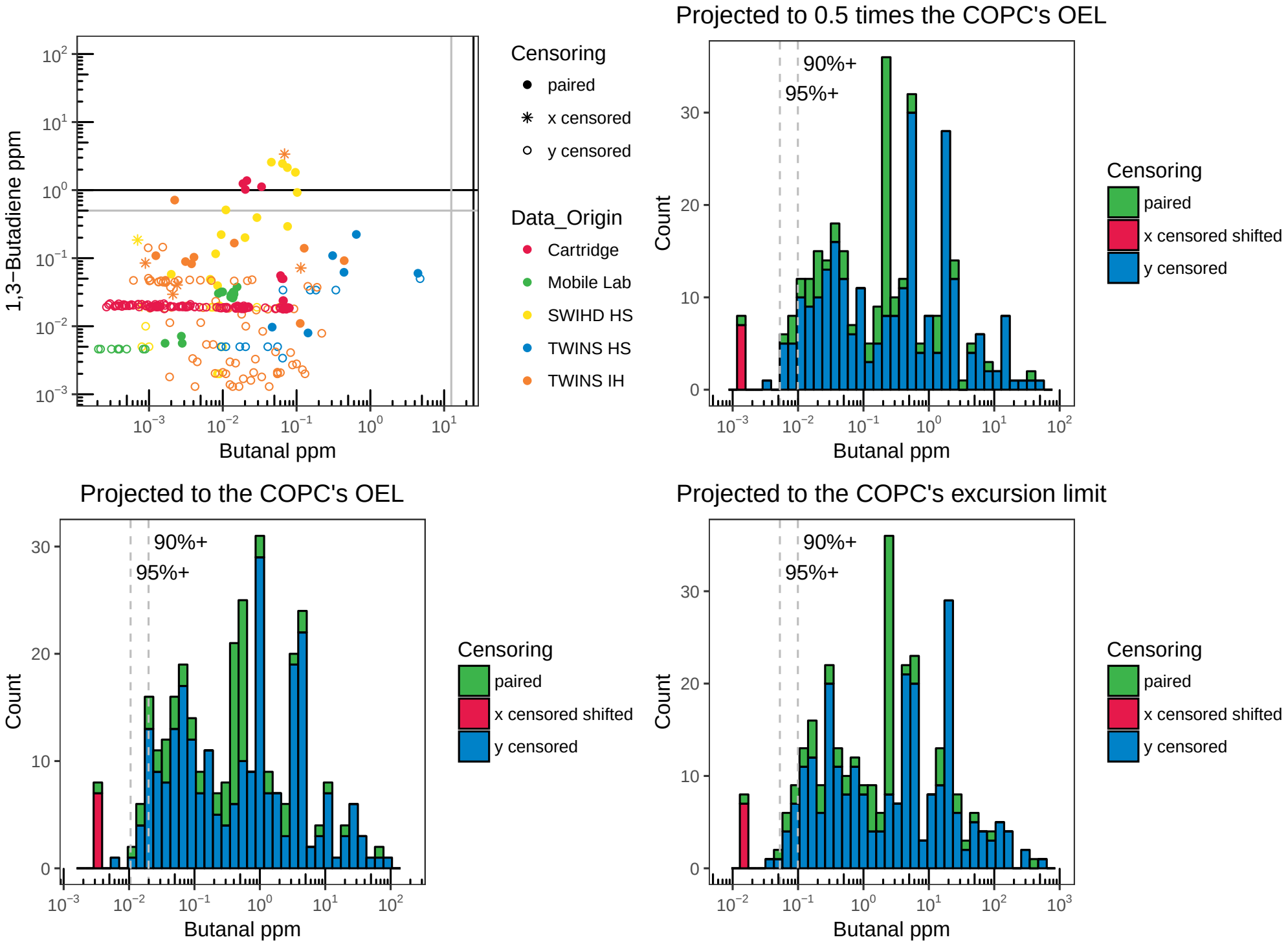


Figure C.815: 1,3-Butadiene vs Butanal

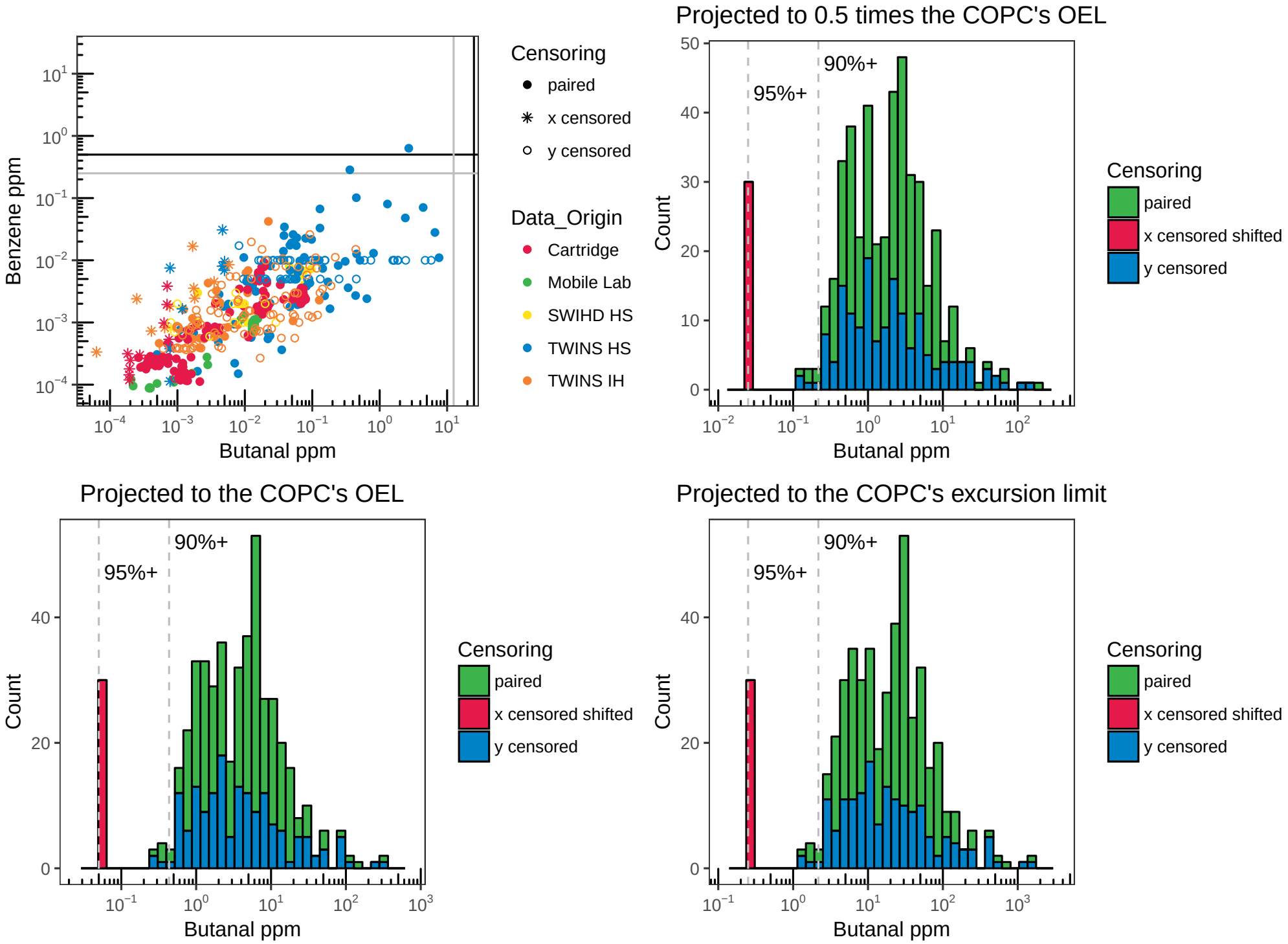


Figure C.816: Benzene vs Butanal

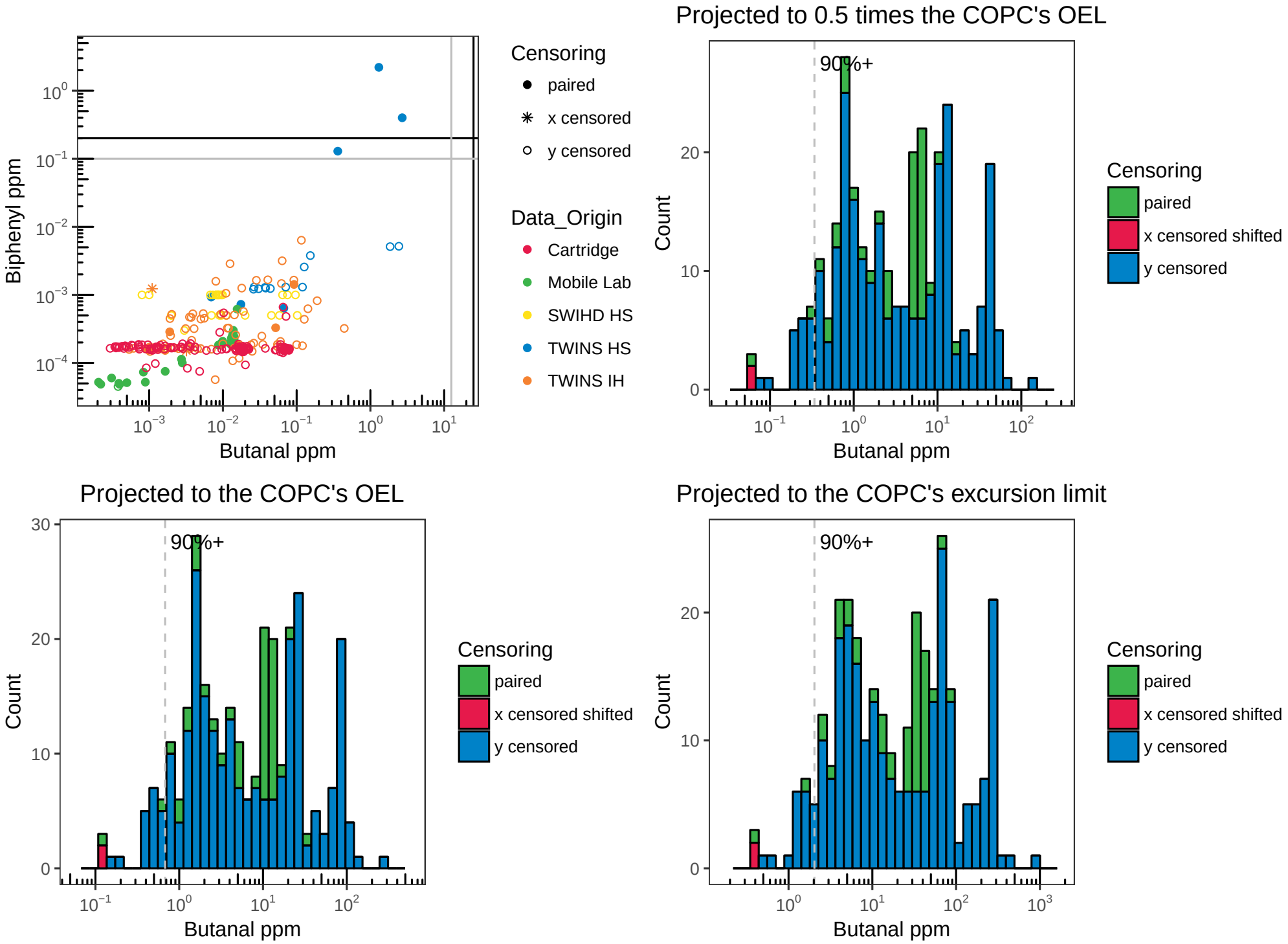


Figure C.817: Biphenyl vs Butanal

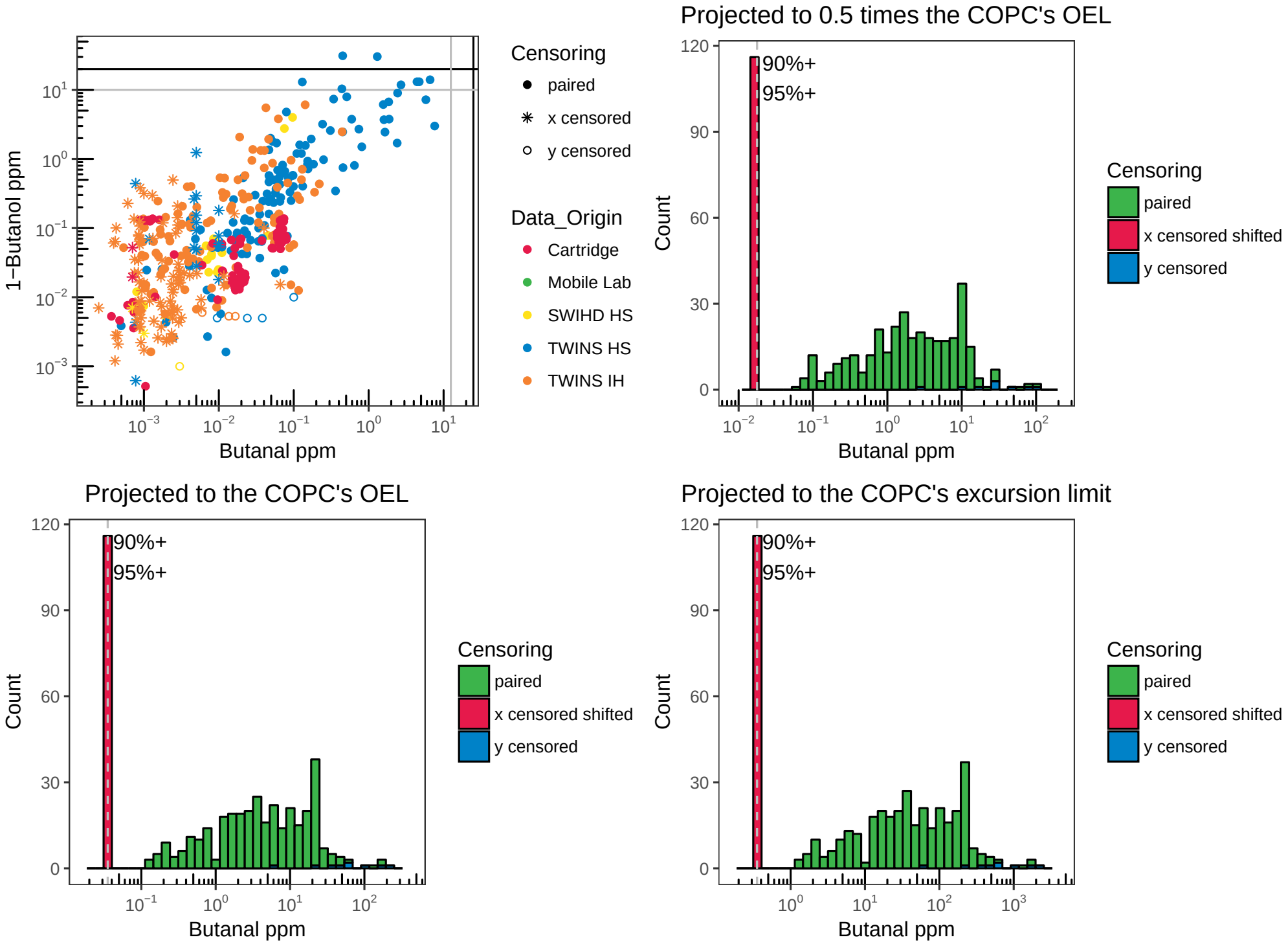


Figure C.818: 1-Butanol vs Butanal

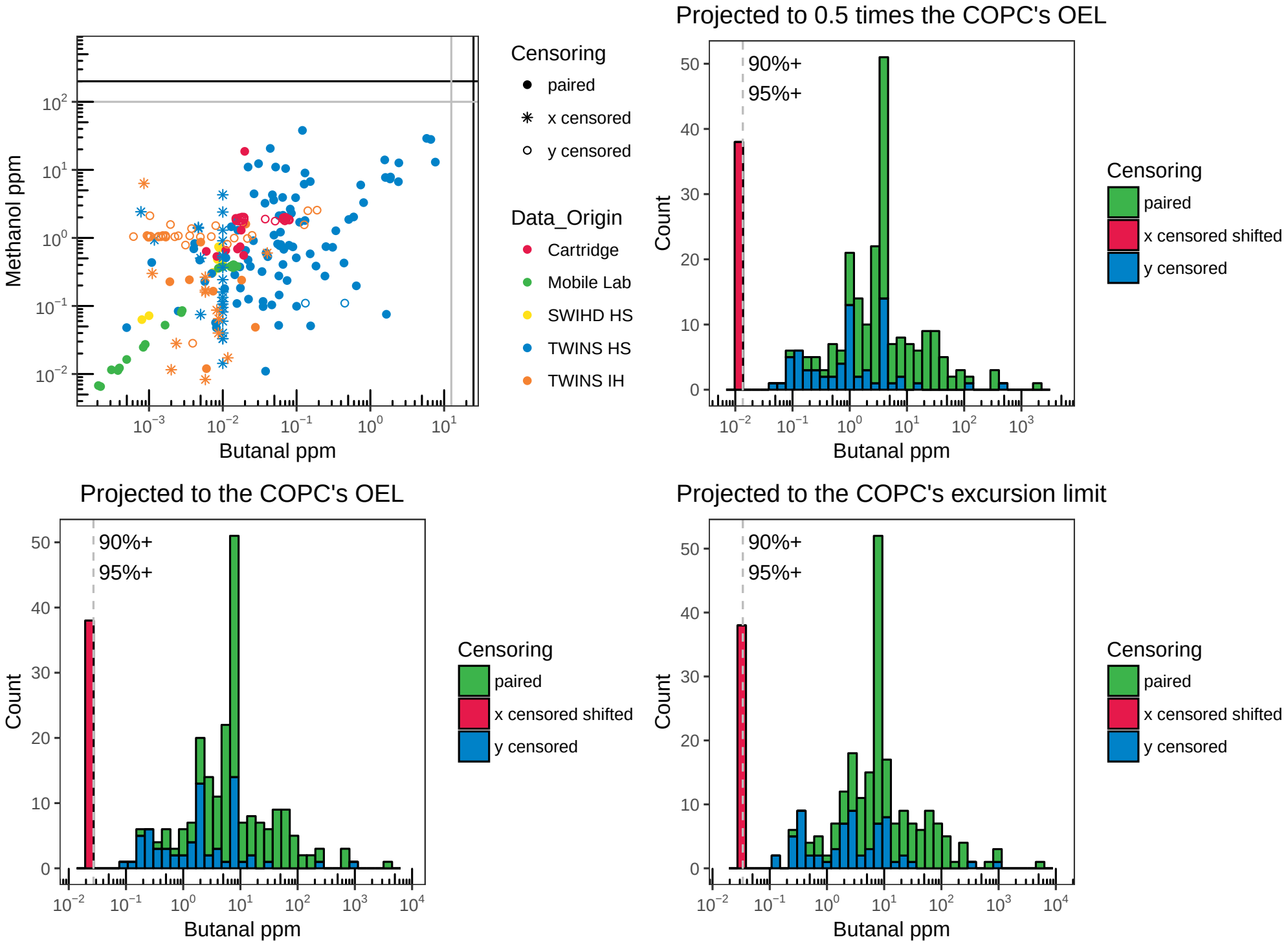


Figure C.819: Methanol vs Butanal

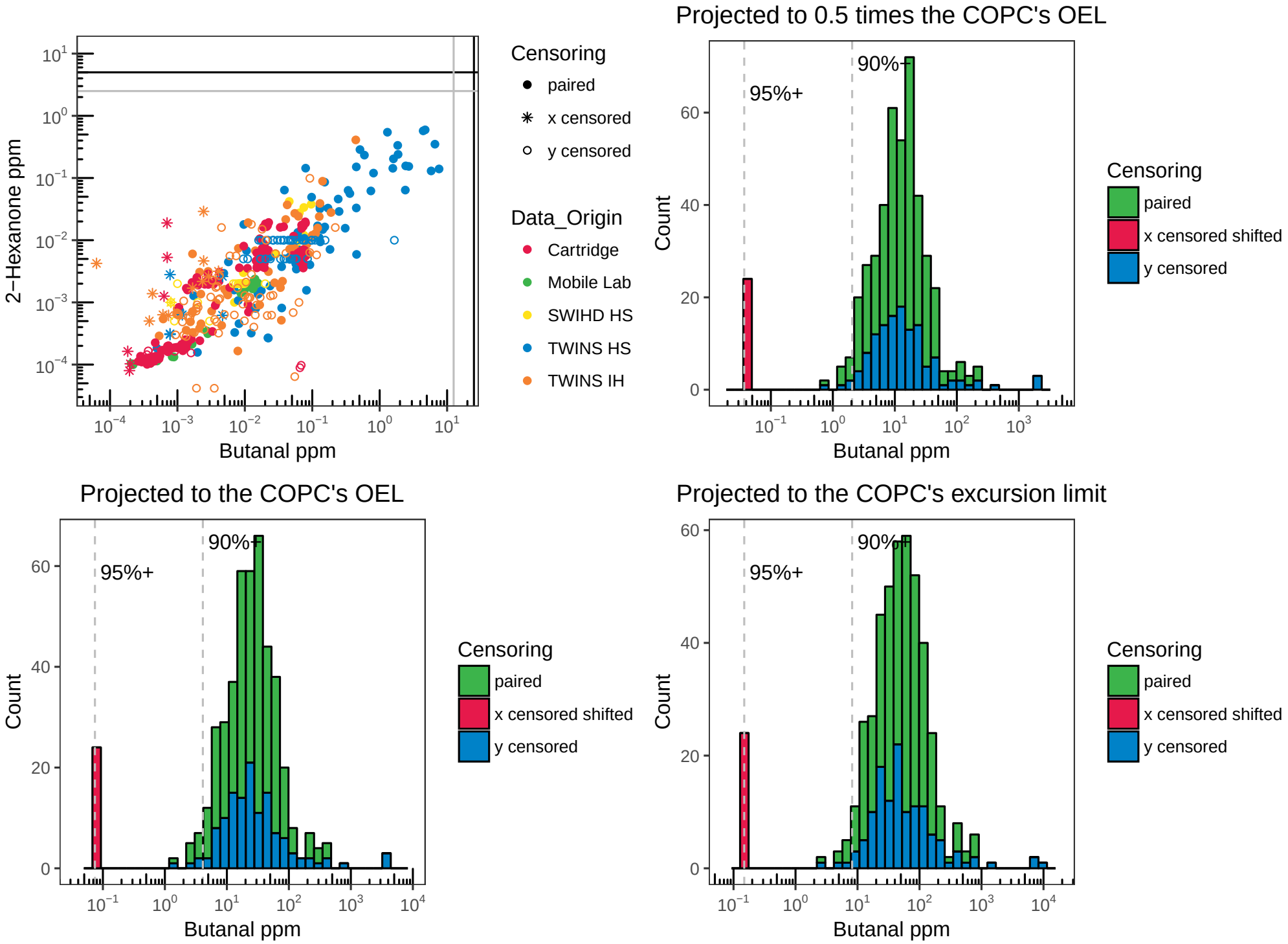


Figure C.820: 2-Hexanone vs Butanal

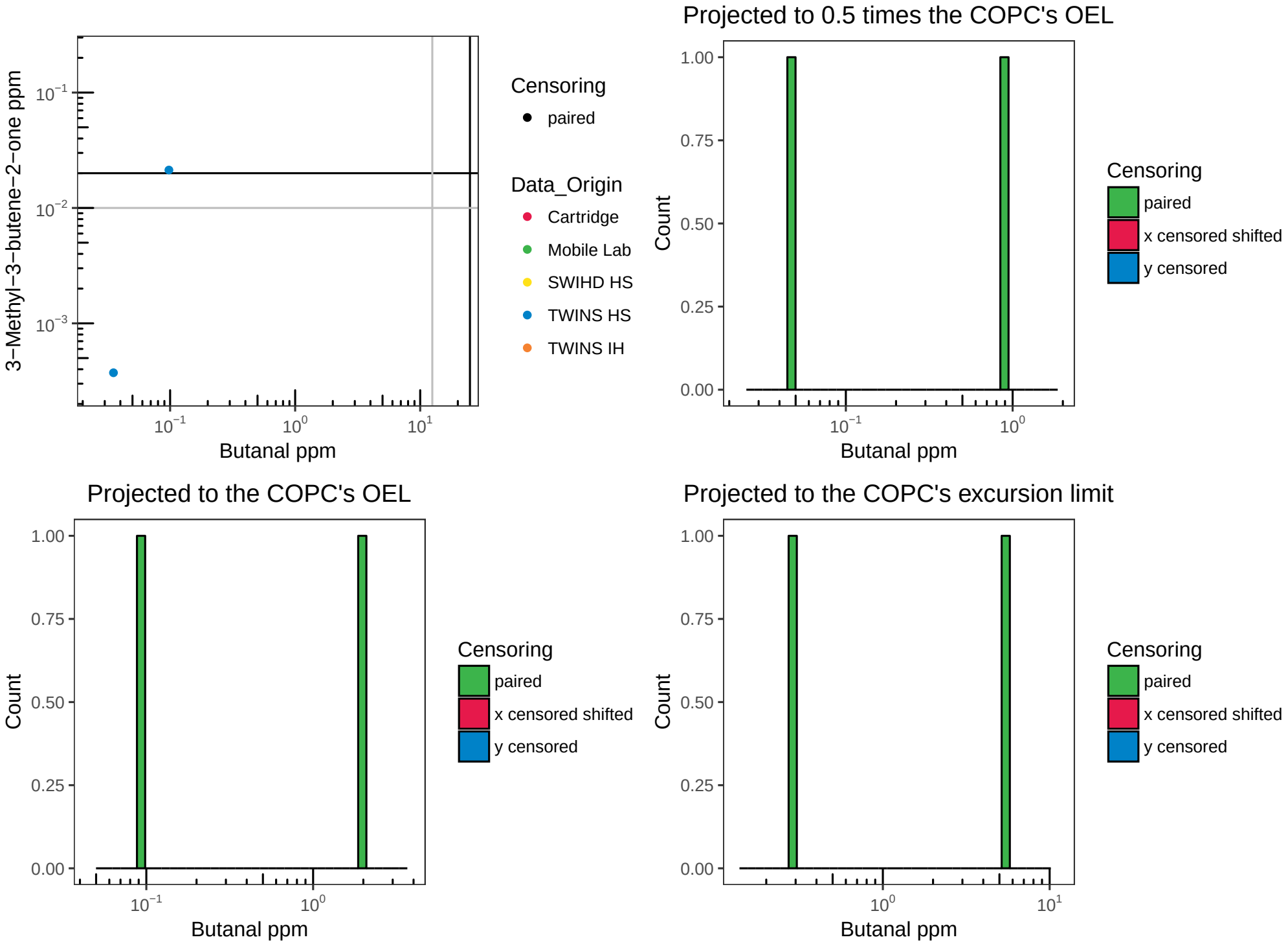


Figure C.821: 3-Methyl-3-butene-2-one vs Butanal

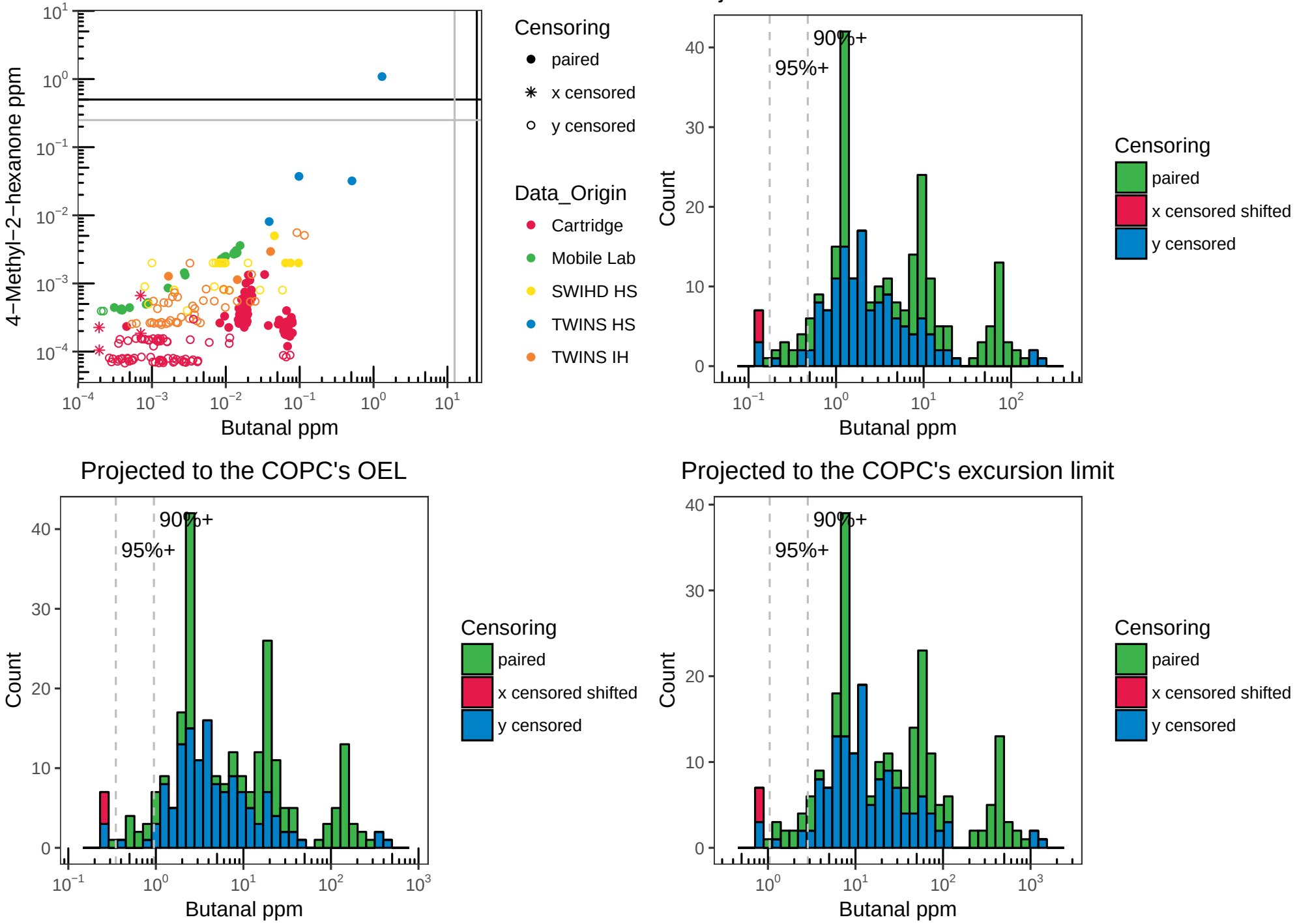


Figure C.822: 4-Methyl-2-hexanone vs Butanal

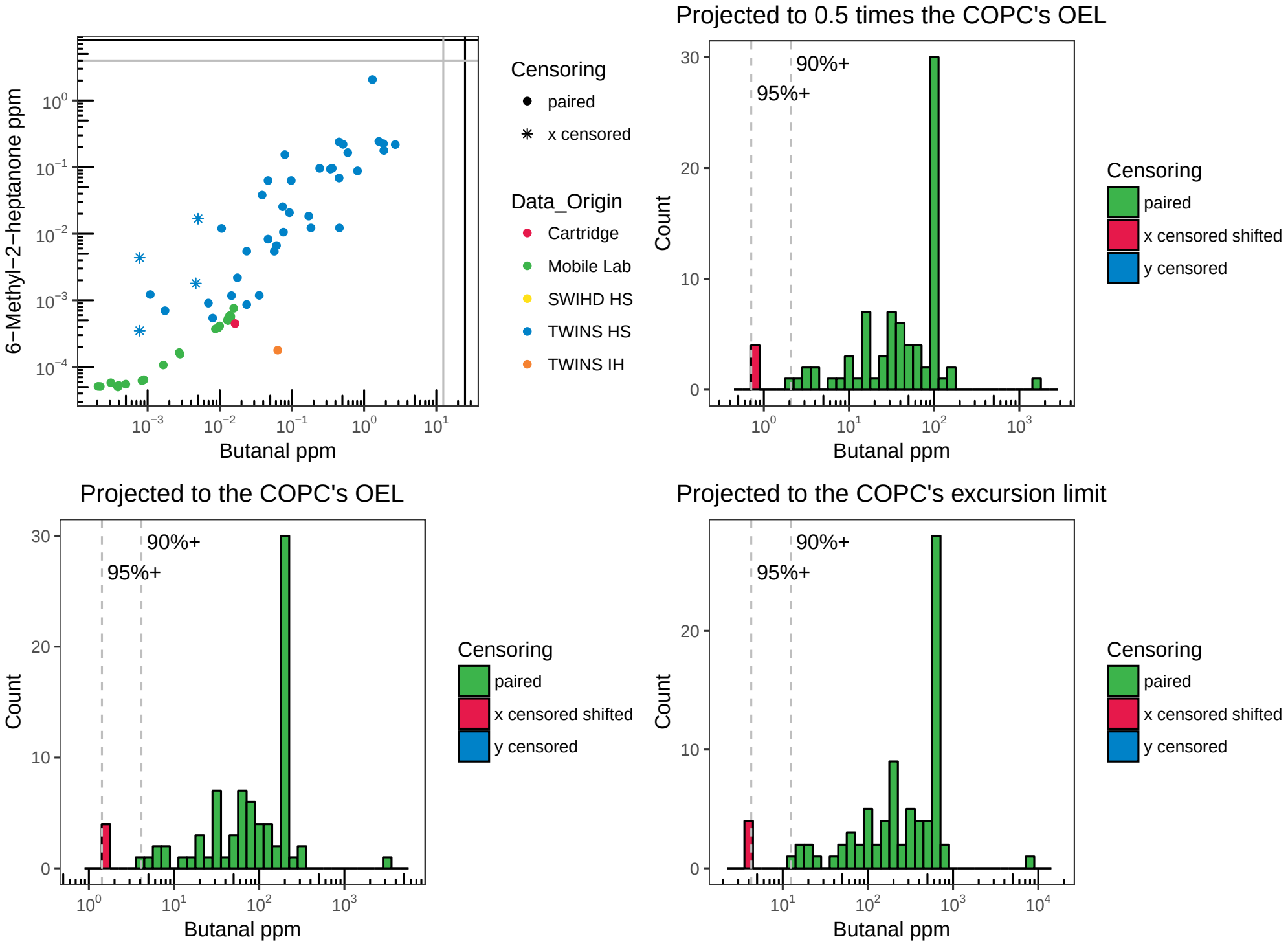


Figure C.823: 6-Methyl-2-heptanone vs Butanal

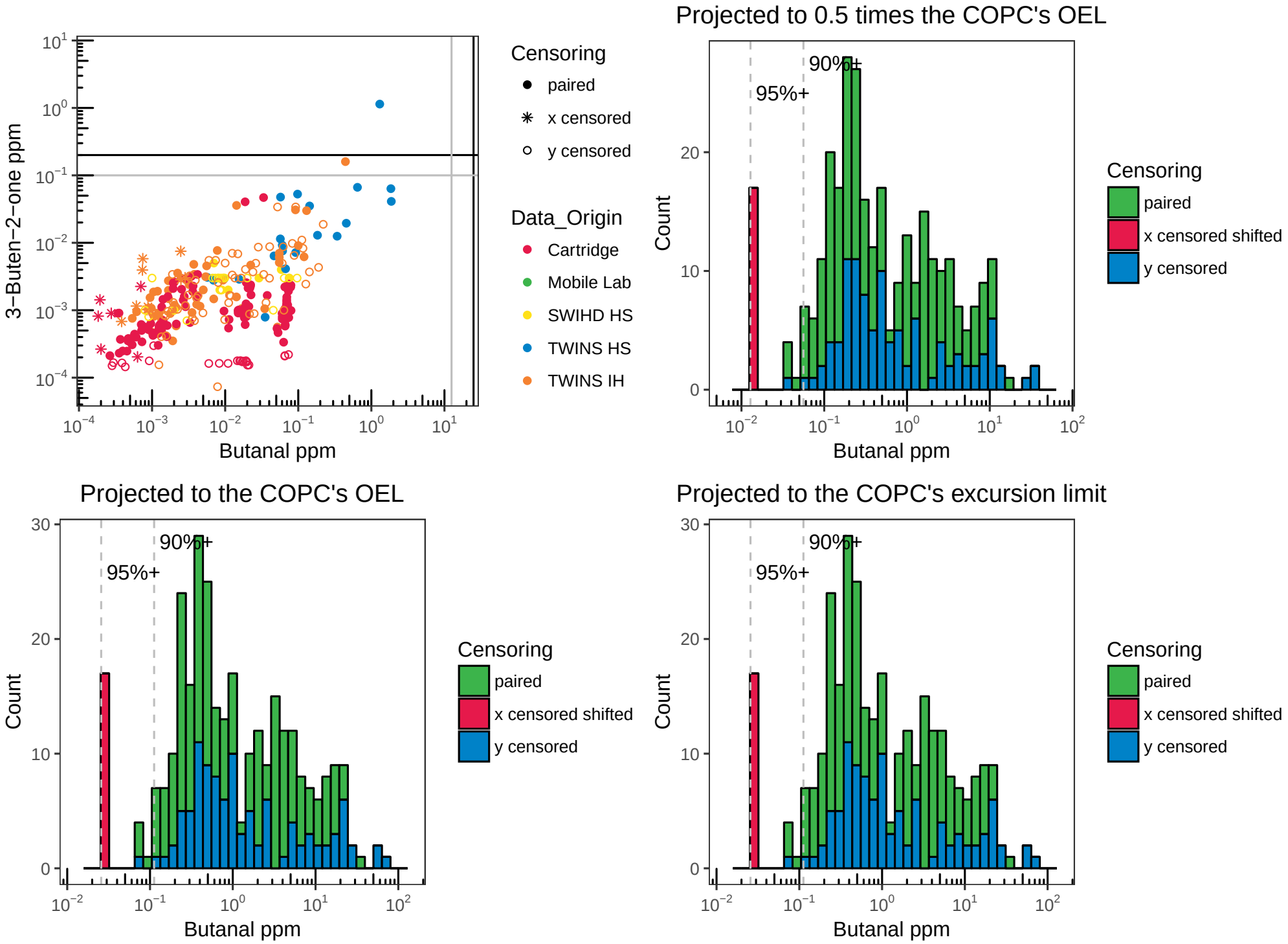


Figure C.824: 3-Buten-2-one vs Butanal

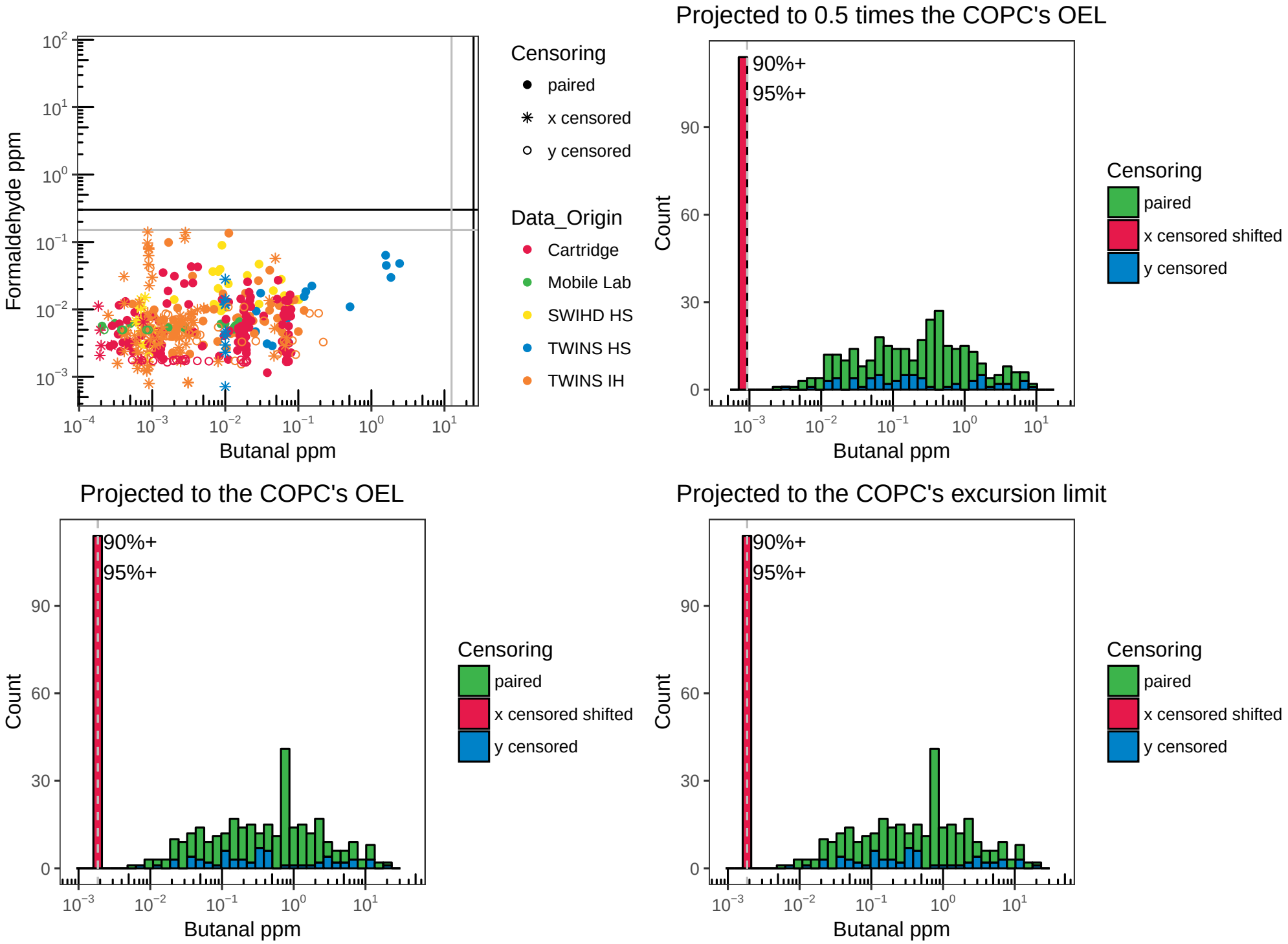


Figure C.825: Formaldehyde vs Butanal

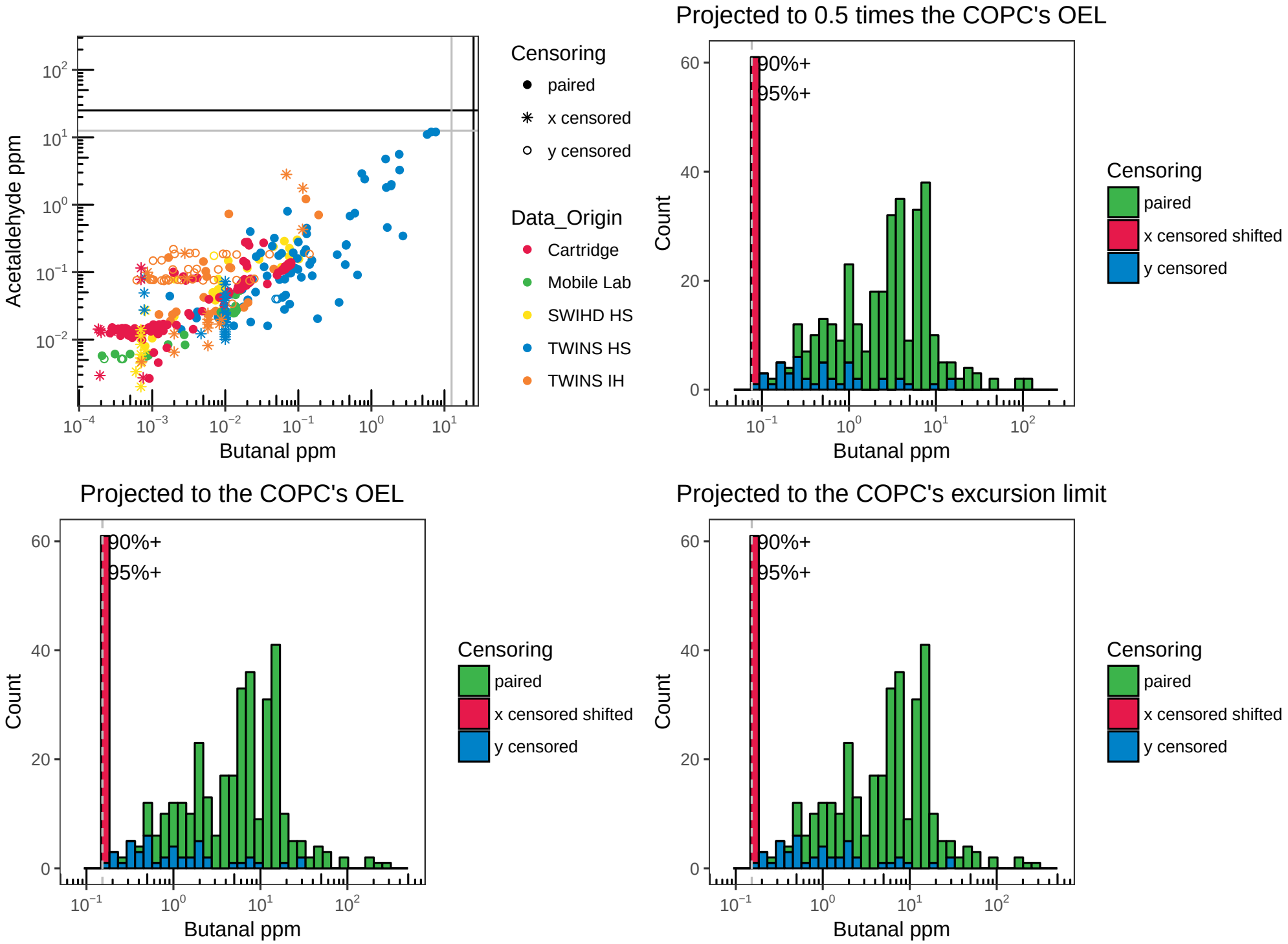


Figure C.826: Acetaldehyde vs Butanal

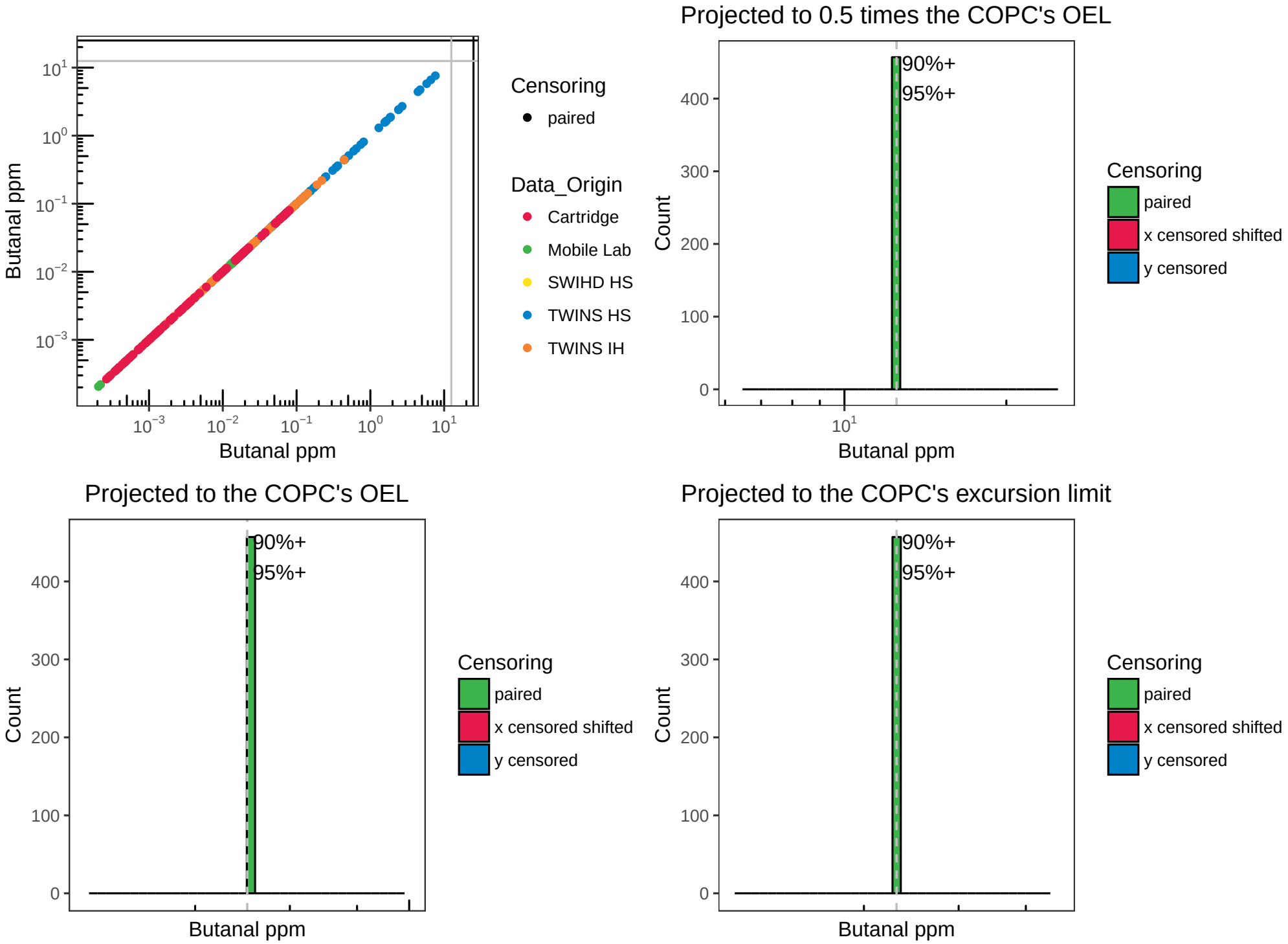


Figure C.827: Butanal vs Butanal

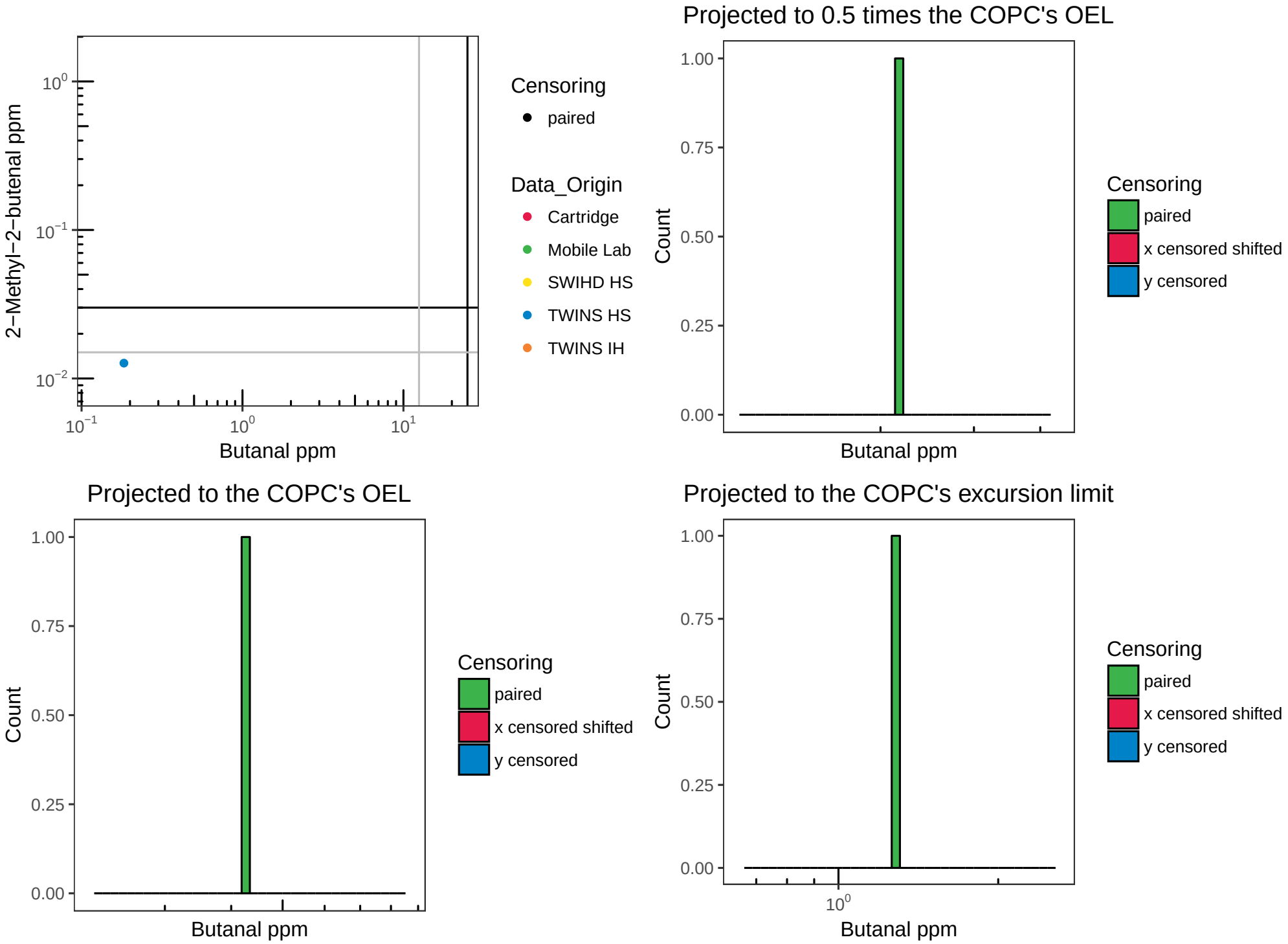


Figure C.828: 2-Methyl-2-butenal vs Butanal

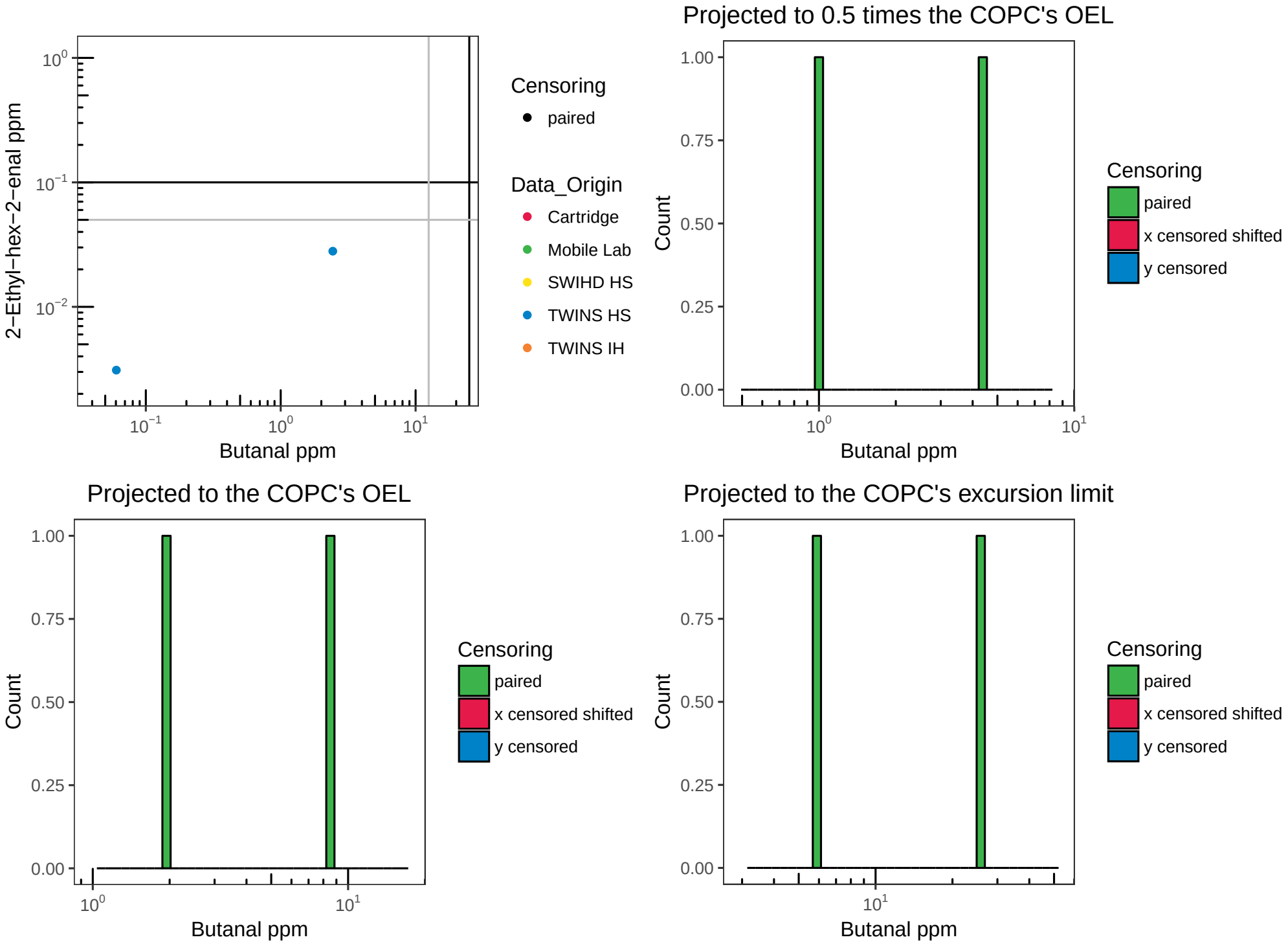


Figure C.829: 2-Ethyl-hex-2-enal vs Butanal

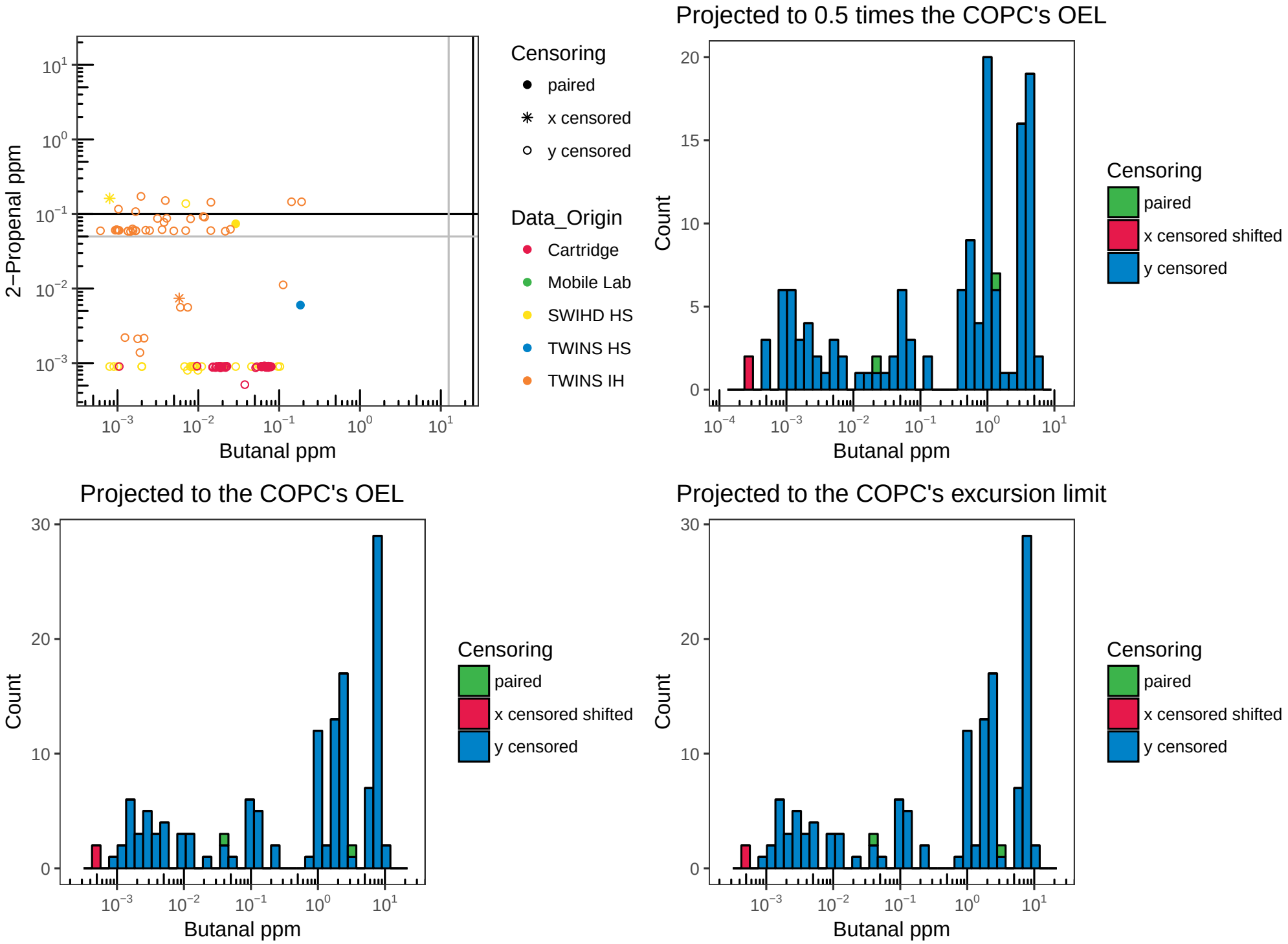


Figure C.830: 2-Propenal vs Butanal

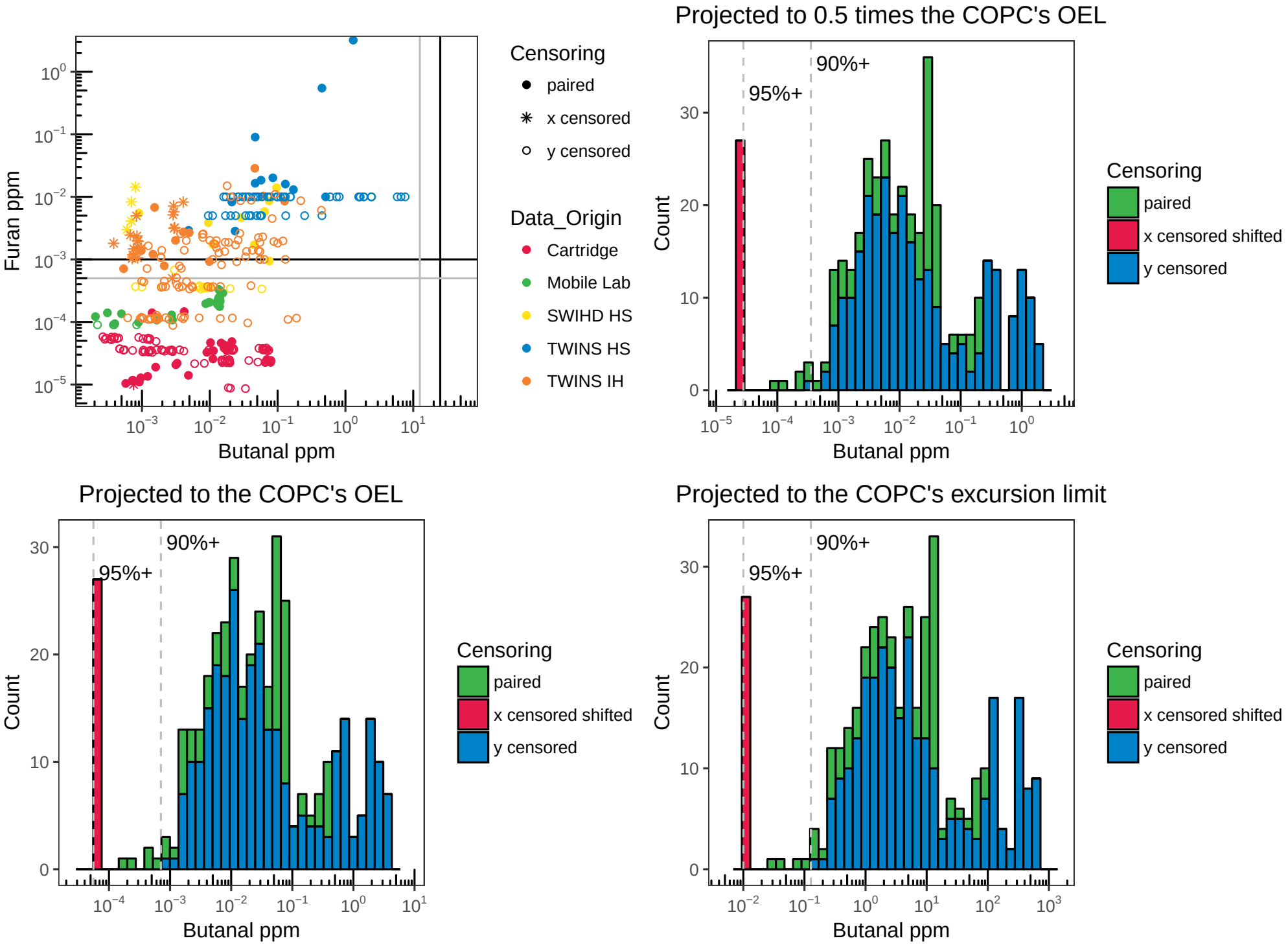


Figure C.831: Furan vs Butanal

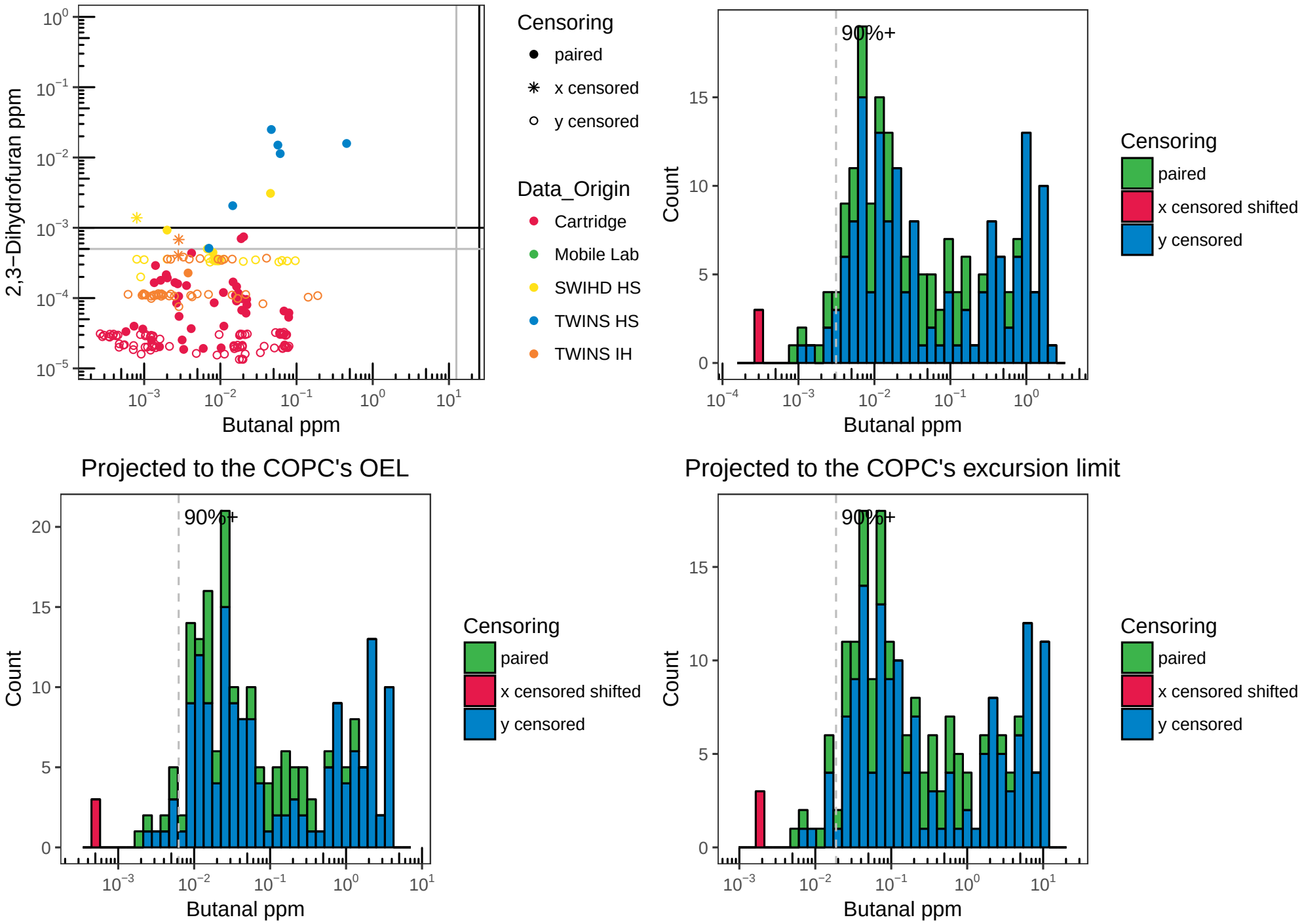


Figure C.832: 2,3-Dihydrofuran vs Butanal

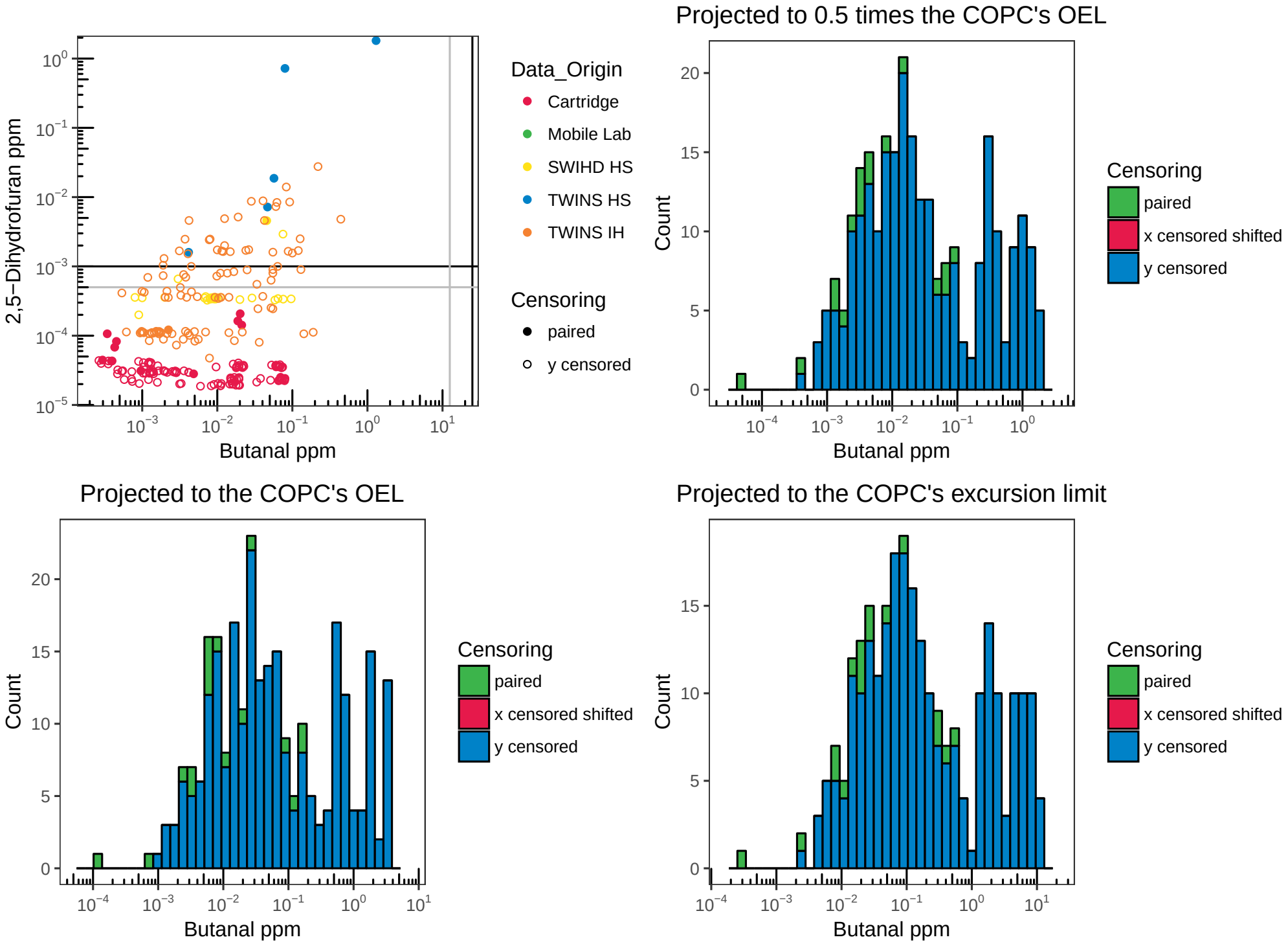


Figure C.833: 2,5-Dihydrofuran vs Butanal

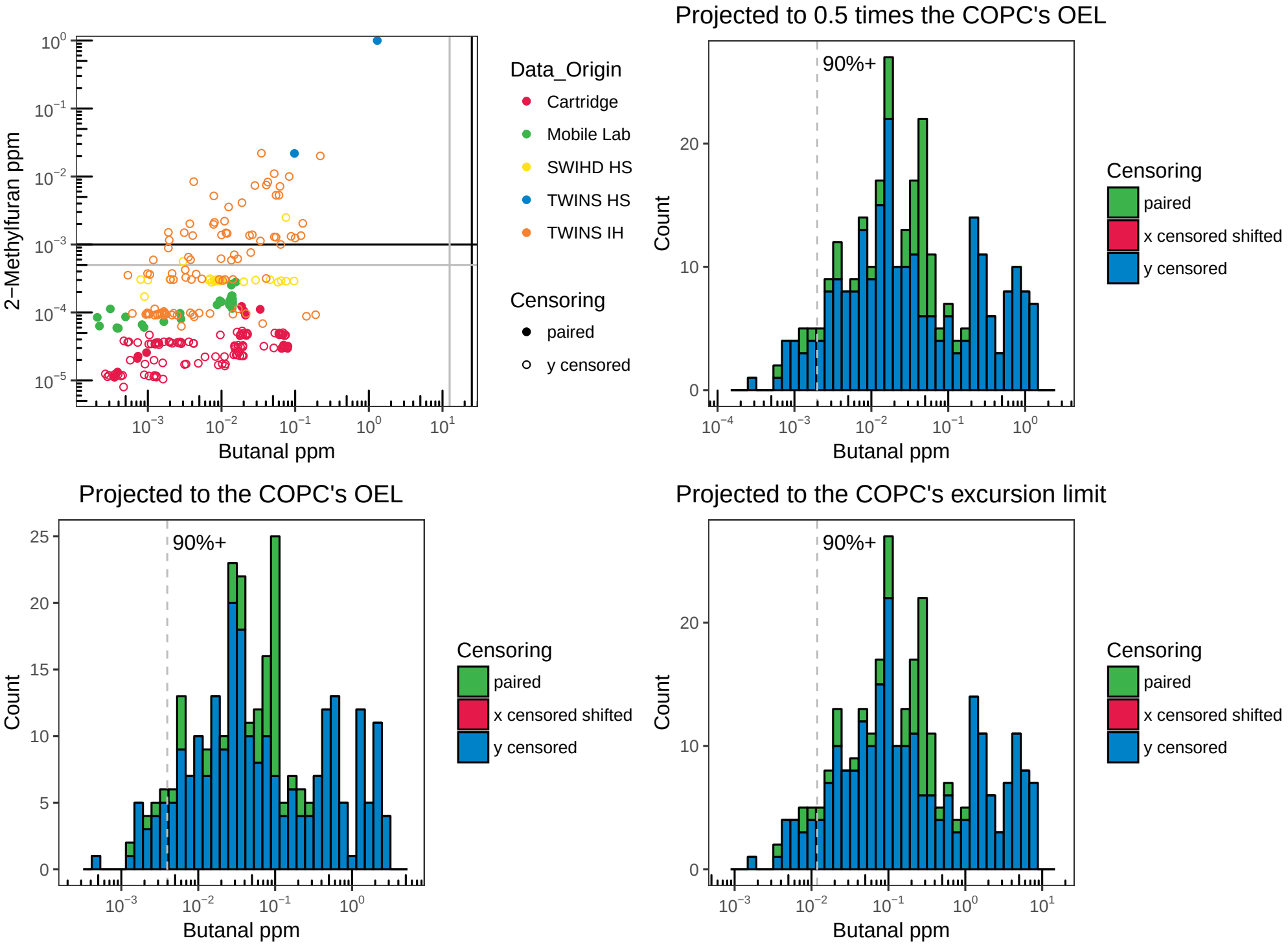


Figure C.834: 2-Methylfuran vs Butanal

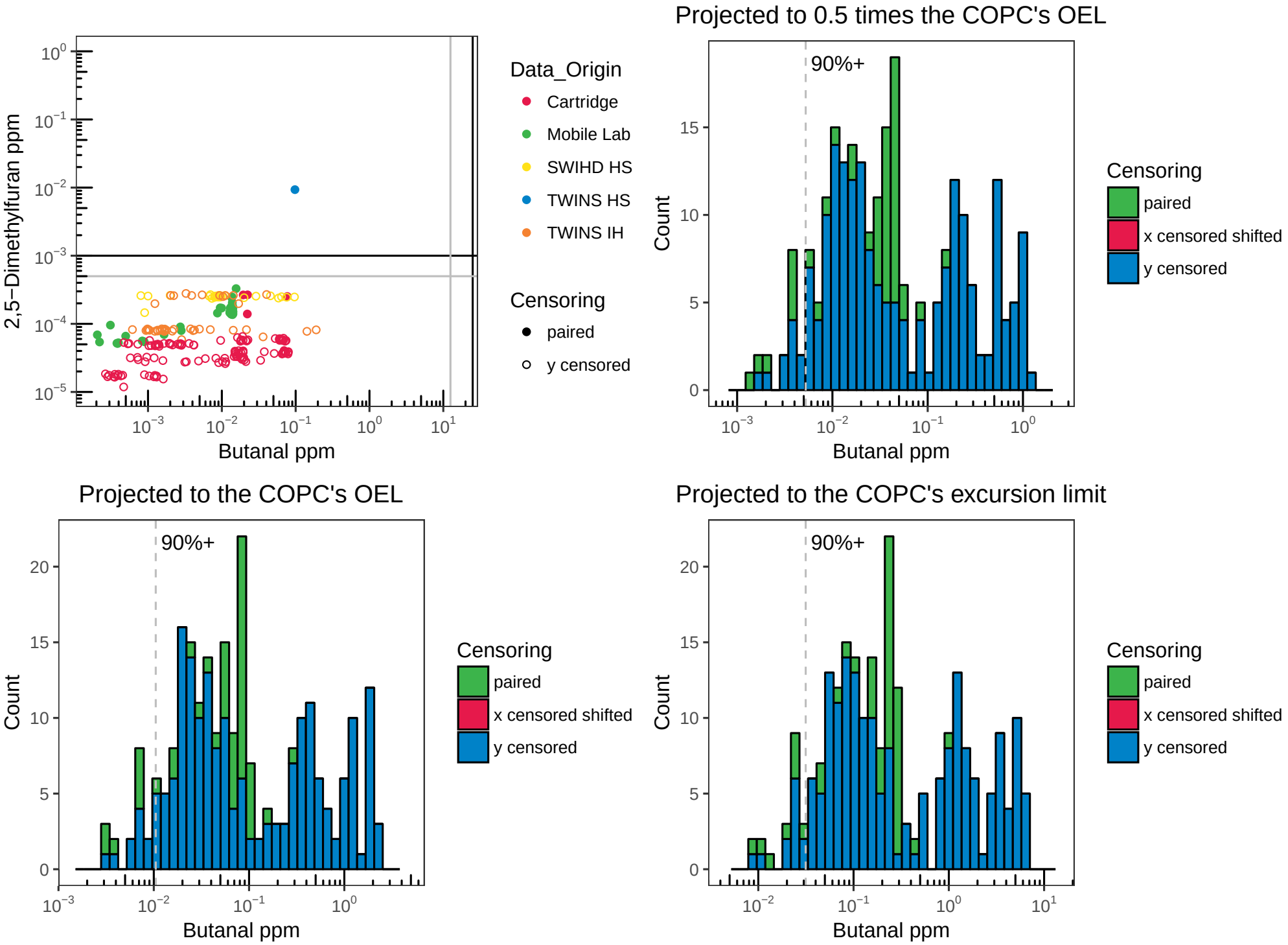


Figure C.835: 2,5-Dimethylfuran vs Butanal

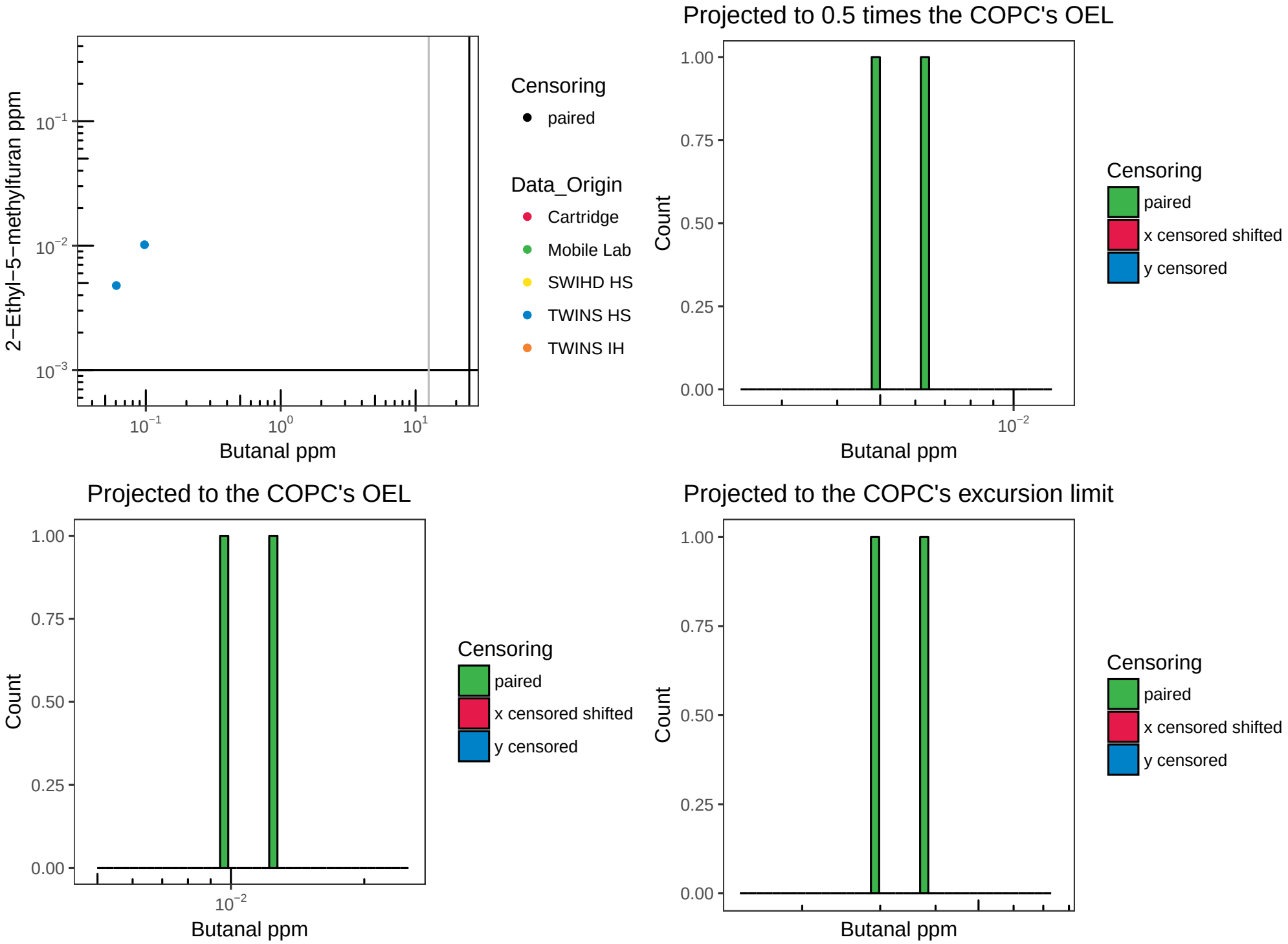


Figure C.836: 2-Ethyl-5-methylfuran vs Butanal

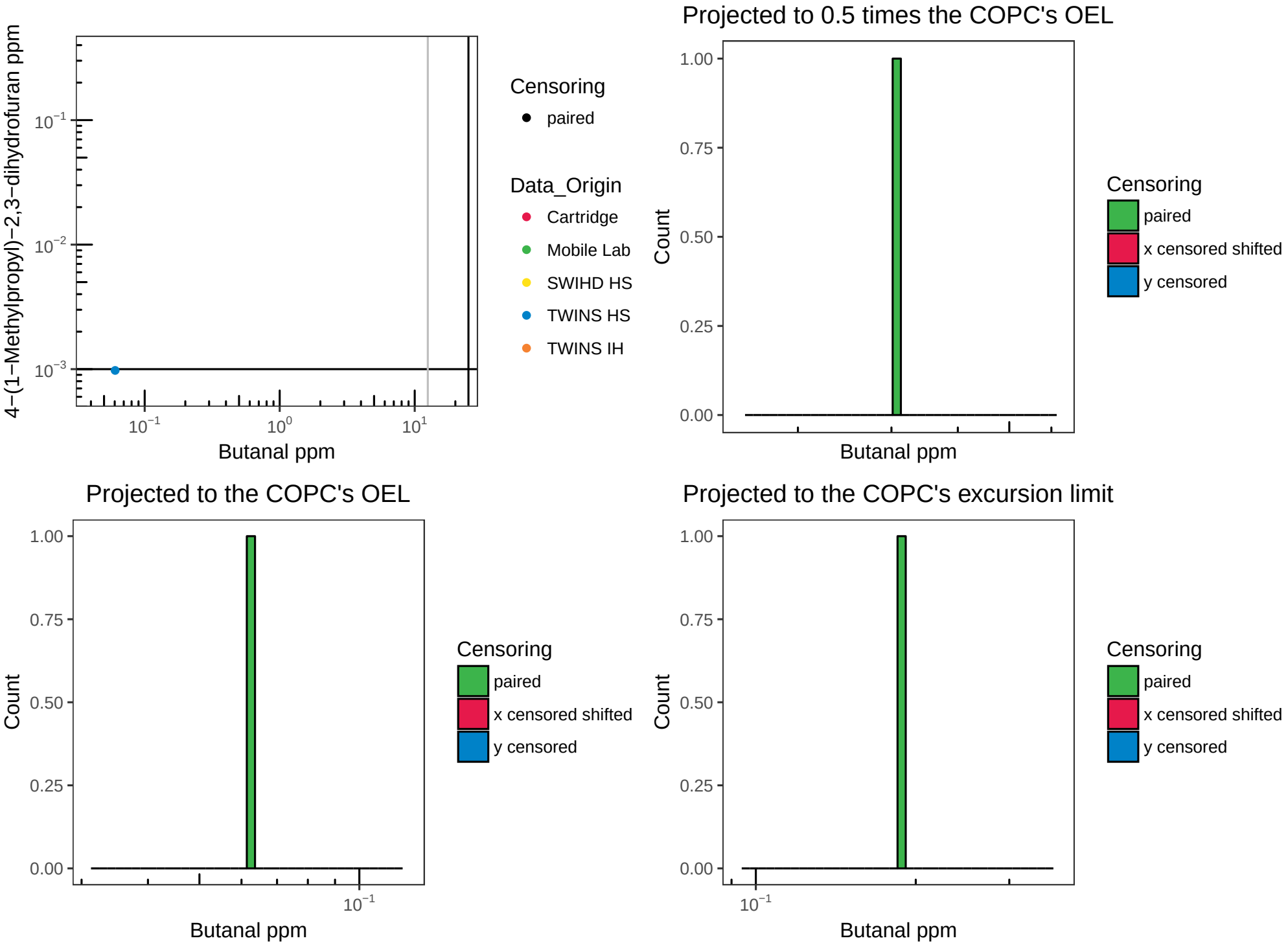


Figure C.837: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Butanal

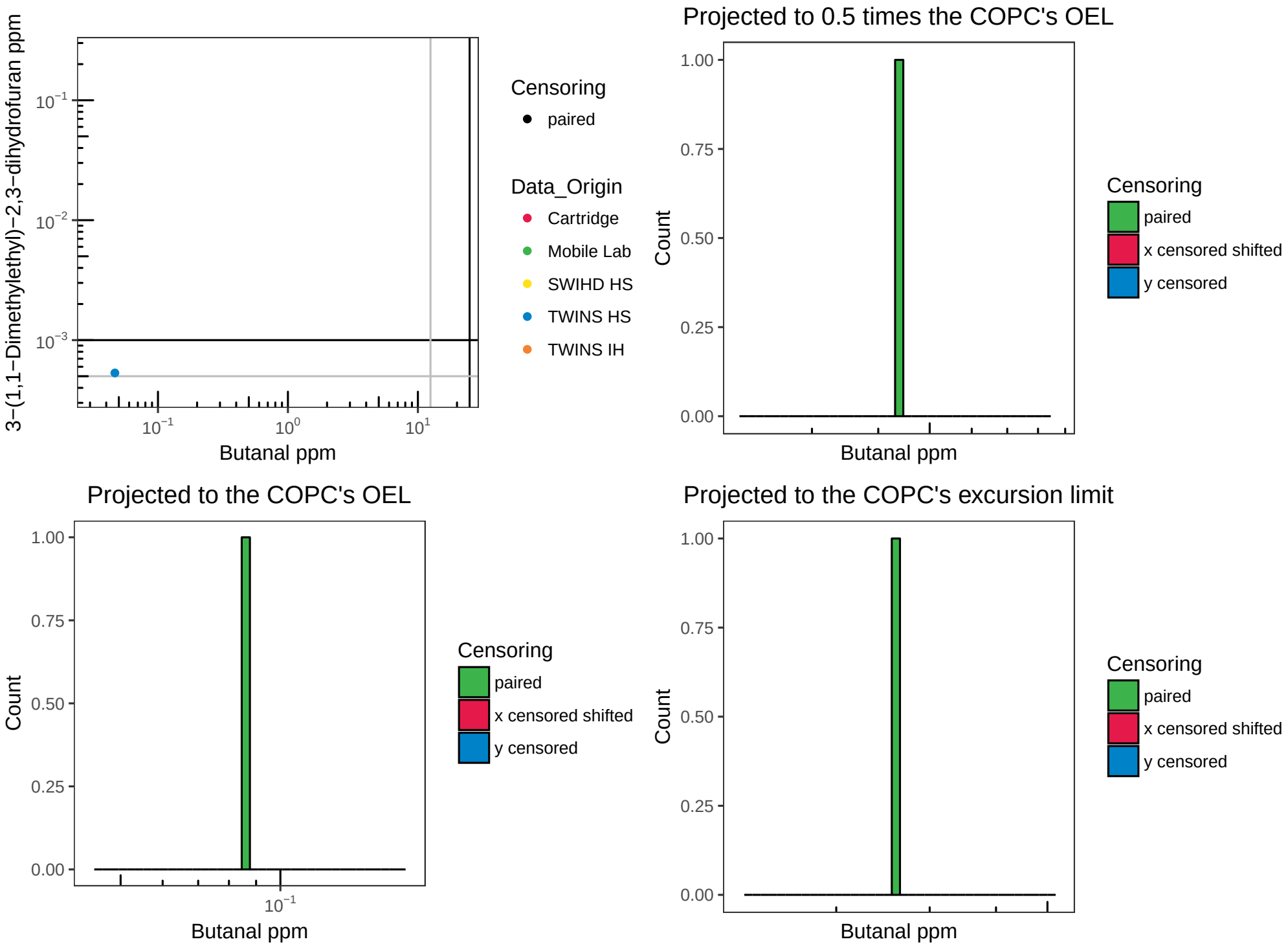


Figure C.838: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Butanal

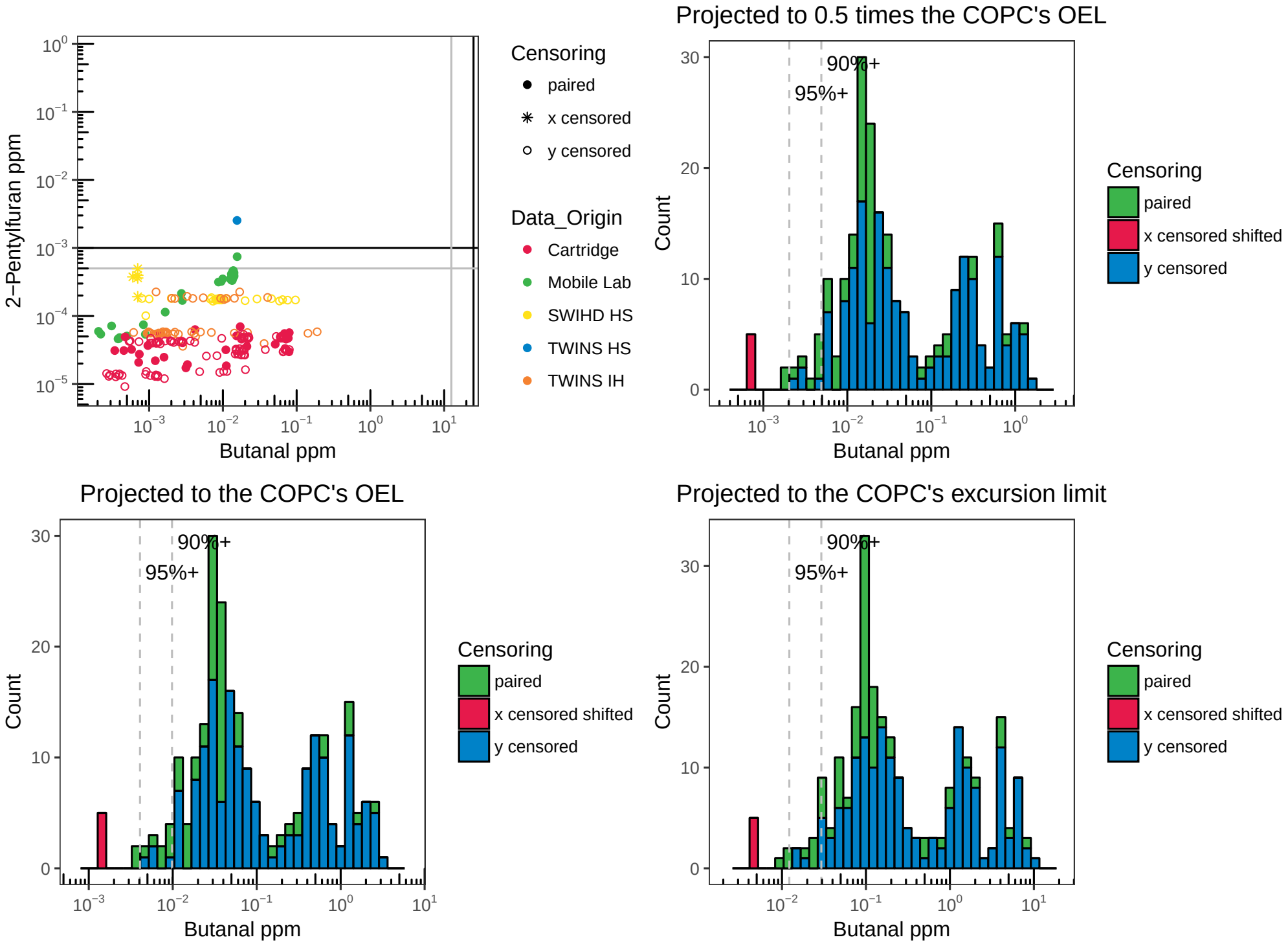


Figure C.839: 2-Pentylfuran vs Butanal

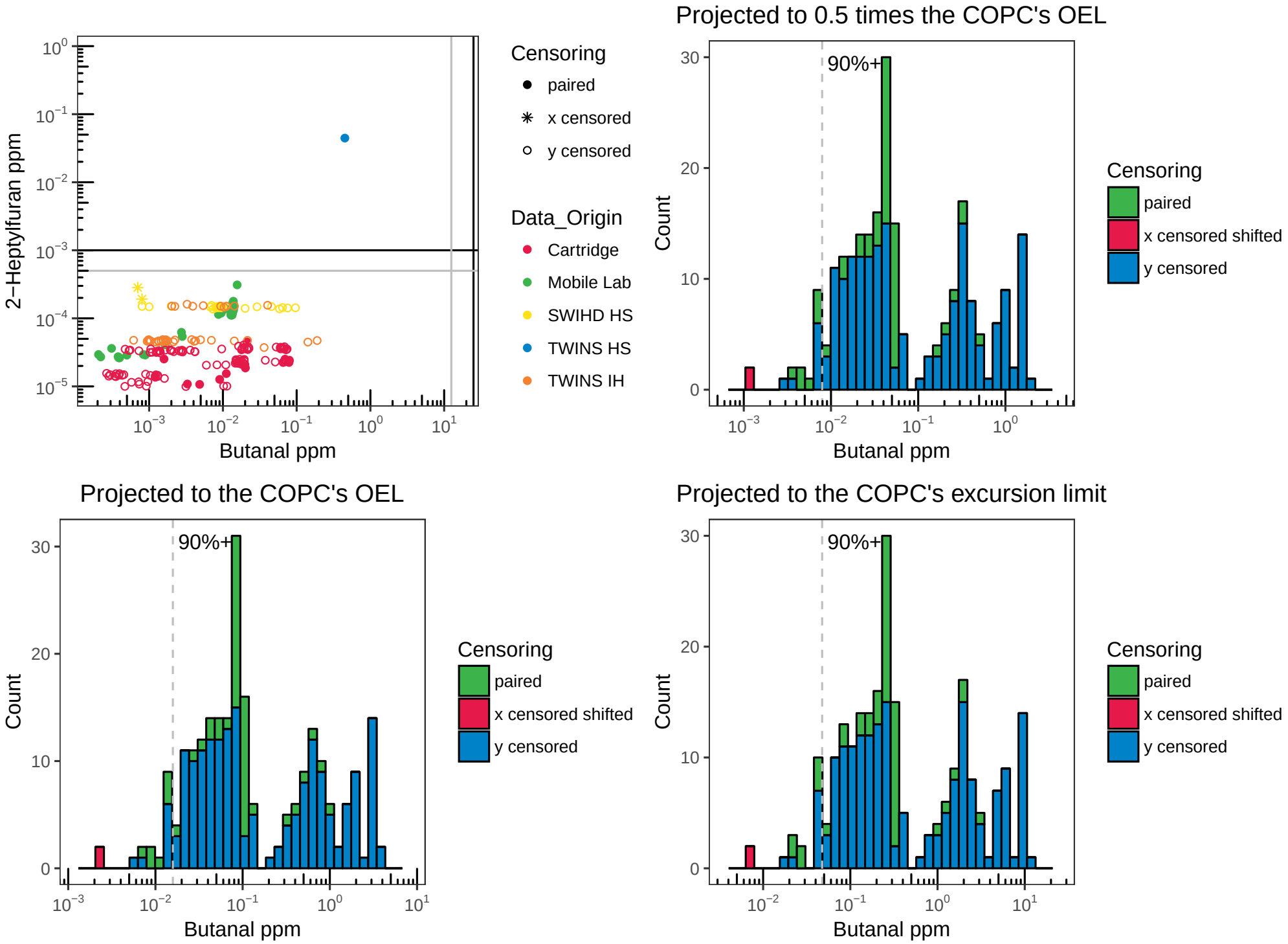


Figure C.840: 2-Heptylfuran vs Butanal

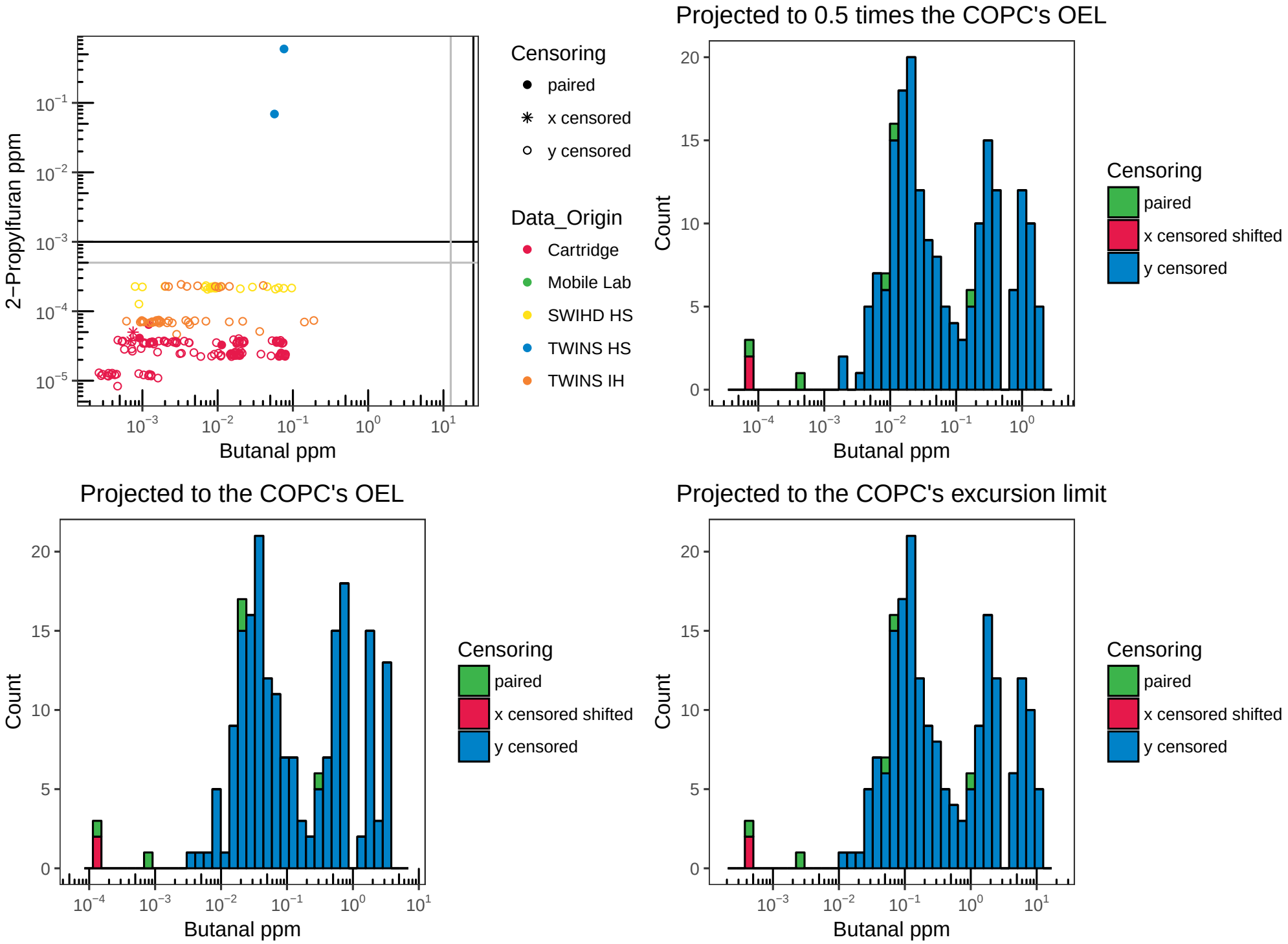


Figure C.841: 2-Propylfuran vs Butanal

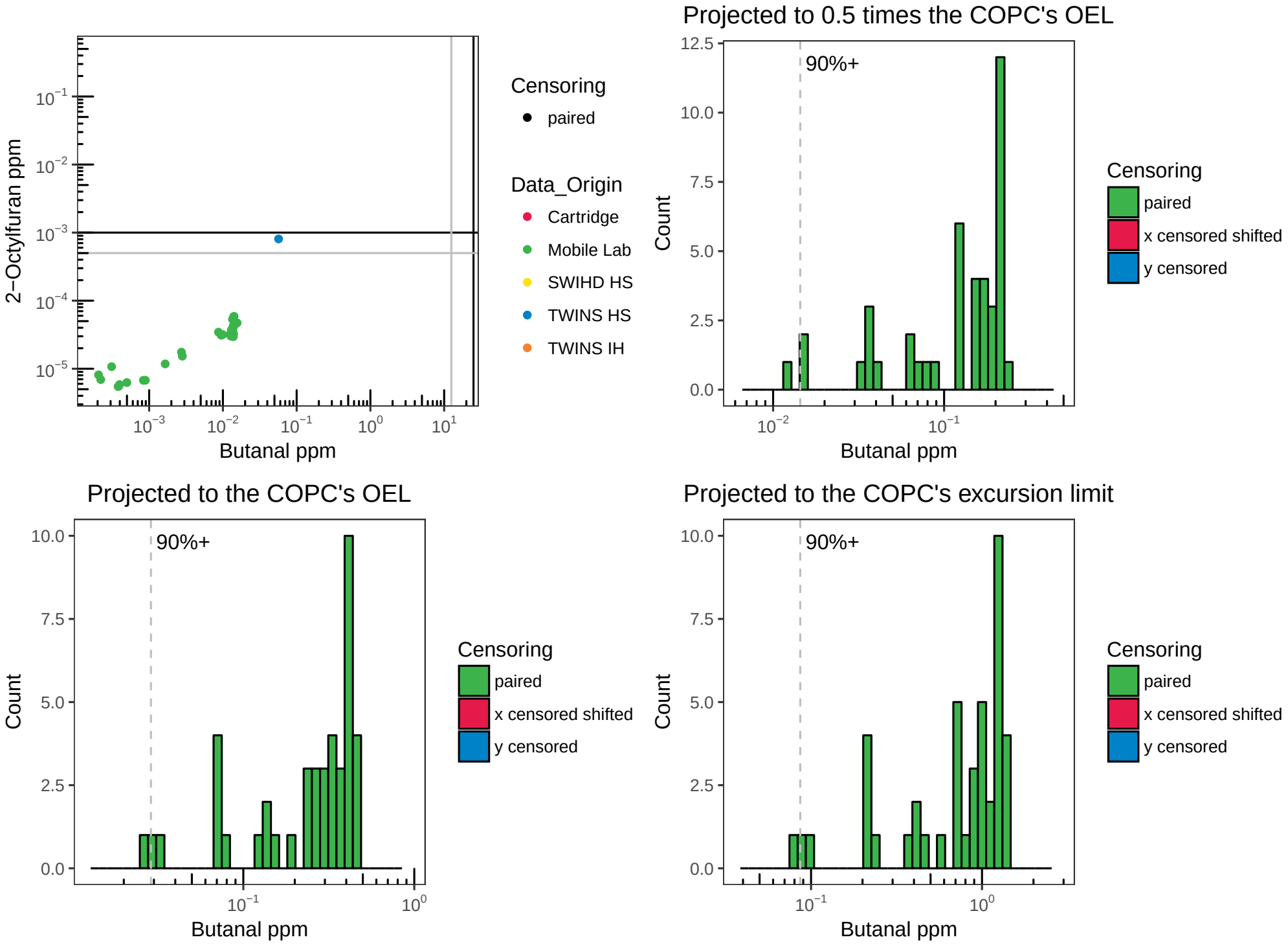


Figure C.842: 2-Octylfuran vs Butanal

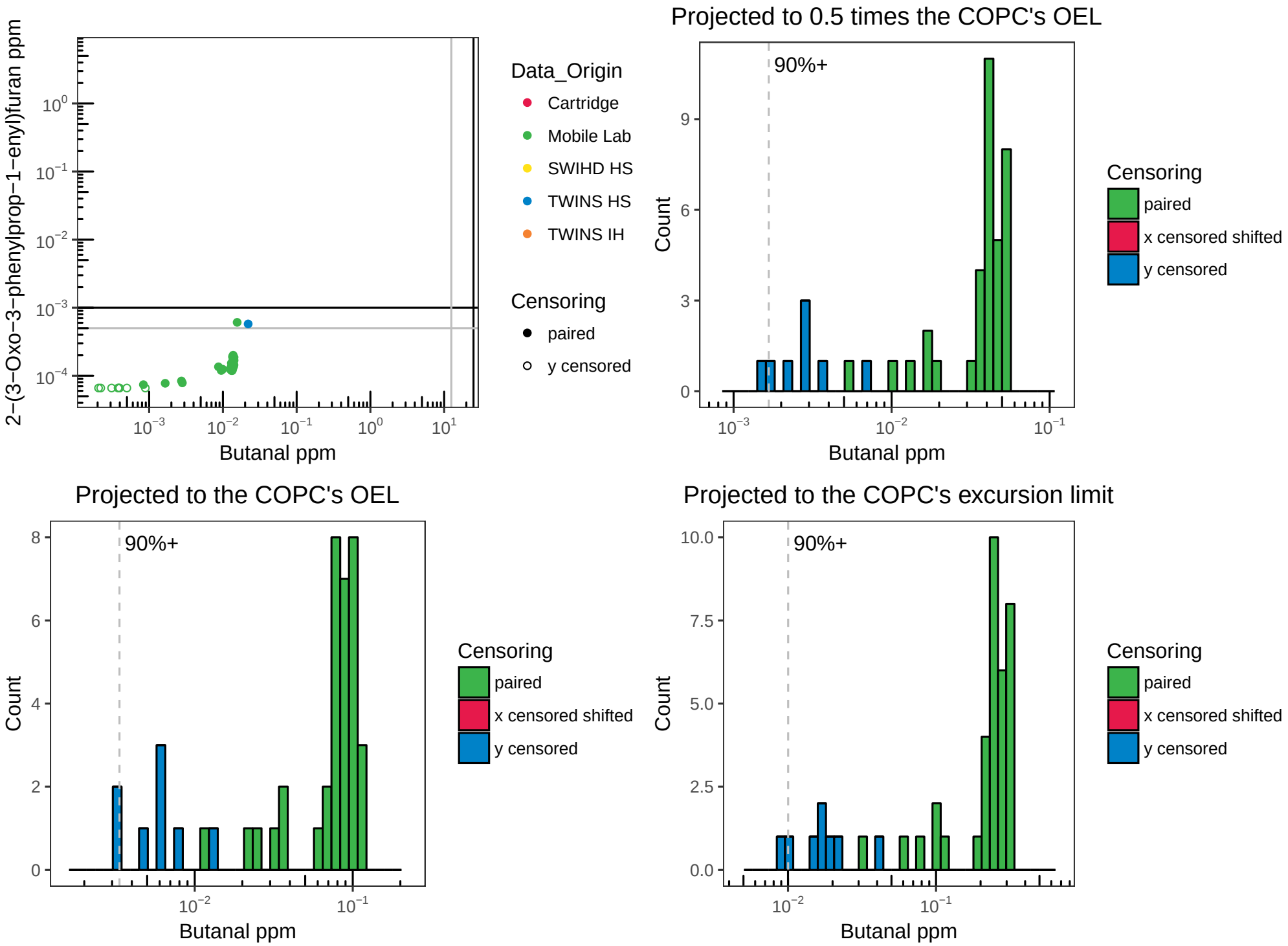


Figure C.843: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Butanal

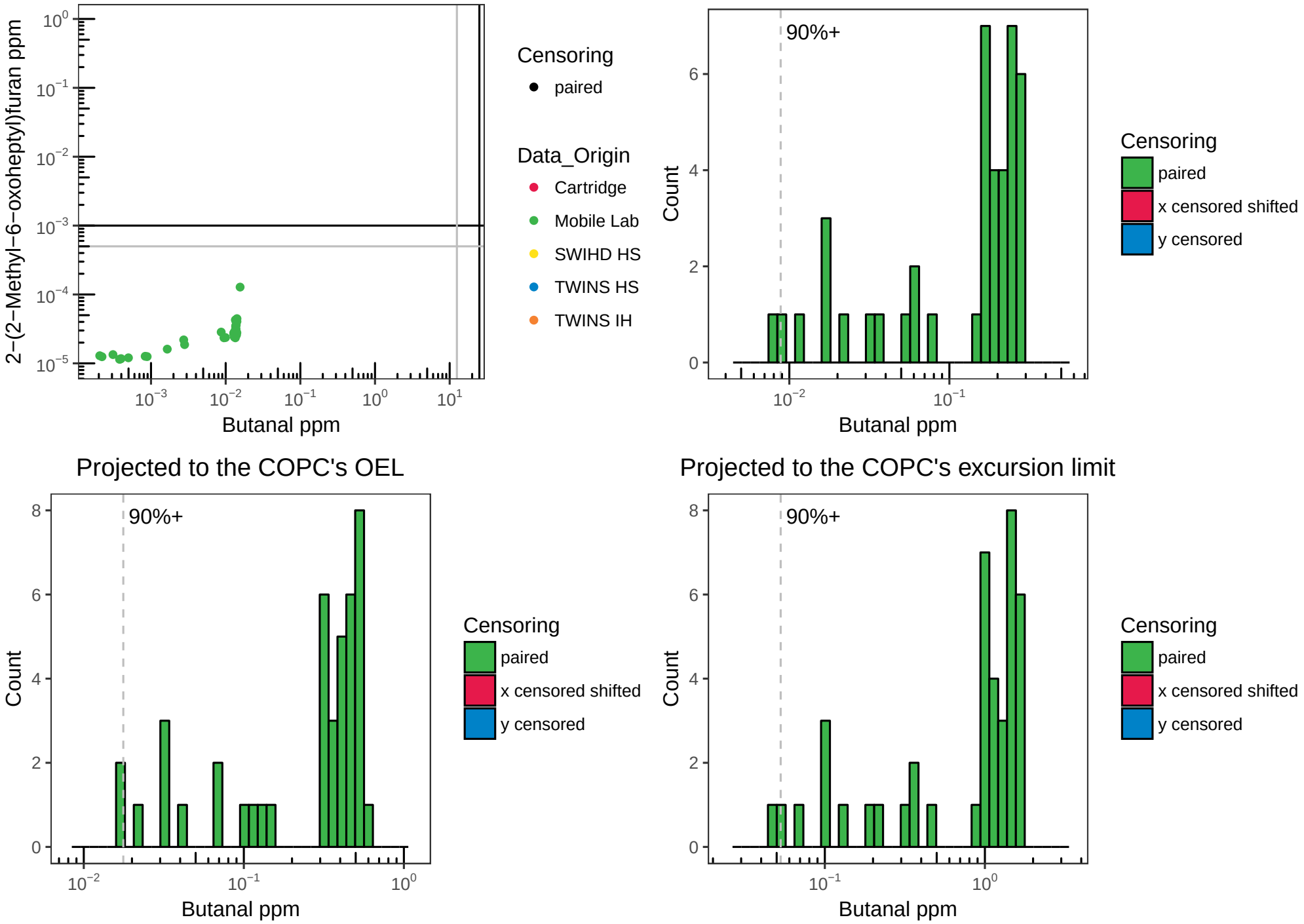


Figure C.844: 2-(2-Methyl-6-oxoheptyl)furan vs Butanal

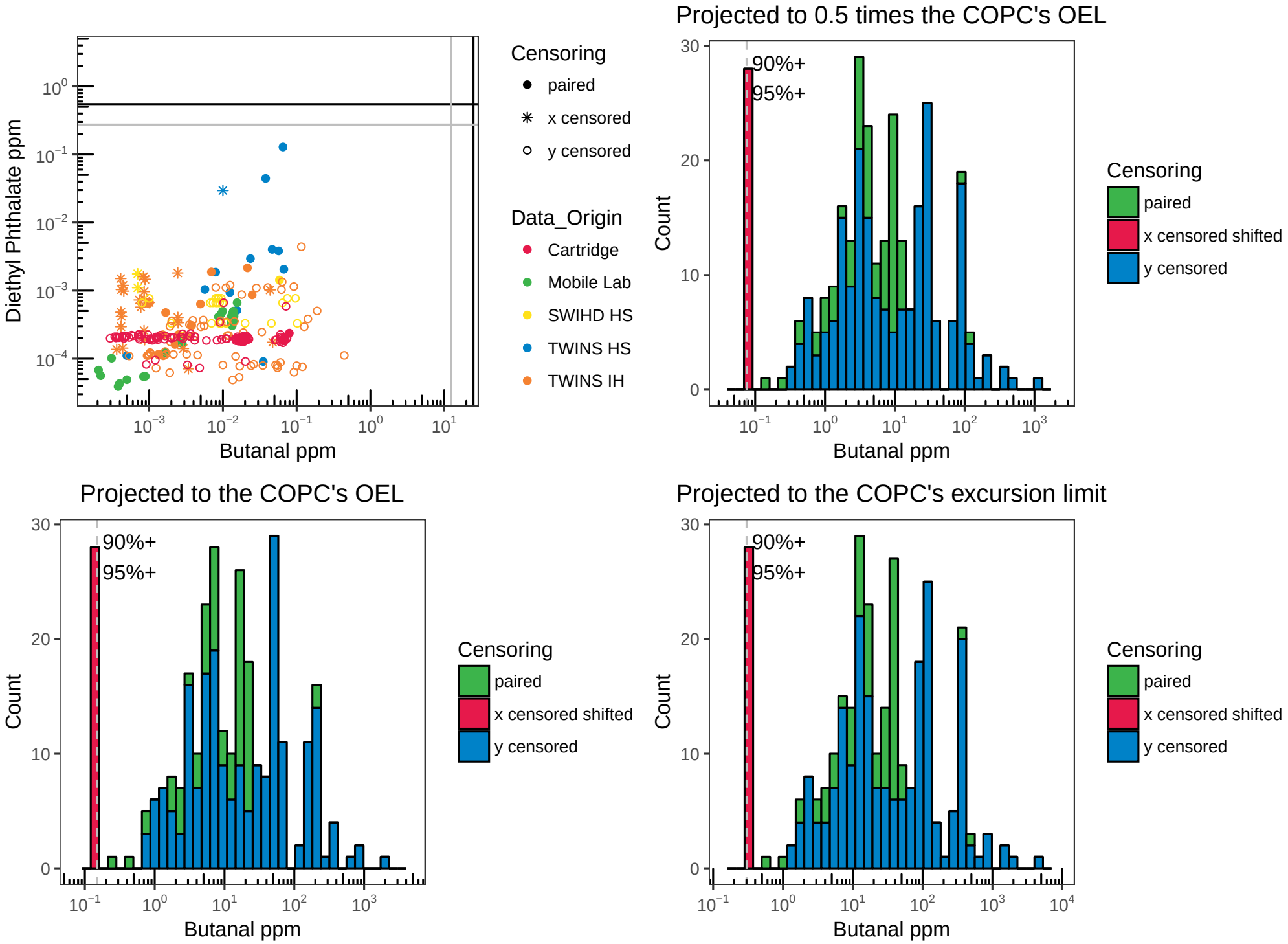


Figure C.845: Diethyl Phthalate vs Butanal

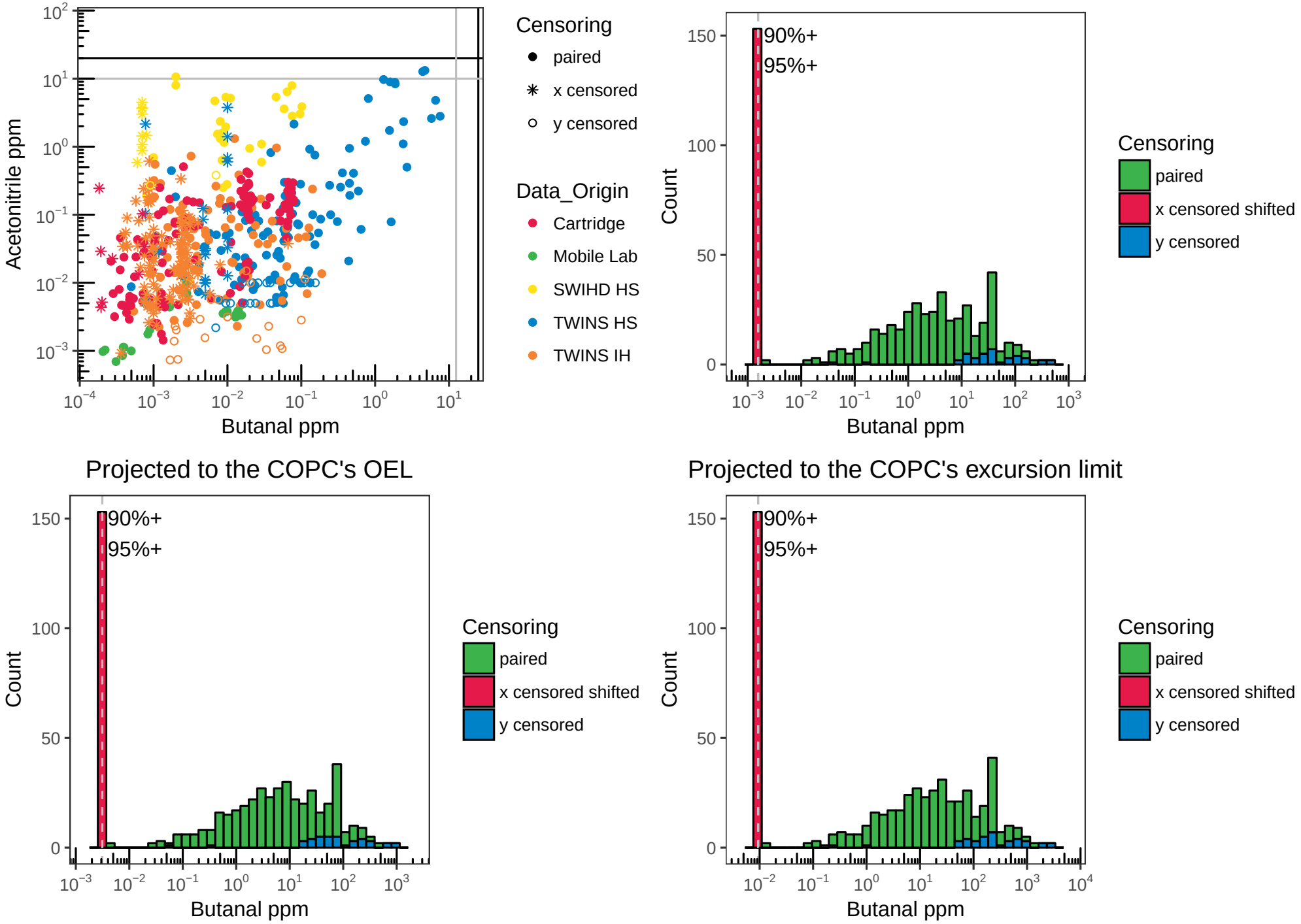


Figure C.846: Acetonitrile vs Butanal

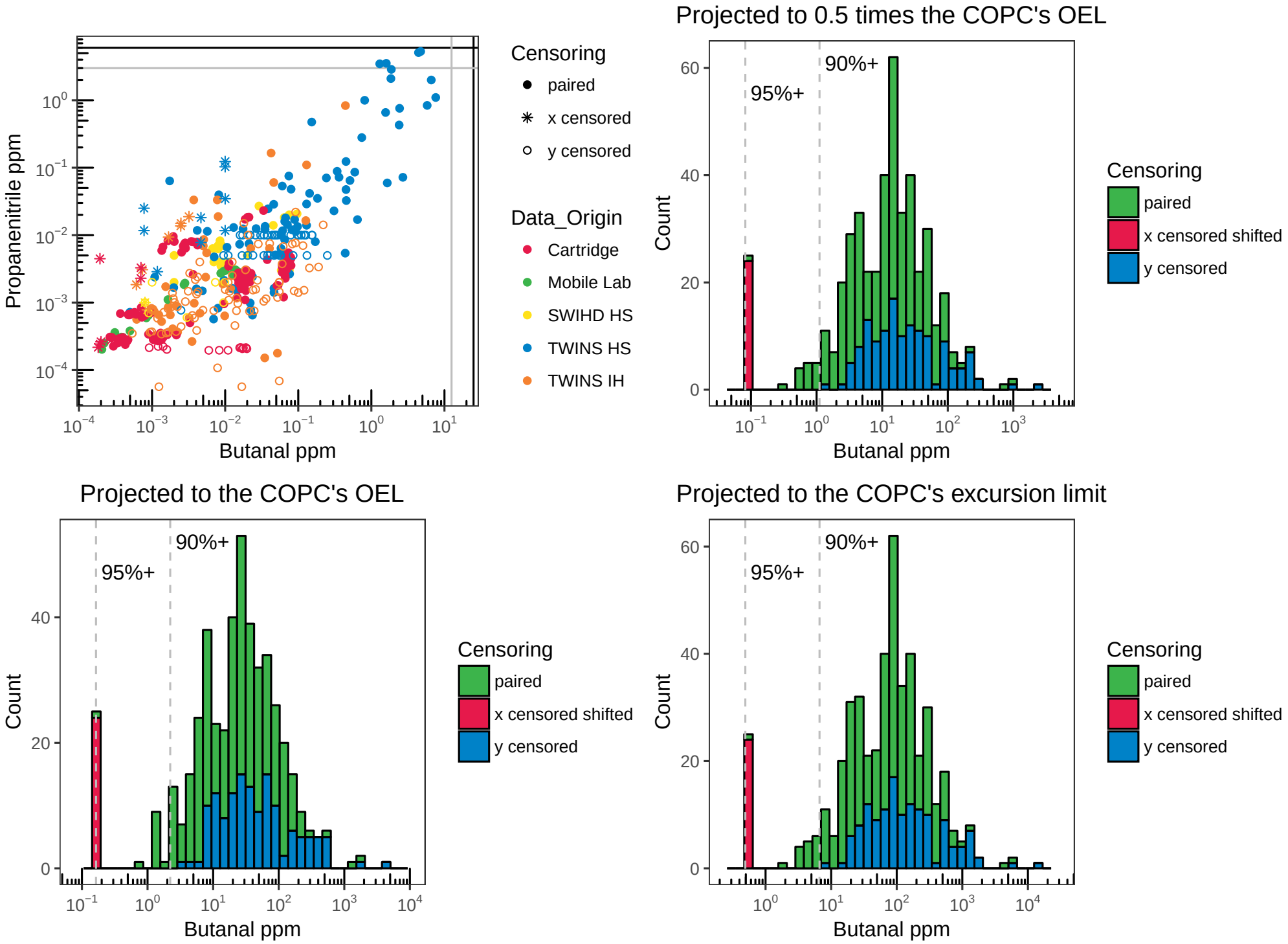


Figure C.847: Propanenitrile vs Butanal

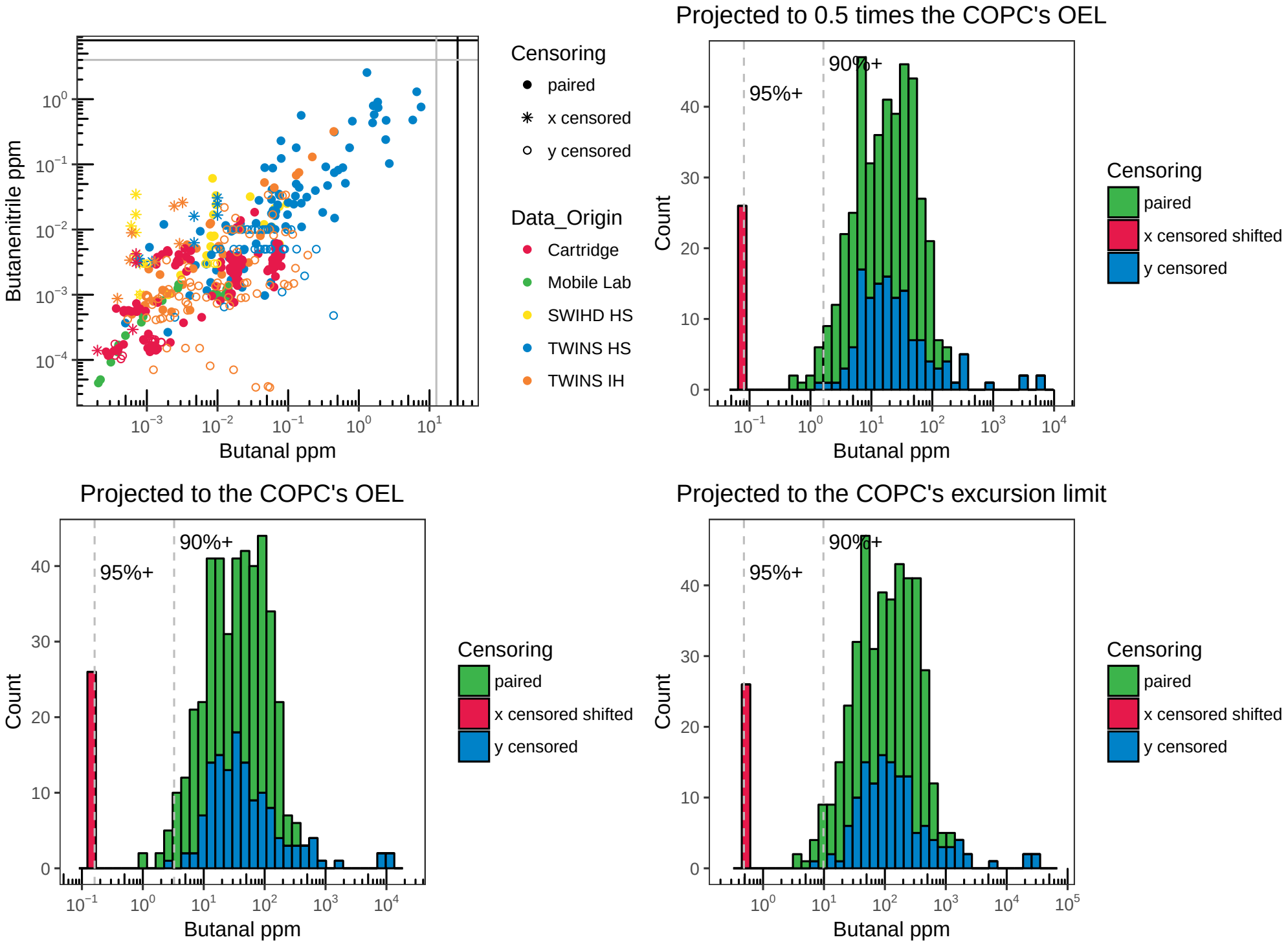


Figure C.848: Butanenitrile vs Butanal

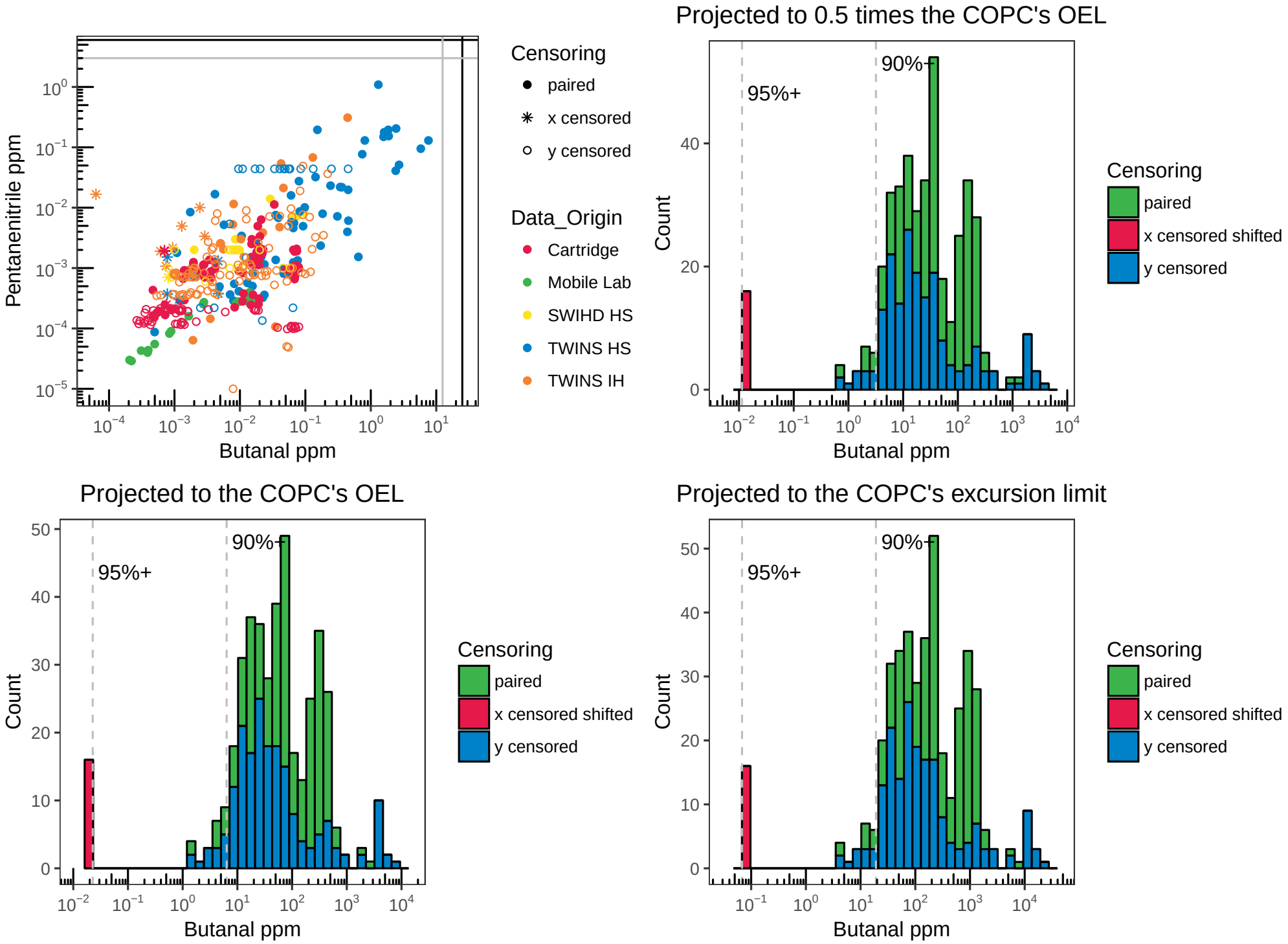


Figure C.849: Pentanenitrile vs Butanal

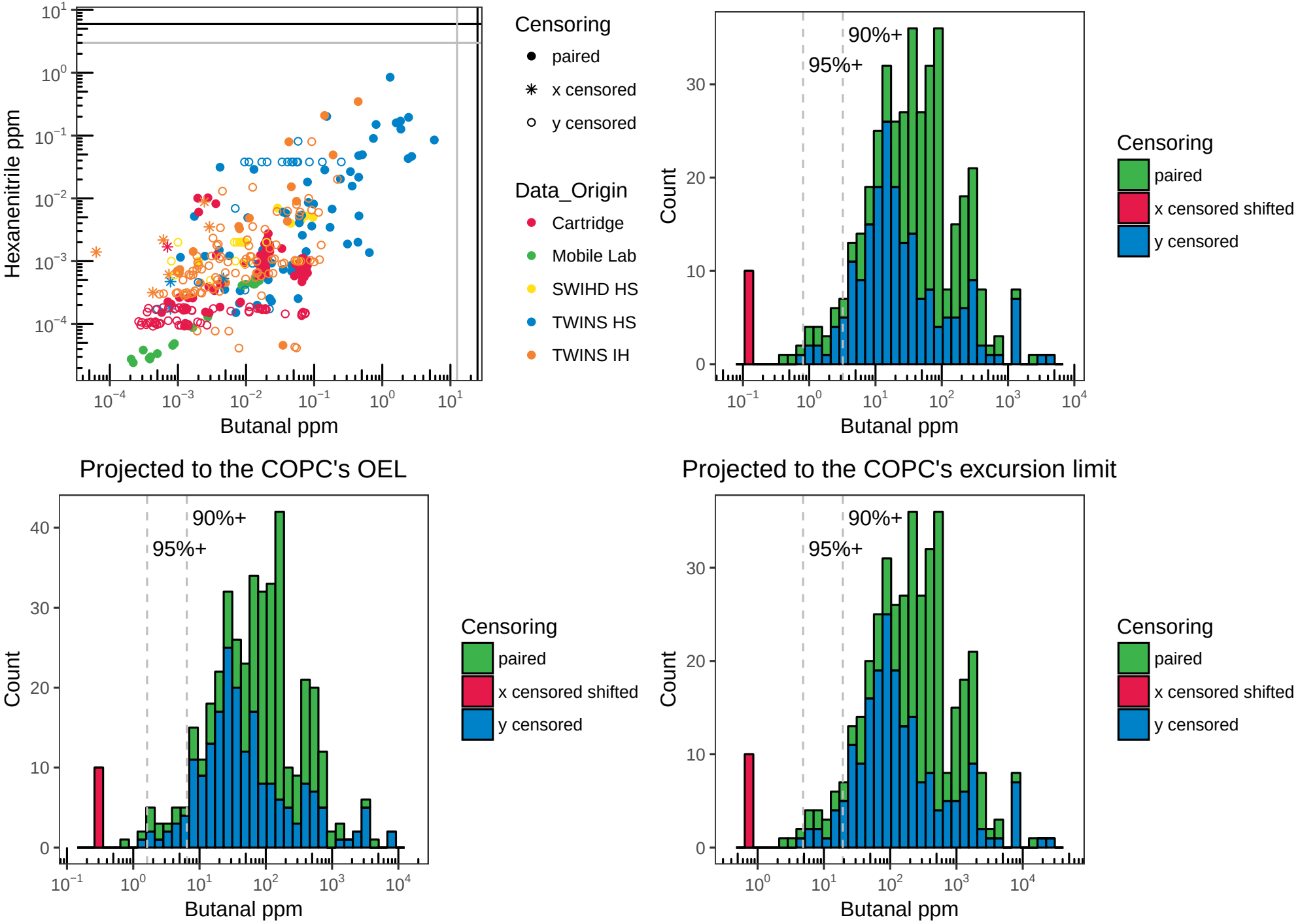


Figure C.850: Hexanenitrile vs Butanal

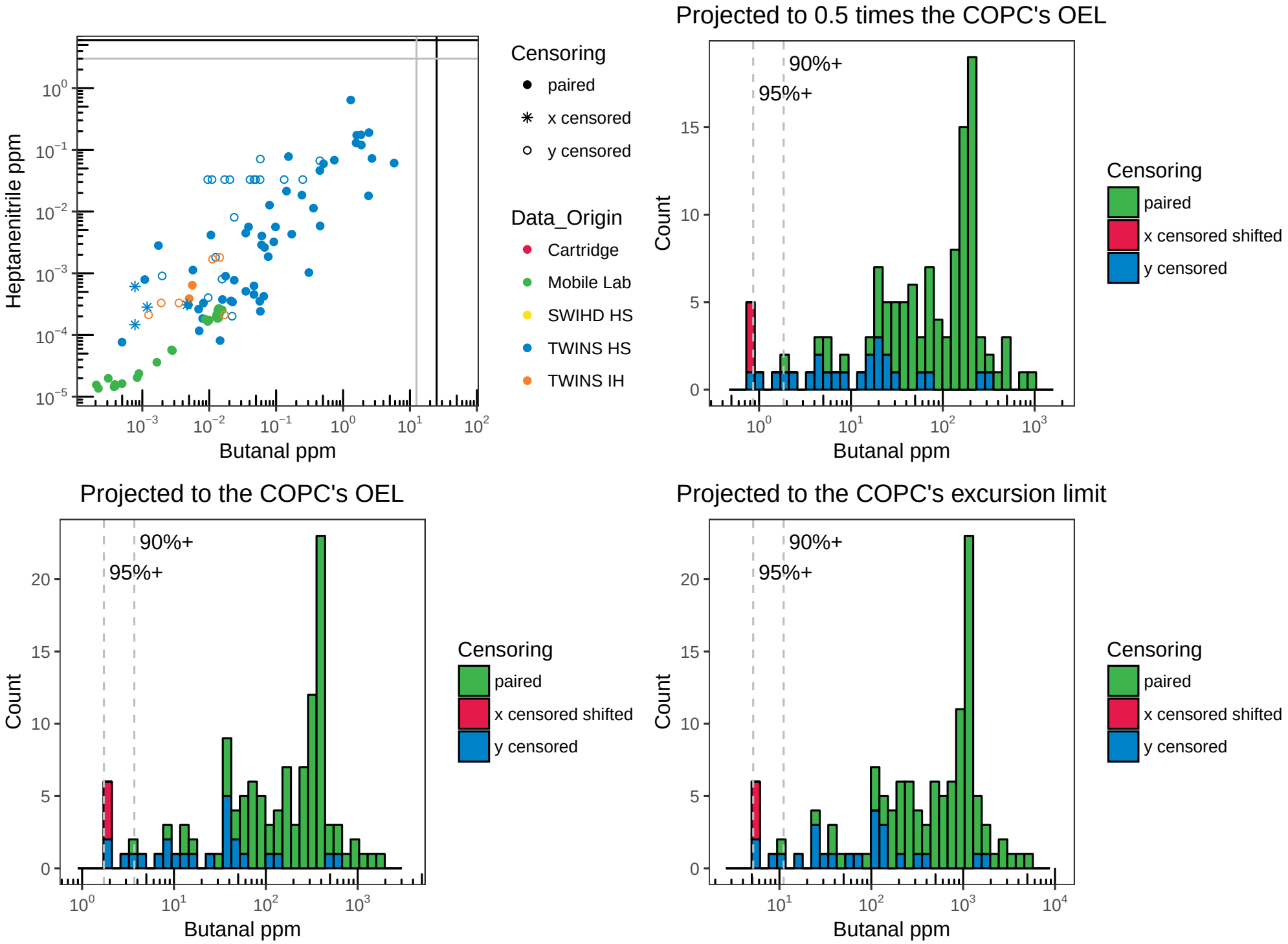


Figure C.851: Heptanenitrile vs Butanal

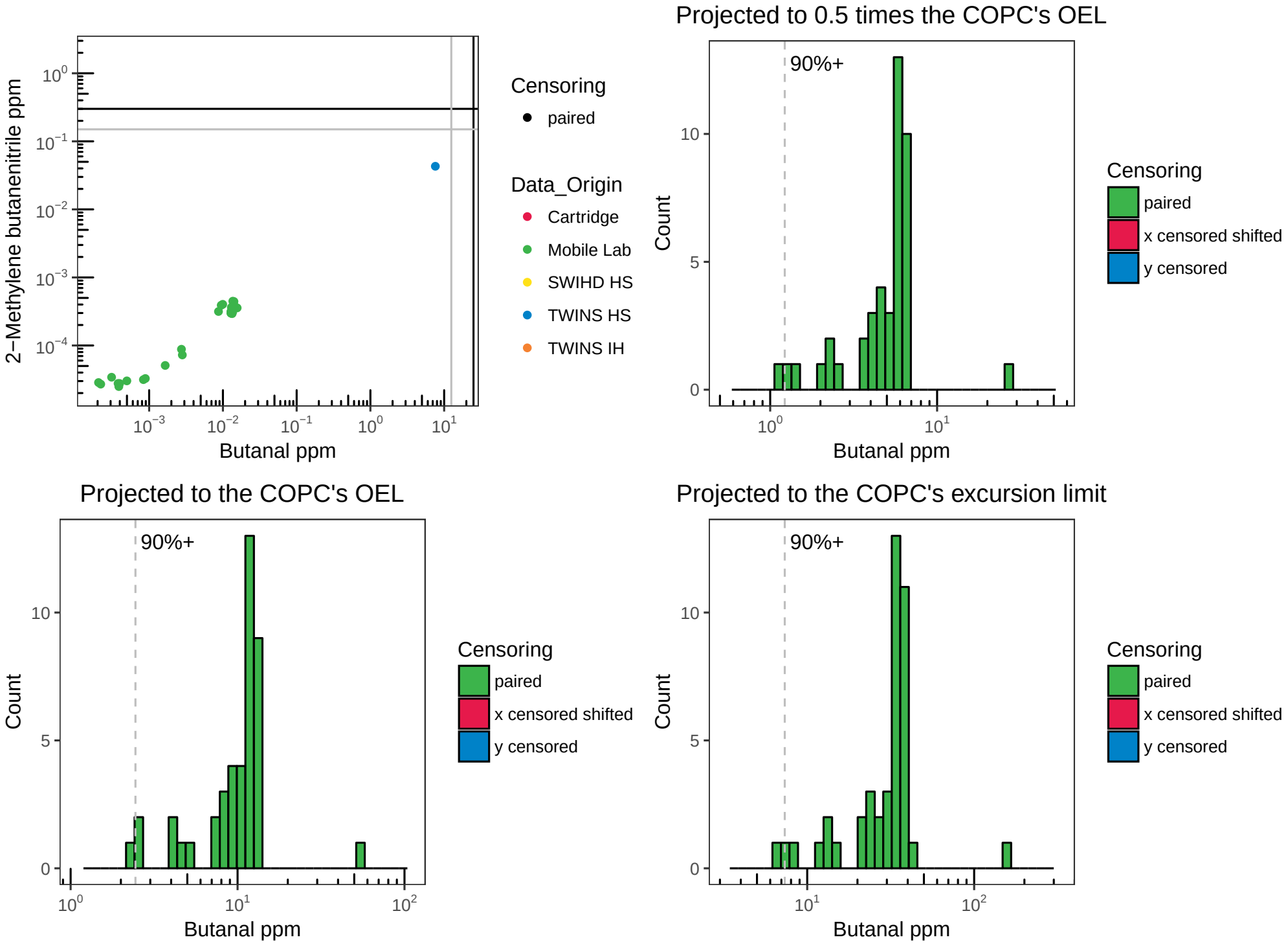


Figure C.852: 2-Methylene butanenitrile vs Butanal

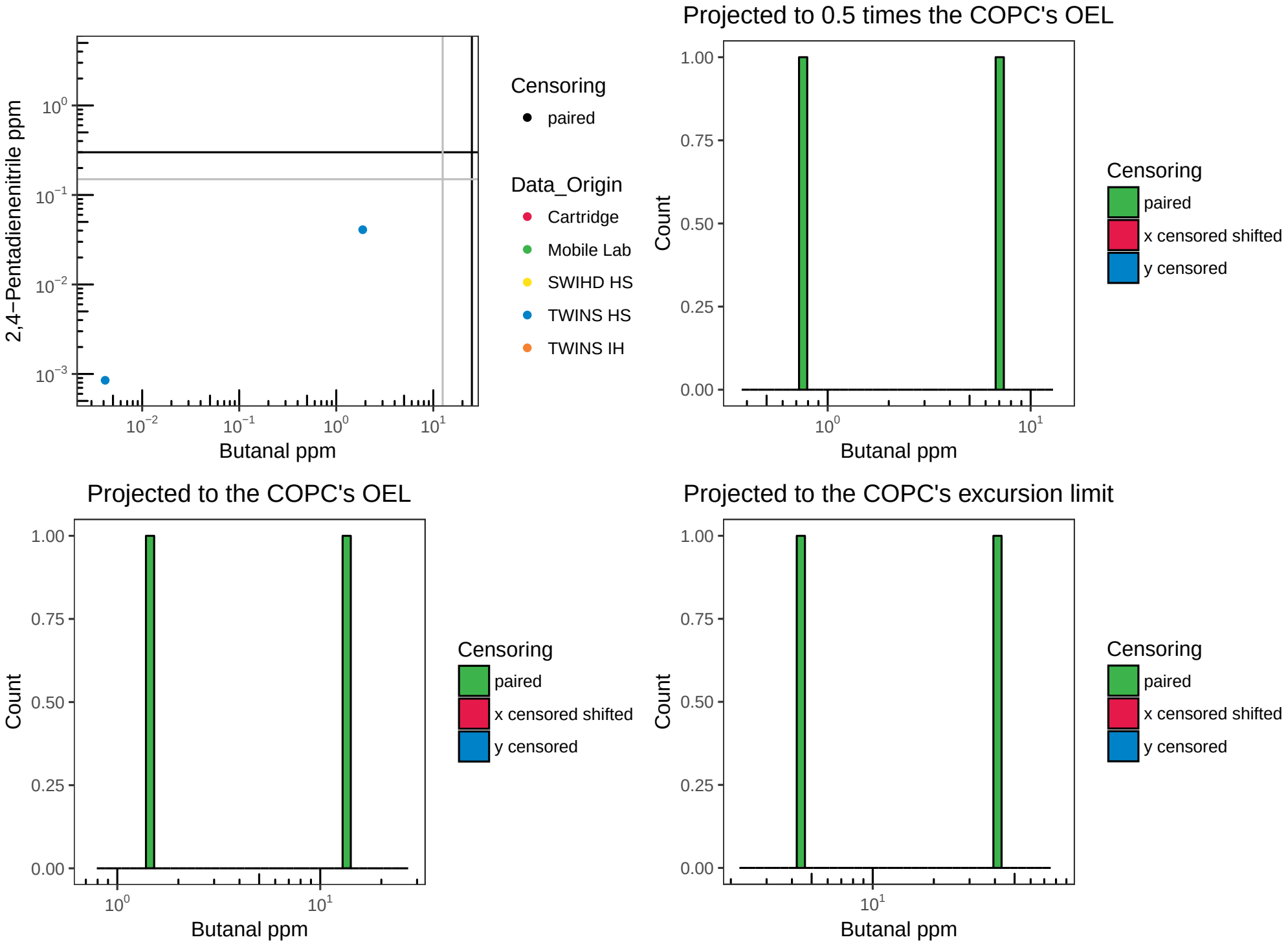


Figure C.853: 2,4-Pentadienenitrile vs Butanal

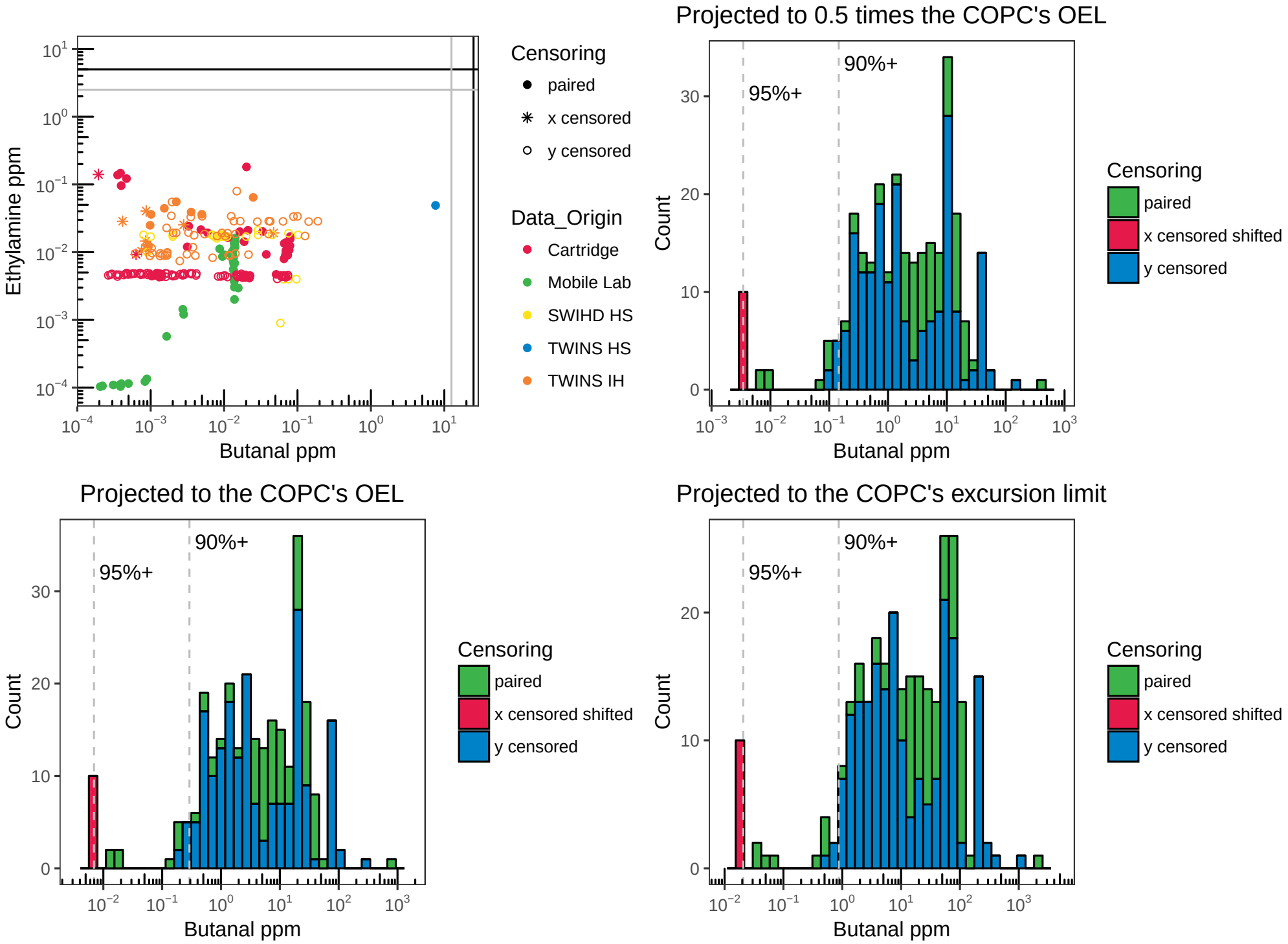


Figure C.854: Ethylamine vs Butanal

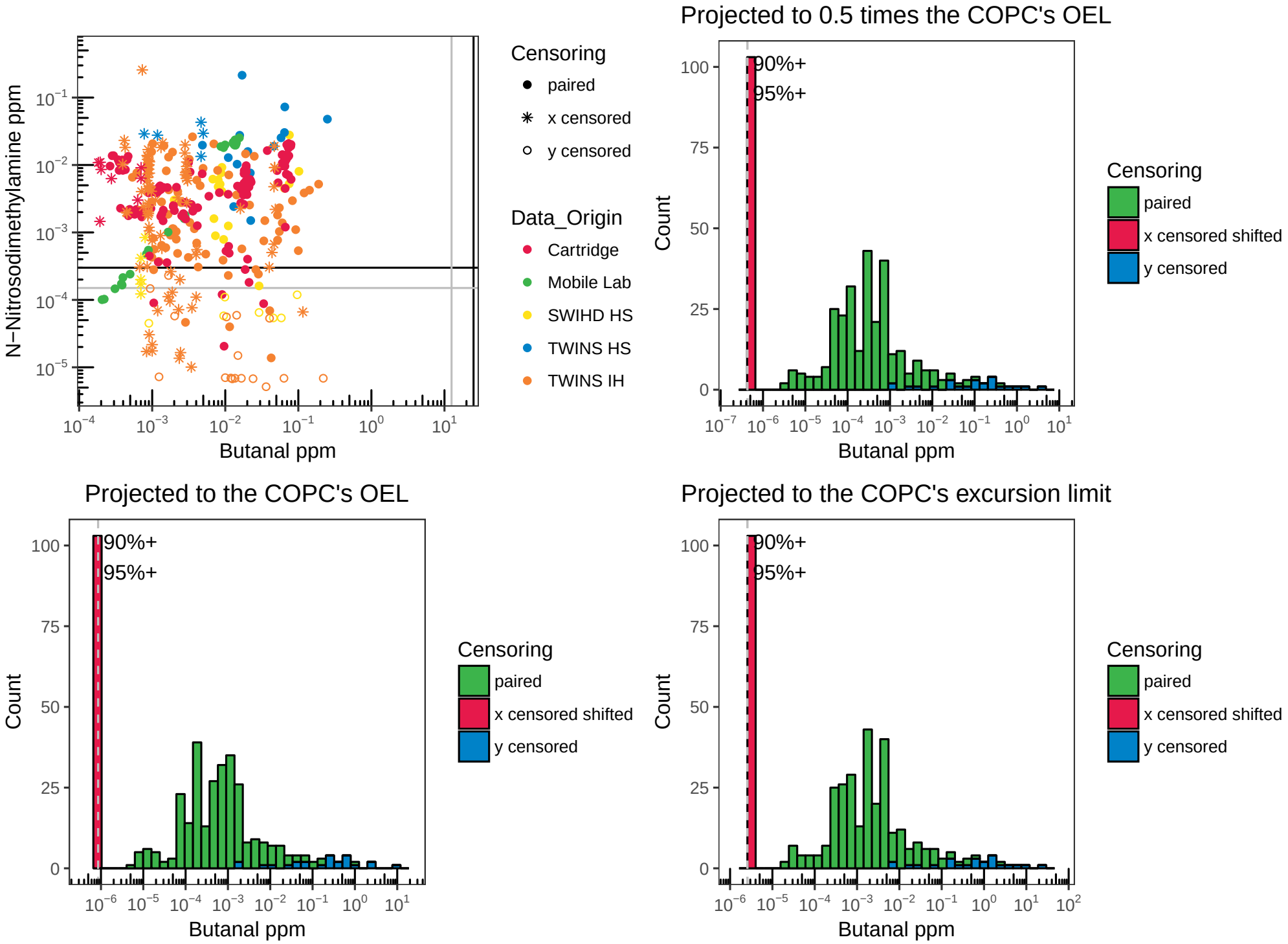


Figure C.855: N-Nitrosodimethylamine vs Butanal

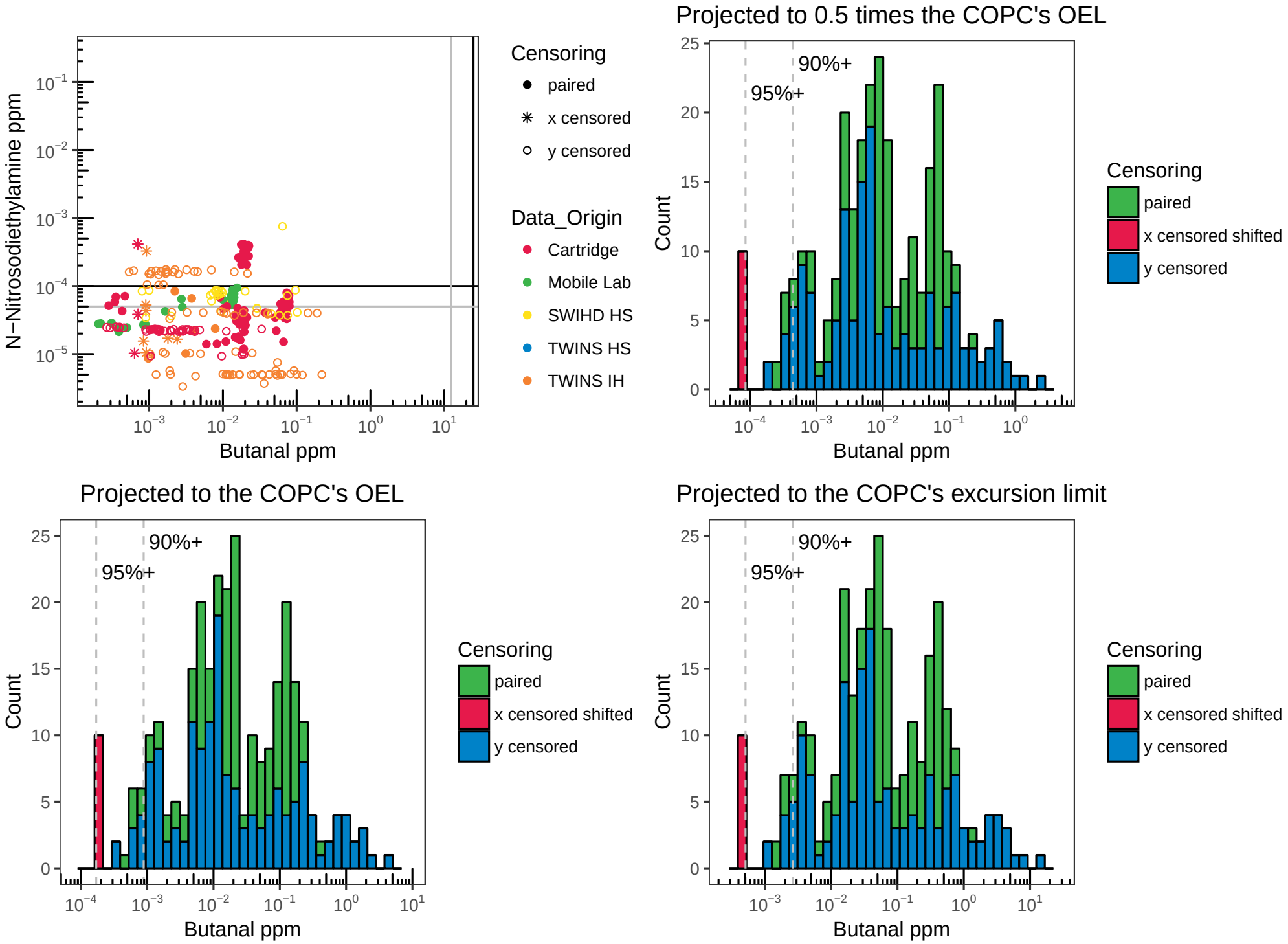


Figure C.856: N-Nitrosodiethylamine vs Butanal

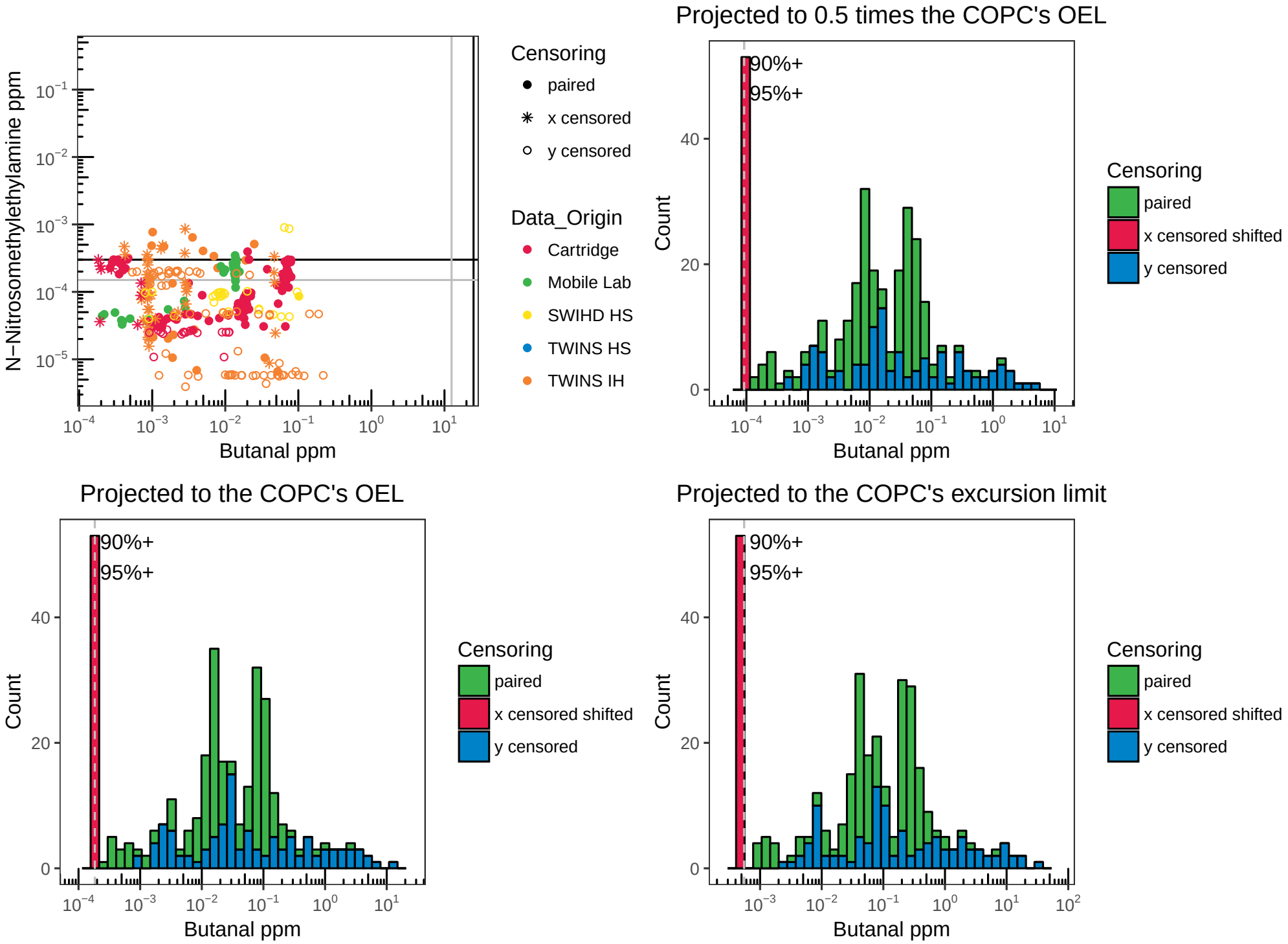


Figure C.857: N-Nitrosomethylethylamine vs Butanal

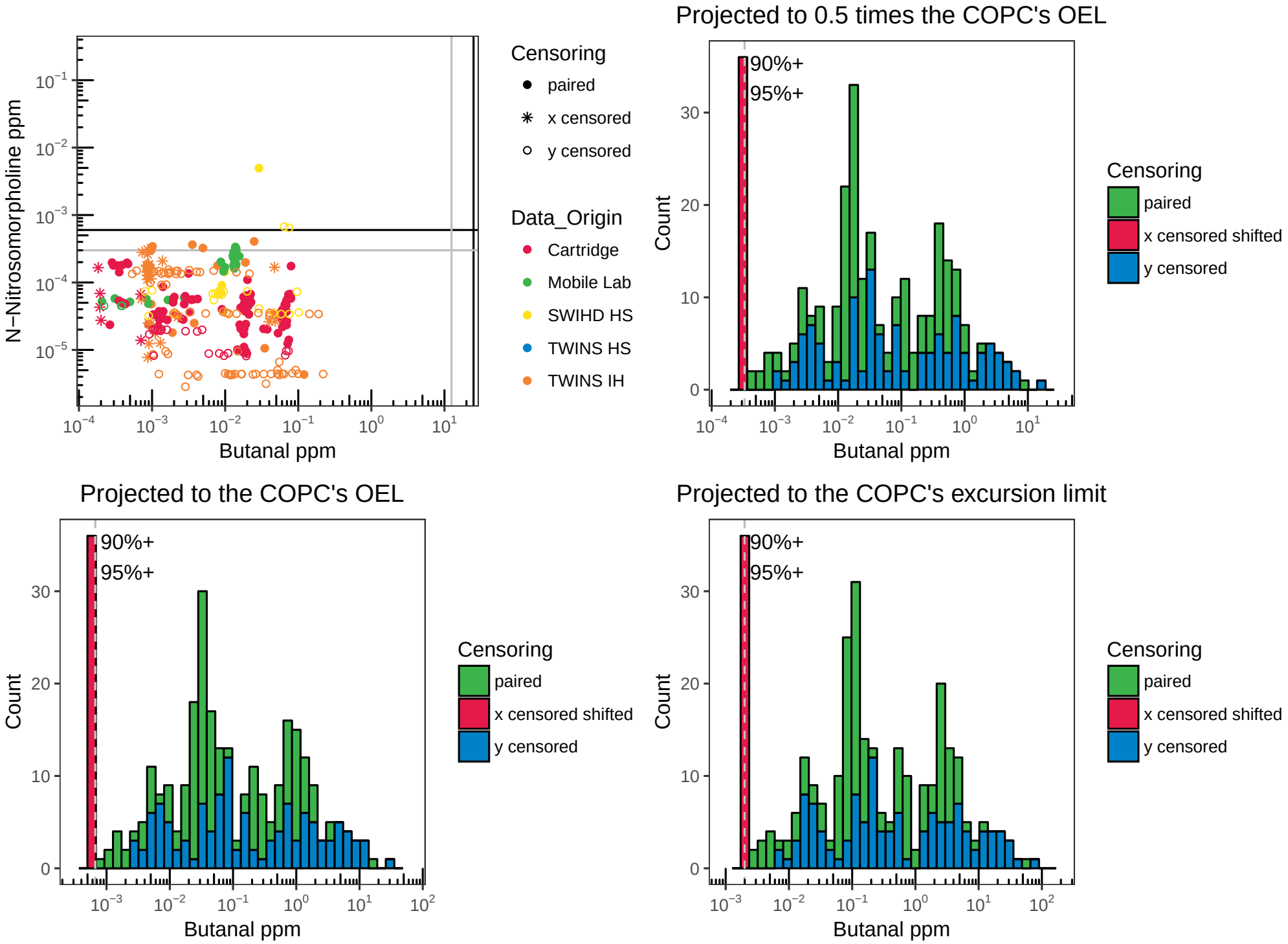


Figure C.858: N-Nitrosomorpholine vs Butanal

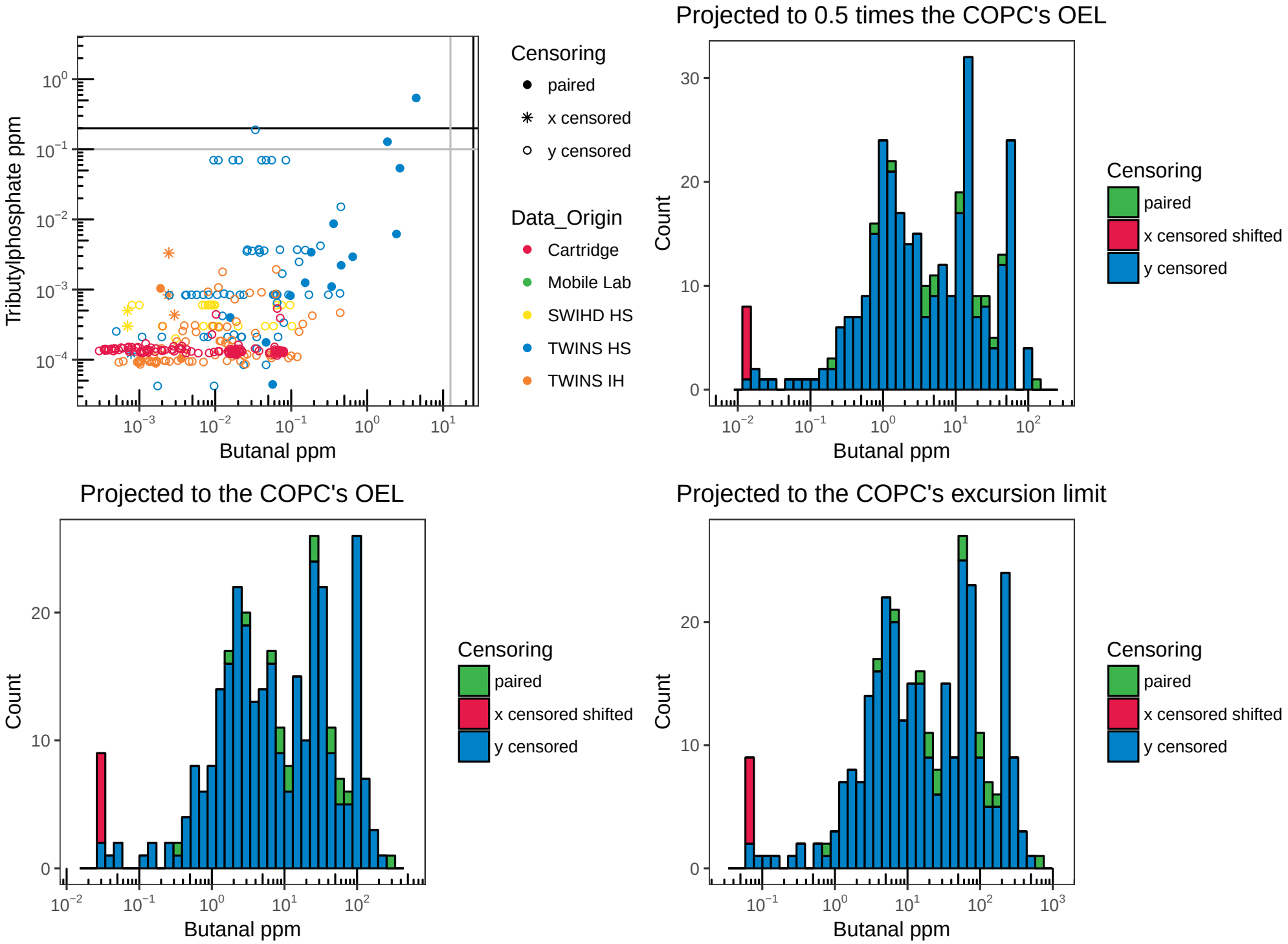


Figure C.859: Tributylphosphate vs Butanal

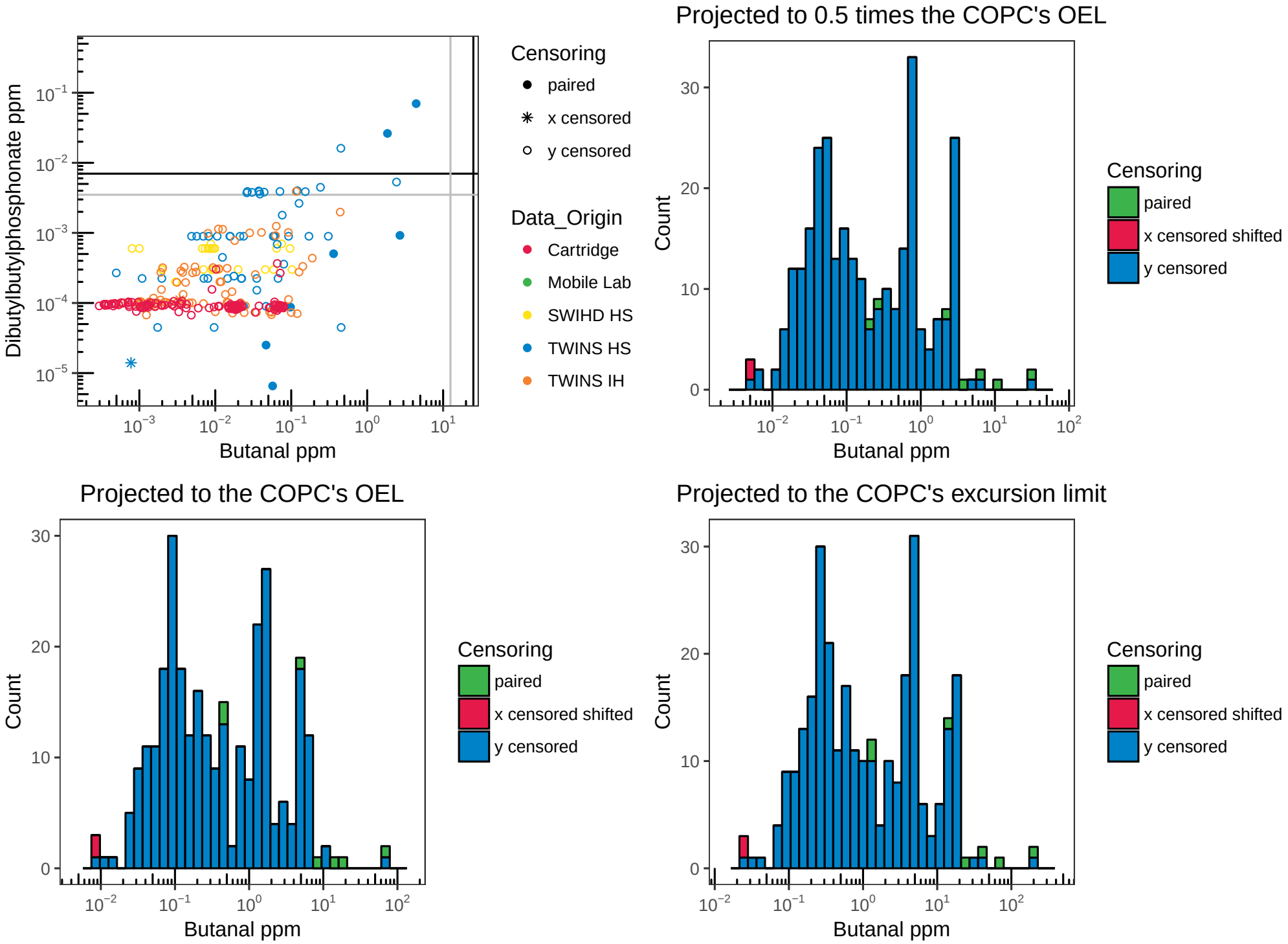


Figure C.860: Dibutylbutylphosphonate vs Butanal

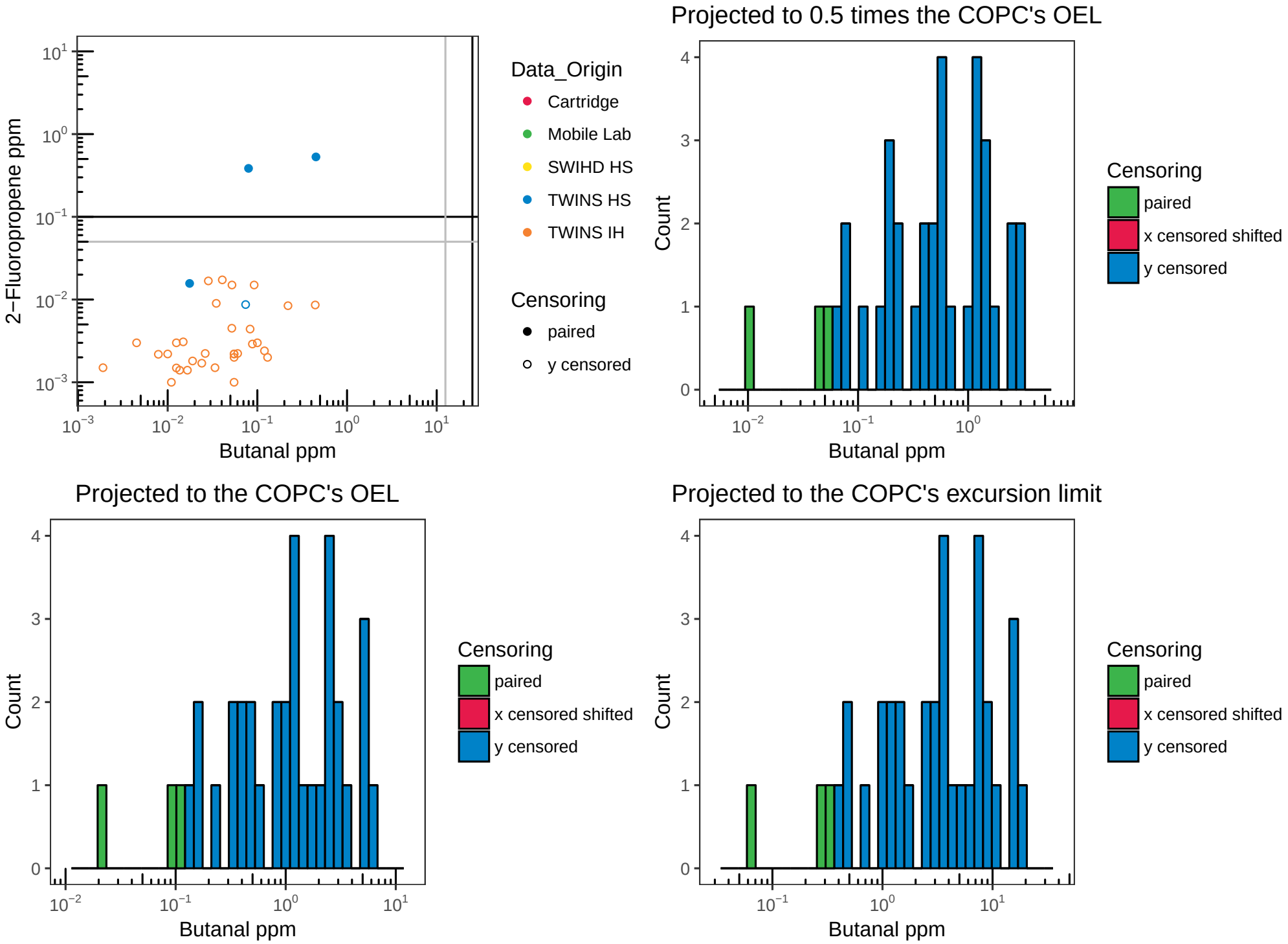


Figure C.861: 2-Fluoropropene vs Butanal

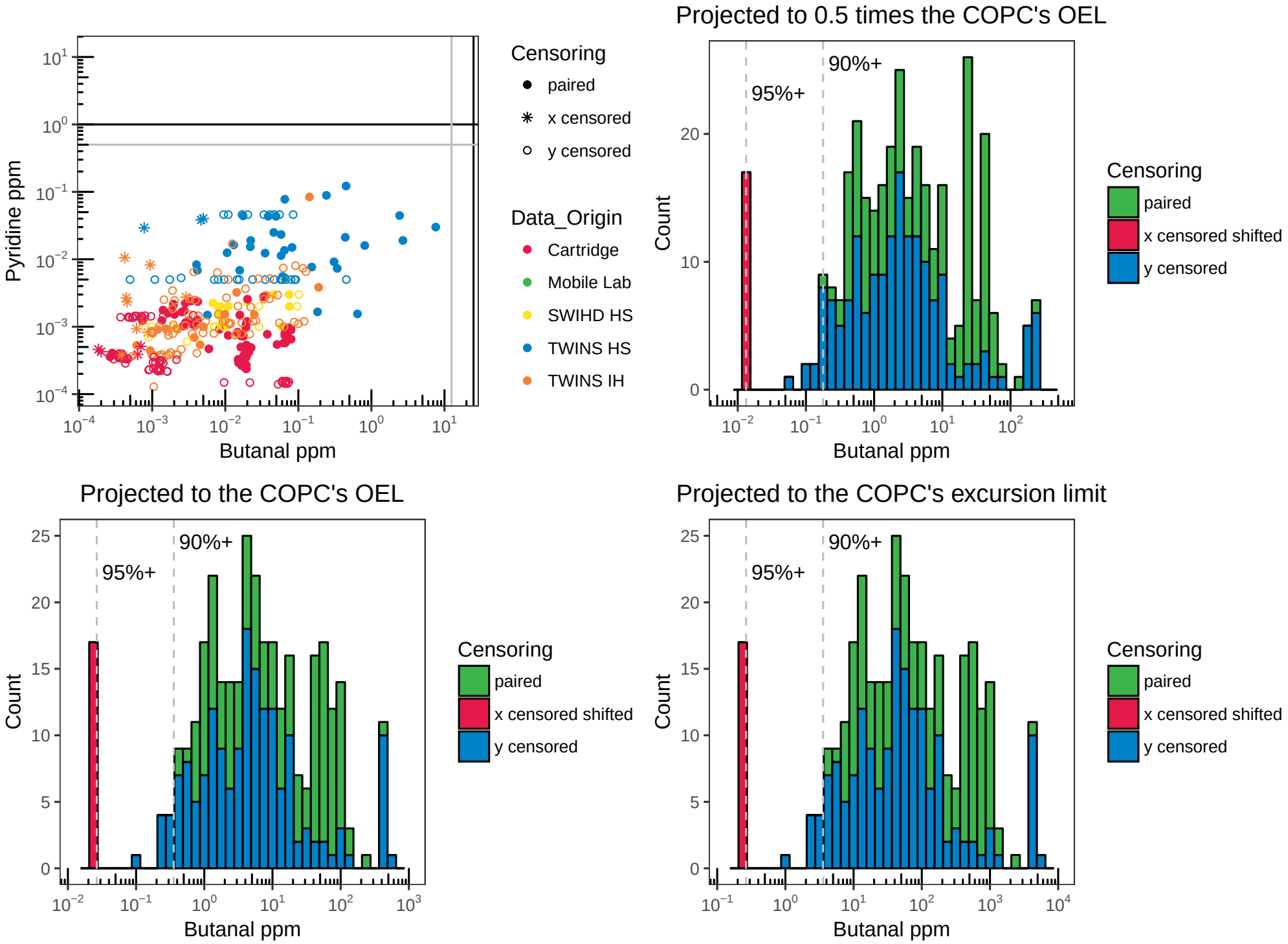


Figure C.862: Pyridine vs Butanal

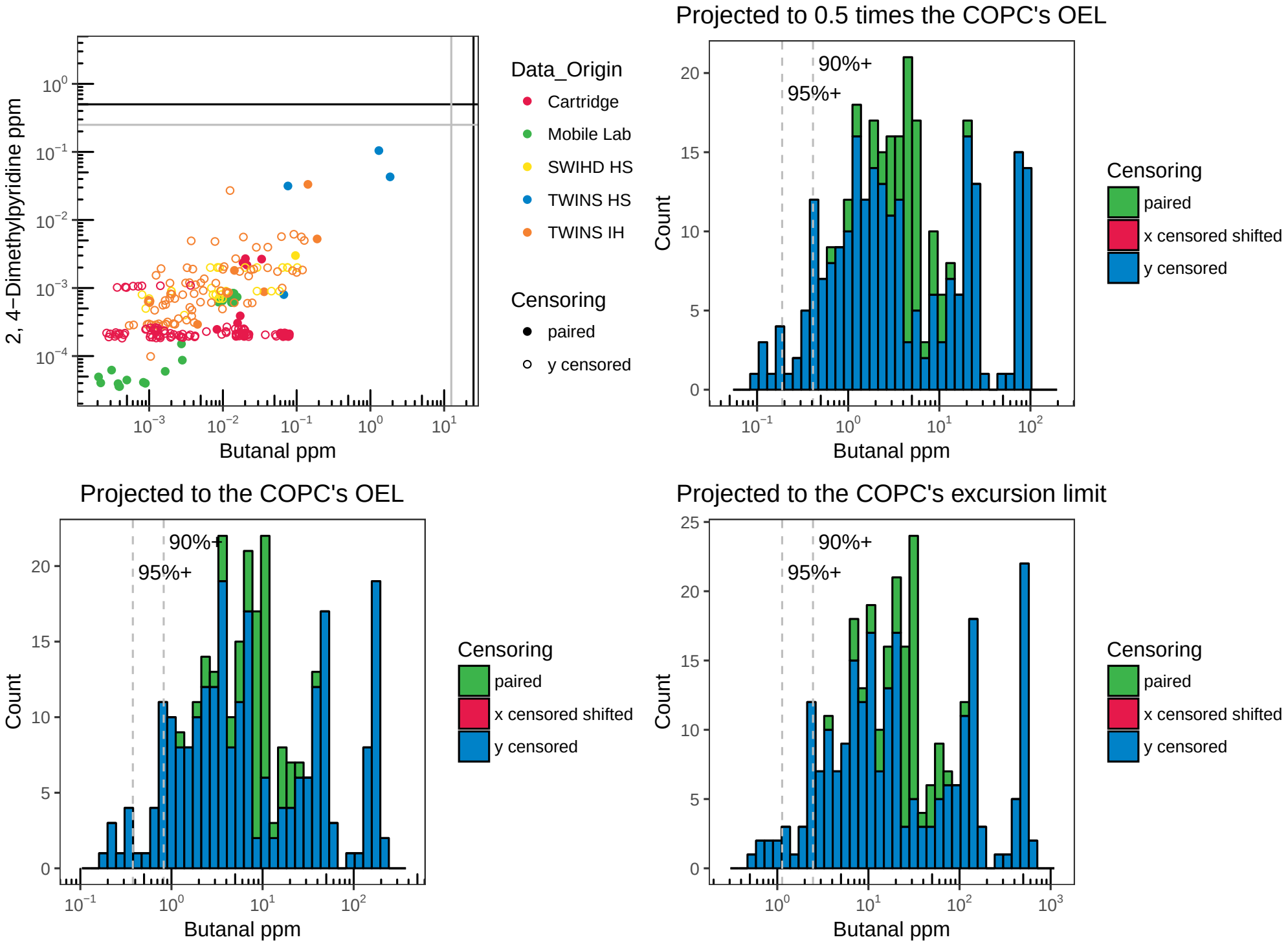


Figure C.863: 2, 4-Dimethylpyridine vs Butanal

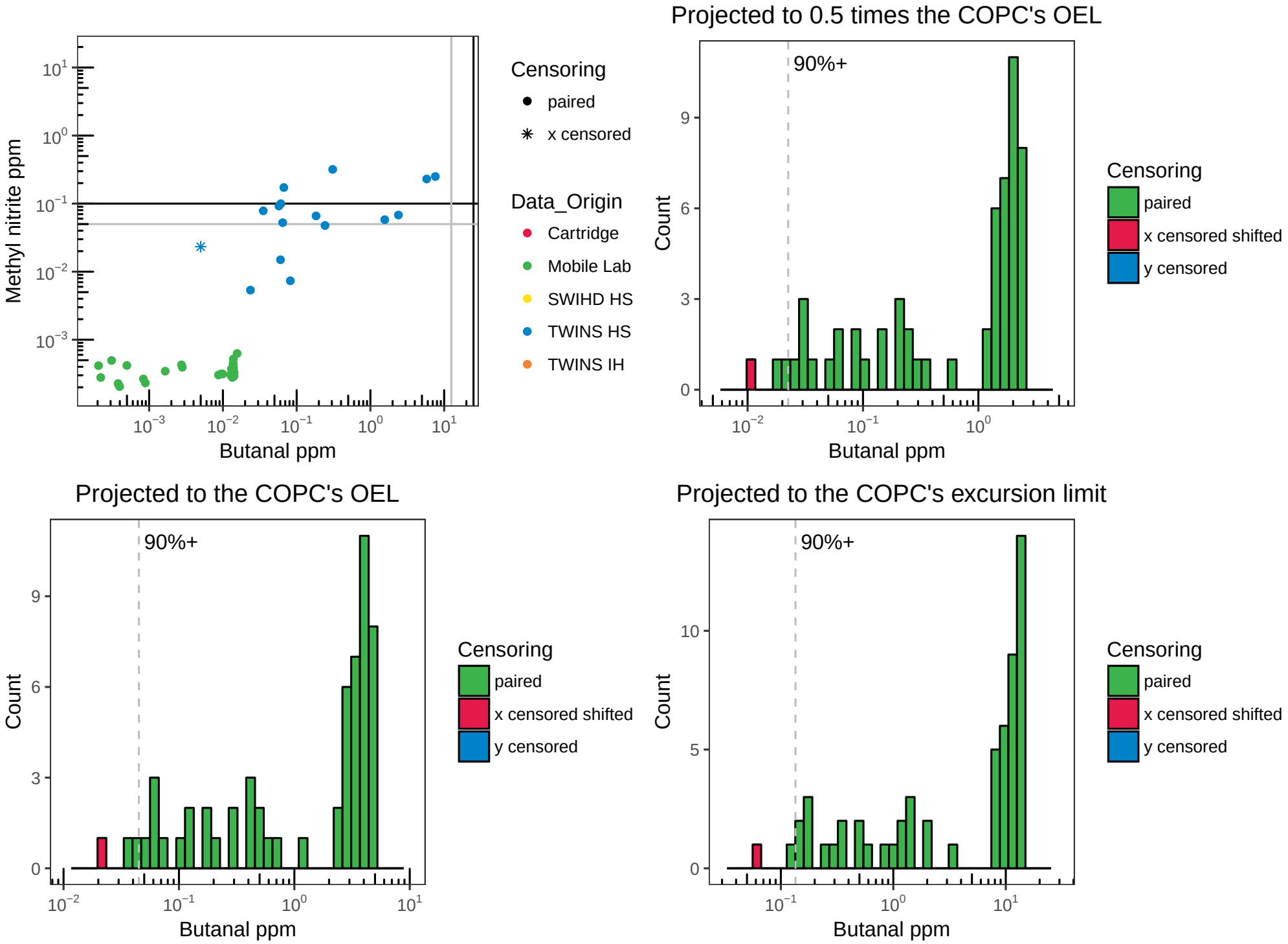


Figure C.864: Methyl nitrite vs Butanal

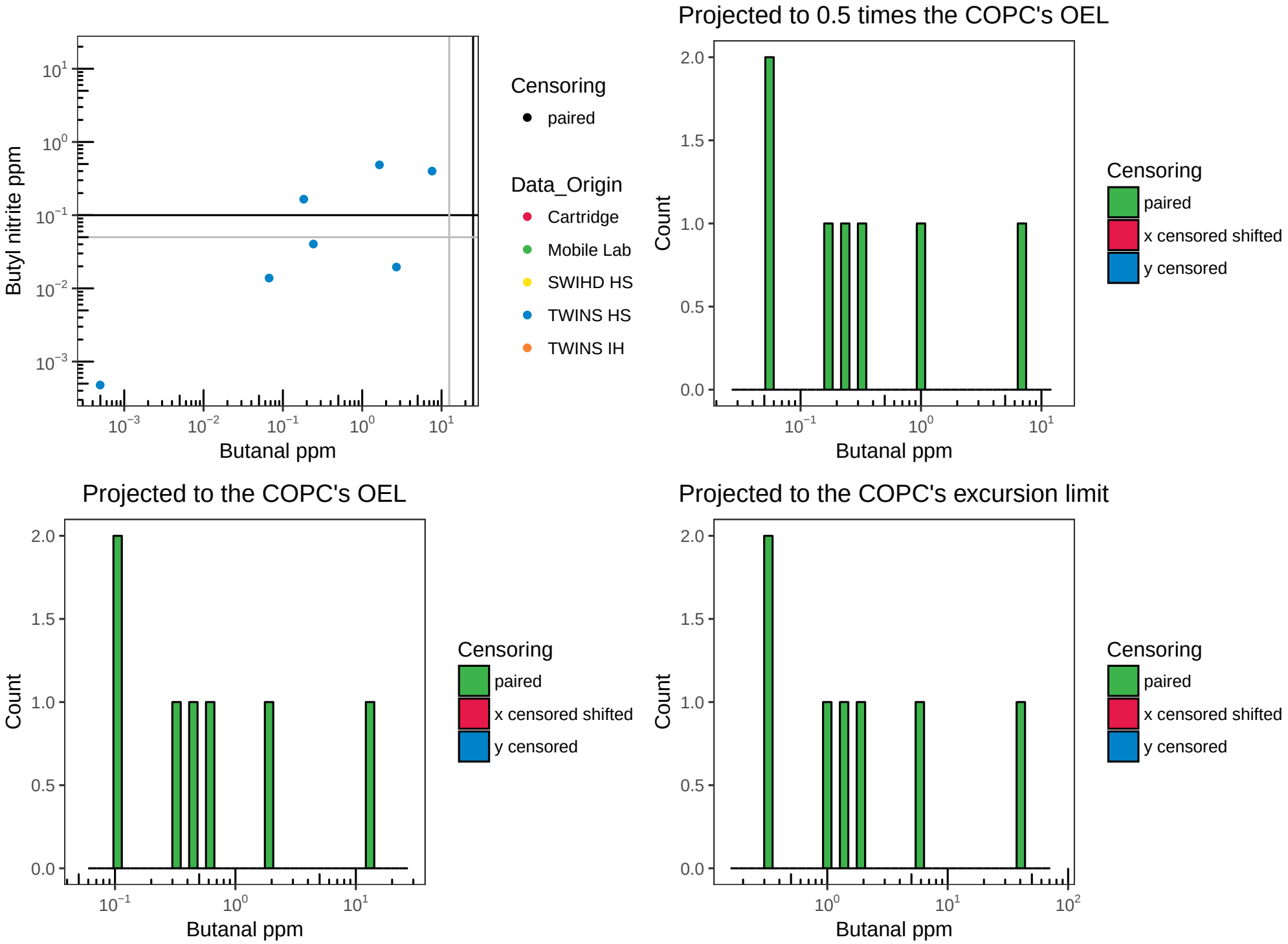


Figure C.865: Butyl nitrite vs Butanal

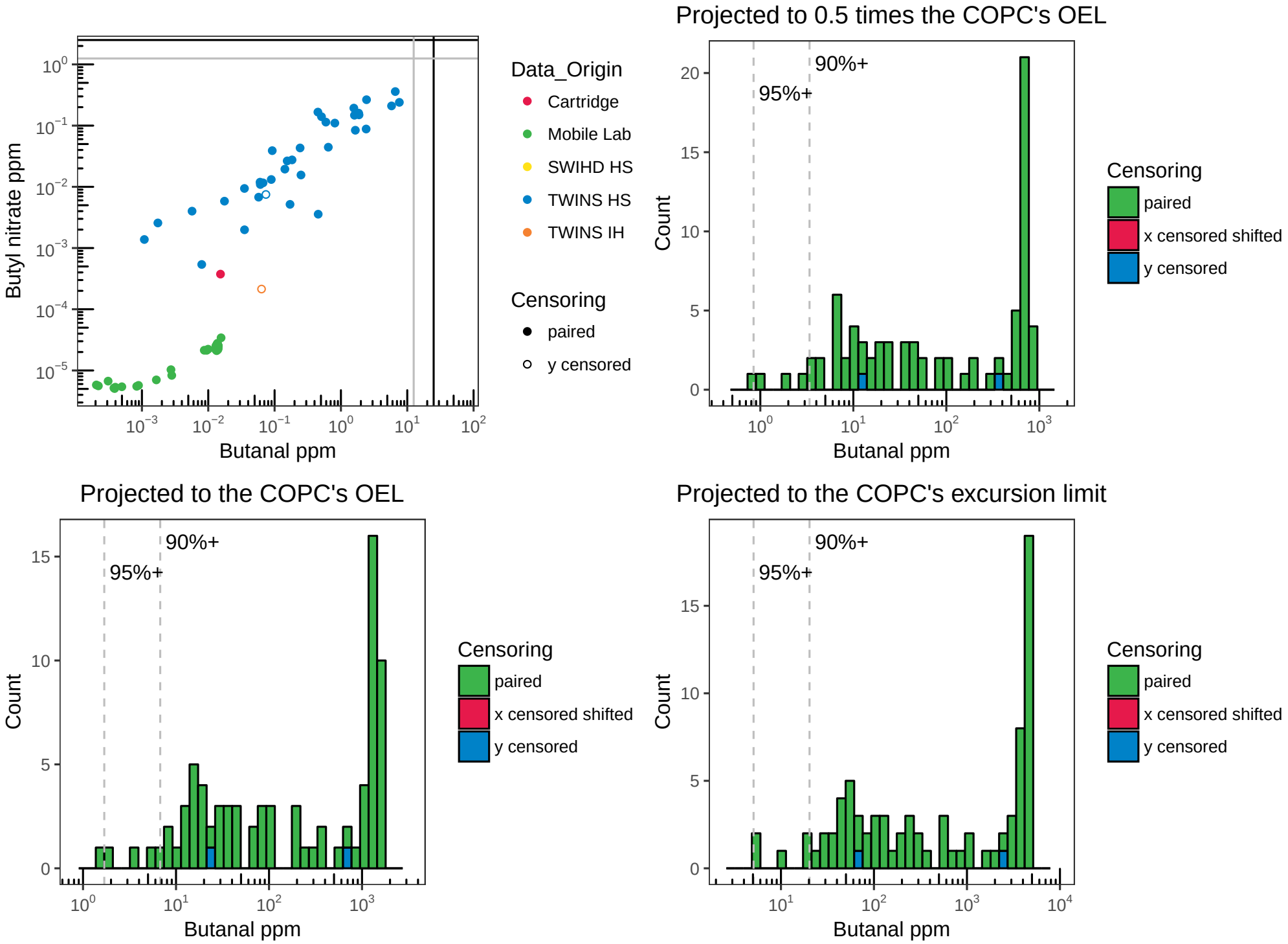


Figure C.866: Butyl nitrate vs Butanal

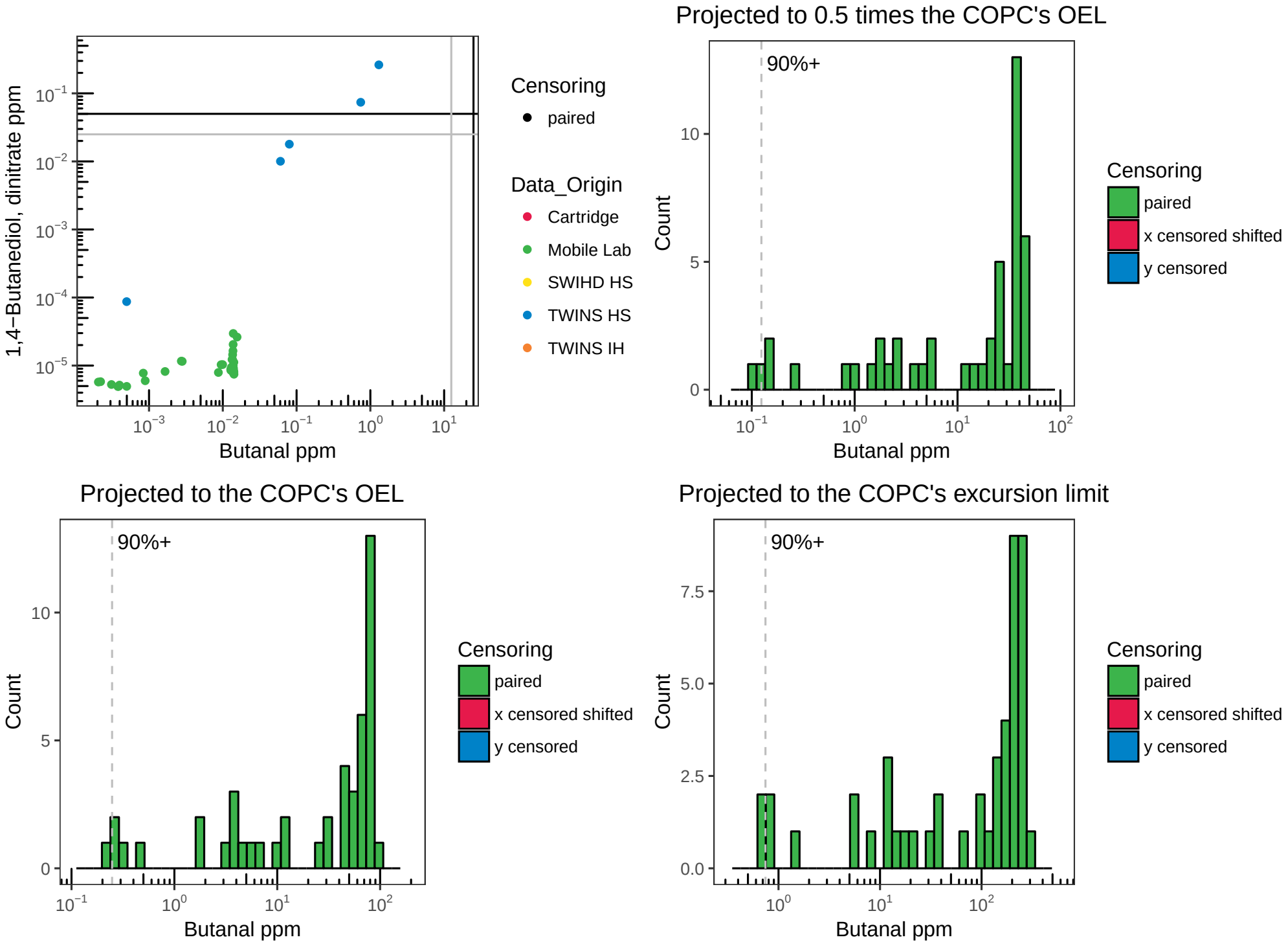


Figure C.867: 1,4-Butanediol, dinitrate vs Butanal

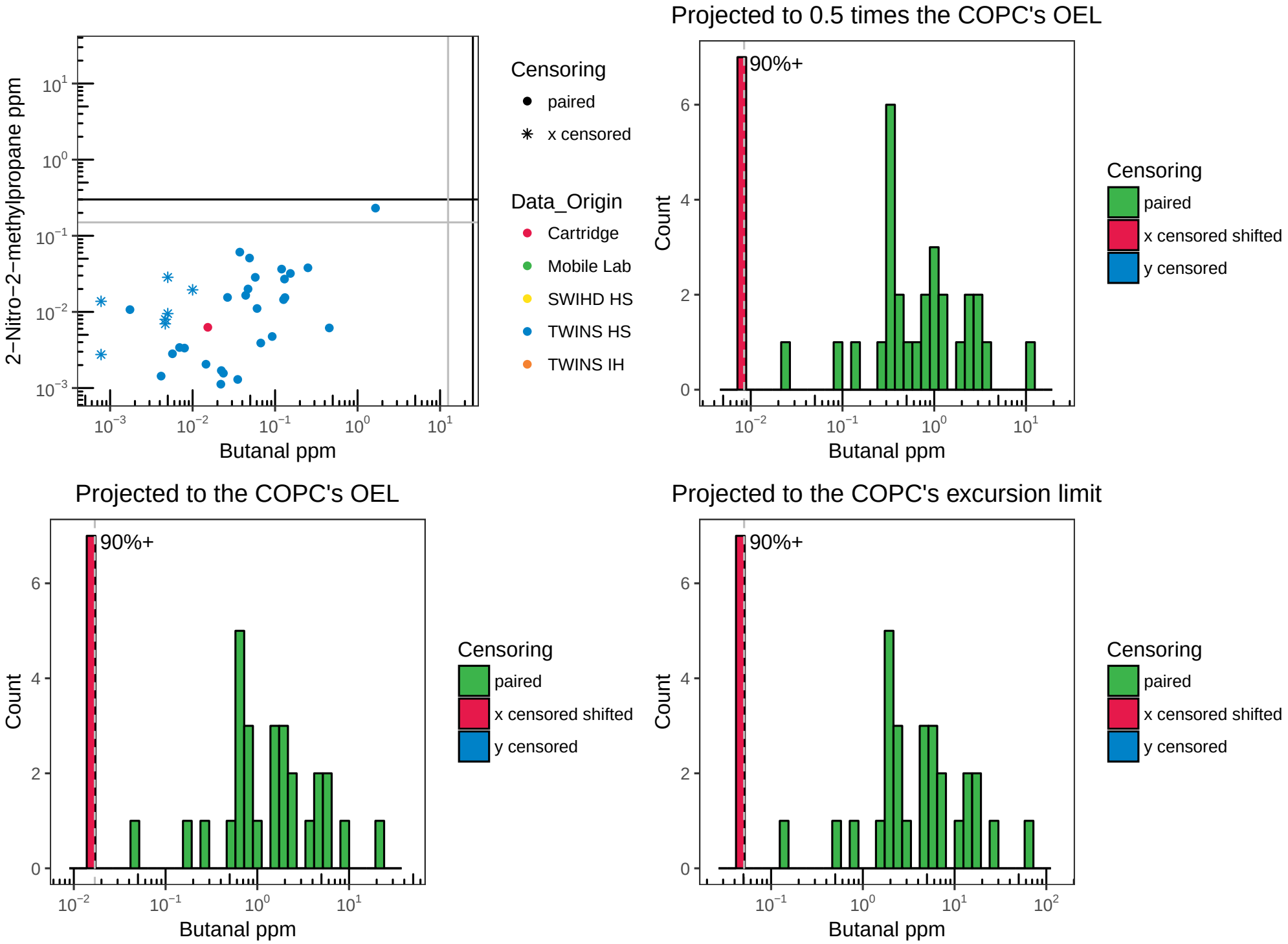


Figure C.868: 2-Nitro-2-methylpropane vs Butanal

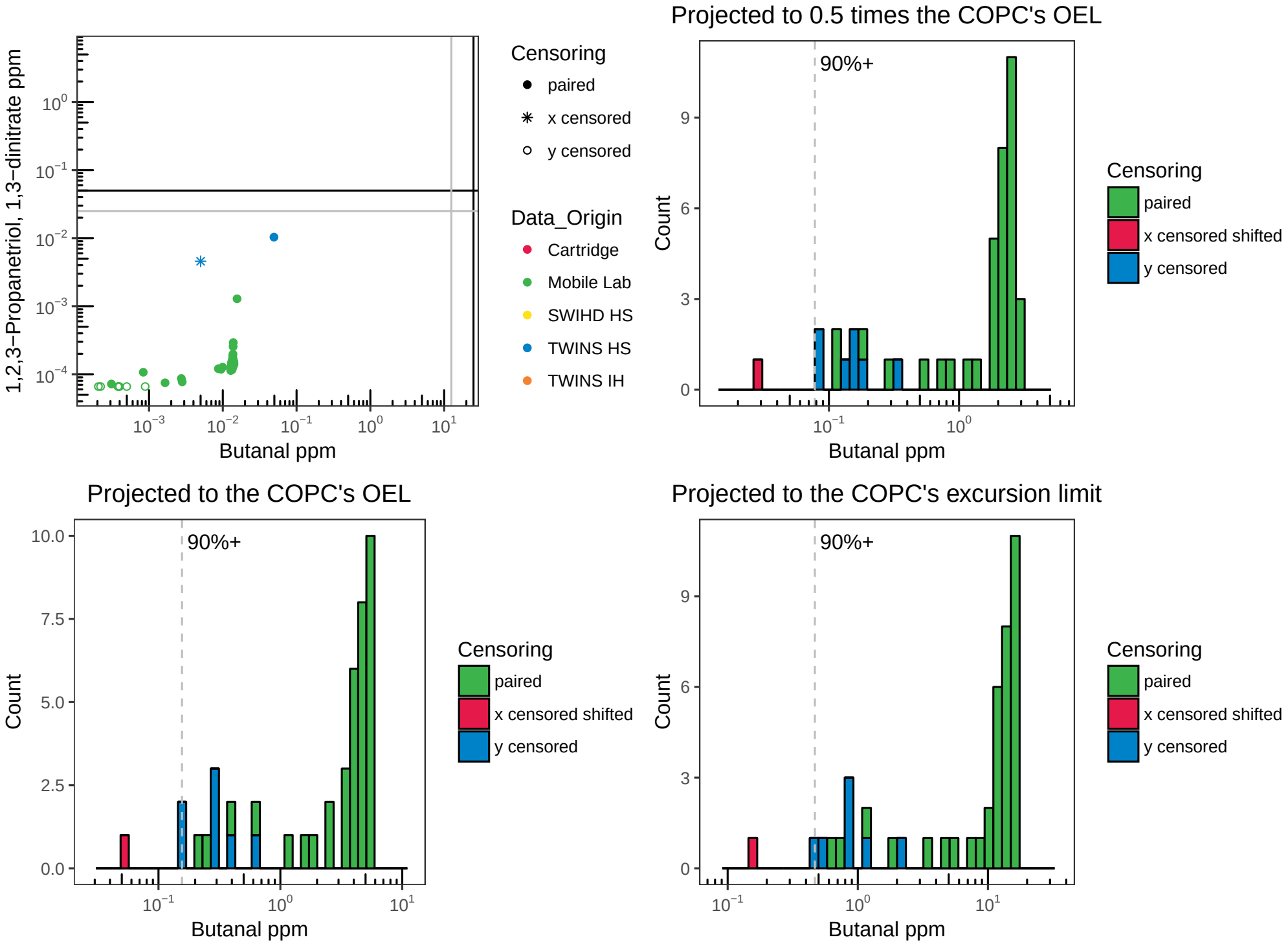


Figure C.869: 1,2,3-Propanetriol, 1,3-dinitrate vs Butanal

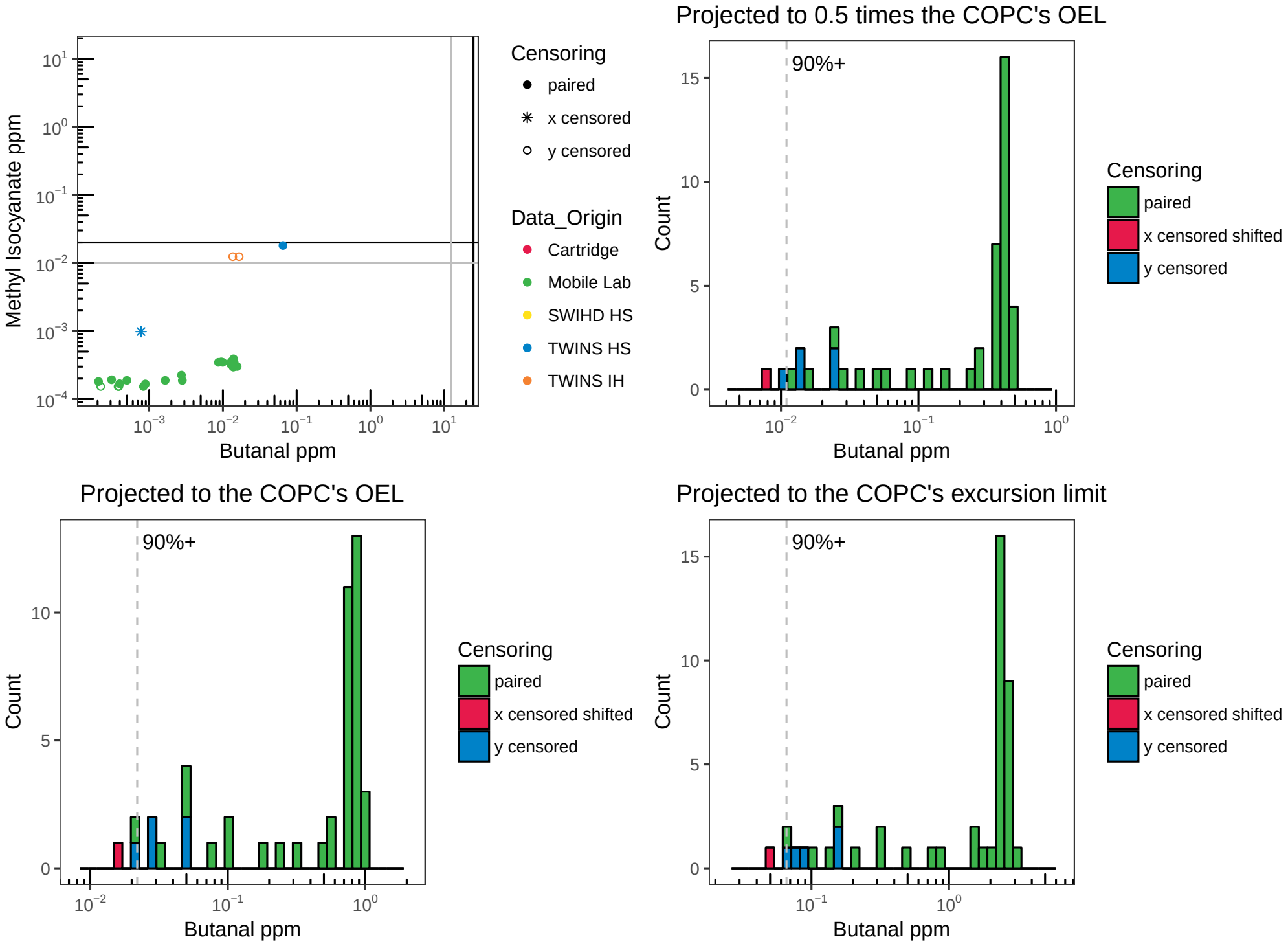


Figure C.870: Methyl Isocyanate vs Butanal

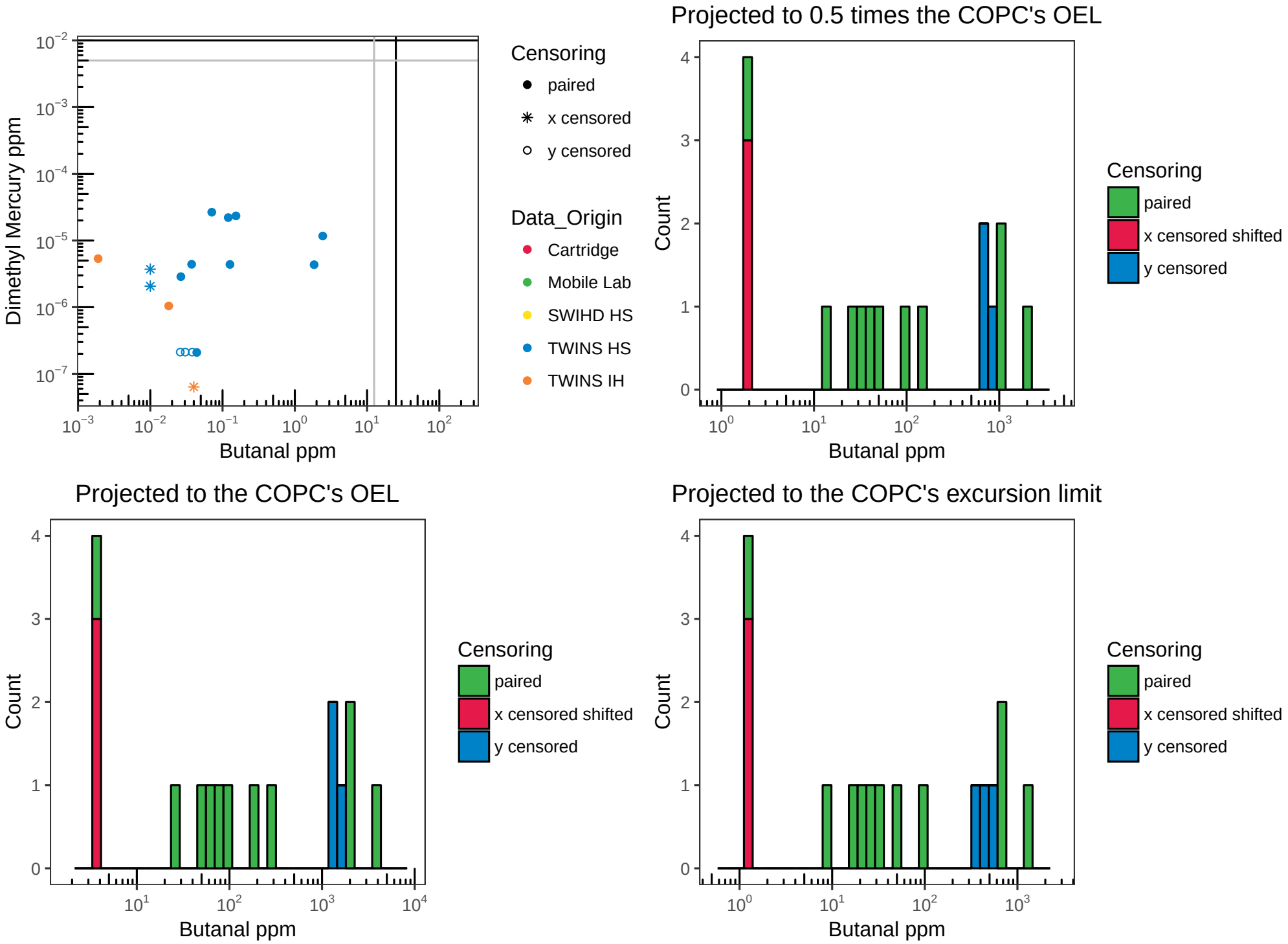


Figure C.871: Dimethyl Mercury vs Butanal

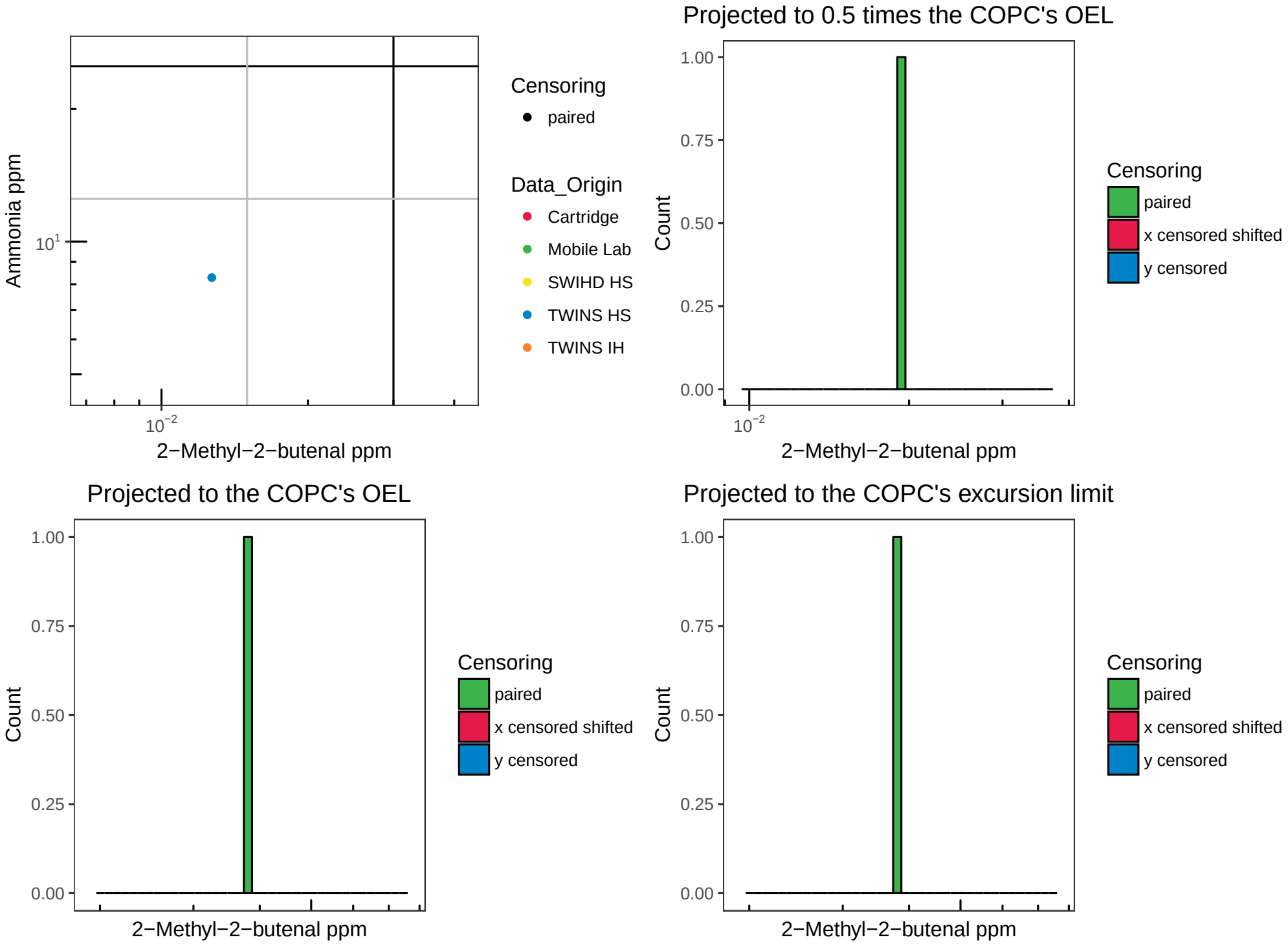


Figure C.872: Ammonia vs 2-Methyl-2-butenal

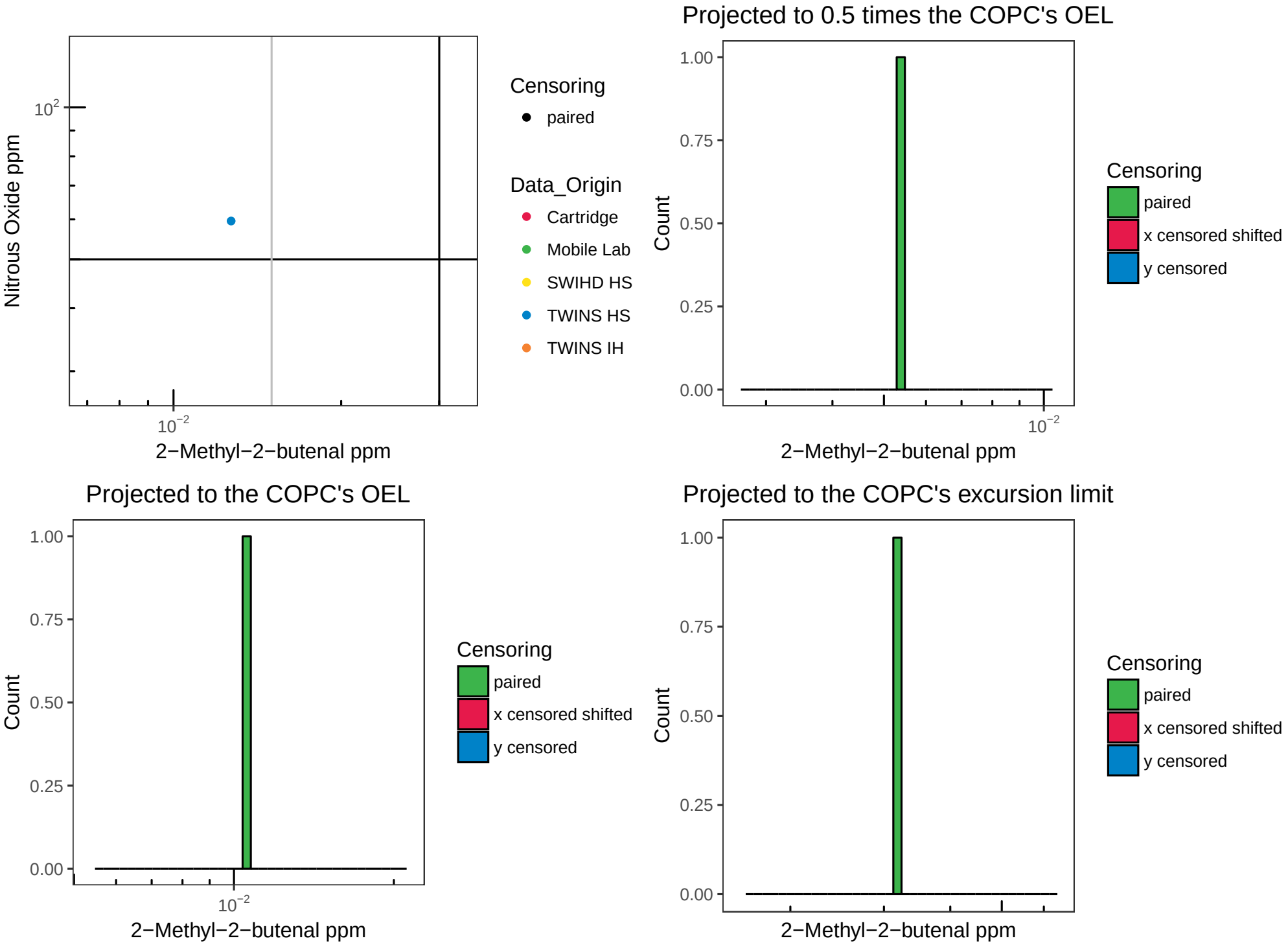


Figure C.873: Nitrous Oxide vs 2-Methyl-2-butenal

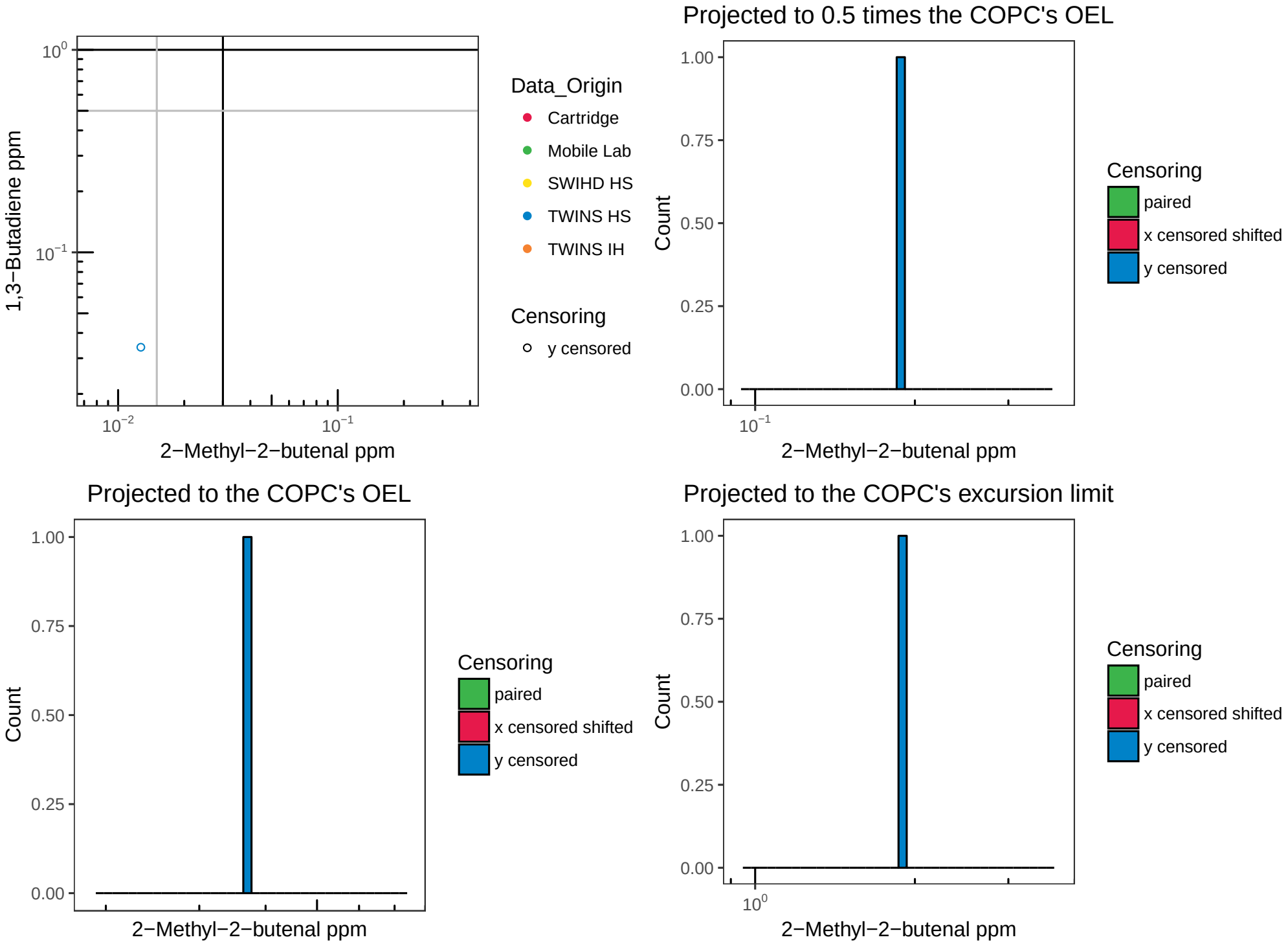


Figure C.874: 1,3-Butadiene vs 2-Methyl-2-butenal

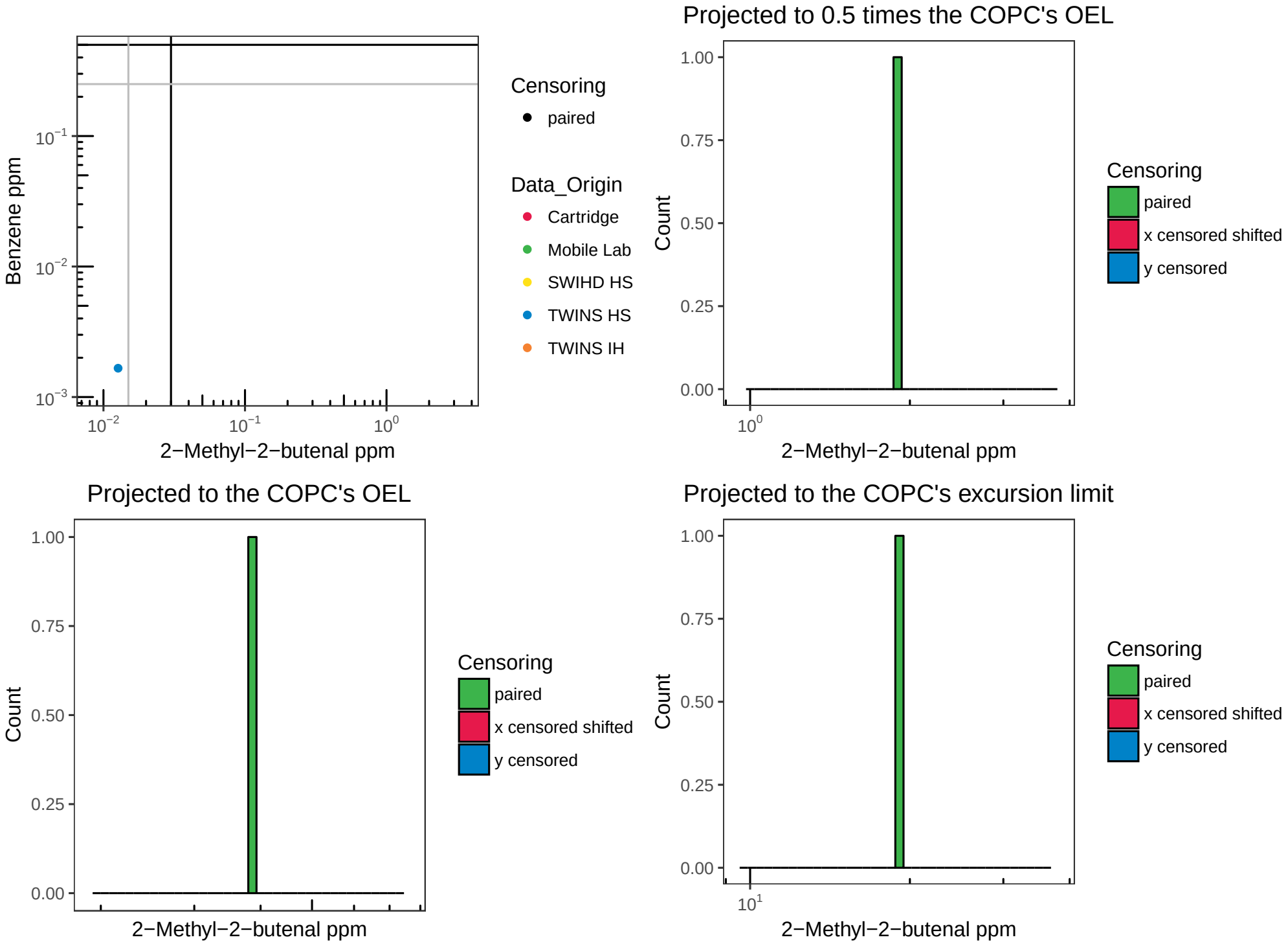


Figure C.875: Benzene vs 2-Methyl-2-butenal

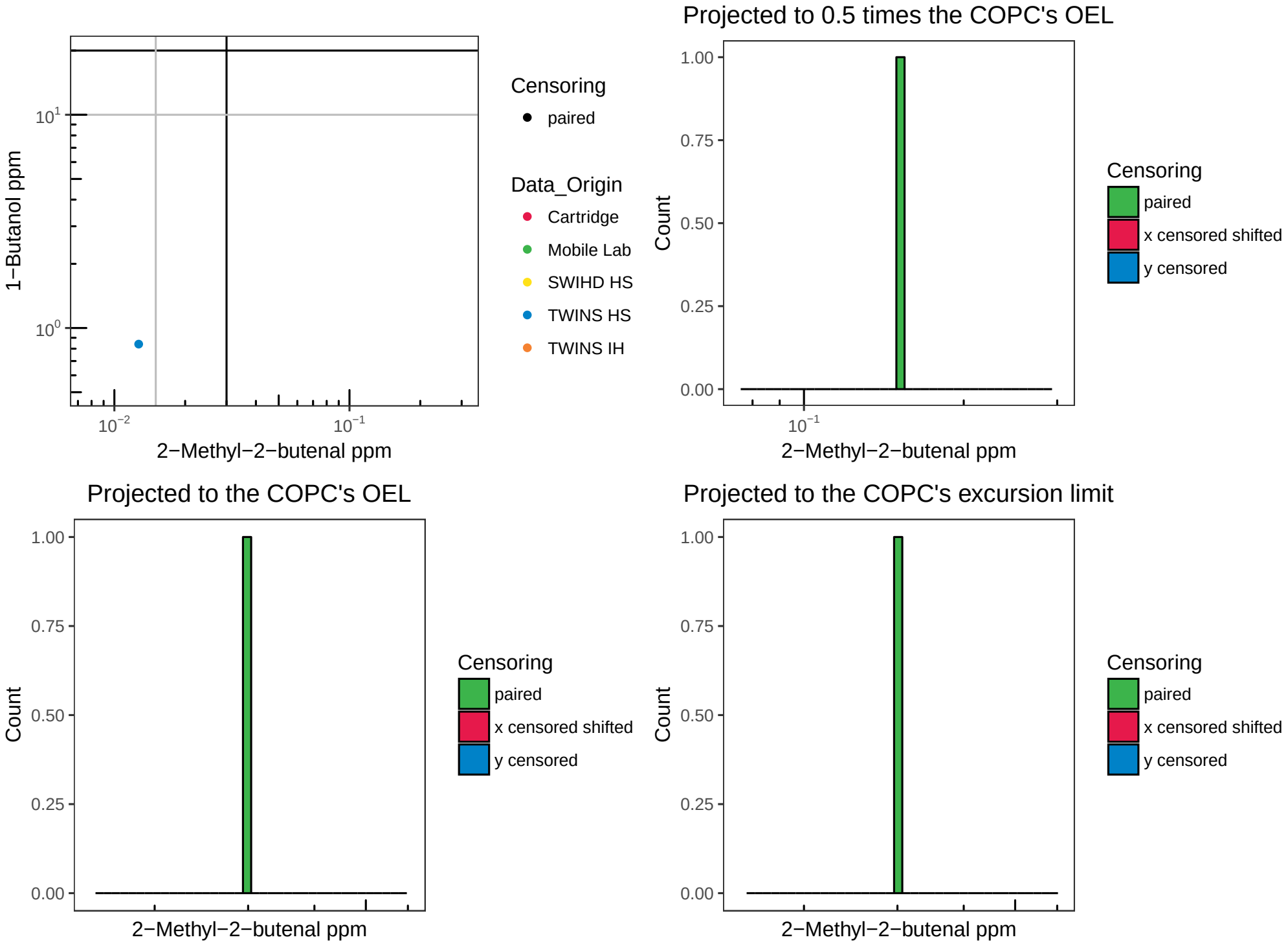


Figure C.876: 1-Butanol vs 2-Methyl-2-butenal

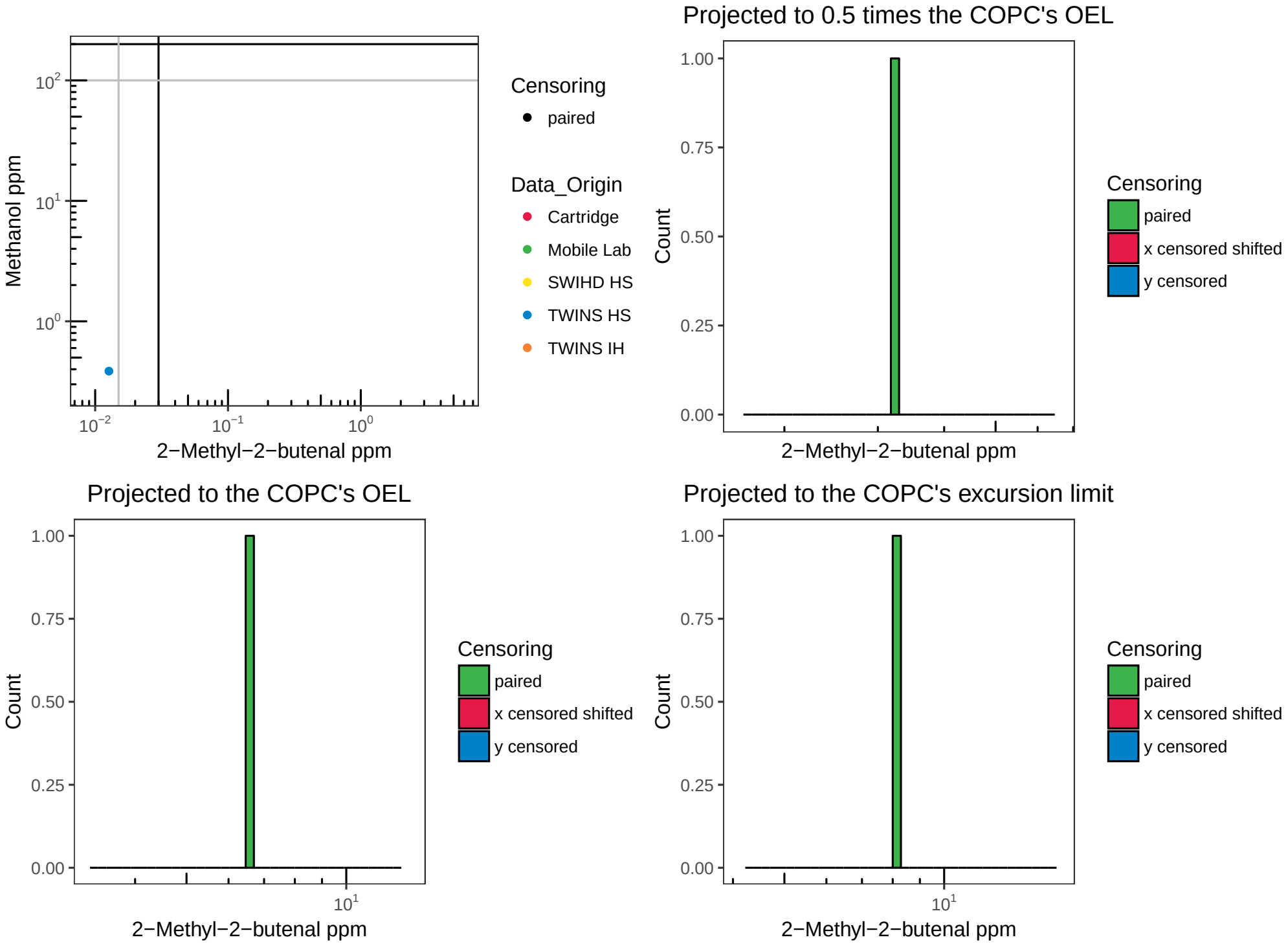


Figure C.877: Methanol vs 2-Methyl-2-butenal

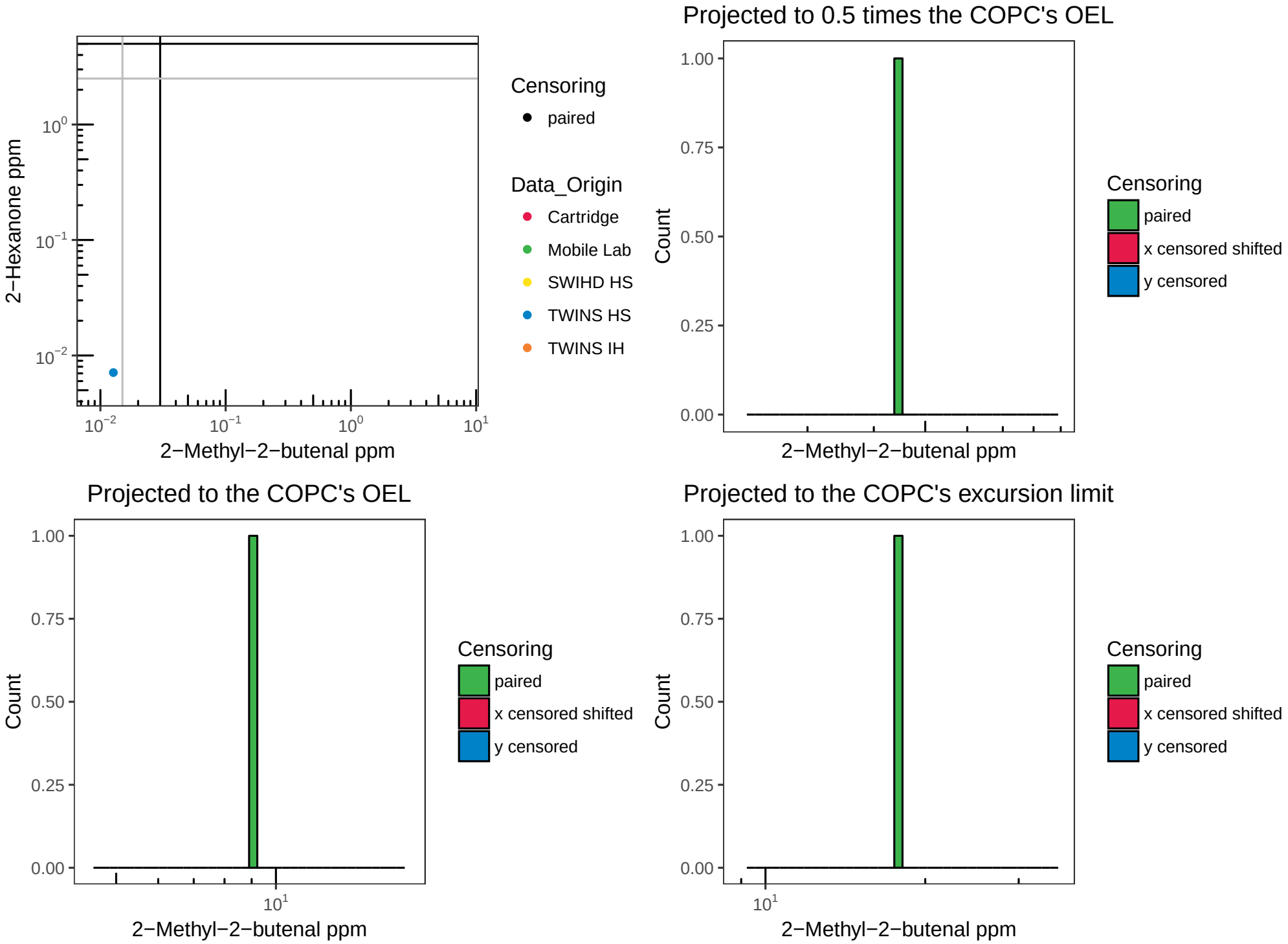


Figure C.878: 2-Hexanone vs 2-Methyl-2-butenal

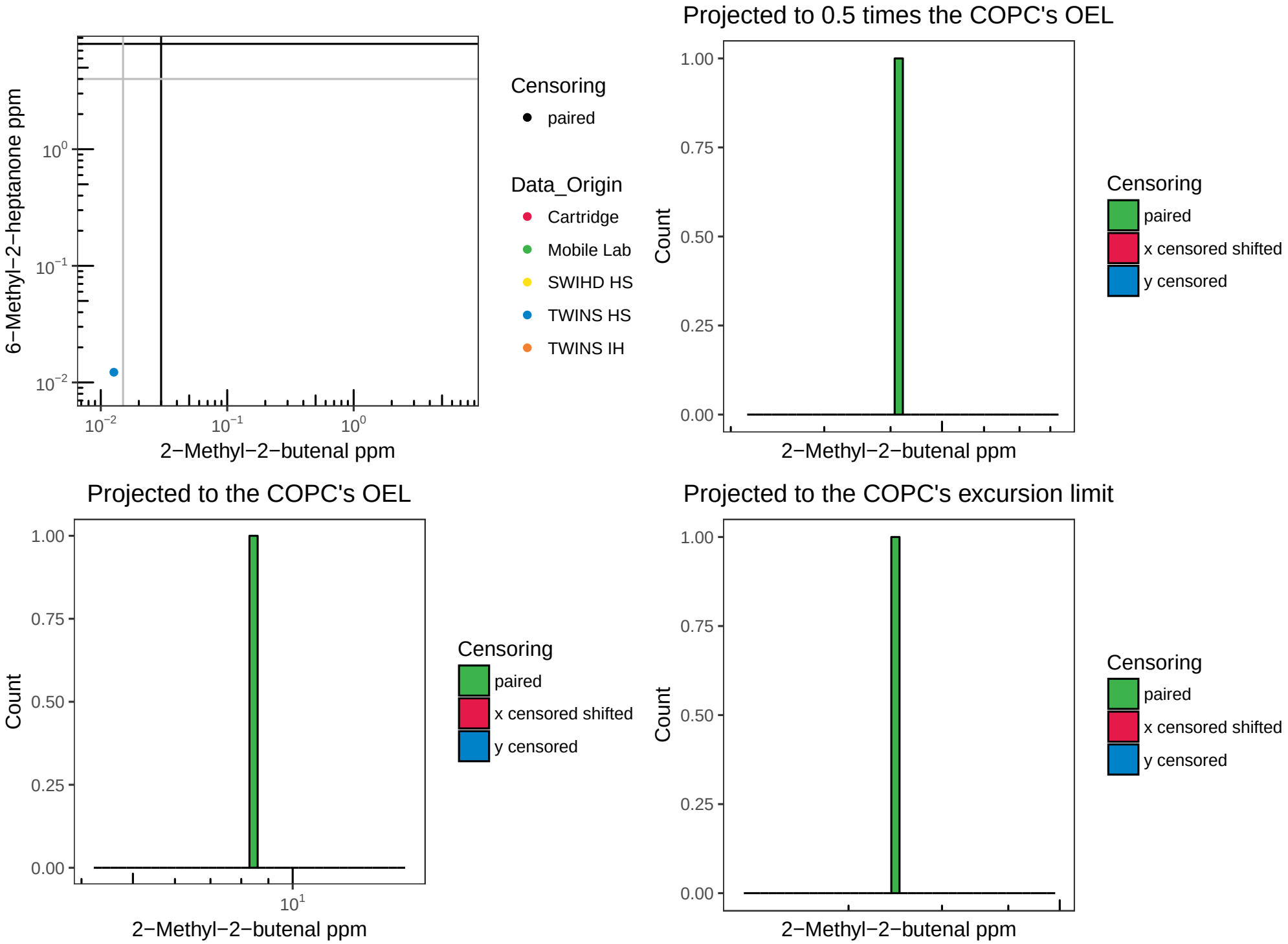


Figure C.879: 6-Methyl-2-heptanone vs 2-Methyl-2-butenal

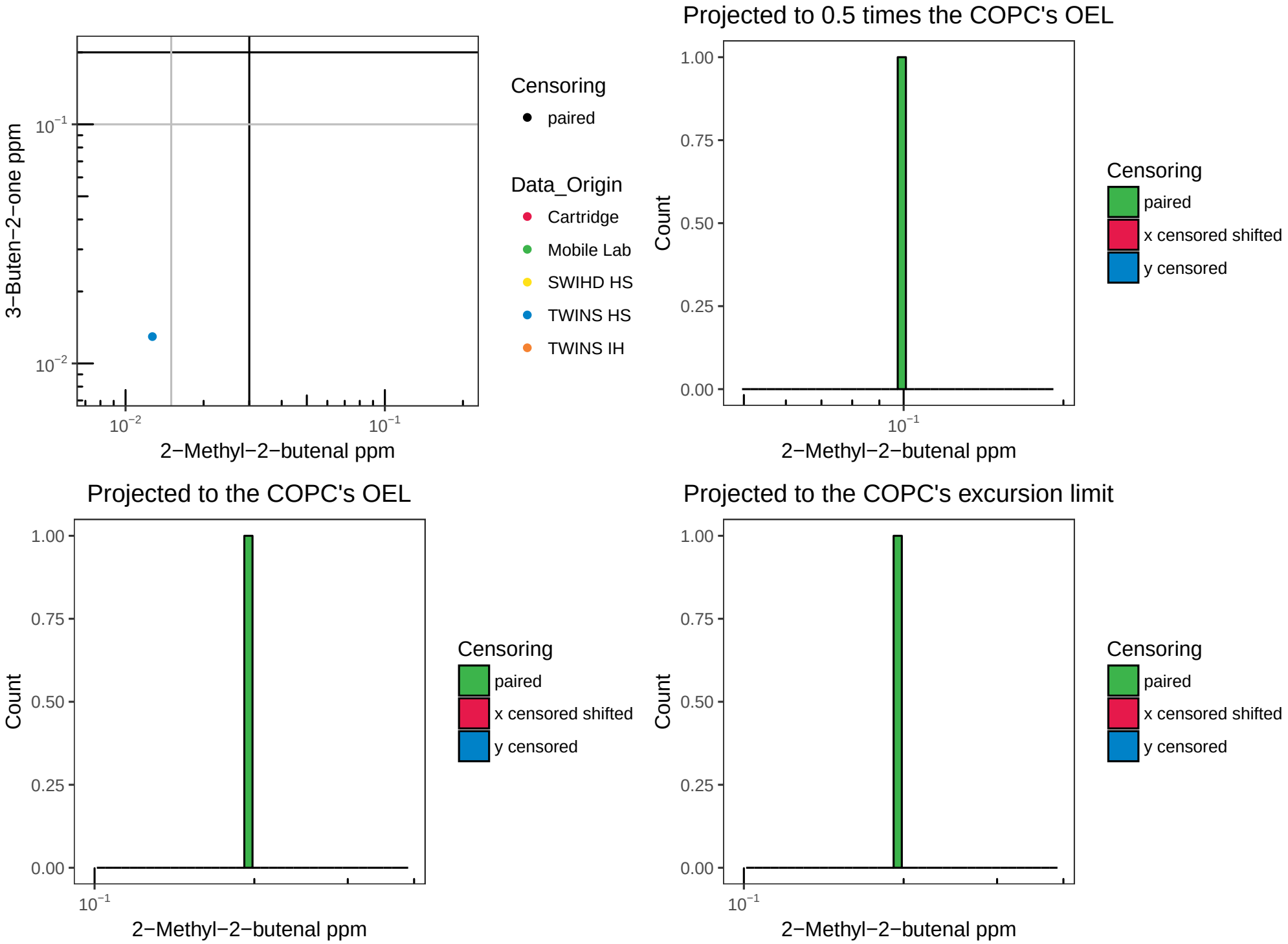


Figure C.880: 3-Buten-2-one vs 2-Methyl-2-butenal

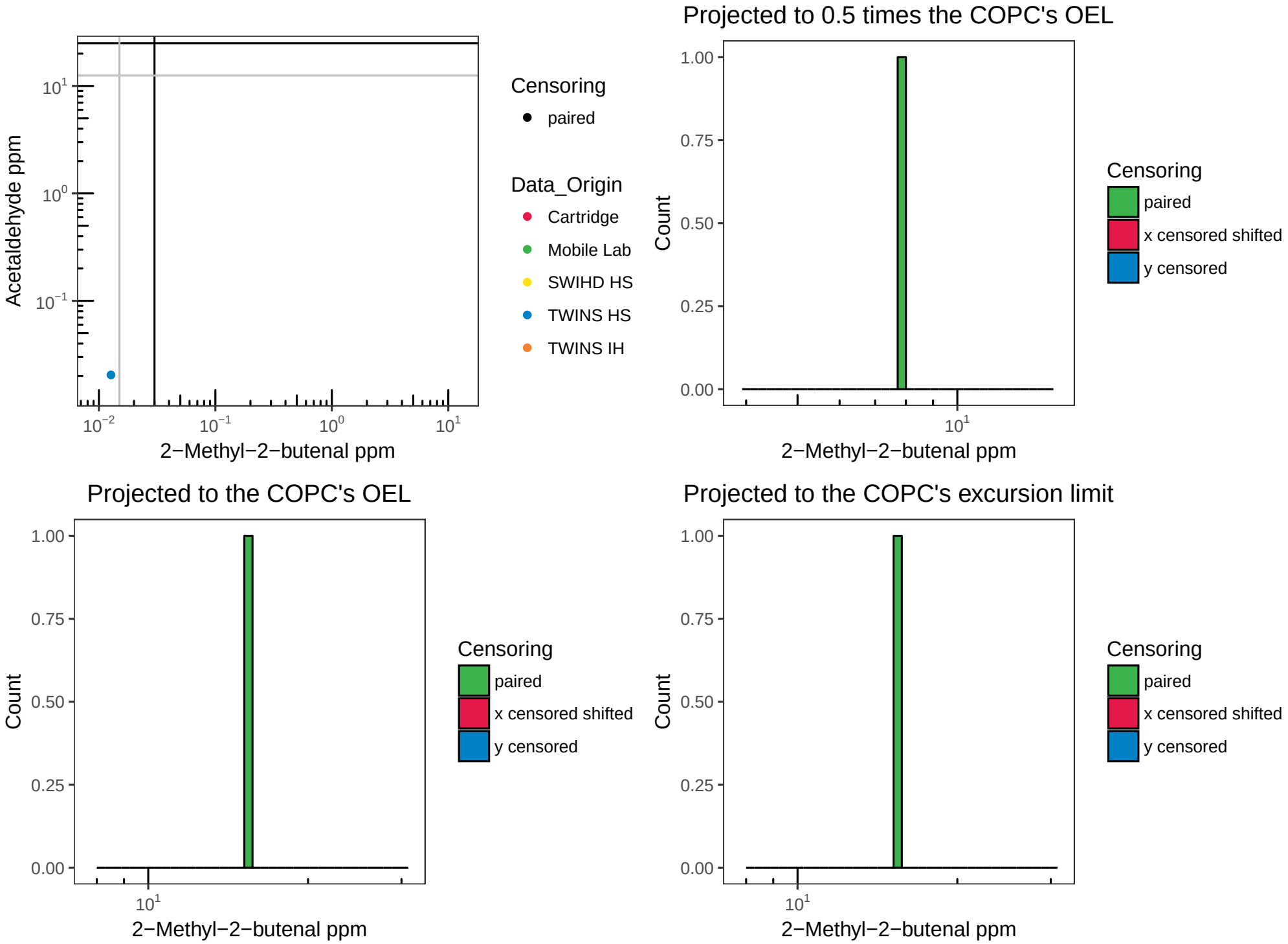


Figure C.881: Acetaldehyde vs 2-Methyl-2-butenal

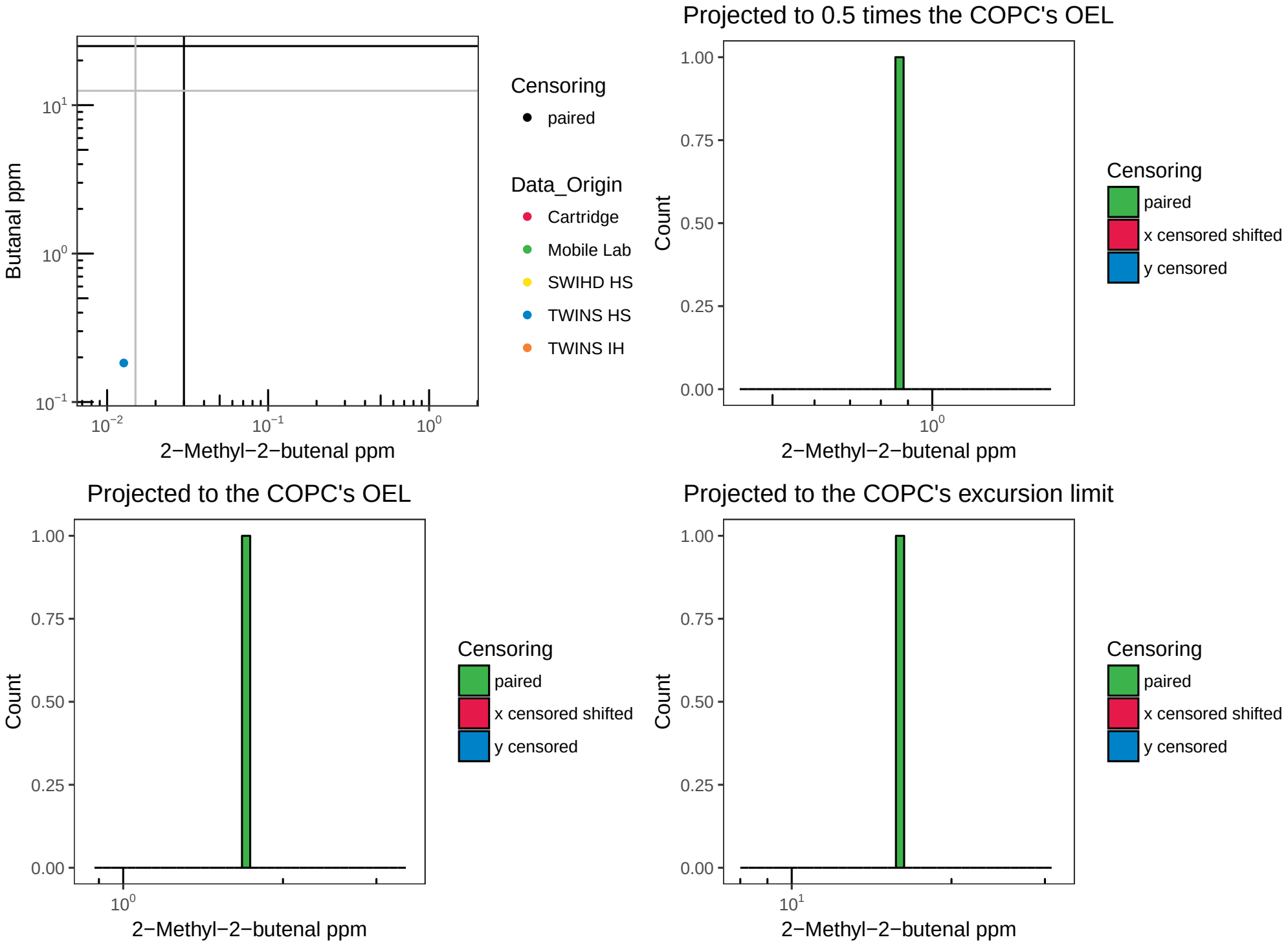


Figure C.882: Butanal vs 2-Methyl-2-butenal

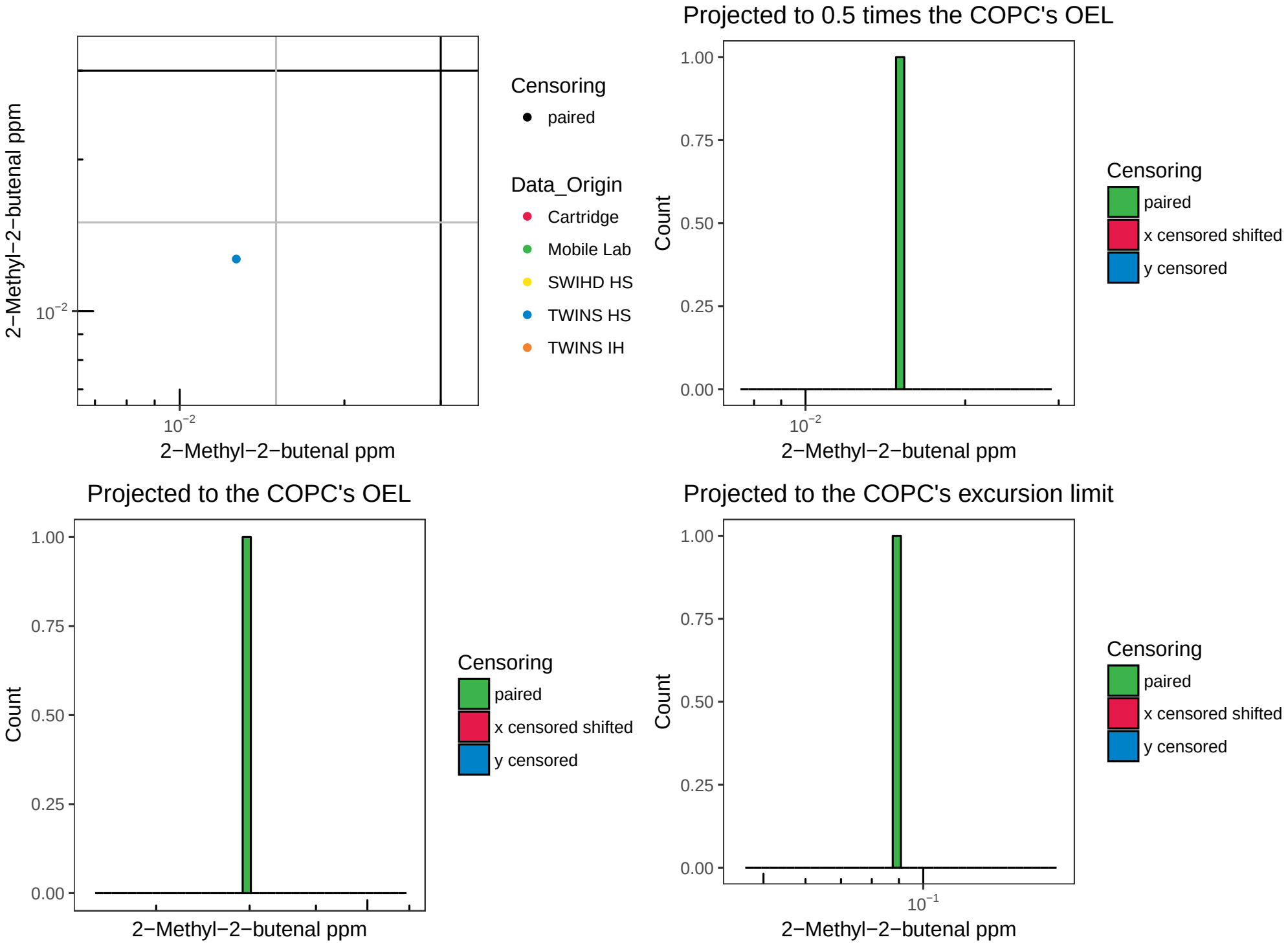


Figure C.883: 2-Methyl-2-butenal vs 2-Methyl-2-butenal

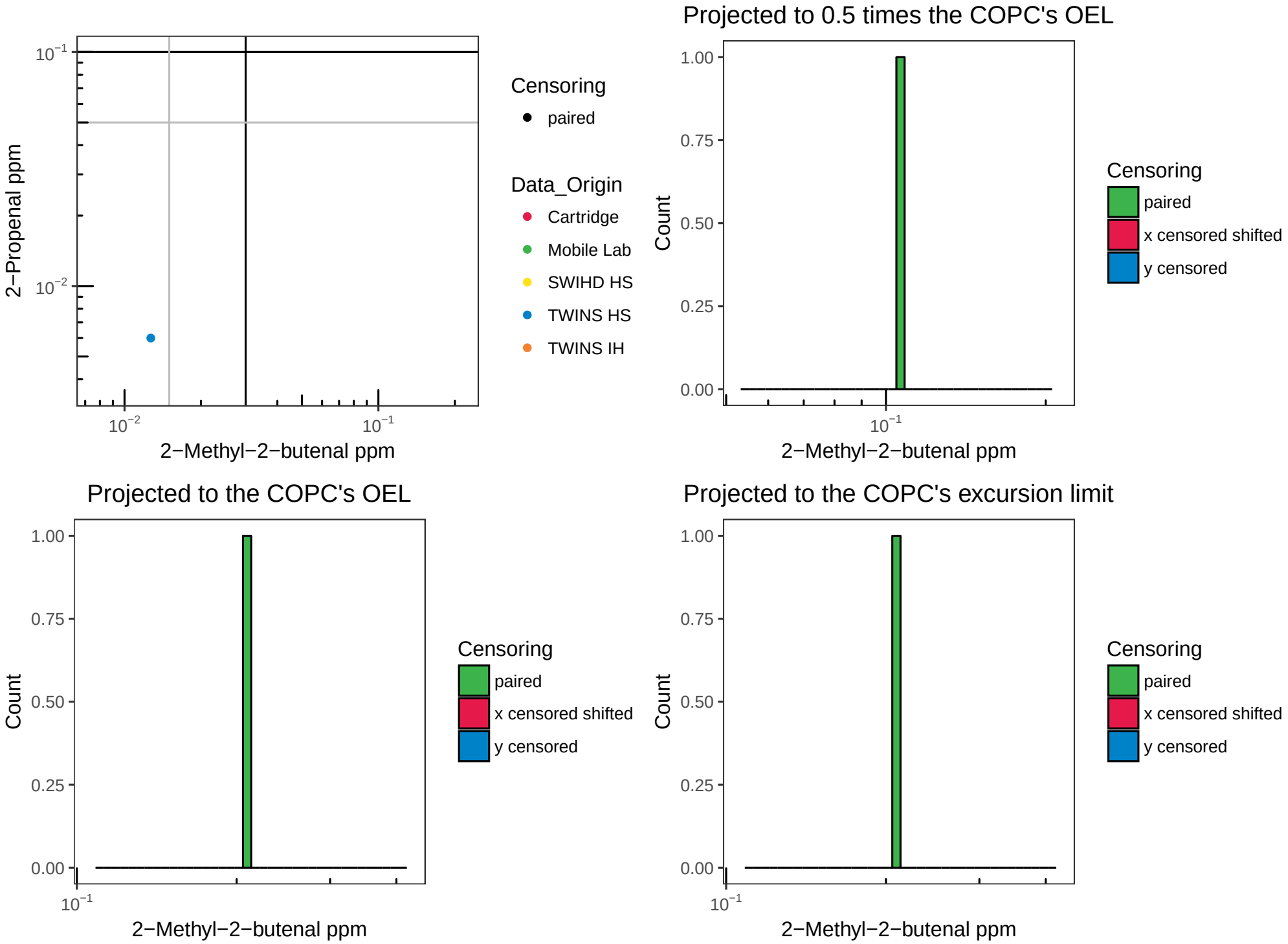


Figure C.884: 2-Propenal vs 2-Methyl-2-butenal

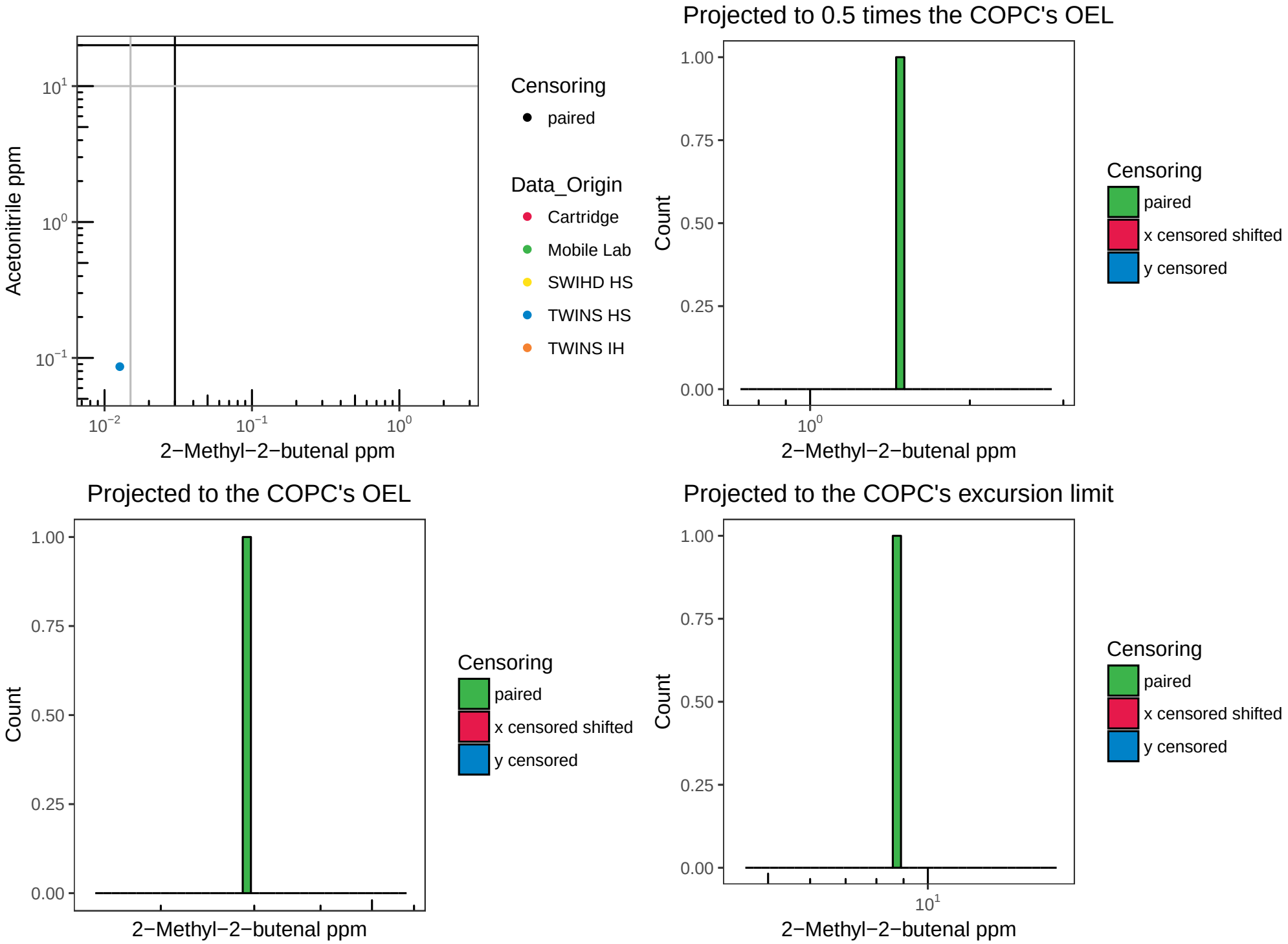


Figure C.885: Acetonitrile vs 2-Methyl-2-butenal

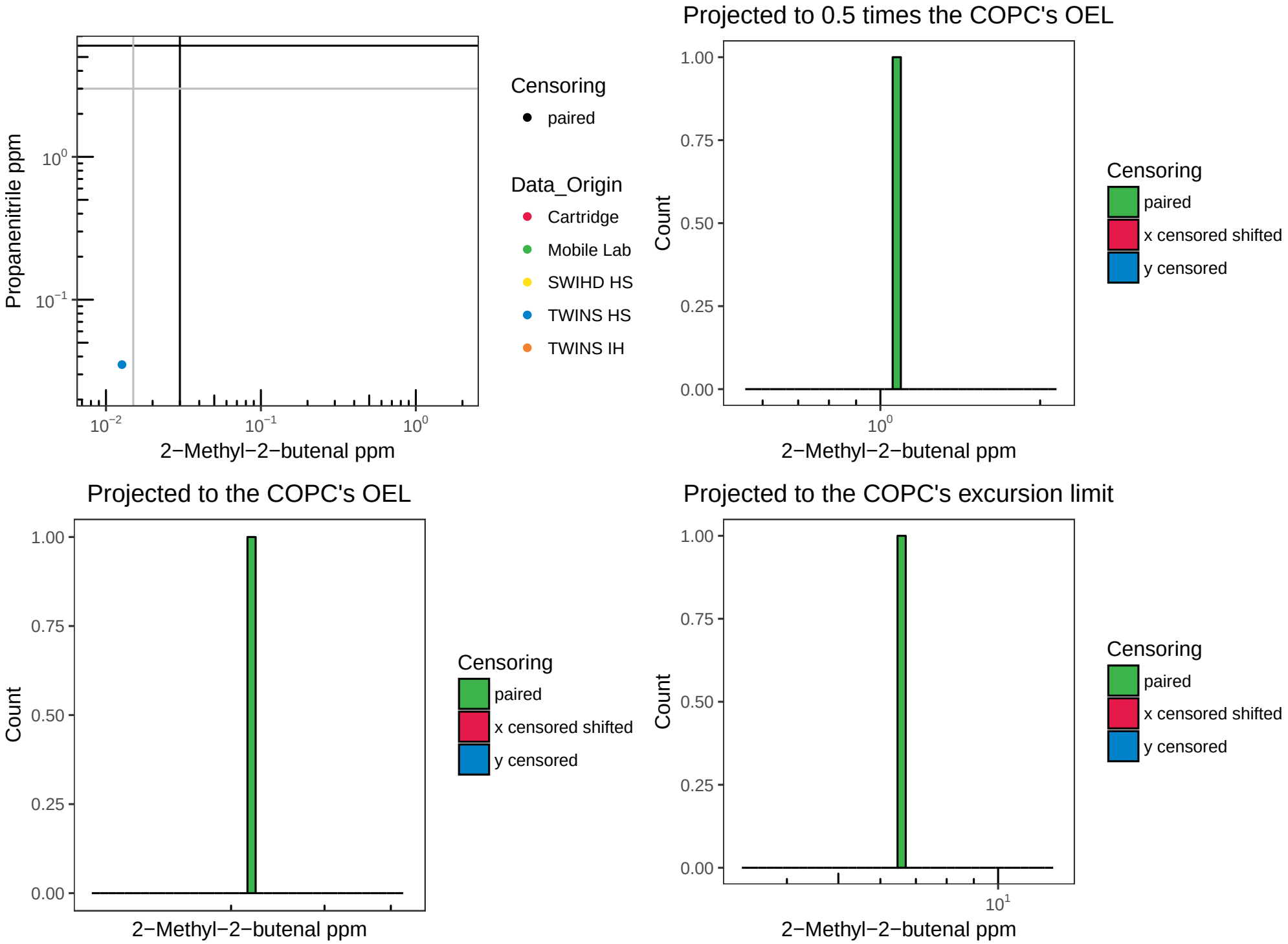


Figure C.886: Propanenitrile vs 2-Methyl-2-butenal

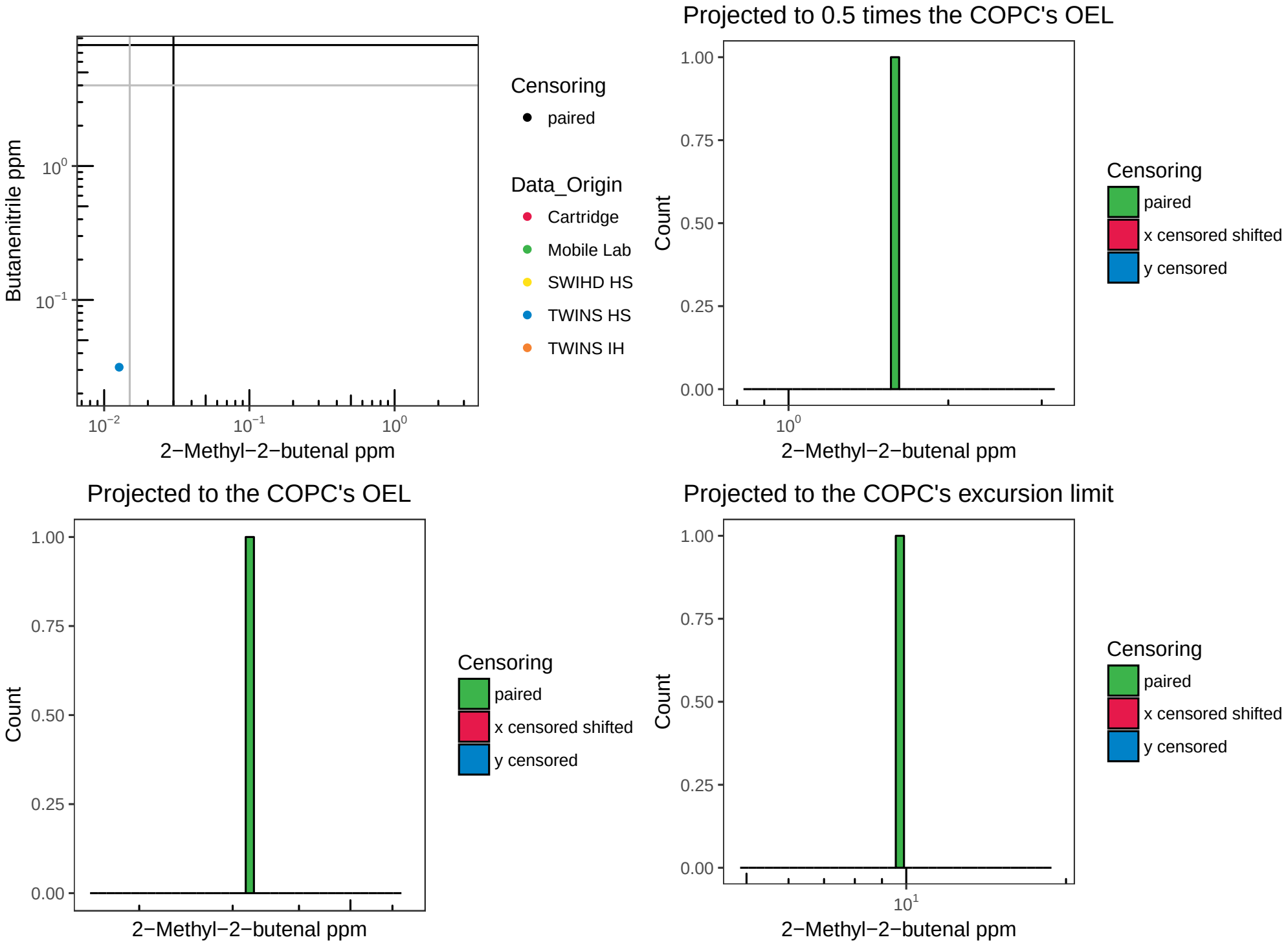


Figure C.887: Butanenitrile vs 2-Methyl-2-butenal

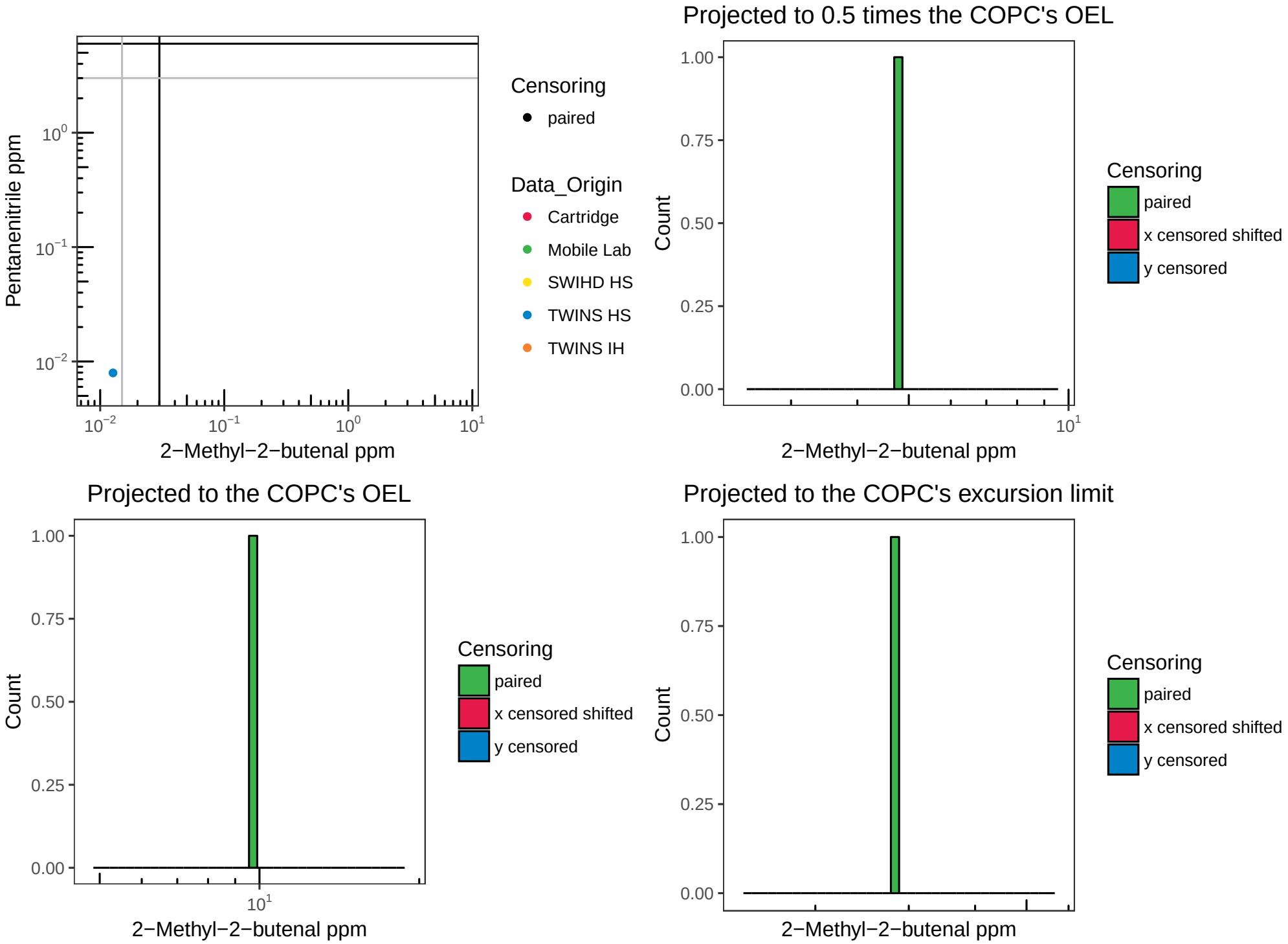


Figure C.888: Pentanenitrile vs 2-Methyl-2-butenal

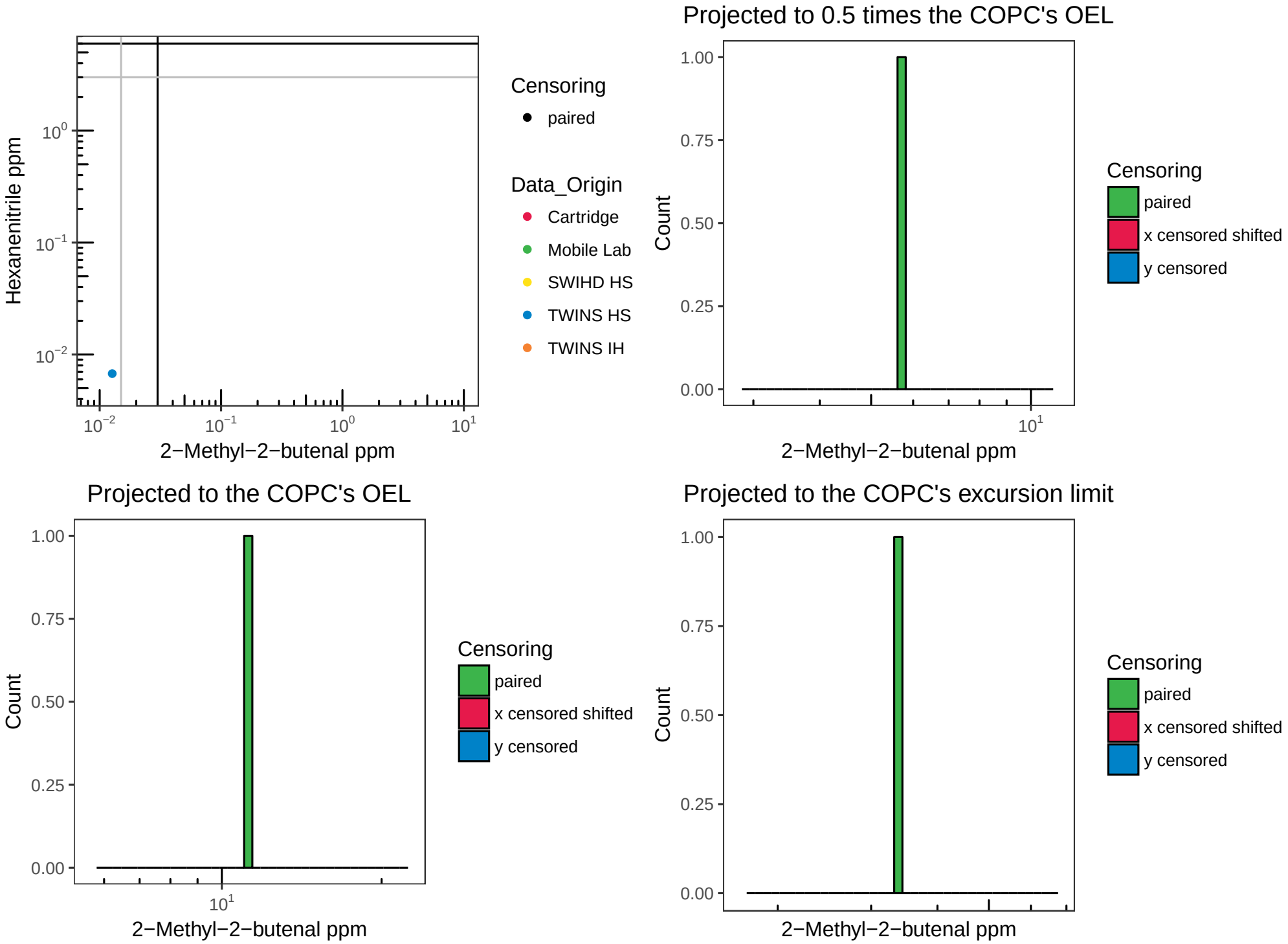


Figure C.889: Hexanenitrile vs 2-Methyl-2-butenal

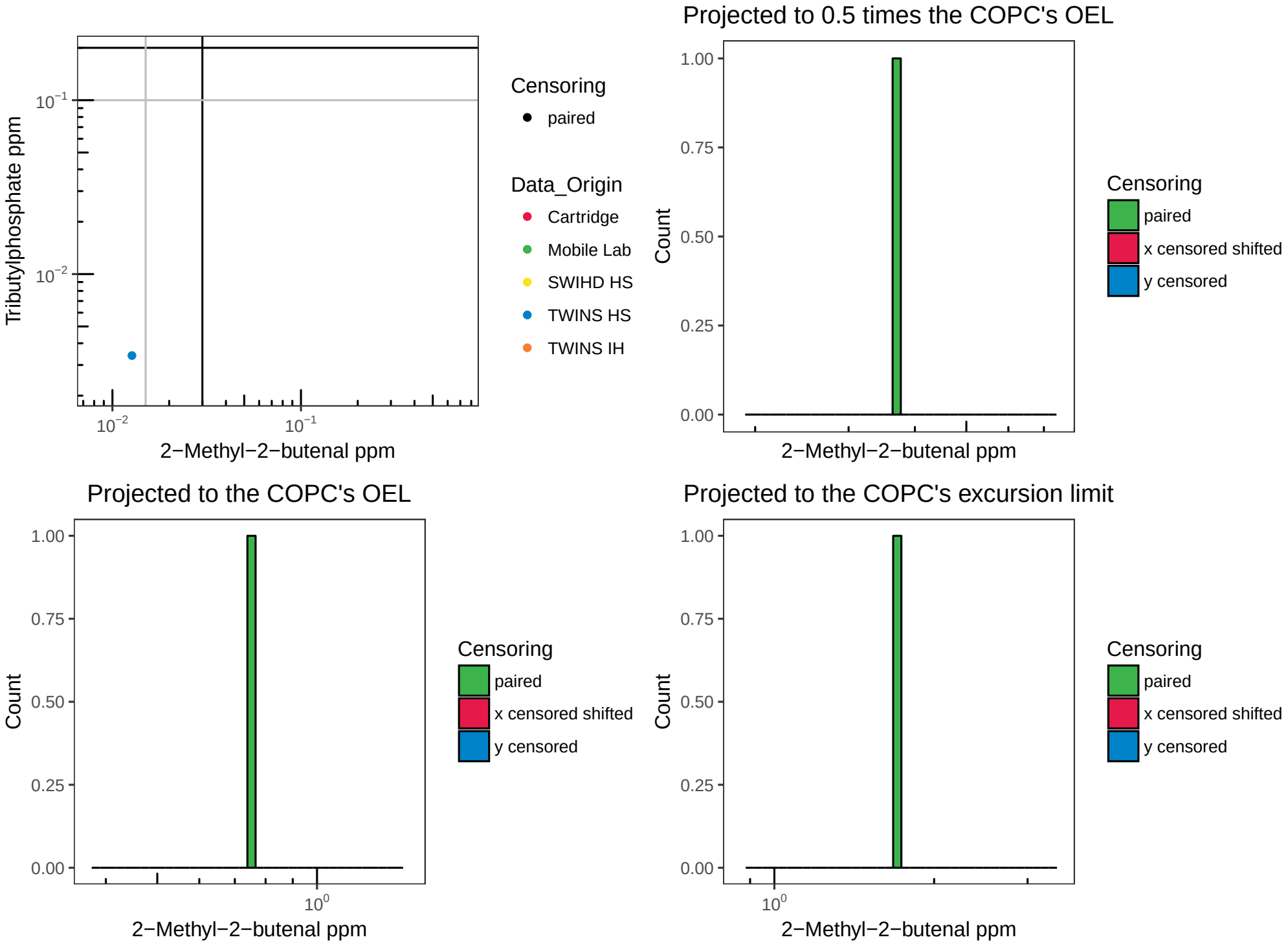


Figure C.890: Tributylphosphate vs 2-Methyl-2-butenal

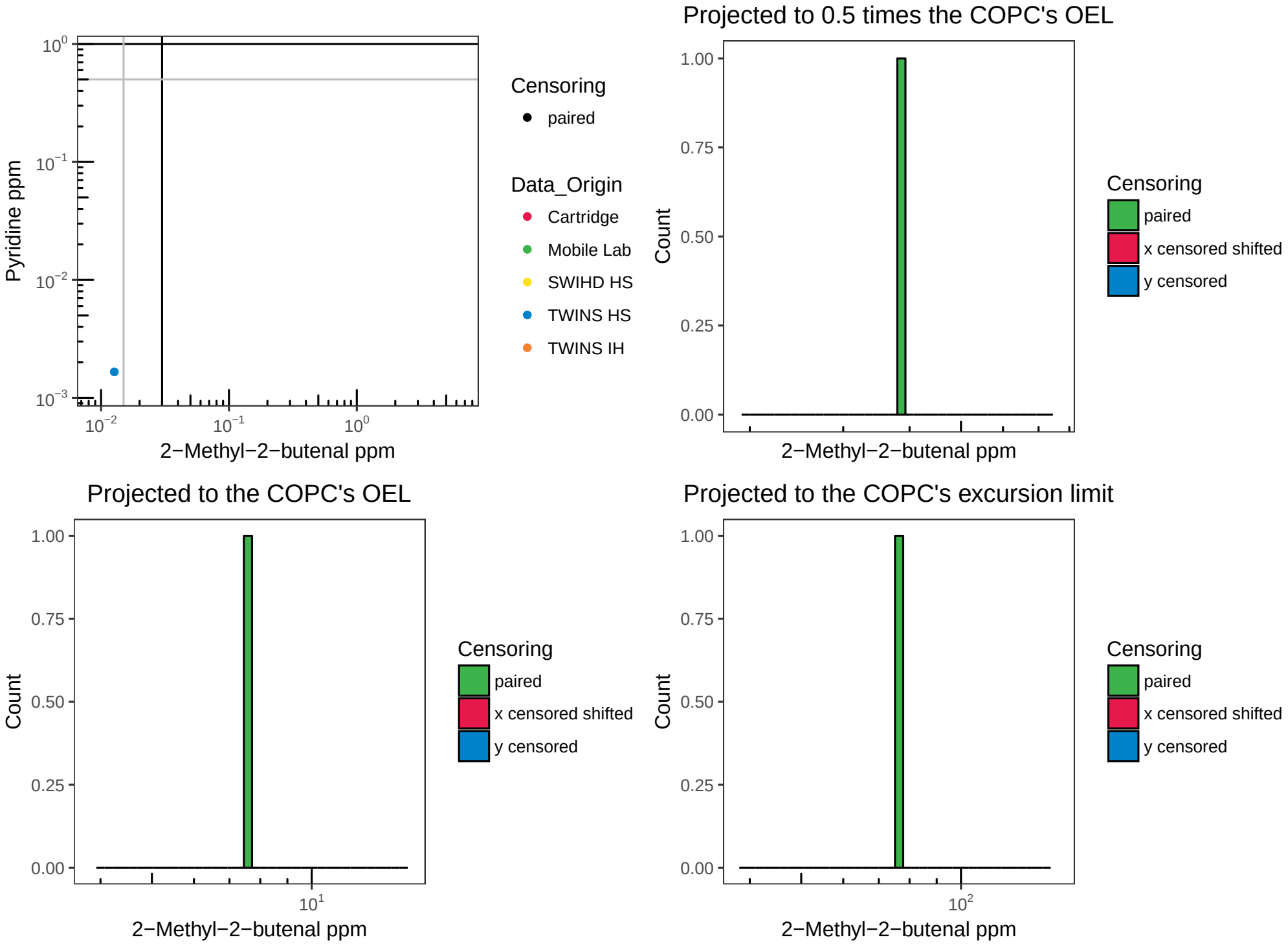


Figure C.891: Pyridine vs 2-Methyl-2-butenal

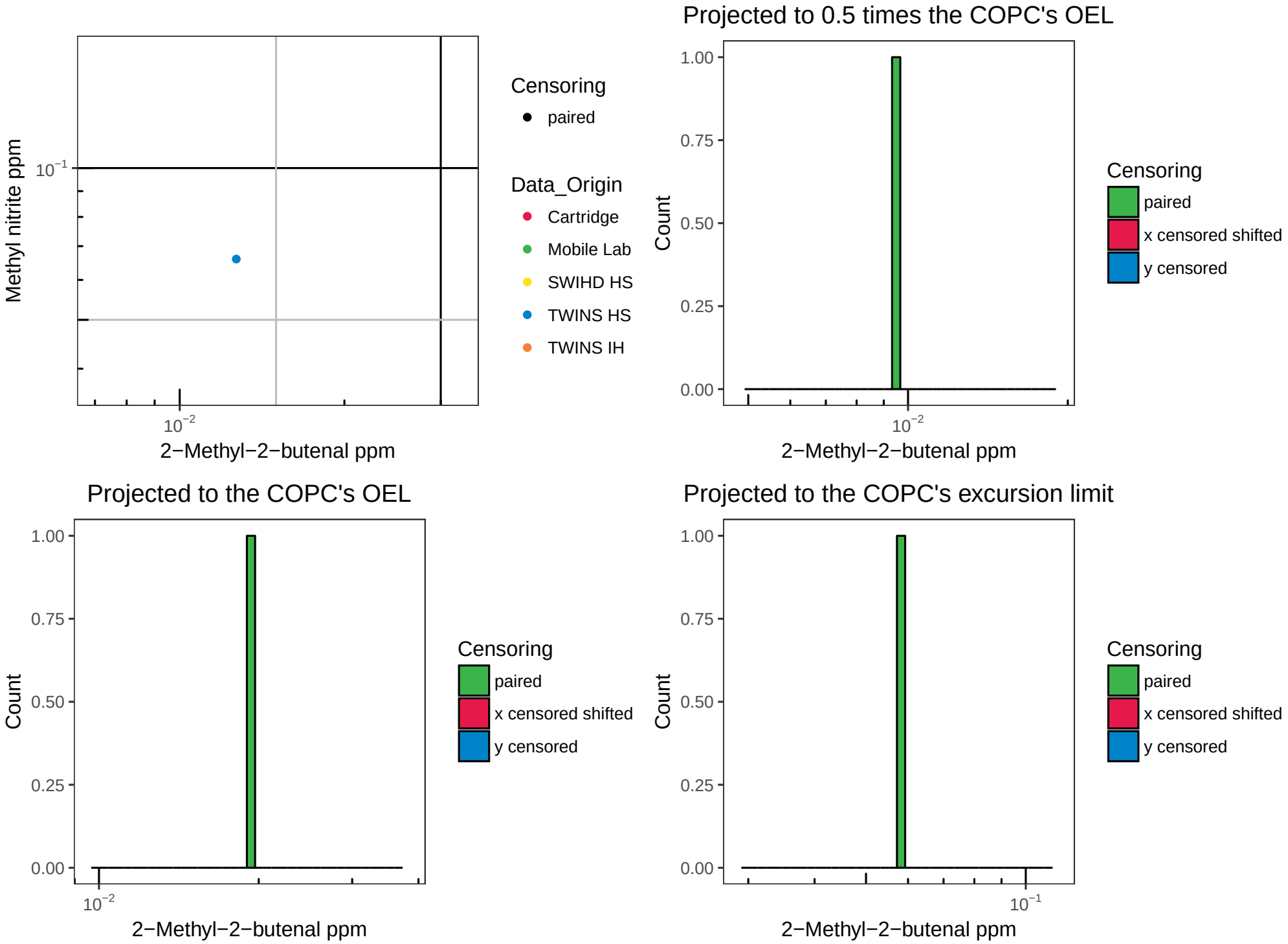


Figure C.892: Methyl nitrite vs 2-Methyl-2-butenal

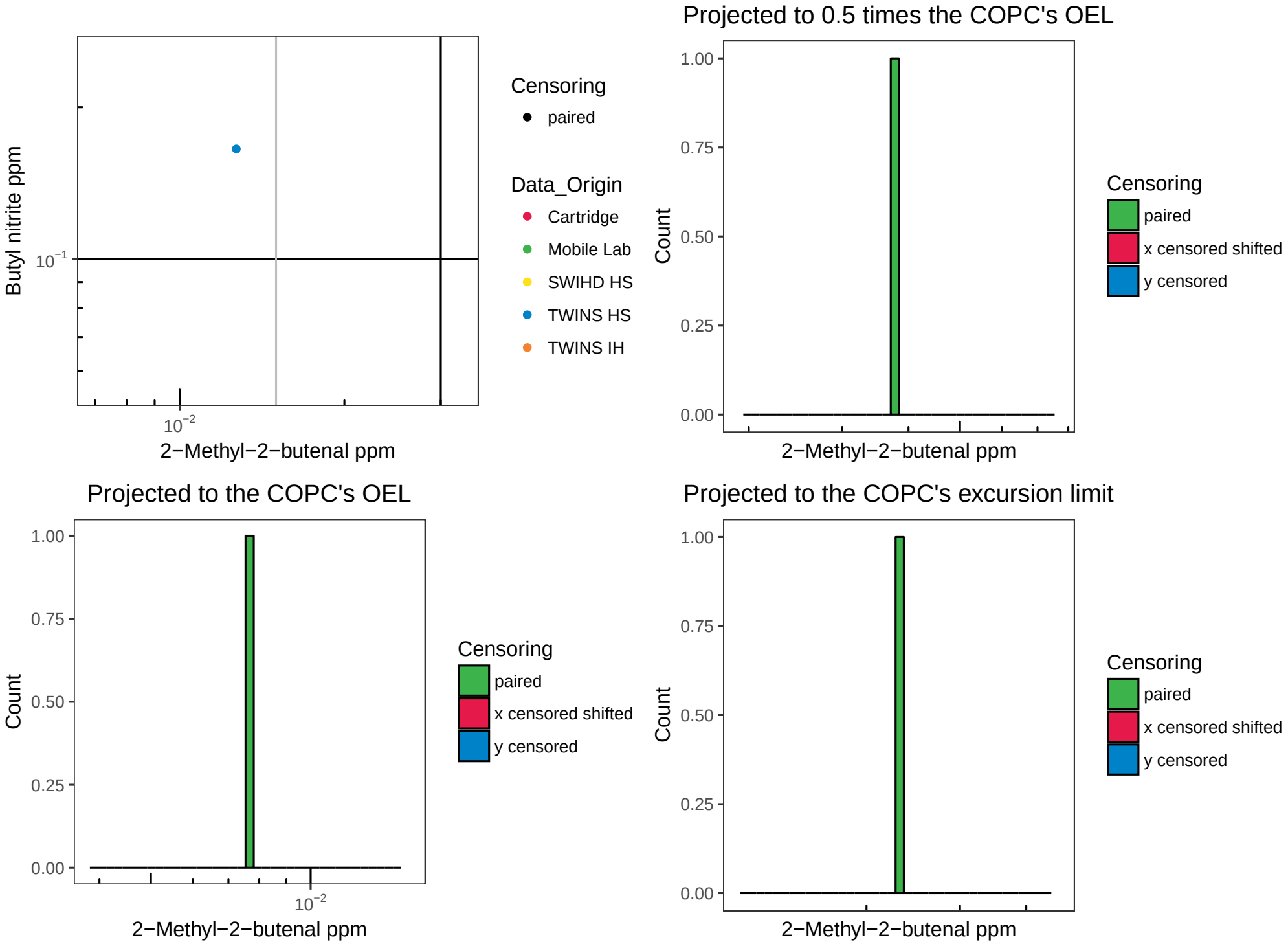


Figure C.893: Butyl nitrite vs 2-Methyl-2-butenal

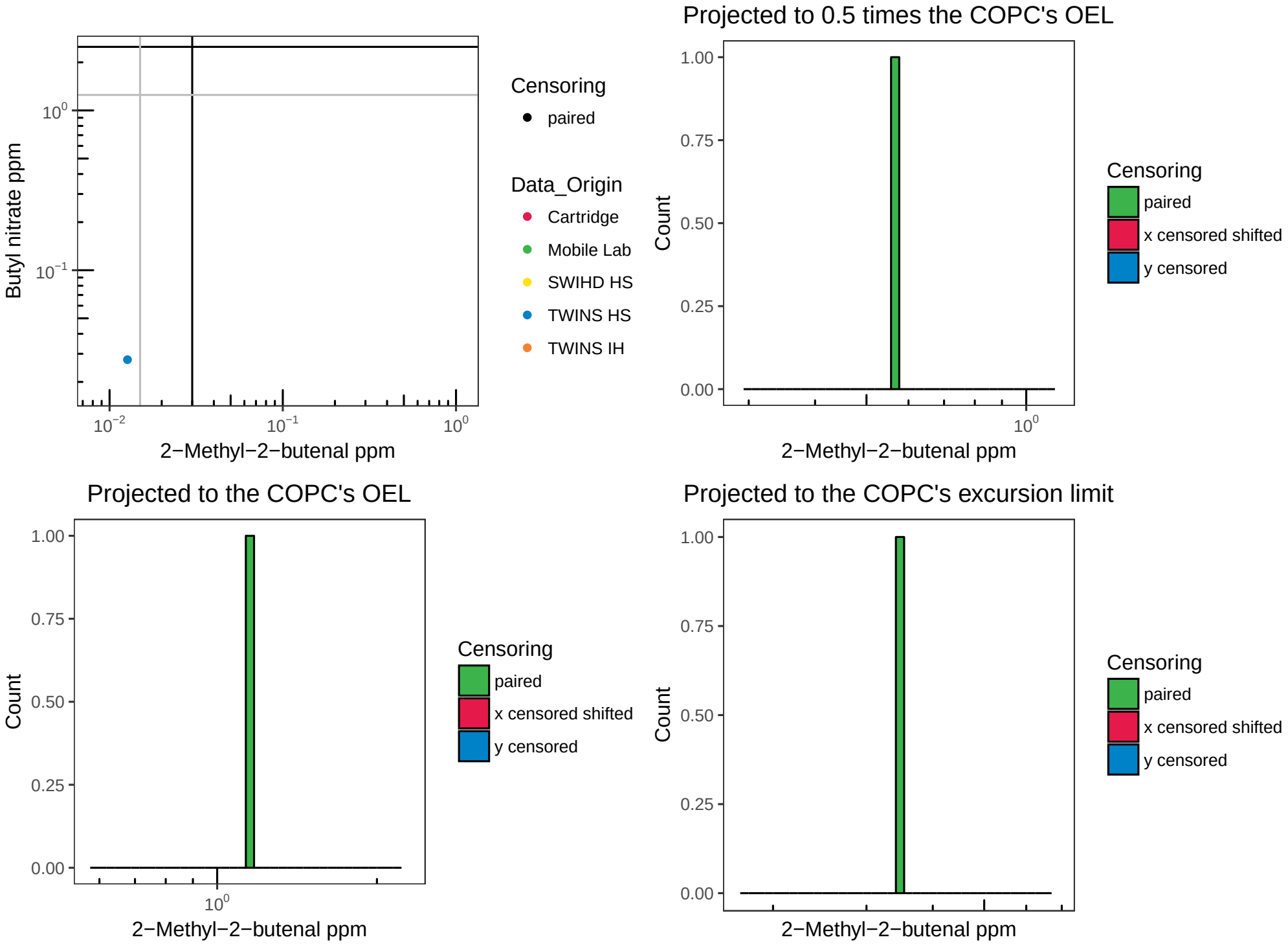


Figure C.894: Butyl nitrate vs 2-Methyl-2-butenal

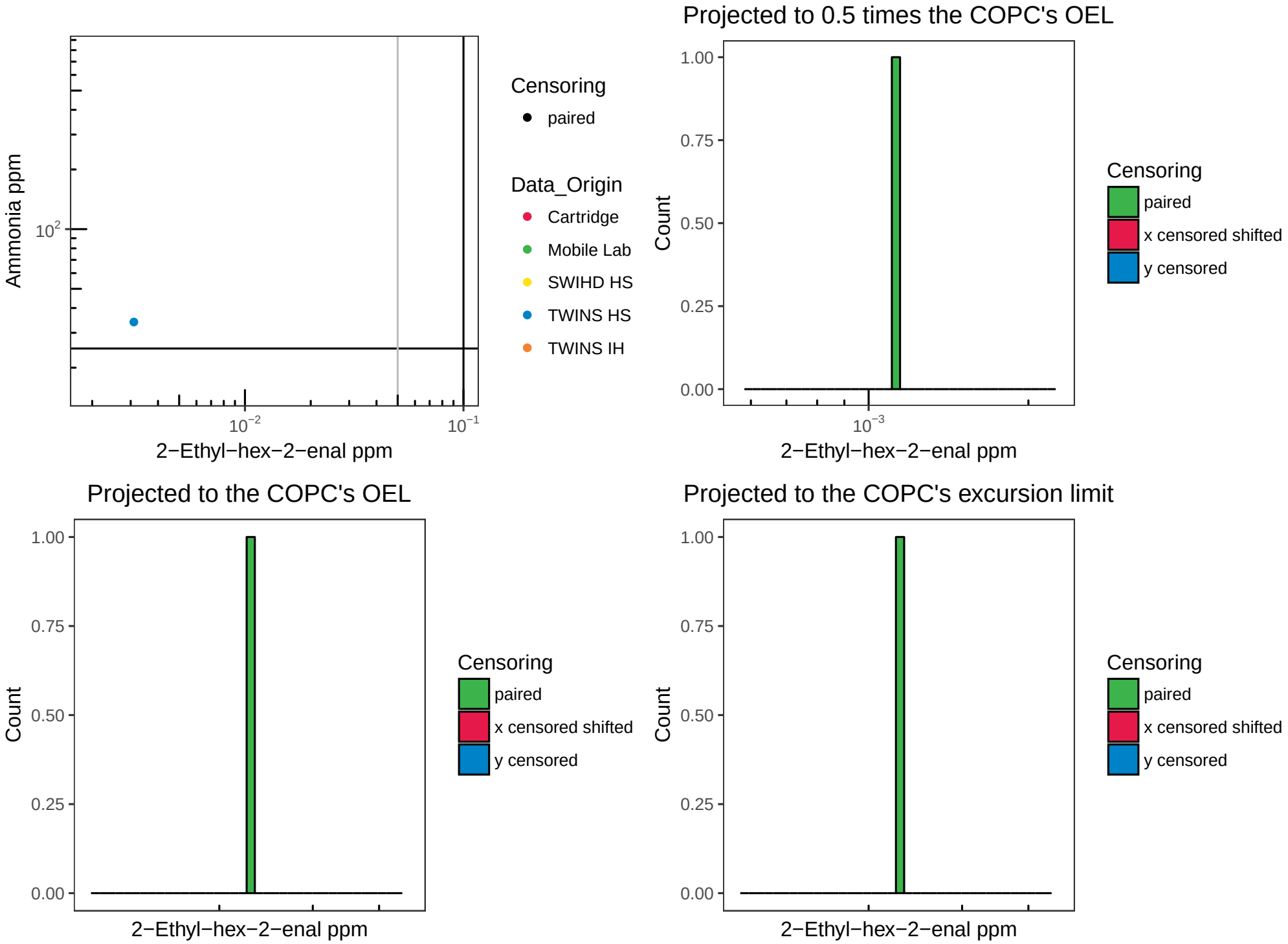


Figure C.895: Ammonia vs 2-Ethyl-hex-2-enal

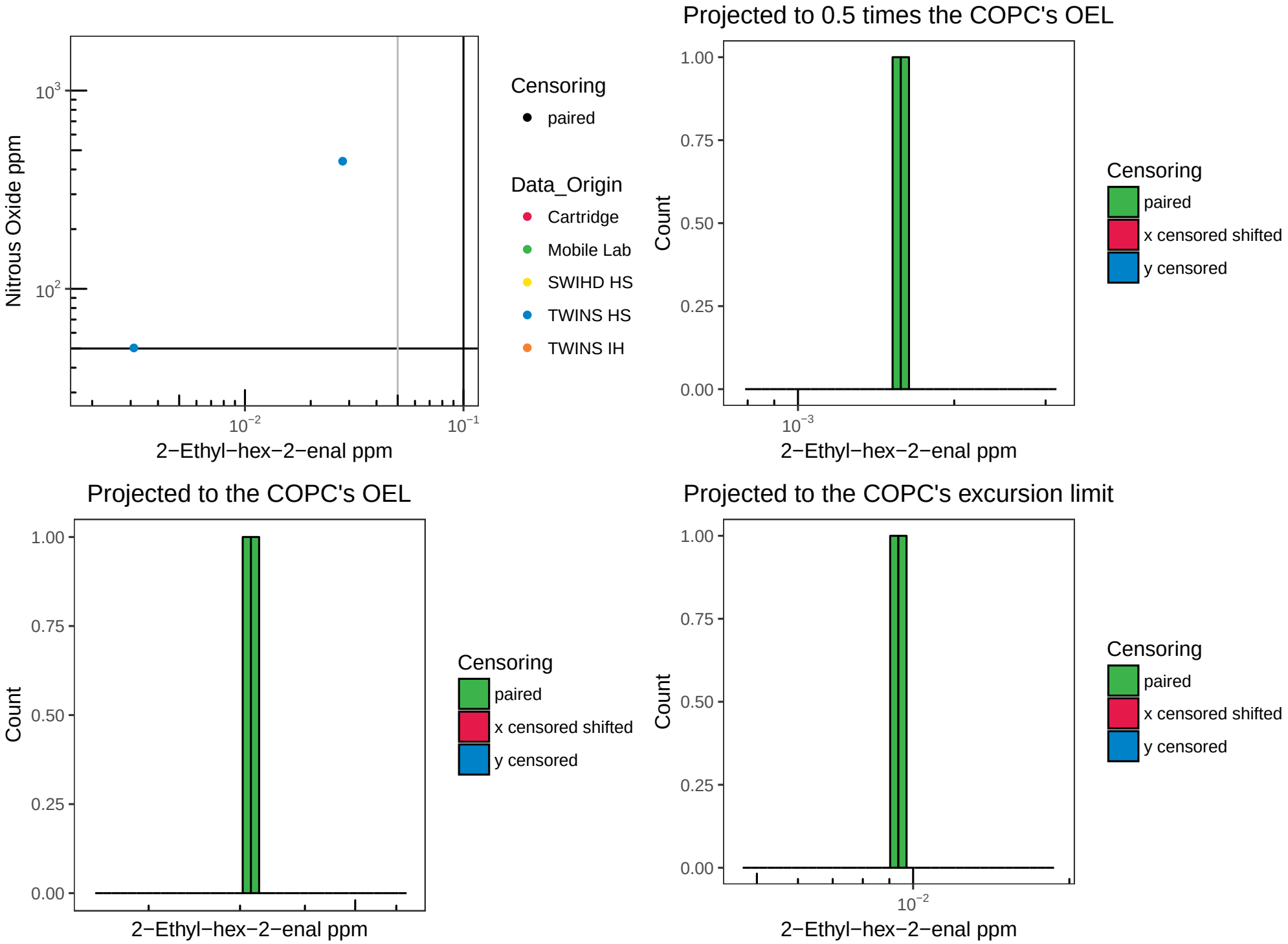


Figure C.896: Nitrous Oxide vs 2-Ethyl-hex-2-enal

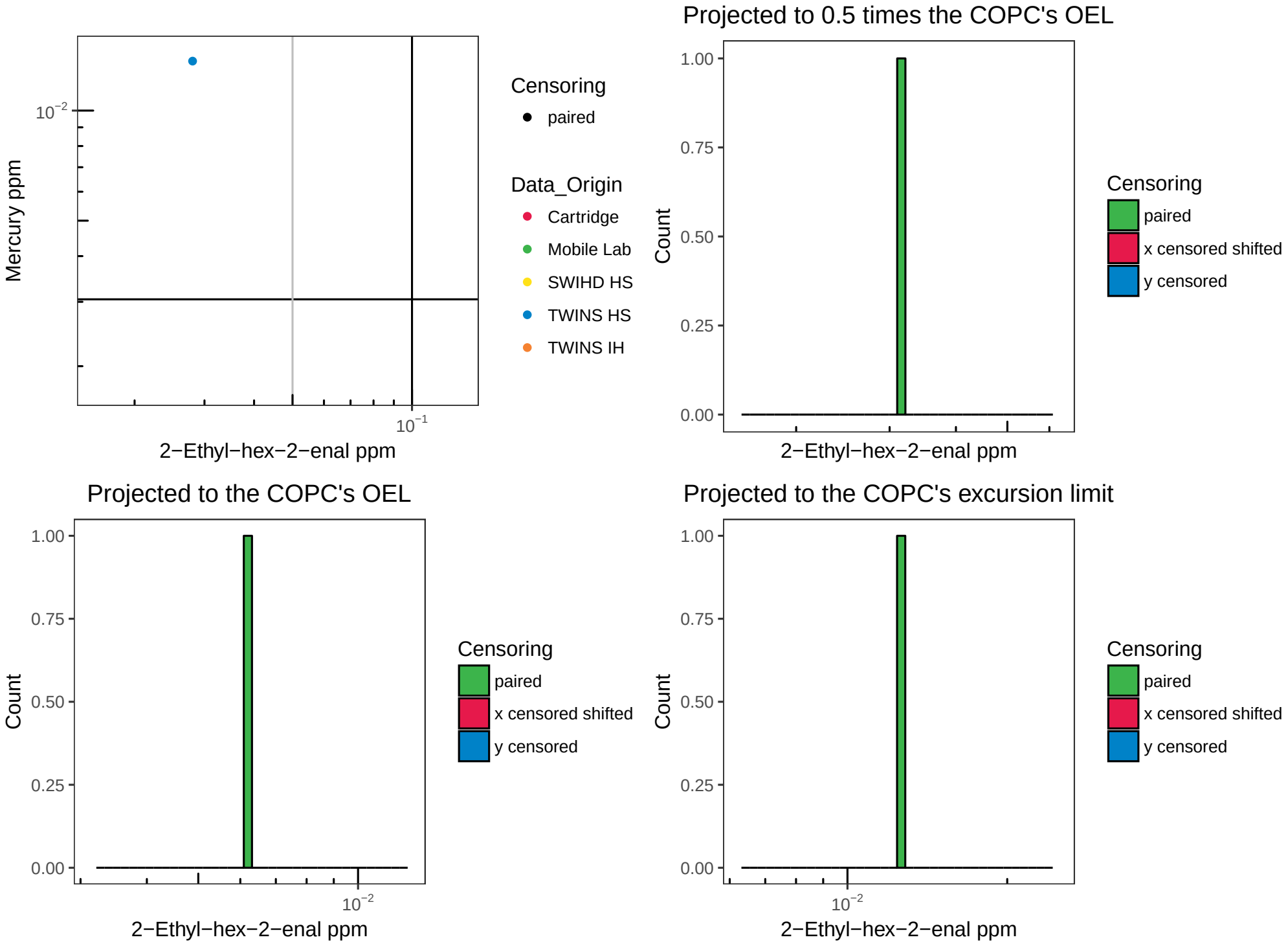


Figure C.897: Mercury vs 2-Ethyl-hex-2-enal

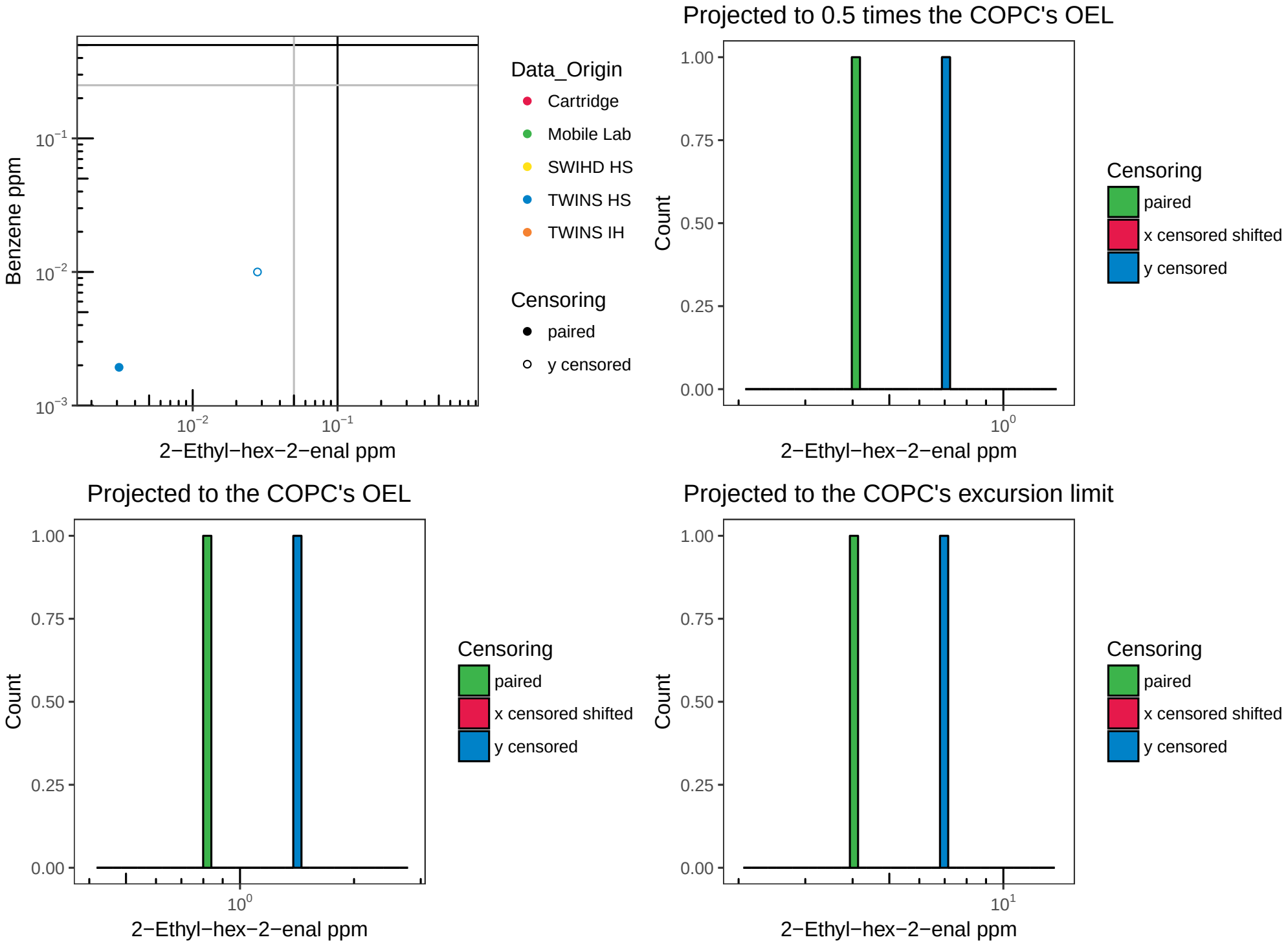


Figure C.898: Benzene vs 2-Ethyl-hex-2-enal

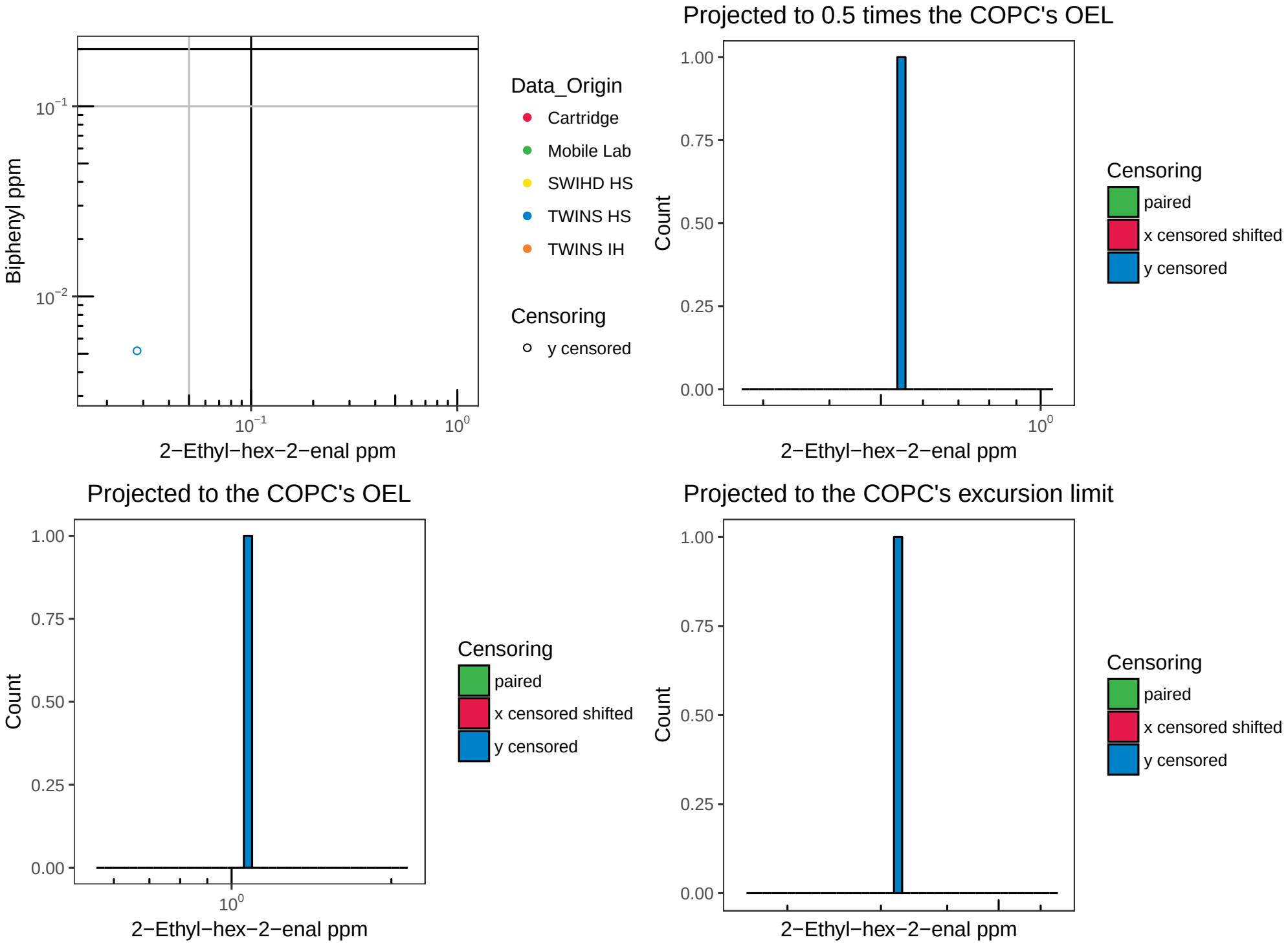


Figure C.899: Biphenyl vs 2-Ethyl-hex-2-enal

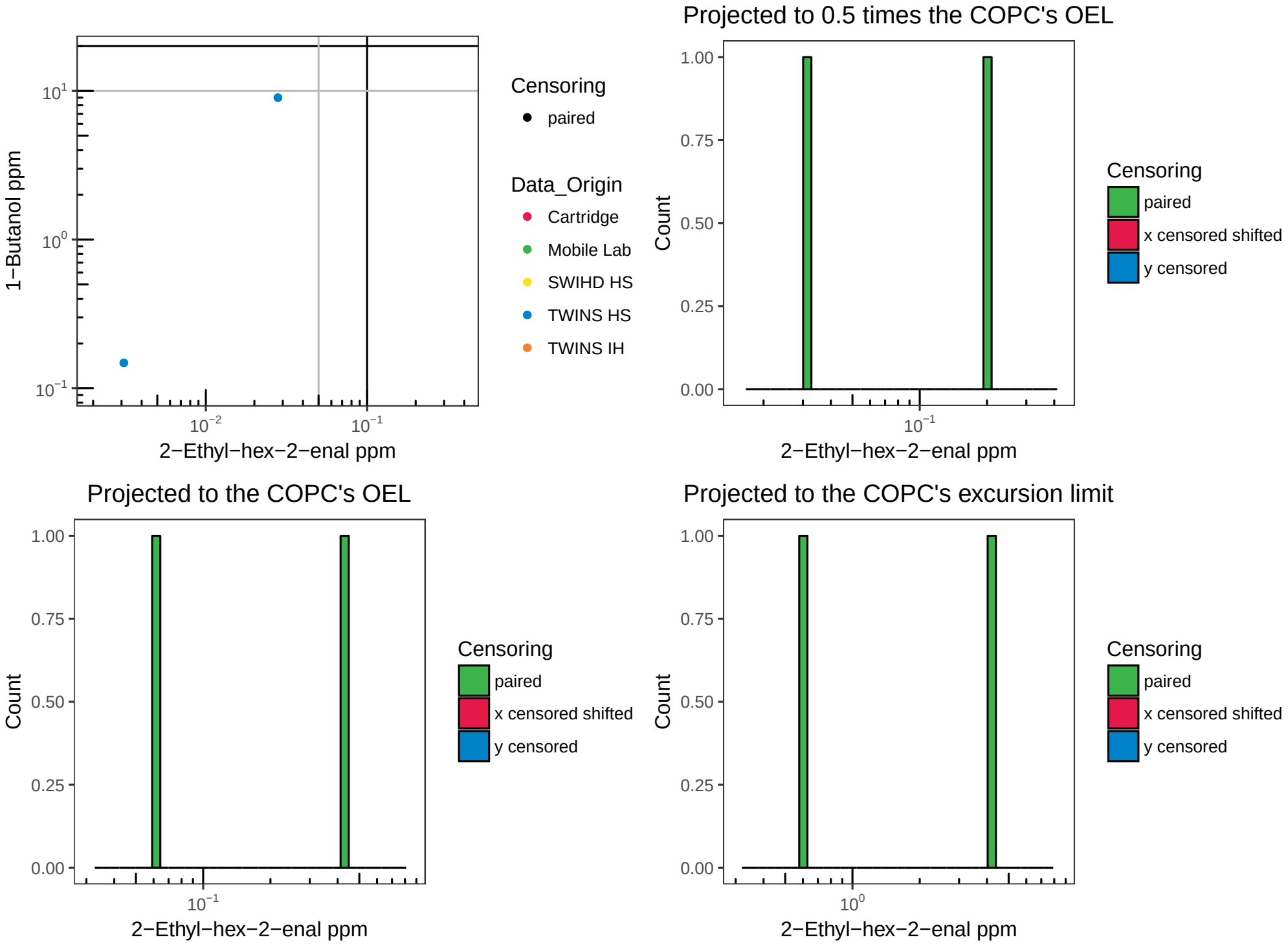


Figure C.900: 1-Butanol vs 2-Ethyl-hex-2-enal

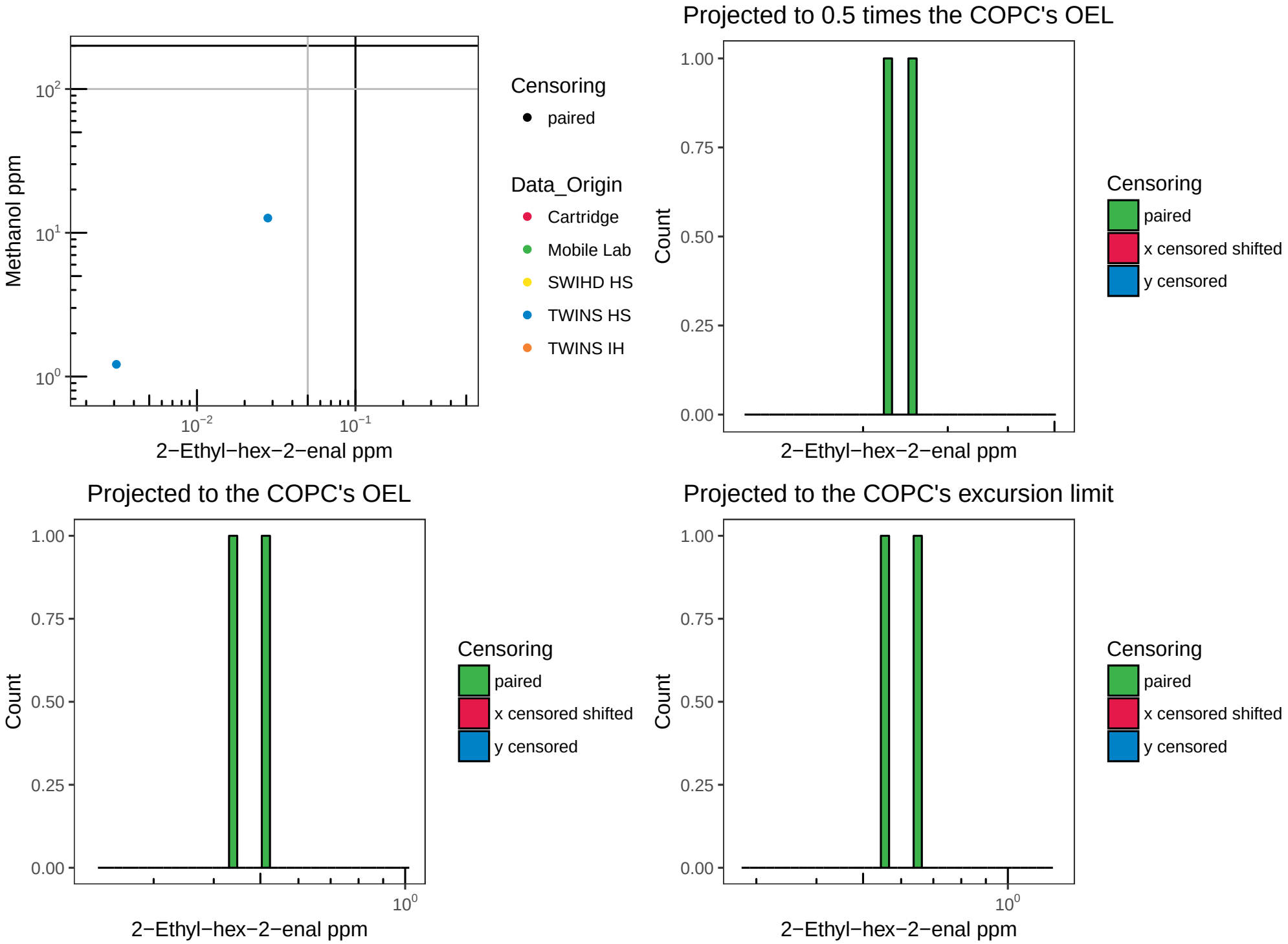


Figure C.901: Methanol vs 2-Ethyl-hex-2-enal

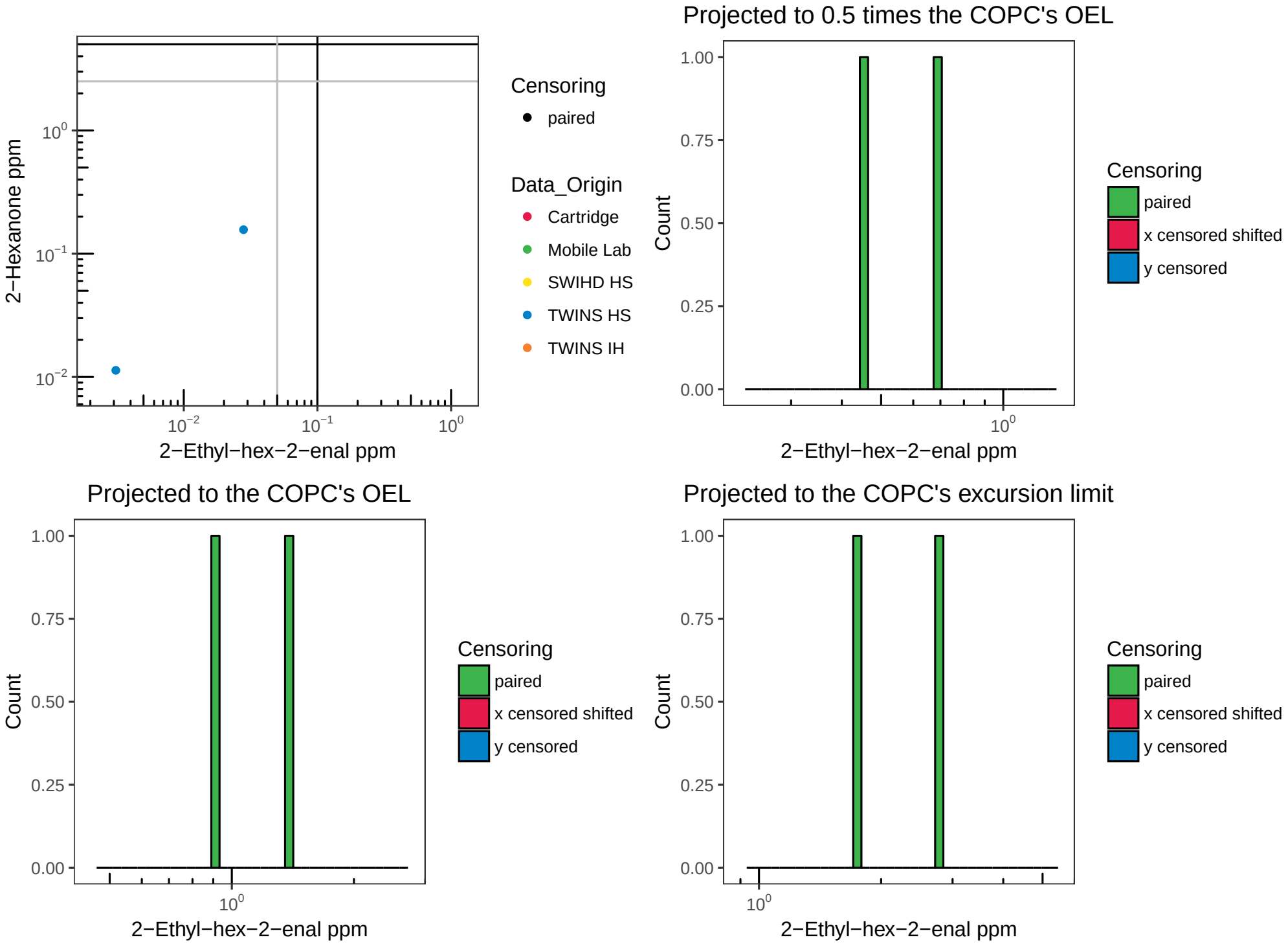


Figure C.902: 2-Hexanone vs 2-Ethyl-hex-2-enal

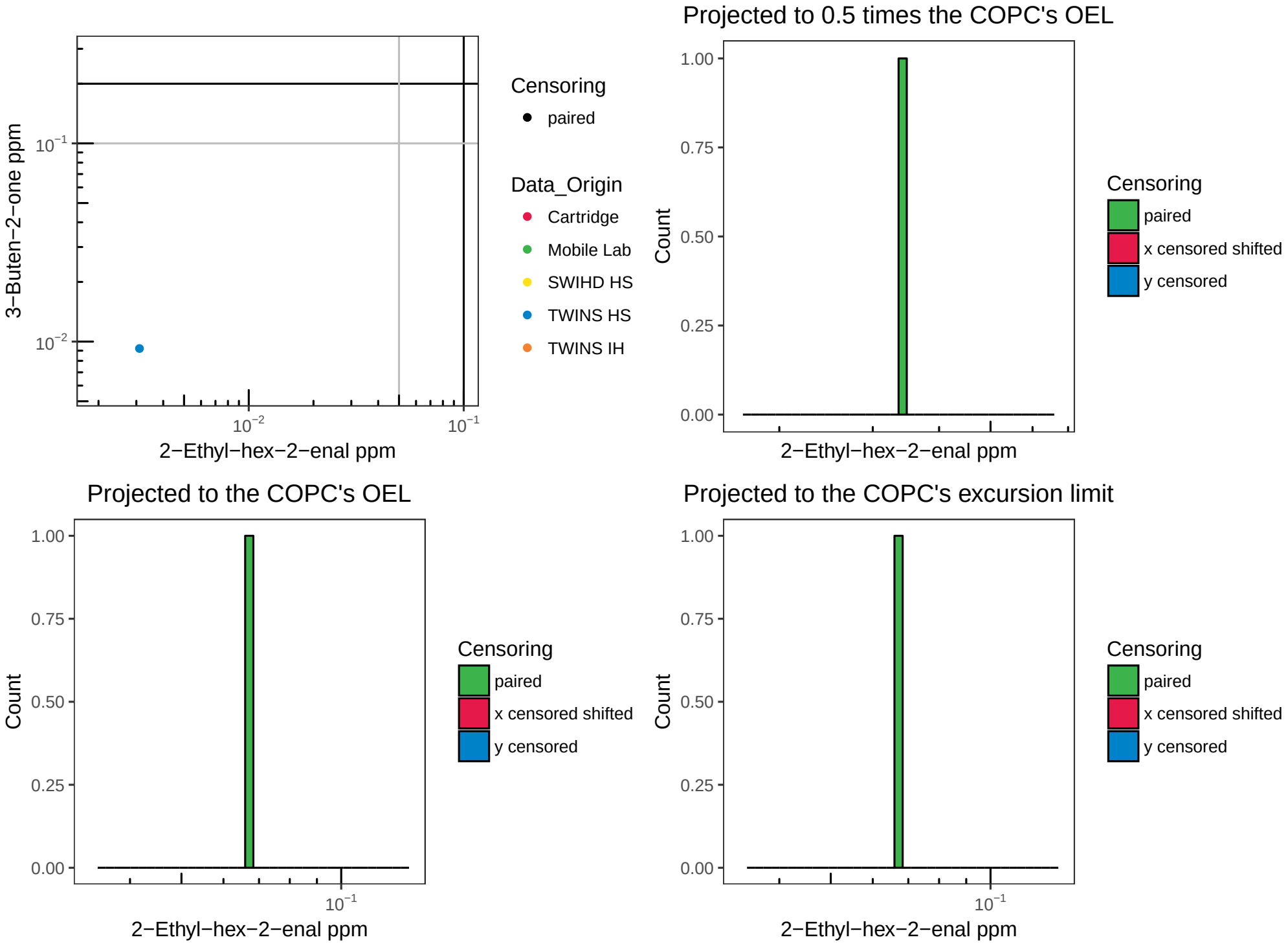


Figure C.903: 3-Buten-2-one vs 2-Ethyl-hex-2-enal

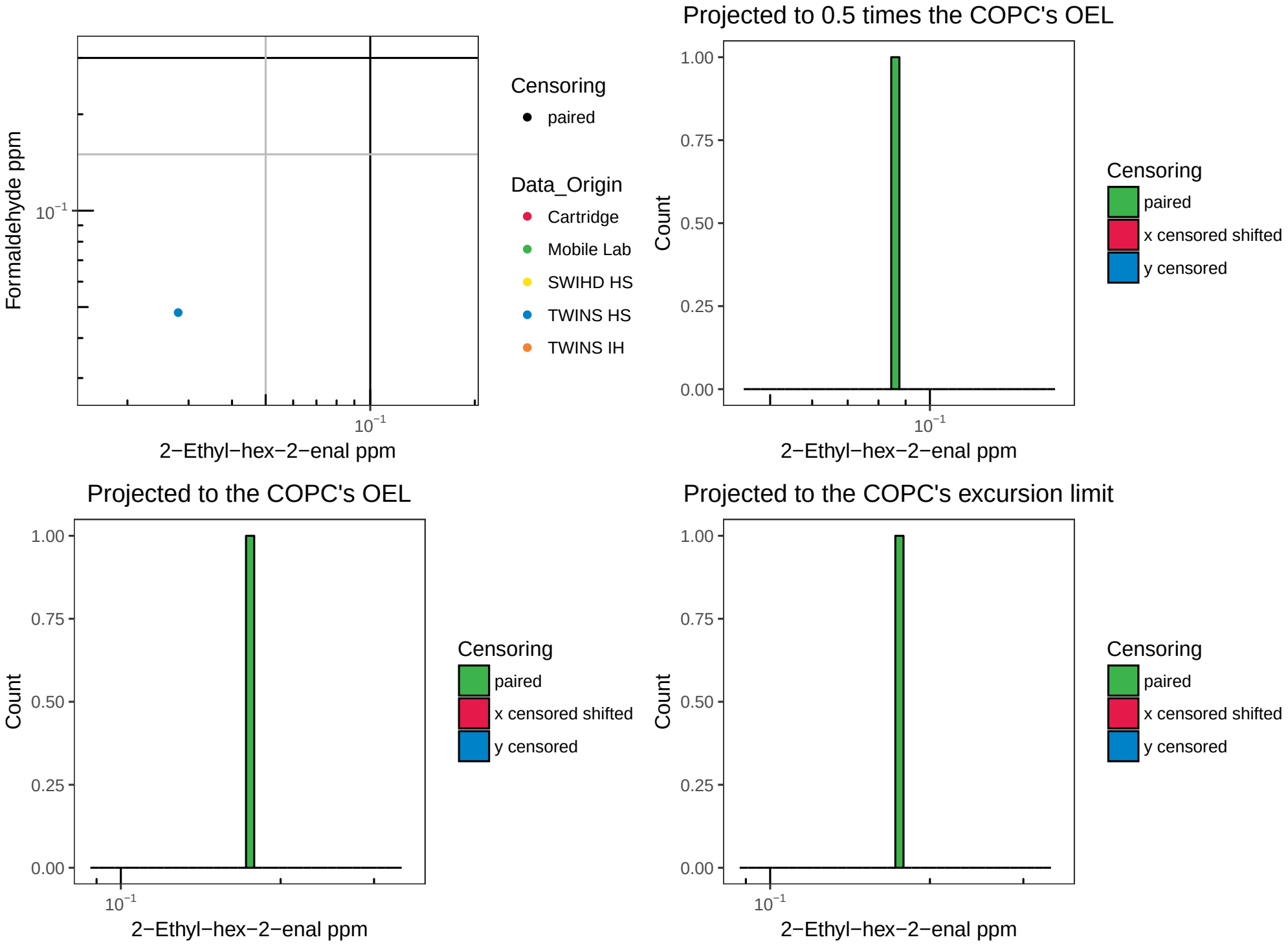


Figure C.904: Formaldehyde vs 2-Ethyl-hex-2-enal

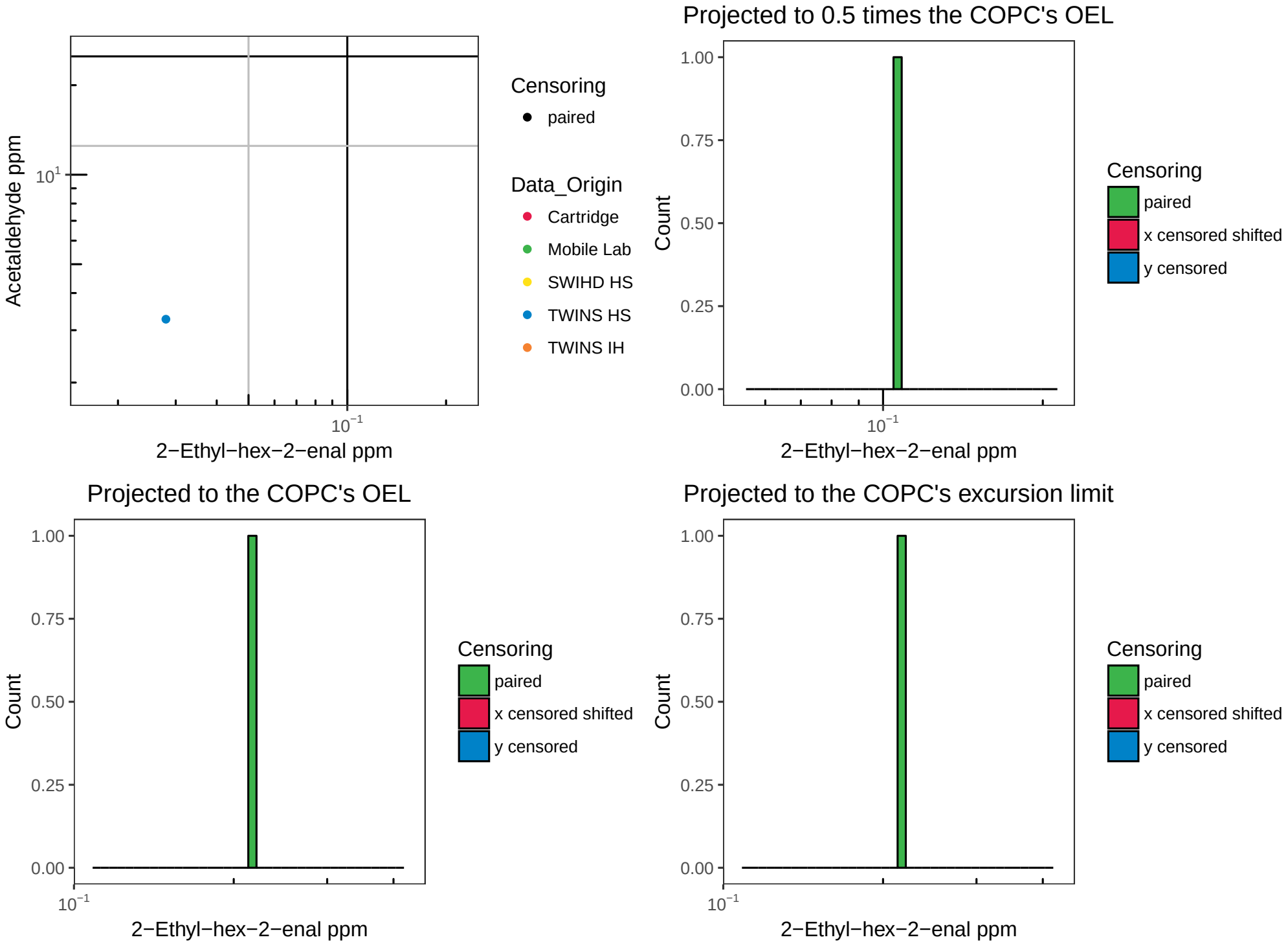


Figure C.905: Acetaldehyde vs 2-Ethyl-hex-2-enal

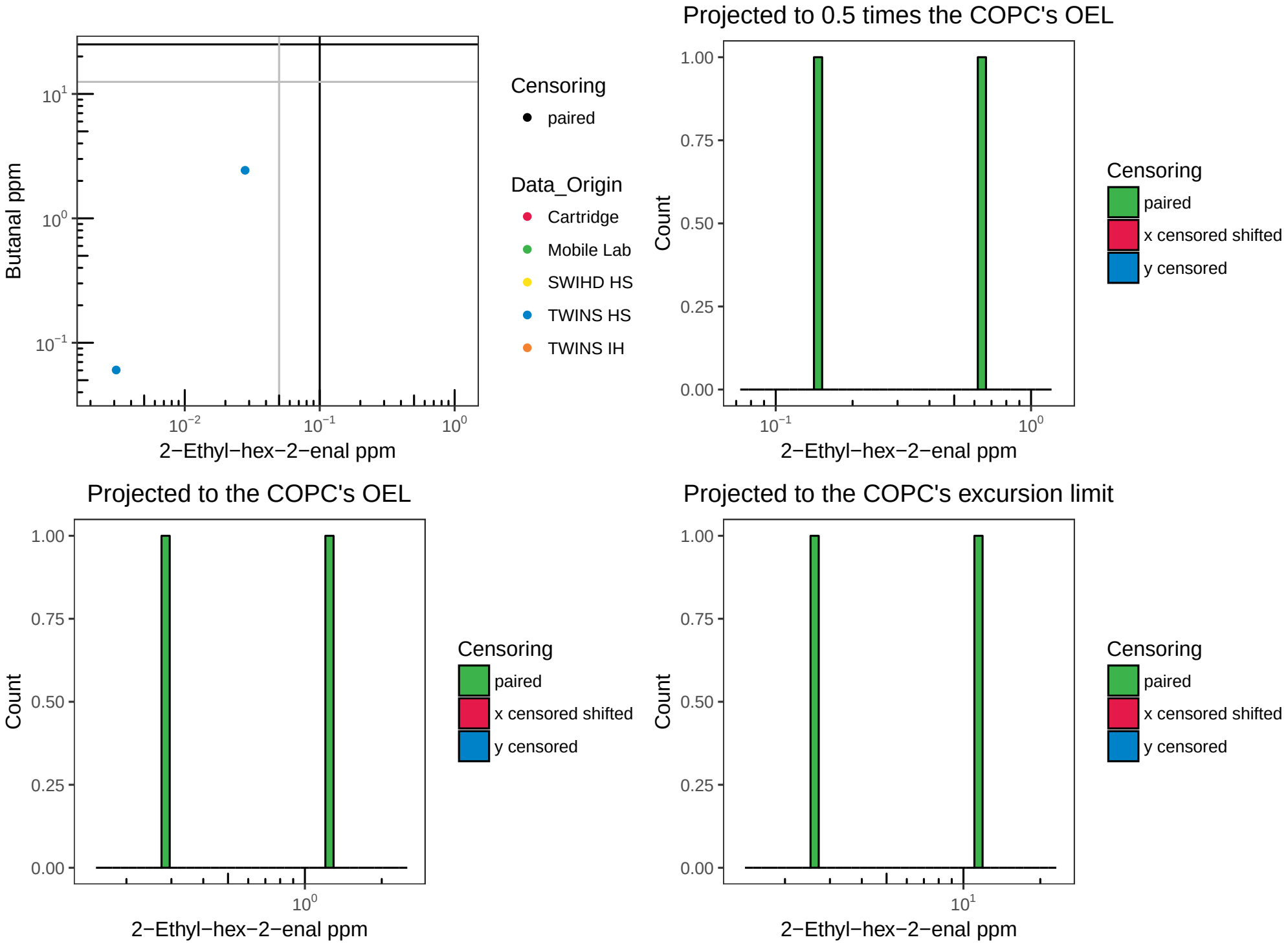


Figure C.906: Butanal vs 2-Ethyl-hex-2-enal

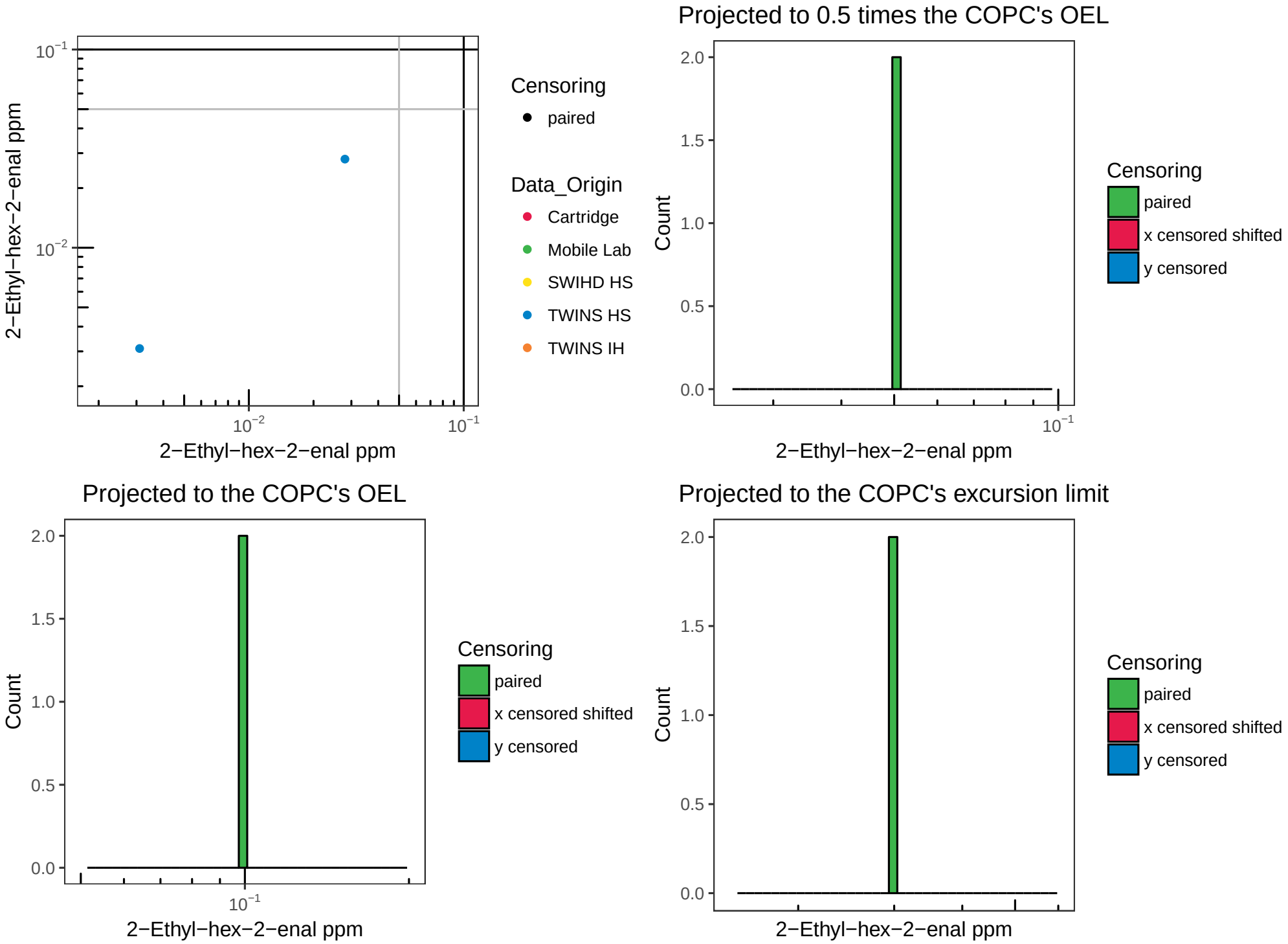


Figure C.907: 2-Ethyl-hex-2-enal vs 2-Ethyl-hex-2-enal

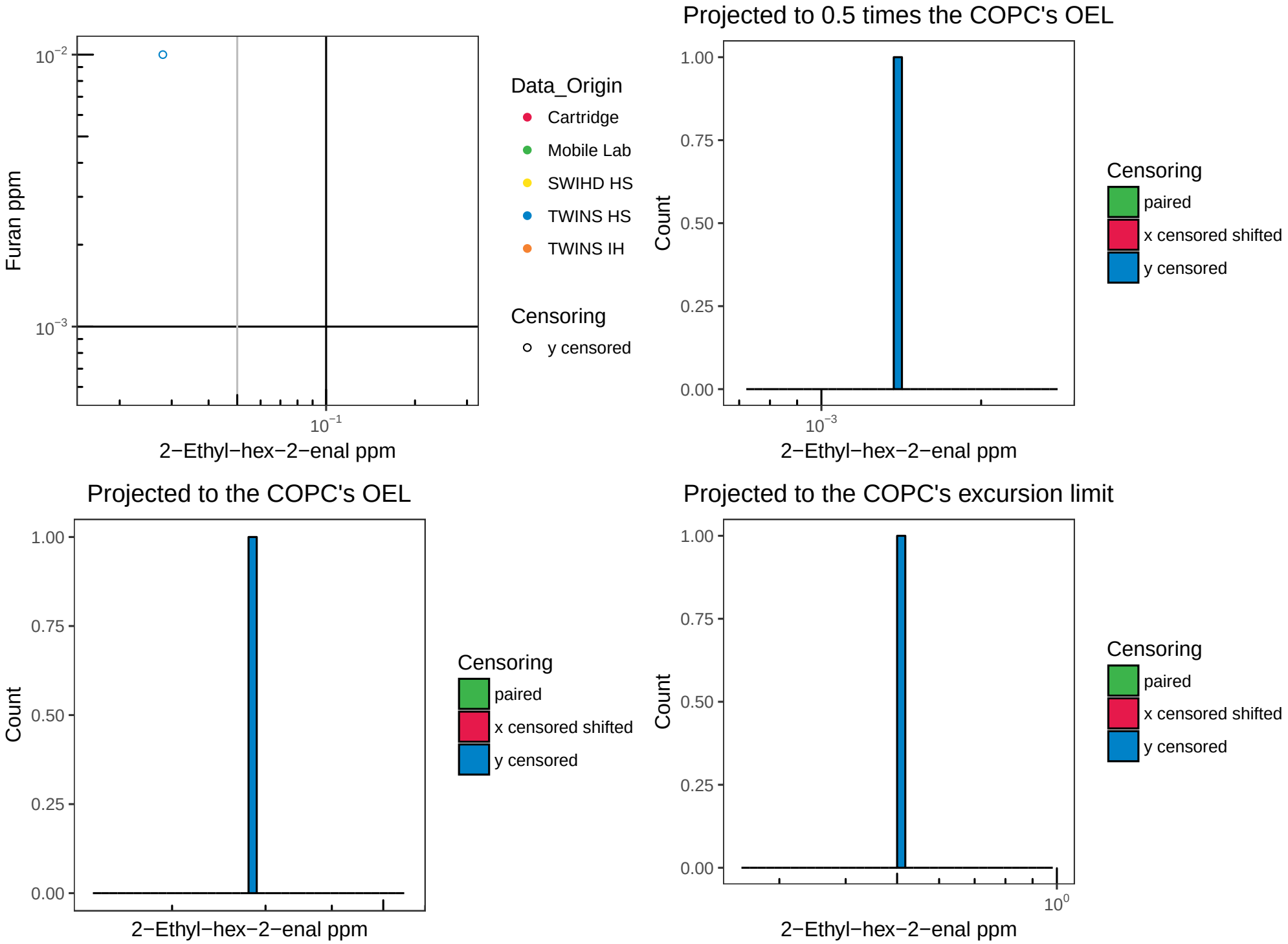


Figure C.908: Furan vs 2-Ethyl-hex-2-enal

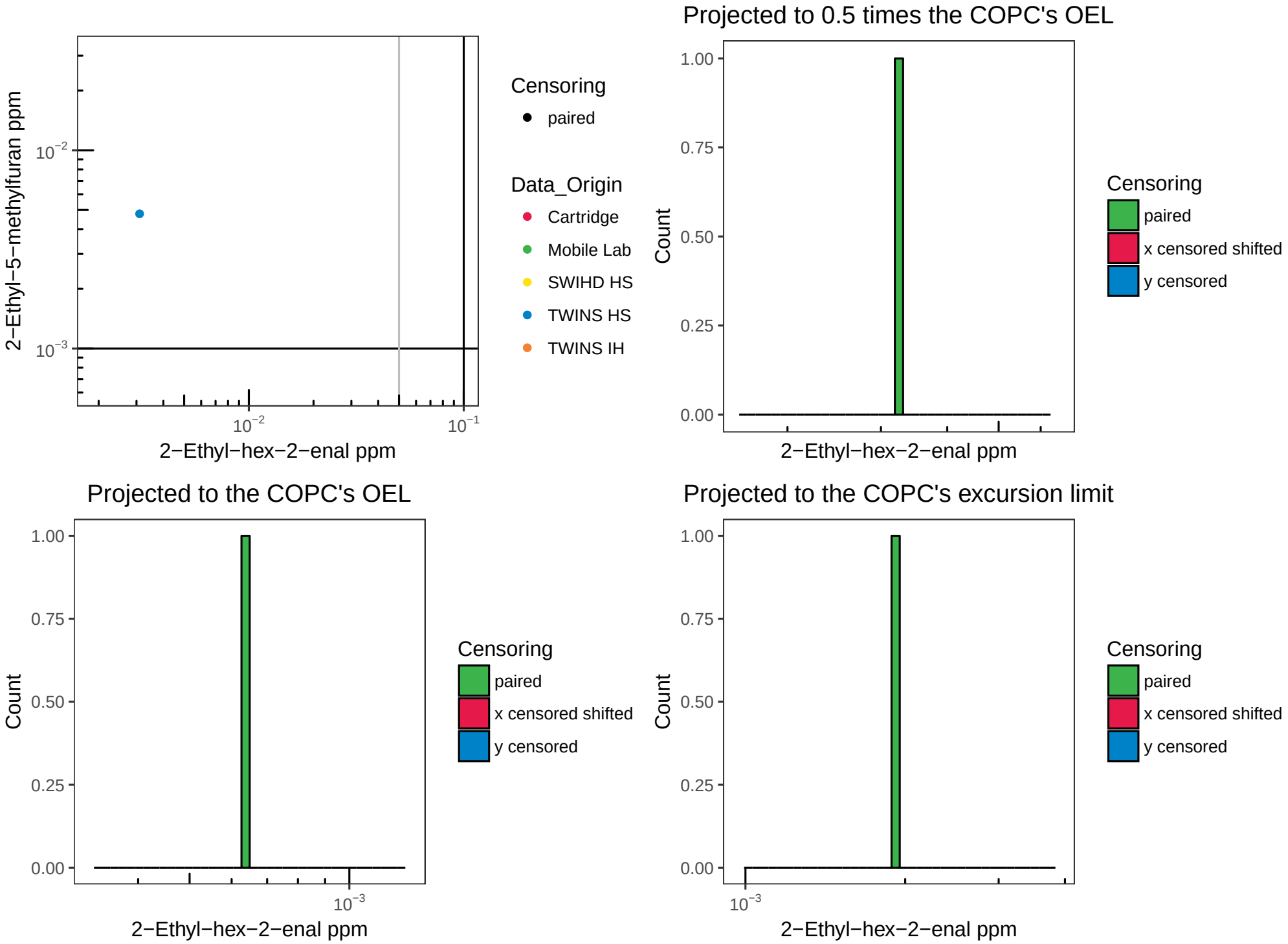


Figure C.909: 2-Ethyl-5-methylfuran vs 2-Ethyl-hex-2-enal

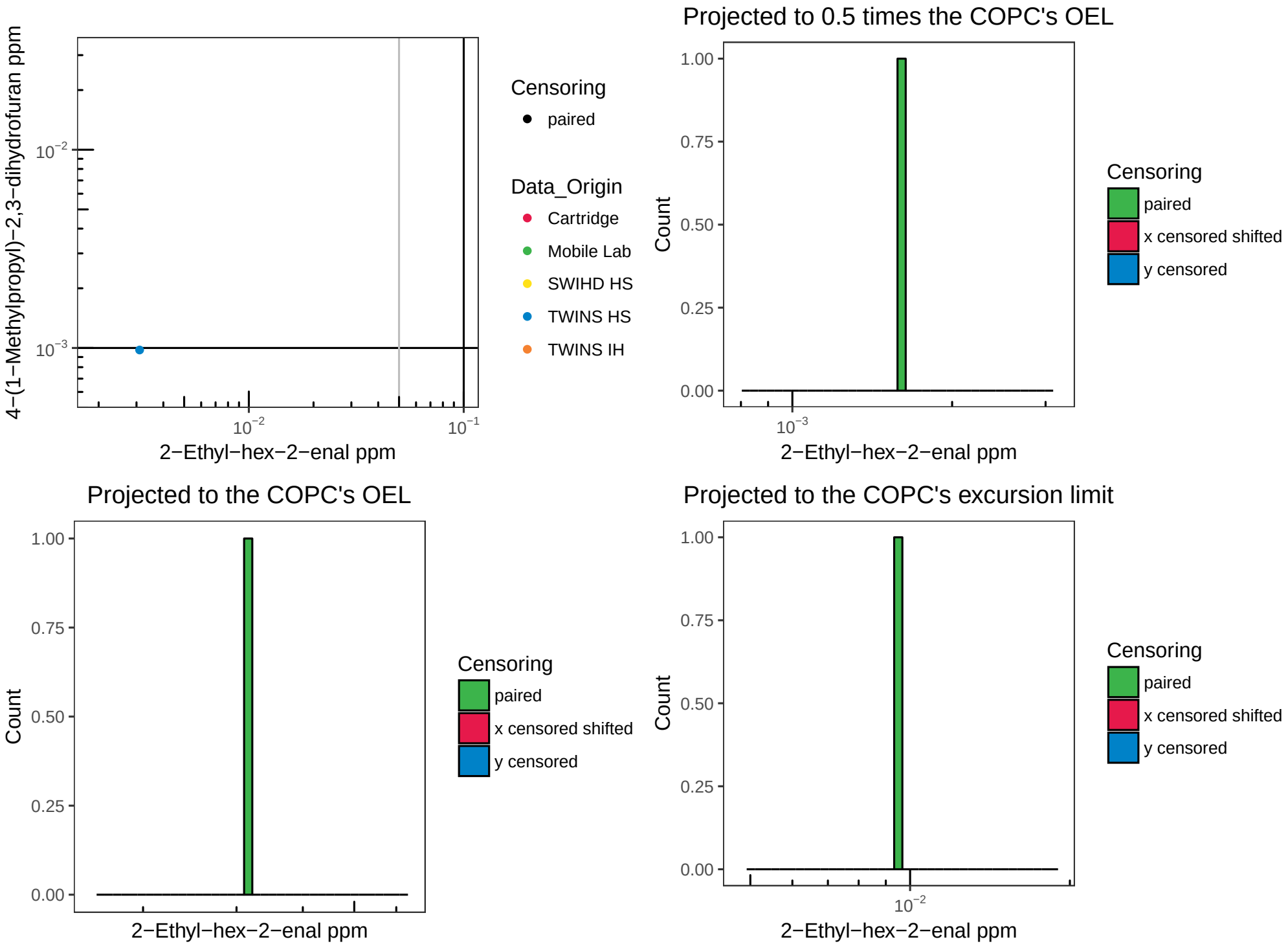


Figure C.910: 4-(1-Methylpropyl)-2,3-dihydrofuran vs 2-Ethyl-hex-2-enal

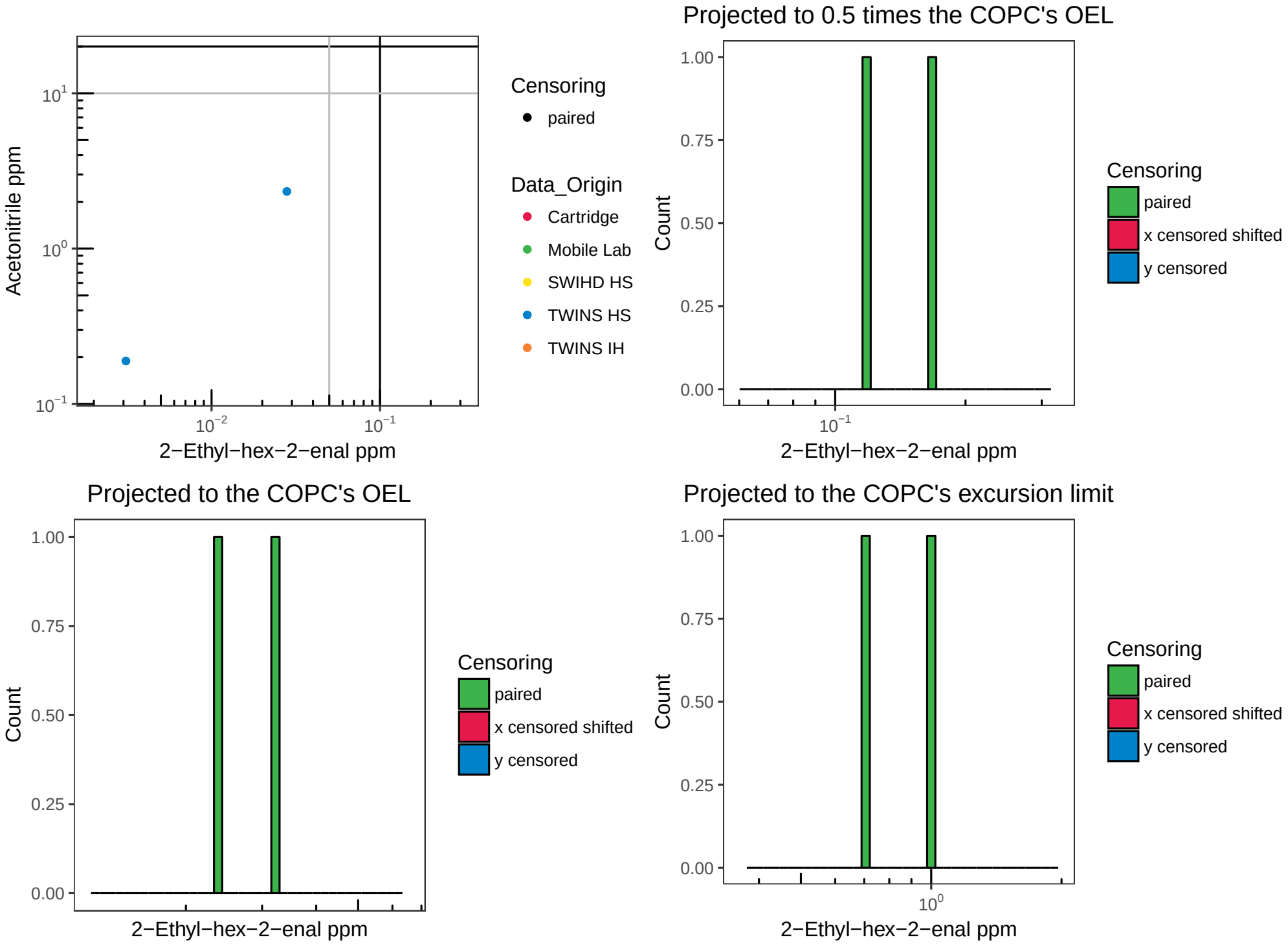


Figure C.911: Acetonitrile vs 2-Ethyl-hex-2-enal

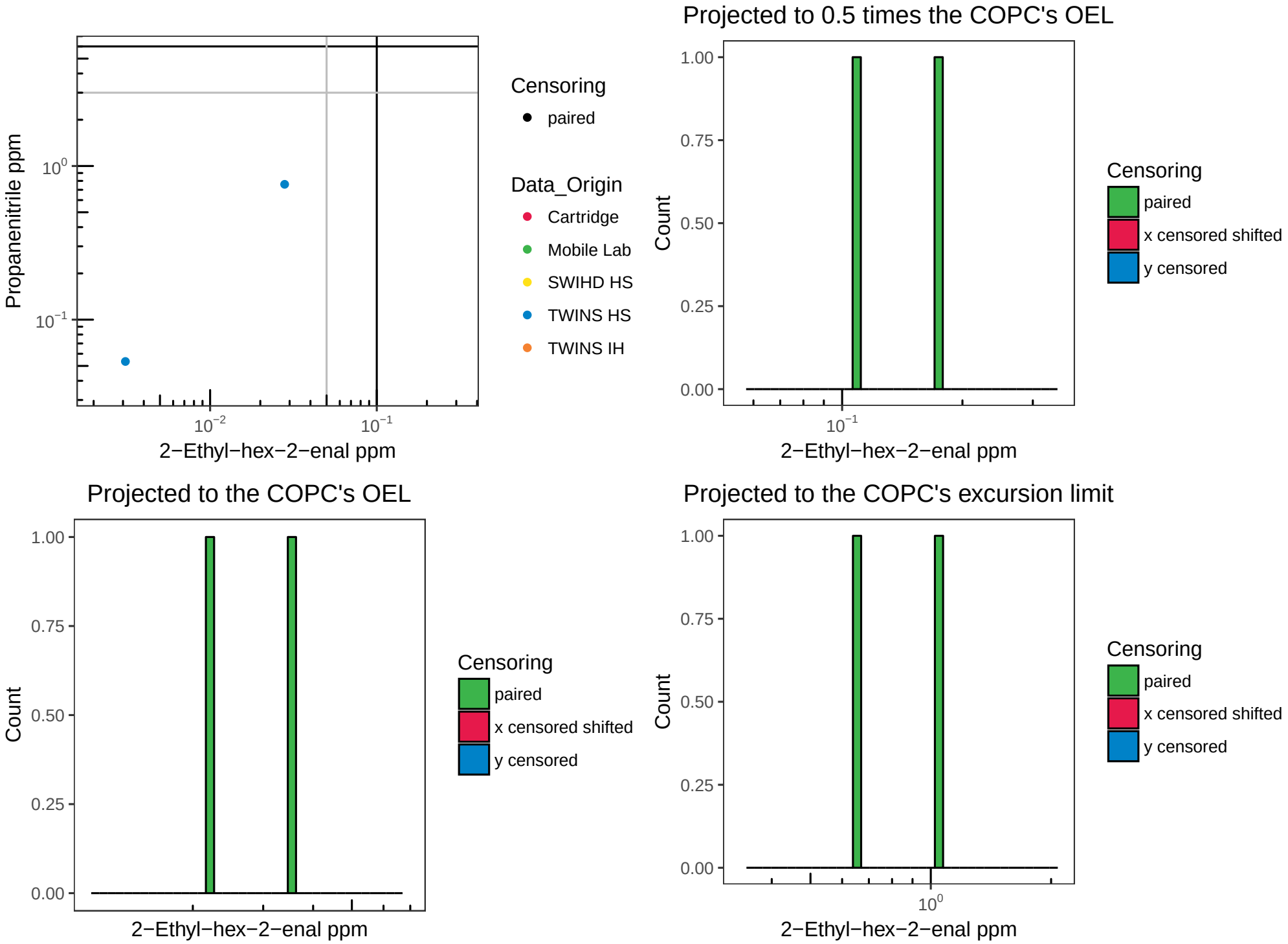


Figure C.912: Propanenitrile vs 2-Ethyl-hex-2-enal

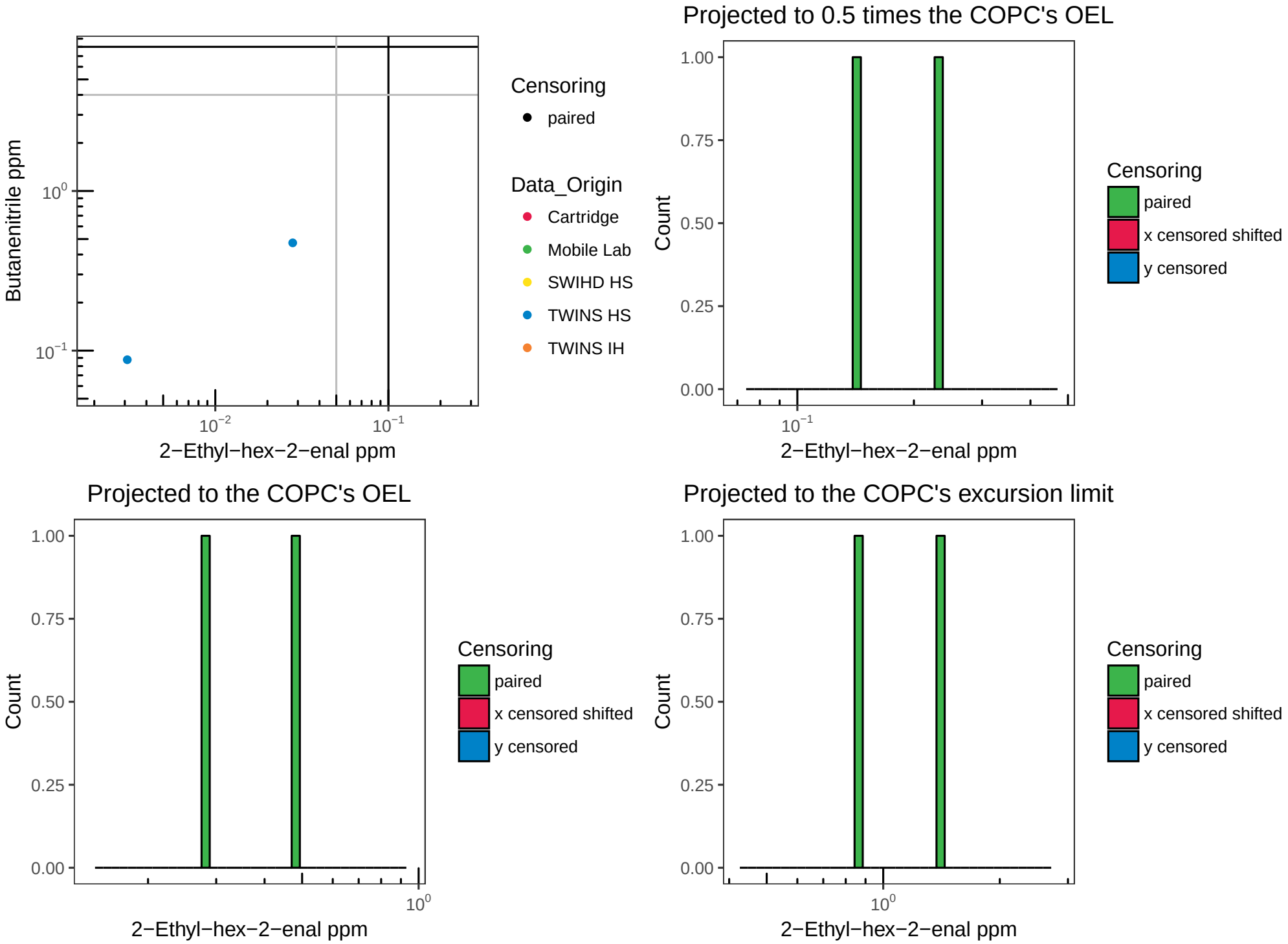


Figure C.913: Butanenitrile vs 2-Ethyl-hex-2-enal

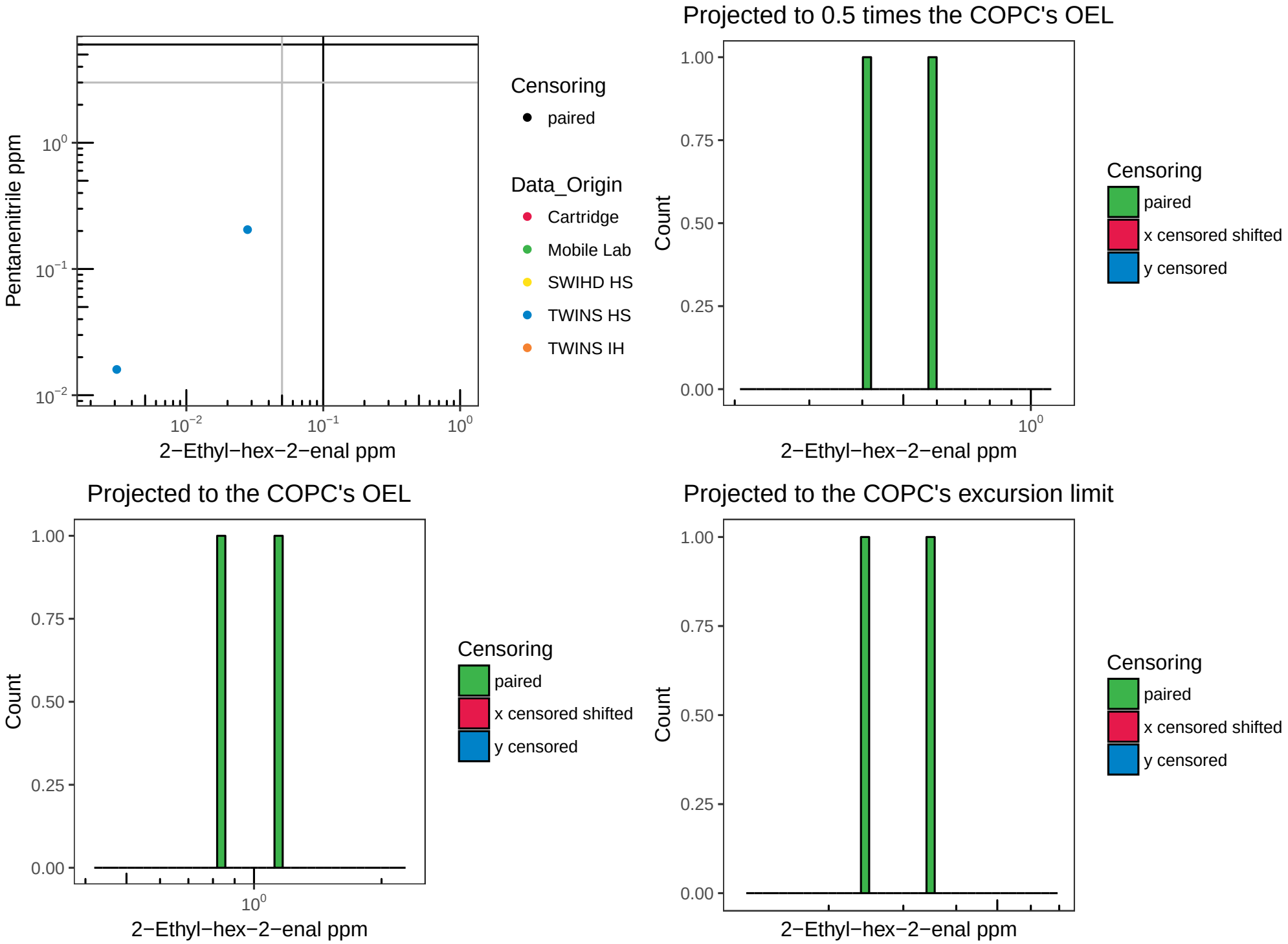


Figure C.914: Pentanenitrile vs 2-Ethyl-hex-2-enal

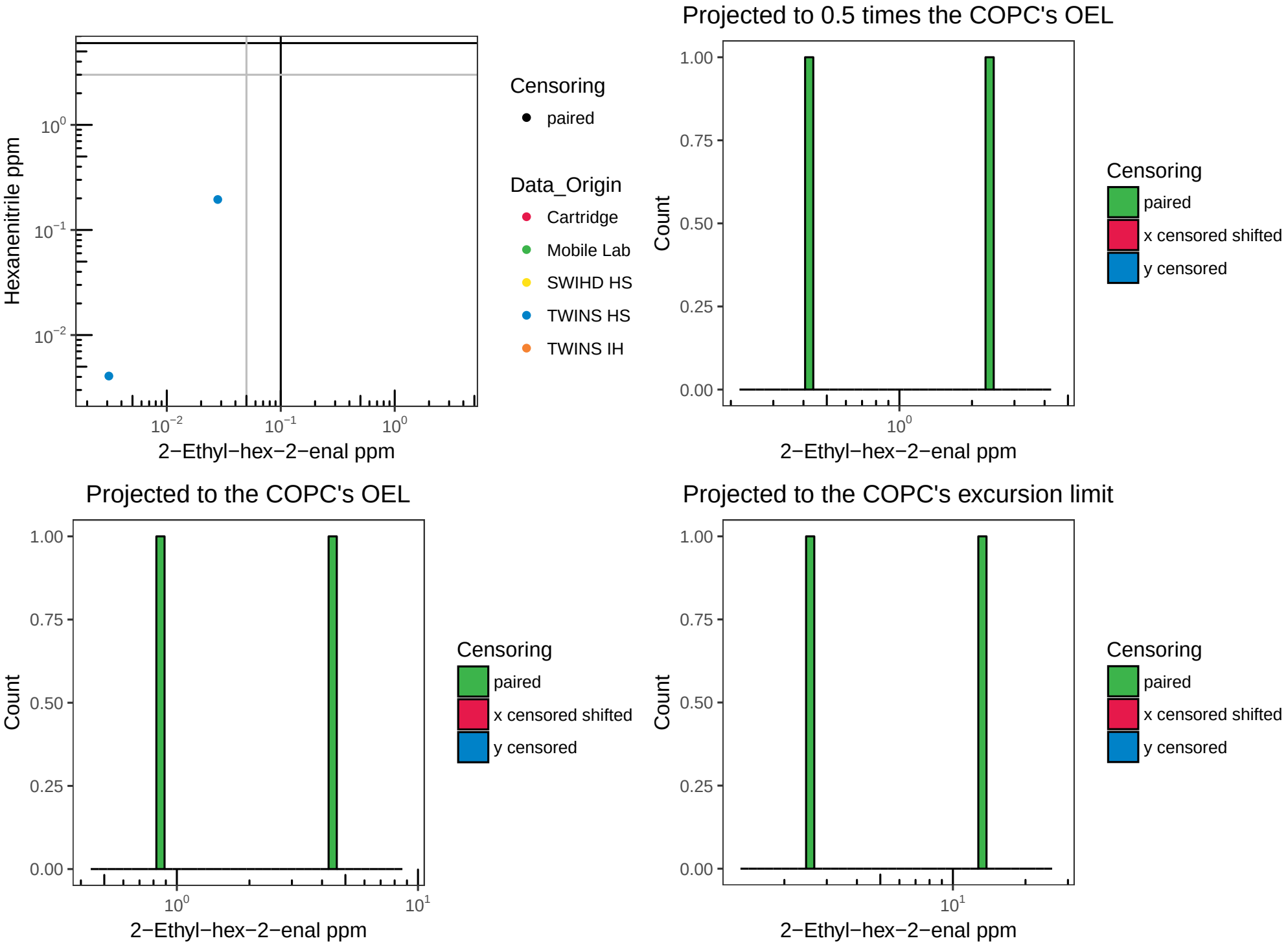


Figure C.915: Hexanenitrile vs 2-Ethyl-hex-2-enal

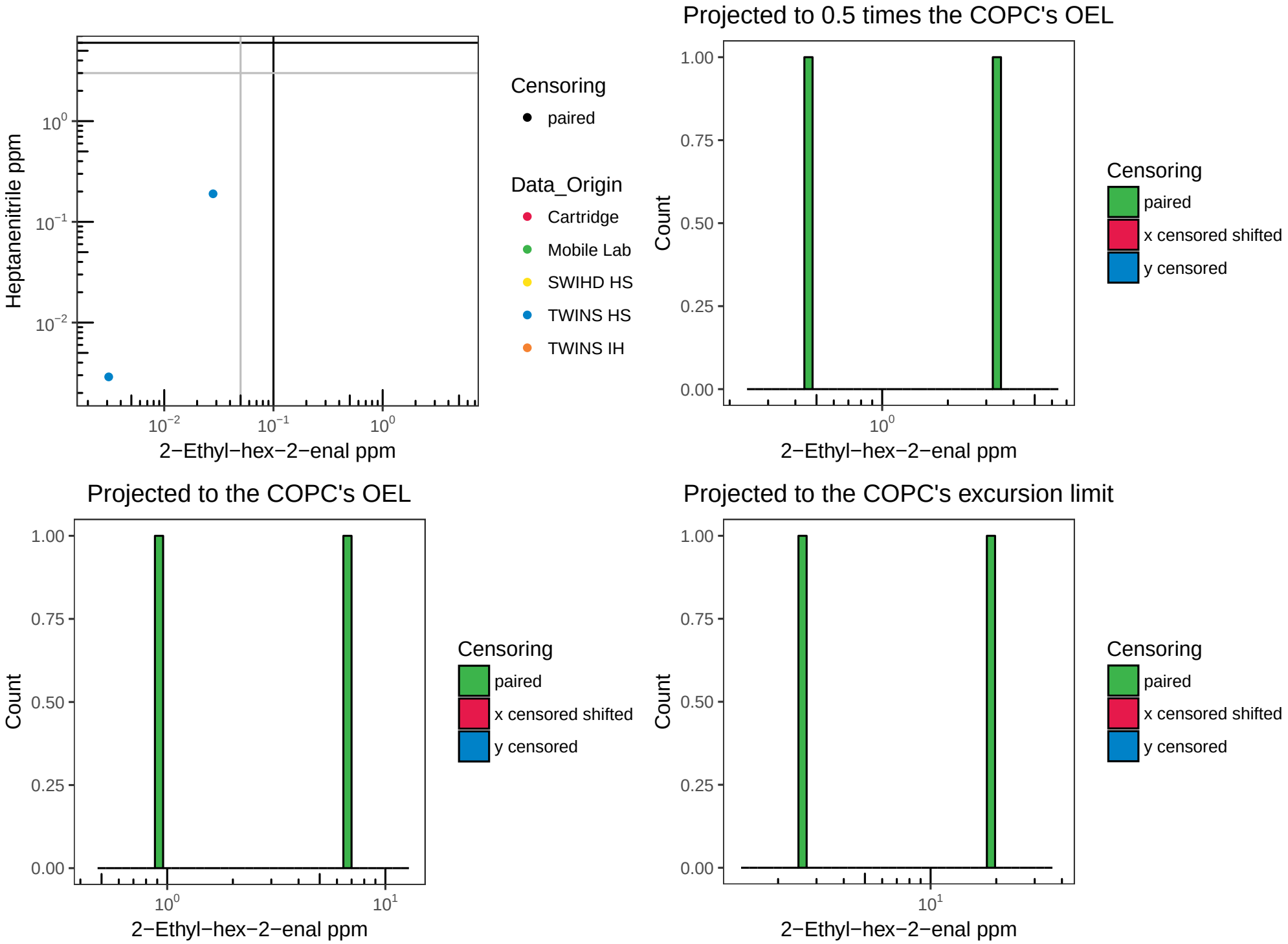


Figure C.916: Heptanenitrile vs 2-Ethyl-hex-2-enal

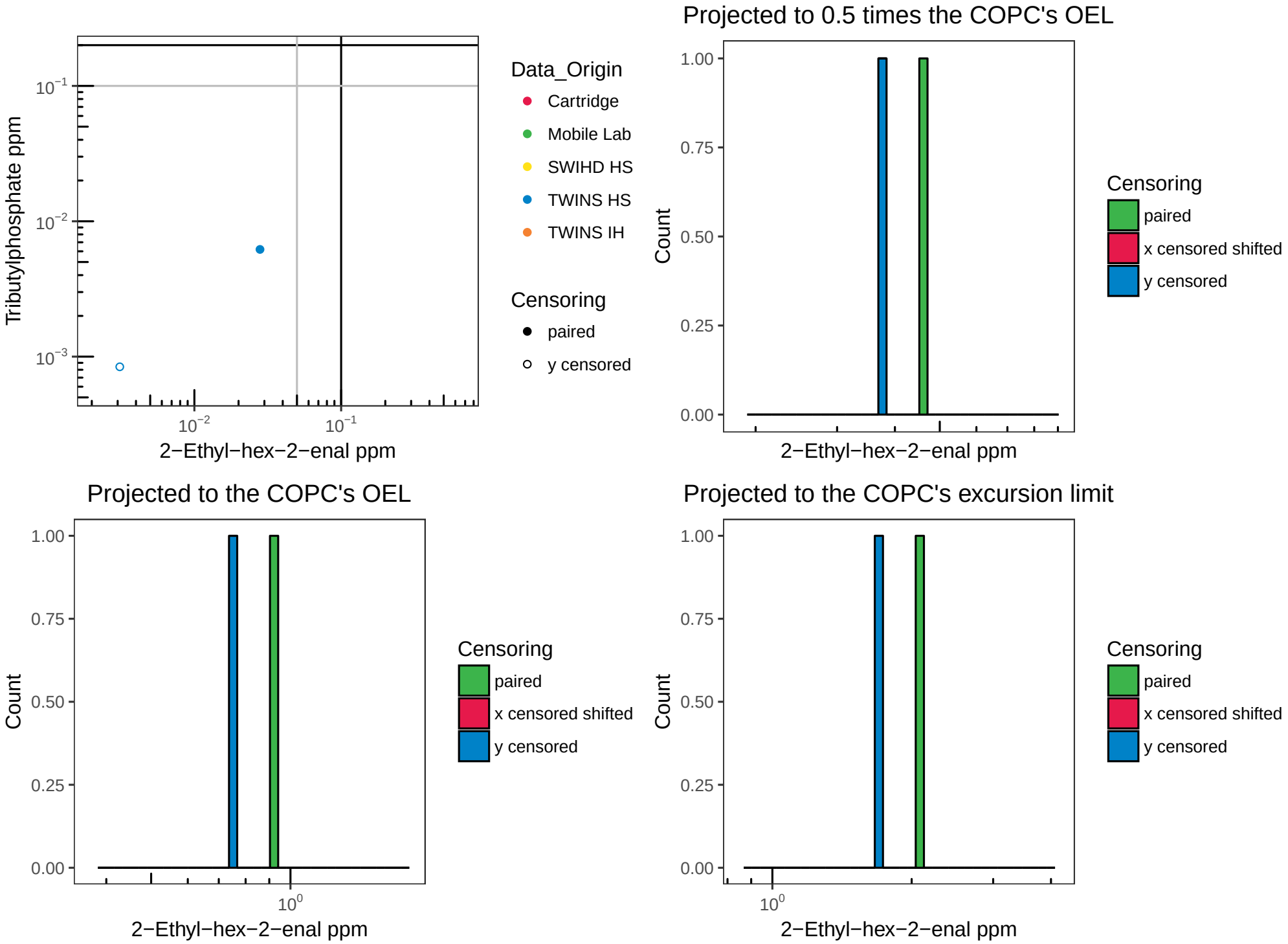


Figure C.917: Tributylphosphate vs 2-Ethyl-hex-2-enal

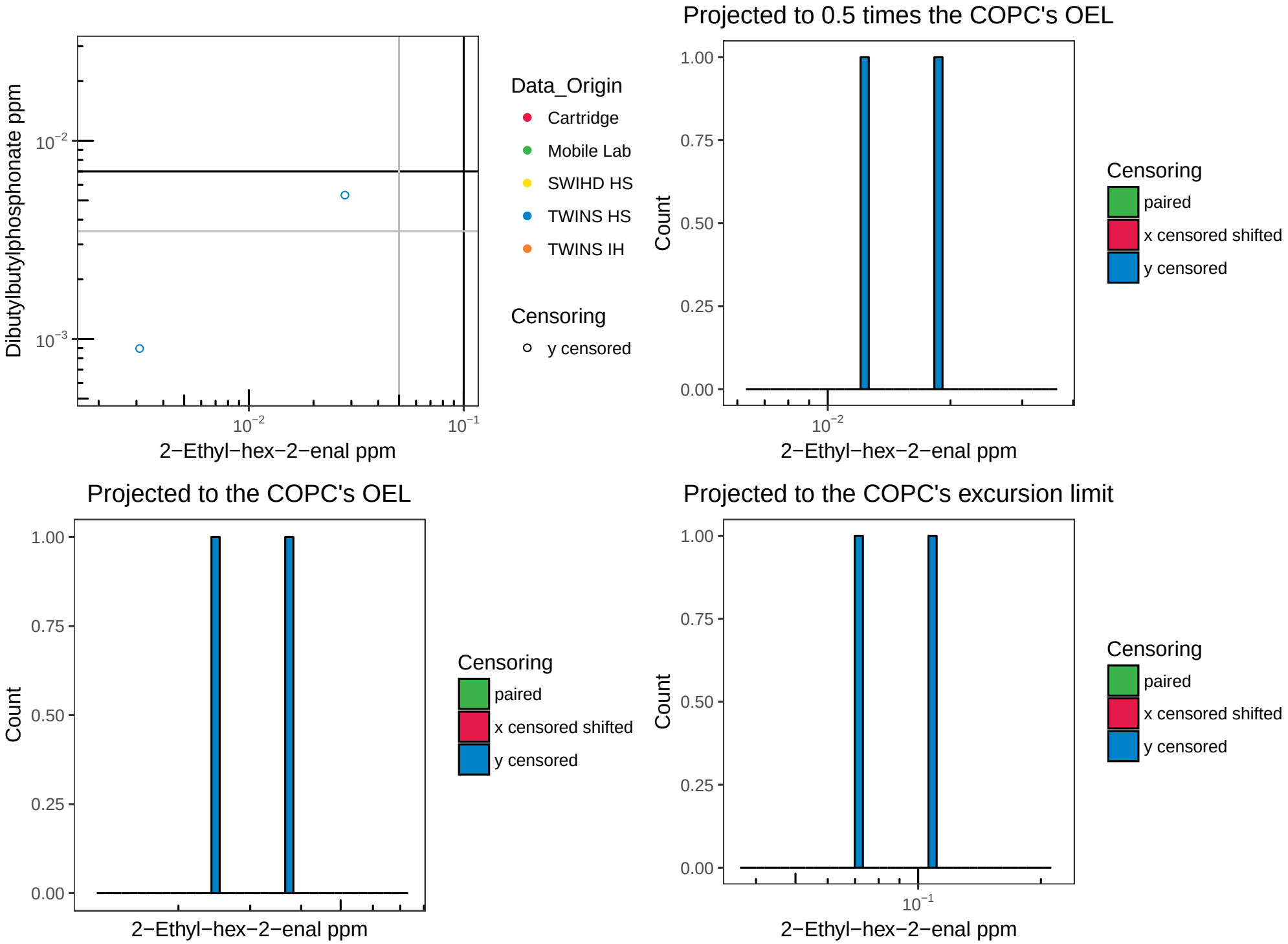


Figure C.918: Dibutylbutylphosphonate vs 2-Ethyl-hex-2-enal

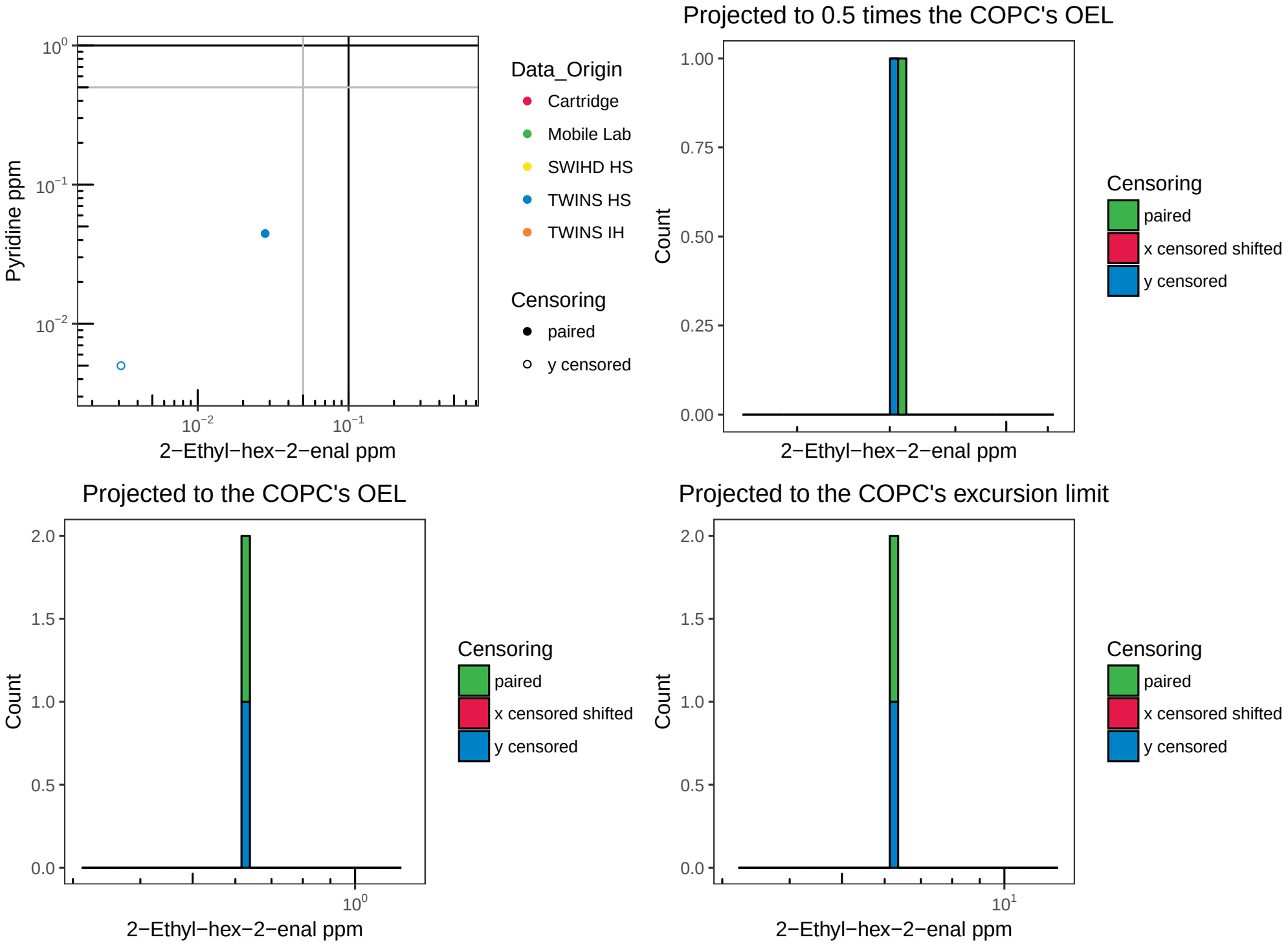


Figure C.919: Pyridine vs 2-Ethyl-hex-2-enal

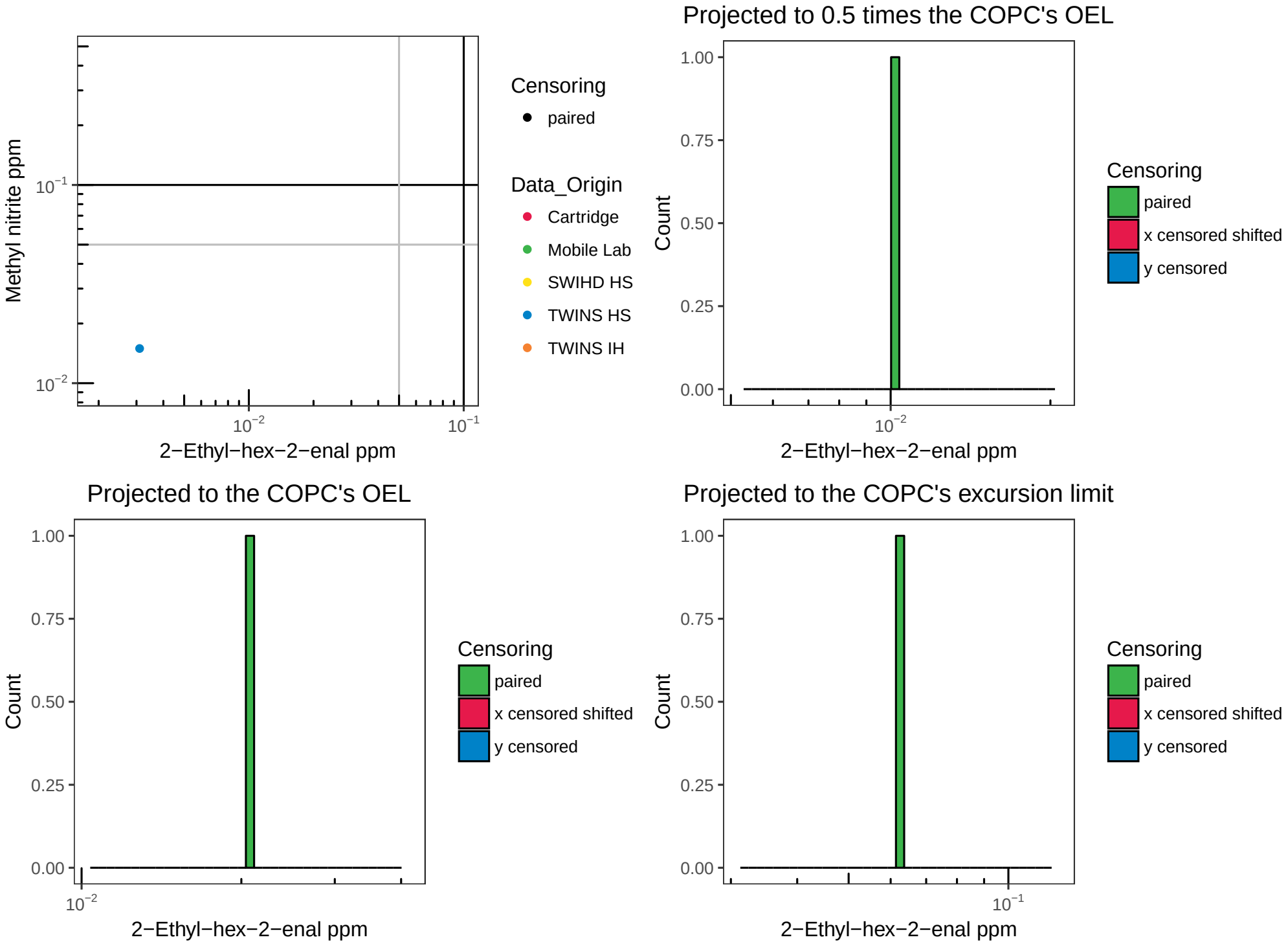


Figure C.920: Methyl nitrite vs 2-Ethyl-hex-2-enal

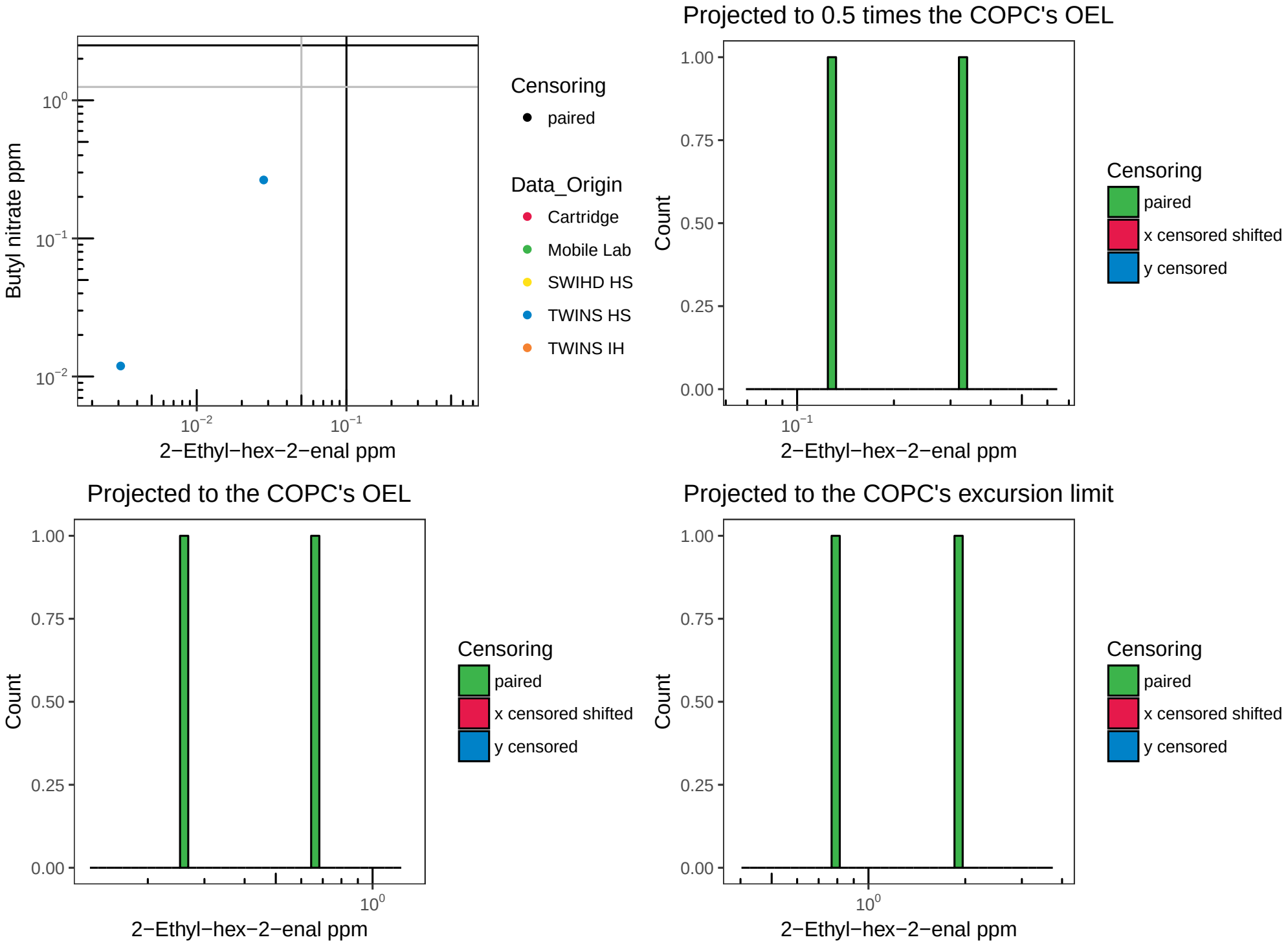


Figure C.921: Butyl nitrate vs 2-Ethyl-hex-2-enal

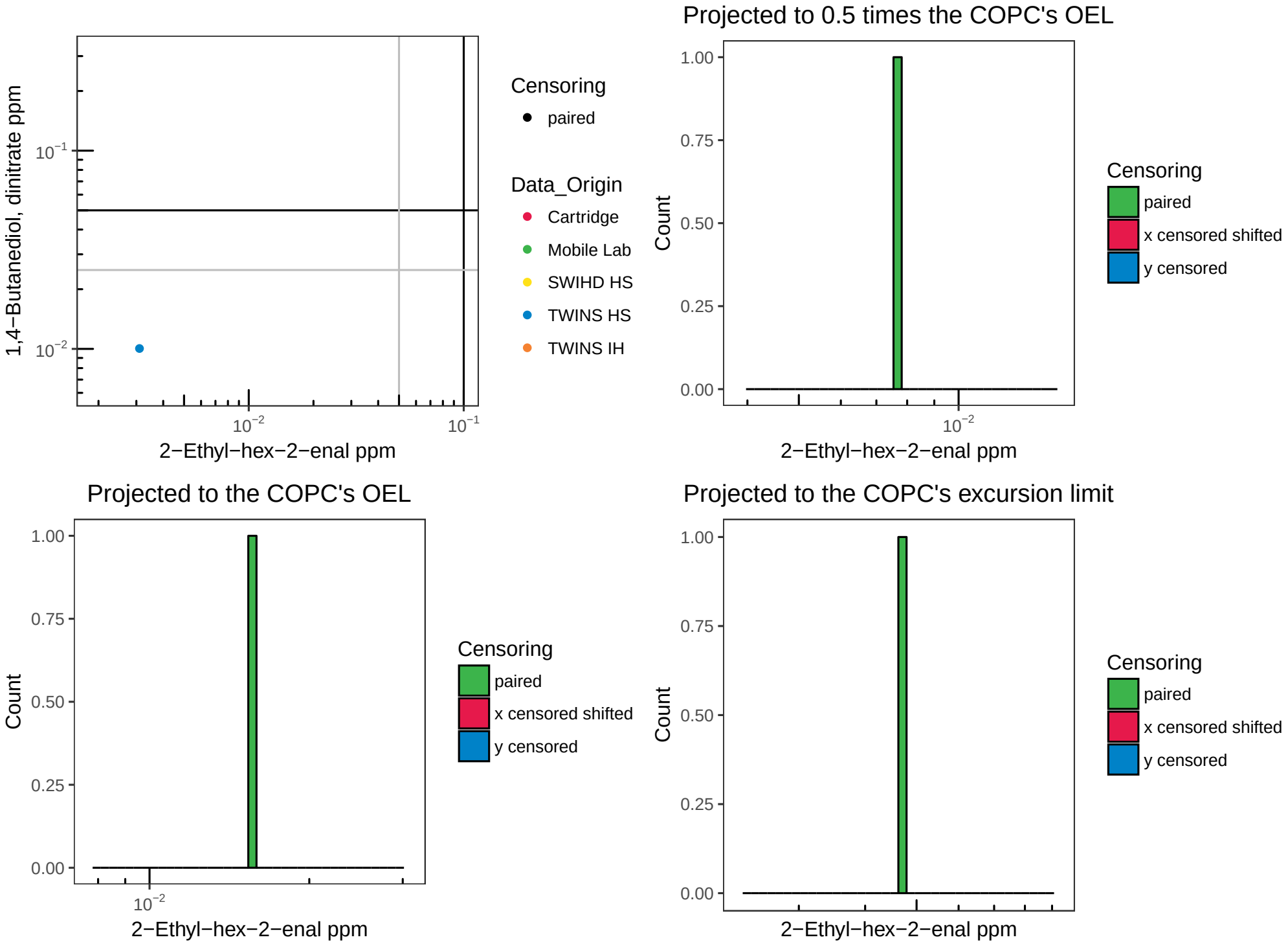


Figure C.922: 1,4-Butanediol, dinitrate vs 2-Ethyl-hex-2-enal

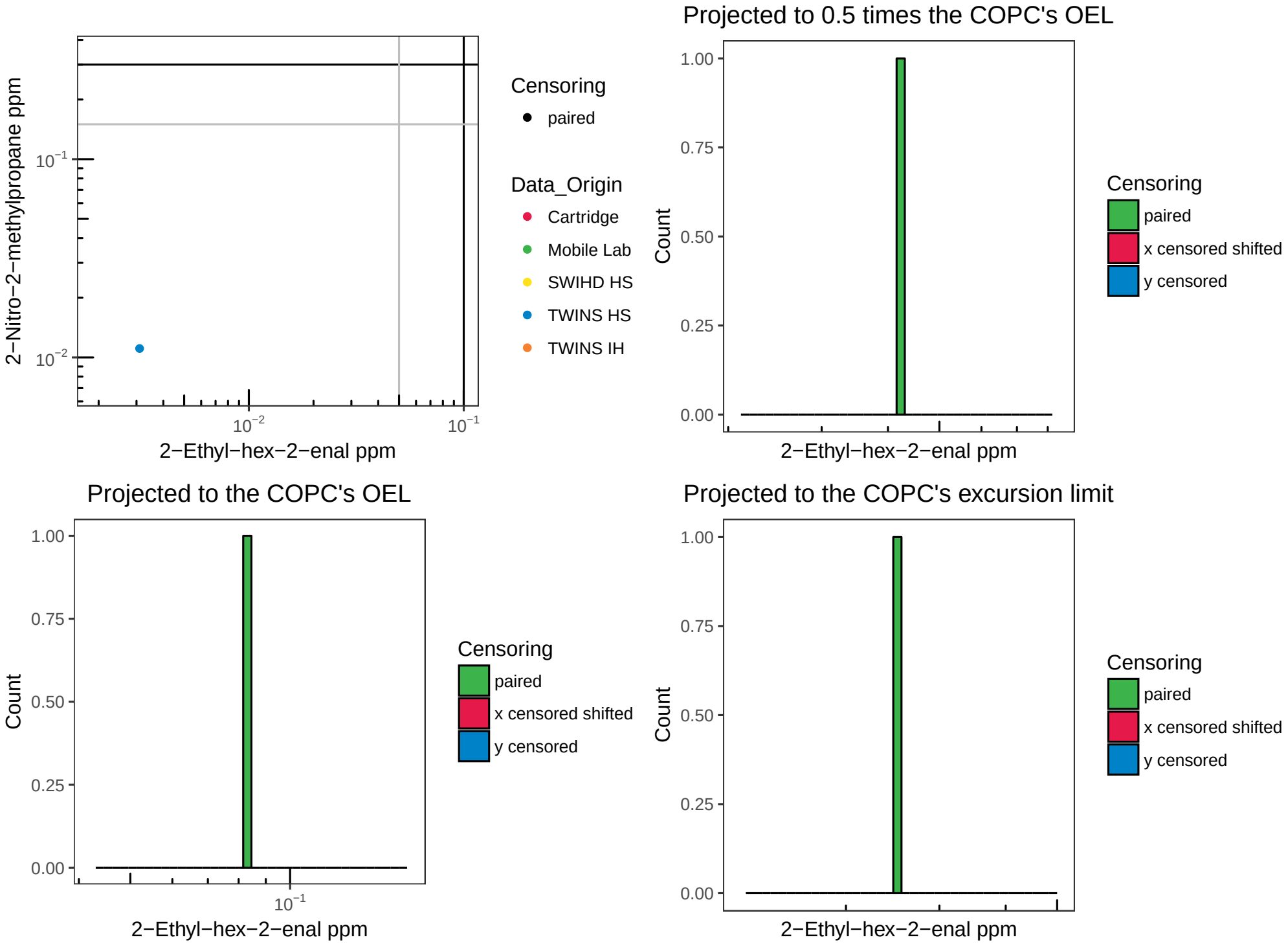


Figure C.923: 2-Nitro-2-methylpropane vs 2-Ethyl-hex-2-enal

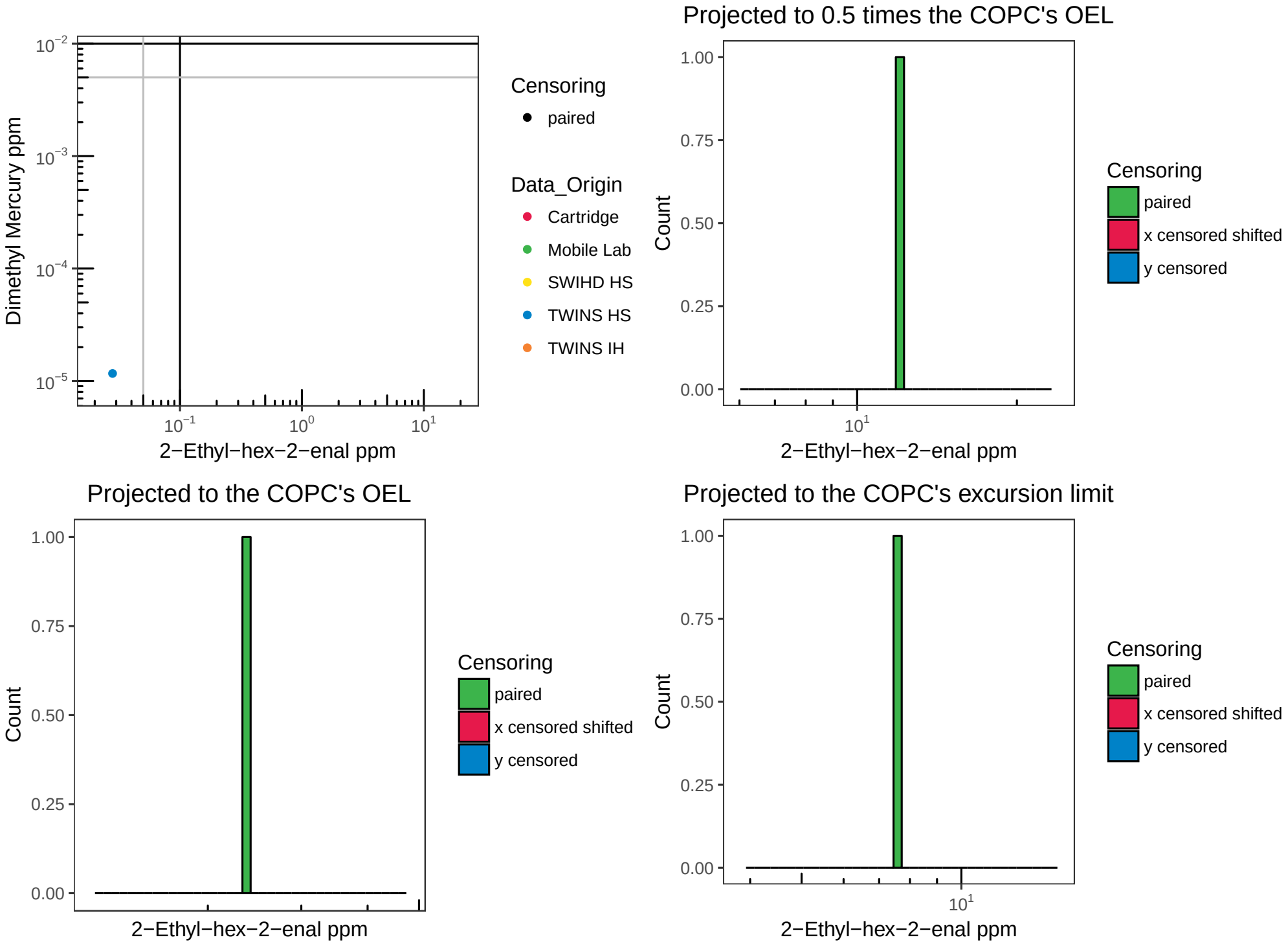


Figure C.924: Dimethyl Mercury vs 2-Ethyl-hex-2-enal

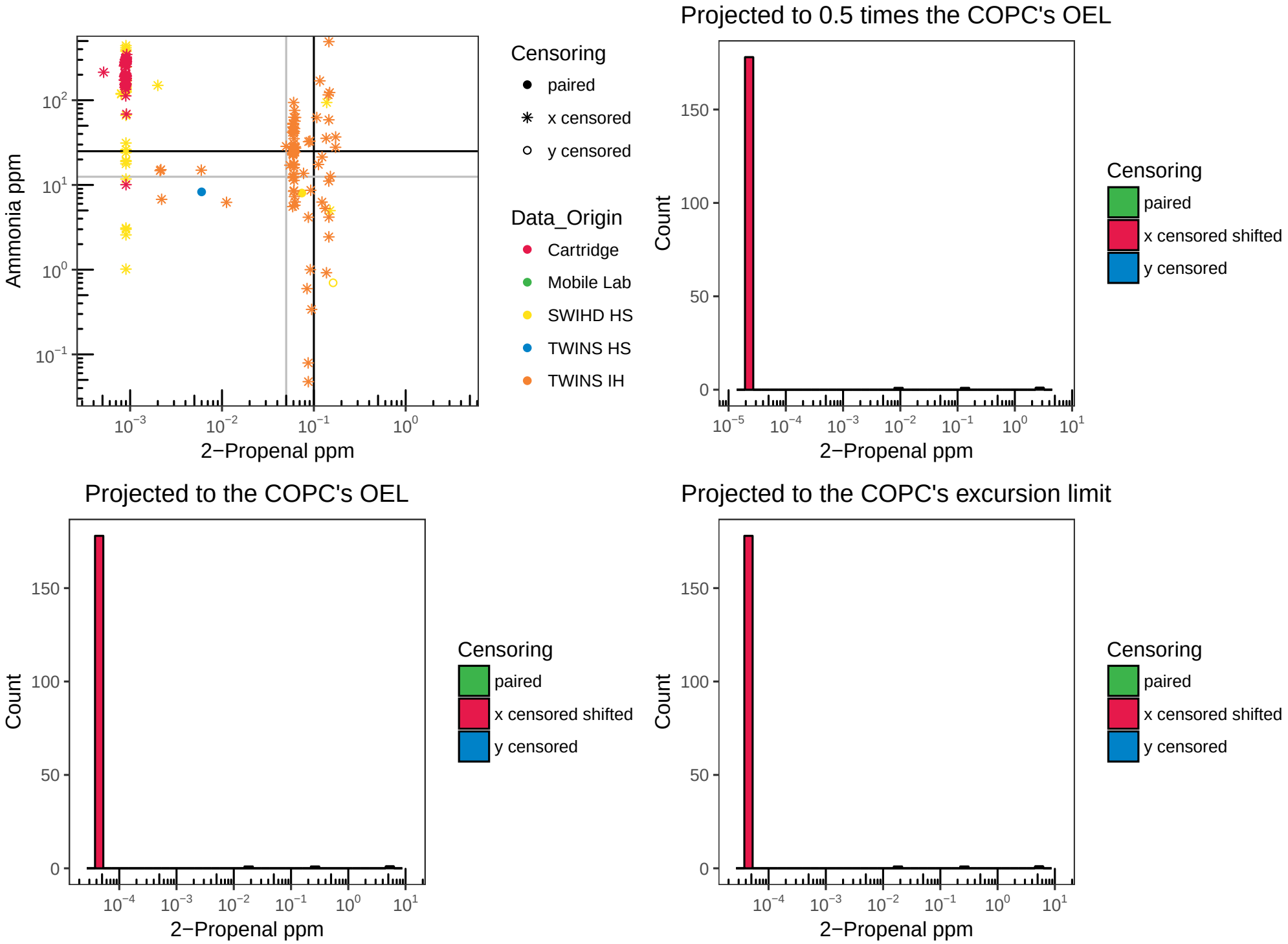


Figure C.925: Ammonia vs 2-Propenal

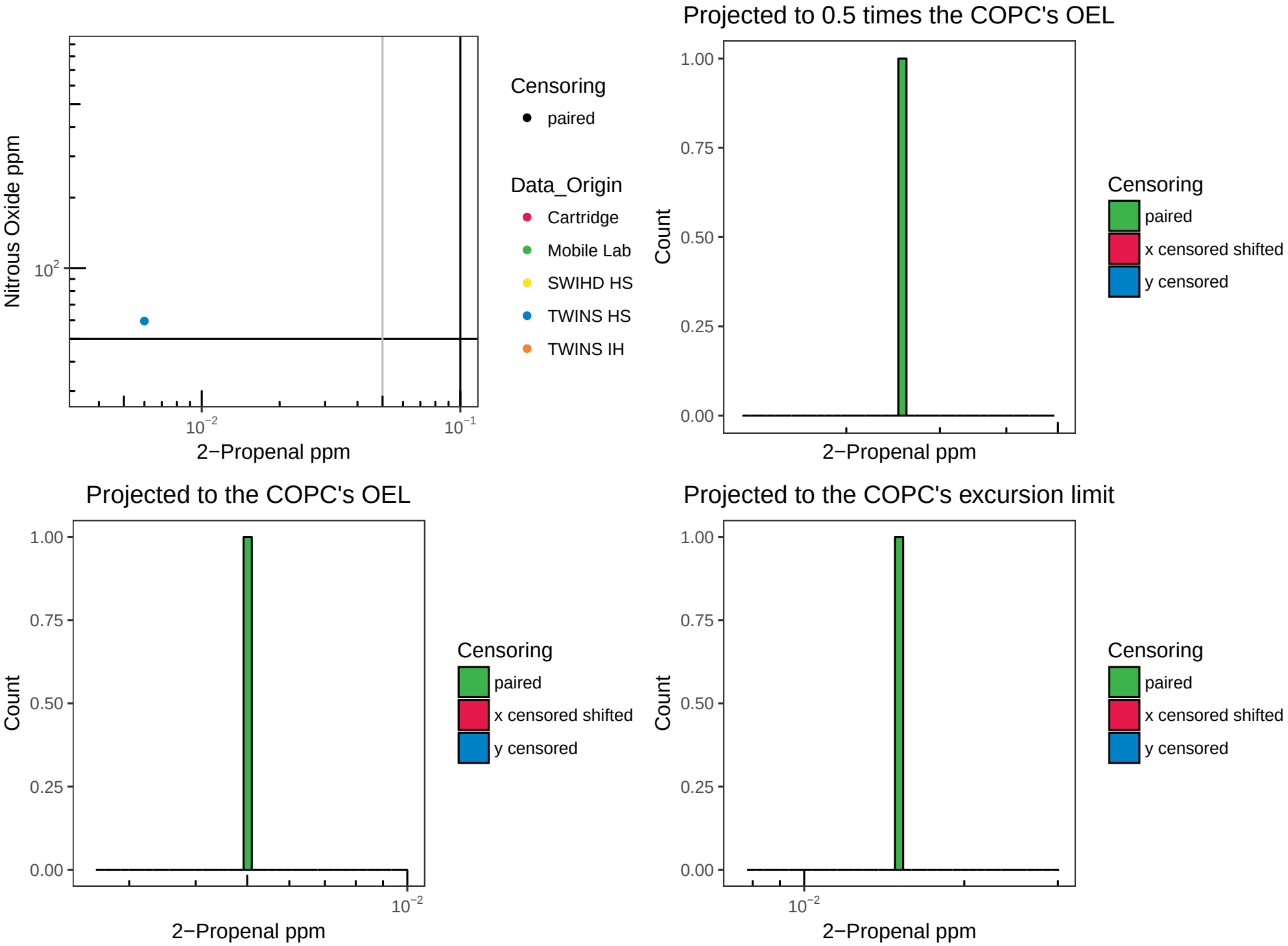


Figure C.926: Nitrous Oxide vs 2-Propenal

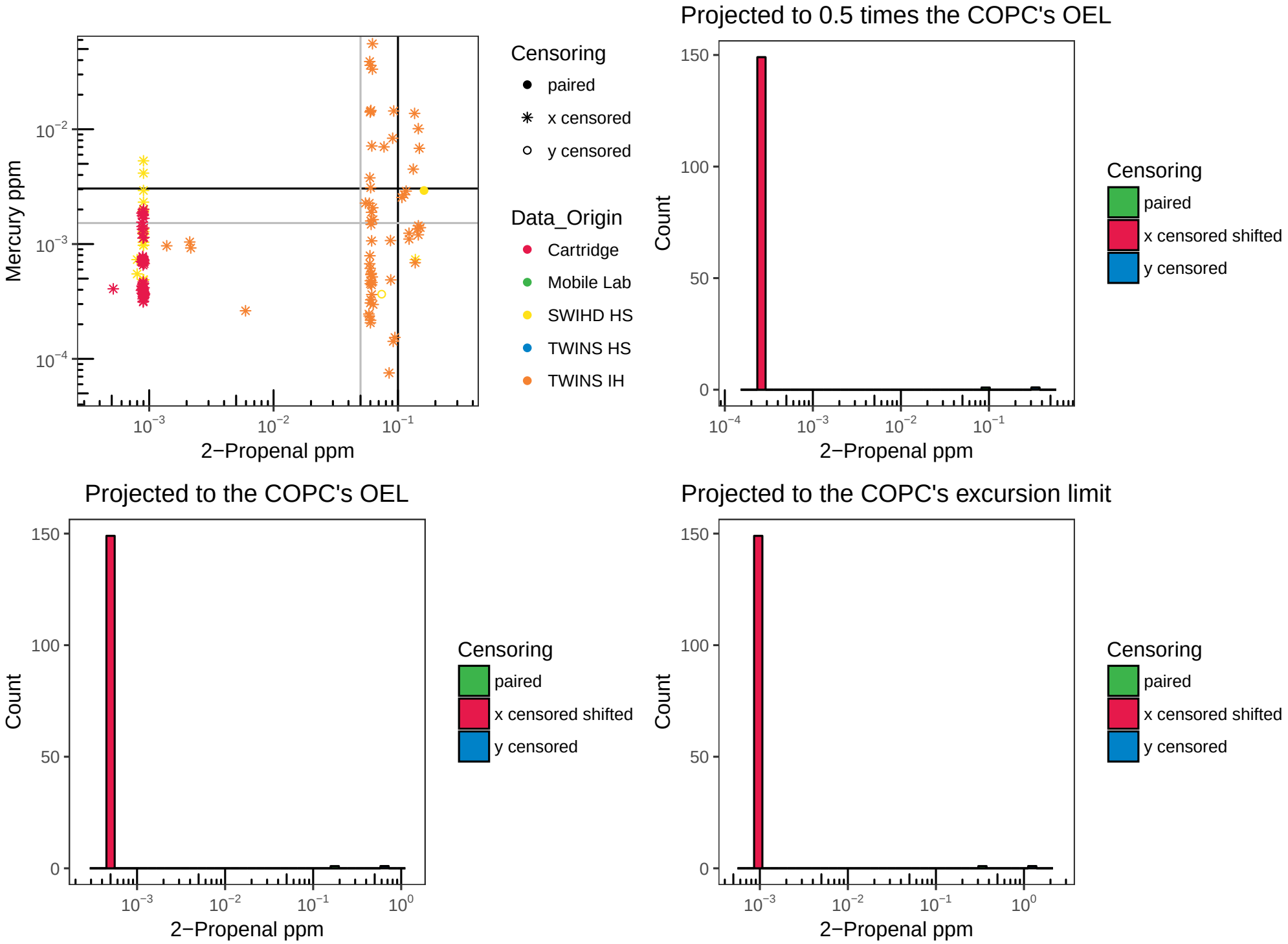


Figure C.927: Mercury vs 2-Propenal

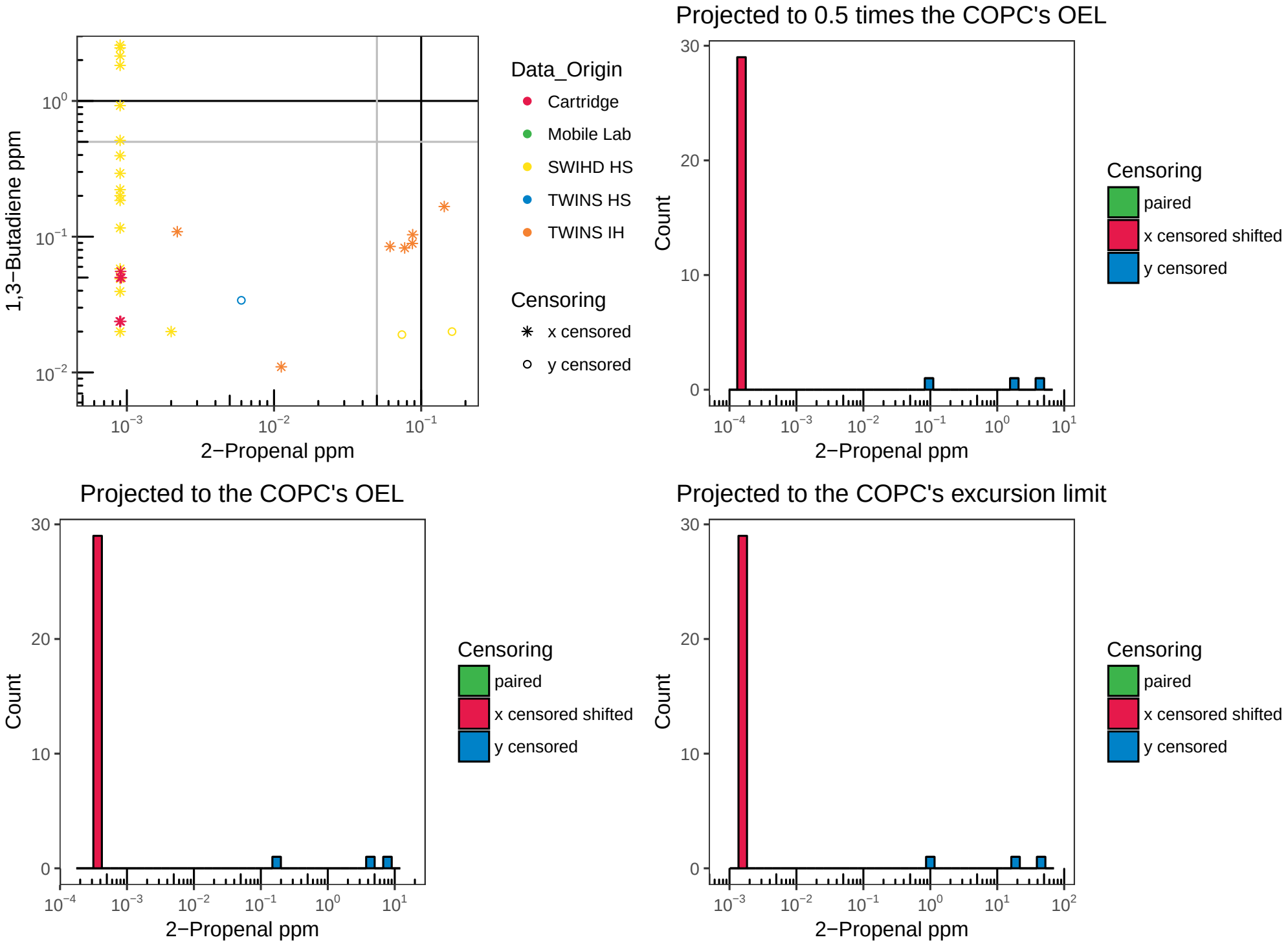


Figure C.928: 1,3-Butadiene vs 2-Propenal

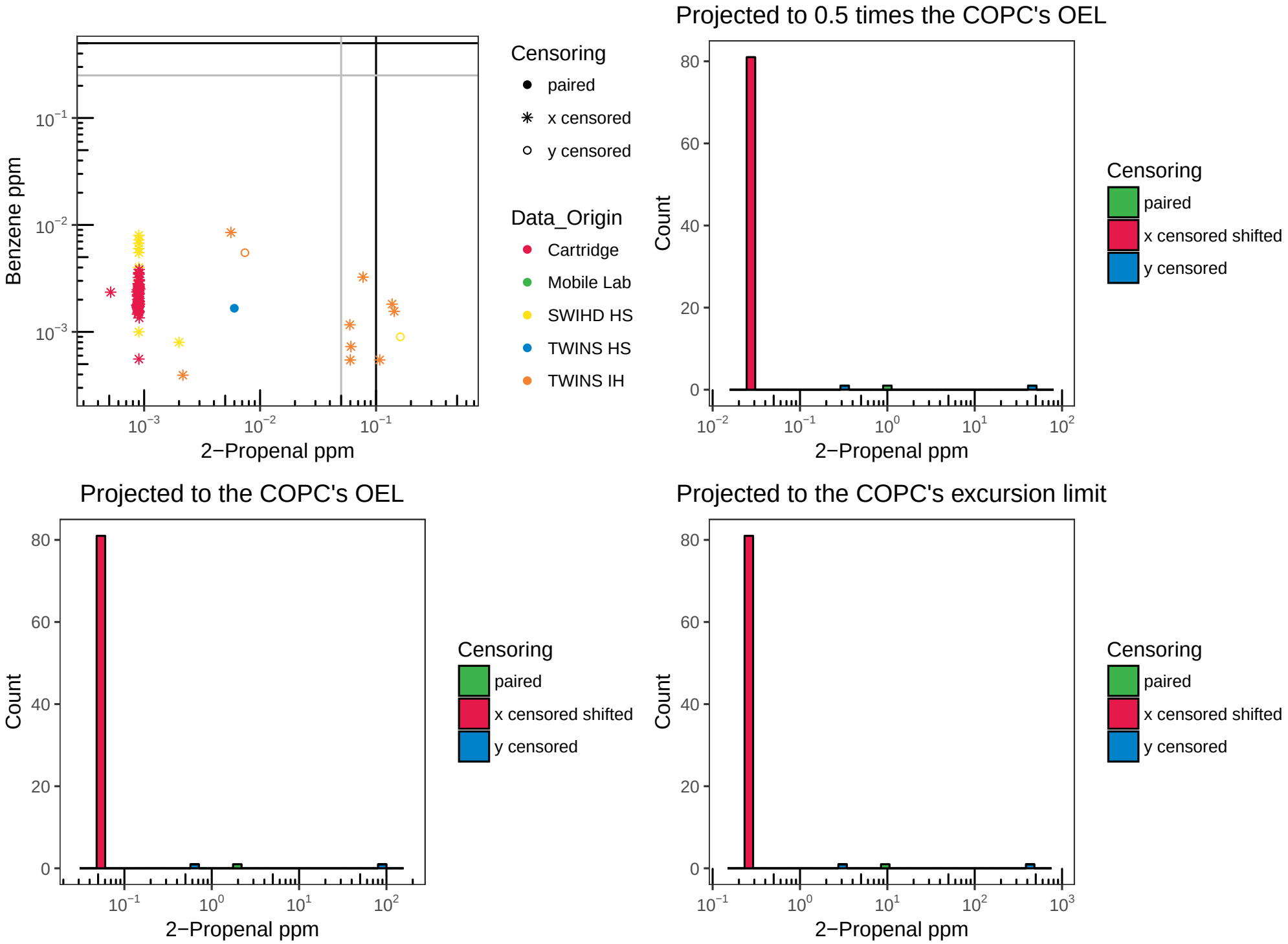


Figure C.929: Benzene vs 2-Propenal

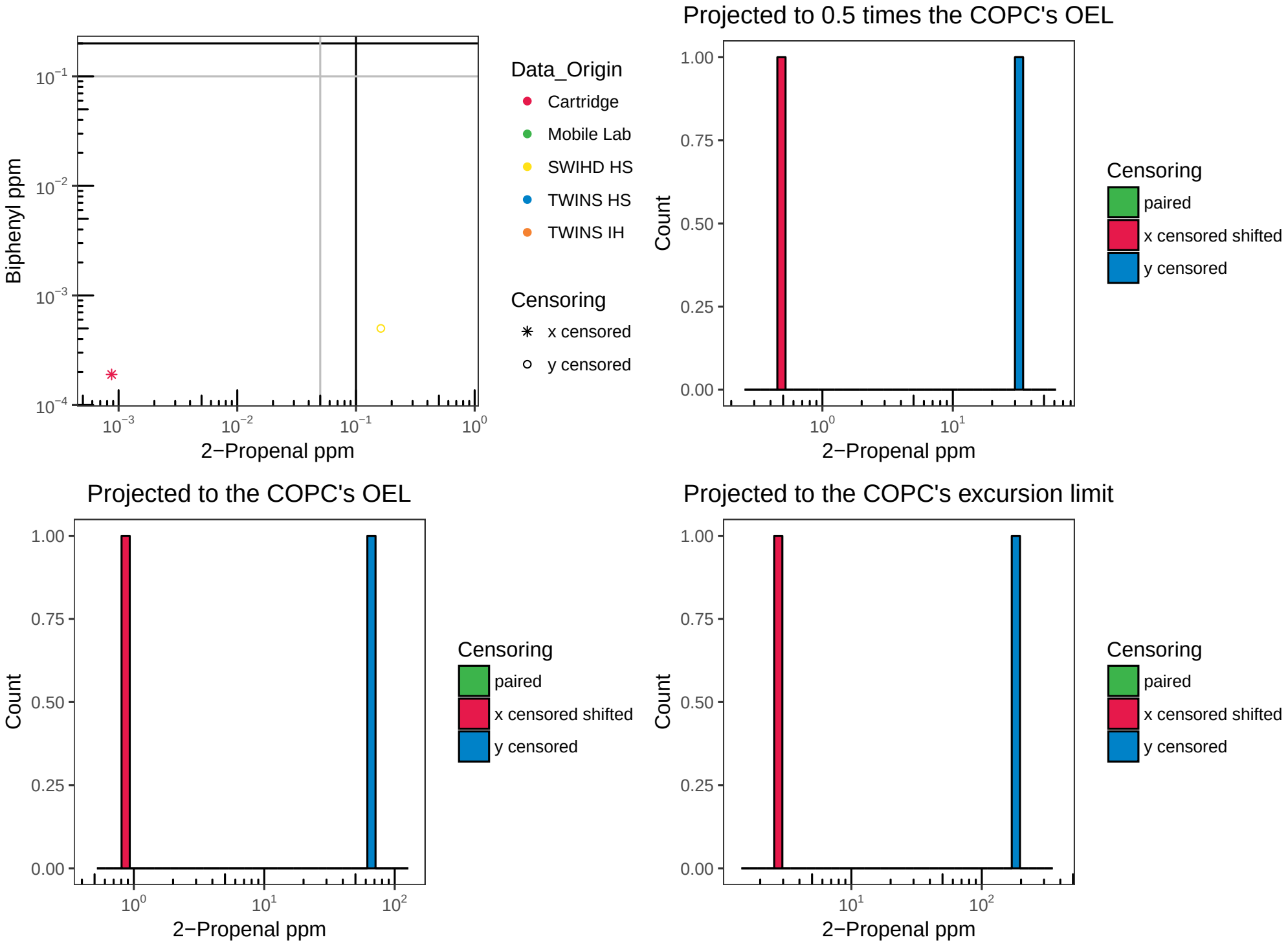


Figure C.930: Biphenyl vs 2-Propenal

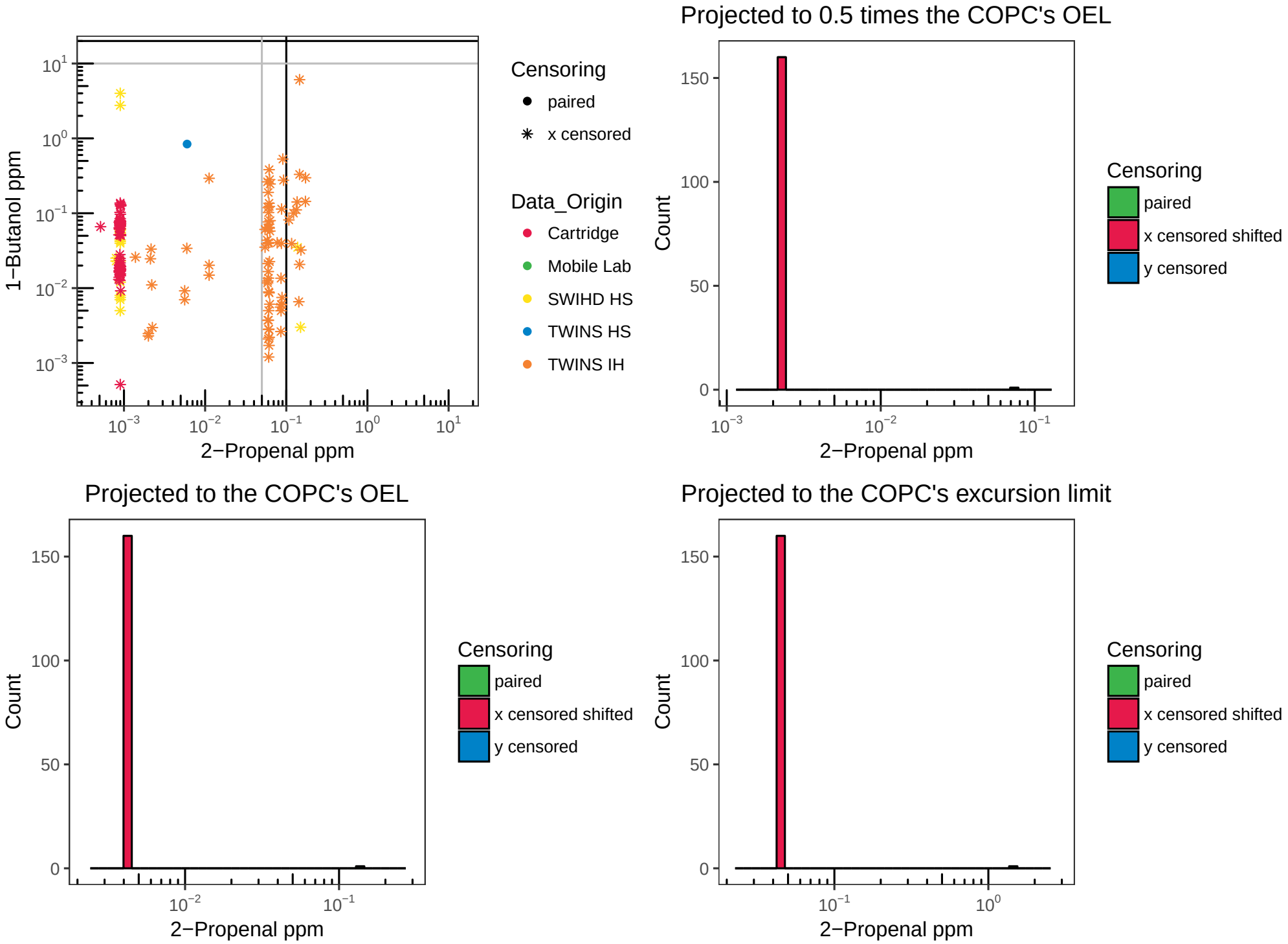


Figure C.931: 1-Butanol vs 2-Propenal

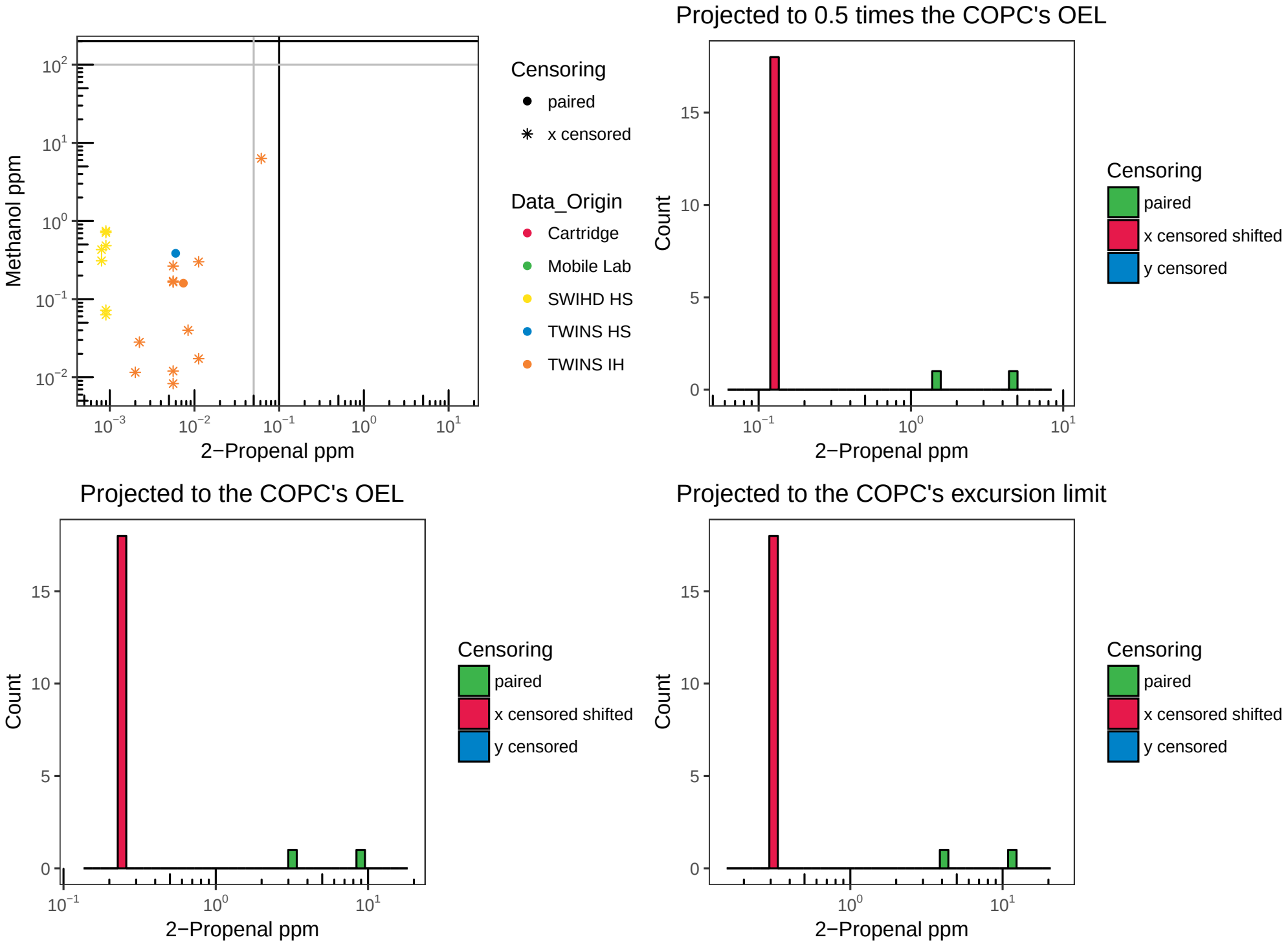


Figure C.932: Methanol vs 2-Propenal

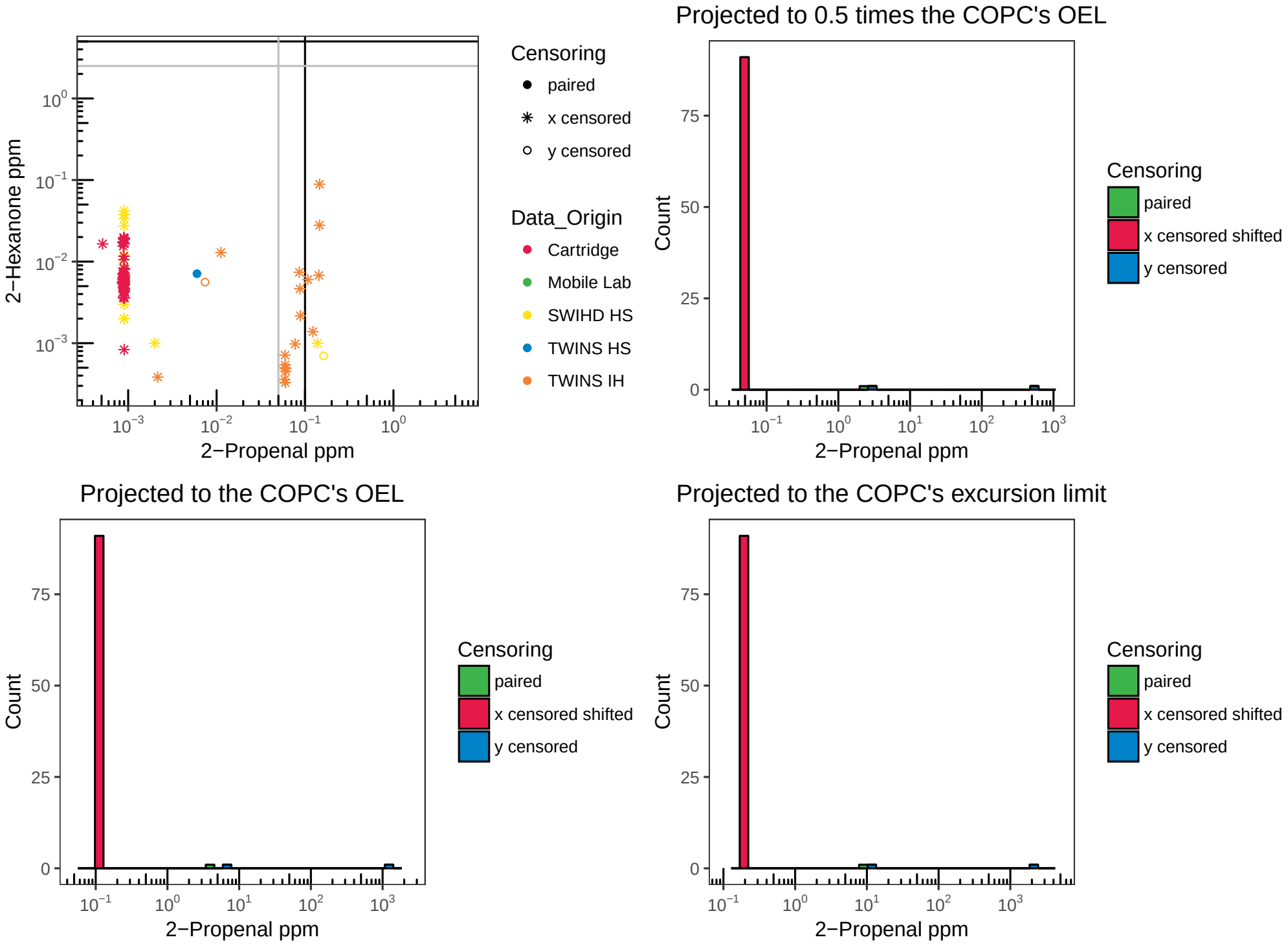


Figure C.933: 2-Hexanone vs 2-Propenal

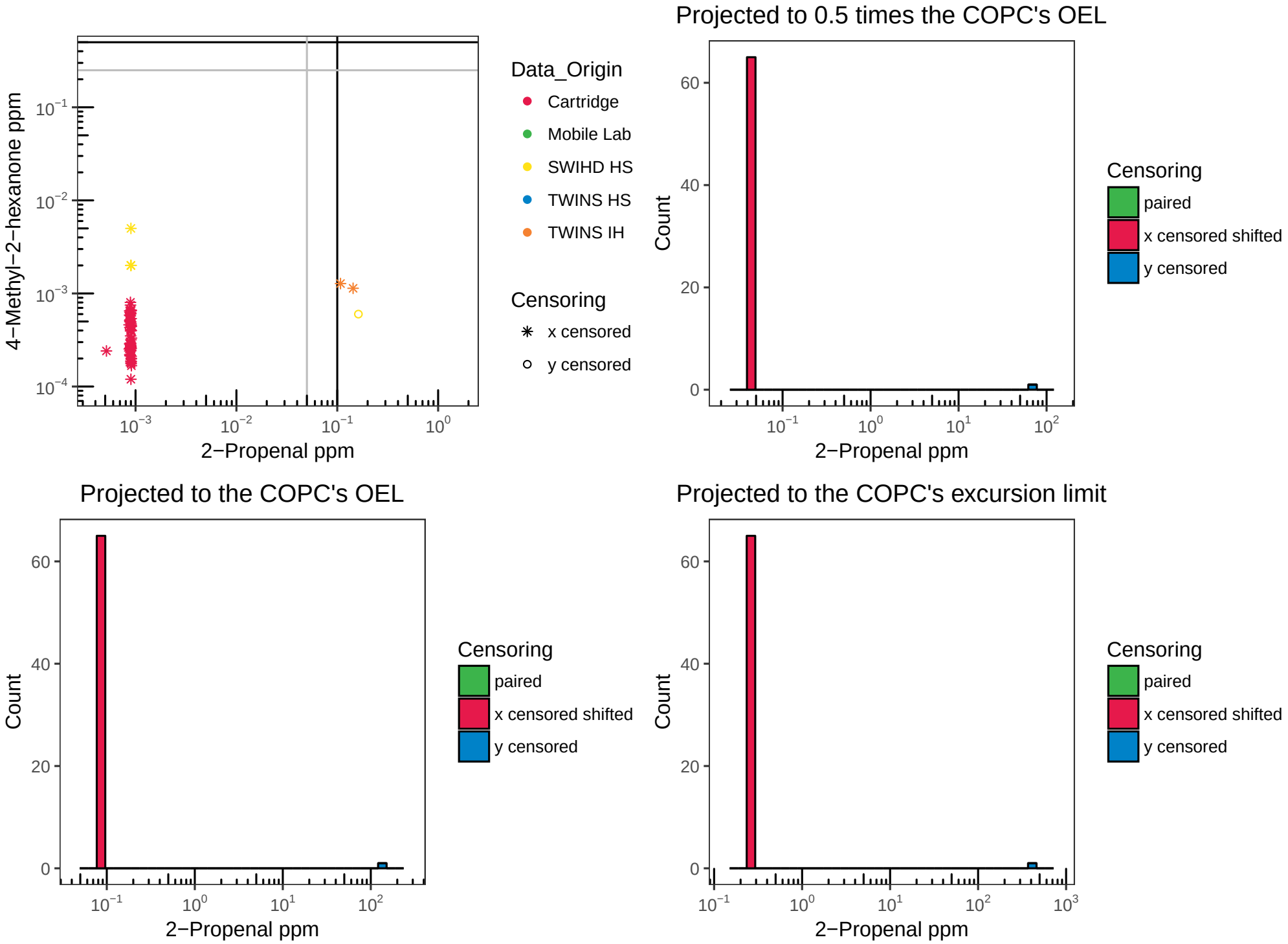


Figure C.934: 4-Methyl-2-hexanone vs 2-Propenal

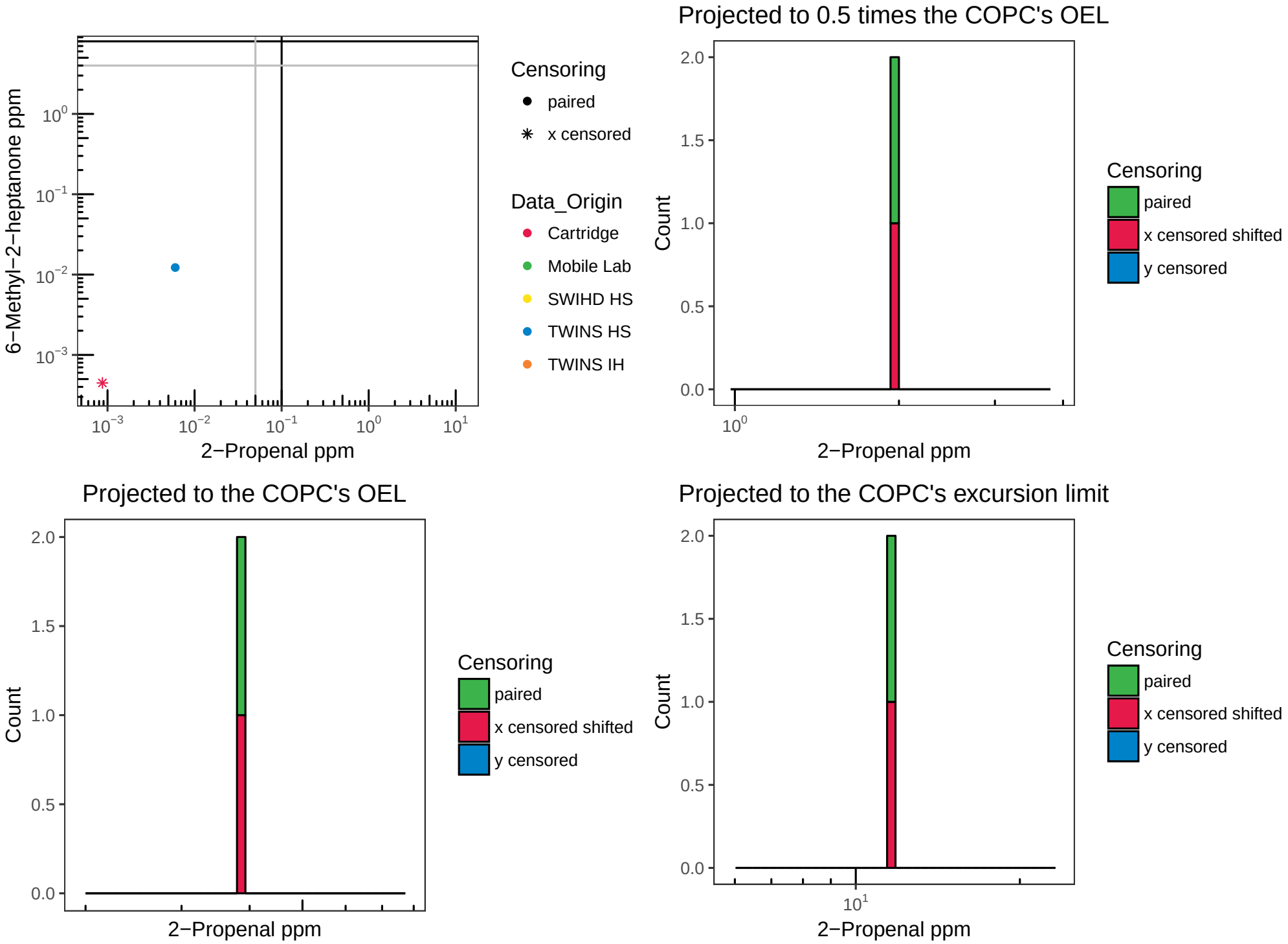


Figure C.935: 6-Methyl-2-heptanone vs 2-Propenal

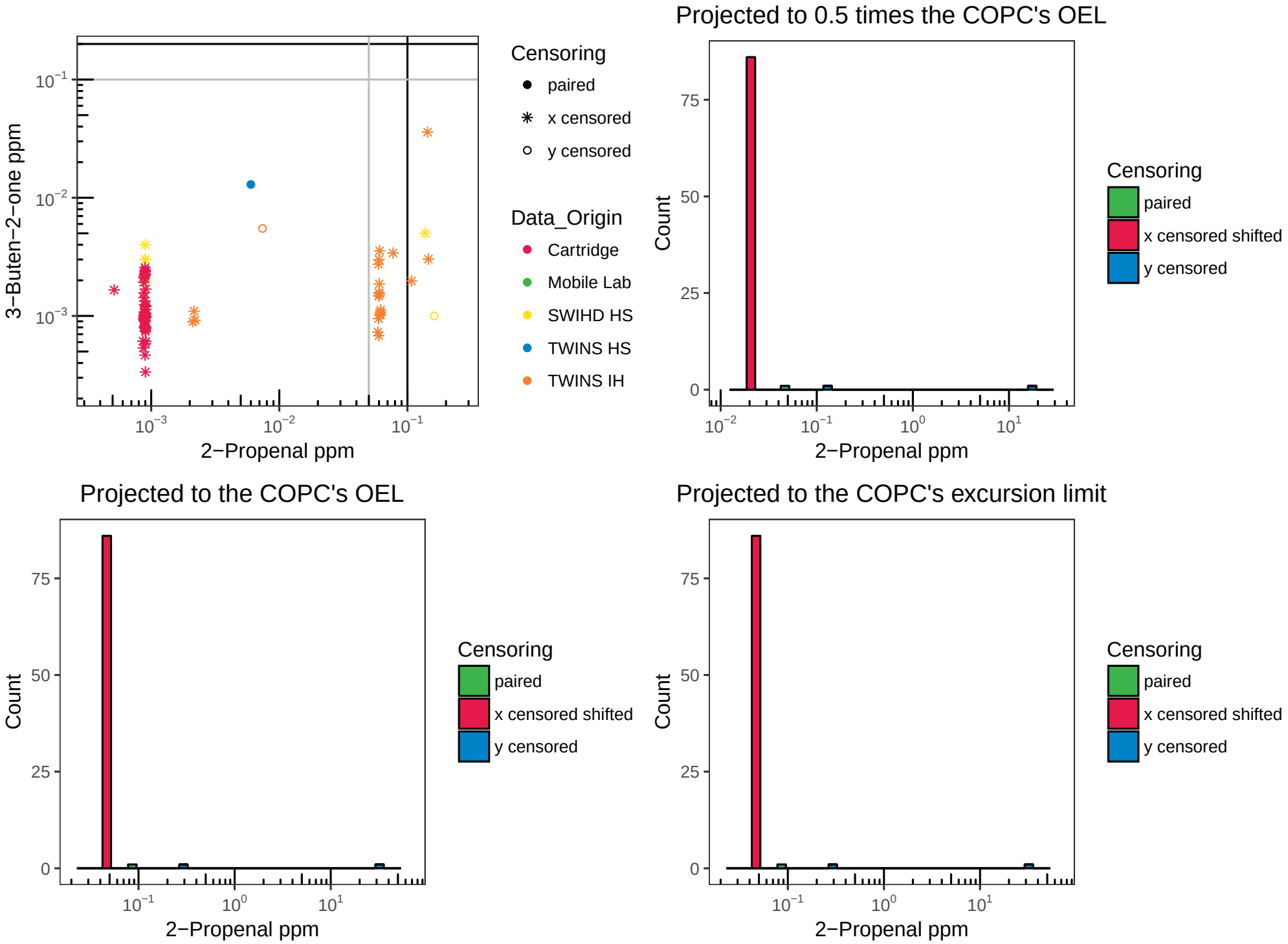


Figure C.936: 3-Buten-2-one vs 2-Propenal

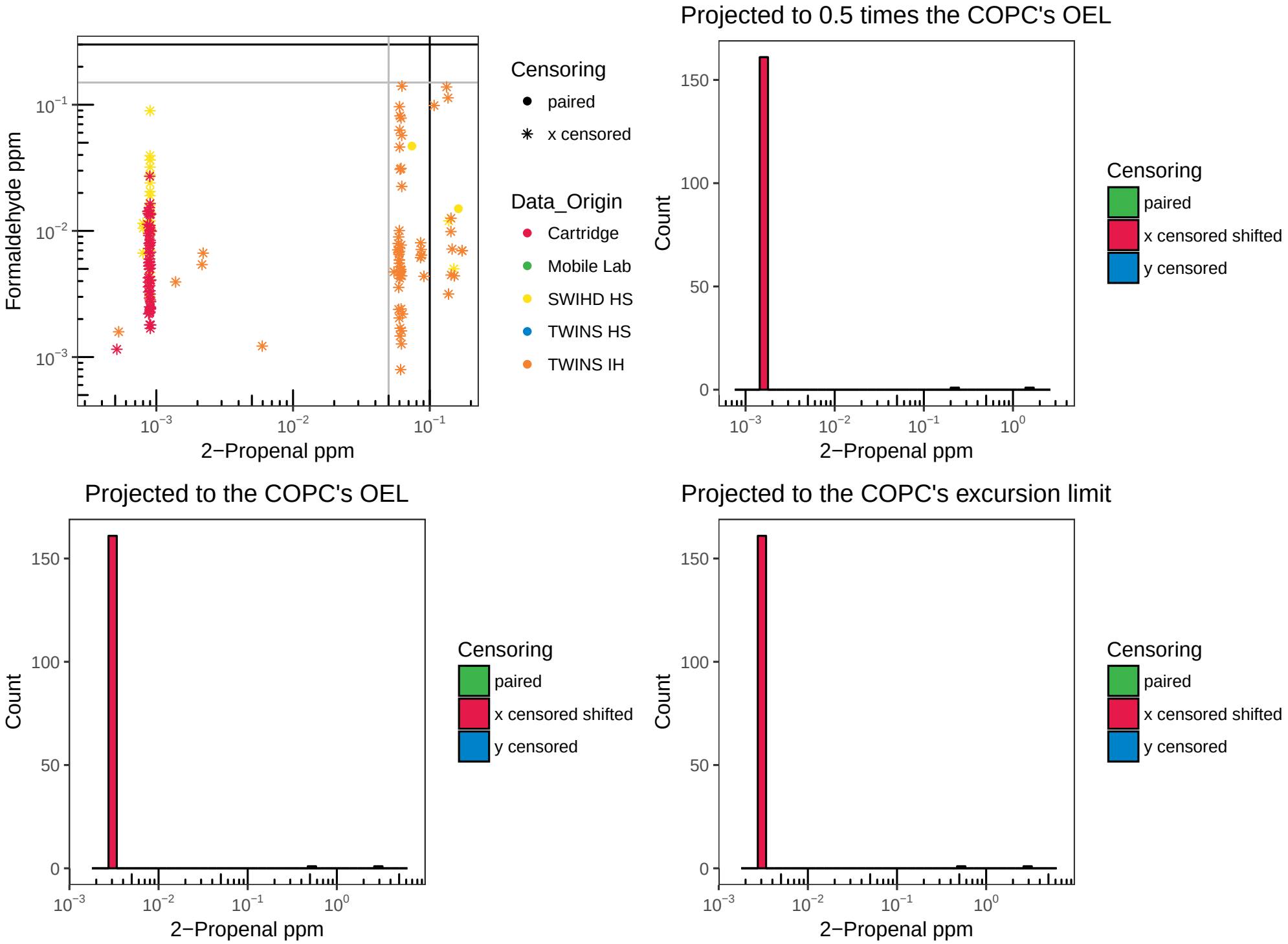


Figure C.937: Formaldehyde vs 2-Propenal

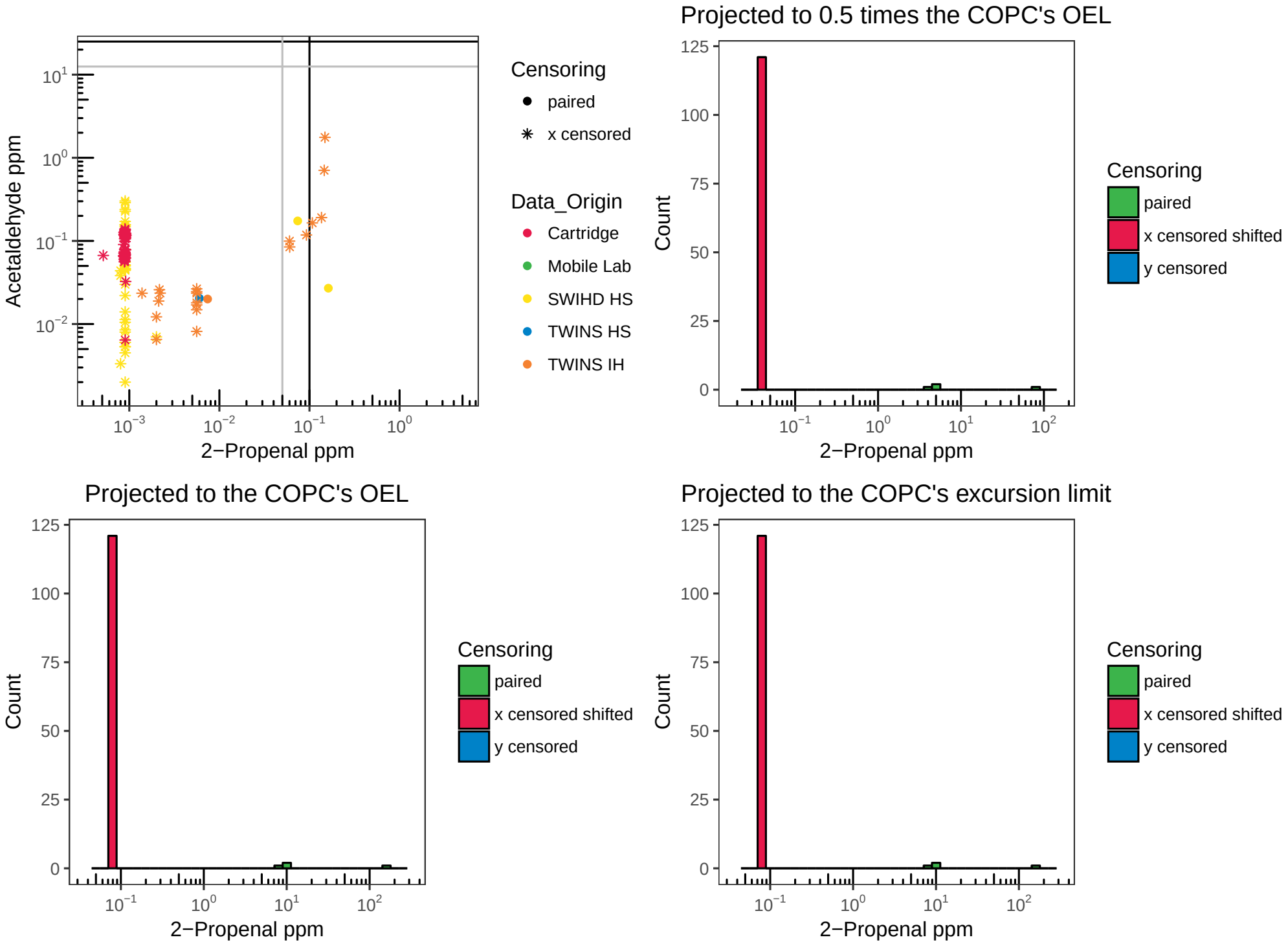


Figure C.938: Acetaldehyde vs 2-Propenal

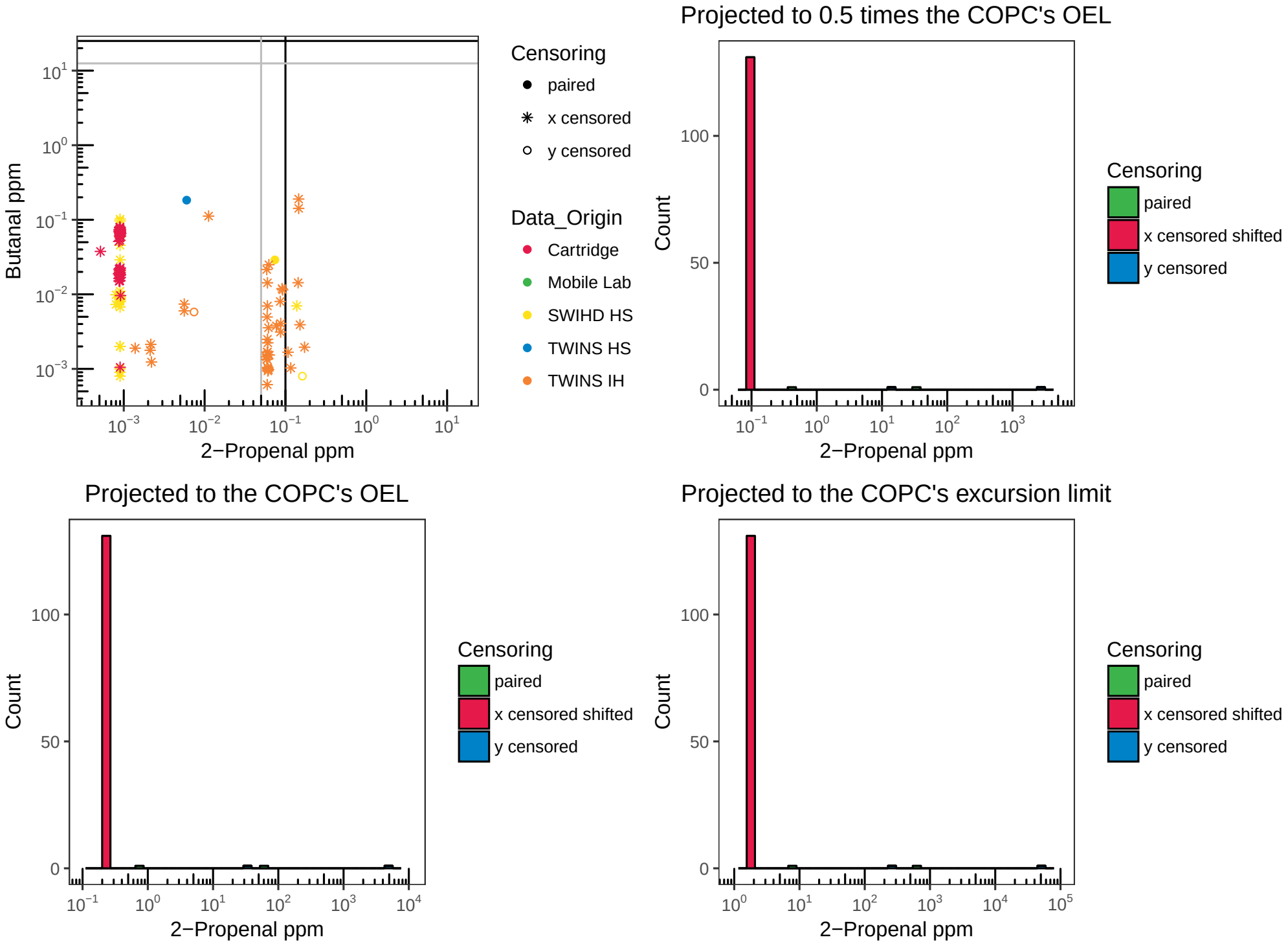


Figure C.939: Butanal vs 2-Propenal

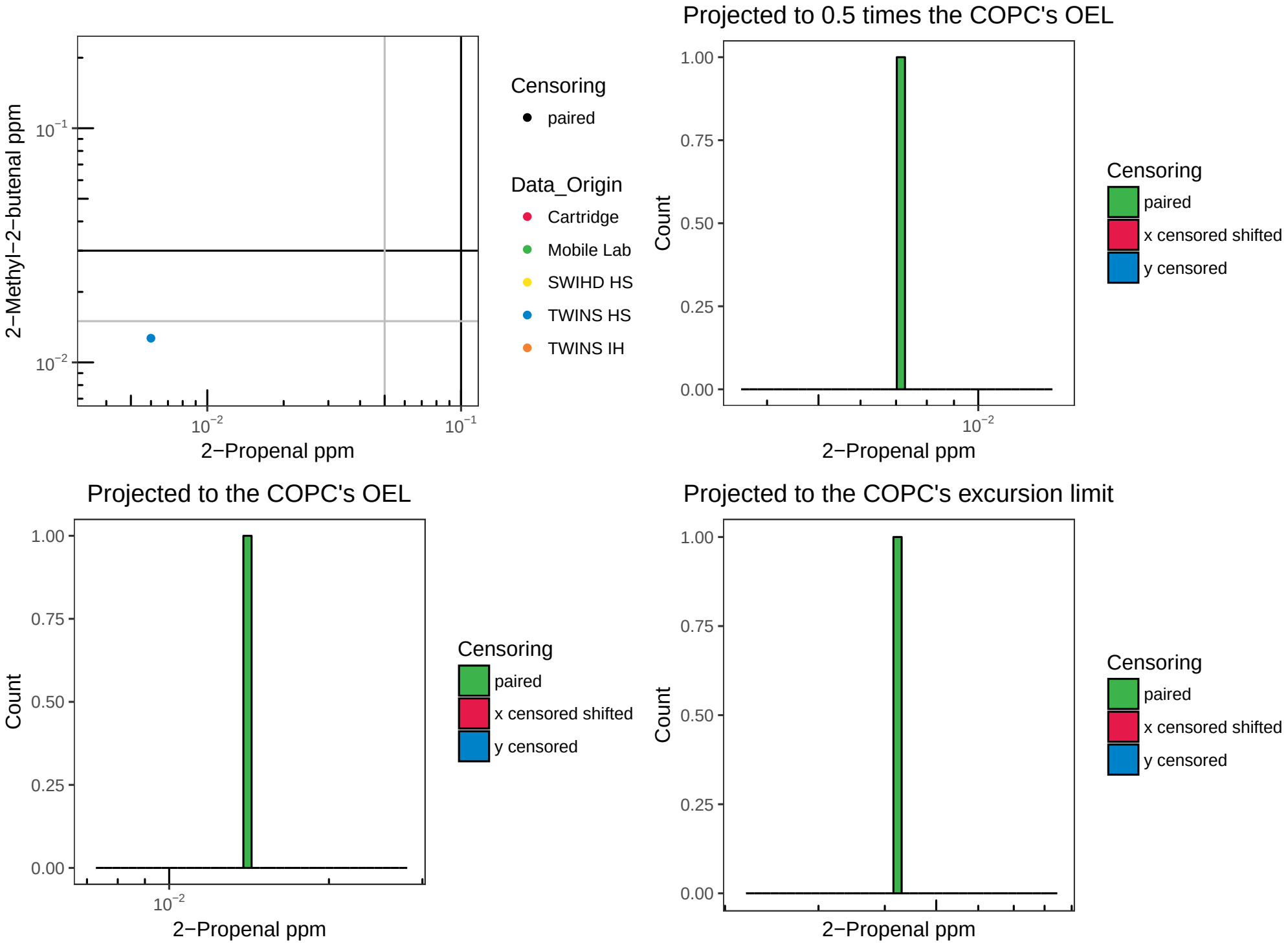


Figure C.940: 2-Methyl-2-butenal vs 2-Propenal

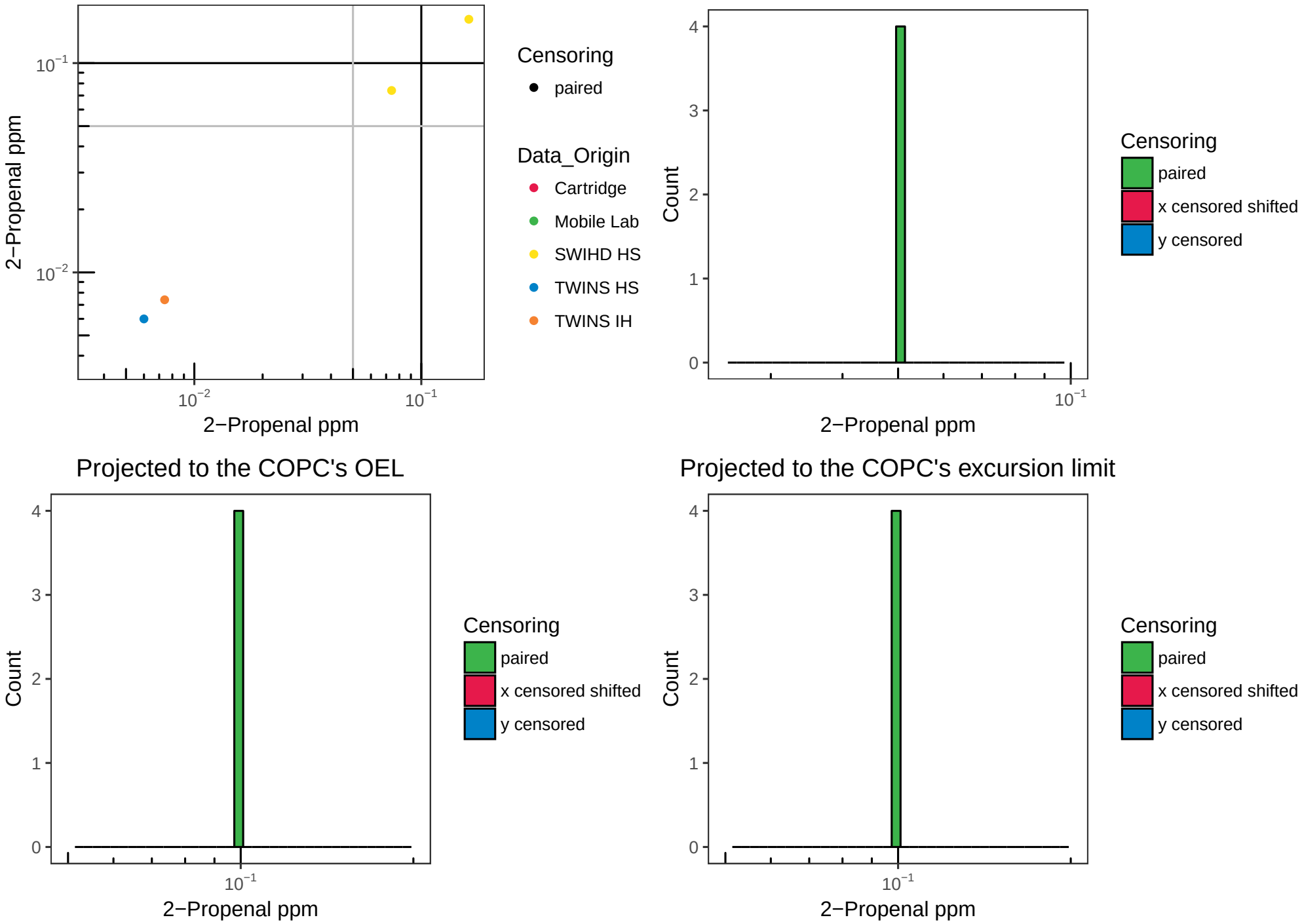


Figure C.941: 2-Propenal vs 2-Propenal

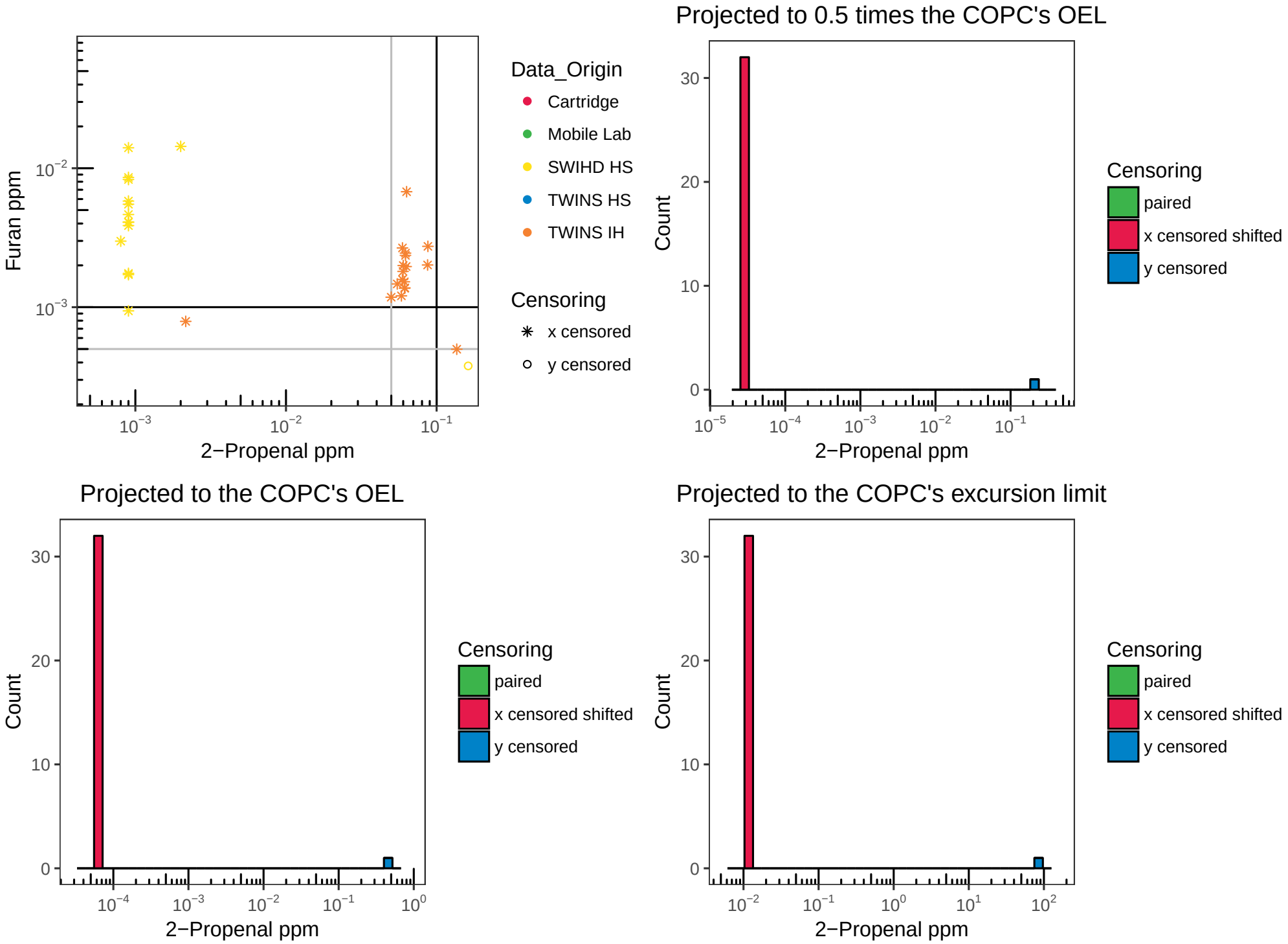


Figure C.942: Furan vs 2-Propenal

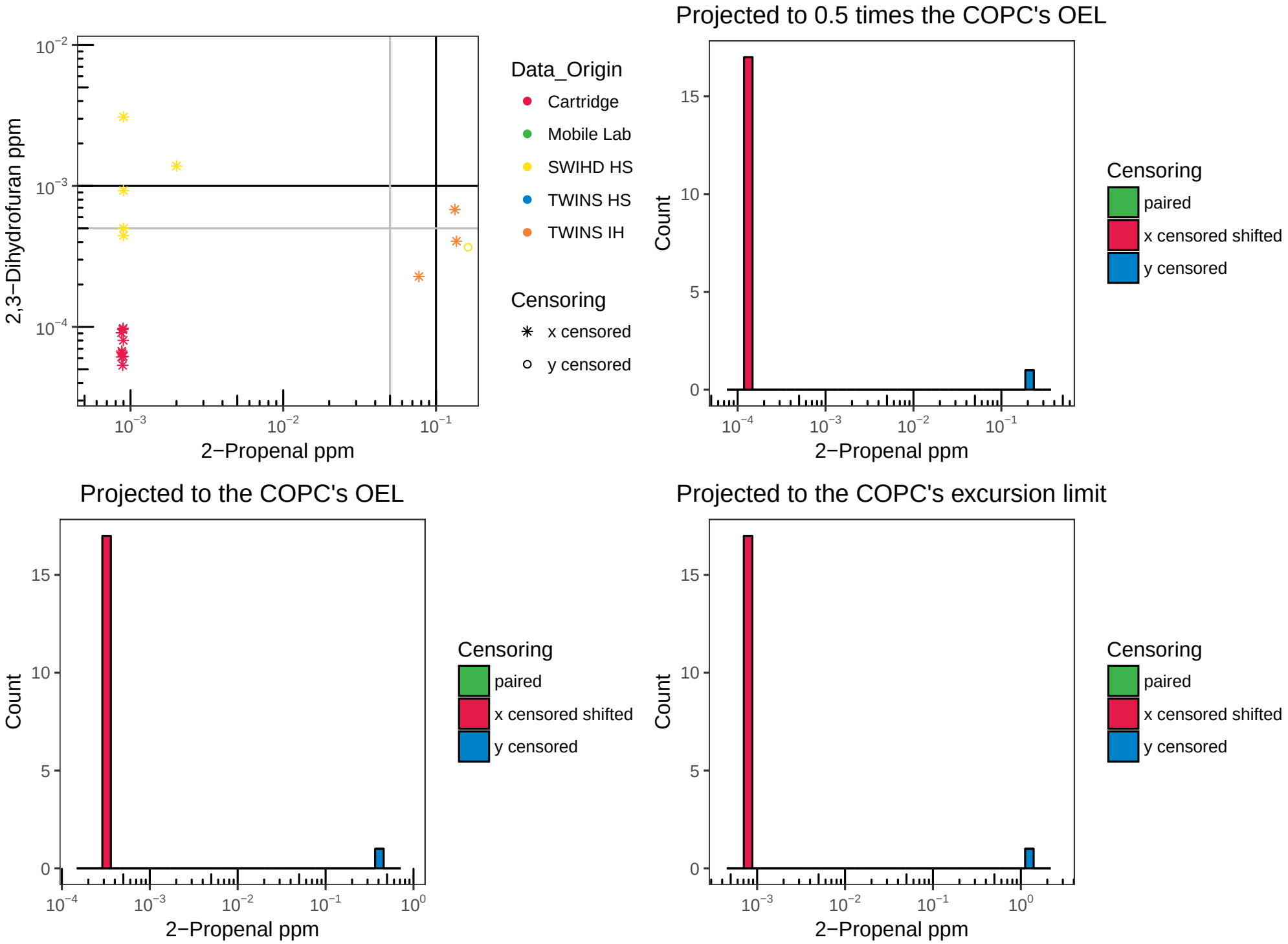


Figure C.943: 2,3-Dihydrofuran vs 2-Propenal

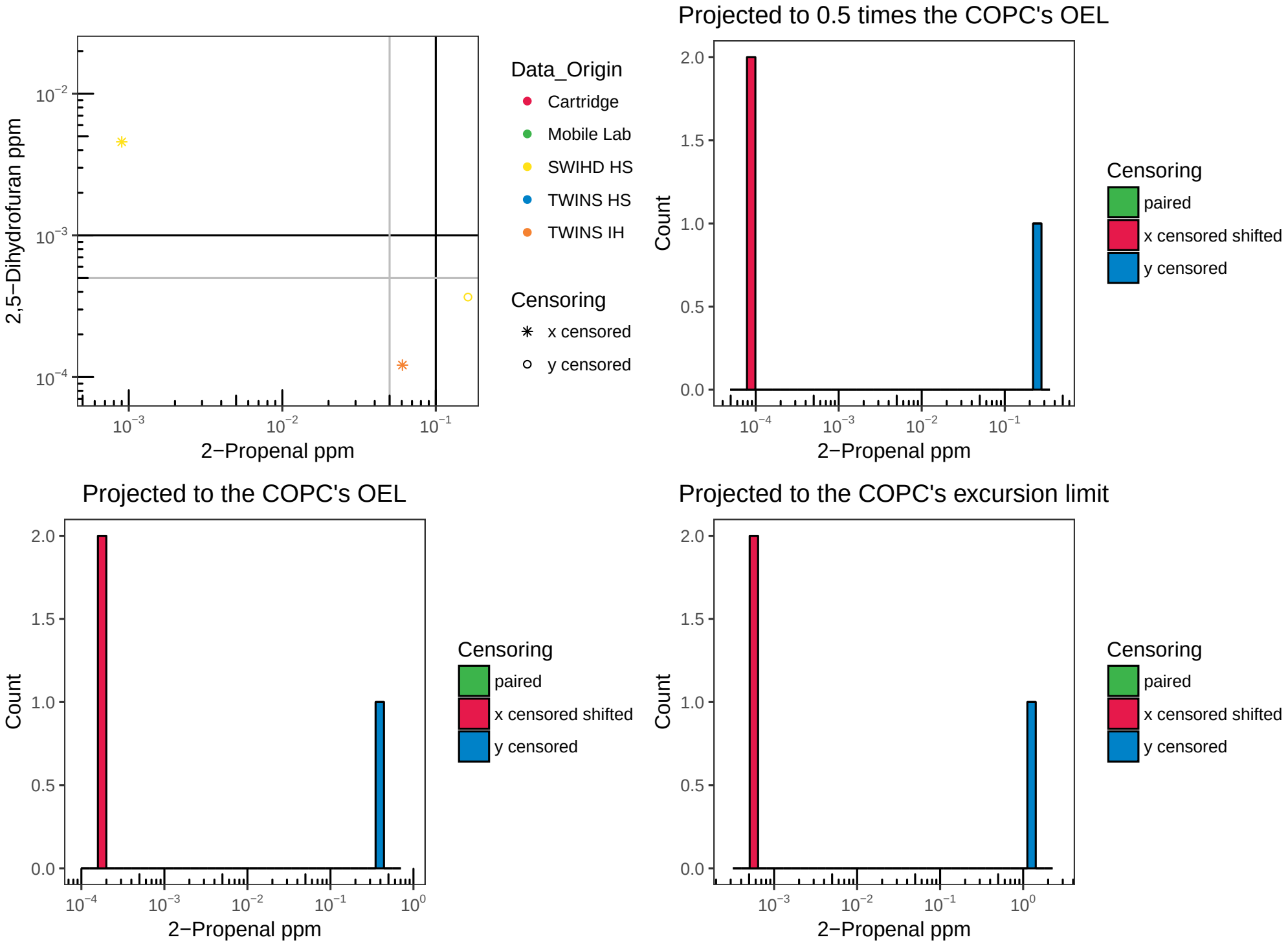


Figure C.944: 2,5-Dihydrofuran vs 2-Propenal

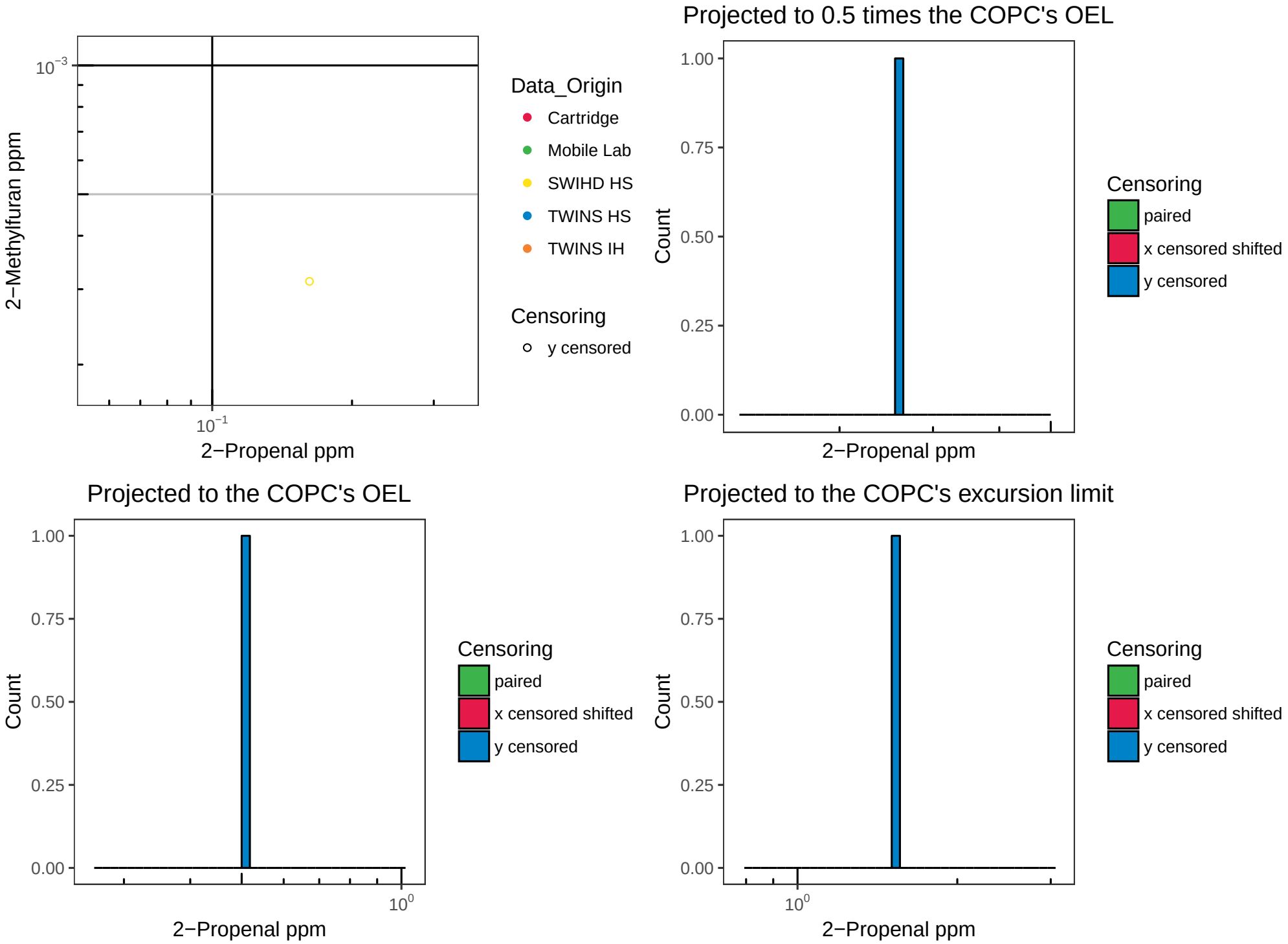


Figure C.945: 2-Methylfuran vs 2-Propenal

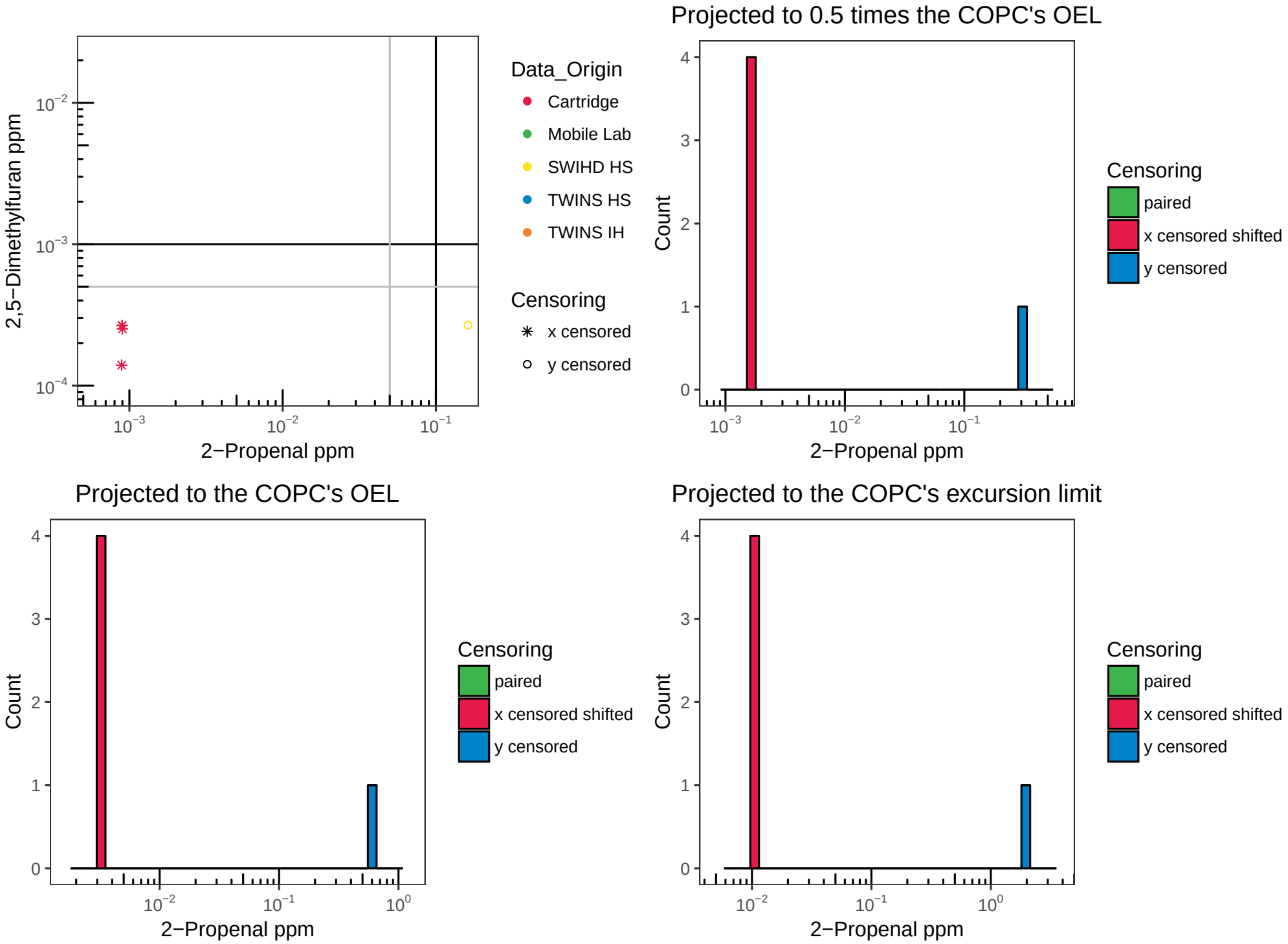


Figure C.946: 2,5-Dimethylfuran vs 2-Propenal

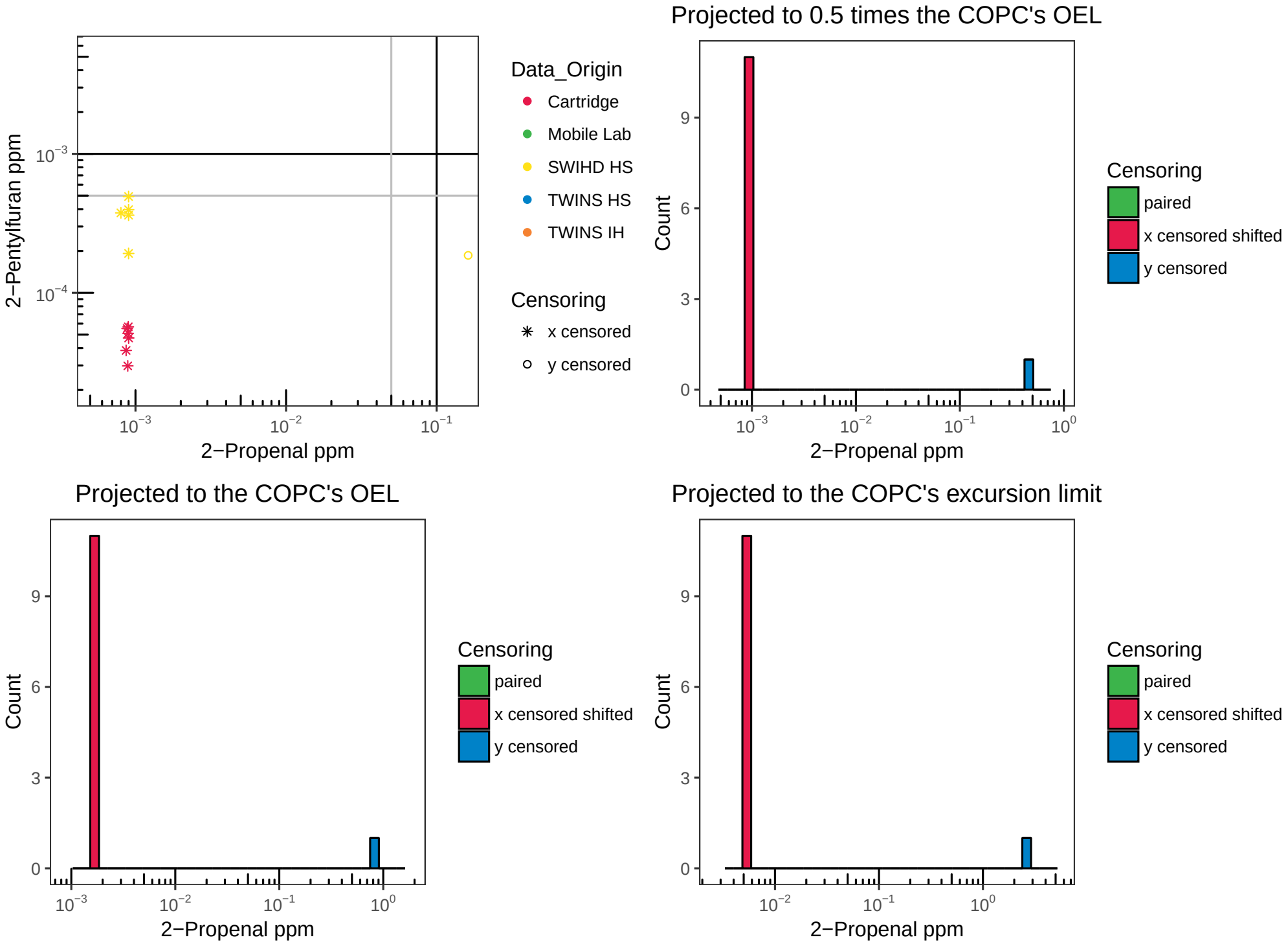


Figure C.947: 2-Pentylfuran vs 2-Propenal

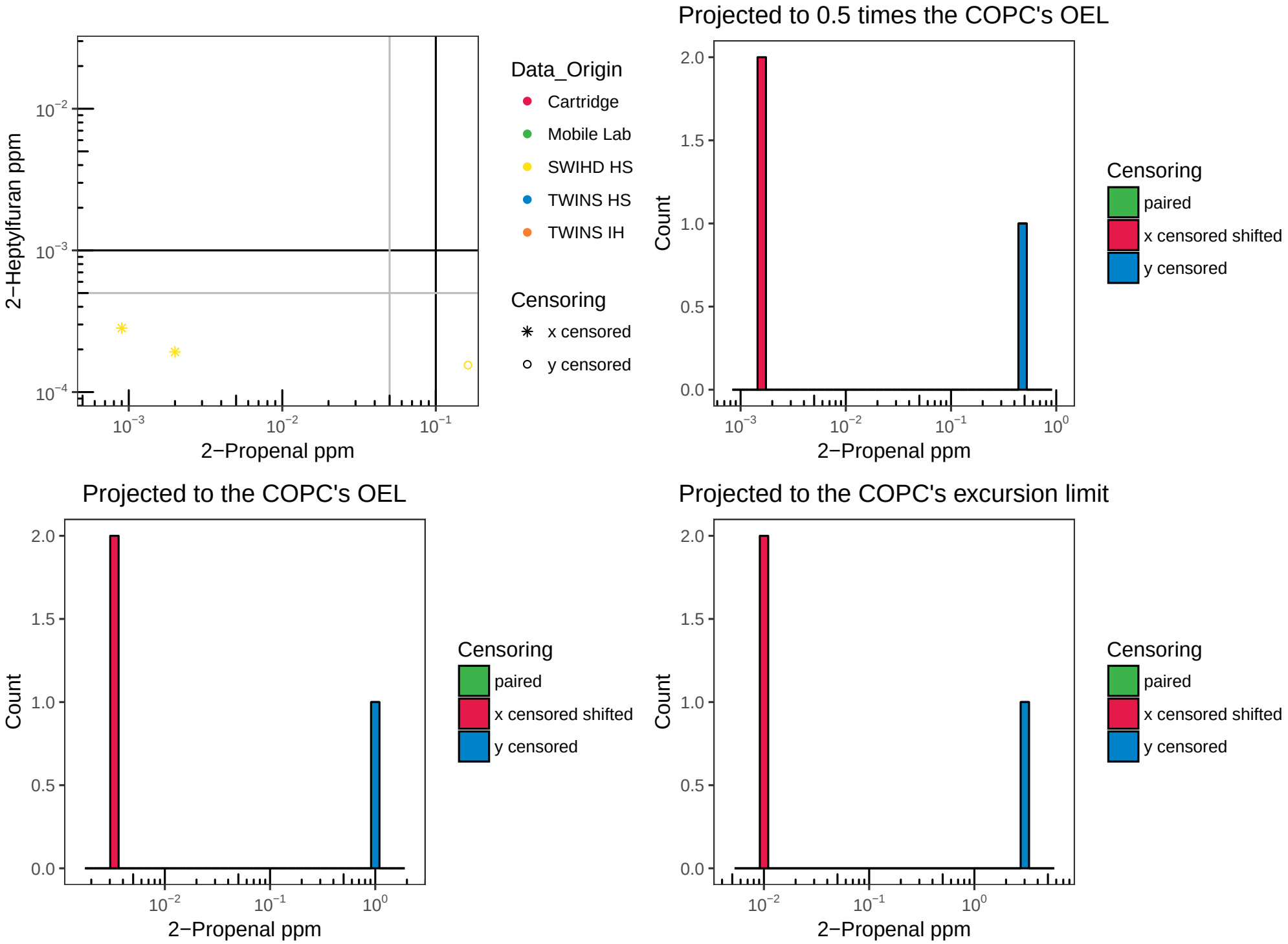


Figure C.948: 2-Heptylfuran vs 2-Propenal

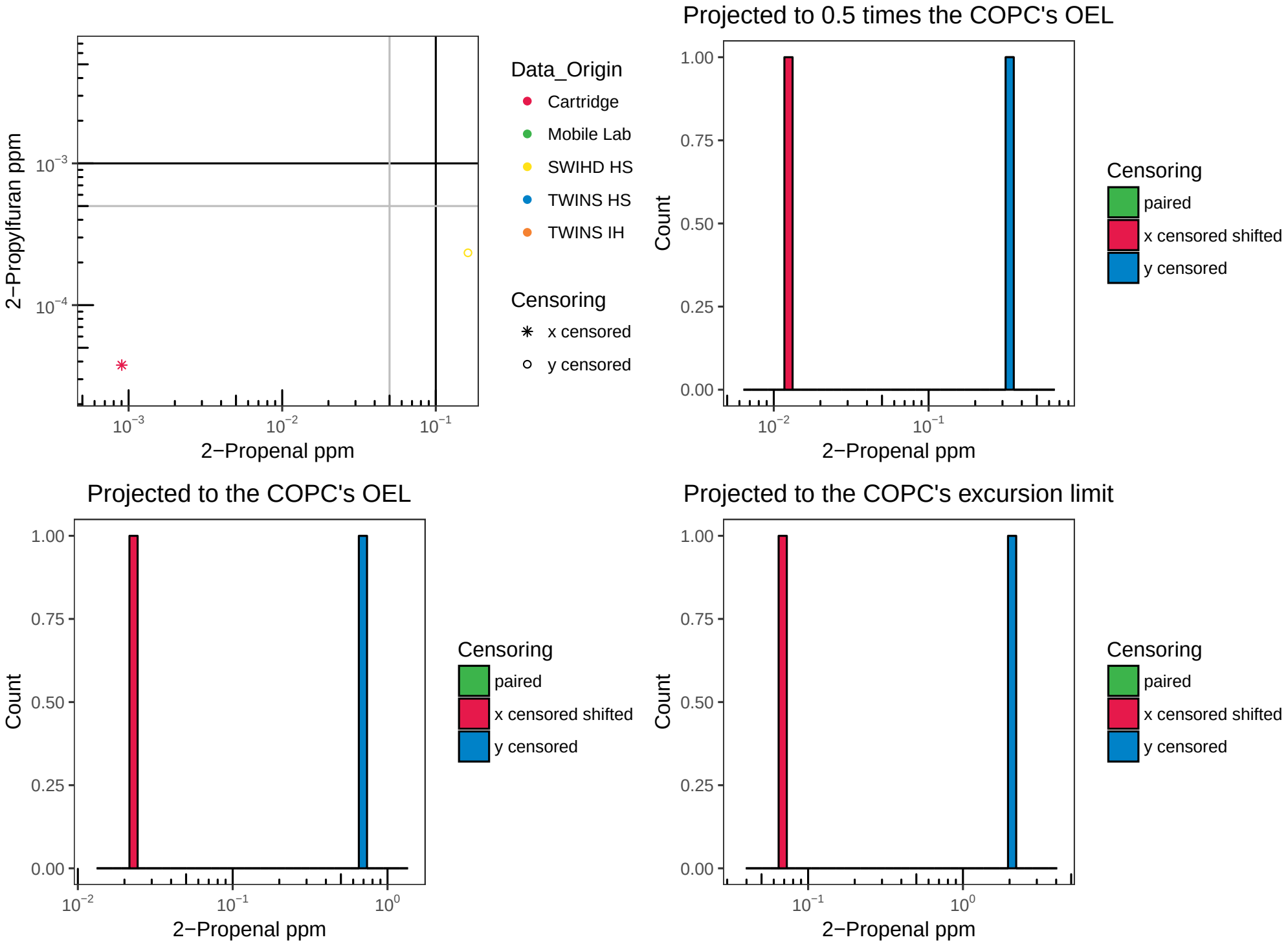


Figure C.949: 2-Propylfuran vs 2-Propenal

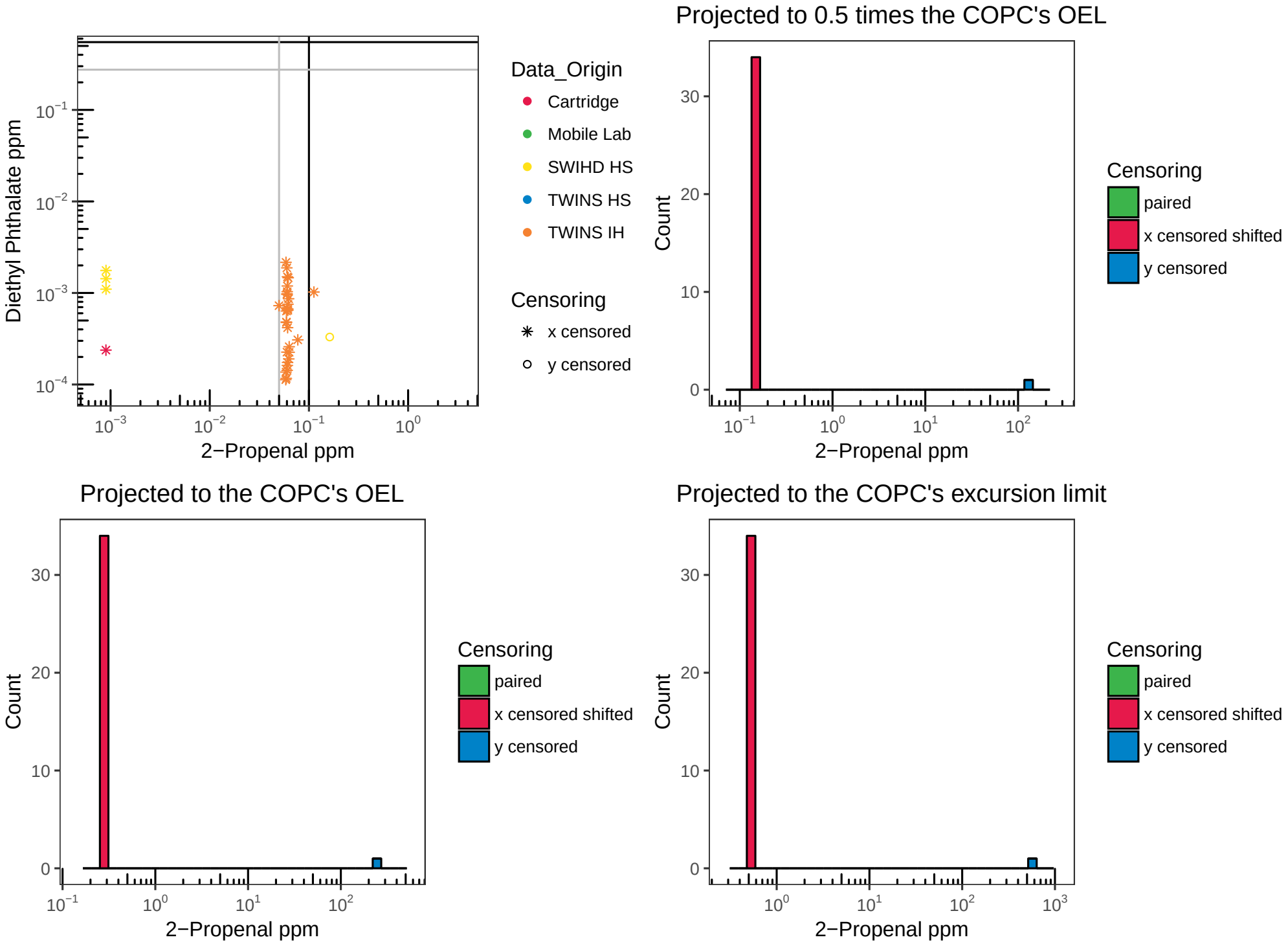


Figure C.950: Diethyl Phthalate vs 2-Propenal

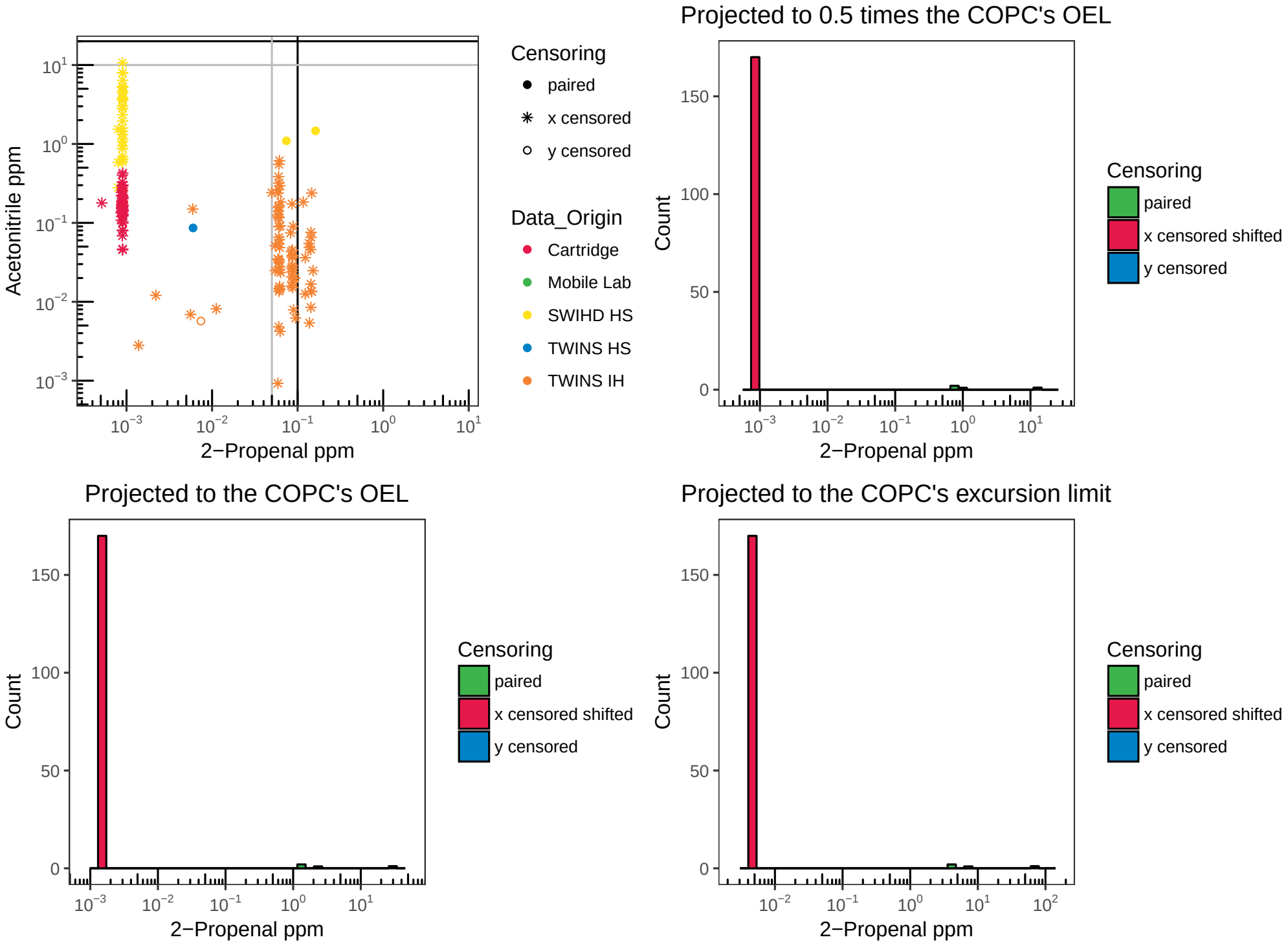


Figure C.951: Acetonitrile vs 2-Propenal

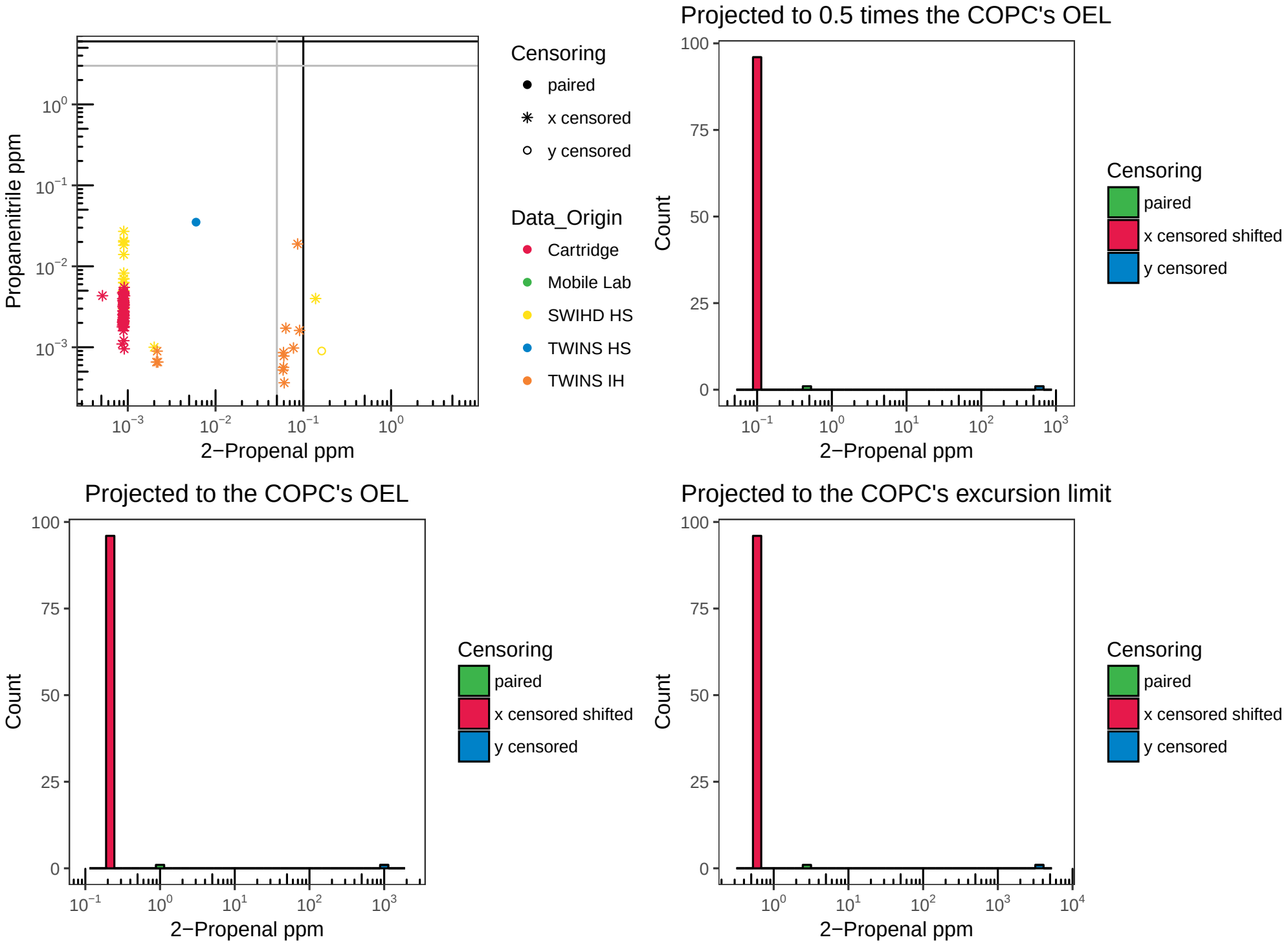


Figure C.952: Propanenitrile vs 2-Propenal

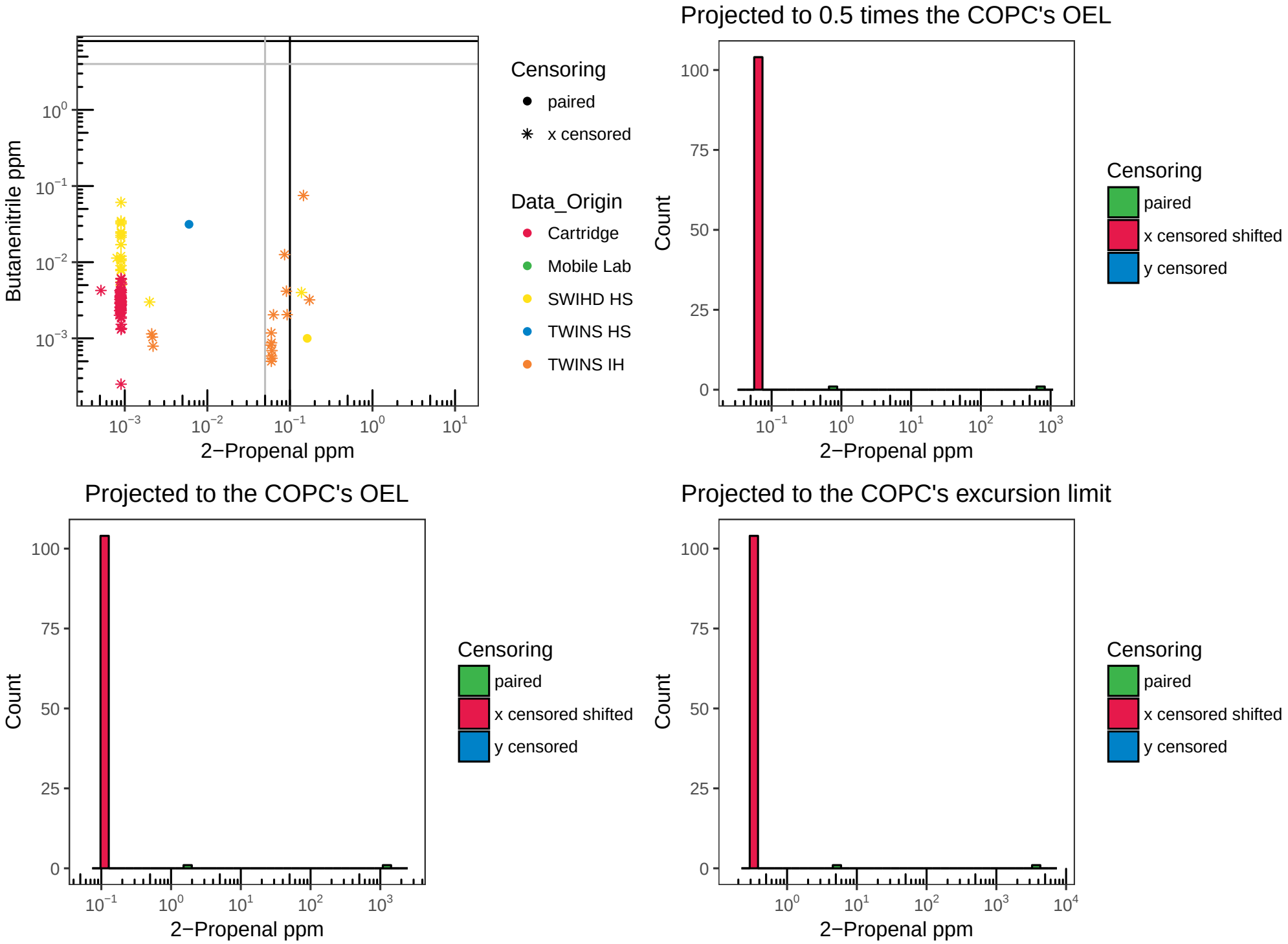


Figure C.953: Butanenitrile vs 2-Propenal

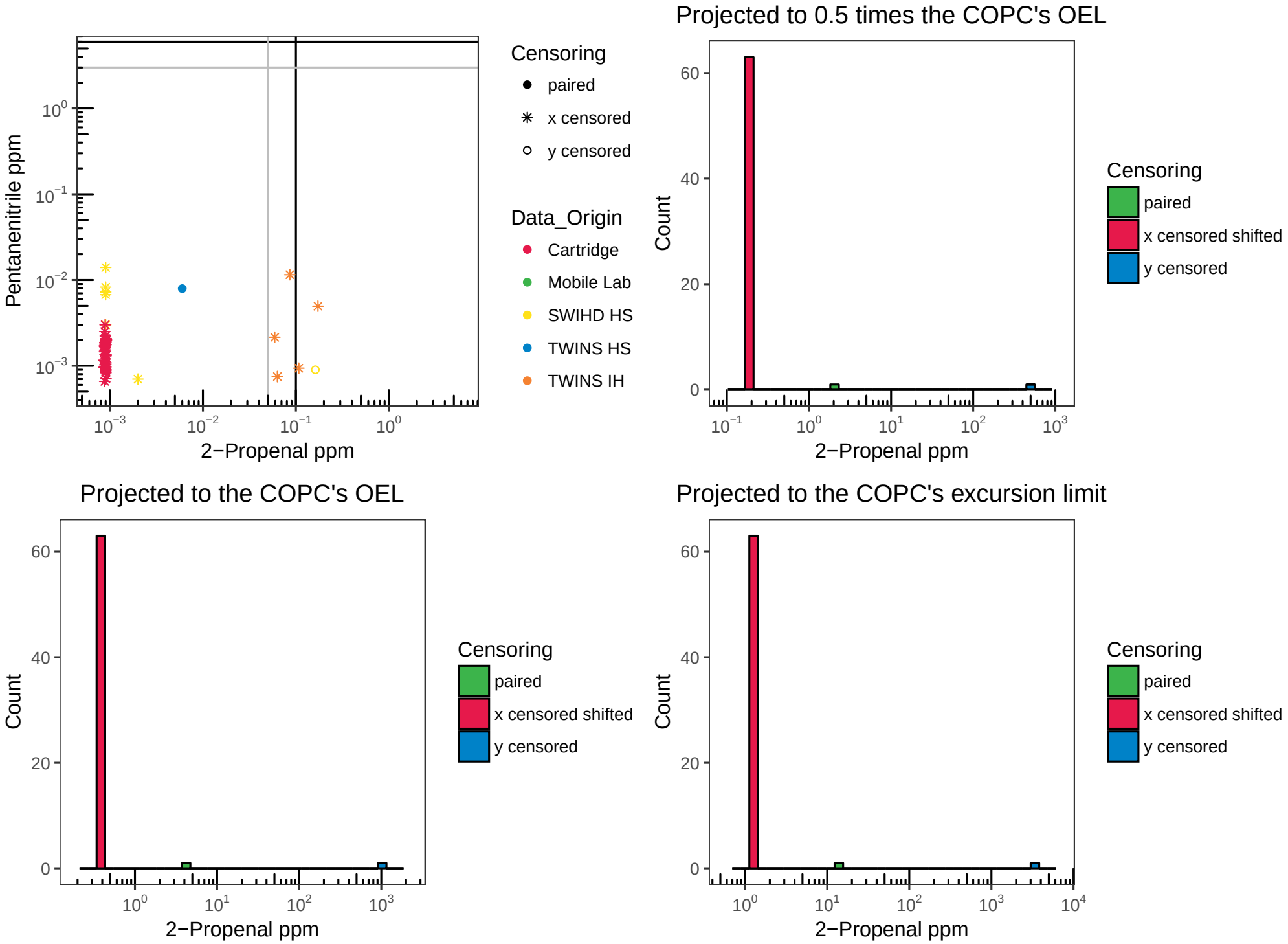


Figure C.954: Pentanenitrile vs 2-Propenal

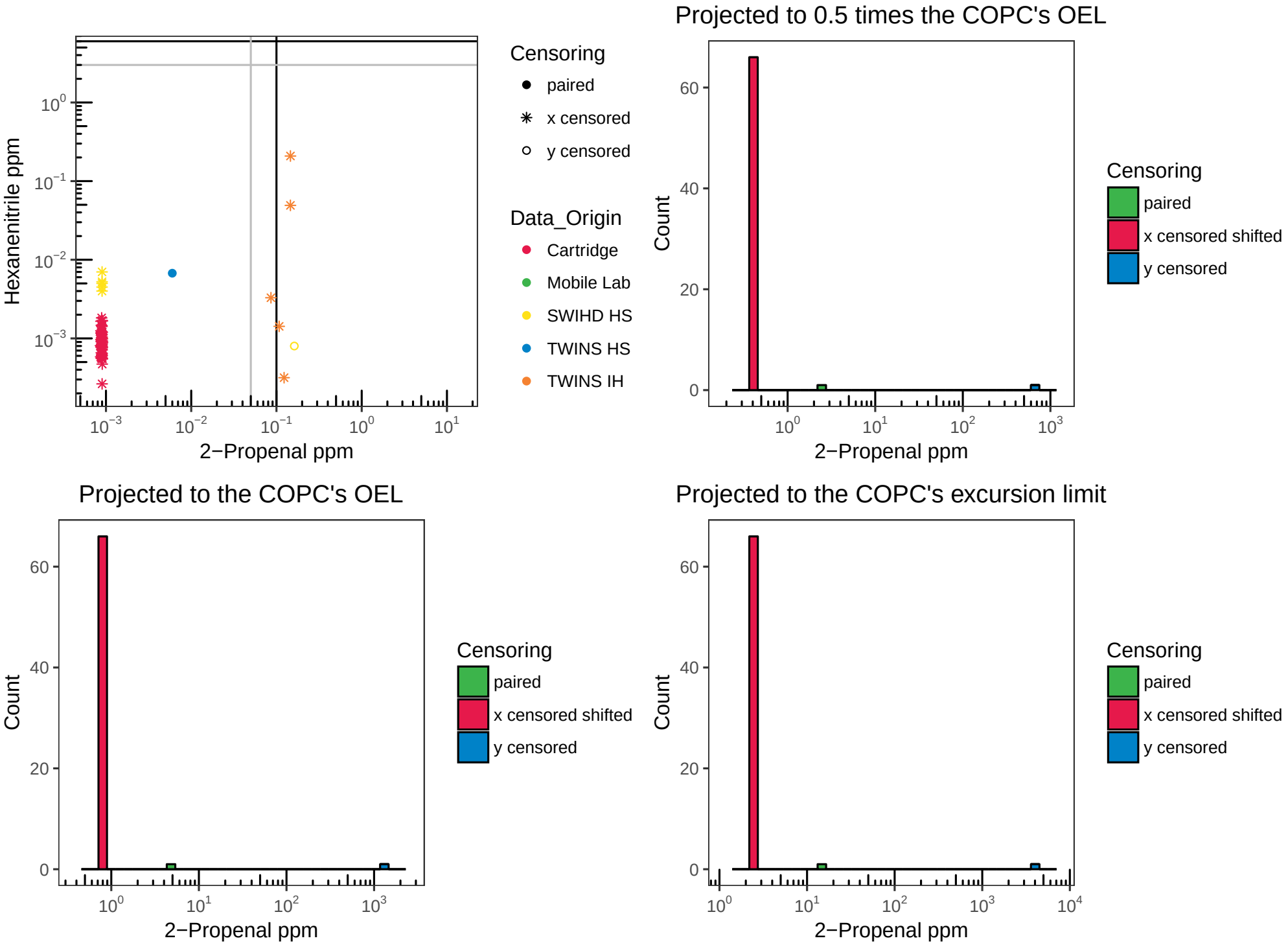


Figure C.955: Hexanenitrile vs 2-Propenal

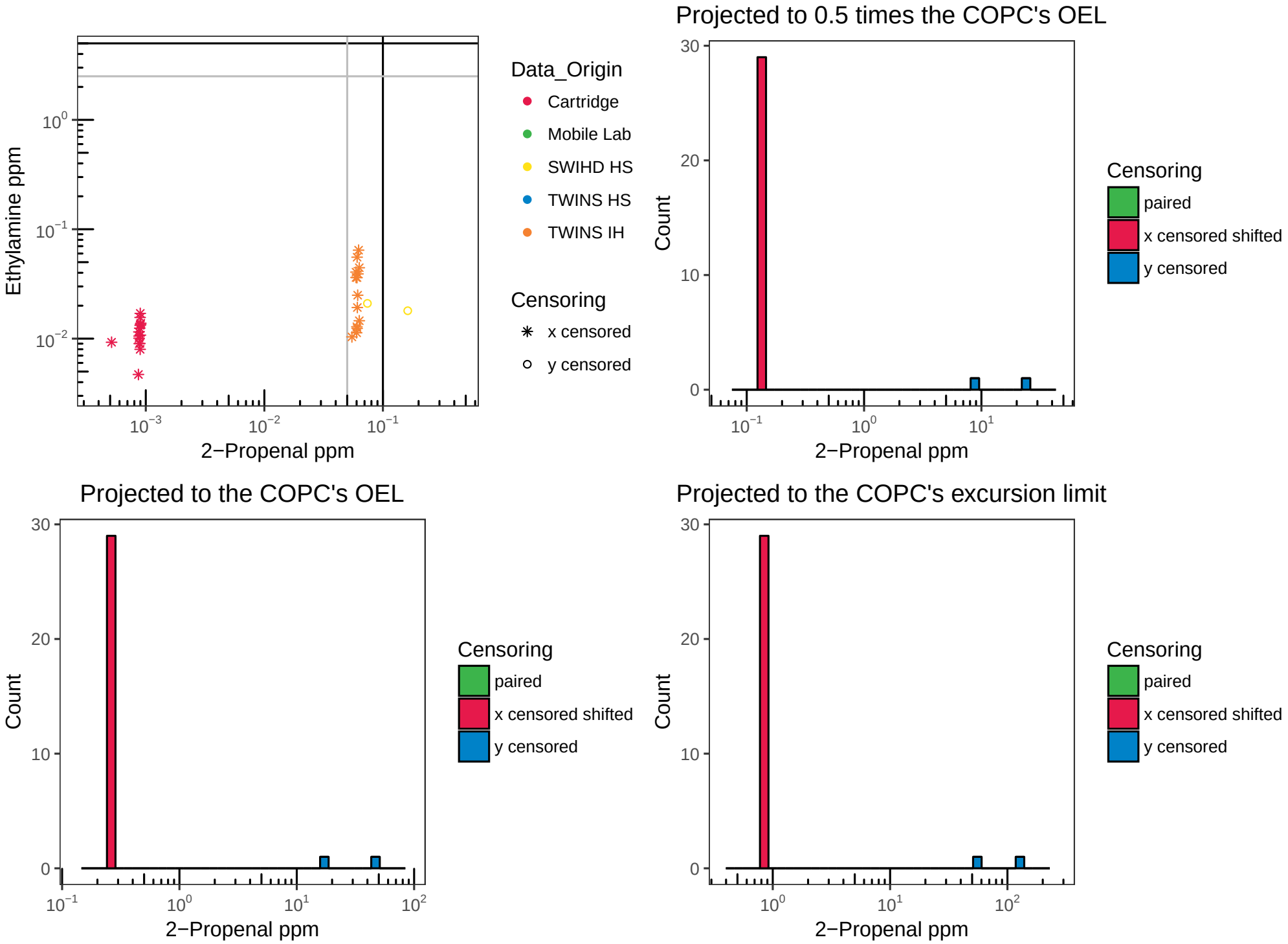


Figure C.956: Ethylamine vs 2-Propenal

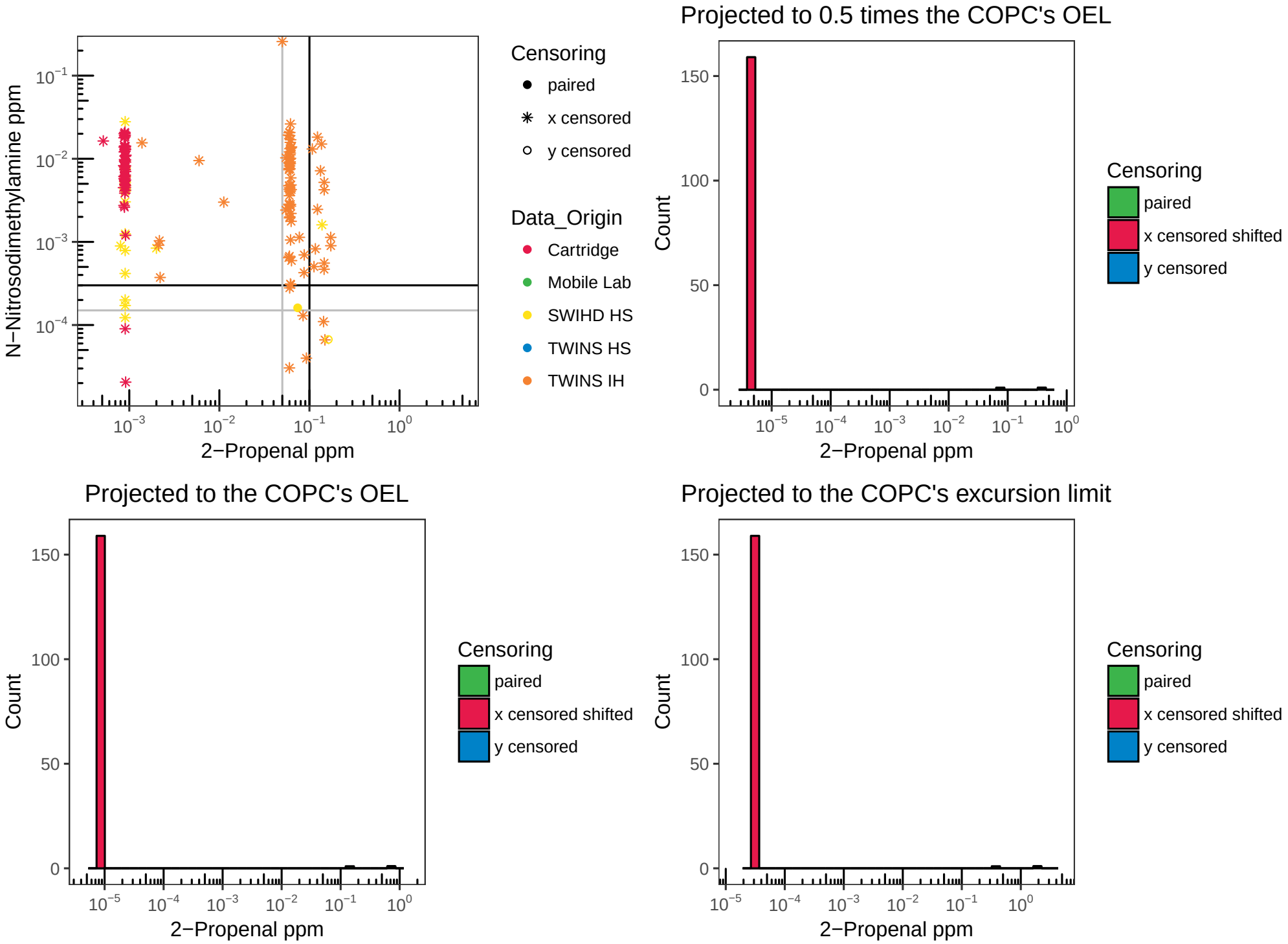


Figure C.957: N-Nitrosodimethylamine vs 2-Propenal

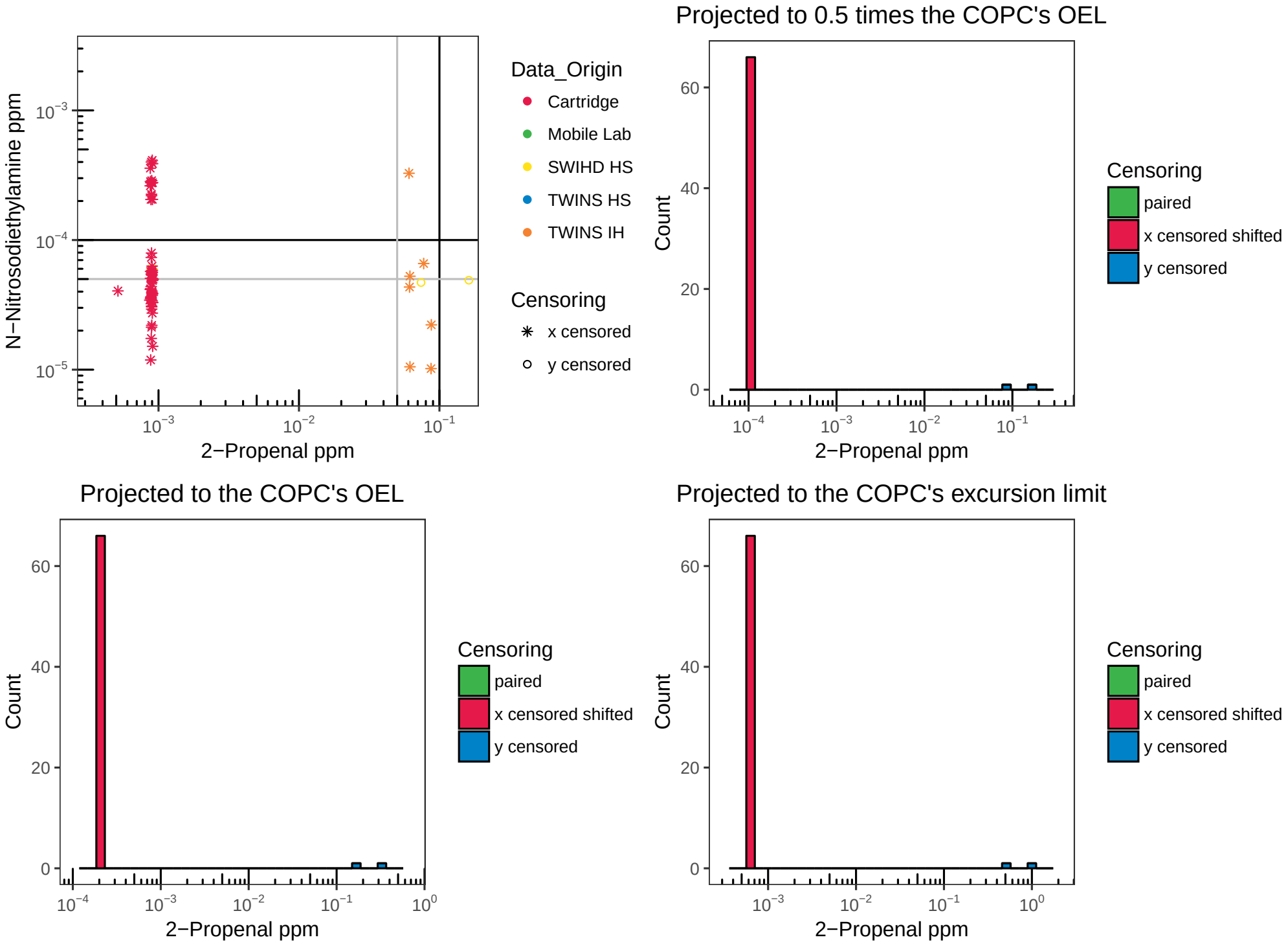


Figure C.958: N-Nitrosodiethylamine vs 2-Propenal

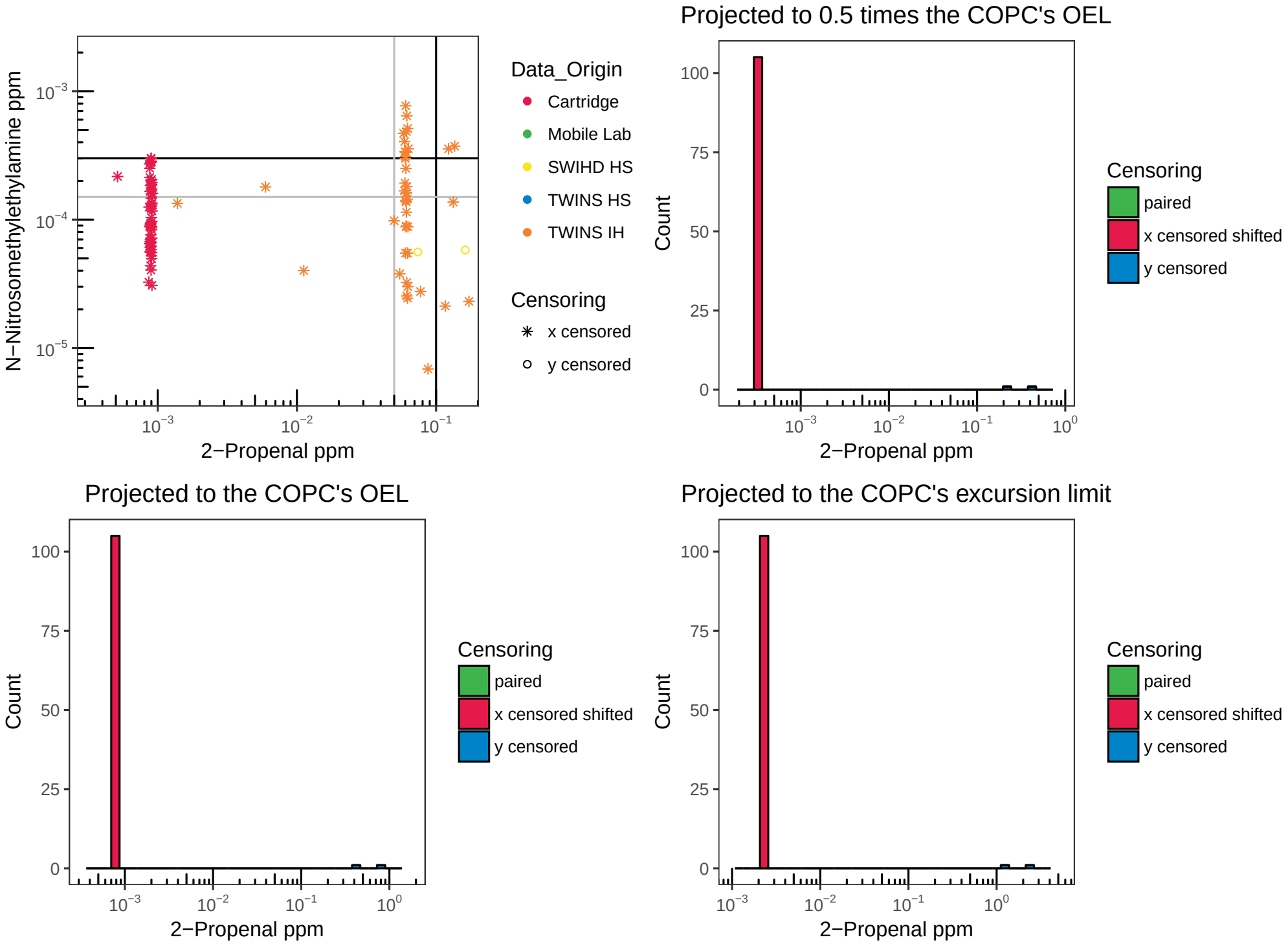


Figure C.959: N-Nitrosomethylethylamine vs 2-Propenal

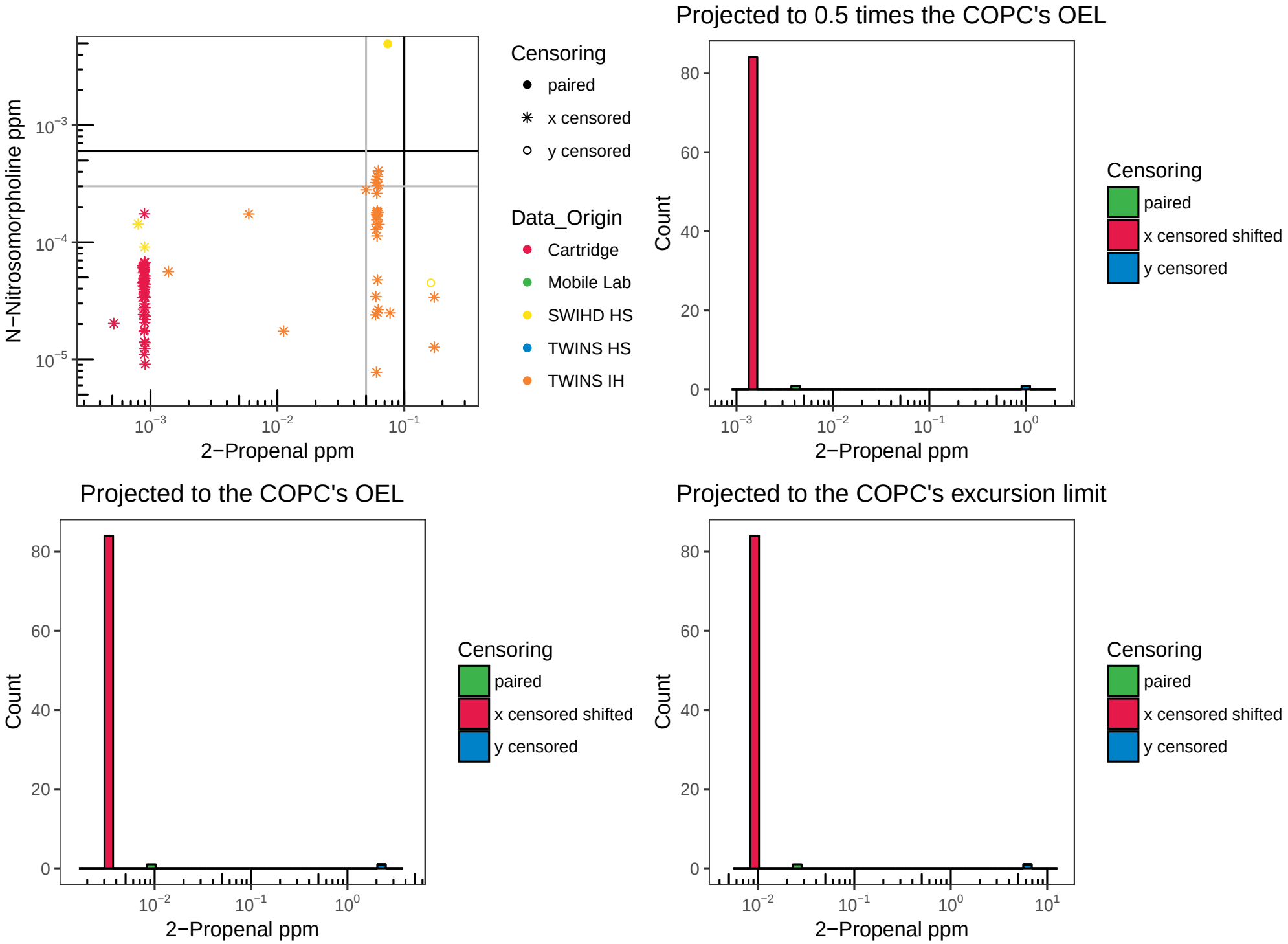


Figure C.960: N-Nitrosomorpholine vs 2-Propenal

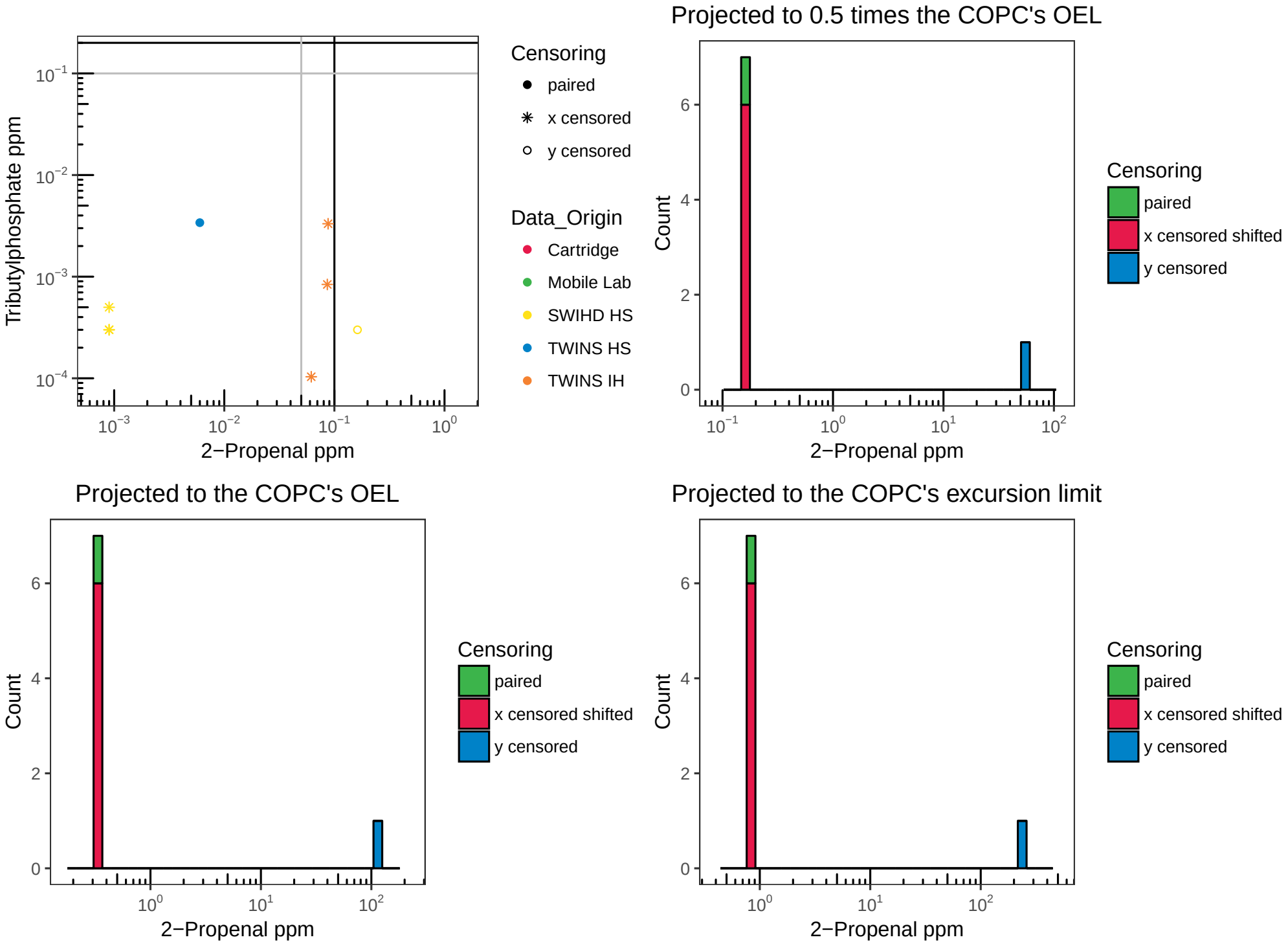


Figure C.961: Tributylphosphate vs 2-Propenal

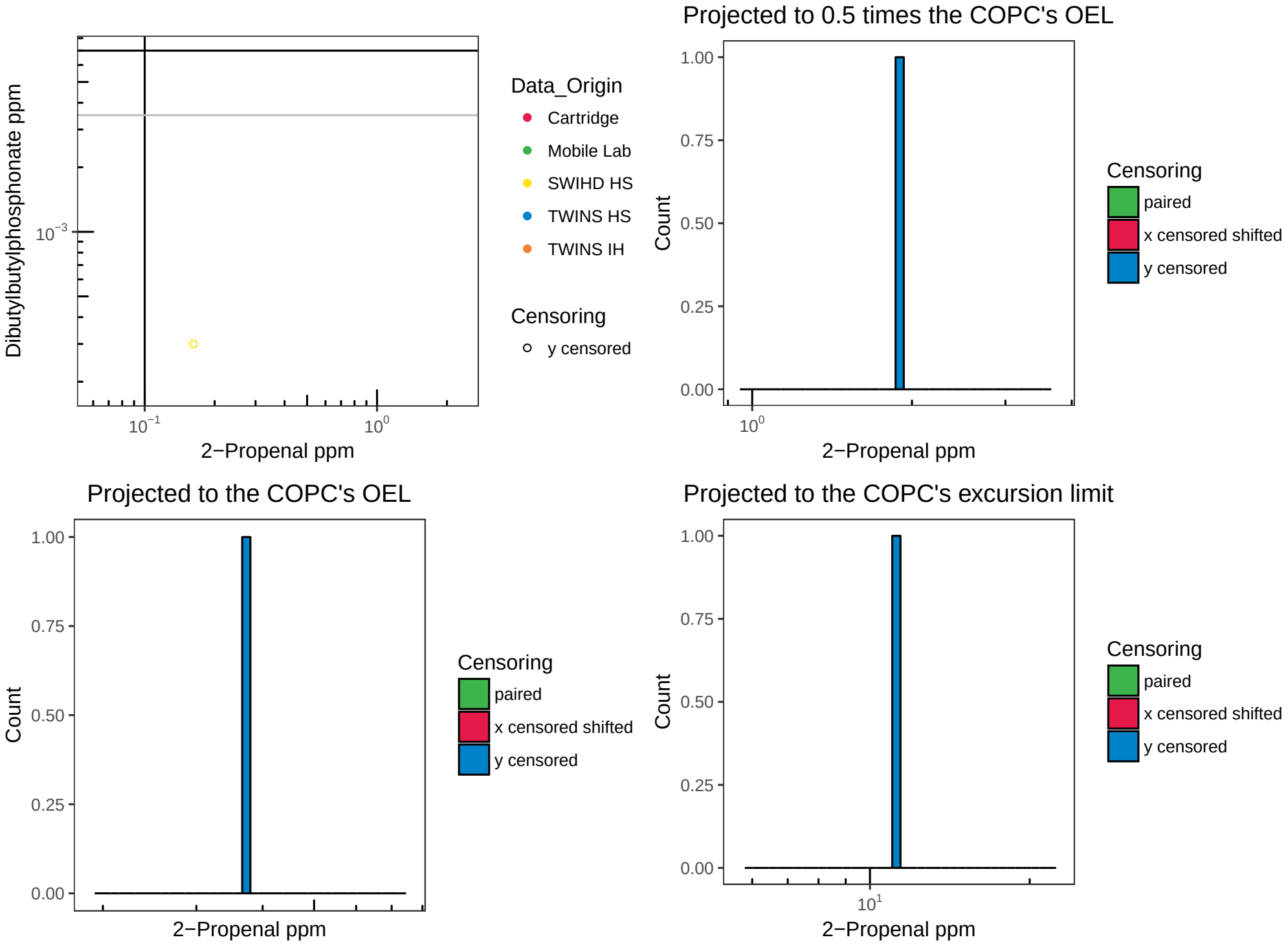


Figure C.962: Dibutylbutylphosphonate vs 2-Propenal

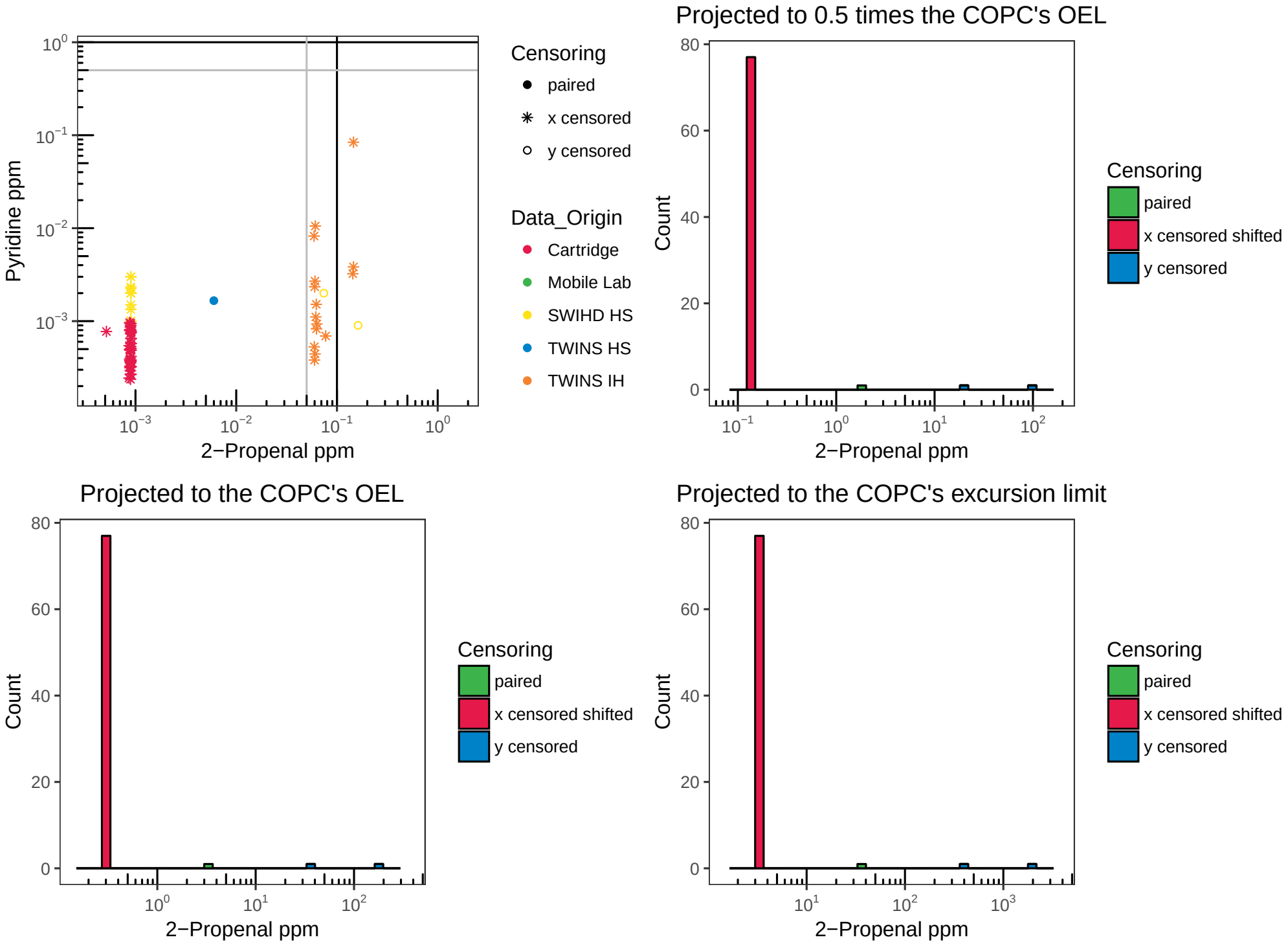


Figure C.963: Pyridine vs 2-Propenal

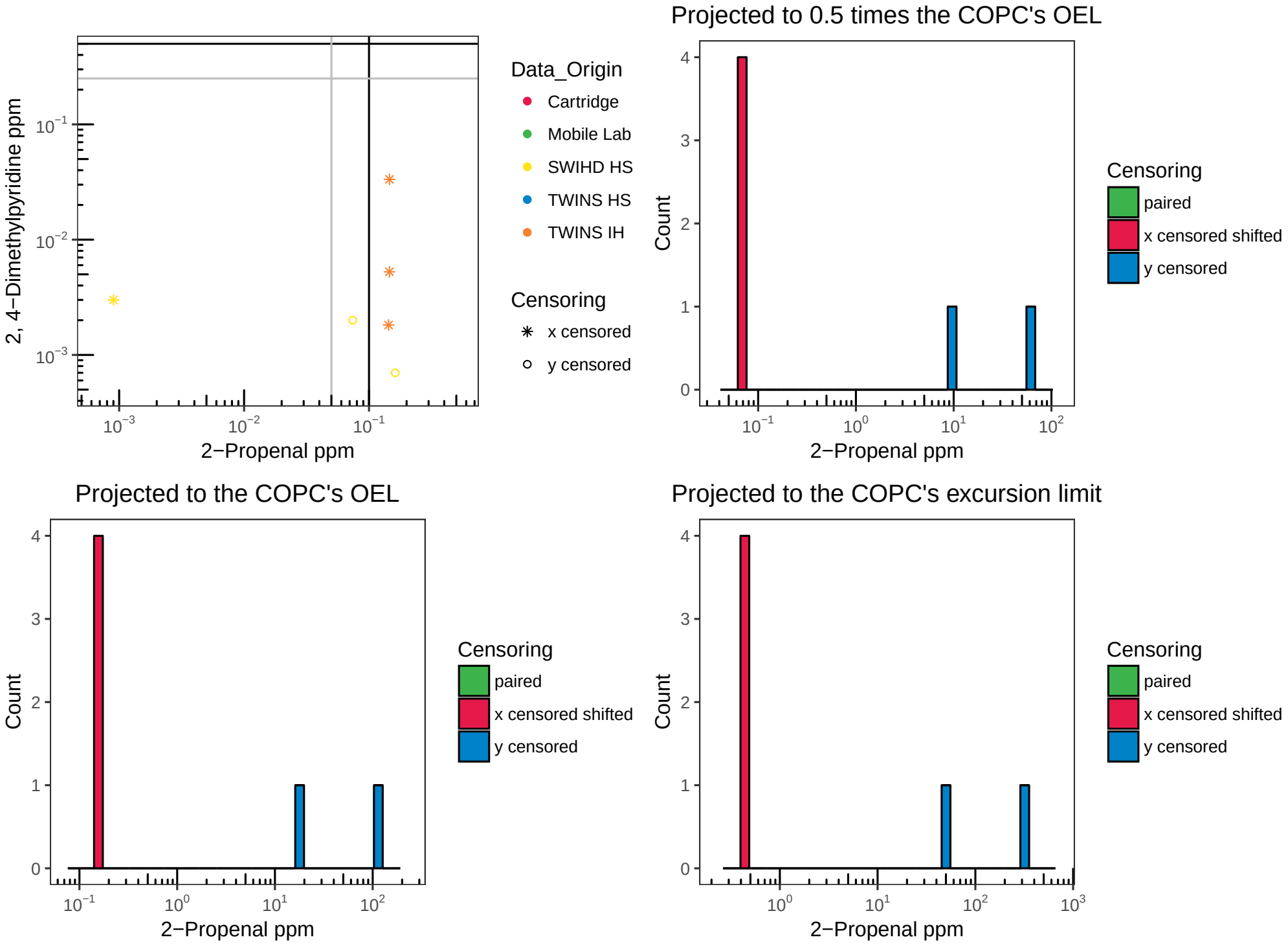


Figure C.964: 2, 4-Dimethylpyridine vs 2-Propenal

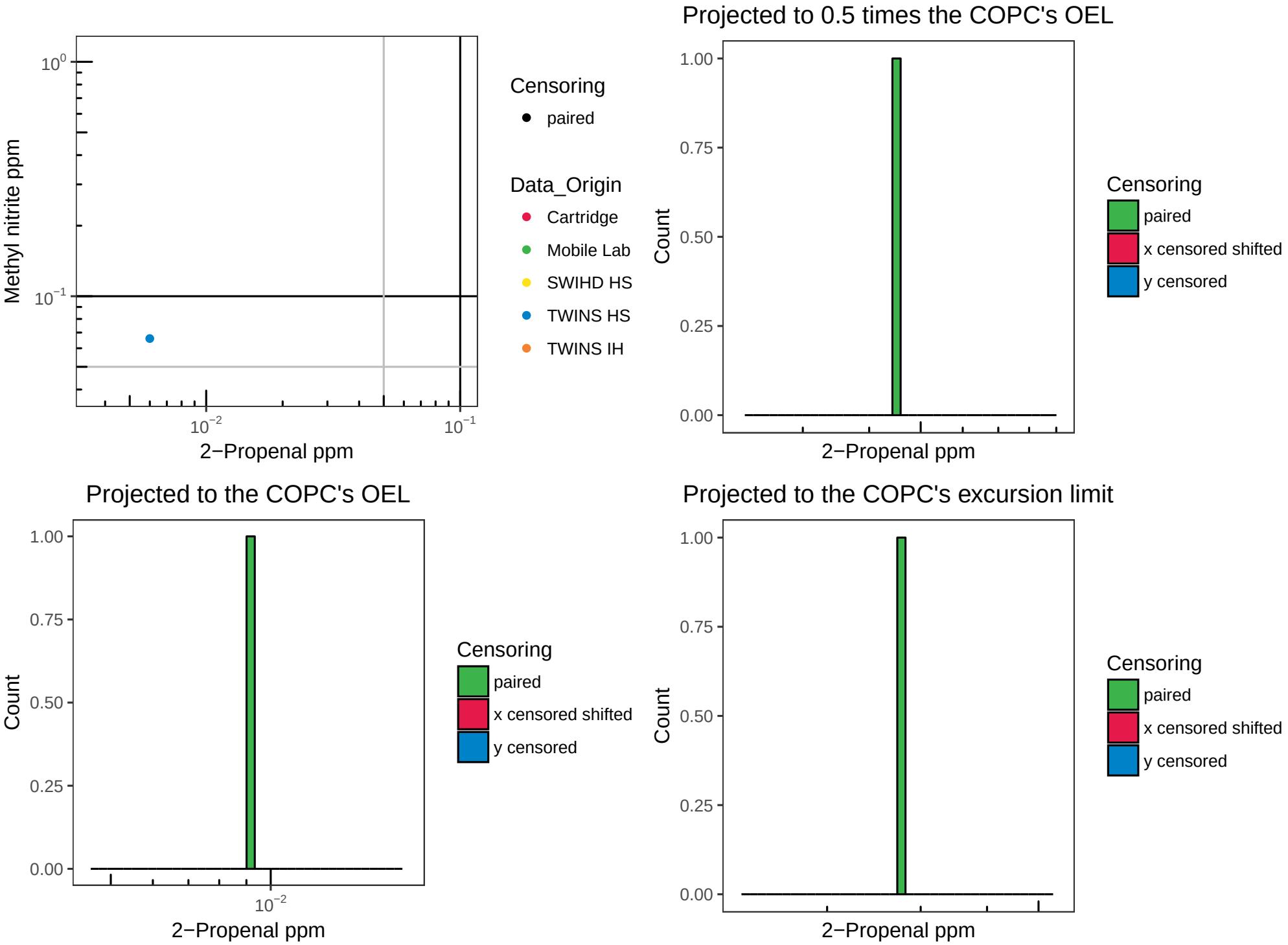


Figure C.965: Methyl nitrite vs 2-Propenal

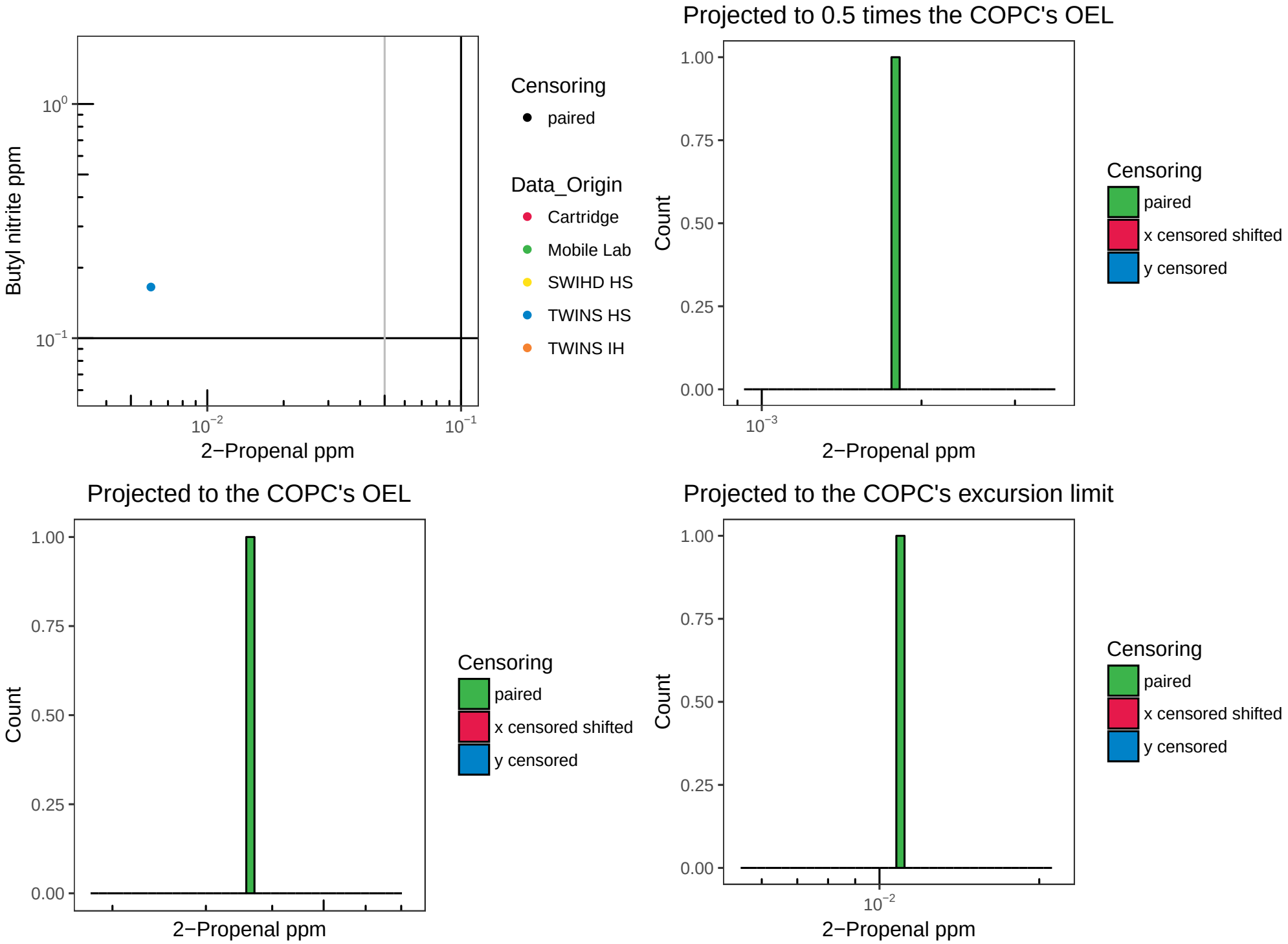


Figure C.966: Butyl nitrite vs 2-Propenal

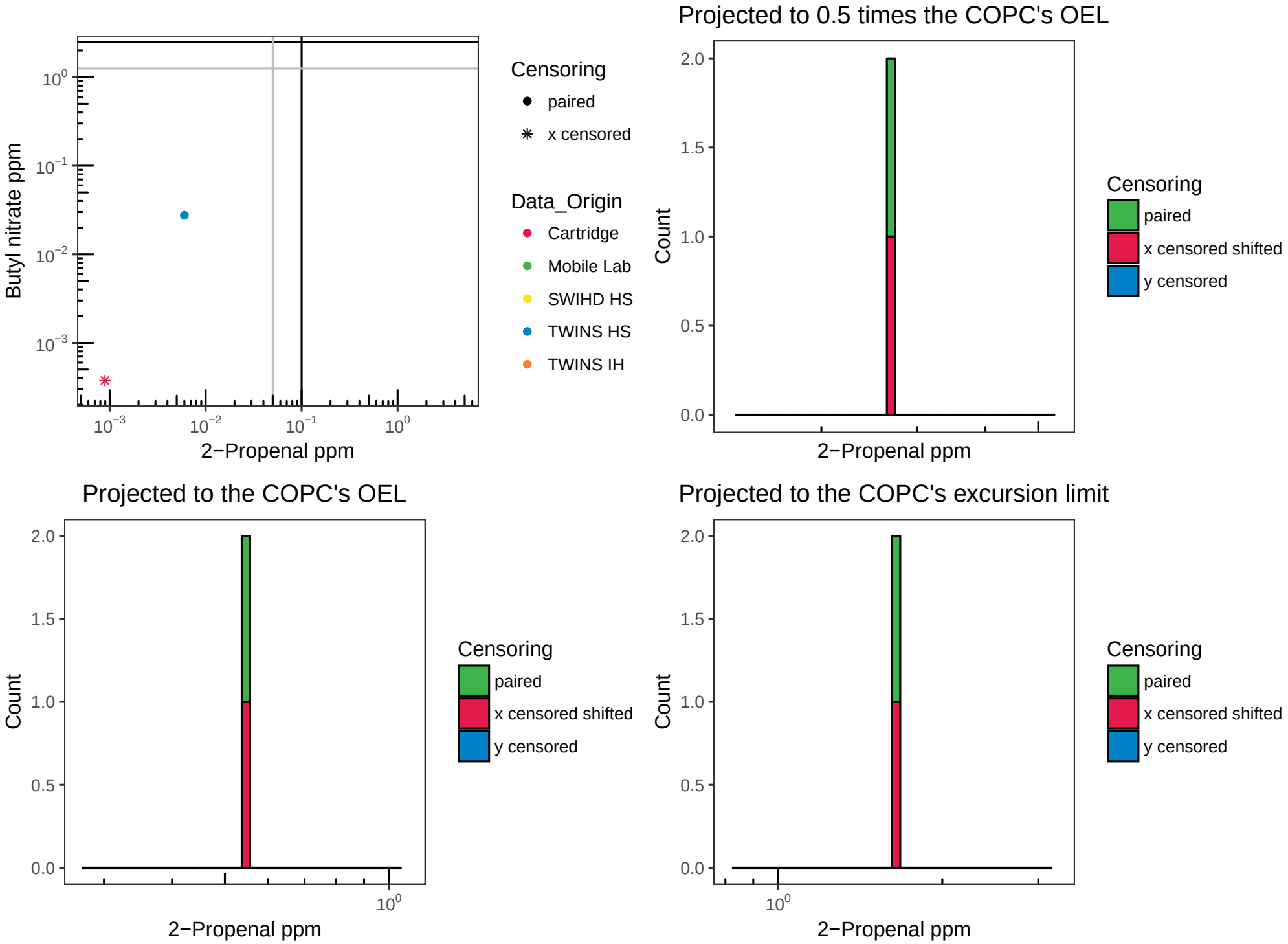


Figure C.967: Butyl nitrate vs 2-Propenal

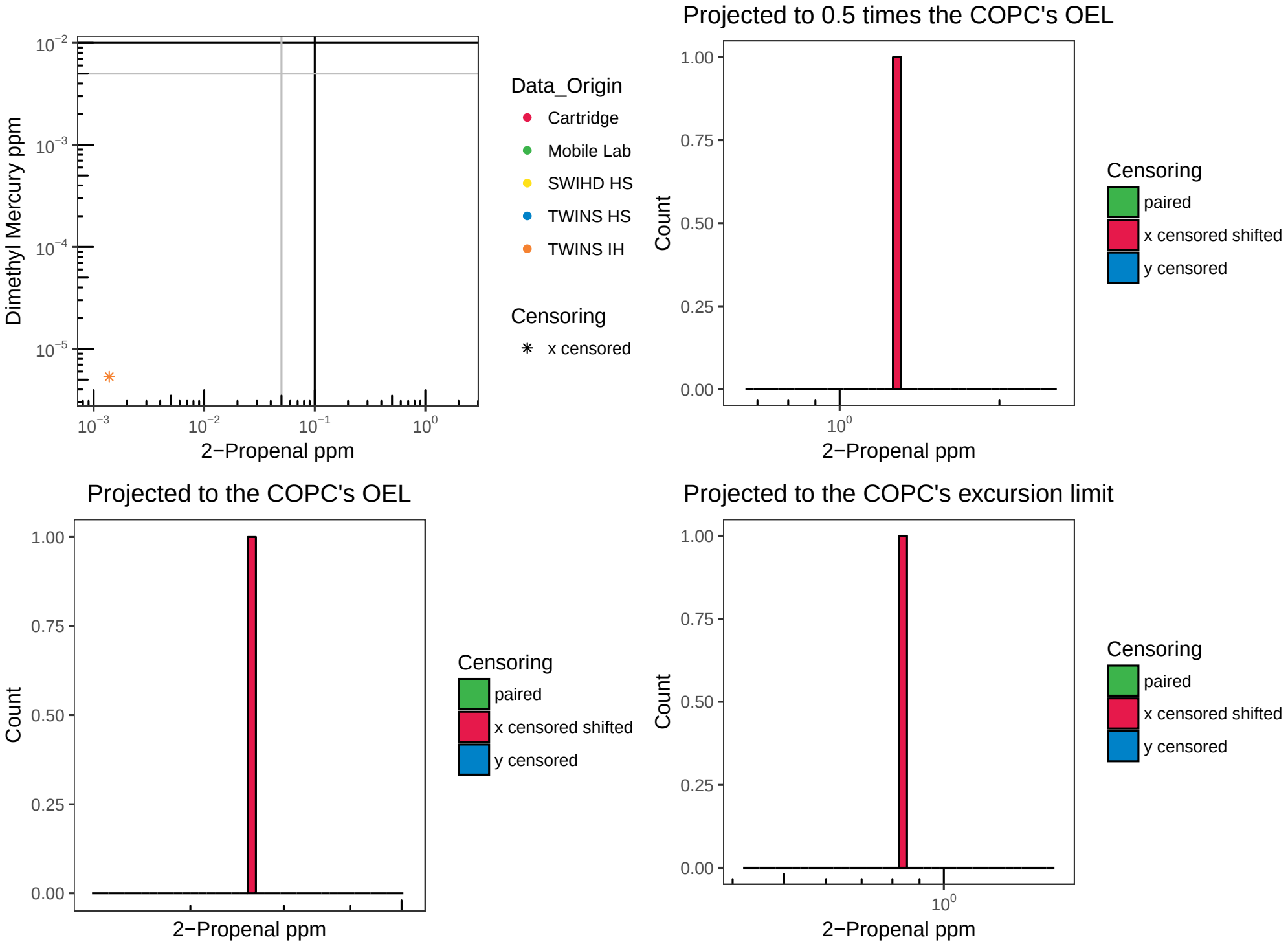


Figure C.968: Dimethyl Mercury vs 2-Propenal

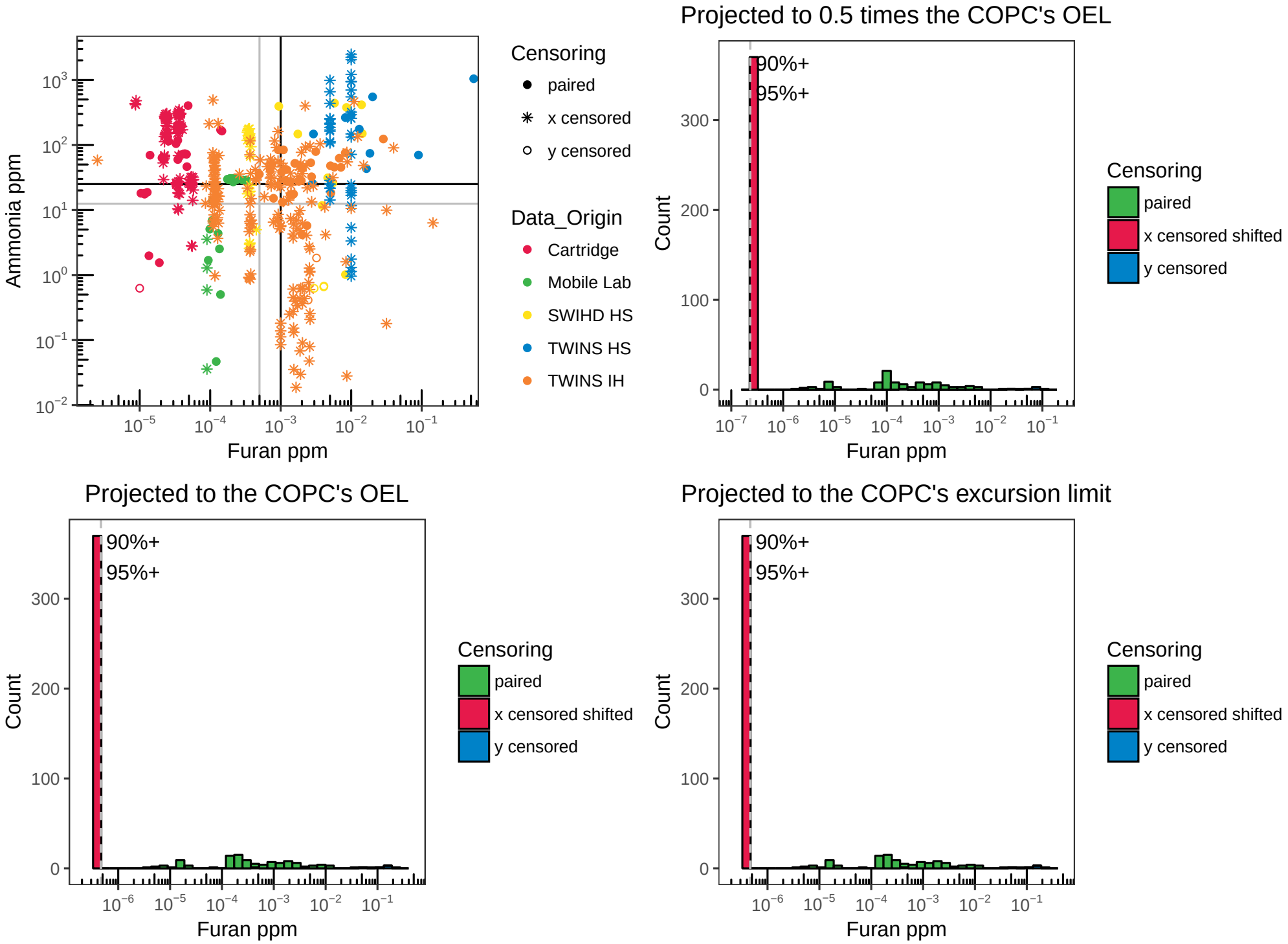


Figure C.969: Ammonia vs Furan

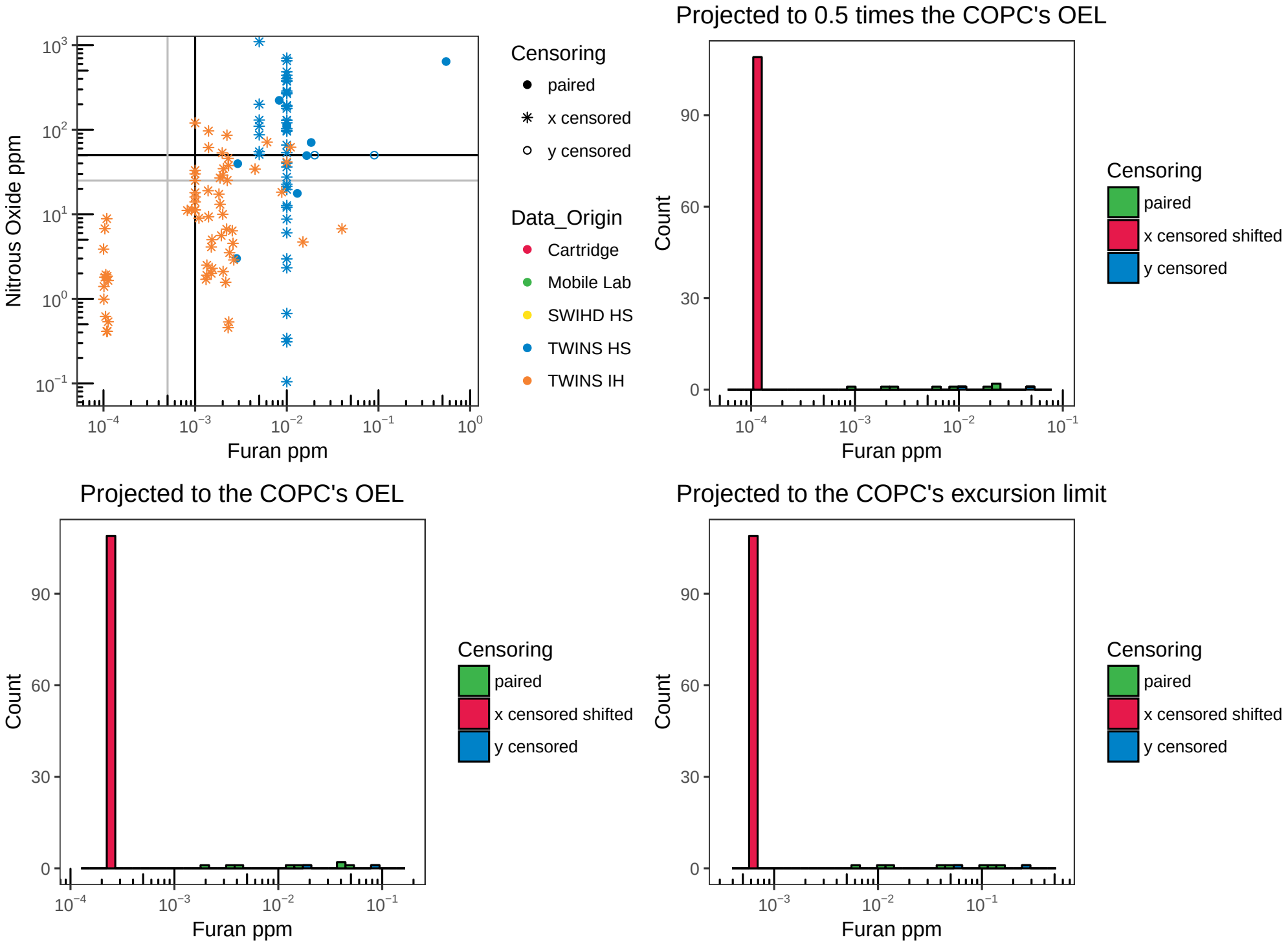


Figure C.970: Nitrous Oxide vs Furan

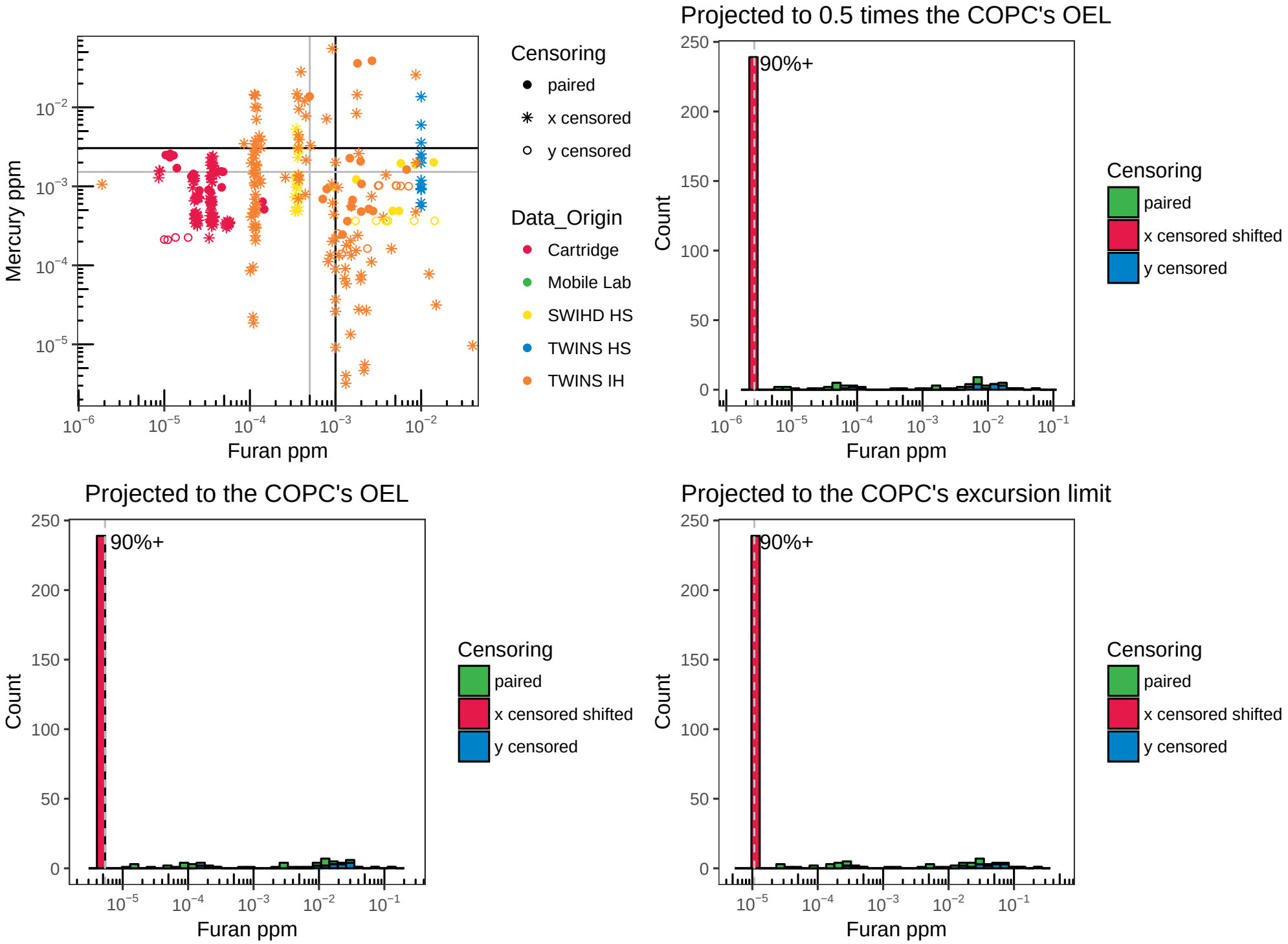


Figure C.971: Mercury vs Furan

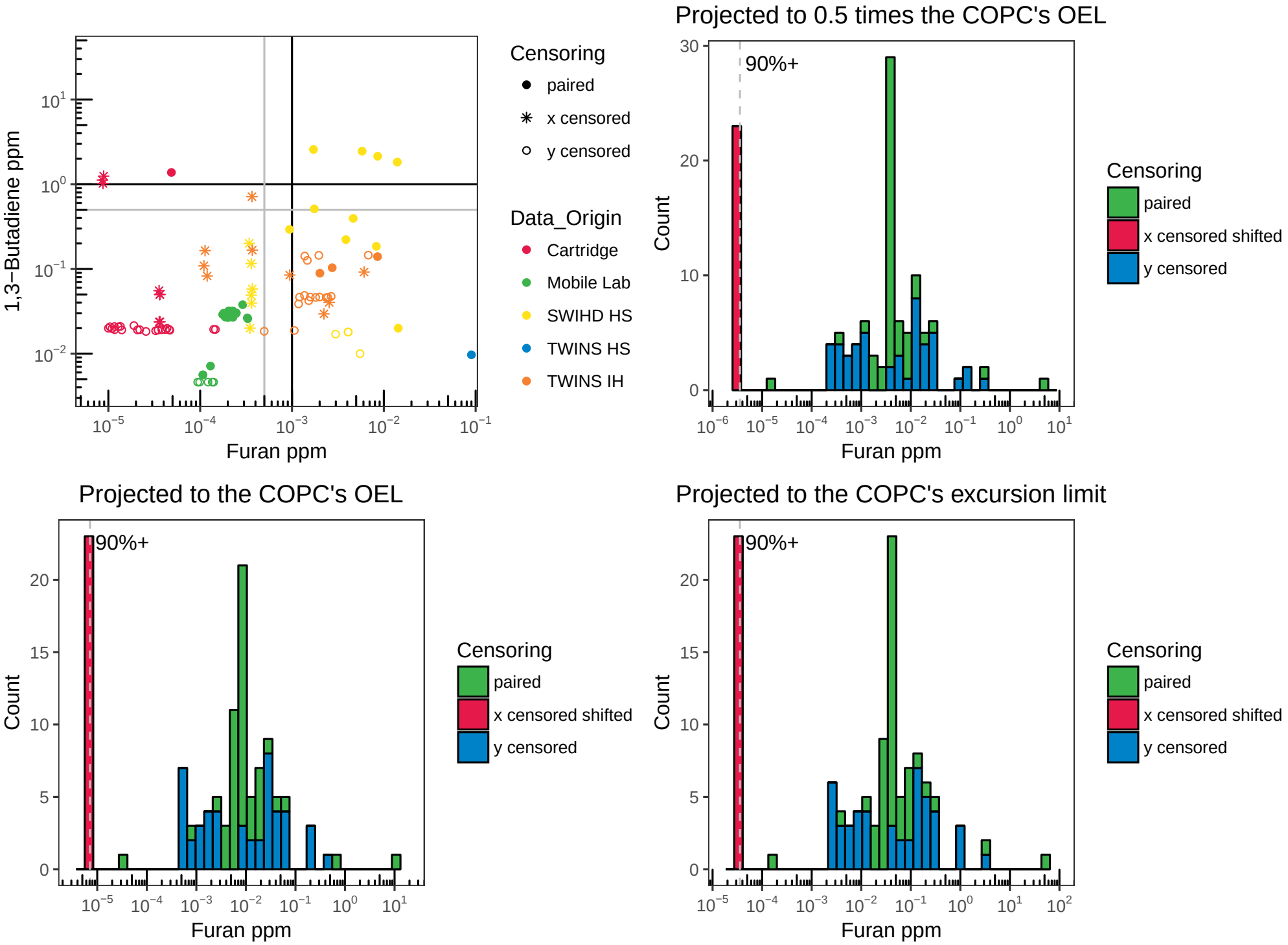


Figure C.972: 1,3-Butadiene vs Furan

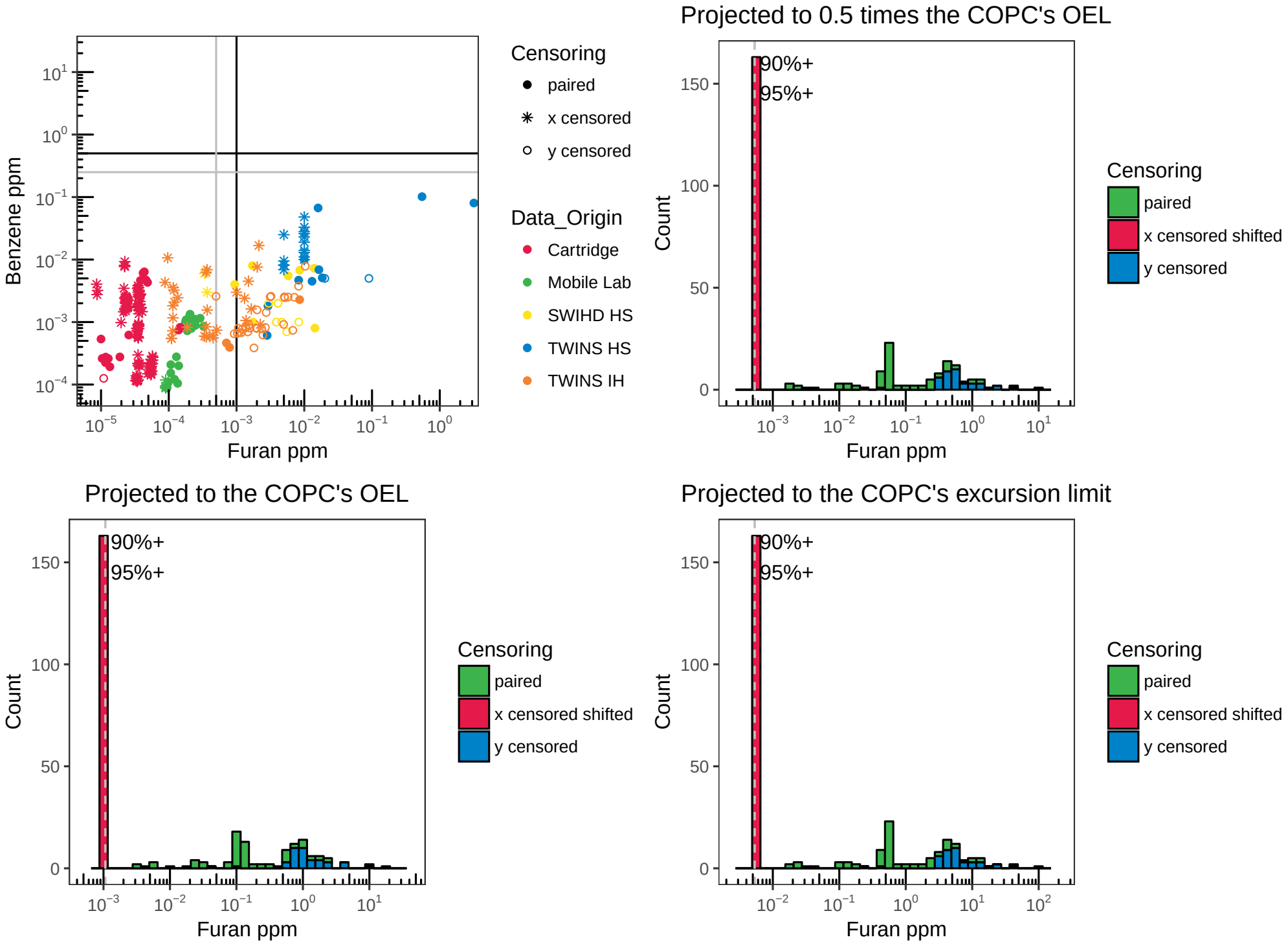


Figure C.973: Benzene vs Furan

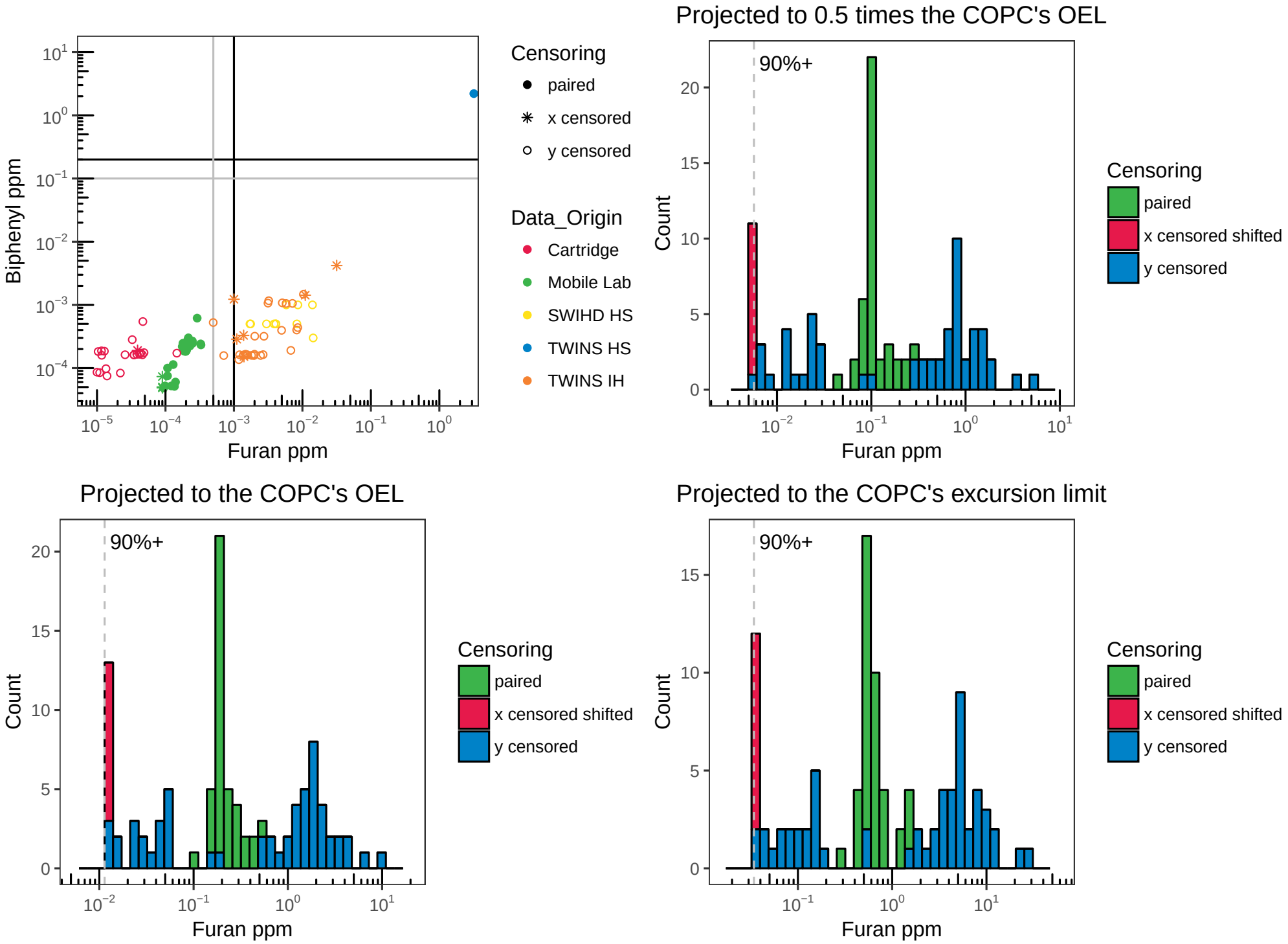


Figure C.974: Biphenyl vs Furan

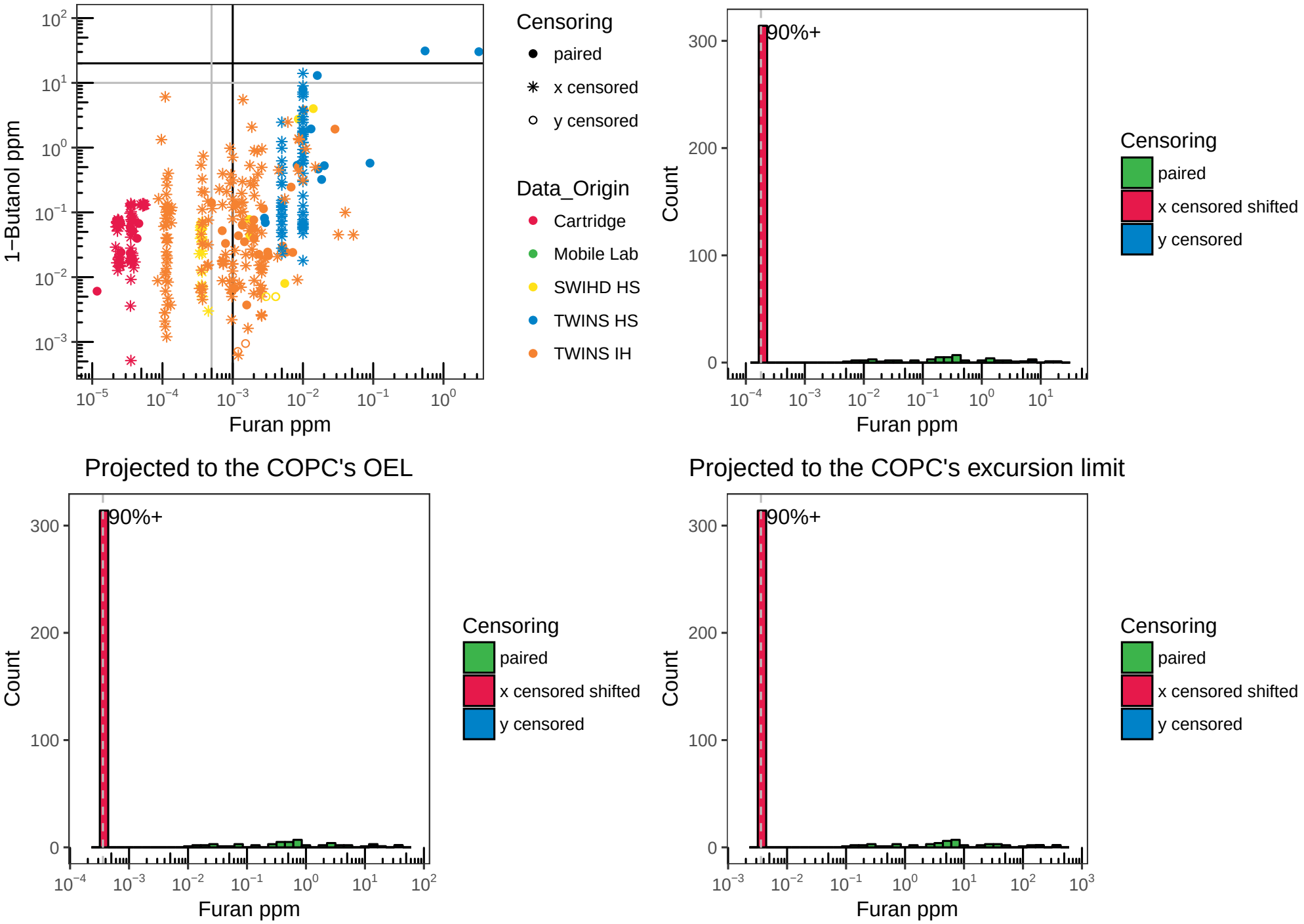


Figure C.975: 1-Butanol vs Furan

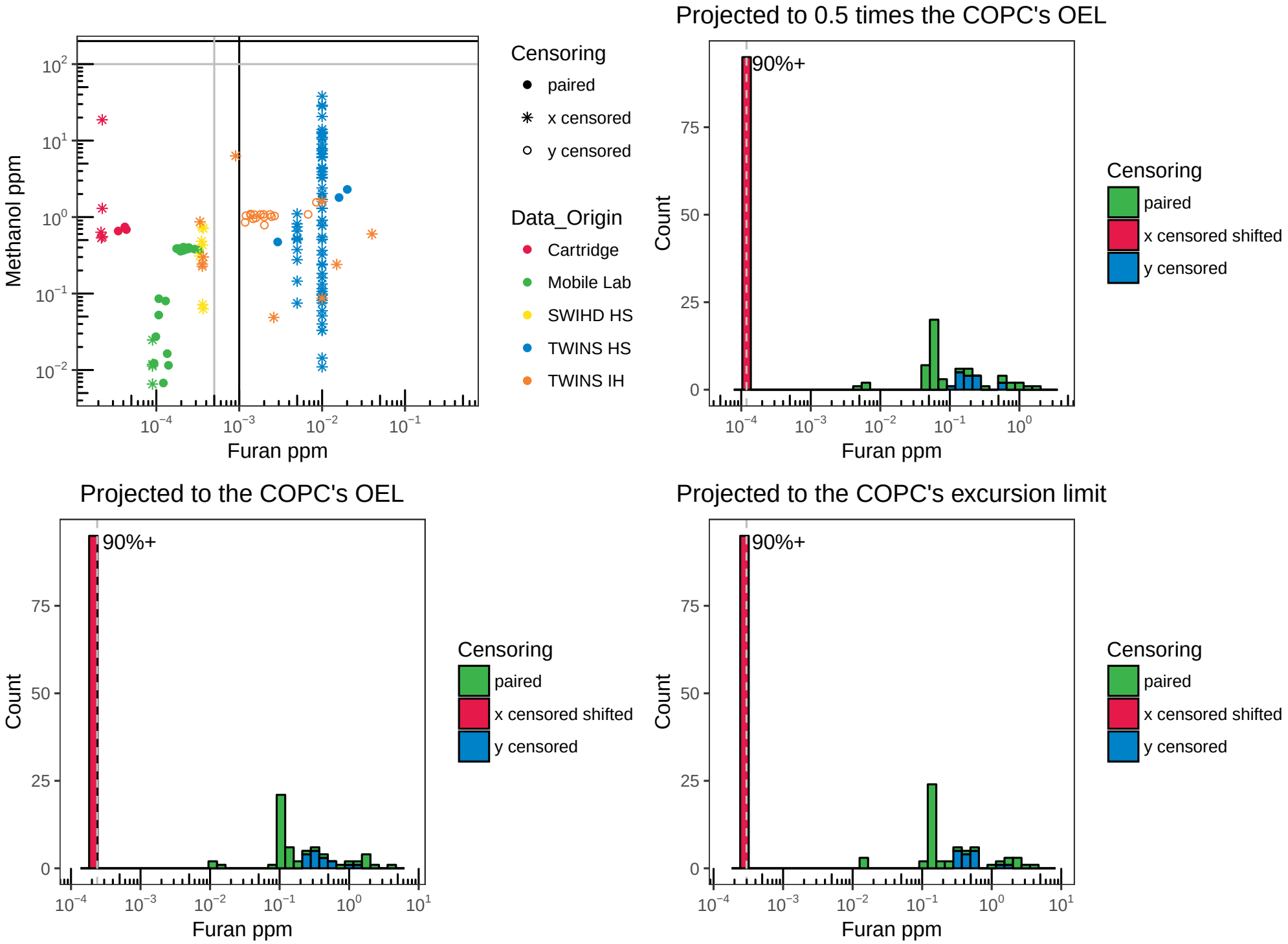


Figure C.976: Methanol vs Furan

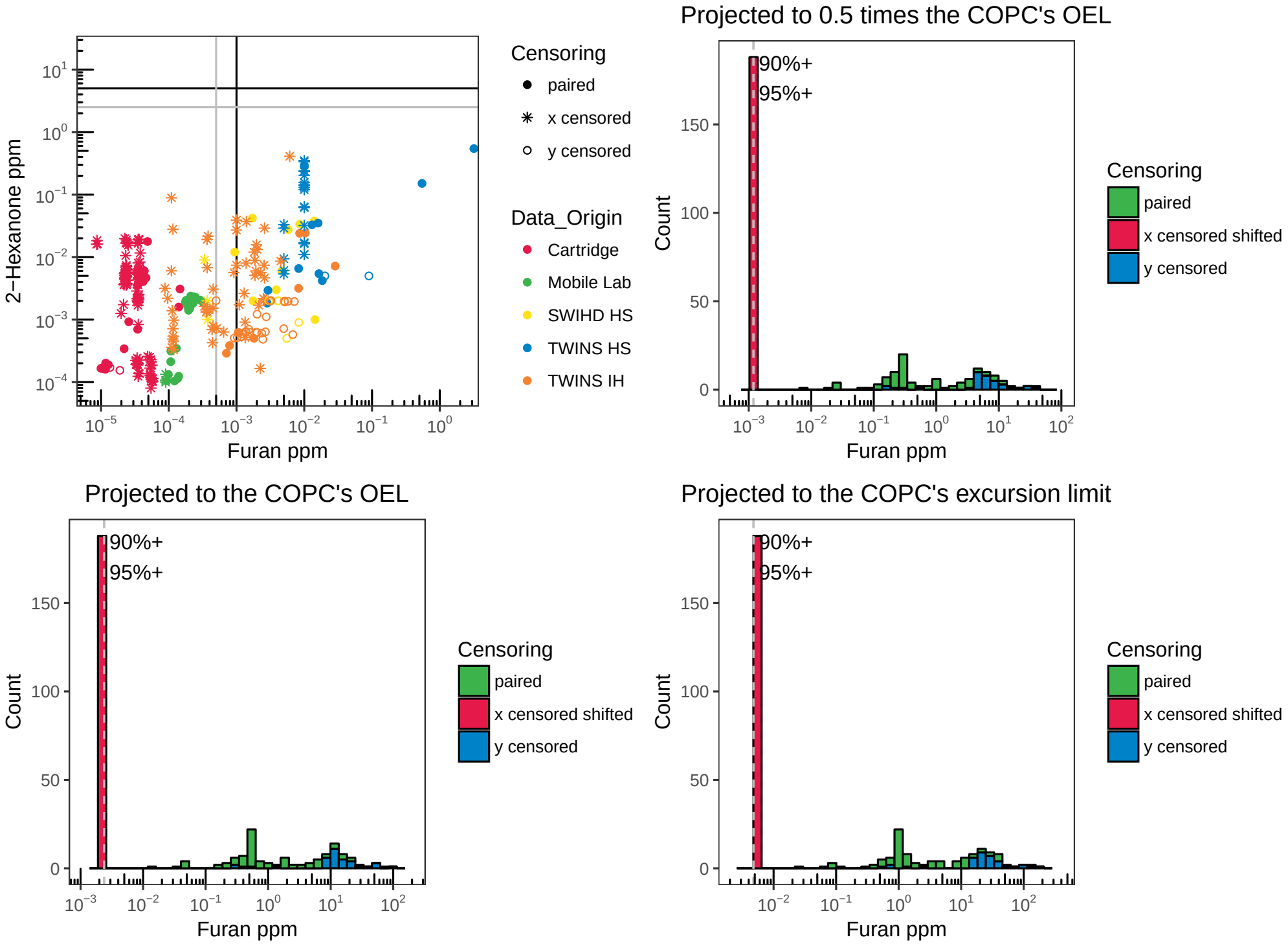


Figure C.977: 2-Hexanone vs Furan

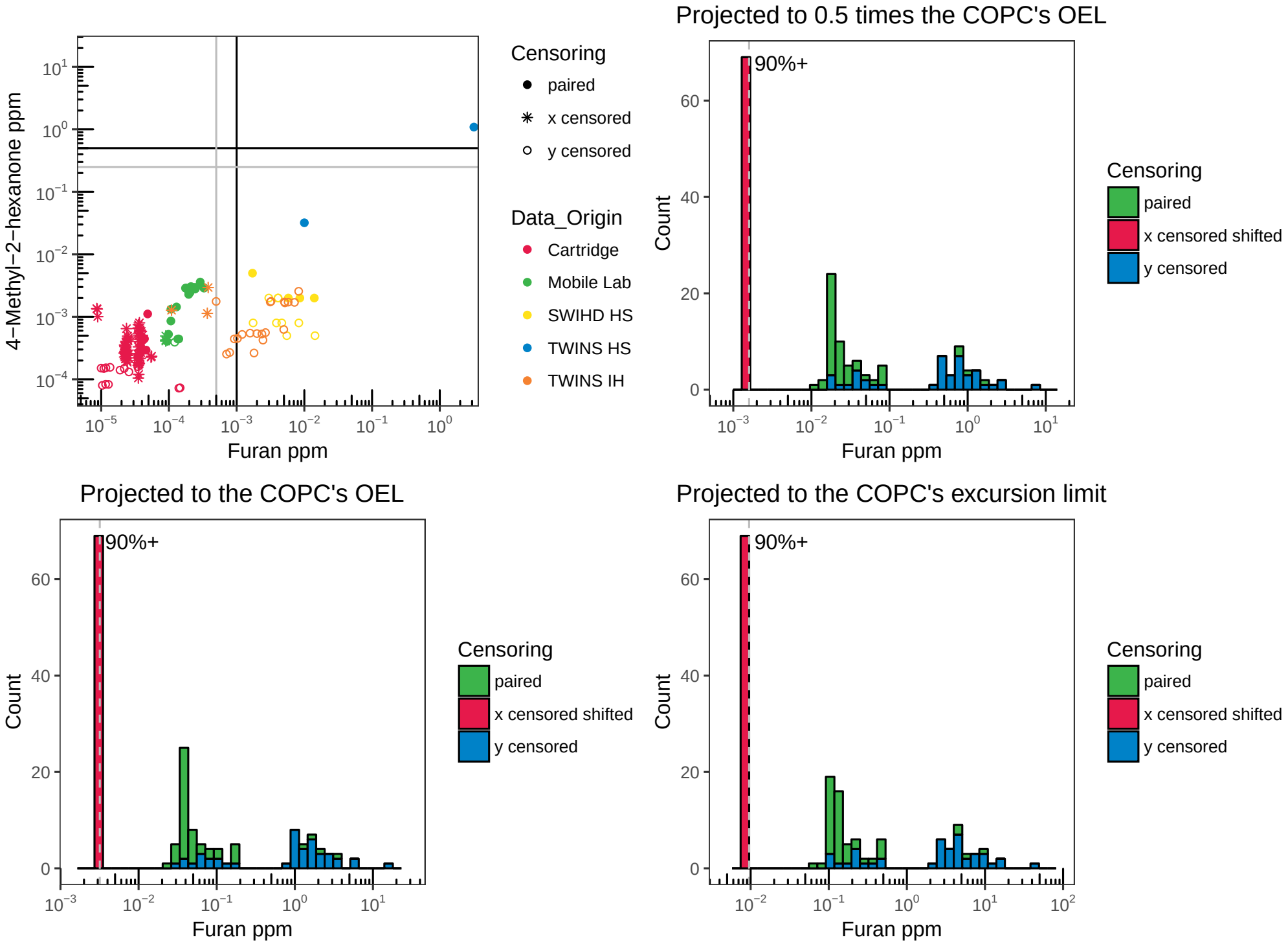


Figure C.978: 4-Methyl-2-hexanone vs Furan

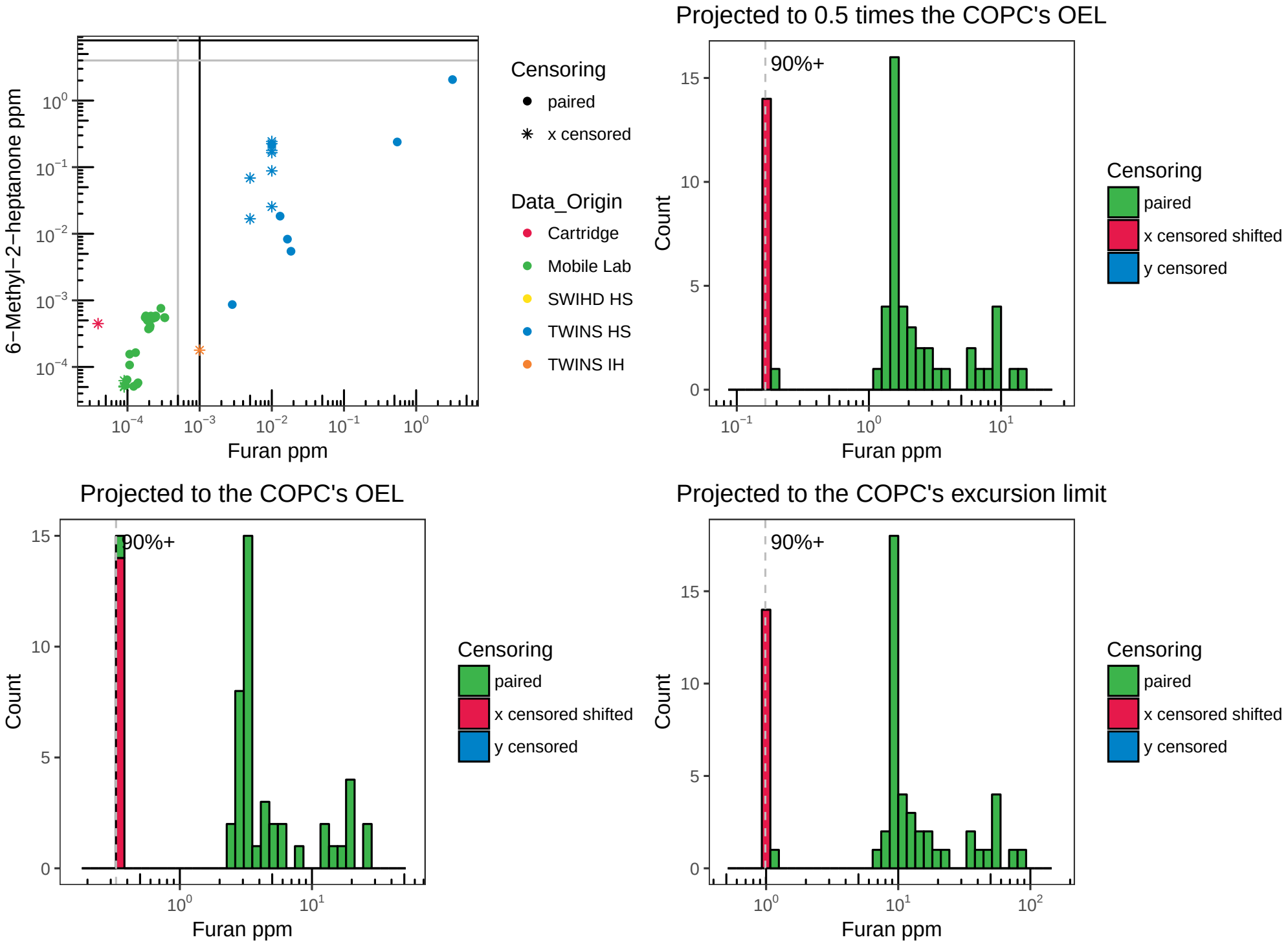


Figure C.979: 6-Methyl-2-heptanone vs Furan

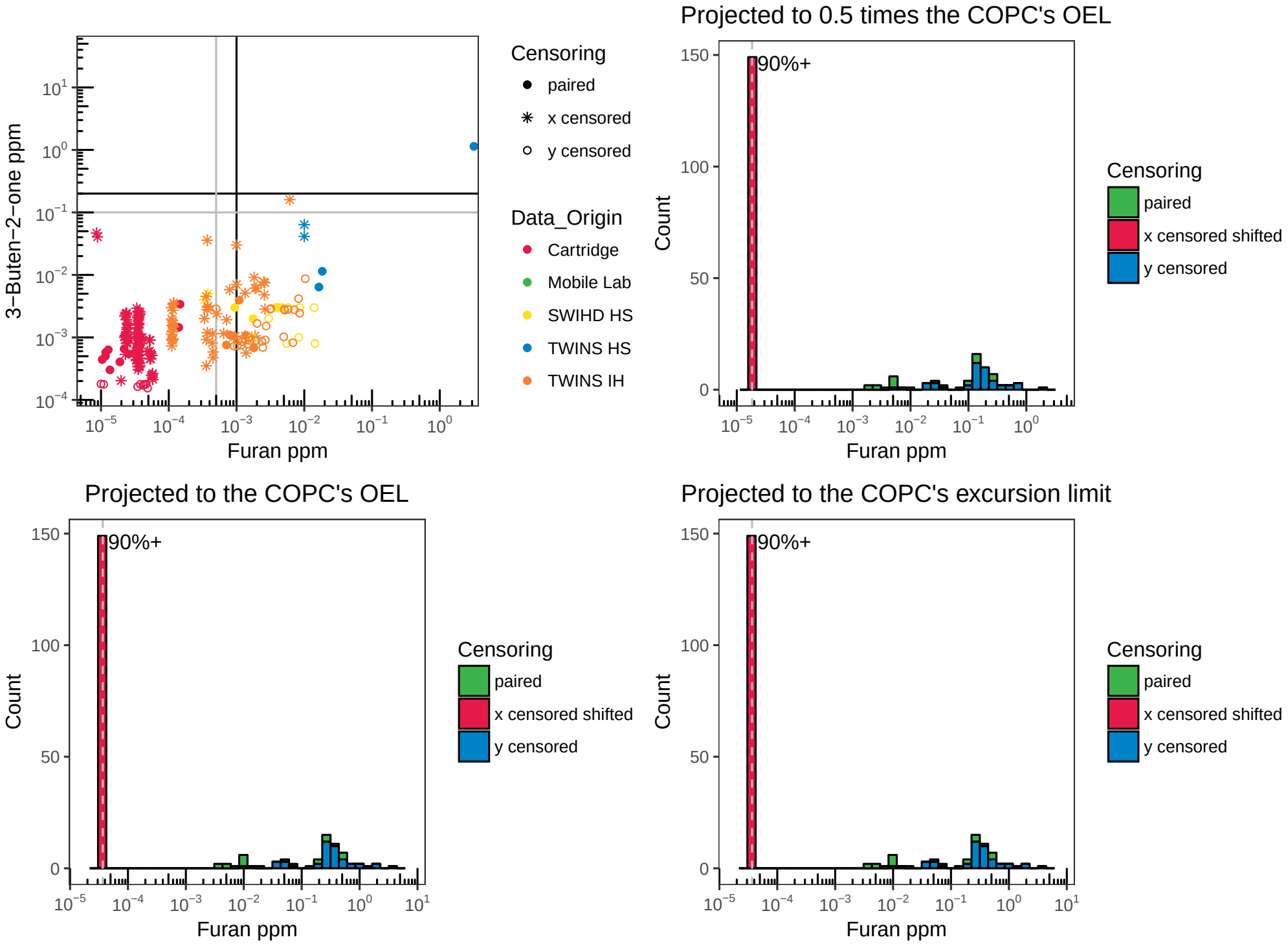


Figure C.980: 3-Buten-2-one vs Furan

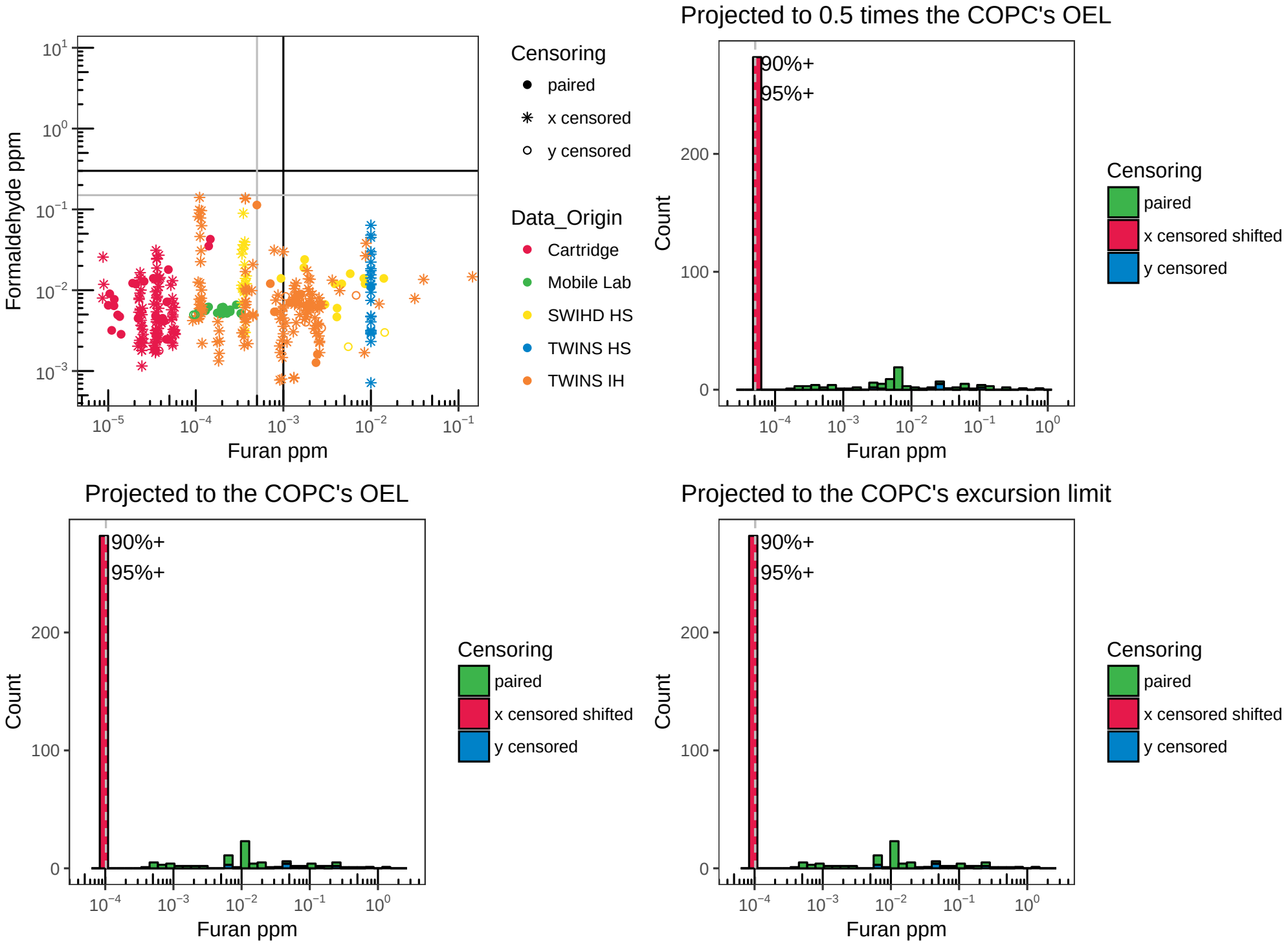


Figure C.981: Formaldehyde vs Furan

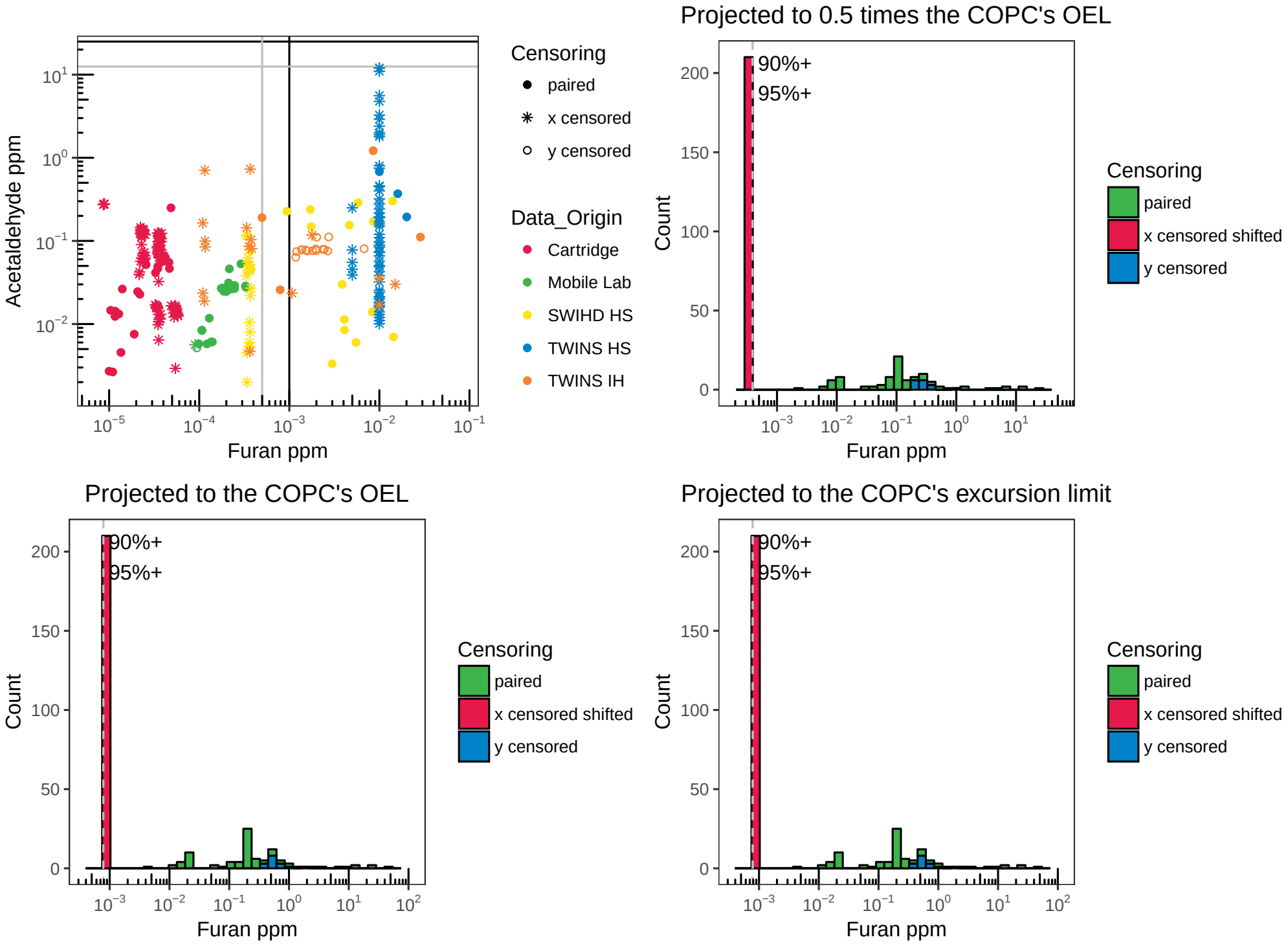


Figure C.982: Acetaldehyde vs Furan

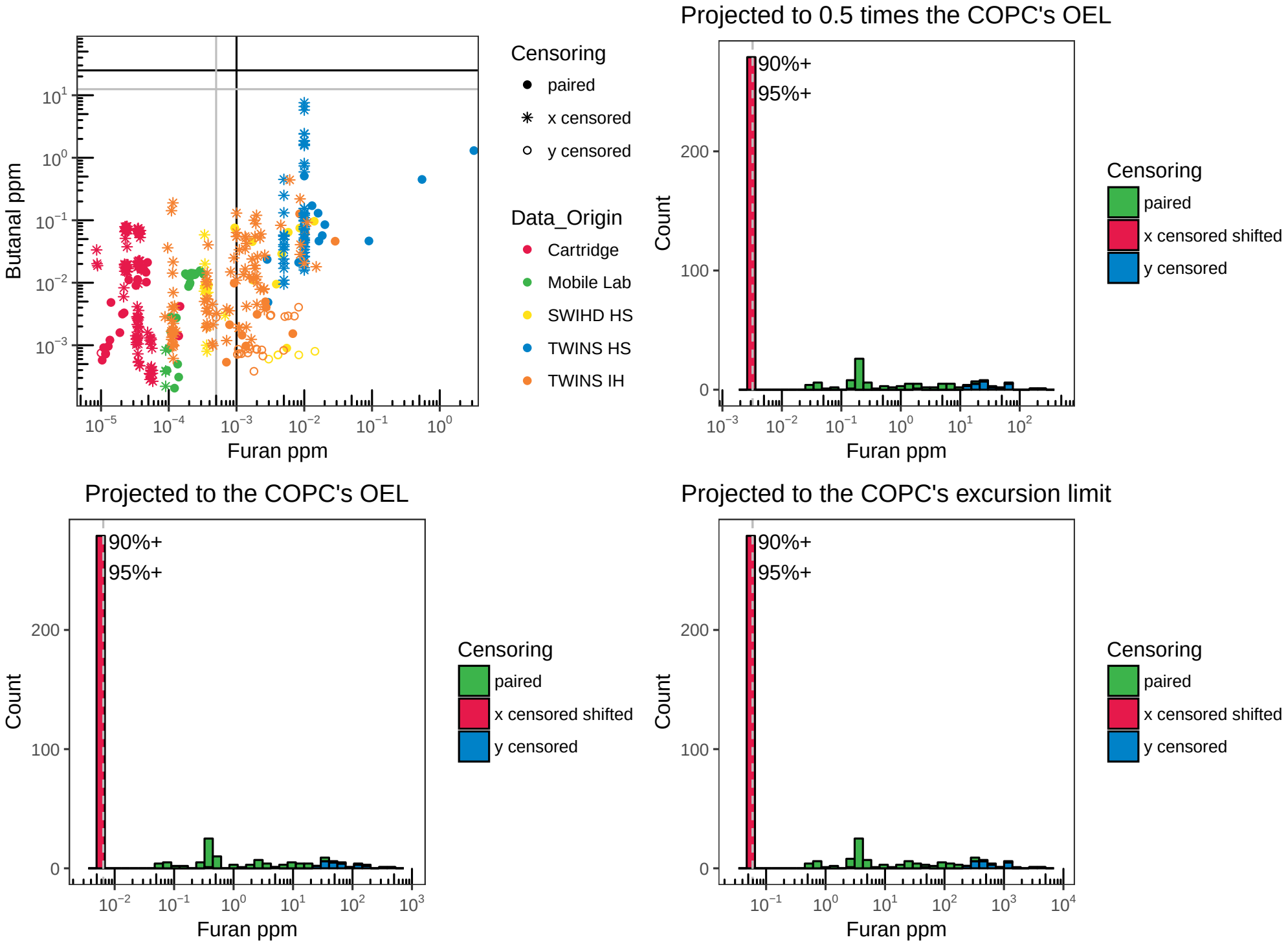


Figure C.983: Butanal vs Furan

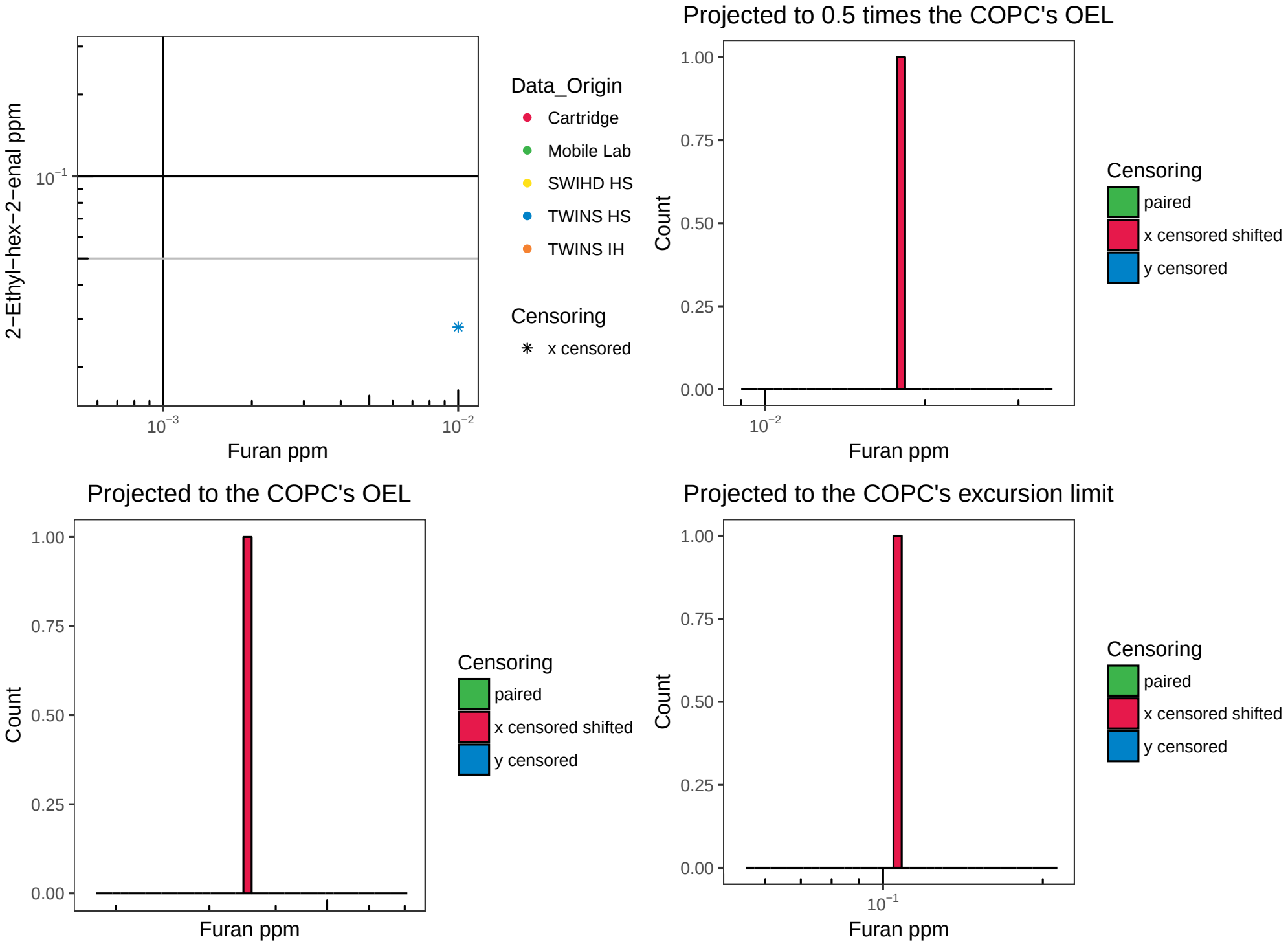


Figure C.984: 2-Ethyl-hex-2-enal vs Furan

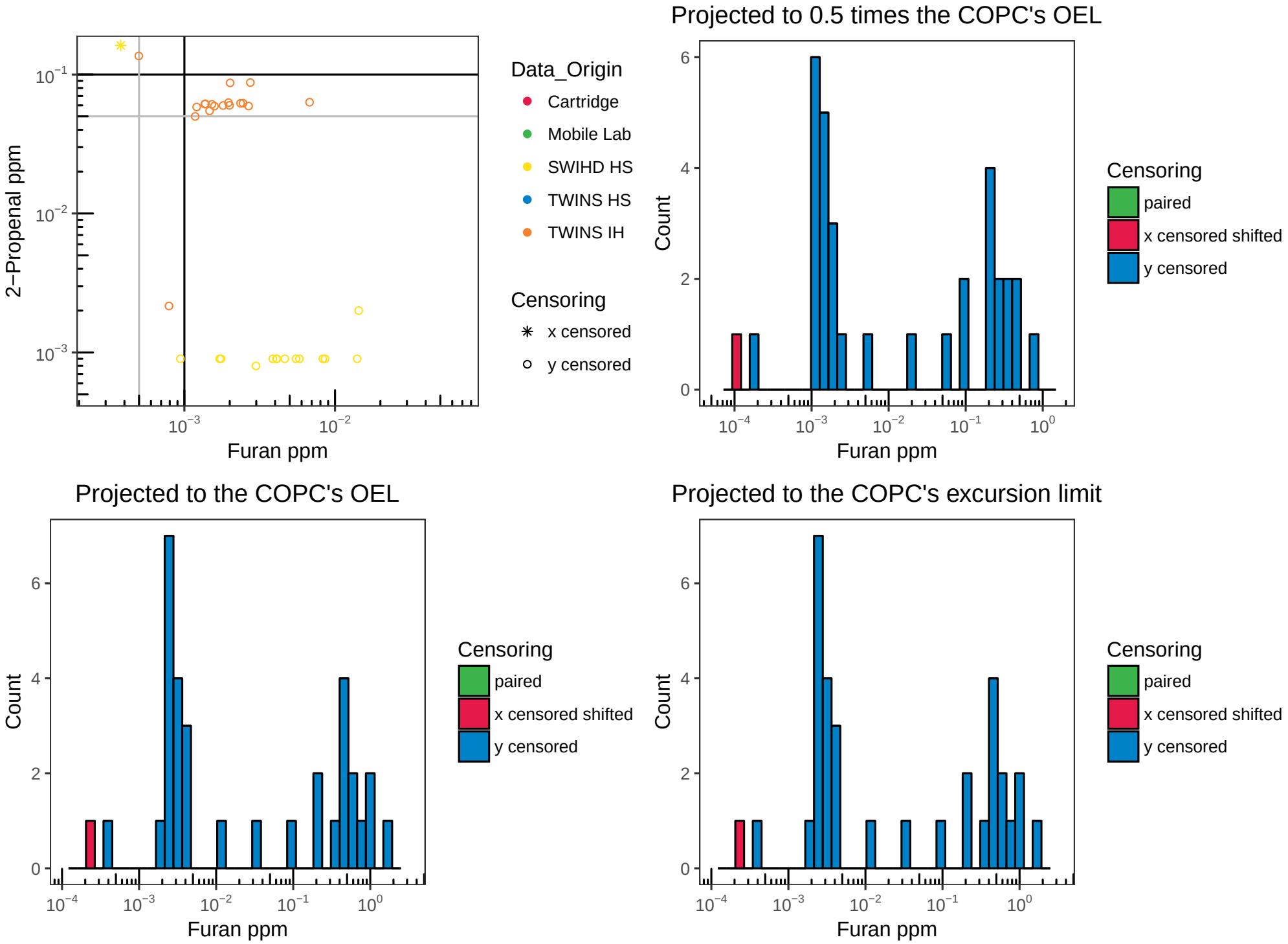


Figure C.985: 2-Propenal vs Furan

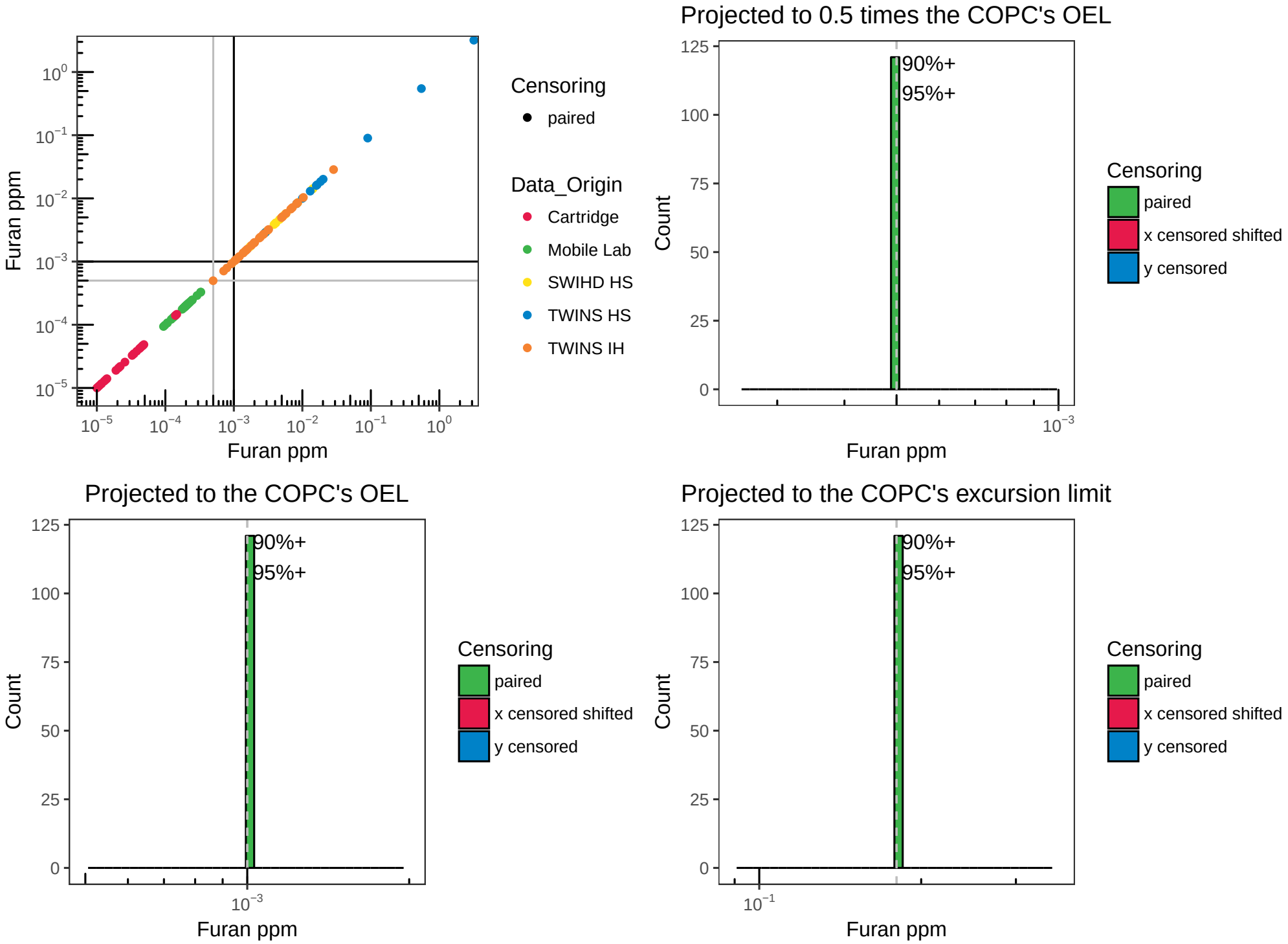


Figure C.986: Furan vs Furan

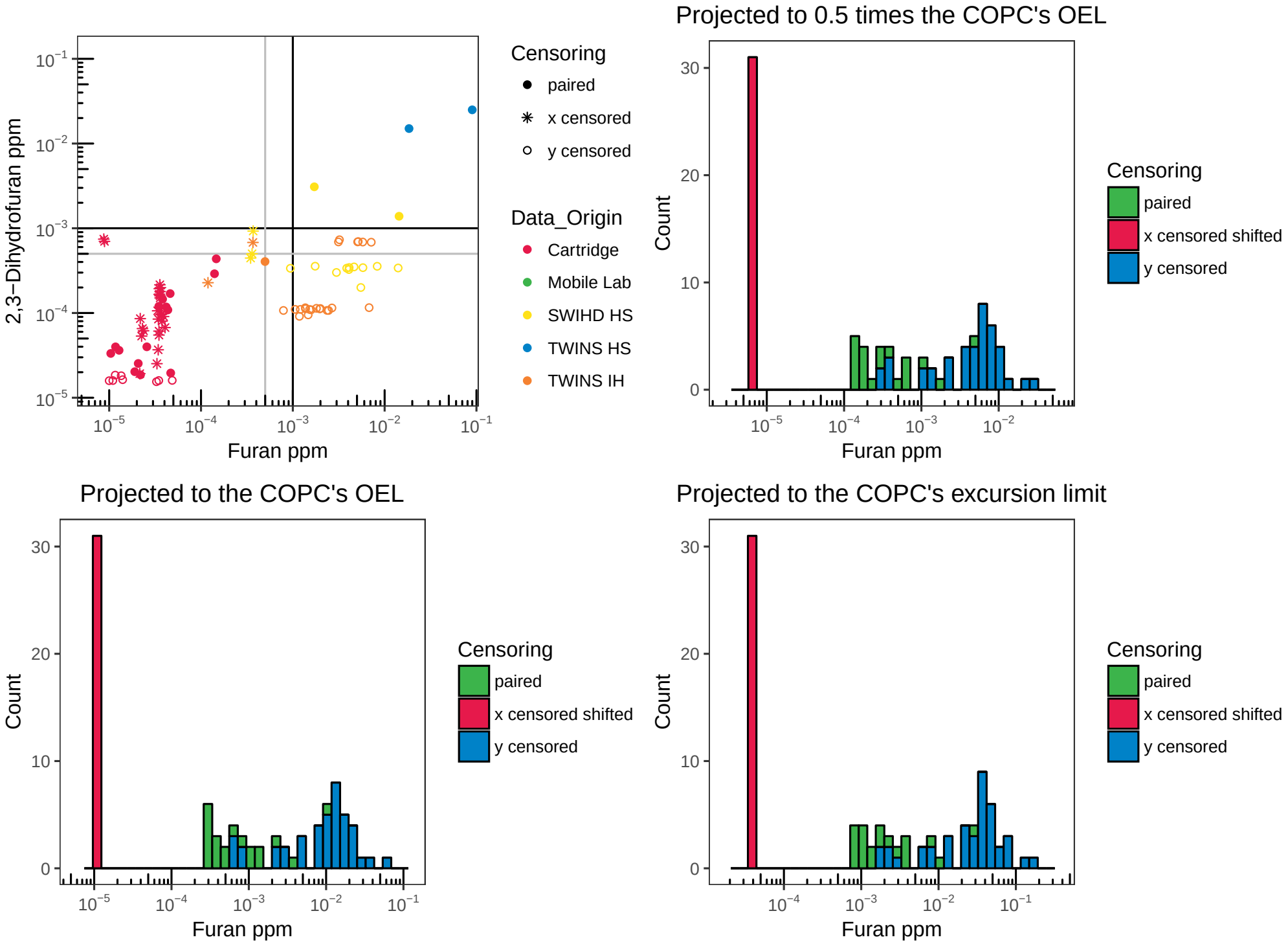


Figure C.987: 2,3-Dihydrofuran vs Furan

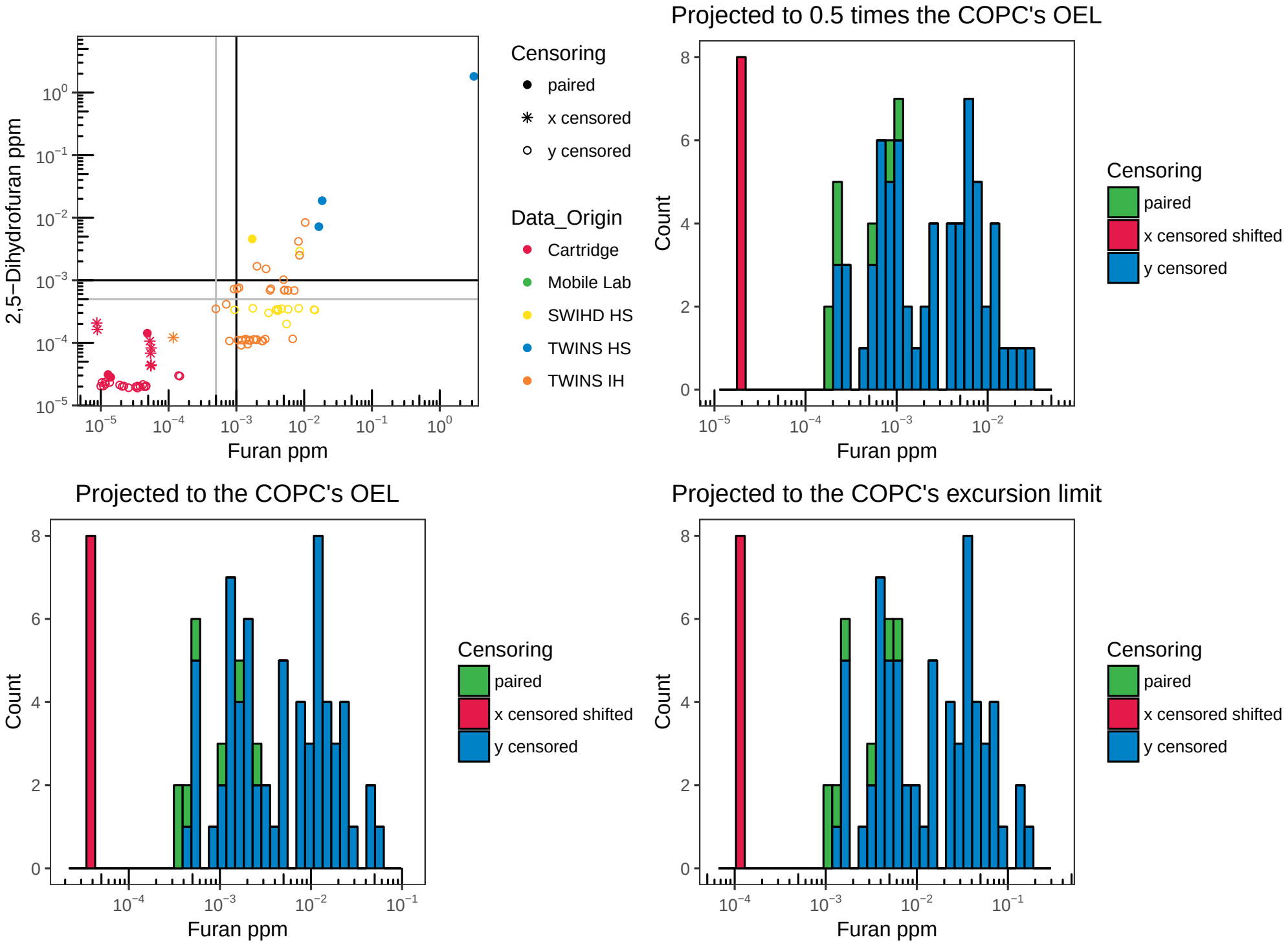


Figure C.988: 2,5-Dihydrofuran vs Furan

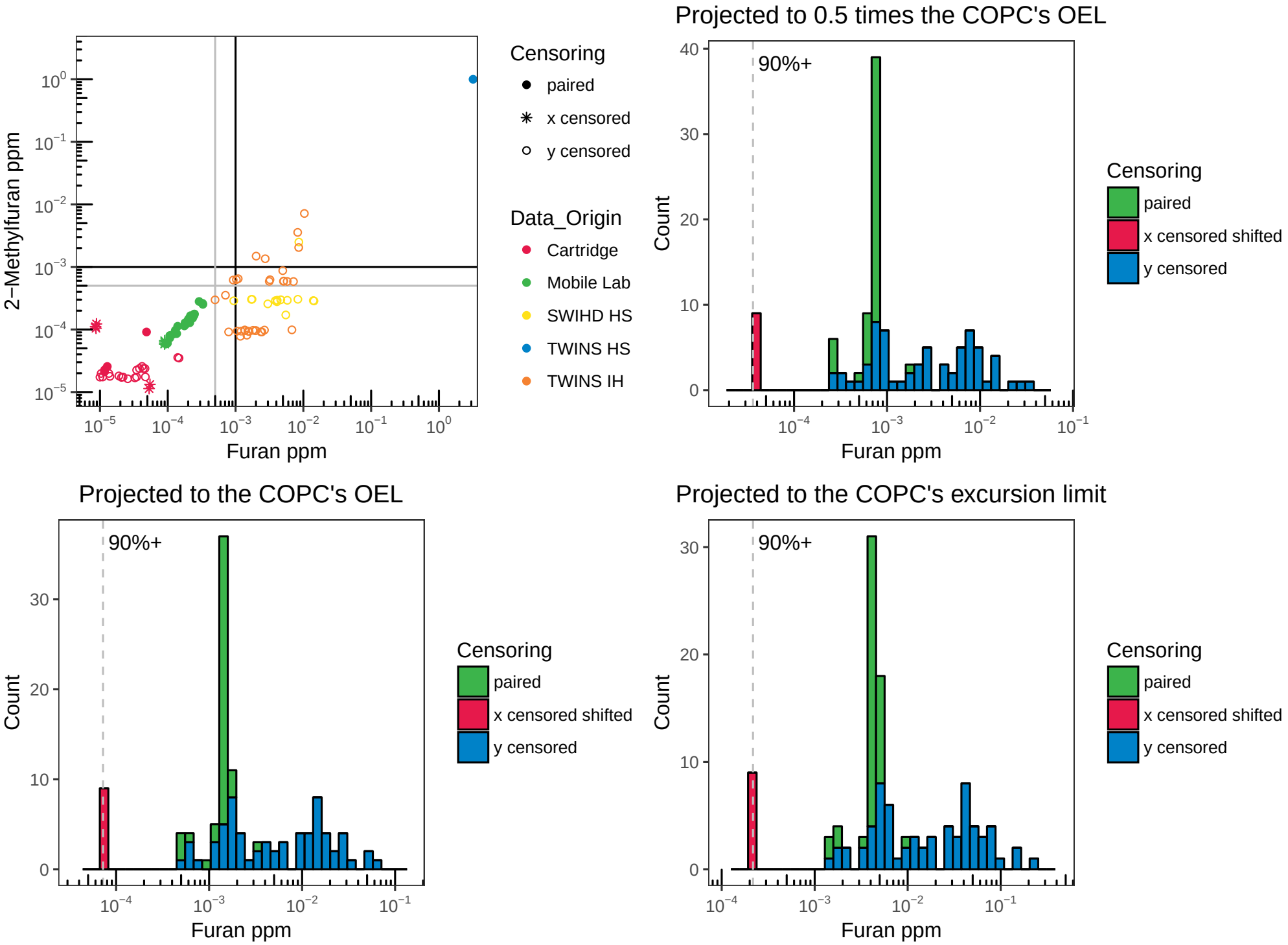


Figure C.989: 2-Methylfuran vs Furan

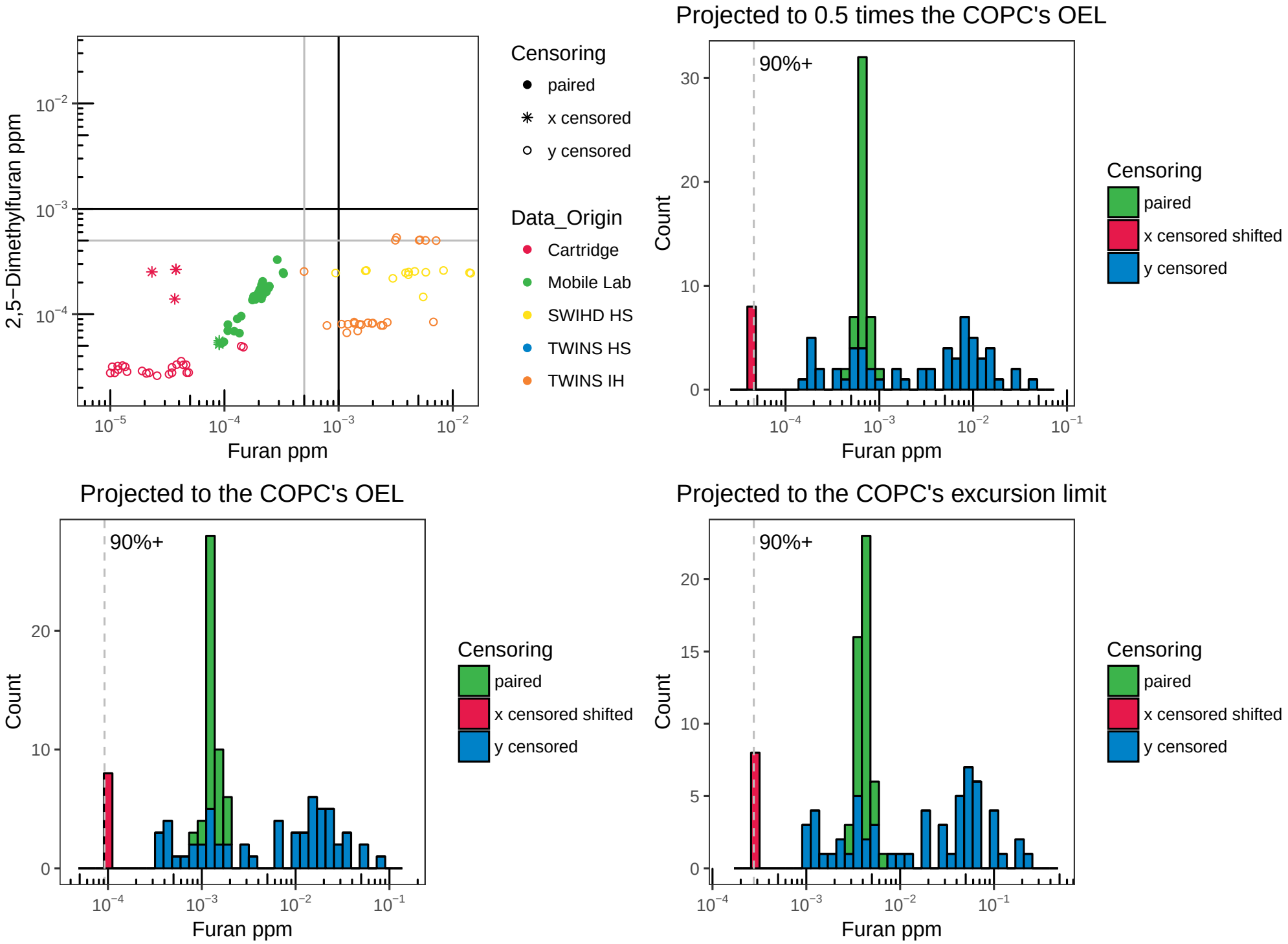


Figure C.990: 2,5-Dimethylfuran vs Furan

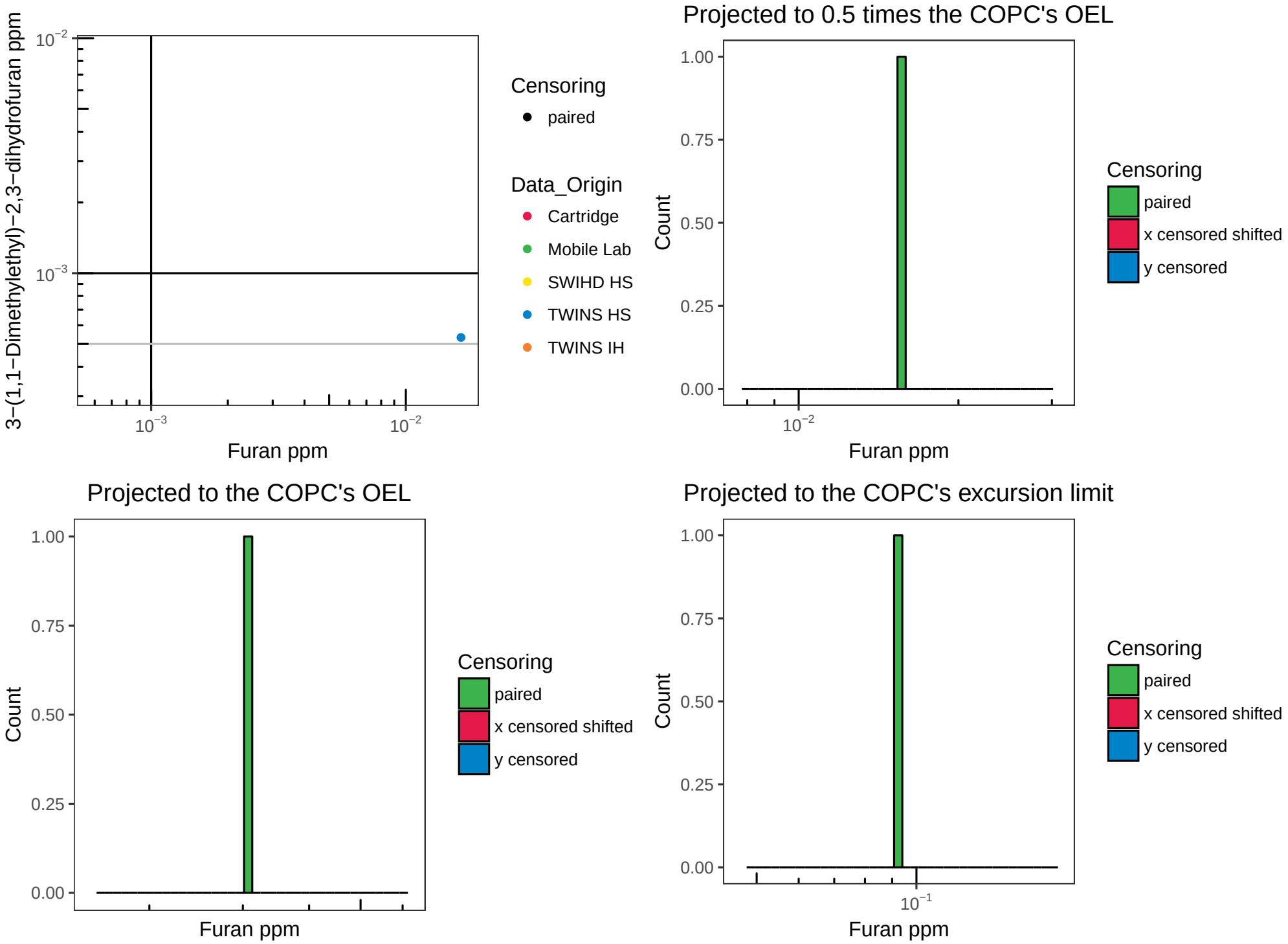


Figure C.991: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Furan

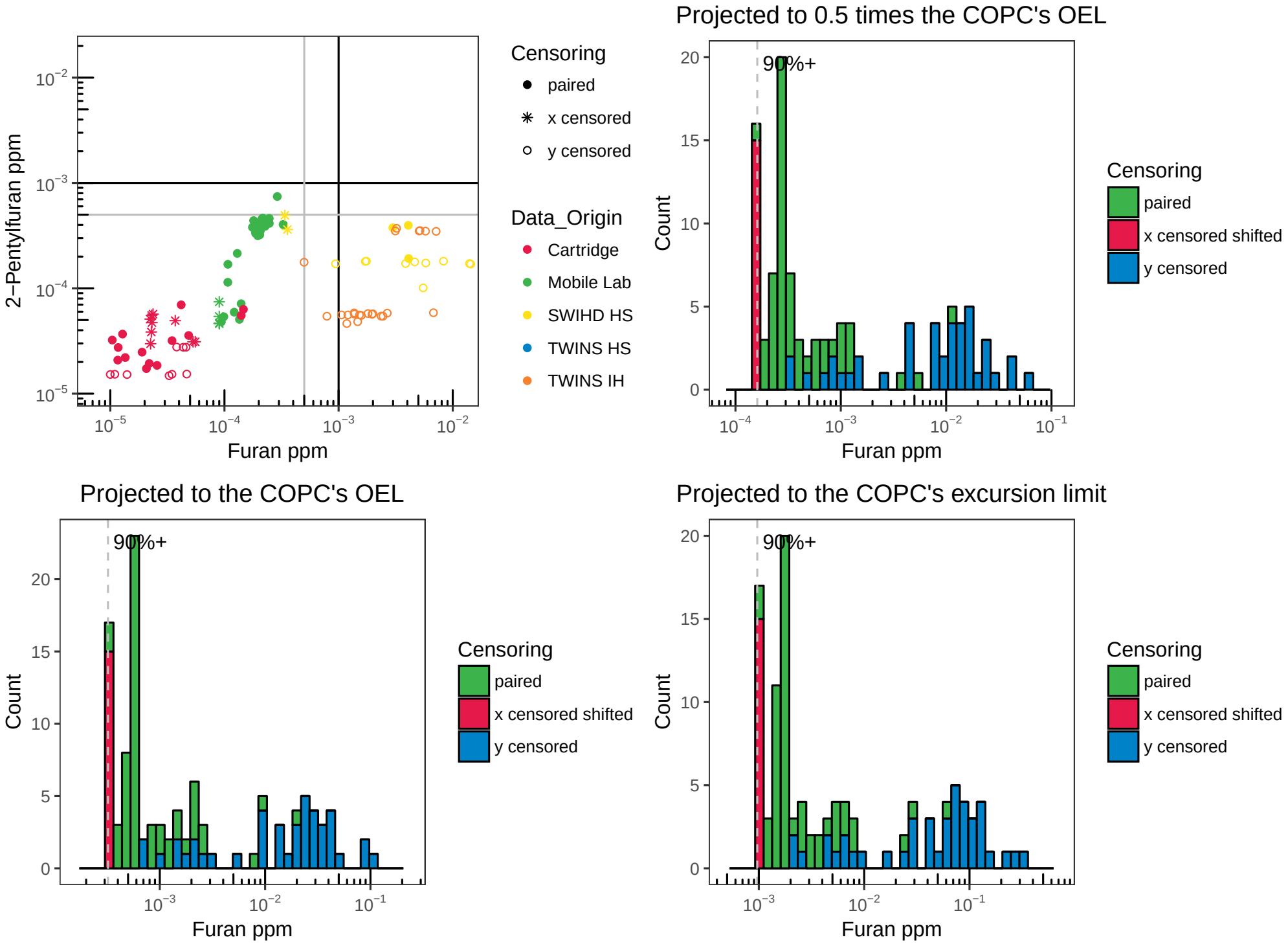


Figure C.992: 2-Pentylfuran vs Furan

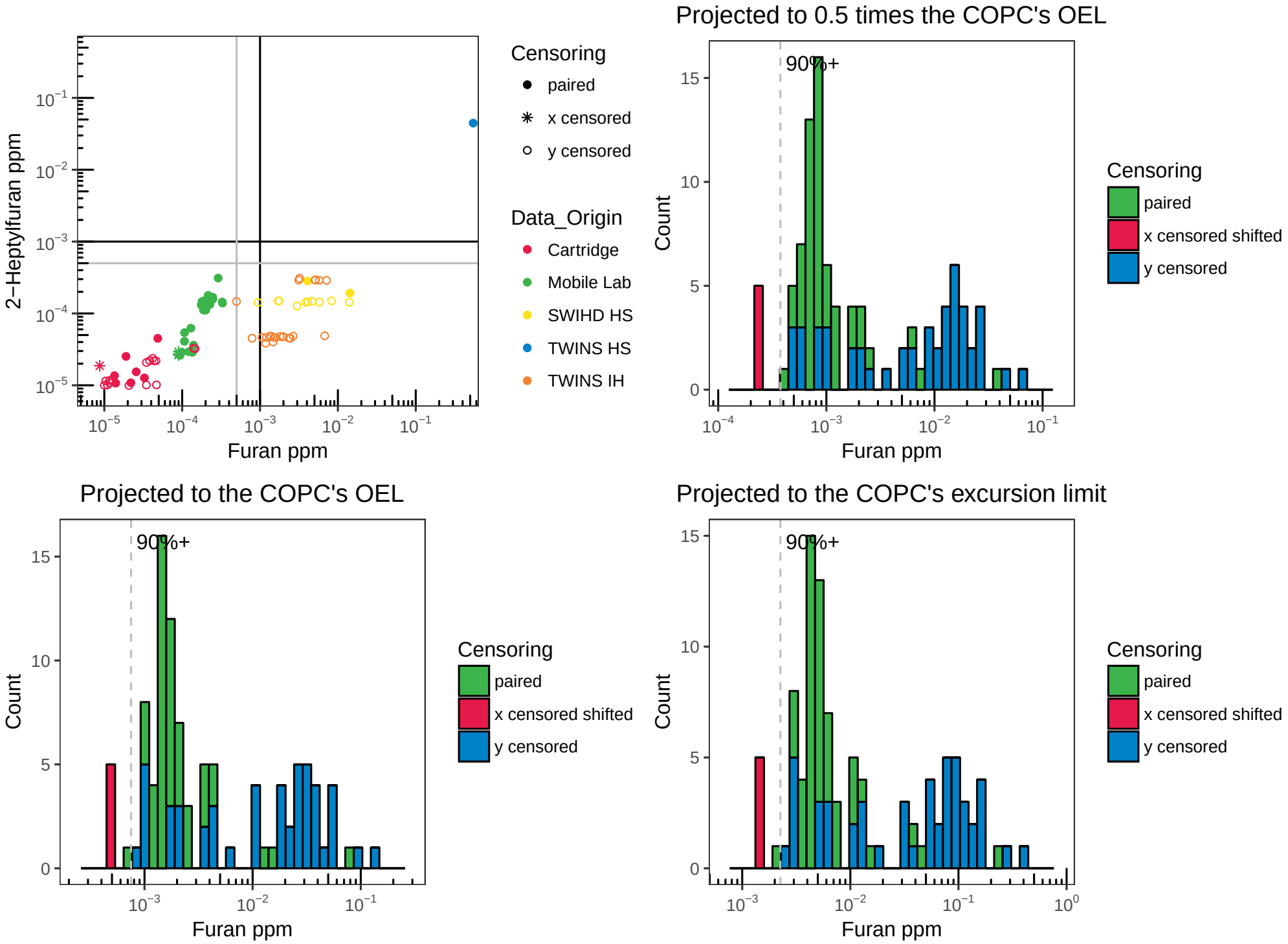


Figure C.993: 2-Heptylfuran vs Furan

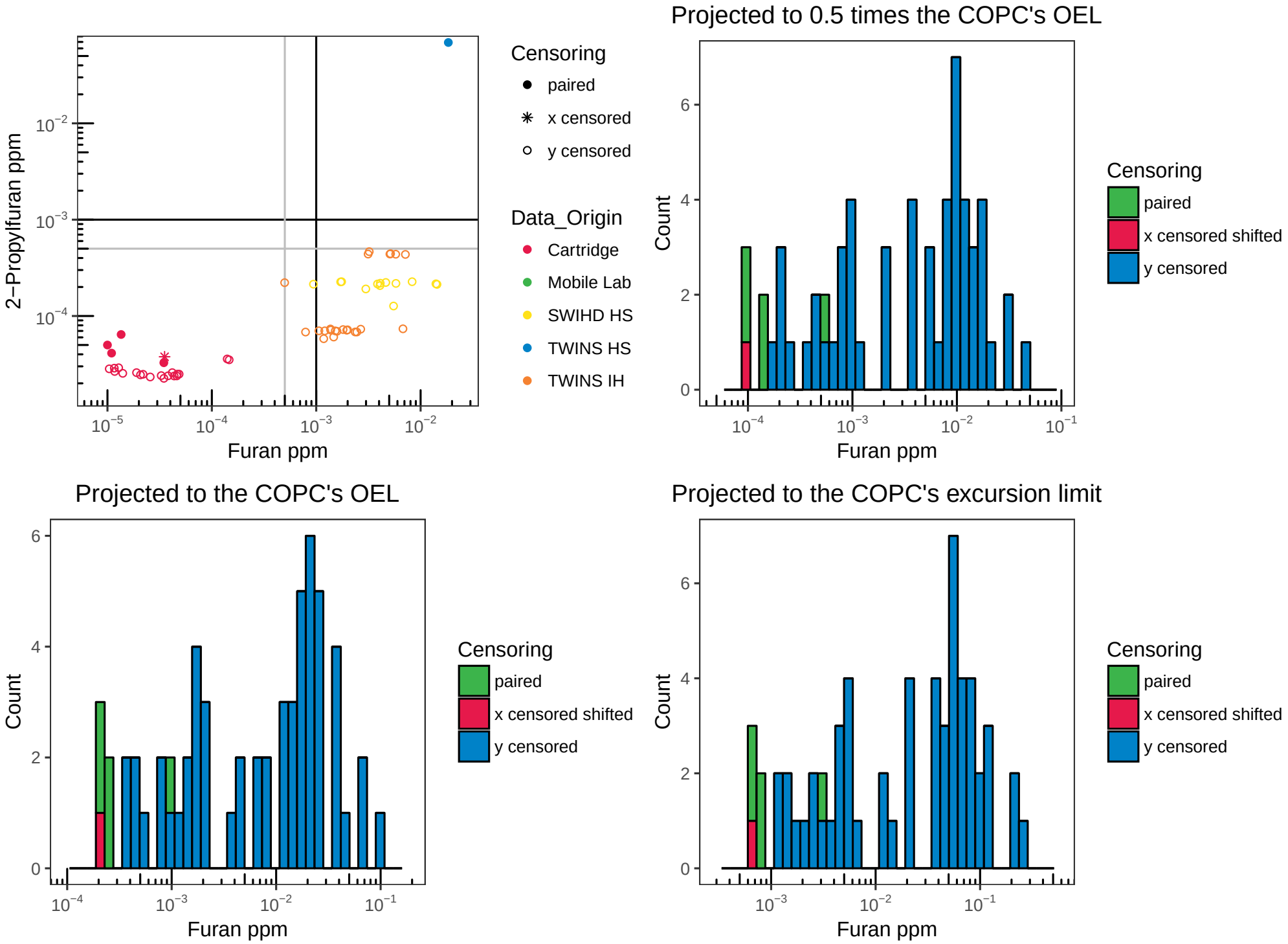


Figure C.994: 2-Propylfuran vs Furan

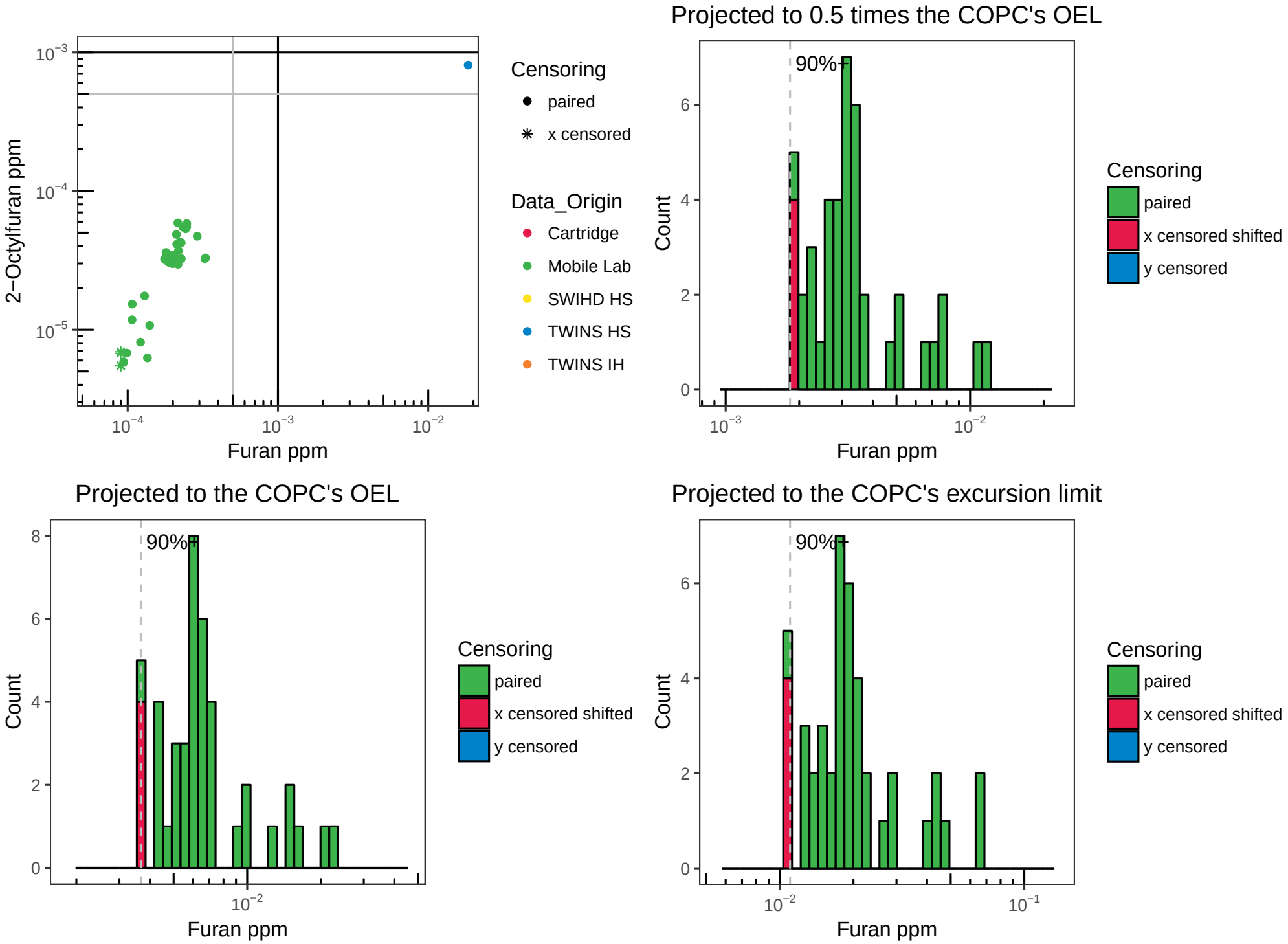


Figure C.995: 2-Octylfuran vs Furan

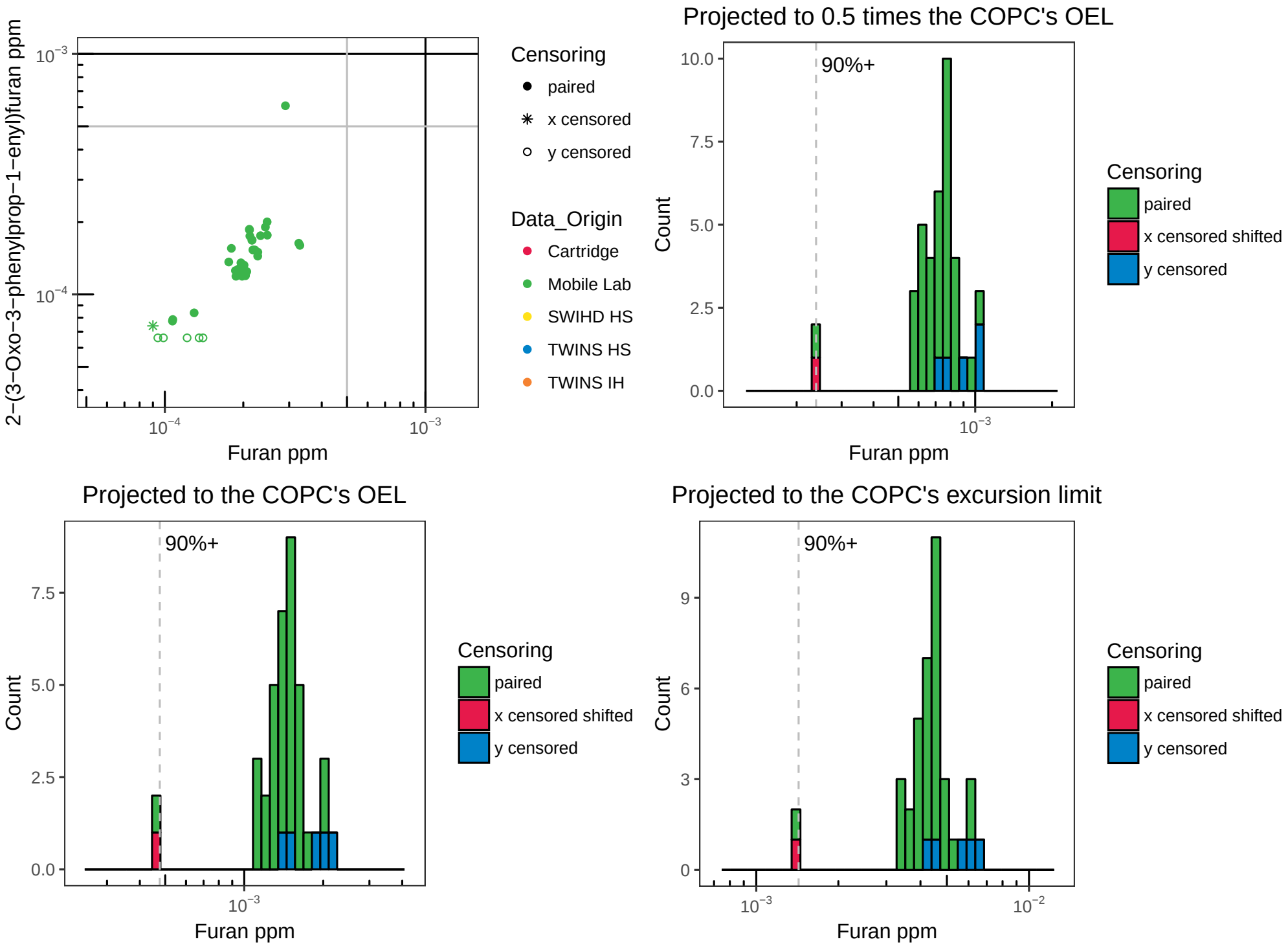


Figure C.996: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Furan

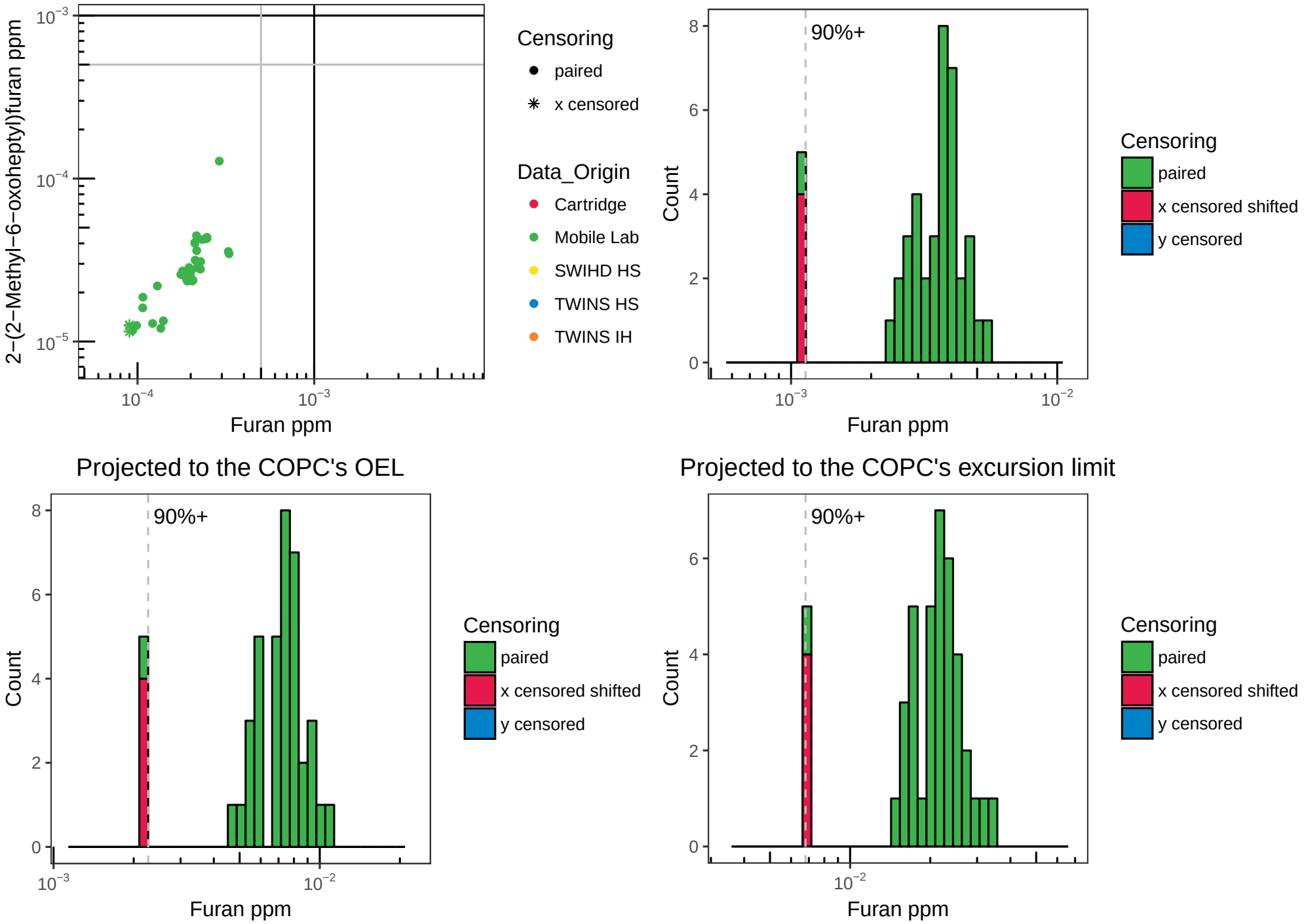


Figure C.997: 2-(2-Methyl-6-oxoheptyl)furan vs Furan

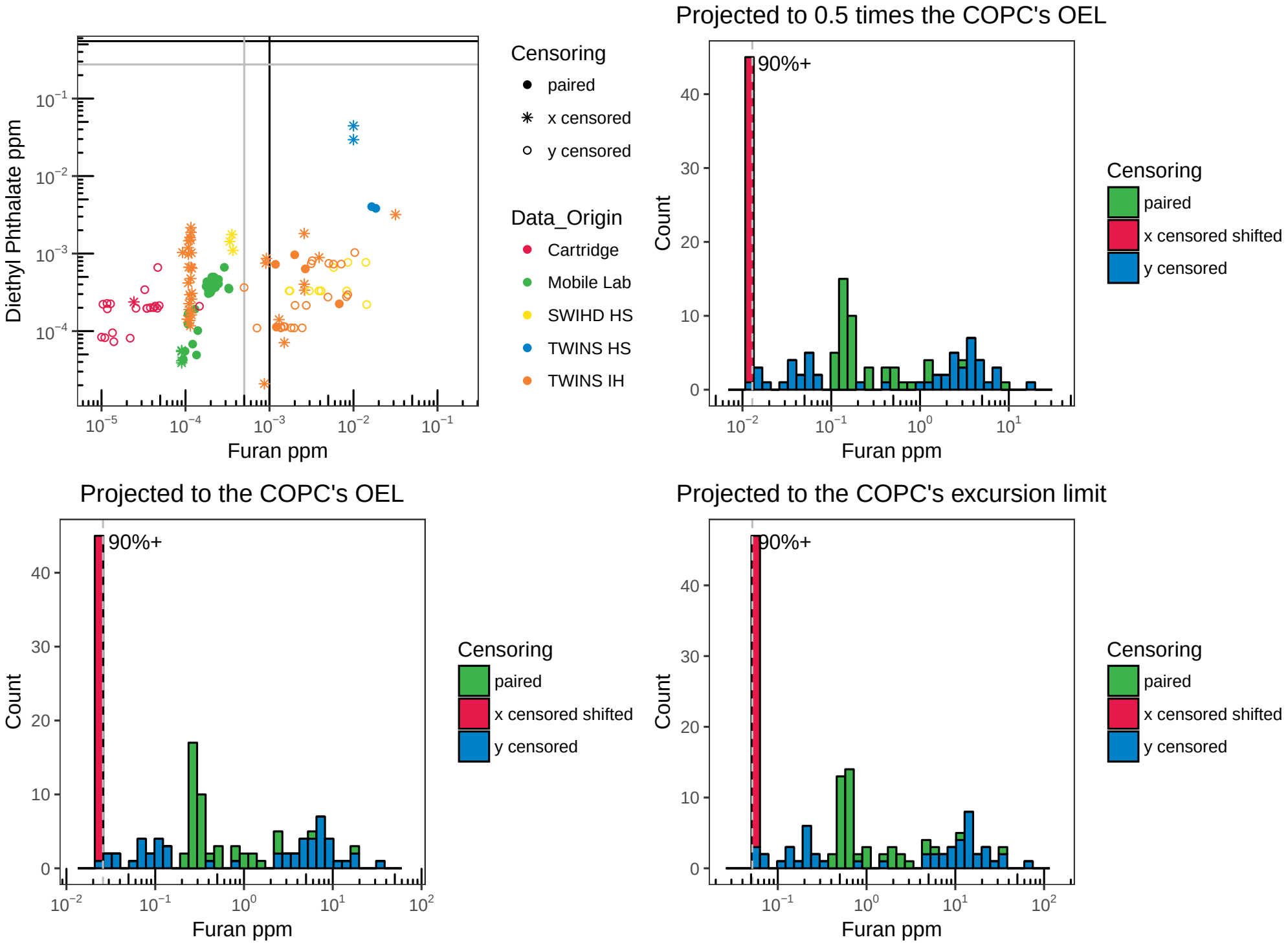


Figure C.998: Diethyl Phthalate vs Furan

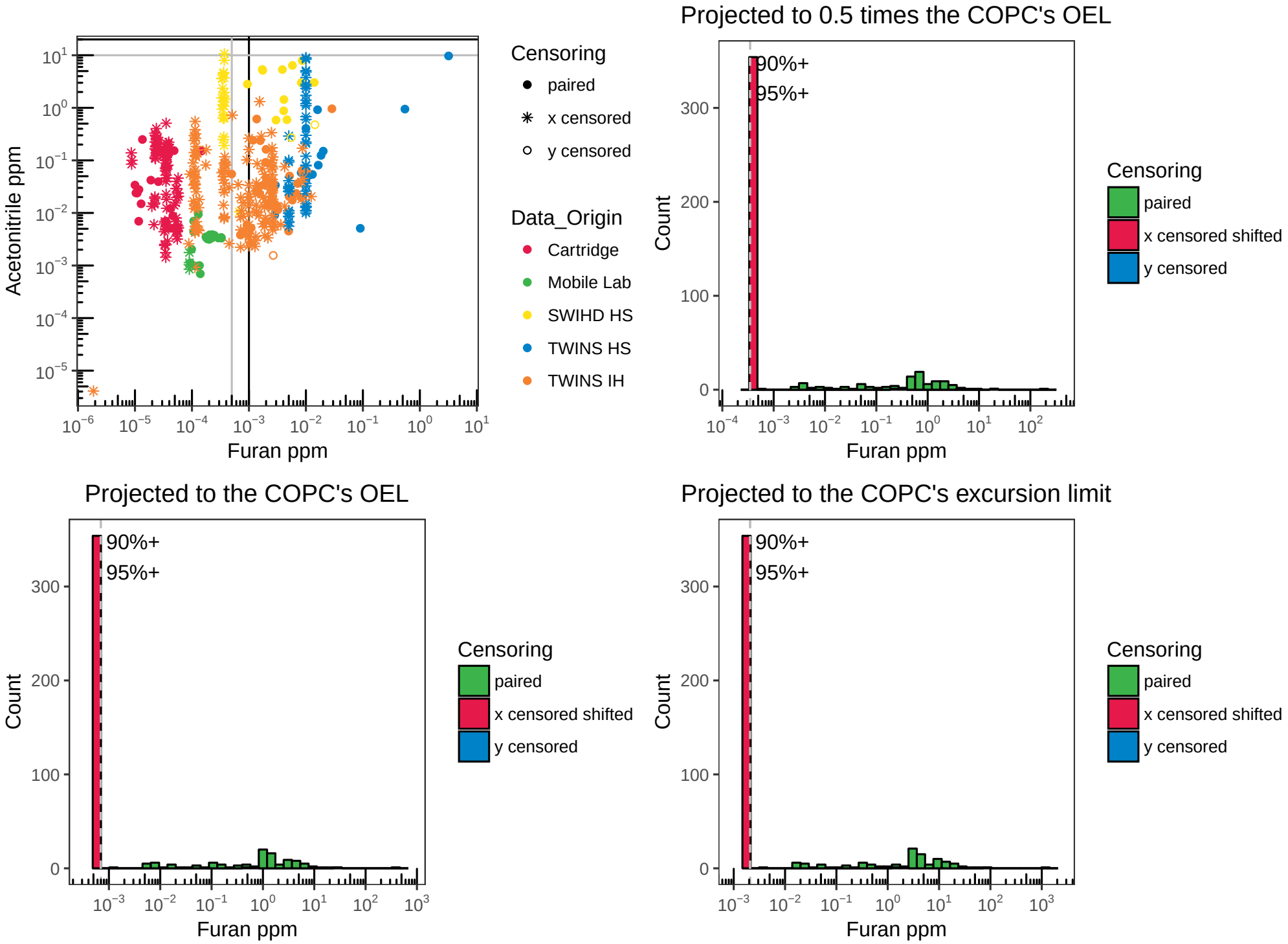


Figure C.999: Acetonitrile vs Furan

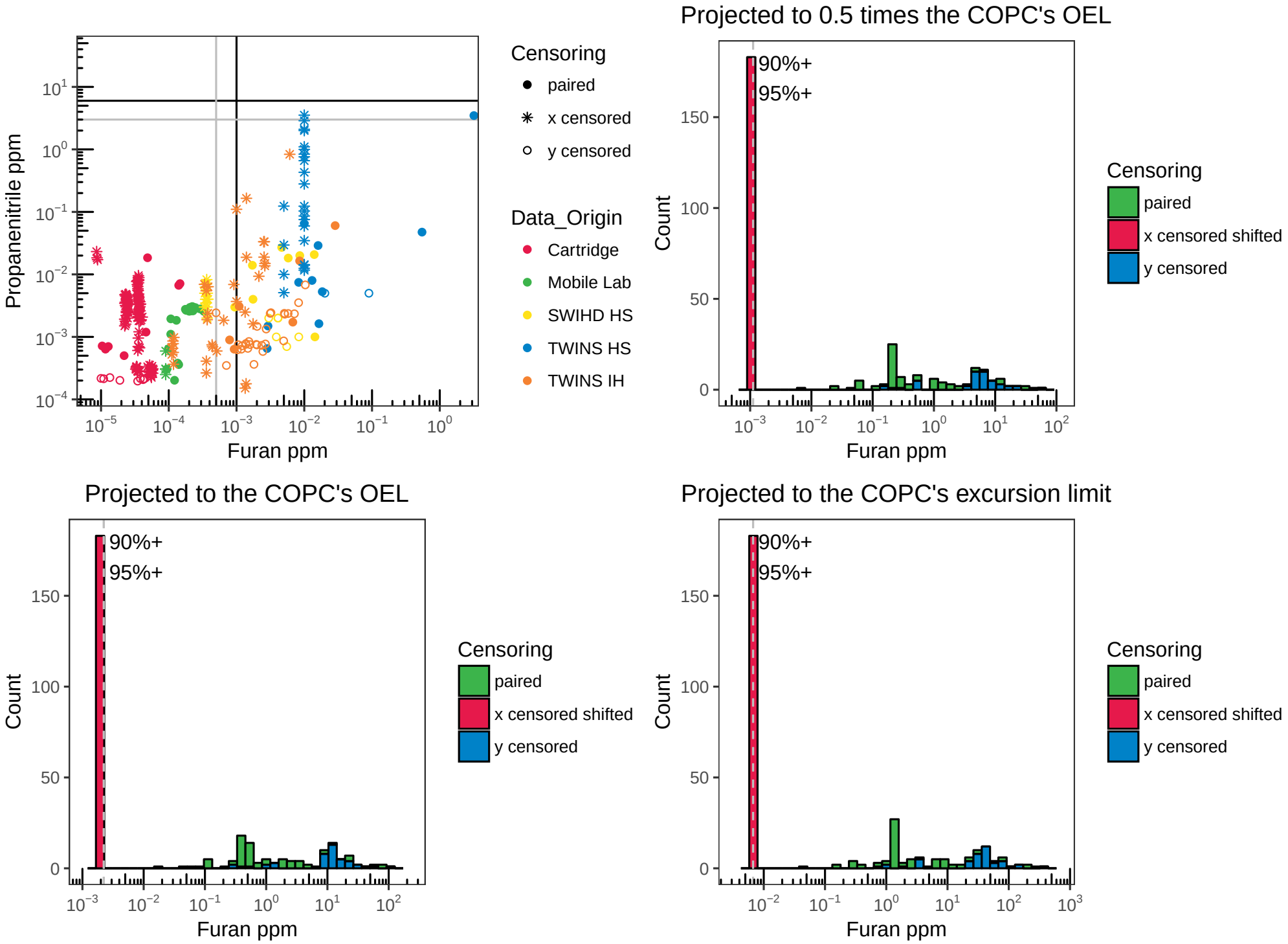


Figure C.1000: Propanenitrile vs Furan

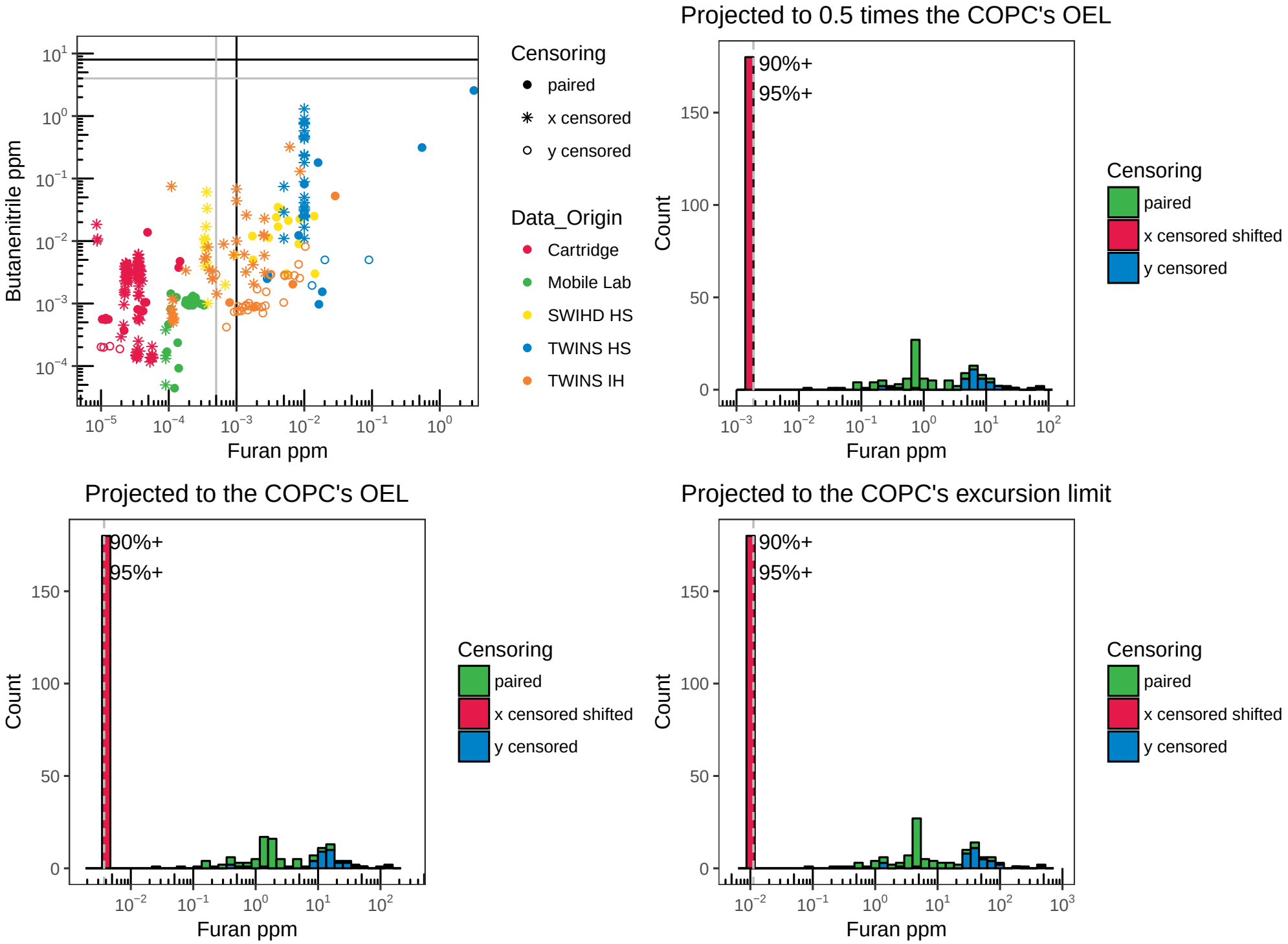


Figure C.1001: Butanenitrile vs Furan

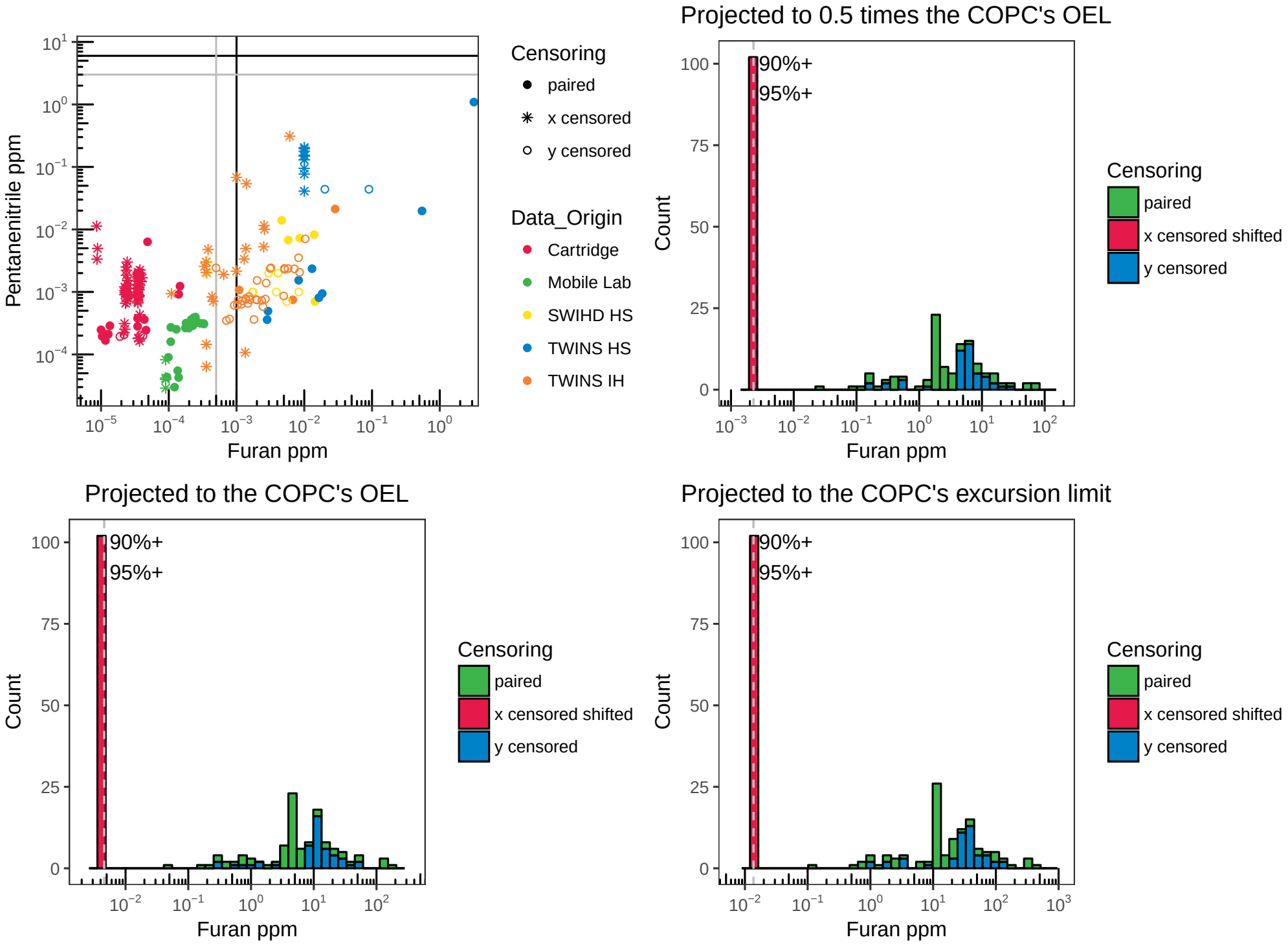


Figure C.1002: Pentanenitrile vs Furan

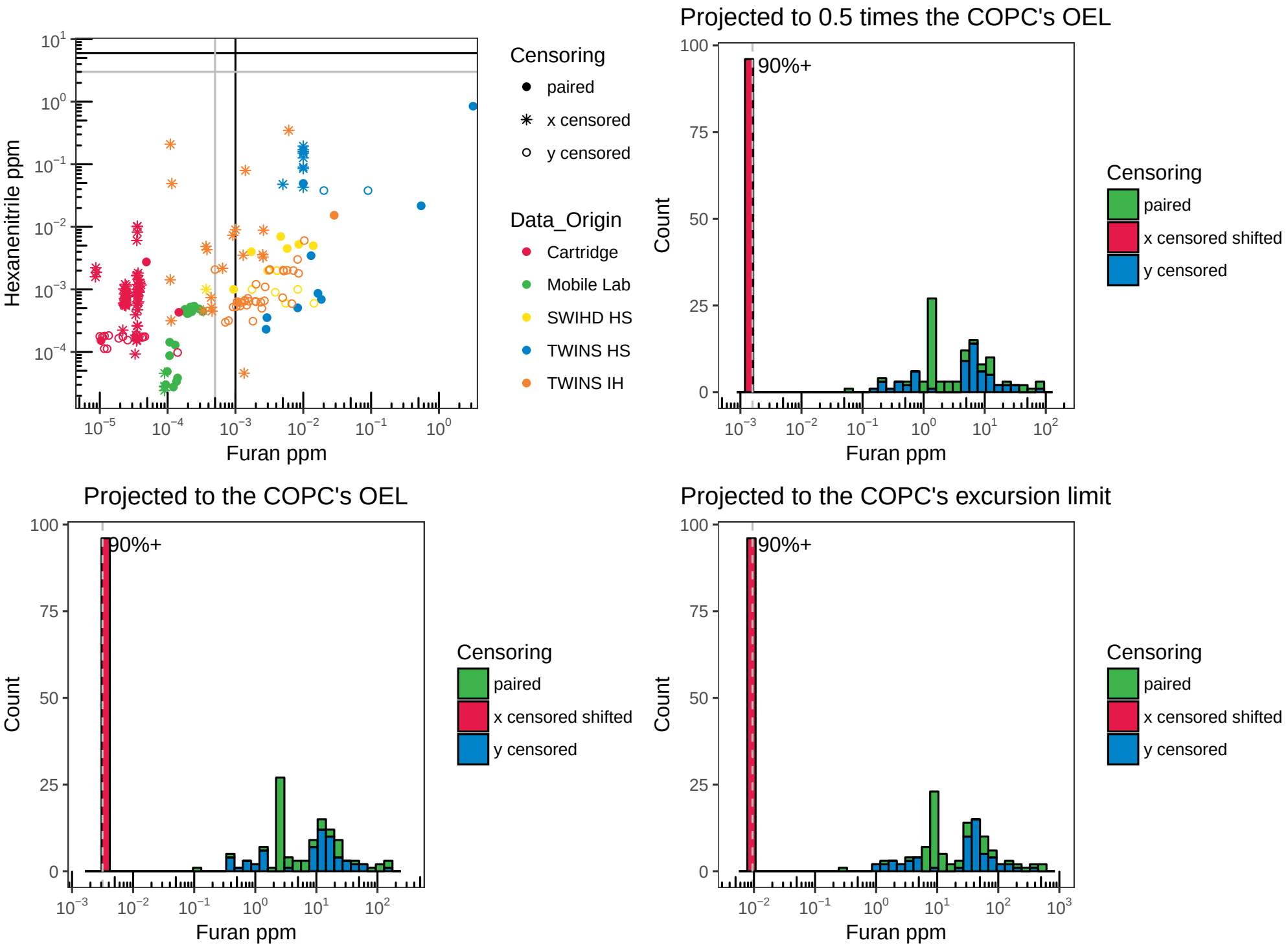


Figure C.1003: Hexanenitrile vs Furan

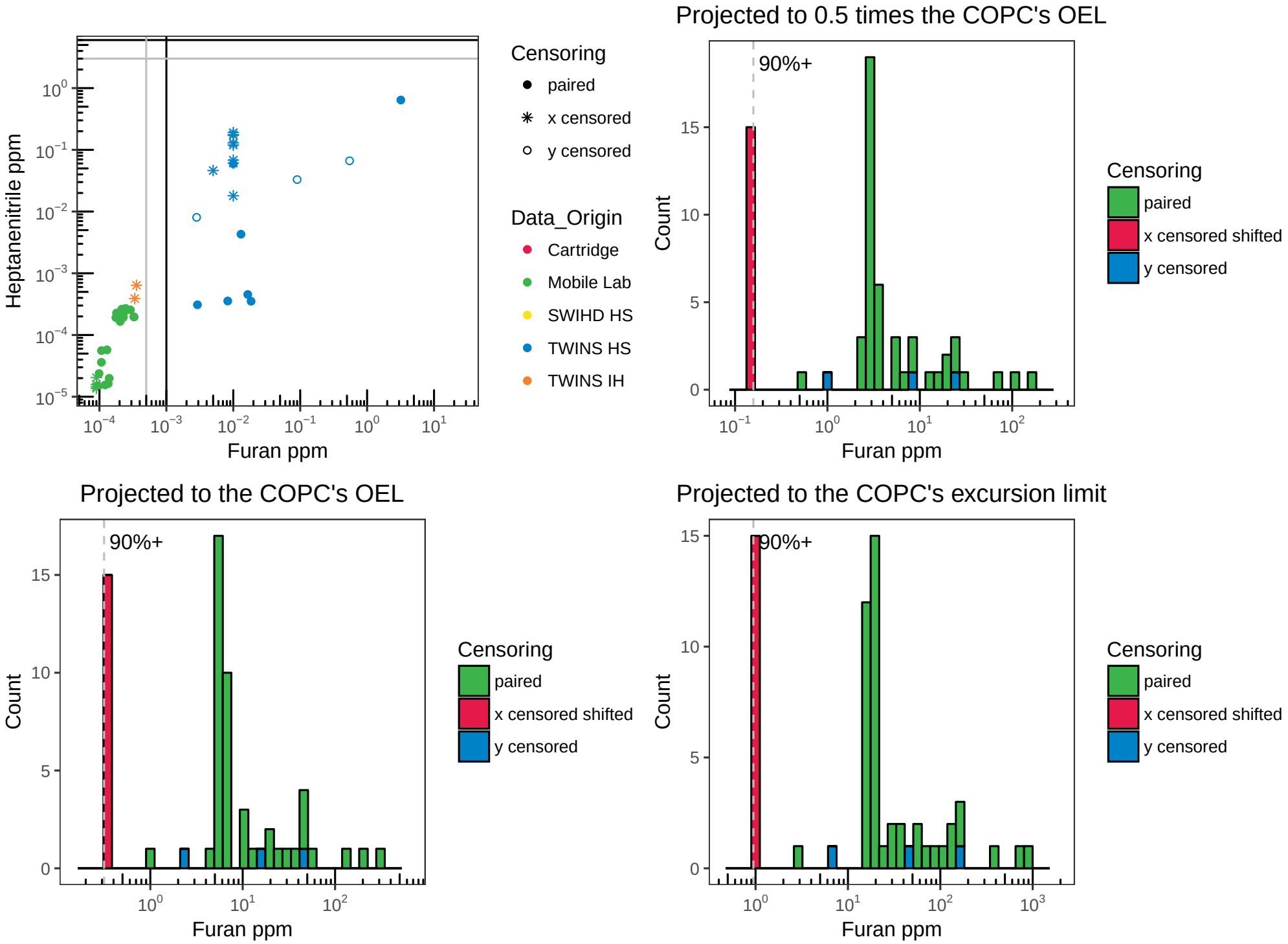


Figure C.1004: Heptanenitrile vs Furan

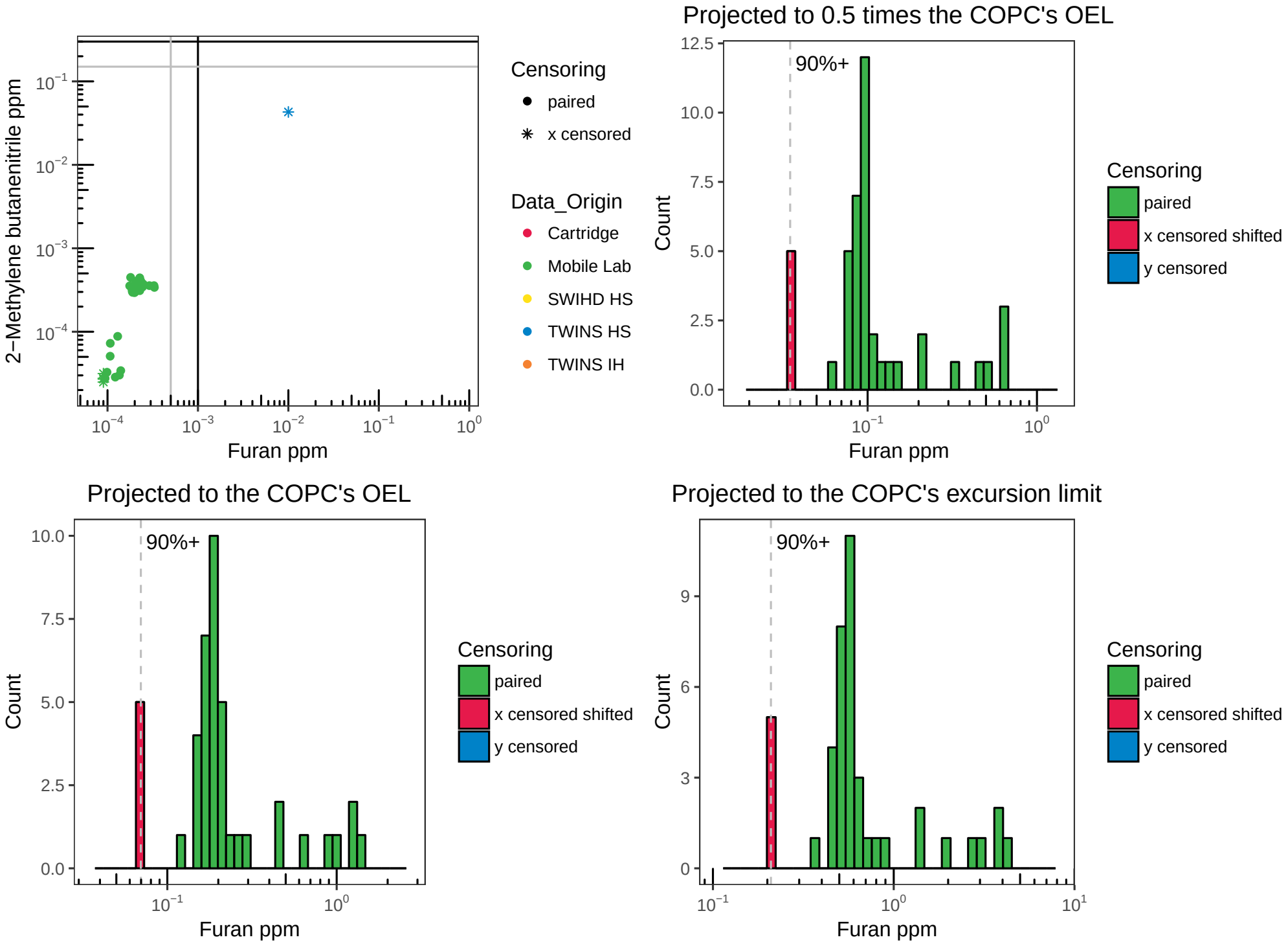


Figure C.1005: 2-Methylene butanenitrile vs Furan

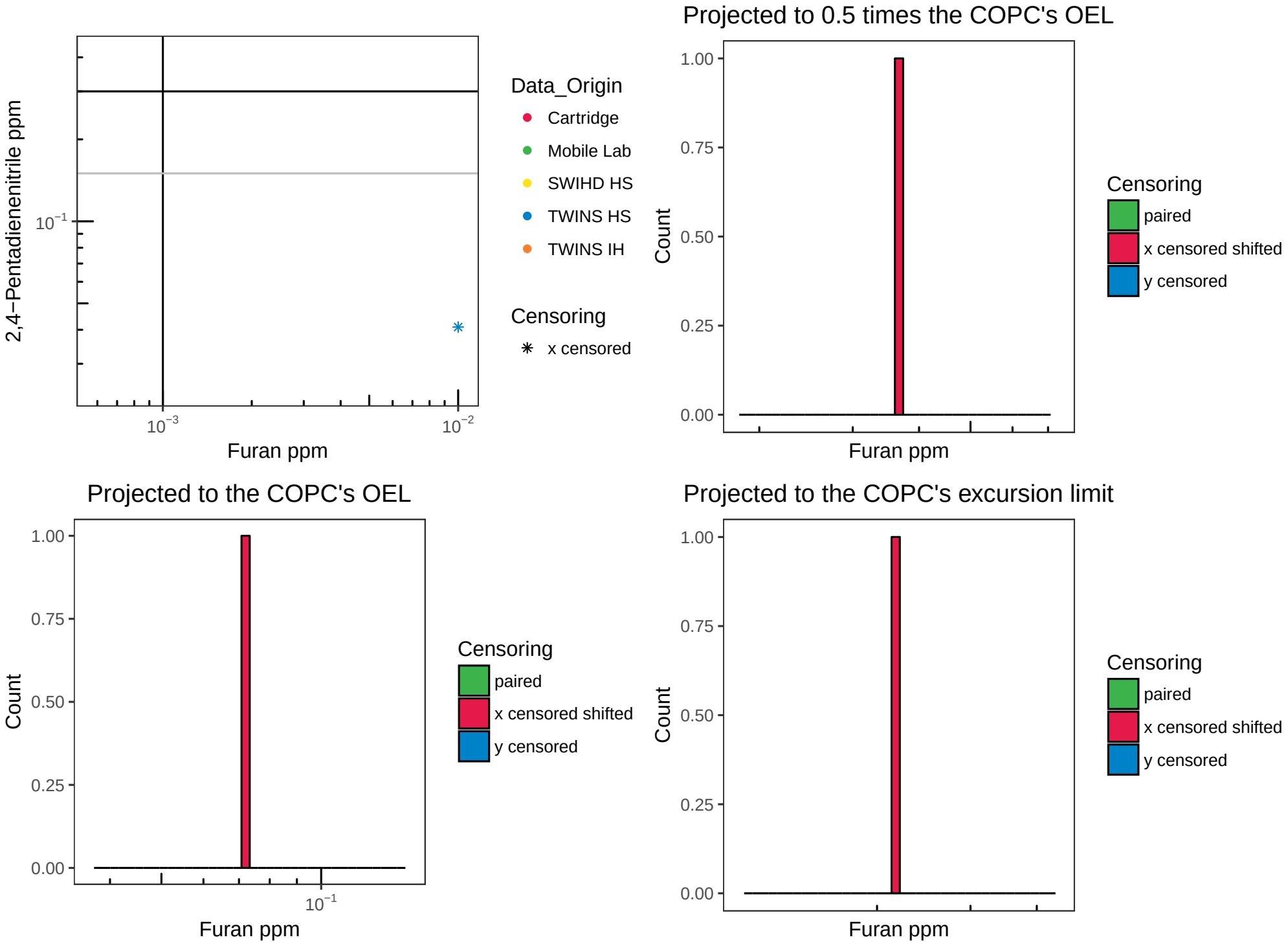


Figure C.1006: 2,4-Pentadienenitrile vs Furan

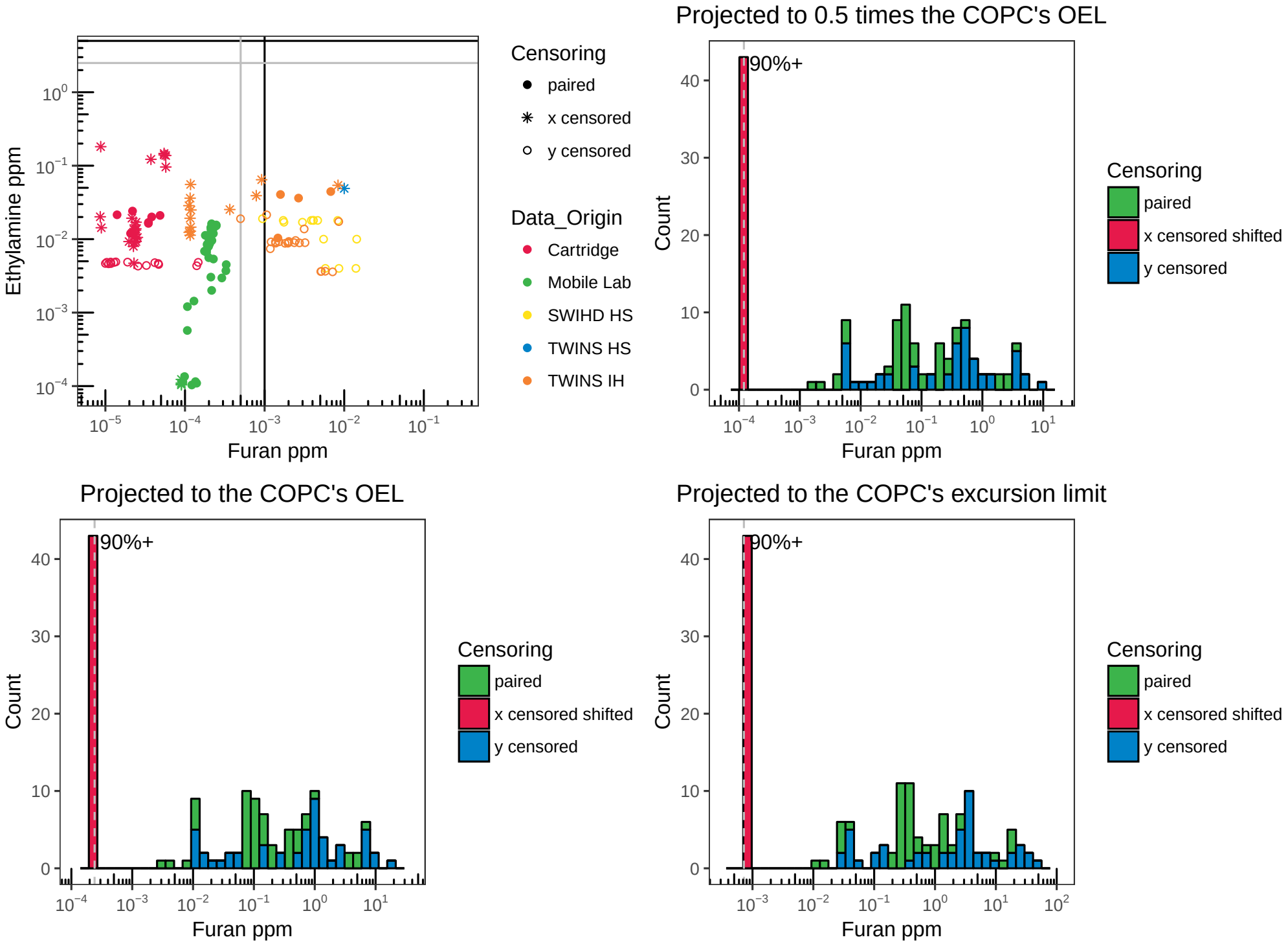


Figure C.1007: Ethylamine vs Furan

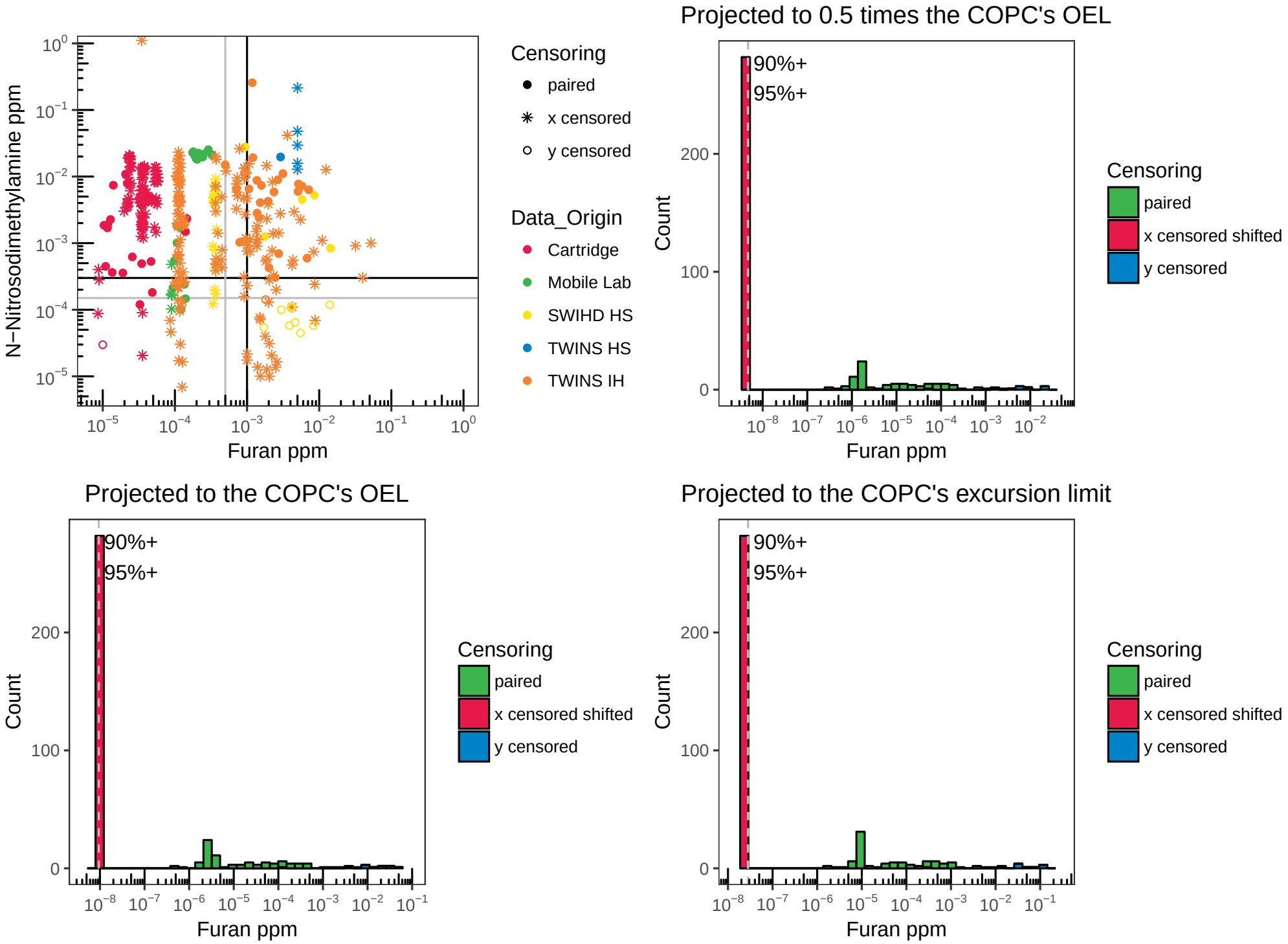


Figure C.1008: N-Nitrosodimethylamine vs Furan

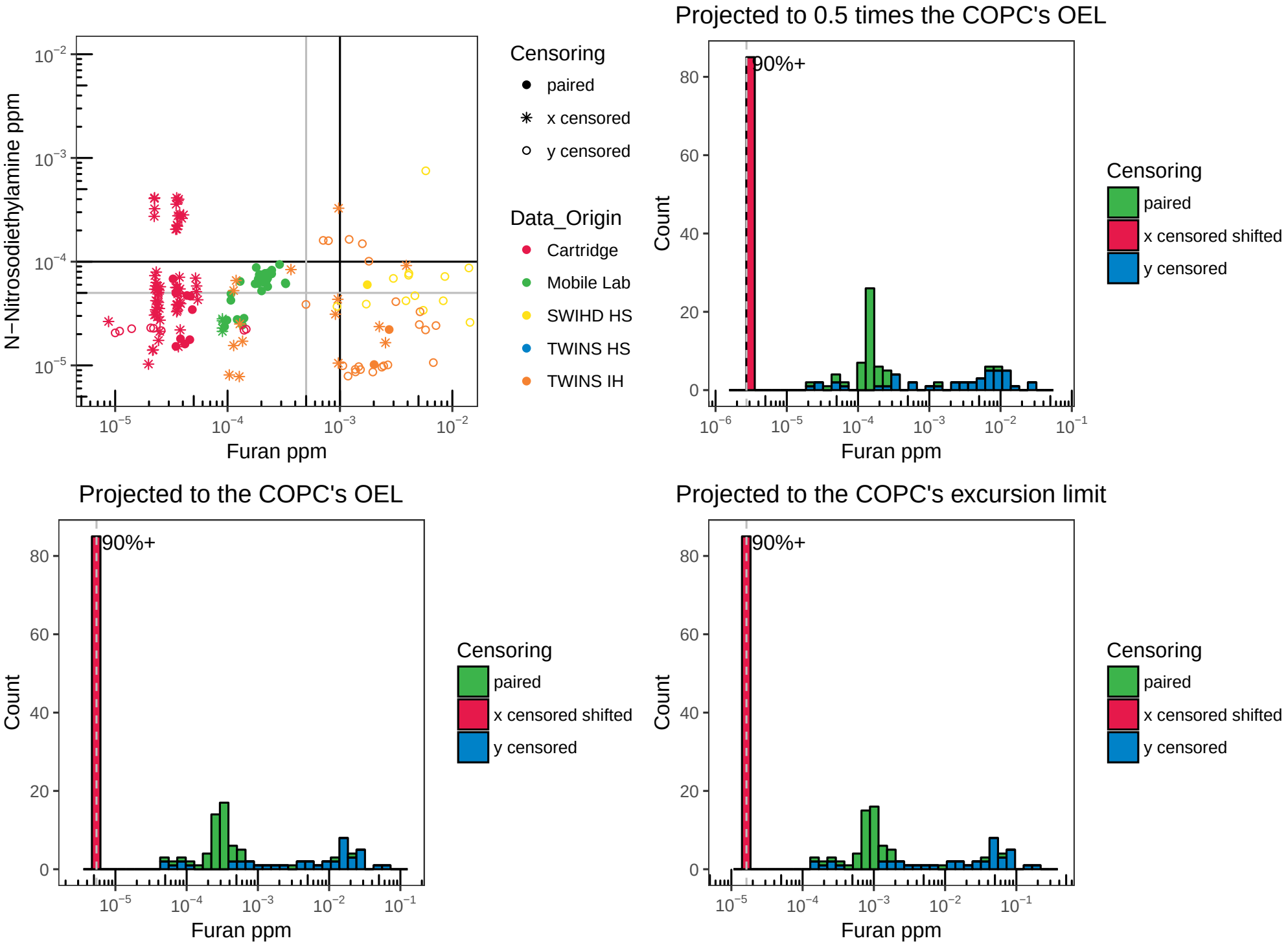


Figure C.1009: N-Nitrosodiethylamine vs Furan

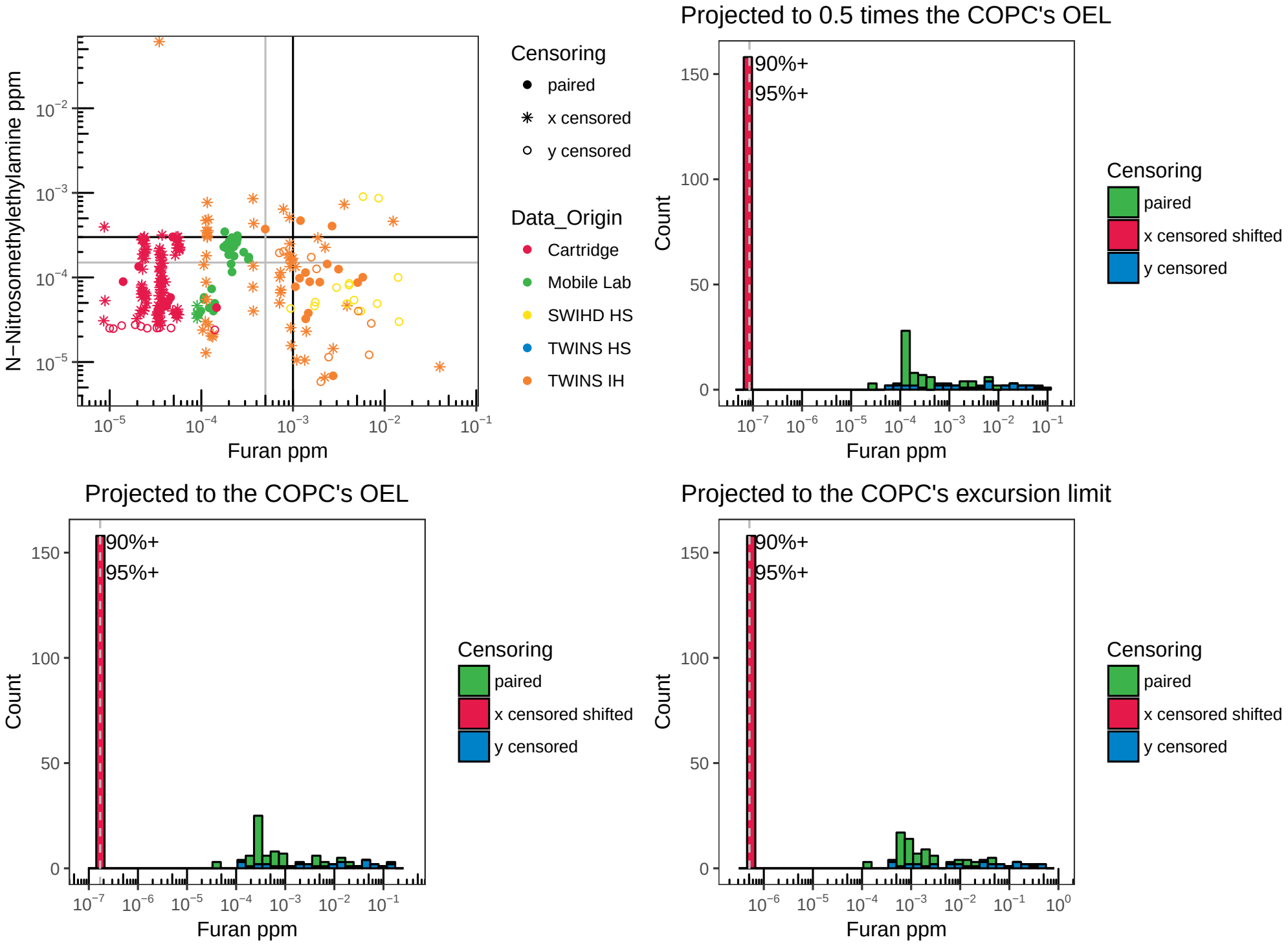


Figure C.1010: N-Nitrosomethylethylamine vs Furan

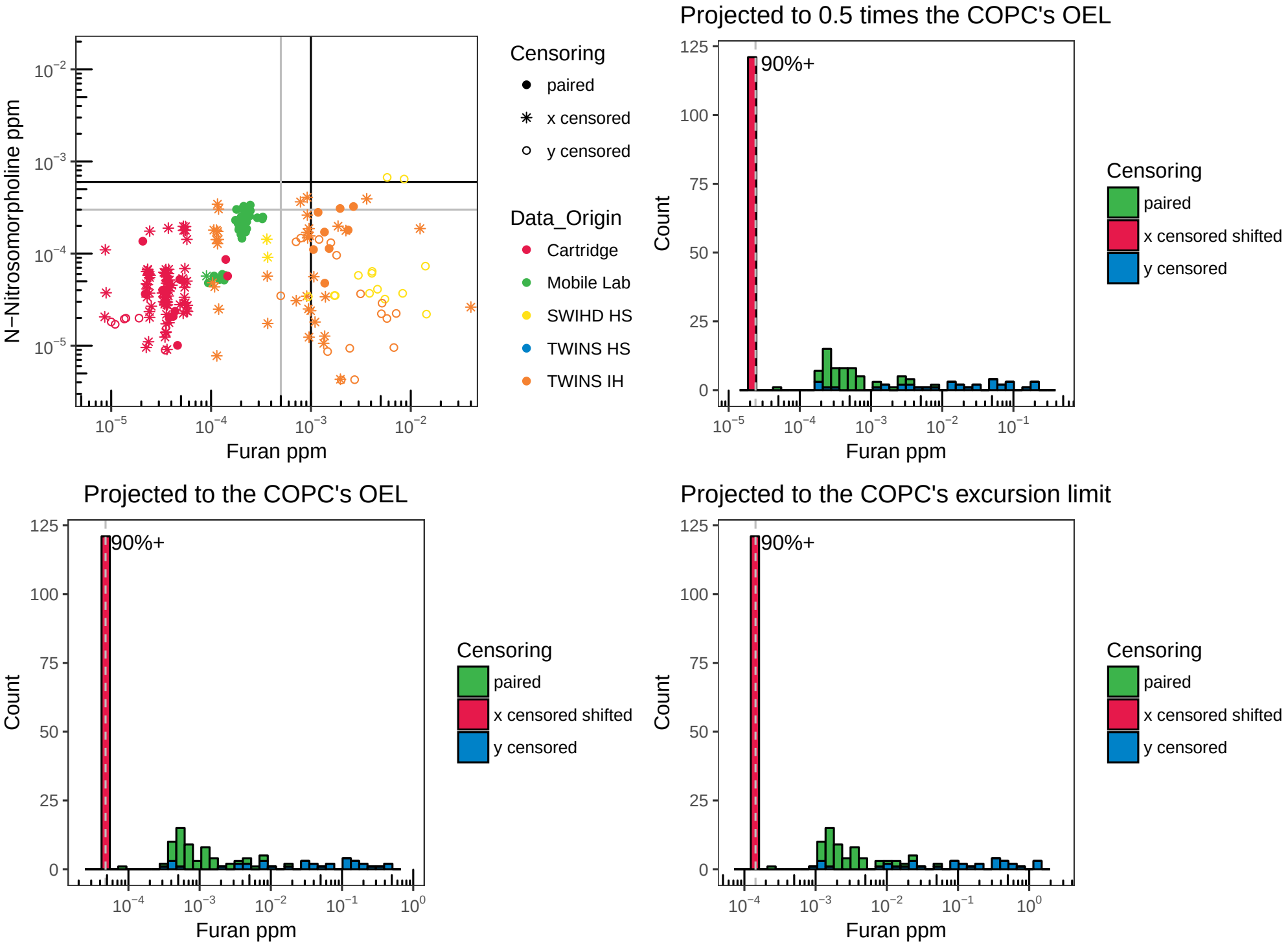


Figure C.1011: N-Nitrosomorpholine vs Furan

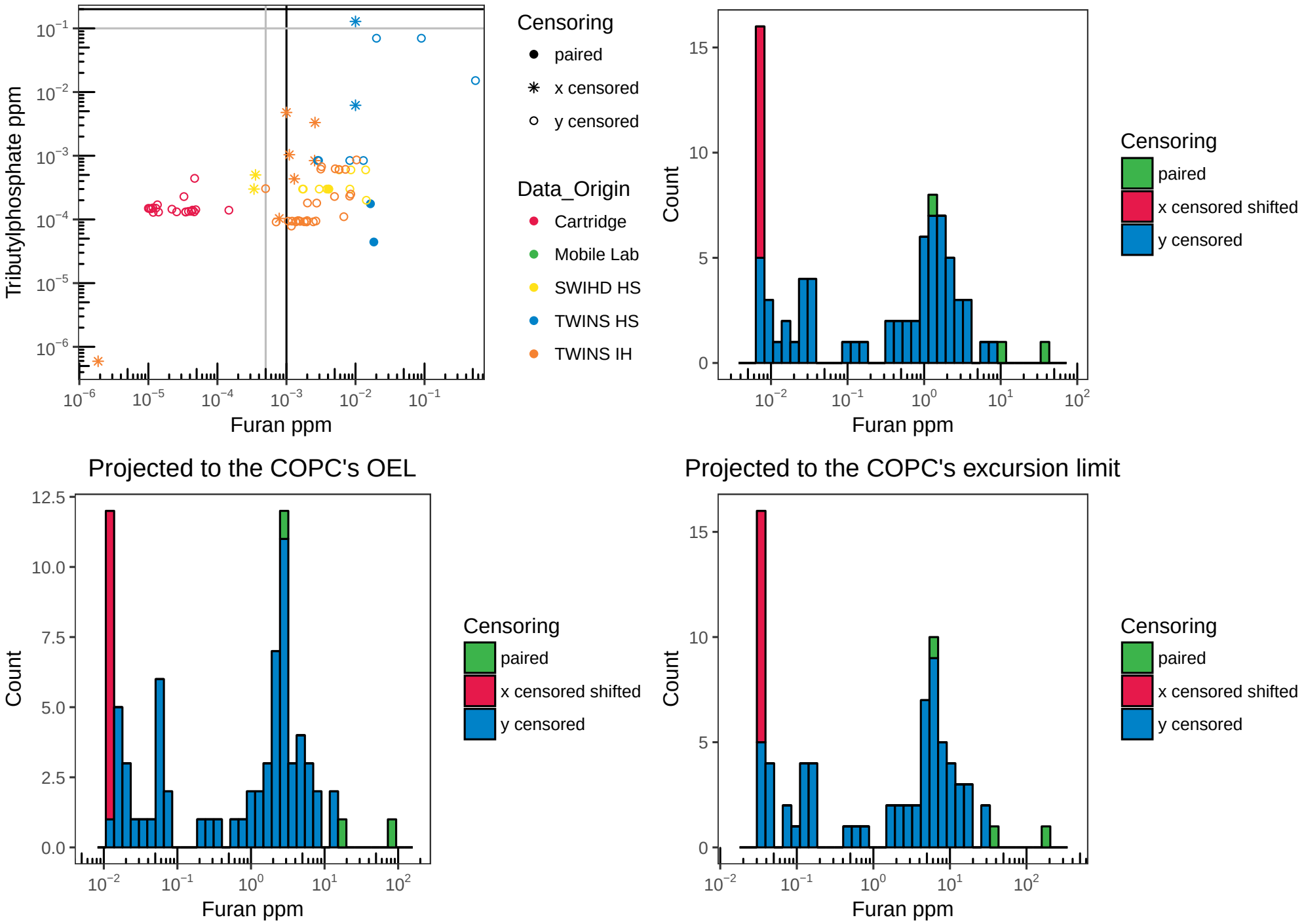


Figure C.1012: Tributylphosphate vs Furan

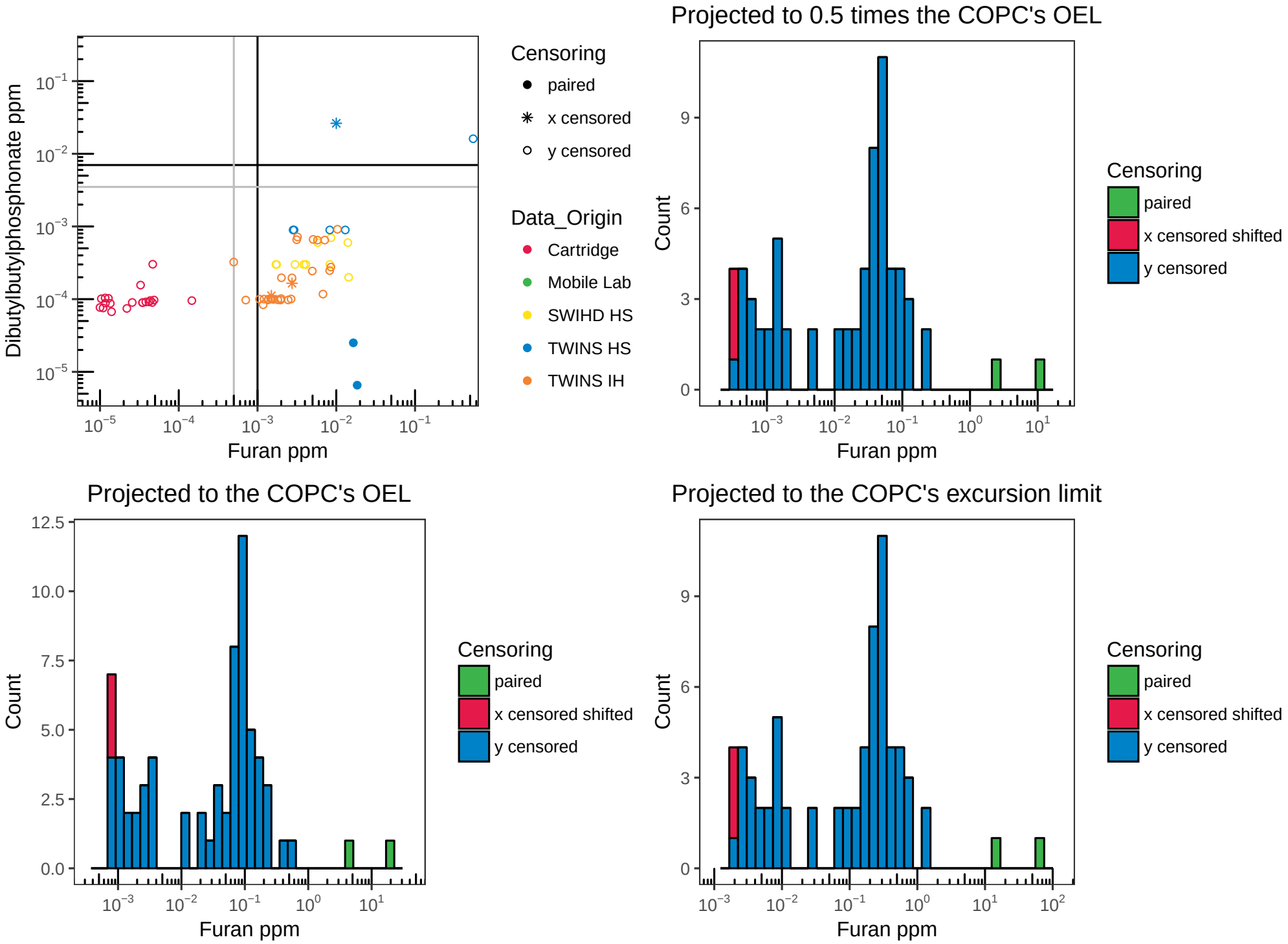


Figure C.1013: Dibutylbutylphosphonate vs Furan

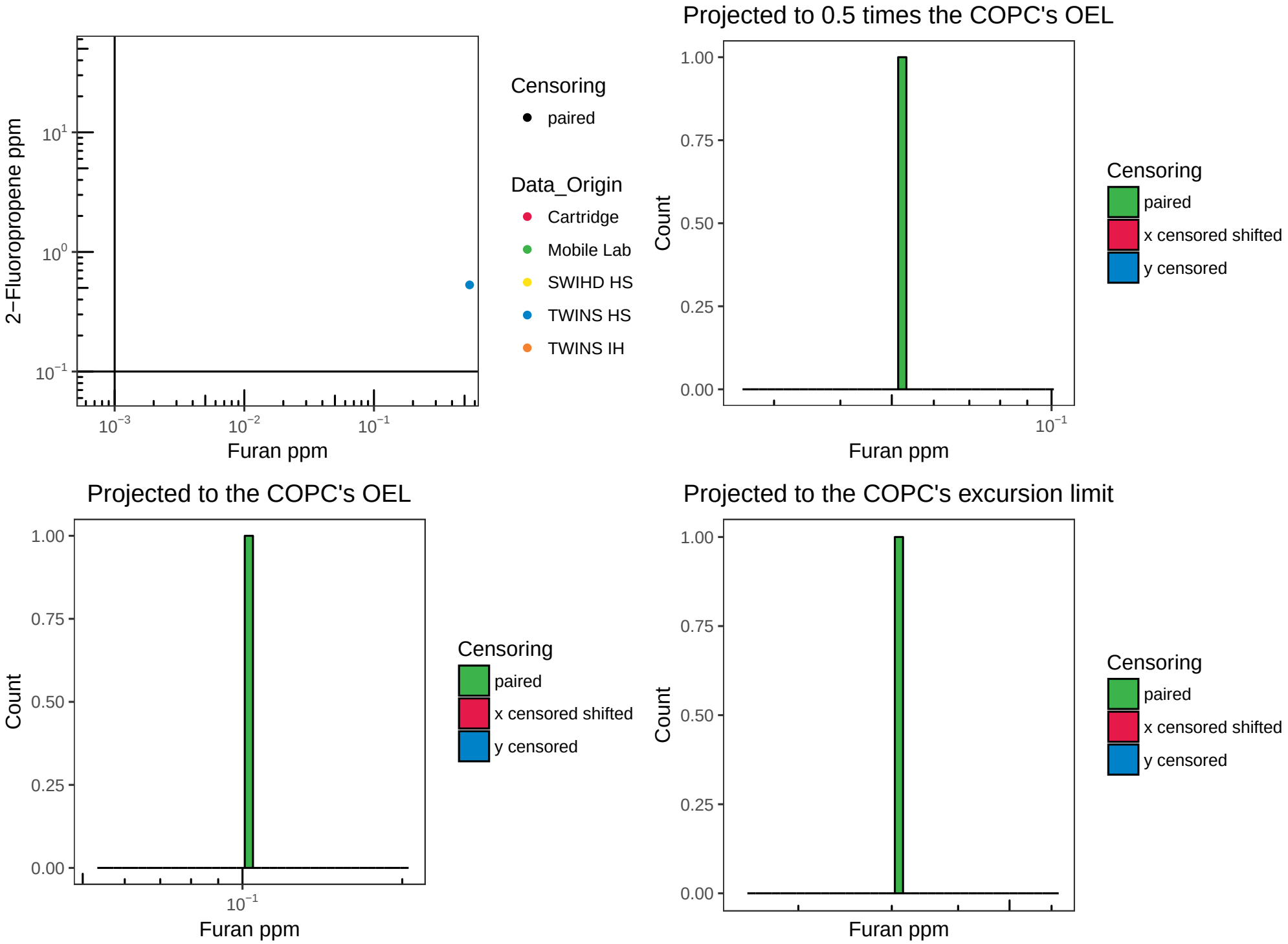


Figure C.1014: 2-Fluoropropene vs Furan

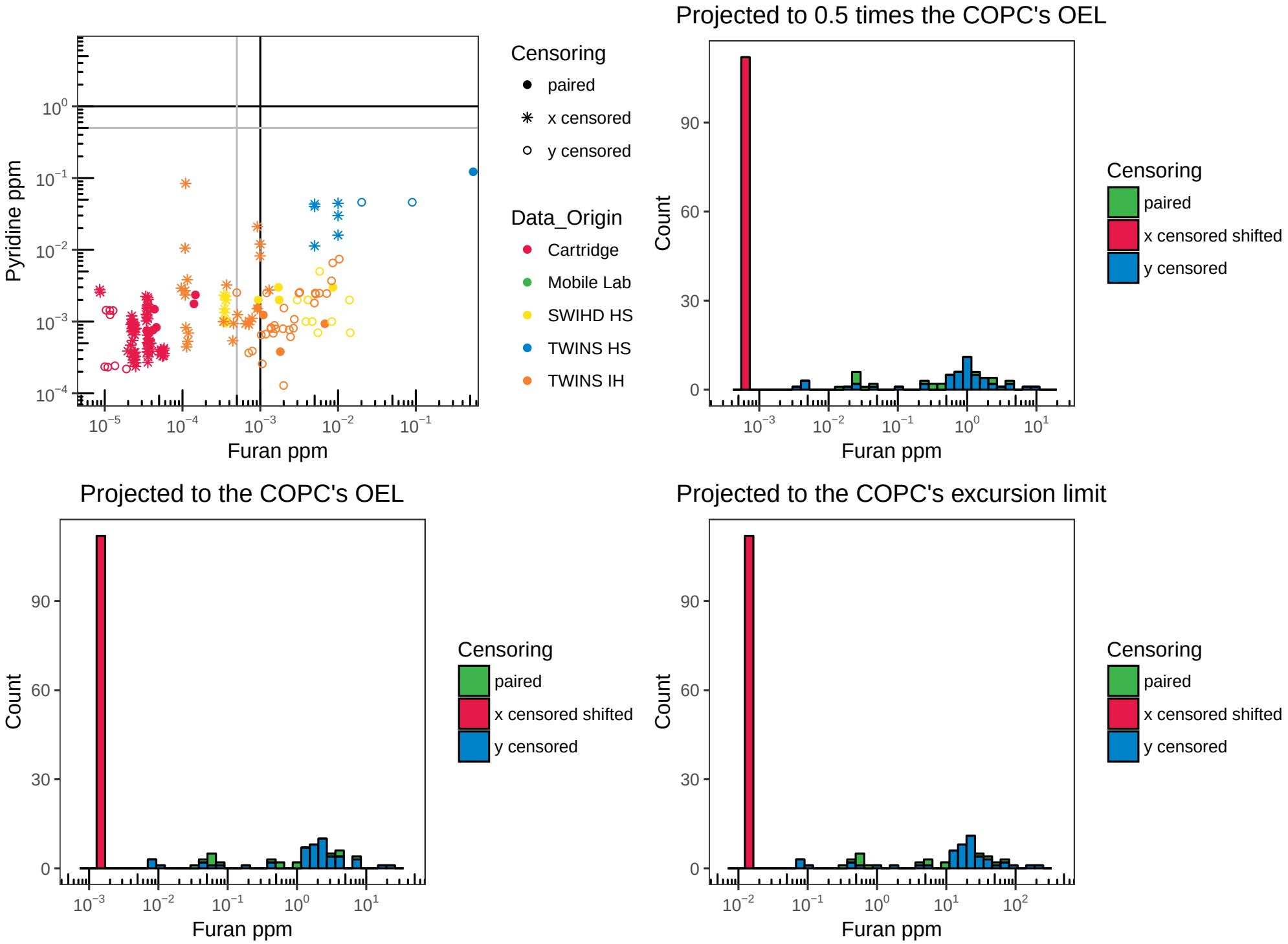


Figure C.1015: Pyridine vs Furan

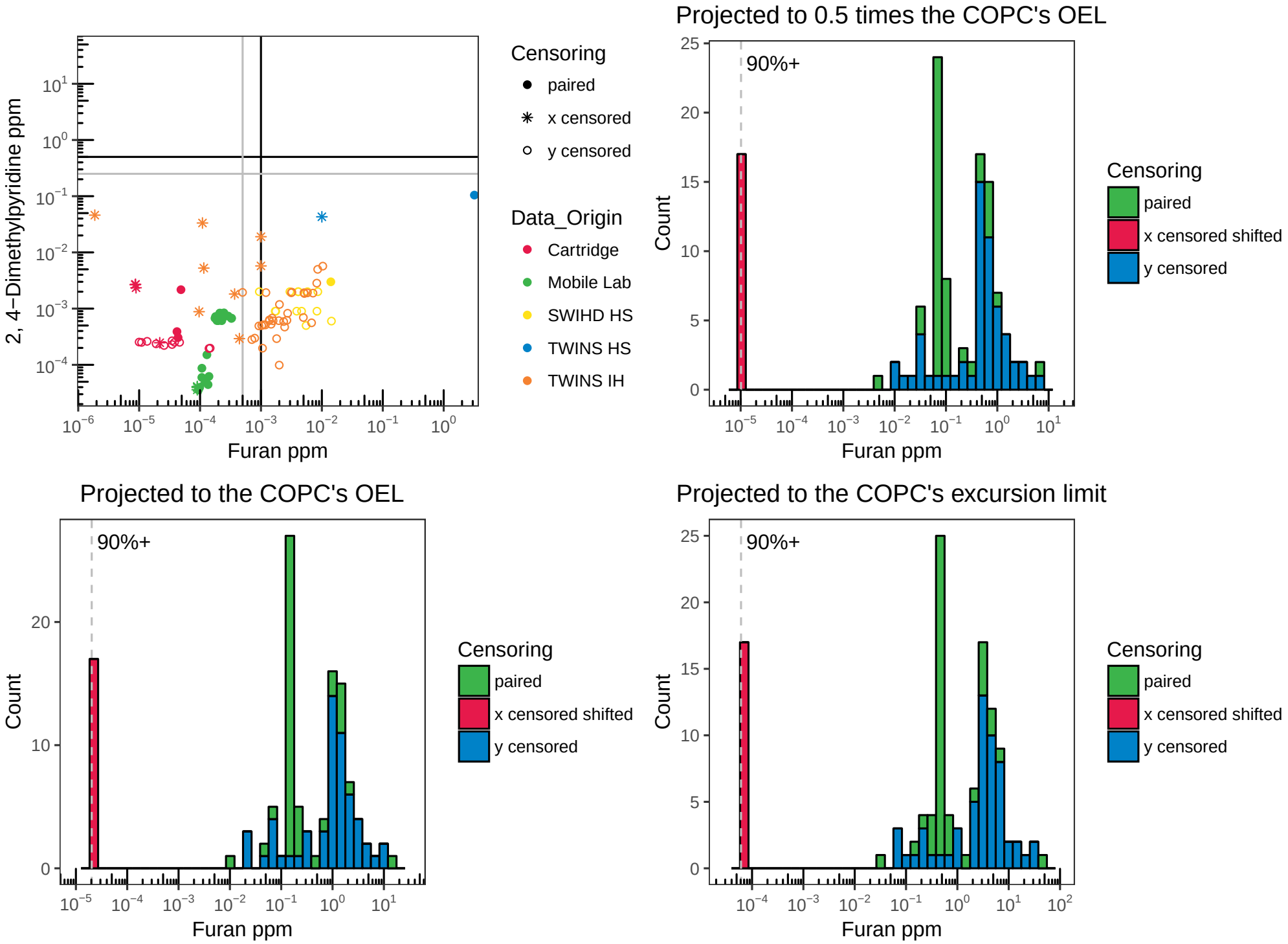


Figure C.1016: 2, 4-Dimethylpyridine vs Furan

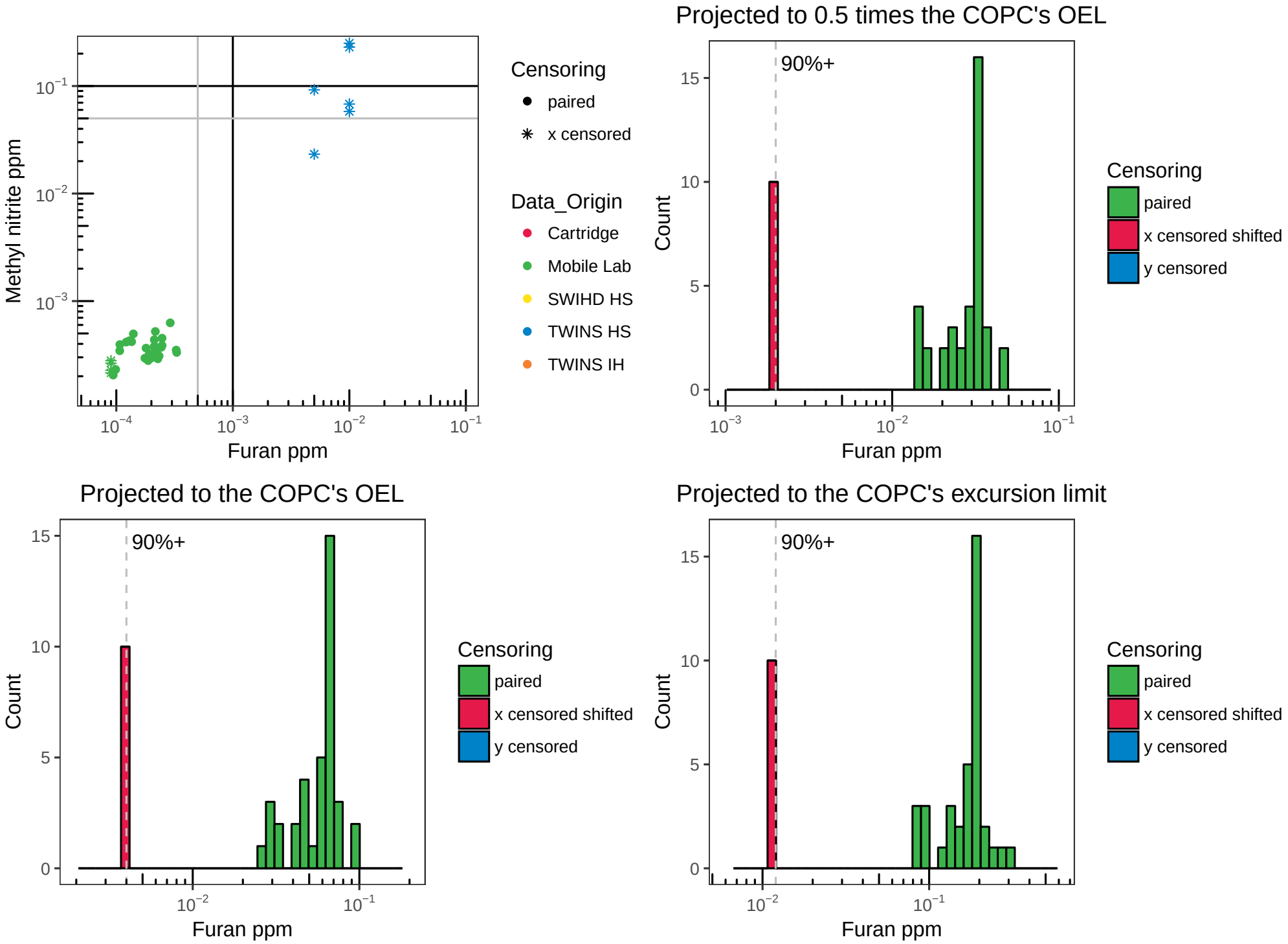


Figure C.1017: Methyl nitrite vs Furan

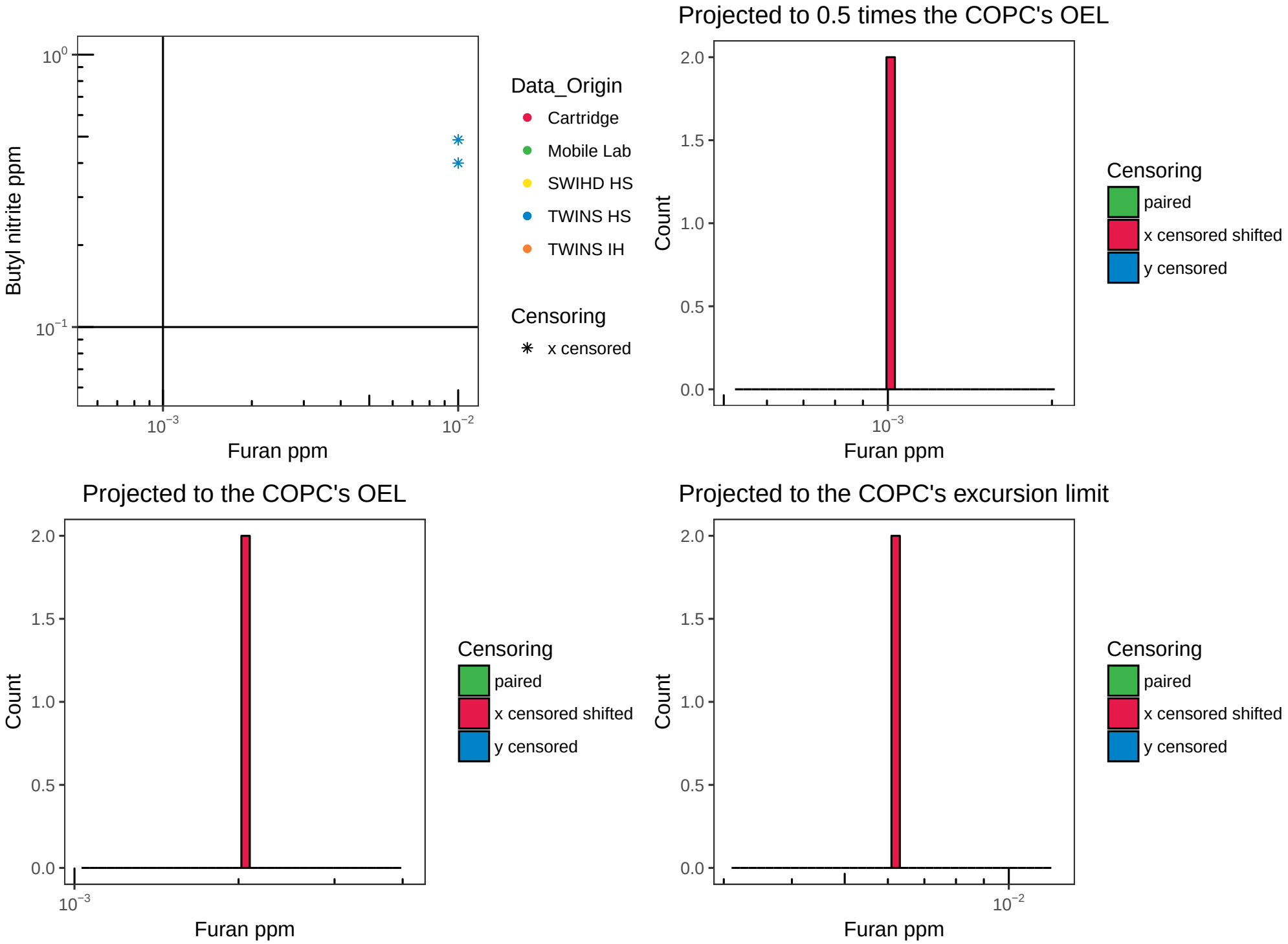


Figure C.1018: Butyl nitrite vs Furan

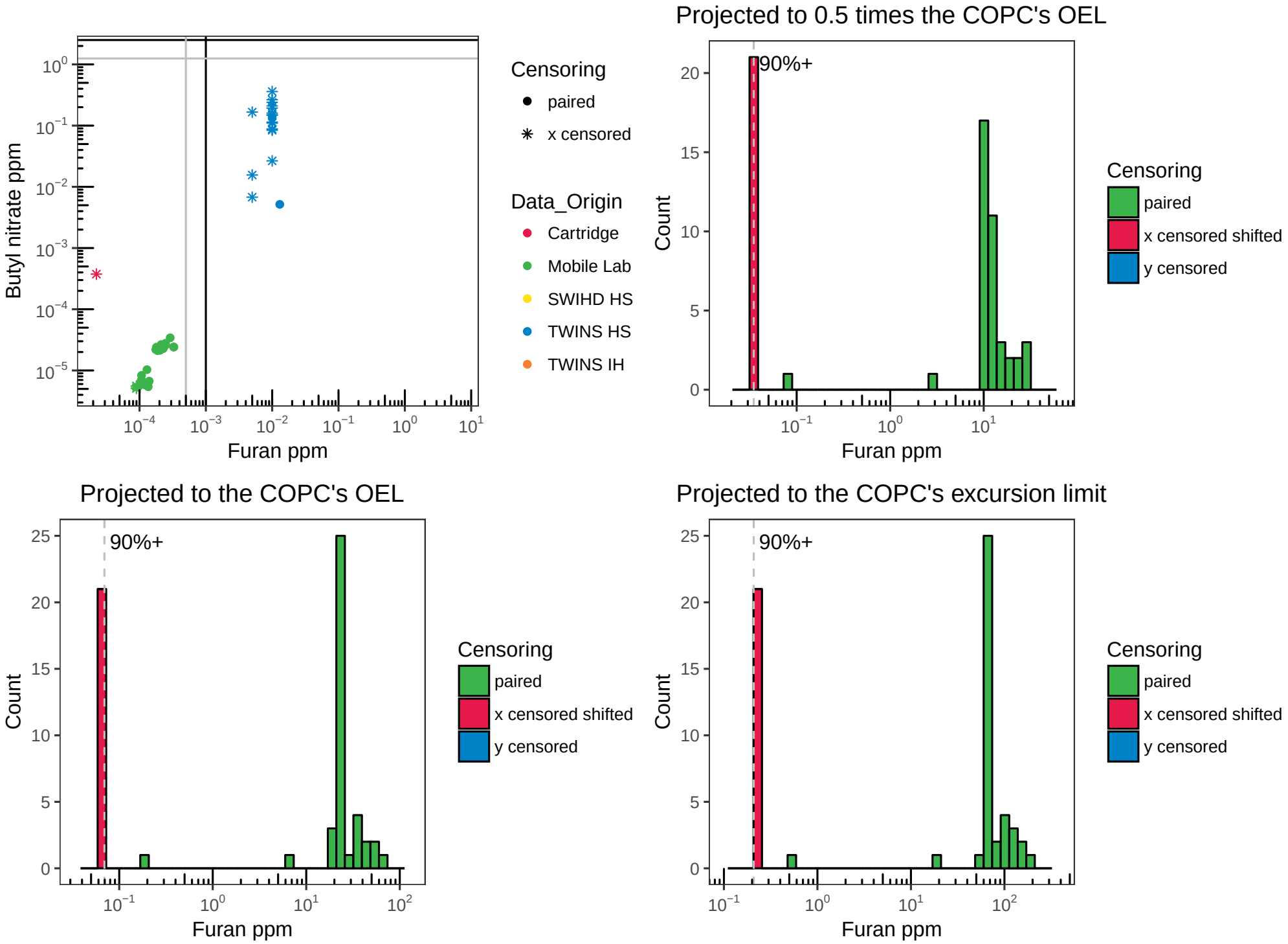


Figure C.1019: Butyl nitrate vs Furan

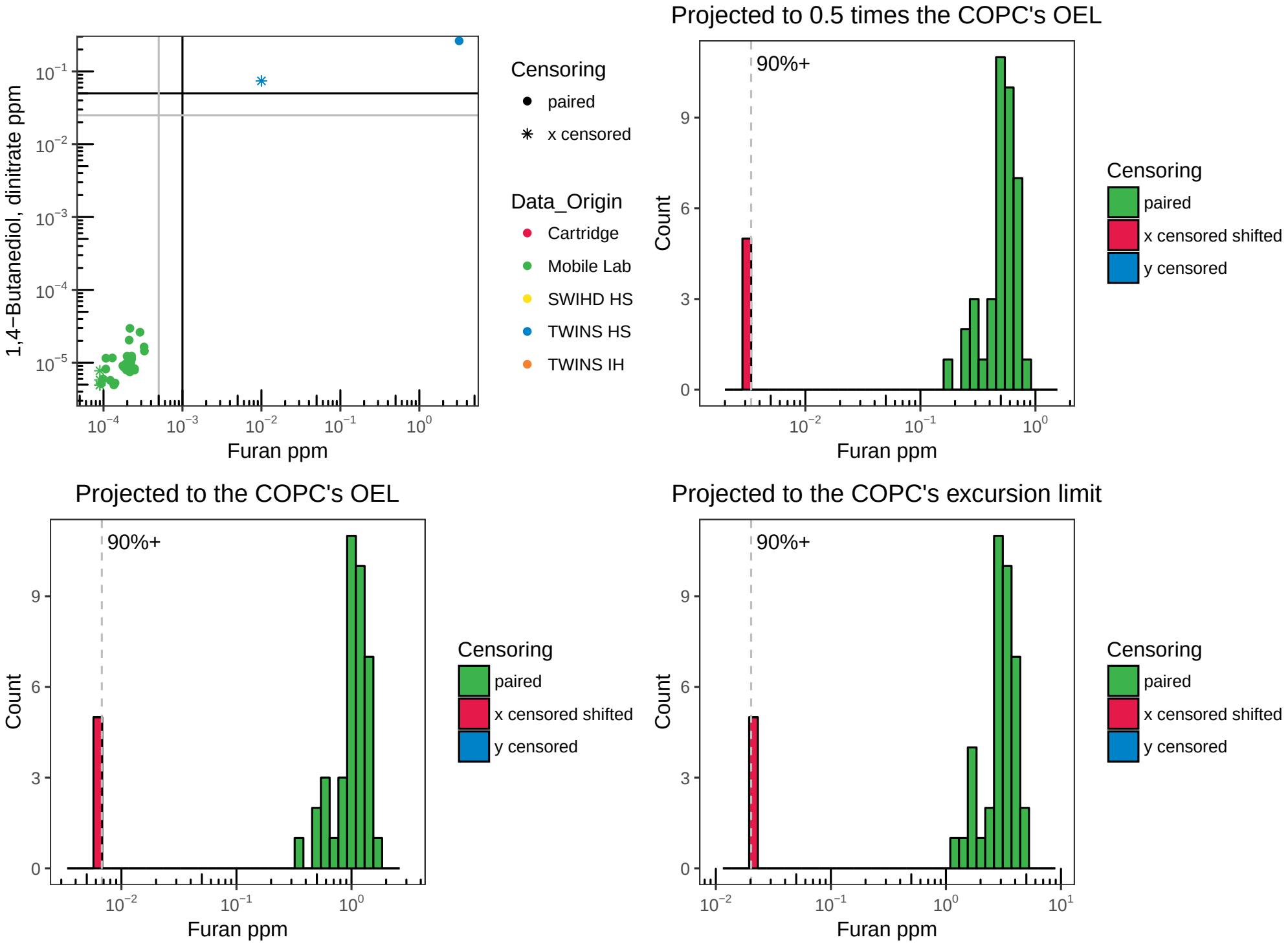


Figure C.1020: 1,4-Butanediol, dinitrate vs Furan

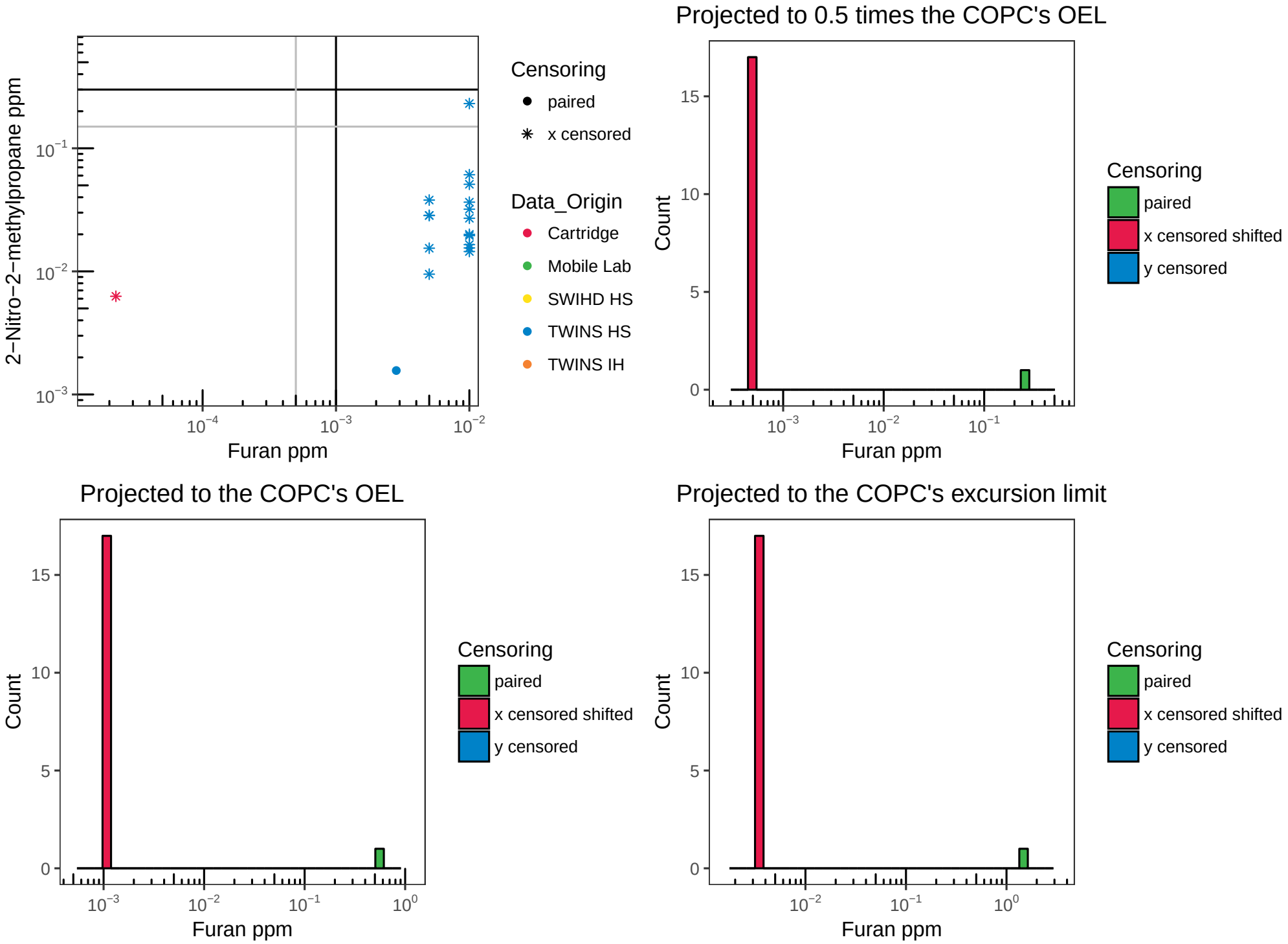


Figure C.1021: 2-Nitro-2-methylpropane vs Furan

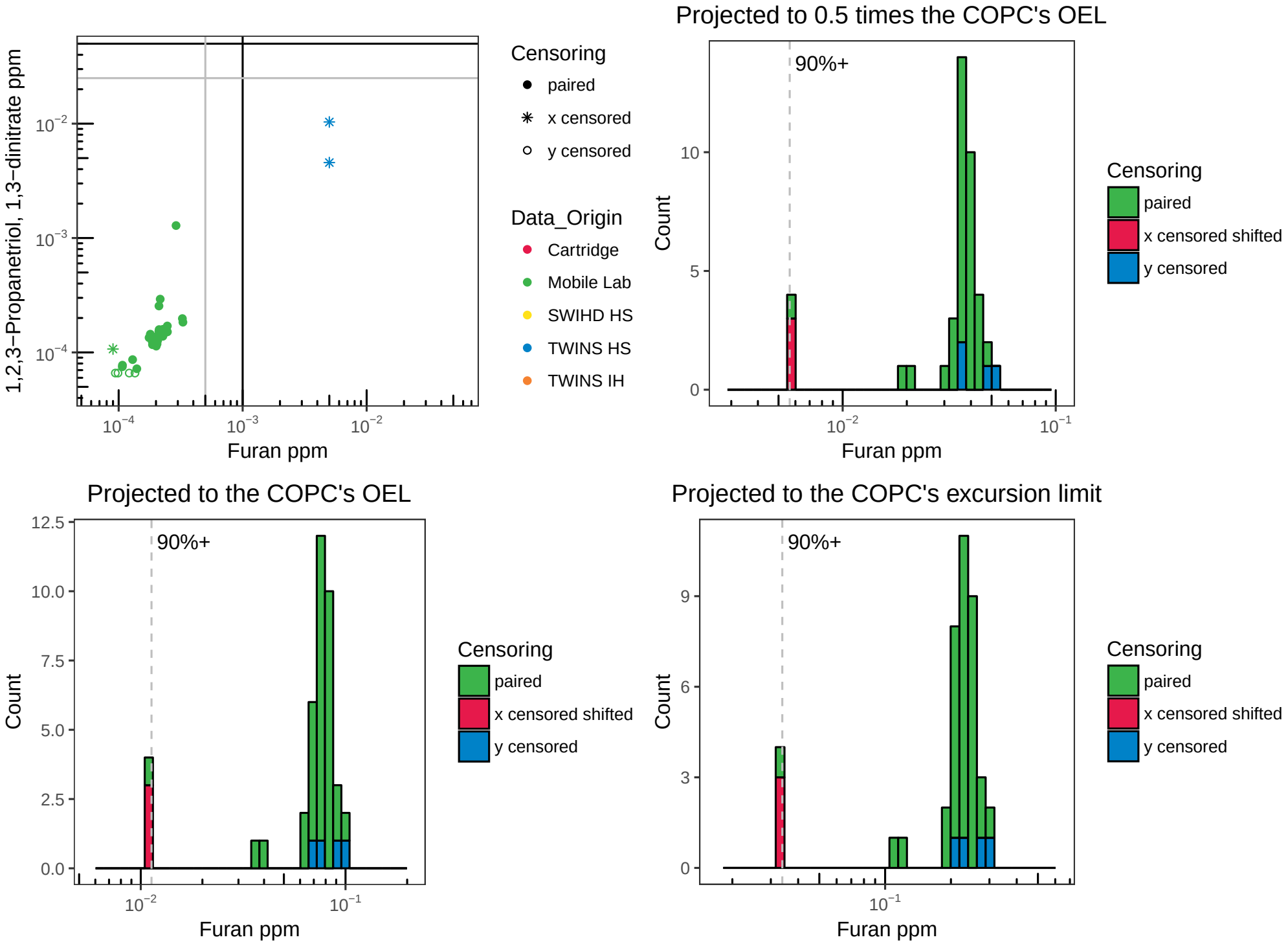


Figure C.1022: 1,2,3-Propanetriol, 1,3-dinitrate vs Furan

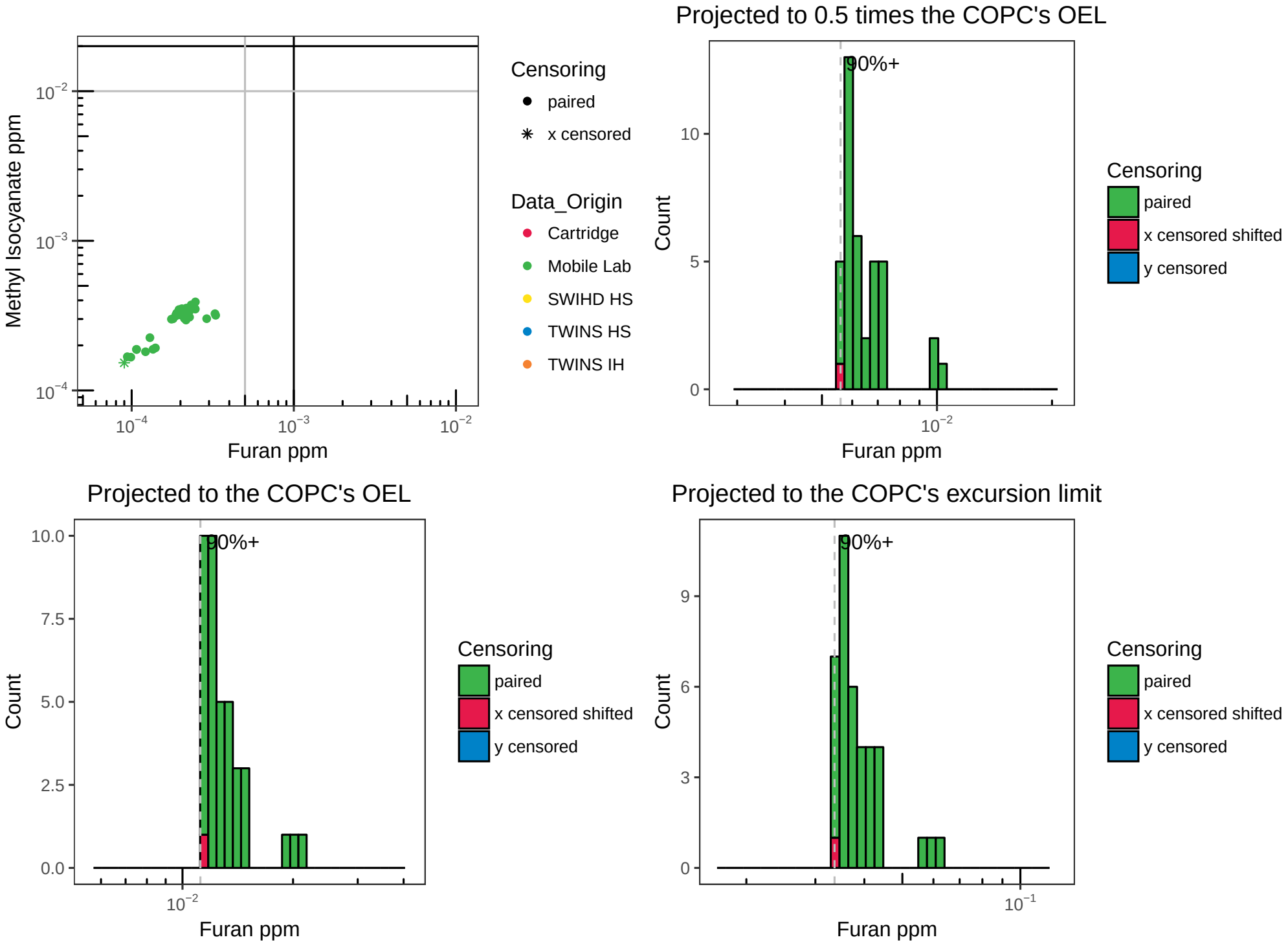


Figure C.1023: Methyl Isocyanate vs Furan

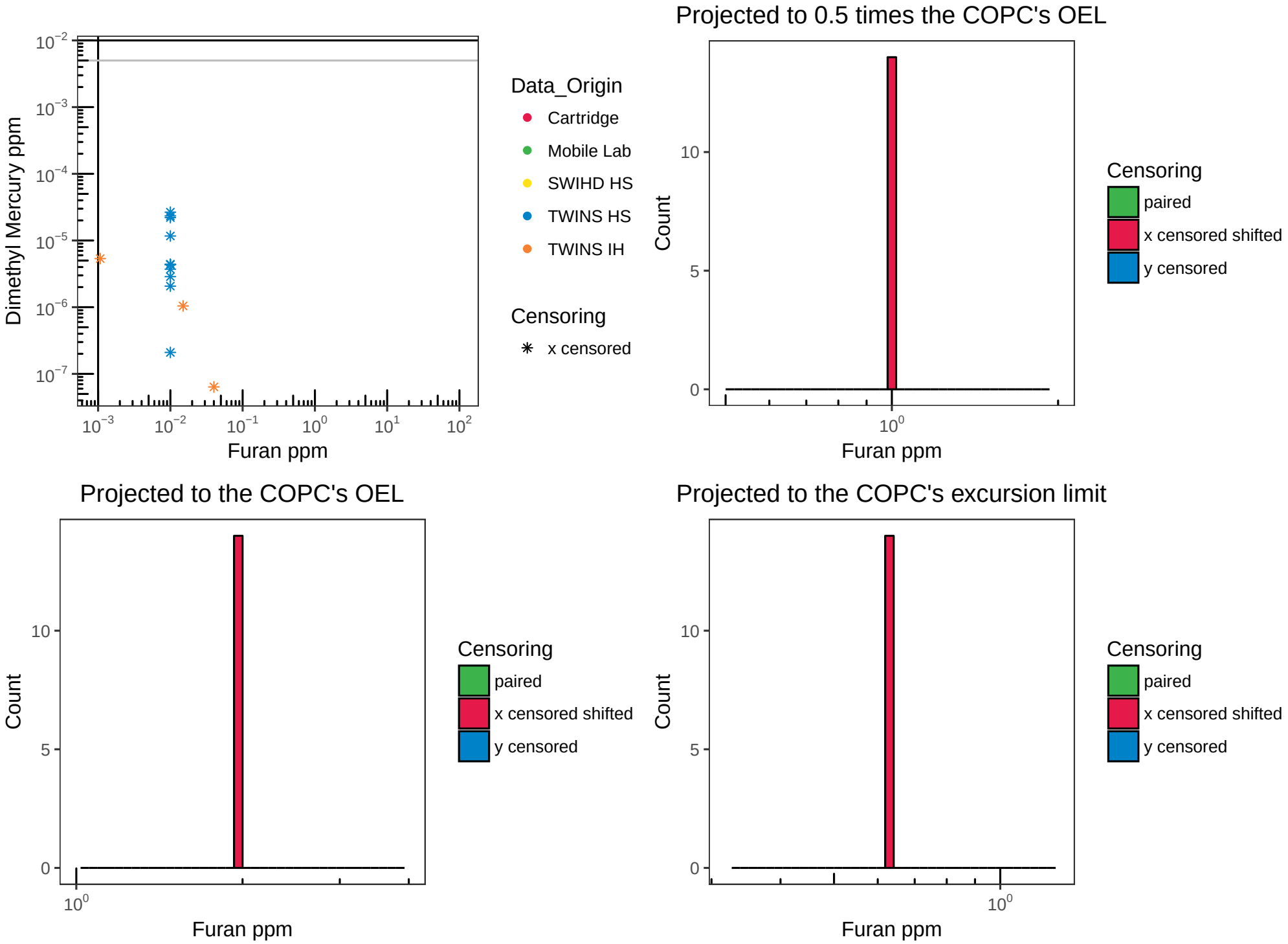


Figure C.1024: Dimethyl Mercury vs Furan

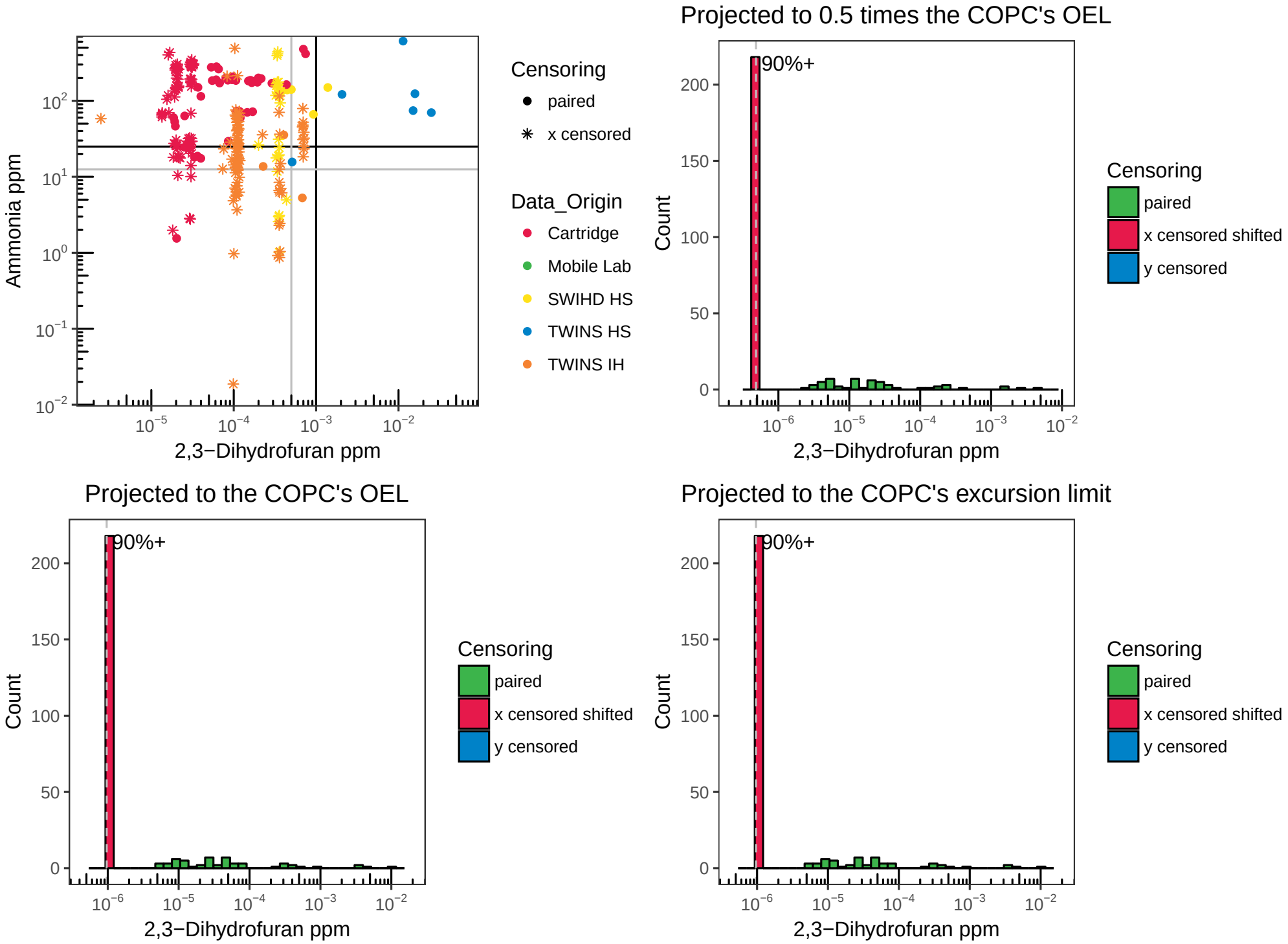


Figure C.1025: Ammonia vs 2,3-Dihydrofuran

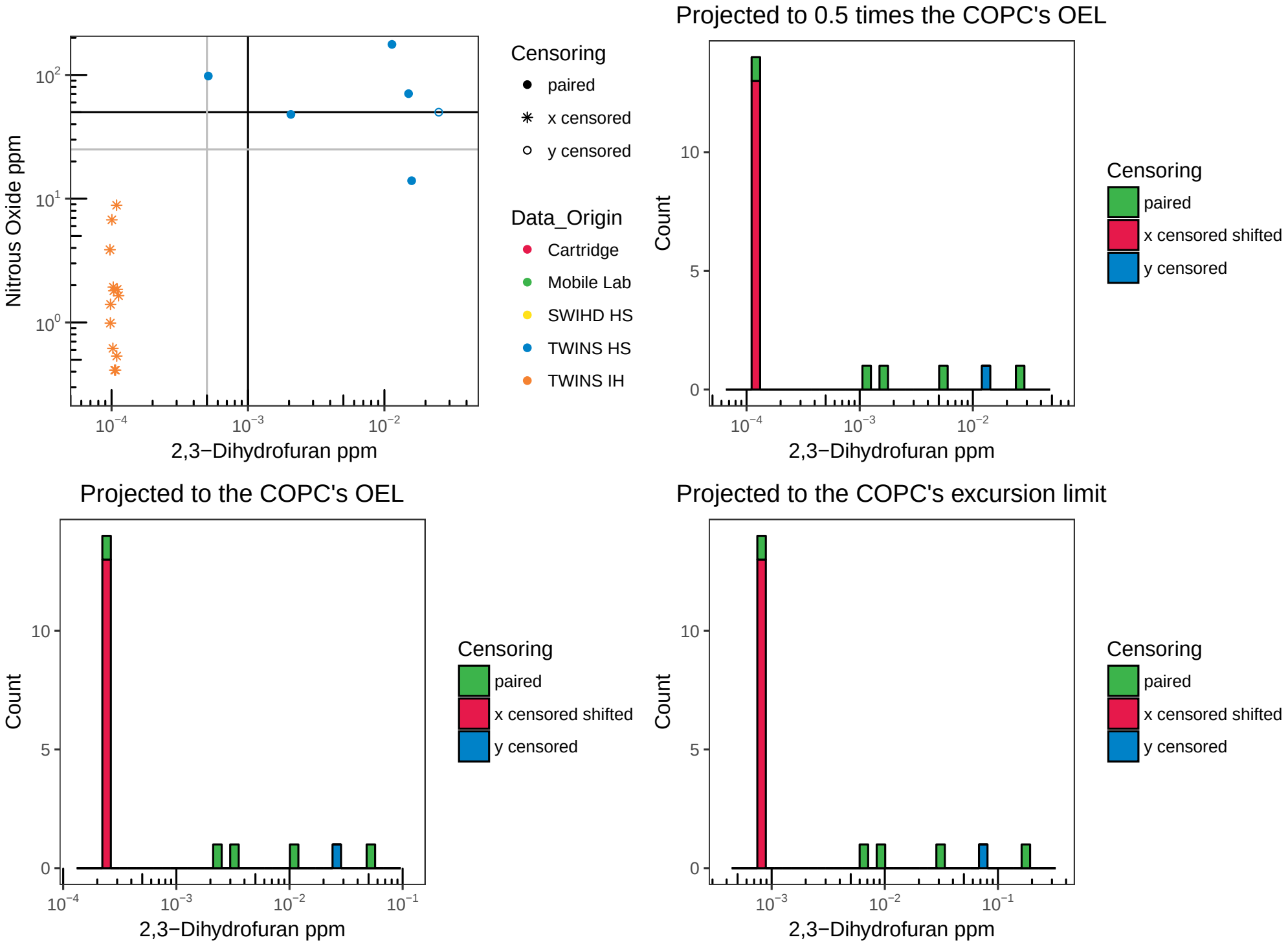


Figure C.1026: Nitrous Oxide vs 2,3-Dihydrofuran

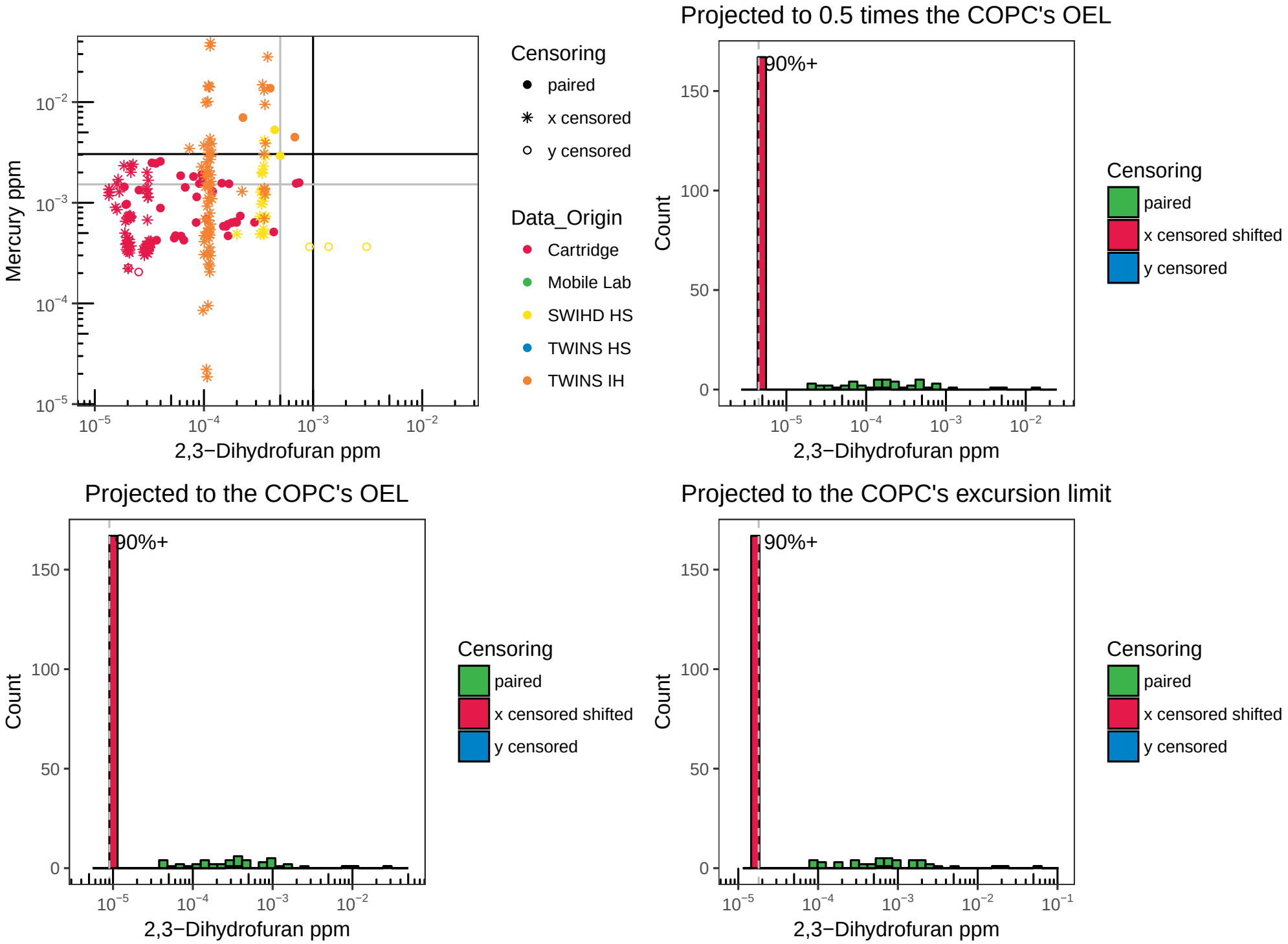


Figure C.1027: Mercury vs 2,3-Dihydrofuran

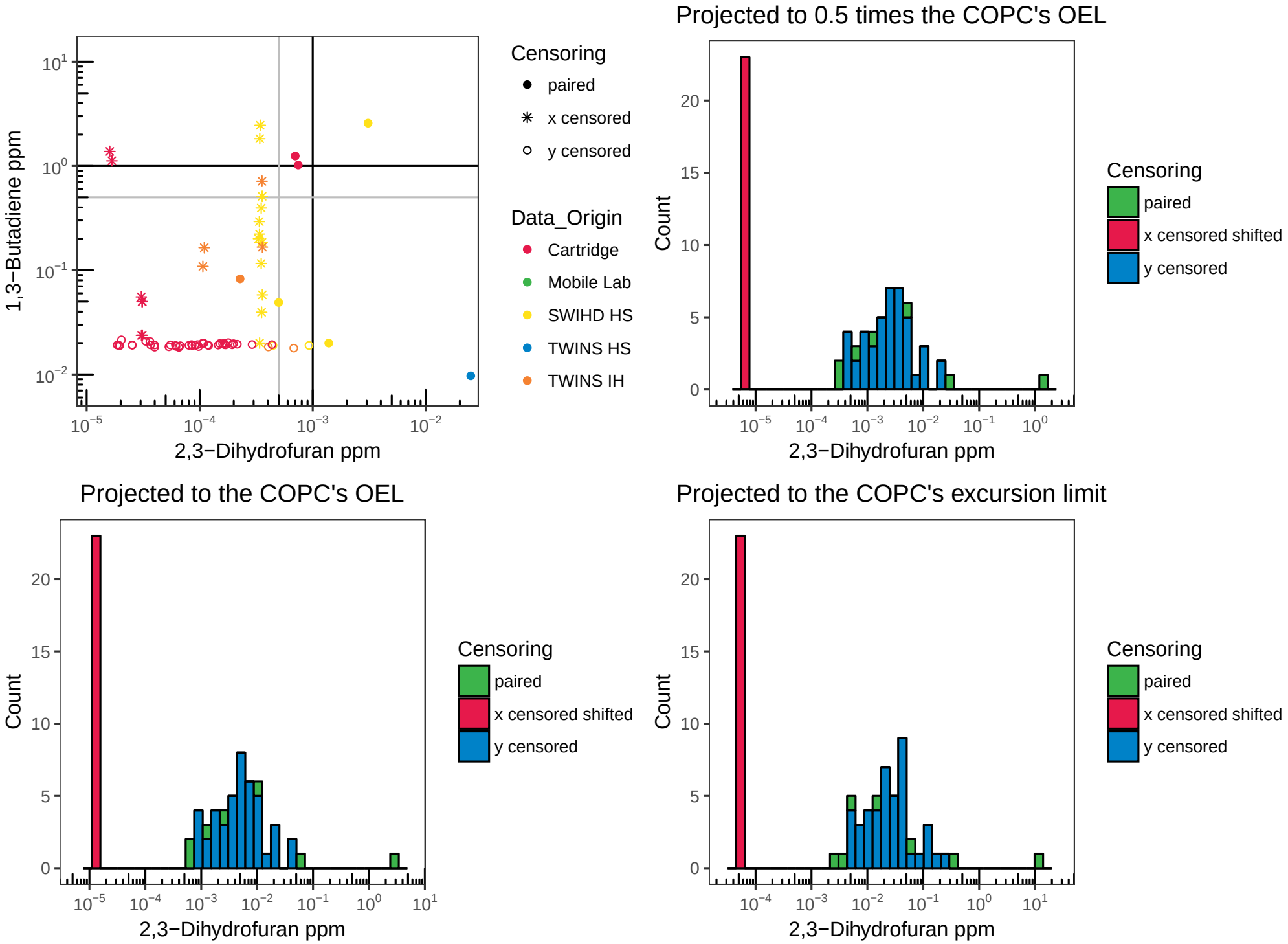


Figure C.1028: 1,3-Butadiene vs 2,3-Dihydrofuran

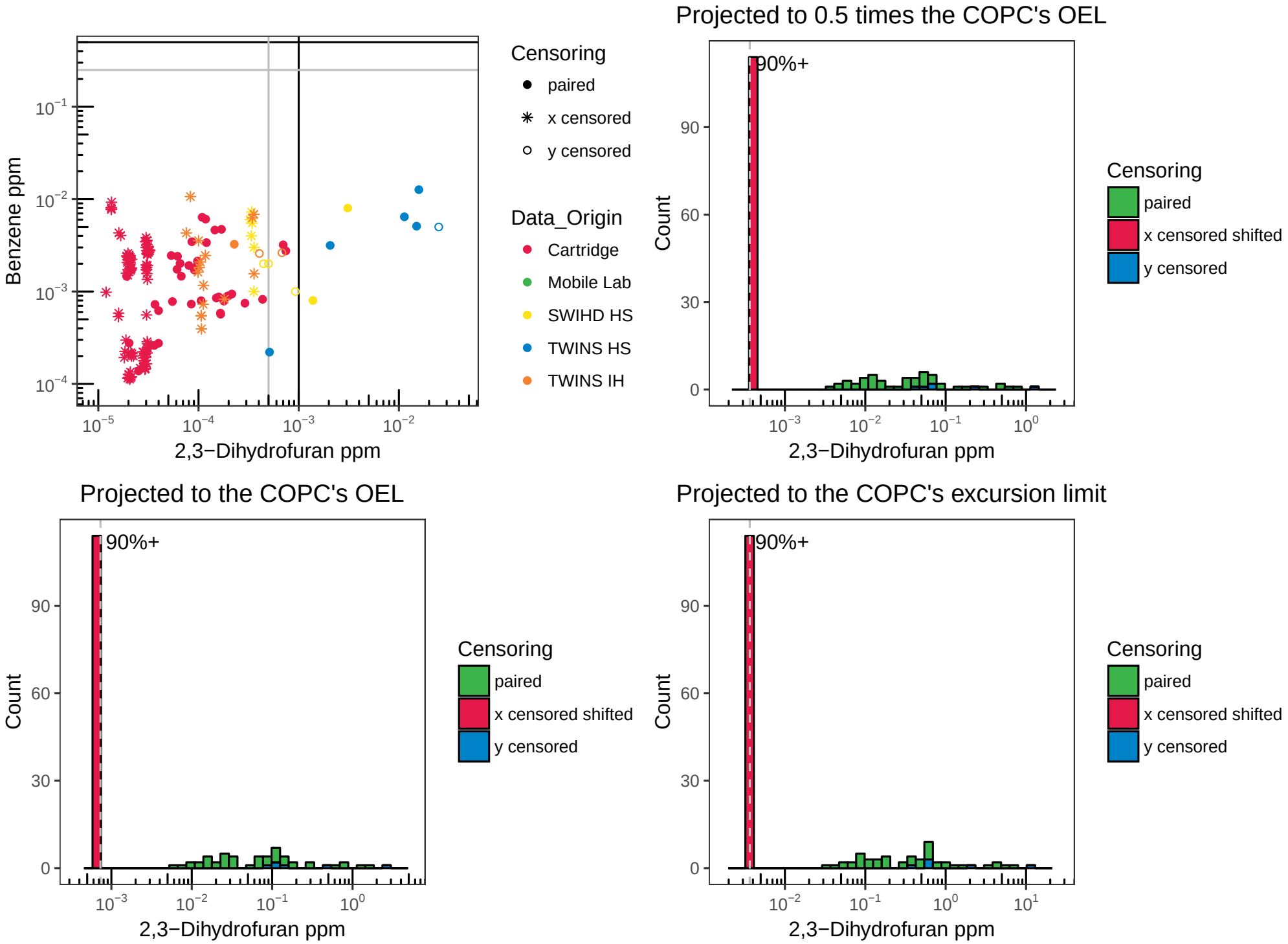


Figure C.1029: Benzene vs 2,3-Dihydrofuran

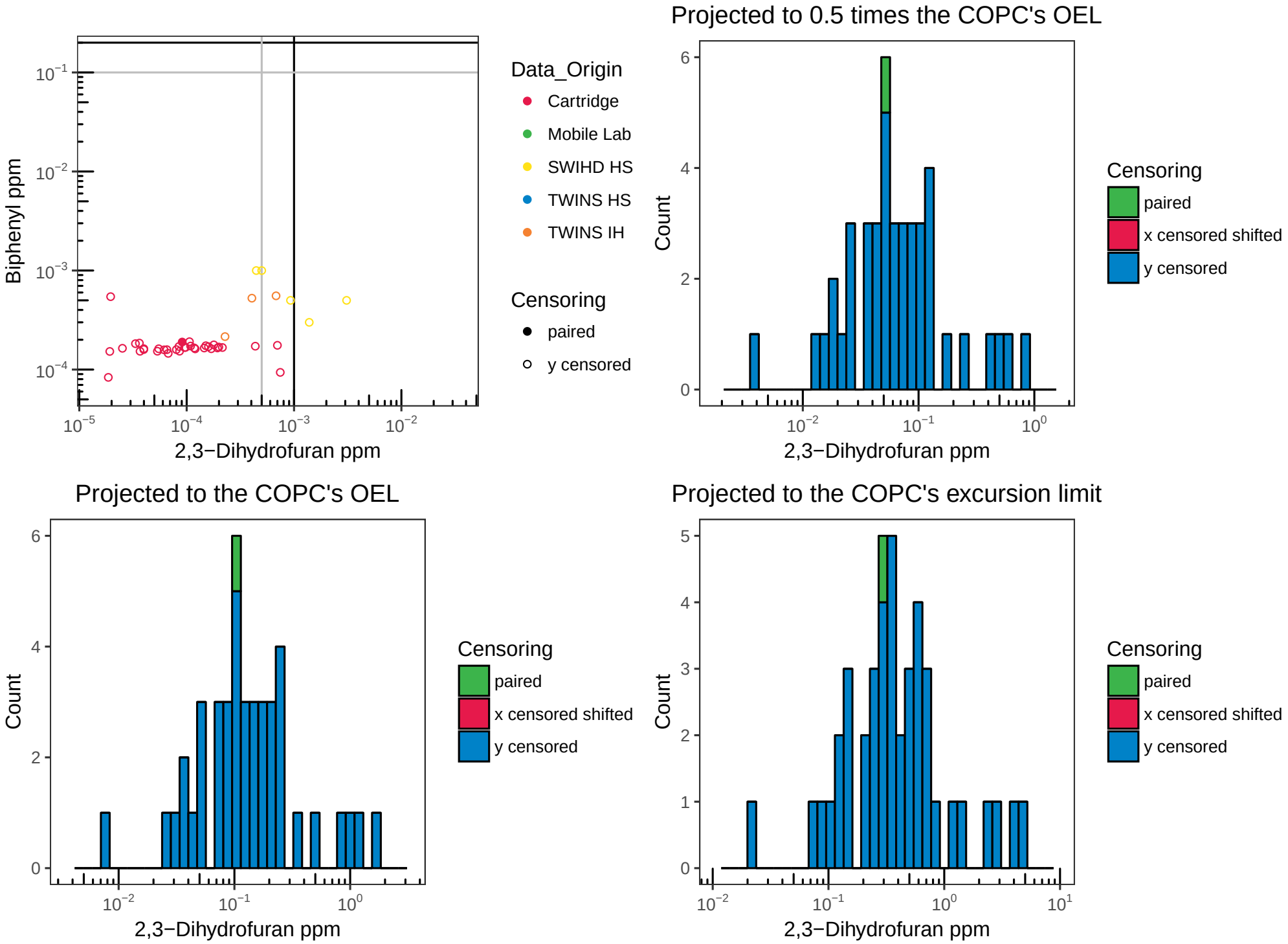


Figure C.1030: Biphenyl vs 2,3-Dihydrofuran

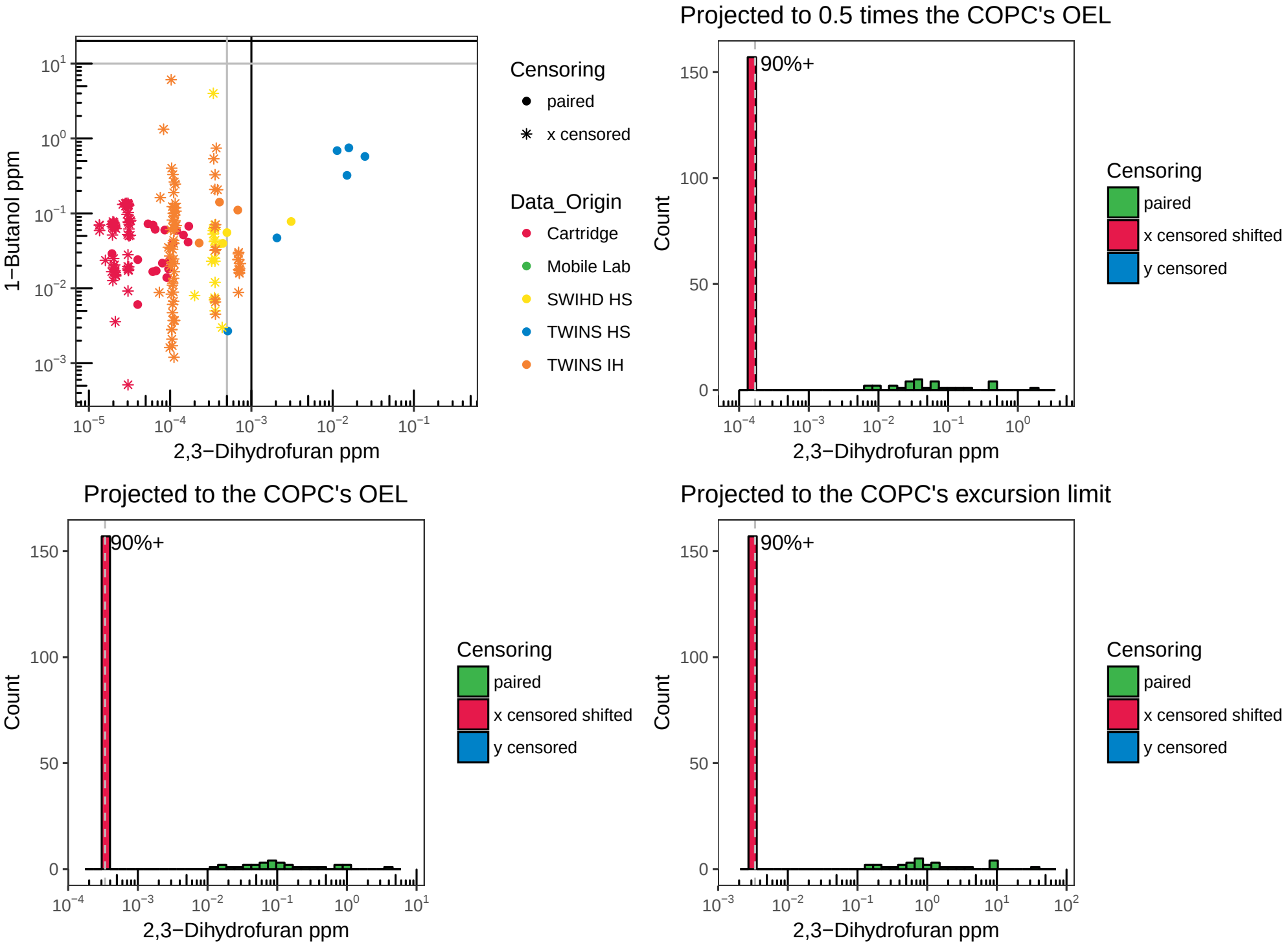


Figure C.1031: 1-Butanol vs 2,3-Dihydrofuran

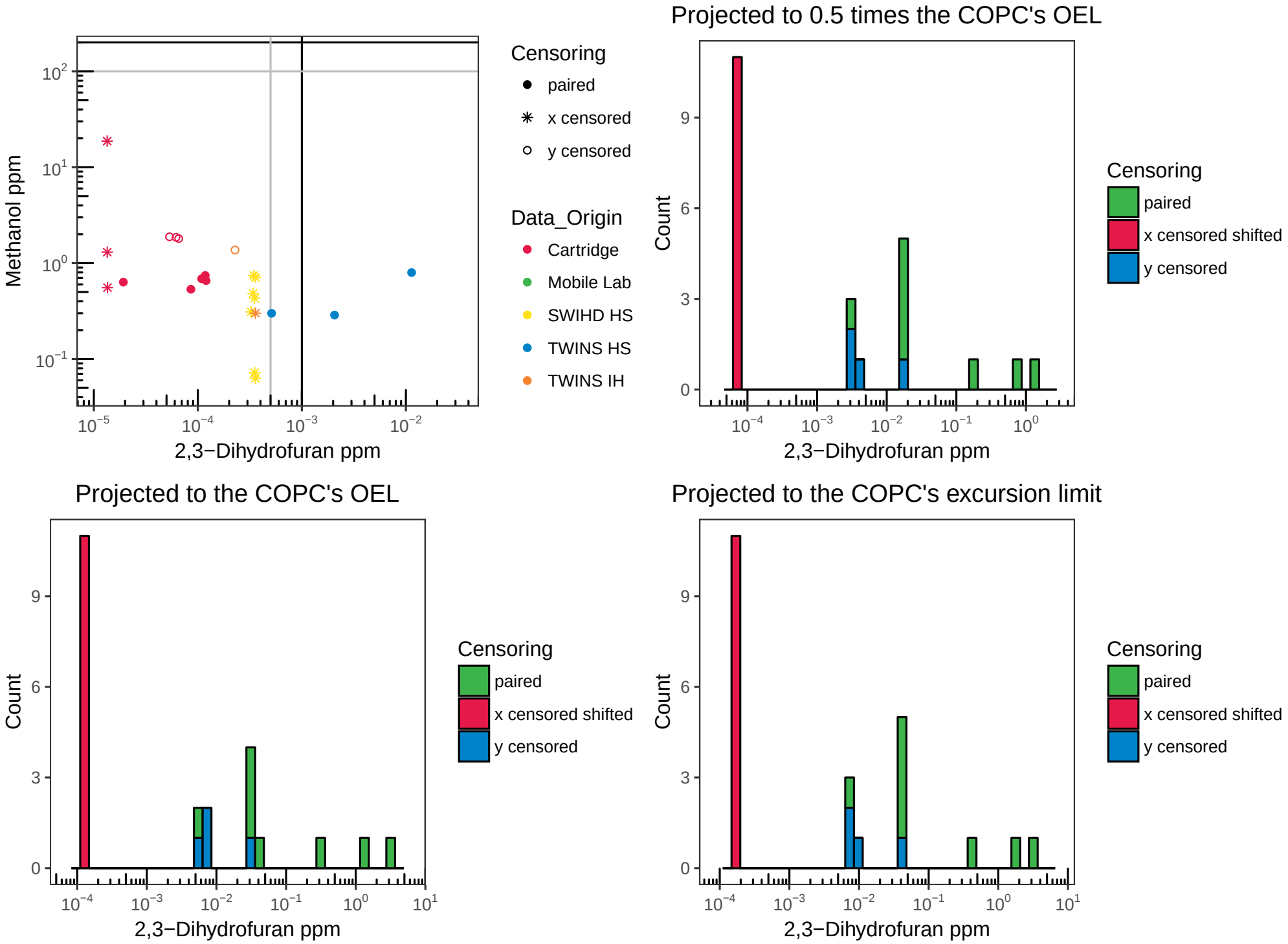


Figure C.1032: Methanol vs 2,3-Dihydrofuran

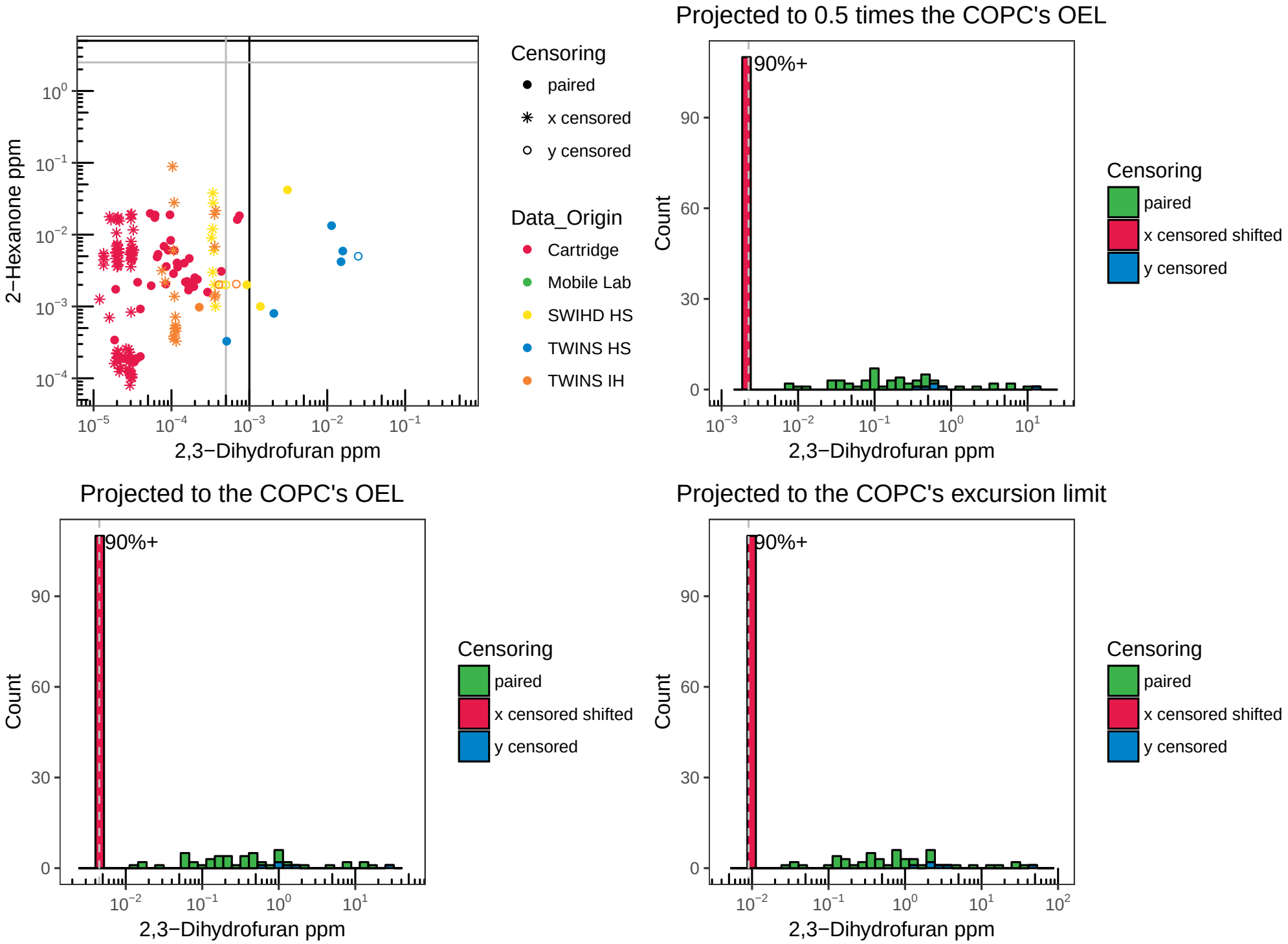


Figure C.1033: 2-Hexanone vs 2,3-Dihydrofuran

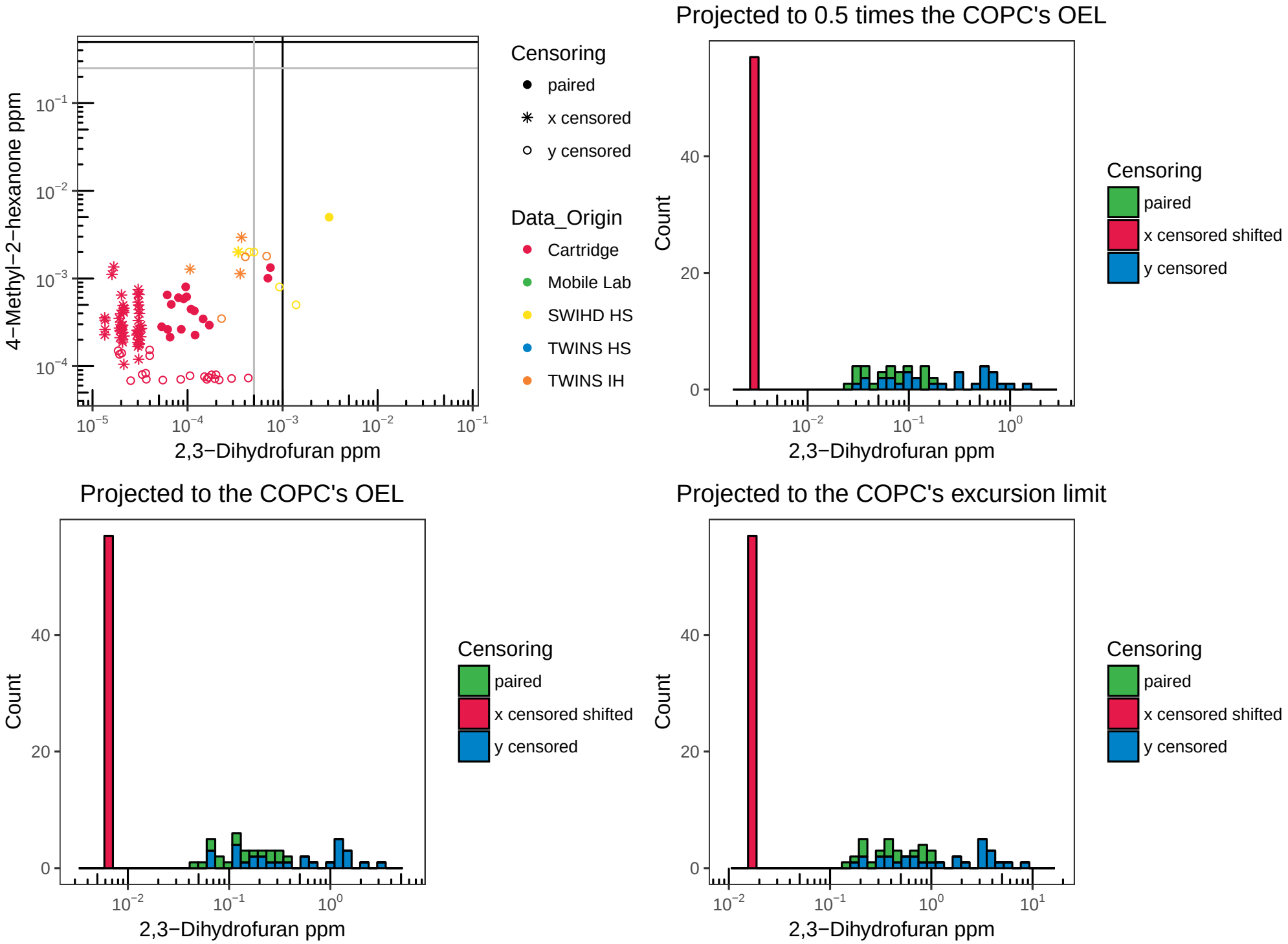


Figure C.1034: 4-Methyl-2-hexanone vs 2,3-Dihydrofuran

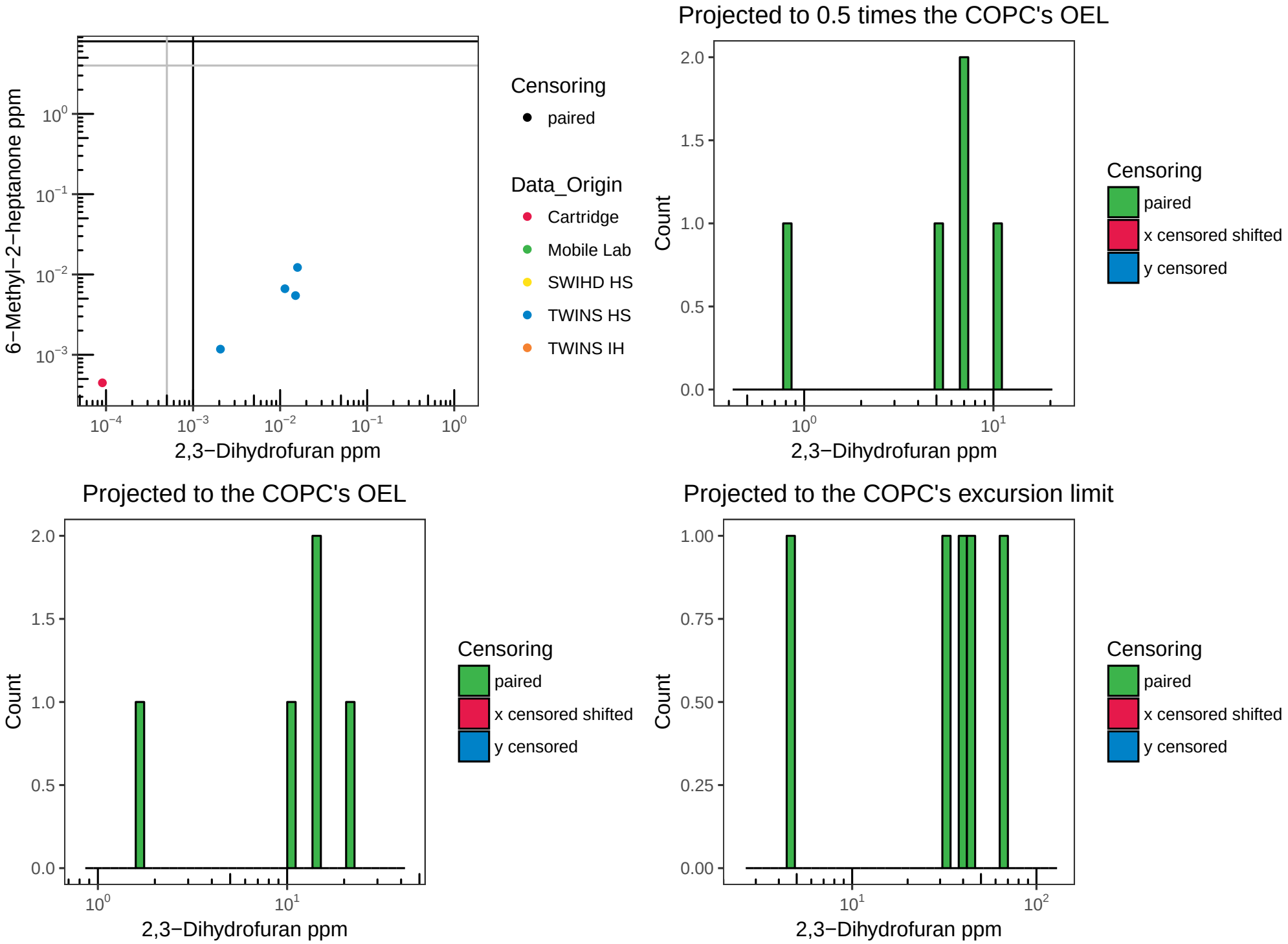


Figure C.1035: 6-Methyl-2-heptanone vs 2,3-Dihydrofuran

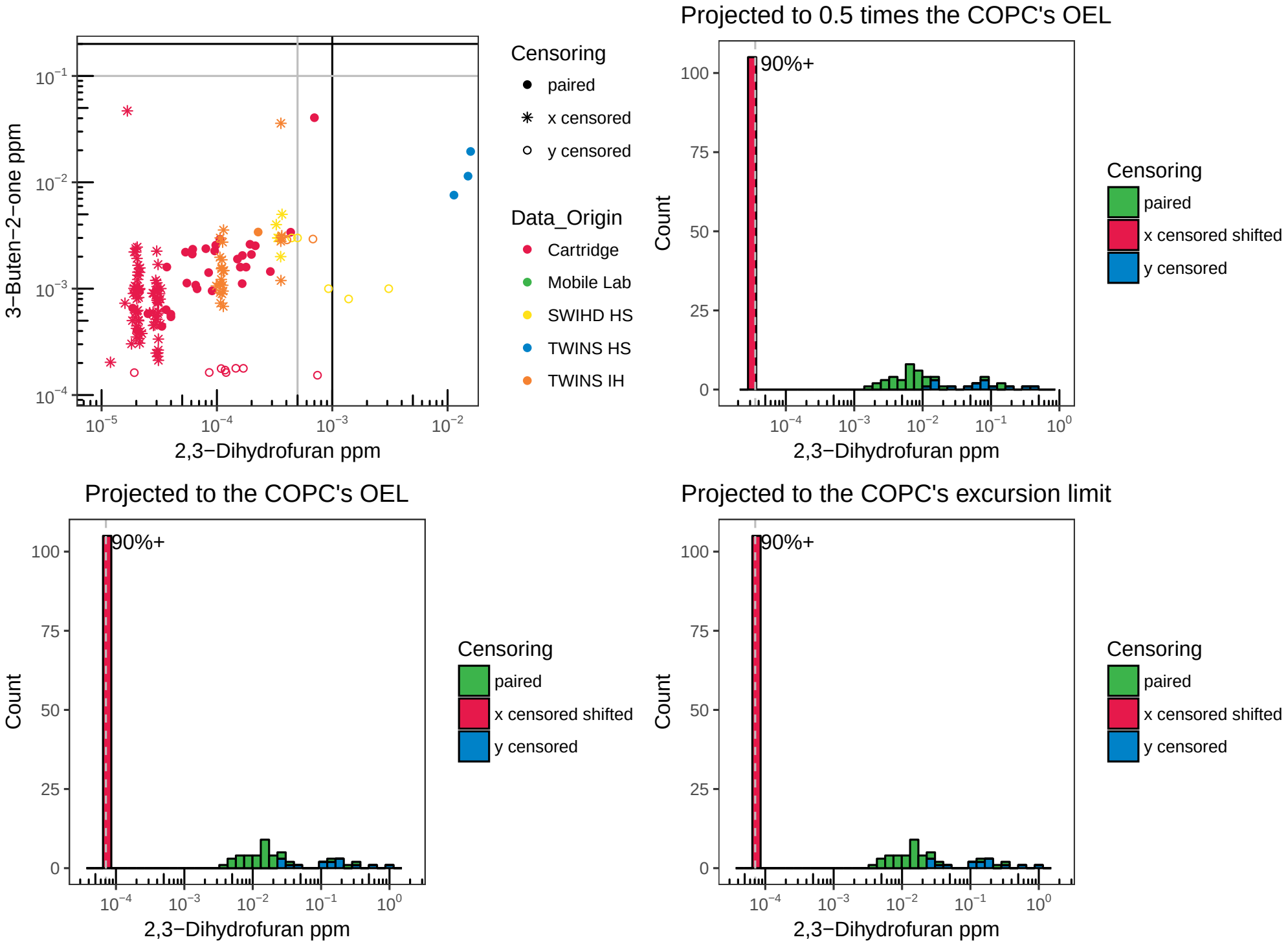


Figure C.1036: 3-Buten-2-one vs 2,3-Dihydrofuran

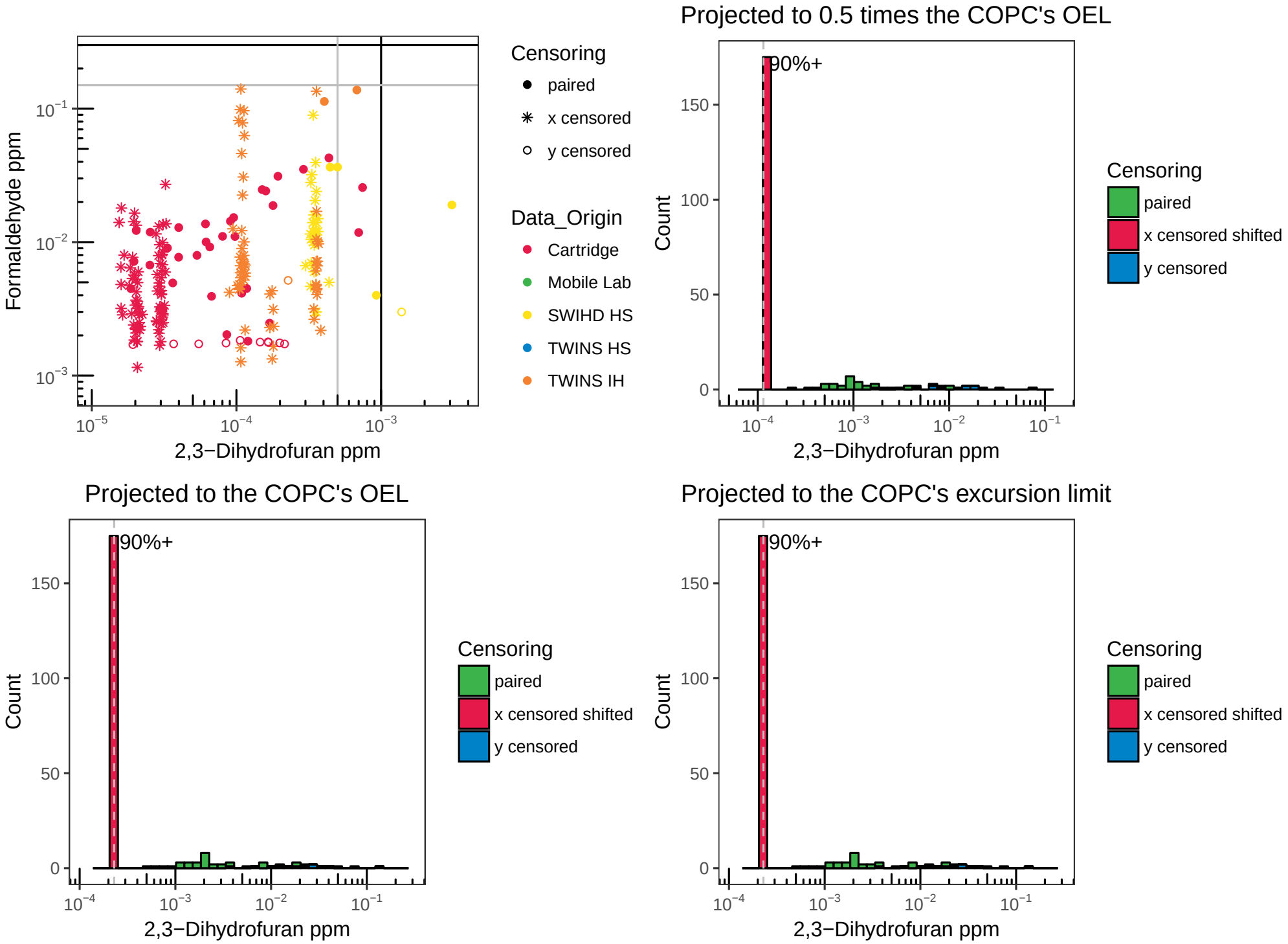


Figure C.1037: Formaldehyde vs 2,3-Dihydrofuran

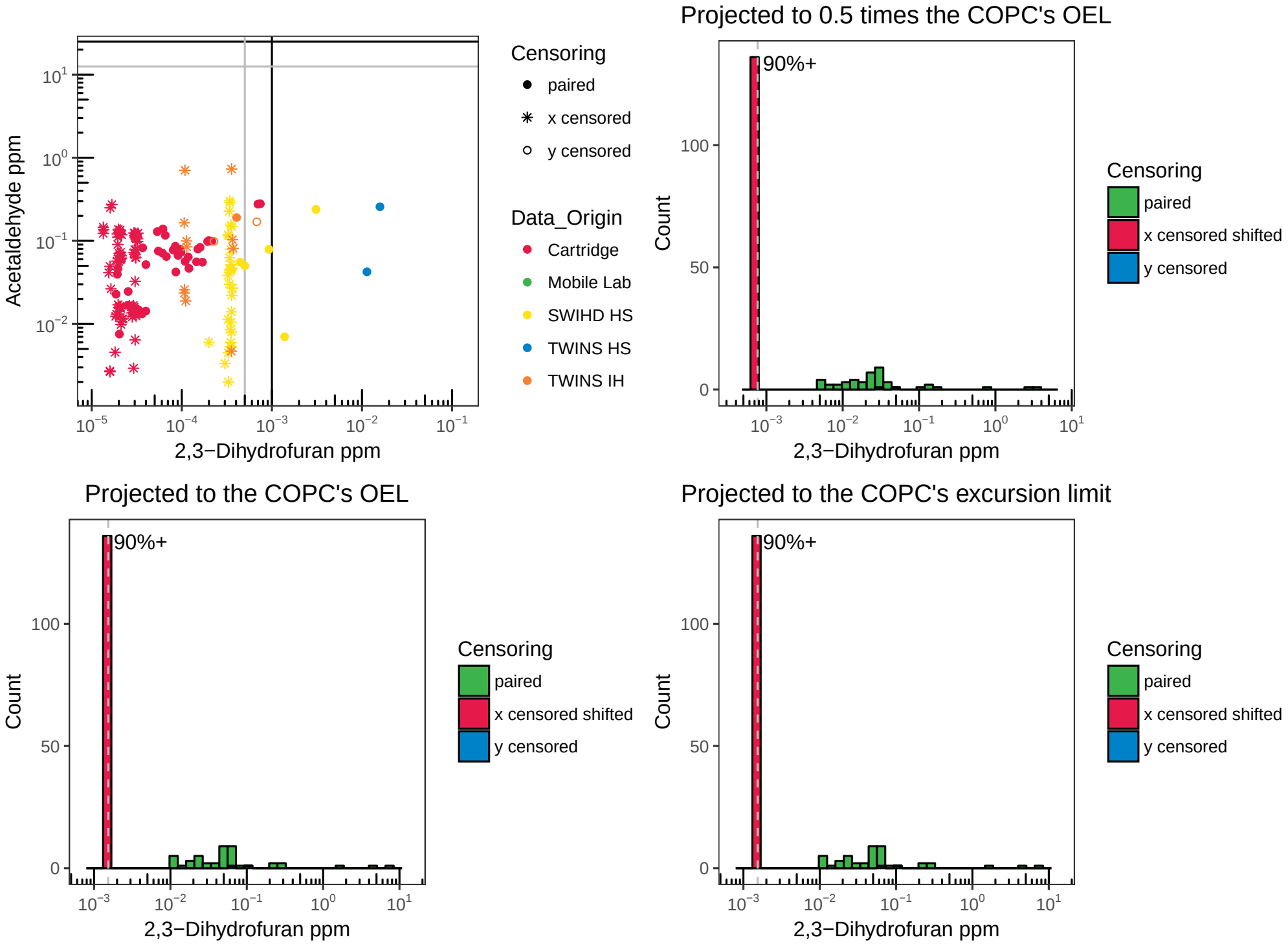


Figure C.1038: Acetaldehyde vs 2,3-Dihydrofuran

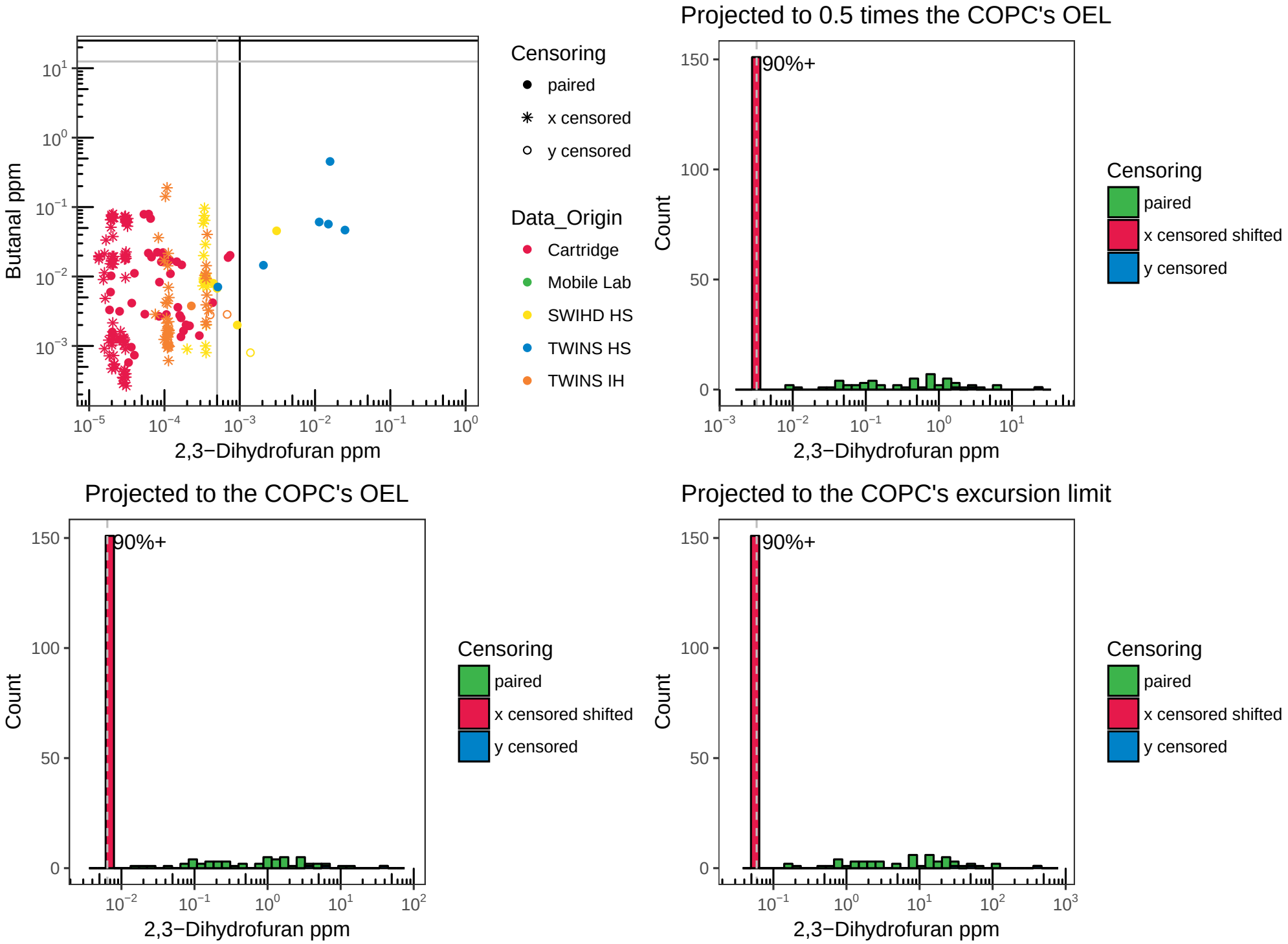


Figure C.1039: Butanal vs 2,3-Dihydrofuran

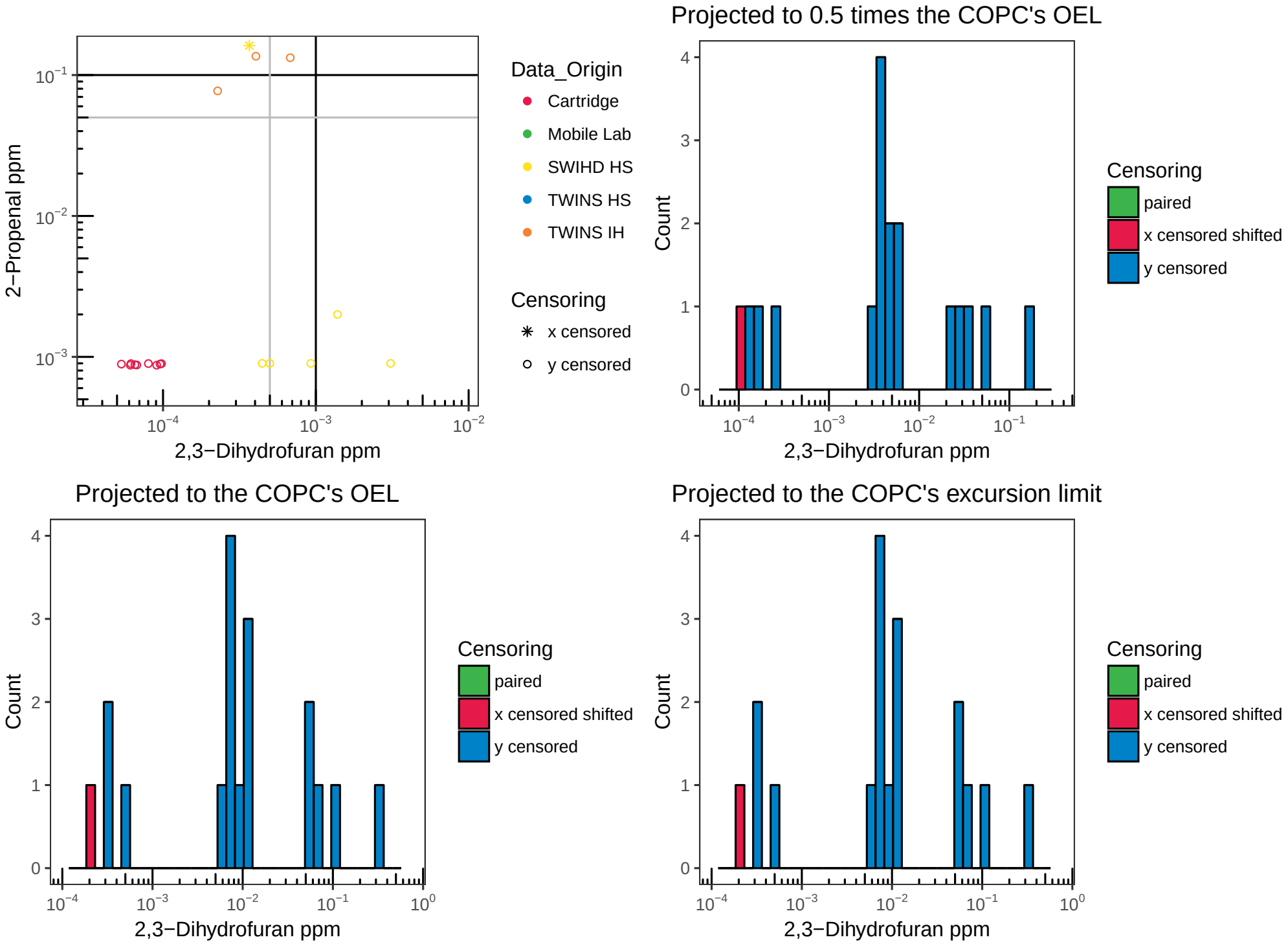


Figure C.1040: 2-Propenal vs 2,3-Dihydrofuran

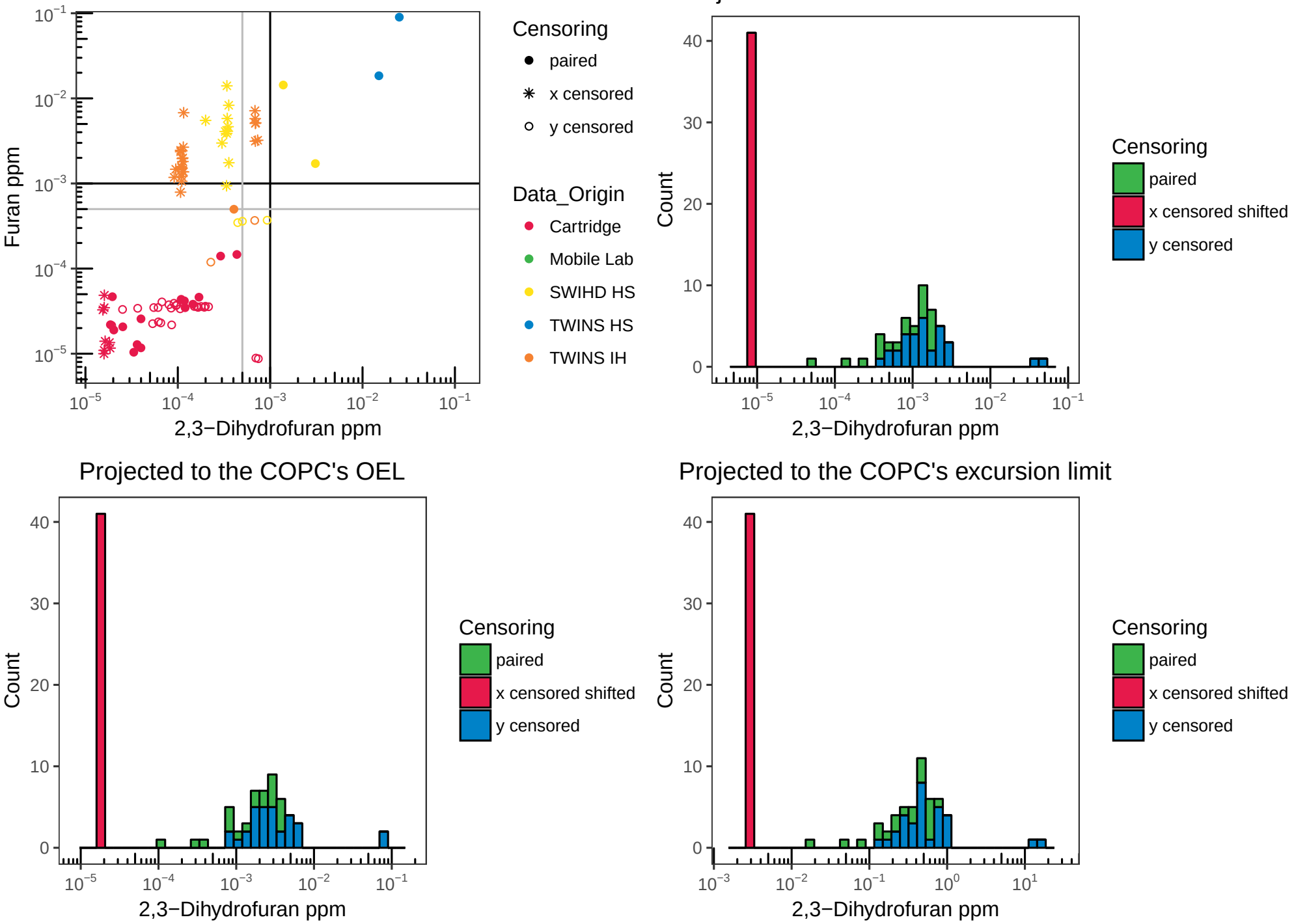


Figure C.1041: Furan vs 2,3-Dihydrofuran

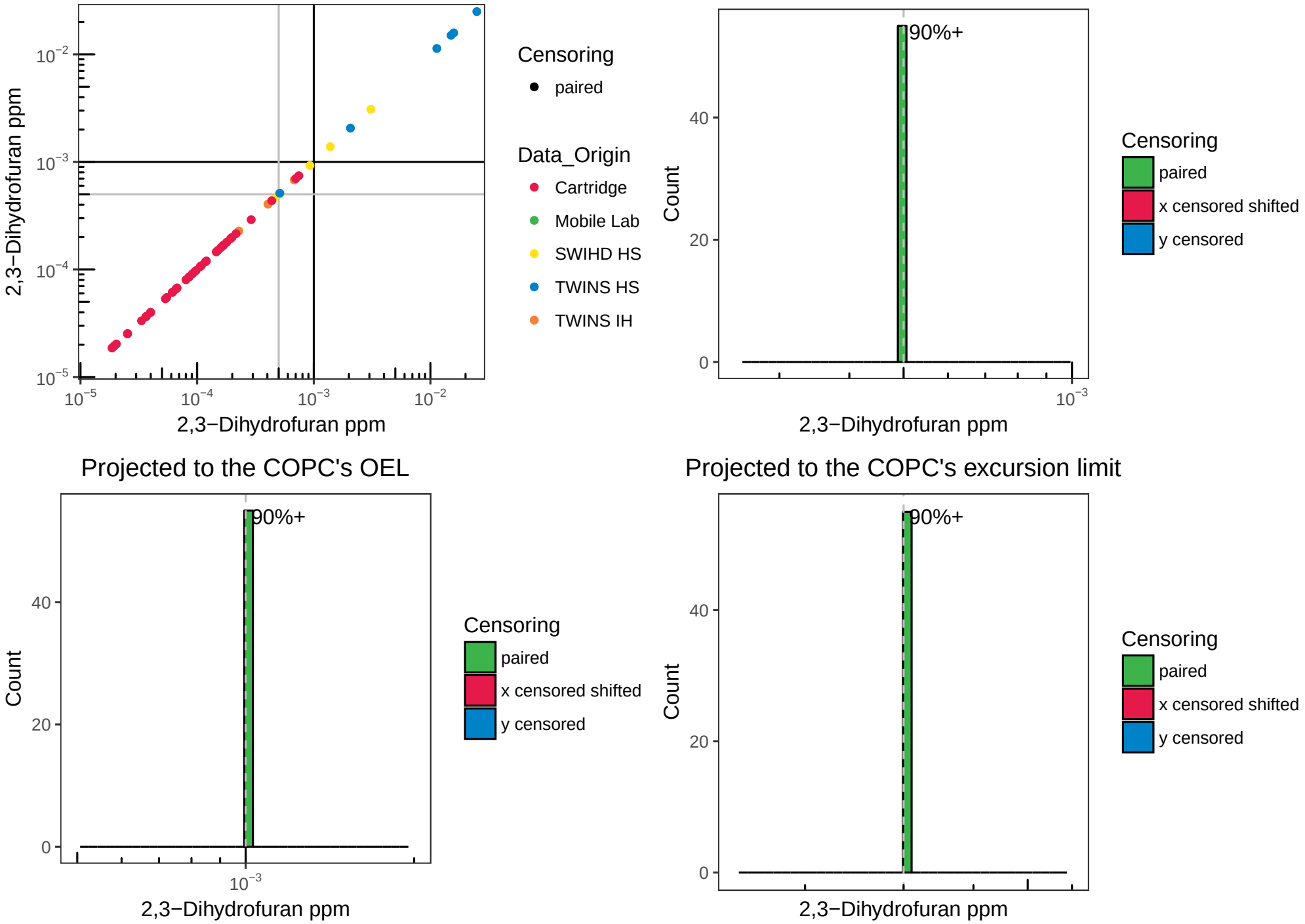


Figure C.1042: 2,3-Dihydrofuran vs 2,3-Dihydrofuran

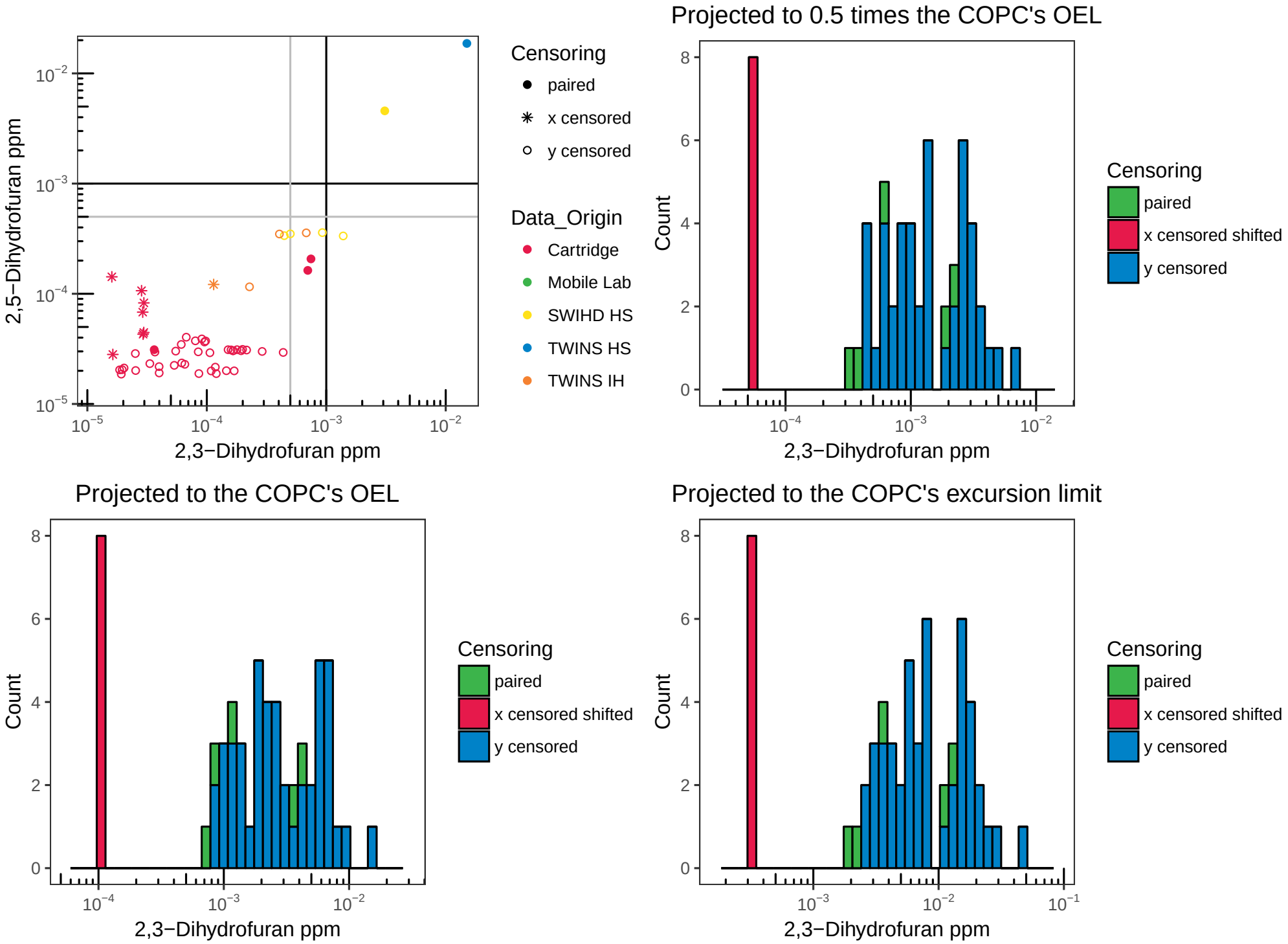


Figure C.1043: 2,5-Dihydrofuran vs 2,3-Dihydrofuran

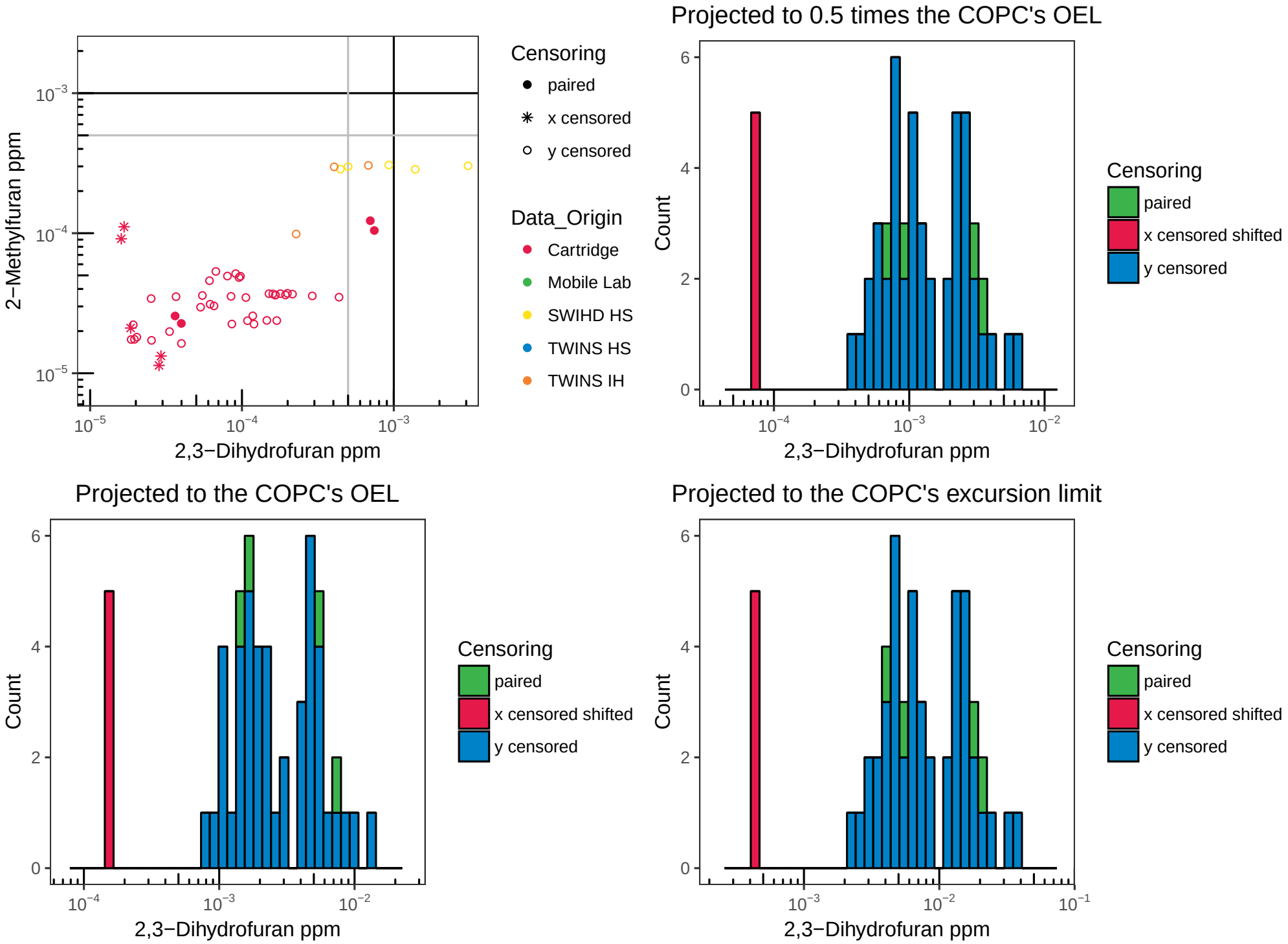


Figure C.1044: 2-Methylfuran vs 2,3-Dihydrofuran

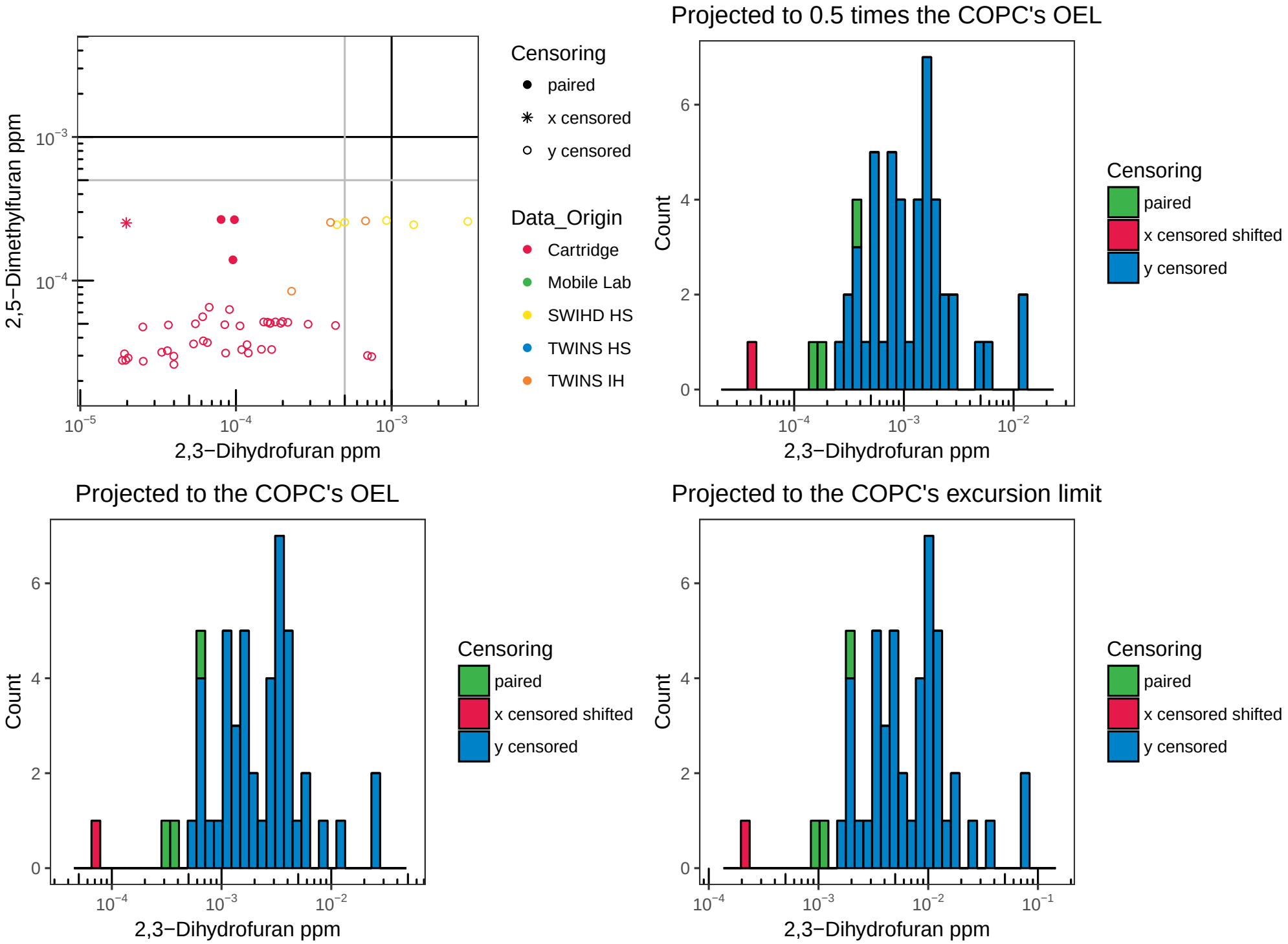


Figure C.1045: 2,5-Dimethylfuran vs 2,3-Dihydrofuran

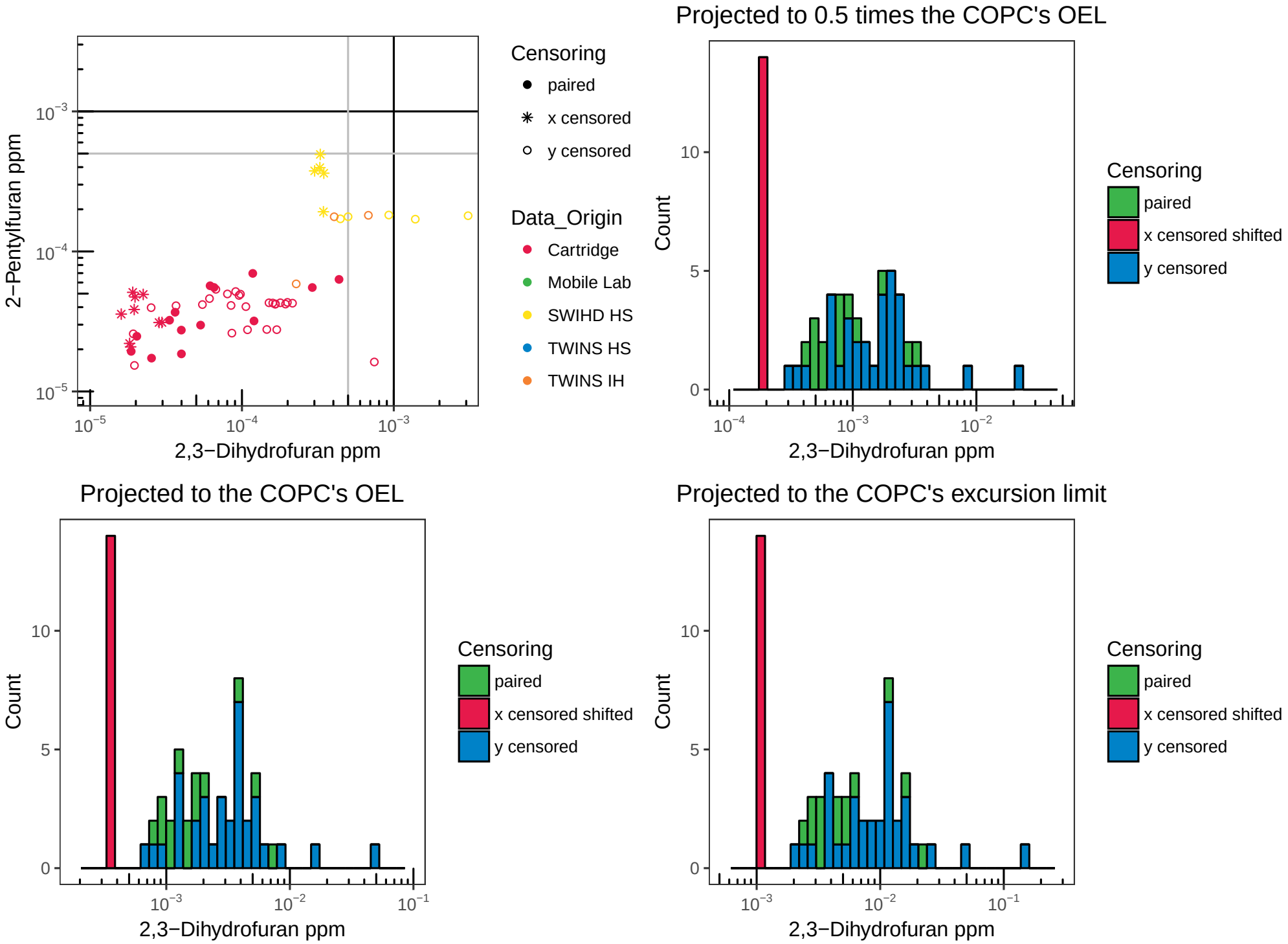


Figure C.1046: 2-Pentylfuran vs 2,3-Dihydrofuran

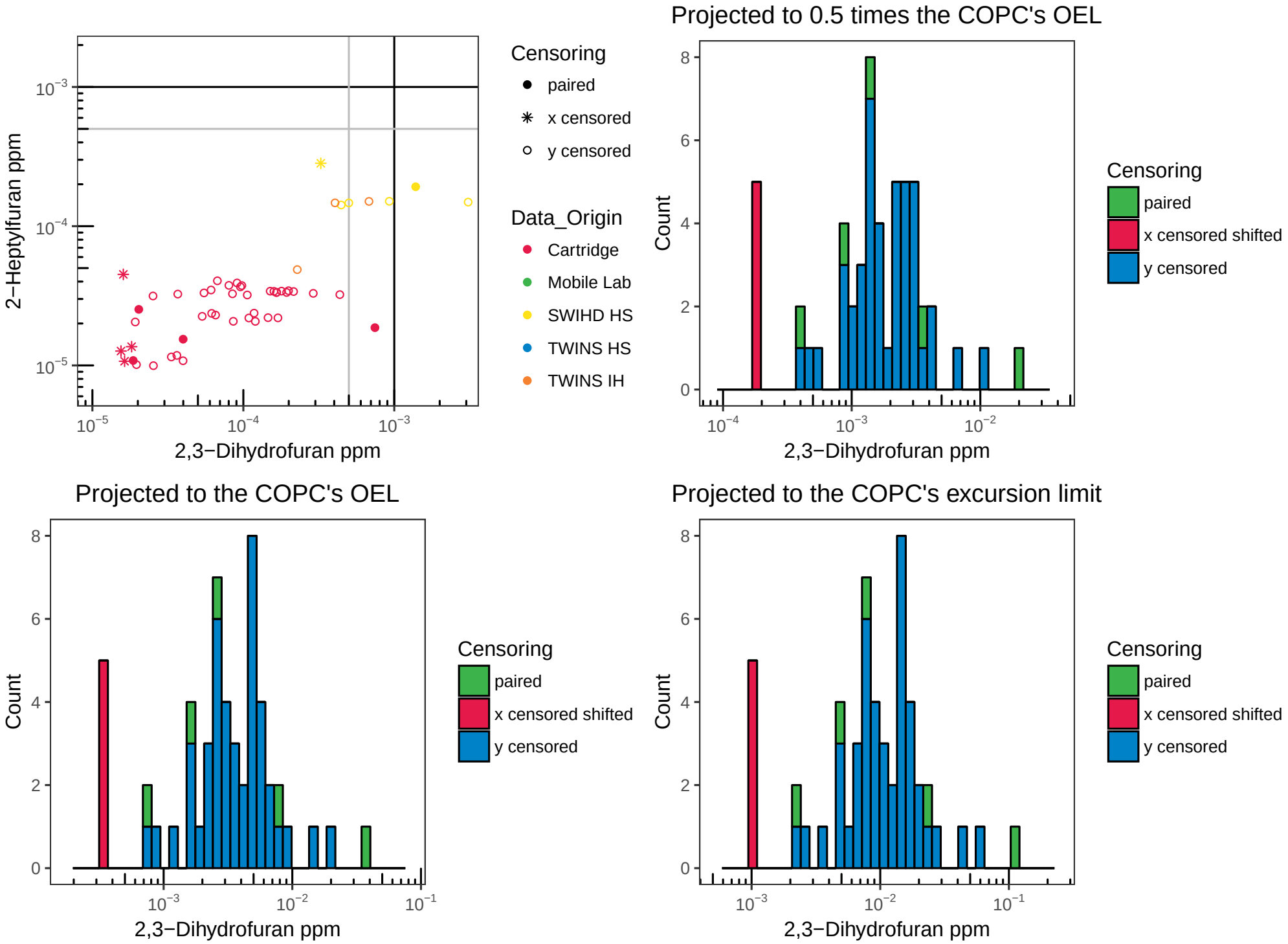


Figure C.1047: 2-Heptylfuran vs 2,3-Dihydrofuran

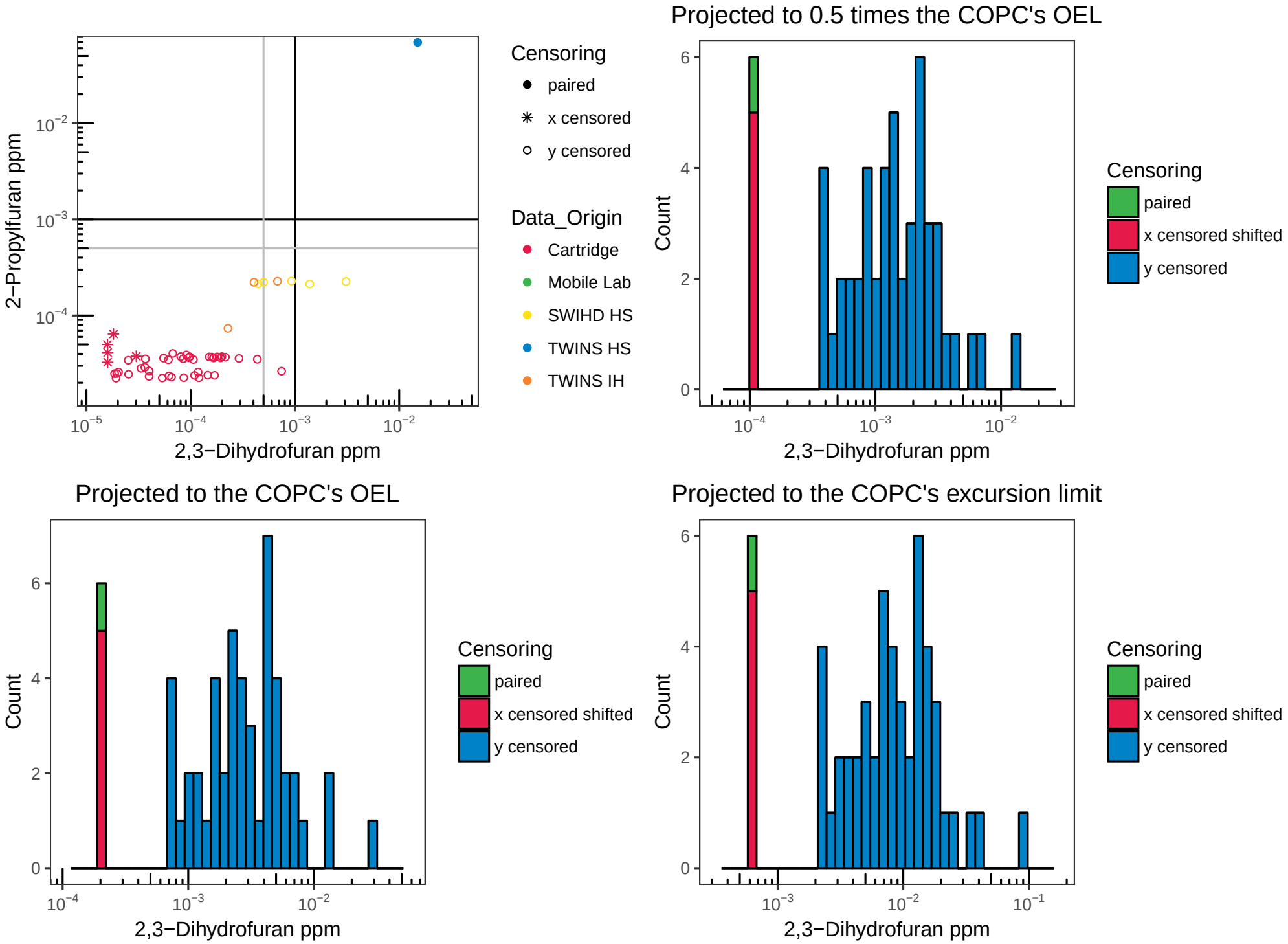


Figure C.1048: 2-Propylfuran vs 2,3-Dihydrofuran

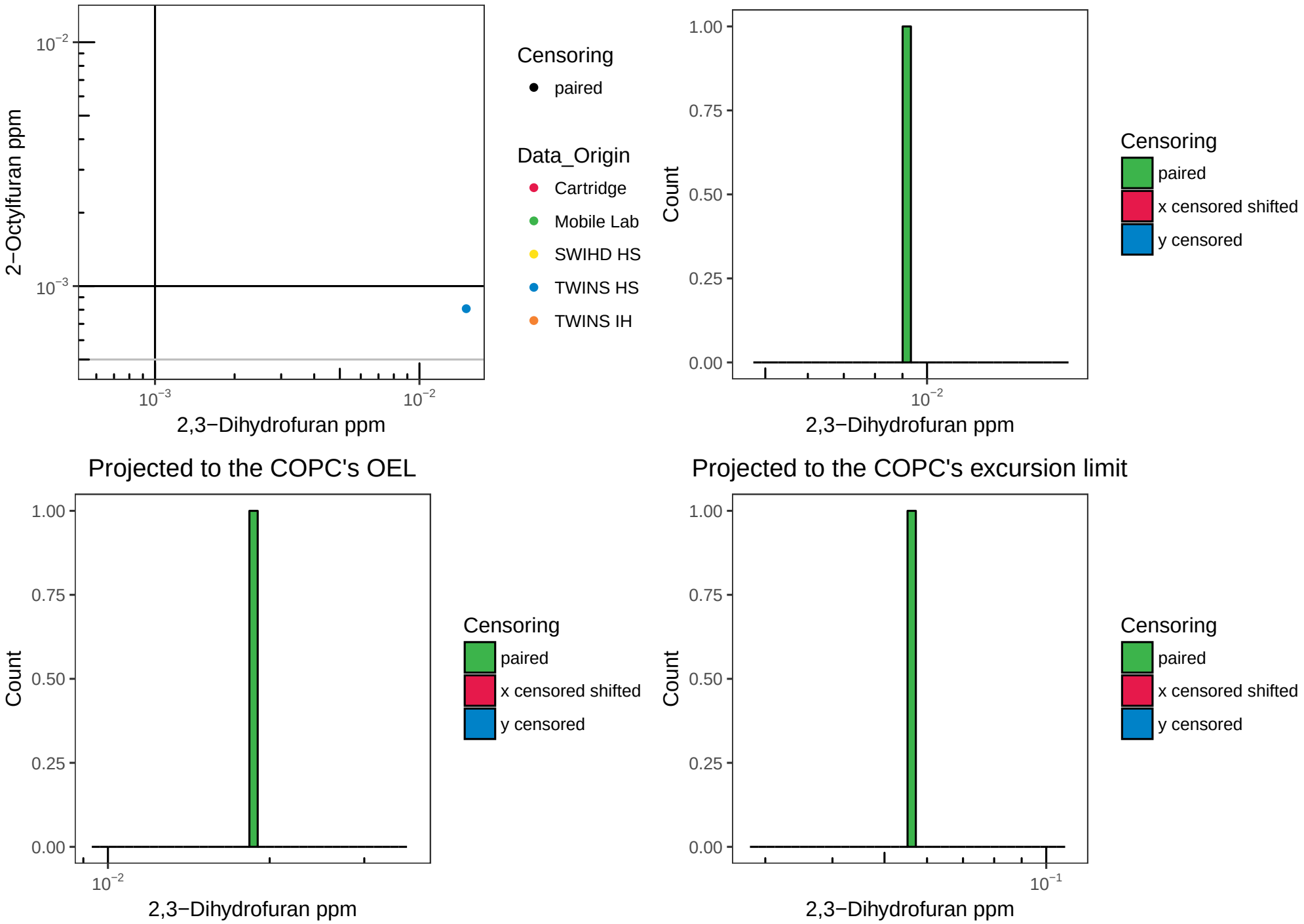


Figure C.1049: 2-Octylfuran vs 2,3-Dihydrofuran

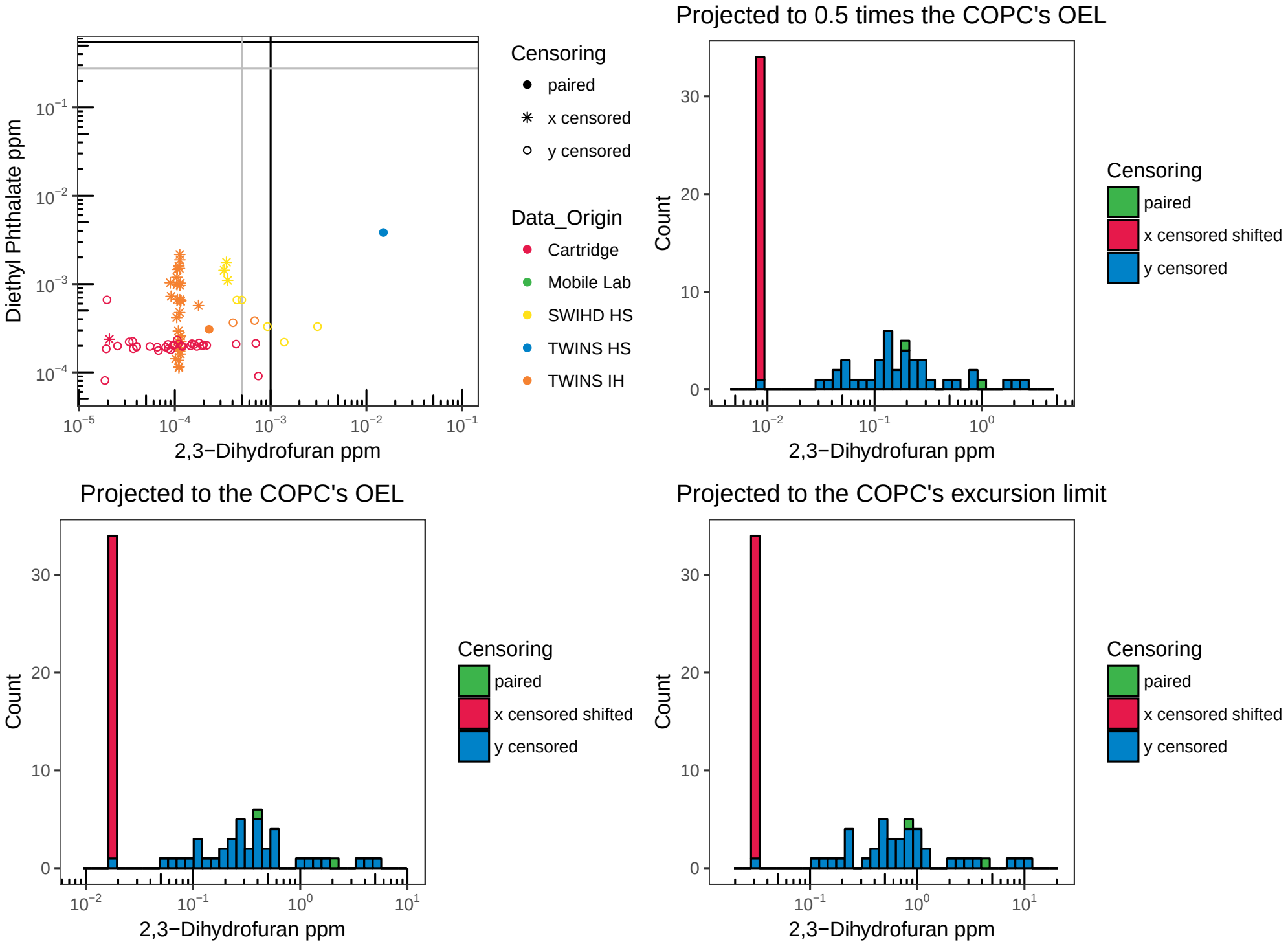


Figure C.1050: Diethyl Phthalate vs 2,3-Dihydrofuran

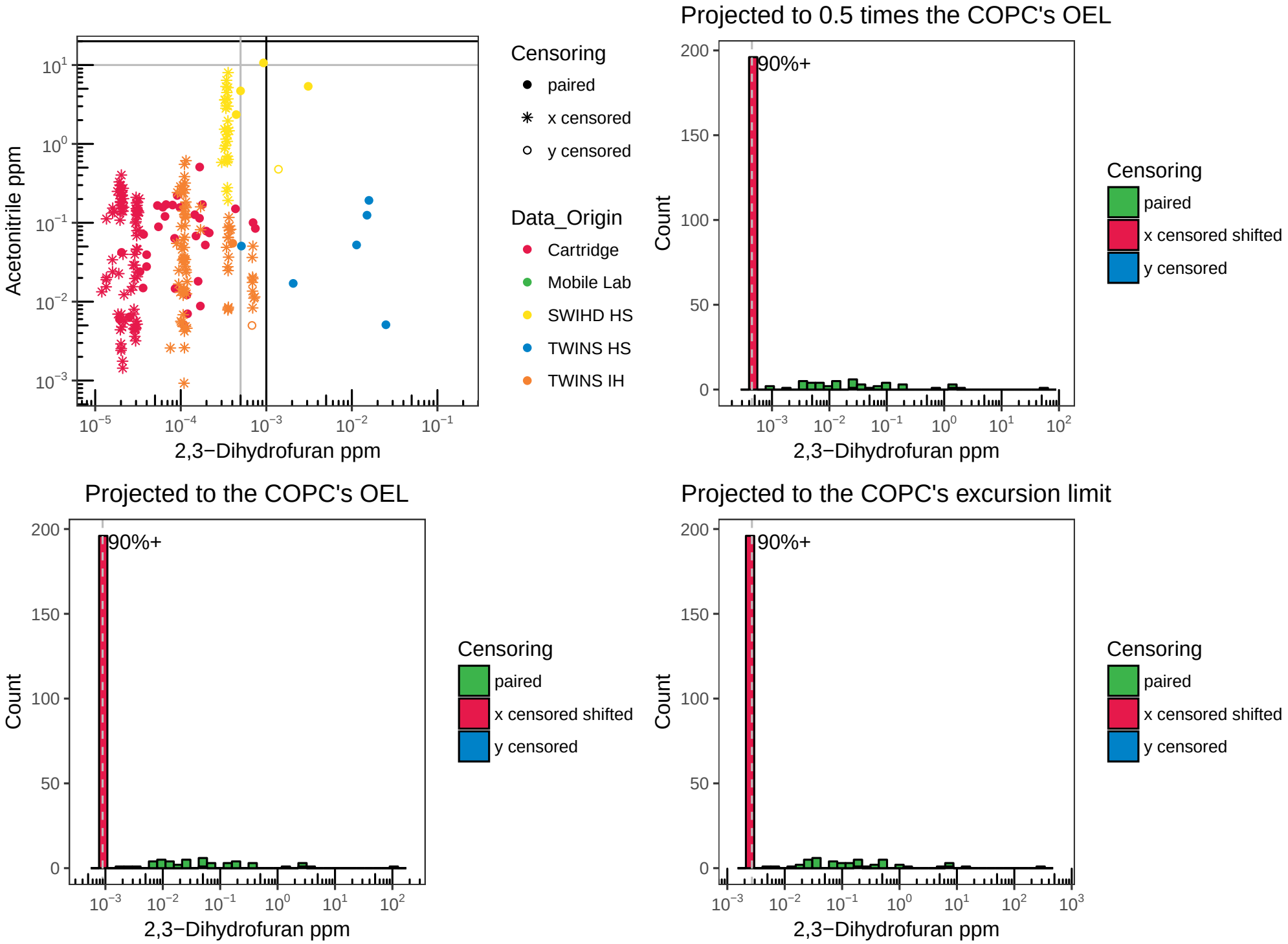


Figure C.1051: Acetonitrile vs 2,3-Dihydrofuran

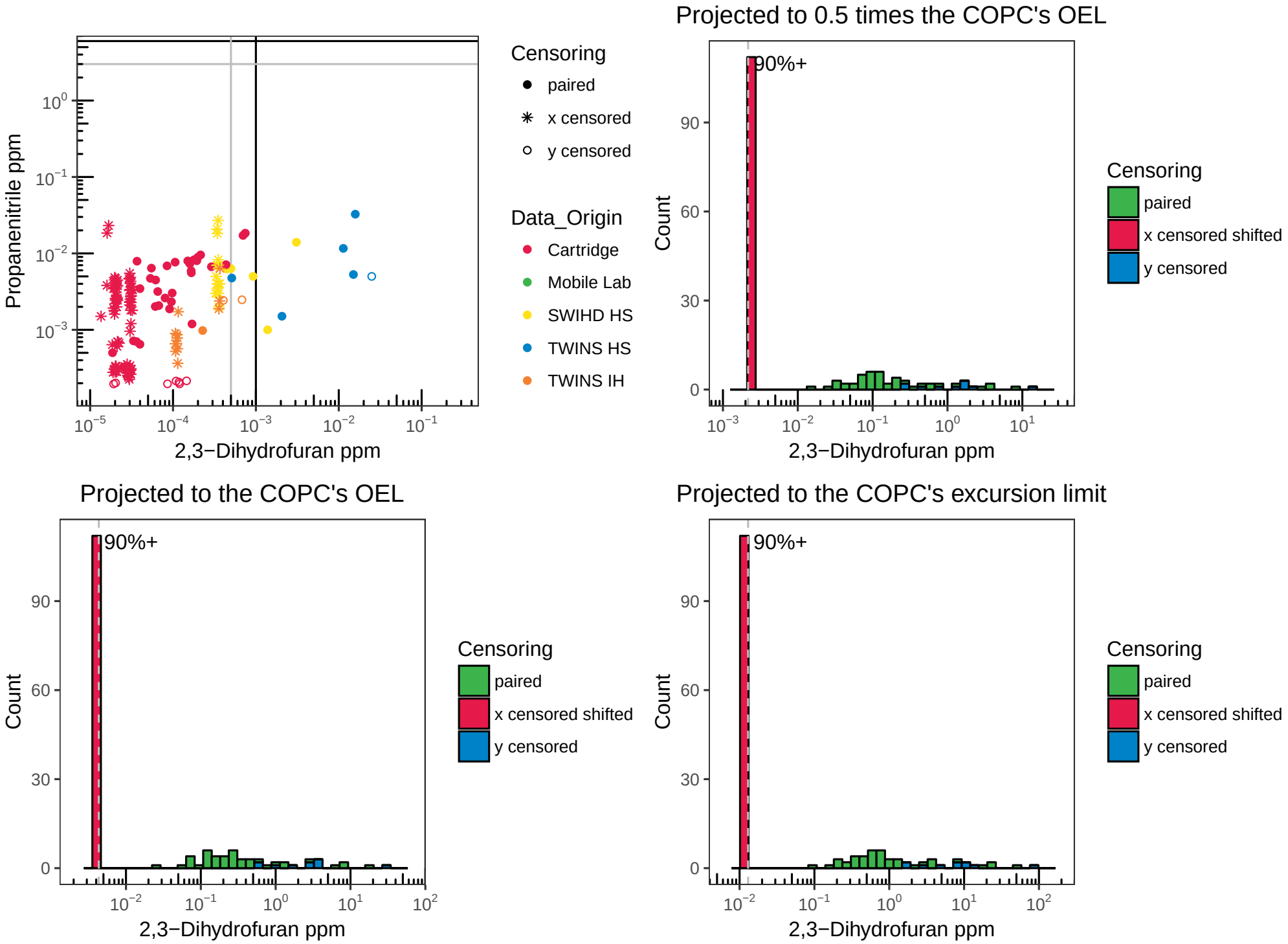


Figure C.1052: Propanenitrile vs 2,3-Dihydrofuran

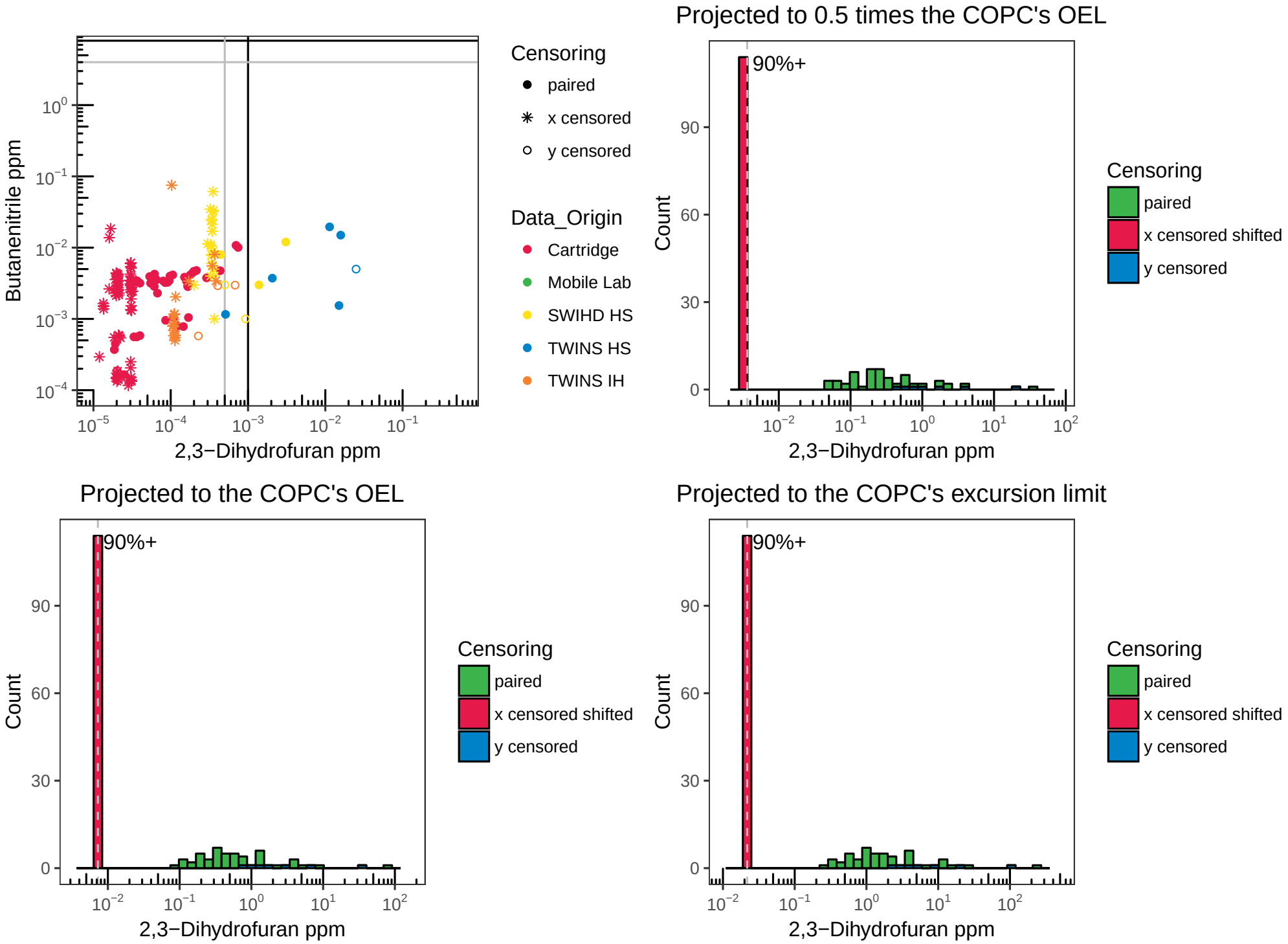


Figure C.1053: Butanenitrile vs 2,3-Dihydrofuran

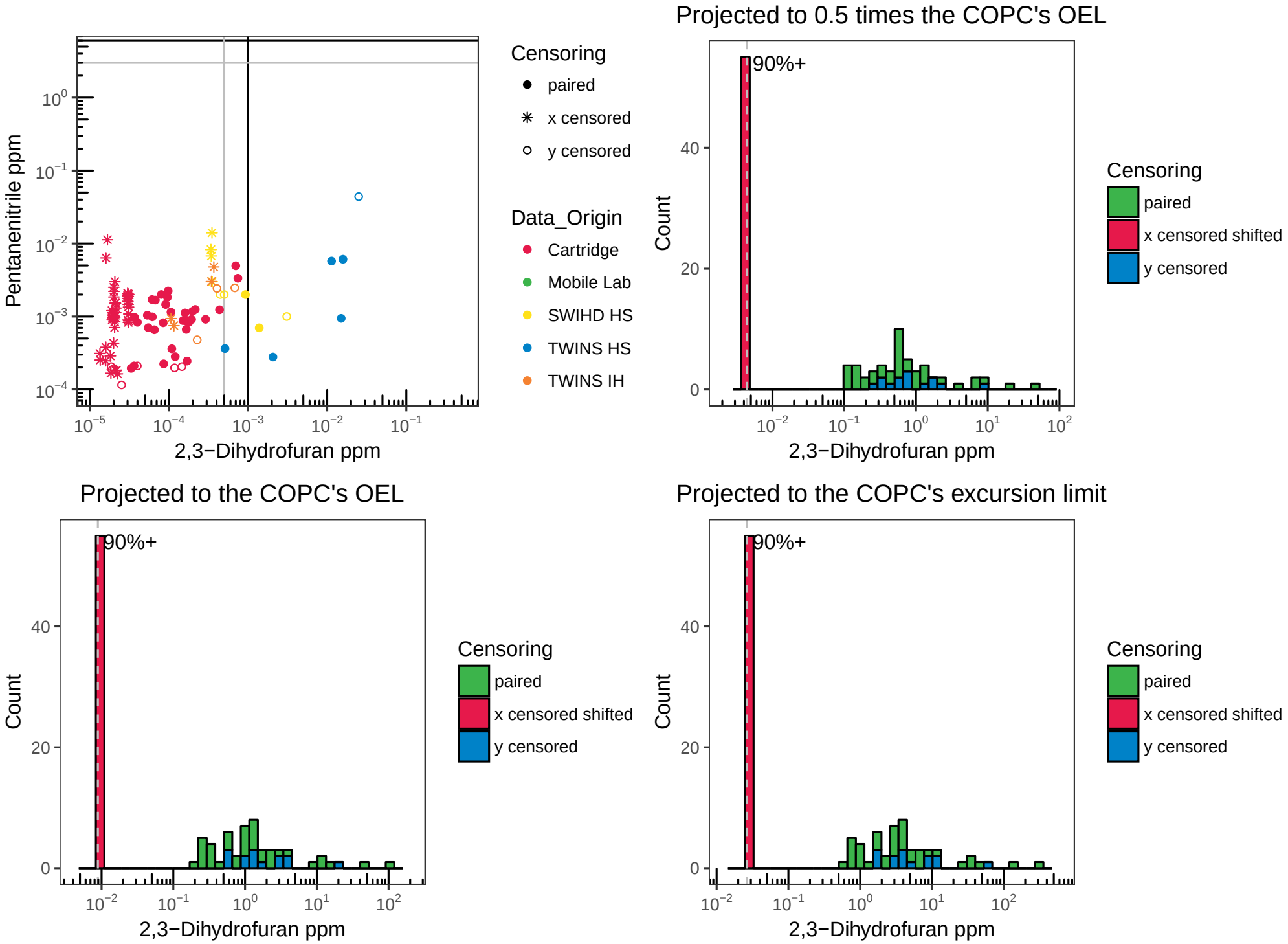


Figure C.1054: Pentanenitrile vs 2,3-Dihydrofuran

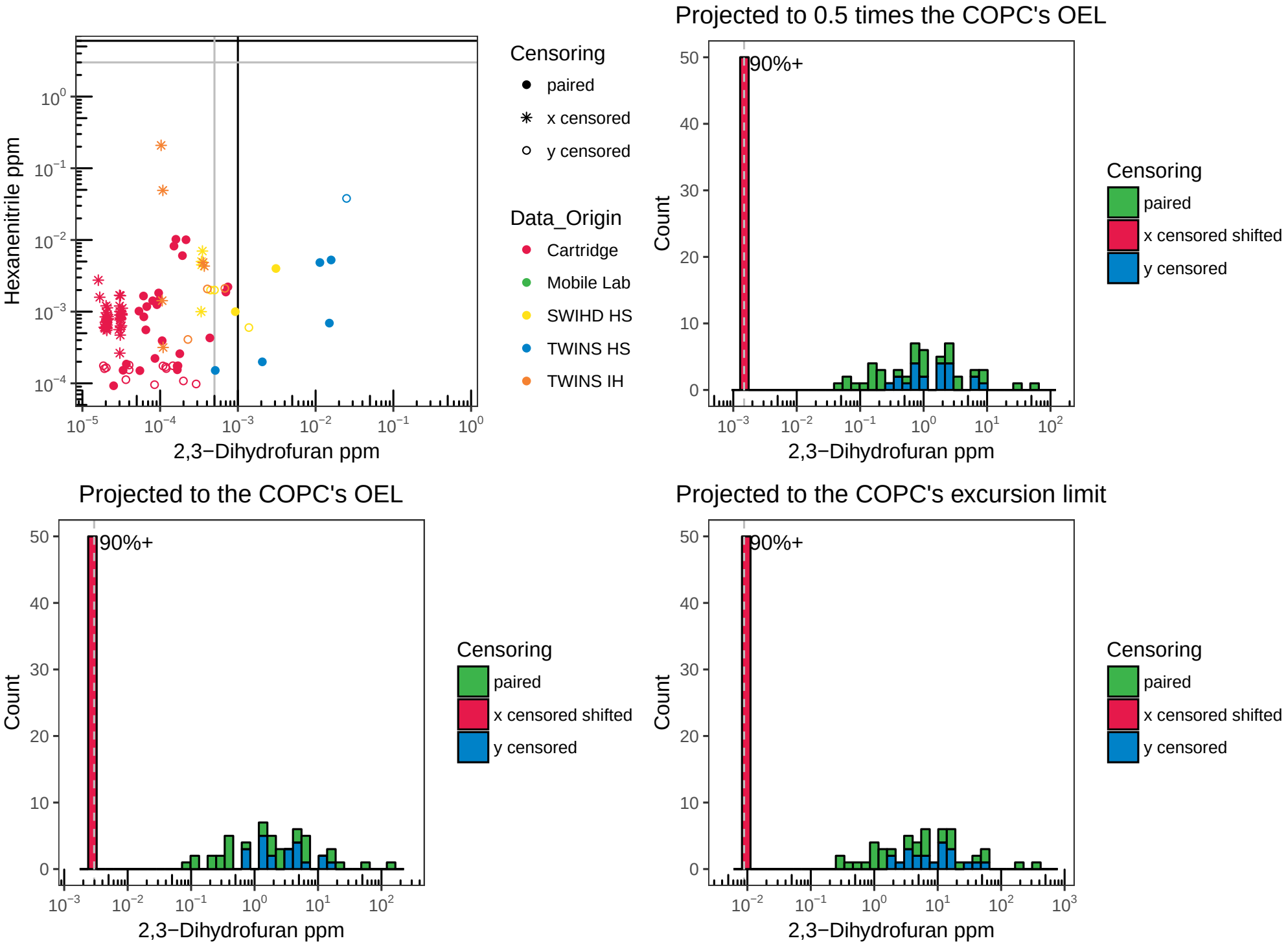


Figure C.1055: Hexanenitrile vs 2,3-Dihydrofuran

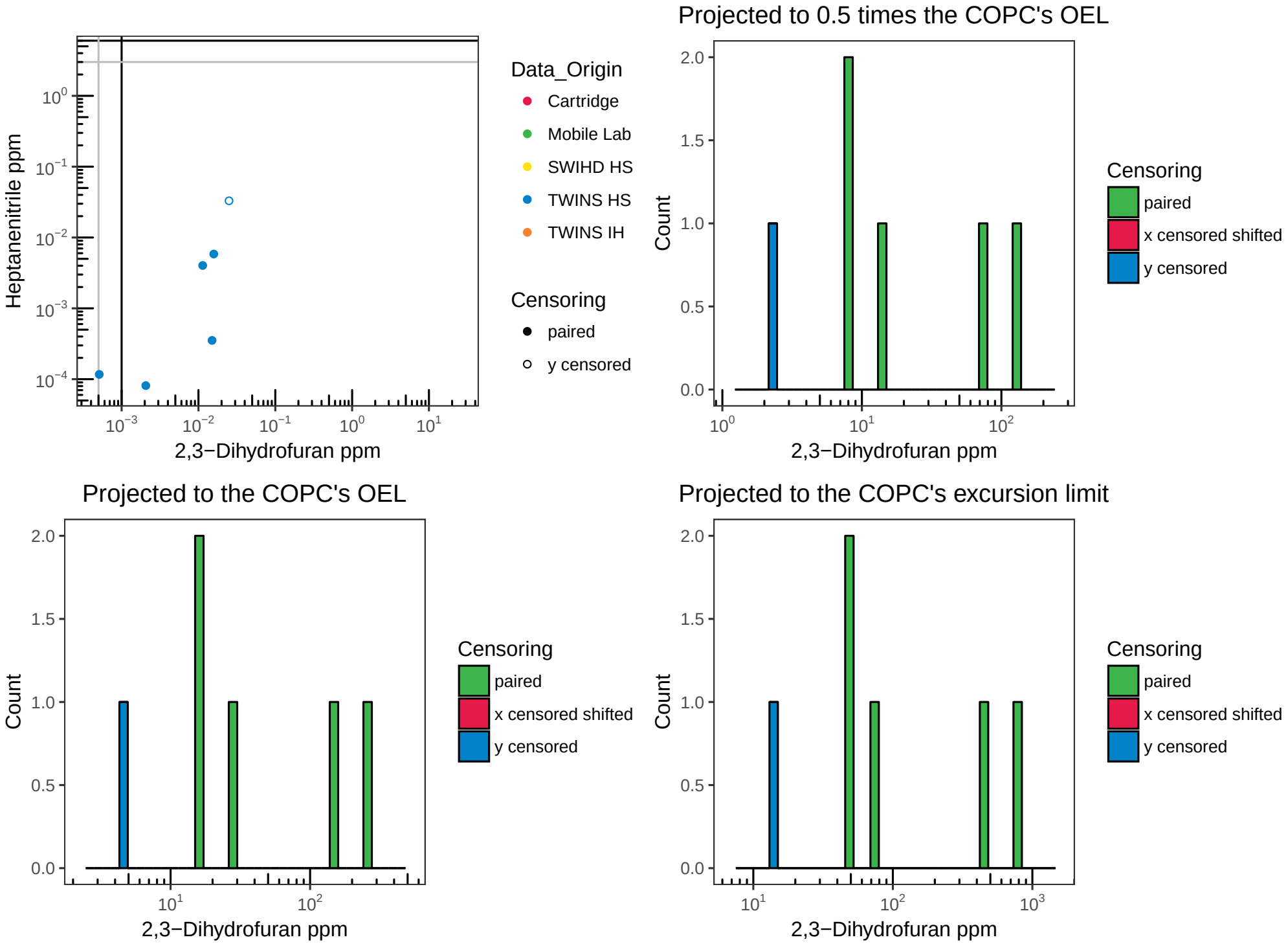


Figure C.1056: Heptanenitrile vs 2,3-Dihydrofuran

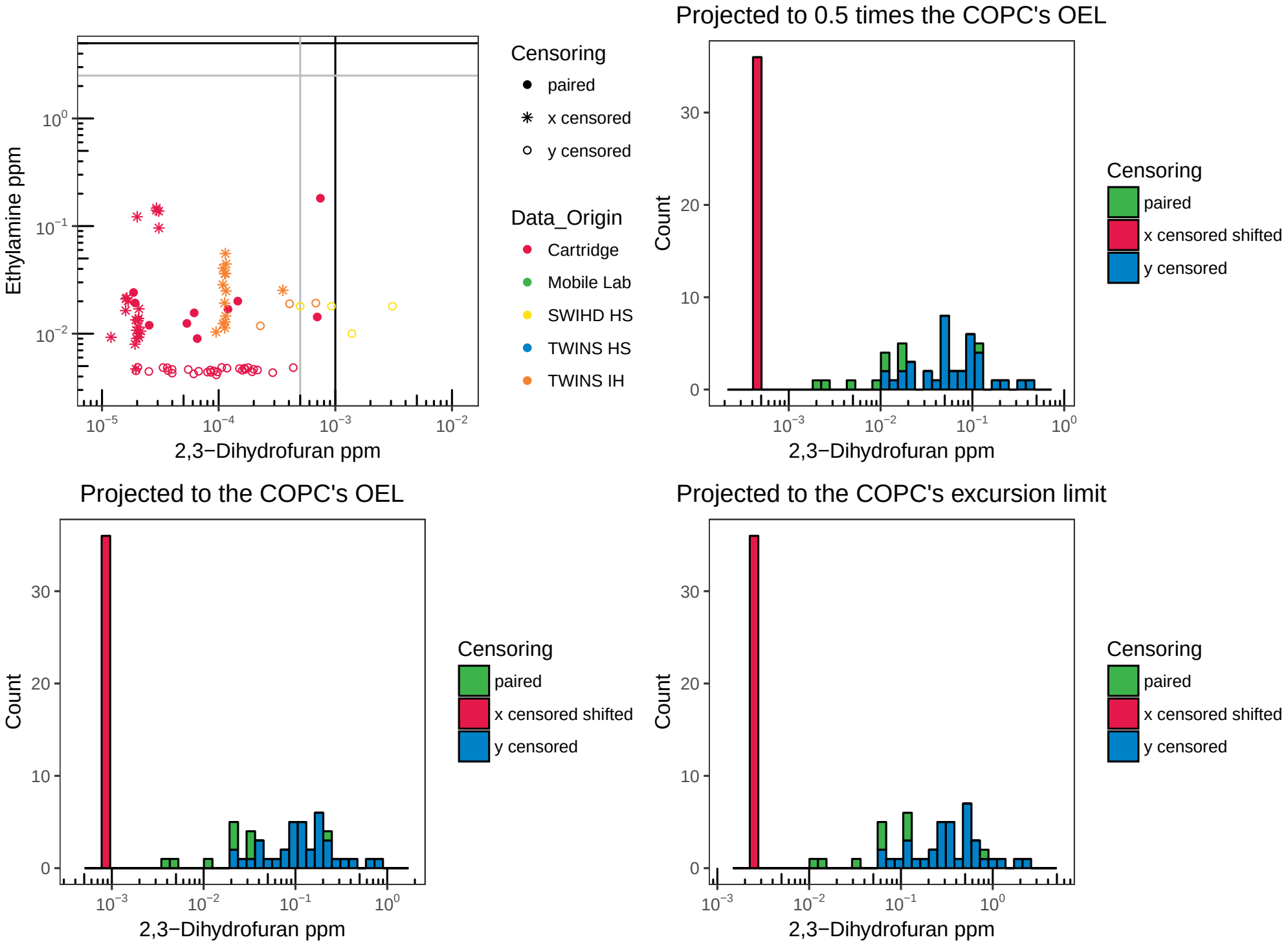


Figure C.1057: Ethylamine vs 2,3-Dihydrofuran

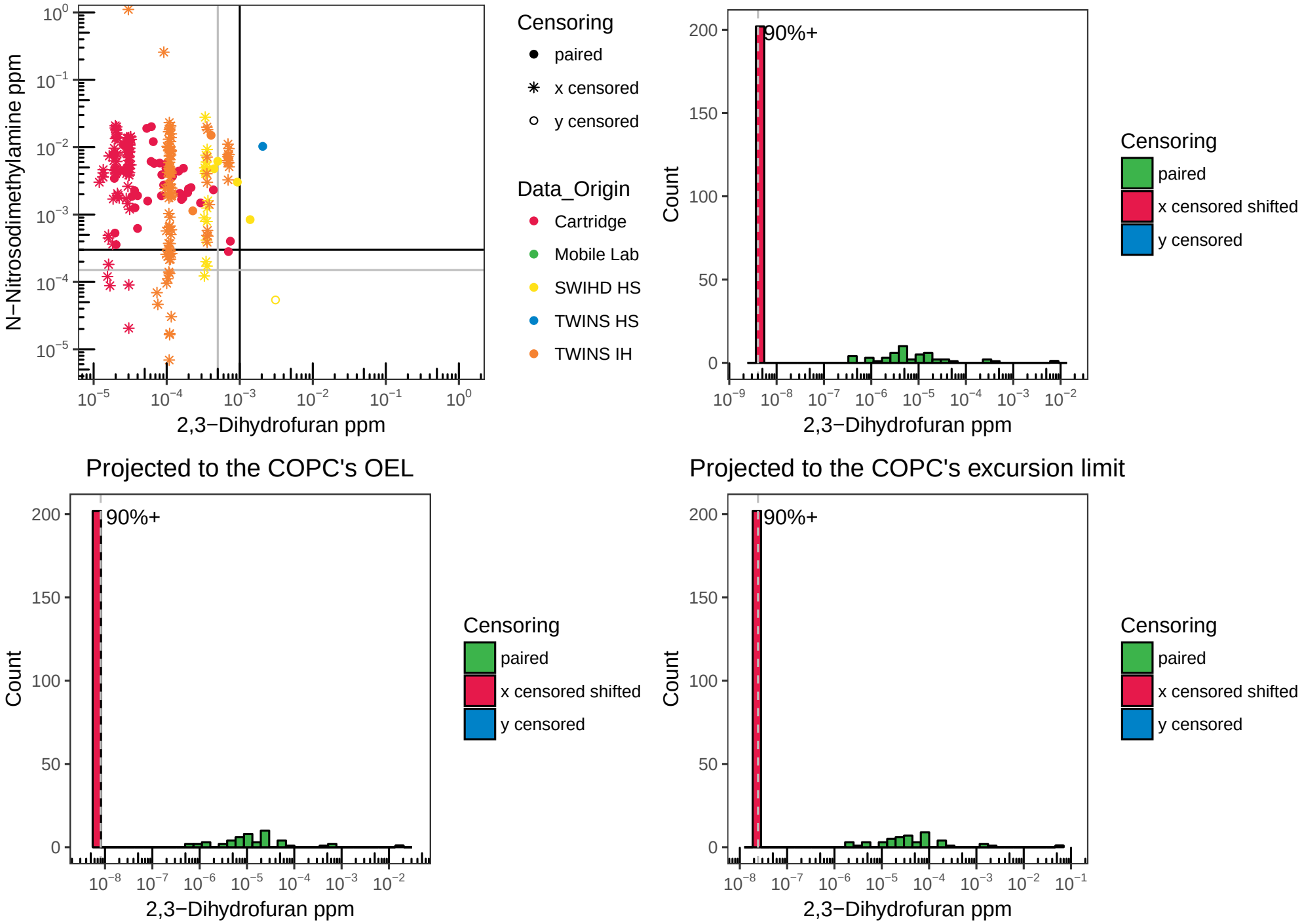


Figure C.1058: N-Nitrosodimethylamine vs 2,3-Dihydrofuran

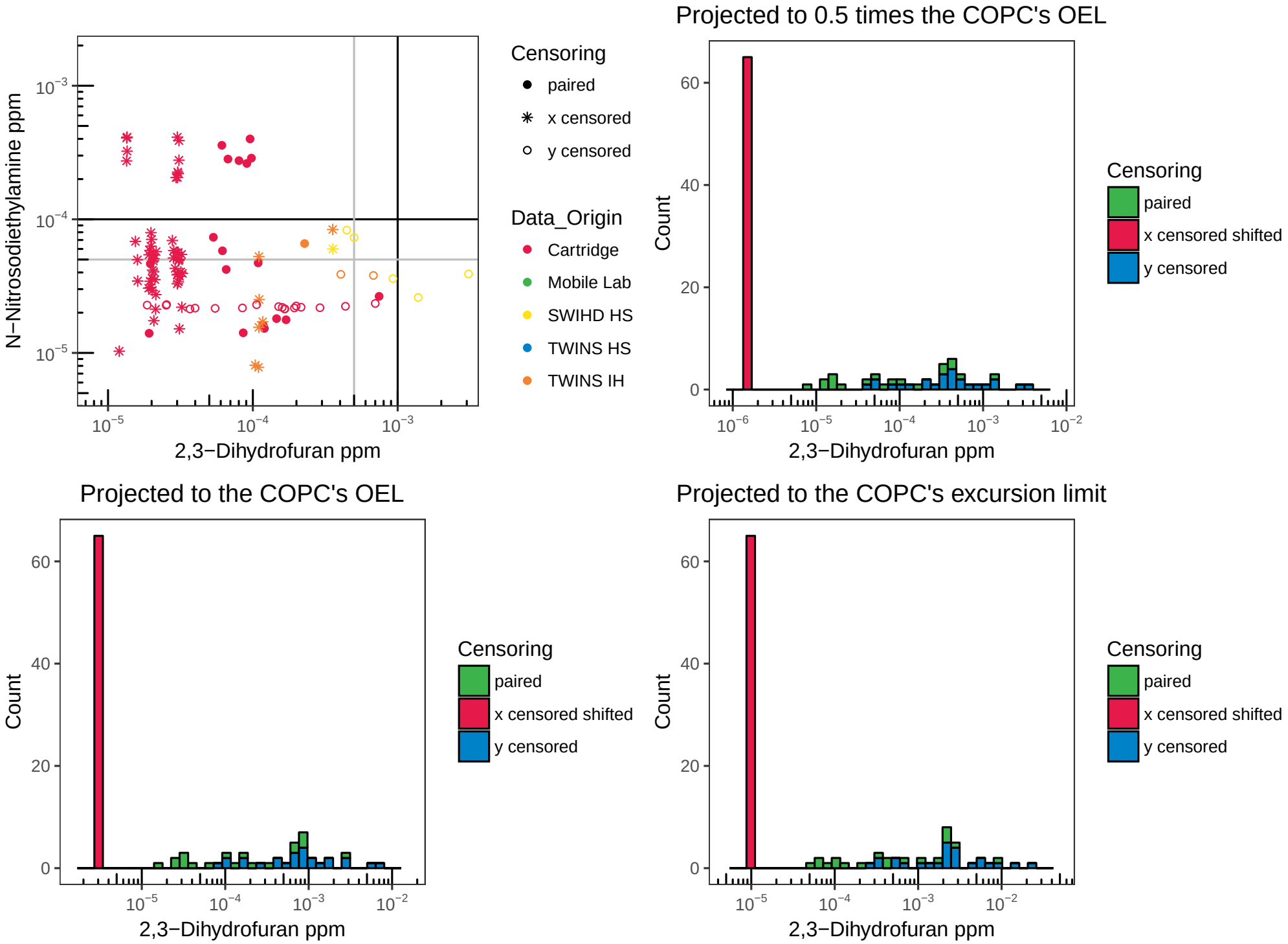


Figure C.1059: N-Nitrosodiethylamine vs 2,3-Dihydrofuran

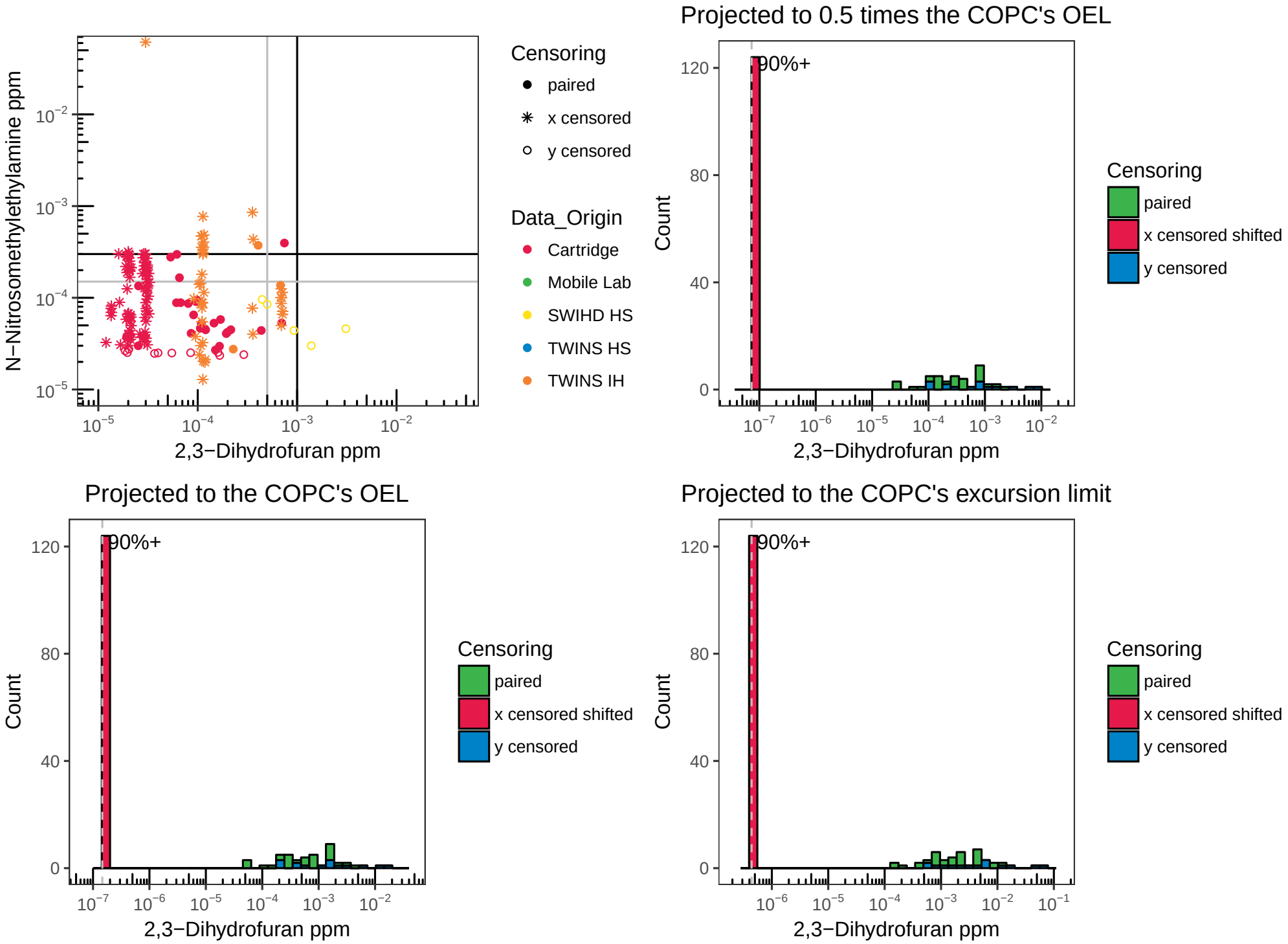


Figure C.1060: N-Nitrosomethylethylamine vs 2,3-Dihydrofuran

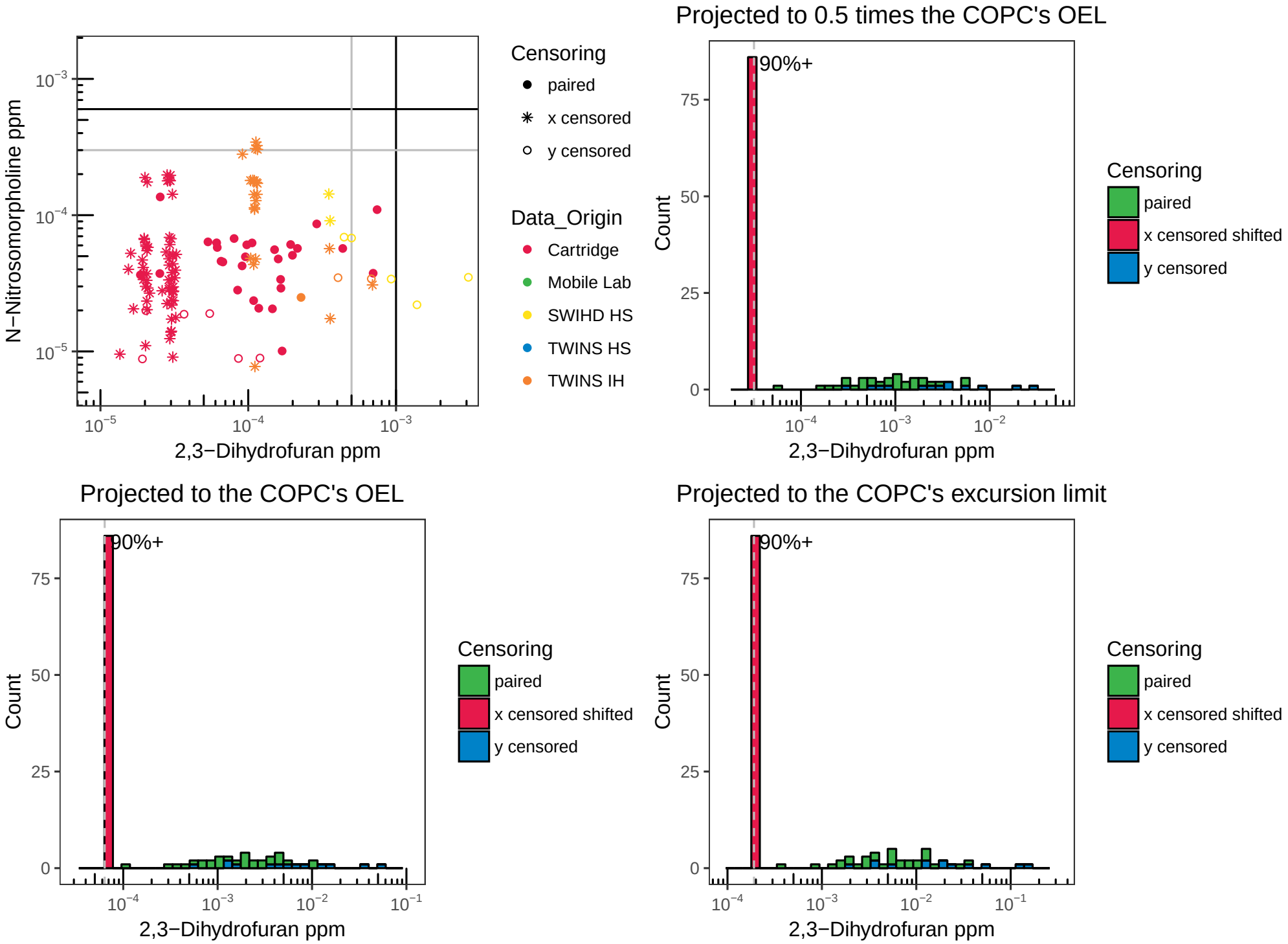


Figure C.1061: N-Nitrosomorpholine vs 2,3-Dihydrofuran

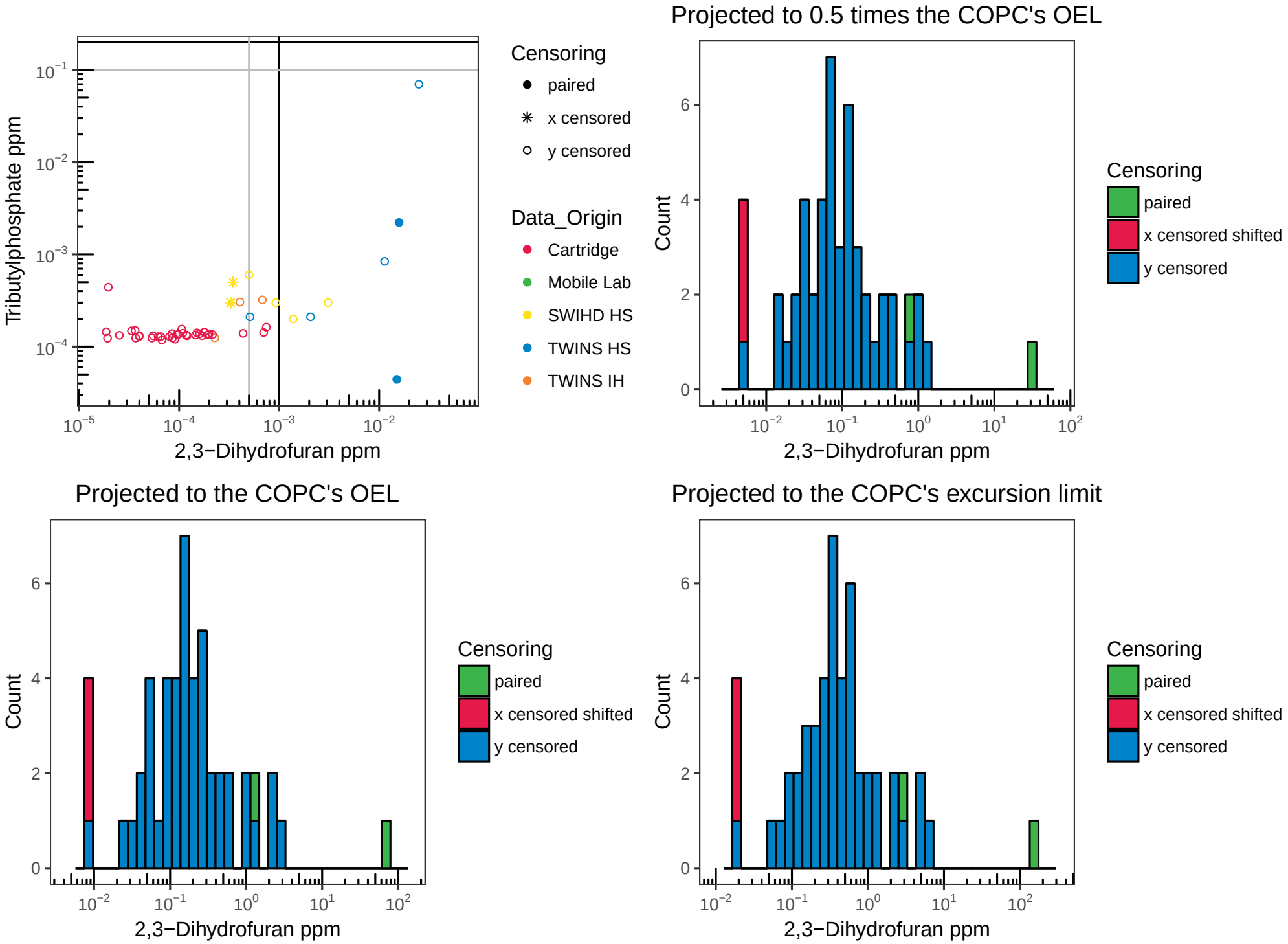


Figure C.1062: Tributylphosphate vs 2,3-Dihydrofuran

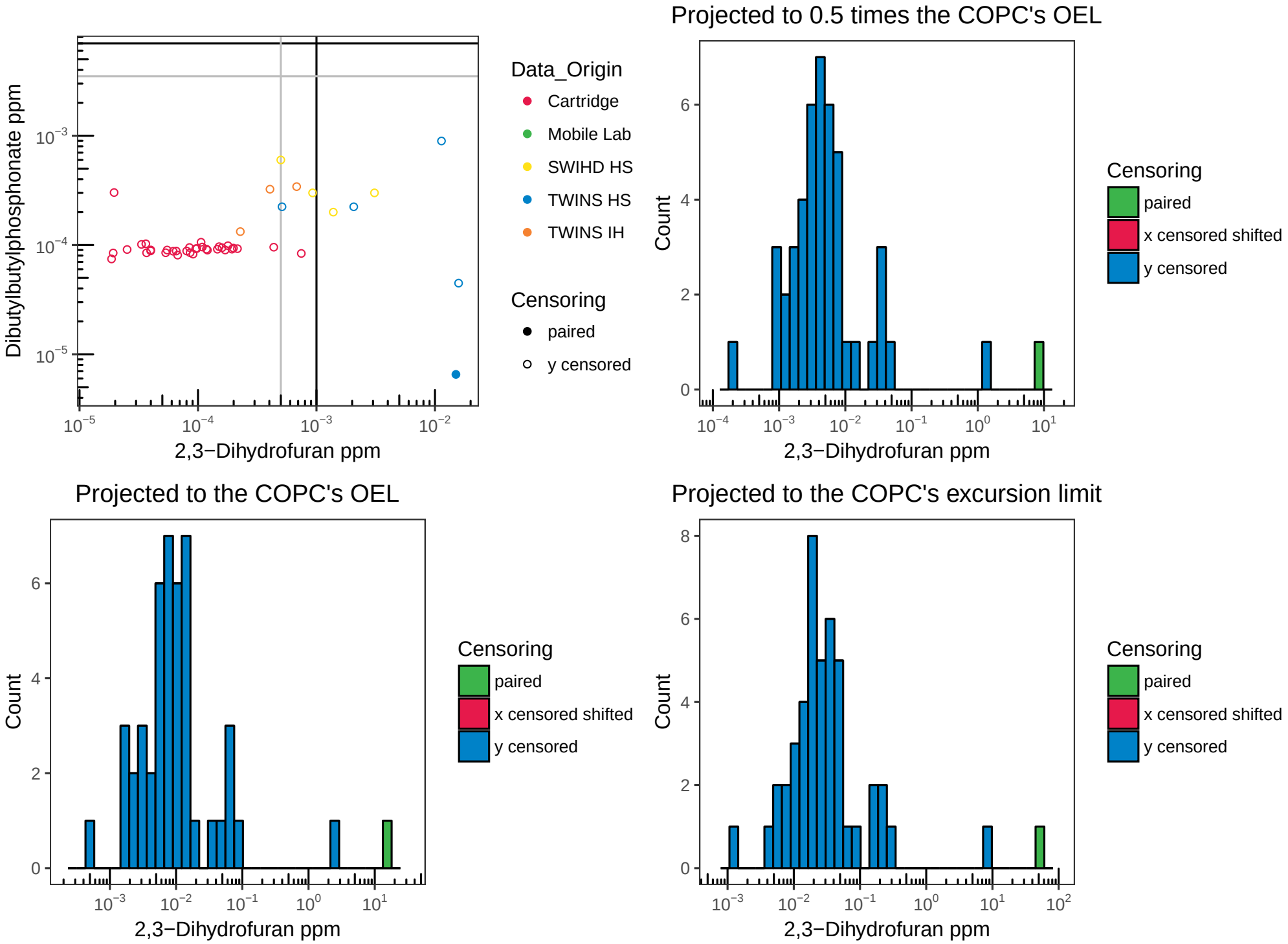


Figure C.1063: Dibutylbutylphosphonate vs 2,3-Dihydrofuran

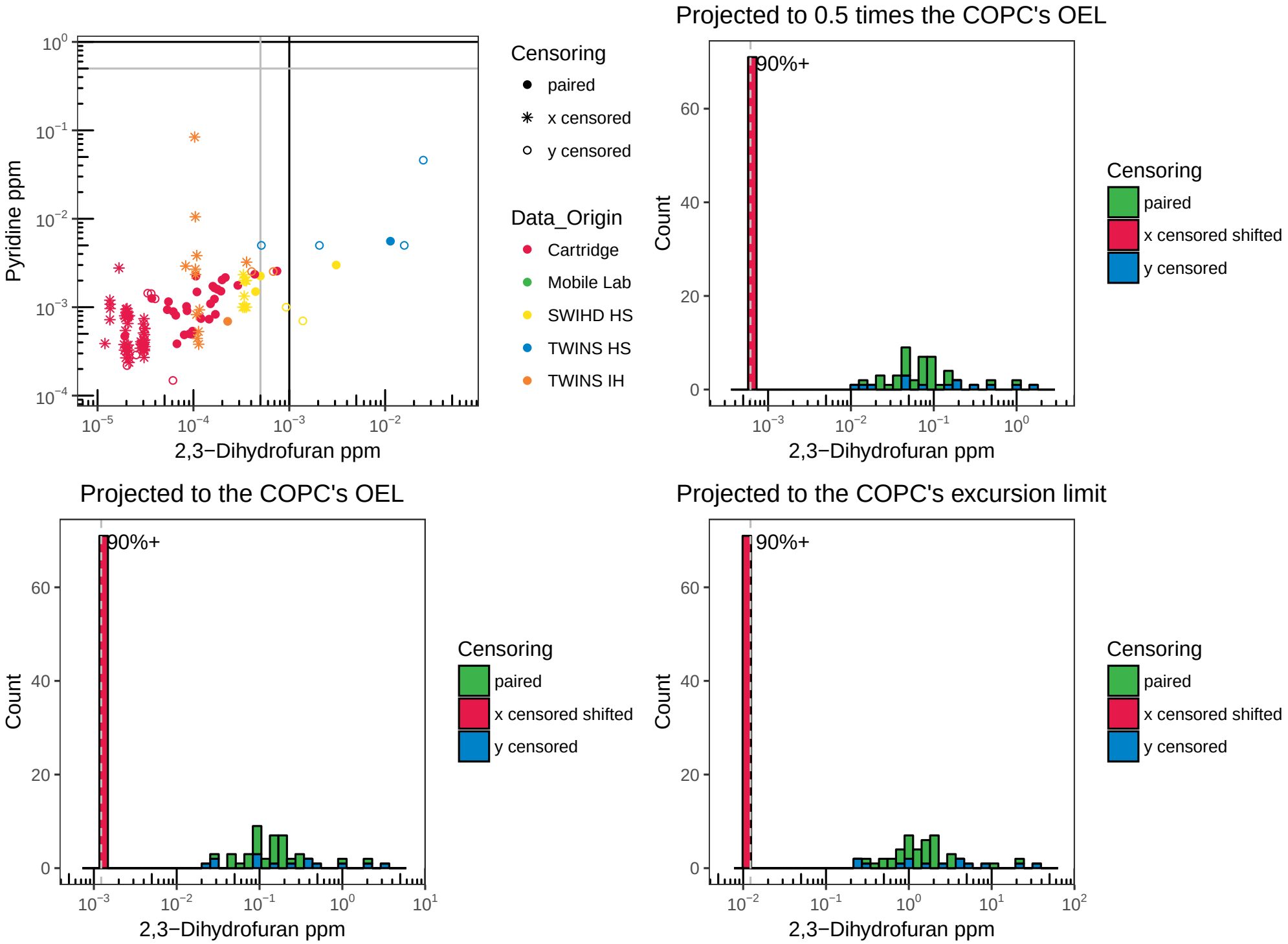


Figure C.1064: Pyridine vs 2,3-Dihydrofuran

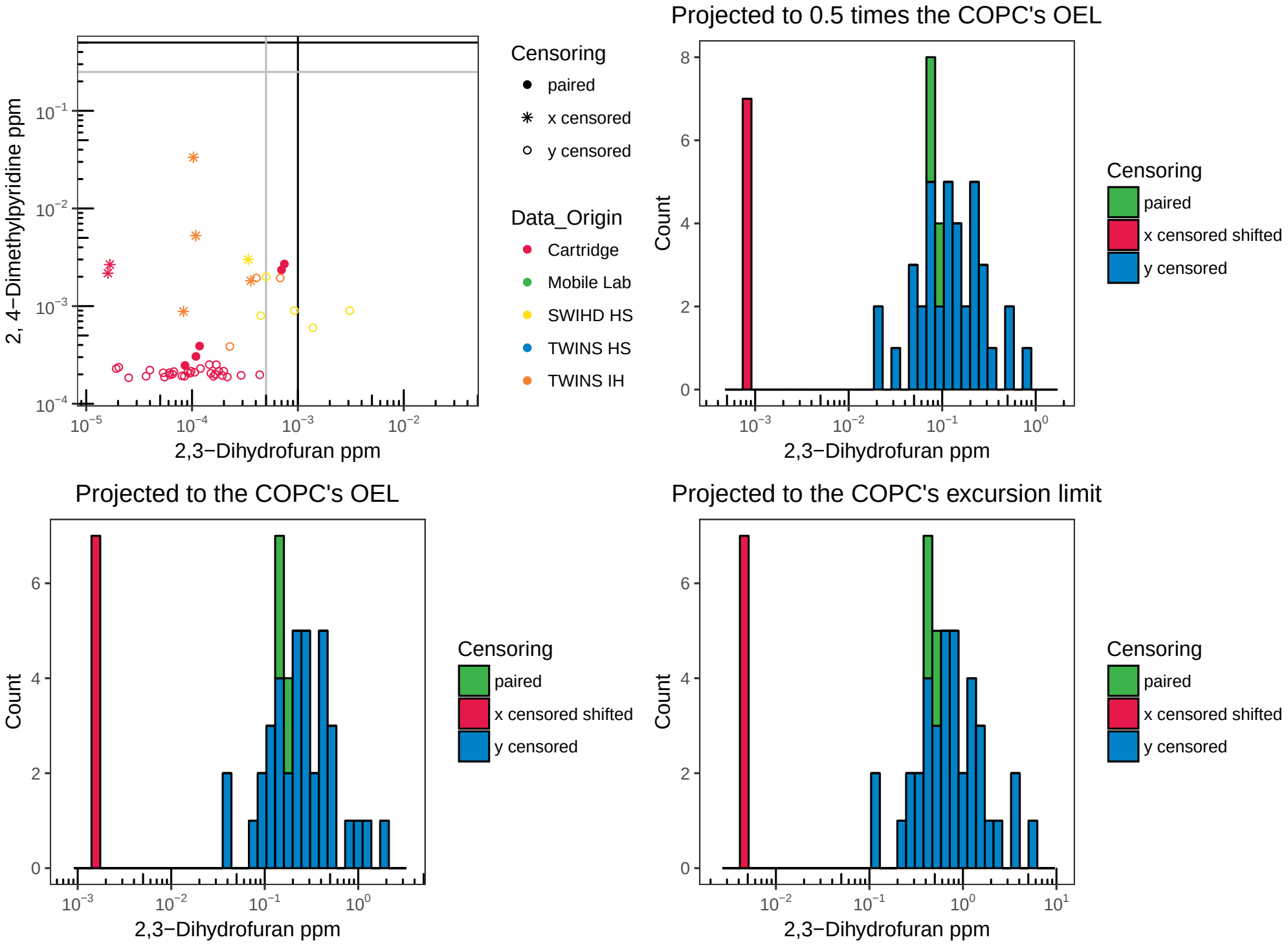


Figure C.1065: 2, 4-Dimethylpyridine vs 2,3-Dihydrofuran

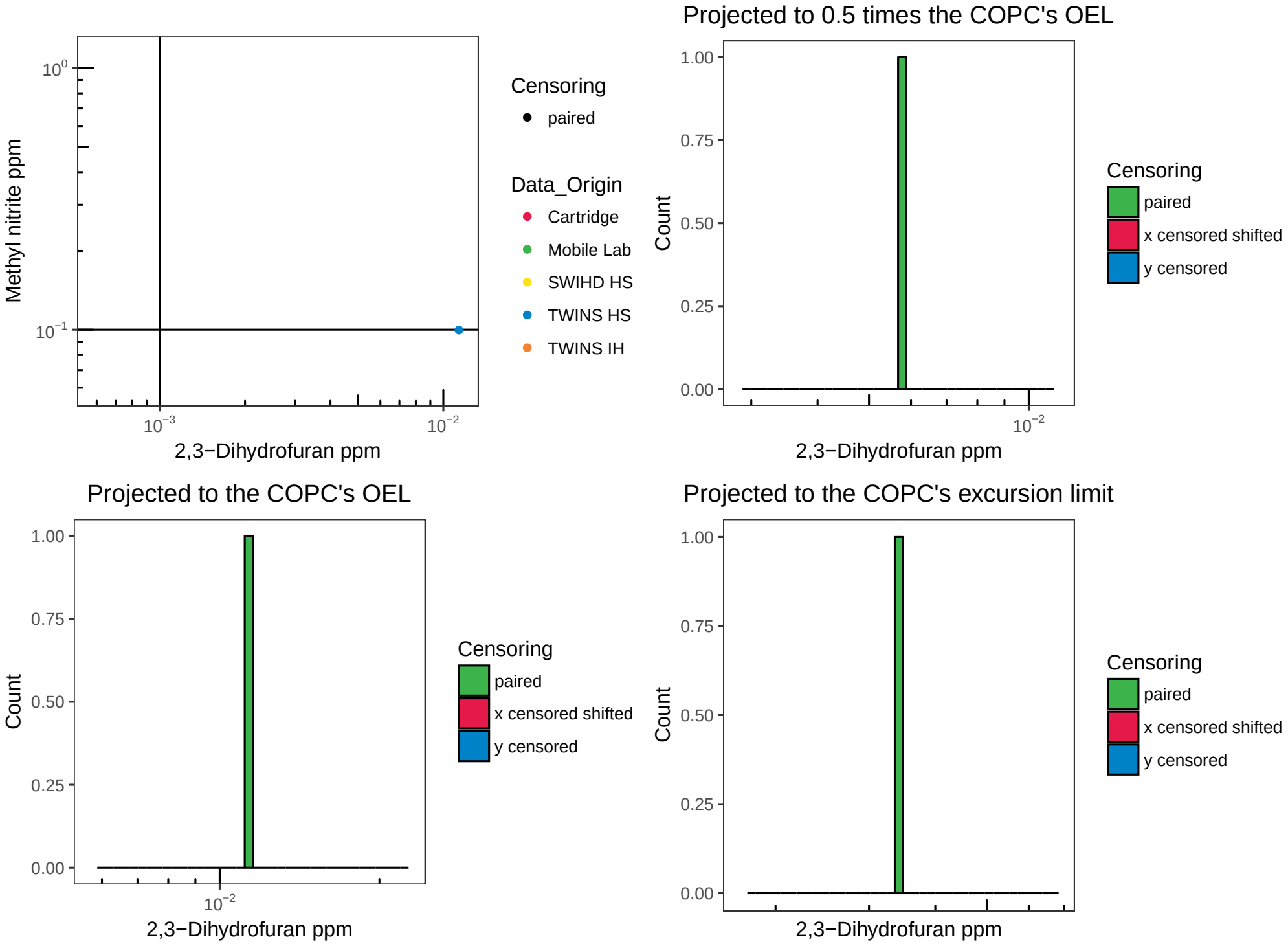


Figure C.1066: Methyl nitrite vs 2,3-Dihydrofuran

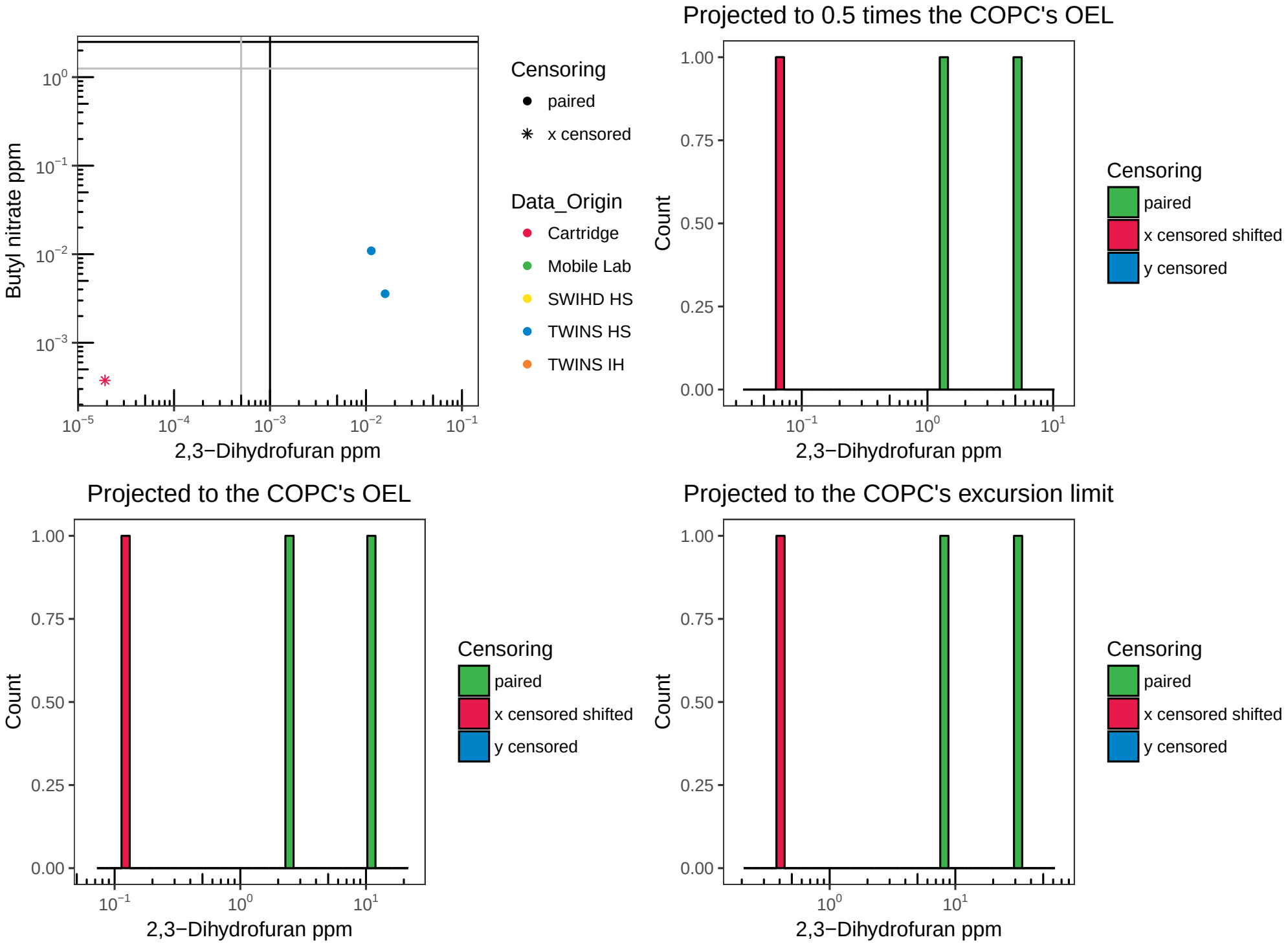


Figure C.1067: Butyl nitrate vs 2,3-Dihydrofuran

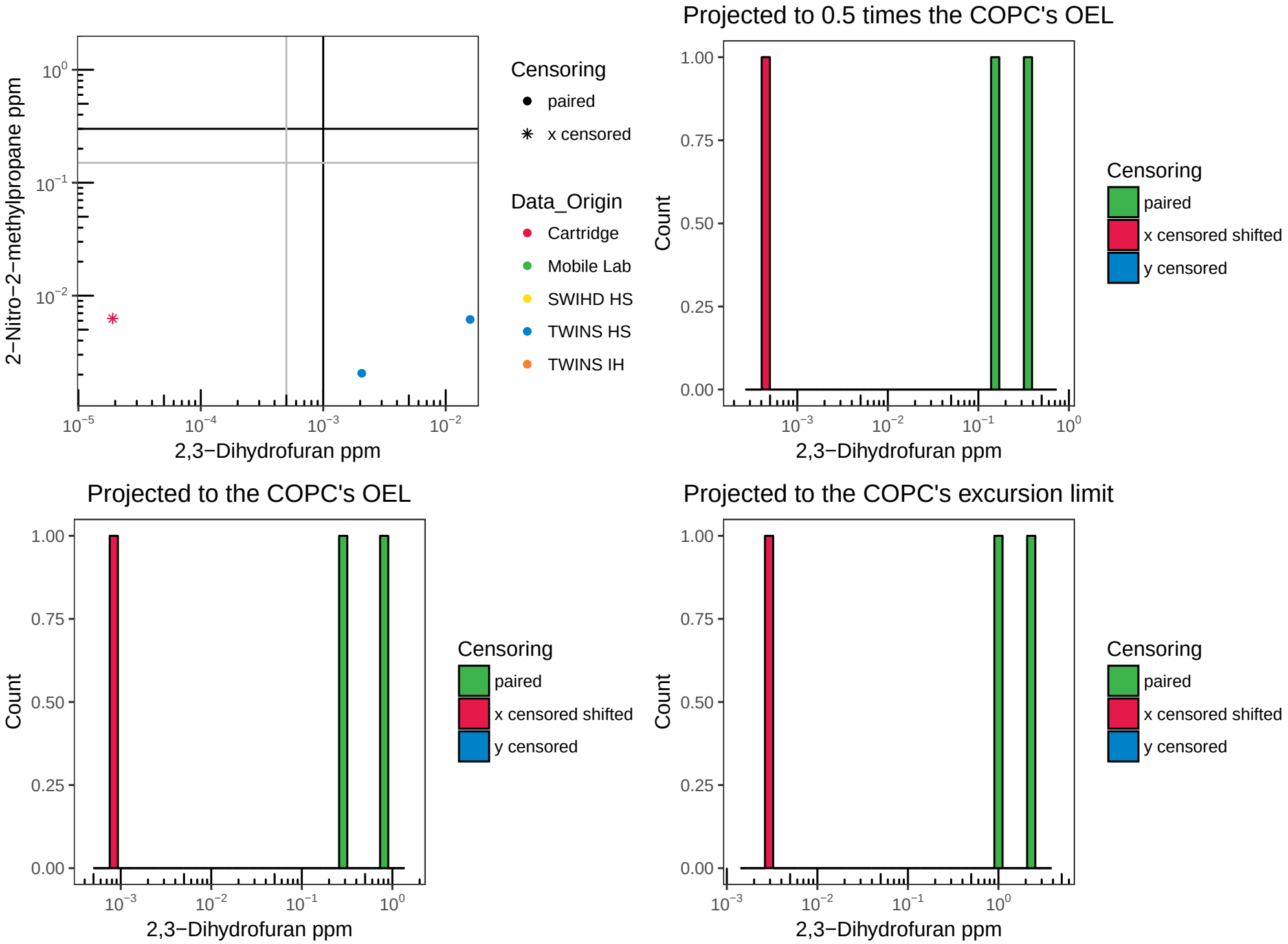


Figure C.1068: 2-Nitro-2-methylpropane vs 2,3-Dihydrofuran

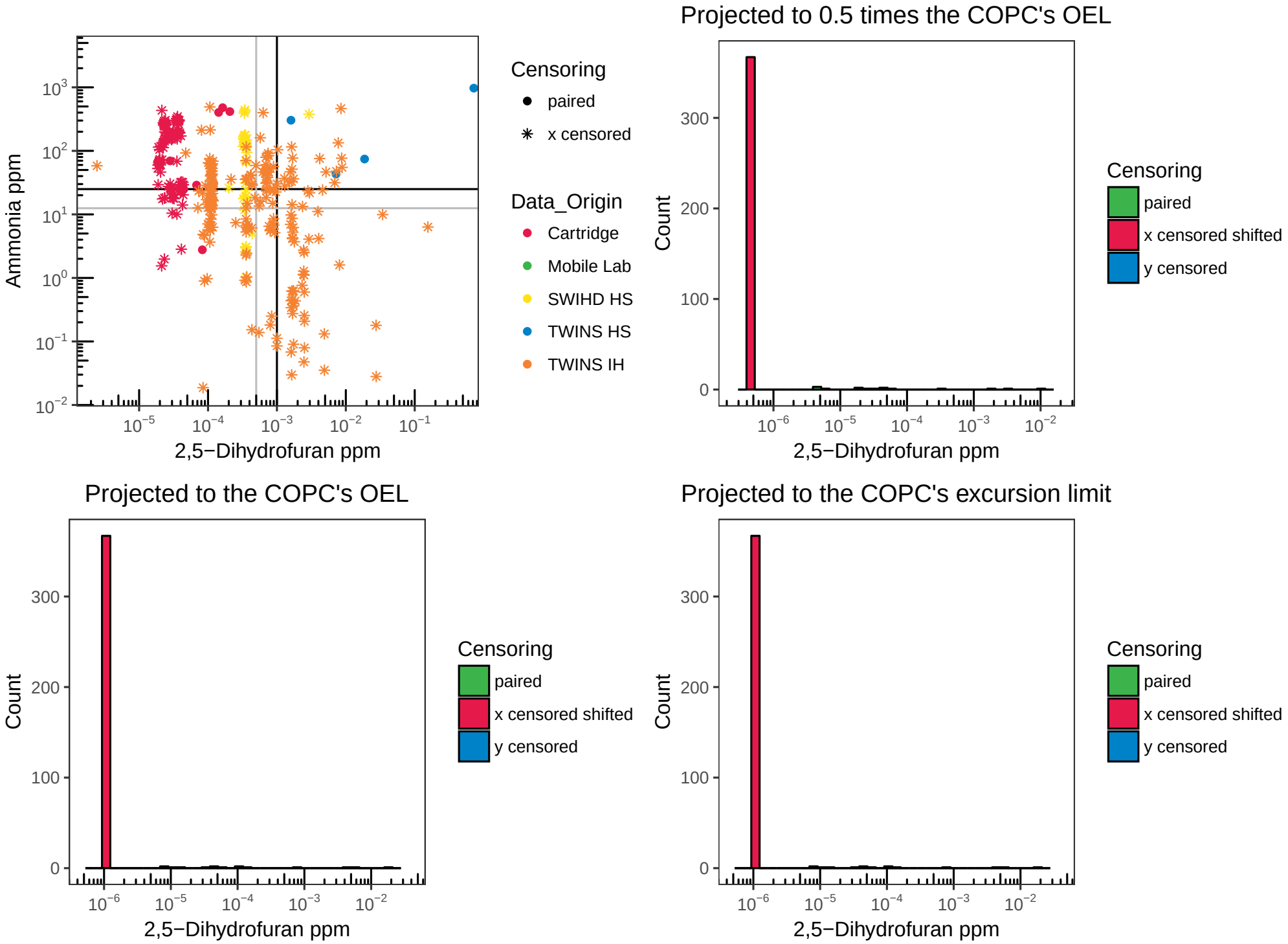


Figure C.1069: Ammonia vs 2,5-Dihydrofuran

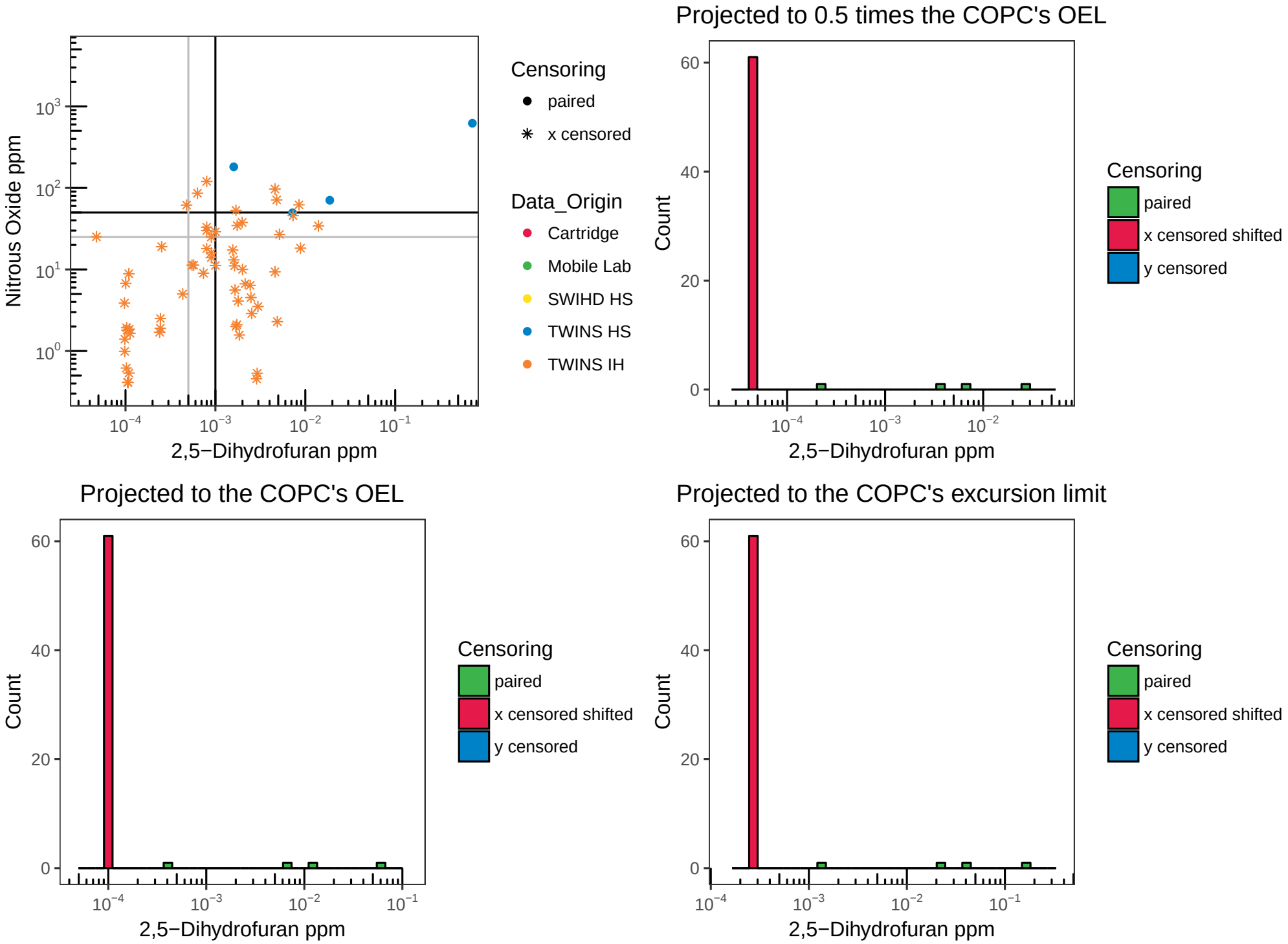


Figure C.1070: Nitrous Oxide vs 2,5-Dihydrofuran

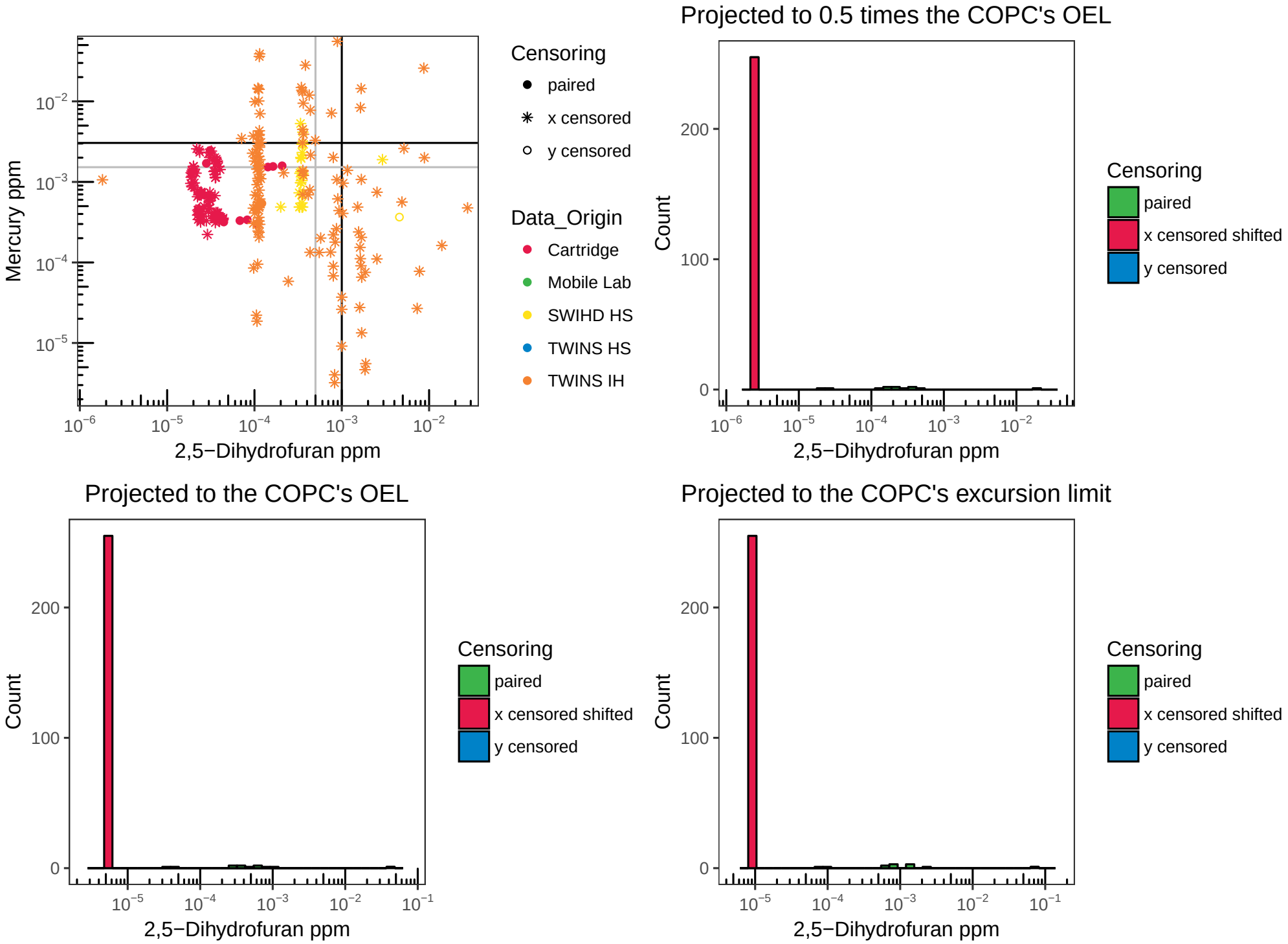


Figure C.1071: Mercury vs 2,5-Dihydrofuran

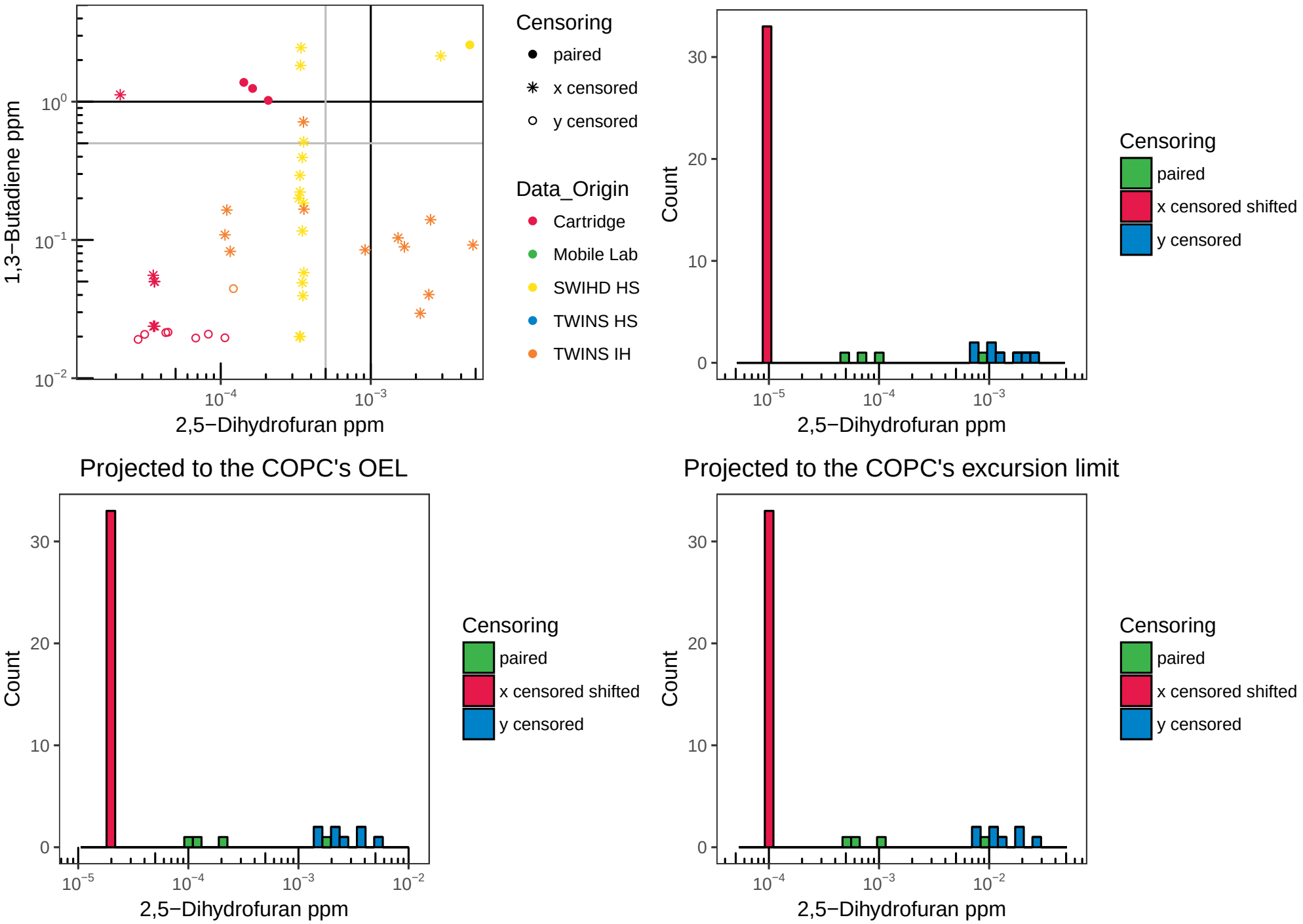


Figure C.1072: 1,3-Butadiene vs 2,5-Dihydrofuran

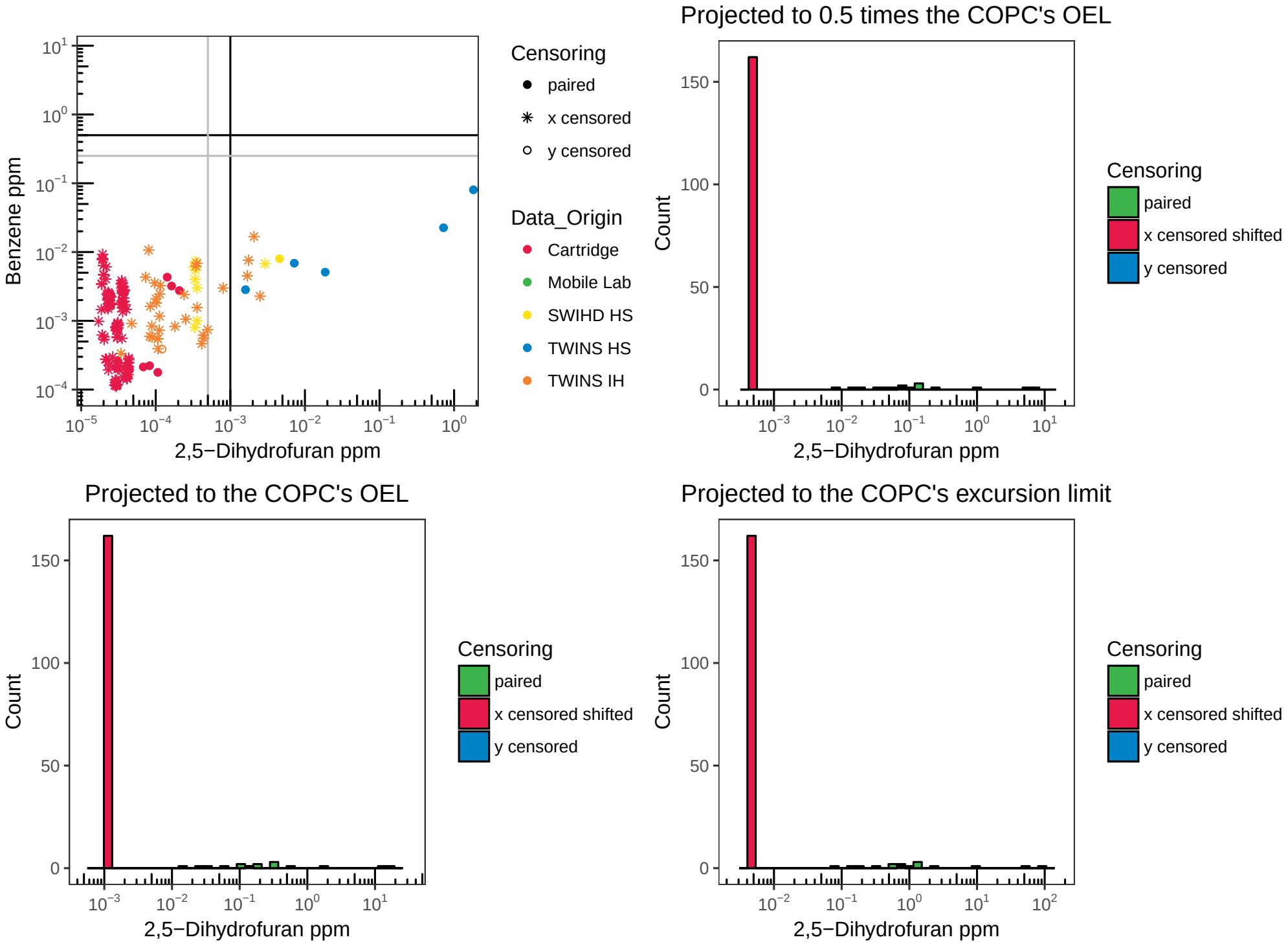


Figure C.1073: Benzene vs 2,5-Dihydrofuran

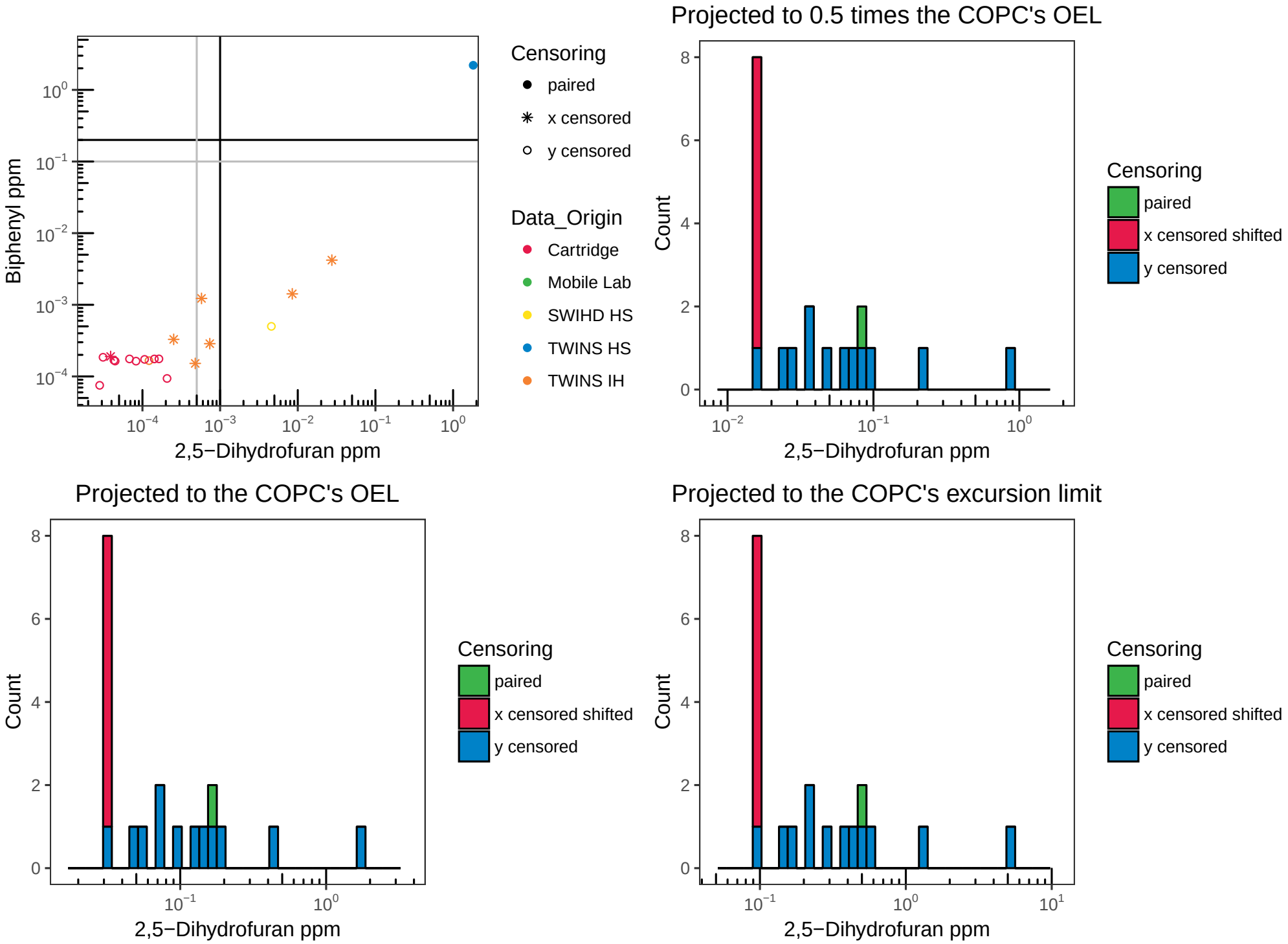


Figure C.1074: Biphenyl vs 2,5-Dihydrofuran

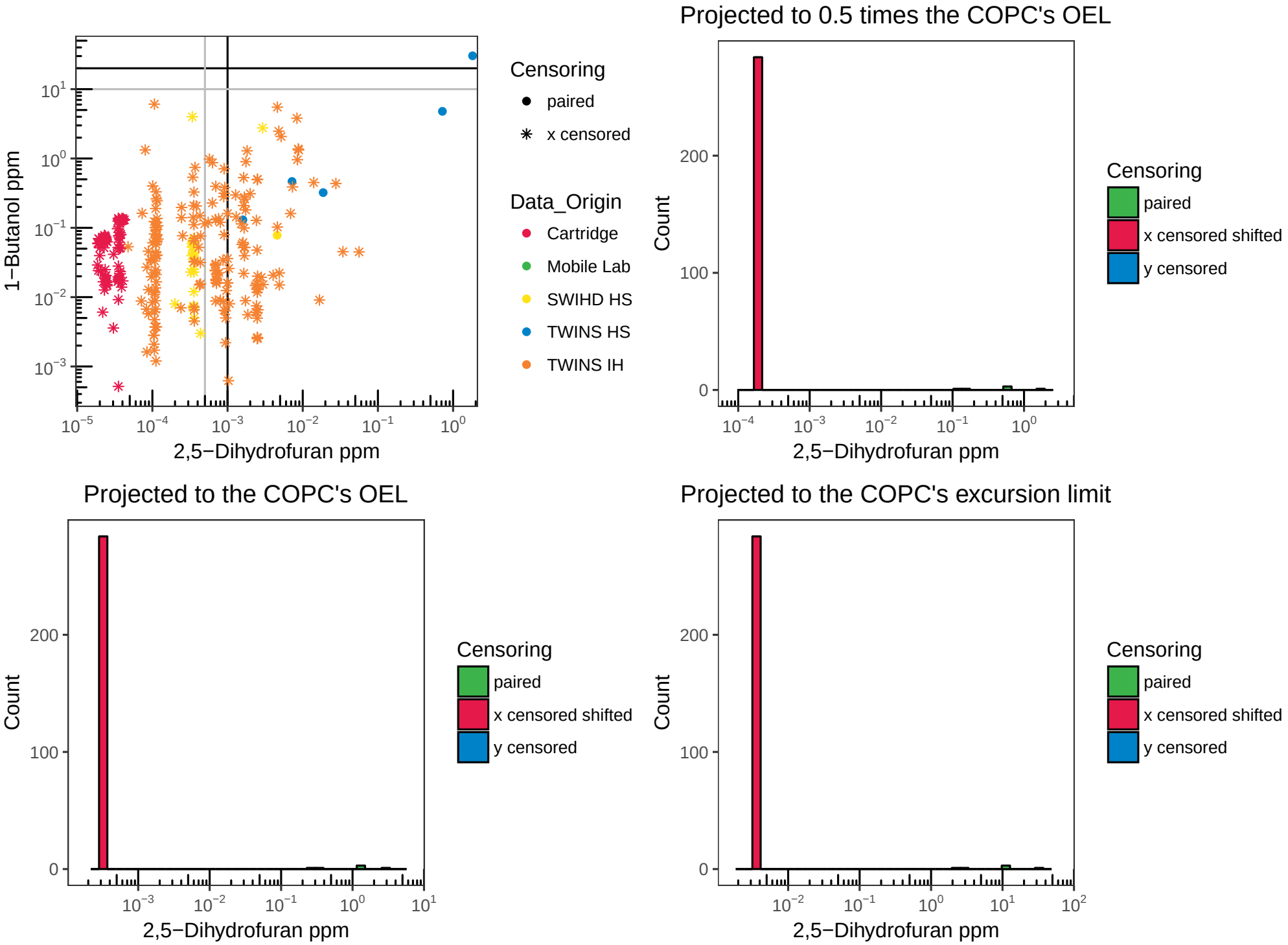


Figure C.1075: 1-Butanol vs 2,5-Dihydrofuran

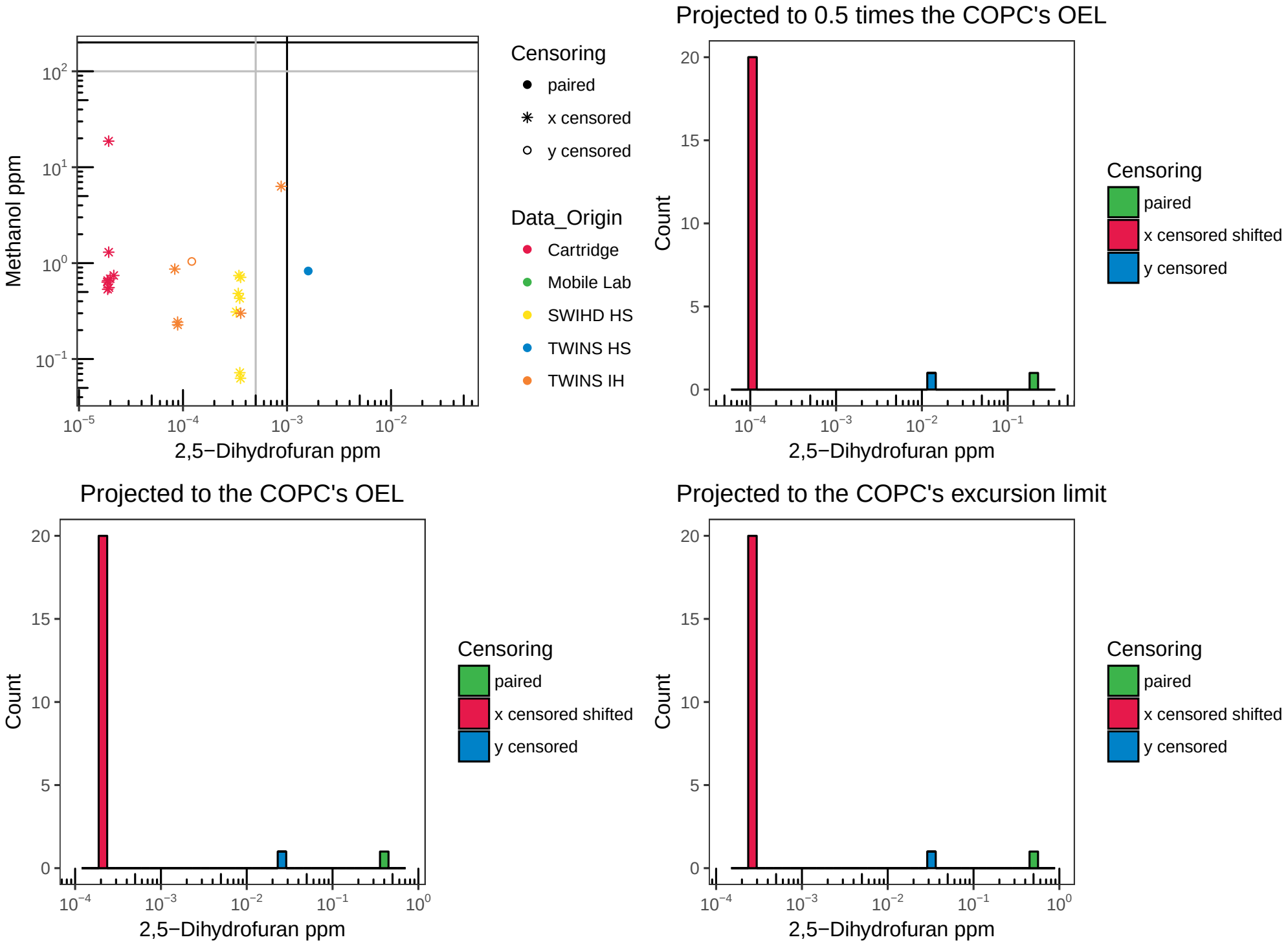


Figure C.1076: Methanol vs 2,5-Dihydrofuran

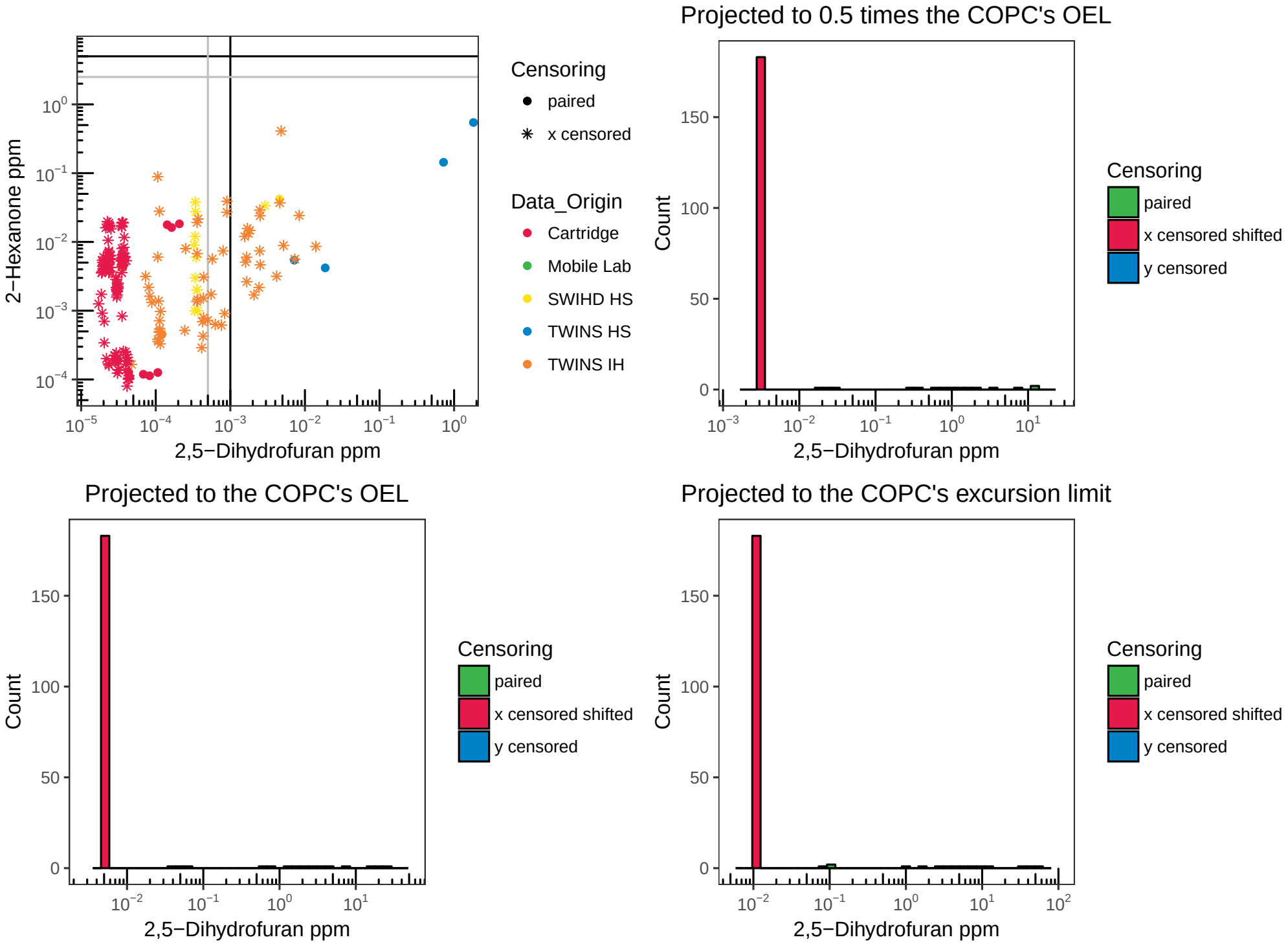


Figure C.1077: 2-Hexanone vs 2,5-Dihydrofuran

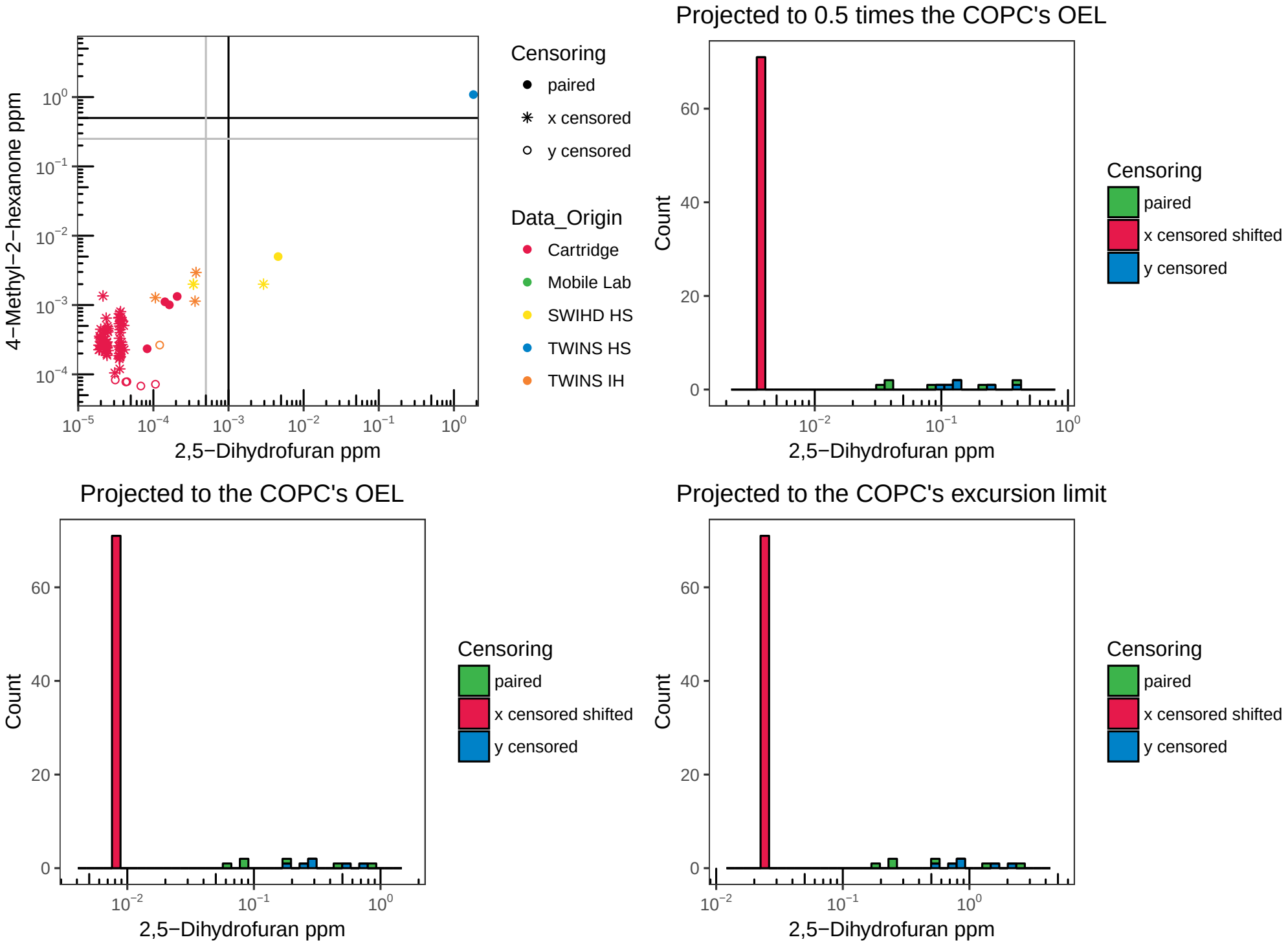


Figure C.1078: 4-Methyl-2-hexanone vs 2,5-Dihydrofuran

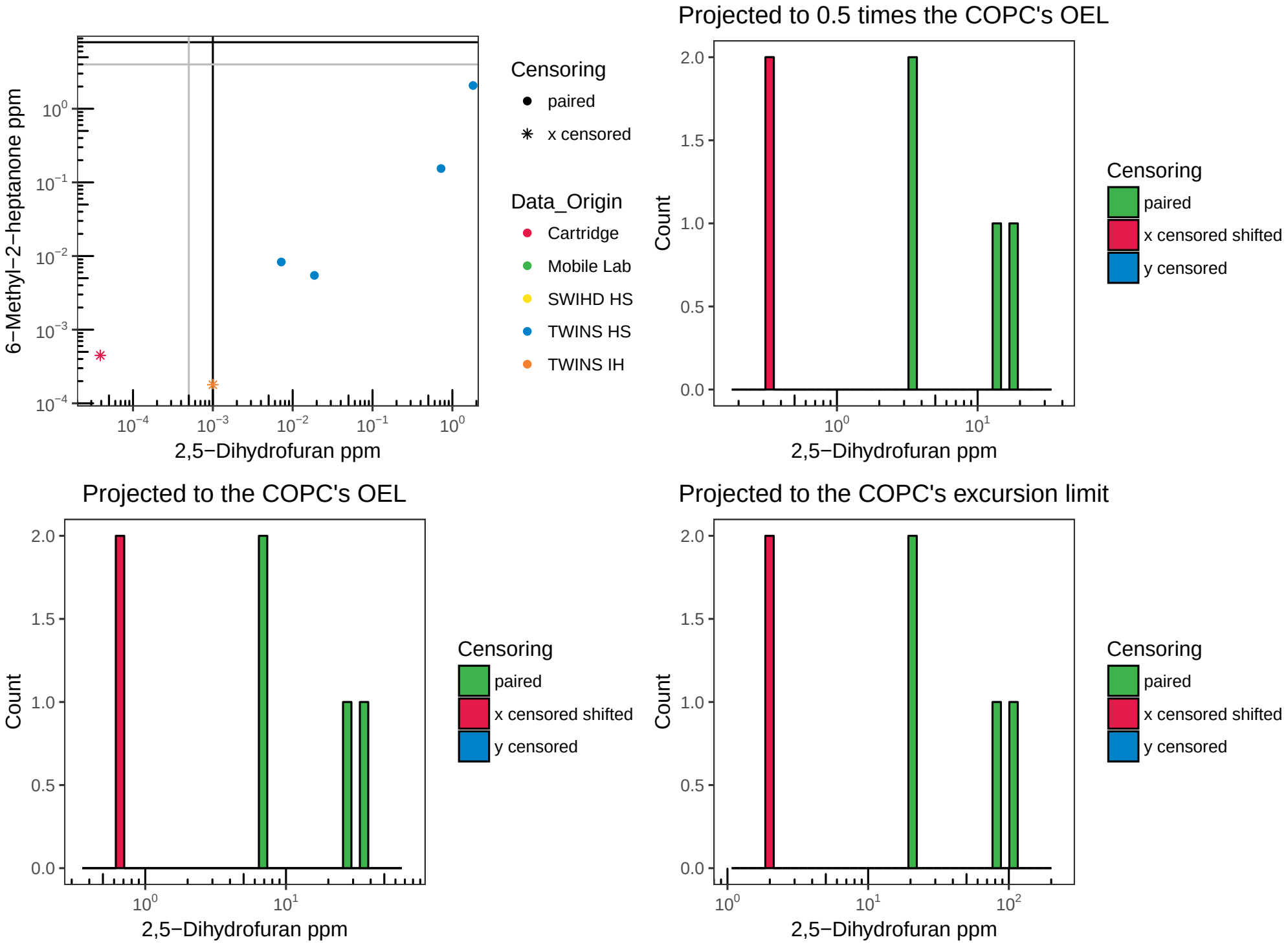


Figure C.1079: 6-Methyl-2-heptanone vs 2,5-Dihydrofuran

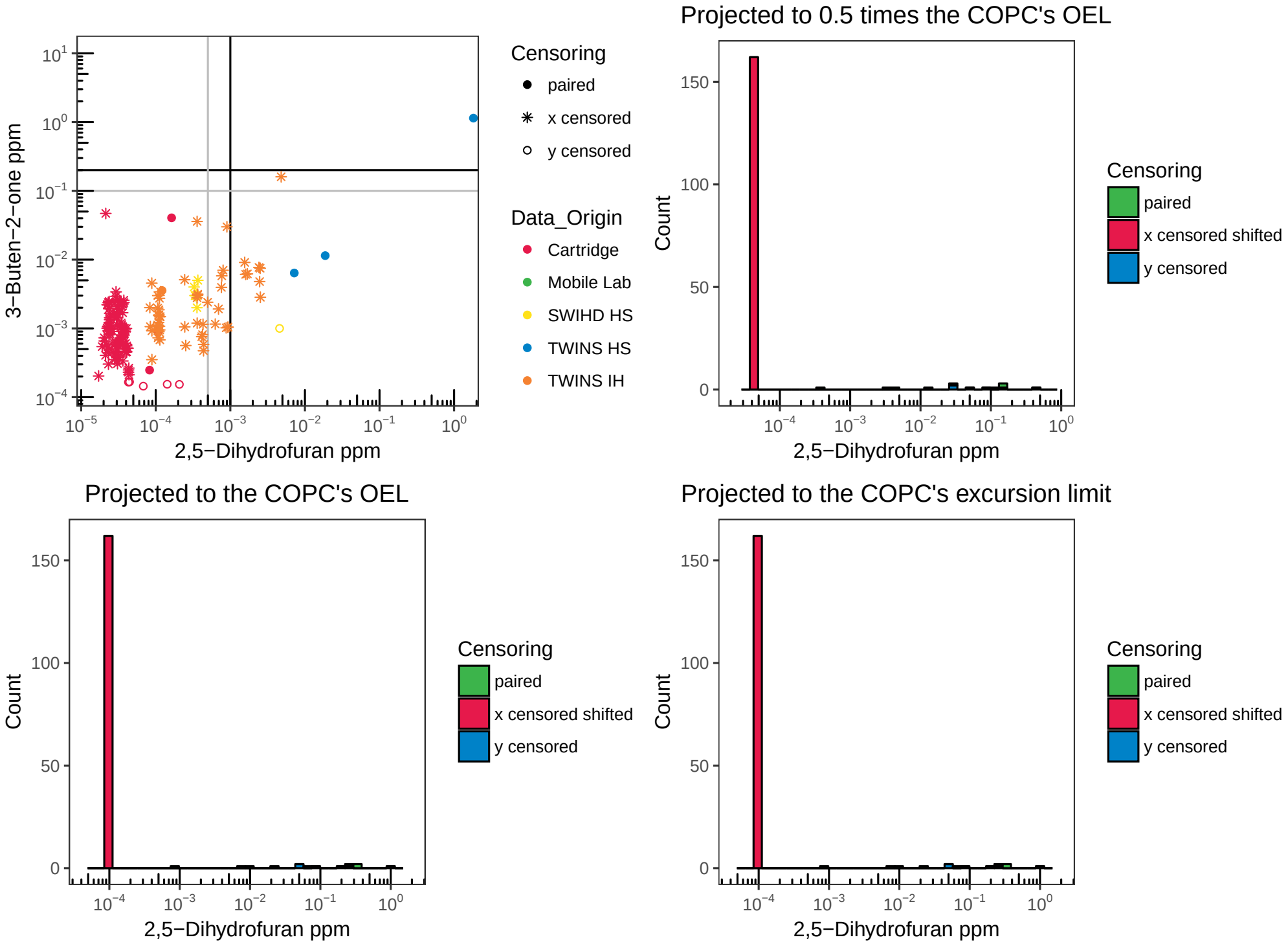


Figure C.1080: 3-Buten-2-one vs 2,5-Dihydrofuran

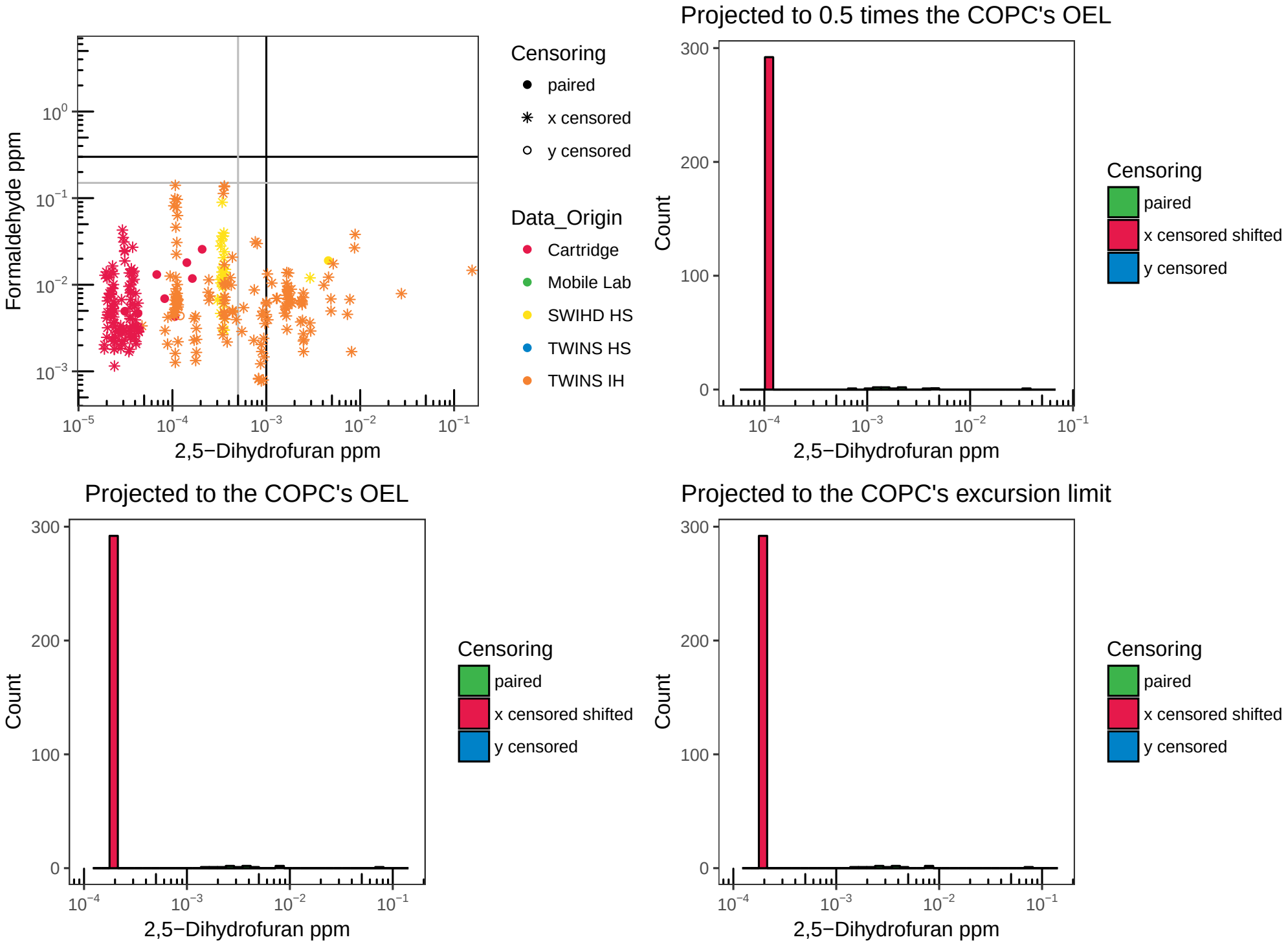


Figure C.1081: Formaldehyde vs 2,5-Dihydrofuran

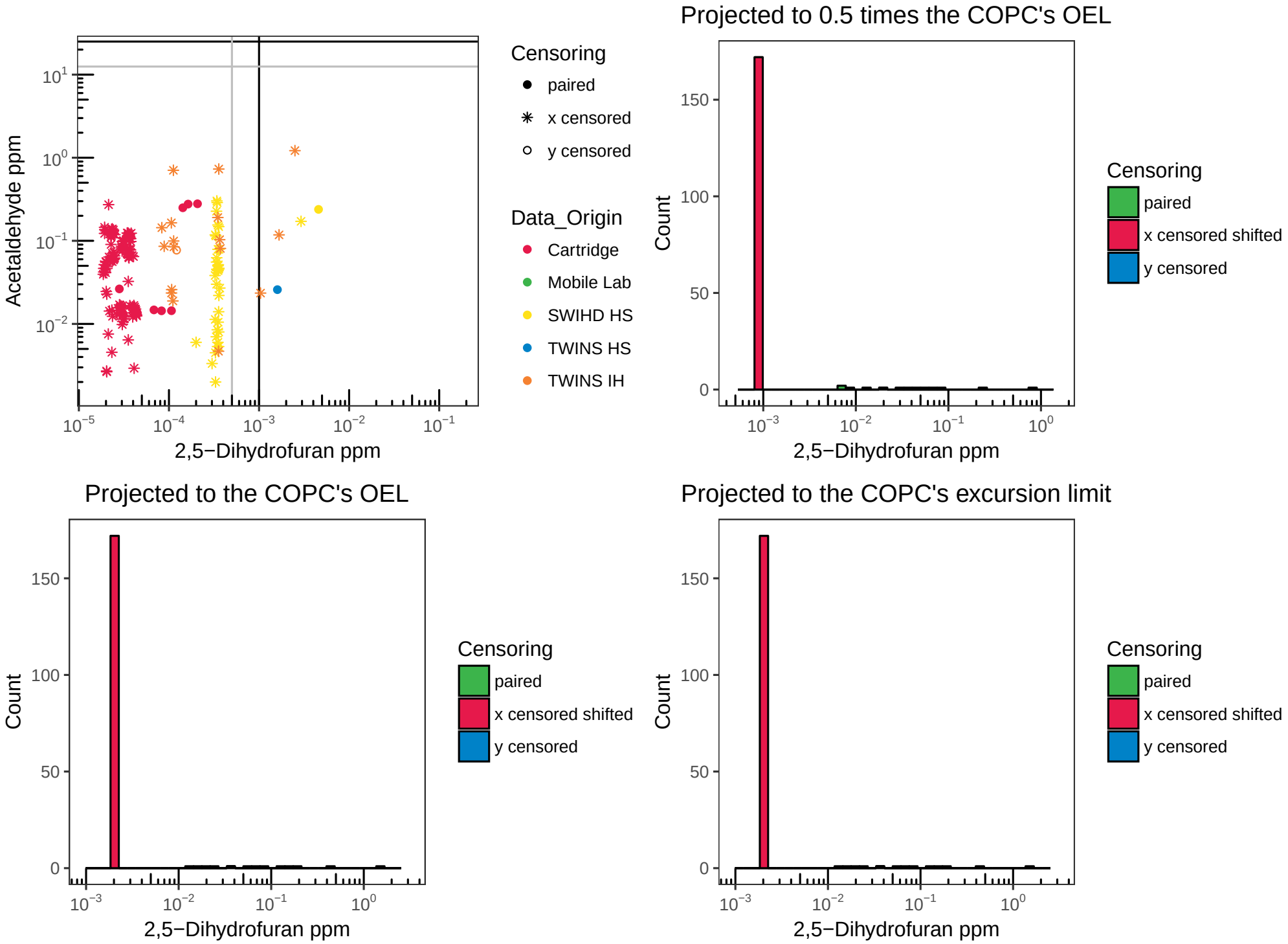


Figure C.1082: Acetaldehyde vs 2,5-Dihydrofuran

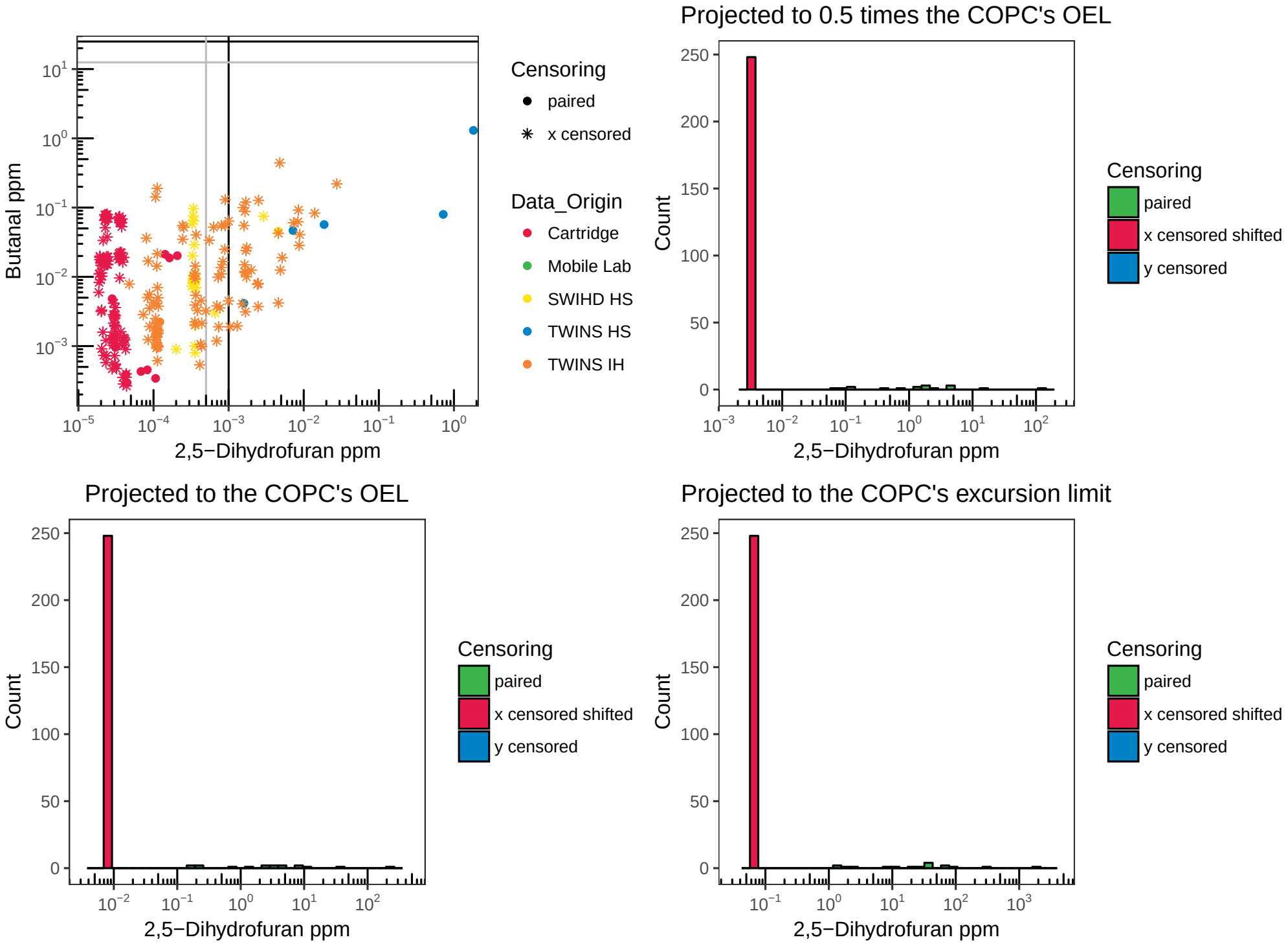


Figure C.1083: Butanal vs 2,5-Dihydrofuran

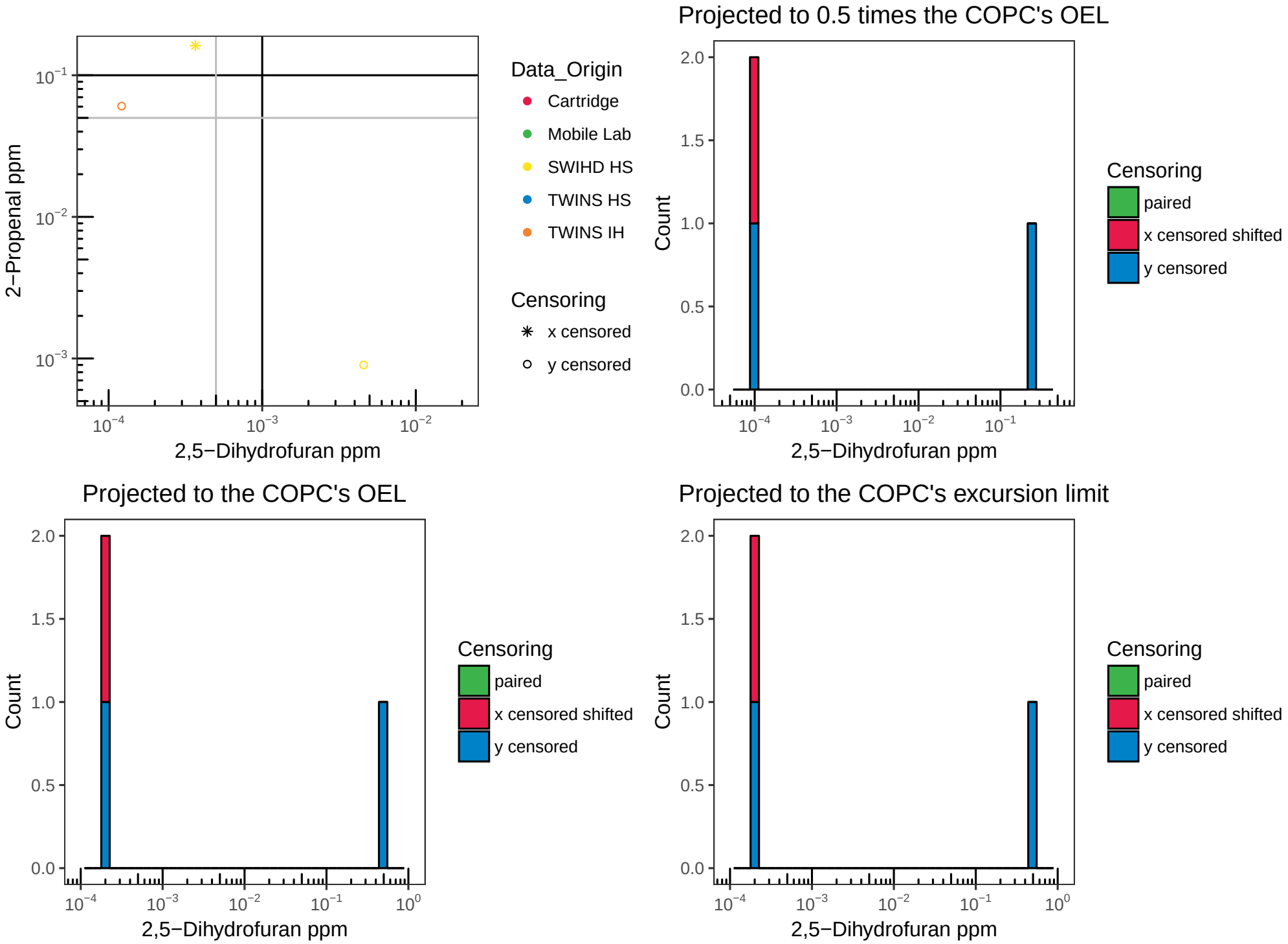


Figure C.1084: 2-Propenal vs 2,5-Dihydrofuran

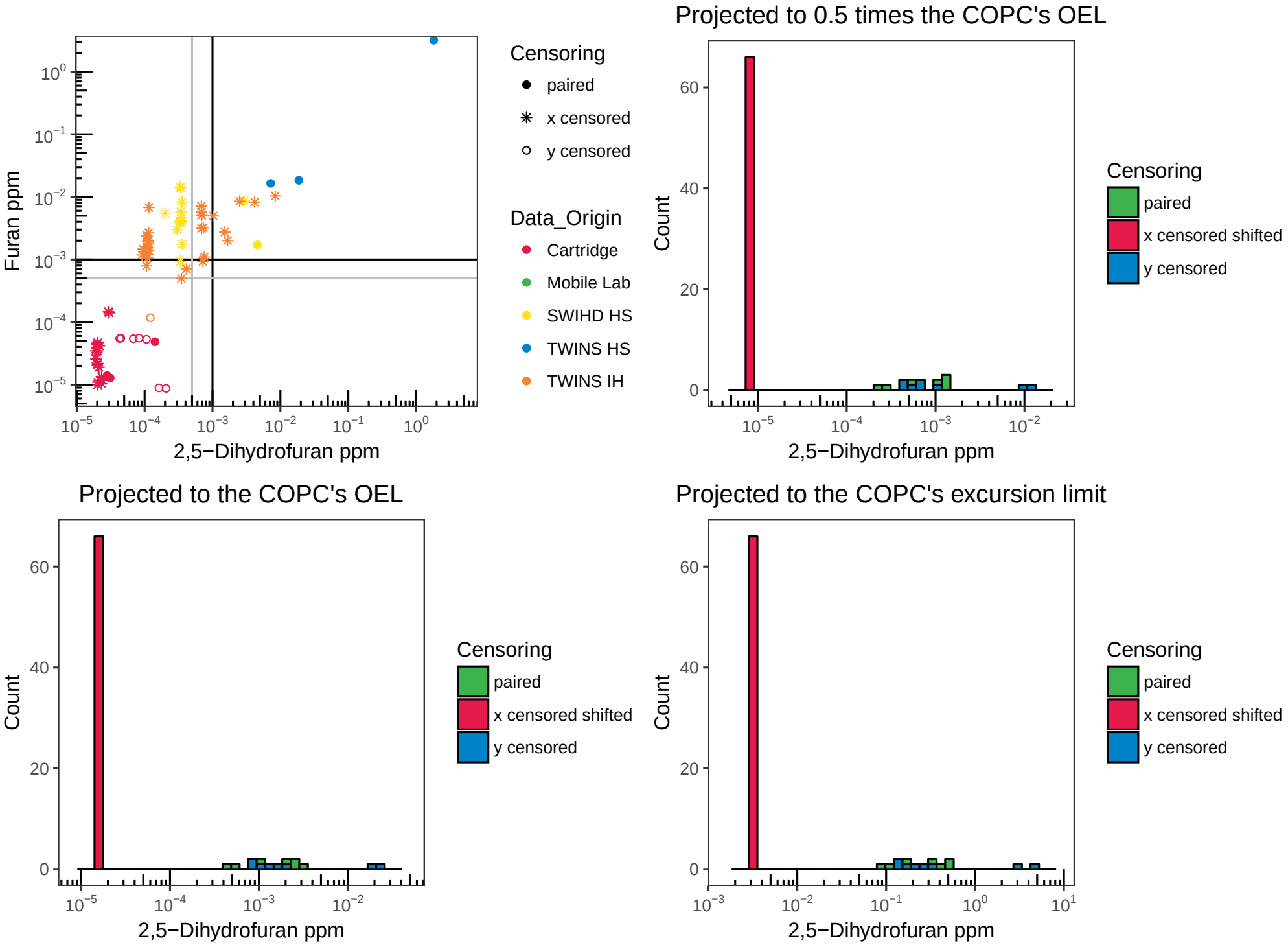


Figure C.1085: Furan vs 2,5-Dihydrofuran

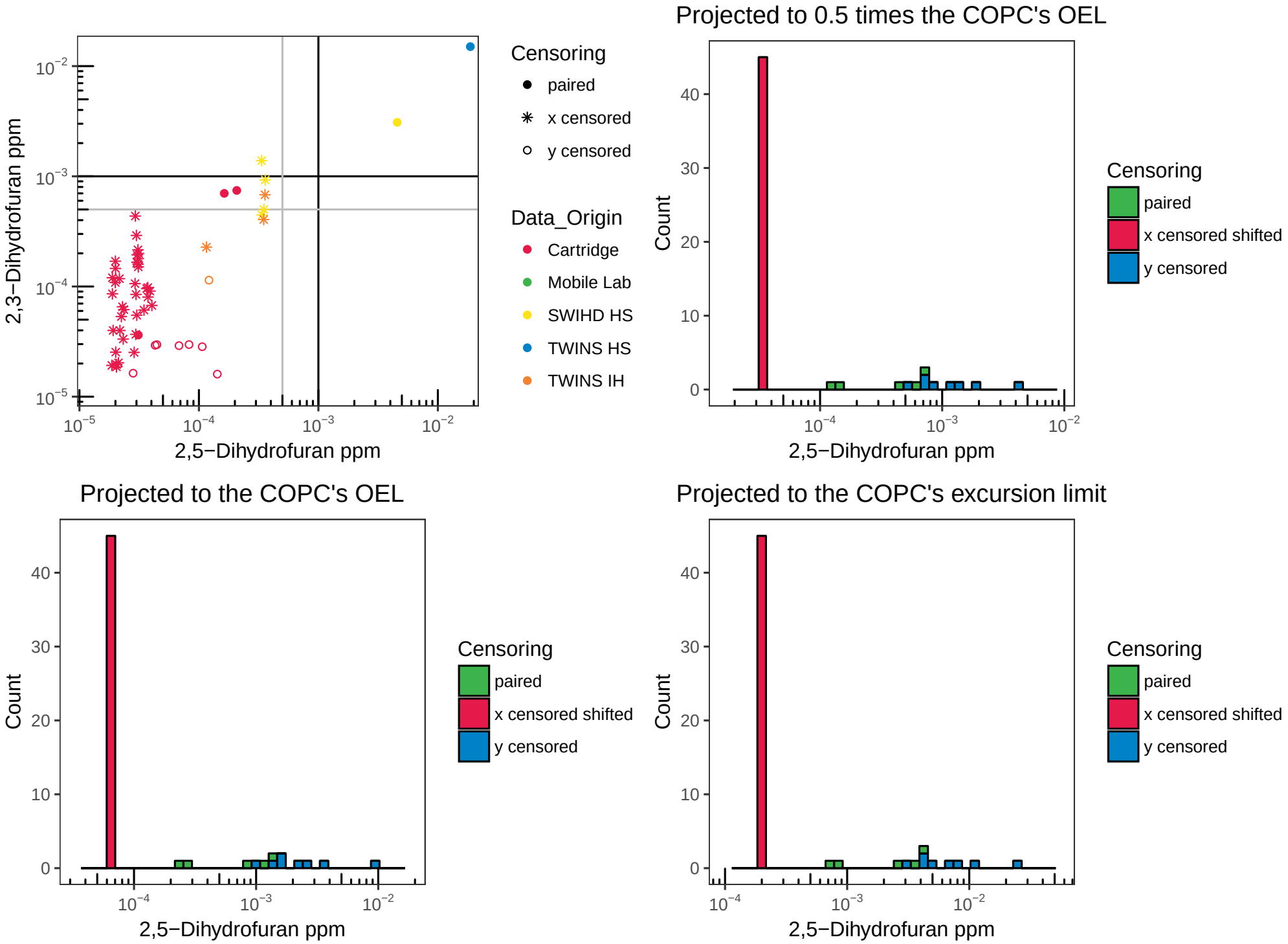


Figure C.1086: 2,3-Dihydrofuran vs 2,5-Dihydrofuran

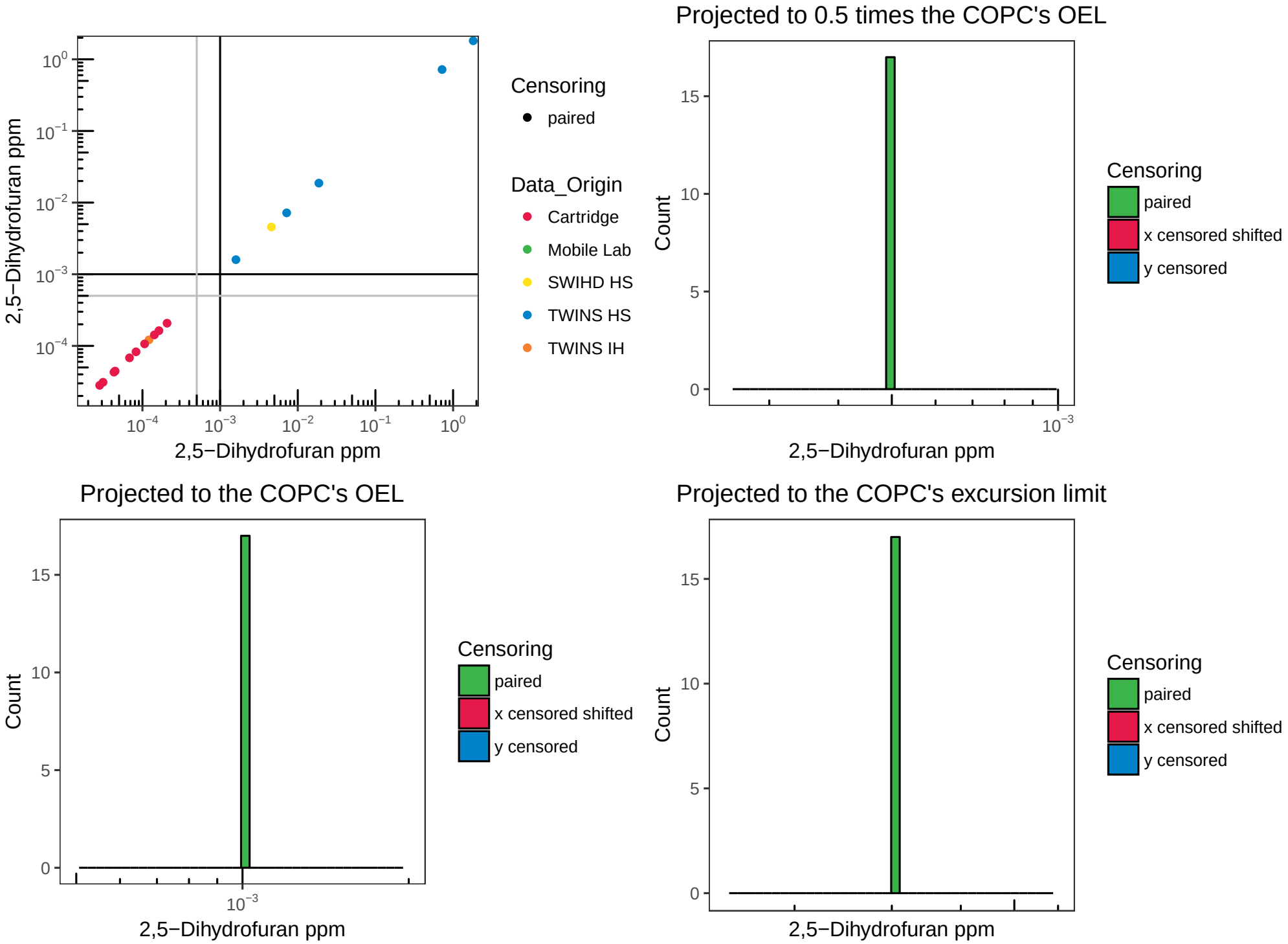


Figure C.1087: 2,5-Dihydrofuran vs 2,5-Dihydrofuran

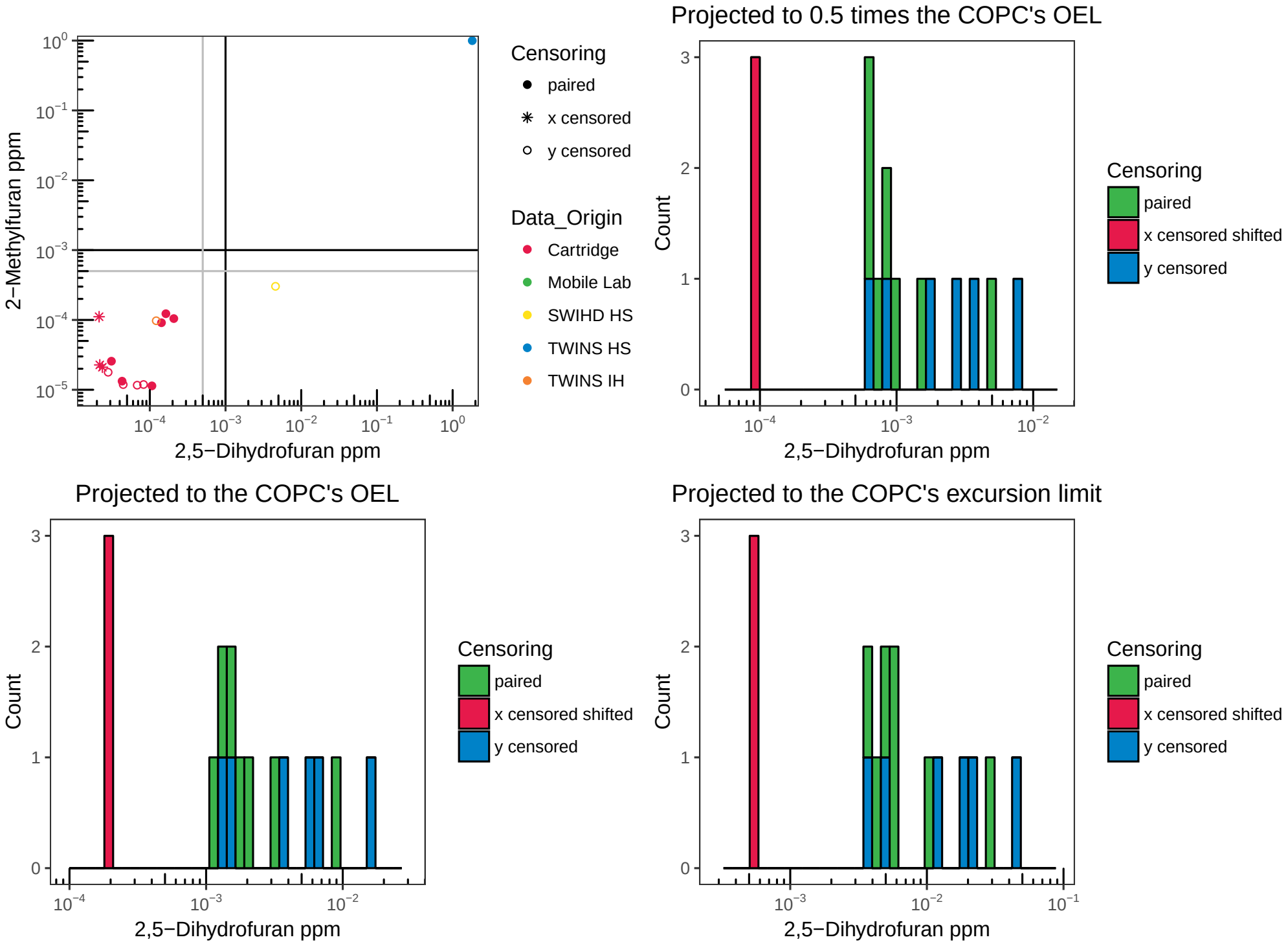


Figure C.1088: 2-Methylfuran vs 2,5-Dihydrofuran

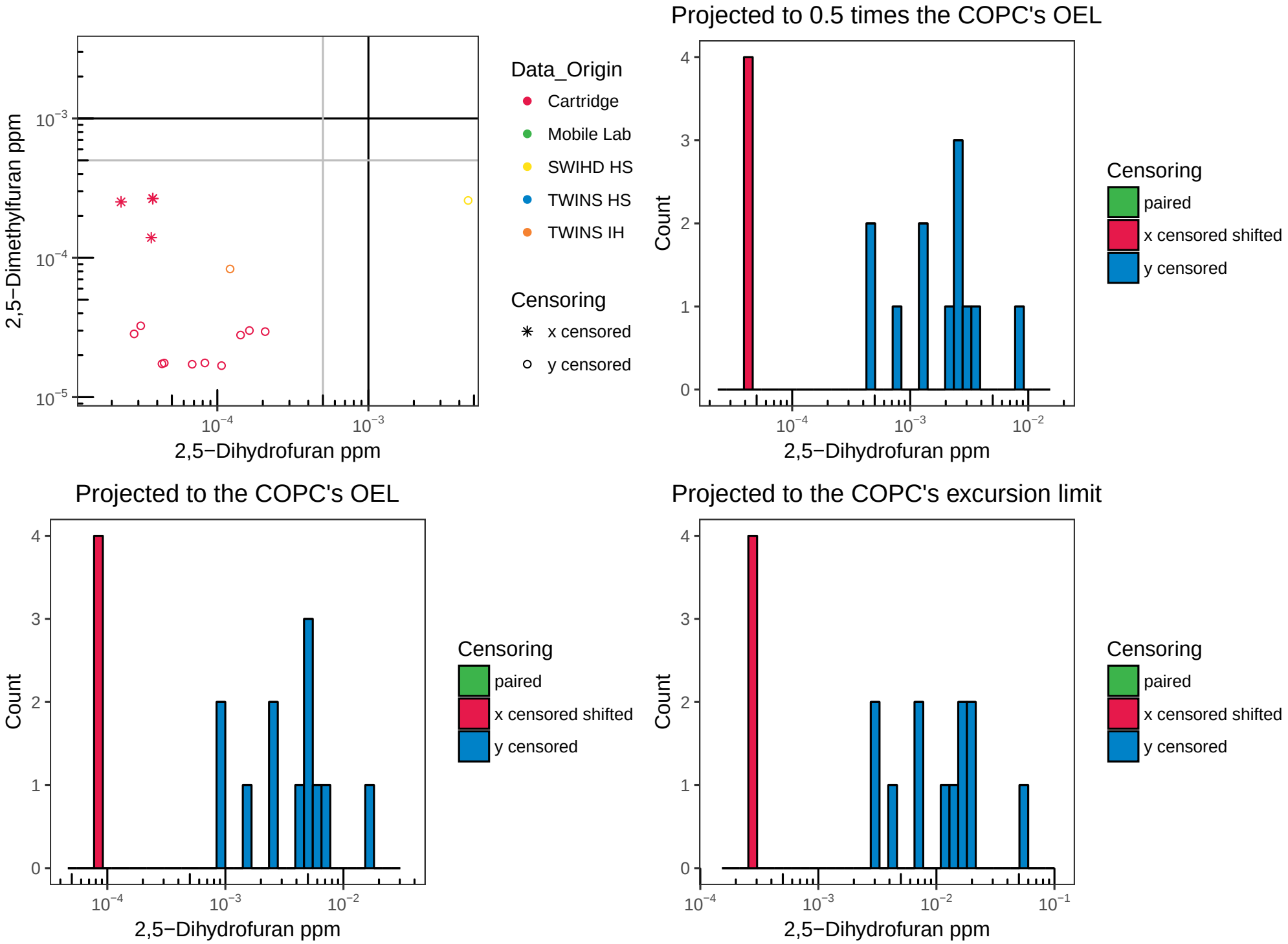


Figure C.1089: 2,5-Dimethylfuran vs 2,5-Dihydrofuran

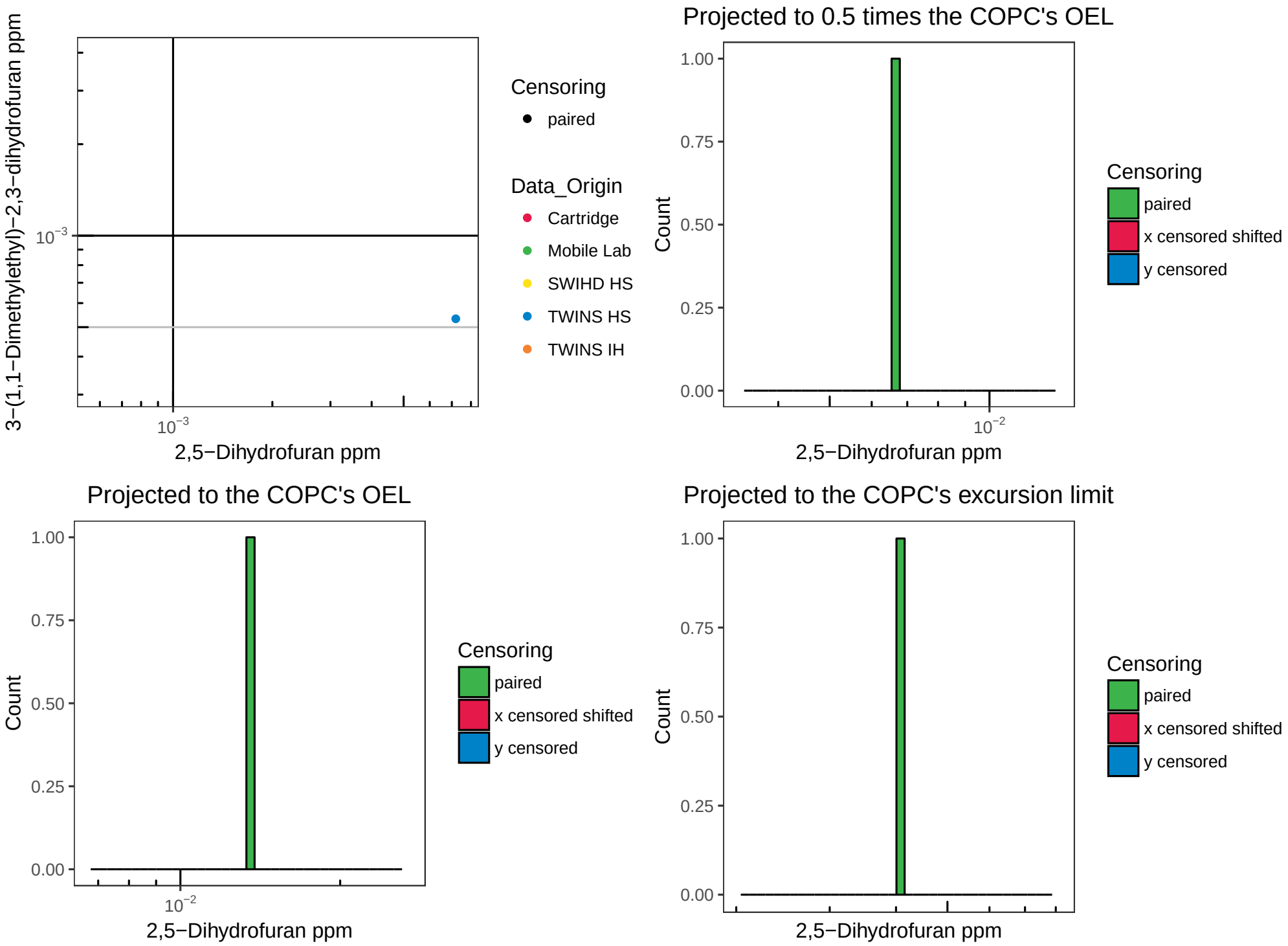


Figure C.1090: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs 2,5-Dihydrofuran

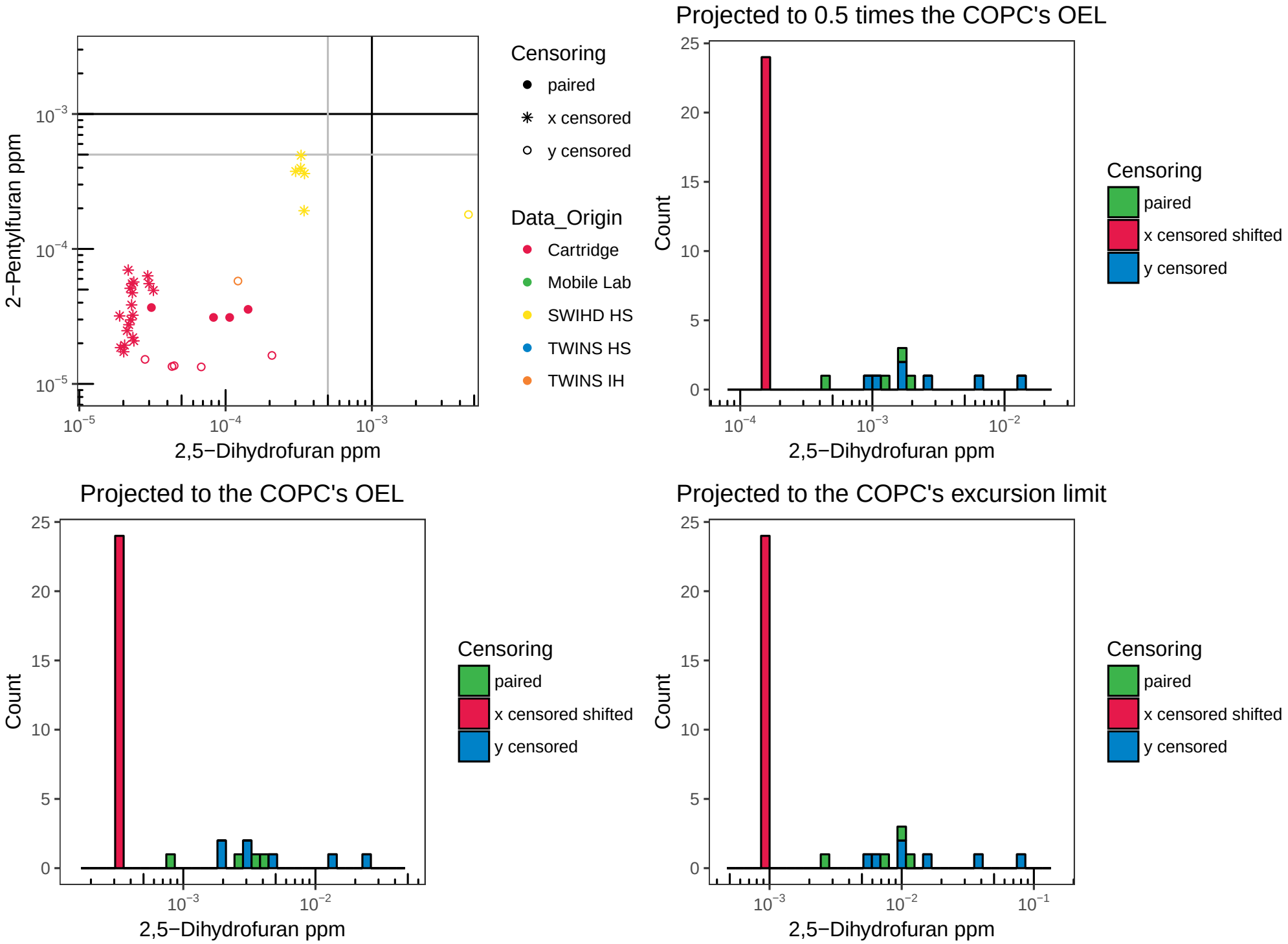


Figure C.1091: 2-Pentylfuran vs 2,5-Dihydrofuran

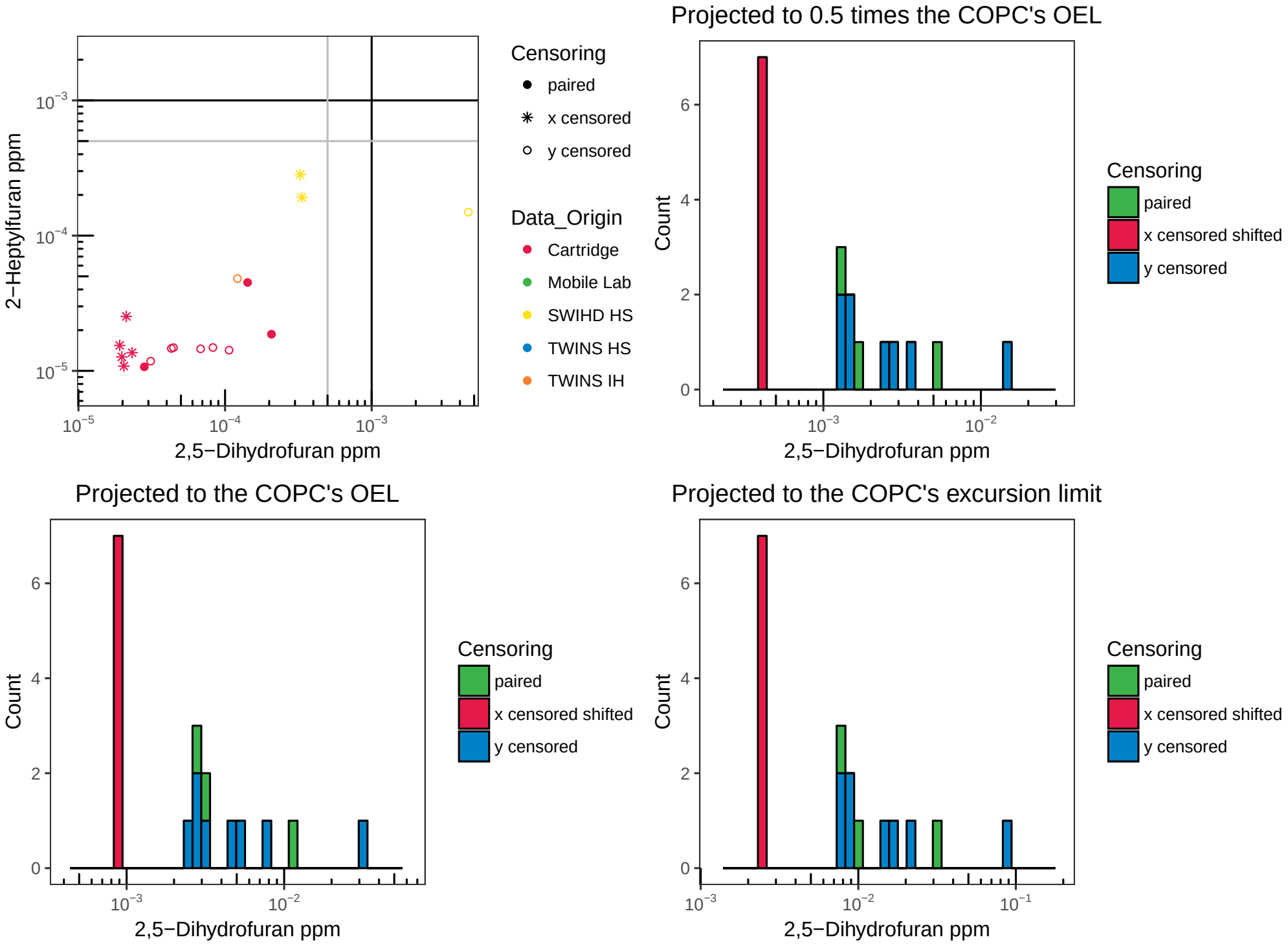


Figure C.1092: 2-Heptylfuran vs 2,5-Dihydrofuran

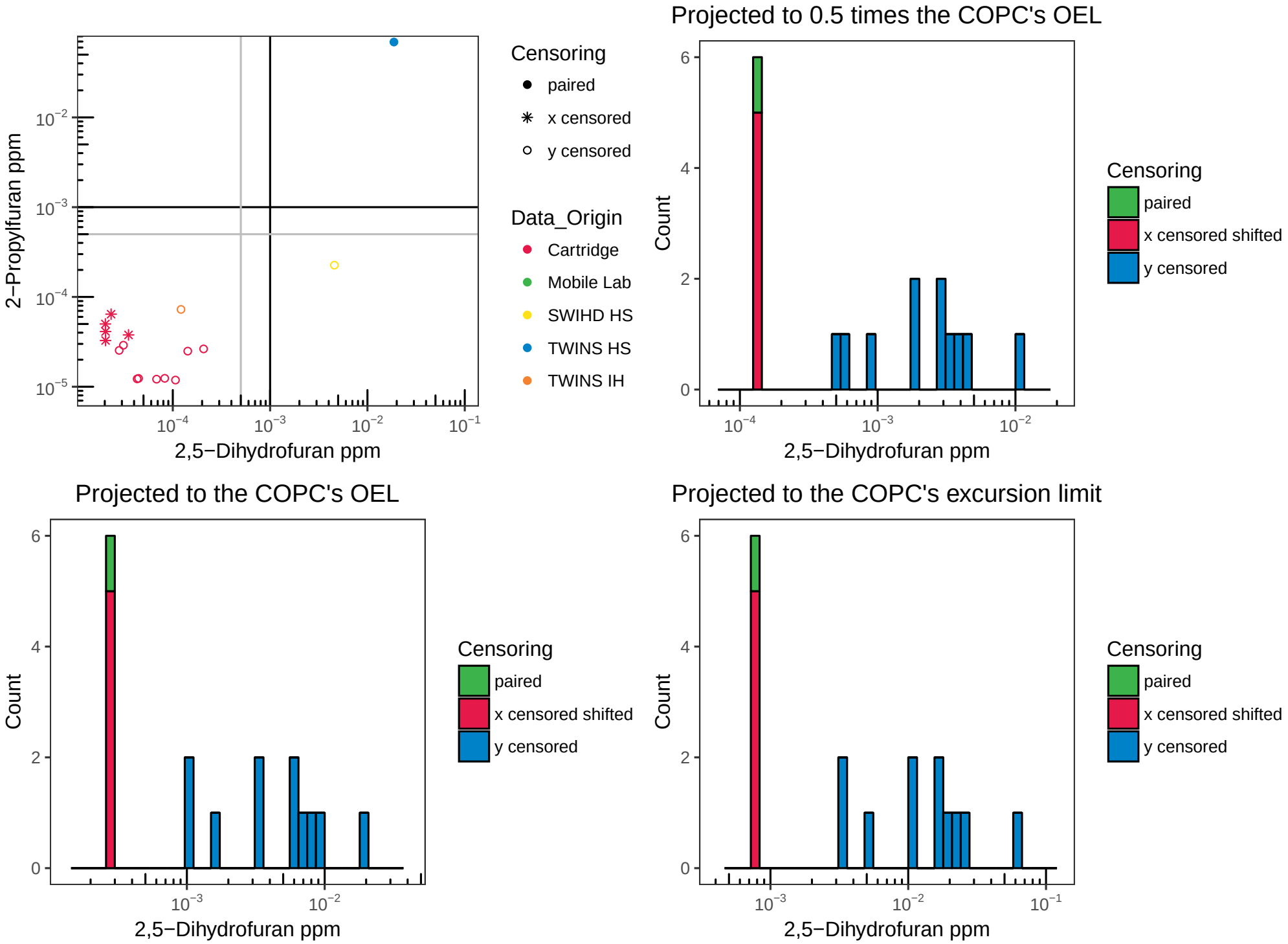


Figure C.1093: 2-Propylfuran vs 2,5-Dihydrofuran

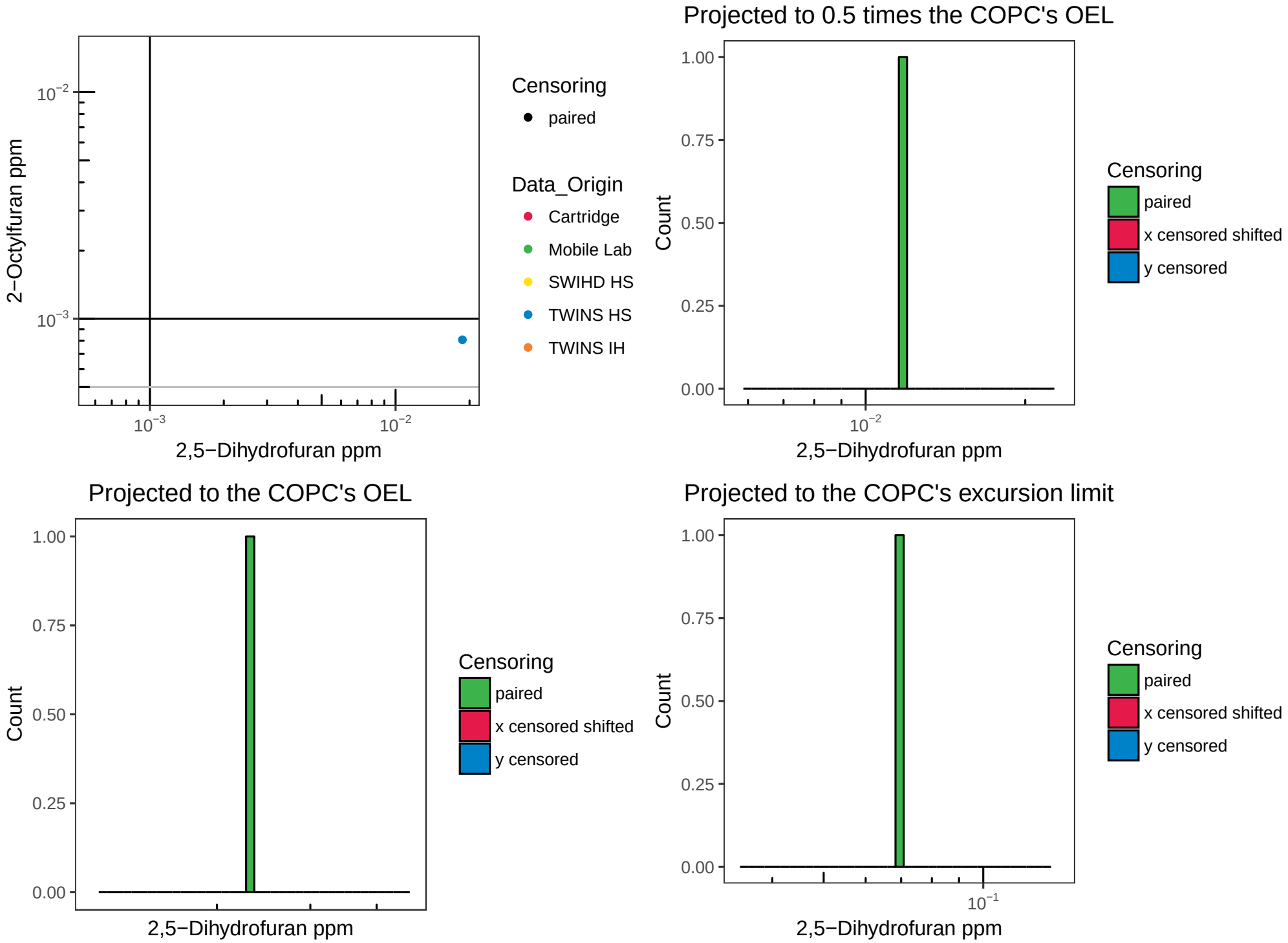


Figure C.1094: 2-Octylfuran vs 2,5-Dihydrofuran

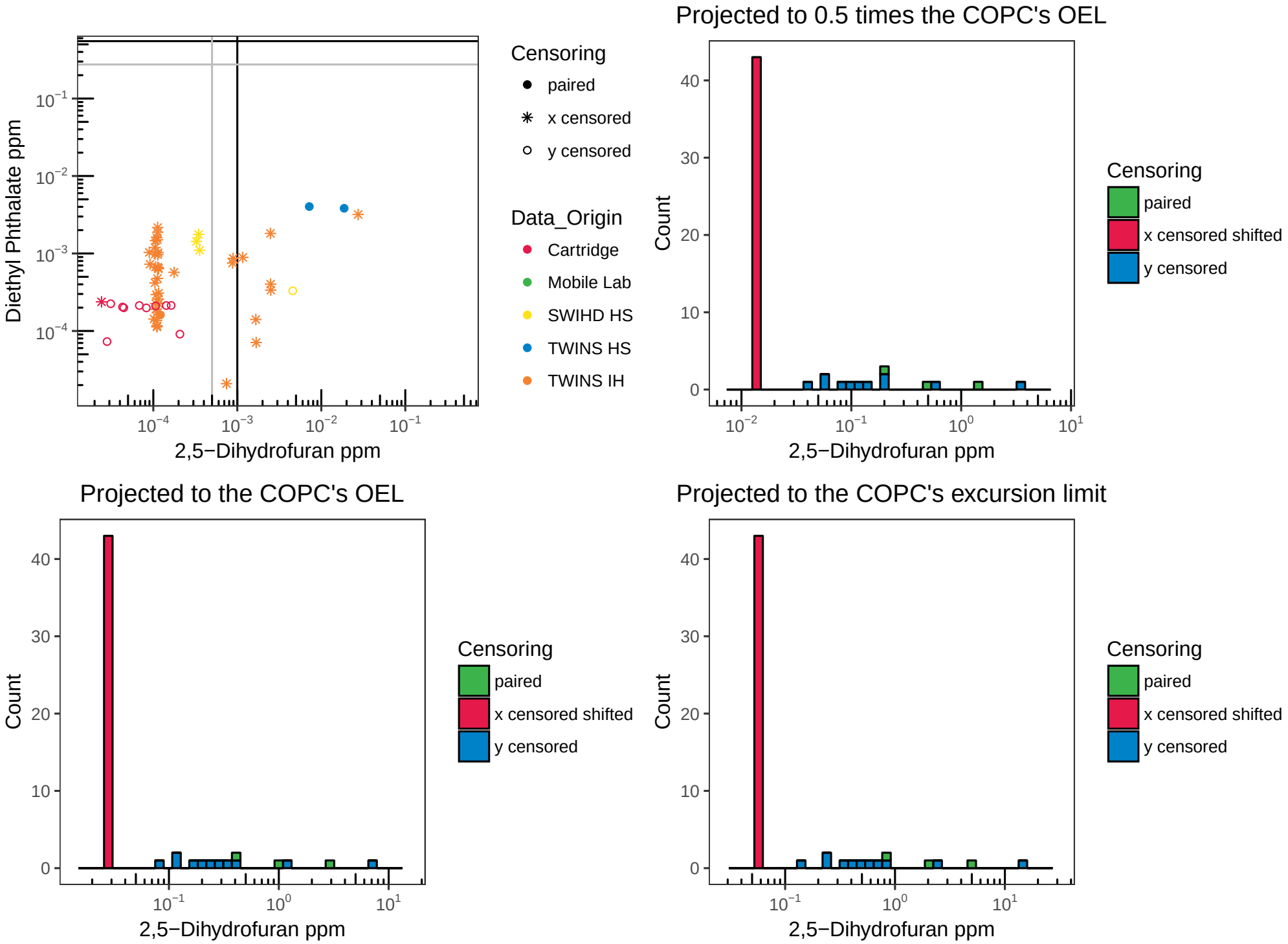


Figure C.1095: Diethyl Phthalate vs 2,5-Dihydrofuran

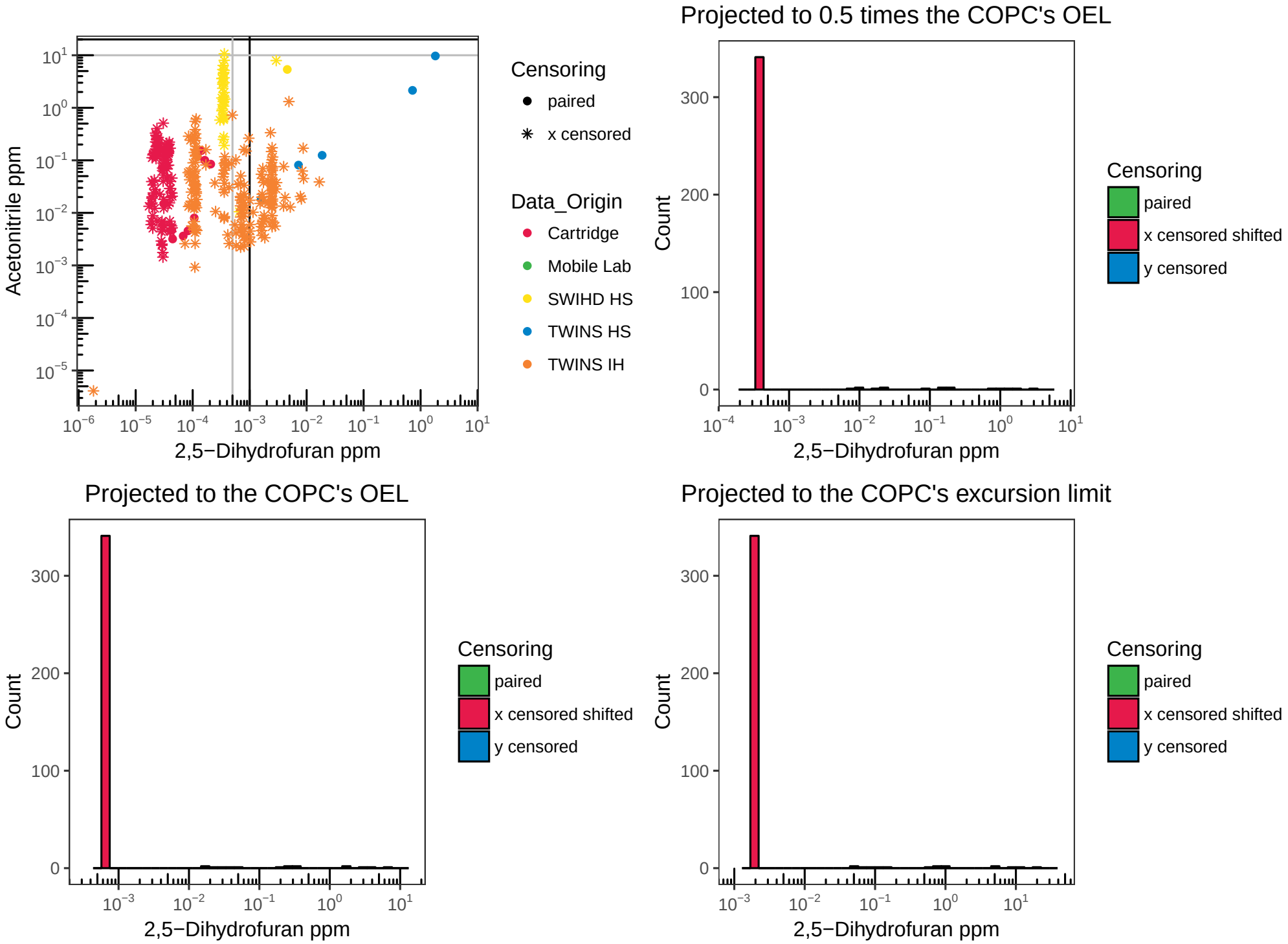


Figure C.1096: Acetonitrile vs 2,5-Dihydrofuran

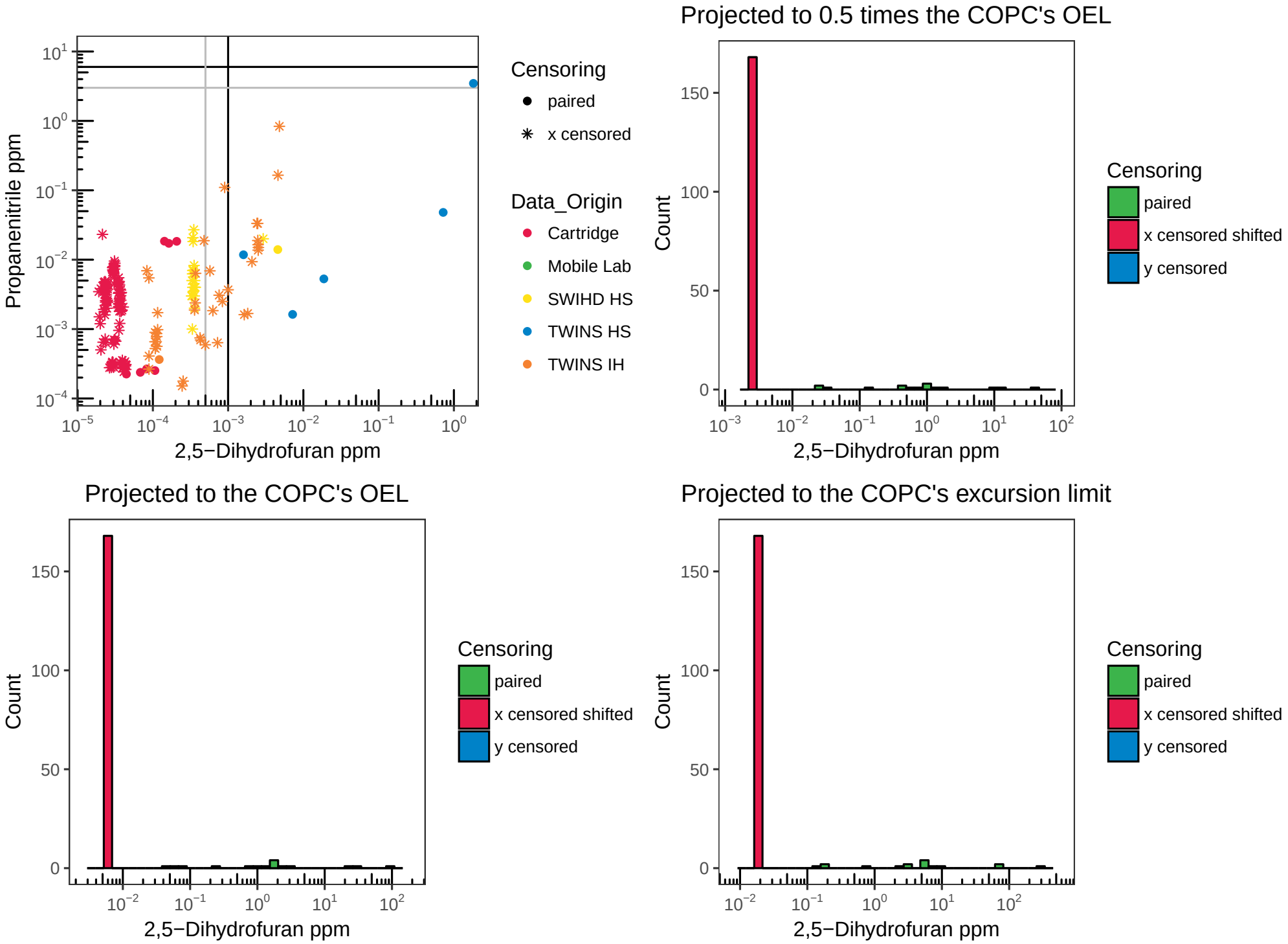


Figure C.1097: Propanenitrile vs 2,5-Dihydrofuran

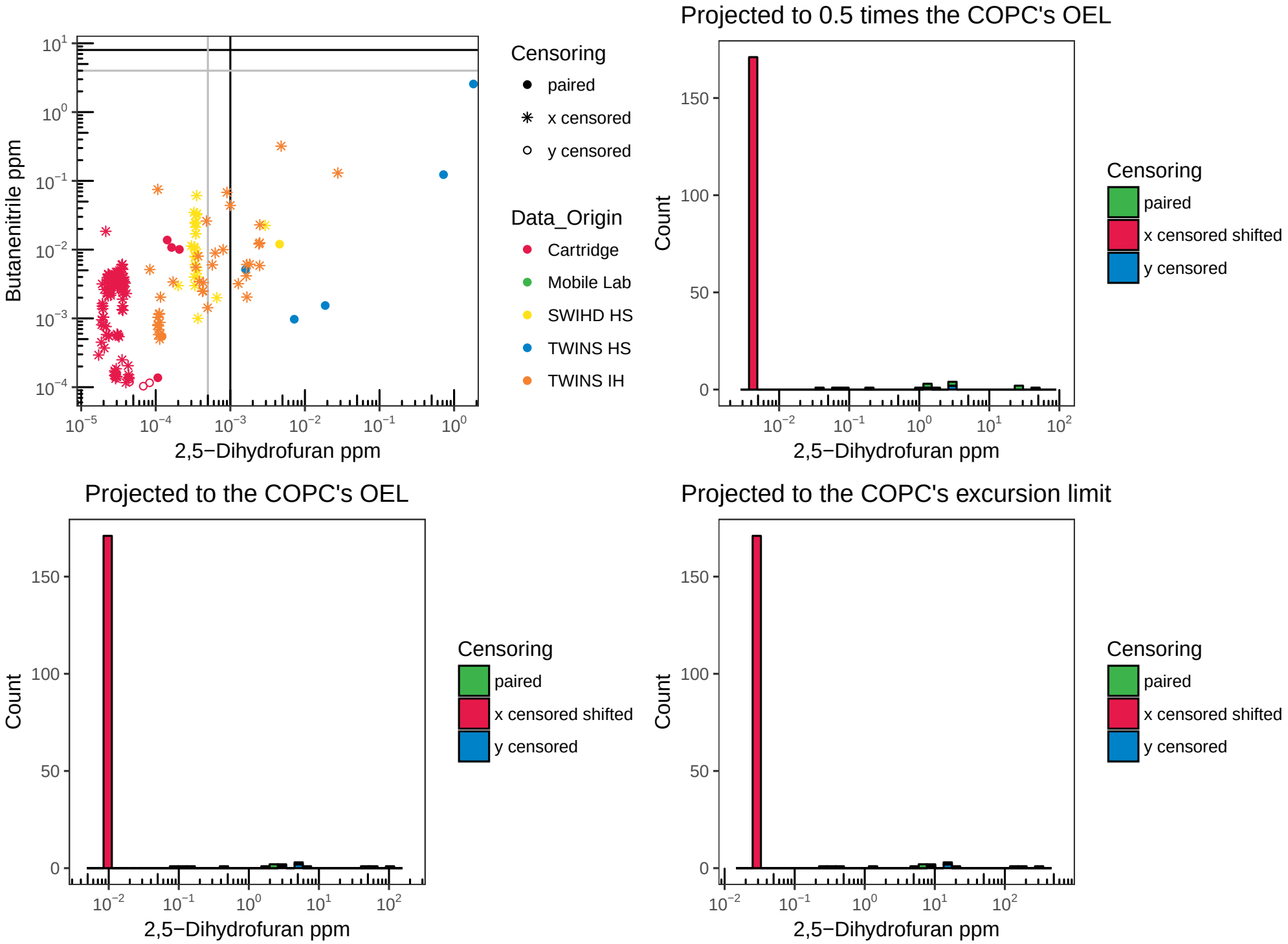


Figure C.1098: Butanenitrile vs 2,5-Dihydrofuran

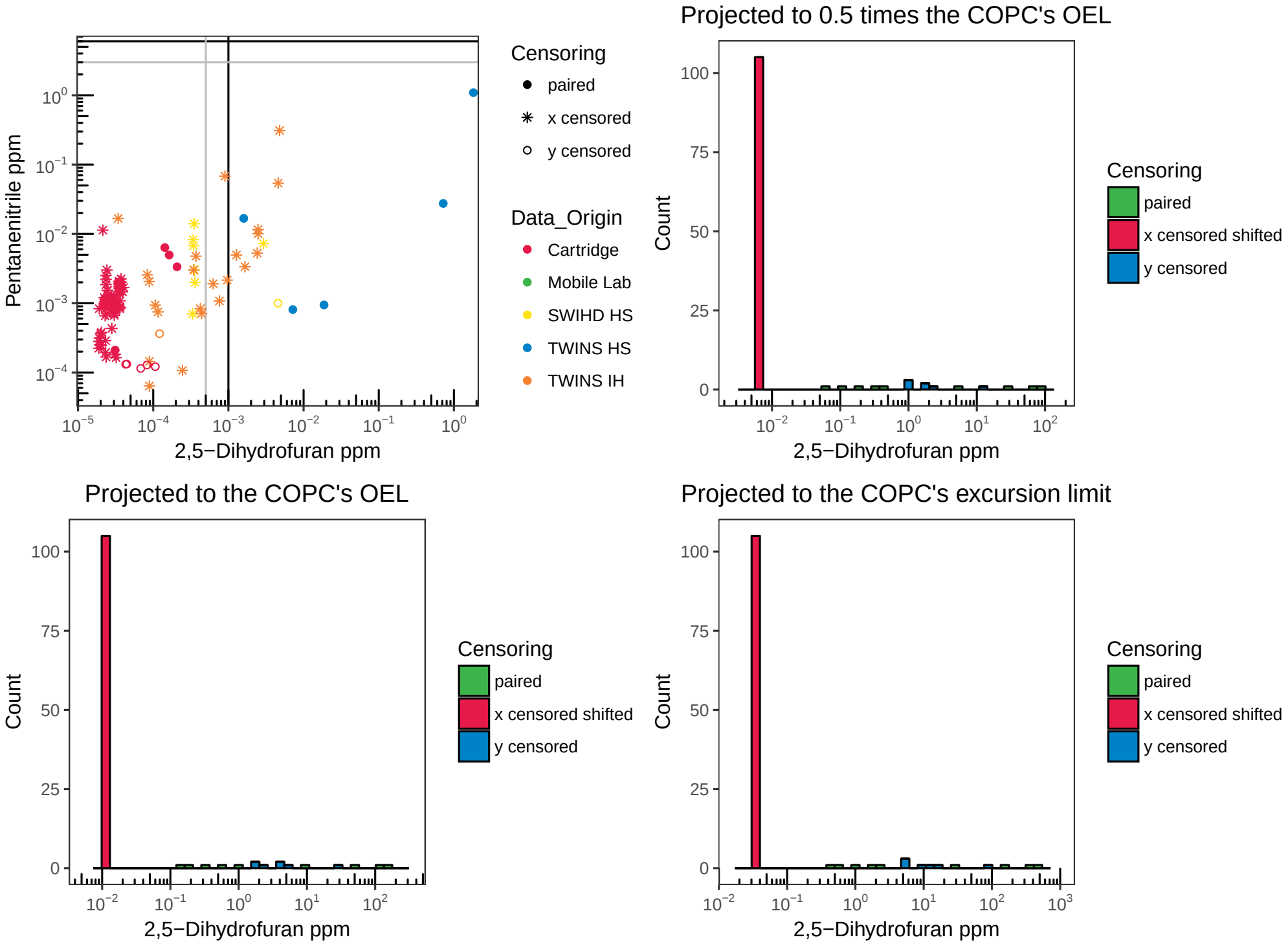


Figure C.1099: Pentanenitrile vs 2,5-Dihydrofuran

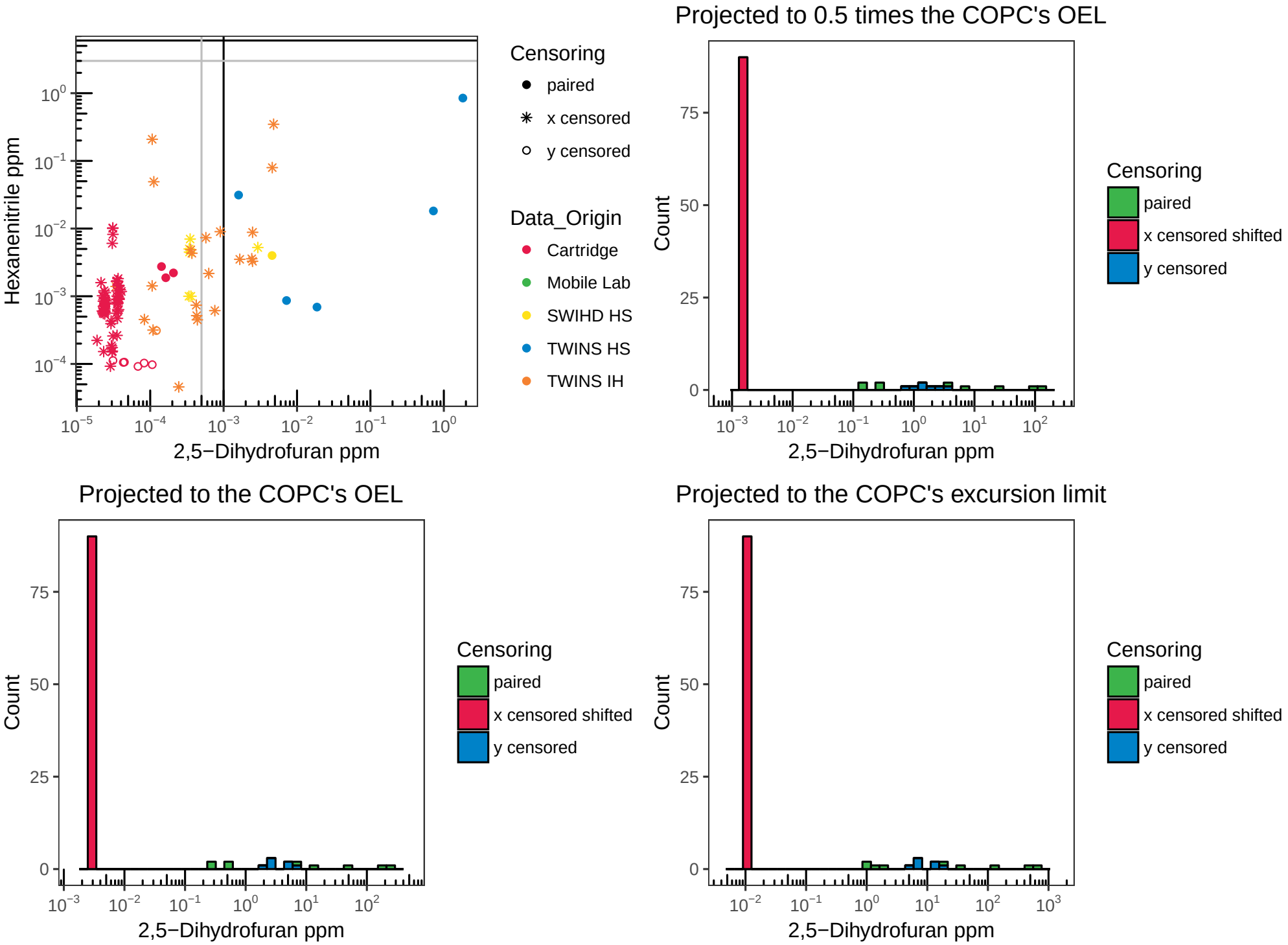


Figure C.1100: Hexanenitrile vs 2,5-Dihydrofuran

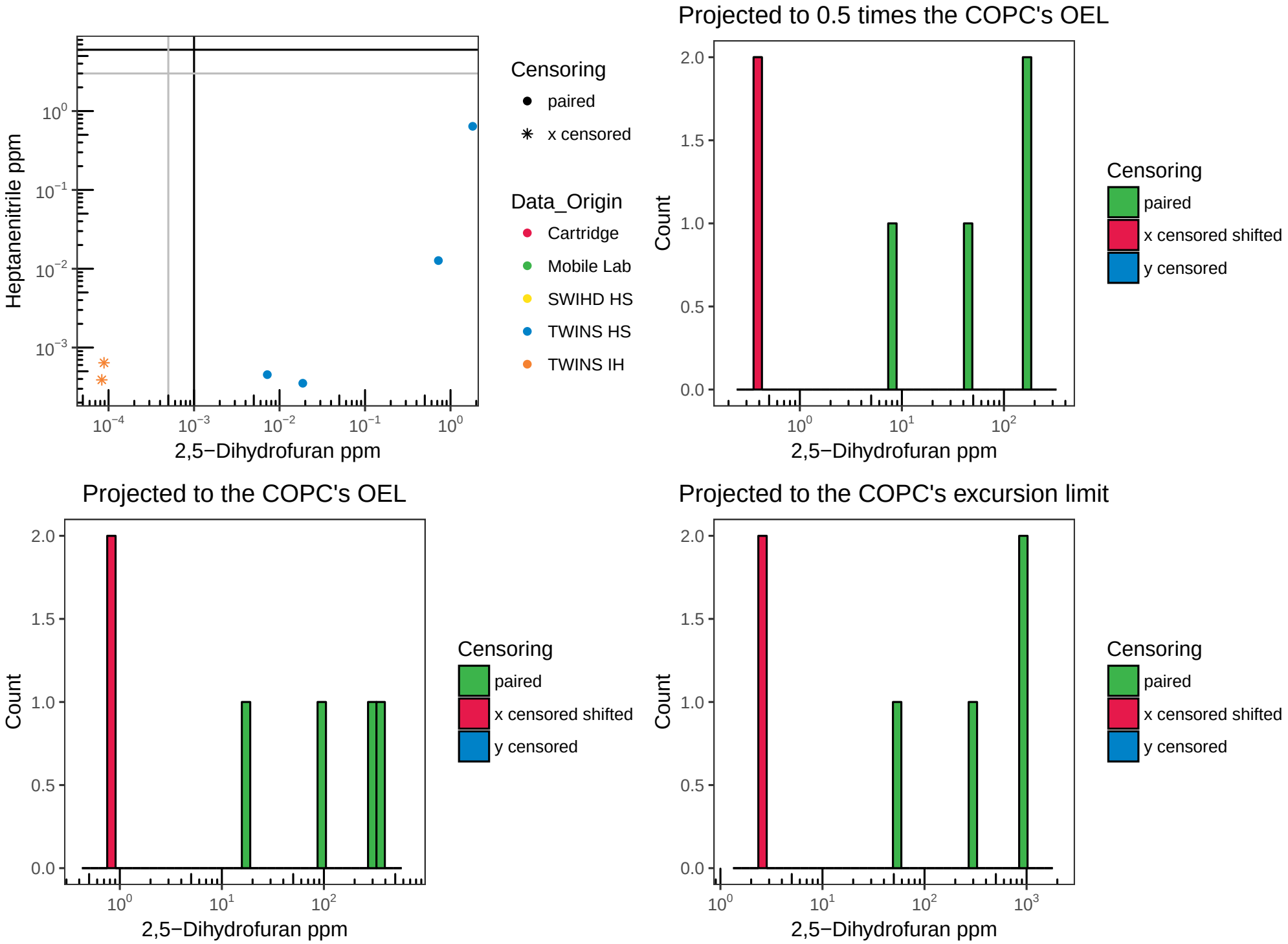


Figure C.1101: Heptanenitrile vs 2,5-Dihydrofuran

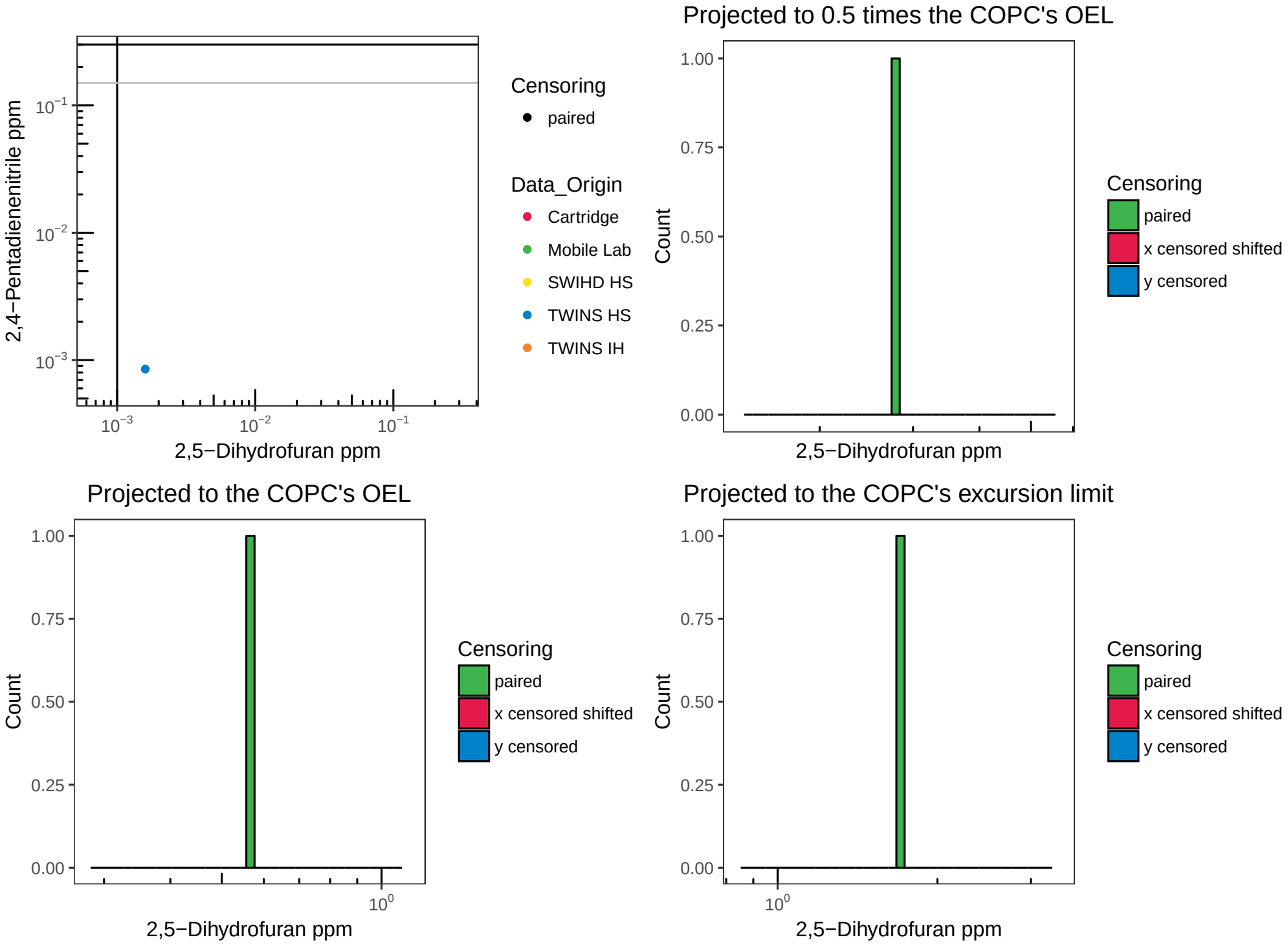


Figure C.1102: 2,4-Pentadienenitrile vs 2,5-Dihydrofuran

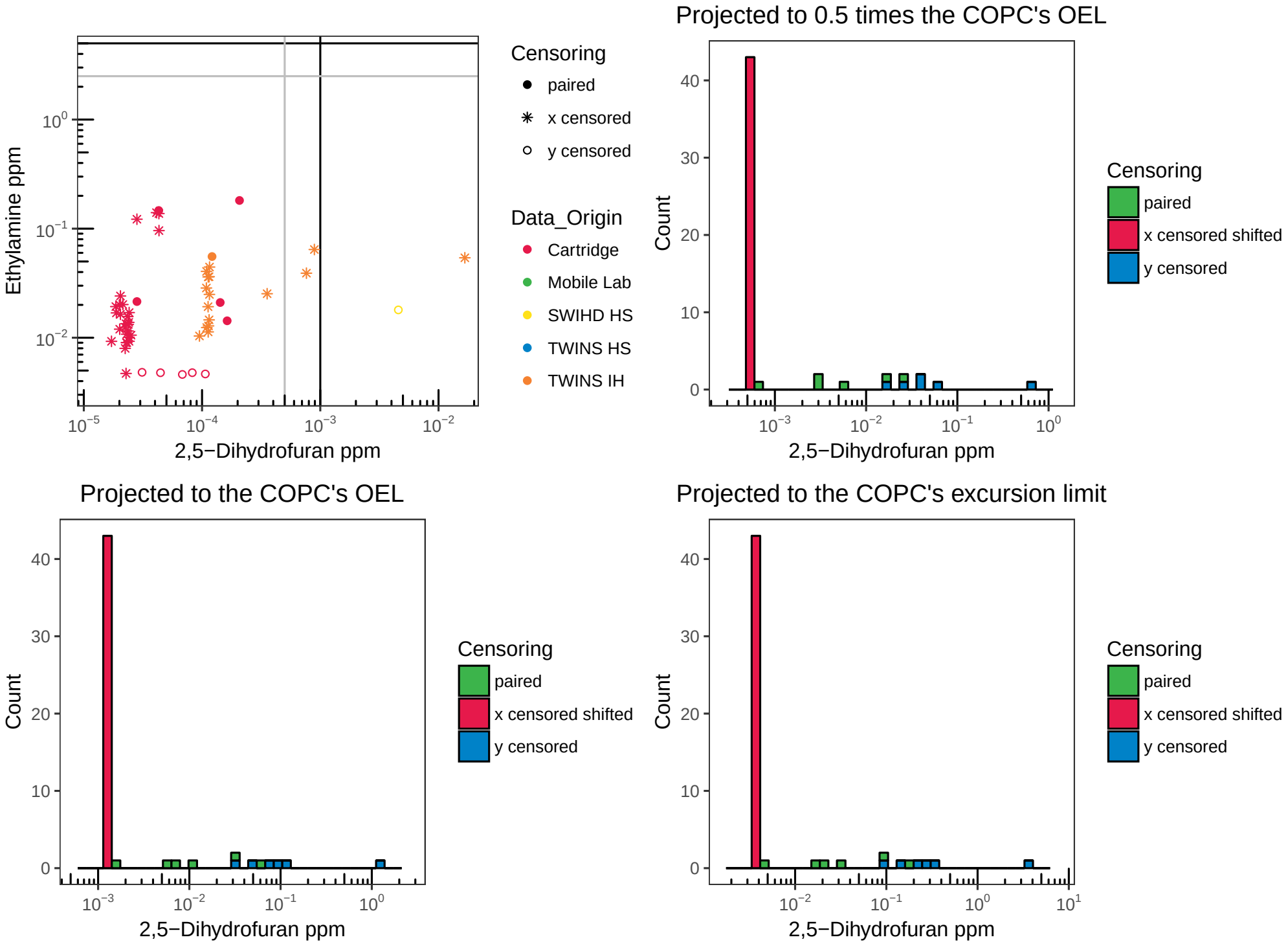


Figure C.1103: Ethylamine vs 2,5-Dihydrofuran

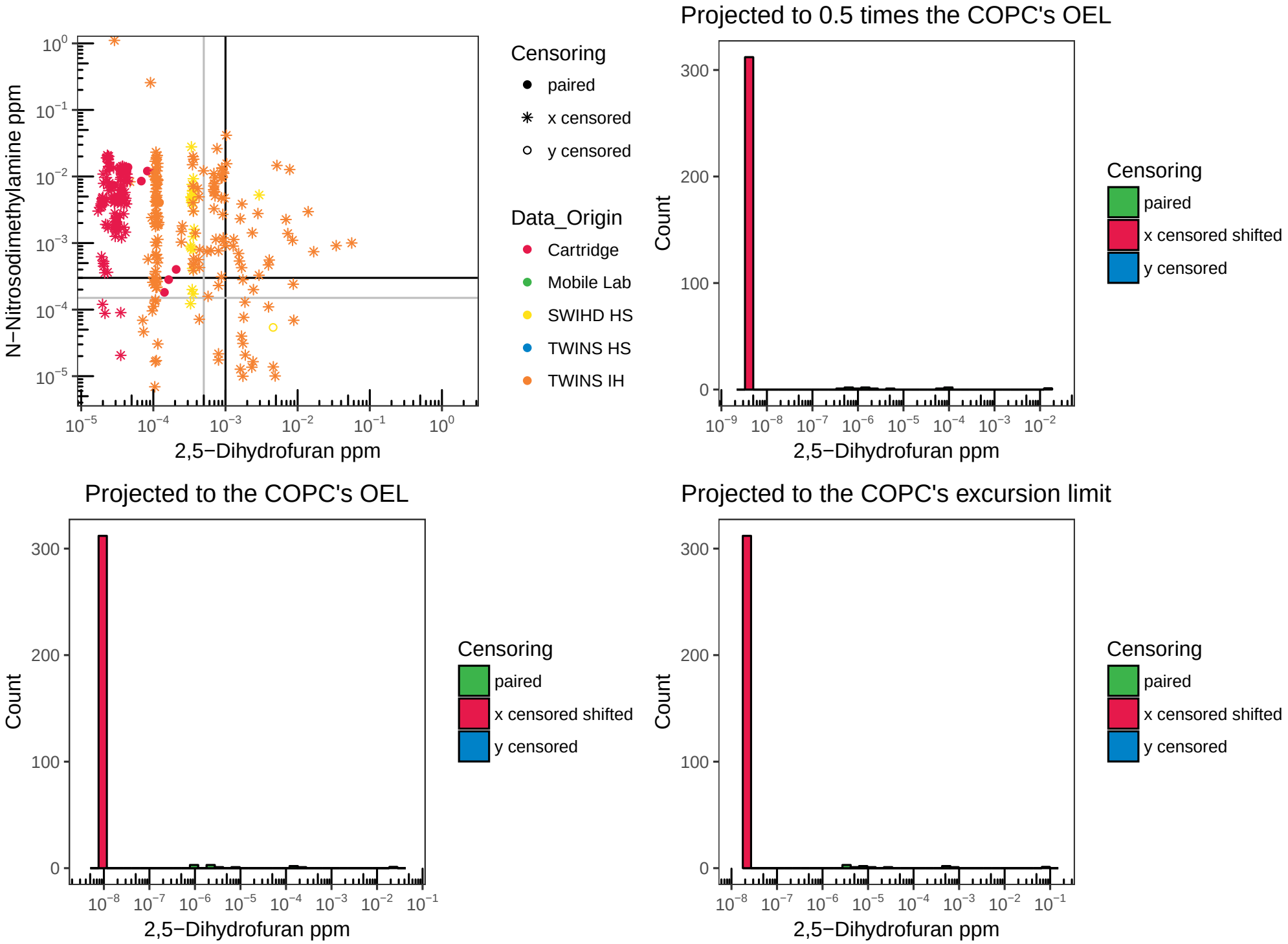


Figure C.1104: N-Nitrosodimethylamine vs 2,5-Dihydrofuran

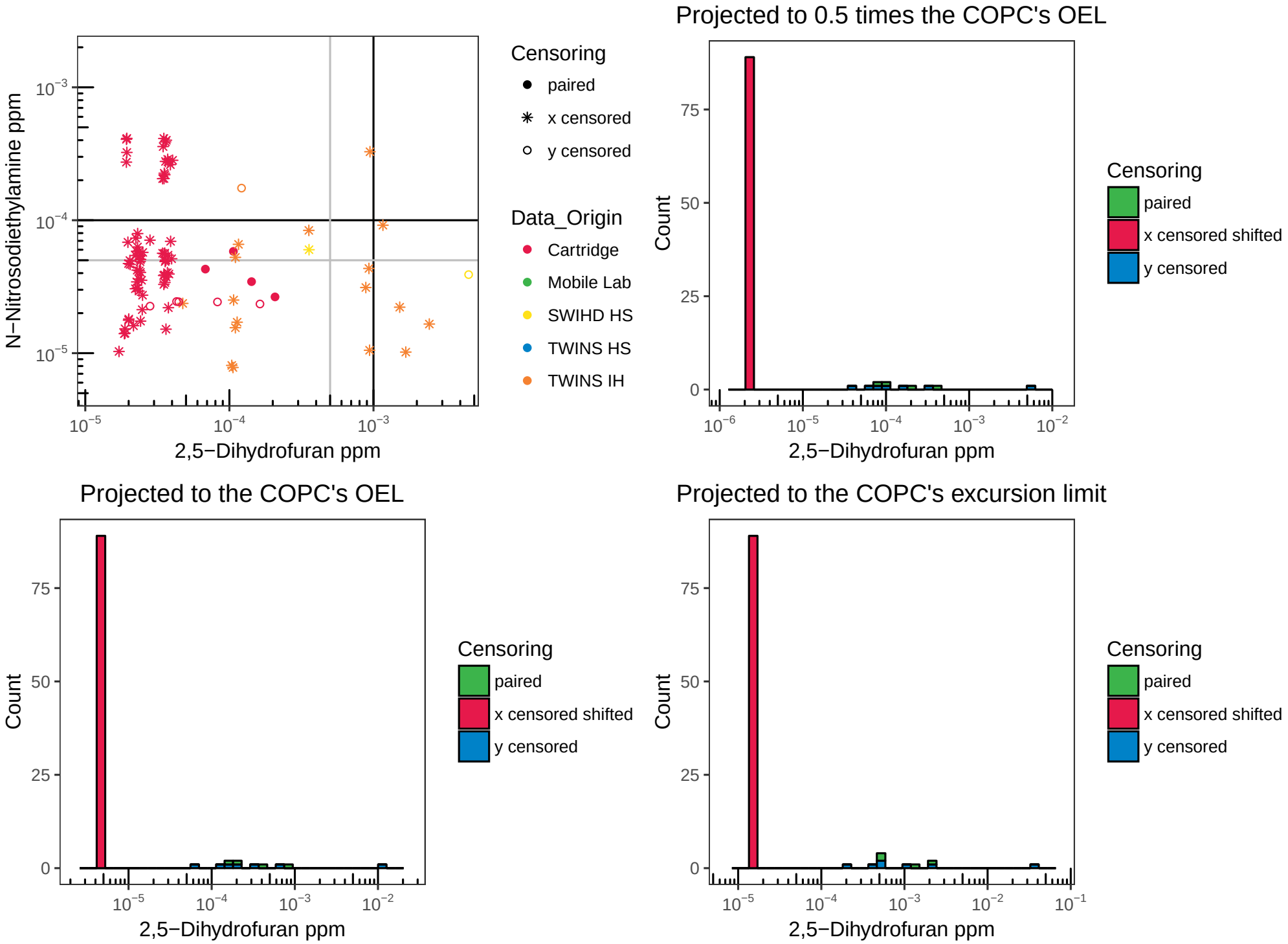


Figure C.1105: N-Nitrosodiethylamine vs 2,5-Dihydrofuran

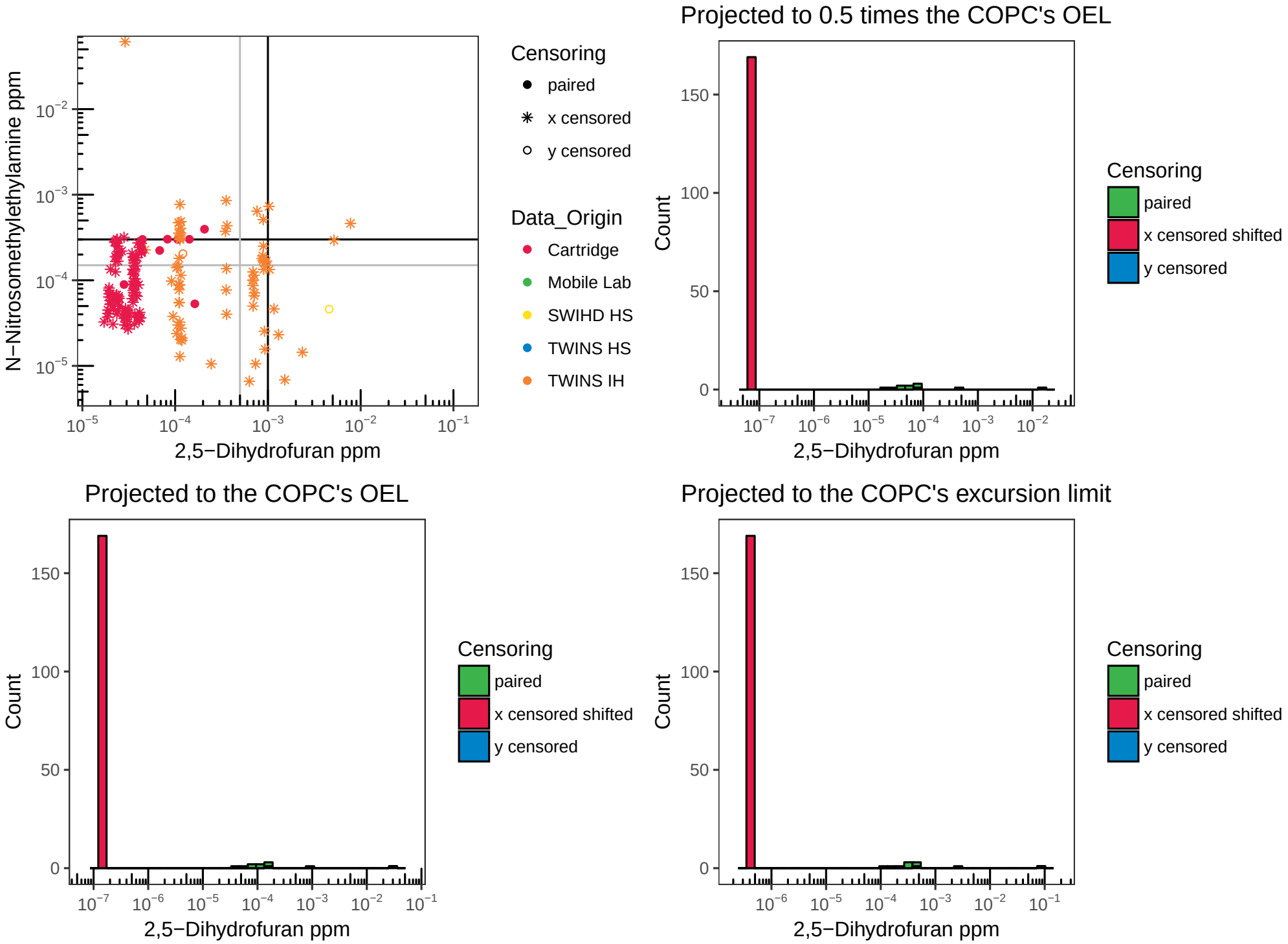


Figure C.1106: N-Nitrosomethylethylamine vs 2,5-Dihydrofuran

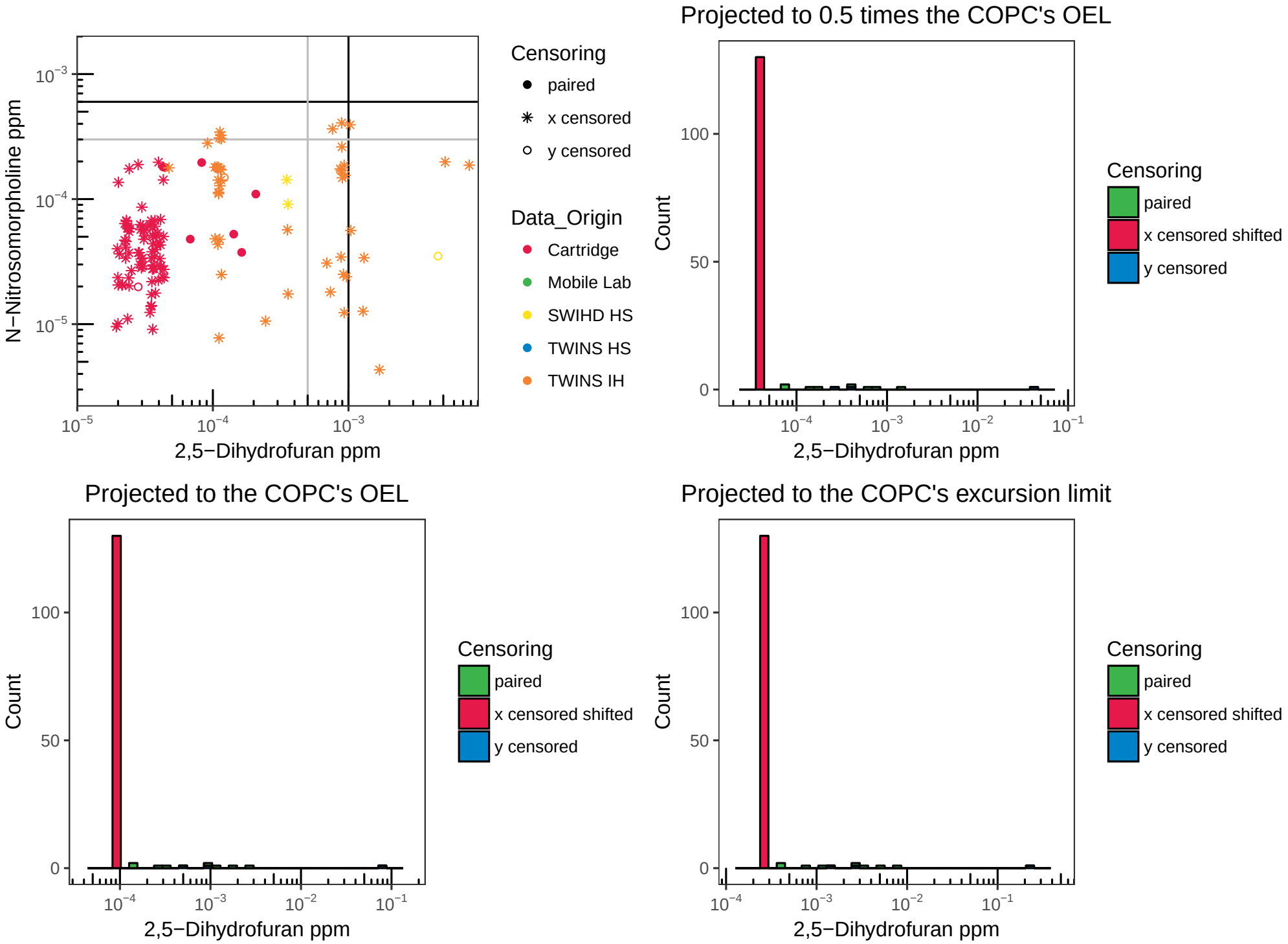


Figure C.1107: N-Nitrosomorpholine vs 2,5-Dihydrofuran

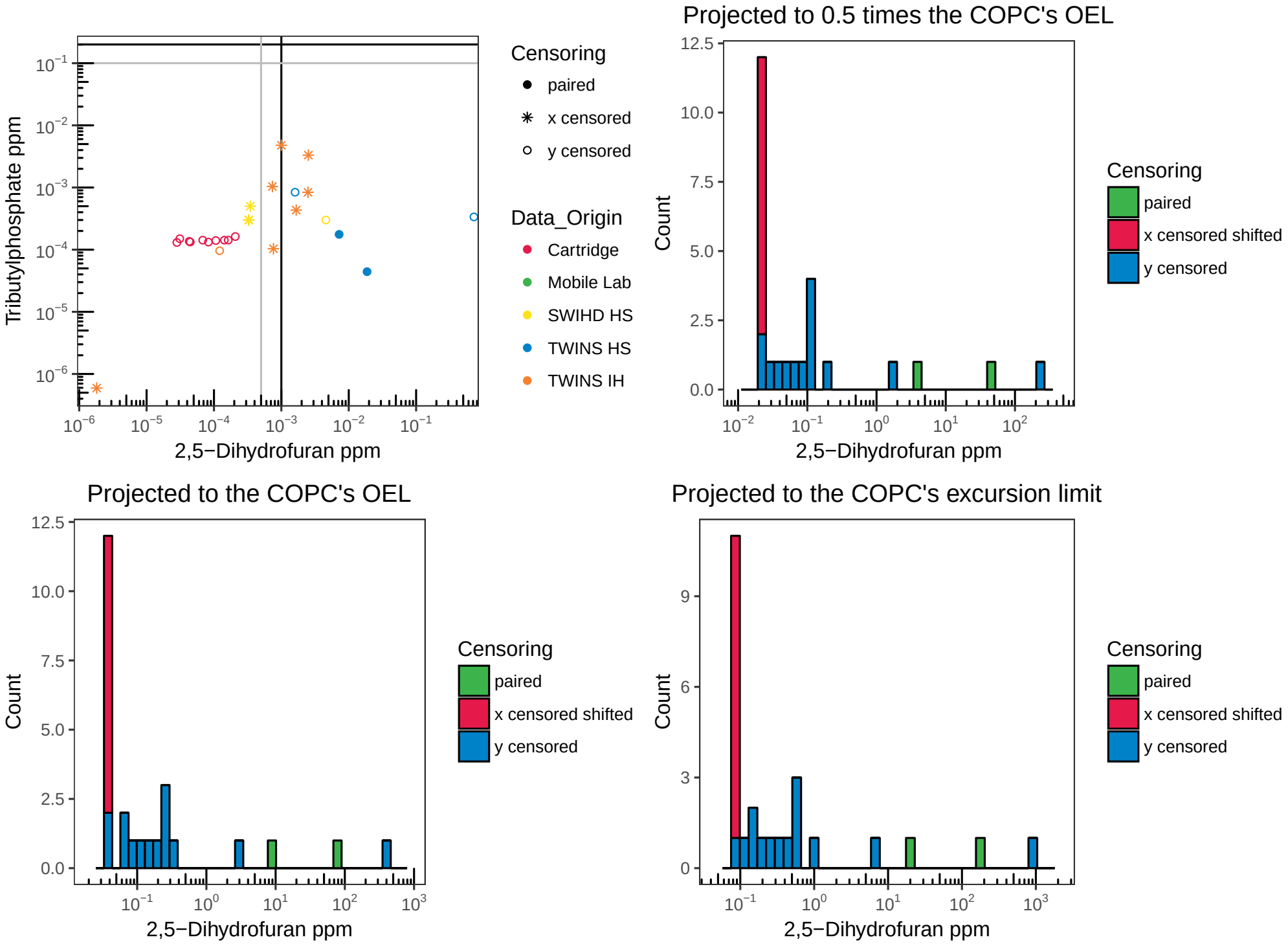


Figure C.1108: Tributylphosphate vs 2,5-Dihydrofuran

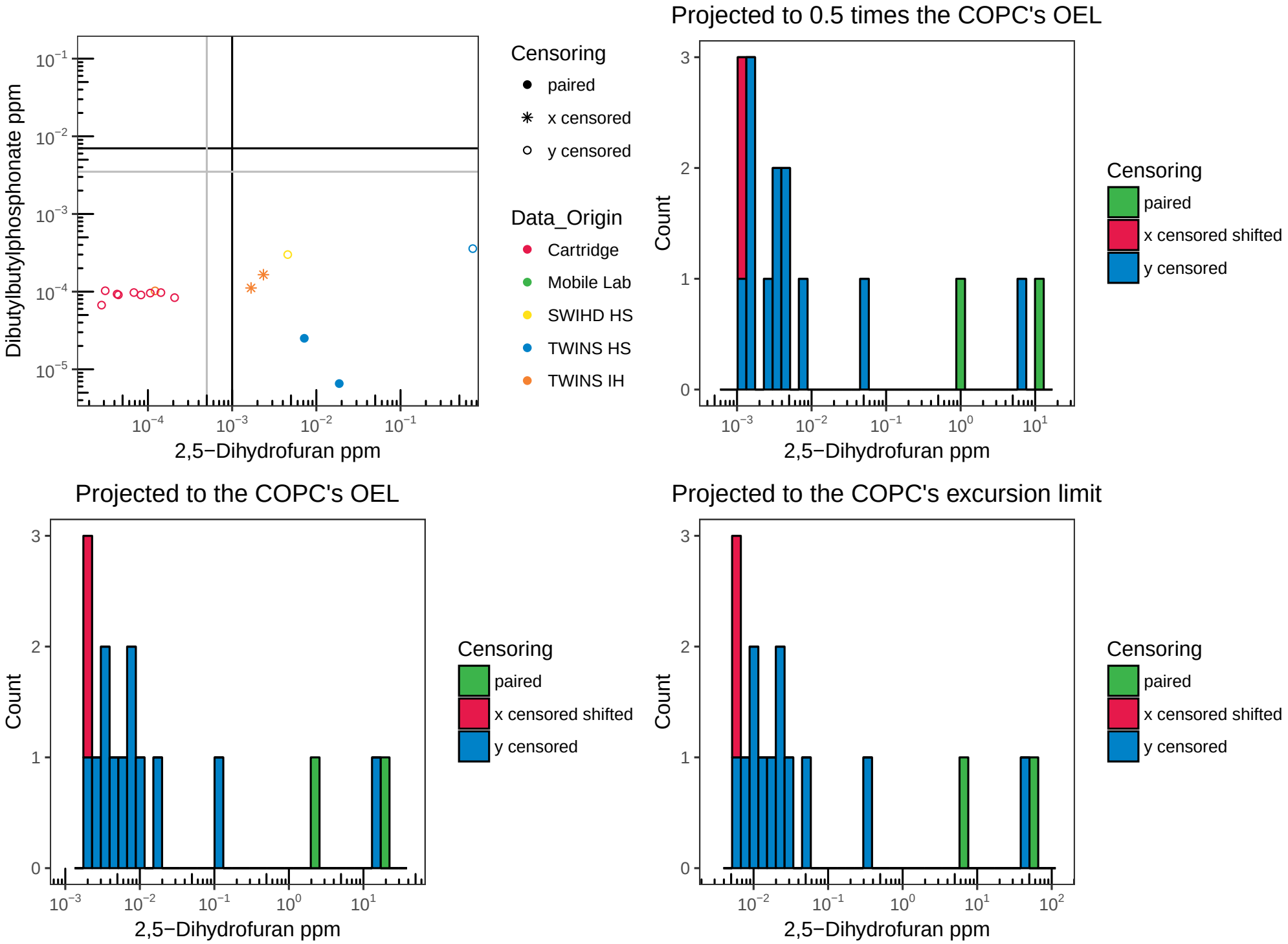


Figure C.1109: Dibutylbutylphosphonate vs 2,5-Dihydrofuran

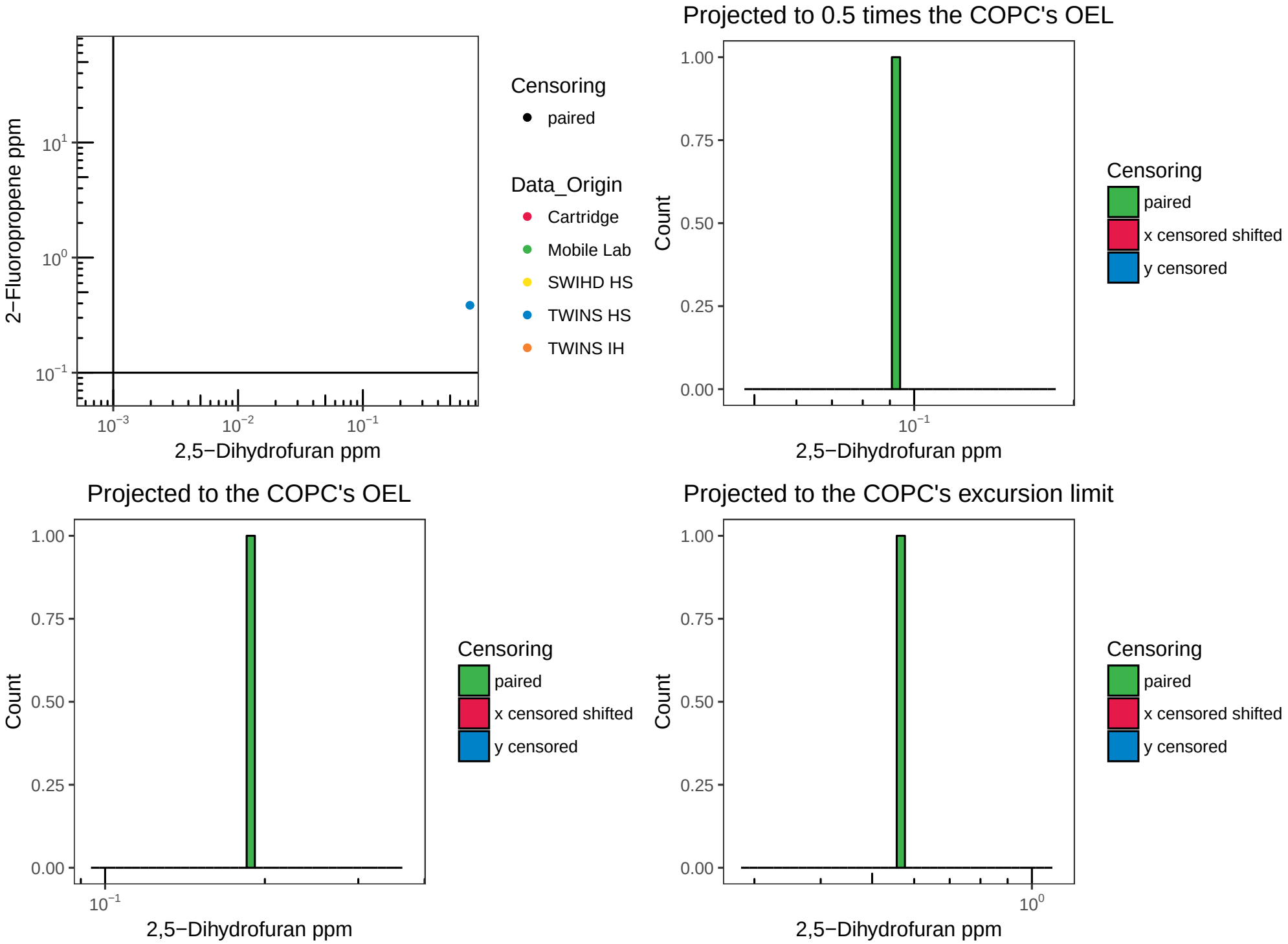


Figure C.1110: 2-Fluoropropene vs 2,5-Dihydrofuran

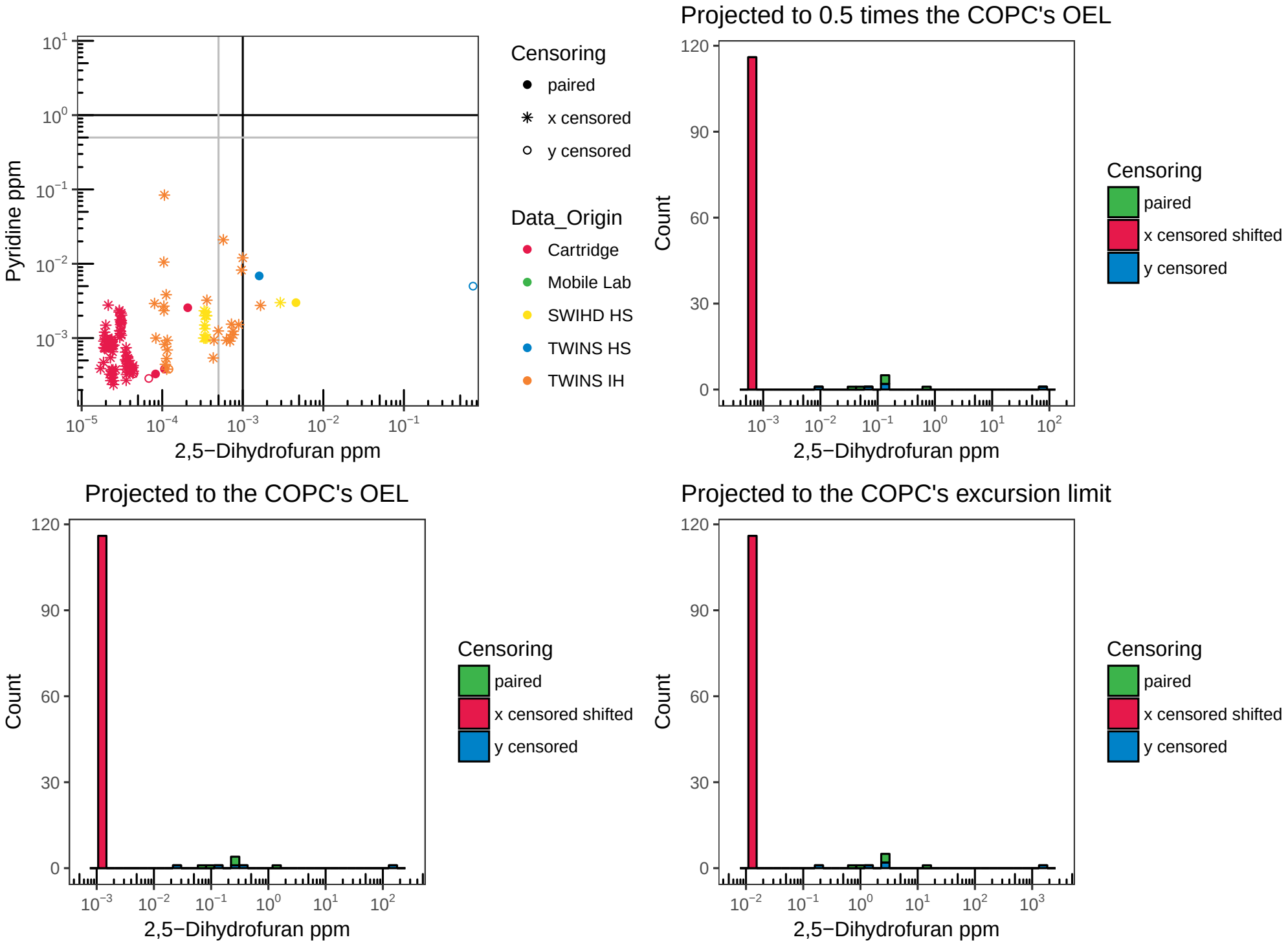


Figure C.1111: Pyridine vs 2,5-Dihydrofuran

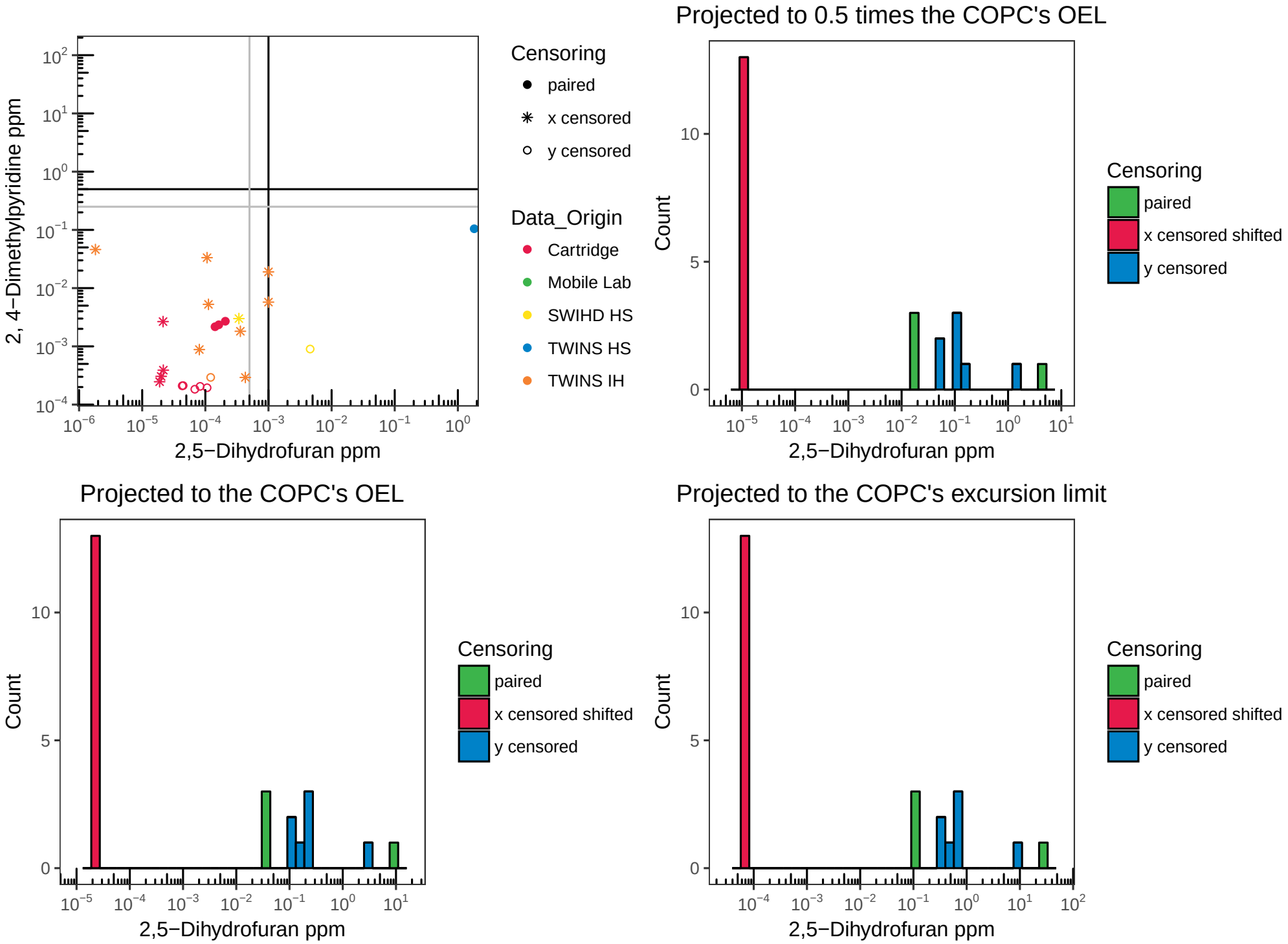


Figure C.1112: 2, 4-Dimethylpyridine vs 2,5-Dihydrofuran

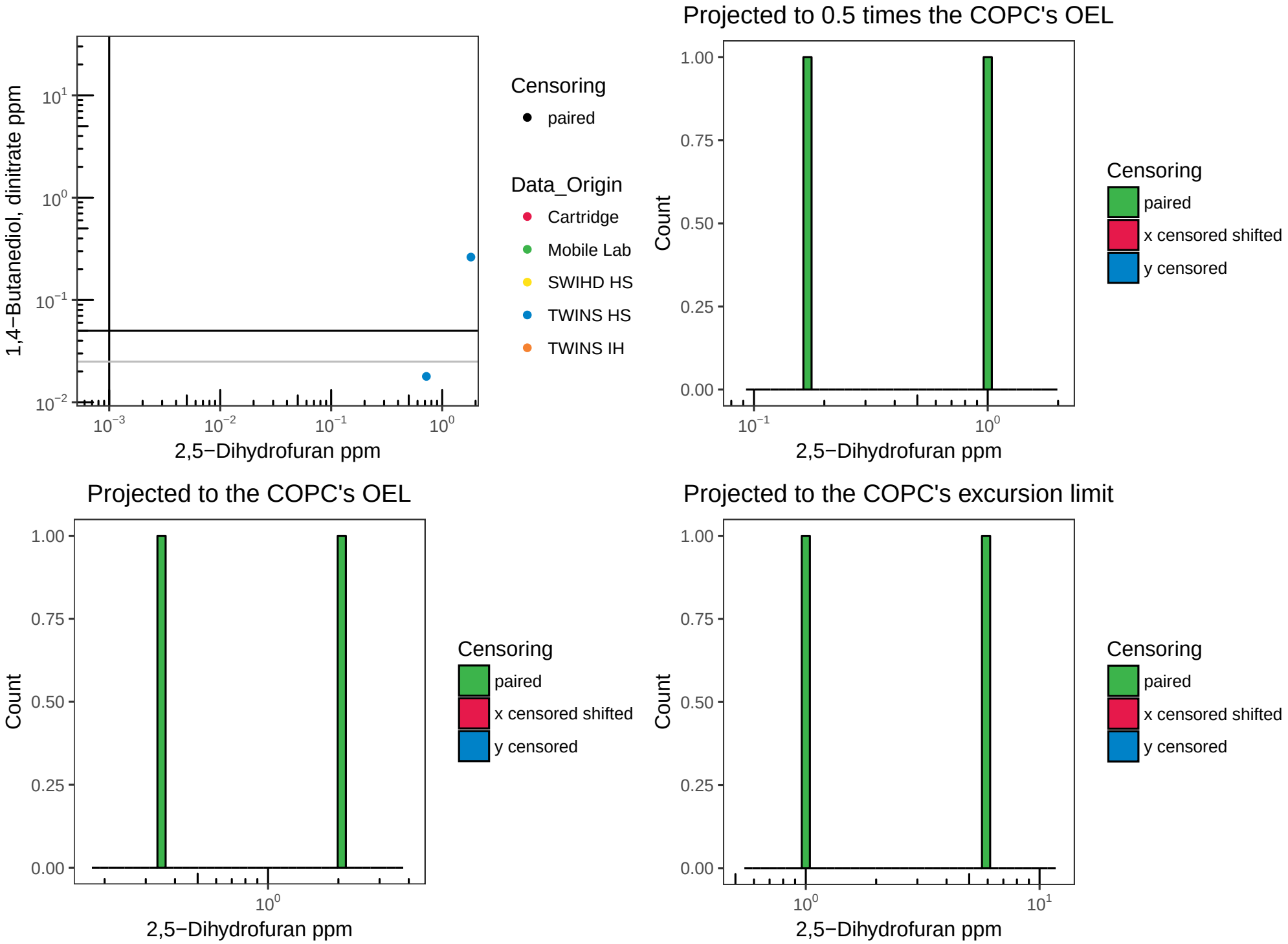


Figure C.1113: 1,4-Butanediol, dinitrate vs 2,5-Dihydrofuran

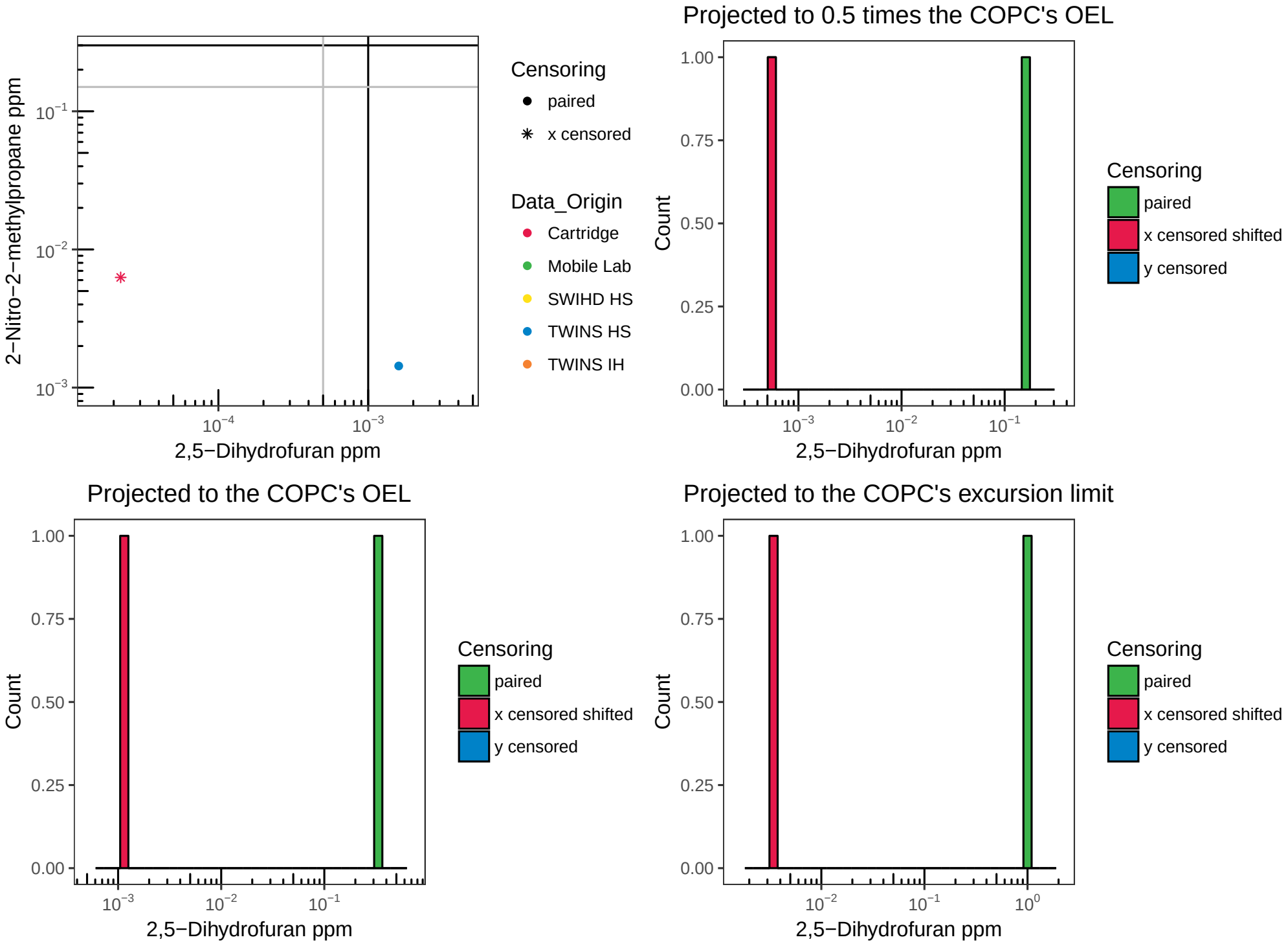


Figure C.1114: 2-Nitro-2-methylpropane vs 2,5-Dihydrofuran

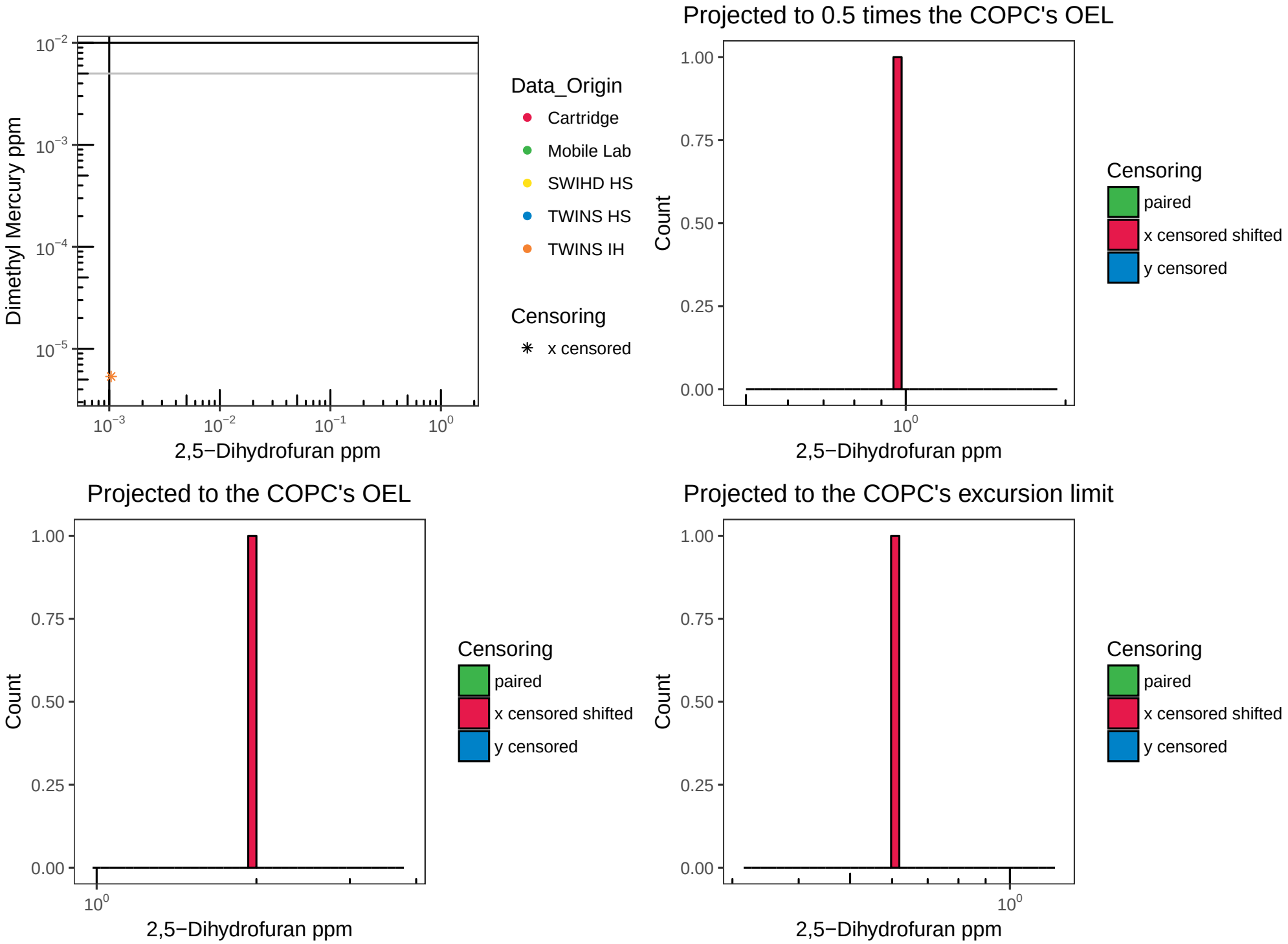


Figure C.1115: Dimethyl Mercury vs 2,5-Dihydrofuran

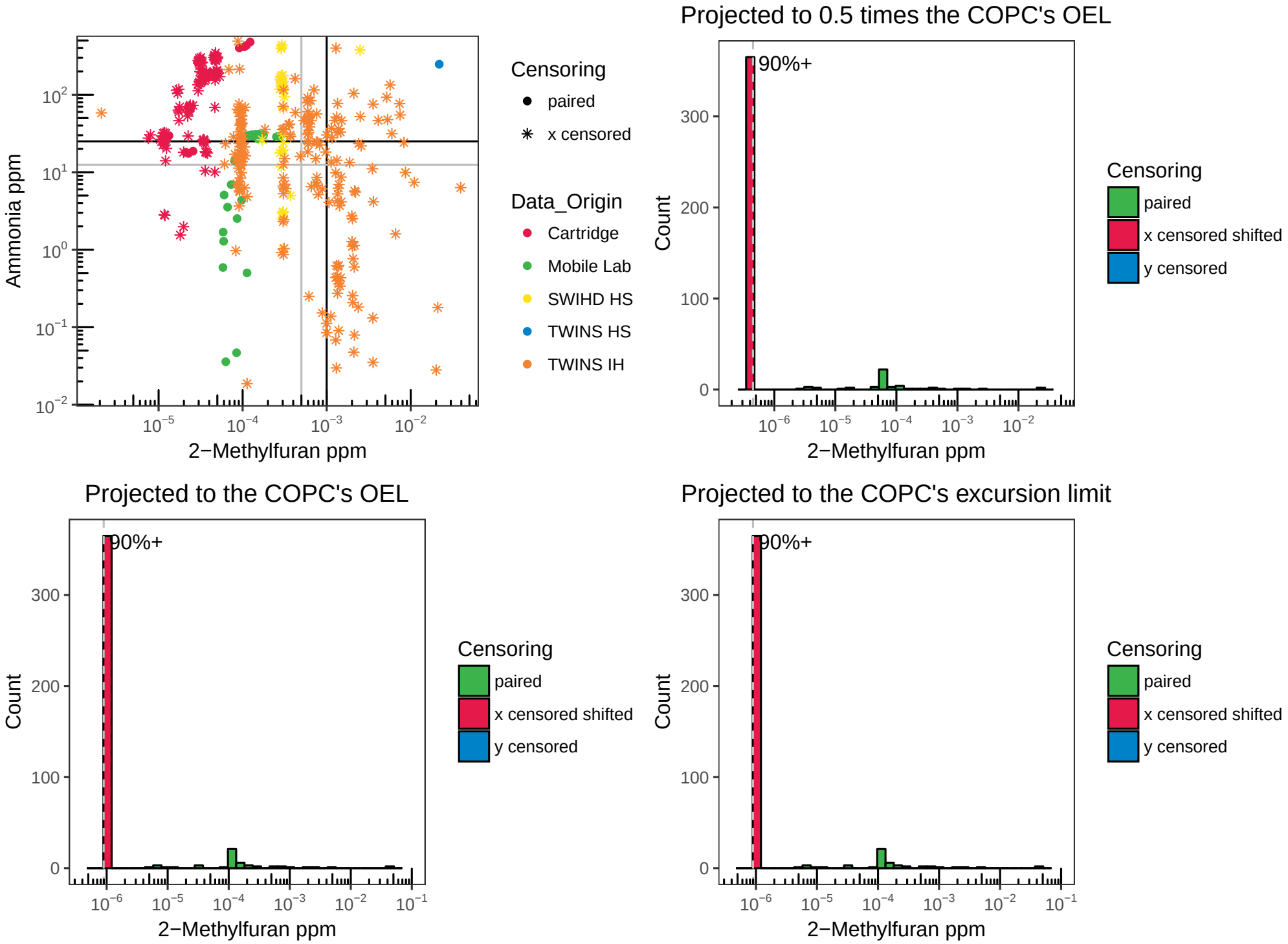


Figure C.1116: Ammonia vs 2-Methylfuran

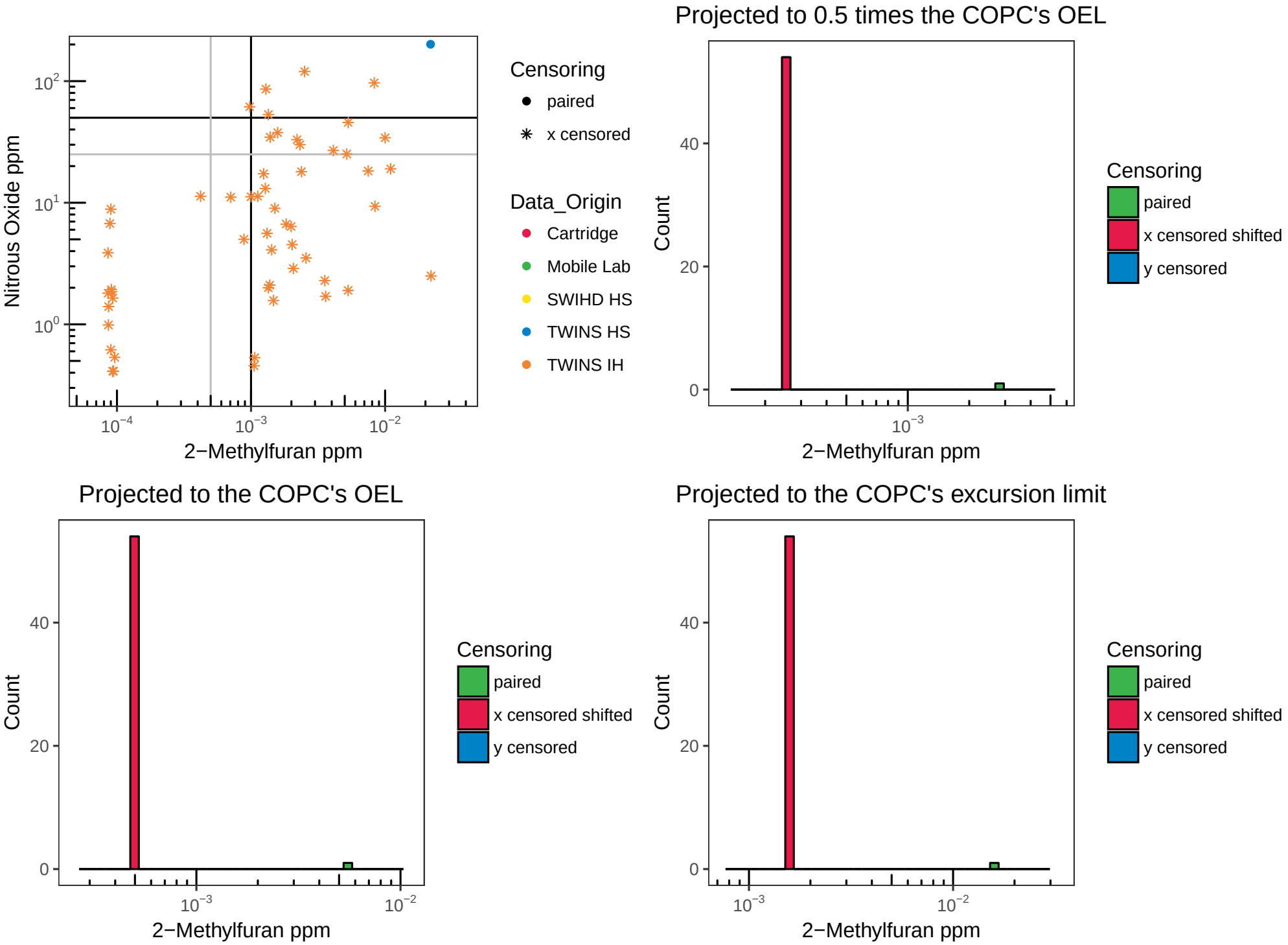


Figure C.1117: Nitrous Oxide vs 2-Methylfuran

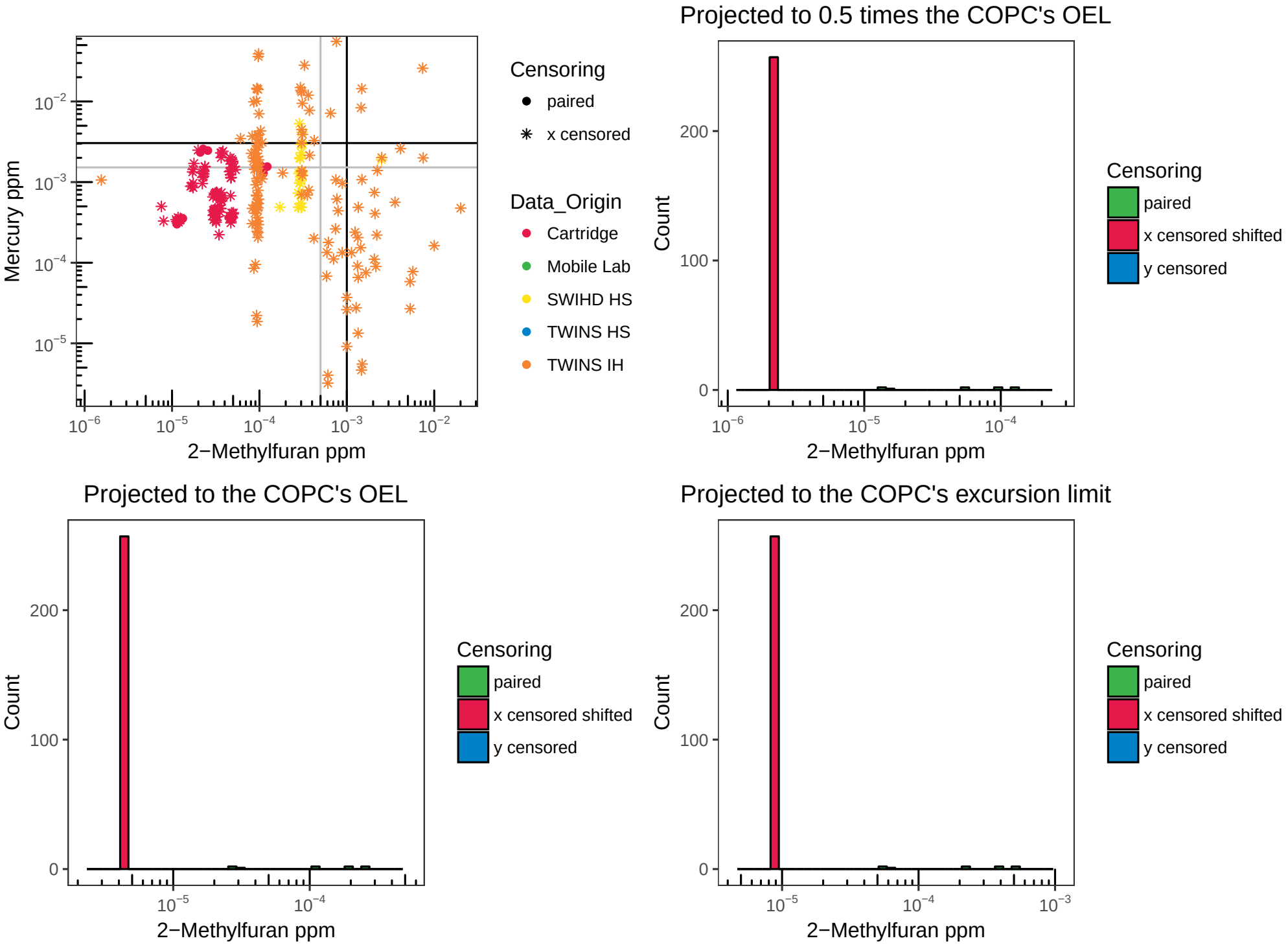


Figure C.1118: Mercury vs 2-Methylfuran

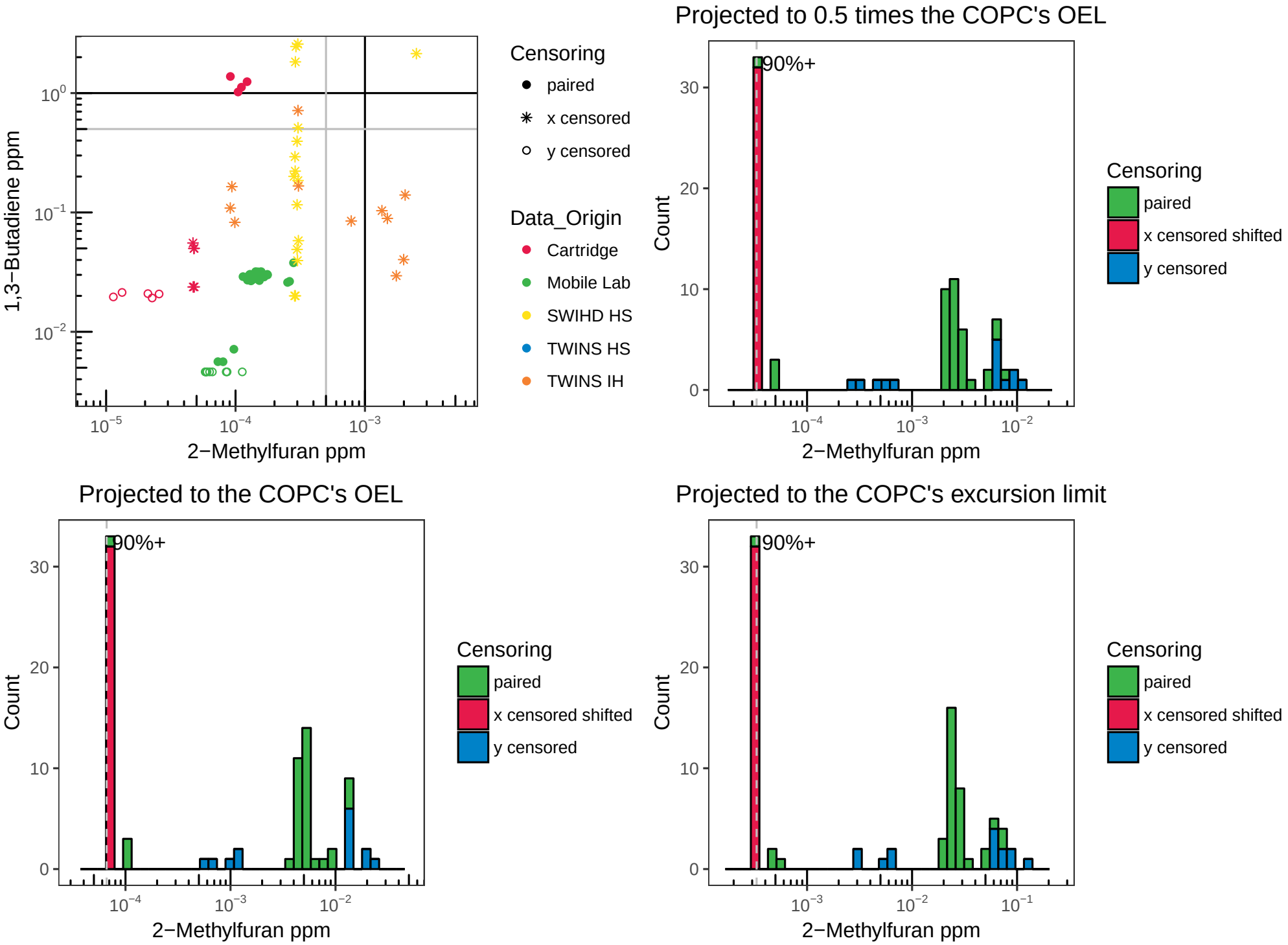


Figure C.1119: 1,3-Butadiene vs 2-Methylfuran

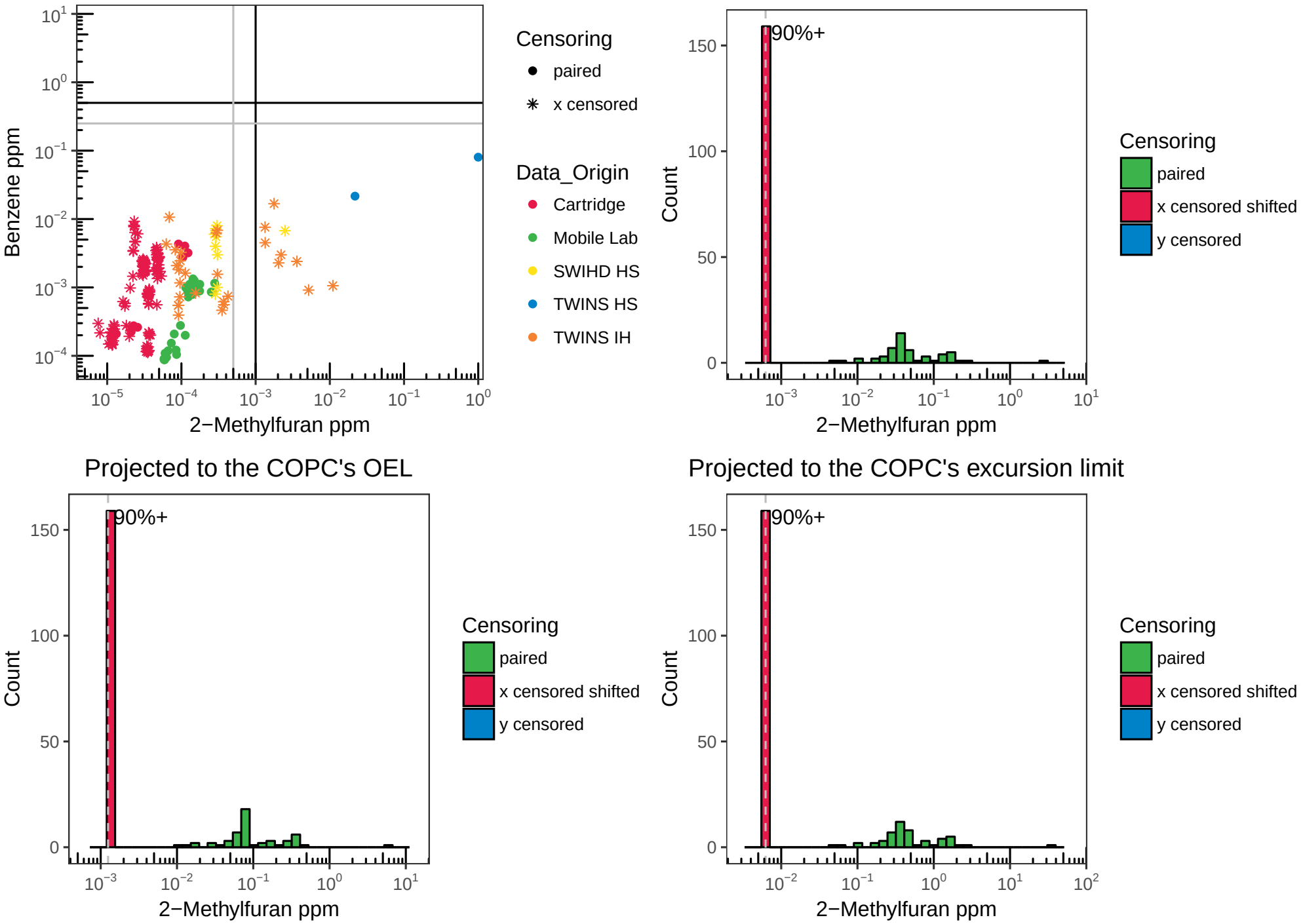


Figure C.1120: Benzene vs 2-Methylfuran

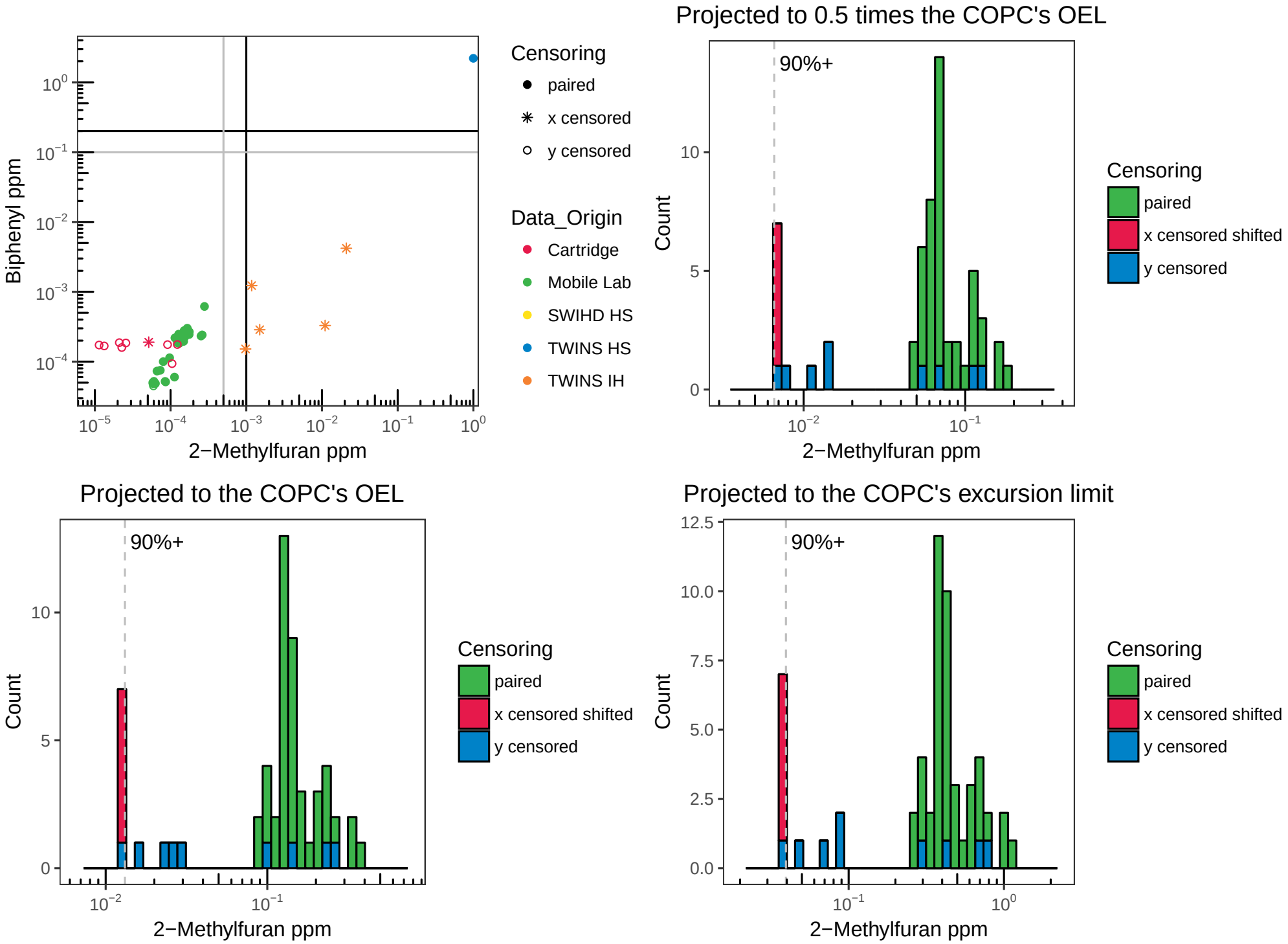


Figure C.1121: Biphenyl vs 2-Methylfuran

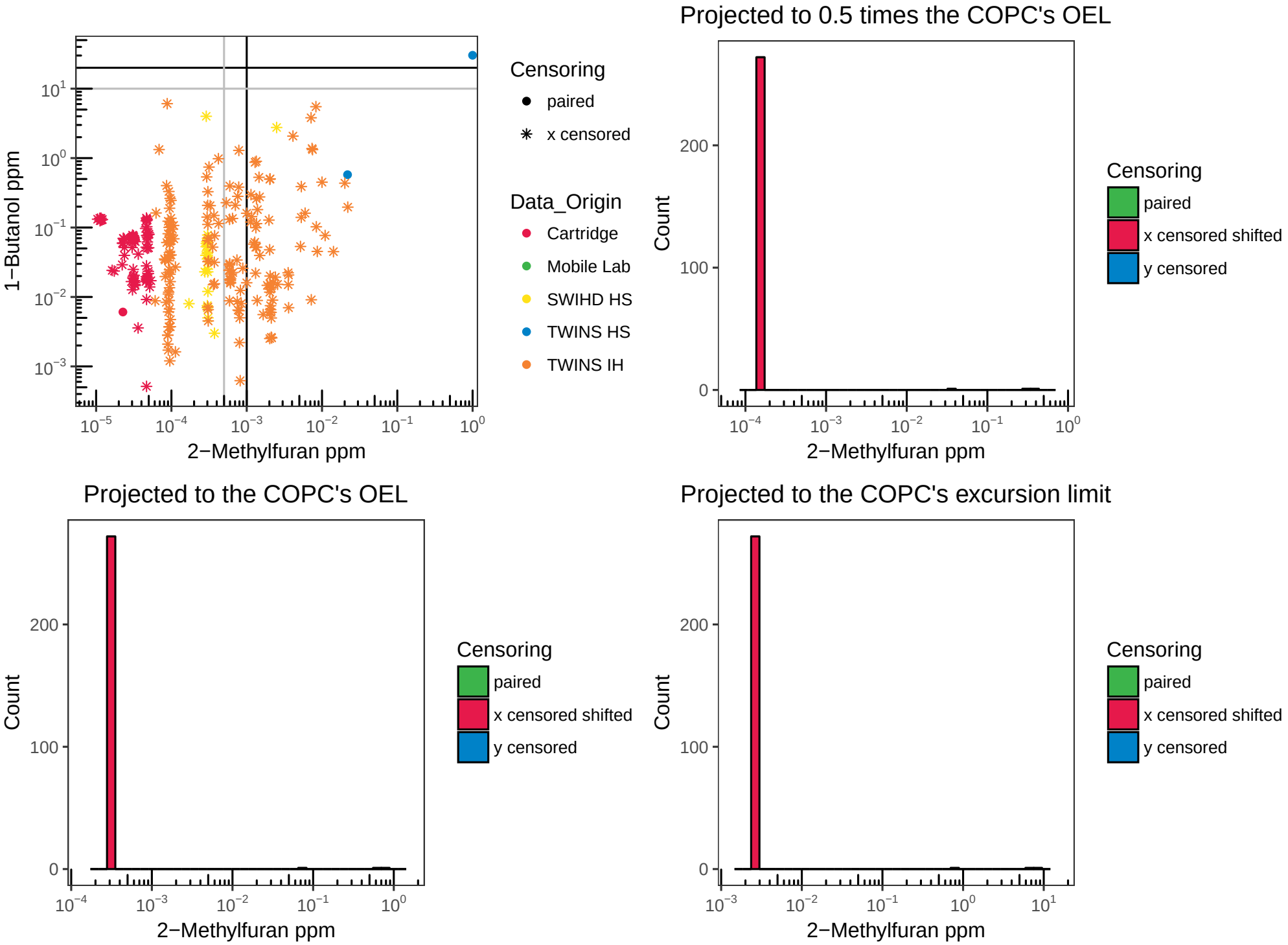


Figure C.1122: 1-Butanol vs 2-Methylfuran

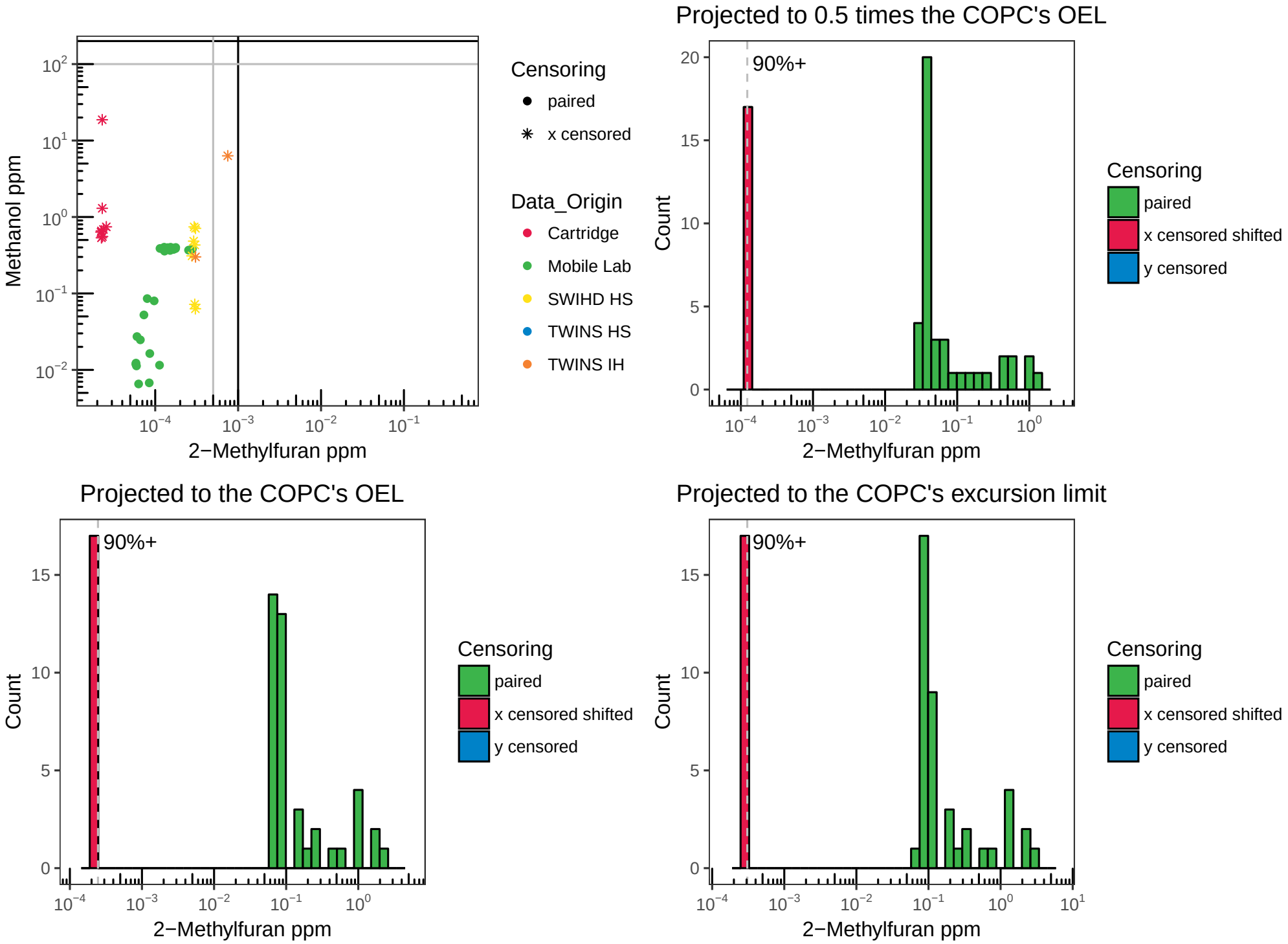


Figure C.1123: Methanol vs 2-Methylfuran

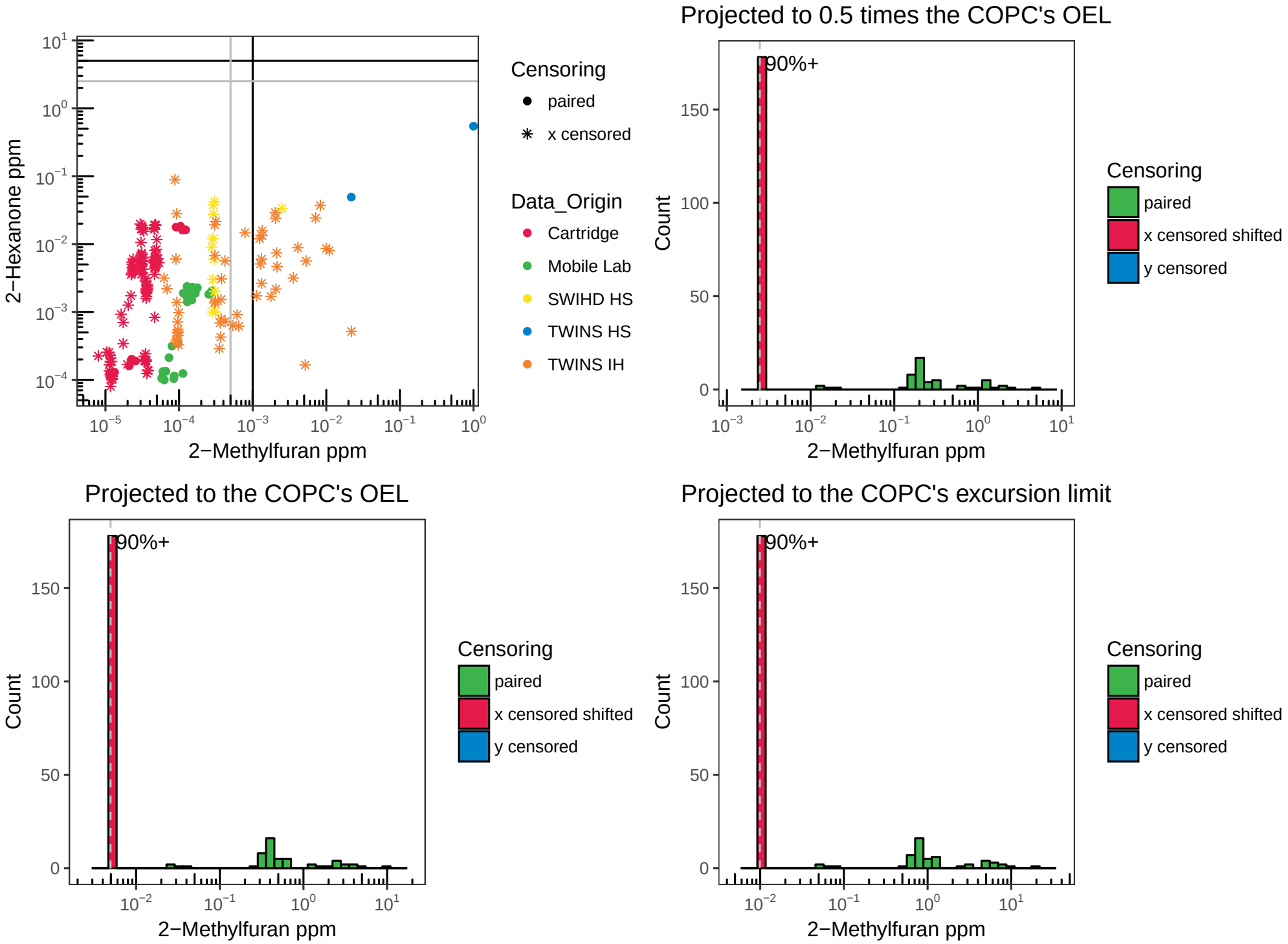


Figure C.1124: 2-Hexanone vs 2-Methylfuran

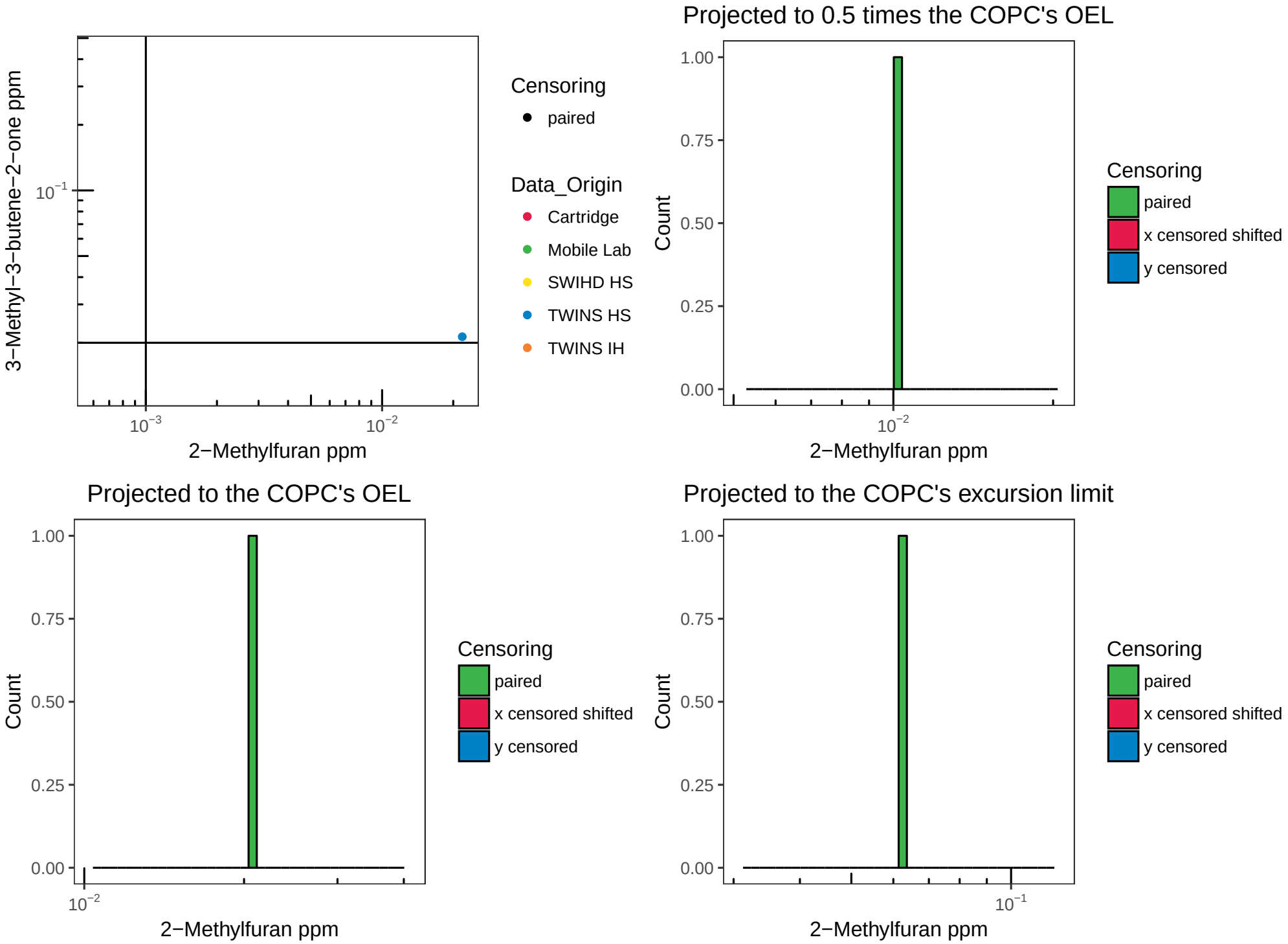


Figure C.1125: 3-Methyl-3-butene-2-one vs 2-Methylfuran

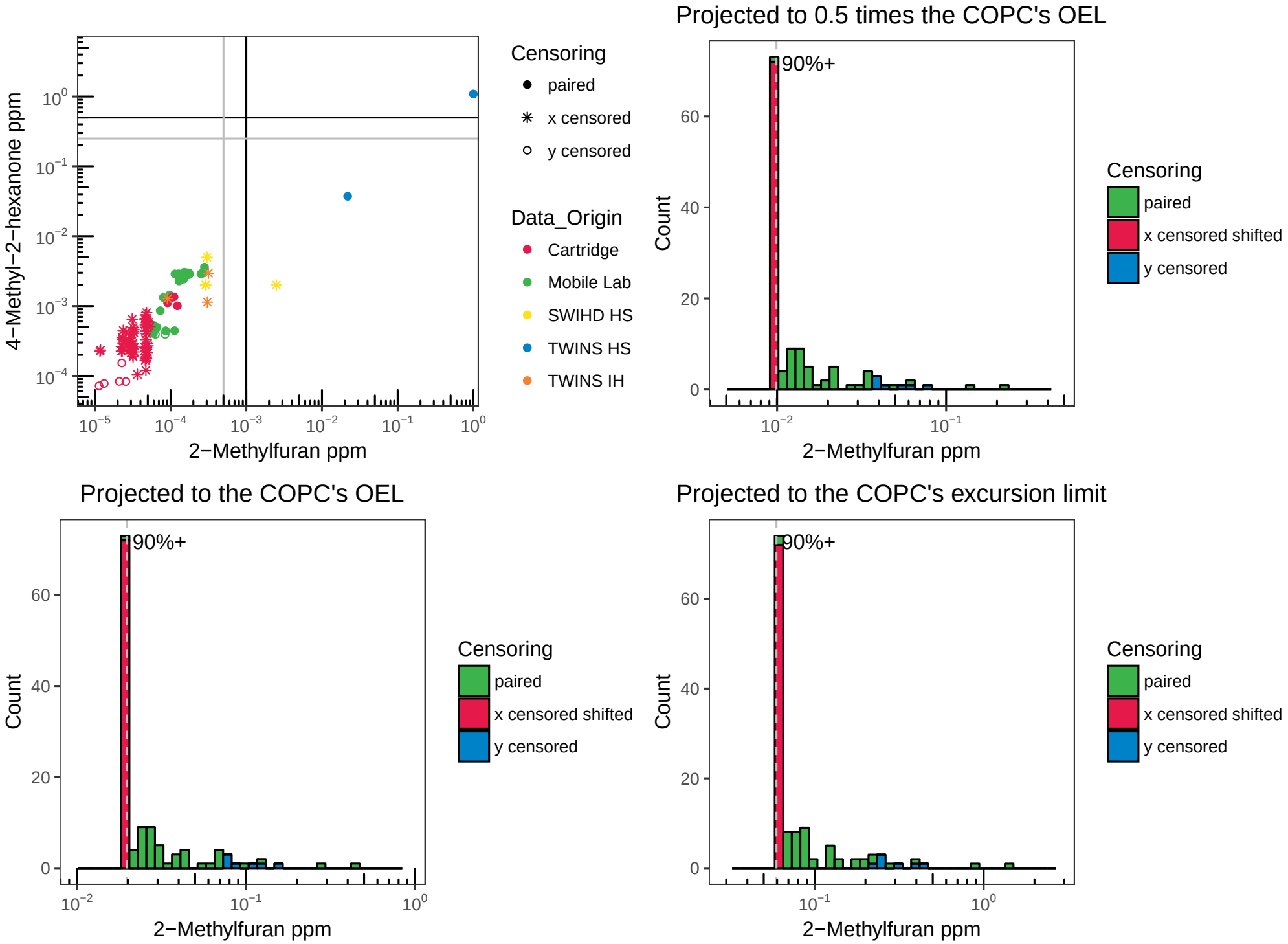


Figure C.1126: 4-Methyl-2-hexanone vs 2-Methylfuran

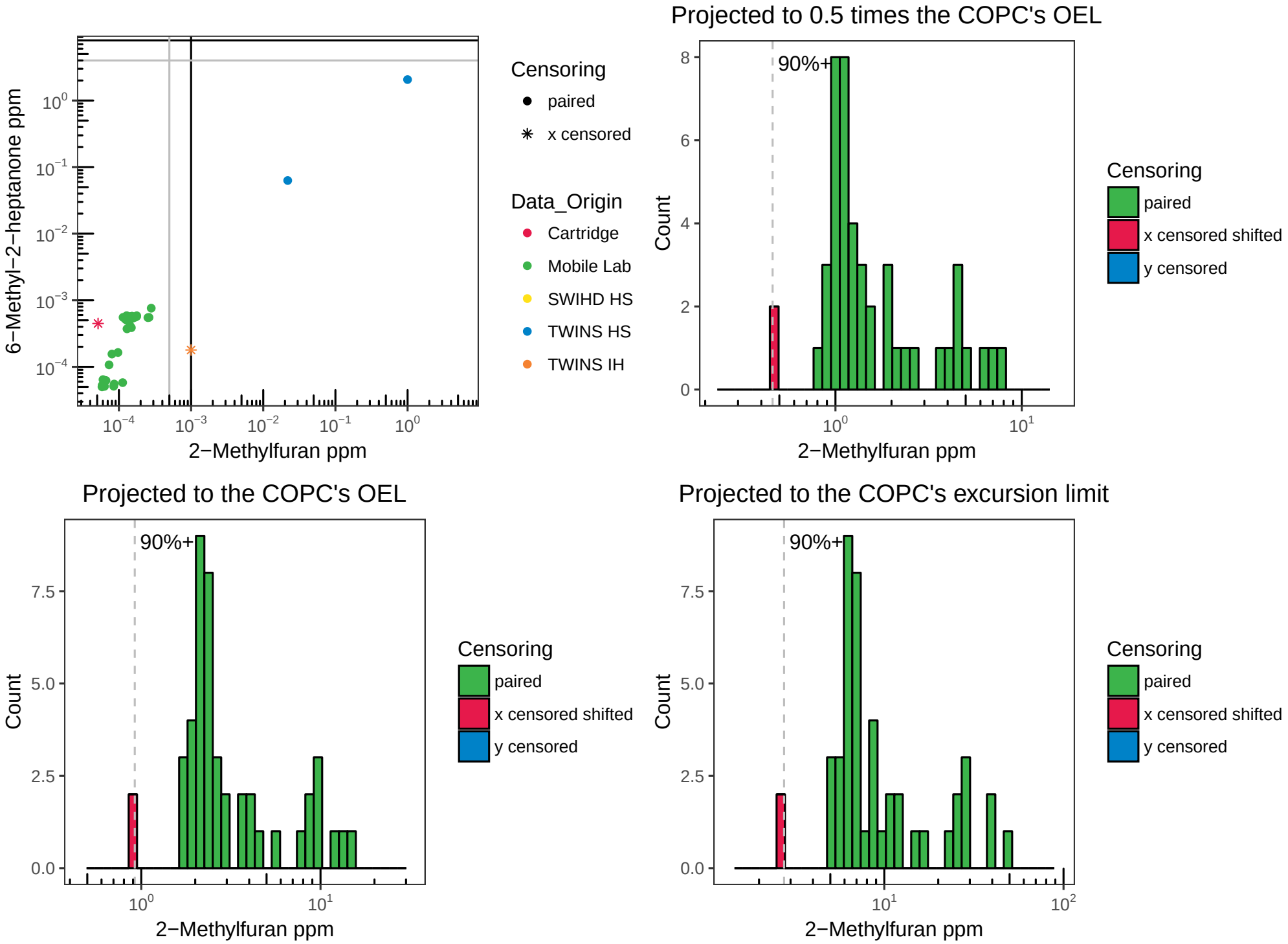


Figure C.1127: 6-Methyl-2-heptanone vs 2-Methylfuran

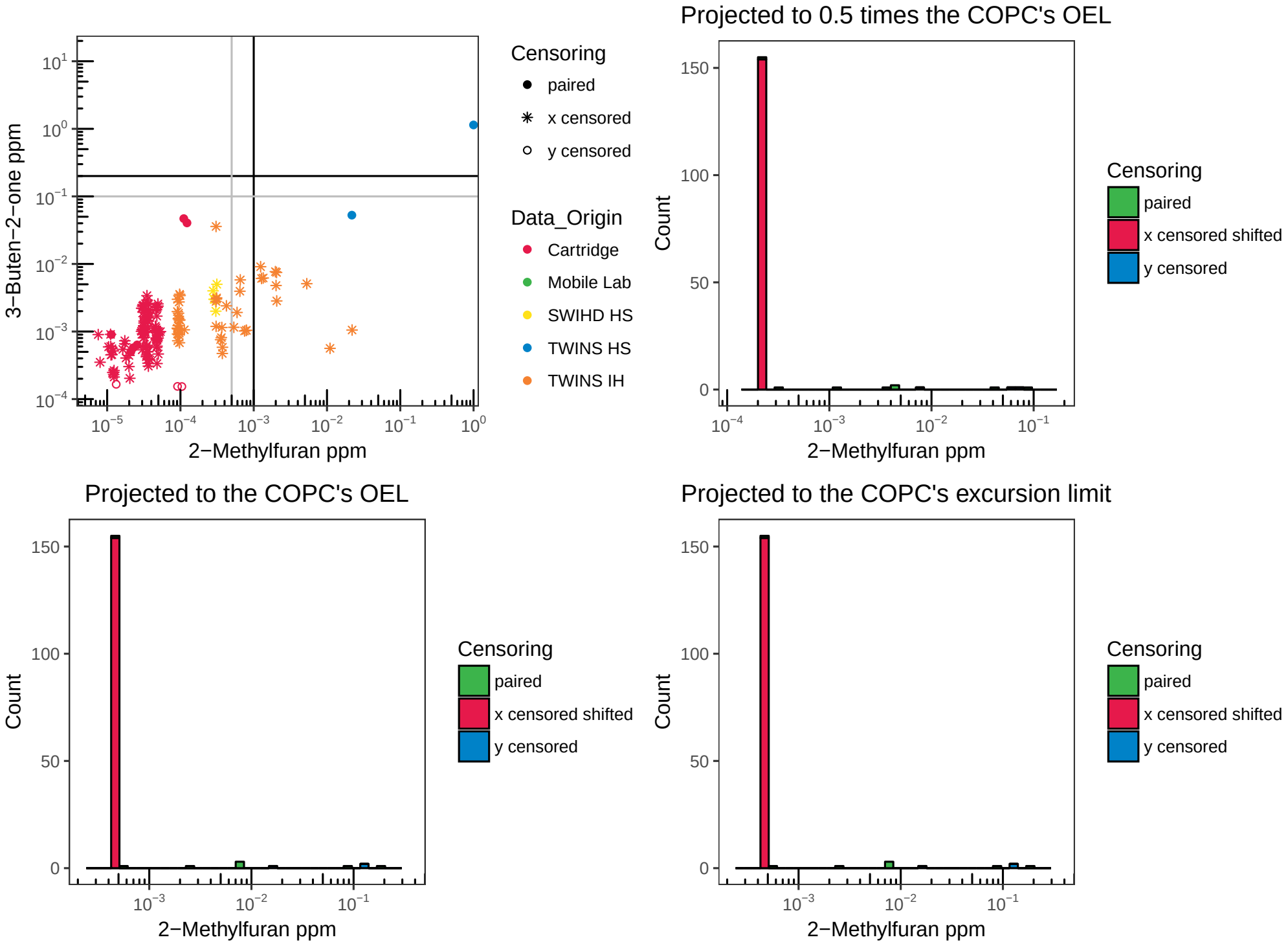


Figure C.1128: 3-Buten-2-one vs 2-Methylfuran

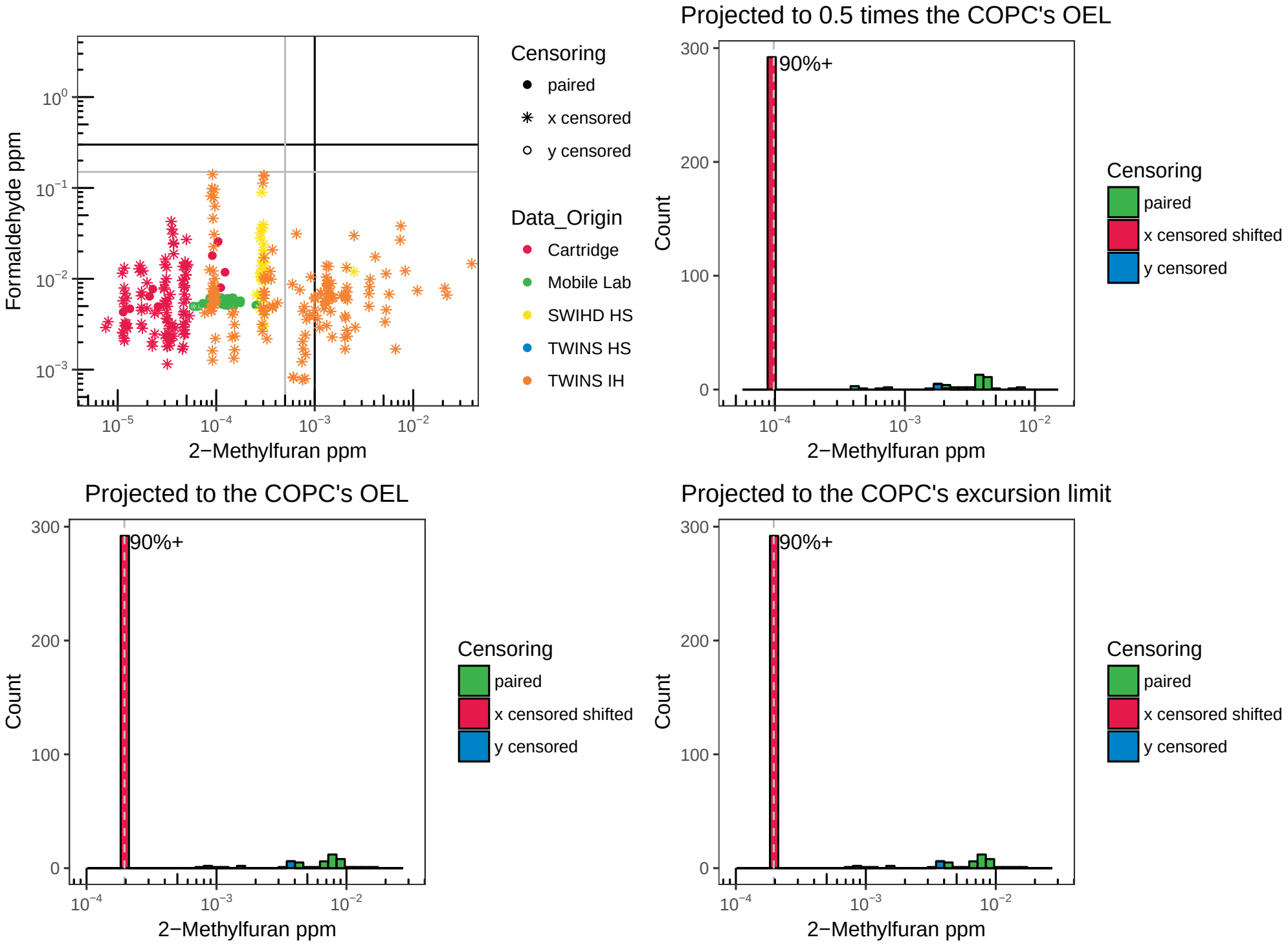


Figure C.1129: Formaldehyde vs 2-Methylfuran

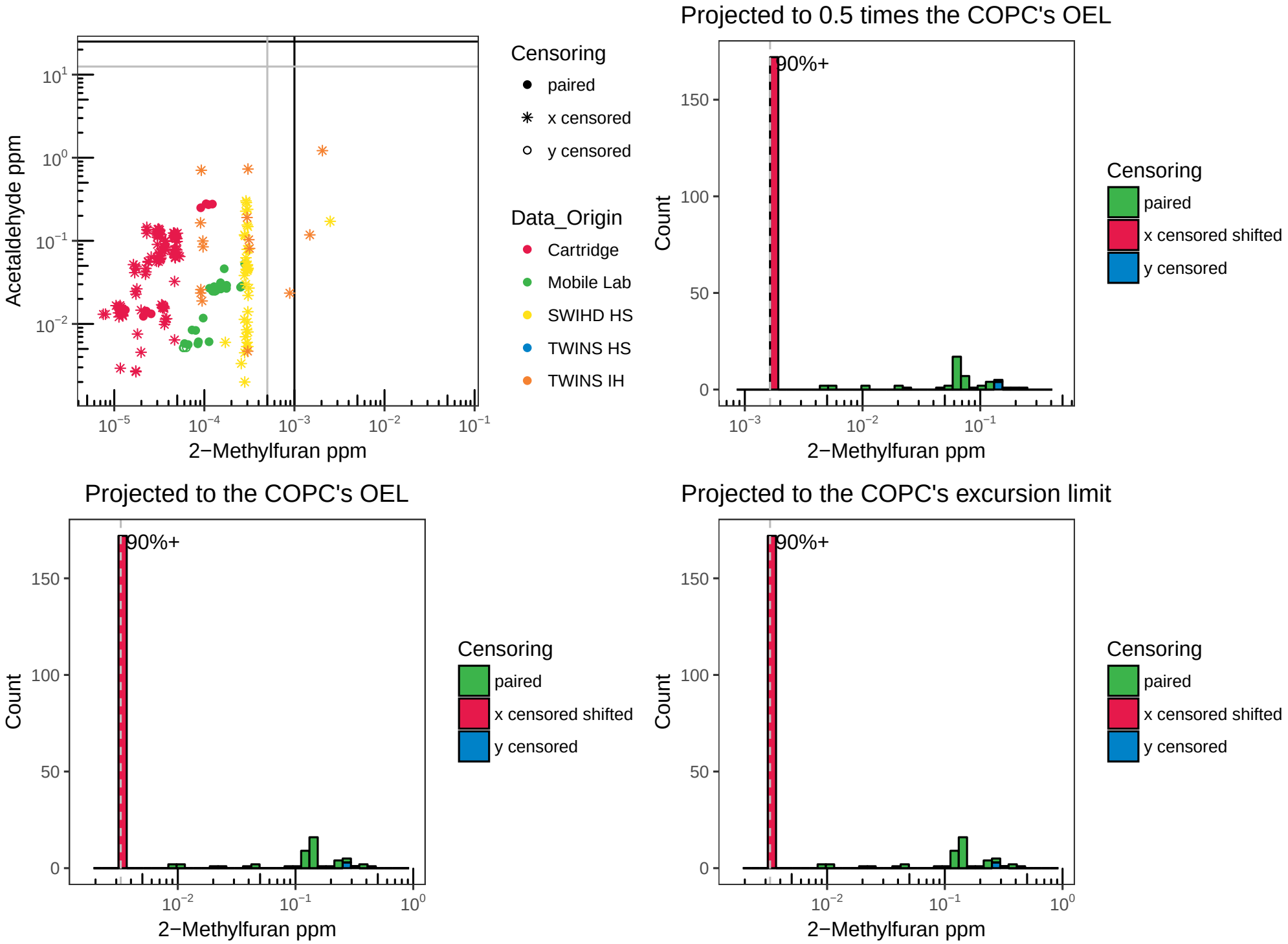


Figure C.1130: Acetaldehyde vs 2-Methylfuran

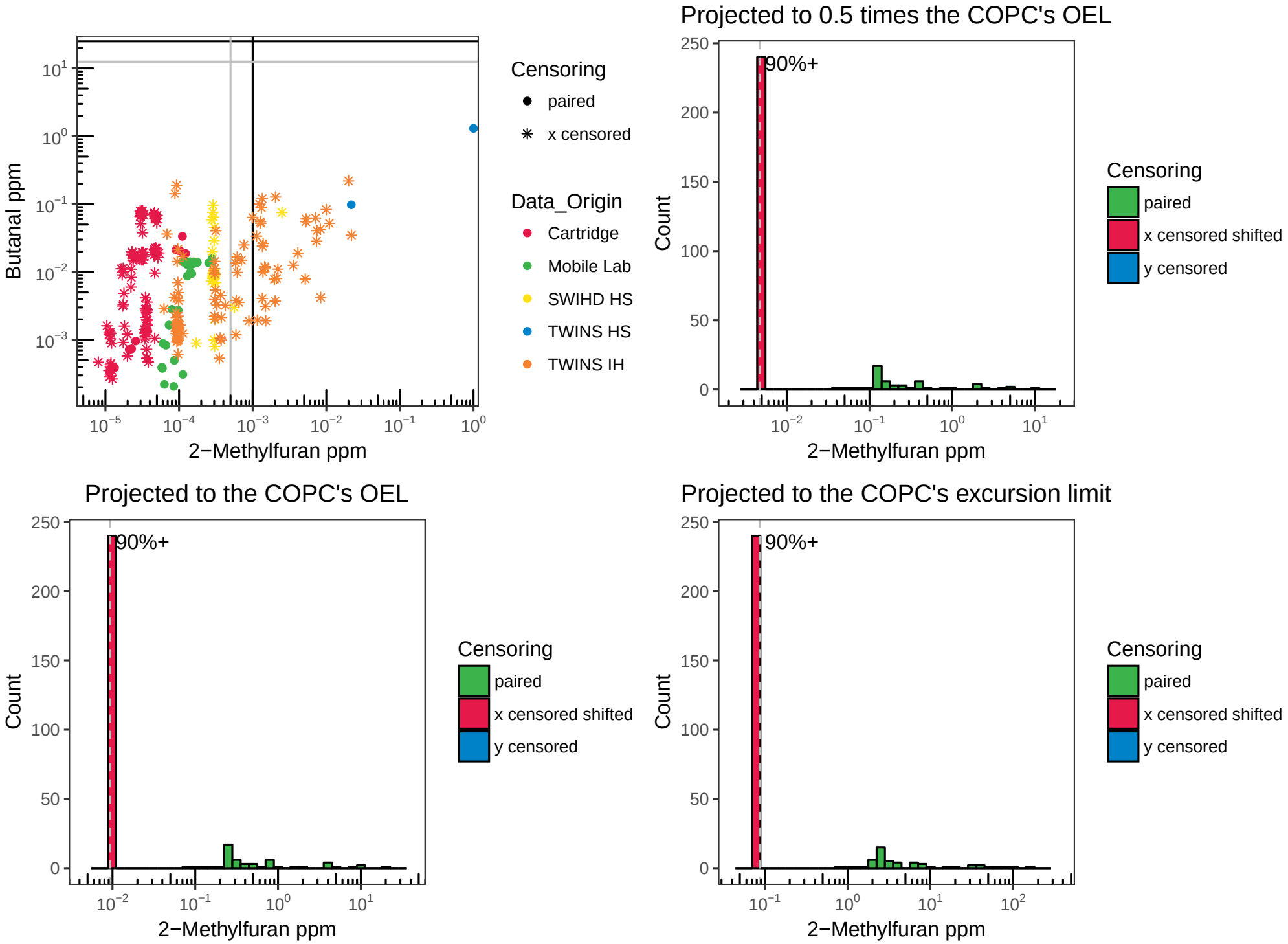


Figure C.1131: Butanal vs 2-Methylfuran

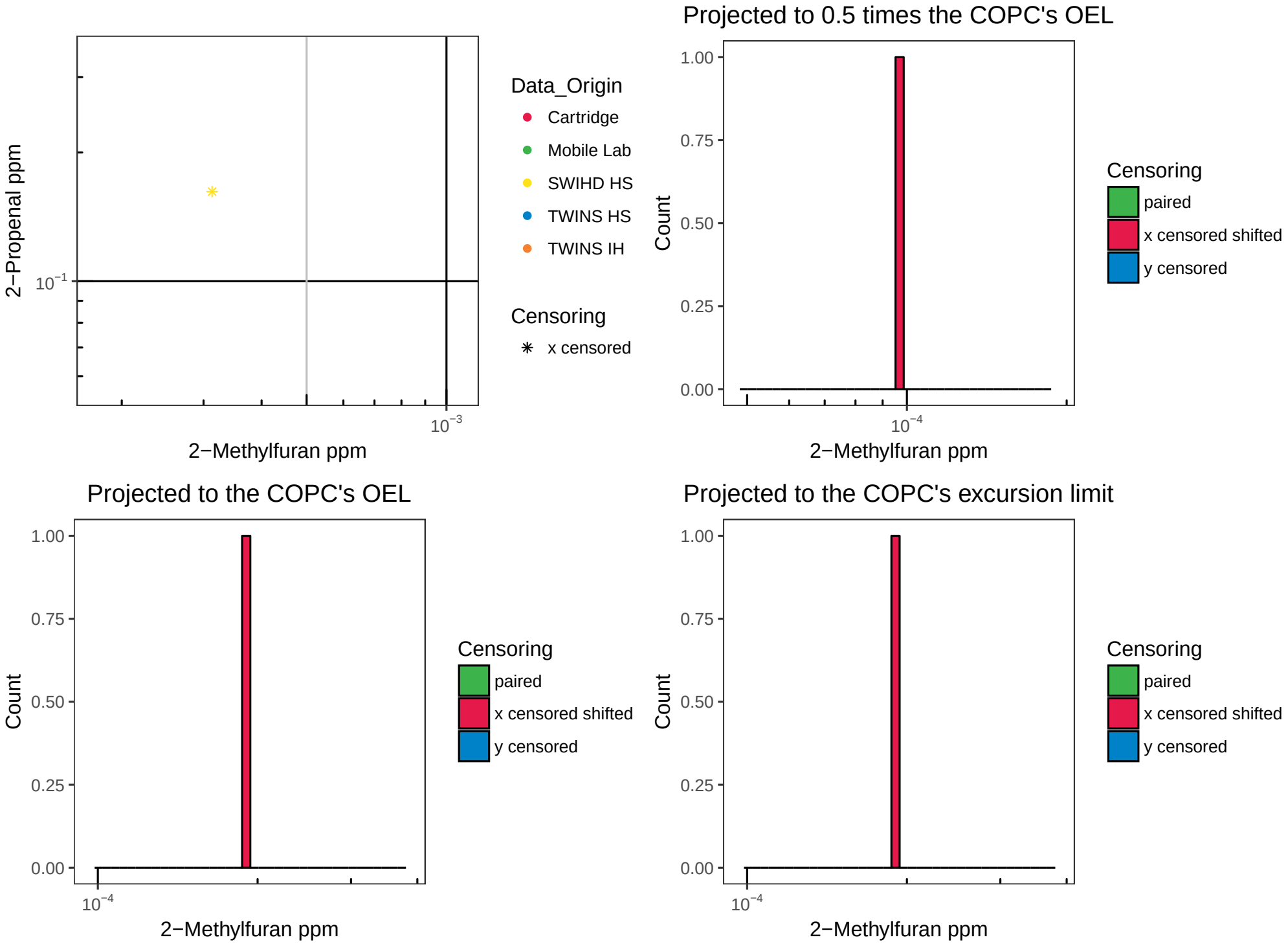


Figure C.1132: 2-Propenal vs 2-Methylfuran

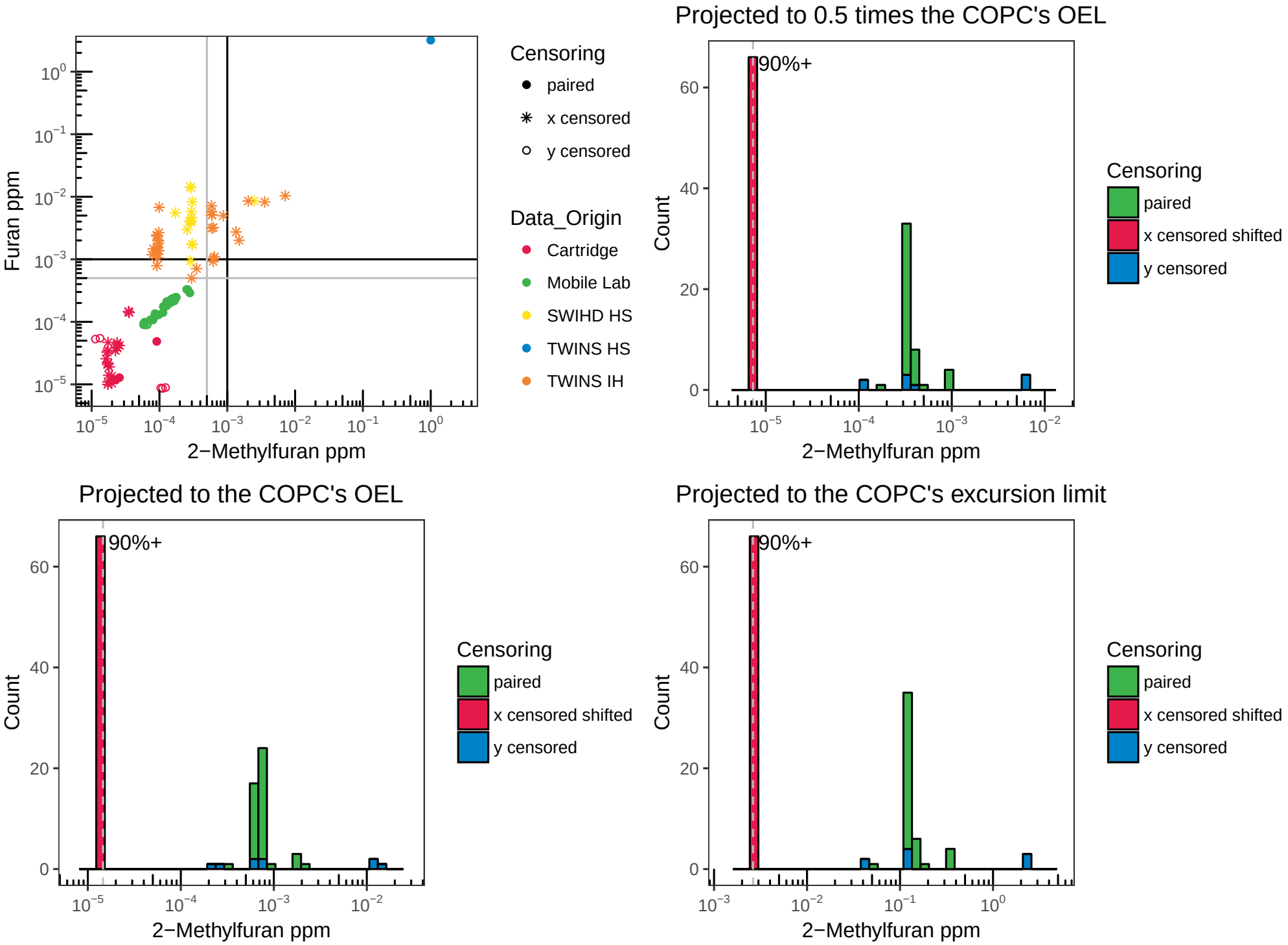


Figure C.1133: Furan vs 2-Methylfuran

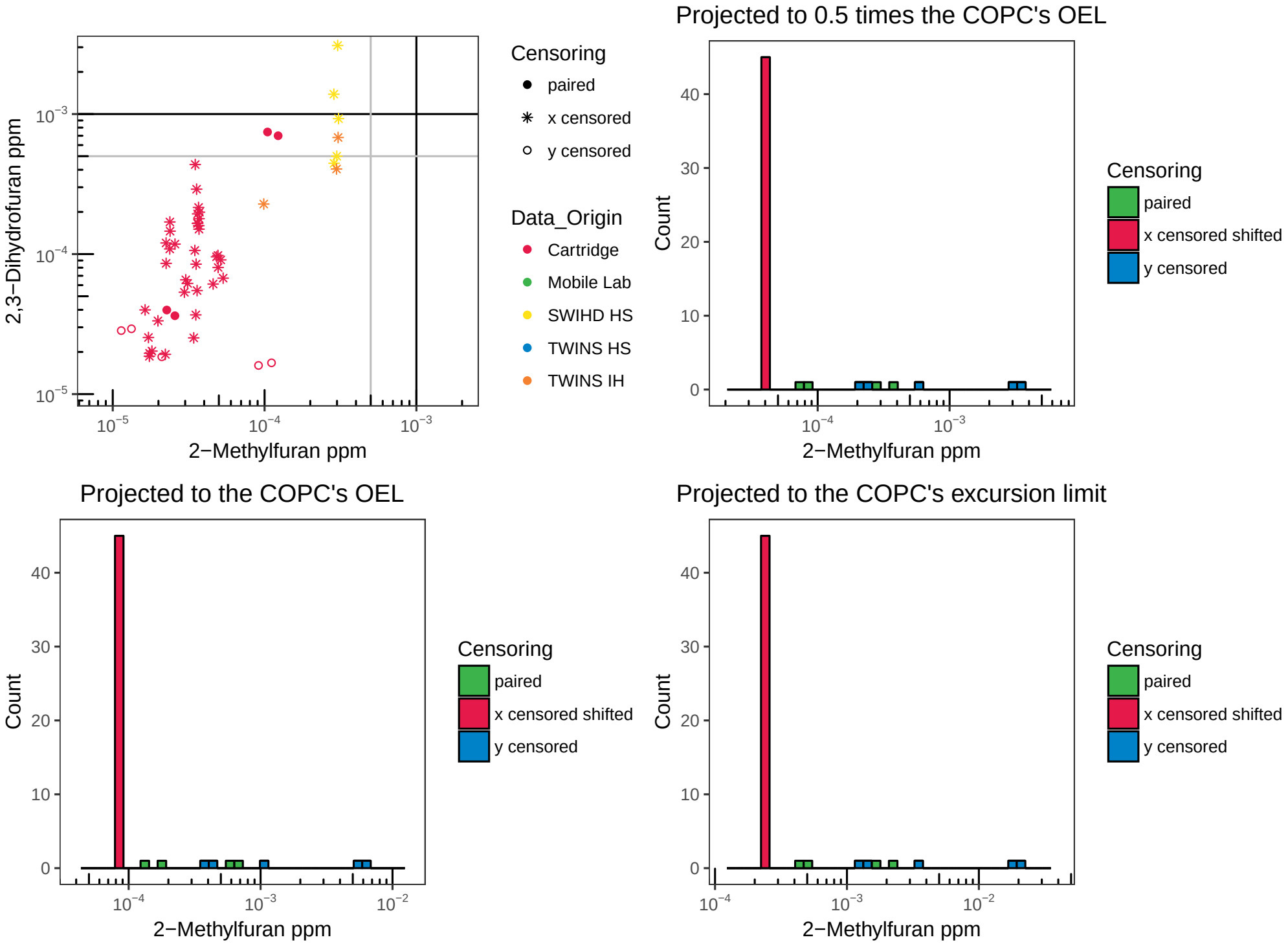


Figure C.1134: 2,3-Dihydrofuran vs 2-Methylfuran

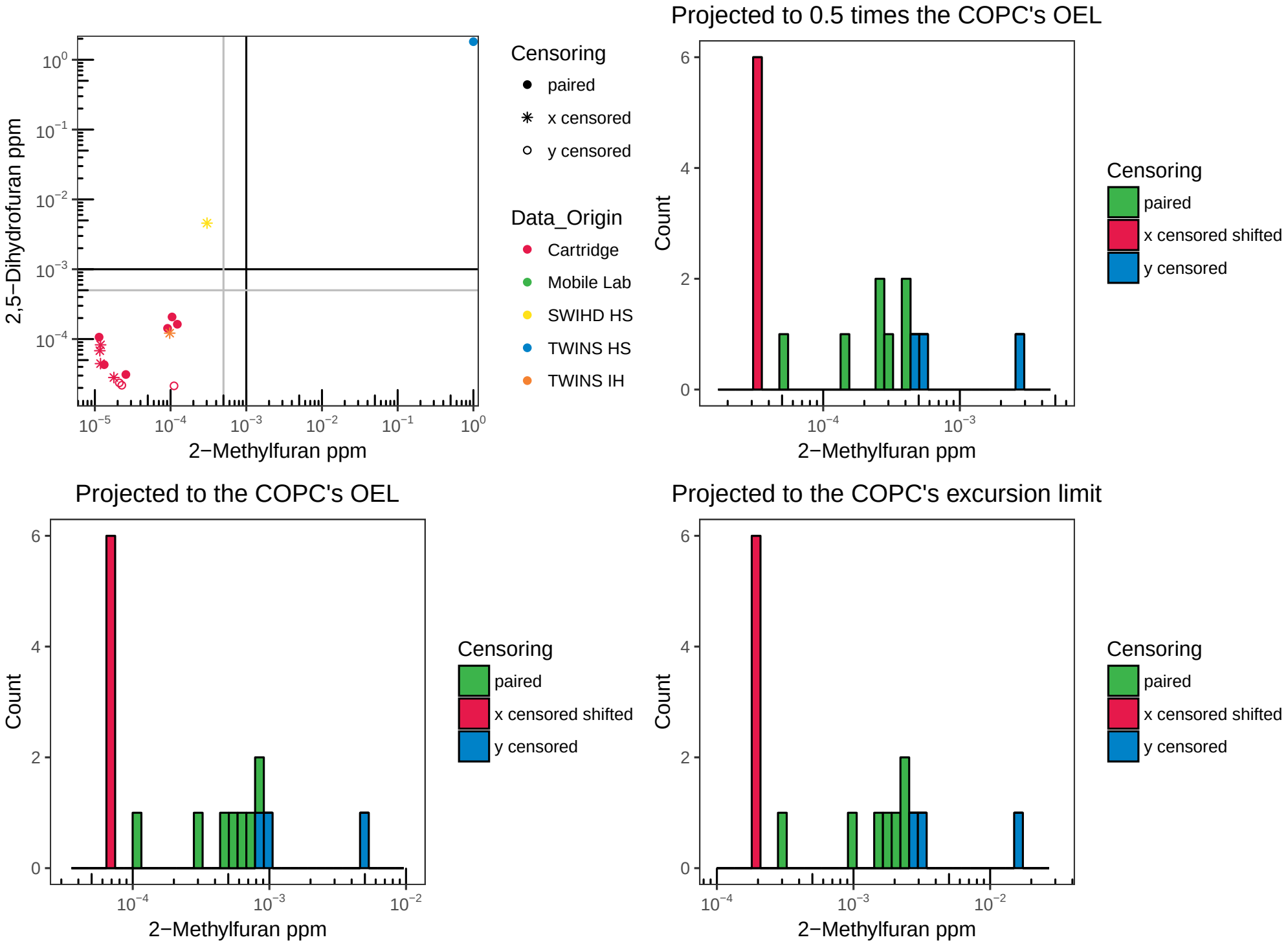


Figure C.1135: 2,5-Dihydrofuran vs 2-Methylfuran

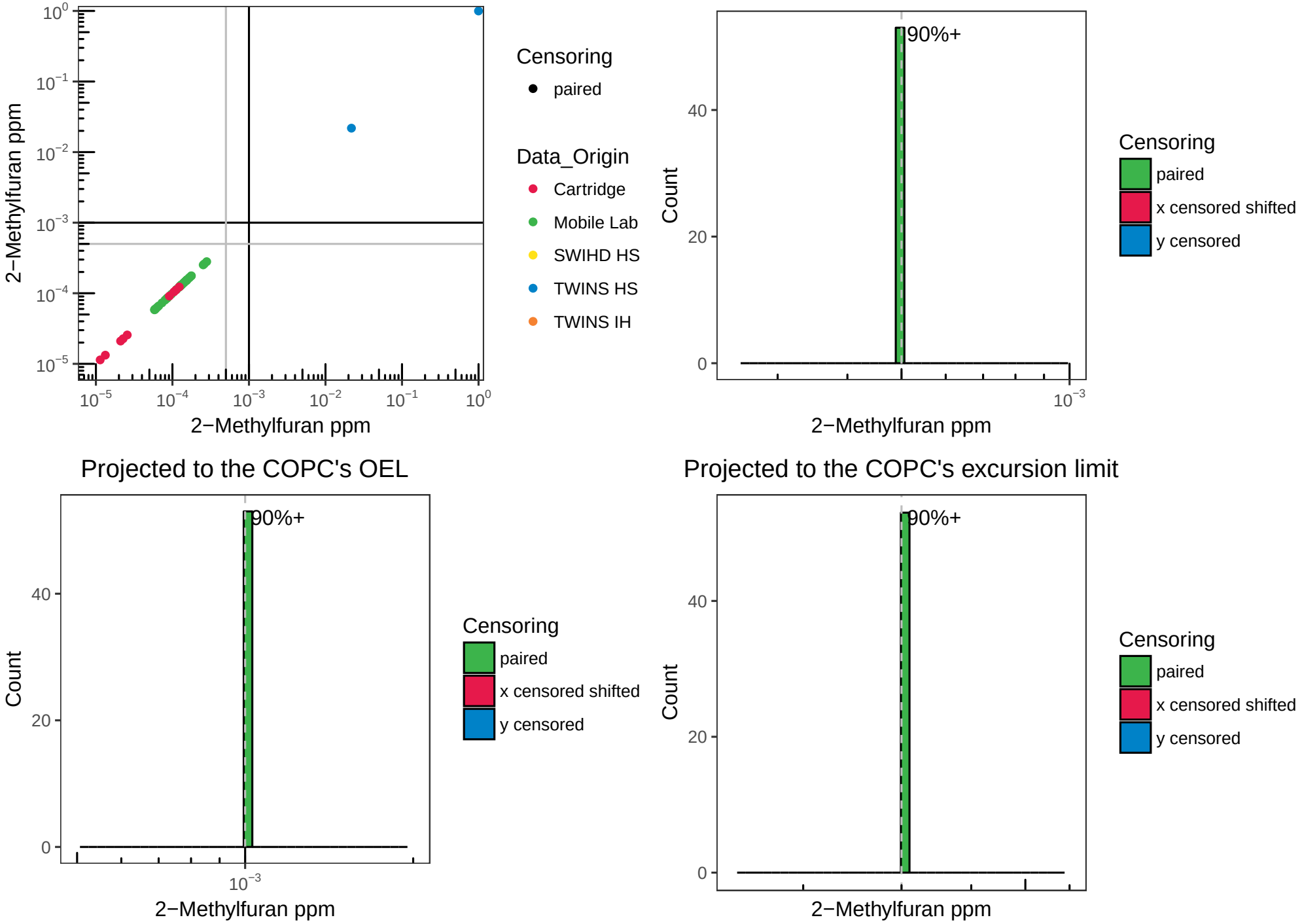


Figure C.1136: 2-Methylfuran vs 2-Methylfuran

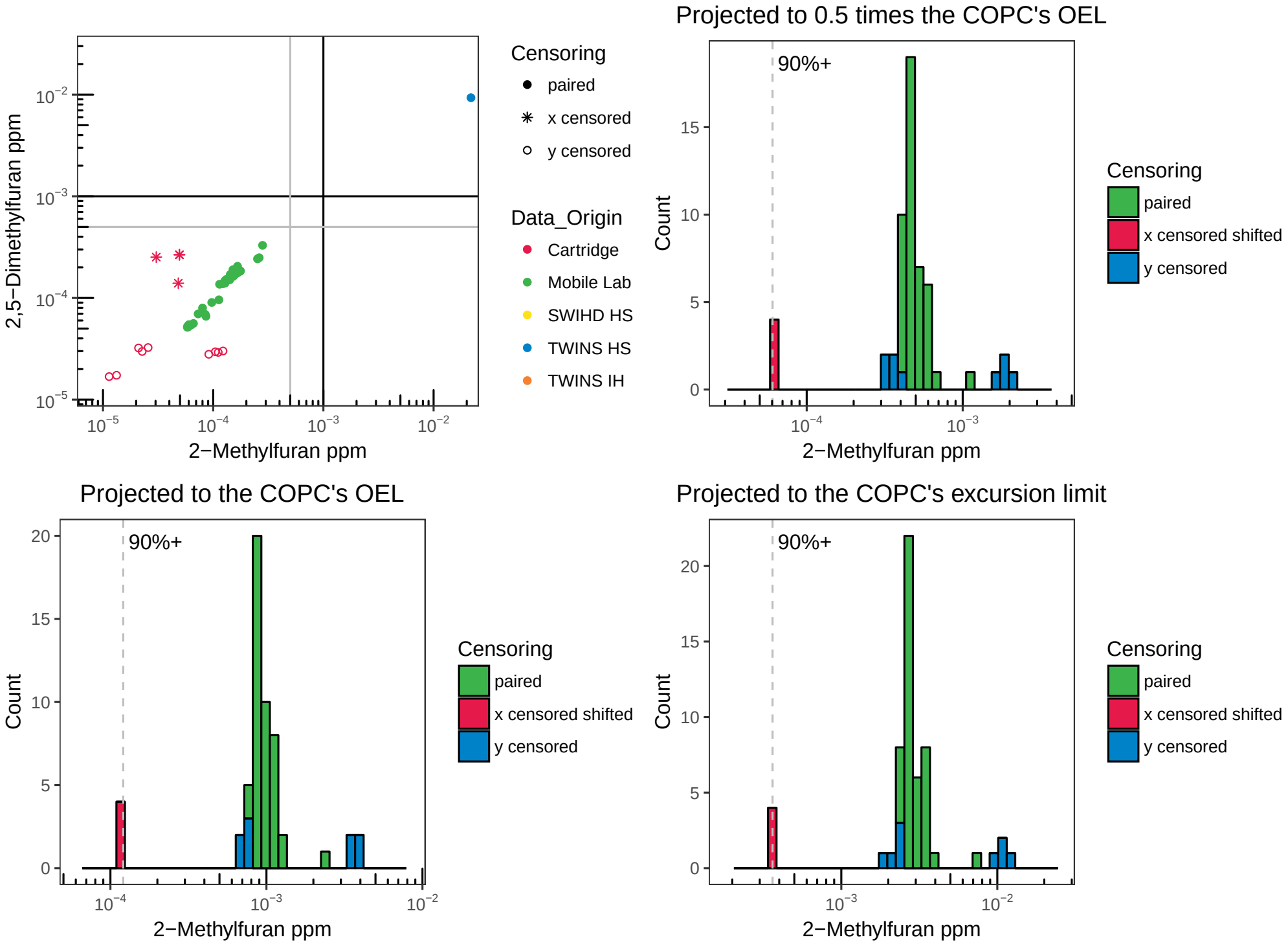


Figure C.1137: 2,5-Dimethylfuran vs 2-Methylfuran

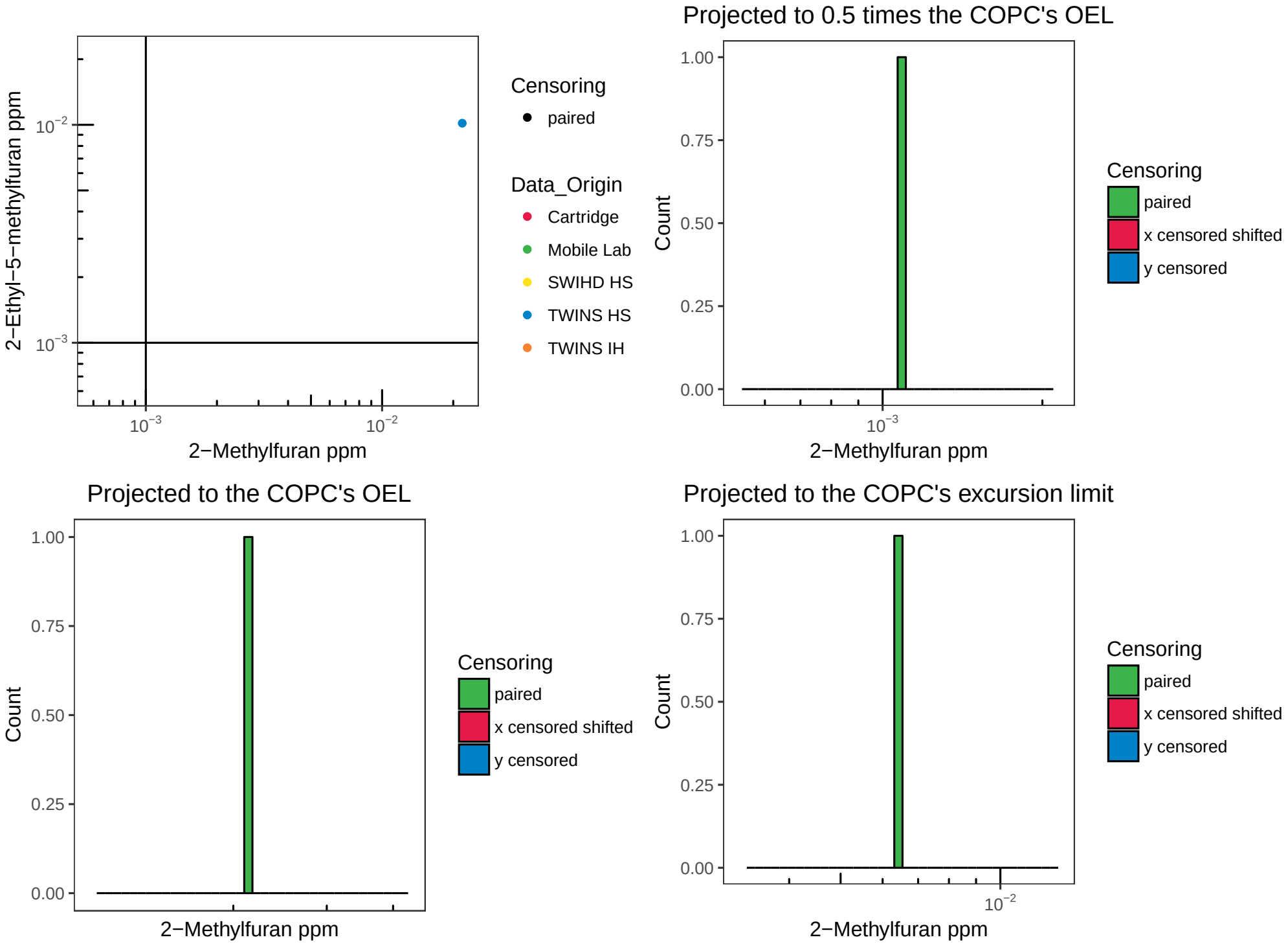


Figure C.1138: 2-Ethyl-5-methylfuran vs 2-Methylfuran

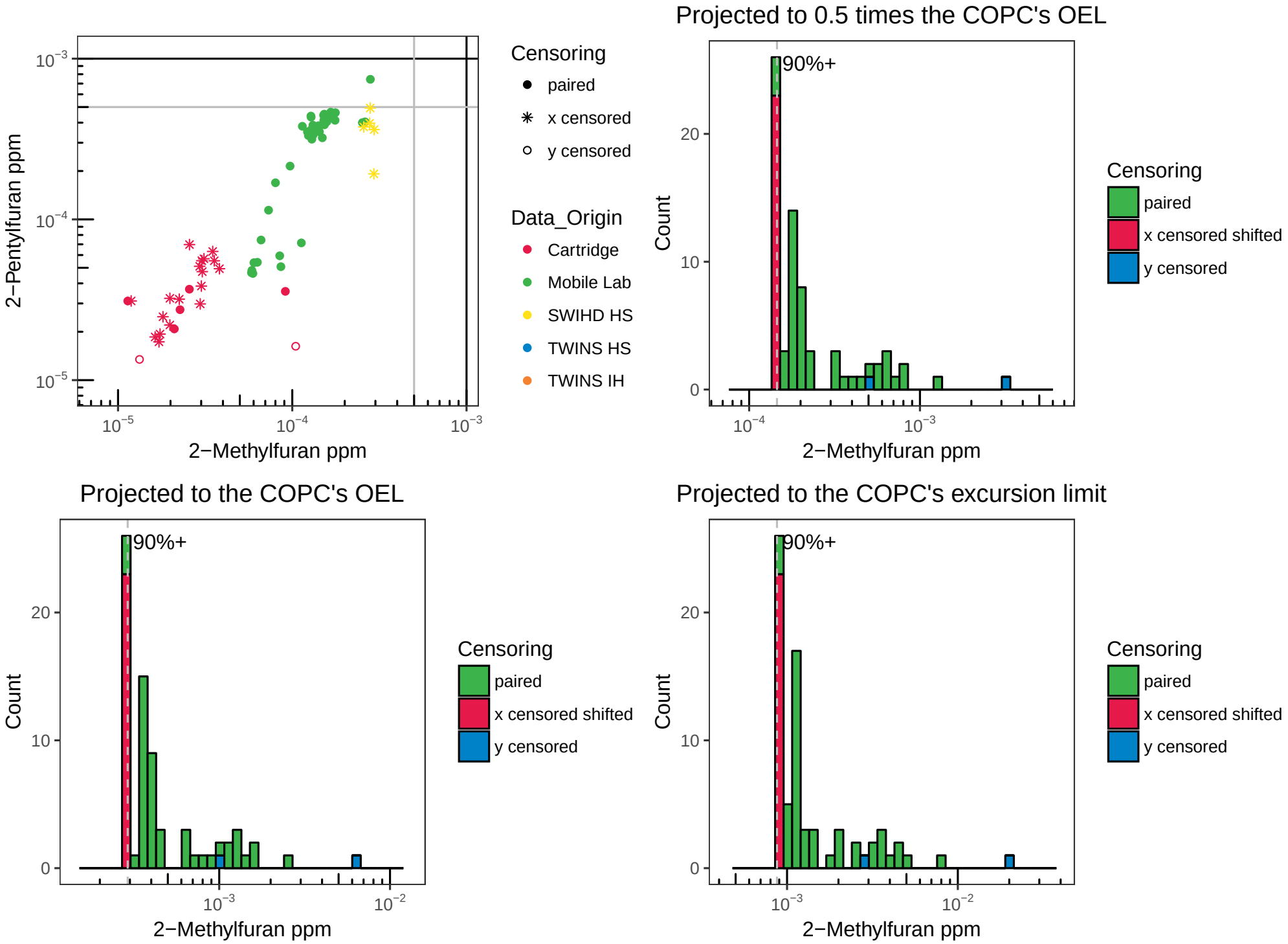


Figure C.1139: 2-Pentylfuran vs 2-Methylfuran

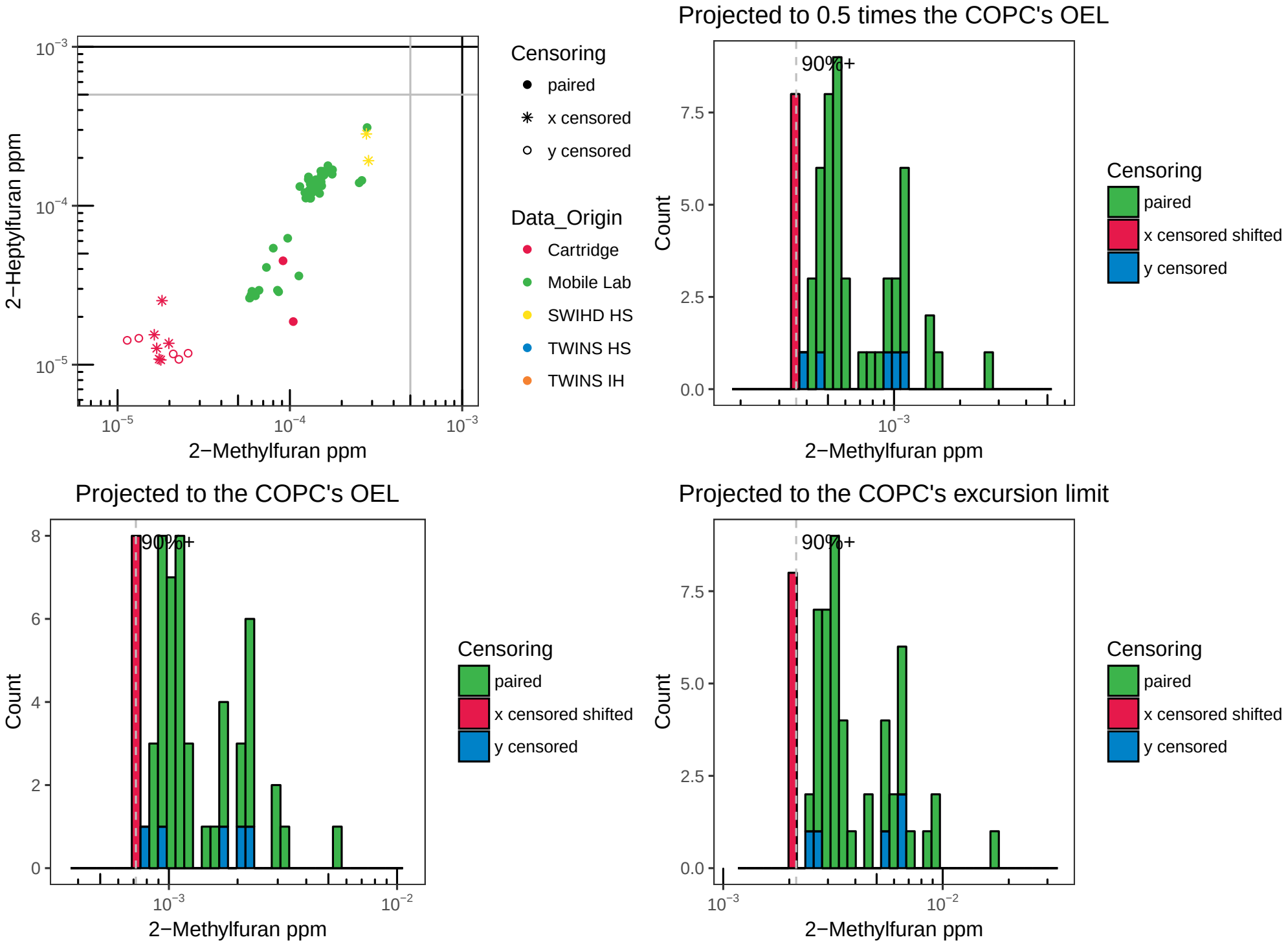


Figure C.1140: 2-Heptylfuran vs 2-Methylfuran

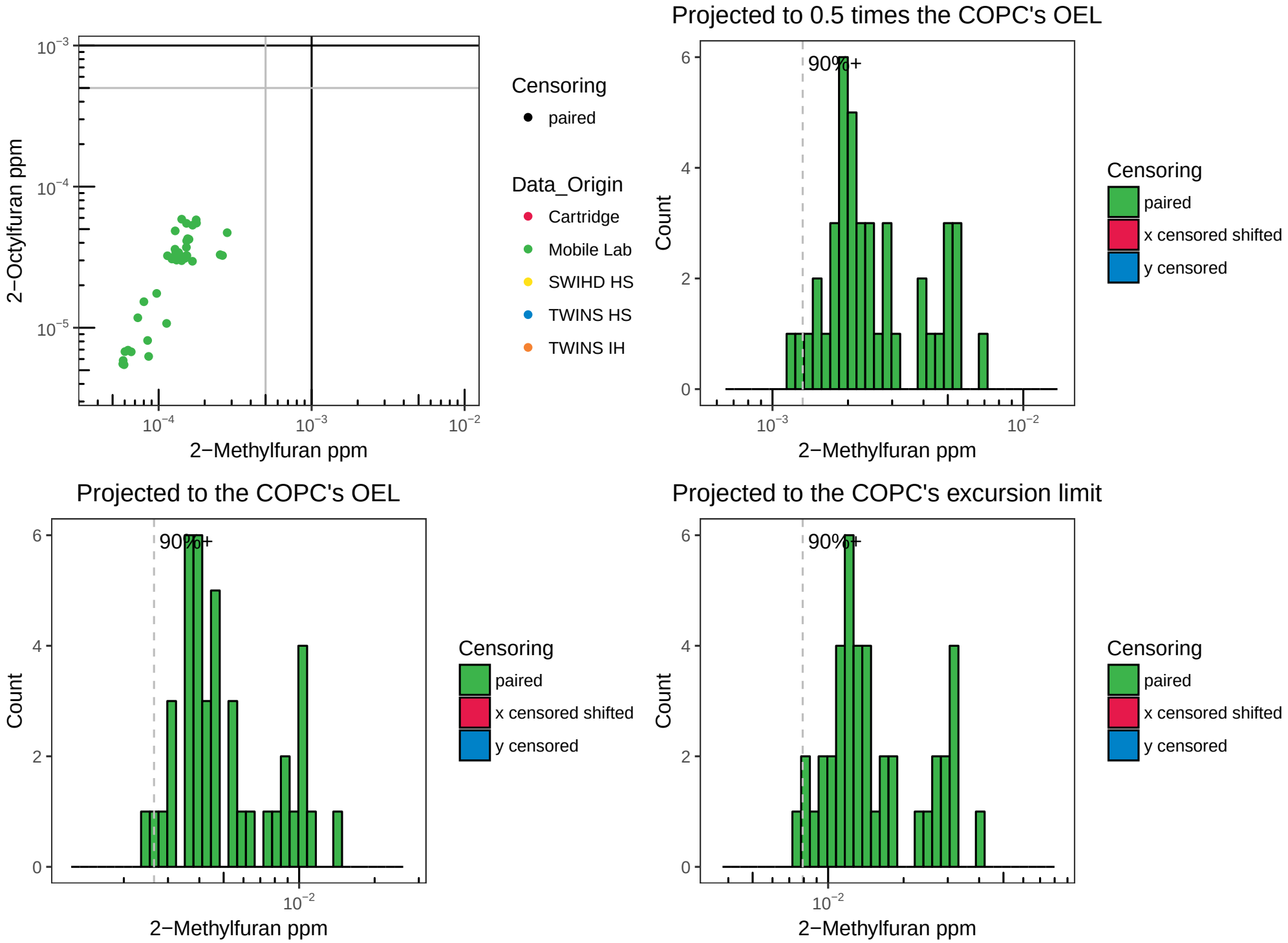


Figure C.1141: 2-Octylfuran vs 2-Methylfuran

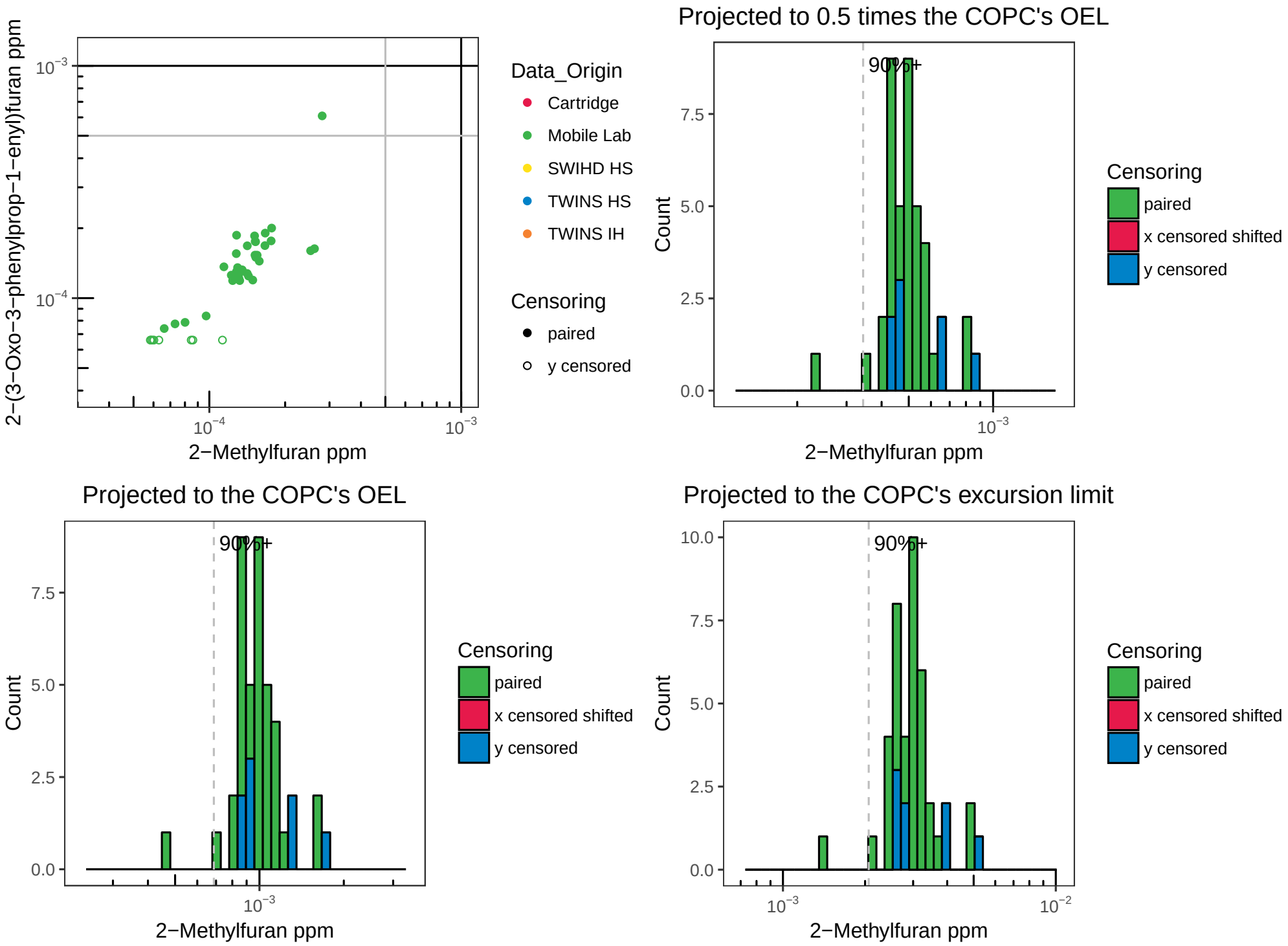


Figure C.1142: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2-Methylfuran

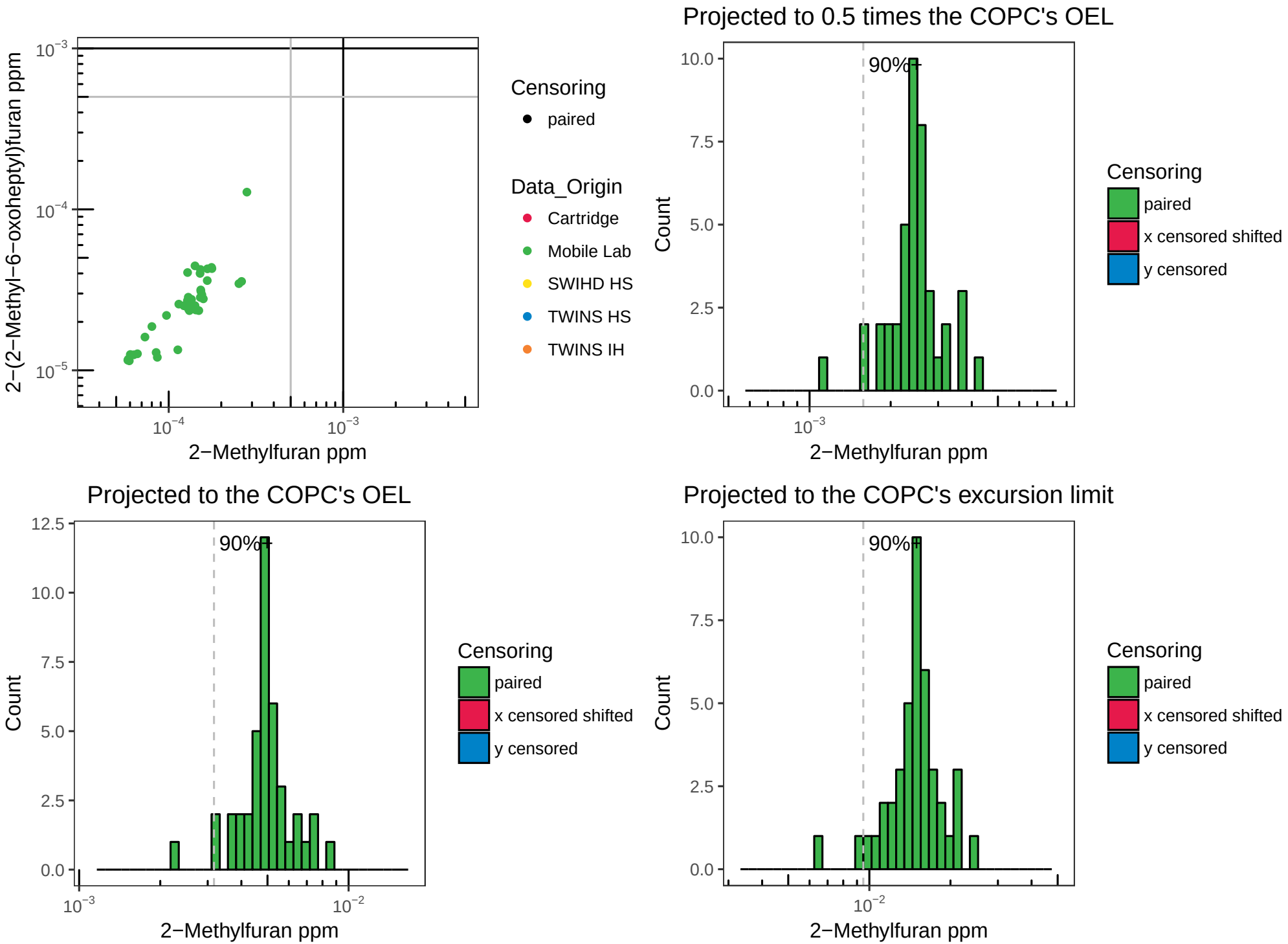


Figure C.1143: 2-(2-Methyl-6-oxoheptyl)furan vs 2-Methylfuran

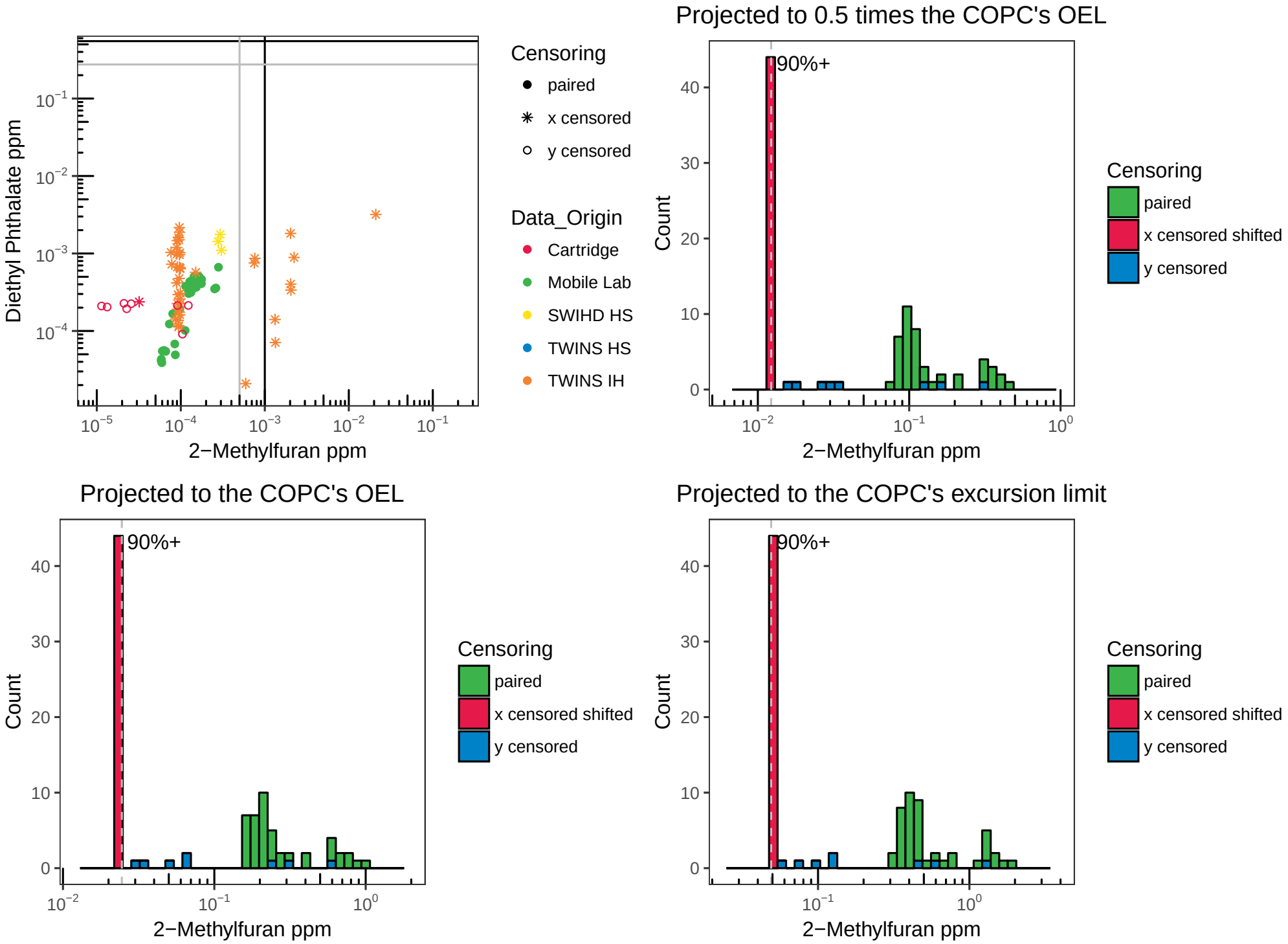


Figure C.1144: Diethyl Phthalate vs 2-Methylfuran

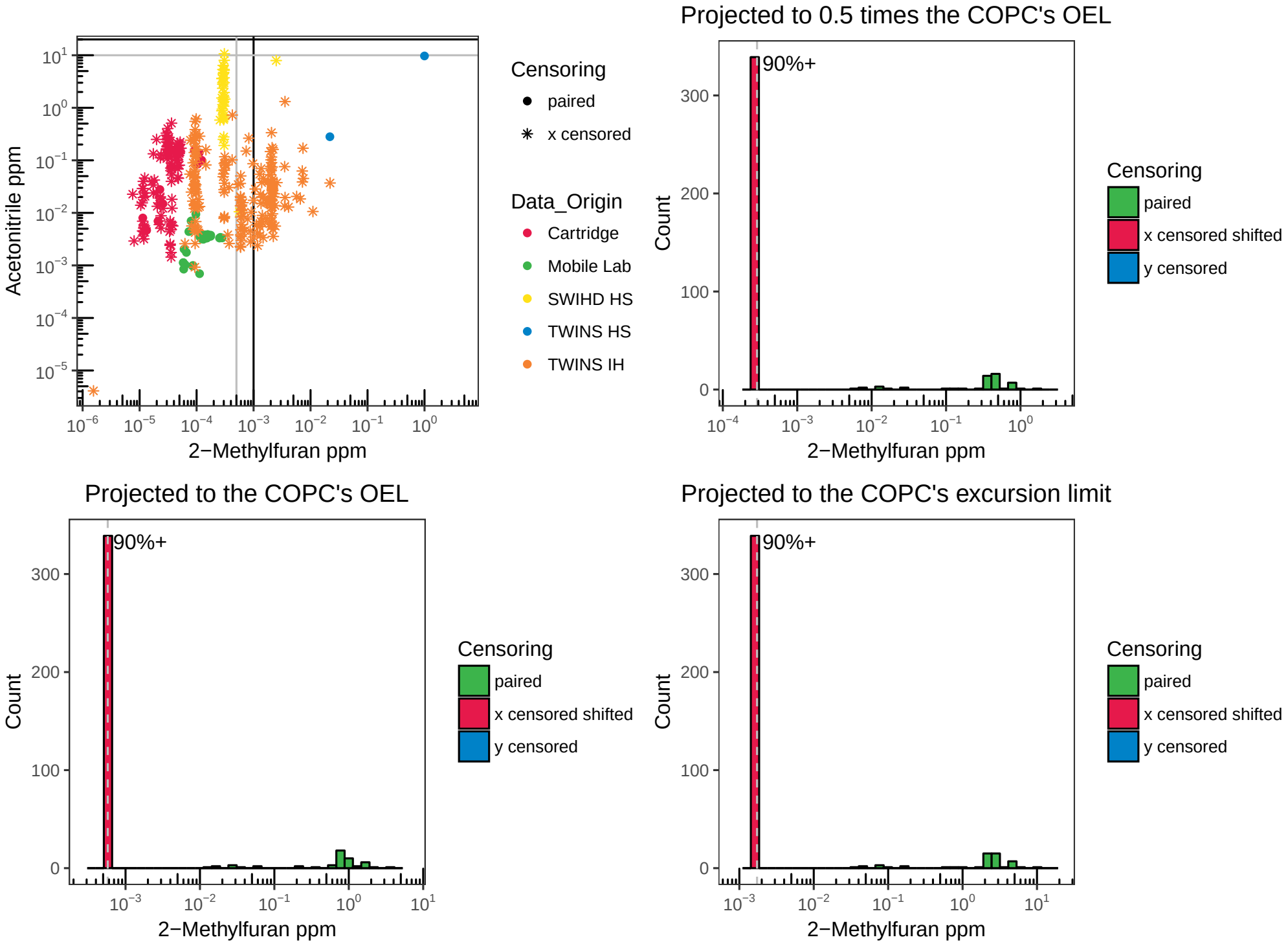


Figure C.1145: Acetonitrile vs 2-Methylfuran

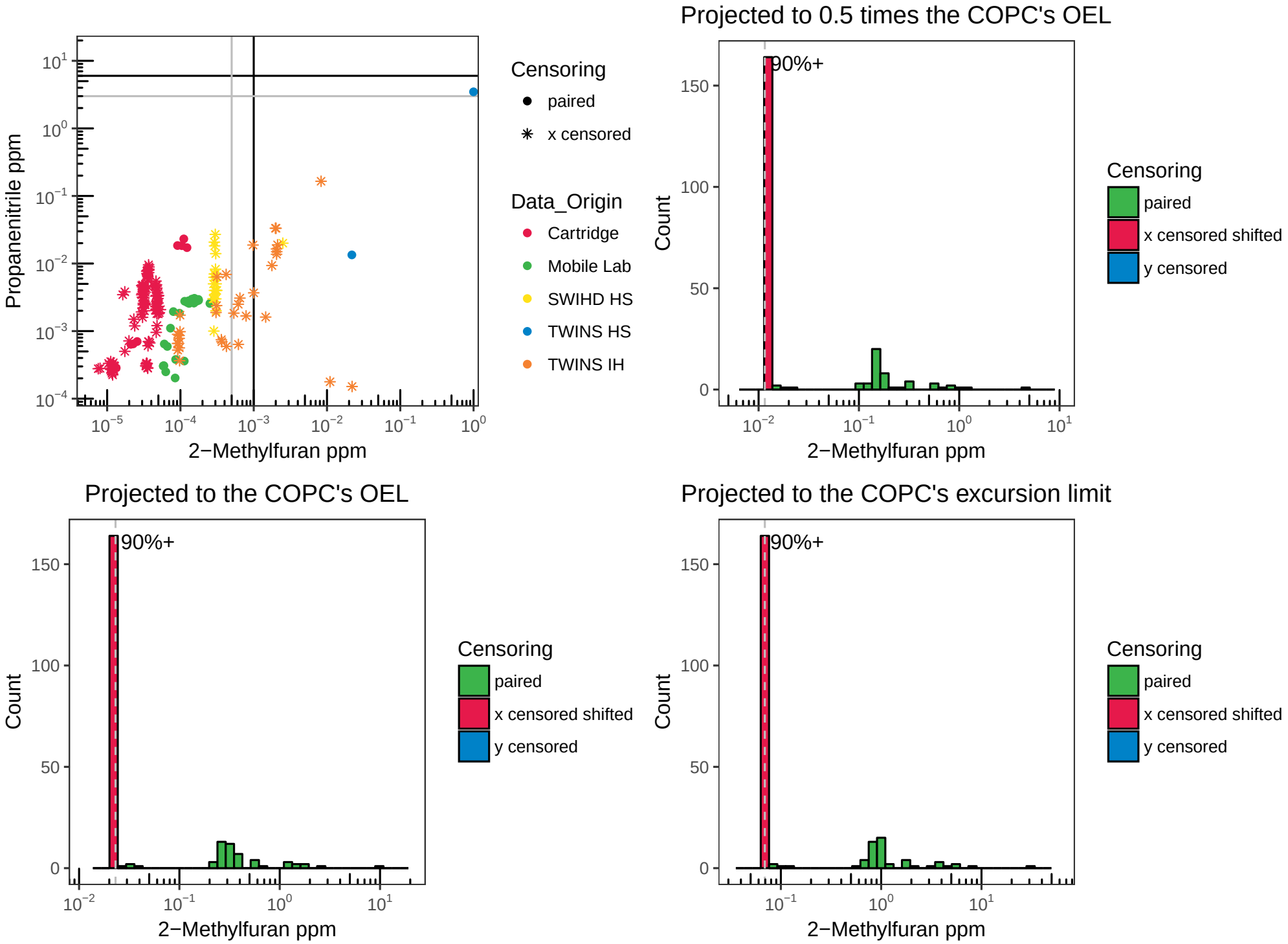


Figure C.1146: Propanenitrile vs 2-Methylfuran

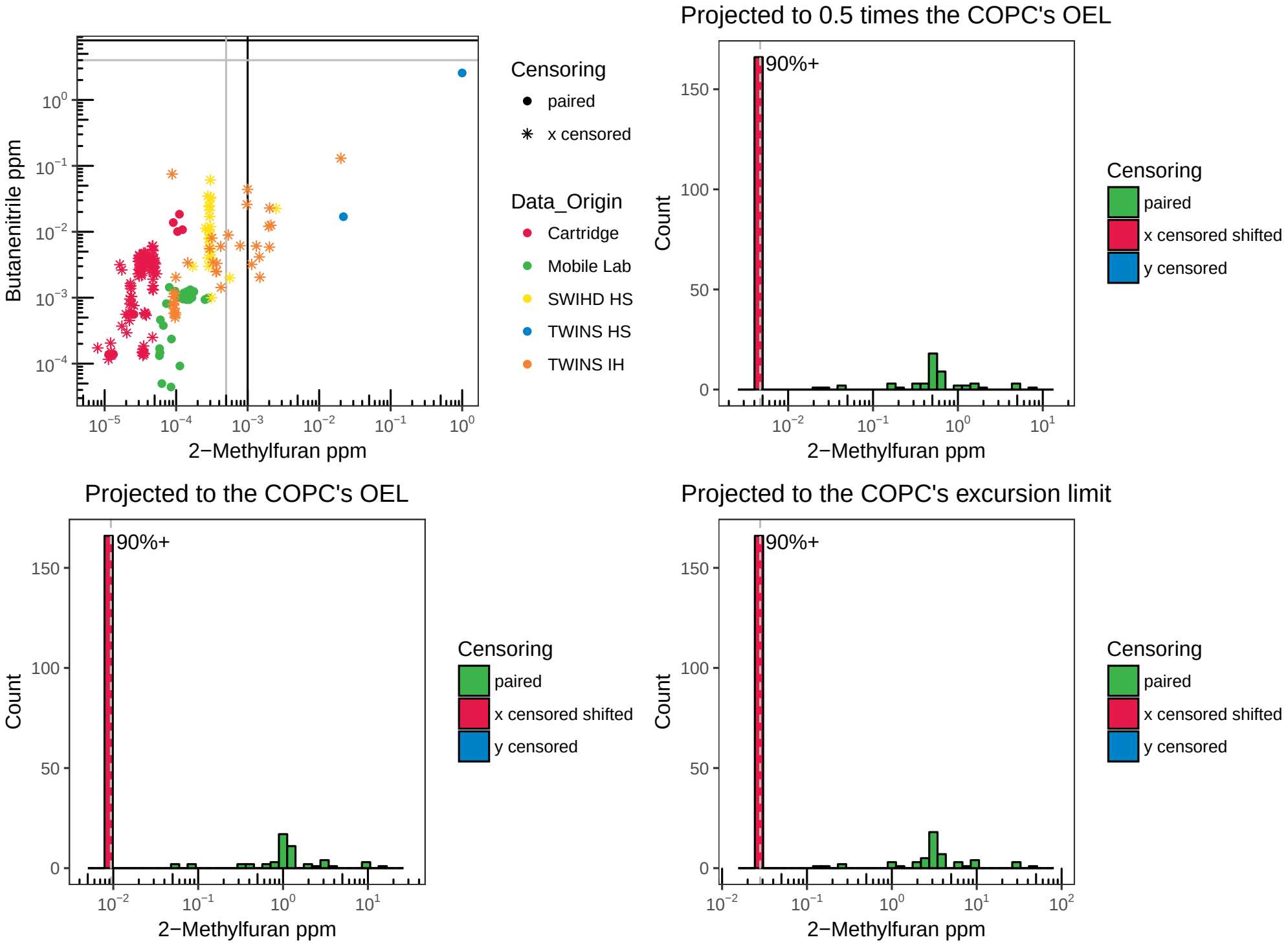


Figure C.1147: Butanenitrile vs 2-Methylfuran

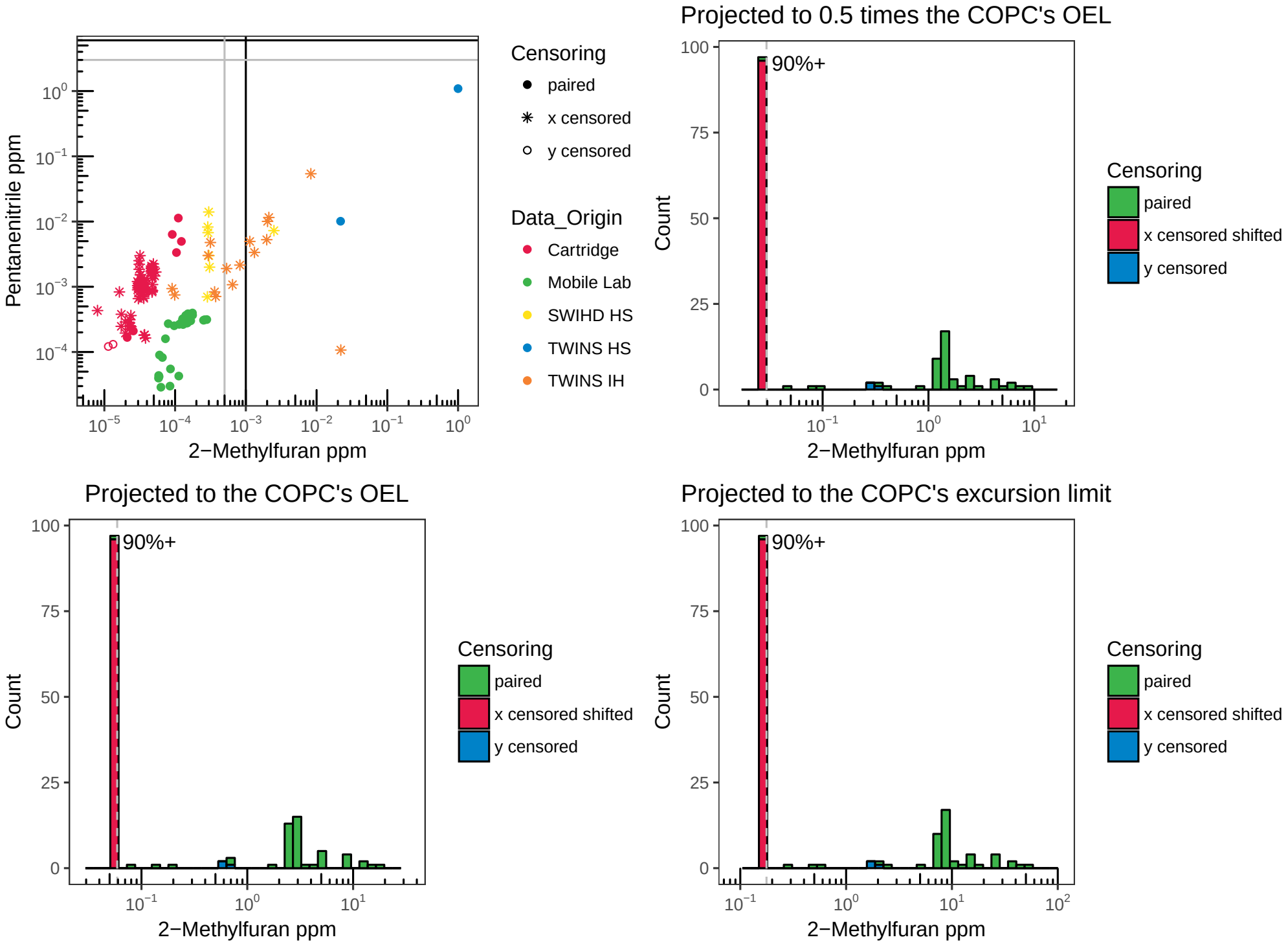


Figure C.1148: Pentanenitrile vs 2-Methylfuran

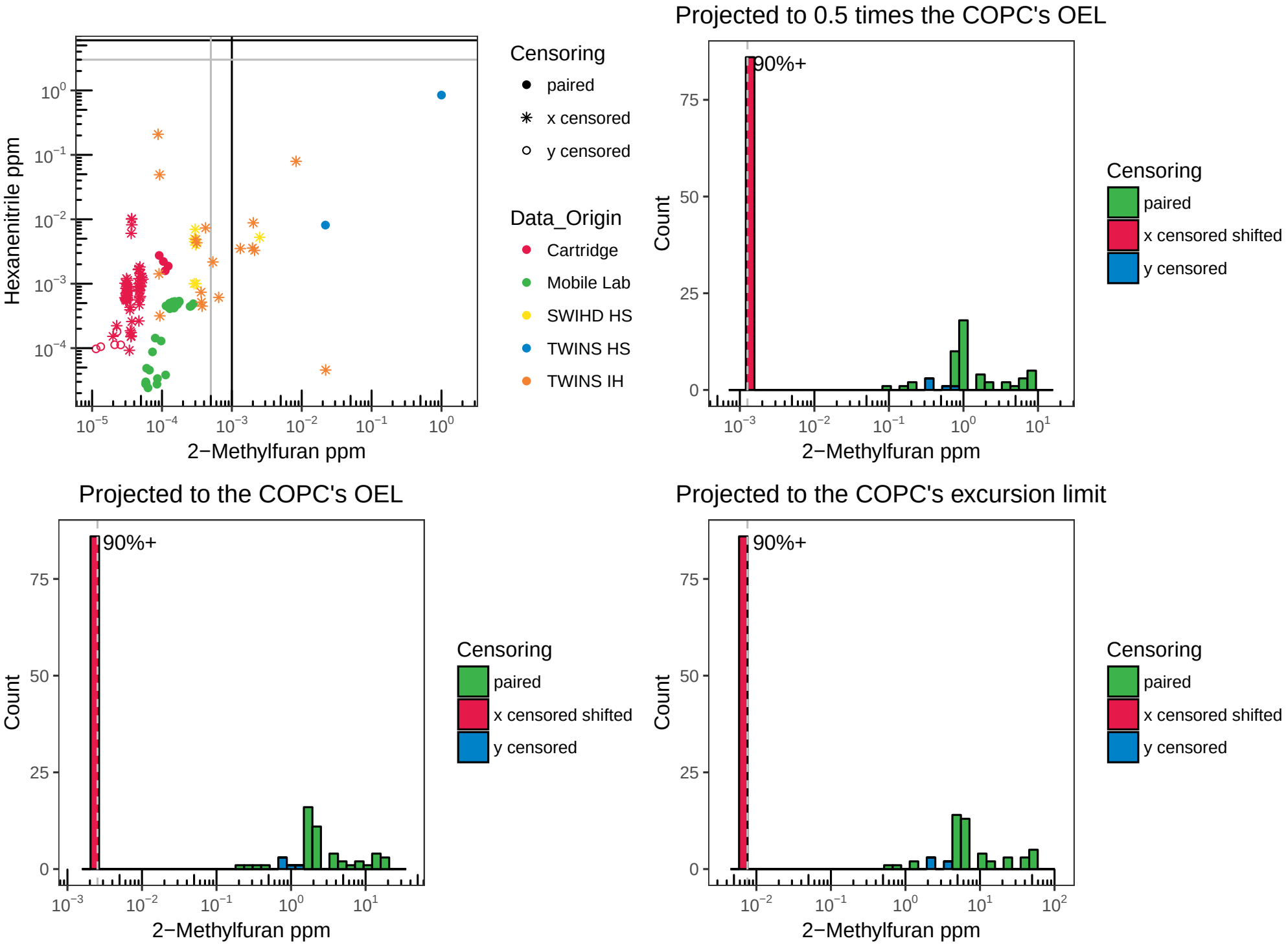


Figure C.1149: Hexanenitrile vs 2-Methylfuran

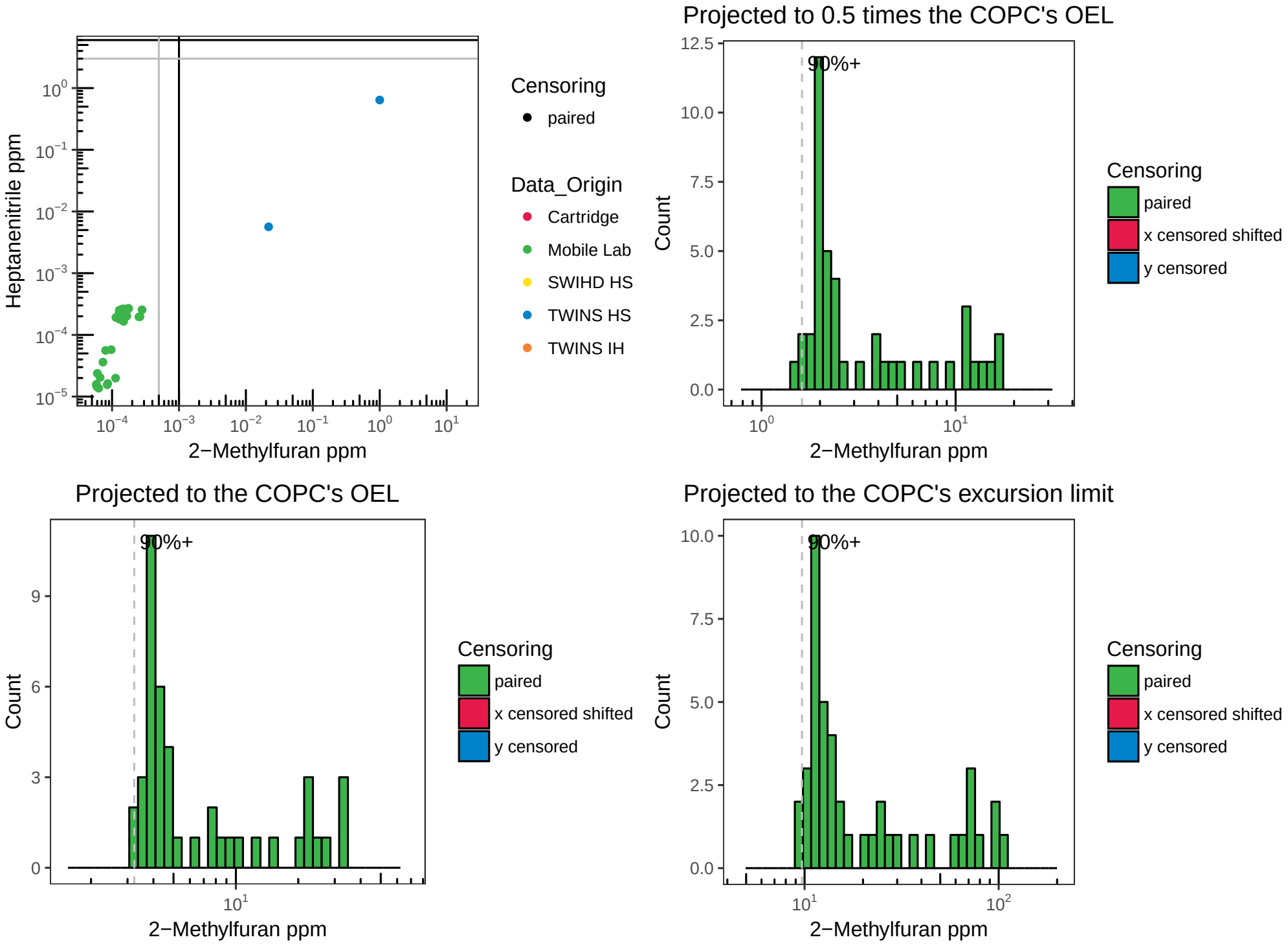


Figure C.1150: Heptanenitrile vs 2-Methylfuran

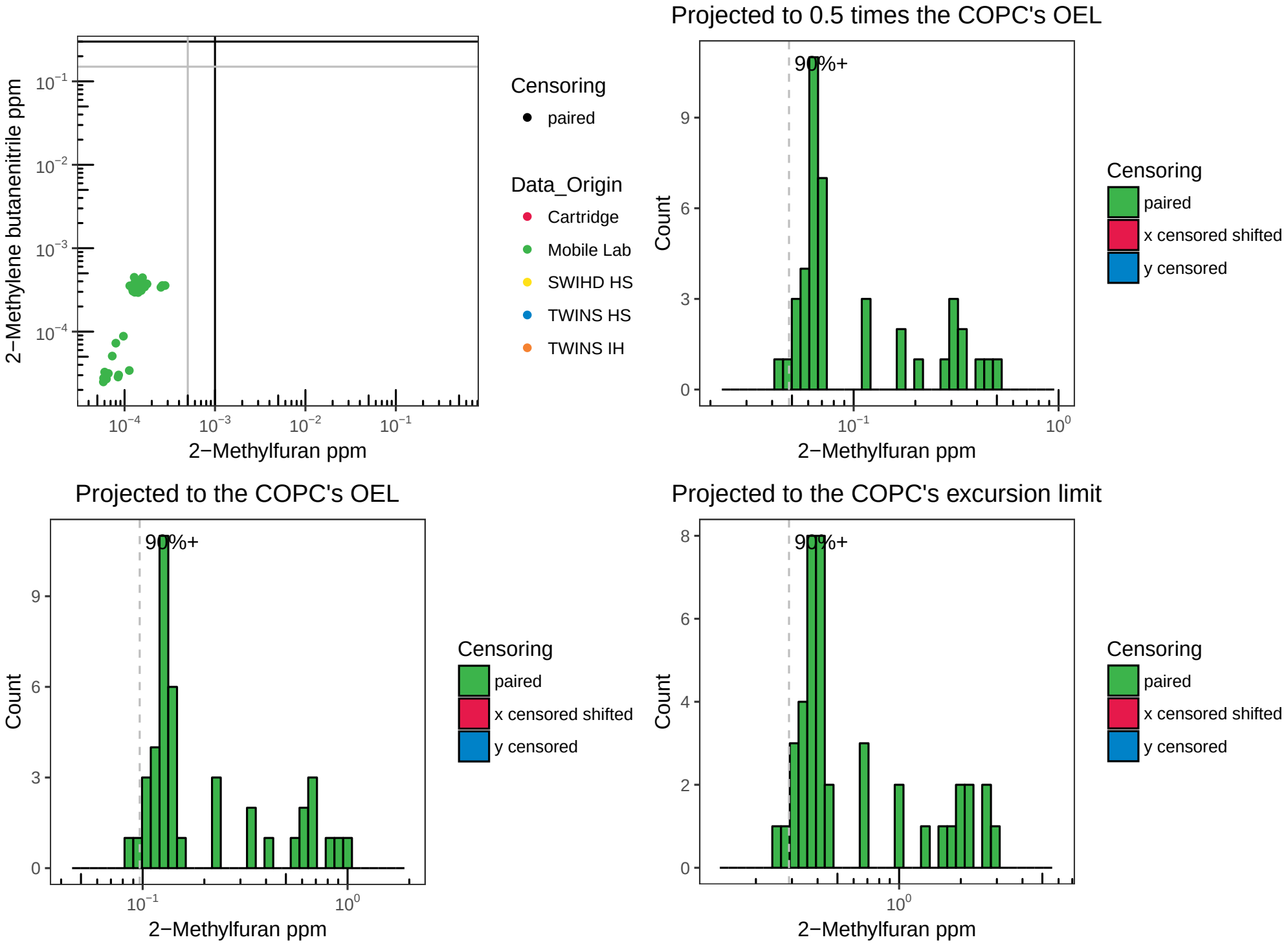


Figure C.1151: 2-Methylene butanenitrile vs 2-Methylfuran

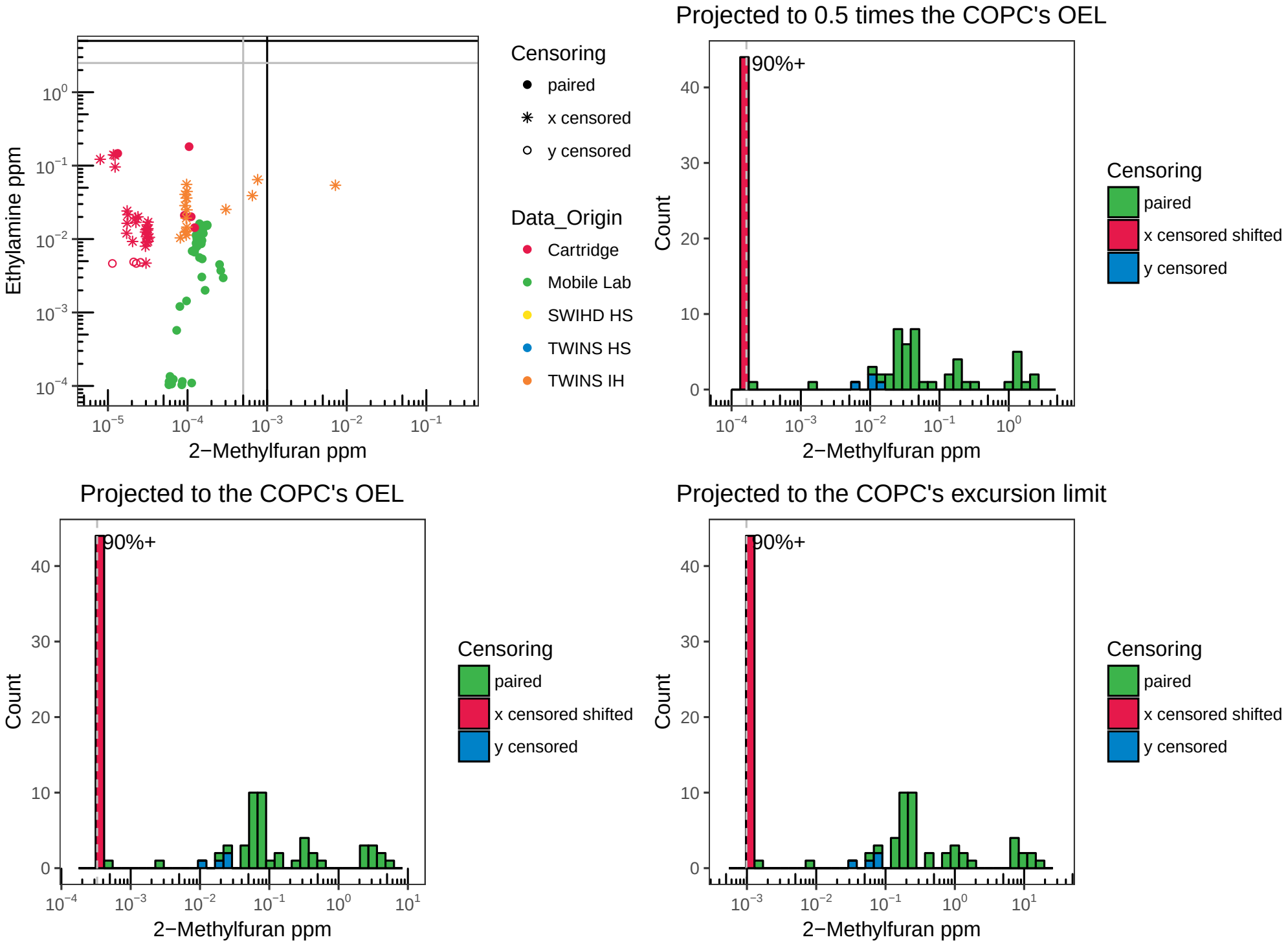


Figure C.1152: Ethylamine vs 2-Methylfuran

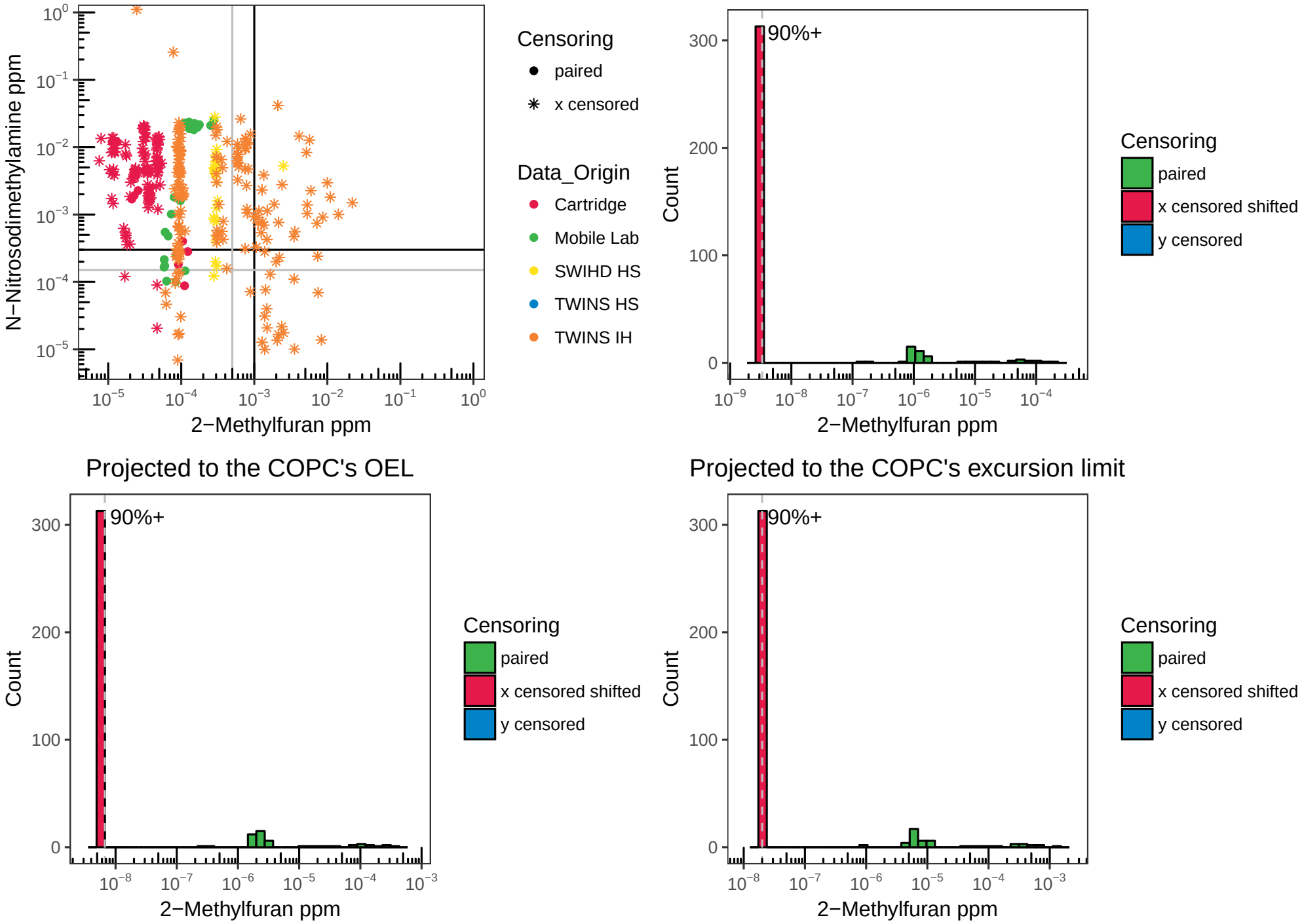


Figure C.1153: N-Nitrosodimethylamine vs 2-Methylfuran

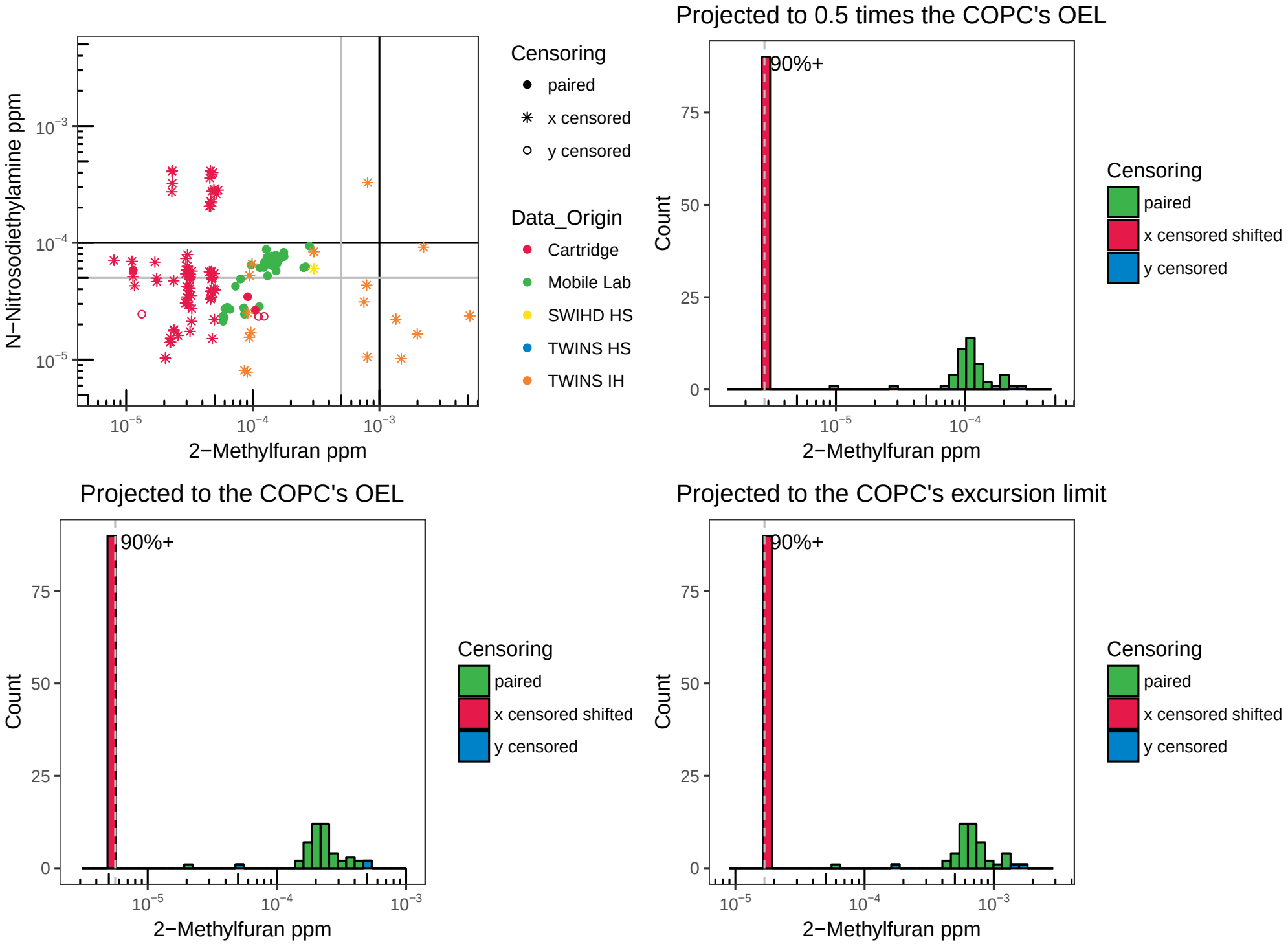


Figure C.1154: N-Nitrosodiethylamine vs 2-Methylfuran

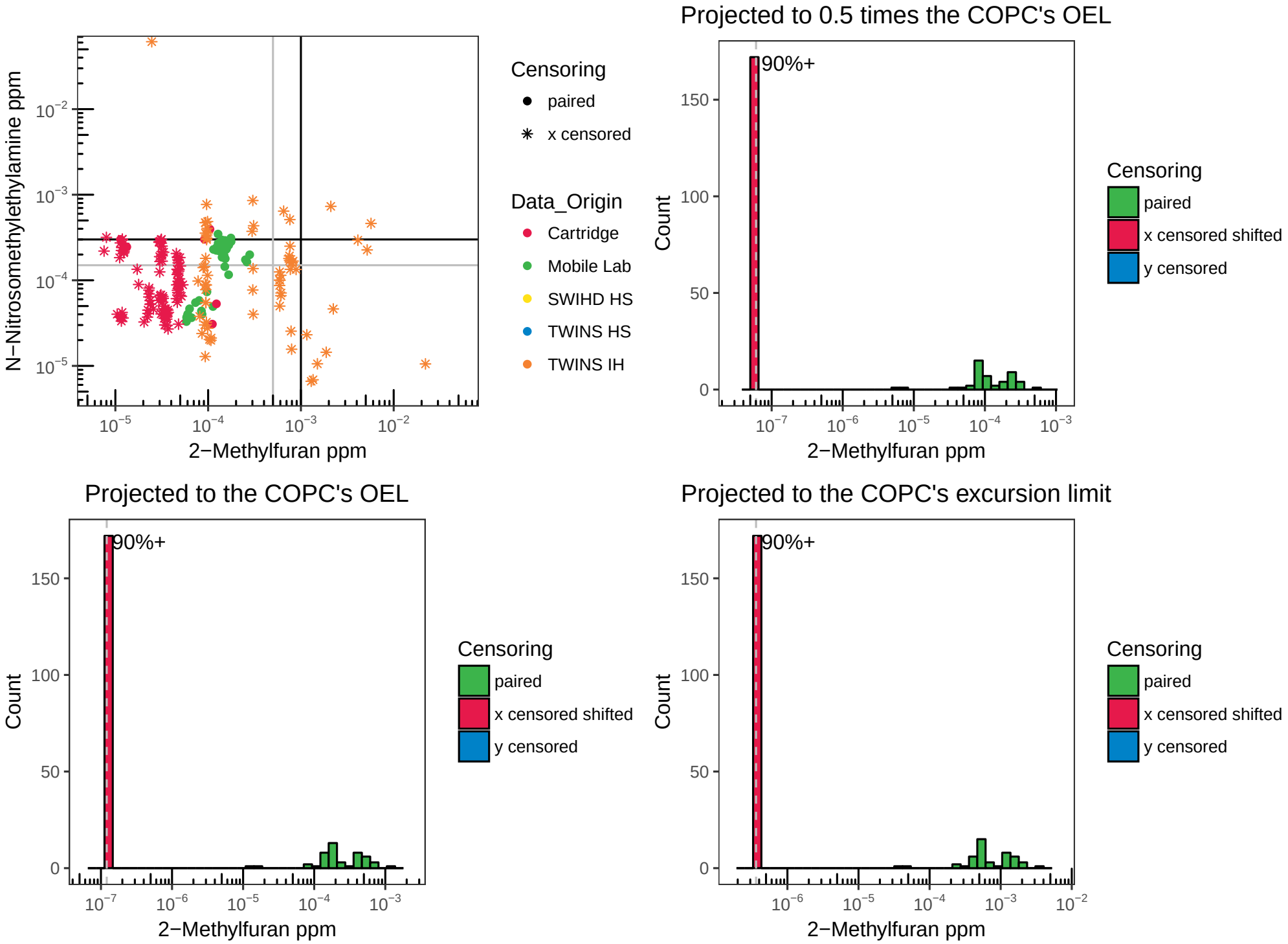


Figure C.1155: N-Nitrosomethylethylamine vs 2-Methylfuran

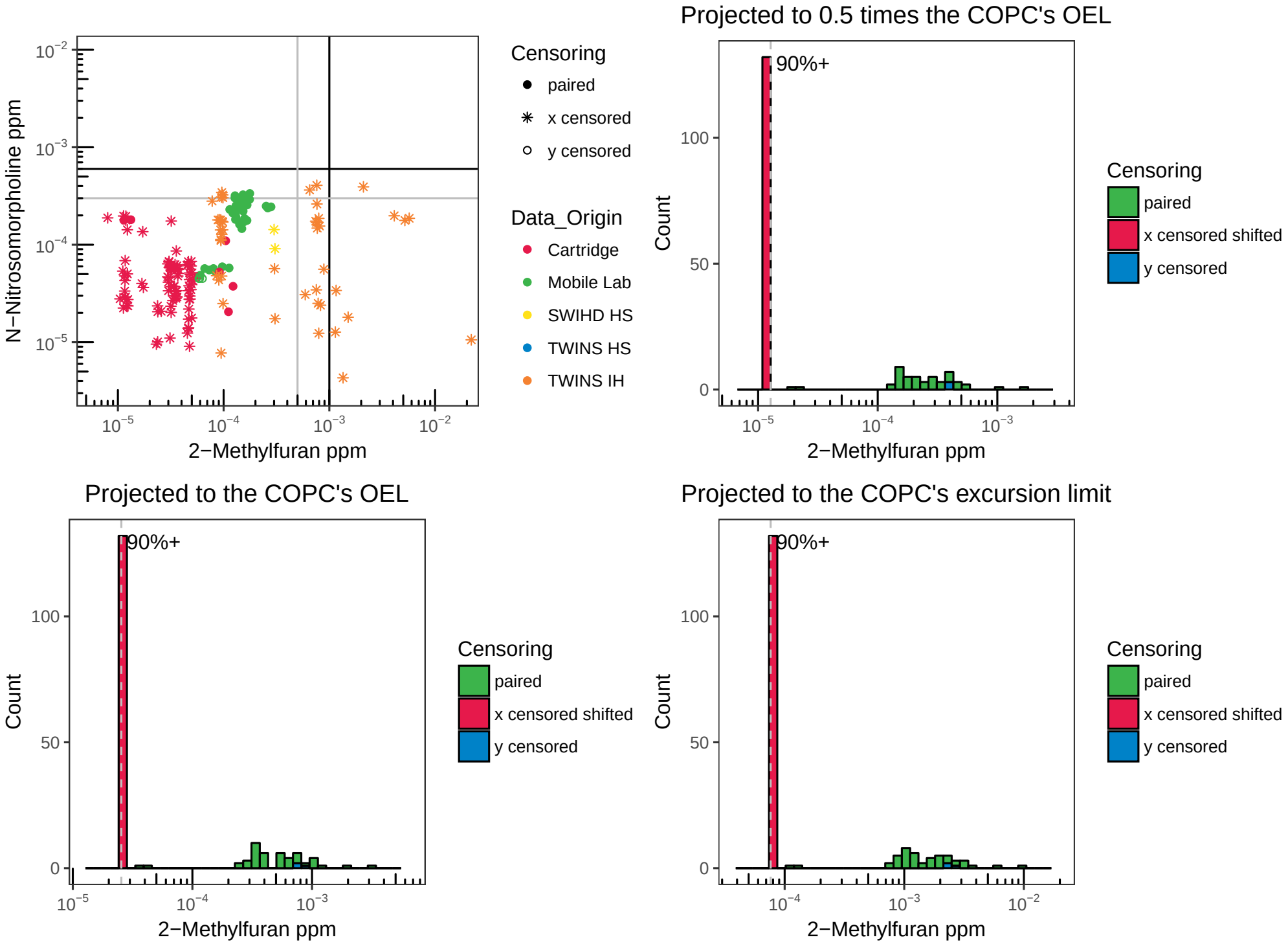


Figure C.1156: N-Nitrosomorpholine vs 2-Methylfuran

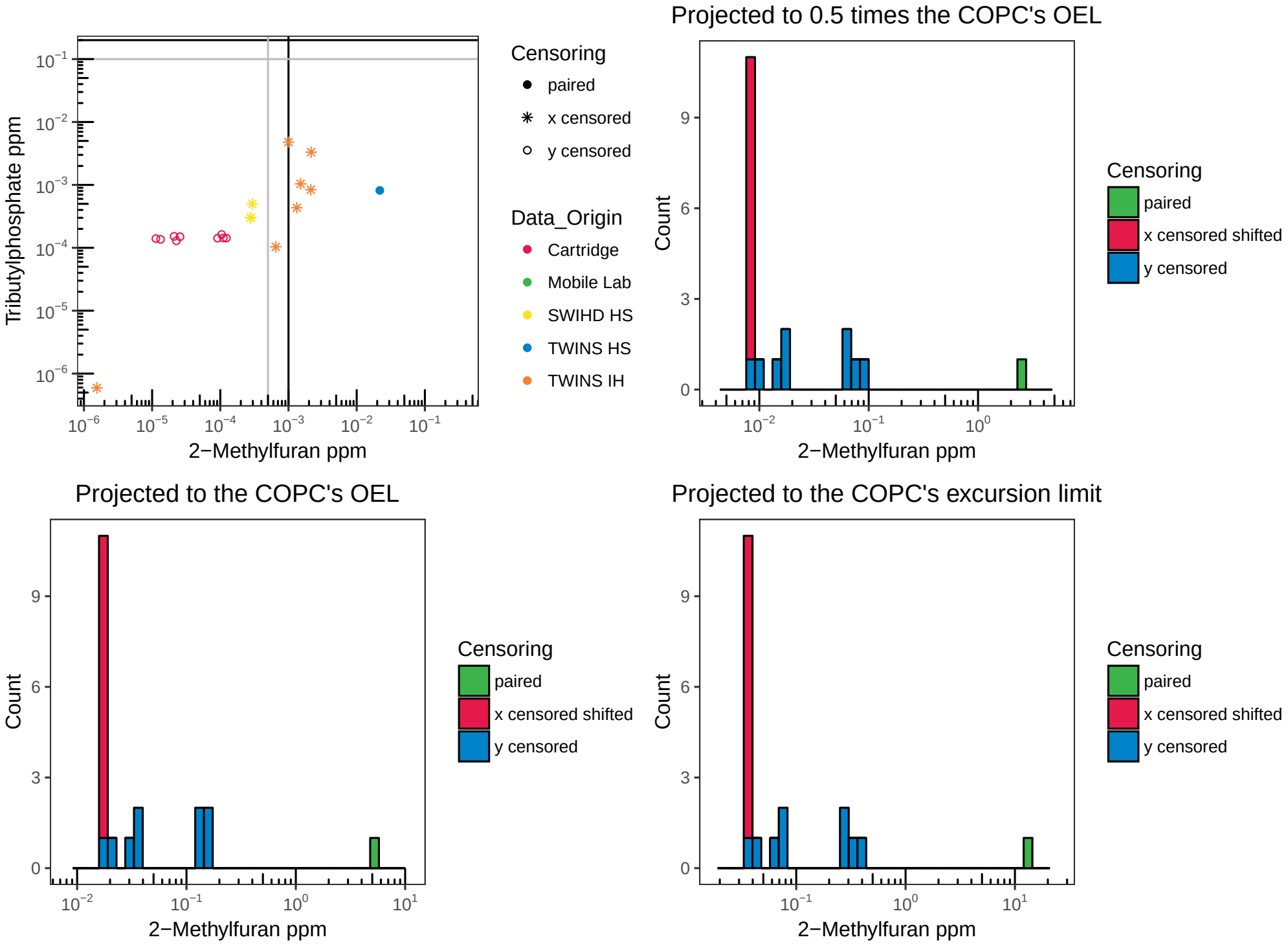


Figure C.1157: Tributylphosphate vs 2-Methylfuran

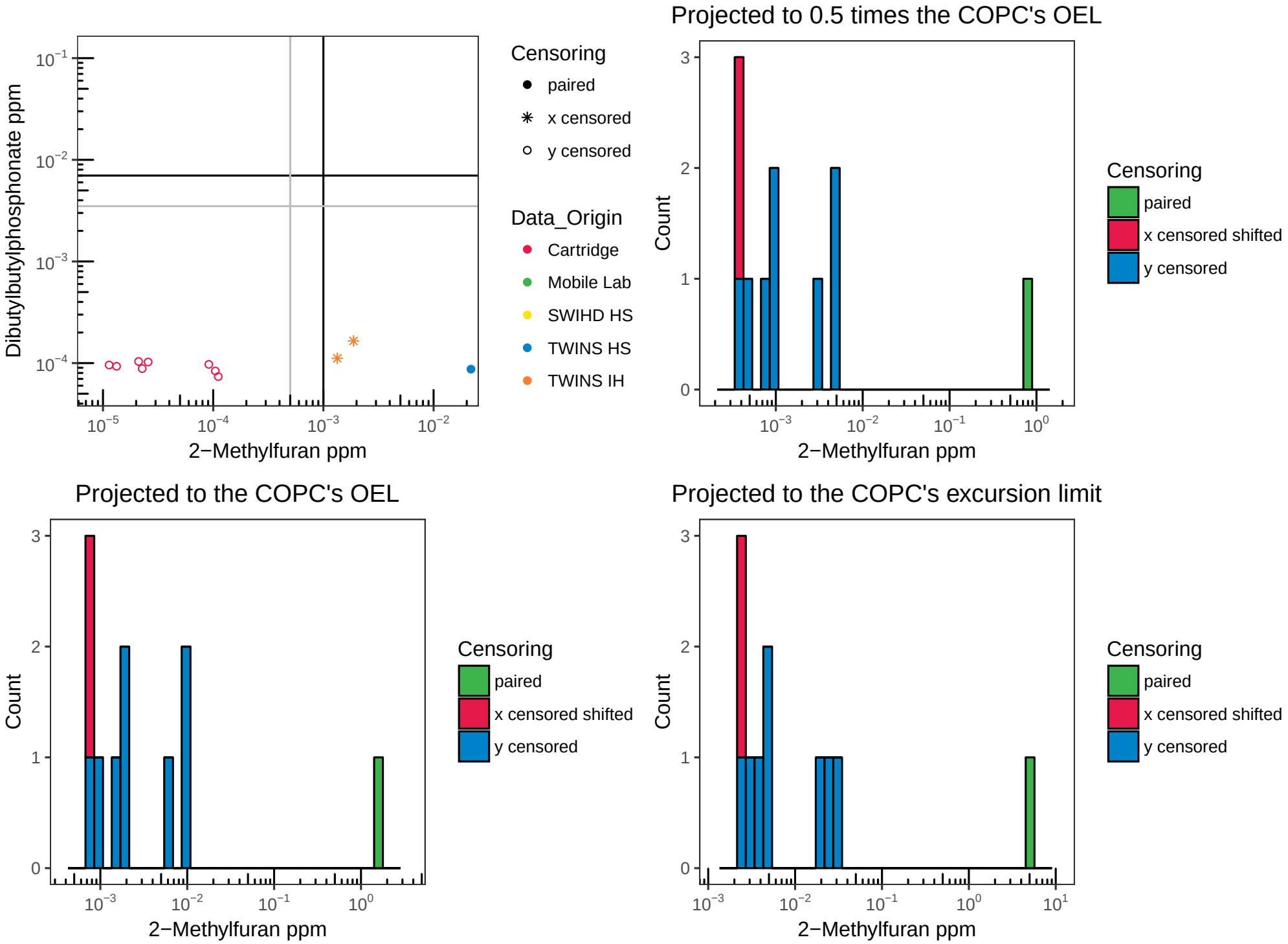


Figure C.1158: Dibutylbutylphosphonate vs 2-Methylfuran

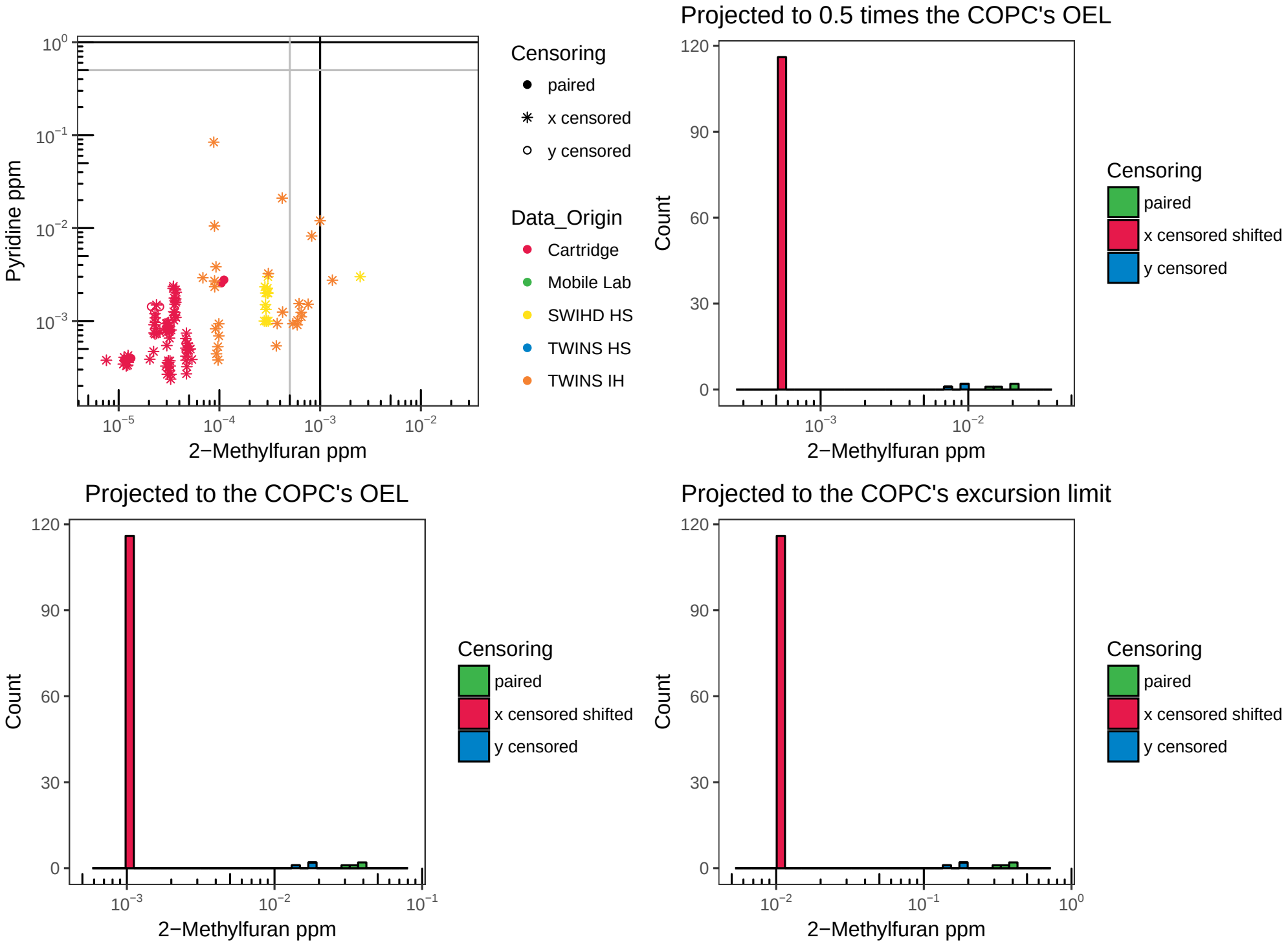


Figure C.1159: Pyridine vs 2-Methylfuran

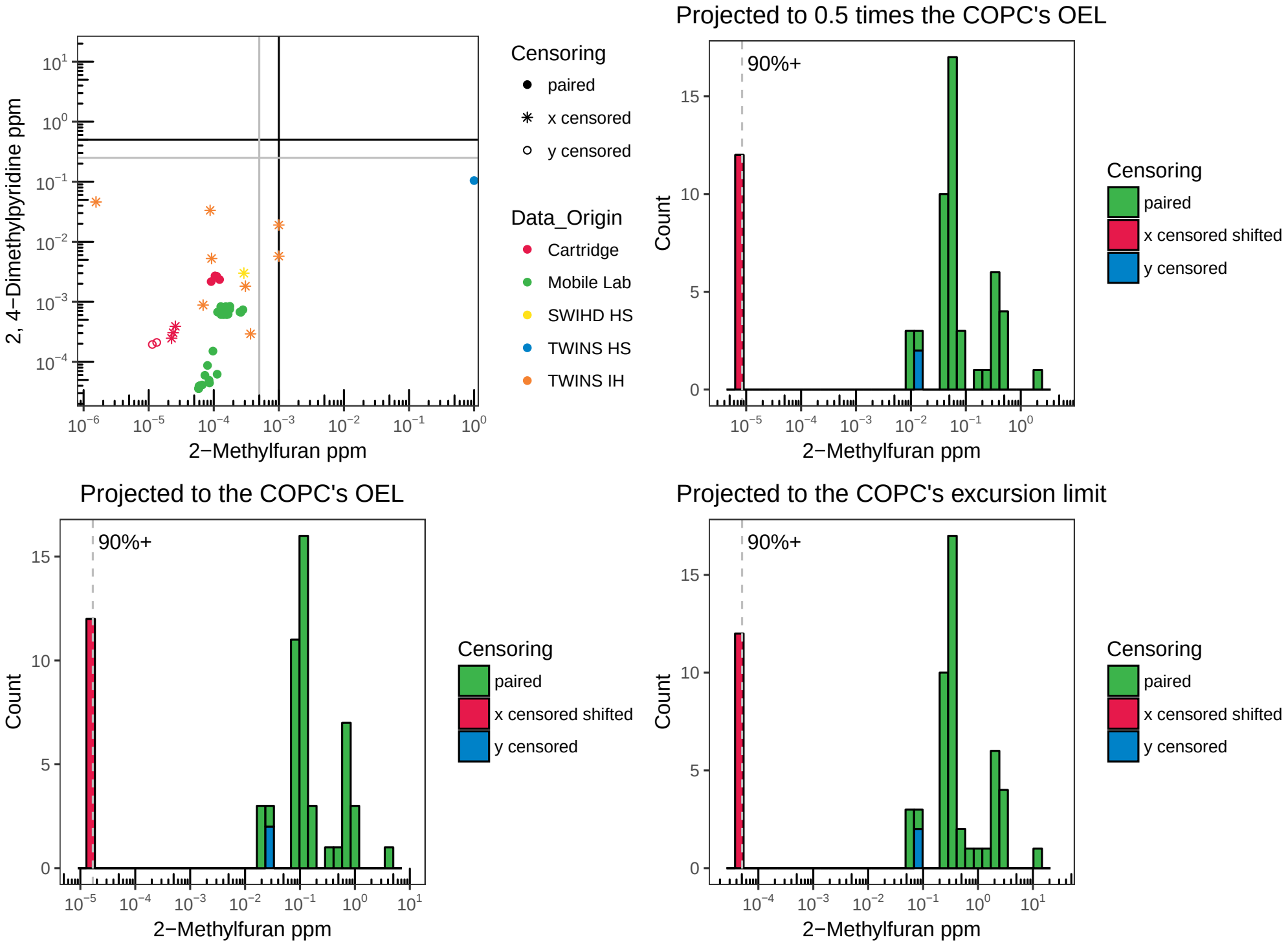


Figure C.1160: 2, 4-Dimethylpyridine vs 2-Methylfuran

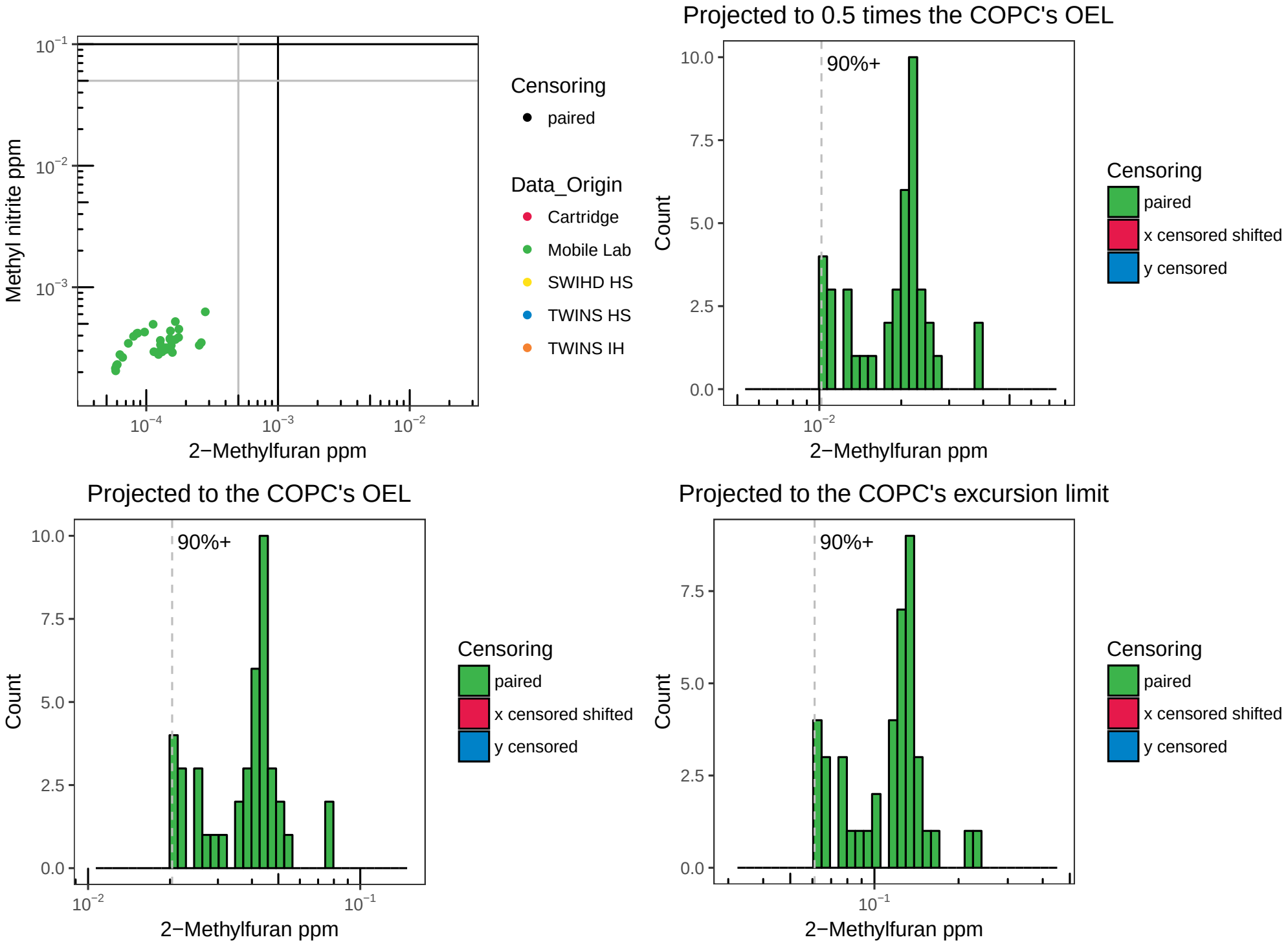


Figure C.1161: Methyl nitrite vs 2-Methylfuran

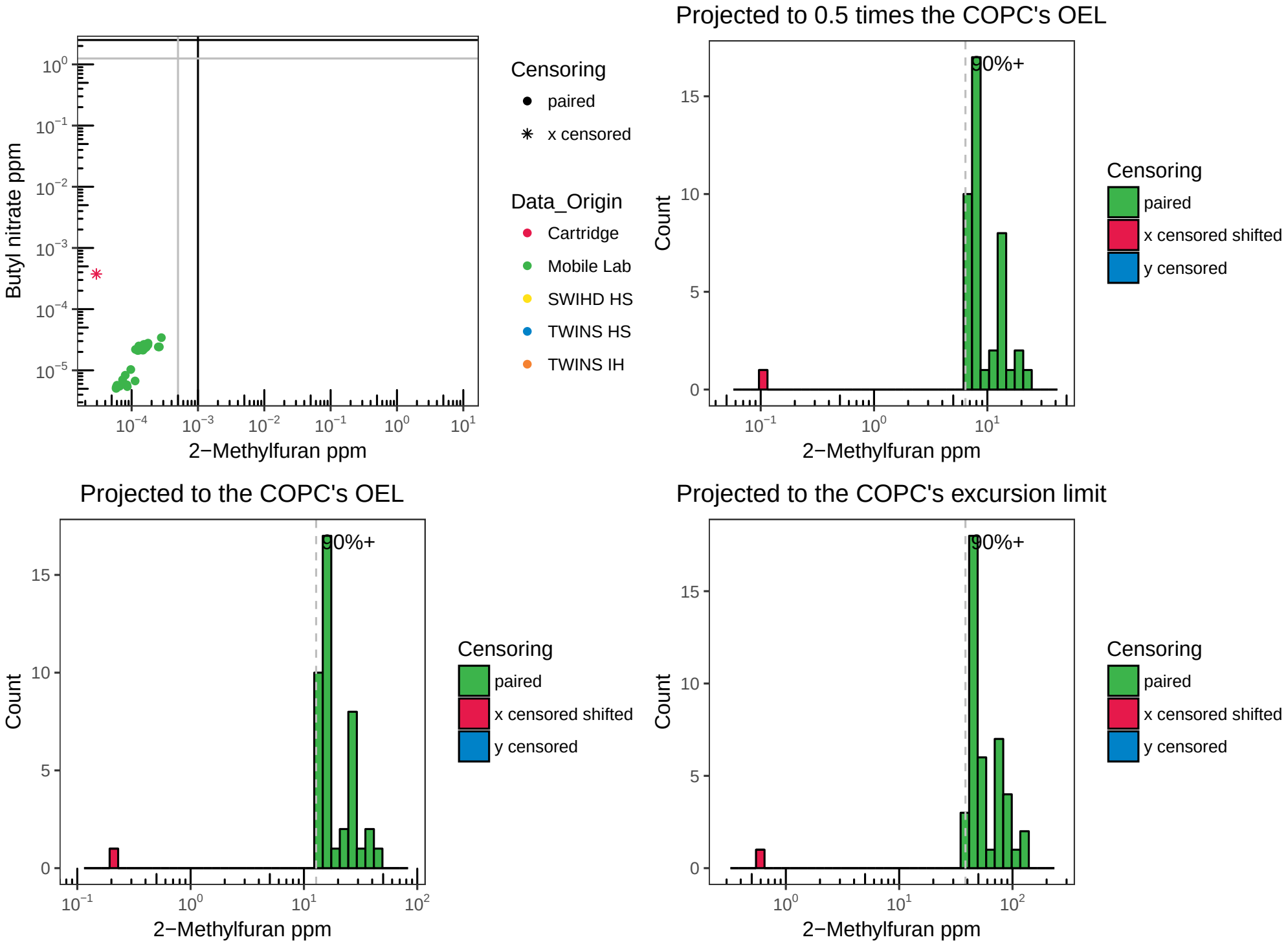


Figure C.1162: Butyl nitrate vs 2-Methylfuran

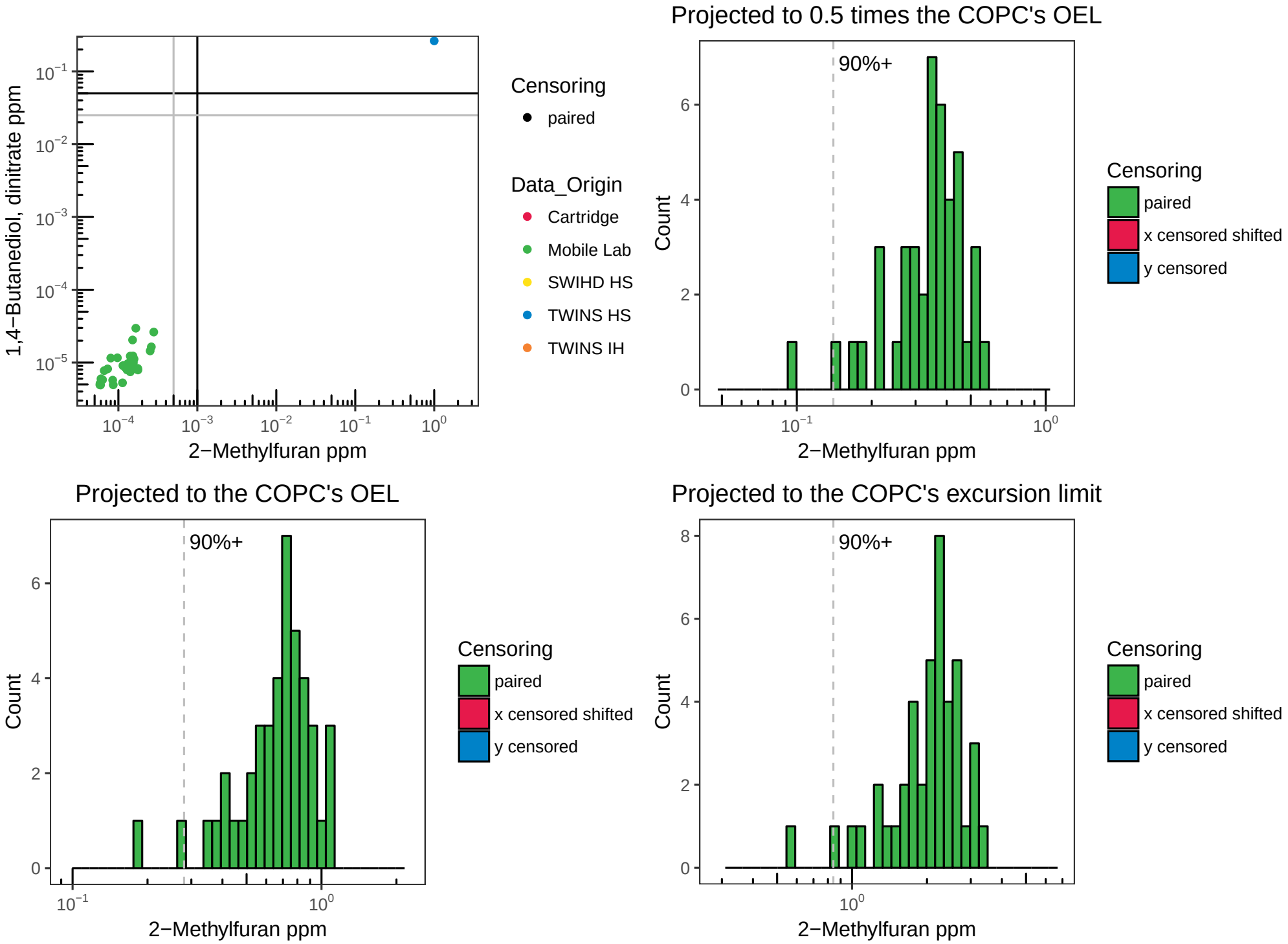


Figure C.1163: 1,4-Butanediol, dinitrate vs 2-Methylfuran

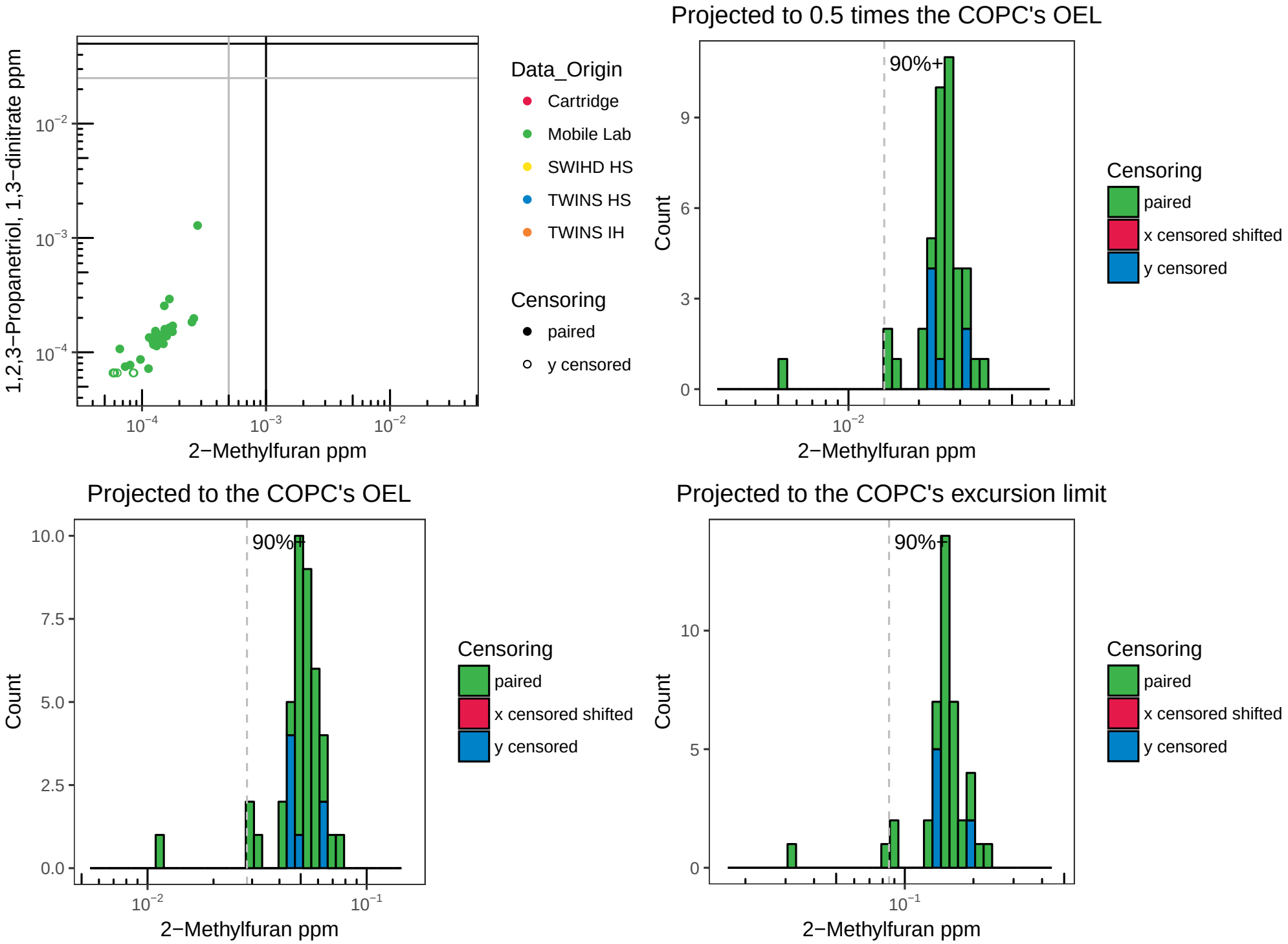


Figure C.1164: 1,2,3-Propanetriol, 1,3-dinitrate vs 2-Methylfuran

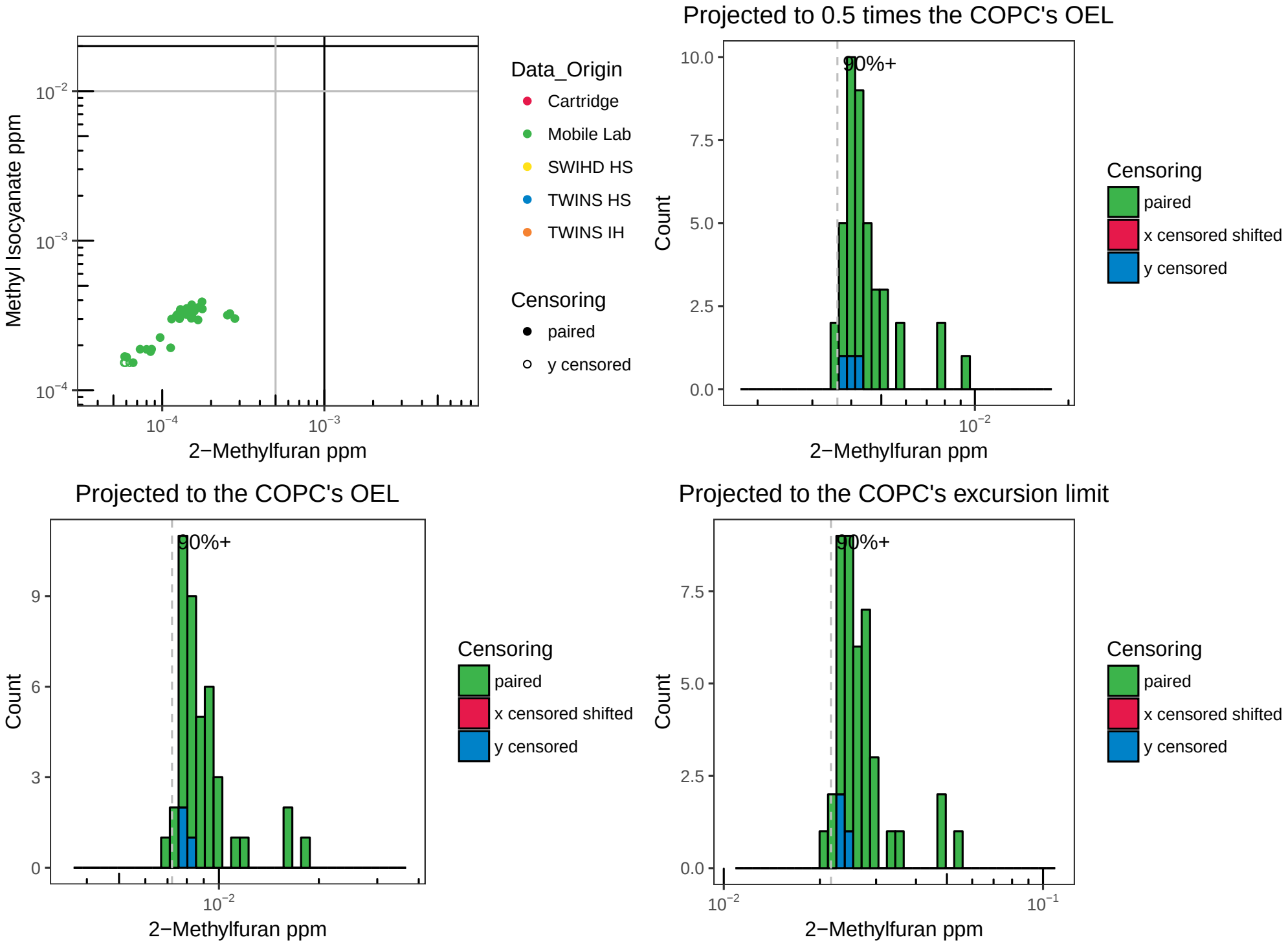


Figure C.1165: Methyl Isocyanate vs 2-Methylfuran

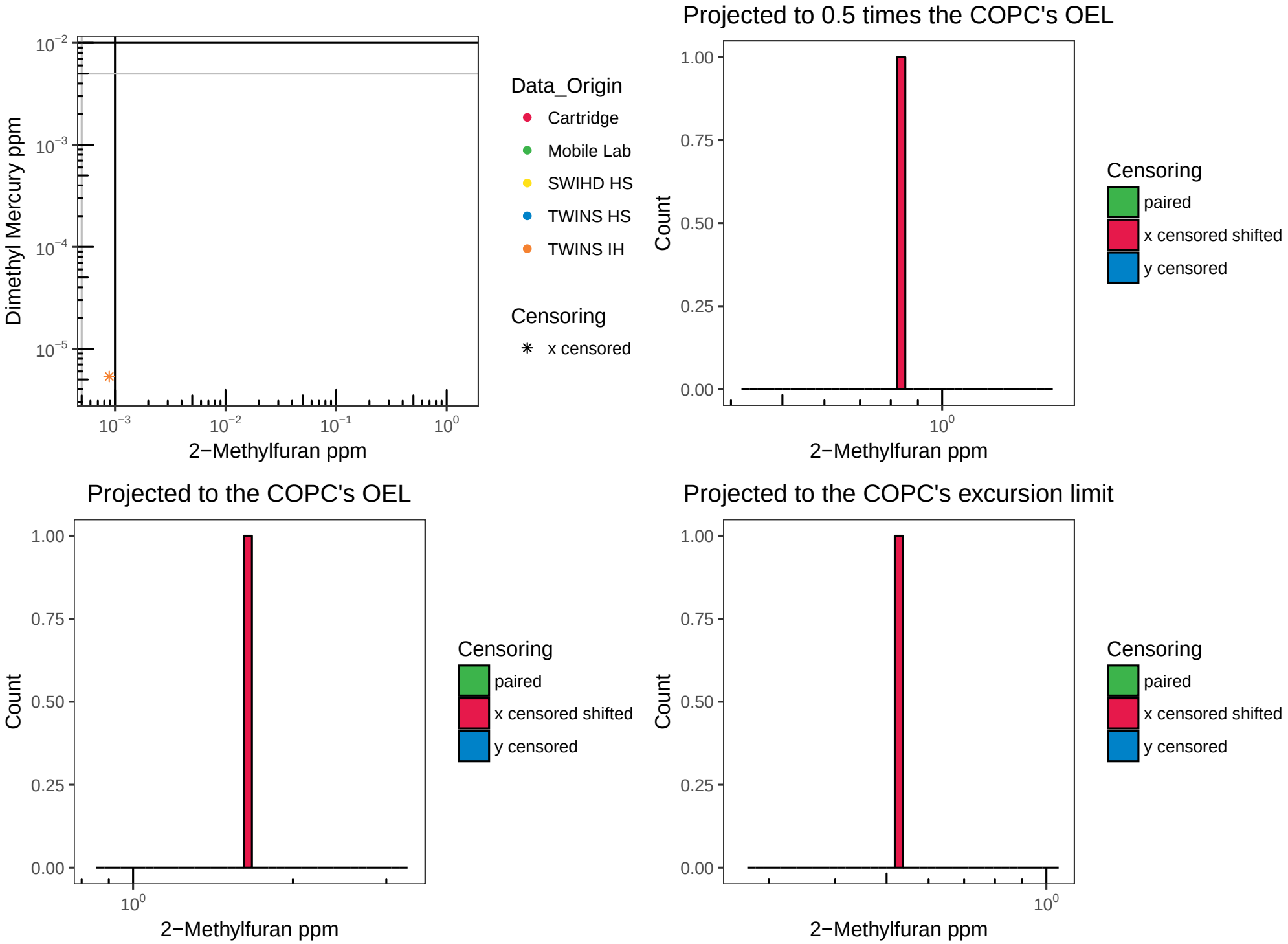


Figure C.1166: Dimethyl Mercury vs 2-Methylfuran

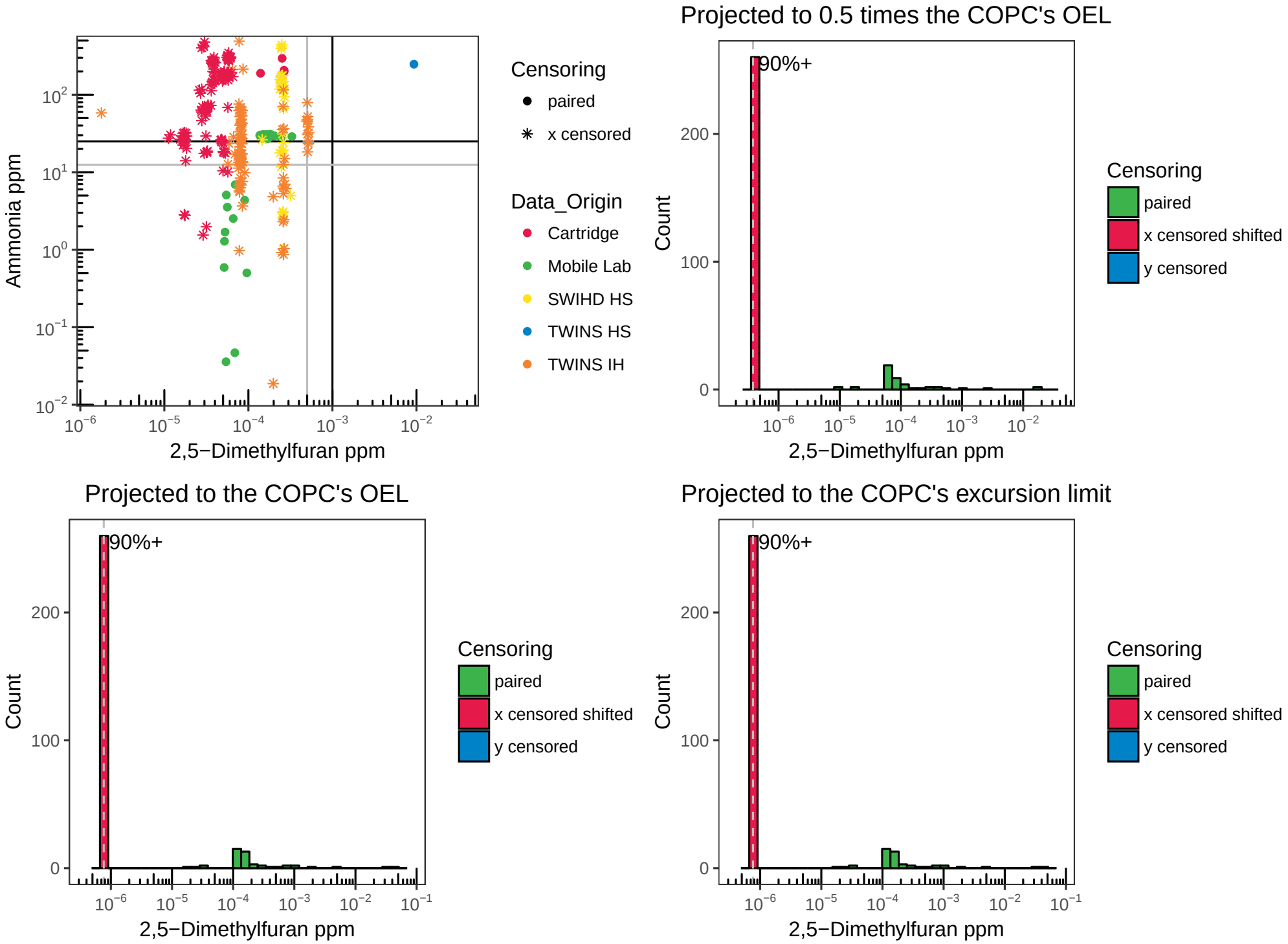


Figure C.1167: Ammonia vs 2,5-Dimethylfuran

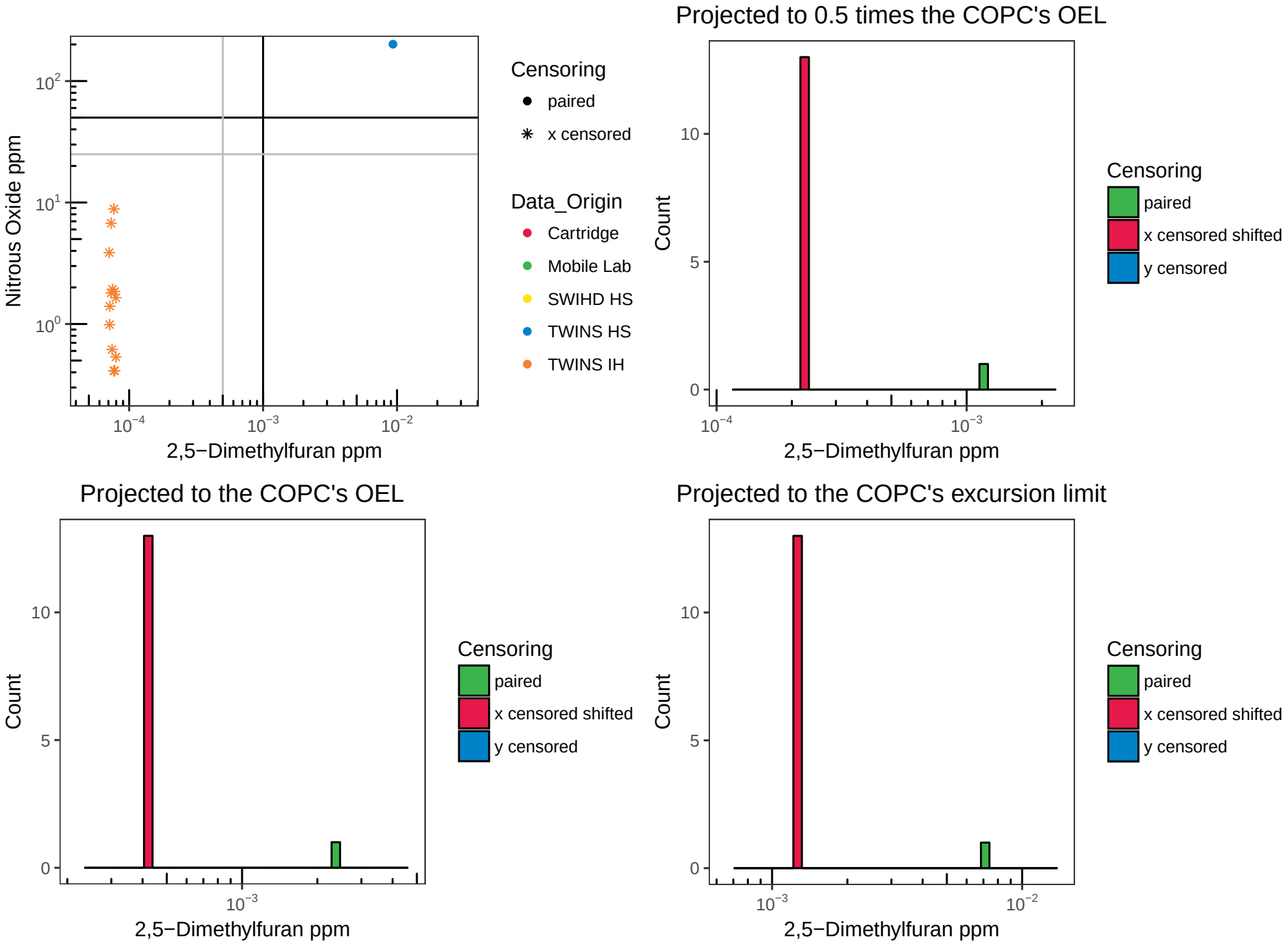


Figure C.1168: Nitrous Oxide vs 2,5-Dimethylfuran

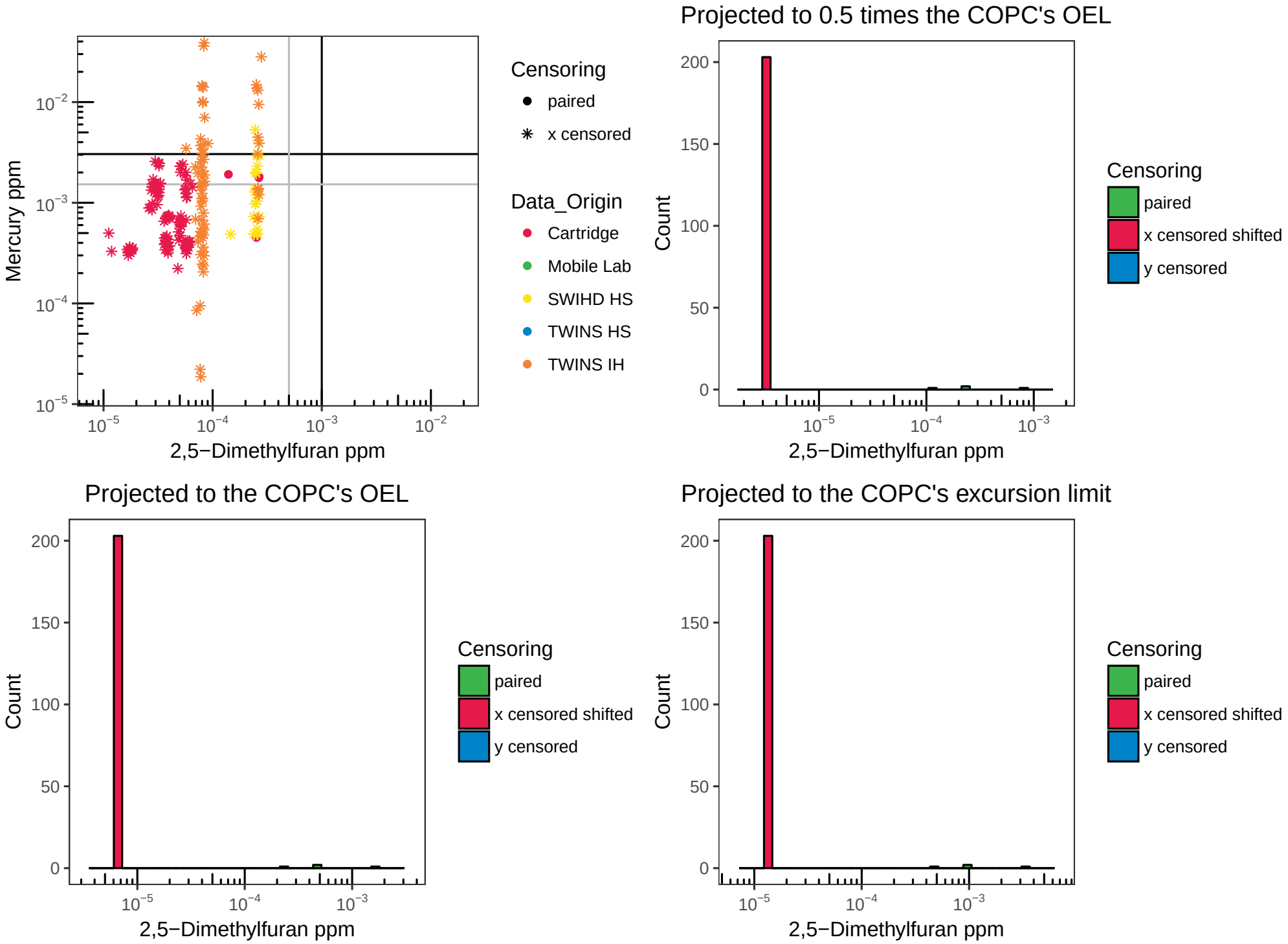


Figure C.1169: Mercury vs 2,5-Dimethylfuran

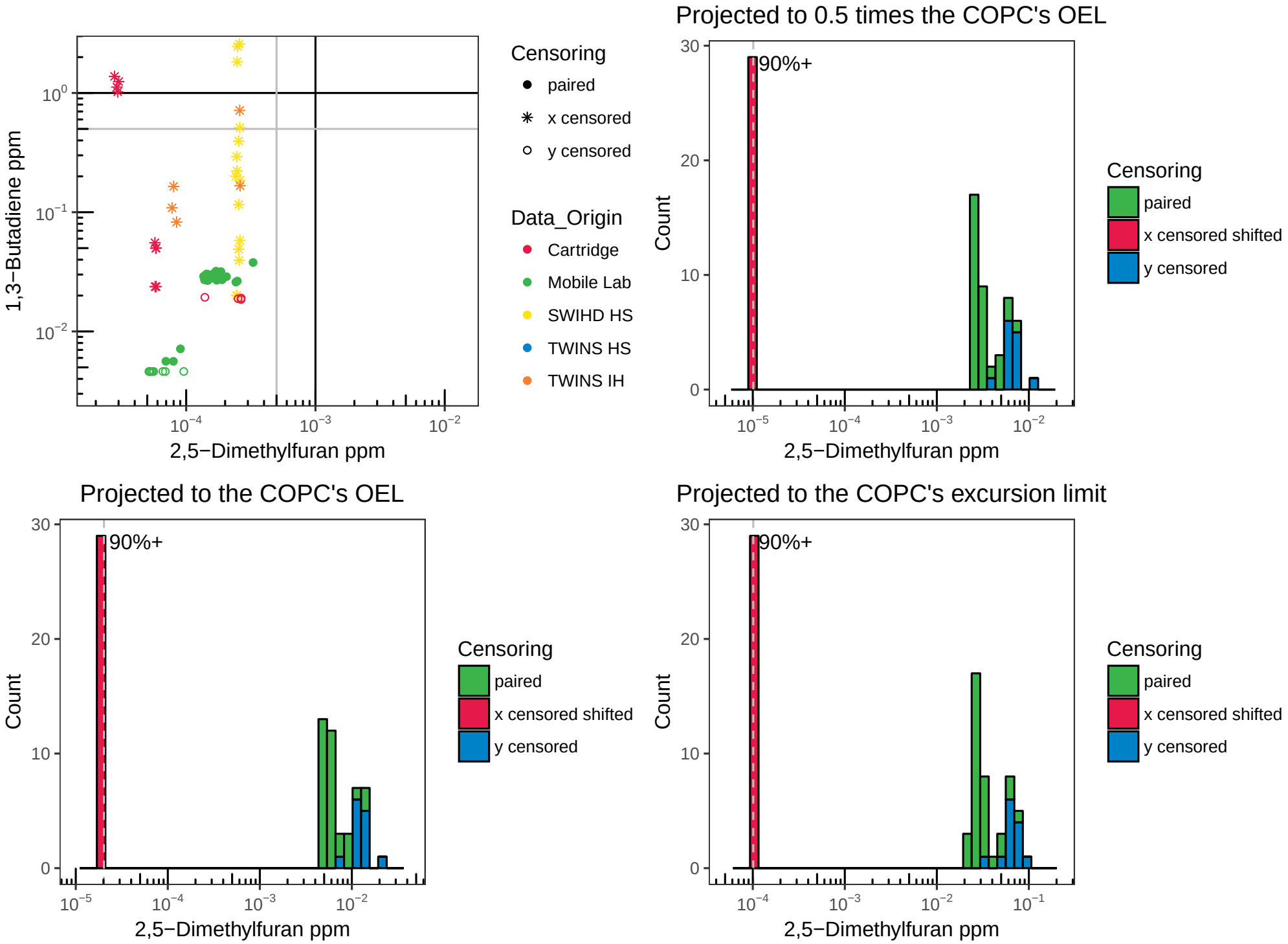


Figure C.1170: 1,3-Butadiene vs 2,5-Dimethylfuran

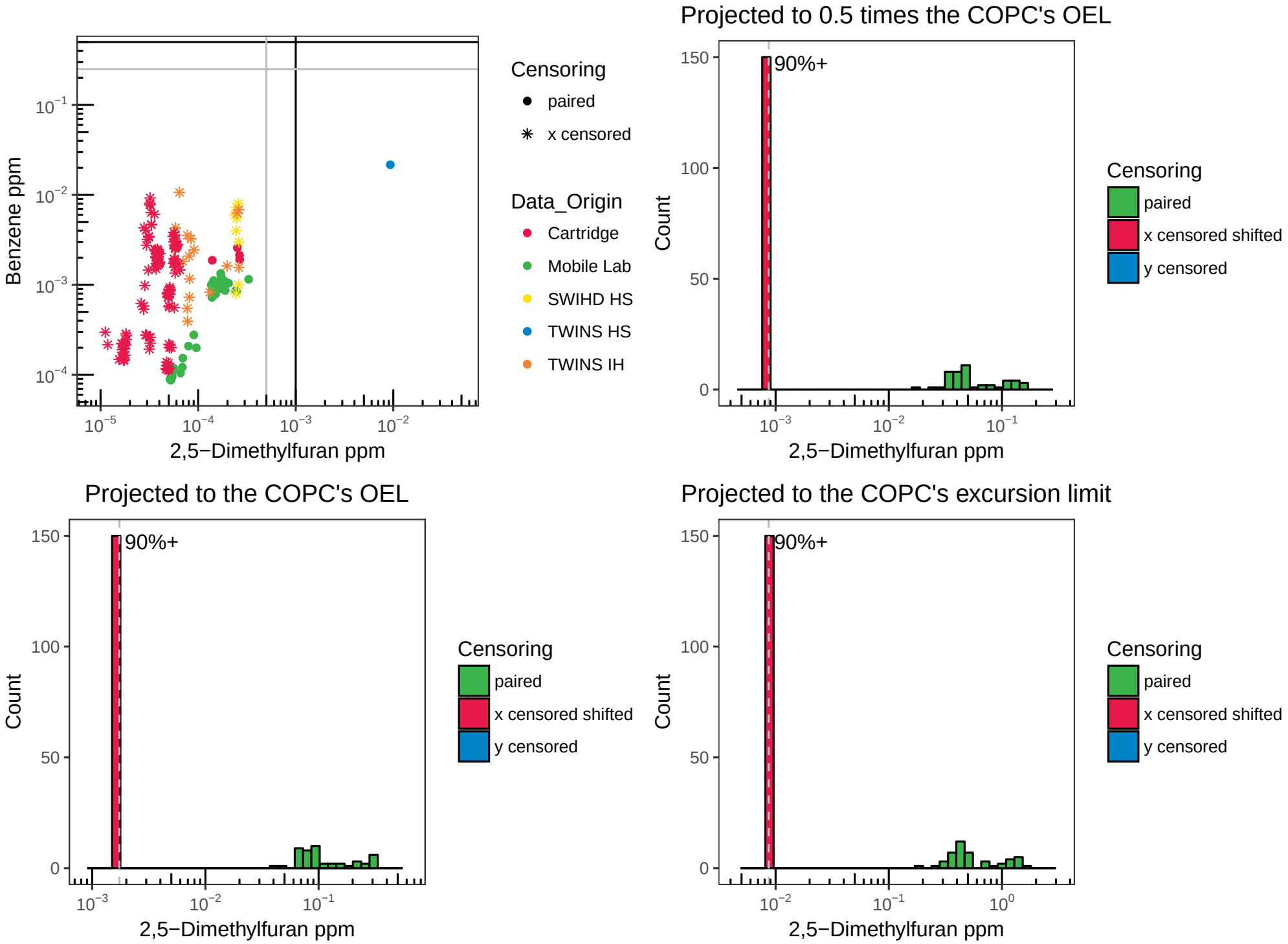


Figure C.1171: Benzene vs 2,5-Dimethylfuran

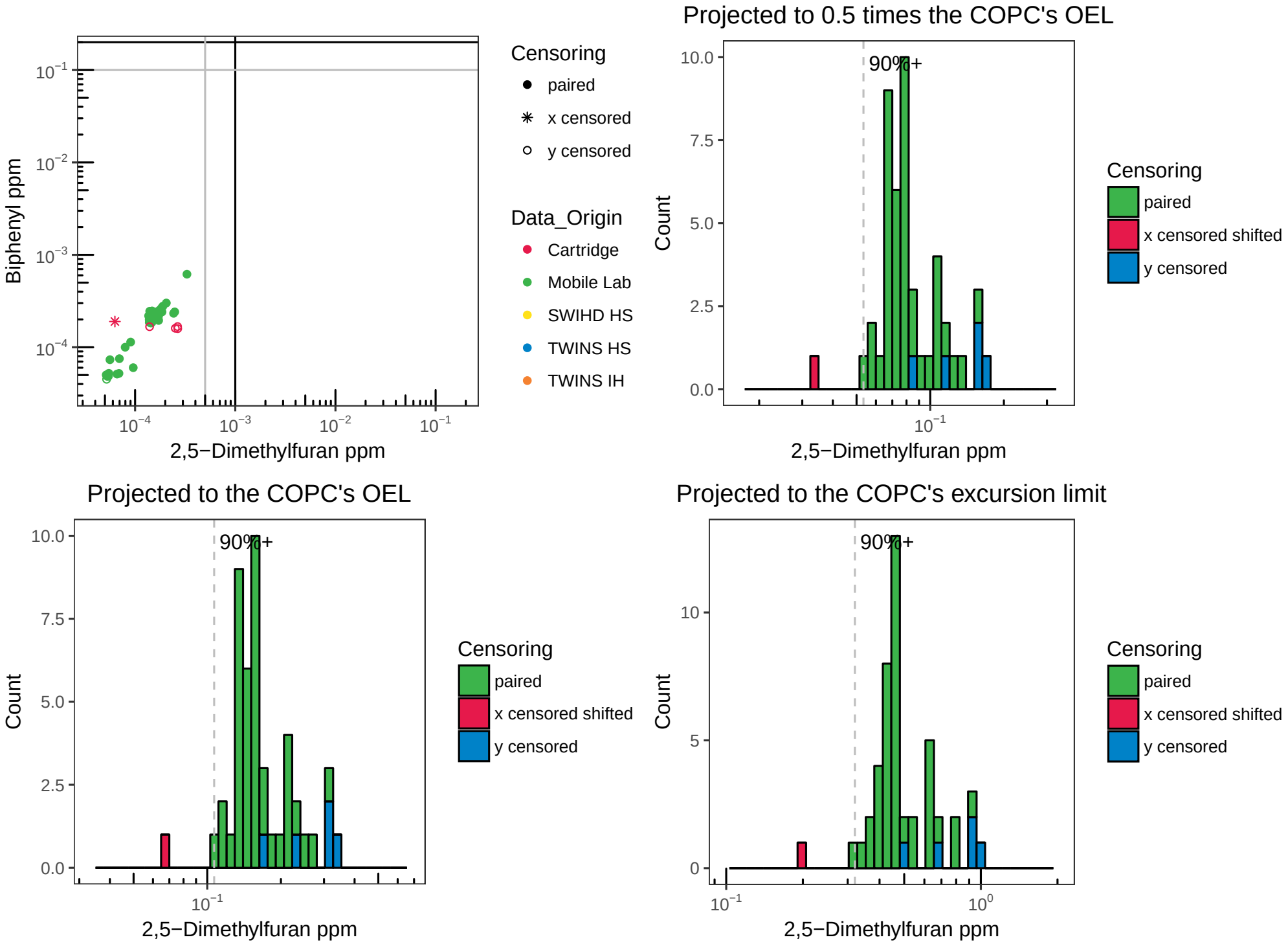


Figure C.1172: Biphenyl vs 2,5-Dimethylfuran

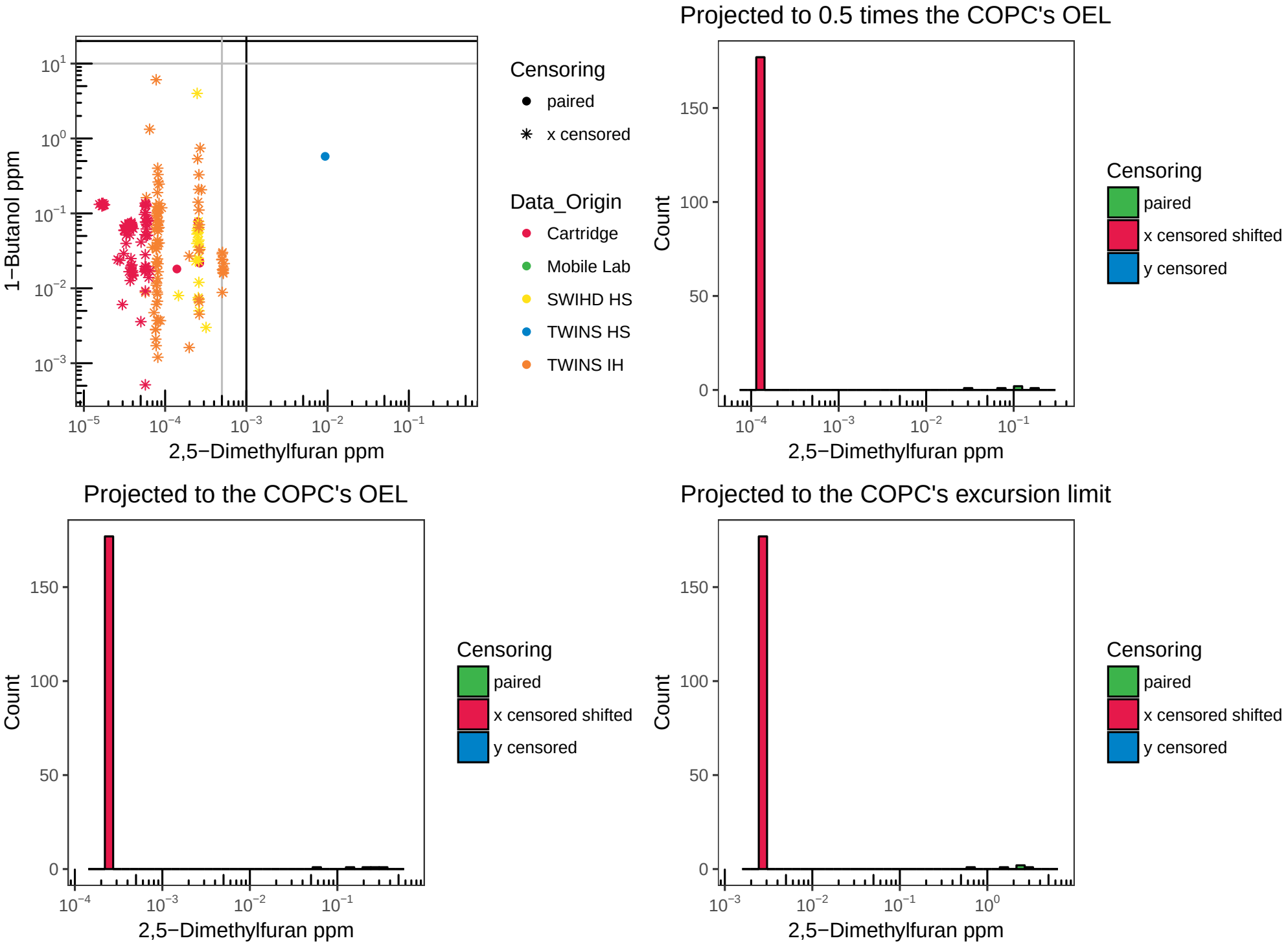


Figure C.1173: 1-Butanol vs 2,5-Dimethylfuran

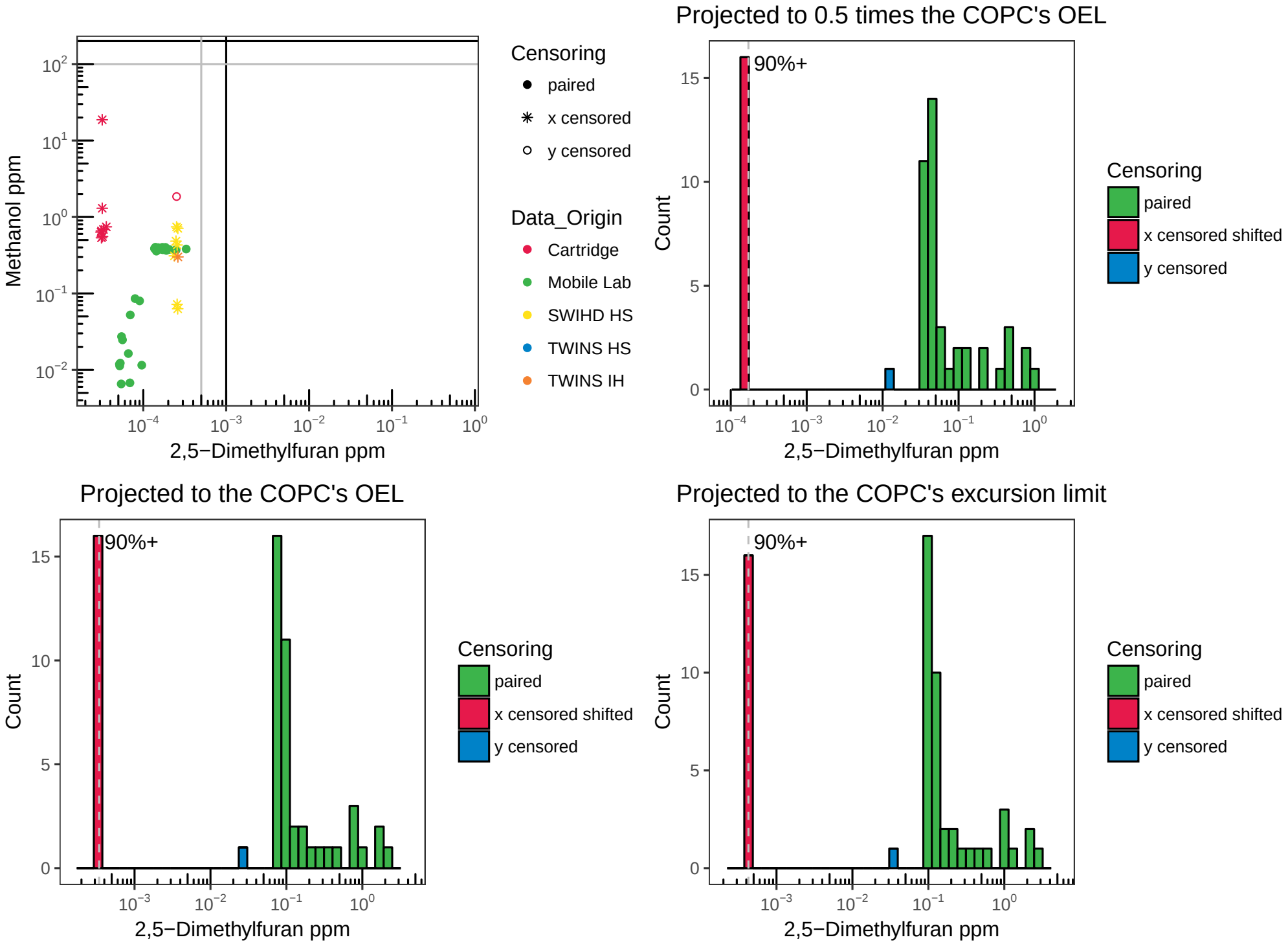


Figure C.1174: Methanol vs 2,5-Dimethylfuran

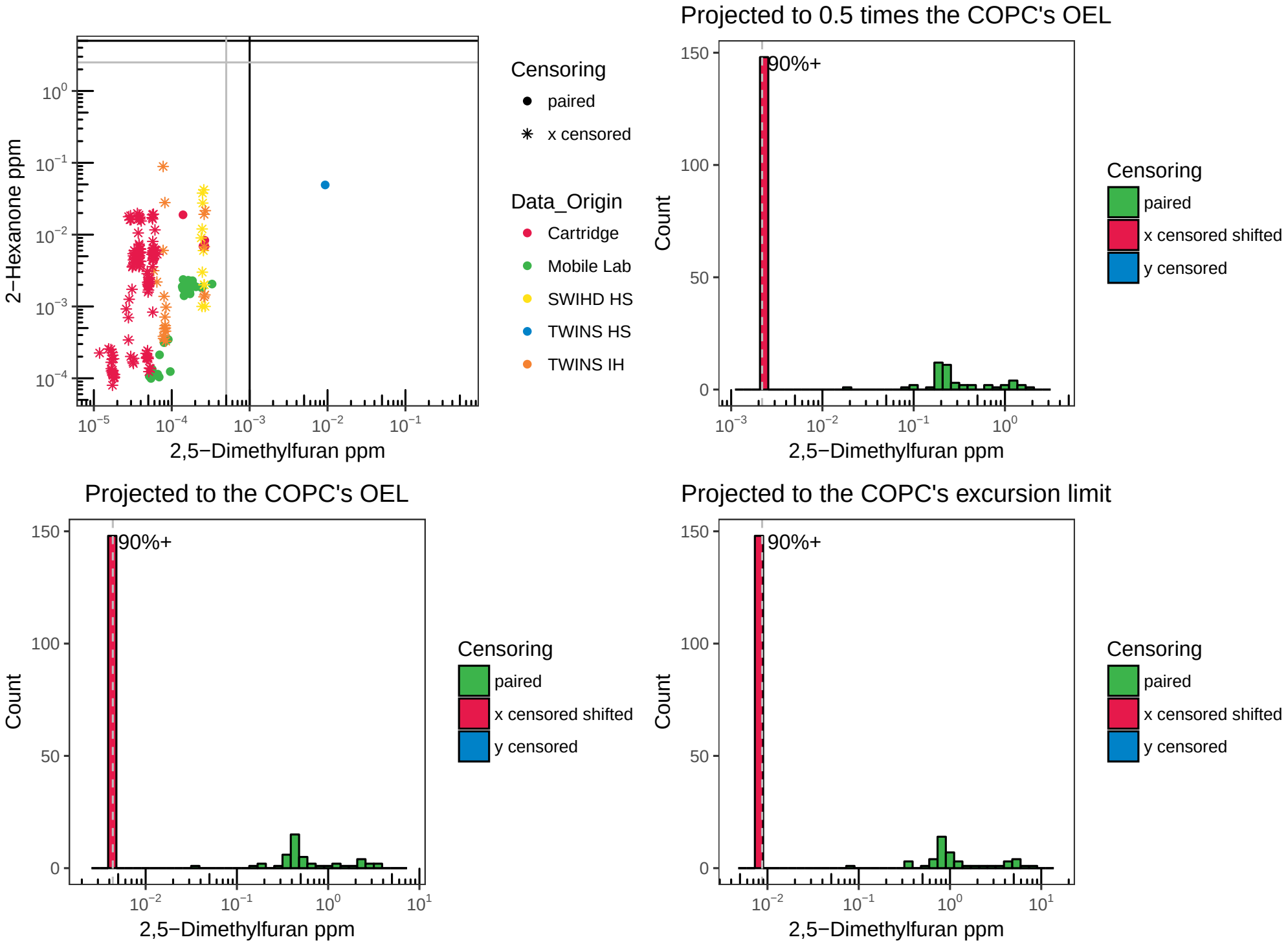


Figure C.1175: 2-Hexanone vs 2,5-Dimethylfuran

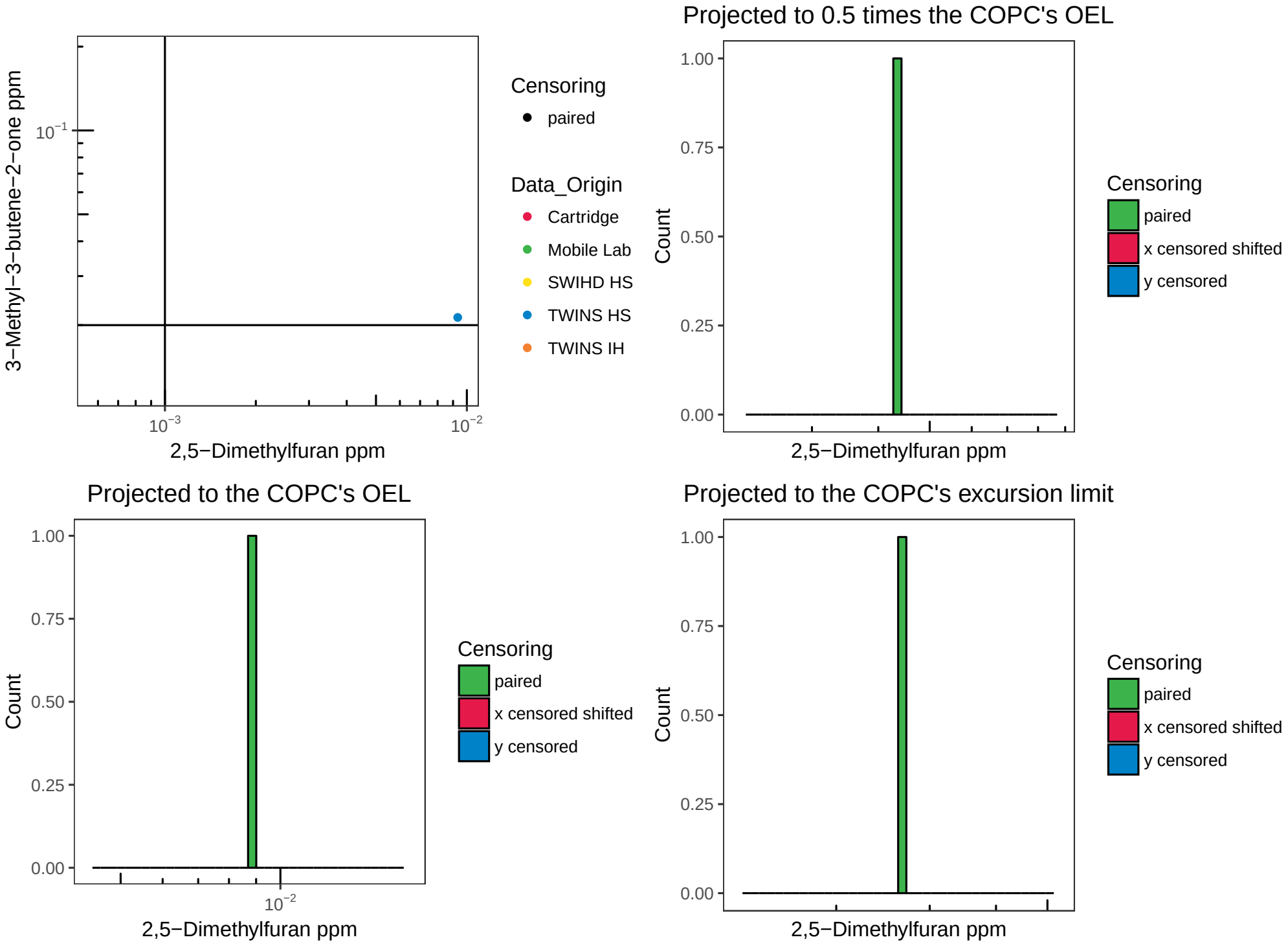


Figure C.1176: 3-Methyl-3-butene-2-one vs 2,5-Dimethylfuran

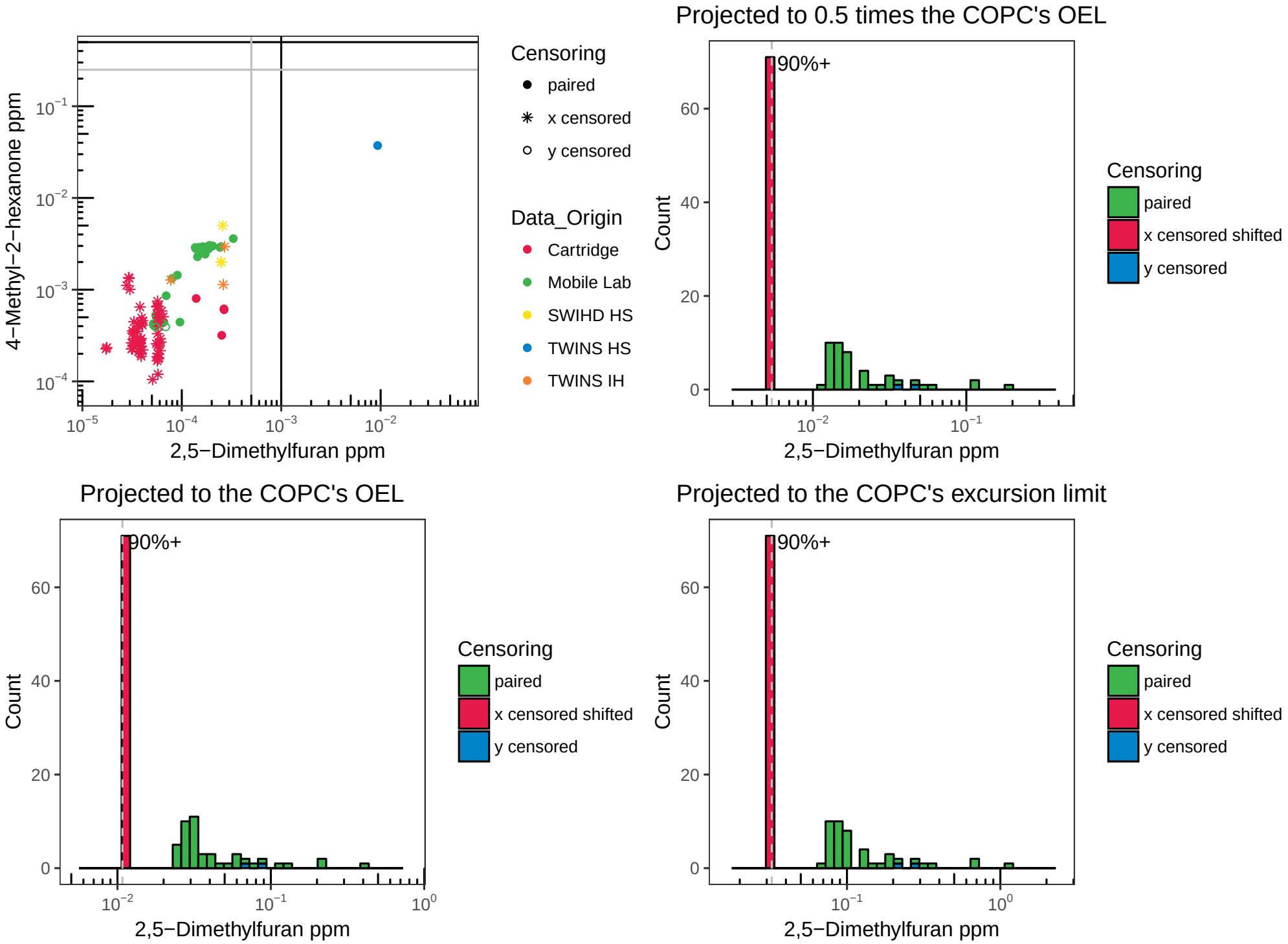


Figure C.1177: 4-Methyl-2-hexanone vs 2,5-Dimethylfuran

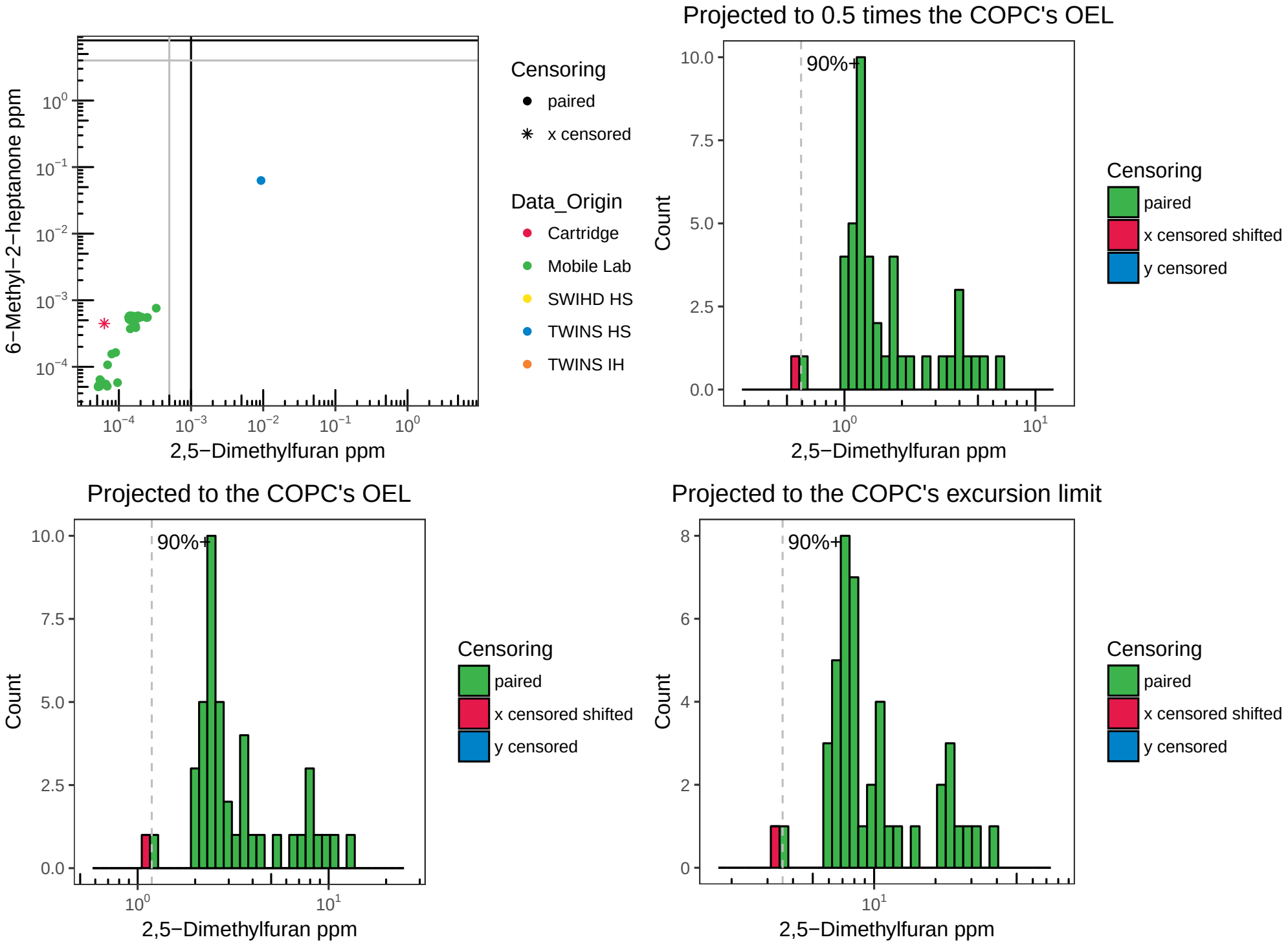


Figure C.1178: 6-Methyl-2-heptanone vs 2,5-Dimethylfuran

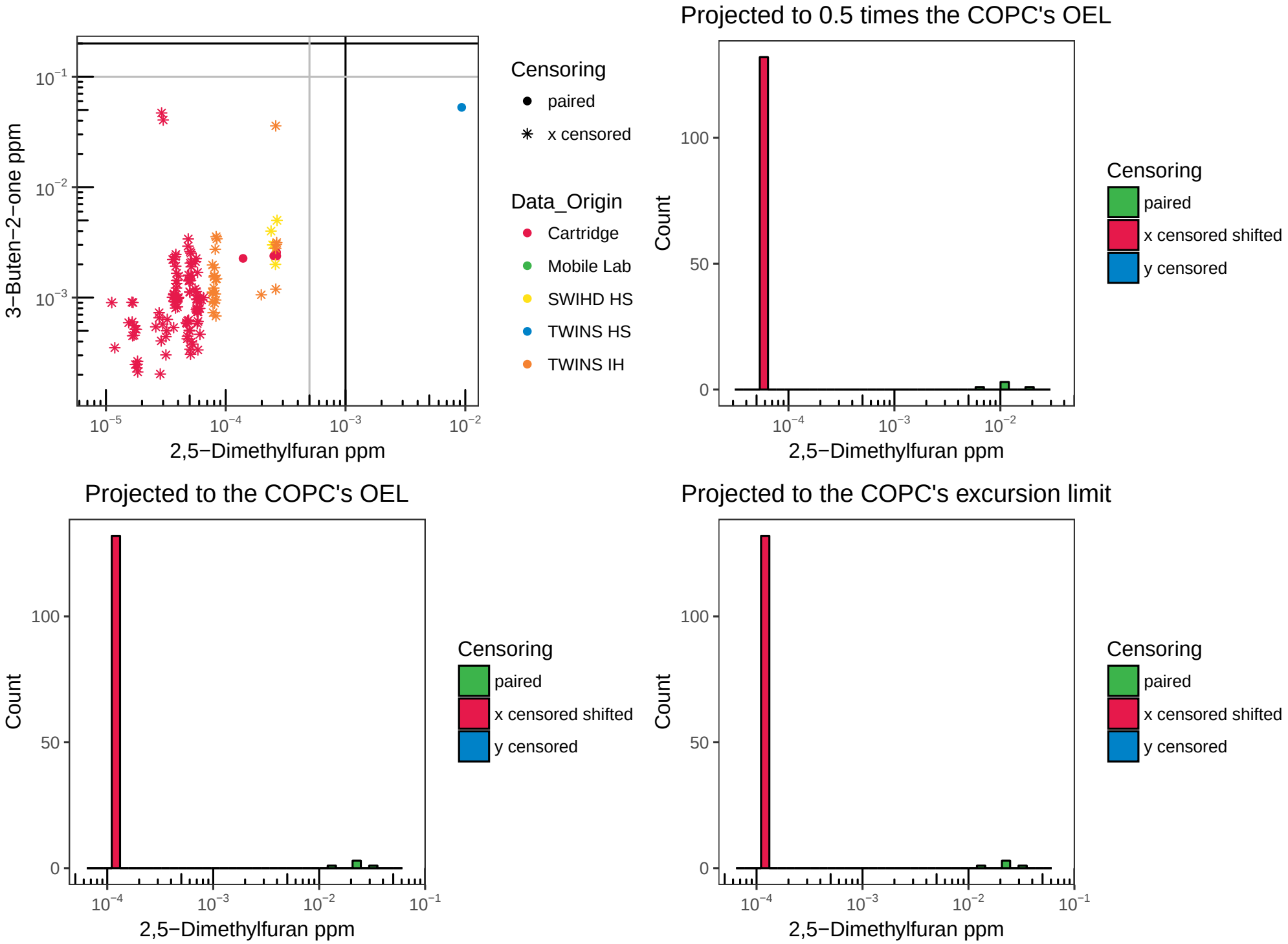


Figure C.1179: 3-Buten-2-one vs 2,5-Dimethylfuran

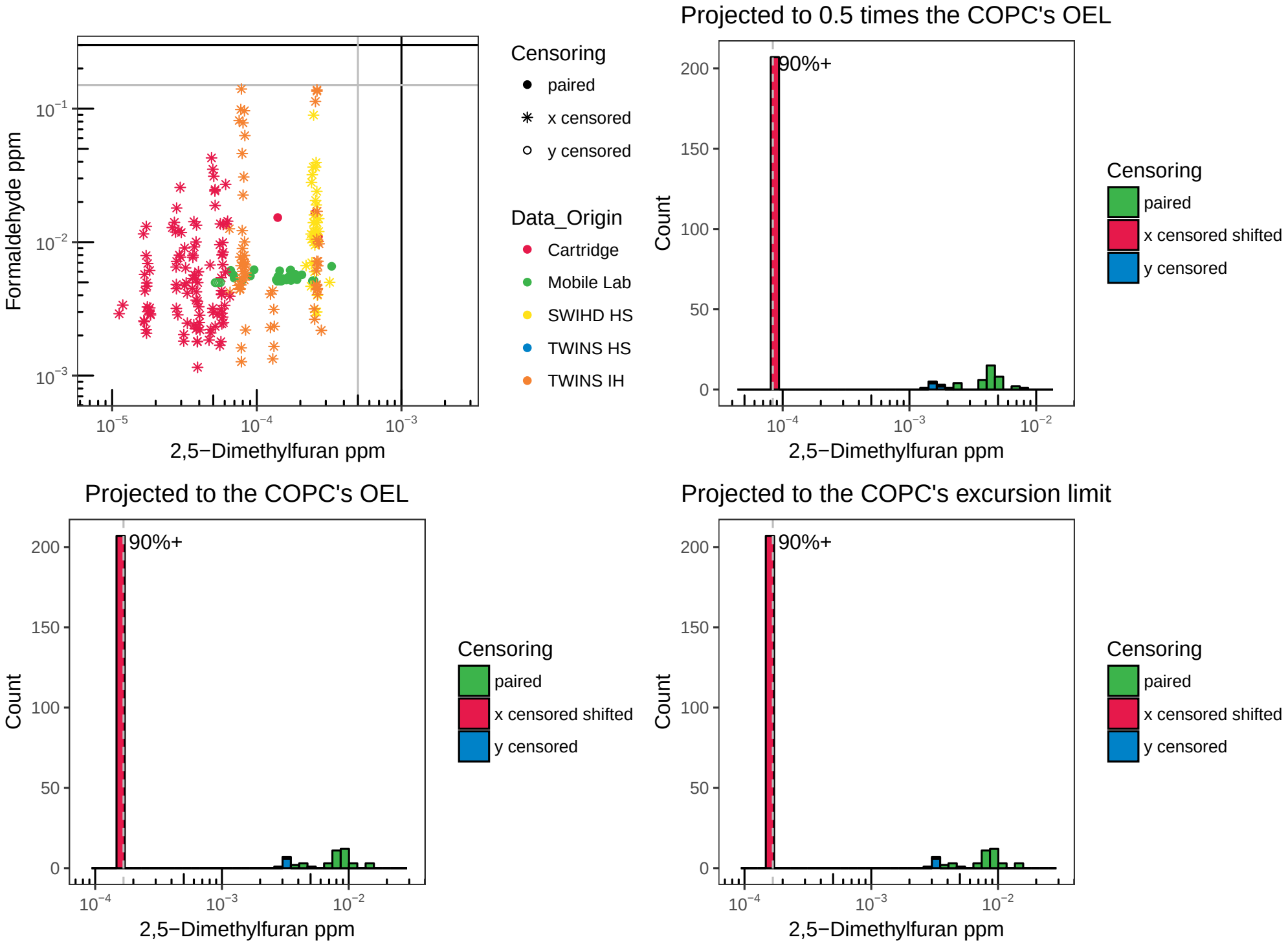


Figure C.1180: Formaldehyde vs 2,5-Dimethylfuran

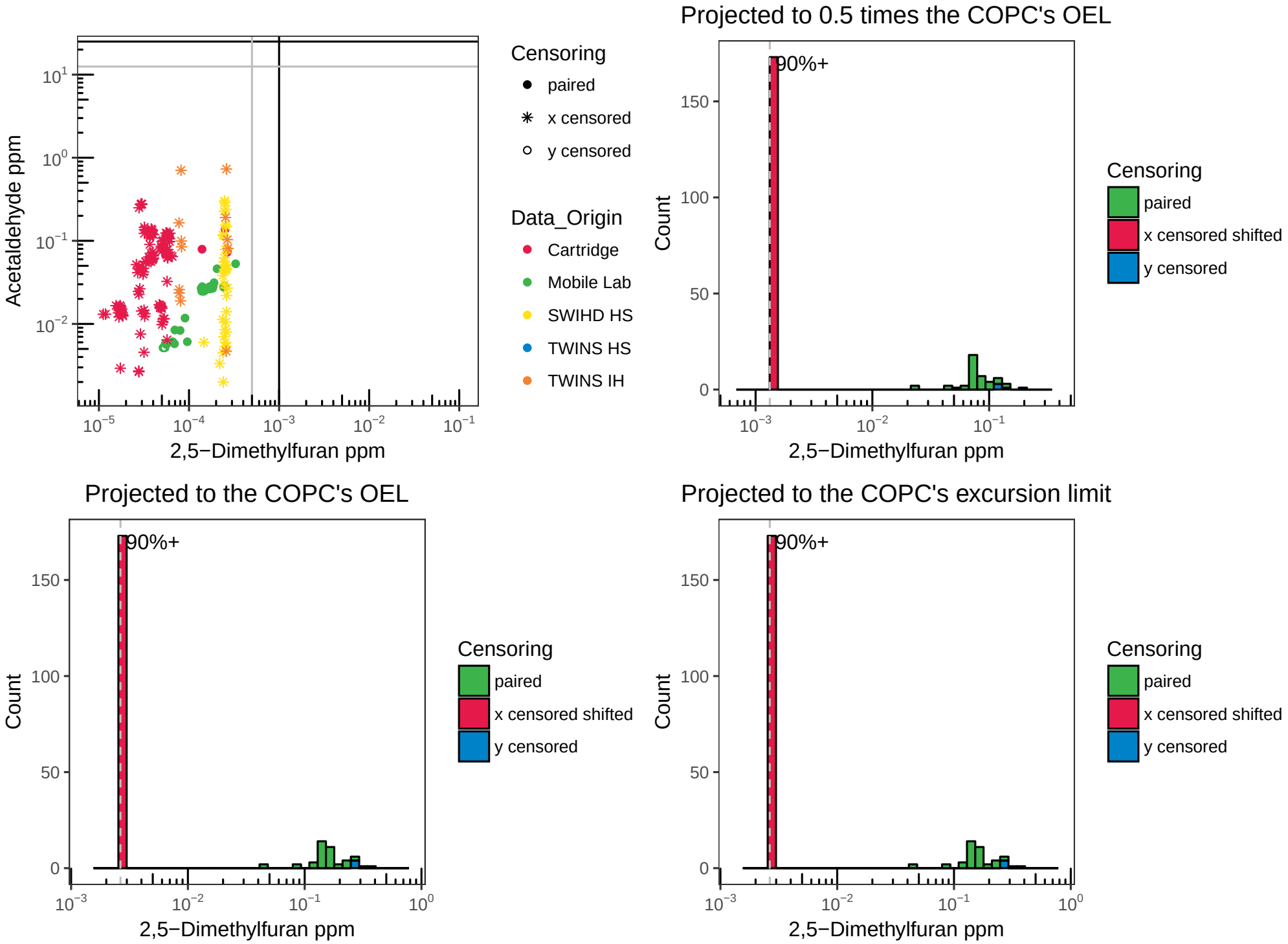


Figure C.1181: Acetaldehyde vs 2,5-Dimethylfuran

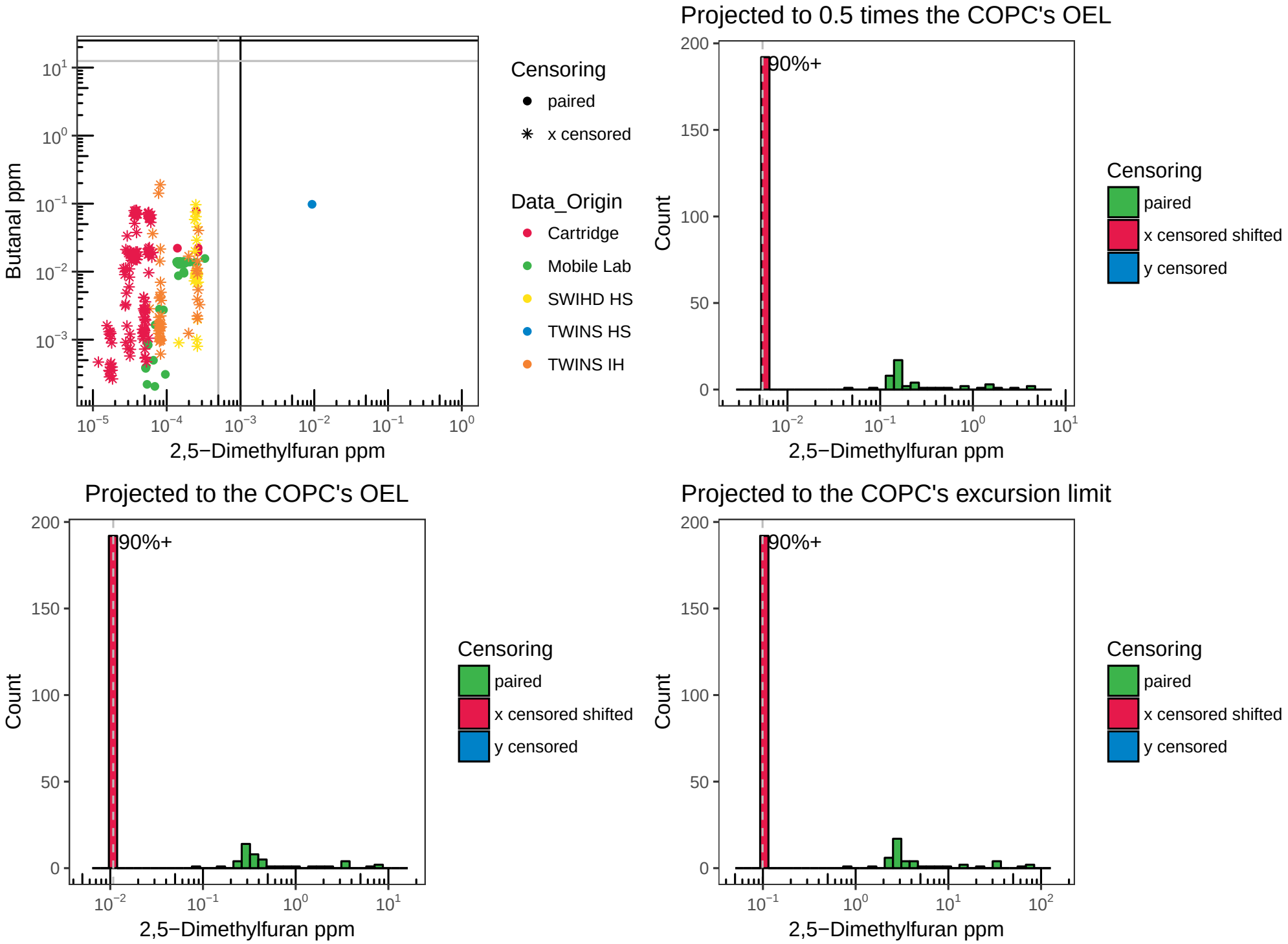


Figure C.1182: Butanal vs 2,5-Dimethylfuran

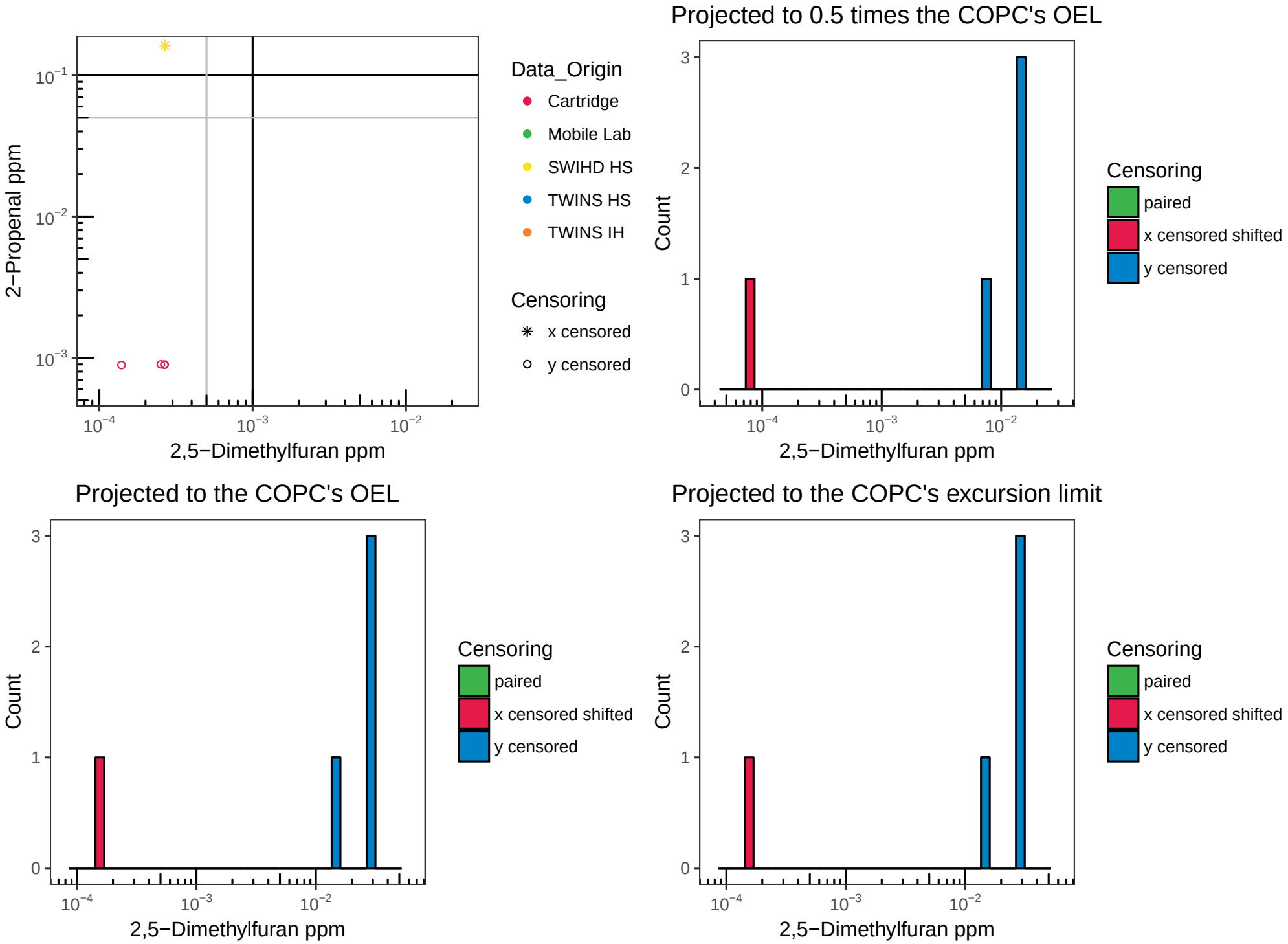


Figure C.1183: 2-Propenal vs 2,5-Dimethylfuran

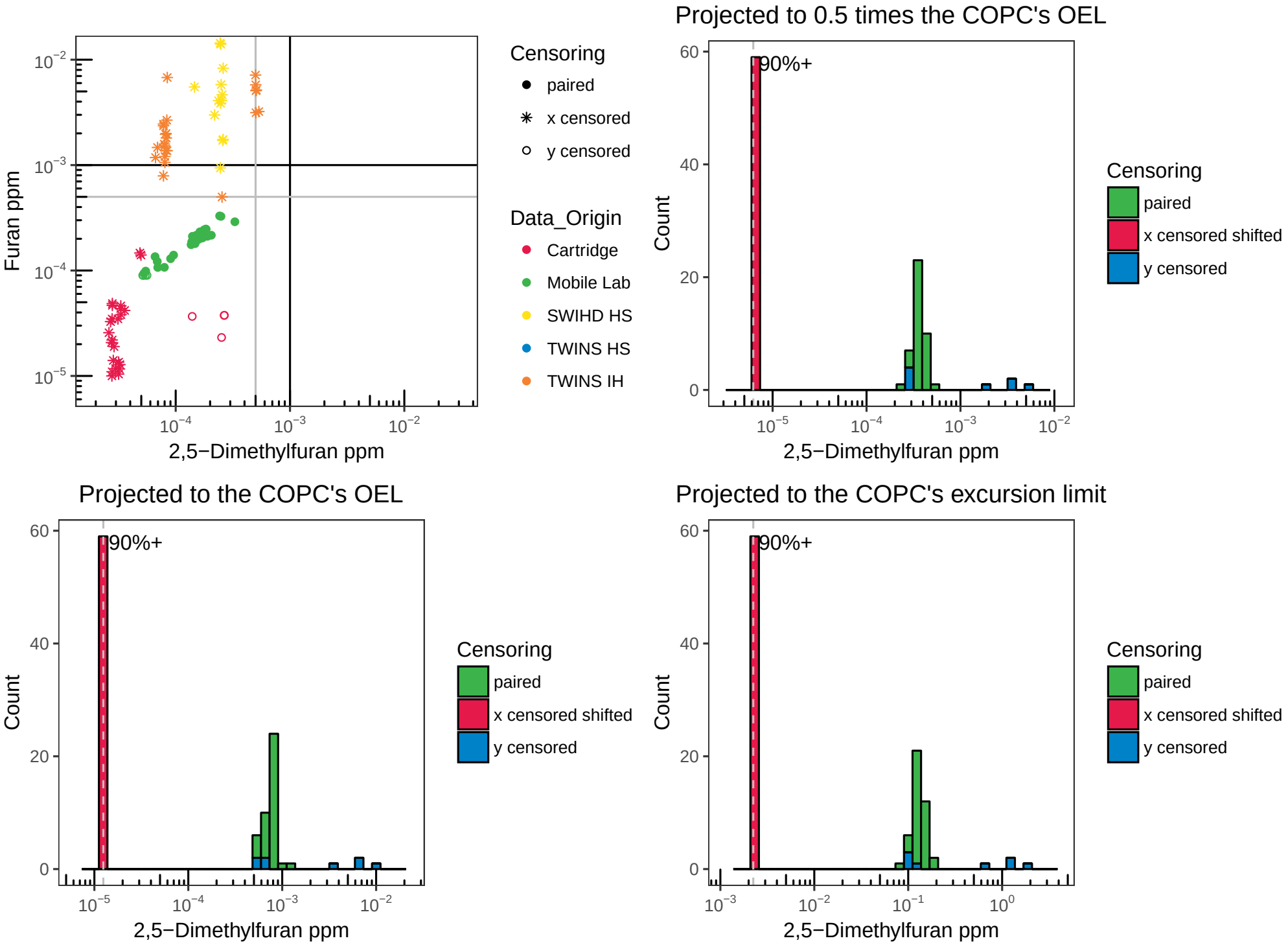


Figure C.1184: Furan vs 2,5-Dimethylfuran

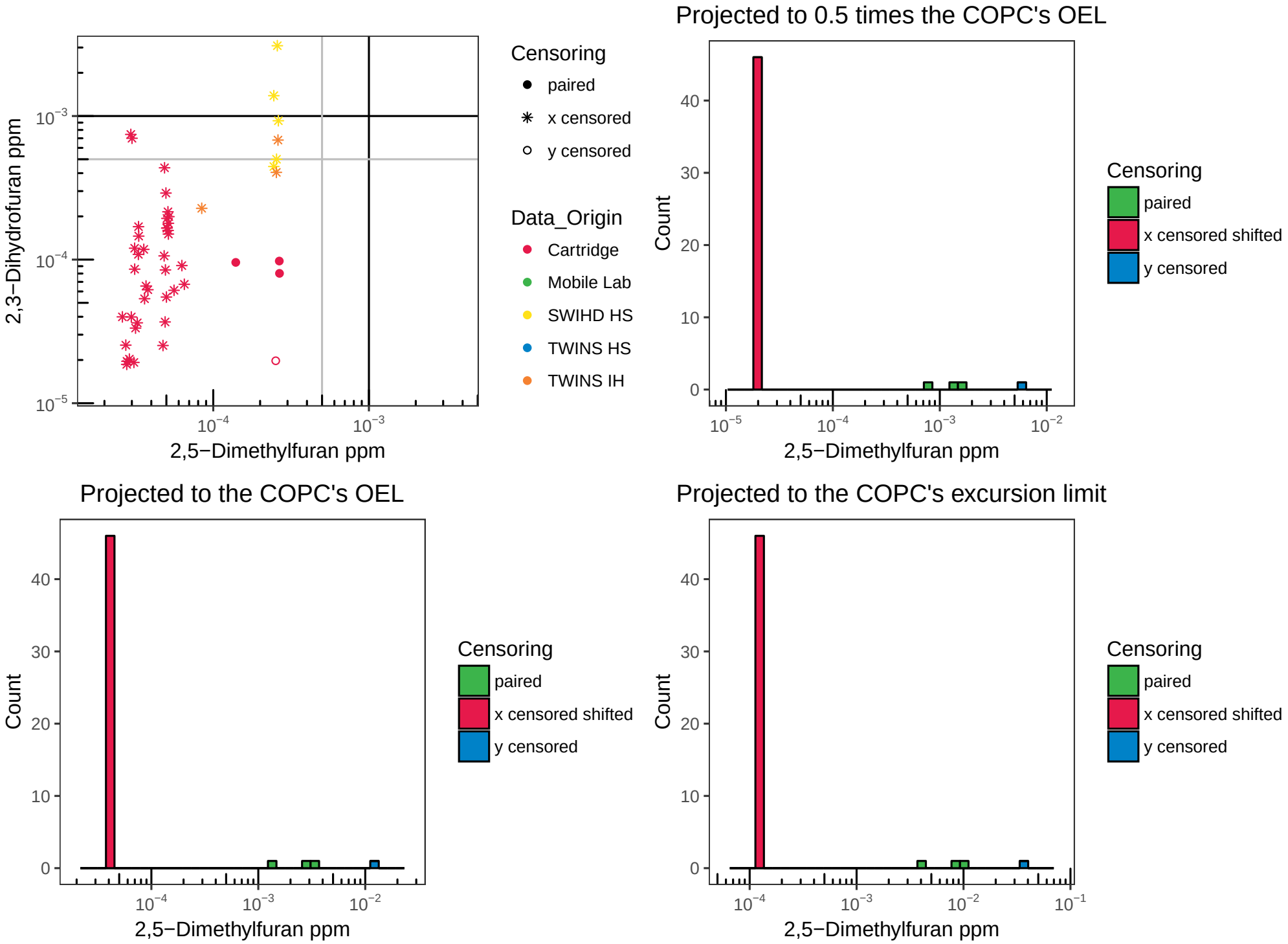


Figure C.1185: 2,3-Dihydrofuran vs 2,5-Dimethylfuran

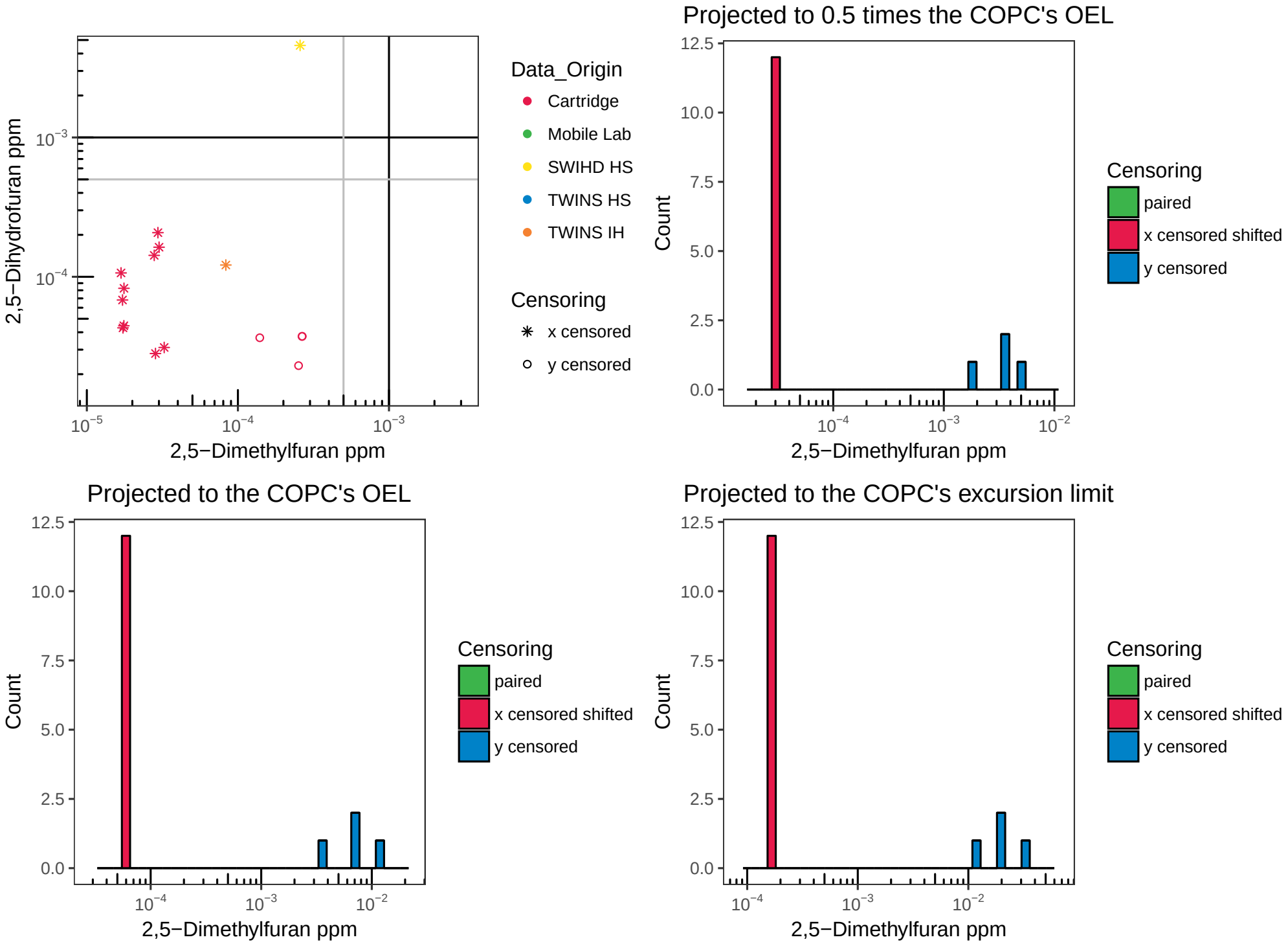


Figure C.1186: 2,5-Dihydrofuran vs 2,5-Dimethylfuran

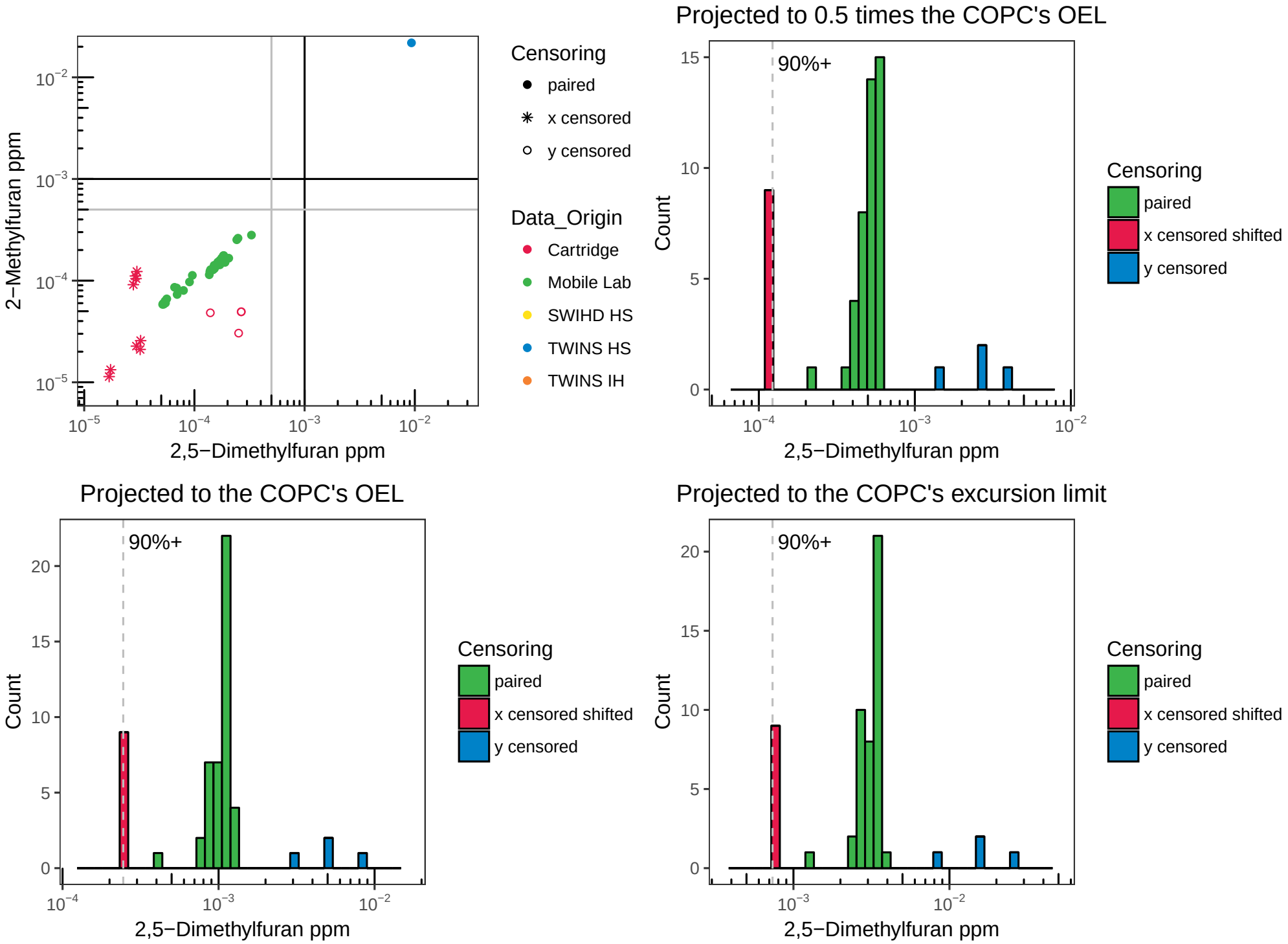


Figure C.1187: 2-Methylfuran vs 2,5-Dimethylfuran

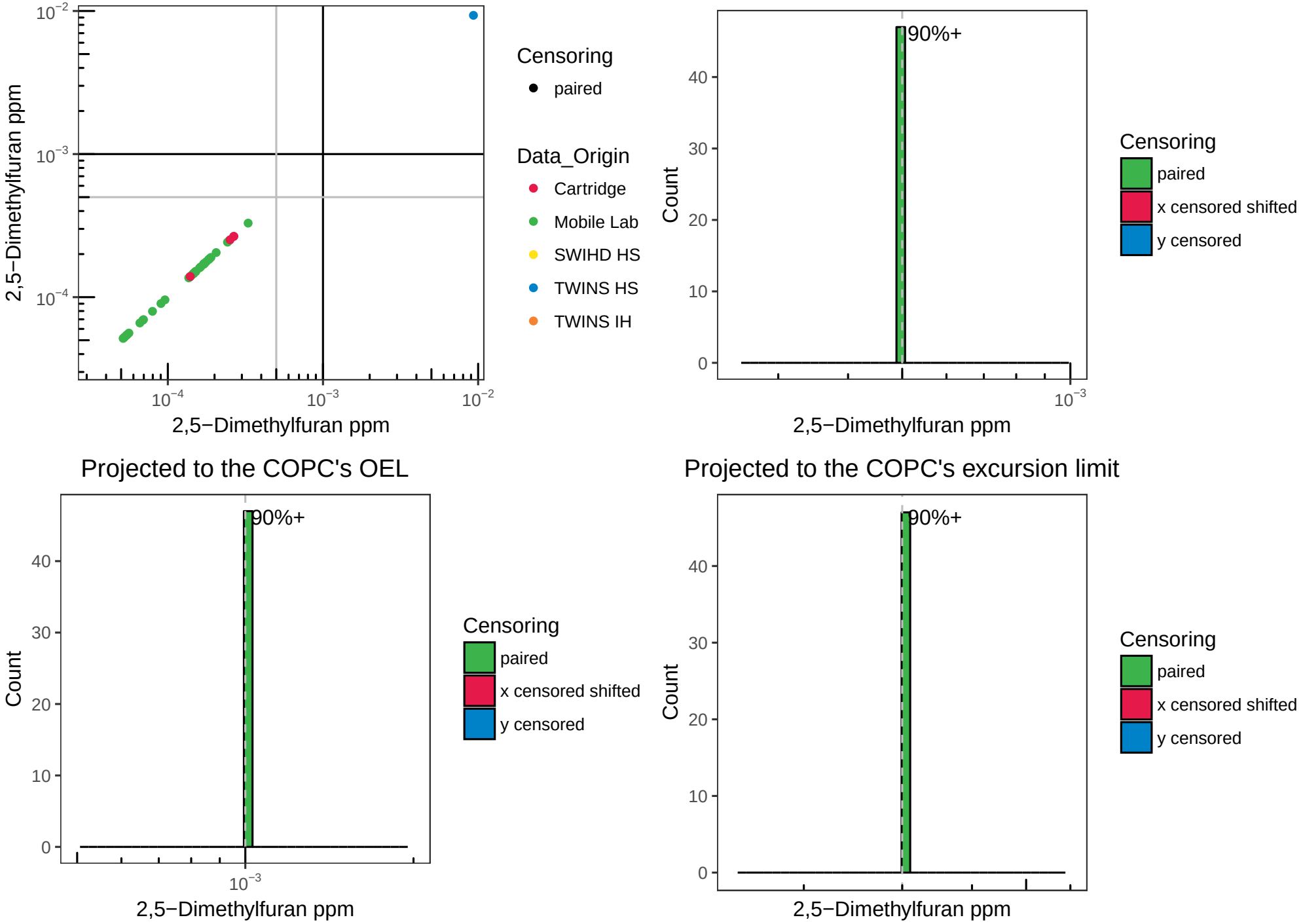


Figure C.1188: 2,5-Dimethylfuran vs 2,5-Dimethylfuran

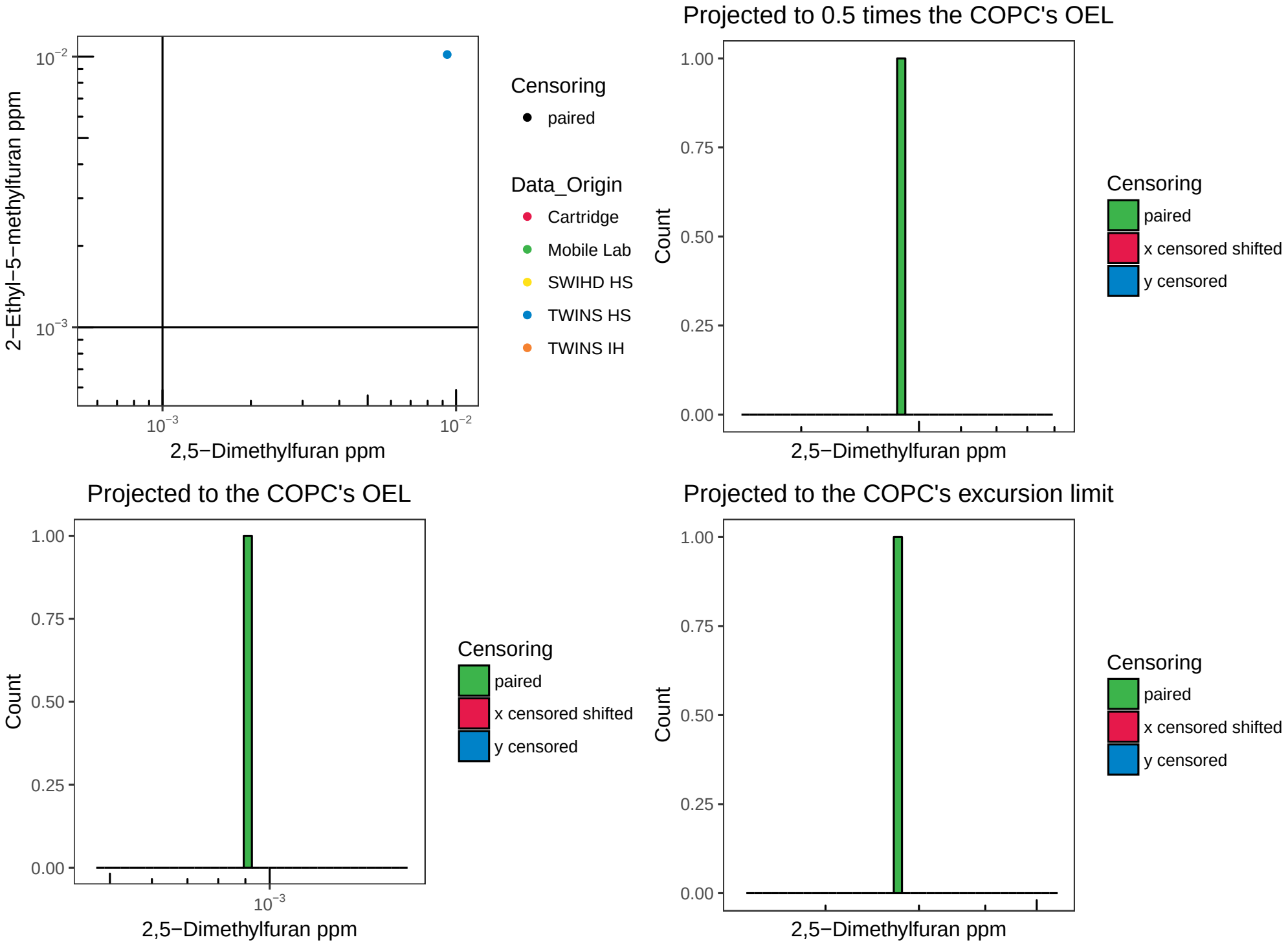


Figure C.1189: 2-Ethyl-5-methylfuran vs 2,5-Dimethylfuran

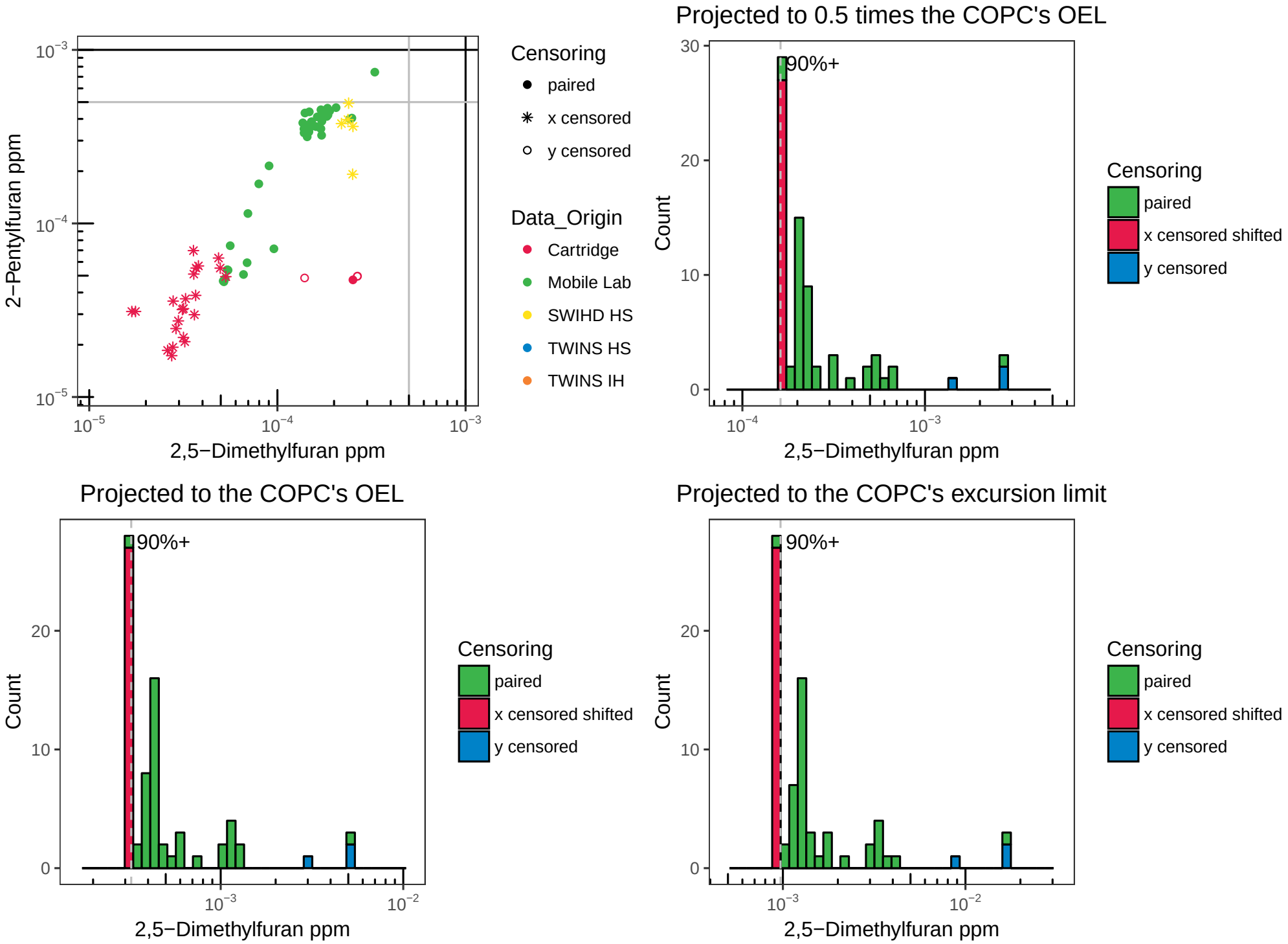


Figure C.1190: 2-Pentylfuran vs 2,5-Dimethylfuran

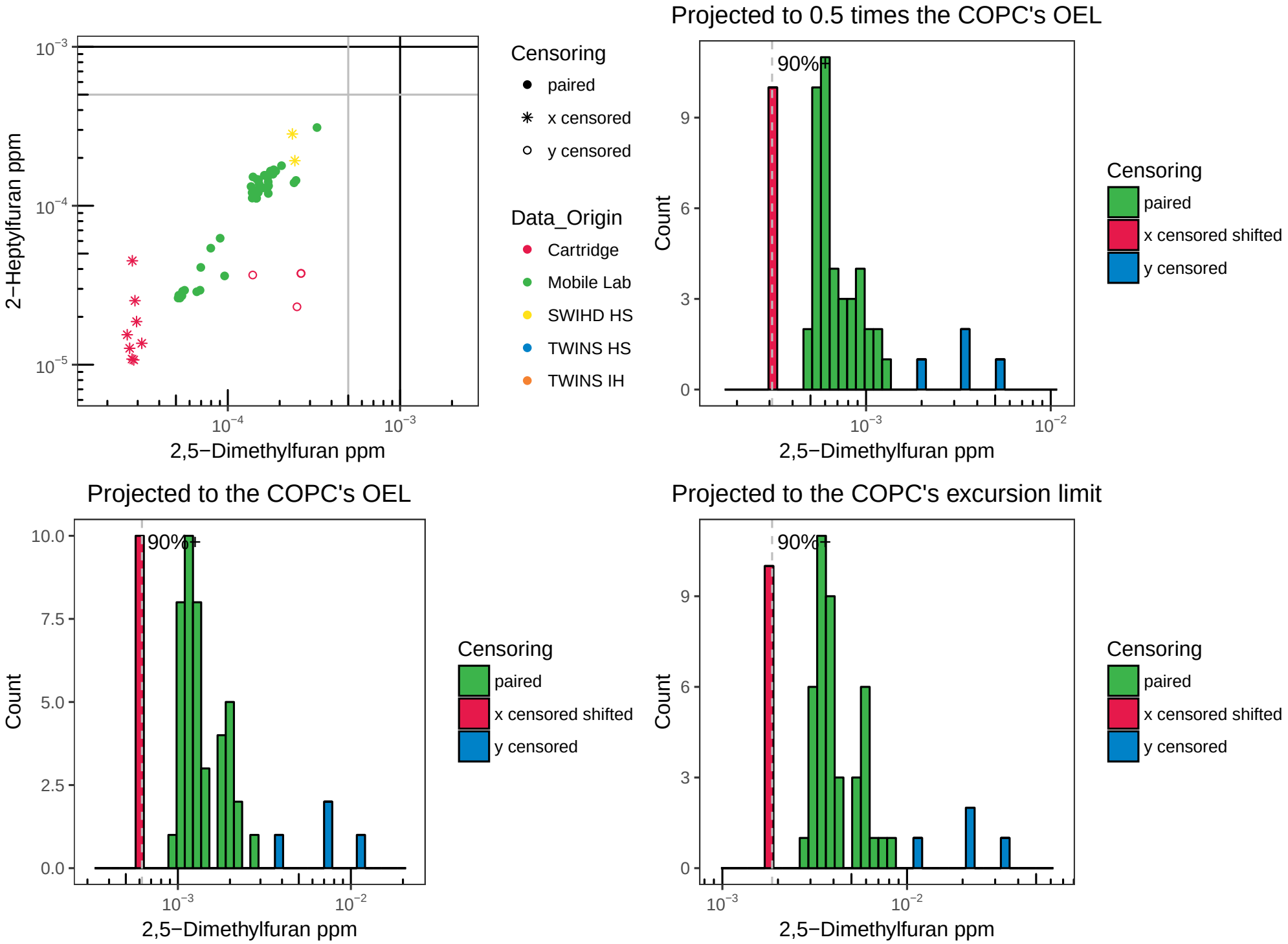


Figure C.1191: 2-Heptylfuran vs 2,5-Dimethylfuran

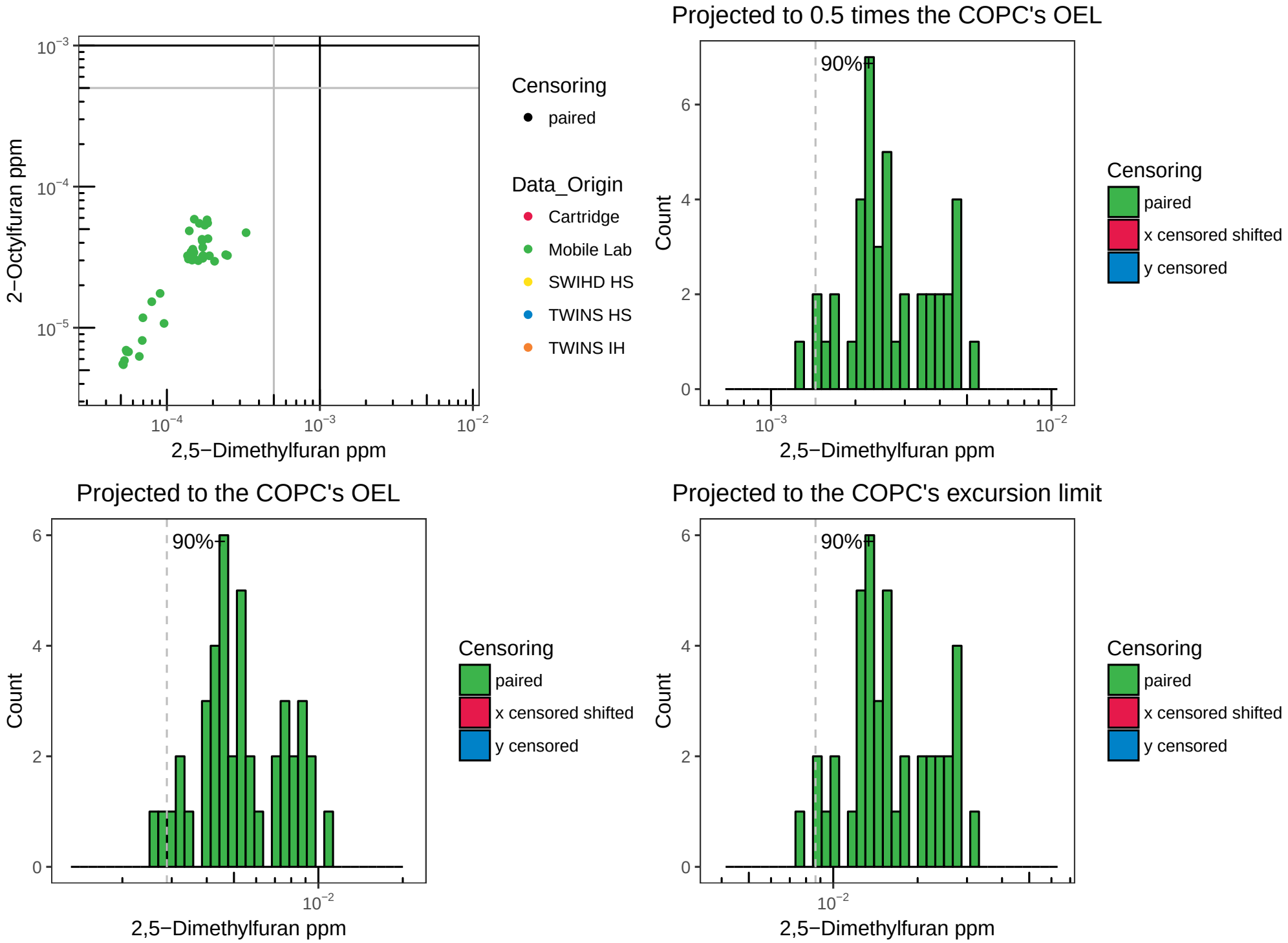


Figure C.1192: 2-Octylfuran vs 2,5-Dimethylfuran

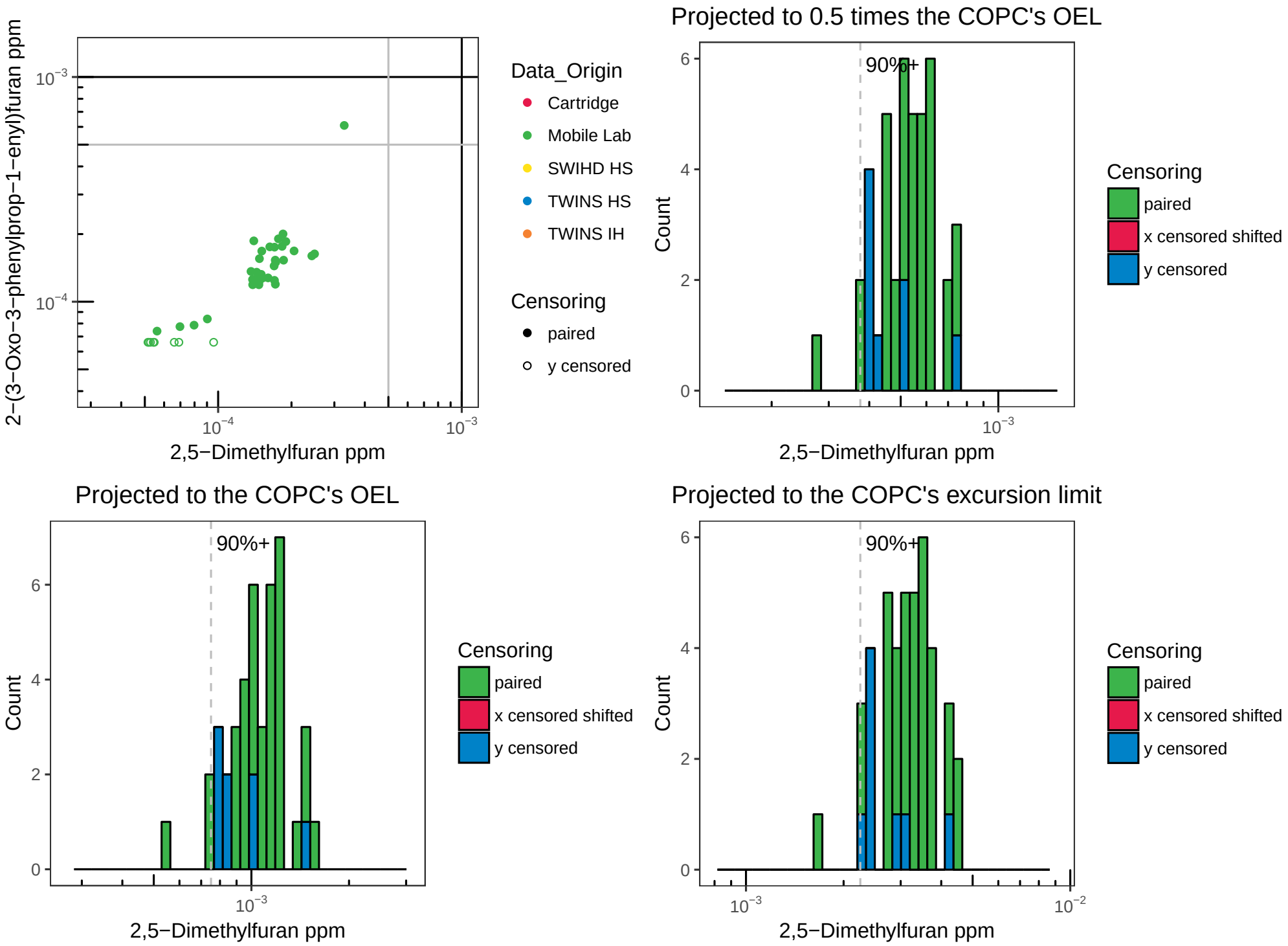


Figure C.1193: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2,5-Dimethylfuran

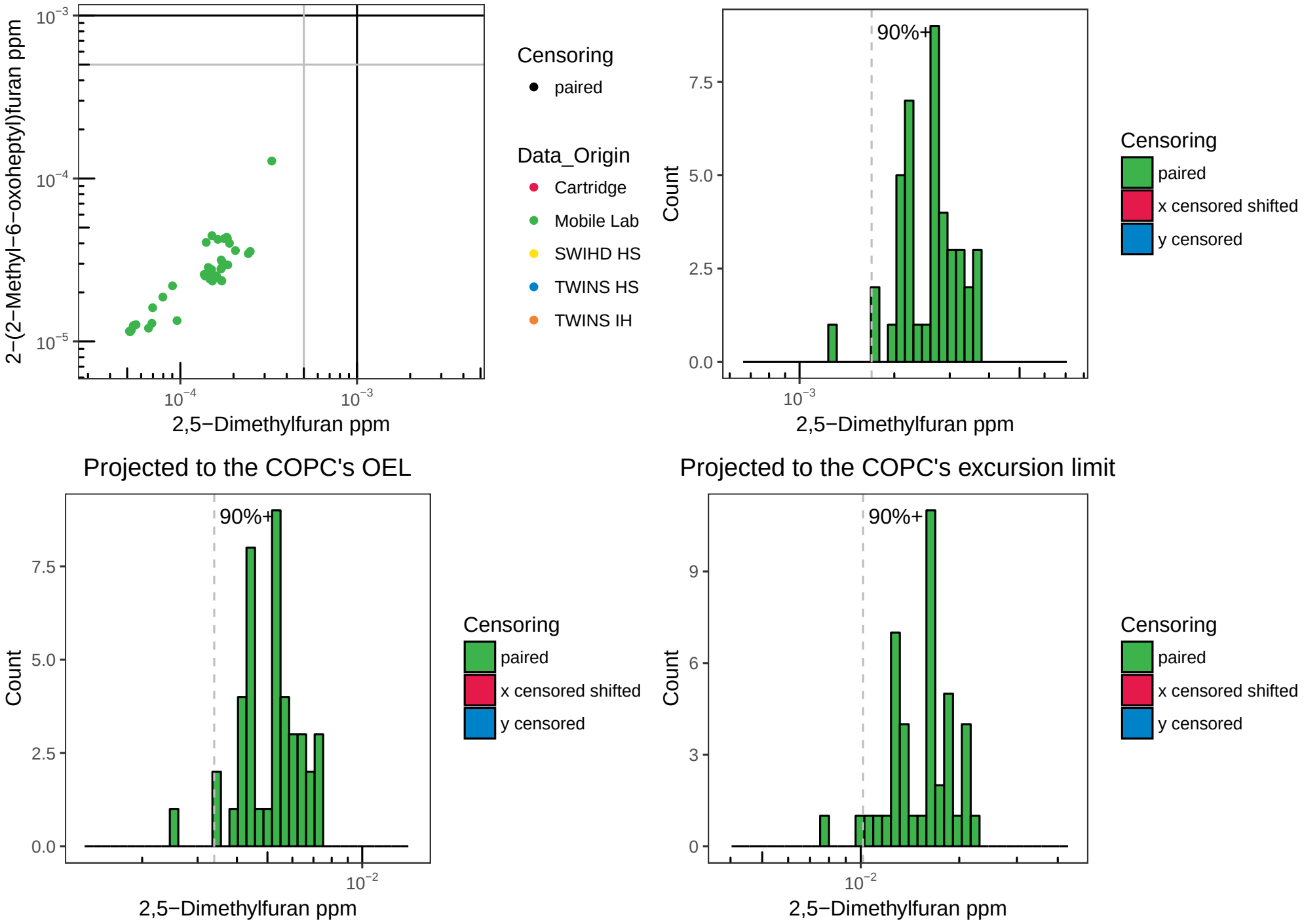


Figure C.1194: 2-(2-Methyl-6-oxoheptyl)furan vs 2,5-Dimethylfuran

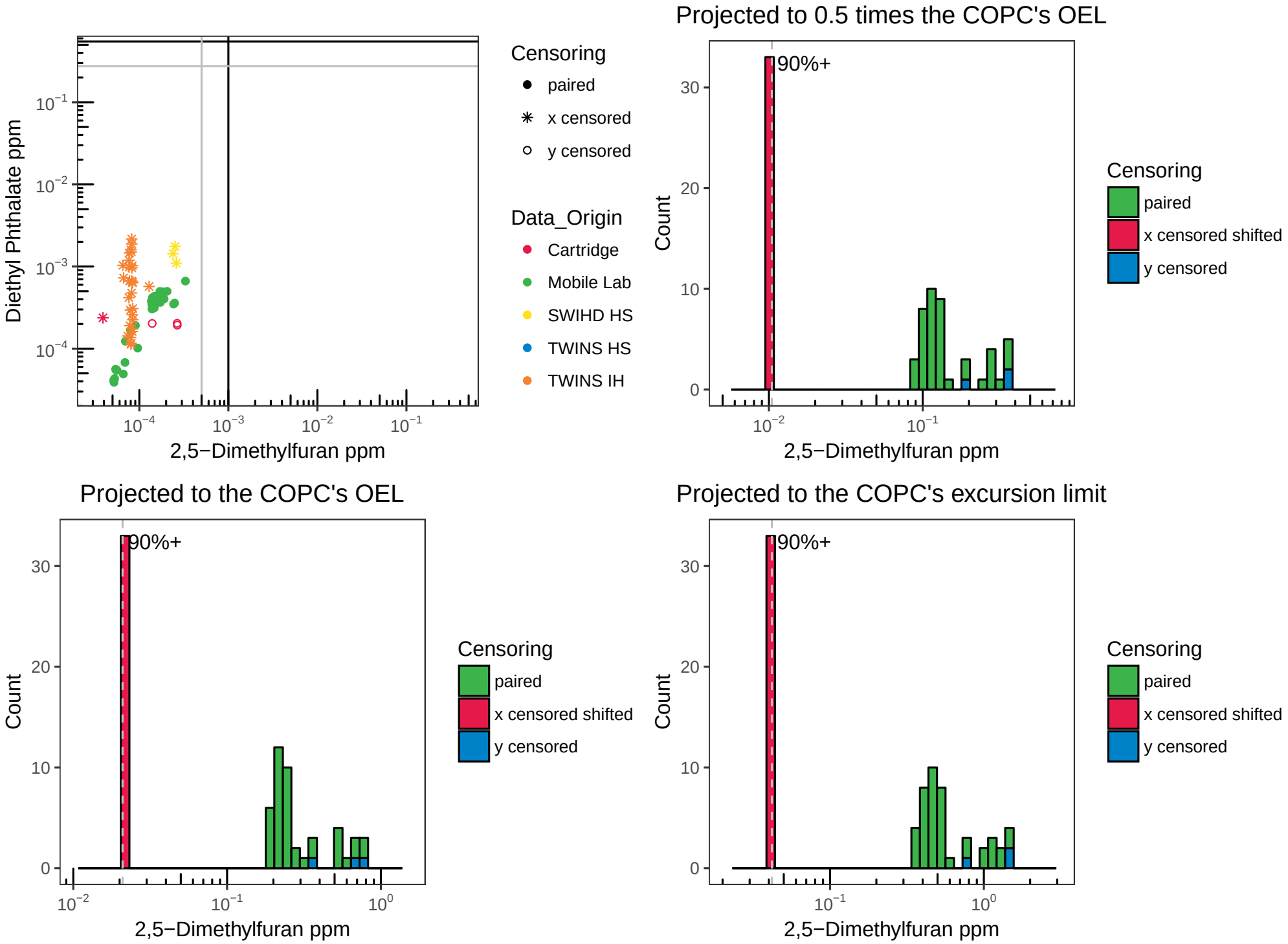


Figure C.1195: Diethyl Phthalate vs 2,5-Dimethylfuran

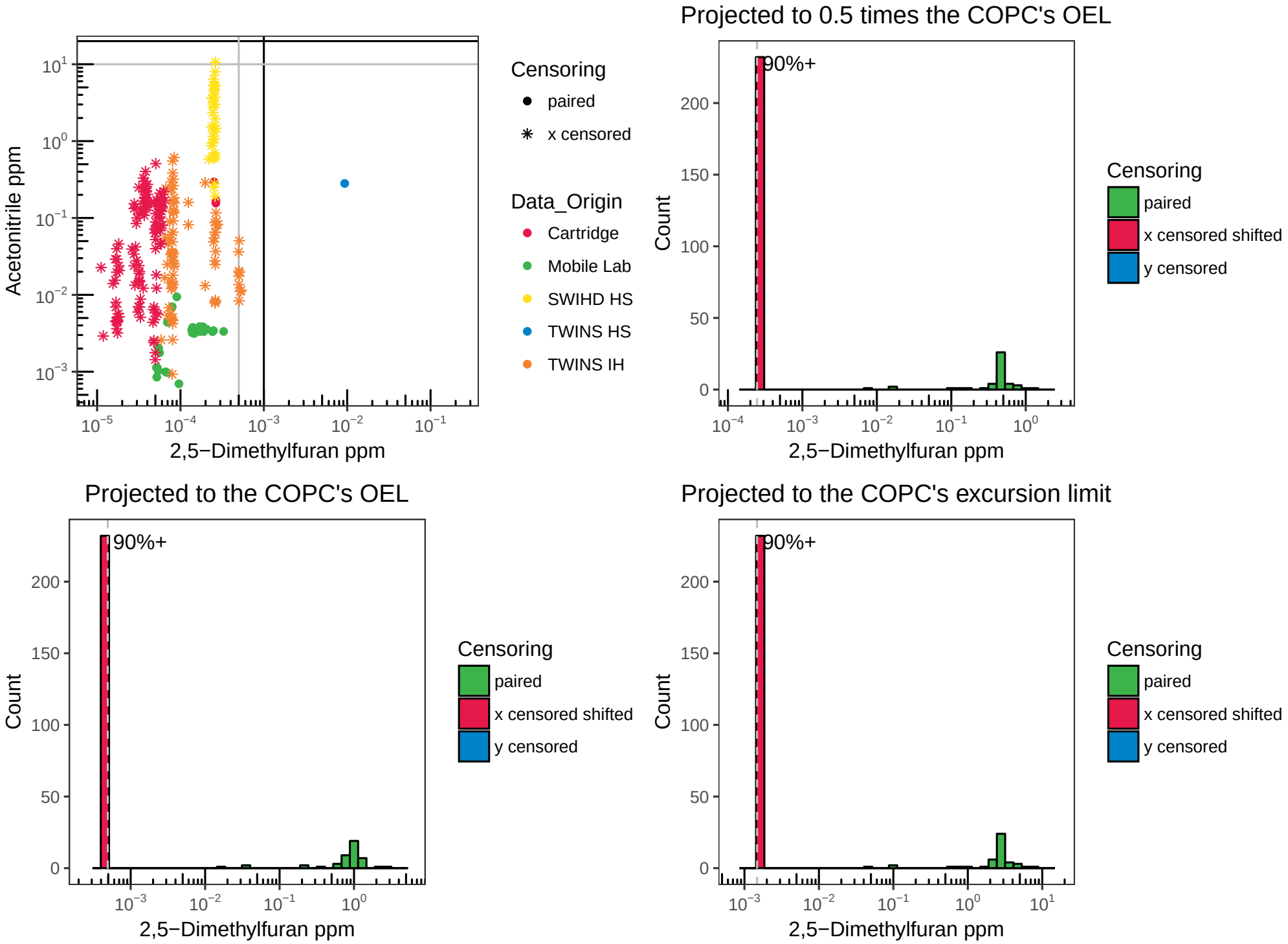


Figure C.1196: Acetonitrile vs 2,5-Dimethylfuran

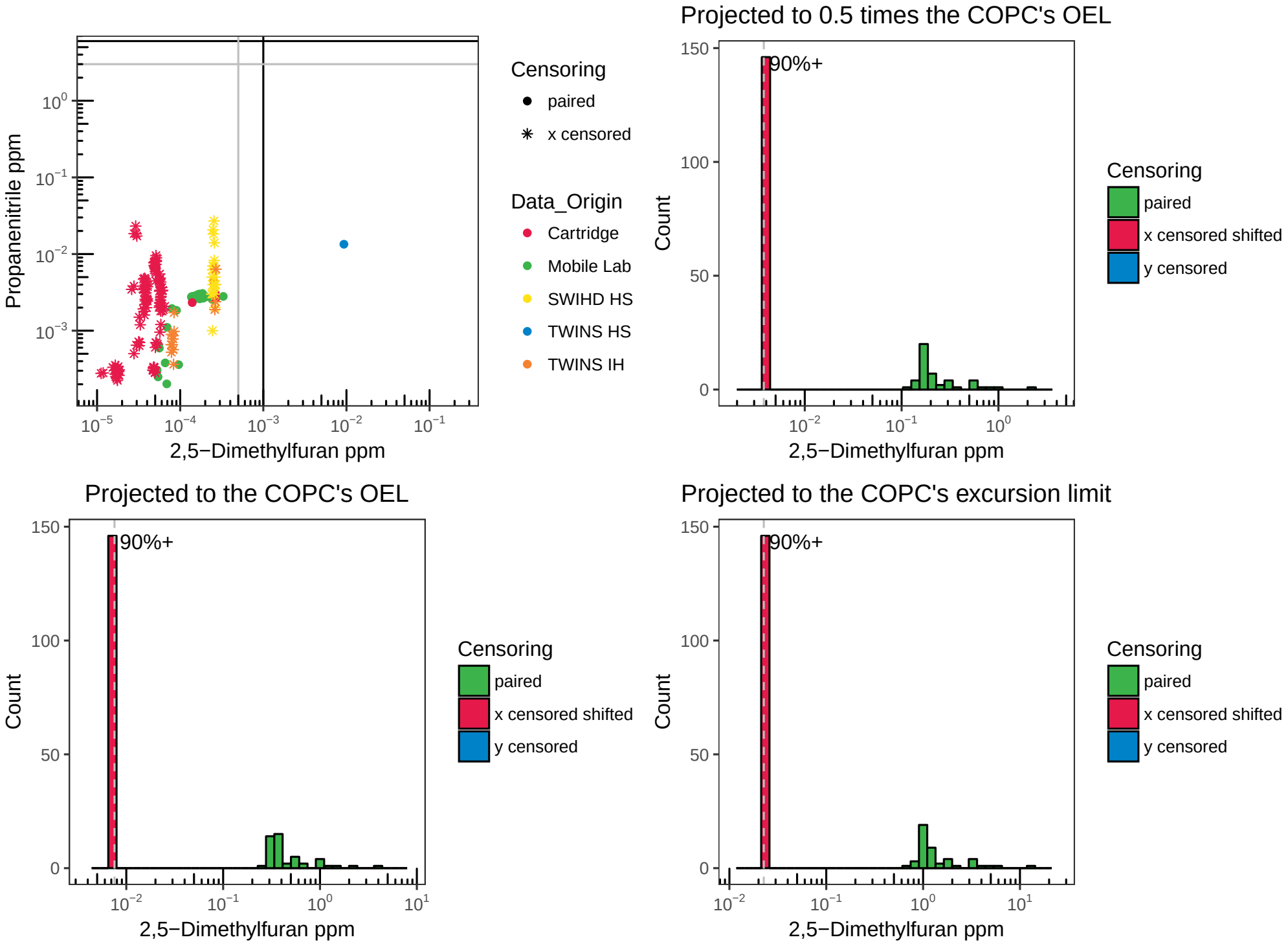


Figure C.1197: Propanenitrile vs 2,5-Dimethylfuran

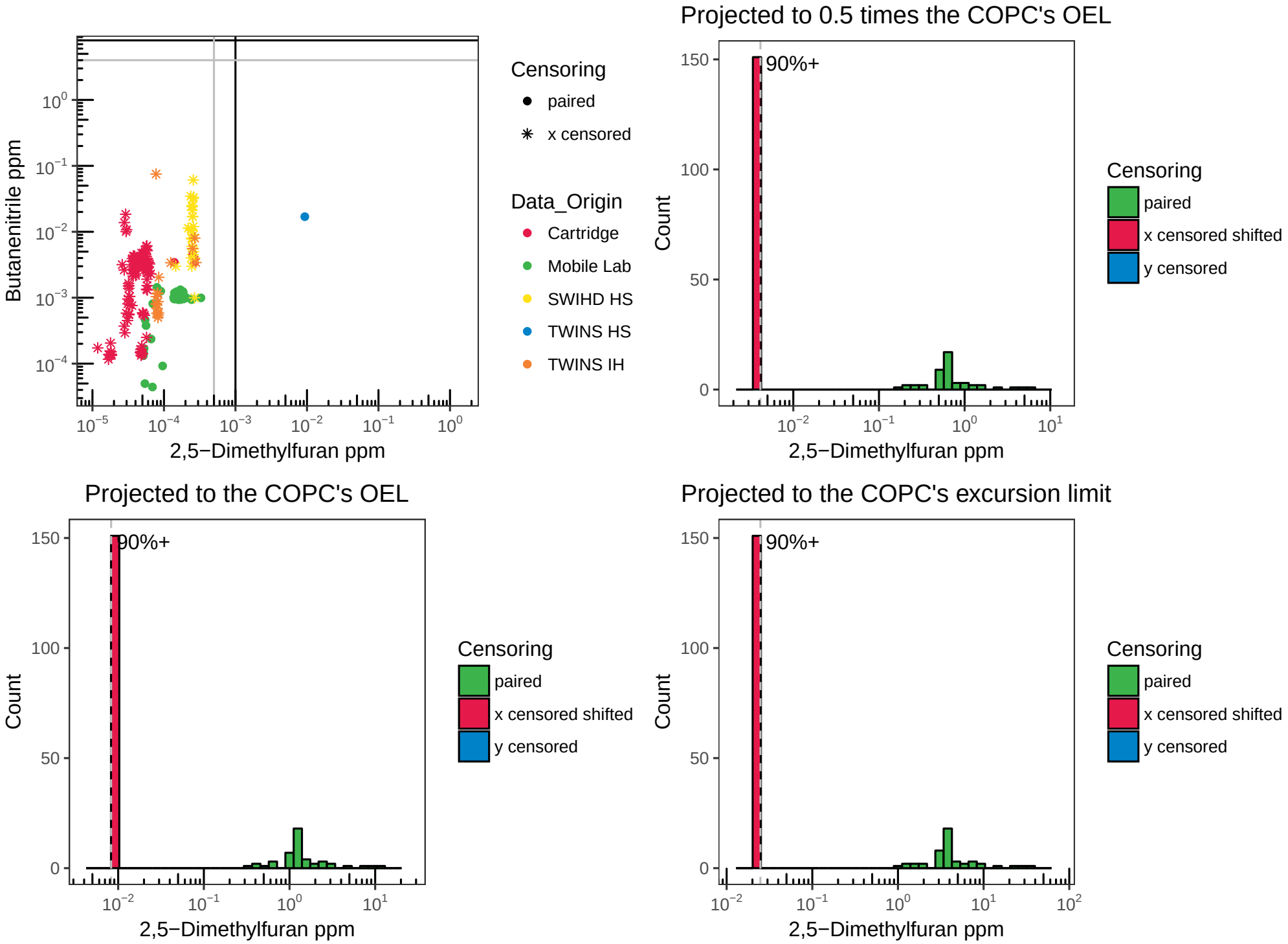


Figure C.1198: Butanenitrile vs 2,5-Dimethylfuran

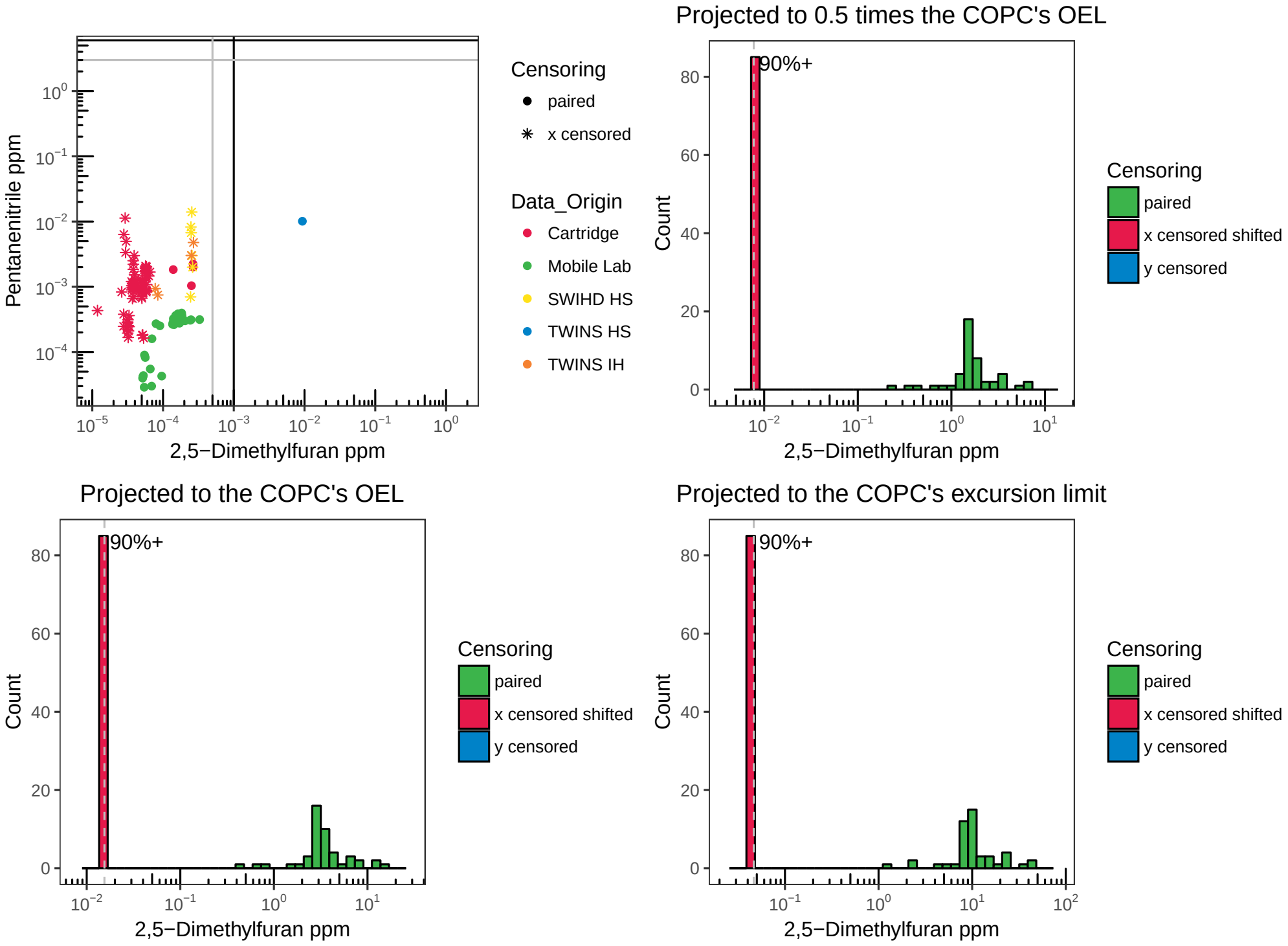


Figure C.1199: Pentanenitrile vs 2,5-Dimethylfuran

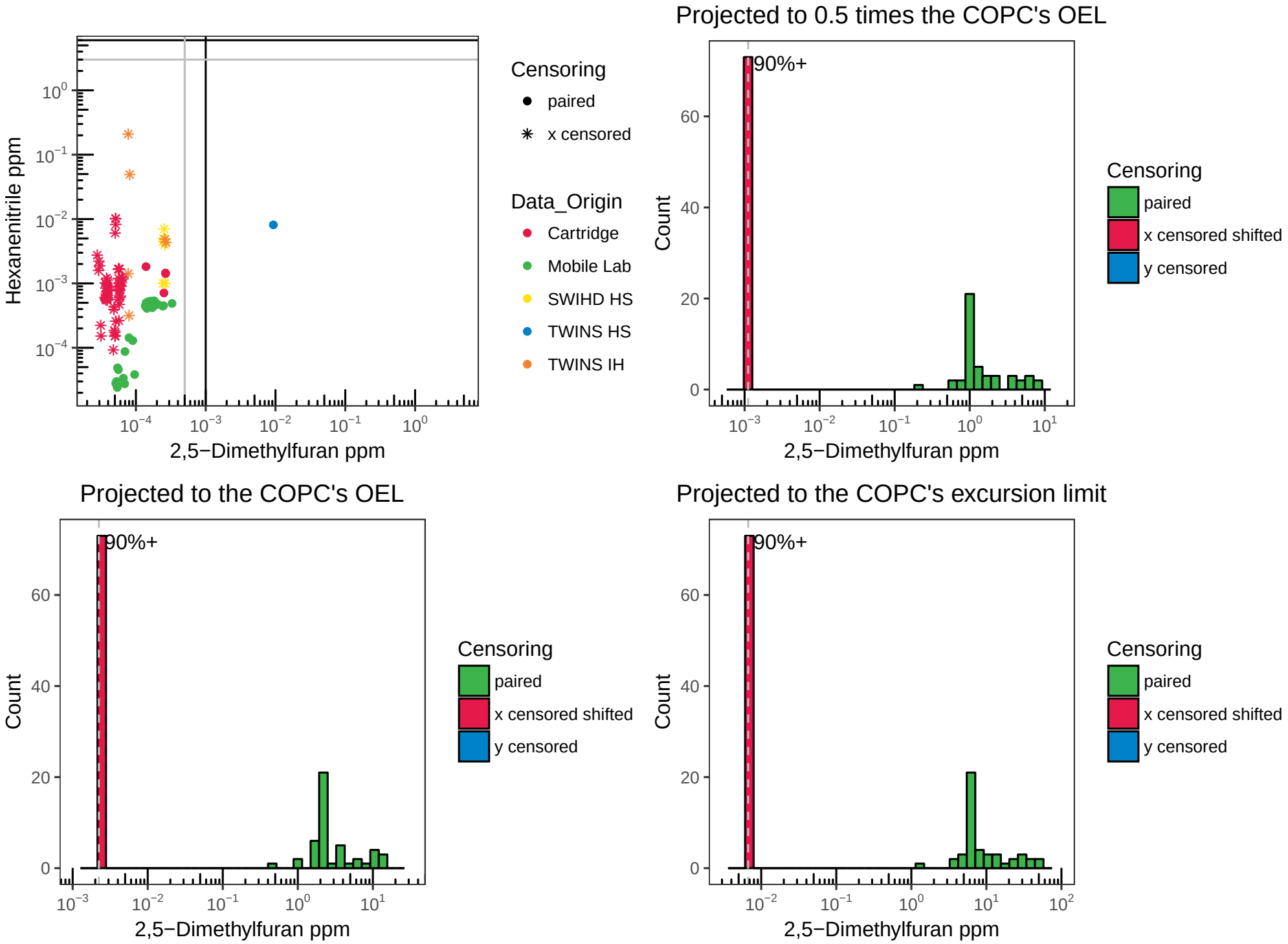


Figure C.1200: Hexanenitrile vs 2,5-Dimethylfuran

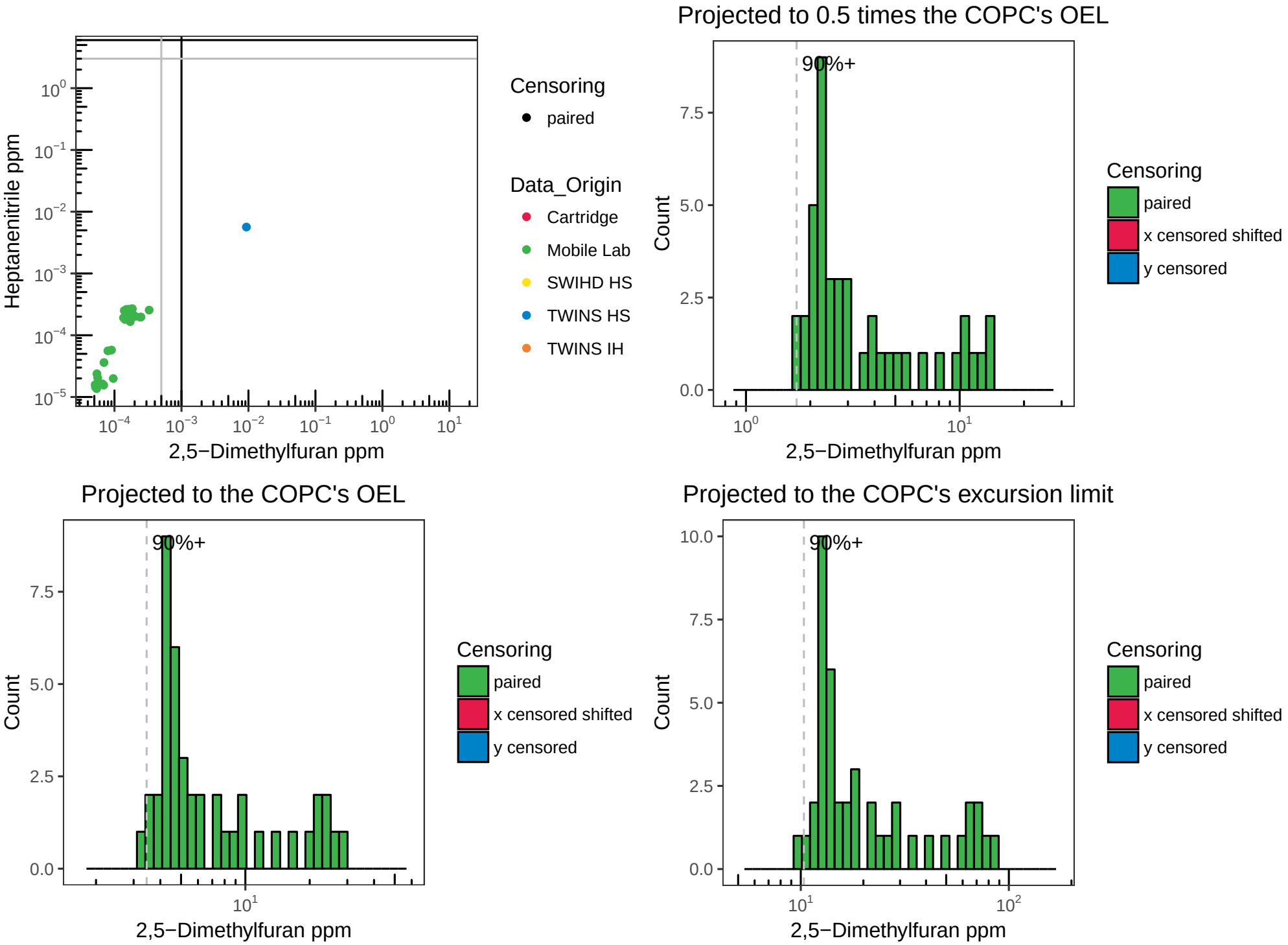


Figure C.1201: Heptanenitrile vs 2,5-Dimethylfuran

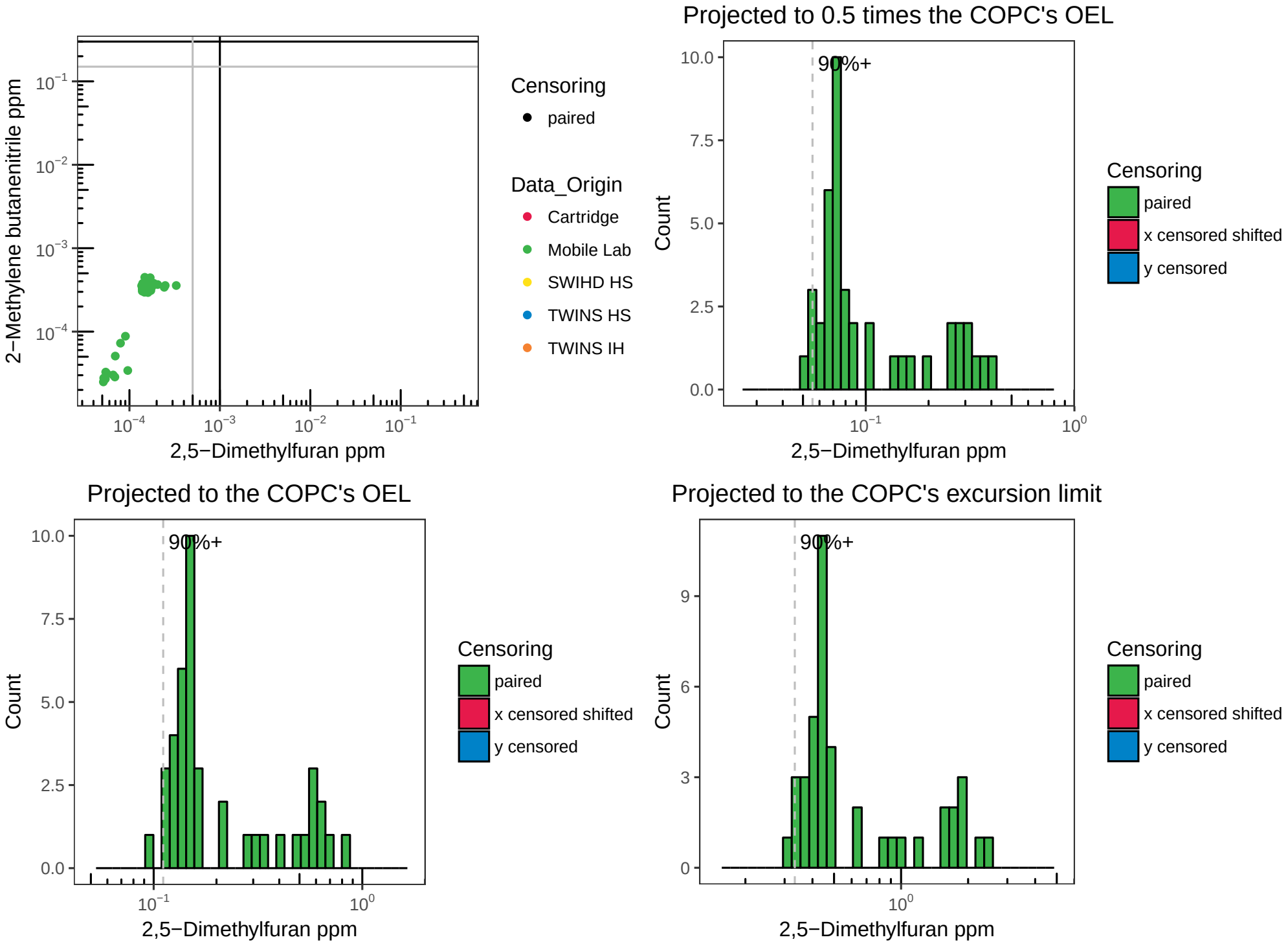


Figure C.1202: 2-Methylene butanenitrile vs 2,5-Dimethylfuran

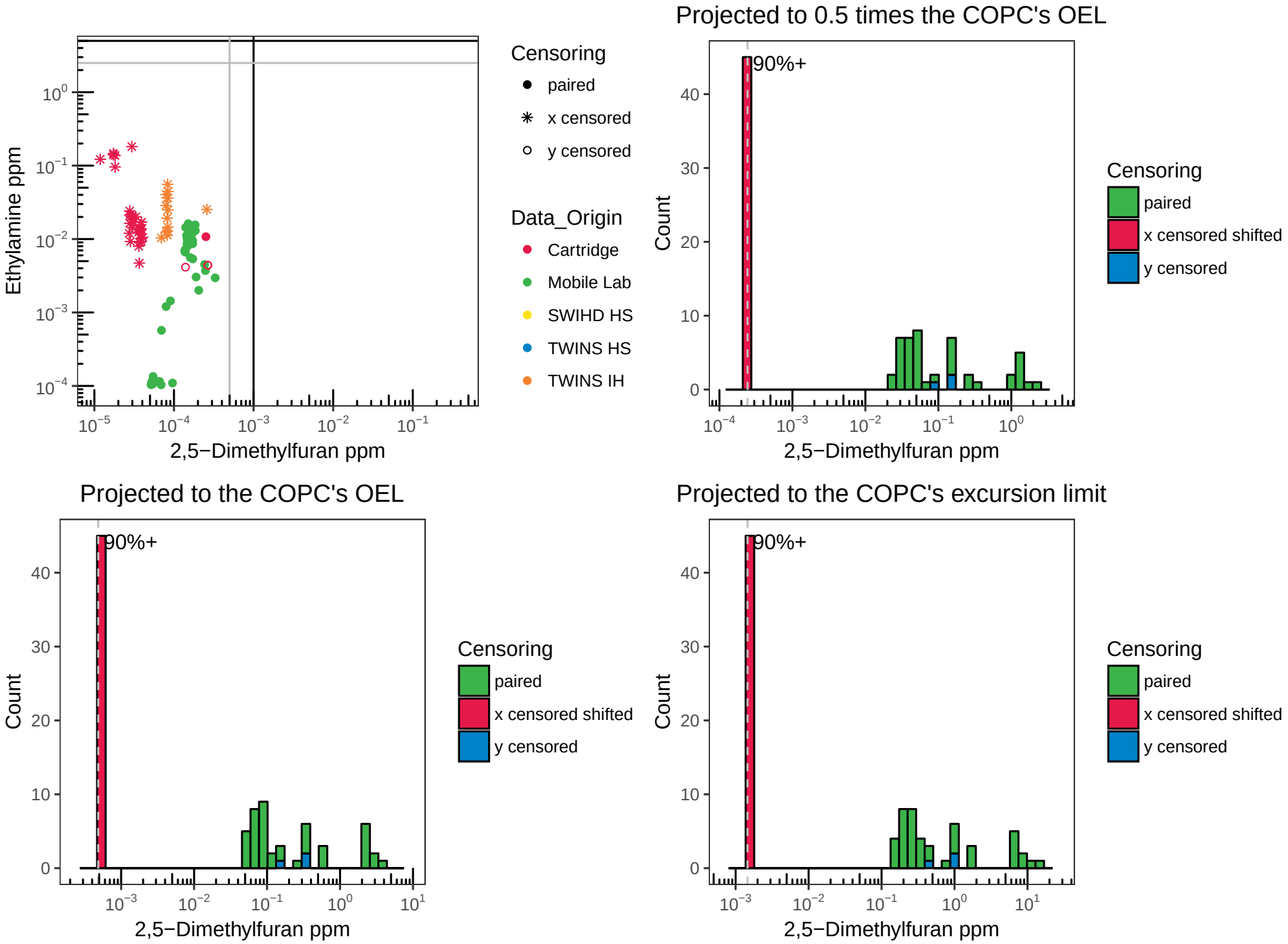


Figure C.1203: Ethylamine vs 2,5-Dimethylfuran

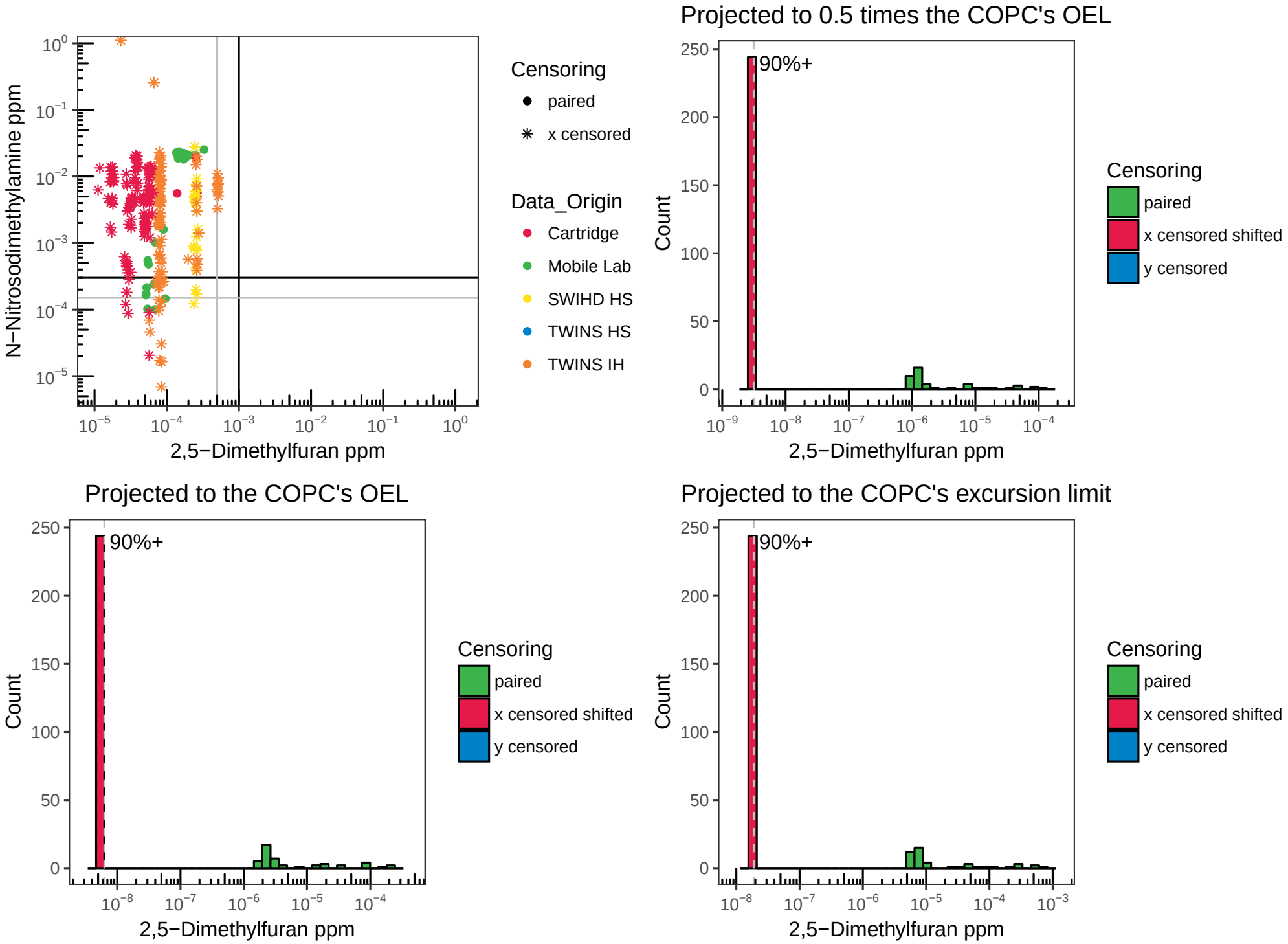


Figure C.1204: N-Nitrosodimethylamine vs 2,5-Dimethylfuran

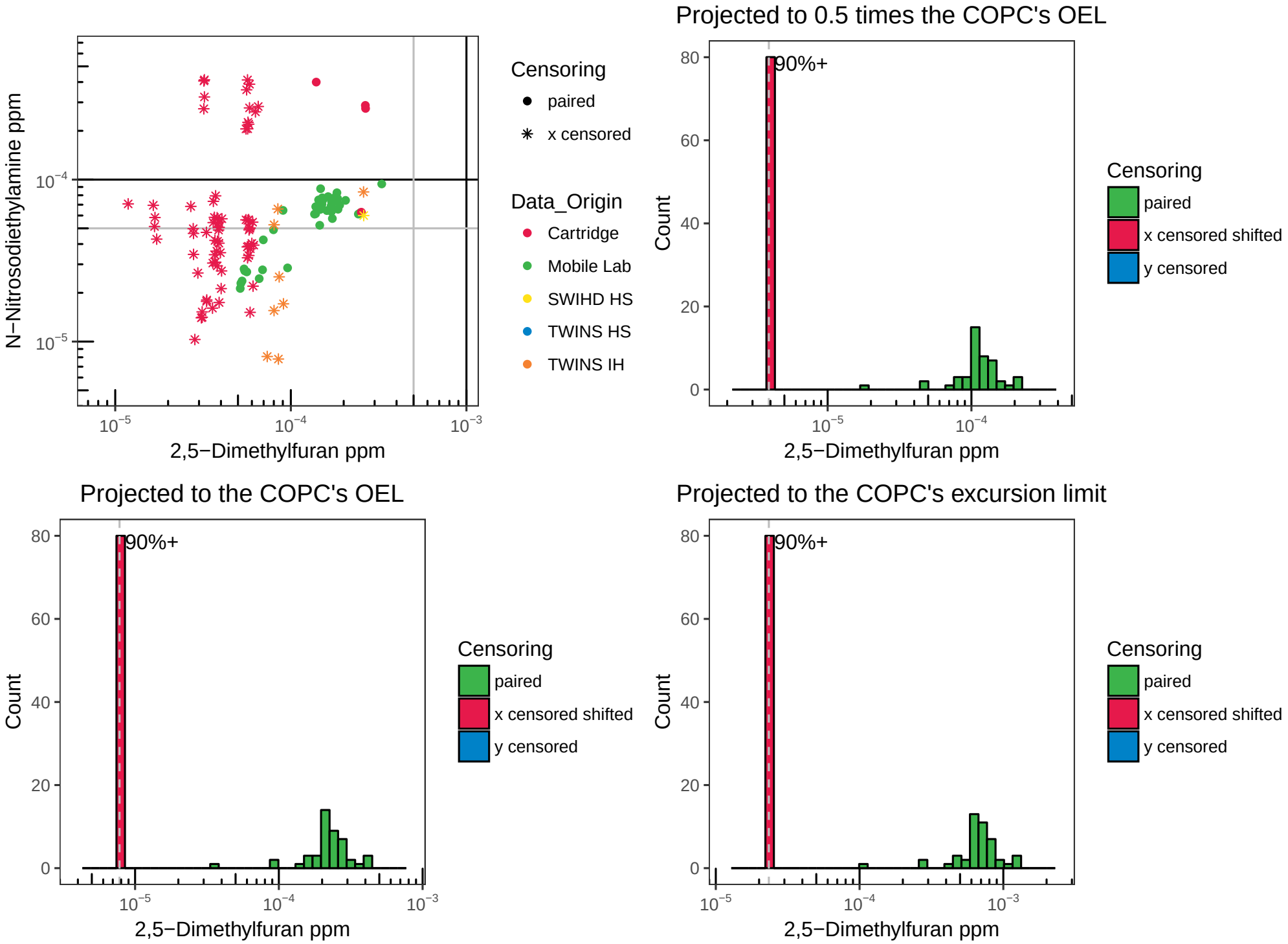


Figure C.1205: N-Nitrosodiethylamine vs 2,5-Dimethylfuran

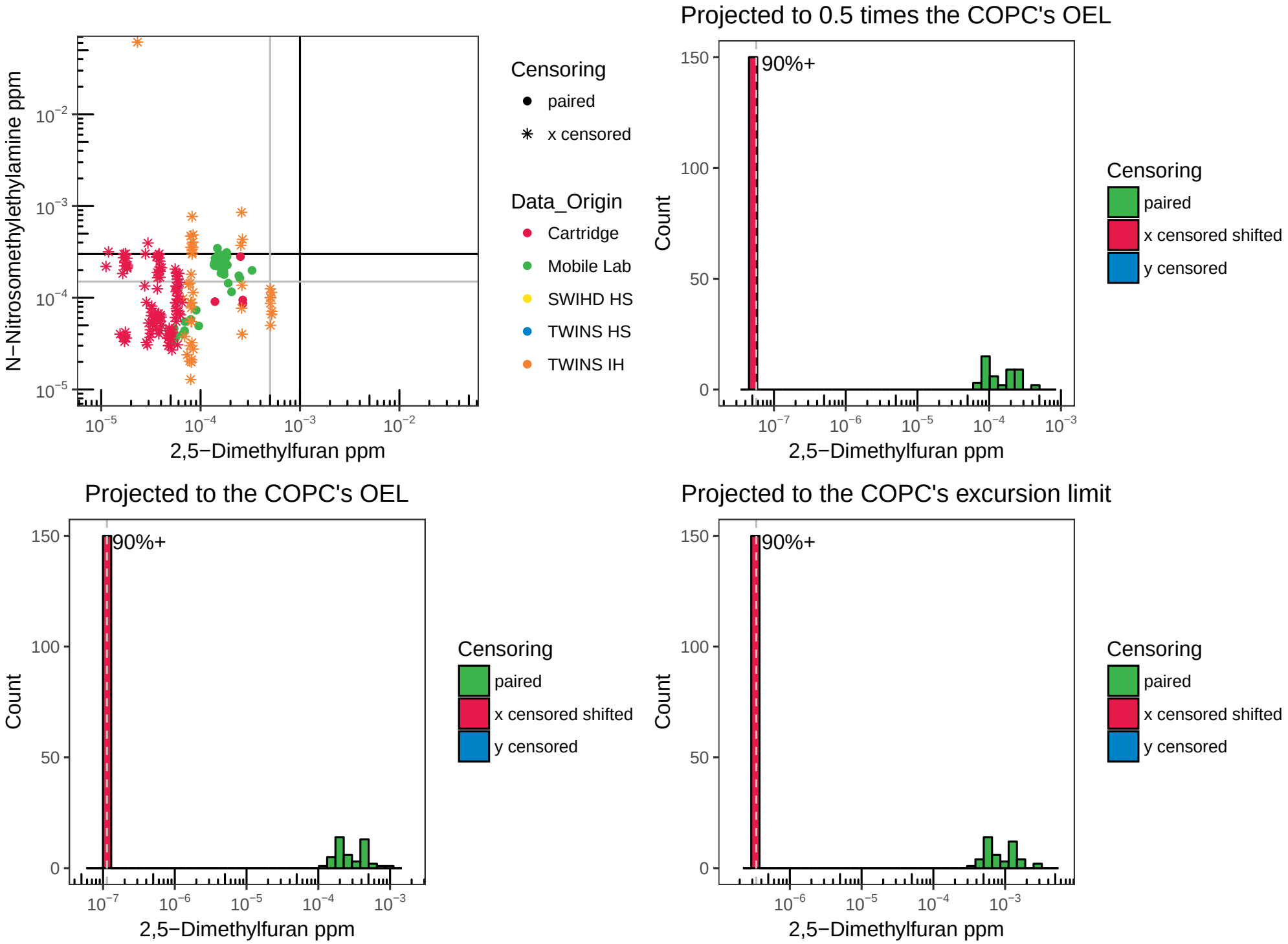


Figure C.1206: N-Nitrosomethylethylamine vs 2,5-Dimethylfuran

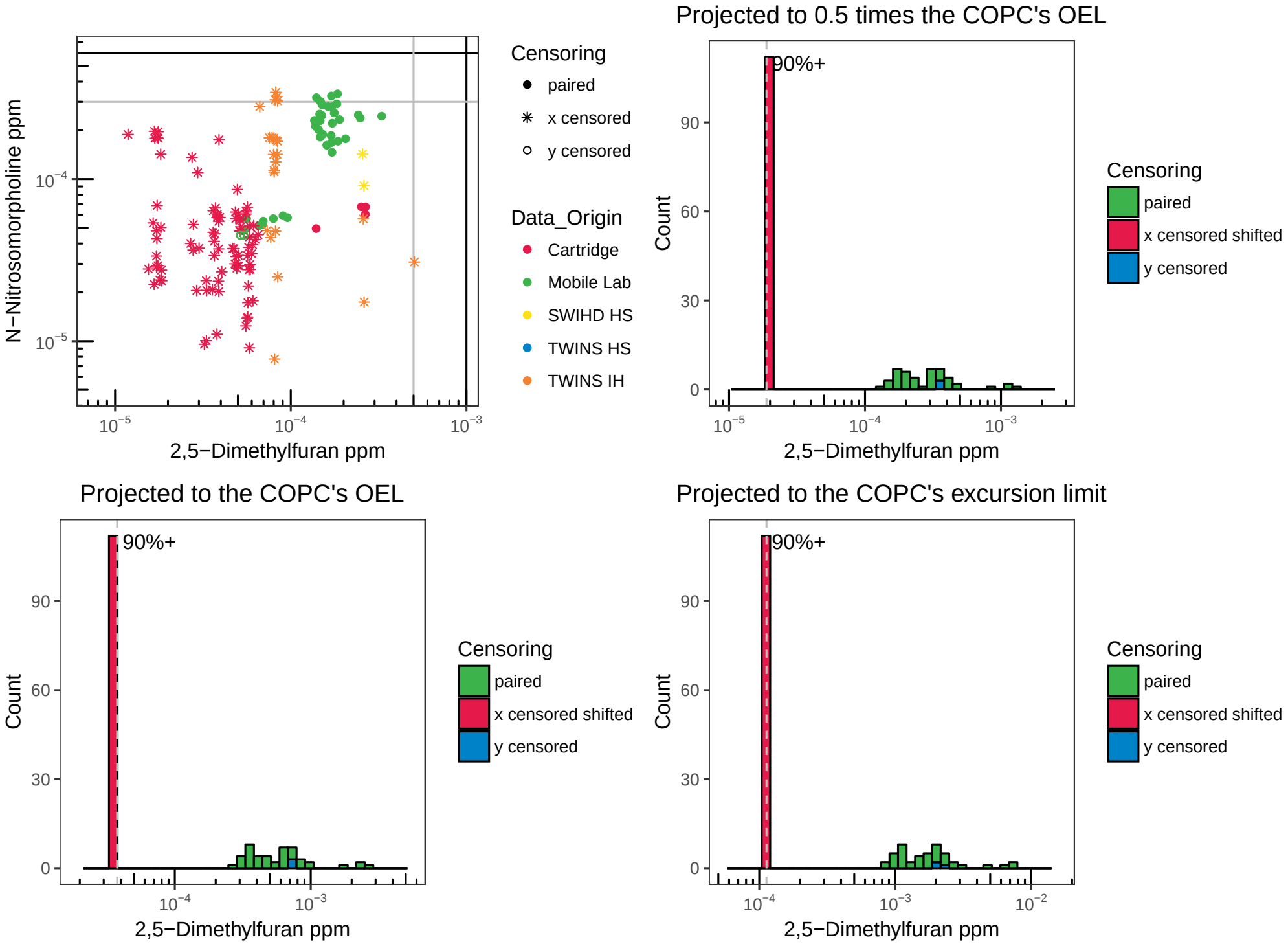


Figure C.1207: N-Nitrosomorpholine vs 2,5-Dimethylfuran

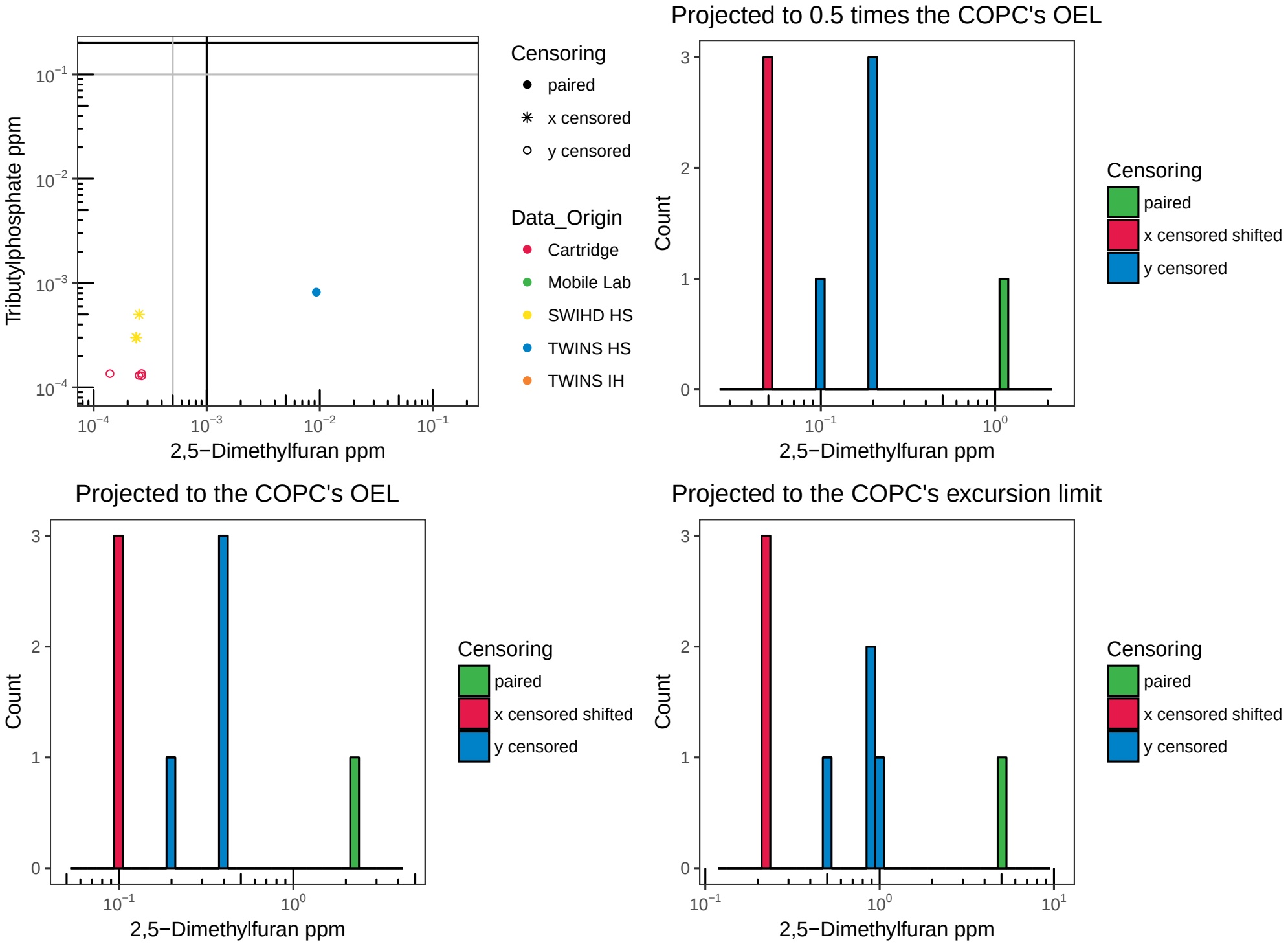


Figure C.1208: Tributylphosphate vs 2,5-Dimethylfuran

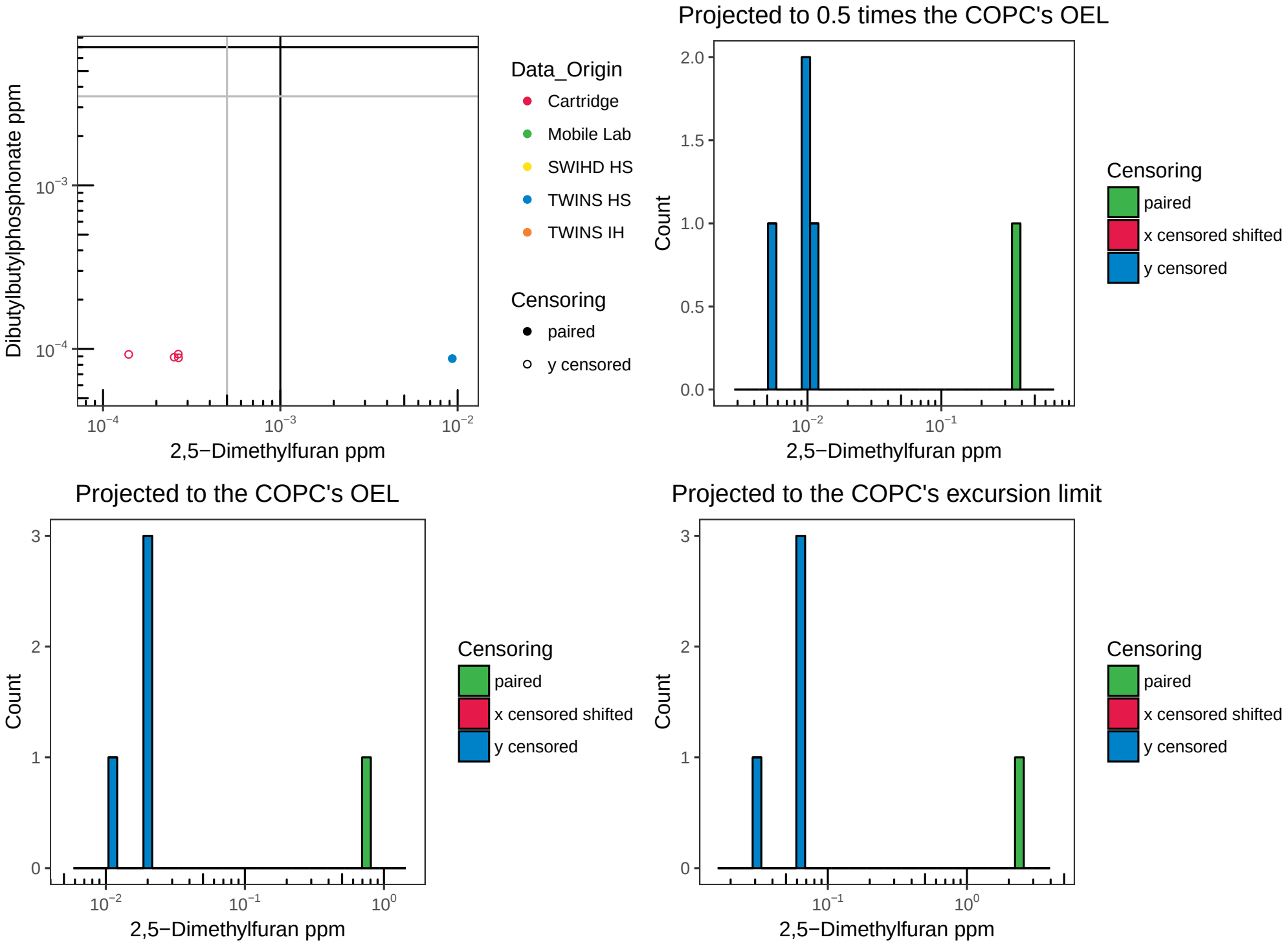


Figure C.1209: Dibutylbutylphosphonate vs 2,5-Dimethylfuran

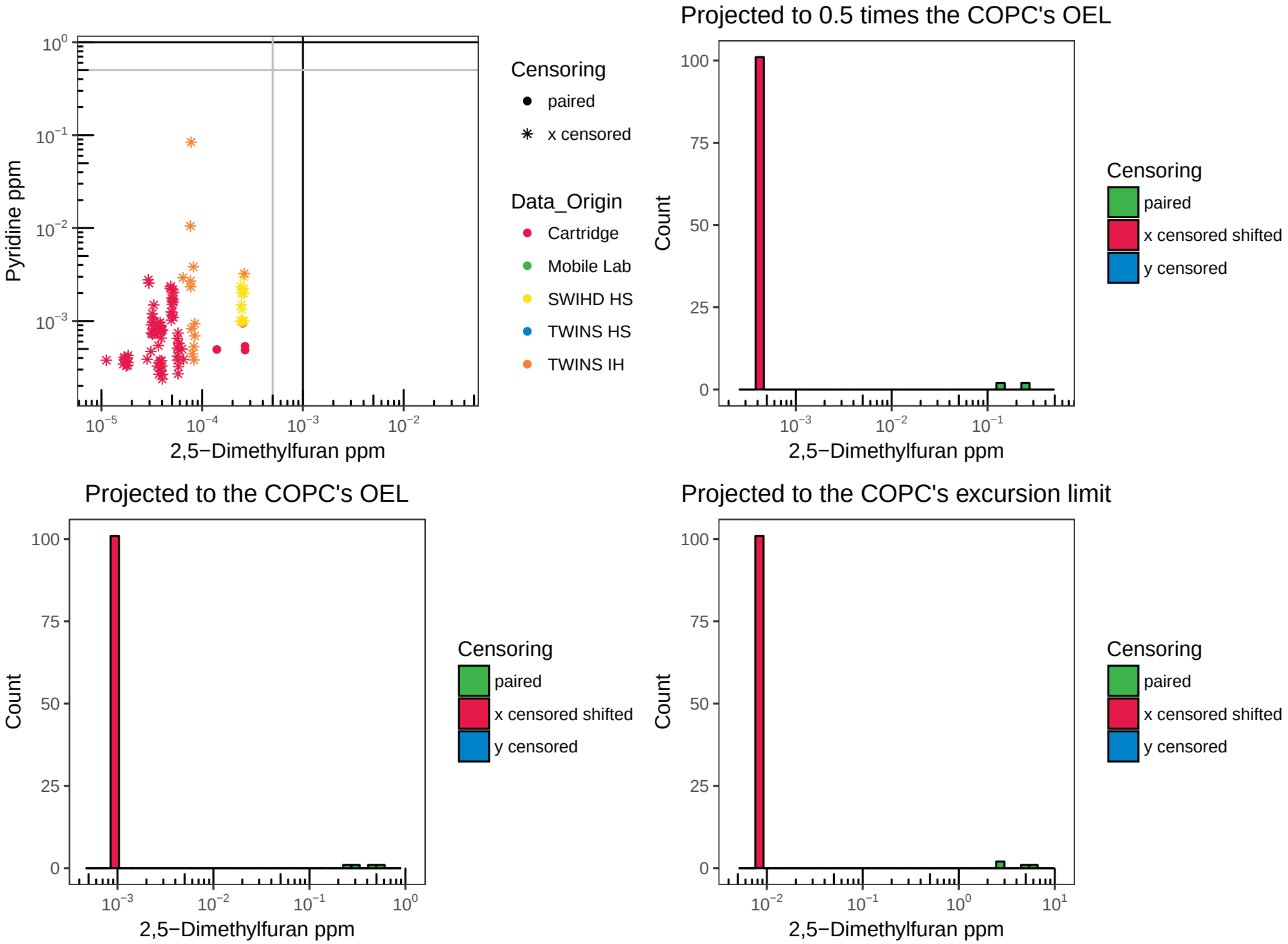


Figure C.1210: Pyridine vs 2,5-Dimethylfuran

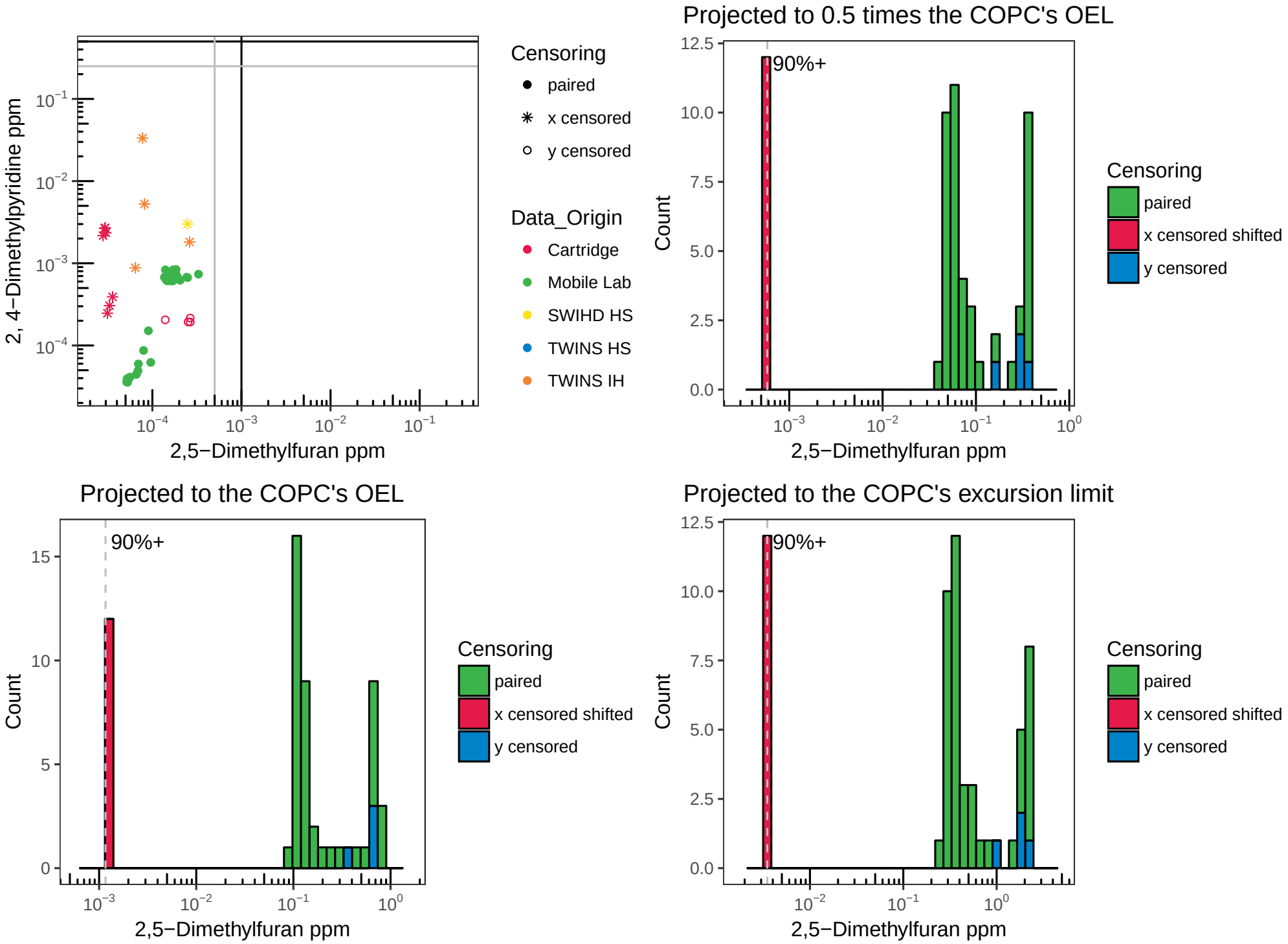


Figure C.1211: 2, 4-Dimethylpyridine vs 2,5-Dimethylfuran

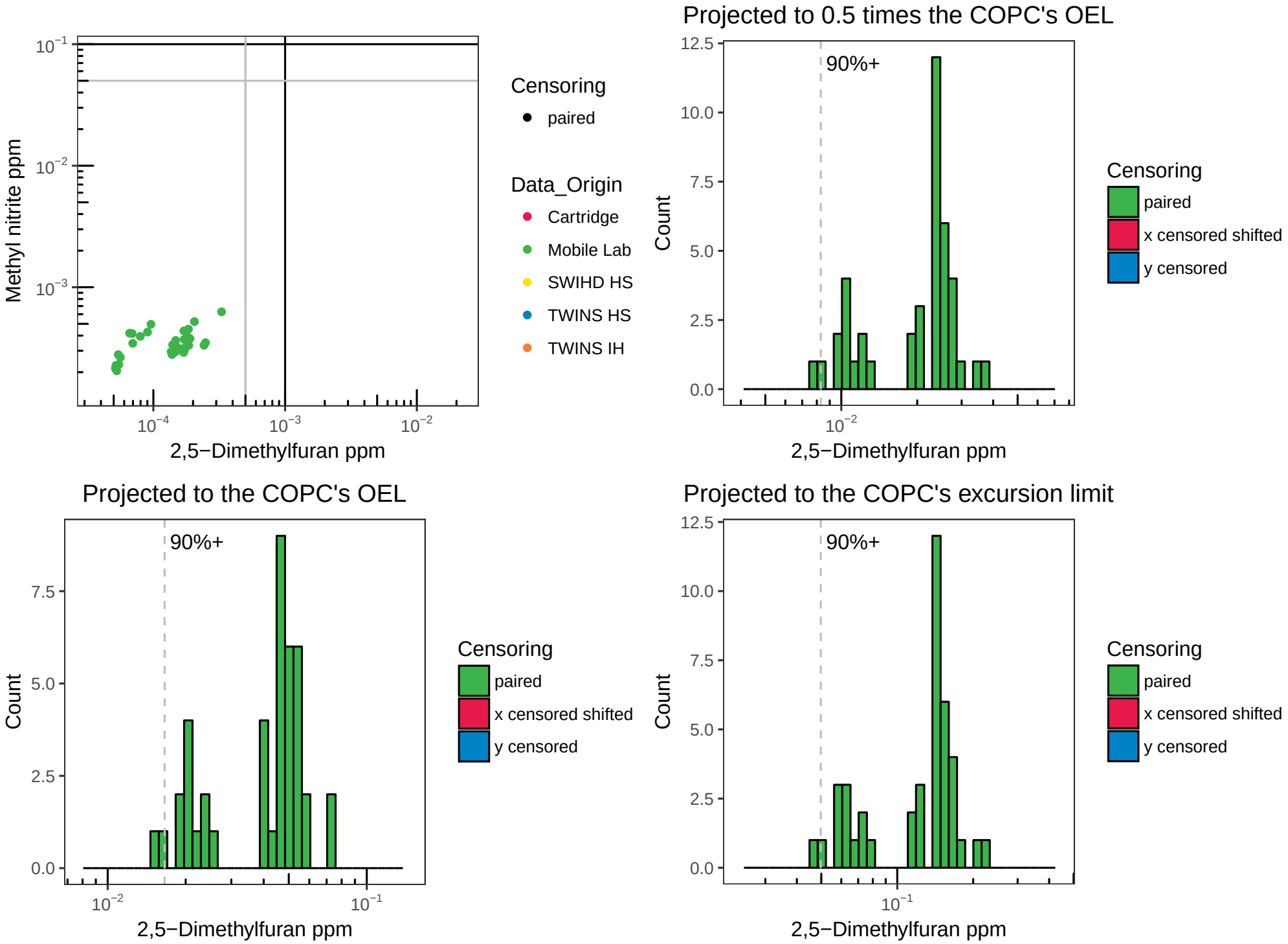


Figure C.1212: Methyl nitrite vs 2,5-Dimethylfuran

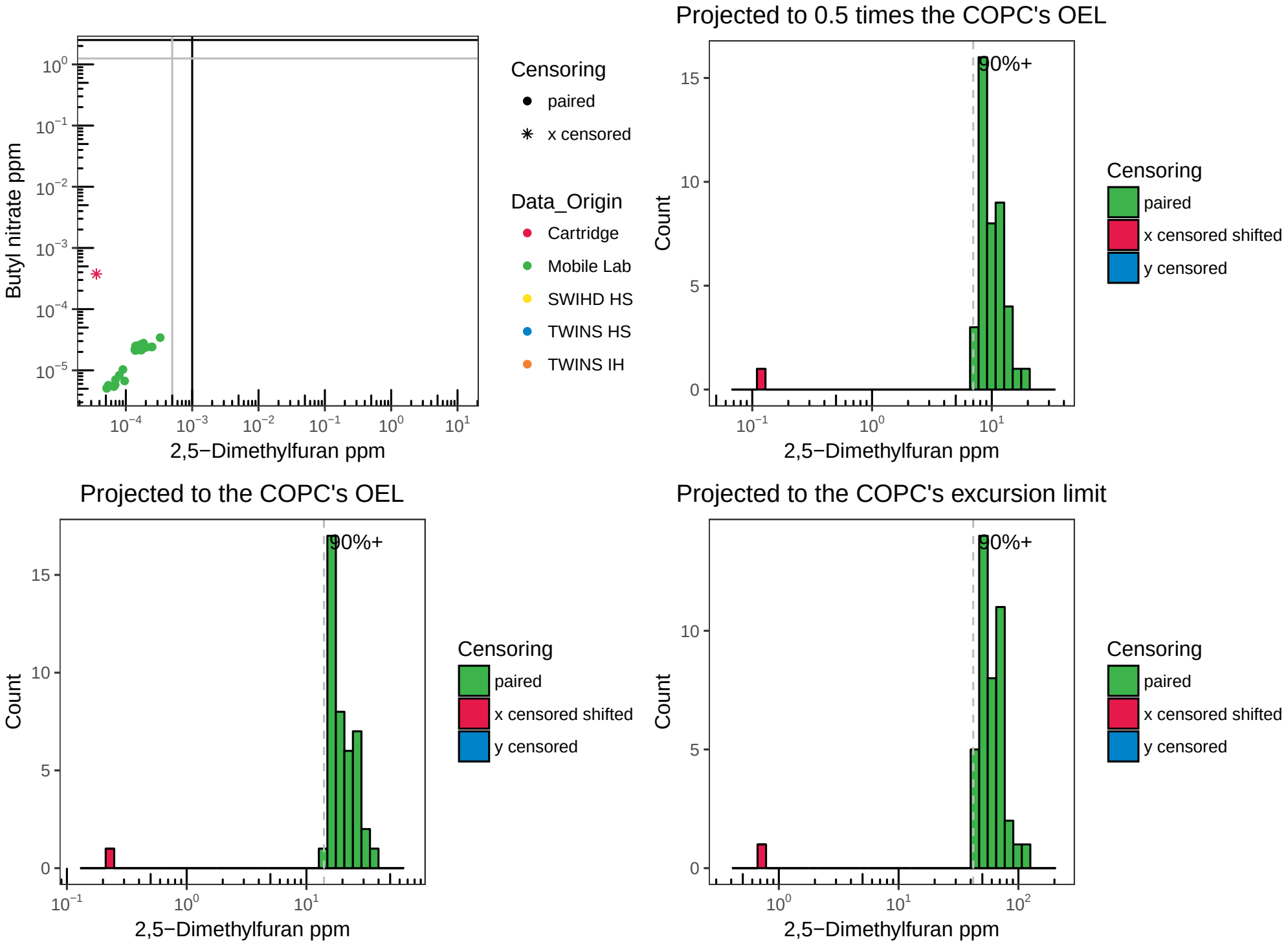


Figure C.1213: Butyl nitrate vs 2,5-Dimethylfuran

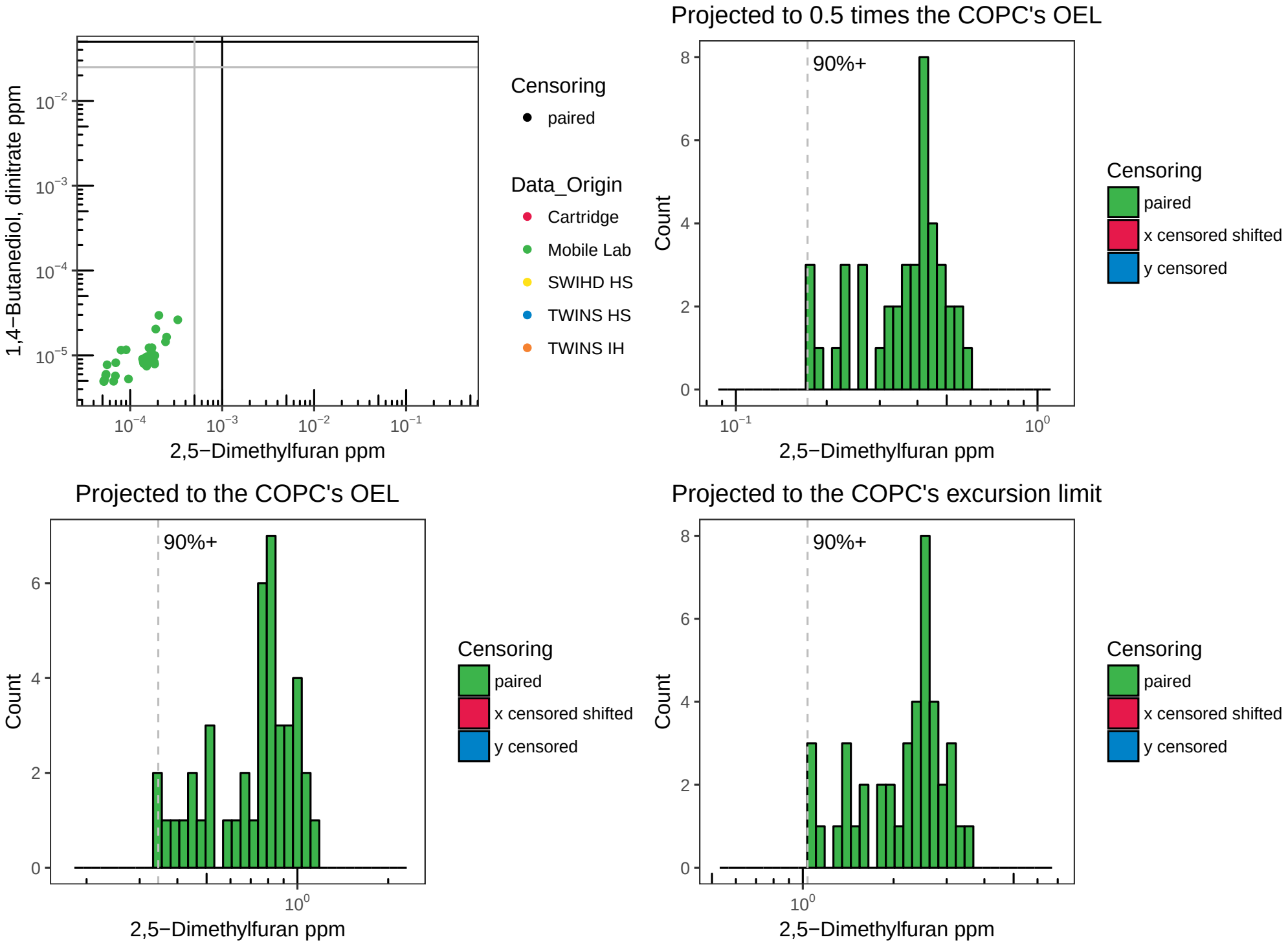


Figure C.1214: 1,4-Butanediol, dinitrate vs 2,5-Dimethylfuran

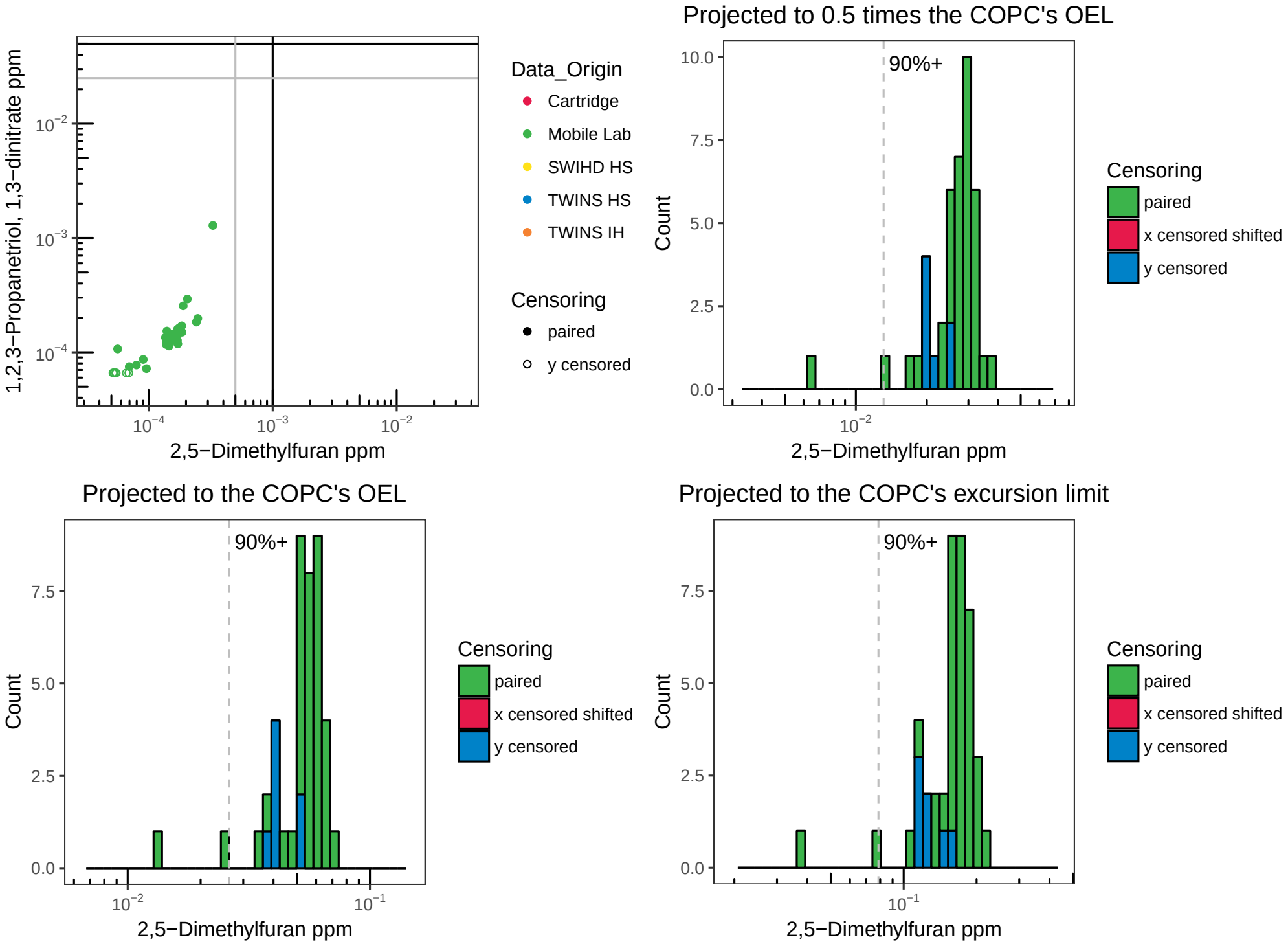


Figure C.1215: 1,2,3-Propanetriol, 1,3-dinitrate vs 2,5-Dimethylfuran

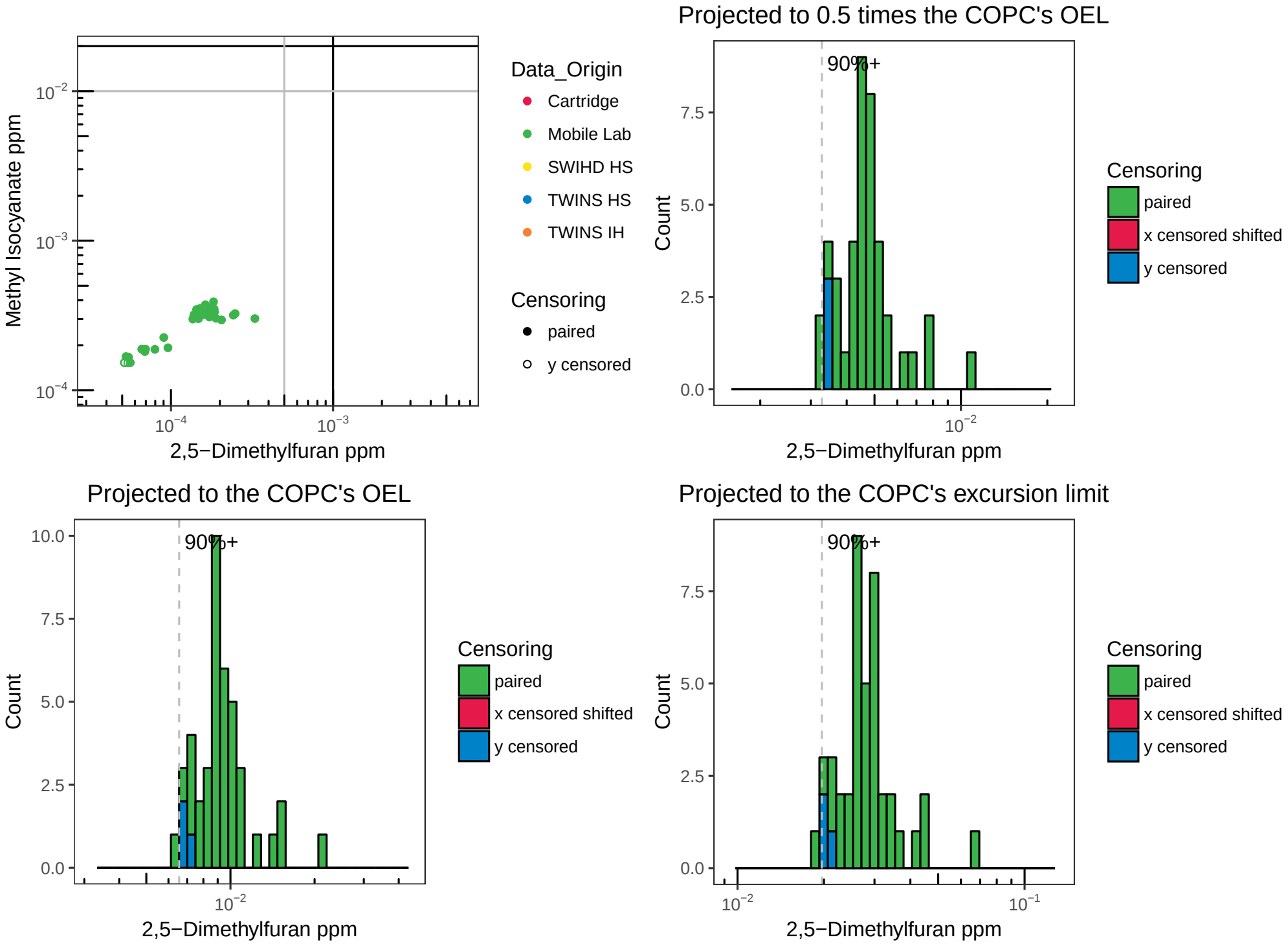


Figure C.1216: Methyl Isocyanate vs 2,5-Dimethylfuran

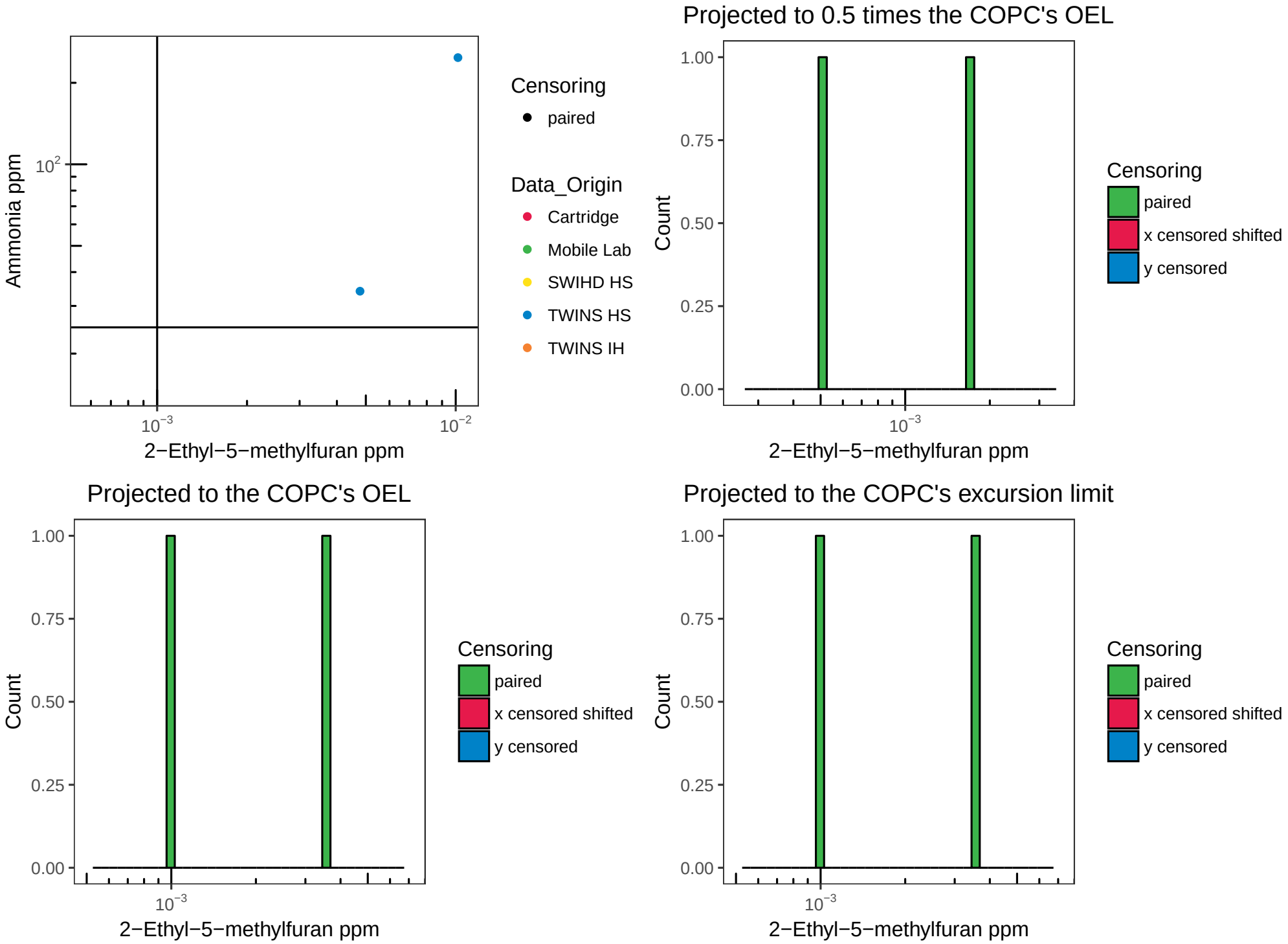


Figure C.1217: Ammonia vs 2-Ethyl-5-methylfuran

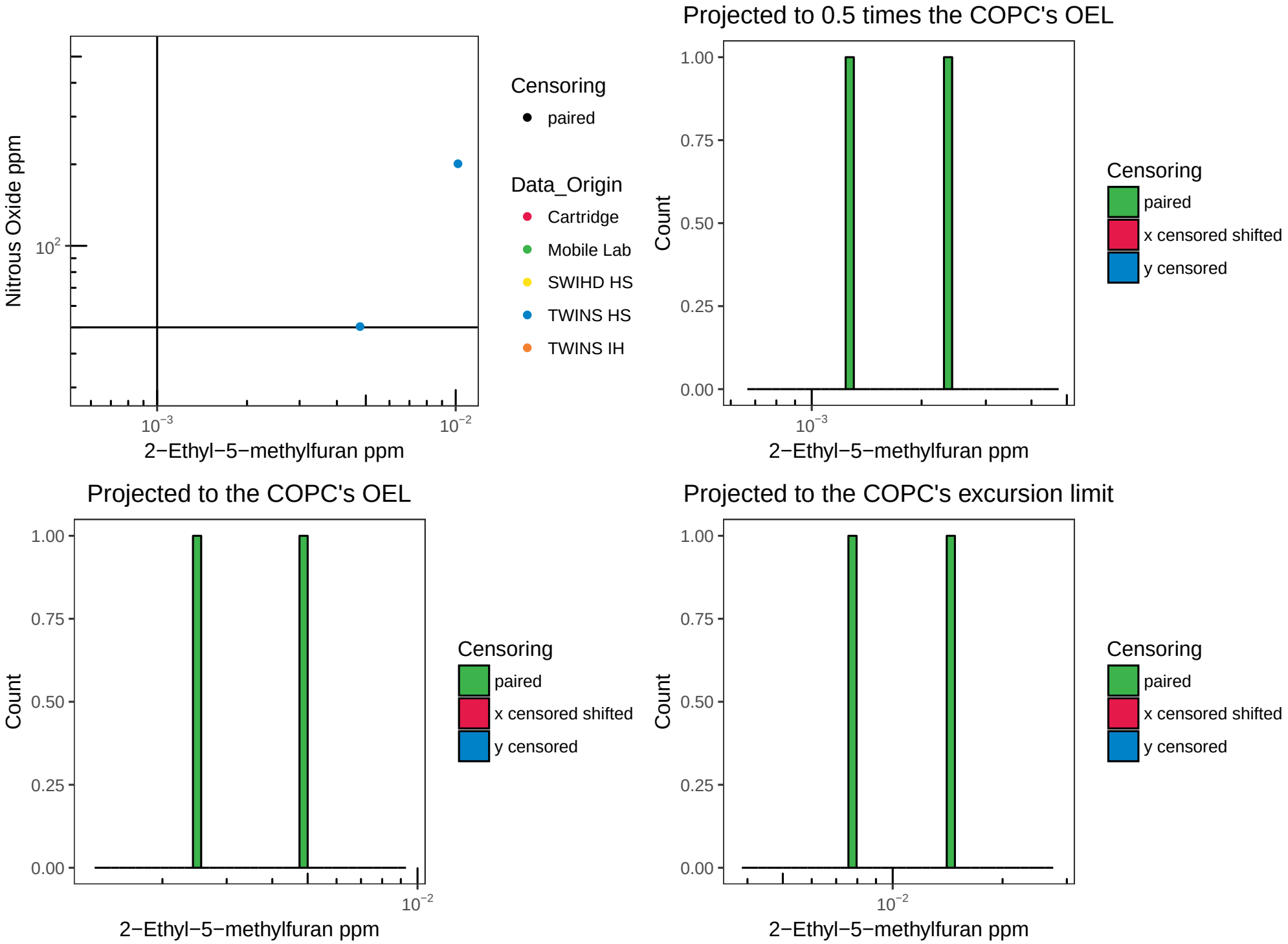


Figure C.1218: Nitrous Oxide vs 2-Ethyl-5-methylfuran

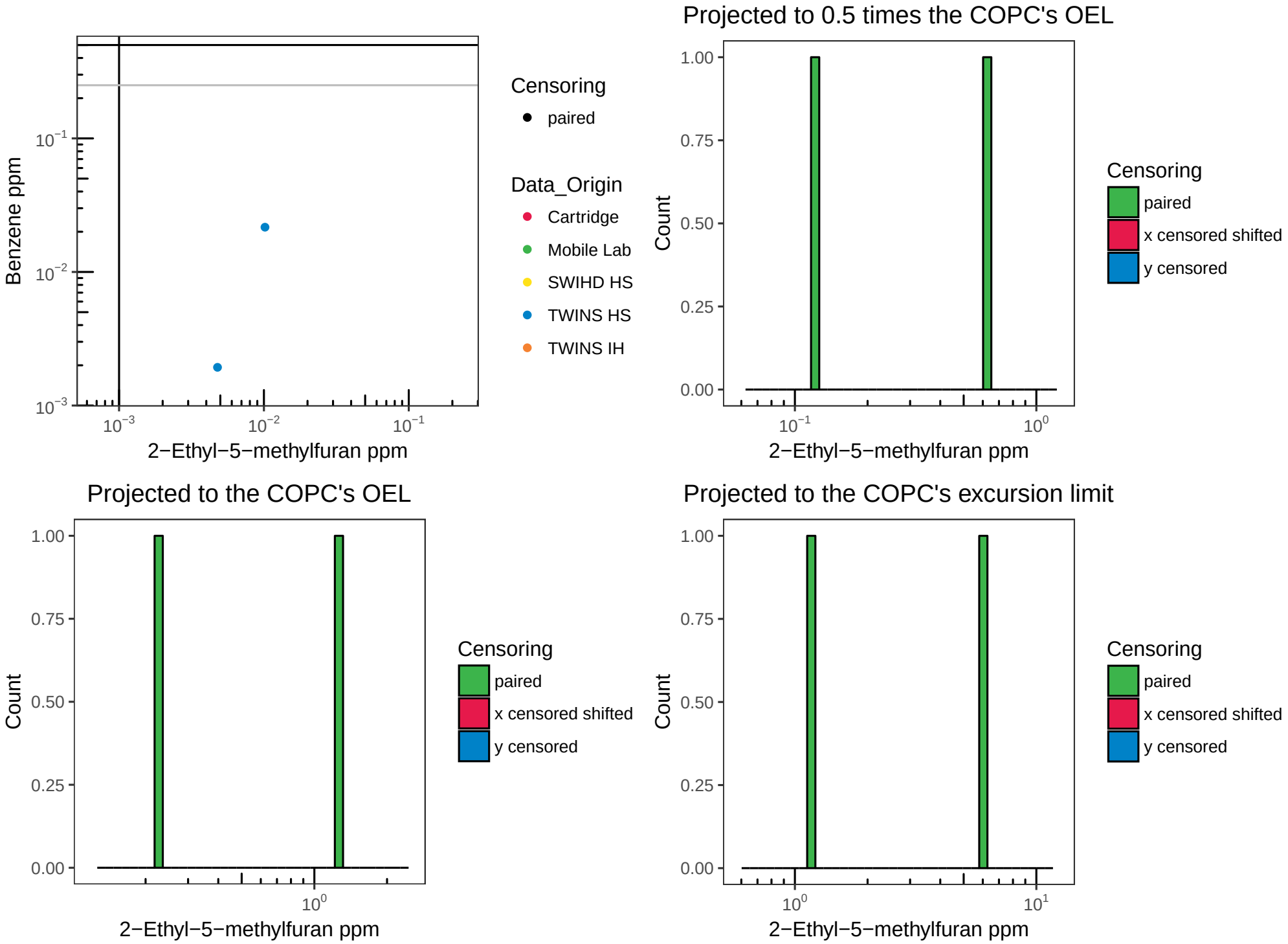


Figure C.1219: Benzene vs 2-Ethyl-5-methylfuran

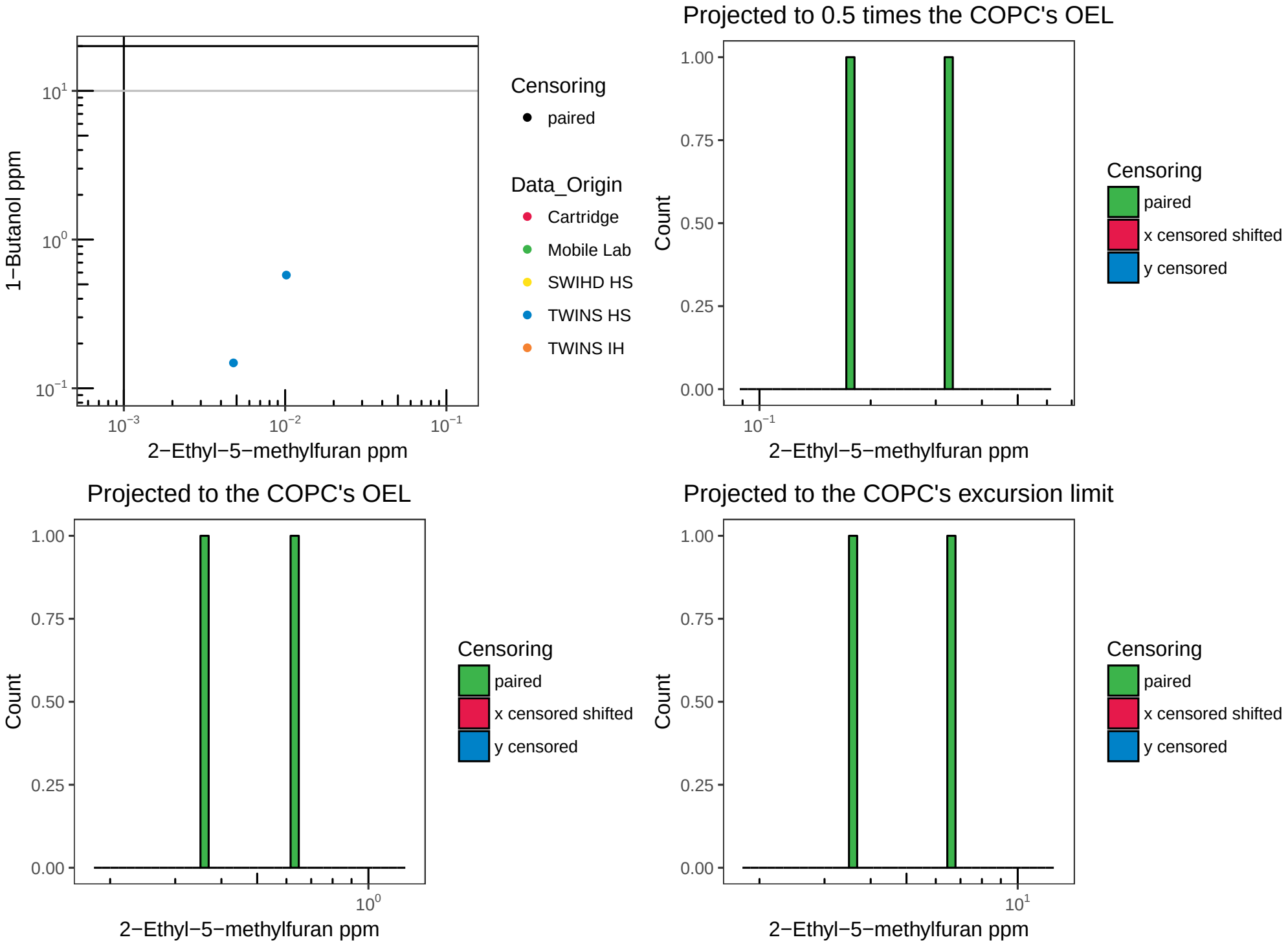


Figure C.1220: 1-Butanol vs 2-Ethyl-5-methylfuran

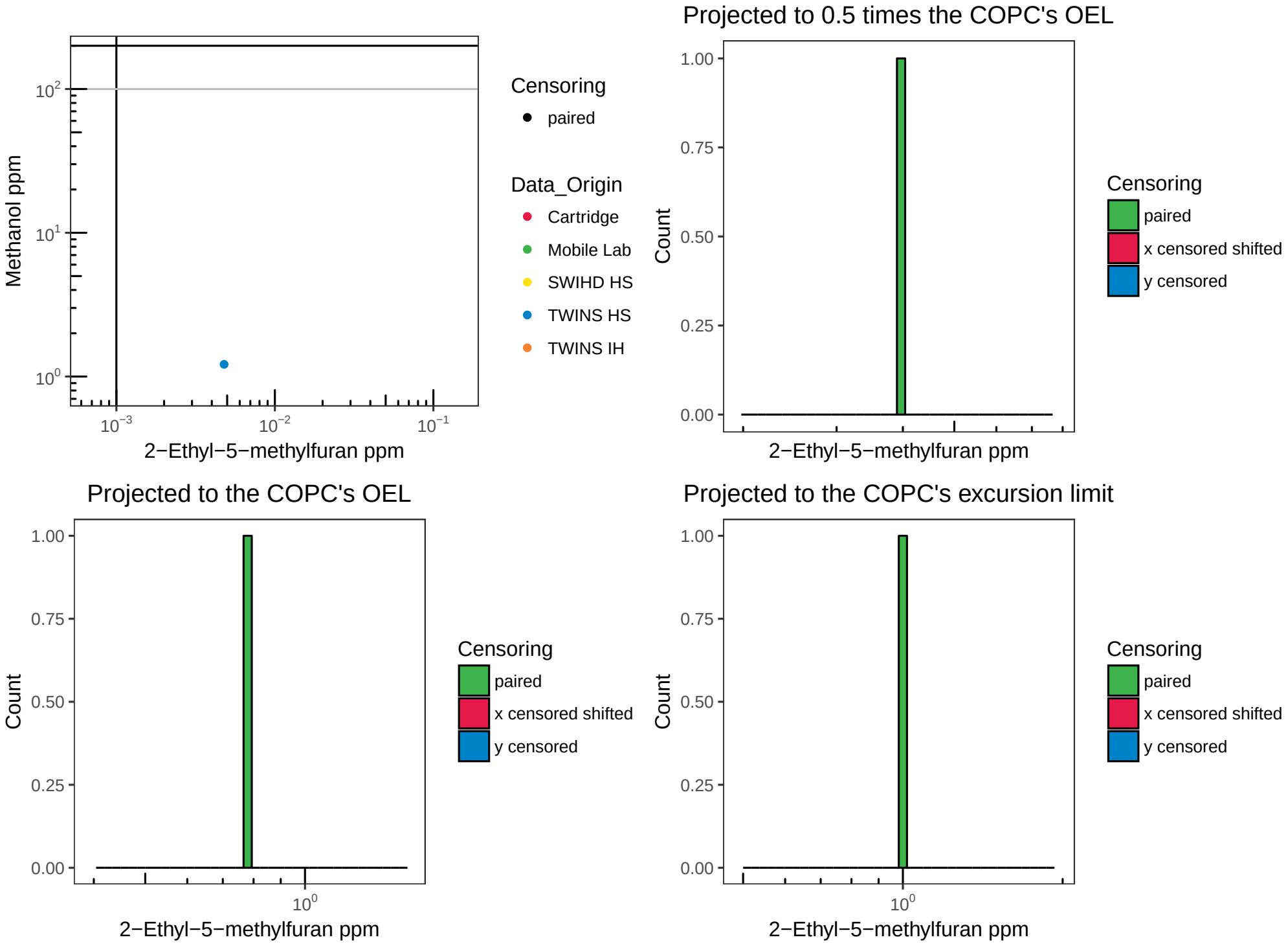


Figure C.1221: Methanol vs 2-Ethyl-5-methylfuran

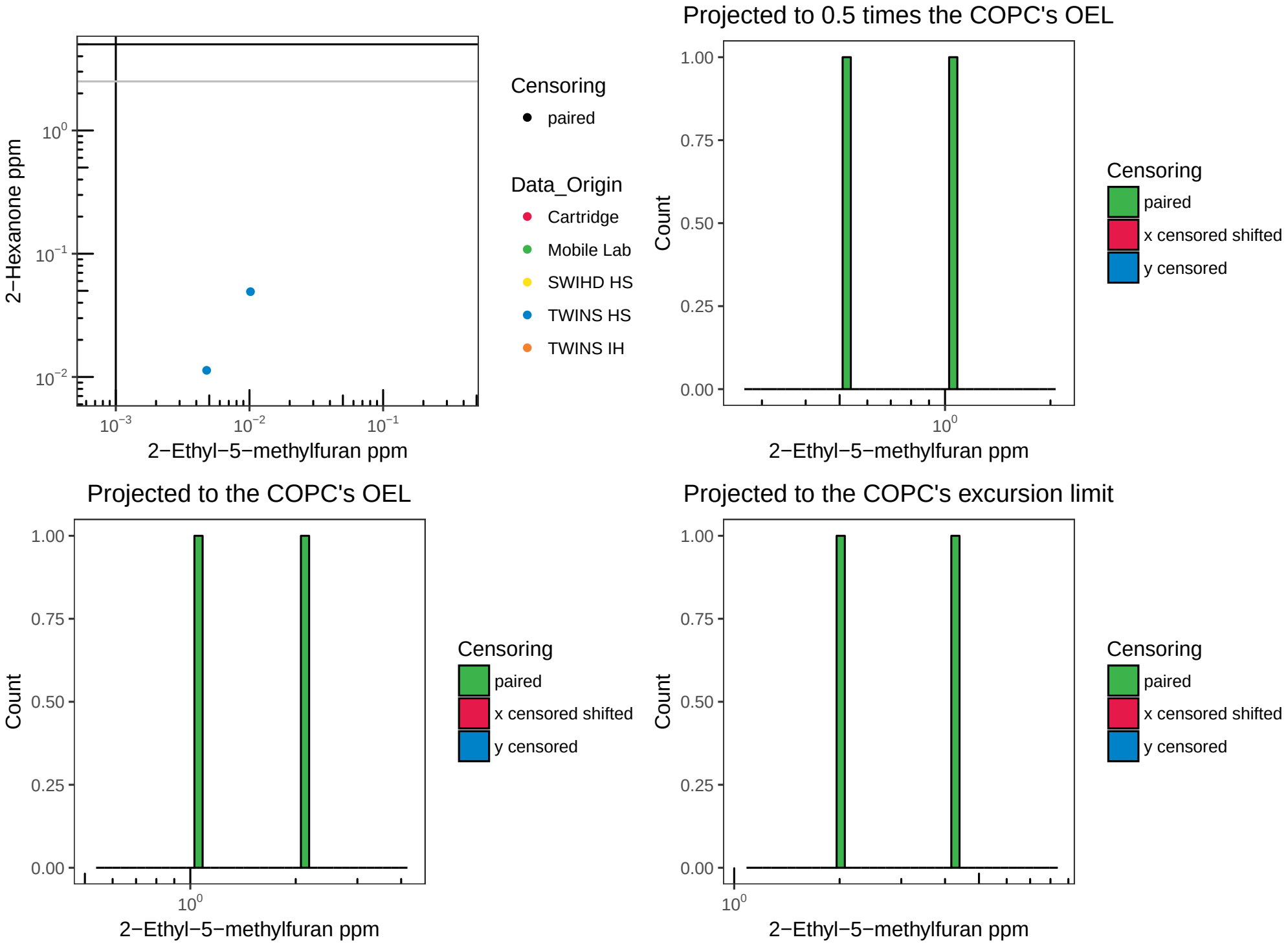


Figure C.1222: 2-Hexanone vs 2-Ethyl-5-methylfuran

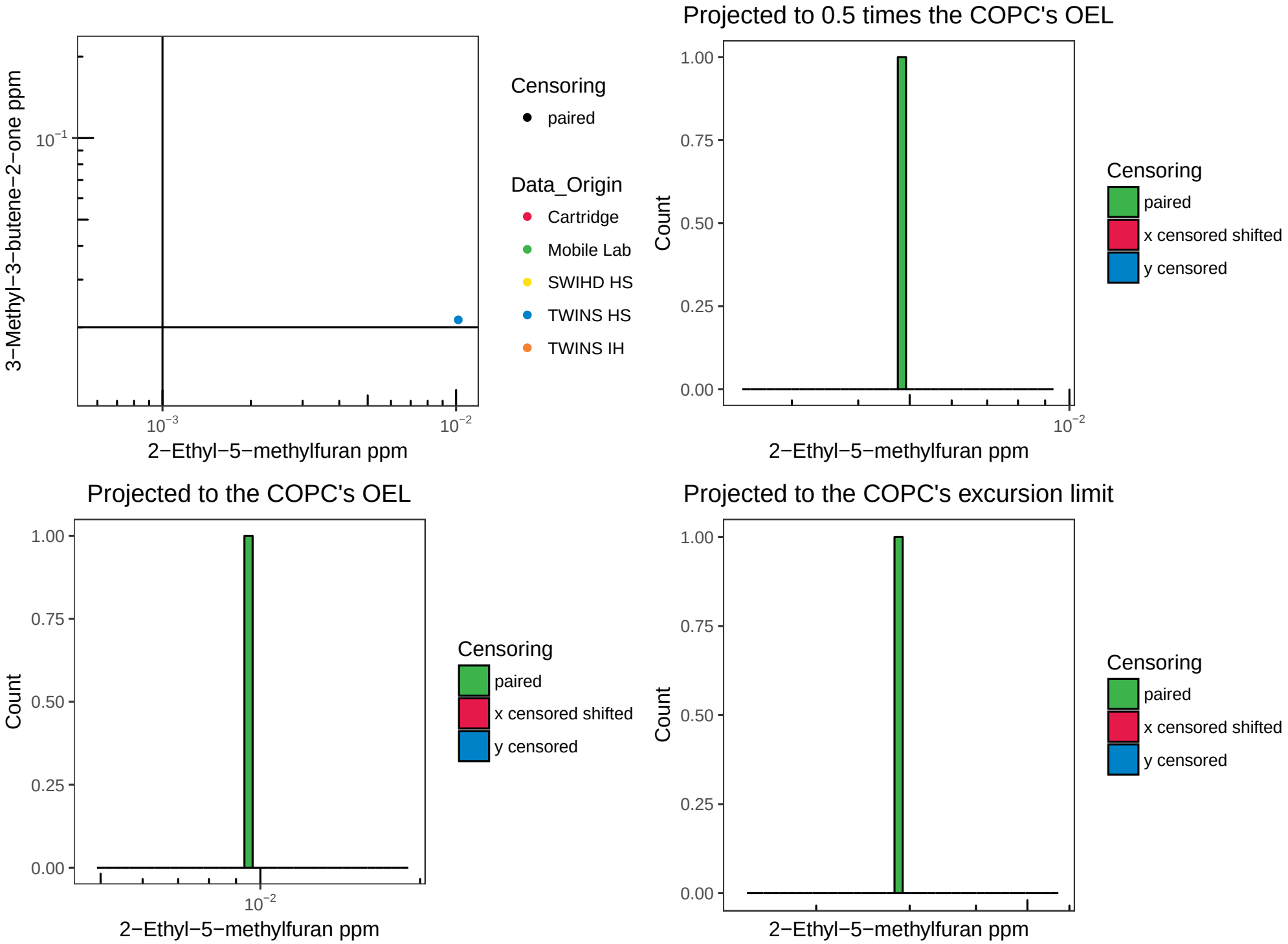


Figure C.1223: 3-Methyl-3-butene-2-one vs 2-Ethyl-5-methylfuran

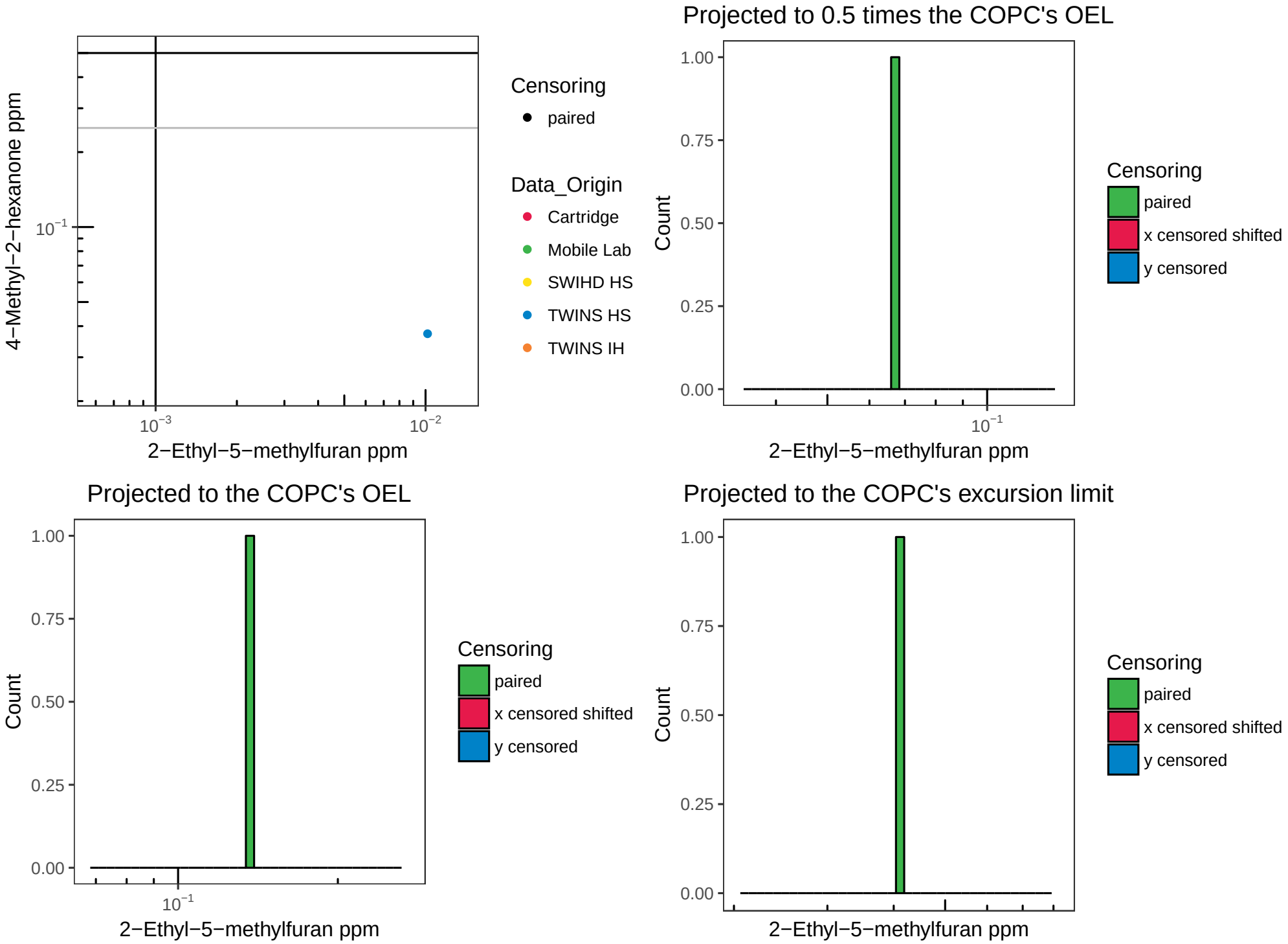


Figure C.1224: 4-Methyl-2-hexanone vs 2-Ethyl-5-methylfuran

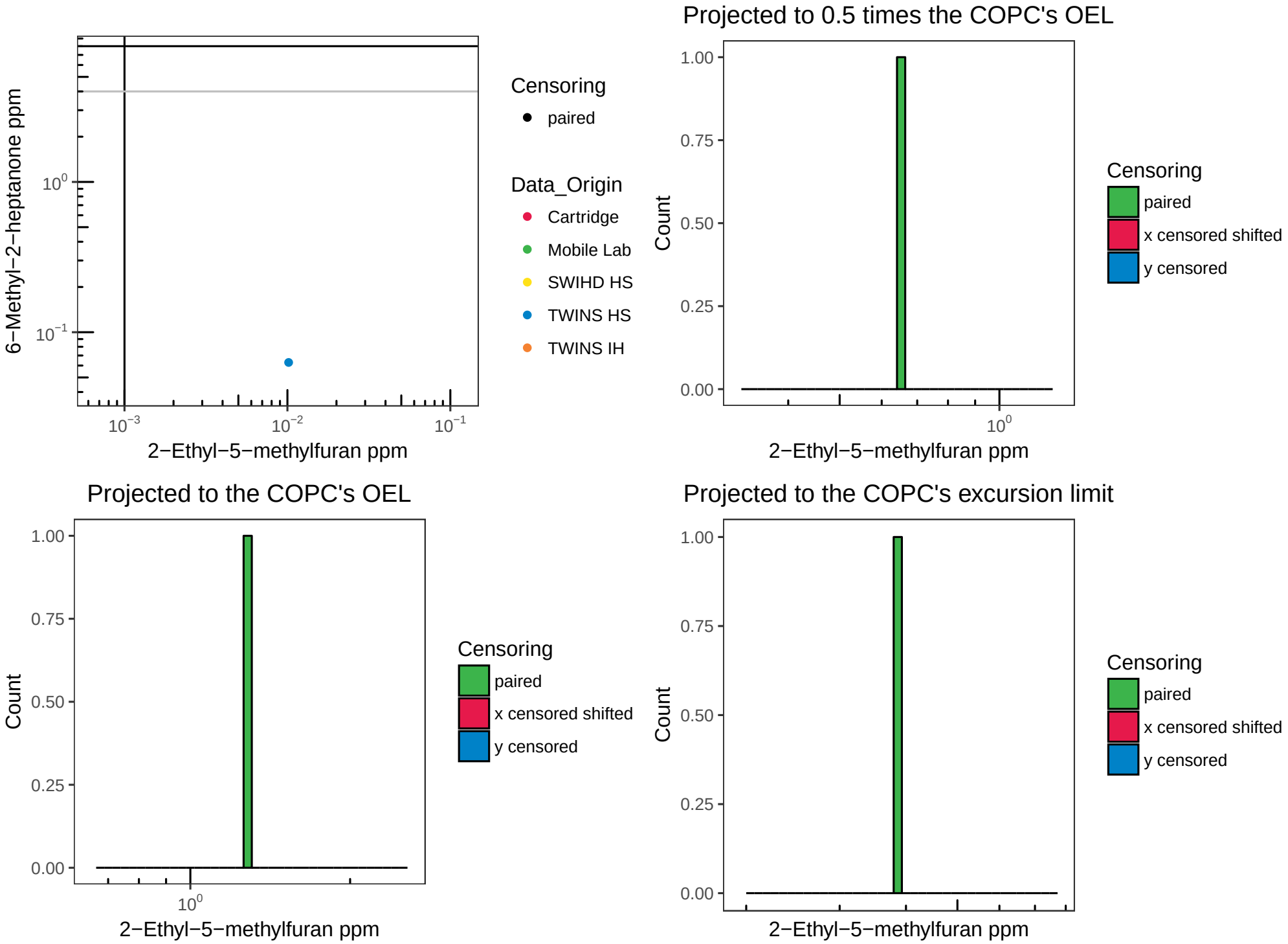


Figure C.1225: 6-Methyl-2-heptanone vs 2-Ethyl-5-methylfuran

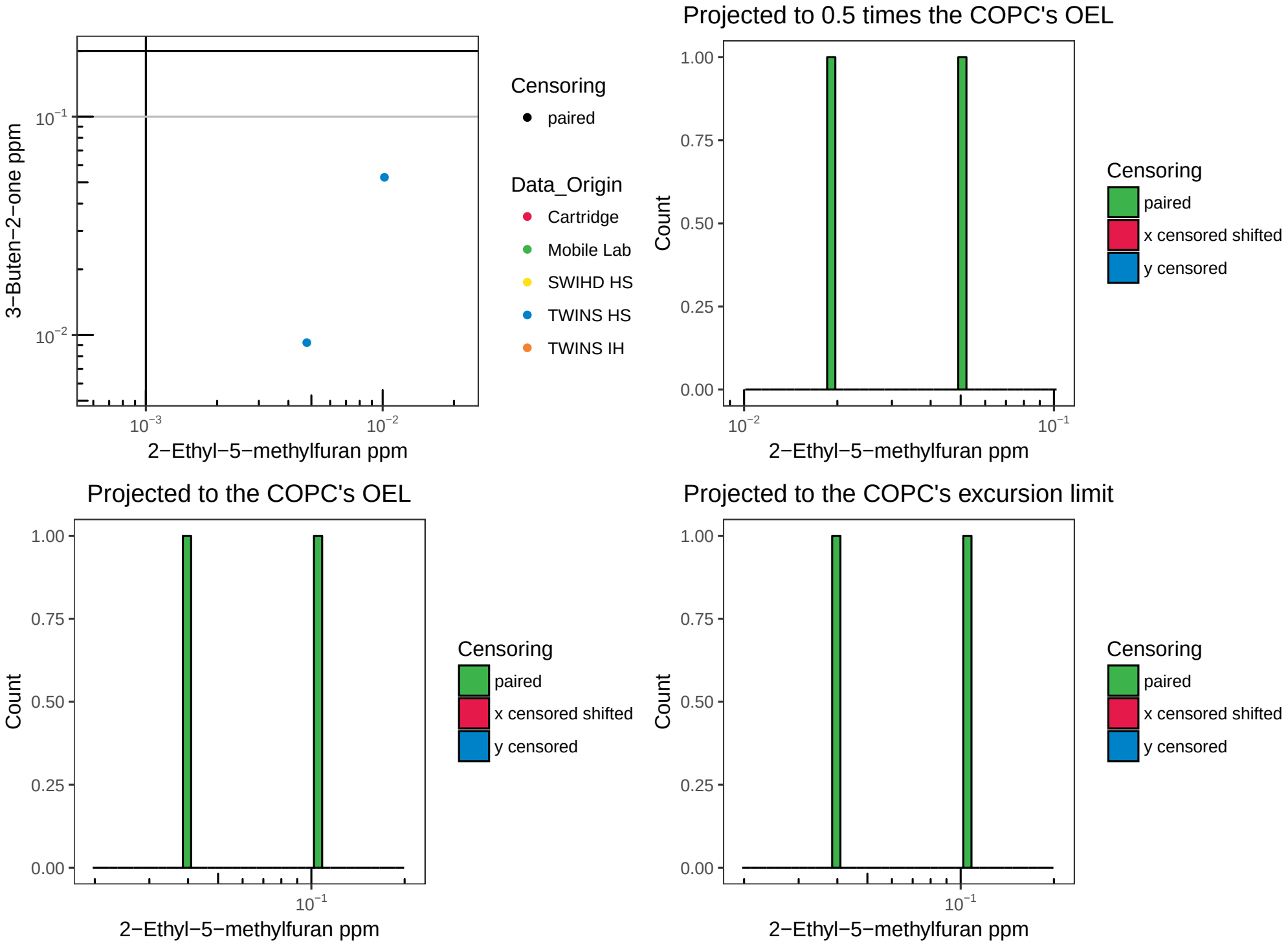


Figure C.1226: 3-Buten-2-one vs 2-Ethyl-5-methylfuran

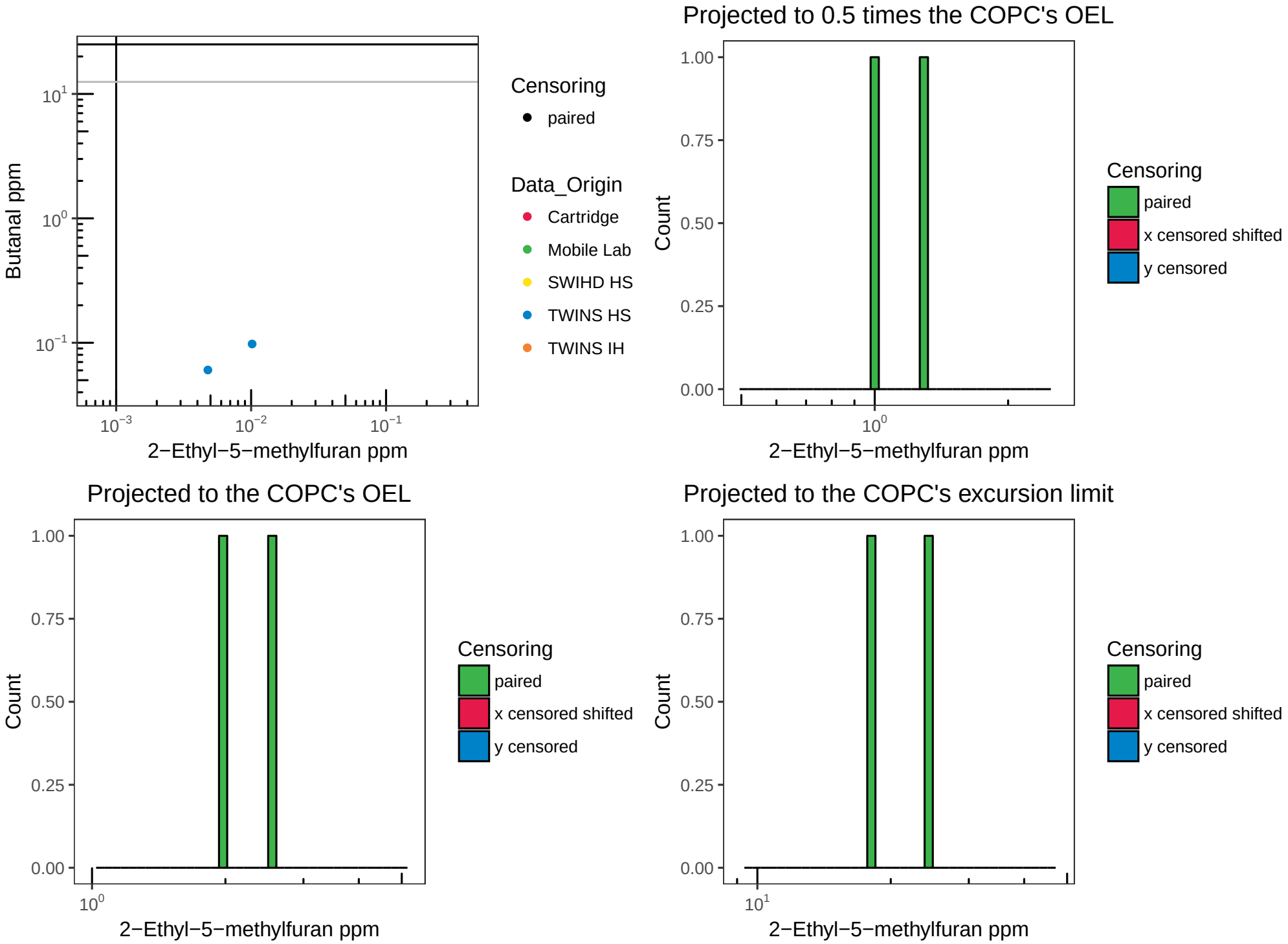


Figure C.1227: Butanal vs 2-Ethyl-5-methylfuran

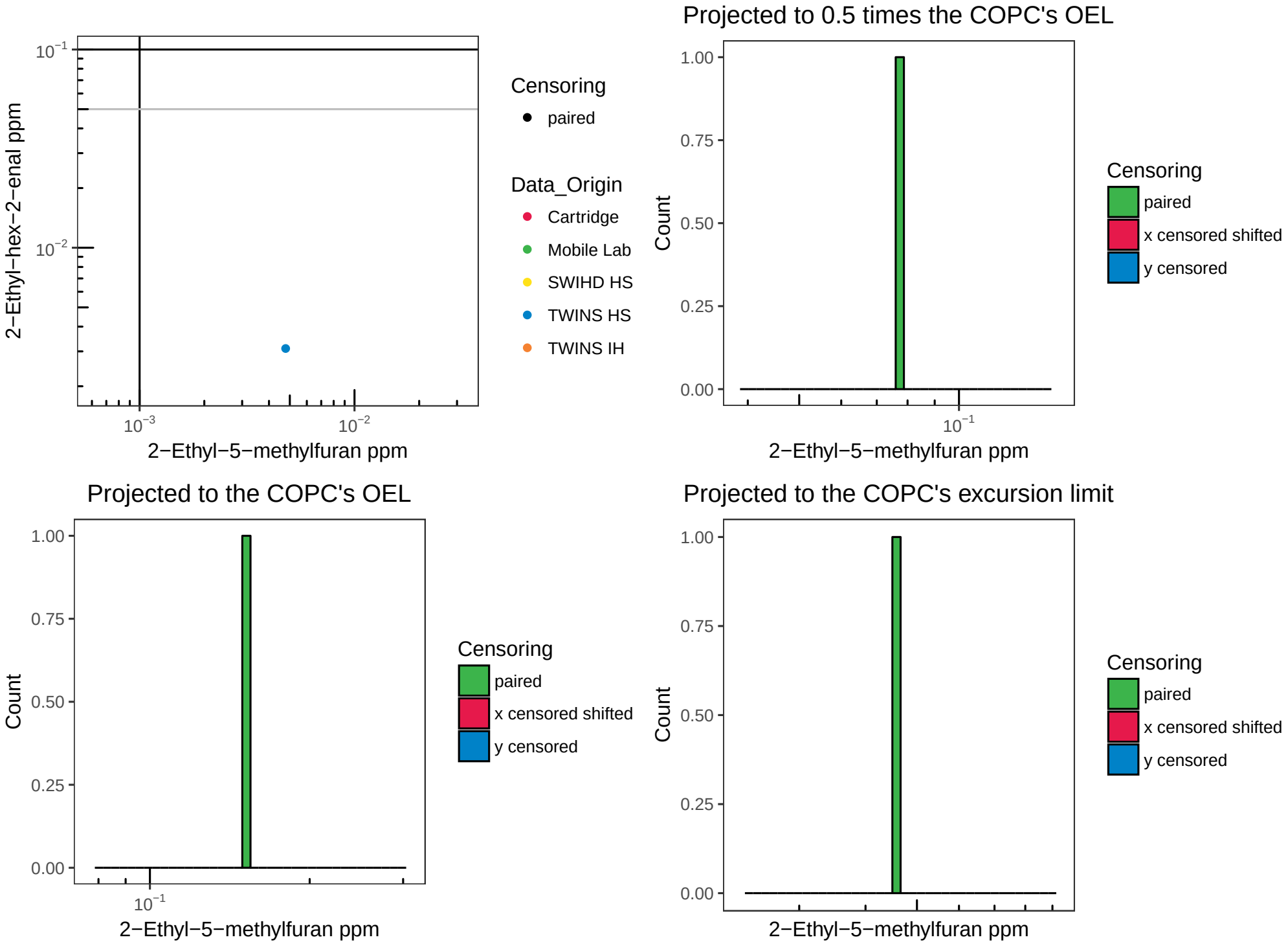


Figure C.1228: 2-Ethyl-hex-2-enal vs 2-Ethyl-5-methylfuran

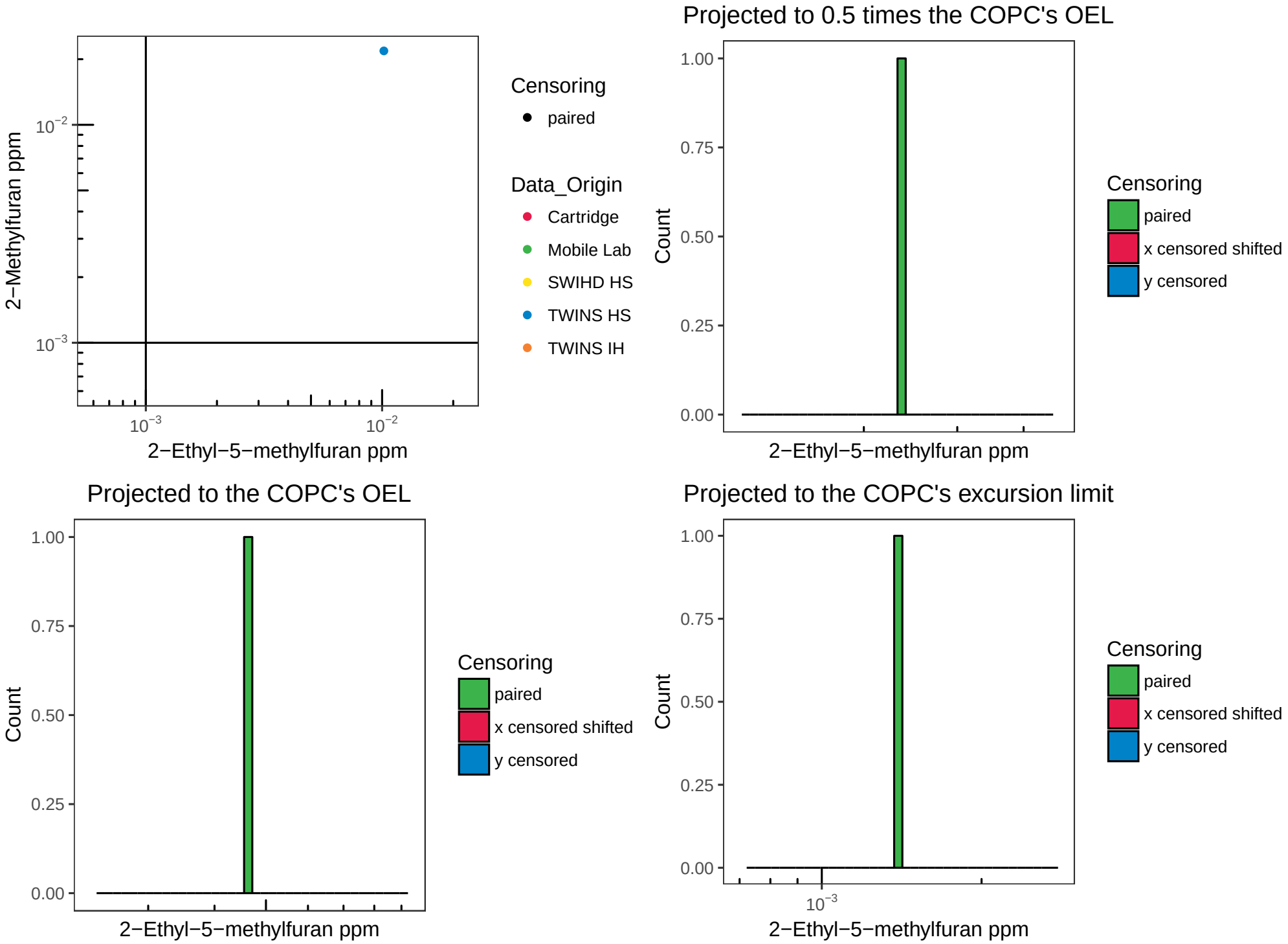


Figure C.1229: 2-Methylfuran vs 2-Ethyl-5-methylfuran

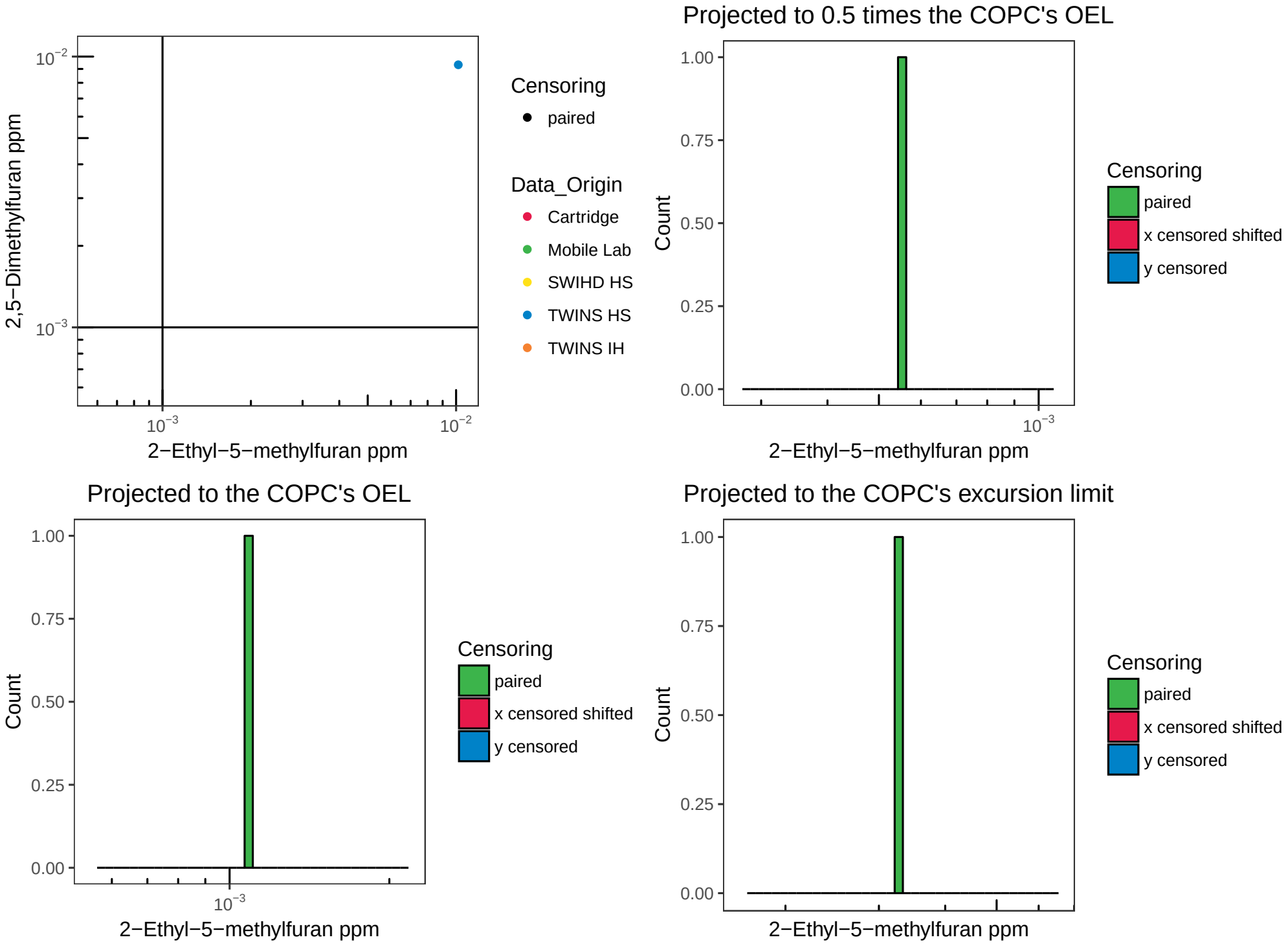


Figure C.1230: 2,5-Dimethylfuran vs 2-Ethyl-5-methylfuran

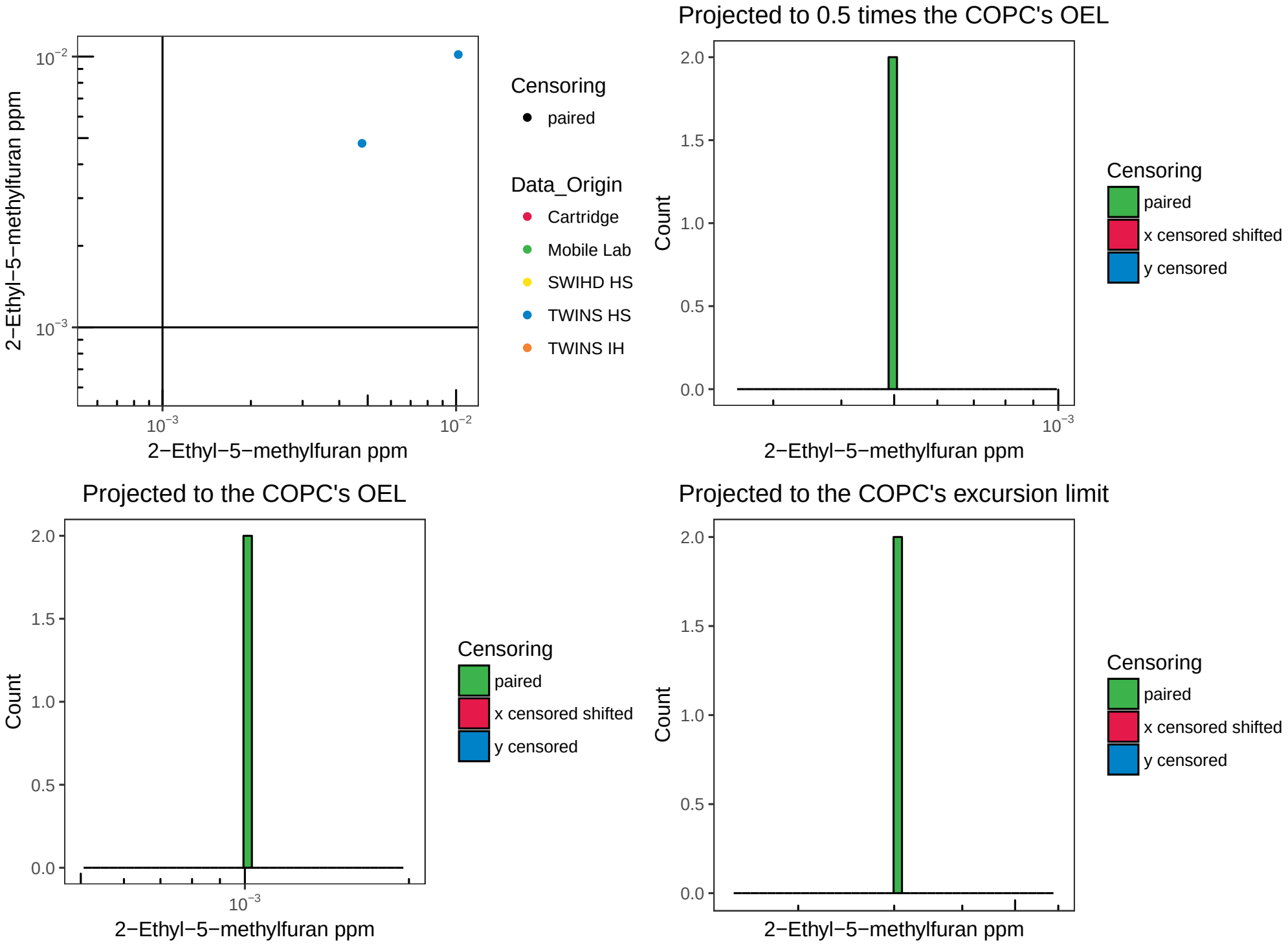


Figure C.1231: 2-Ethyl-5-methylfuran vs 2-Ethyl-5-methylfuran

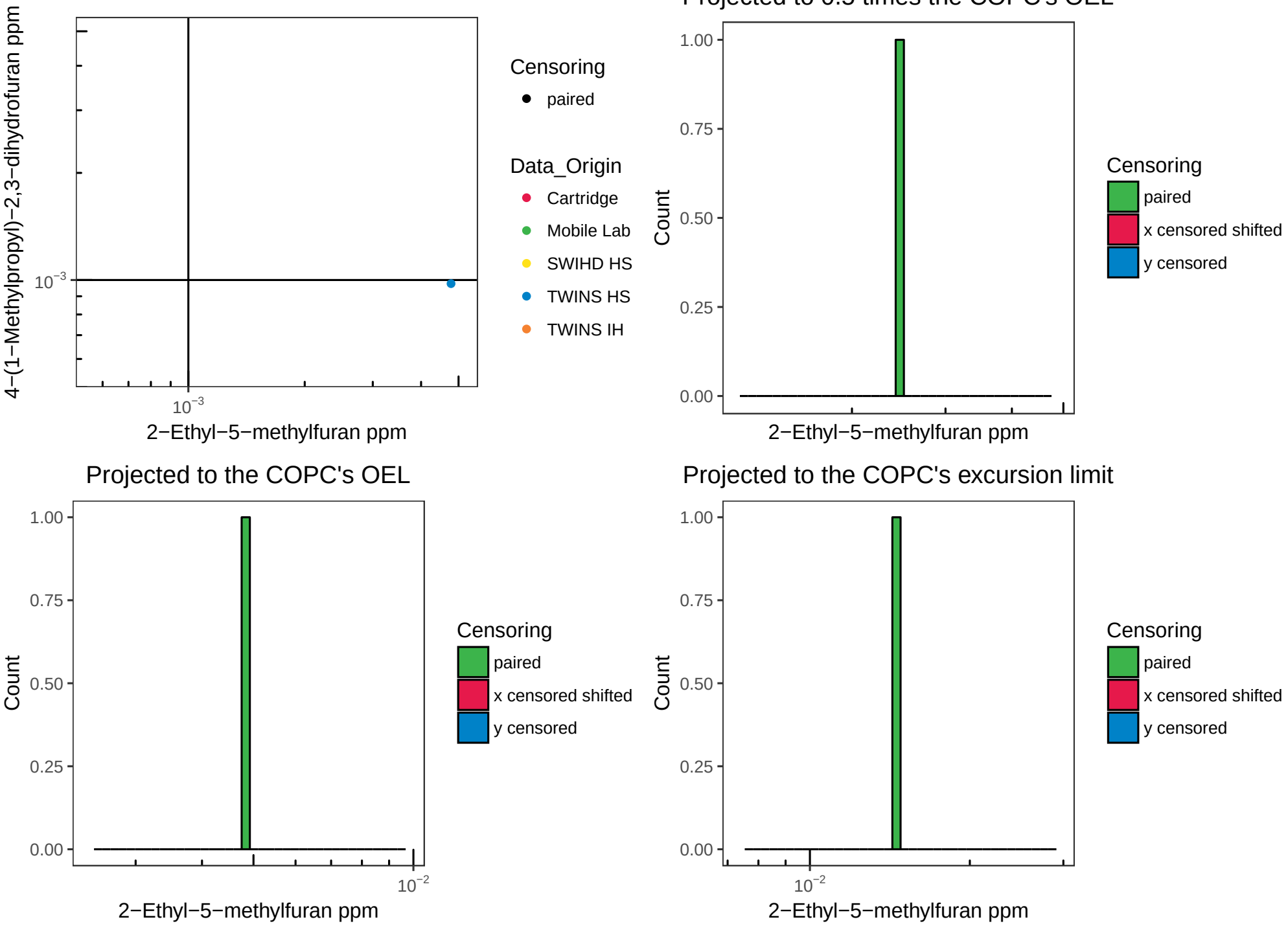


Figure C.1232: 4-(1-Methylpropyl)-2,3-dihydrofuran vs 2-Ethyl-5-methylfuran

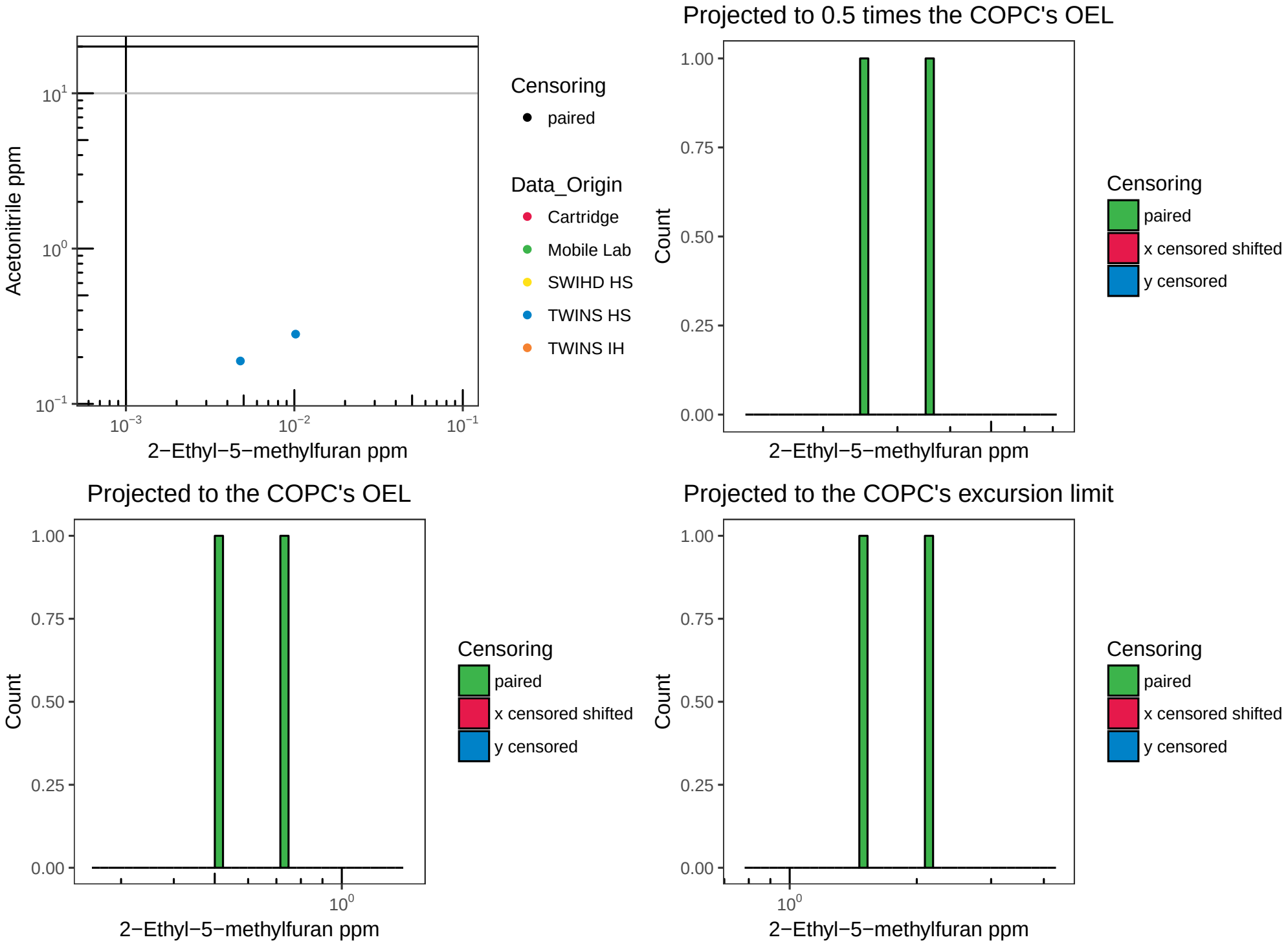


Figure C.1233: Acetonitrile vs 2-Ethyl-5-methylfuran

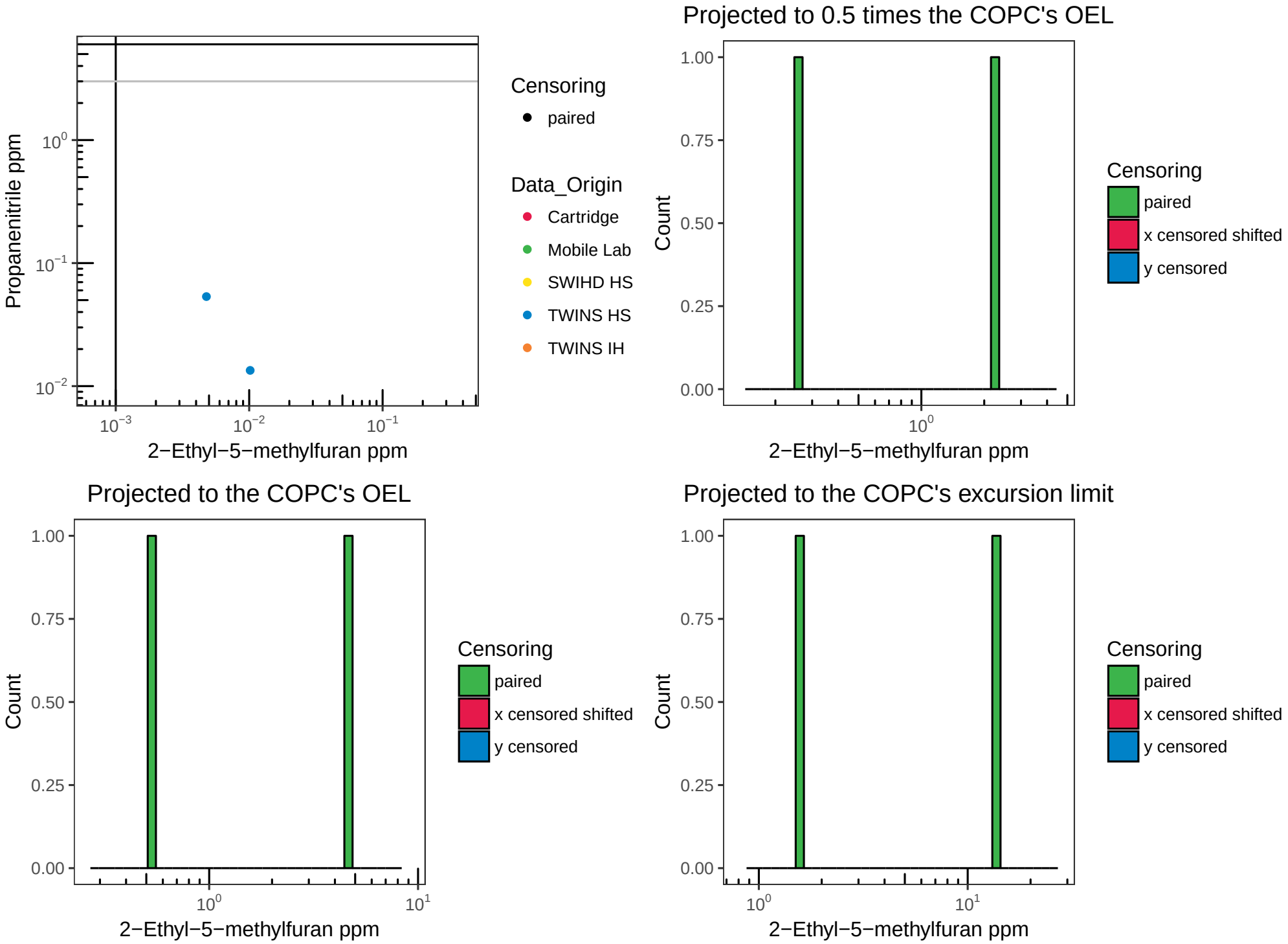


Figure C.1234: Propanenitrile vs 2-Ethyl-5-methylfuran

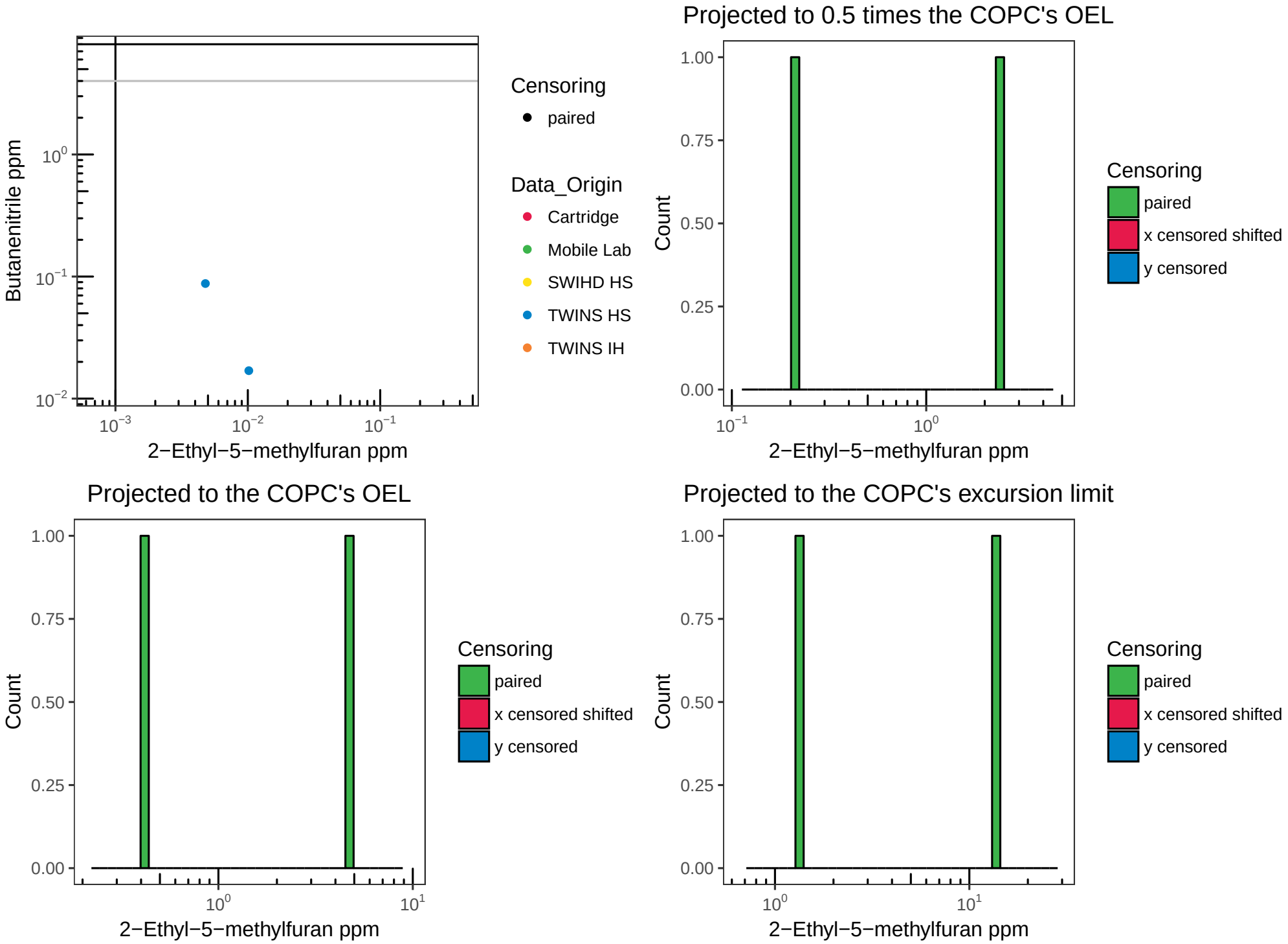


Figure C.1235: Butanenitrile vs 2-Ethyl-5-methylfuran

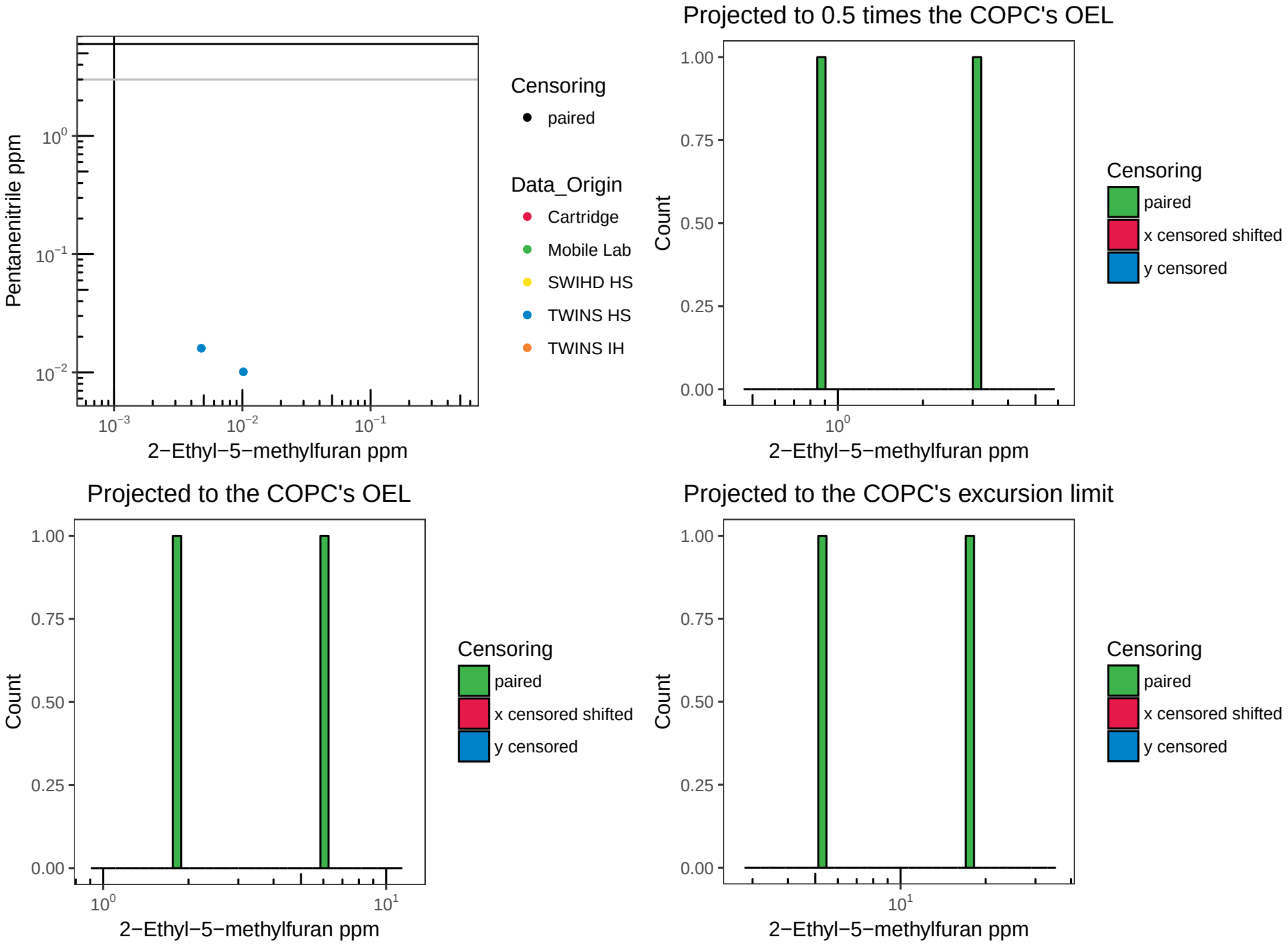


Figure C.1236: Pentanenitrile vs 2-Ethyl-5-methylfuran

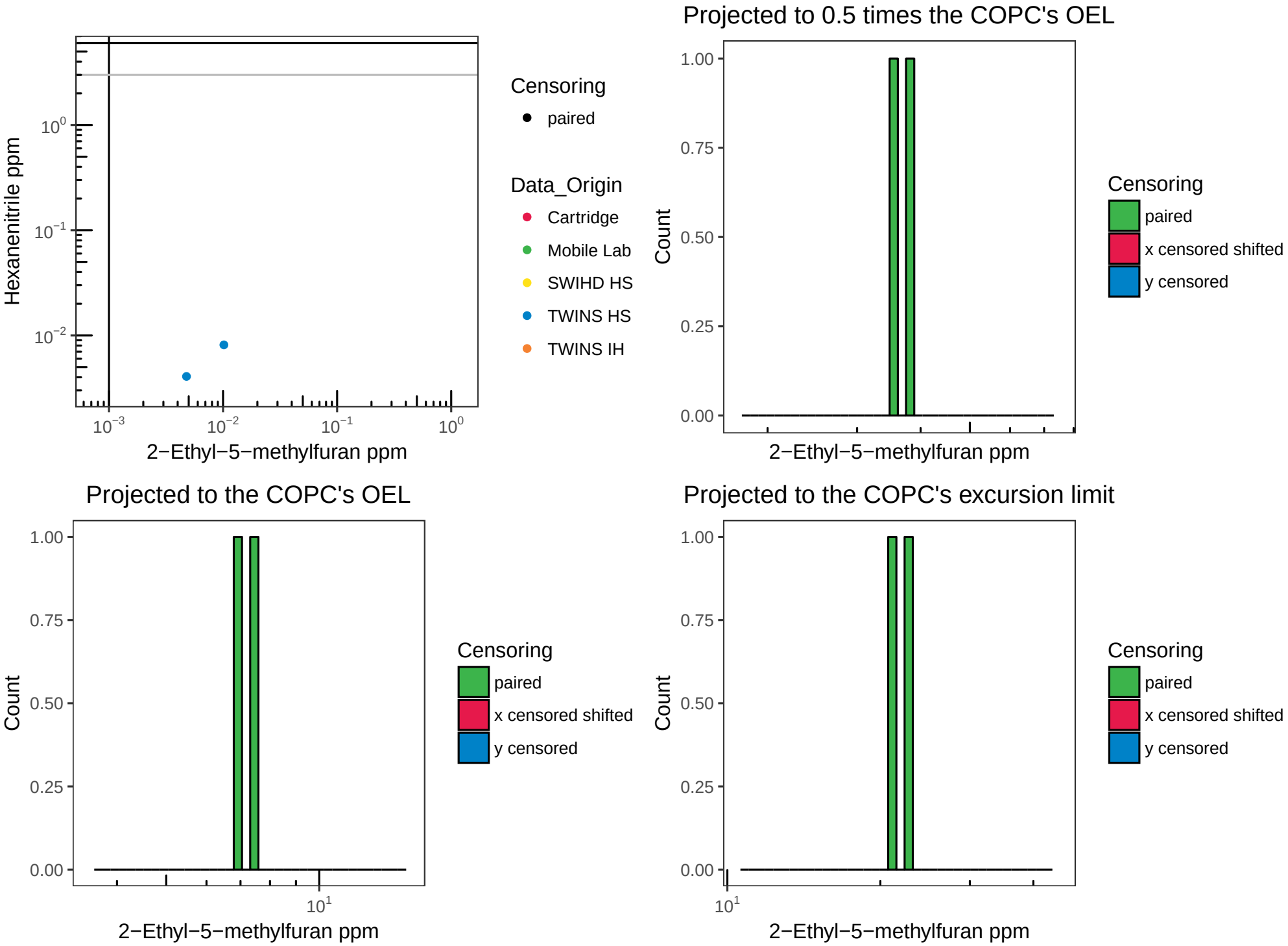


Figure C.1237: Hexanenitrile vs 2-Ethyl-5-methylfuran

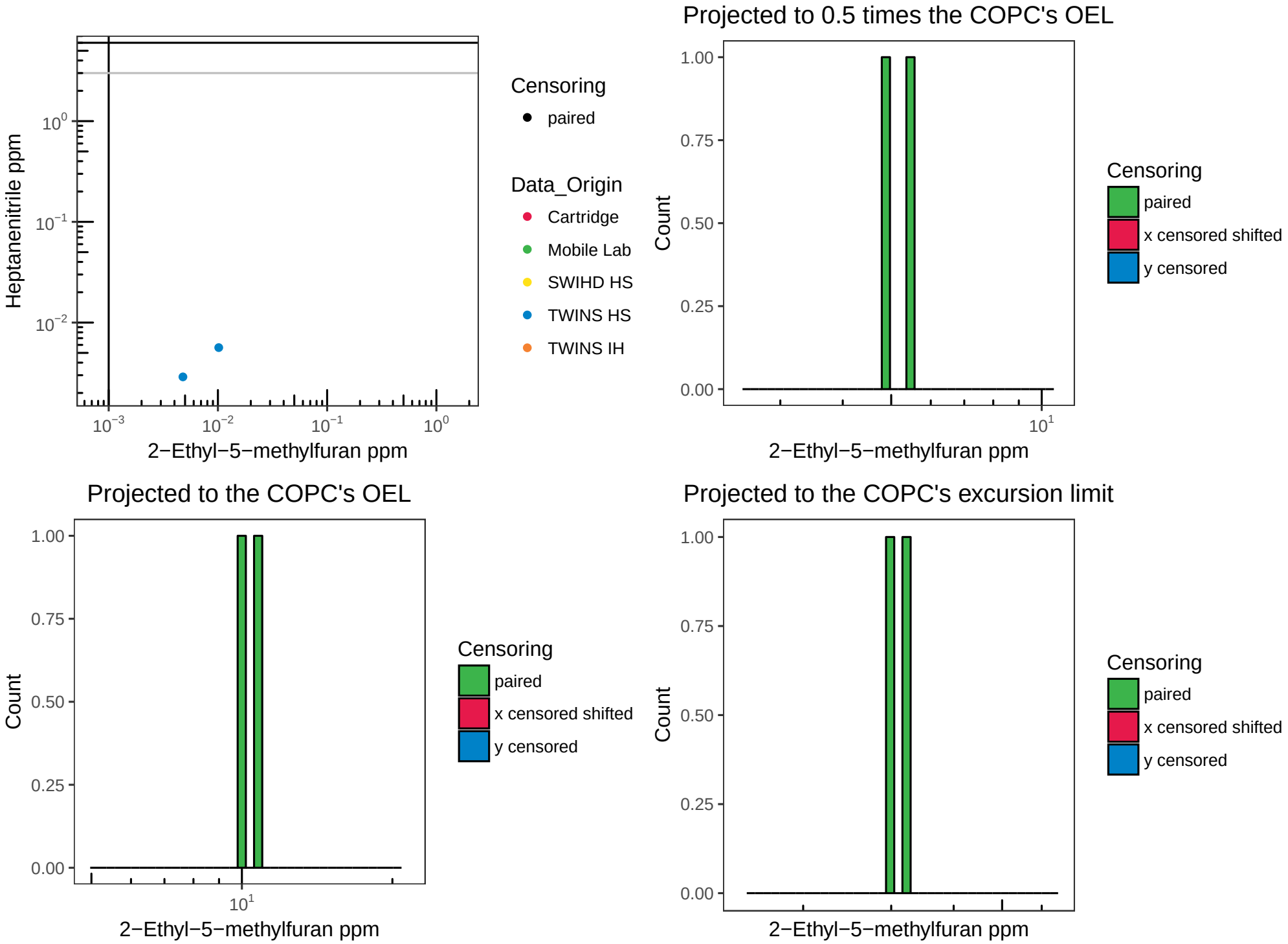


Figure C.1238: Heptanenitrile vs 2-Ethyl-5-methylfuran

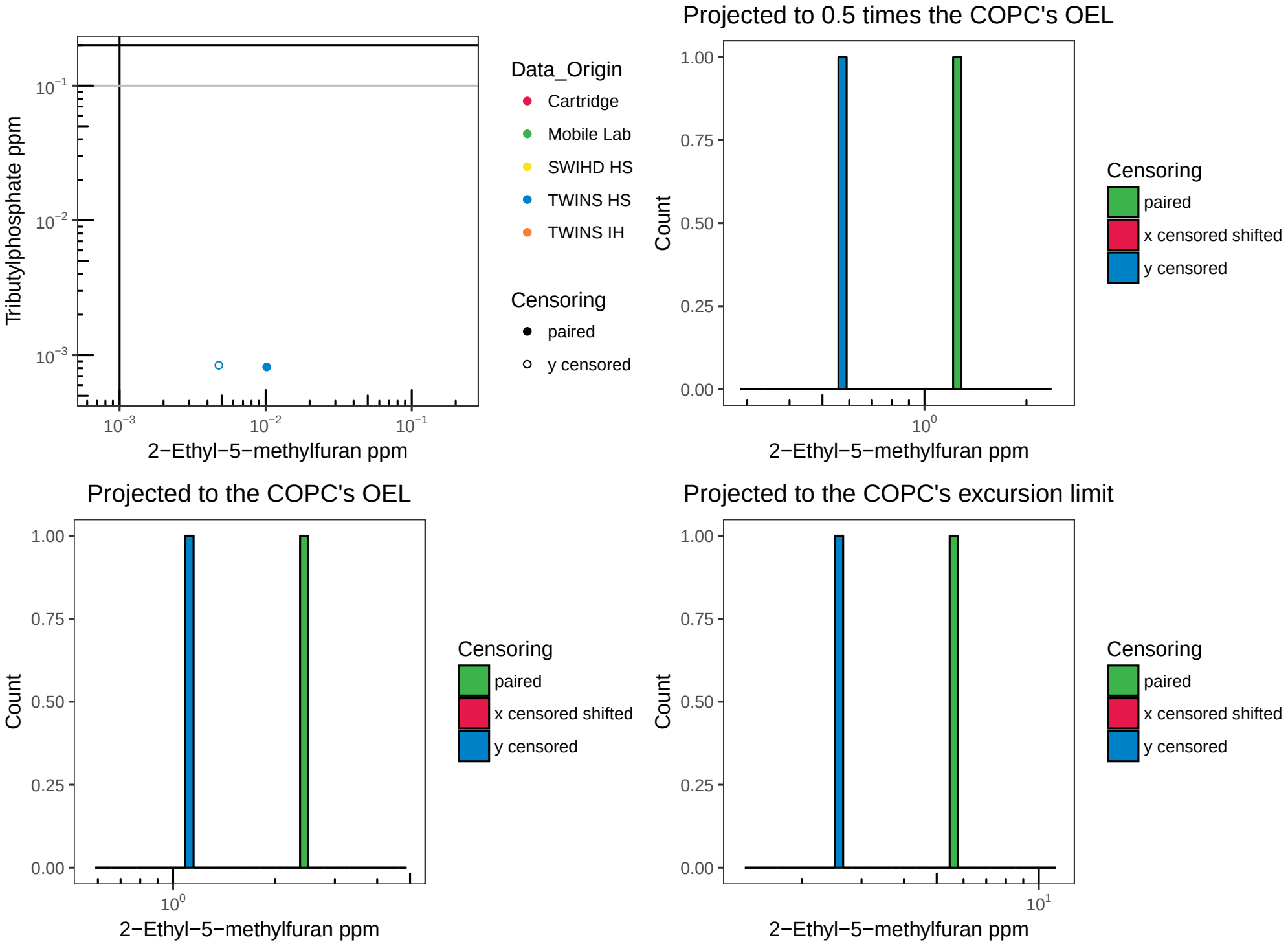


Figure C.1239: Tributylphosphate vs 2-Ethyl-5-methylfuran

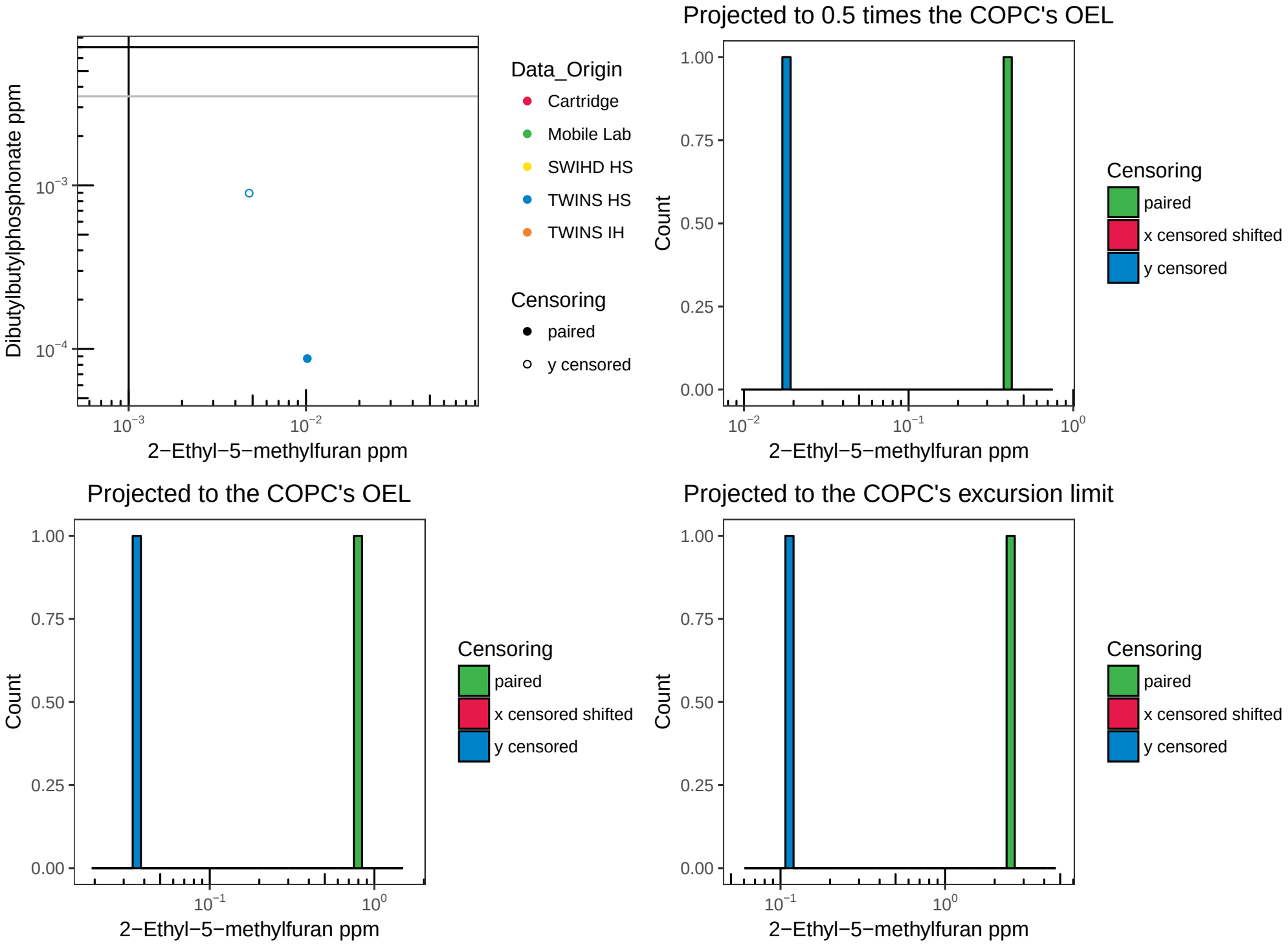


Figure C.1240: Dibutylbutylphosphonate vs 2-Ethyl-5-methylfuran

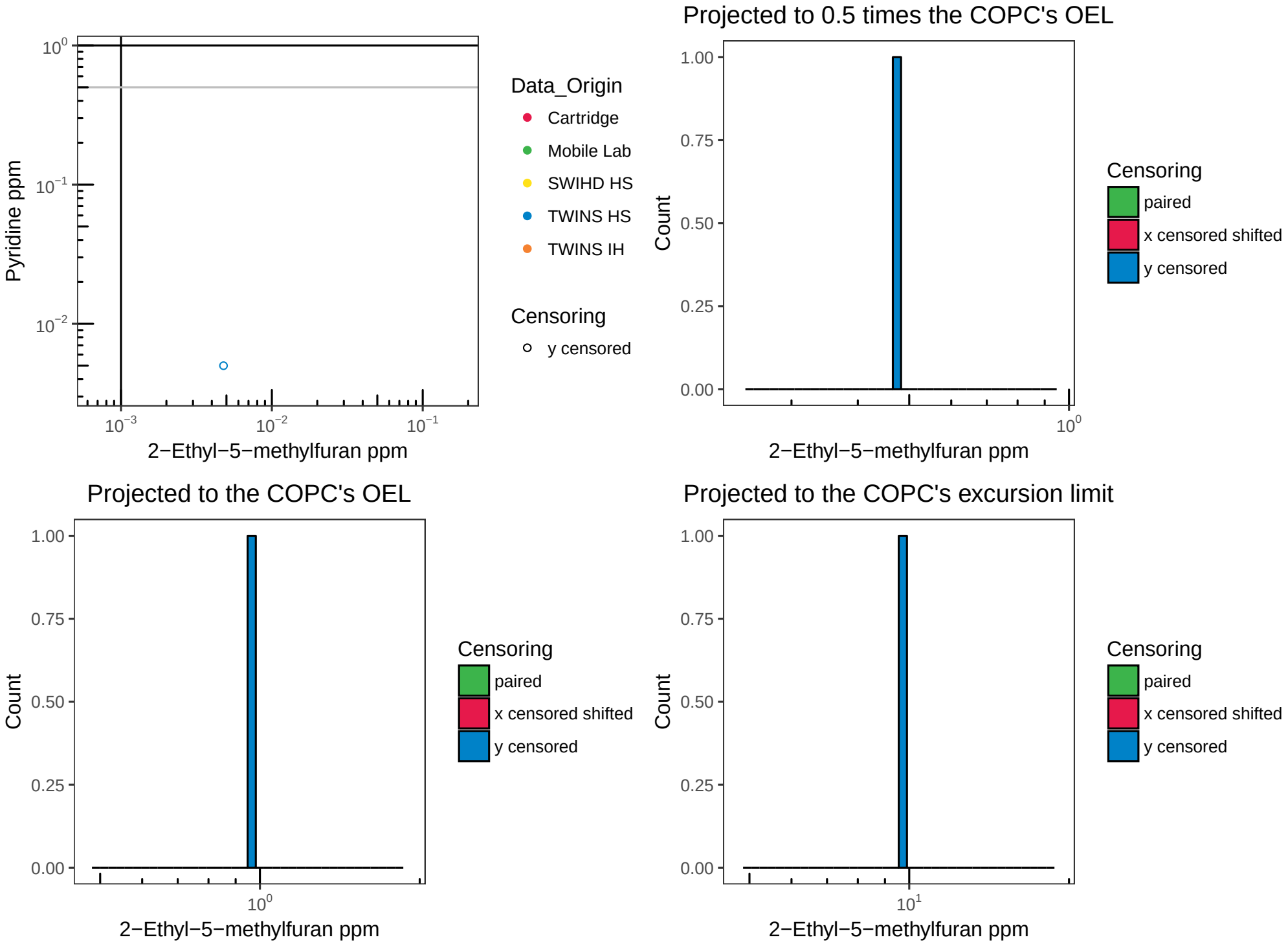


Figure C.1241: Pyridine vs 2-Ethyl-5-methylfuran

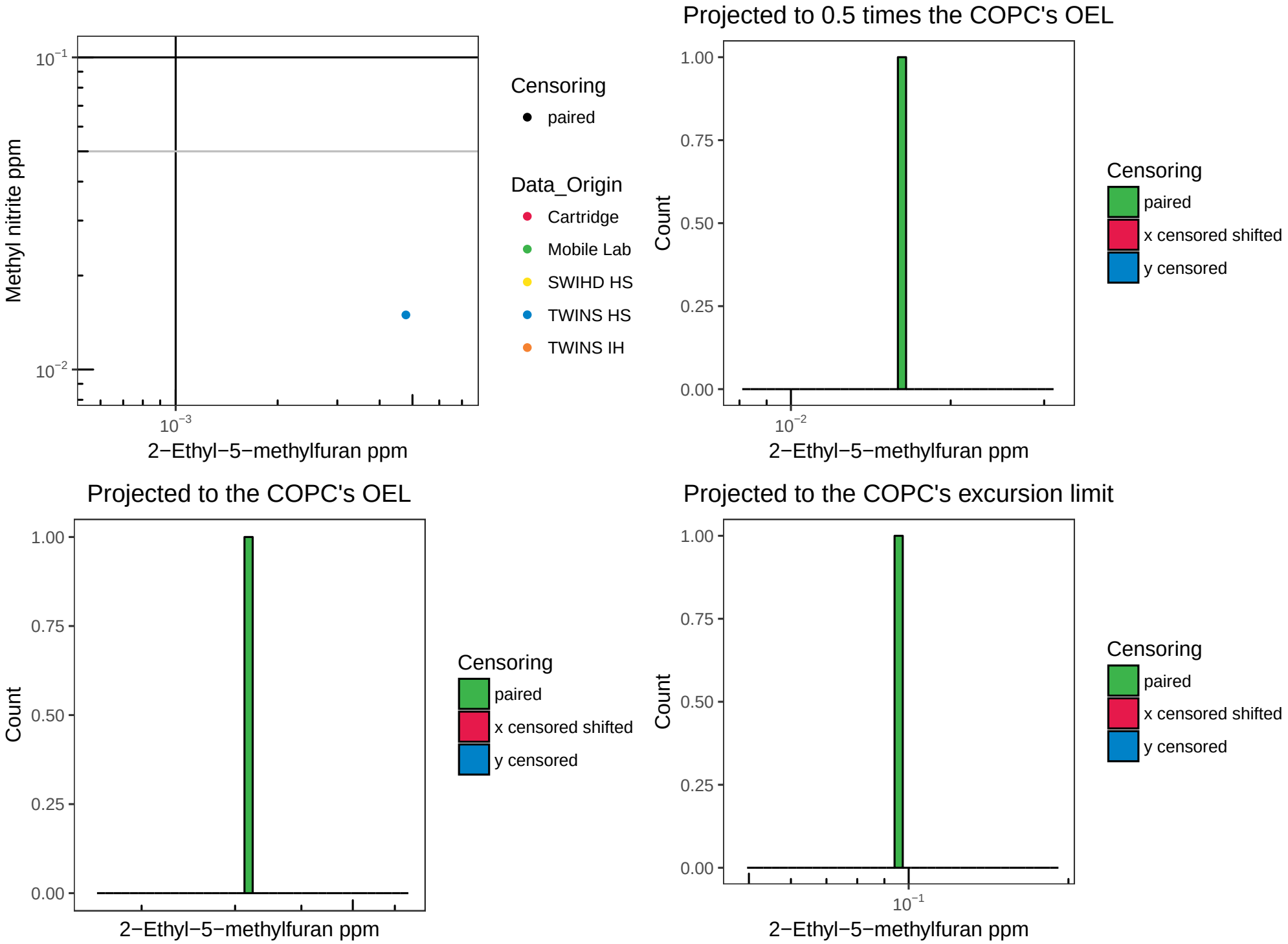


Figure C.1242: Methyl nitrite vs 2-Ethyl-5-methylfuran

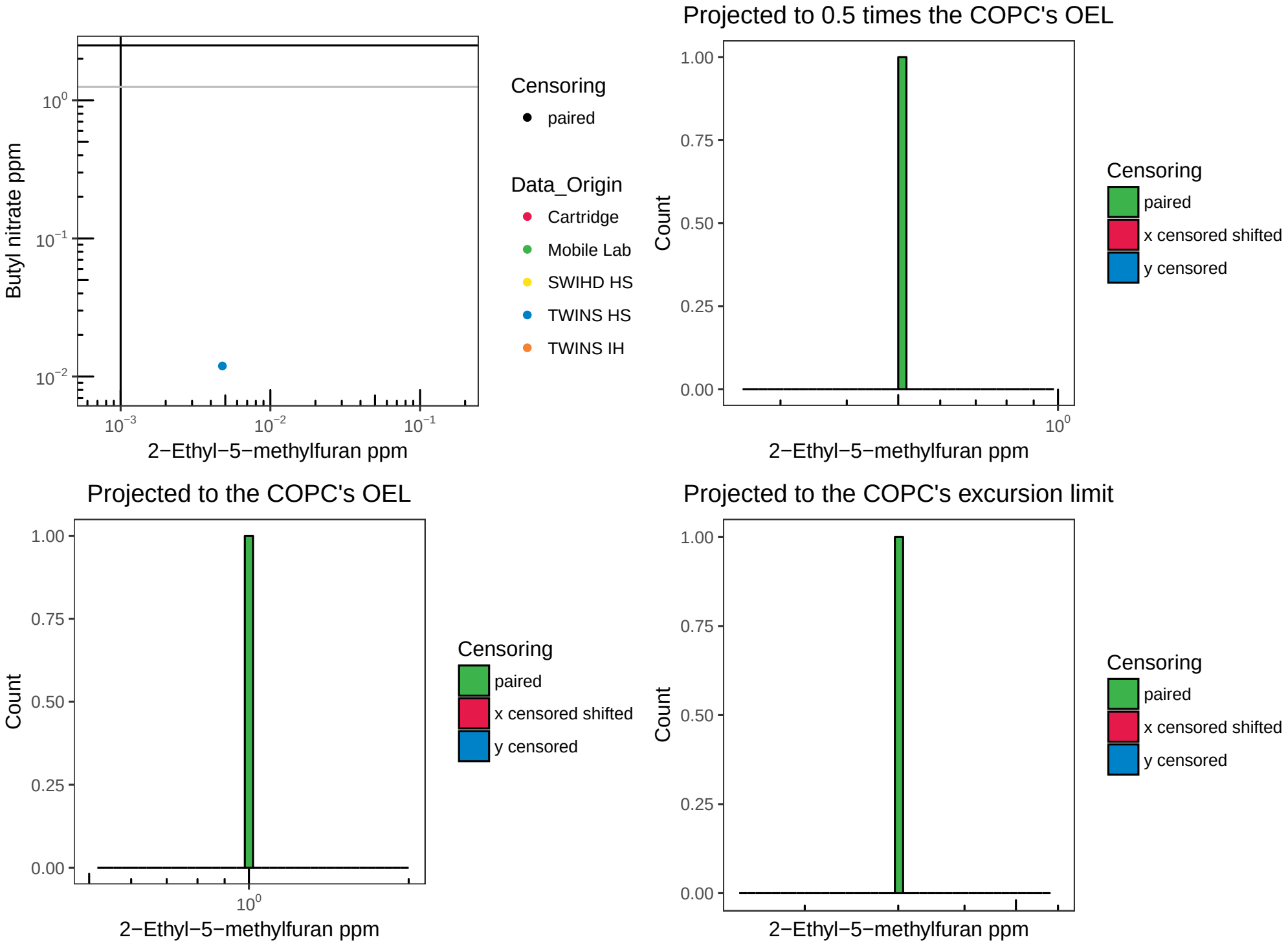


Figure C.1243: Butyl nitrate vs 2-Ethyl-5-methylfuran

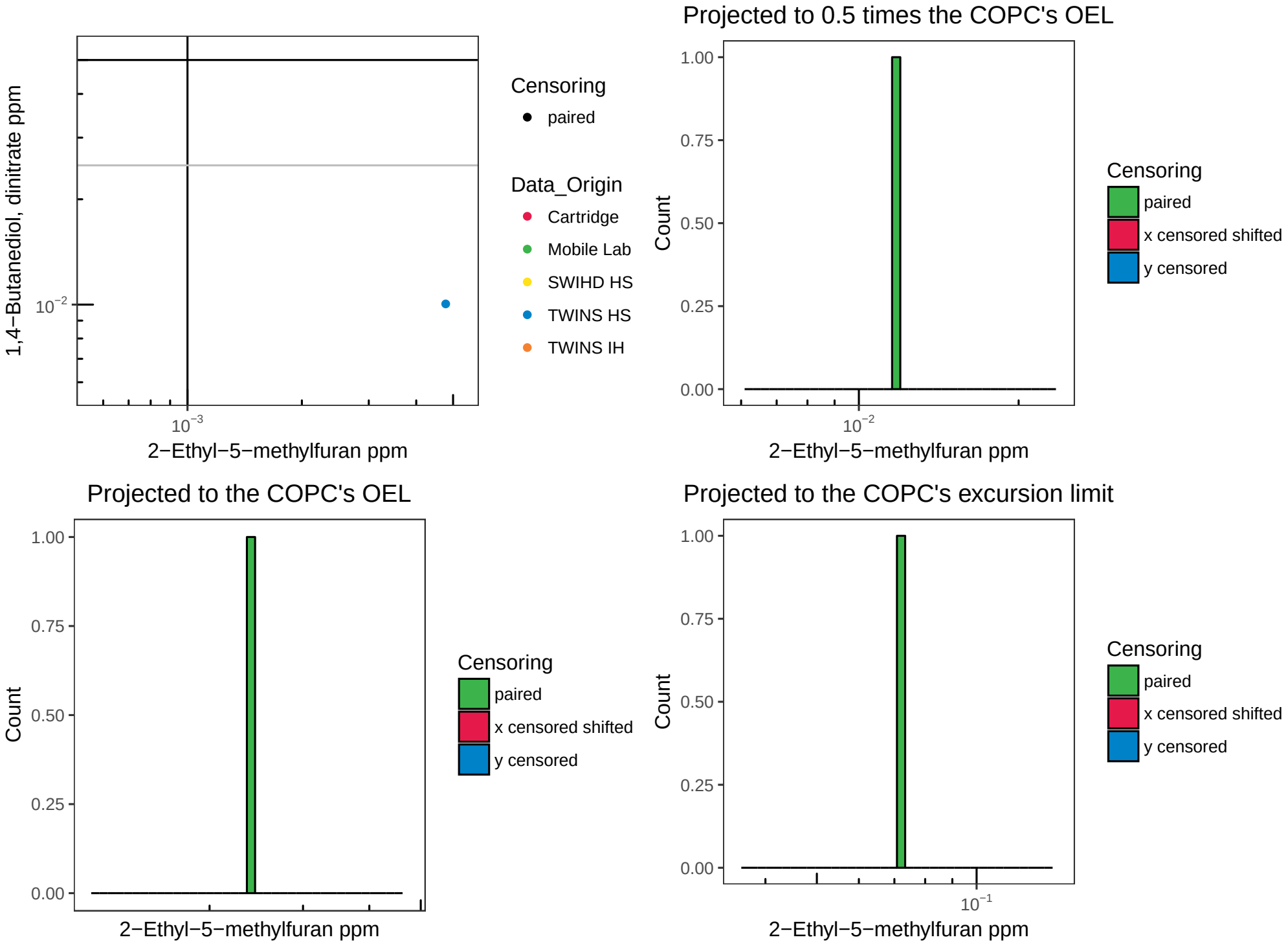


Figure C.1244: 1,4-Butanediol, dinitrate vs 2-Ethyl-5-methylfuran

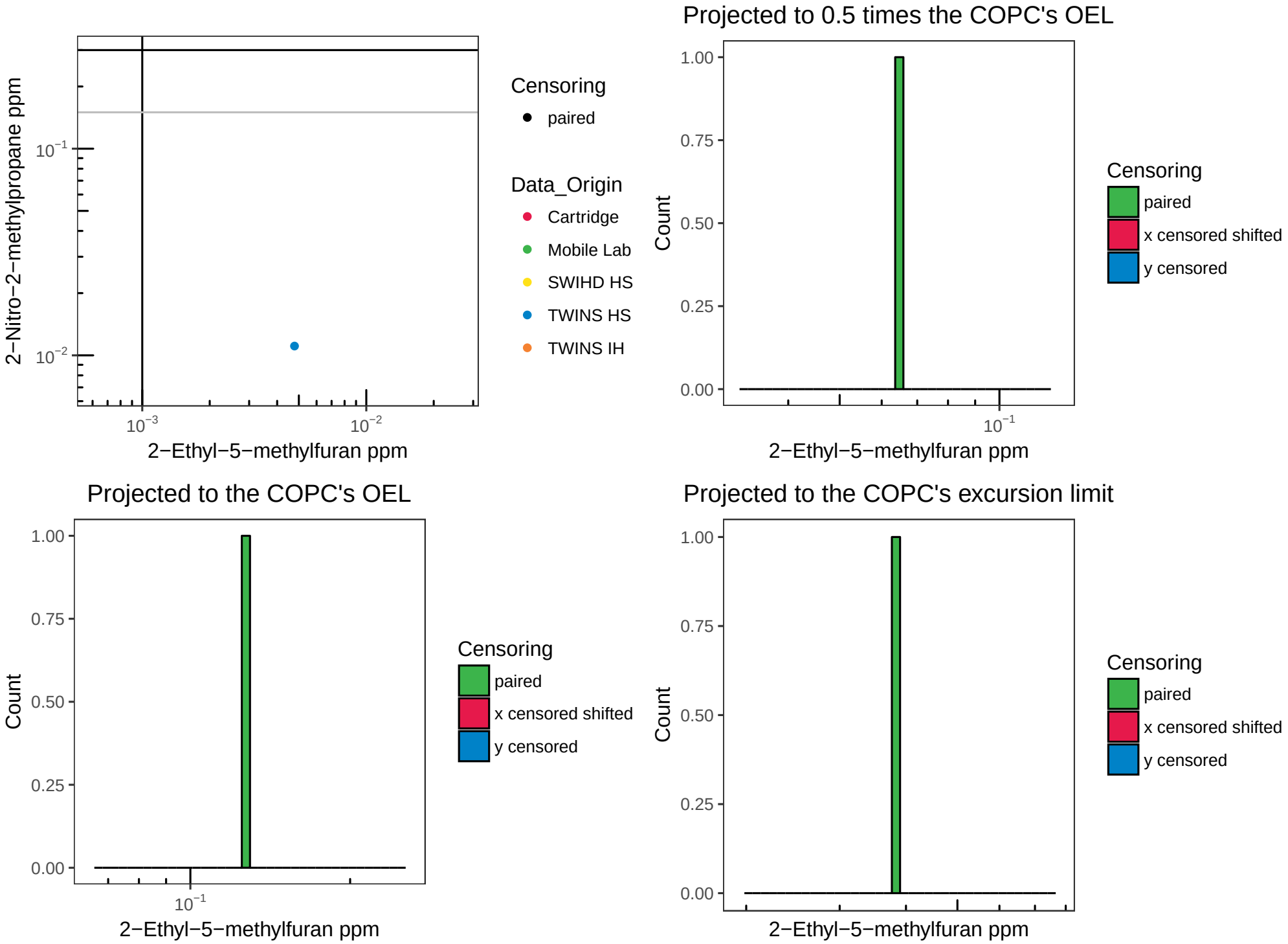


Figure C.1245: 2-Nitro-2-methylpropane vs 2-Ethyl-5-methylfuran

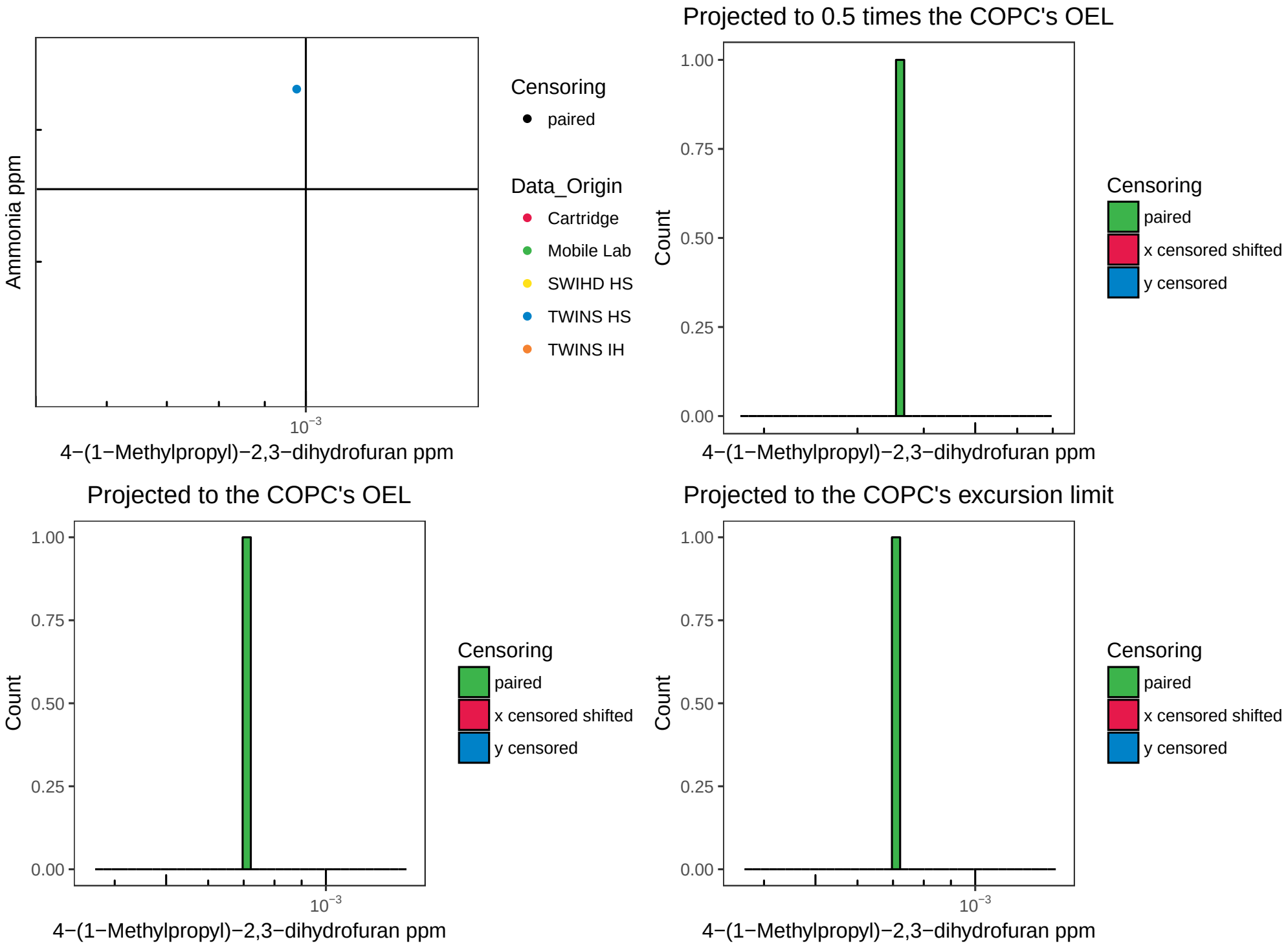


Figure C.1246: Ammonia vs 4-(1-Methylpropyl)-2,3-dihydrofuran

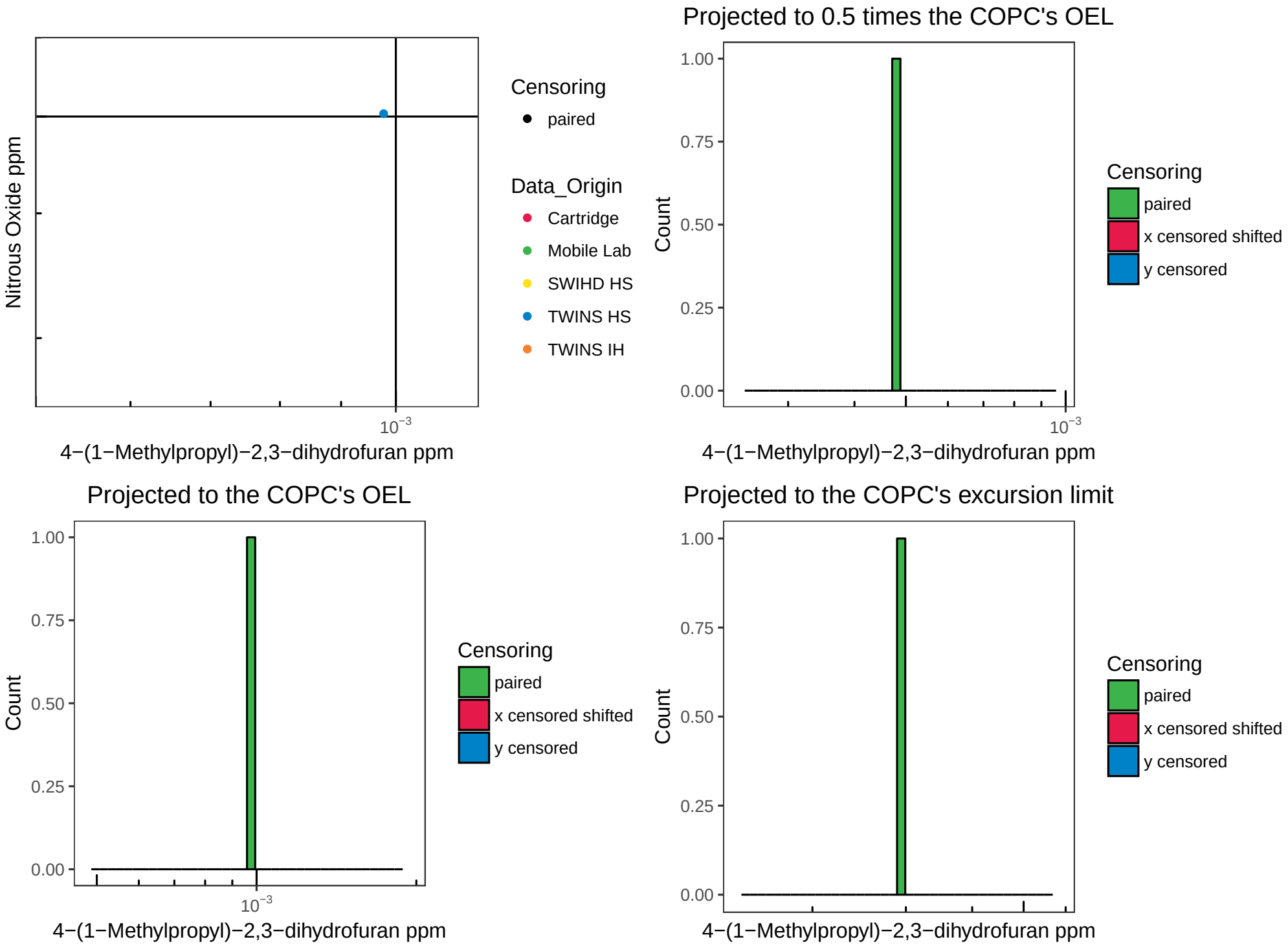


Figure C.1247: Nitrous Oxide vs 4-(1-Methylpropyl)-2,3-dihydrofuran

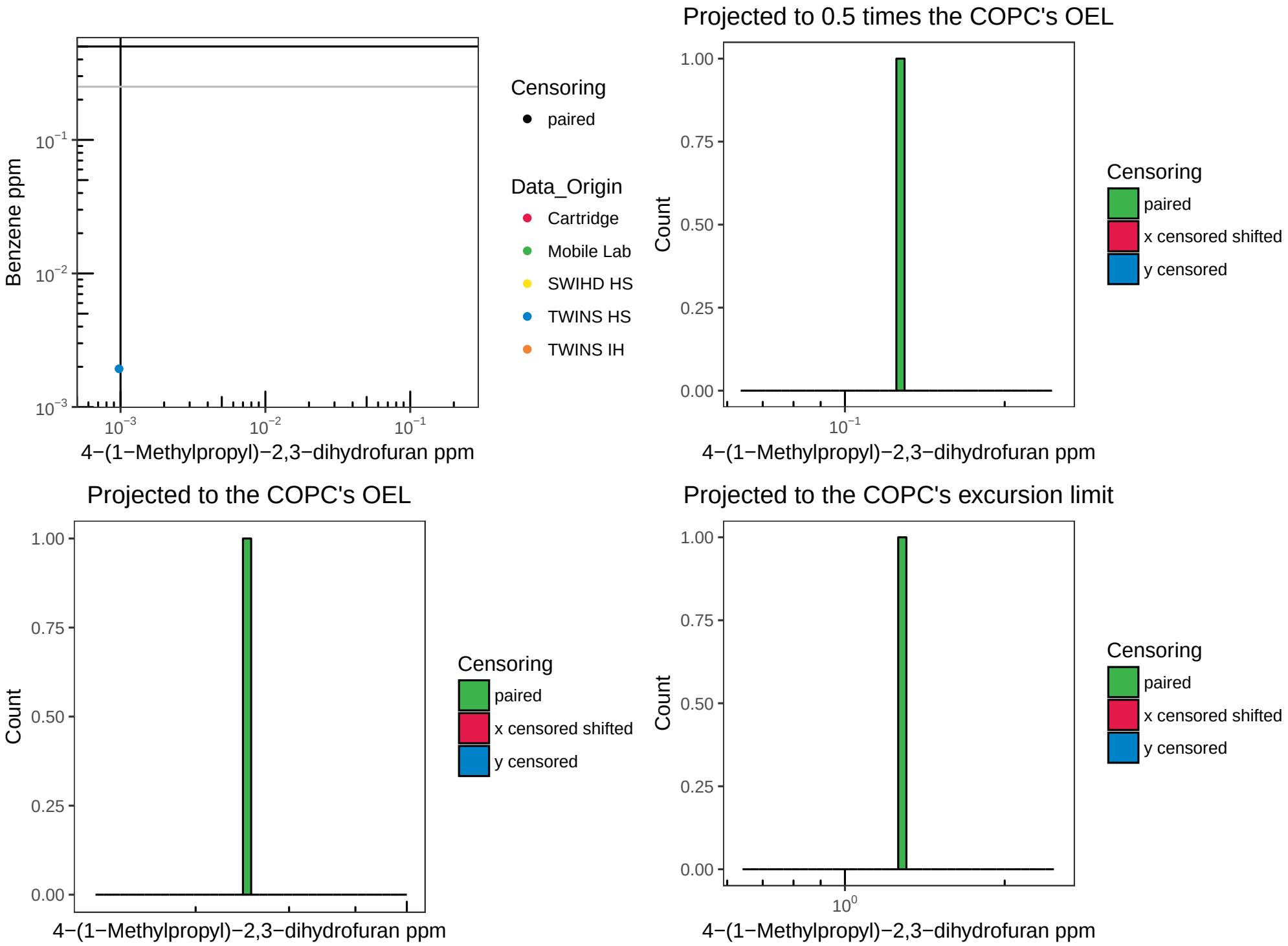


Figure C.1248: Benzene vs 4-(1-Methylpropyl)-2,3-dihydrofuran

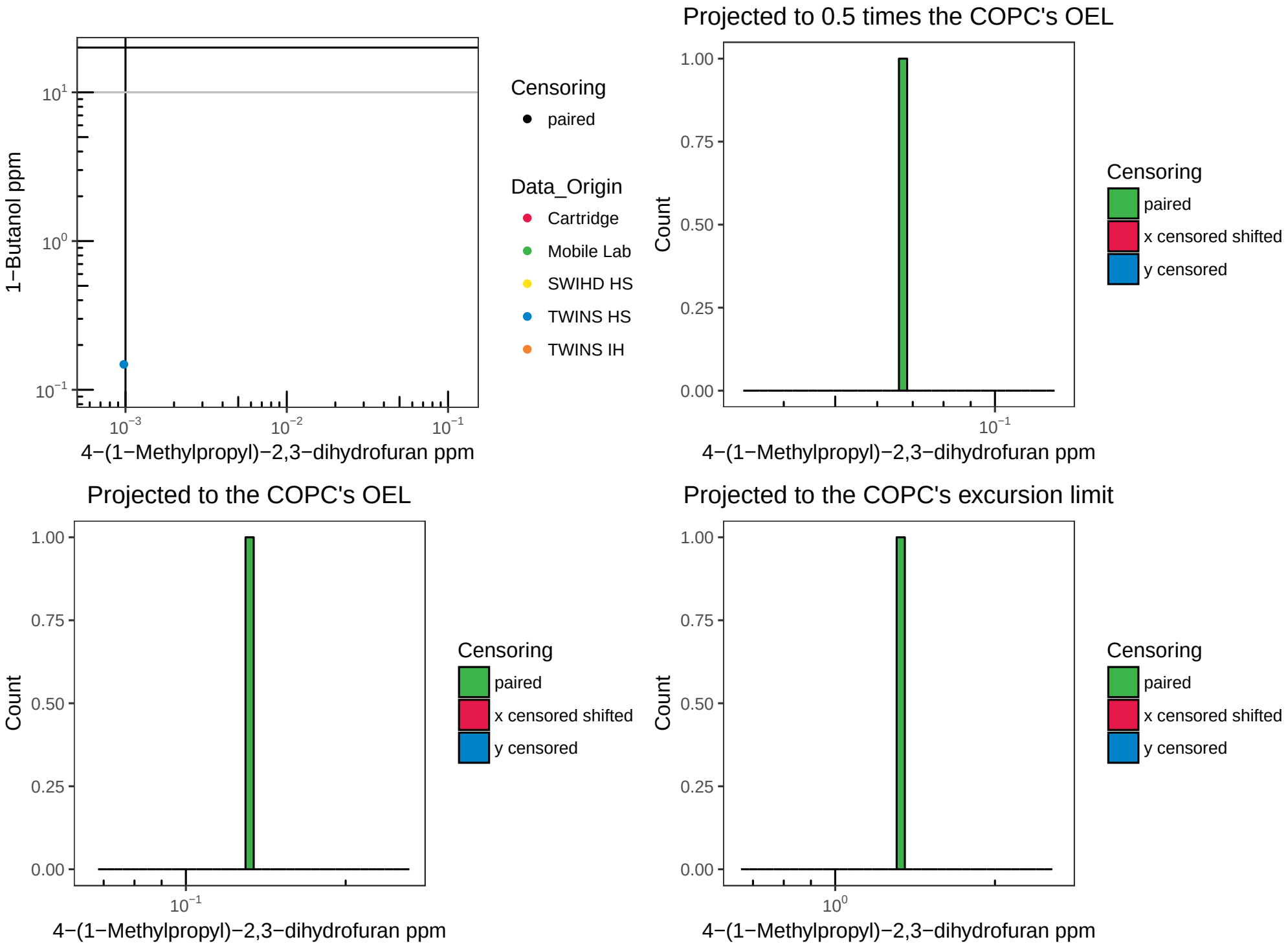


Figure C.1249: 1-Butanol vs 4-(1-Methylpropyl)-2,3-dihydrofuran

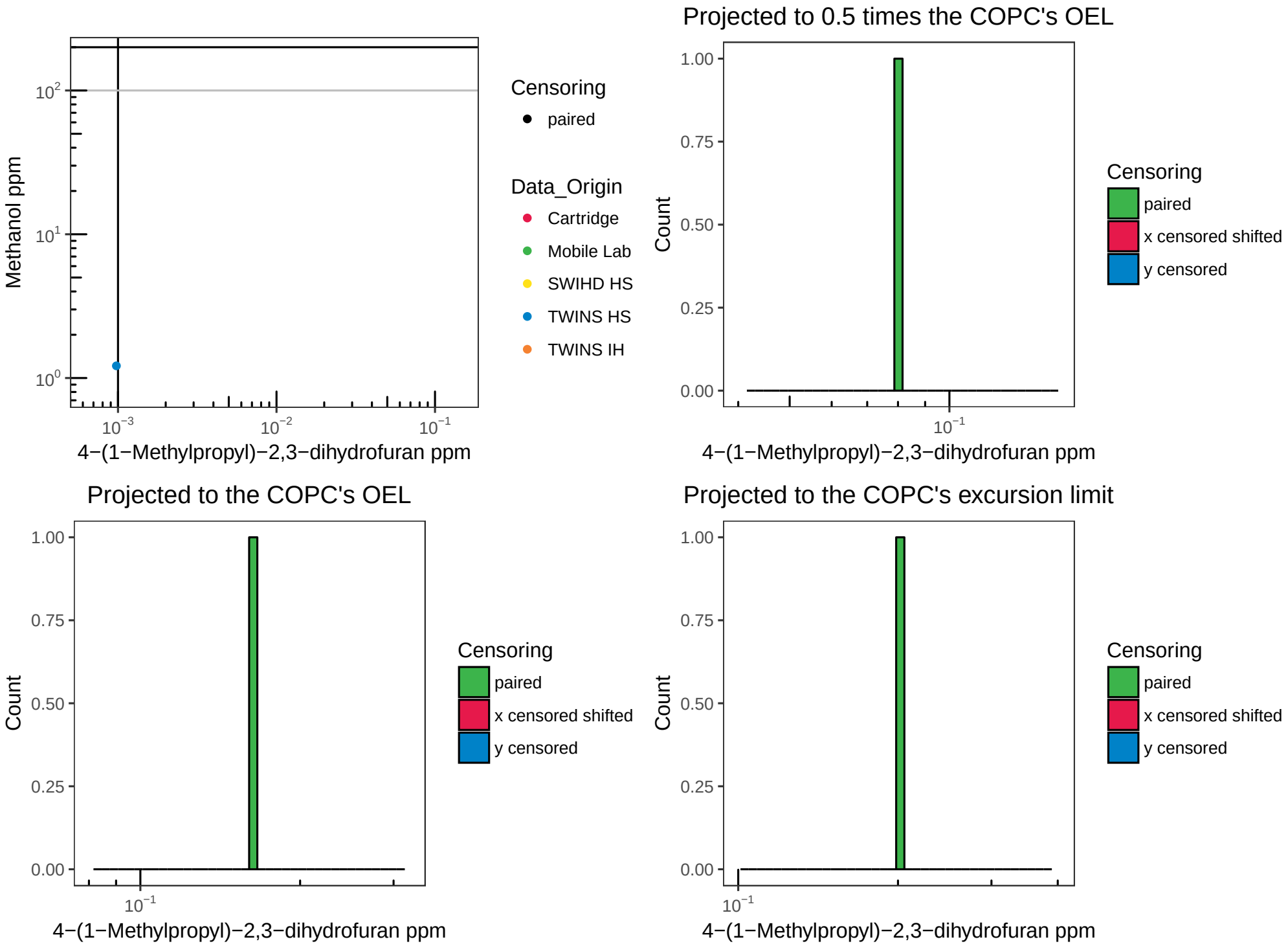


Figure C.1250: Methanol vs 4-(1-Methylpropyl)-2,3-dihydrofuran

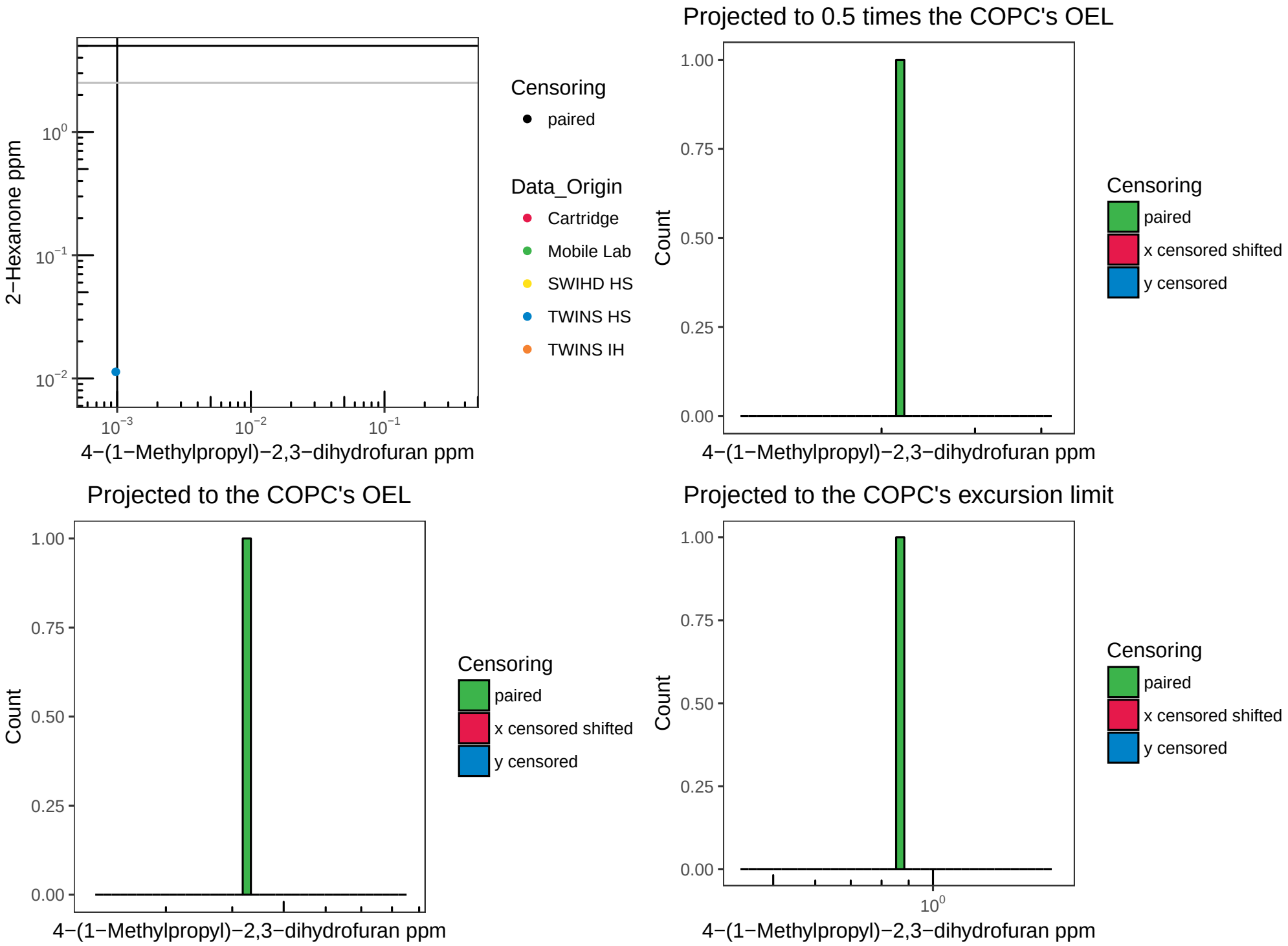


Figure C.1251: 2-Hexanone vs 4-(1-Methylpropyl)-2,3-dihydrofuran

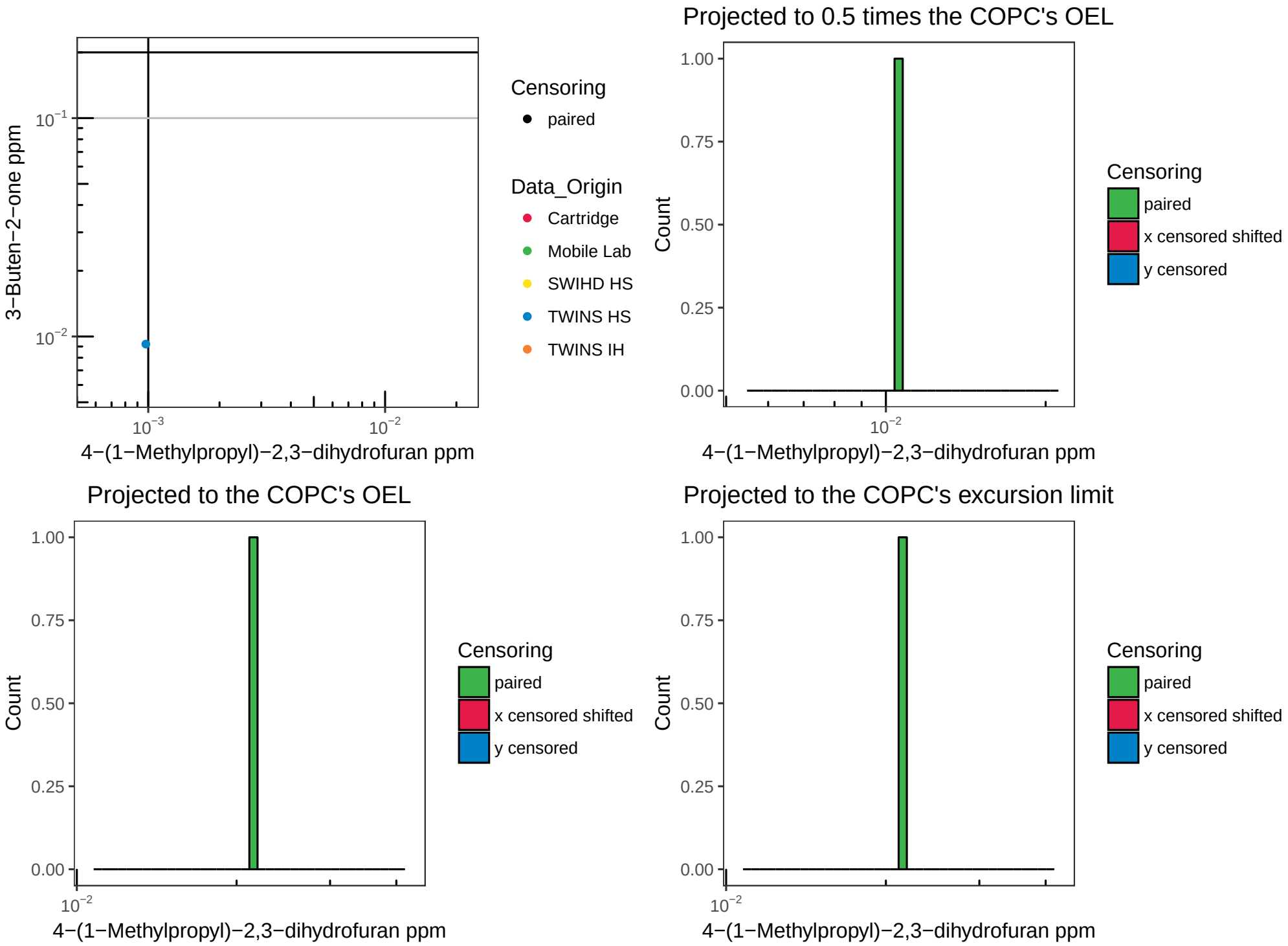


Figure C.1252: 3-Buten-2-one vs 4-(1-Methylpropyl)-2,3-dihydrofuran

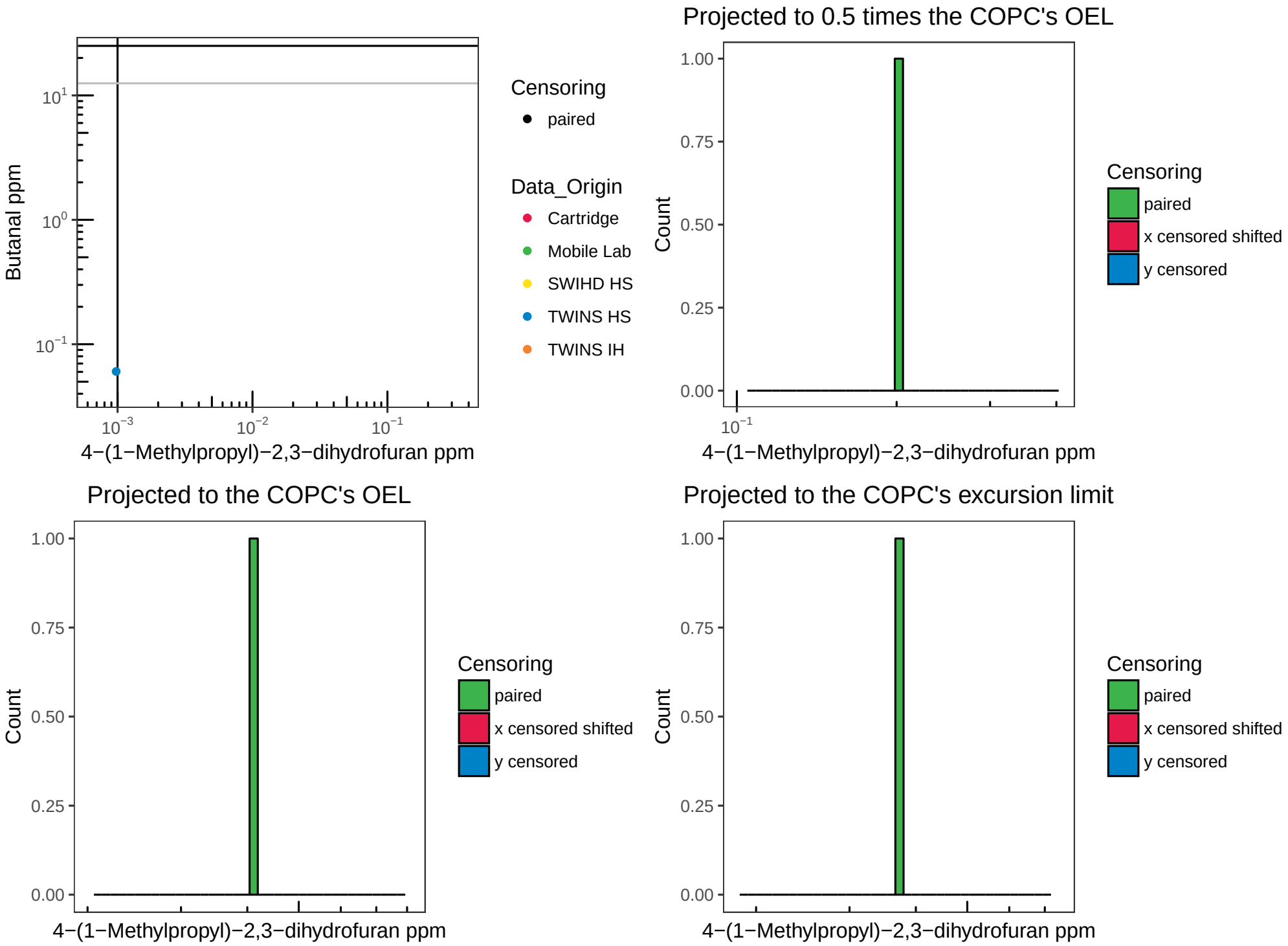


Figure C.1253: Butanal vs 4-(1-Methylpropyl)-2,3-dihydrofuran

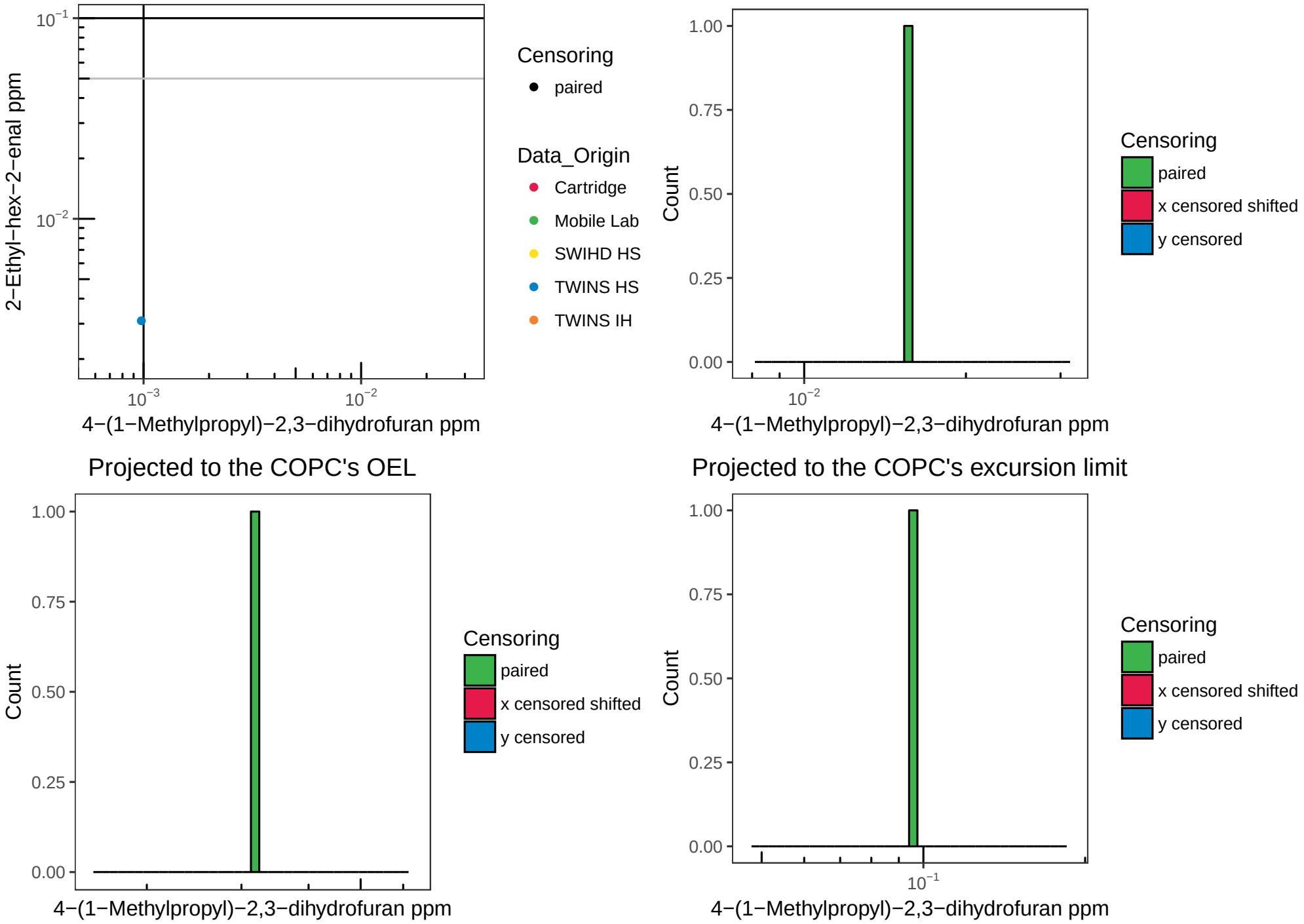


Figure C.1254: 2-Ethyl-hex-2-enal vs 4-(1-Methylpropyl)-2,3-dihydrofuran

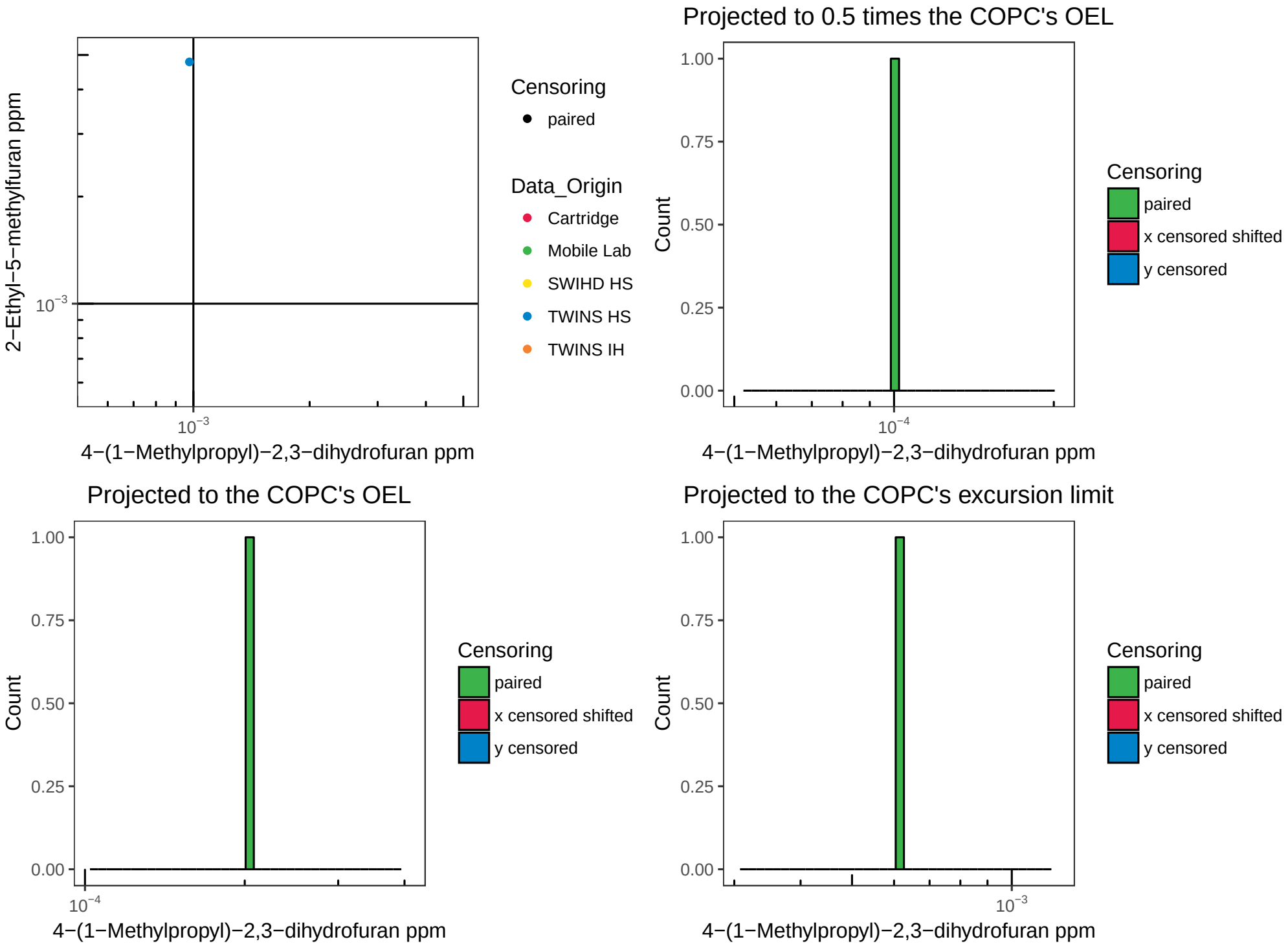


Figure C.1255: 2-Ethyl-5-methylfuran vs 4-(1-Methylpropyl)-2,3-dihydrofuran

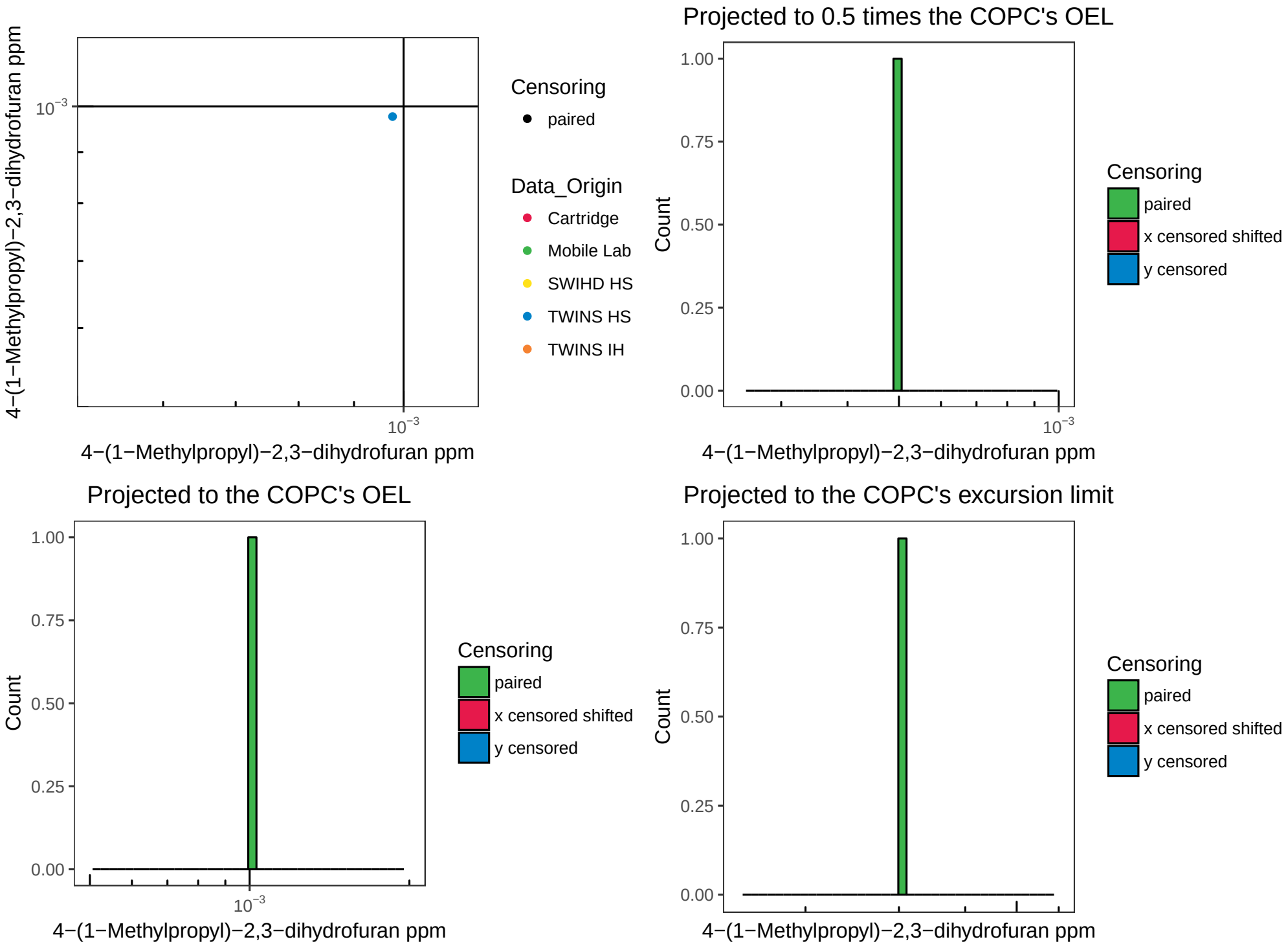


Figure C.1256: 4-(1-Methylpropyl)-2,3-dihydrofuran vs 4-(1-Methylpropyl)-2,3-dihydrofuran

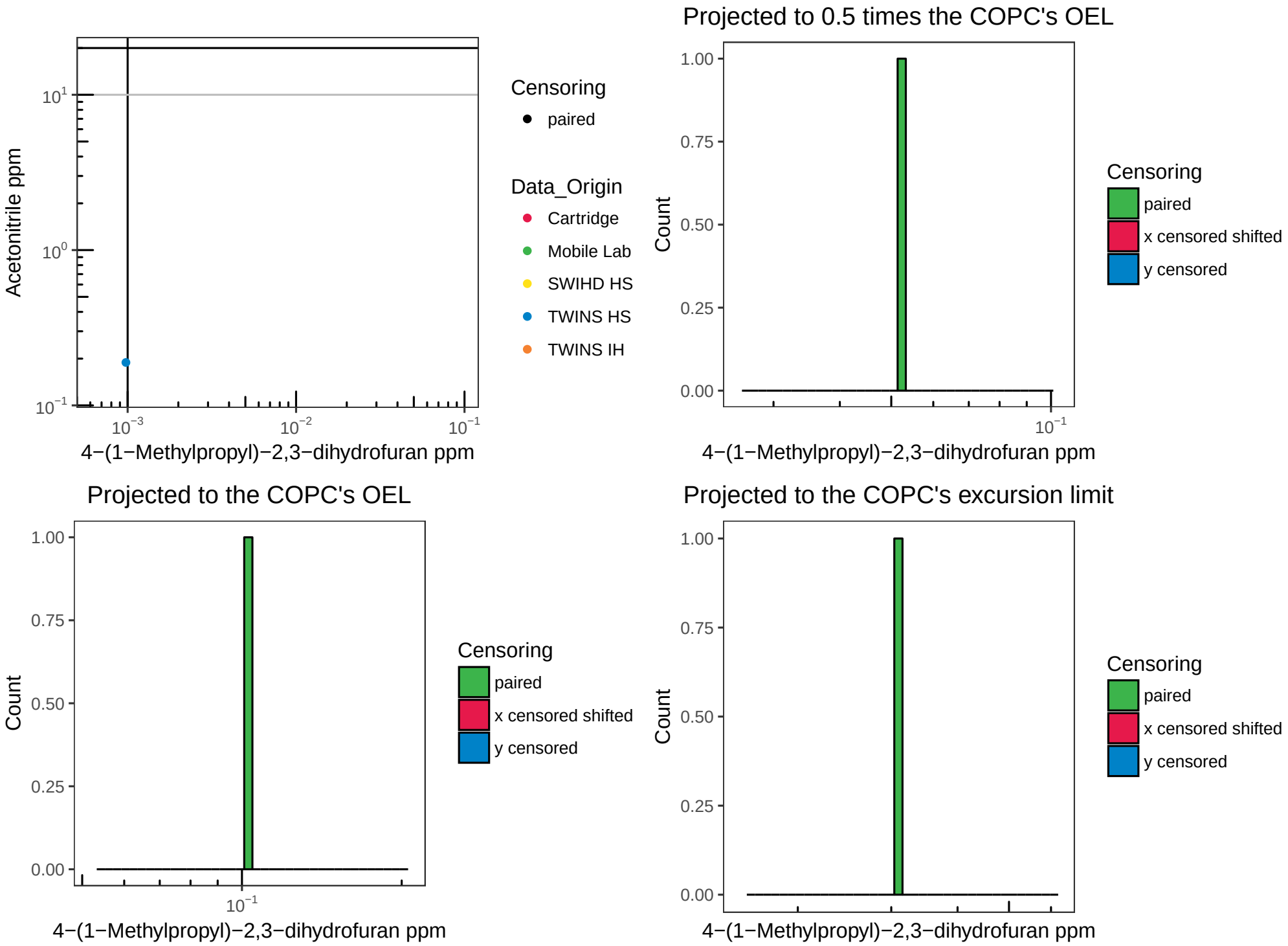


Figure C.1257: Acetonitrile vs 4-(1-Methylpropyl)-2,3-dihydrofuran

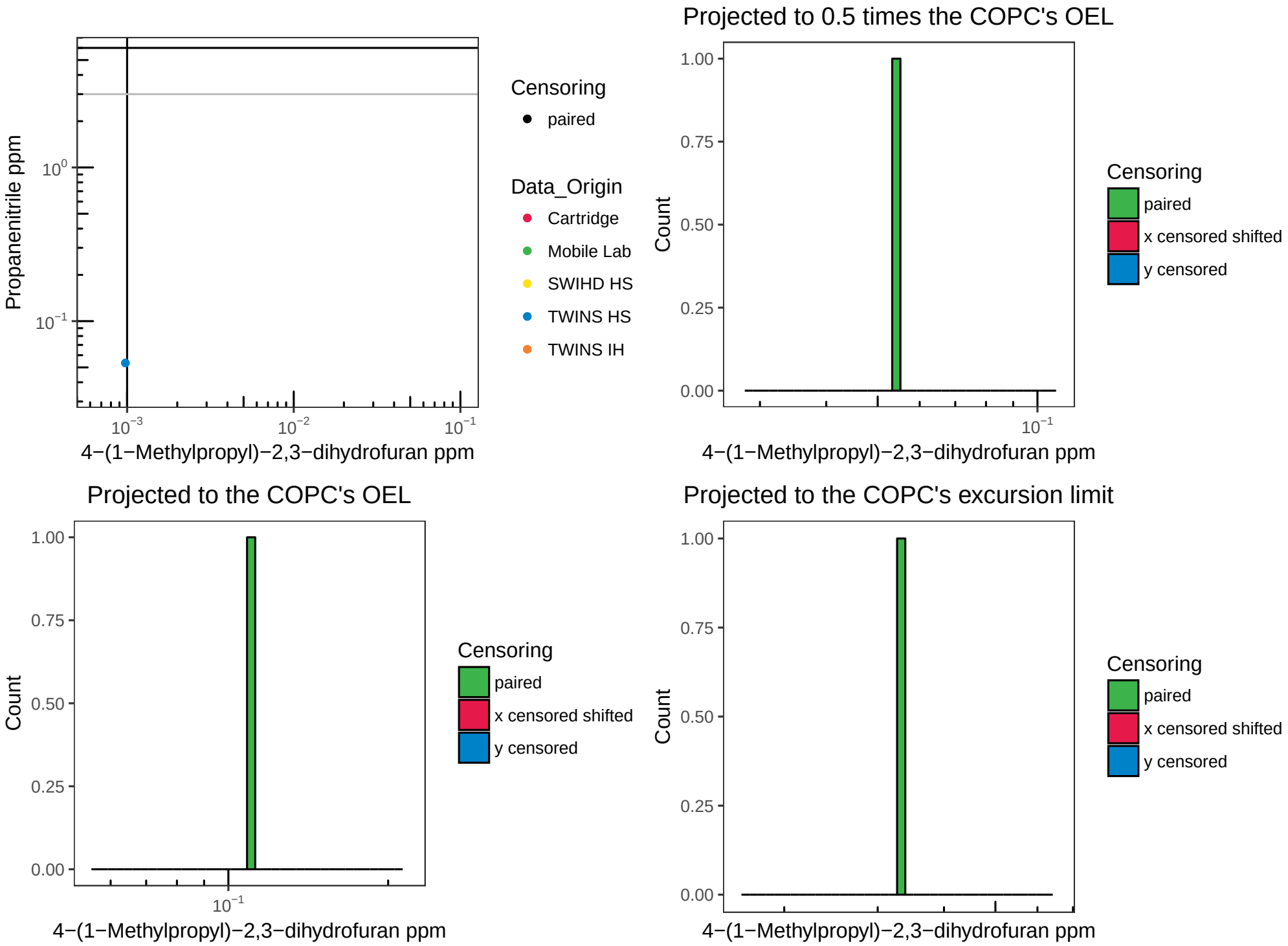


Figure C.1258: Propanenitrile vs 4-(1-Methylpropyl)-2,3-dihydrofuran

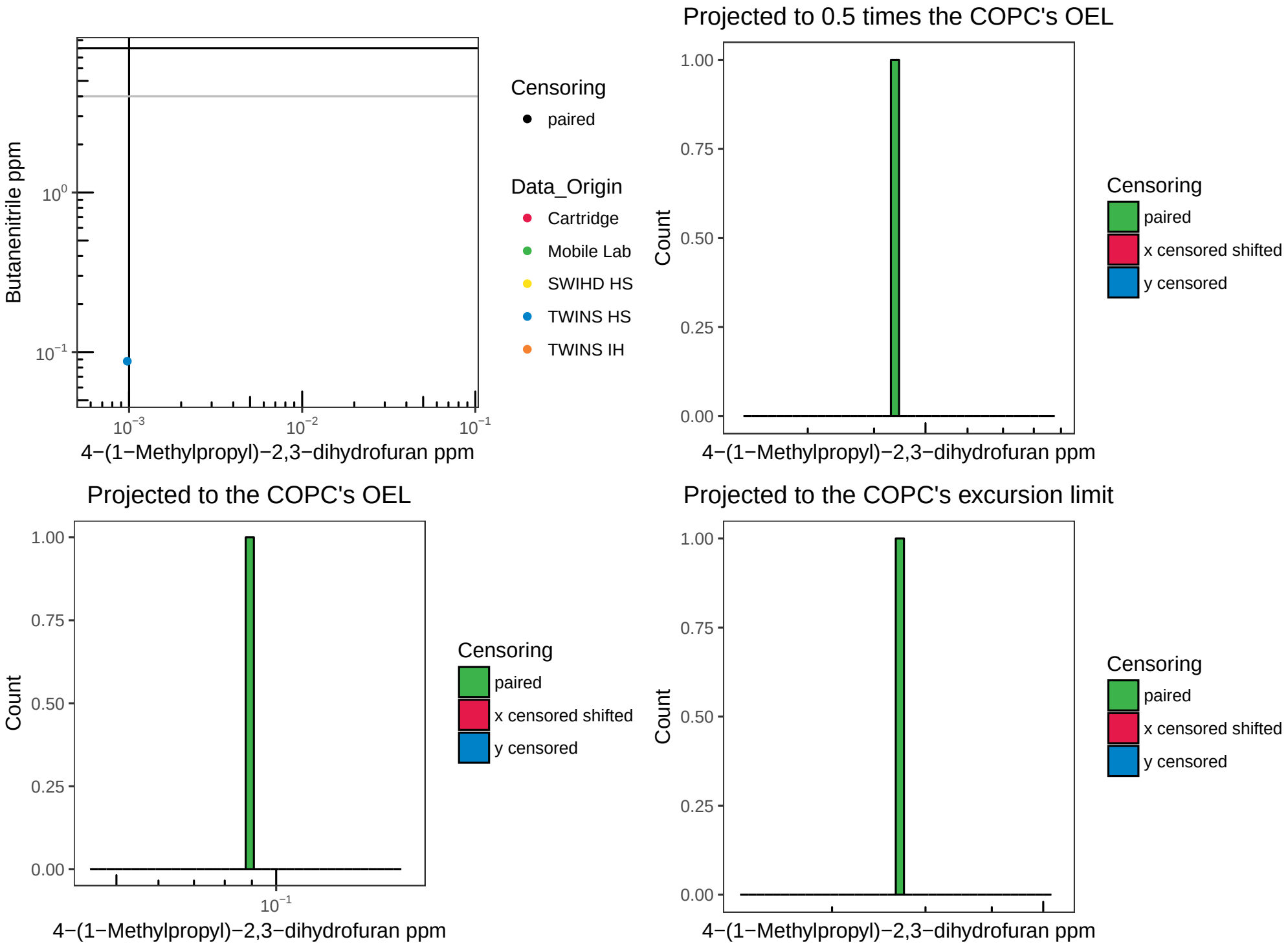


Figure C.1259: Butanenitrile vs 4-(1-Methylpropyl)-2,3-dihydrofuran

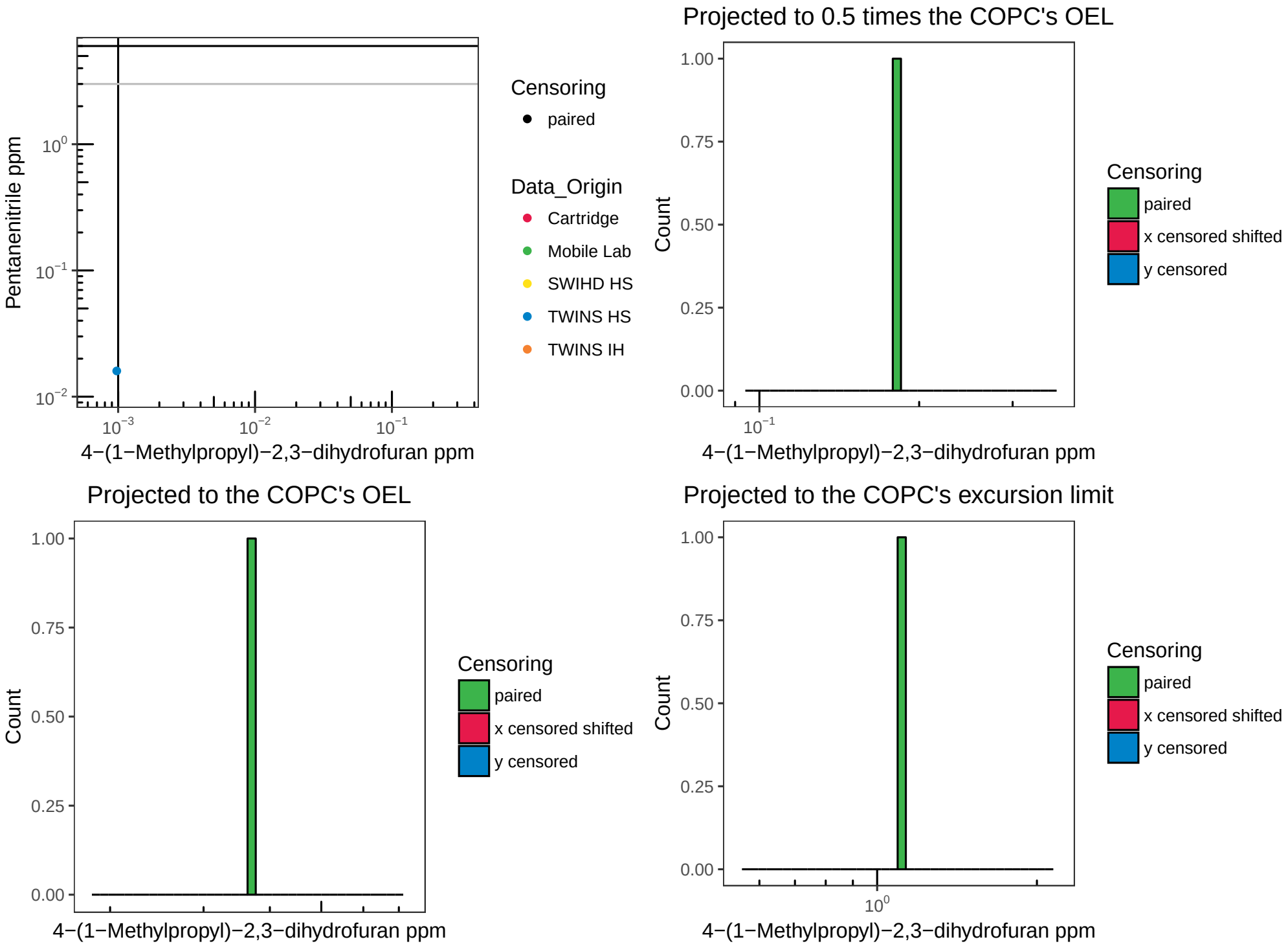


Figure C.1260: Pentanenitrile vs 4-(1-Methylpropyl)-2,3-dihydrofuran

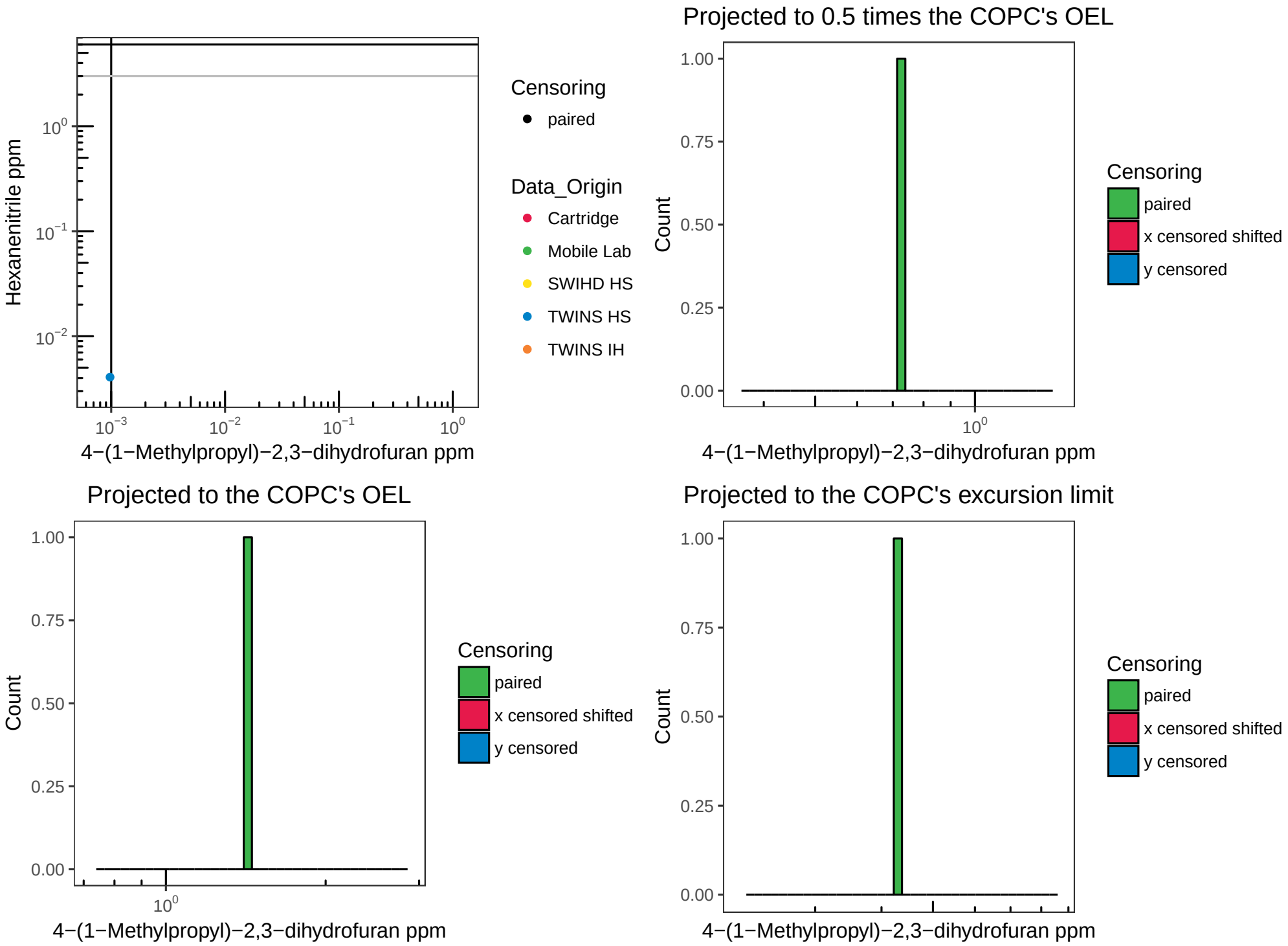


Figure C.1261: Hexanenitrile vs 4-(1-Methylpropyl)-2,3-dihydrofuran

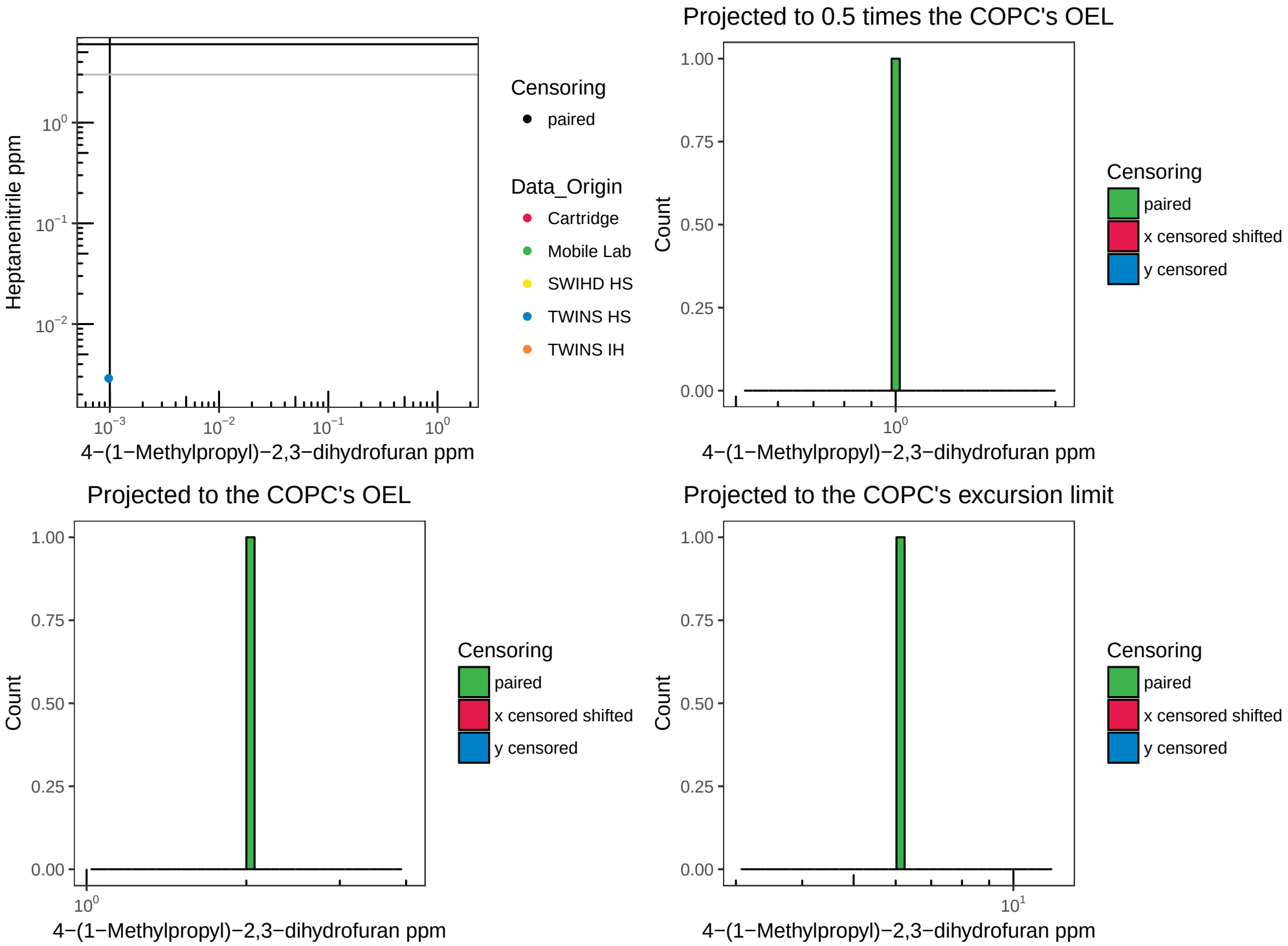


Figure C.1262: Heptanenitrile vs 4-(1-Methylpropyl)-2,3-dihydrofuran

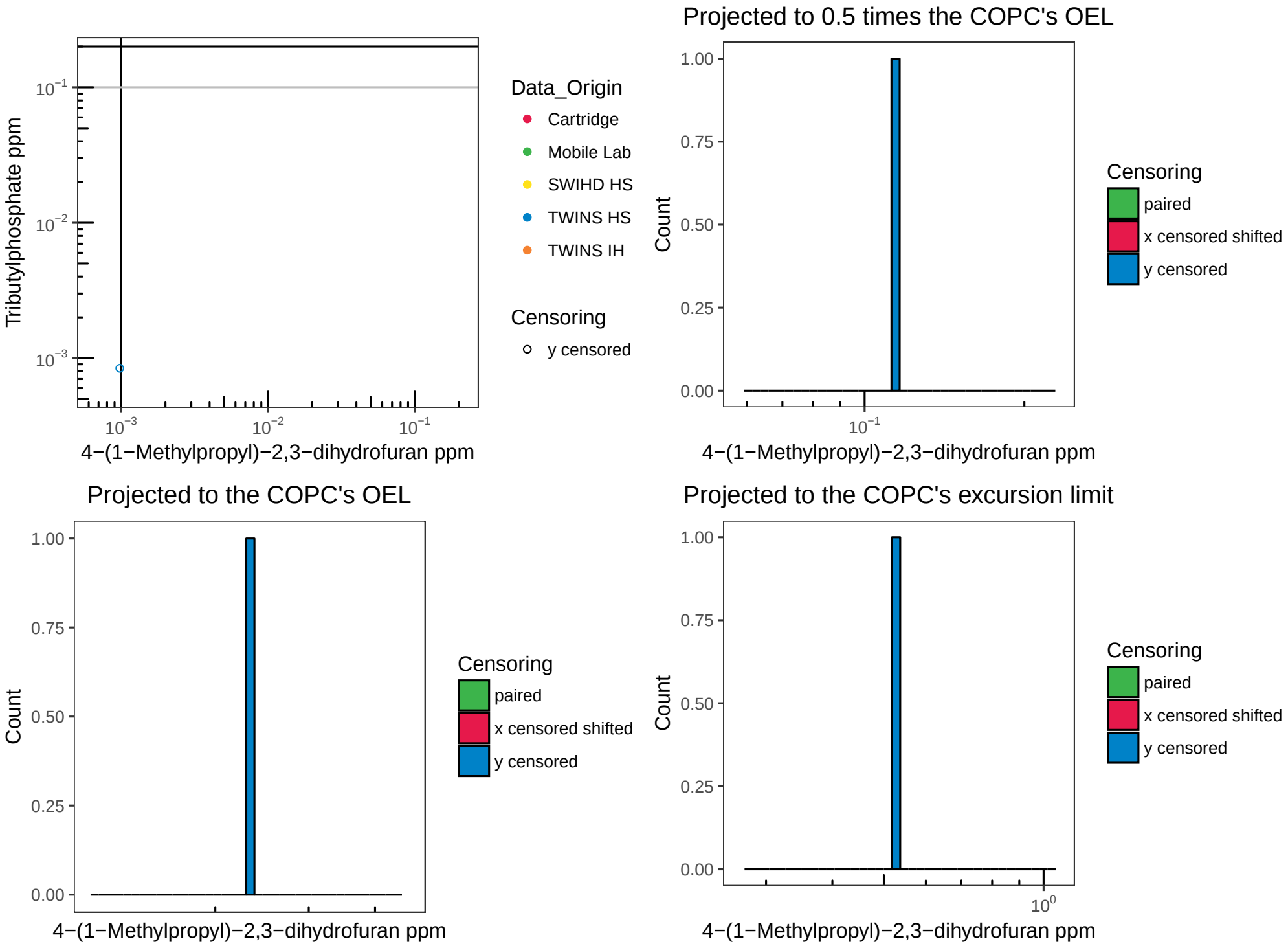


Figure C.1263: Tributylphosphate vs 4-(1-Methylpropyl)-2,3-dihydrofuran

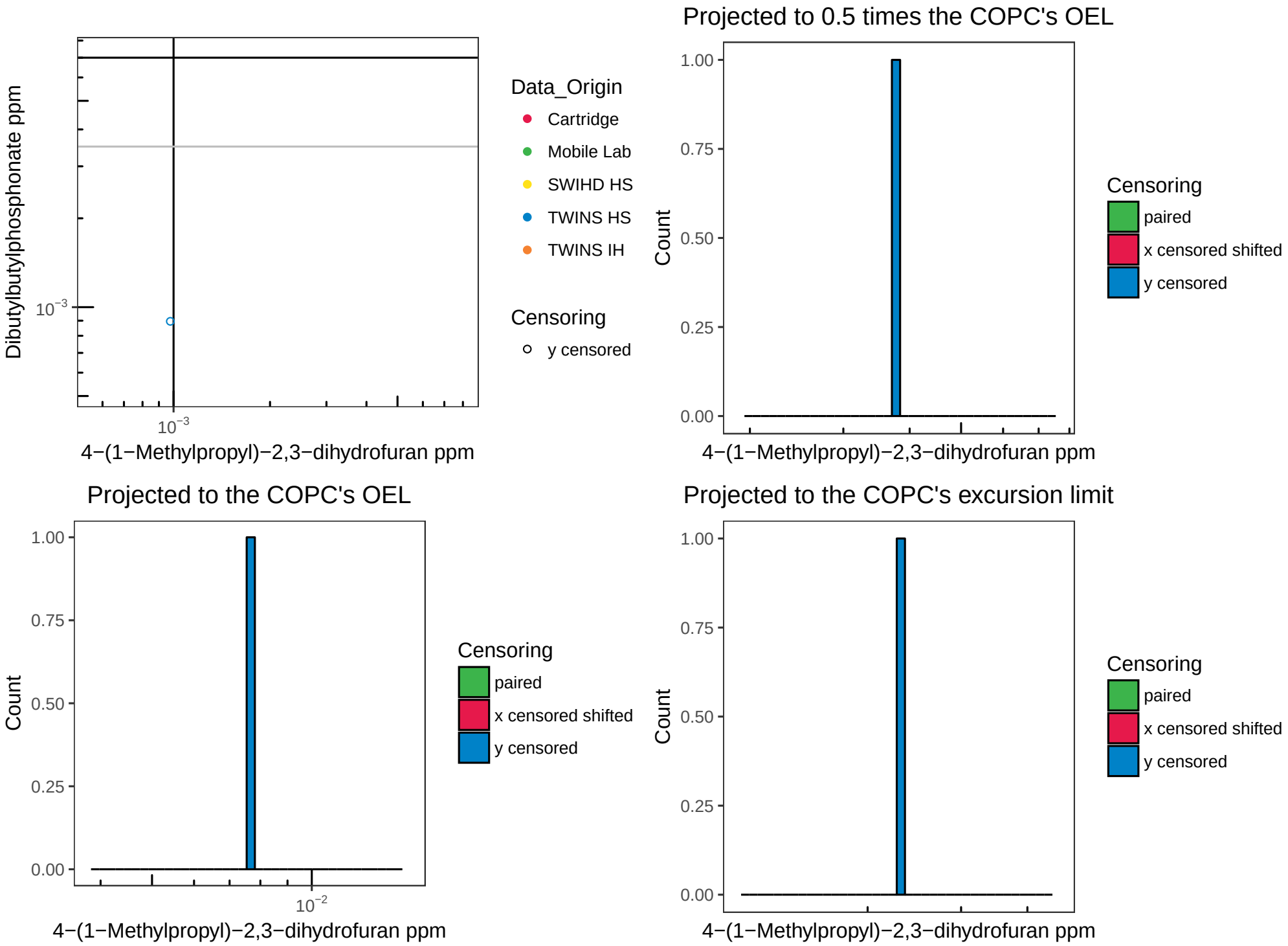


Figure C.1264: Dibutylbutylphosphonate vs 4-(1-Methylpropyl)-2,3-dihydrofuran

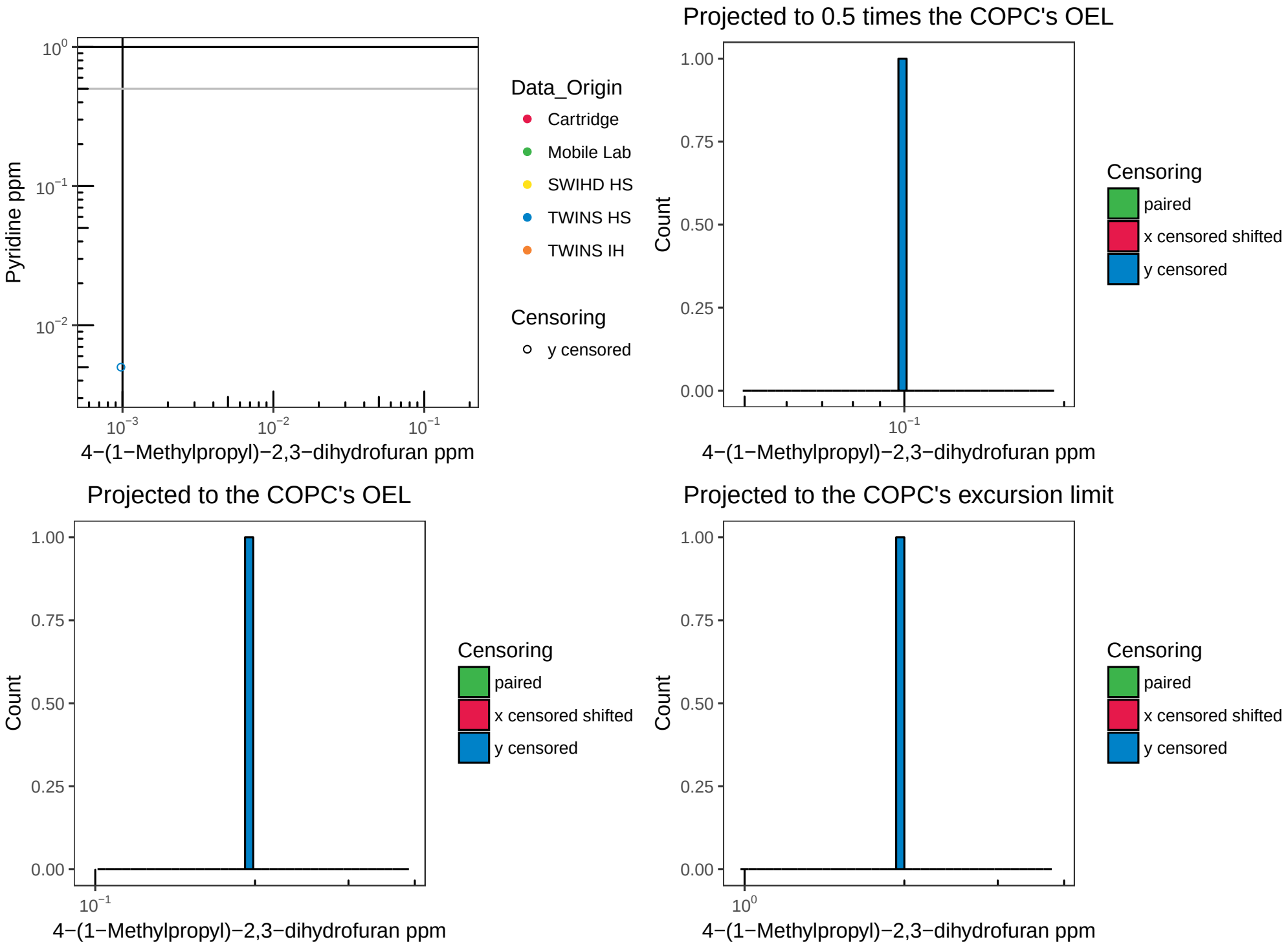


Figure C.1265: Pyridine vs 4-(1-Methylpropyl)-2,3-dihydrofuran

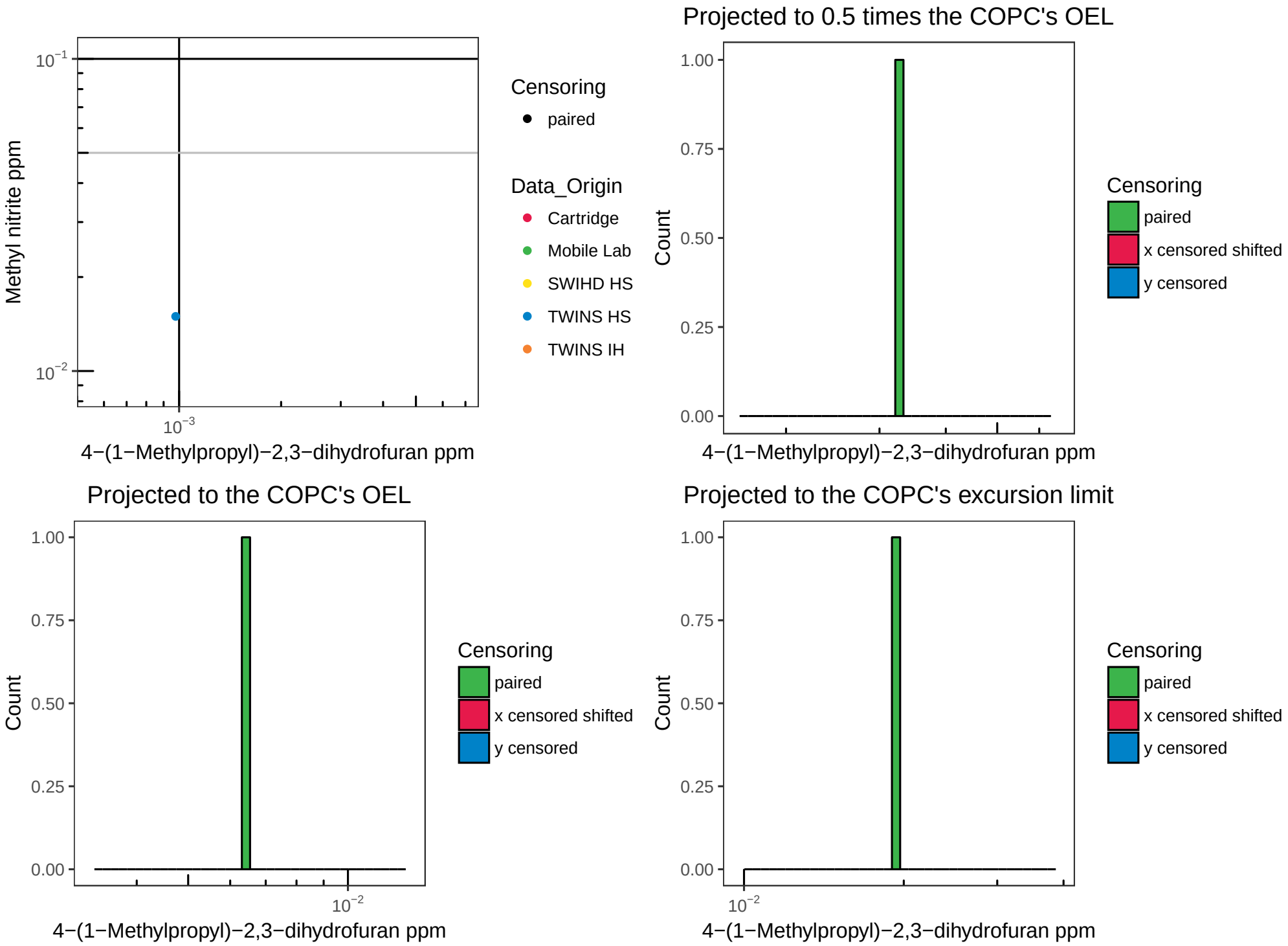


Figure C.1266: Methyl nitrite vs 4-(1-Methylpropyl)-2,3-dihydrofuran

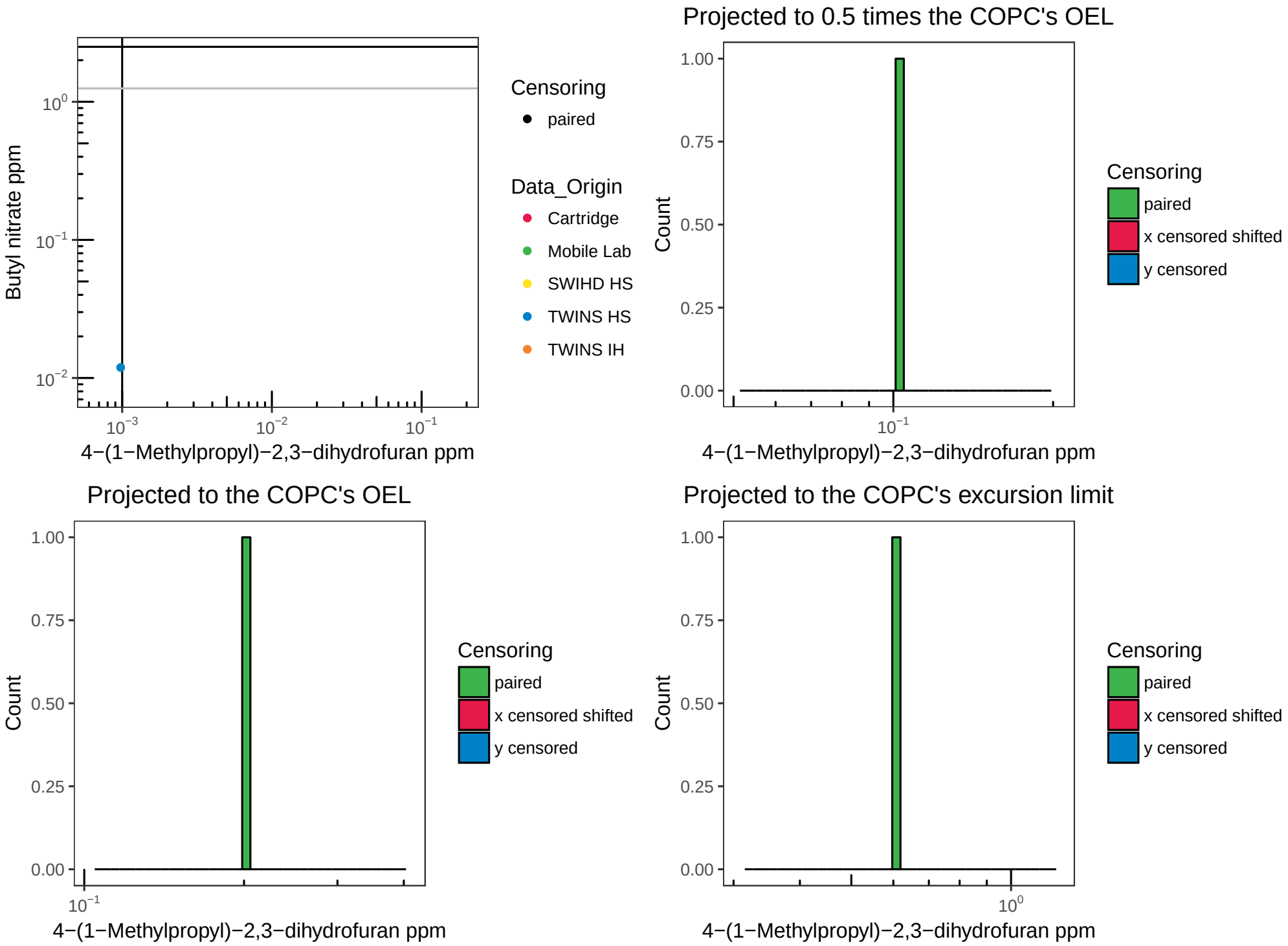


Figure C.1267: Butyl nitrate vs 4-(1-Methylpropyl)-2,3-dihydrofuran

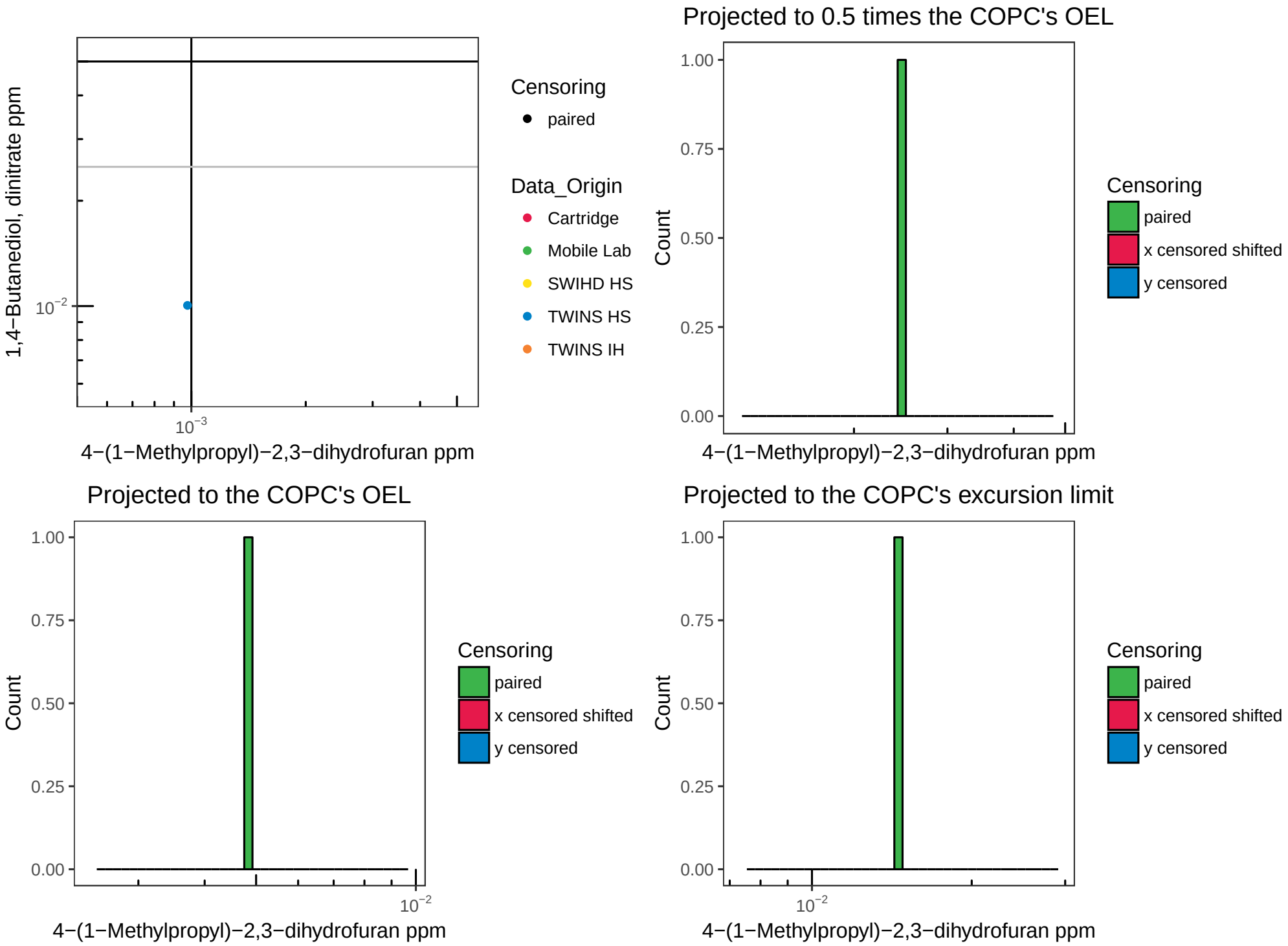


Figure C.1268: 1,4-Butanediol, dinitrate vs 4-(1-Methylpropyl)-2,3-dihydrofuran

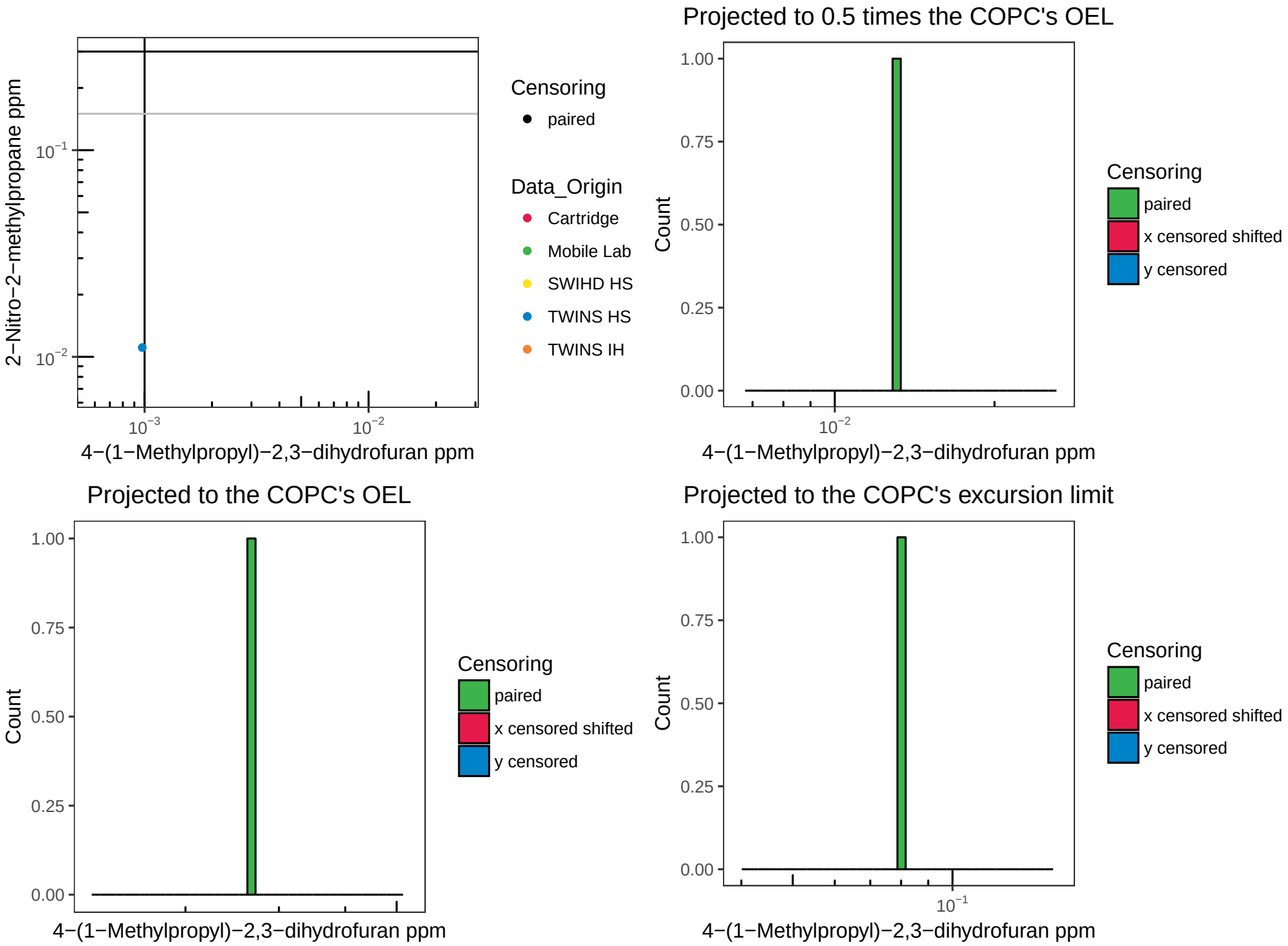


Figure C.1269: 2-Nitro-2-methylpropane vs 4-(1-Methylpropyl)-2,3-dihydrofuran

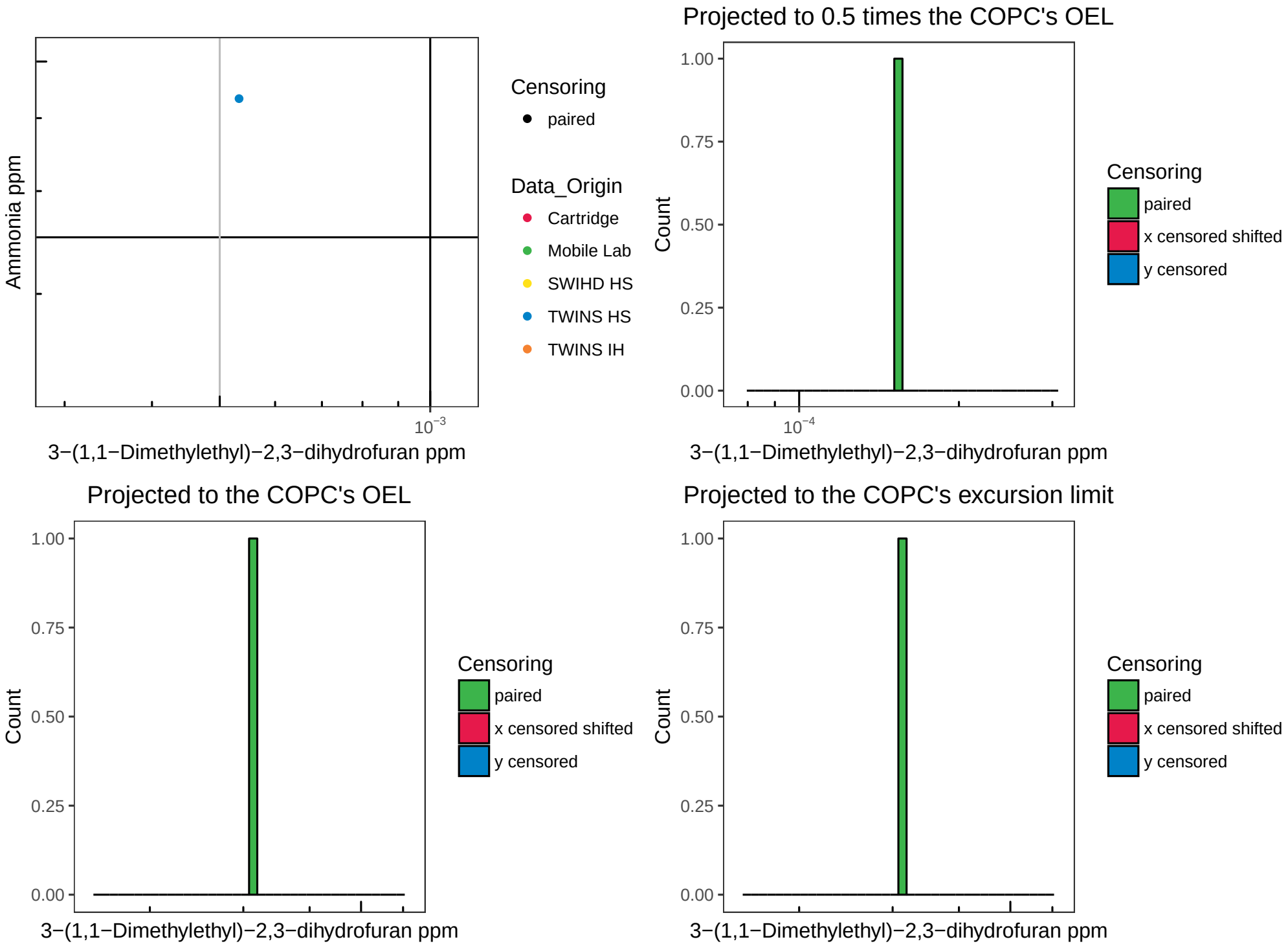


Figure C.1270: Ammonia vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

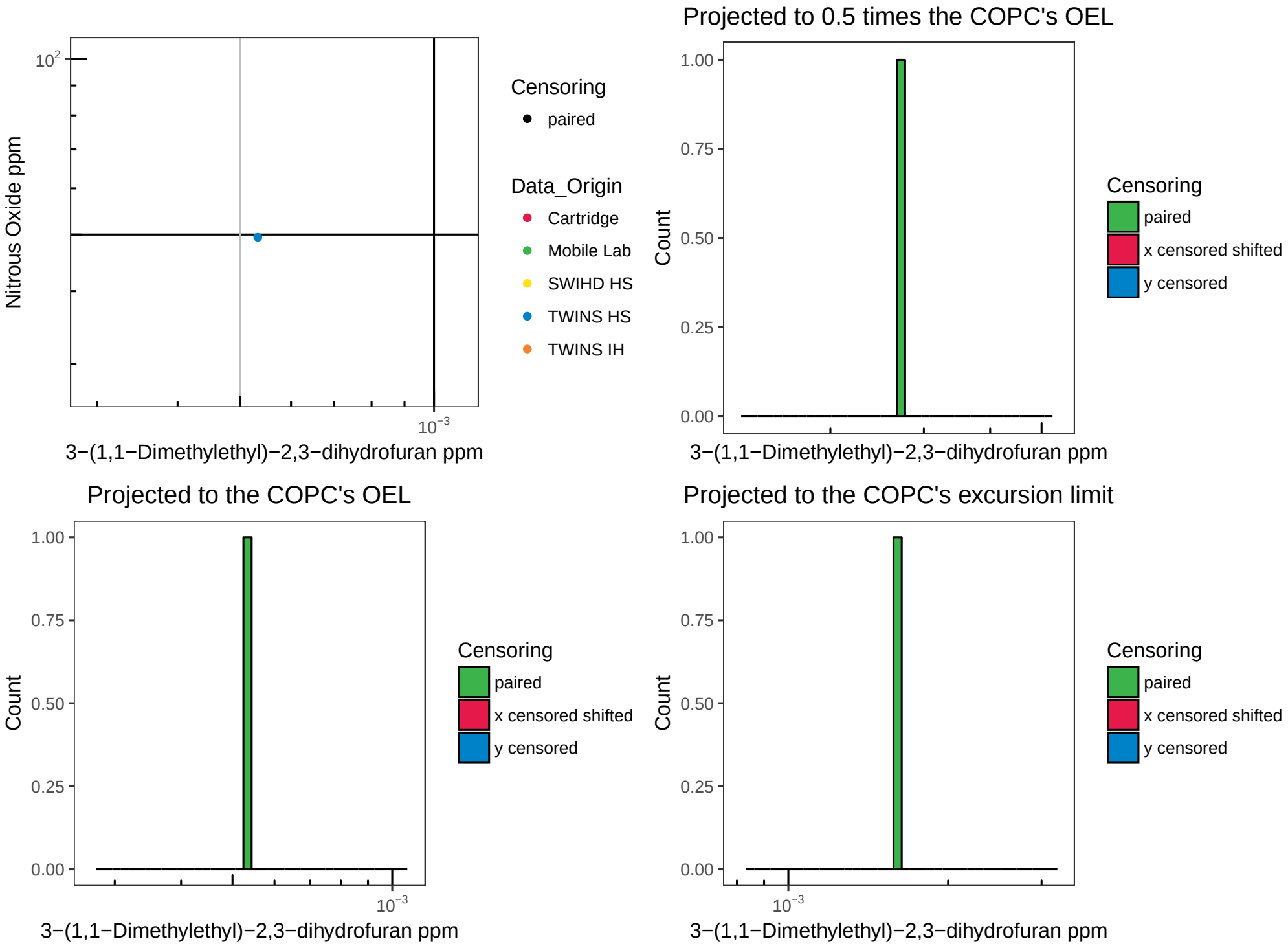


Figure C.1271: Nitrous Oxide vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

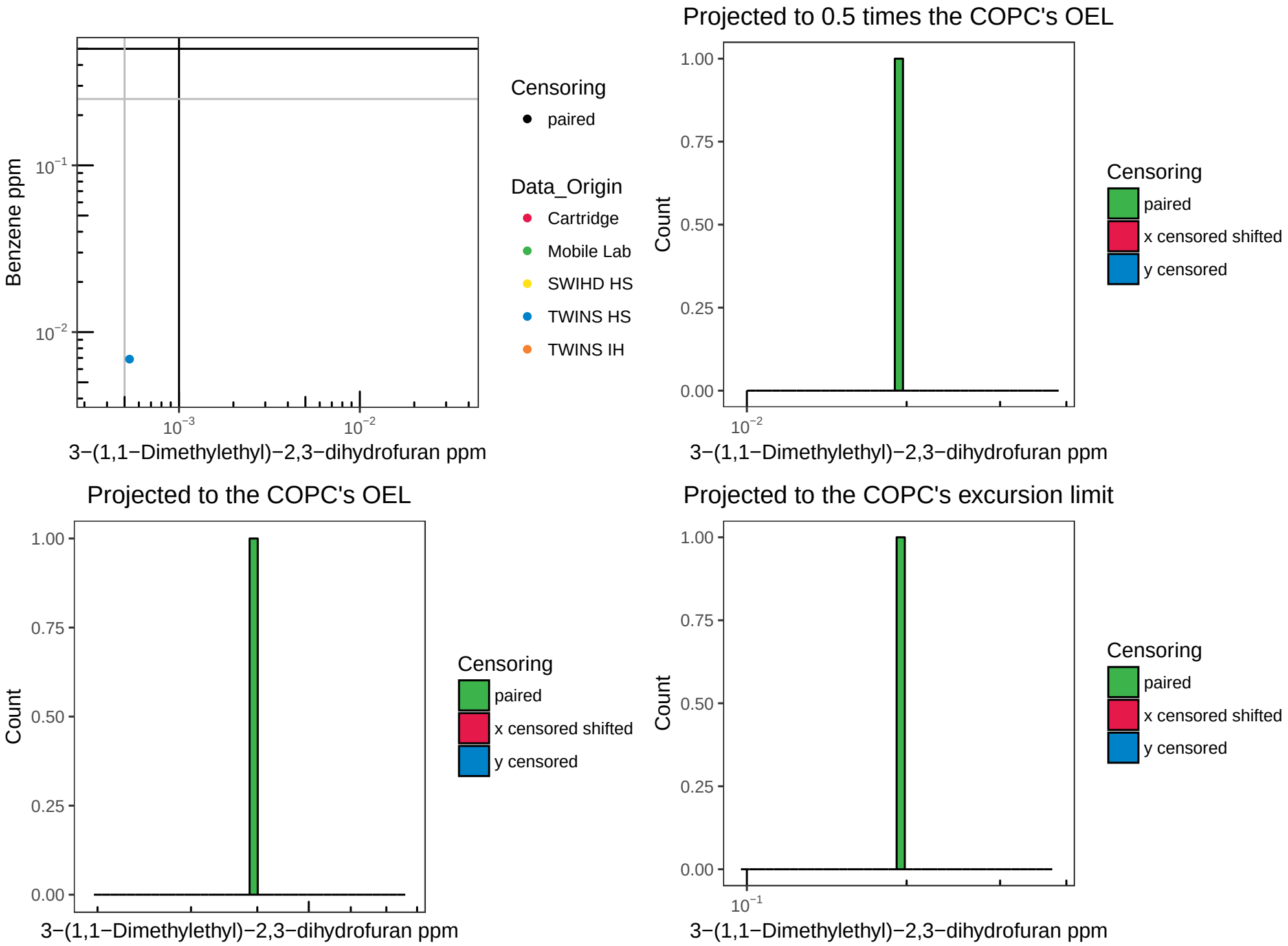


Figure C.1272: Benzene vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

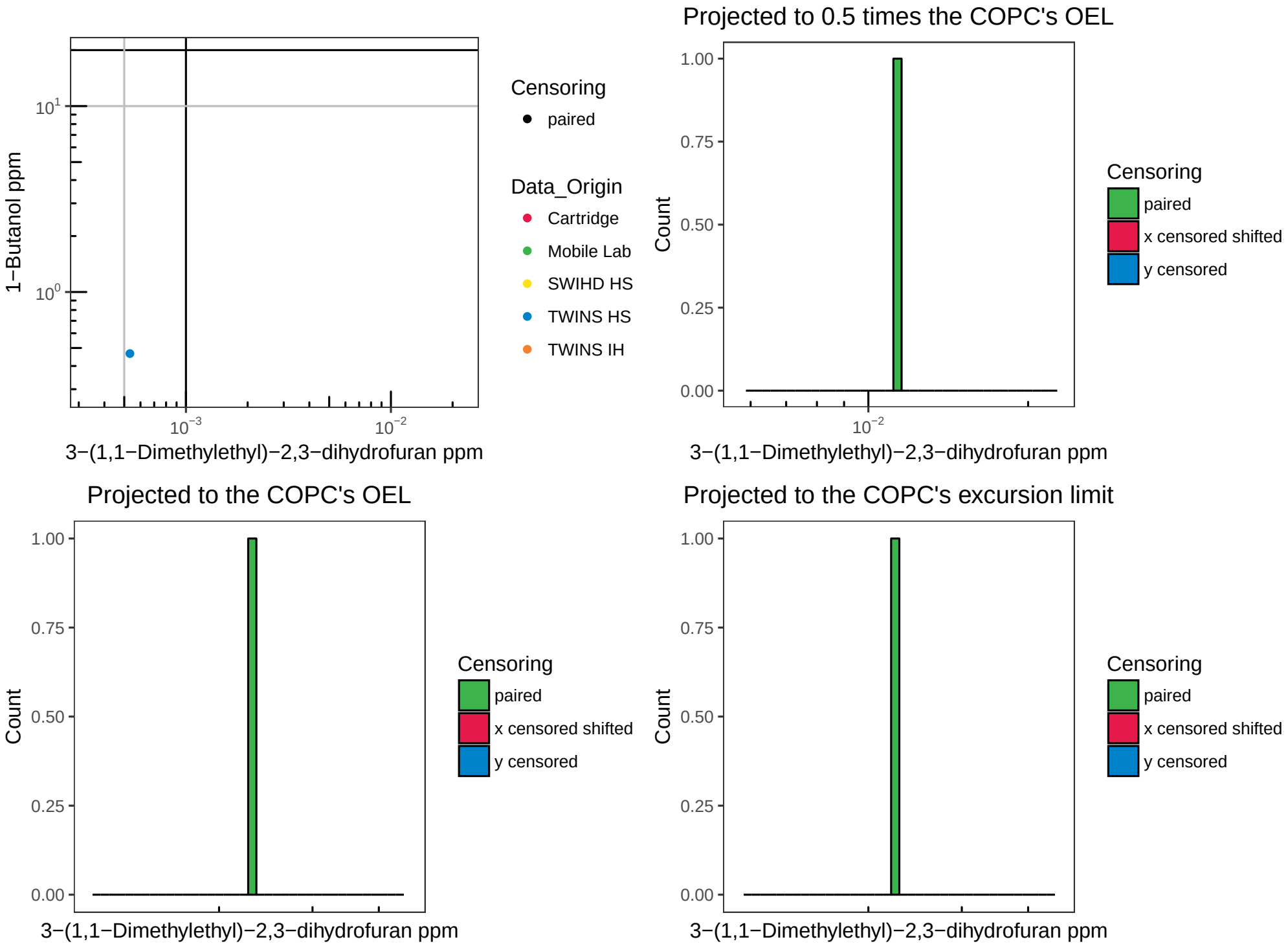


Figure C.1273: 1-Butanol vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

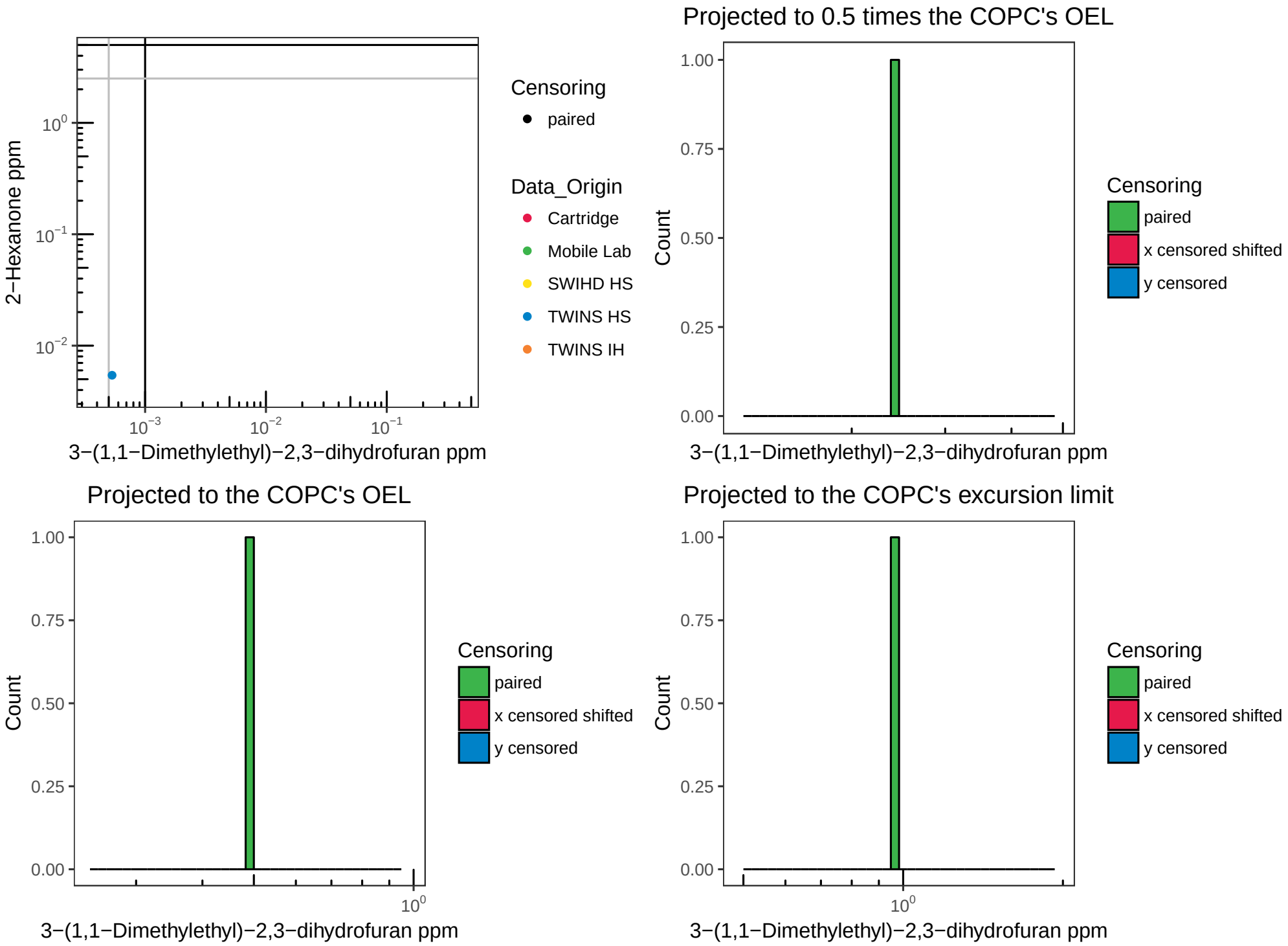


Figure C.1274: 2-Hexanone vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

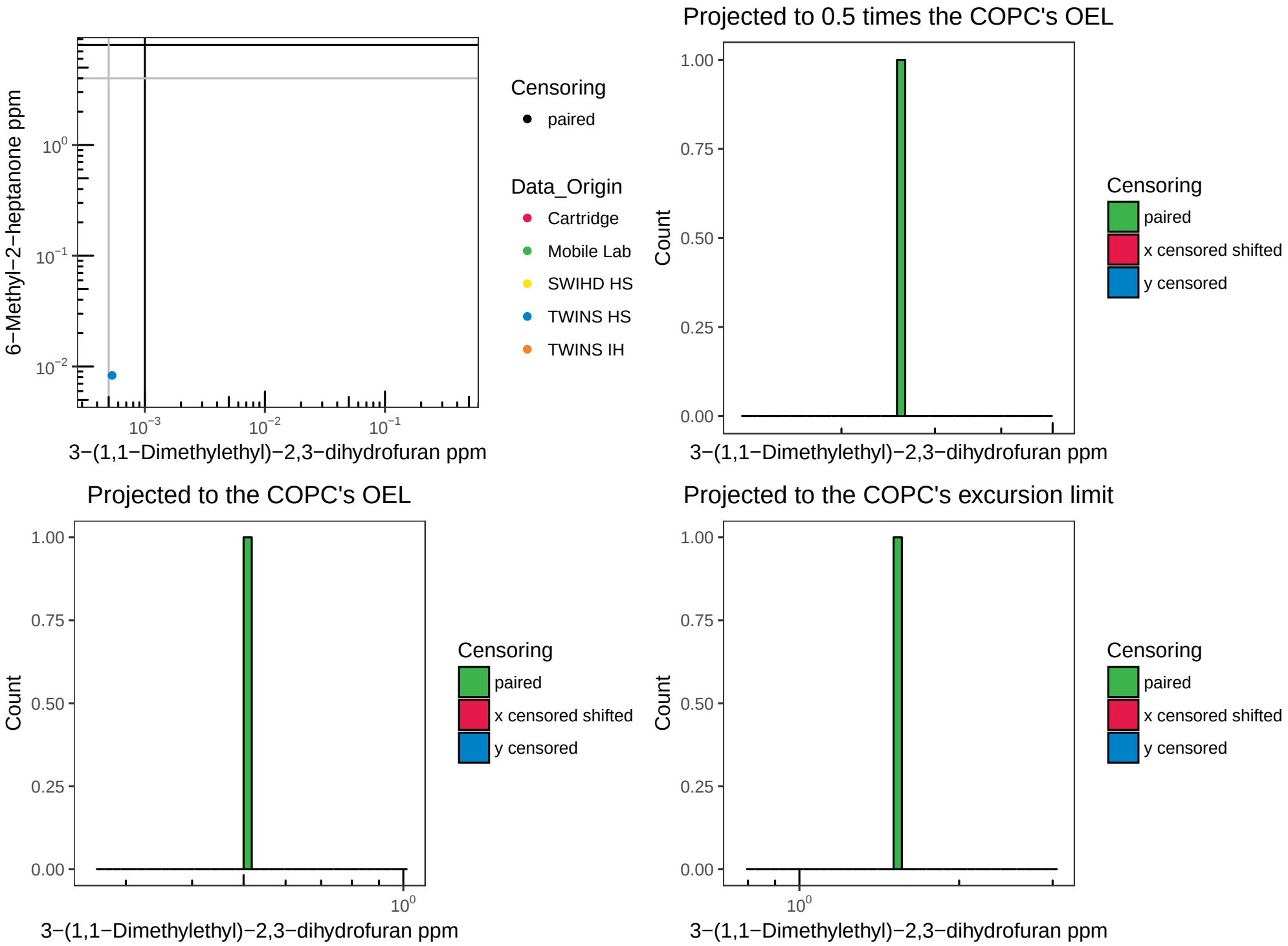


Figure C.1275: 6-Methyl-2-heptanone vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

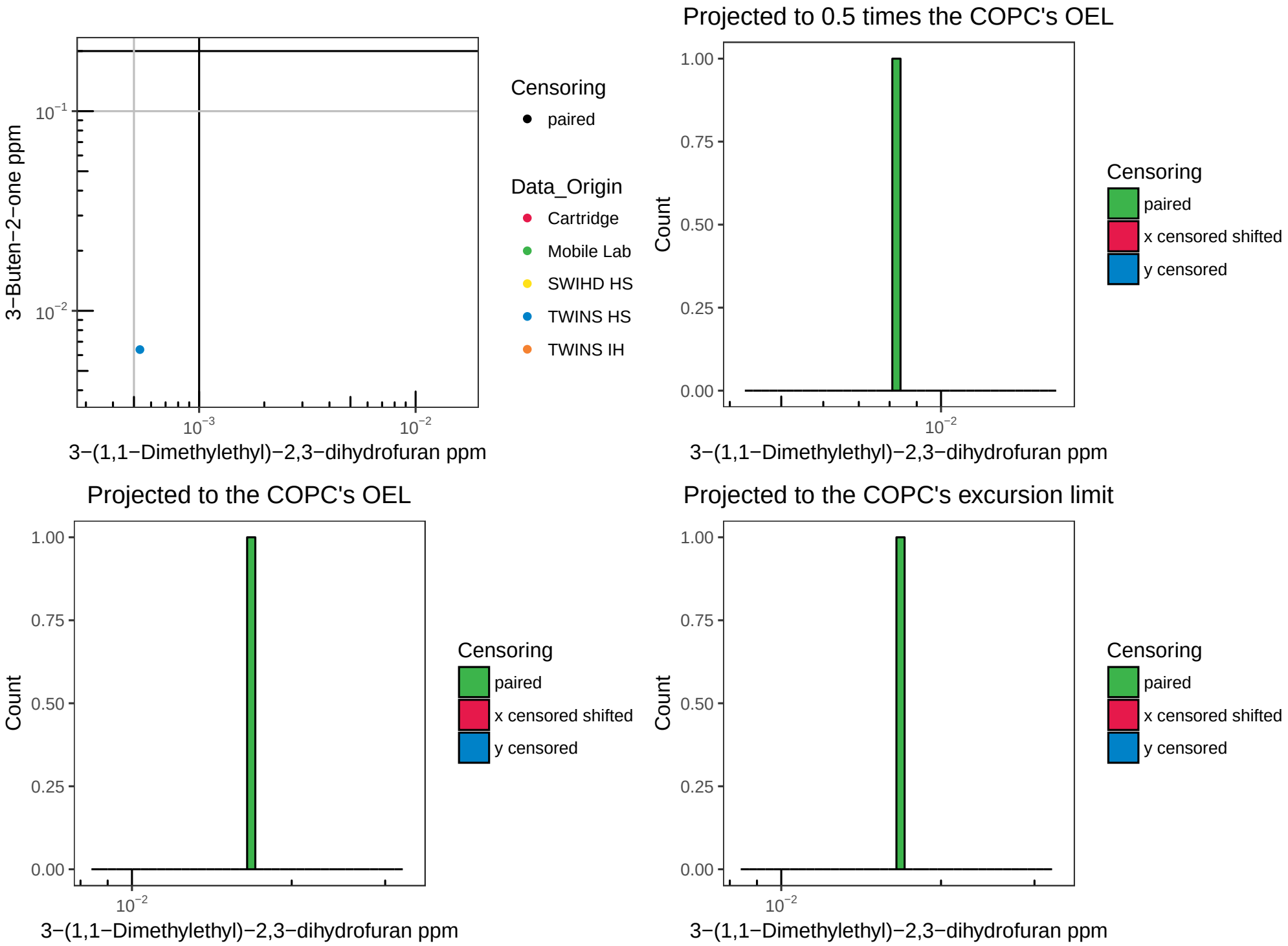


Figure C.1276: 3-Buten-2-one vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

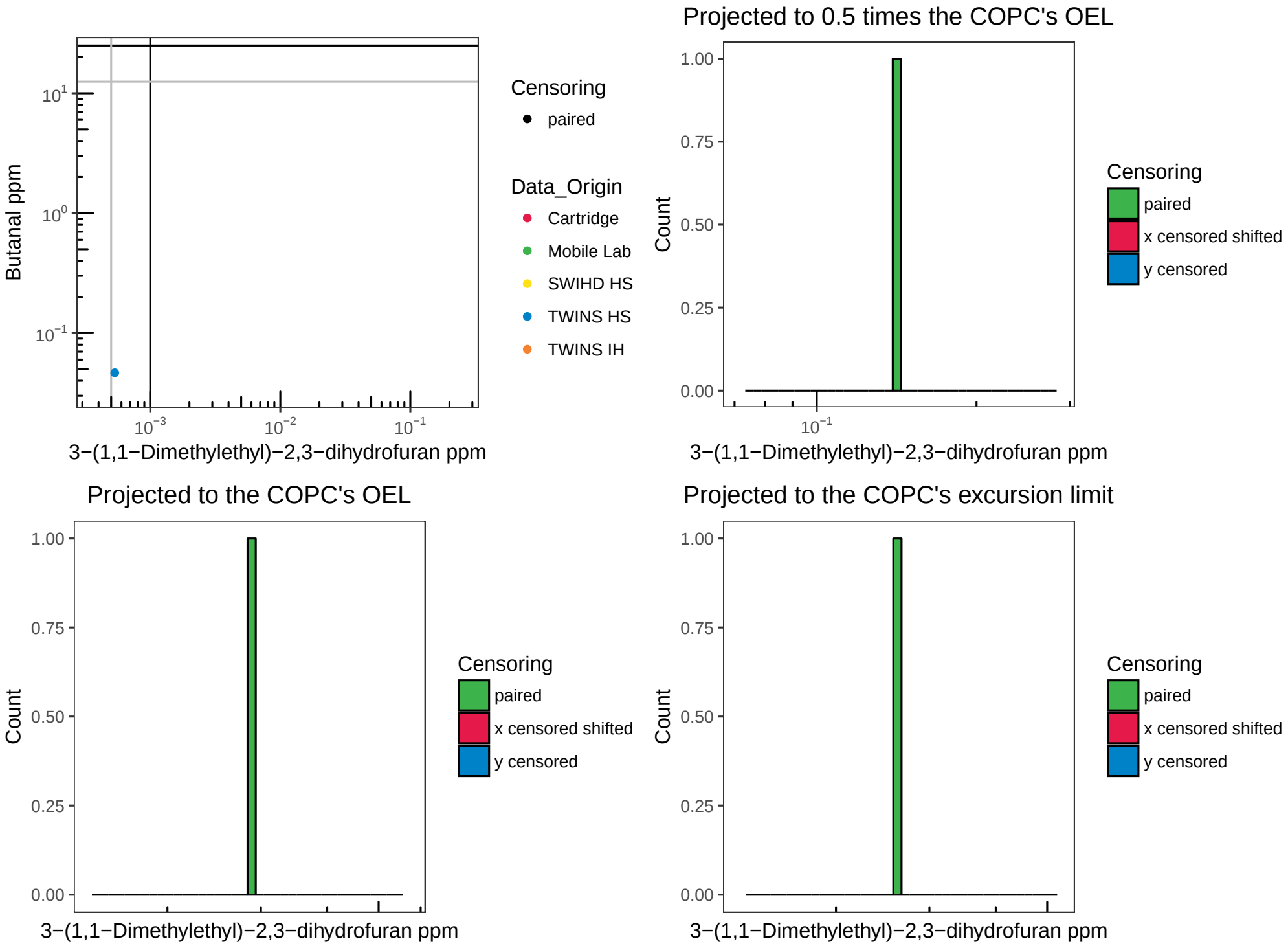


Figure C.1277: Butanal vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

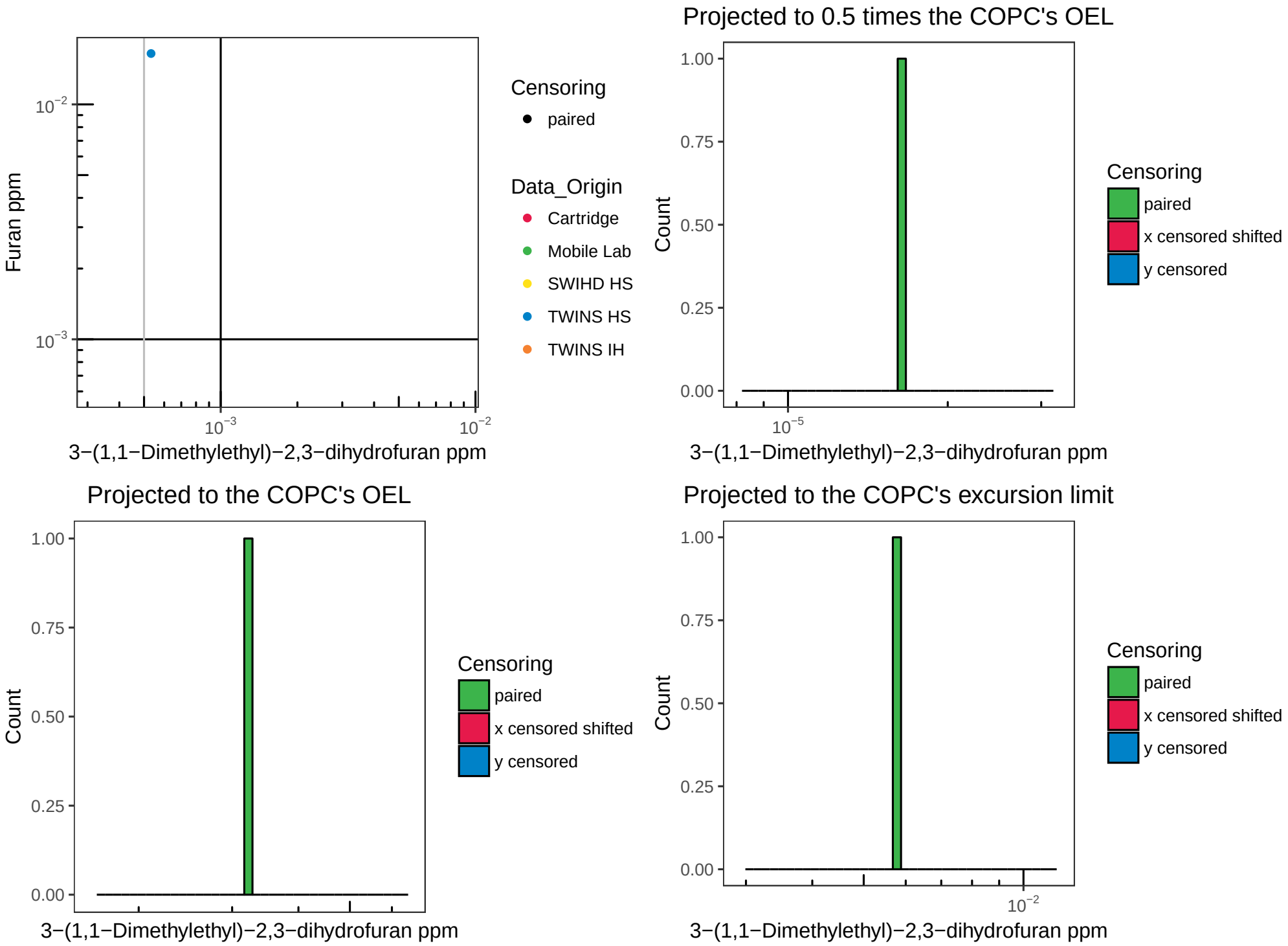


Figure C.1278: Furan vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

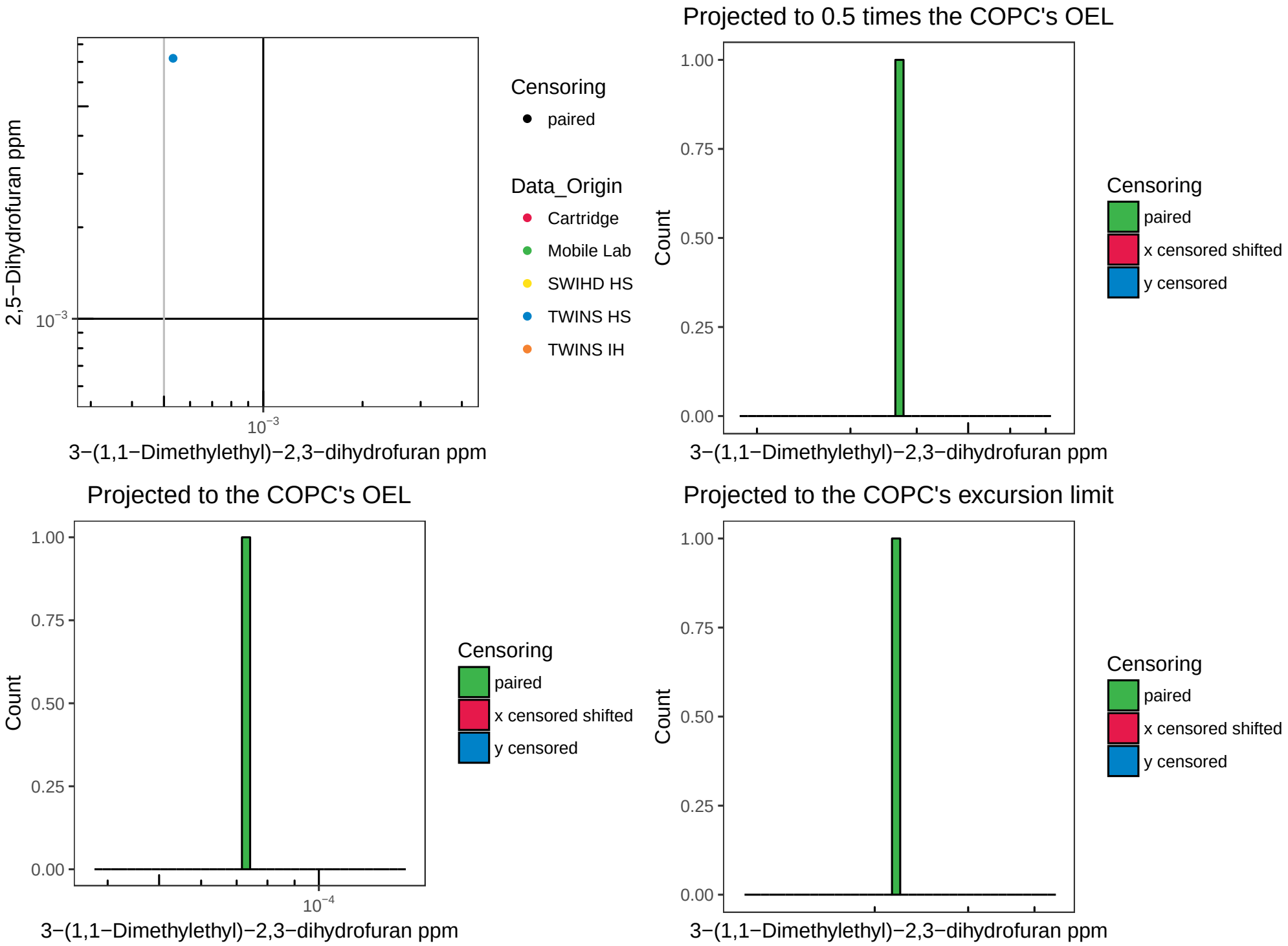


Figure C.1279: 2,5-Dihydrofuran vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

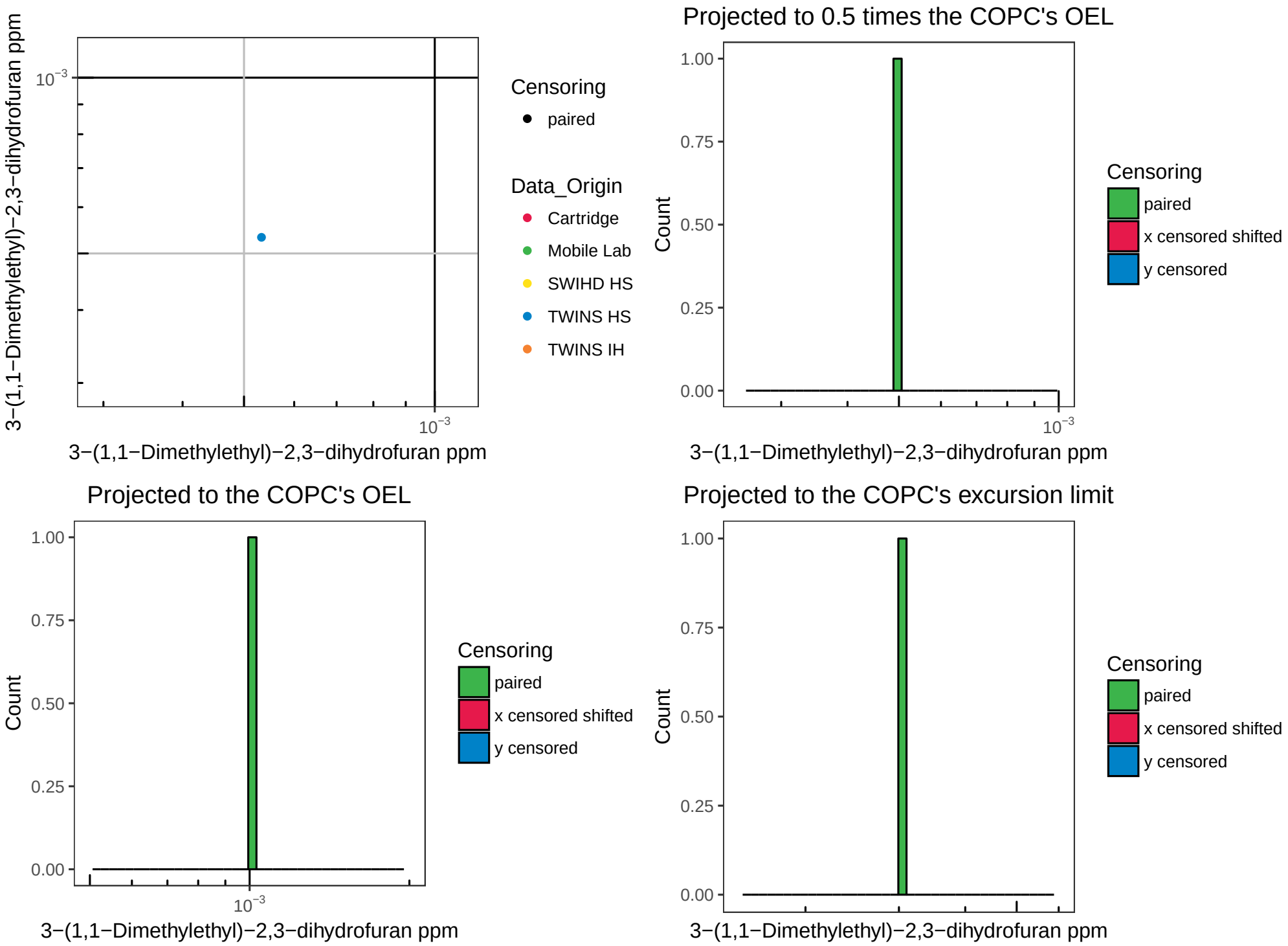


Figure C.1280: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

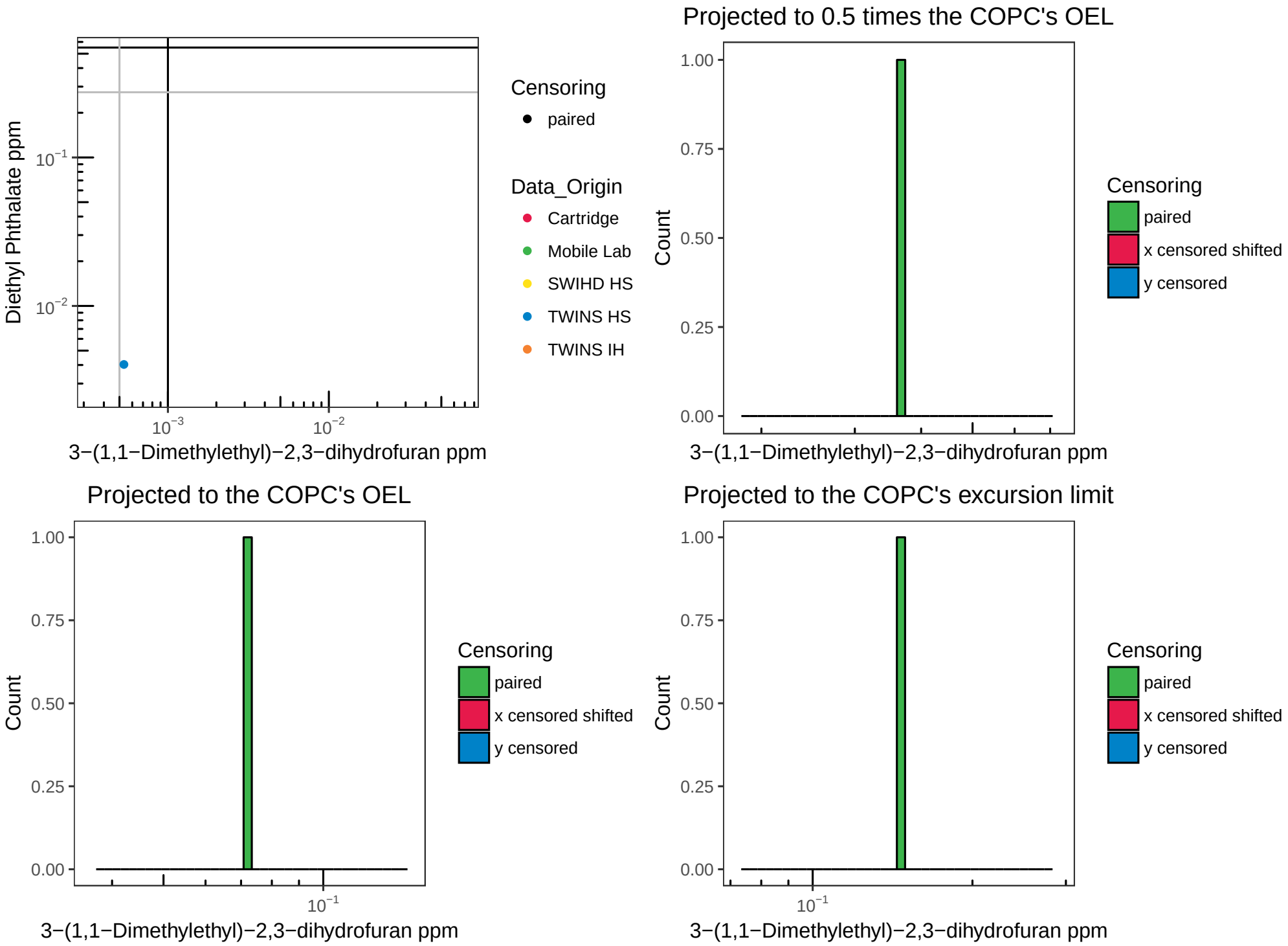


Figure C.1281: Diethyl Phthalate vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

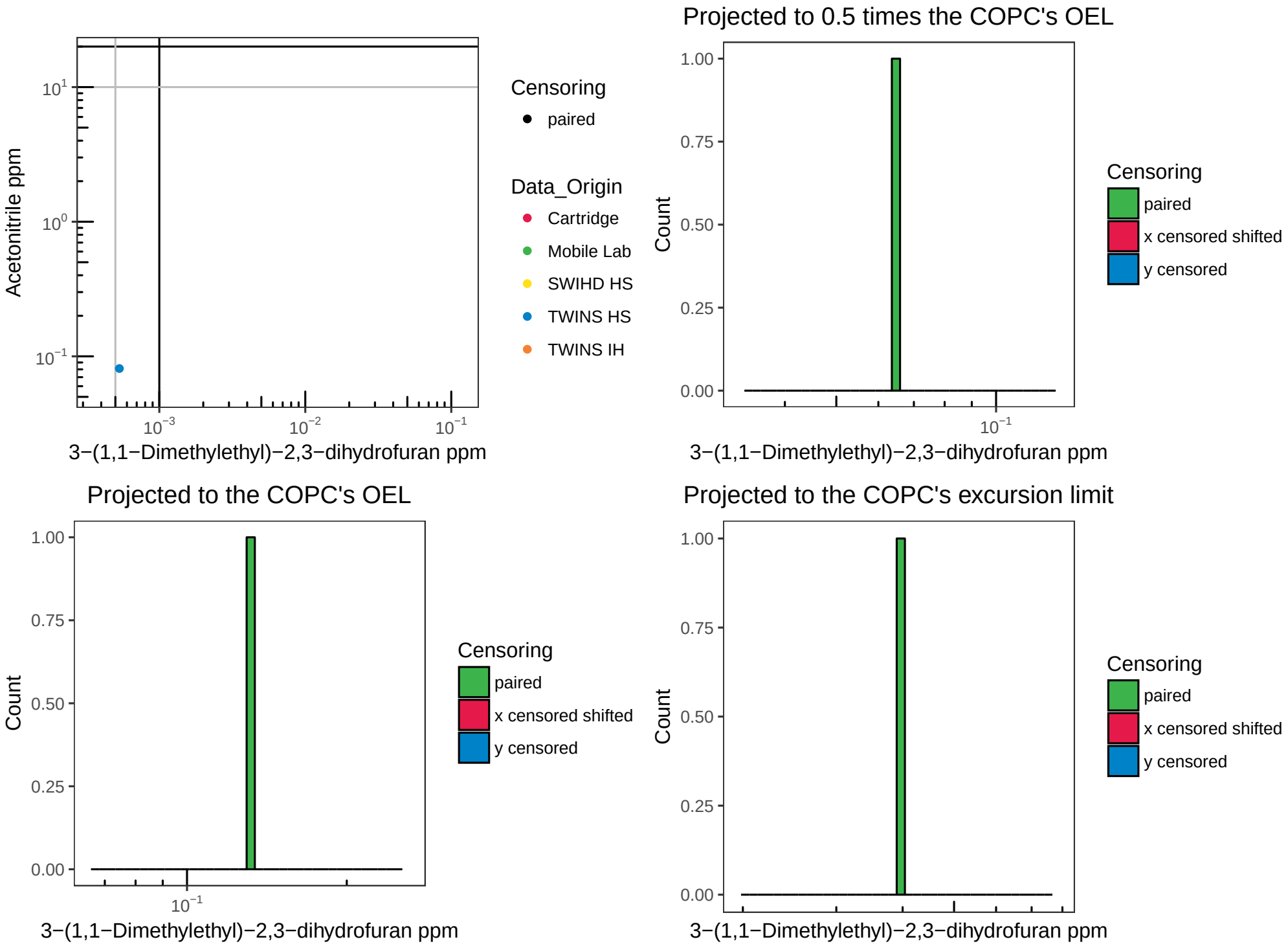


Figure C.1282: Acetonitrile vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

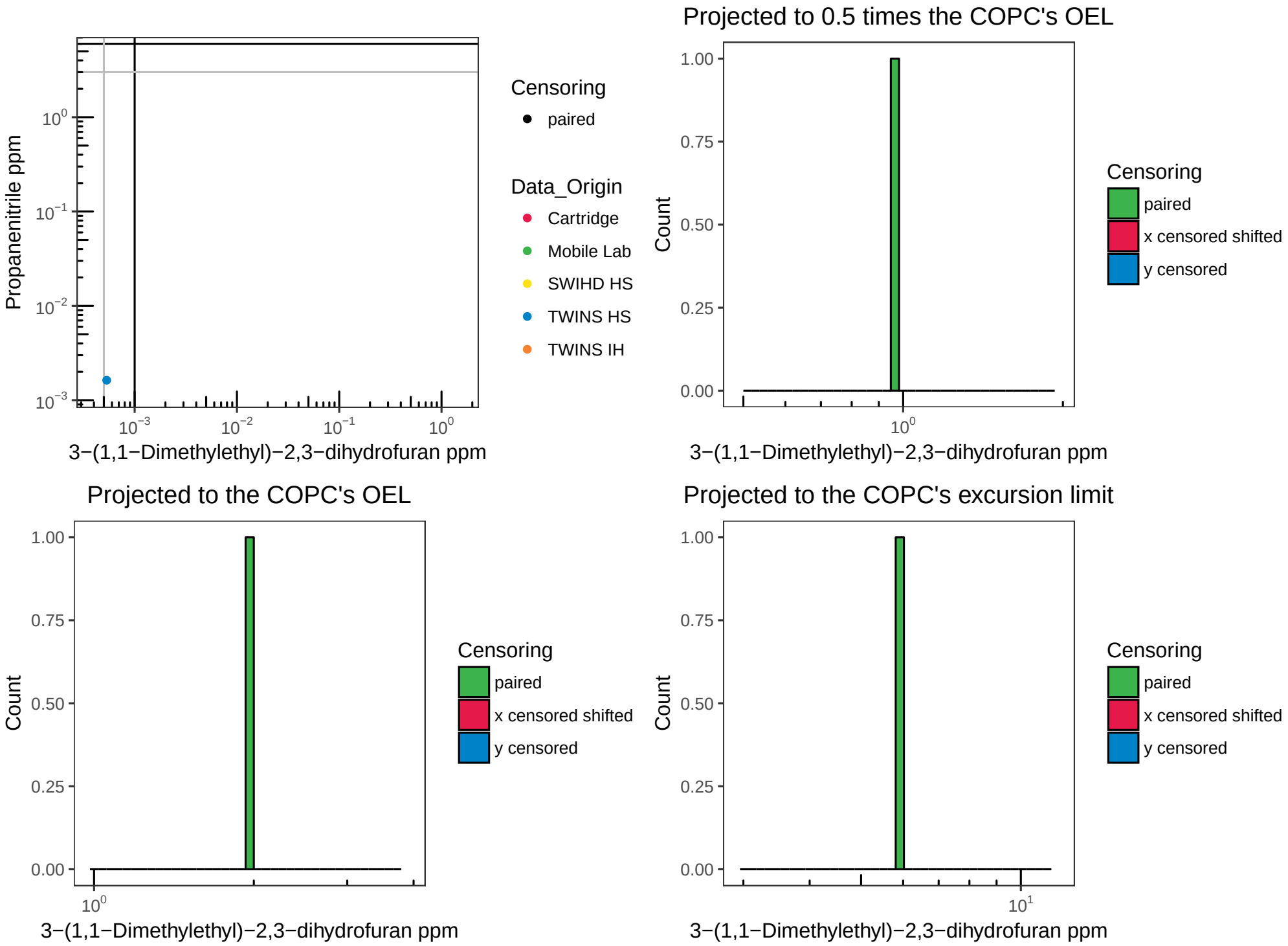


Figure C.1283: Propanenitrile vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

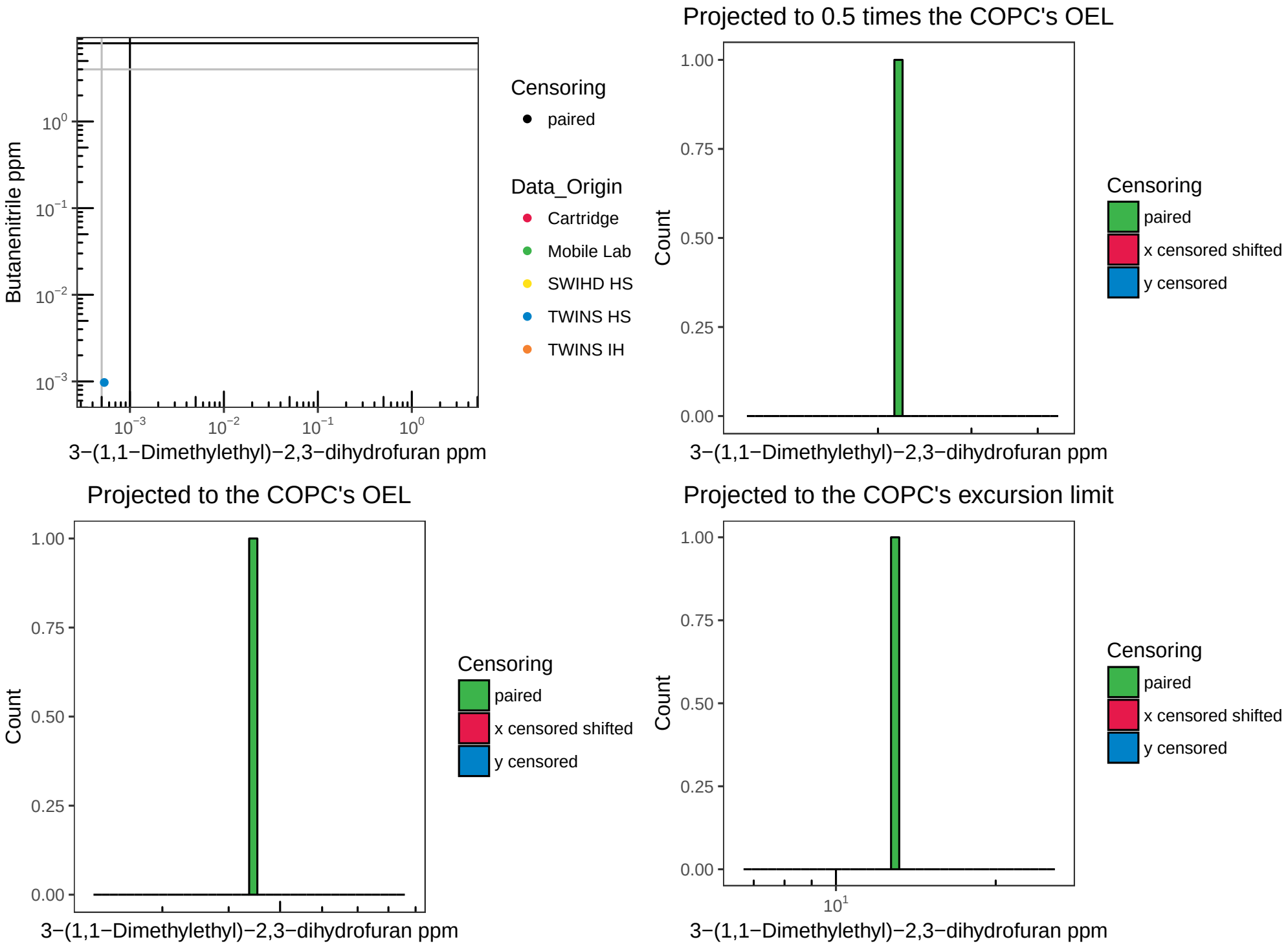


Figure C.1284: Butanenitrile vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

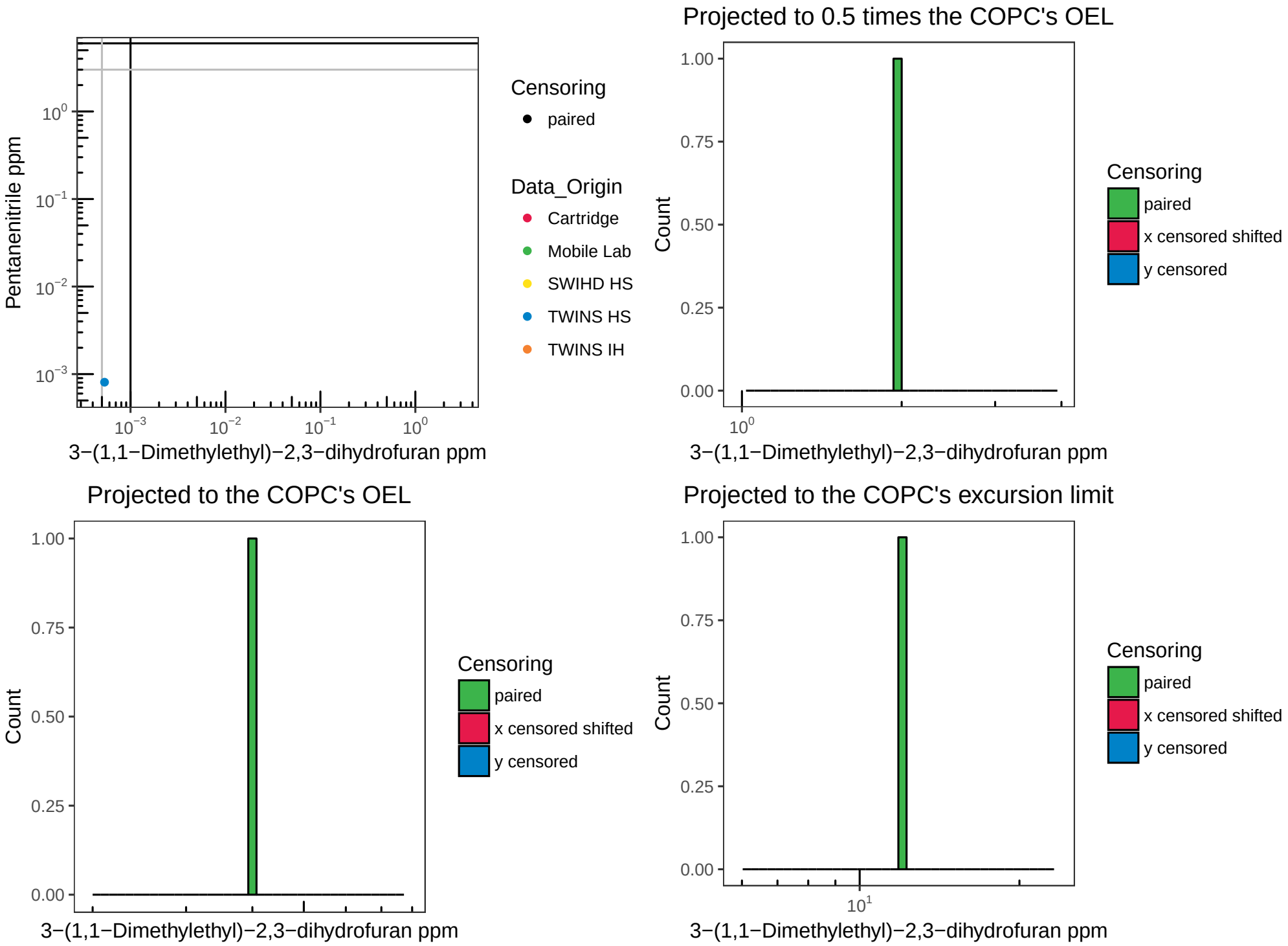


Figure C.1285: Pentanenitrile vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

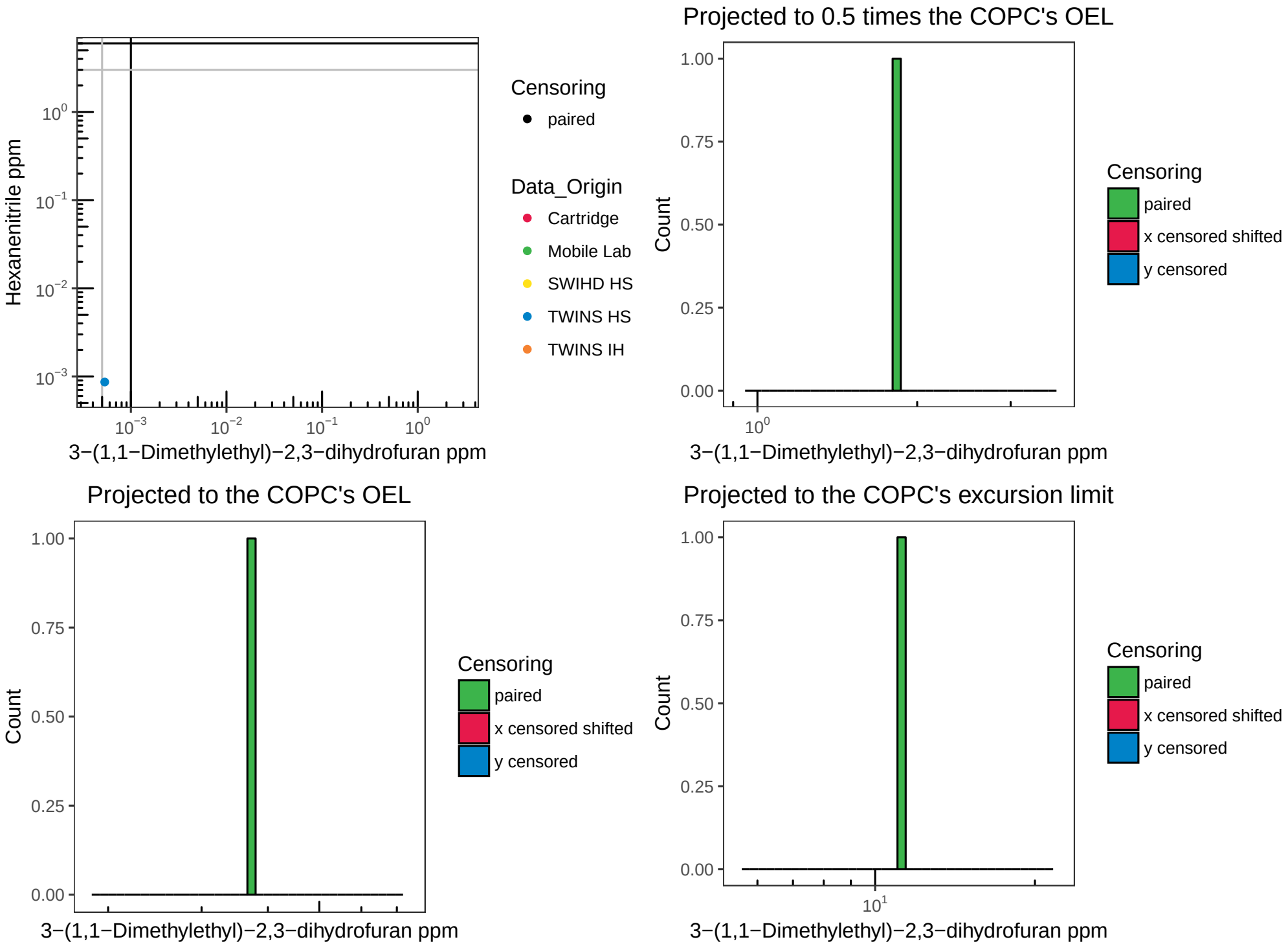


Figure C.1286: Hexanenitrile vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

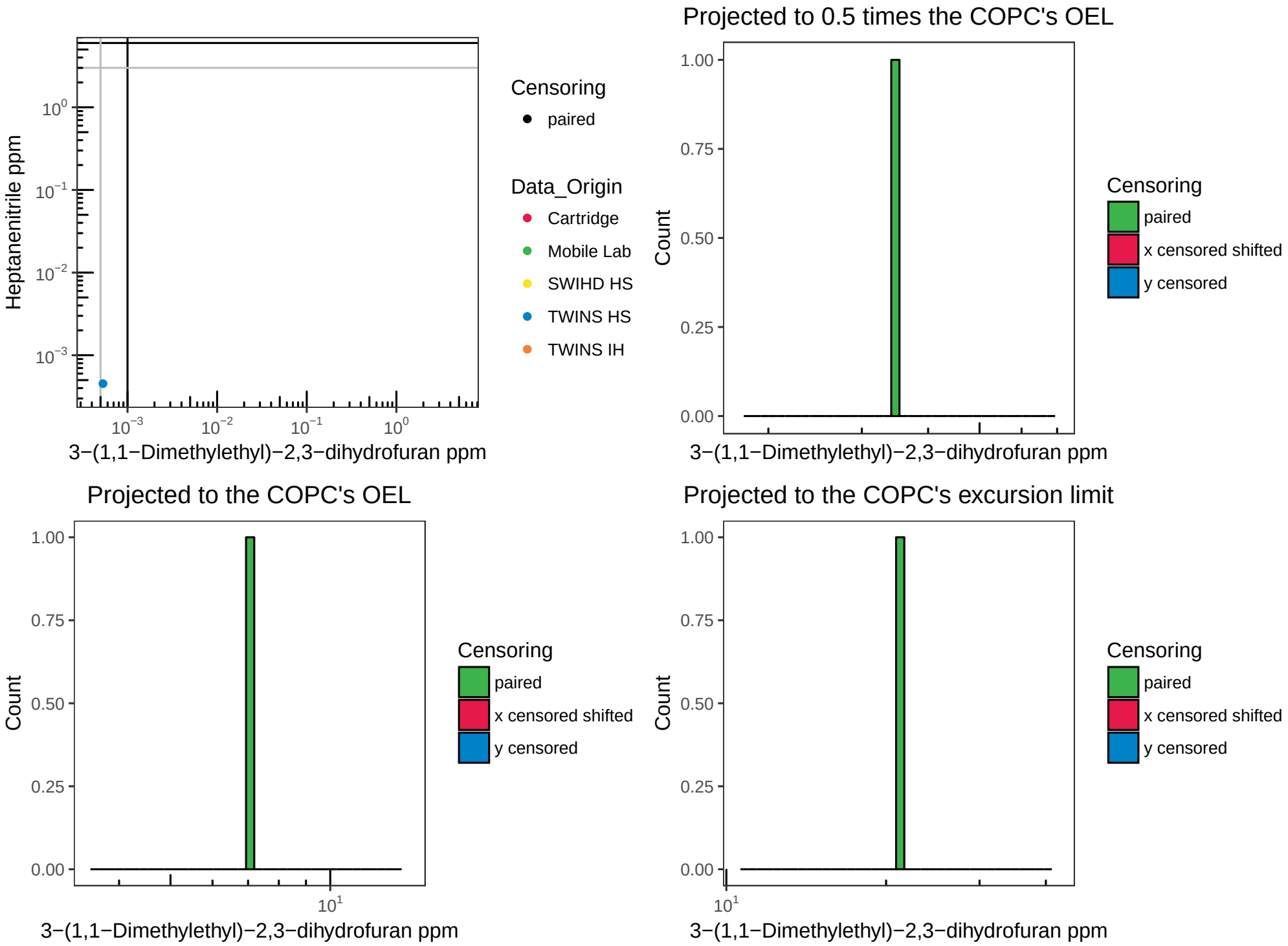


Figure C.1287: Heptanenitrile vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

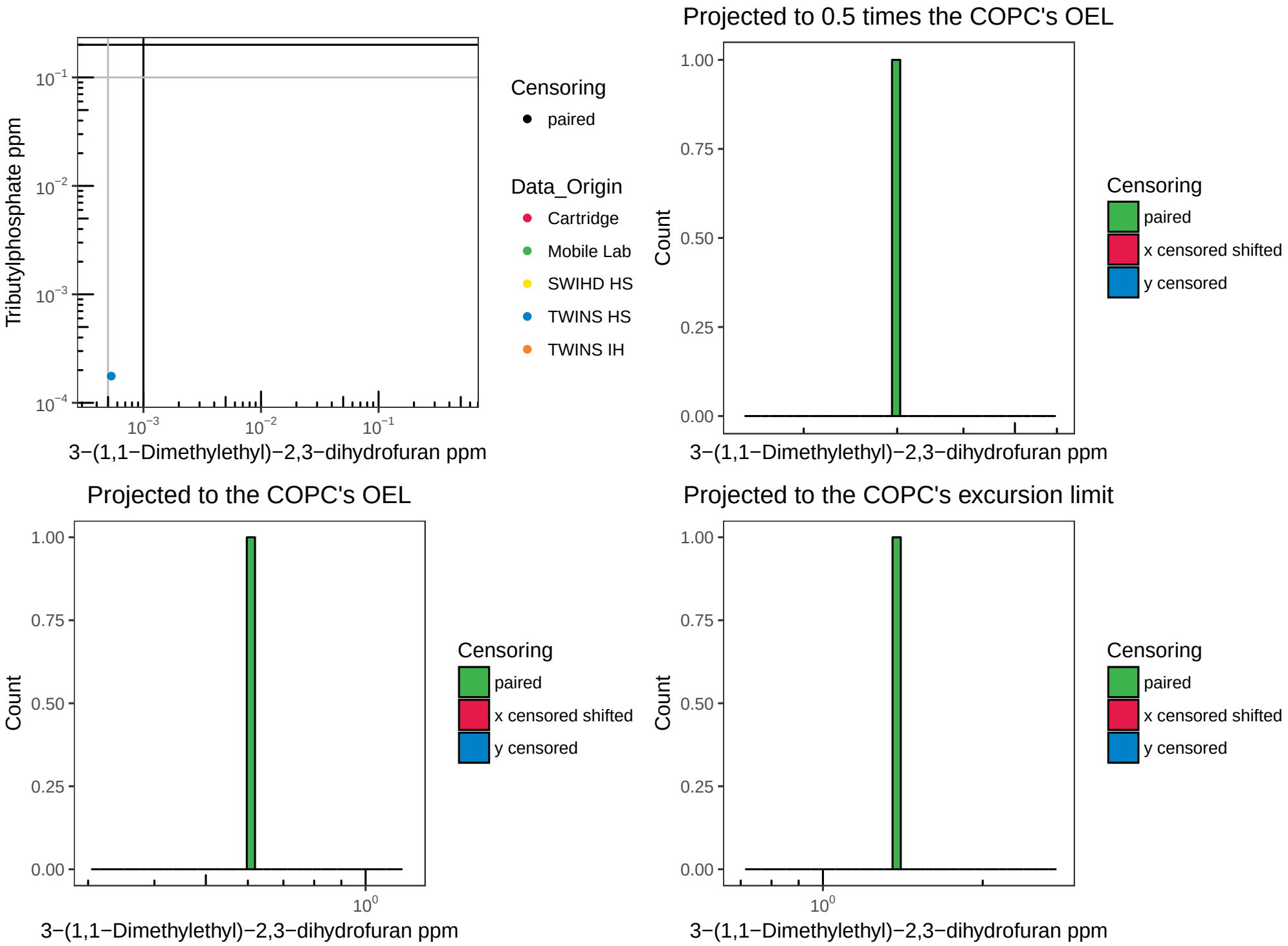


Figure C.1288: Tributylphosphate vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

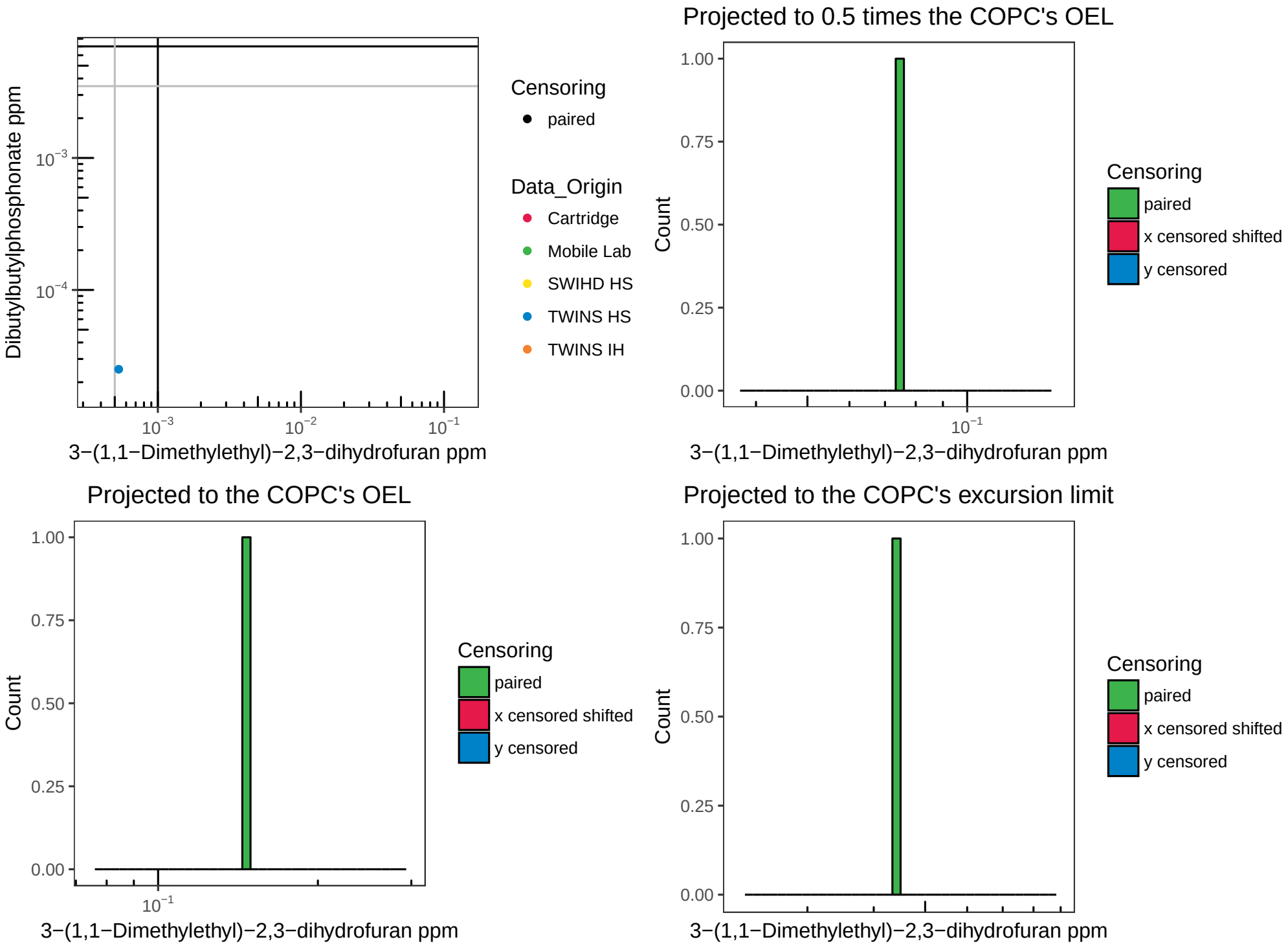


Figure C.1289: Dibutylbutylphosphonate vs 3-(1,1-Dimethylethyl)-2,3-dihydrofuran

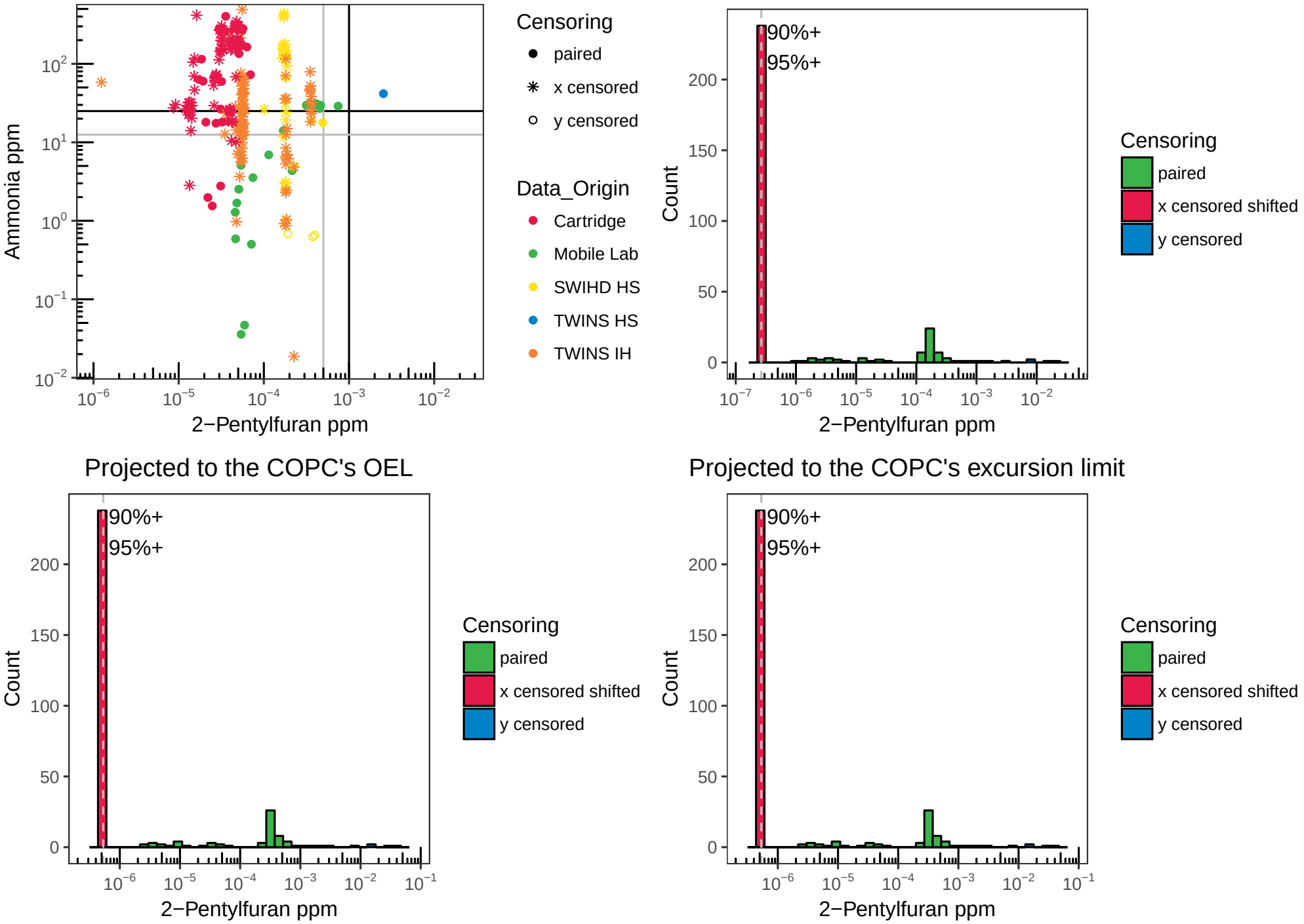


Figure C.1290: Ammonia vs 2-Pentylfuran

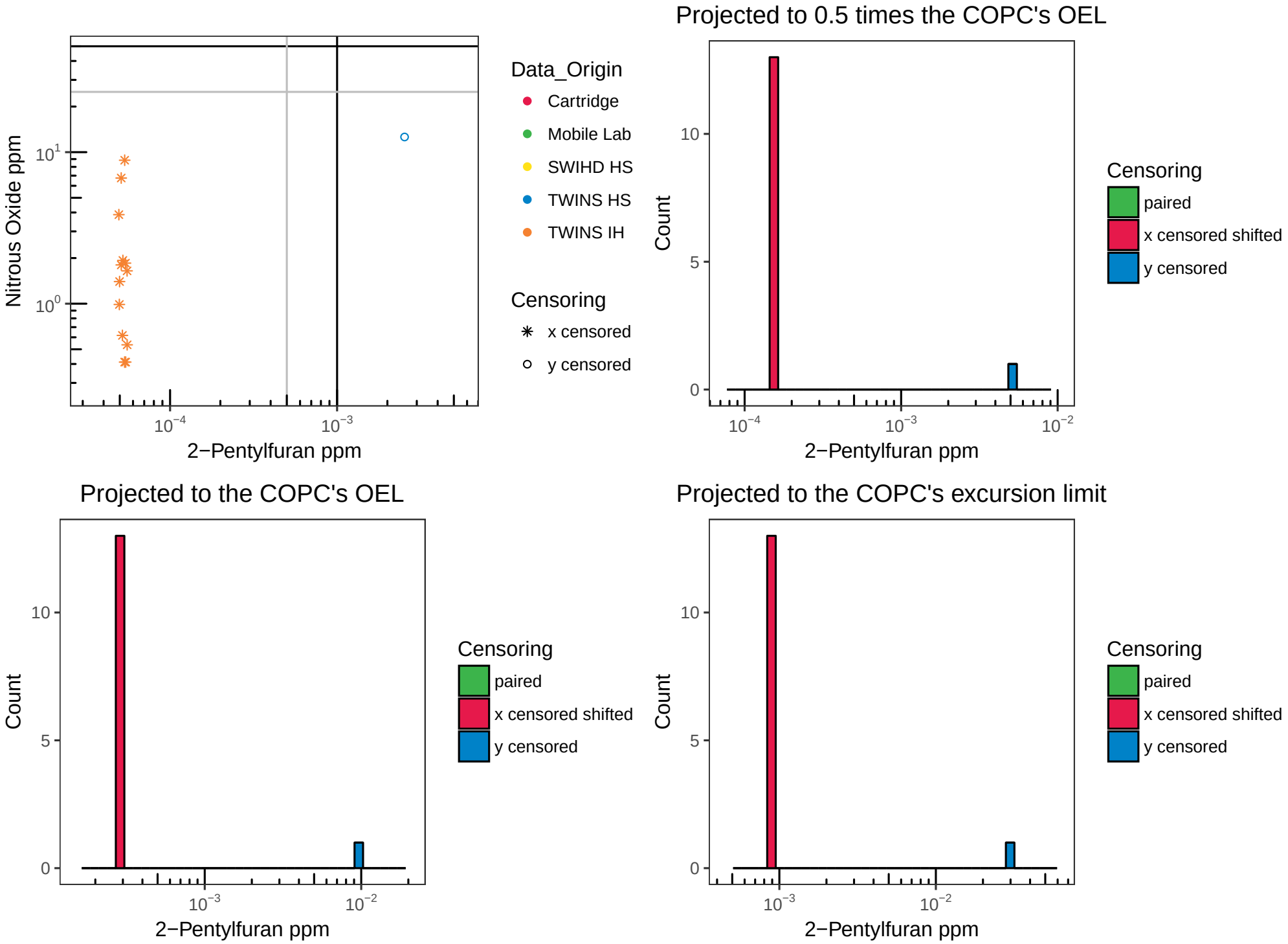


Figure C.1291: Nitrous Oxide vs 2-Pentylfuran

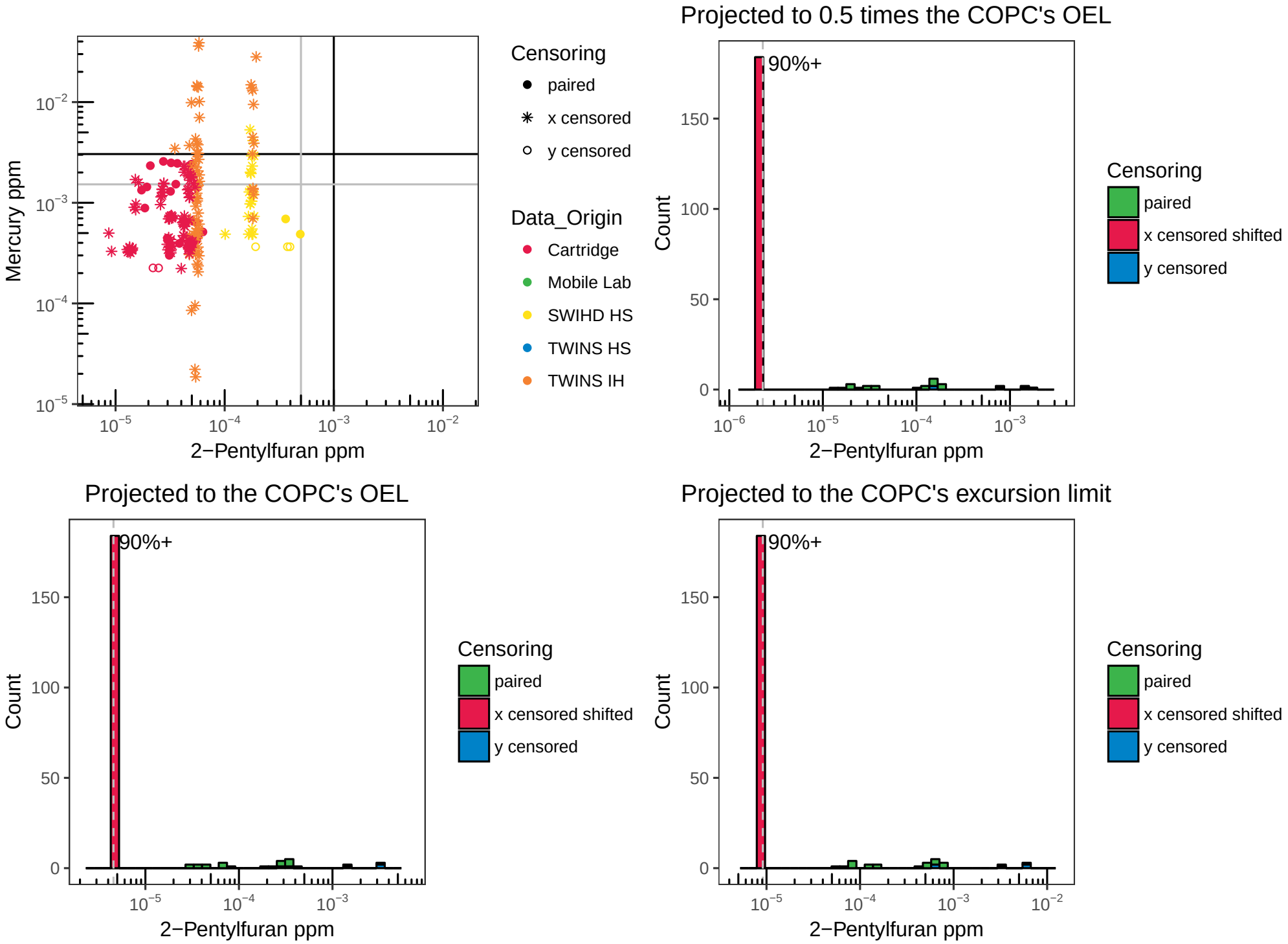


Figure C.1292: Mercury vs 2-Pentylfuran

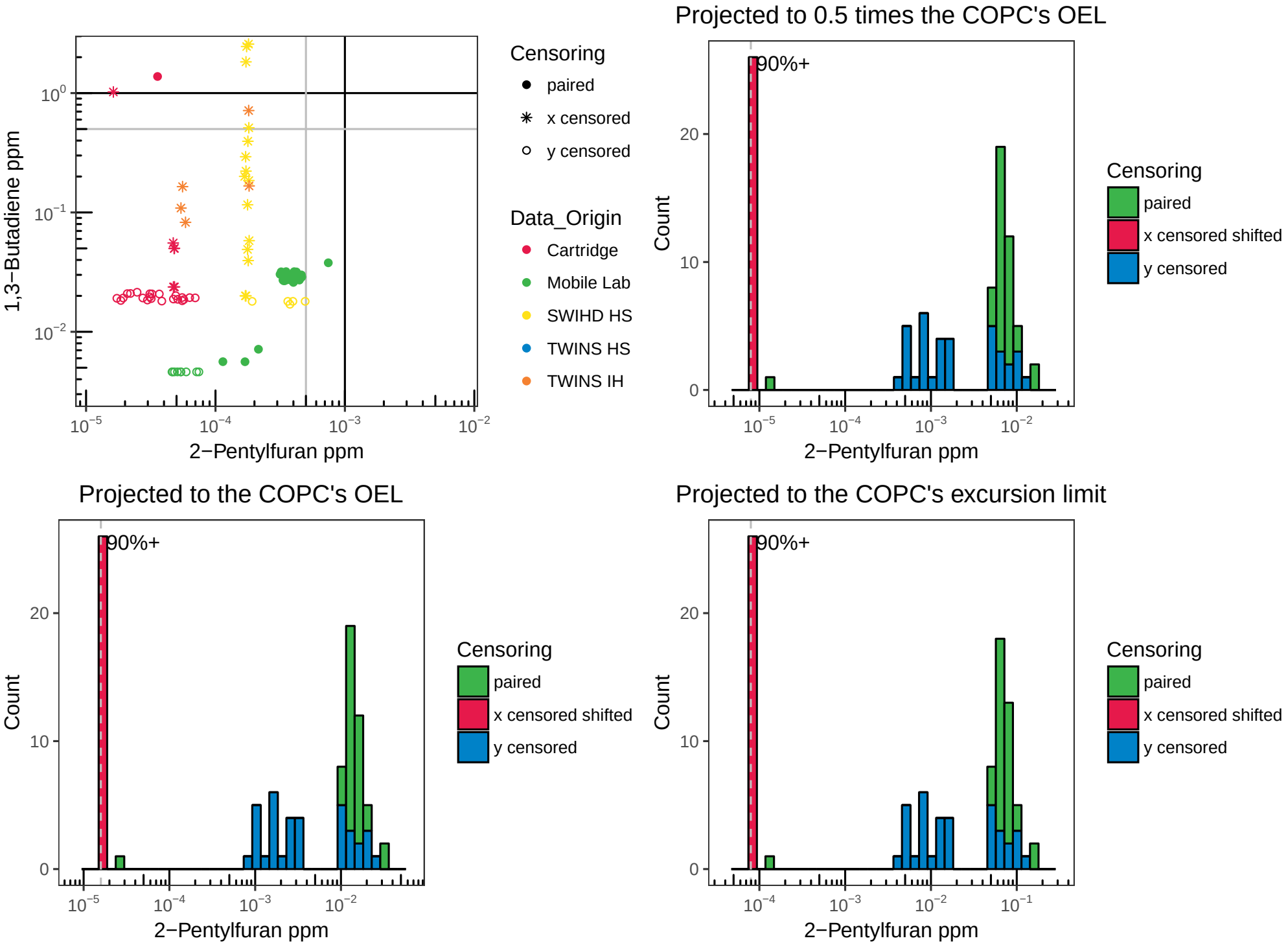


Figure C.1293: 1,3-Butadiene vs 2-Pentylfuran

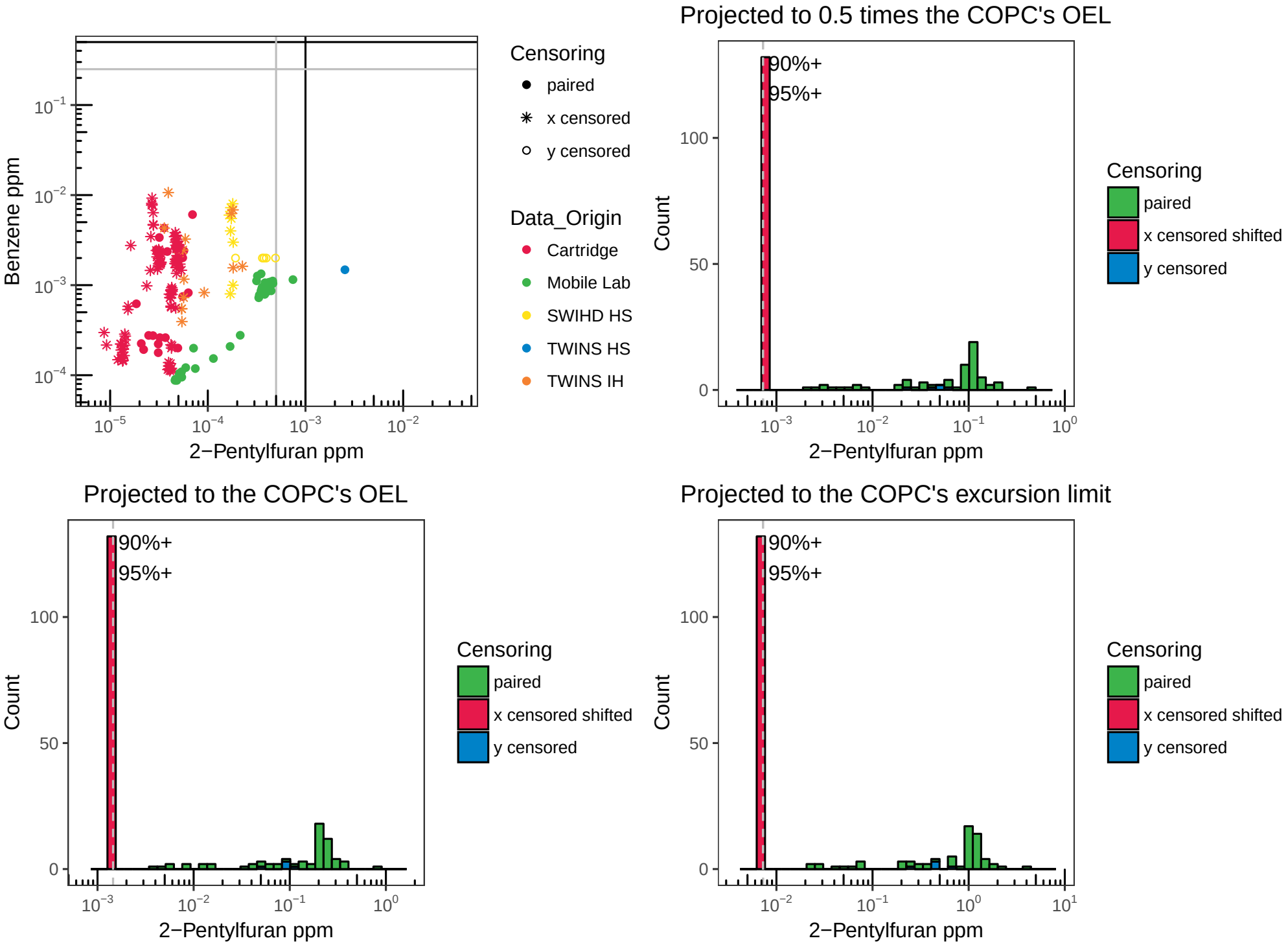


Figure C.1294: Benzene vs 2-Pentylfuran

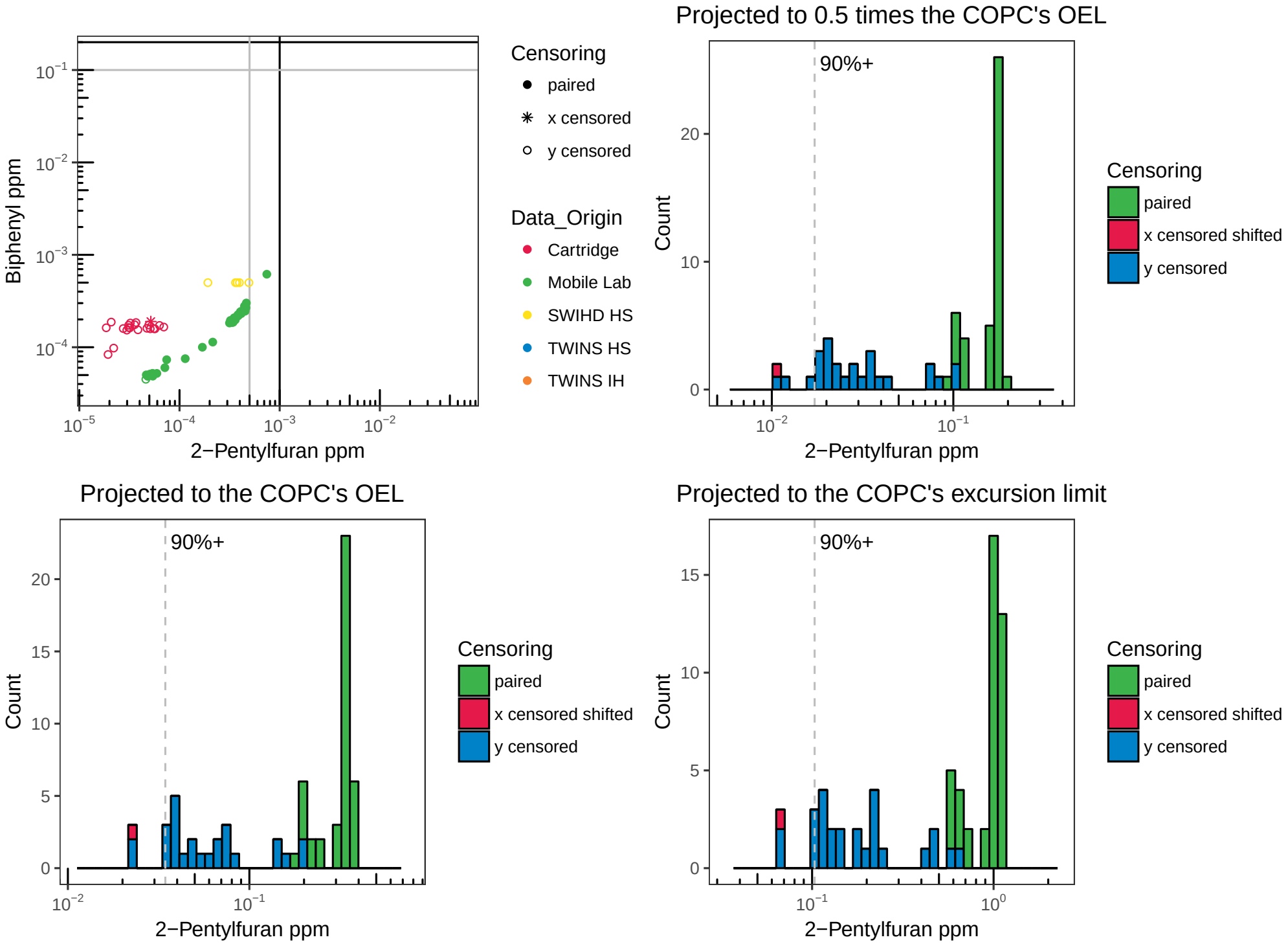


Figure C.1295: Biphenyl vs 2-Pentylfuran

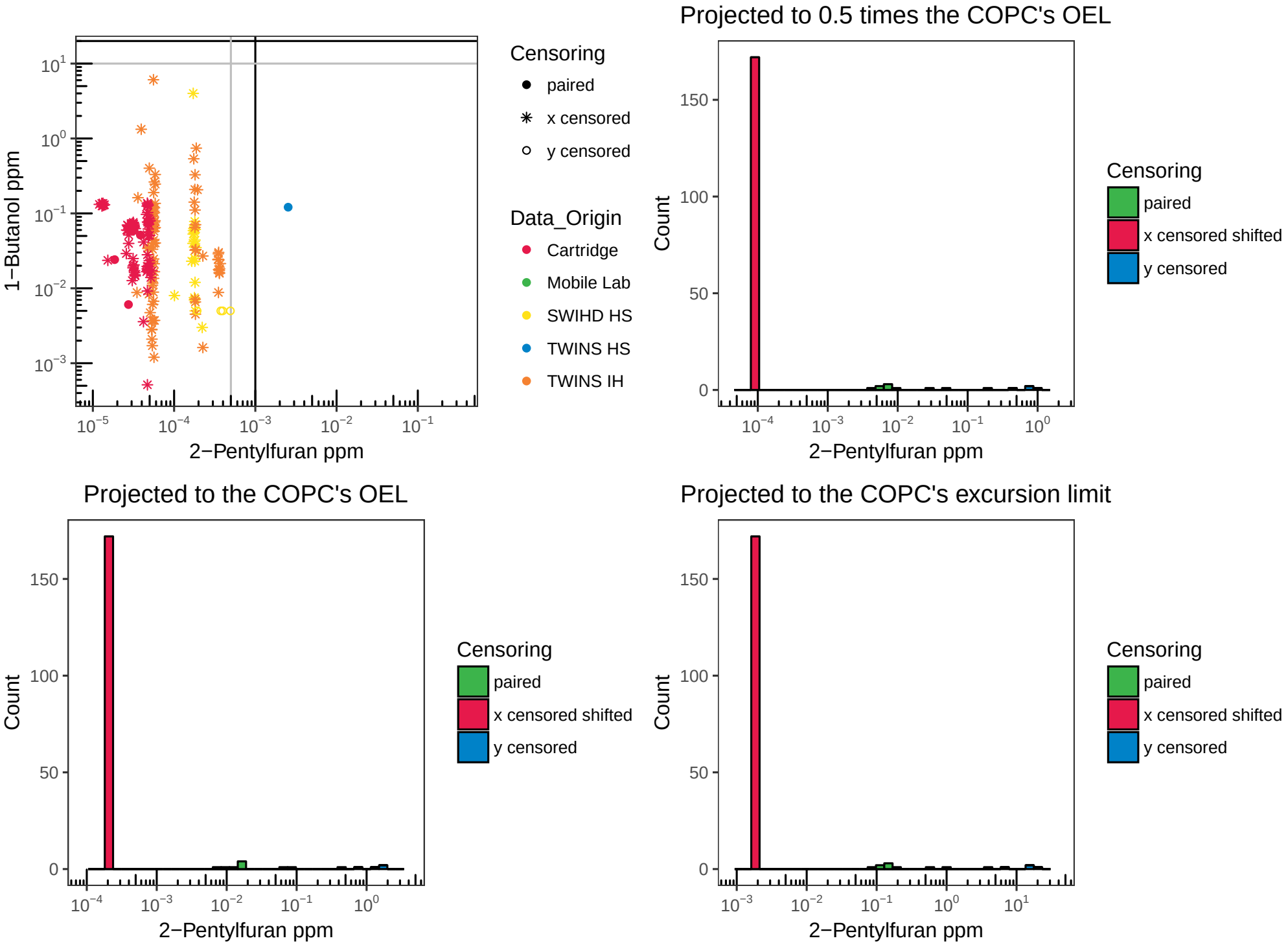


Figure C.1296: 1-Butanol vs 2-Pentylfuran

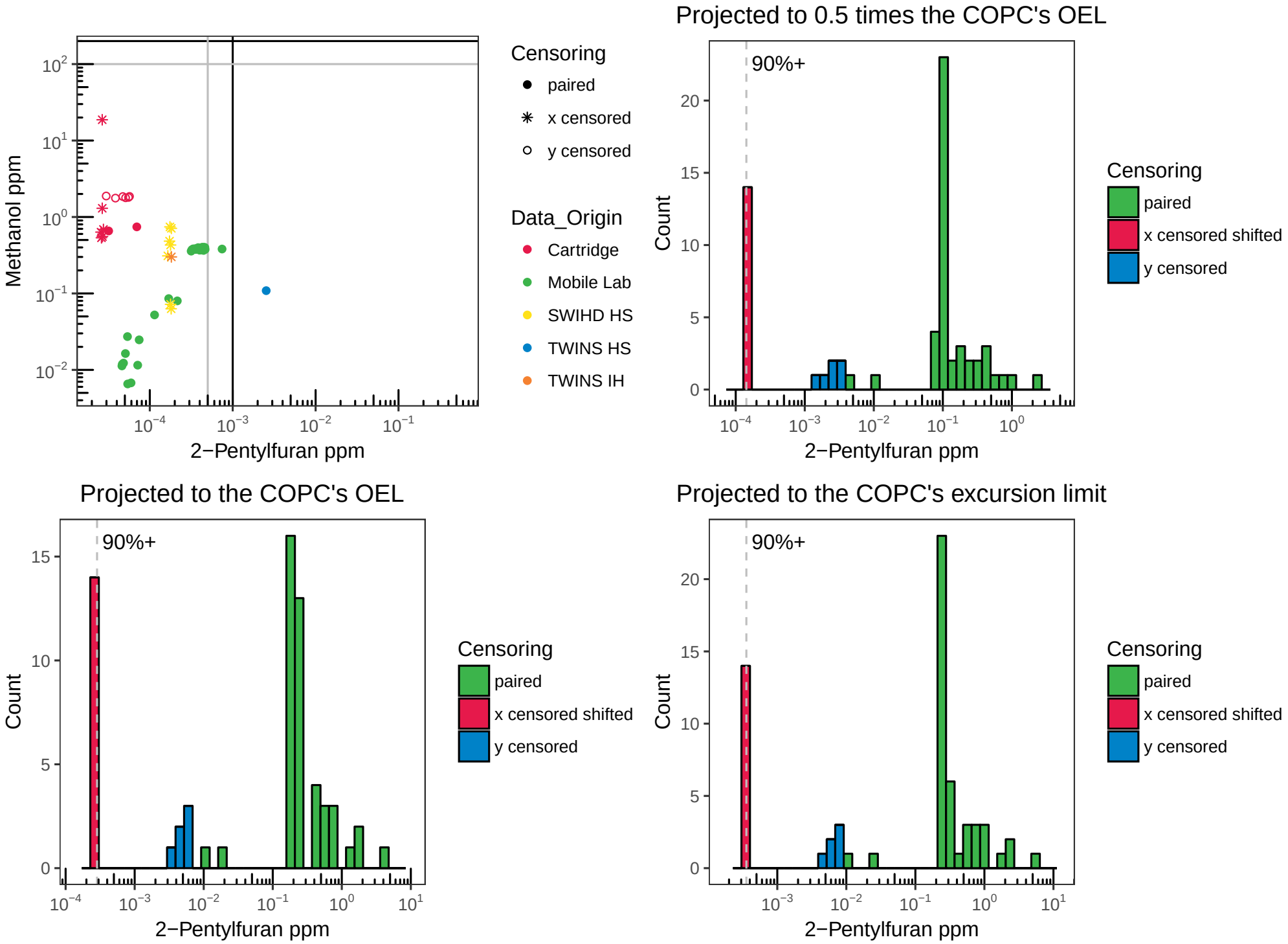


Figure C.1297: Methanol vs 2-Pentylfuran

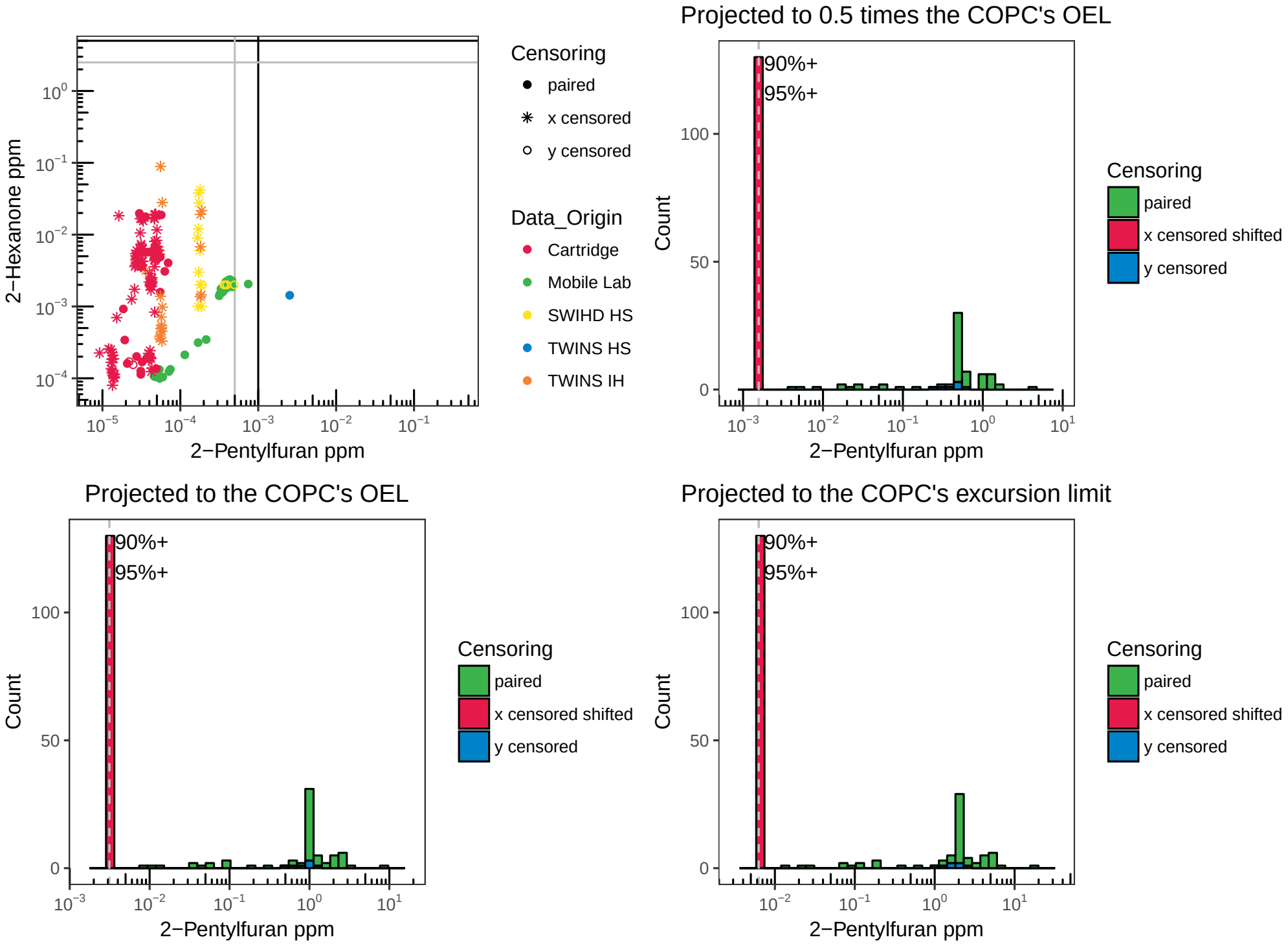


Figure C.1298: 2-Hexanone vs 2-Pentylfuran

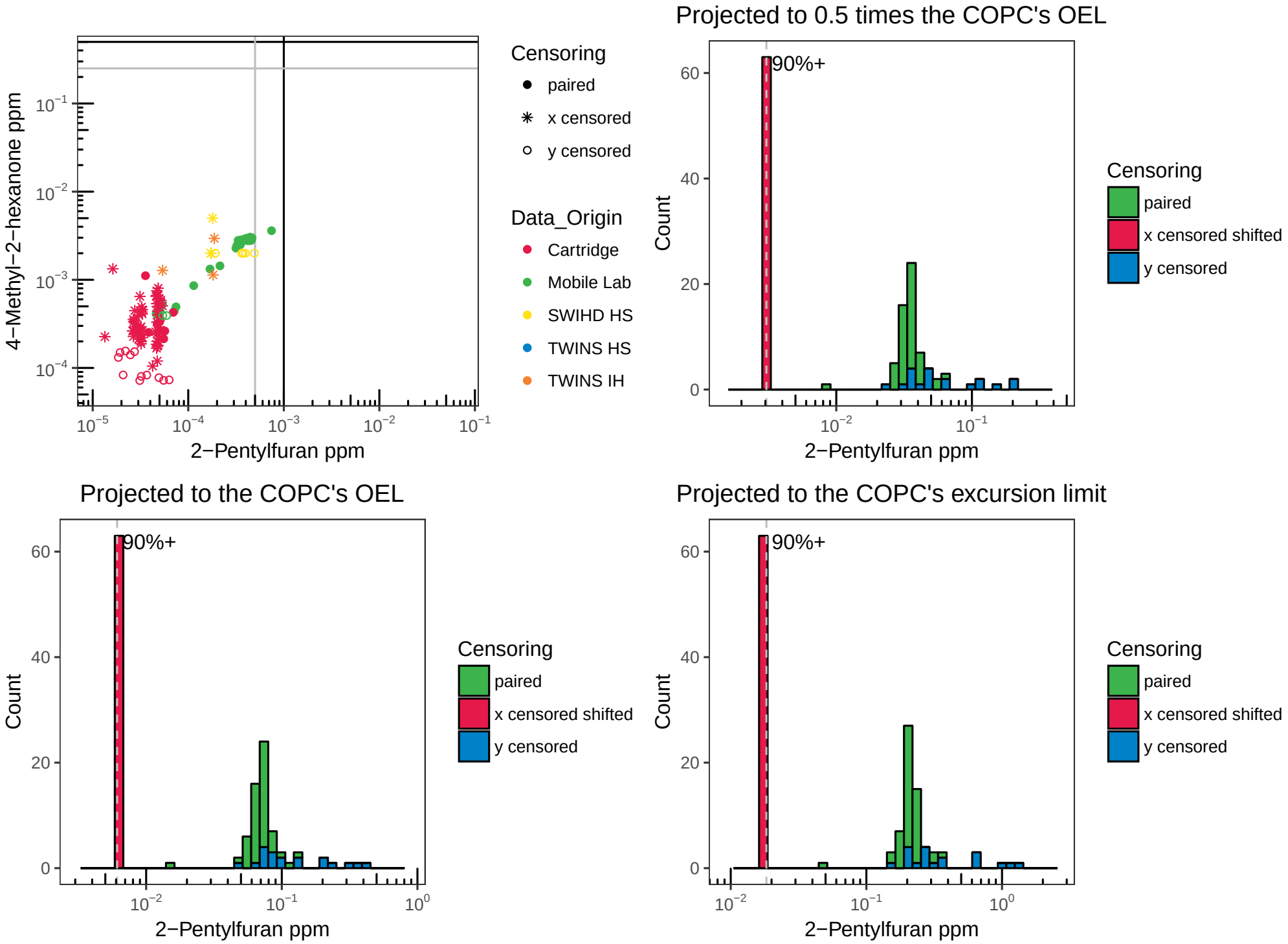


Figure C.1299: 4-Methyl-2-hexanone vs 2-Pentylfuran

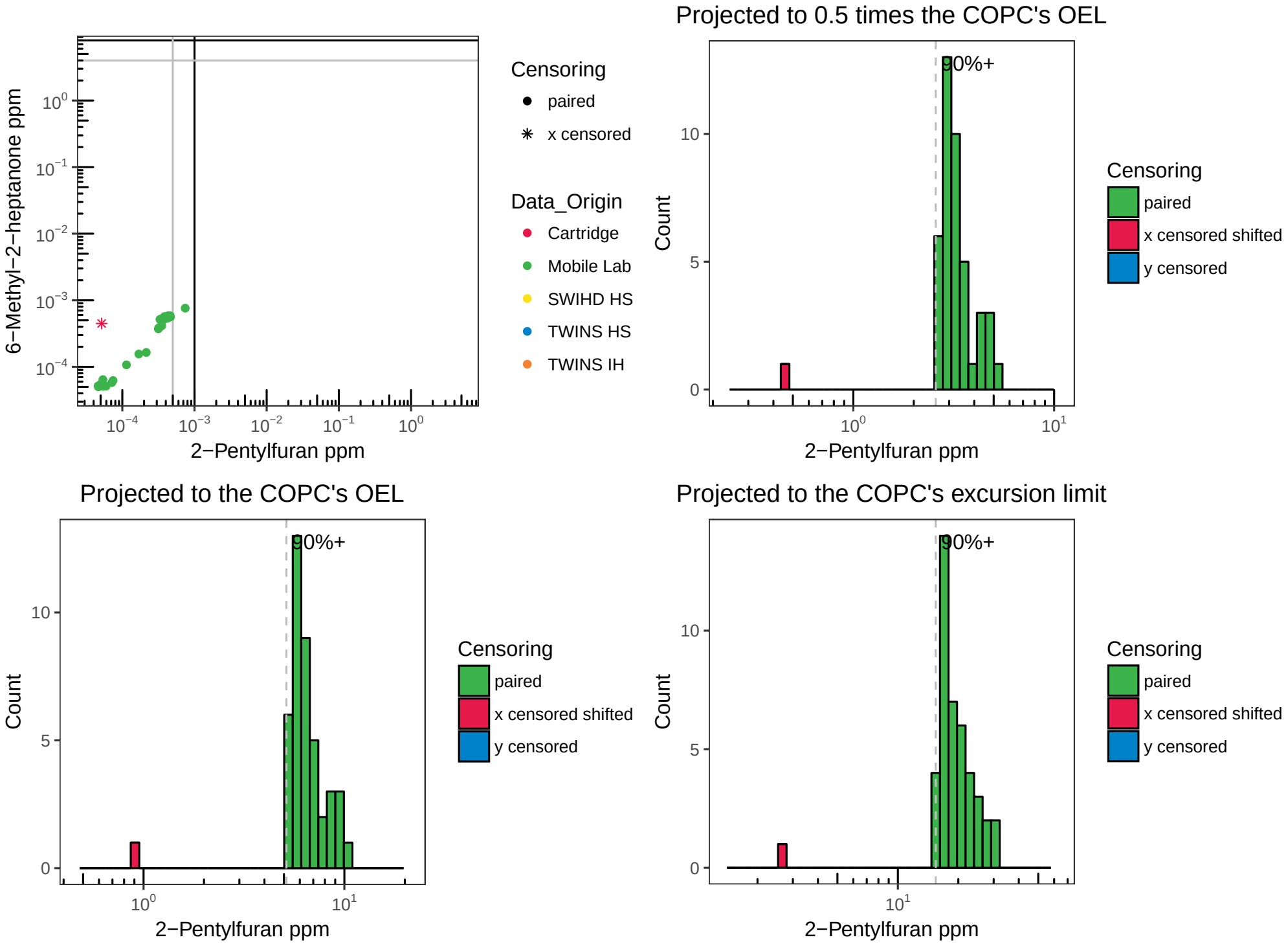


Figure C.1300: 6-Methyl-2-heptanone vs 2-Pentylfuran

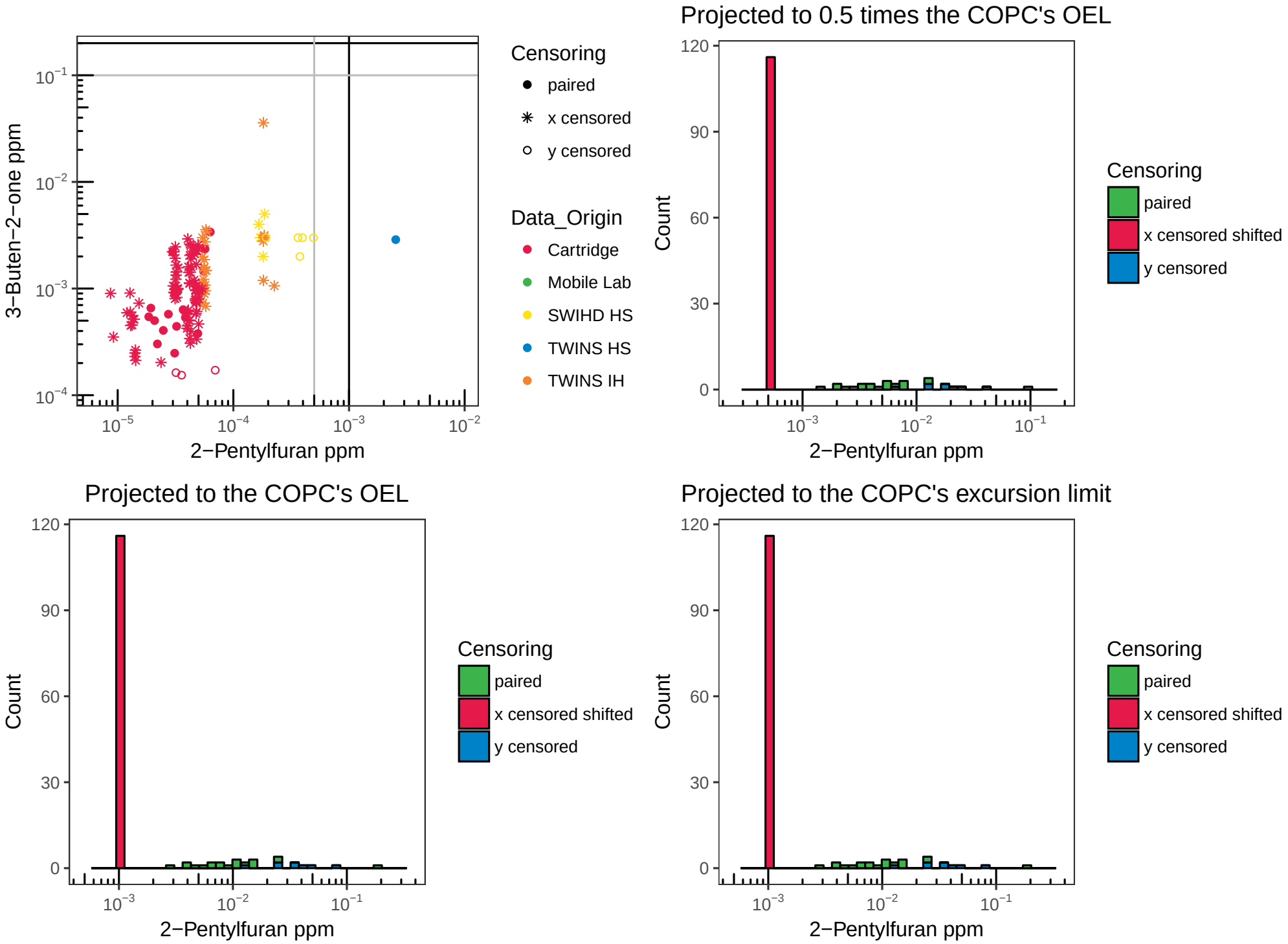


Figure C.1301: 3-Buten-2-one vs 2-Pentylfuran

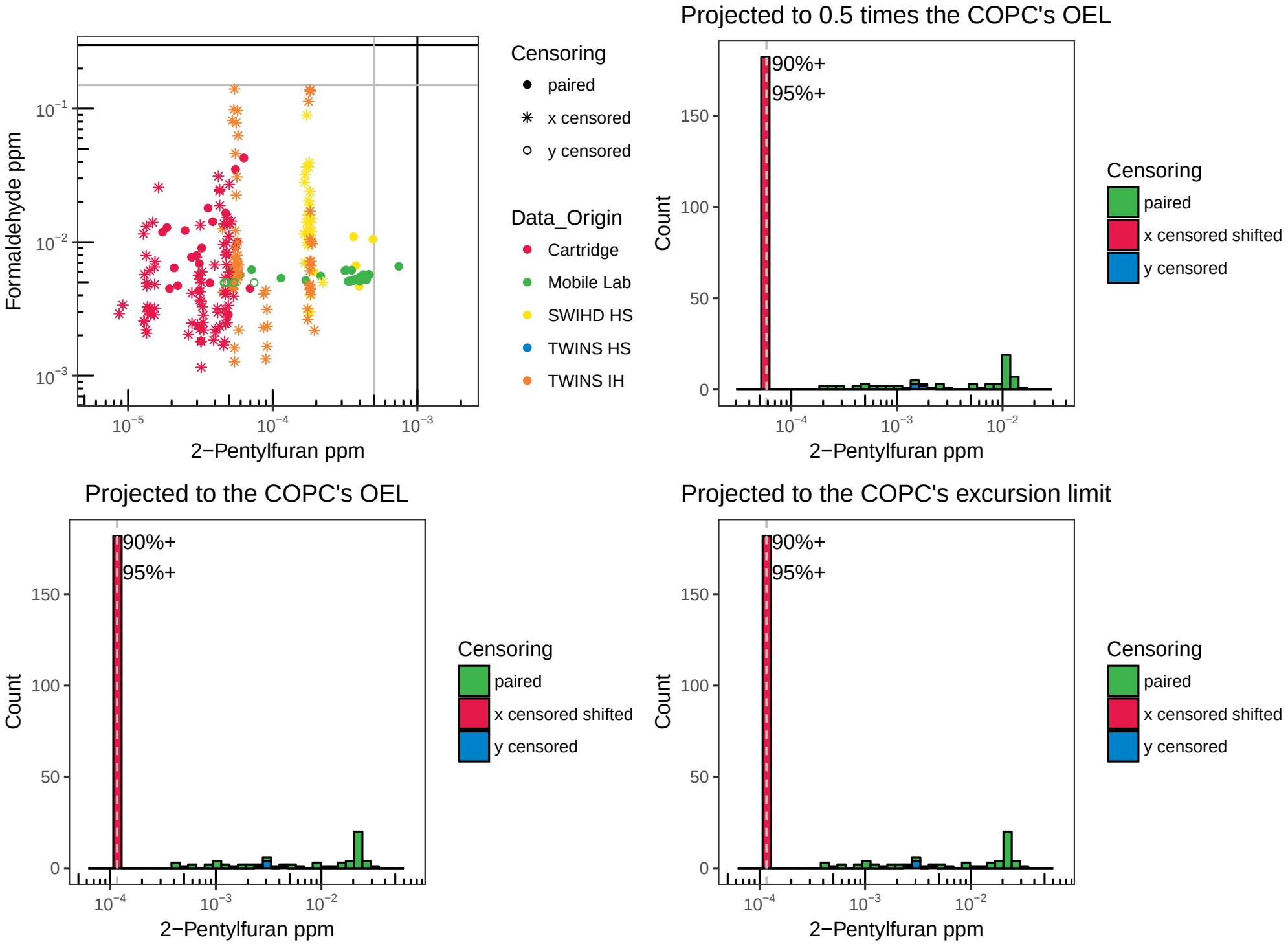


Figure C.1302: Formaldehyde vs 2-Pentylfuran

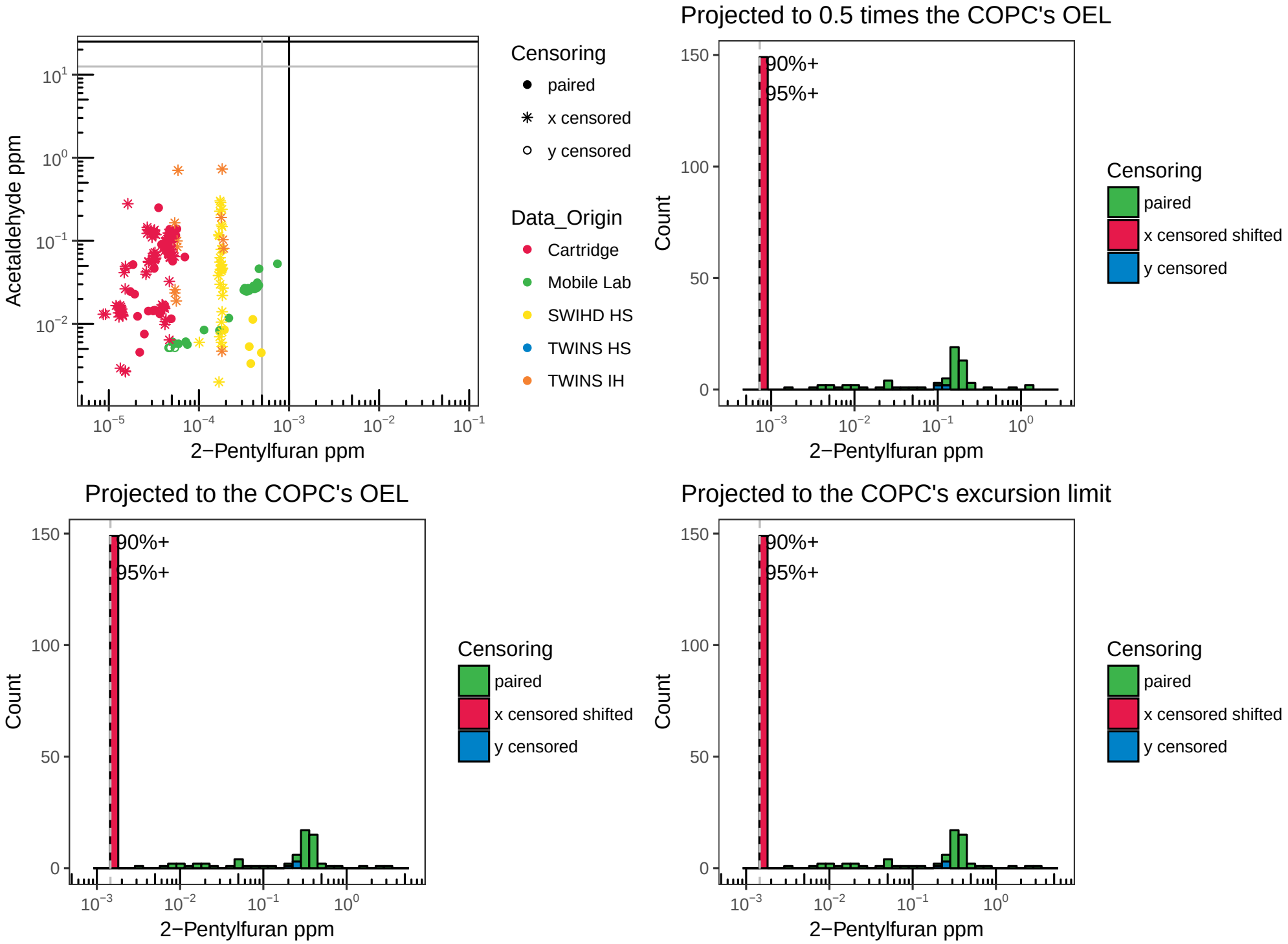


Figure C.1303: Acetaldehyde vs 2-Pentylfuran

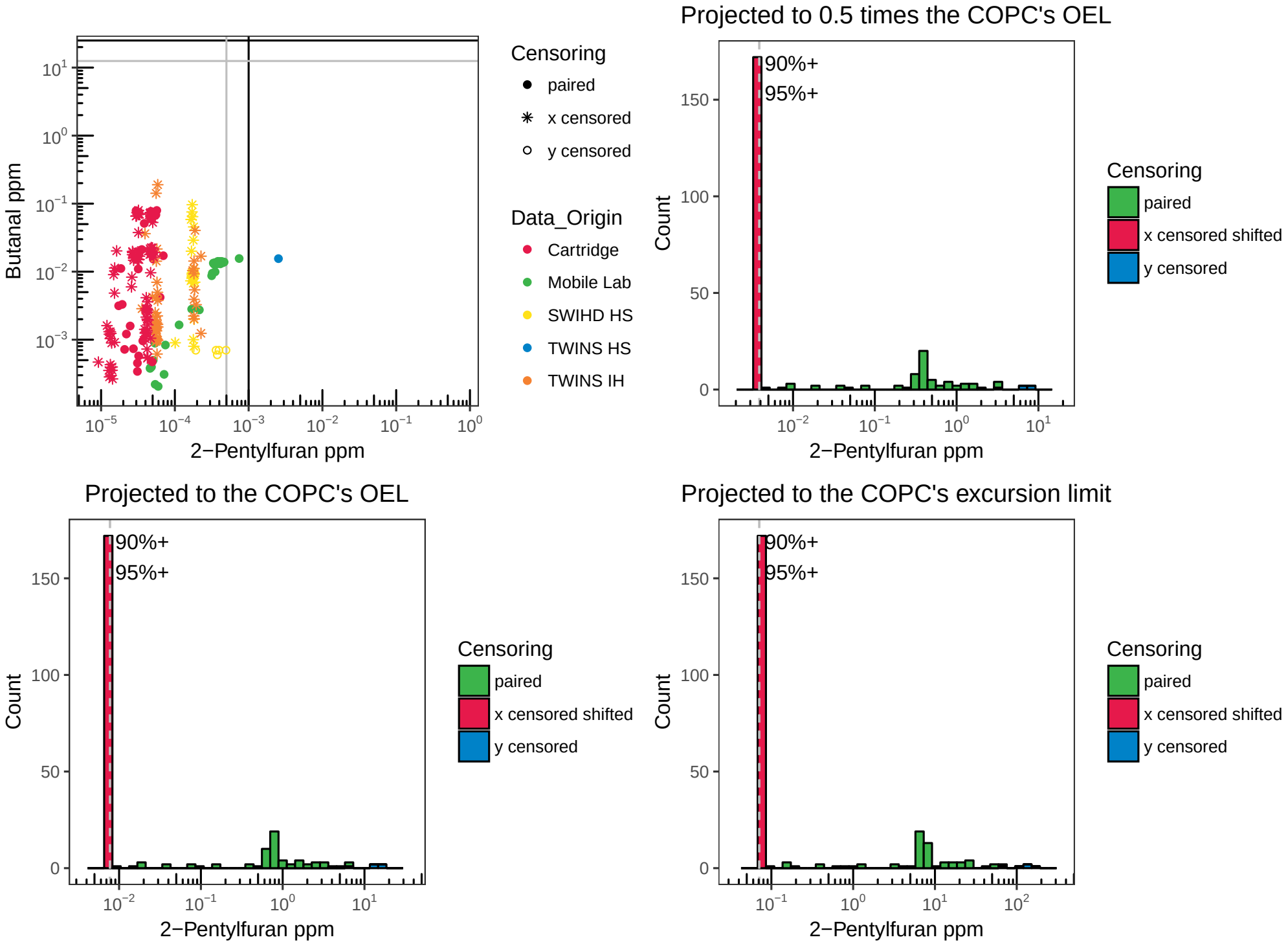


Figure C.1304: Butanal vs 2-Pentylfuran

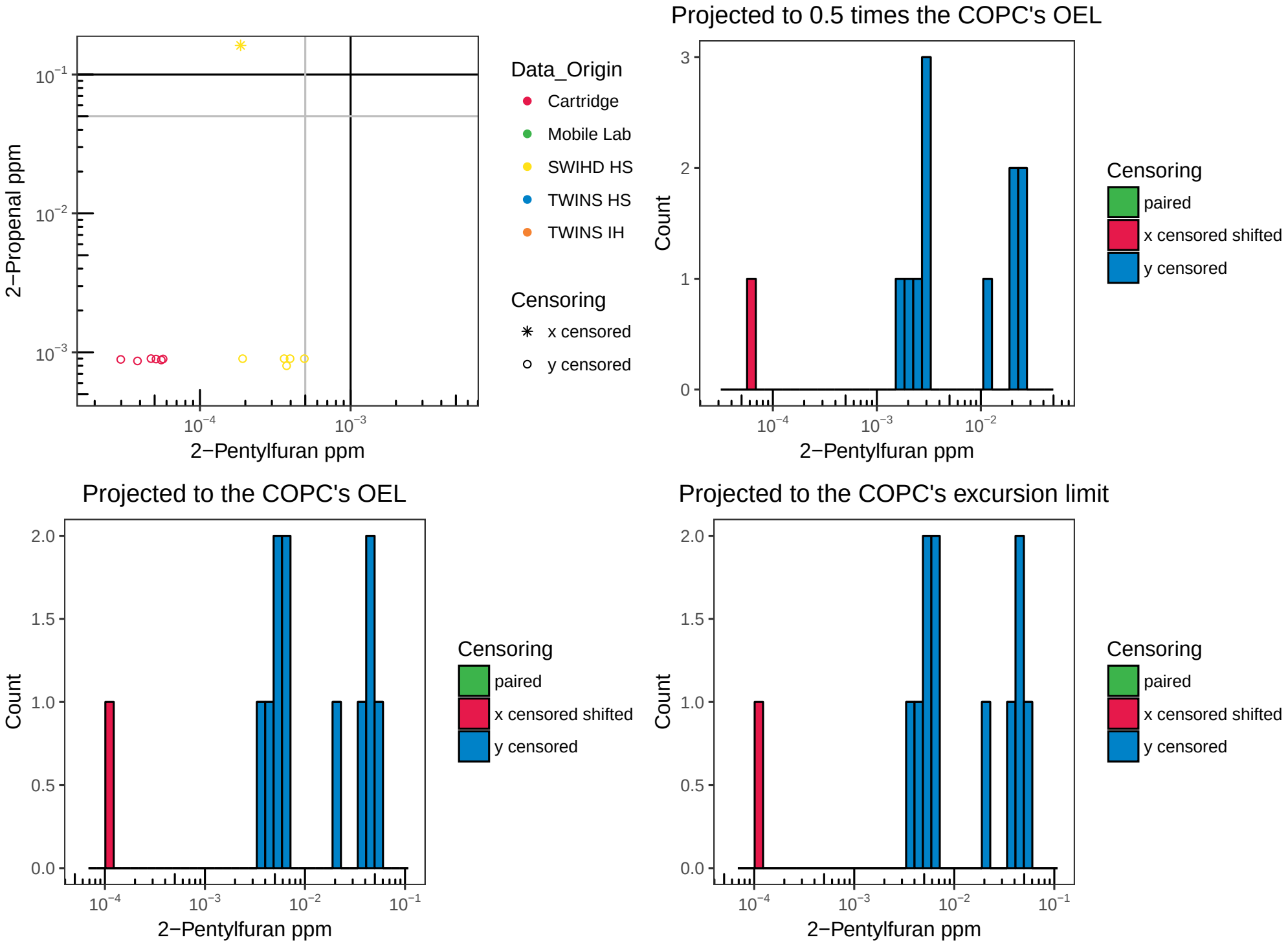


Figure C.1305: 2-Propenal vs 2-Pentylfuran

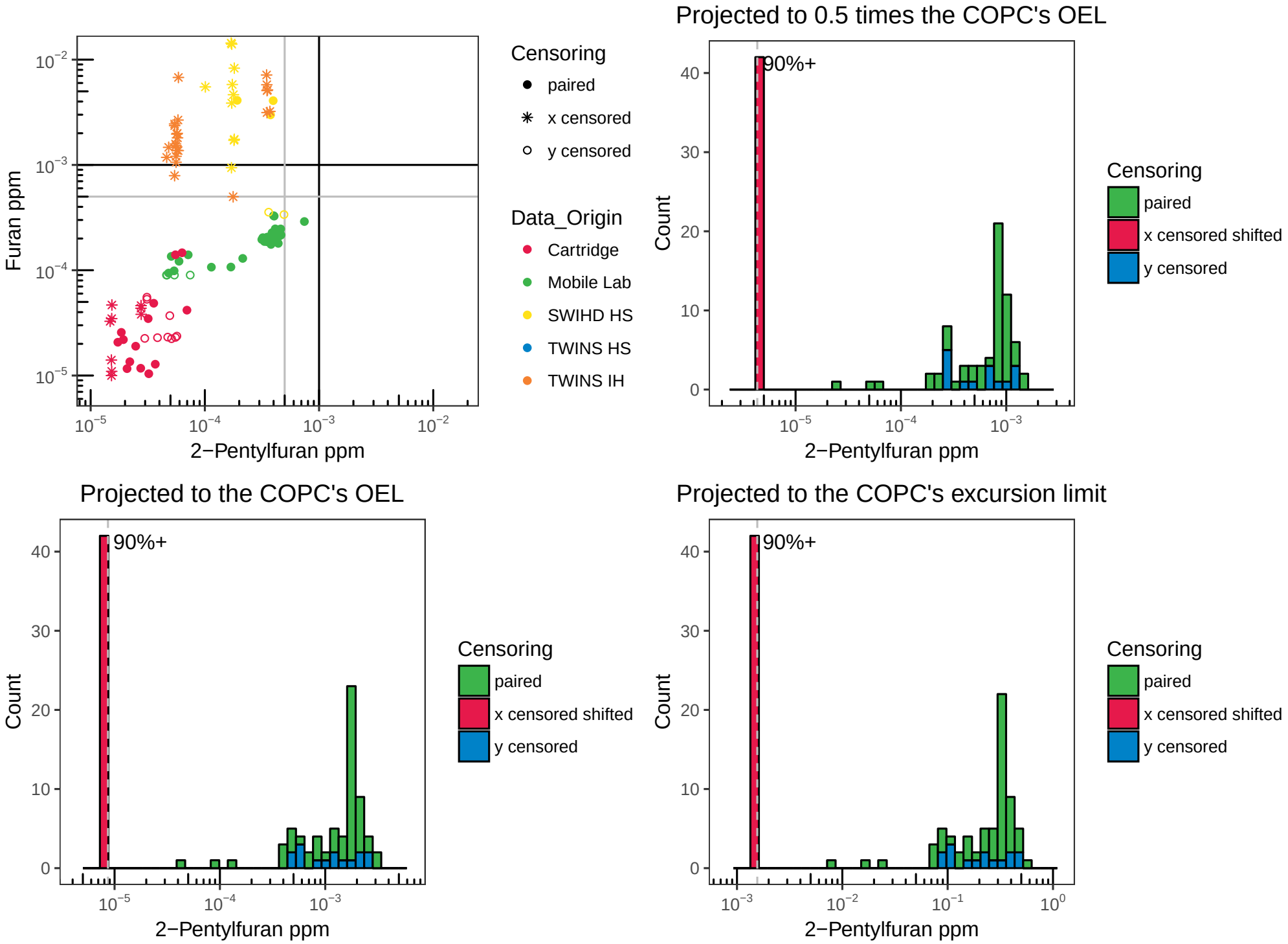


Figure C.1306: Furan vs 2-Pentylfuran

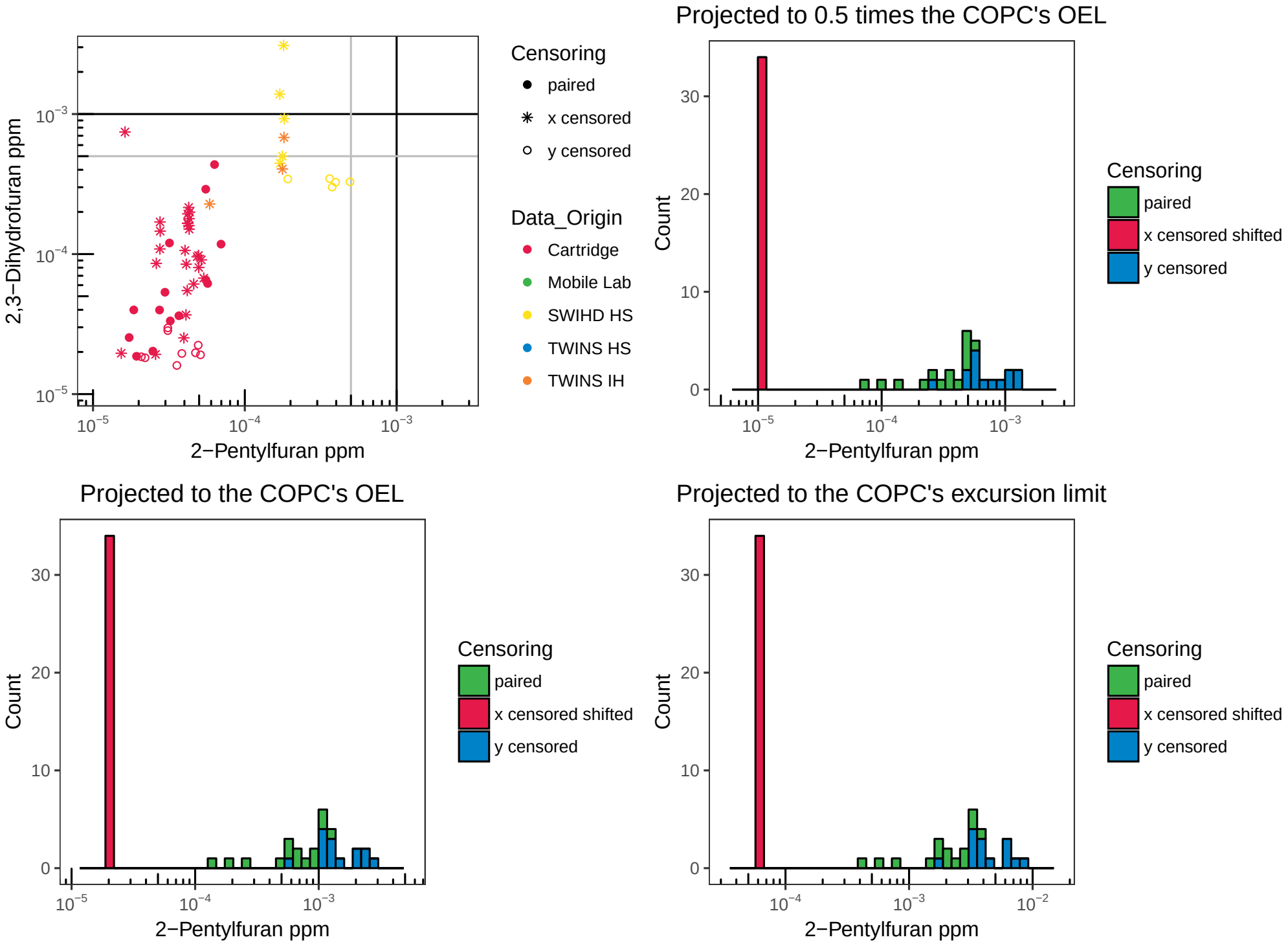


Figure C.1307: 2,3-Dihydrofuran vs 2-Pentylfuran

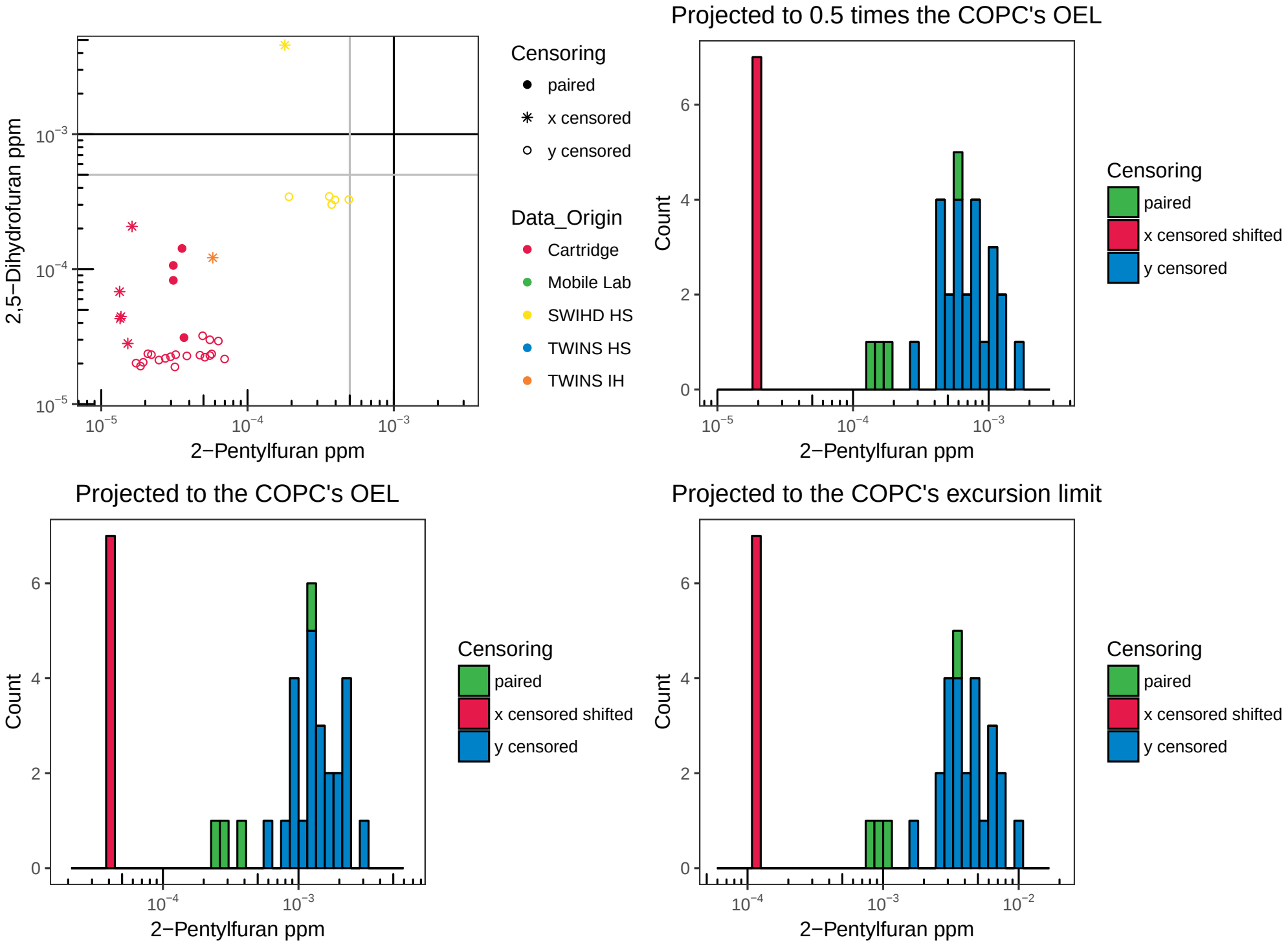


Figure C.1308: 2,5-Dihydrofuran vs 2-Pentylfuran

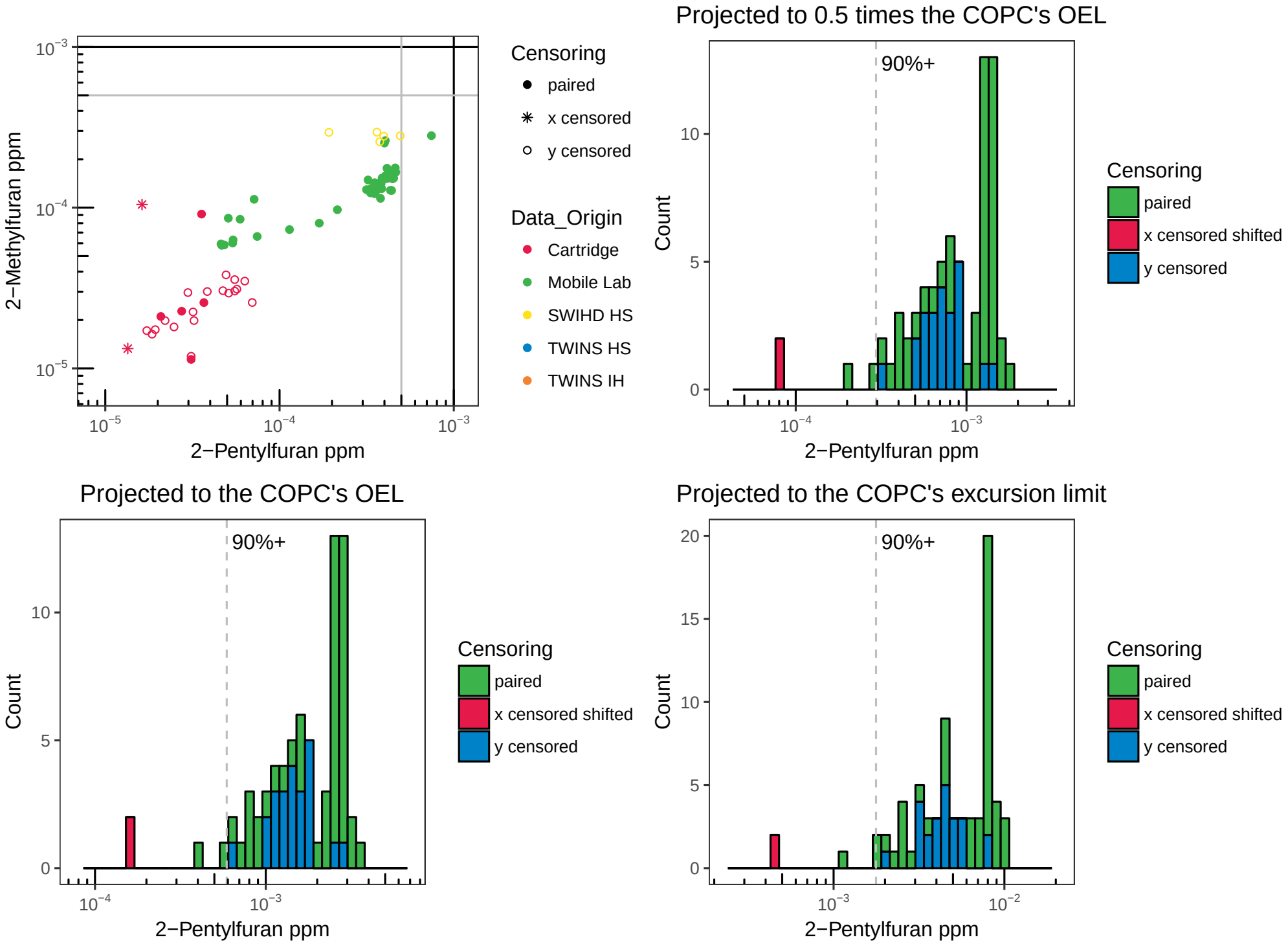


Figure C.1309: 2-Methylfuran vs 2-Pentylfuran

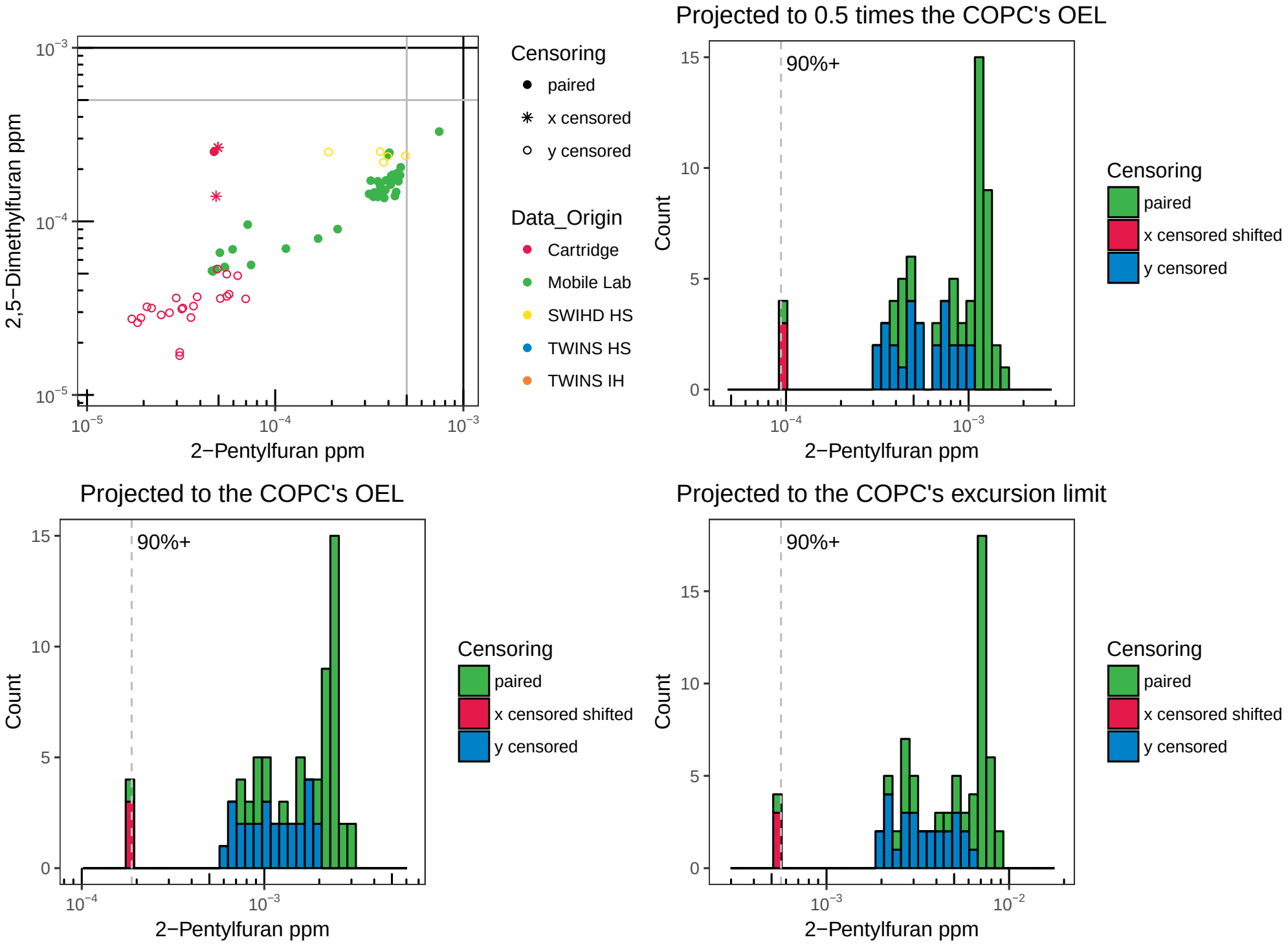


Figure C.1310: 2,5-Dimethylfuran vs 2-Pentylfuran

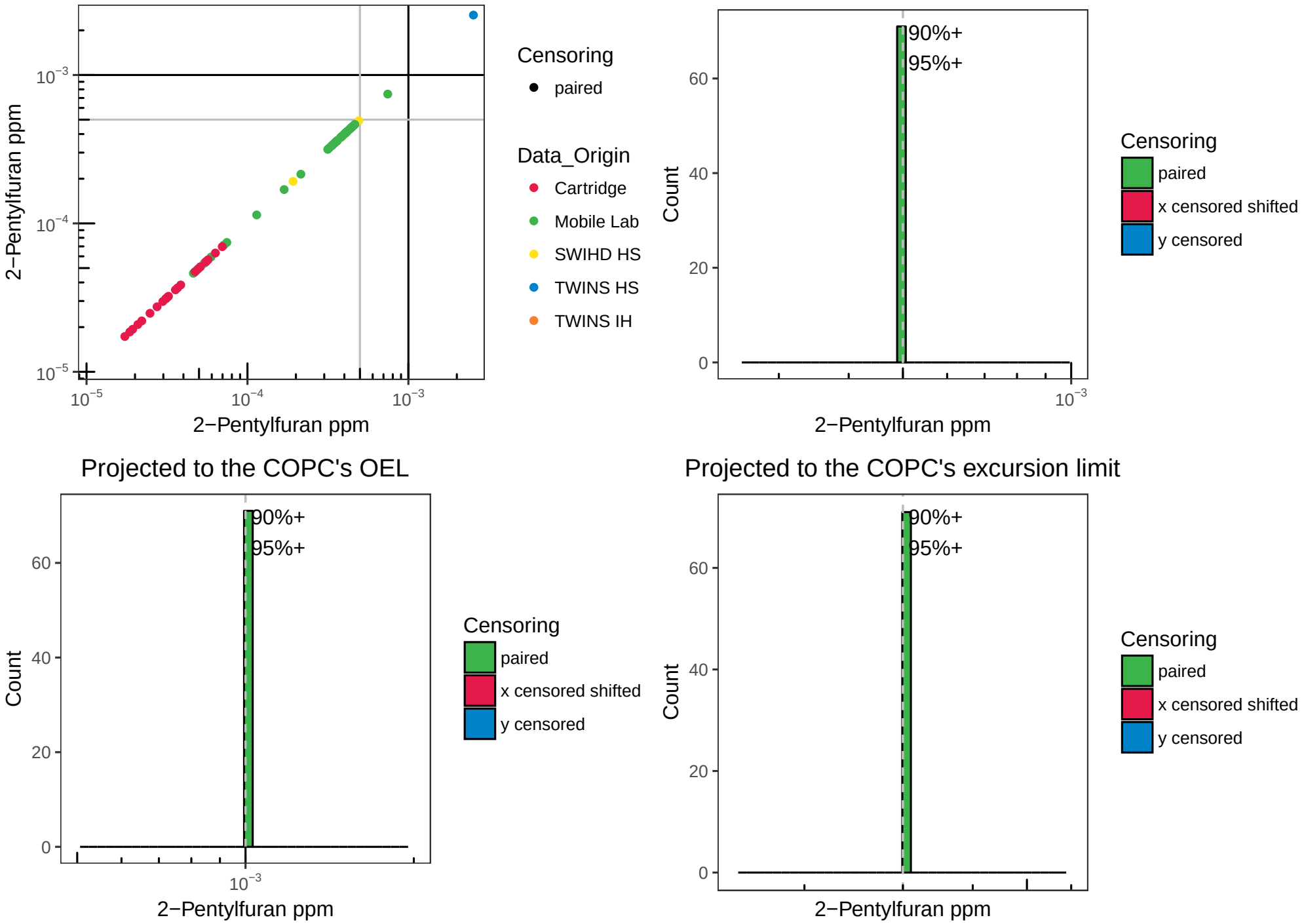


Figure C.1311: 2-Pentylfuran vs 2-Pentylfuran

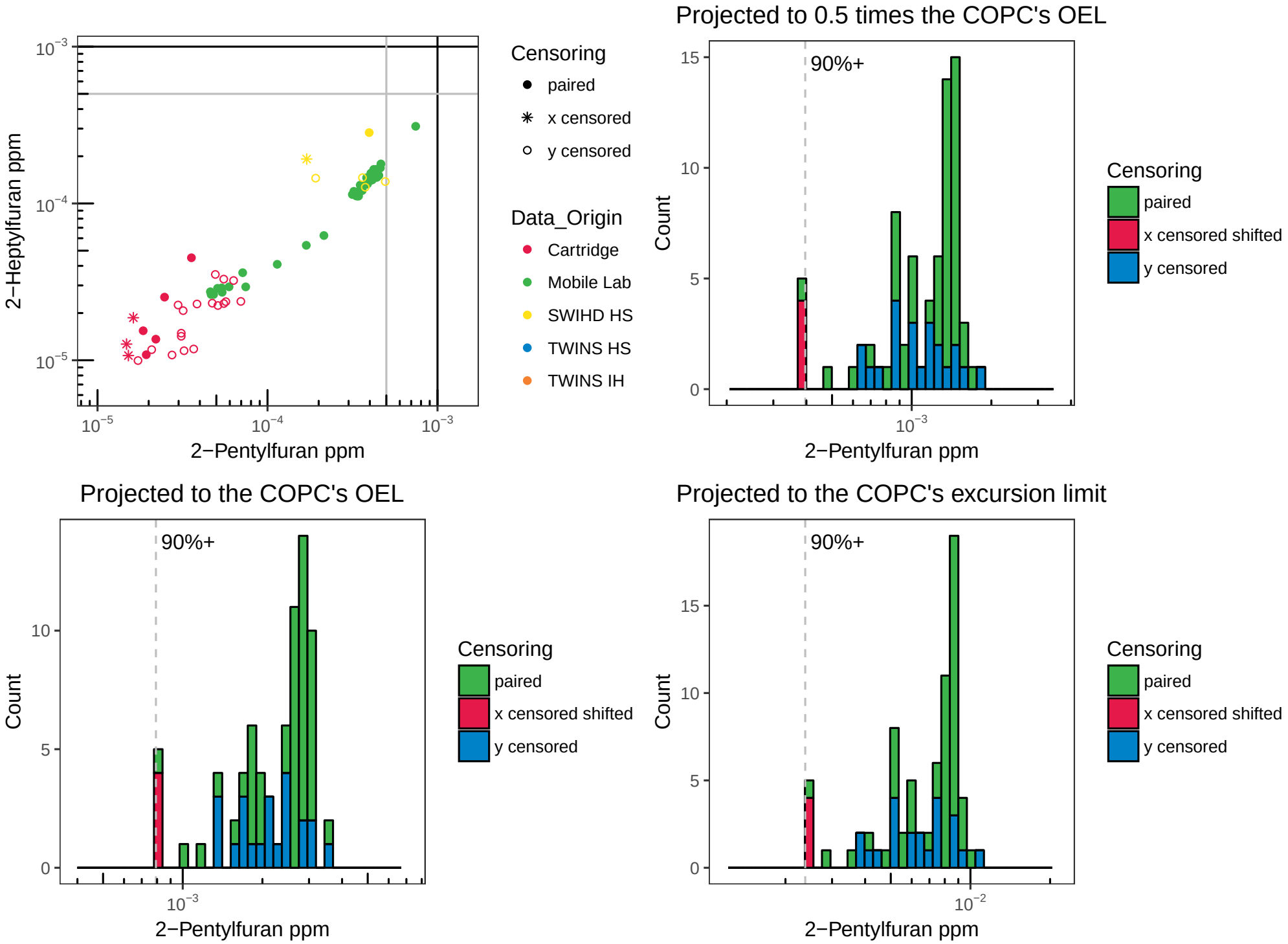


Figure C.1312: 2-Heptylfuran vs 2-Pentylfuran

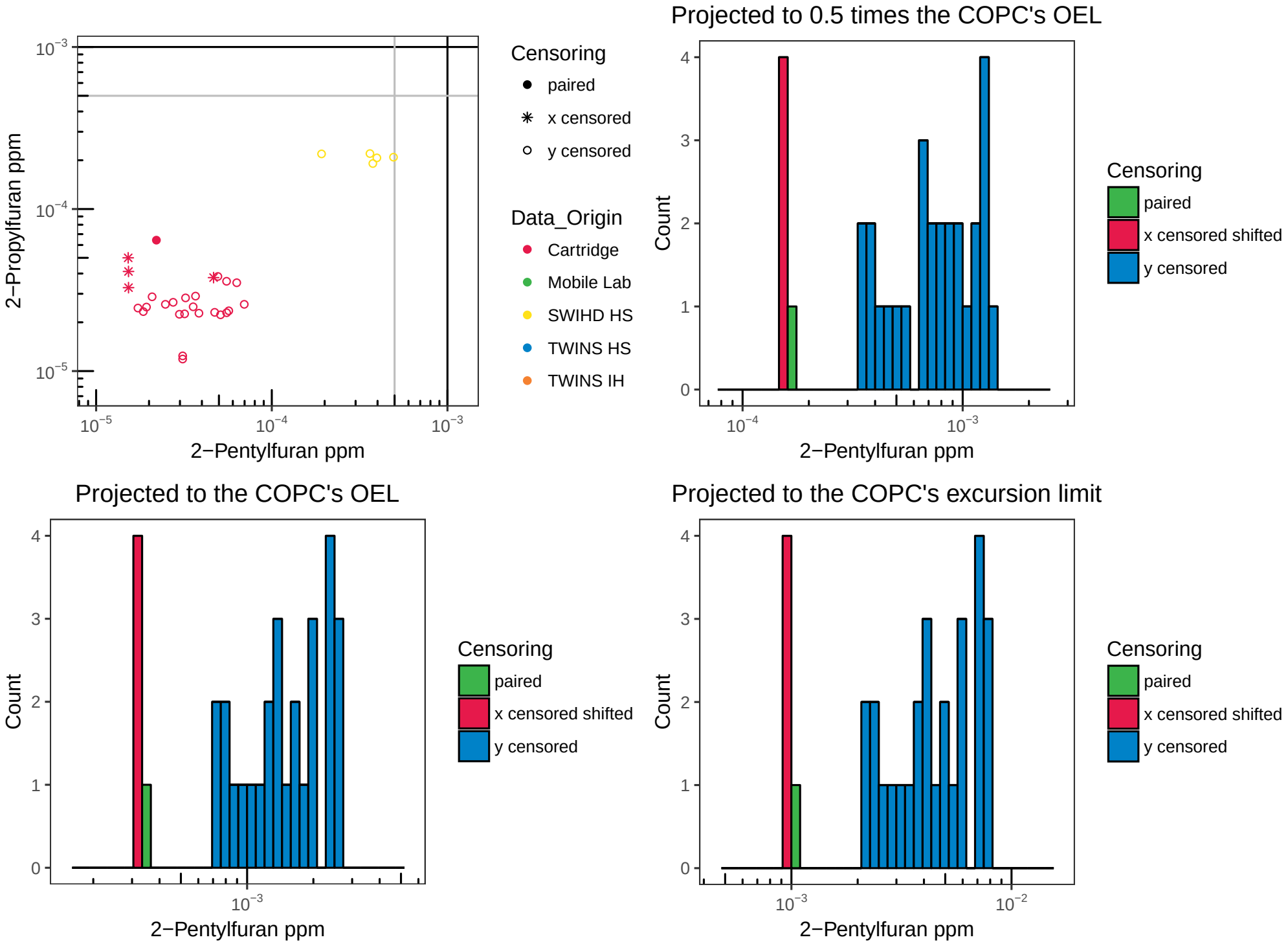


Figure C.1313: 2-Propylfuran vs 2-Pentylfuran

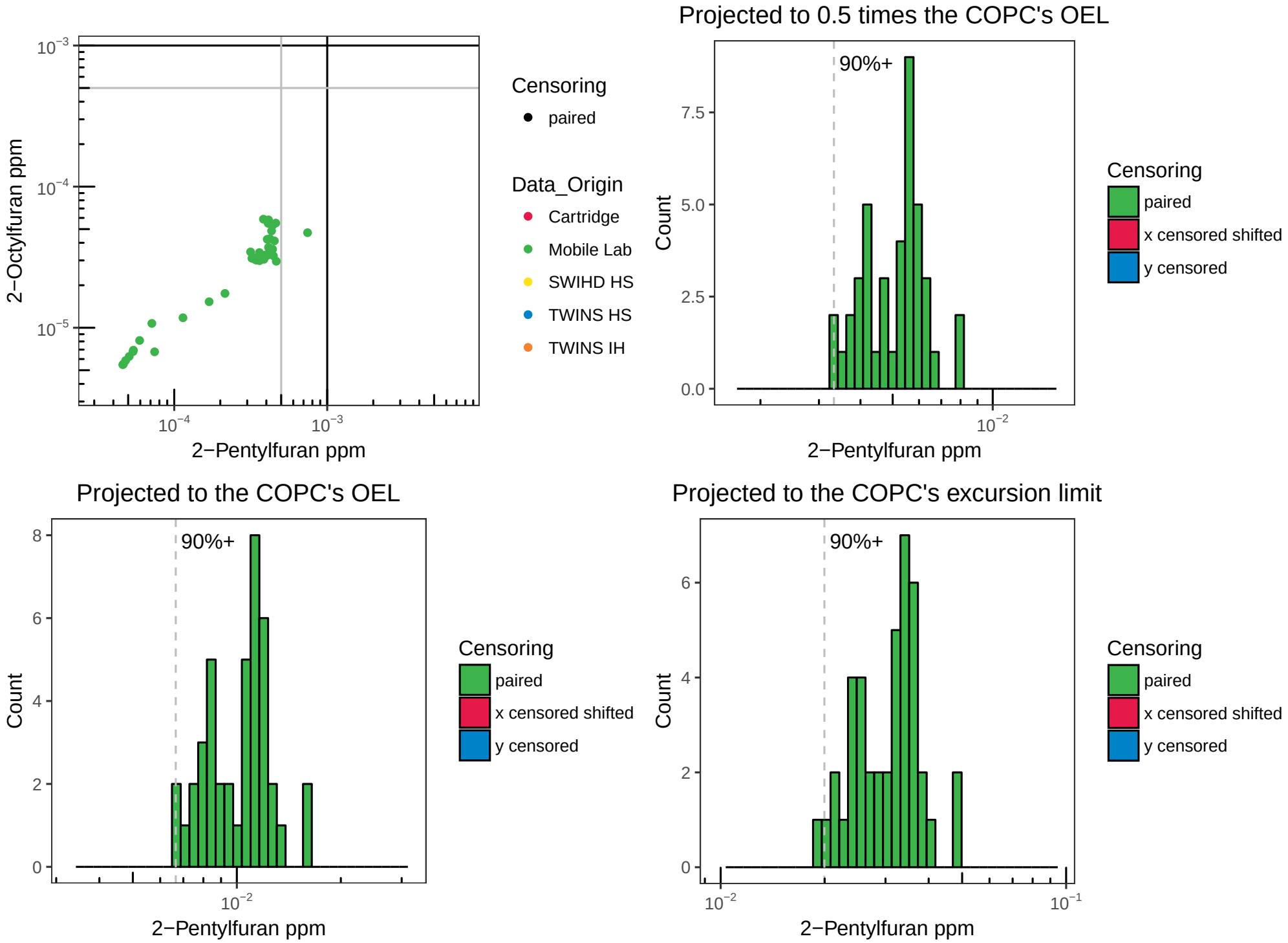


Figure C.1314: 2-Octylfuran vs 2-Pentylfuran

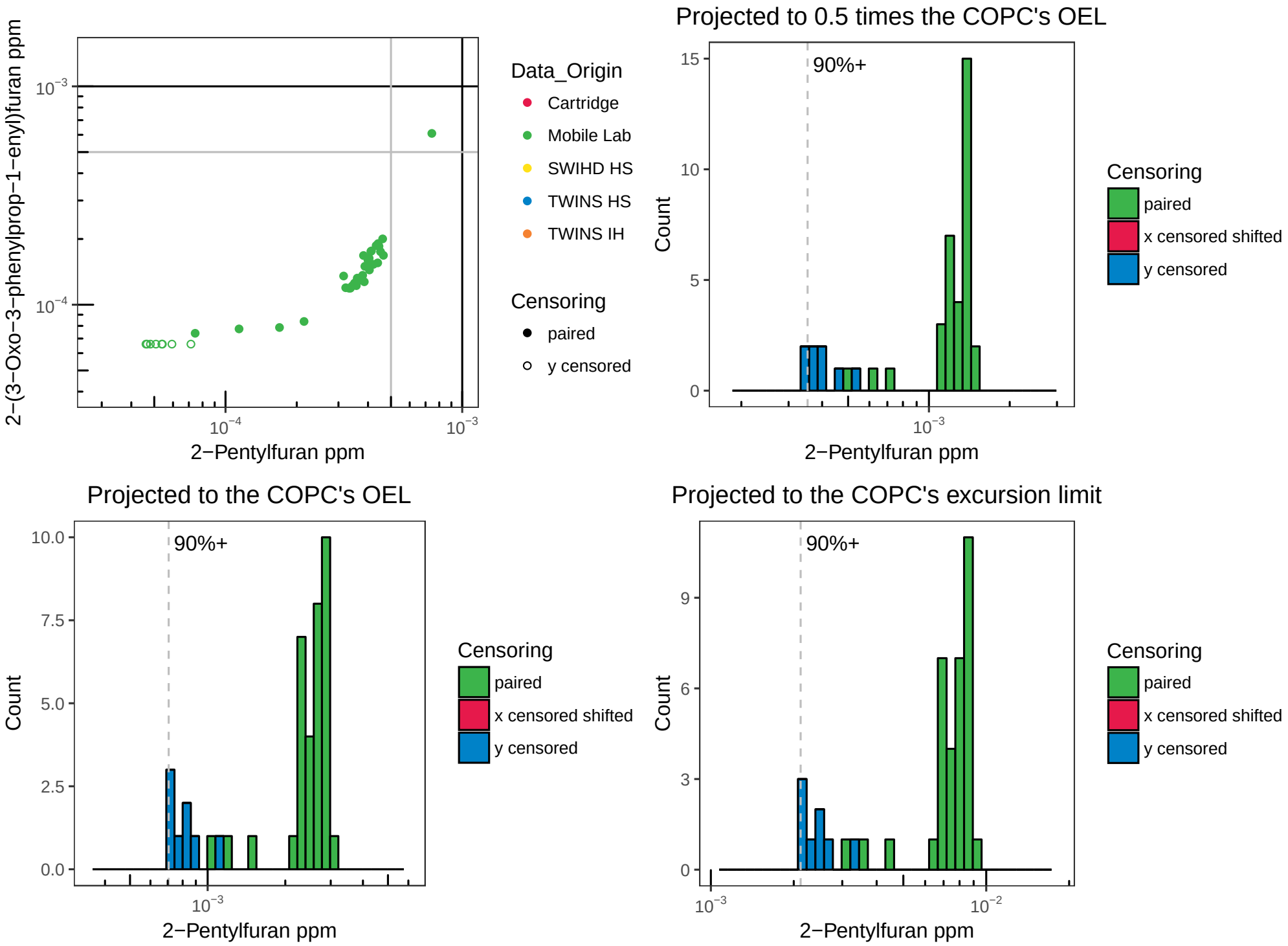


Figure C.1315: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2-Pentylfuran

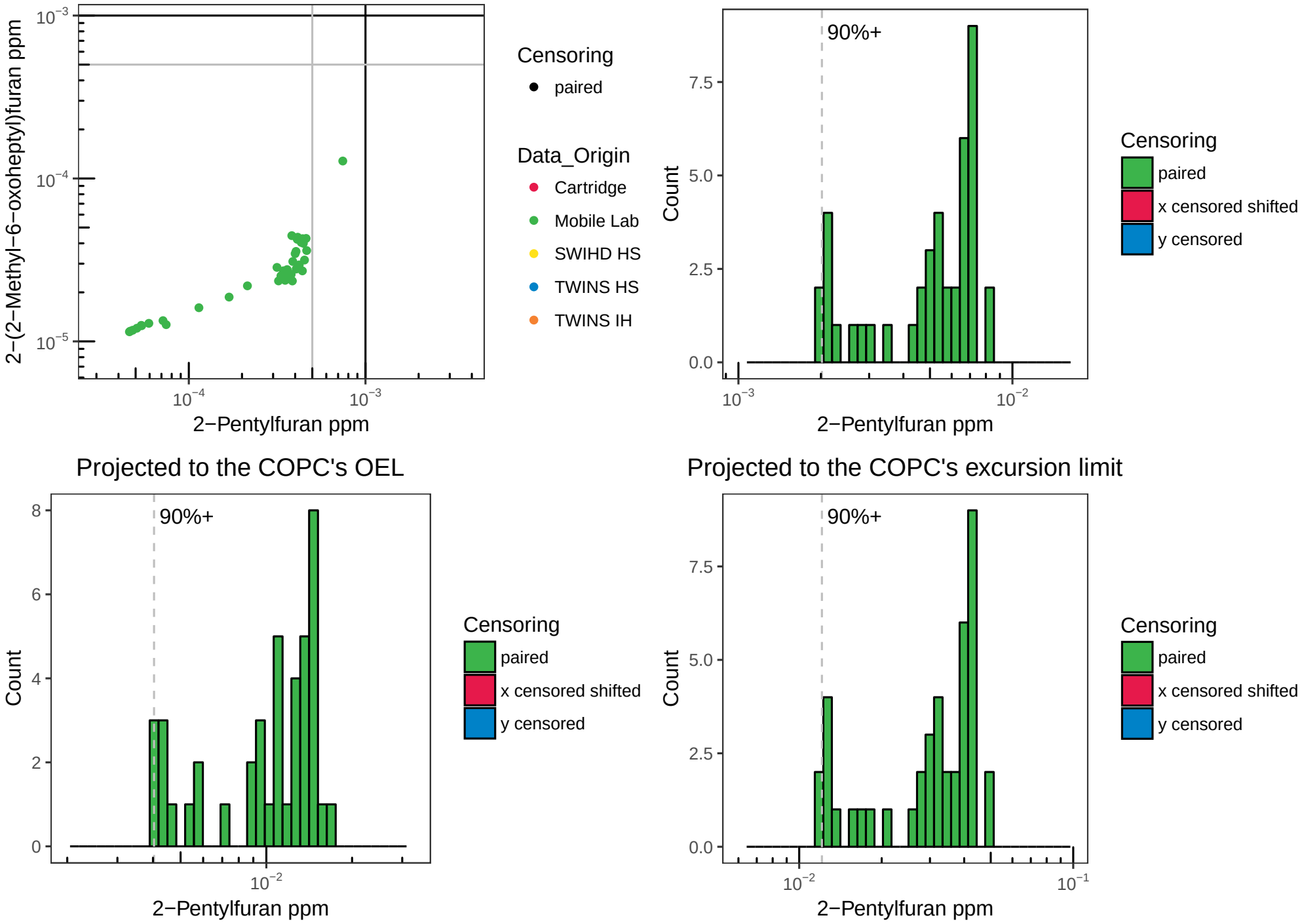


Figure C.1316: 2-(2-Methyl-6-oxoheptyl)furan vs 2-Pentylfuran

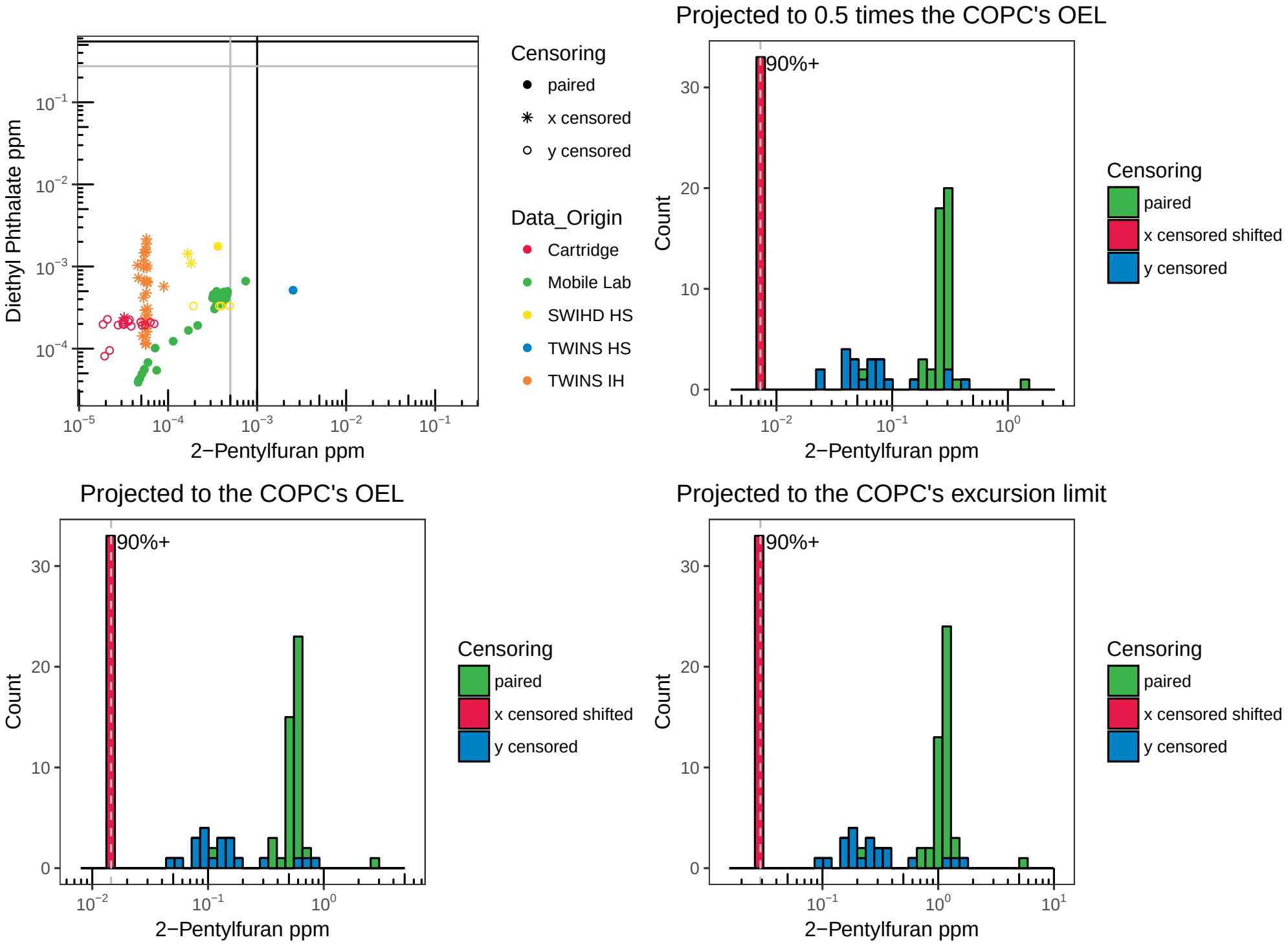


Figure C.1317: Diethyl Phthalate vs 2-Pentylfuran

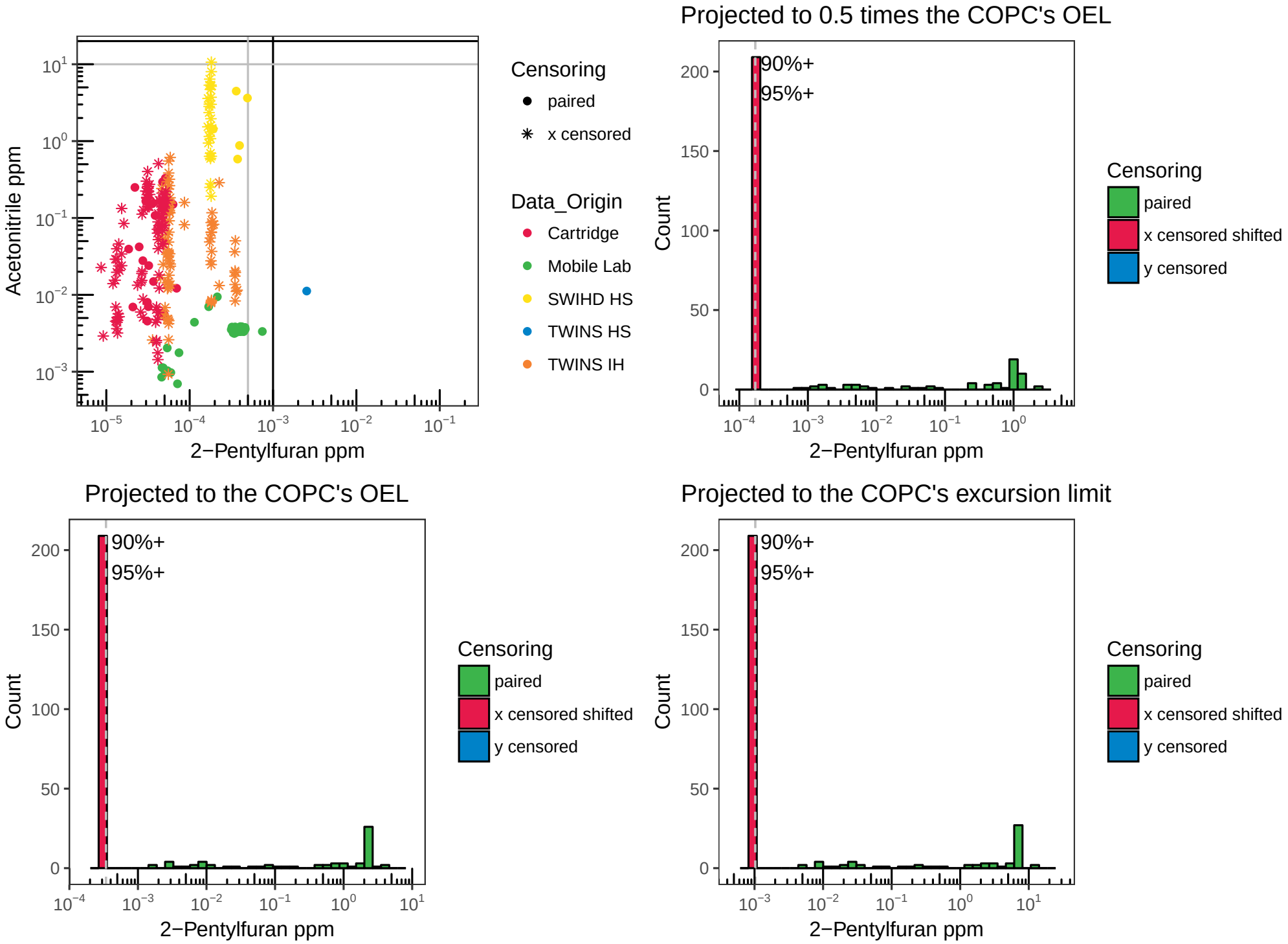


Figure C.1318: Acetonitrile vs 2-Pentylfuran

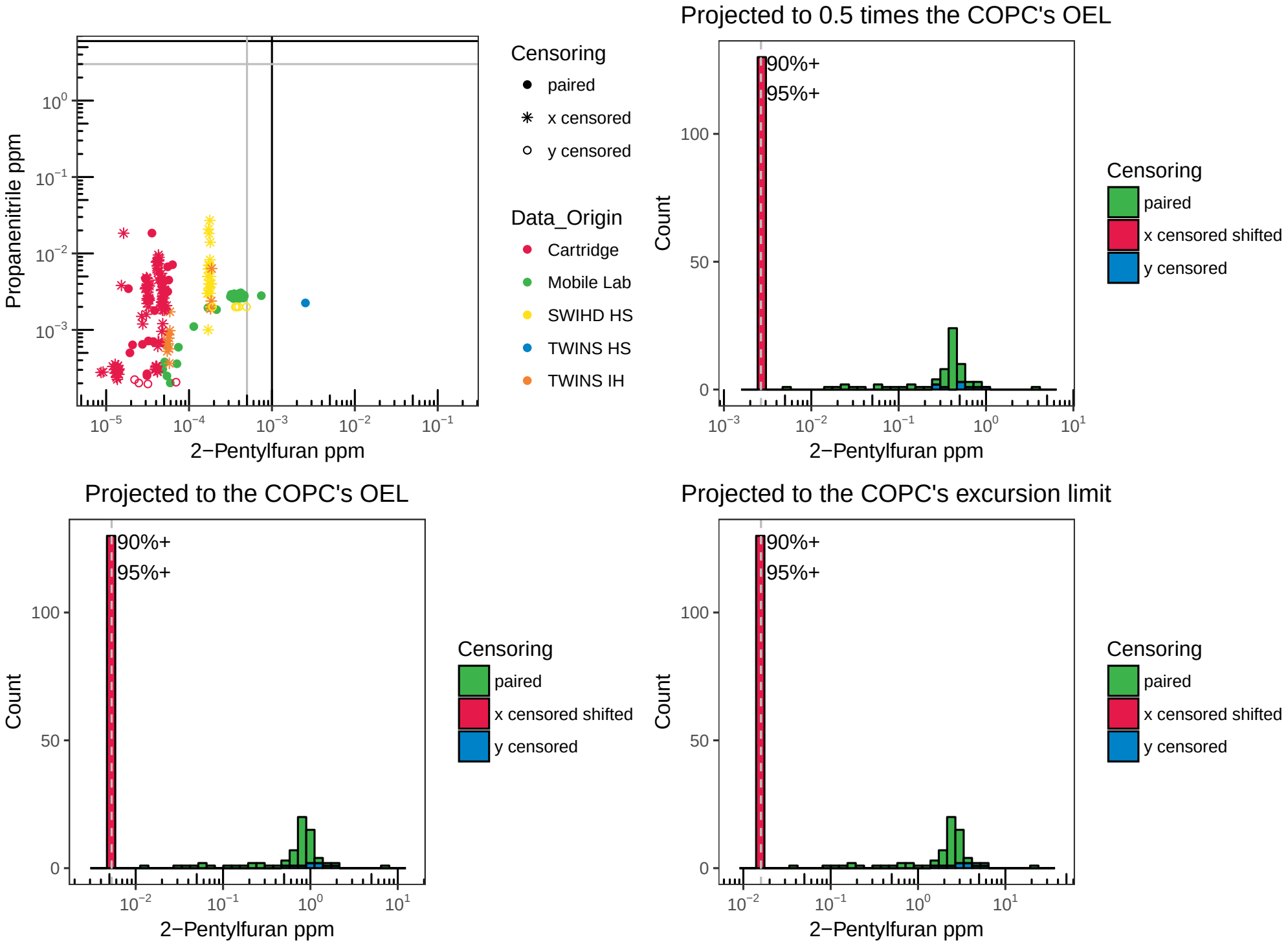


Figure C.1319: Propanenitrile vs 2-Pentylfuran

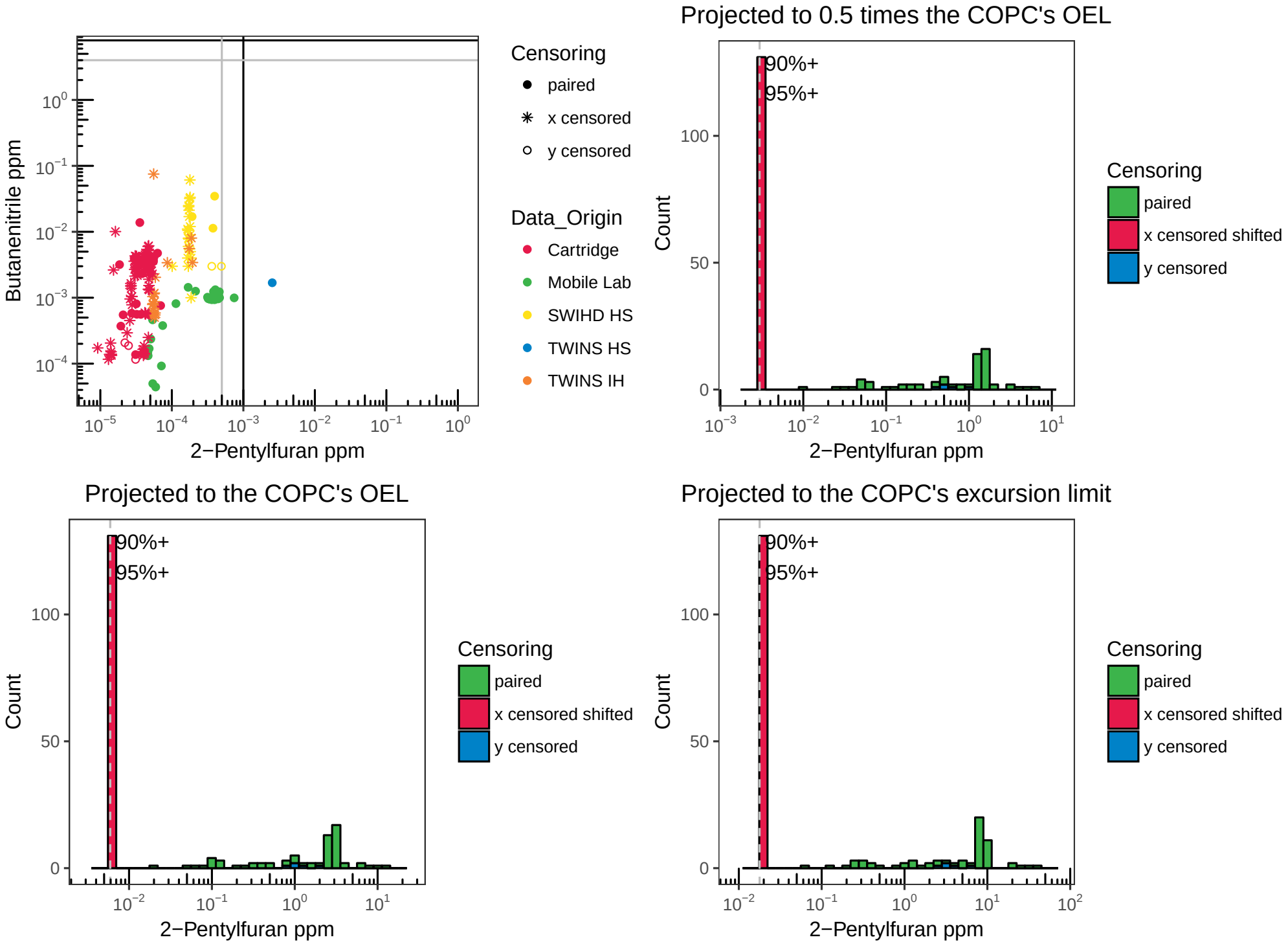


Figure C.1320: Butanenitrile vs 2-Pentylfuran

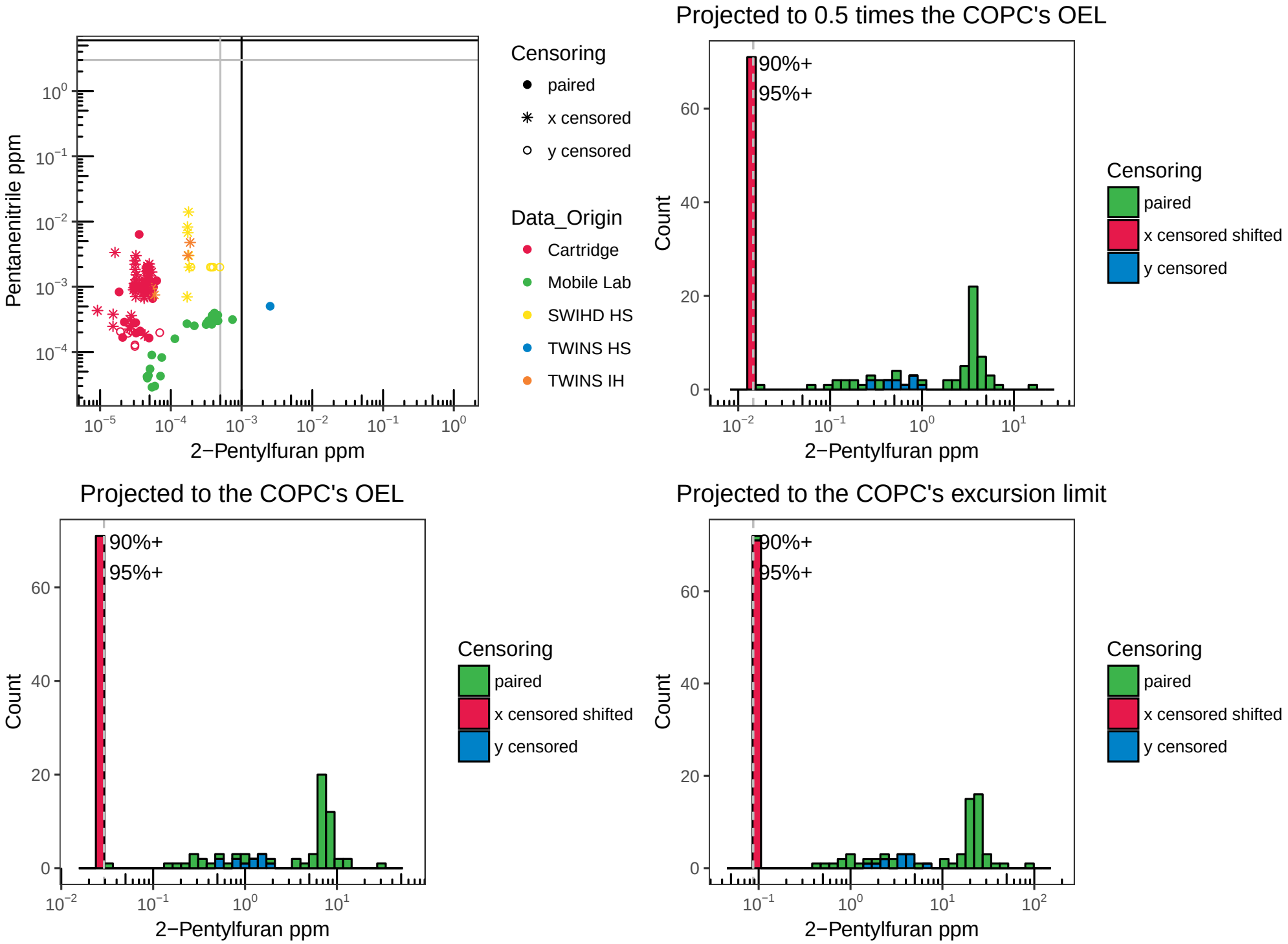


Figure C.1321: Pentanenitrile vs 2-Pentylfuran

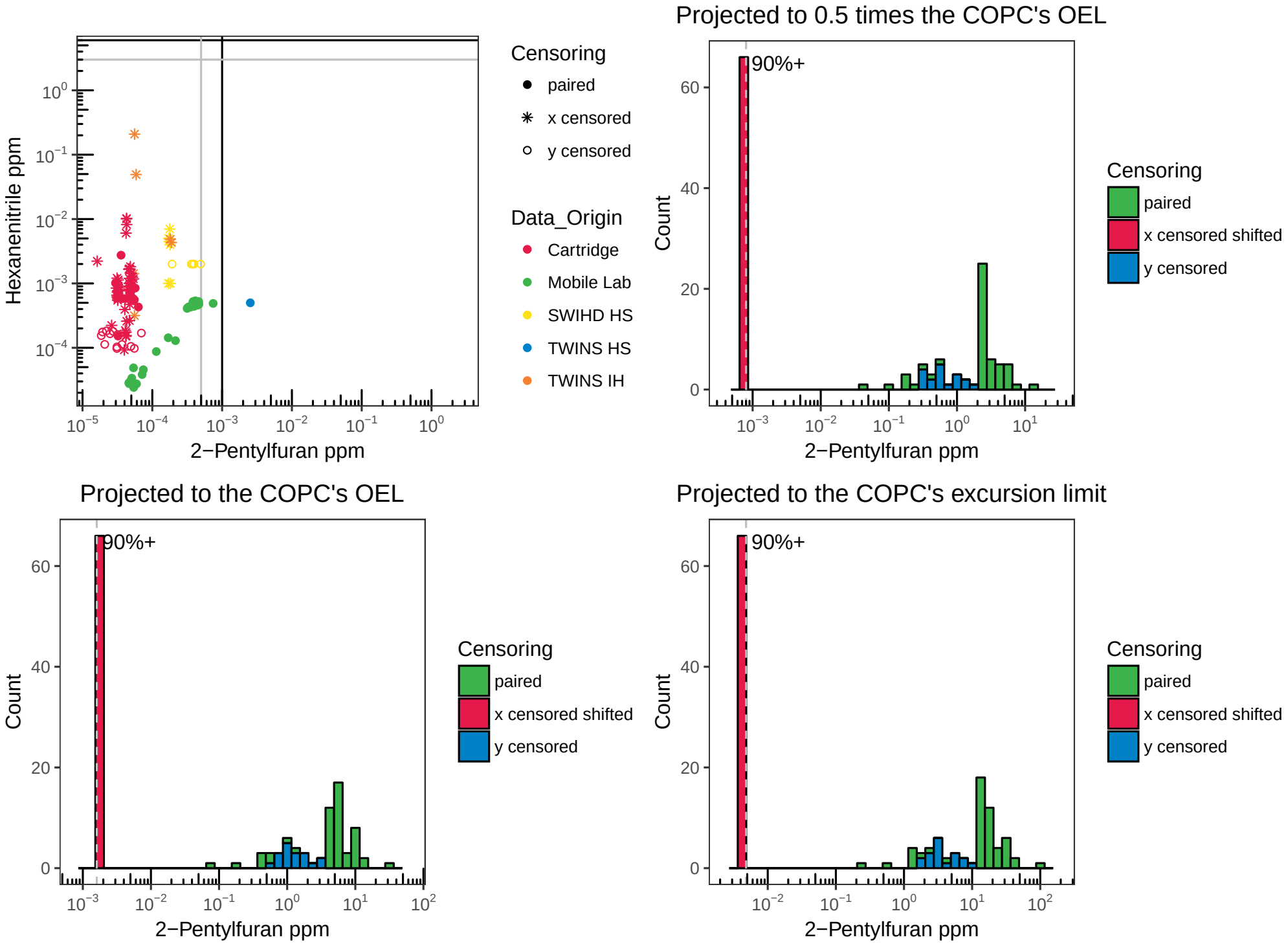


Figure C.1322: Hexanenitrile vs 2-Pentylfuran

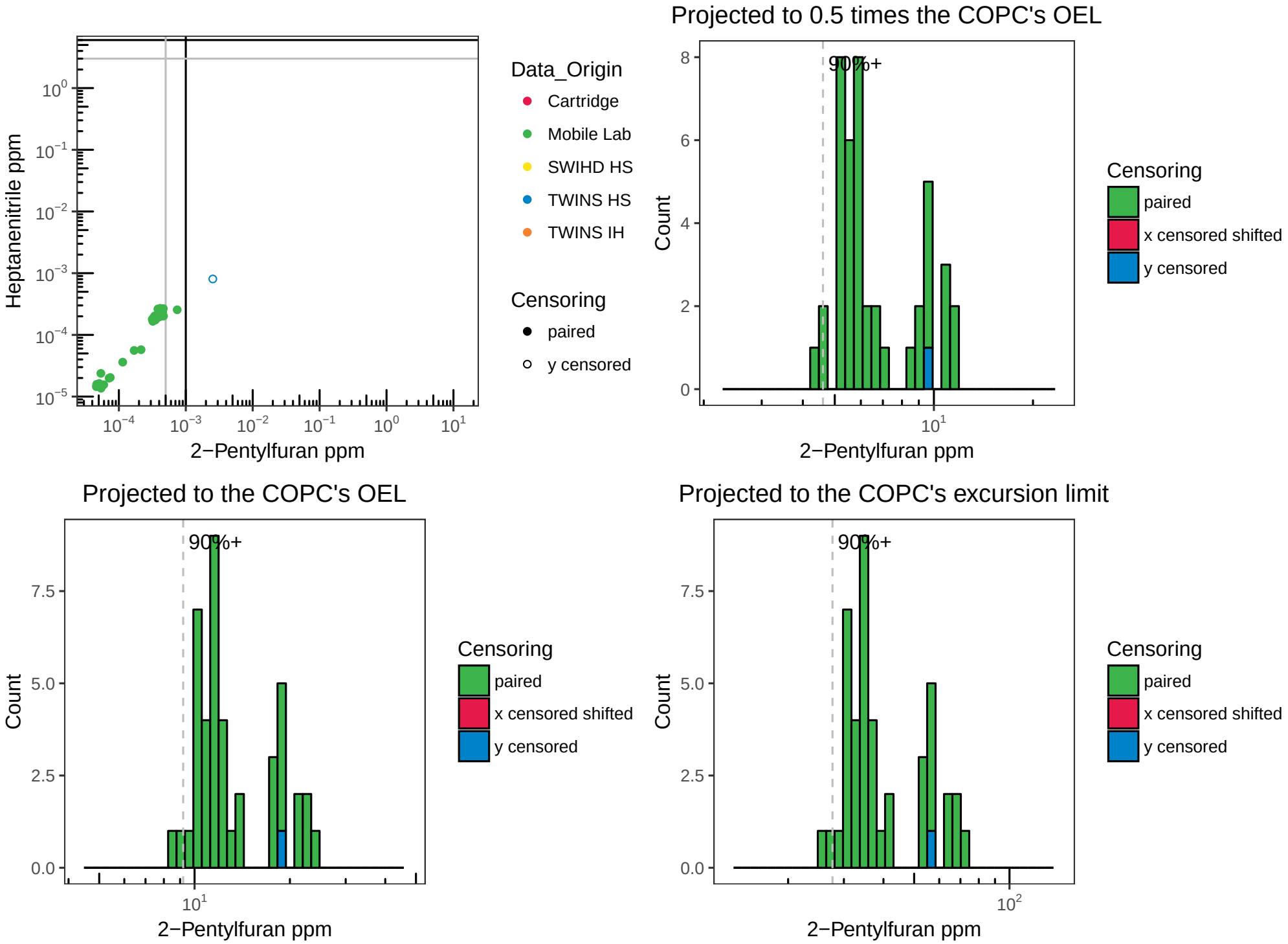


Figure C.1323: Heptanenitrile vs 2-Pentylfuran

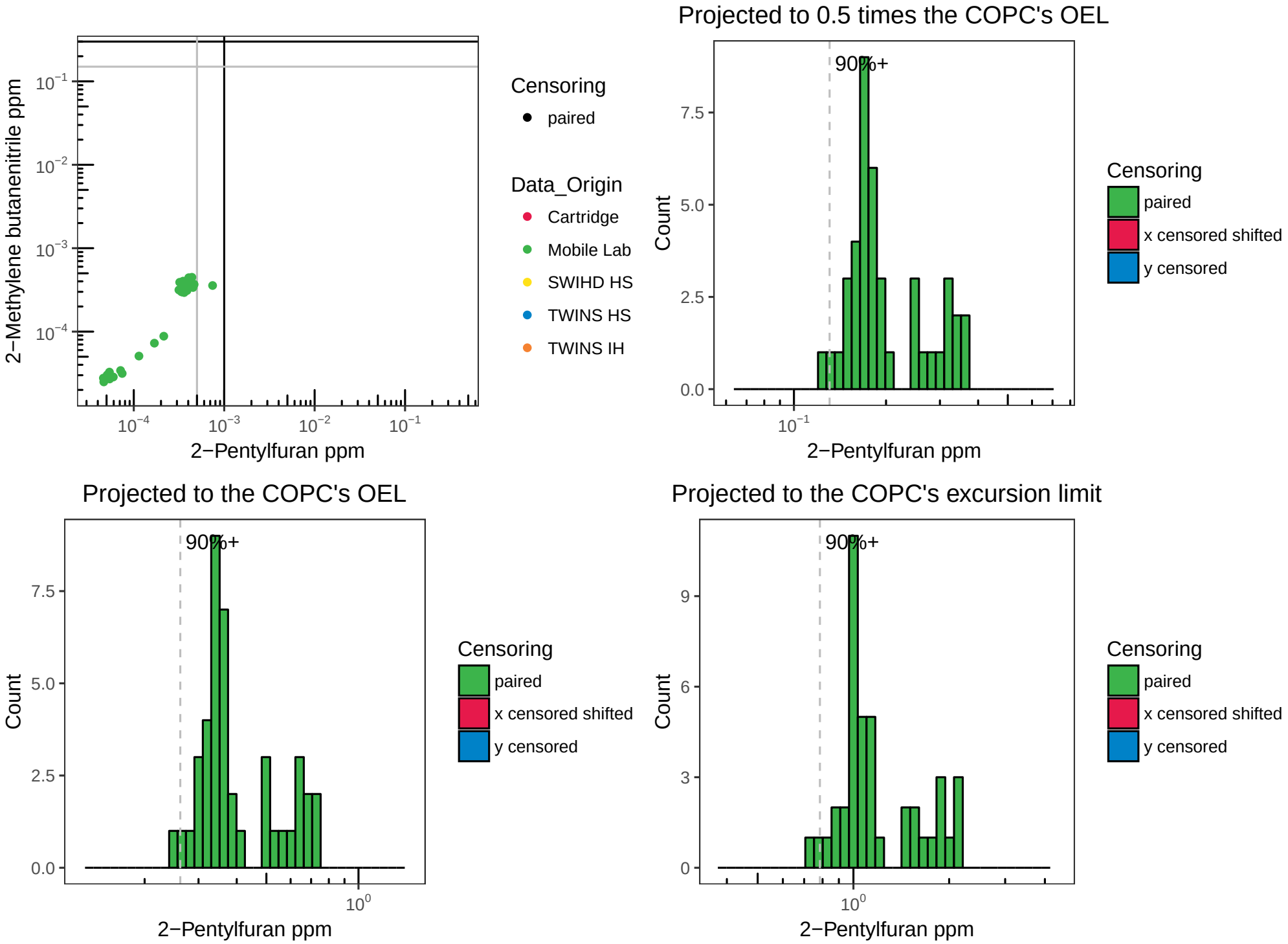


Figure C.1324: 2-Methylene butanenitrile vs 2-Pentylfuran

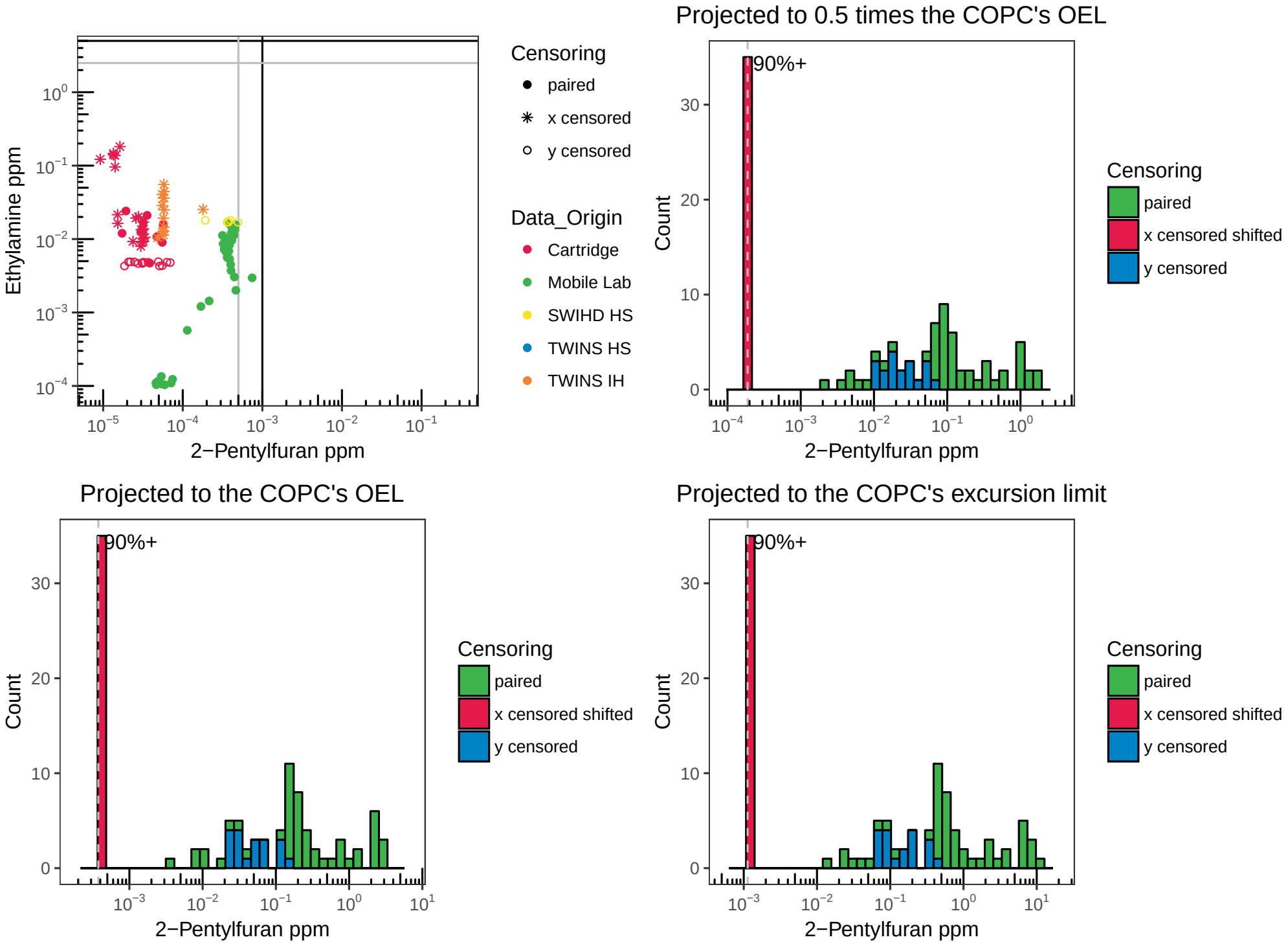


Figure C.1325: Ethylamine vs 2-Pentylfuran

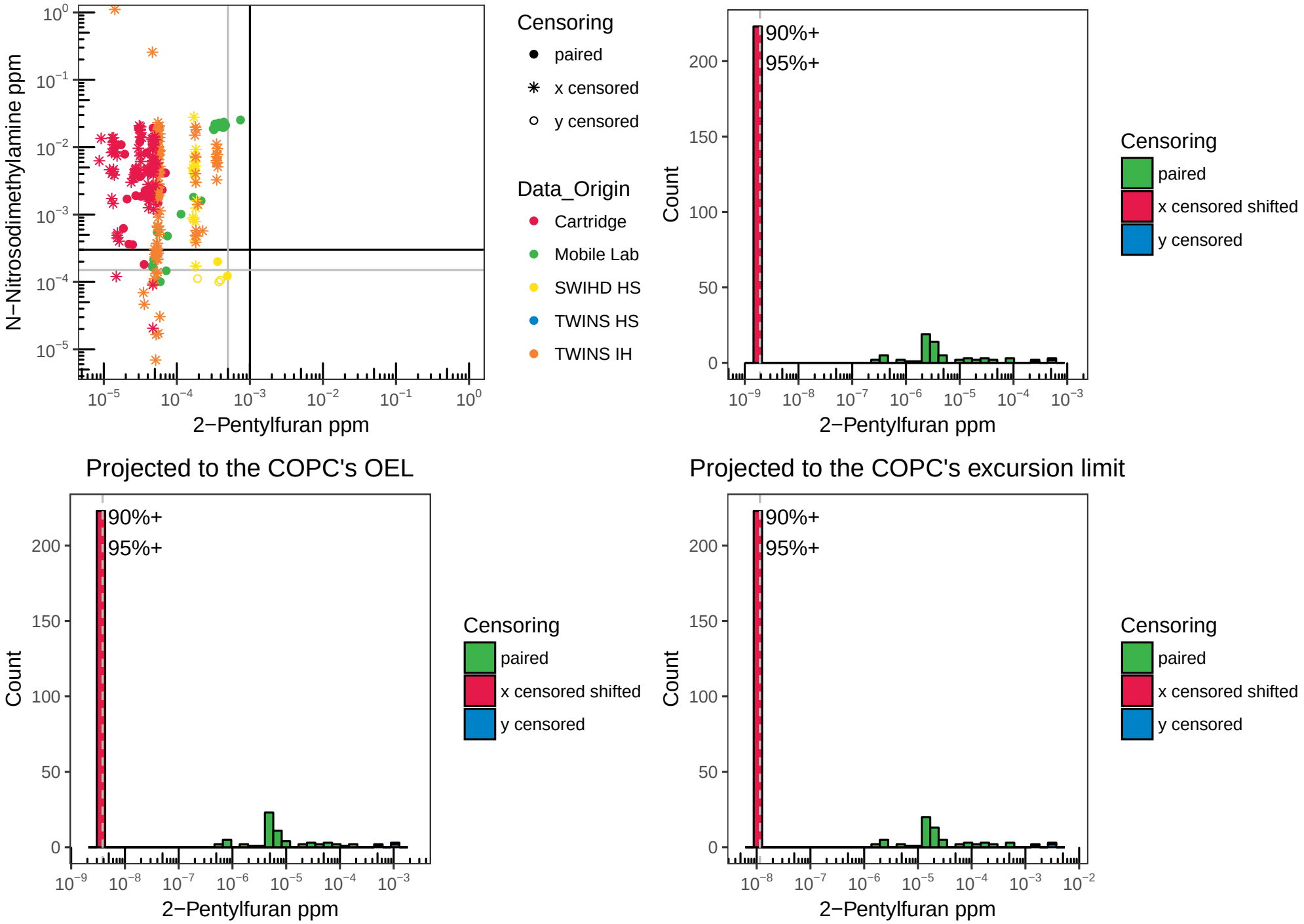


Figure C.1326: N-Nitrosodimethylamine vs 2-Pentylfuran

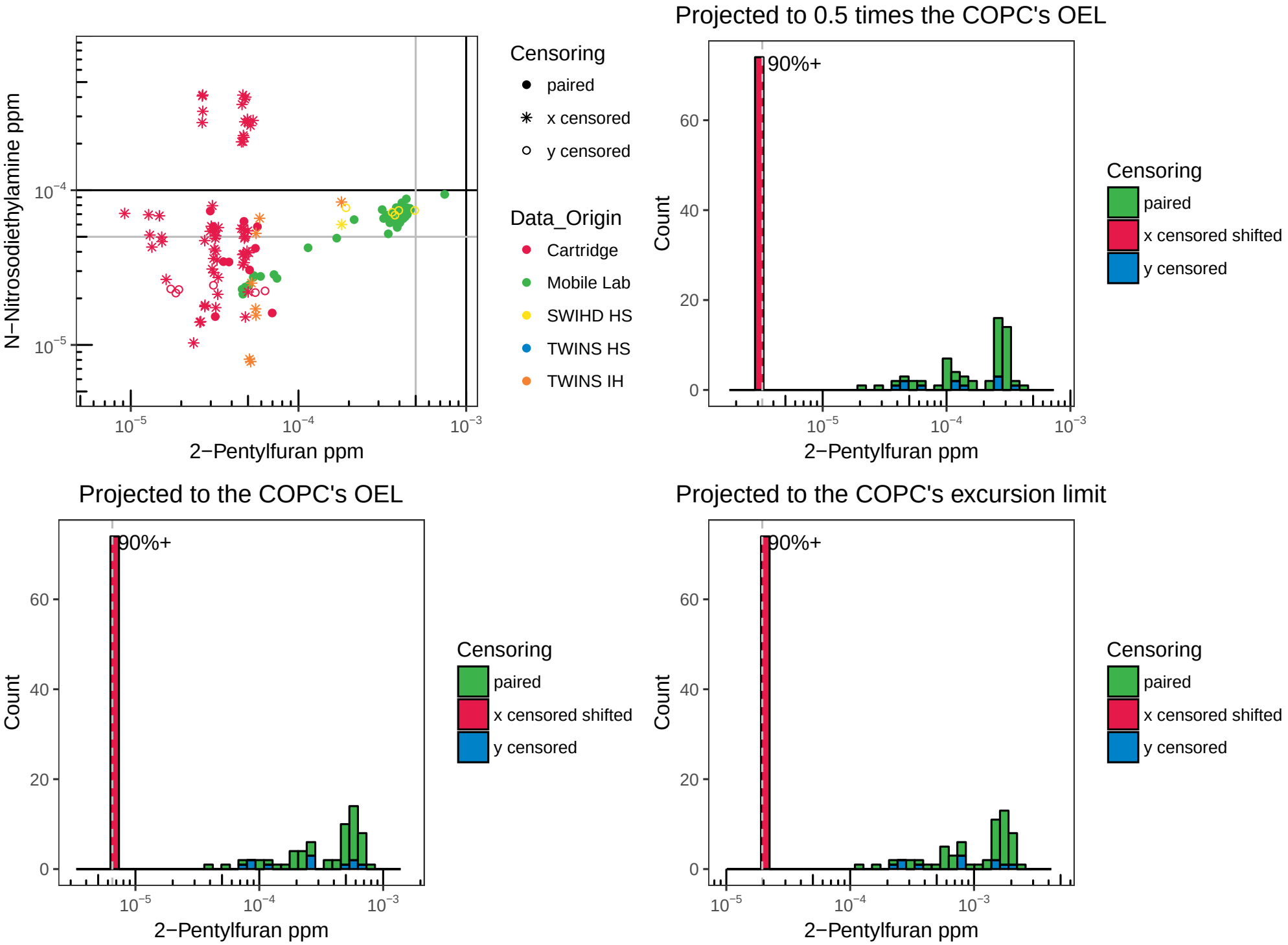


Figure C.1327: N-Nitrosodiethylamine vs 2-Pentylfuran

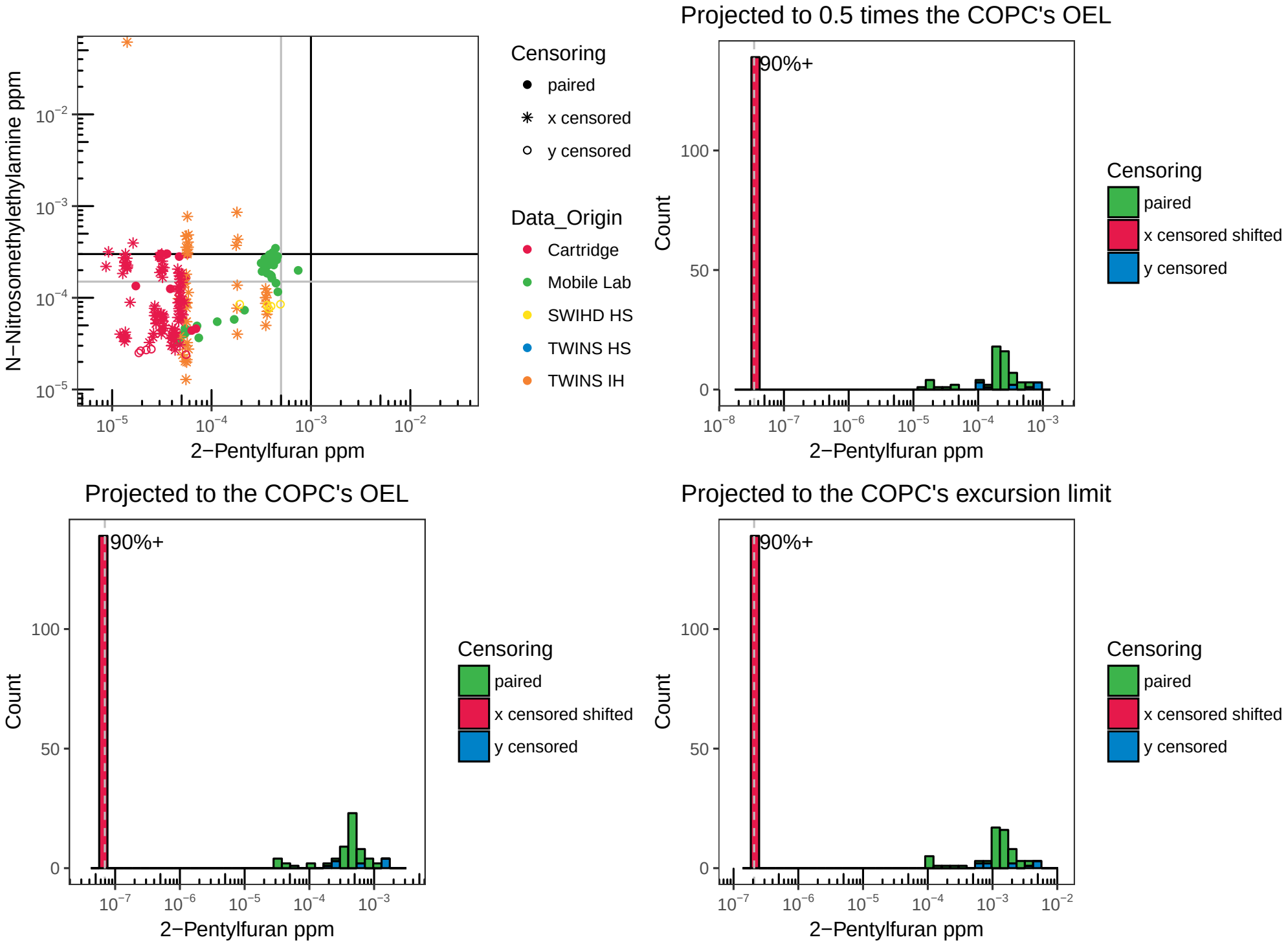


Figure C.1328: N-Nitrosomethylethylamine vs 2-Pentylfuran

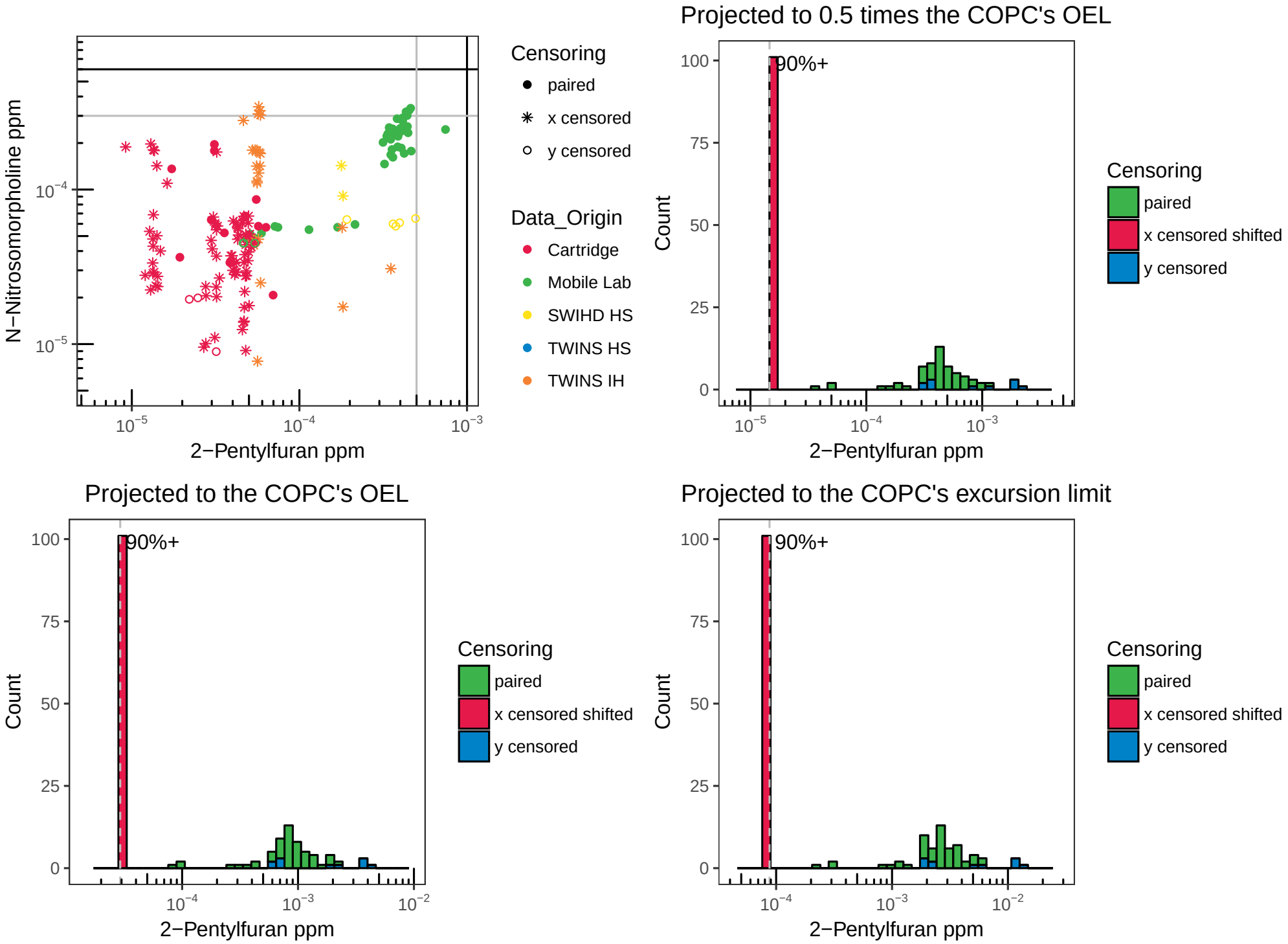


Figure C.1329: N-Nitrosomorpholine vs 2-Pentylfuran

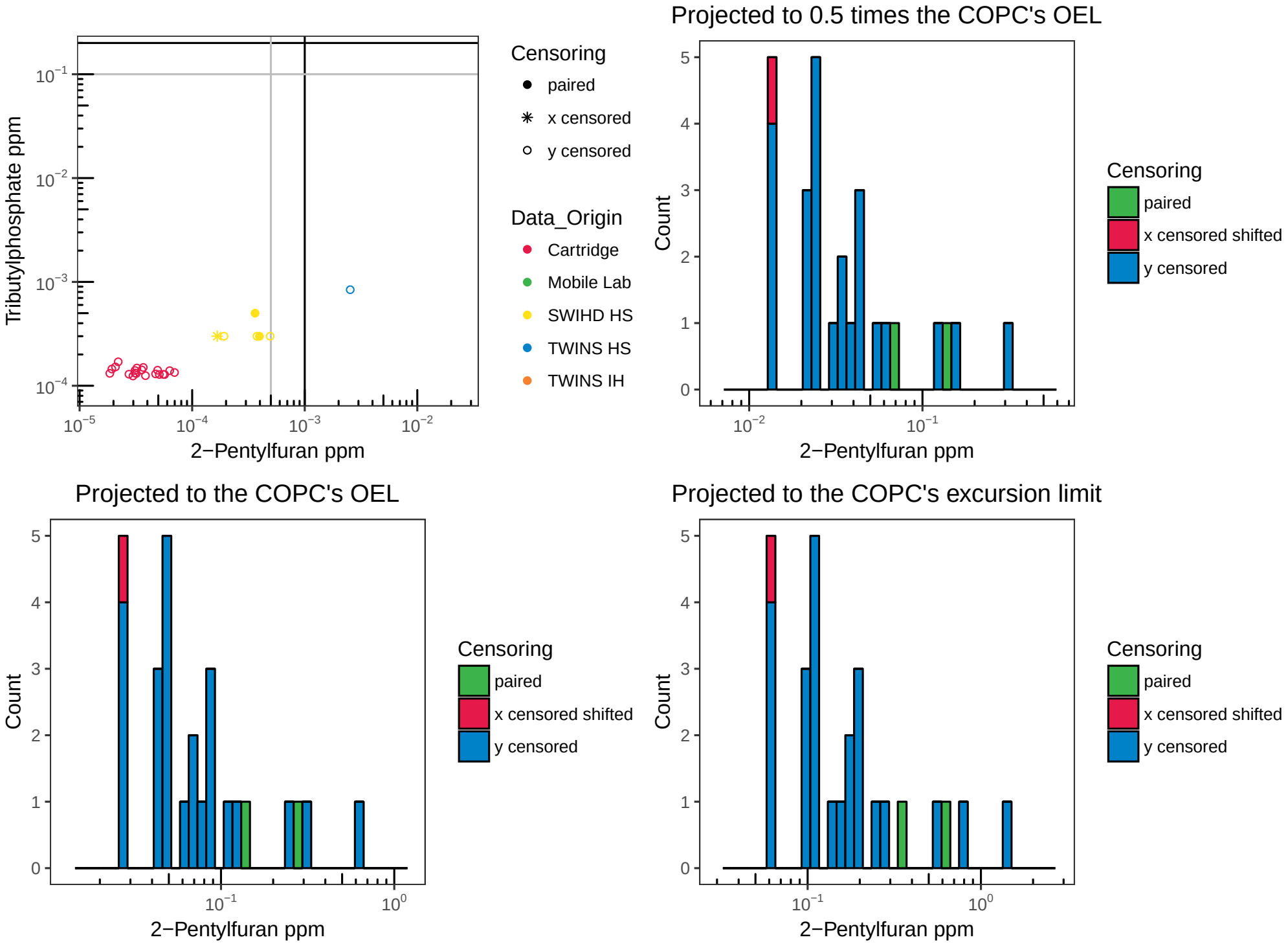


Figure C.1330: Tributylphosphate vs 2-Pentylfuran

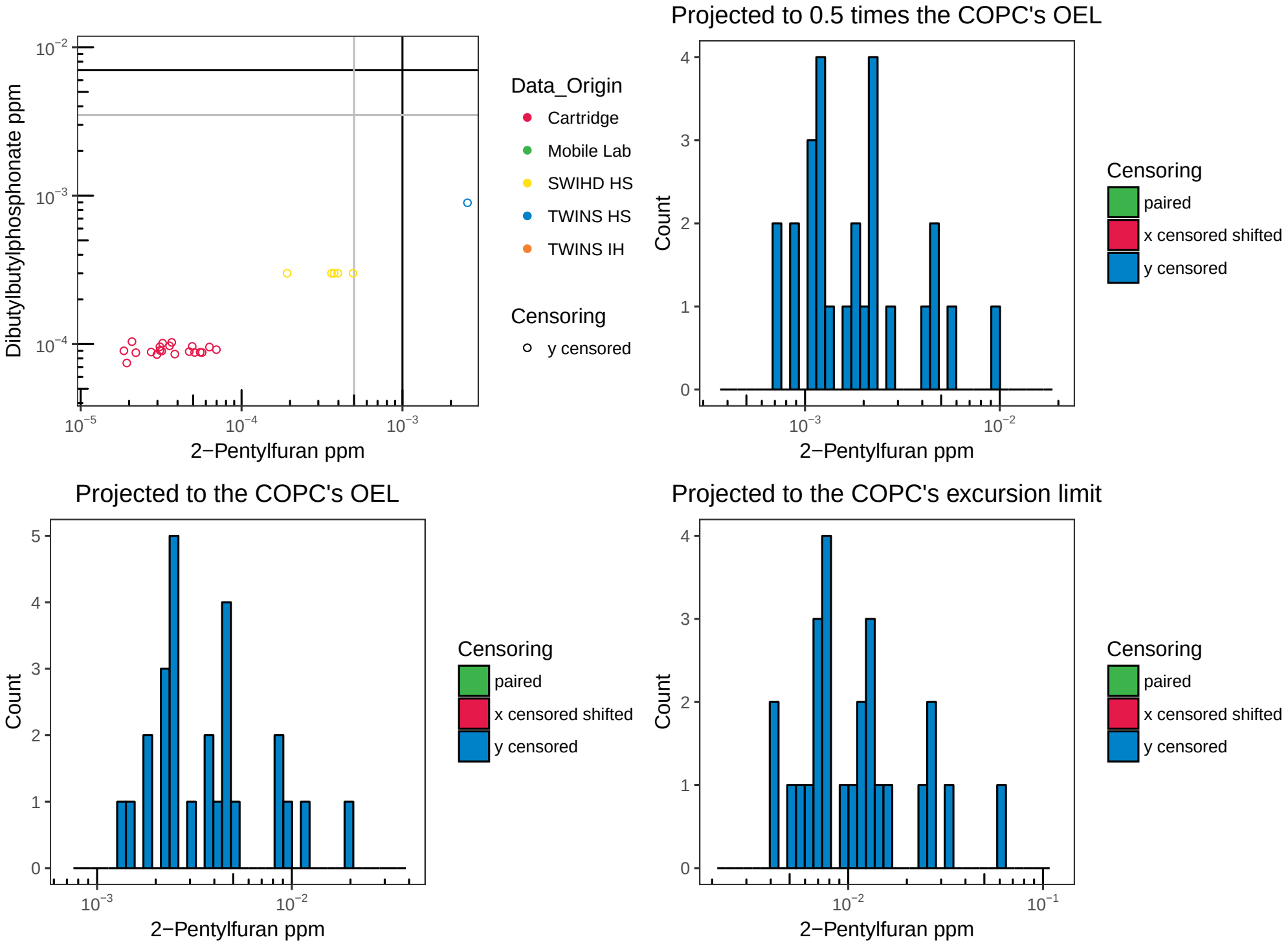


Figure C.1331: Dibutylbutylphosphonate vs 2-Pentylfuran

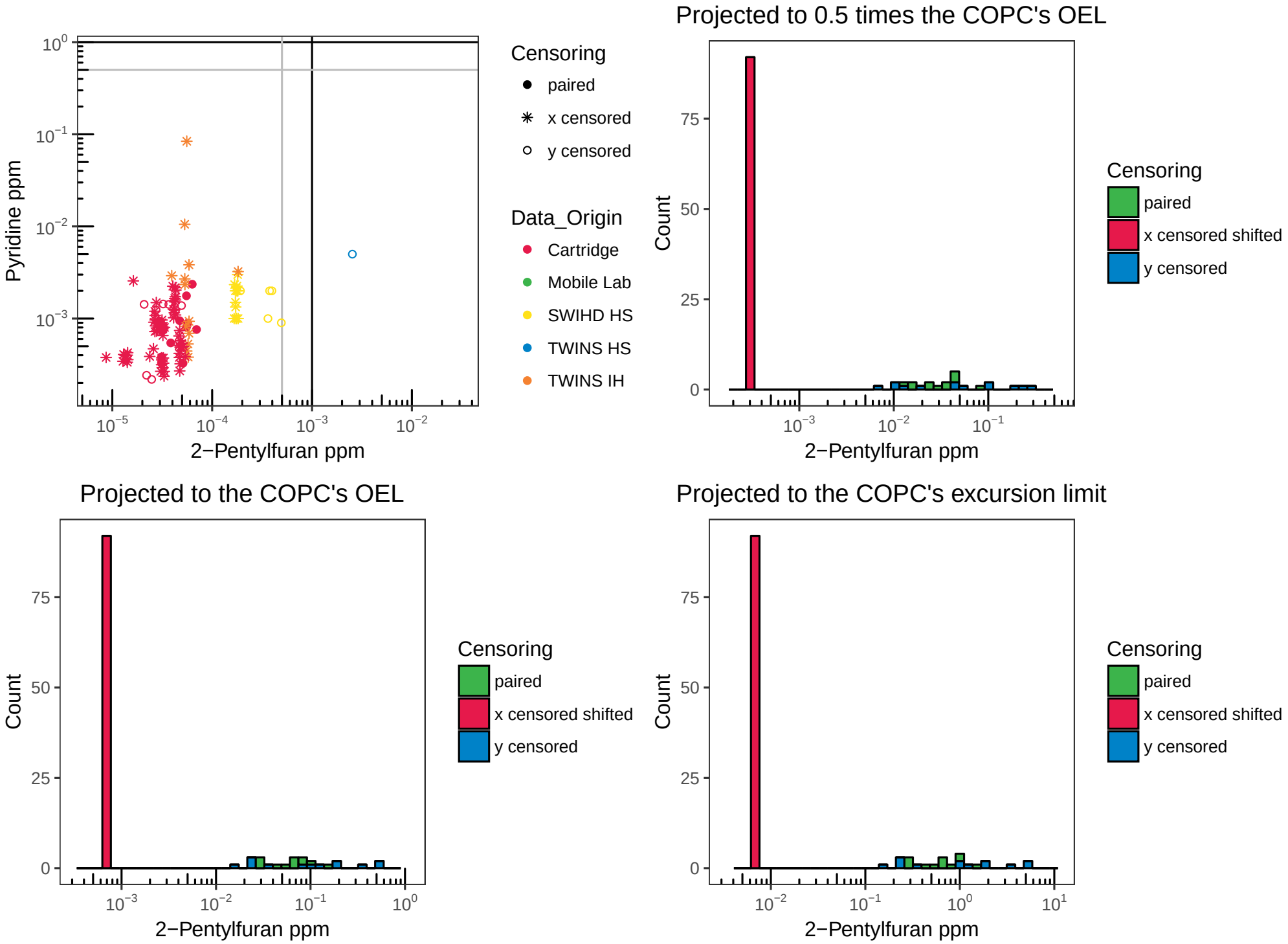


Figure C.1332: Pyridine vs 2-Pentylfuran

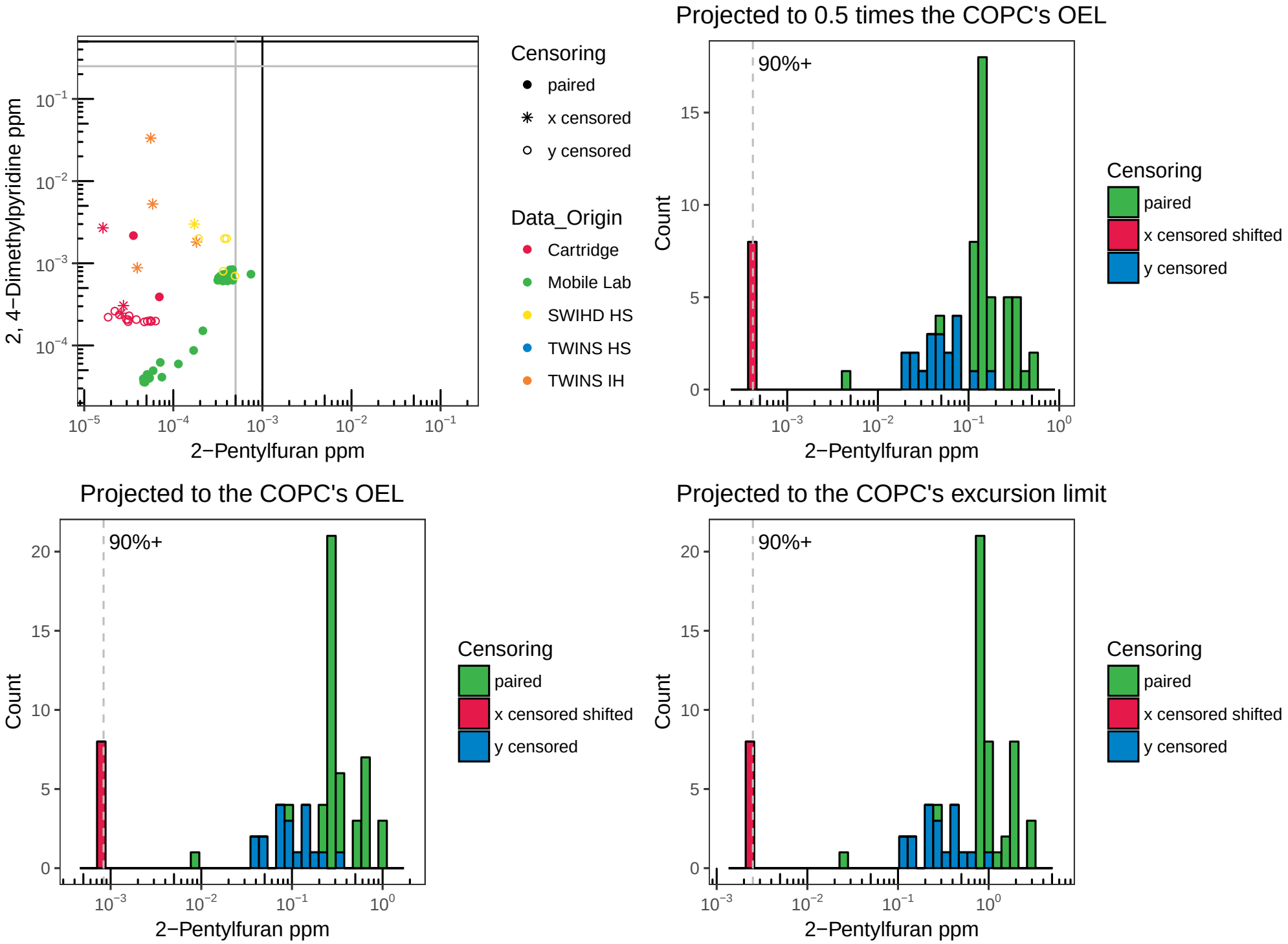


Figure C.1333: 2, 4-Dimethylpyridine vs 2-Pentylfuran

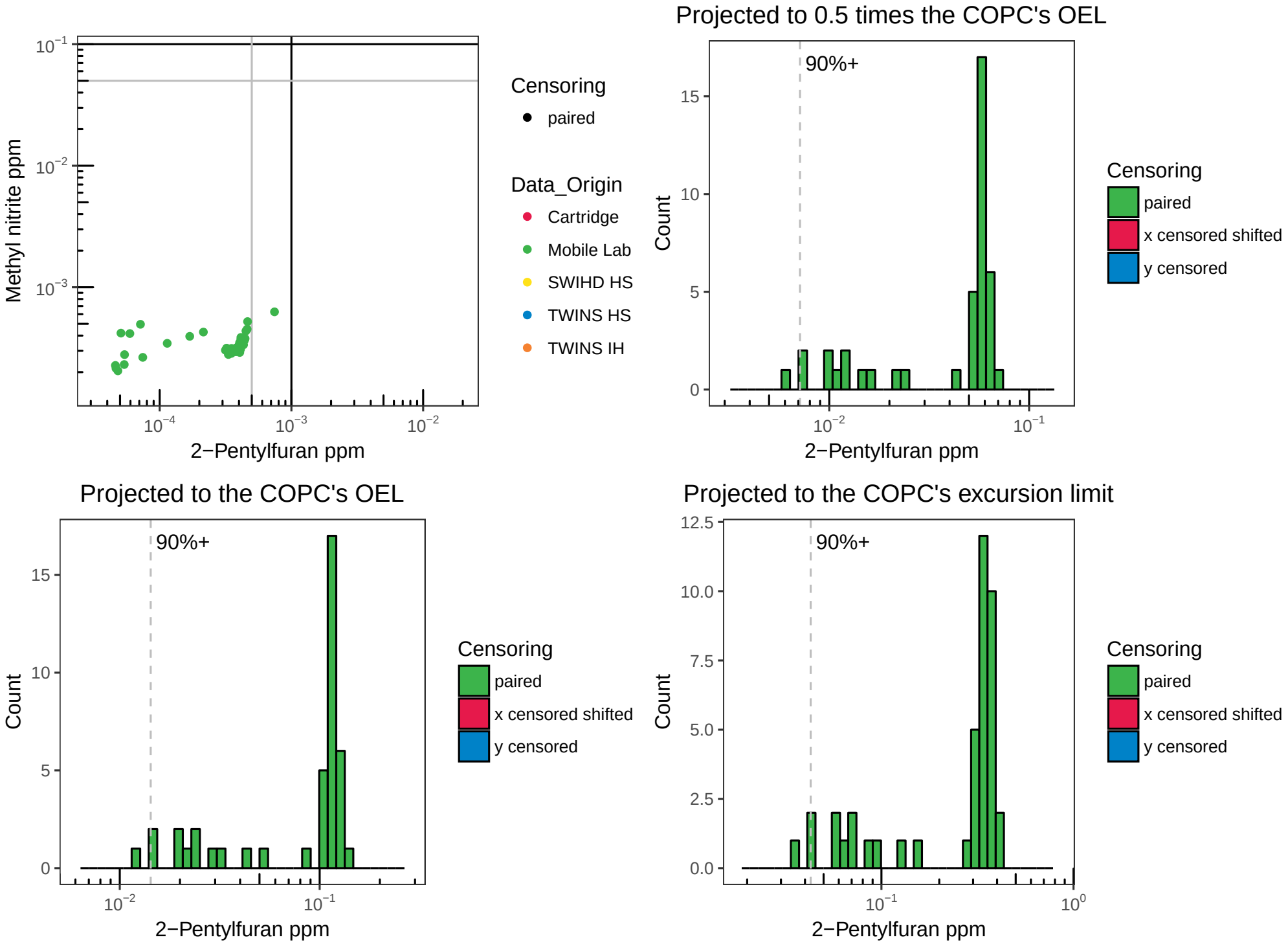


Figure C.1334: Methyl nitrite vs 2-Pentylfuran

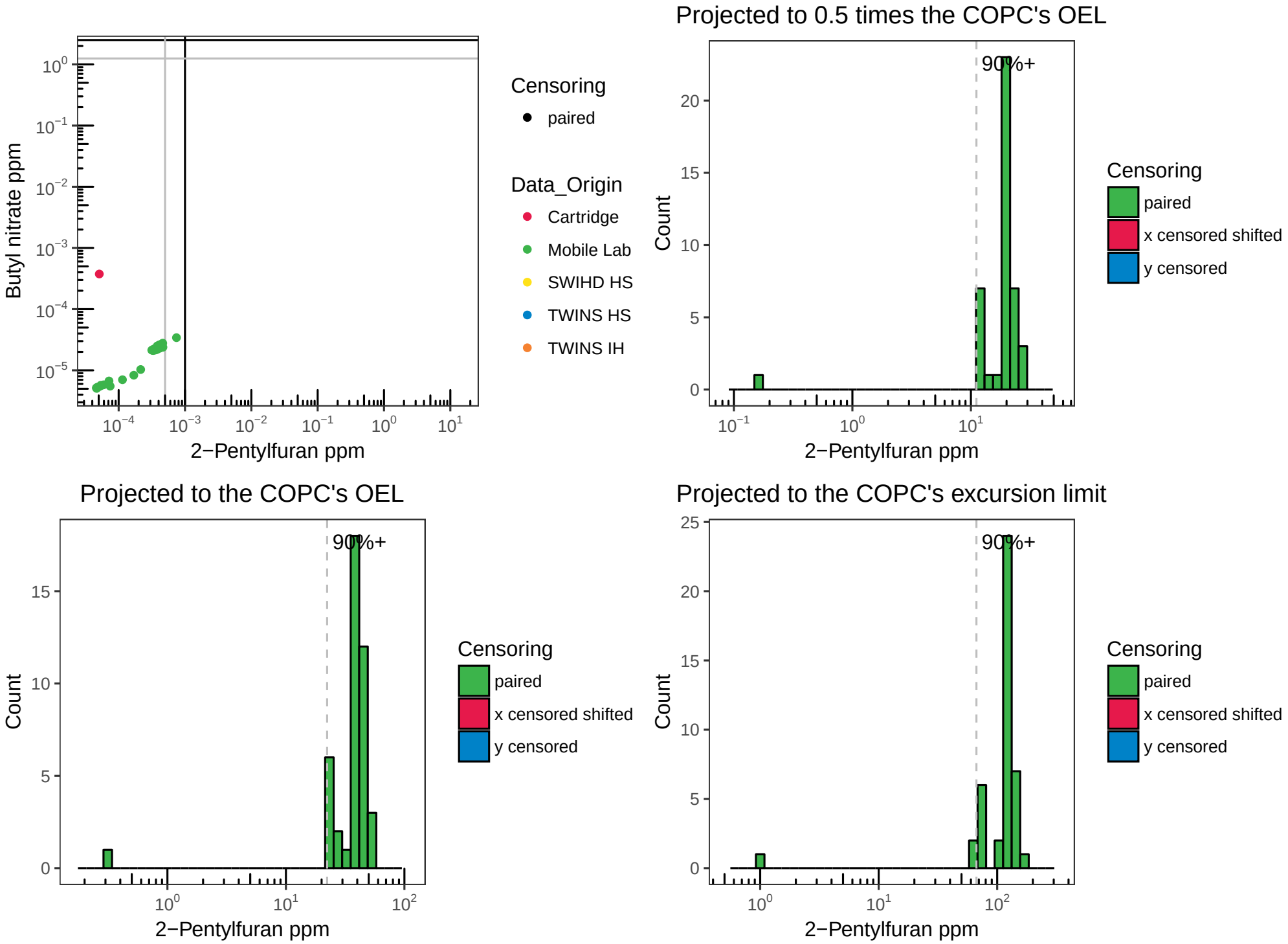


Figure C.1335: Butyl nitrate vs 2-Pentylfuran

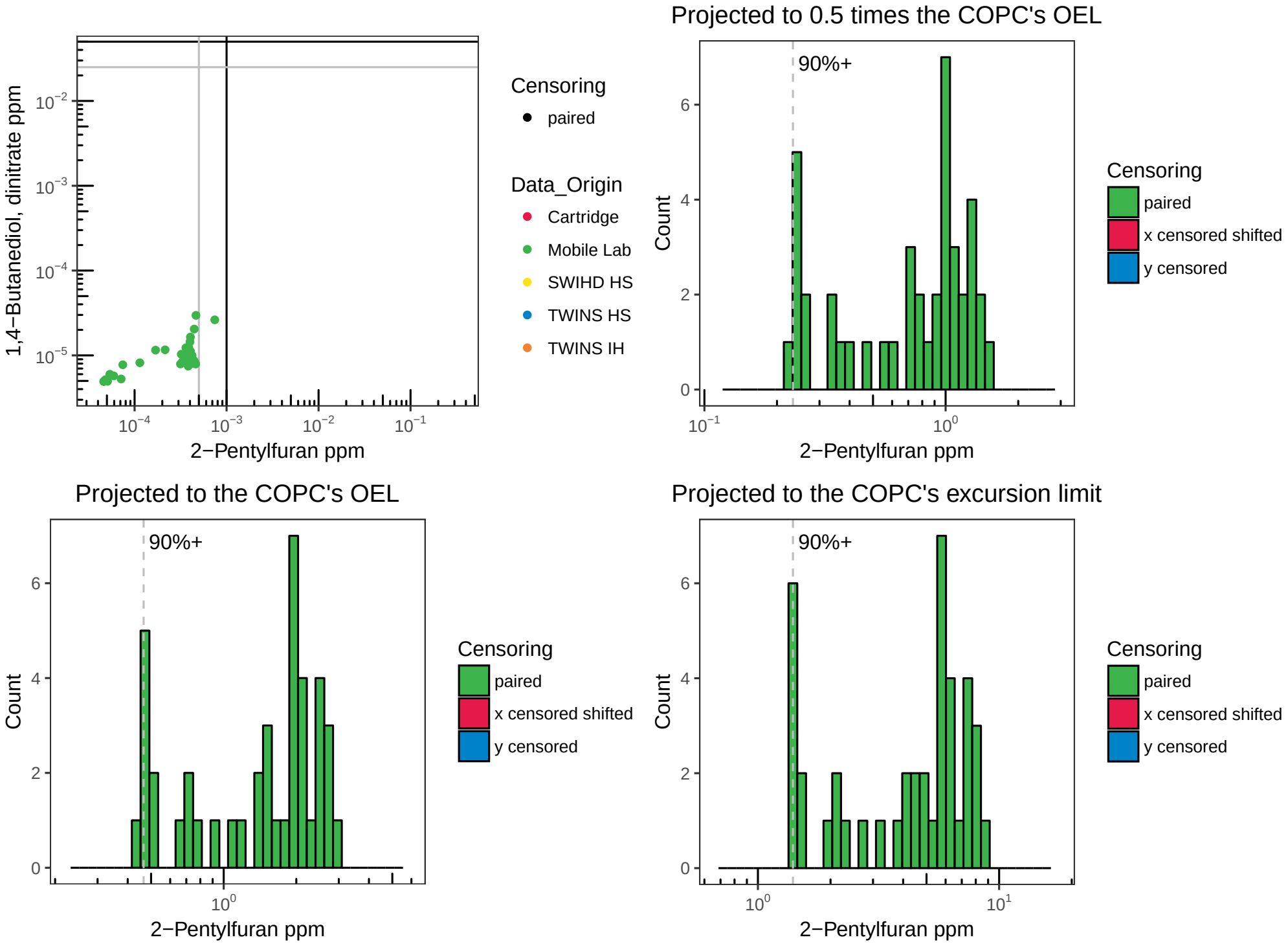


Figure C.1336: 1,4-Butanediol, dinitrate vs 2-Pentylfuran

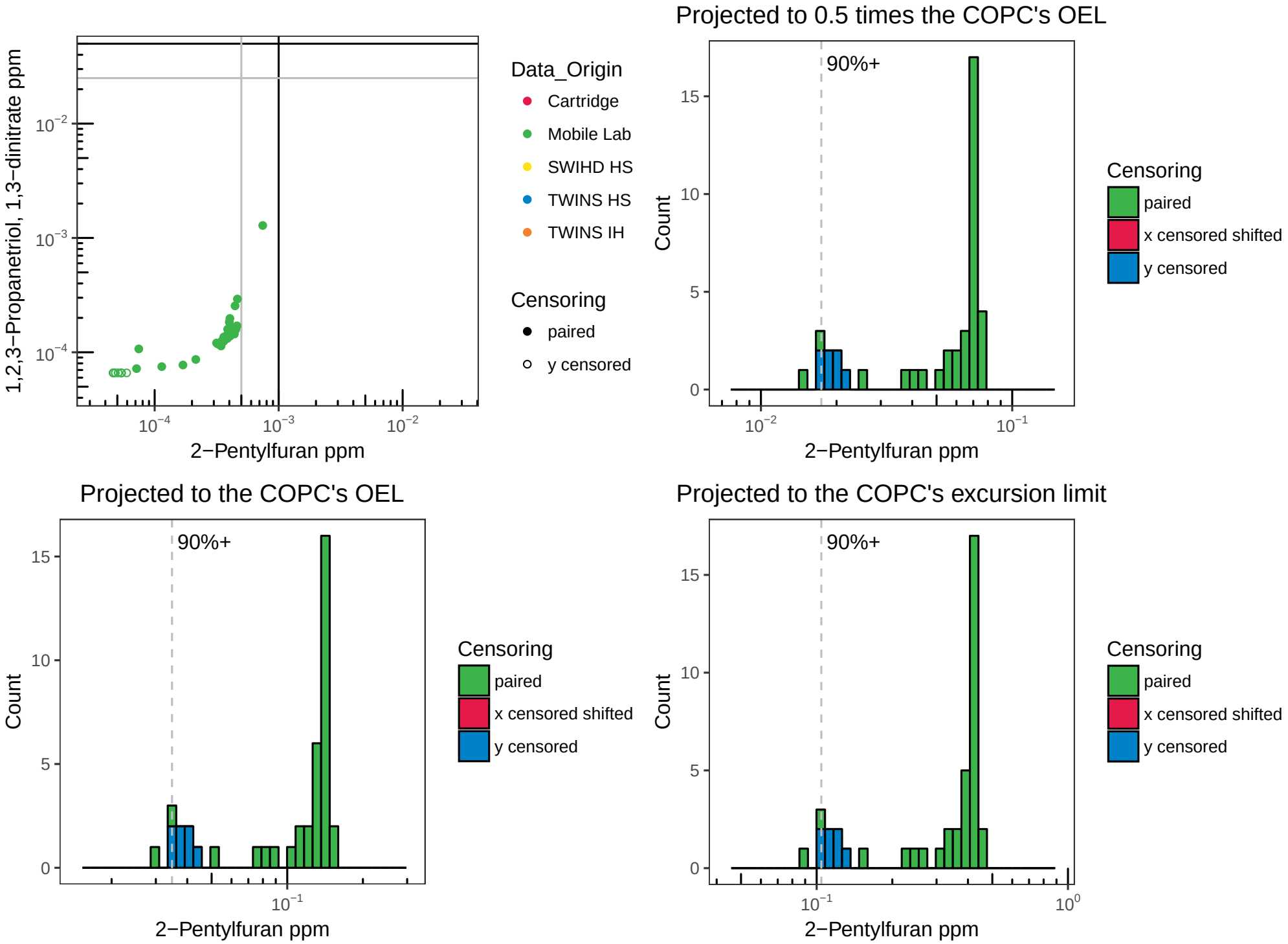


Figure C.1337: 1,2,3-Propanetriol, 1,3-dinitrate vs 2-Pentylfuran

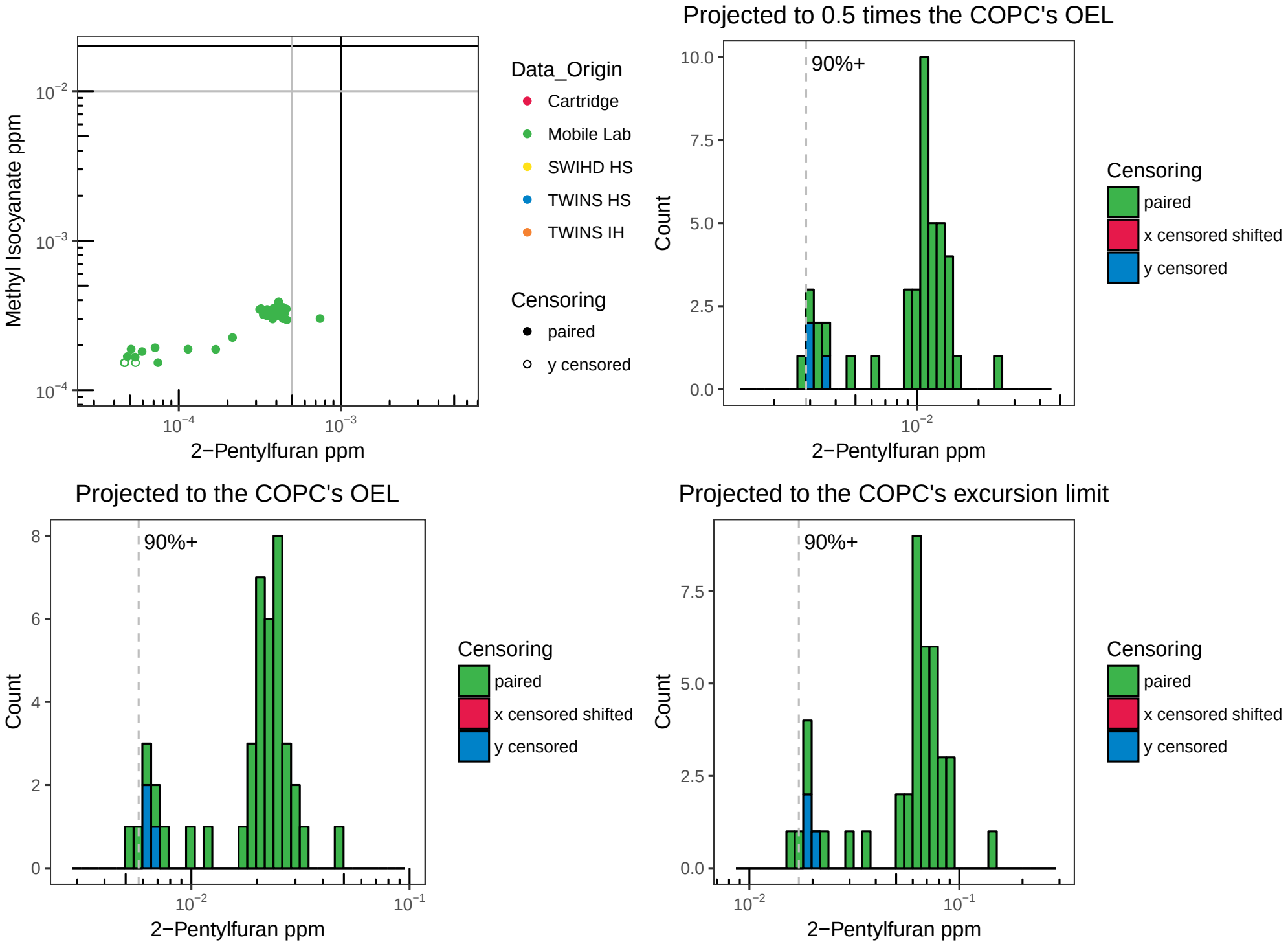


Figure C.1338: Methyl Isocyanate vs 2-Pentylfuran

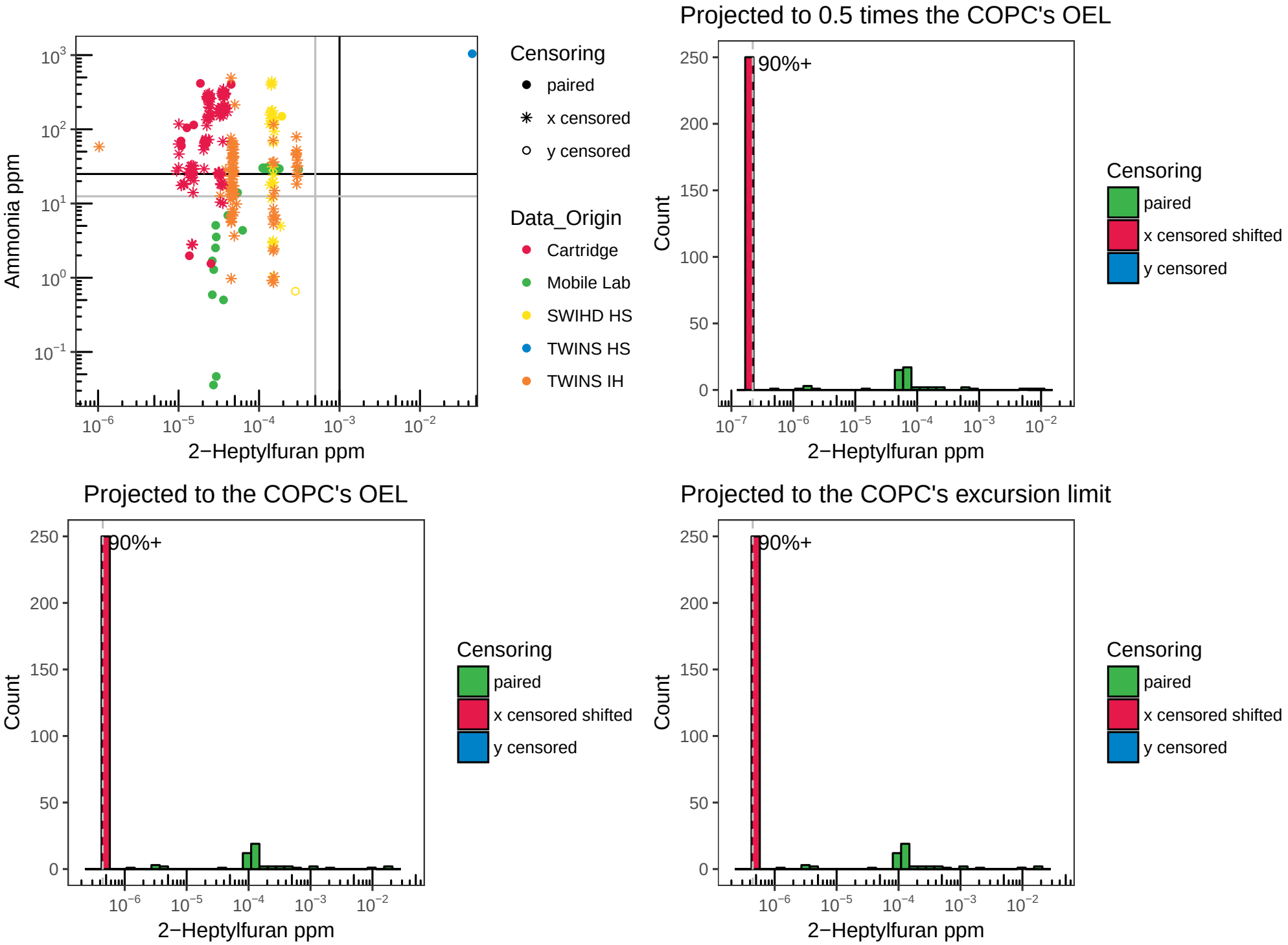


Figure C.1339: Ammonia vs 2-Heptylfuran

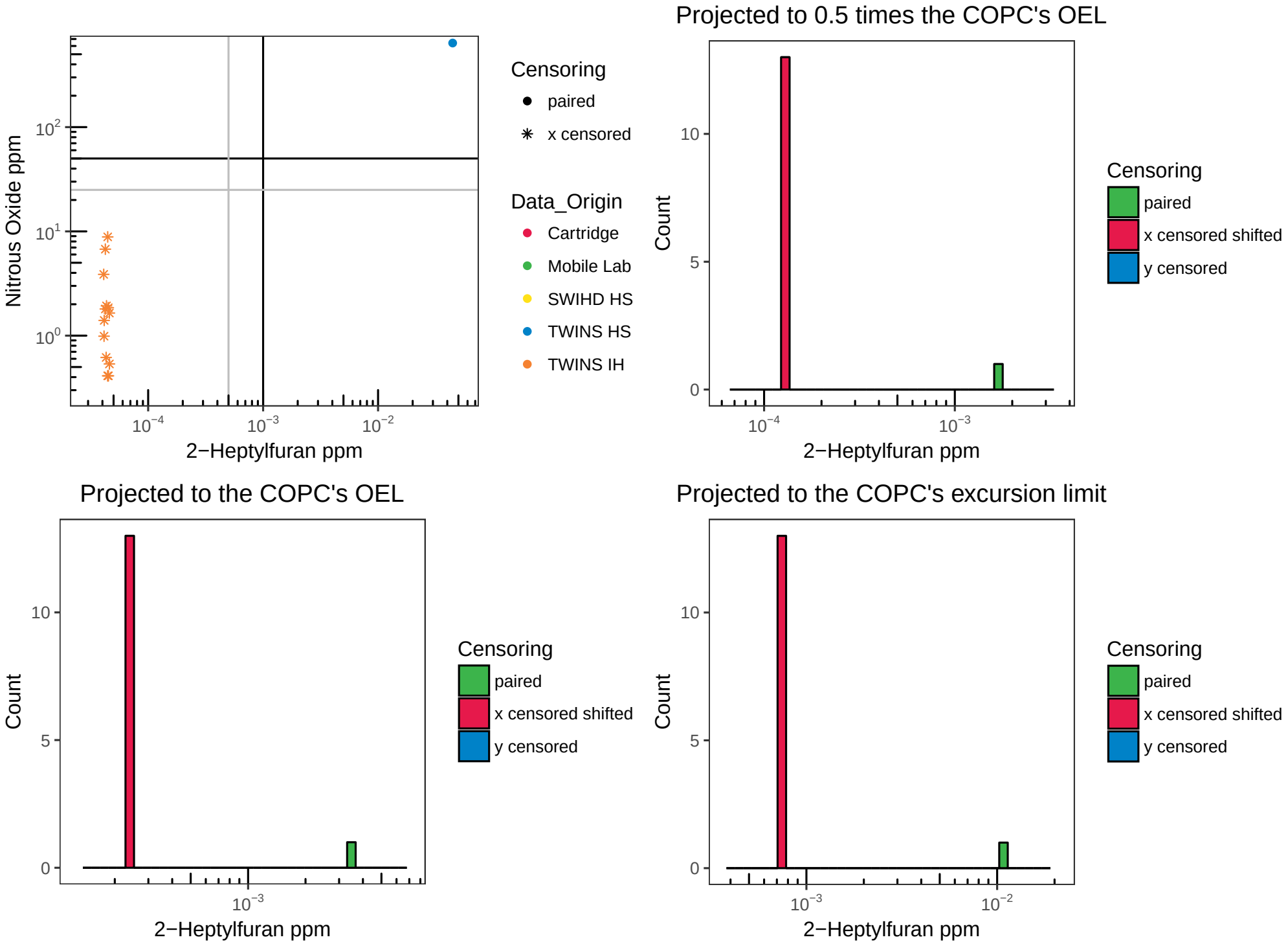


Figure C.1340: Nitrous Oxide vs 2-Heptylfuran

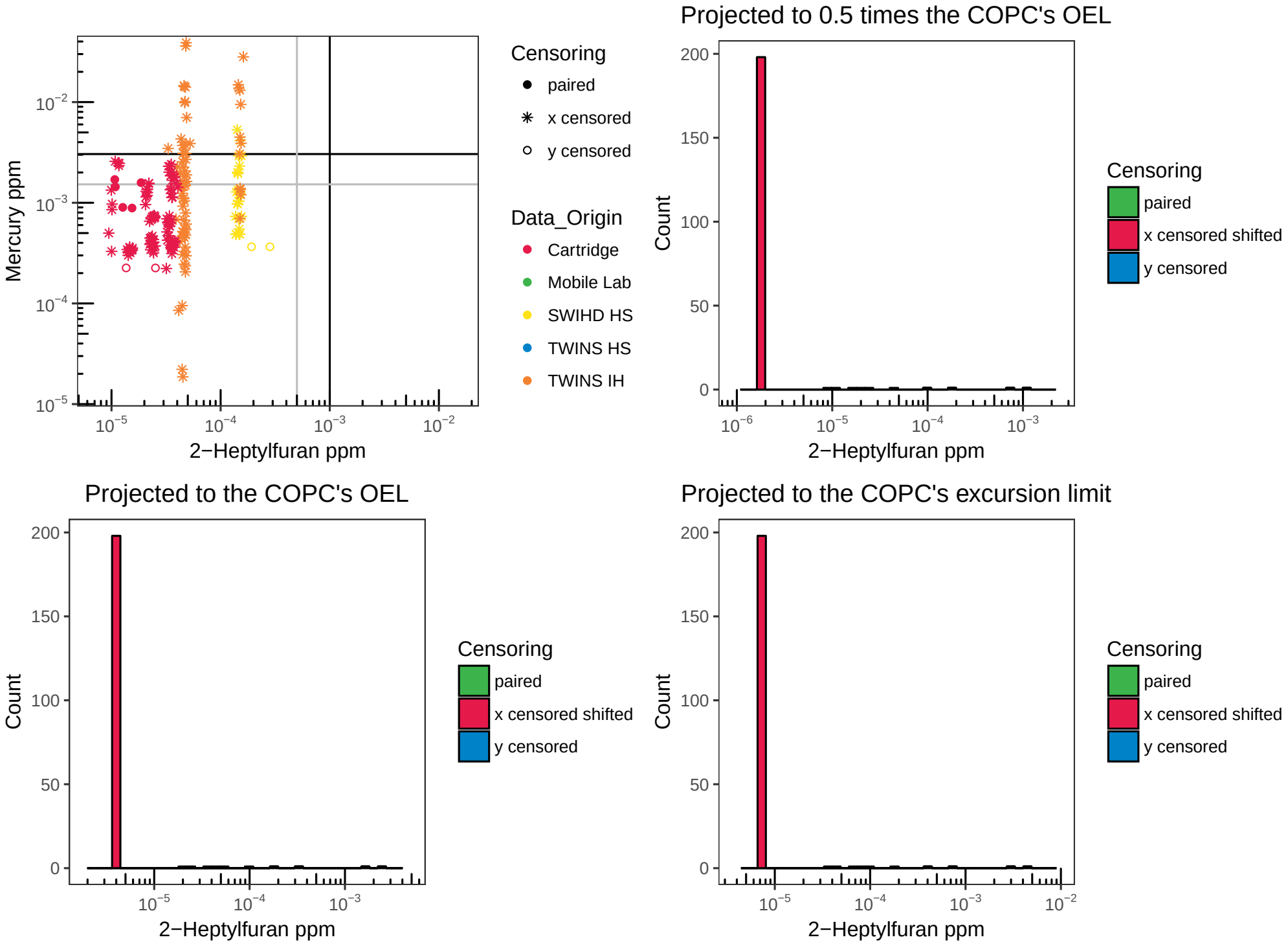


Figure C.1341: Mercury vs 2-Heptylfuran

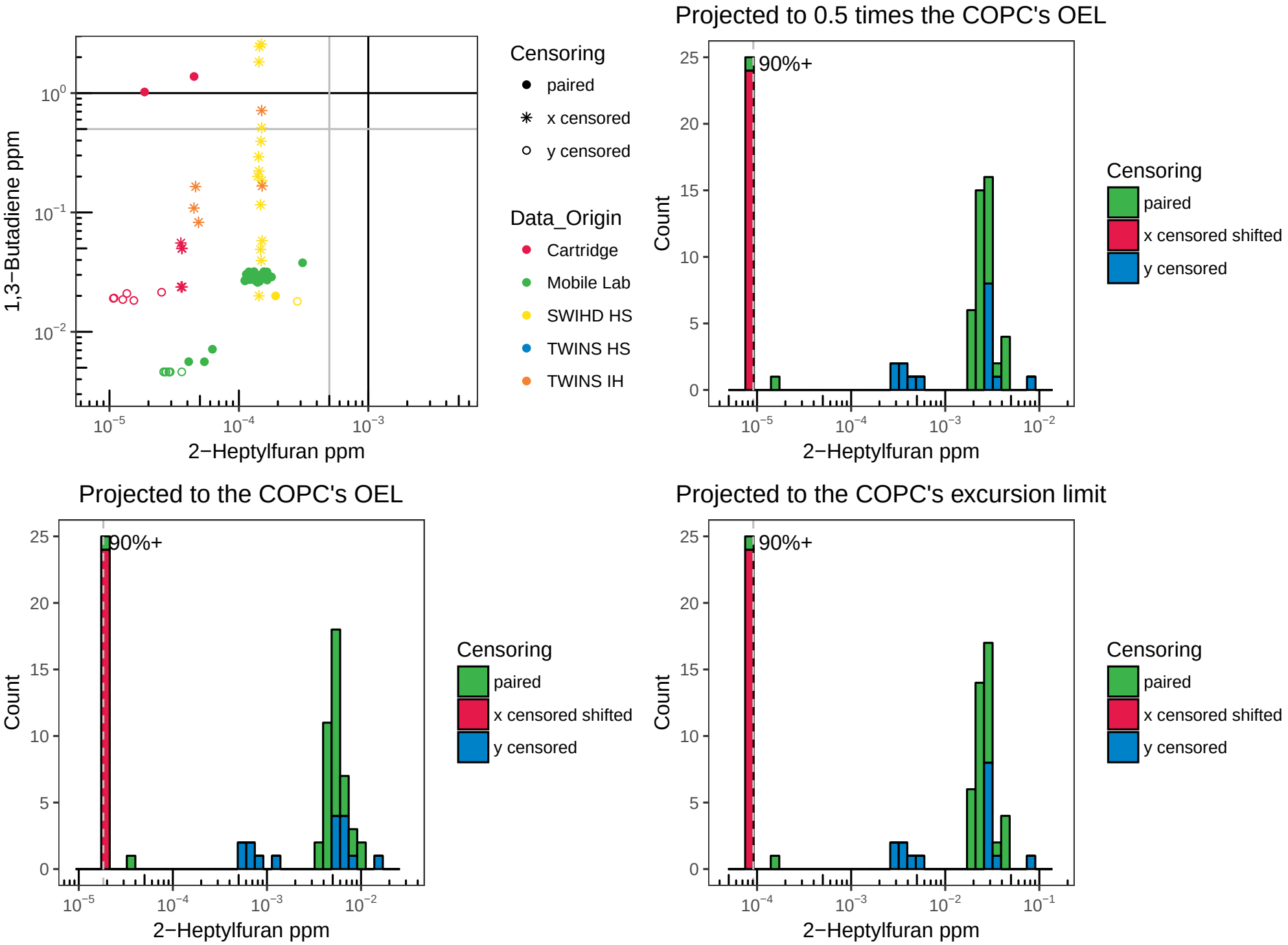


Figure C.1342: 1,3-Butadiene vs 2-Heptylfuran

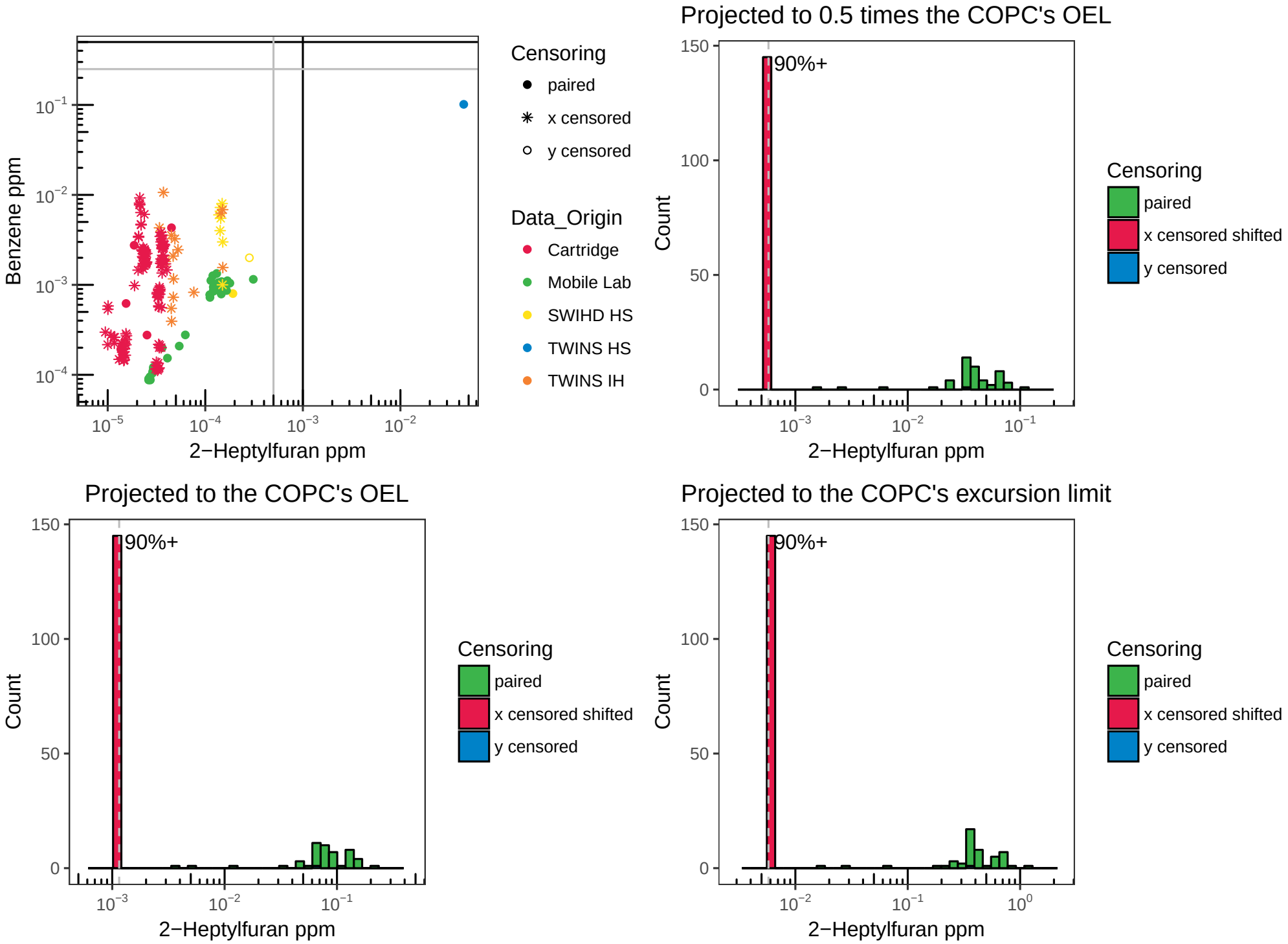


Figure C.1343: Benzene vs 2-Heptylfuran

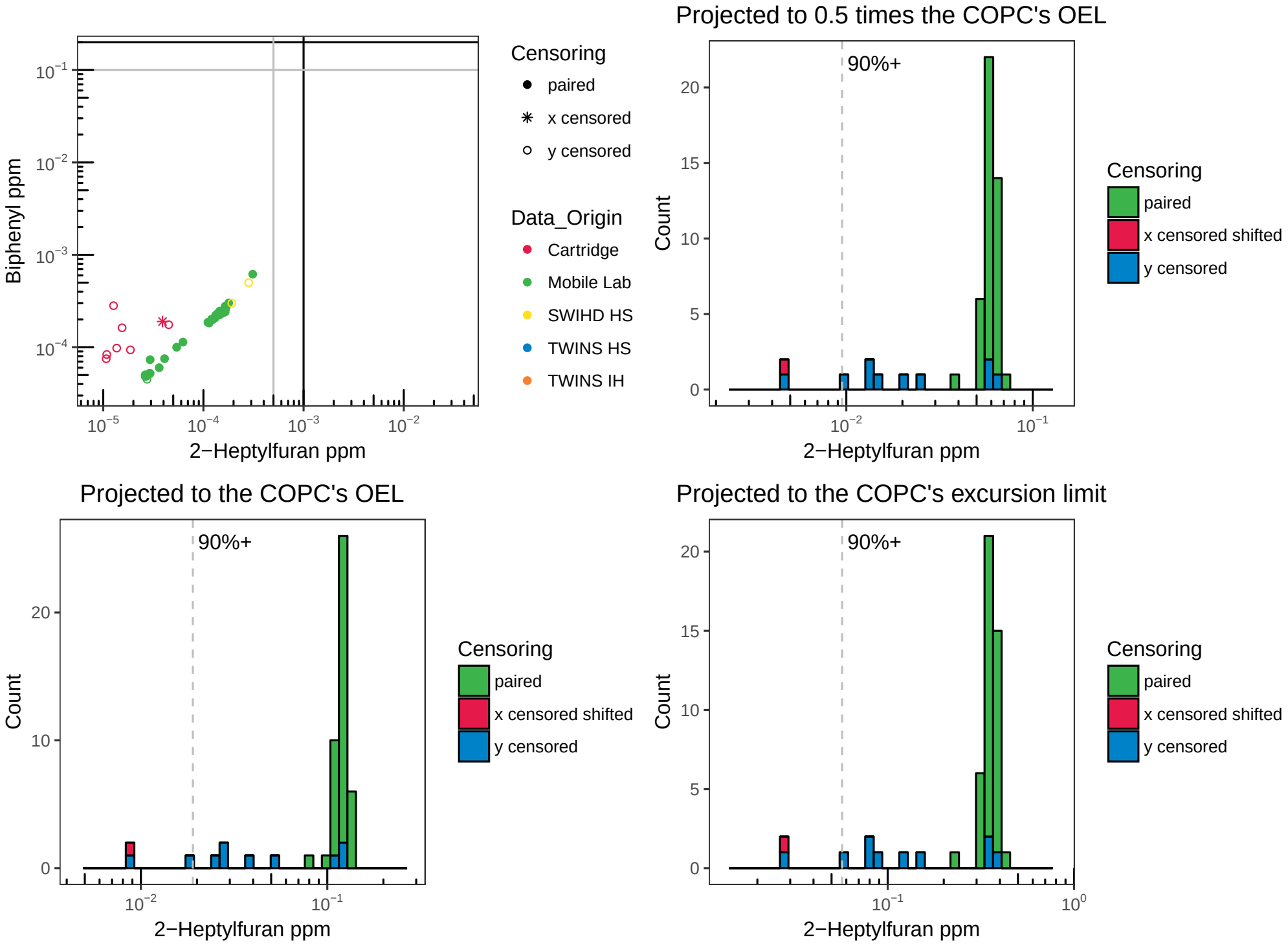


Figure C.1344: Biphenyl vs 2-Heptylfuran

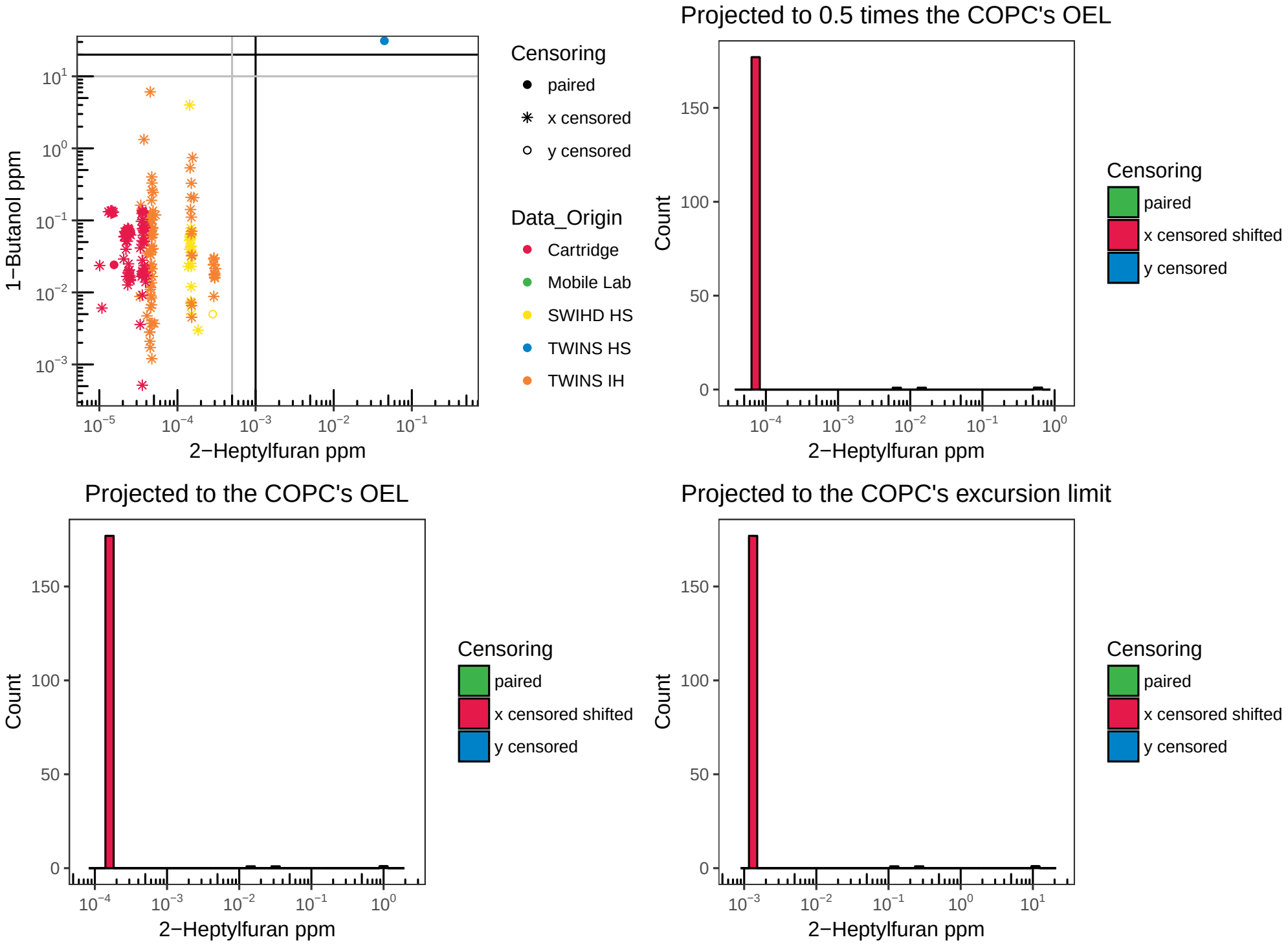


Figure C.1345: 1-Butanol vs 2-Heptylfuran

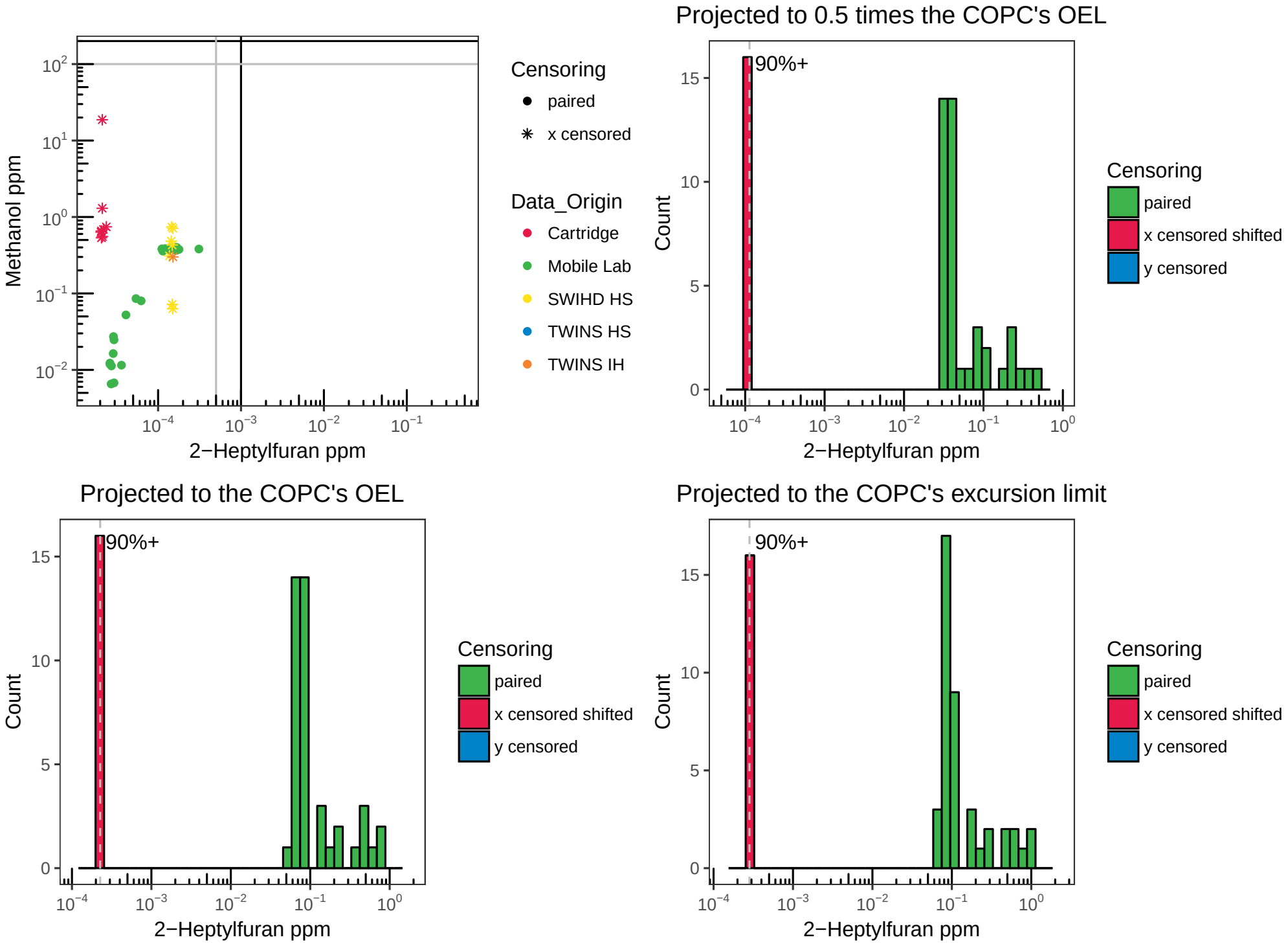


Figure C.1346: Methanol vs 2-Heptylfuran

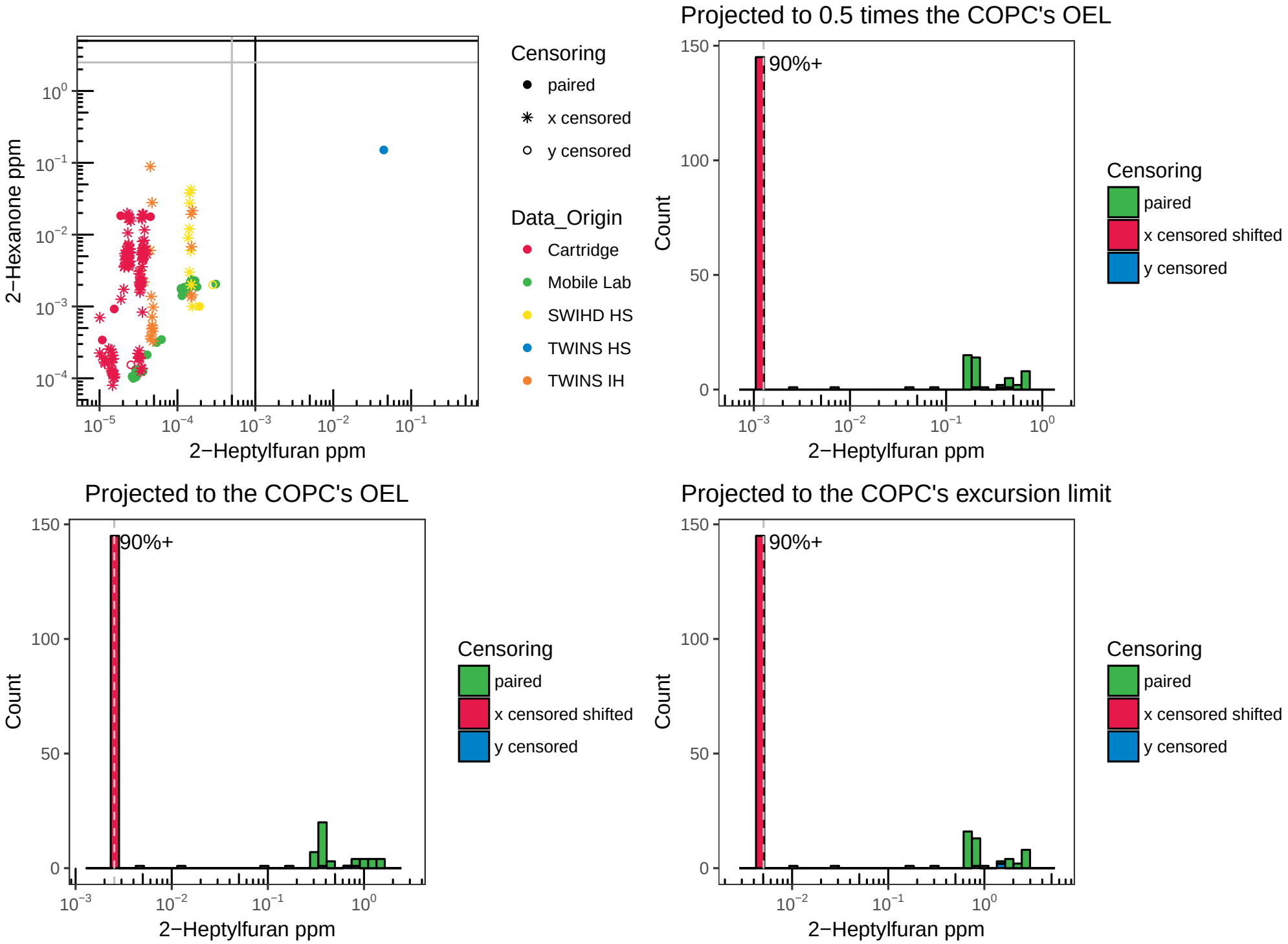


Figure C.1347: 2-Hexanone vs 2-Heptylfuran

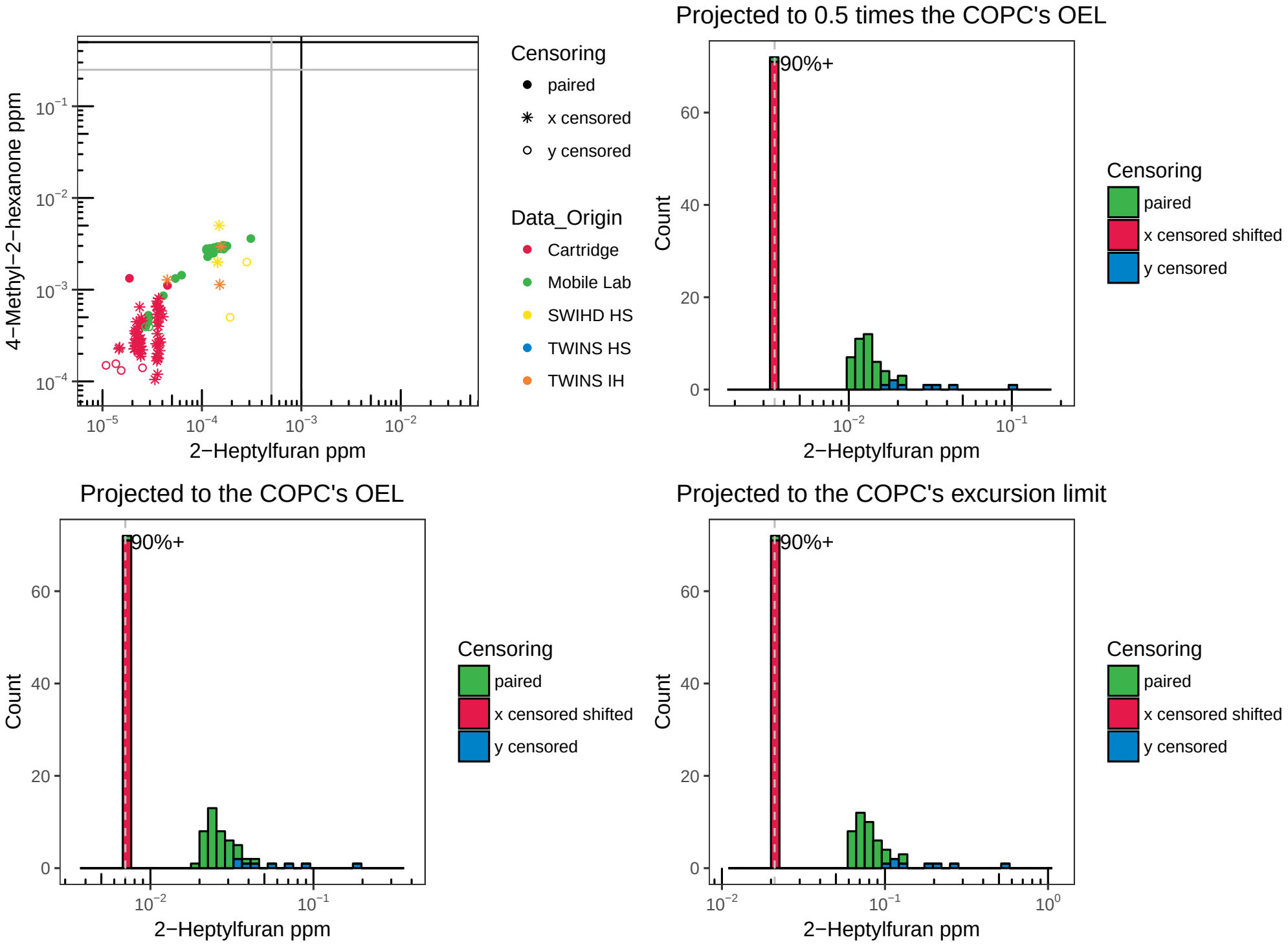


Figure C.1348: 4-Methyl-2-hexanone vs 2-Heptylfuran

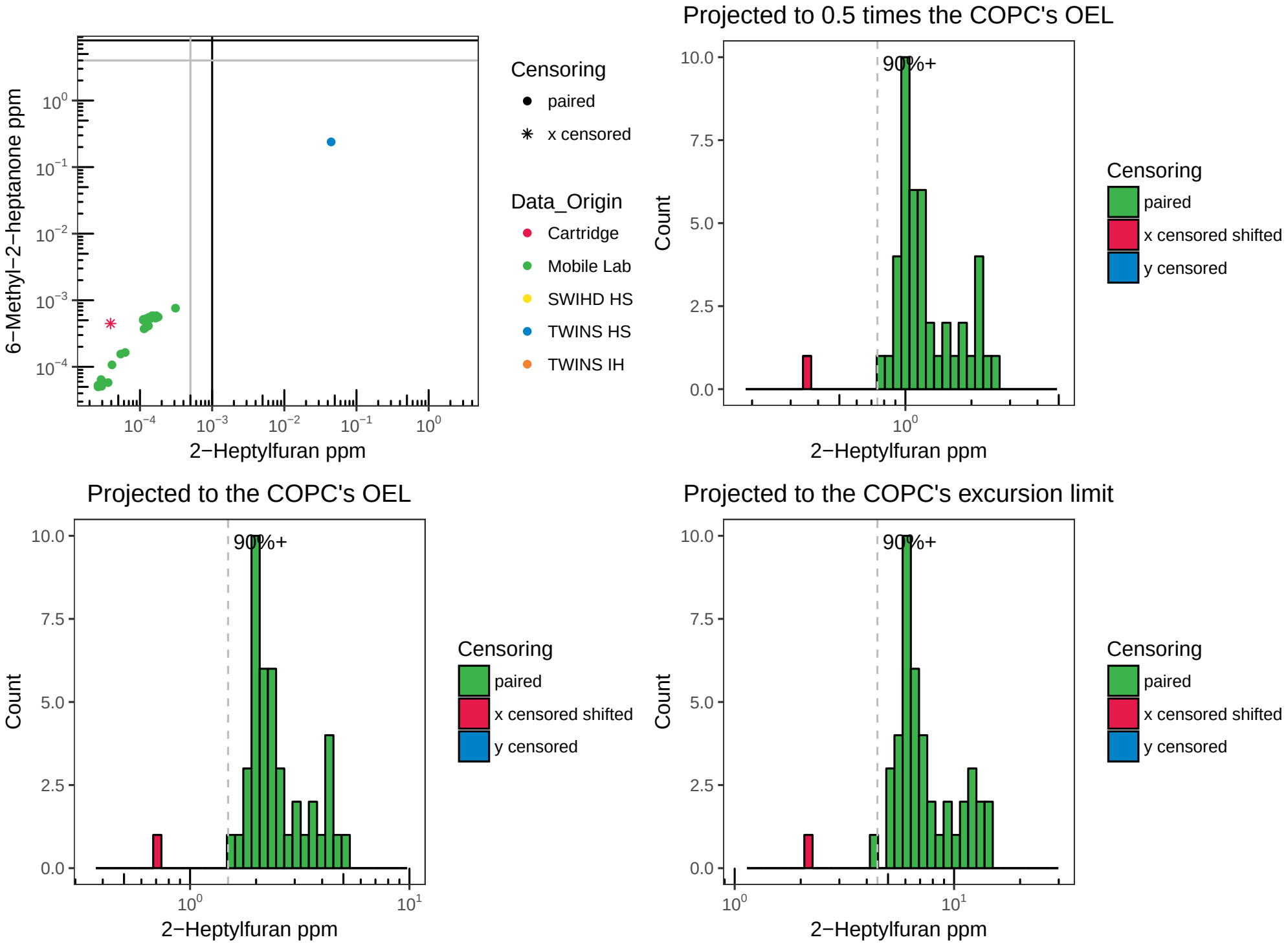


Figure C.1349: 6-Methyl-2-heptanone vs 2-Heptylfuran

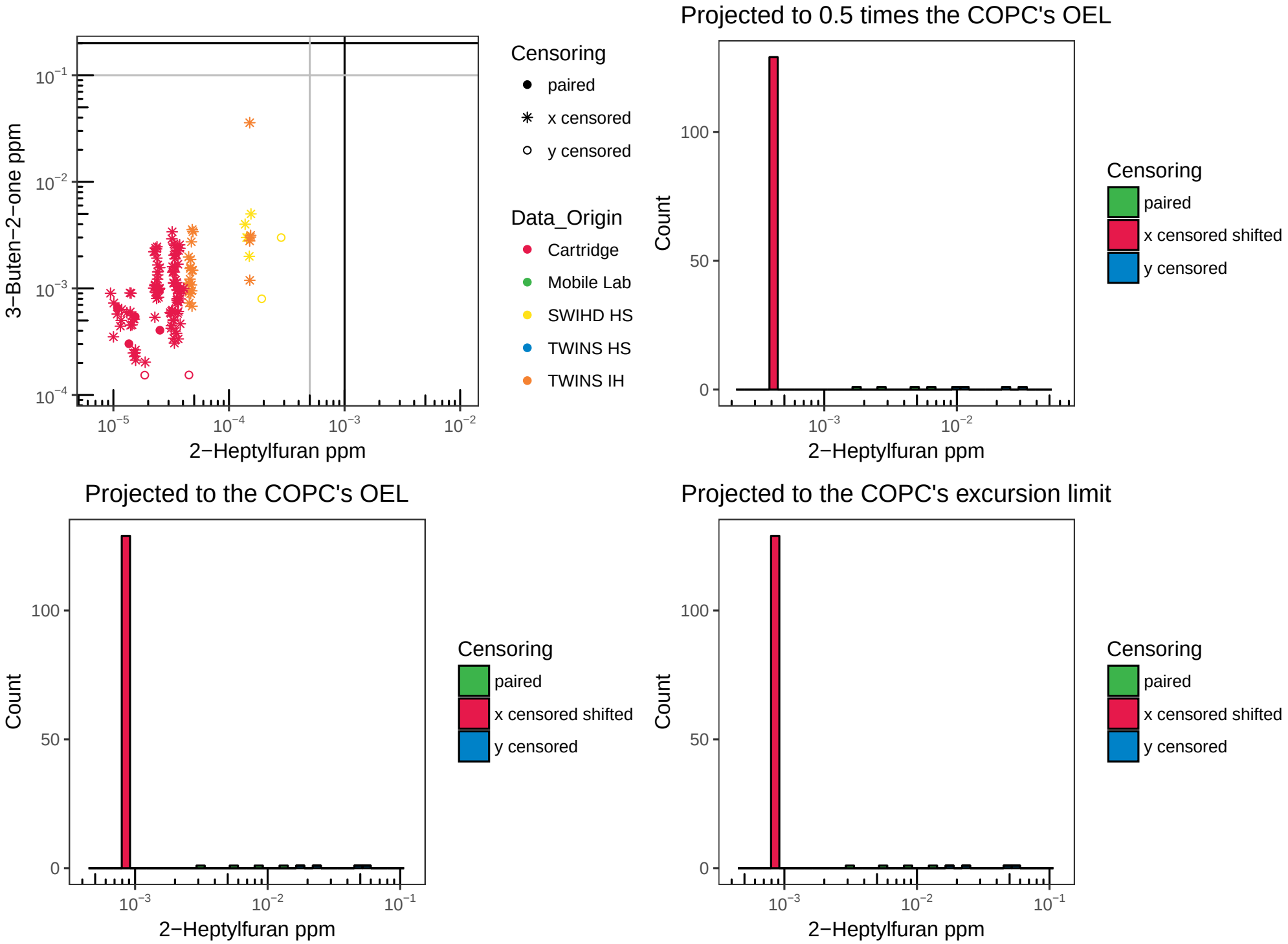


Figure C.1350: 3-Buten-2-one vs 2-Heptylfuran

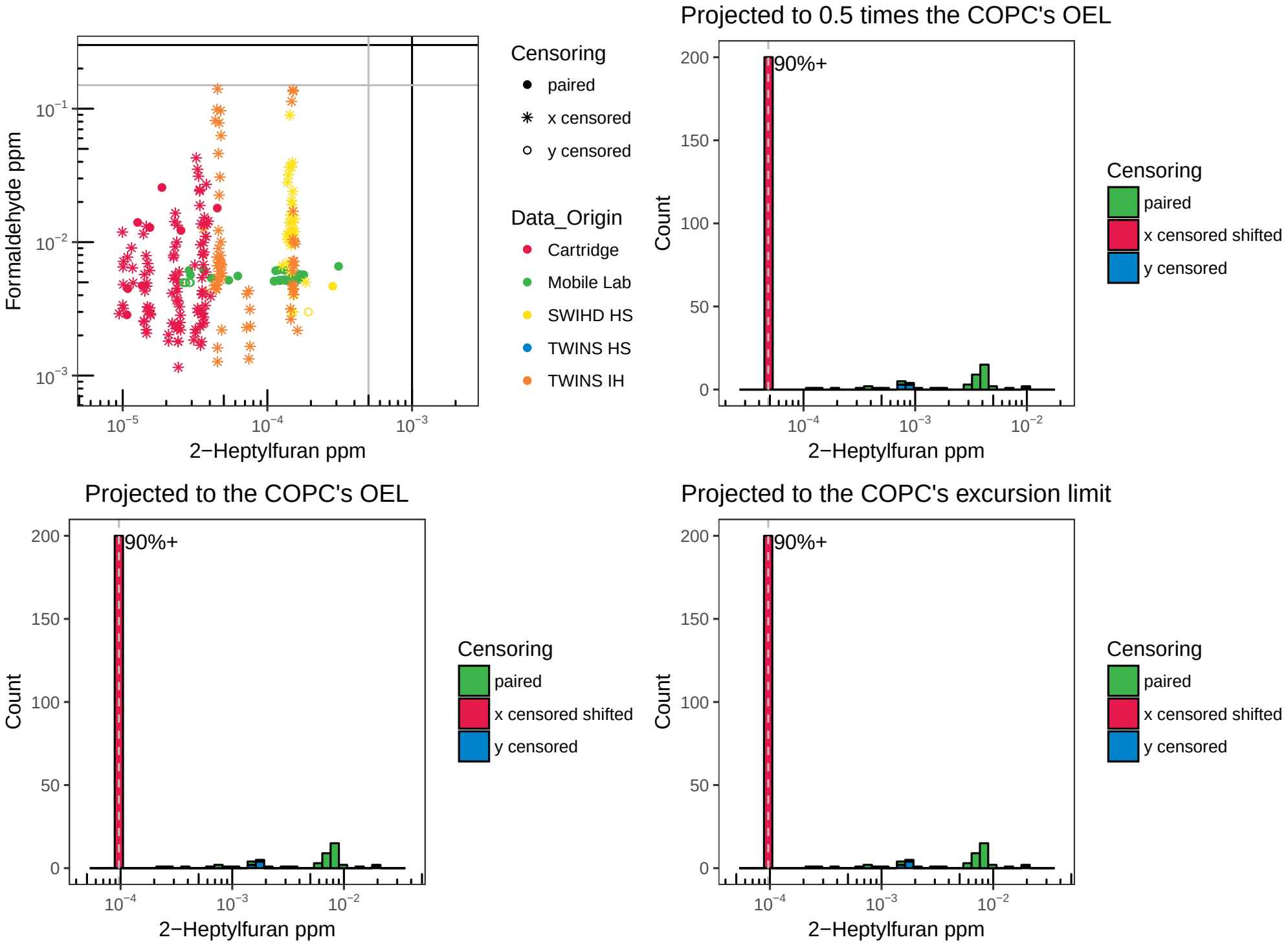


Figure C.1351: Formaldehyde vs 2-Heptylfuran

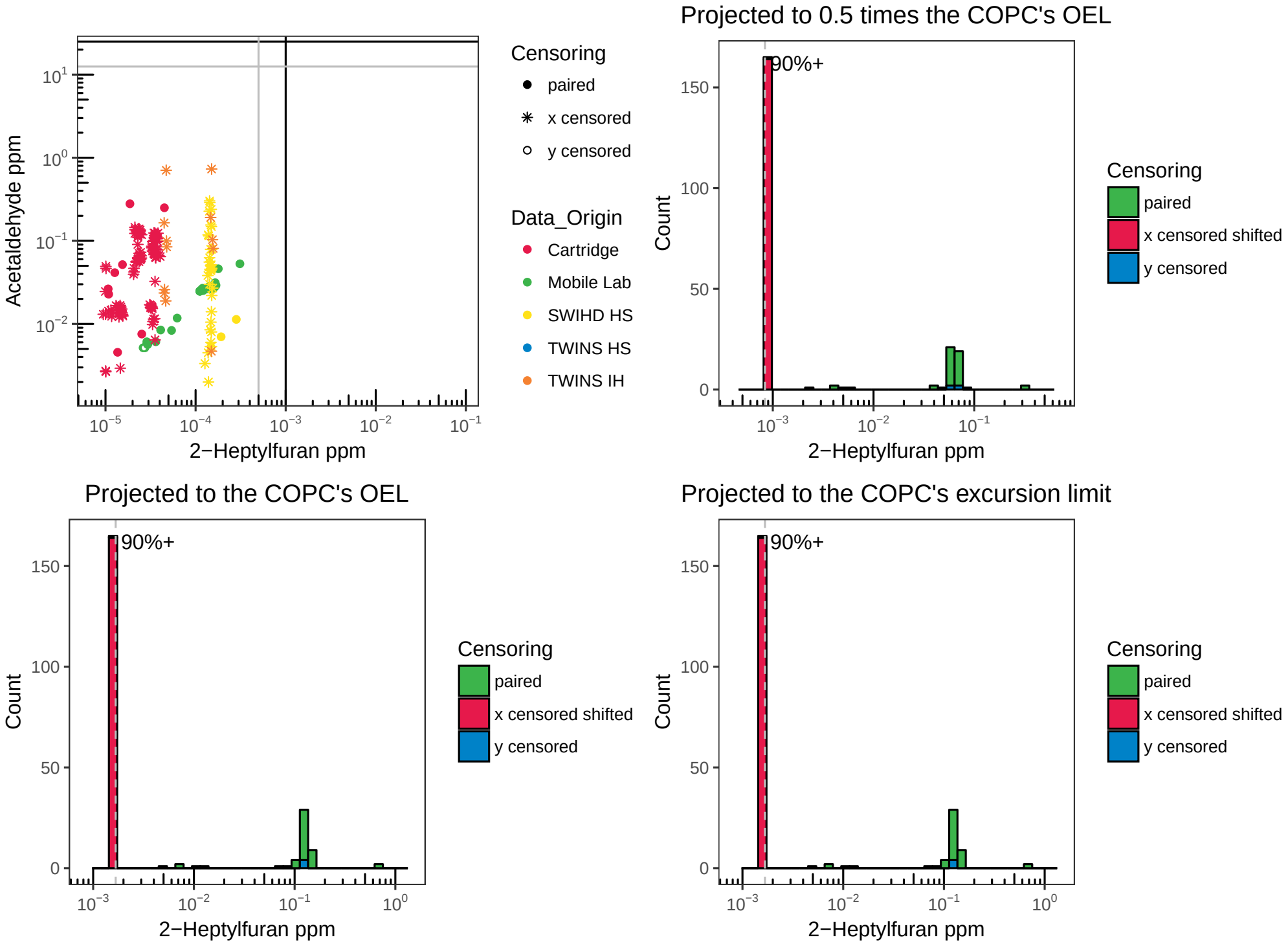


Figure C.1352: Acetaldehyde vs 2-Heptylfuran

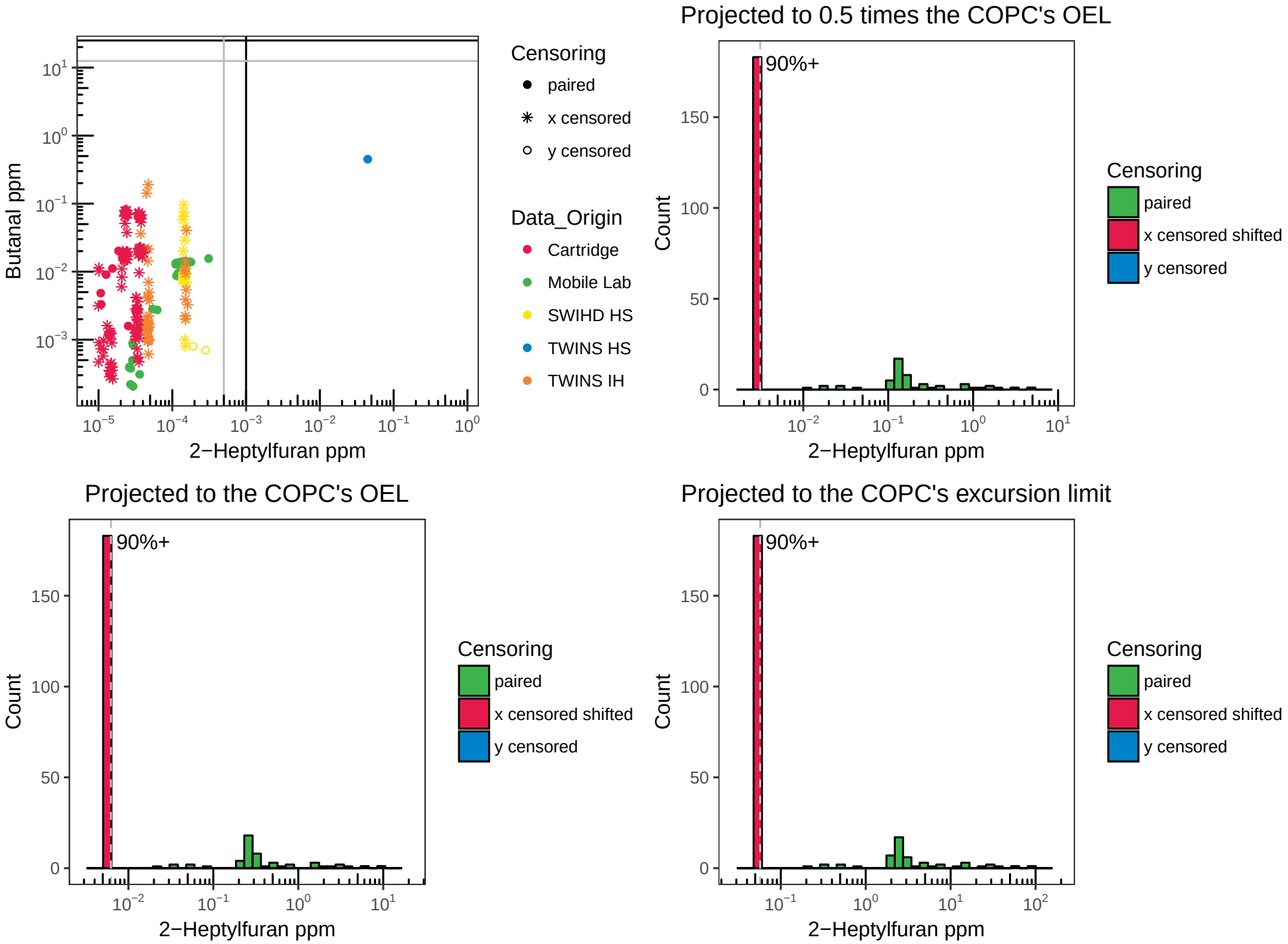


Figure C.1353: Butanal vs 2-Heptylfuran

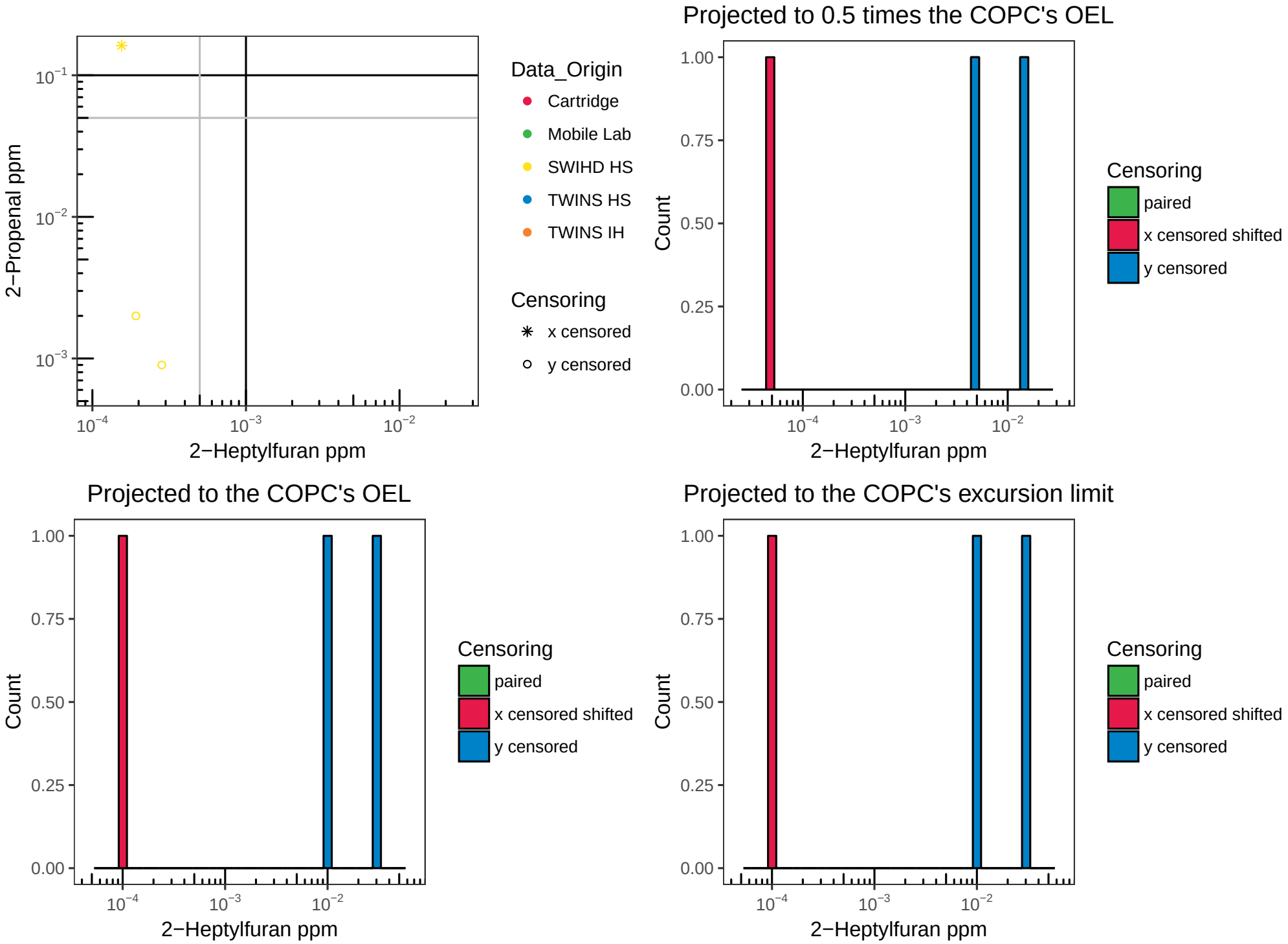


Figure C.1354: 2-Propenal vs 2-Heptylfuran

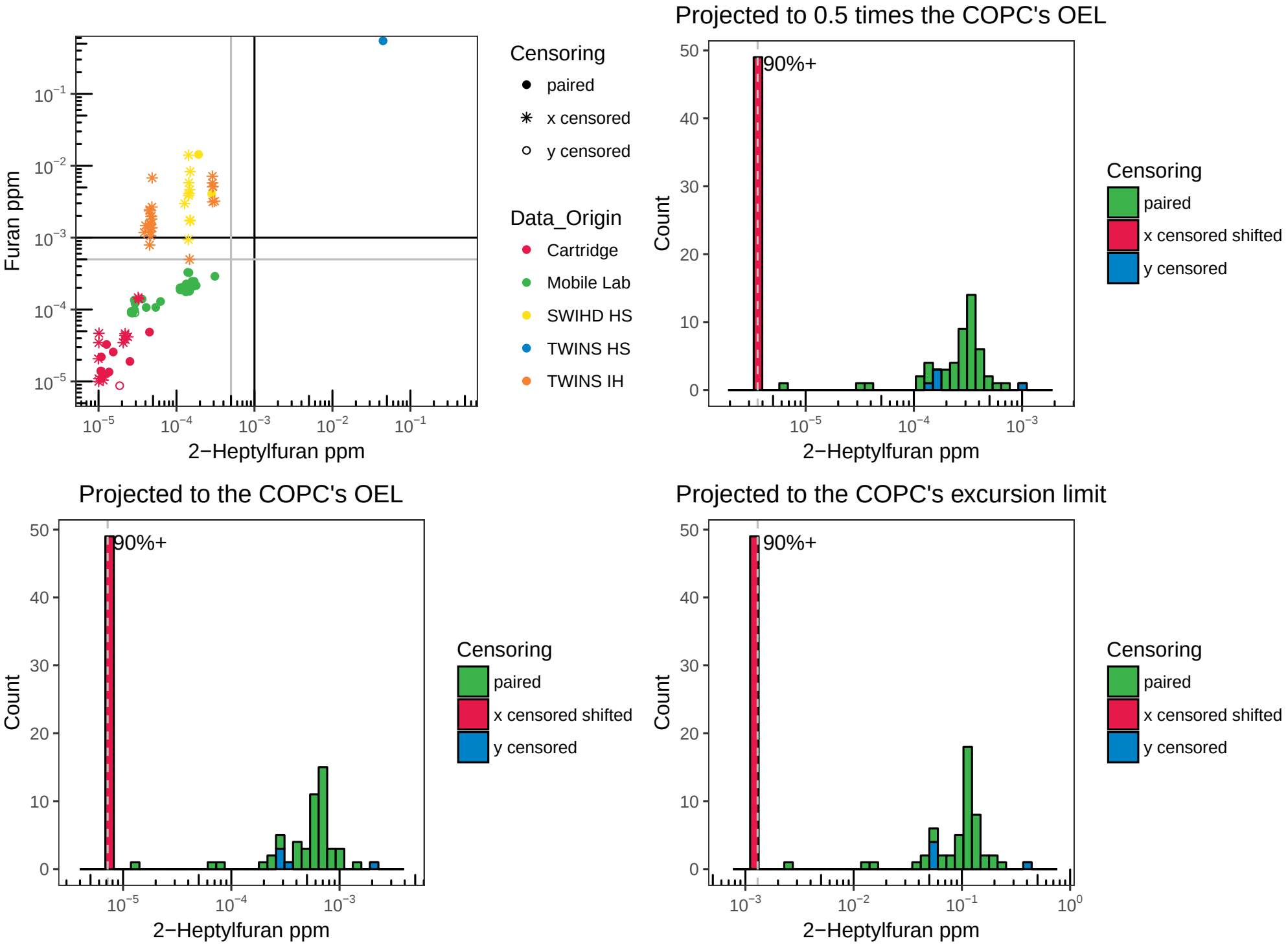


Figure C.1355: Furan vs 2-Heptylfuran

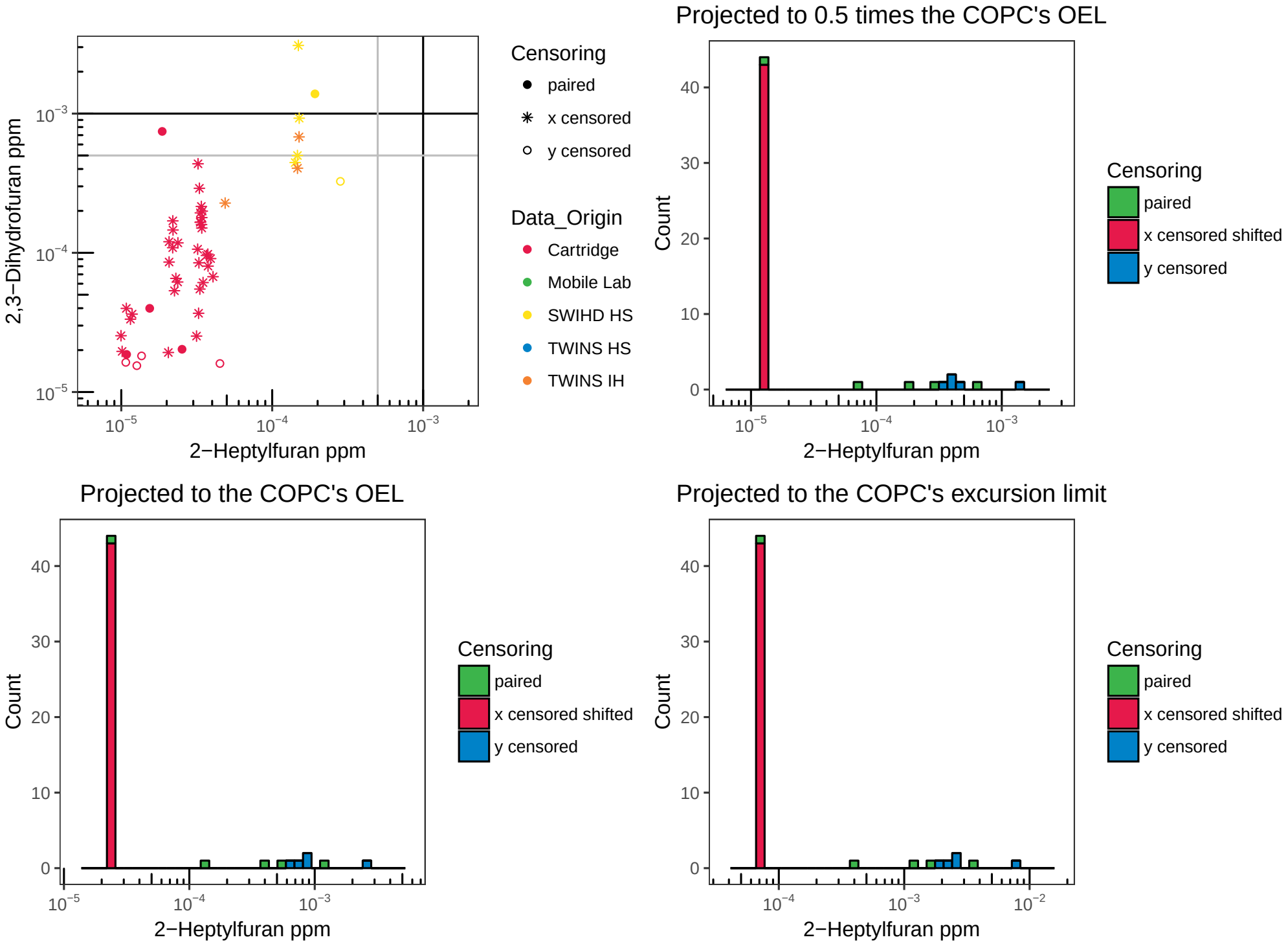


Figure C.1356: 2,3-Dihydrofuran vs 2-Heptylfuran

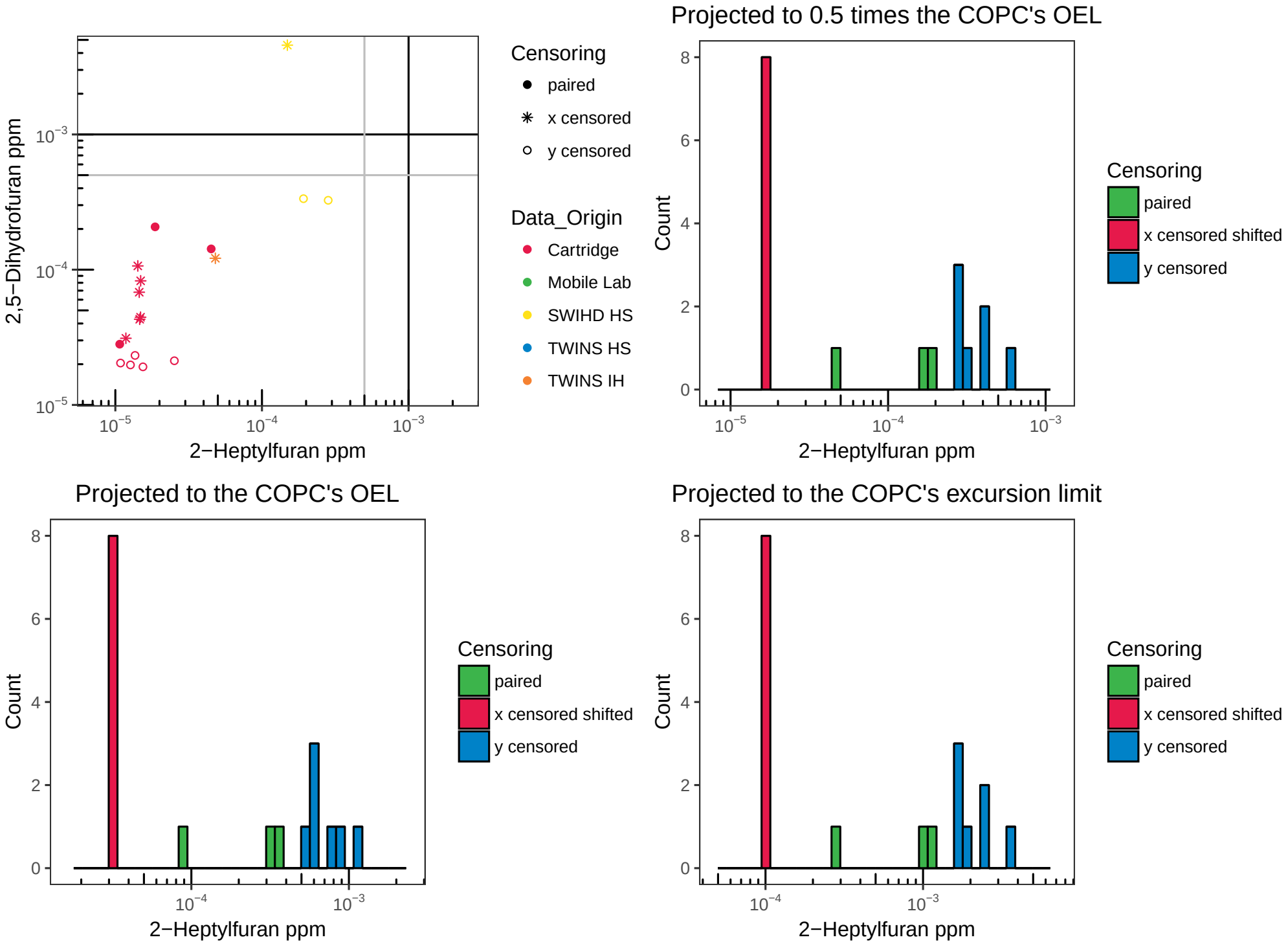


Figure C.1357: 2,5-Dihydrofuran vs 2-Heptylfuran

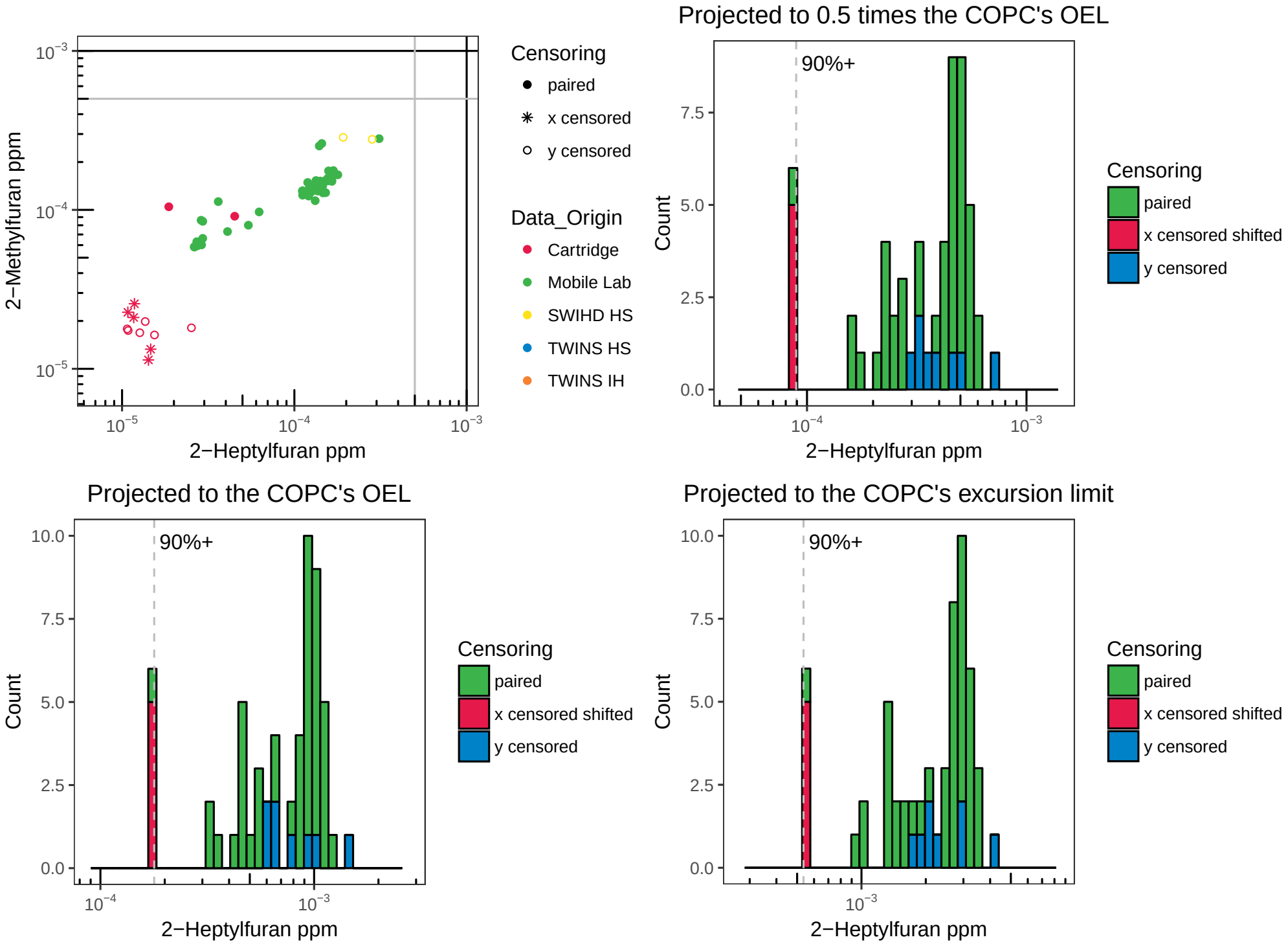


Figure C.1358: 2-Methylfuran vs 2-Heptylfuran

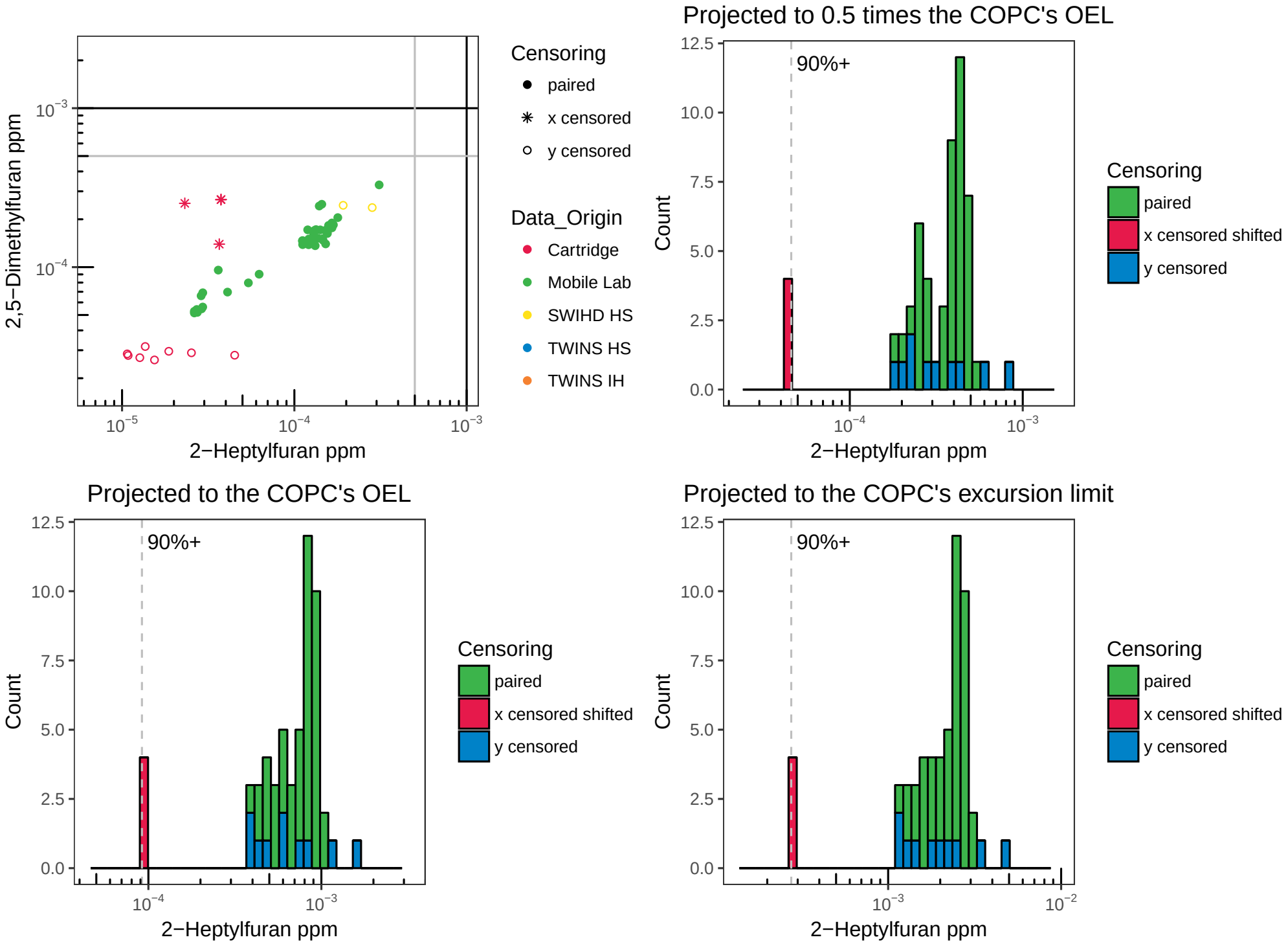


Figure C.1359: 2,5-Dimethylfuran vs 2-Heptylfuran

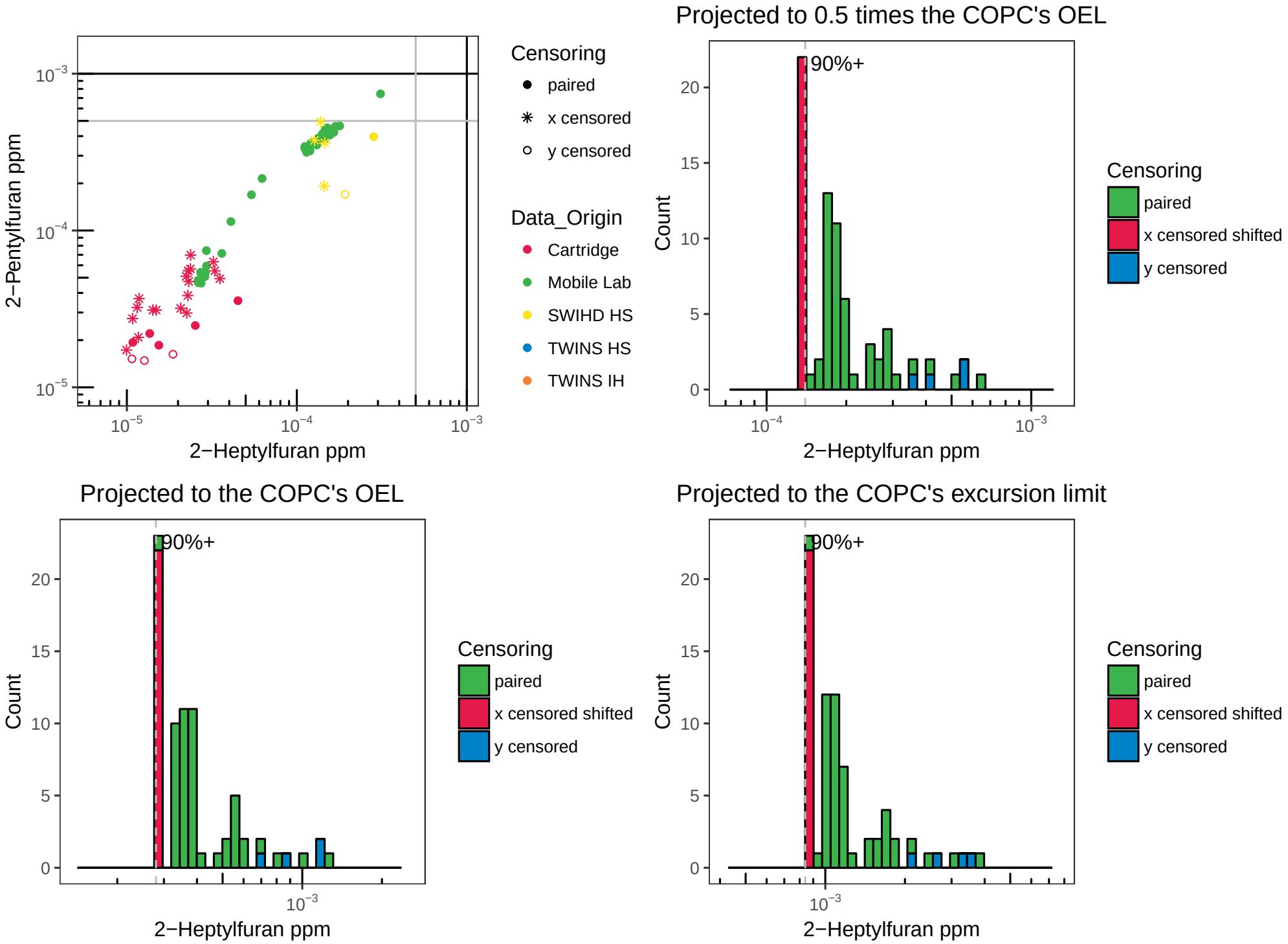


Figure C.1360: 2-Pentylfuran vs 2-Heptylfuran

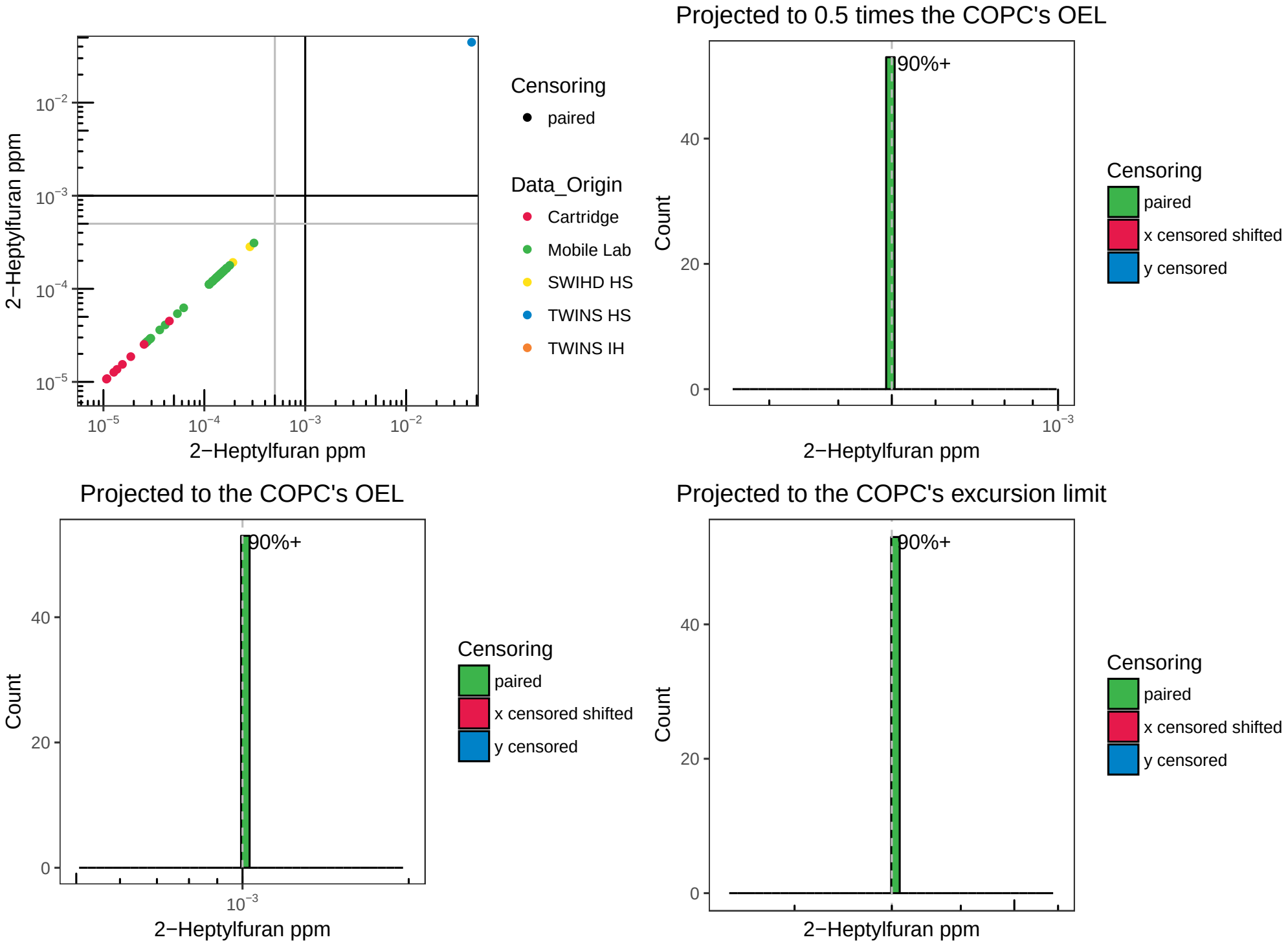


Figure C.1361: 2-Heptylfuran vs 2-Heptylfuran

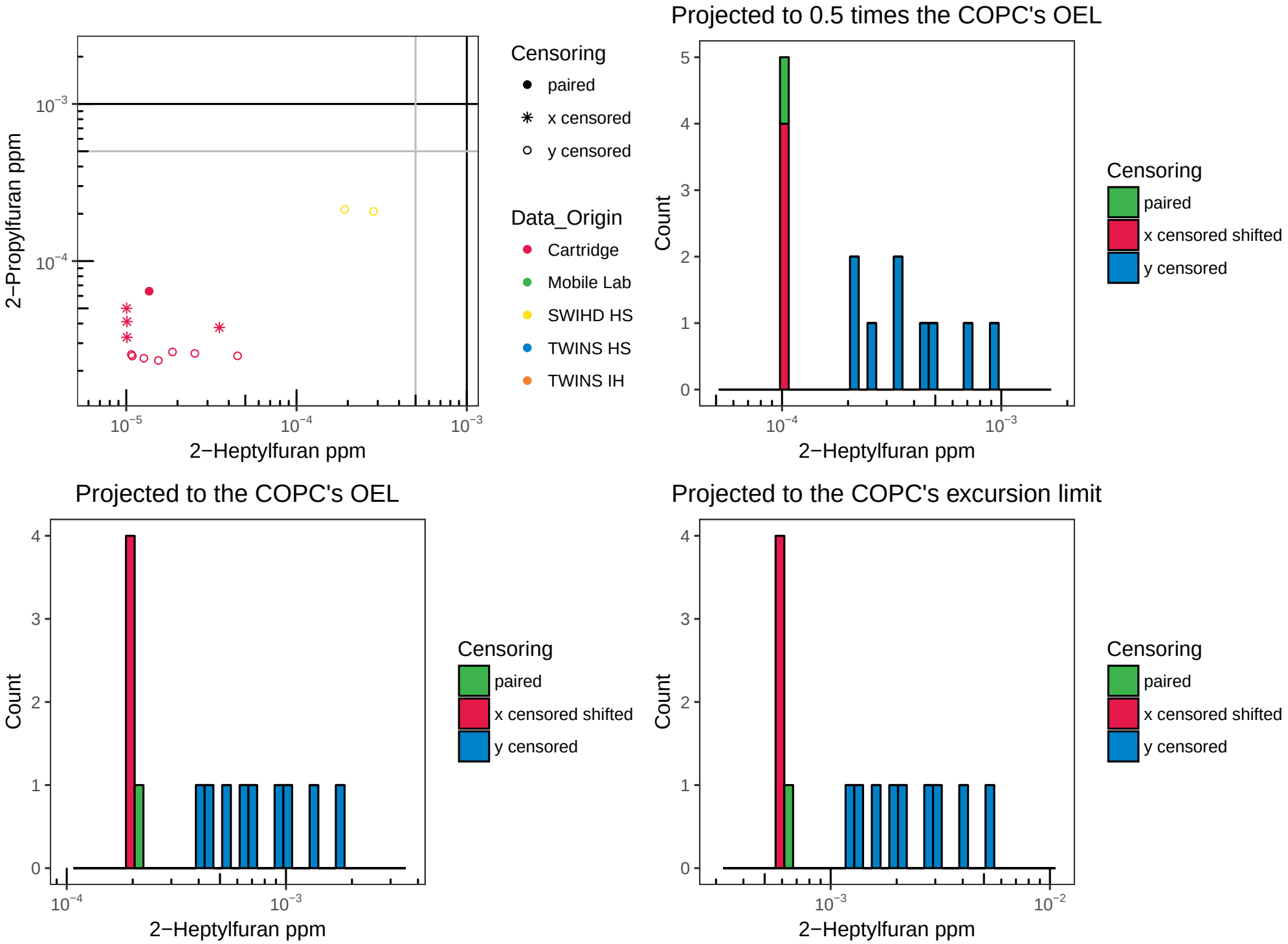


Figure C.1362: 2-Propylfuran vs 2-Heptylfuran

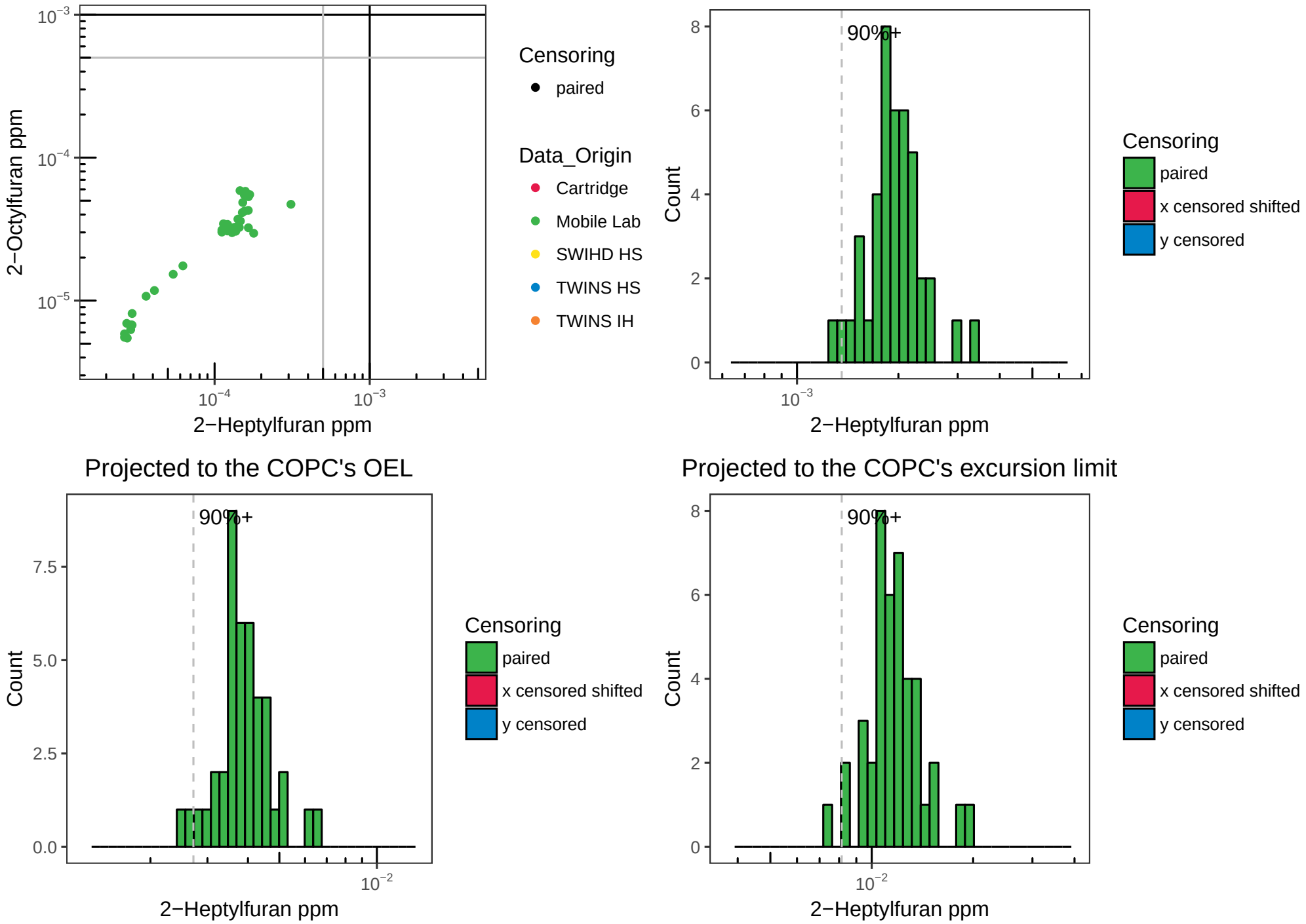


Figure C.1363: 2-Octylfuran vs 2-Heptylfuran

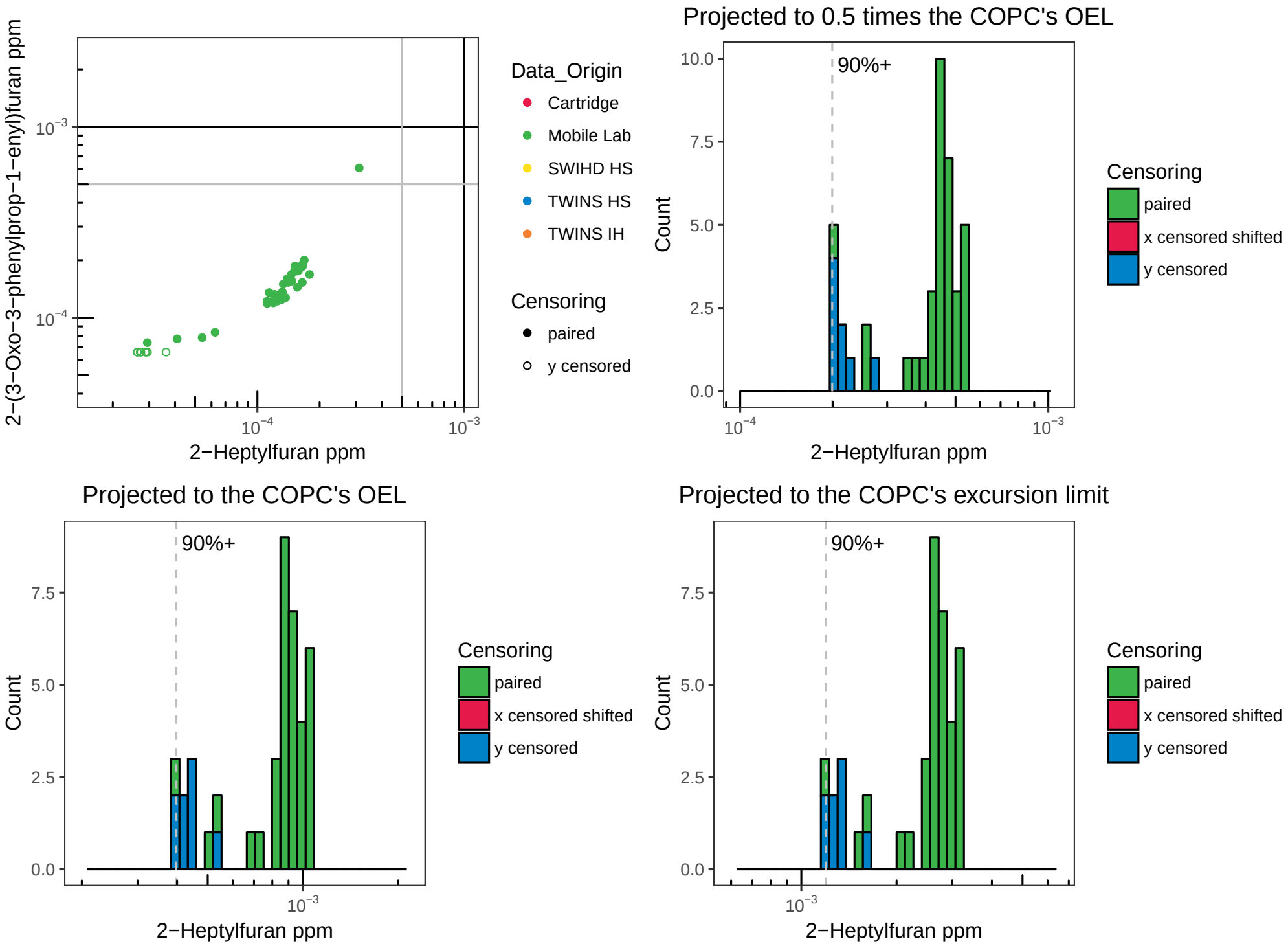


Figure C.1364: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2-Heptylfuran

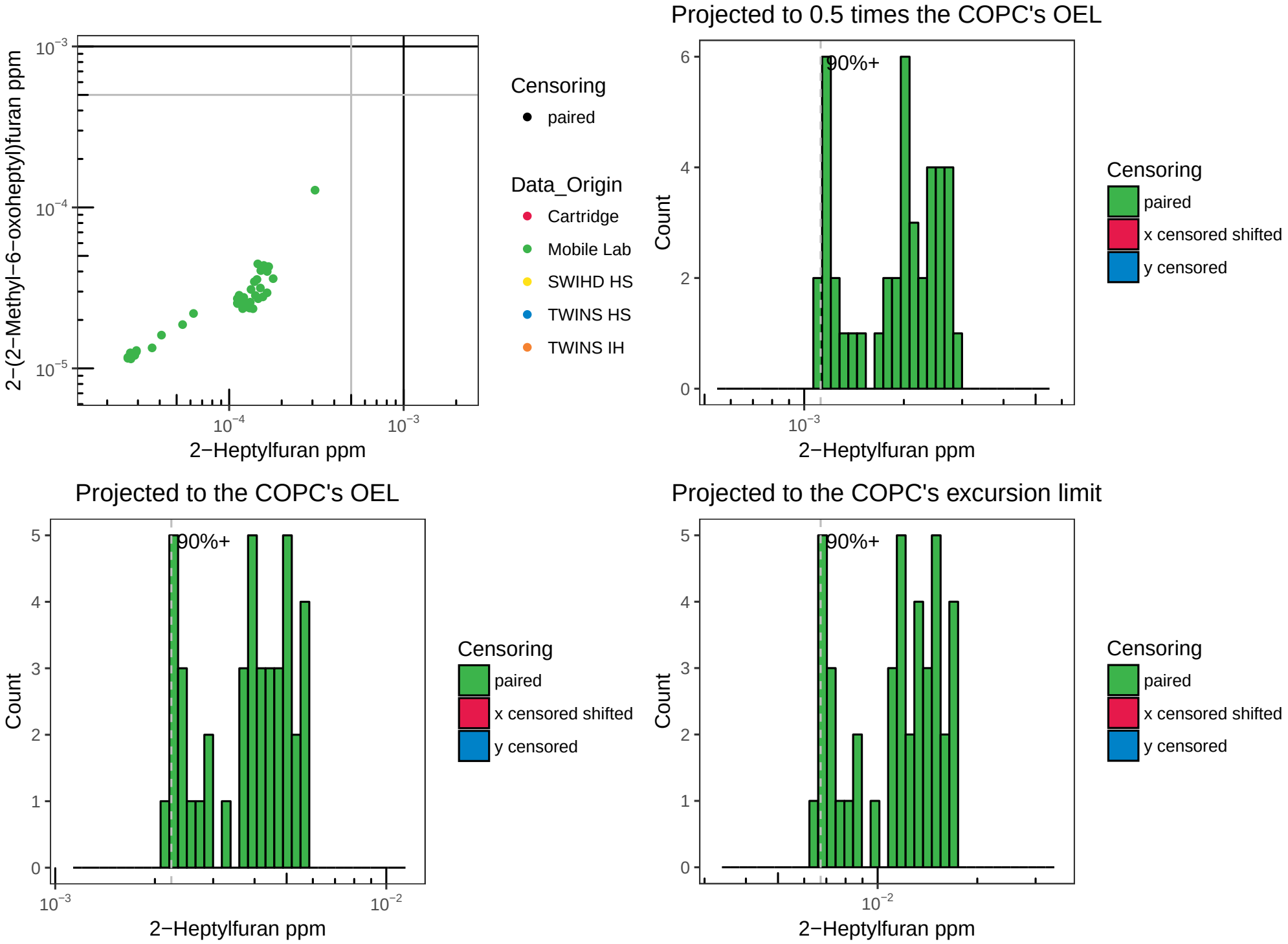


Figure C.1365: 2-(2-Methyl-6-oxoheptyl)furan vs 2-Heptylfuran

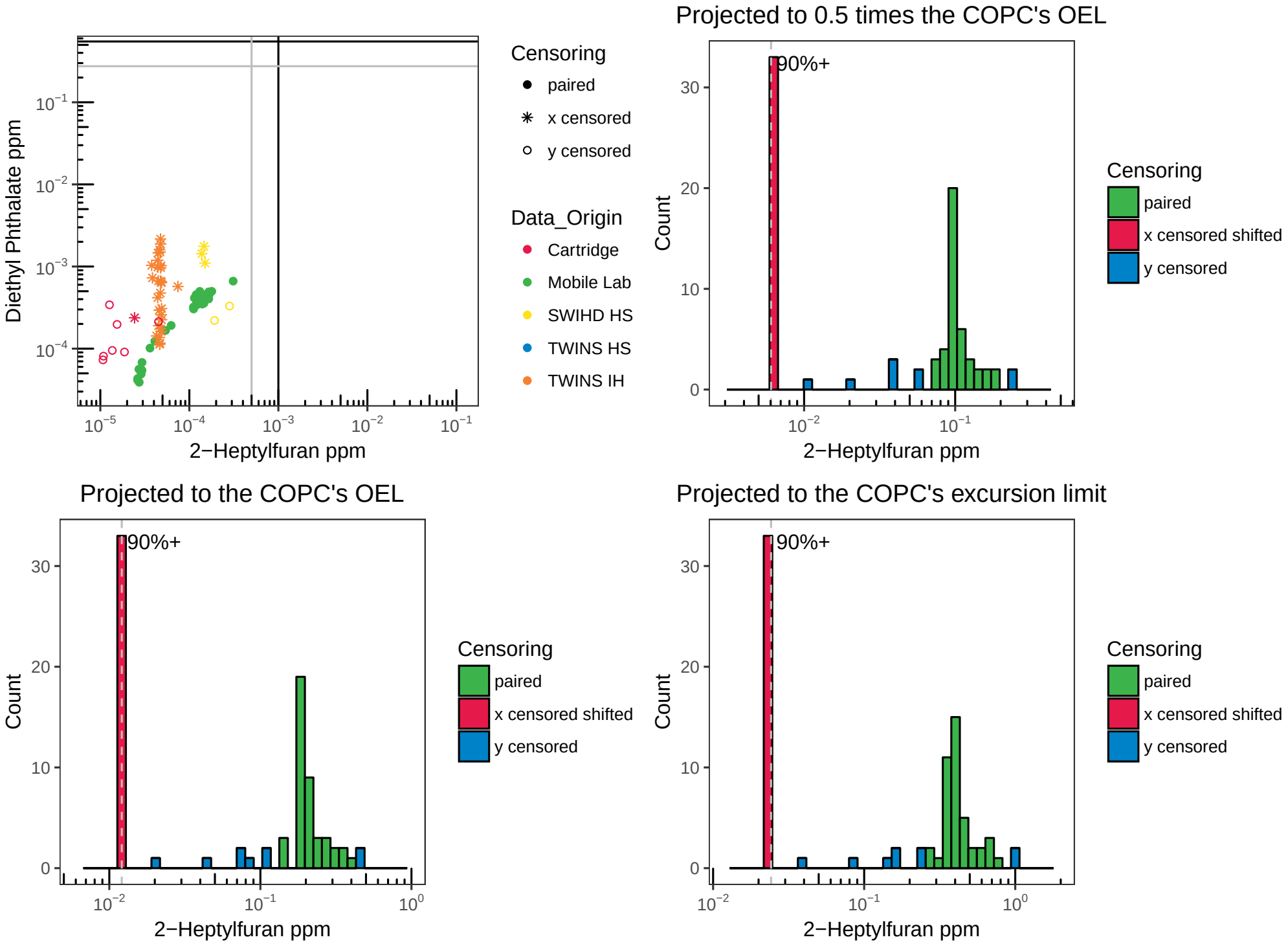


Figure C.1366: Diethyl Phthalate vs 2-Heptylfuran

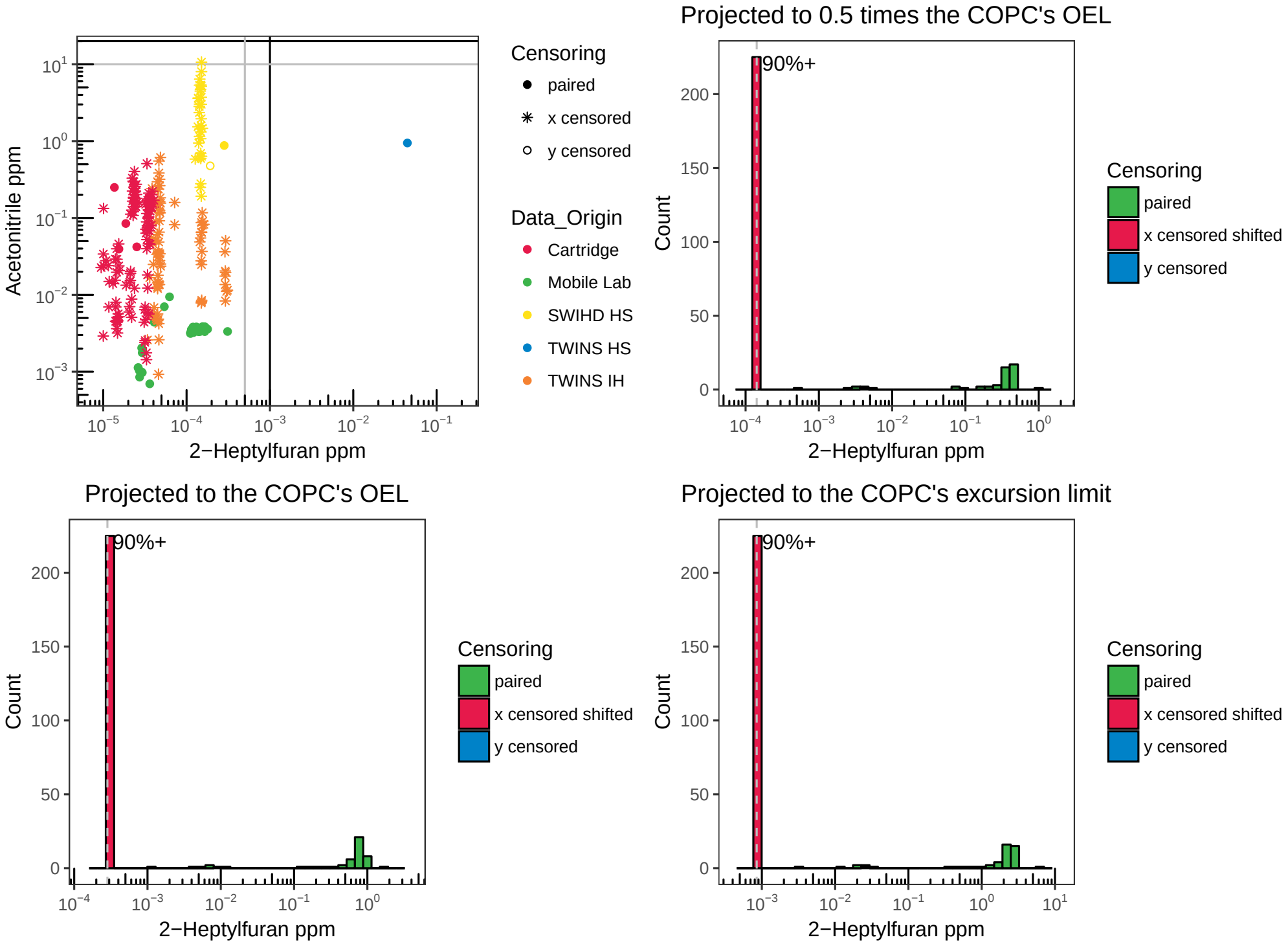


Figure C.1367: Acetonitrile vs 2-Heptylfuran

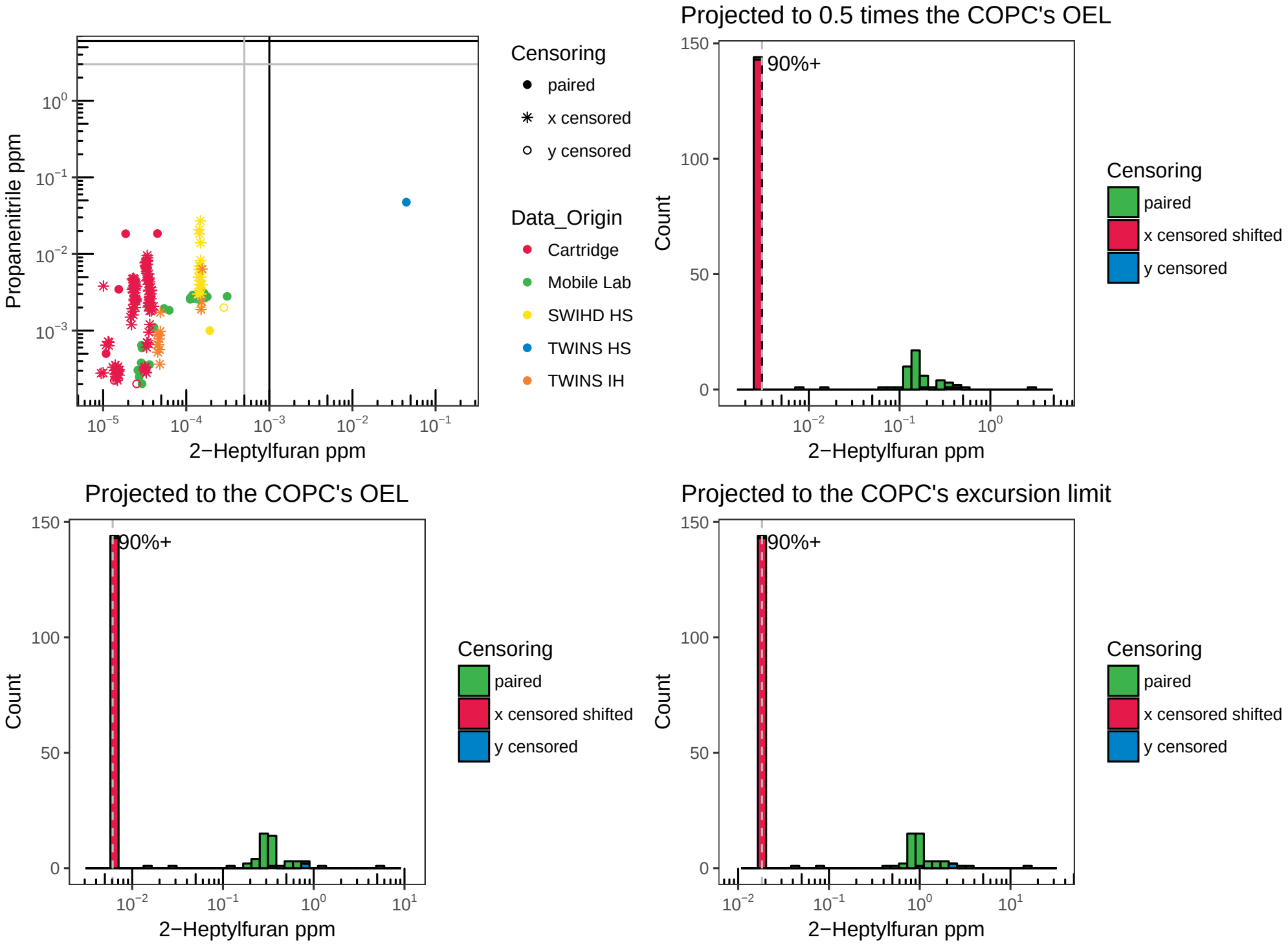


Figure C.1368: Propanenitrile vs 2-Heptylfuran

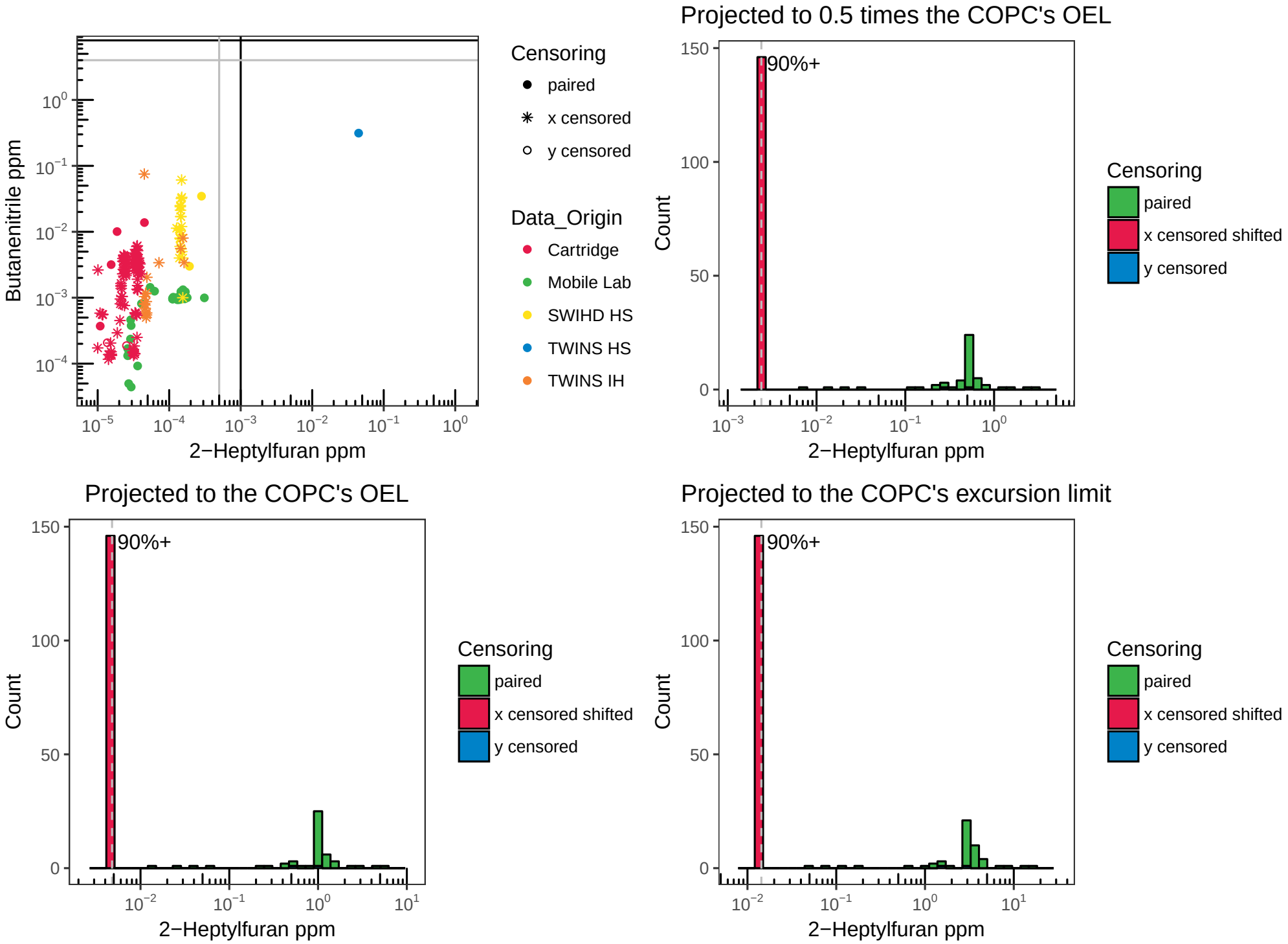


Figure C.1369: Butanenitrile vs 2-Heptylfuran

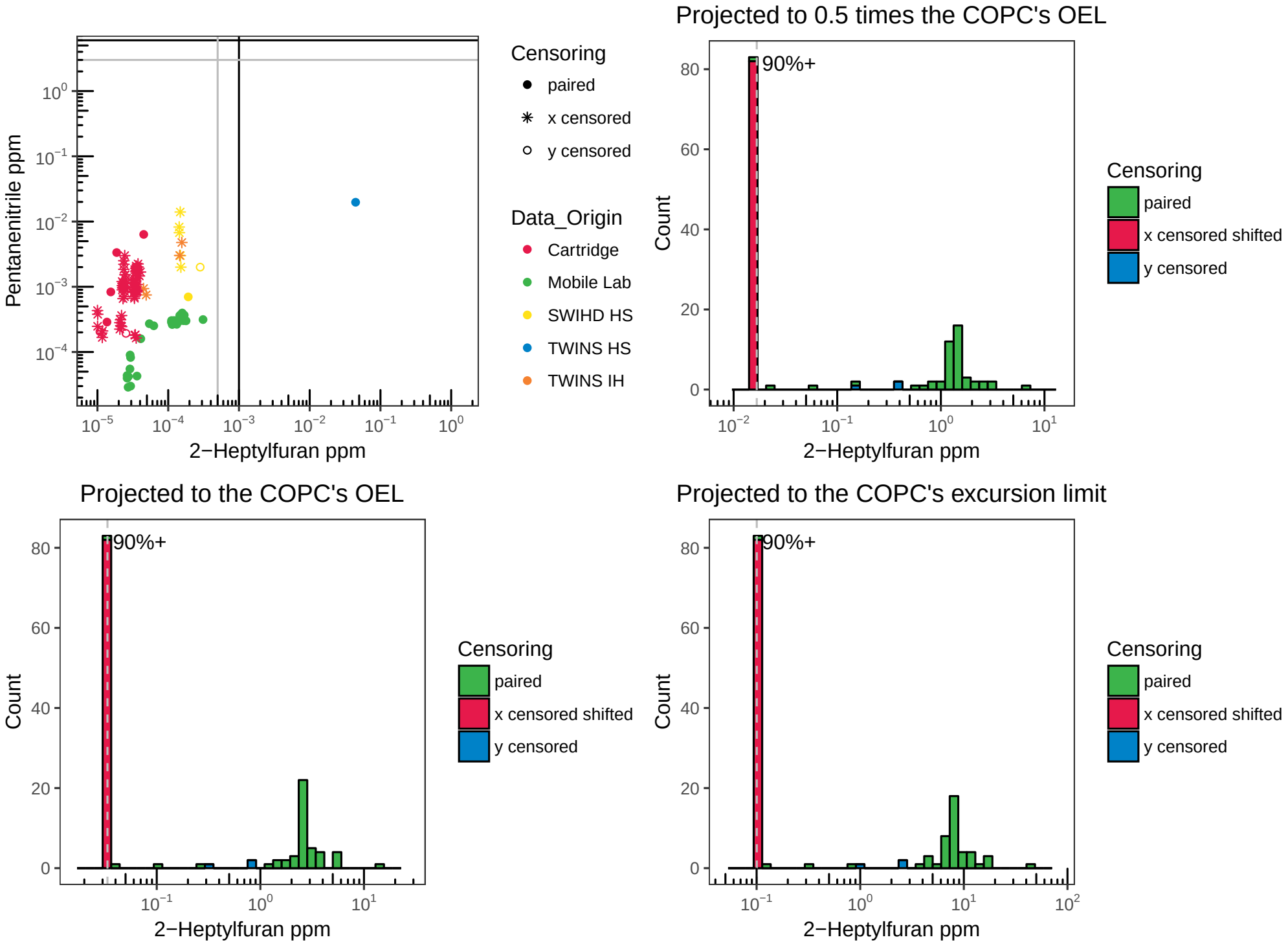


Figure C.1370: Pentanenitrile vs 2-Heptylfuran

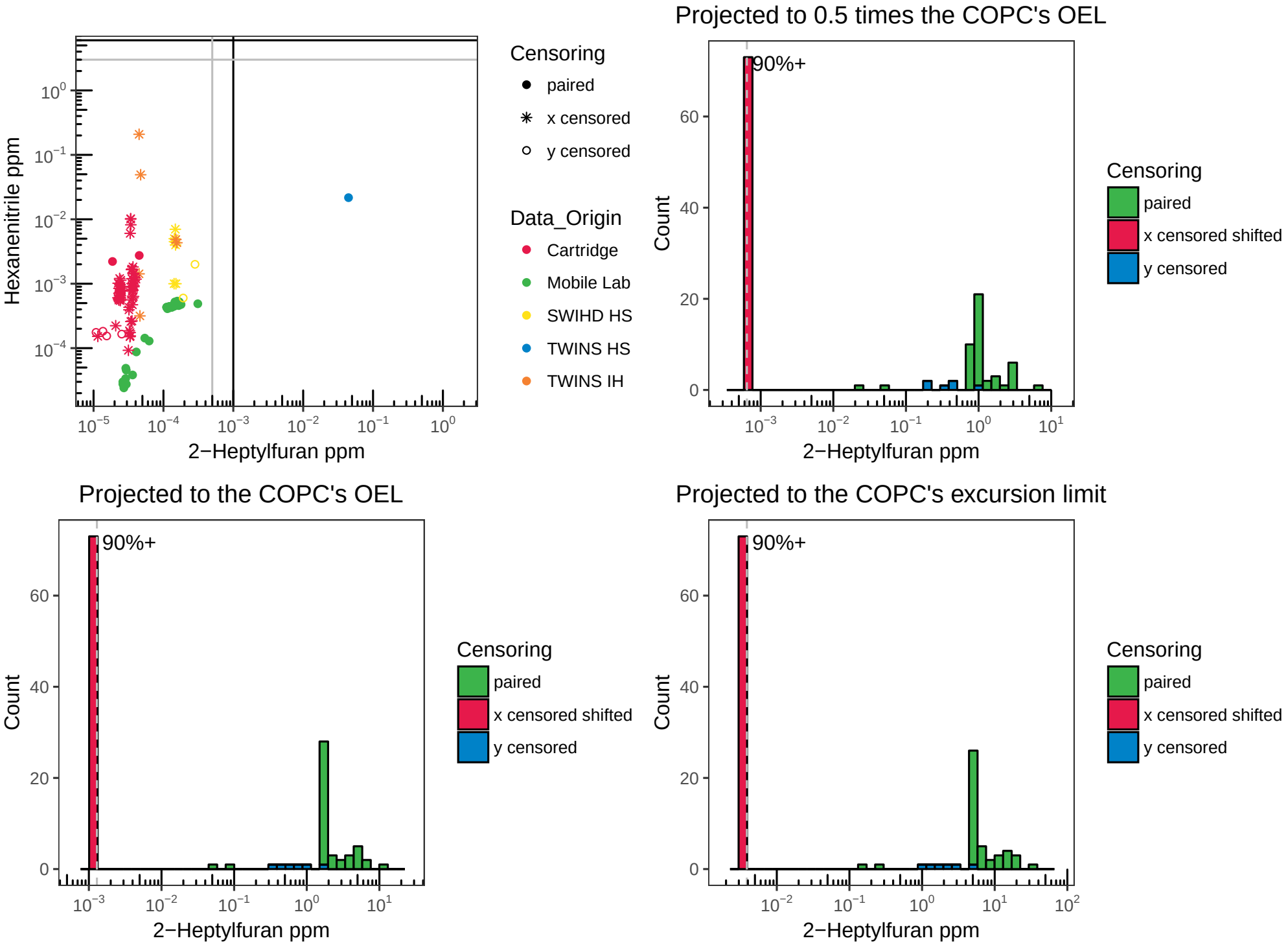


Figure C.1371: Hexanenitrile vs 2-Heptylfuran

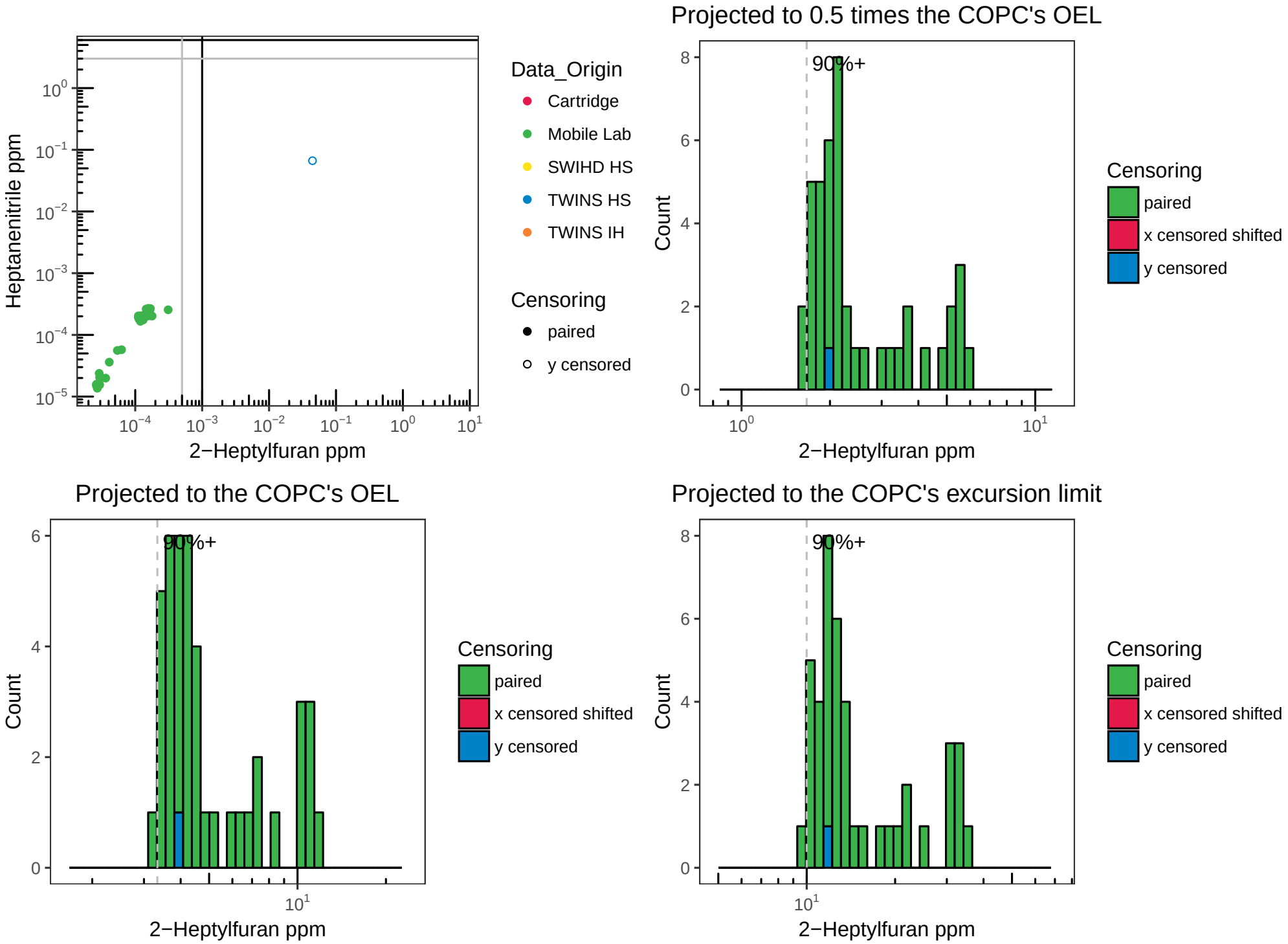


Figure C.1372: Heptanenitrile vs 2-Heptylfuran

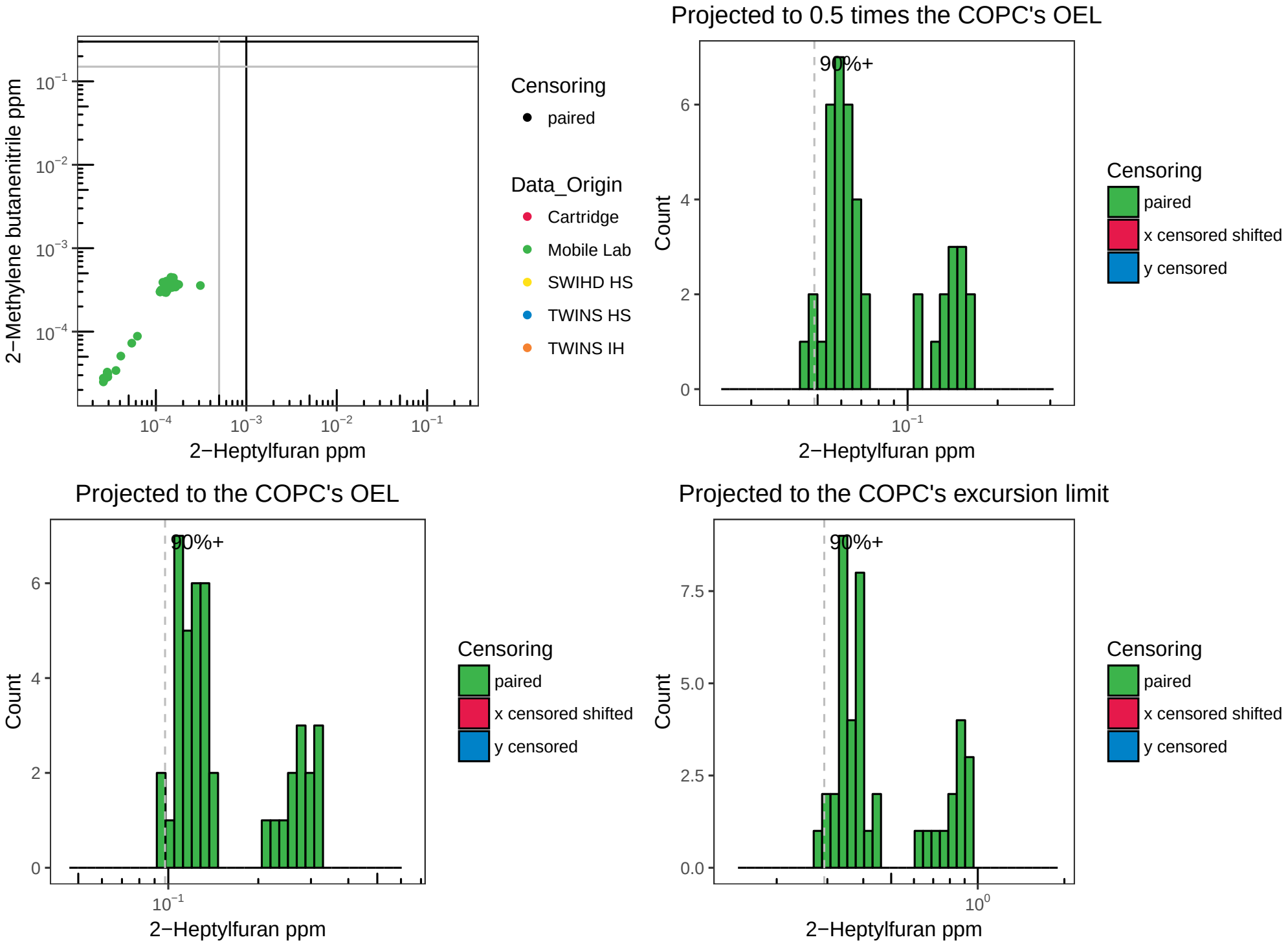


Figure C.1373: 2-Methylene butanenitrile vs 2-Heptylfuran

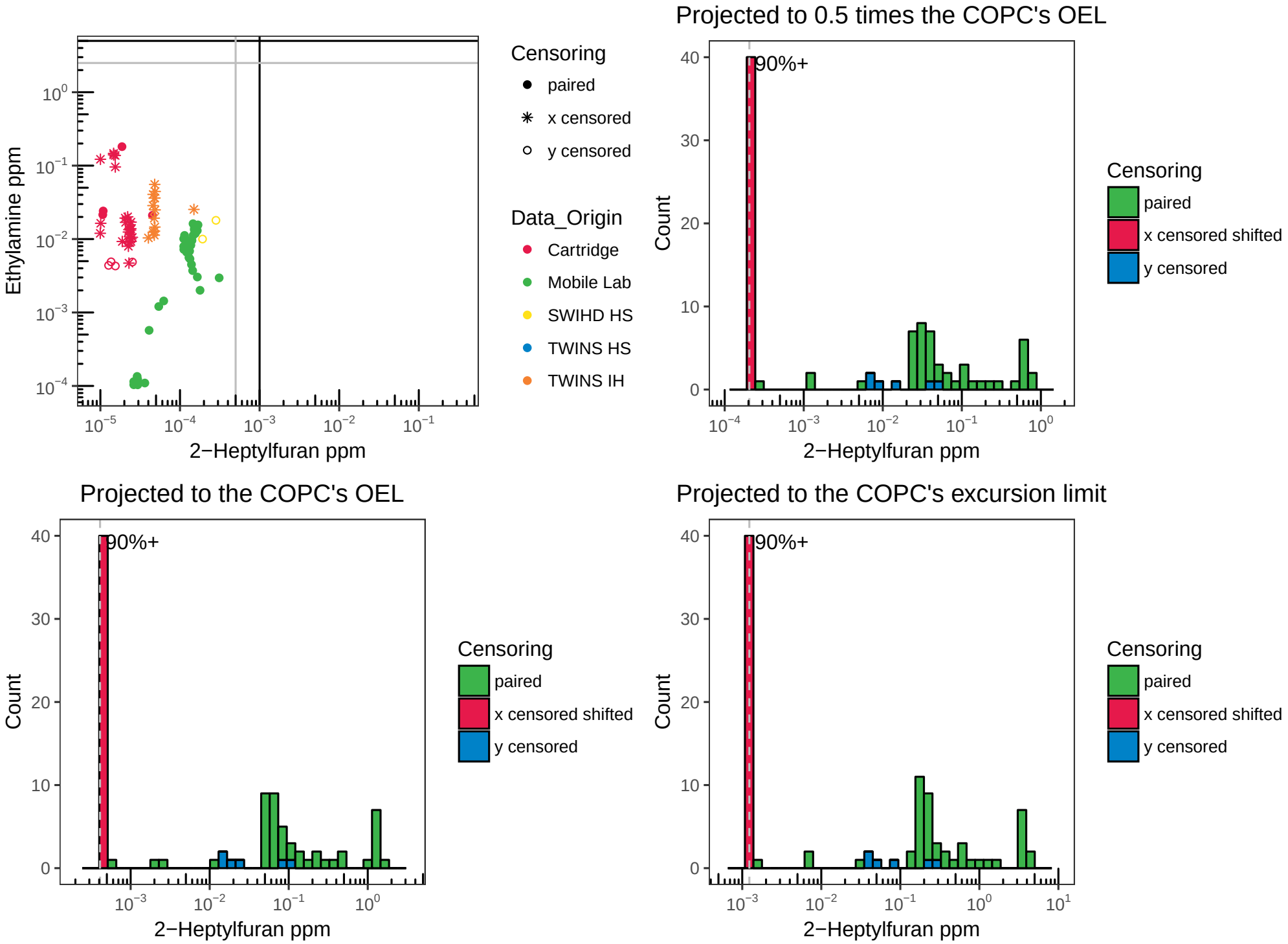


Figure C.1374: Ethylamine vs 2-Heptylfuran

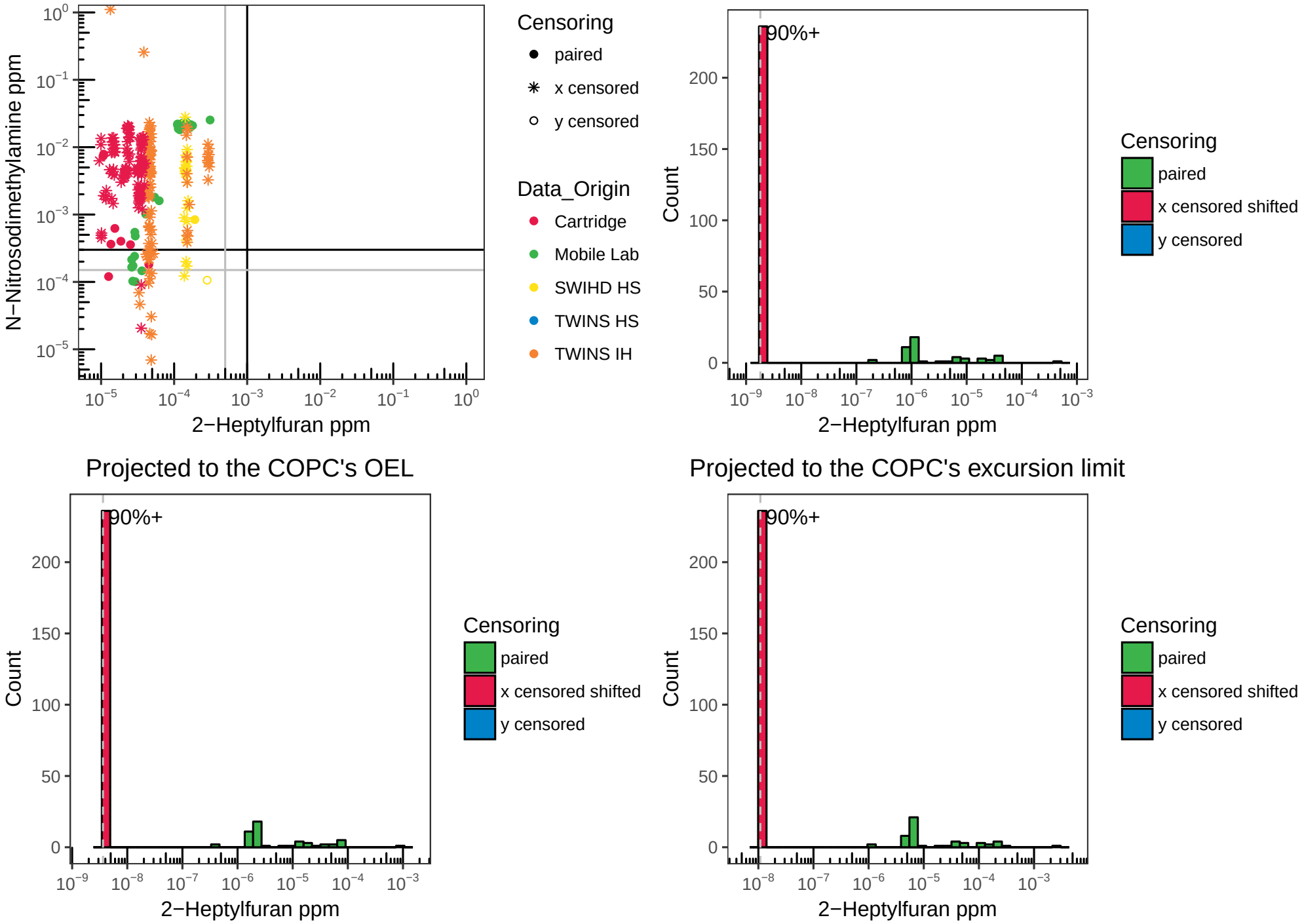


Figure C.1375: N-Nitrosodimethylamine vs 2-Heptylfuran

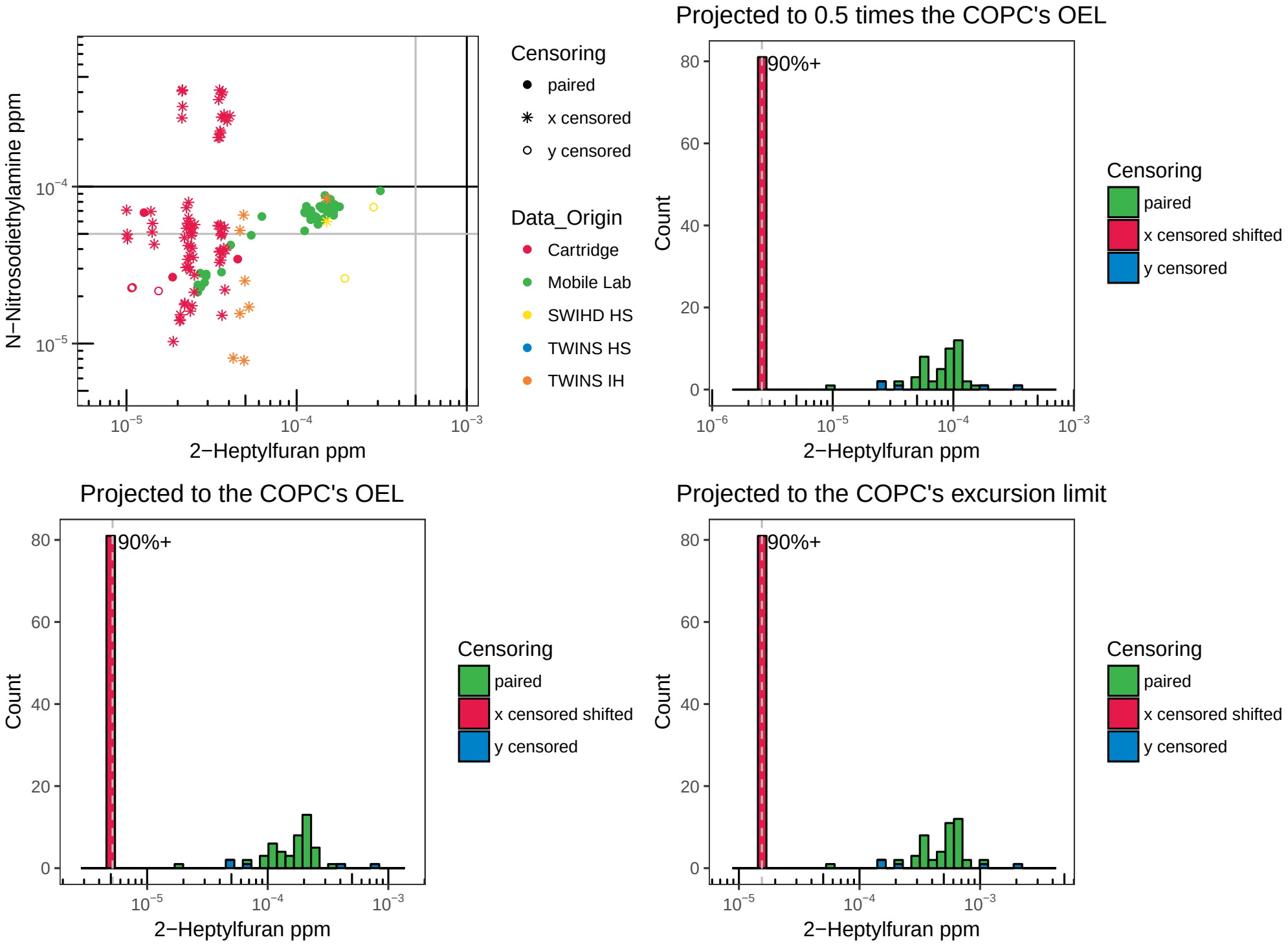


Figure C.1376: N-Nitrosodiethylamine vs 2-Heptylfuran

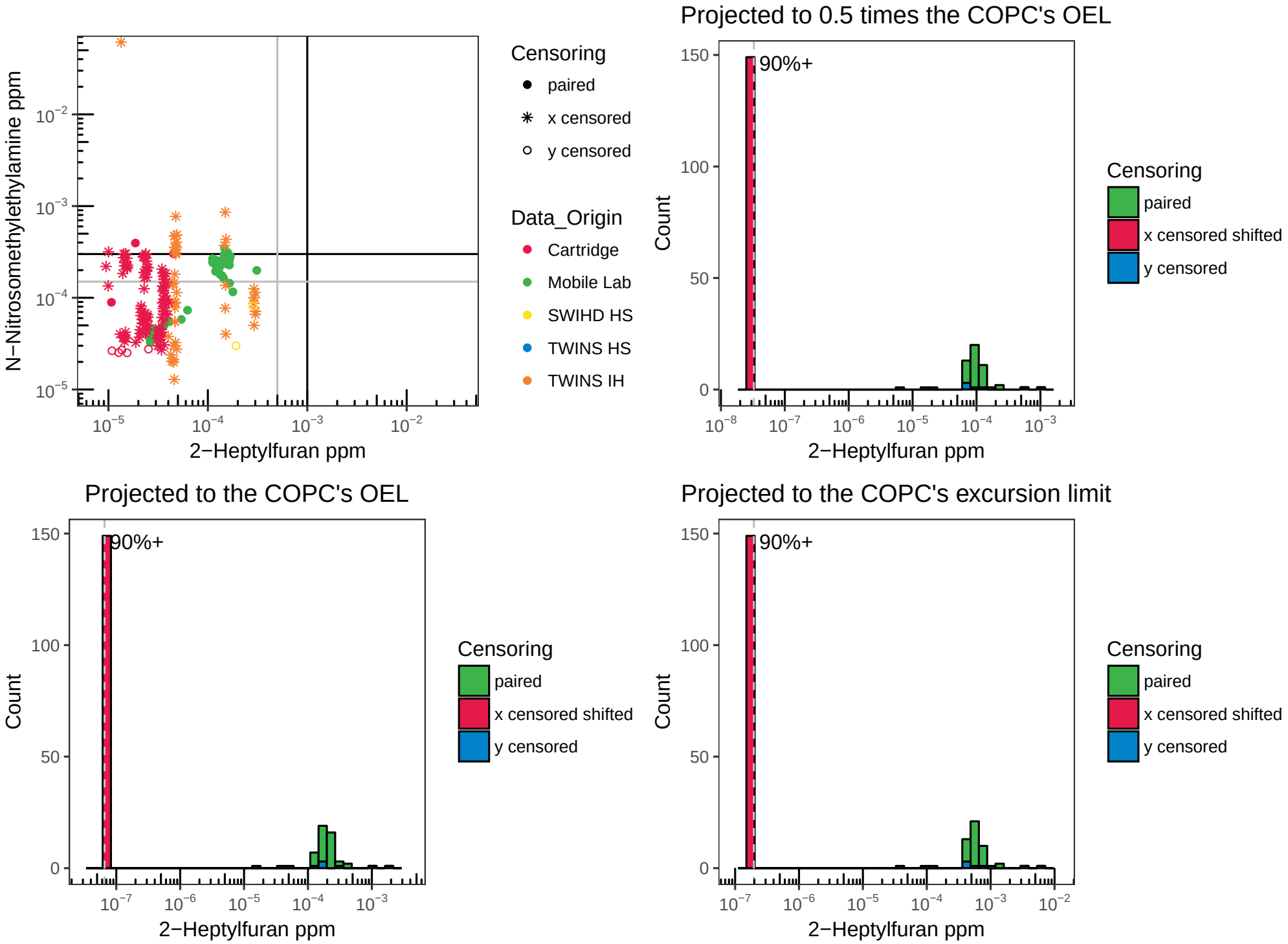


Figure C.1377: N-Nitrosomethylethylamine vs 2-Heptylfuran

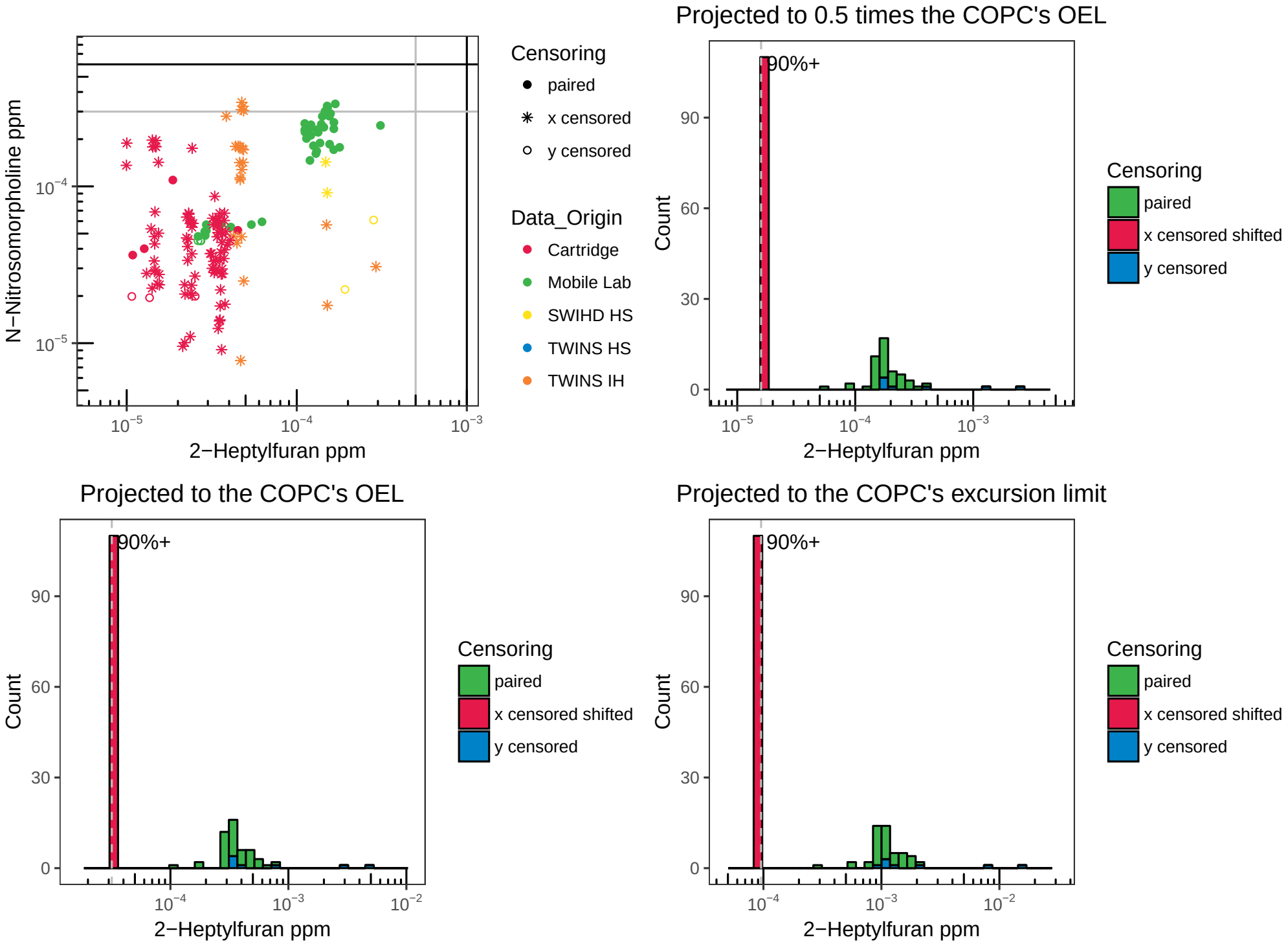


Figure C.1378: N-Nitrosomorpholine vs 2-Heptylfuran

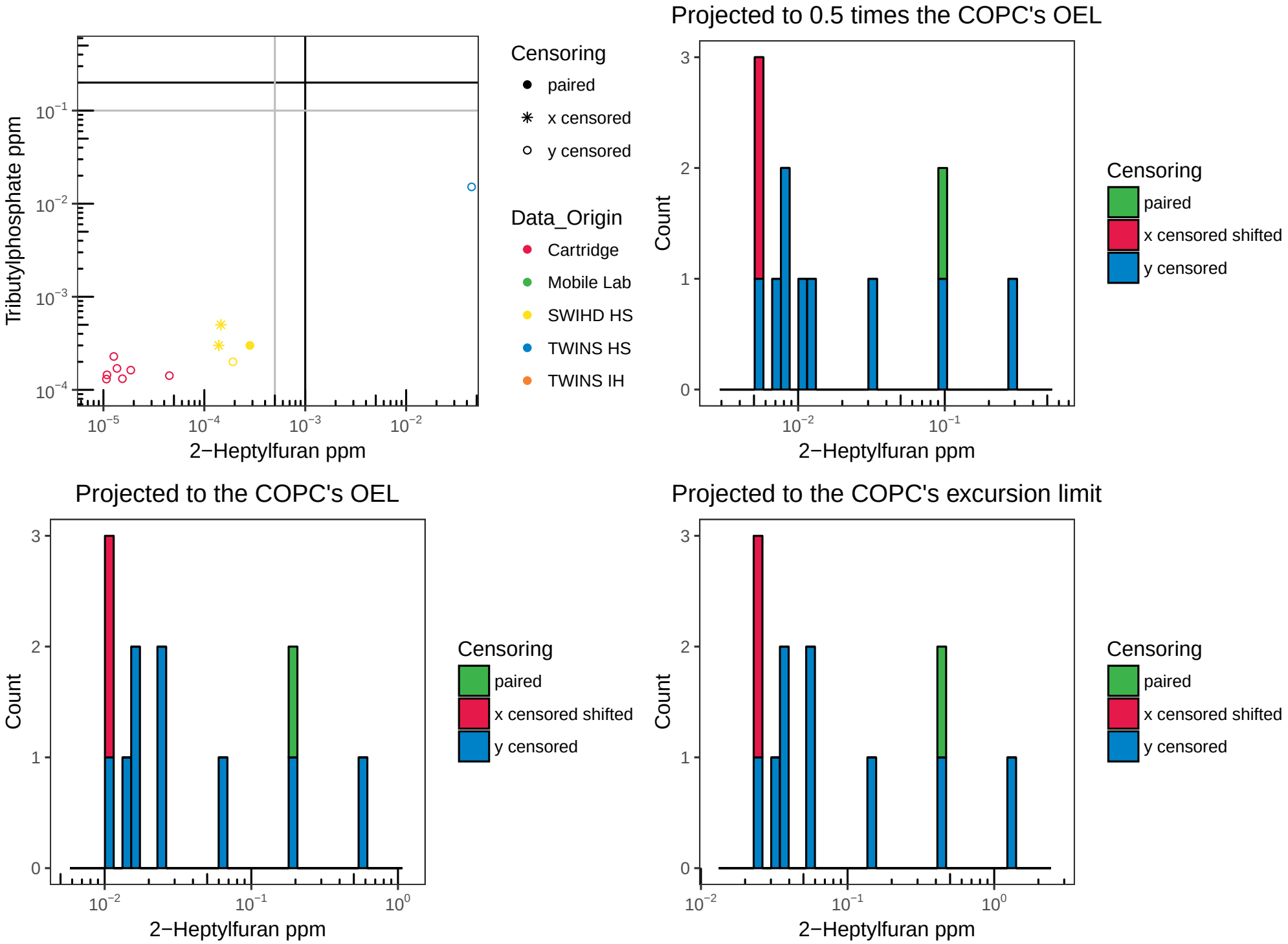


Figure C.1379: Tributylphosphate vs 2-Heptylfuran

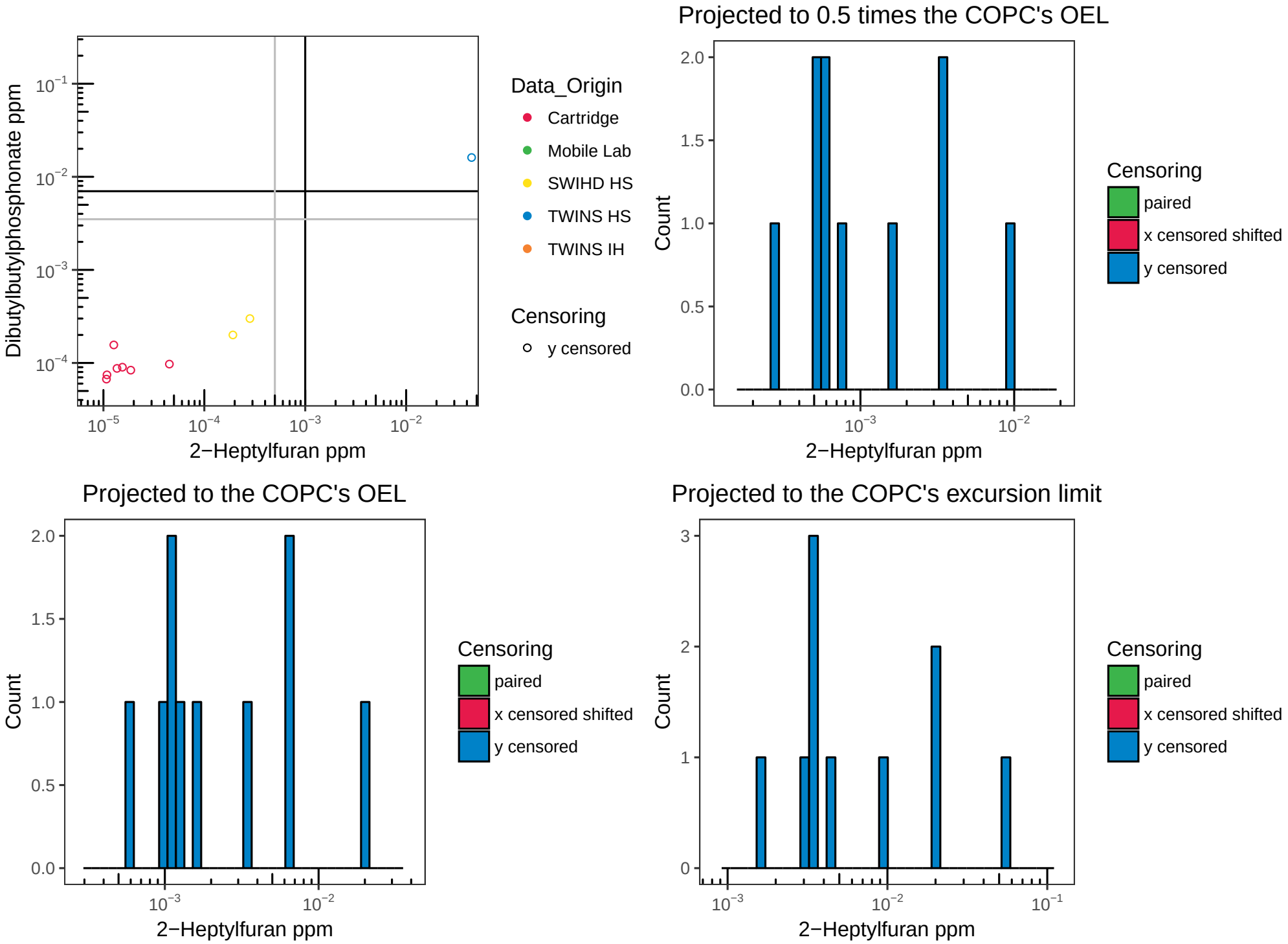


Figure C.1380: Dibutylbutylphosphonate vs 2-Heptylfuran

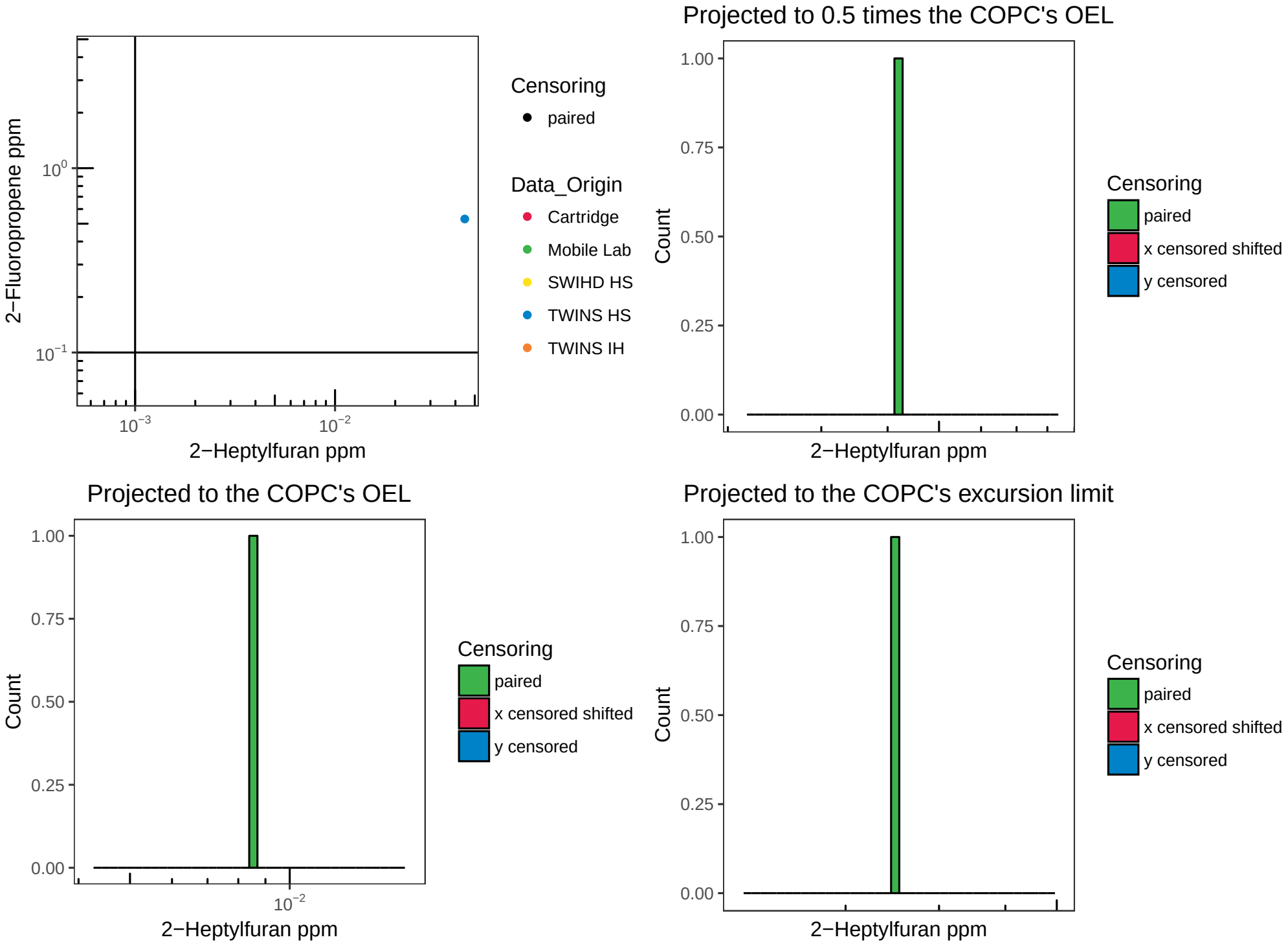


Figure C.1381: 2-Fluoropropene vs 2-Heptylfuran

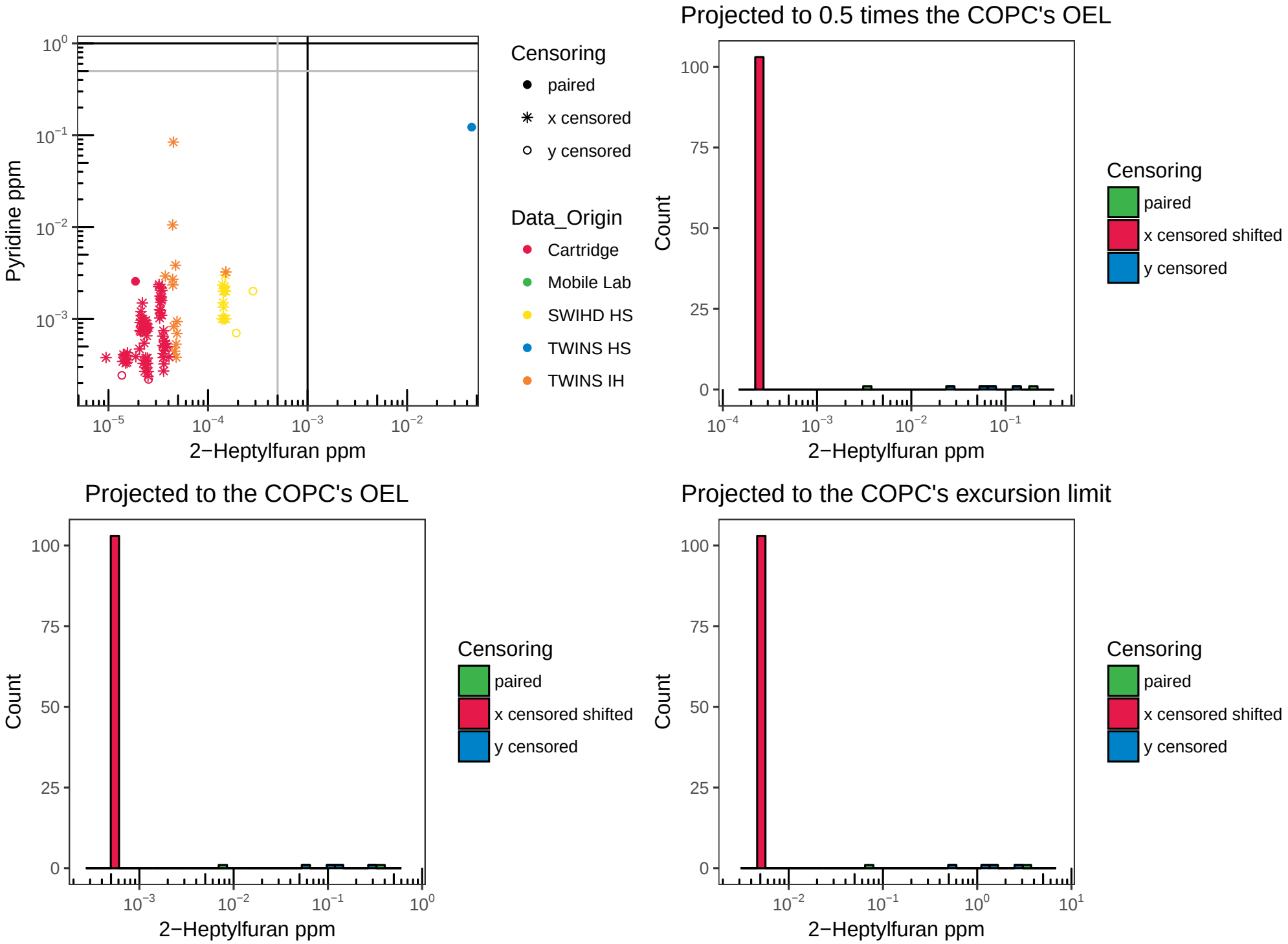


Figure C.1382: Pyridine vs 2-Heptylfuran

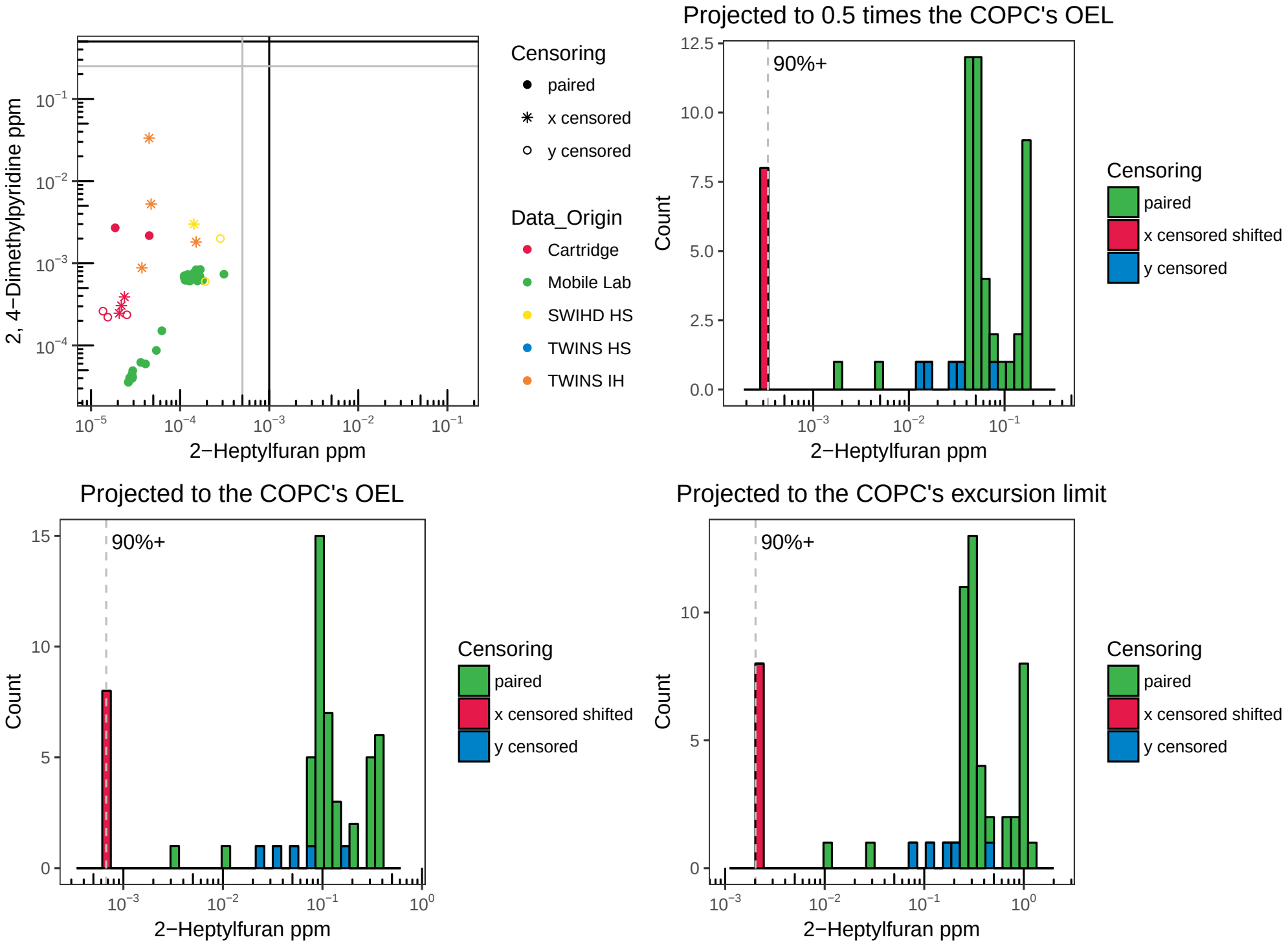


Figure C.1383: 2, 4-Dimethylpyridine vs 2-Heptylfuran

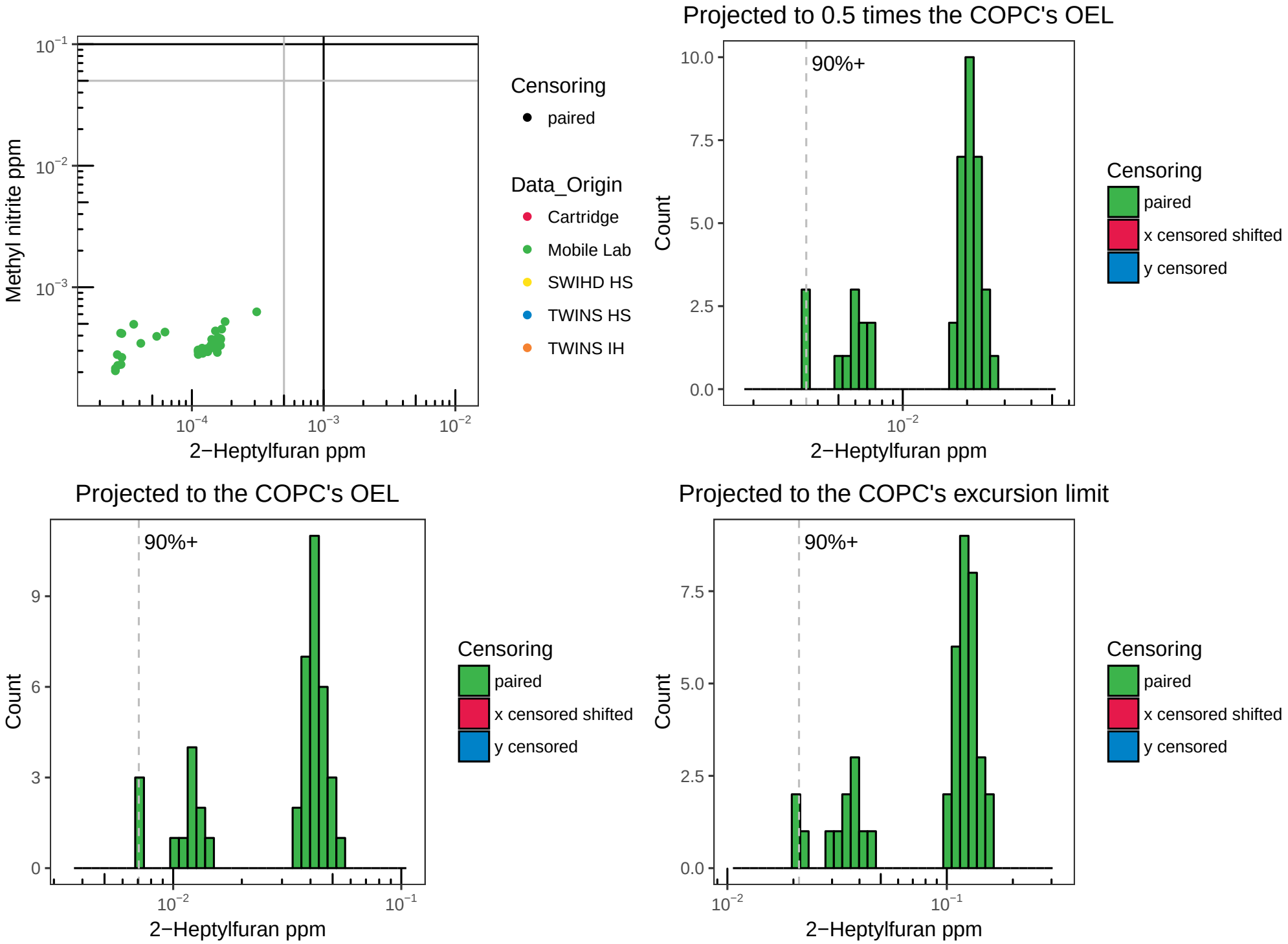


Figure C.1384: Methyl nitrite vs 2-Heptylfuran

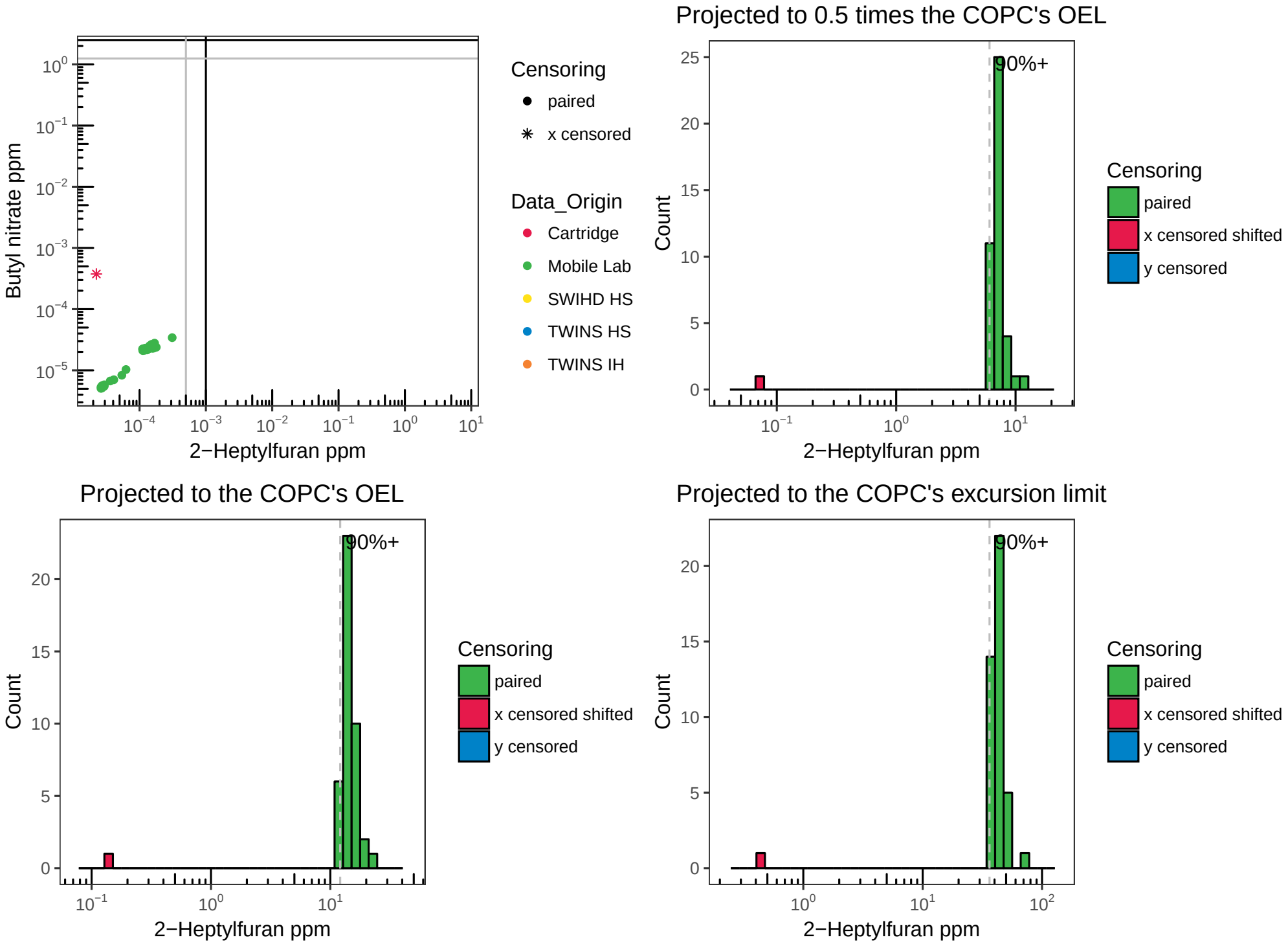


Figure C.1385: Butyl nitrate vs 2-Heptylfuran

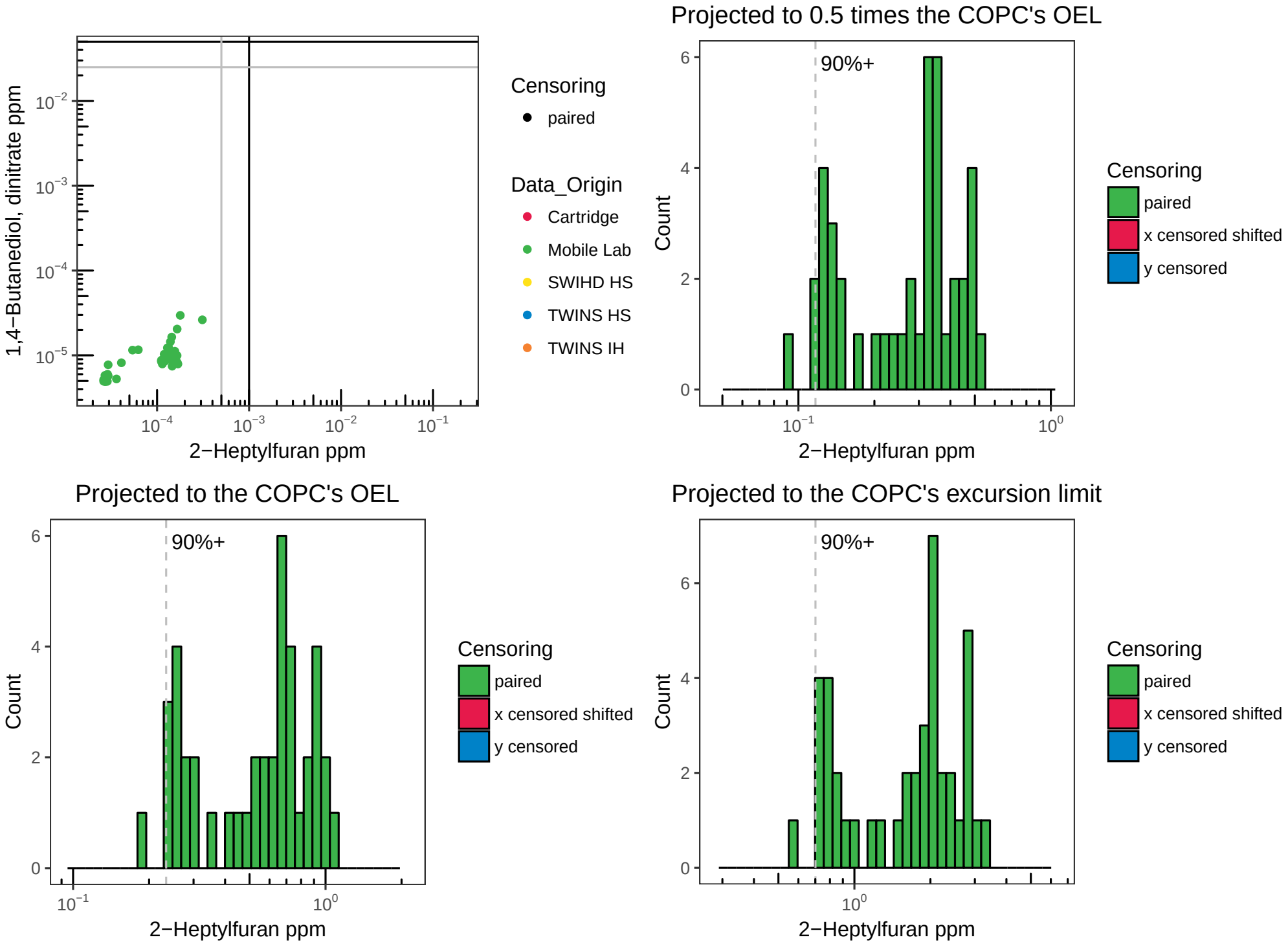


Figure C.1386: 1,4-Butanediol, dinitrate vs 2-Heptylfuran

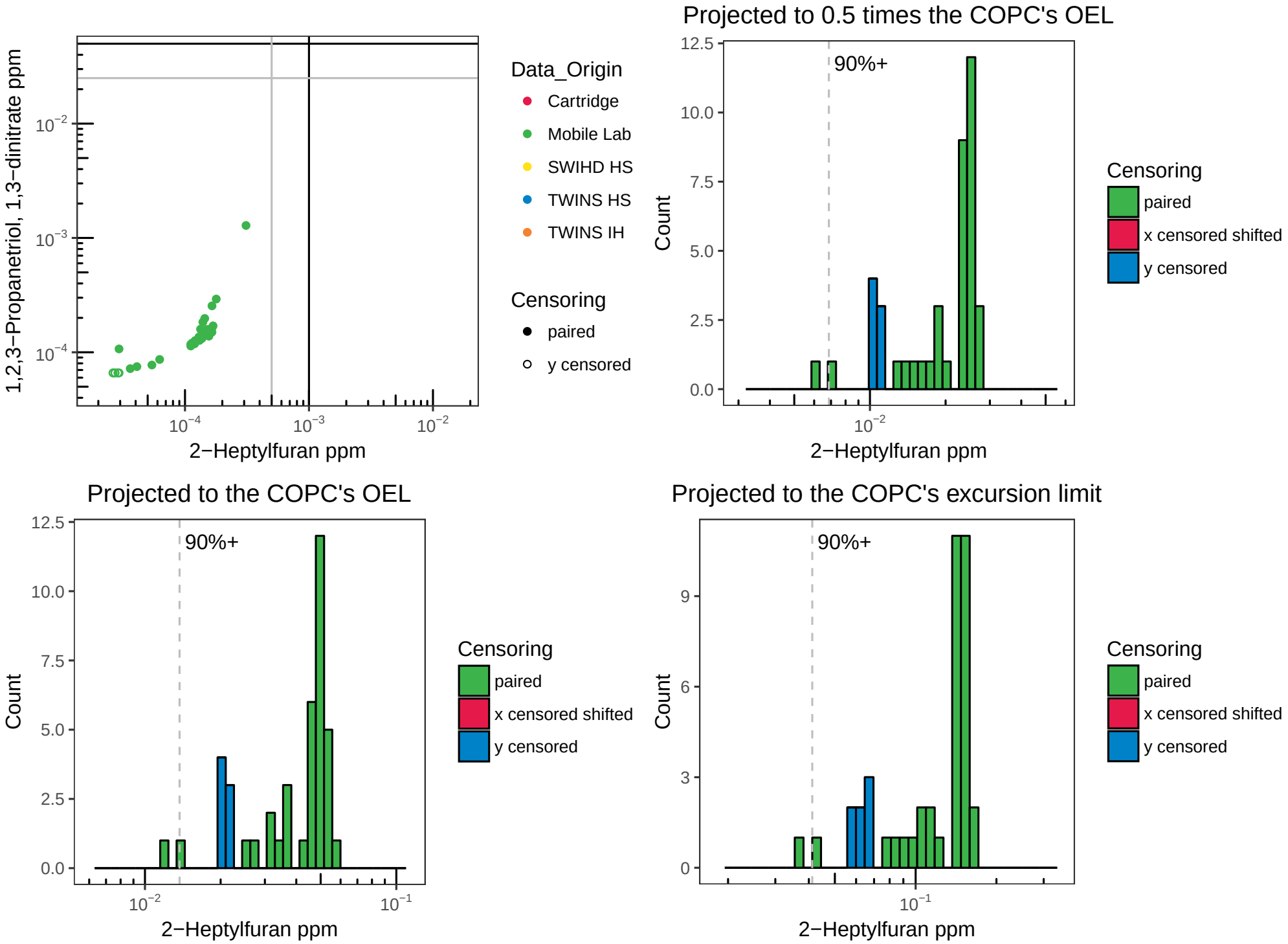


Figure C.1387: 1,2,3-Propanetriol, 1,3-dinitrate vs 2-Heptylfuran

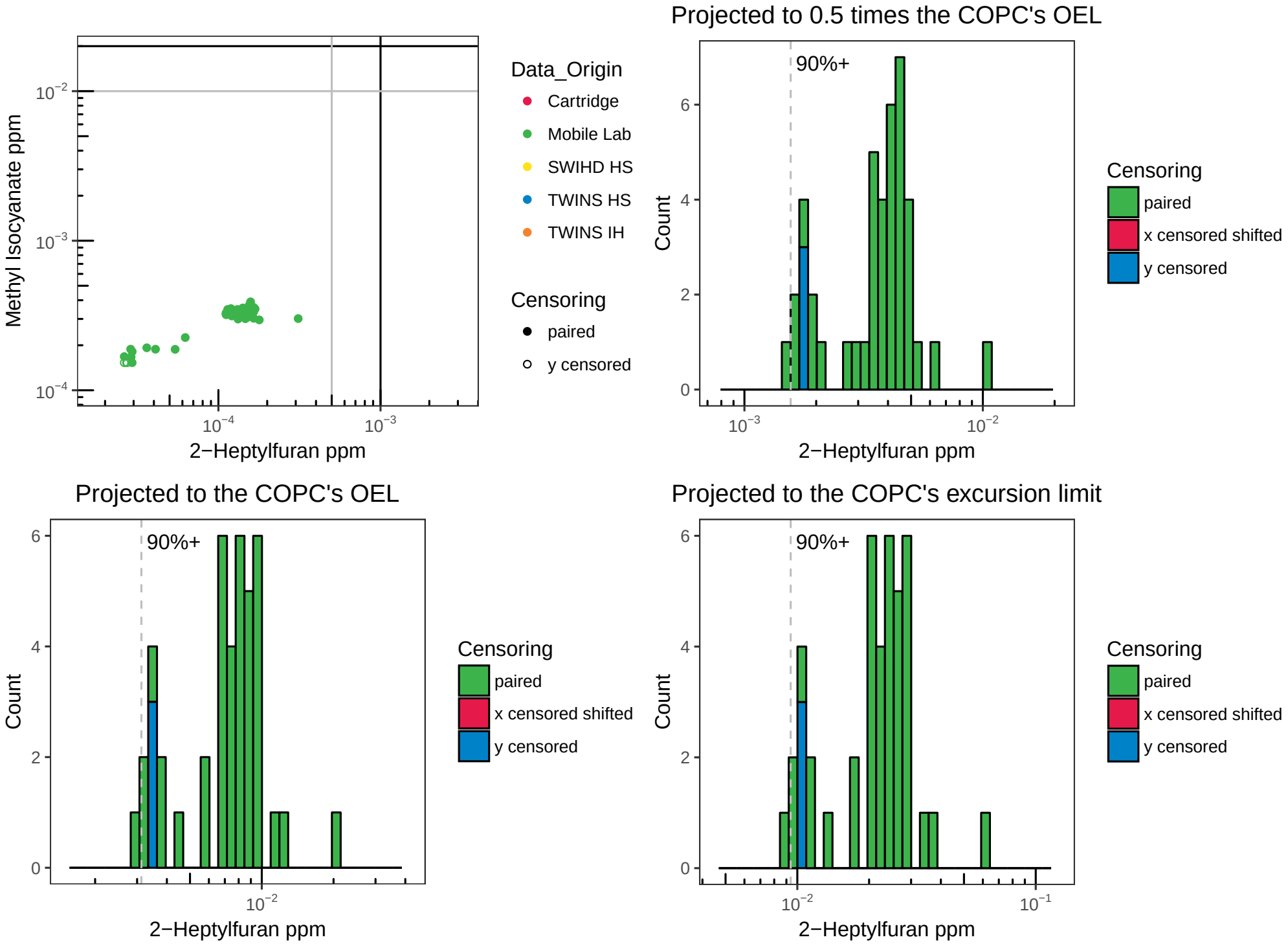


Figure C.1388: Methyl Isocyanate vs 2-Heptylfuran

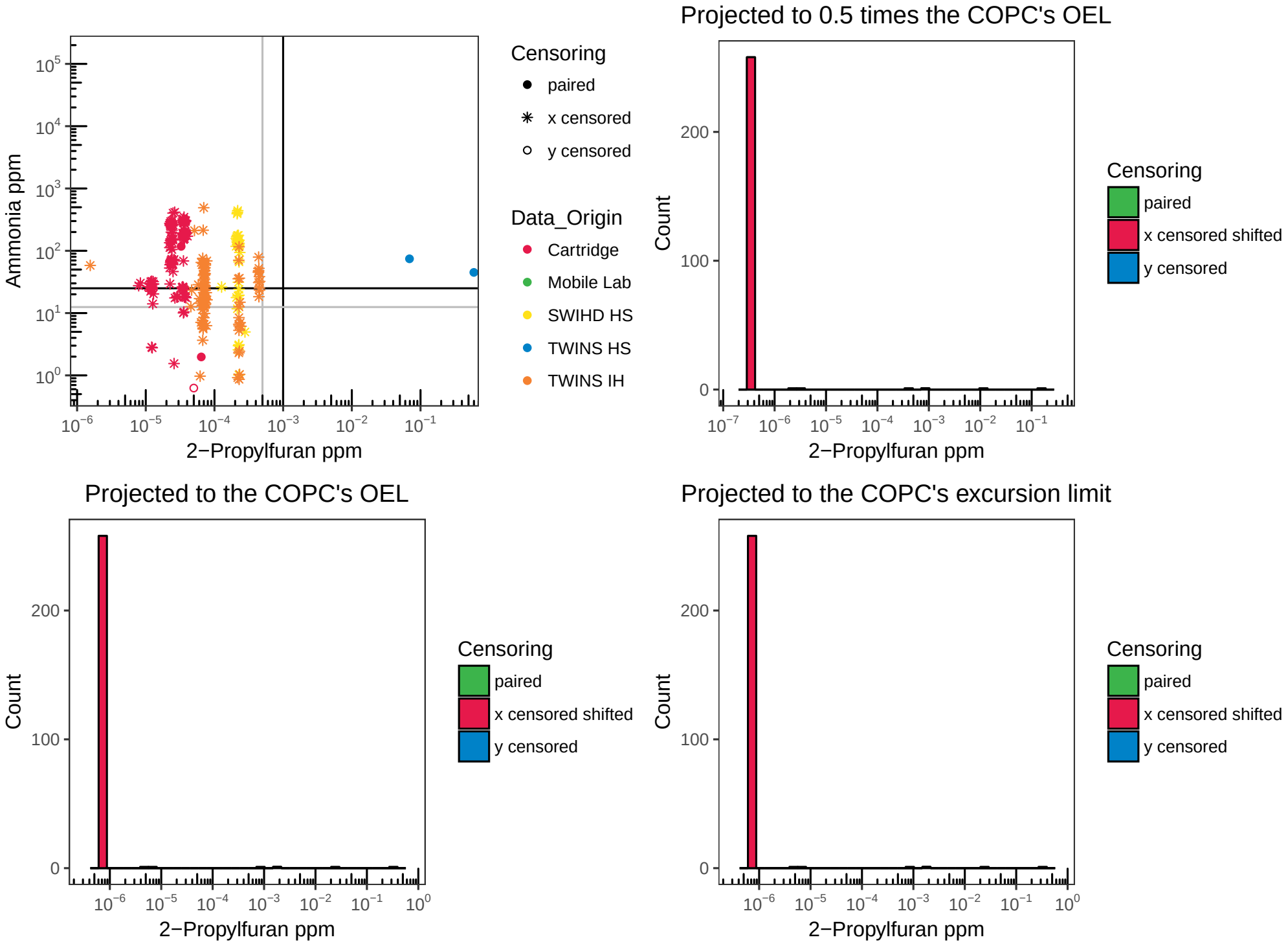


Figure C.1389: Ammonia vs 2-Propylfuran

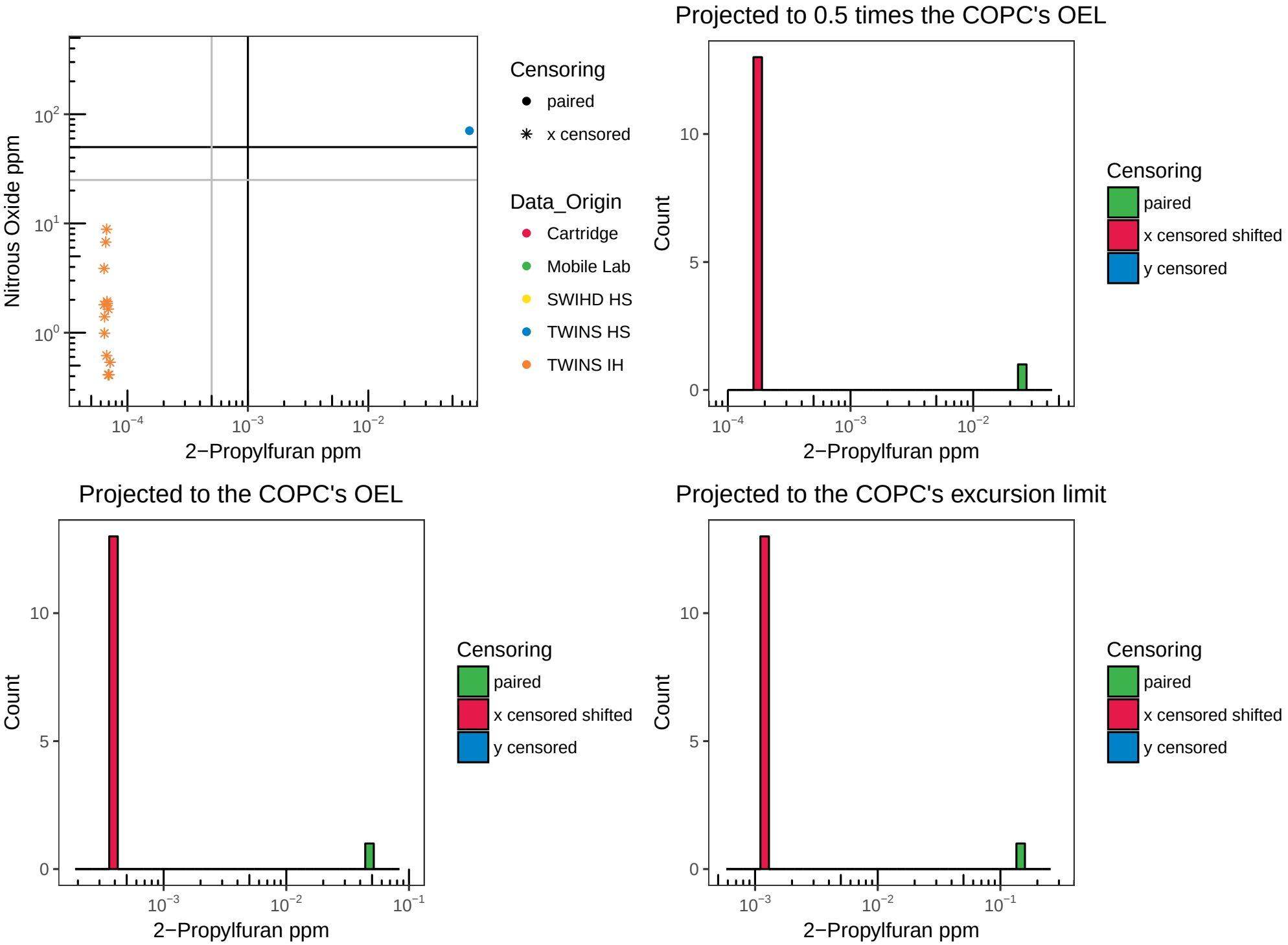


Figure C.1390: Nitrous Oxide vs 2-Propylfuran

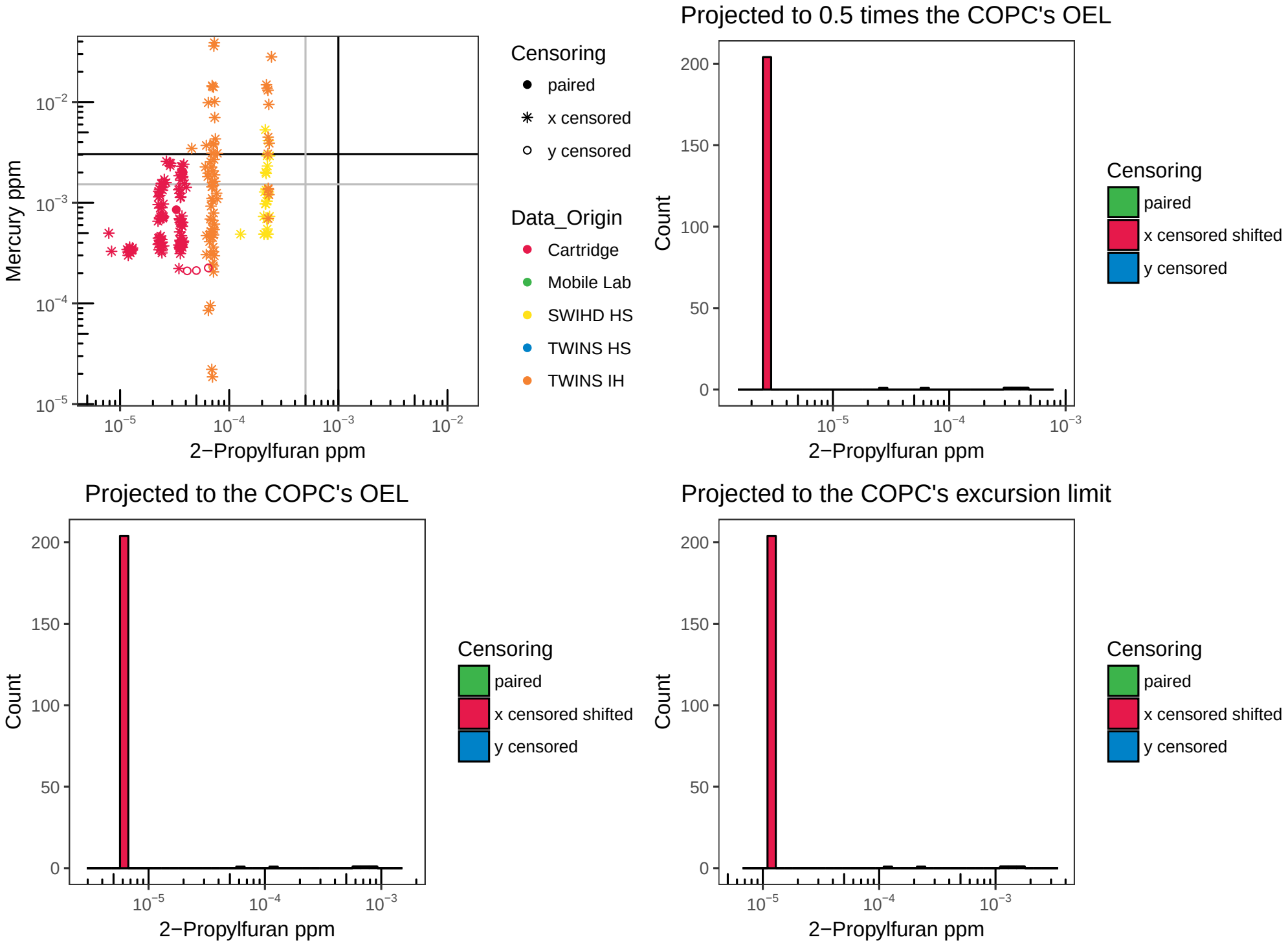


Figure C.1391: Mercury vs 2-Propylfuran

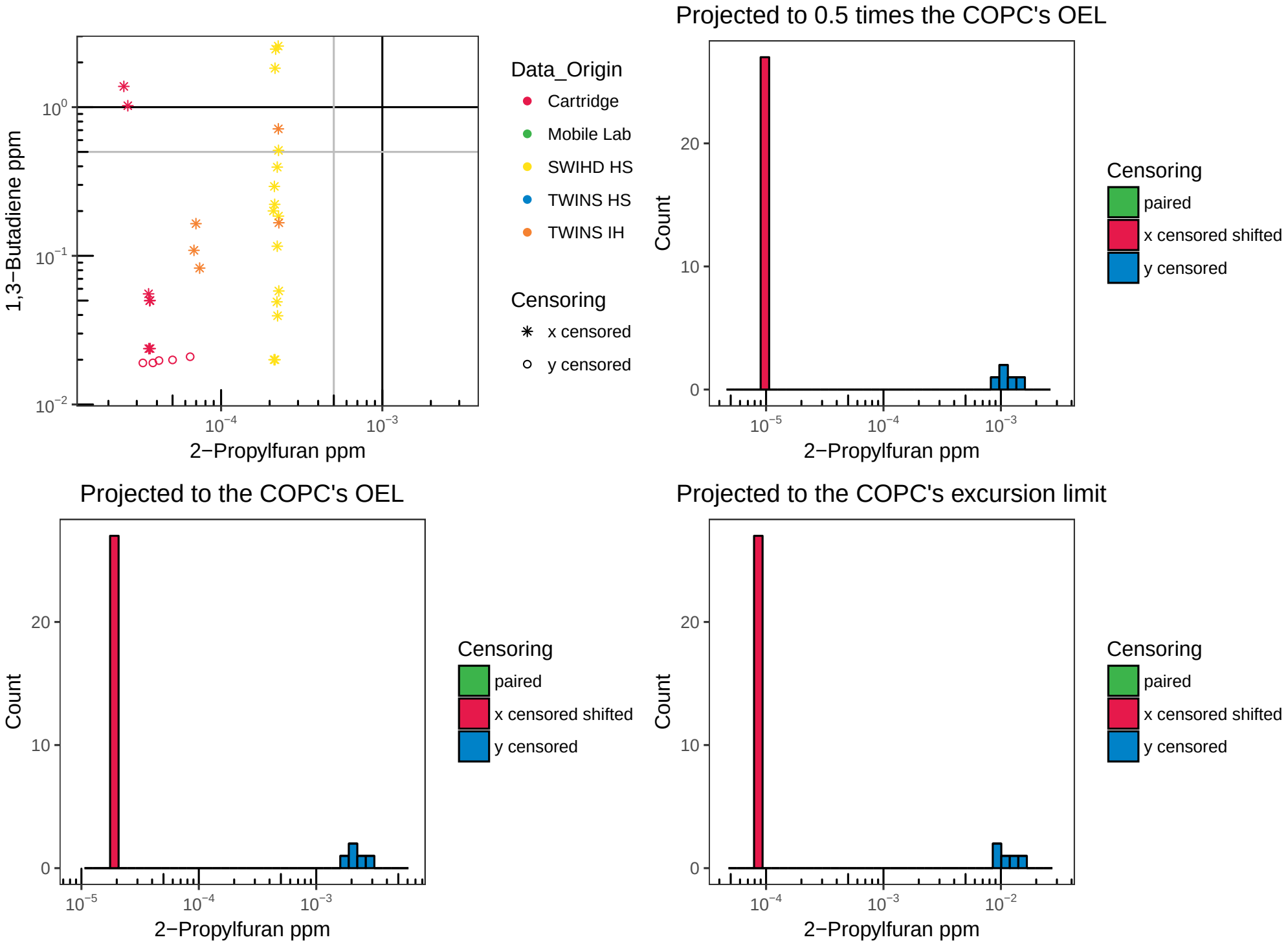


Figure C.1392: 1,3-Butadiene vs 2-Propylfuran

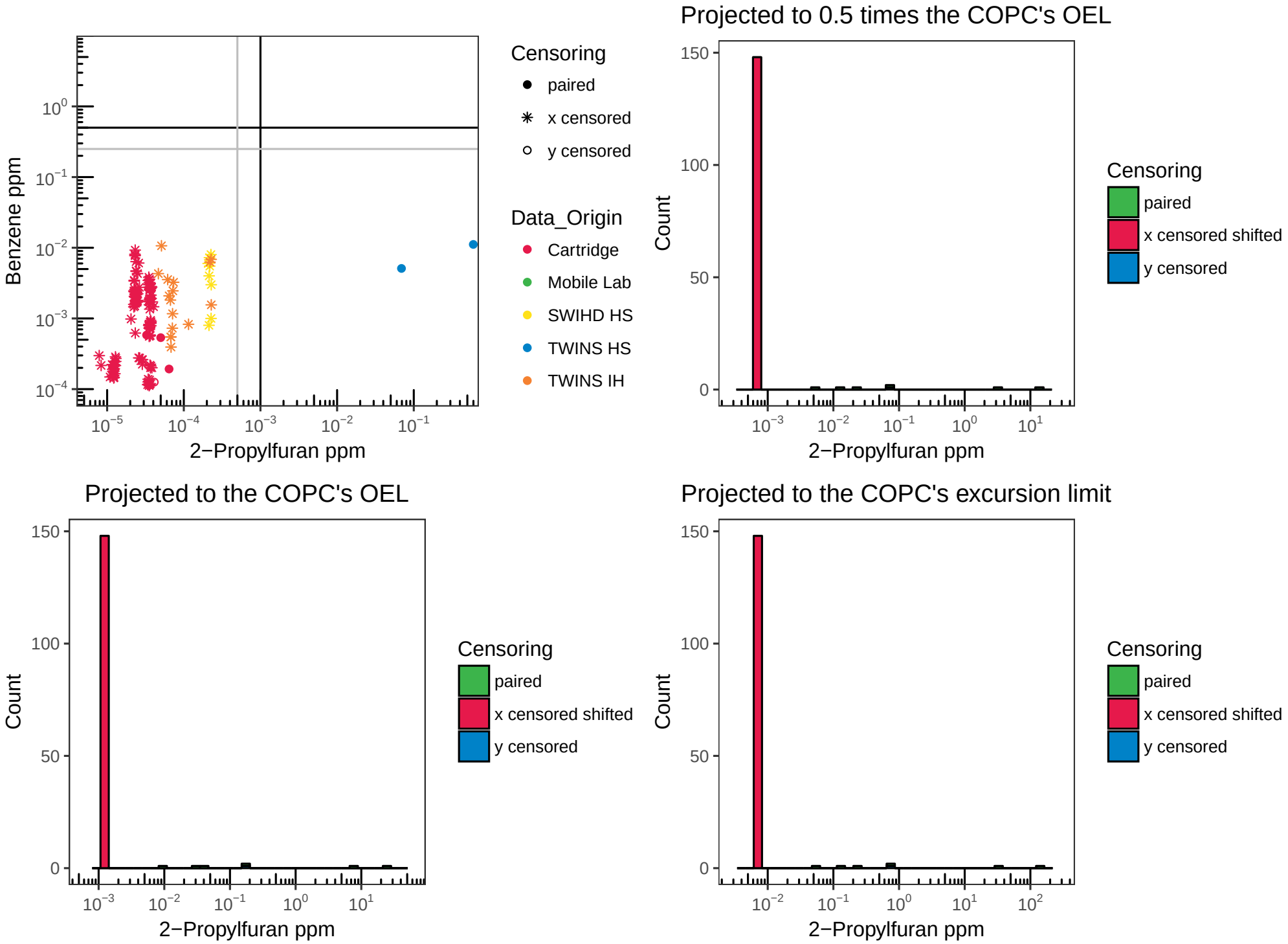


Figure C.1393: Benzene vs 2-Propylfuran

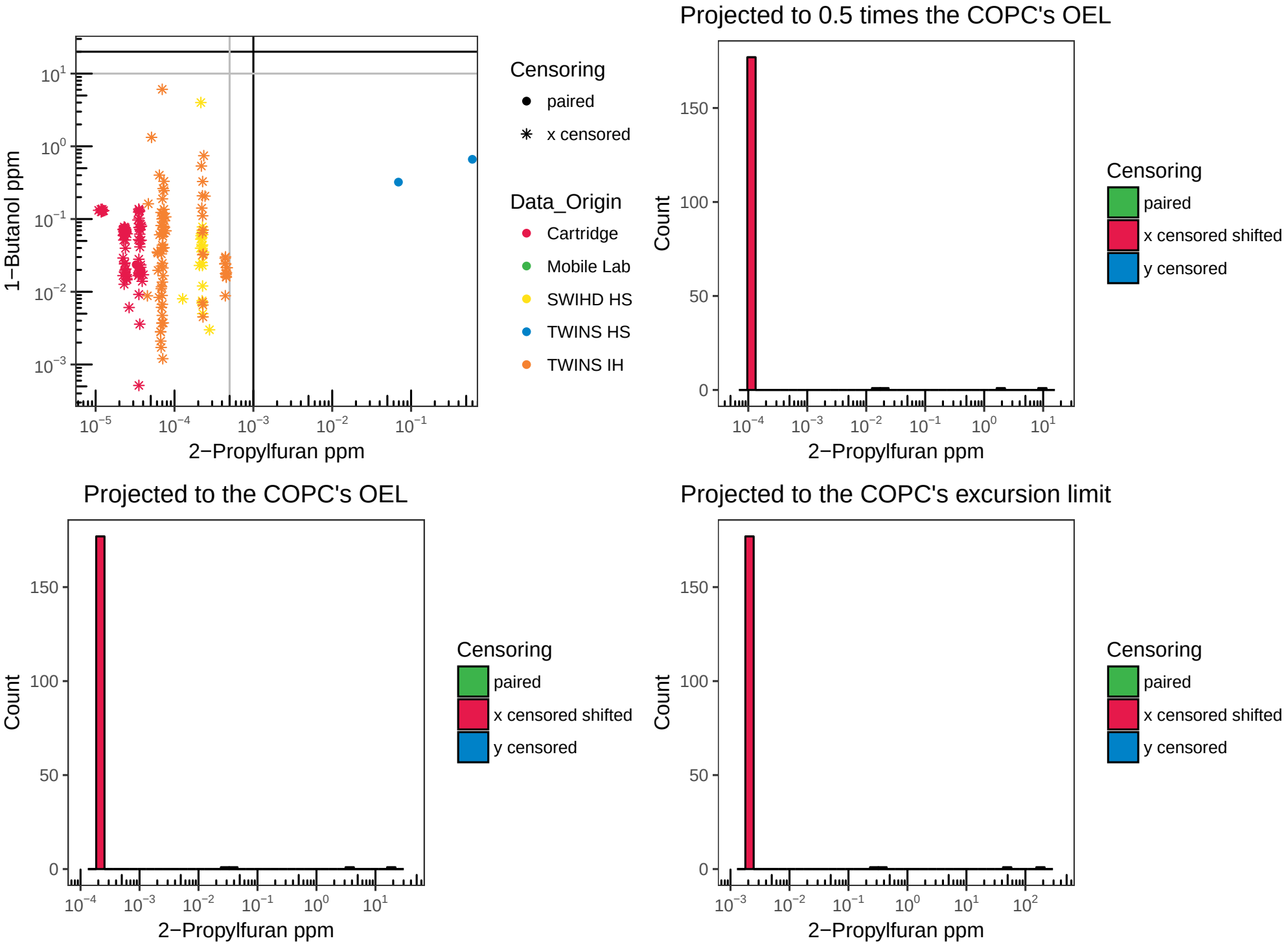


Figure C.1394: 1-Butanol vs 2-Propylfuran

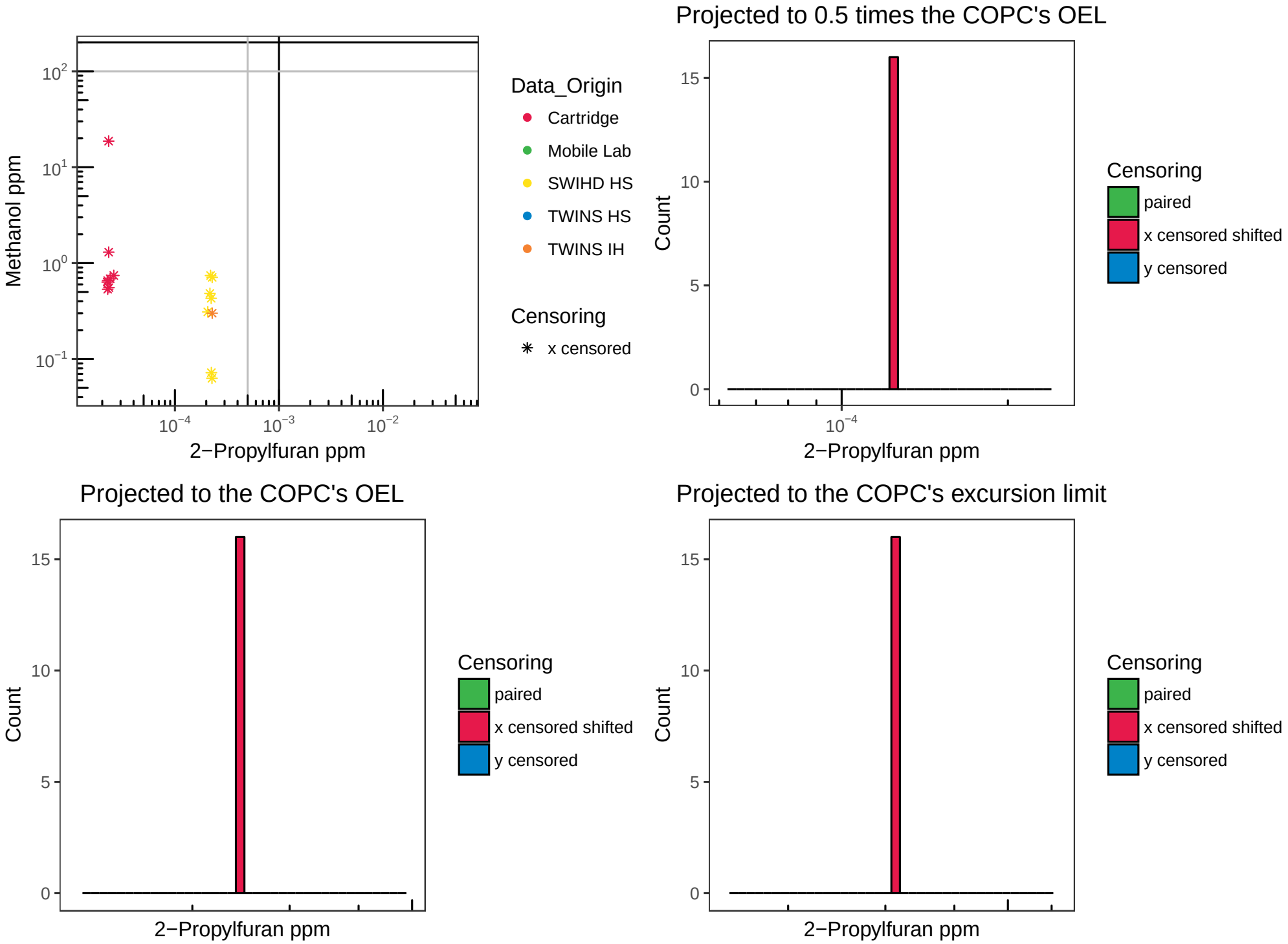


Figure C.1395: Methanol vs 2-Propylfuran

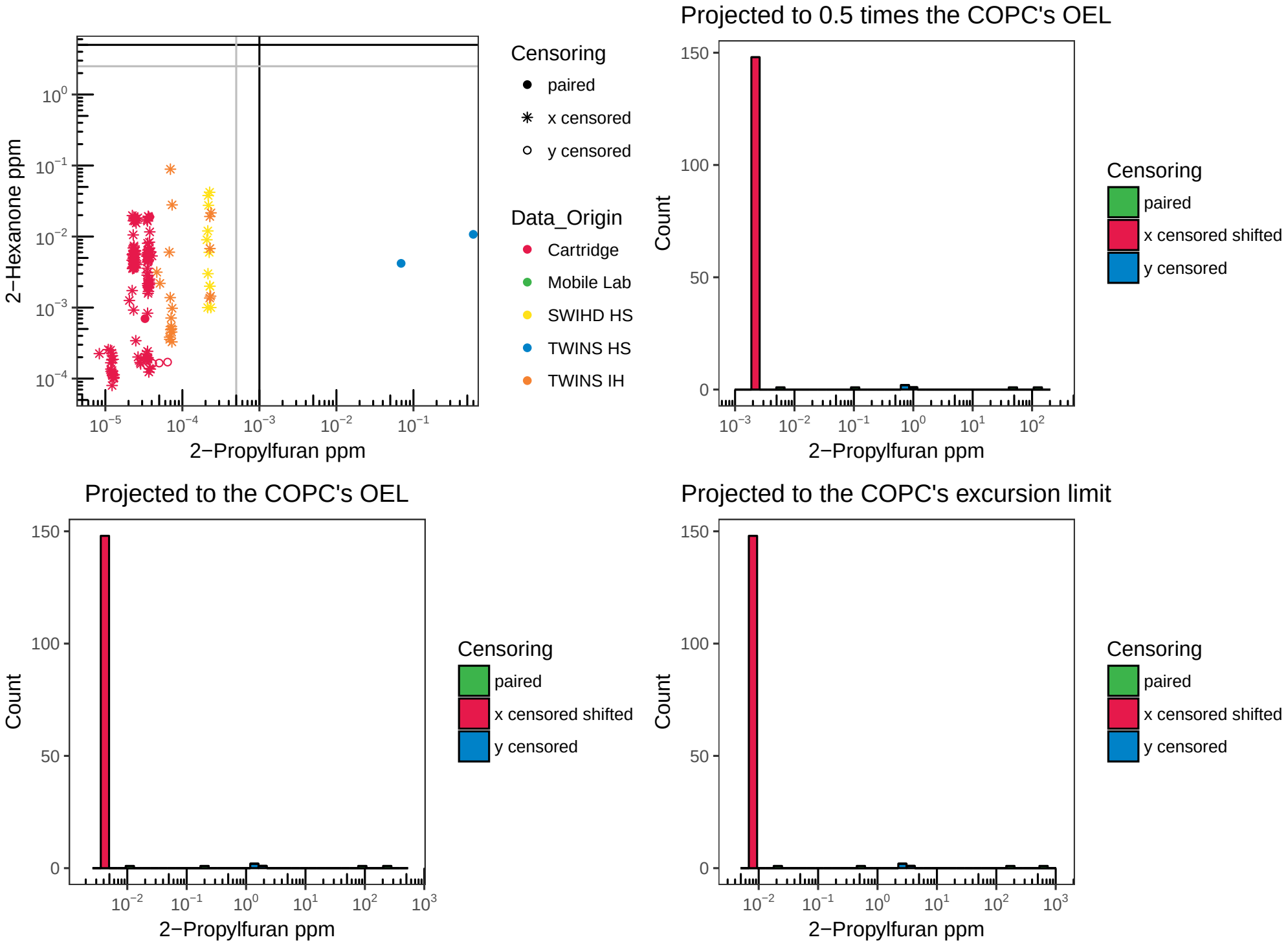


Figure C.1396: 2-Hexanone vs 2-Propylfuran

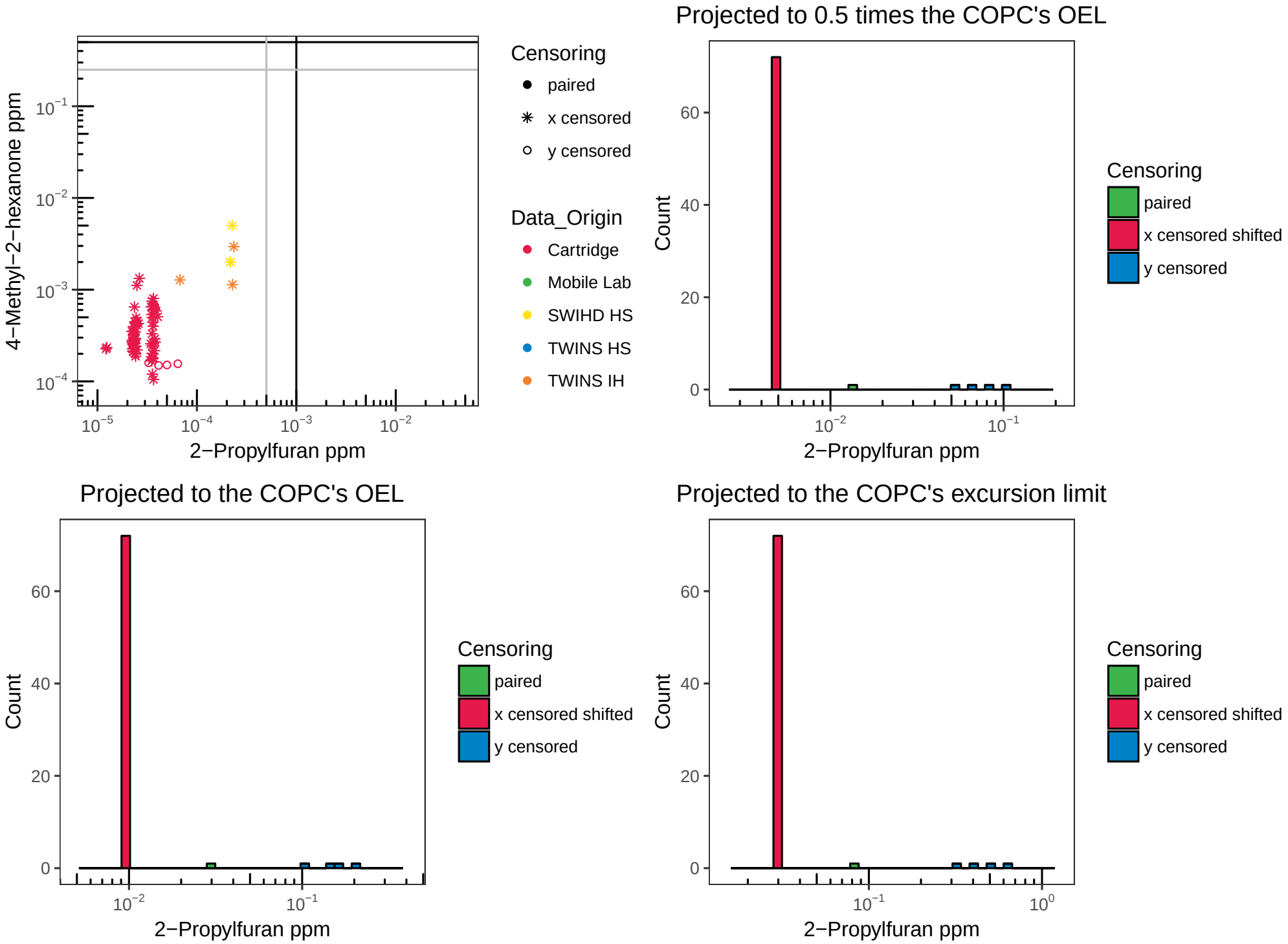


Figure C.1397: 4-Methyl-2-hexanone vs 2-Propylfuran

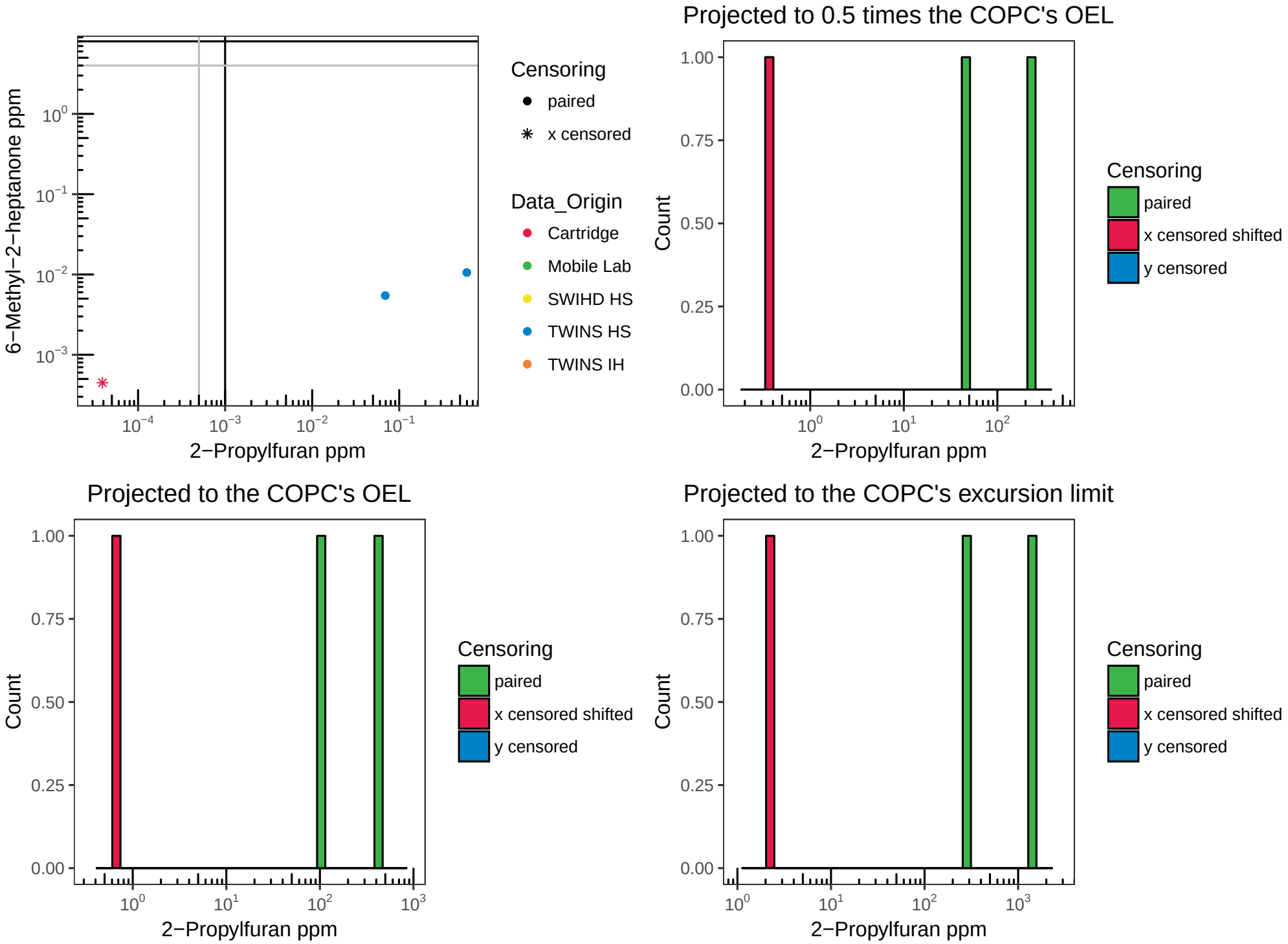


Figure C.1398: 6-Methyl-2-heptanone vs 2-Propylfuran

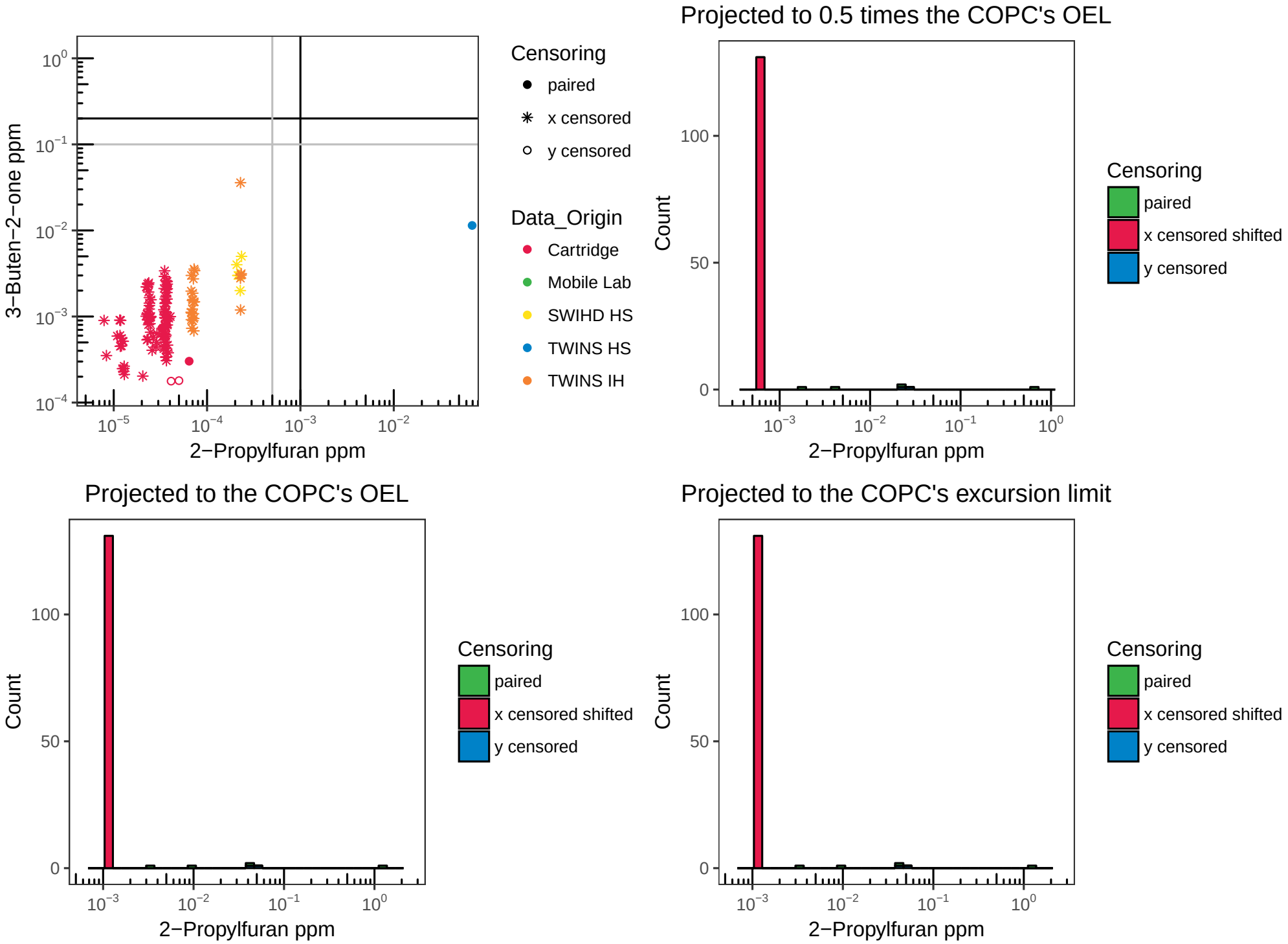


Figure C.1399: 3-Buten-2-one vs 2-Propylfuran

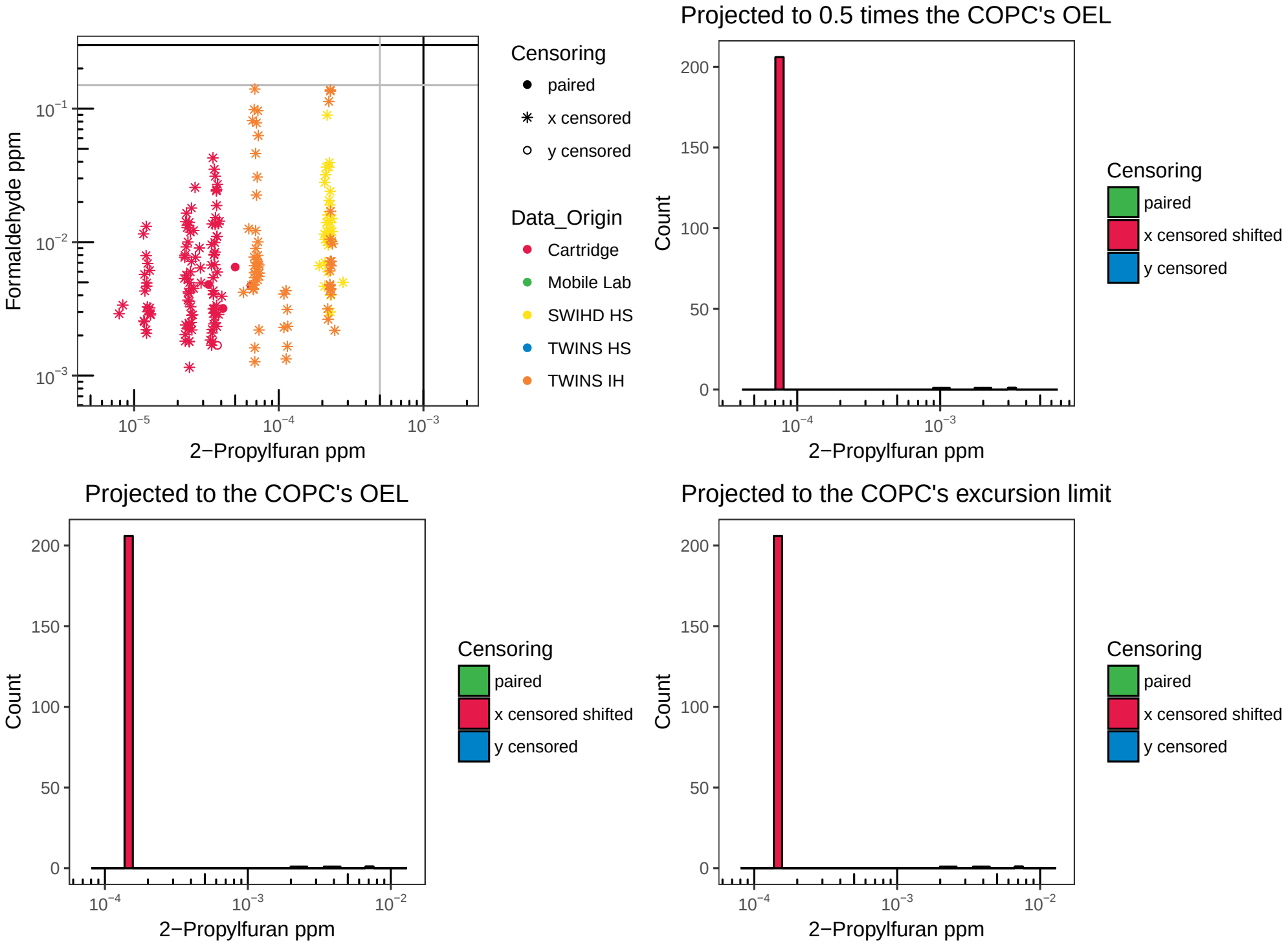


Figure C.1400: Formaldehyde vs 2-Propylfuran

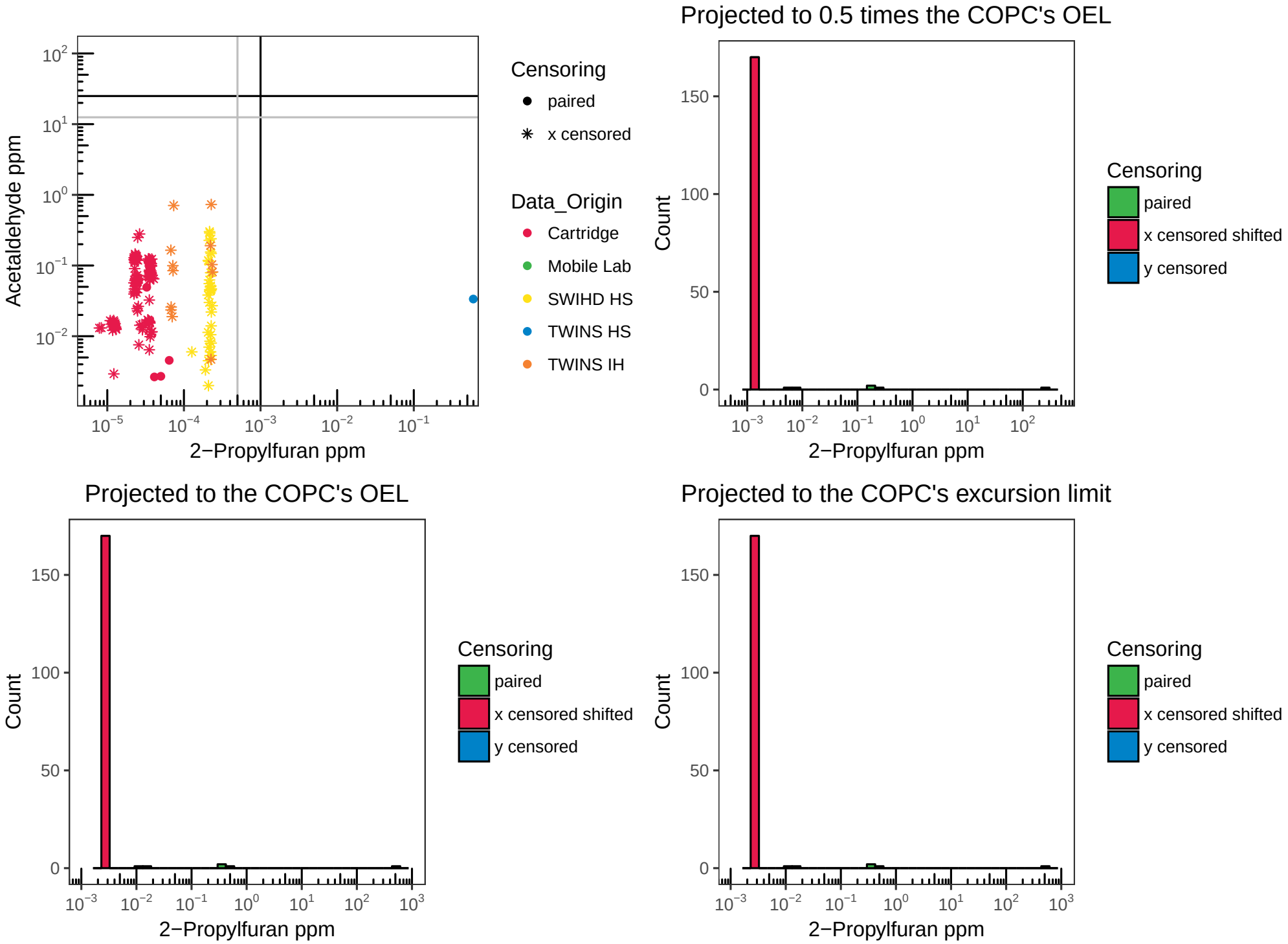


Figure C.1401: Acetaldehyde vs 2-Propylfuran

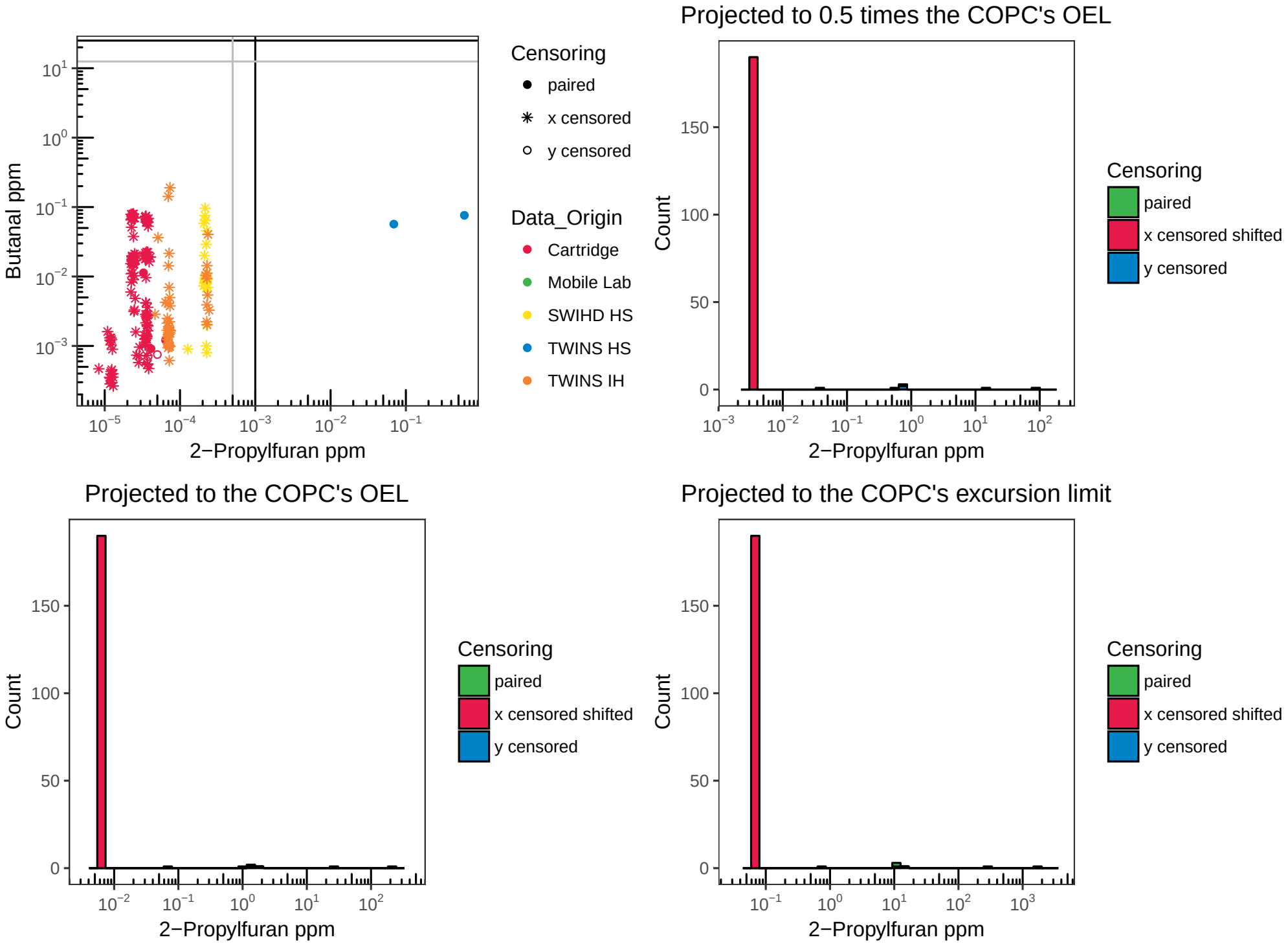


Figure C.1402: Butanal vs 2-Propylfuran

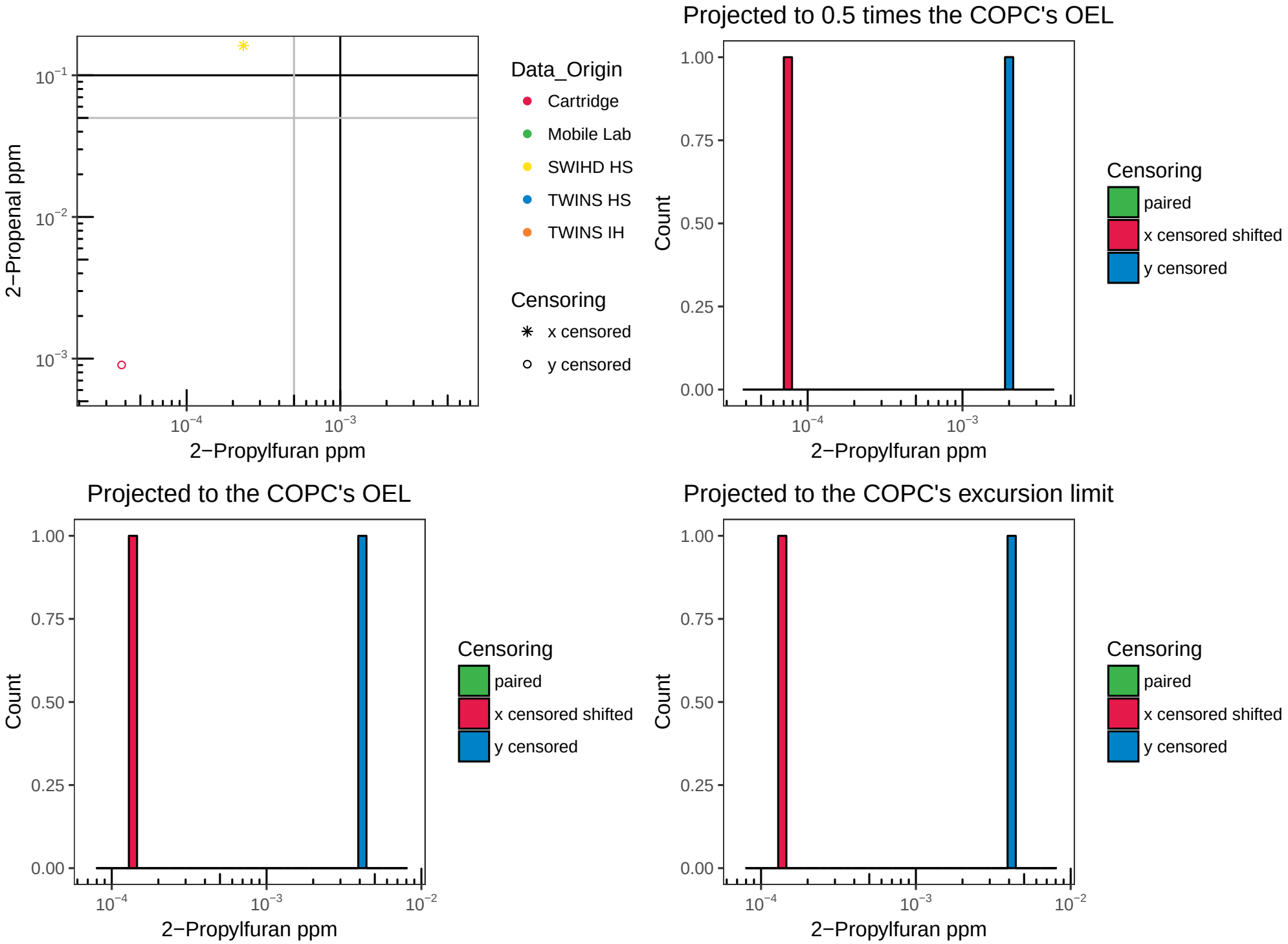


Figure C.1403: 2-Propenal vs 2-Propylfuran

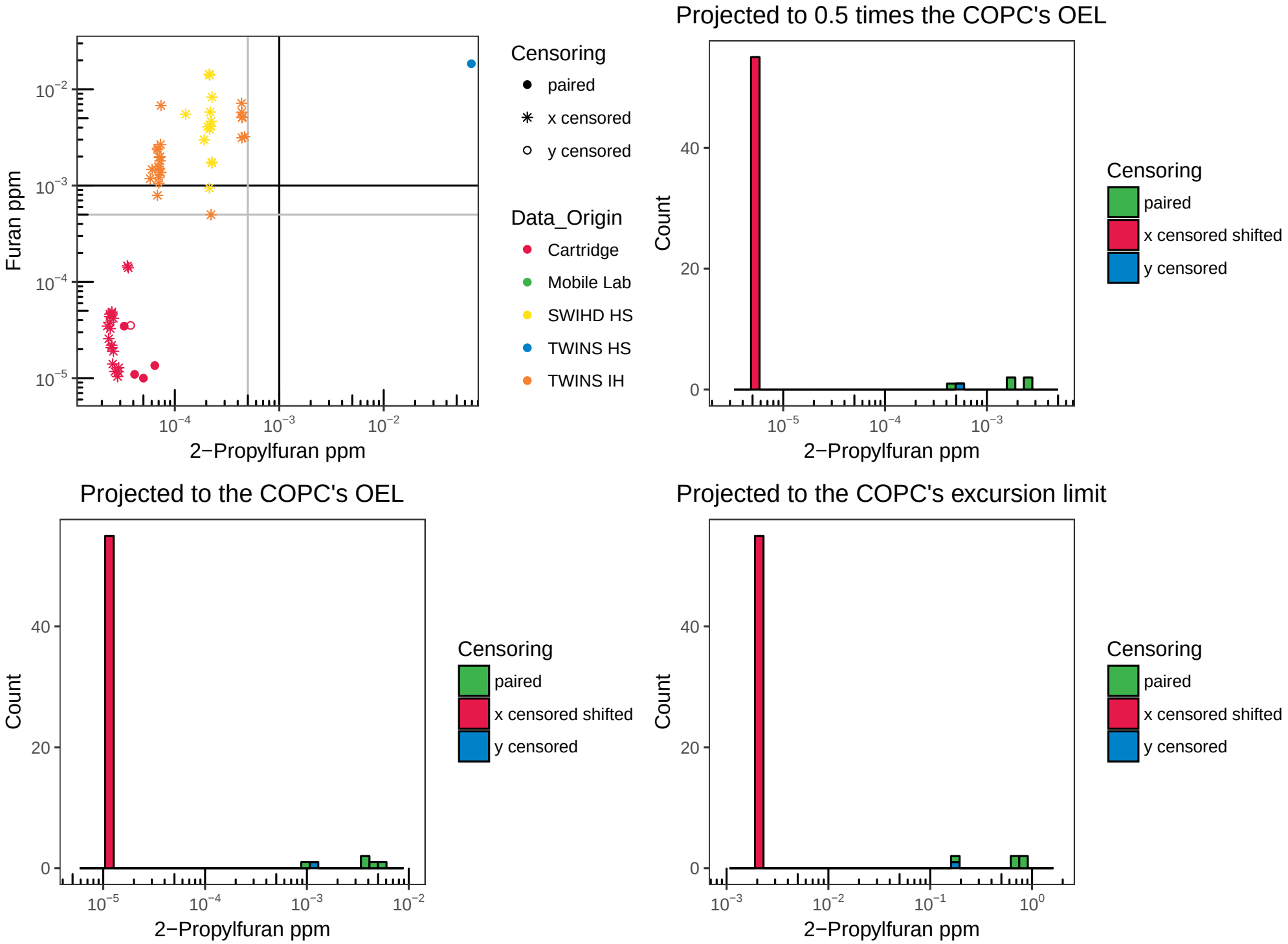


Figure C.1404: Furan vs 2-Propylfuran

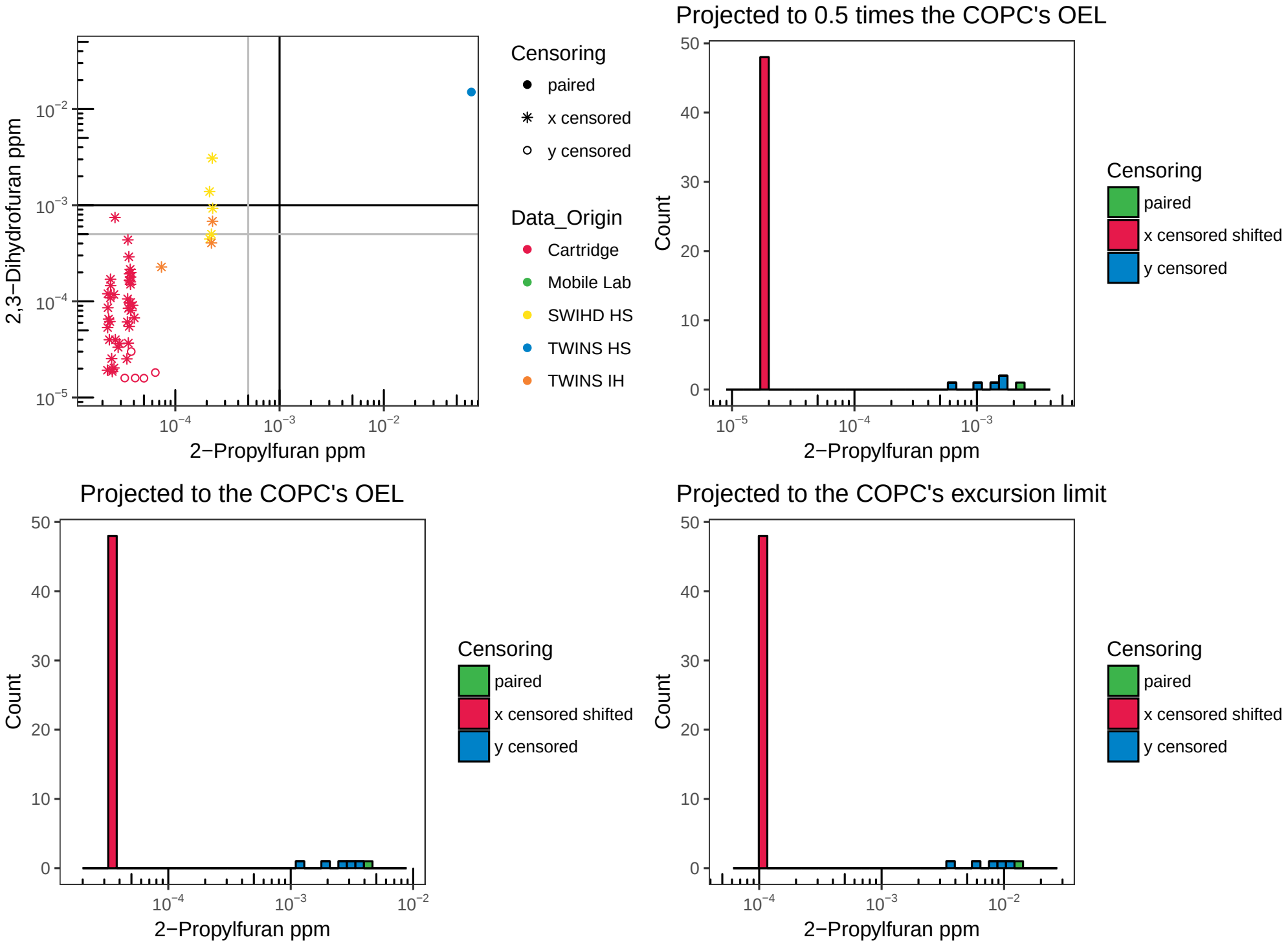


Figure C.1405: 2,3-Dihydrofuran vs 2-Propylfuran

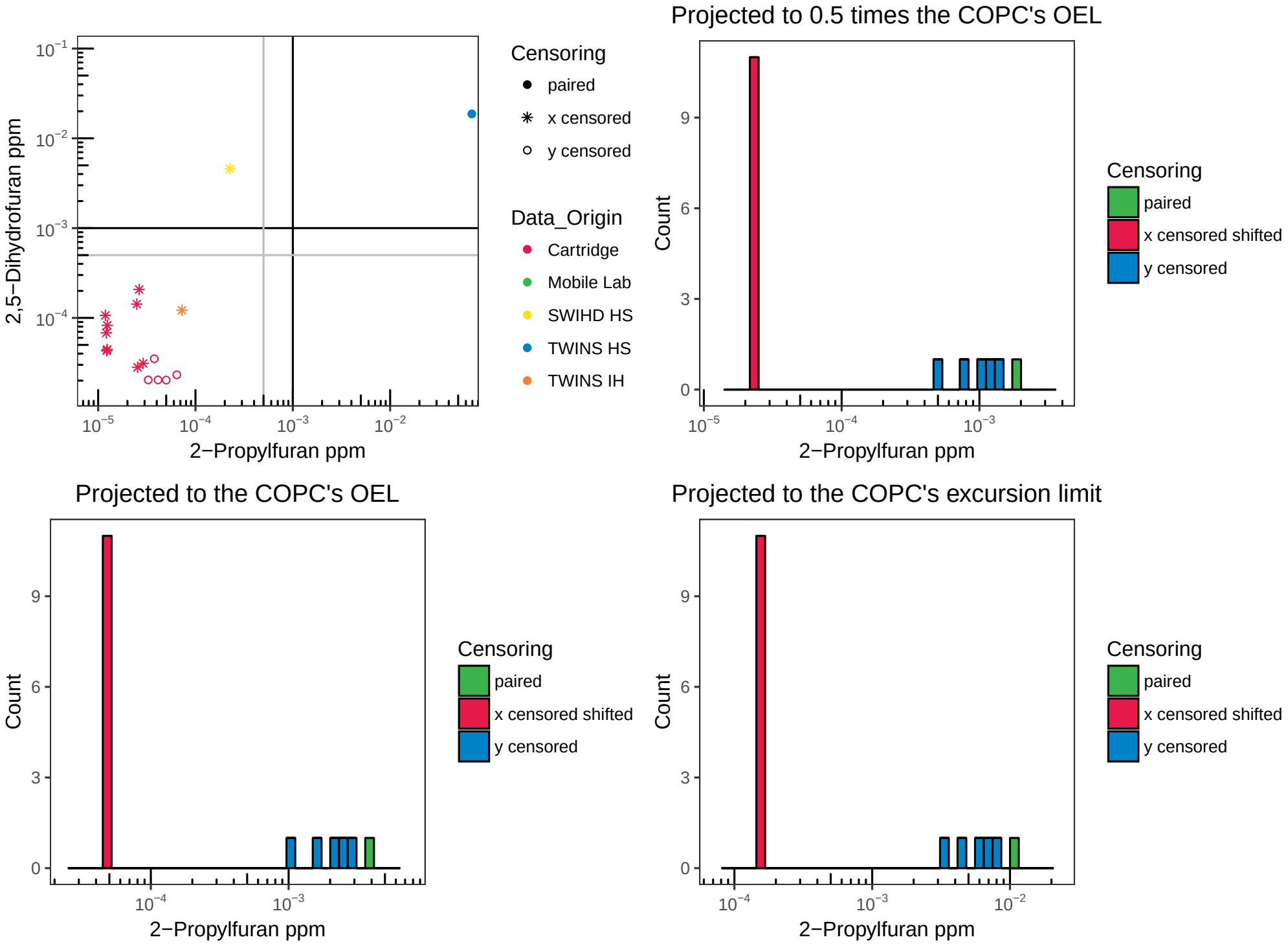


Figure C.1406: 2,5-Dihydrofuran vs 2-Propylfuran

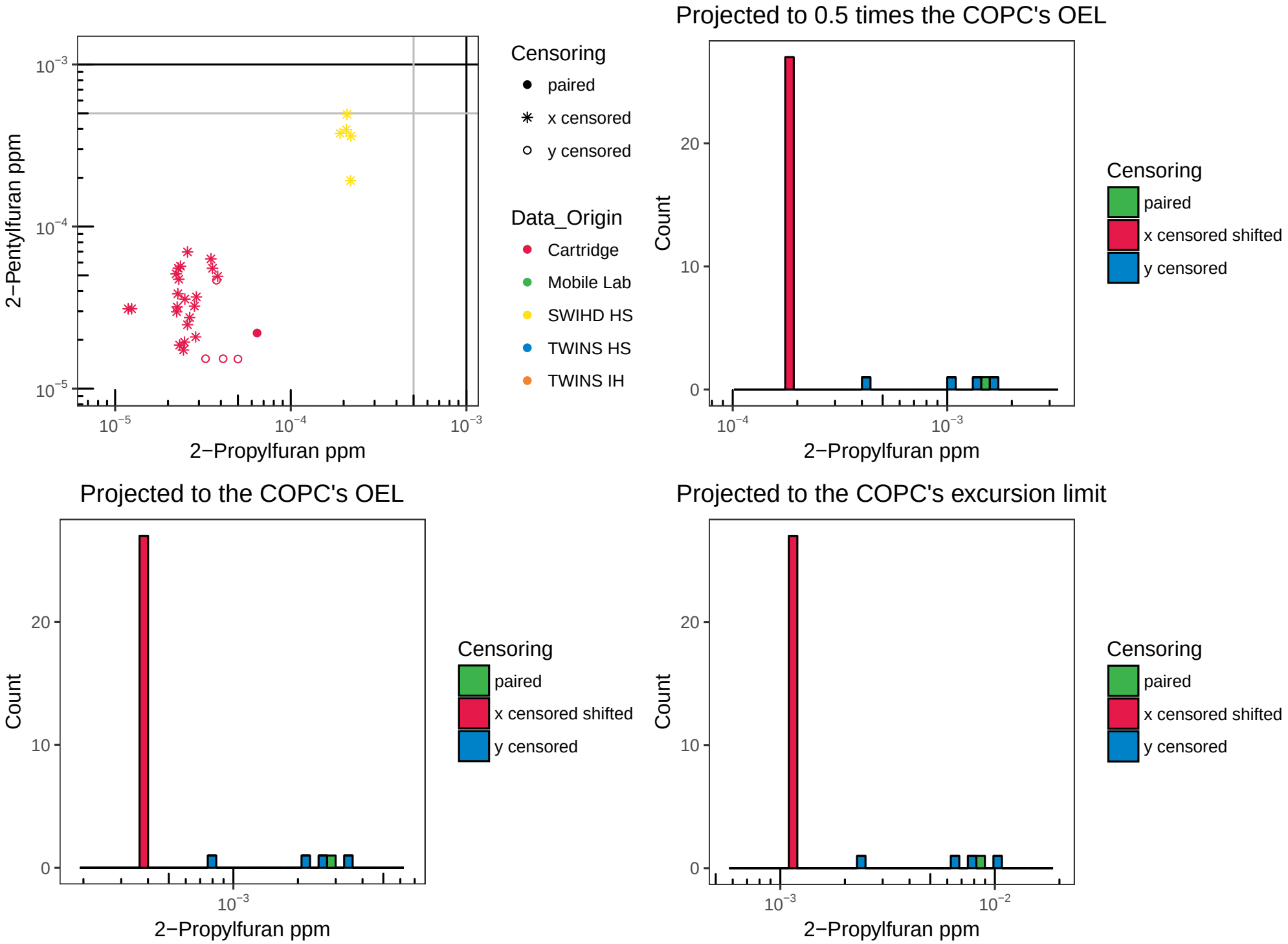


Figure C.1407: 2-Pentylfuran vs 2-Propylfuran

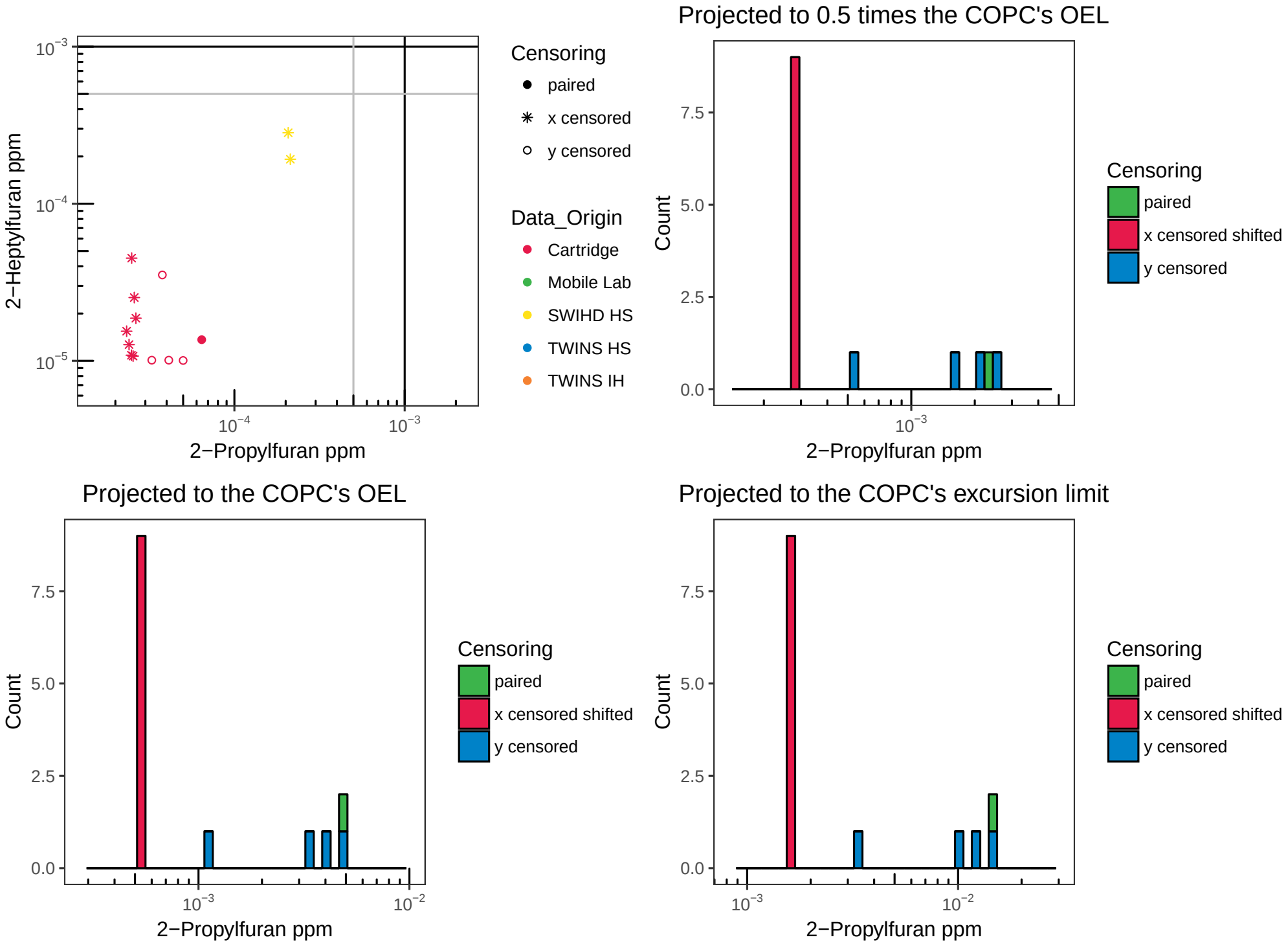


Figure C.1408: 2-Heptylfuran vs 2-Propylfuran

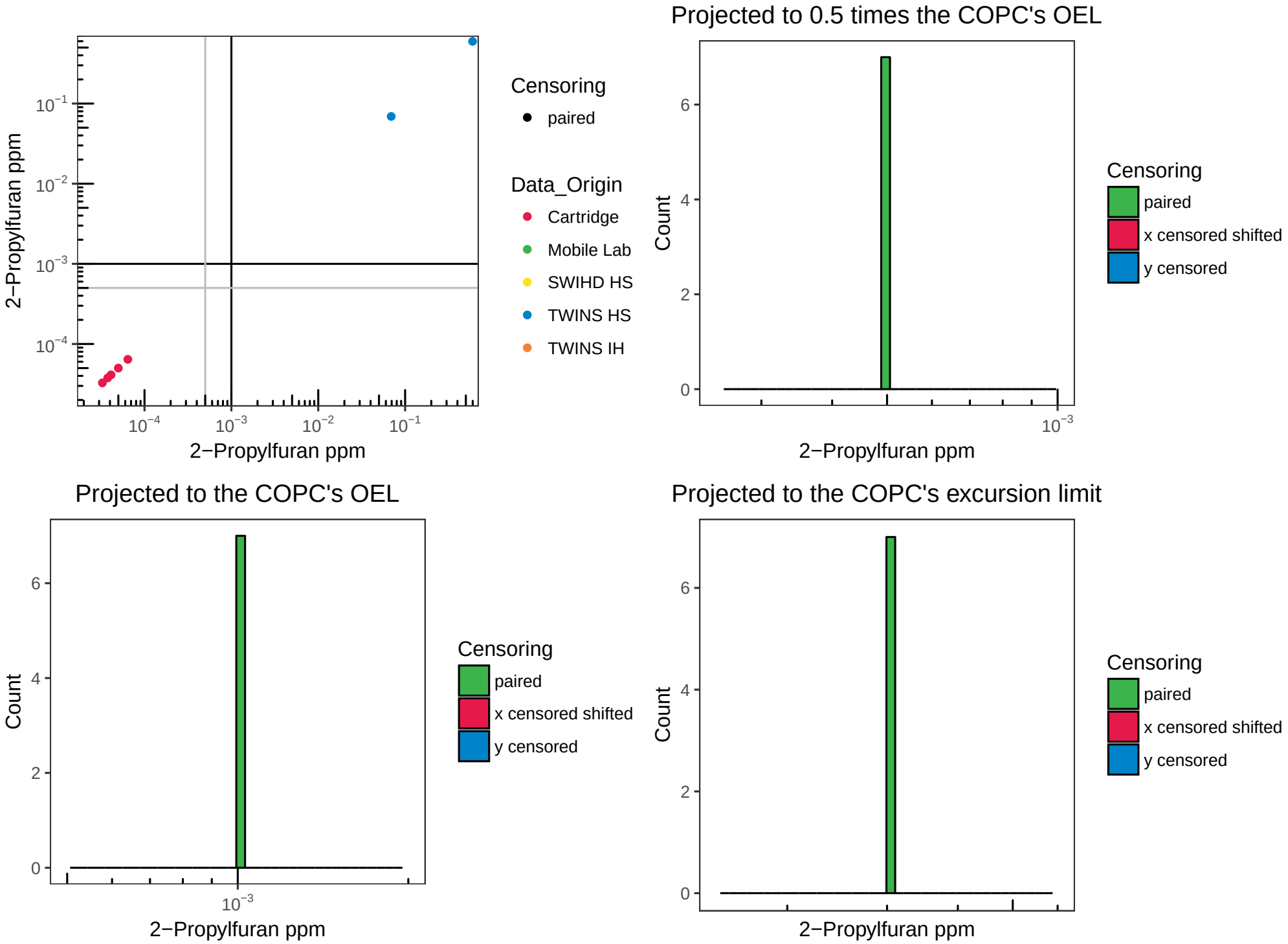


Figure C.1409: 2-Propylfuran vs 2-Propylfuran

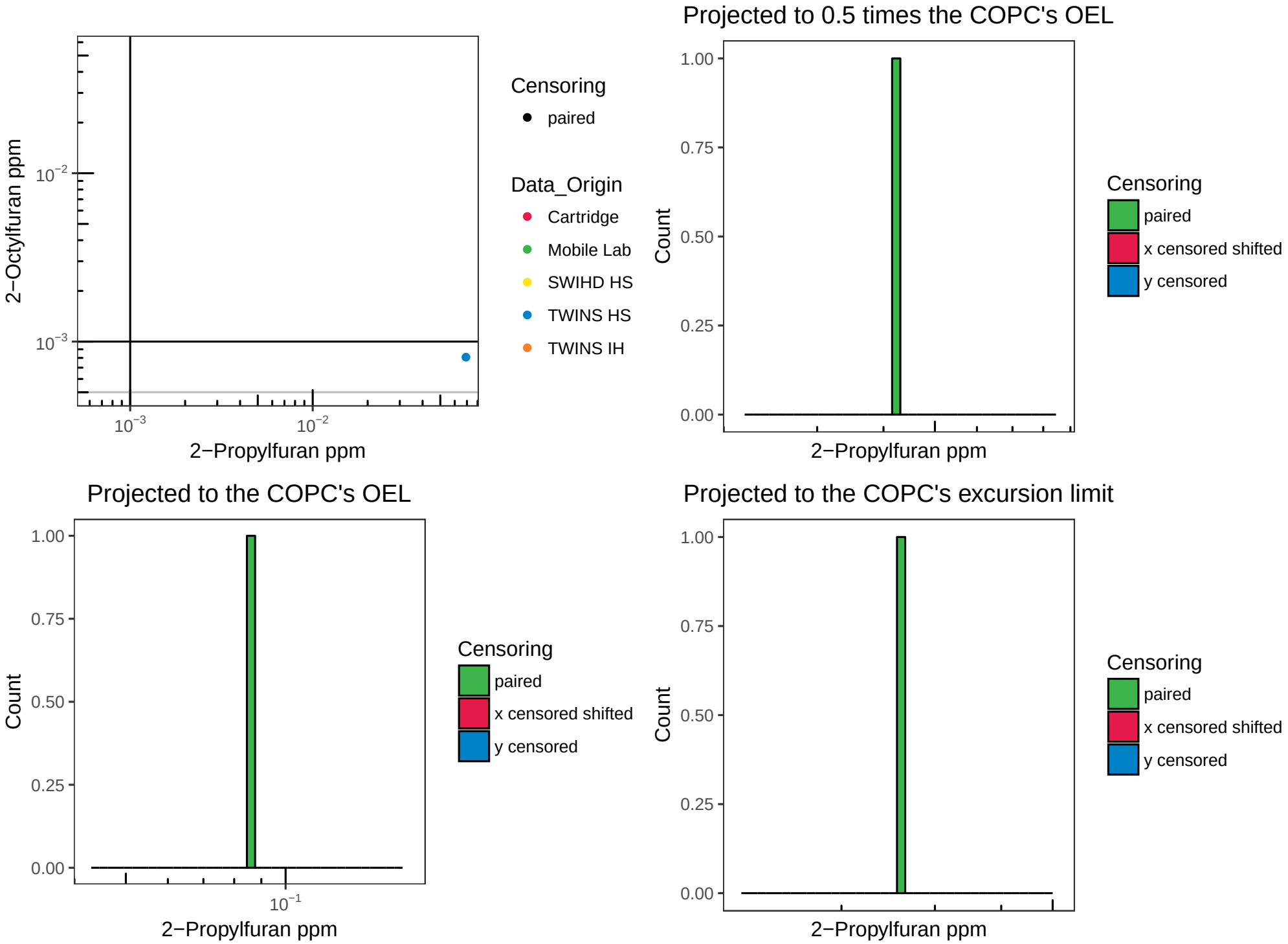


Figure C.1410: 2-Octylfuran vs 2-Propylfuran

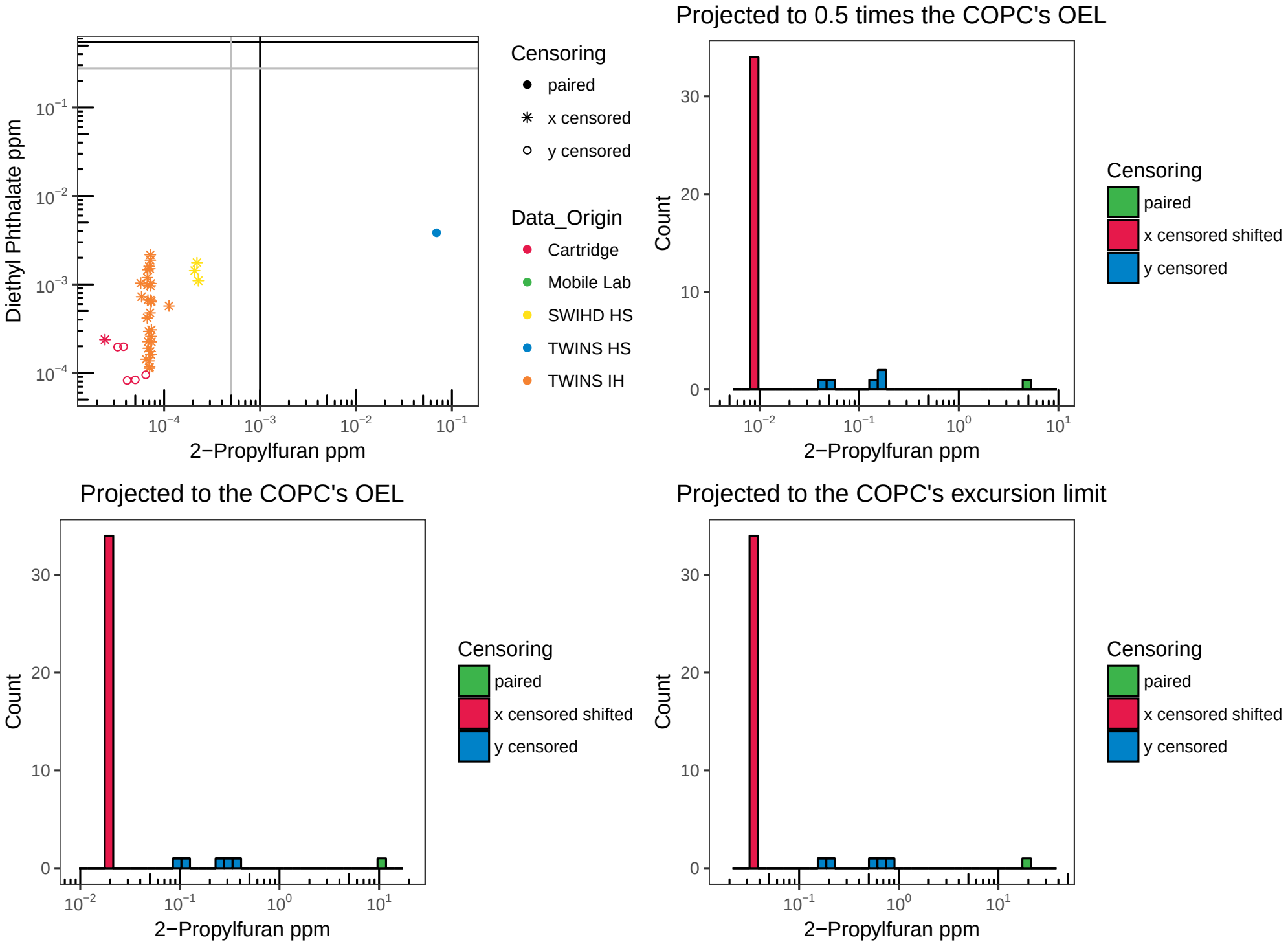


Figure C.1411: Diethyl Phthalate vs 2-Propylfuran

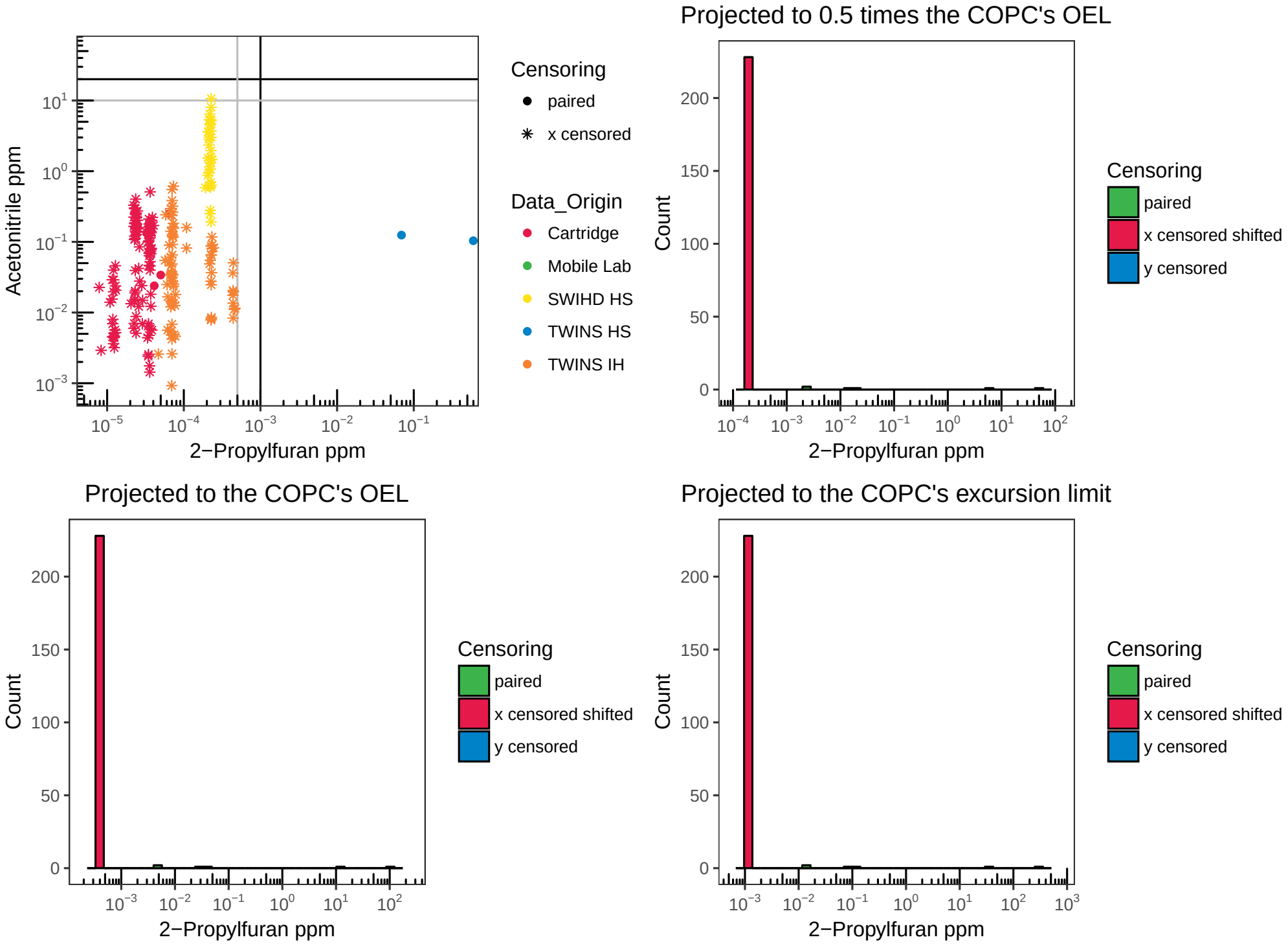


Figure C.1412: Acetonitrile vs 2-Propylfuran

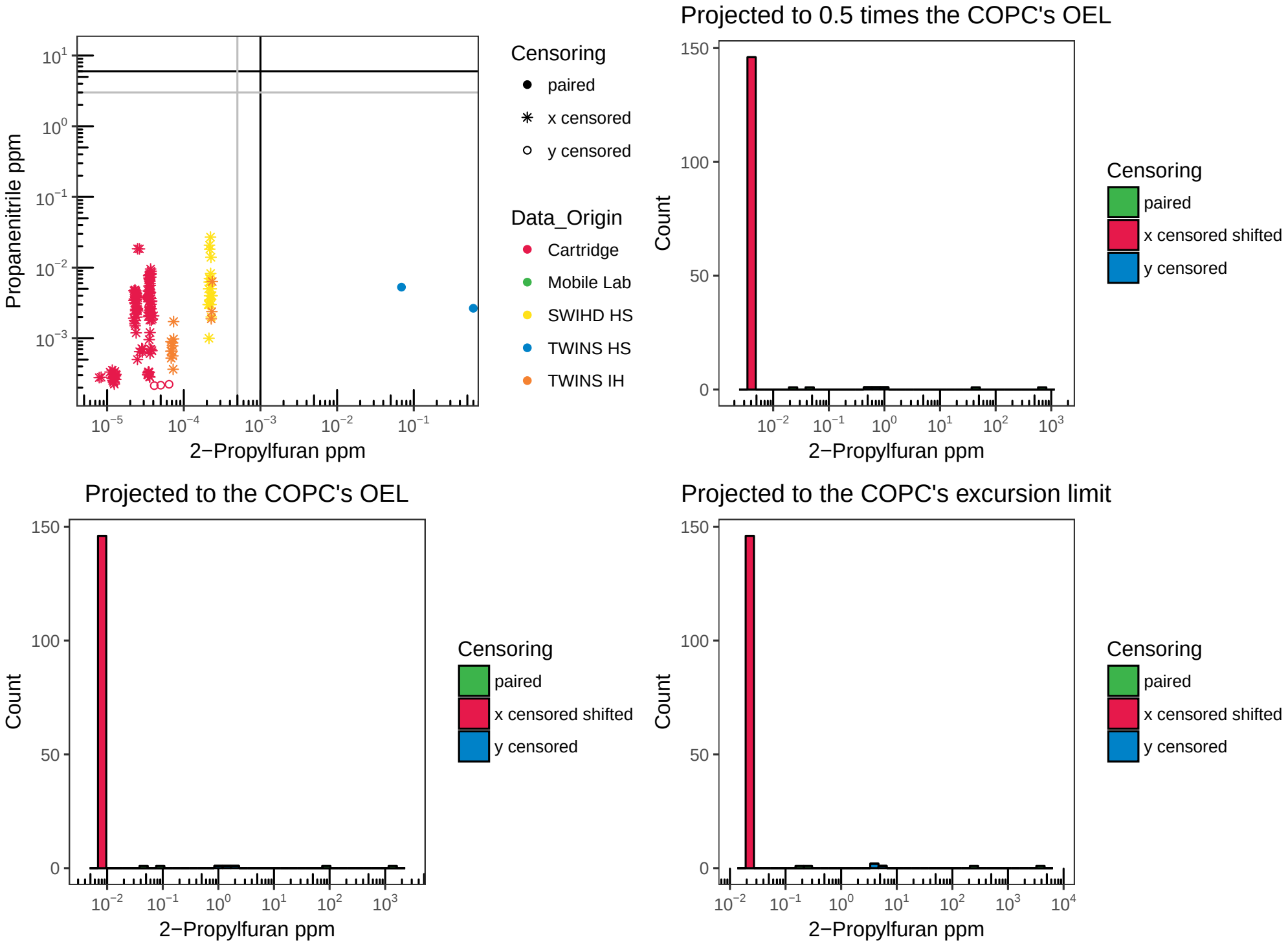


Figure C.1413: Propanenitrile vs 2-Propylfuran

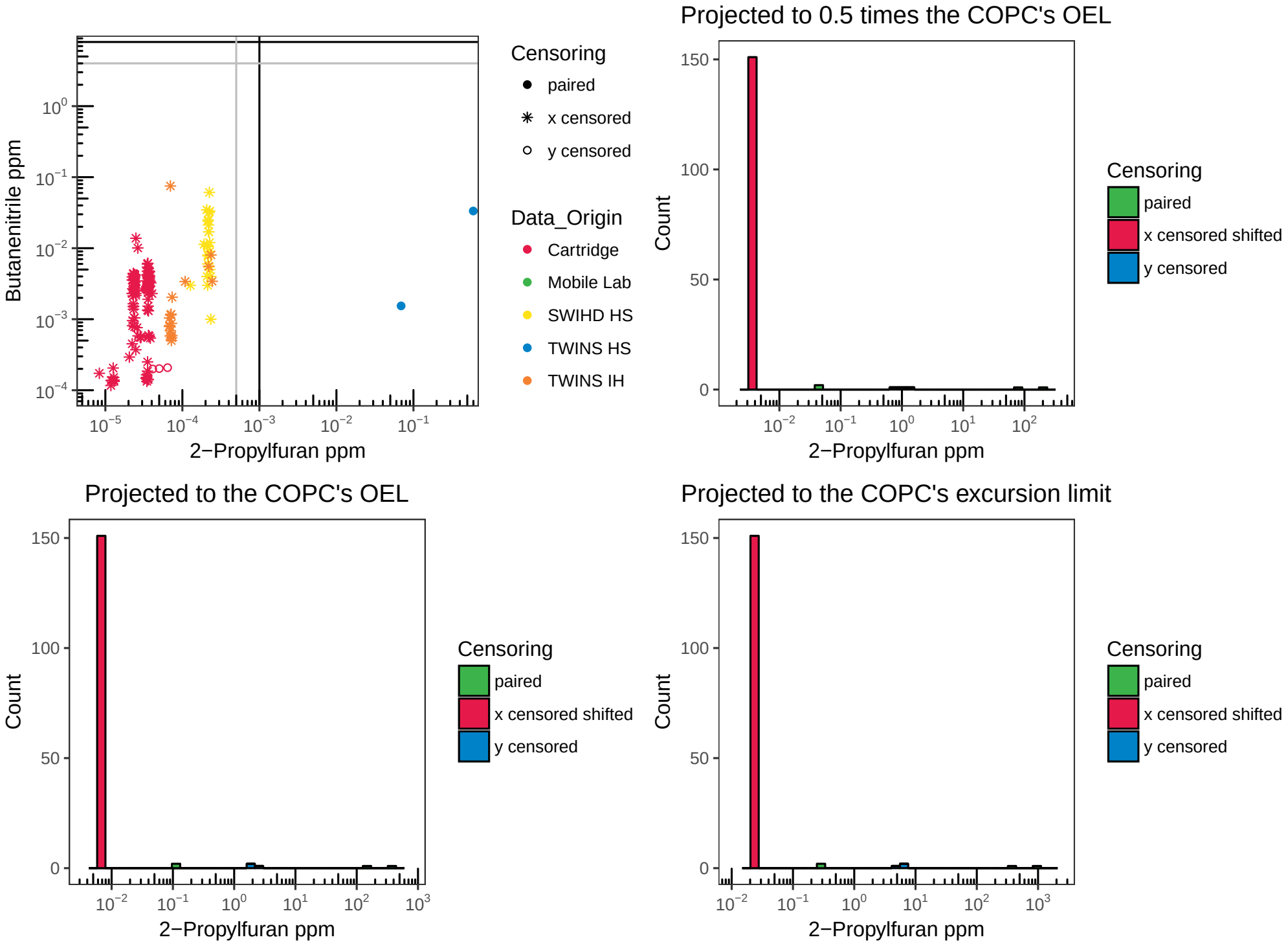


Figure C.1414: Butanenitrile vs 2-Propylfuran

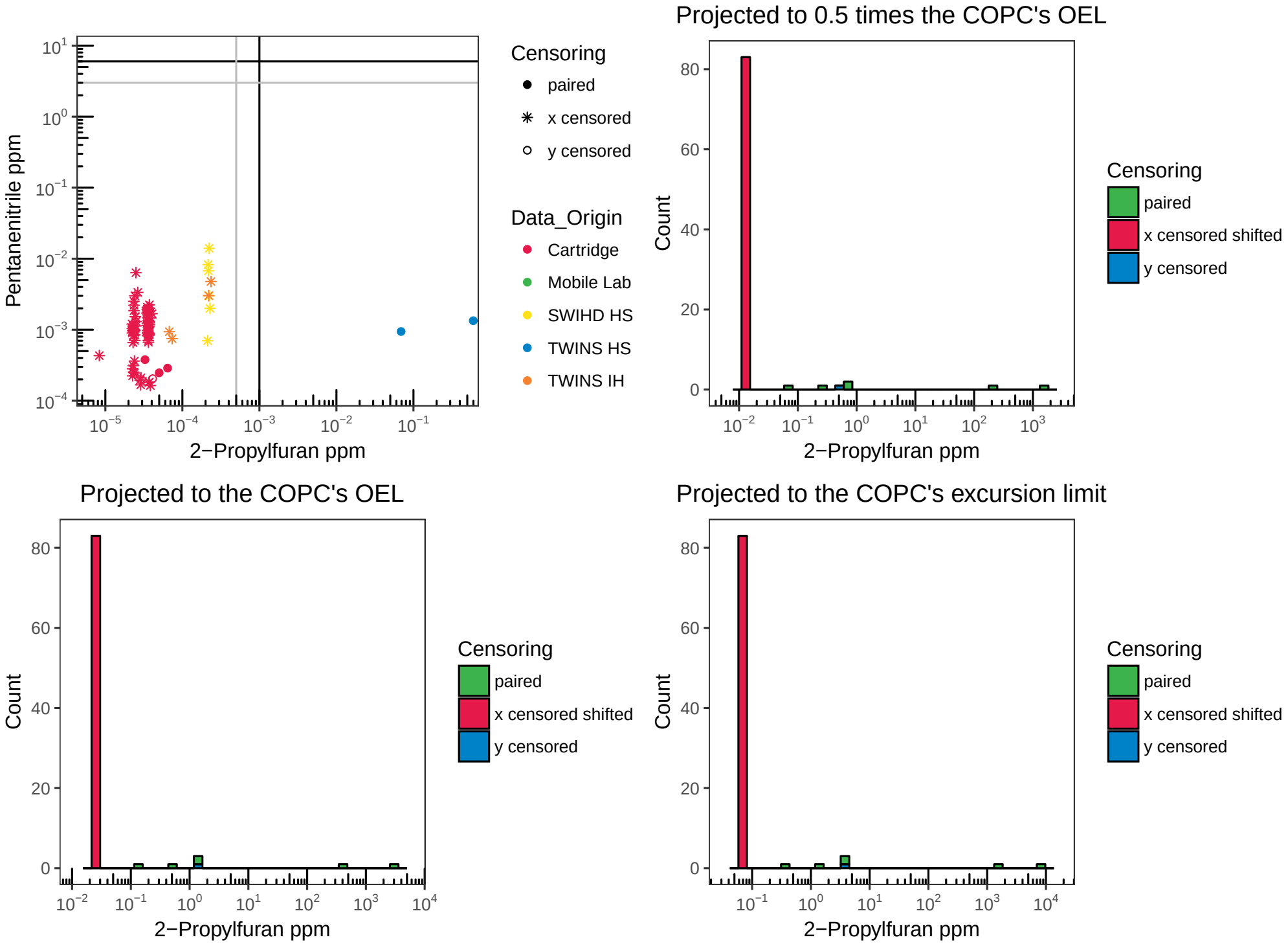


Figure C.1415: Pentanenitrile vs 2-Propylfuran

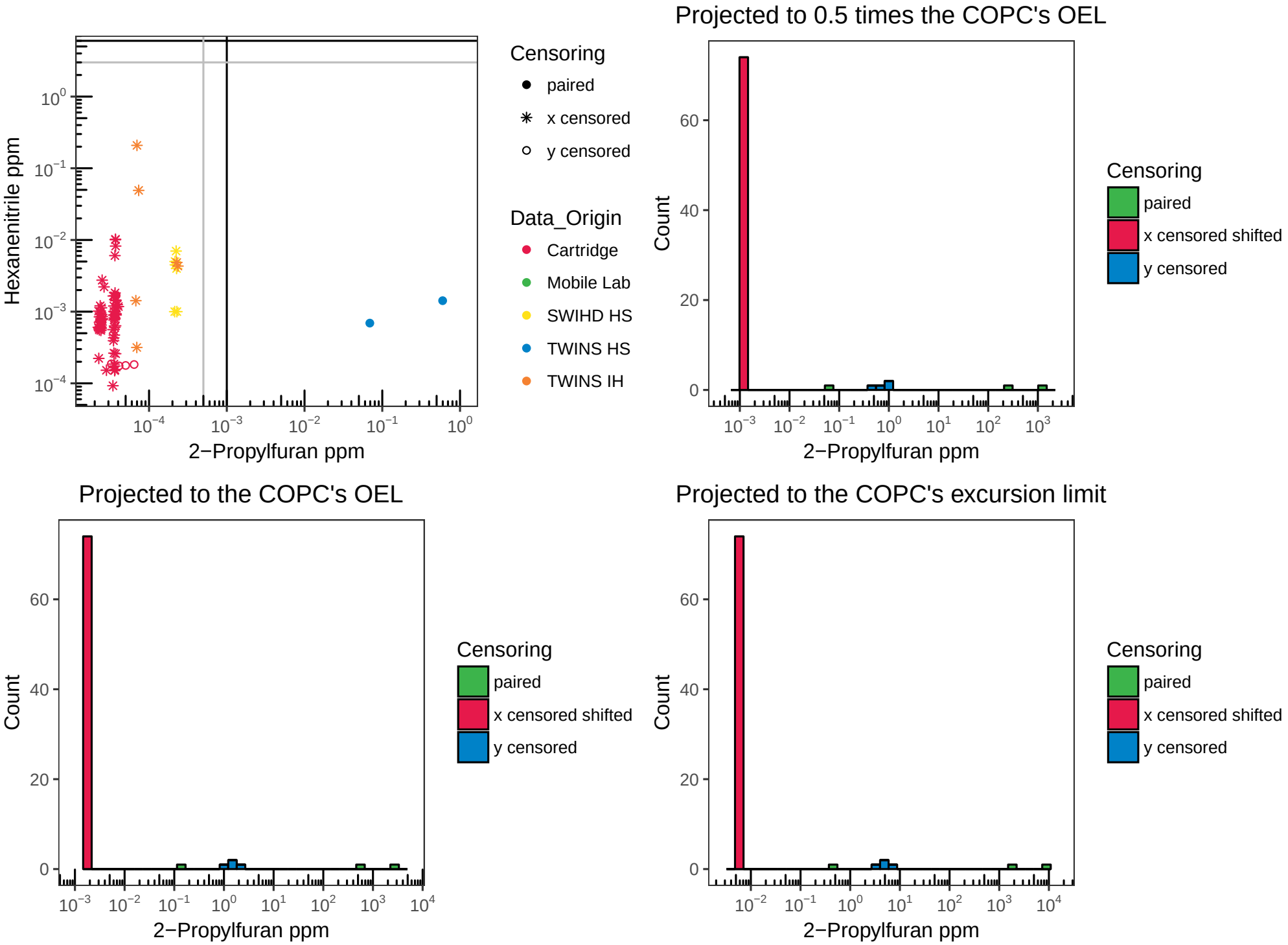


Figure C.1416: Hexanenitrile vs 2-Propylfuran

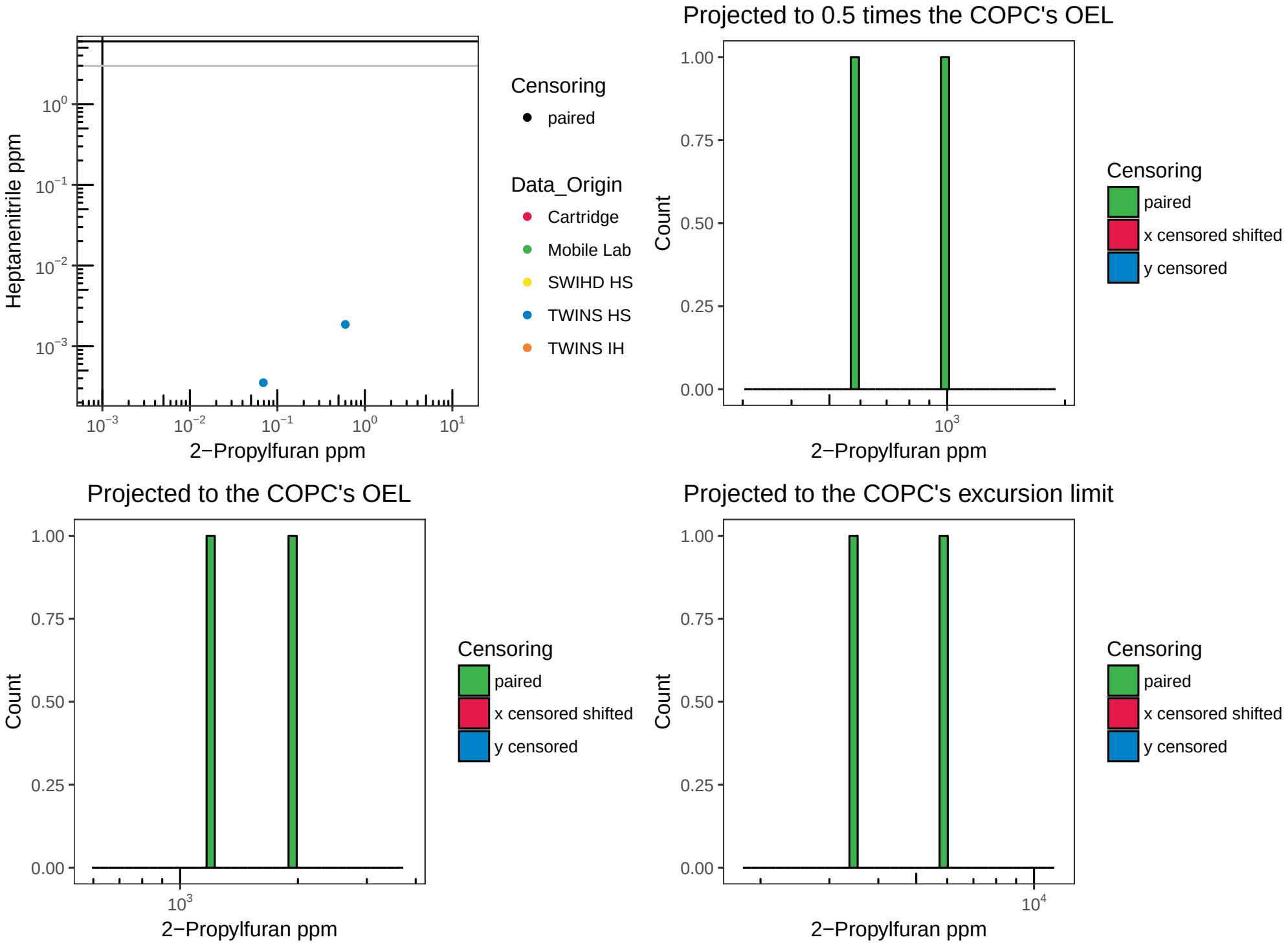


Figure C.1417: Heptanenitrile vs 2-Propylfuran

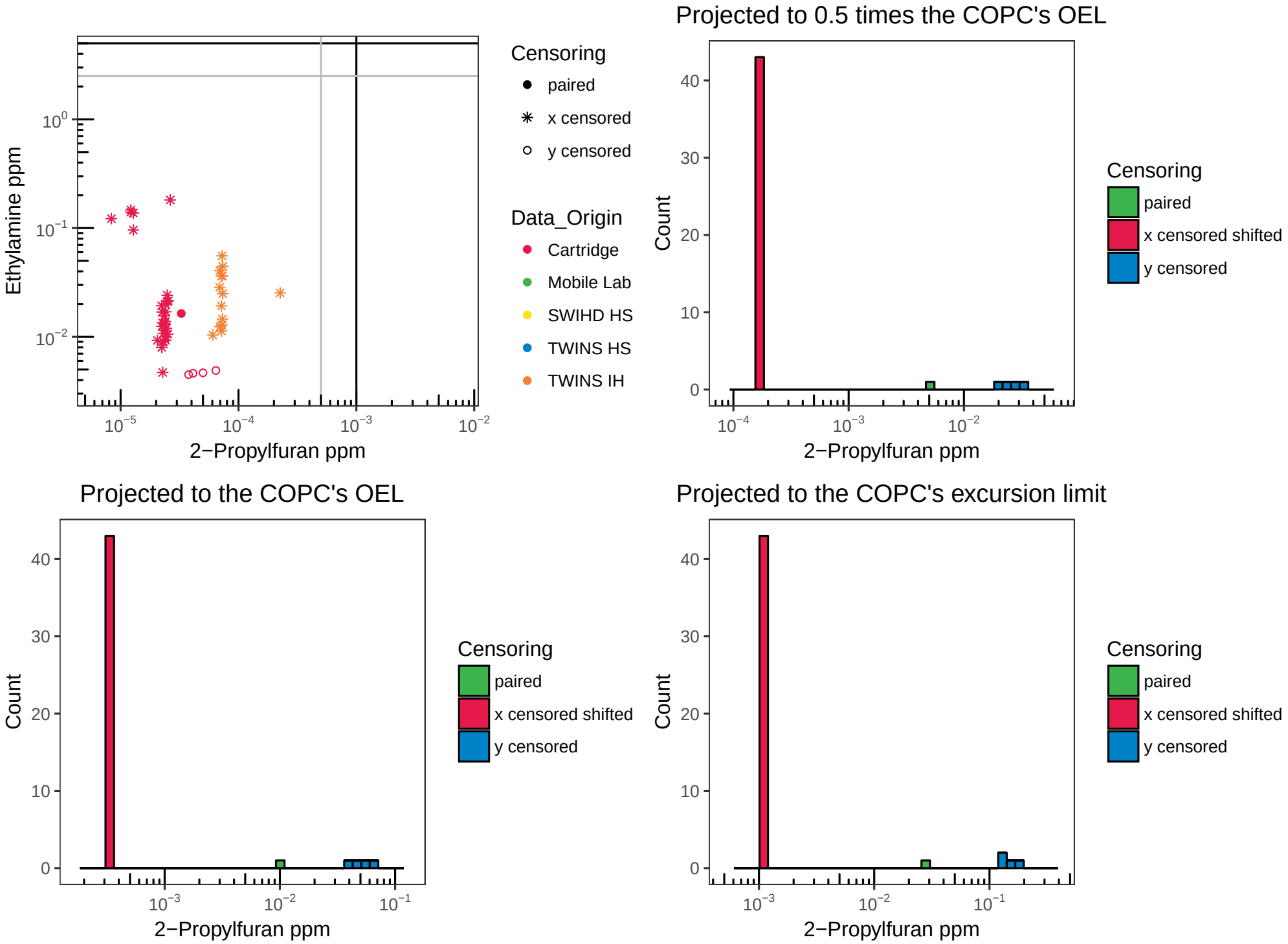


Figure C.1418: Ethylamine vs 2-Propylfuran

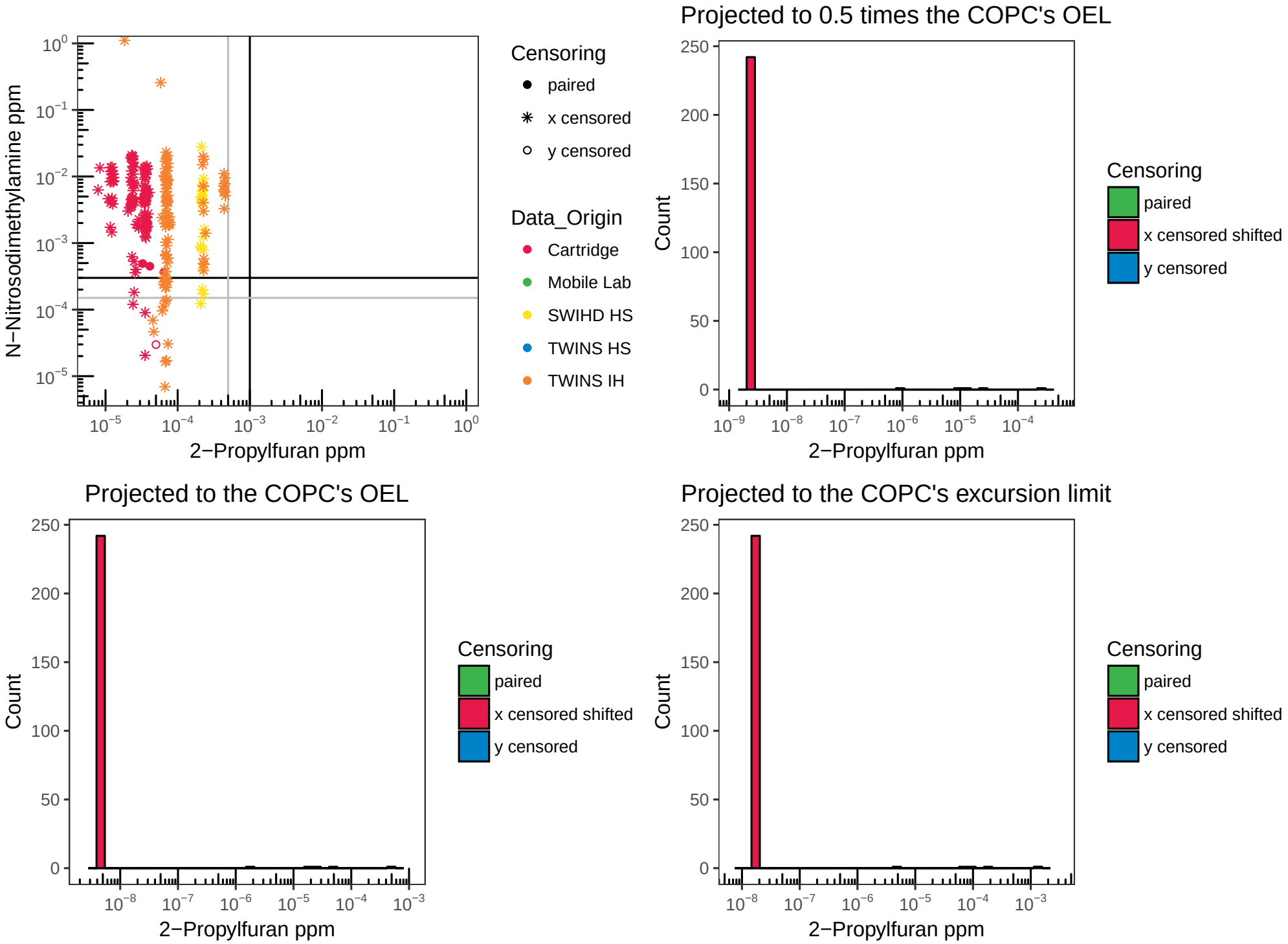


Figure C.1419: N-Nitrosodimethylamine vs 2-Propylfuran

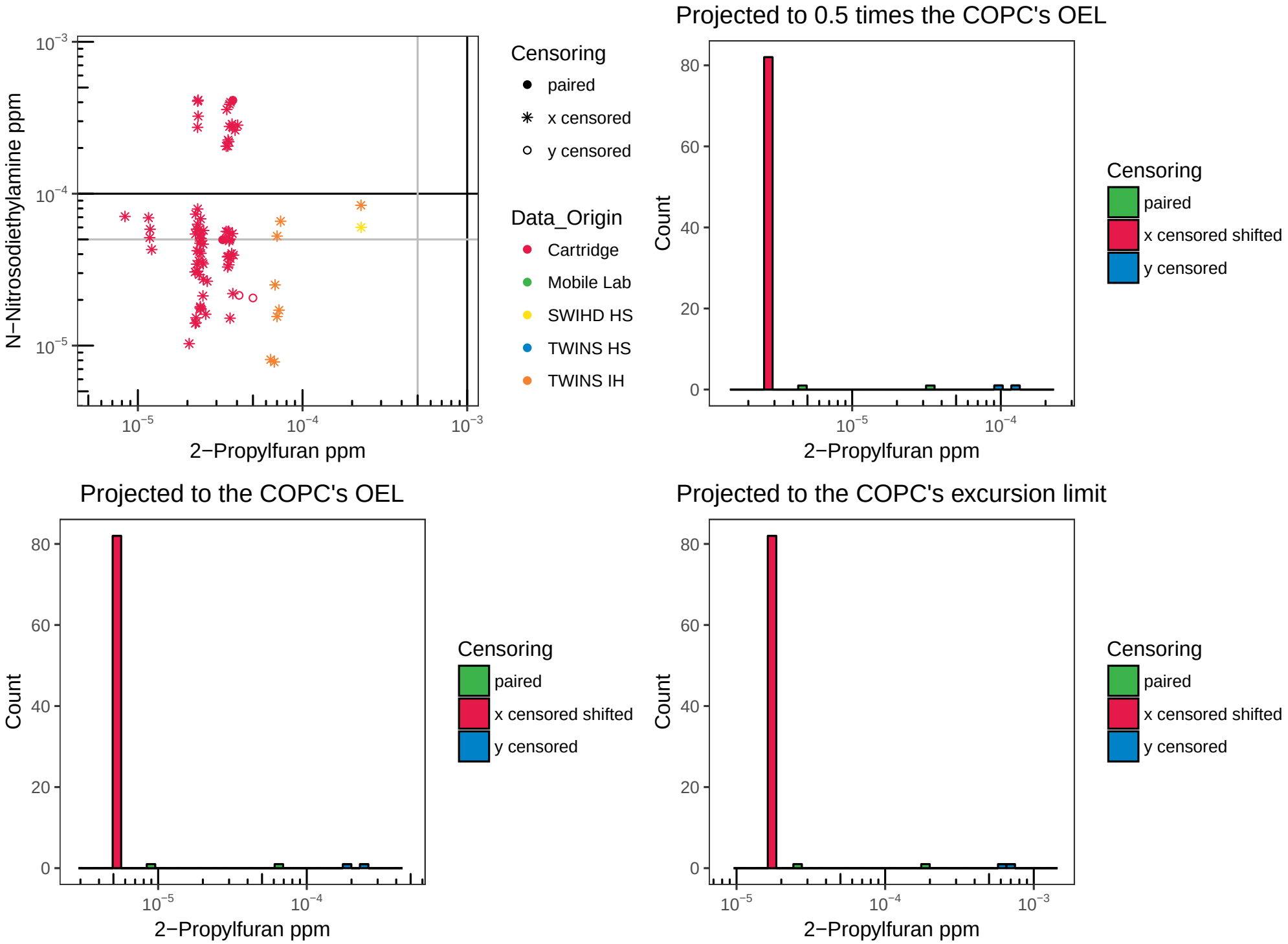


Figure C.1420: N-Nitrosodiethylamine vs 2-Propylfuran

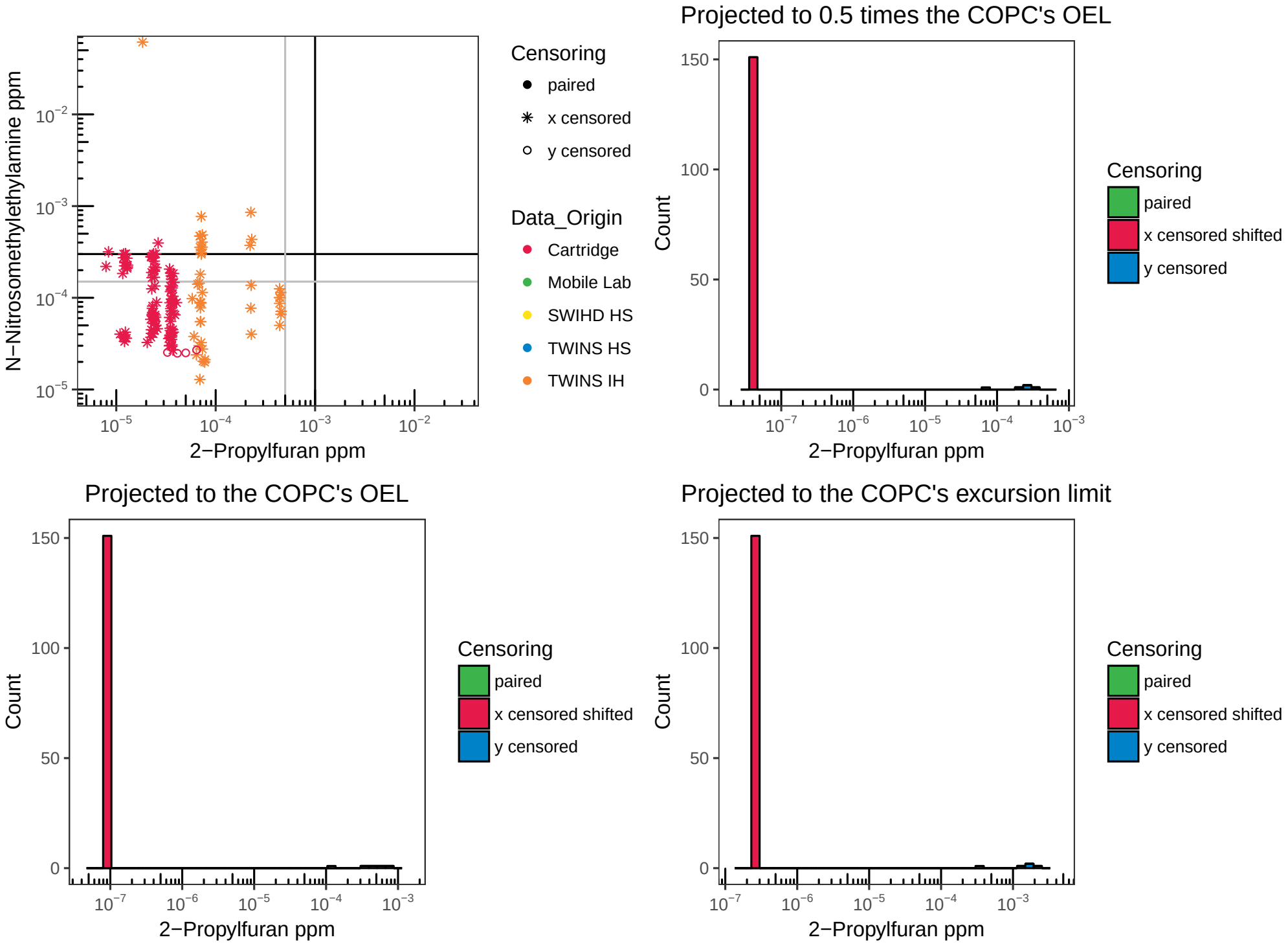


Figure C.1421: N-Nitrosomethylethylamine vs 2-Propylfuran

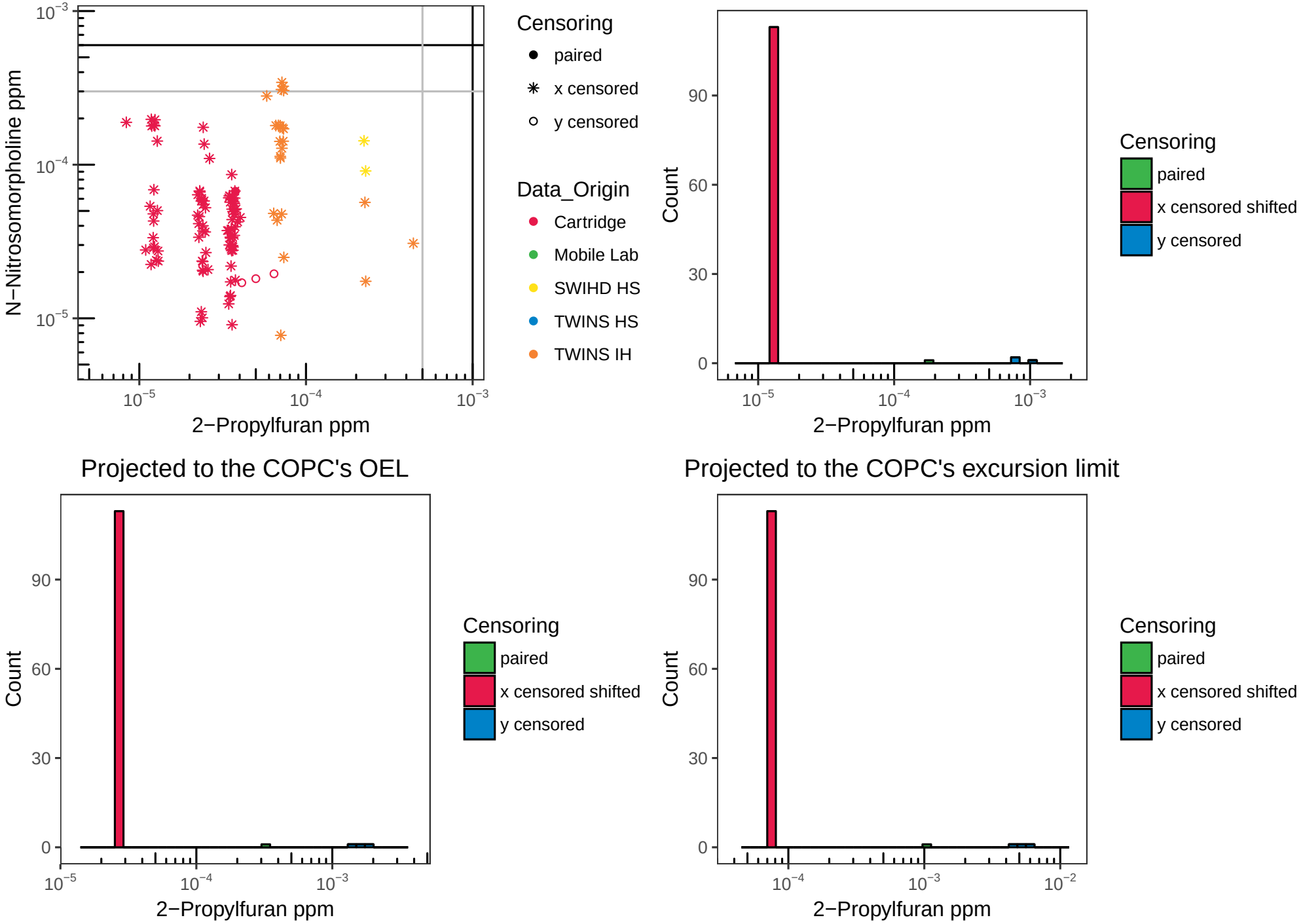


Figure C.1422: N-Nitrosomorpholine vs 2-Propylfuran

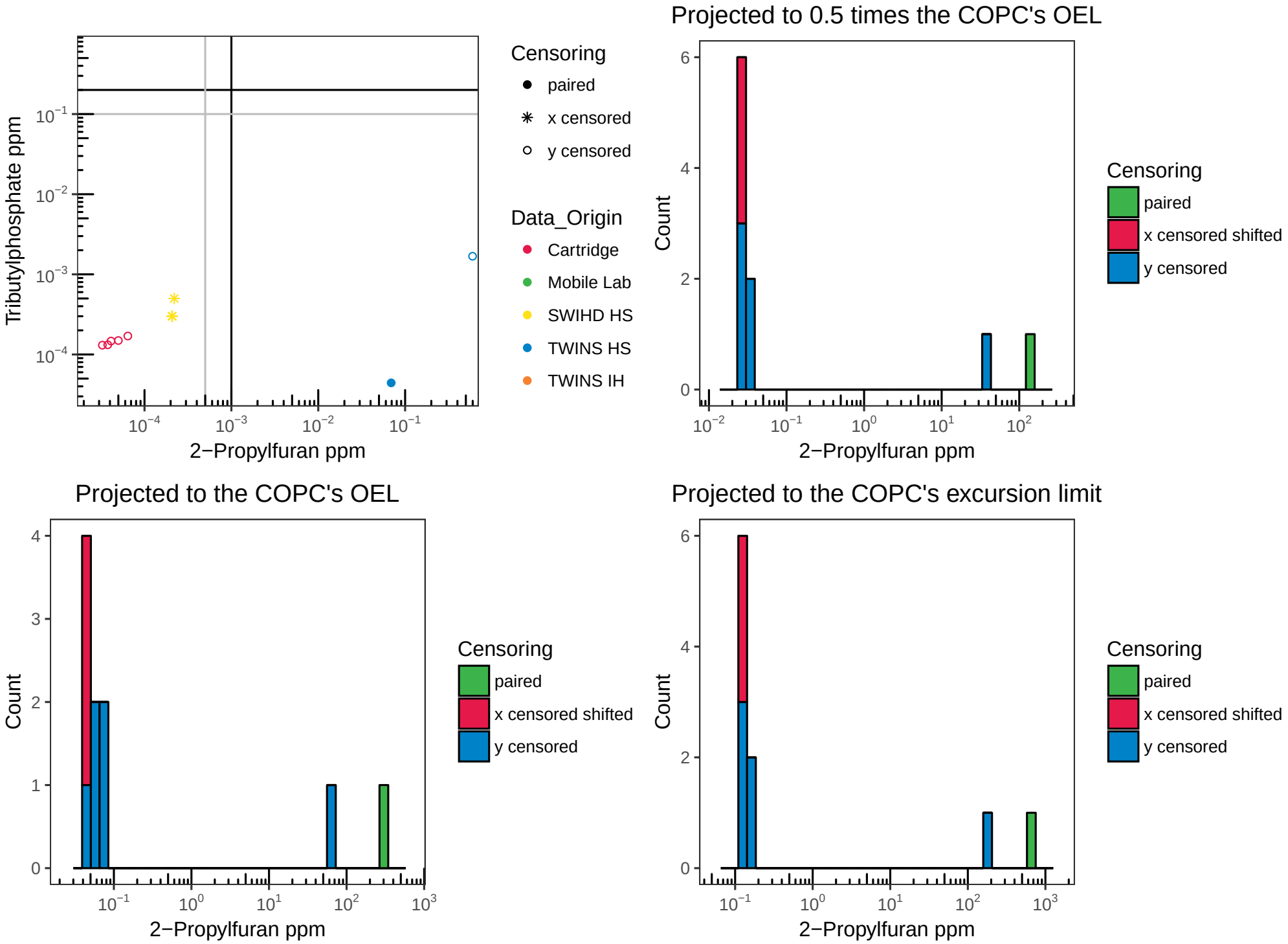


Figure C.1423: Tributylphosphate vs 2-Propylfuran

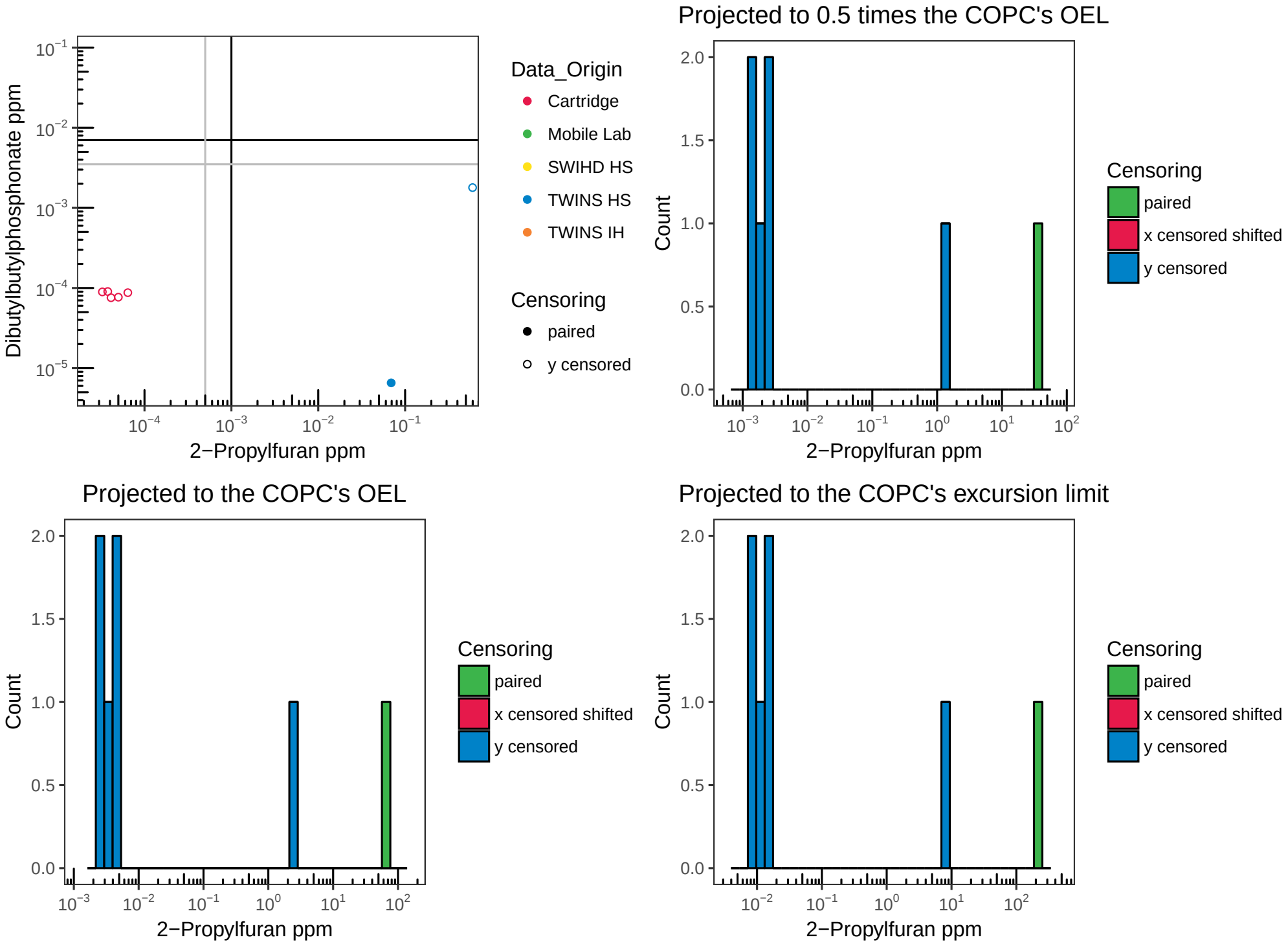


Figure C.1424: Dibutylbutylphosphonate vs 2-Propylfuran

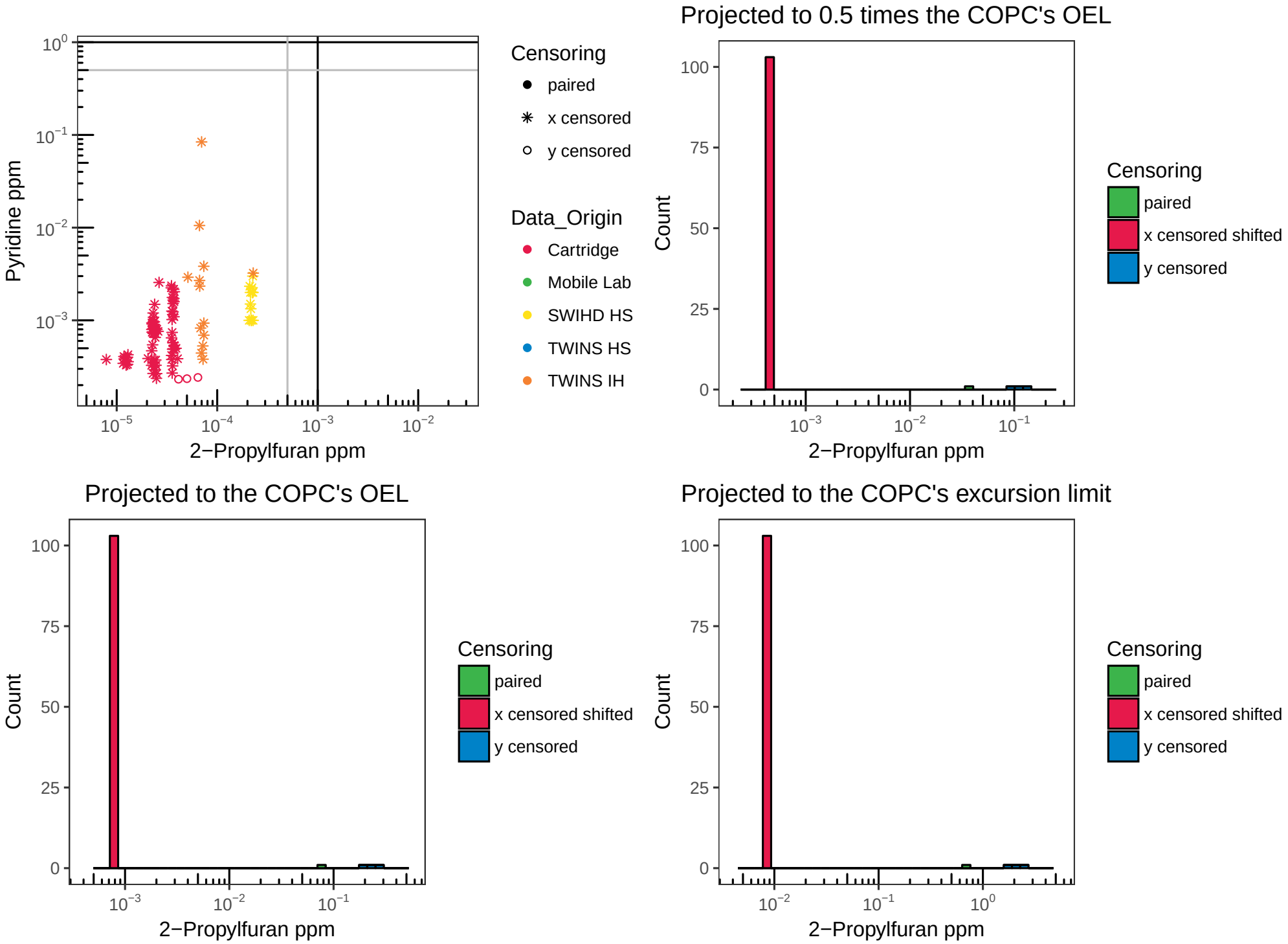


Figure C.1425: Pyridine vs 2-Propylfuran

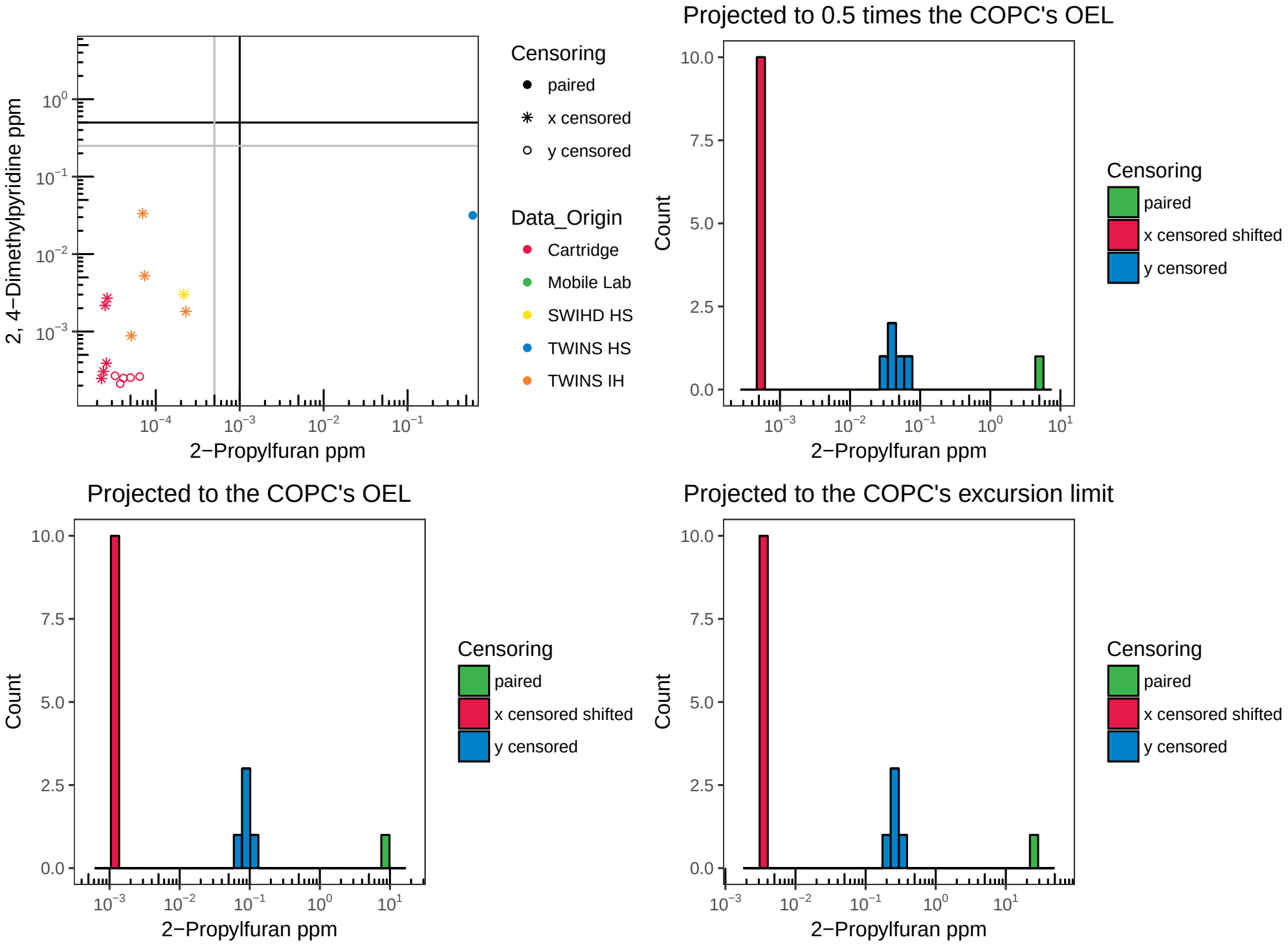


Figure C.1426: 2, 4-Dimethylpyridine vs 2-Propylfuran

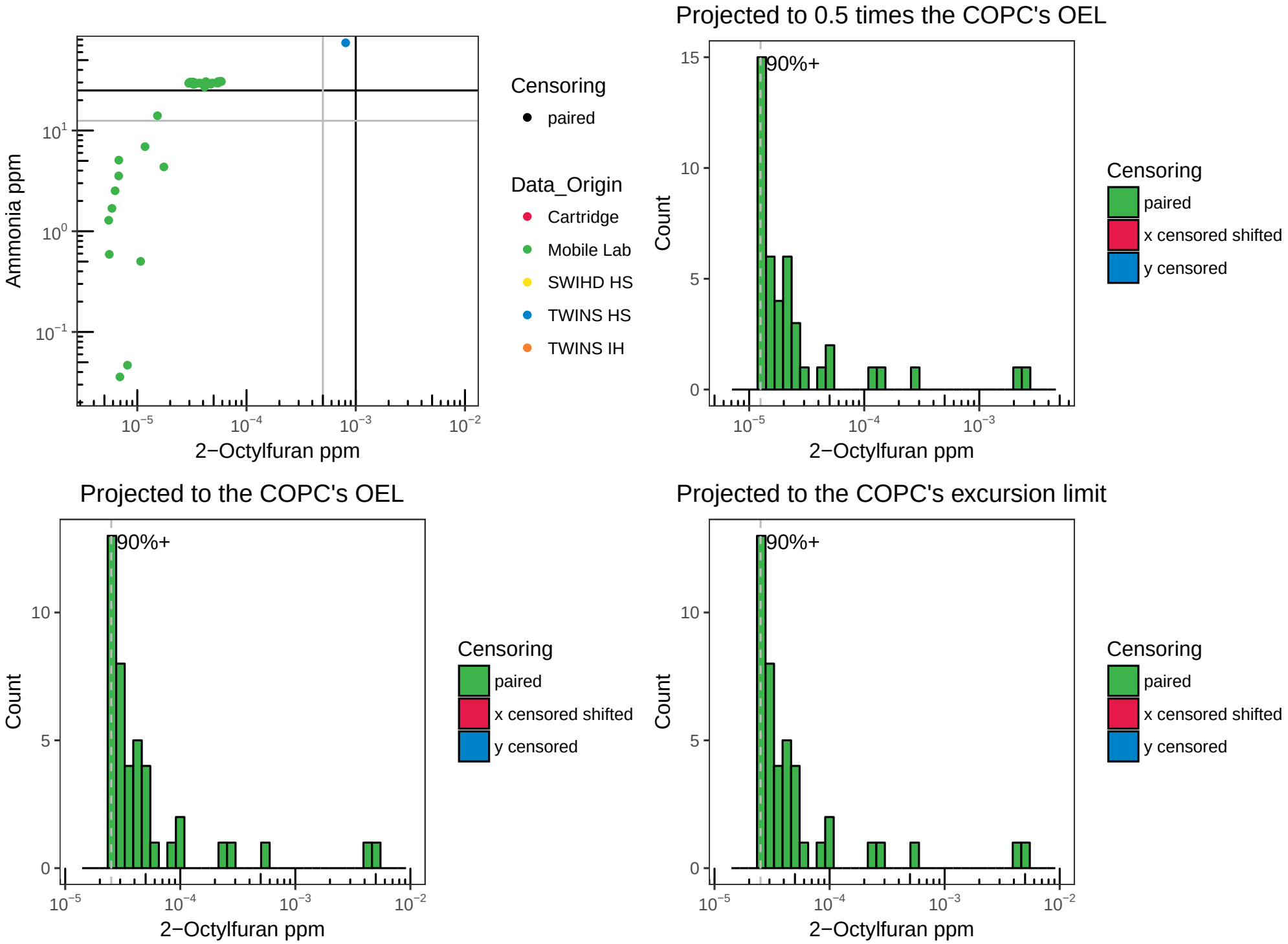


Figure C.1427: Ammonia vs 2-Octylfuran

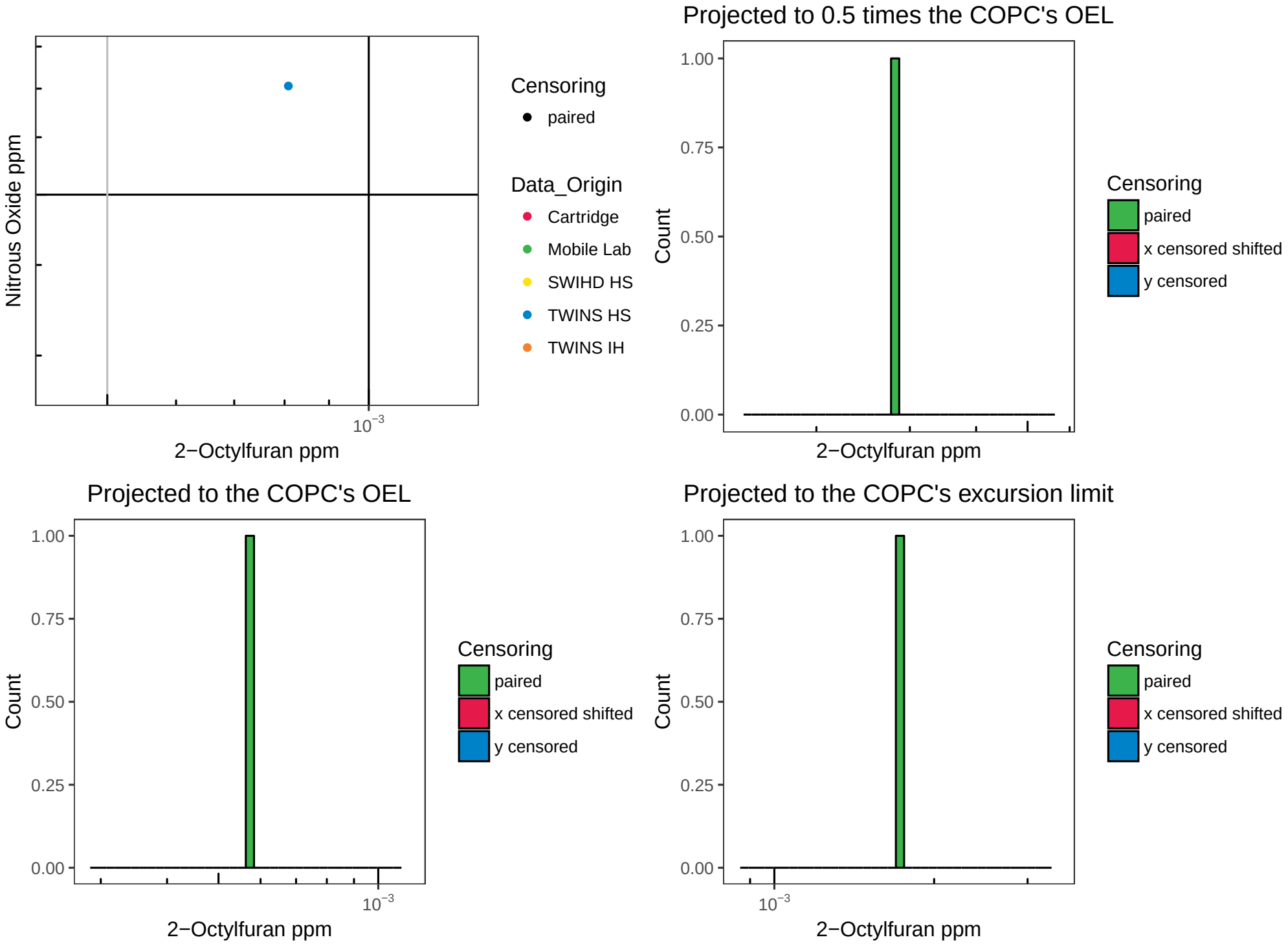


Figure C.1428: Nitrous Oxide vs 2-Octylfuran

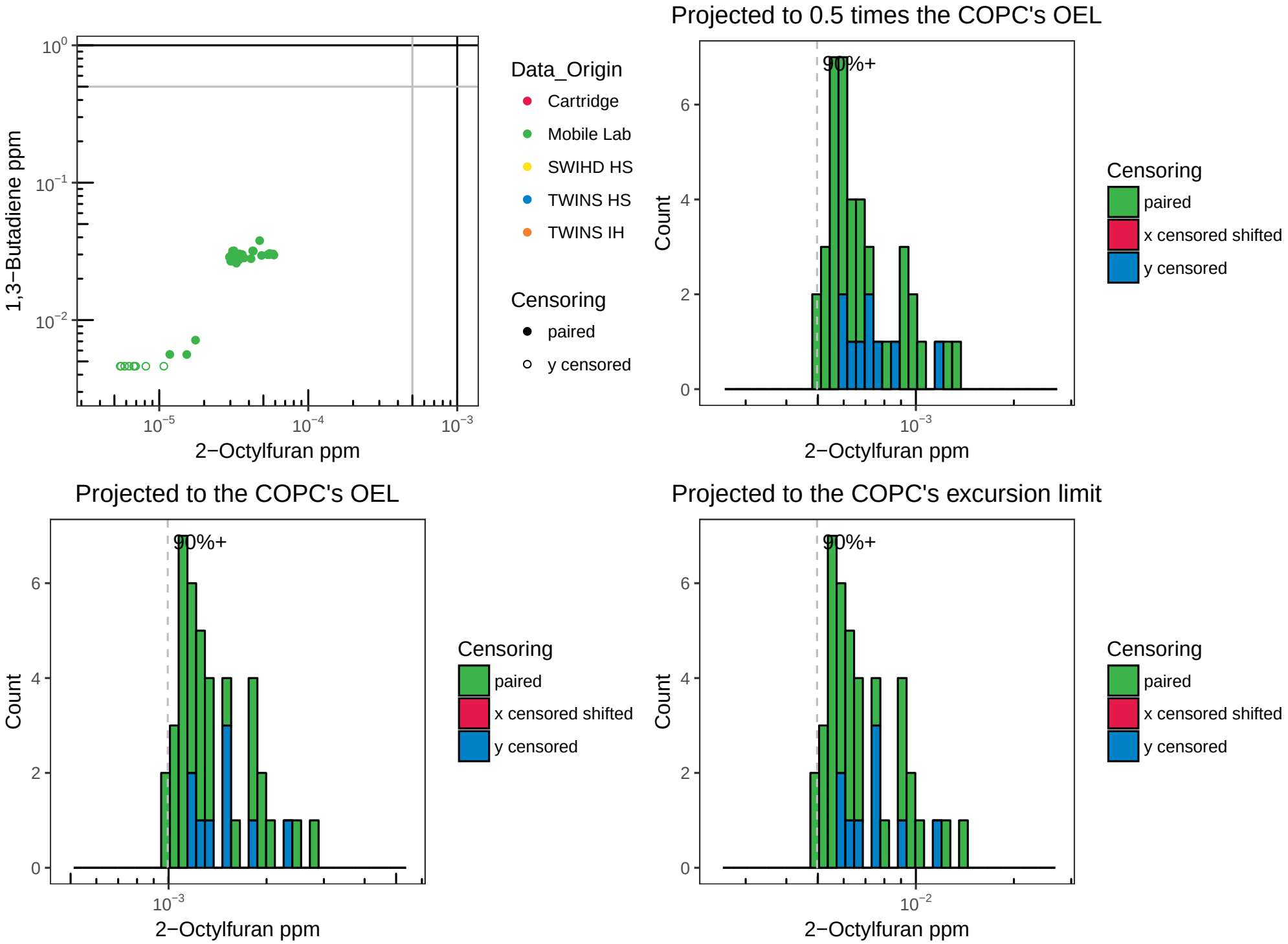


Figure C.1429: 1,3-Butadiene vs 2-Octylfuran

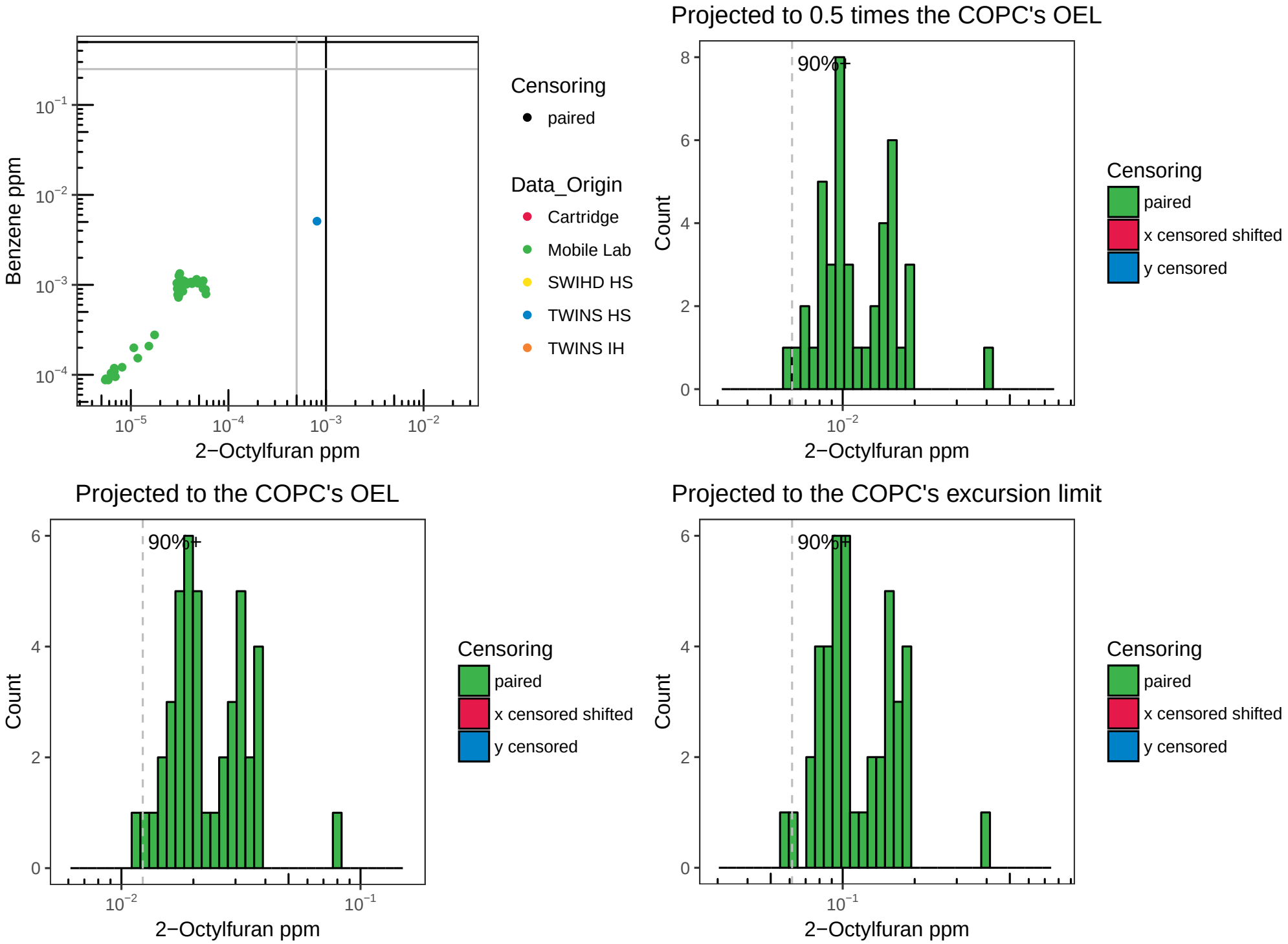


Figure C.1430: Benzene vs 2-Octylfuran

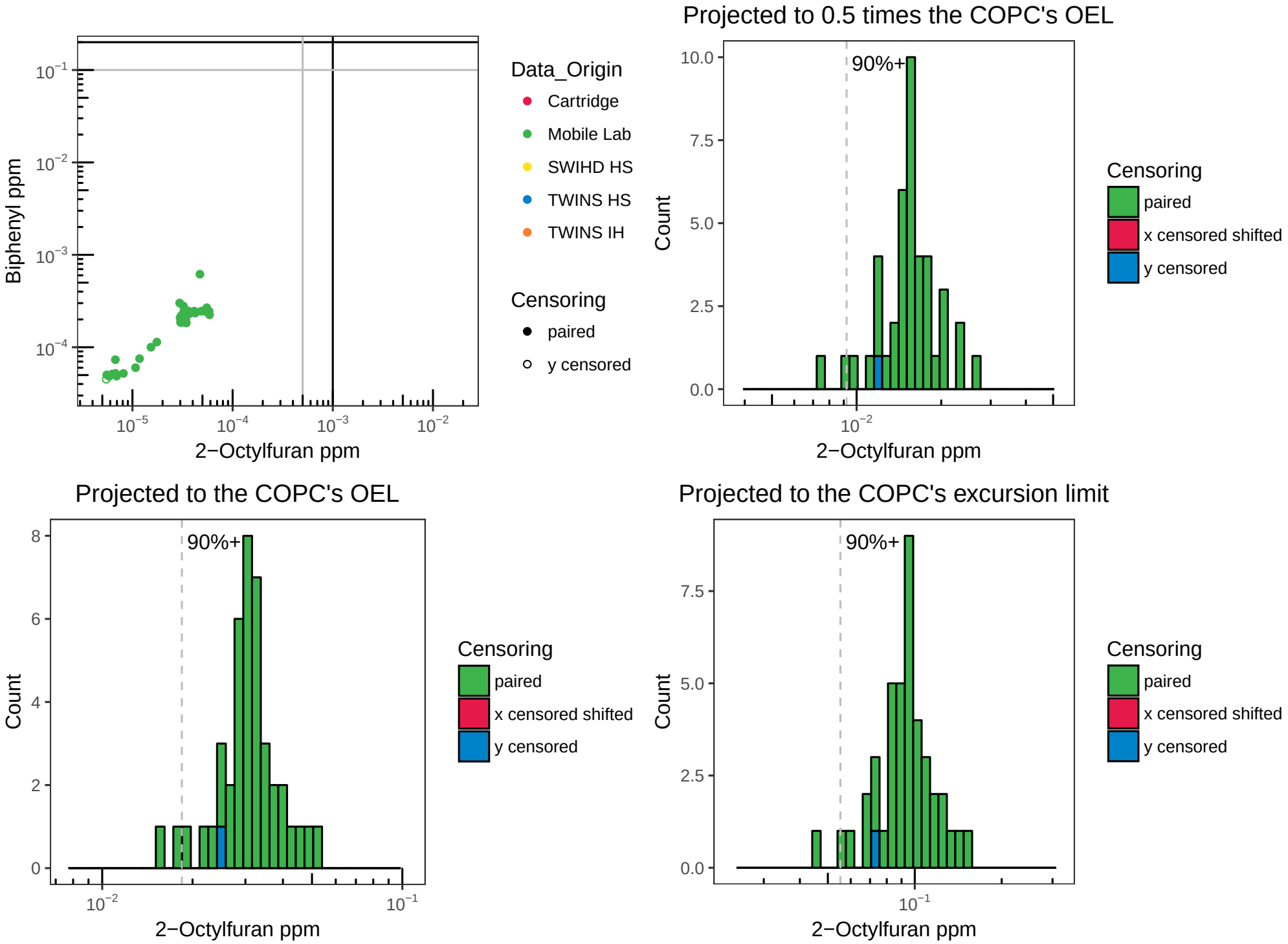


Figure C.1431: Biphenyl vs 2-Octylfuran

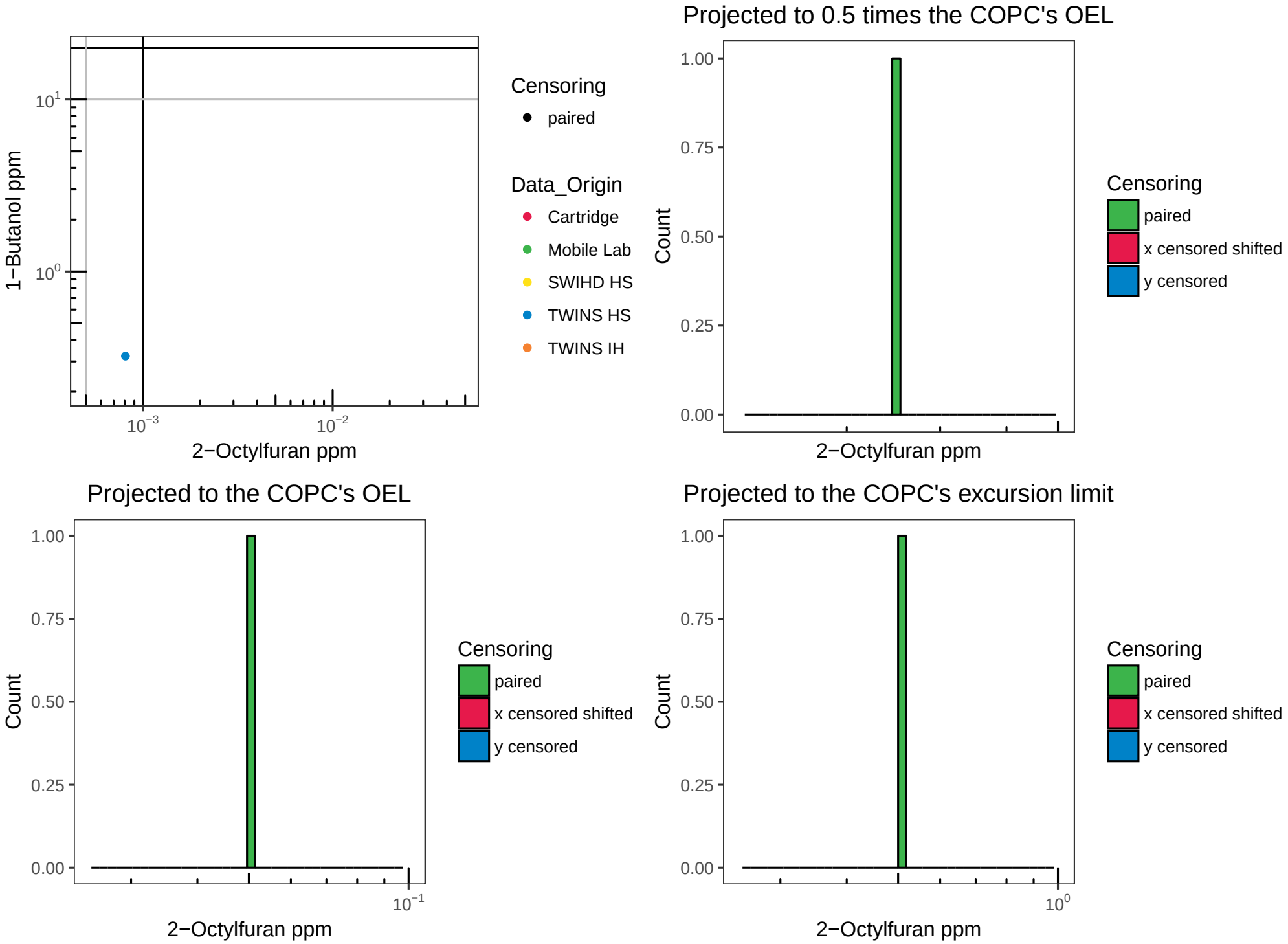


Figure C.1432: 1-Butanol vs 2-Octylfuran

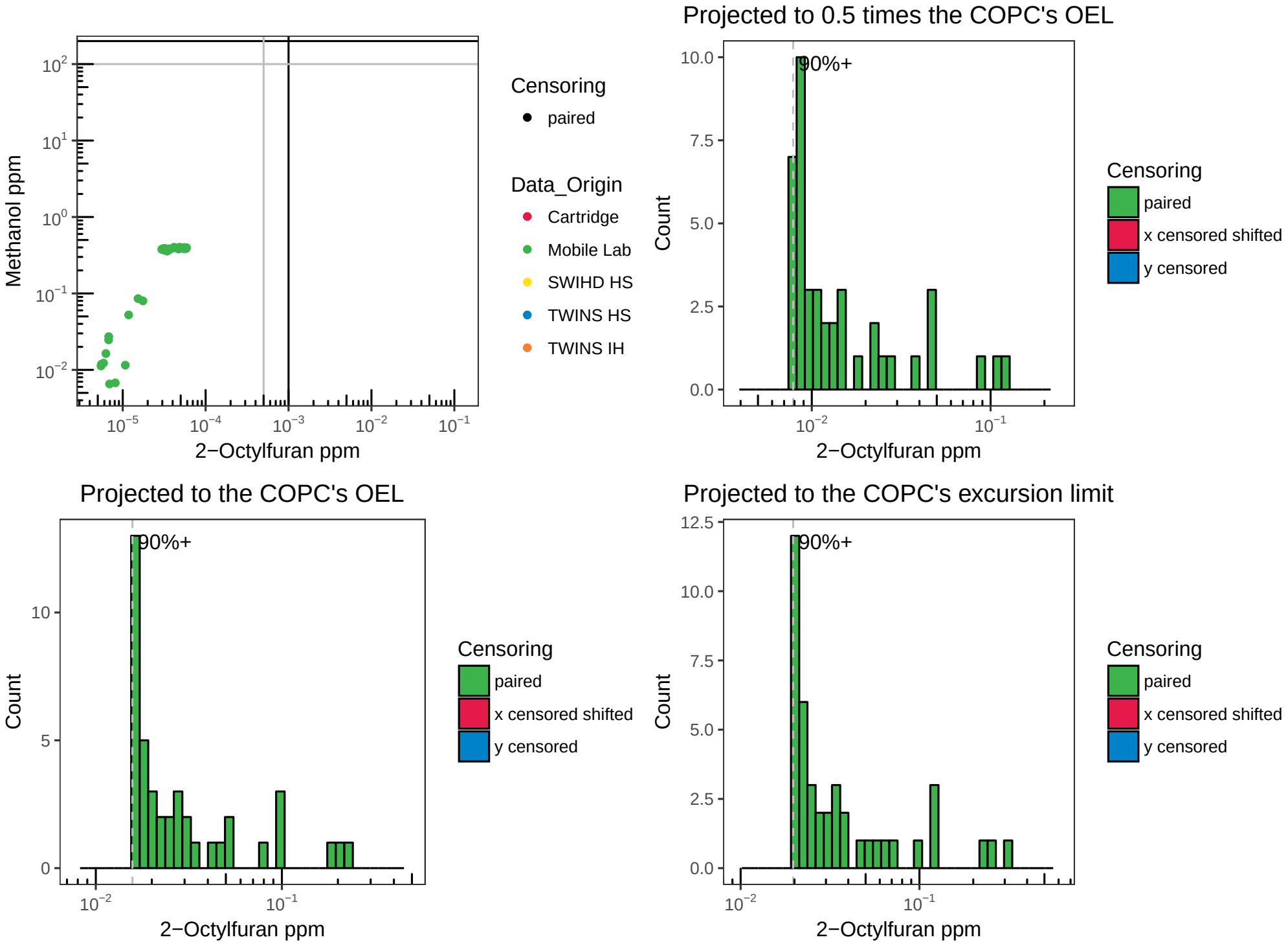


Figure C.1433: Methanol vs 2-Octylfuran

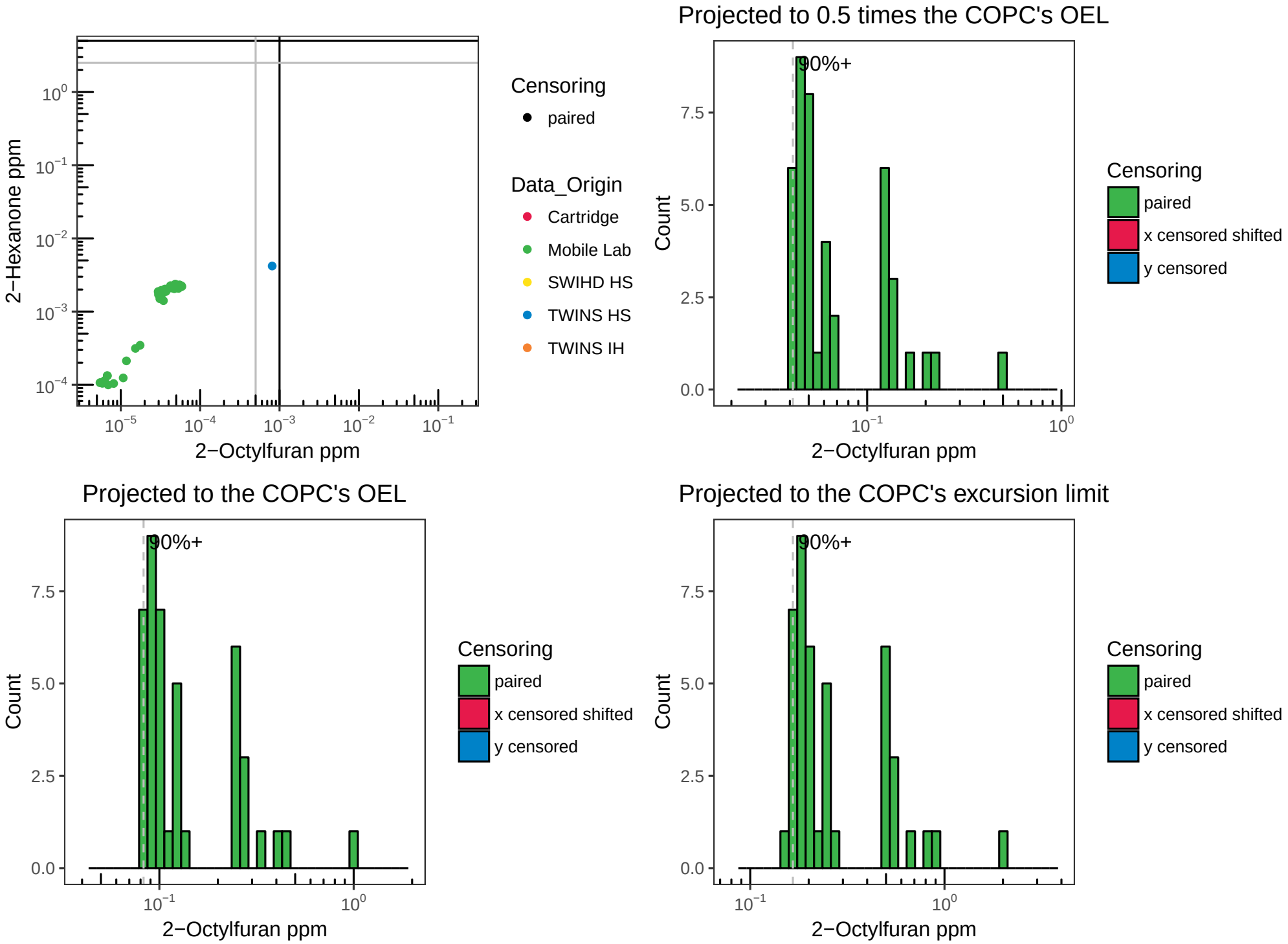


Figure C.1434: 2-Hexanone vs 2-Octylfuran

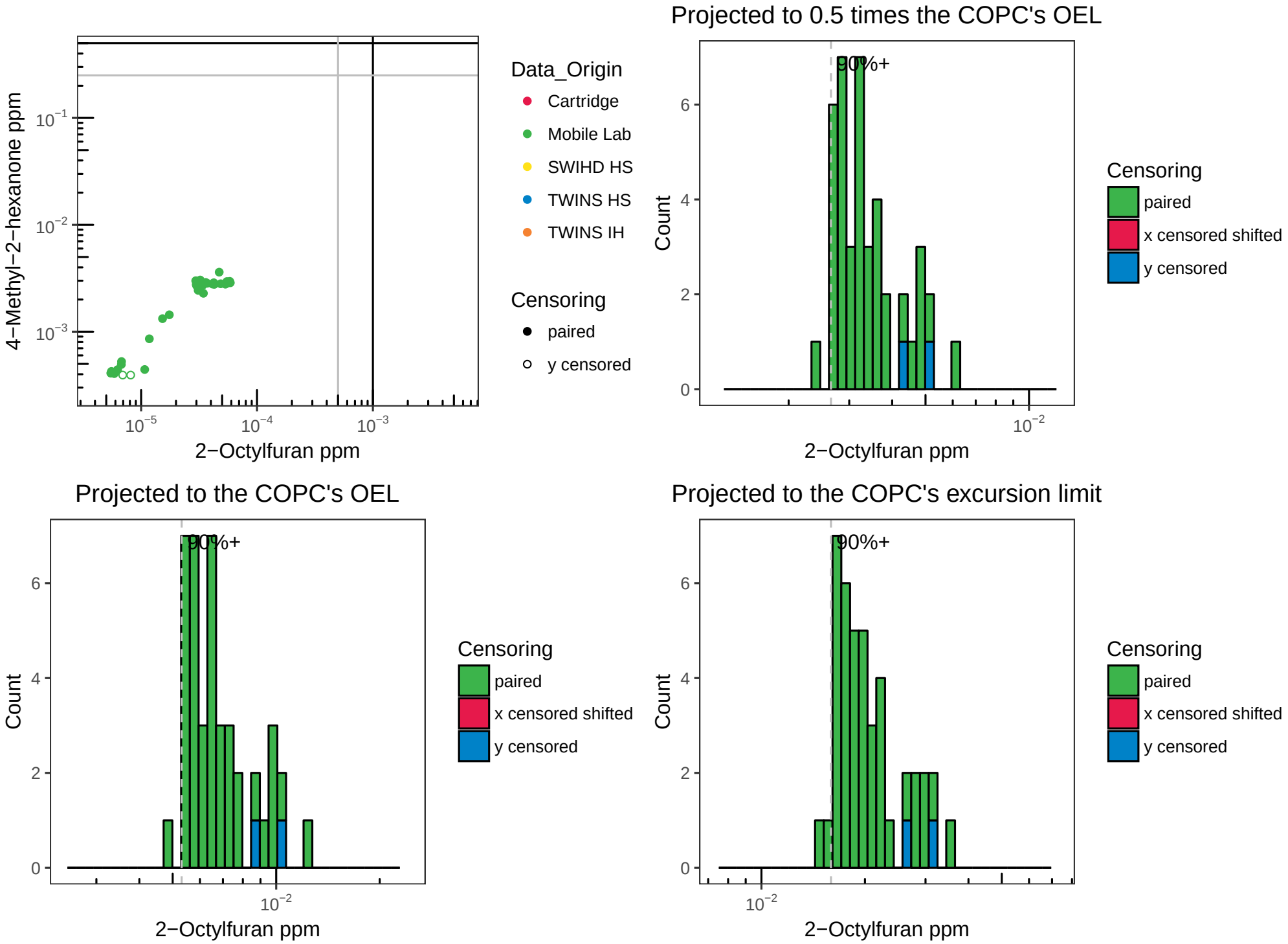


Figure C.1435: 4-Methyl-2-hexanone vs 2-Octylfuran

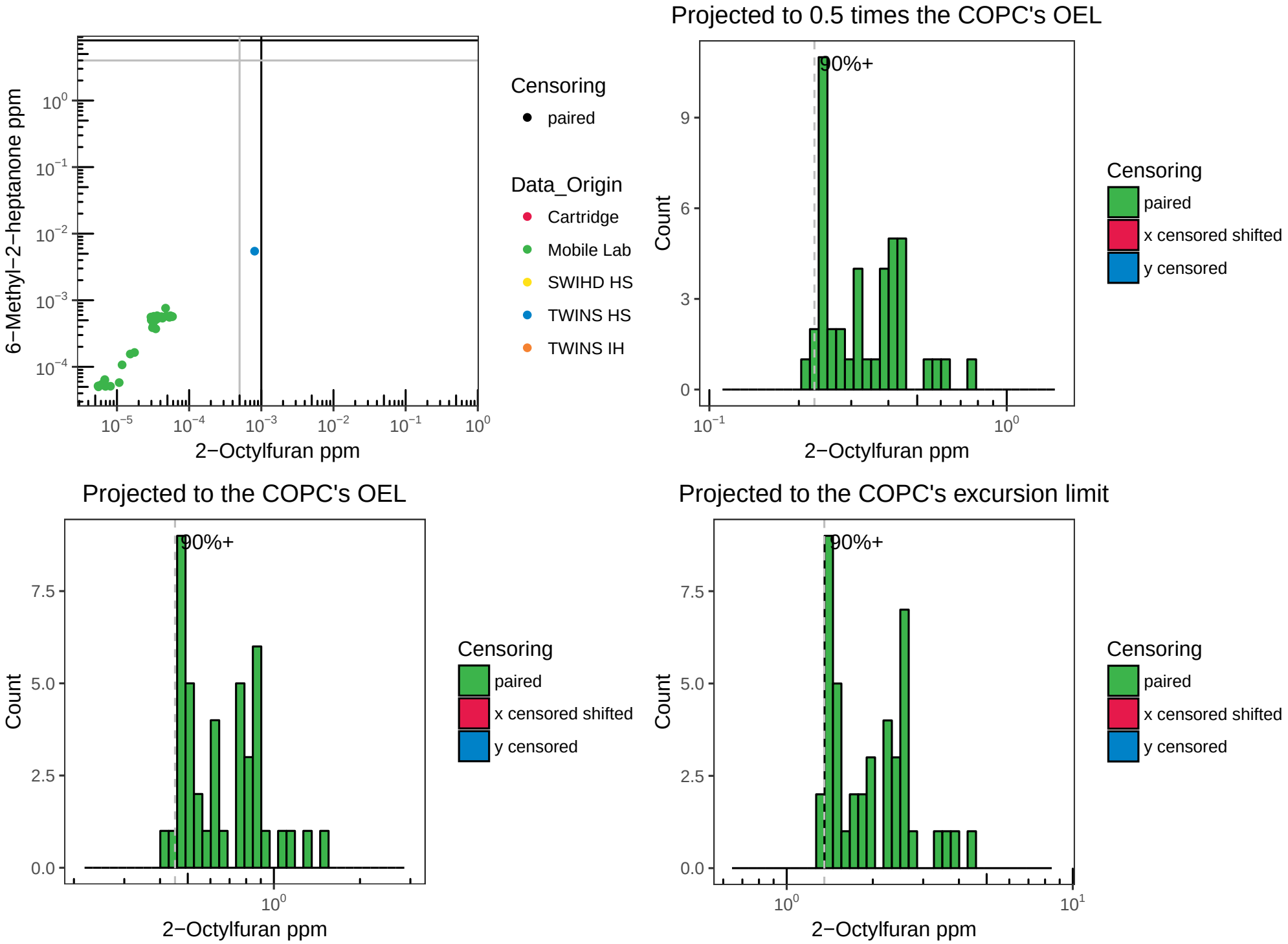


Figure C.1436: 6-Methyl-2-heptanone vs 2-Octylfuran

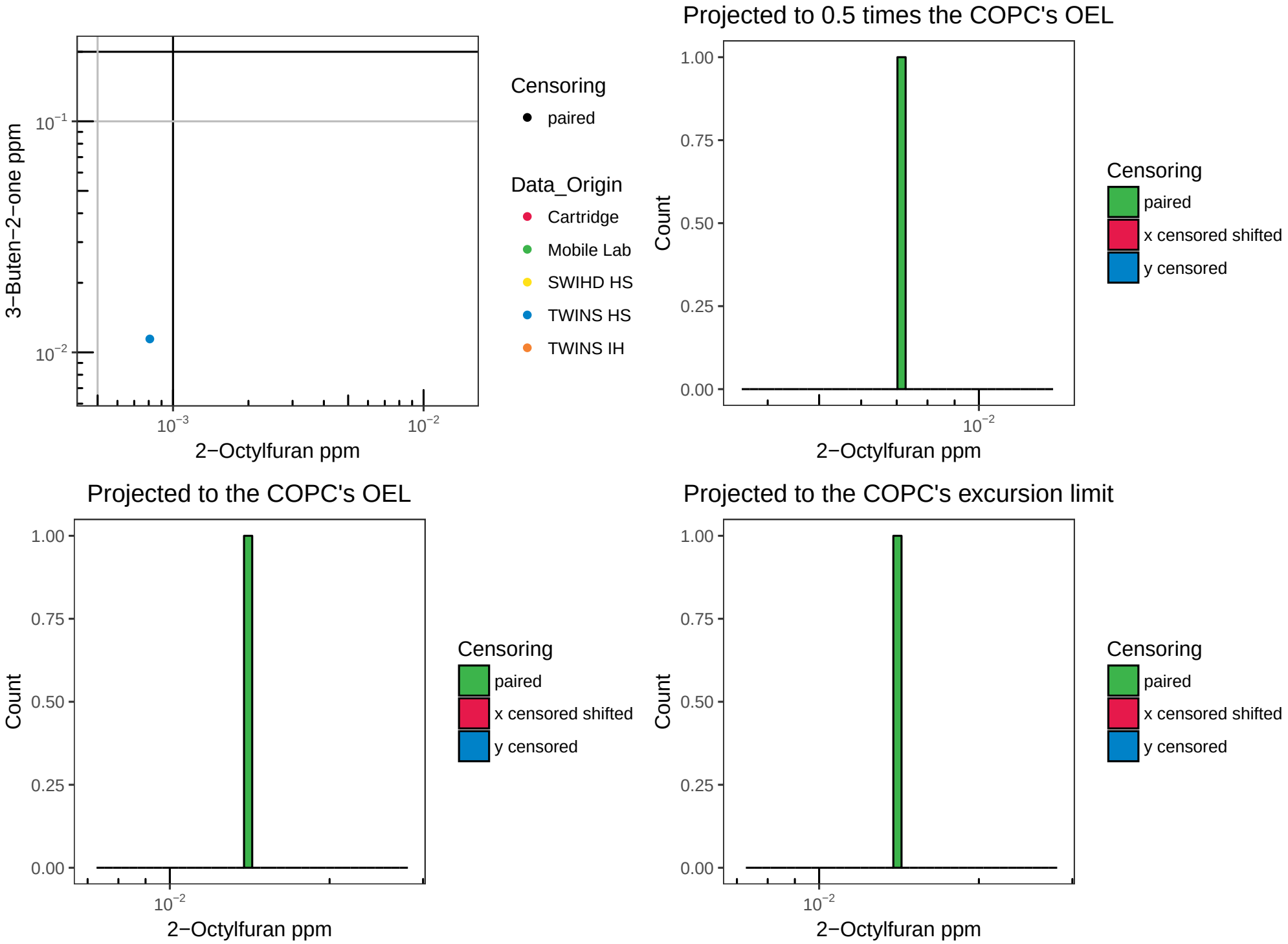


Figure C.1437: 3-Buten-2-one vs 2-Octylfuran

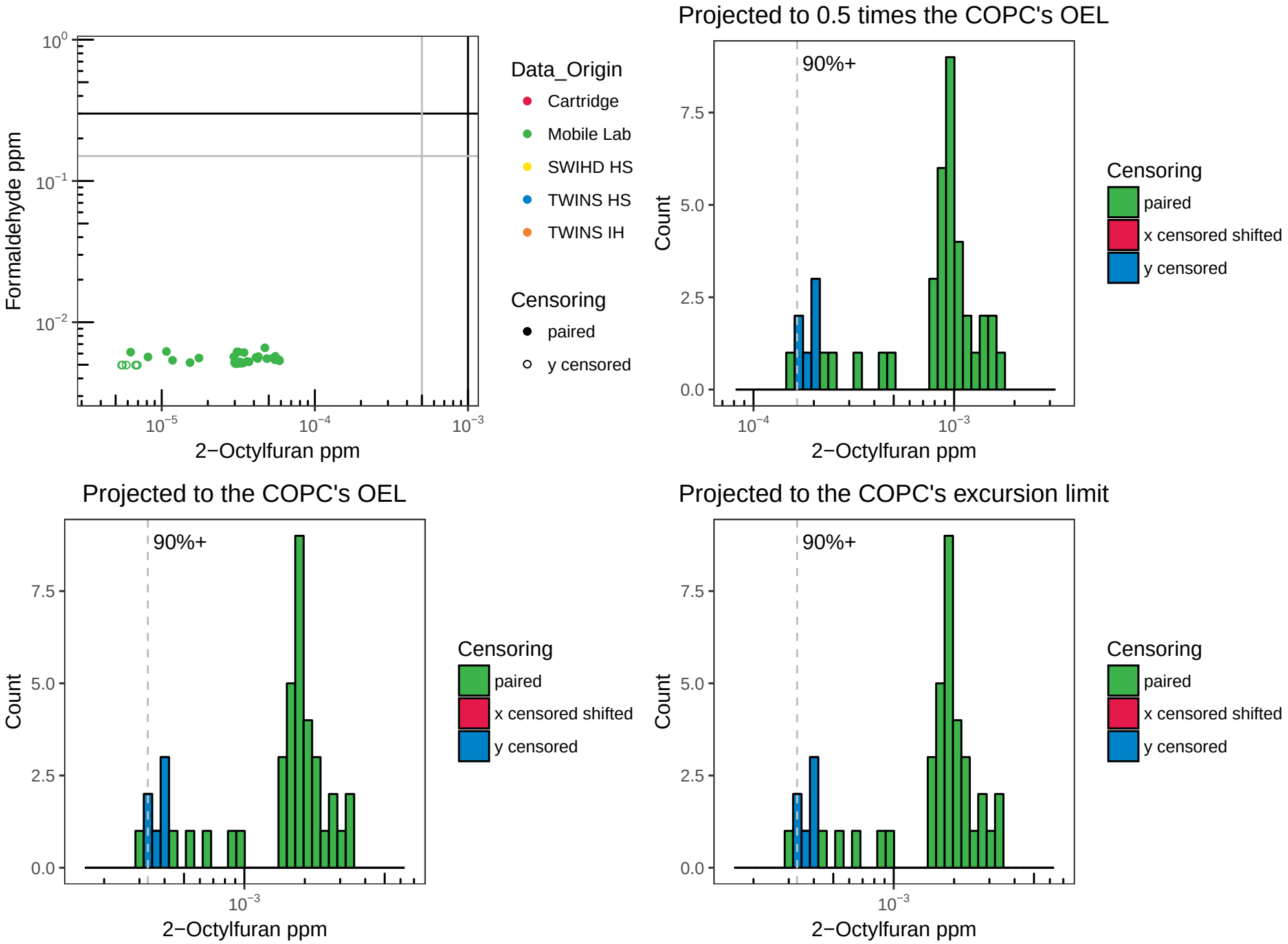


Figure C.1438: Formaldehyde vs 2-Octylfuran

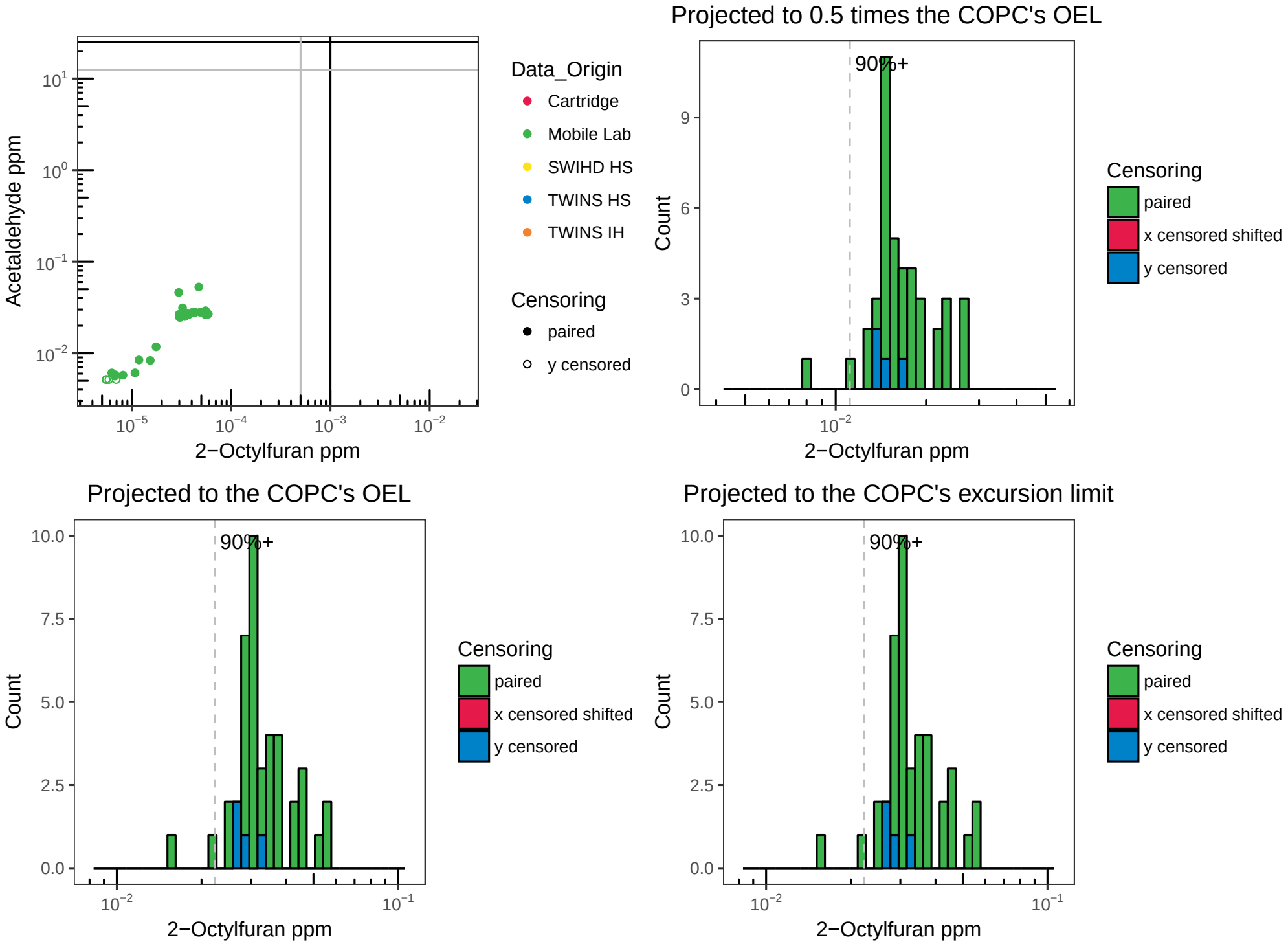


Figure C.1439: Acetaldehyde vs 2-Octylfuran

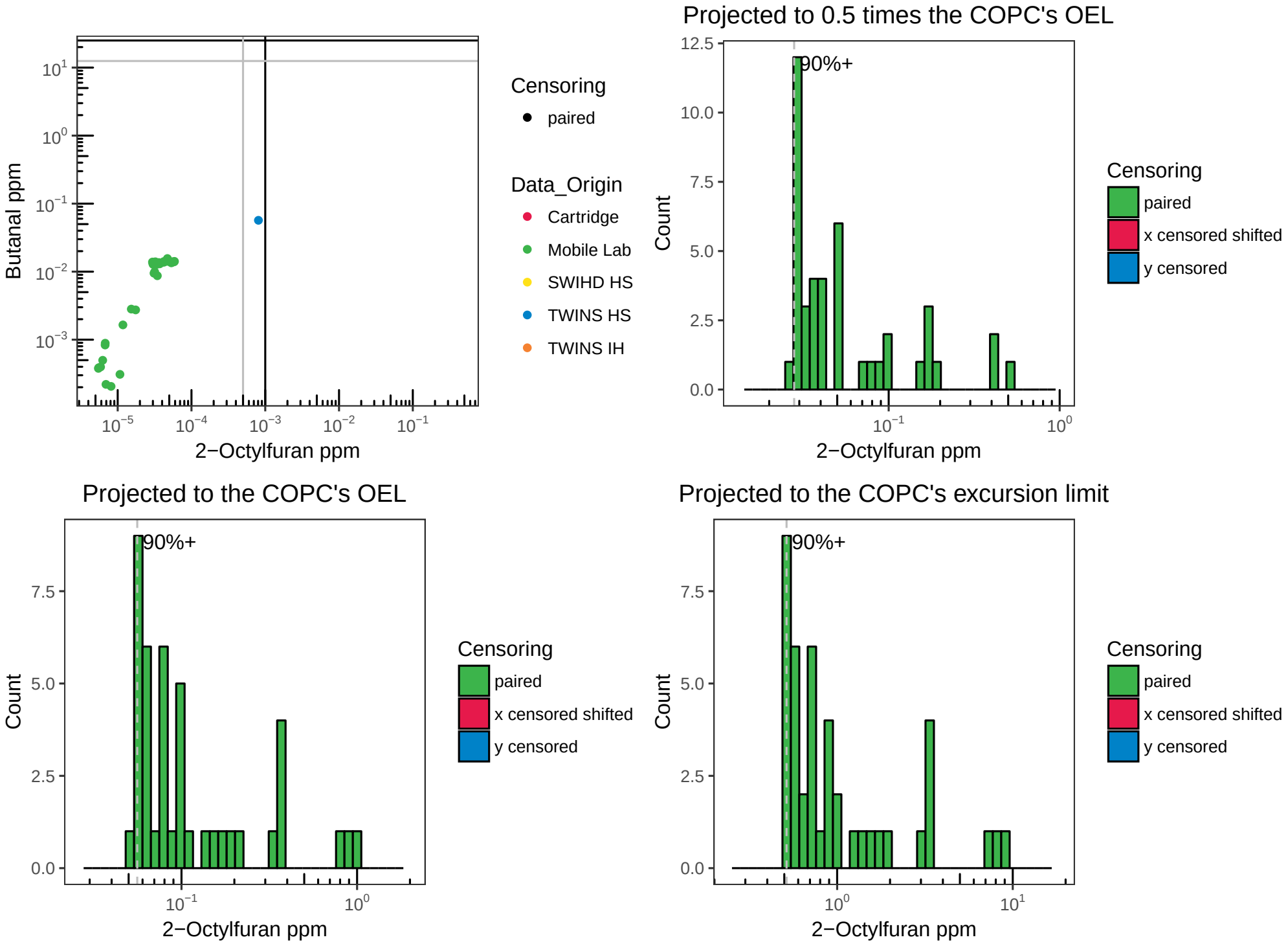


Figure C.1440: Butanal vs 2-Octylfuran

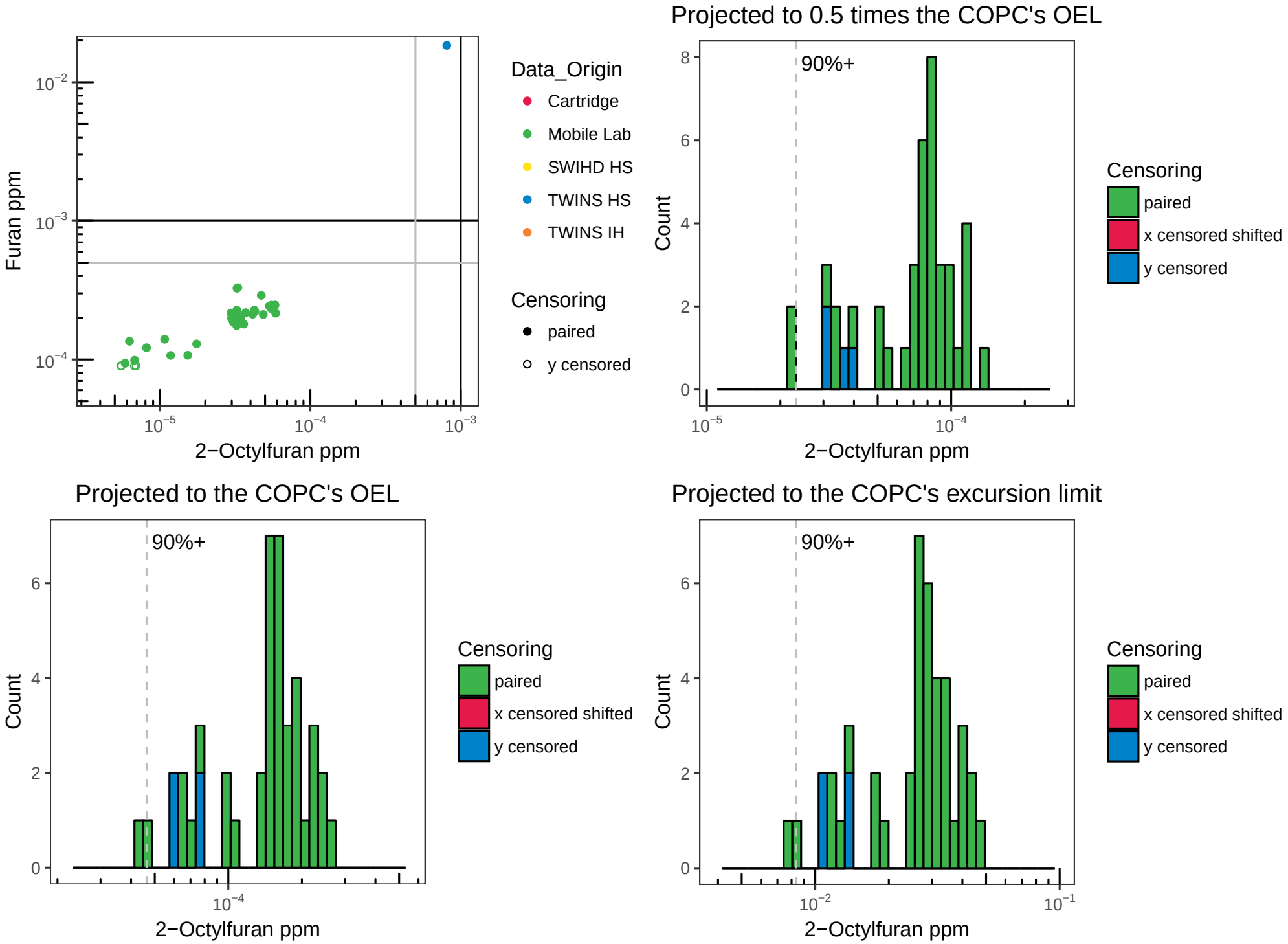


Figure C.1441: Furan vs 2-Octylfuran

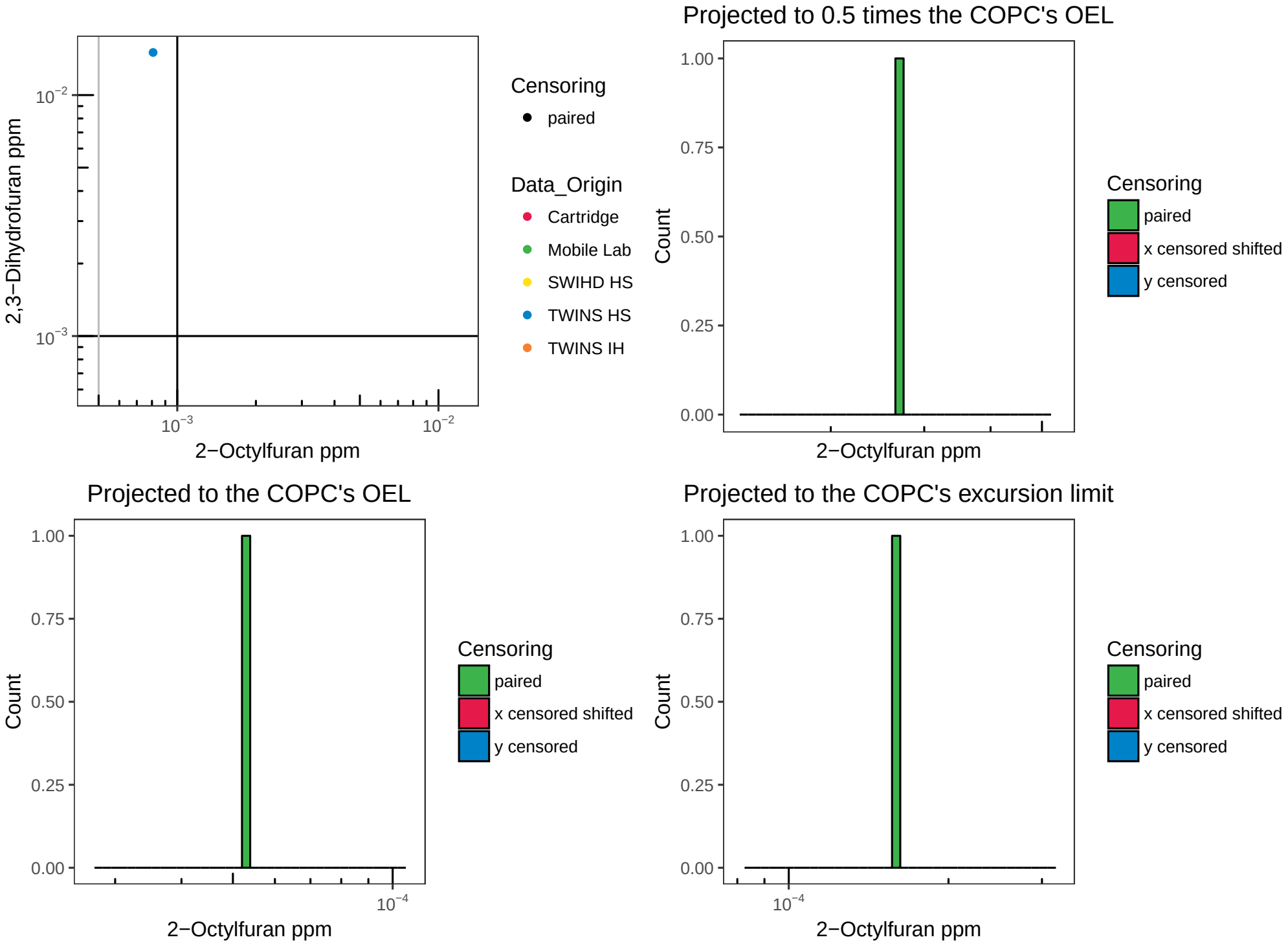


Figure C.1442: 2,3-Dihydrofuran vs 2-Octylfuran

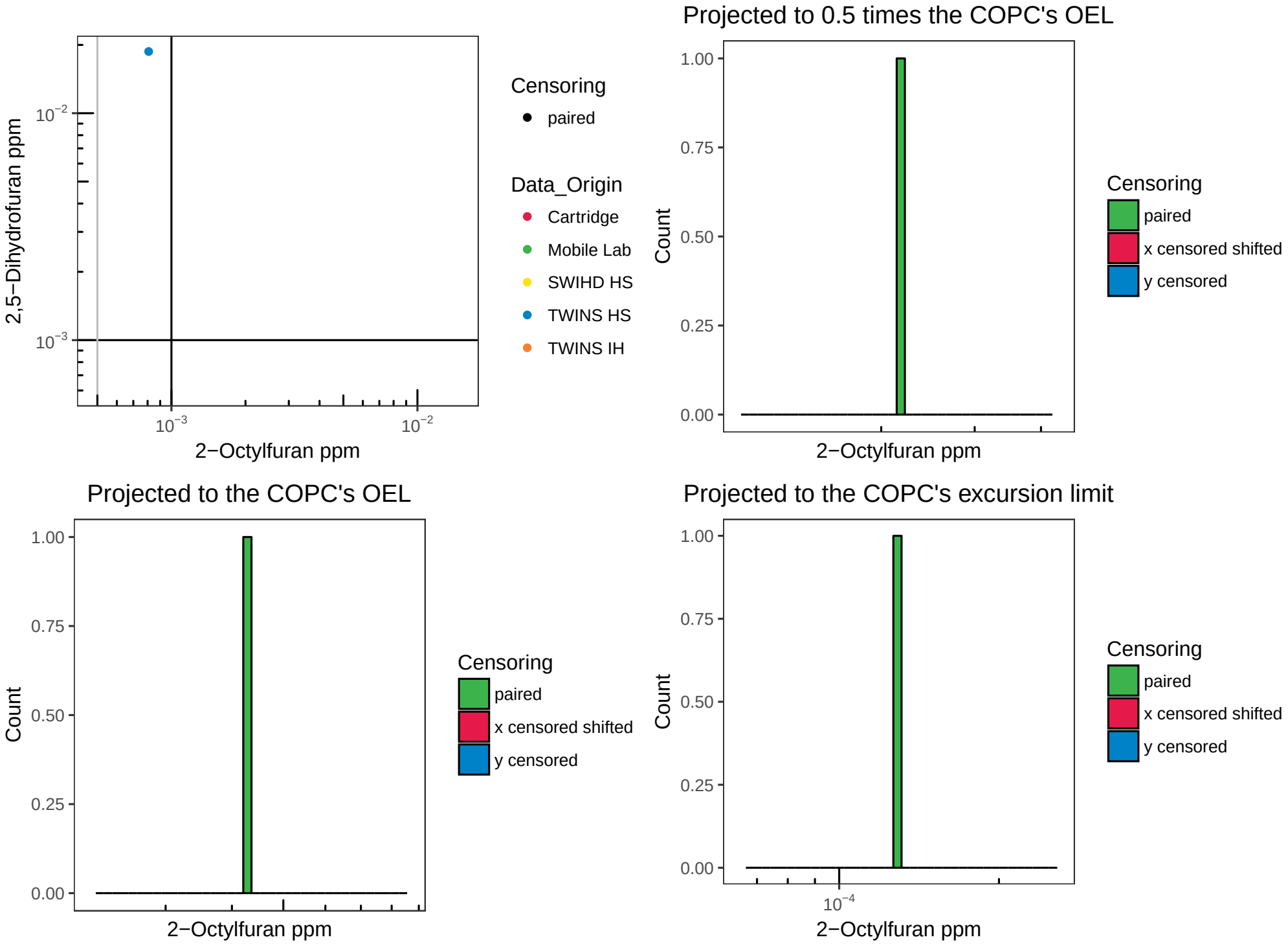


Figure C.1443: 2,5-Dihydrofuran vs 2-Octylfuran

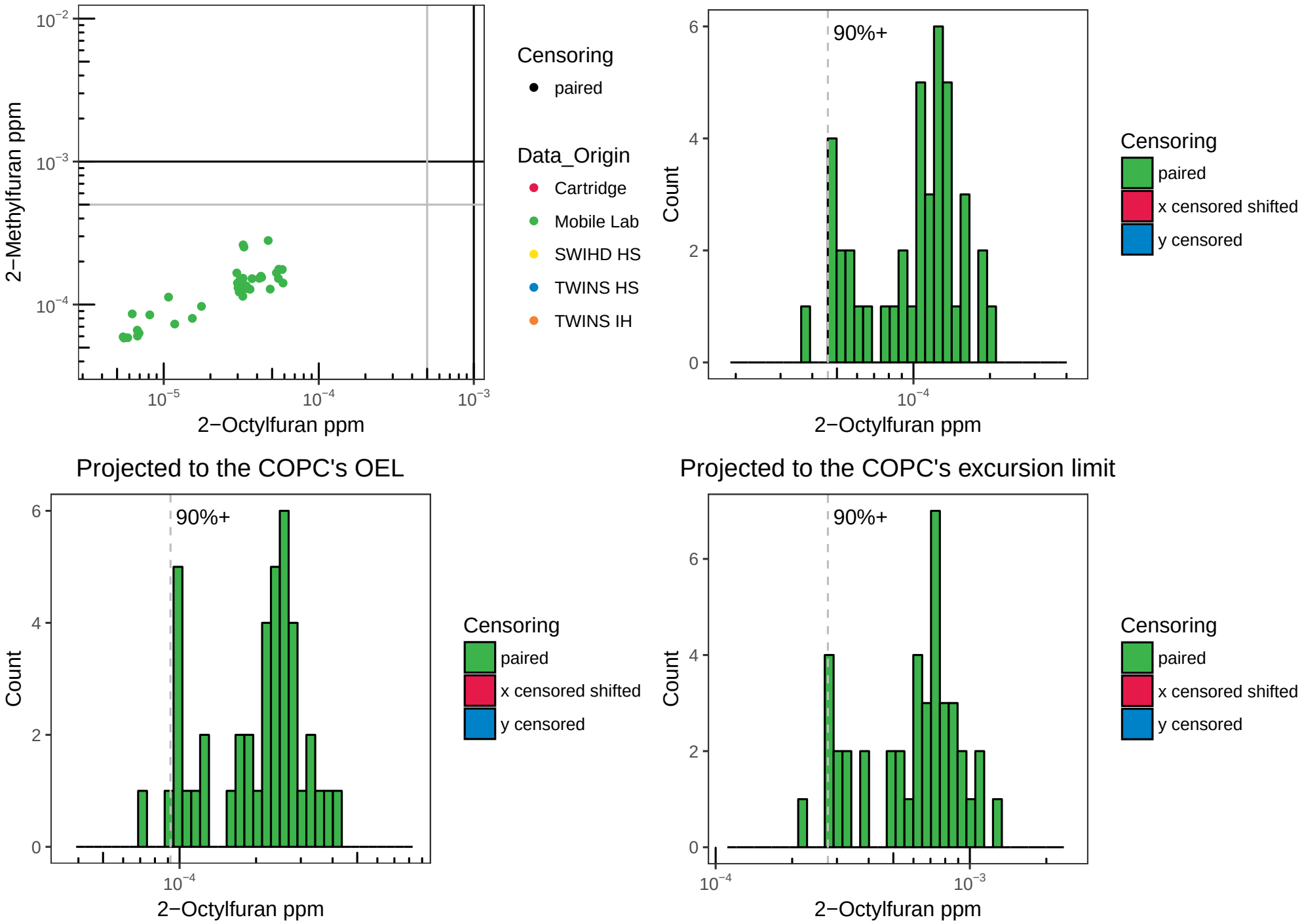


Figure C.1444: 2-Methylfuran vs 2-Octylfuran

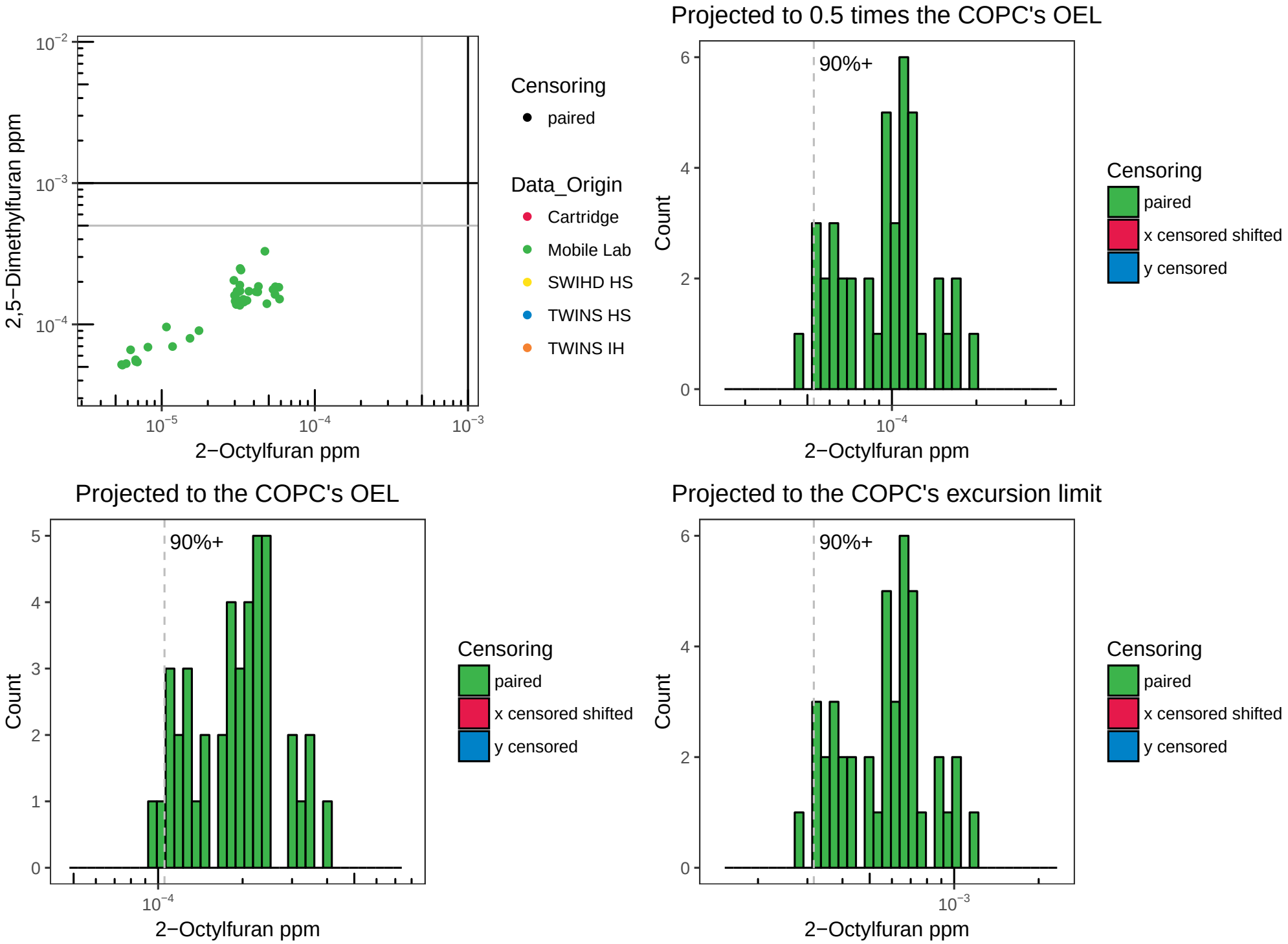


Figure C.1445: 2,5-Dimethylfuran vs 2-Octylfuran

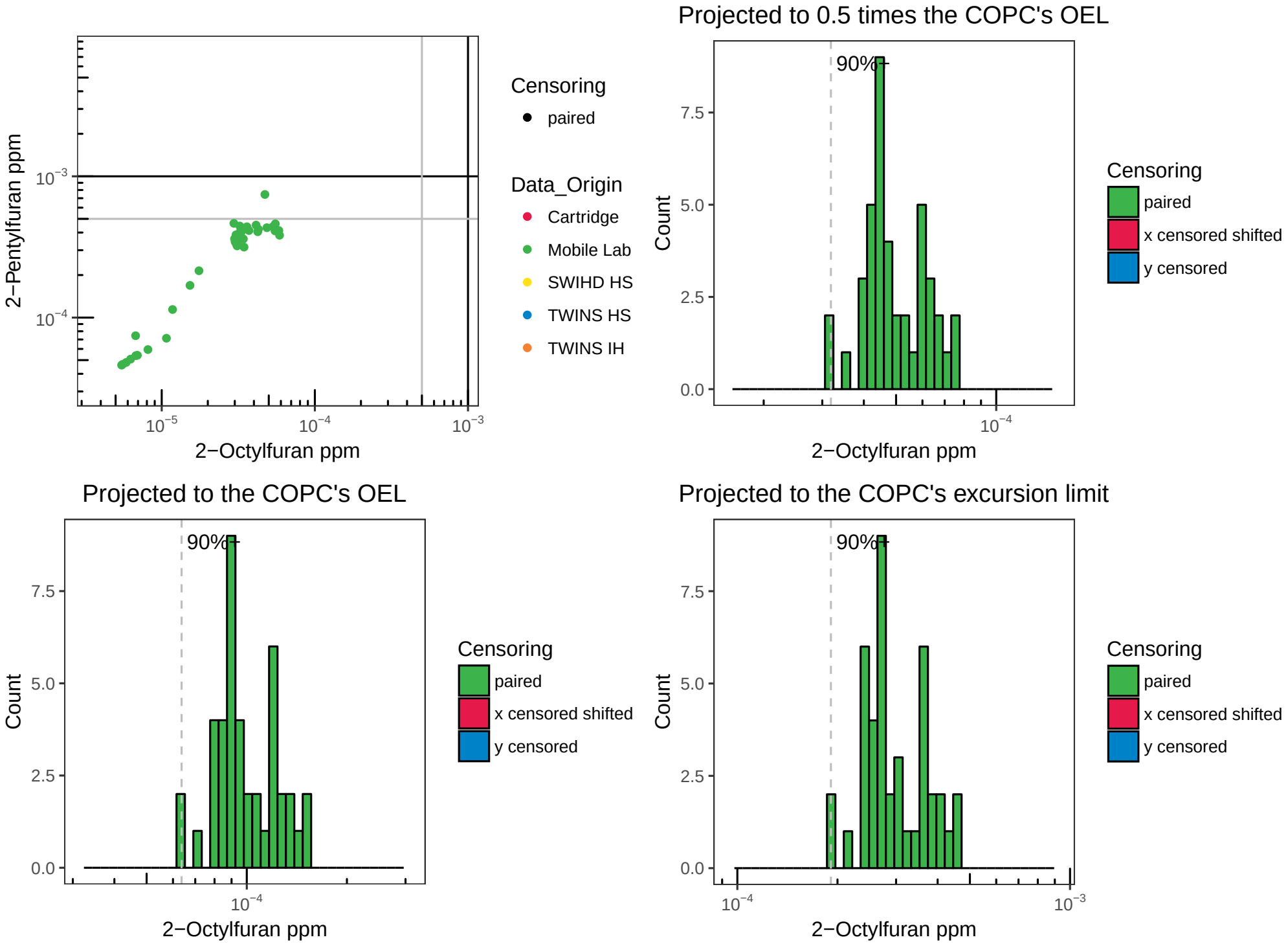


Figure C.1446: 2-Pentylfuran vs 2-Octylfuran

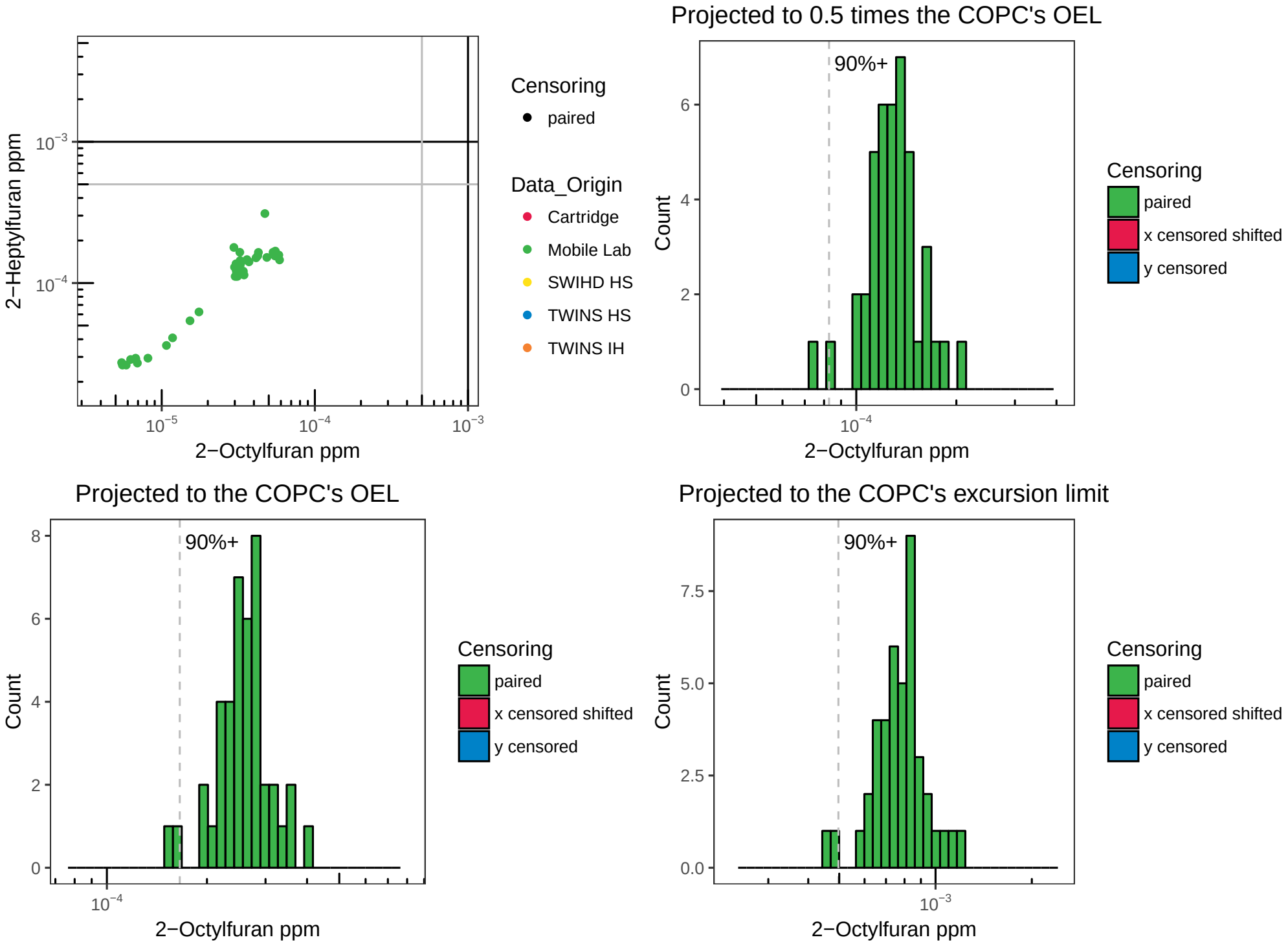


Figure C.1447: 2-Heptylfuran vs 2-Octylfuran

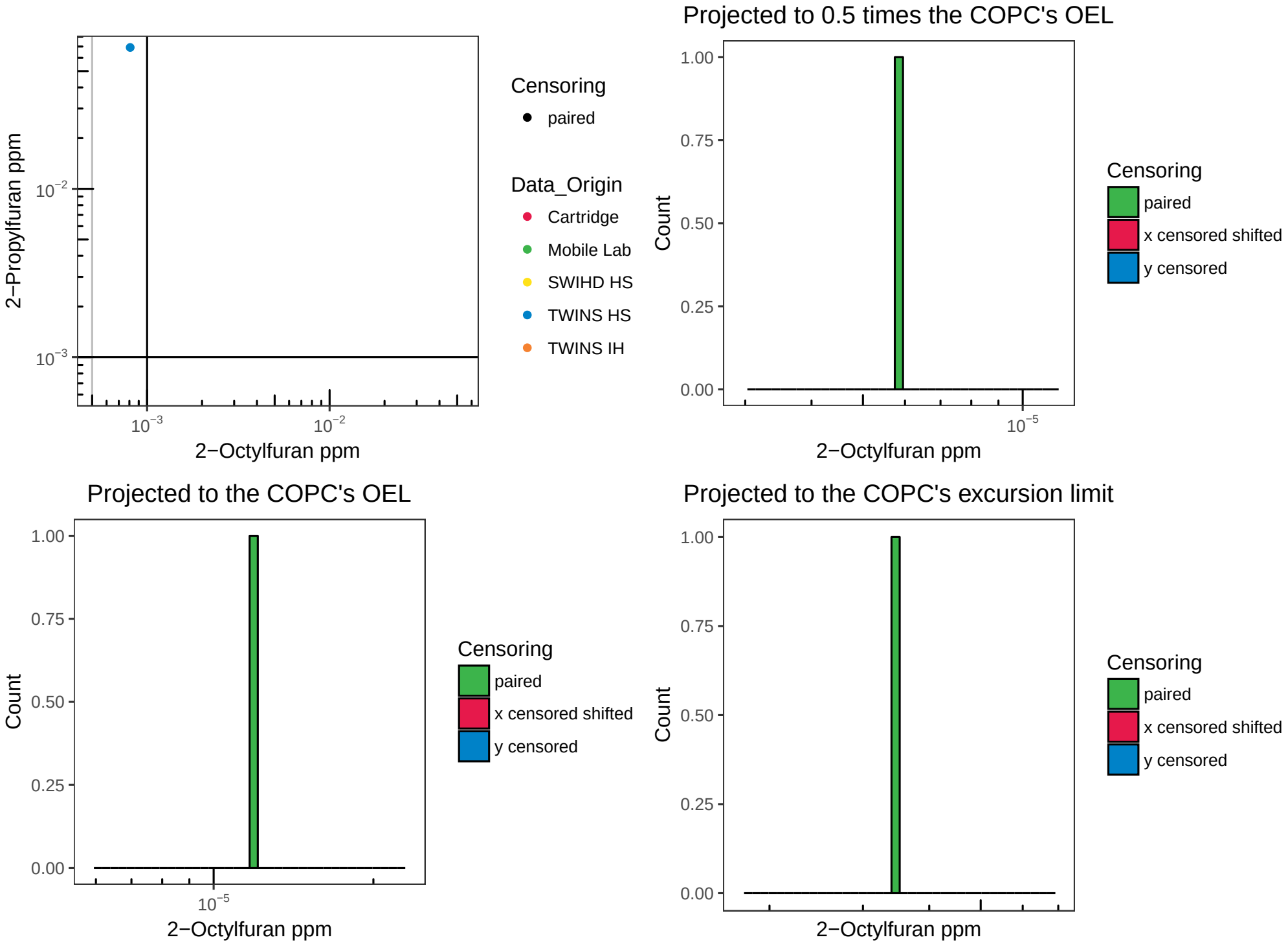


Figure C.1448: 2-Propylfuran vs 2-Octylfuran

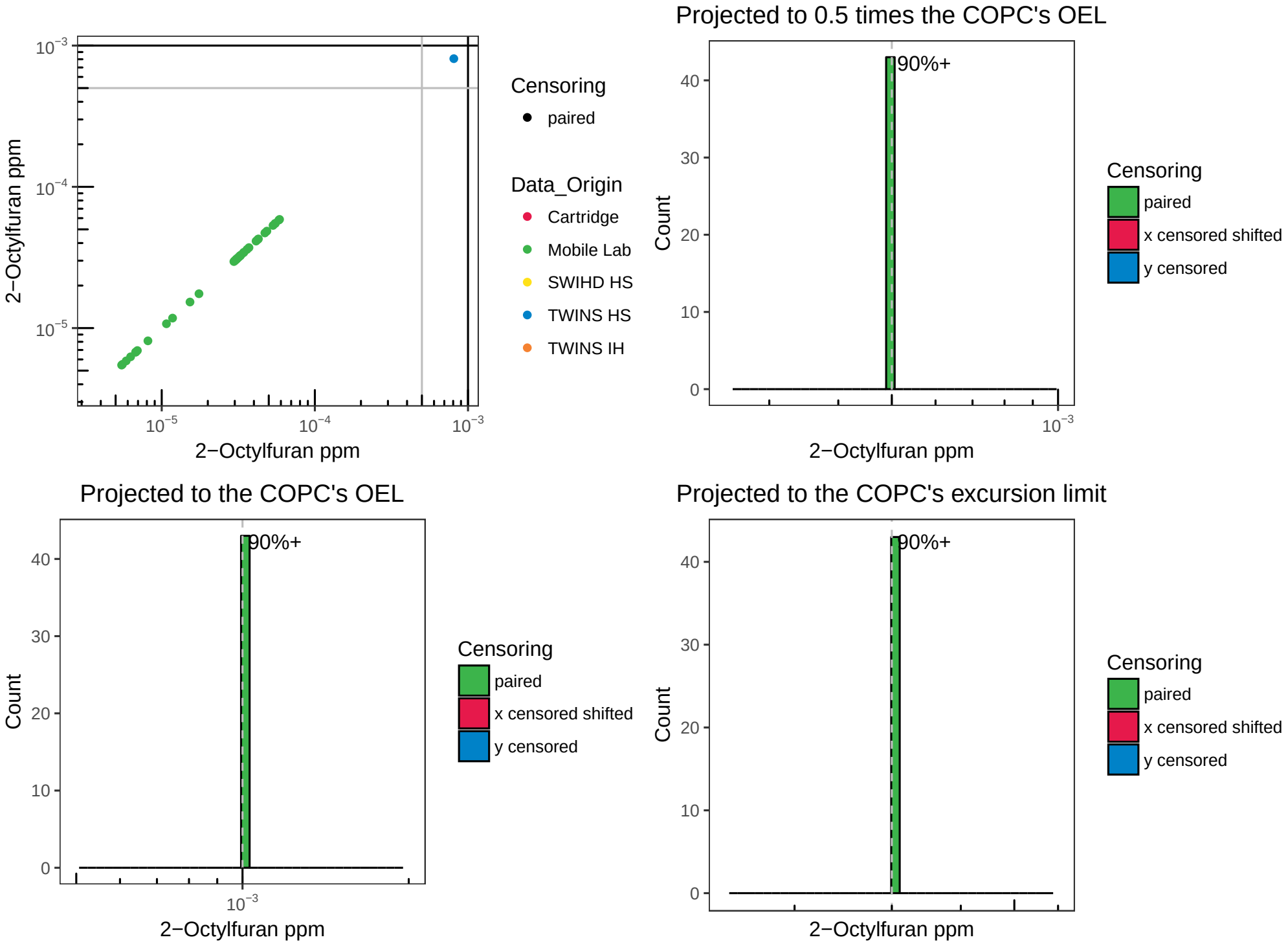


Figure C.1449: 2-Octylfuran vs 2-Octylfuran

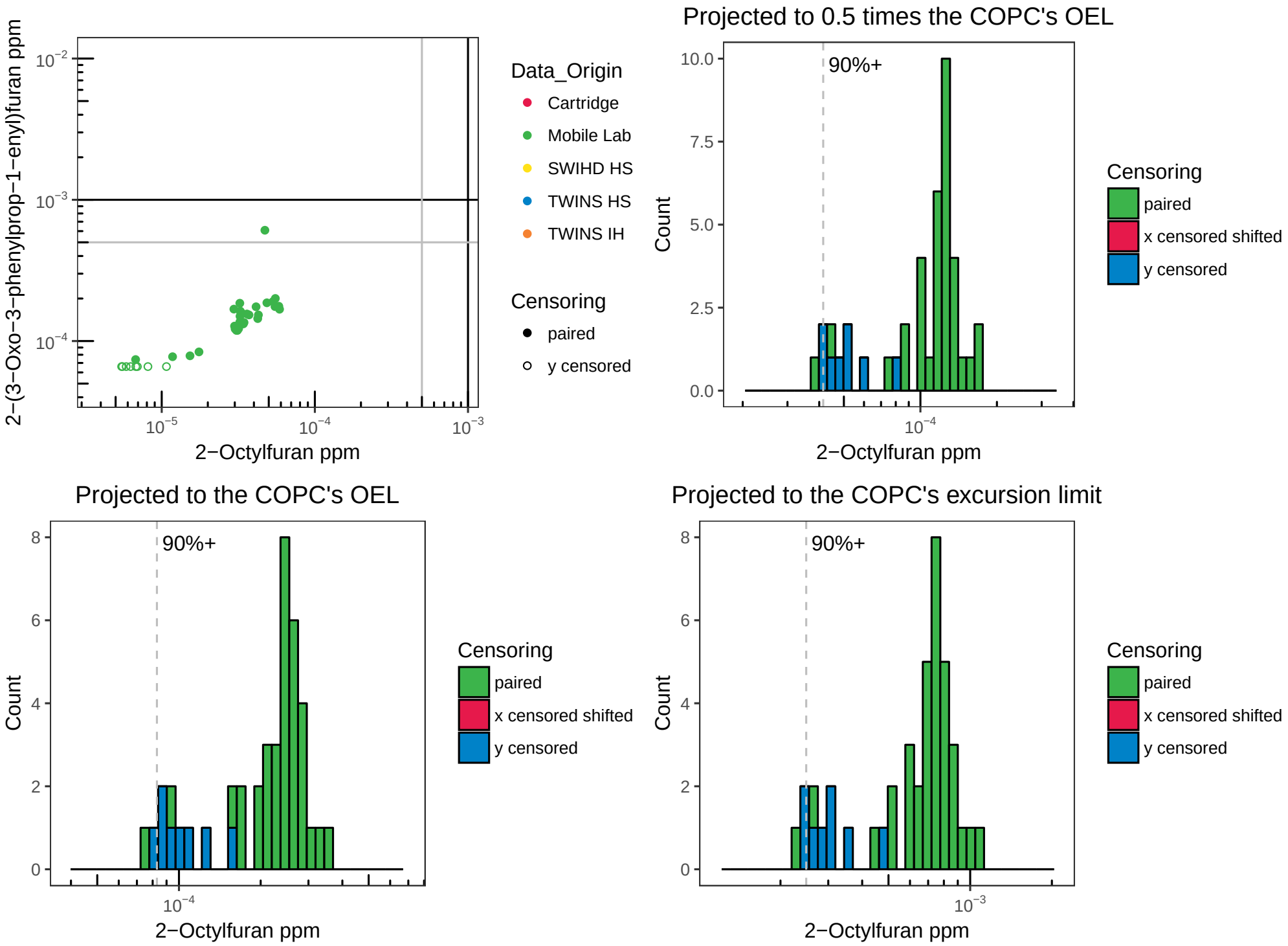


Figure C.1450: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2-Octylfuran

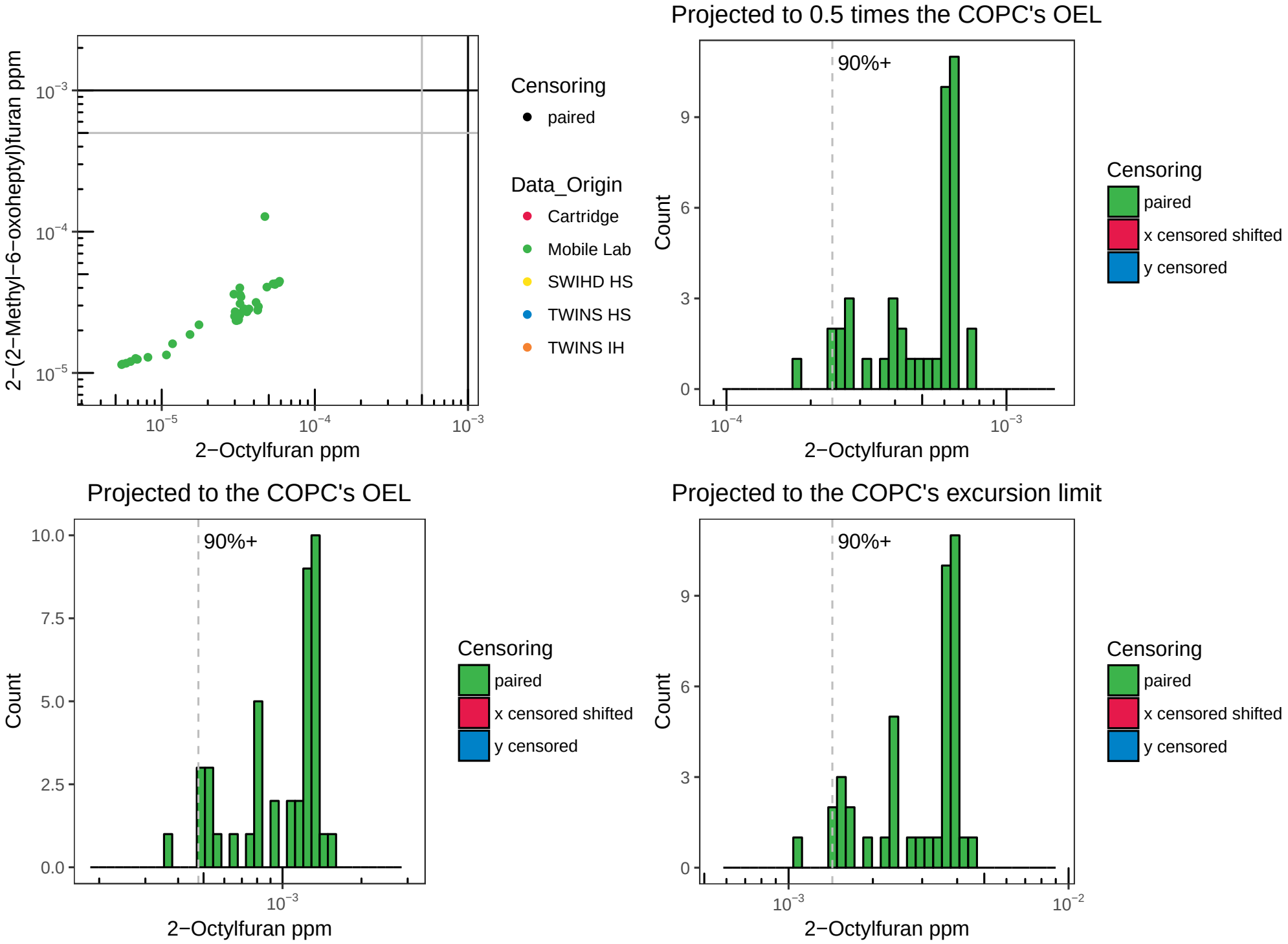


Figure C.1451: 2-(2-Methyl-6-oxoheptyl)furan vs 2-Octylfuran

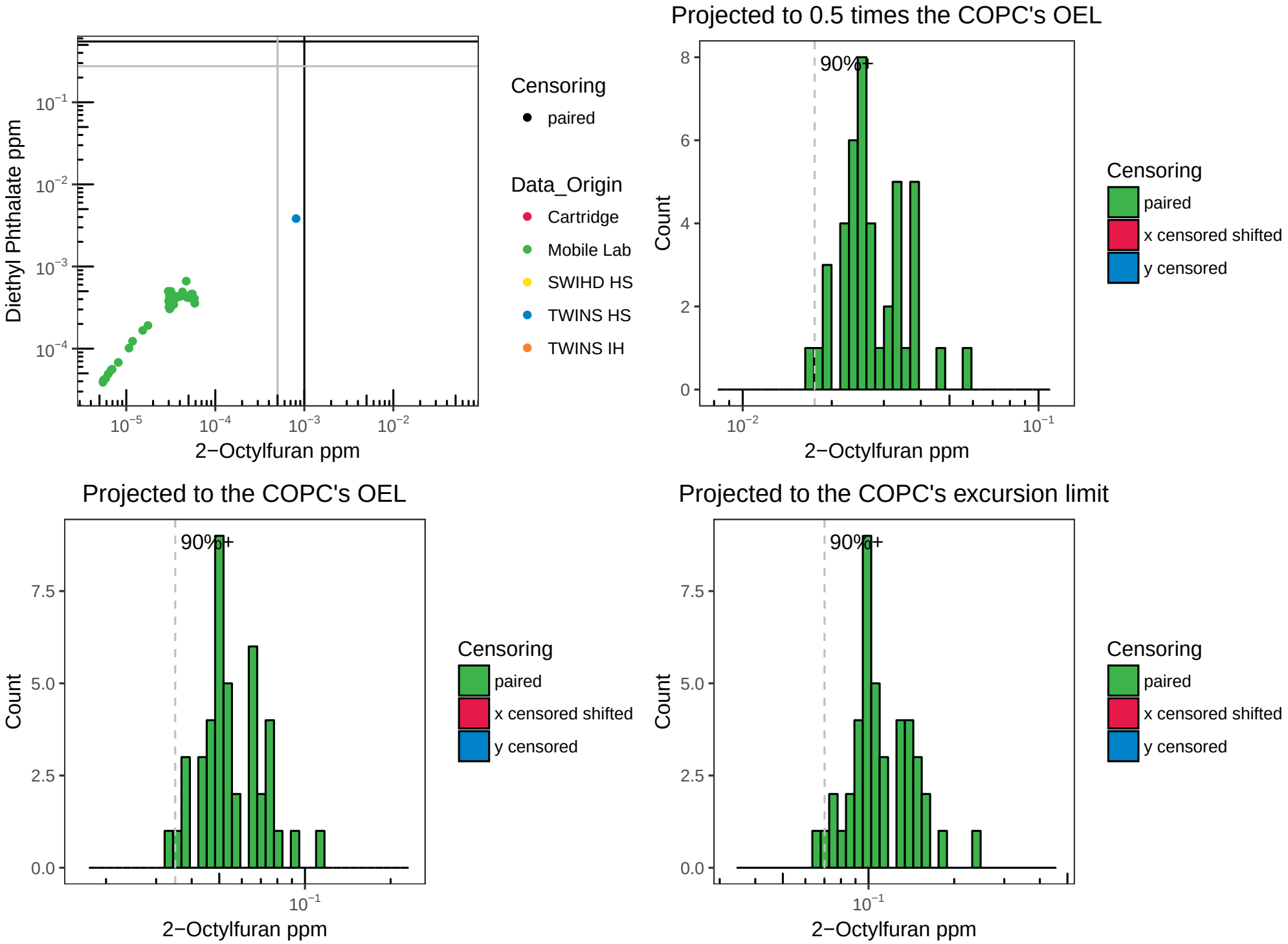


Figure C.1452: Diethyl Phthalate vs 2-Octylfuran

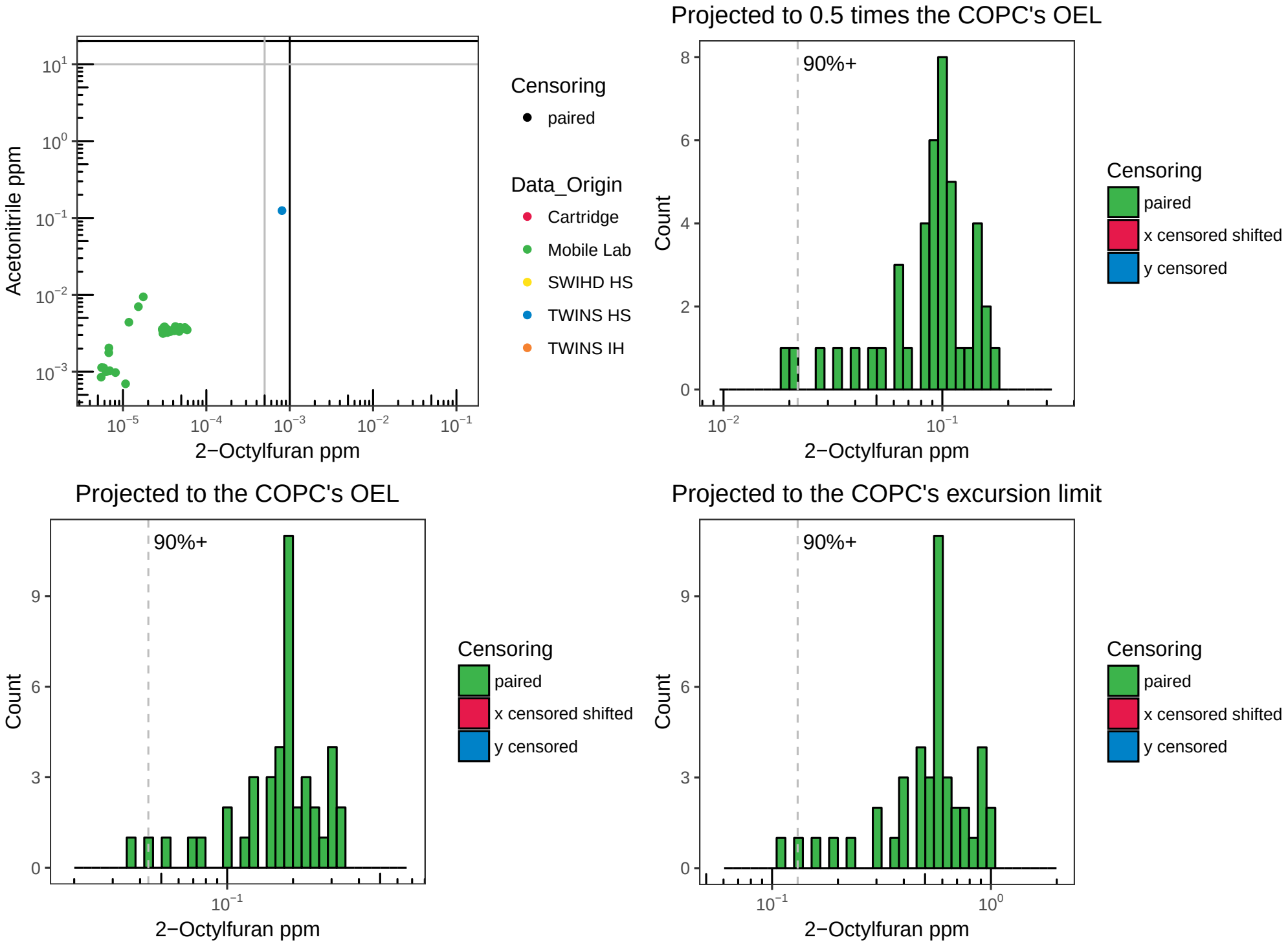


Figure C.1453: Acetonitrile vs 2-Octylfuran

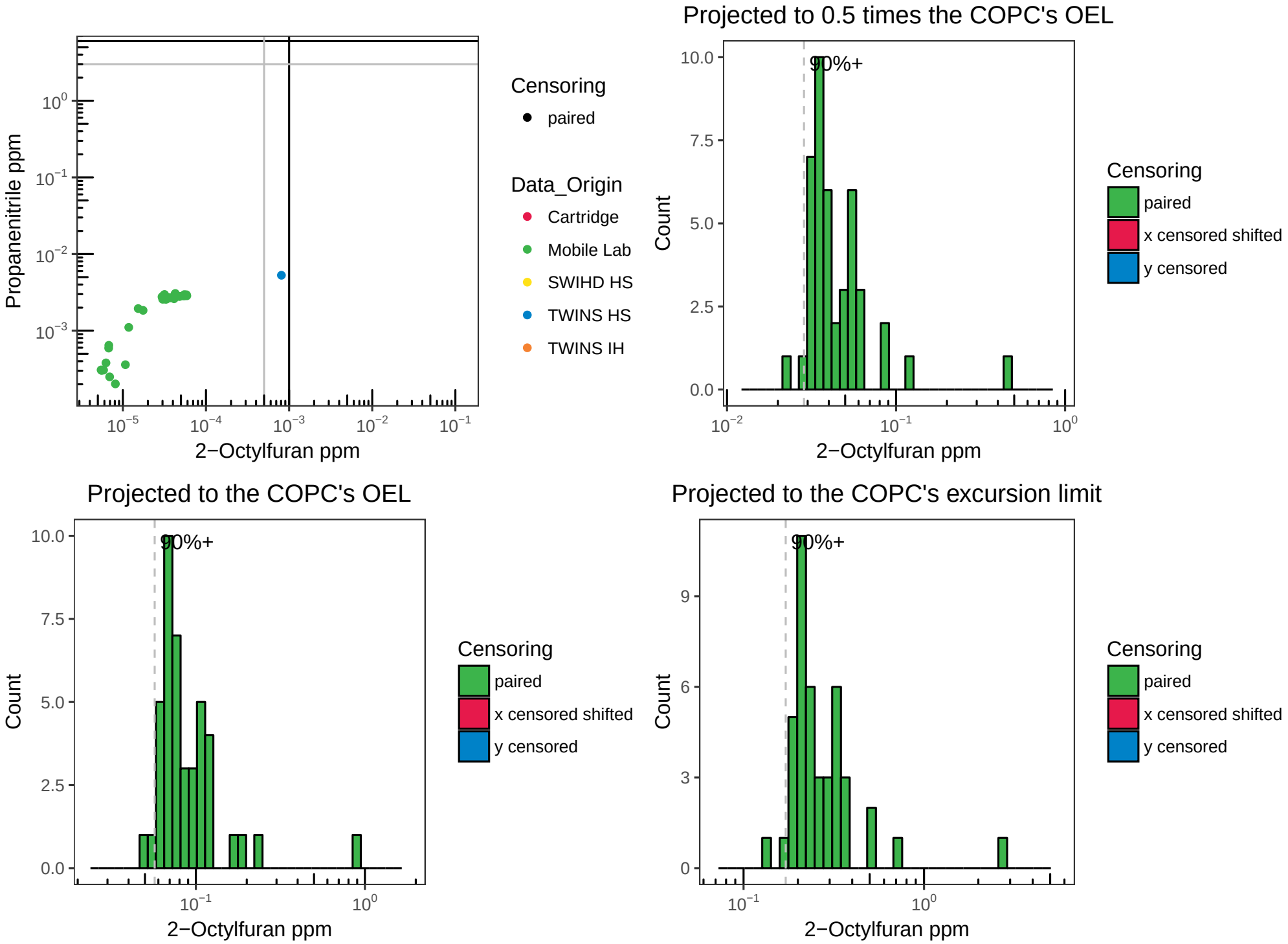


Figure C.1454: Propanenitrile vs 2-Octylfuran

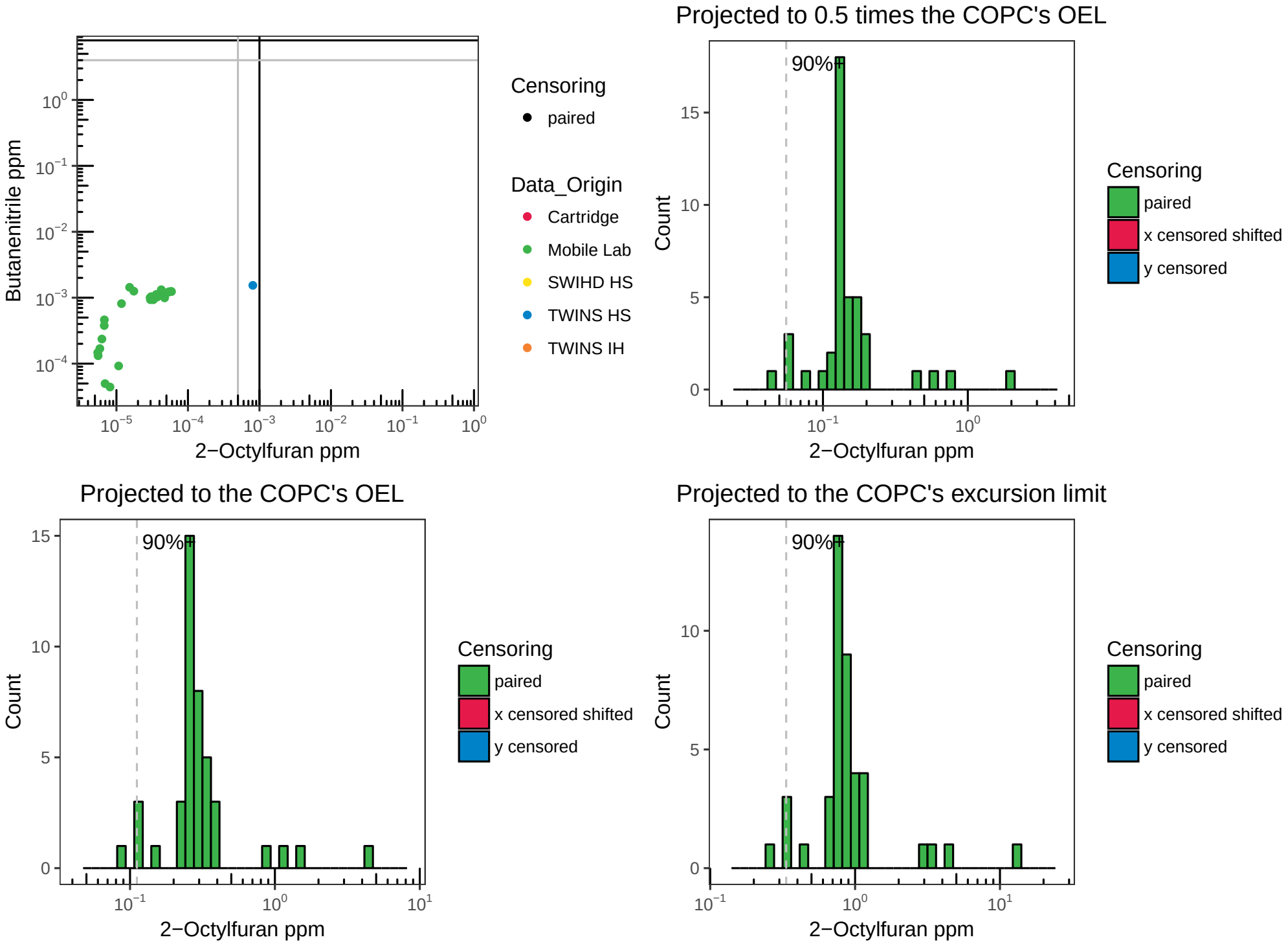


Figure C.1455: Butanenitrile vs 2-Octylfuran

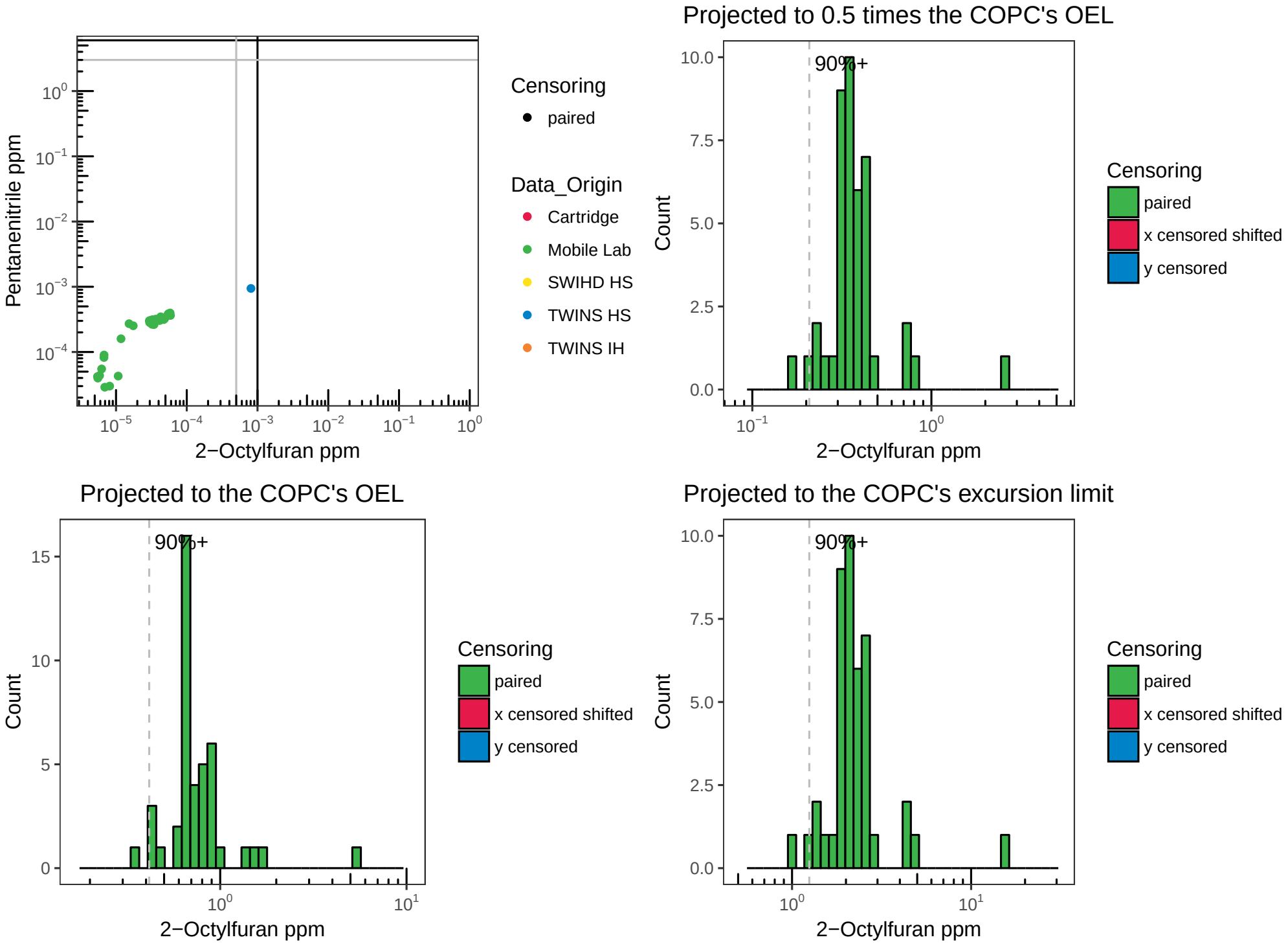


Figure C.1456: Pentanenitrile vs 2-Octylfuran

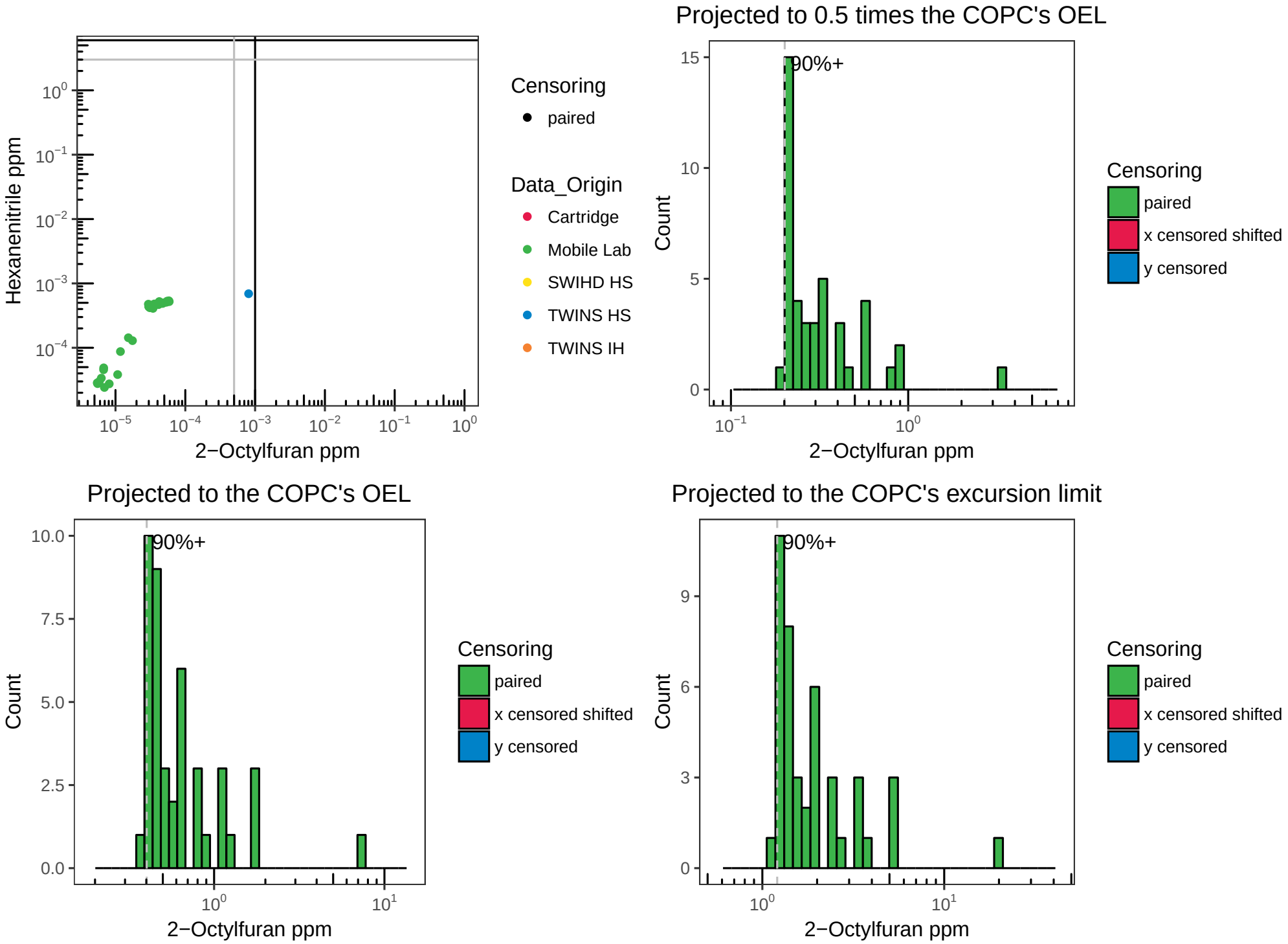


Figure C.1457: Hexanenitrile vs 2-Octylfuran

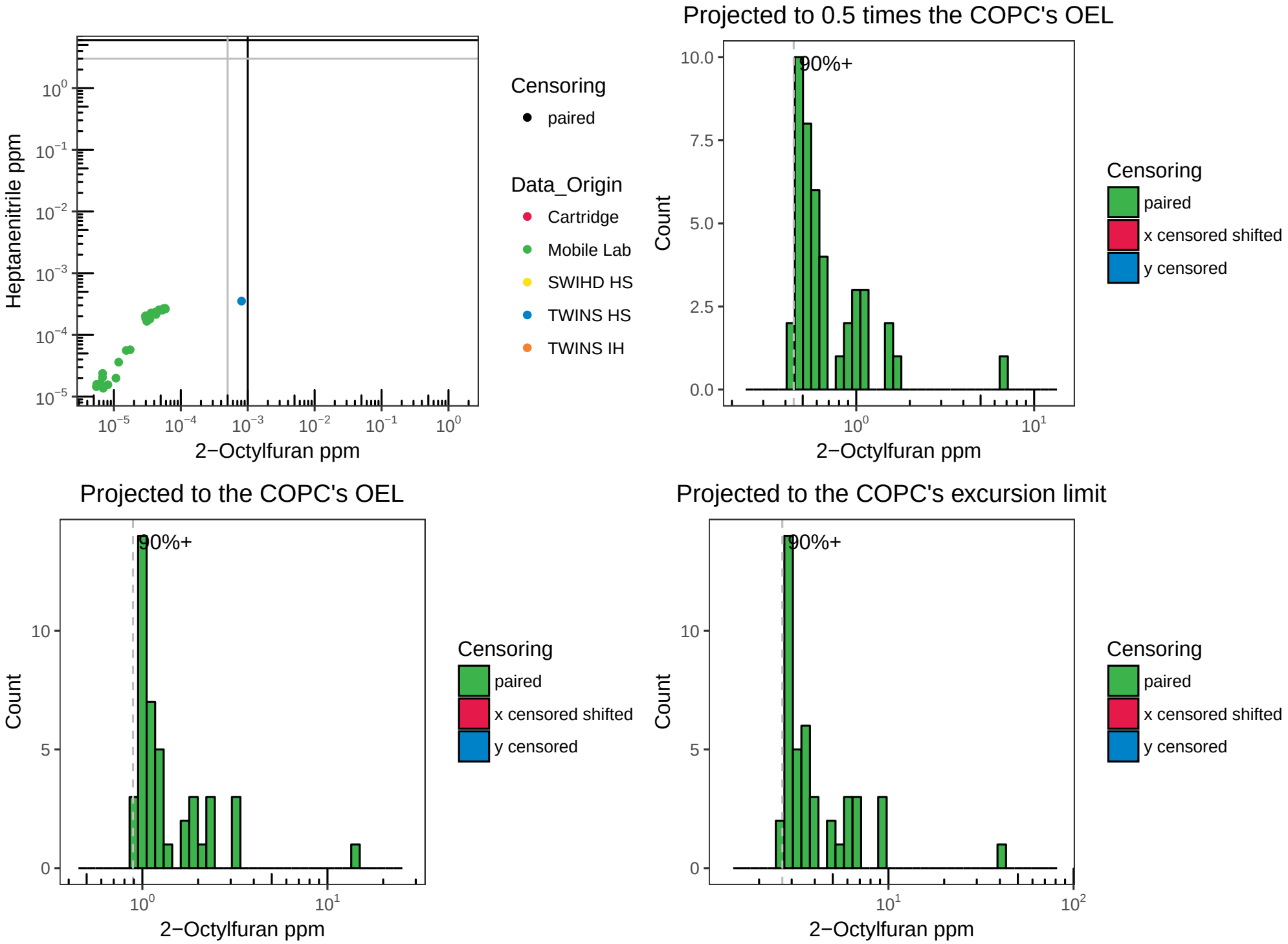


Figure C.1458: Heptanenitrile vs 2-Octylfuran

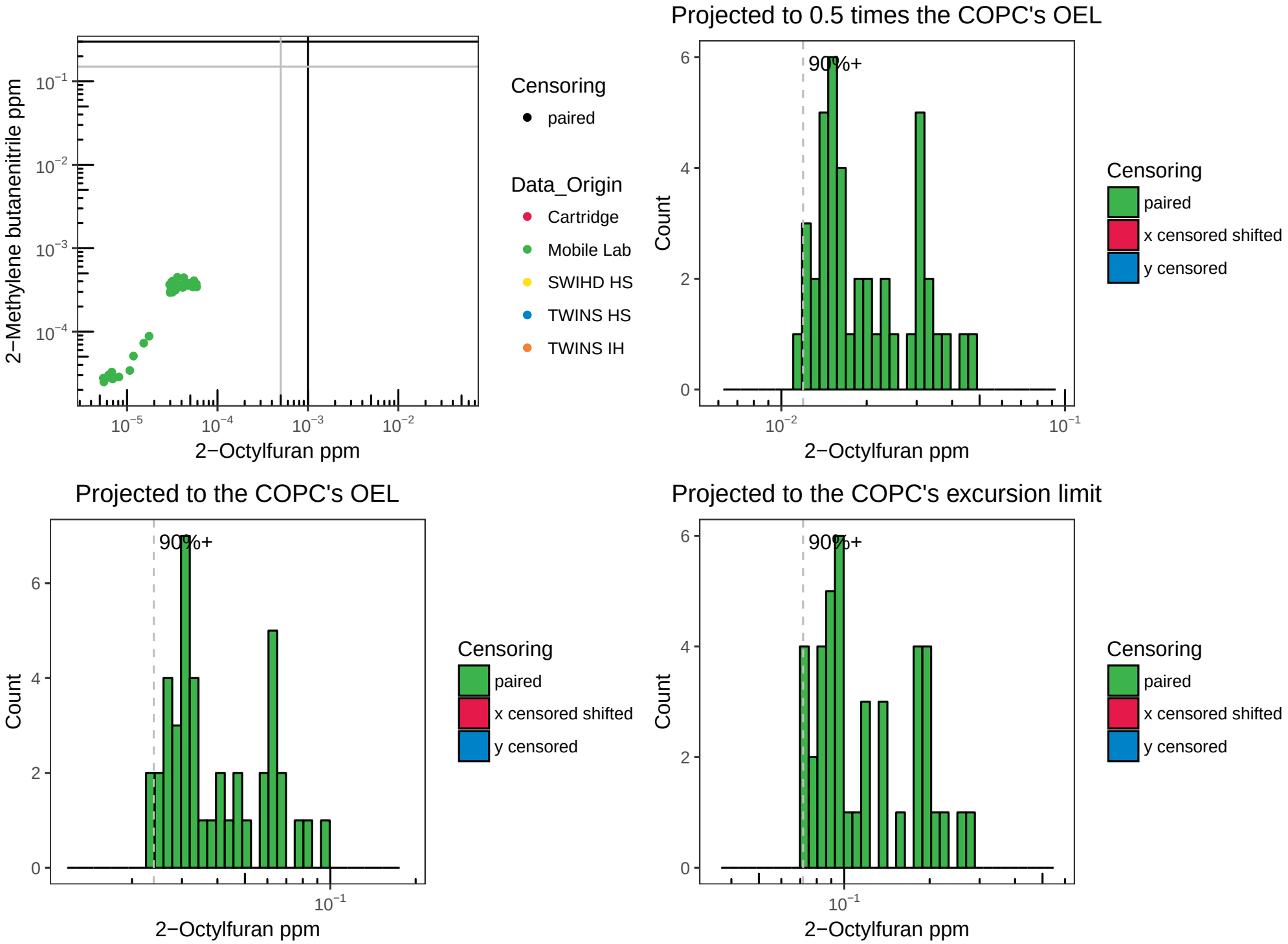


Figure C.1459: 2-Methylene butanenitrile vs 2-Octylfuran

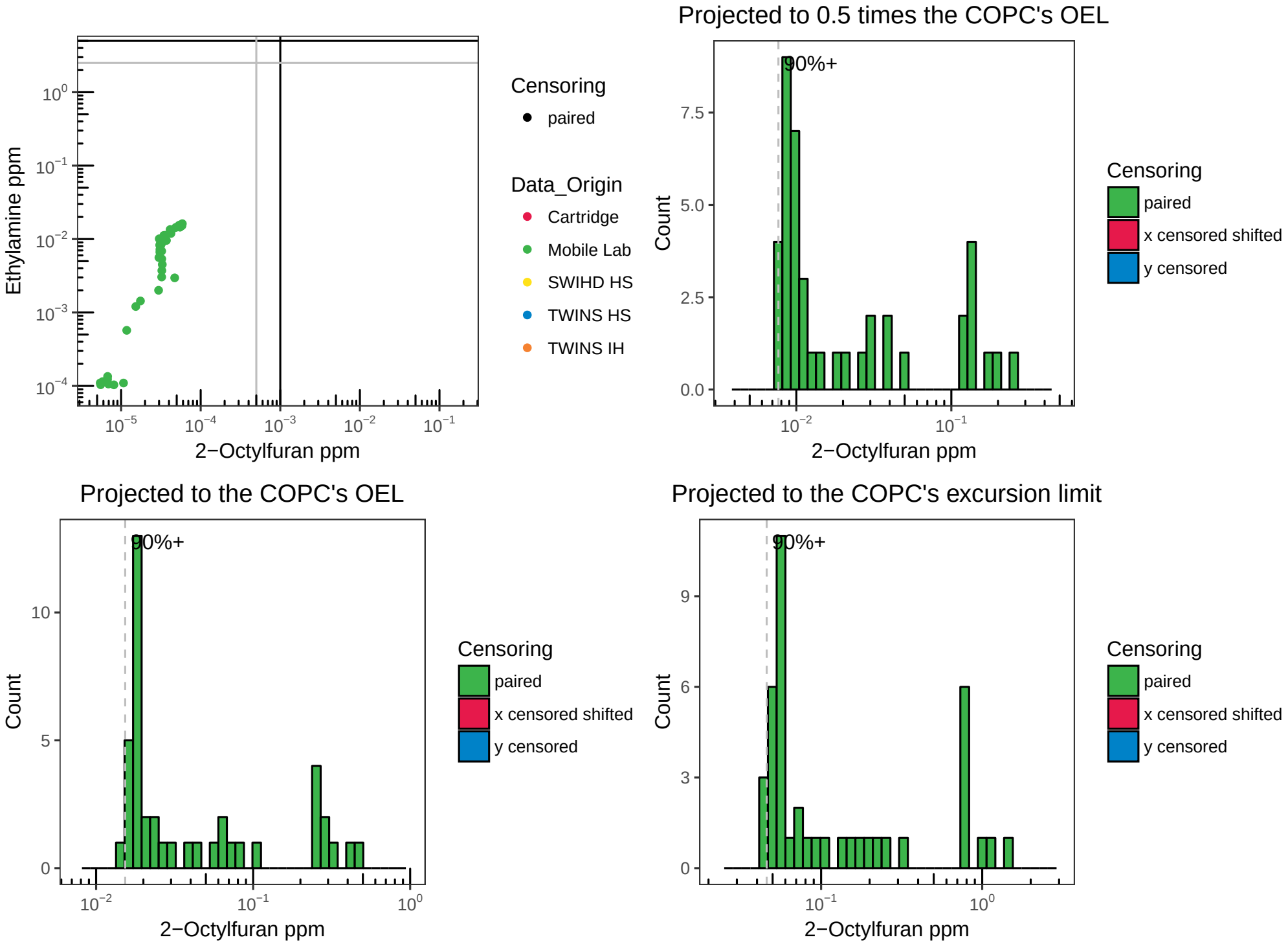


Figure C.1460: Ethylamine vs 2-Octylfuran

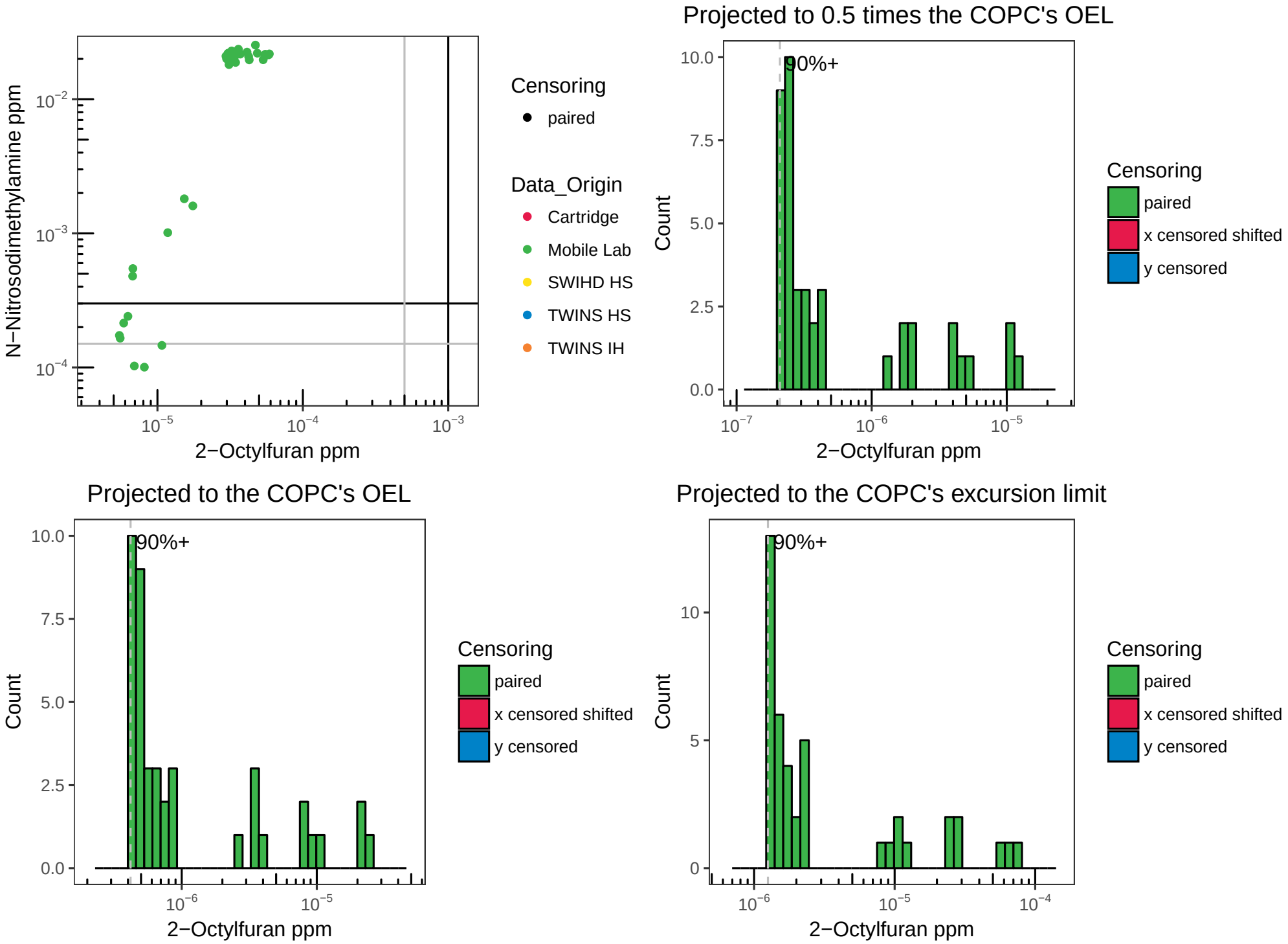


Figure C.1461: N-Nitrosodimethylamine vs 2-Octylfuran

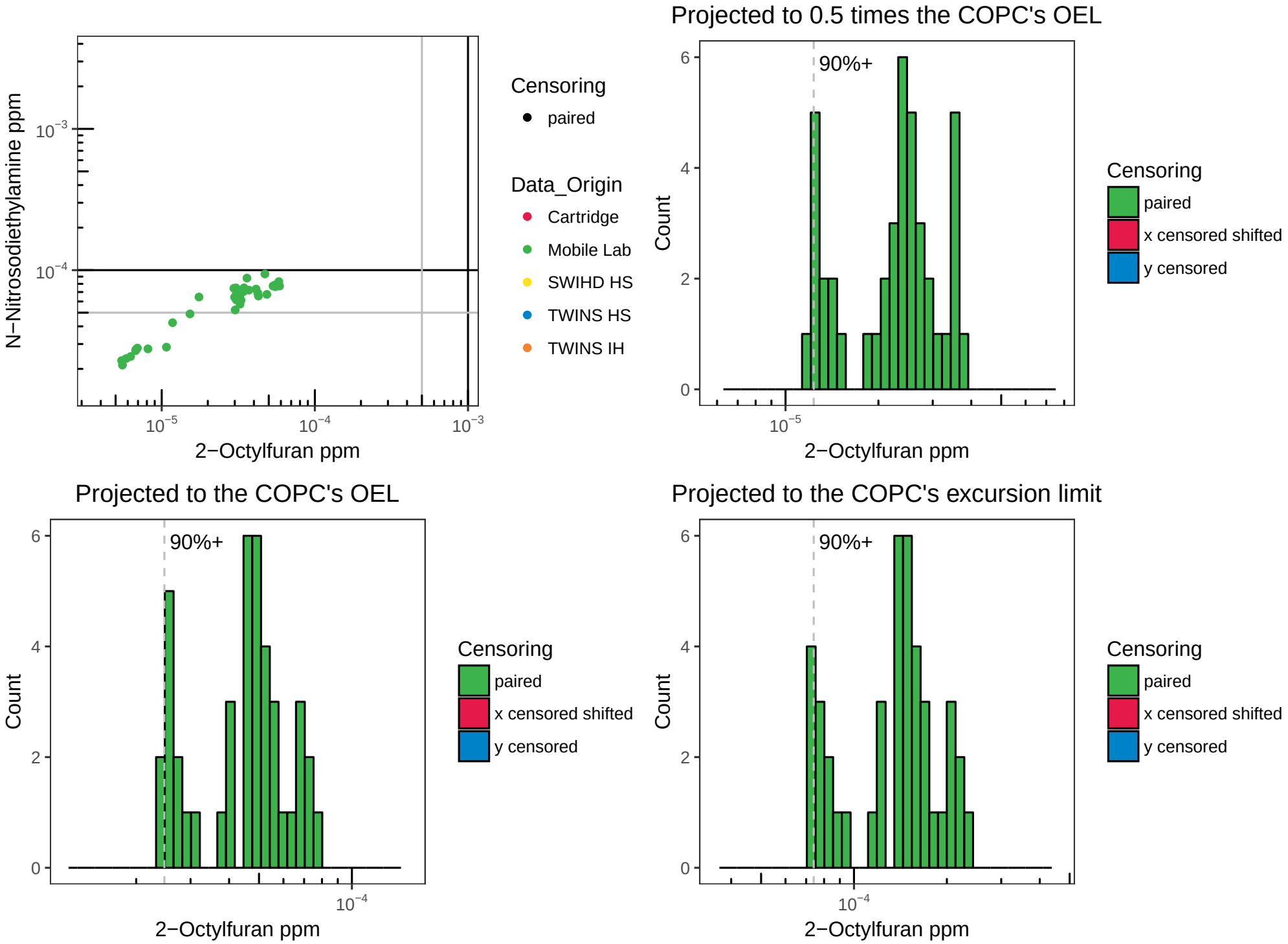


Figure C.1462: N-Nitrosodiethylamine vs 2-Octylfuran

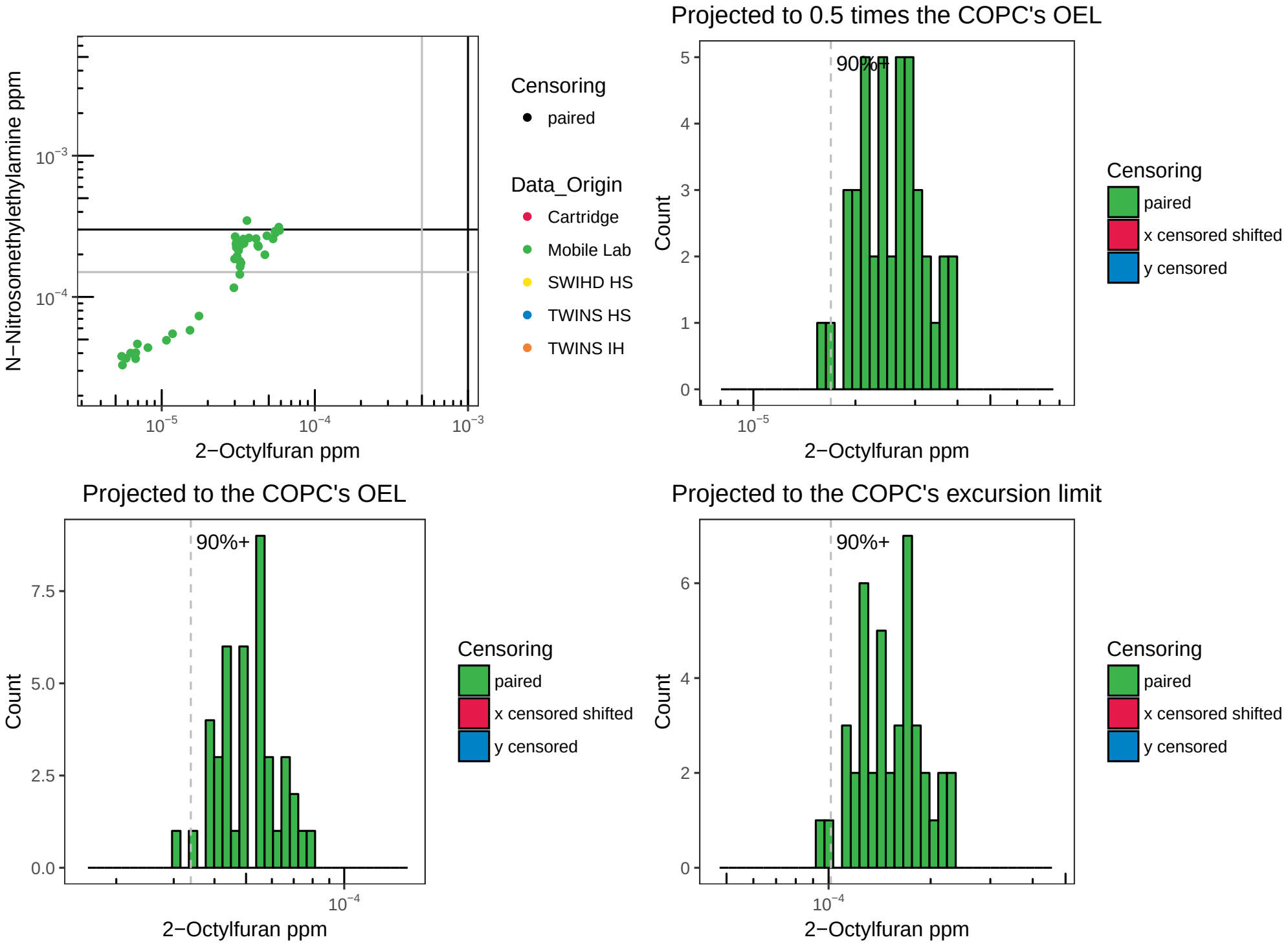


Figure C.1463: N-Nitrosomethylethylamine vs 2-Octylfuran

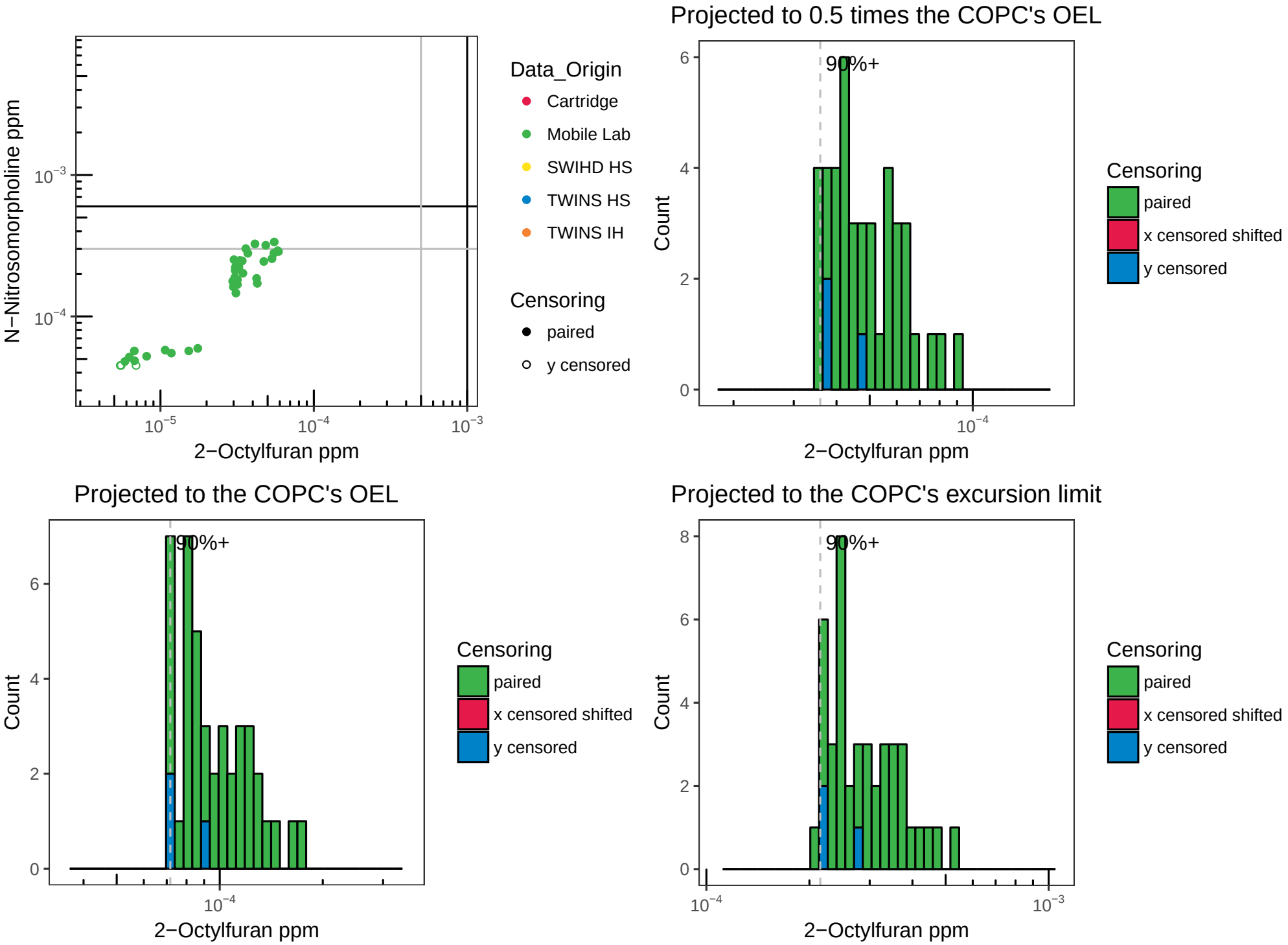


Figure C.1464: N-Nitrosomorpholine vs 2-Octylfuran

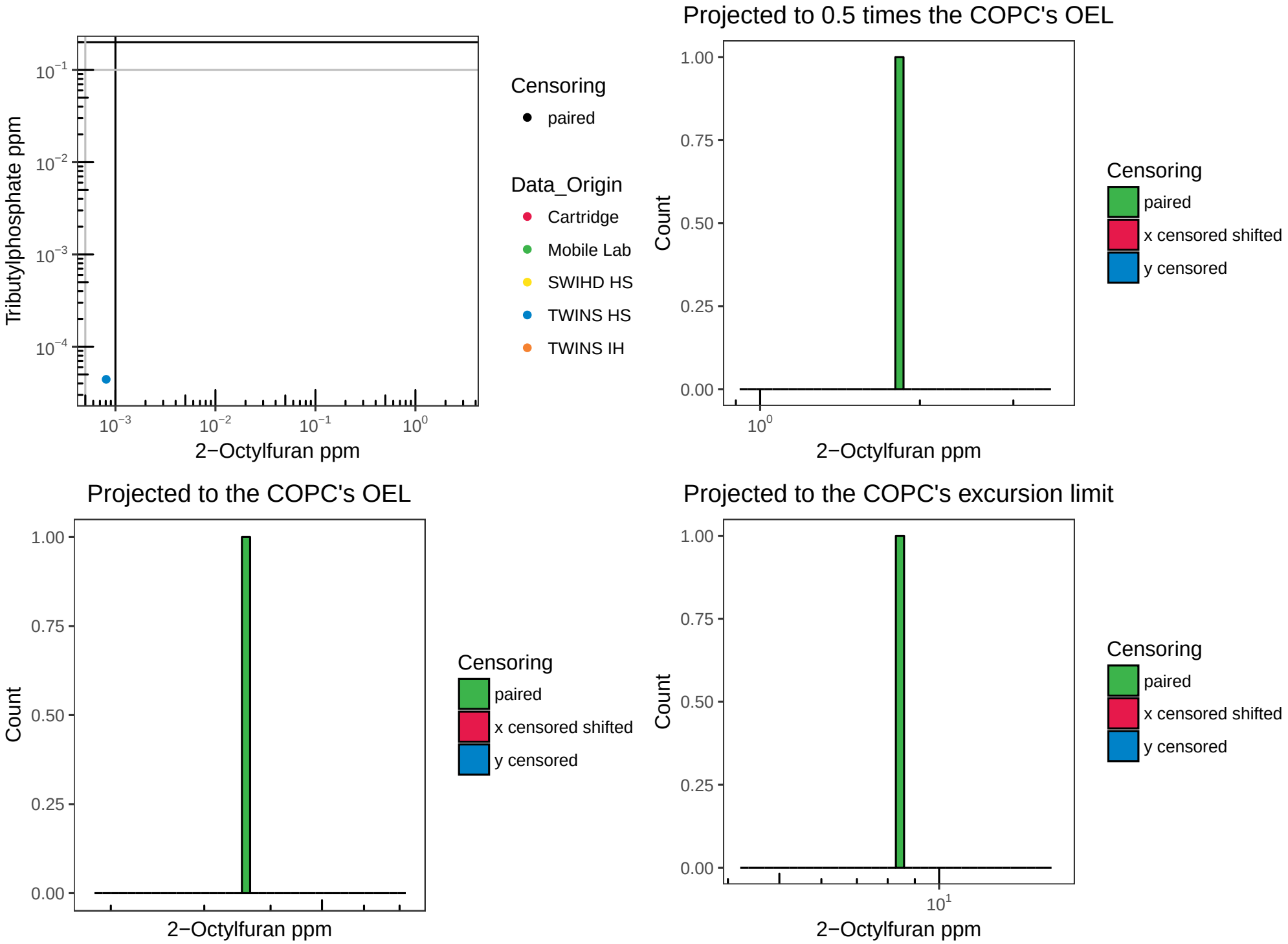


Figure C.1465: Tributylphosphate vs 2-Octylfuran

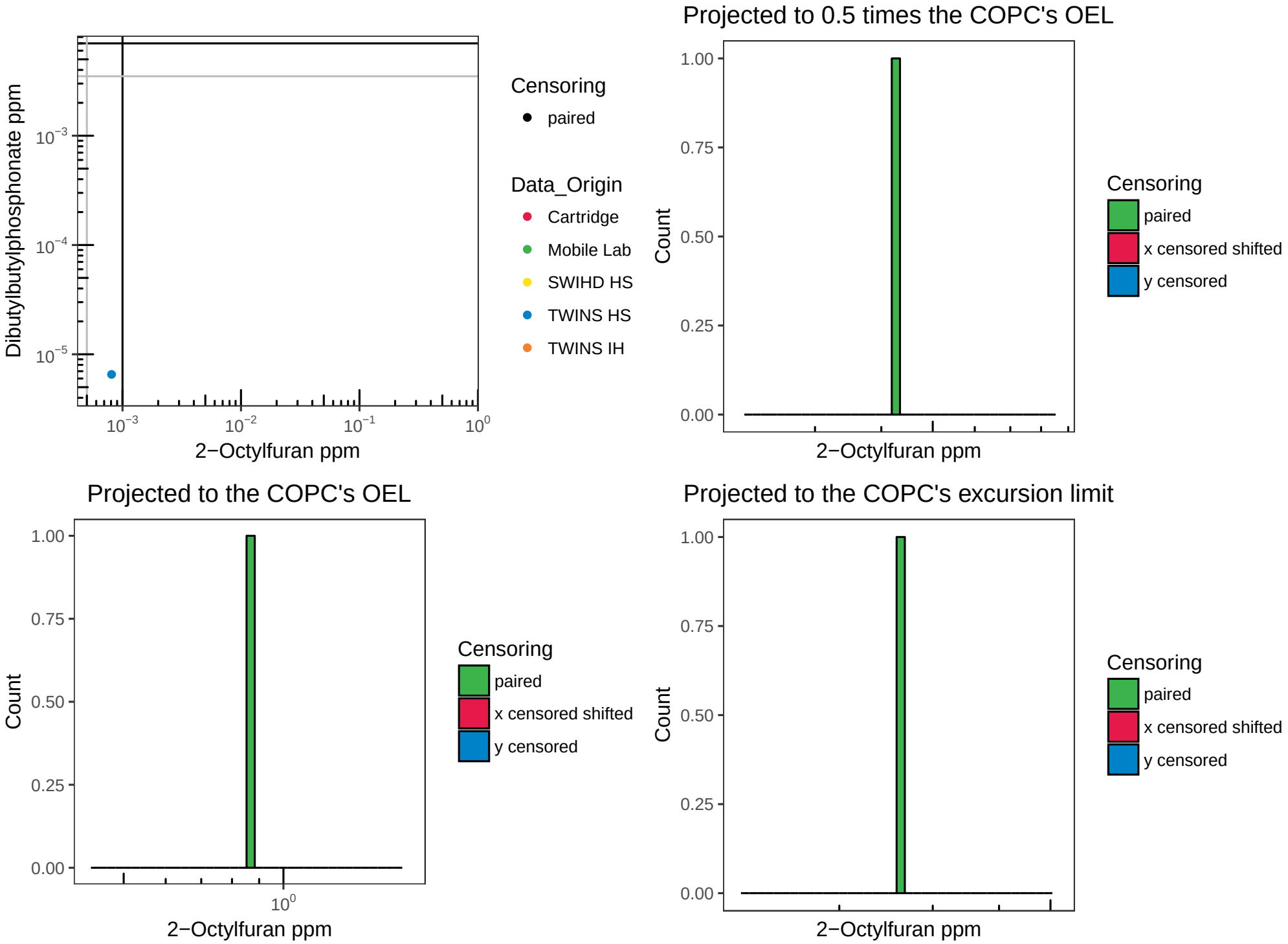


Figure C.1466: Dibutylbutylphosphonate vs 2-Octylfuran

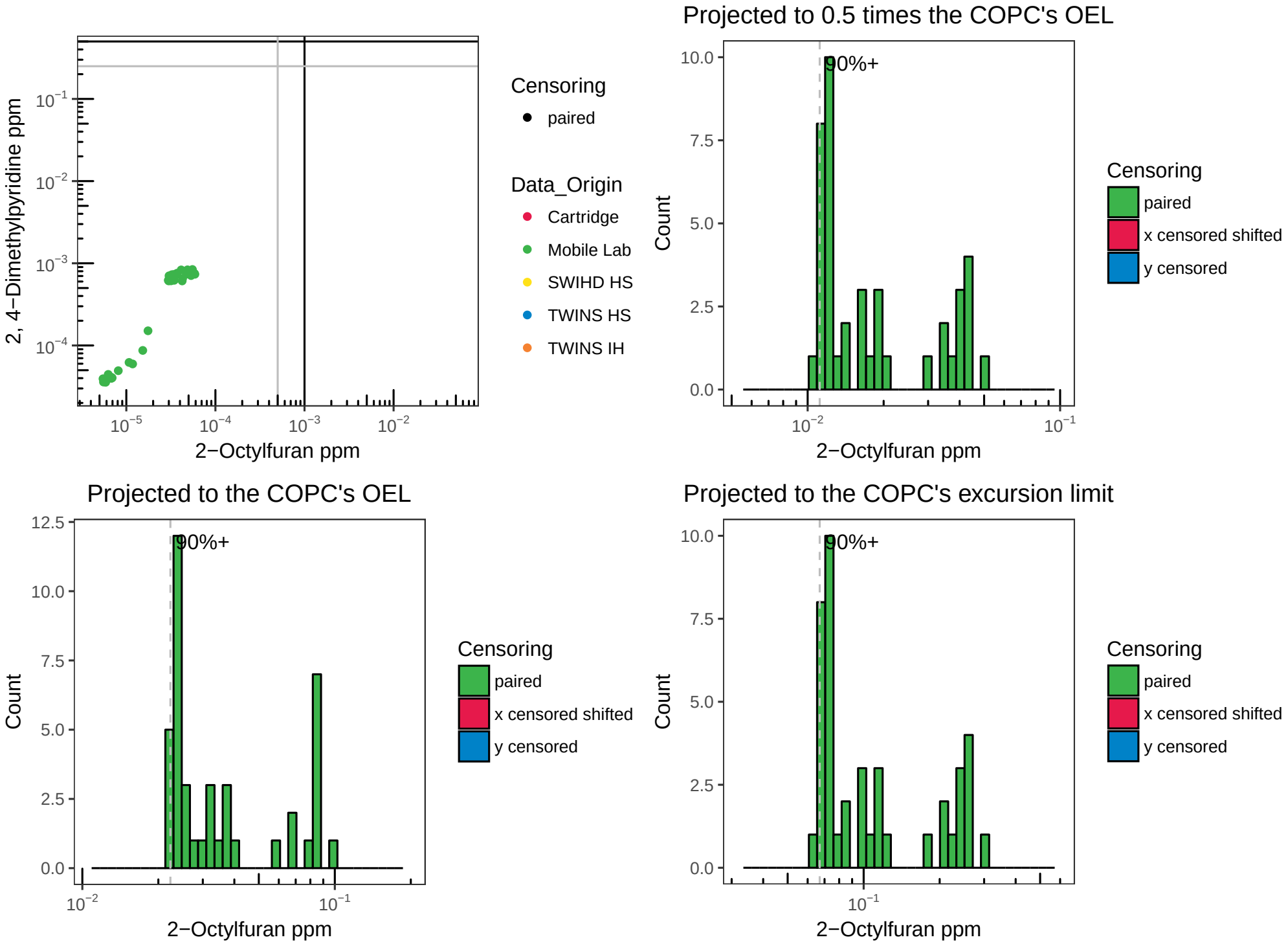


Figure C.1467: 2, 4-Dimethylpyridine vs 2-Octylfuran

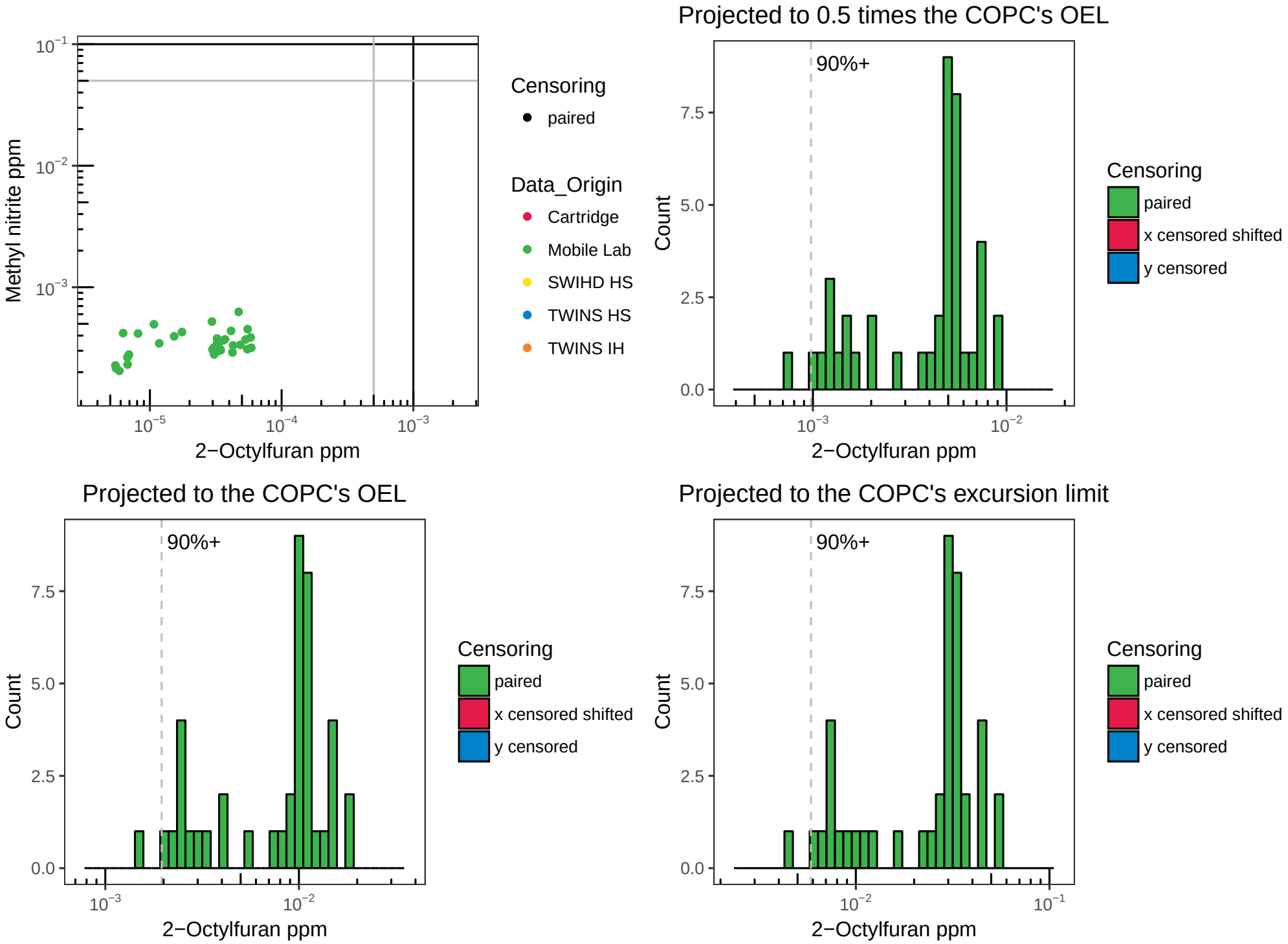


Figure C.1468: Methyl nitrite vs 2-Octylfuran

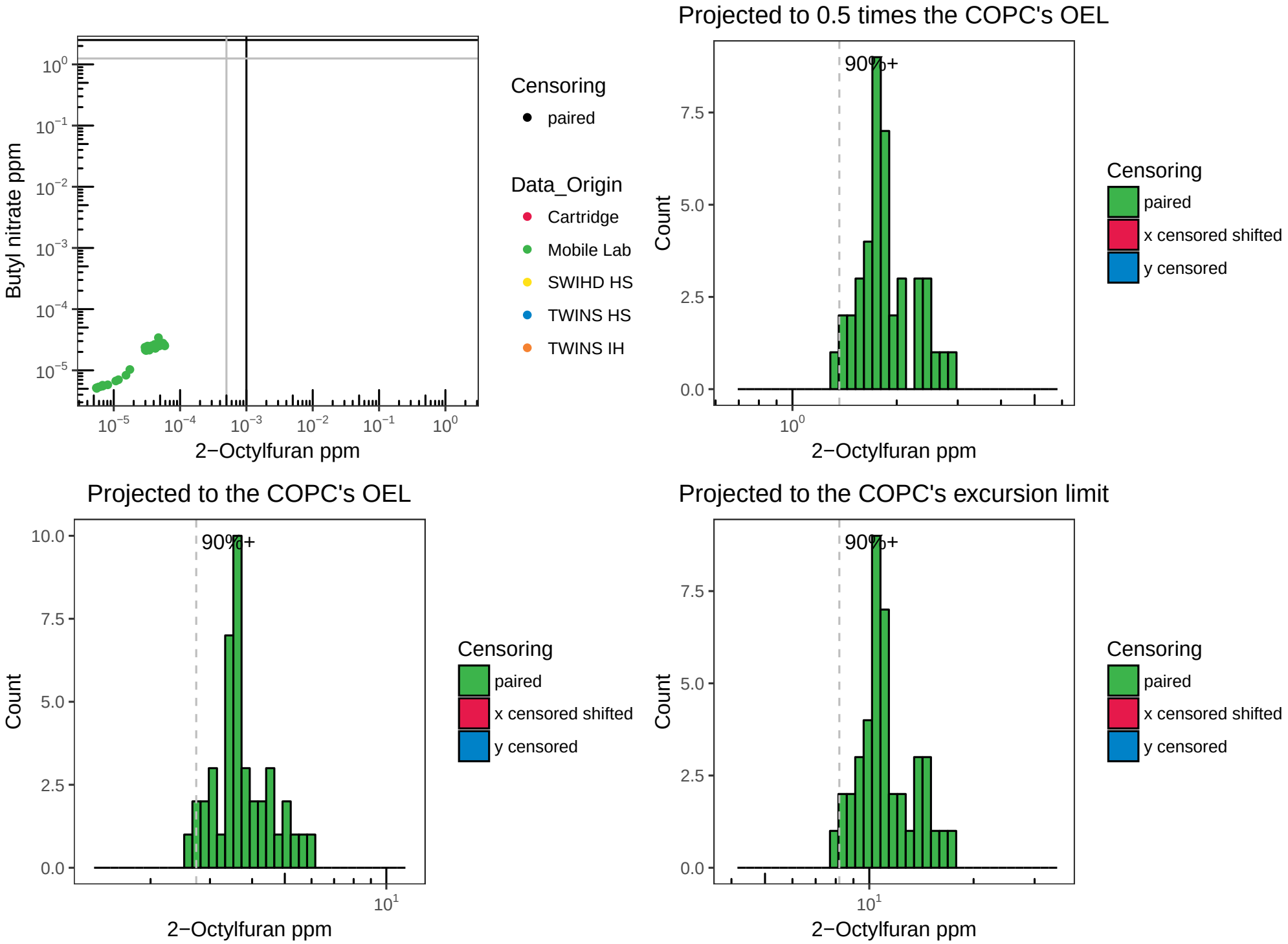


Figure C.1469: Butyl nitrate vs 2-Octylfuran

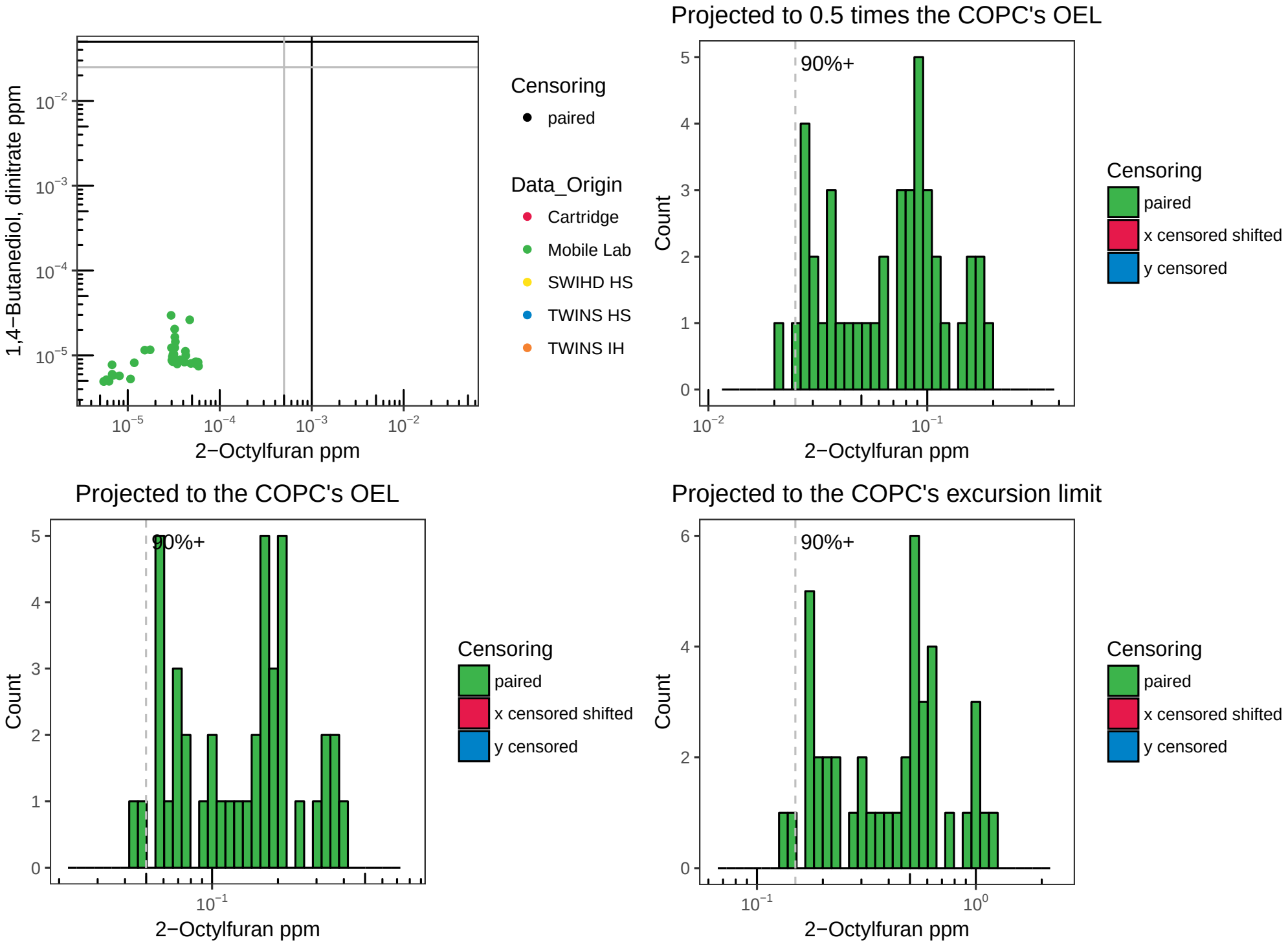


Figure C.1470: 1,4-Butanediol, dinitrate vs 2-Octylfuran

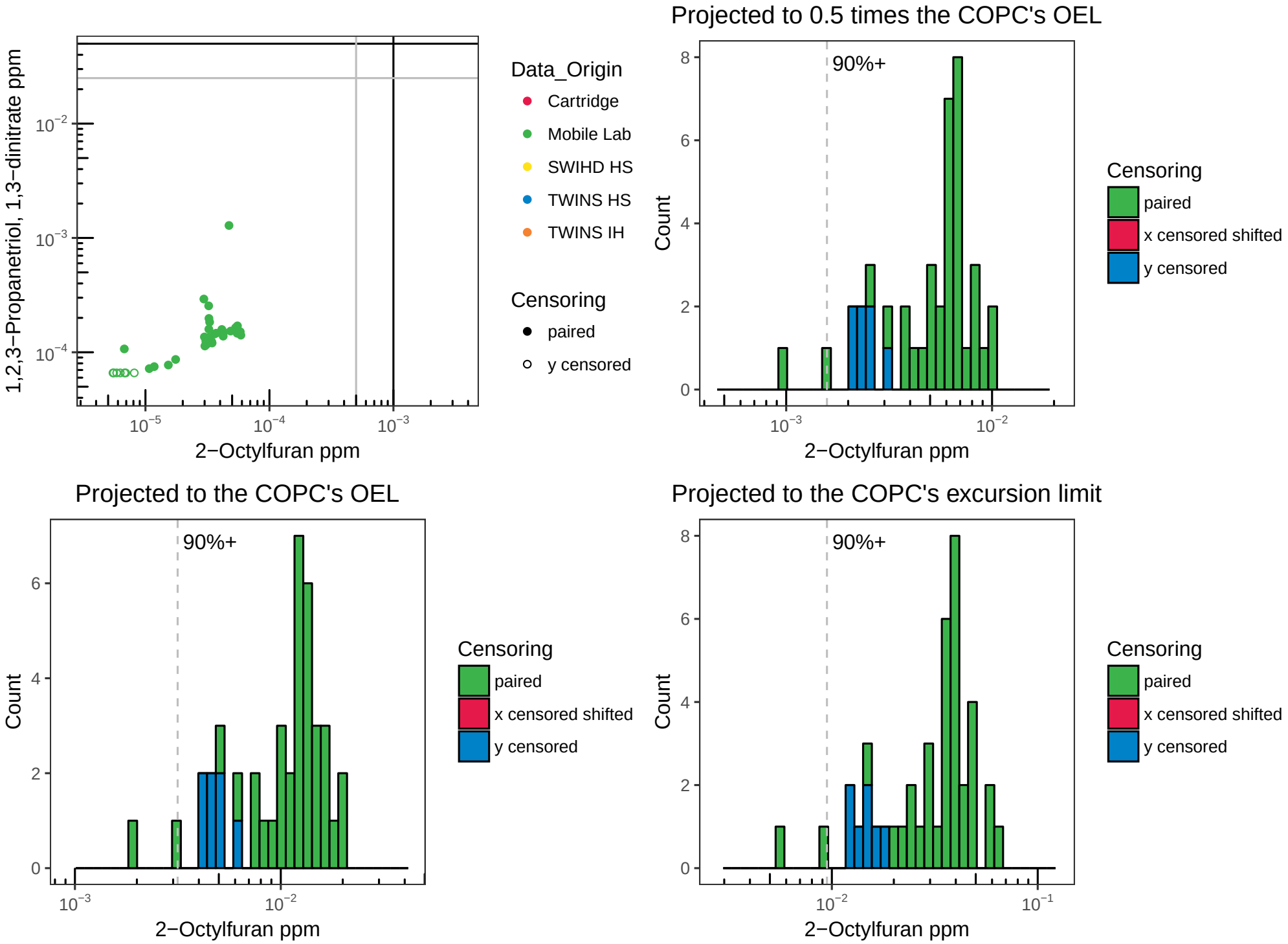


Figure C.1471: 1,2,3-Propanetriol, 1,3-dinitrate vs 2-Octylfuran

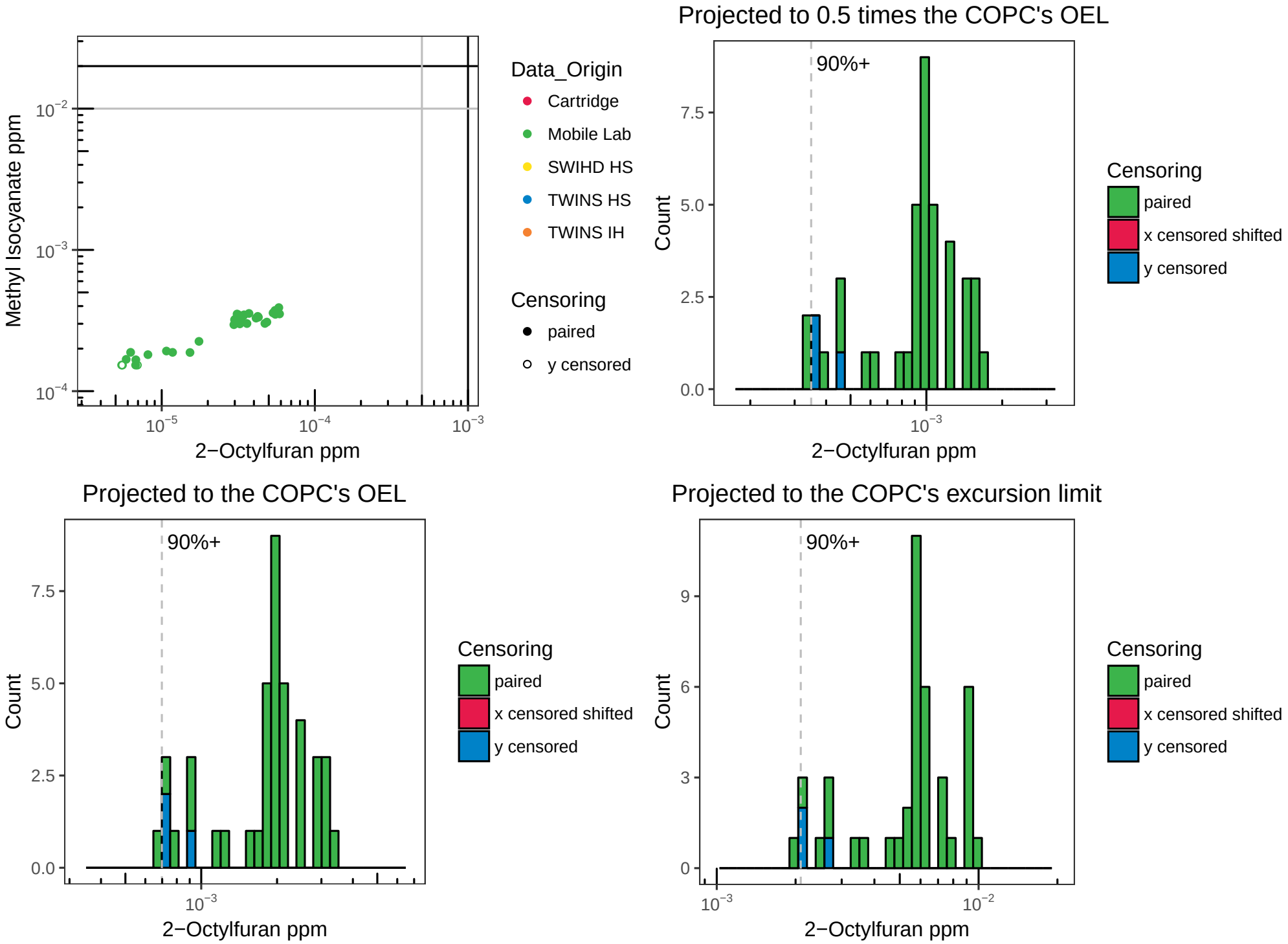


Figure C.1472: Methyl Isocyanate vs 2-Octylfuran

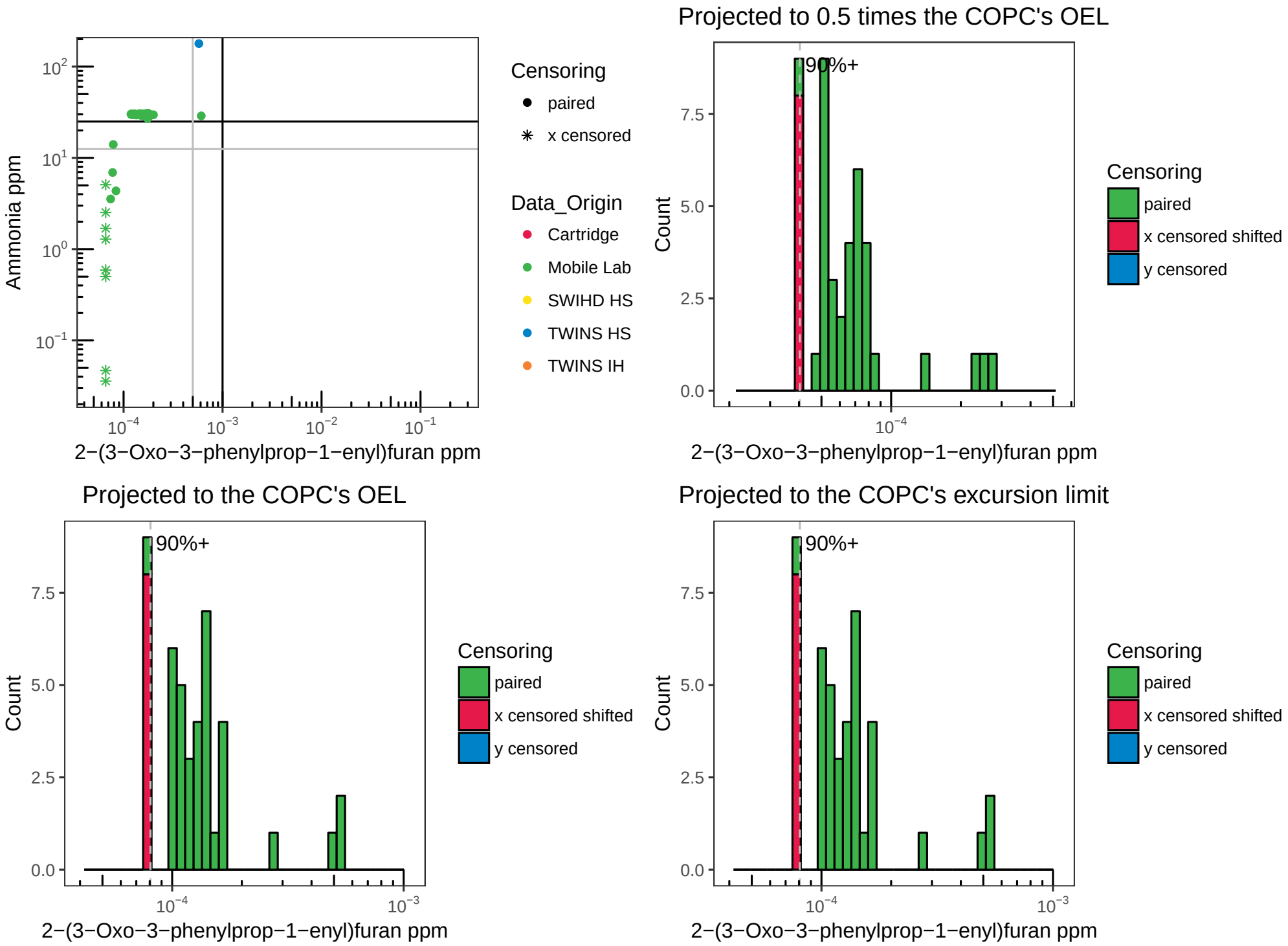


Figure C.1473: Ammonia vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

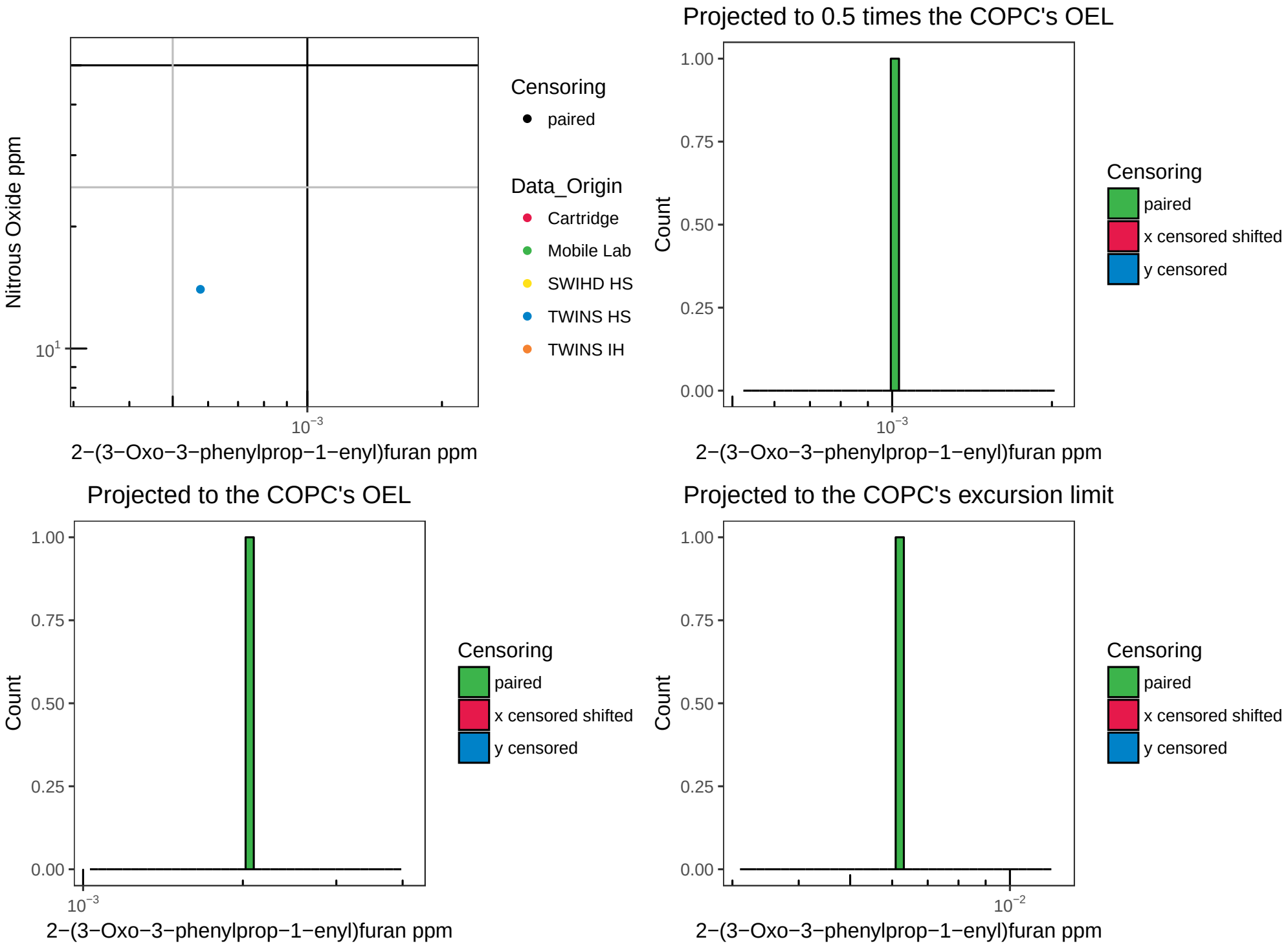


Figure C.1474: Nitrous Oxide vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

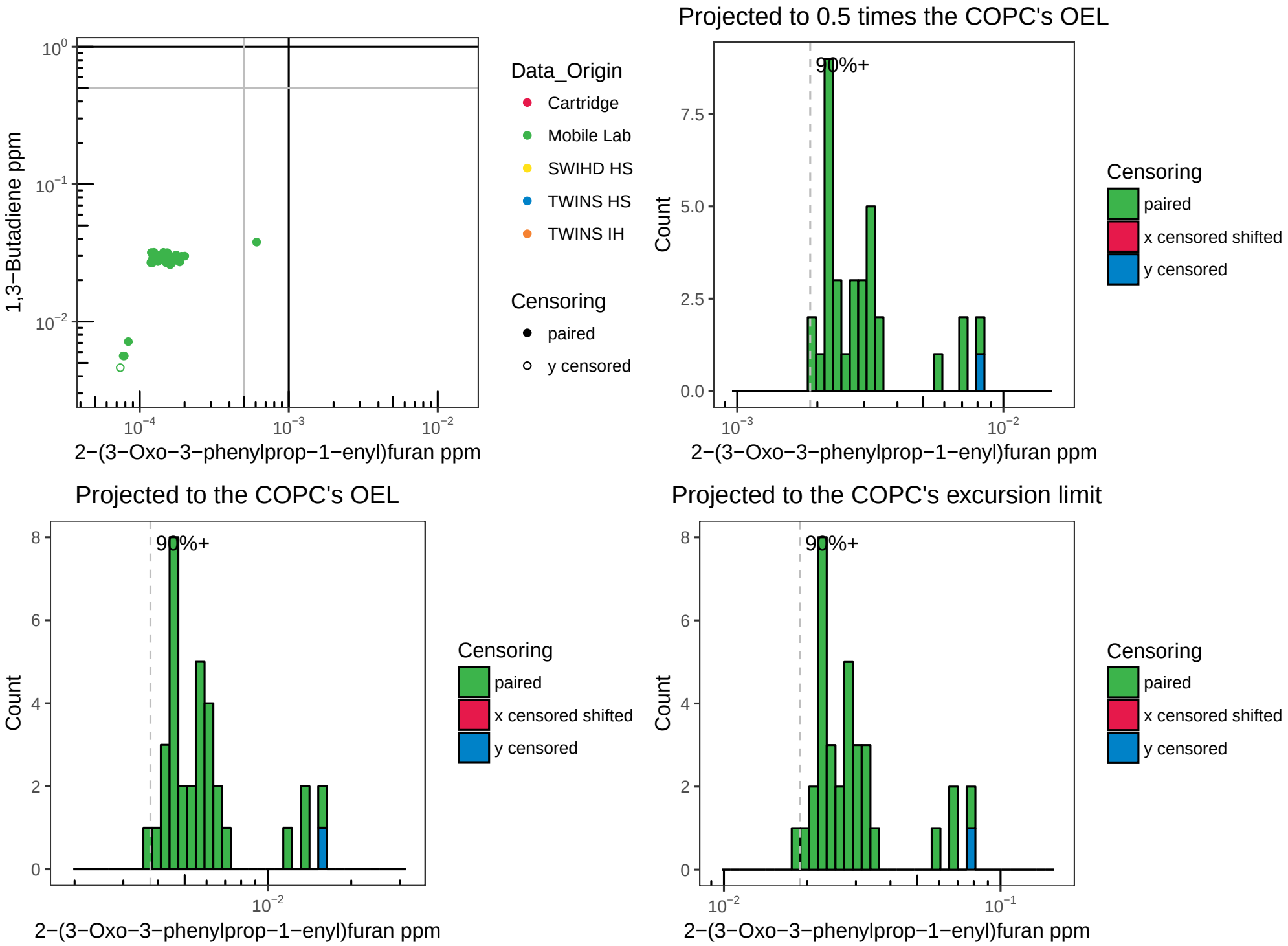


Figure C.1475: 1,3-Butadiene vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

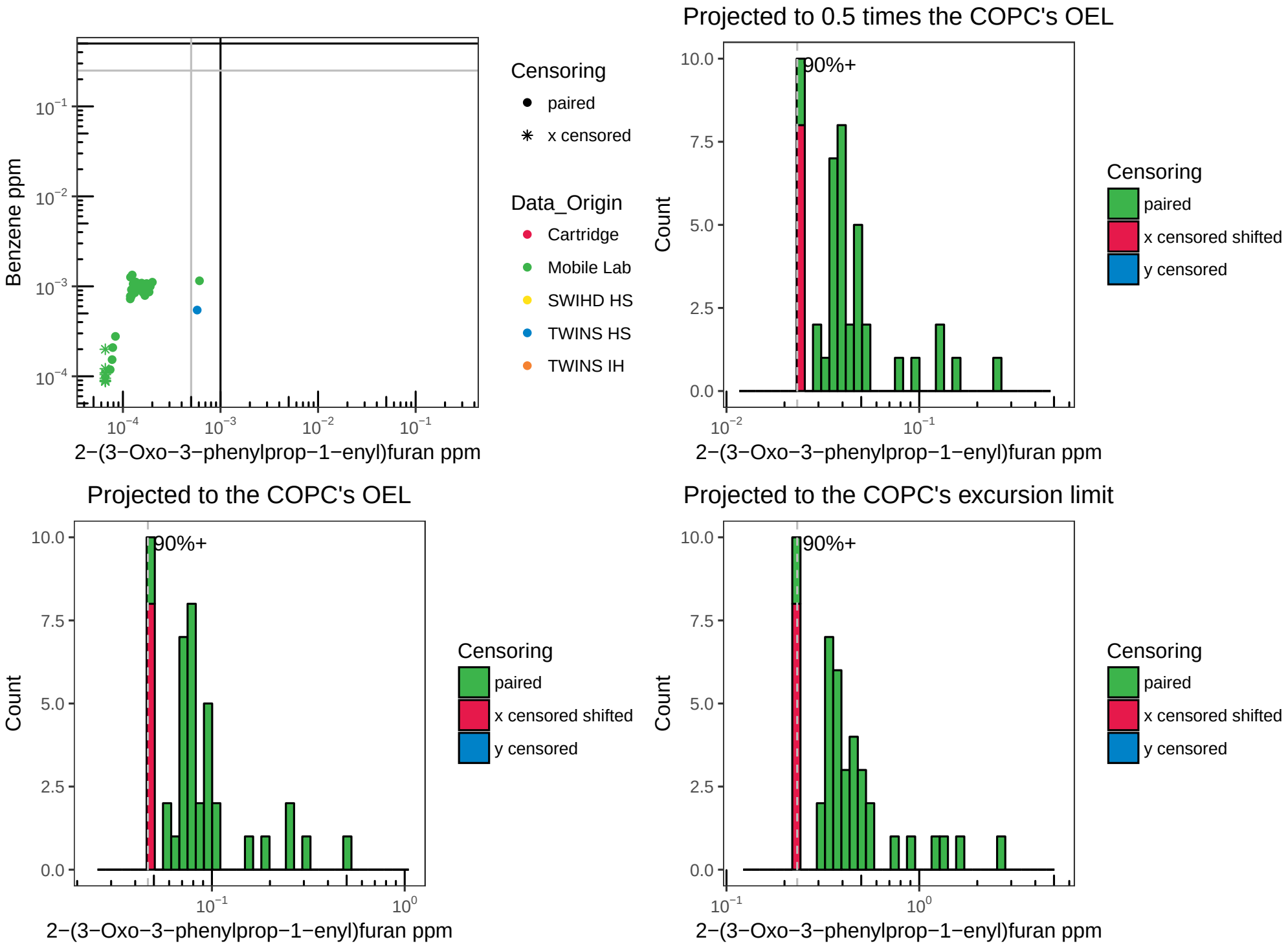


Figure C.1476: Benzene vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

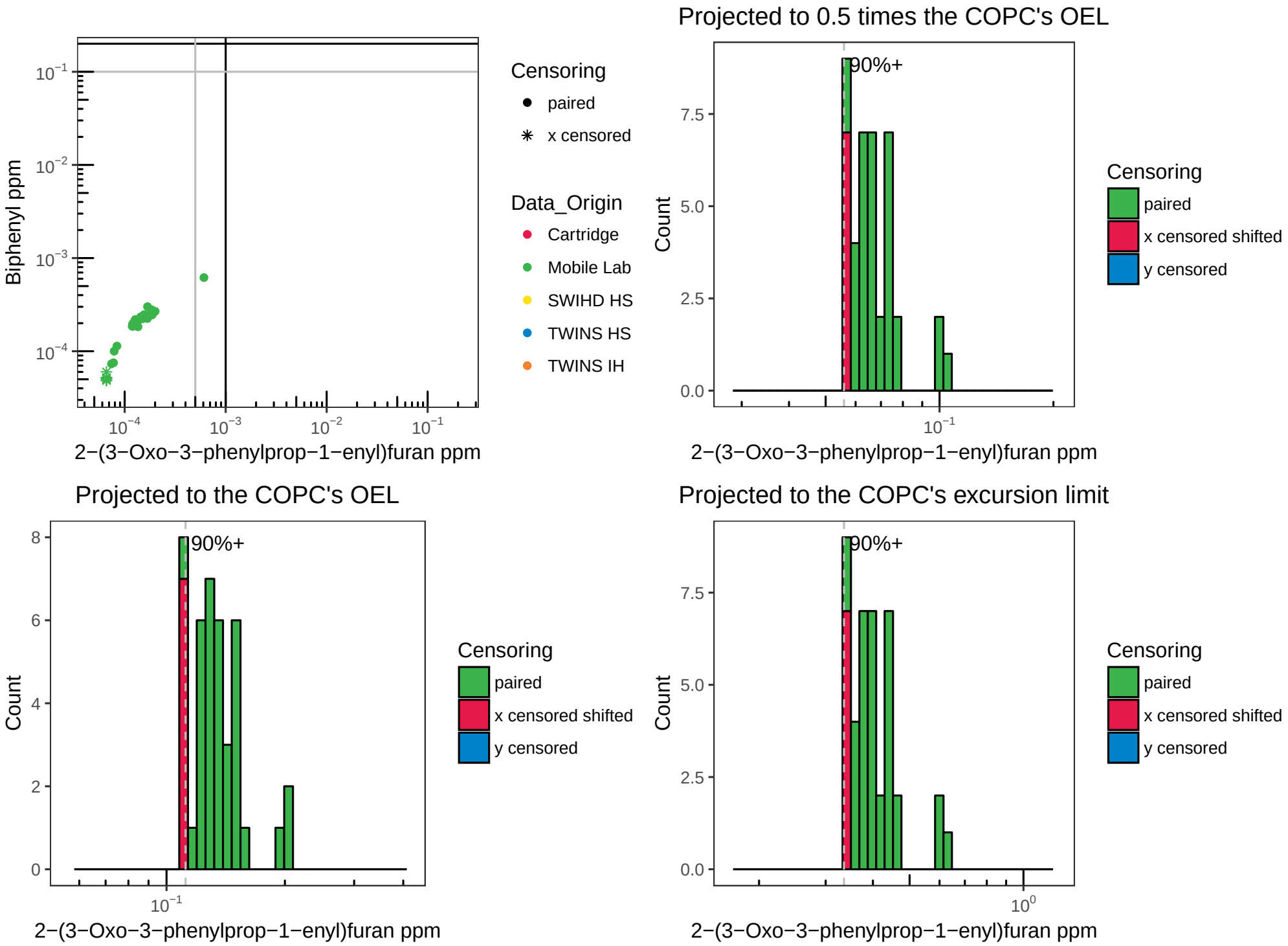


Figure C.1477: Biphenyl vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

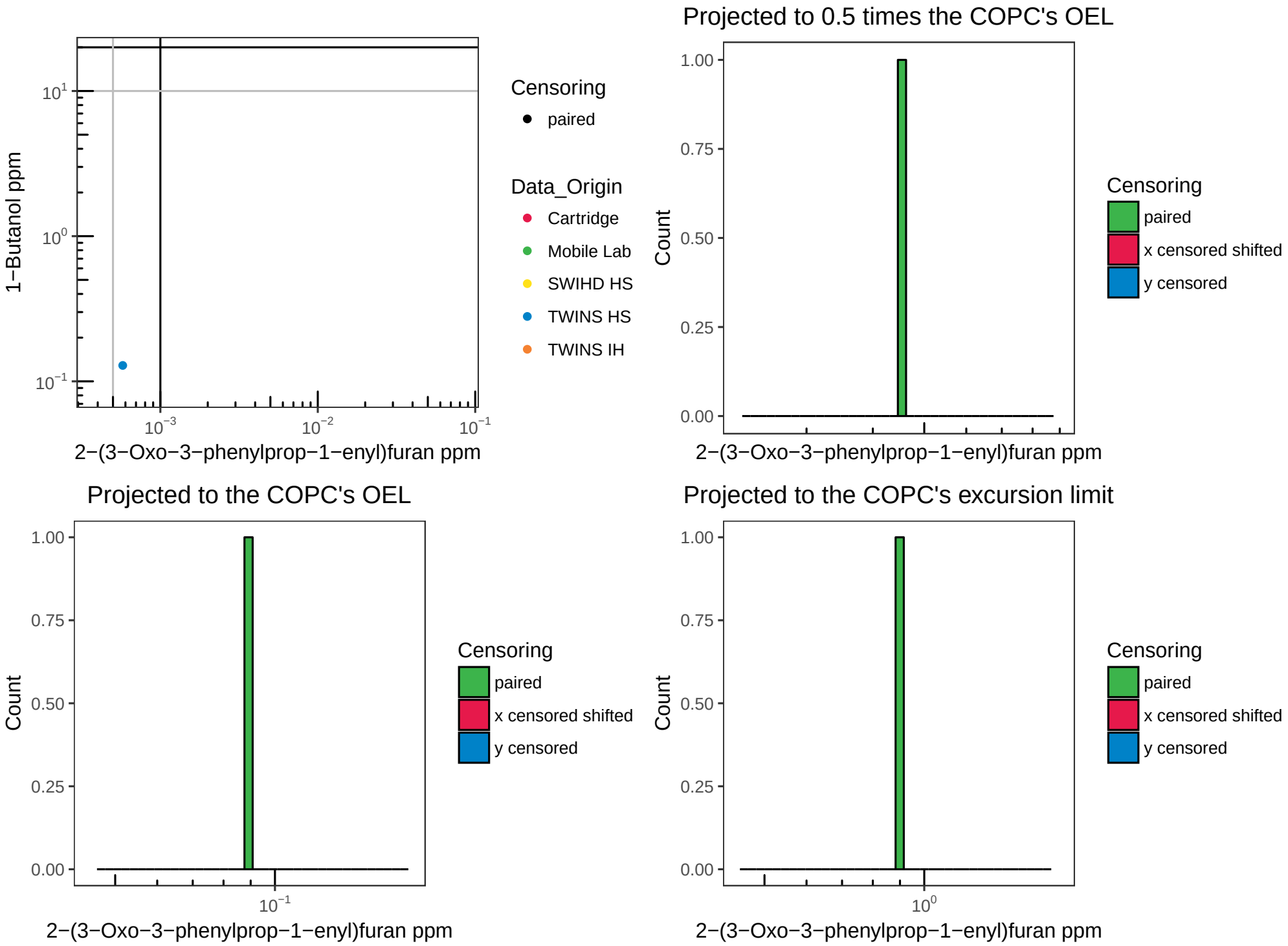


Figure C.1478: 1-Butanol vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

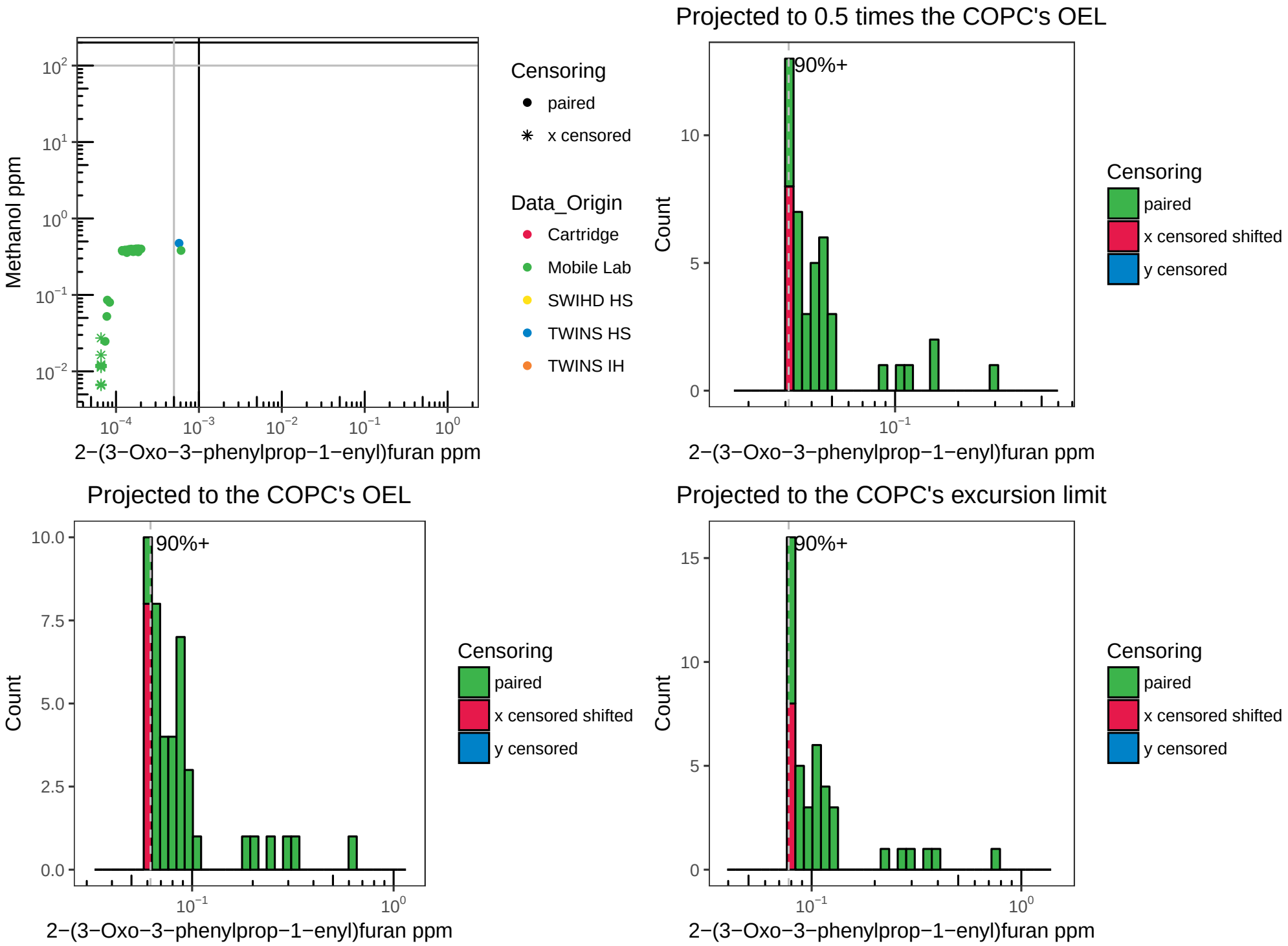


Figure C.1479: Methanol vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

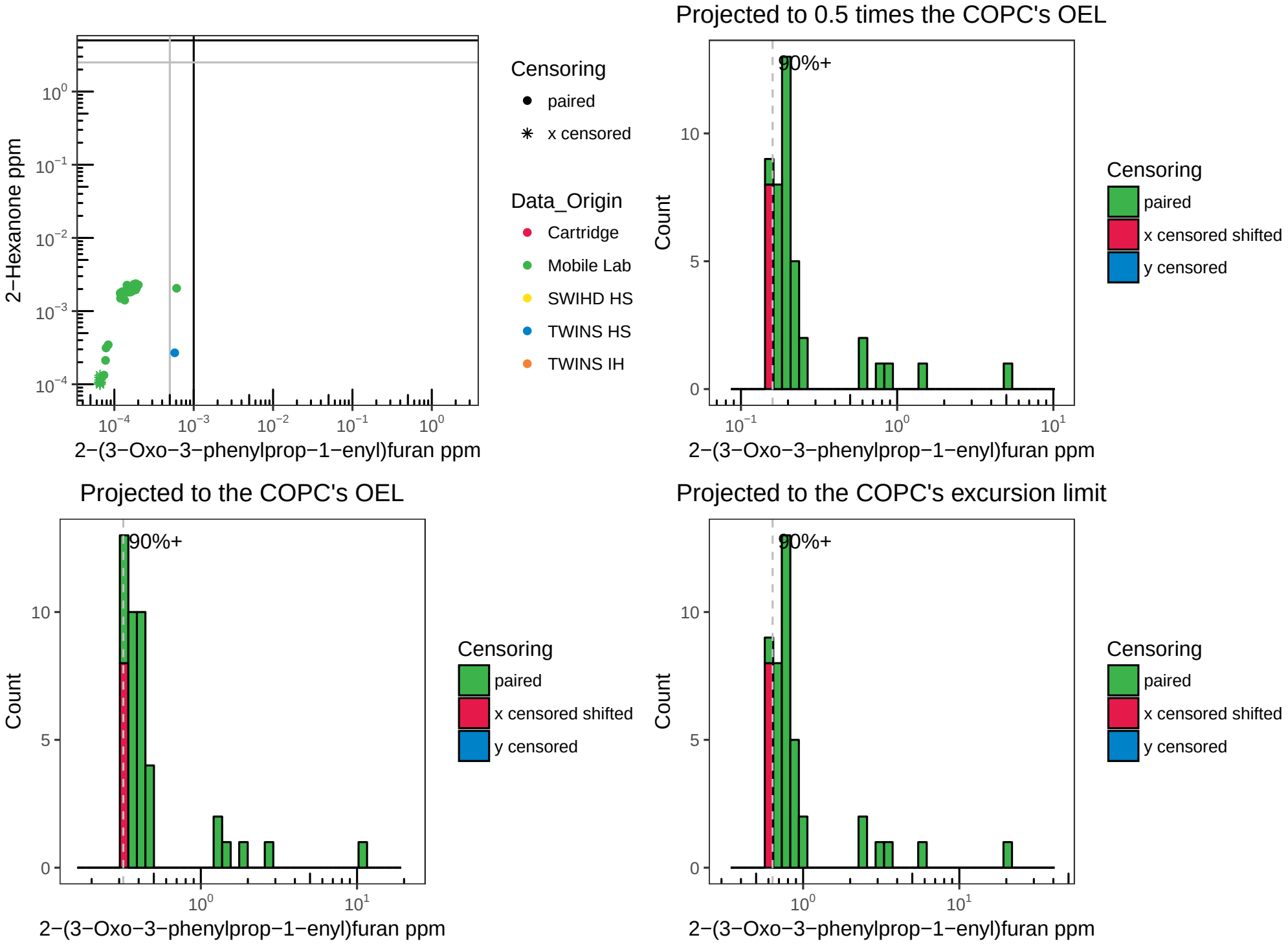


Figure C.1480: 2-Hexanone vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

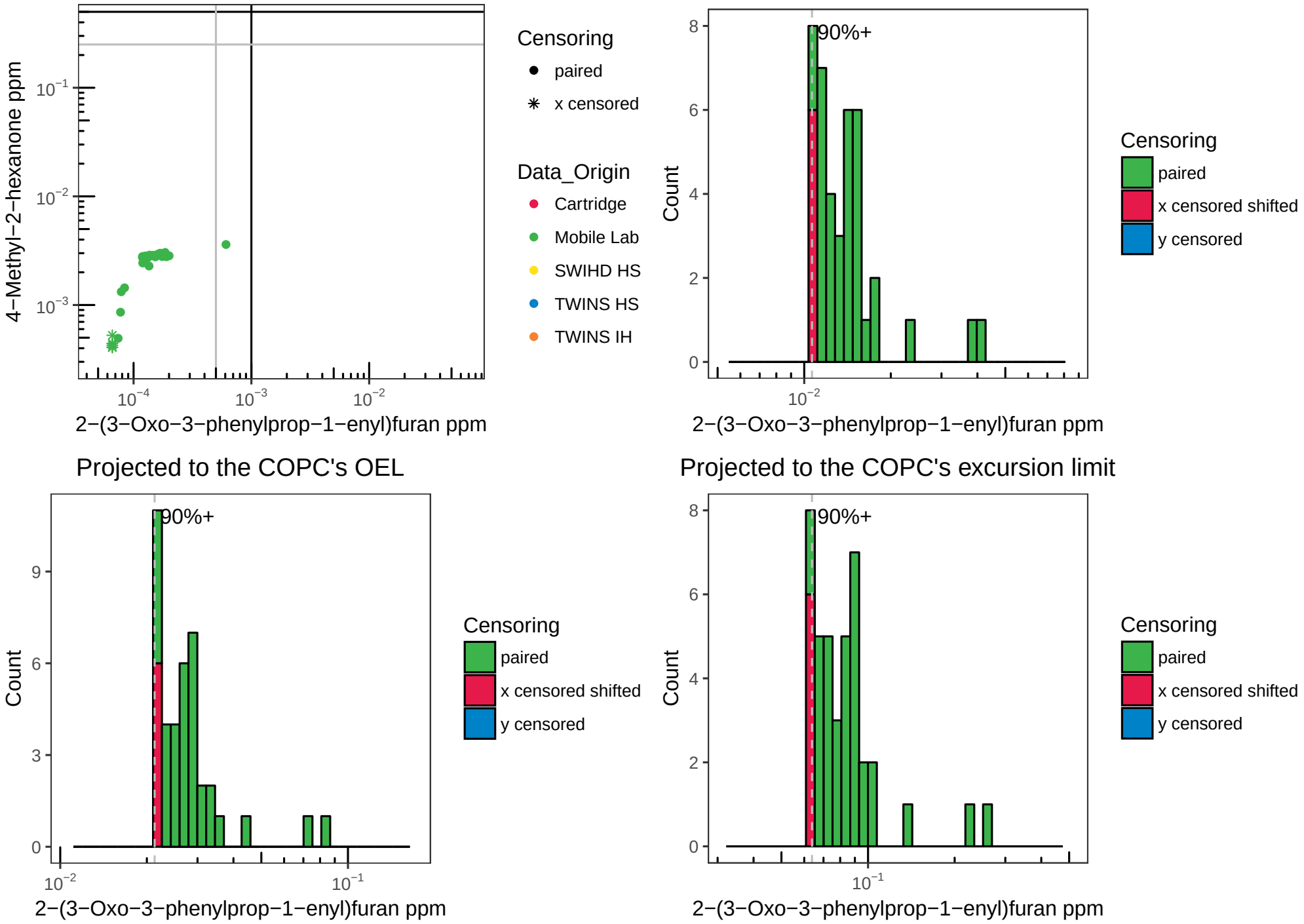


Figure C.1481: 4-Methyl-2-hexanone vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

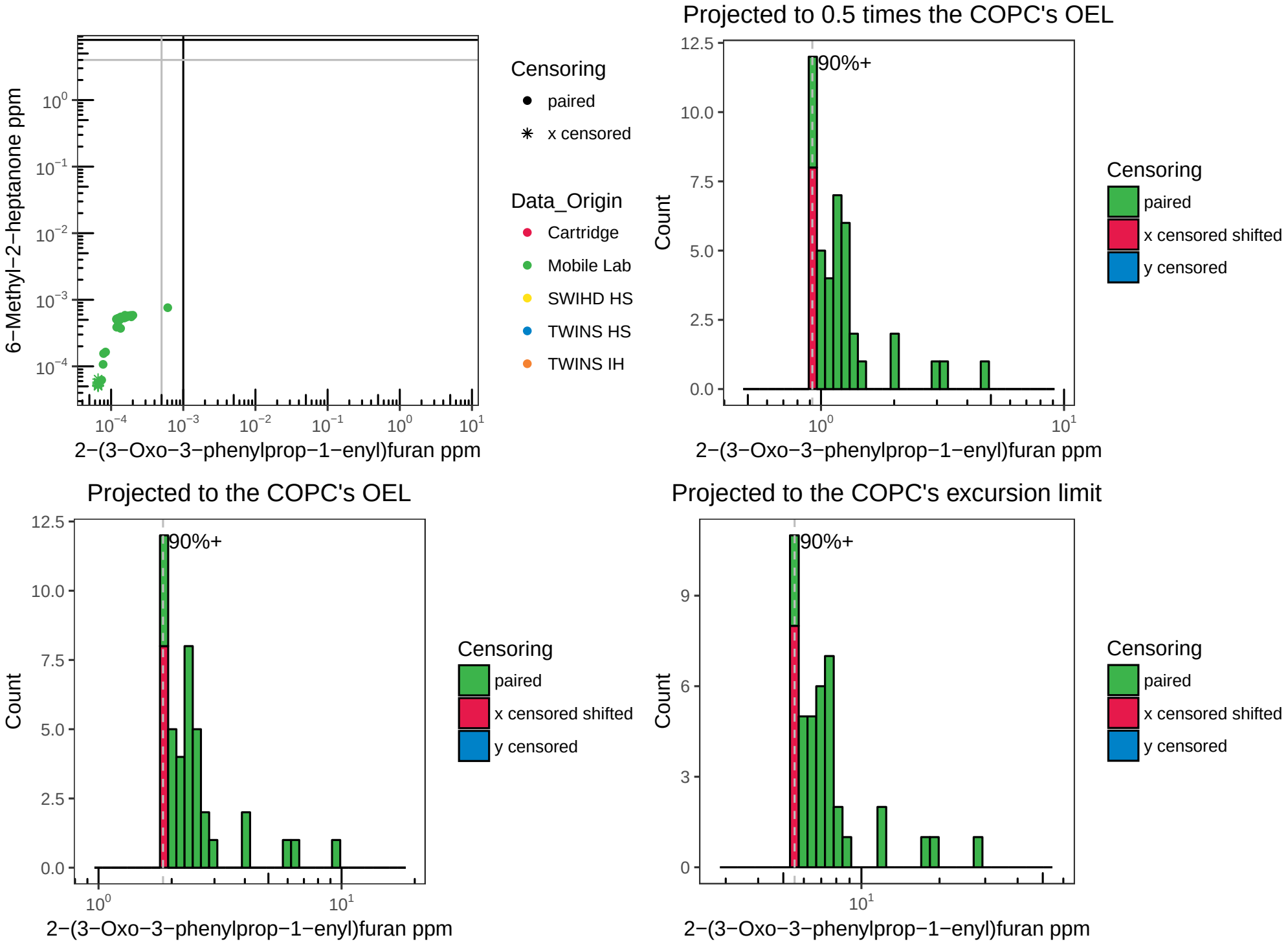


Figure C.1482: 6-Methyl-2-heptanone vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

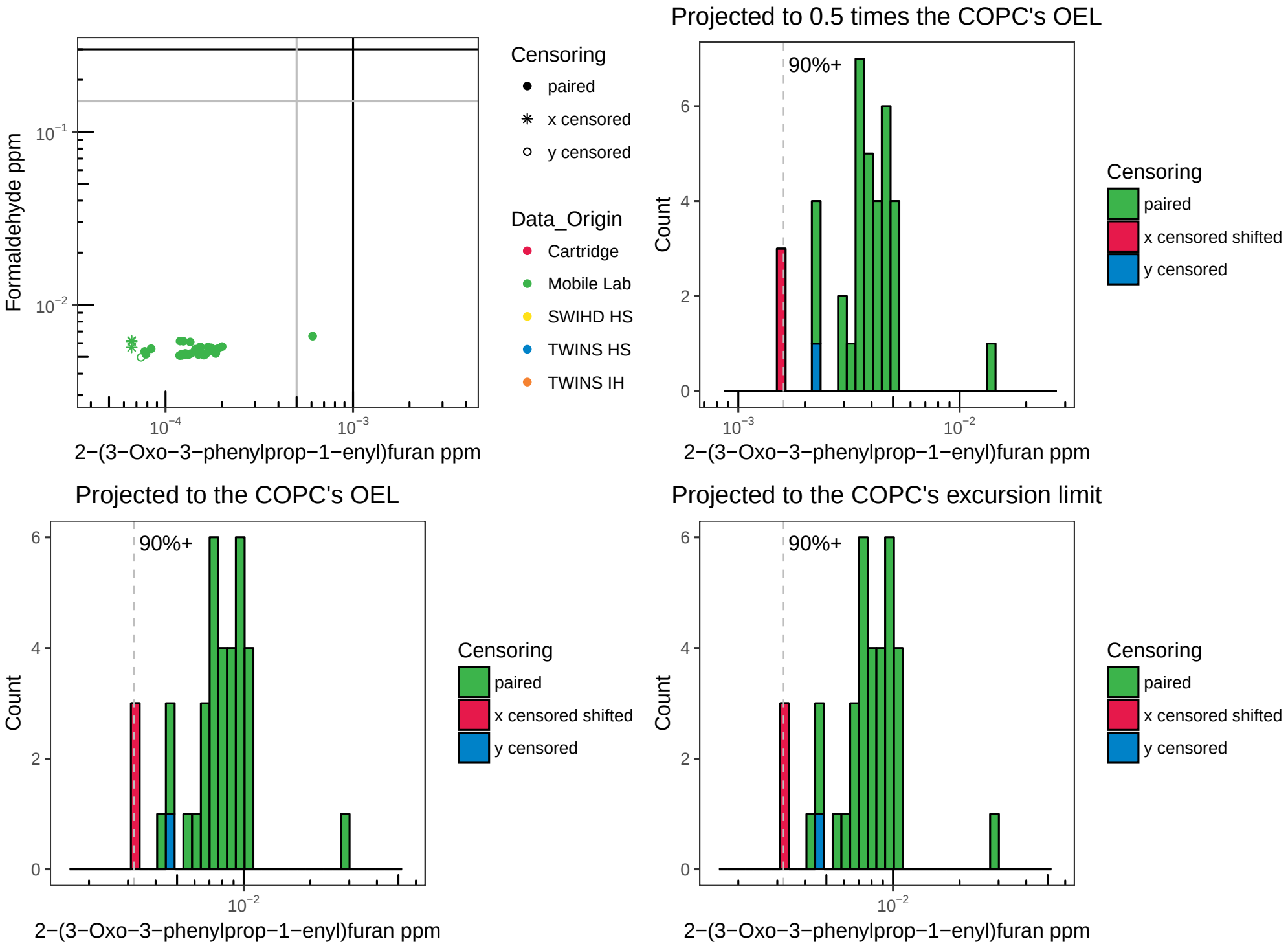


Figure C.1483: Formaldehyde vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

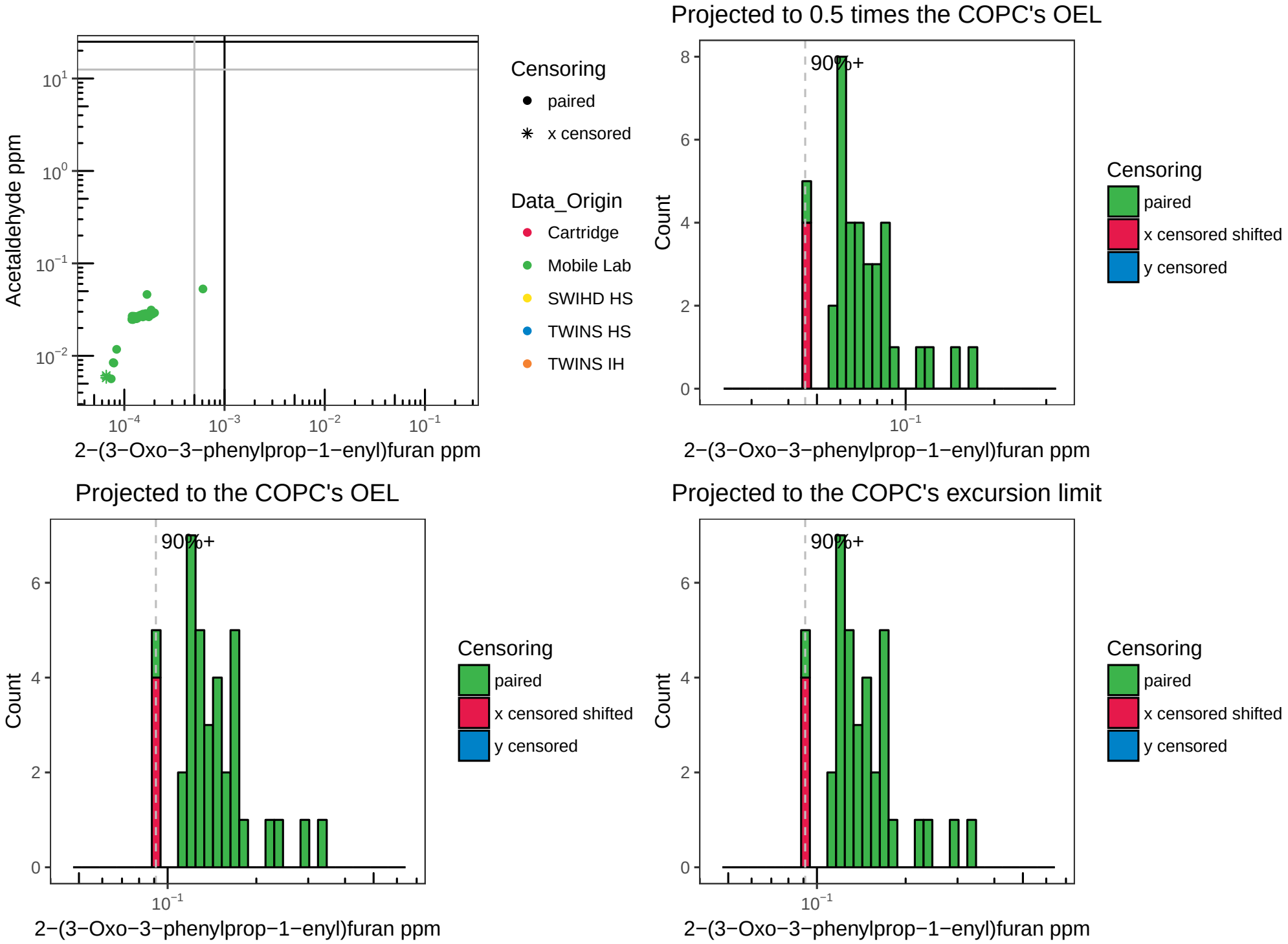


Figure C.1484: Acetaldehyde vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

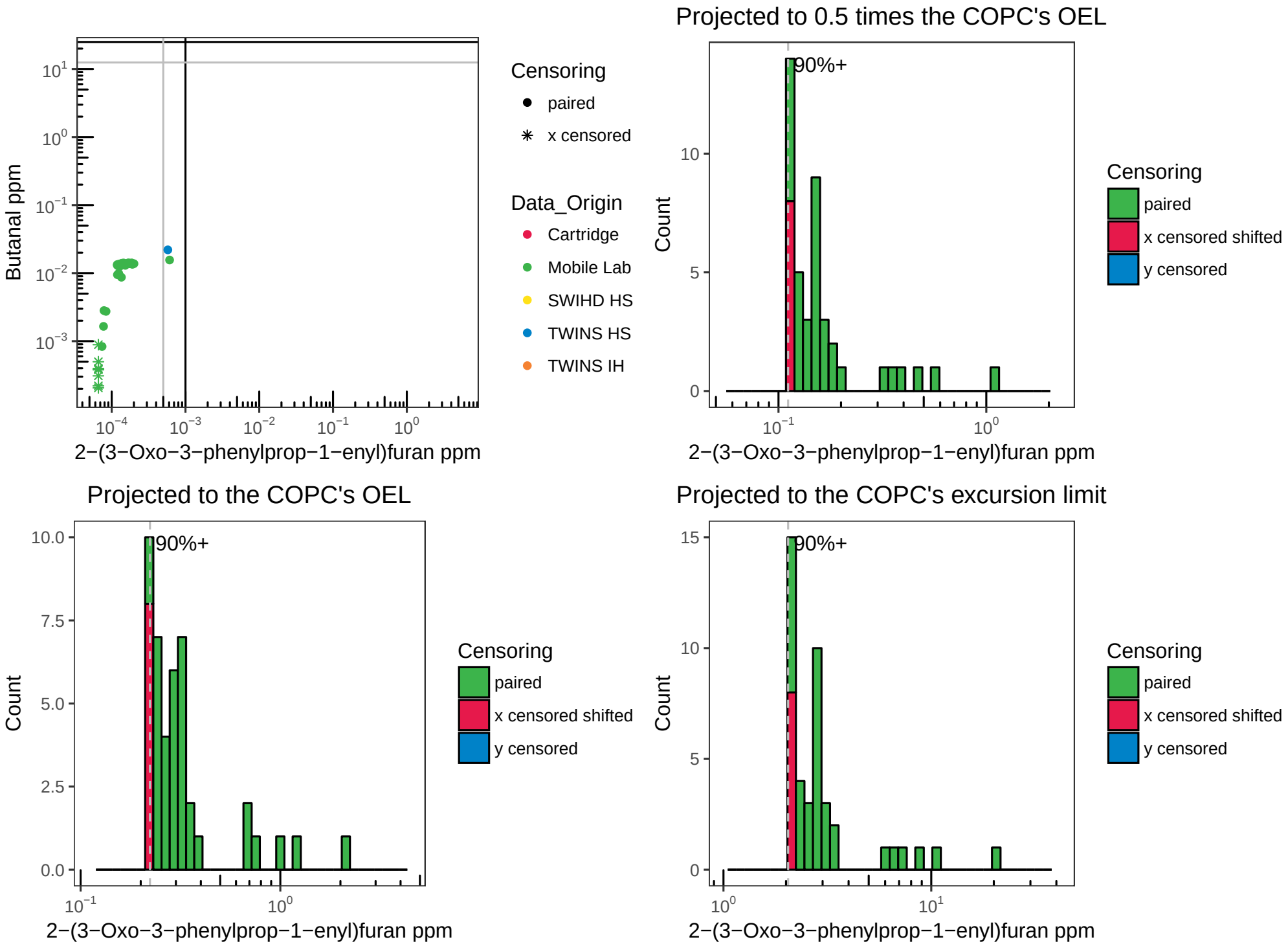


Figure C.1485: Butanal vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

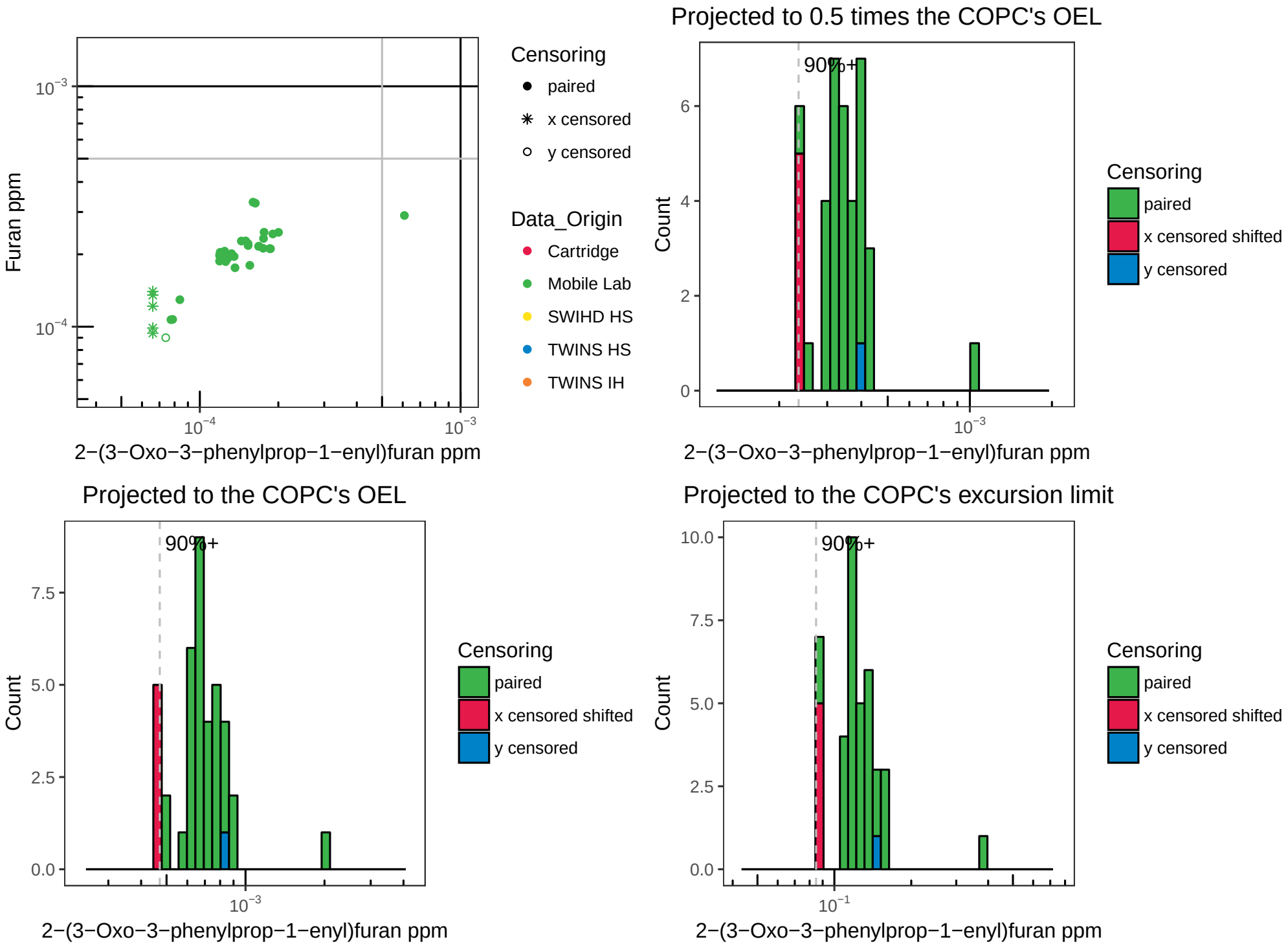


Figure C.1486: Furan vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

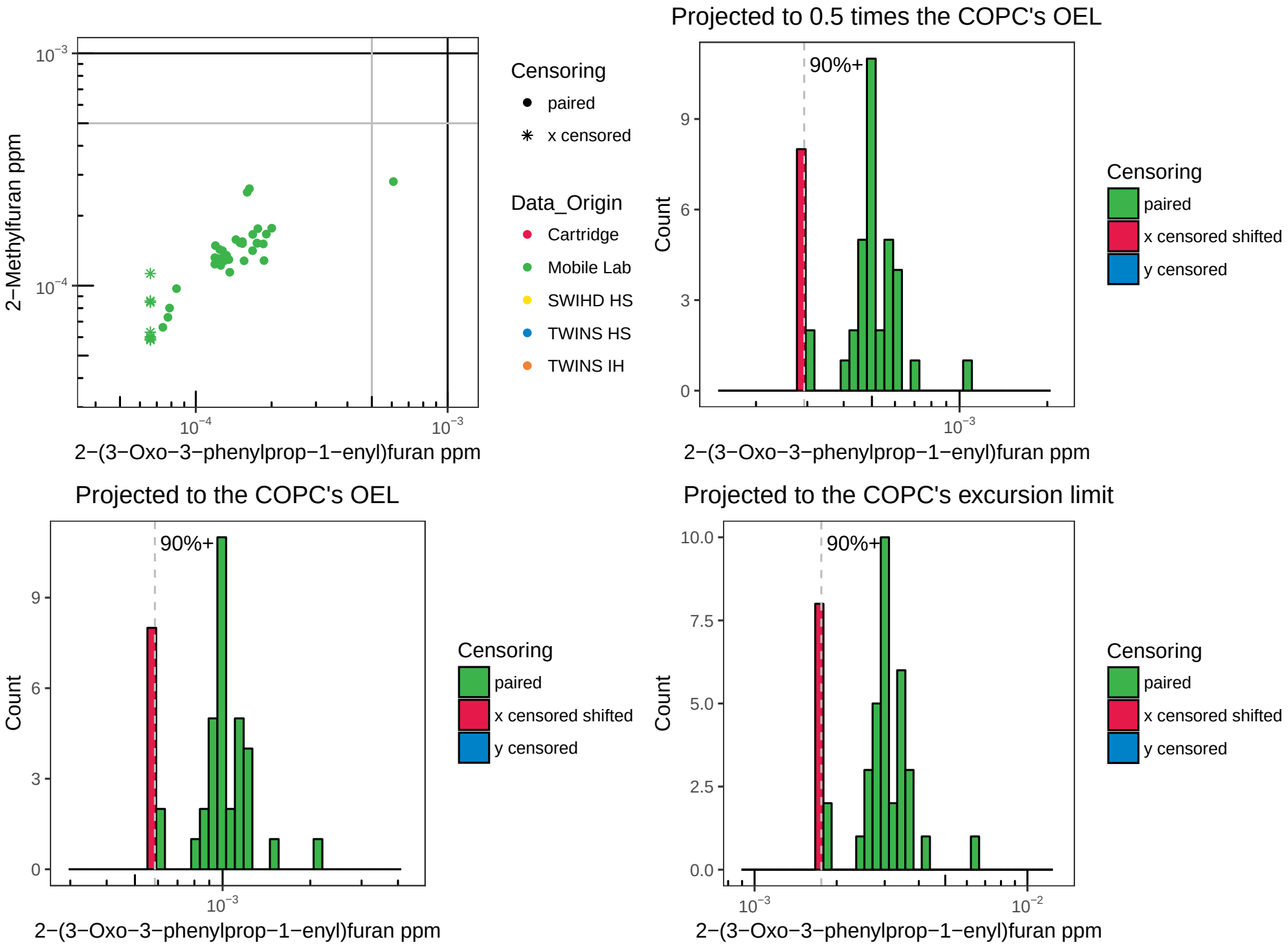


Figure C.1487: 2-Methylfuran vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

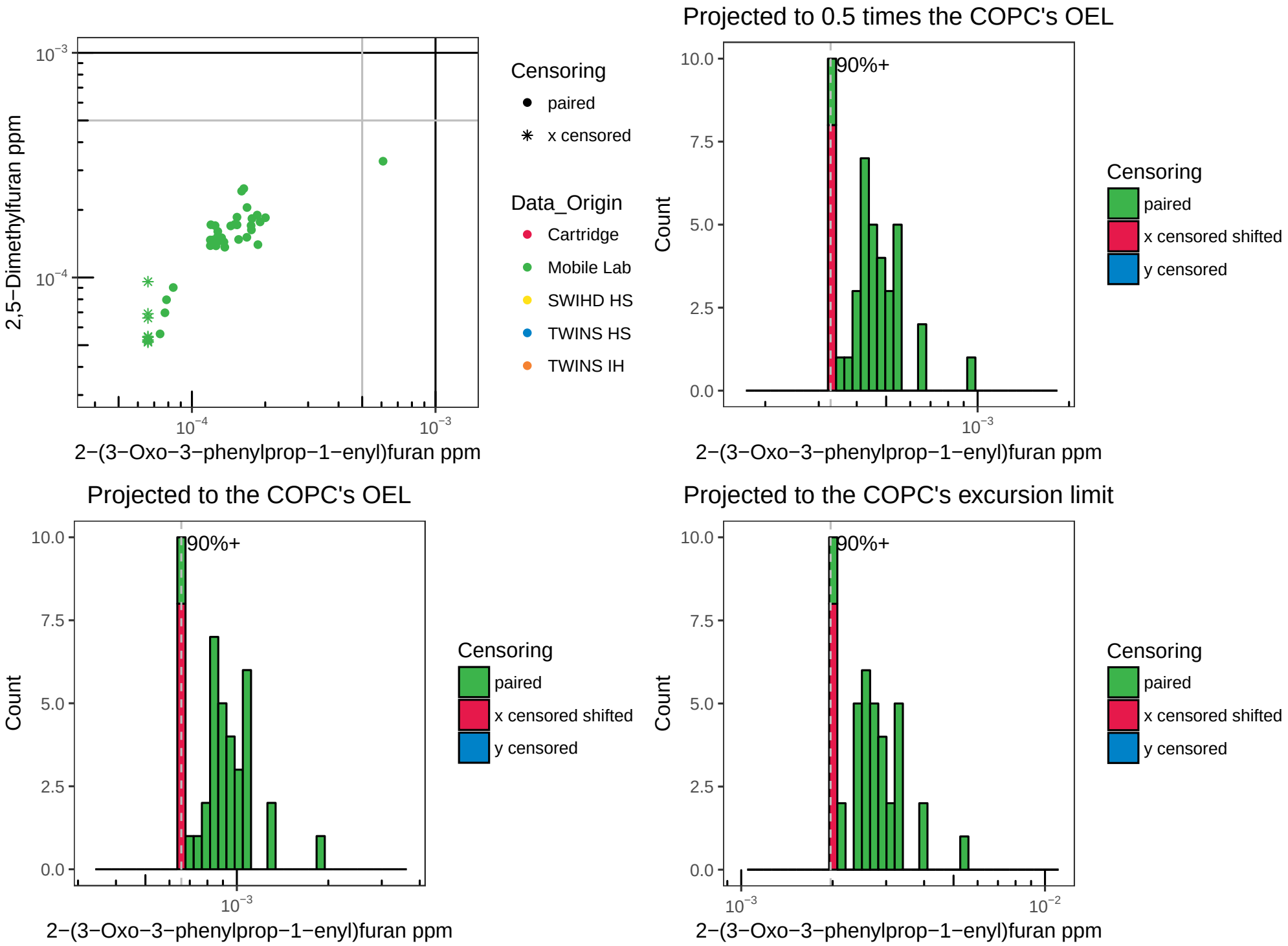


Figure C.1488: 2,5-Dimethylfuran vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

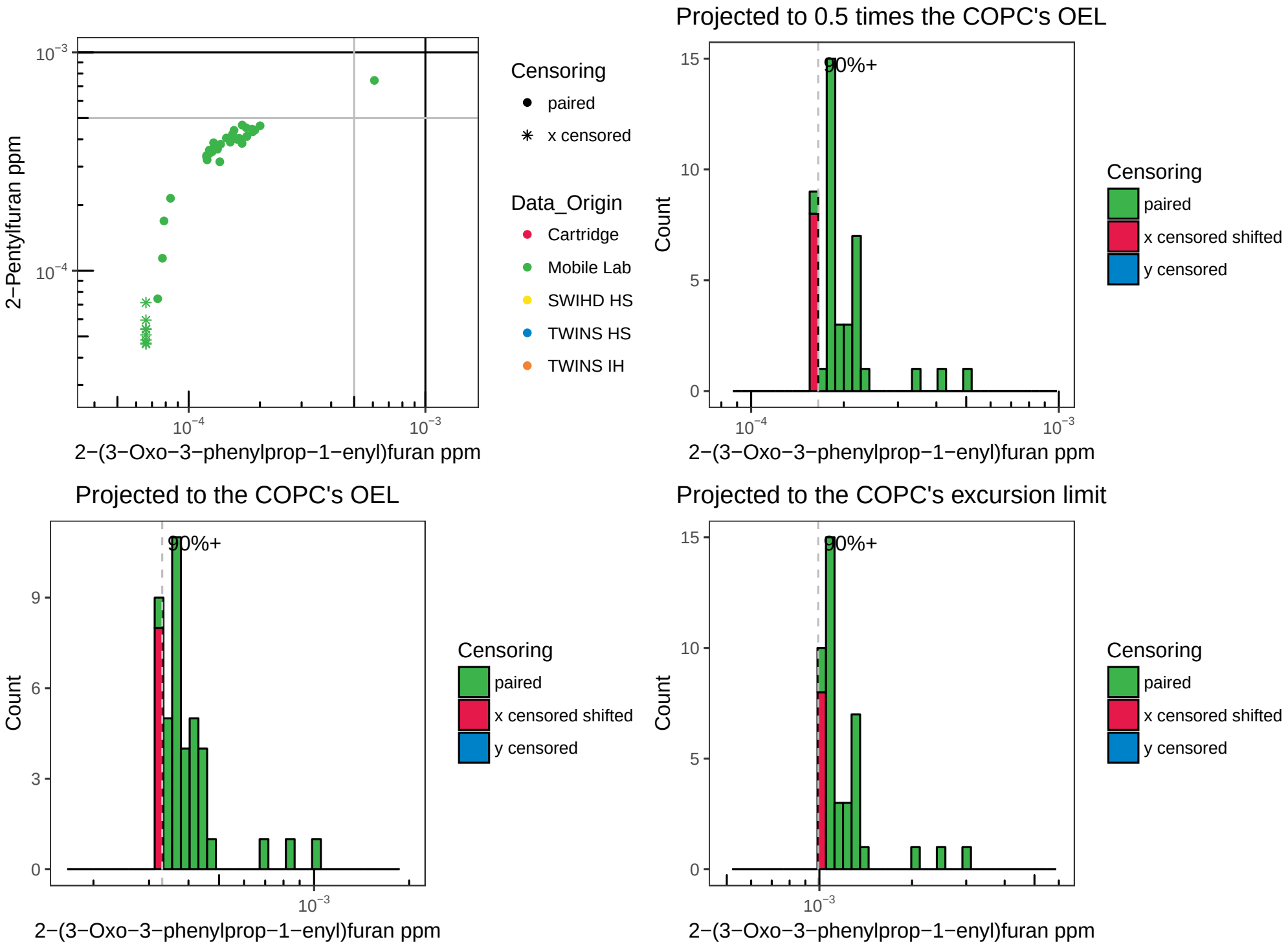


Figure C.1489: 2-Pentylfuran vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

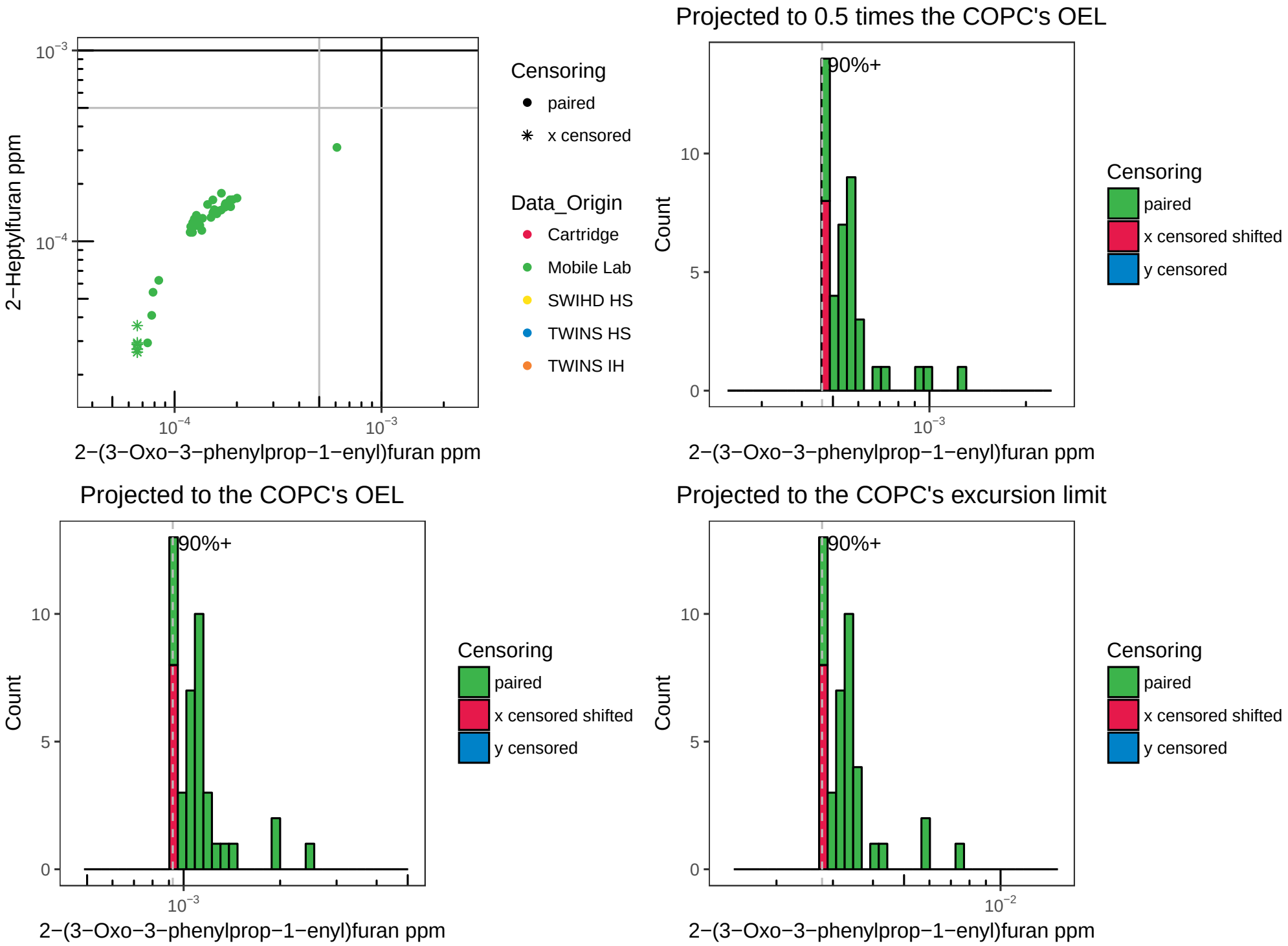


Figure C.1490: 2-Heptylfuran vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

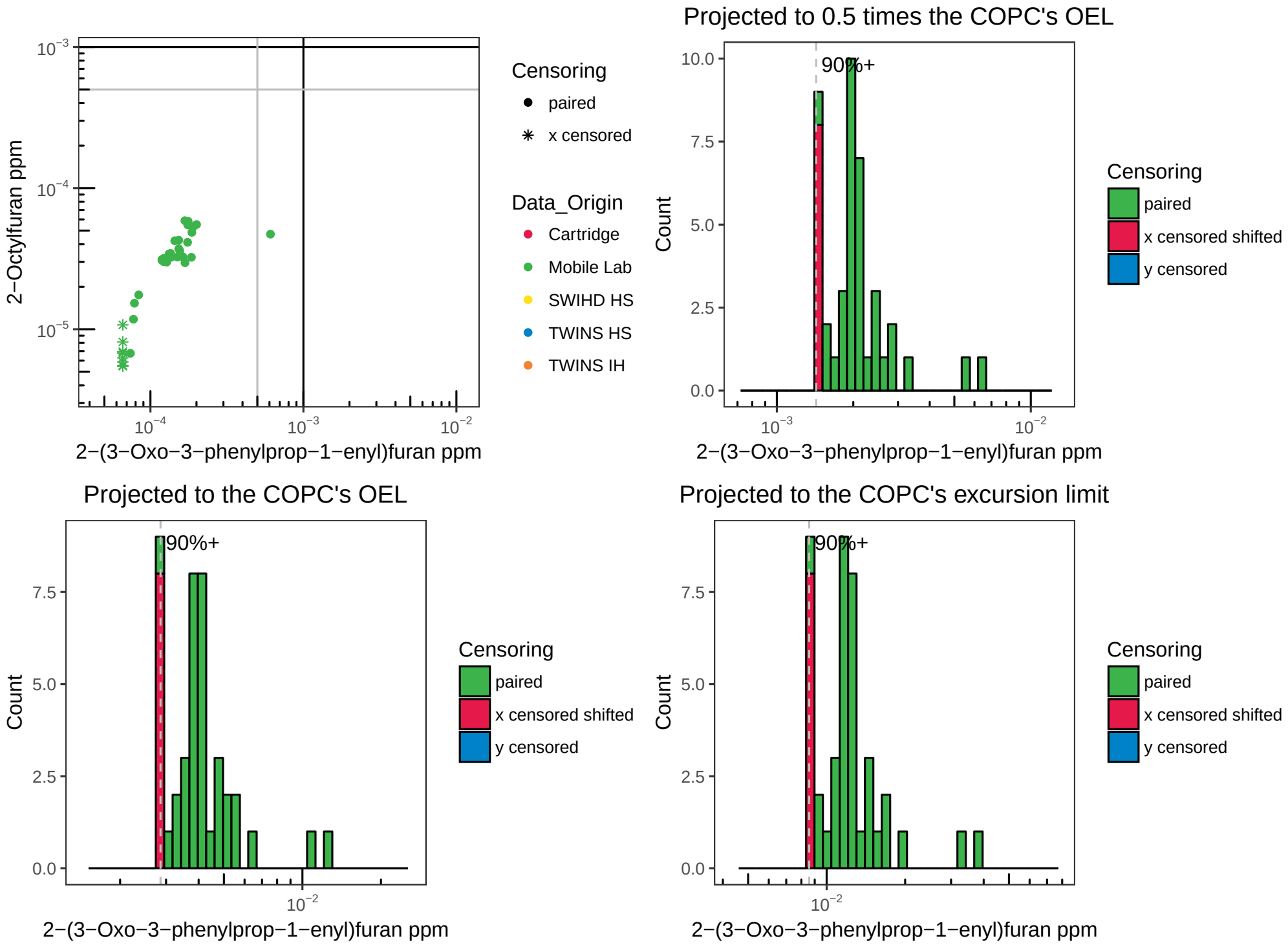


Figure C.1491: 2-Octylfuran vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

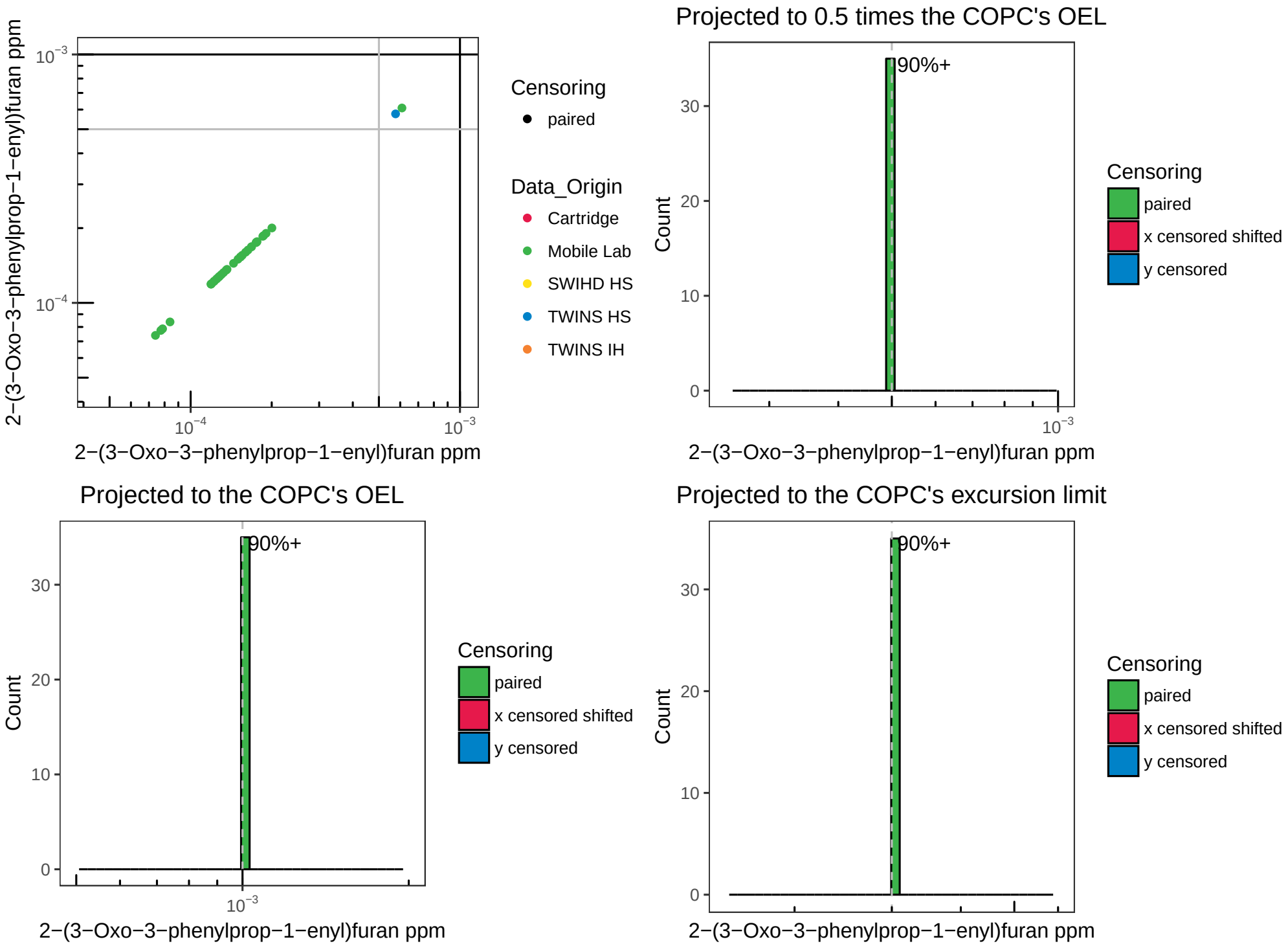


Figure C.1492: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

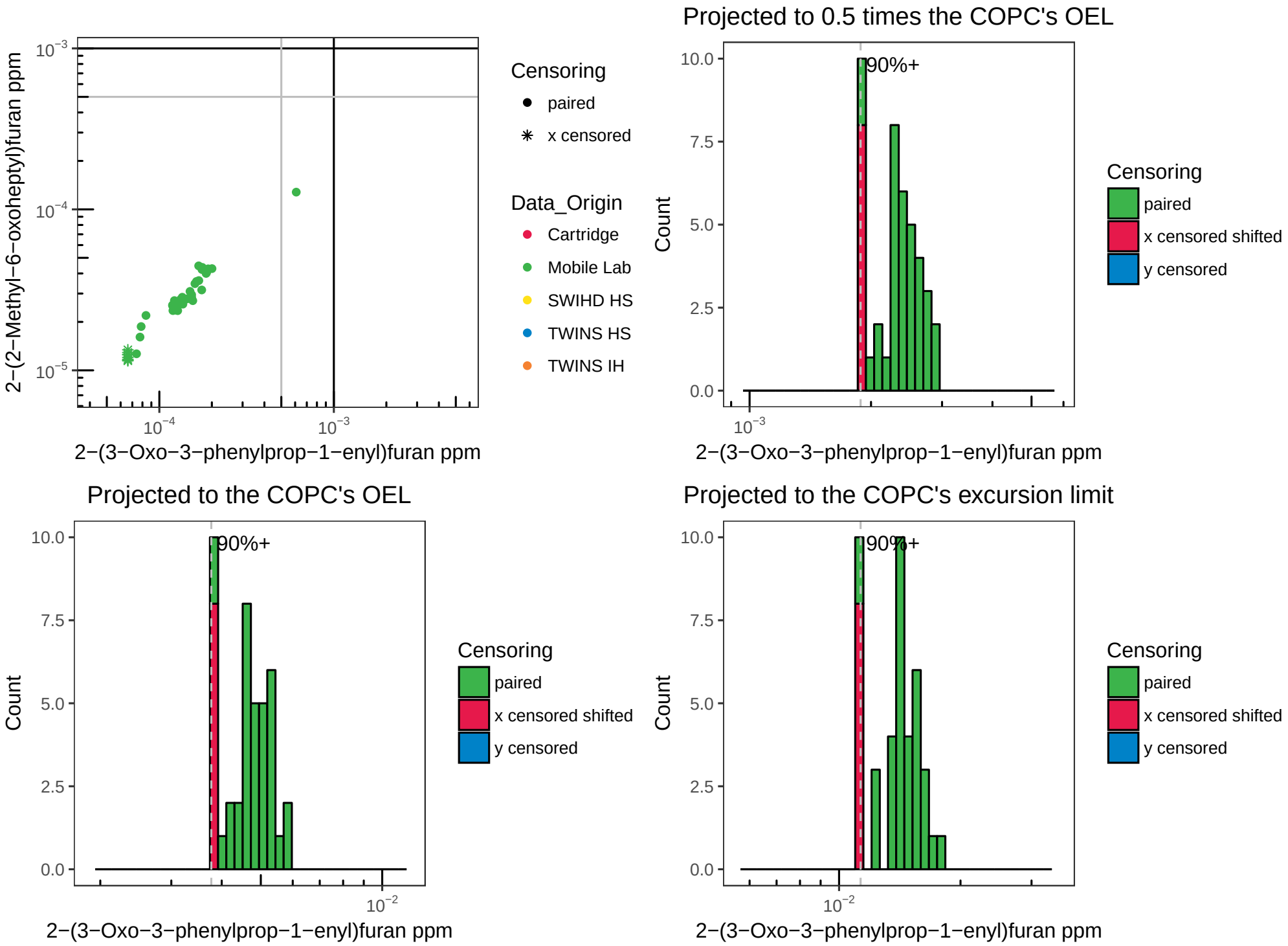


Figure C.1493: 2-(2-Methyl-6-oxoheptyl)furan vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

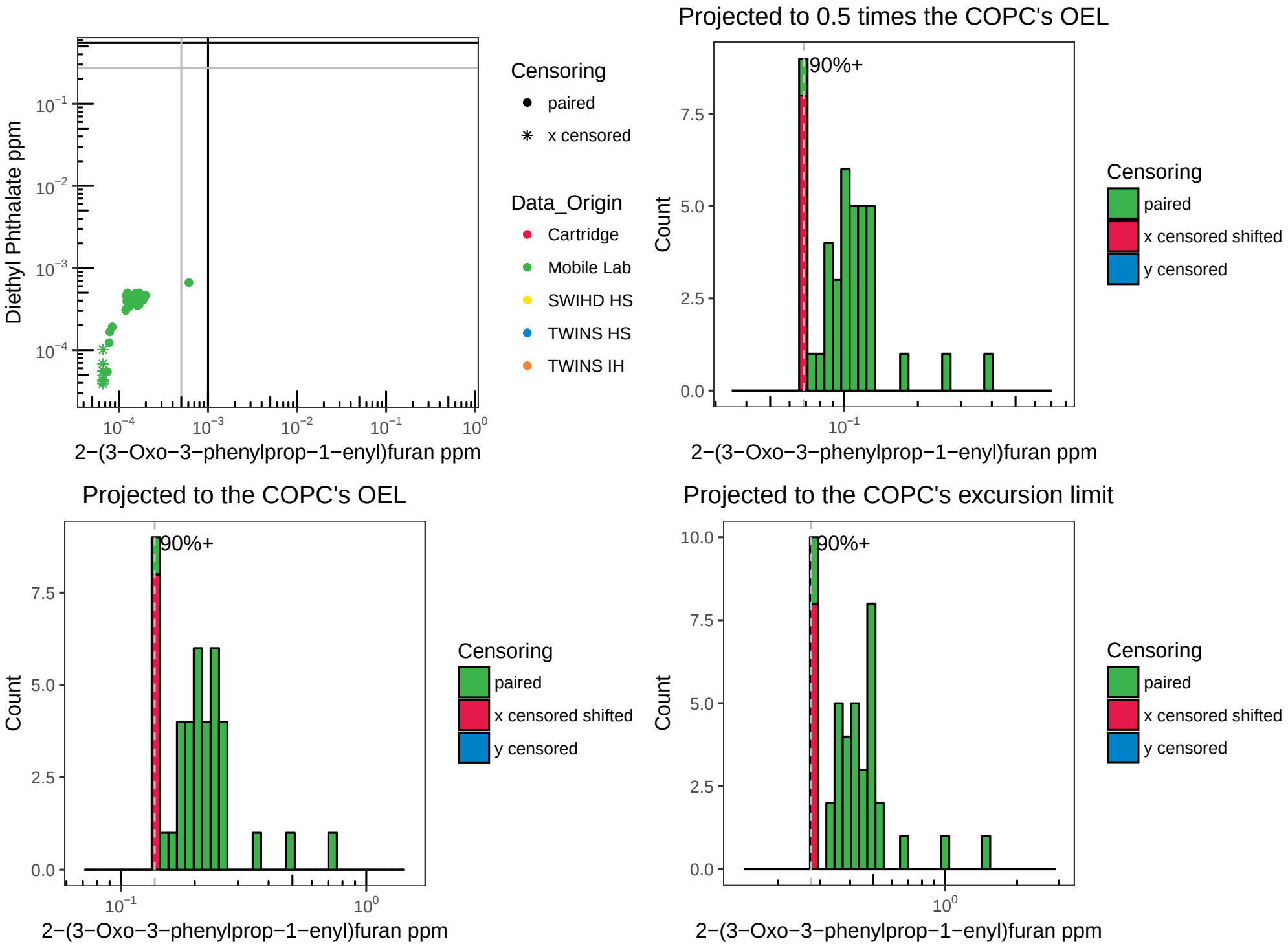


Figure C.1494: Diethyl Phthalate vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

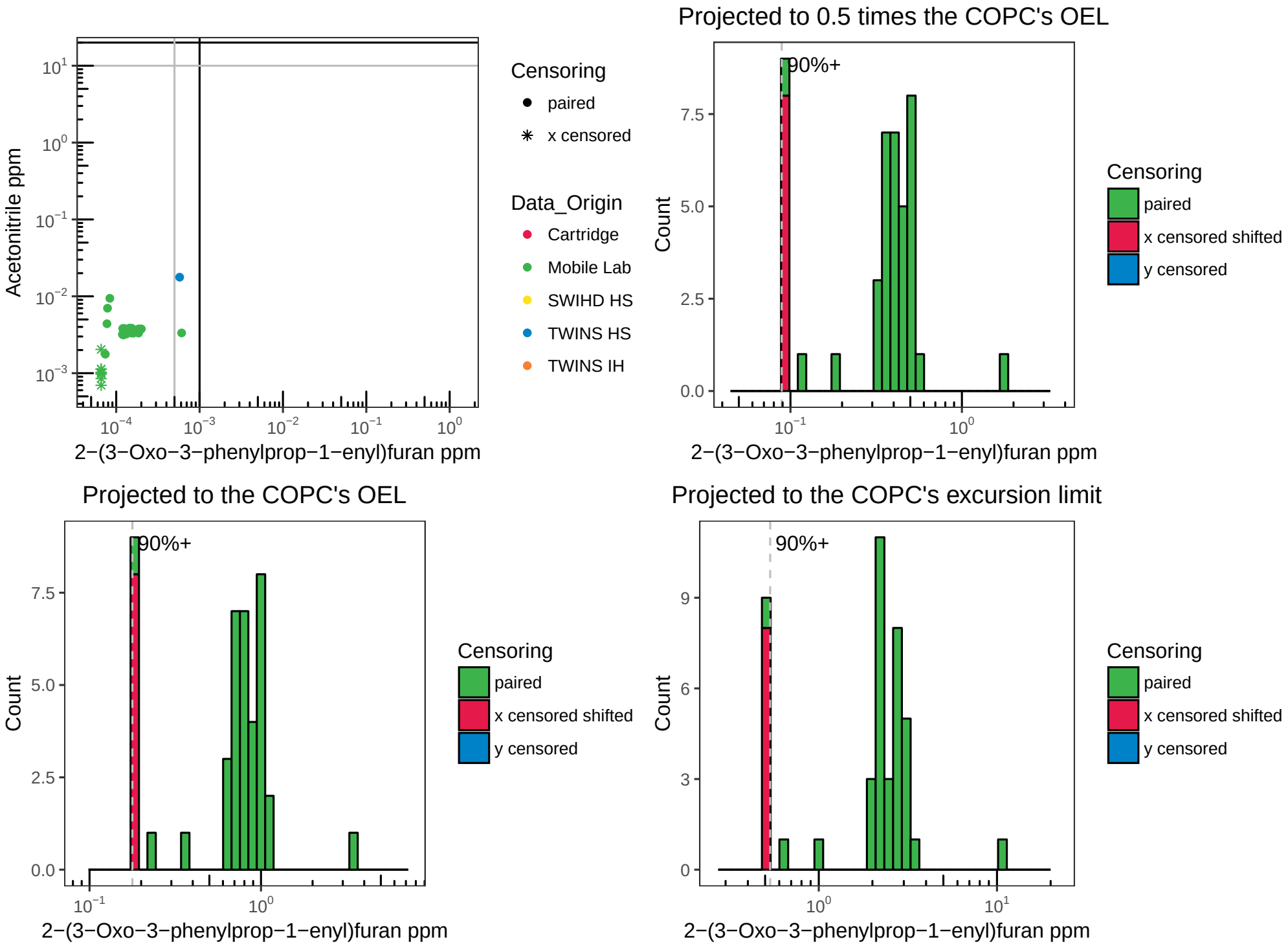


Figure C.1495: Acetonitrile vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

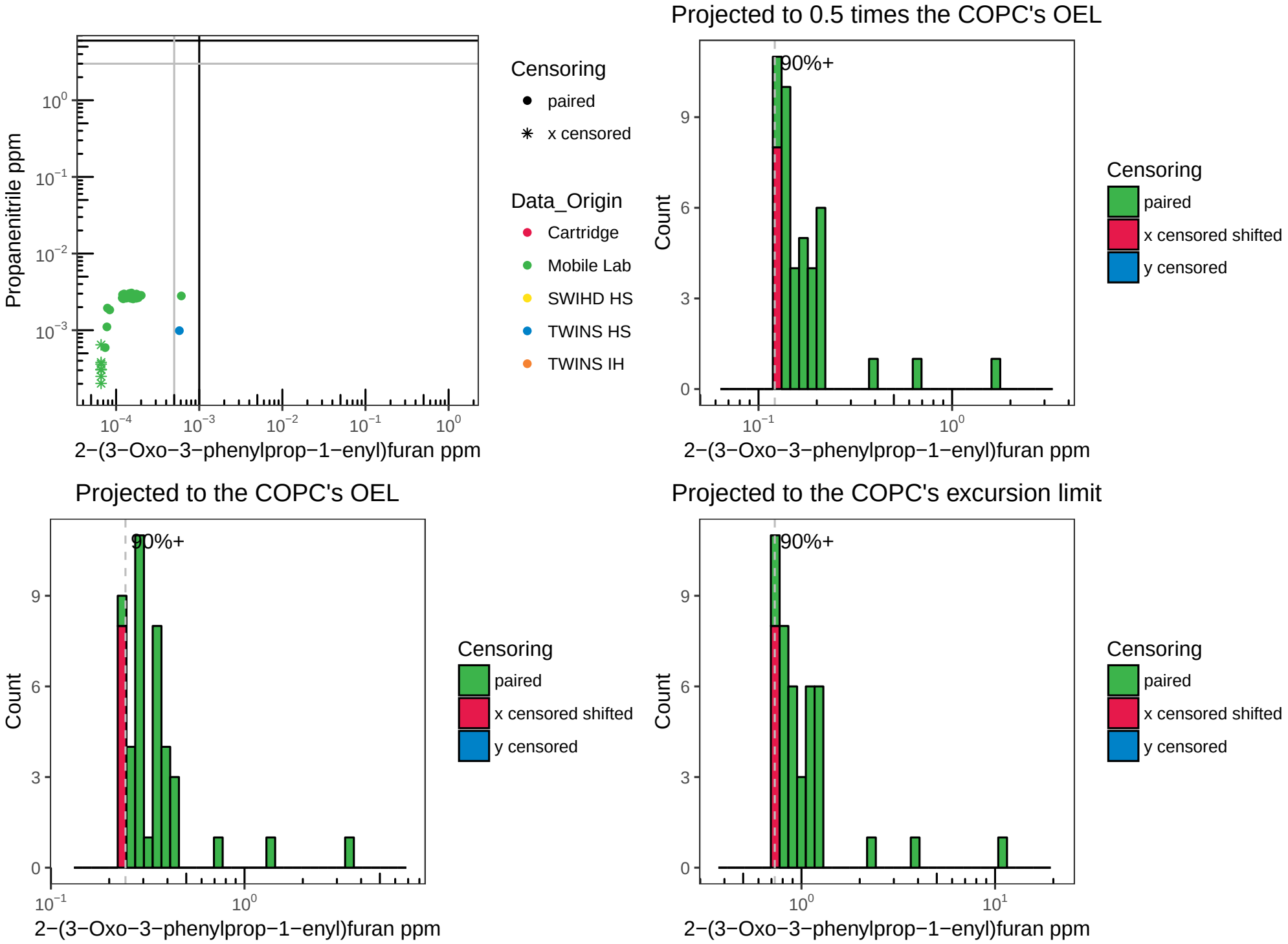


Figure C.1496: Propanenitrile vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

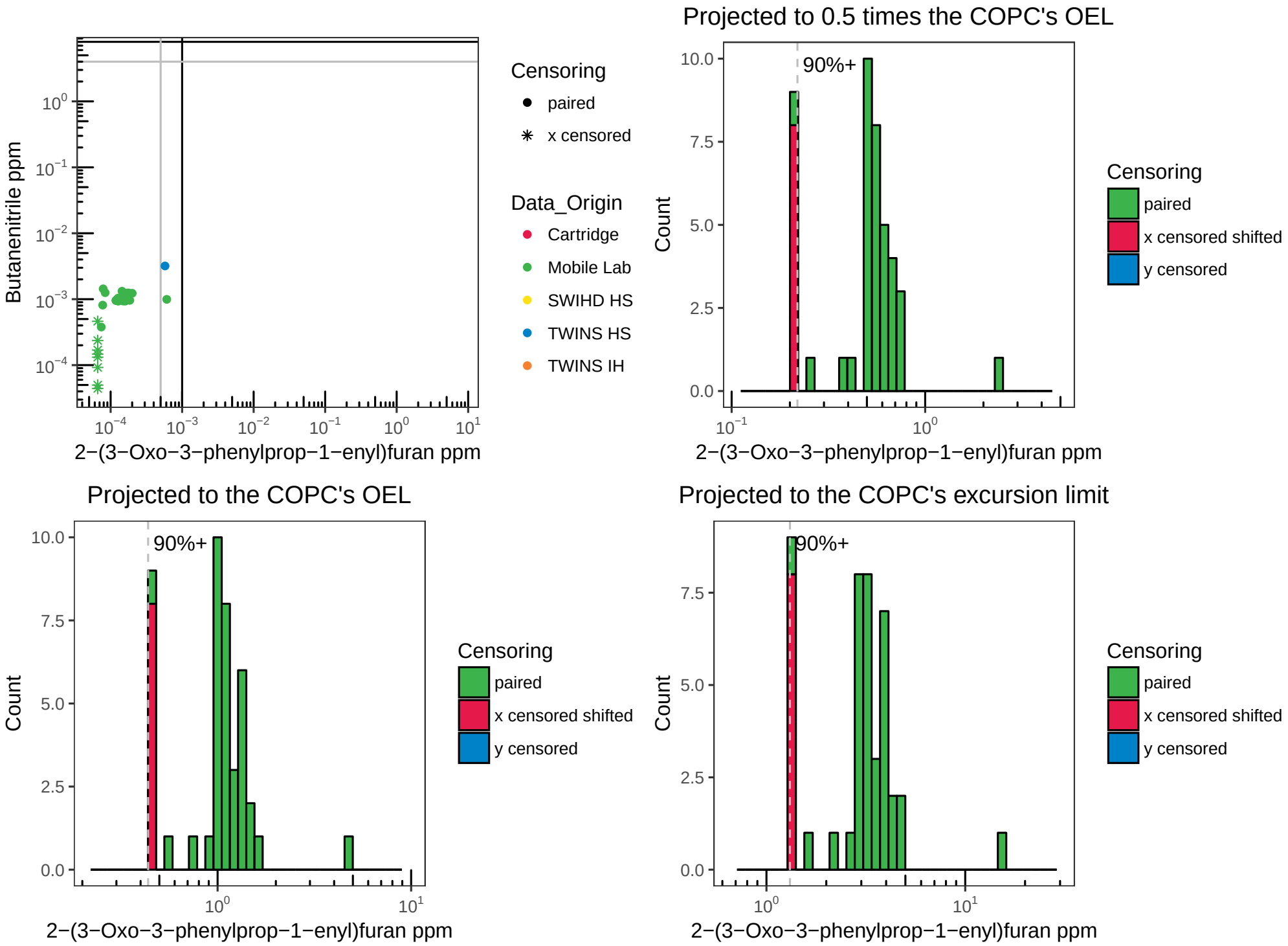


Figure C.1497: Butanenitrile vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

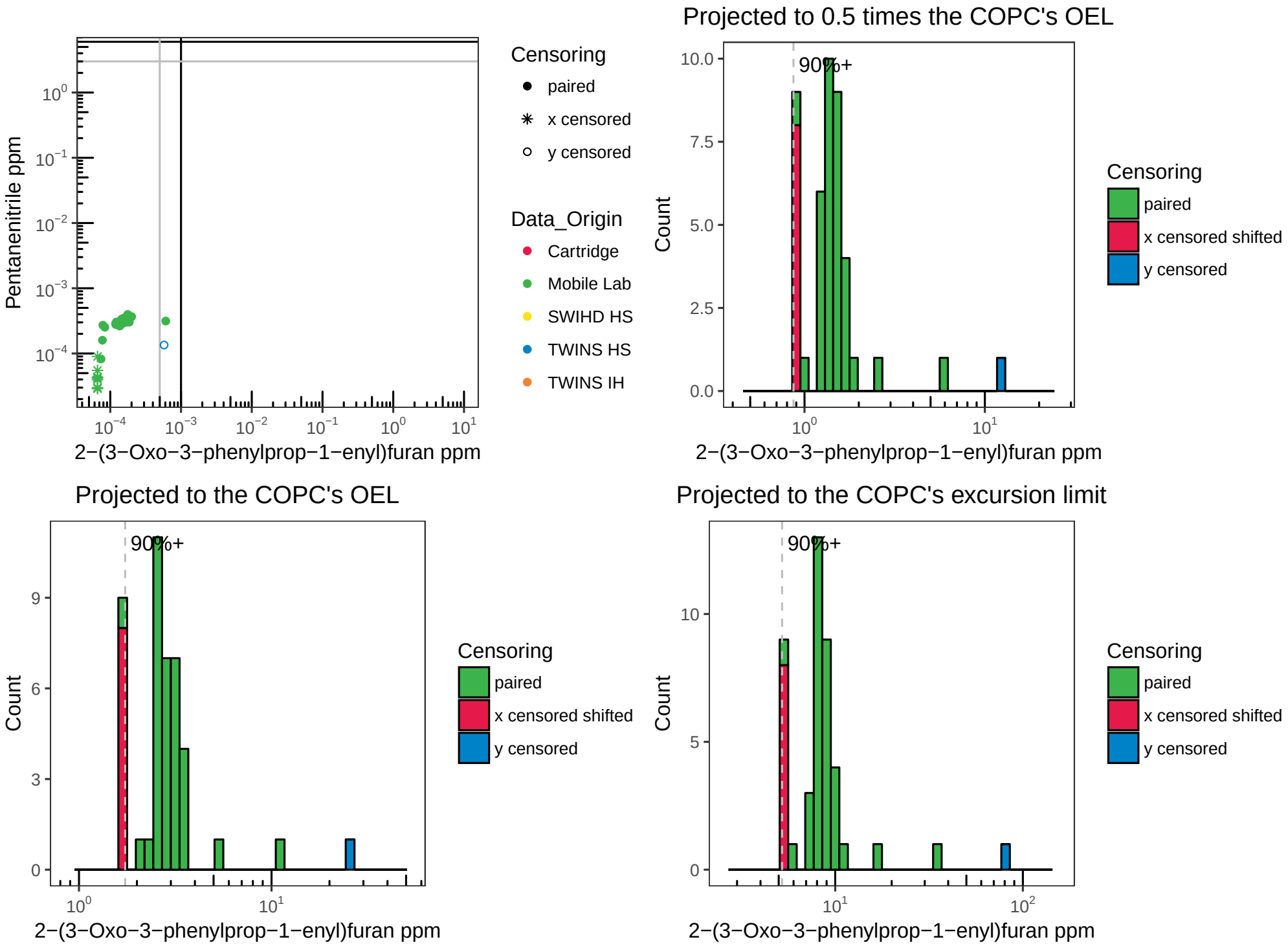


Figure C.1498: Pentanenitrile vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

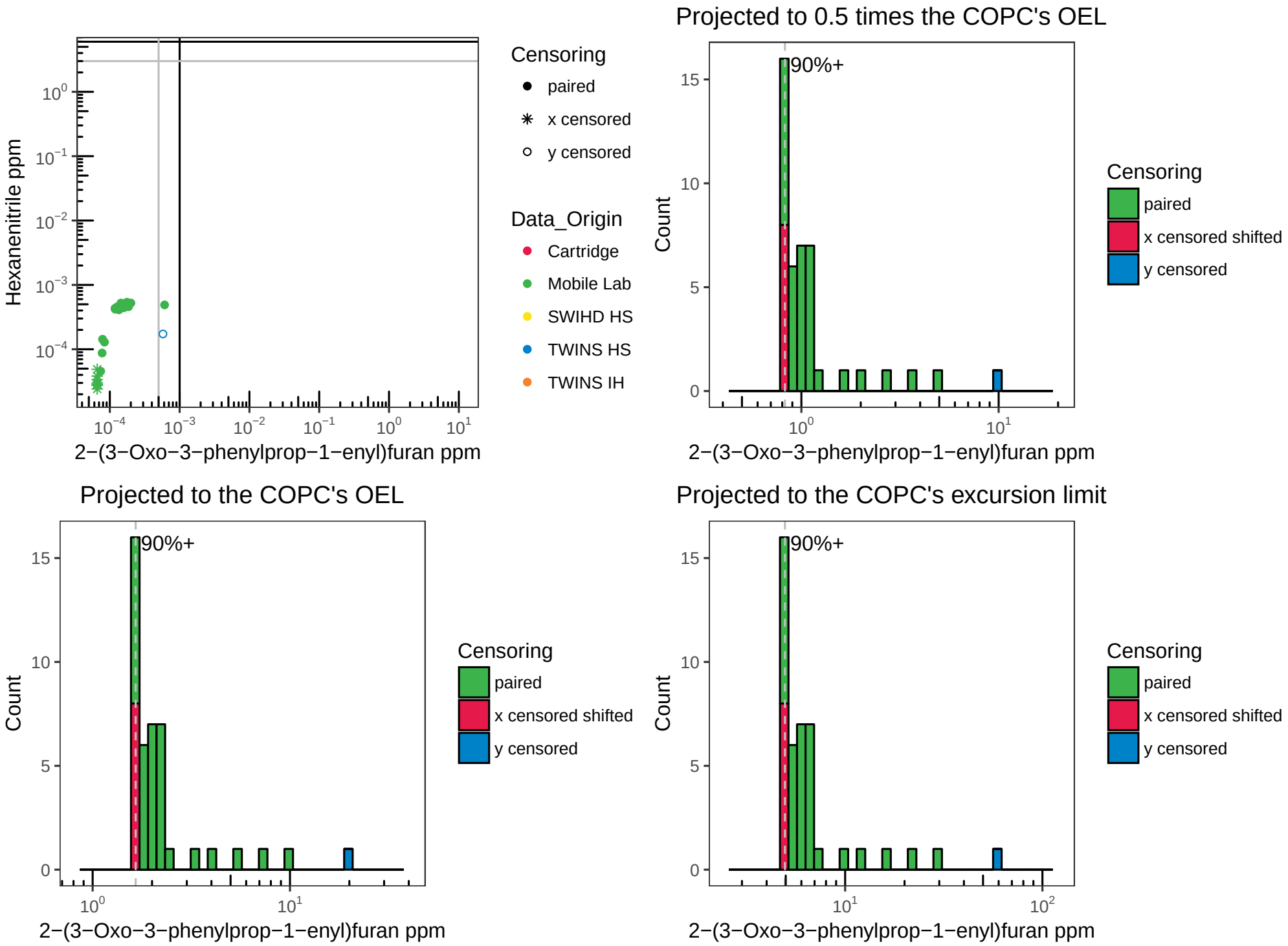


Figure C.1499: Hexanenitrile vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

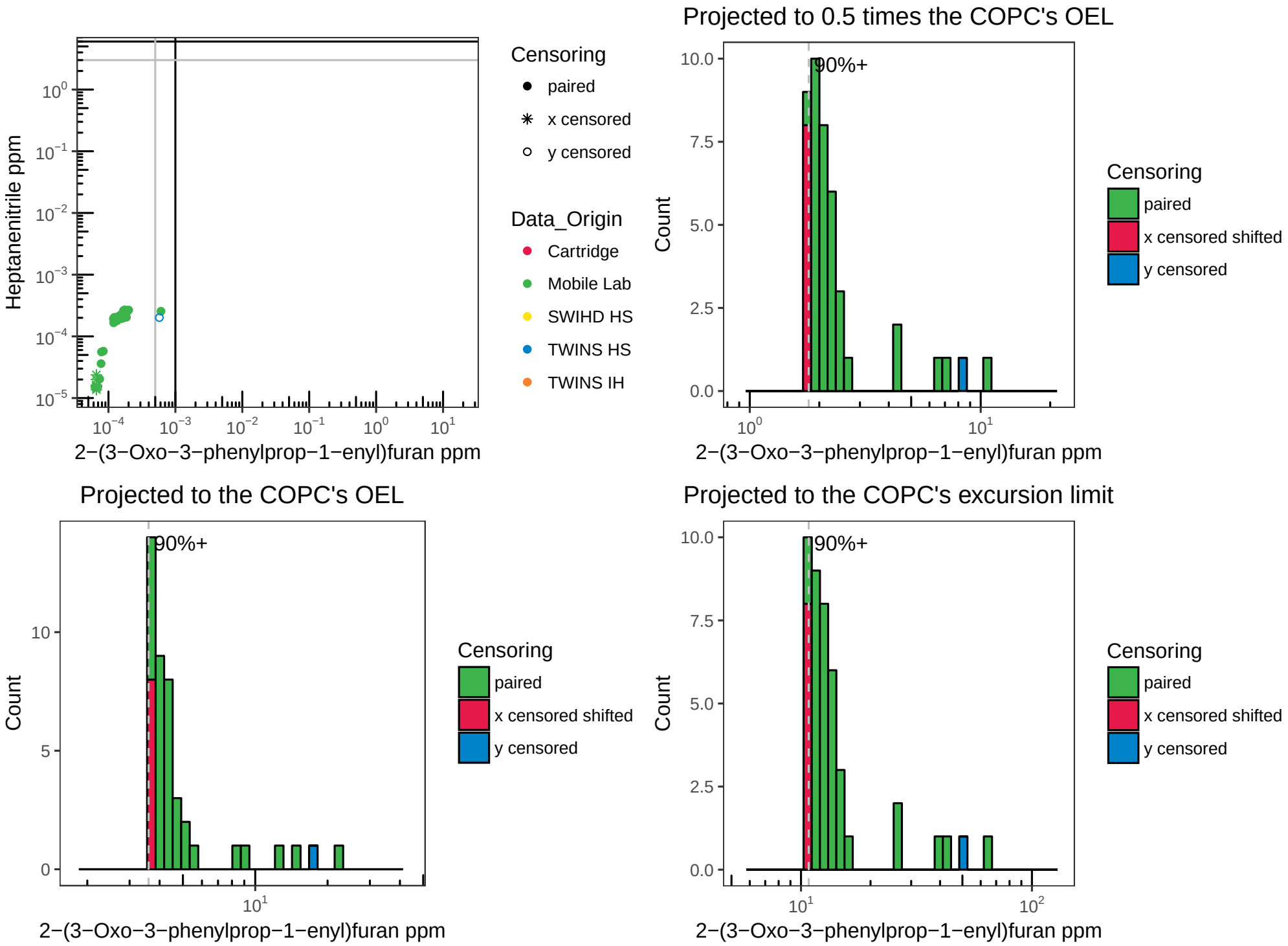


Figure C.1500: Heptanenitrile vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

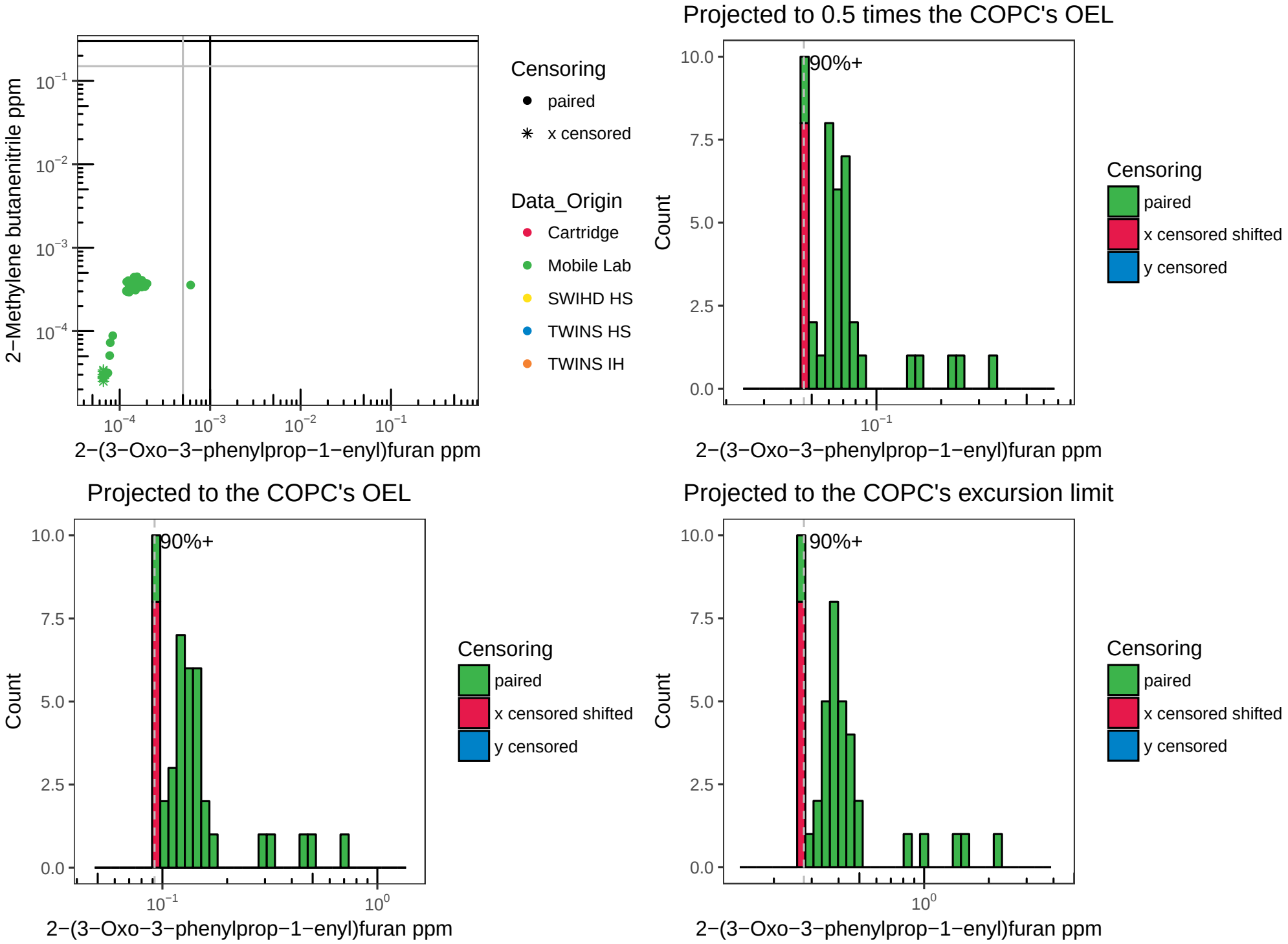


Figure C.1501: 2-Methylene butanenitrile vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

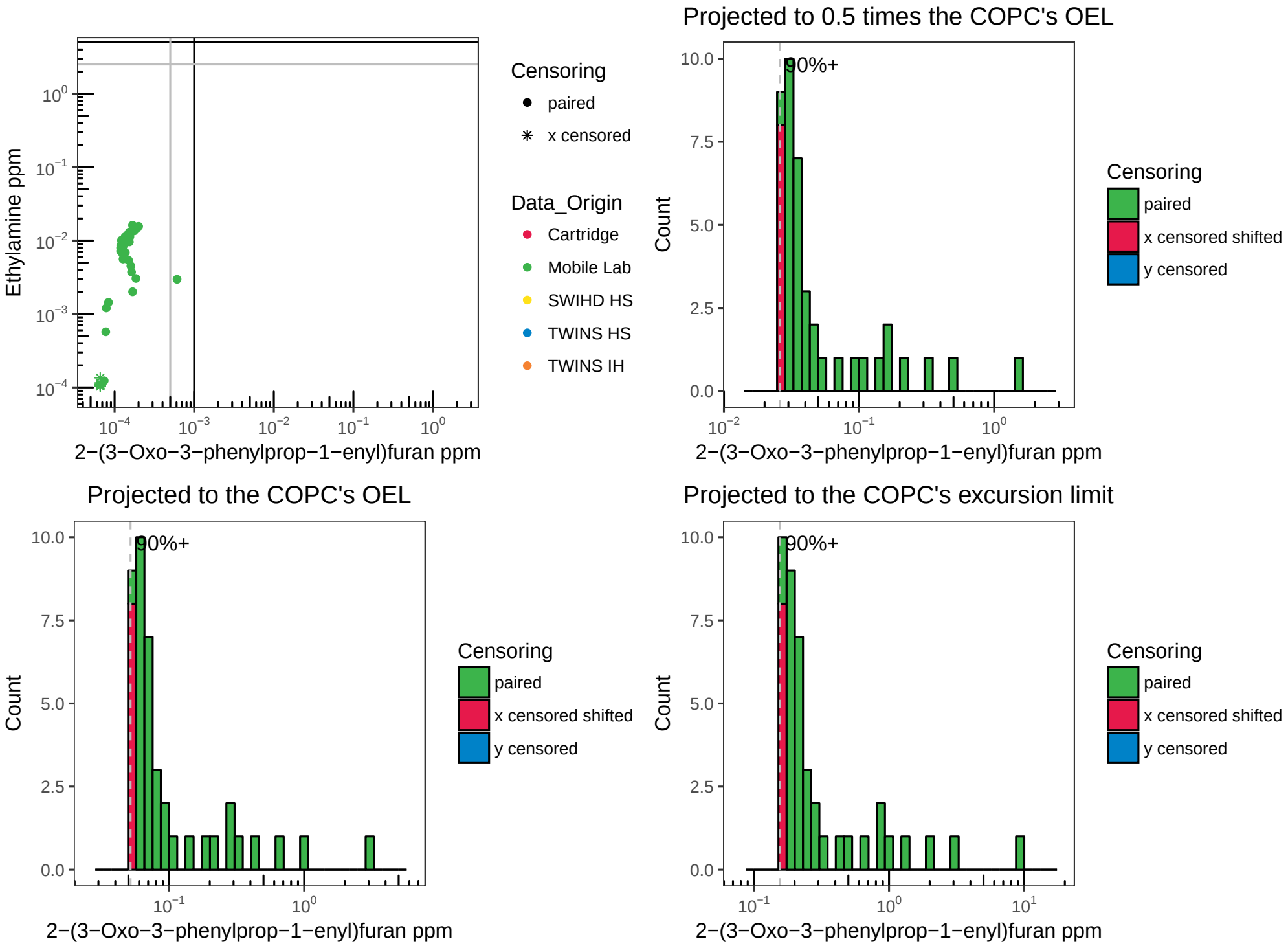


Figure C.1502: Ethylamine vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

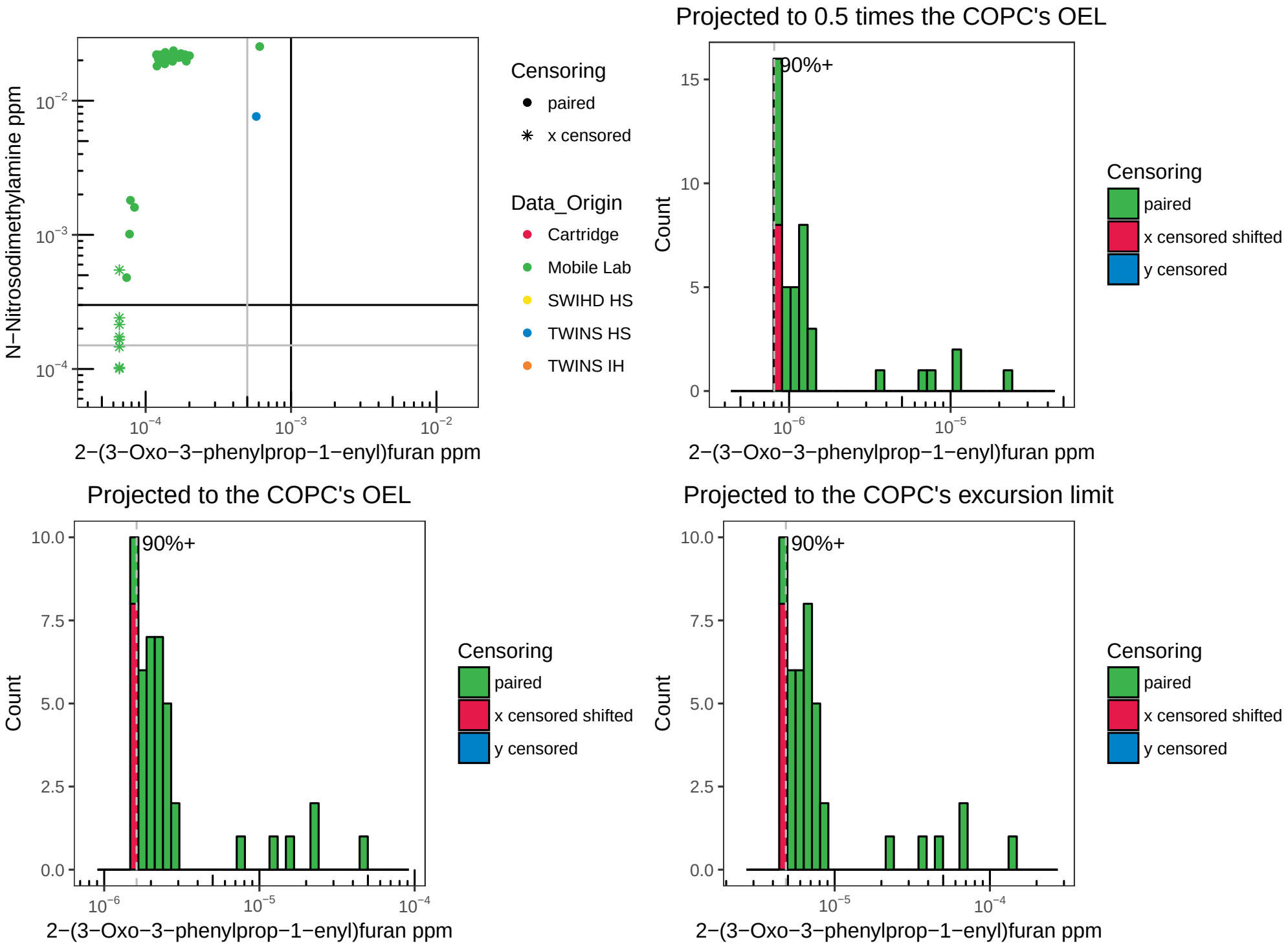


Figure C.1503: N-Nitrosodimethylamine vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

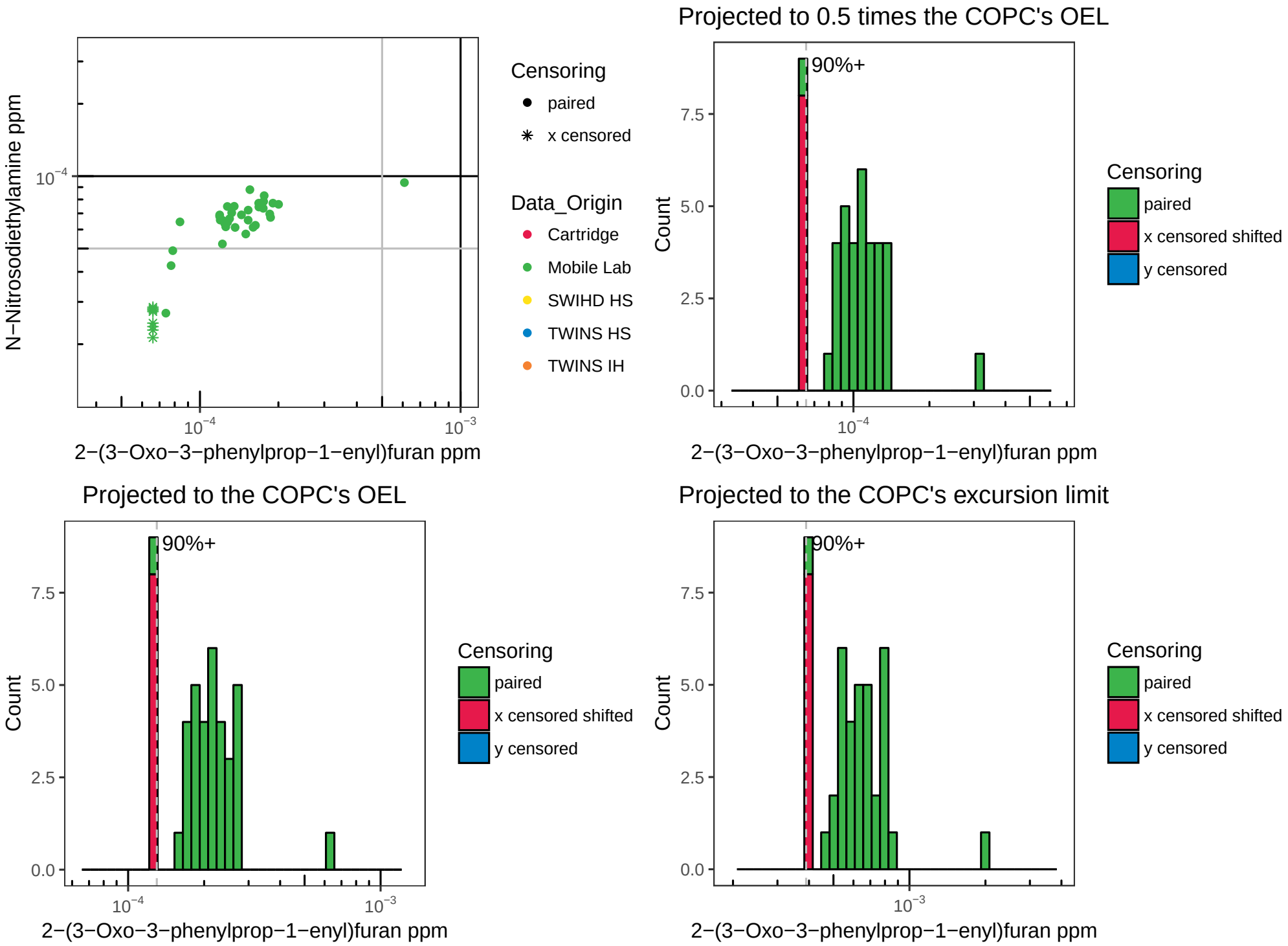


Figure C.1504: N-Nitrosodiethylamine vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

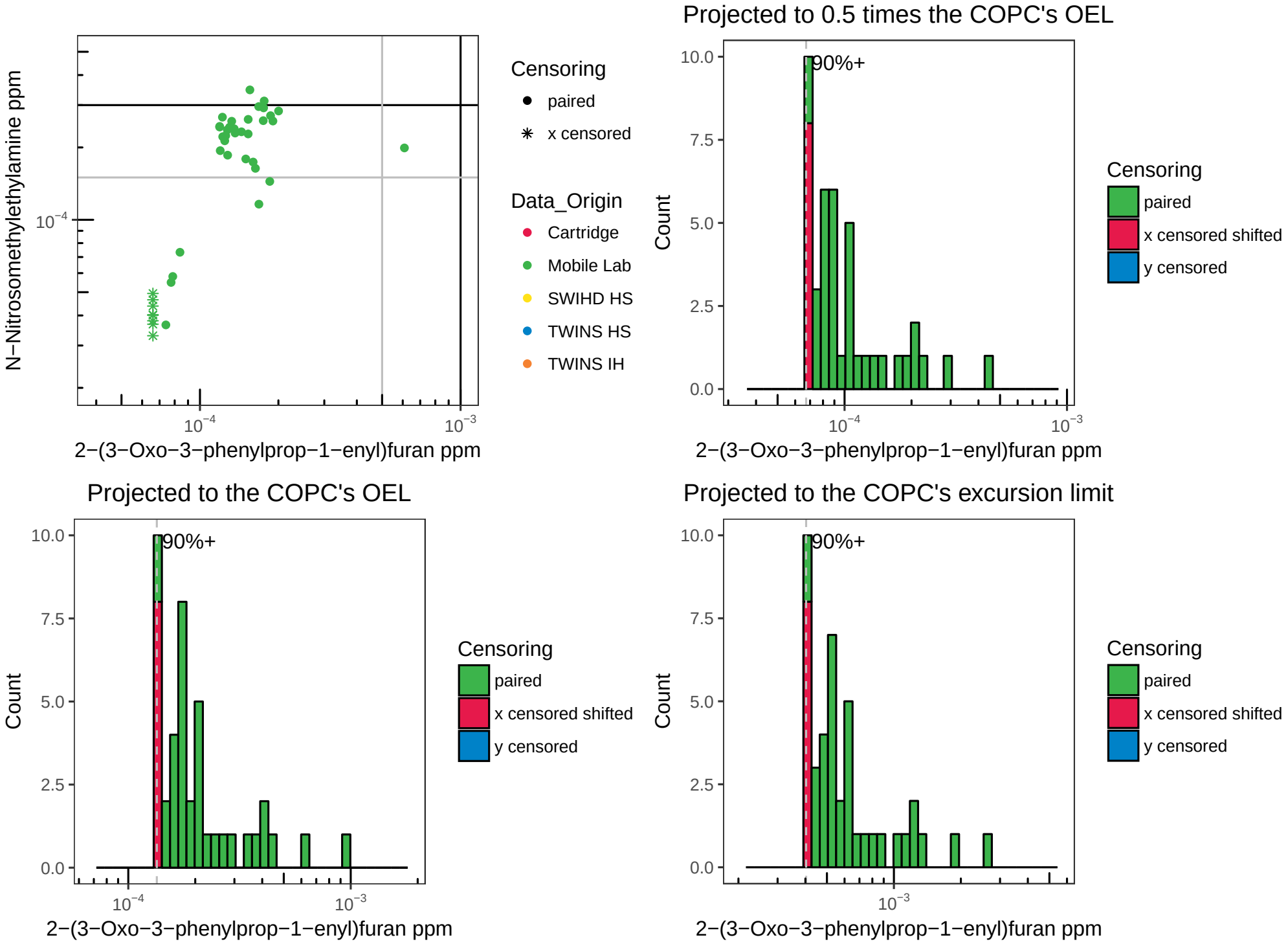


Figure C.1505: N-Nitrosomethylethylamine vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

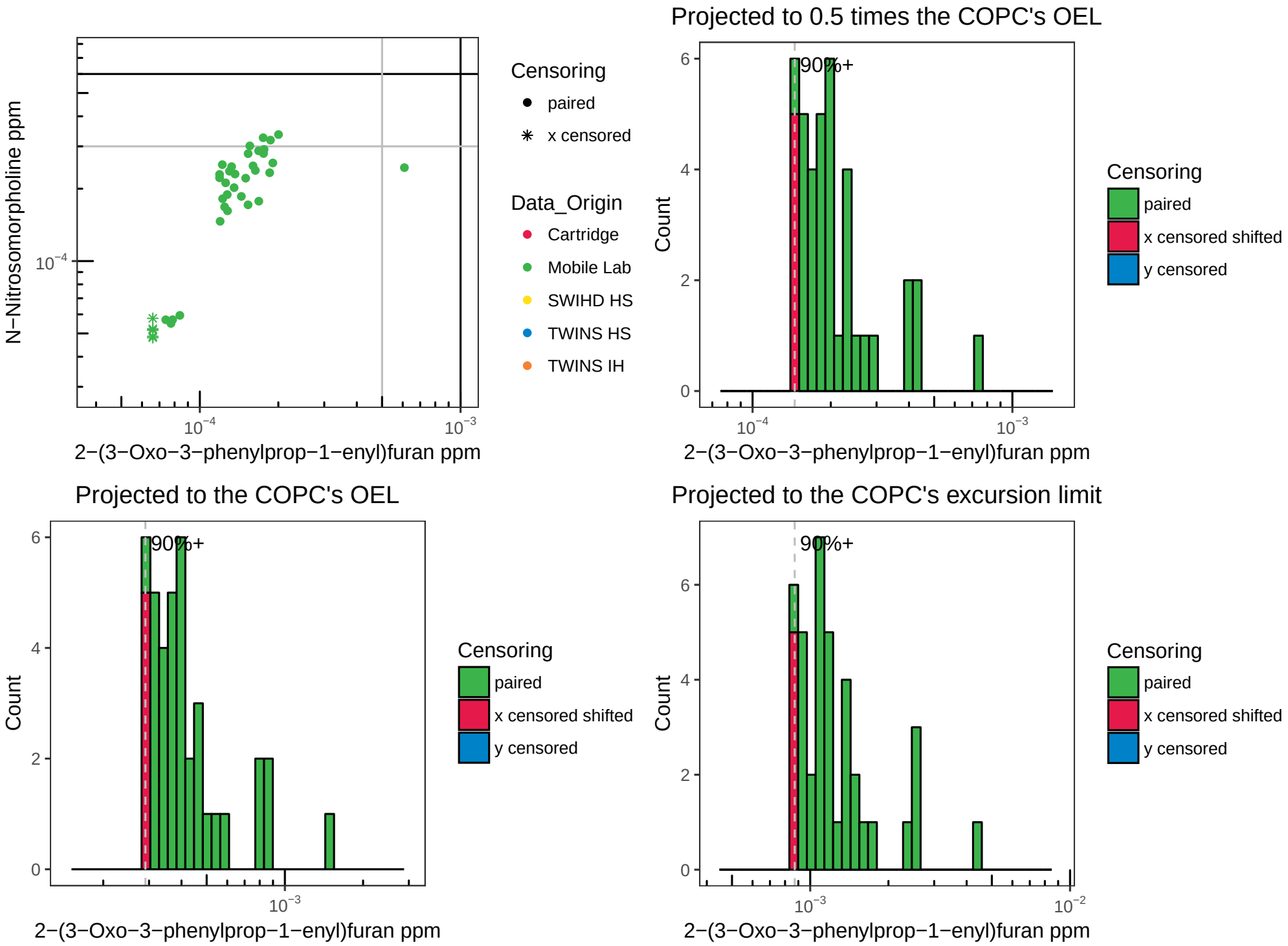


Figure C.1506: N-Nitrosomorpholine vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

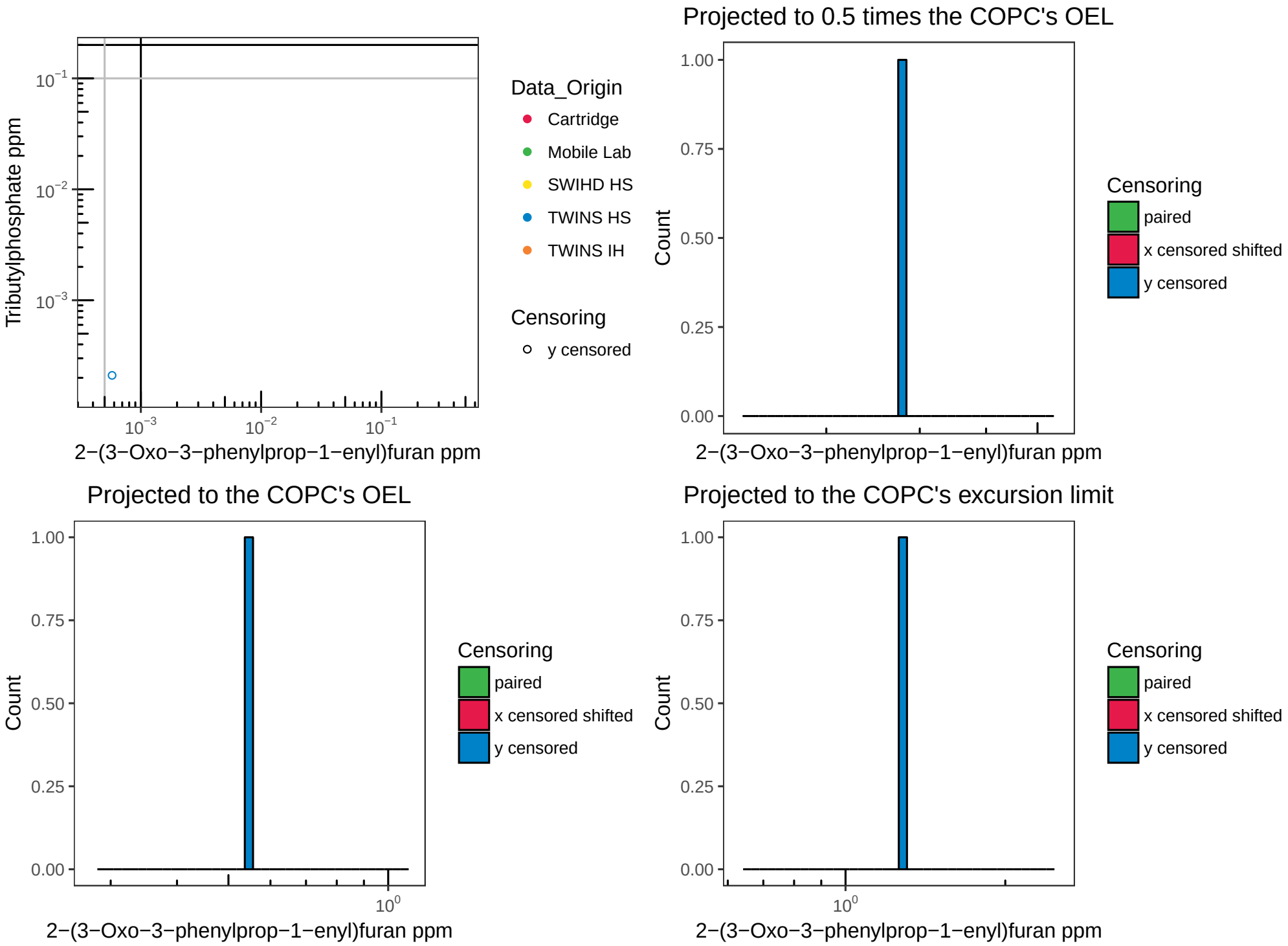


Figure C.1507: Tributylphosphate vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

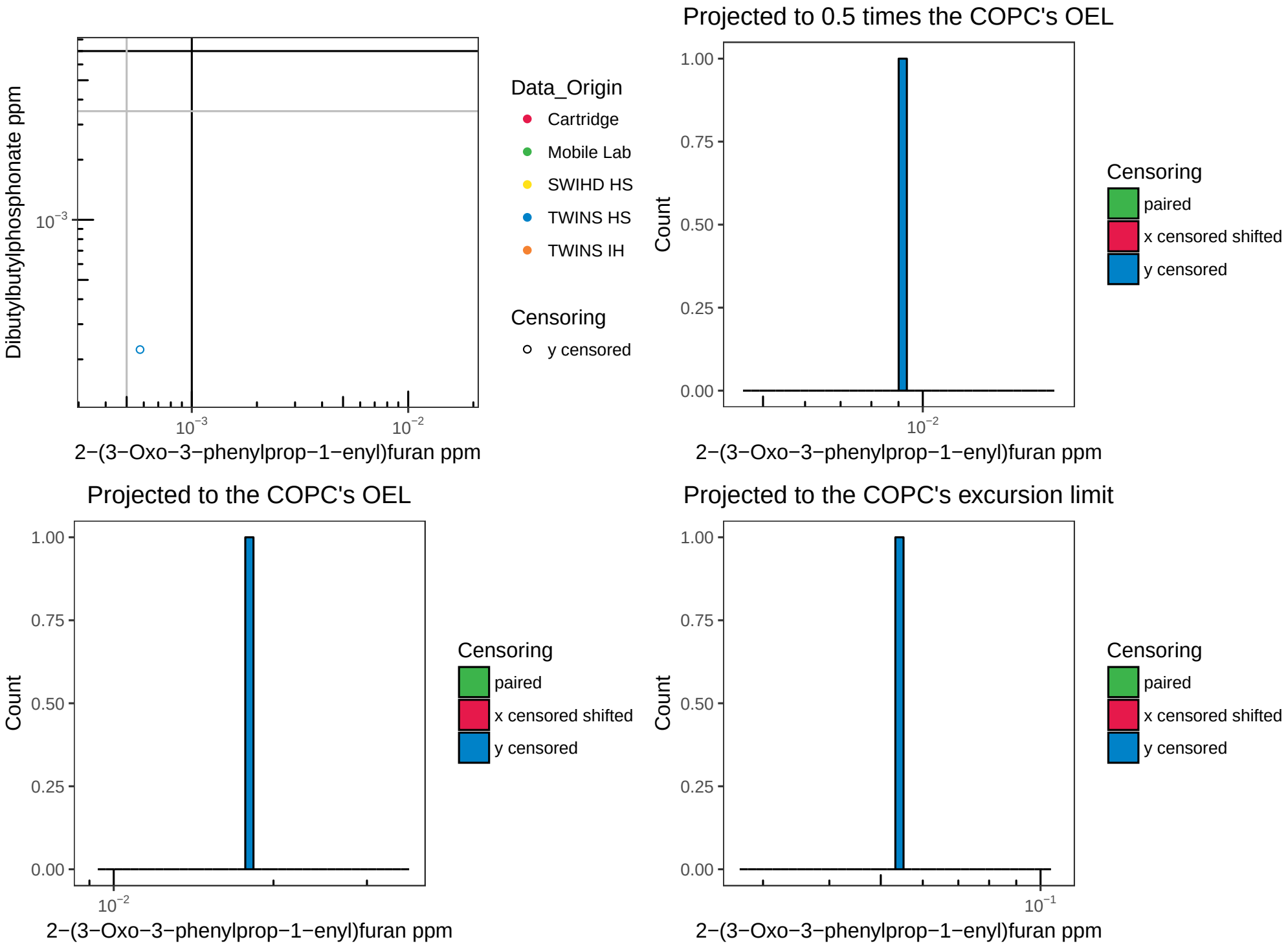


Figure C.1508: Dibutylbutylphosphonate vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

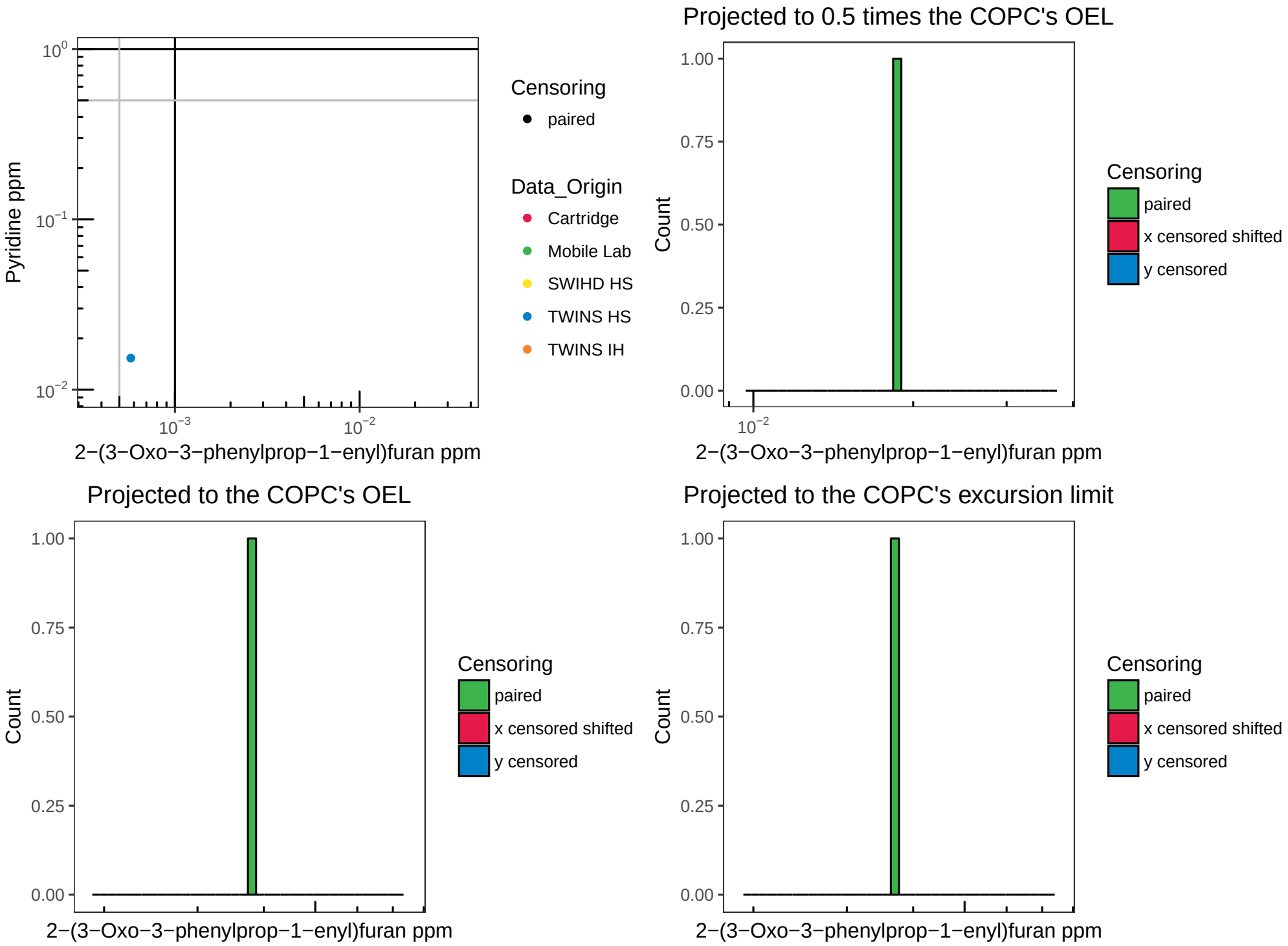


Figure C.1509: Pyridine vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

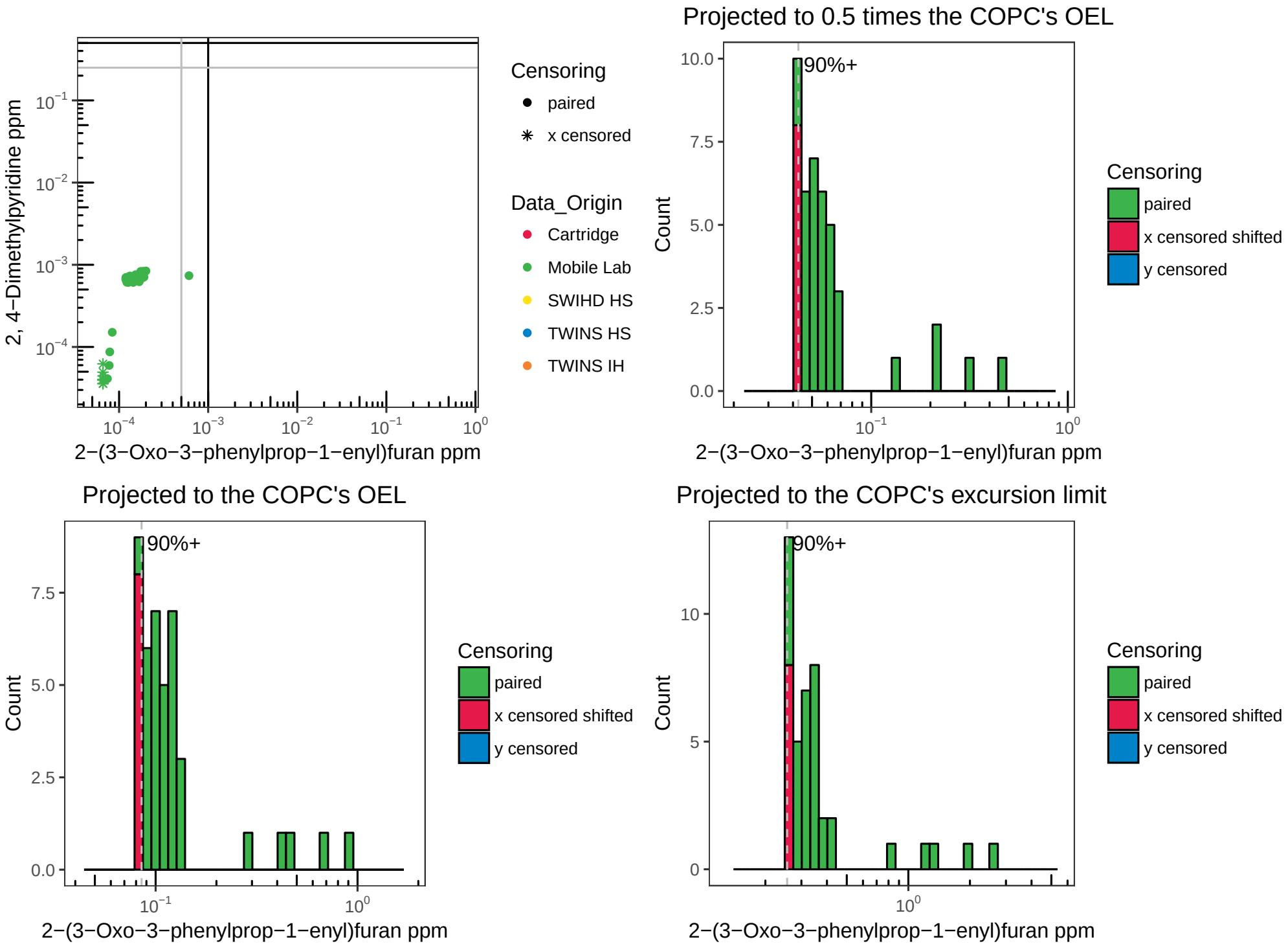


Figure C.1510: 2, 4-Dimethylpyridine vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

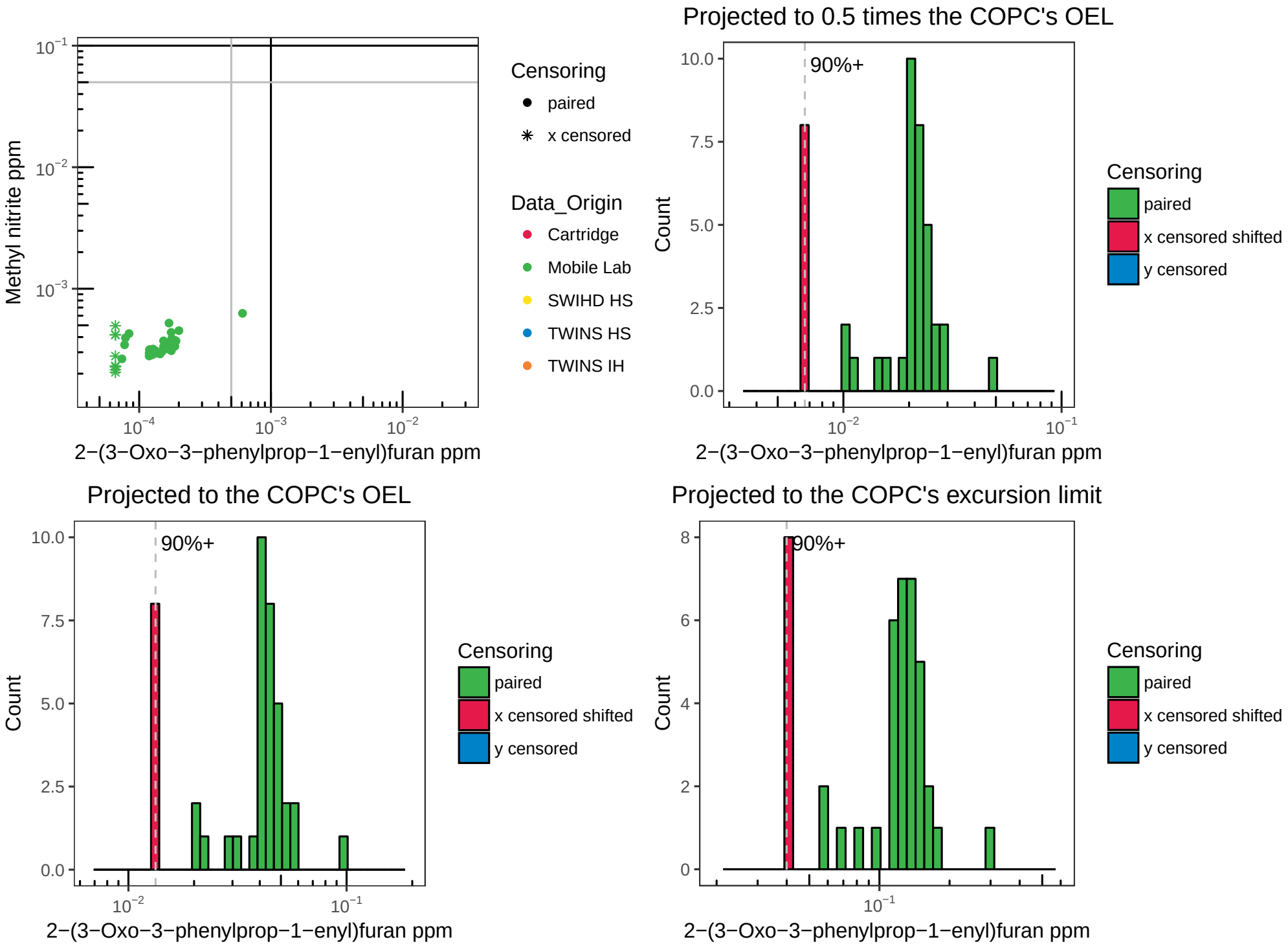


Figure C.1511: Methyl nitrite vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

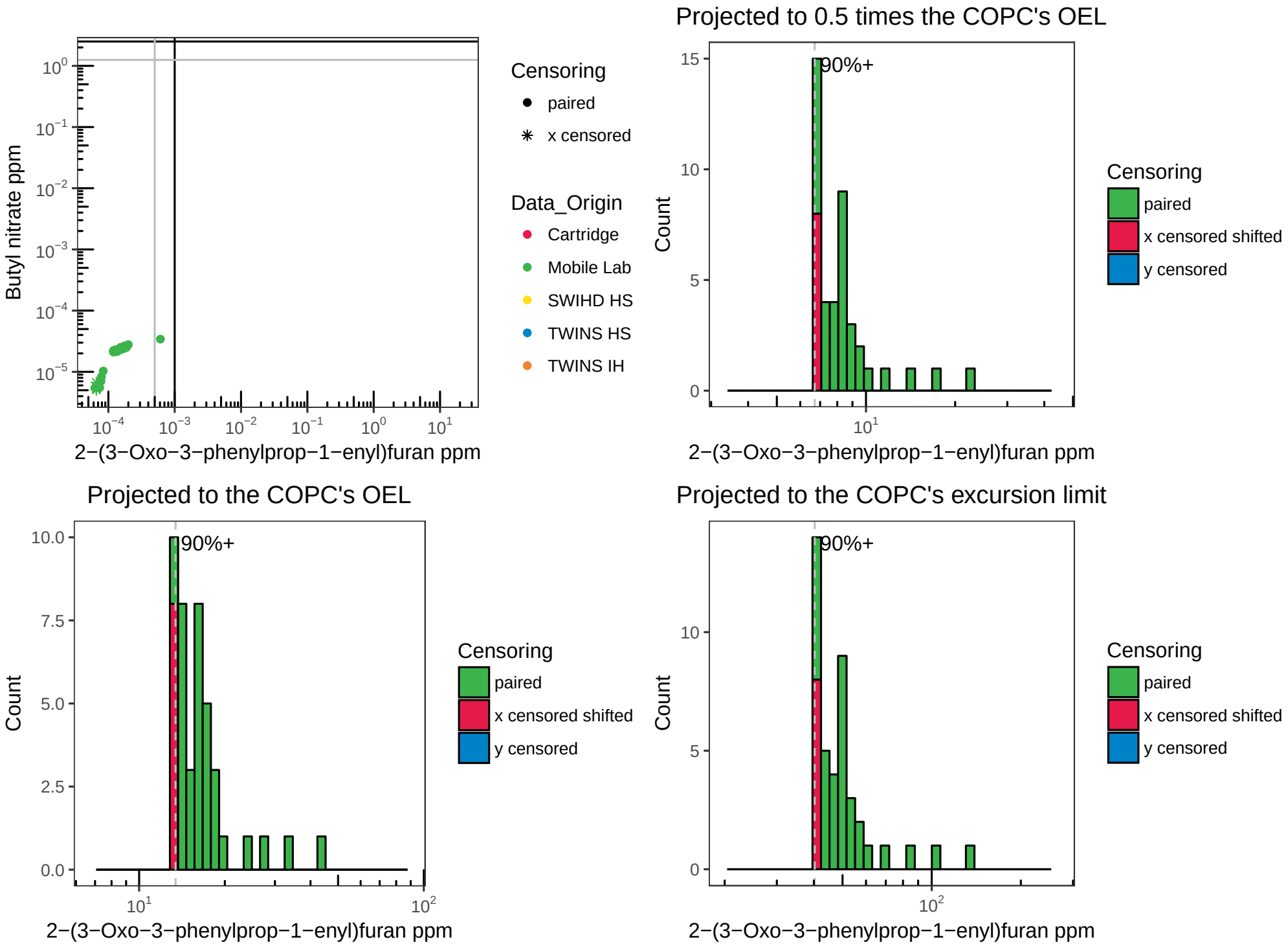


Figure C.1512: Butyl nitrate vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

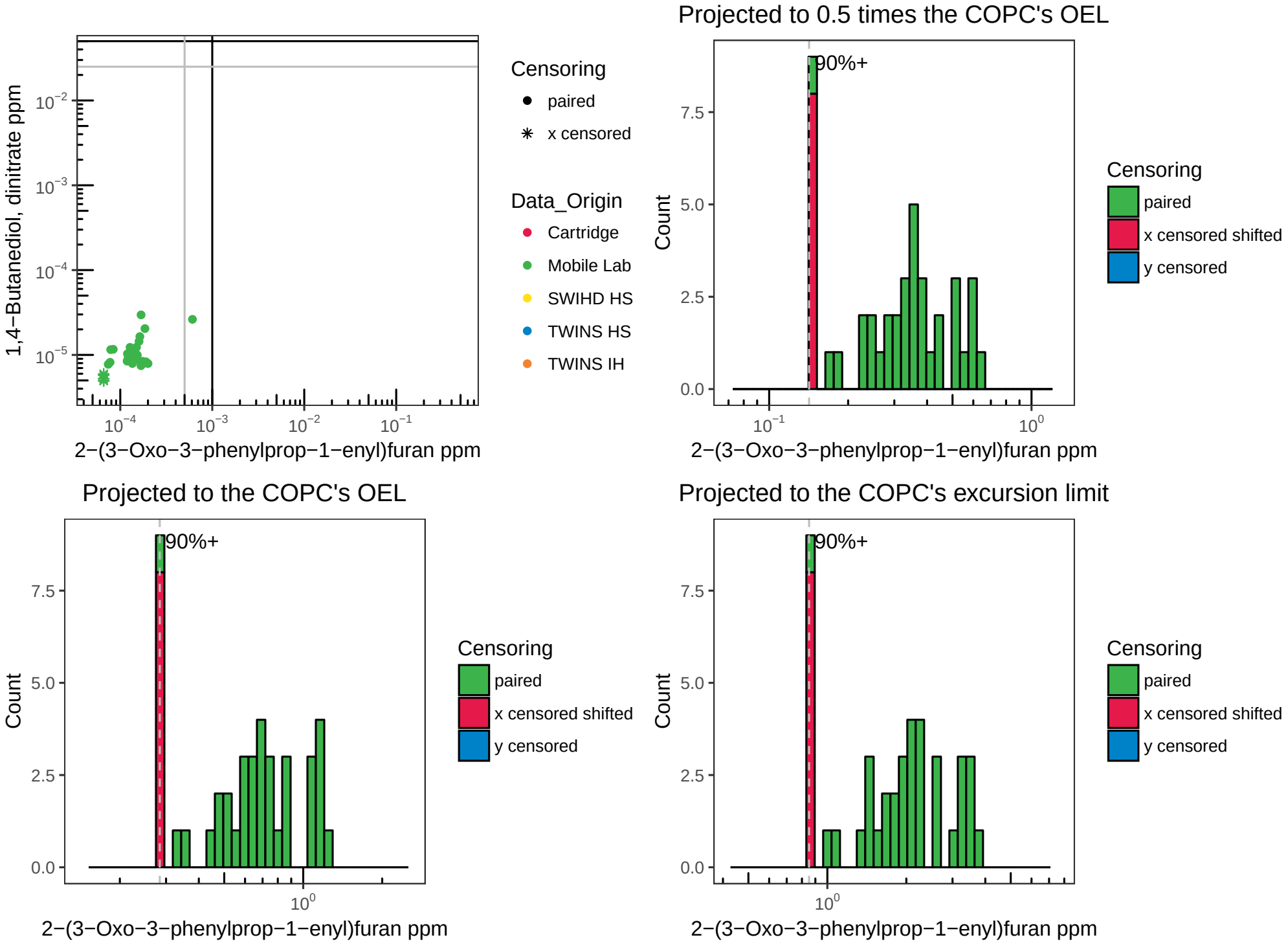


Figure C.1513: 1,4-Butanediol, dinitrate vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

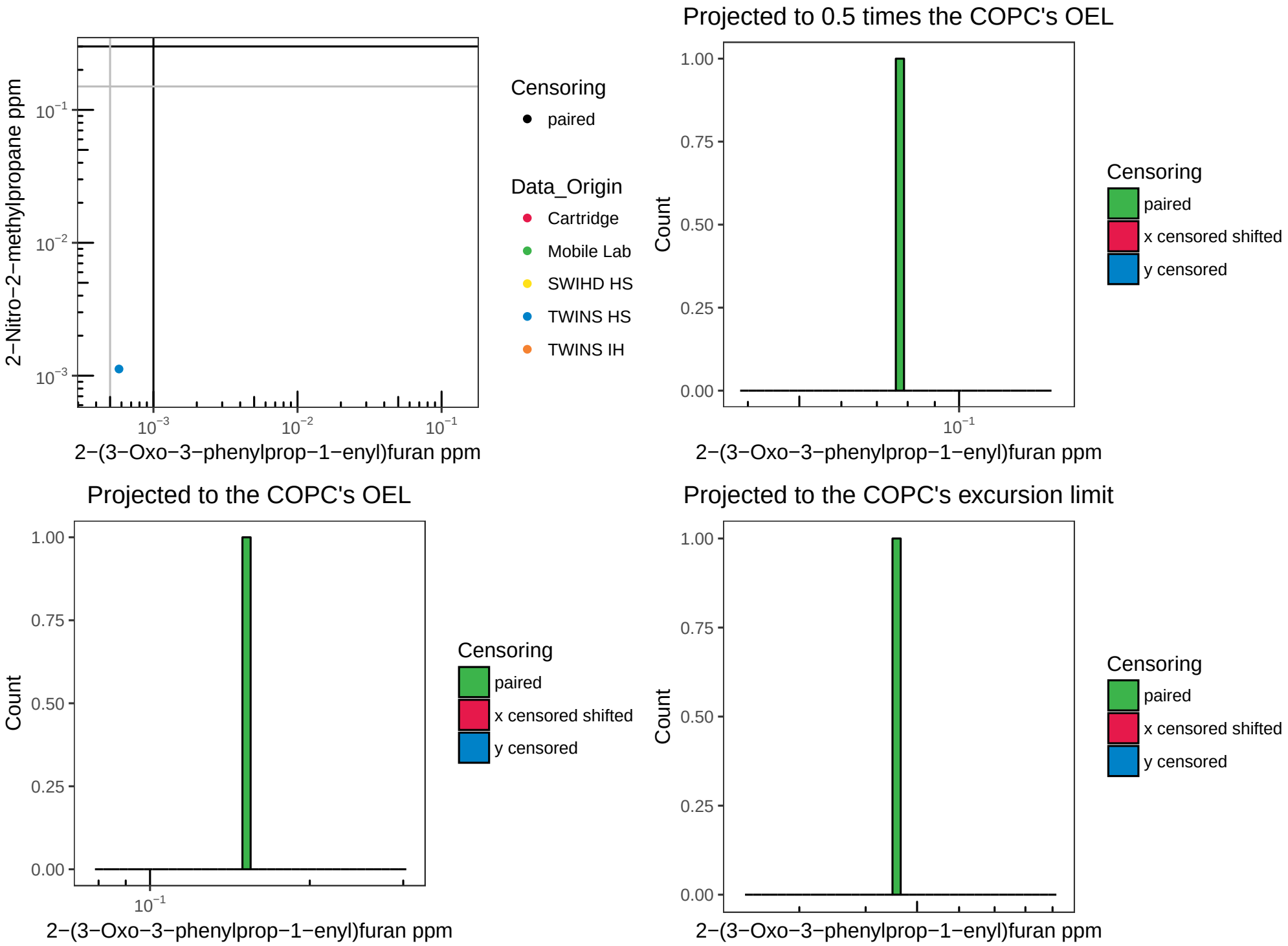


Figure C.1514: 2-Nitro-2-methylpropane vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

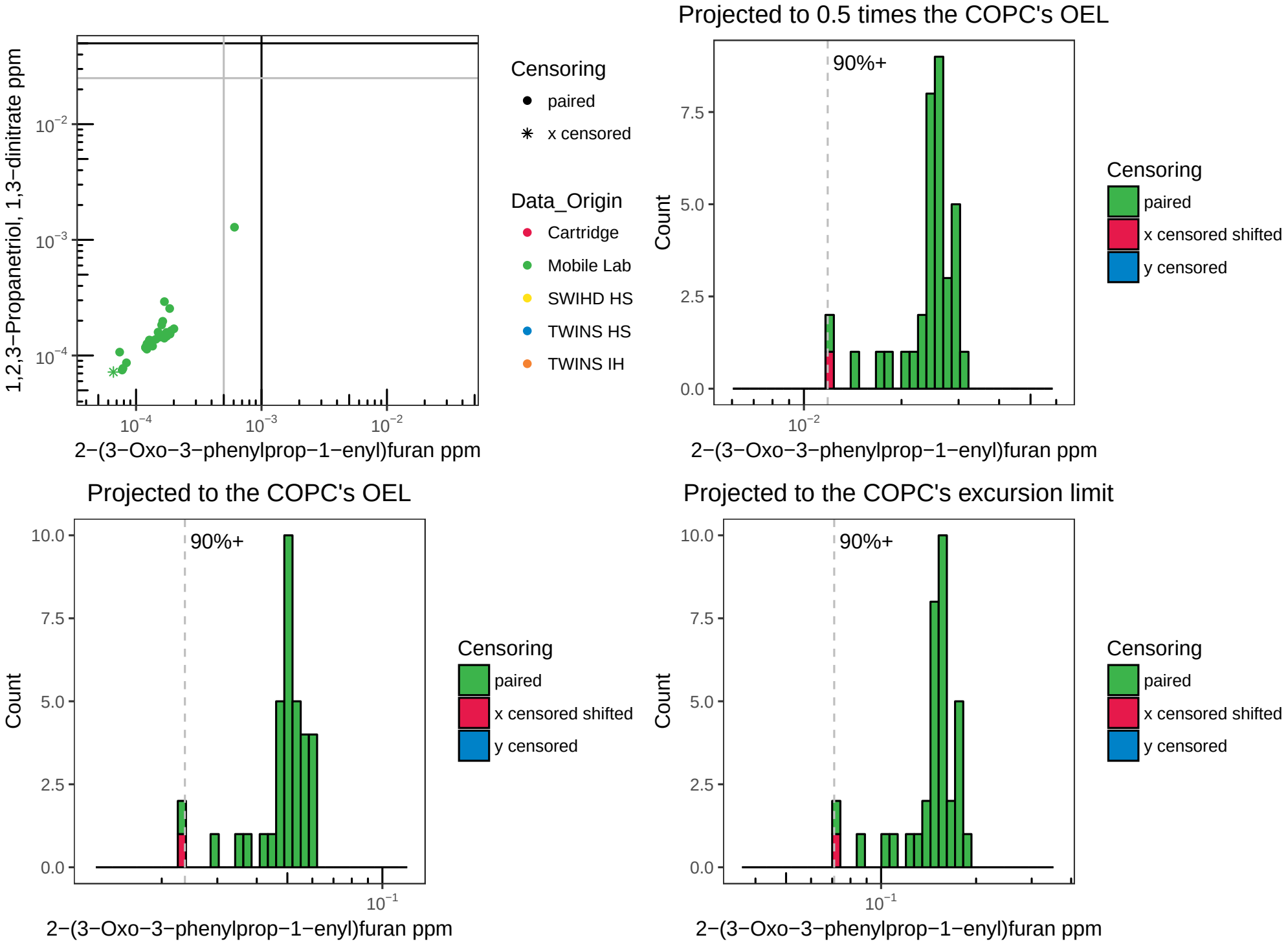


Figure C.1515: 1,2,3-Propanetriol, 1,3-dinitrate vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

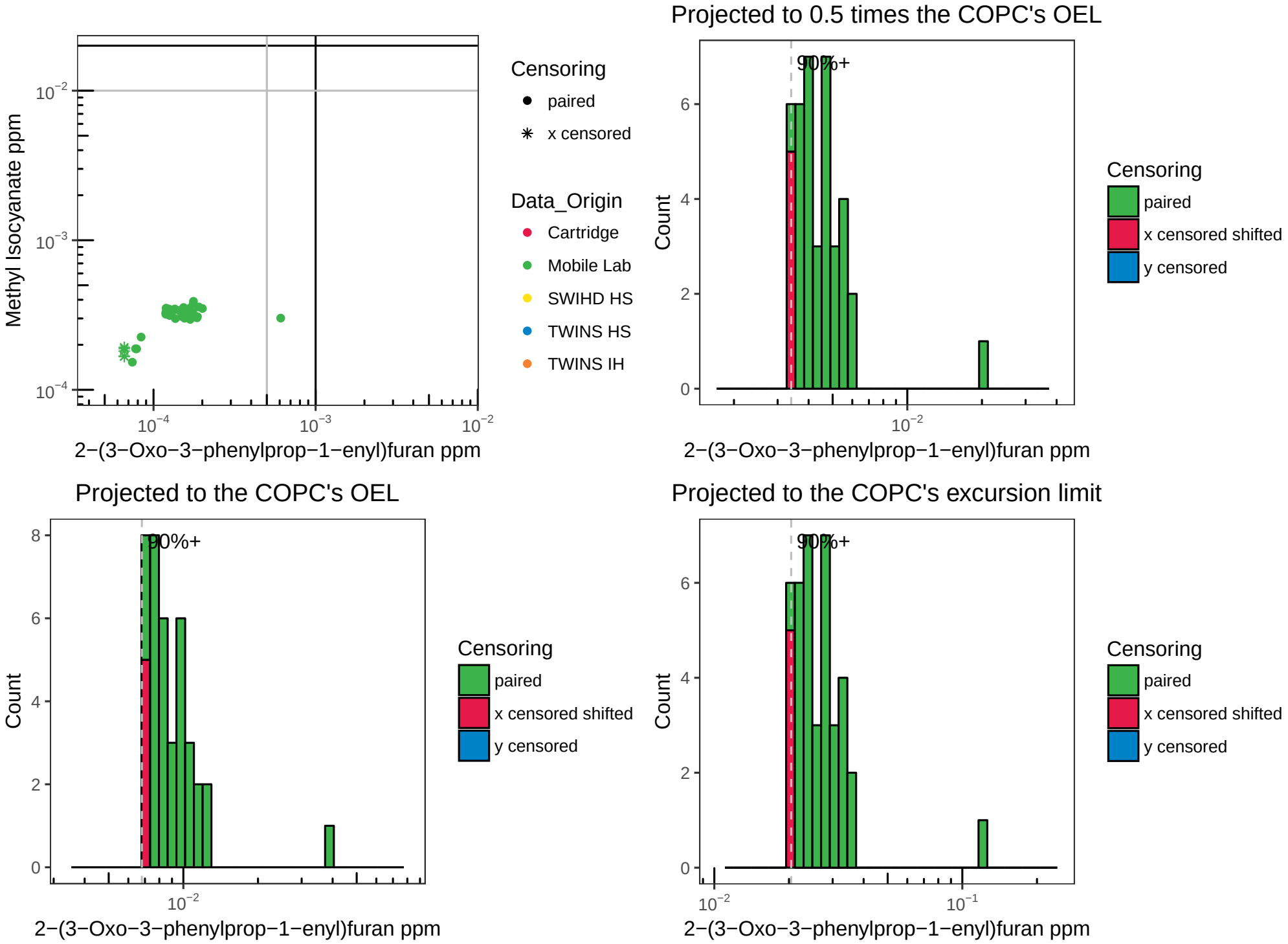


Figure C.1516: Methyl Isocyanate vs 2-(3-Oxo-3-phenylprop-1-enyl)furan

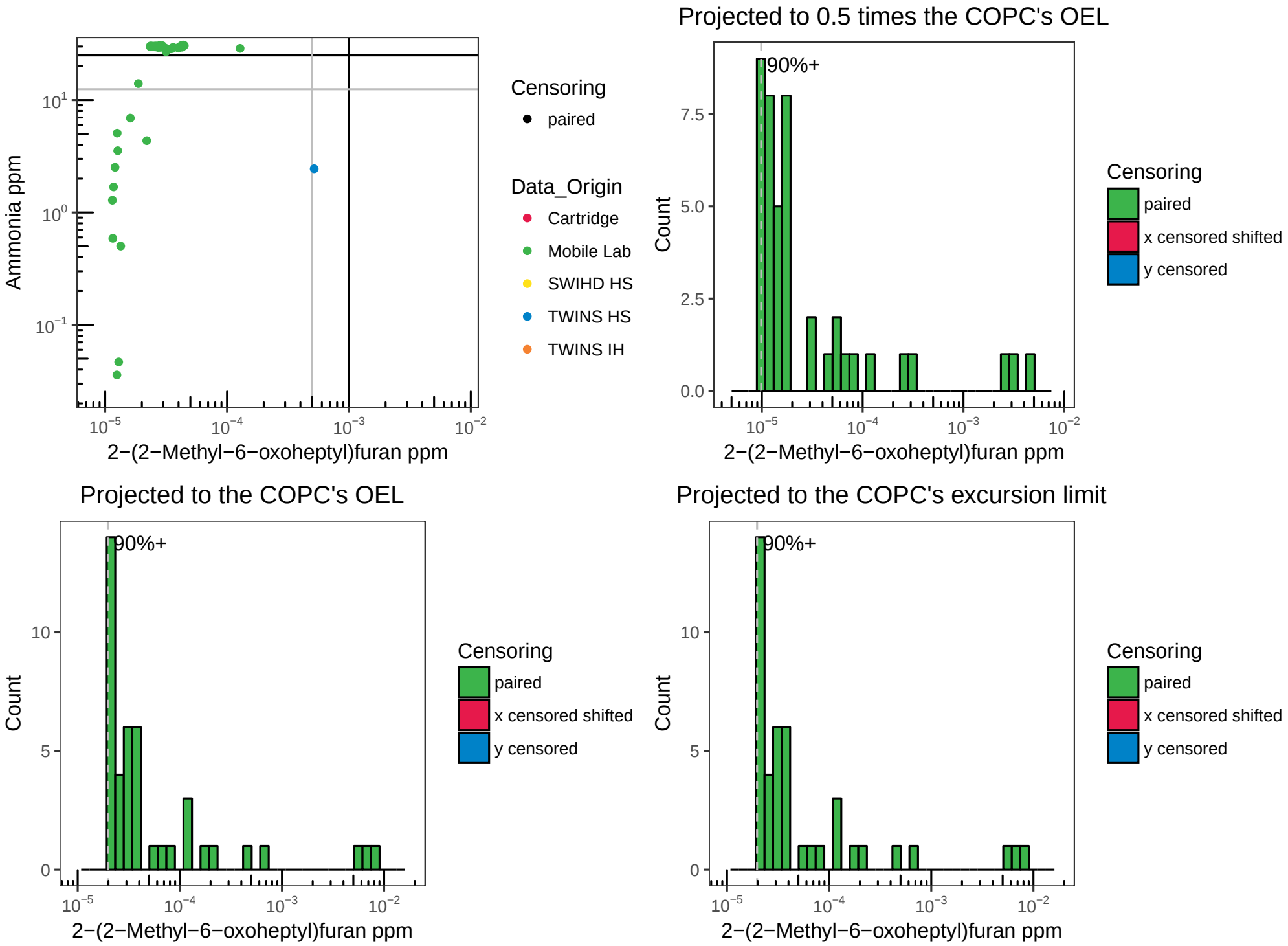


Figure C.1517: Ammonia vs 2-(2-Methyl-6-oxoheptyl)furan

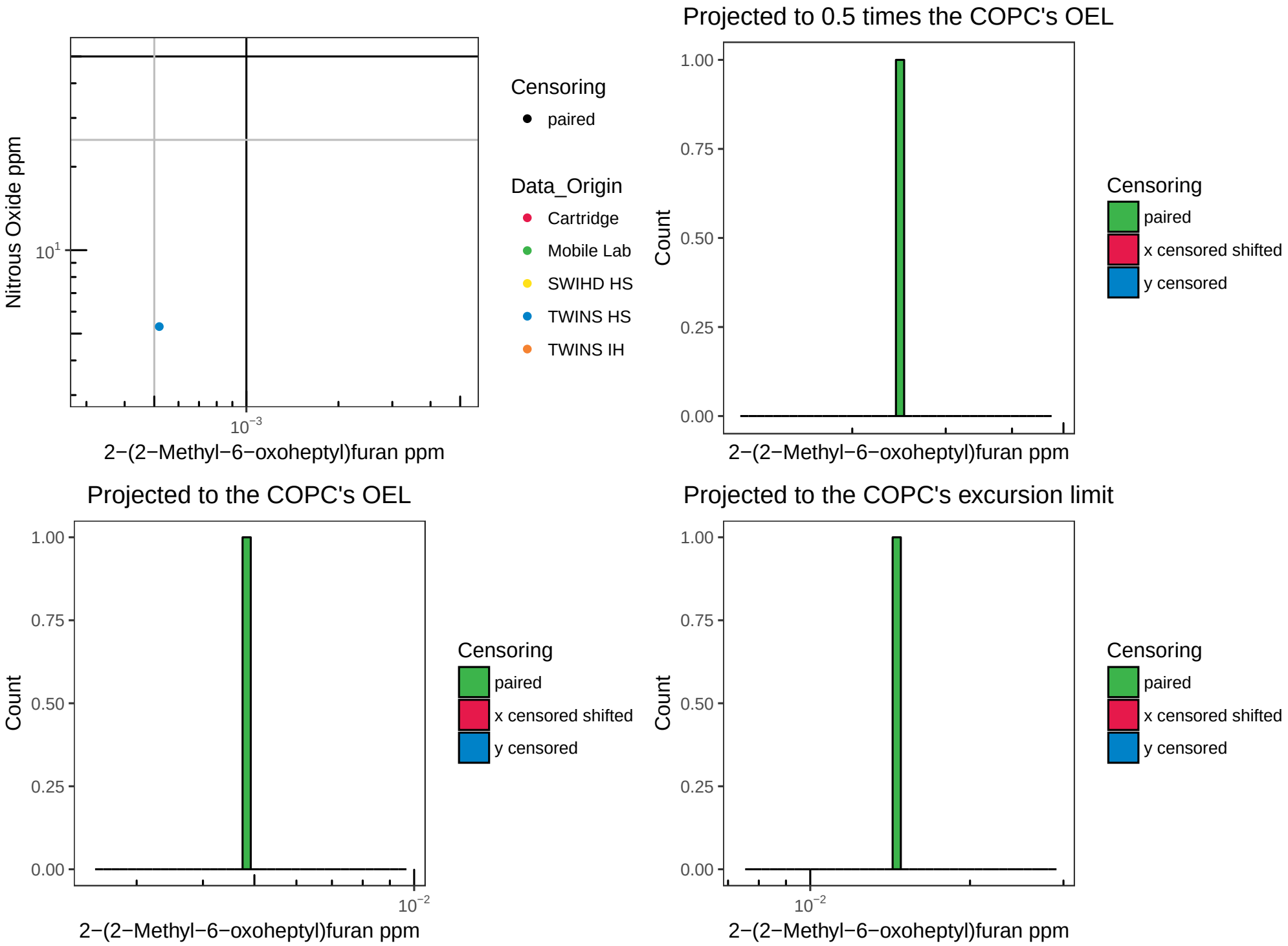


Figure C.1518: Nitrous Oxide vs 2-(2-Methyl-6-oxoheptyl)furan

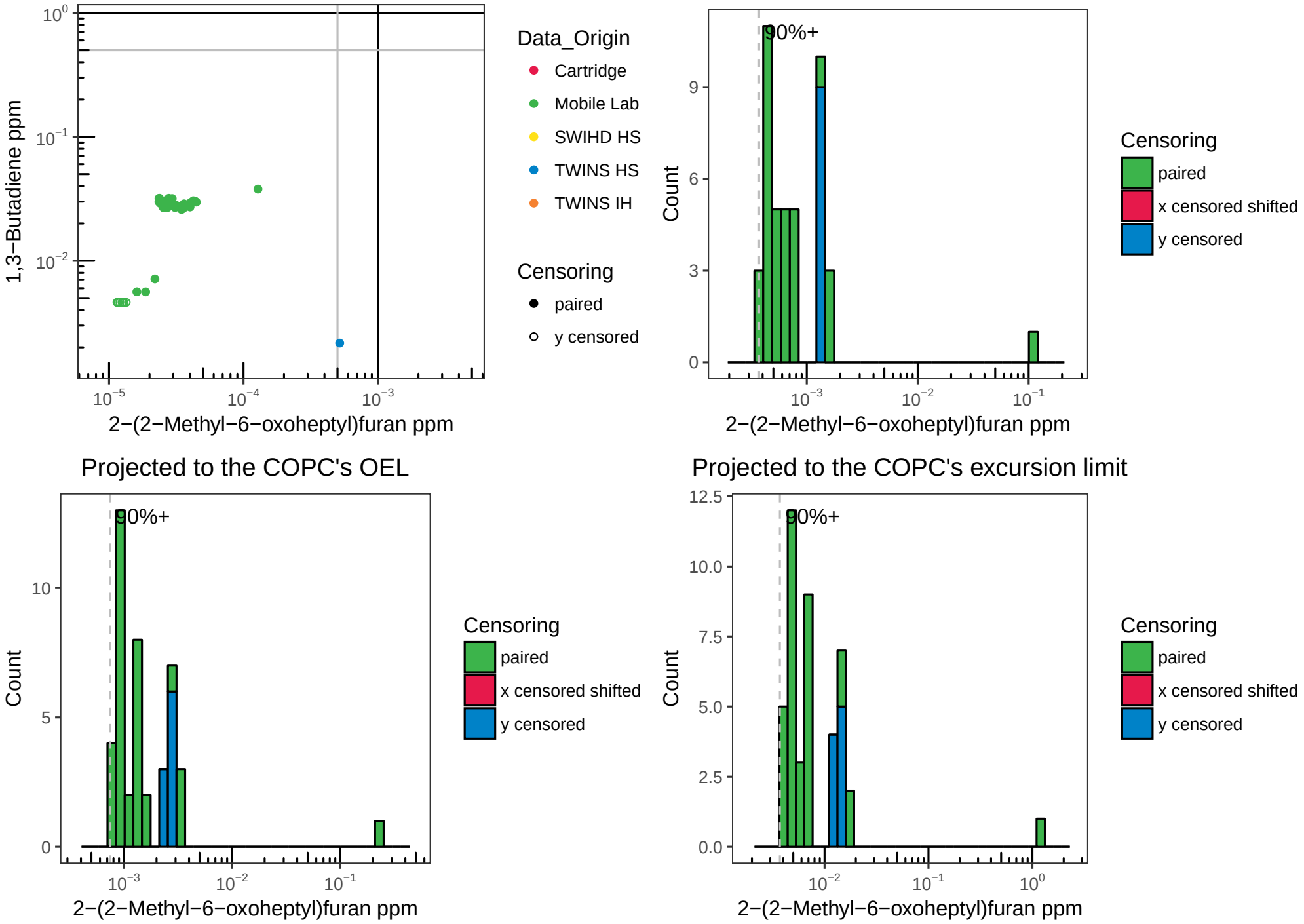


Figure C.1519: 1,3-Butadiene vs 2-(2-Methyl-6-oxoheptyl)furan

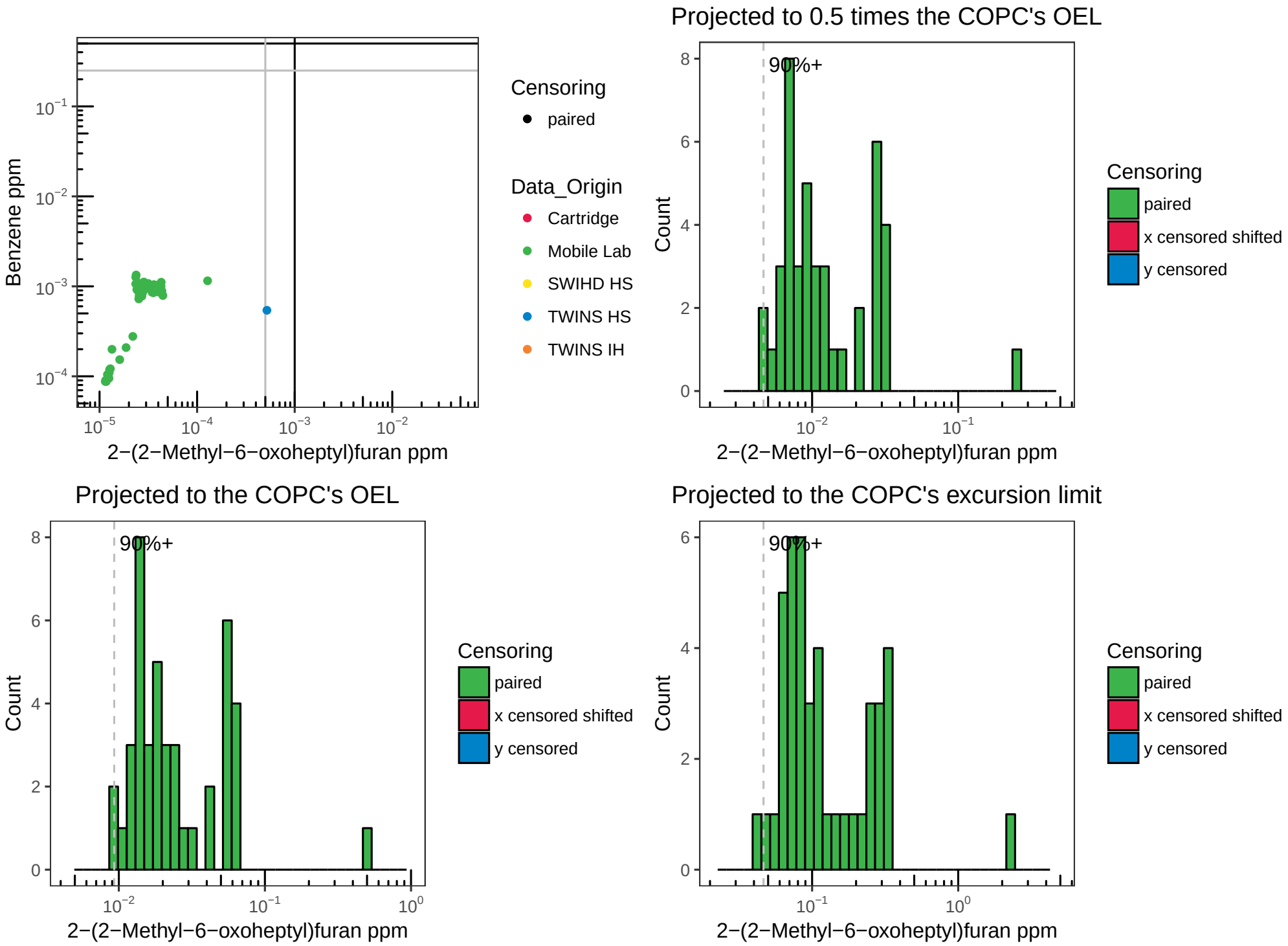


Figure C.1520: Benzene vs 2-(2-Methyl-6-oxoheptyl)furan

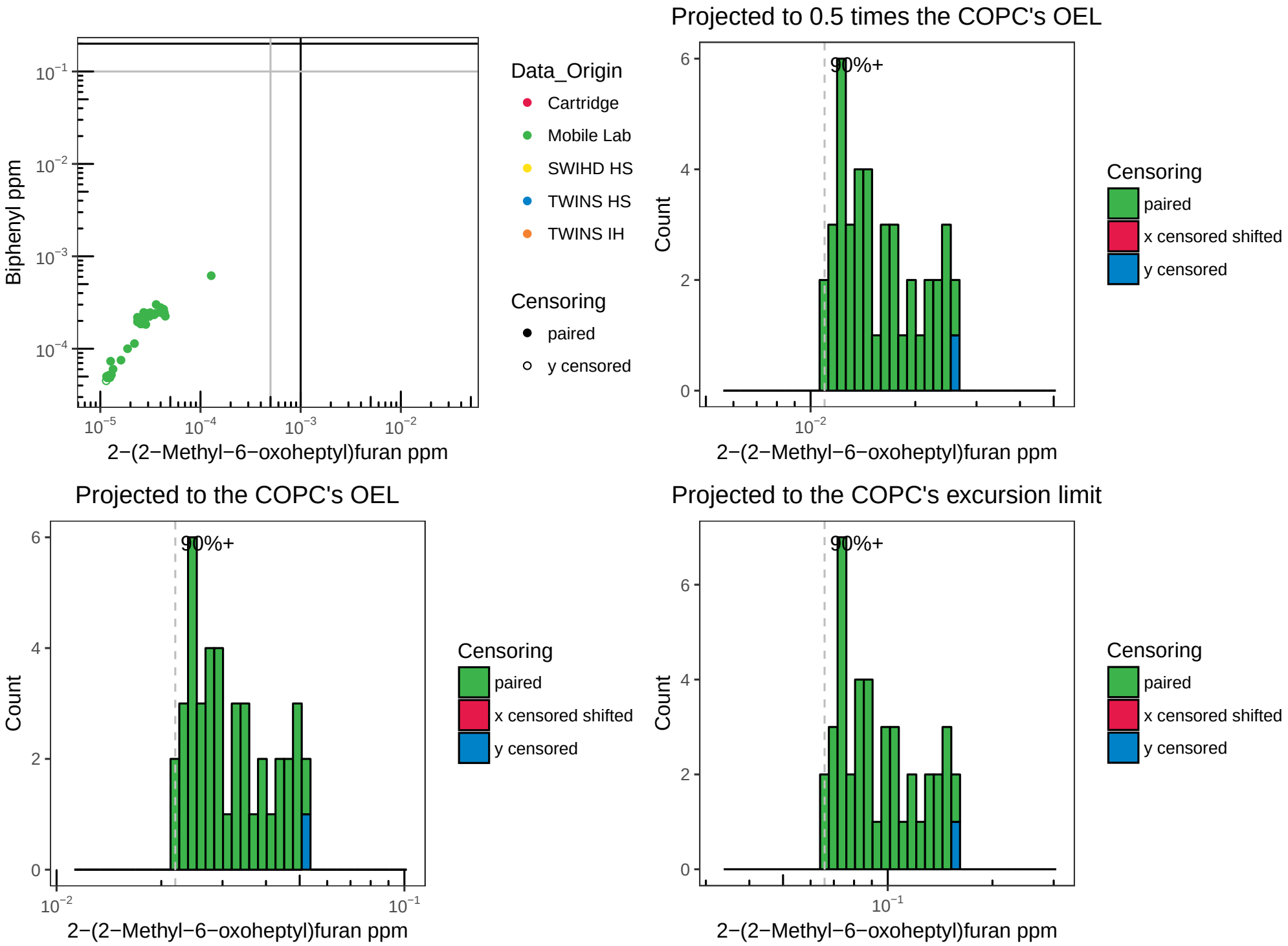


Figure C.1521: Biphenyl vs 2-(2-Methyl-6-oxoheptyl)furan

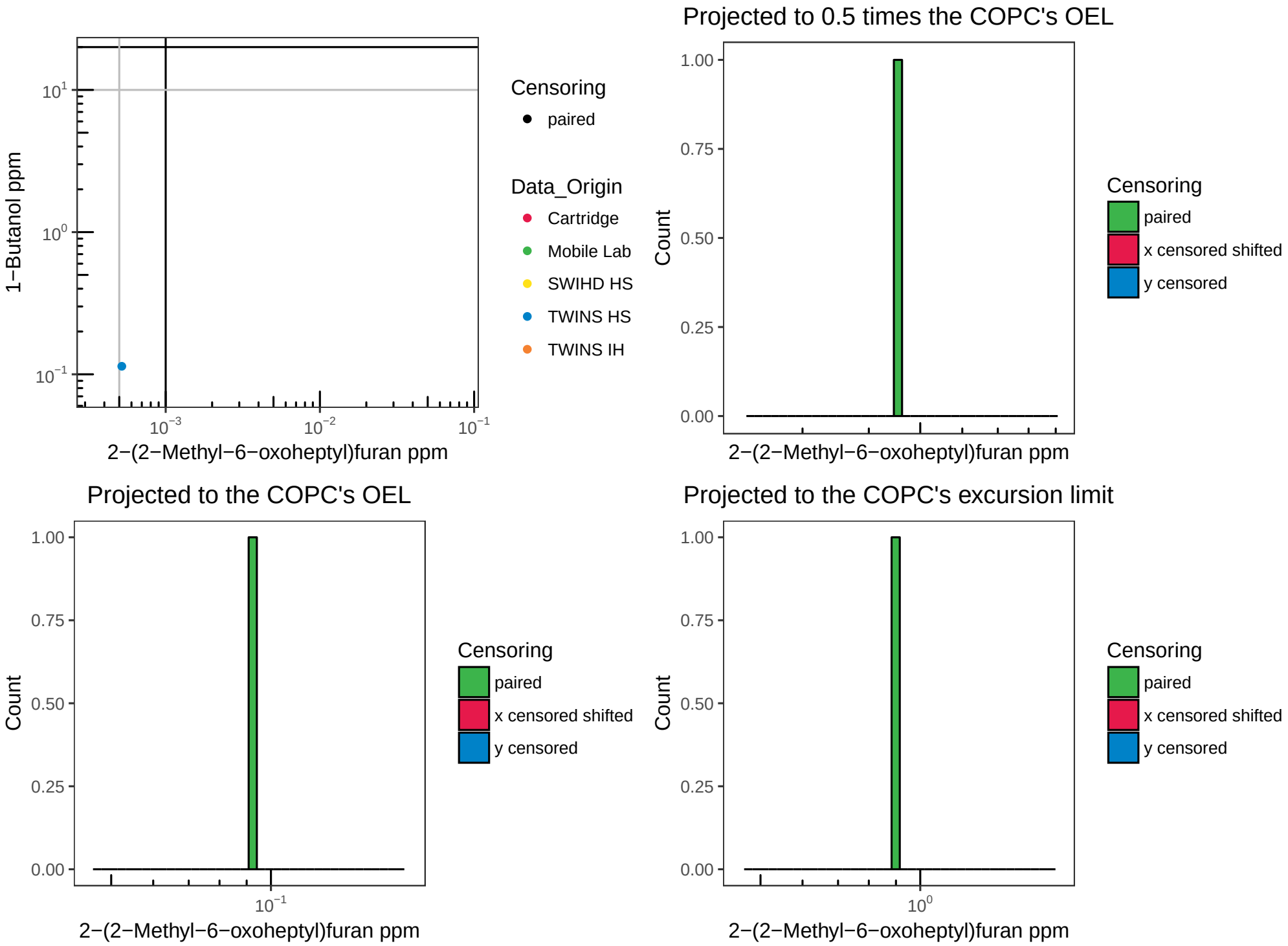


Figure C.1522: 1-Butanol vs 2-(2-Methyl-6-oxoheptyl)furan

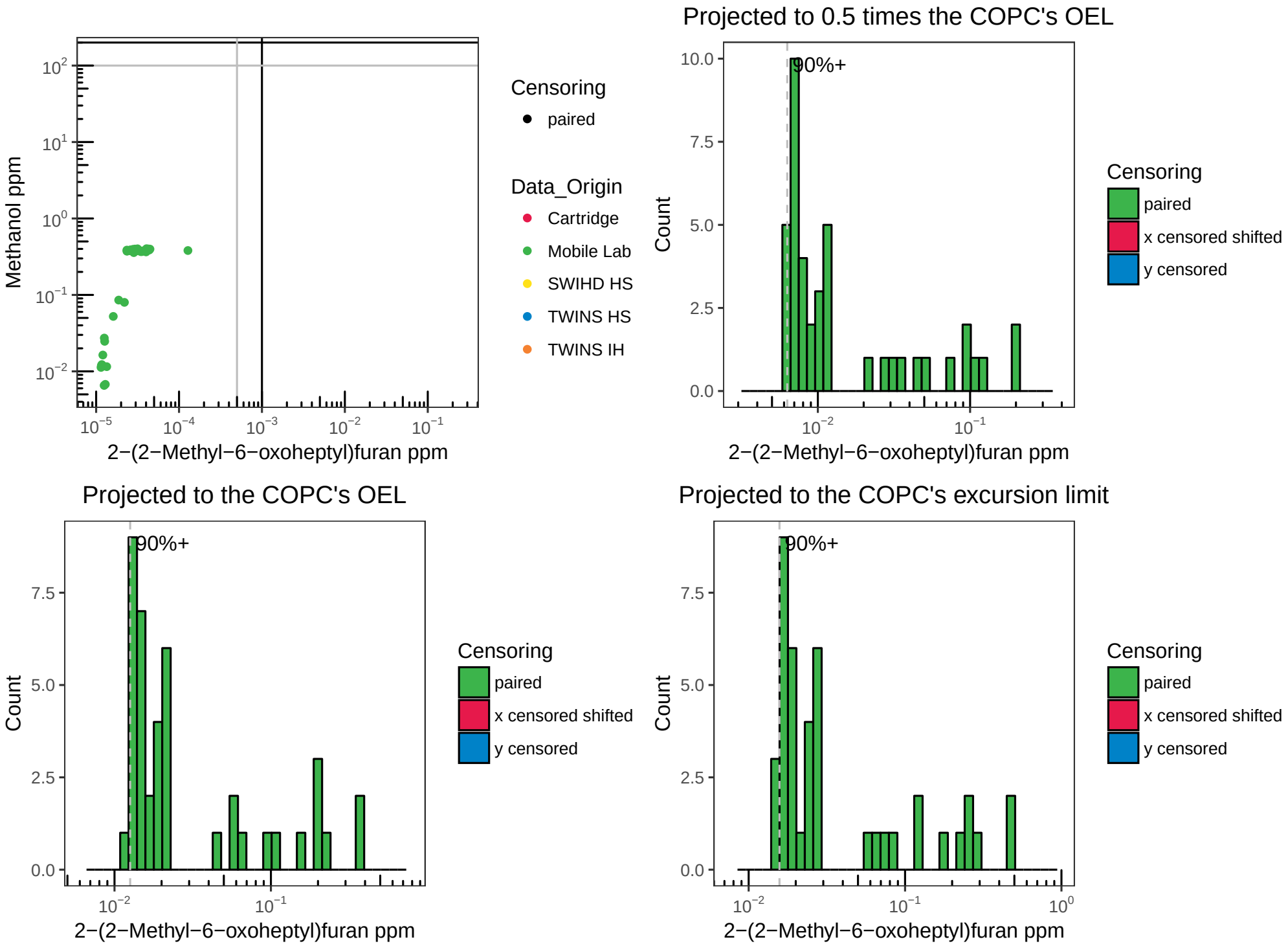


Figure C.1523: Methanol vs 2-(2-Methyl-6-oxoheptyl)furan

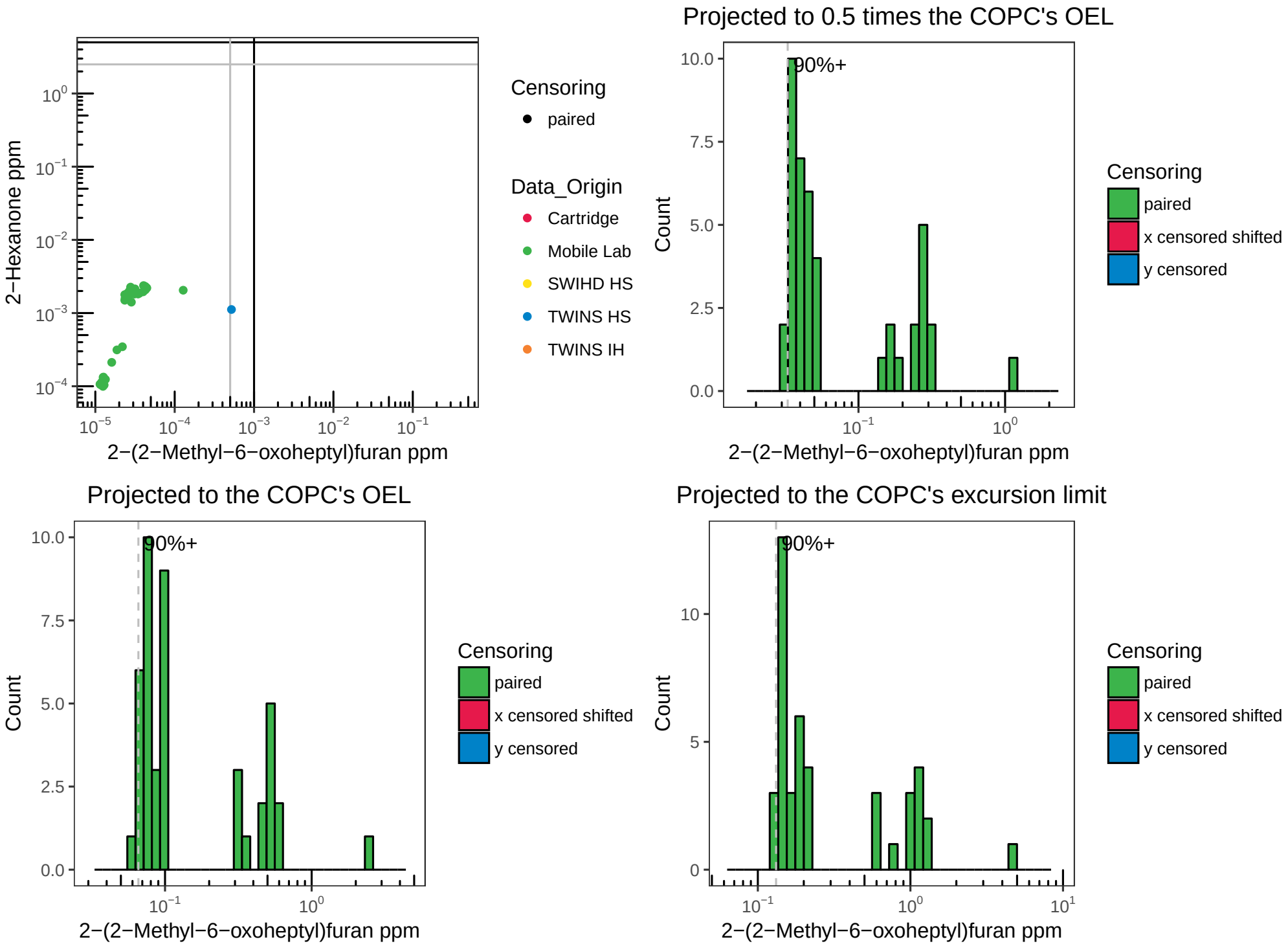


Figure C.1524: 2-Hexanone vs 2-(2-Methyl-6-oxoheptyl)furan

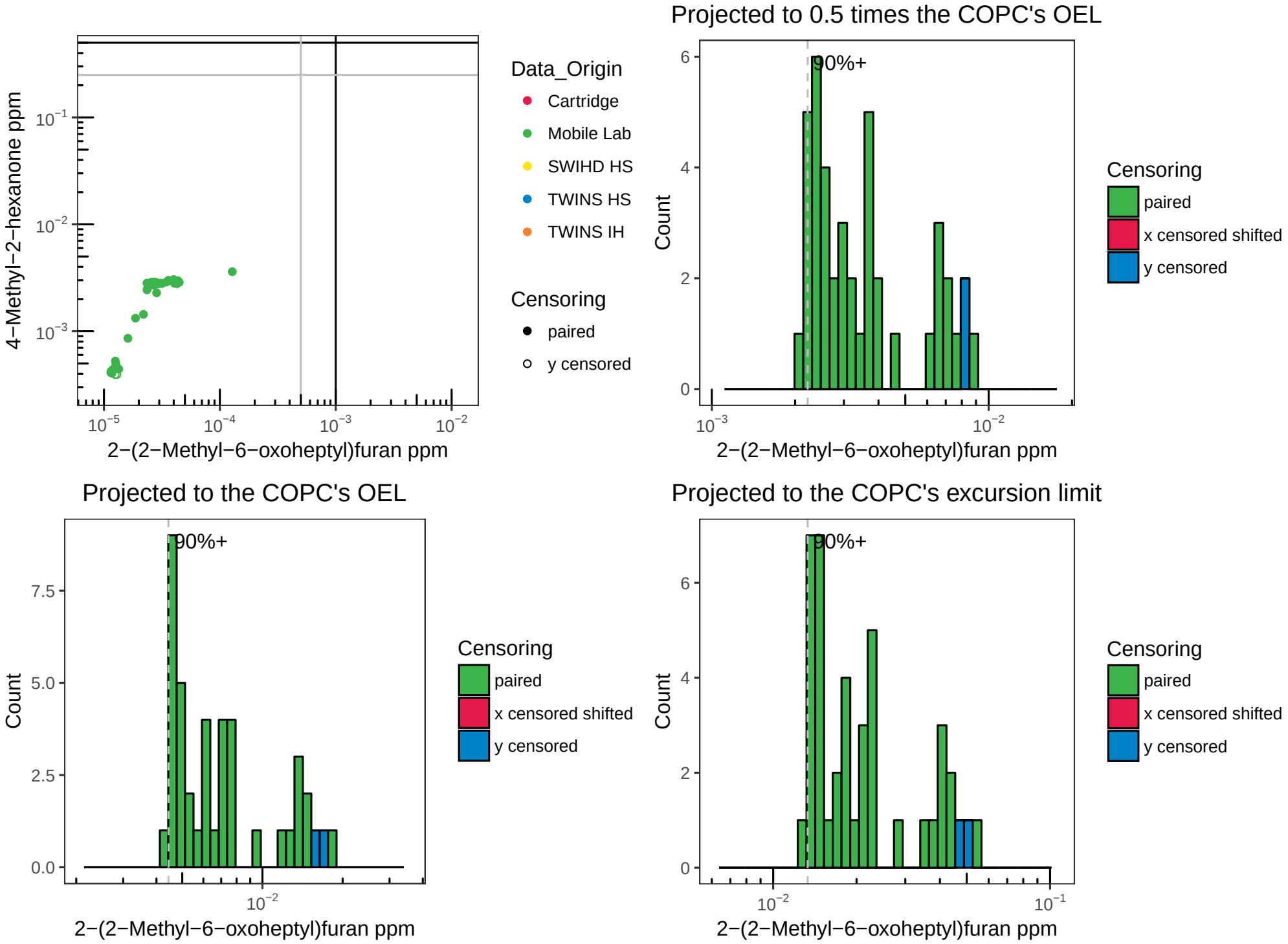


Figure C.1525: 4-Methyl-2-hexanone vs 2-(2-Methyl-6-oxoheptyl)furan

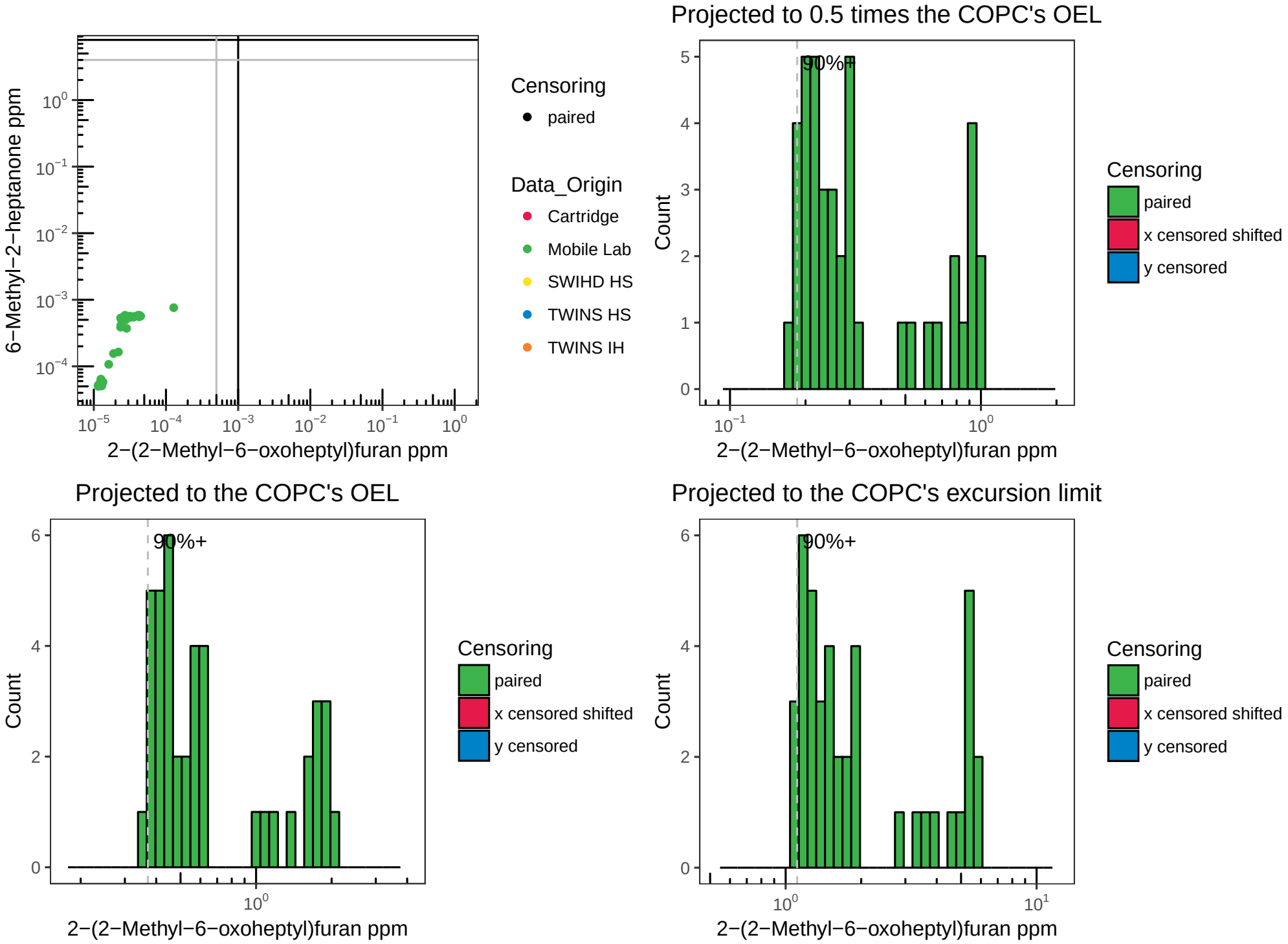


Figure C.1526: 6-Methyl-2-heptanone vs 2-(2-Methyl-6-oxoheptyl)furan

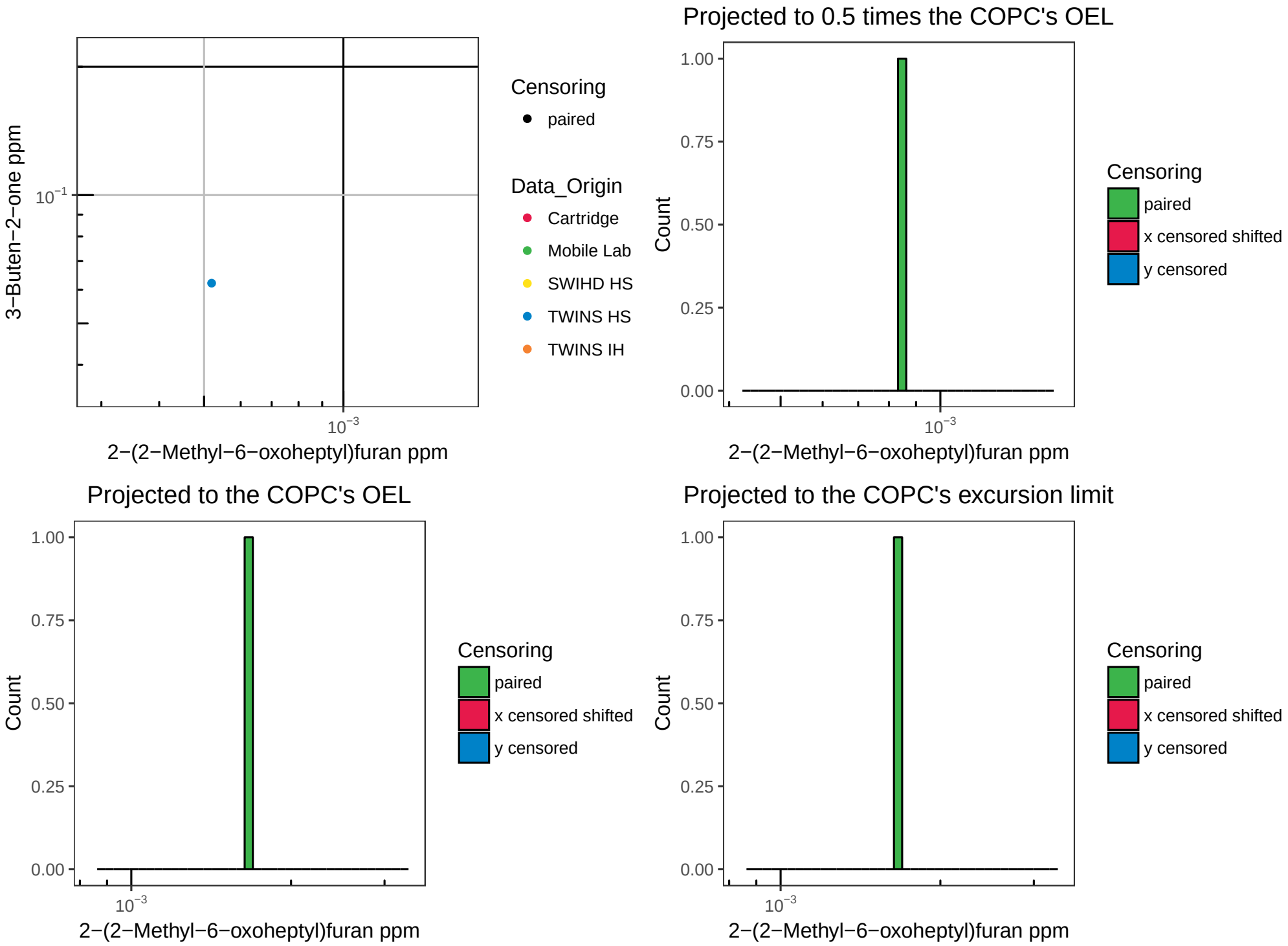


Figure C.1527: 3-Buten-2-one vs 2-(2-Methyl-6-oxoheptyl)furan

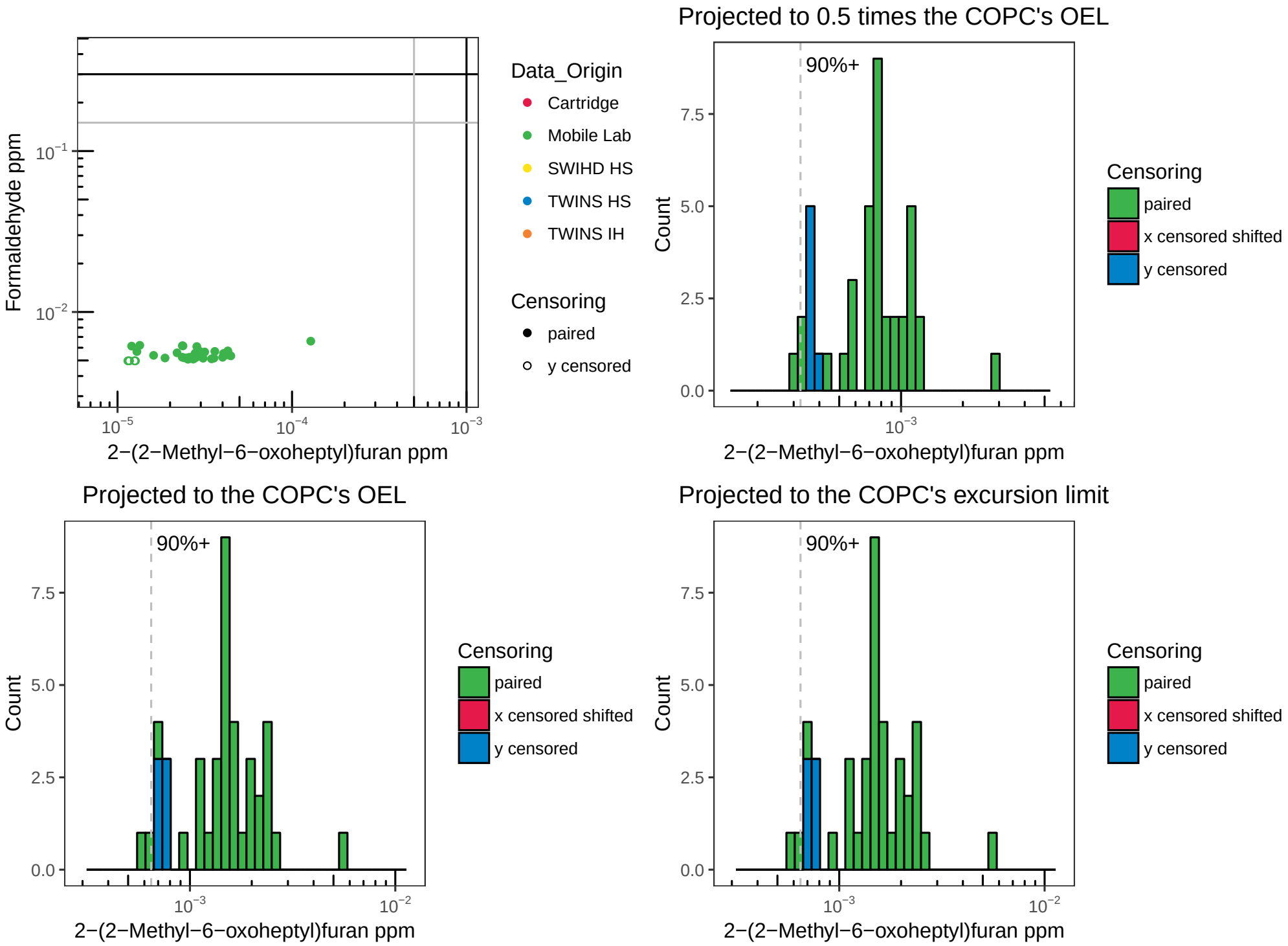


Figure C.1528: Formaldehyde vs 2-(2-Methyl-6-oxoheptyl)furan

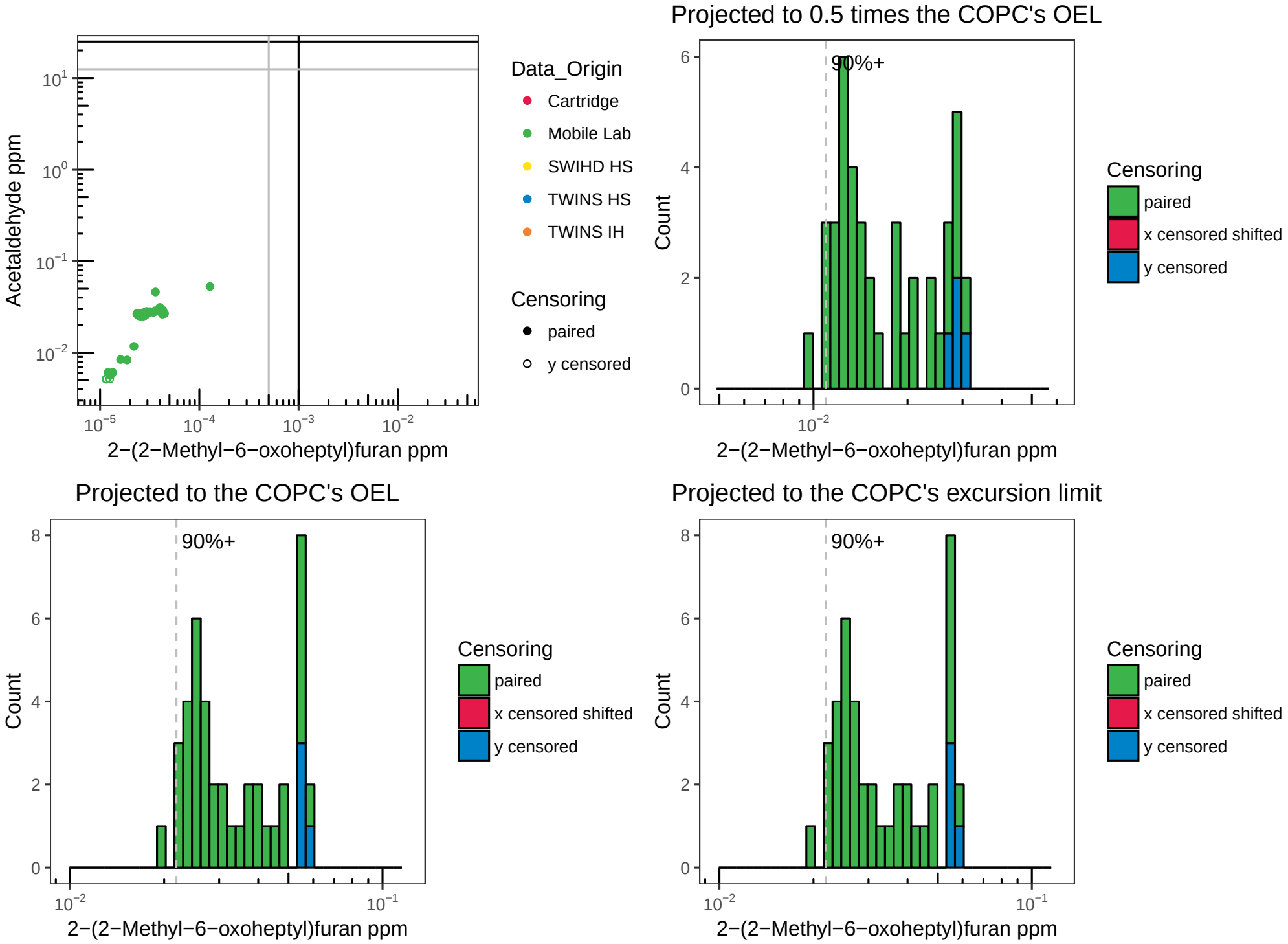


Figure C.1529: Acetaldehyde vs 2-(2-Methyl-6-oxoheptyl)furan

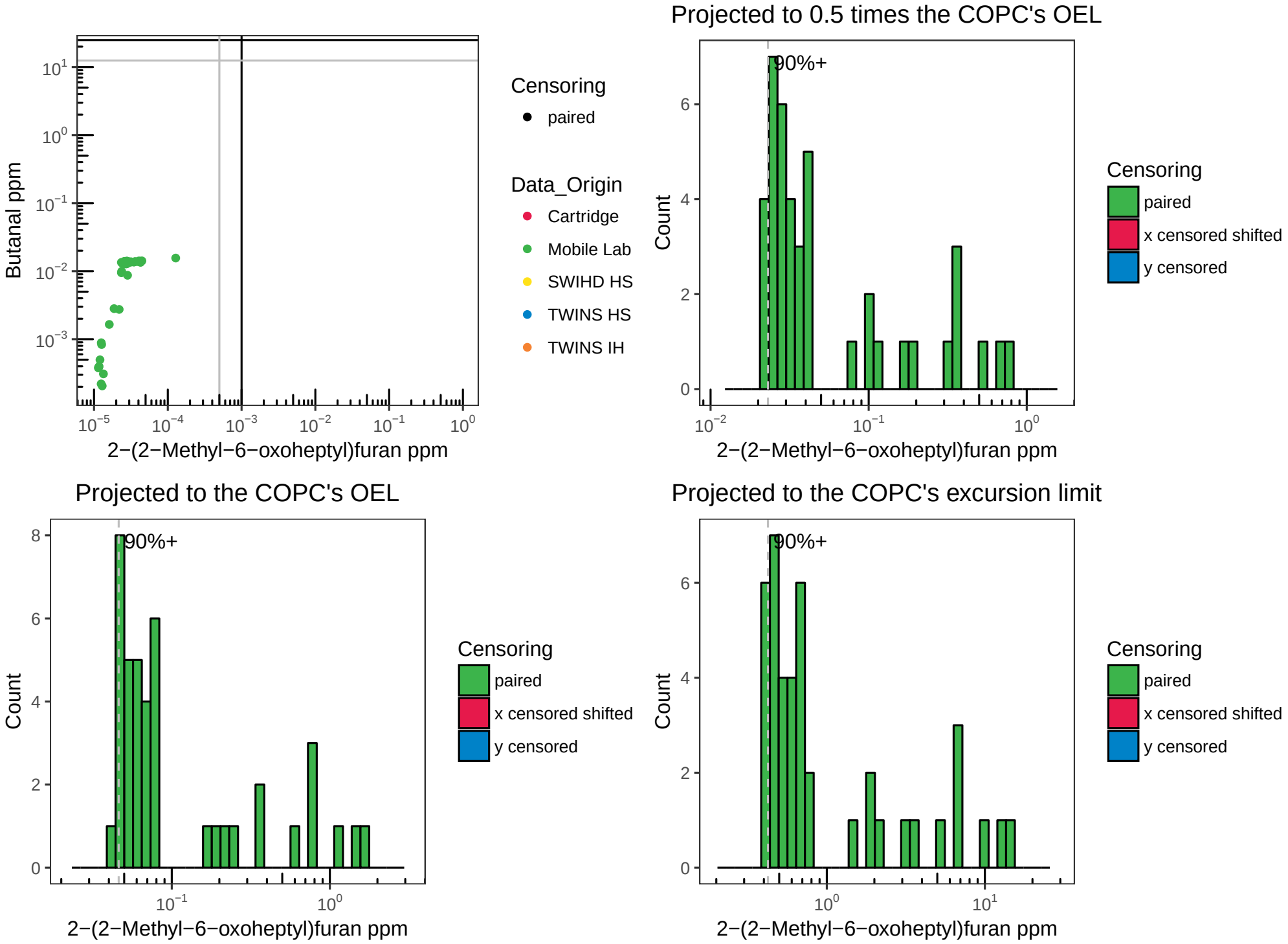


Figure C.1530: Butanal vs 2-(2-Methyl-6-oxoheptyl)furan

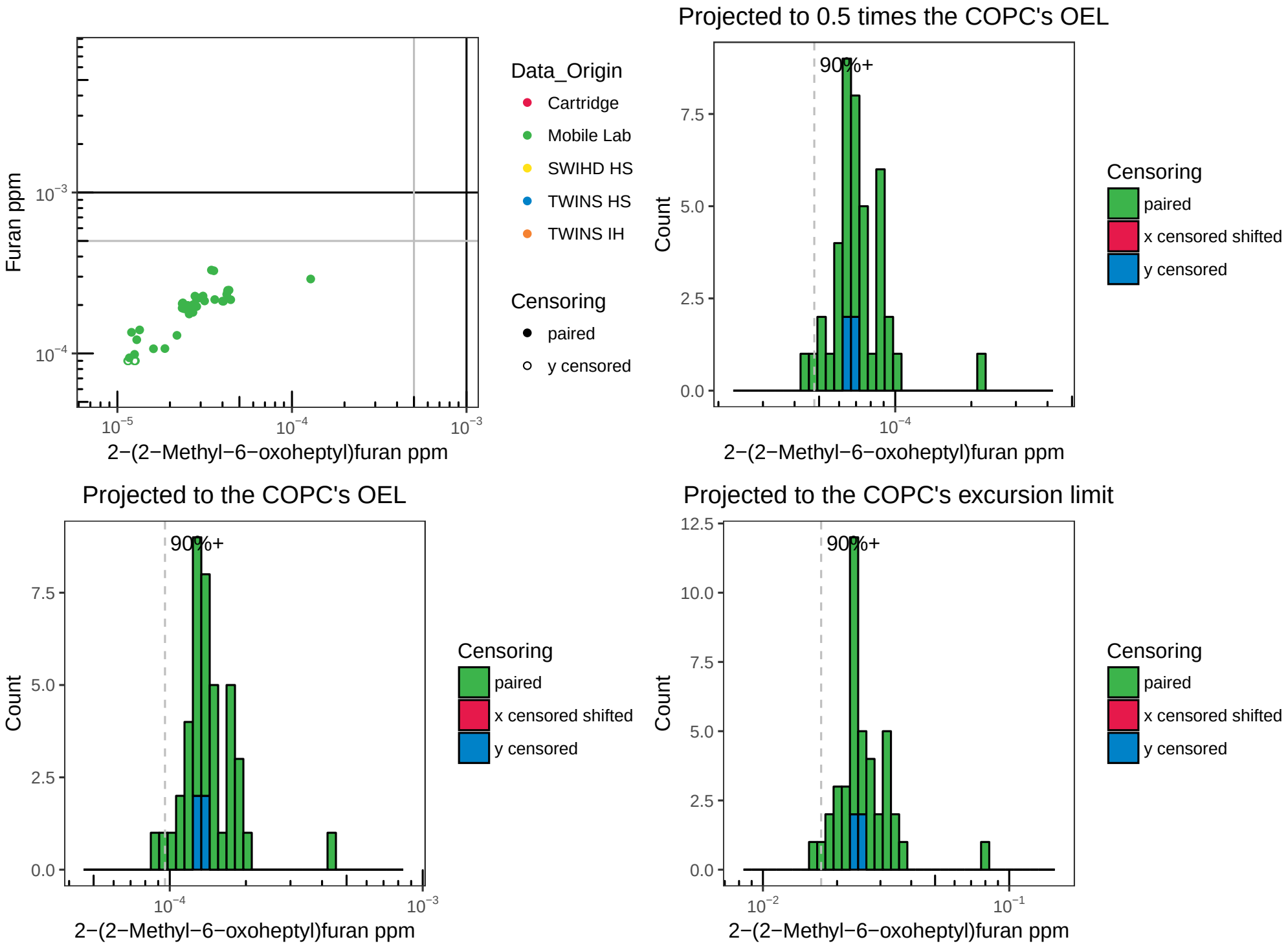


Figure C.1531: Furan vs 2-(2-Methyl-6-oxoheptyl)furan

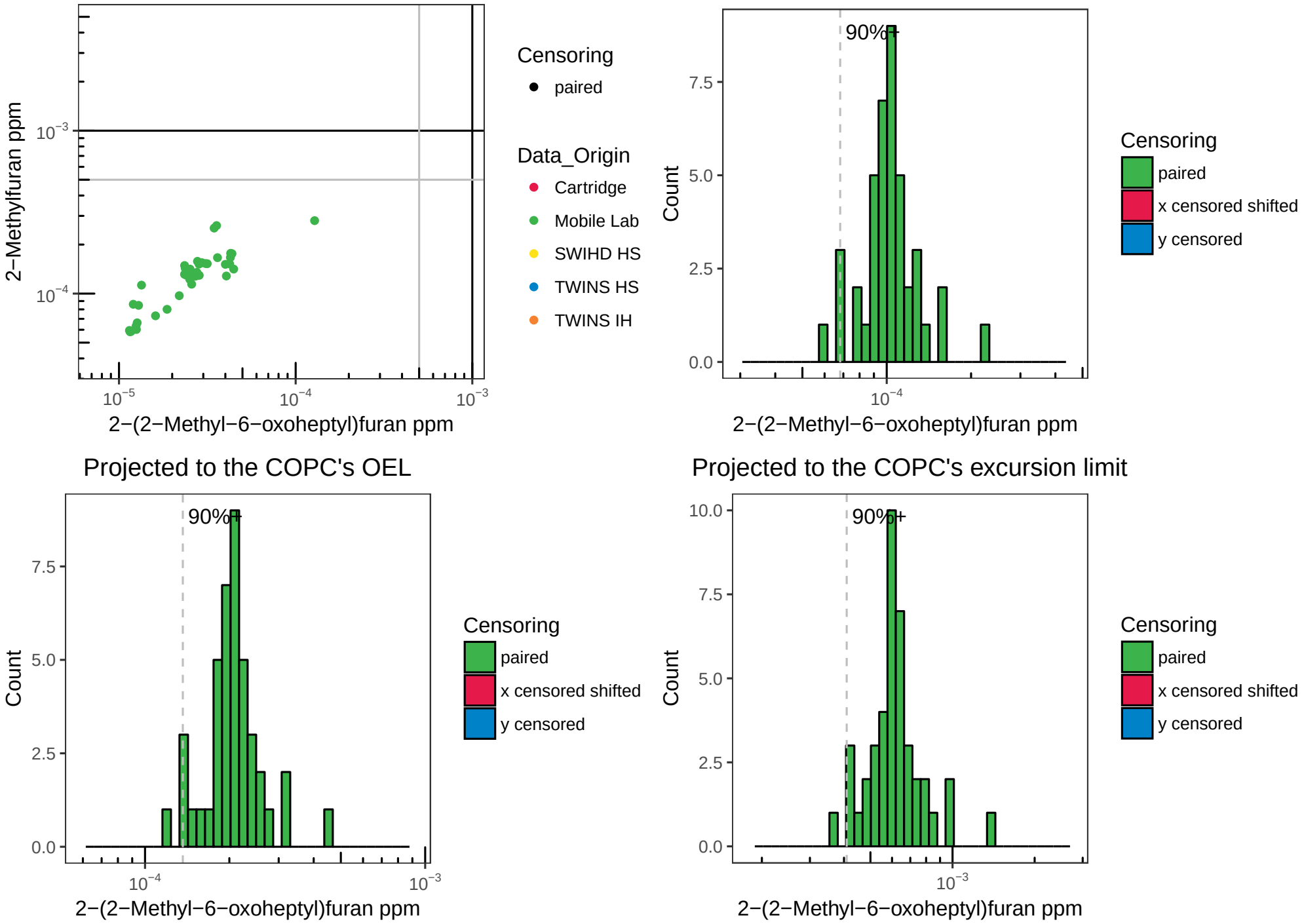


Figure C.1532: 2-Methylfuran vs 2-(2-Methyl-6-oxoheptyl)furan

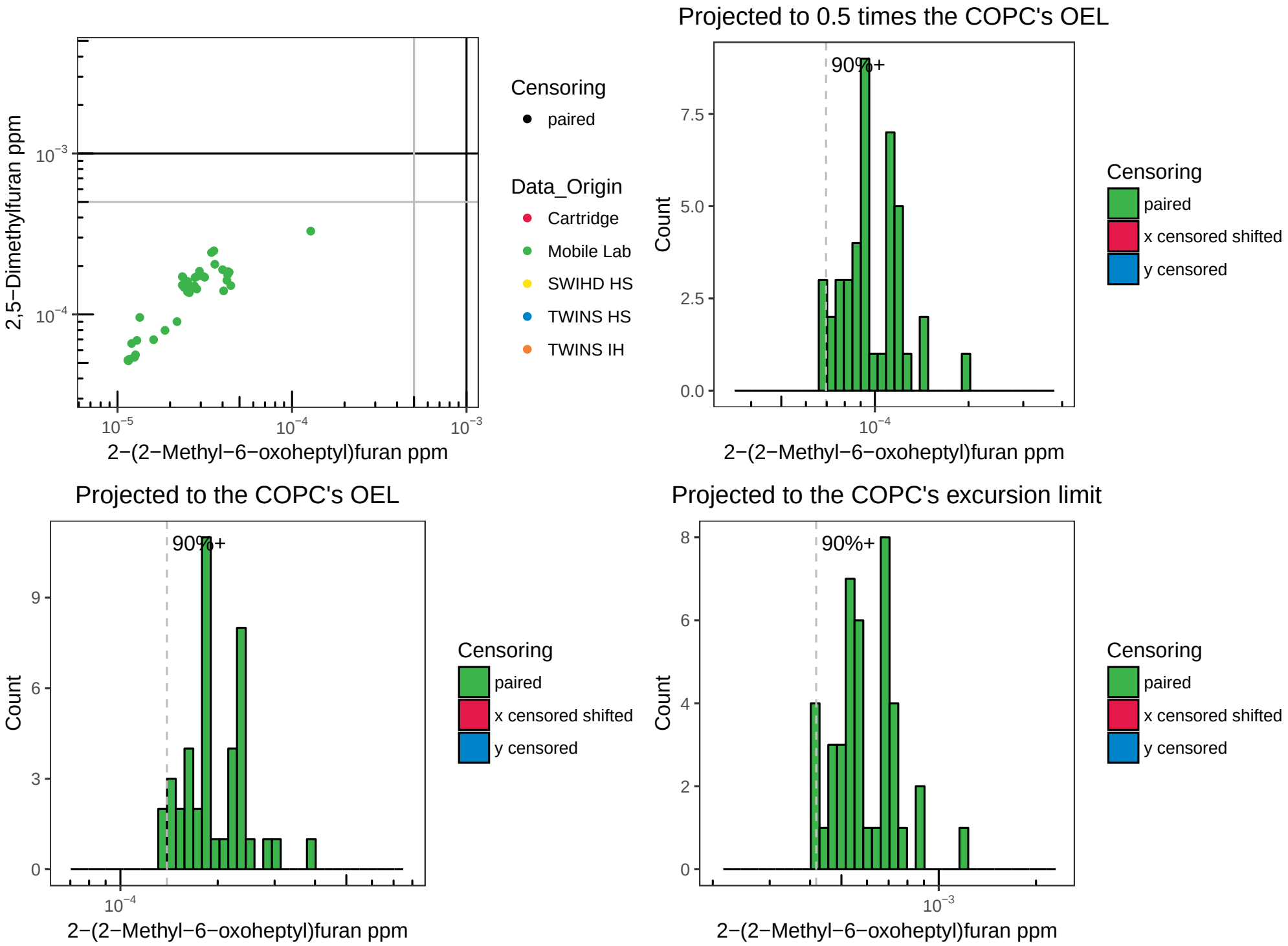


Figure C.1533: 2,5-Dimethylfuran vs 2-(2-Methyl-6-oxoheptyl)furan

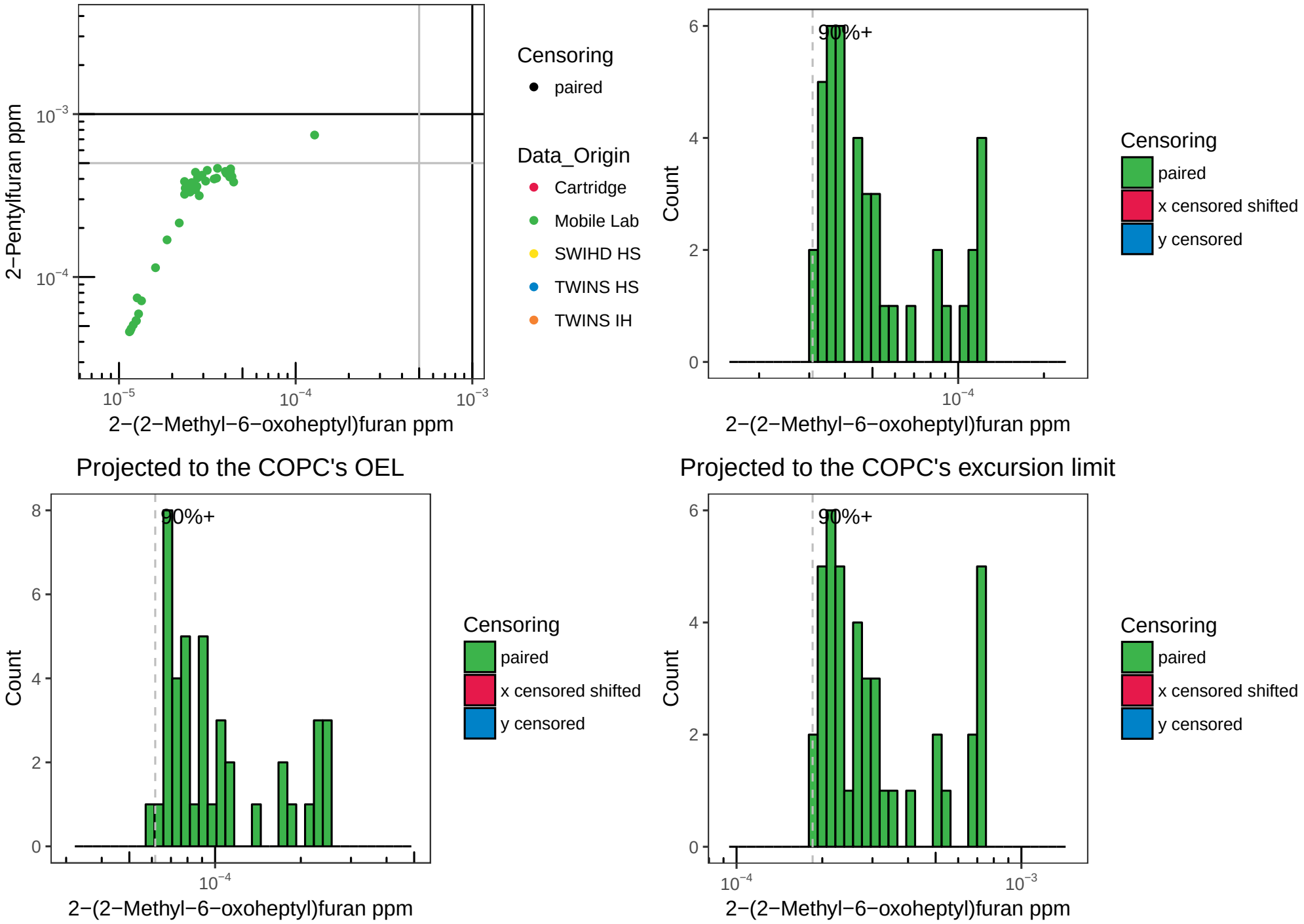


Figure C.1534: 2-Pentylfuran vs 2-(2-Methyl-6-oxoheptyl)furan

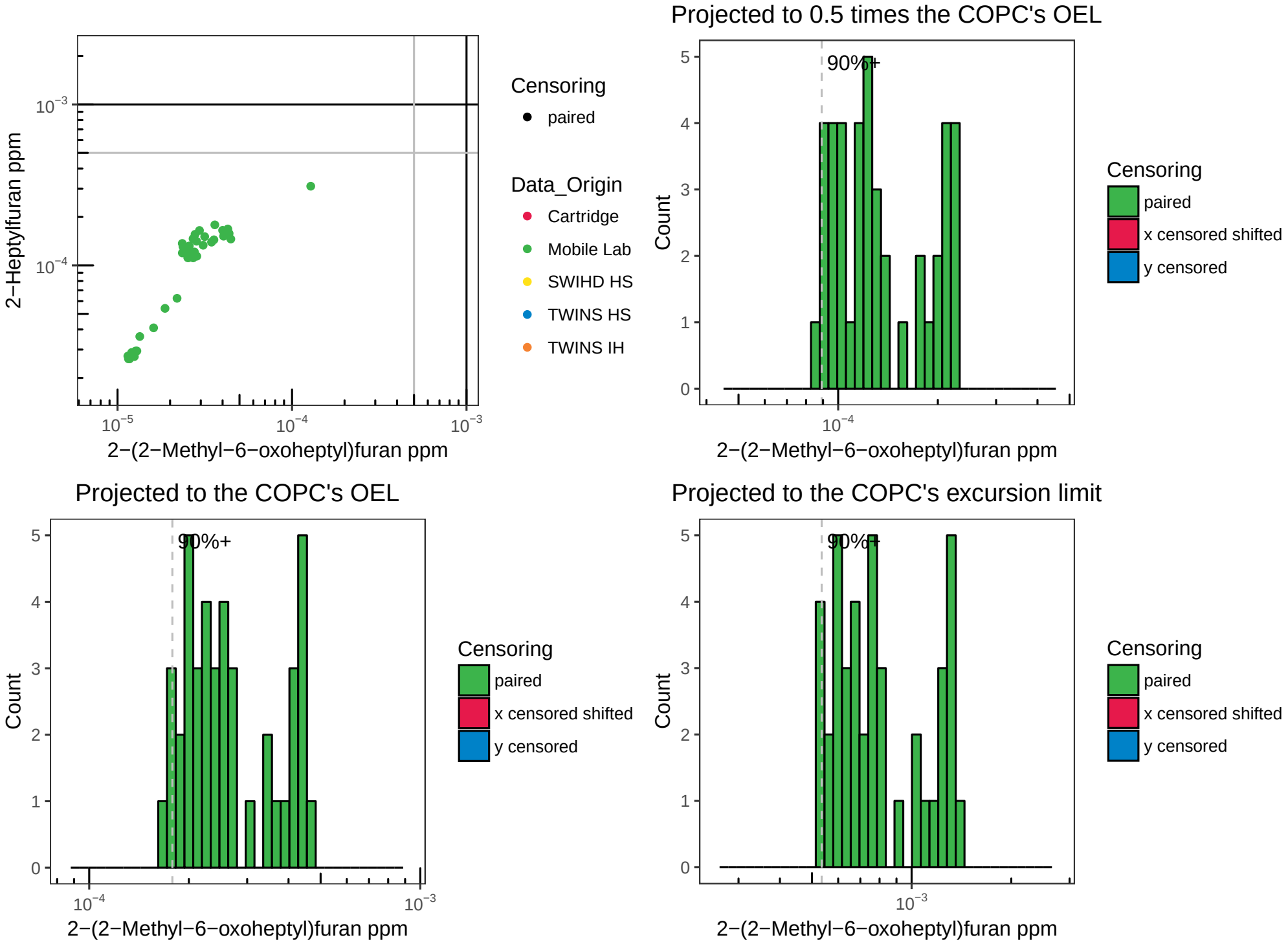


Figure C.1535: 2-Heptylfuran vs 2-(2-Methyl-6-oxoheptyl)furan

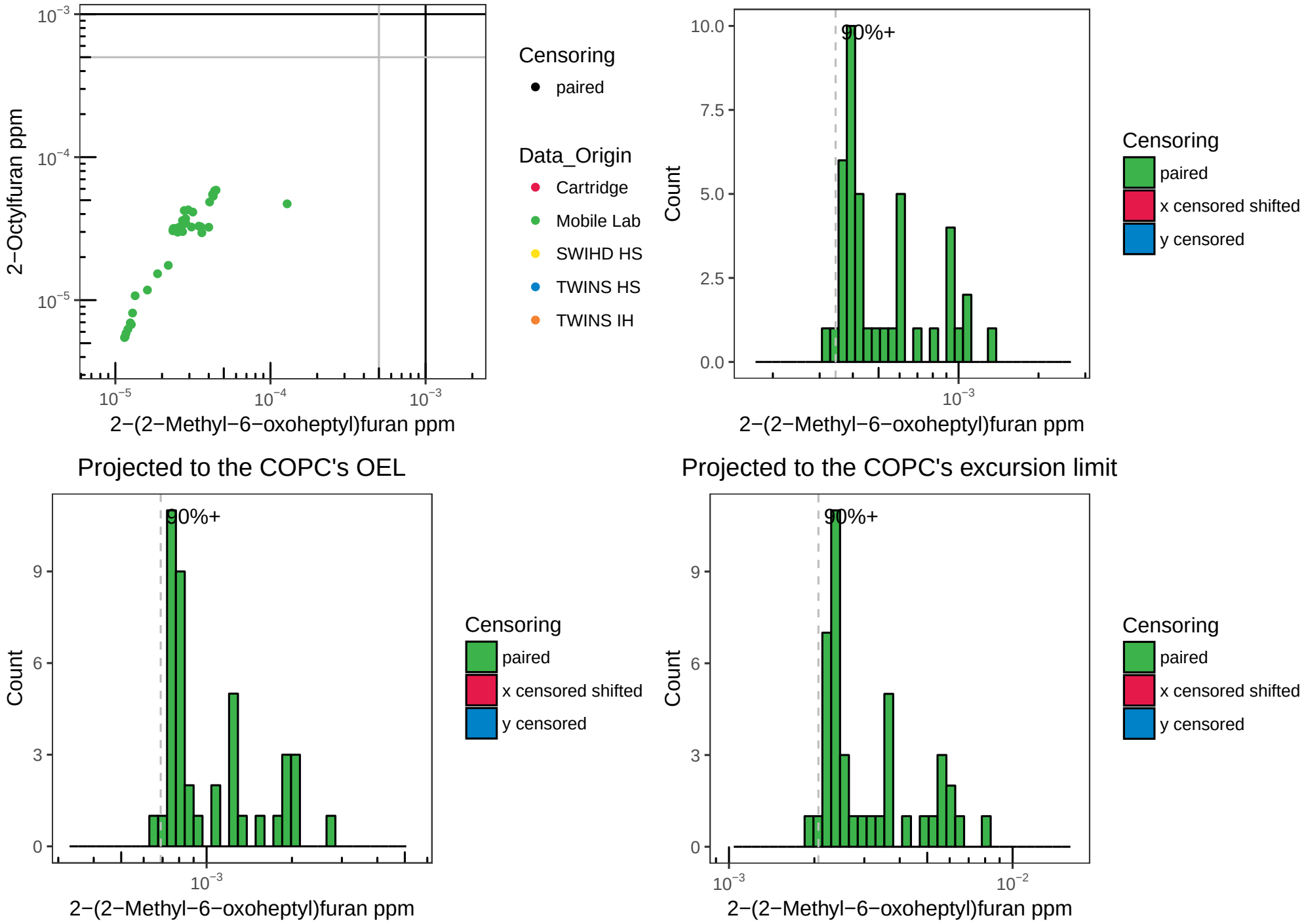


Figure C.1536: 2-Octylfuran vs 2-(2-Methyl-6-oxoheptyl)furan

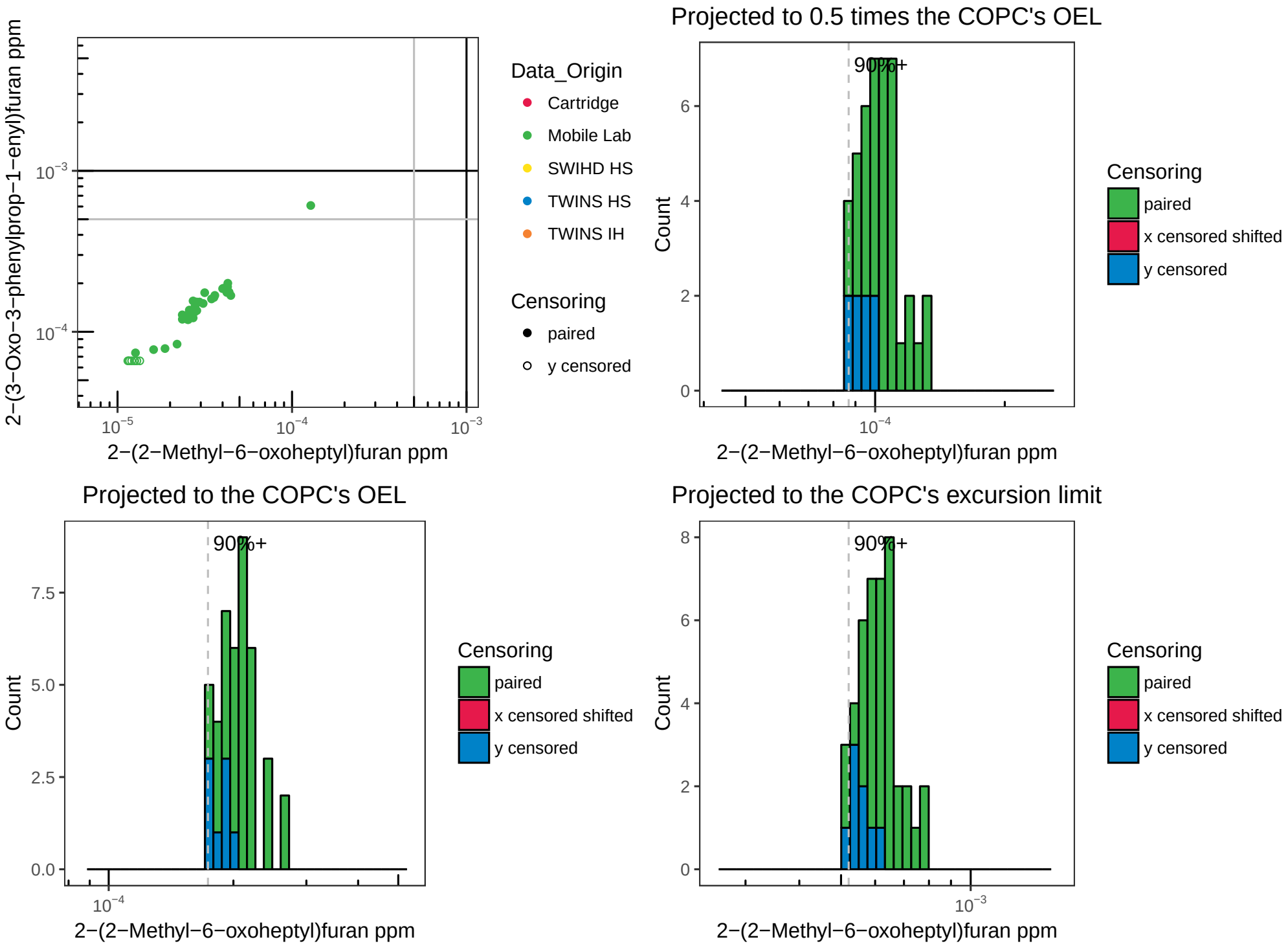


Figure C.1537: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2-(2-Methyl-6-oxoheptyl)furan

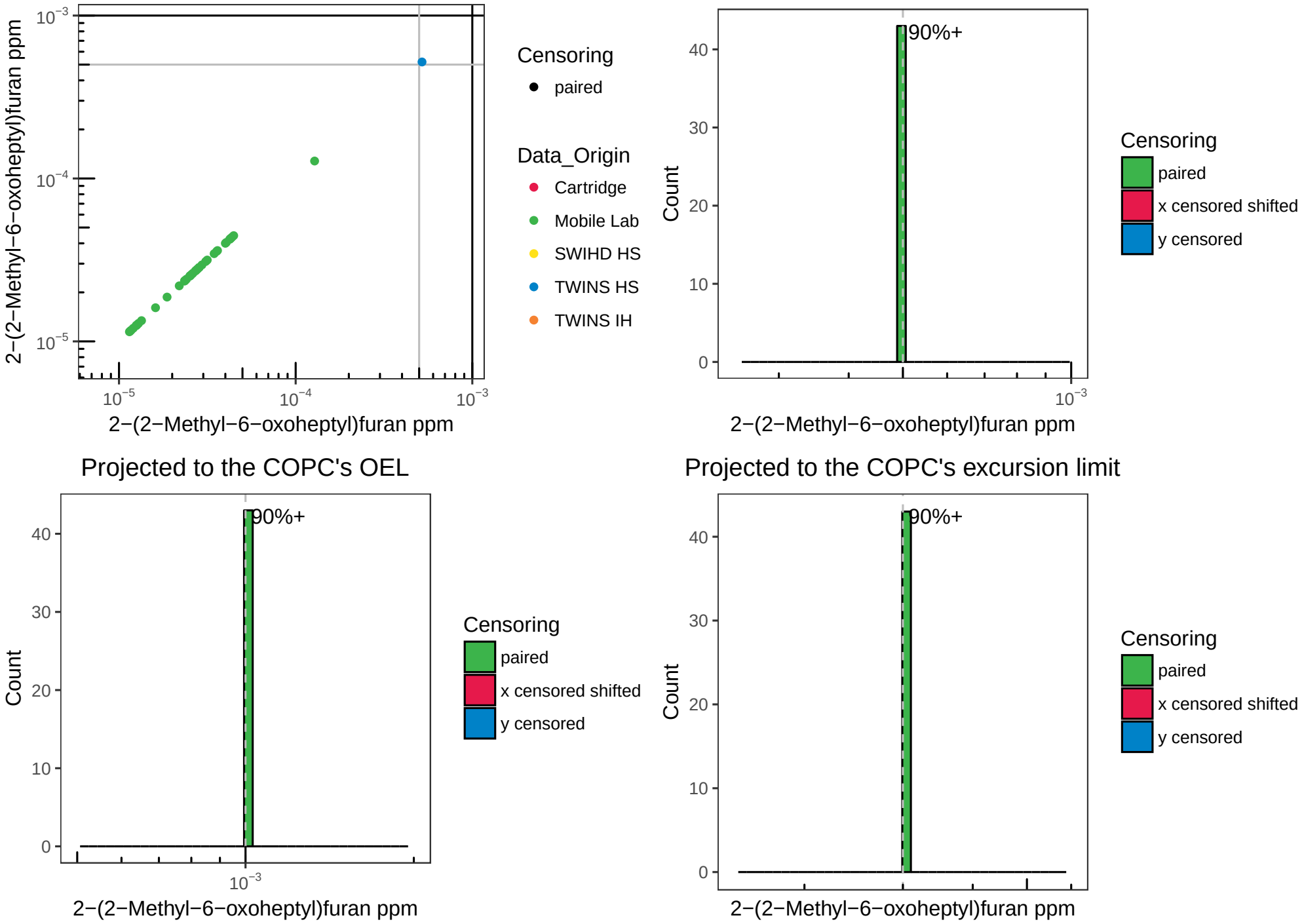


Figure C.1538: 2-(2-Methyl-6-oxoheptyl)furan vs 2-(2-Methyl-6-oxoheptyl)furan

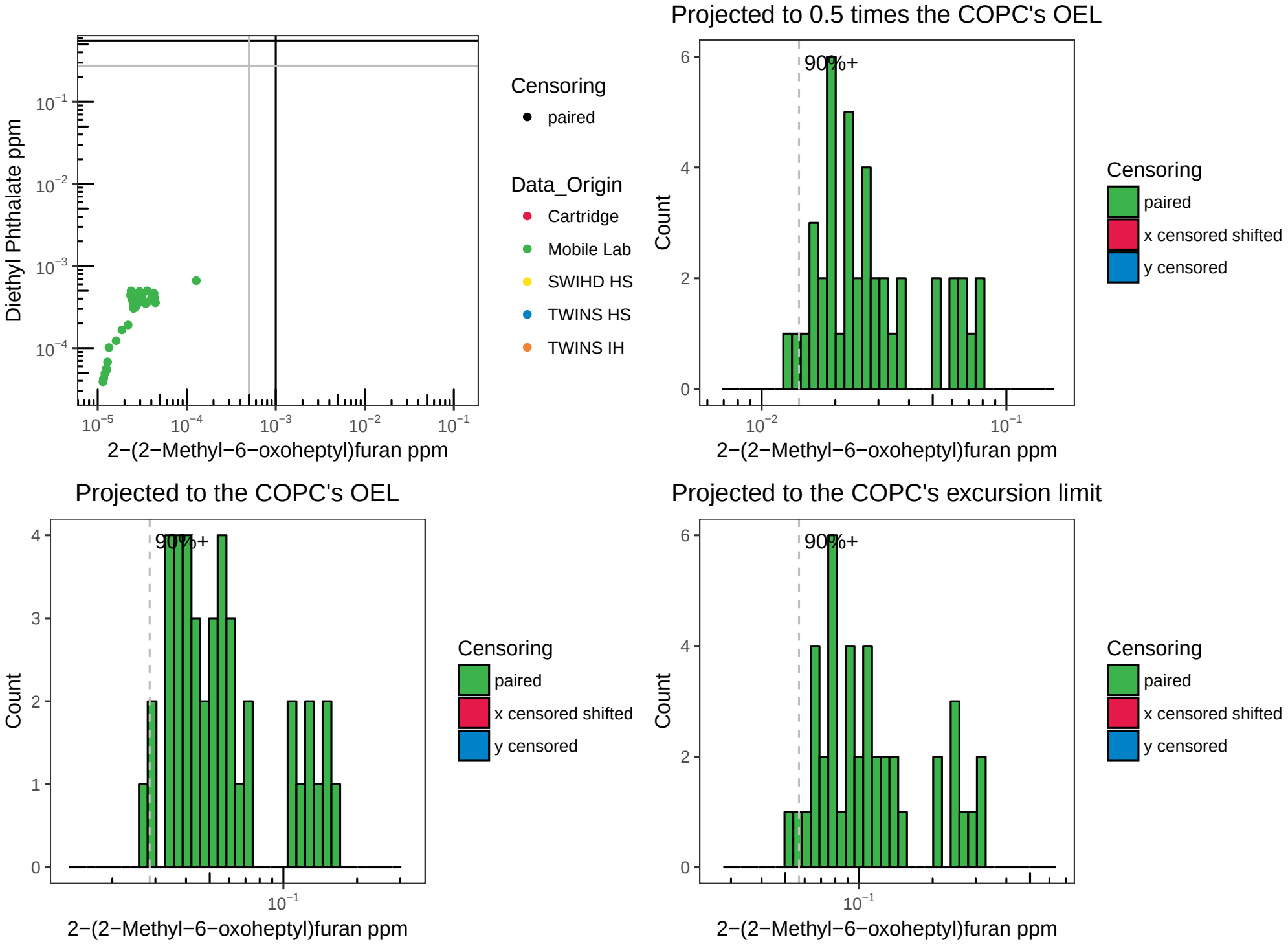


Figure C.1539: Diethyl Phthalate vs 2-(2-Methyl-6-oxoheptyl)furan

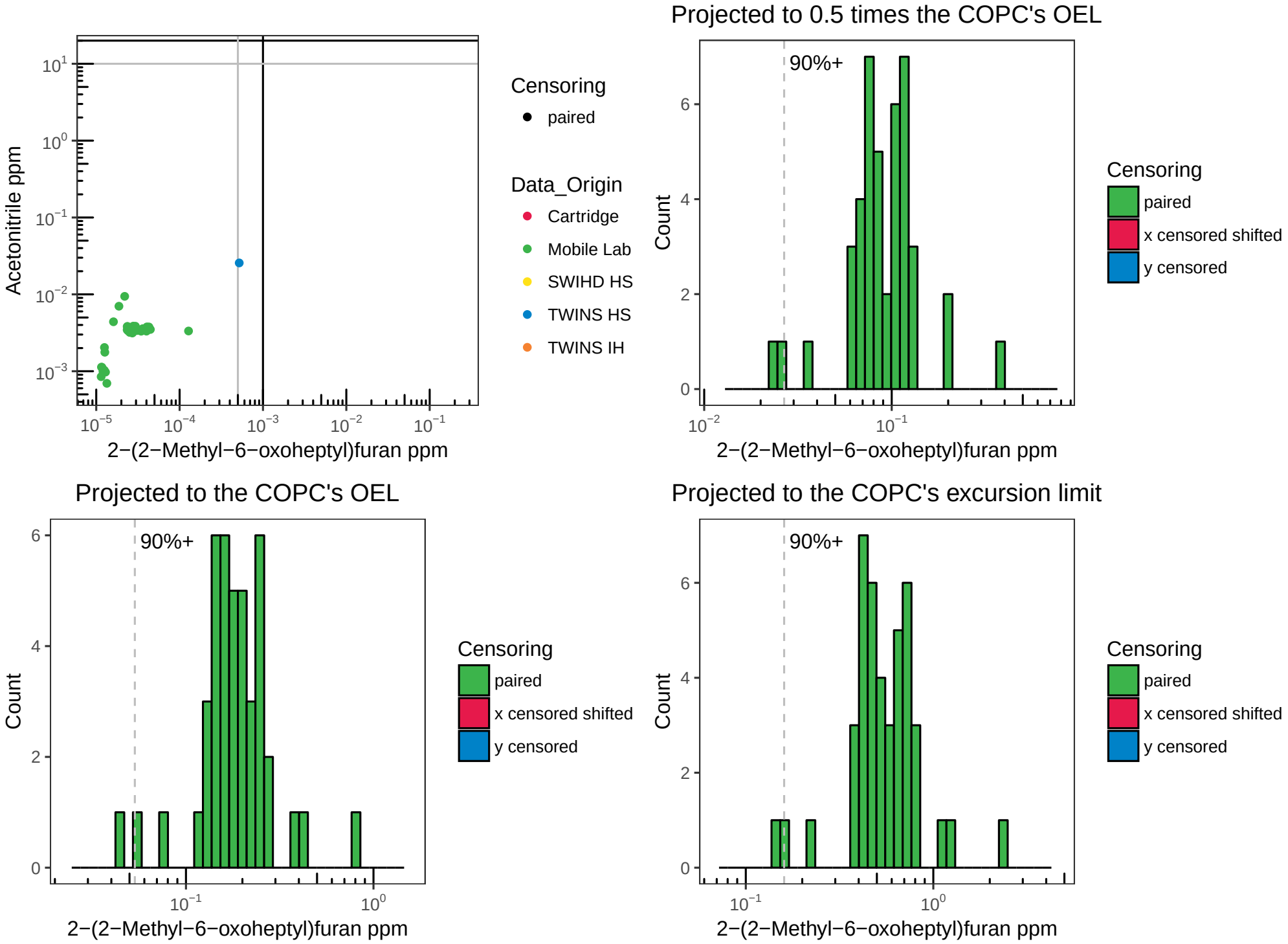


Figure C.1540: Acetonitrile vs 2-(2-Methyl-6-oxoheptyl)furan

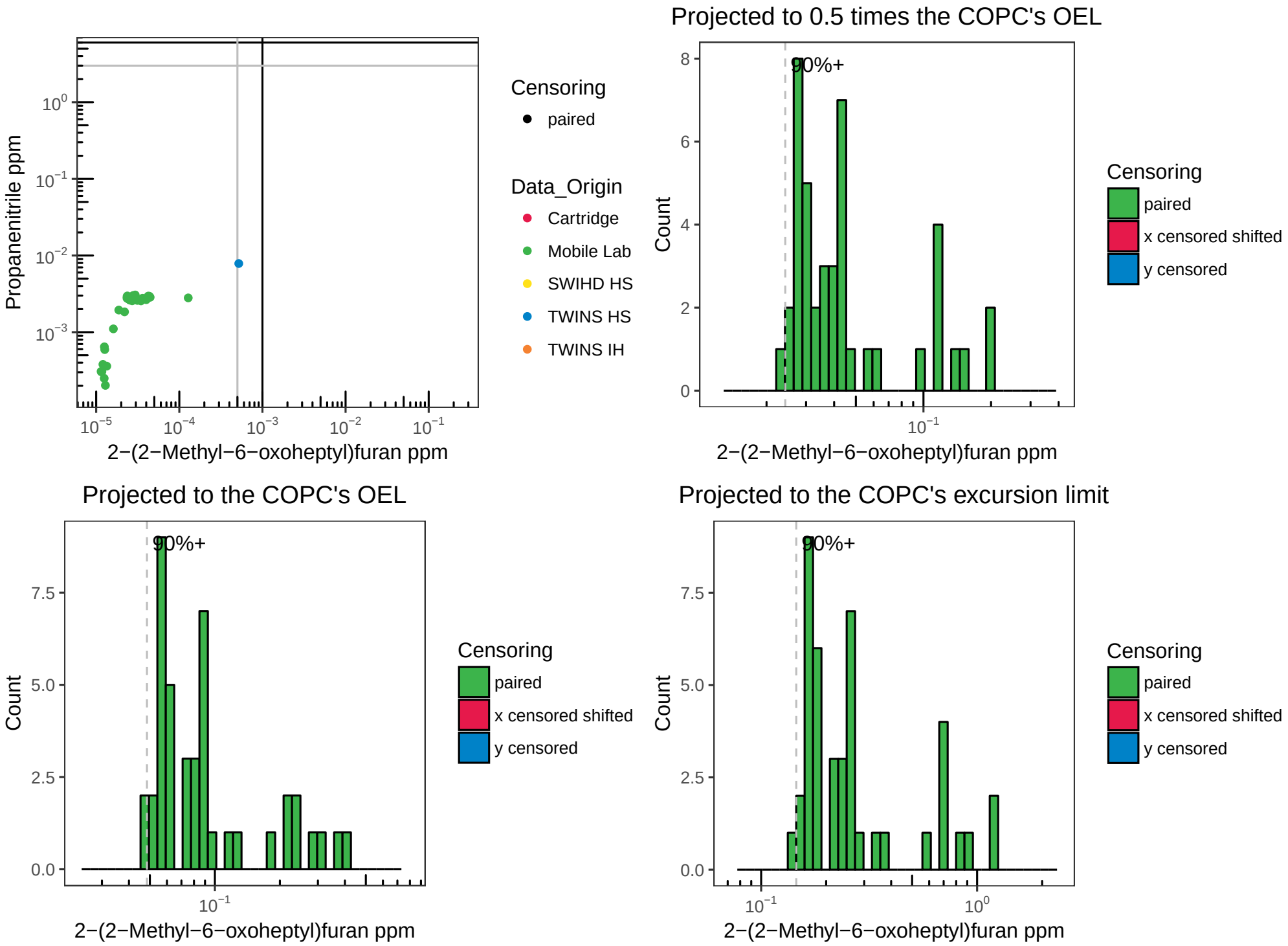


Figure C.1541: Propanenitrile vs 2-(2-Methyl-6-oxoheptyl)furan

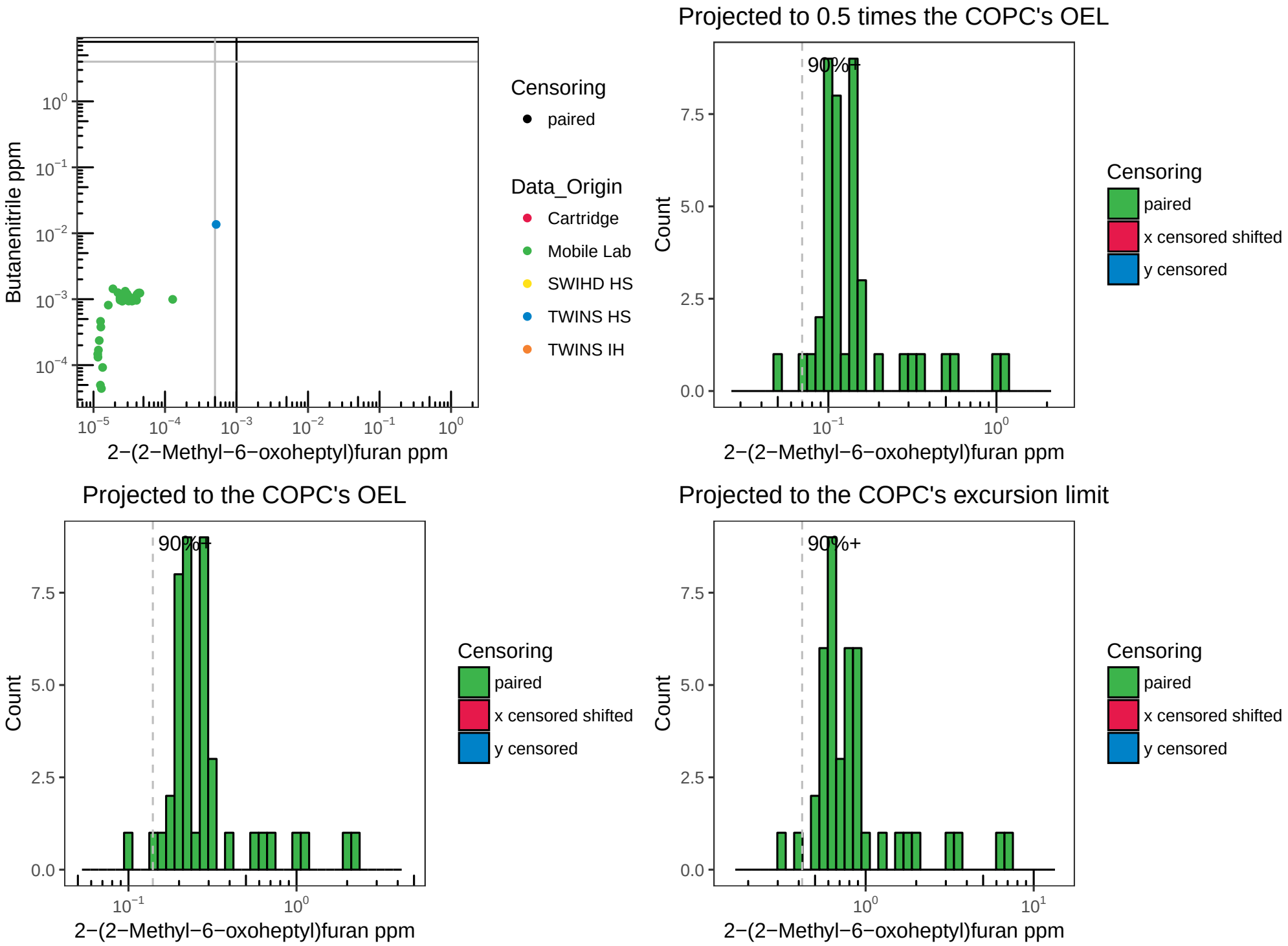


Figure C.1542: Butanenitrile vs 2-(2-Methyl-6-oxoheptyl)furan

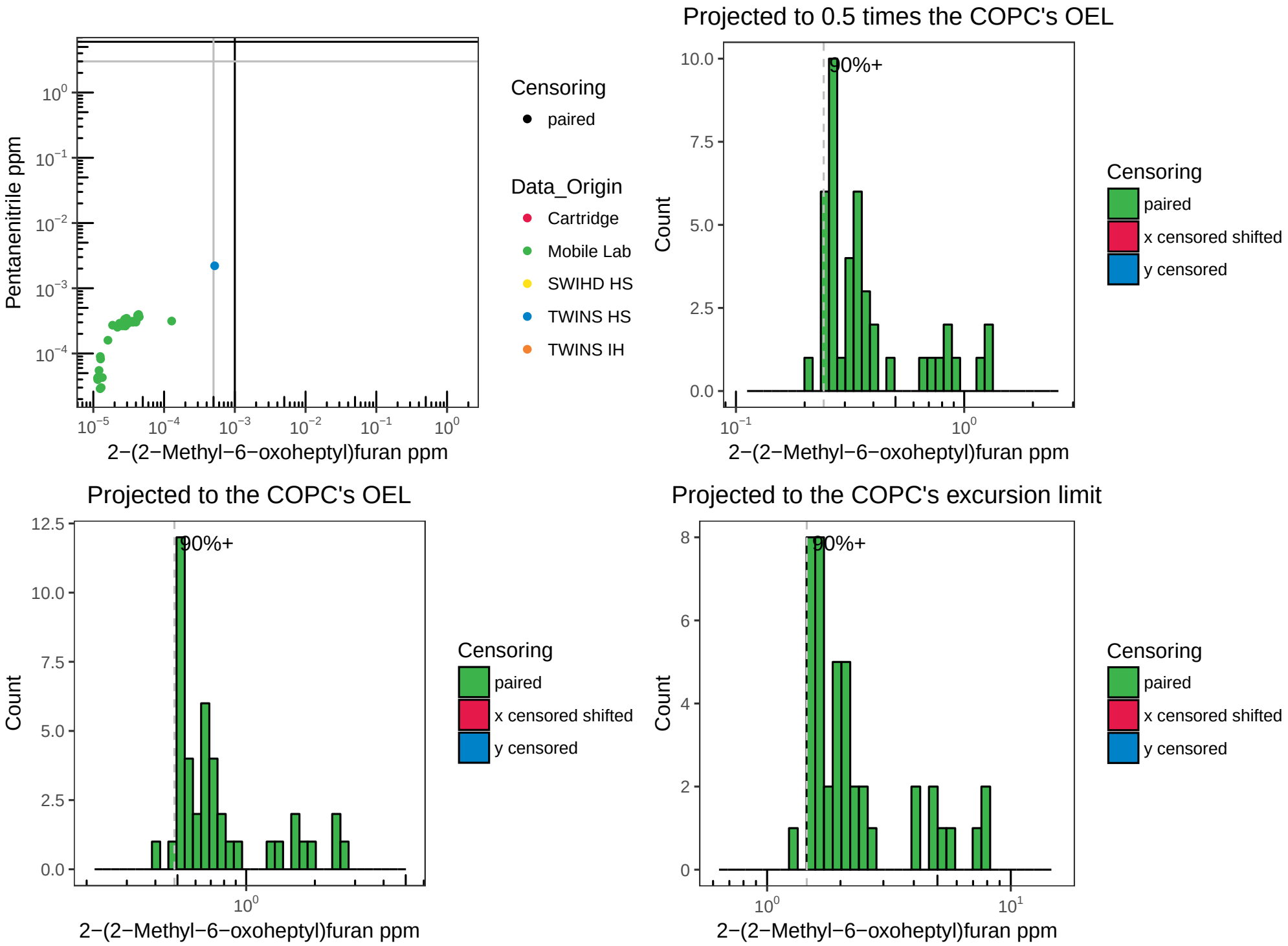


Figure C.1543: Pentanenitrile vs 2-(2-Methyl-6-oxoheptyl)furan

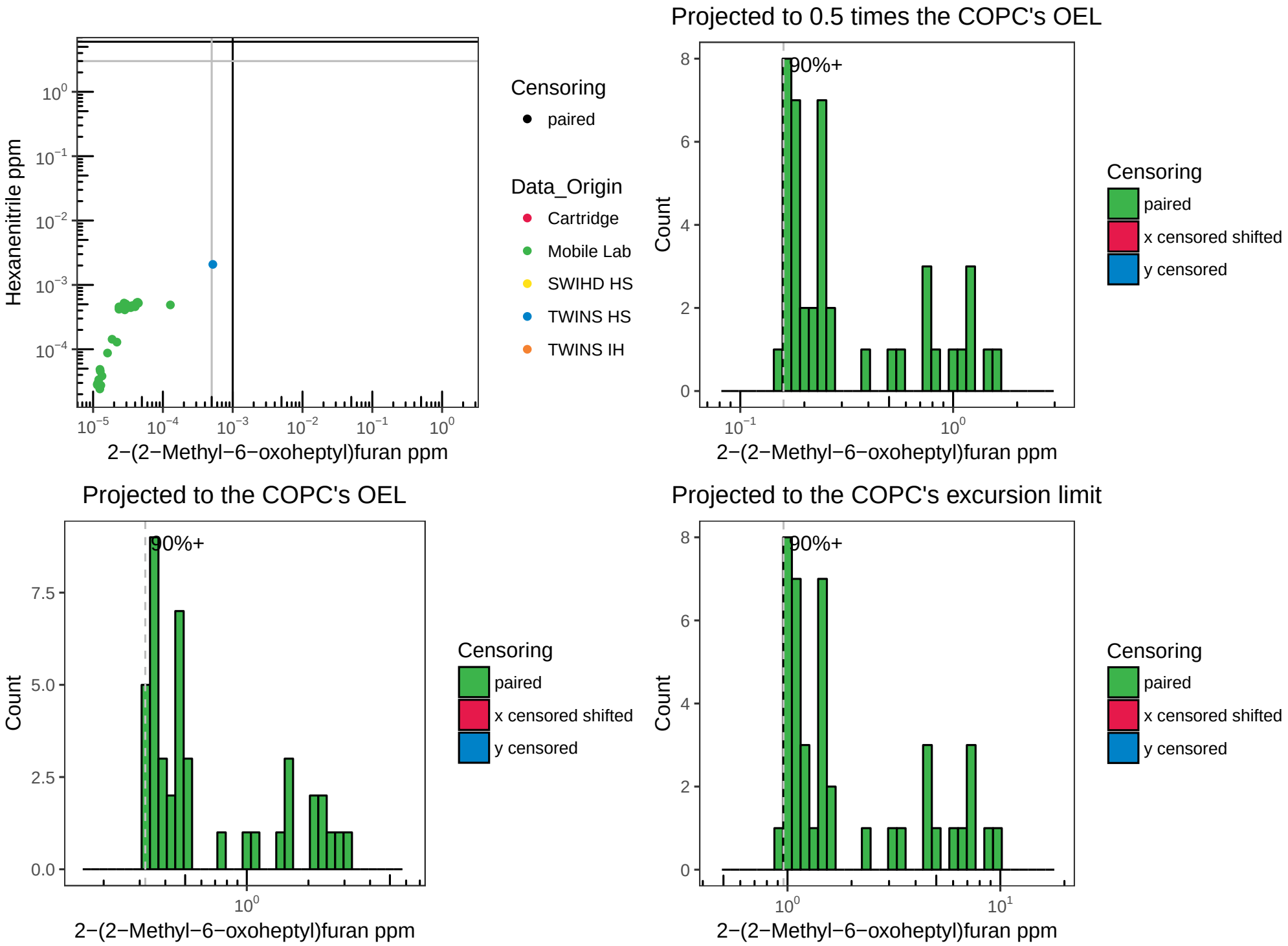


Figure C.1544: Hexanenitrile vs 2-(2-Methyl-6-oxoheptyl)furan

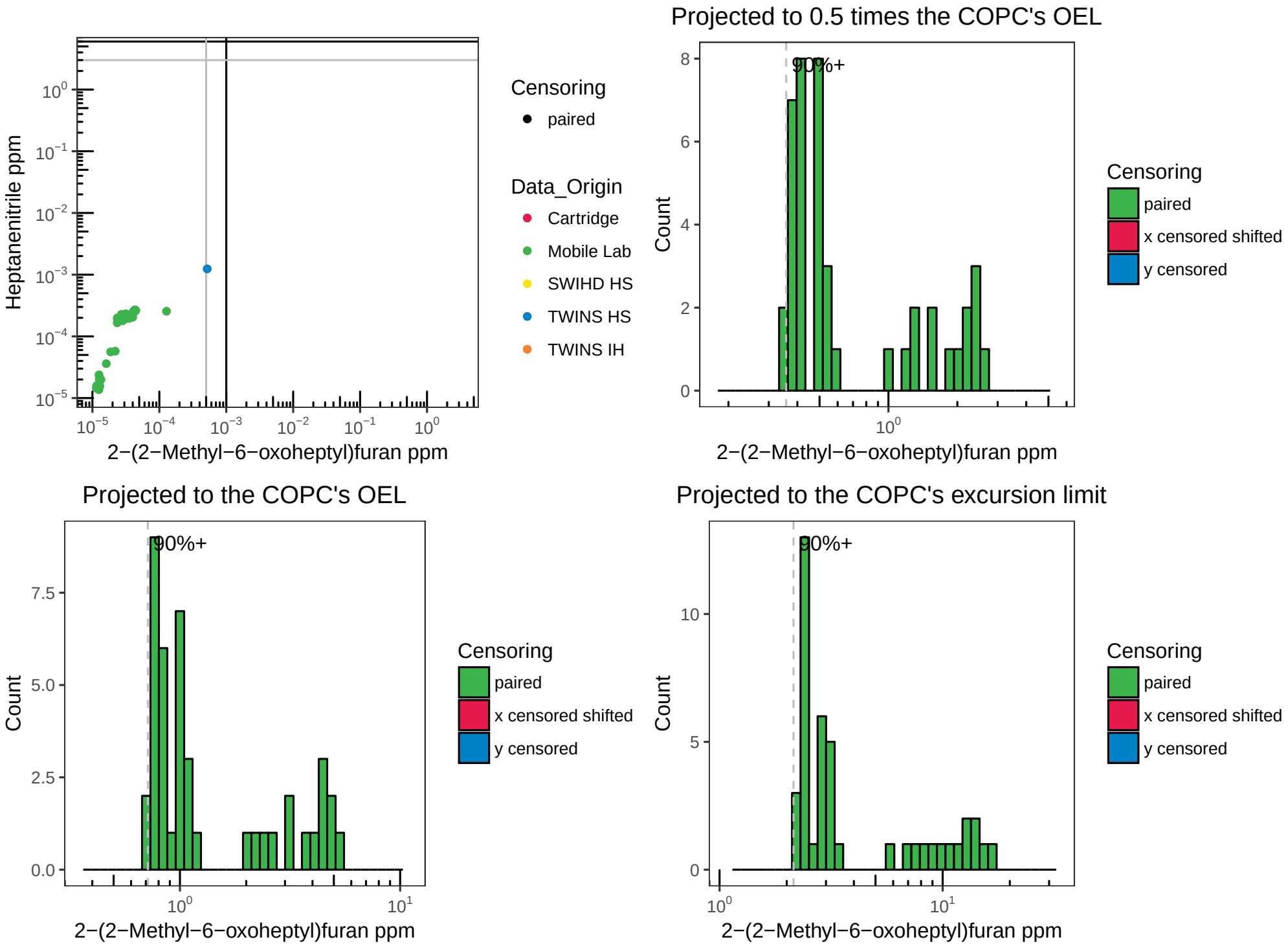


Figure C.1545: Heptanenitrile vs 2-(2-Methyl-6-oxoheptyl)furan

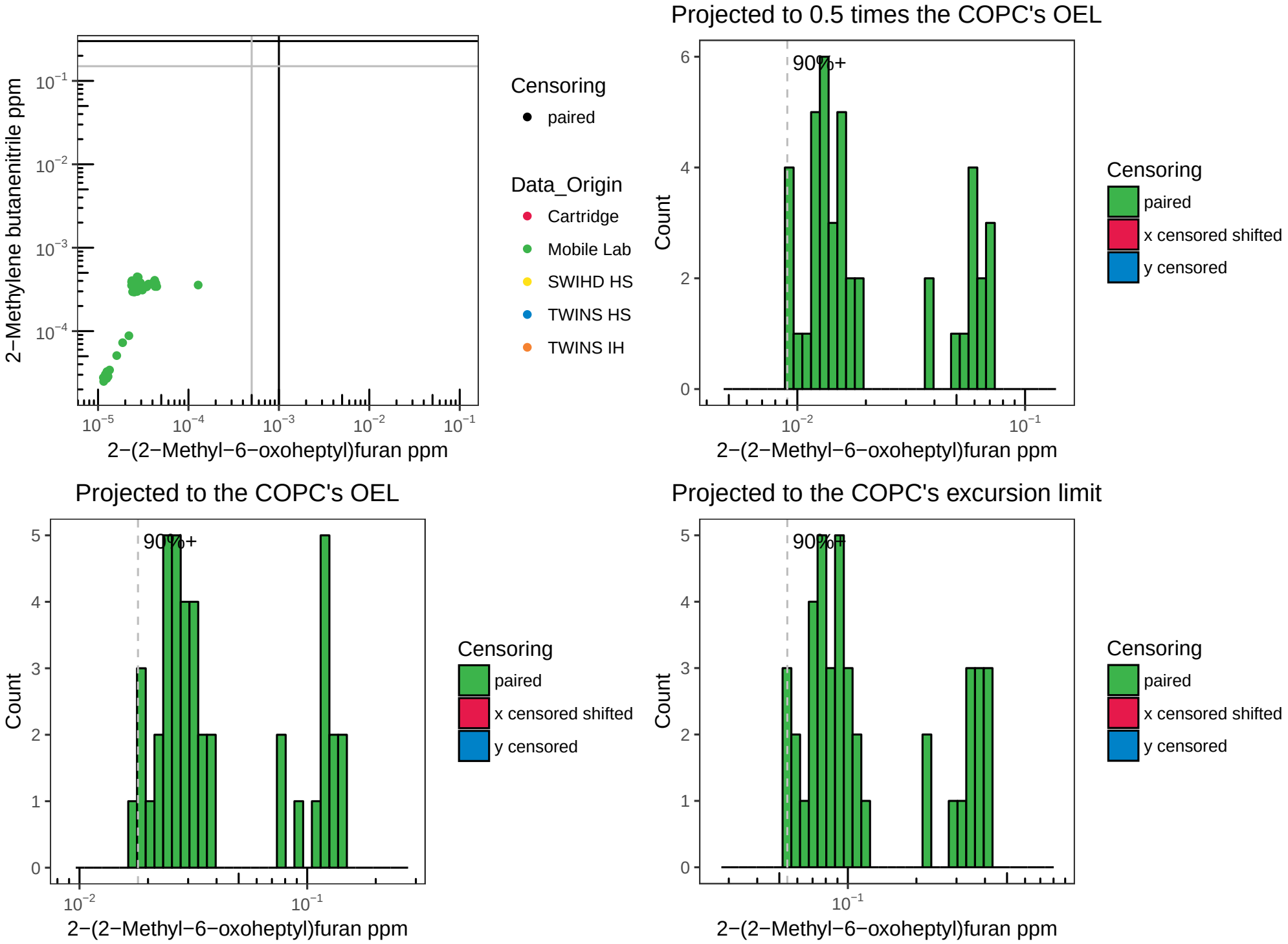


Figure C.1546: 2-Methylene butanenitrile vs 2-(2-Methyl-6-oxoheptyl)furan

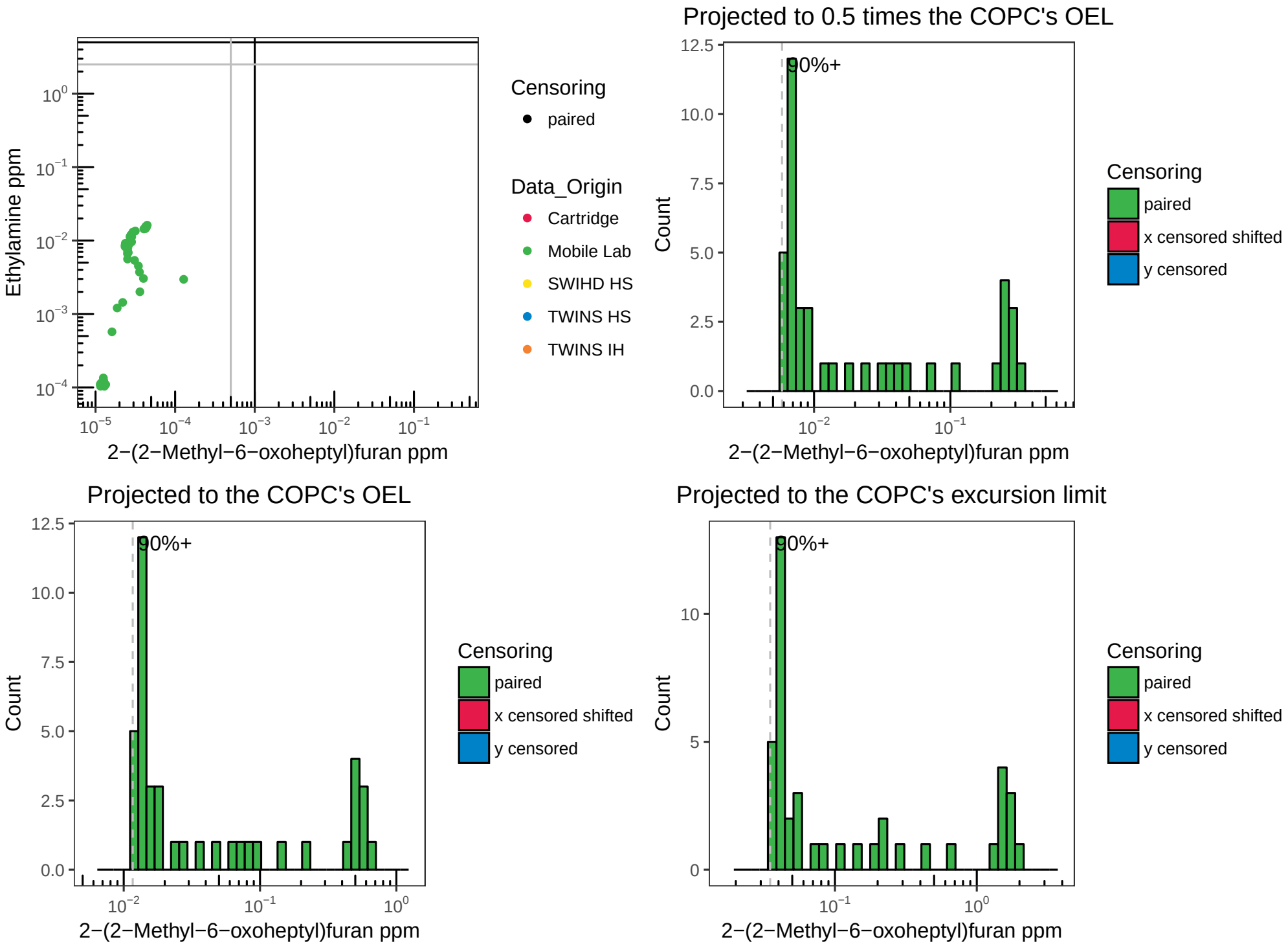


Figure C.1547: Ethylamine vs 2-(2-Methyl-6-oxoheptyl)furan

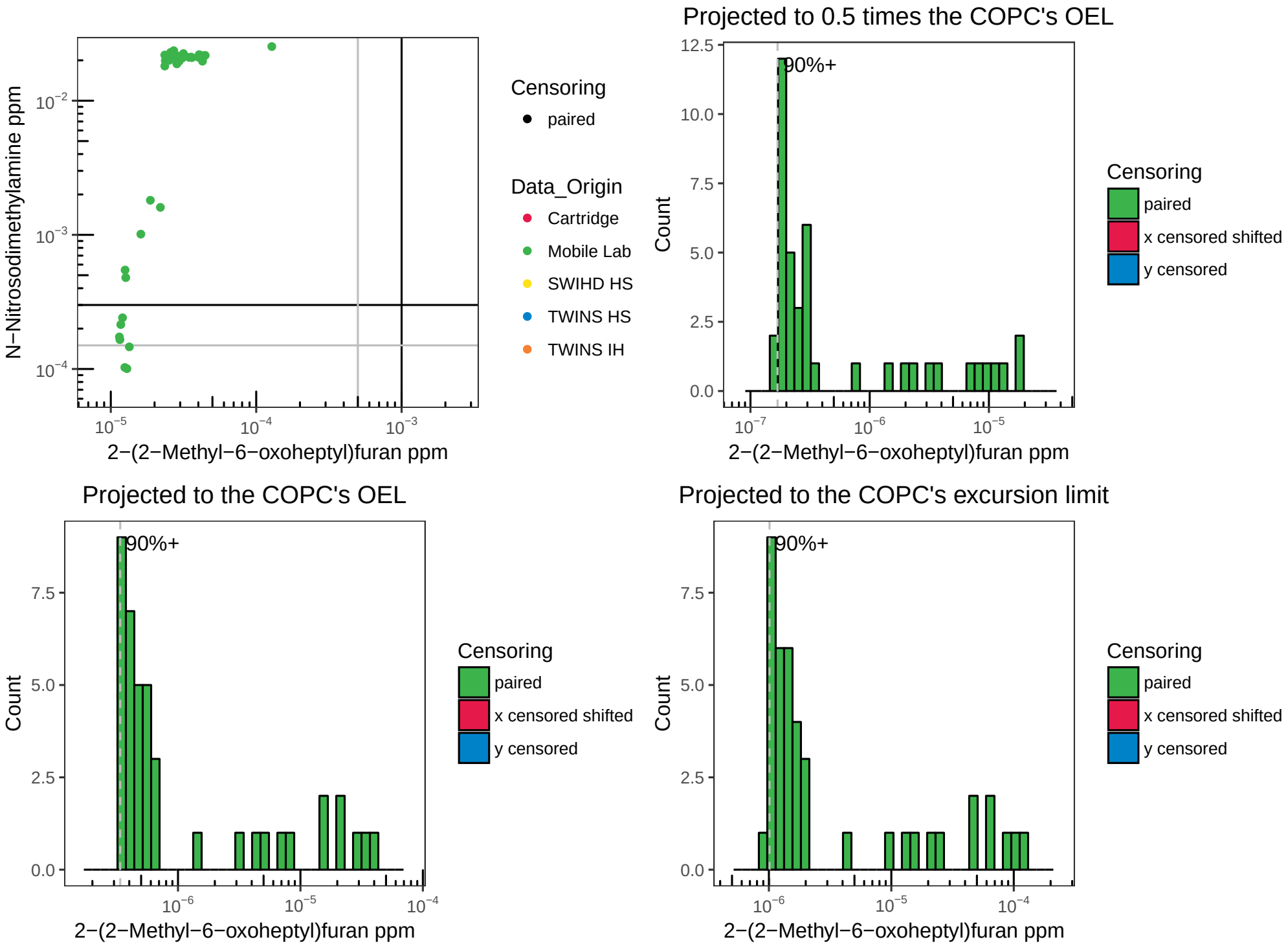


Figure C.1548: N-Nitrosodimethylamine vs 2-(2-Methyl-6-oxoheptyl)furan

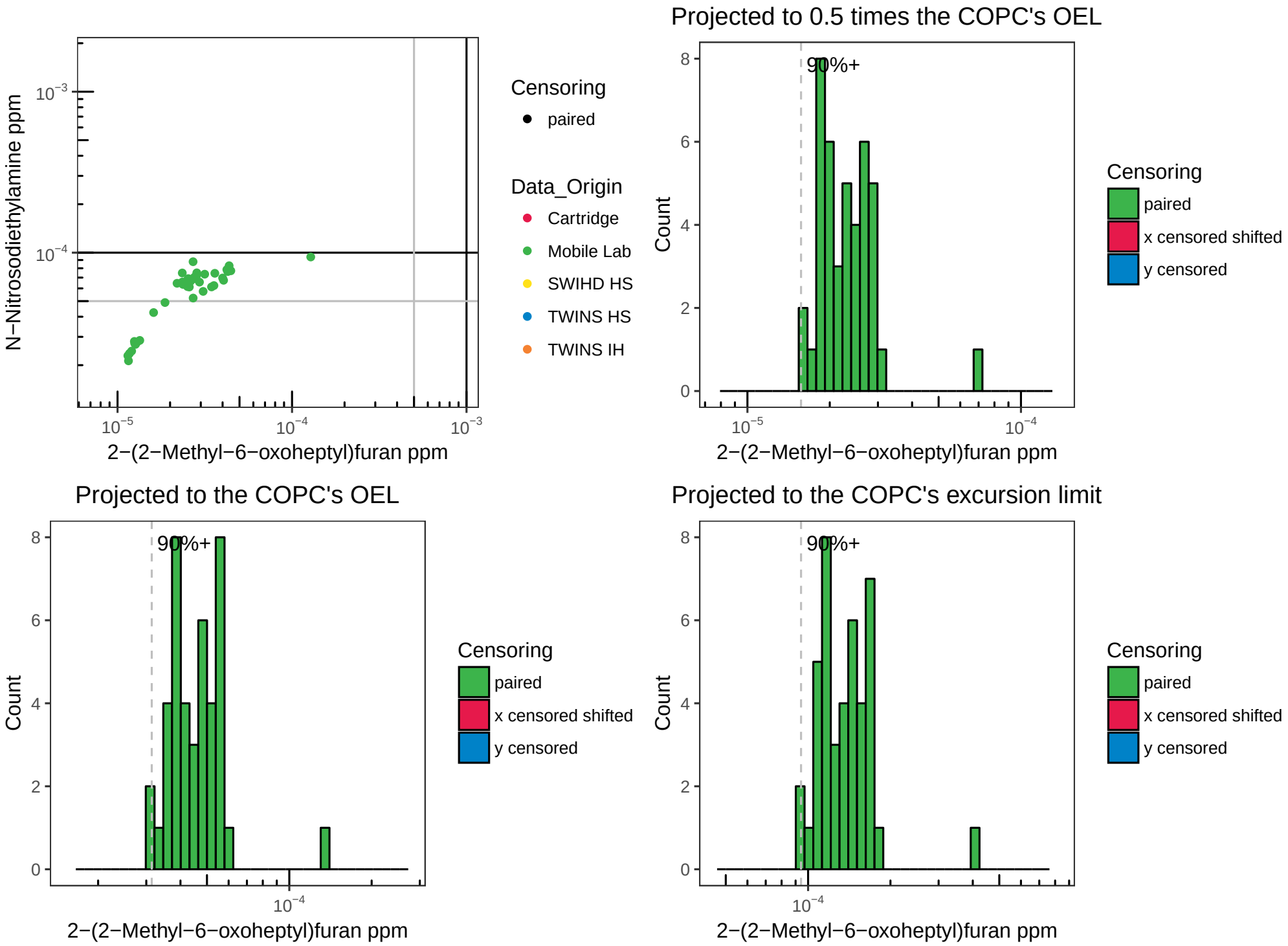


Figure C.1549: N-Nitrosodiethylamine vs 2-(2-Methyl-6-oxoheptyl)furan

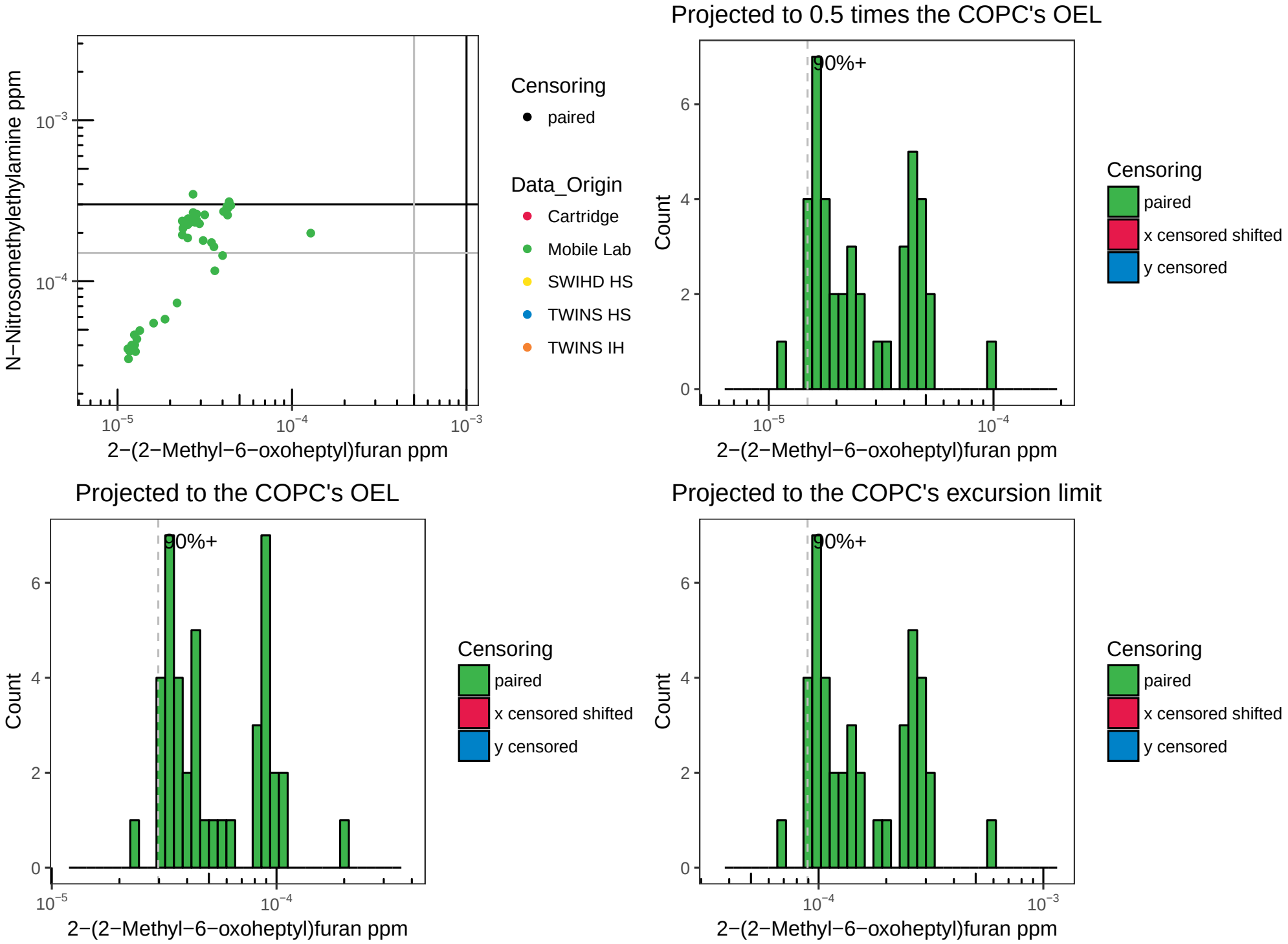


Figure C.1550: N-Nitrosomethylethylamine vs 2-(2-Methyl-6-oxoheptyl)furan

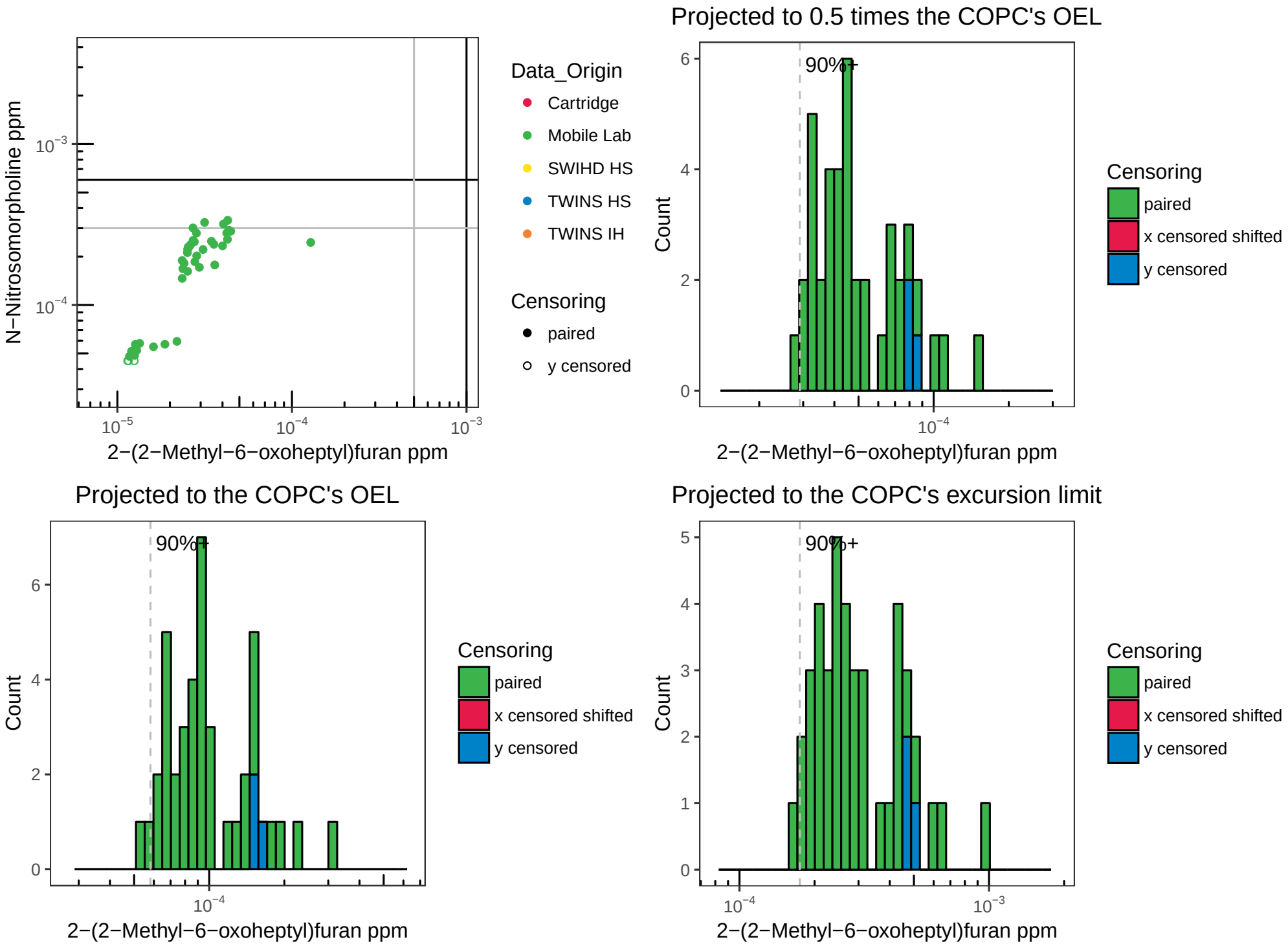


Figure C.1551: N-Nitrosomorpholine vs 2-(2-Methyl-6-oxoheptyl)furan

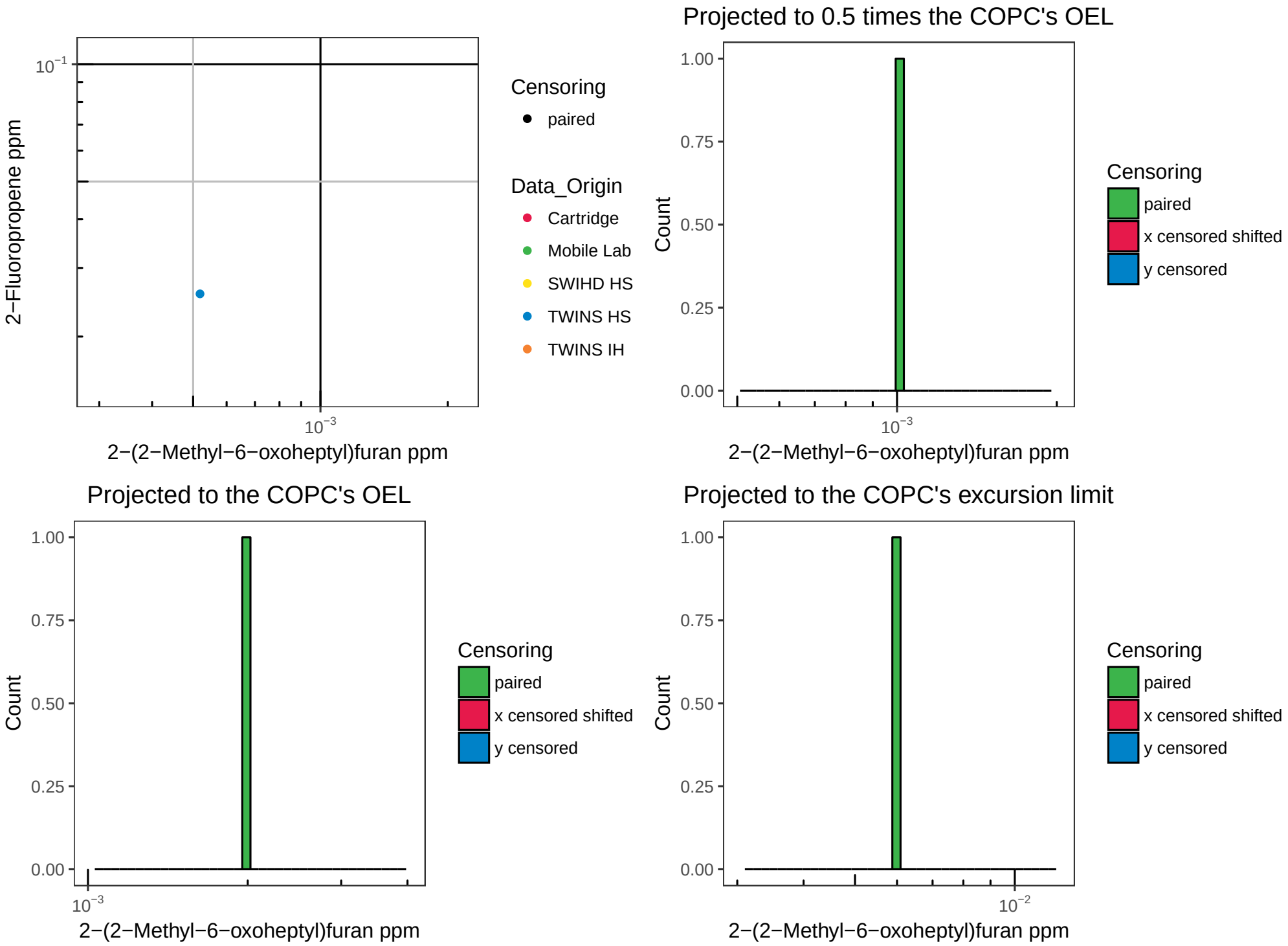


Figure C.1552: 2-Fluoropropene vs 2-(2-Methyl-6-oxoheptyl)furan

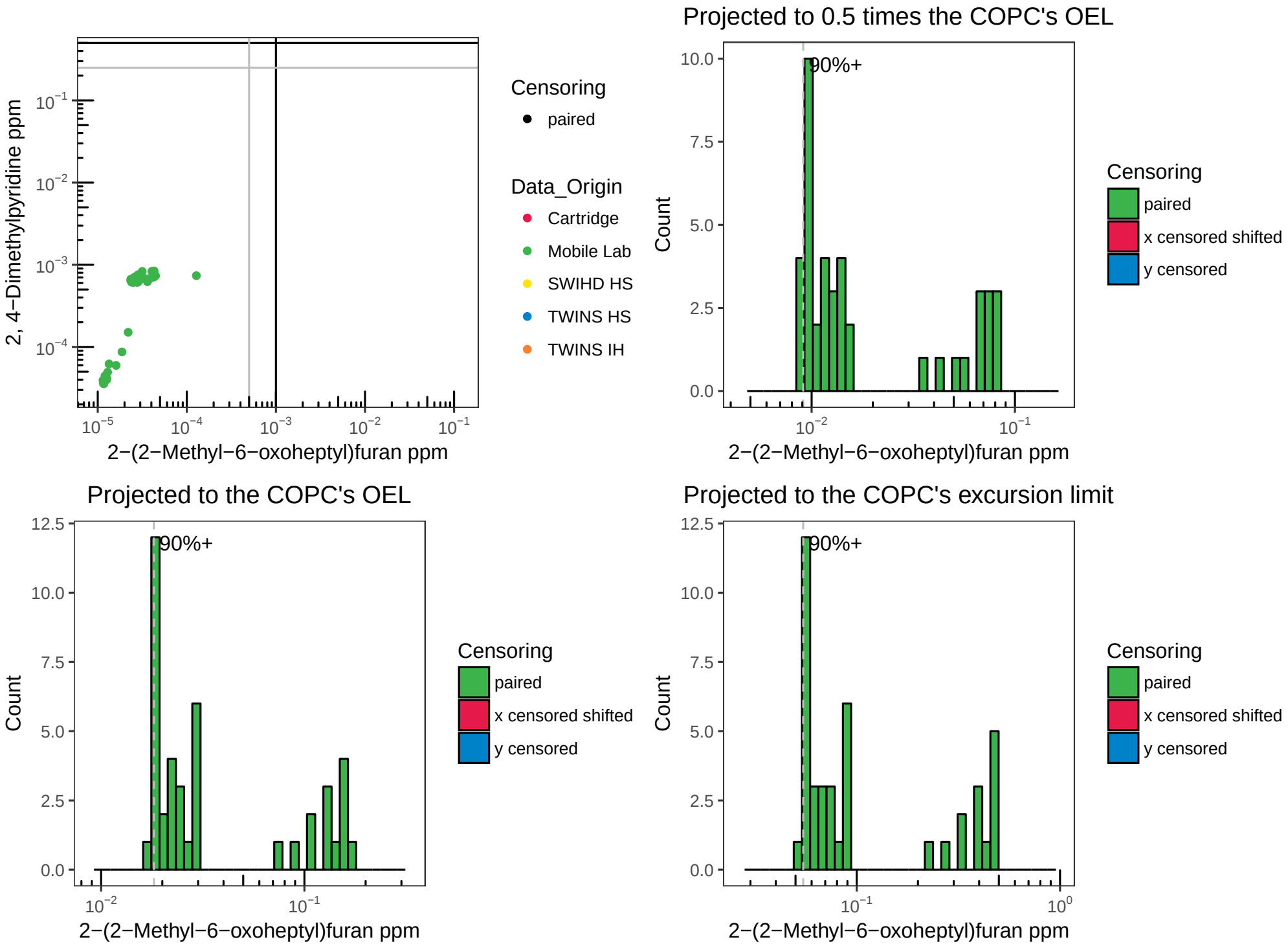


Figure C.1553: 2, 4-Dimethylpyridine vs 2-(2-Methyl-6-oxoheptyl)furan

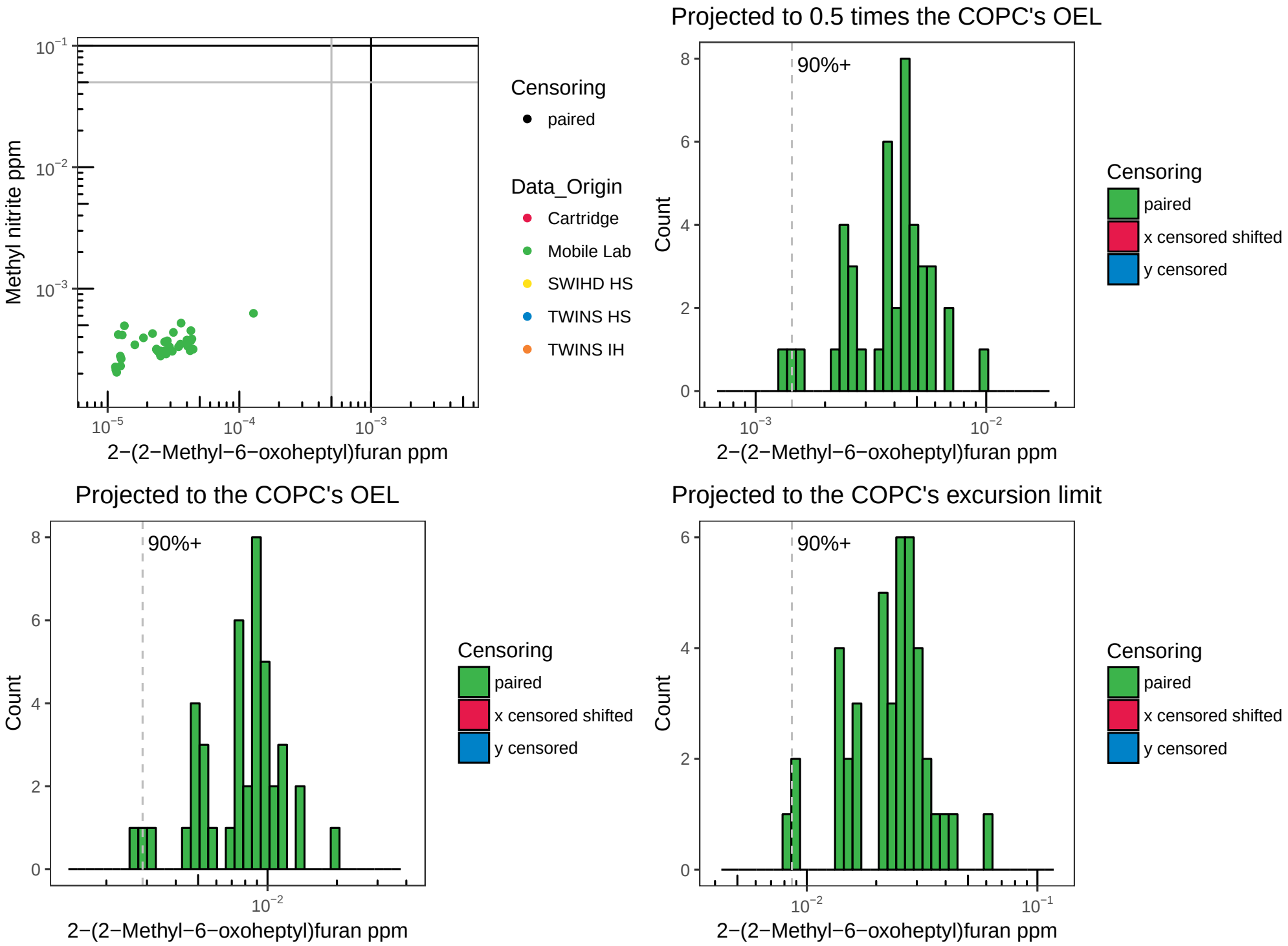


Figure C.1554: Methyl nitrite vs 2-(2-Methyl-6-oxoheptyl)furan

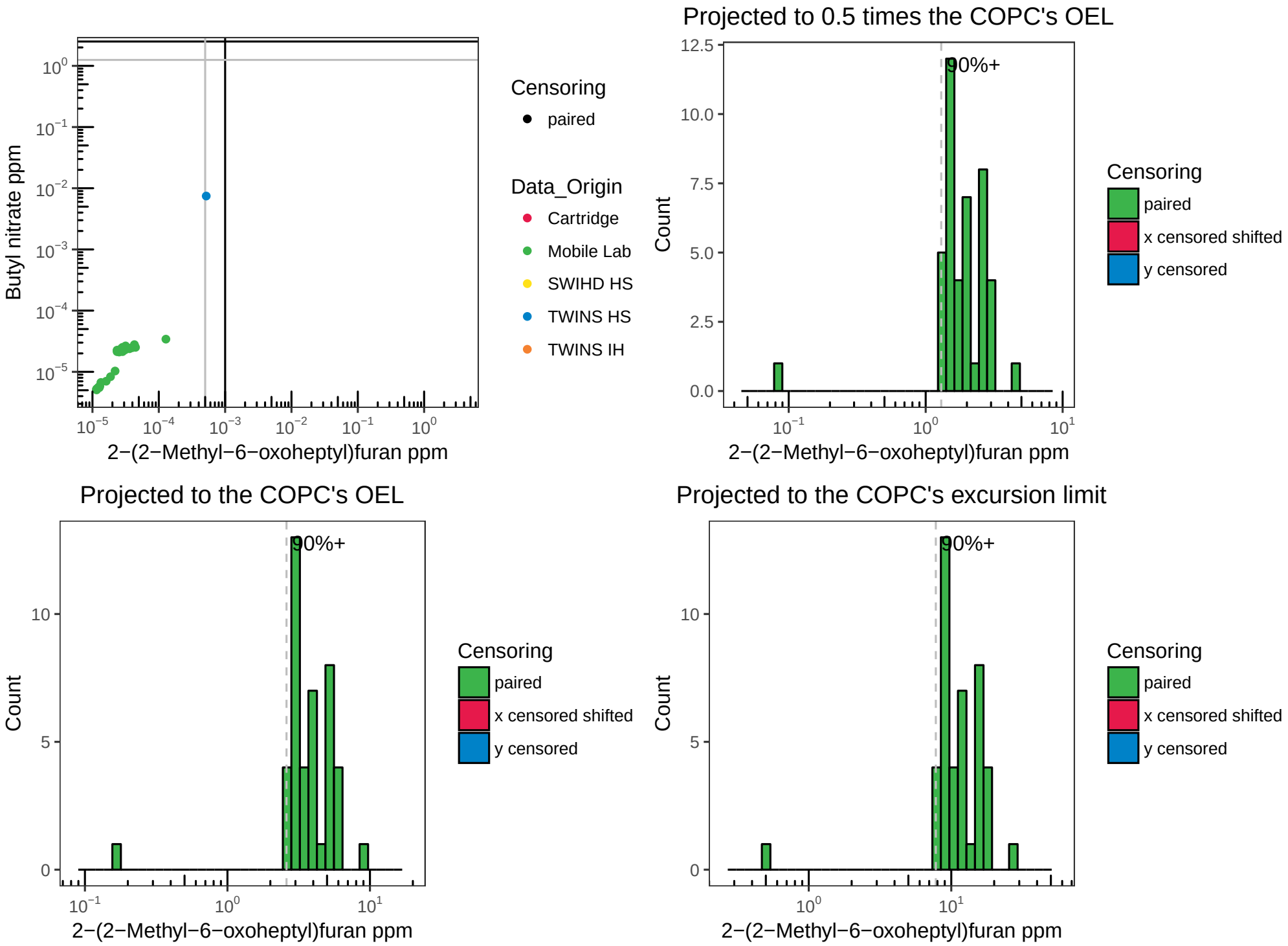


Figure C.1555: Butyl nitrate vs 2-(2-Methyl-6-oxoheptyl)furan

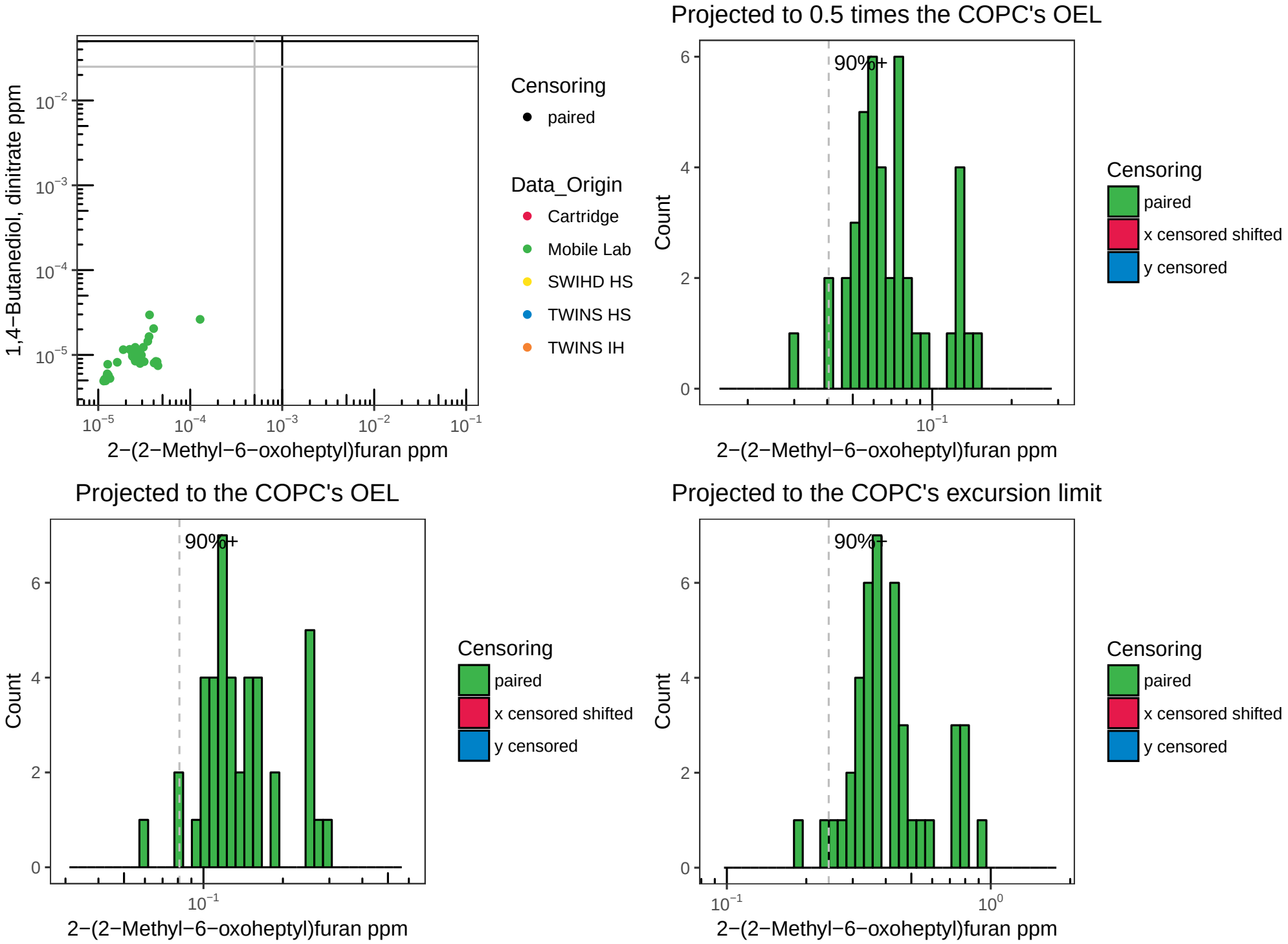


Figure C.1556: 1,4-Butanediol, dinitrate vs 2-(2-Methyl-6-oxoheptyl)furan

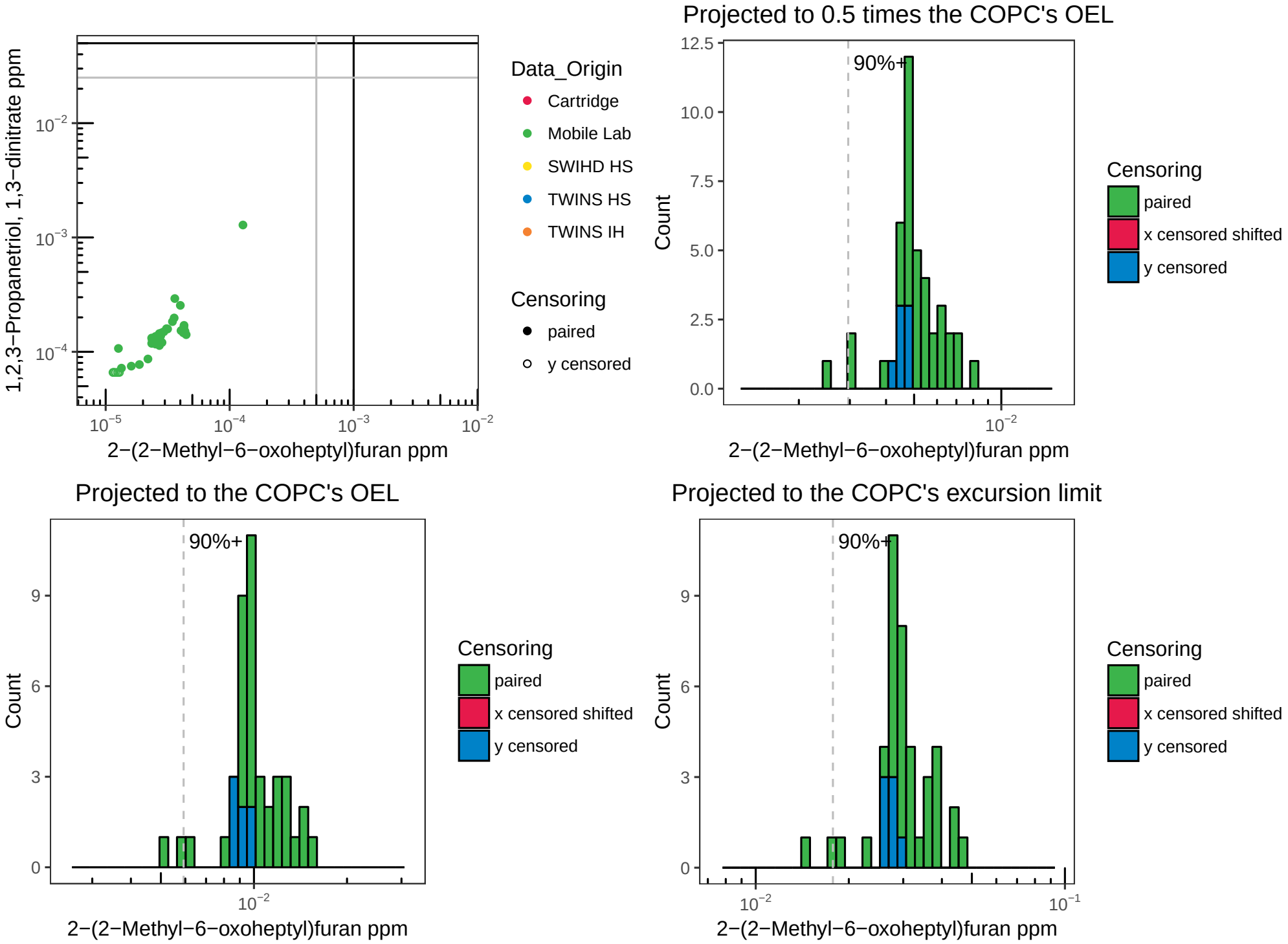


Figure C.1557: 1,2,3-Propanetriol, 1,3-dinitrate vs 2-(2-Methyl-6-oxoheptyl)furan

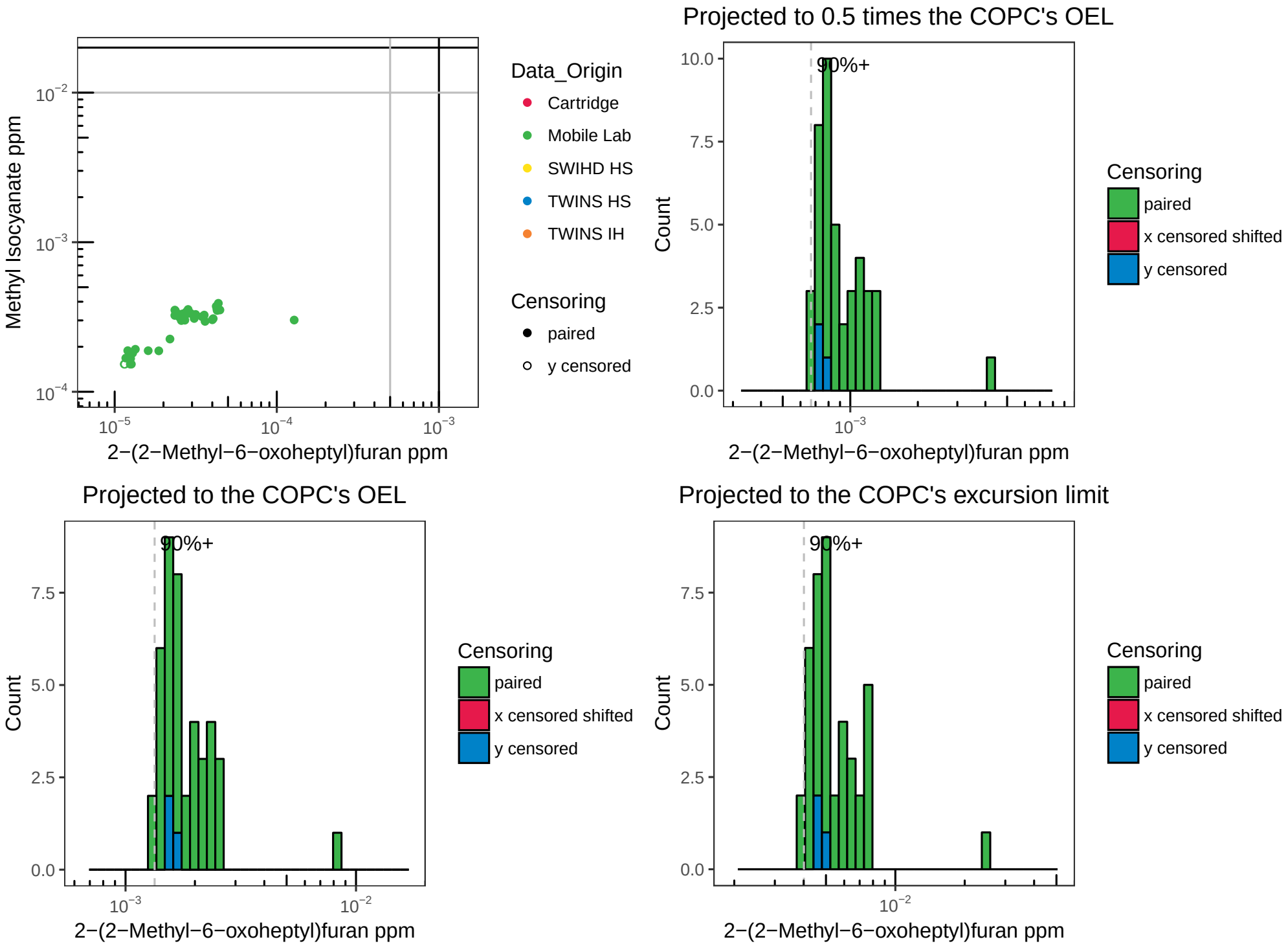


Figure C.1558: Methyl Isocyanate vs 2-(2-Methyl-6-oxoheptyl)furan

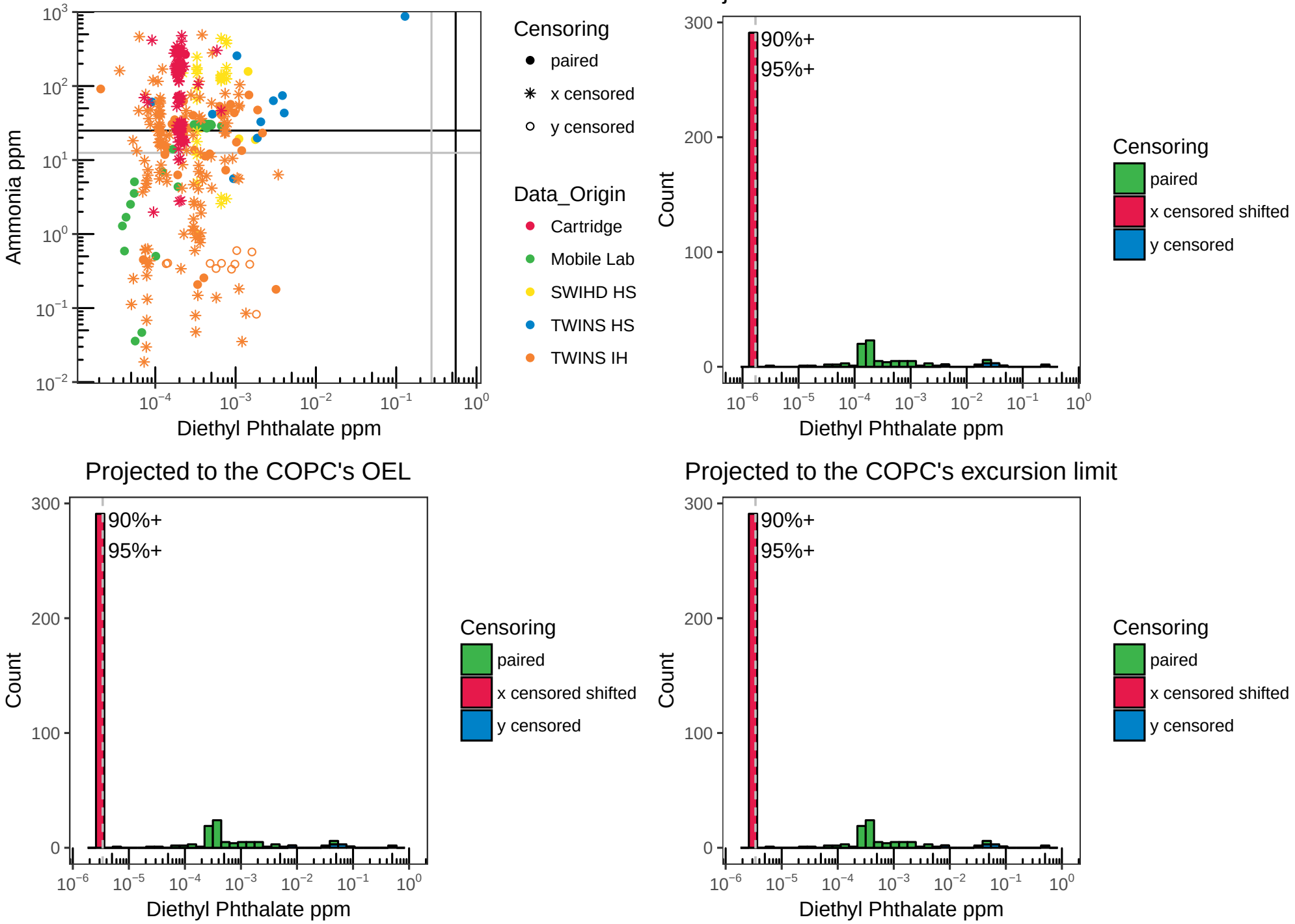


Figure C.1559: Ammonia vs Diethyl Phthalate

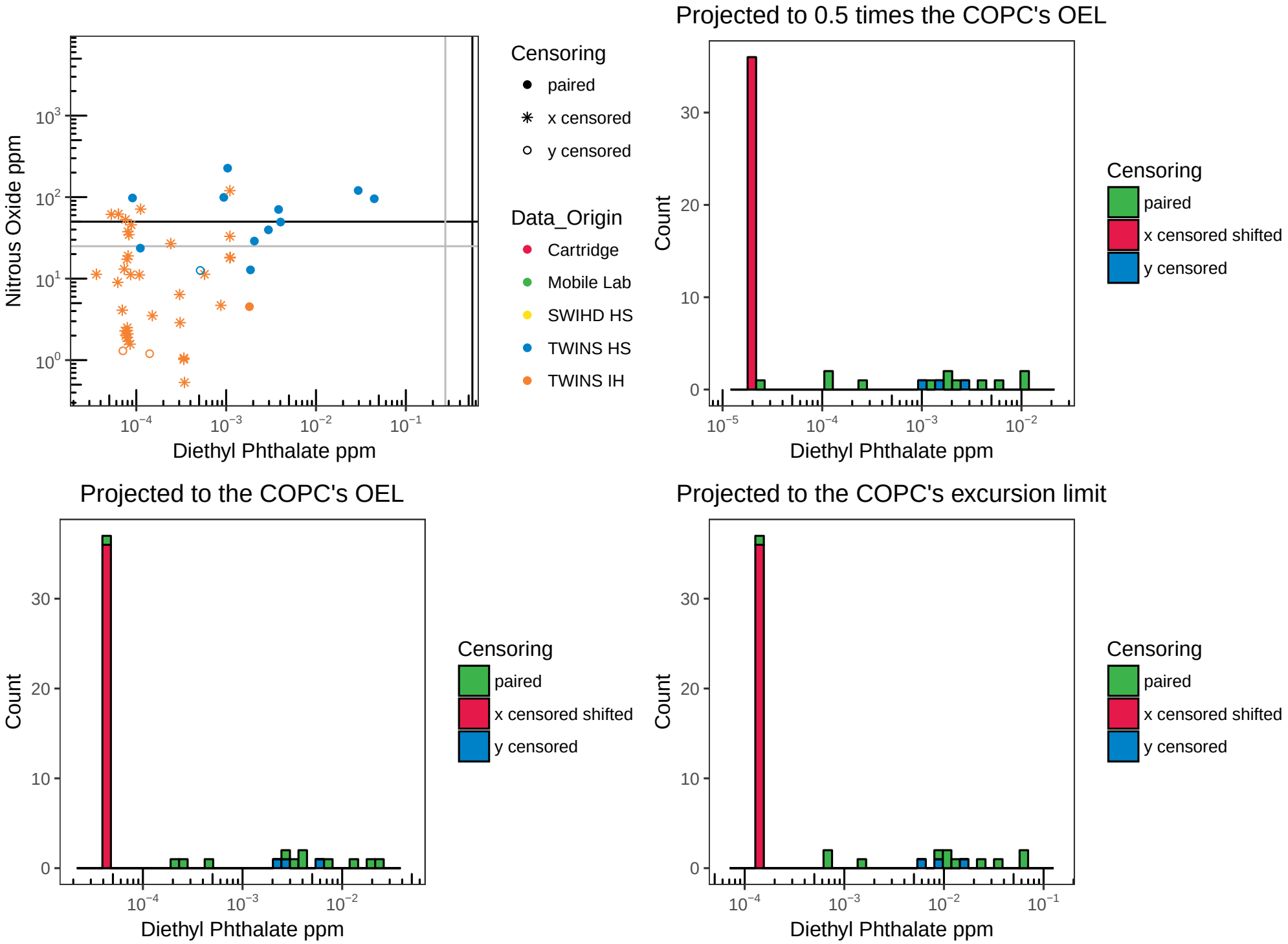


Figure C.1560: Nitrous Oxide vs Diethyl Phthalate

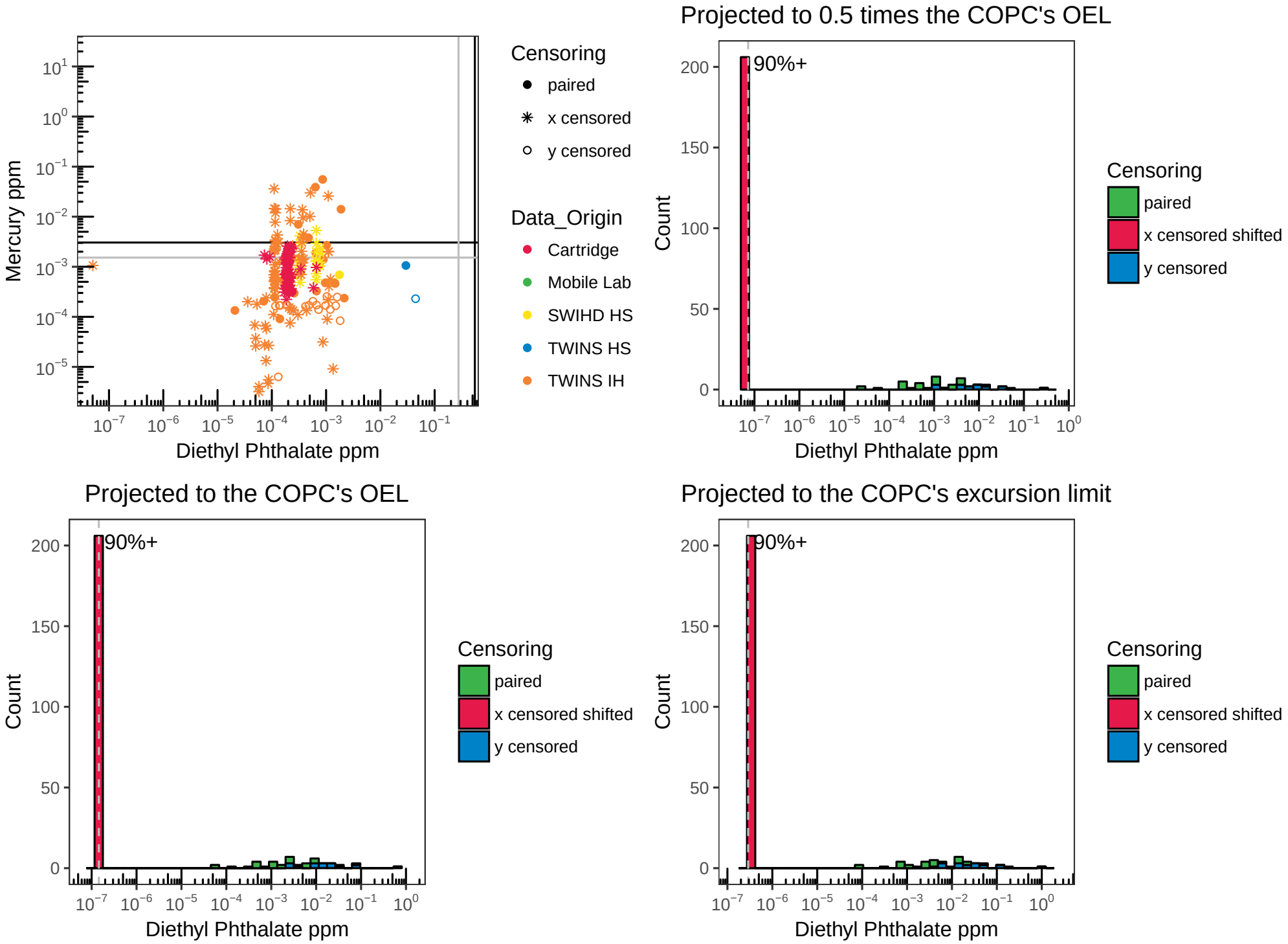


Figure C.1561: Mercury vs Diethyl Phthalate

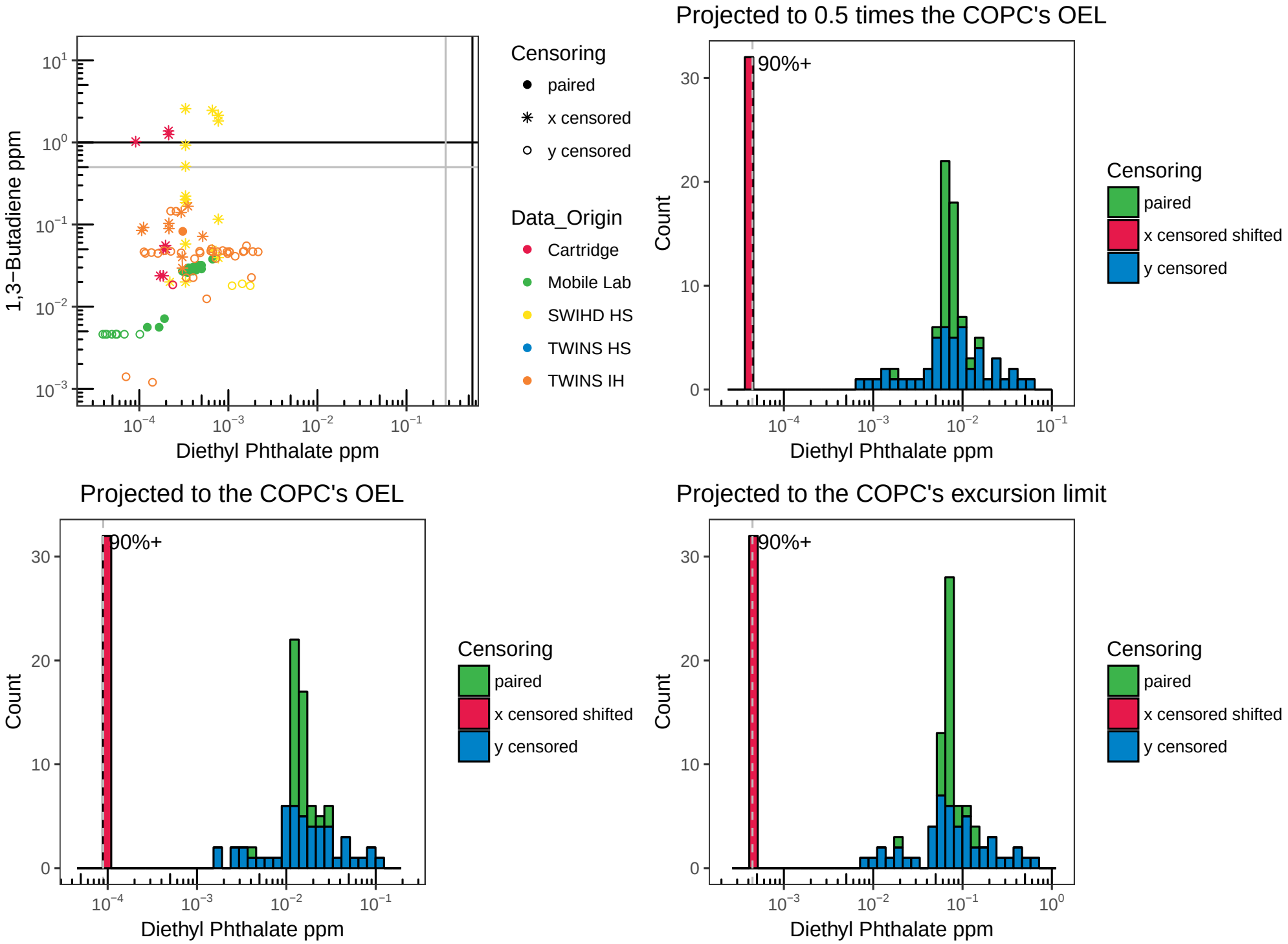


Figure C.1562: 1,3-Butadiene vs Diethyl Phthalate

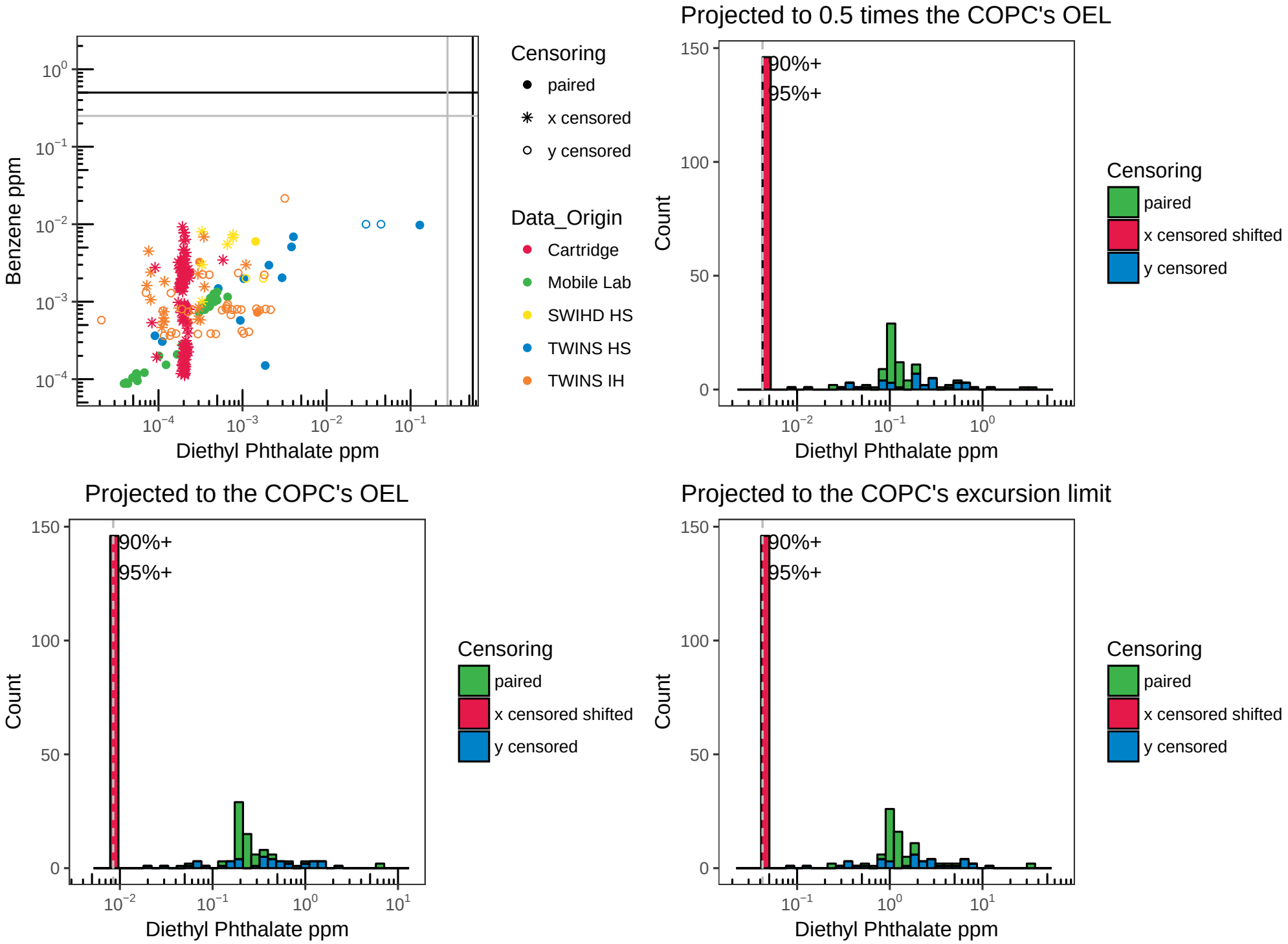


Figure C.1563: Benzene vs Diethyl Phthalate

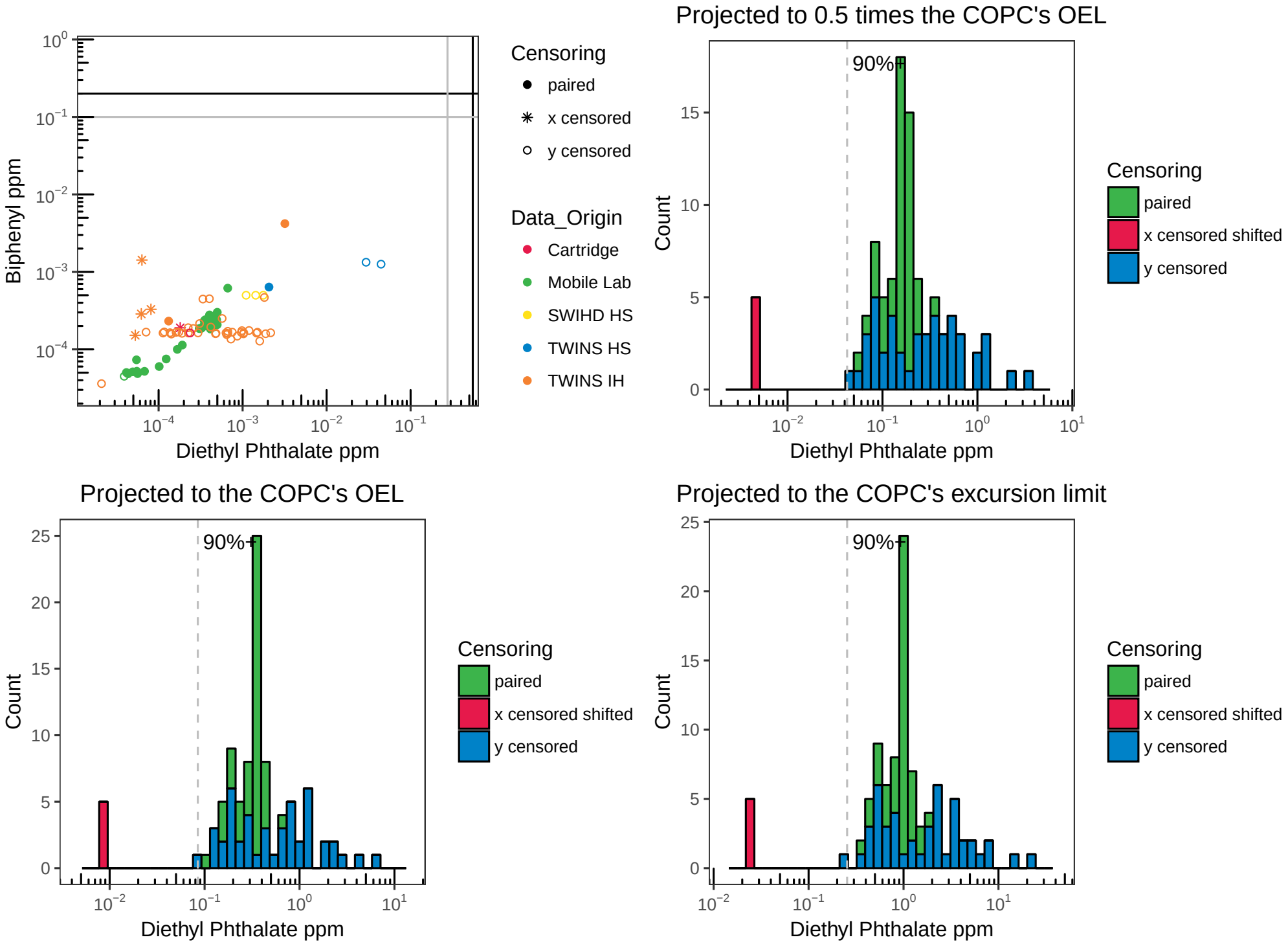


Figure C.1564: Biphenyl vs Diethyl Phthalate

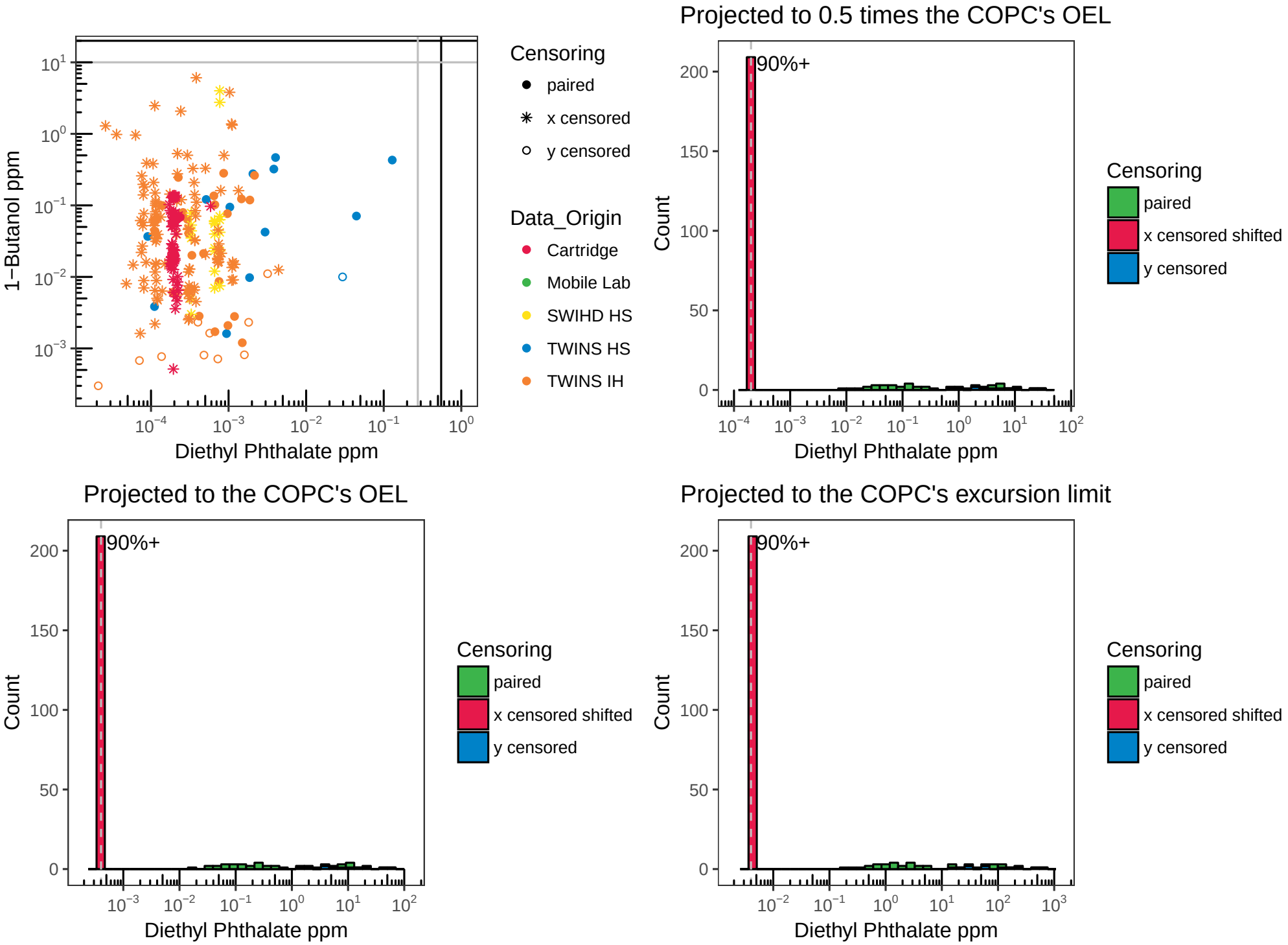


Figure C.1565: 1-Butanol vs Diethyl Phthalate

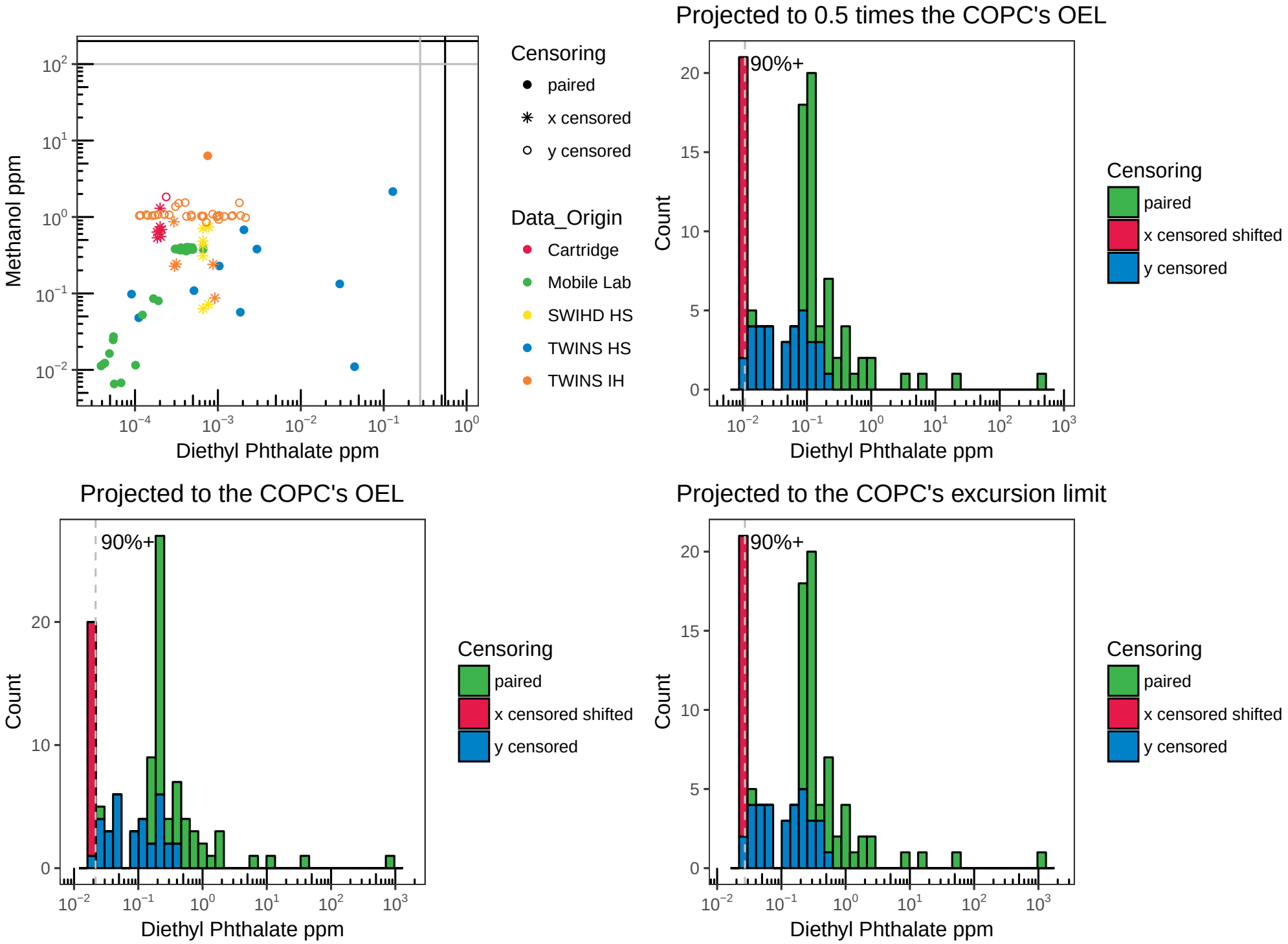


Figure C.1566: Methanol vs Diethyl Phthalate

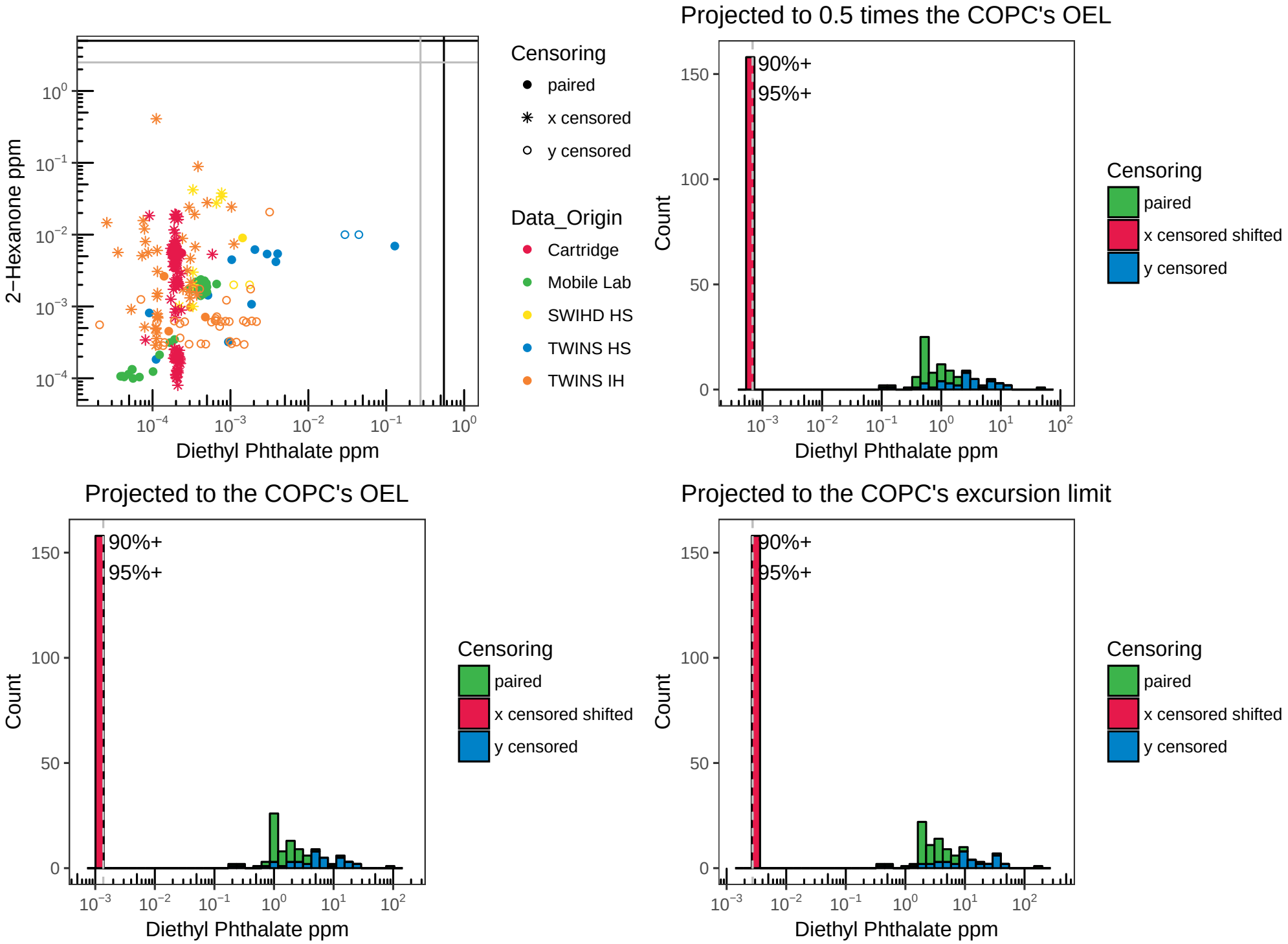


Figure C.1567: 2-Hexanone vs Diethyl Phthalate

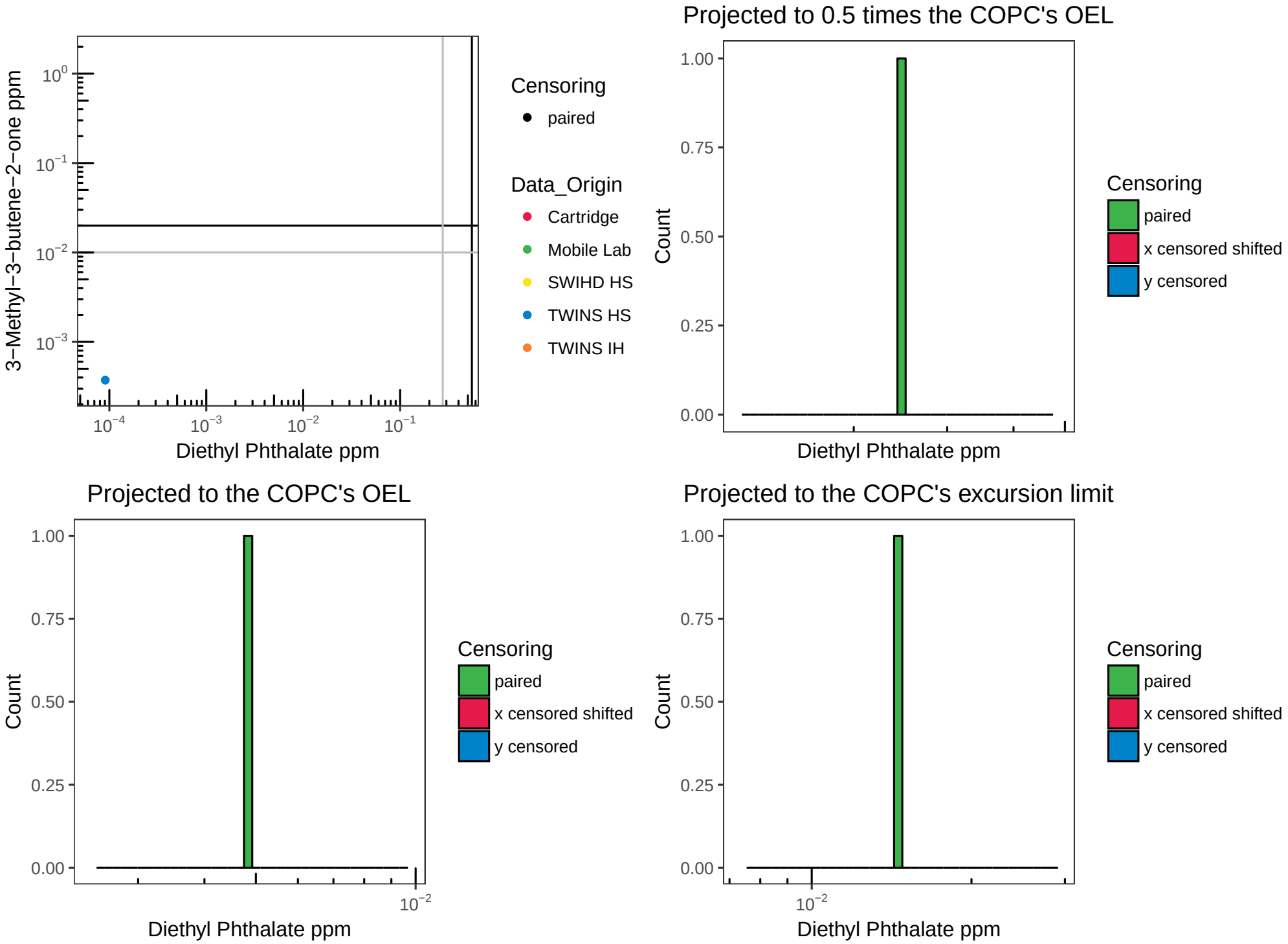


Figure C.1568: 3-Methyl-3-butene-2-one vs Diethyl Phthalate

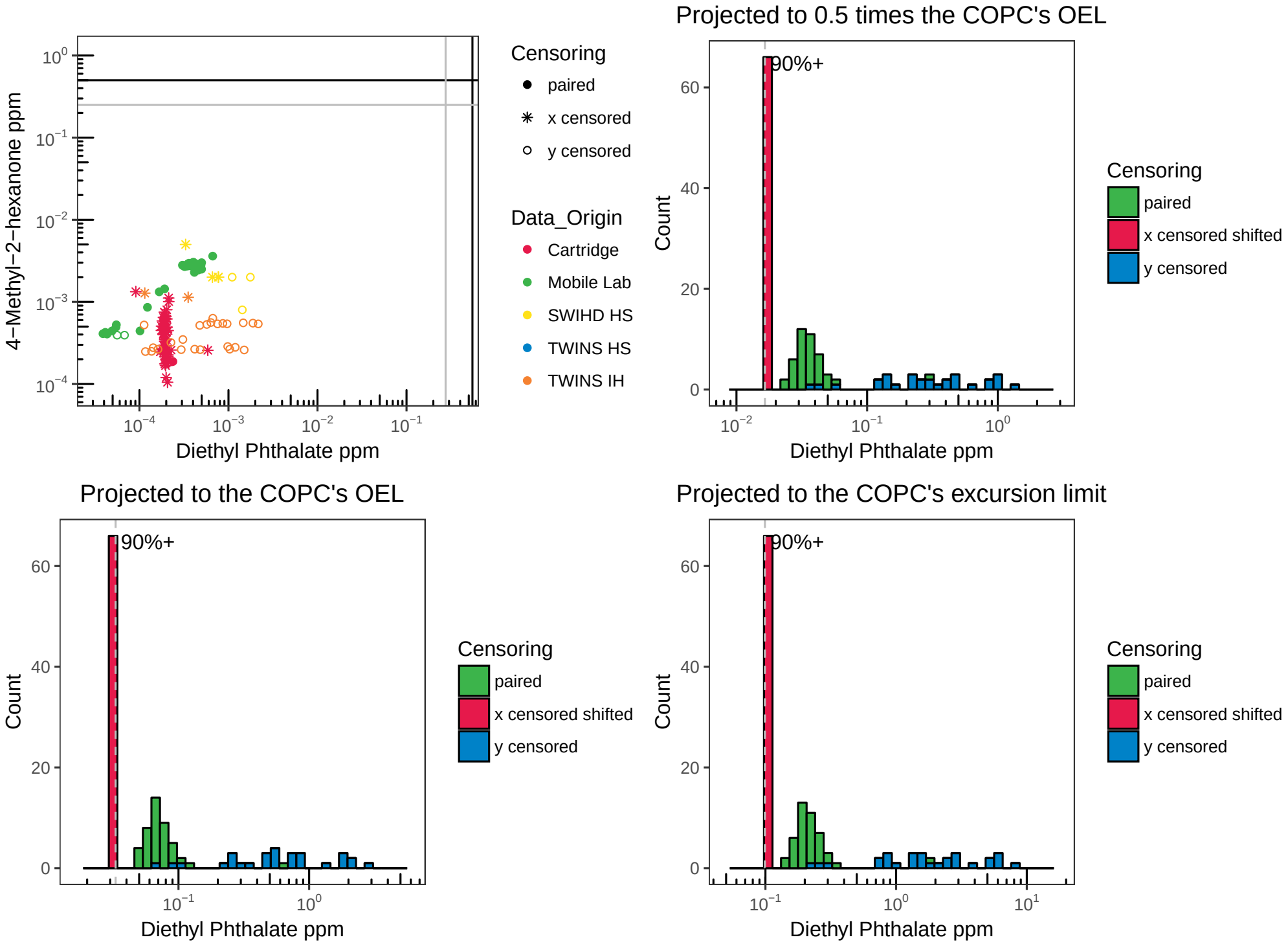


Figure C.1569: 4-Methyl-2-hexanone vs Diethyl Phthalate

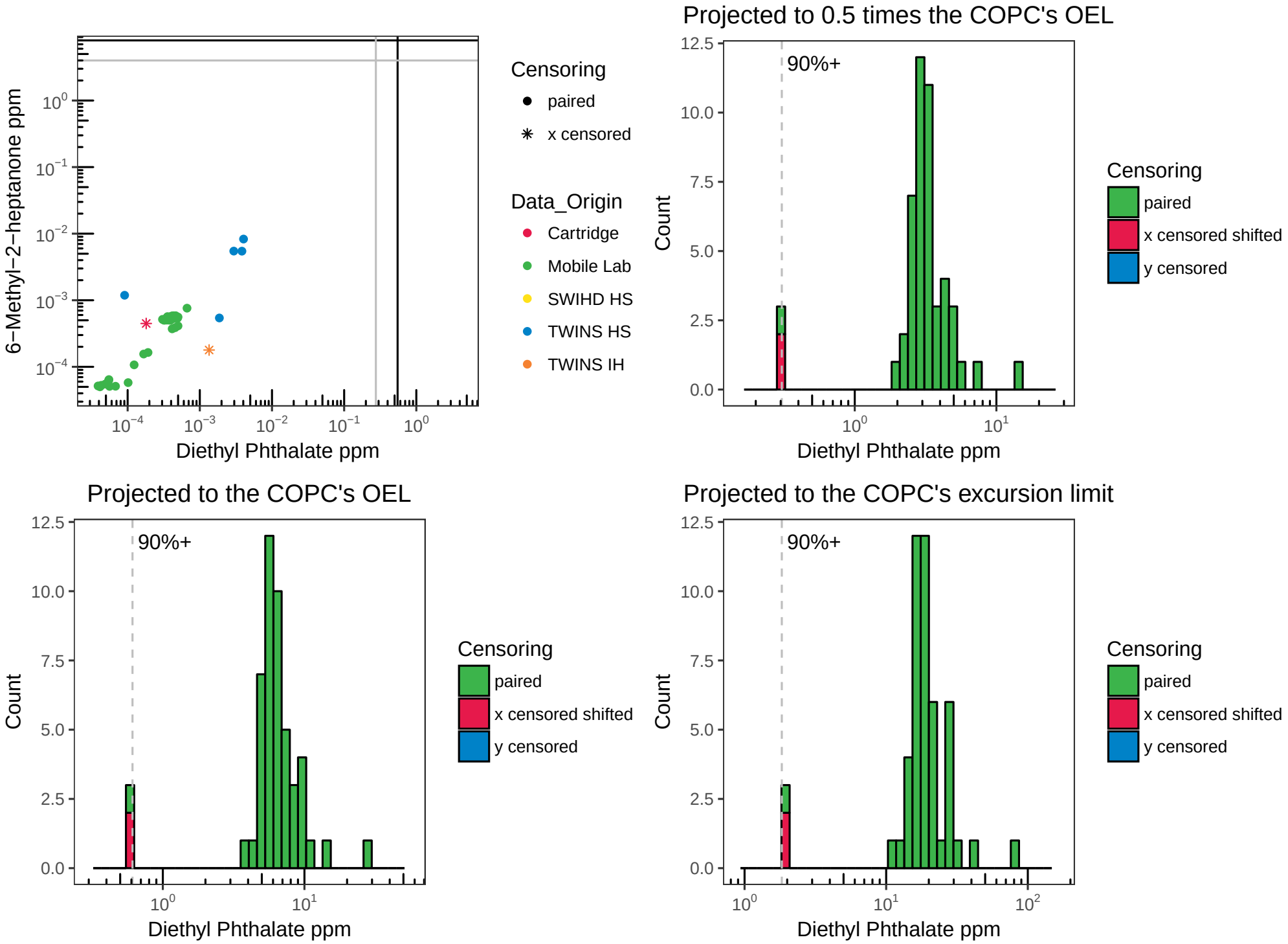


Figure C.1570: 6-Methyl-2-heptanone vs Diethyl Phthalate

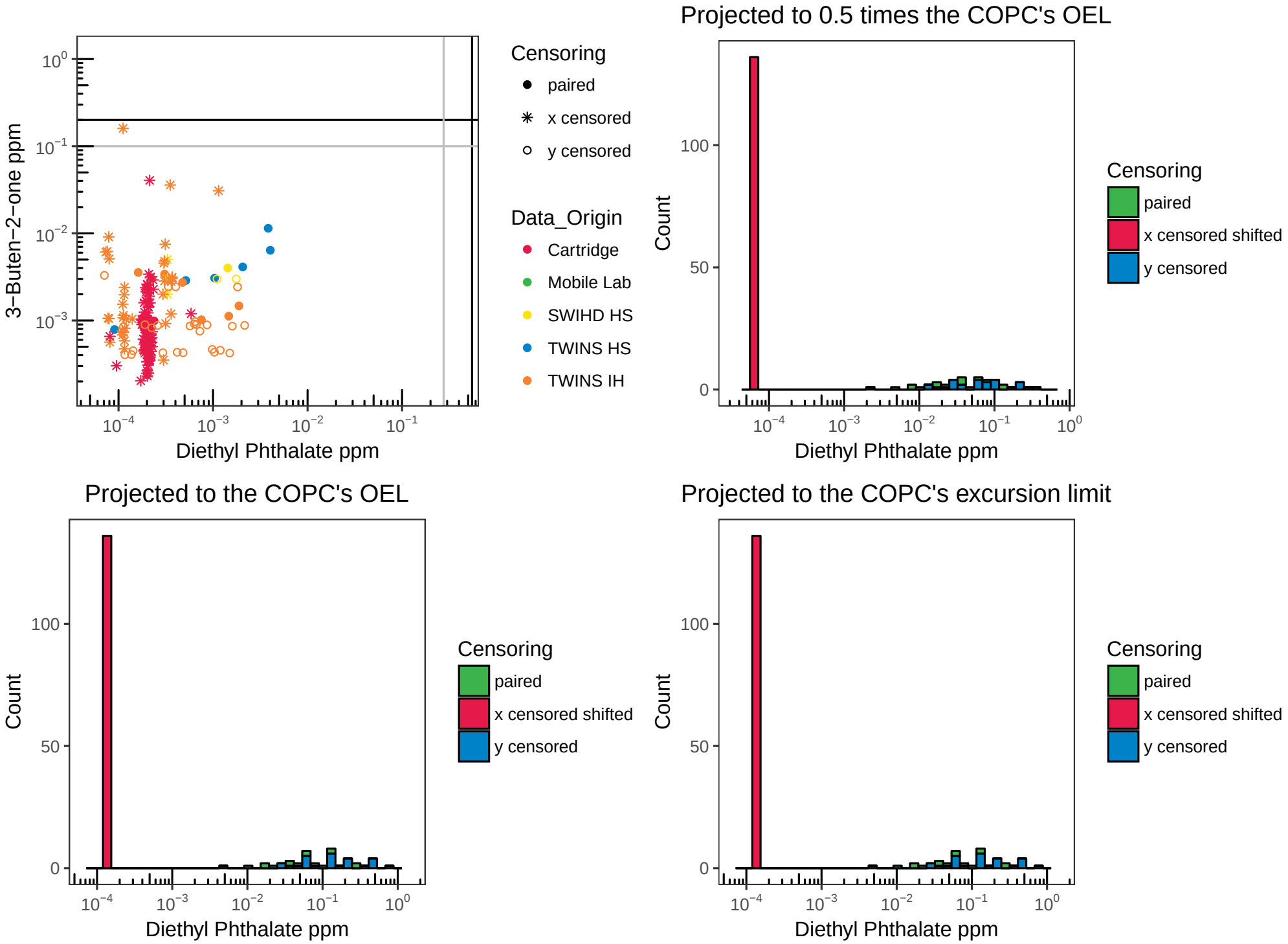


Figure C.1571: 3-Buten-2-one vs Diethyl Phthalate

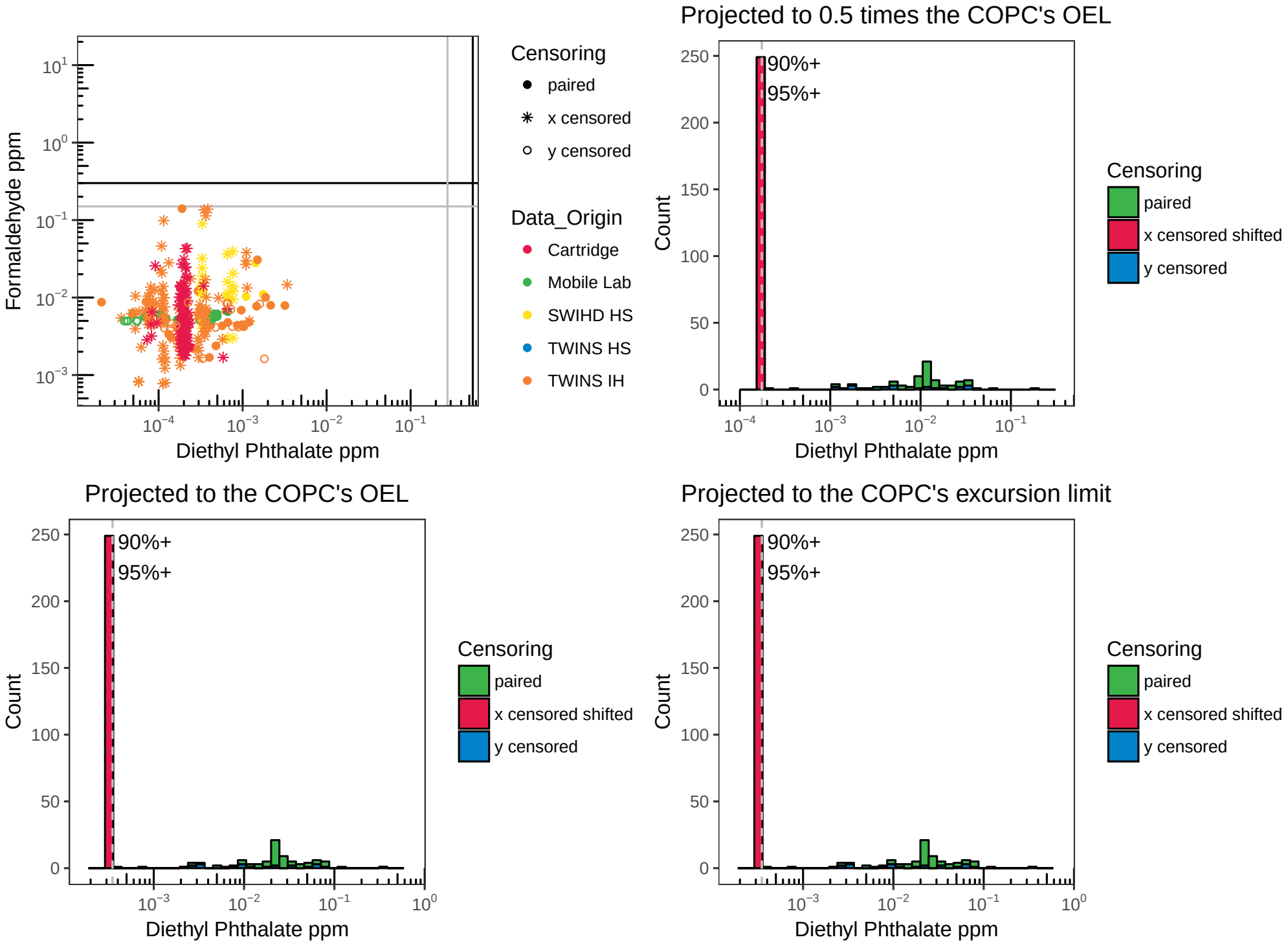


Figure C.1572: Formaldehyde vs Diethyl Phthalate

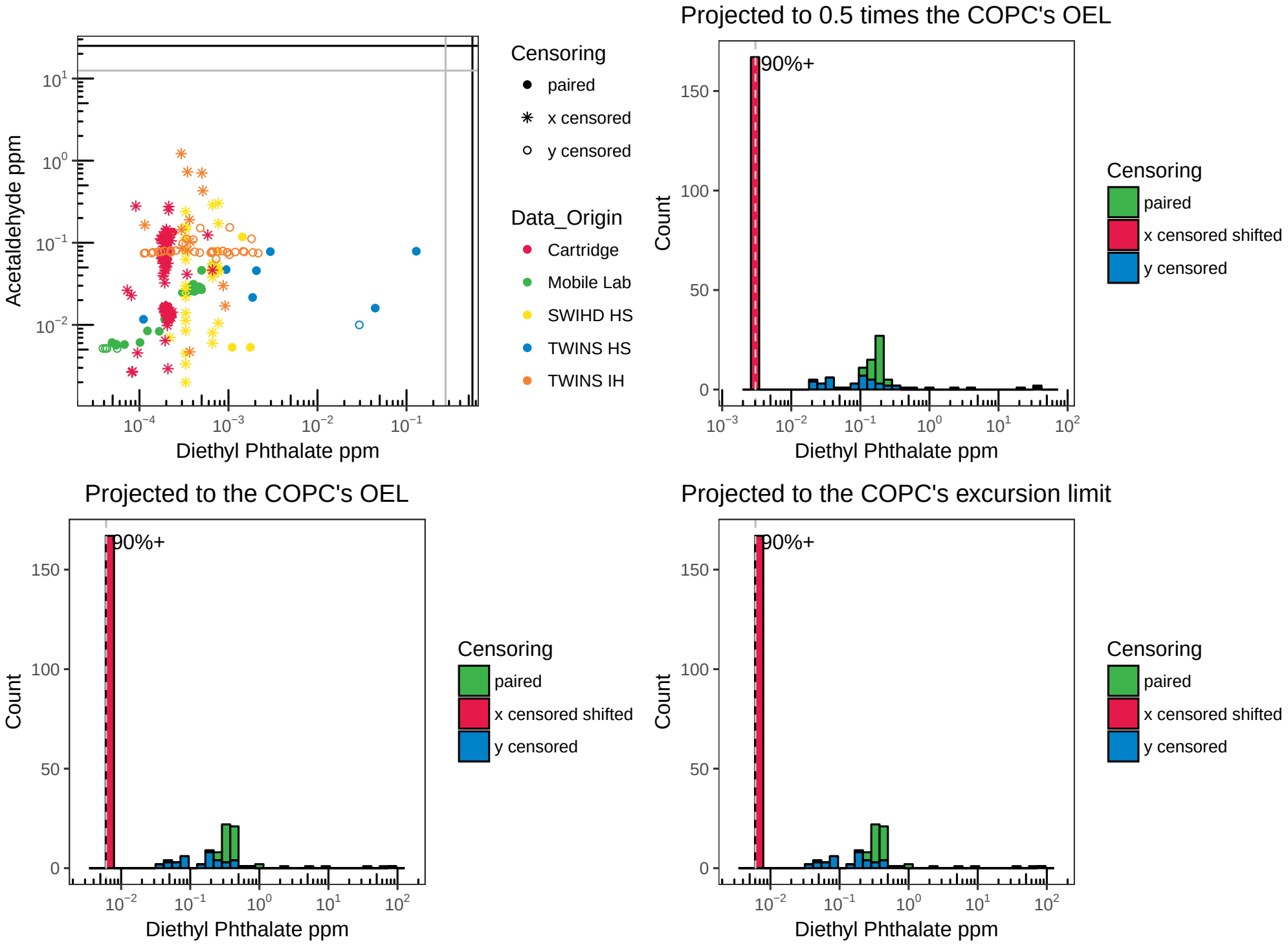


Figure C.1573: Acetaldehyde vs Diethyl Phthalate

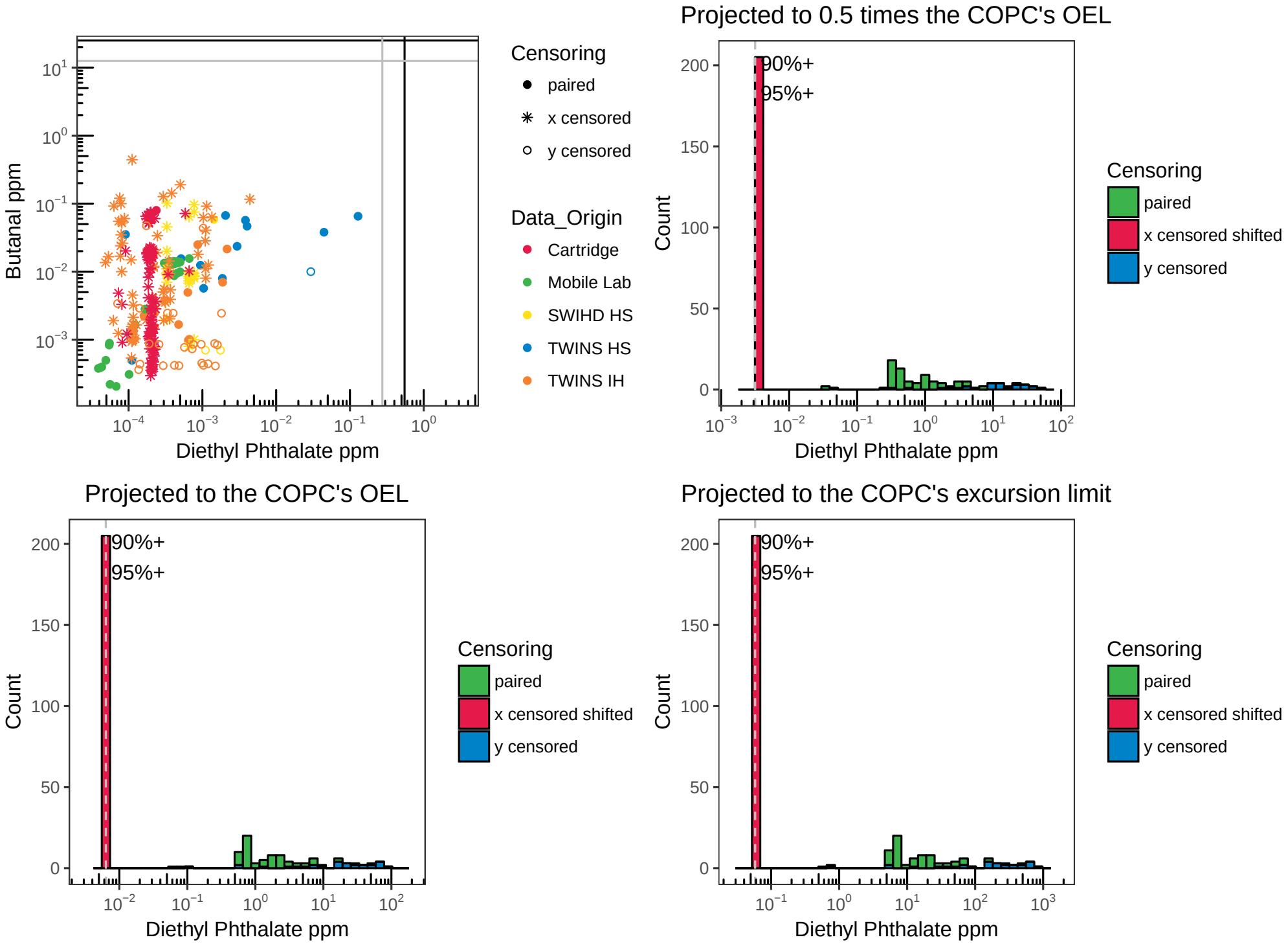


Figure C.1574: Butanal vs Diethyl Phthalate

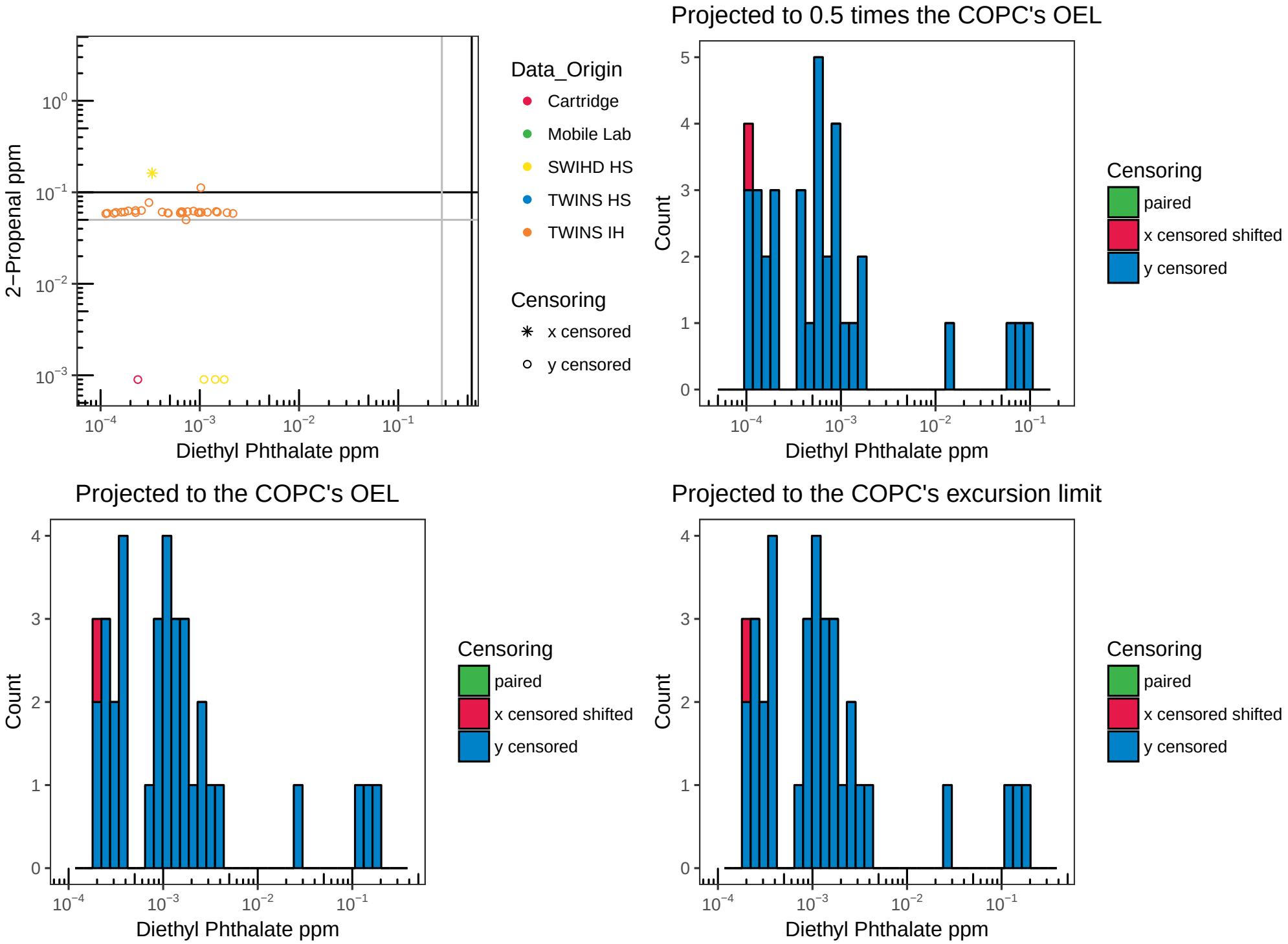


Figure C.1575: 2-Propenal vs Diethyl Phthalate

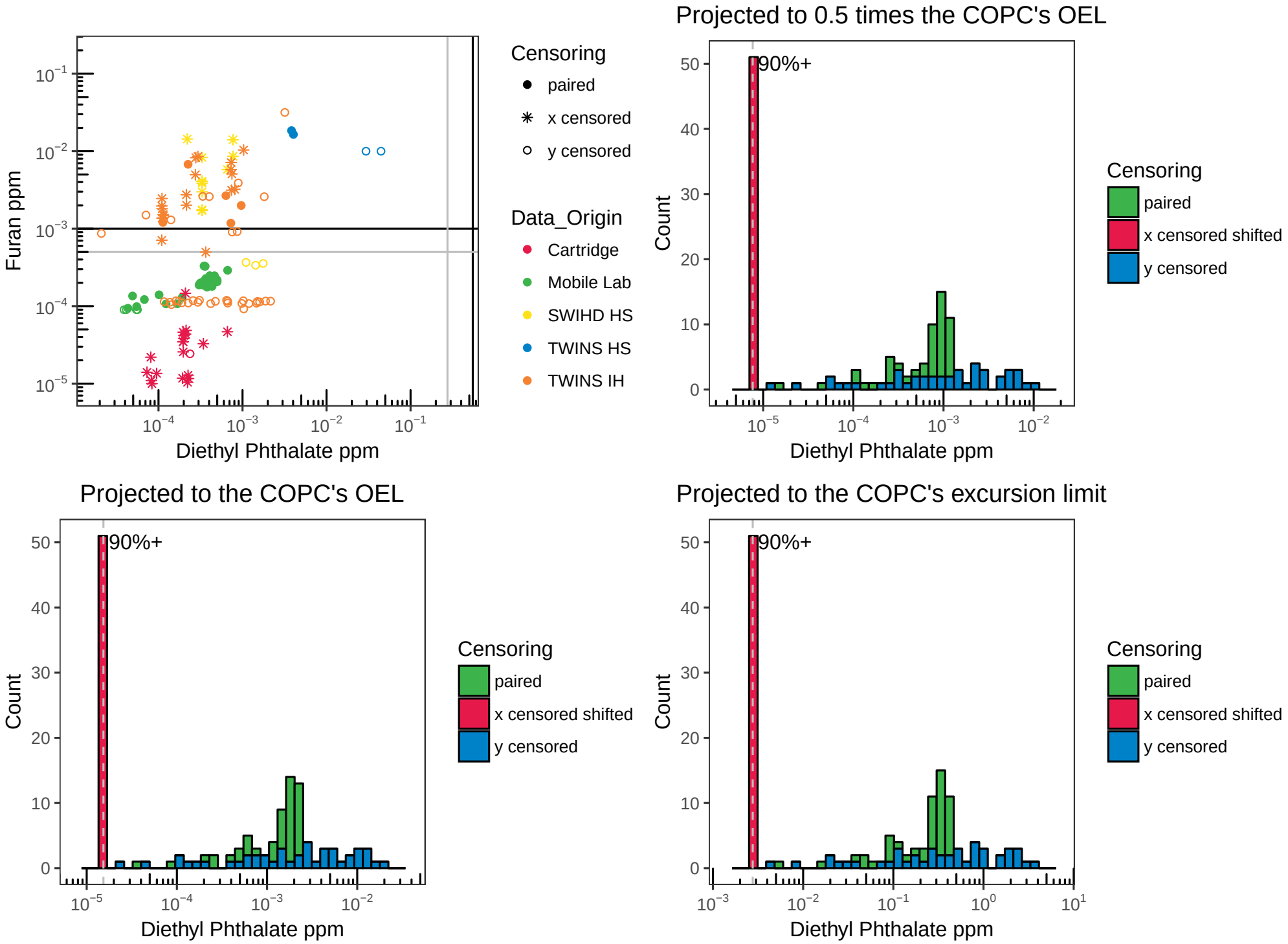


Figure C.1576: Furan vs Diethyl Phthalate

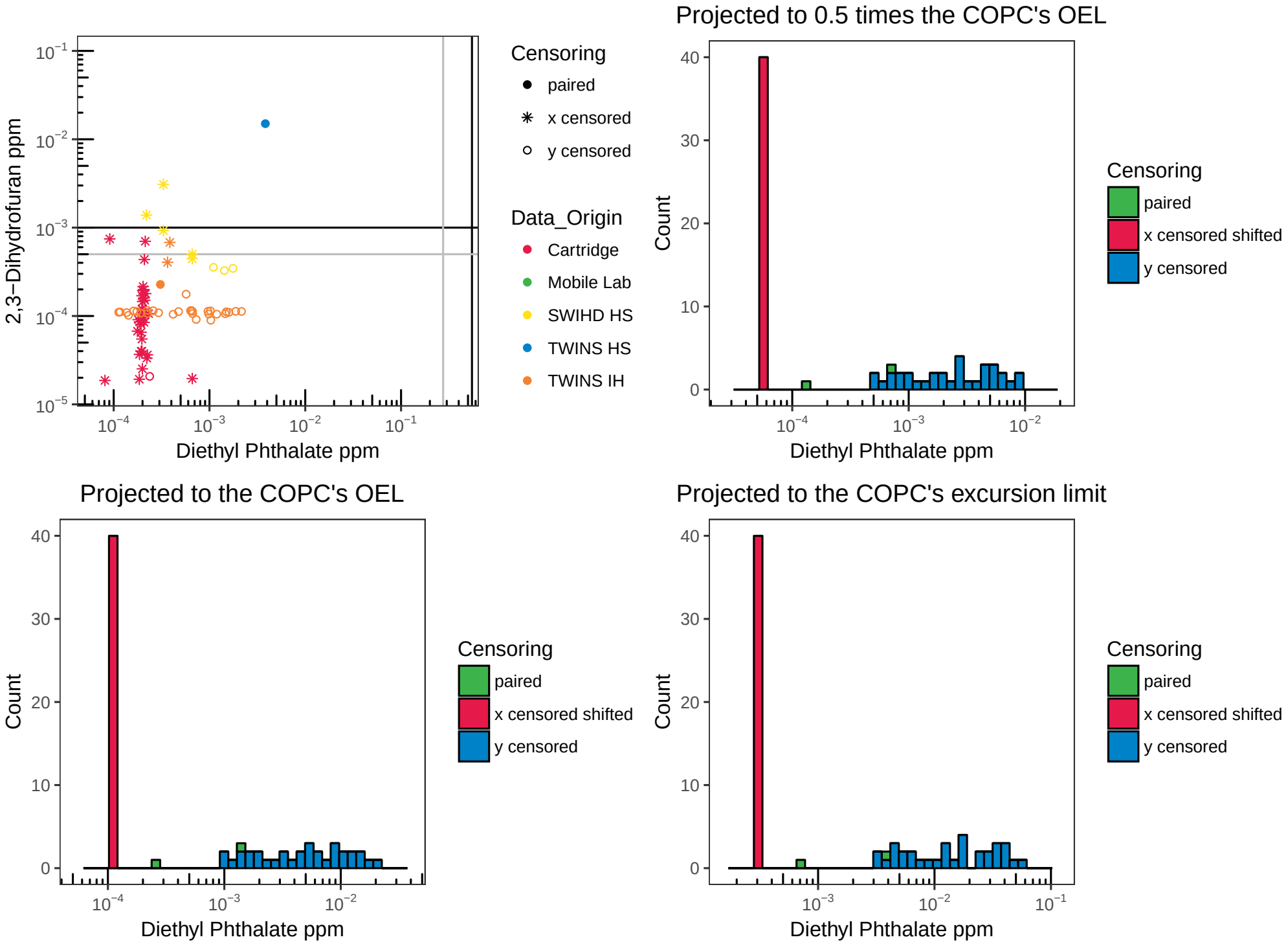


Figure C.1577: 2,3-Dihydrofuran vs Diethyl Phthalate

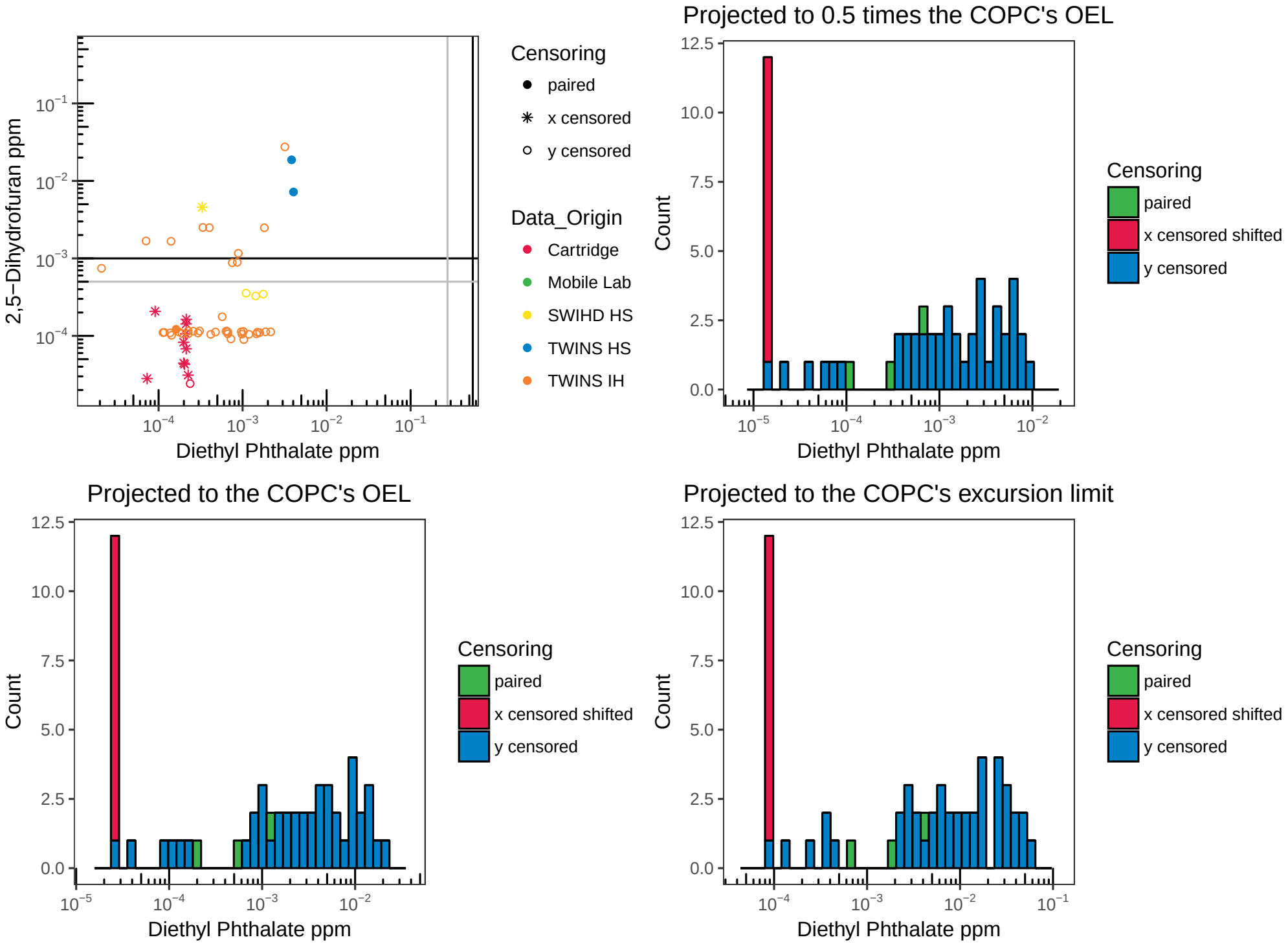


Figure C.1578: 2,5-Dihydrofuran vs Diethyl Phthalate

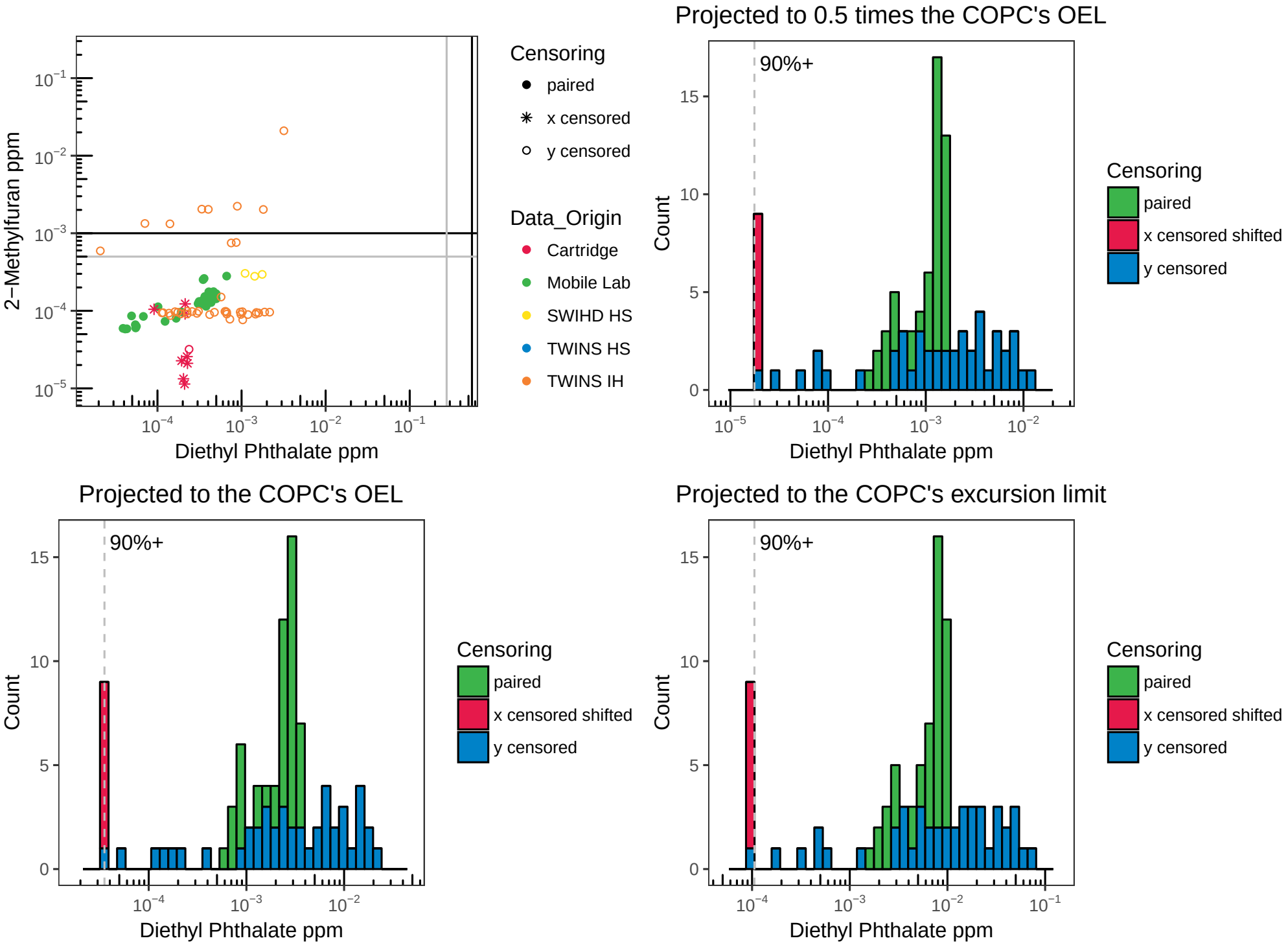


Figure C.1579: 2-Methylfuran vs Diethyl Phthalate

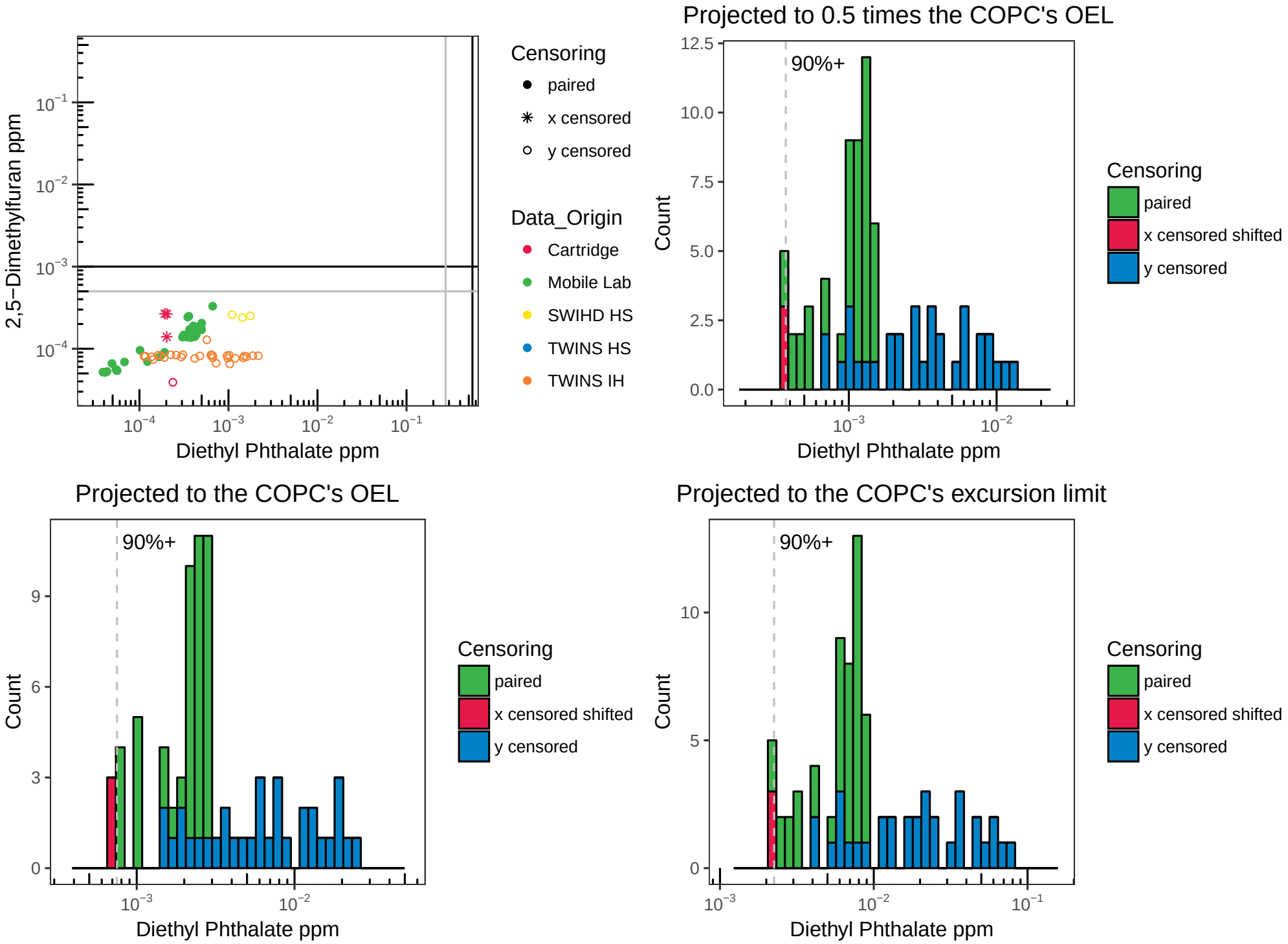


Figure C.1580: 2,5-Dimethylfuran vs Diethyl Phthalate

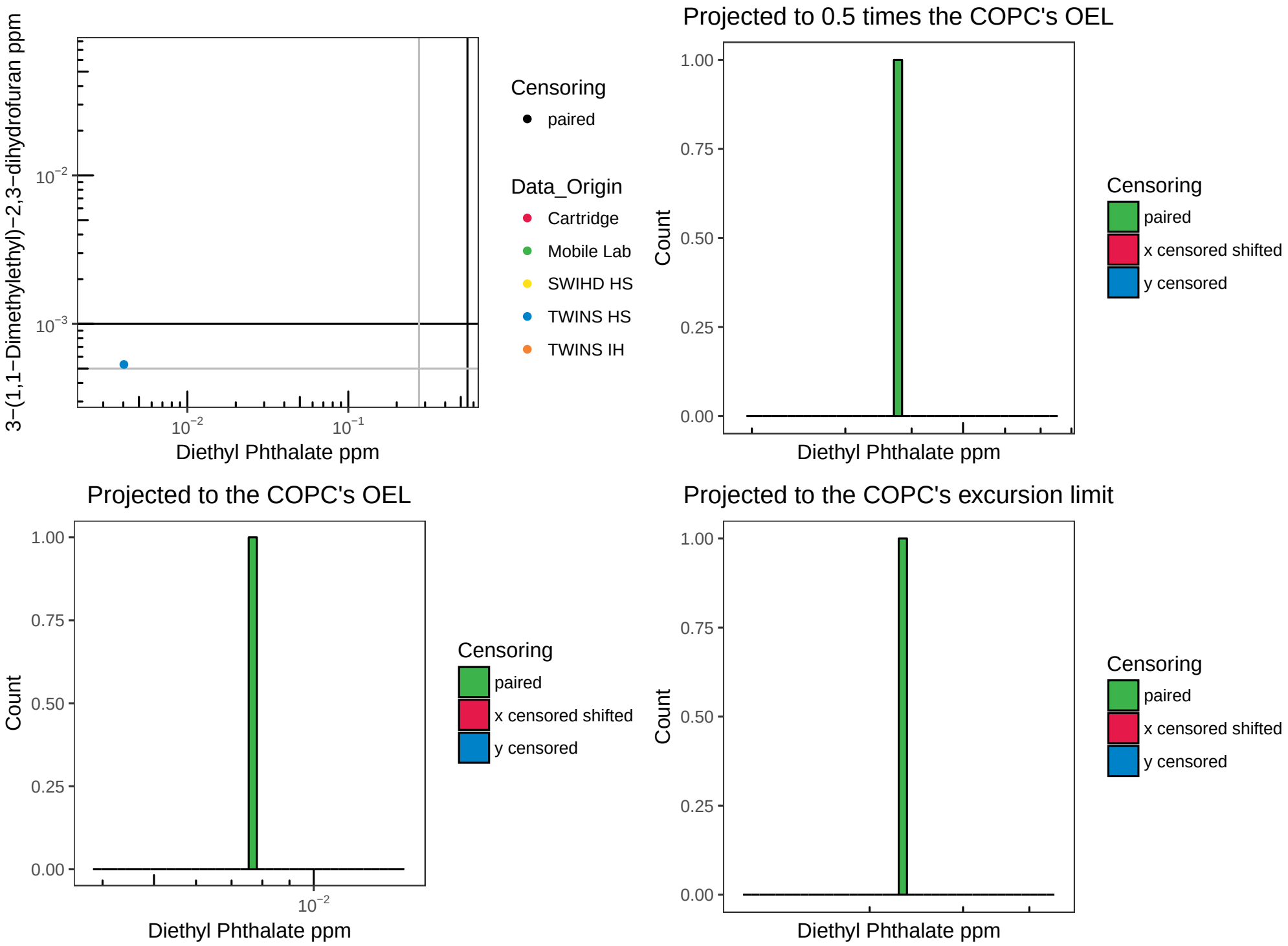


Figure C.1581: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Diethyl Phthalate

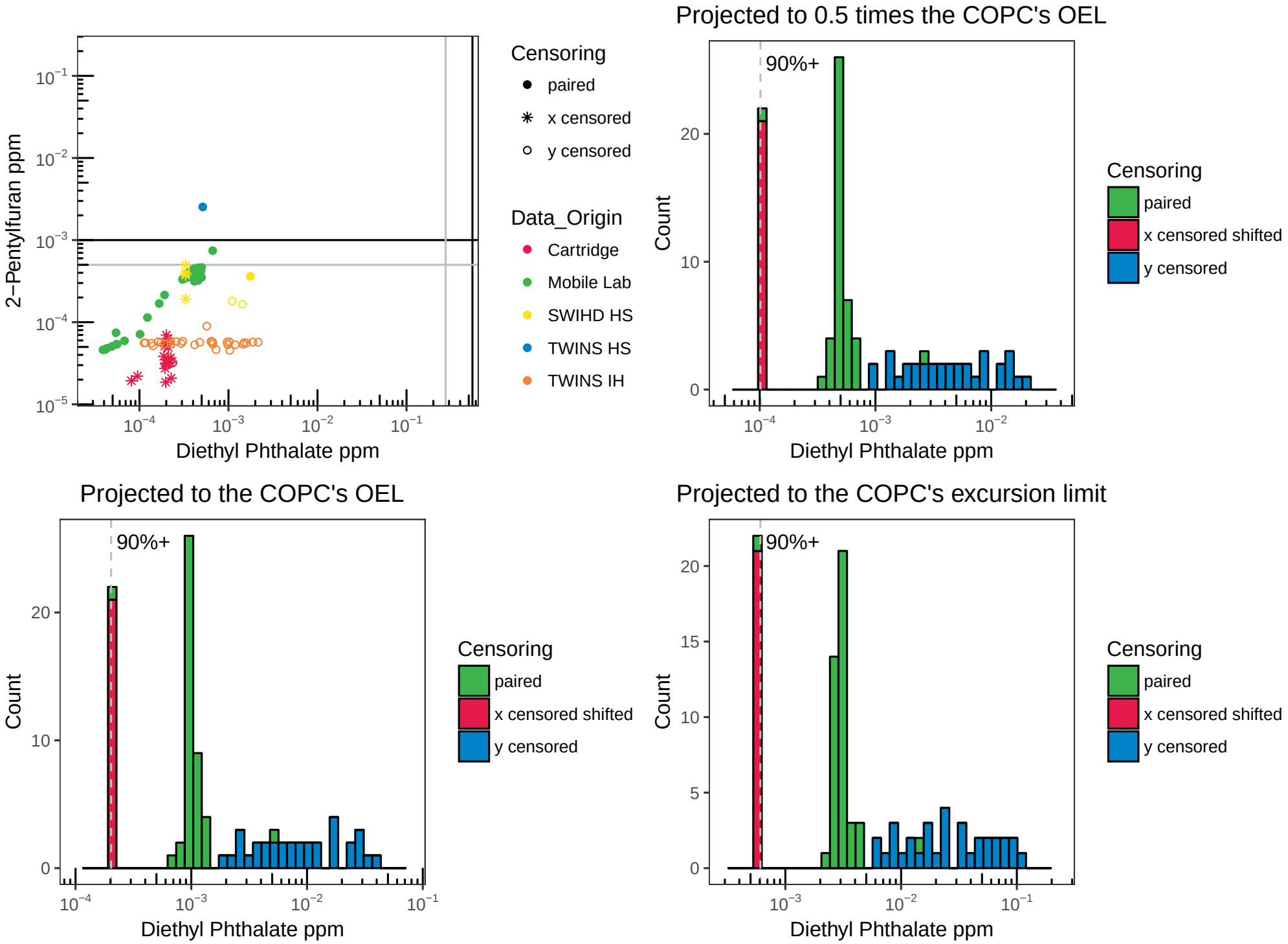


Figure C.1582: 2-Pentylfuran vs Diethyl Phthalate

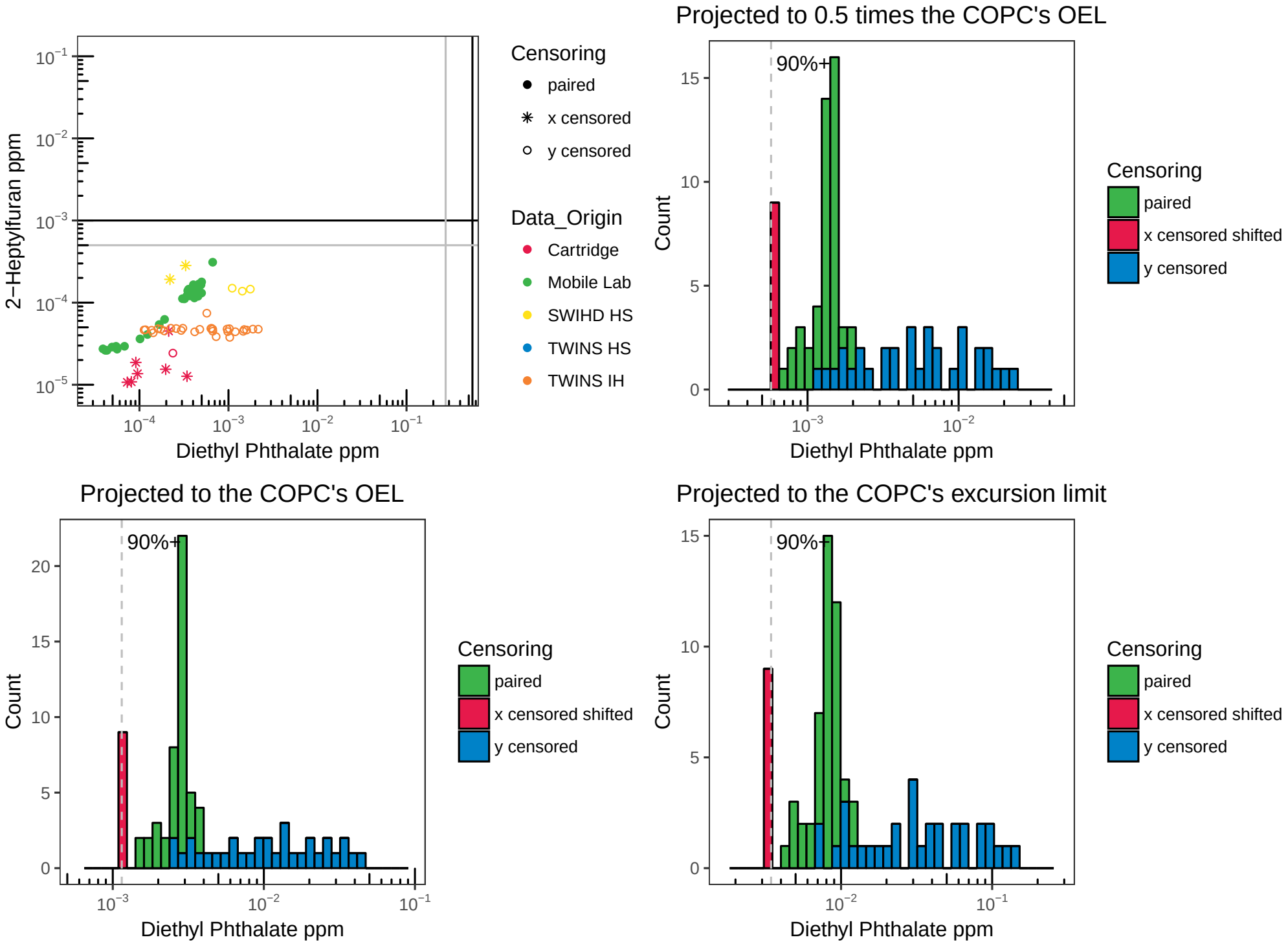


Figure C.1583: 2-Heptylfuran vs Diethyl Phthalate

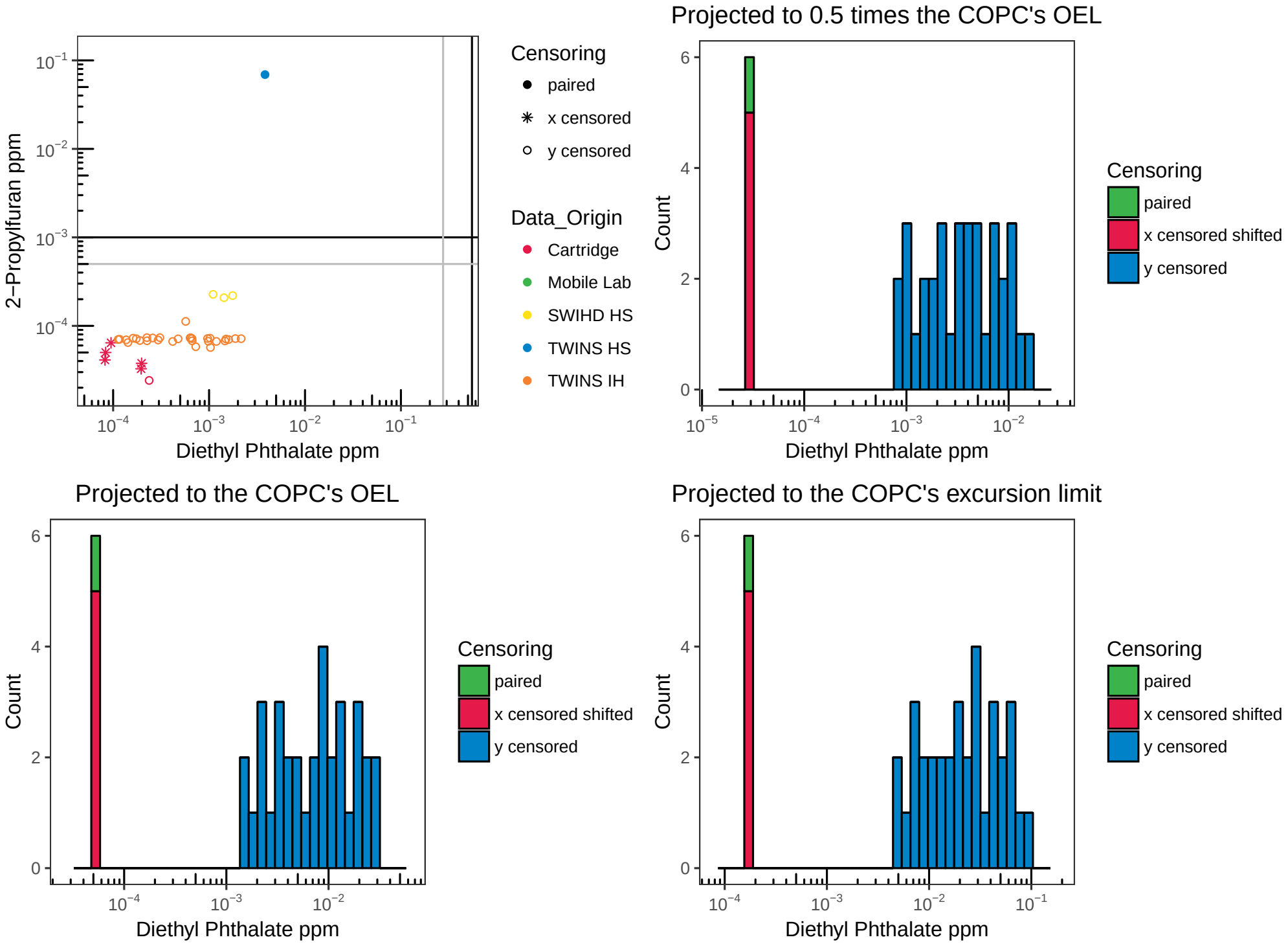


Figure C.1584: 2-Propylfuran vs Diethyl Phthalate

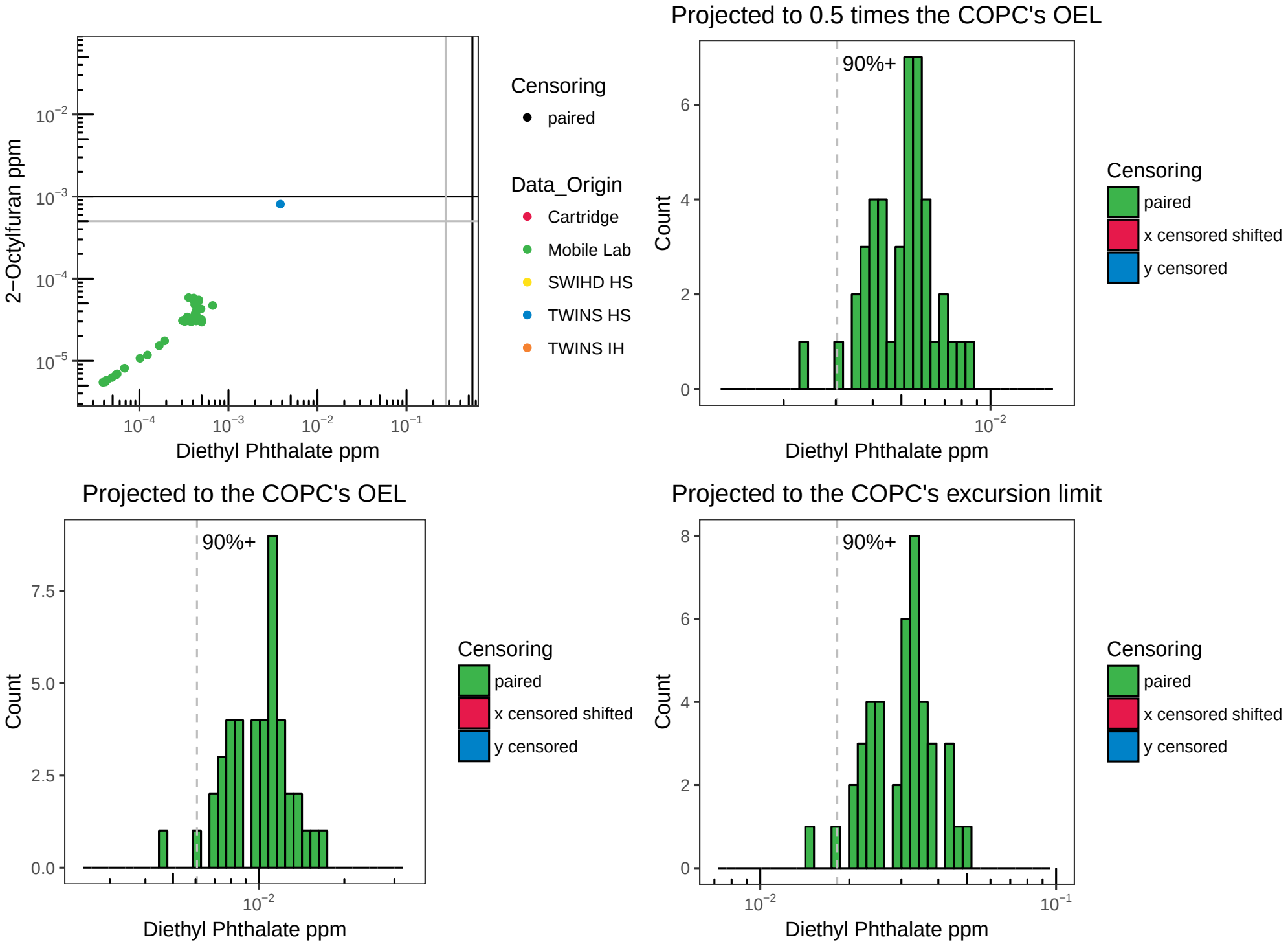


Figure C.1585: 2-Octylfuran vs Diethyl Phthalate

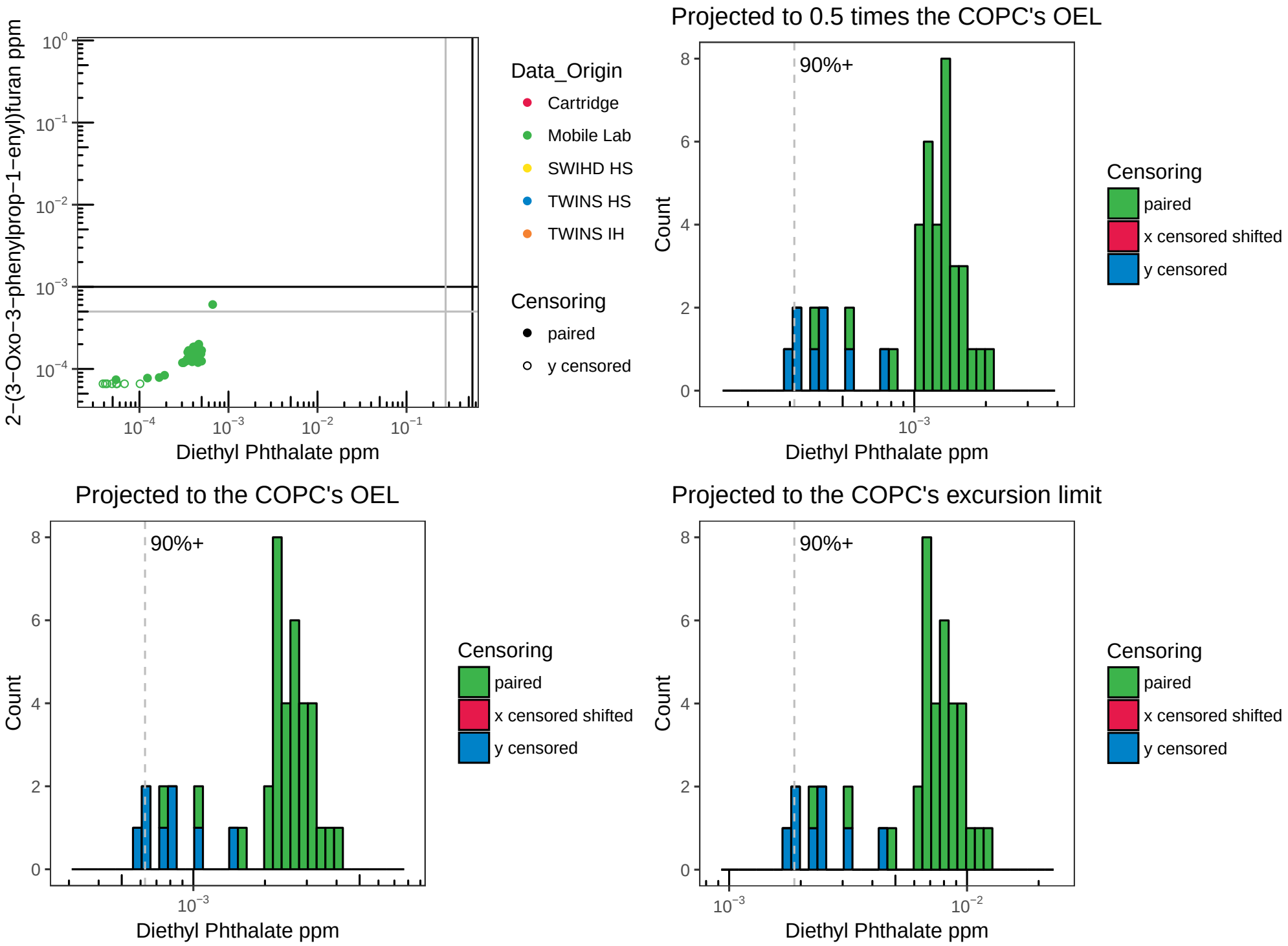


Figure C.1586: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Diethyl Phthalate

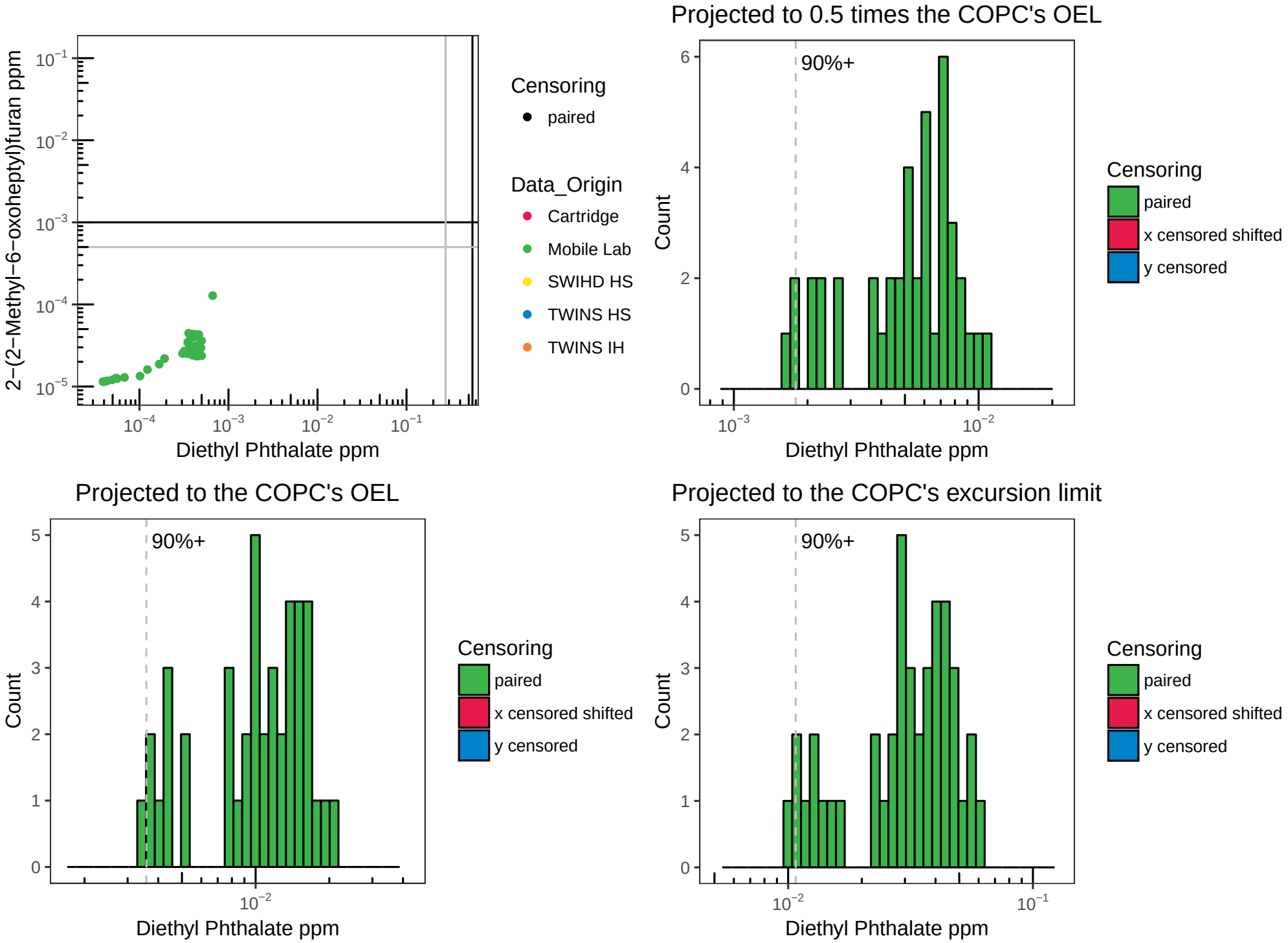


Figure C.1587: 2-(2-Methyl-6-oxoheptyl)furan vs Diethyl Phthalate

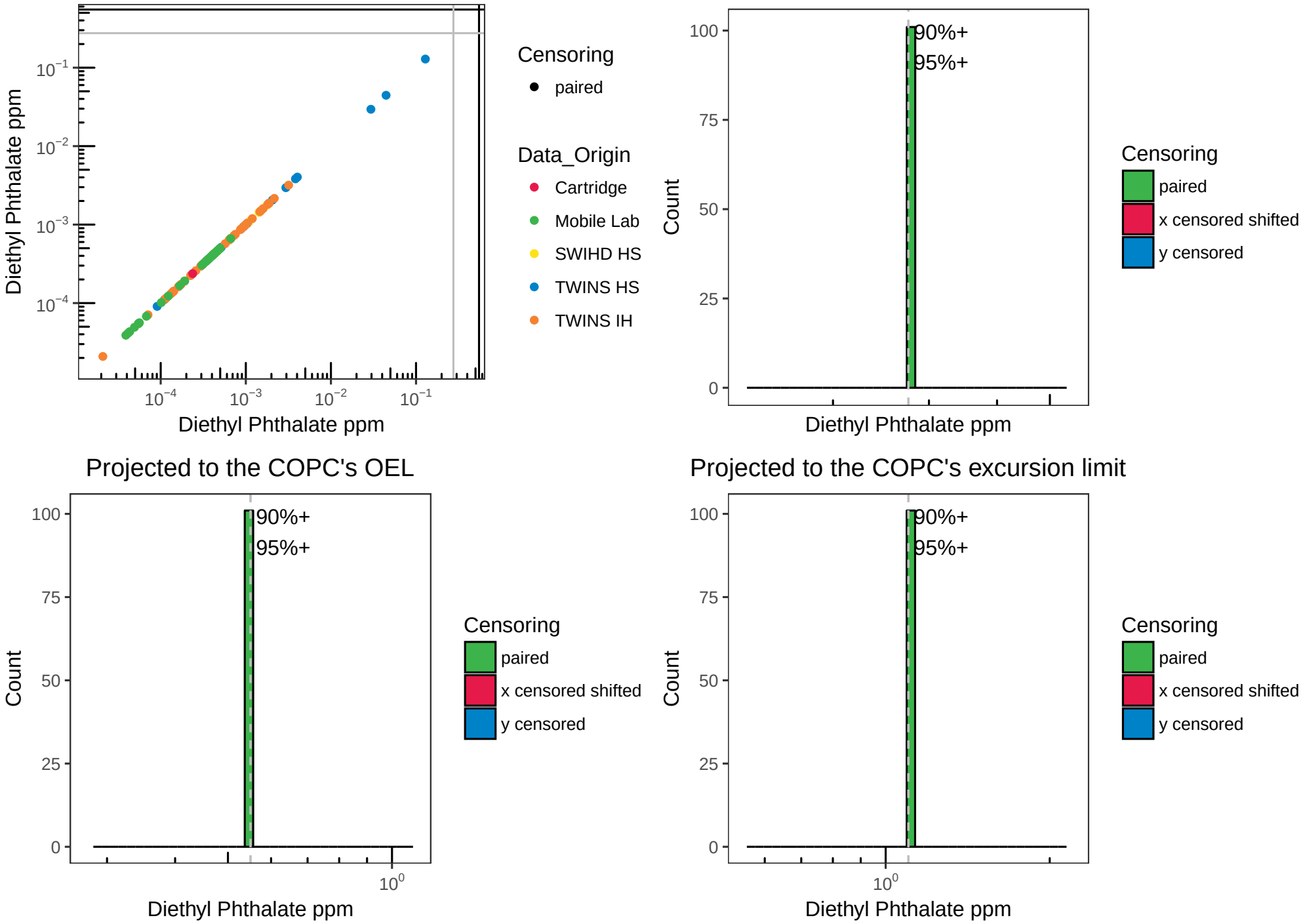


Figure C.1588: Diethyl Phthalate vs Diethyl Phthalate

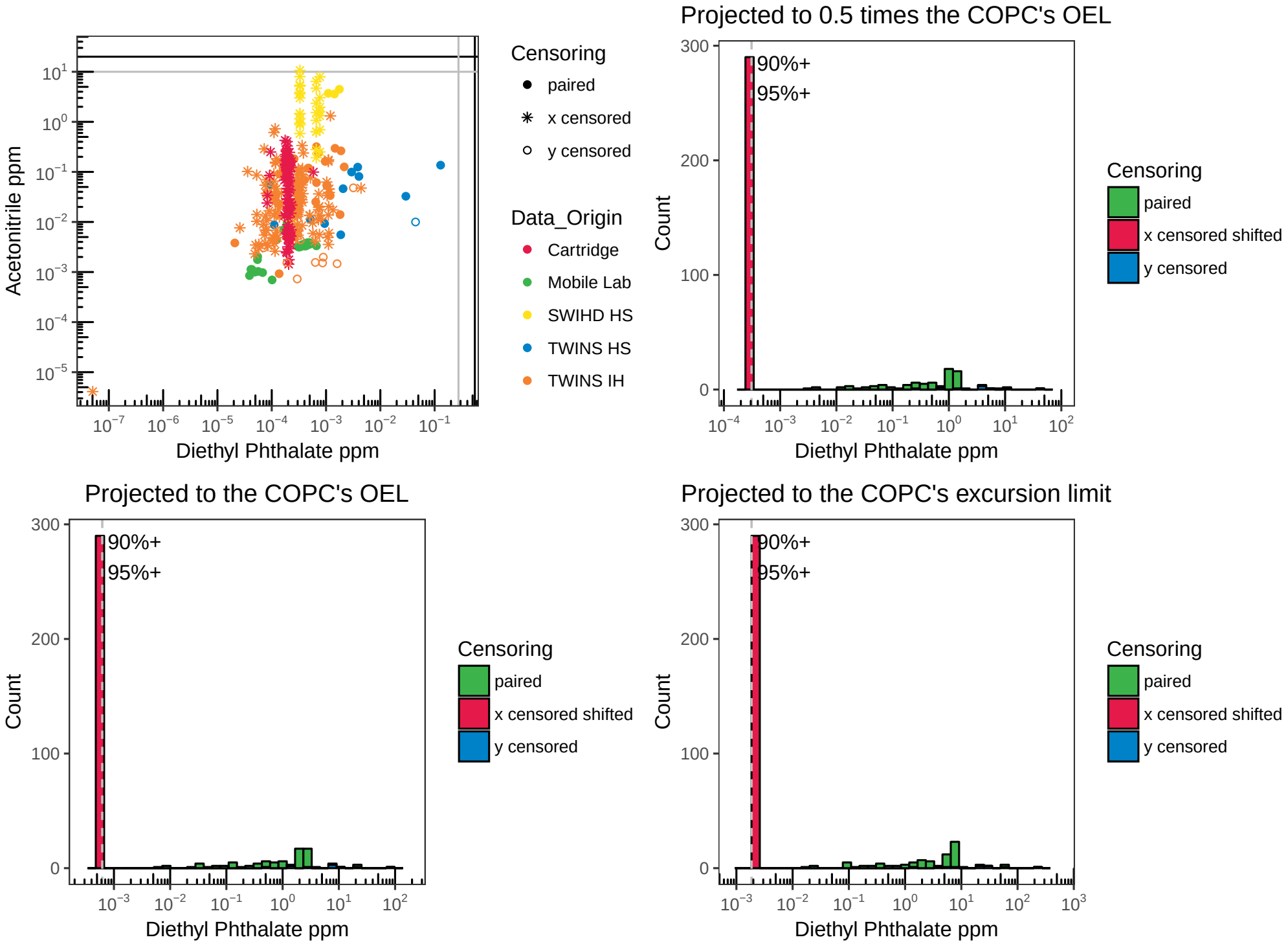


Figure C.1589: Acetonitrile vs Diethyl Phthalate

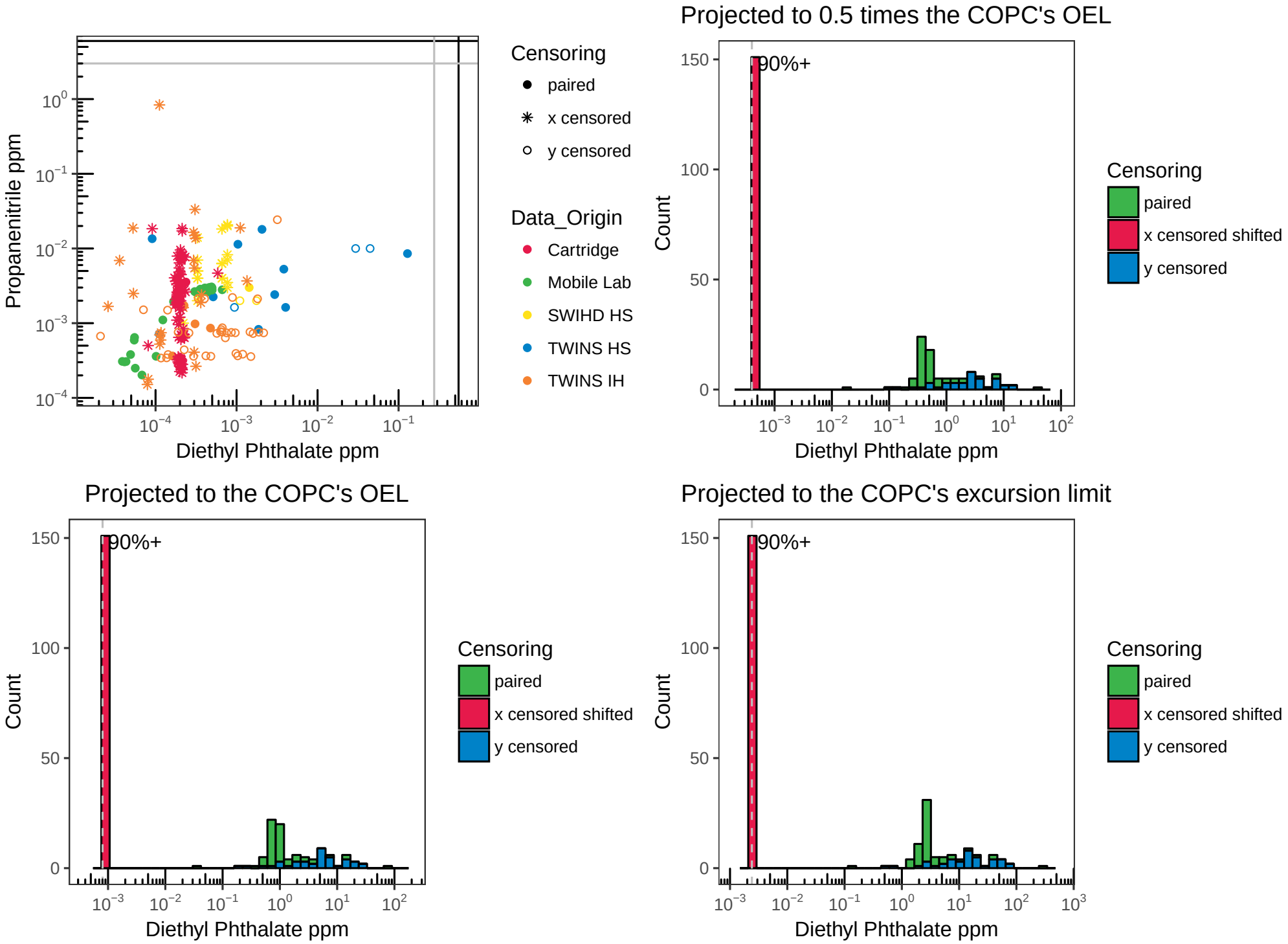


Figure C.1590: Propanenitrile vs Diethyl Phthalate

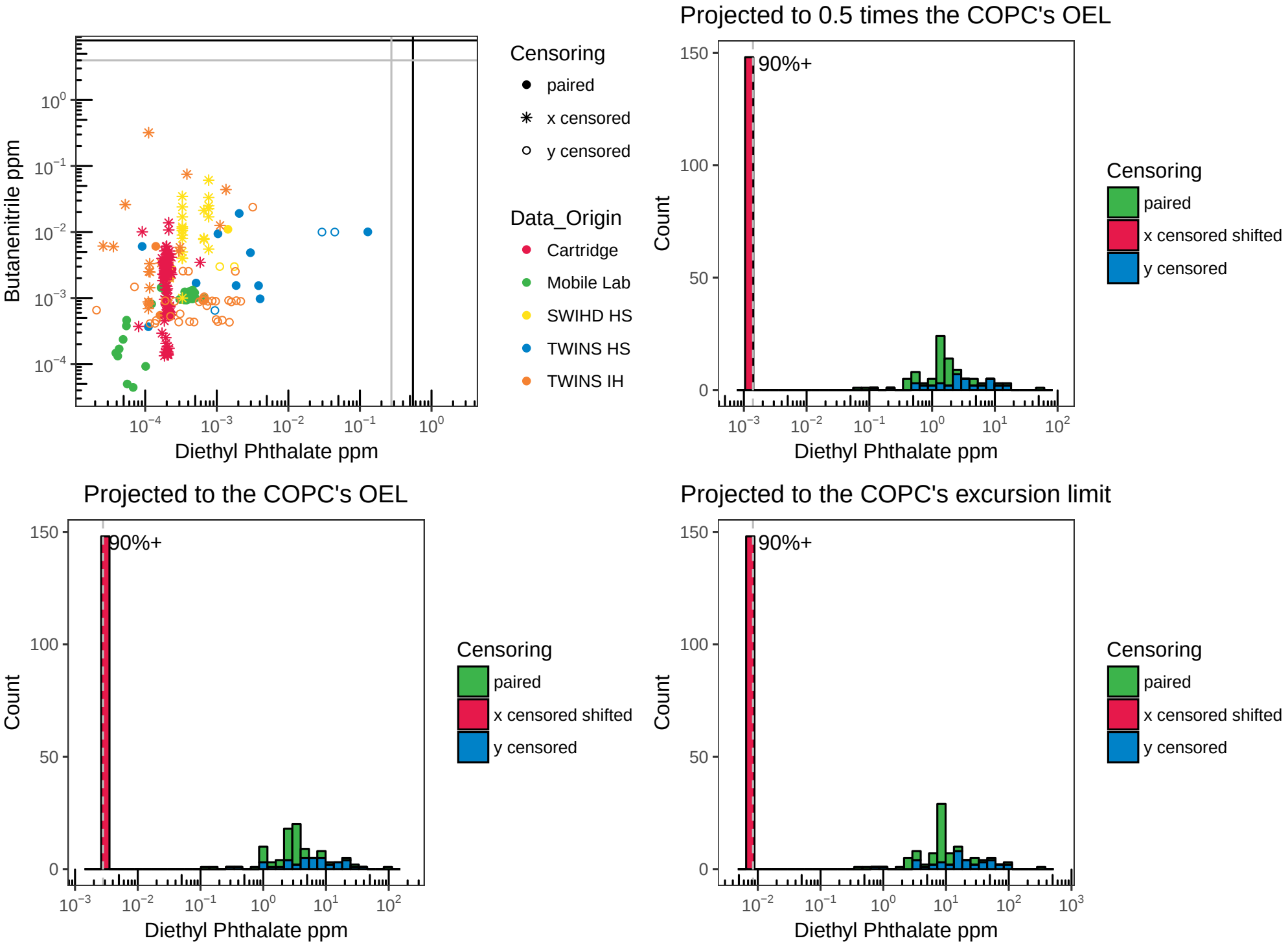


Figure C.1591: Butanenitrile vs Diethyl Phthalate

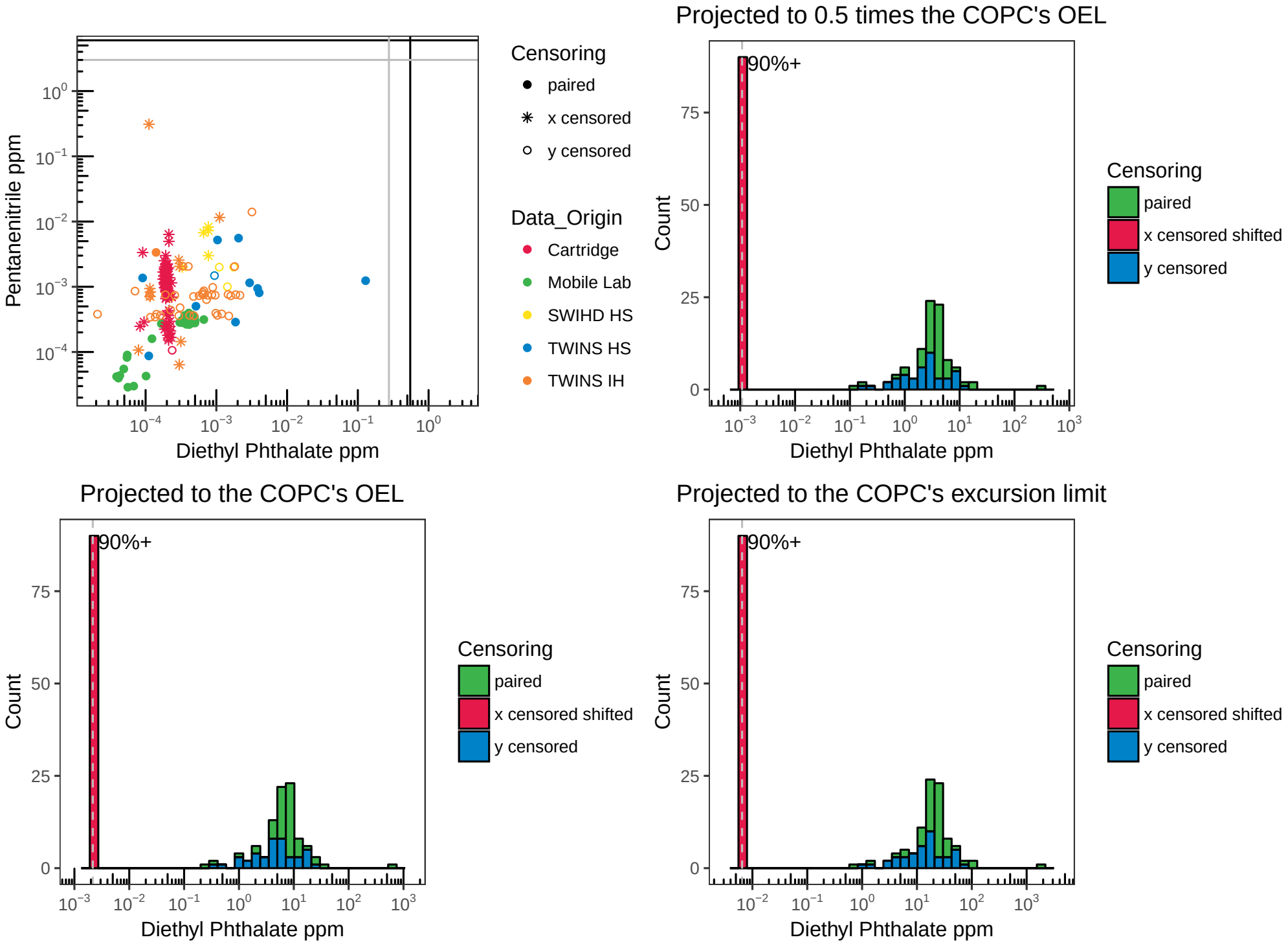


Figure C.1592: Pentanenitrile vs Diethyl Phthalate

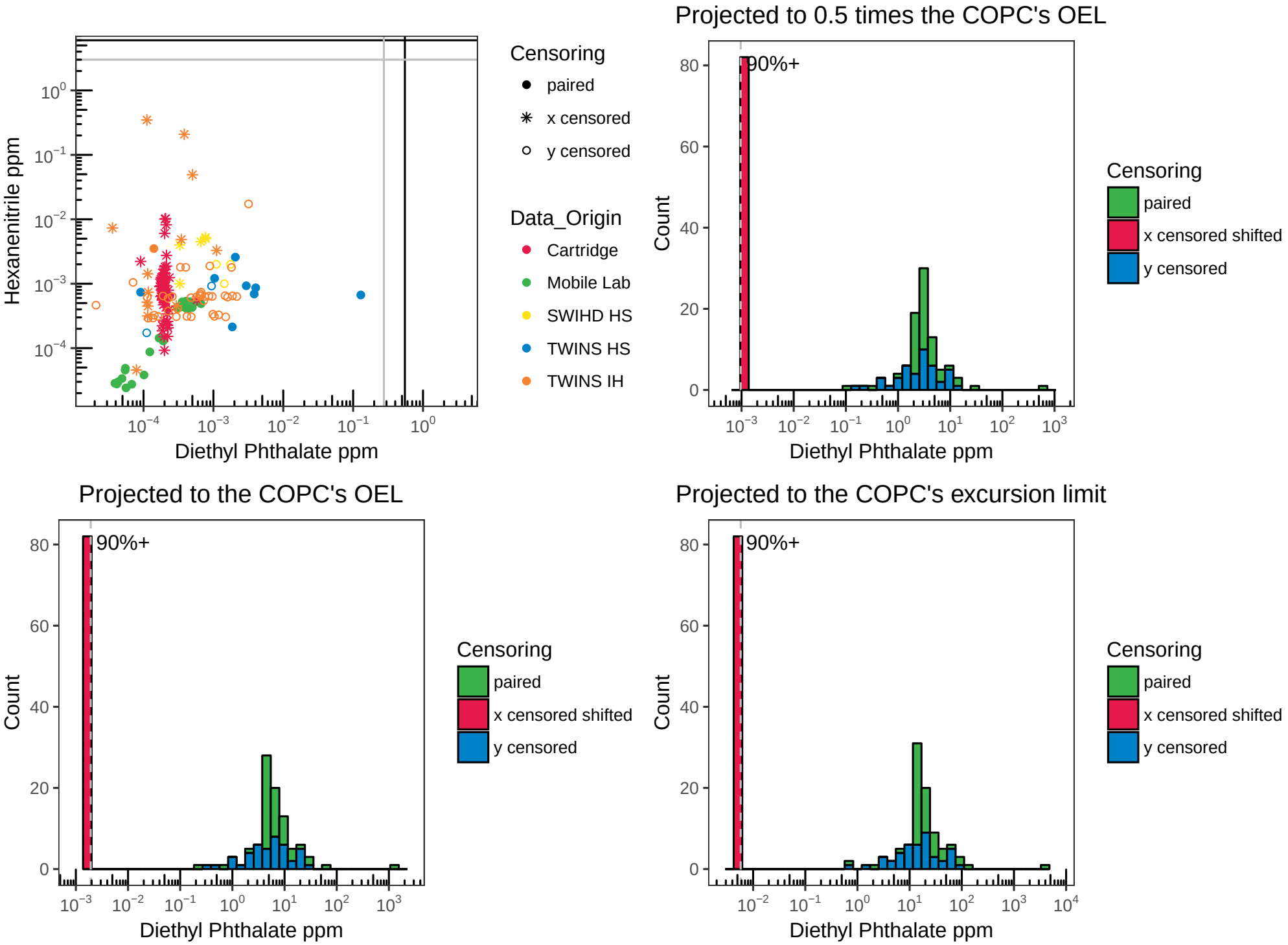


Figure C.1593: Hexanenitrile vs Diethyl Phthalate

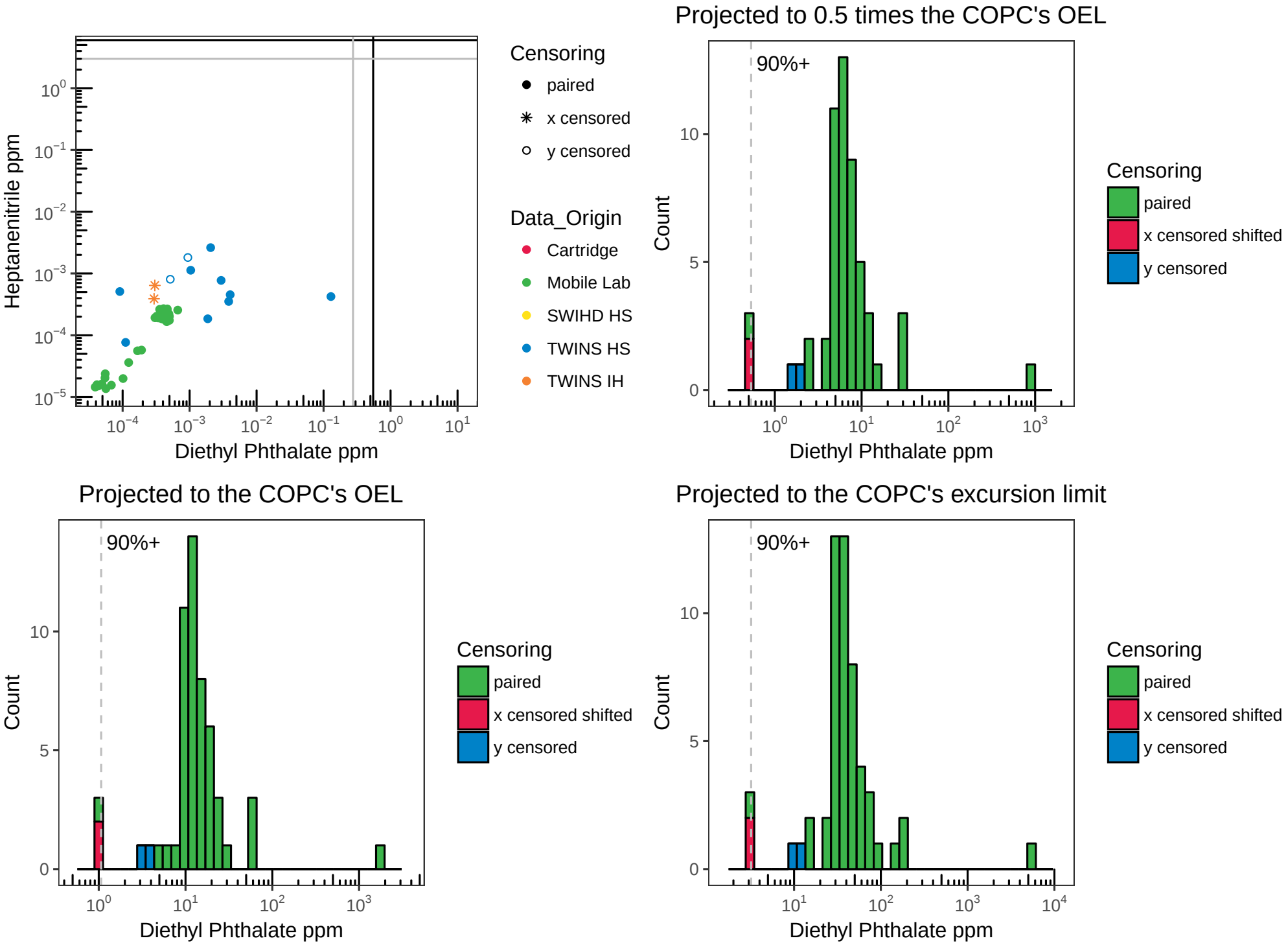


Figure C.1594: Heptanenitrile vs Diethyl Phthalate

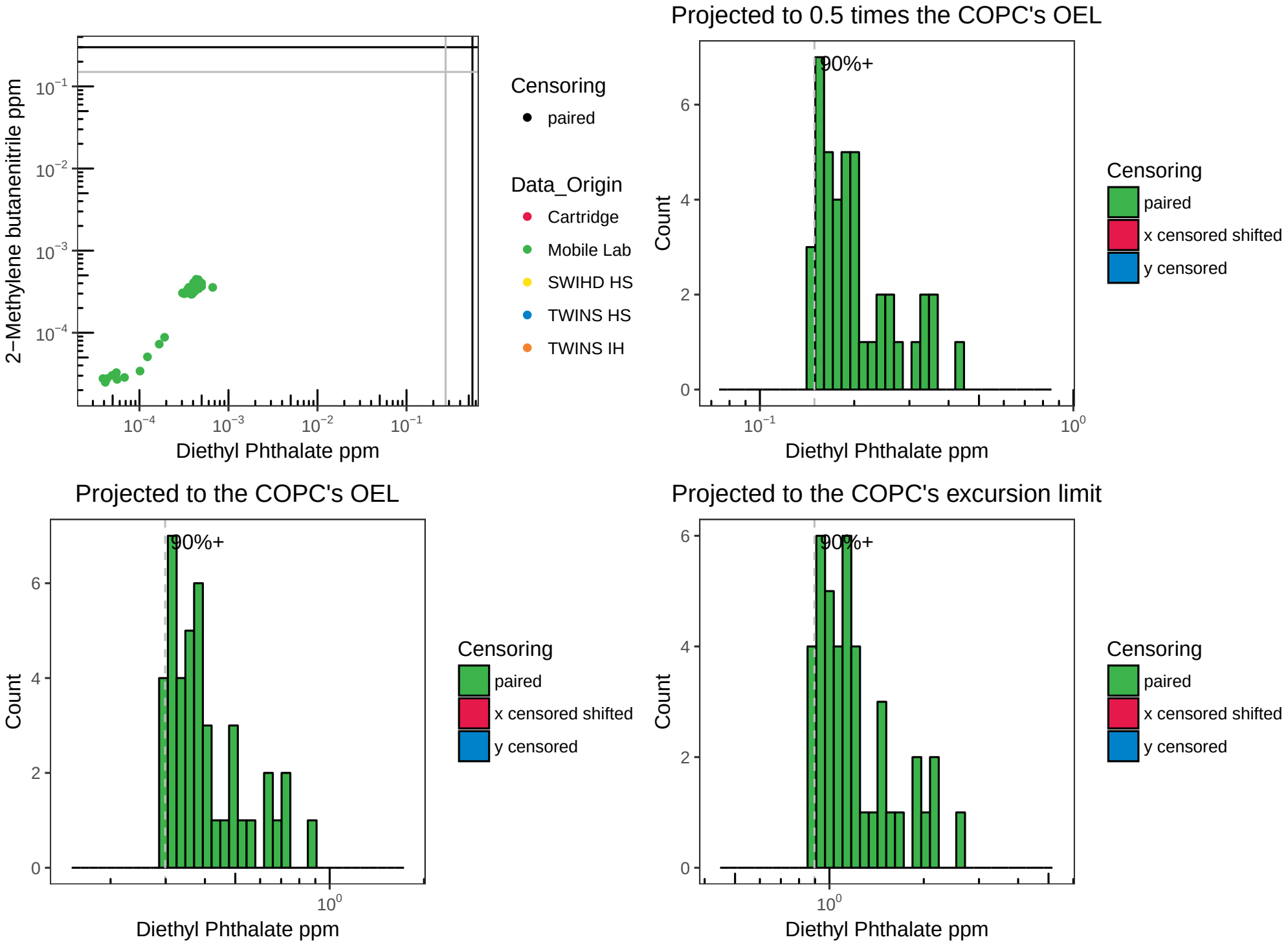


Figure C.1595: 2-Methylene butanenitrile vs Diethyl Phthalate

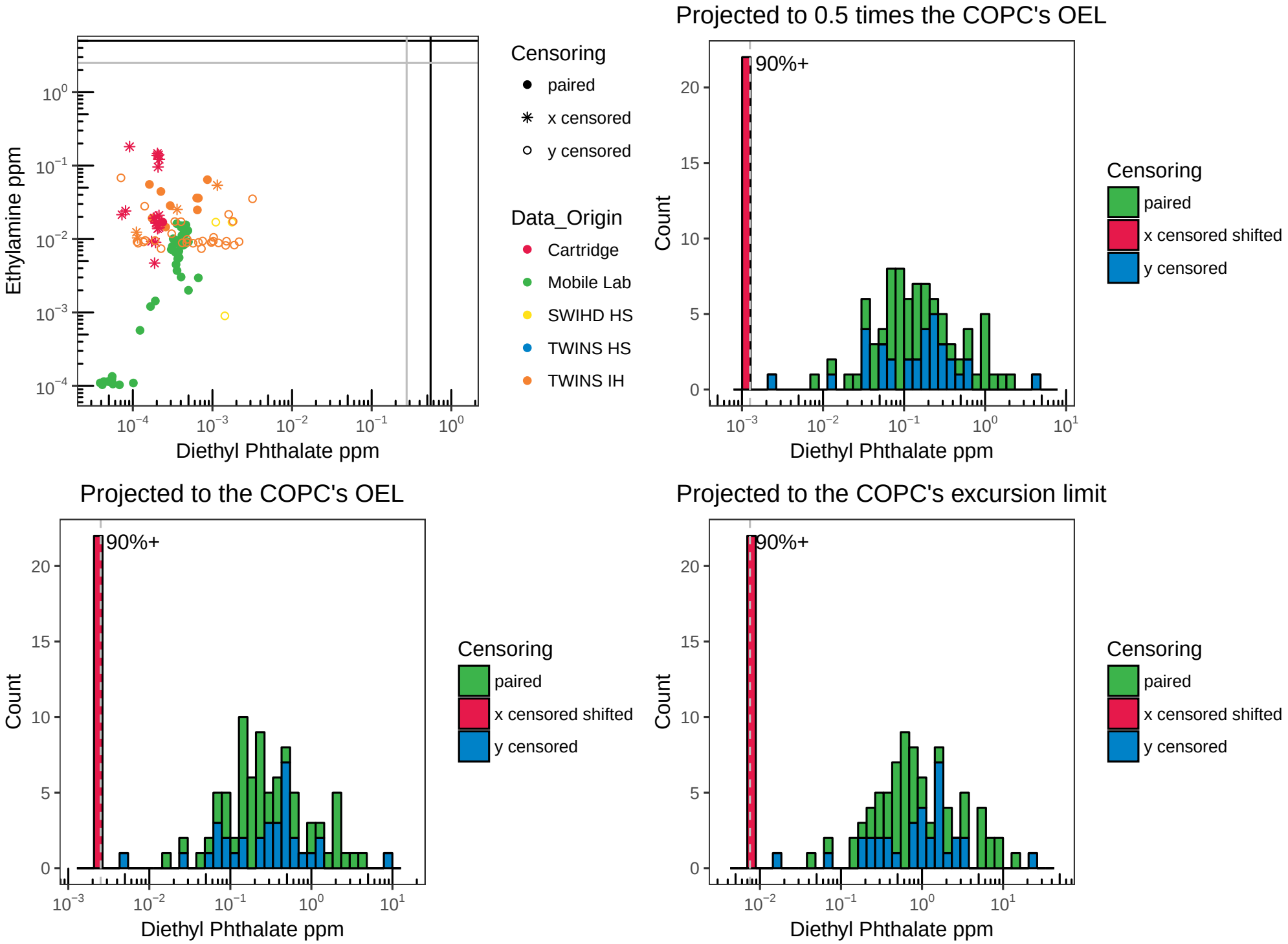


Figure C.1596: Ethylamine vs Diethyl Phthalate

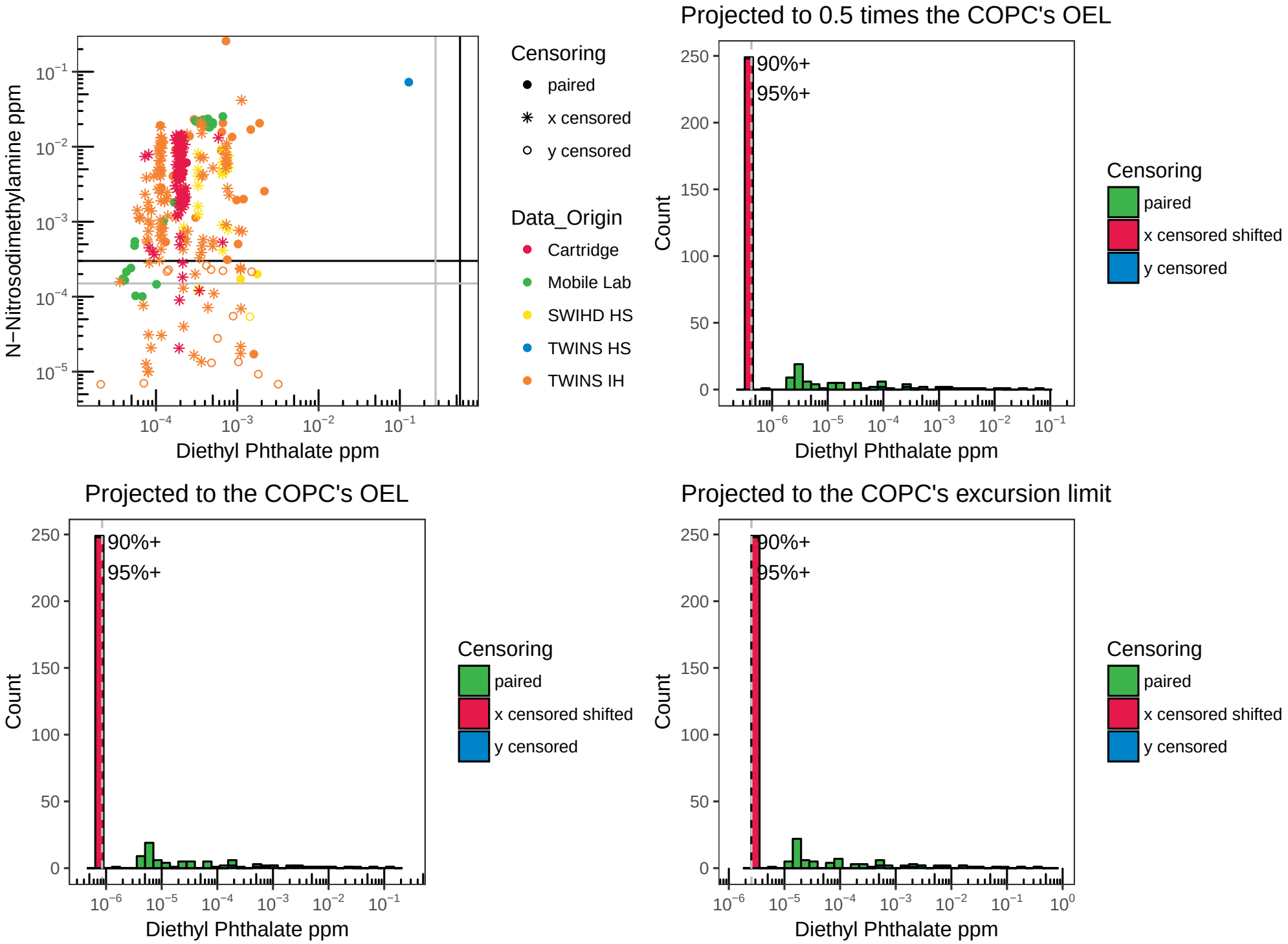


Figure C.1597: N-Nitrosodimethylamine vs Diethyl Phthalate

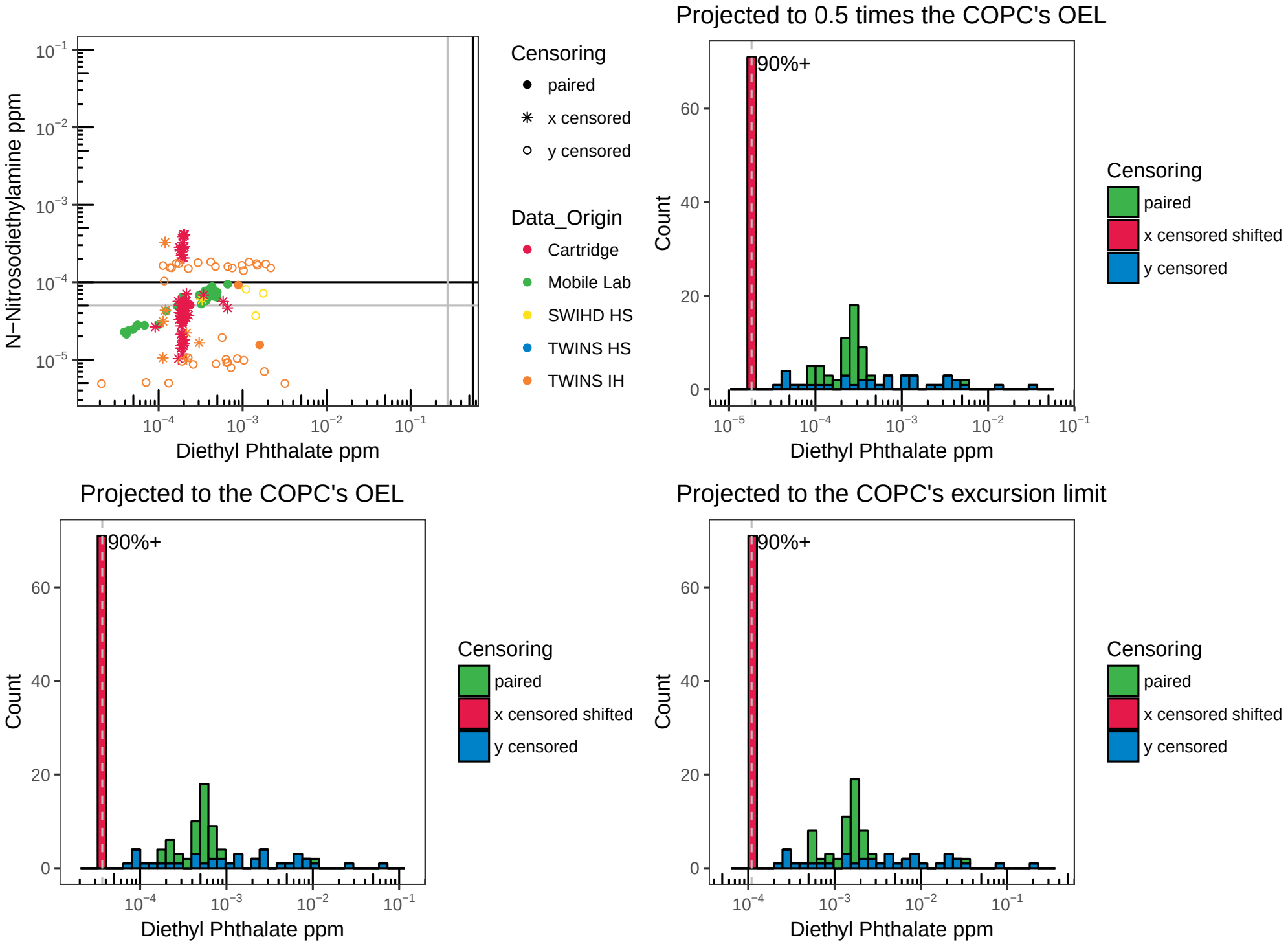


Figure C.1598: N-Nitrosodiethylamine vs Diethyl Phthalate

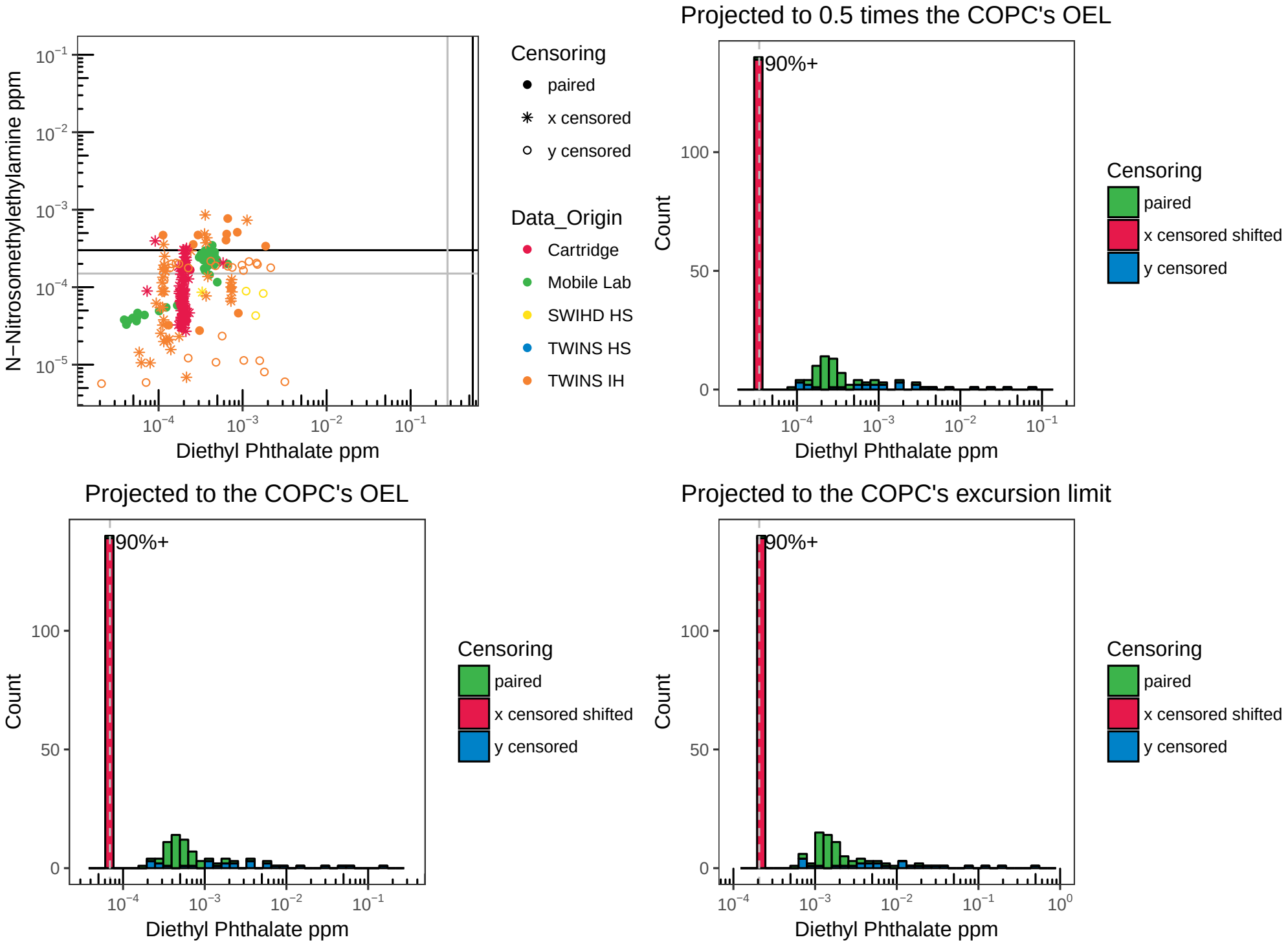


Figure C.1599: N-Nitrosomethylethylamine vs Diethyl Phthalate

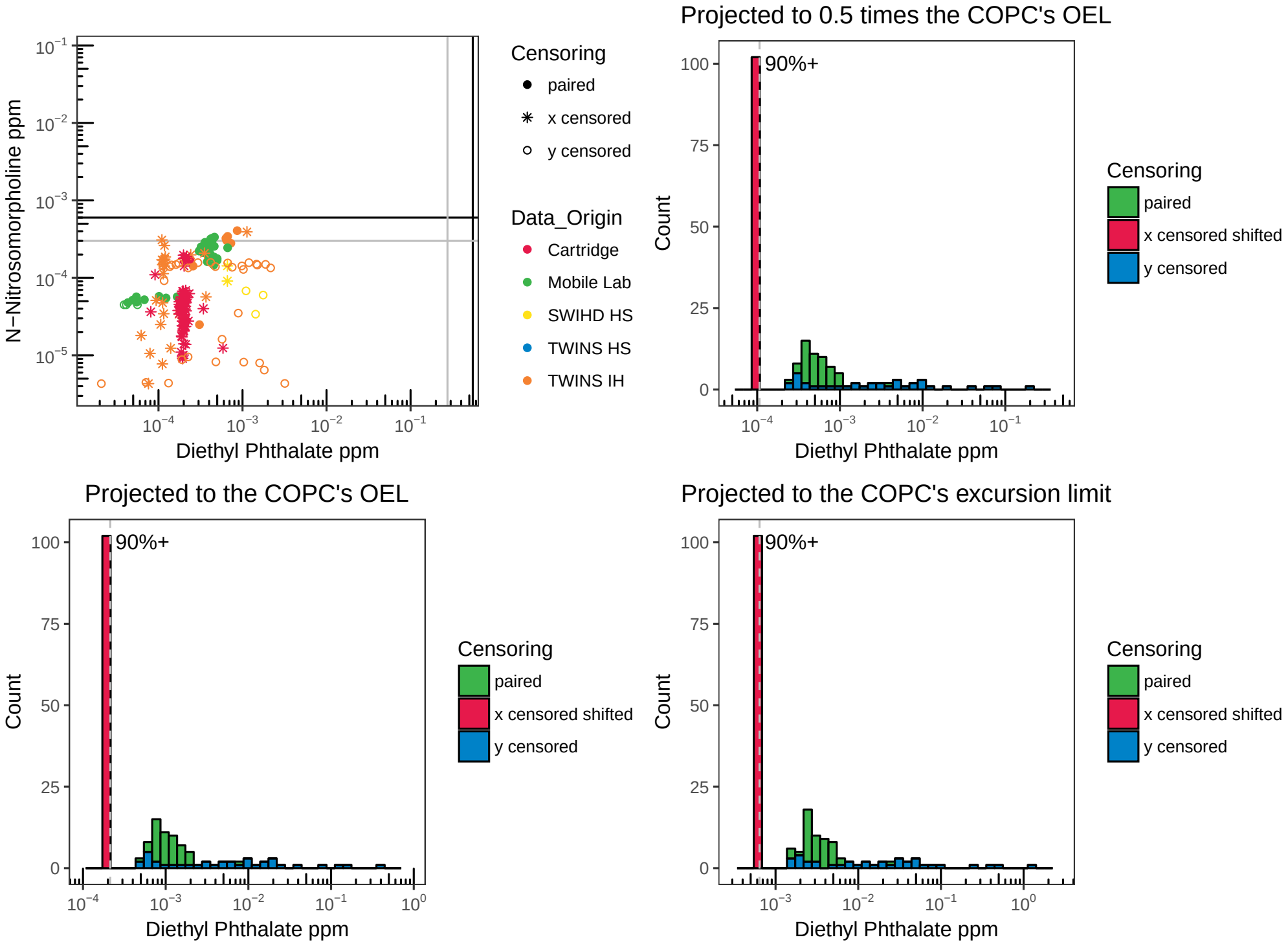


Figure C.1600: N-Nitrosomorpholine vs Diethyl Phthalate

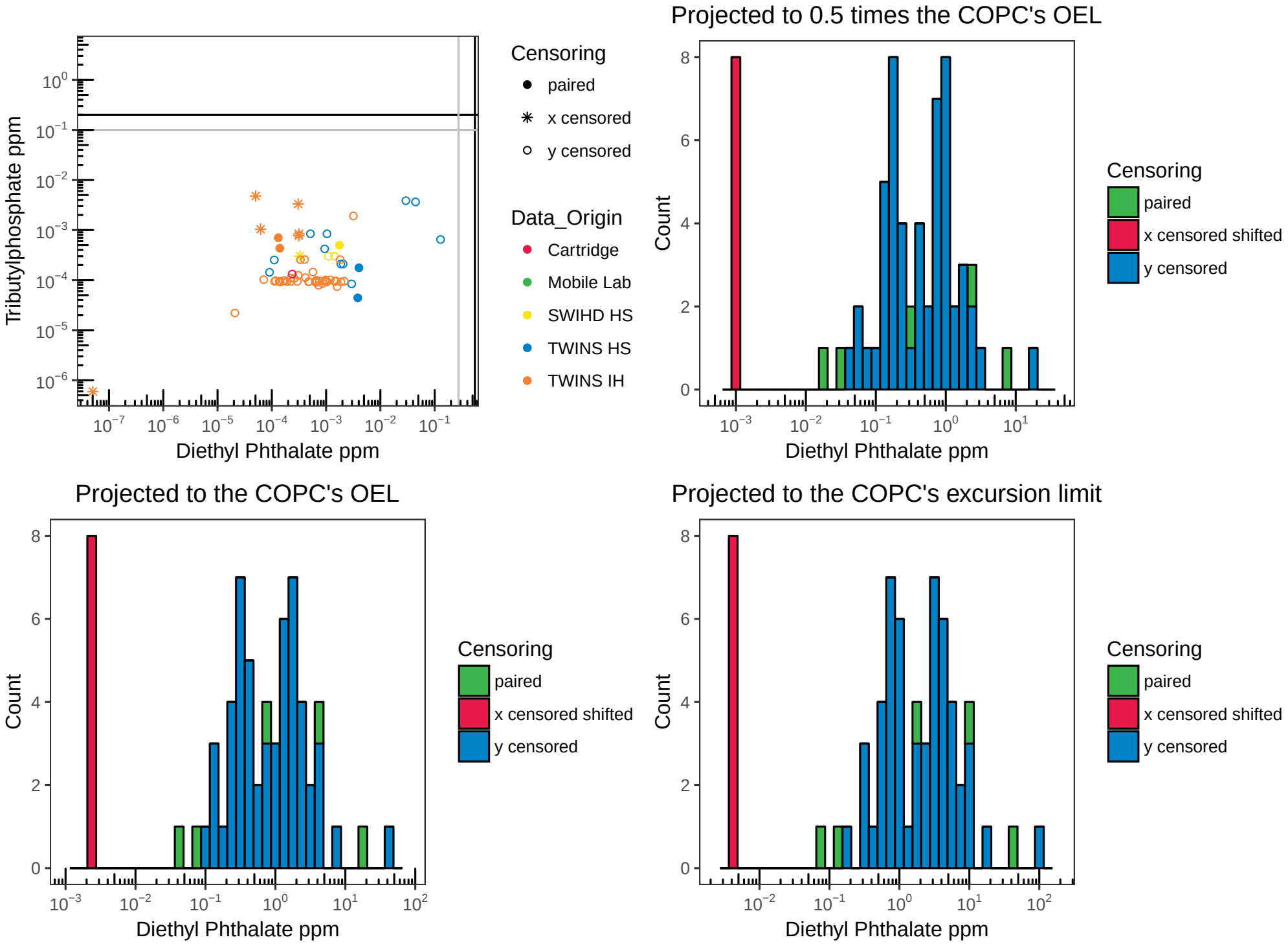


Figure C.1601: Tributylphosphate vs Diethyl Phthalate

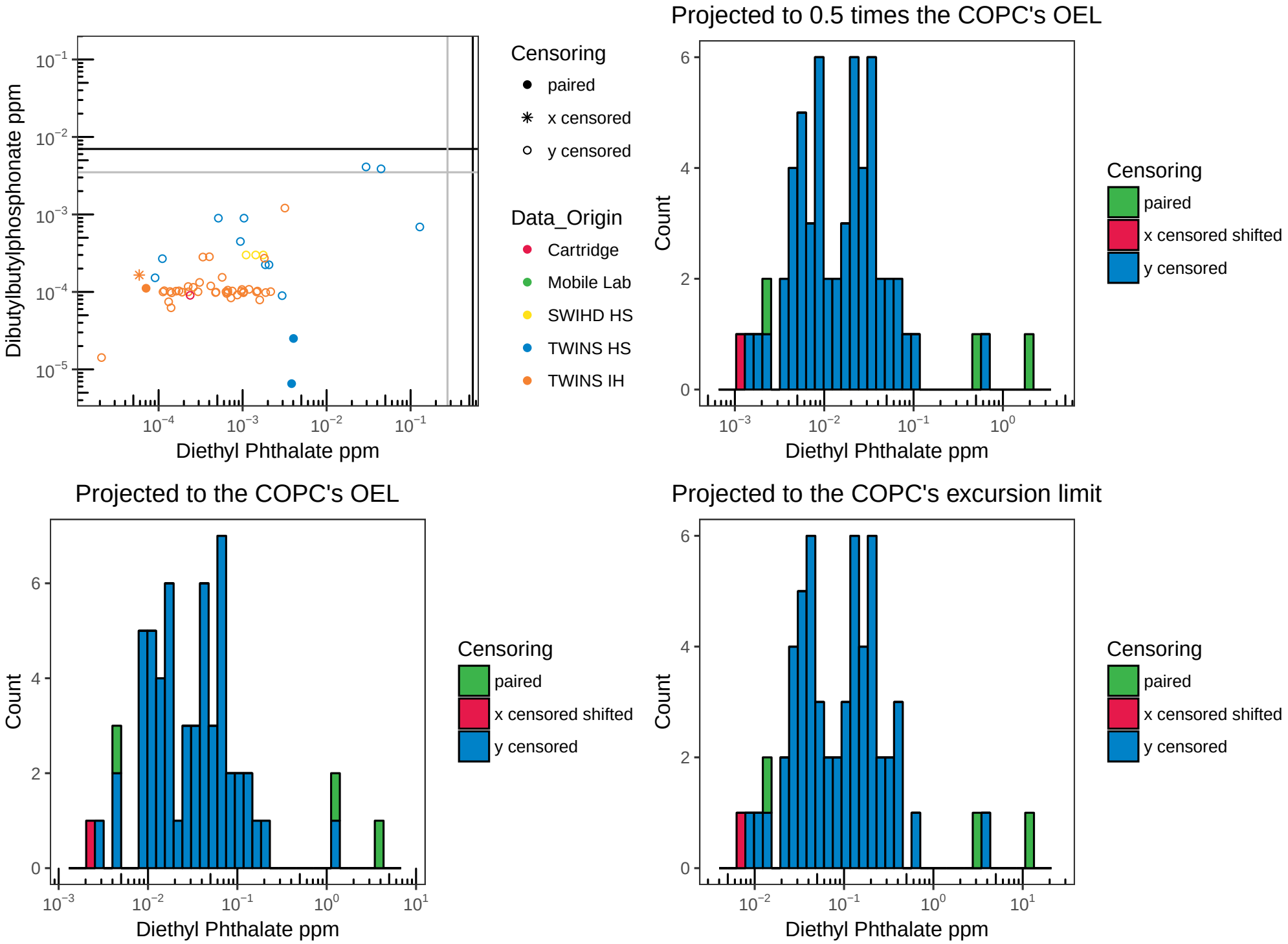


Figure C.1602: Dibutylbutylphosphonate vs Diethyl Phthalate

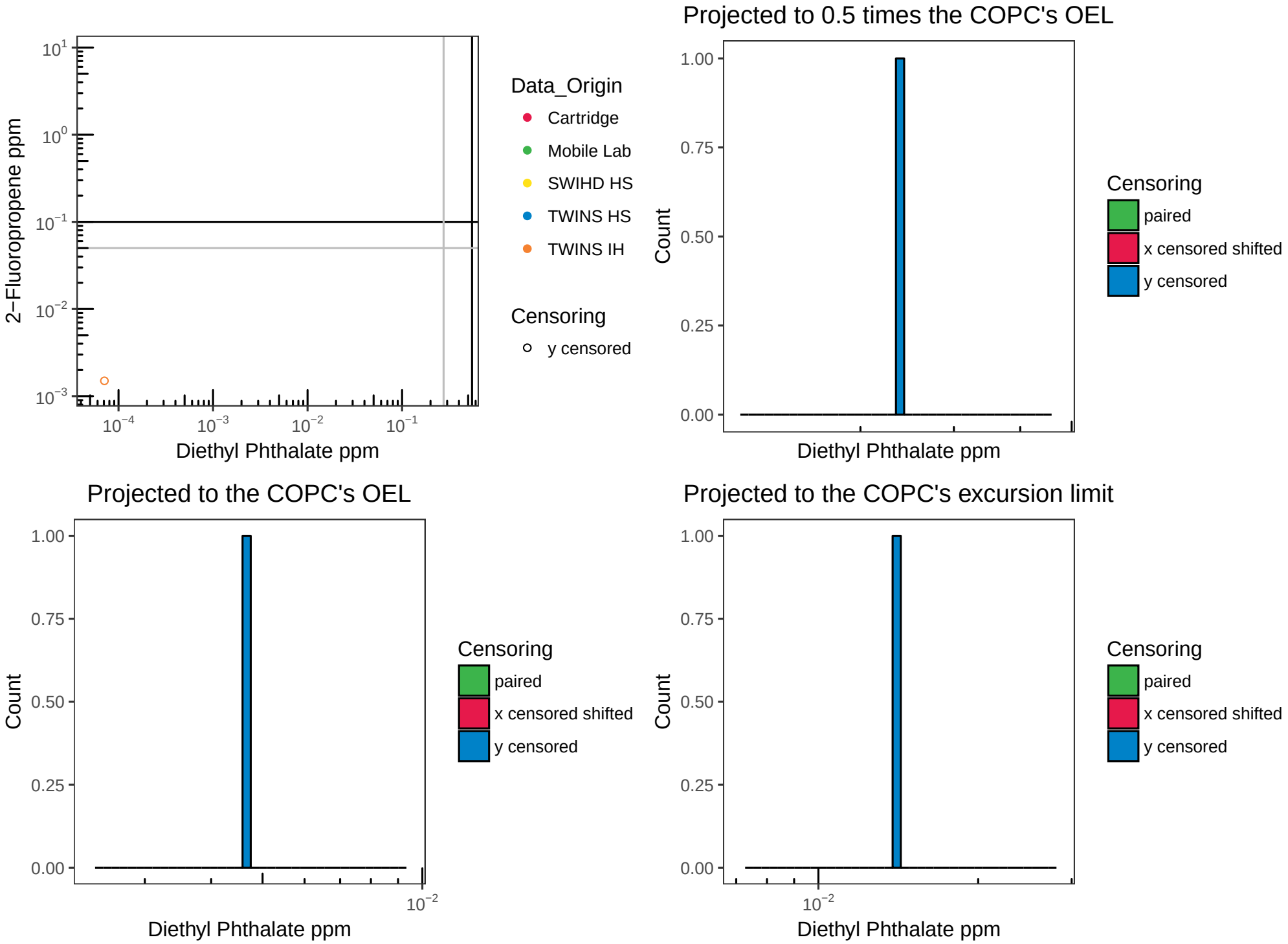


Figure C.1603: 2-Fluoropropene vs Diethyl Phthalate

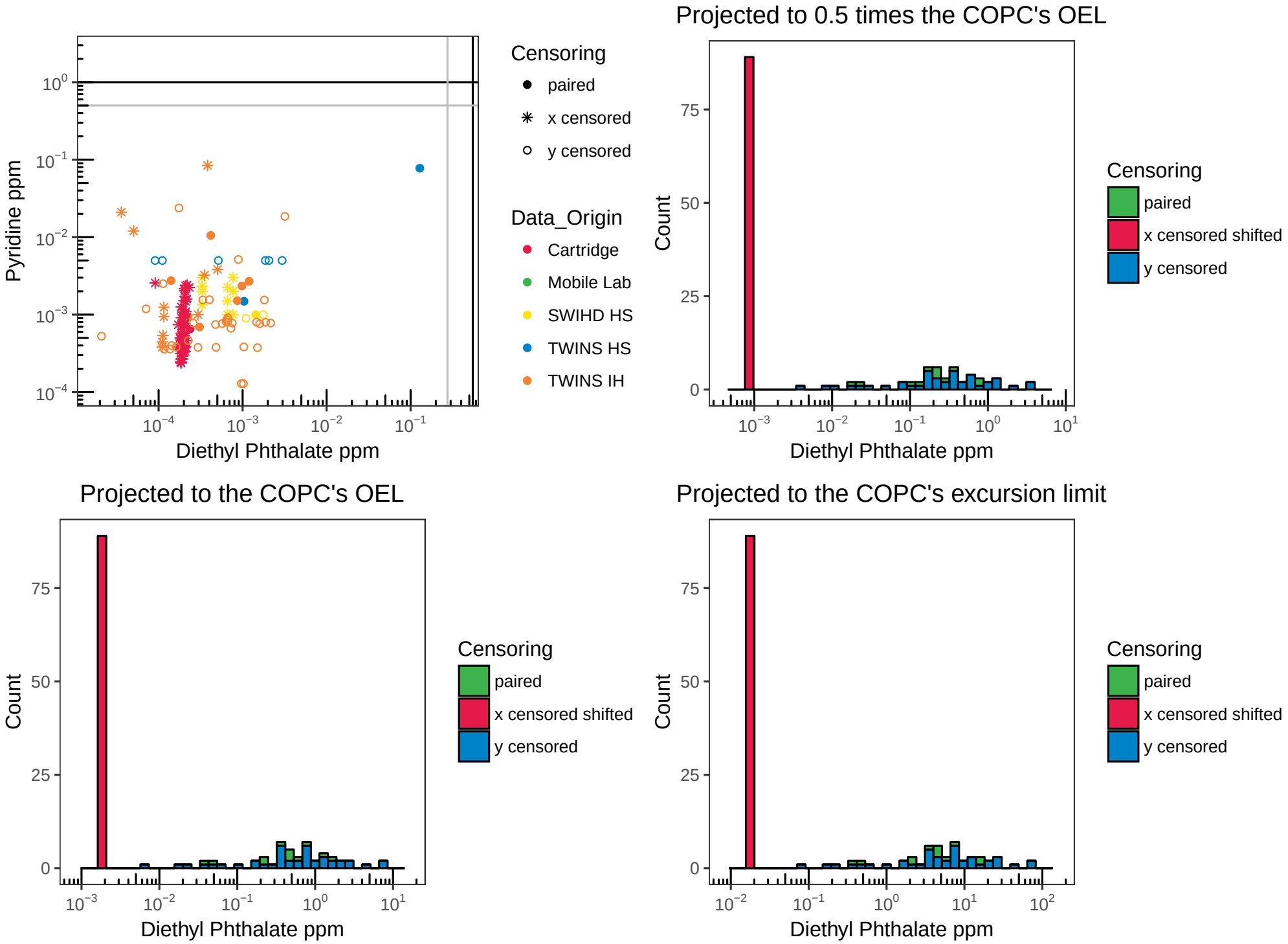


Figure C.1604: Pyridine vs Diethyl Phthalate

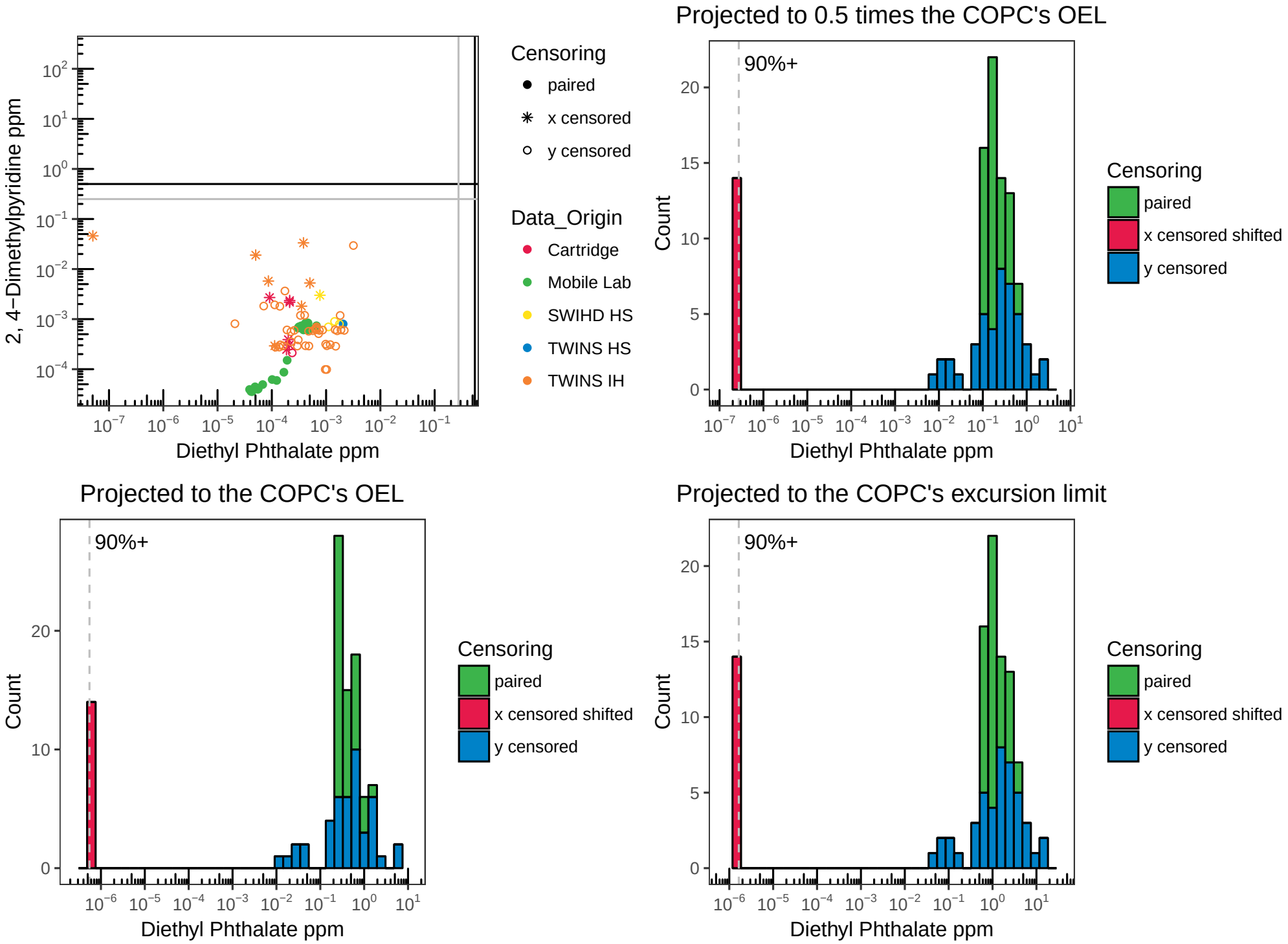


Figure C.1605: 2, 4-Dimethylpyridine vs Diethyl Phthalate

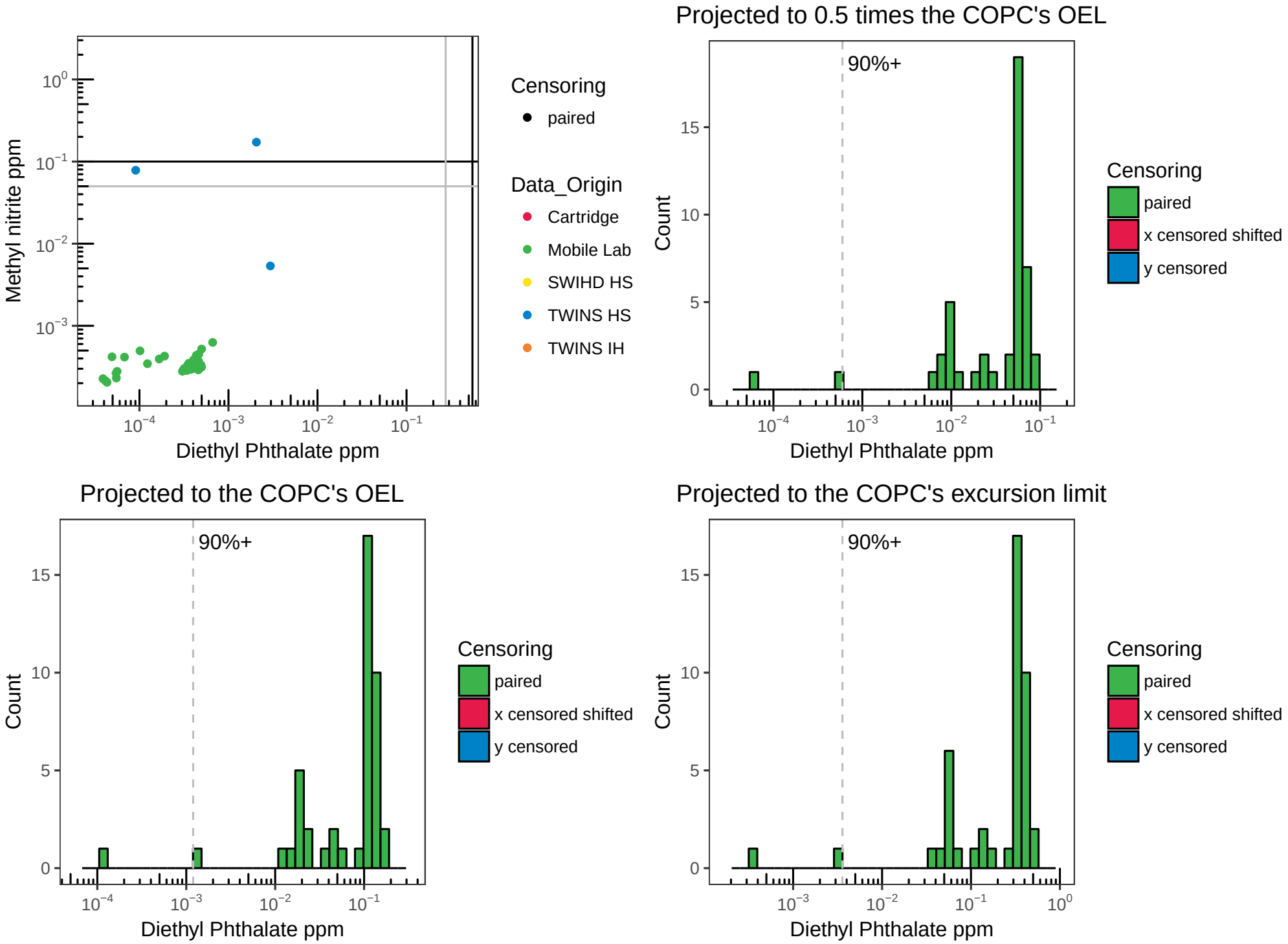


Figure C.1606: Methyl nitrite vs Diethyl Phthalate

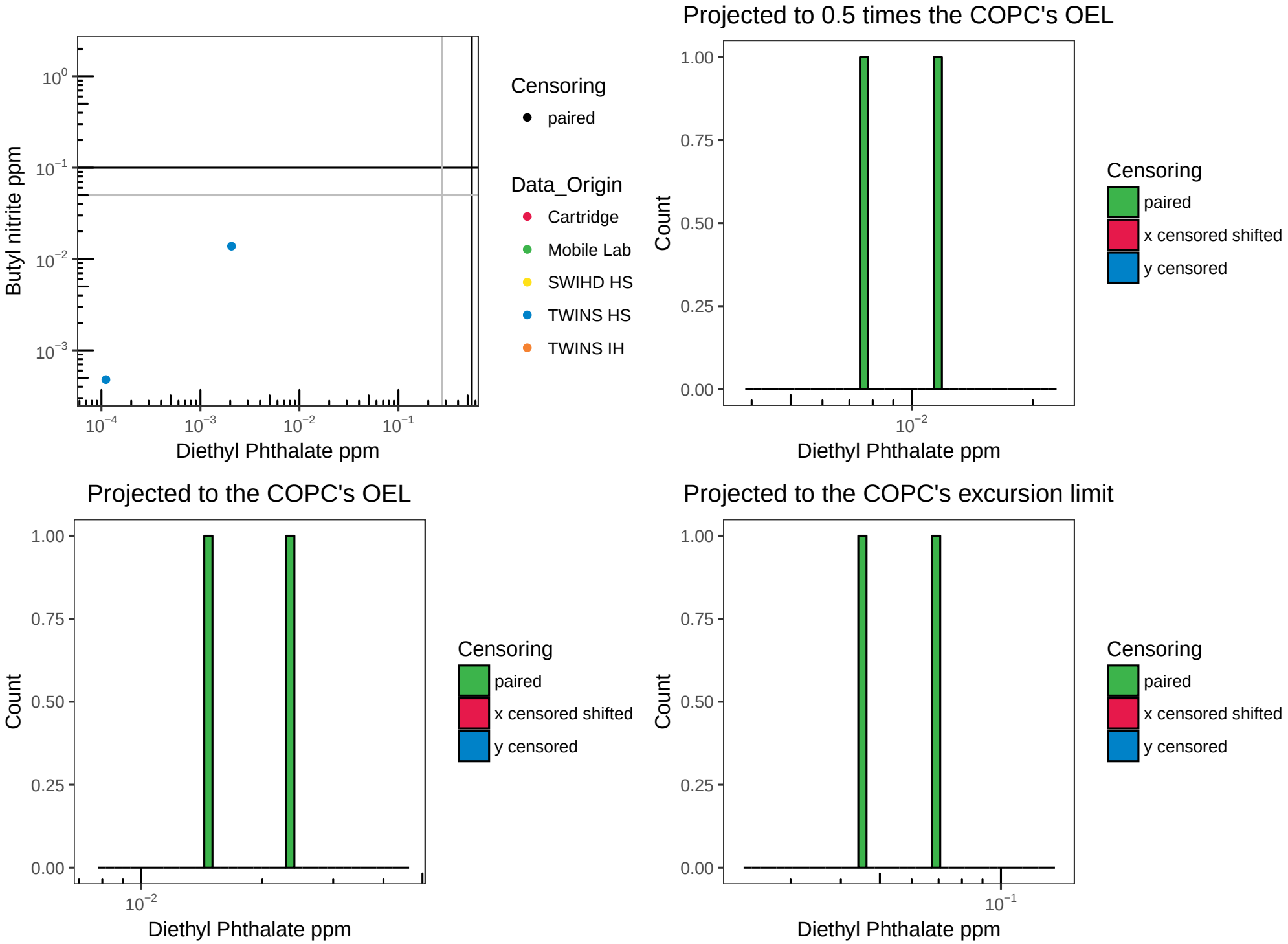


Figure C.1607: Butyl nitrite vs Diethyl Phthalate

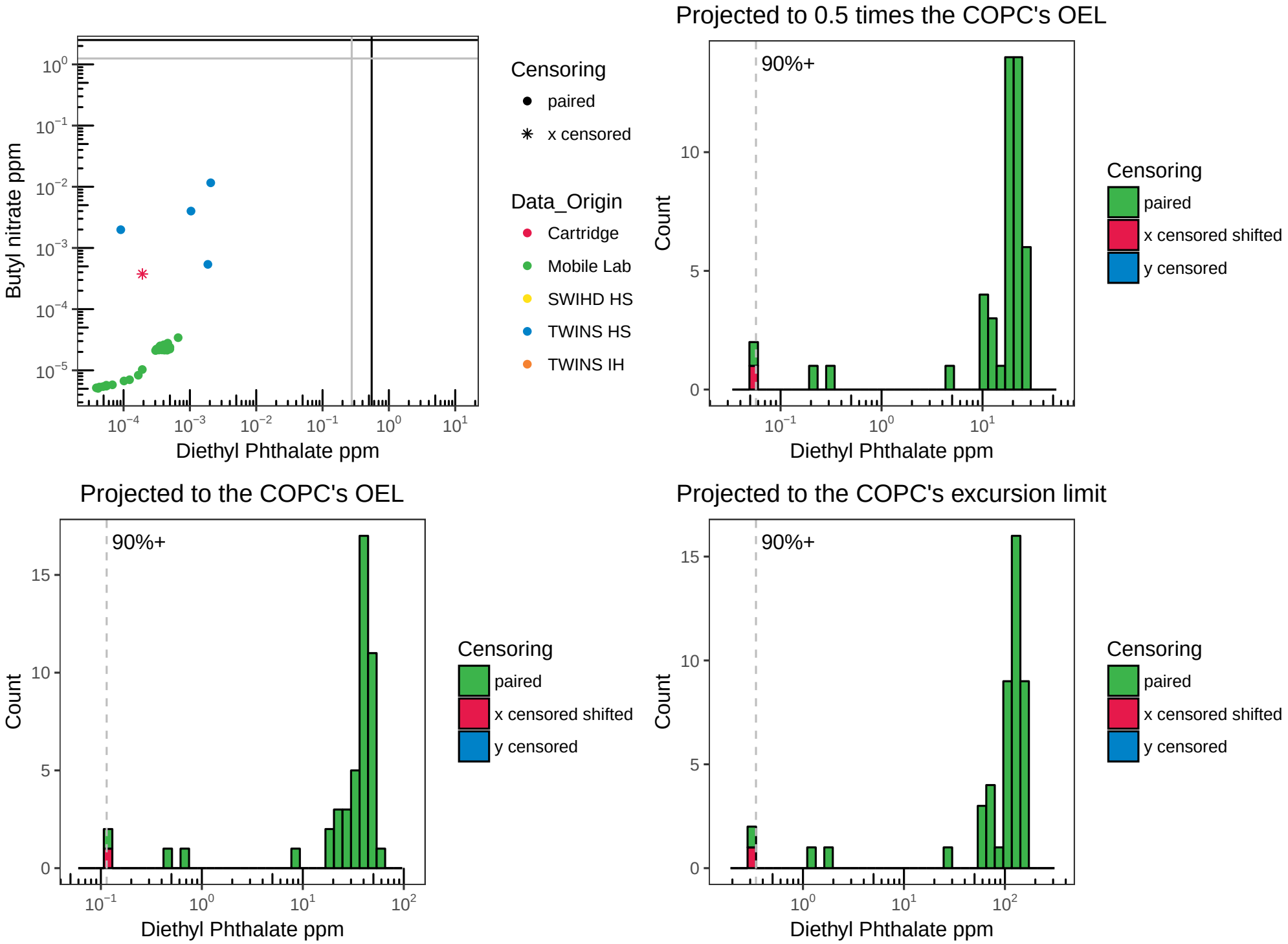


Figure C.1608: Butyl nitrate vs Diethyl Phthalate

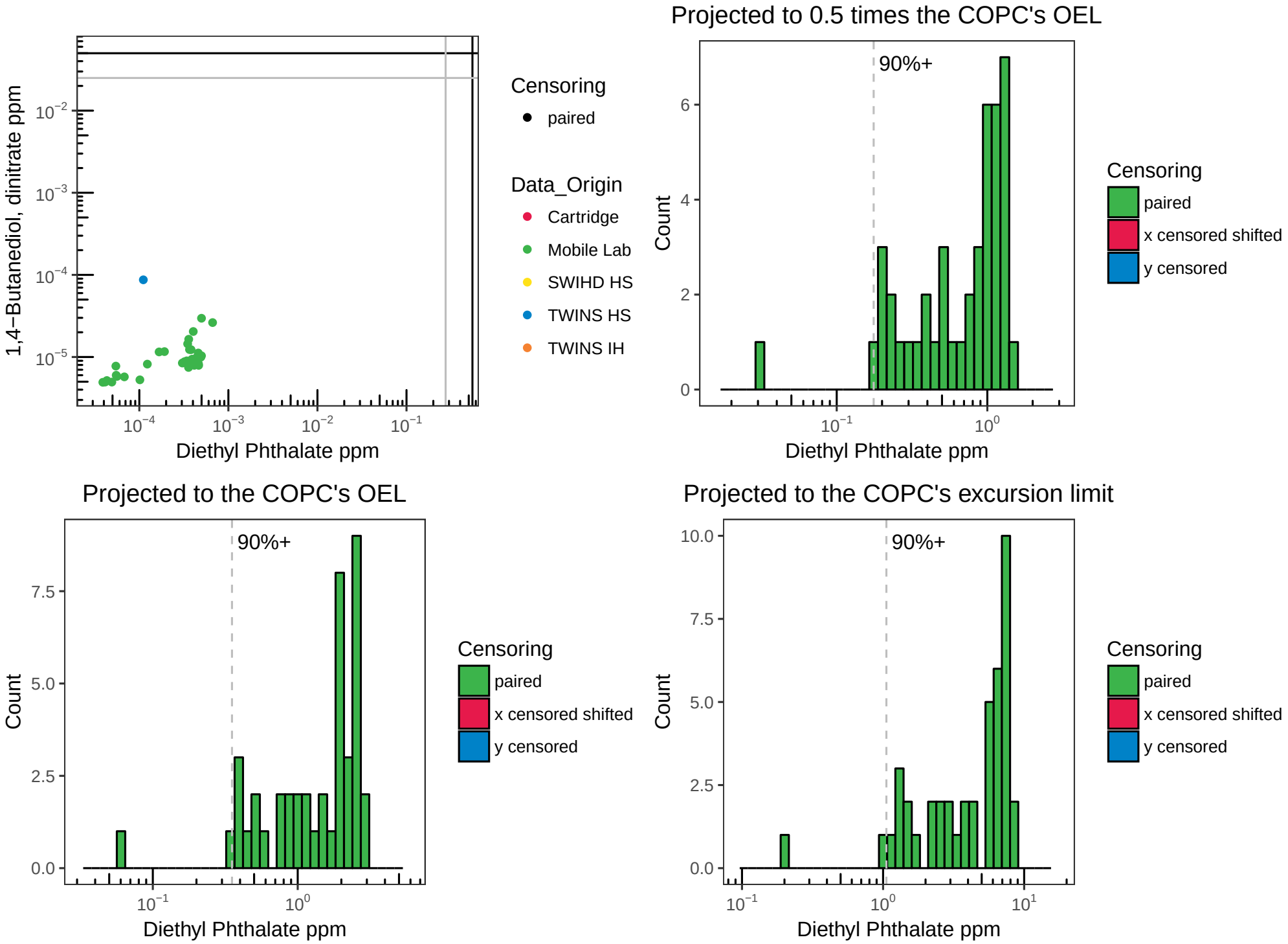


Figure C.1609: 1,4-Butanediol, dinitrate vs Diethyl Phthalate

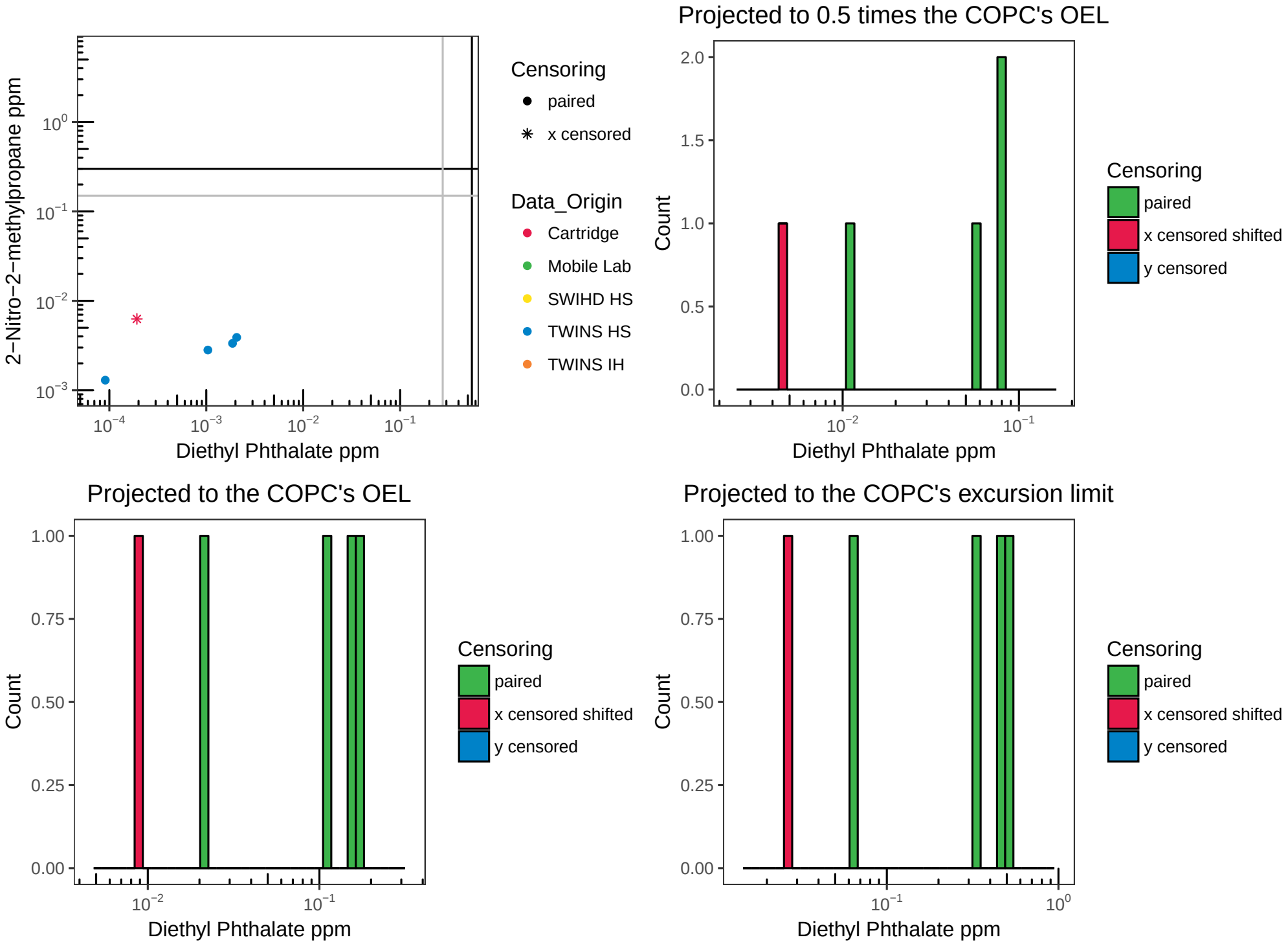


Figure C.1610: 2-Nitro-2-methylpropane vs Diethyl Phthalate

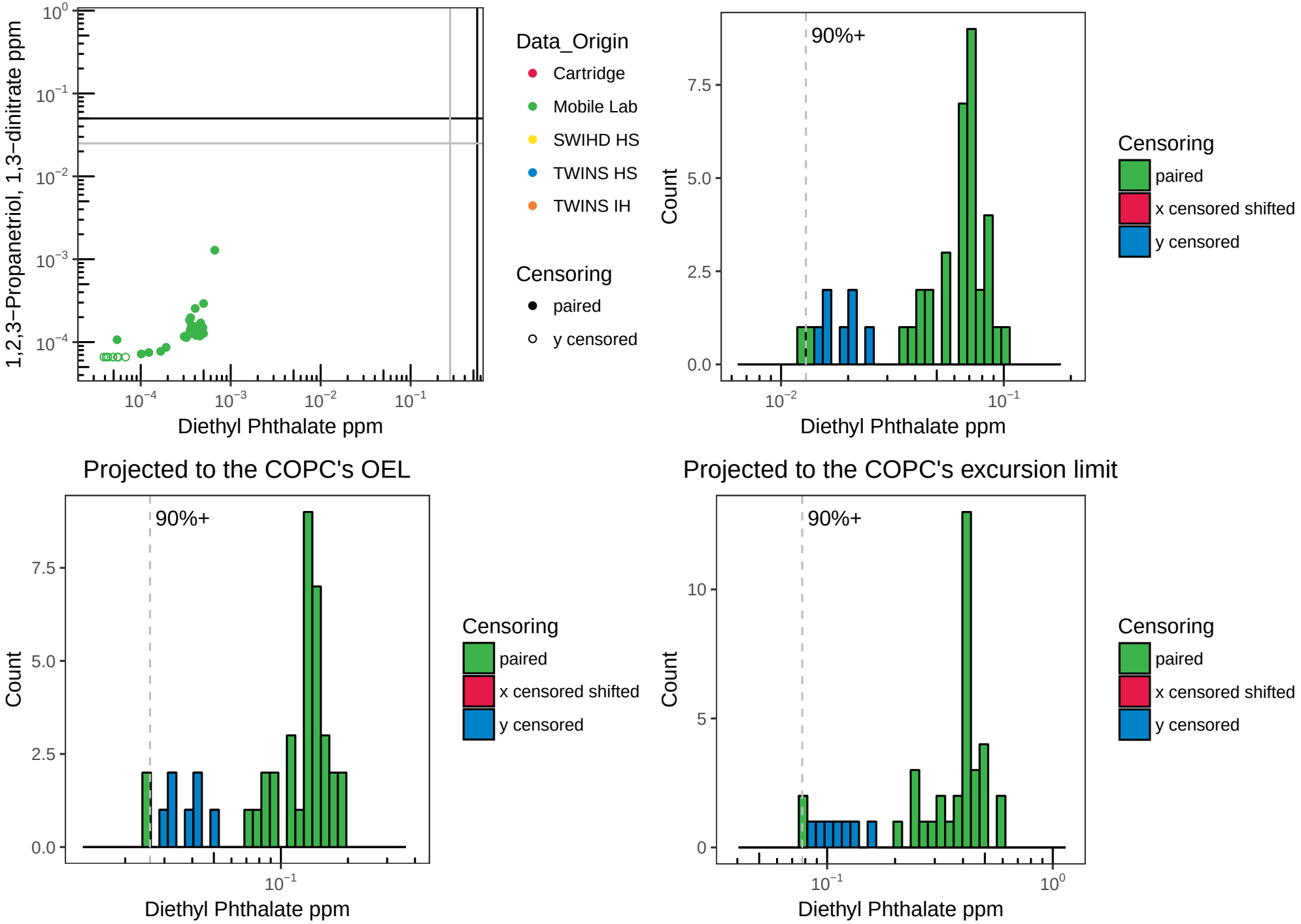


Figure C.1611: 1,2,3-Propanetriol, 1,3-dinitrate vs Diethyl Phthalate

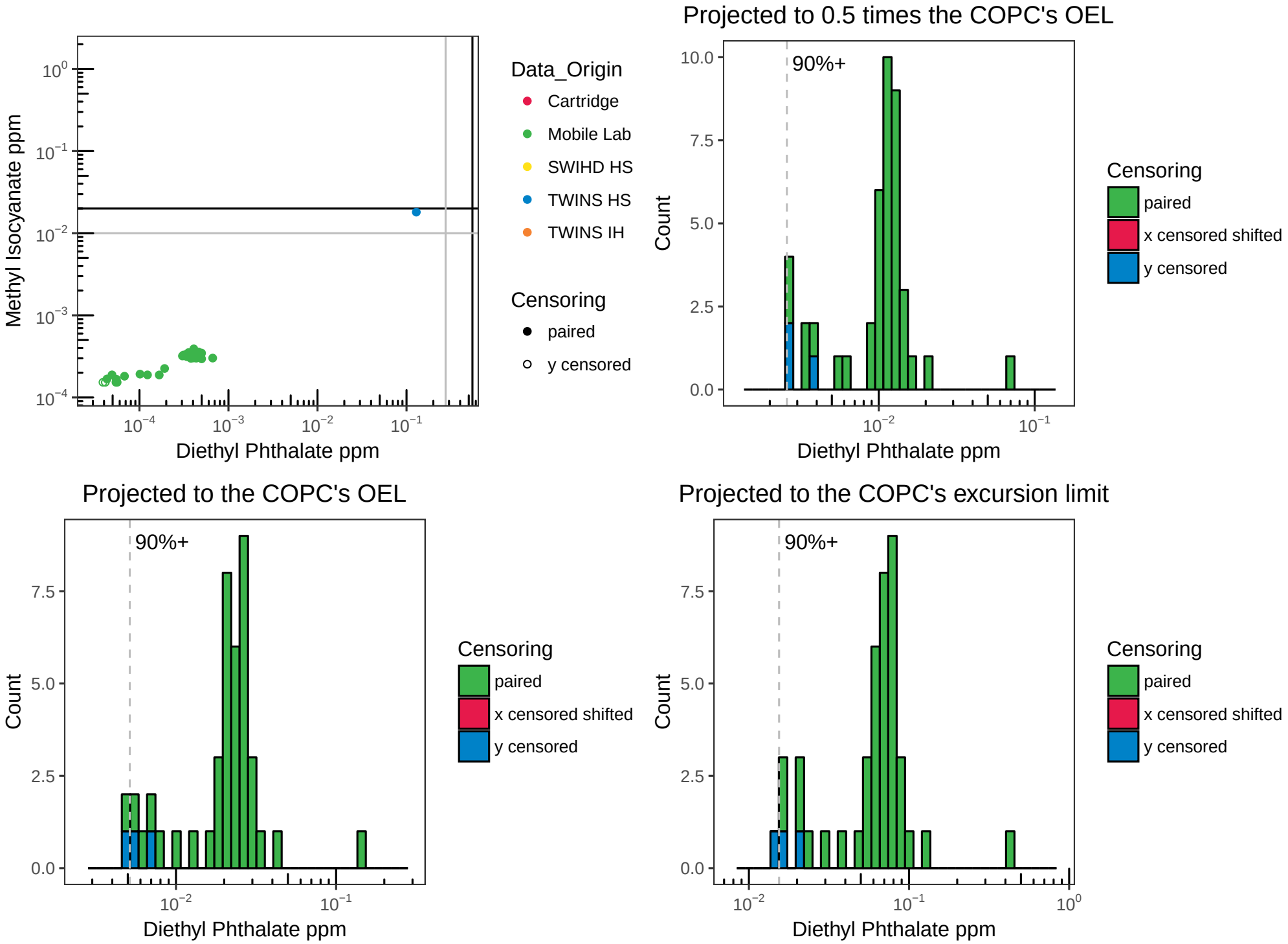


Figure C.1612: Methyl Isocyanate vs Diethyl Phthalate

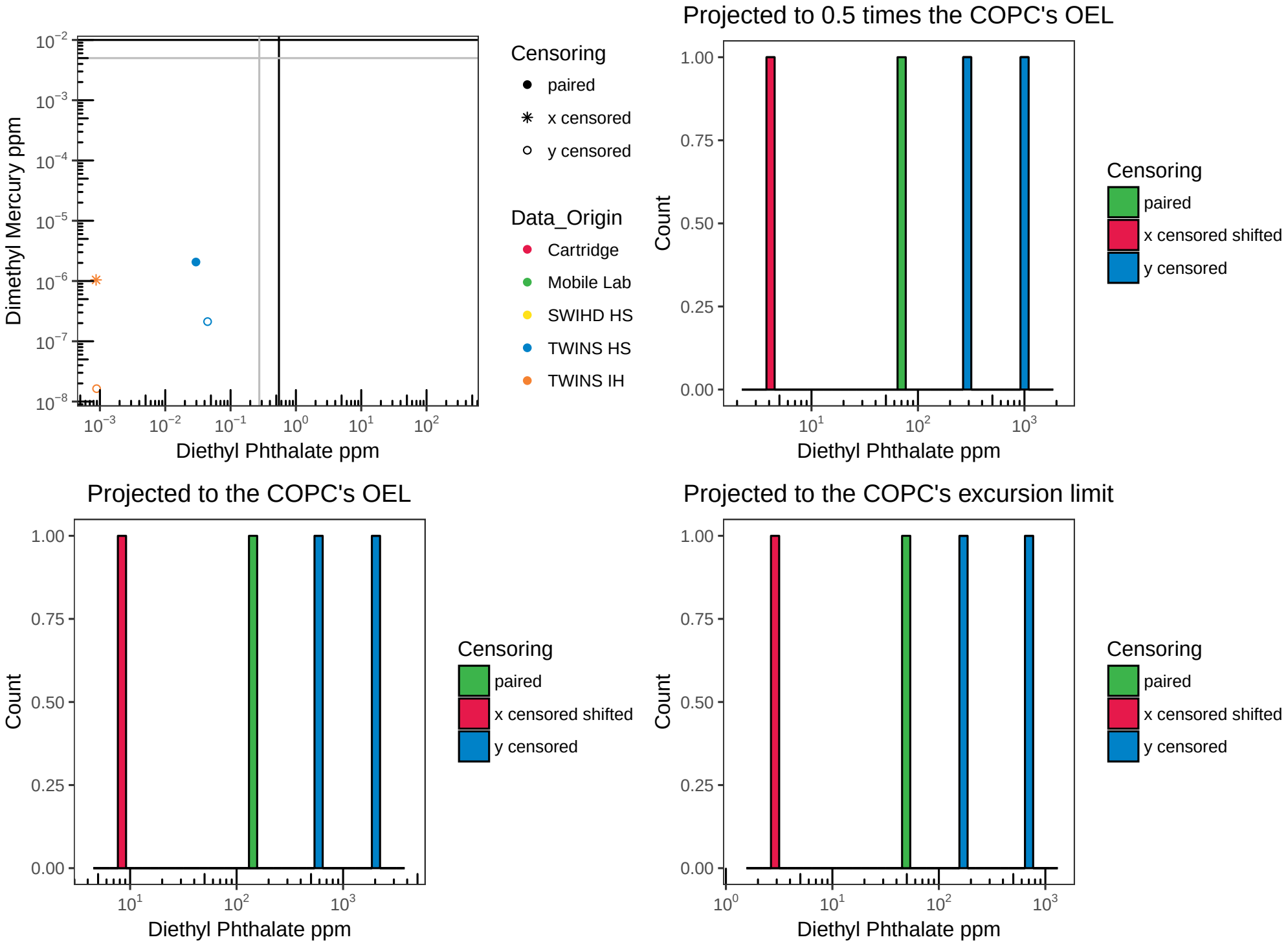


Figure C.1613: Dimethyl Mercury vs Diethyl Phthalate

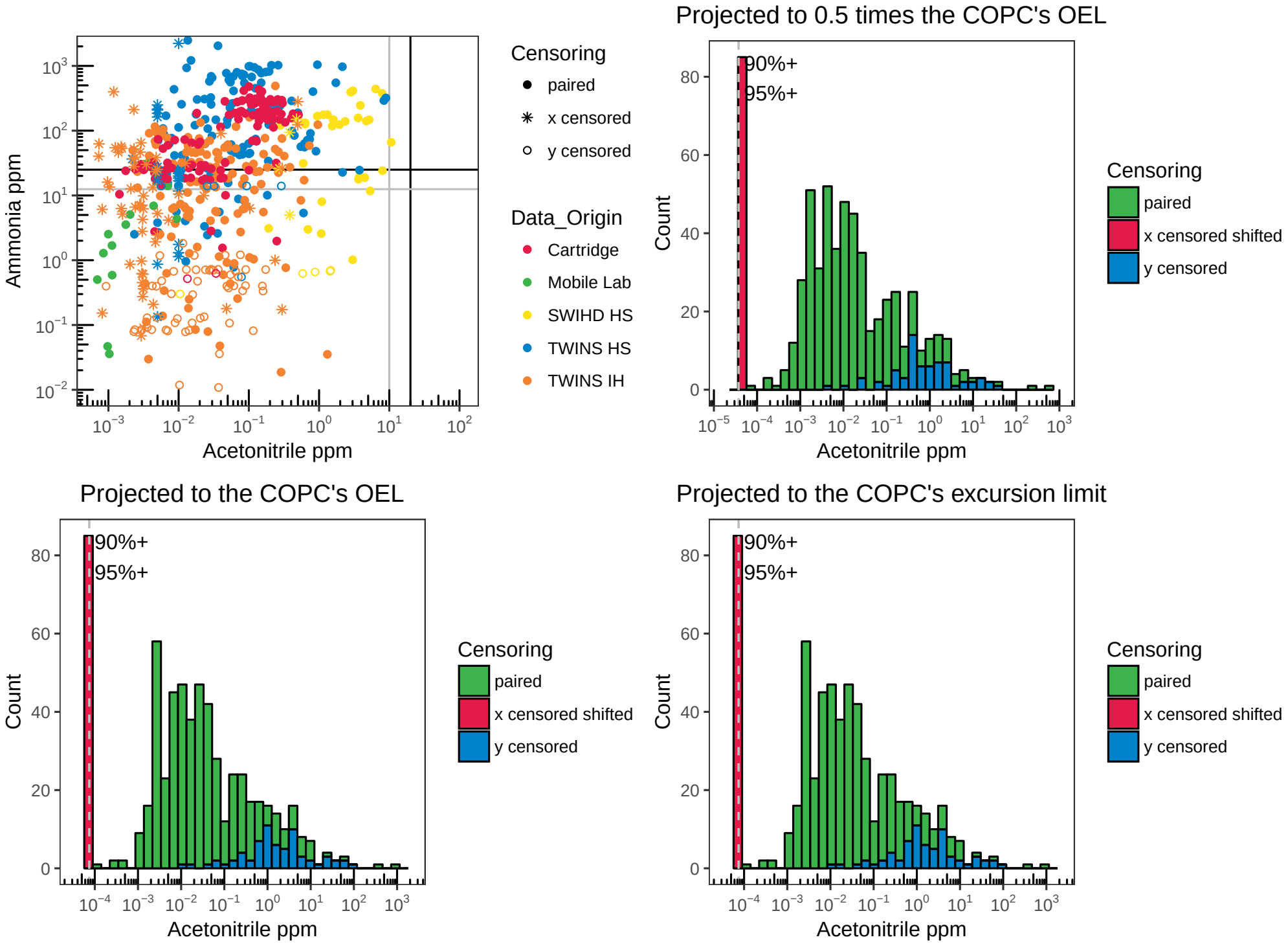


Figure C.1614: Ammonia vs Acetonitrile

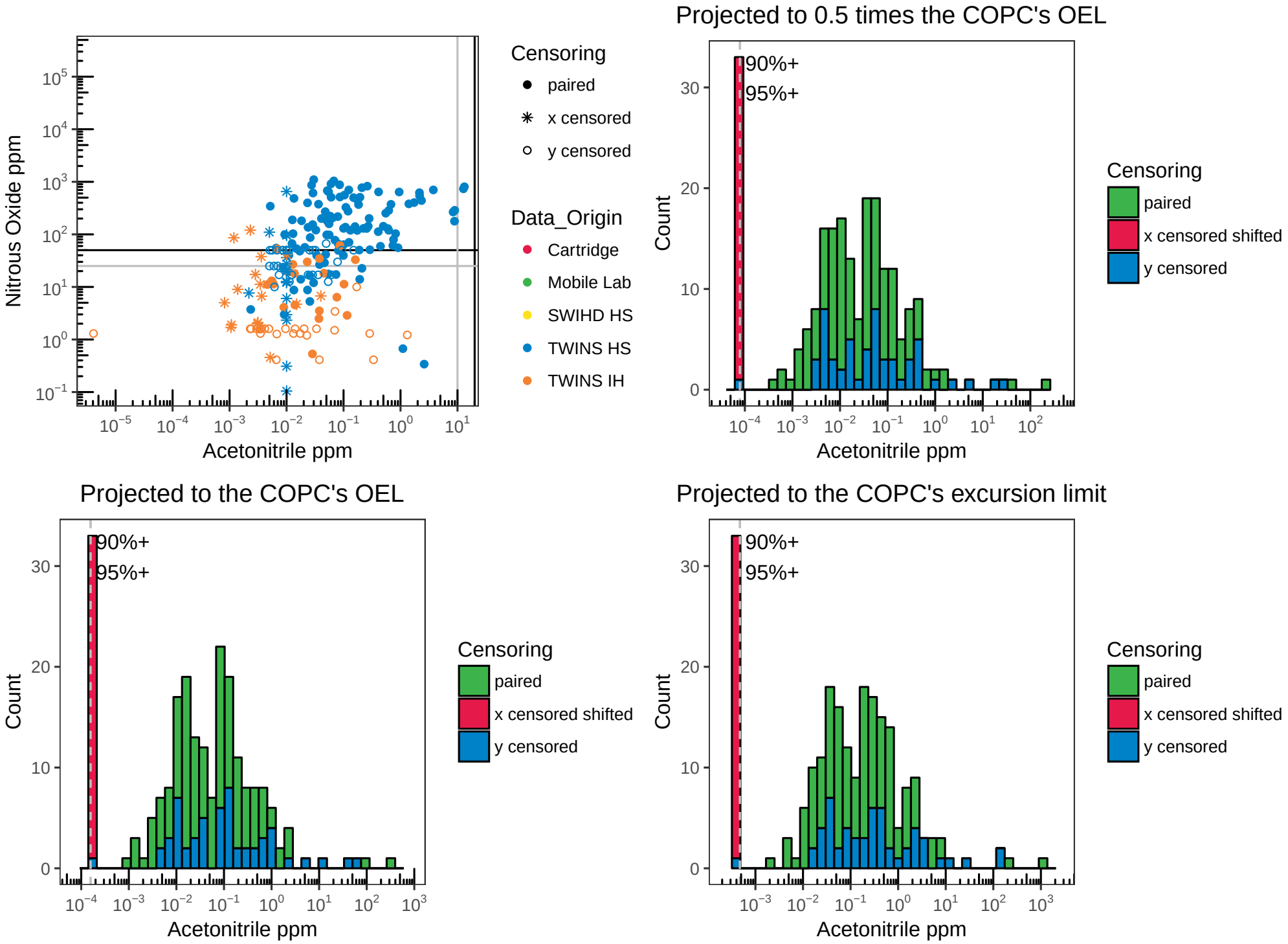


Figure C.1615: Nitrous Oxide vs Acetonitrile

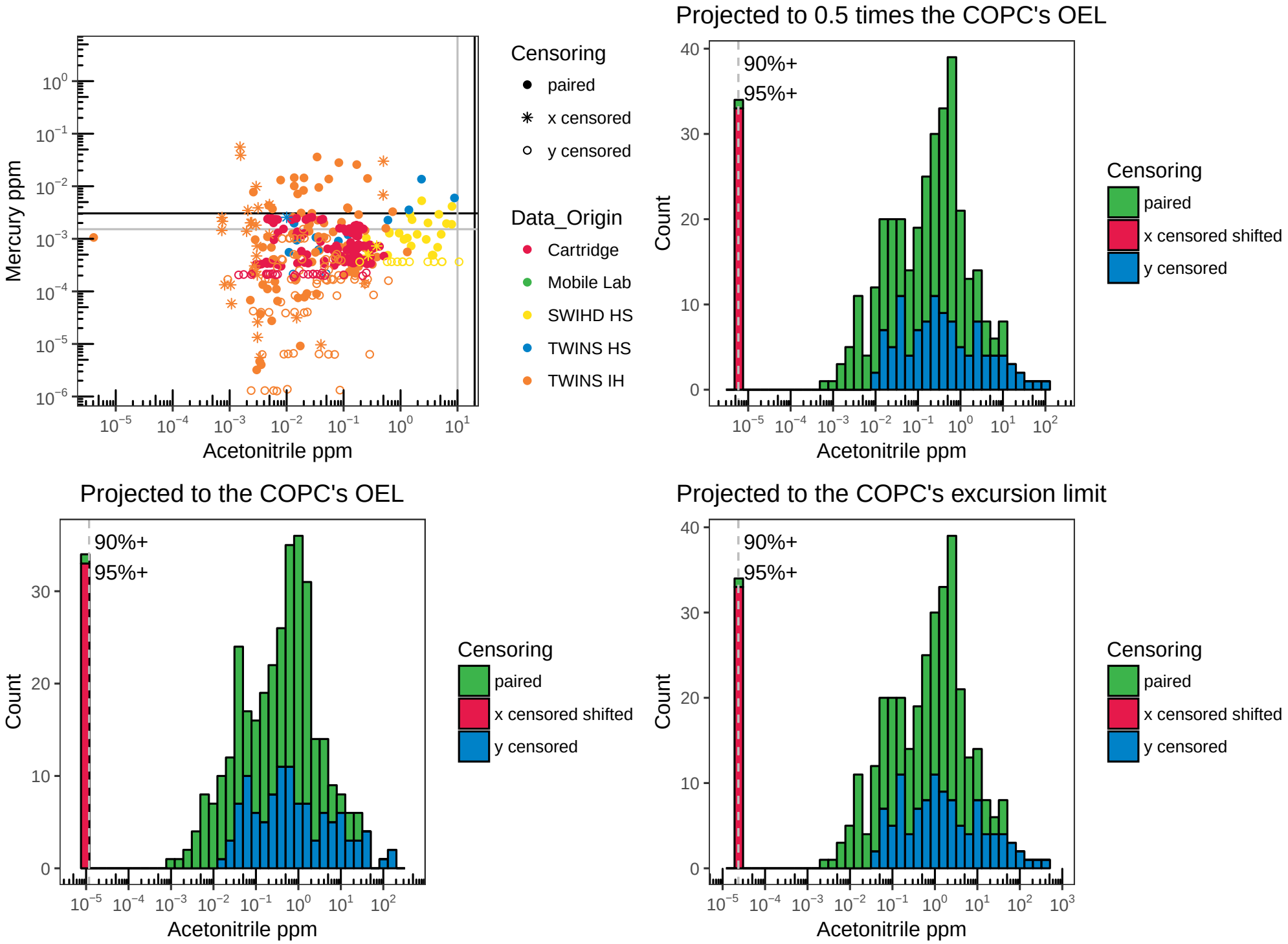


Figure C.1616: Mercury vs Acetonitrile

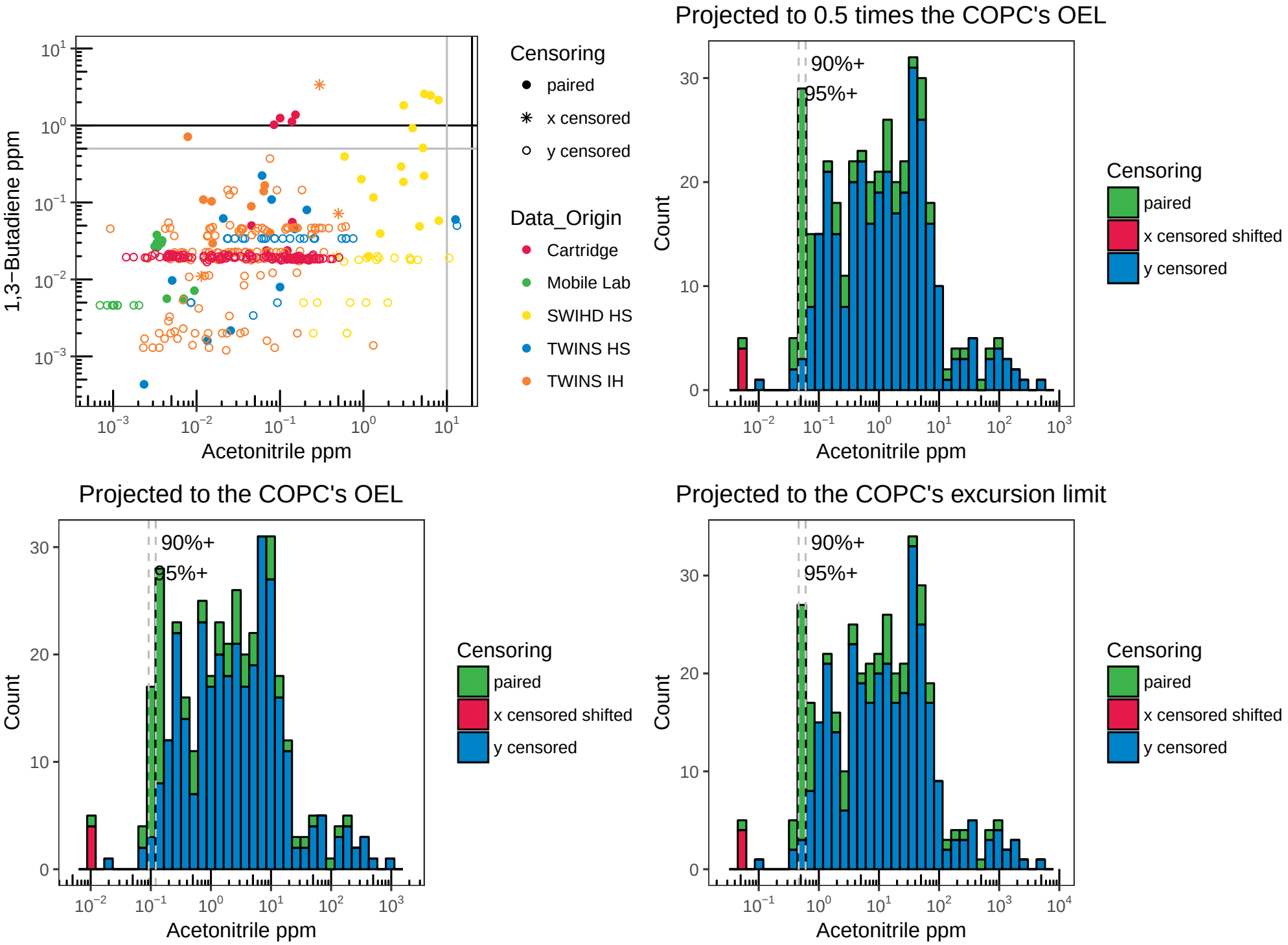


Figure C.1617: 1,3-Butadiene vs Acetonitrile

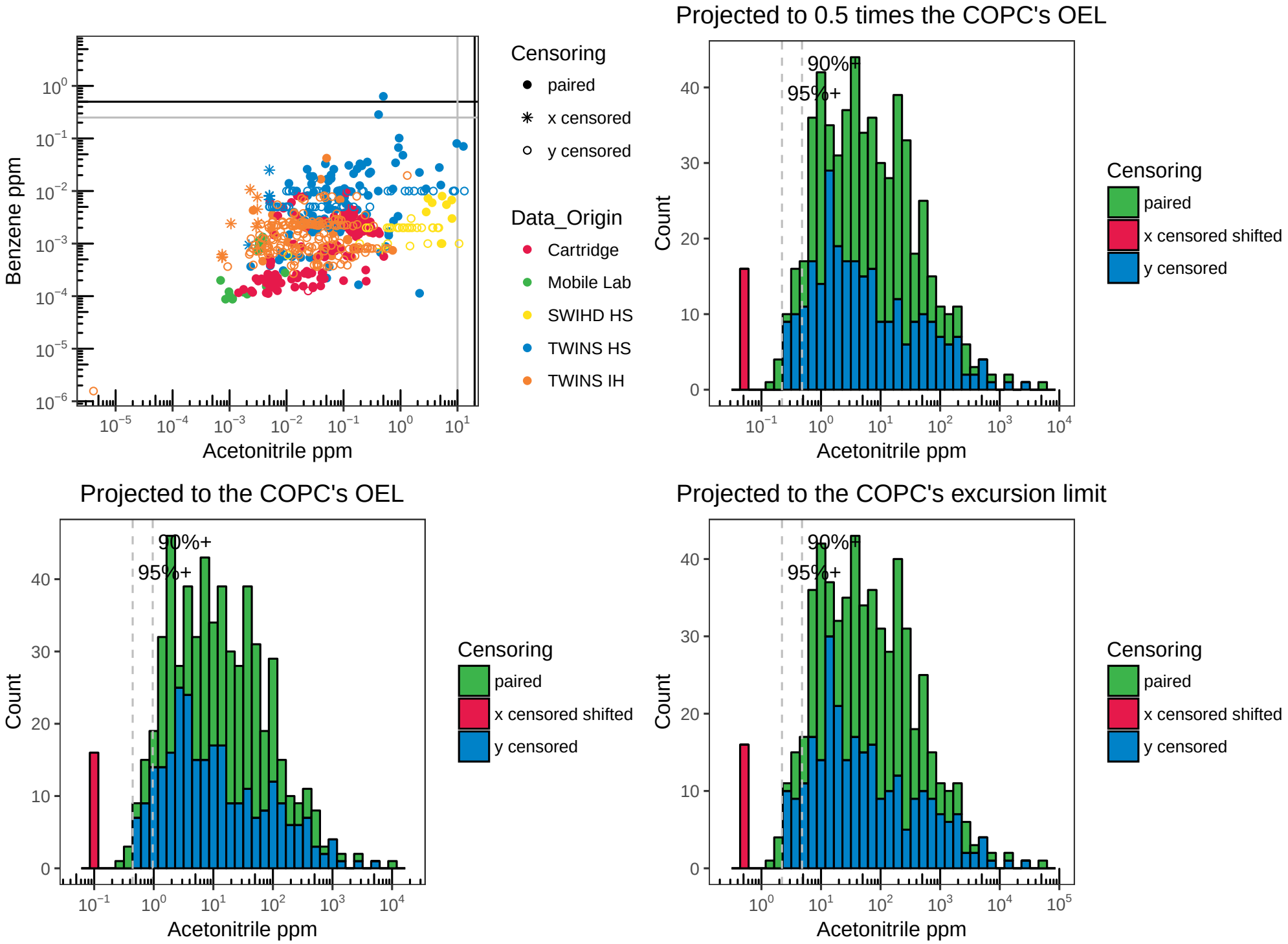


Figure C.1618: Benzene vs Acetonitrile

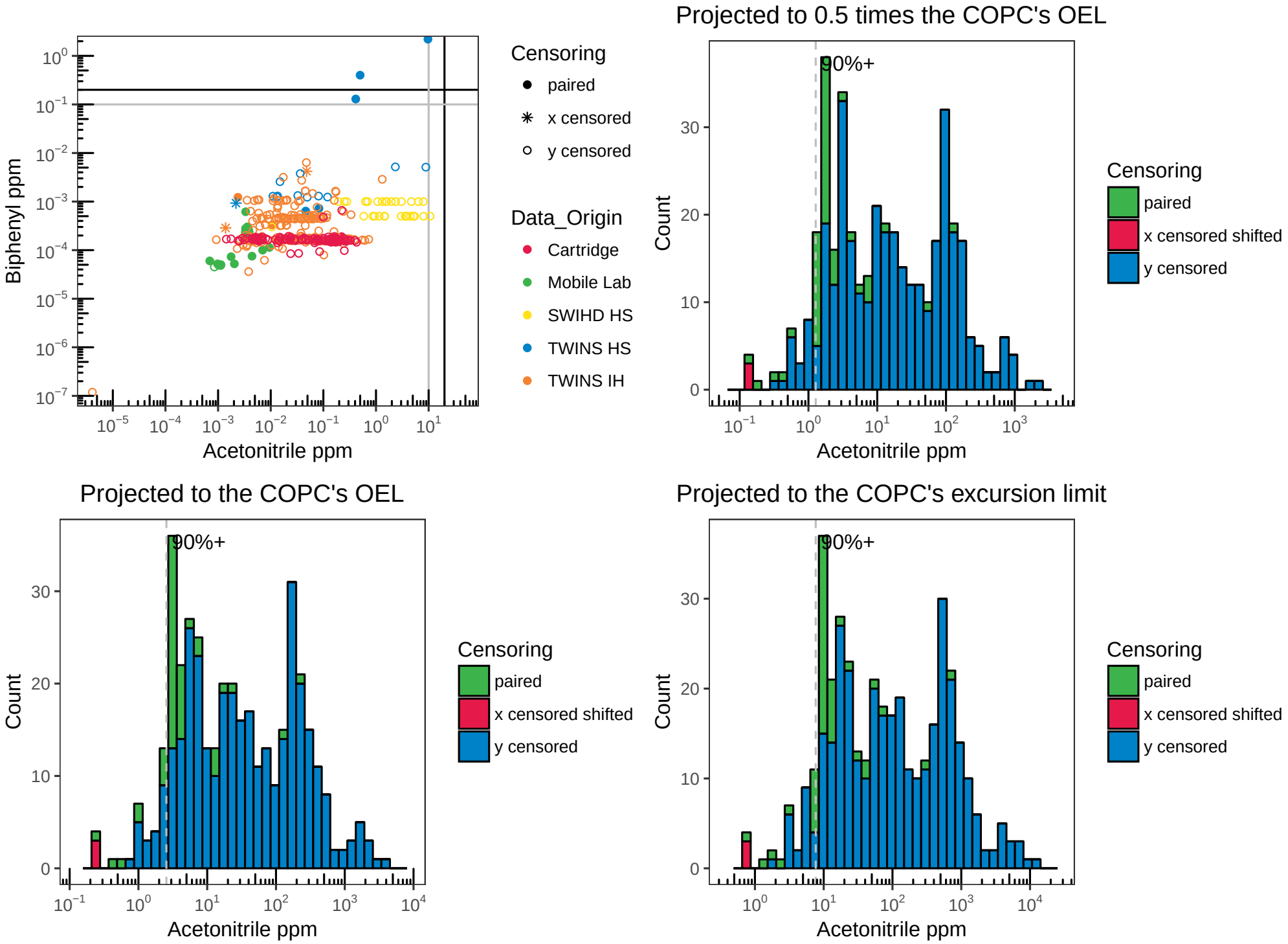


Figure C.1619: Biphenyl vs Acetonitrile

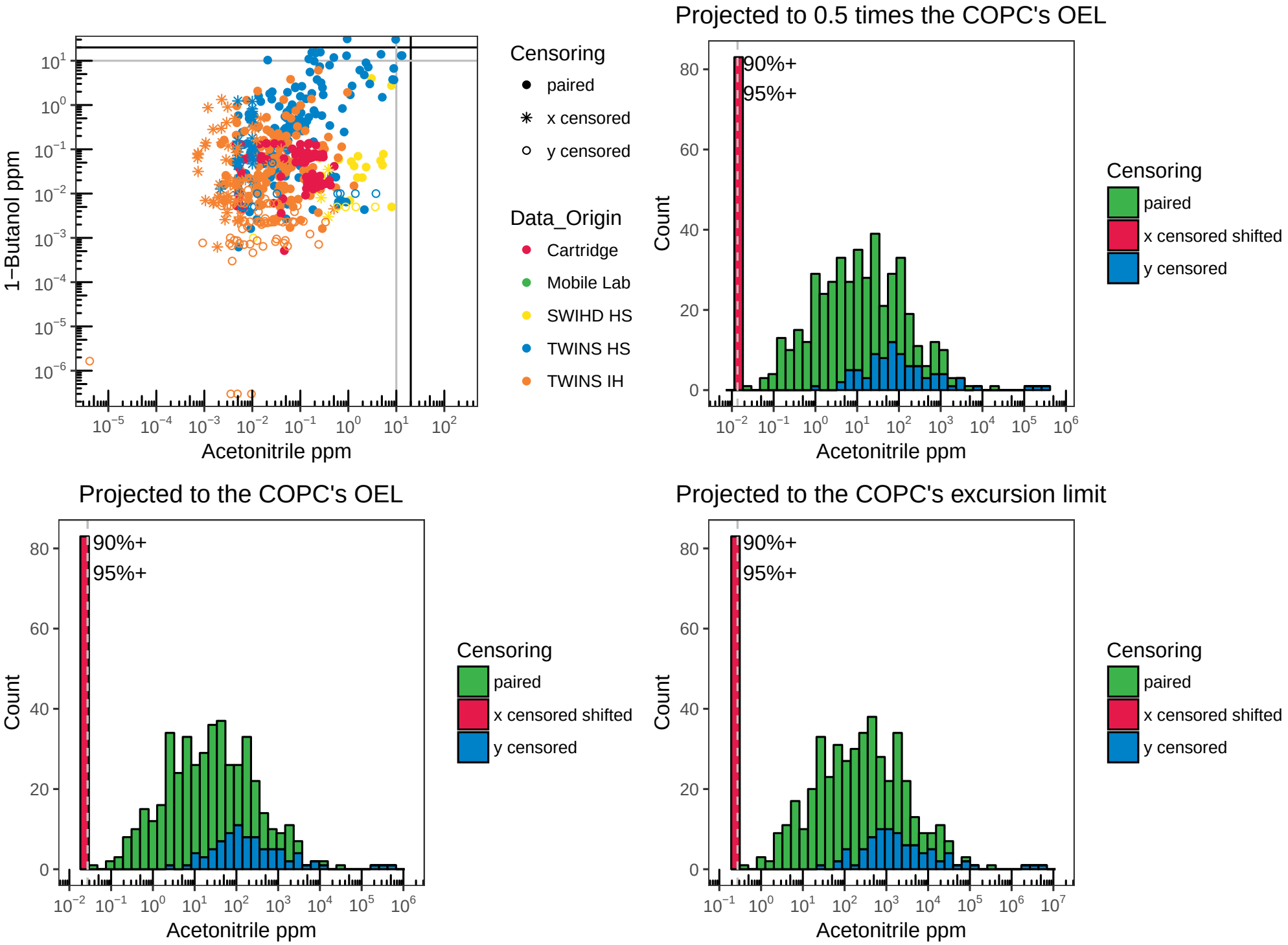


Figure C.1620: 1-Butanol vs Acetonitrile

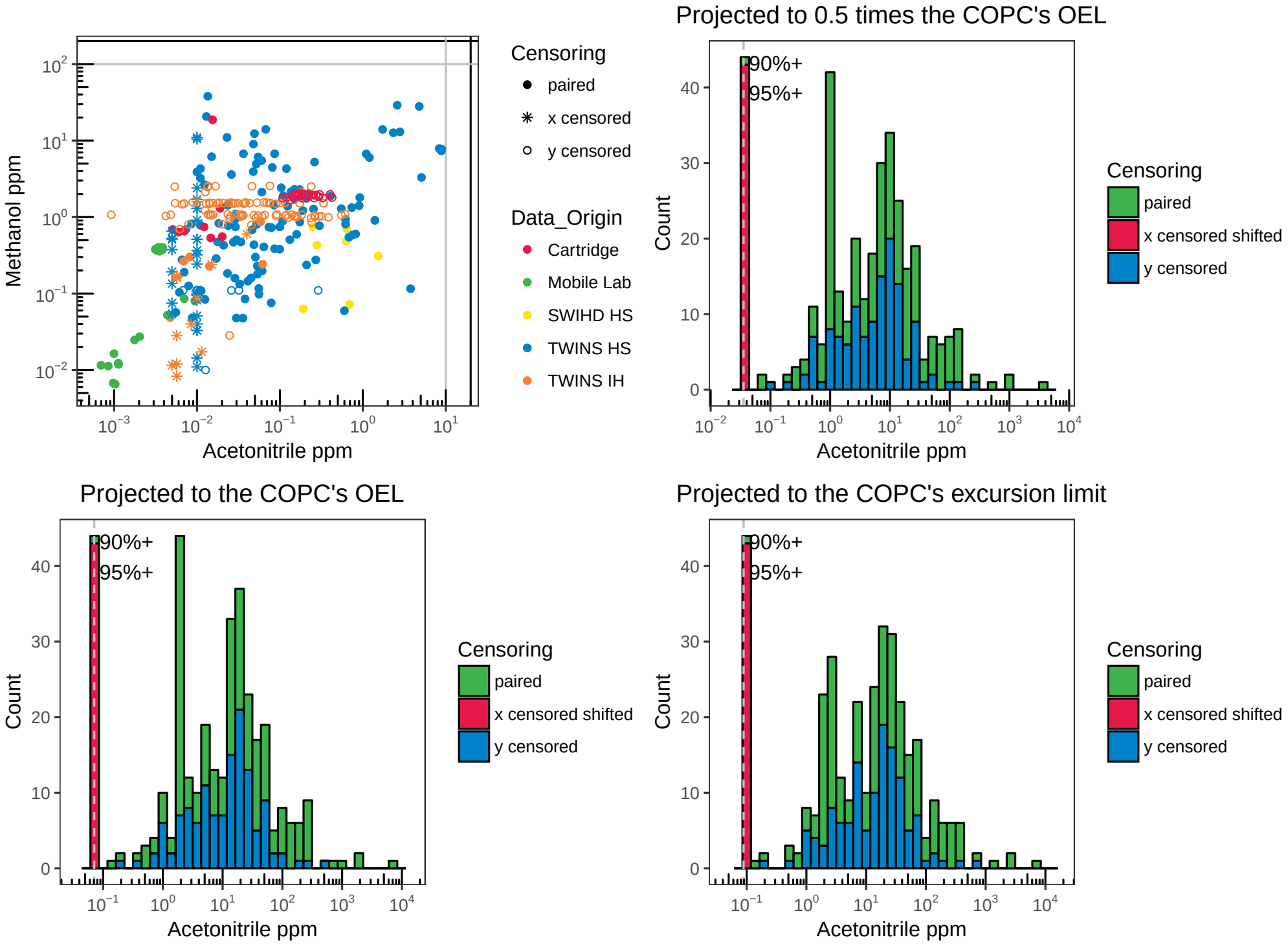


Figure C.1621: Methanol vs Acetonitrile

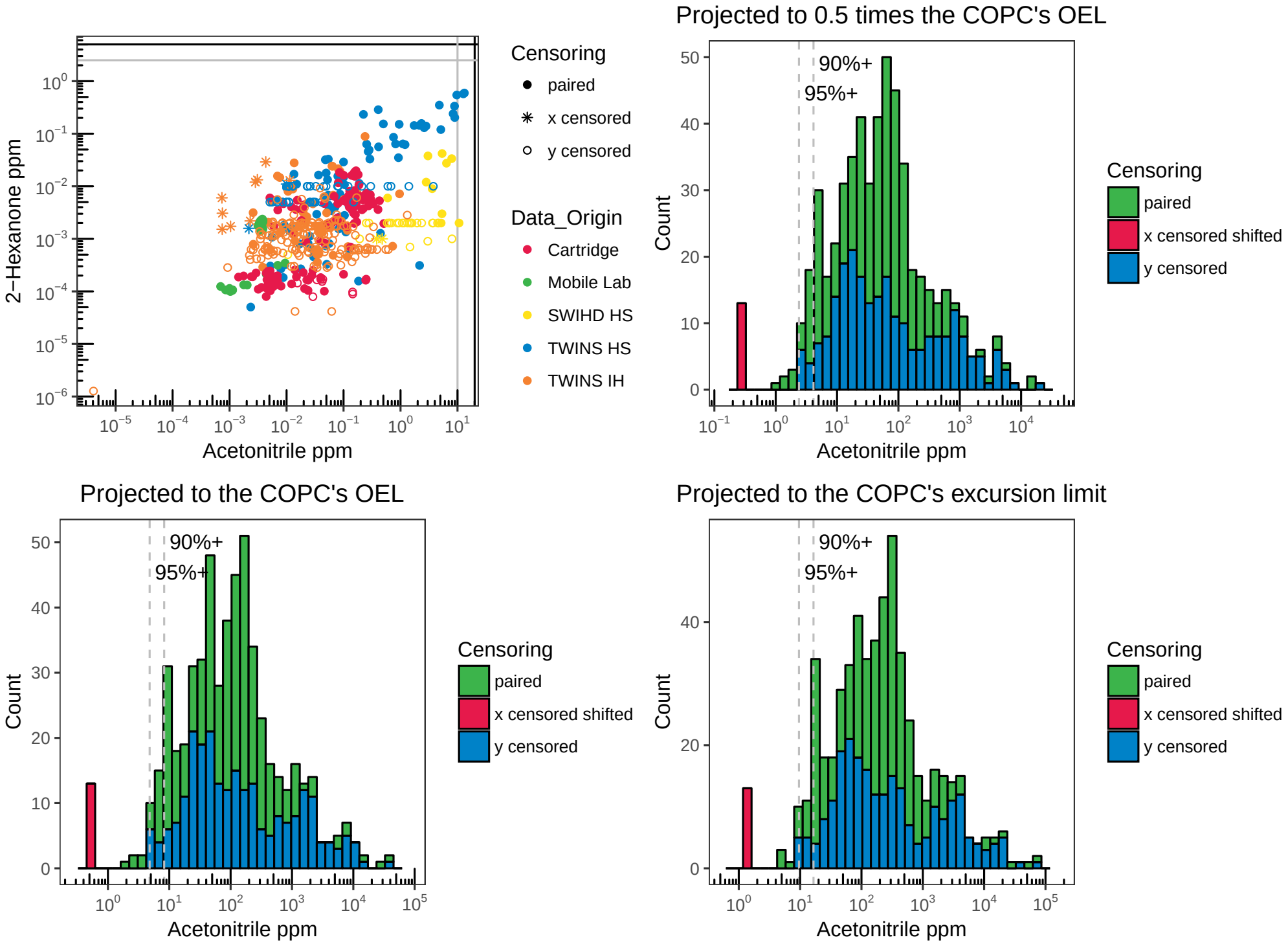


Figure C.1622: 2-Hexanone vs Acetonitrile

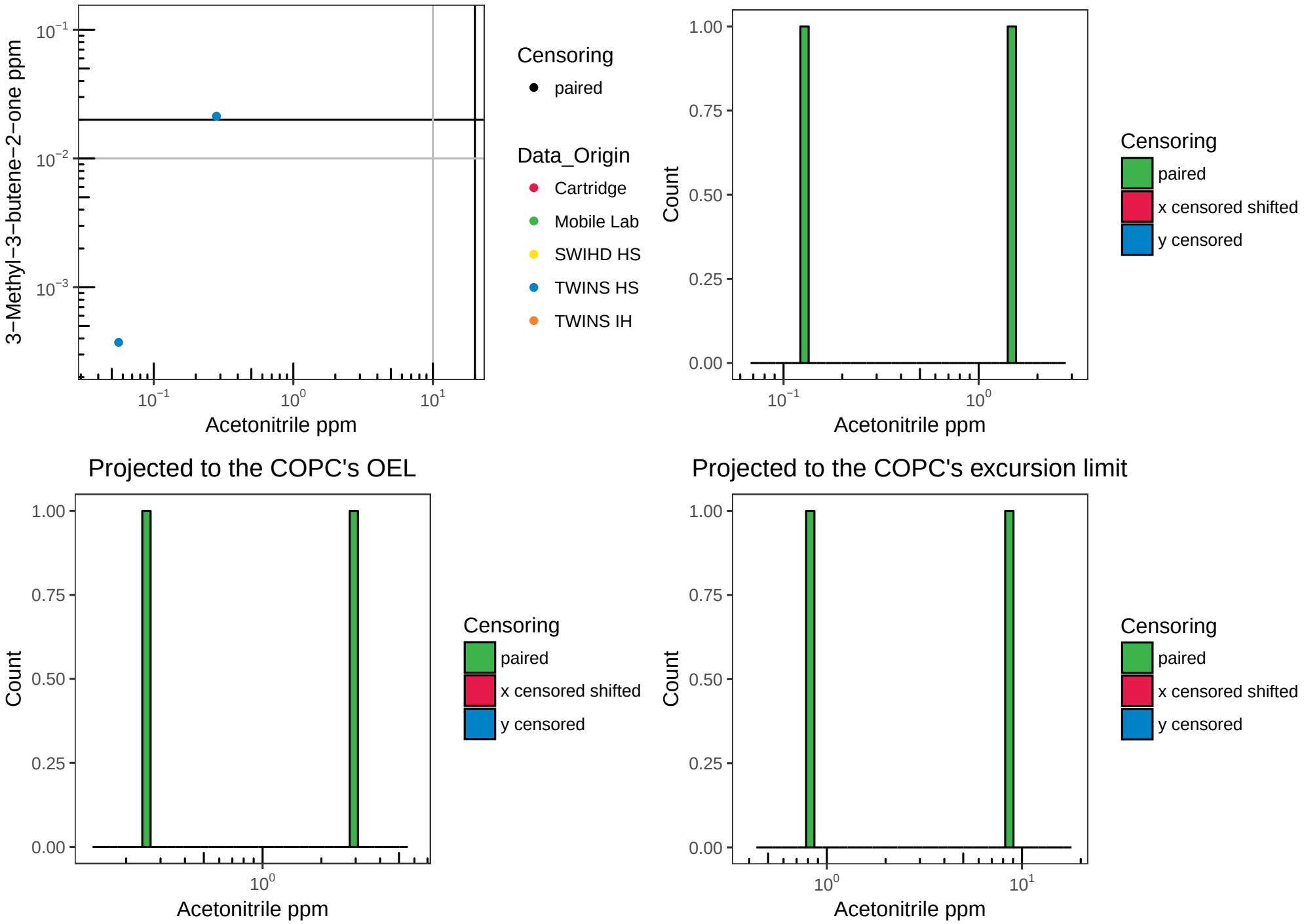


Figure C.1623: 3-Methyl-3-butene-2-one vs Acetonitrile

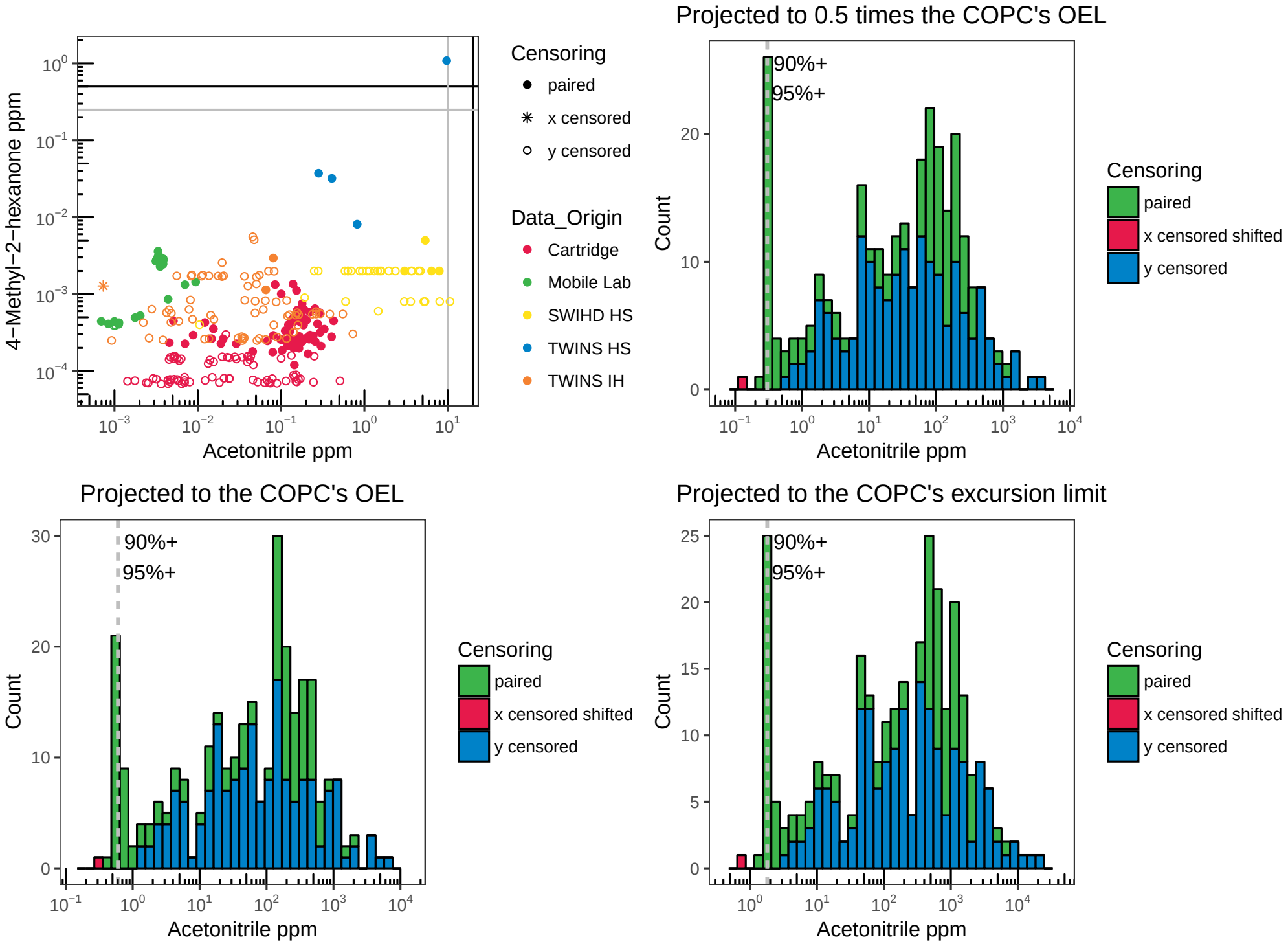


Figure C.1624: 4-Methyl-2-hexanone vs Acetonitrile

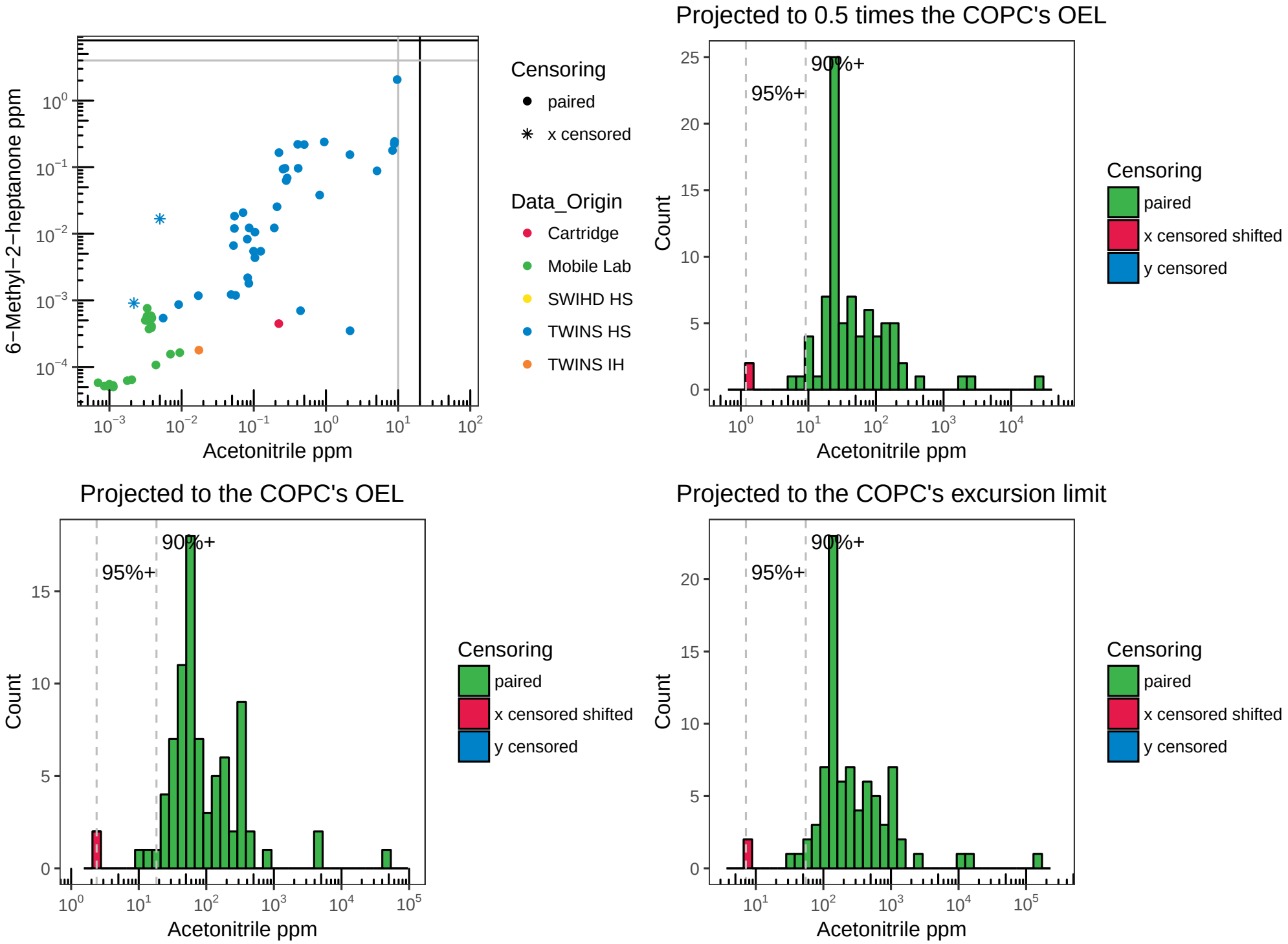


Figure C.1625: 6-Methyl-2-heptanone vs Acetonitrile

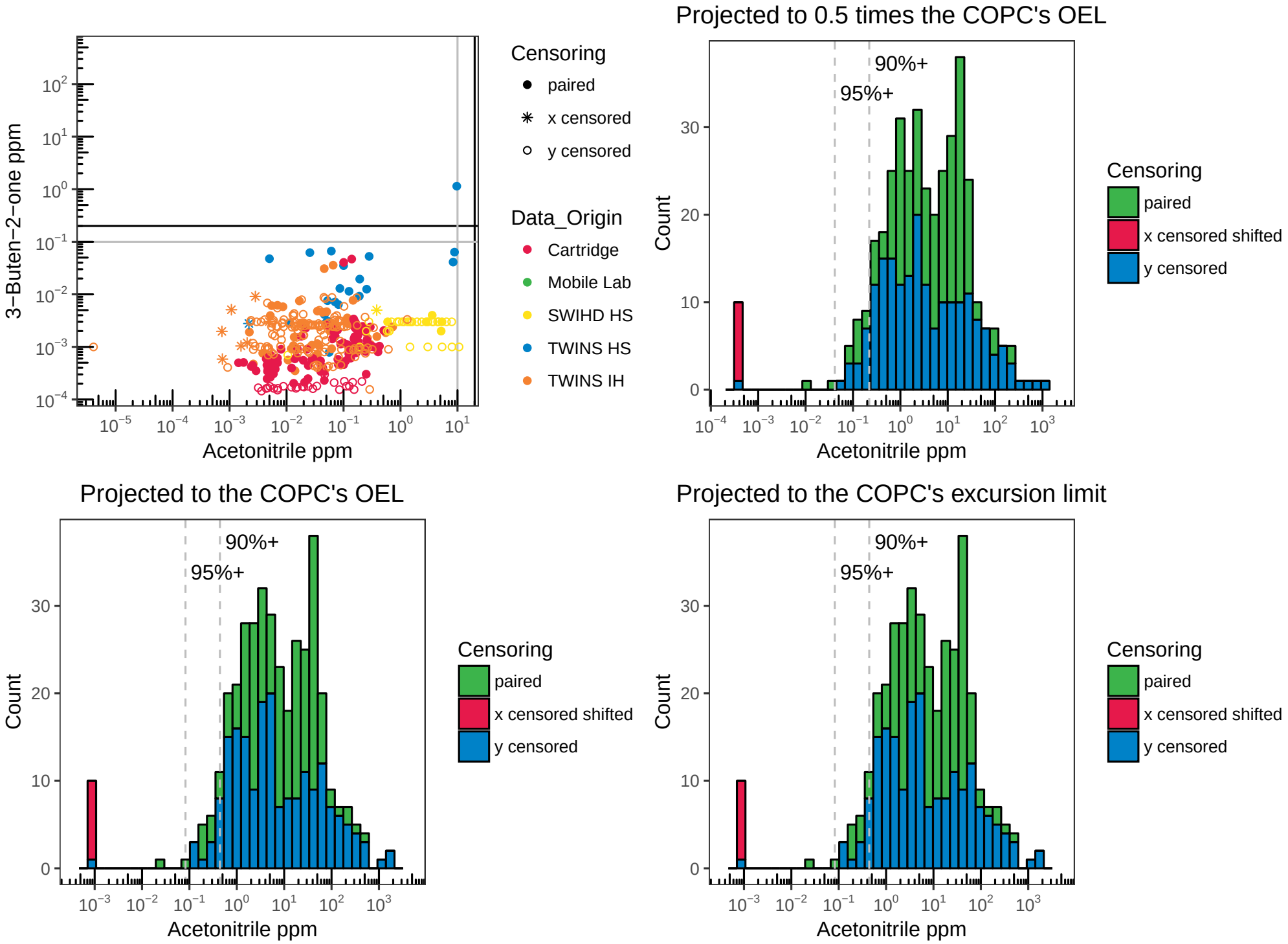


Figure C.1626: 3-Buten-2-one vs Acetonitrile

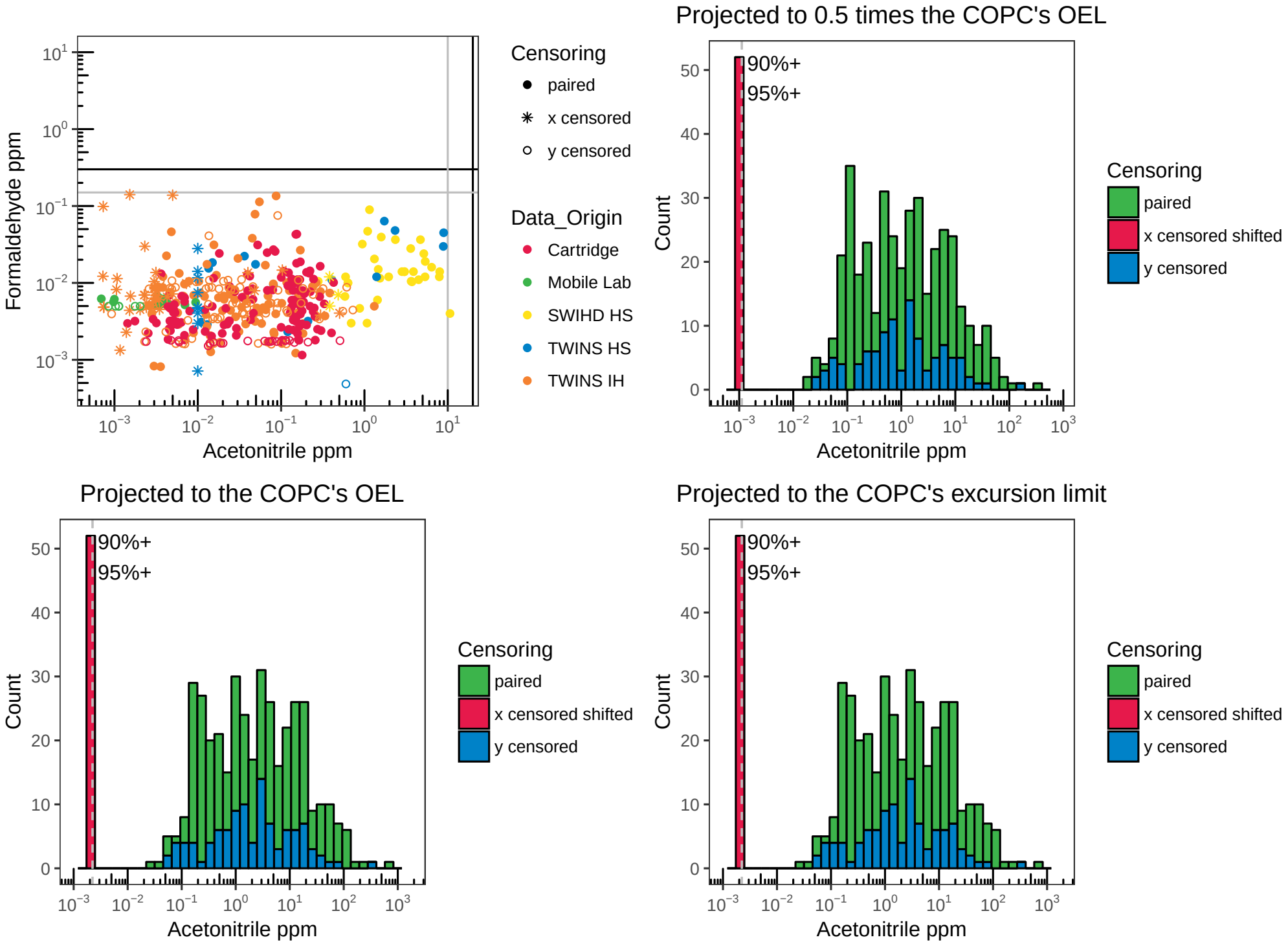


Figure C.1627: Formaldehyde vs Acetonitrile

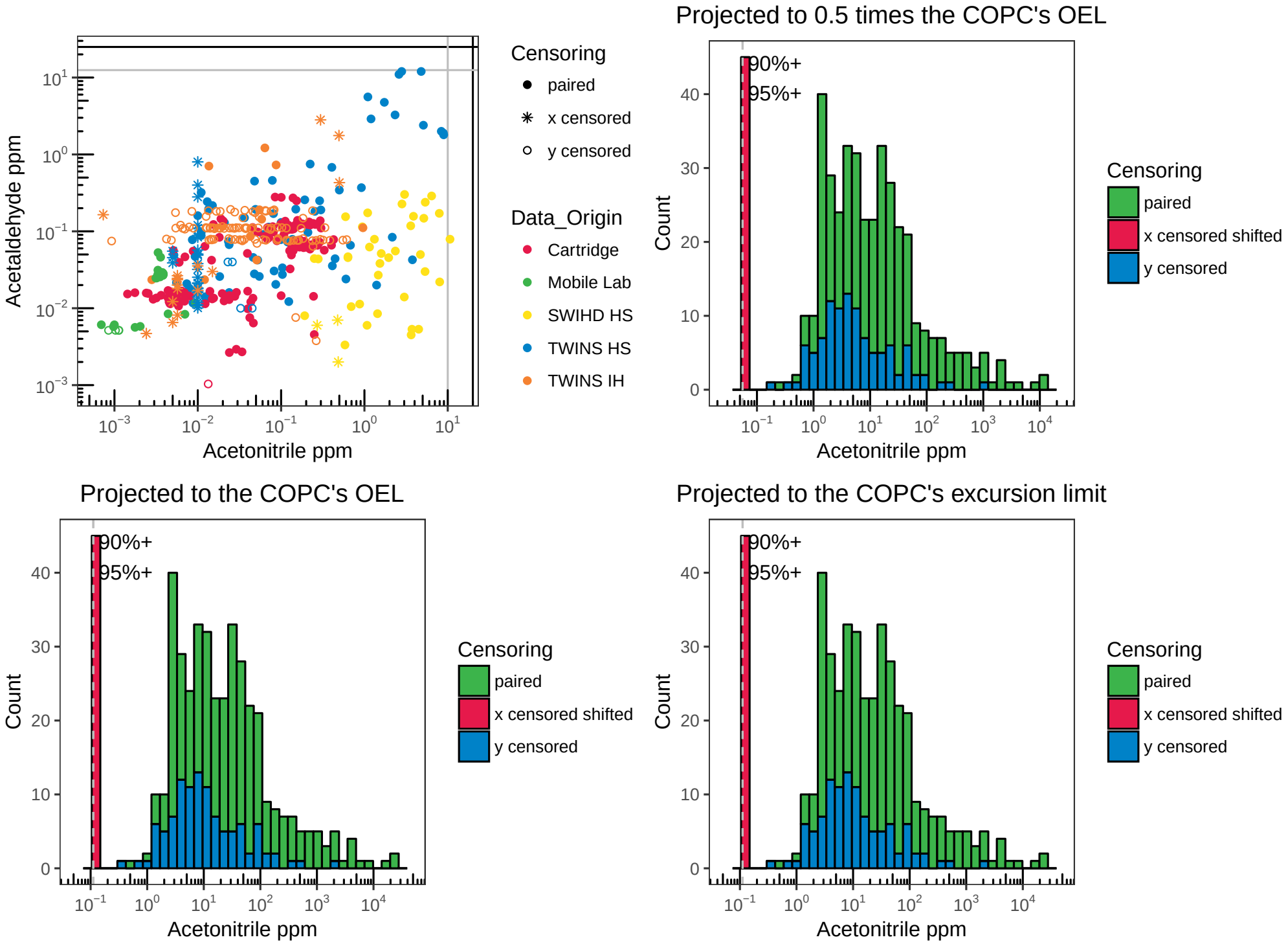


Figure C.1628: Acetaldehyde vs Acetonitrile

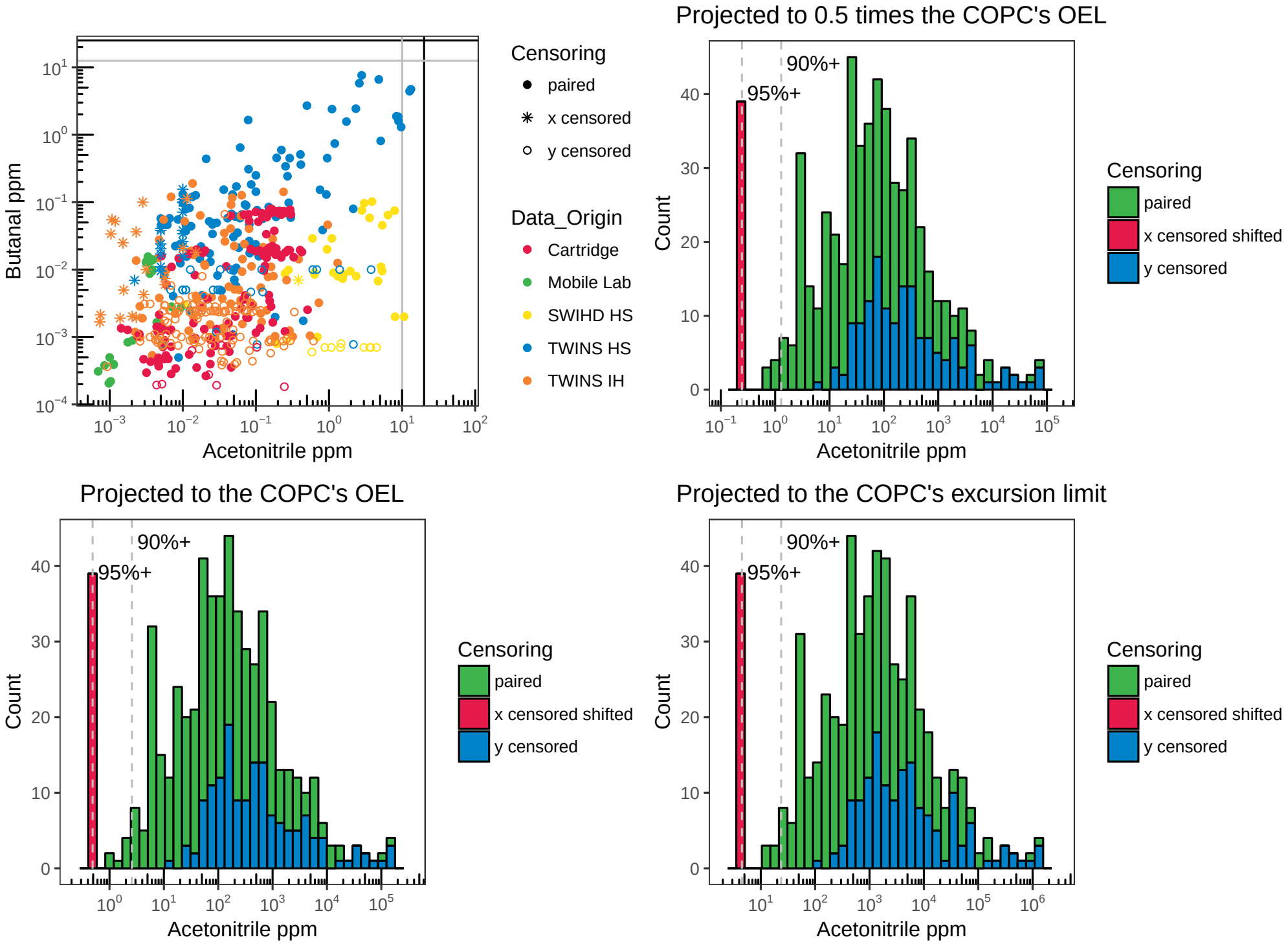


Figure C.1629: Butanal vs Acetonitrile

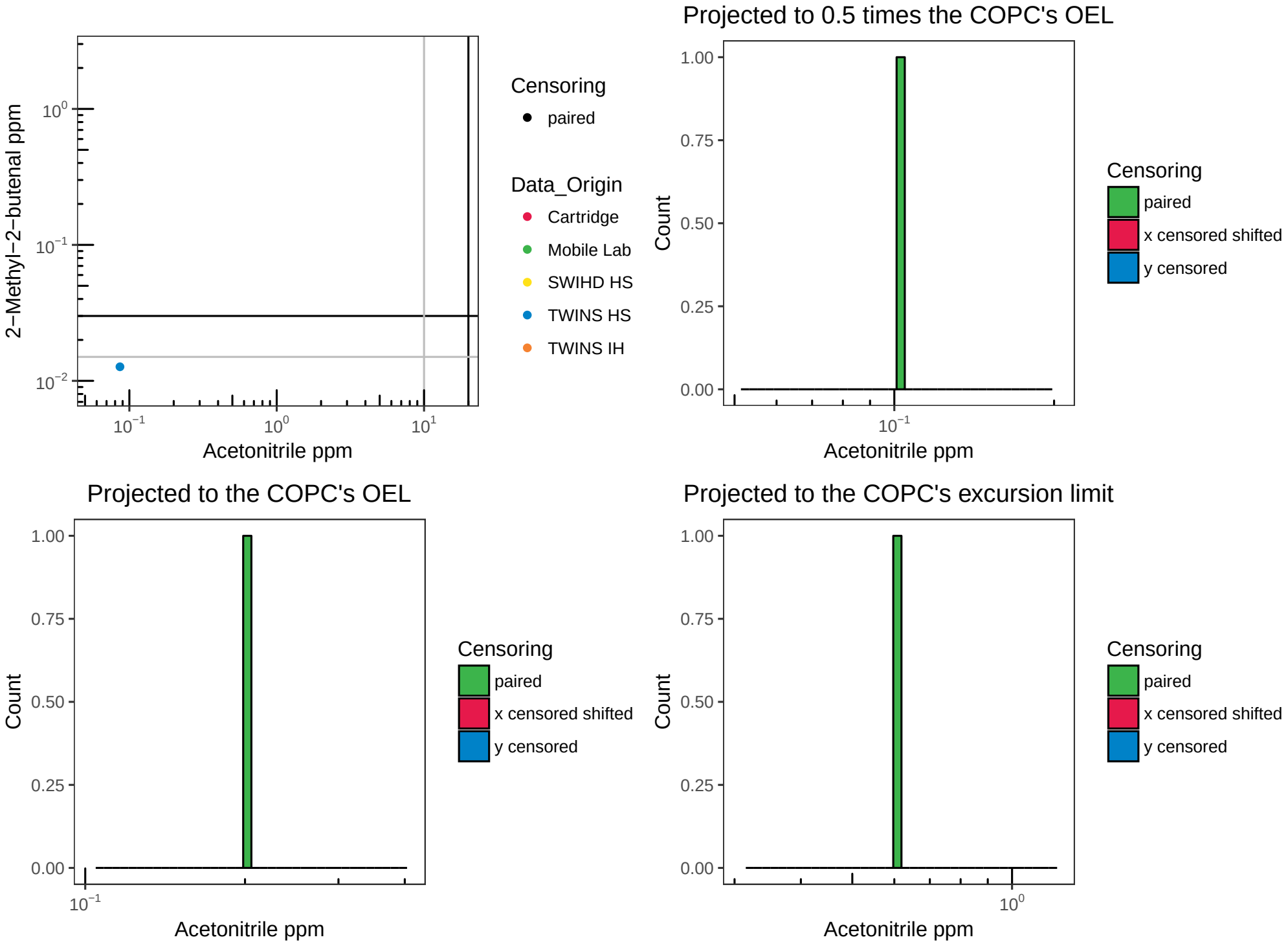


Figure C.1630: 2-Methyl-2-butenal vs Acetonitrile

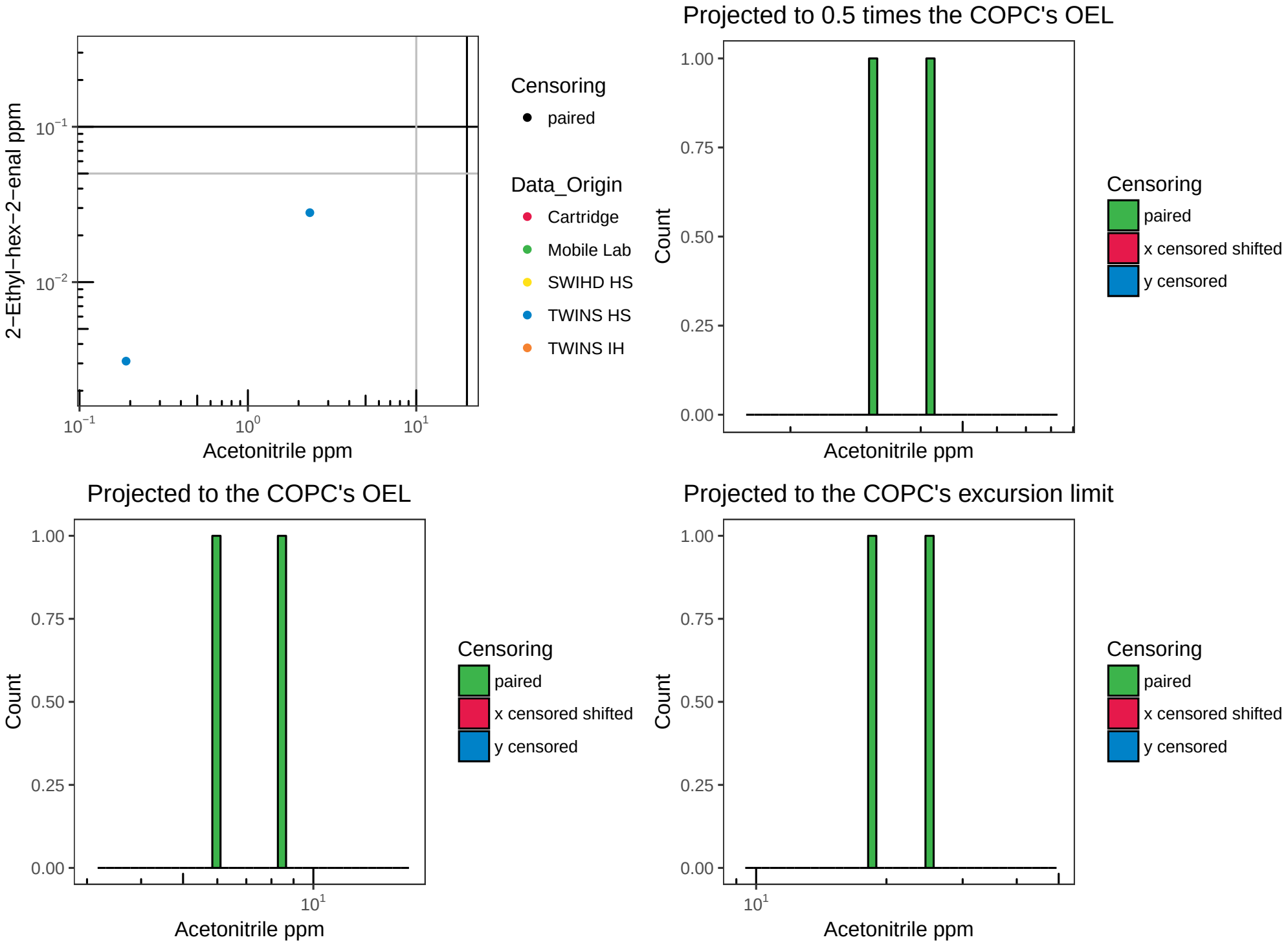


Figure C.1631: 2-Ethyl-hex-2-enal vs Acetonitrile

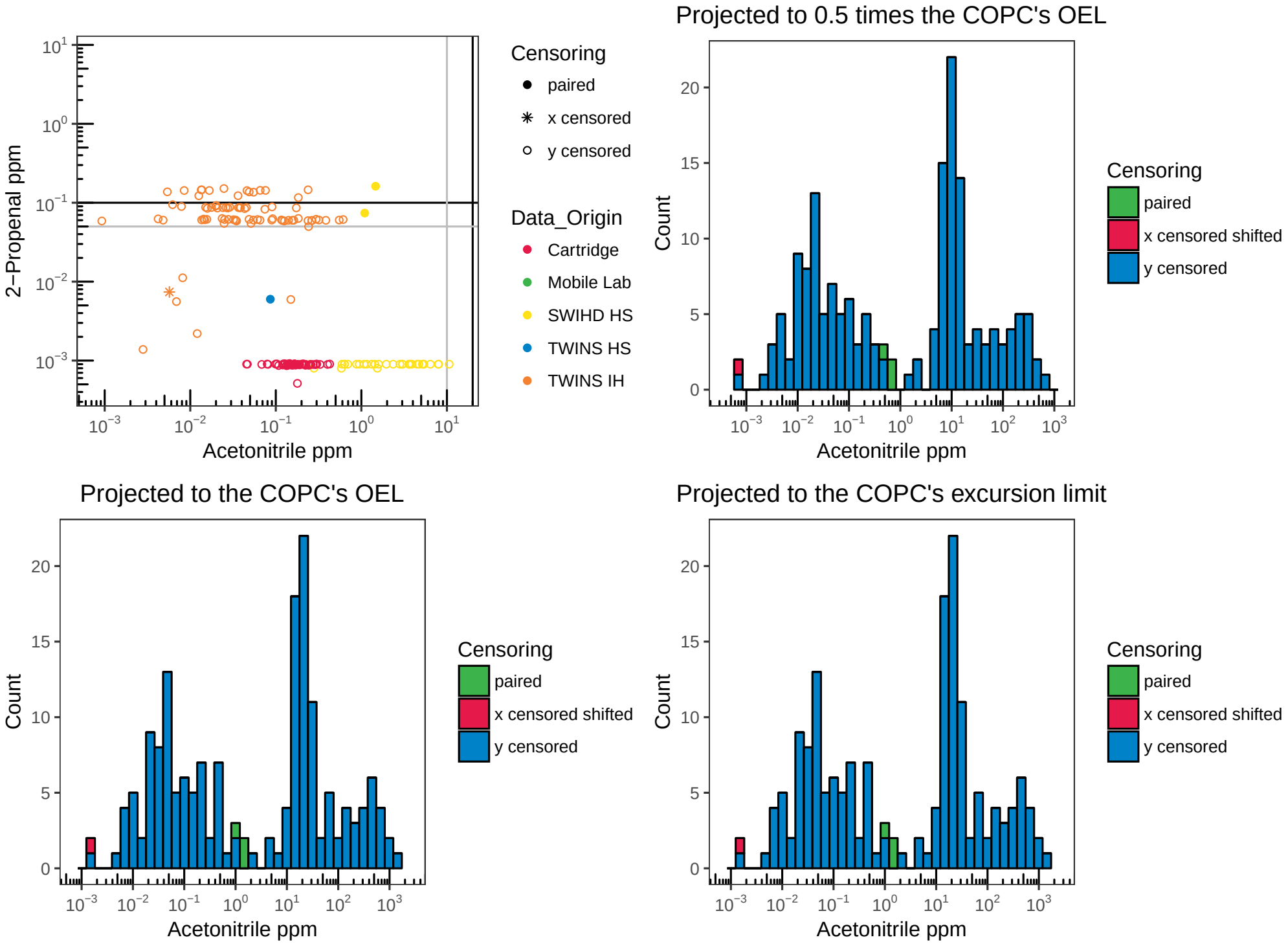


Figure C.1632: 2-Propenal vs Acetonitrile

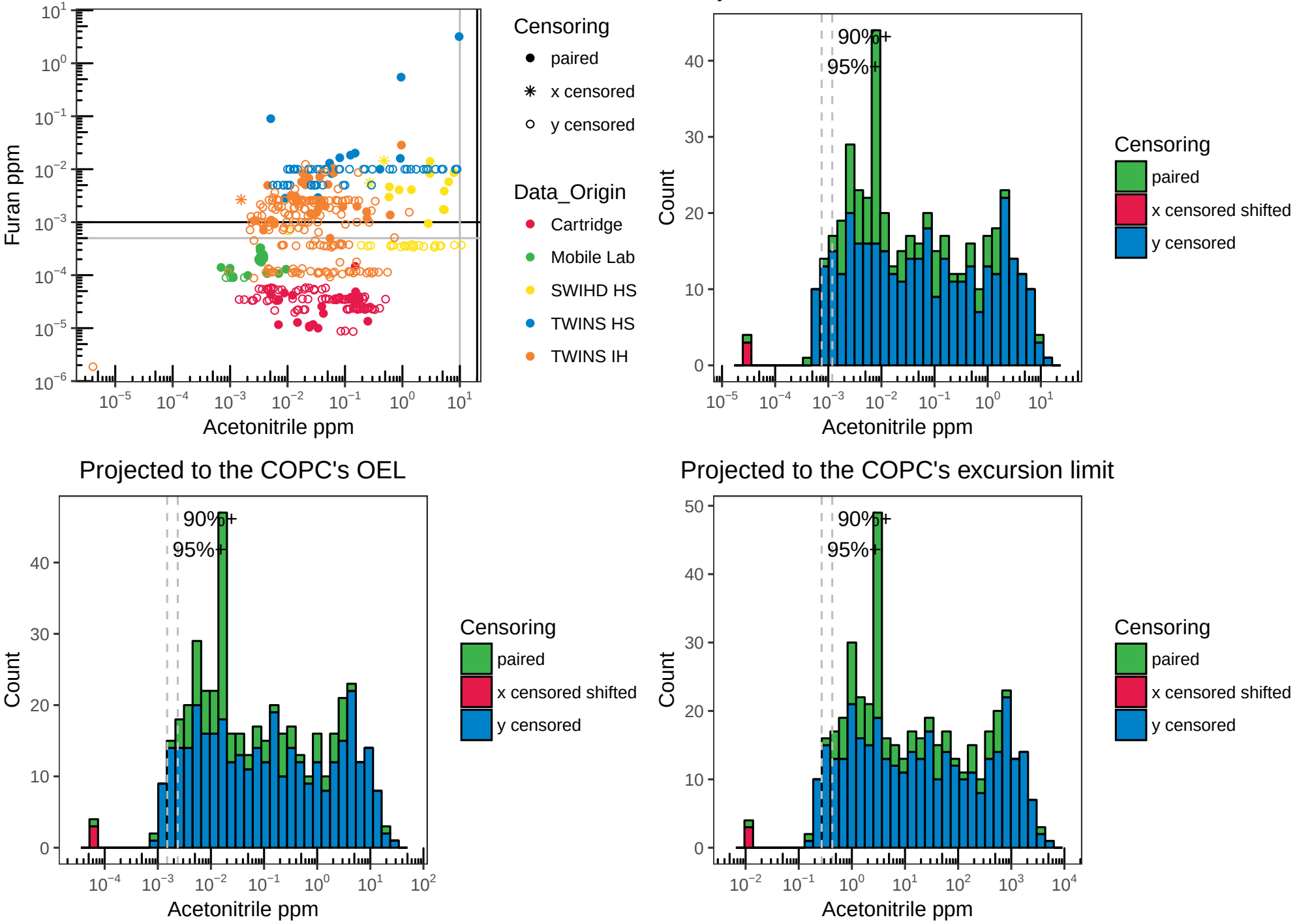


Figure C.1633: Furan vs Acetonitrile

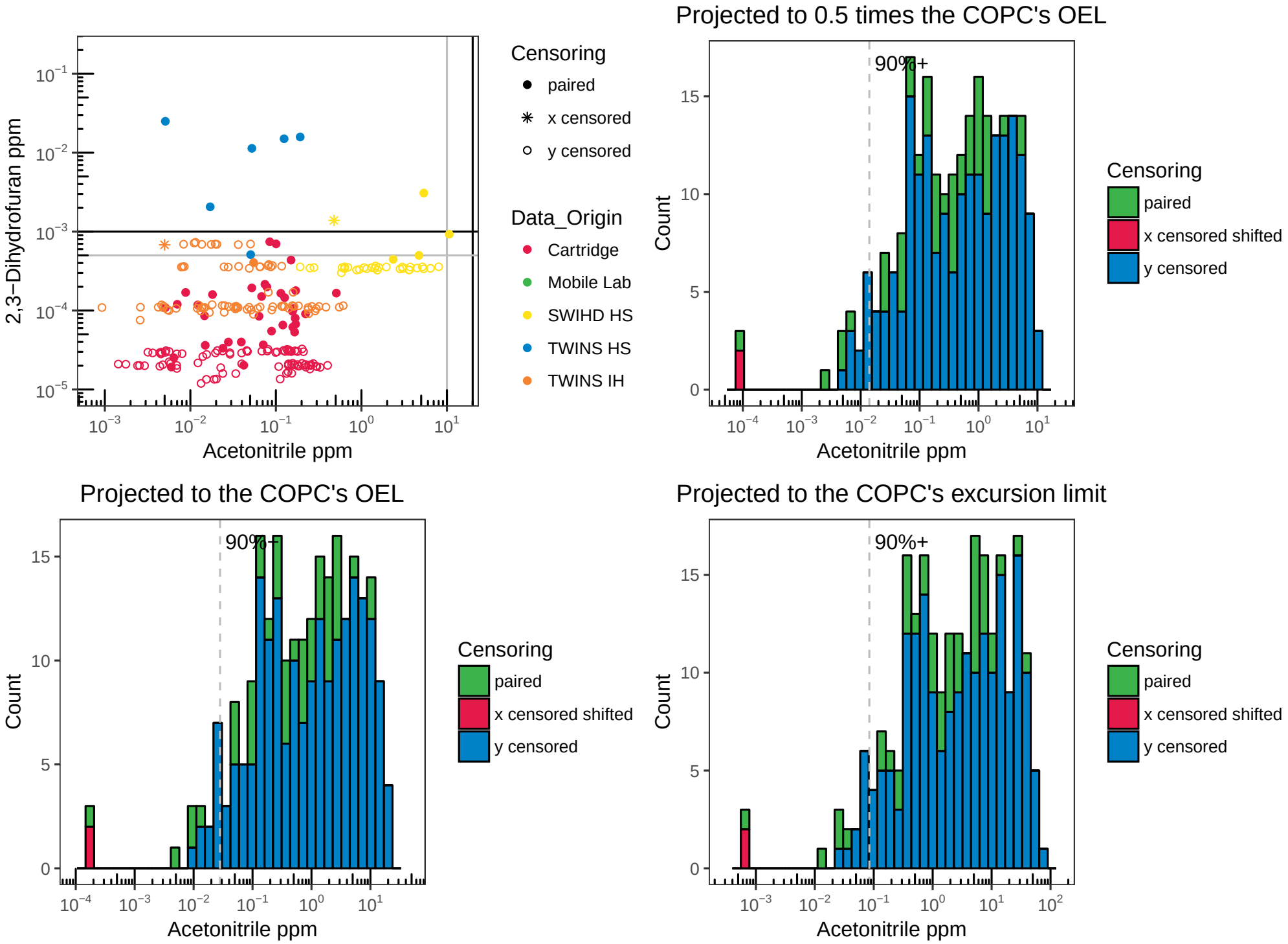


Figure C.1634: 2,3-Dihydrofuran vs Acetonitrile

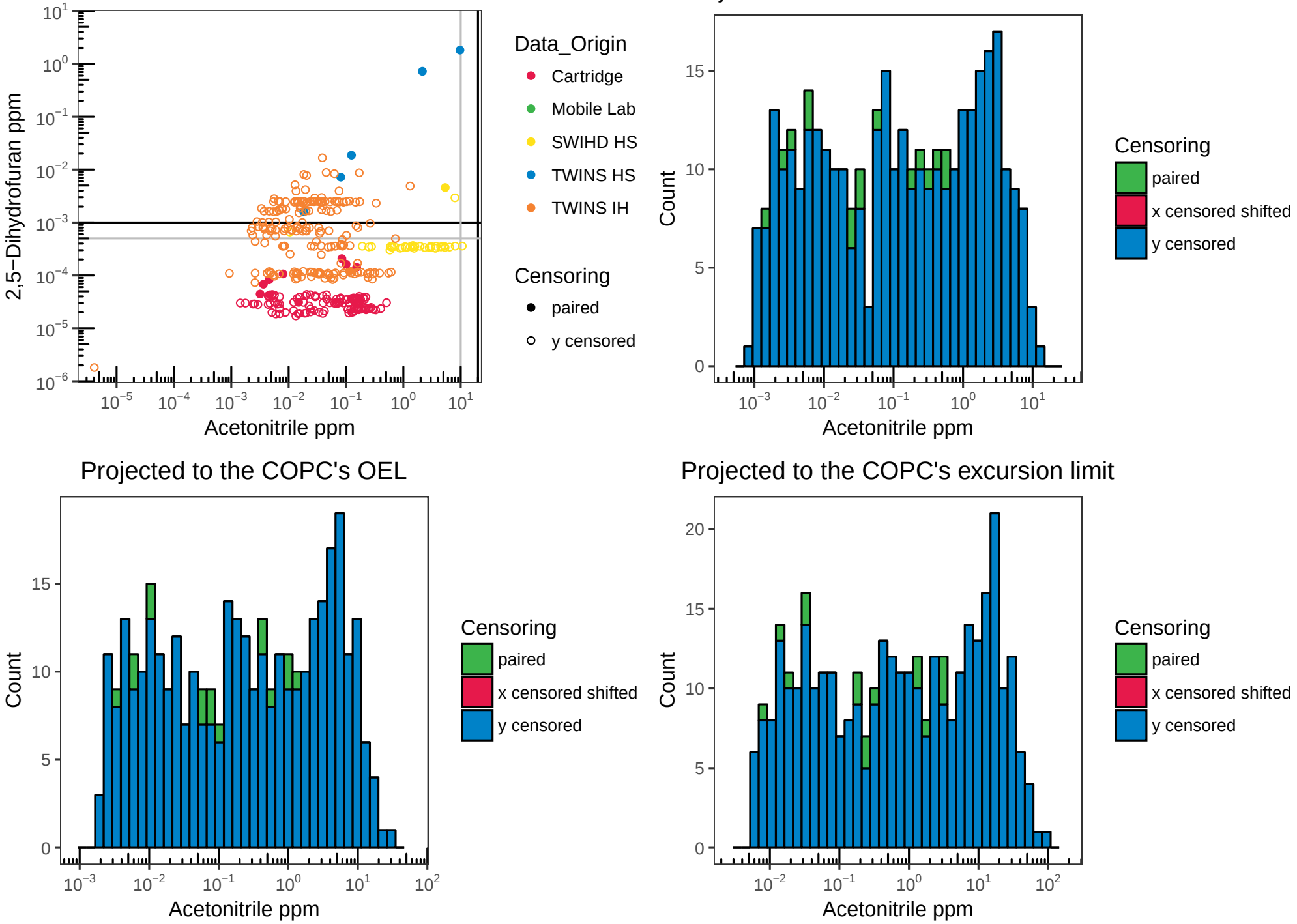


Figure C.1635: 2,5-Dihydrofuran vs Acetonitrile

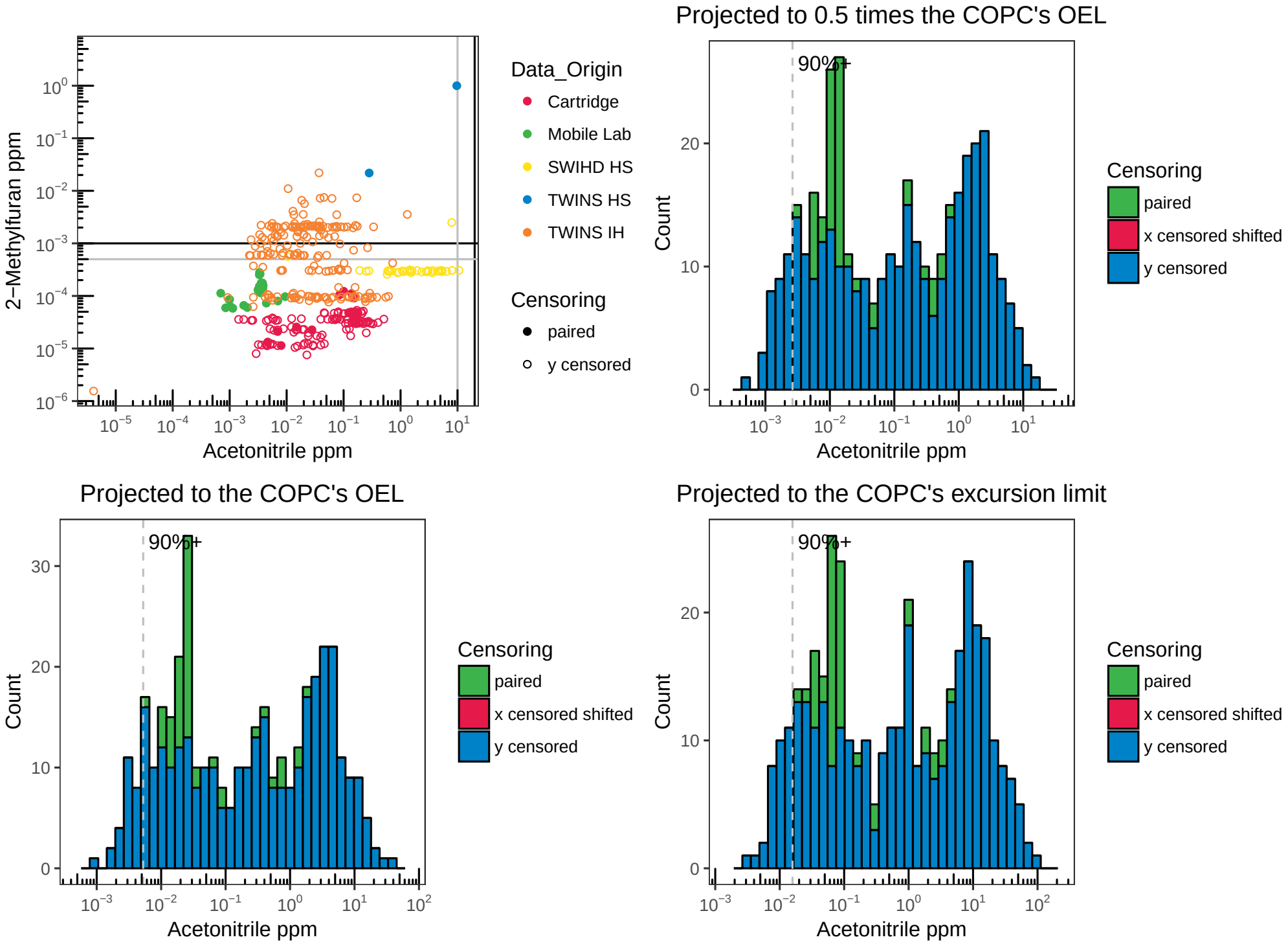


Figure C.1636: 2-Methylfuran vs Acetonitrile

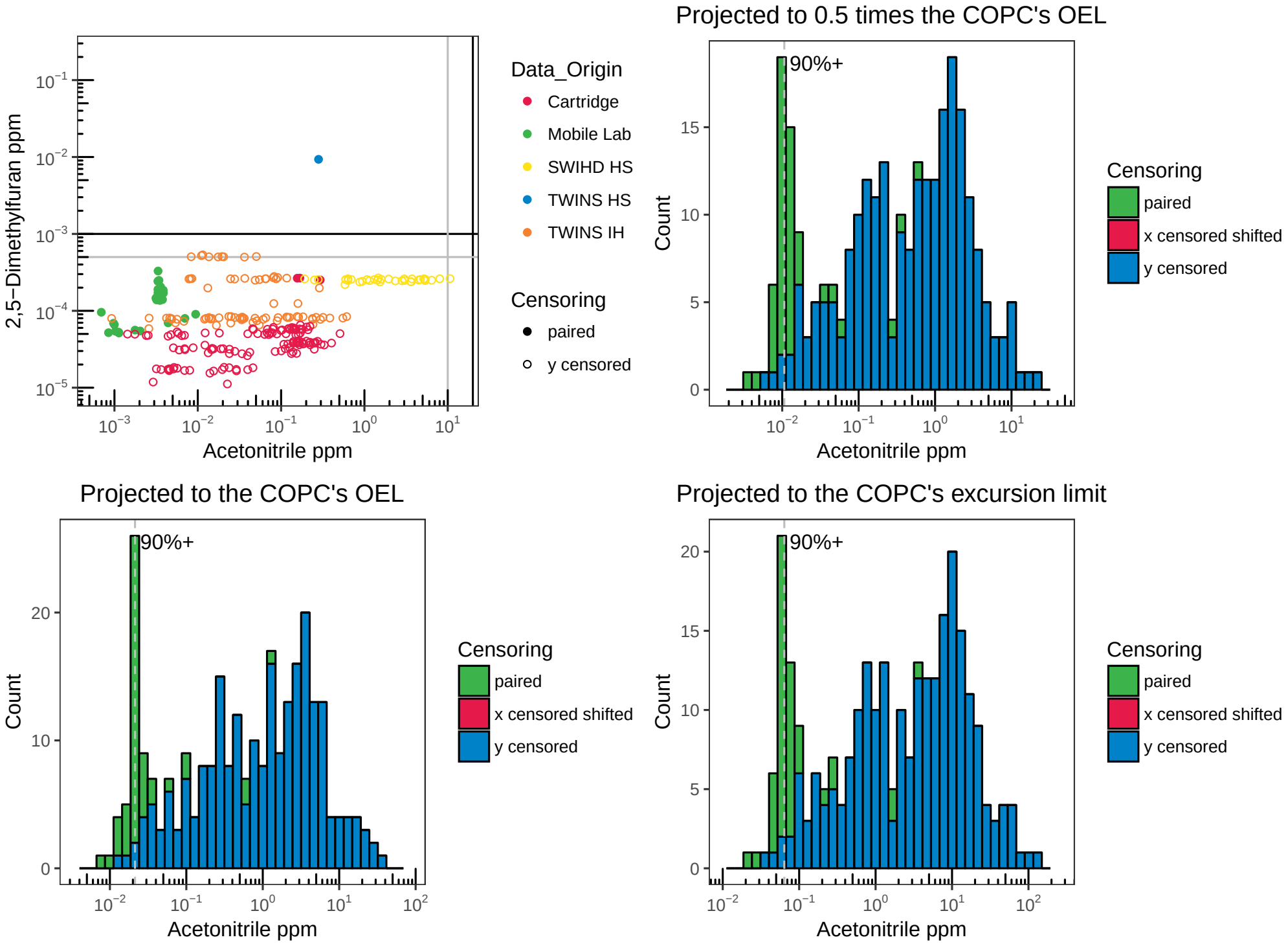


Figure C.1637: 2,5-Dimethylfuran vs Acetonitrile

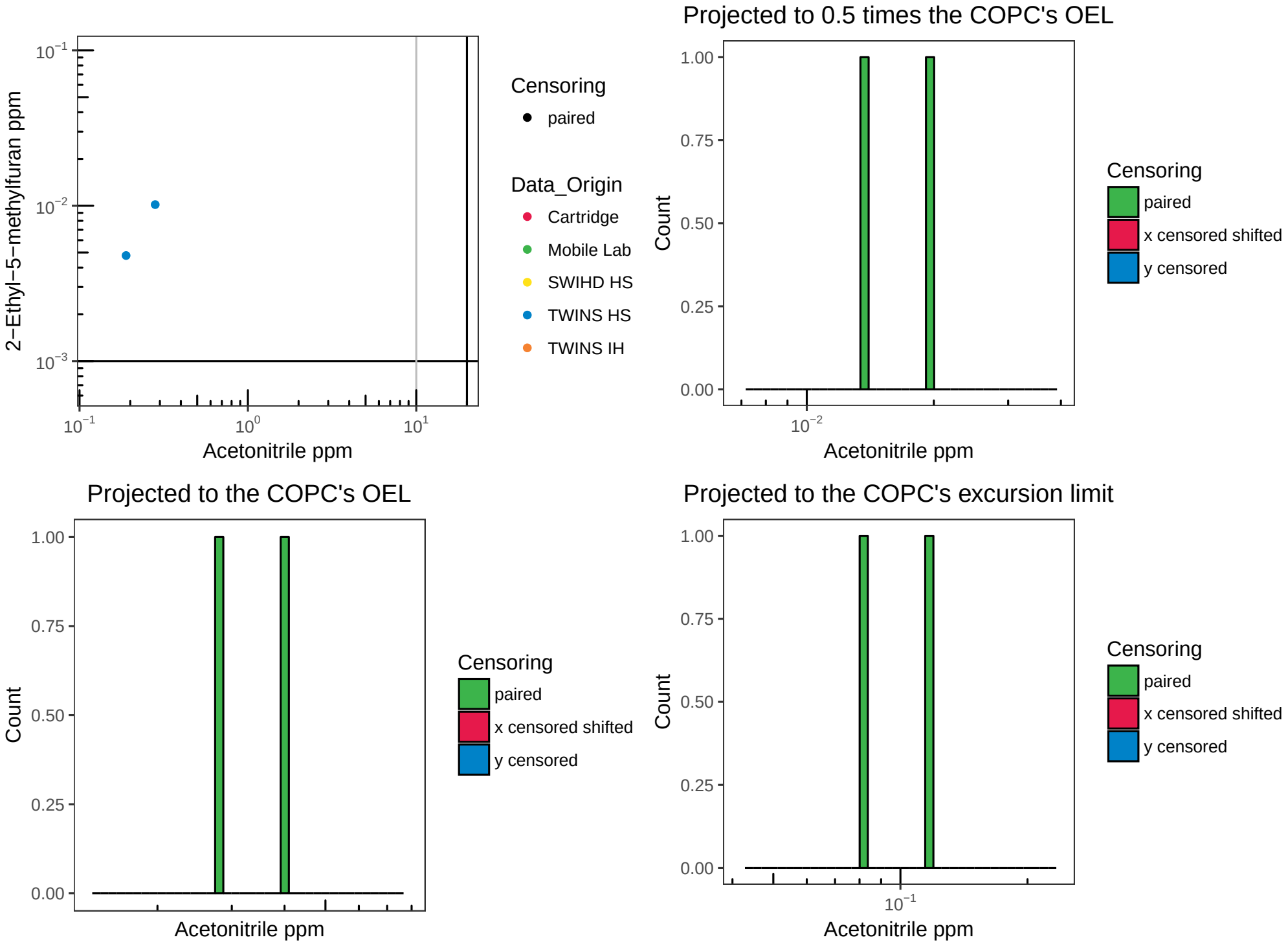


Figure C.1638: 2-Ethyl-5-methylfuran vs Acetonitrile

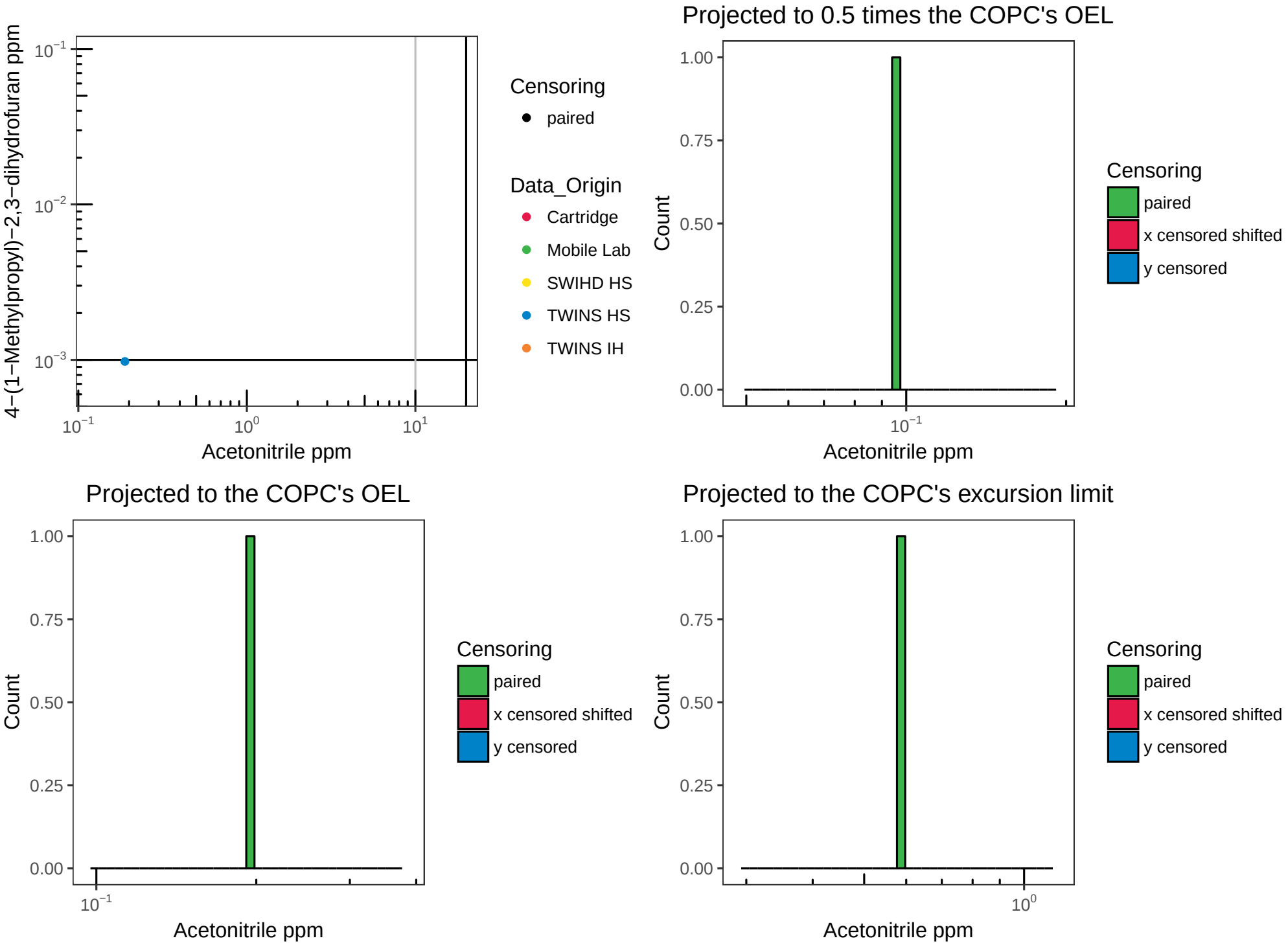


Figure C.1639: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Acetonitrile

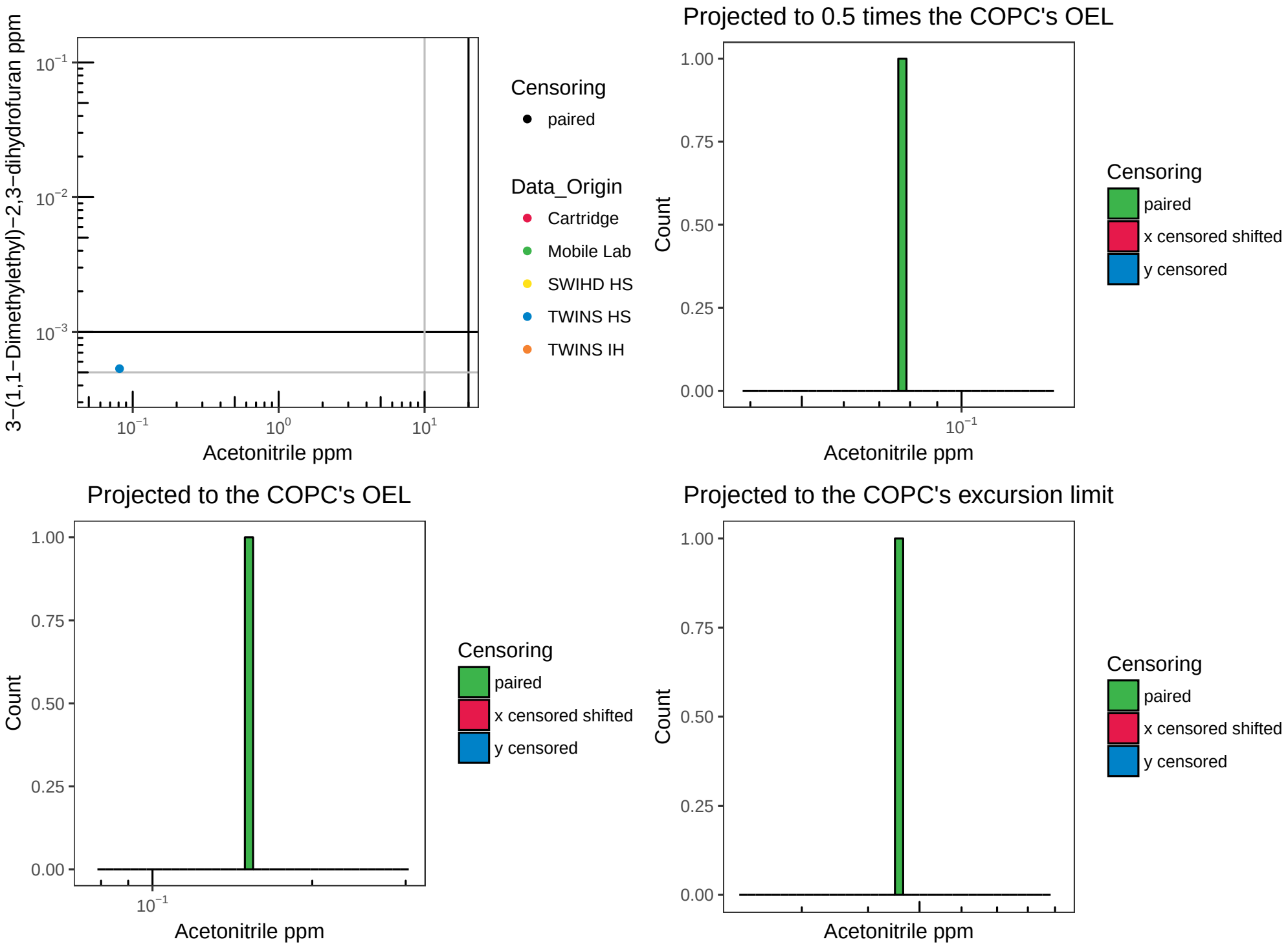


Figure C.1640: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Acetonitrile

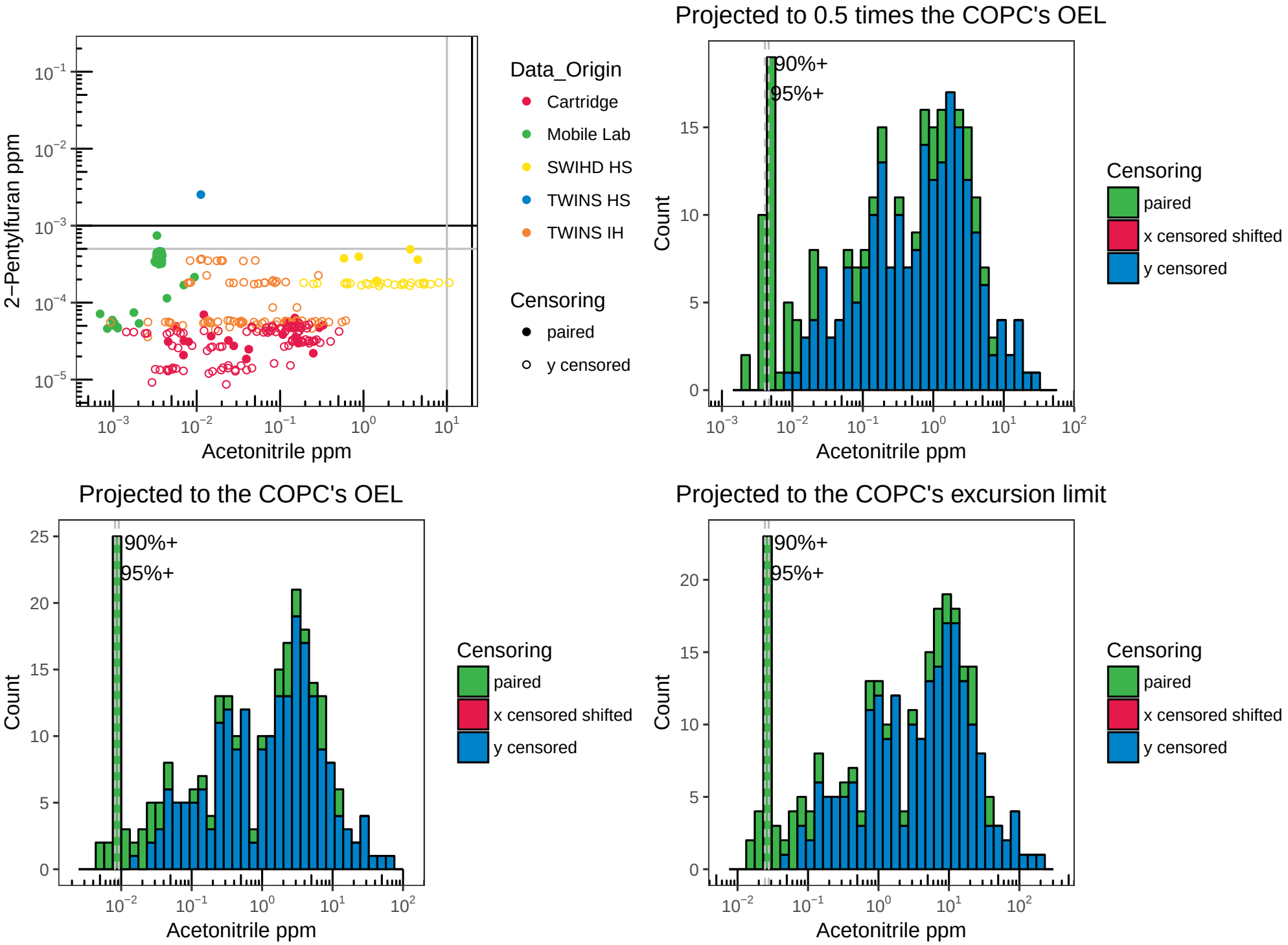


Figure C.1641: 2-Pentylfuran vs Acetonitrile

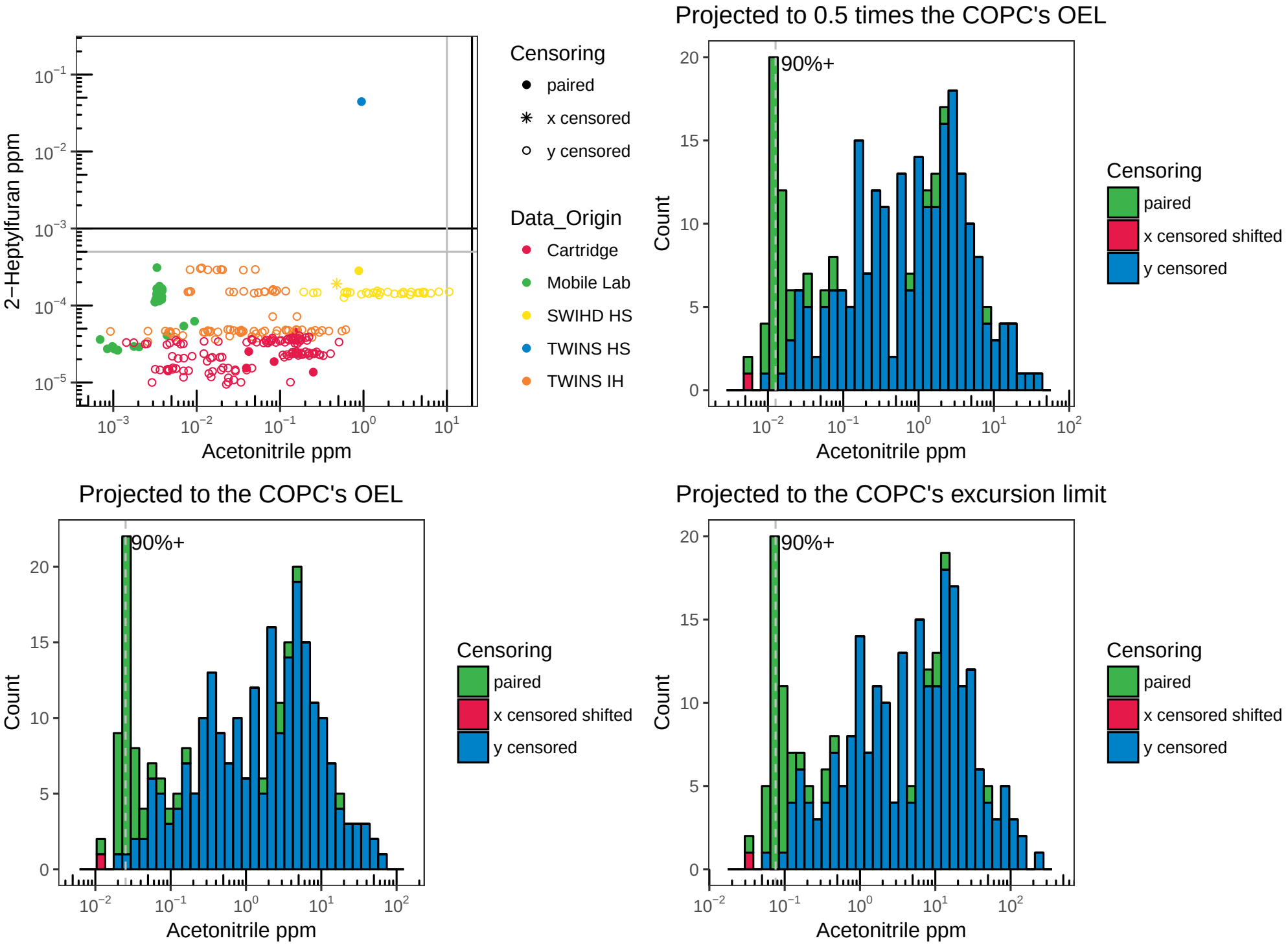


Figure C.1642: 2-Heptylfuran vs Acetonitrile

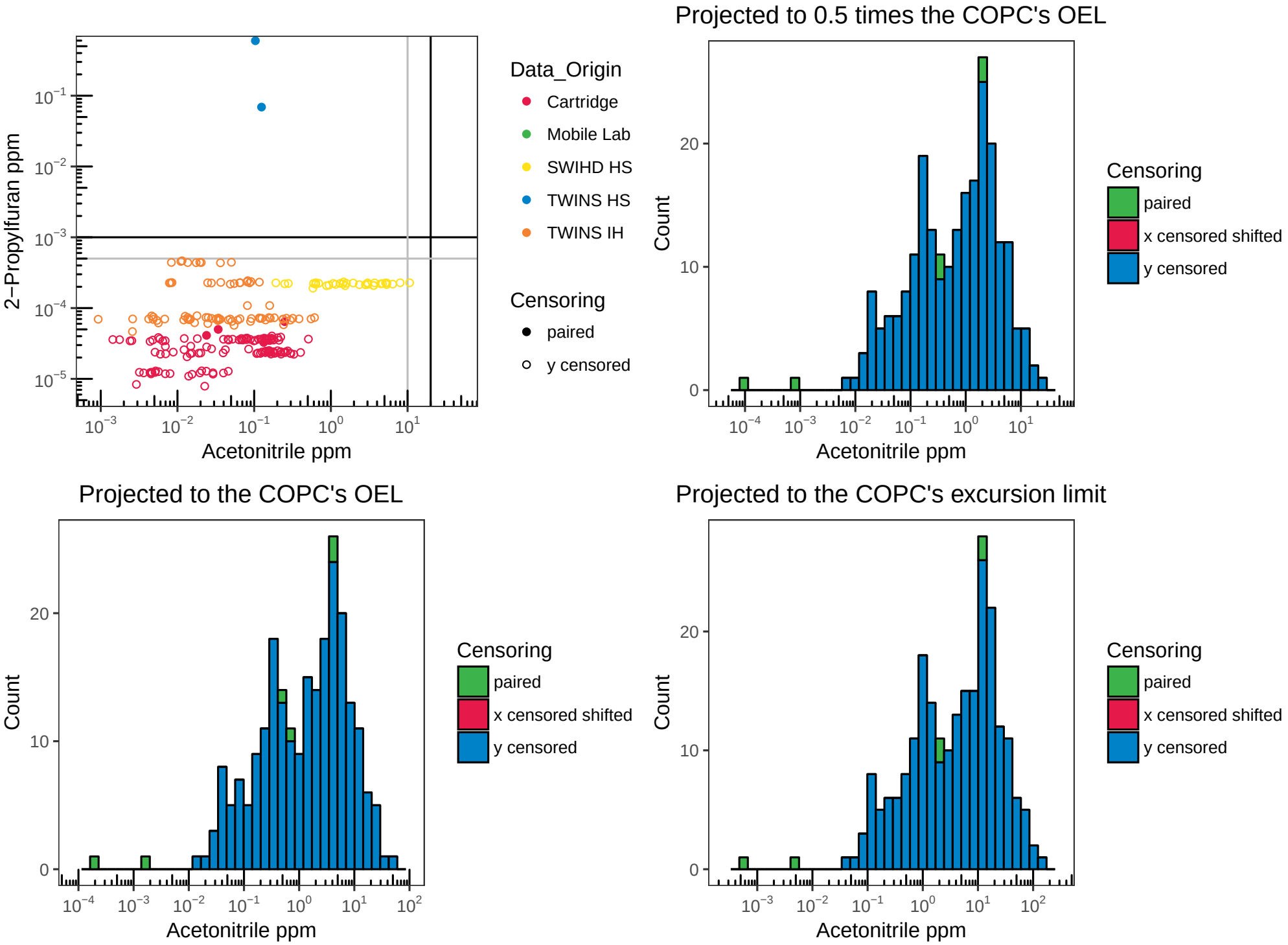


Figure C.1643: 2-Propylfuran vs Acetonitrile

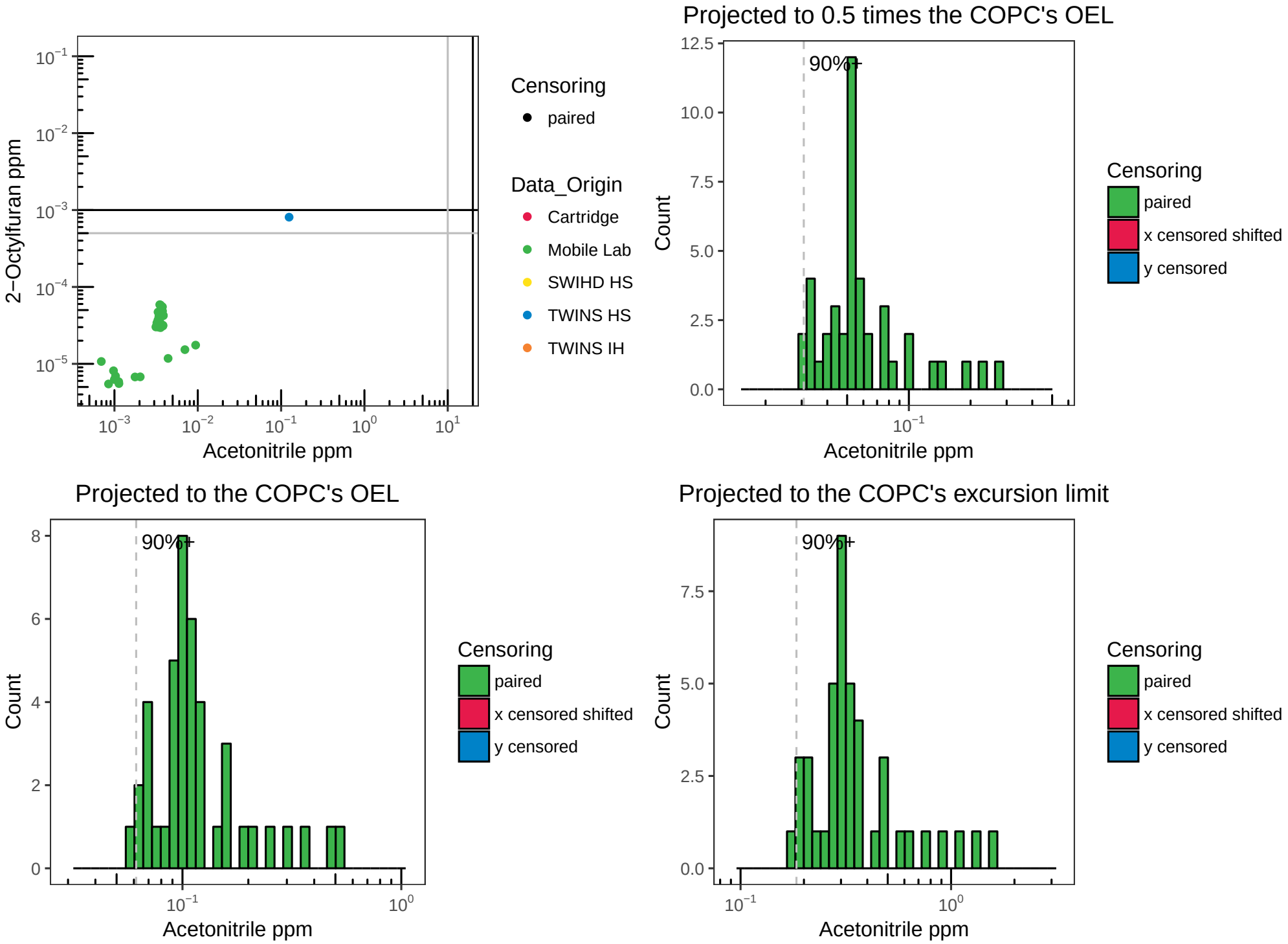


Figure C.1644: 2-Octylfuran vs Acetonitrile

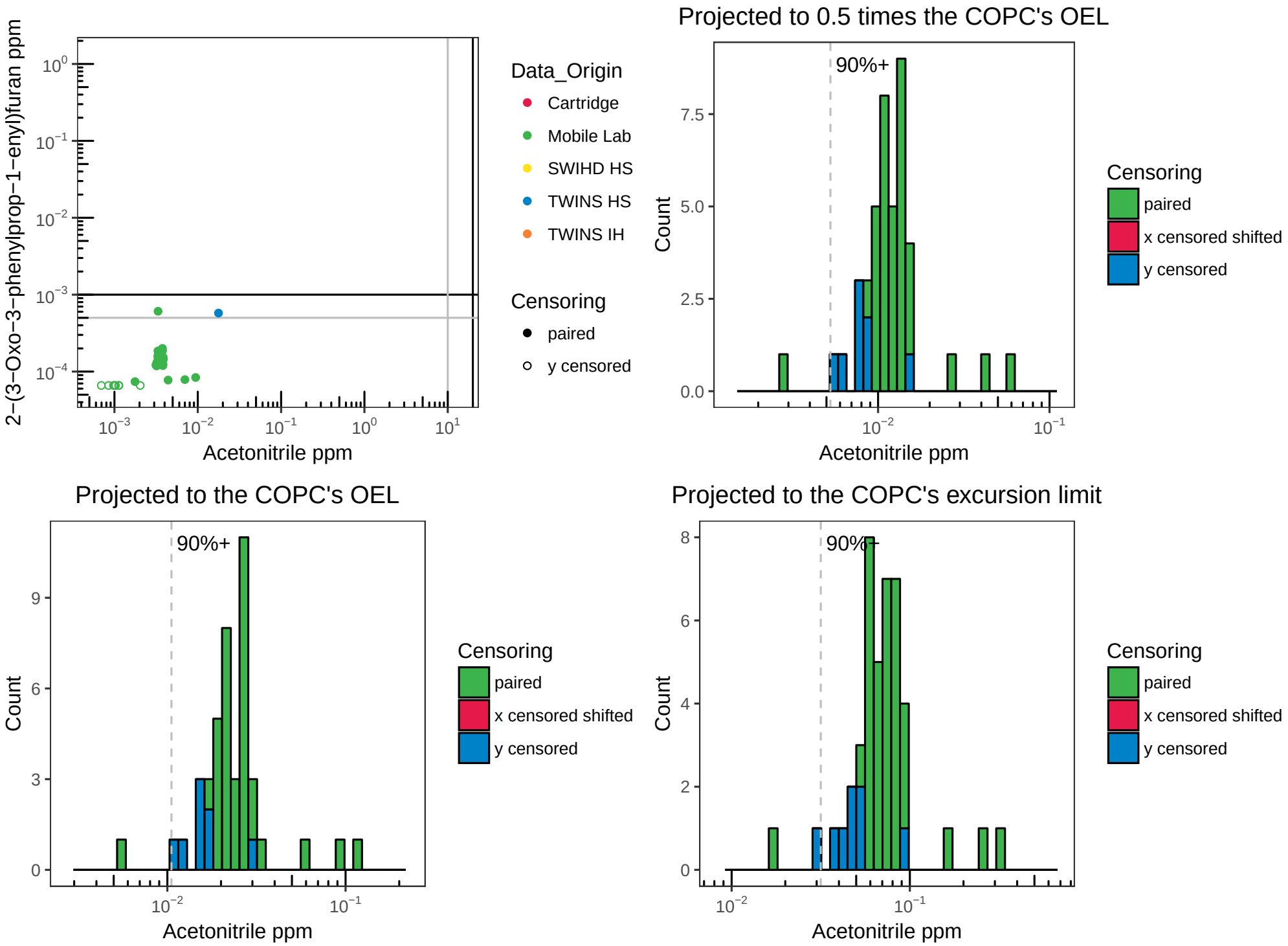


Figure C.1645: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Acetonitrile

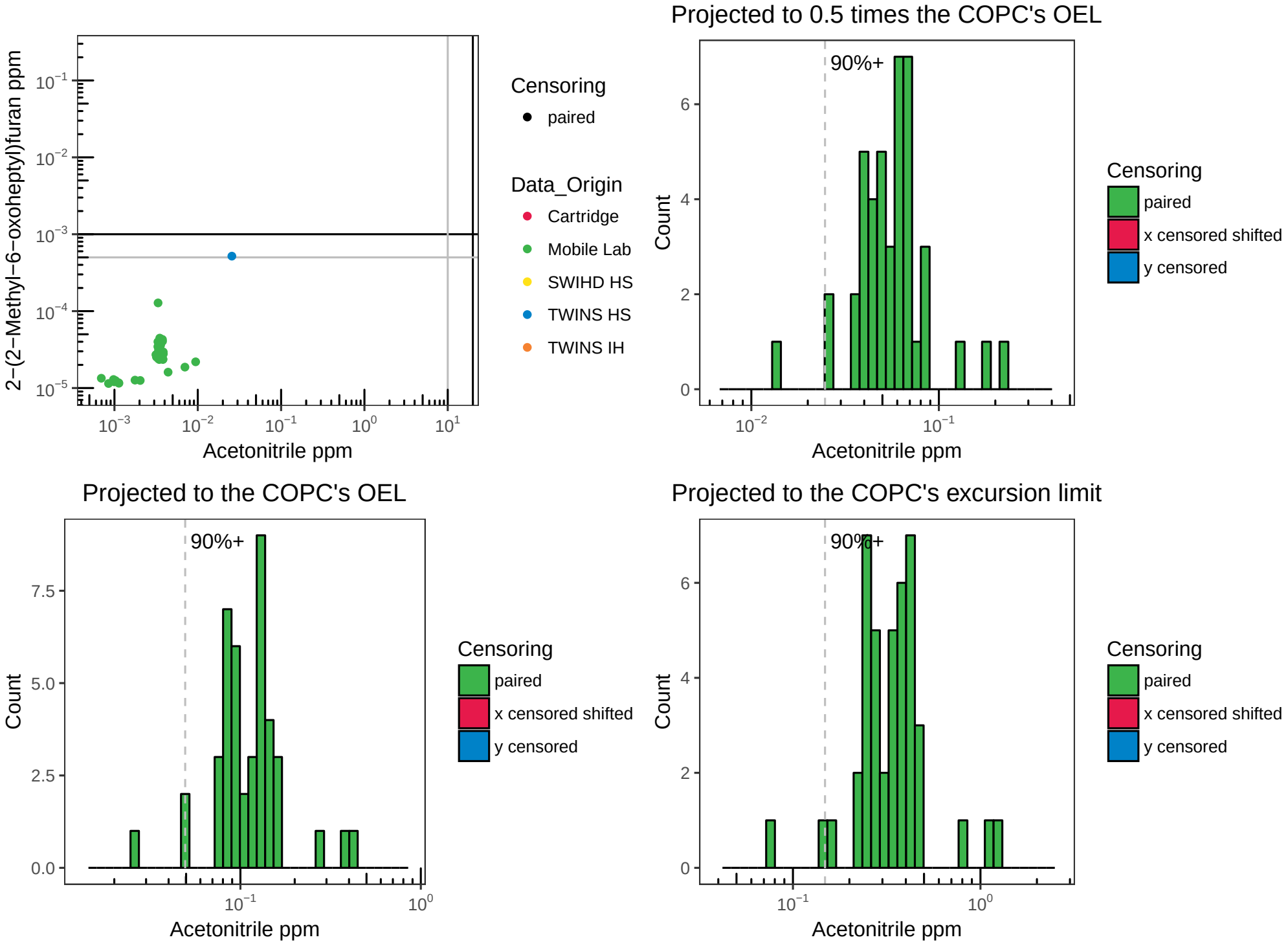


Figure C.1646: 2-(2-Methyl-6-oxoheptyl)furan vs Acetonitrile

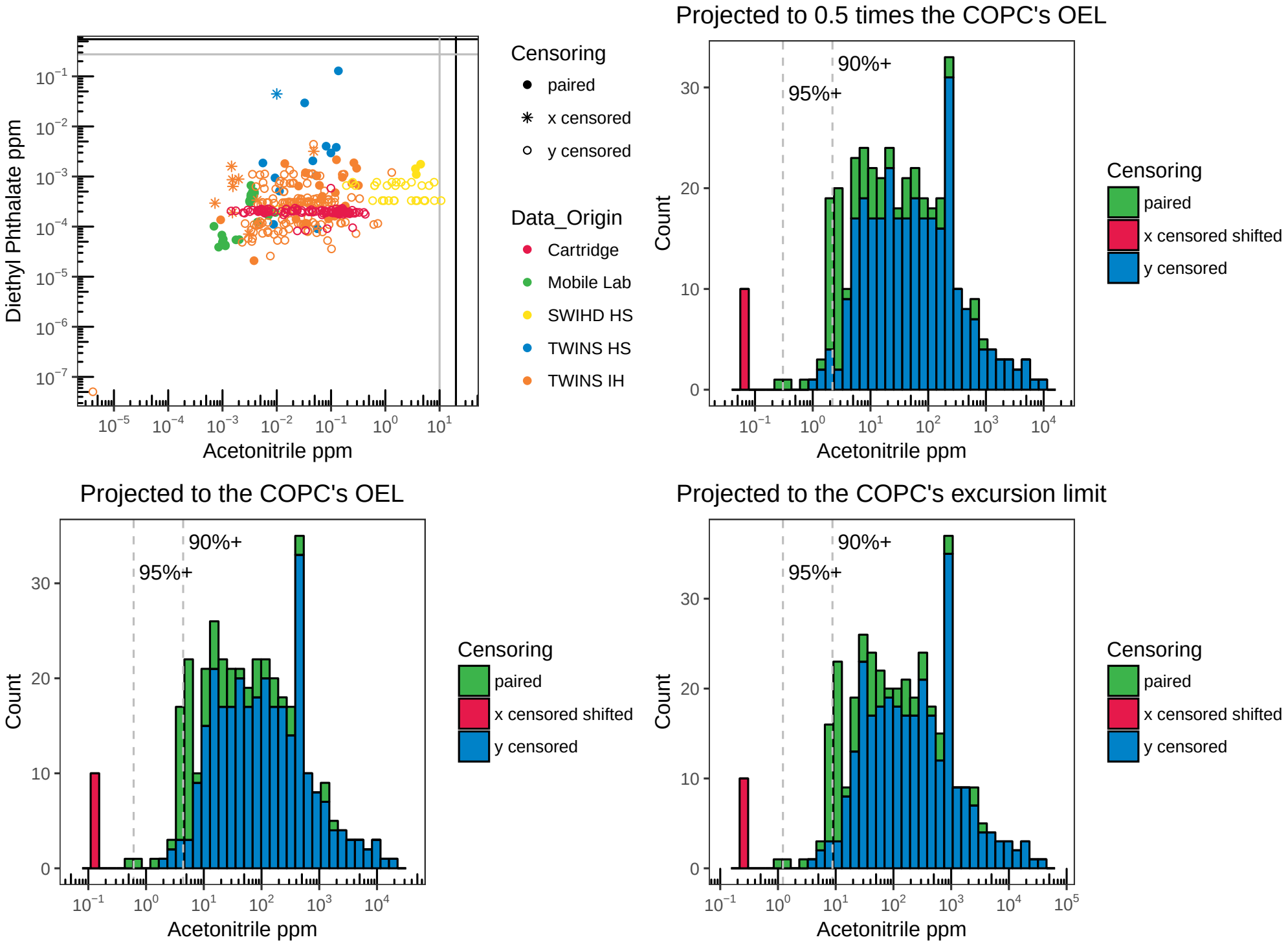


Figure C.1647: Diethyl Phthalate vs Acetonitrile

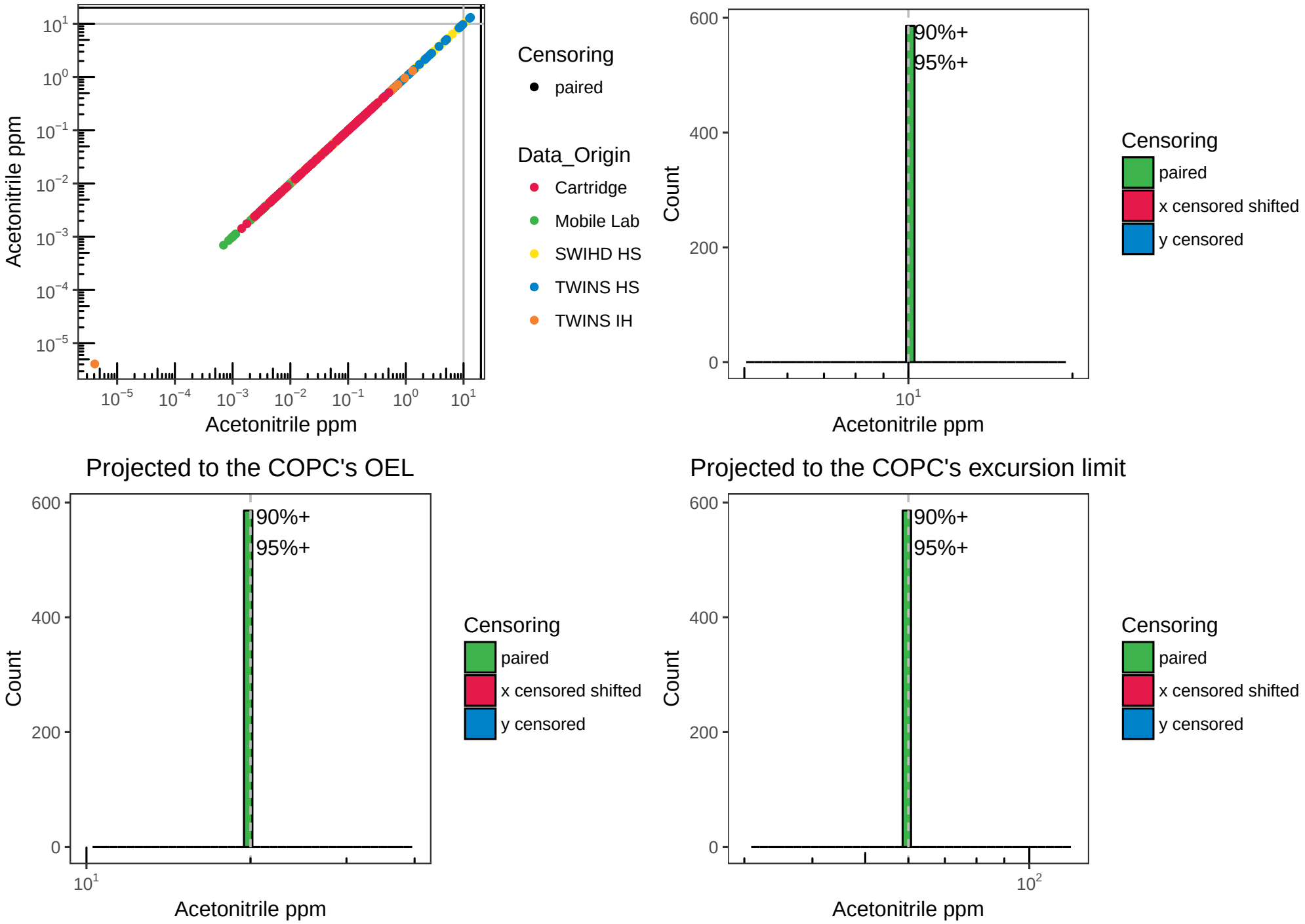


Figure C.1648: Acetonitrile vs Acetonitrile

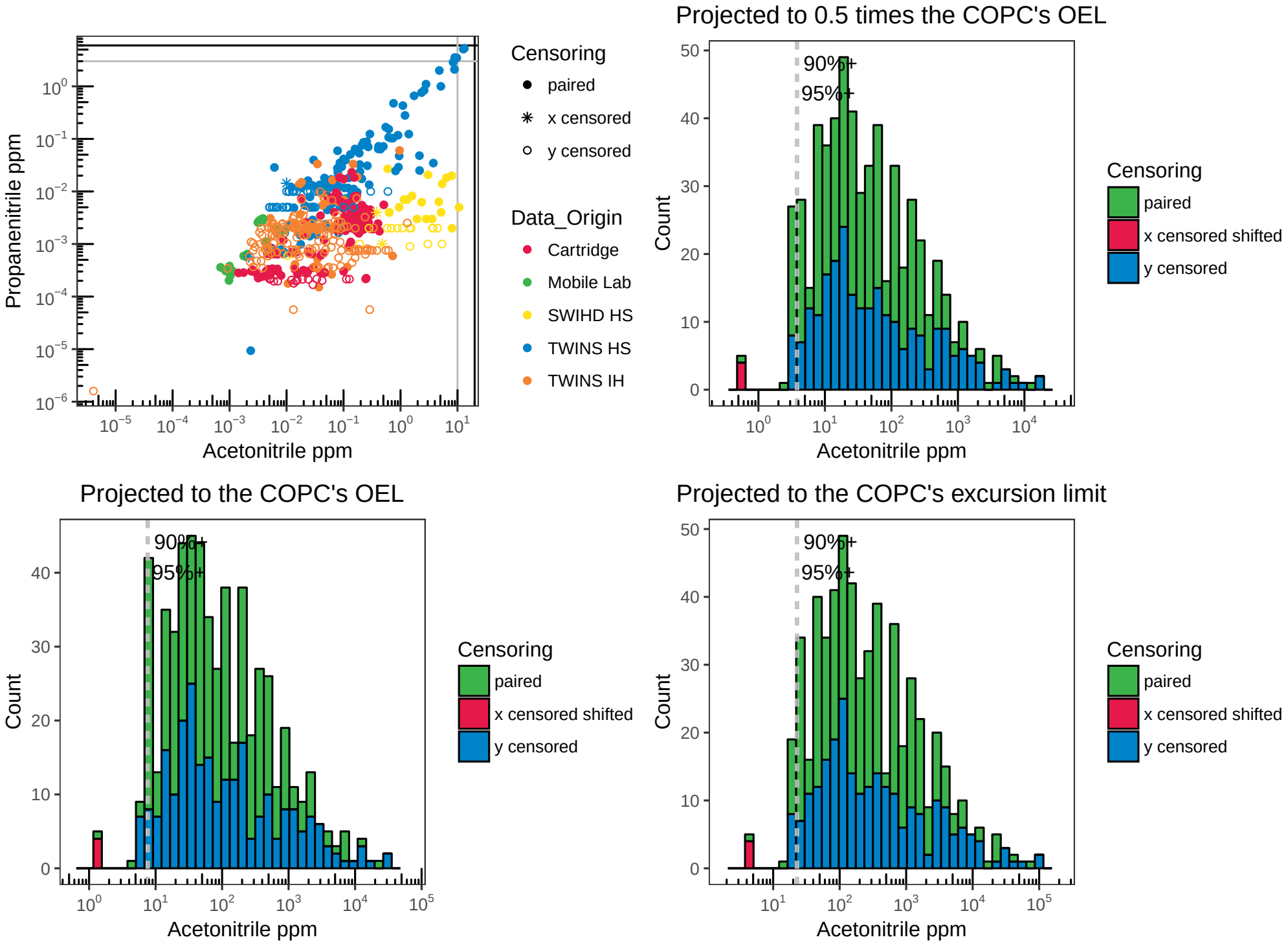


Figure C.1649: Propanenitrile vs Acetonitrile

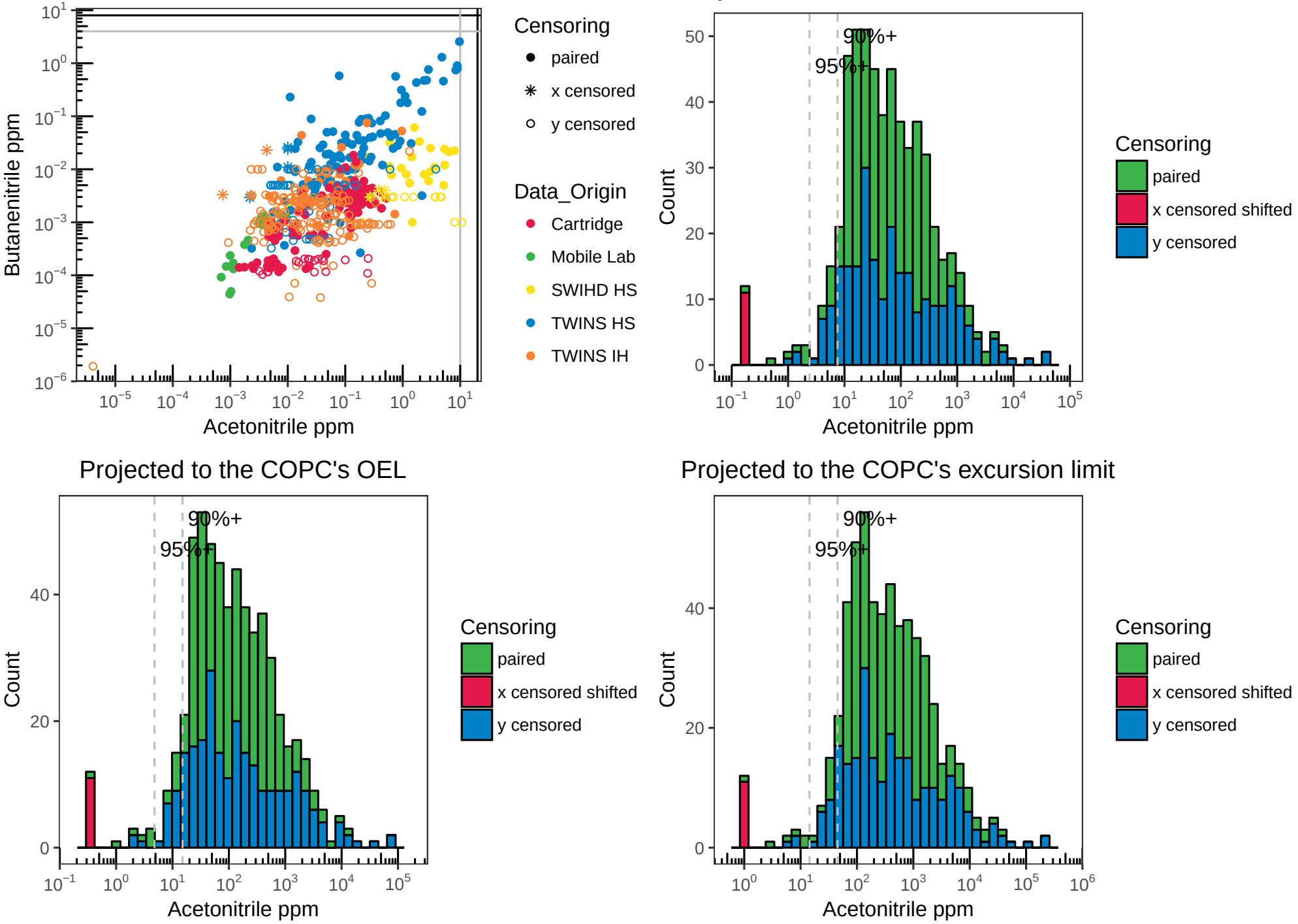


Figure C.1650: Butanenitrile vs Acetonitrile

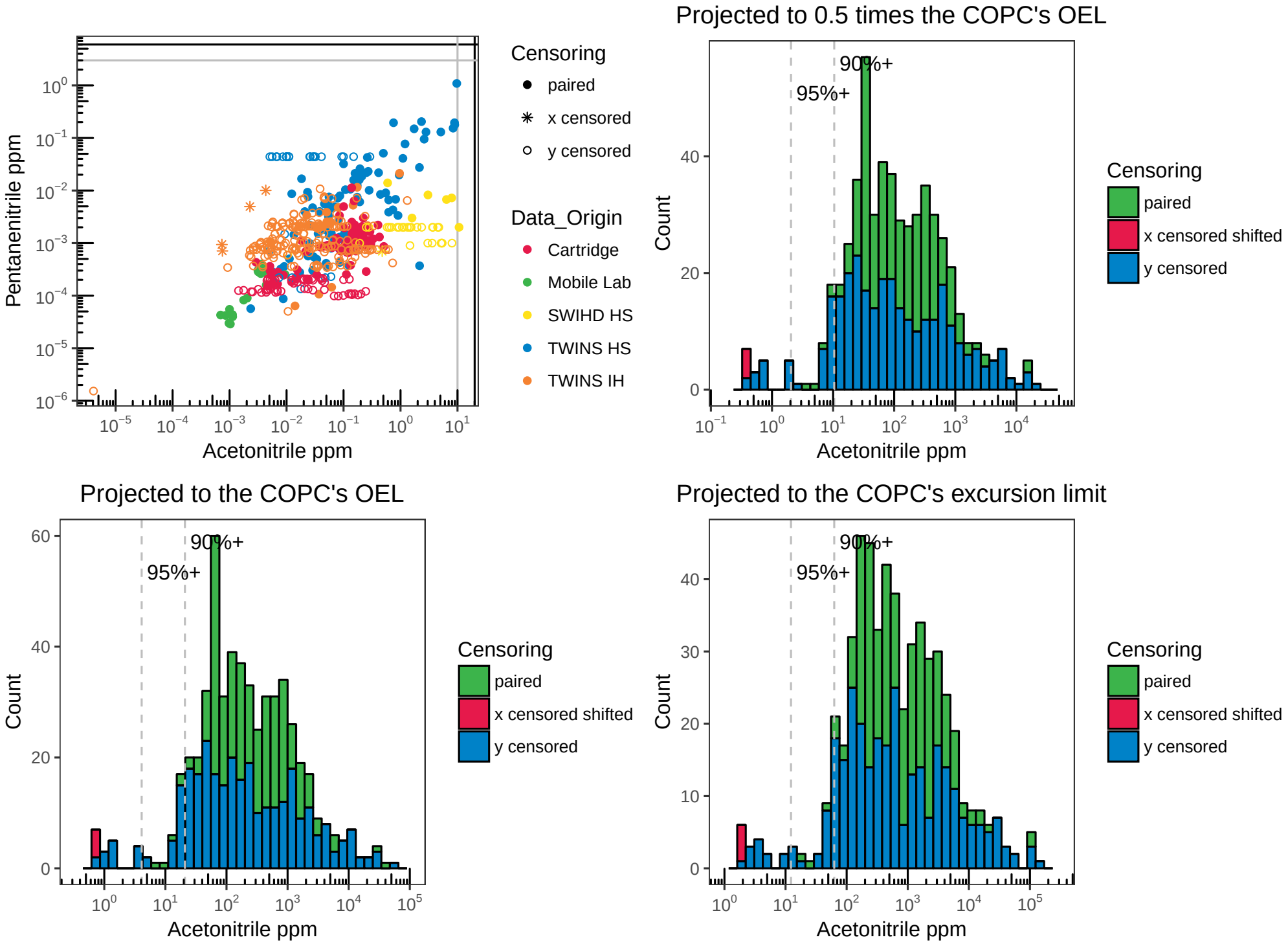


Figure C.1651: Pentanenitrile vs Acetonitrile

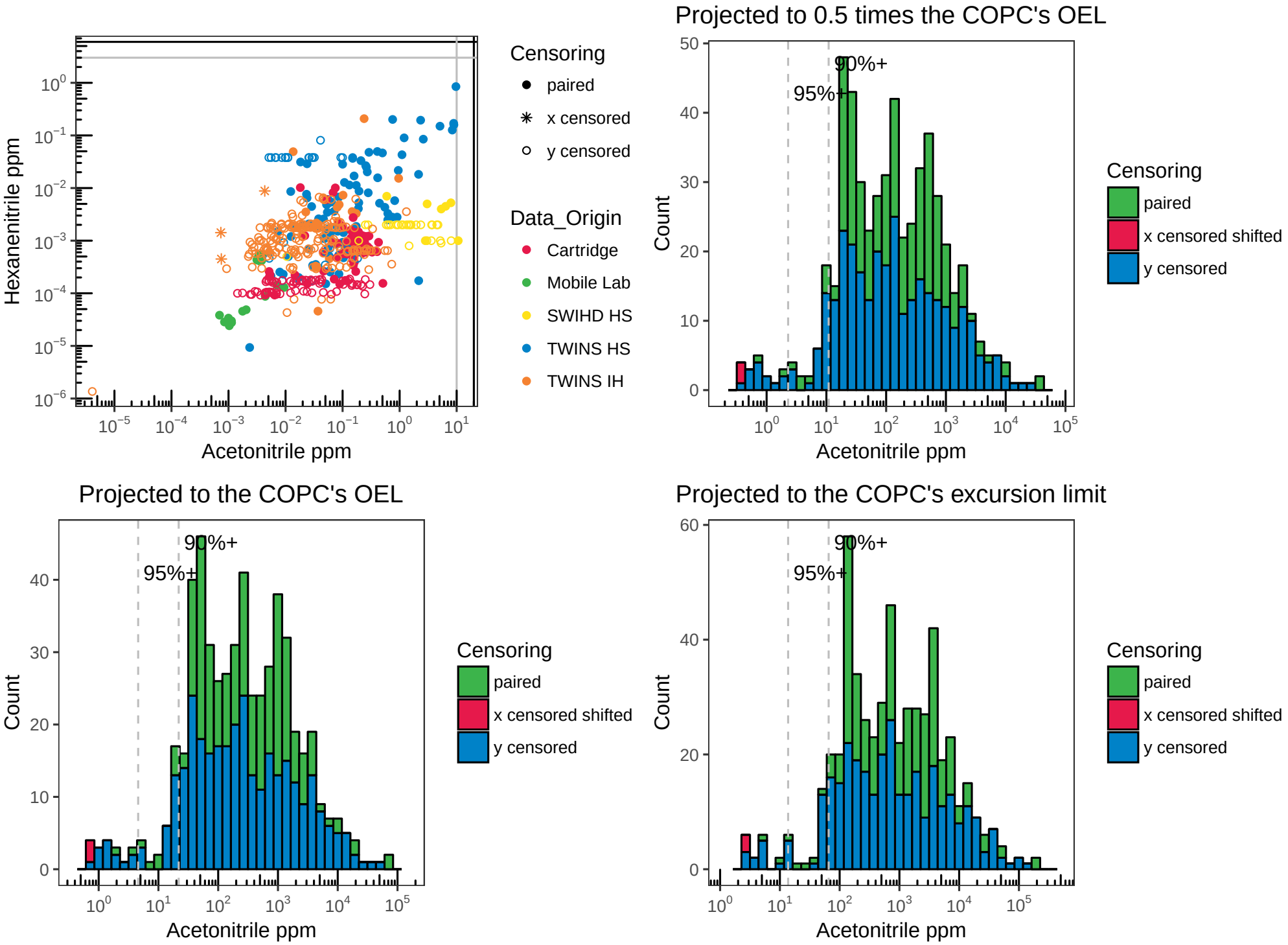


Figure C.1652: Hexanenitrile vs Acetonitrile

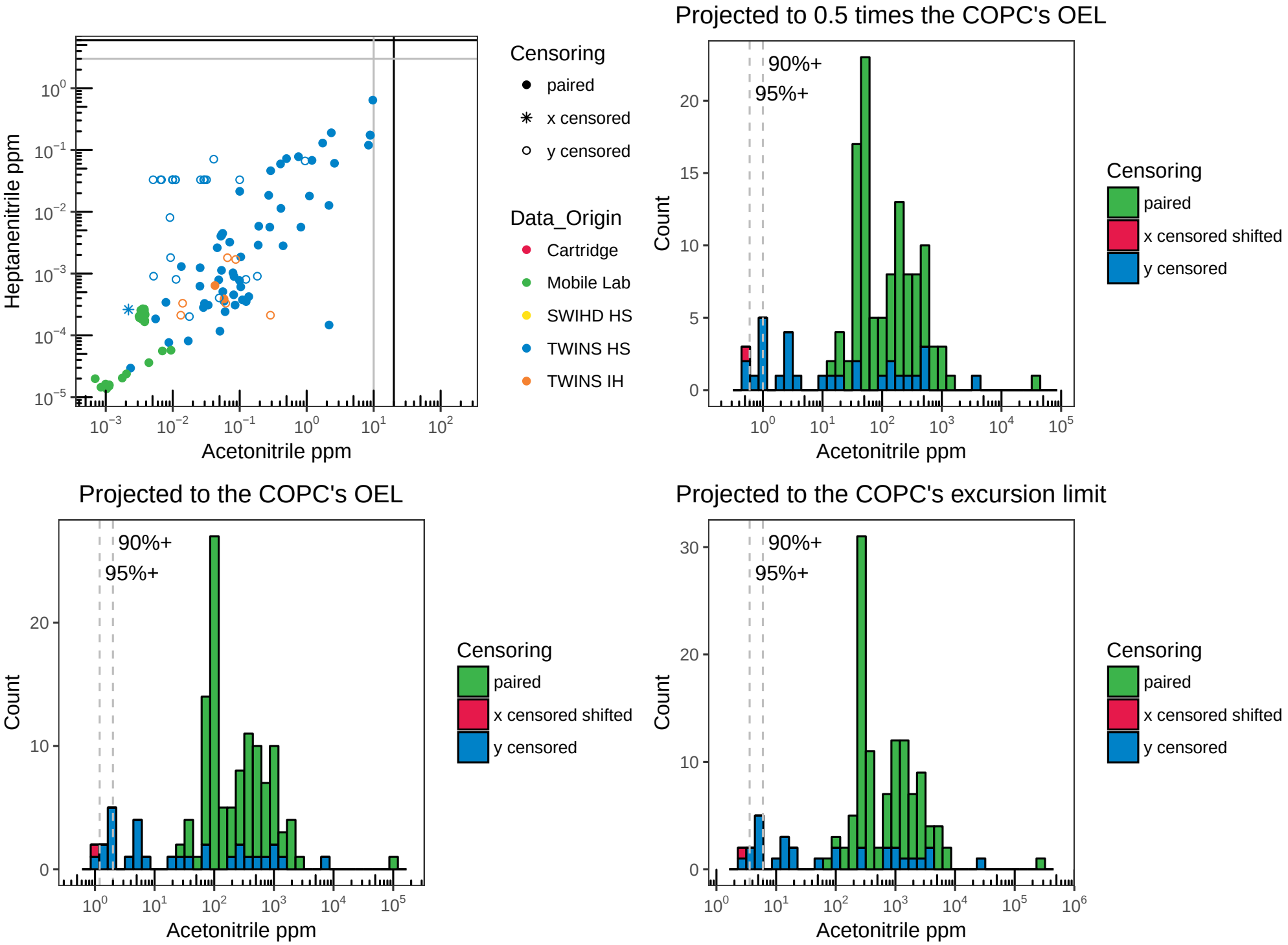


Figure C.1653: Heptanenitrile vs Acetonitrile

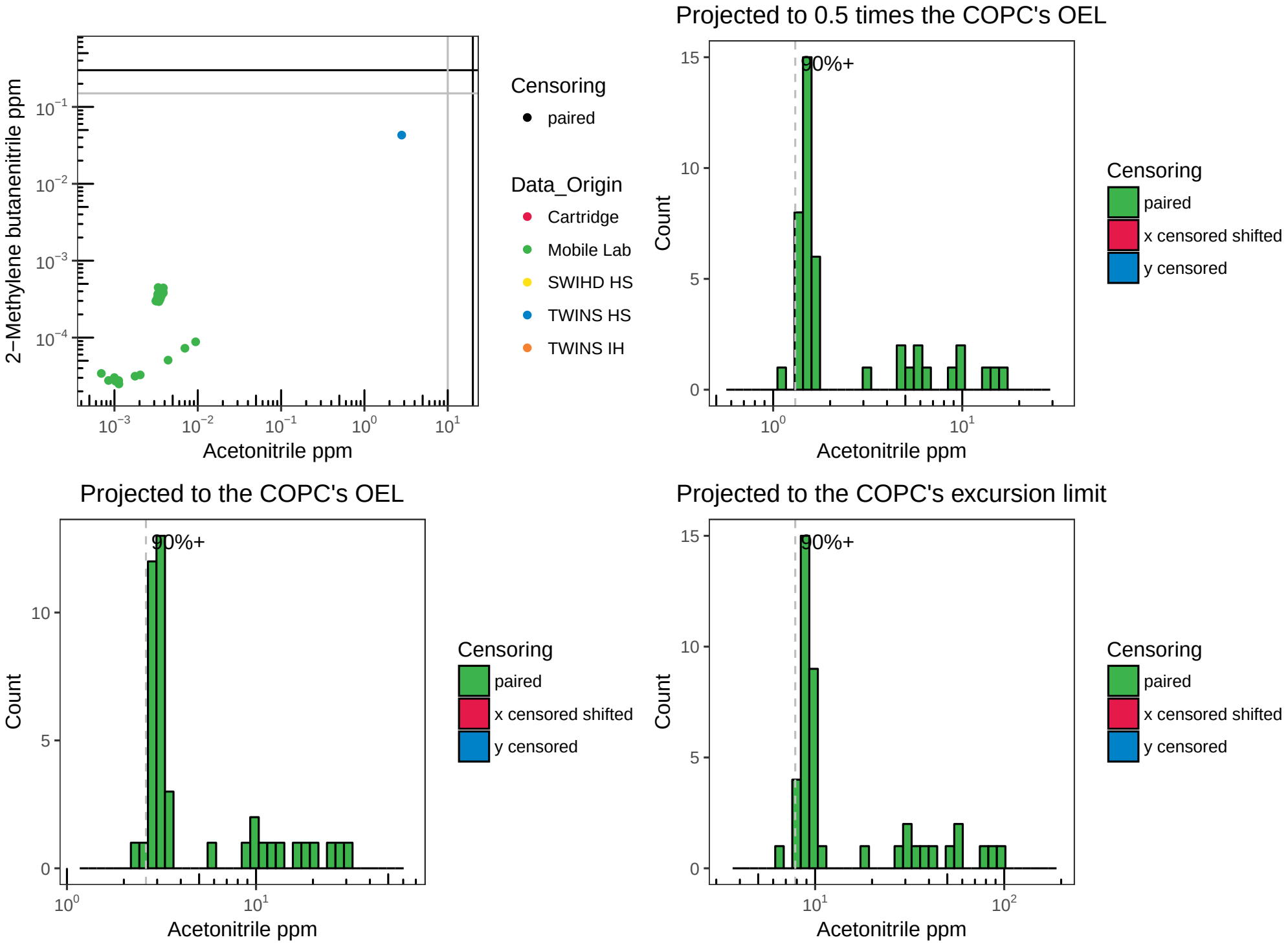


Figure C.1654: 2-Methylene butanenitrile vs Acetonitrile

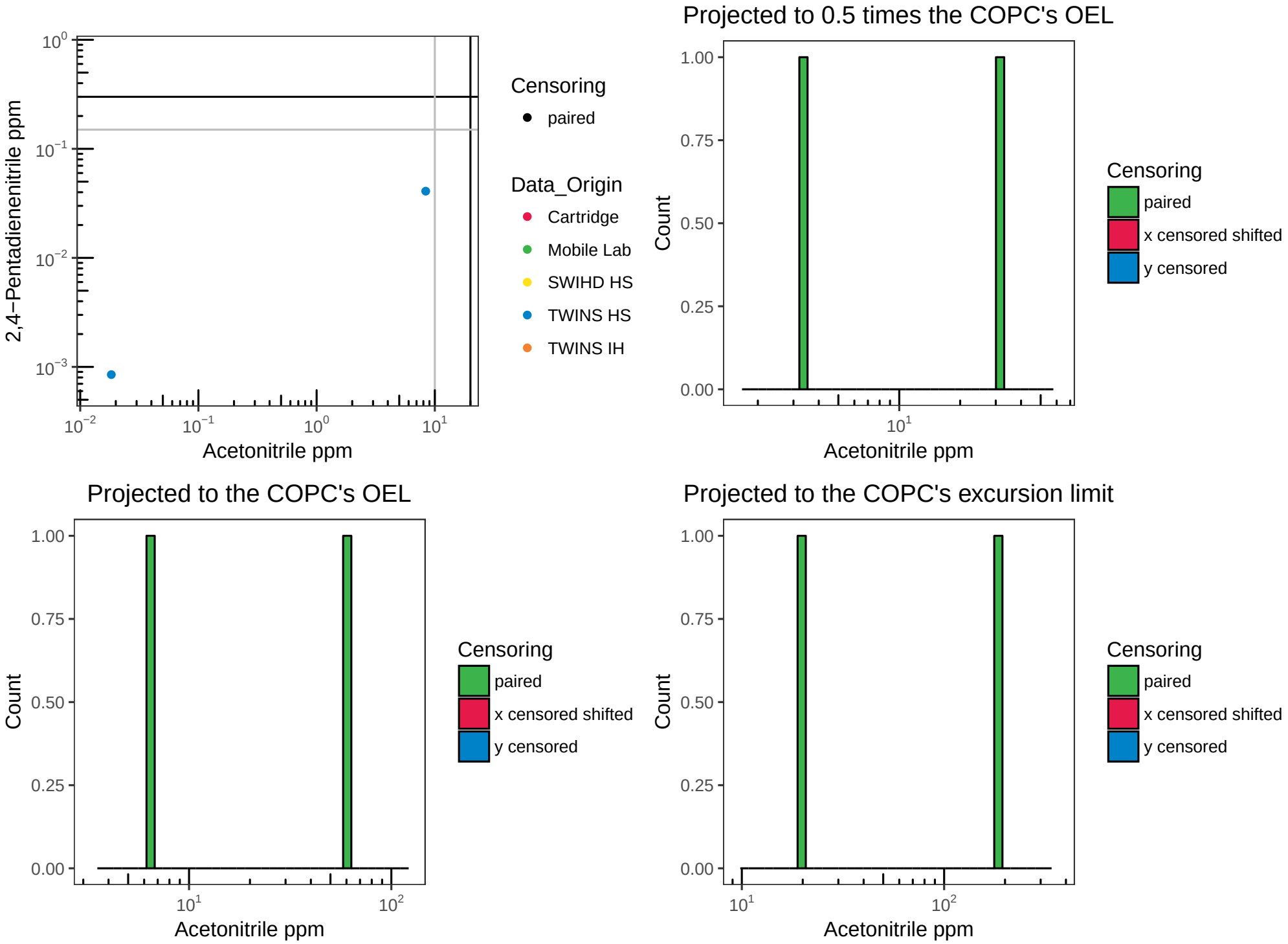


Figure C.1655: 2,4-Pentadienenitrile vs Acetonitrile

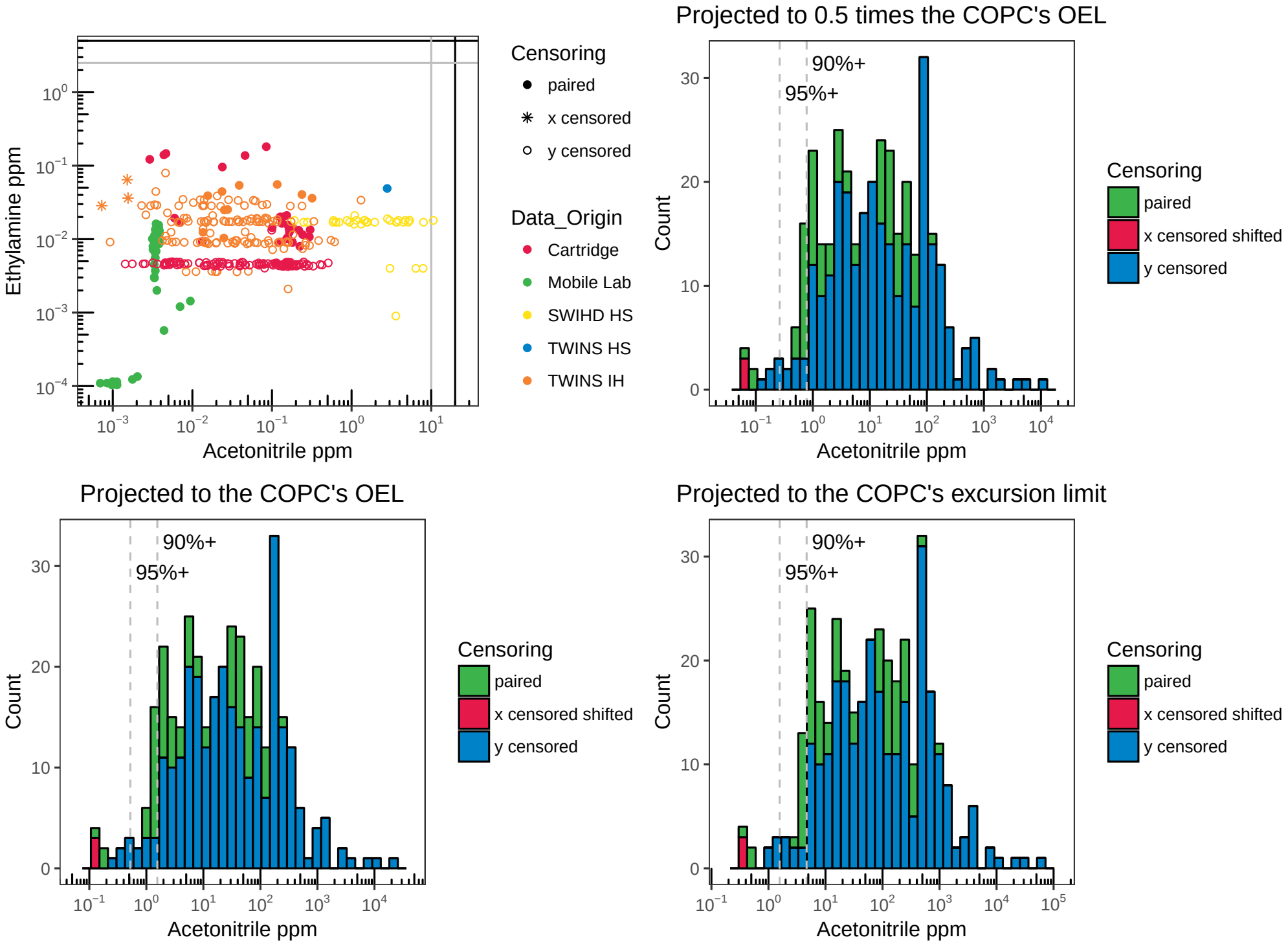


Figure C.1656: Ethylamine vs Acetonitrile

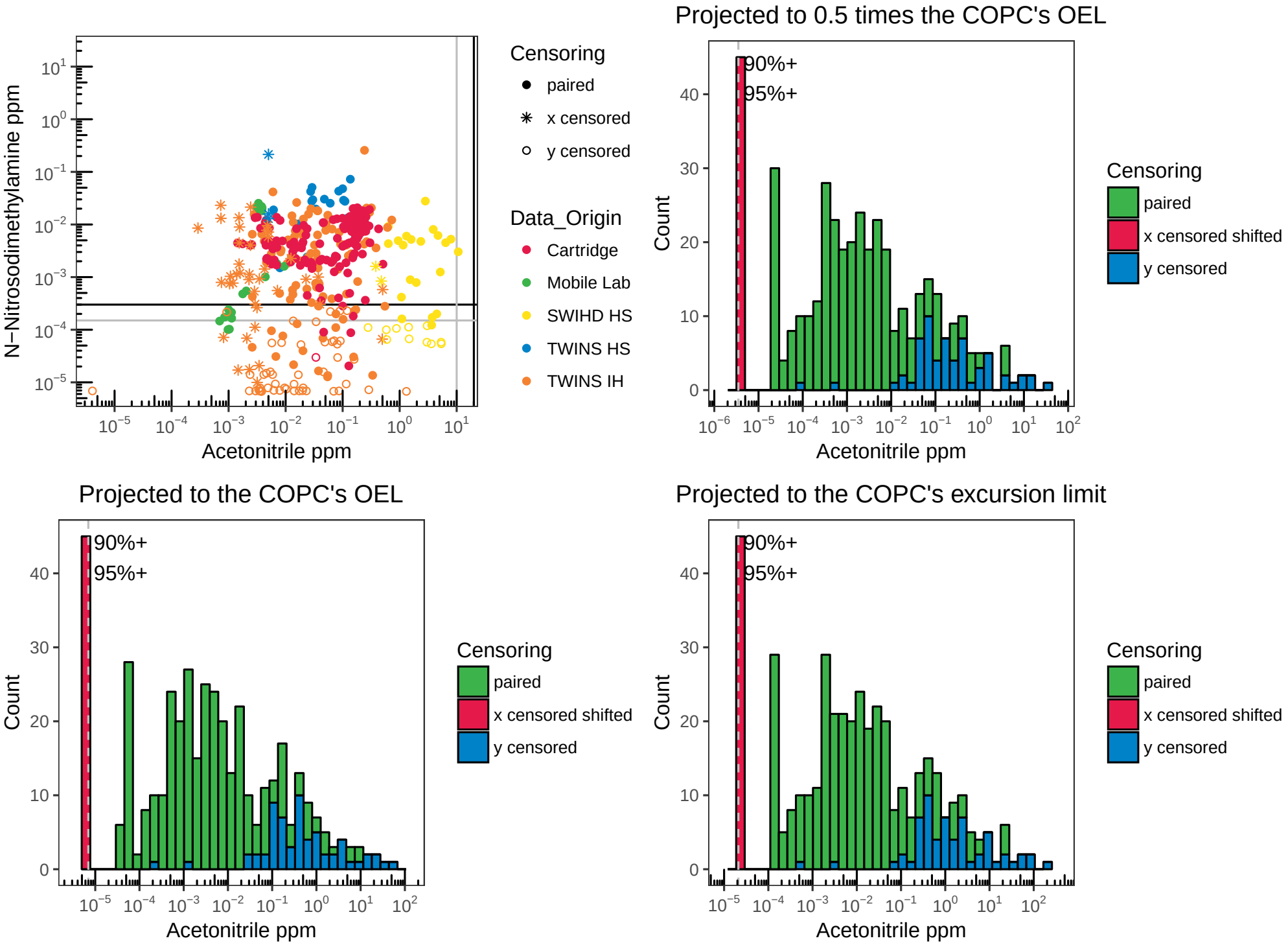


Figure C.1657: N-Nitrosodimethylamine vs Acetonitrile

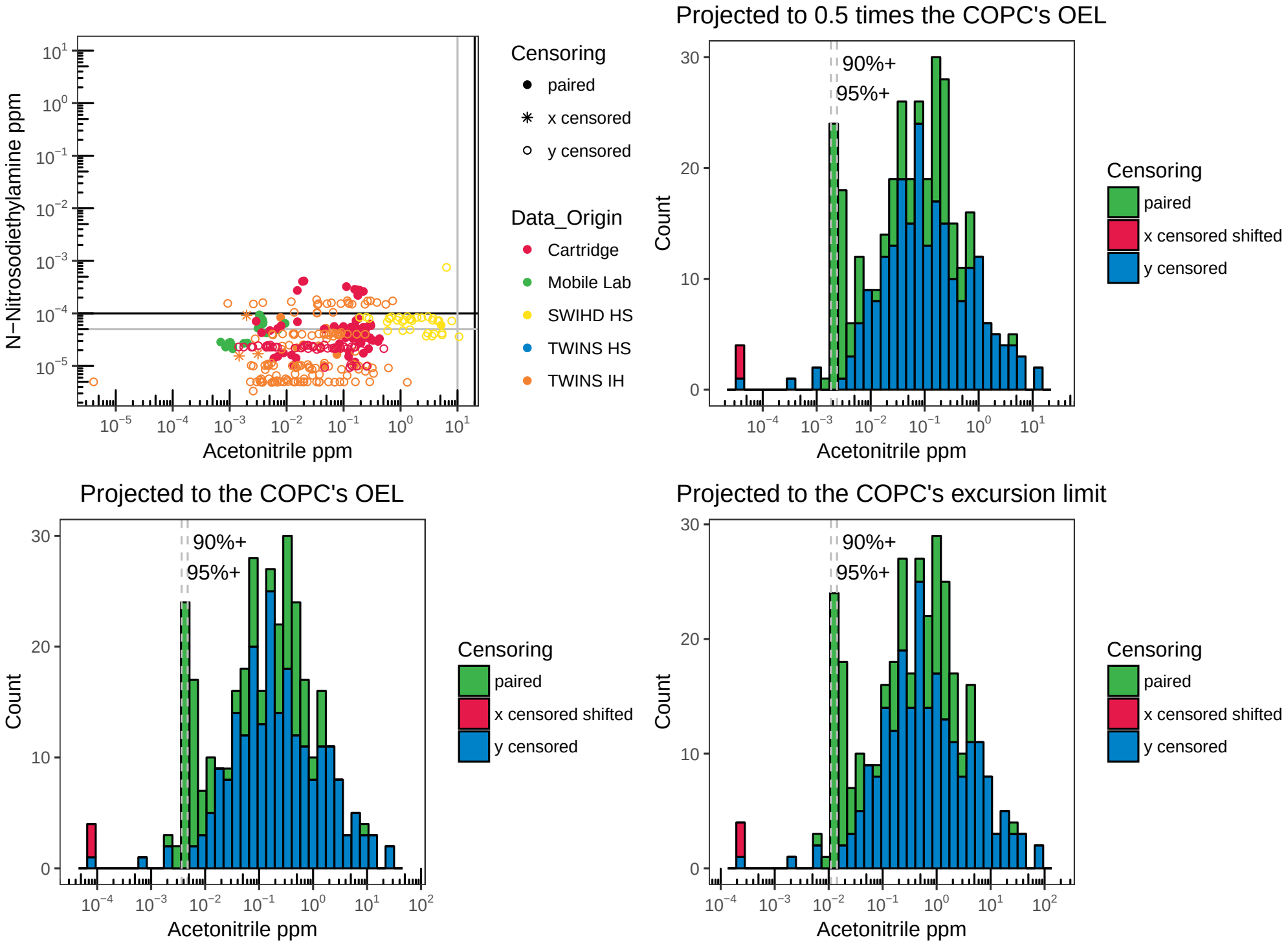


Figure C.1658: N-Nitrosodiethylamine vs Acetonitrile

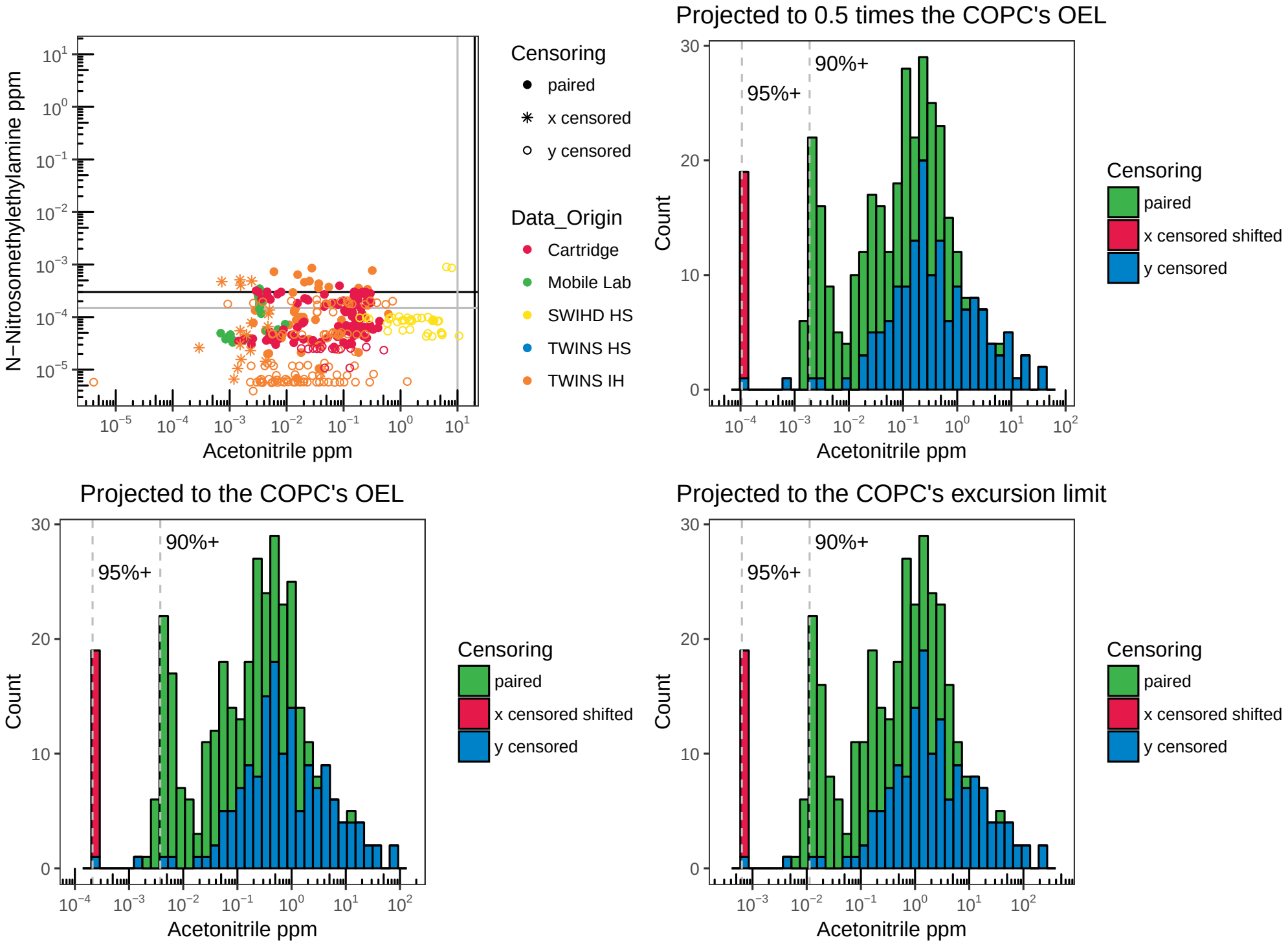


Figure C.1659: N-Nitrosomethylethylamine vs Acetonitrile

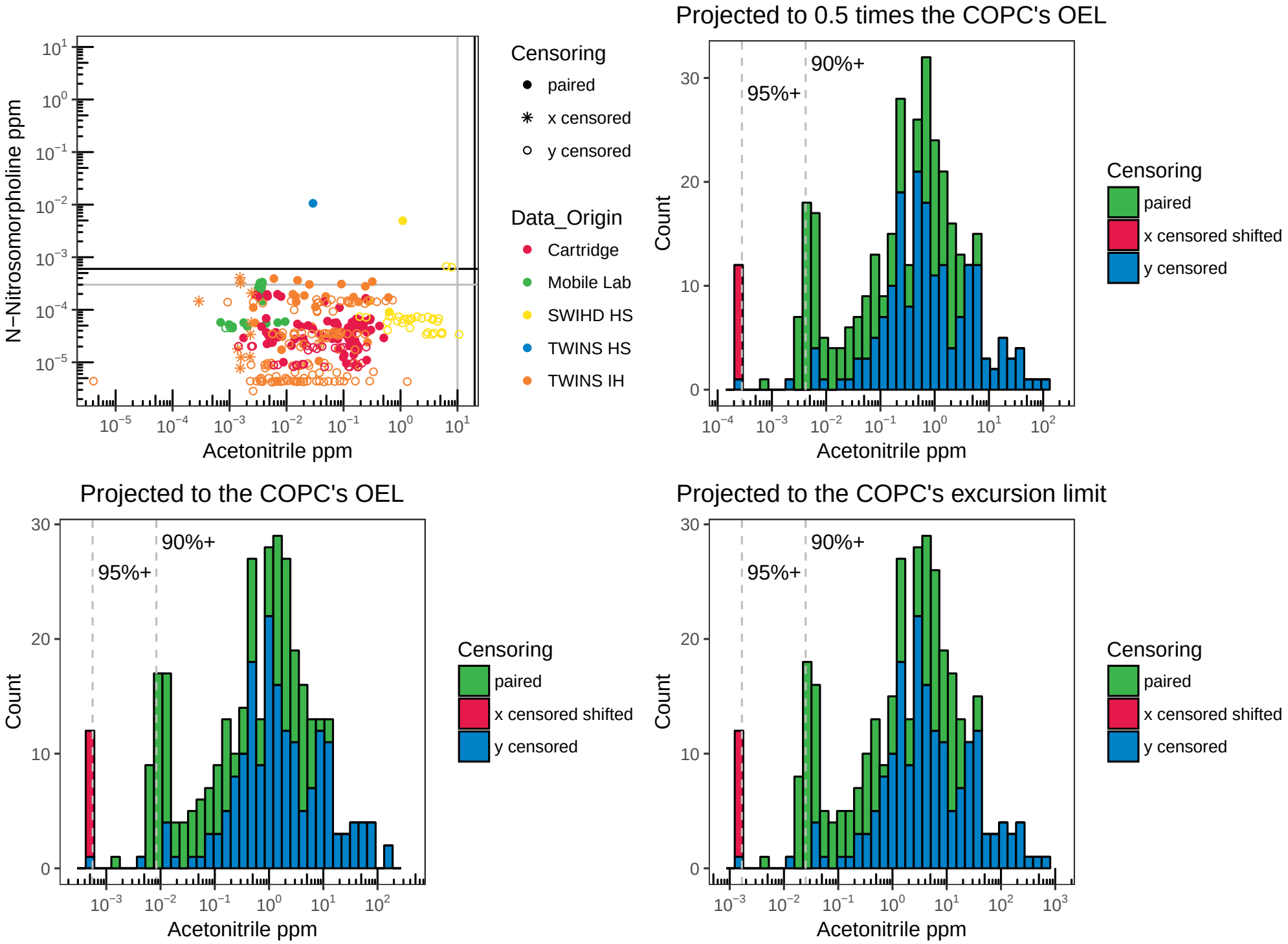


Figure C.1660: N-Nitrosomorpholine vs Acetonitrile

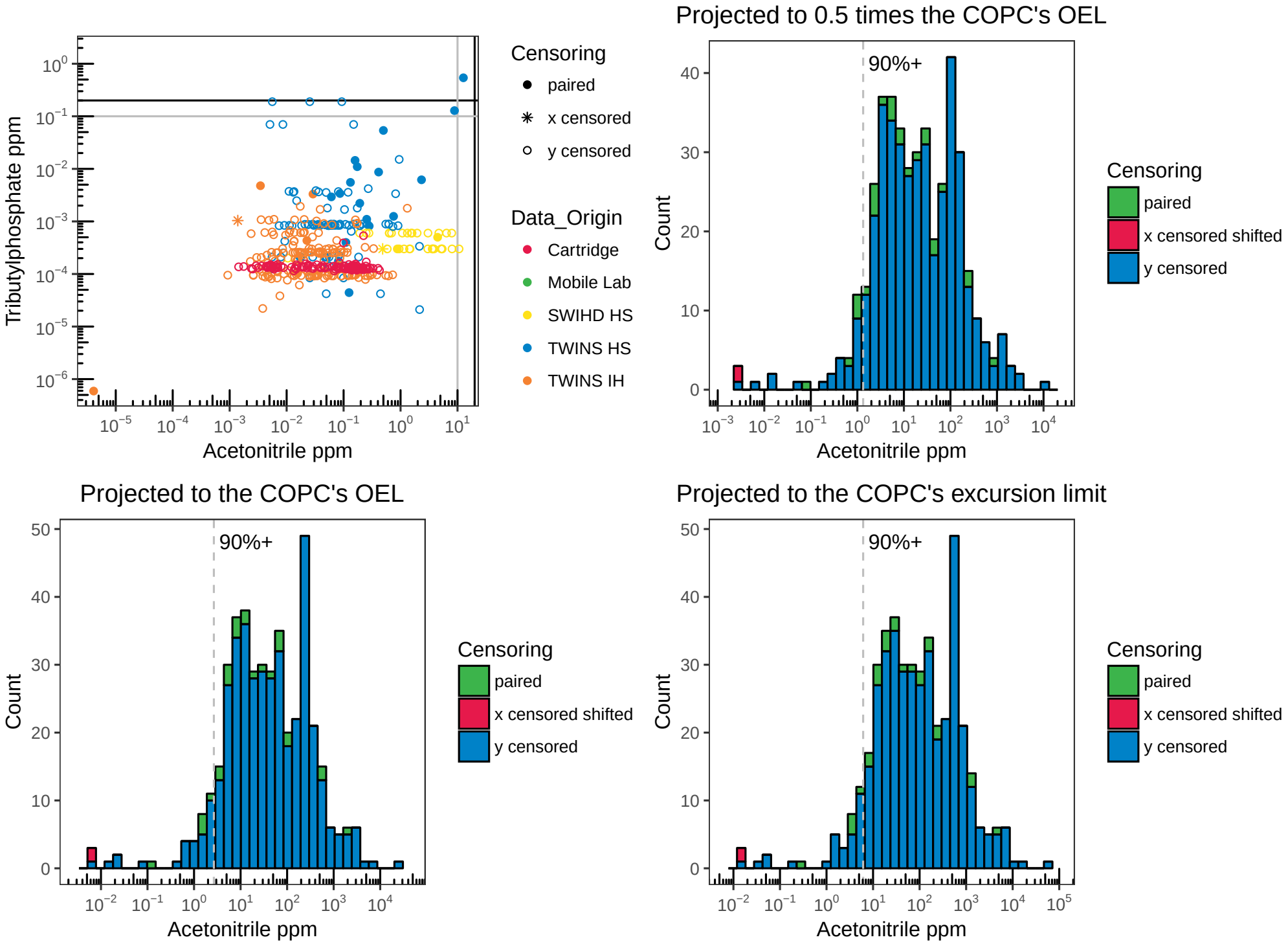


Figure C.1661: Tributylphosphate vs Acetonitrile

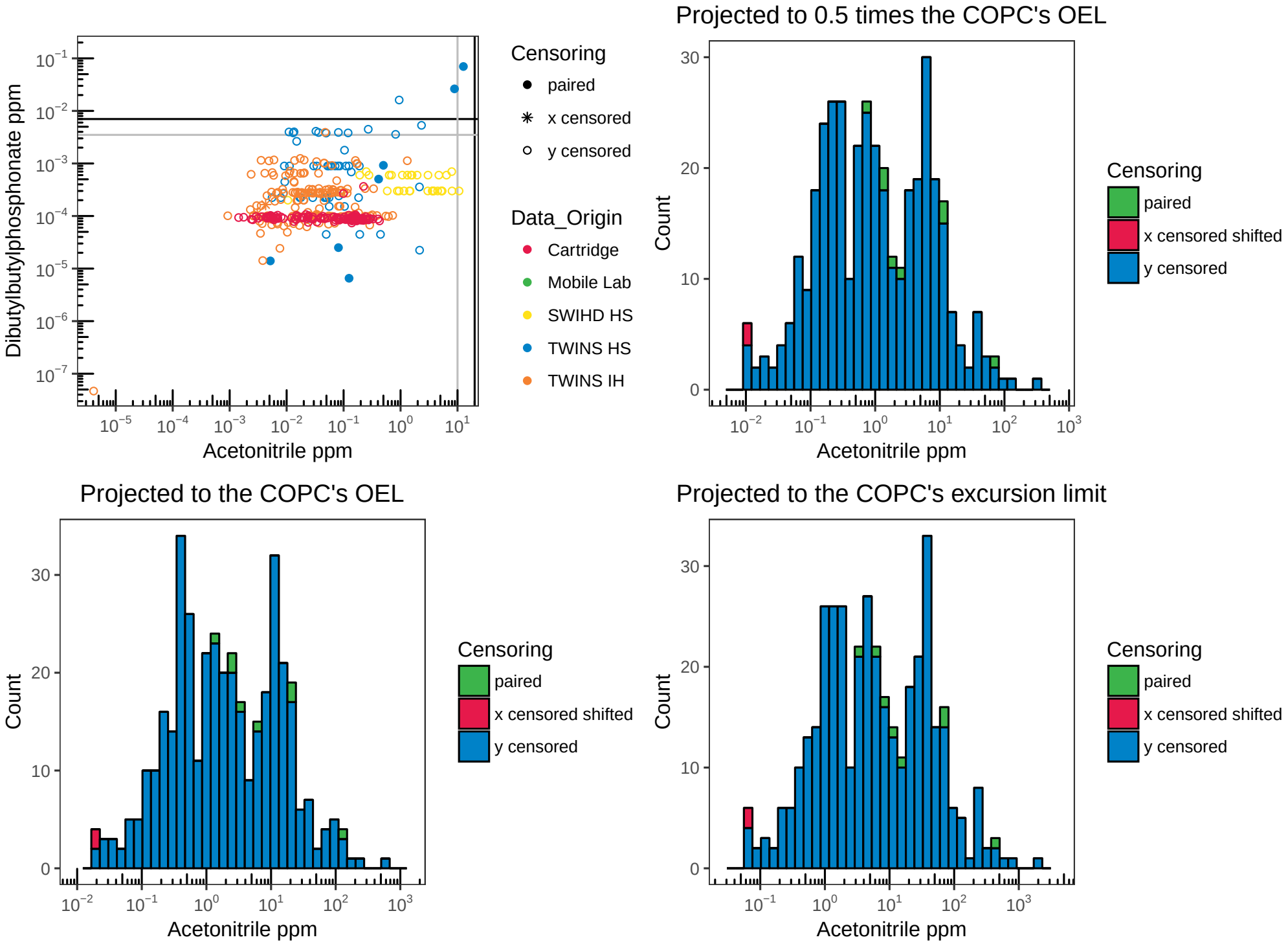


Figure C.1662: Dibutylbutylphosphonate vs Acetonitrile

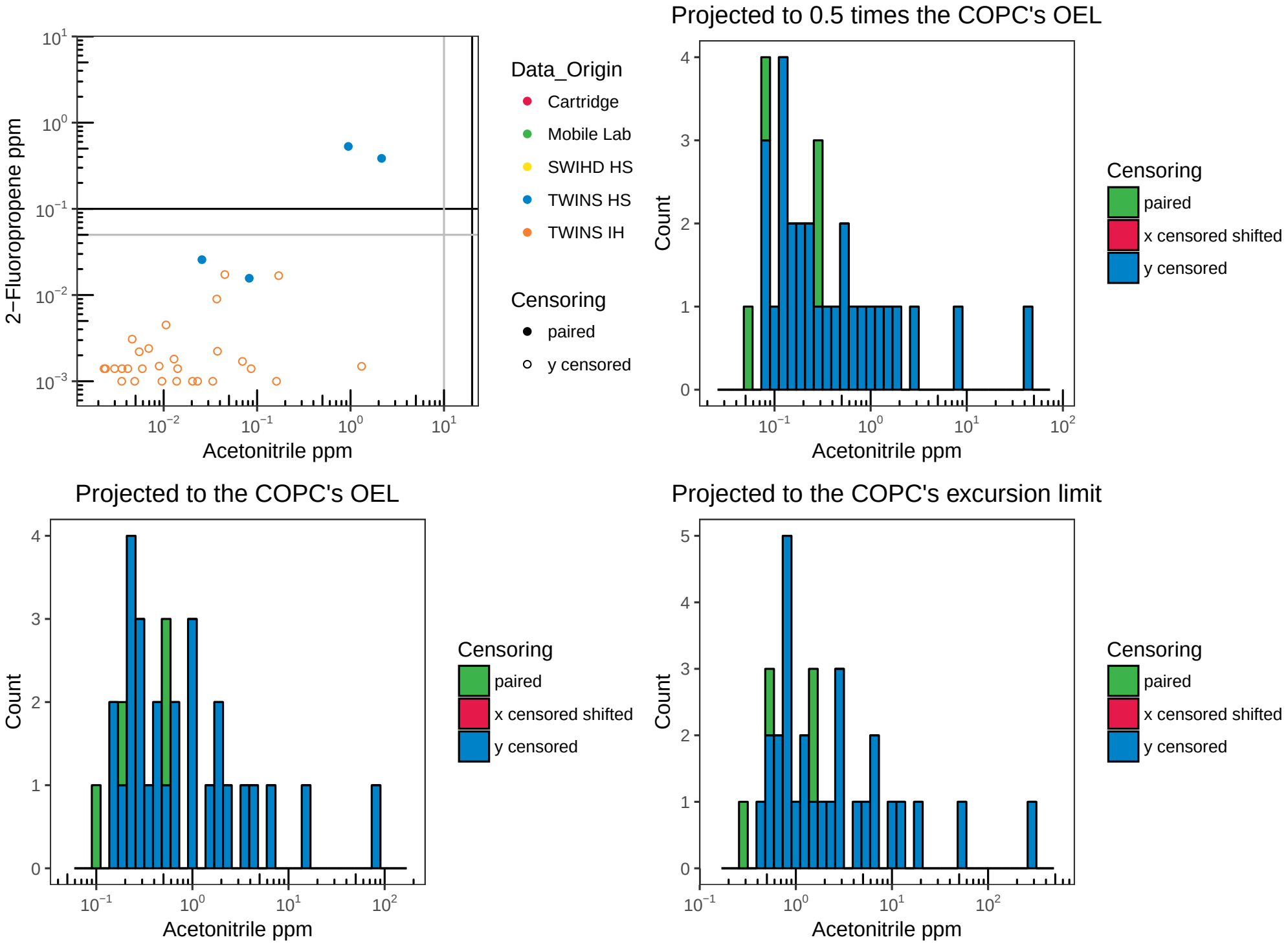


Figure C.1663: 2-Fluoropropene vs Acetonitrile

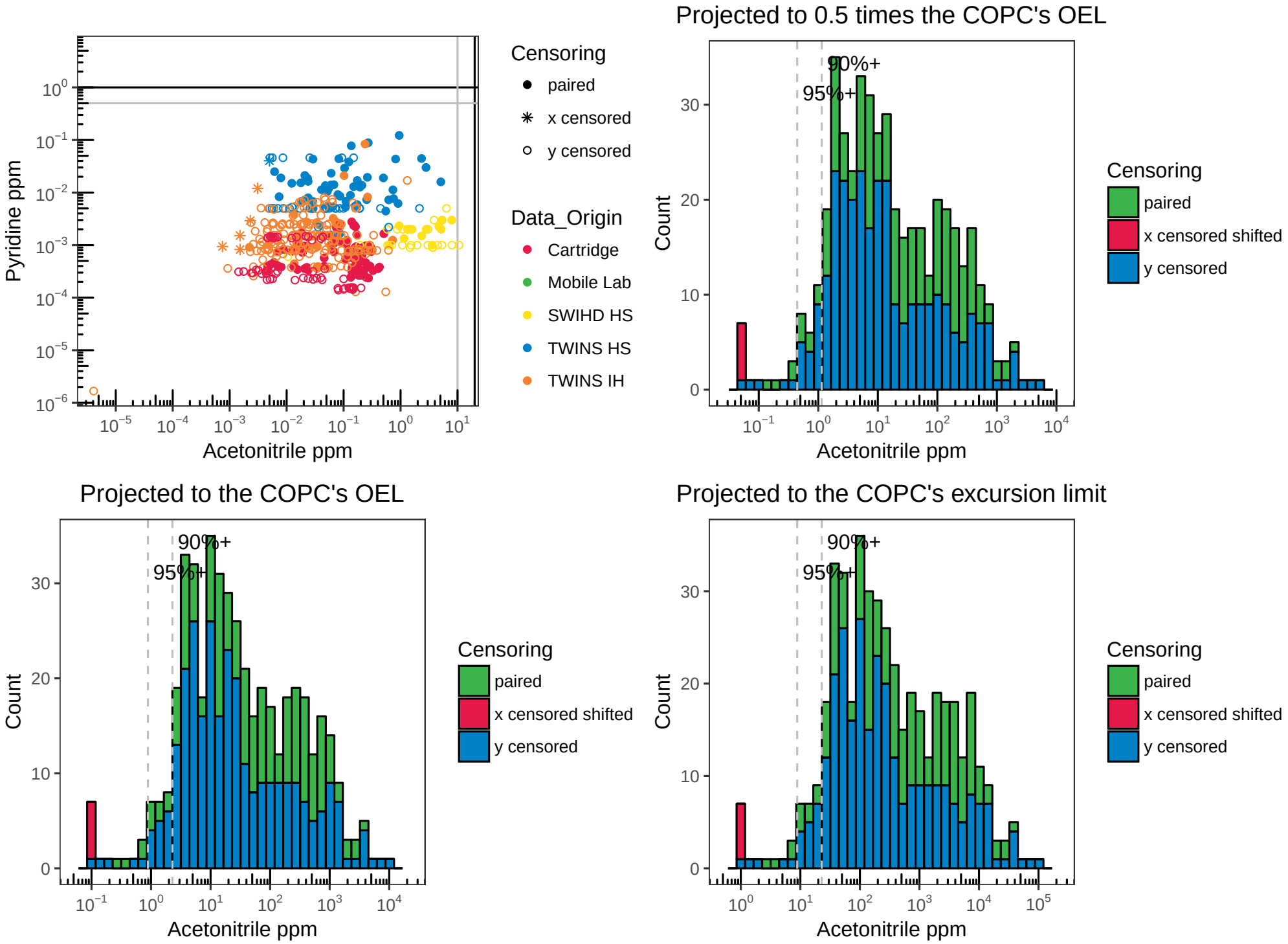


Figure C.1664: Pyridine vs Acetonitrile

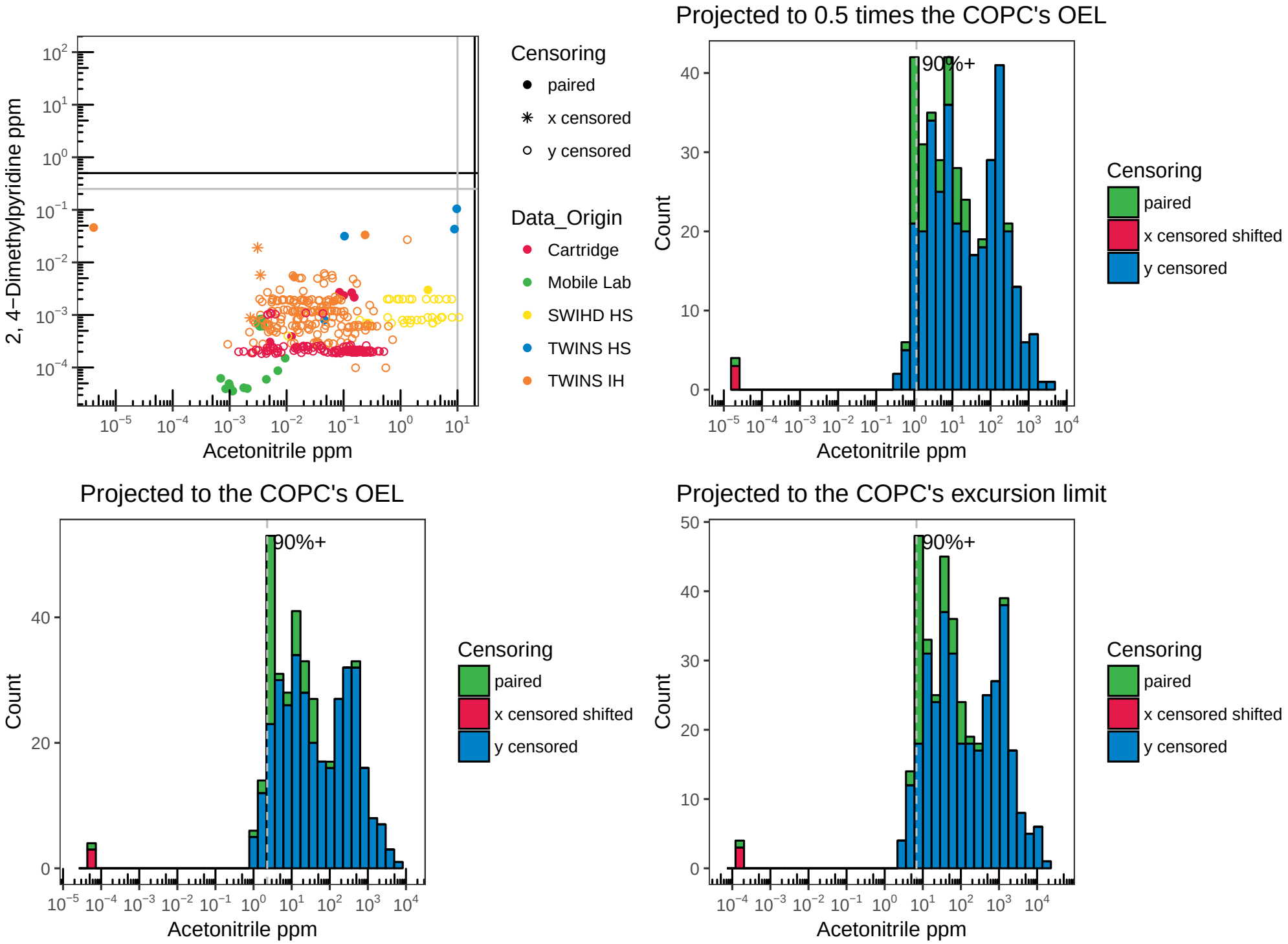


Figure C.1665: 2, 4-Dimethylpyridine vs Acetonitrile

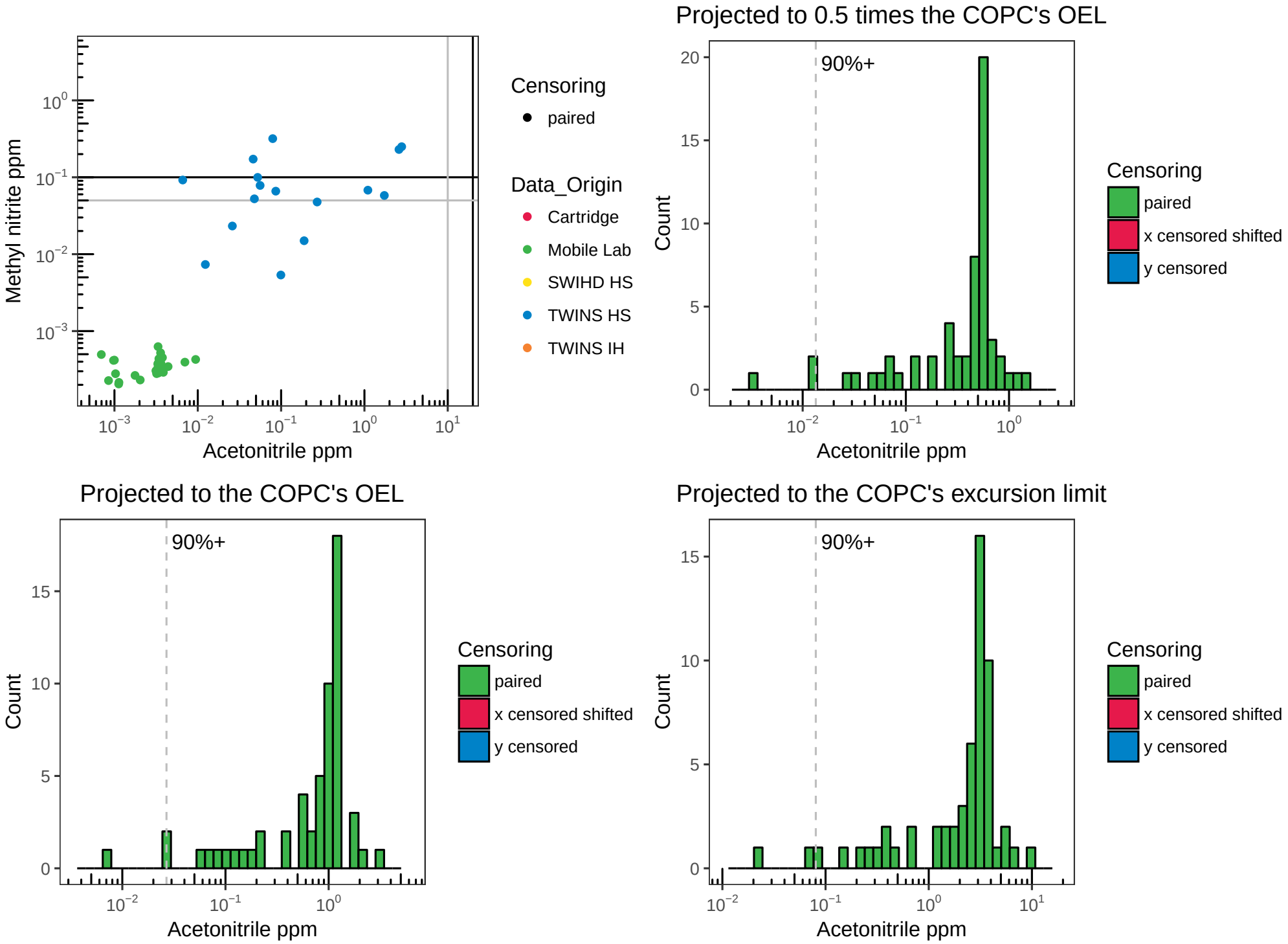


Figure C.1666: Methyl nitrite vs Acetonitrile

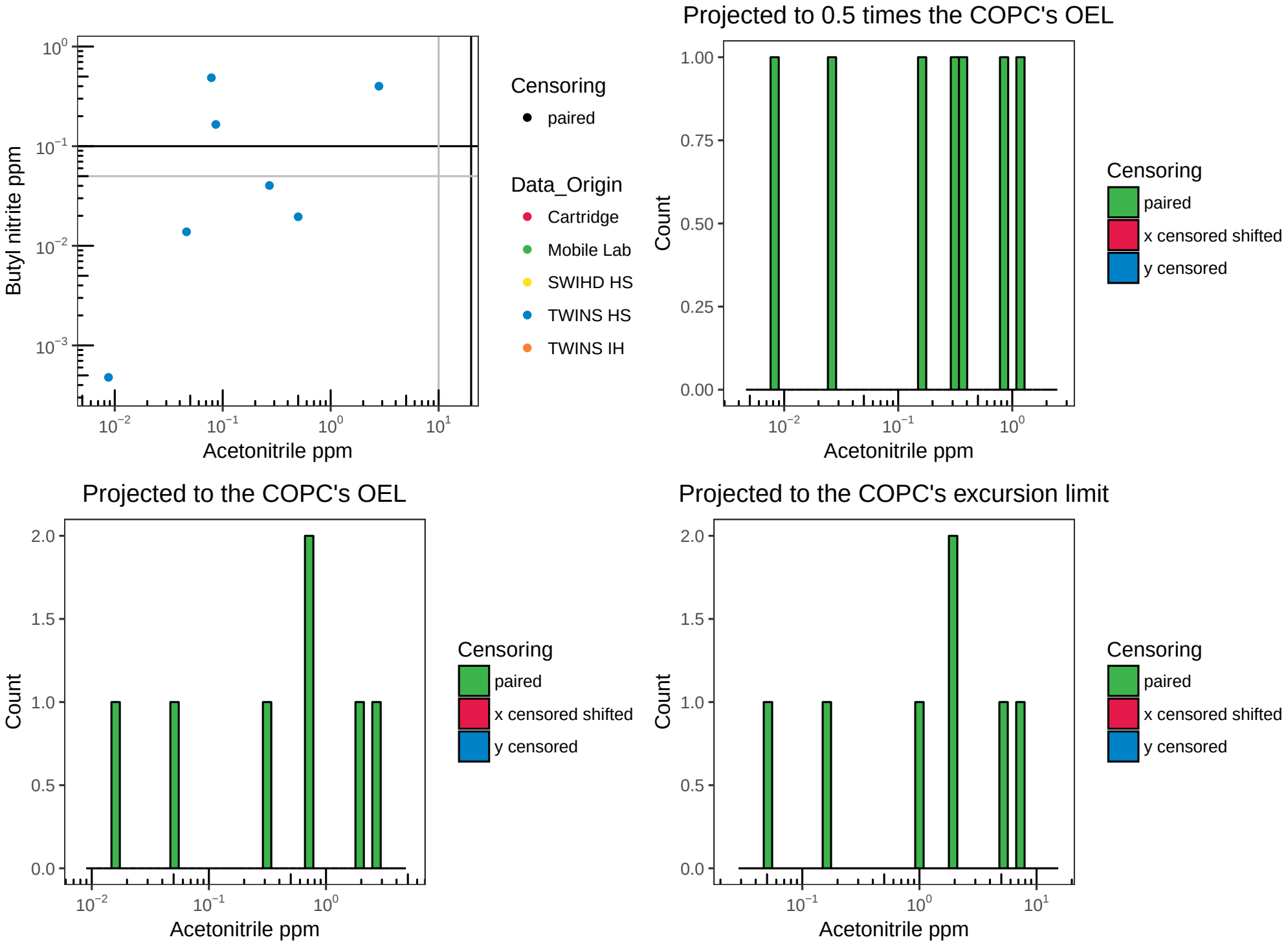


Figure C.1667: Butyl nitrite vs Acetonitrile

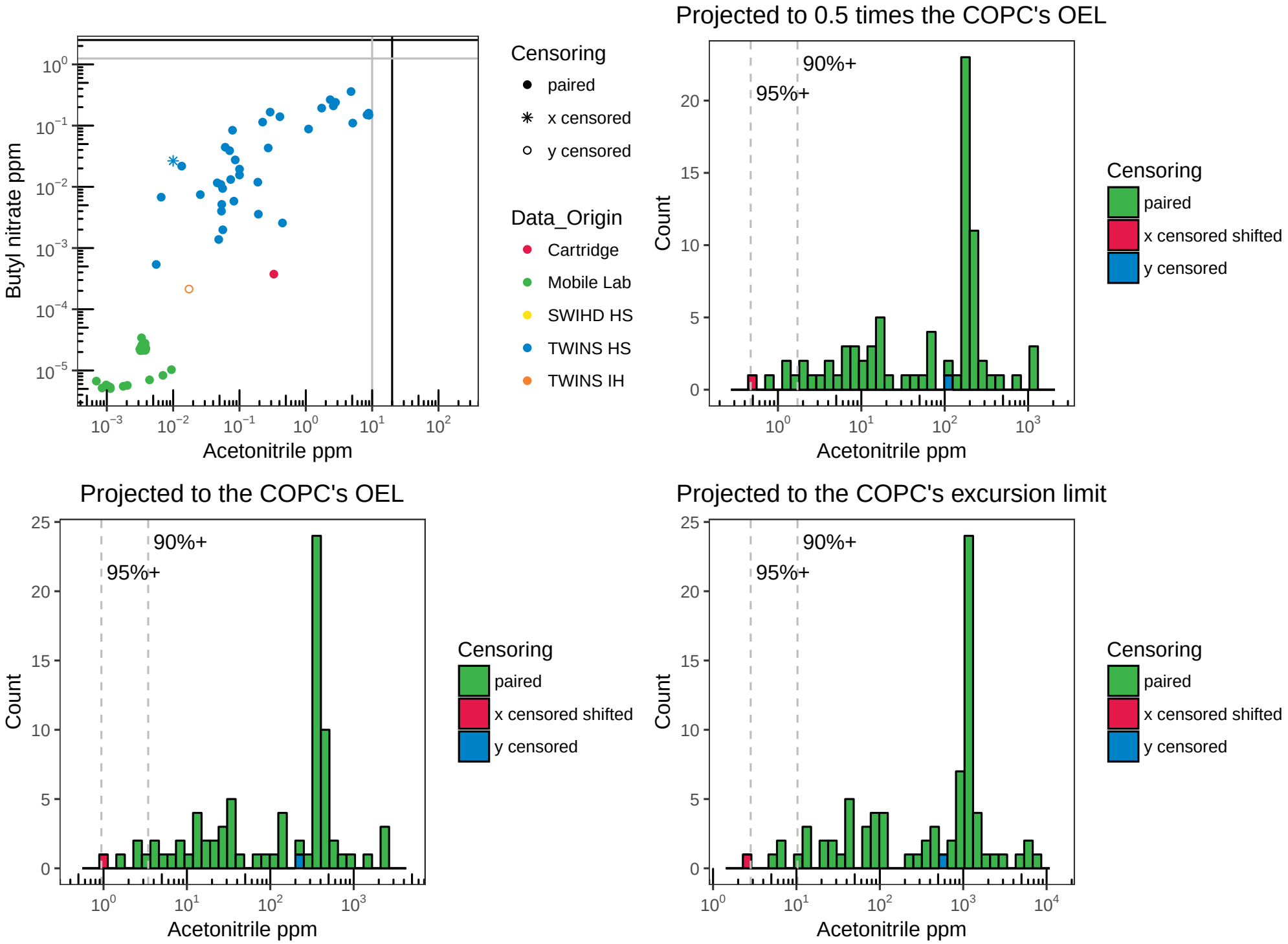


Figure C.1668: Butyl nitrate vs Acetonitrile

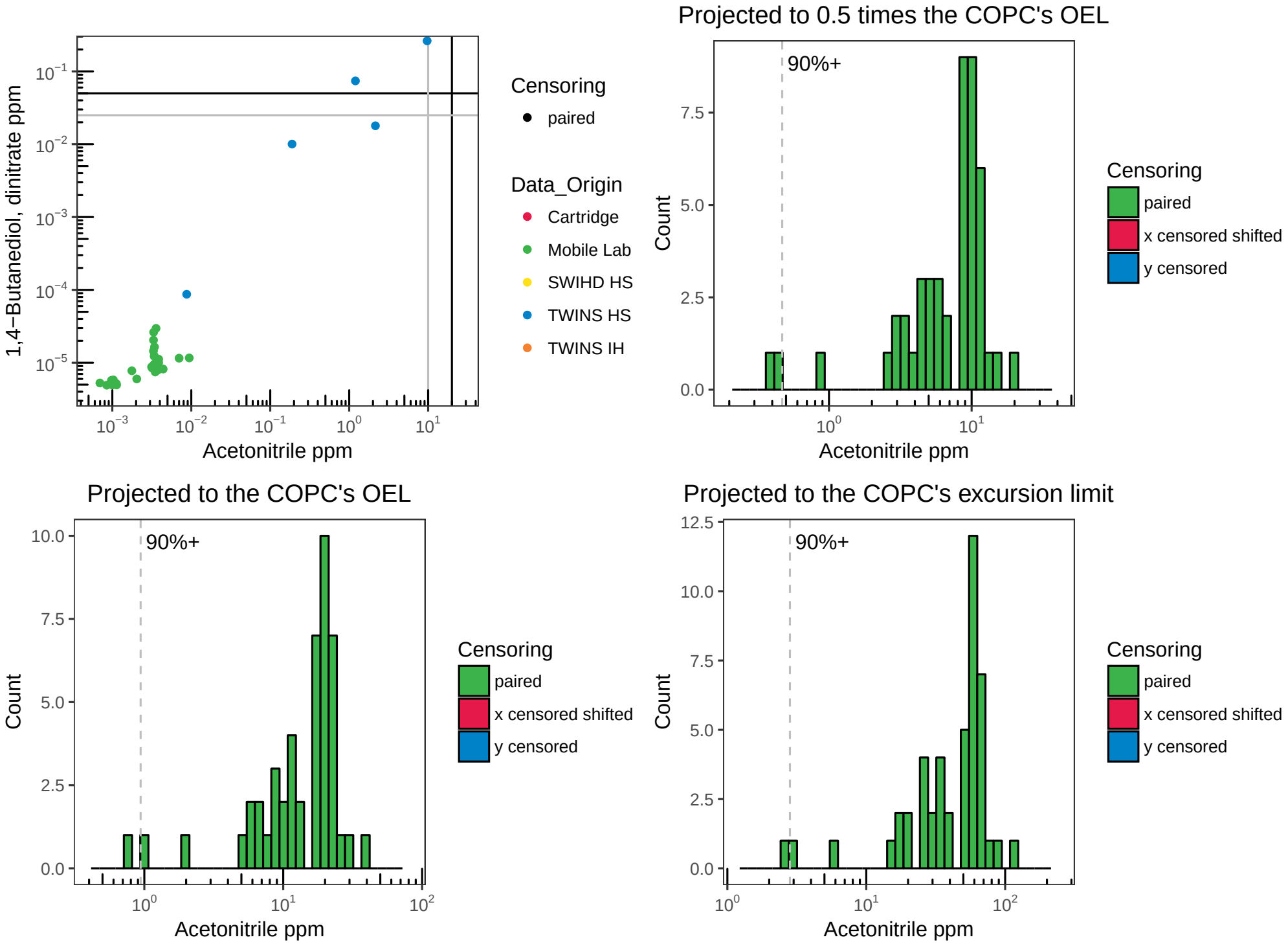


Figure C.1669: 1,4-Butanediol, dinitrate vs Acetonitrile

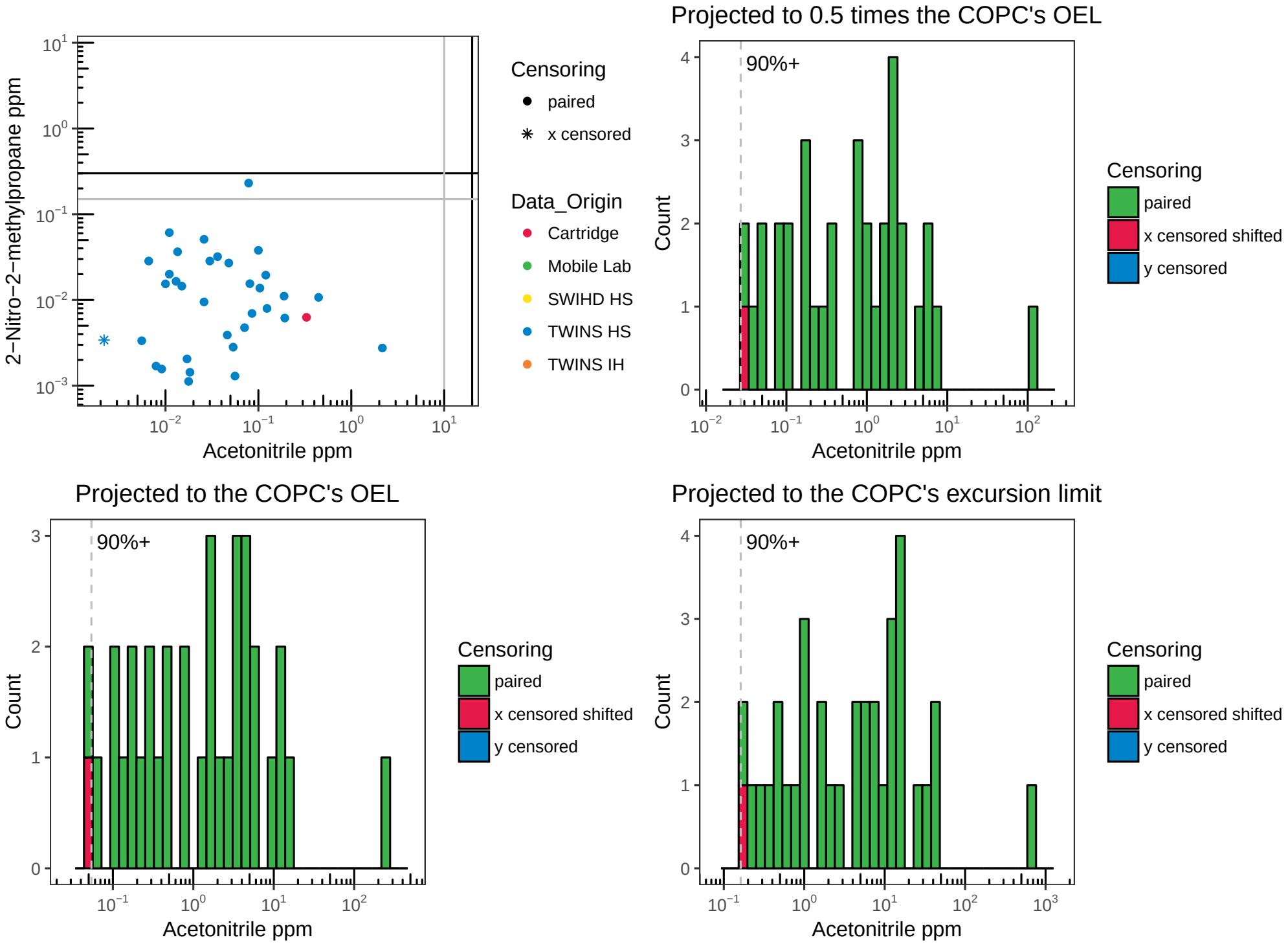


Figure C.1670: 2-Nitro-2-methylpropane vs Acetonitrile

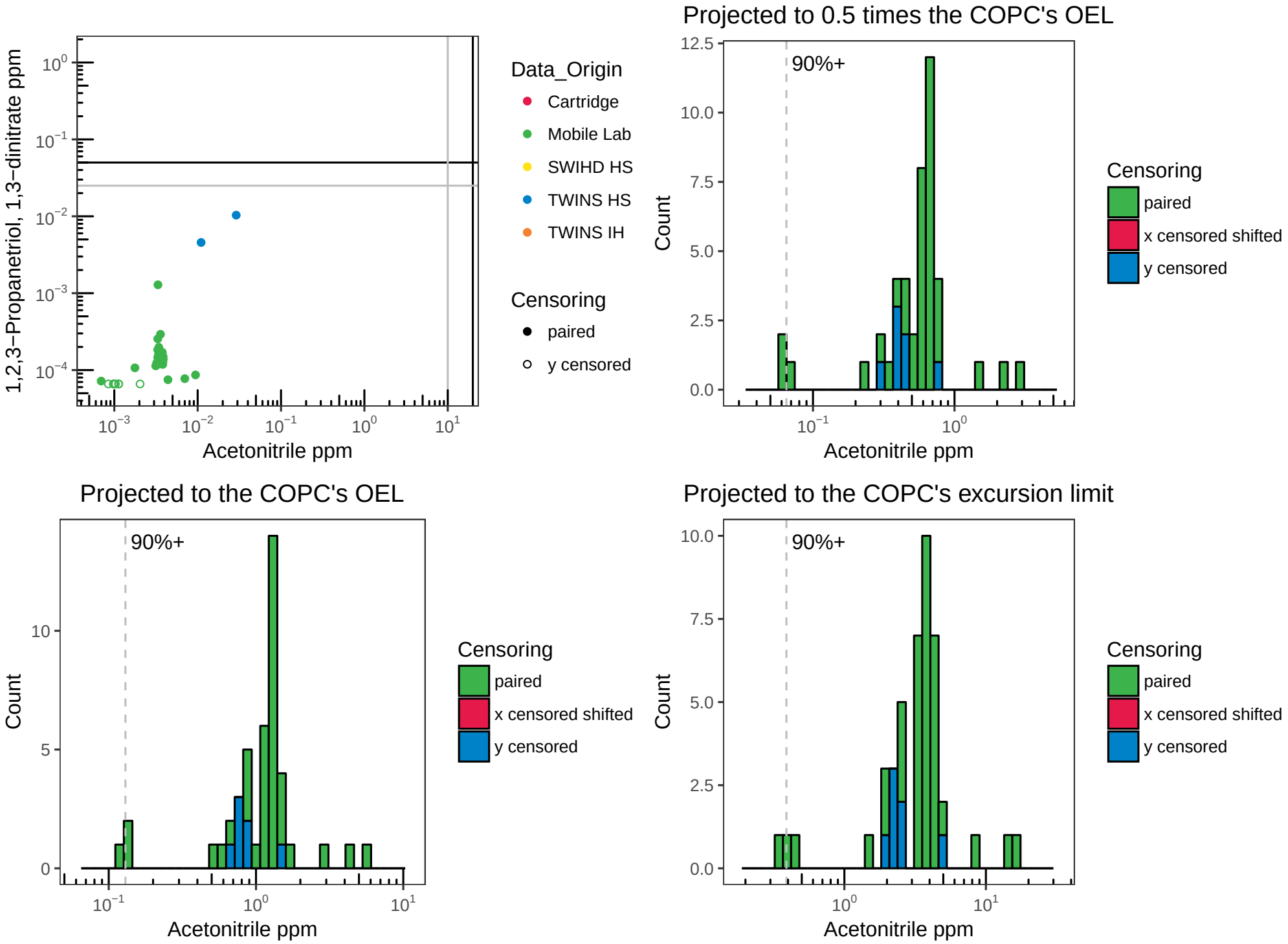


Figure C.1671: 1,2,3-Propanetriol, 1,3-dinitrate vs Acetonitrile

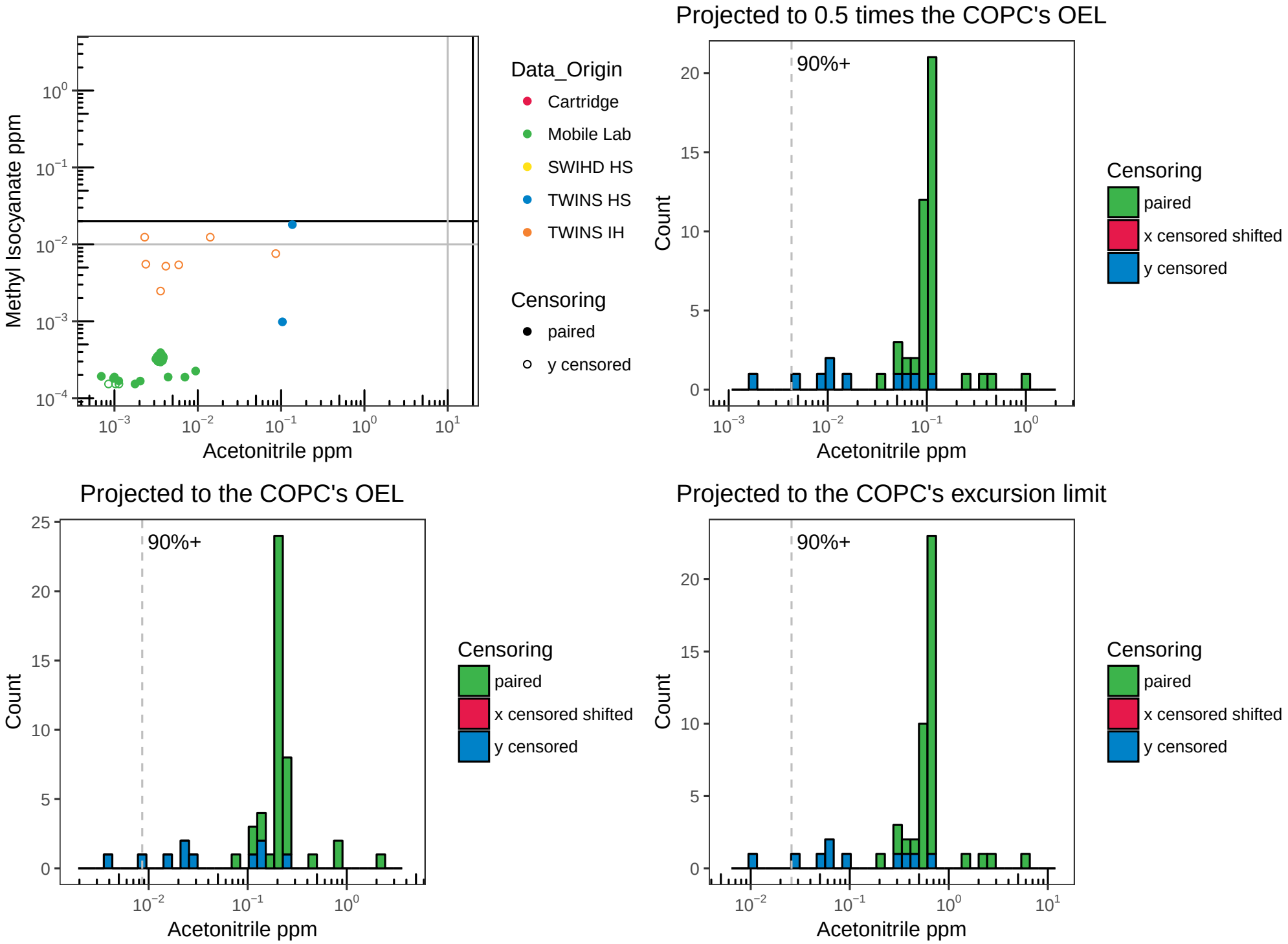


Figure C.1672: Methyl Isocyanate vs Acetonitrile

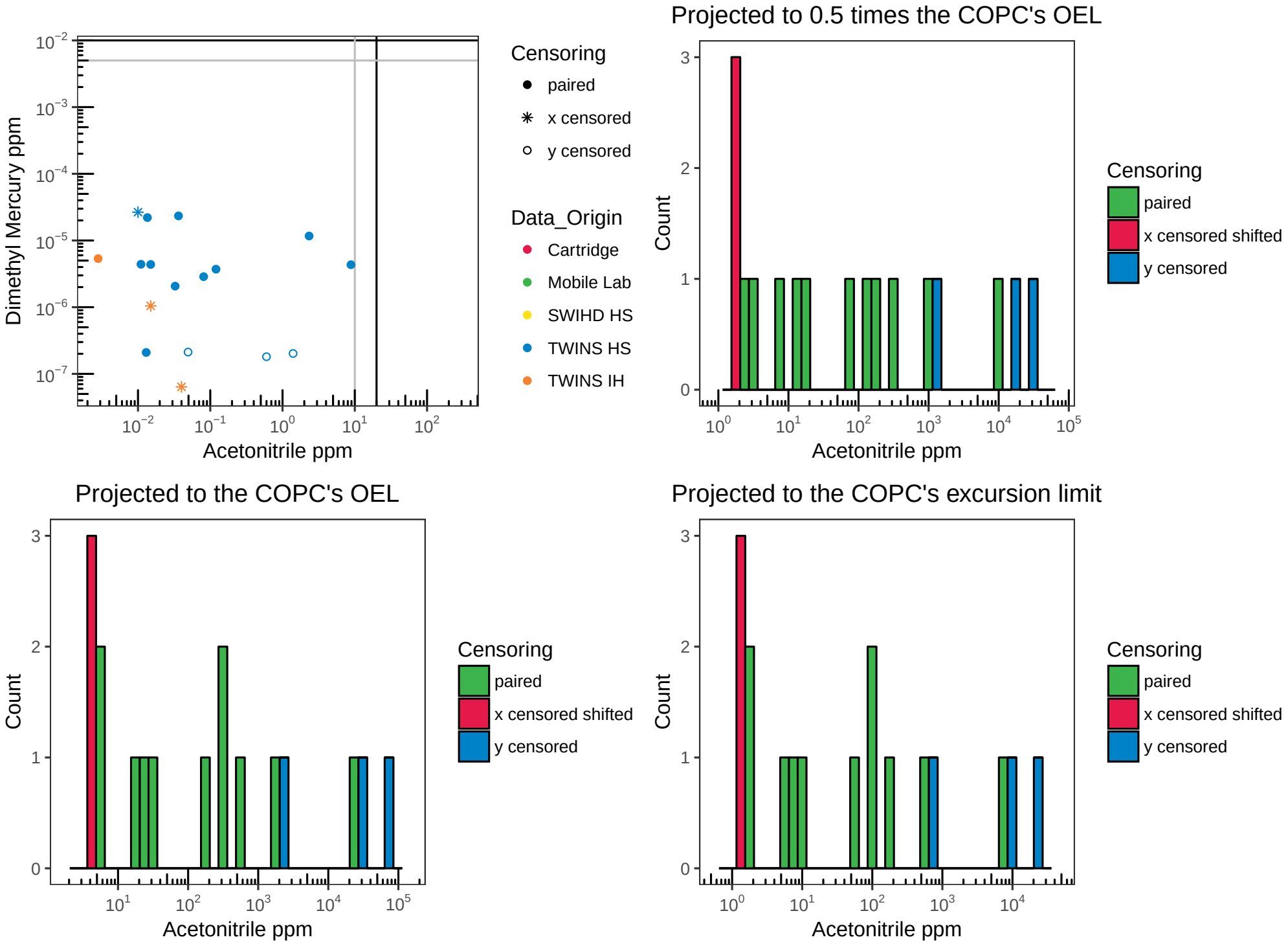


Figure C.1673: Dimethyl Mercury vs Acetonitrile

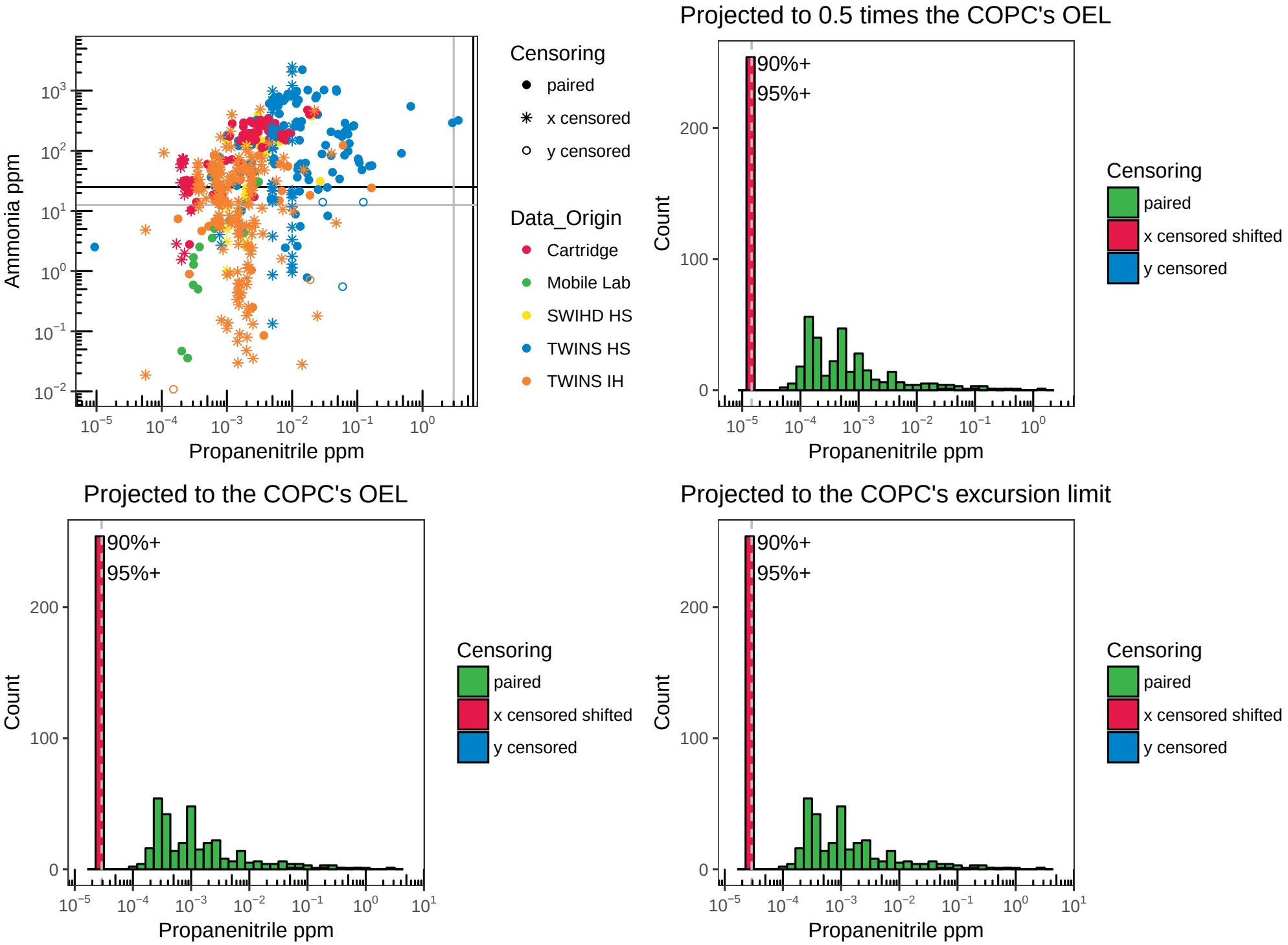


Figure C.1674: Ammonia vs Propanenitrile

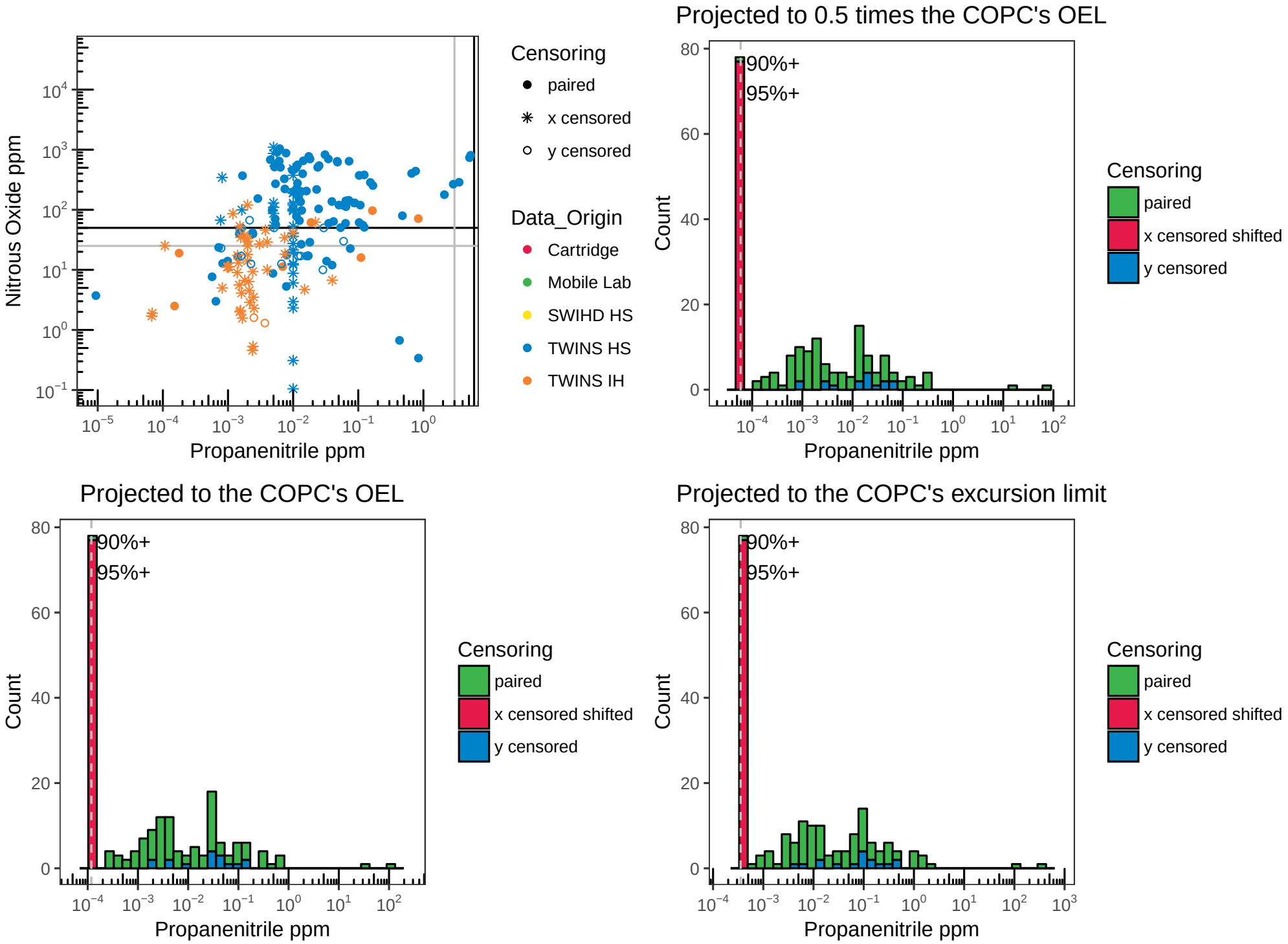


Figure C.1675: Nitrous Oxide vs Propanenitrile

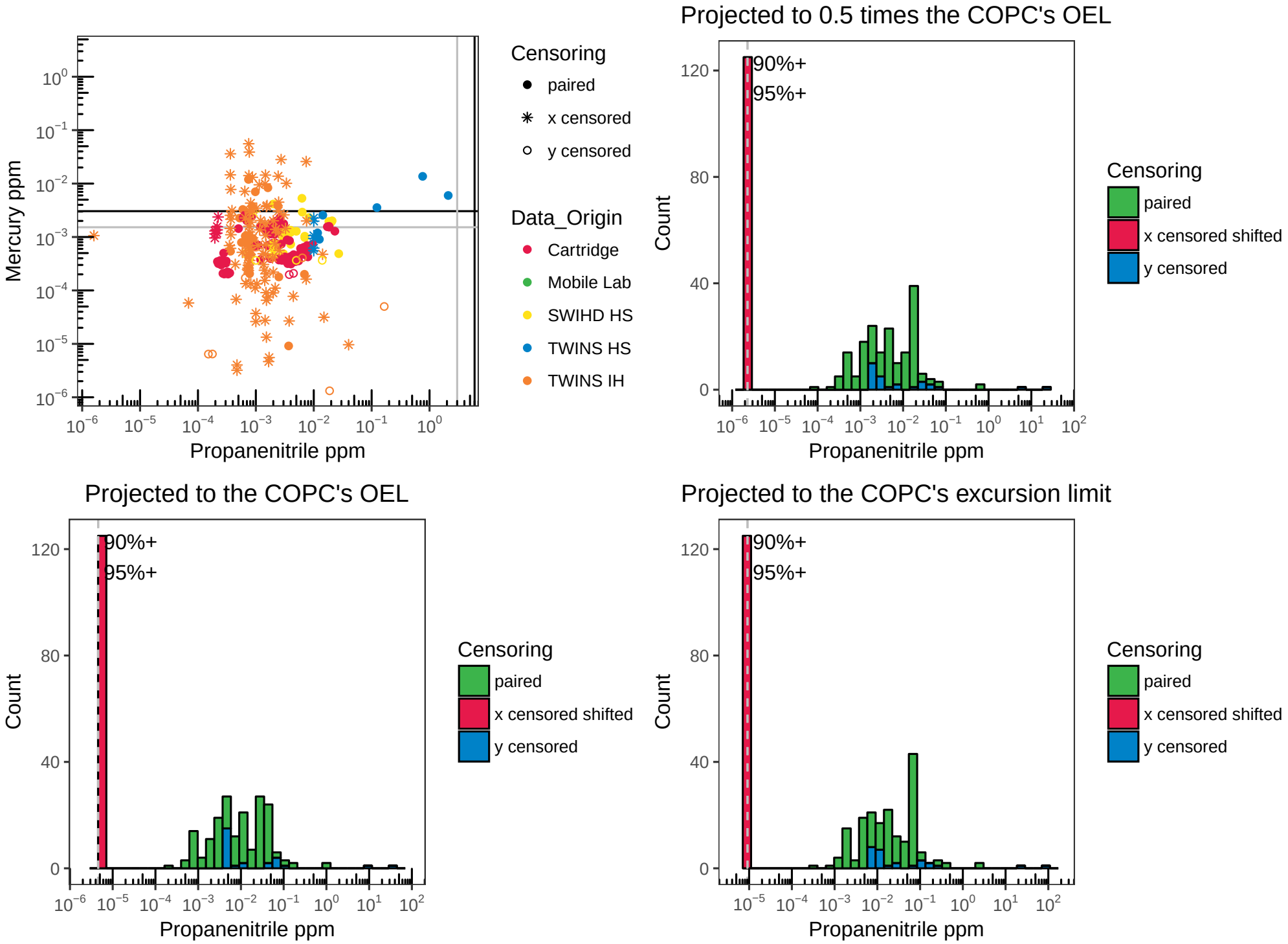


Figure C.1676: Mercury vs Propanenitrile

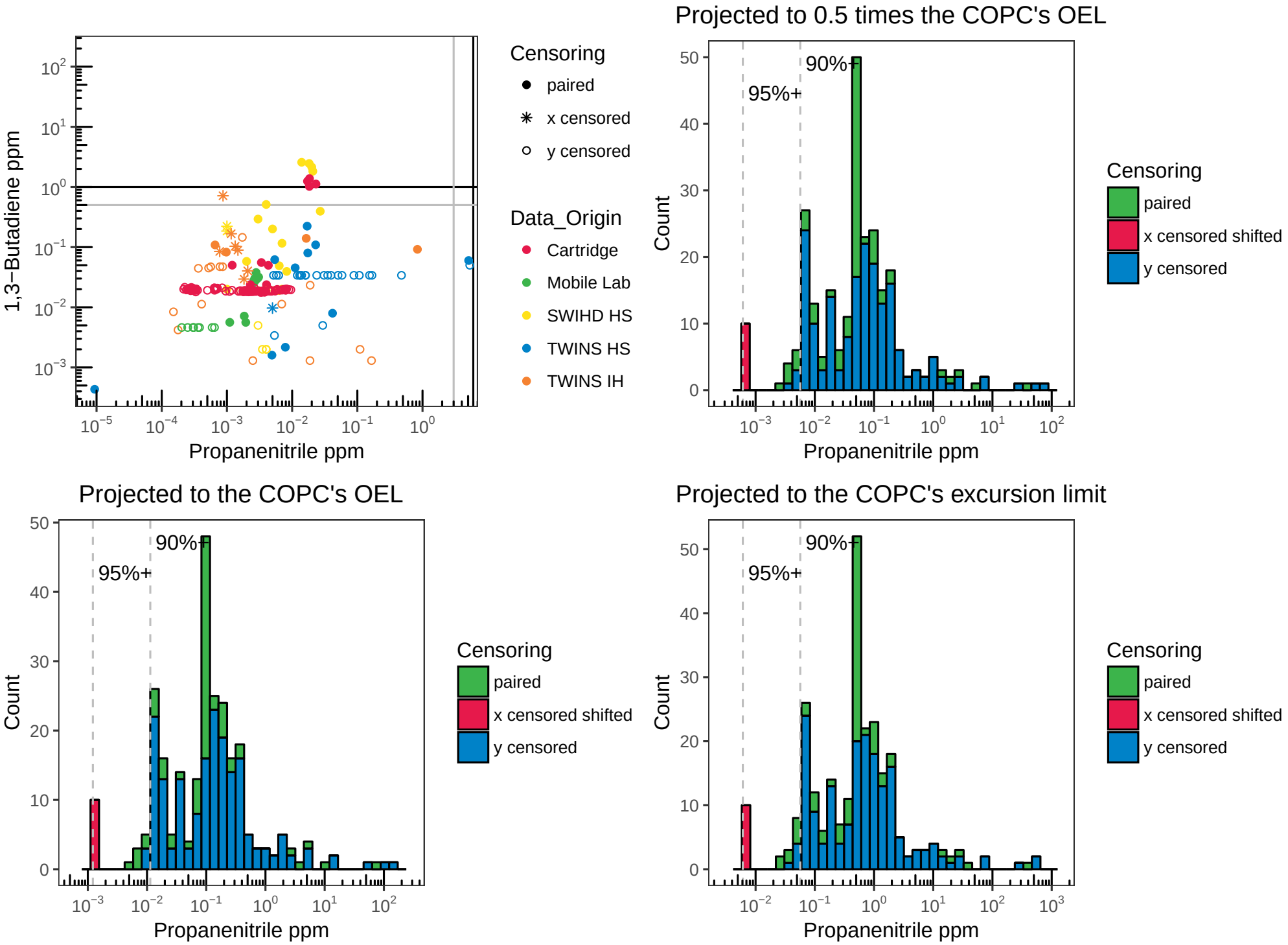


Figure C.1677: 1,3-Butadiene vs Propanenitrile

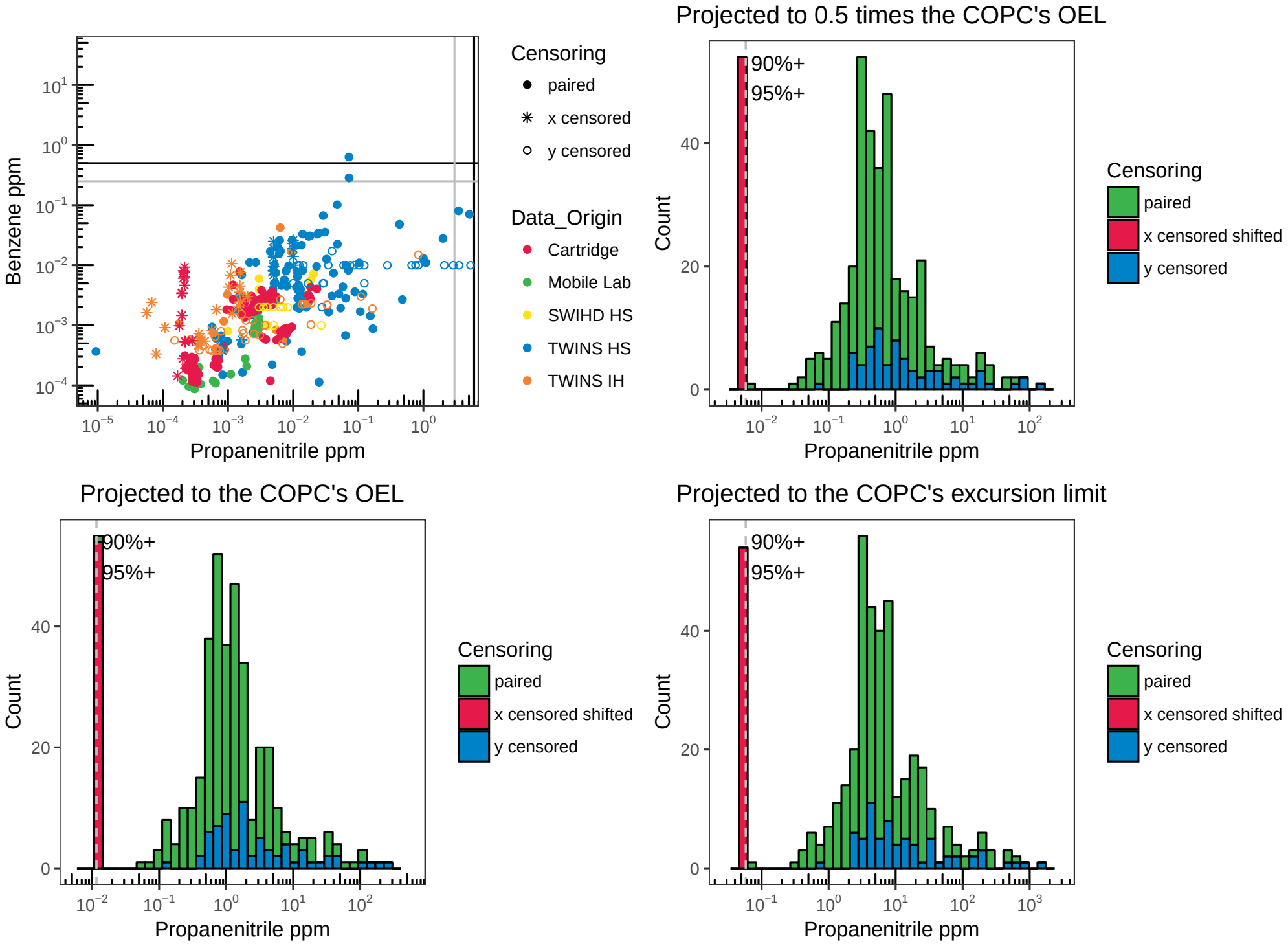


Figure C.1678: Benzene vs Propanenitrile

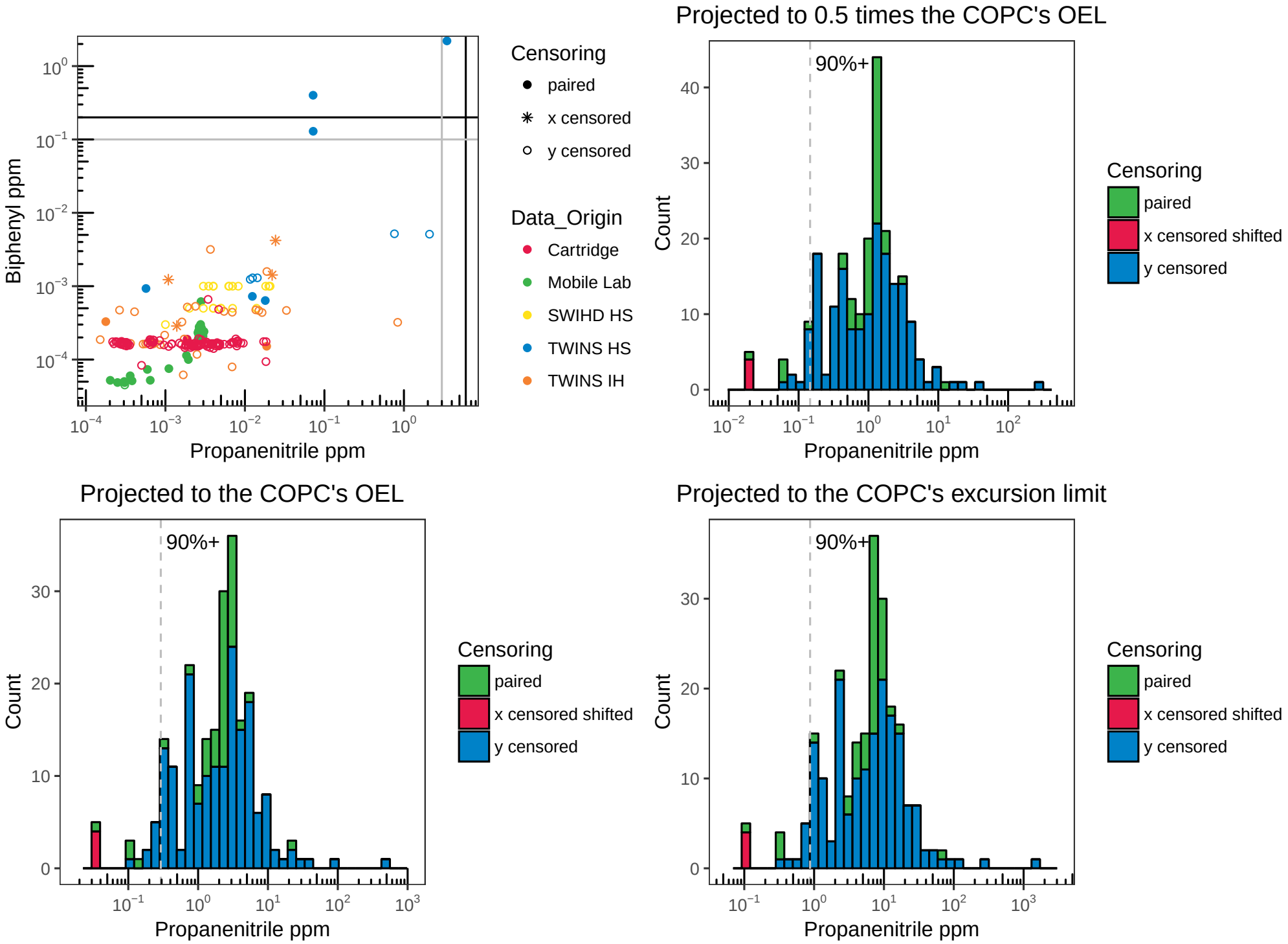


Figure C.1679: Biphenyl vs Propanenitrile

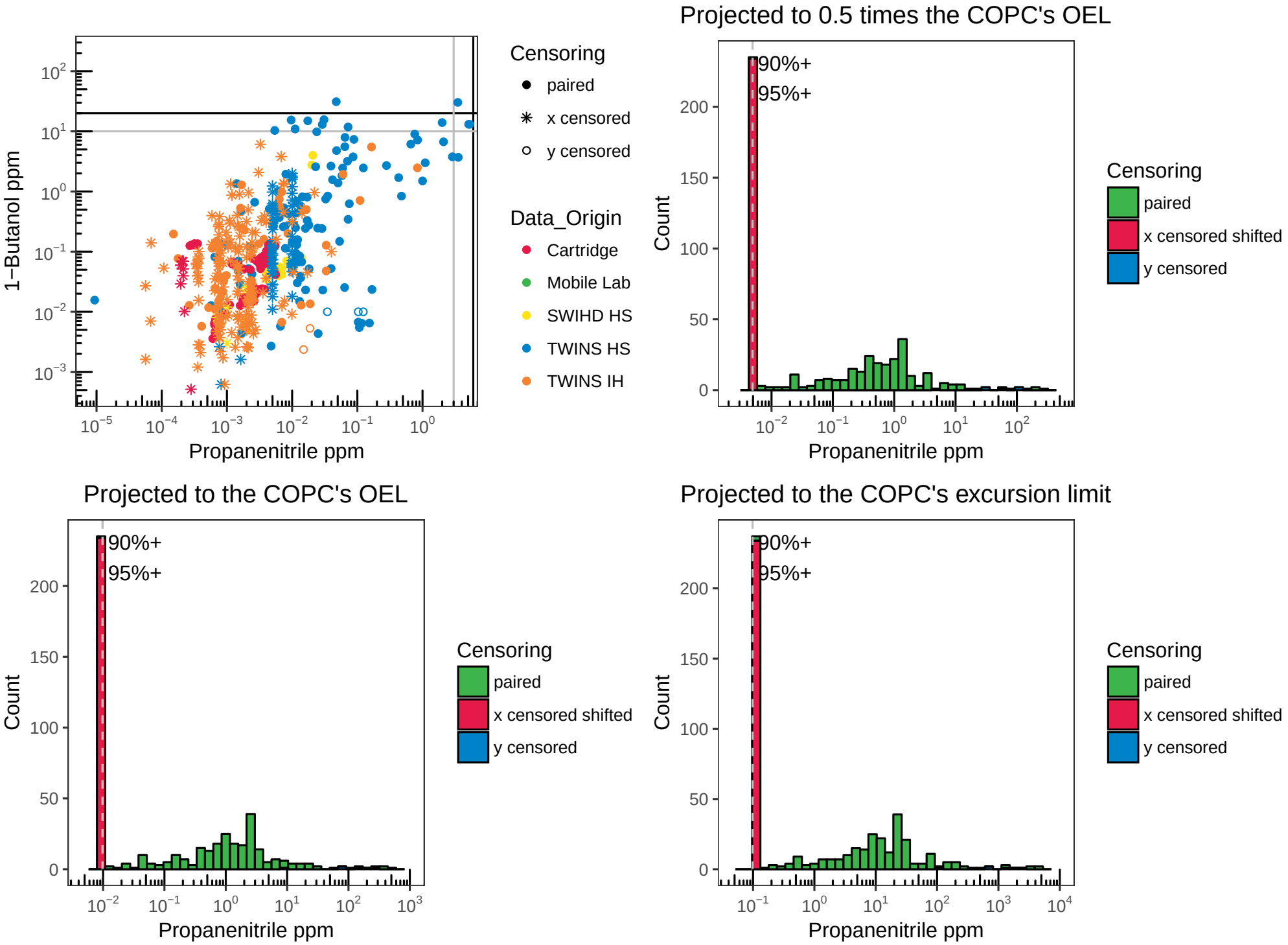


Figure C.1680: 1-Butanol vs Propanenitrile

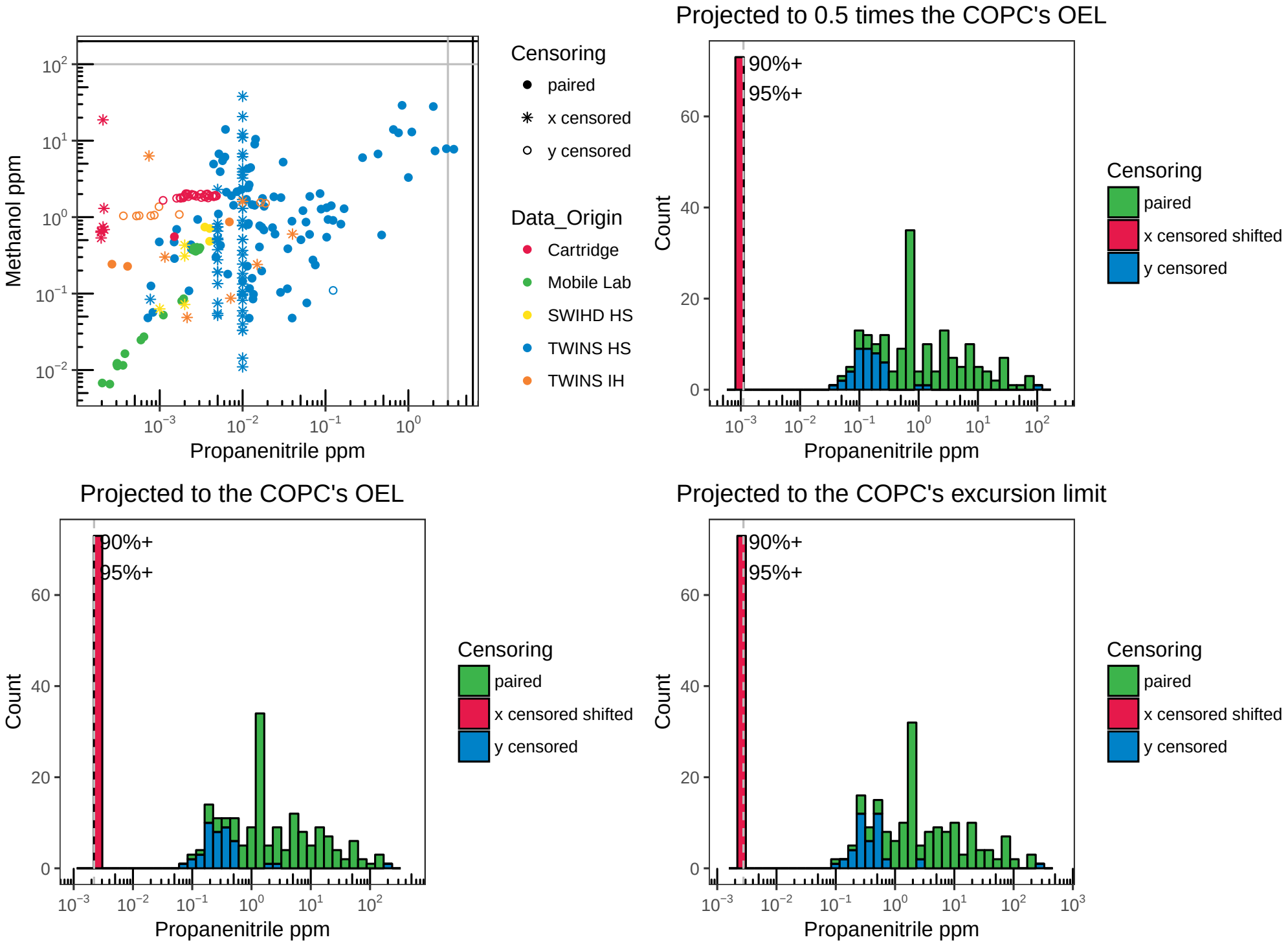


Figure C.1681: Methanol vs Propanenitrile

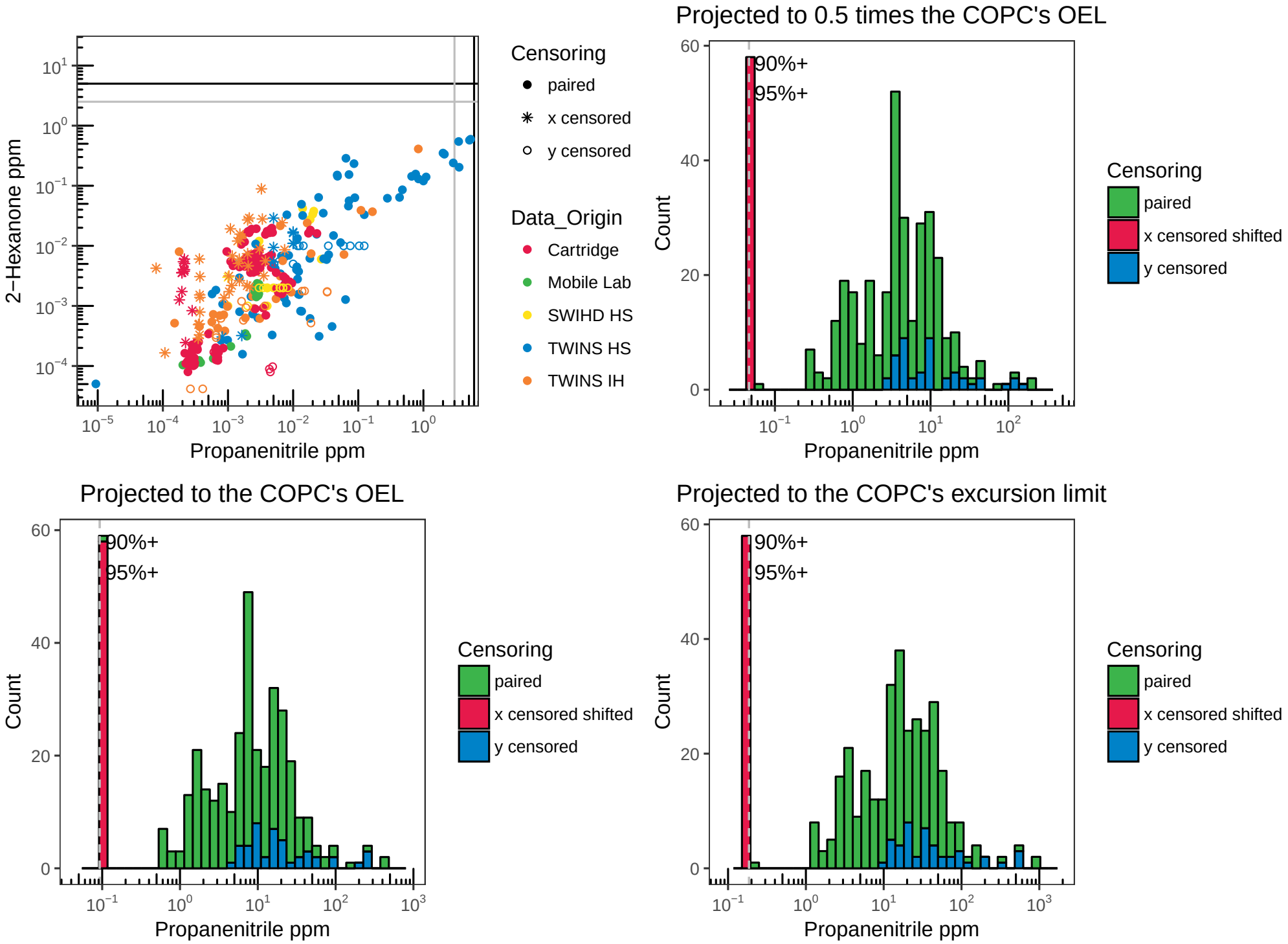


Figure C.1682: 2-Hexanone vs Propanenitrile

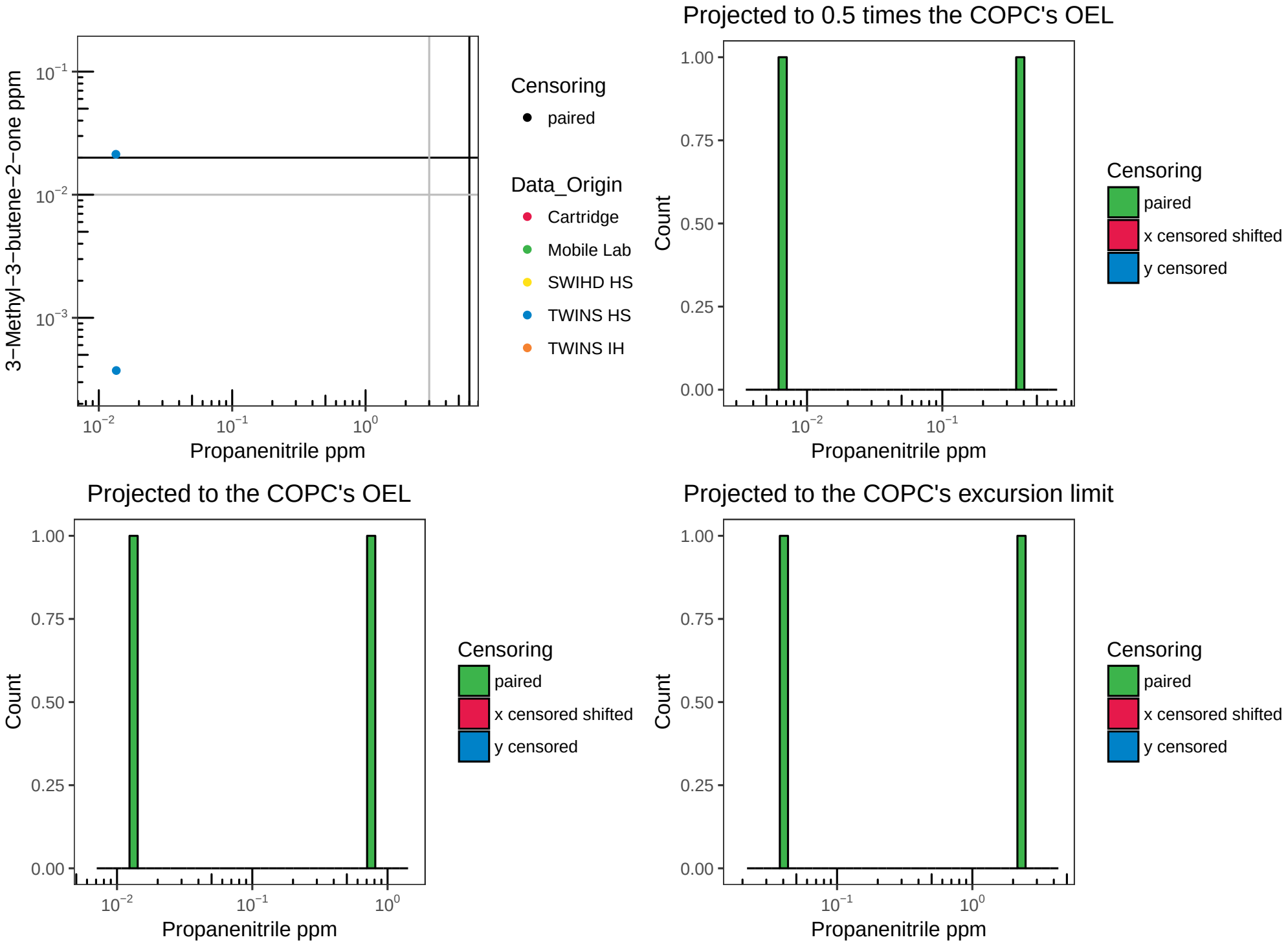


Figure C.1683: 3-Methyl-3-butene-2-one vs Propanenitrile

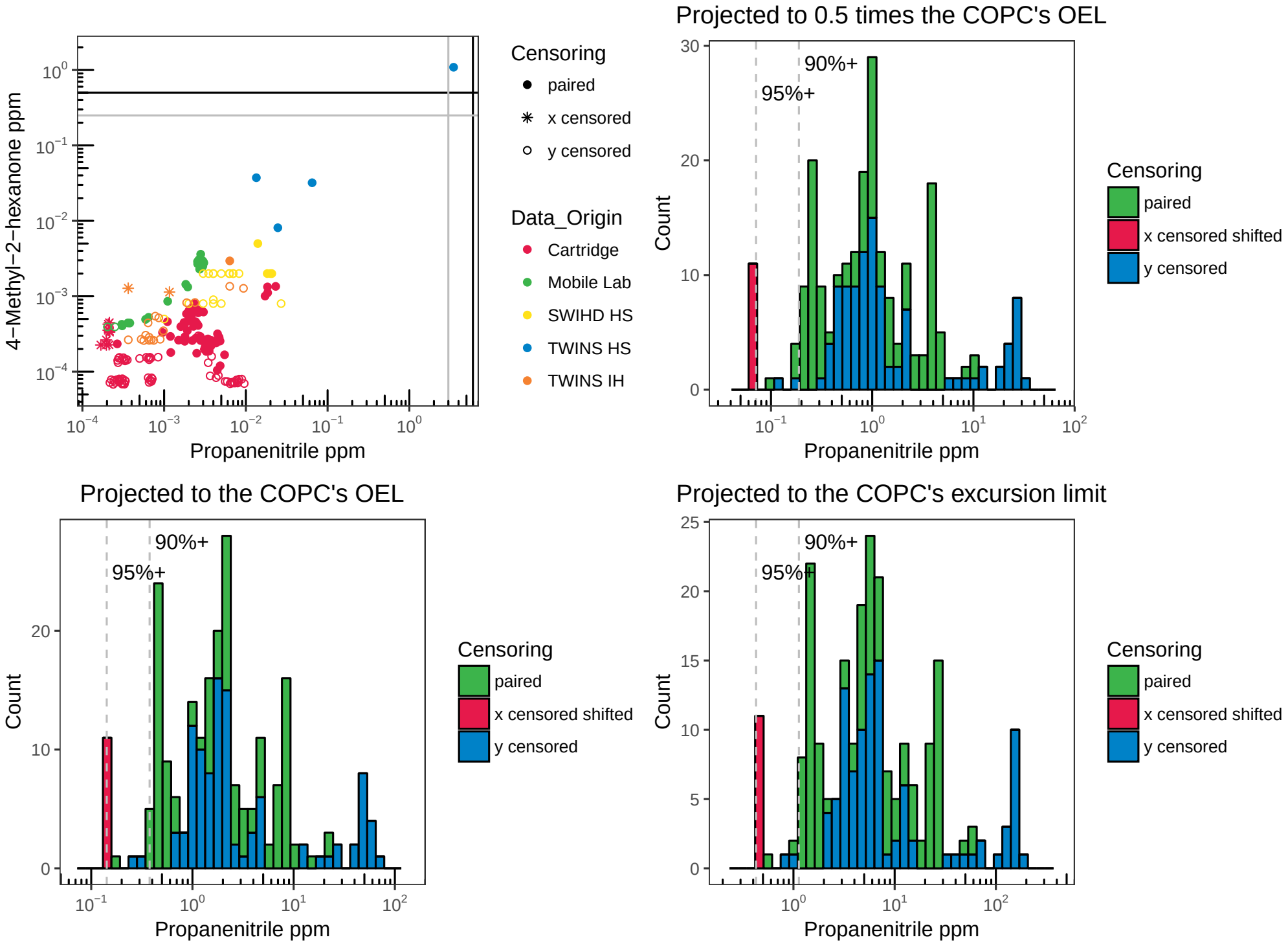


Figure C.1684: 4-Methyl-2-hexanone vs Propanenitrile

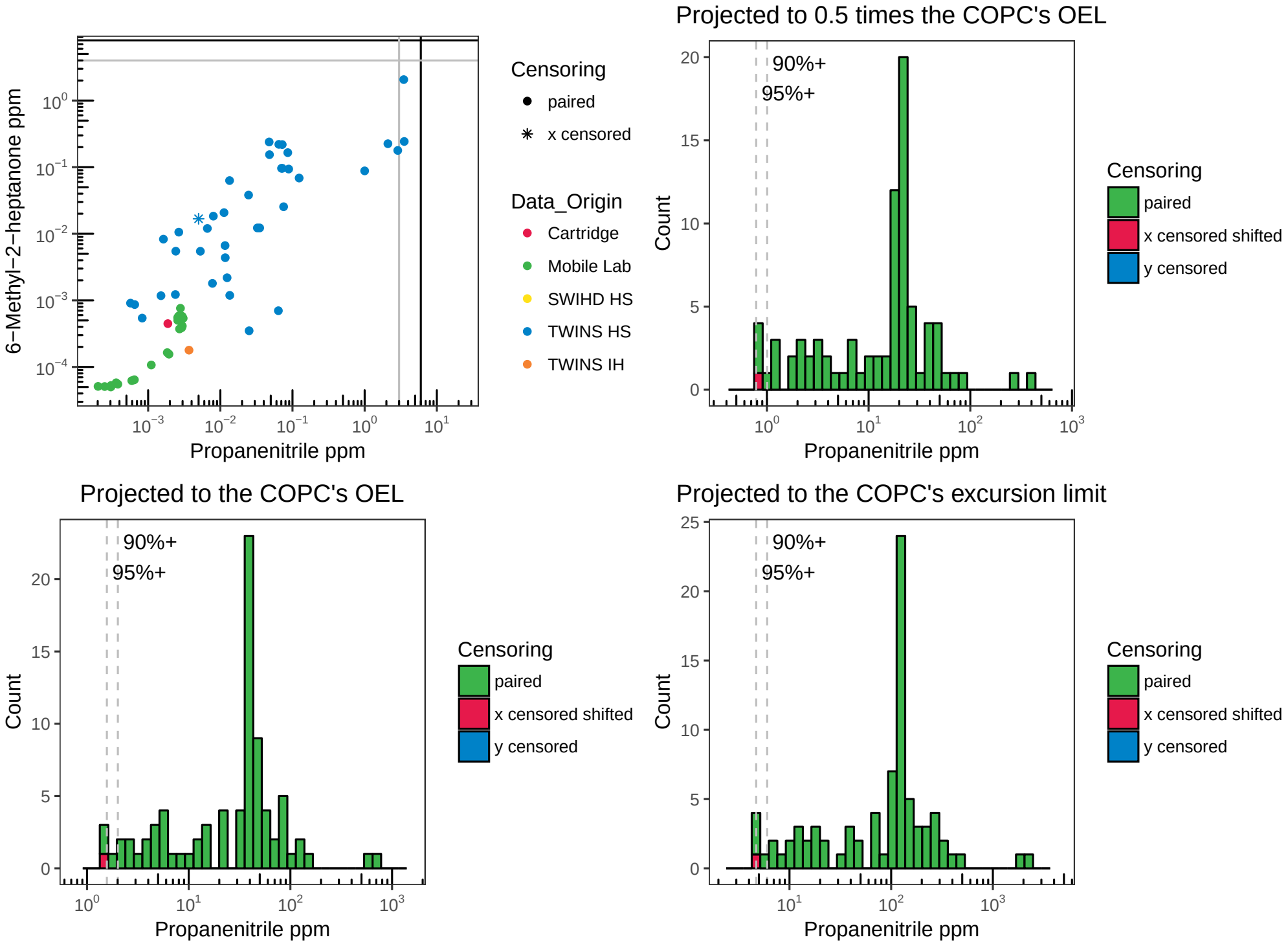


Figure C.1685: 6-Methyl-2-heptanone vs Propanenitrile

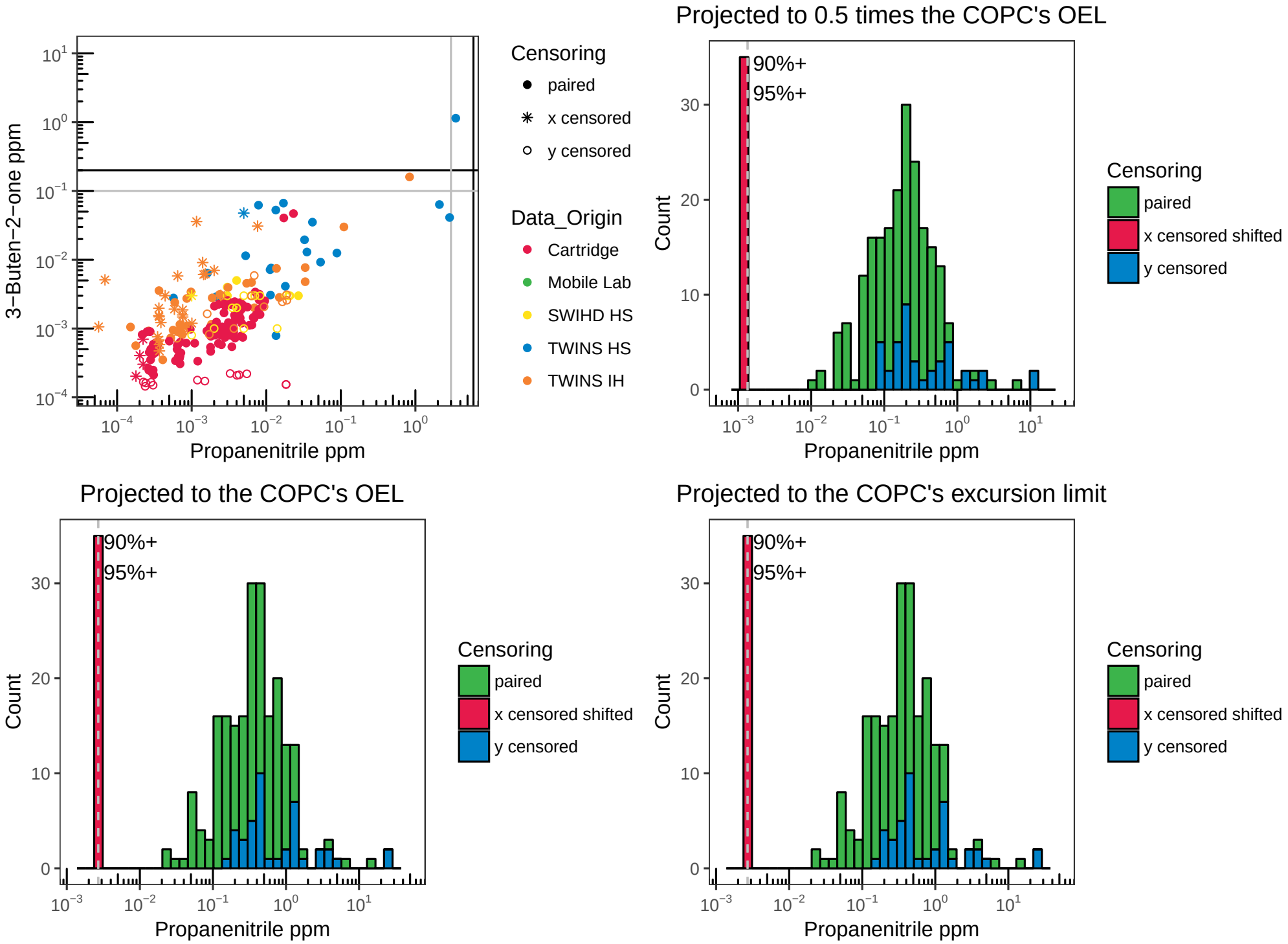


Figure C.1686: 3-Buten-2-one vs Propanenitrile

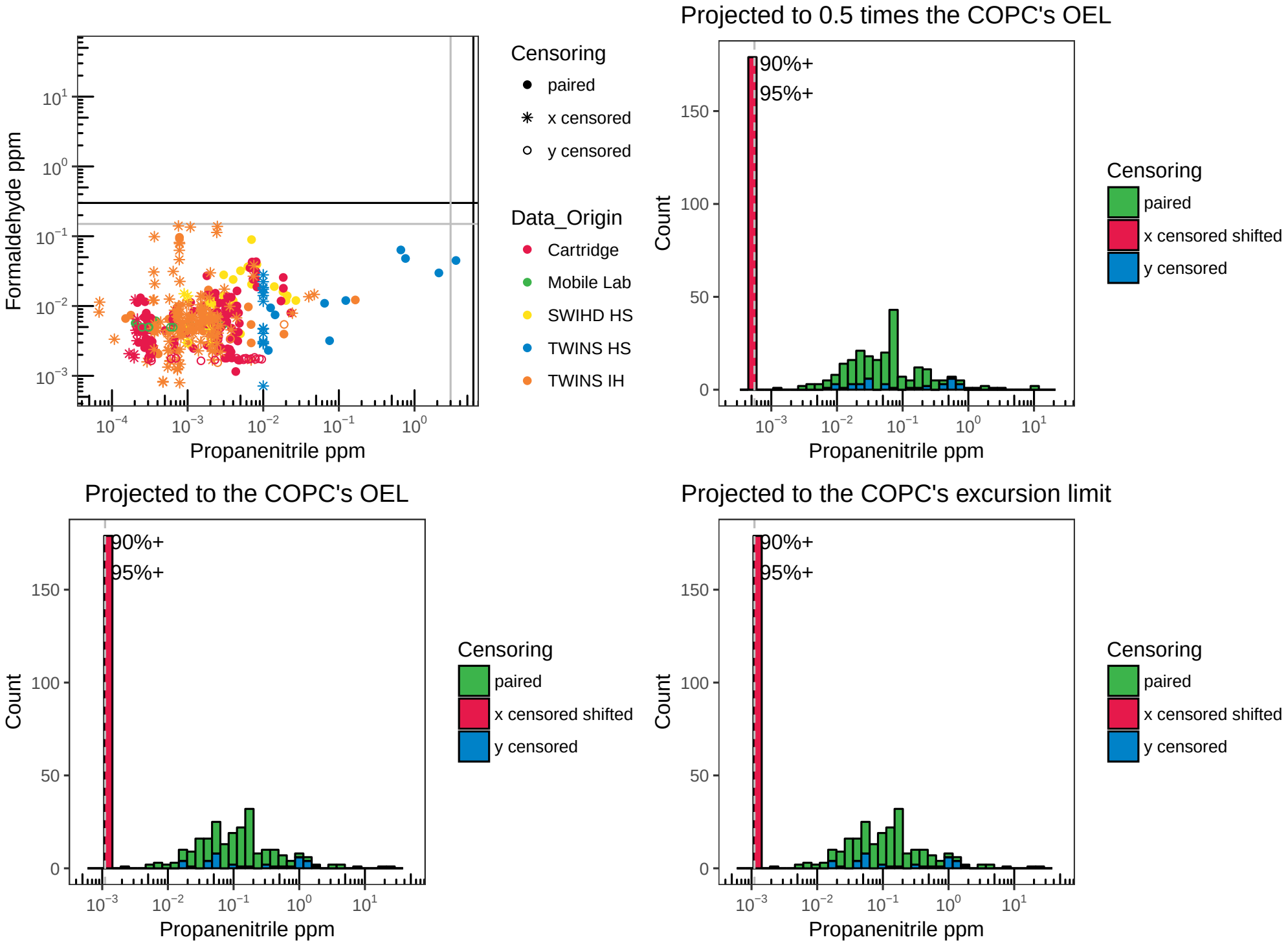


Figure C.1687: Formaldehyde vs Propanenitrile

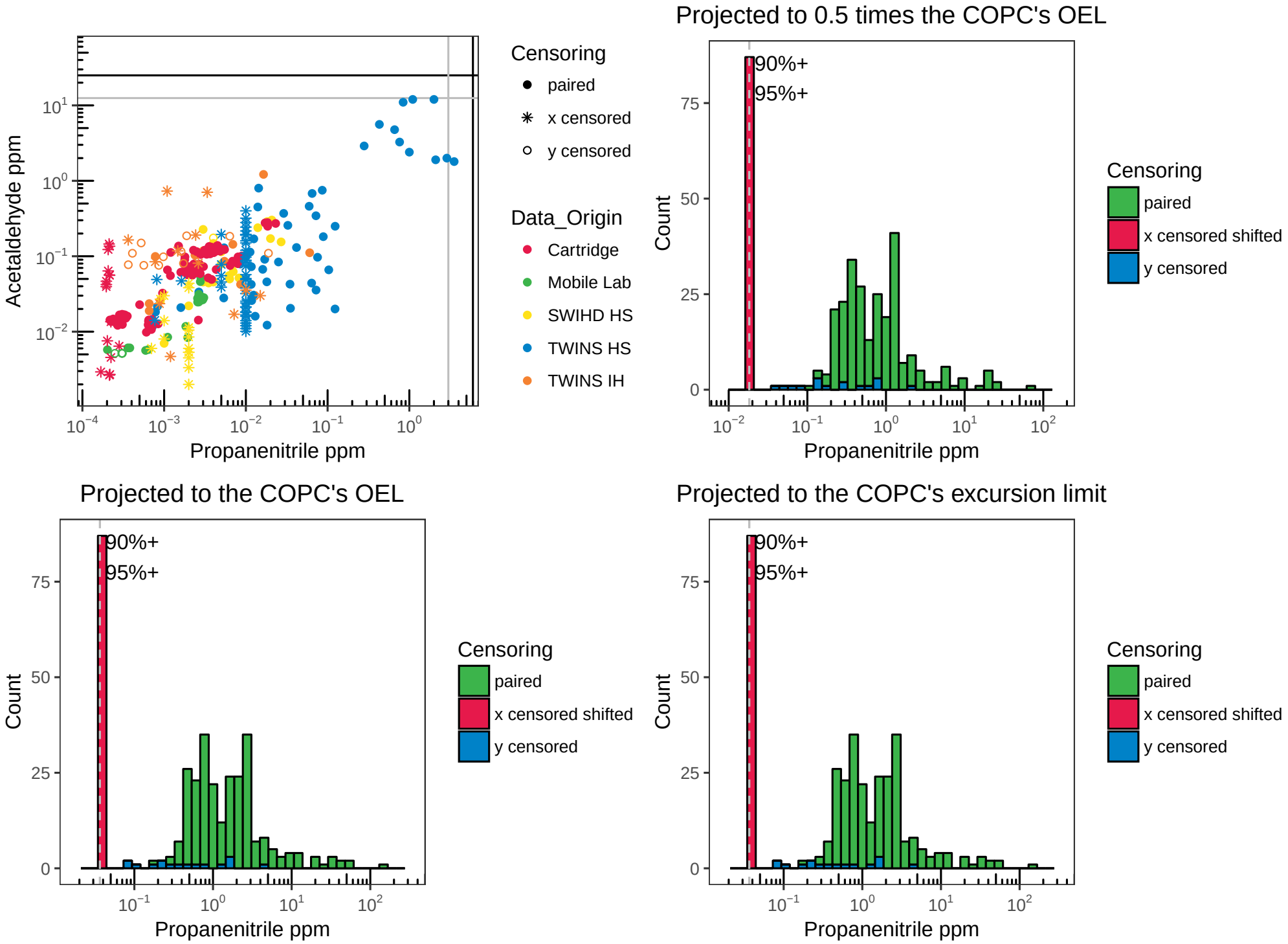


Figure C.1688: Acetaldehyde vs Propanenitrile

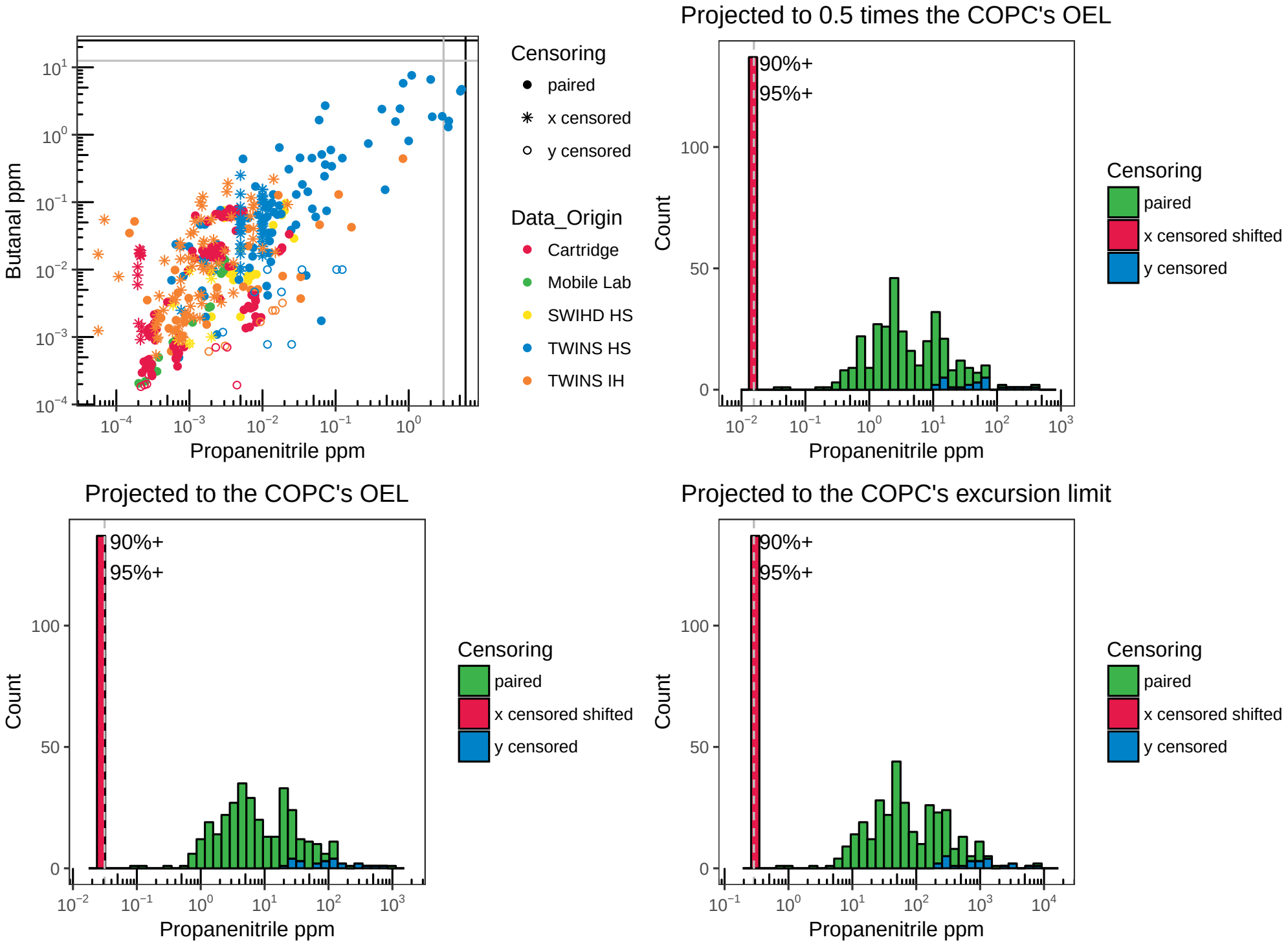


Figure C.1689: Butanal vs Propanenitrile

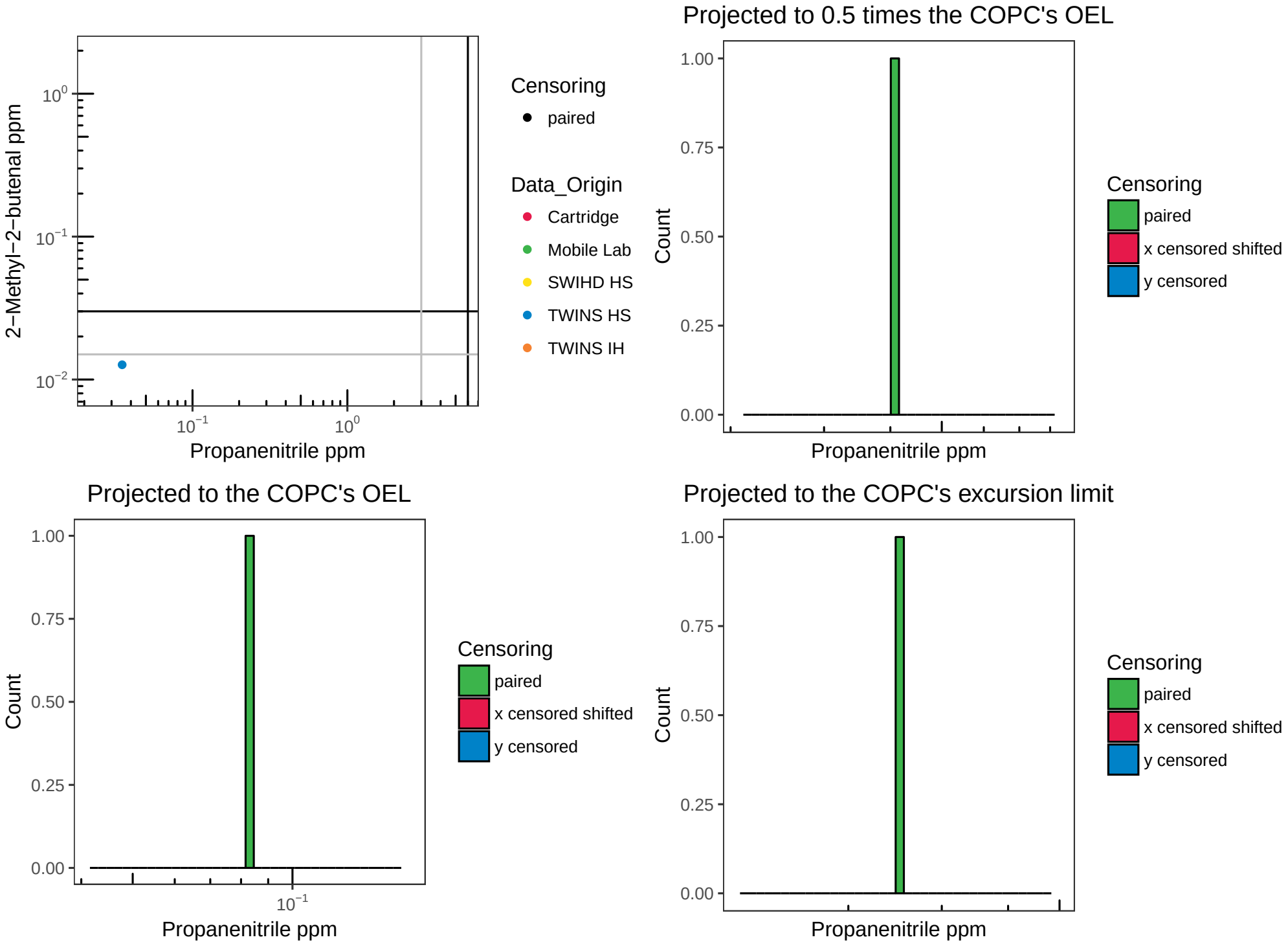


Figure C.1690: 2-Methyl-2-butenal vs Propanenitrile

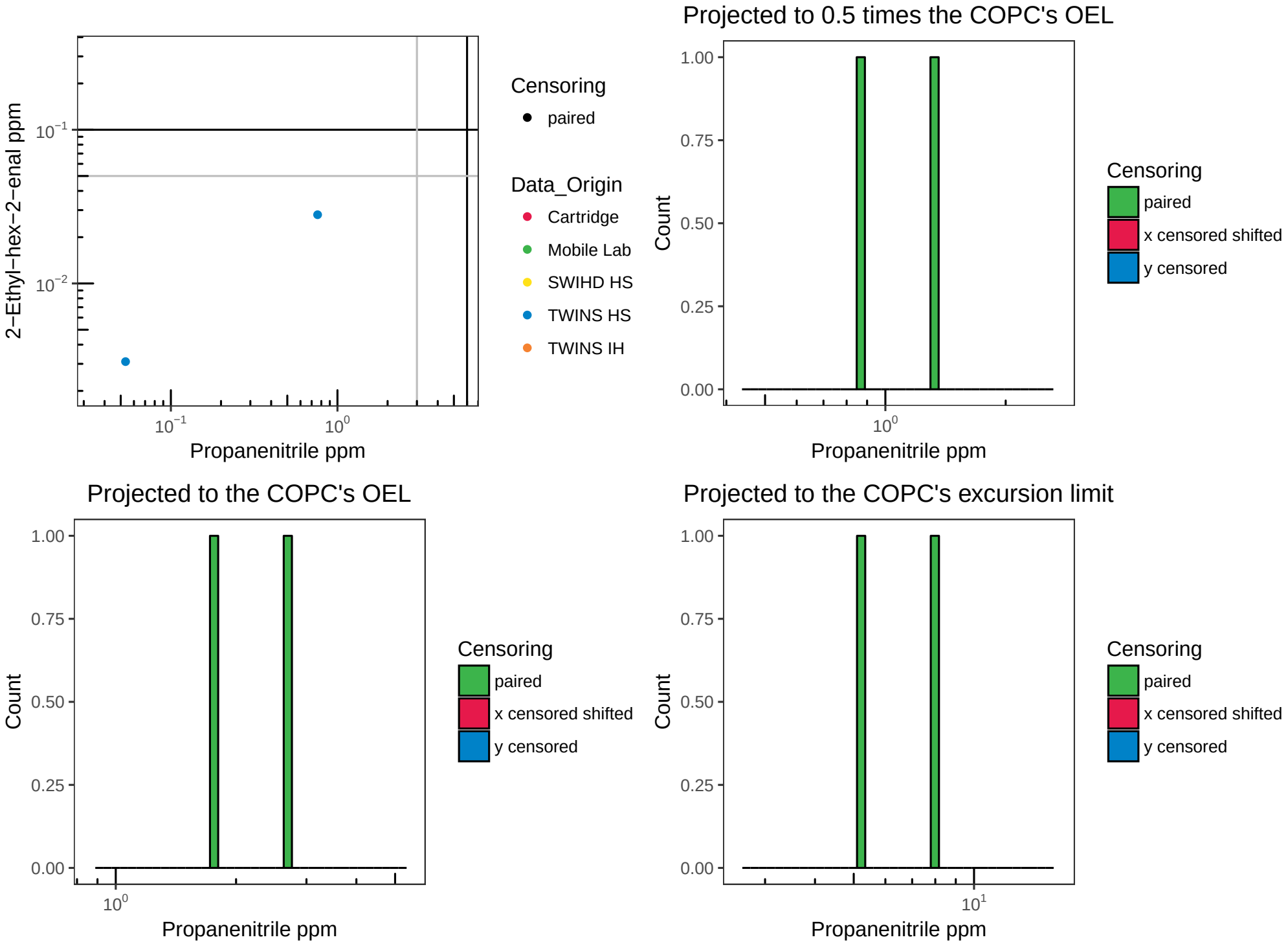


Figure C.1691: 2-Ethyl-hex-2-enal vs Propanenitrile

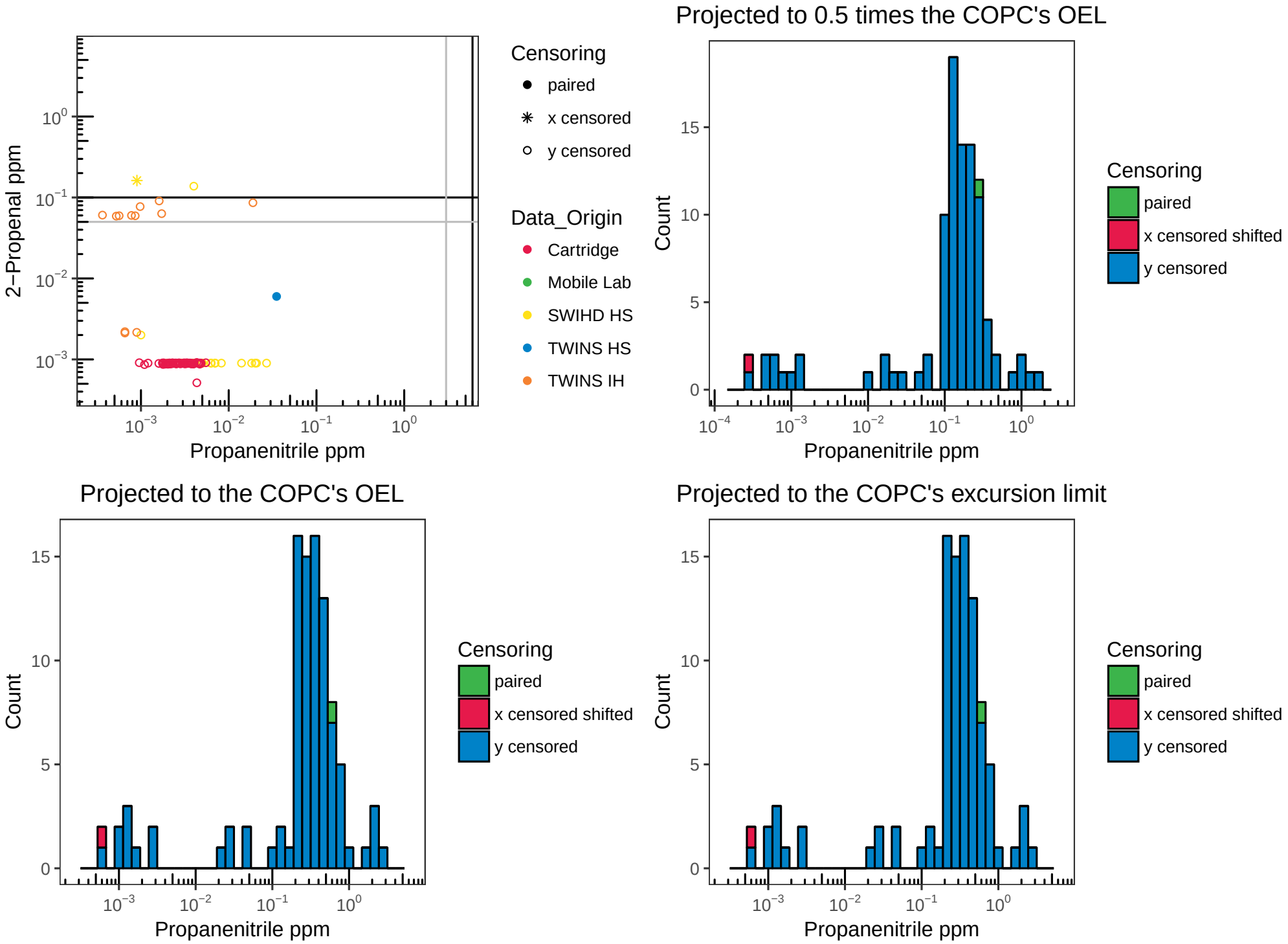


Figure C.1692: 2-Propenal vs Propanenitrile

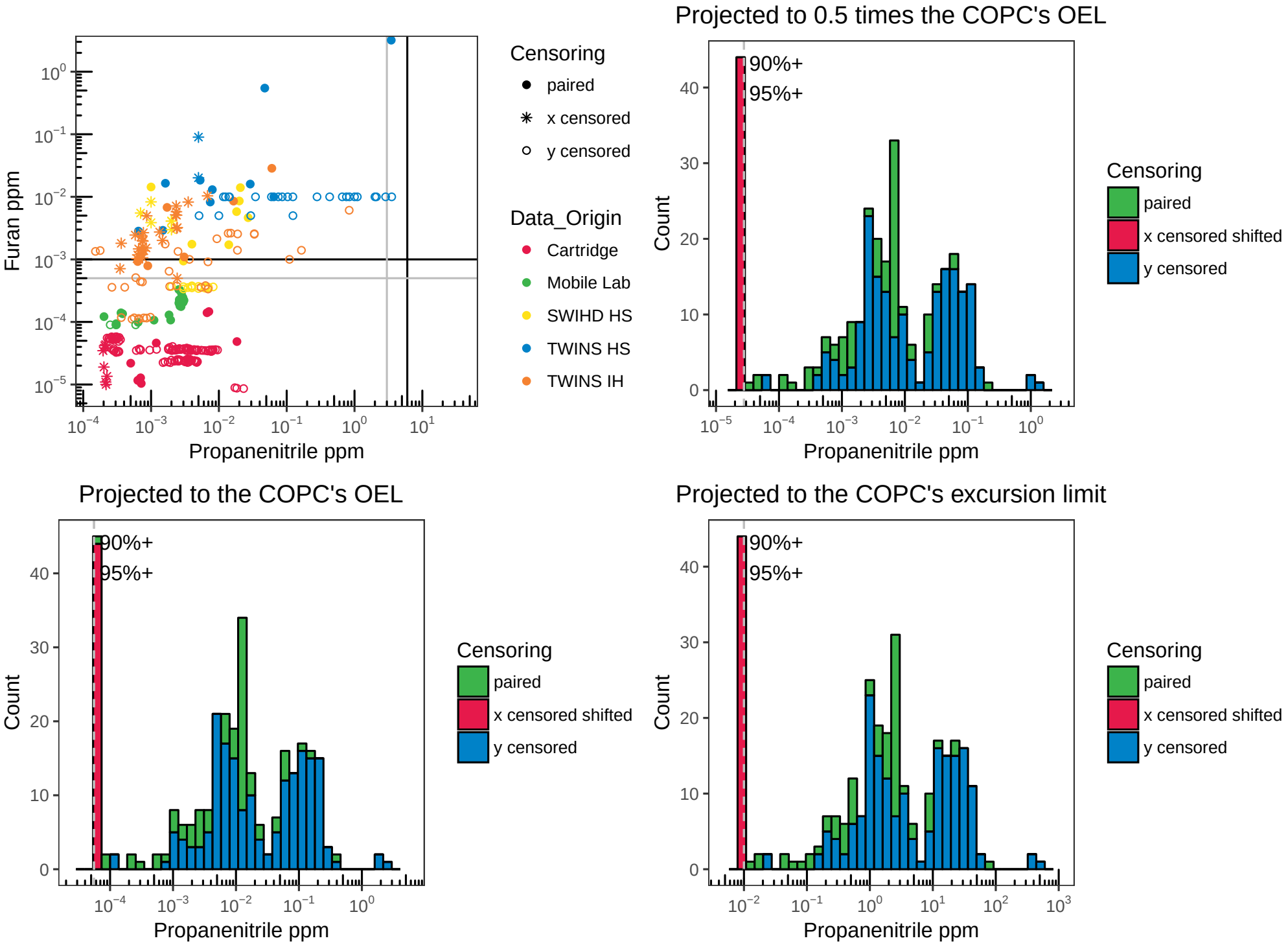


Figure C.1693: Furan vs Propanenitrile

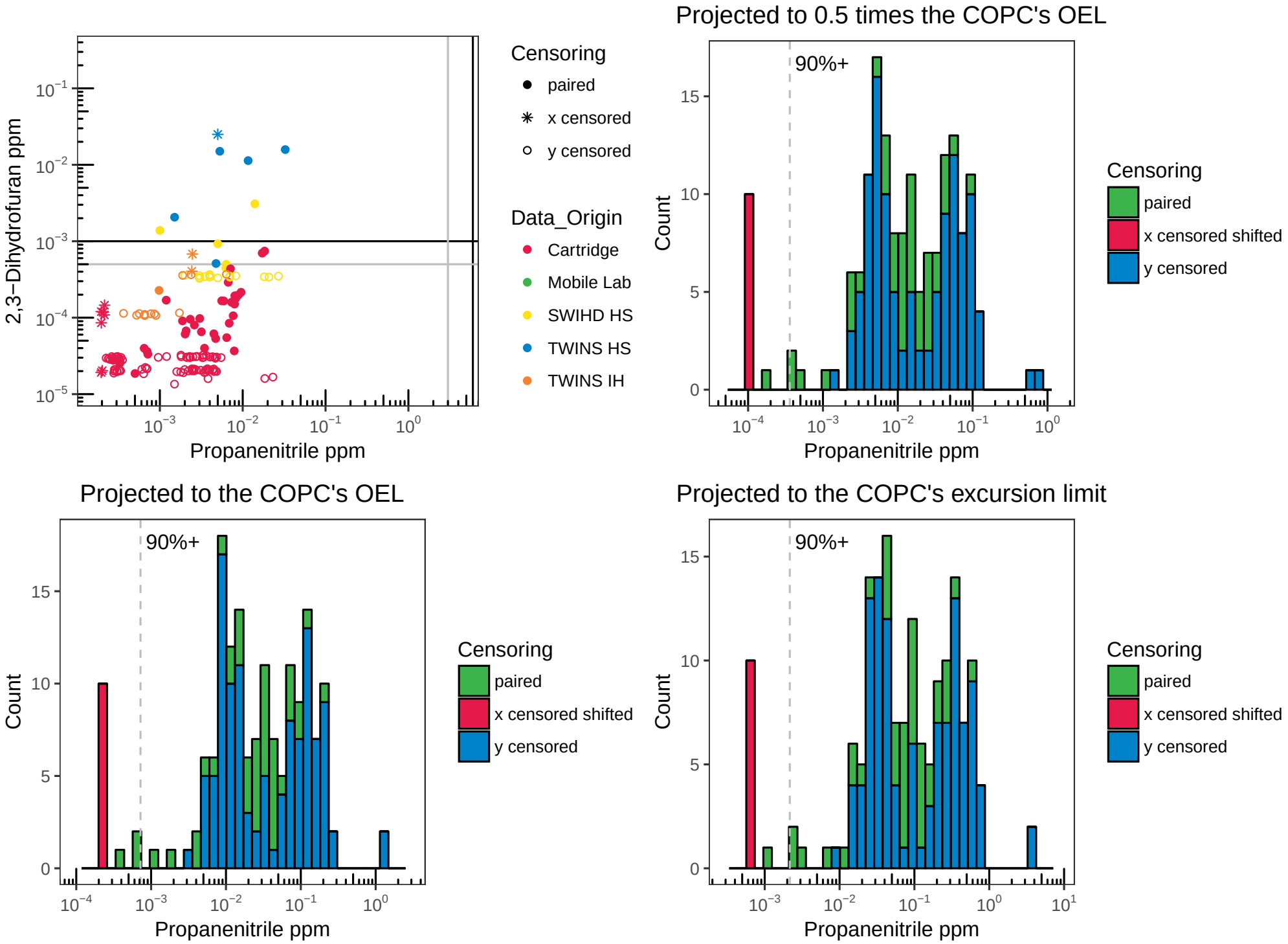


Figure C.1694: 2,3-Dihydrofuran vs Propanenitrile

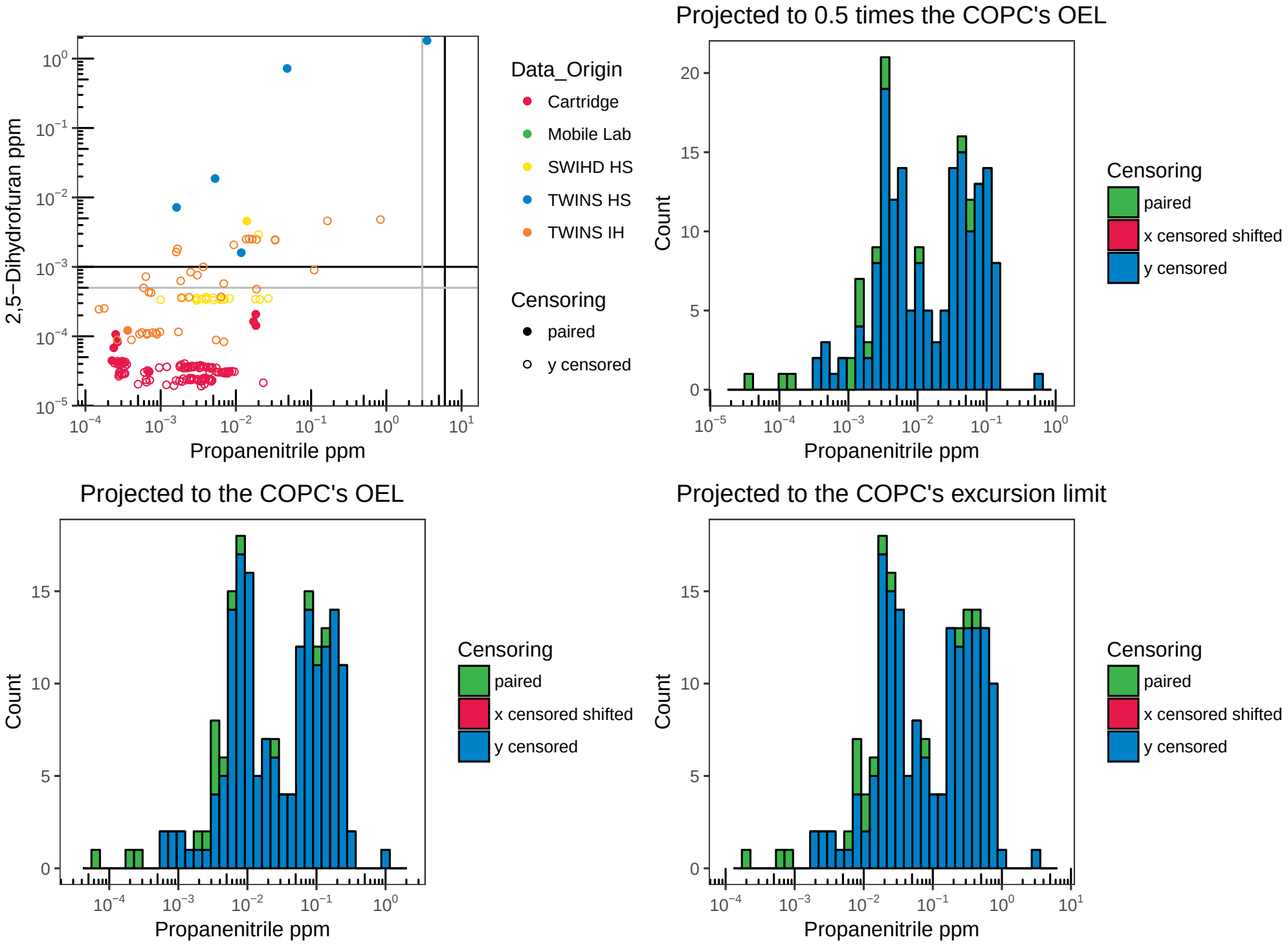


Figure C.1695: 2,5-Dihydrofuran vs Propanenitrile

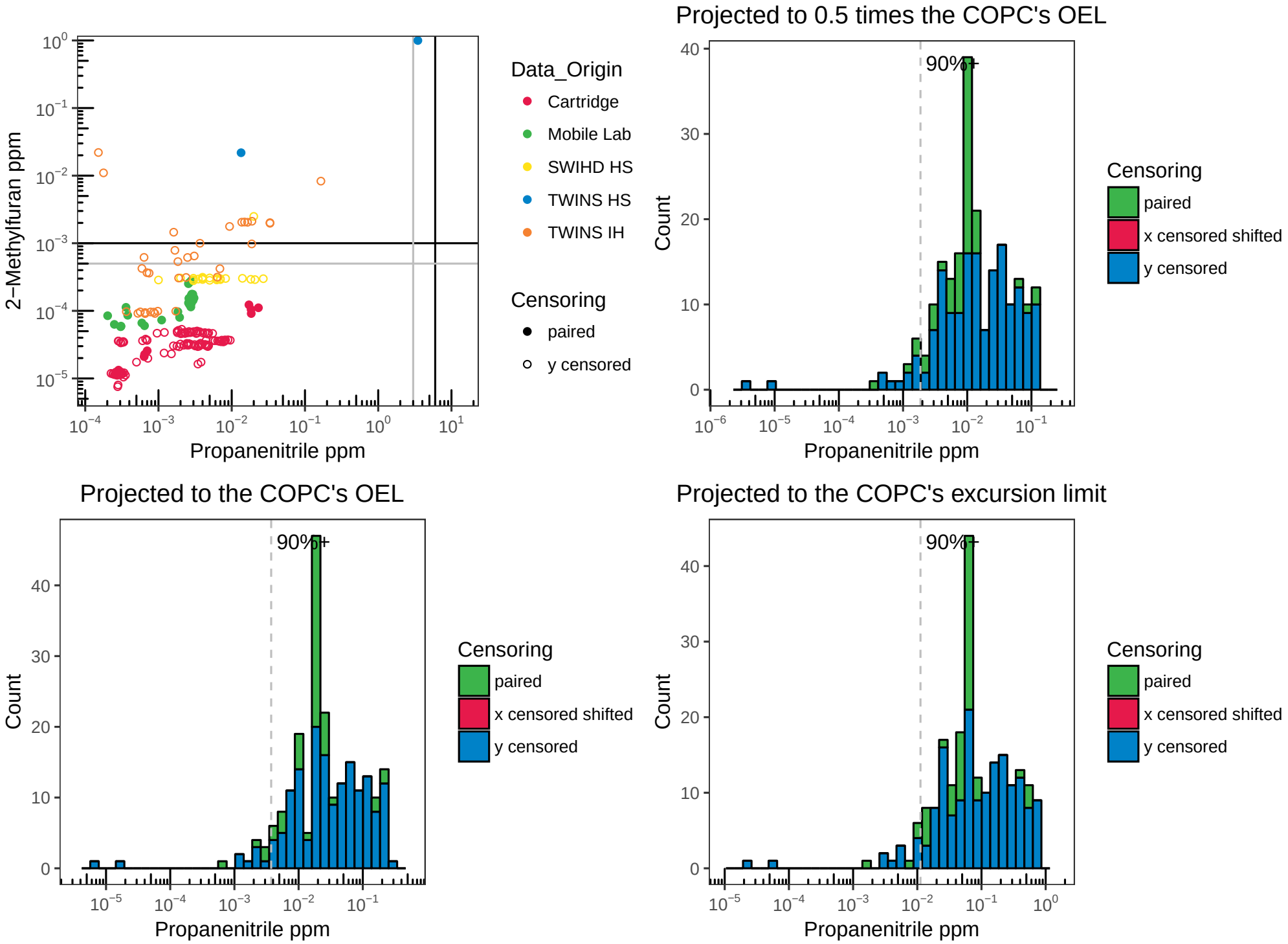


Figure C.1696: 2-Methylfuran vs Propanenitrile

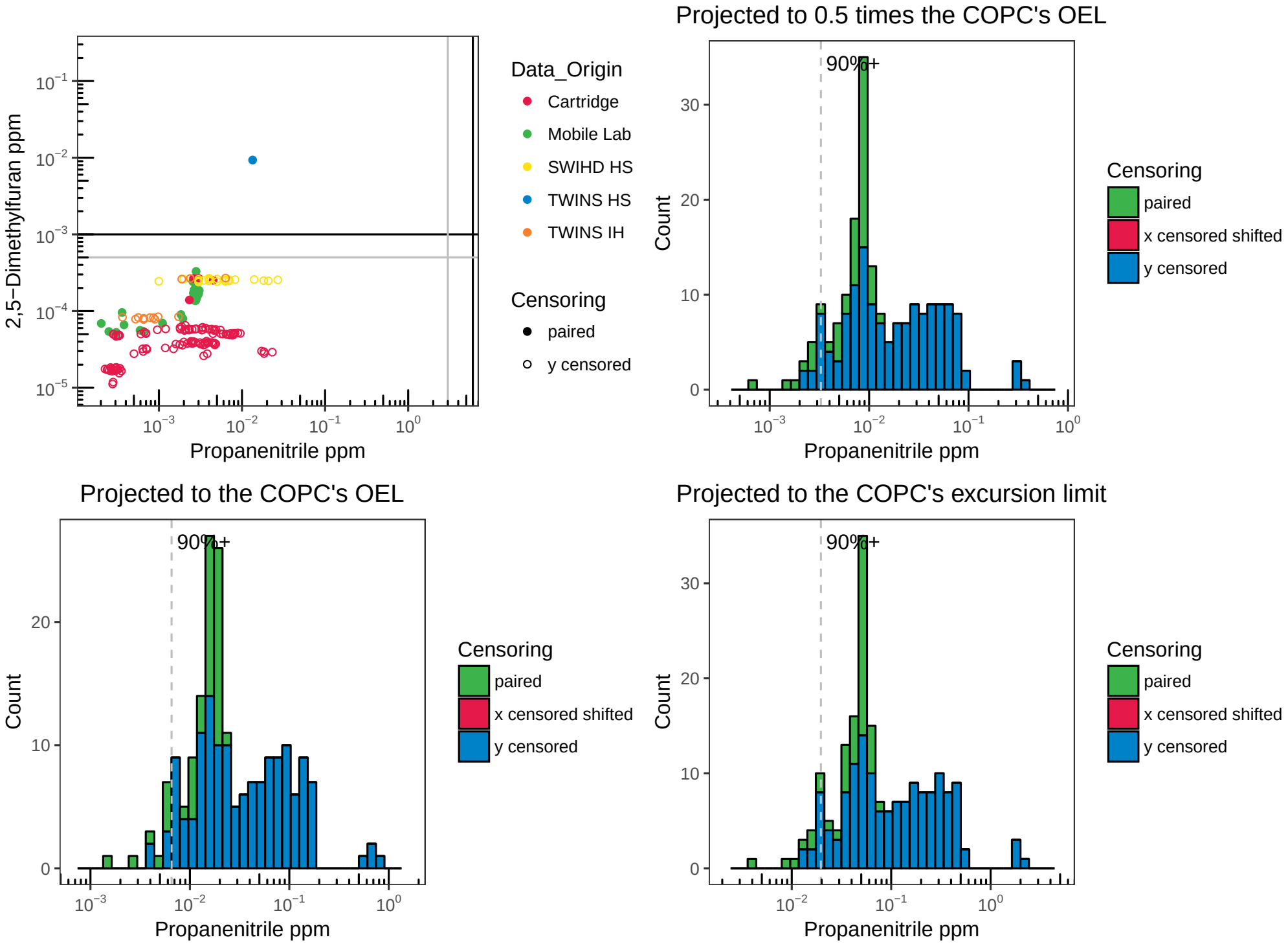


Figure C.1697: 2,5-Dimethylfuran vs Propanenitrile

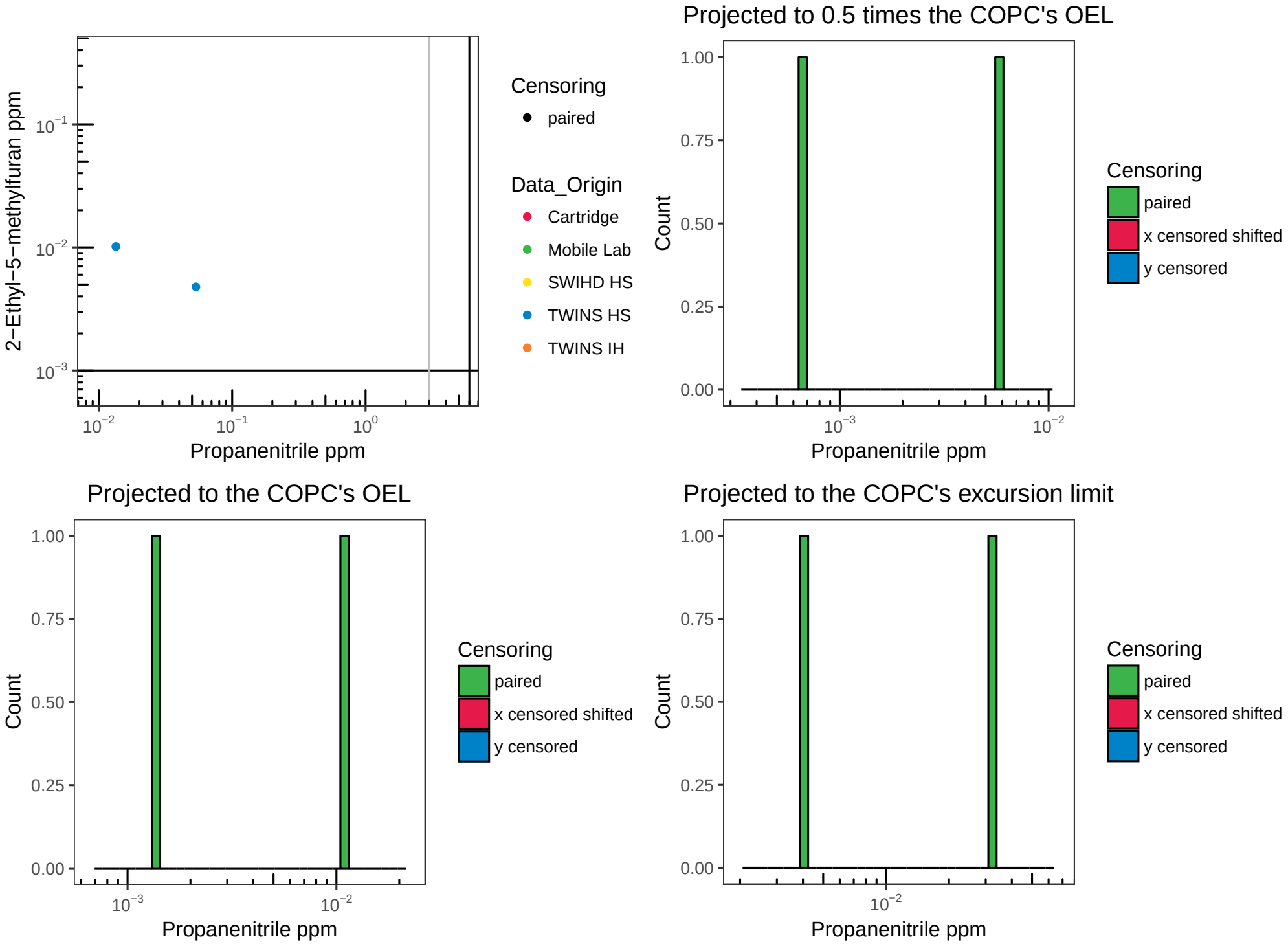


Figure C.1698: 2-Ethyl-5-methylfuran vs Propanenitrile

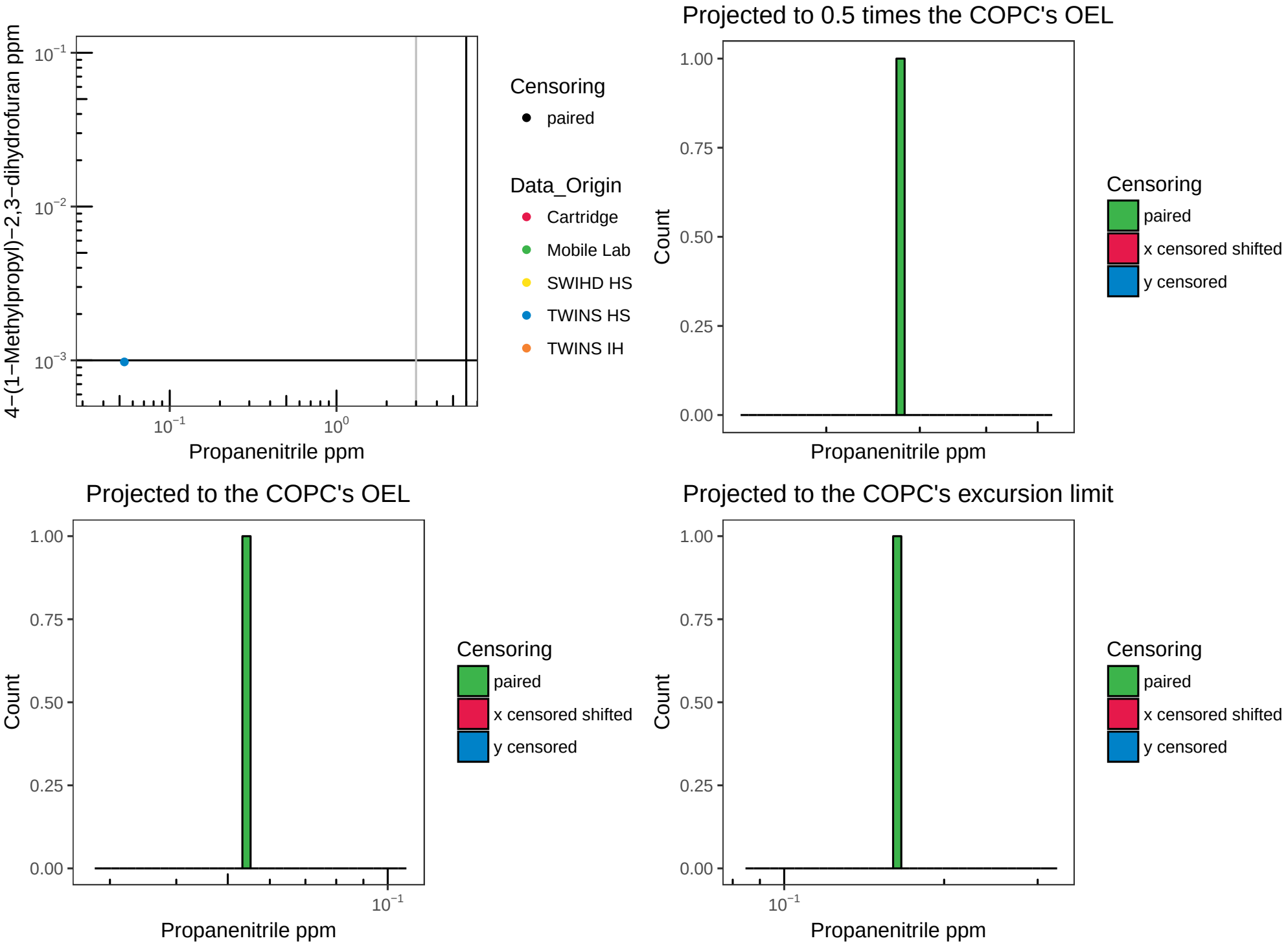


Figure C.1699: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Propanenitrile

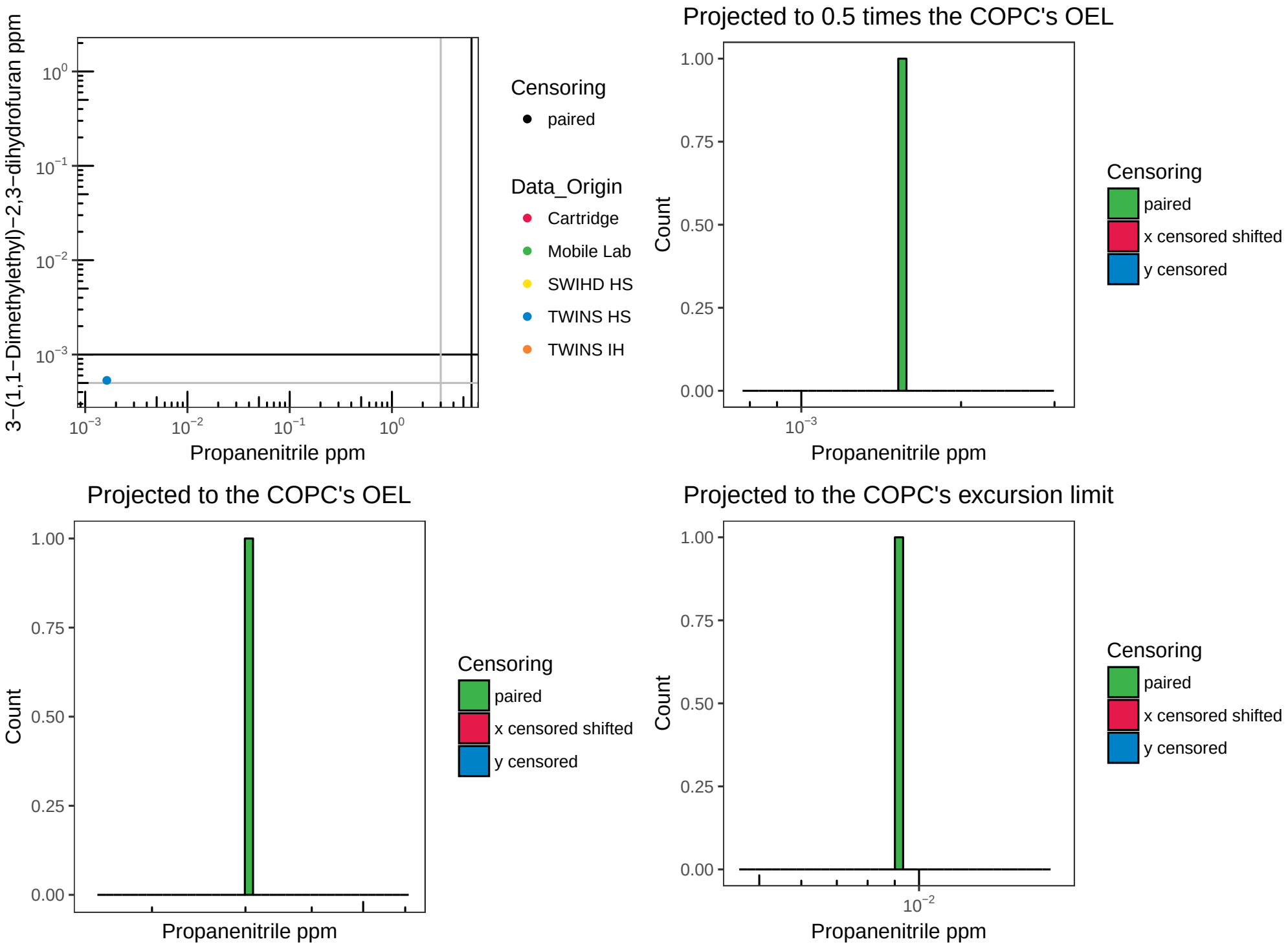


Figure C.1700: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Propanenitrile

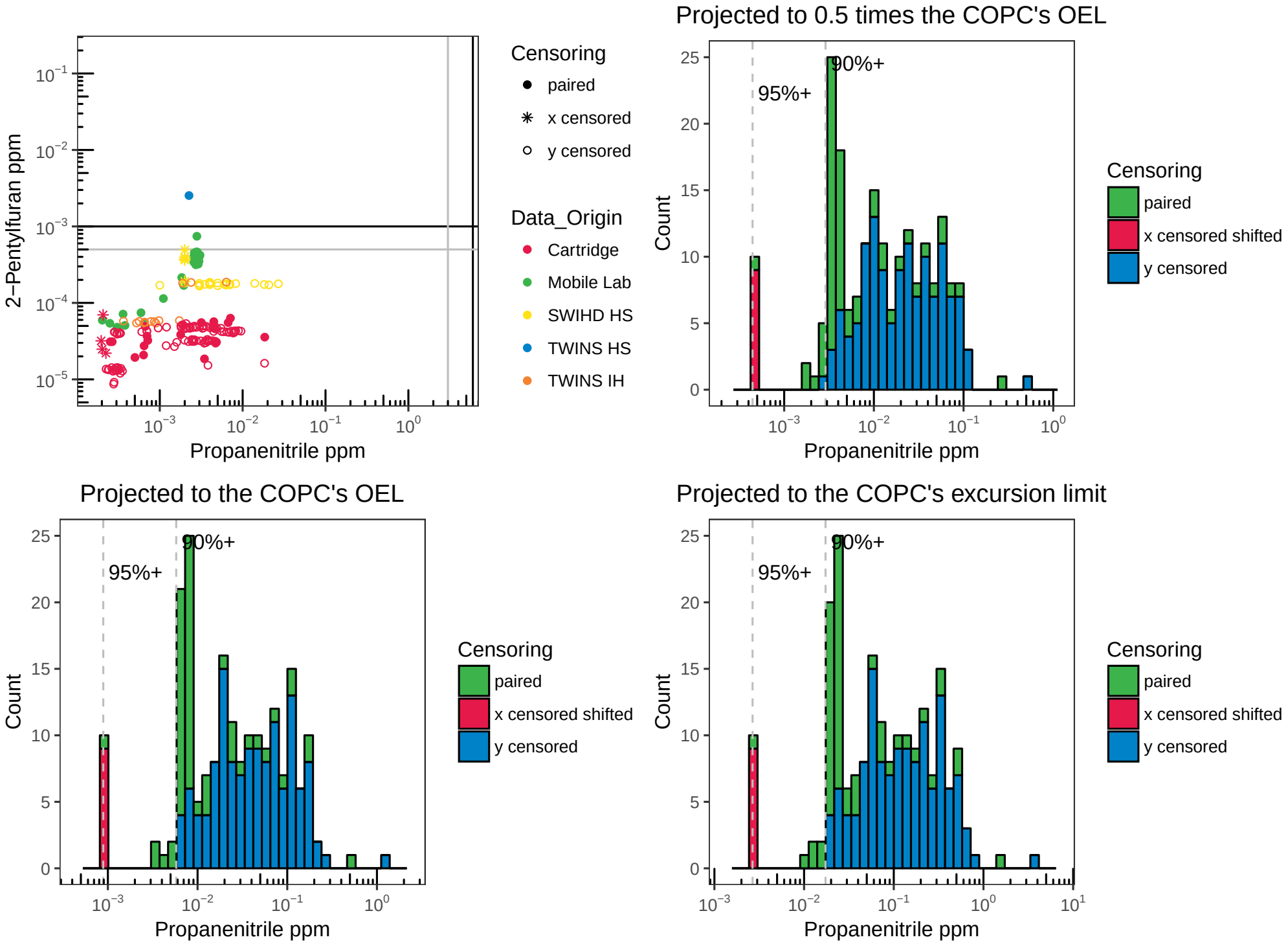


Figure C.1701: 2-Pentylfuran vs Propanenitrile

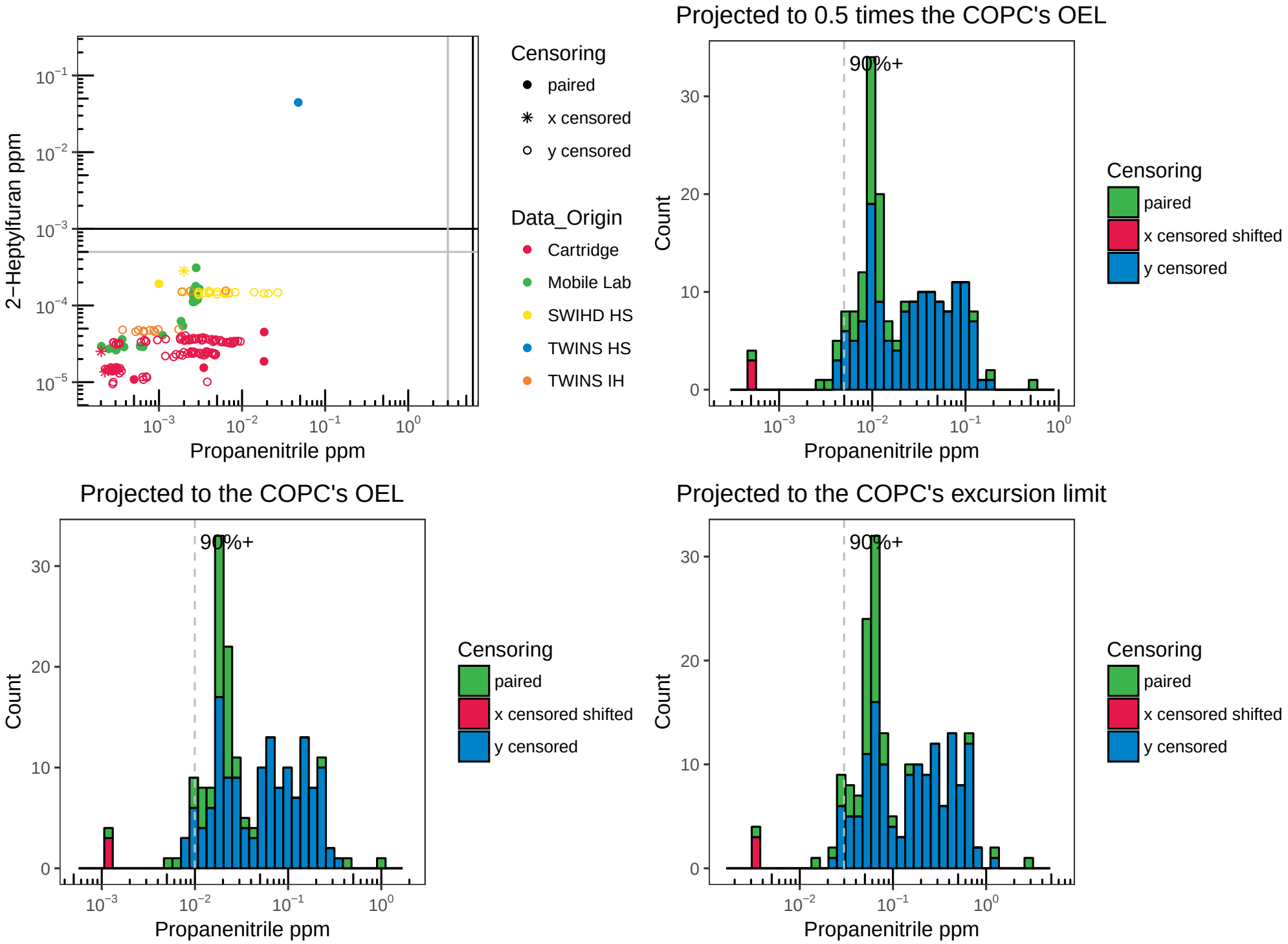


Figure C.1702: 2-Heptylfuran vs Propanenitrile

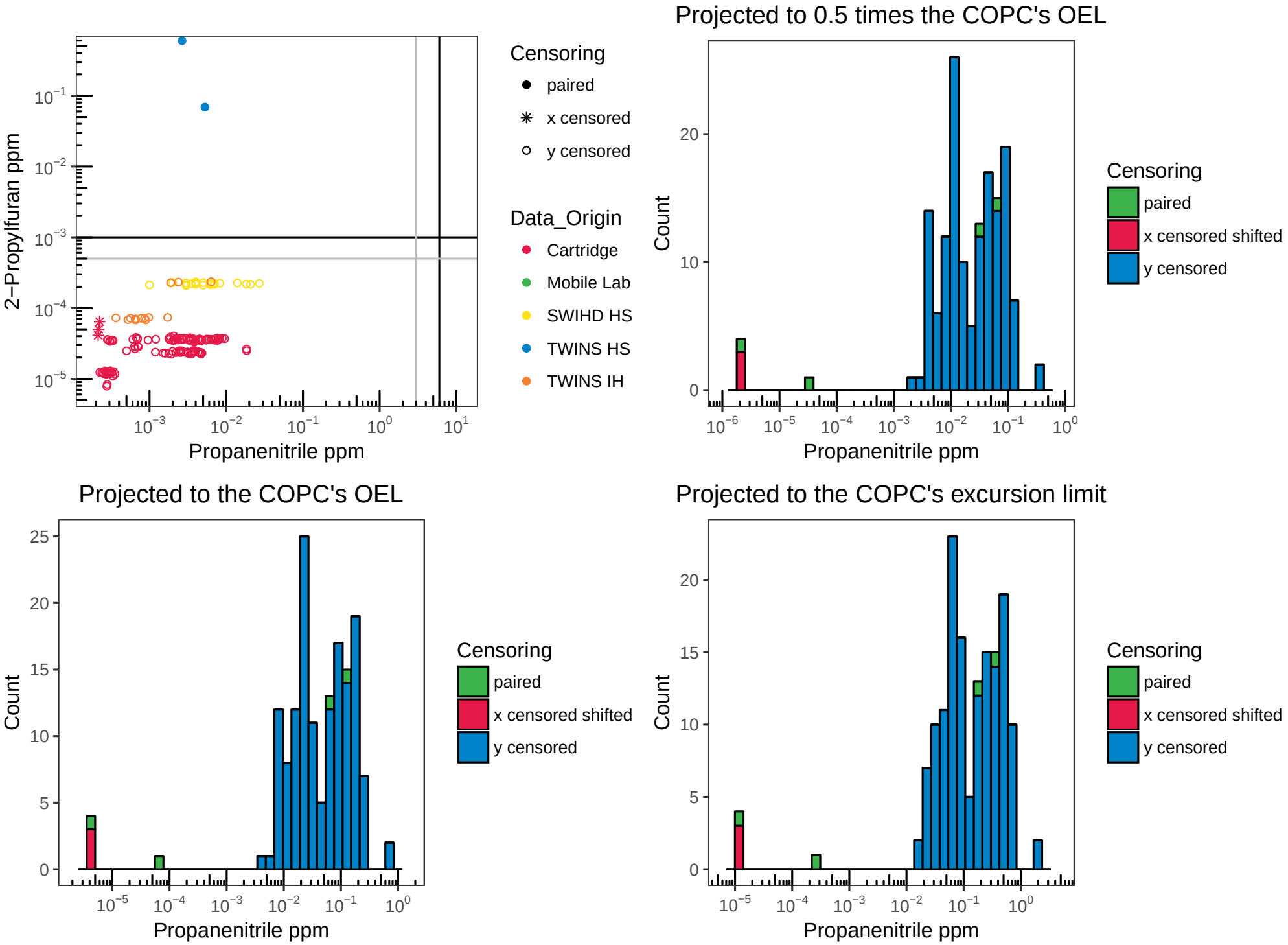


Figure C.1703: 2-Propylfuran vs Propanenitrile

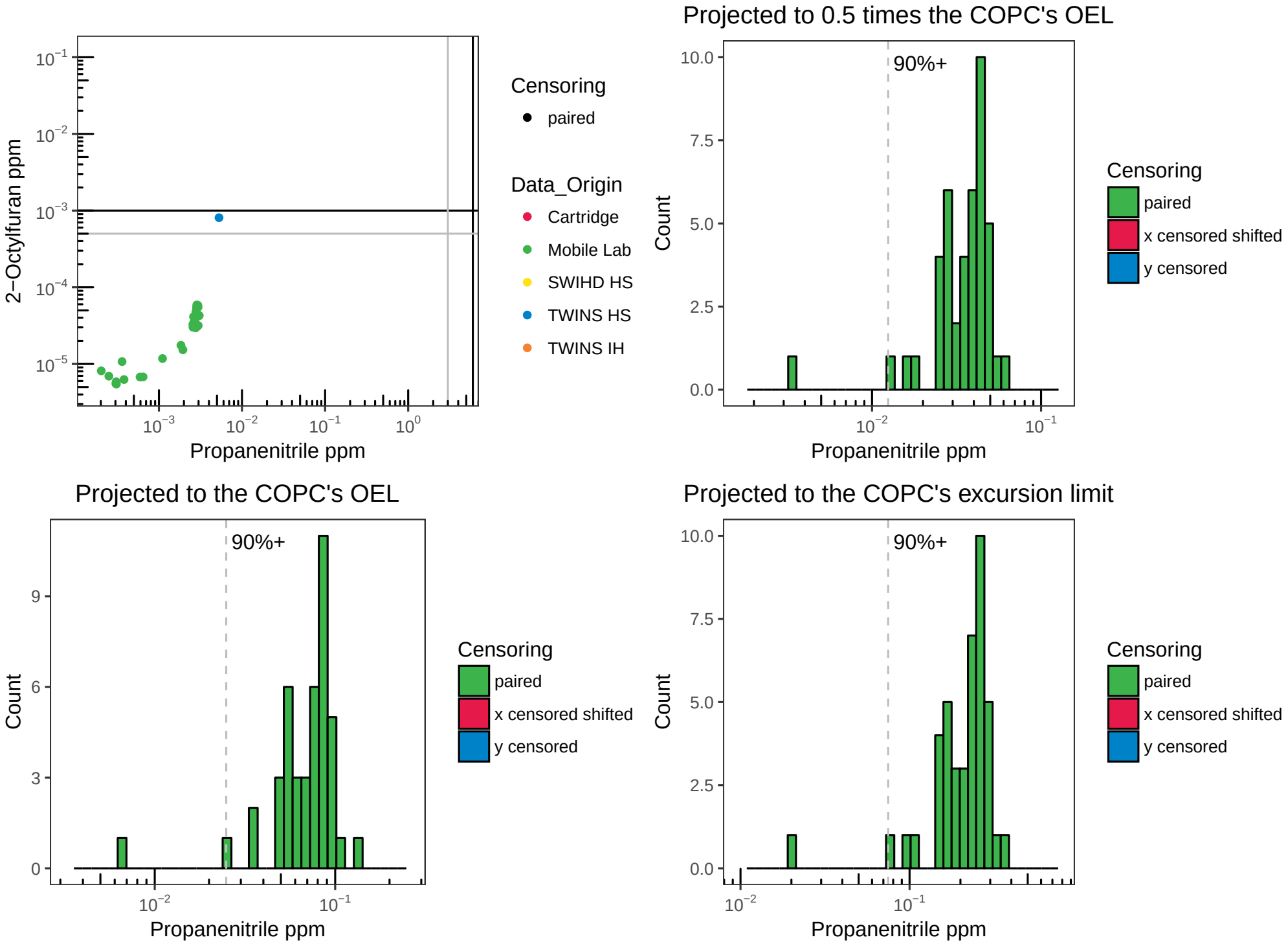


Figure C.1704: 2-Octylfuran vs Propanenitrile

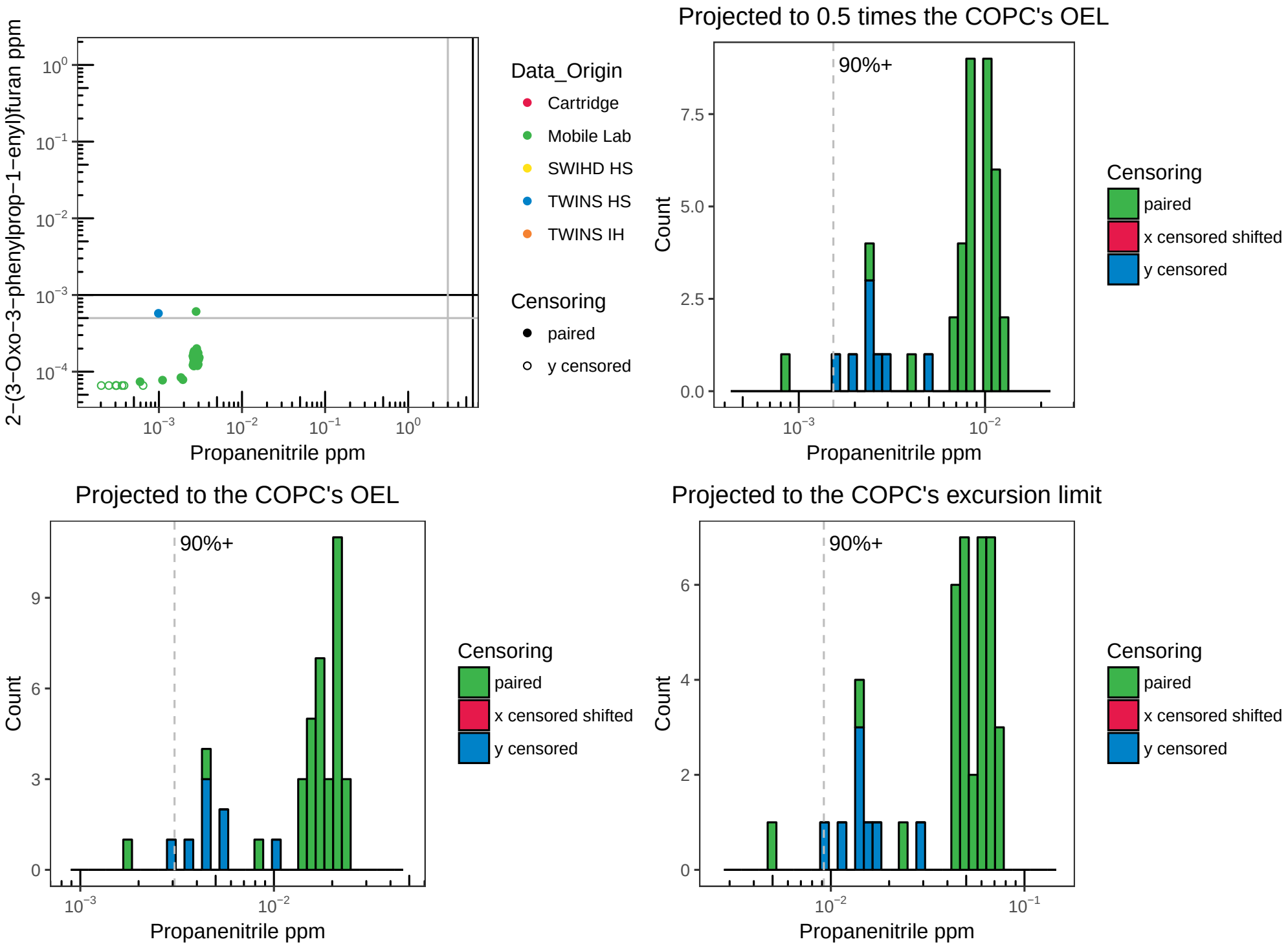


Figure C.1705: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Propanenitrile

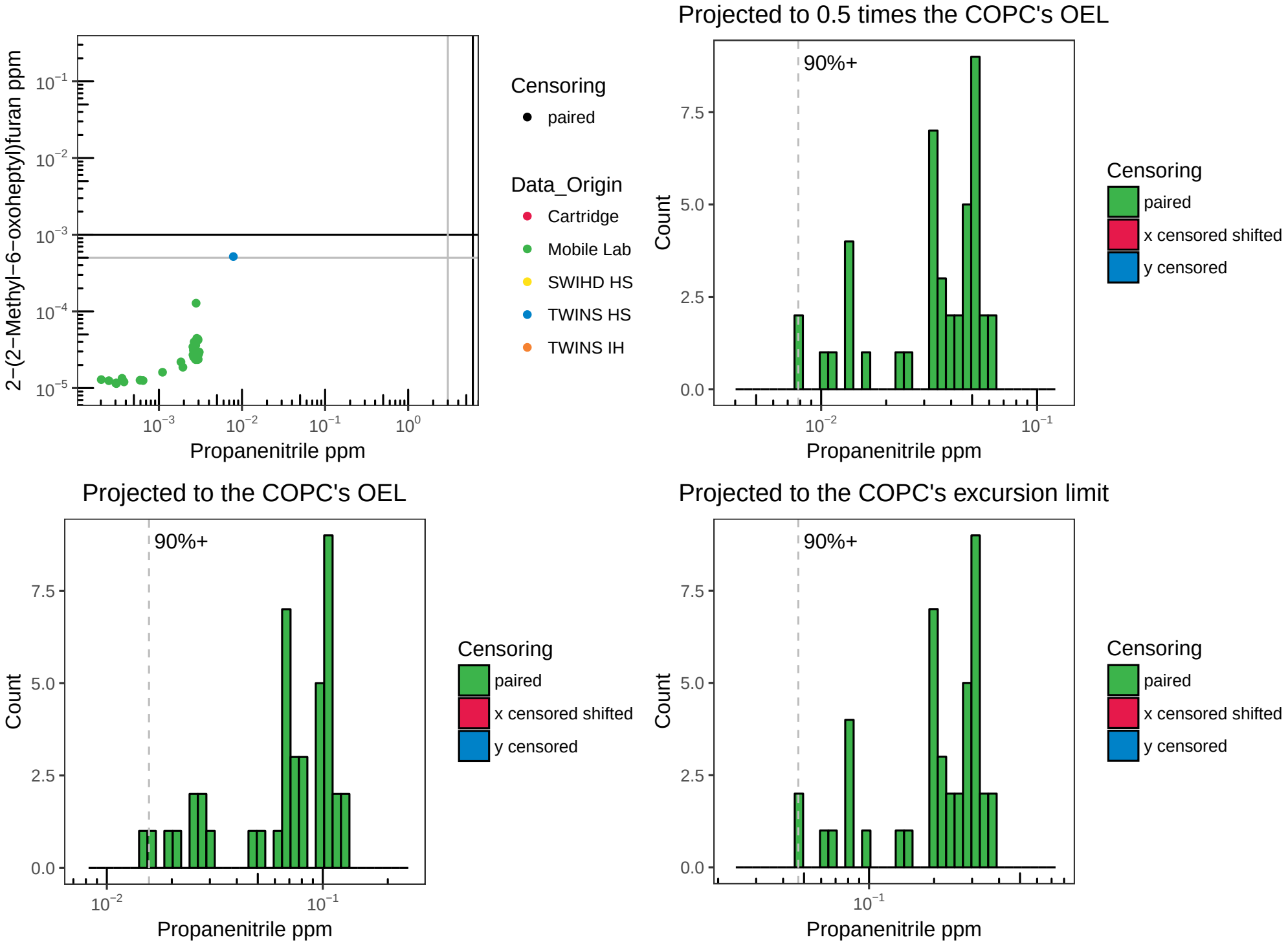


Figure C.1706: 2-(2-Methyl-6-oxoheptyl)furan vs Propanenitrile

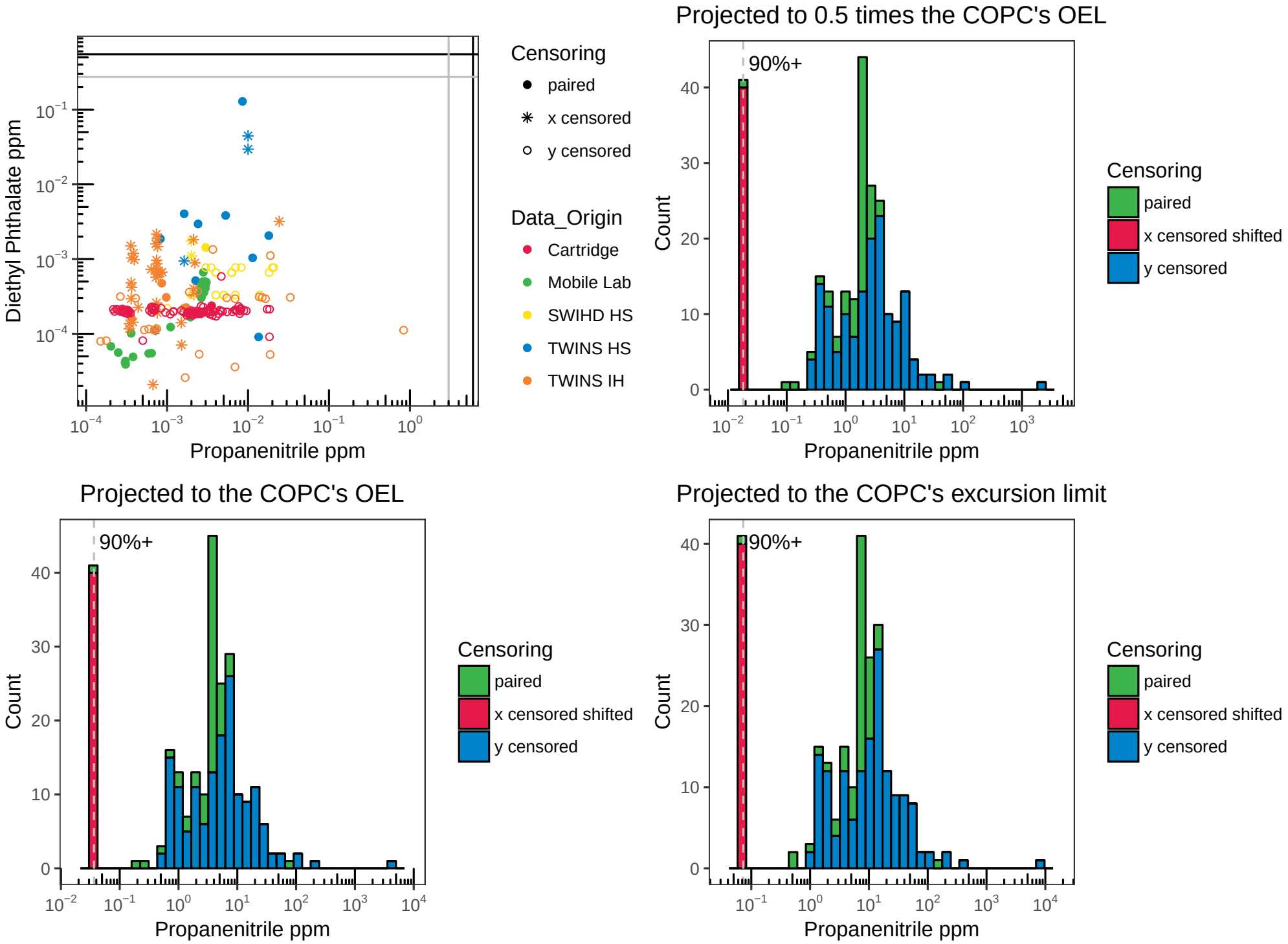


Figure C.1707: Diethyl Phthalate vs Propanenitrile

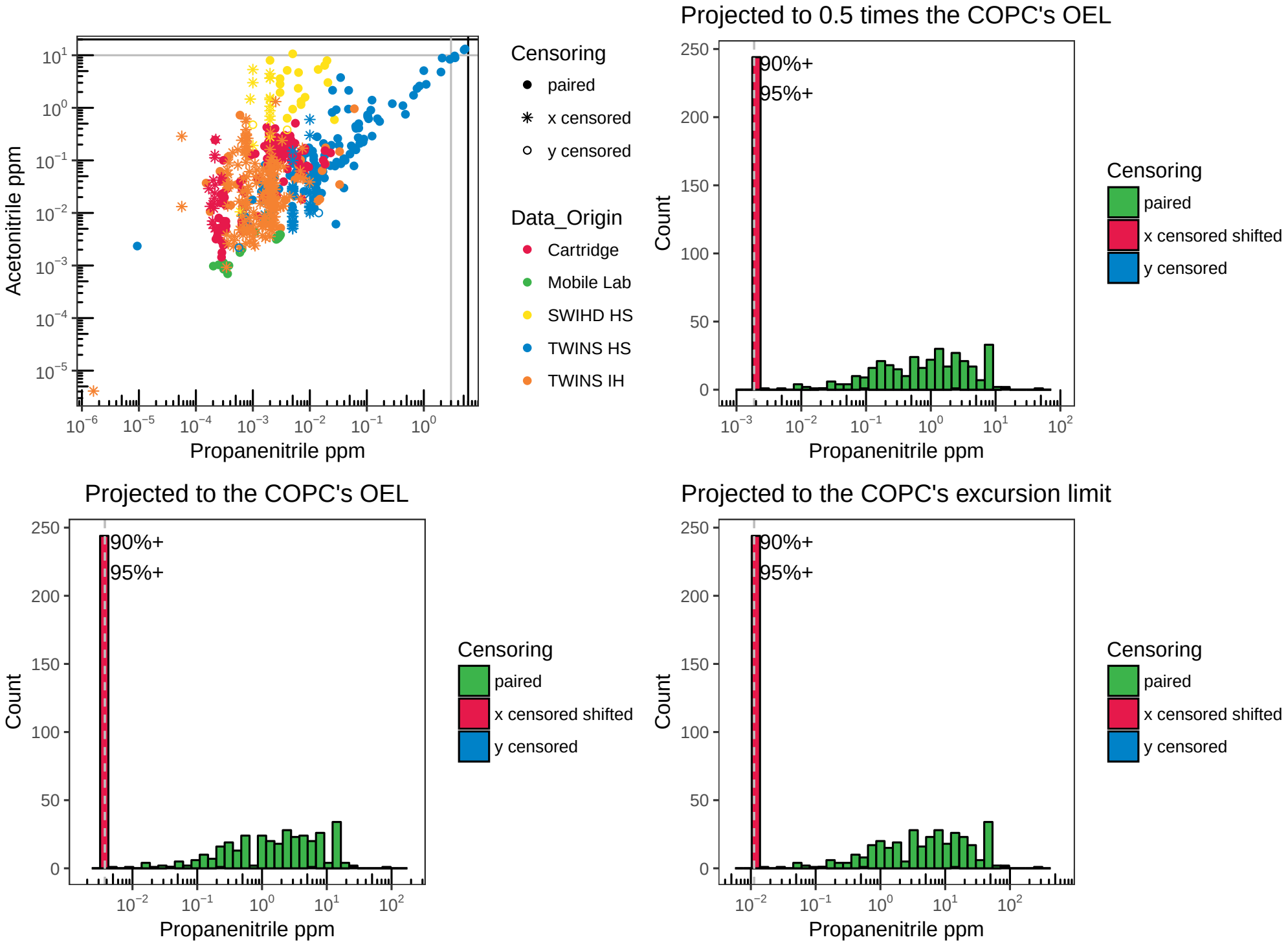


Figure C.1708: Acetonitrile vs Propanenitrile

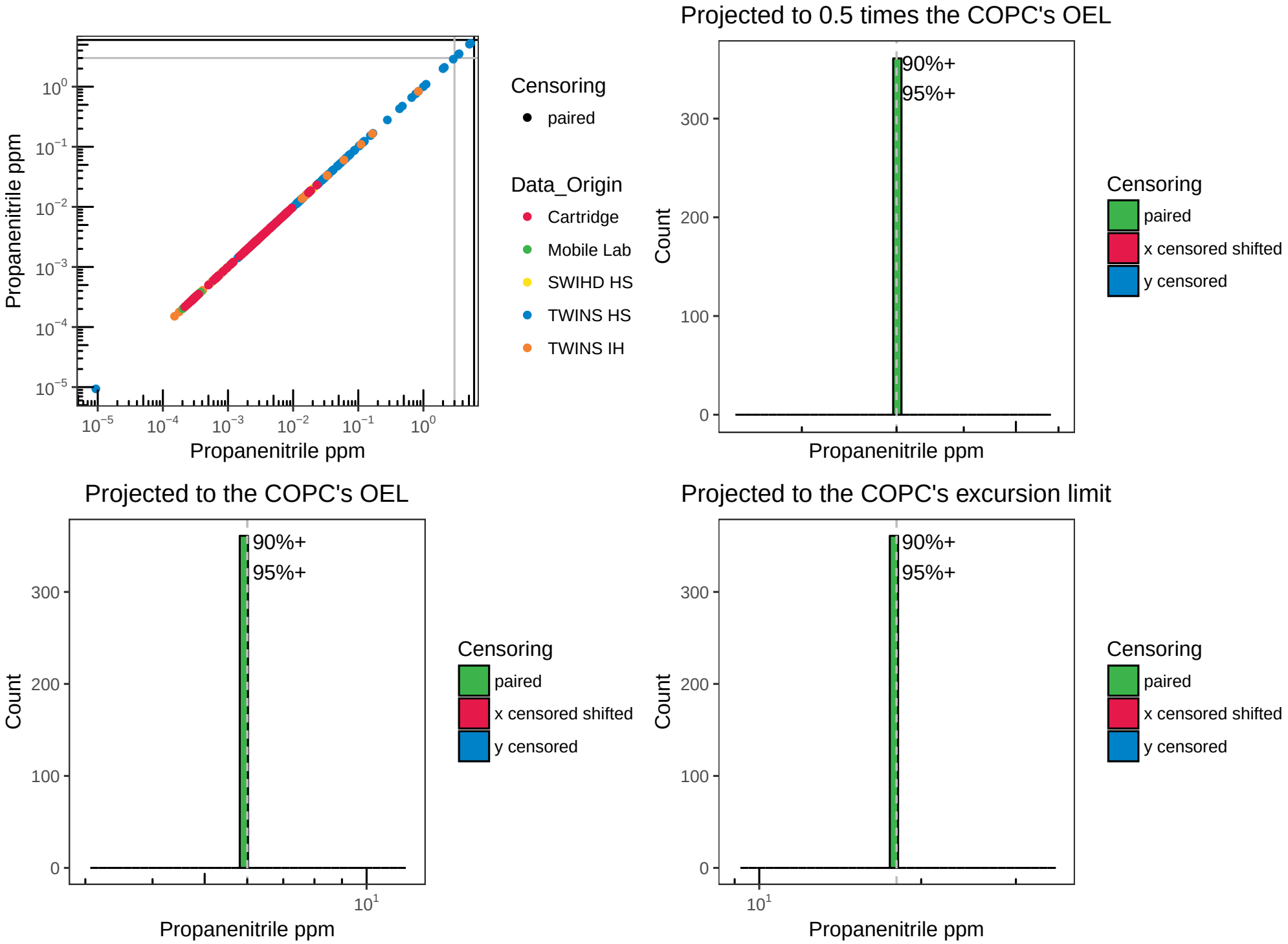


Figure C.1709: Propanenitrile vs Propanenitrile

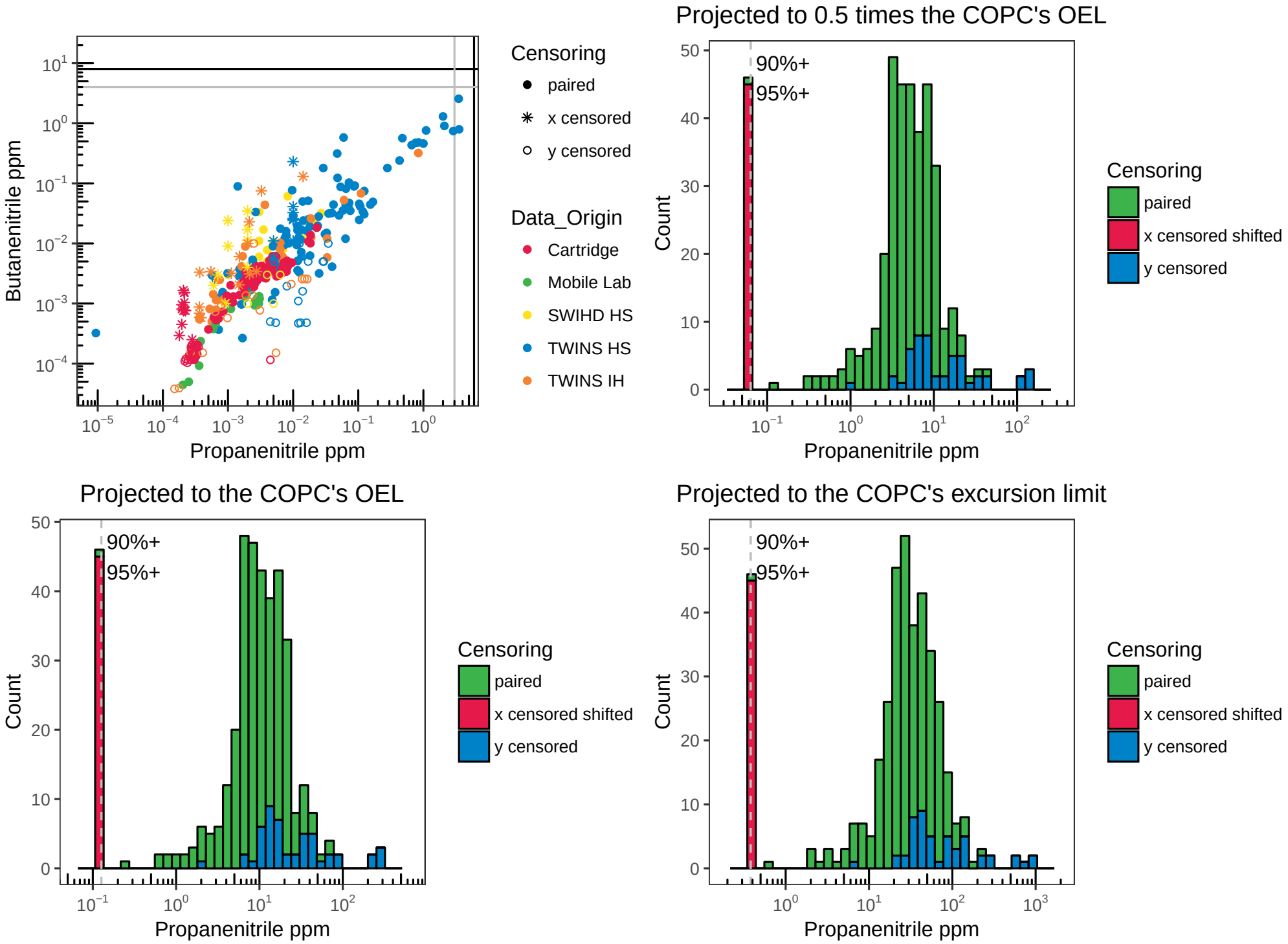


Figure C.1710: Butanenitrile vs Propanenitrile

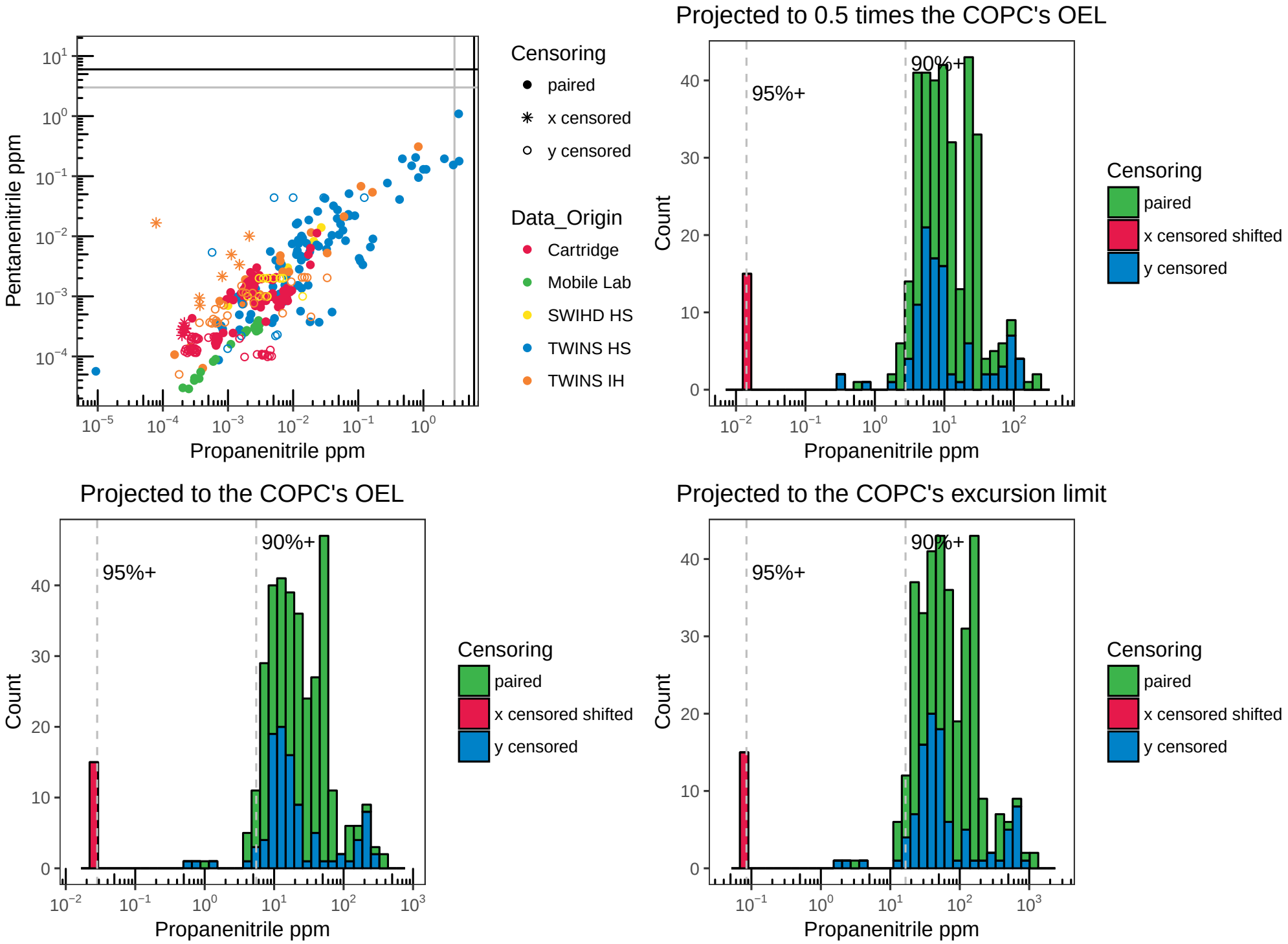


Figure C.1711: Pentanenitrile vs Propanenitrile

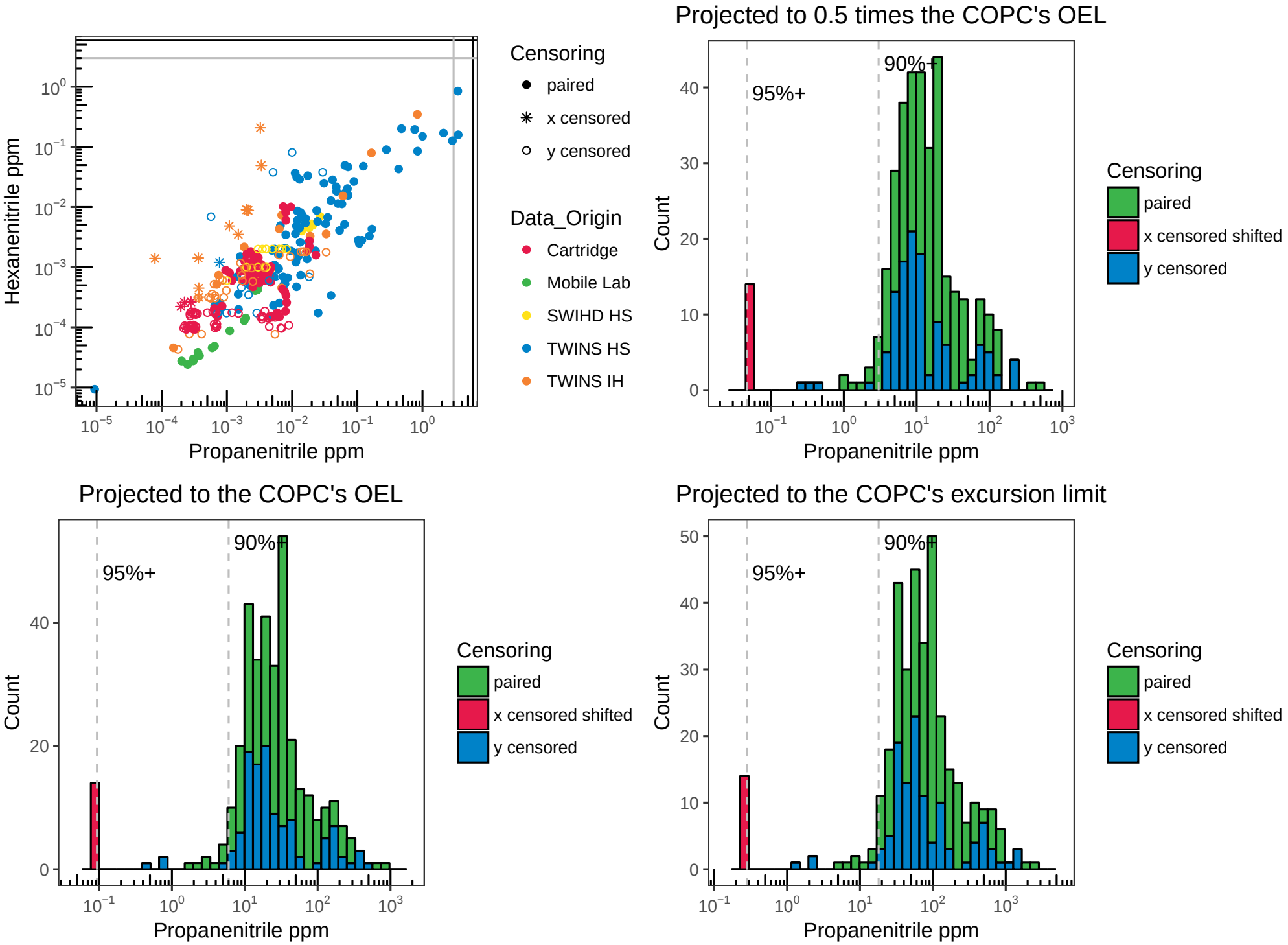


Figure C.1712: Hexanenitrile vs Propanenitrile

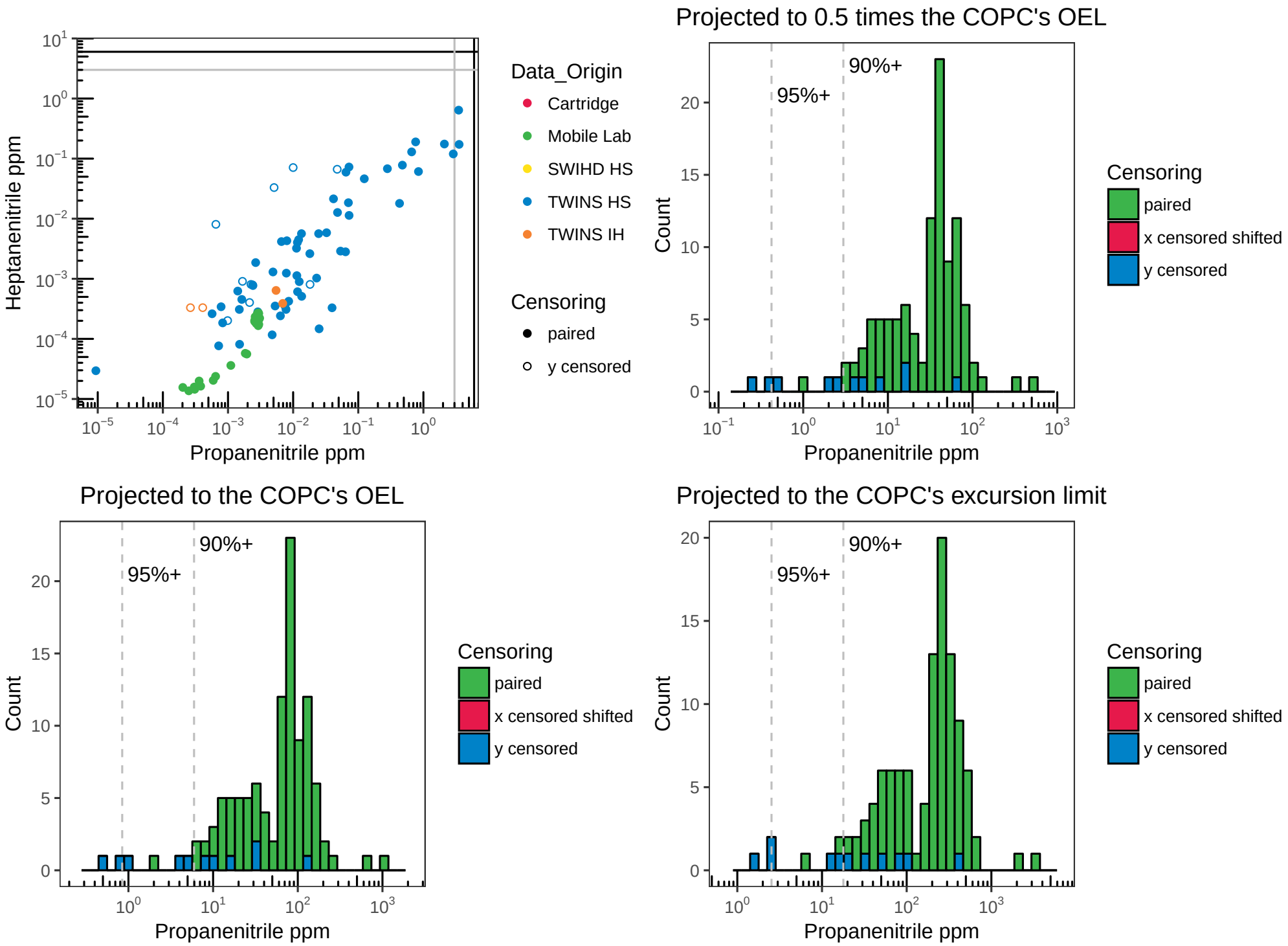


Figure C.1713: Heptanenitrile vs Propanenitrile

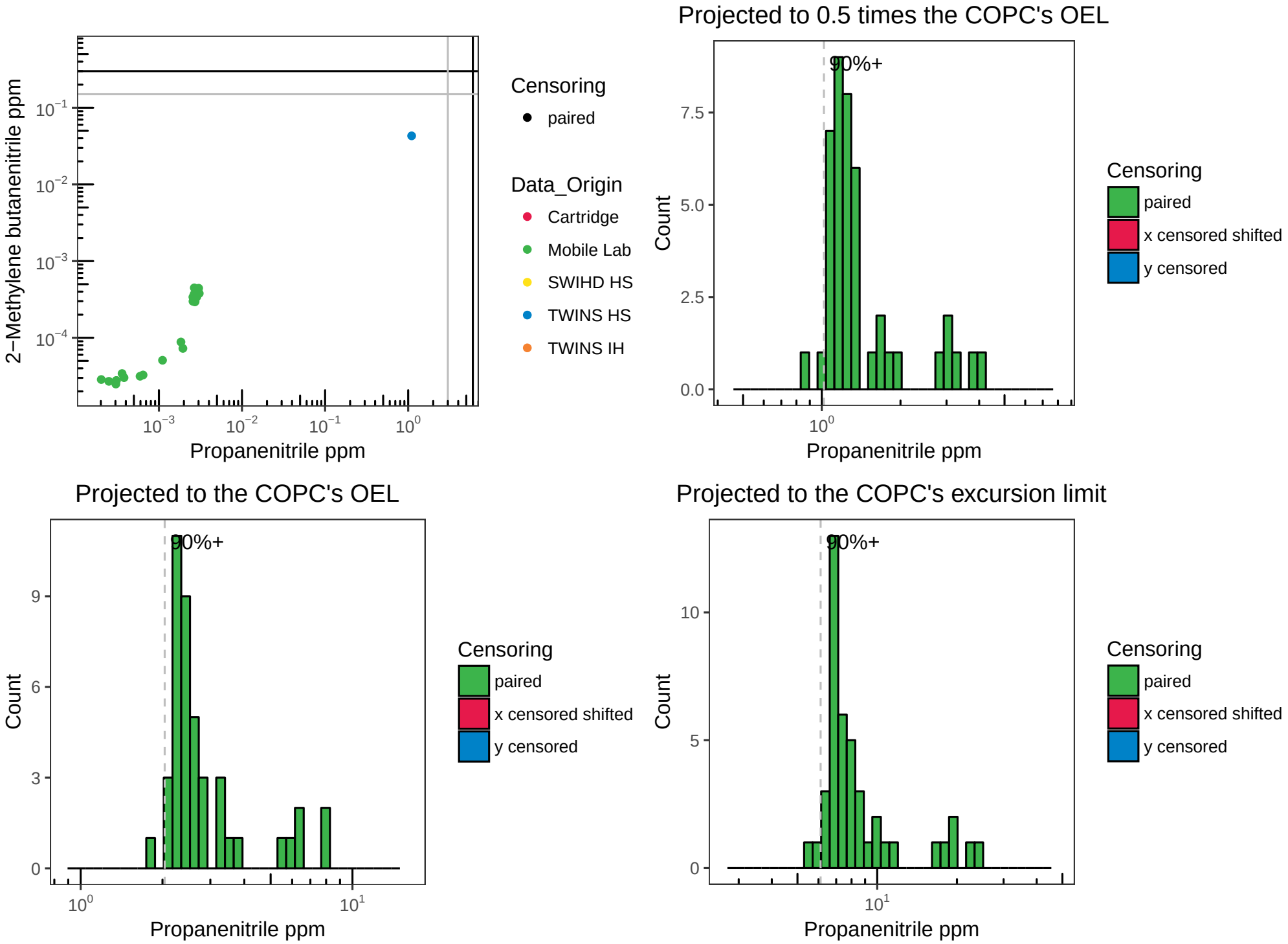


Figure C.1714: 2-Methylene butanenitrile vs Propanenitrile

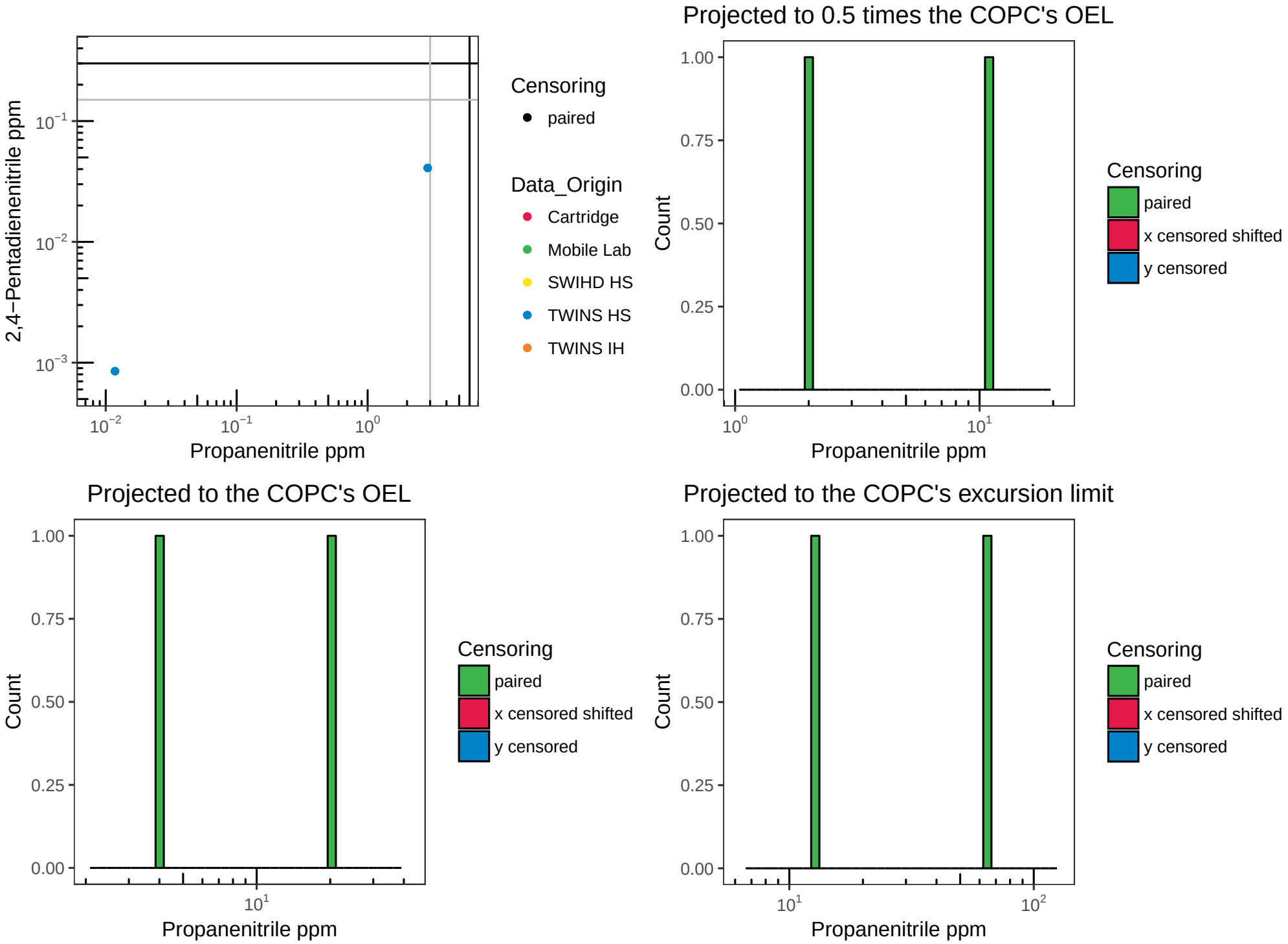


Figure C.1715: 2,4-Pentadienenitrile vs Propanenitrile

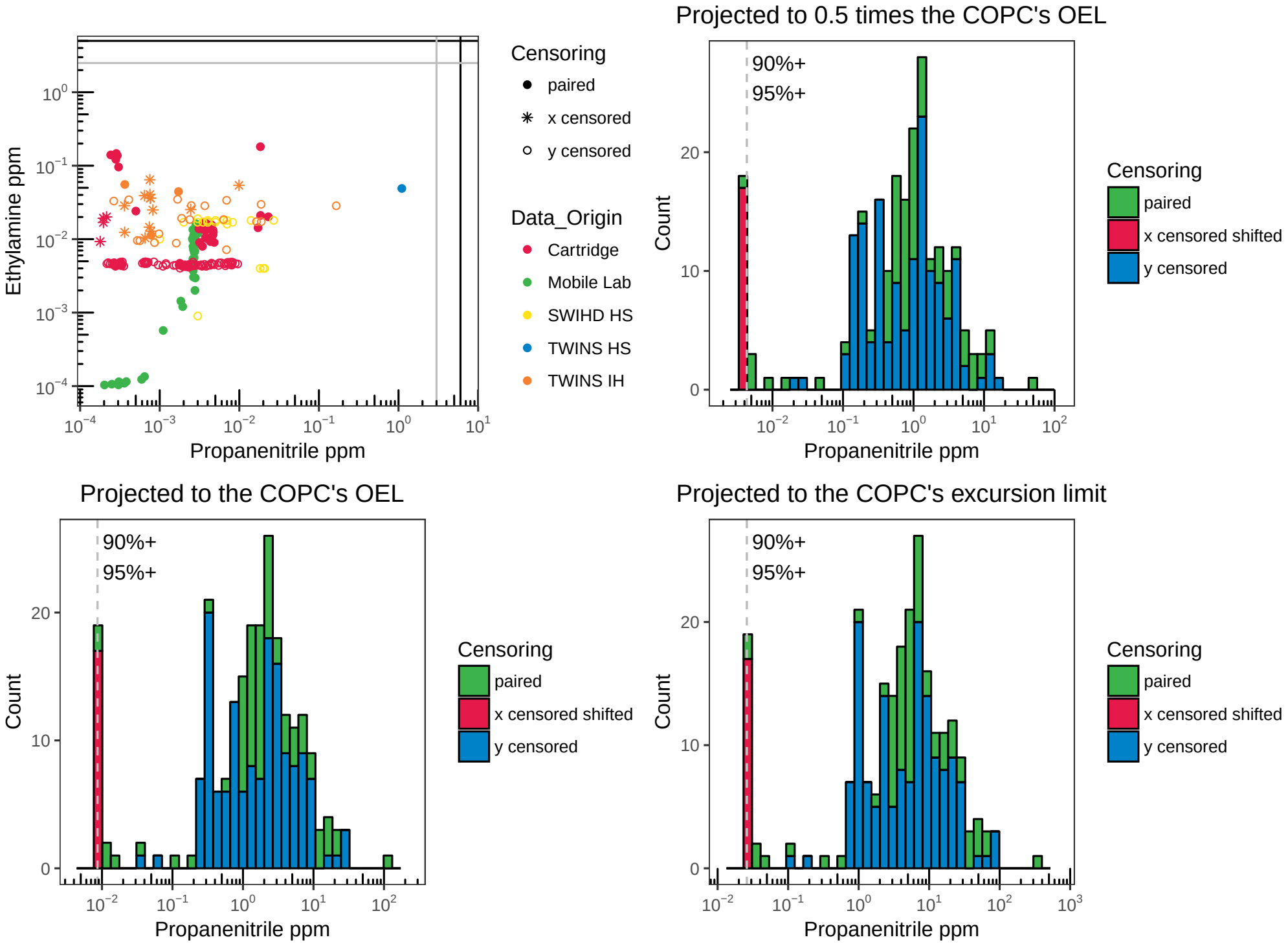


Figure C.1716: Ethylamine vs Propanenitrile

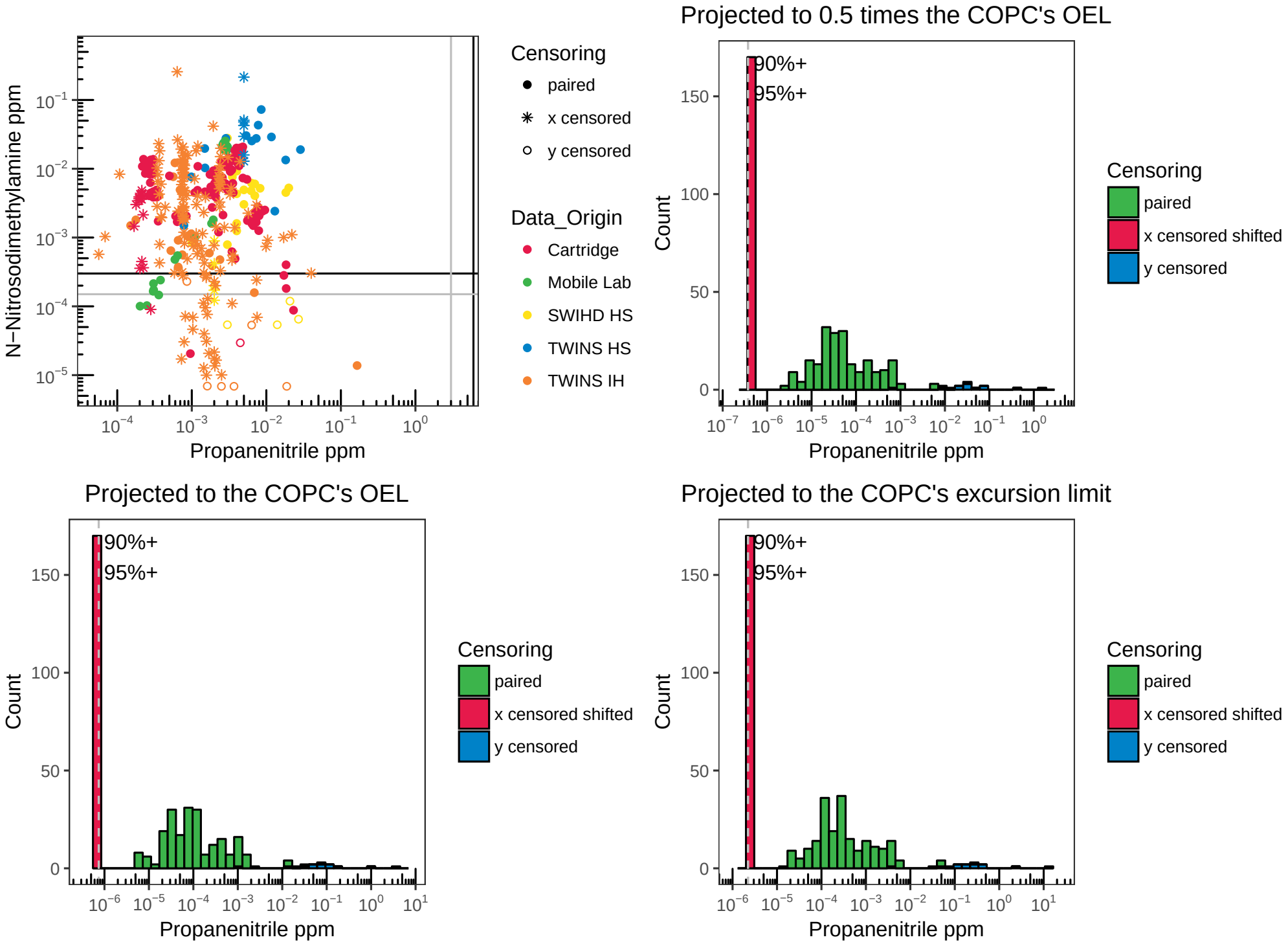


Figure C.1717: N-Nitrosodimethylamine vs Propanenitrile

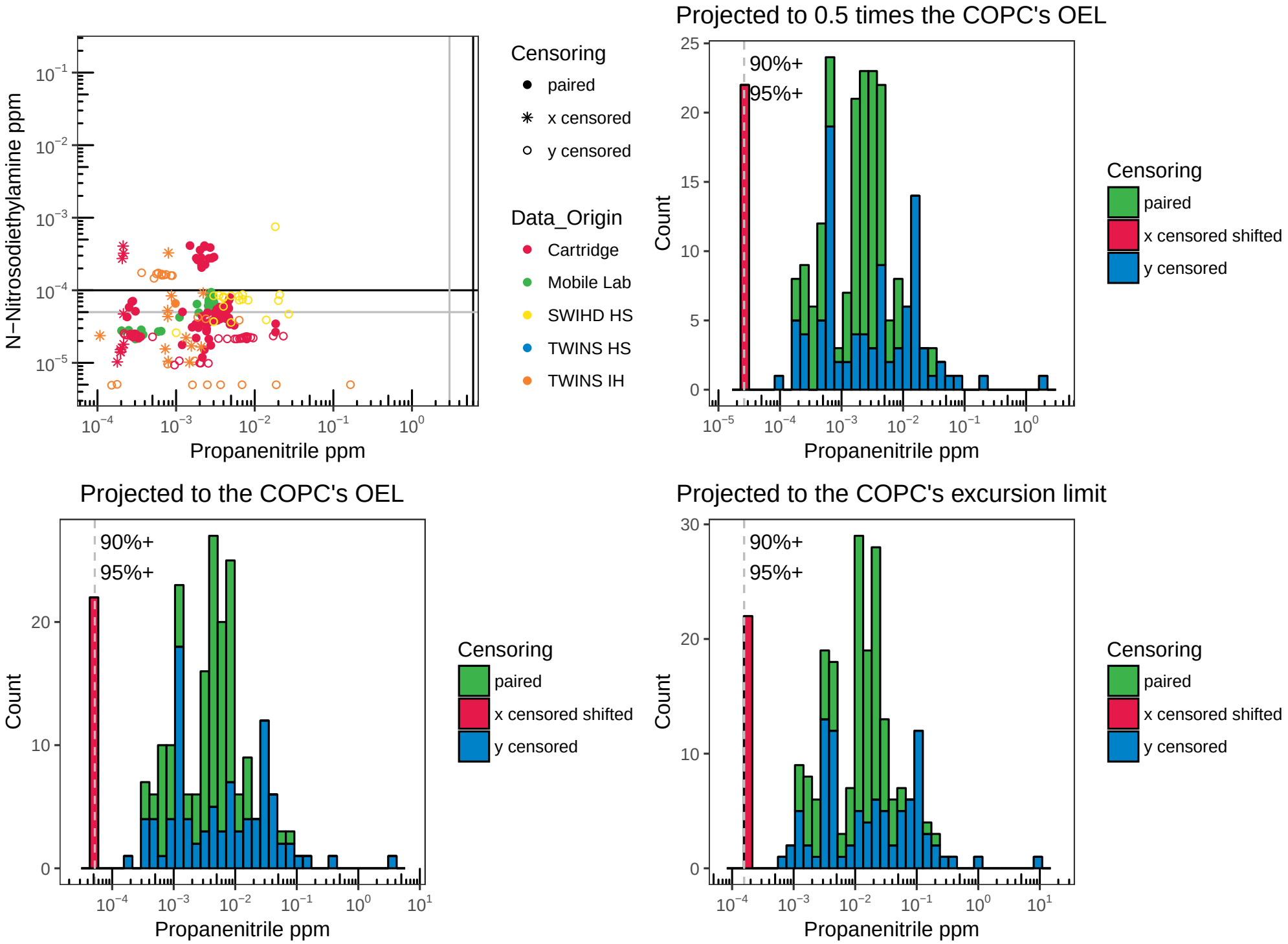


Figure C.1718: N-Nitrosodiethylamine vs Propanenitrile

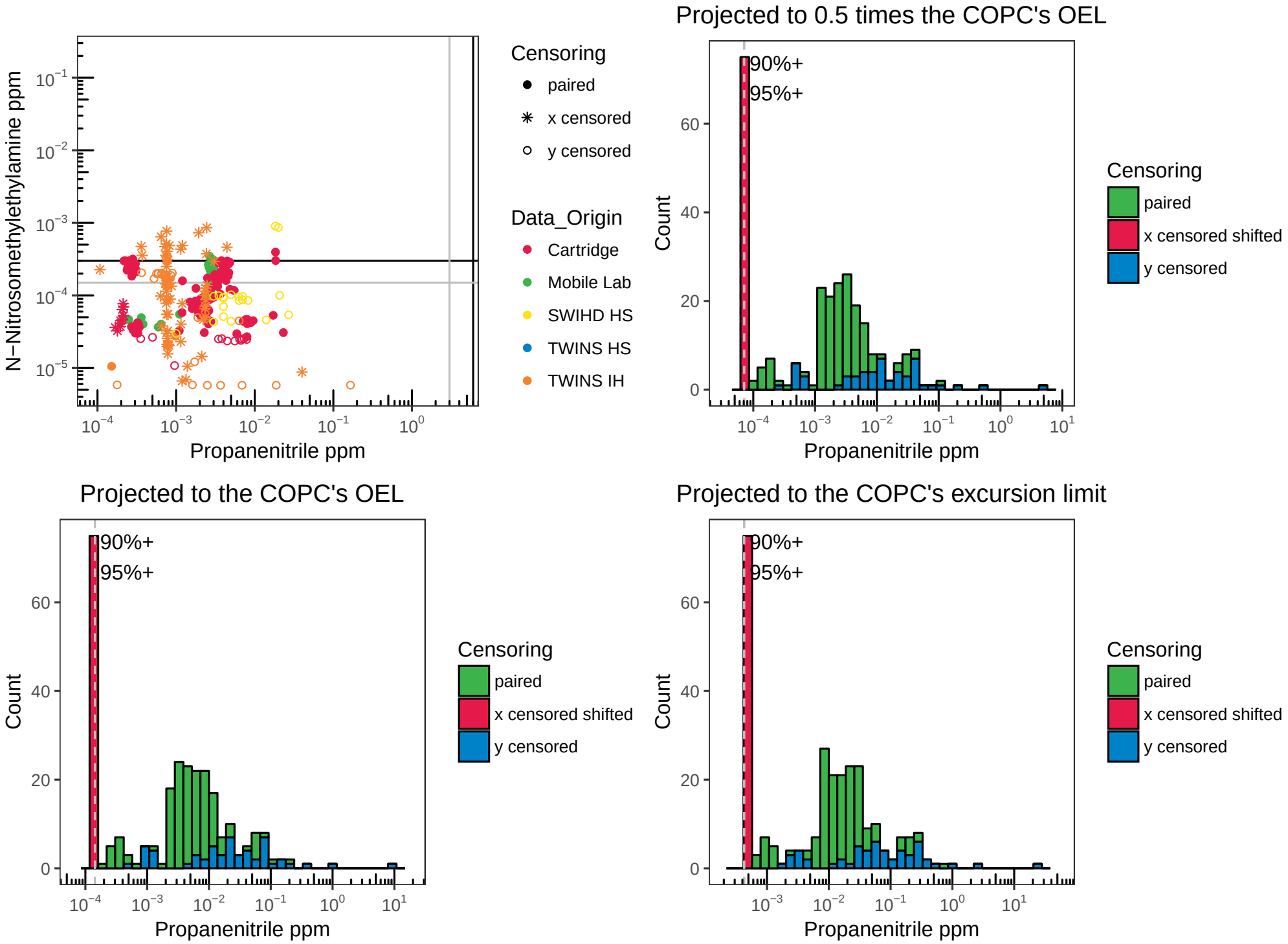


Figure C.1719: N-Nitrosomethylethylamine vs Propanenitrile

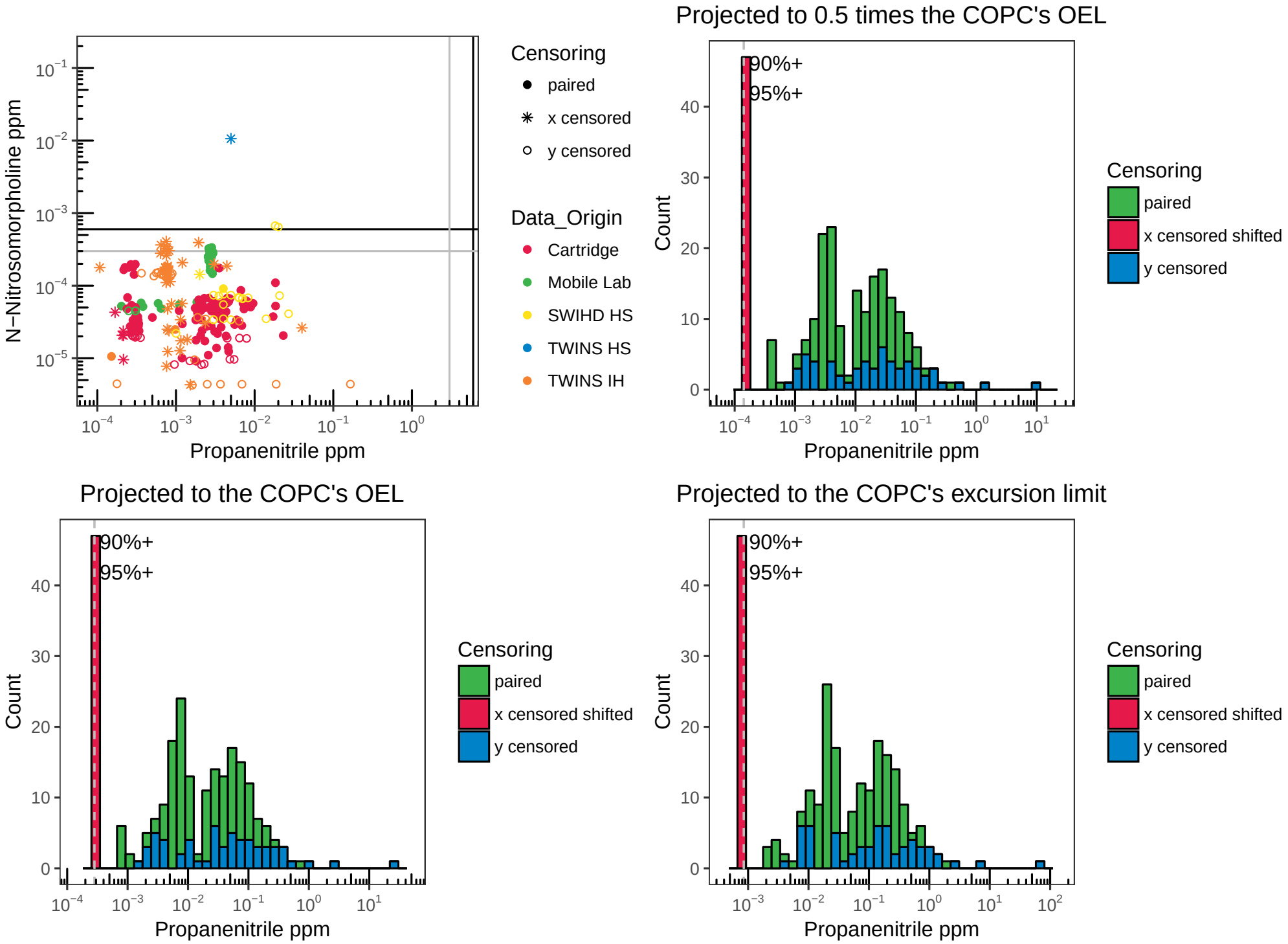


Figure C.1720: N-Nitrosomorpholine vs Propanenitrile

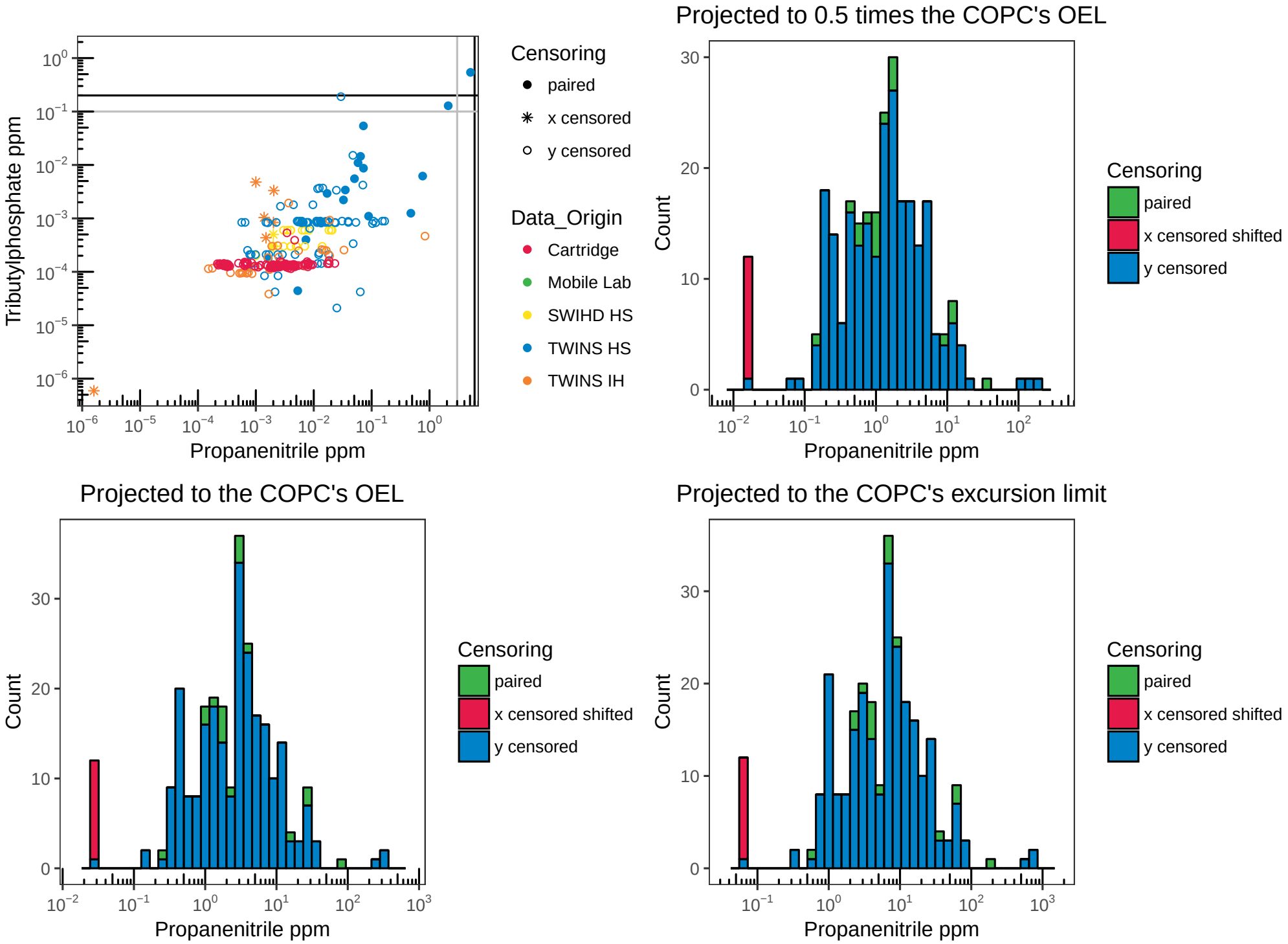


Figure C.1721: Tributylphosphate vs Propanenitrile

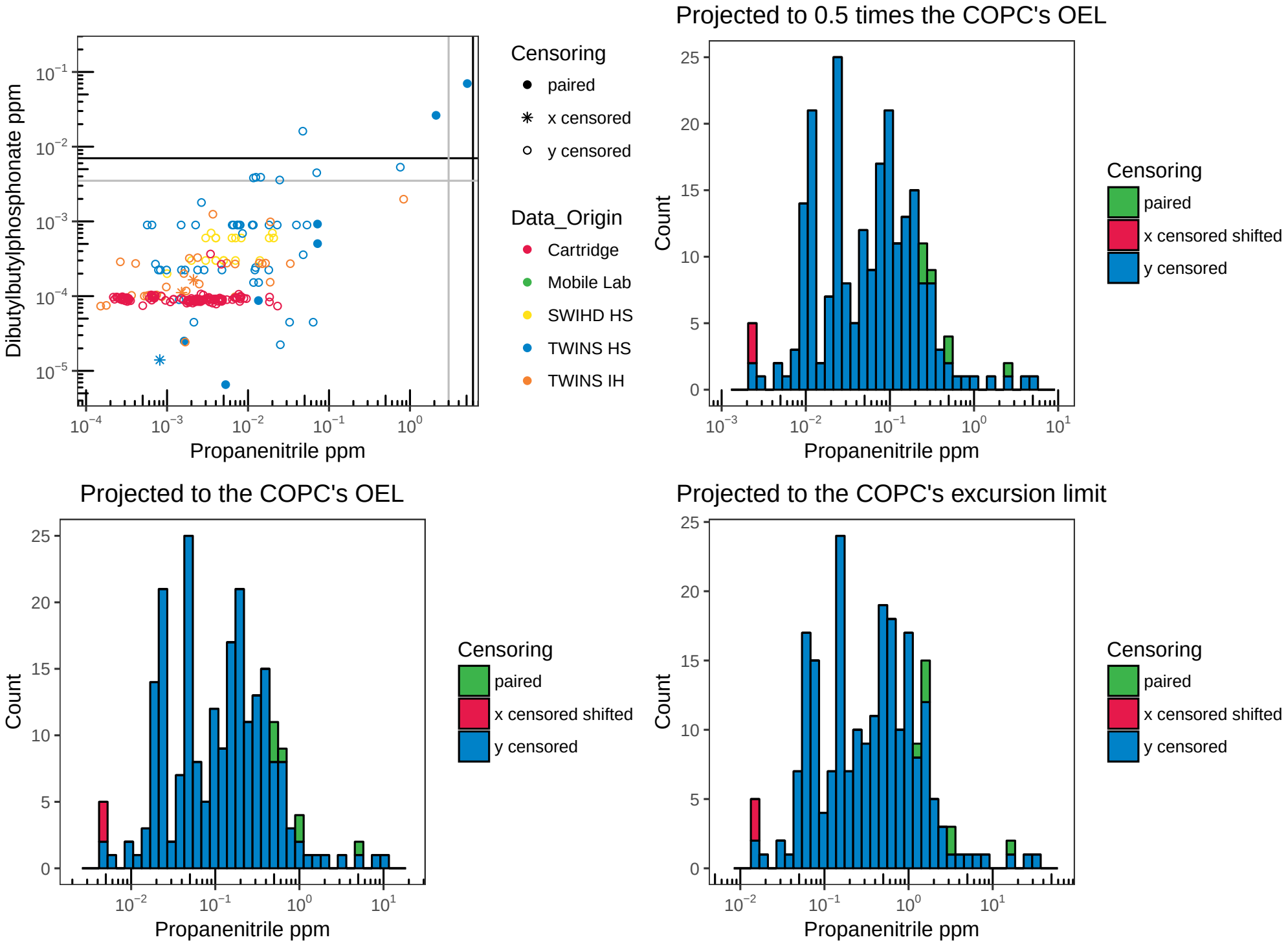


Figure C.1722: Dibutylbutylphosphonate vs Propanenitrile

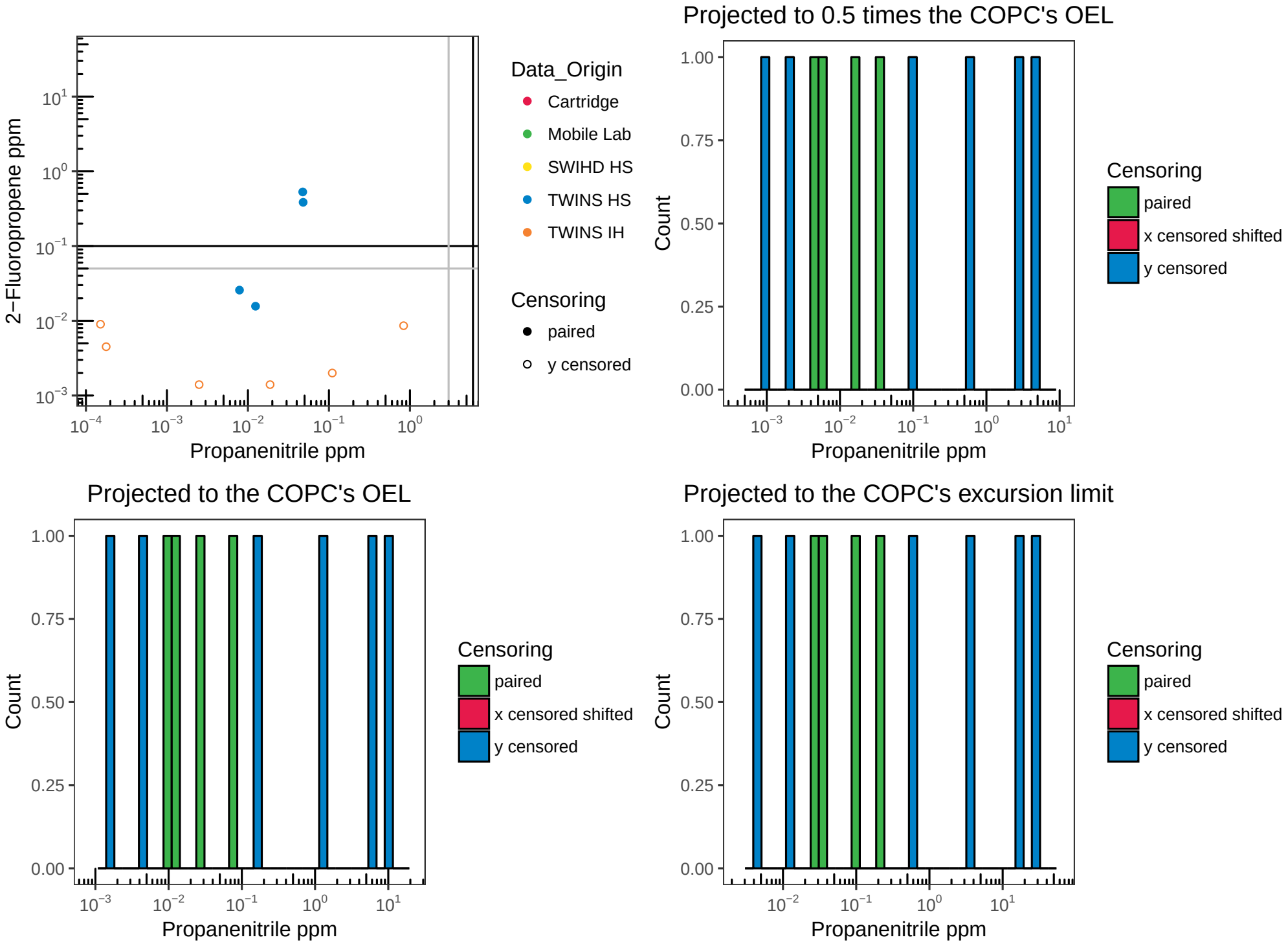


Figure C.1723: 2-Fluoropropene vs Propanenitrile

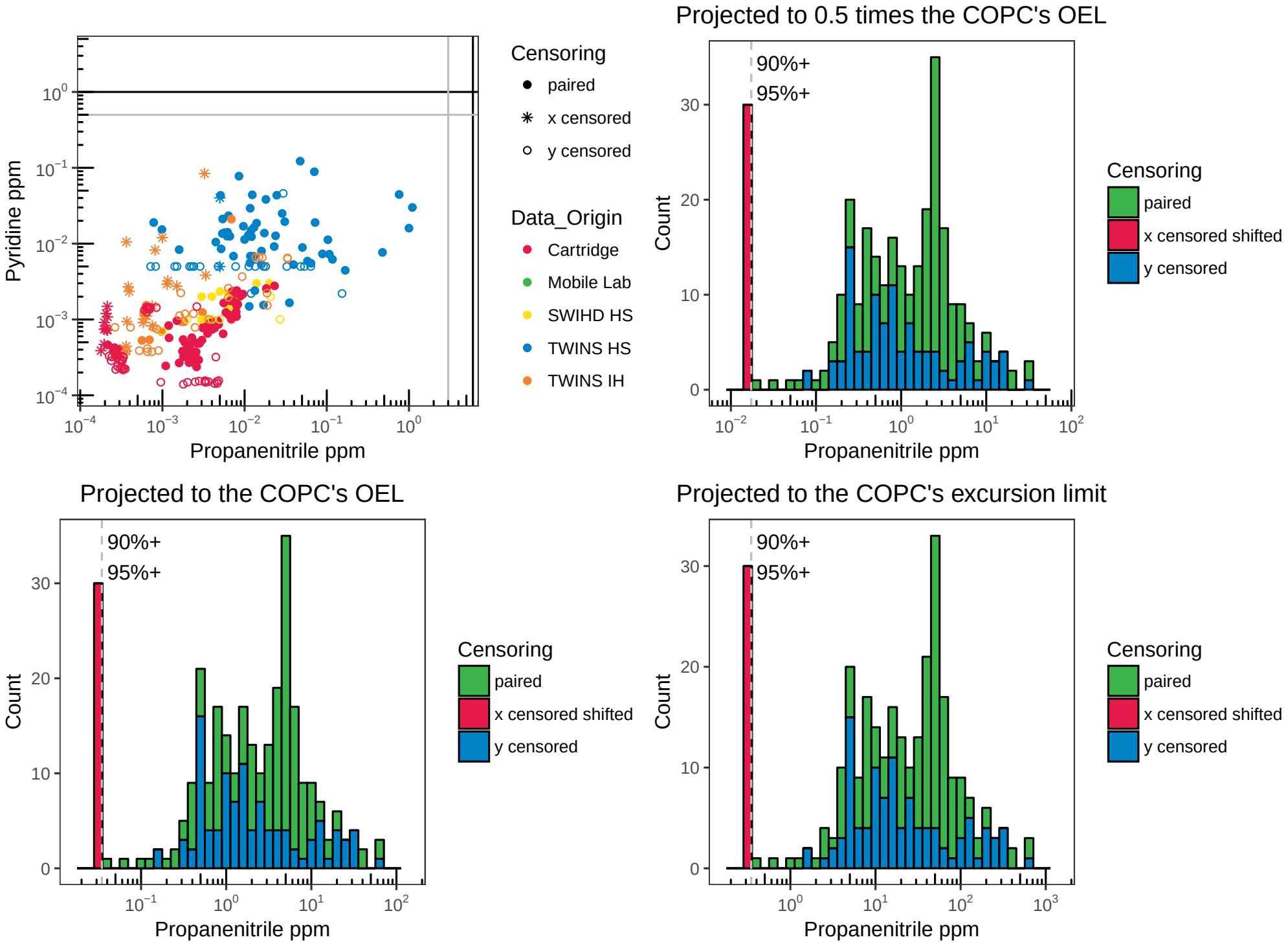


Figure C.1724: Pyridine vs Propanenitrile

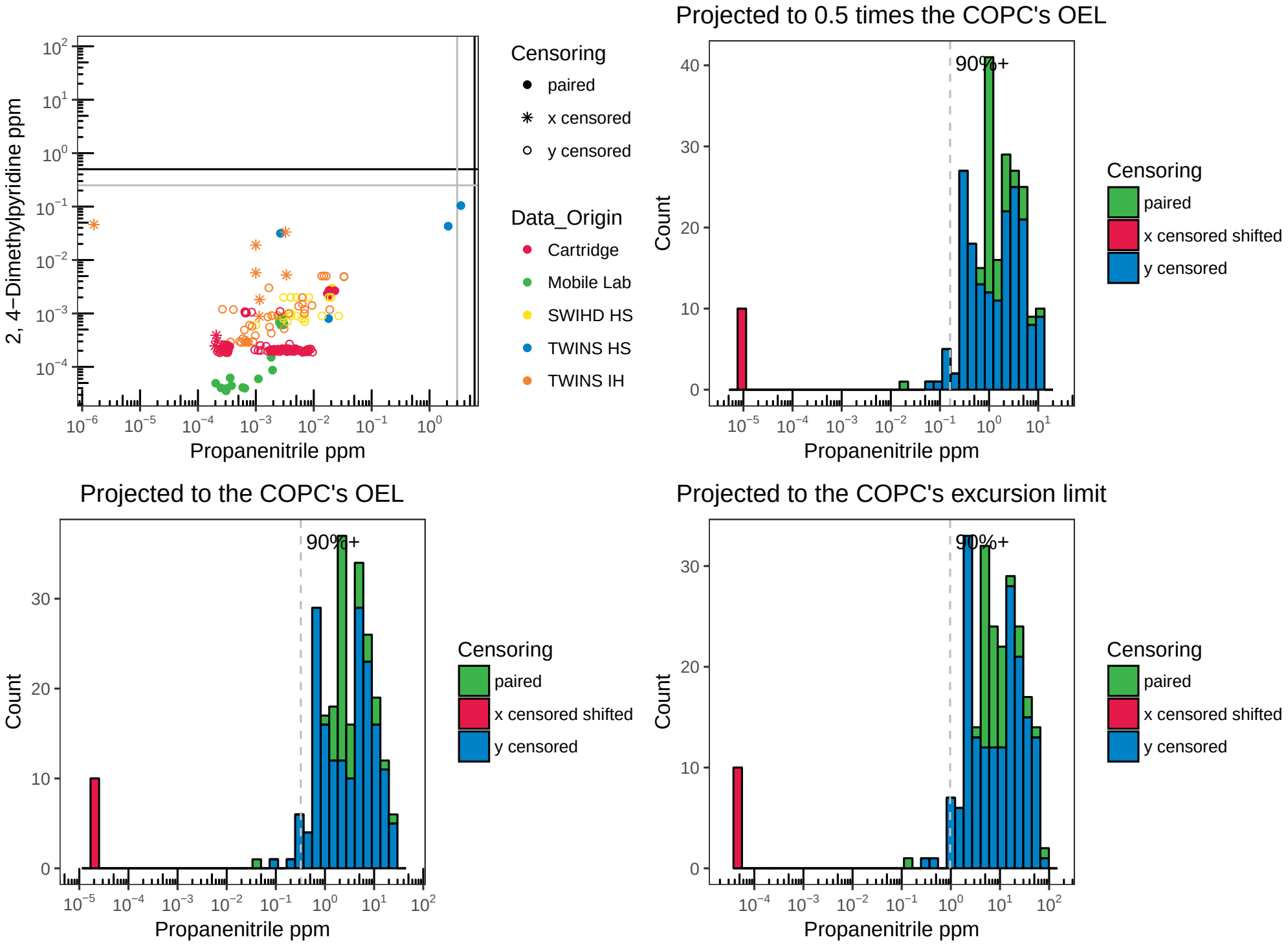


Figure C.1725: 2, 4-Dimethylpyridine vs Propanenitrile

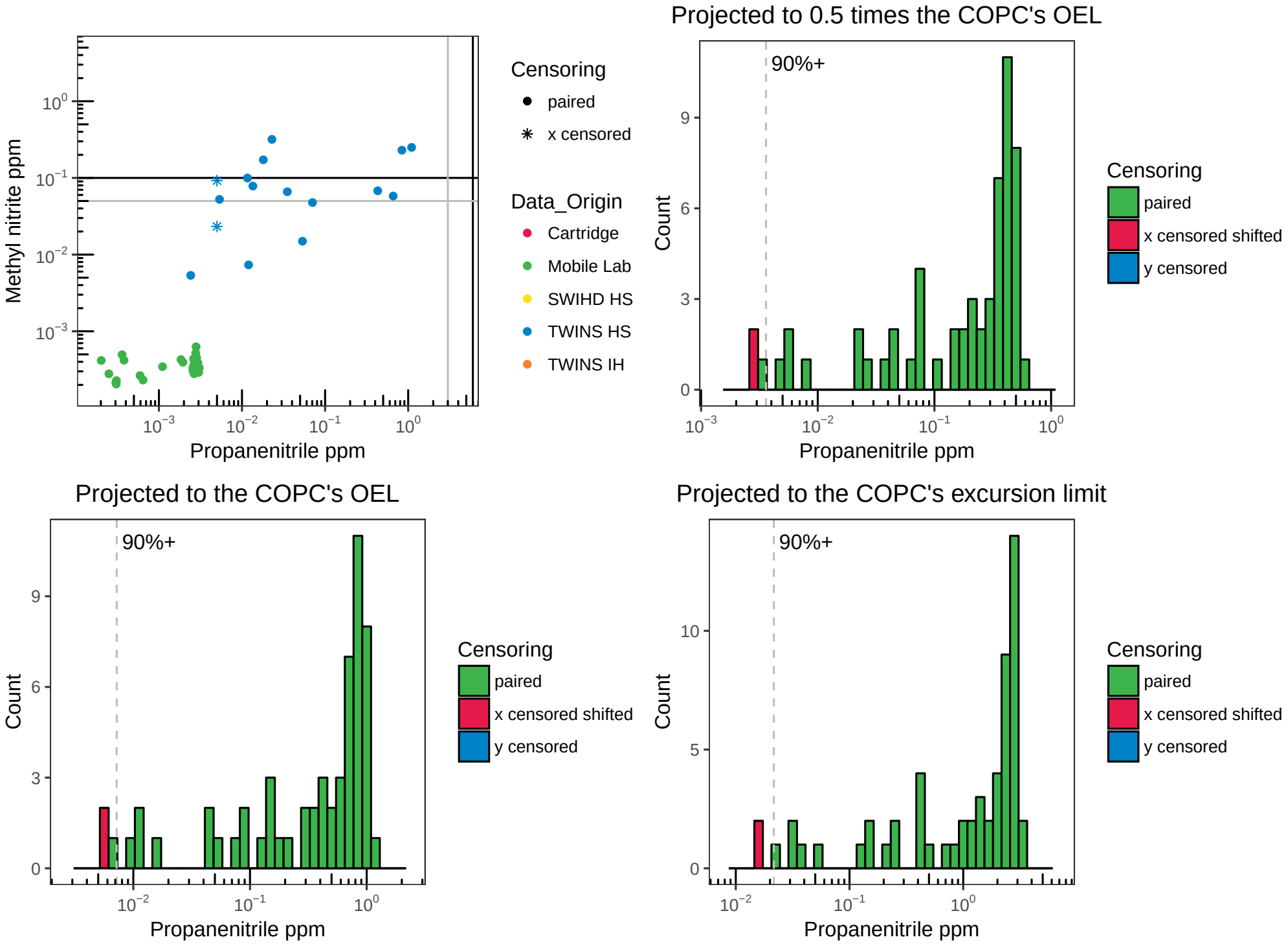


Figure C.1726: Methyl nitrite vs Propanenitrile

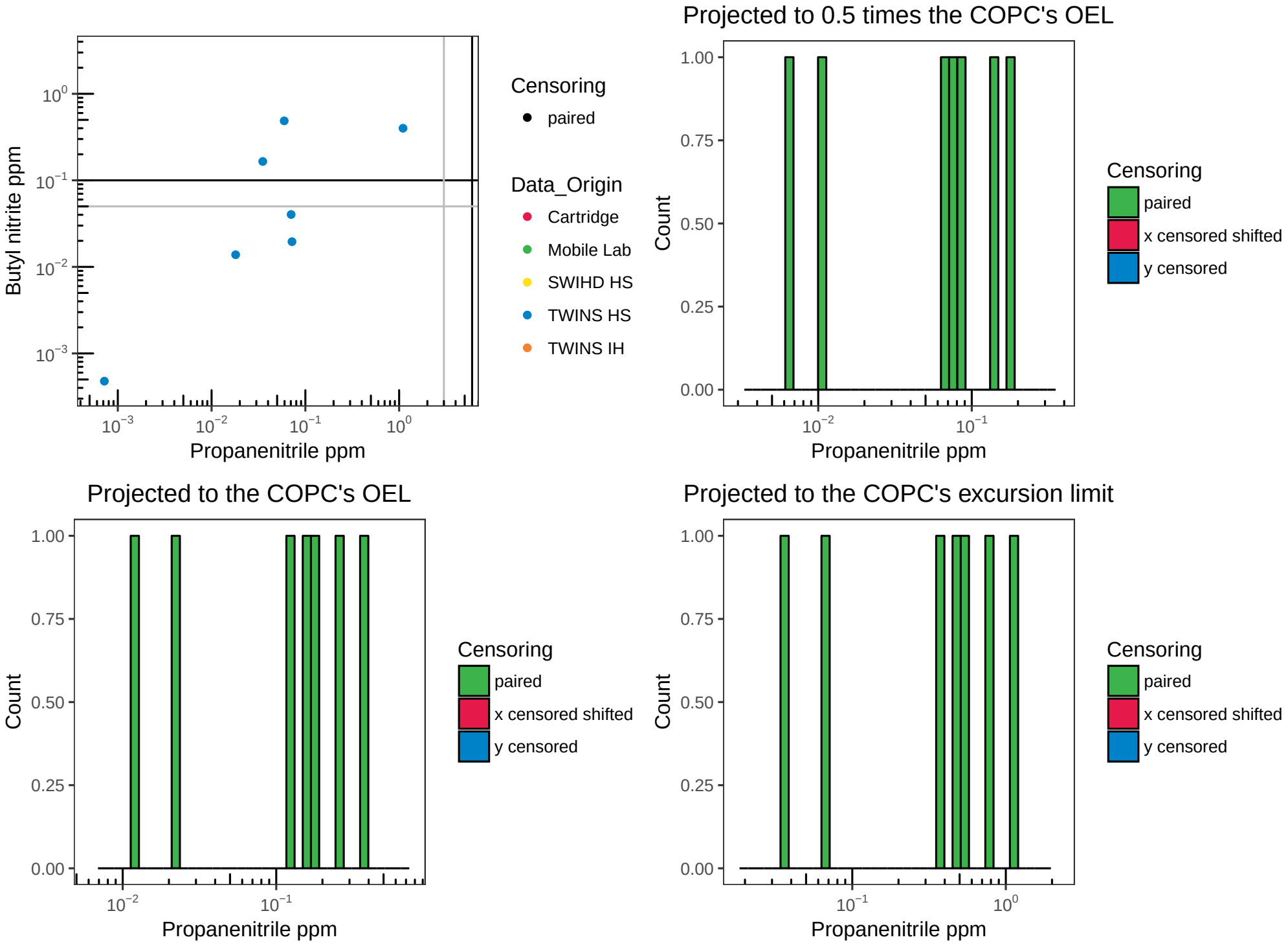


Figure C.1727: Butyl nitrite vs Propanenitrile

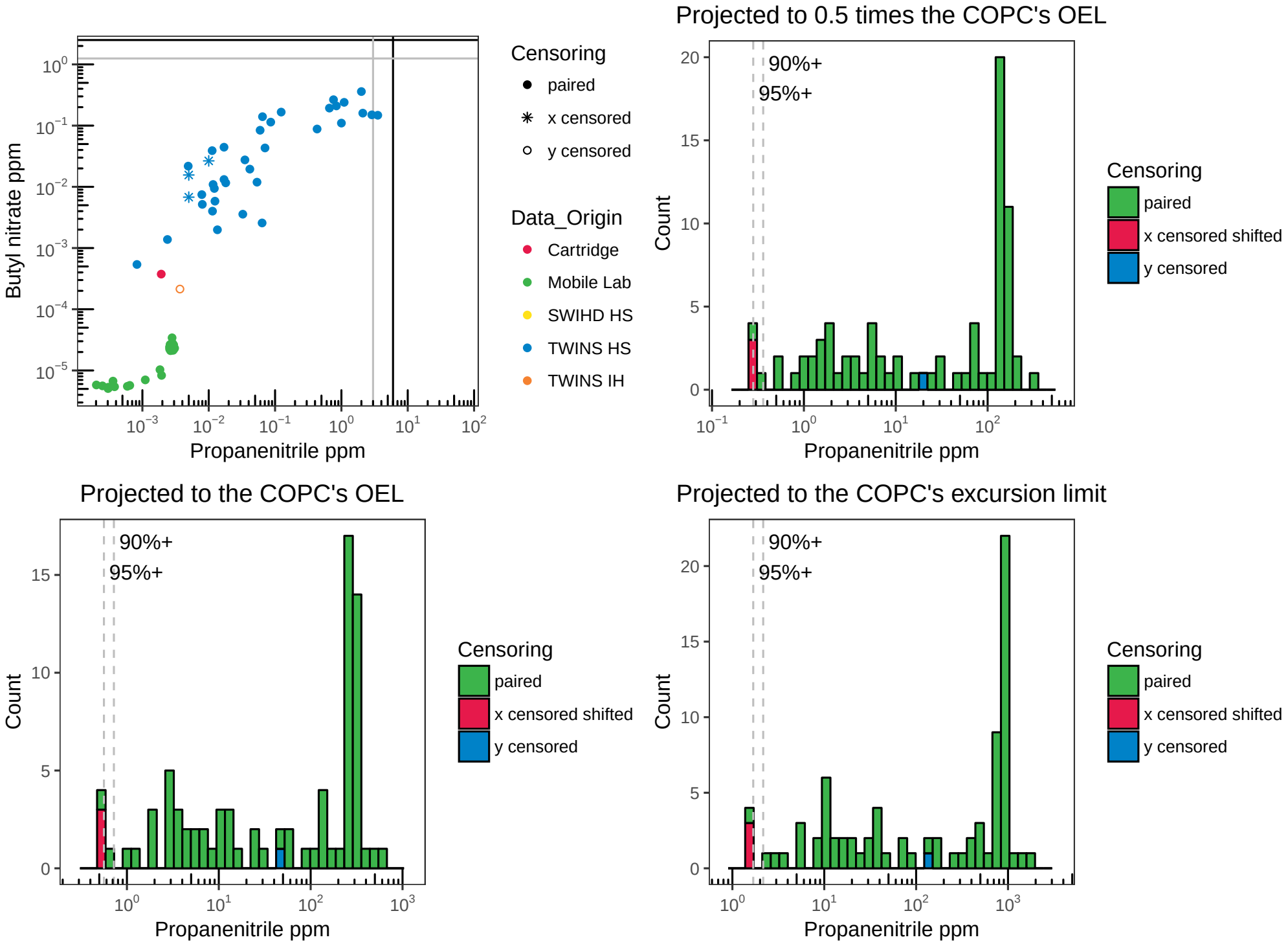


Figure C.1728: Butyl nitrate vs Propanenitrile

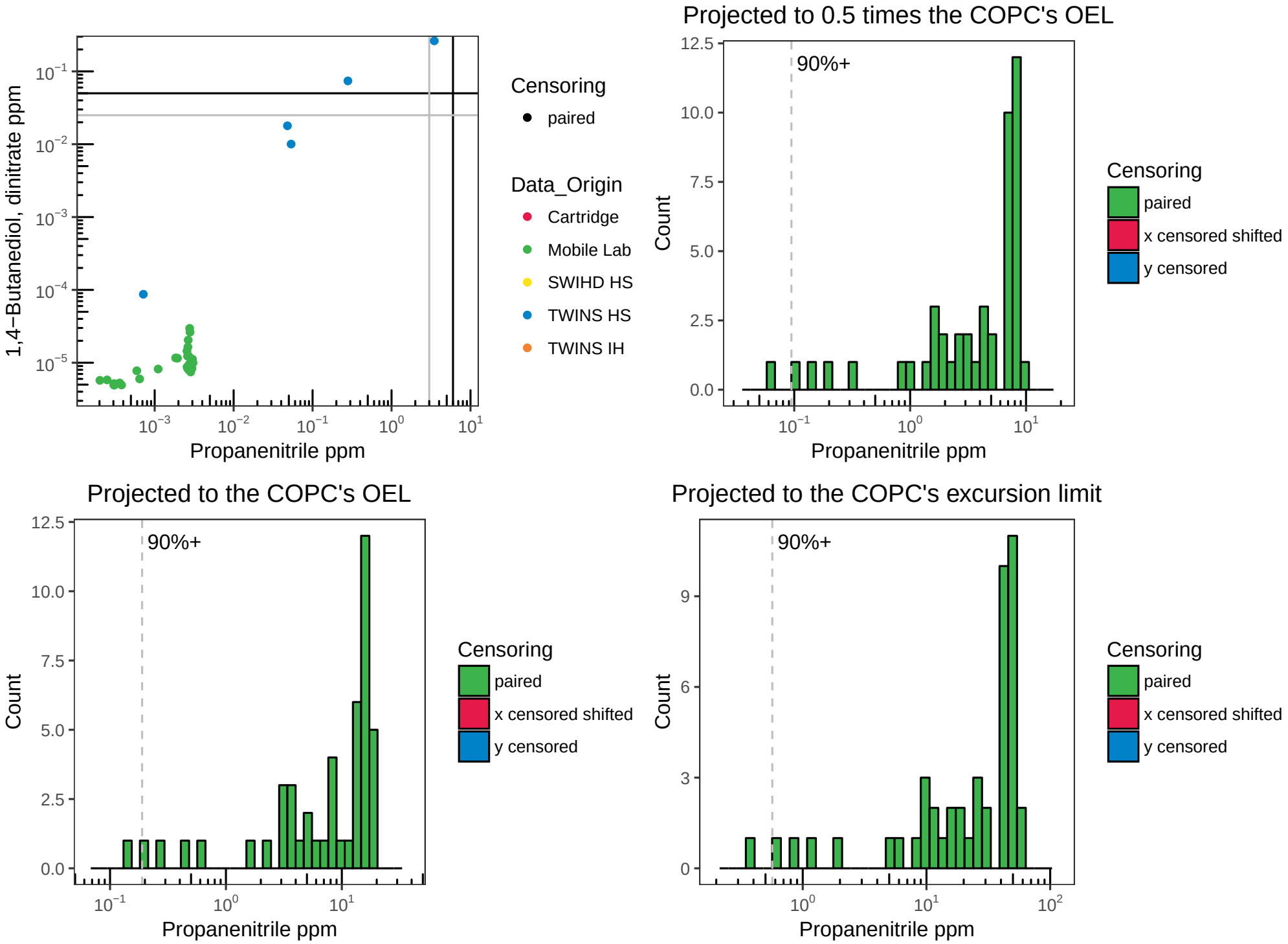


Figure C.1729: 1,4-Butanediol, dinitrate vs Propanenitrile

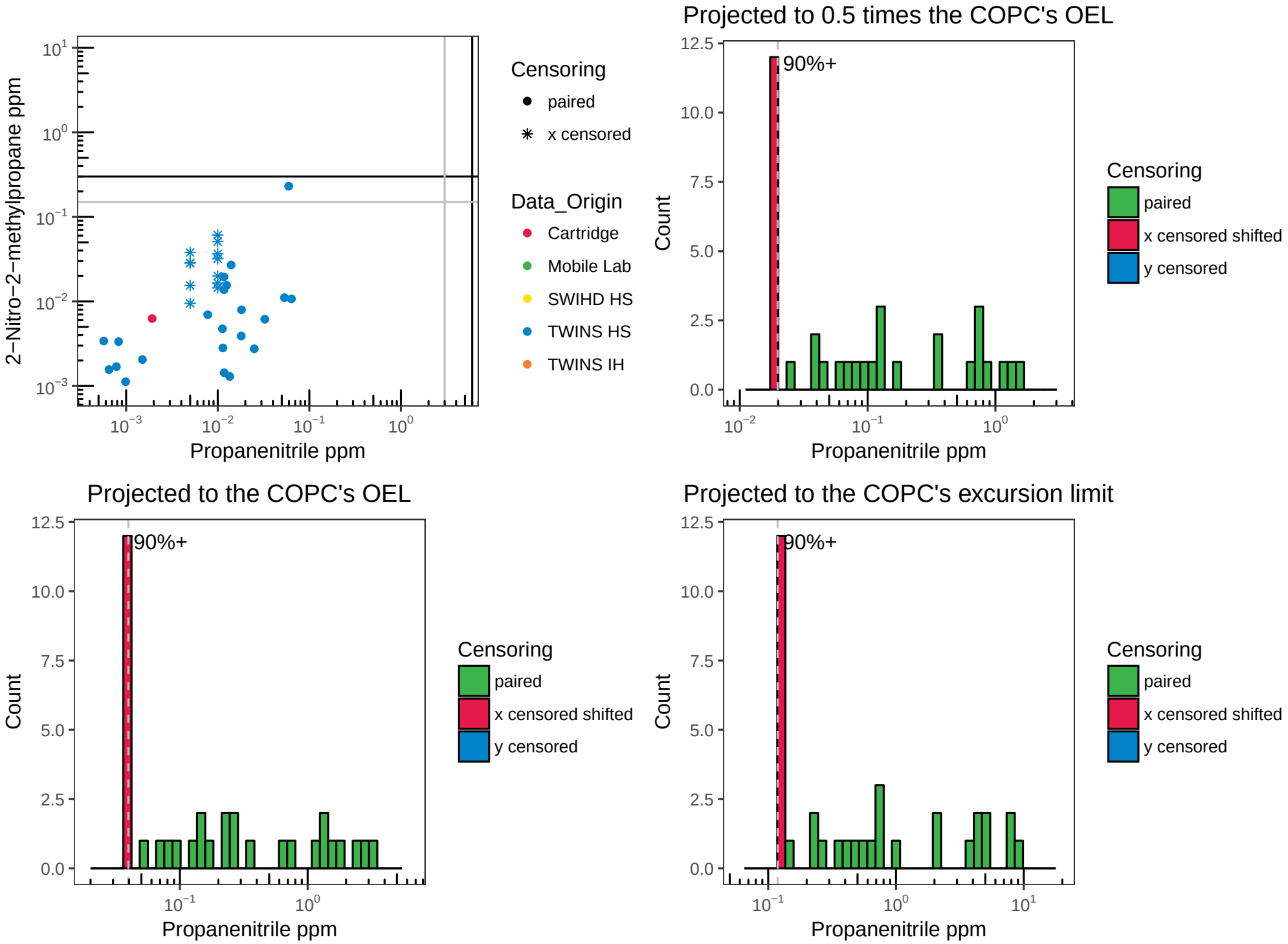


Figure C.1730: 2-Nitro-2-methylpropane vs Propanenitrile

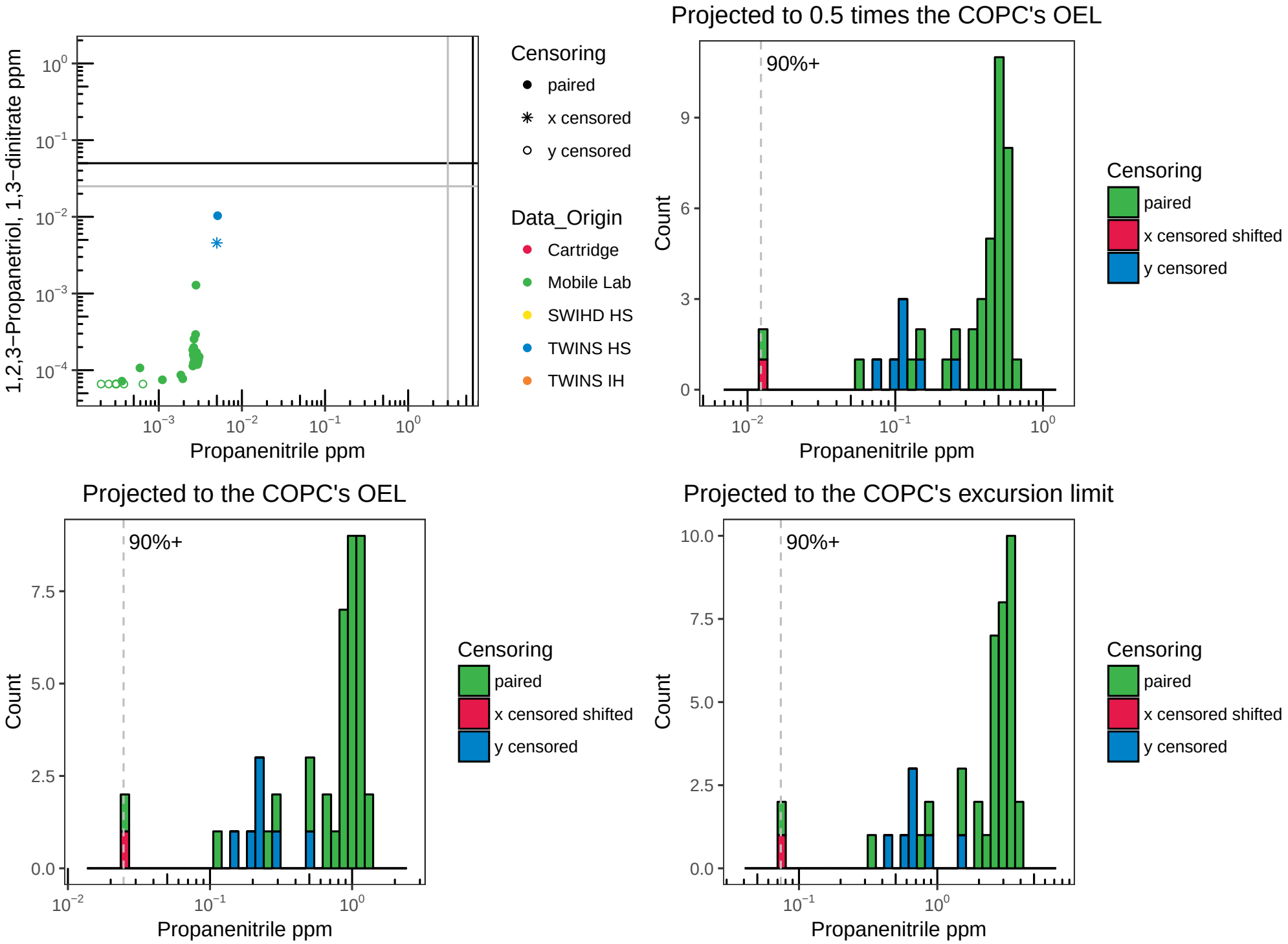


Figure C.1731: 1,2,3-Propanetriol, 1,3-dinitrate vs Propanenitrile

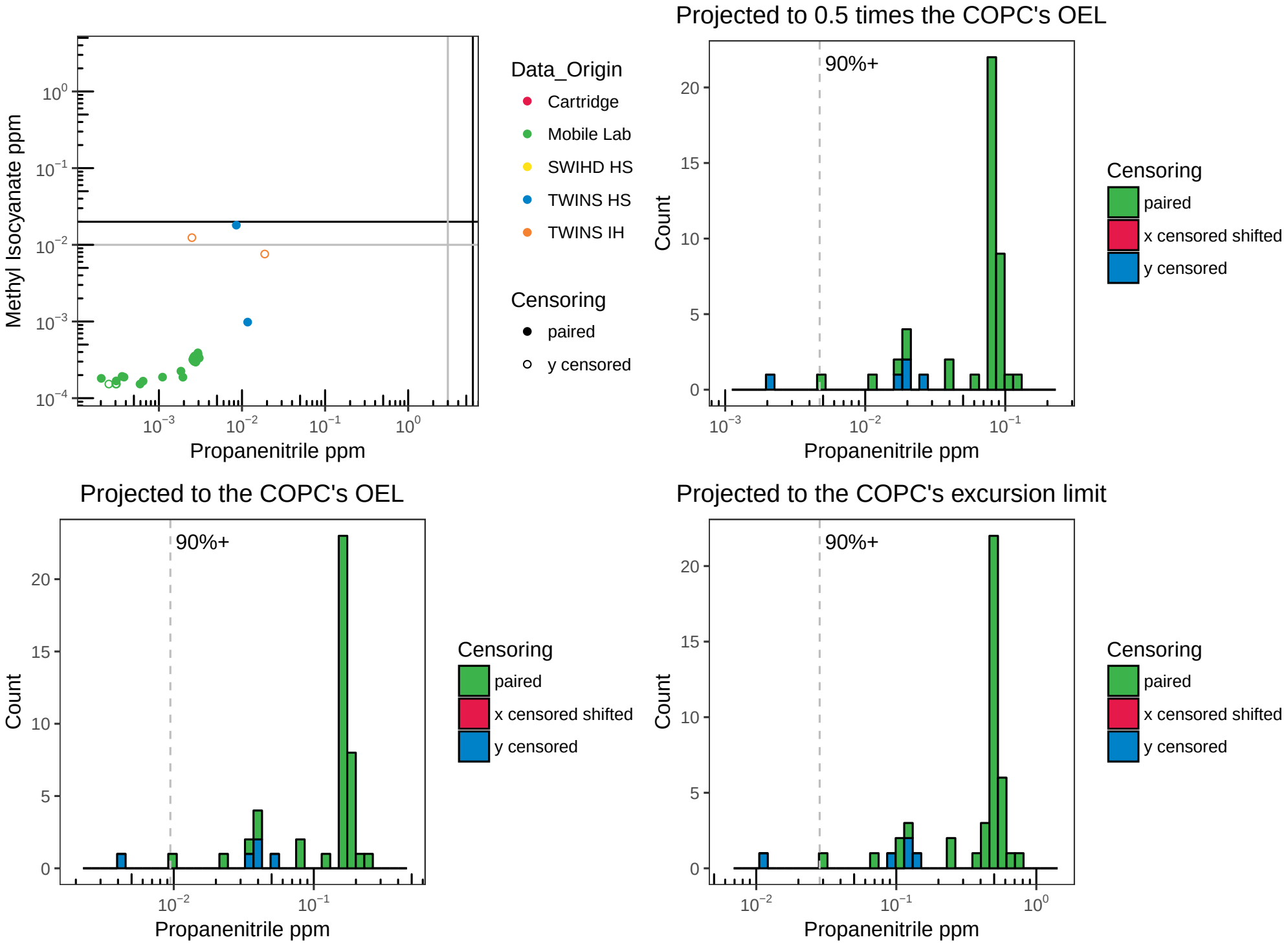


Figure C.1732: Methyl Isocyanate vs Propanenitrile

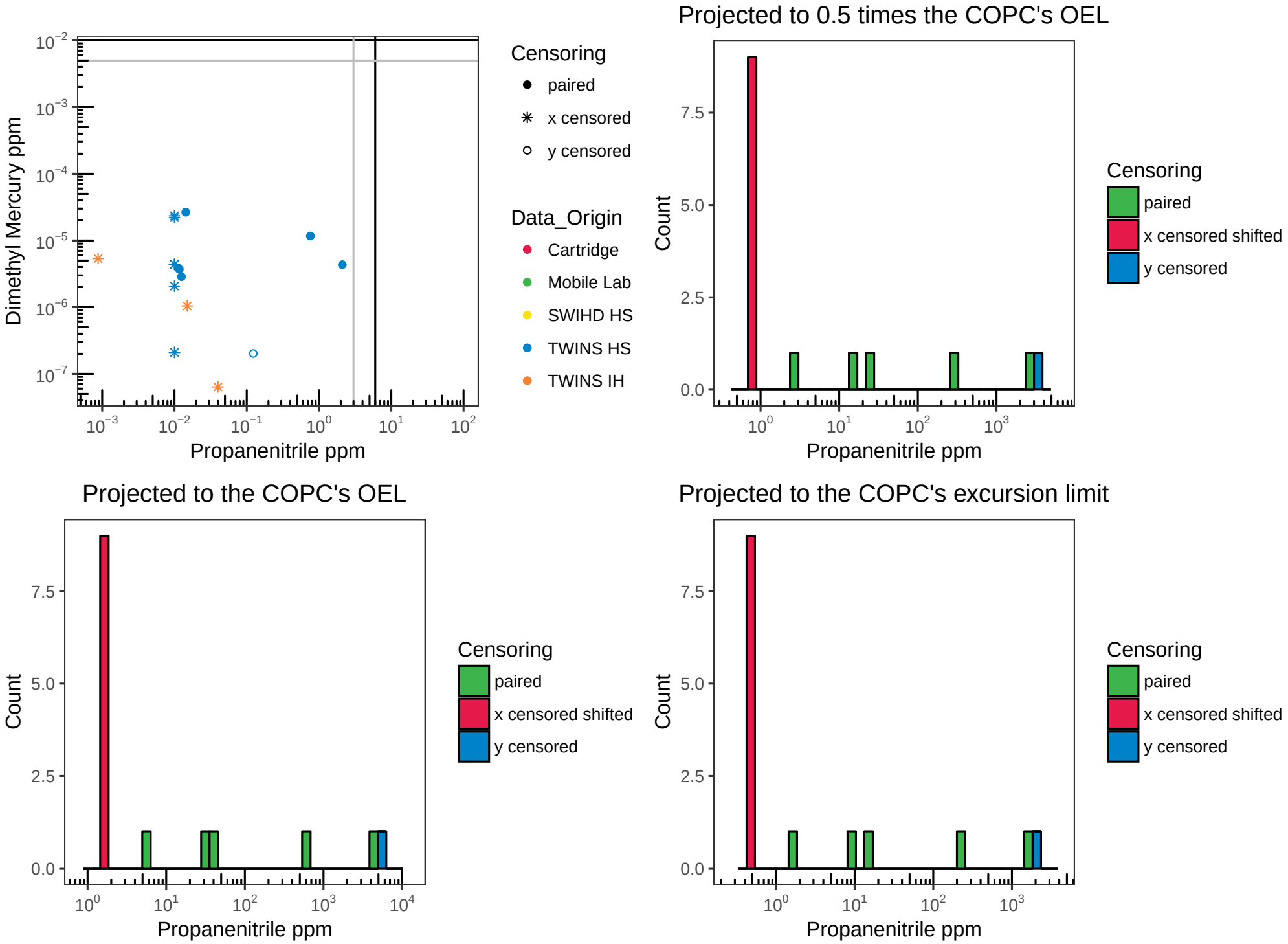


Figure C.1733: Dimethyl Mercury vs Propanenitrile

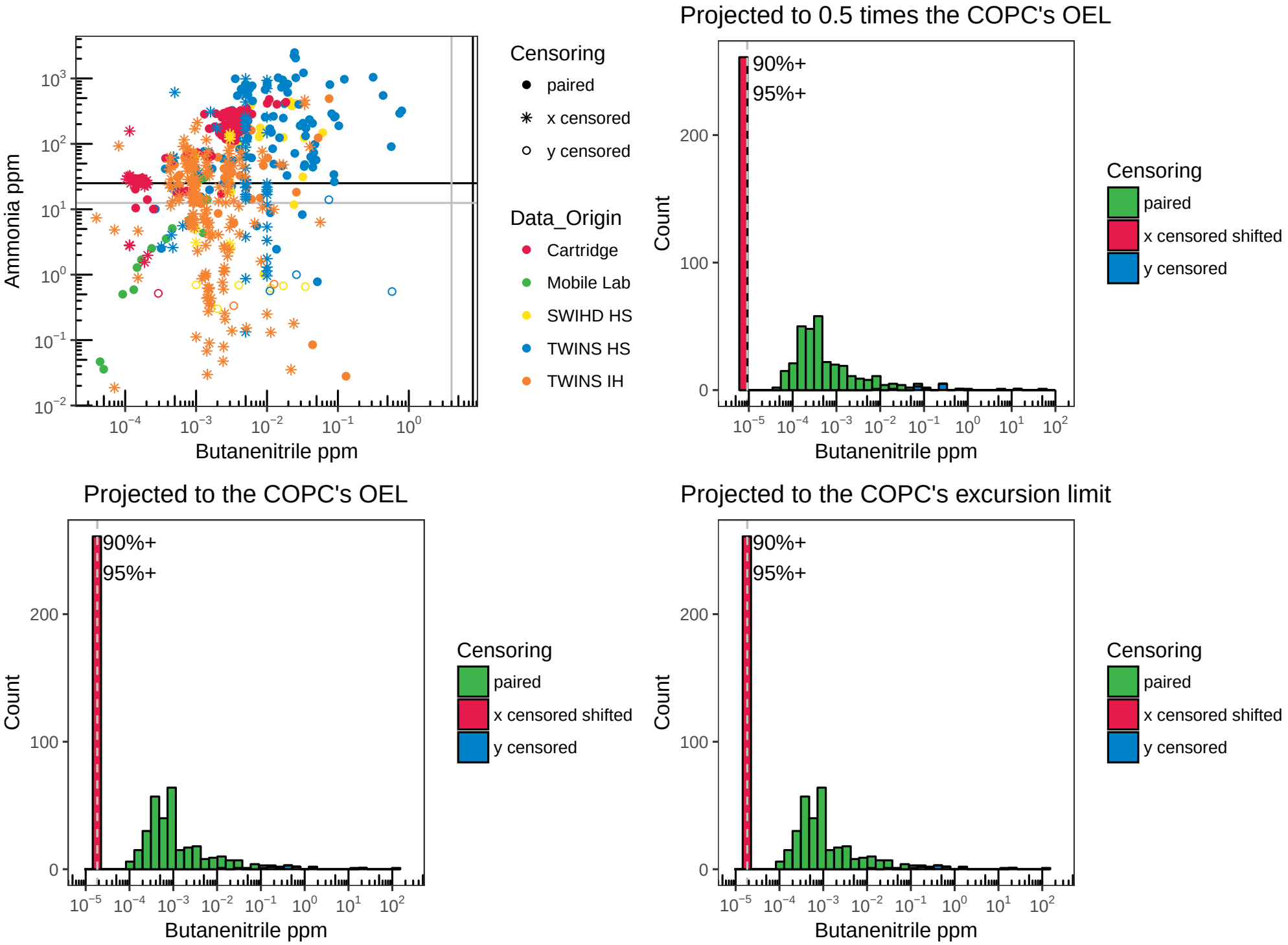


Figure C.1734: Ammonia vs Butanenitrile

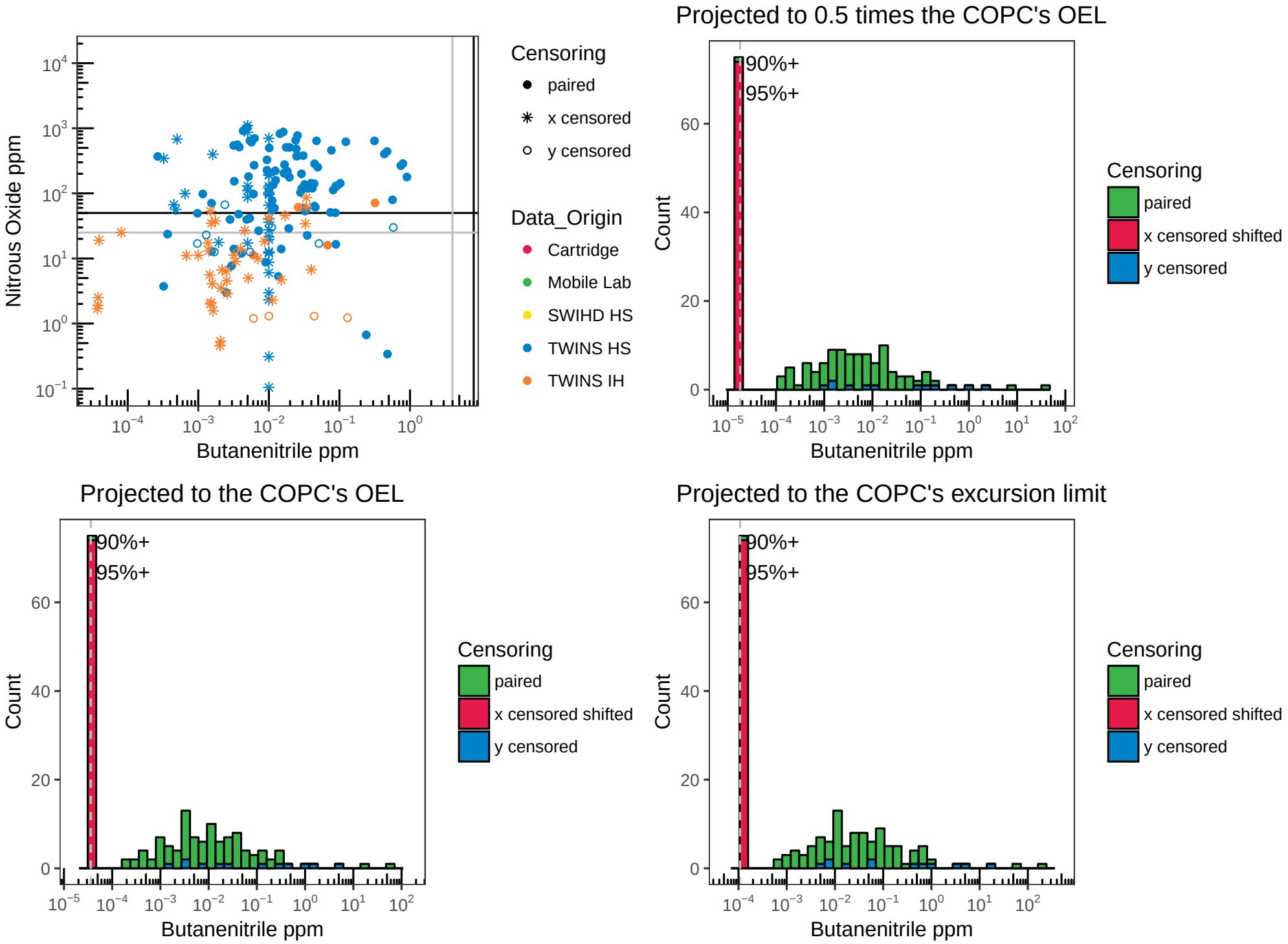


Figure C.1735: Nitrous Oxide vs Butanenitrile

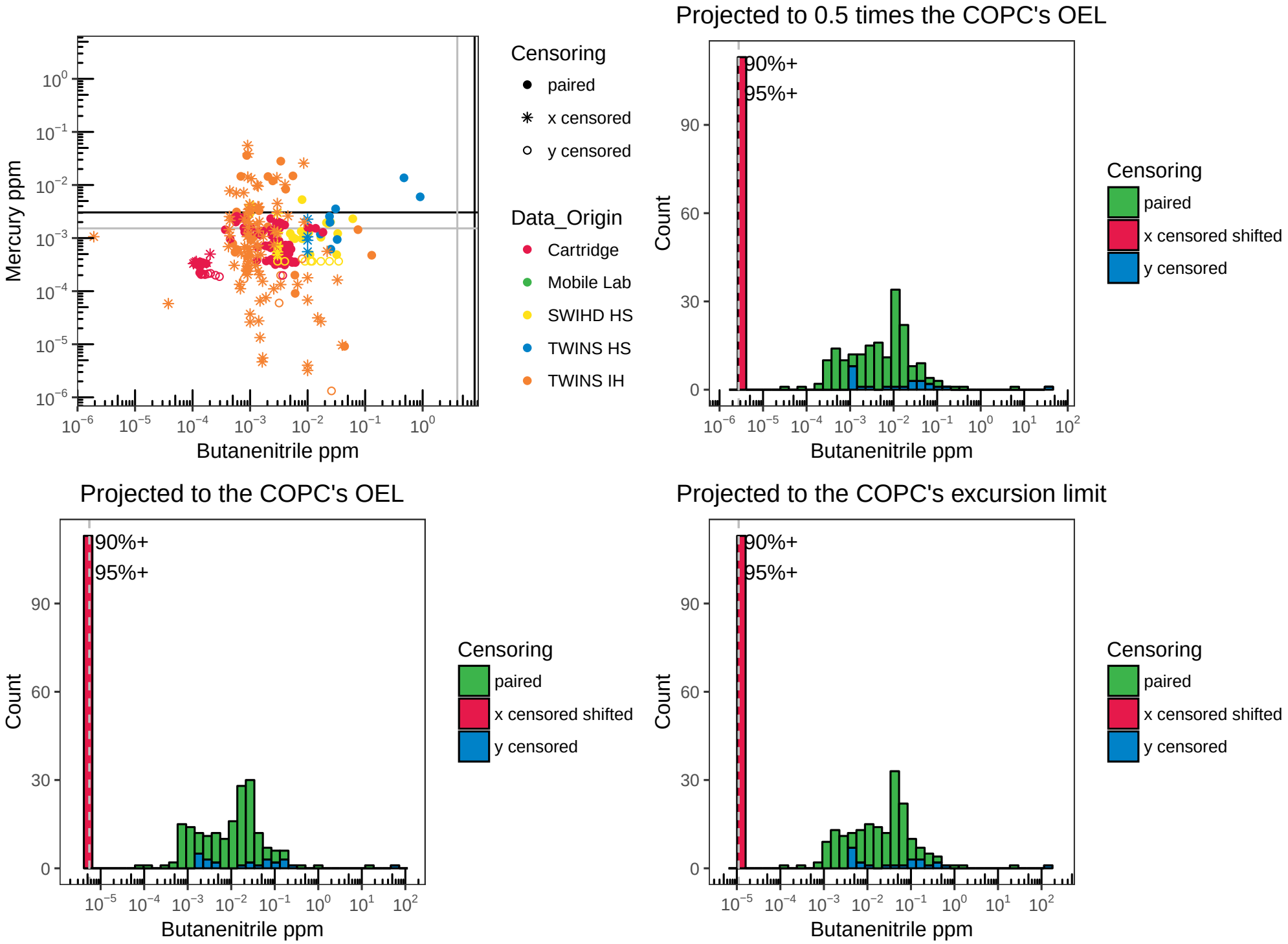


Figure C.1736: Mercury vs Butanenitrile

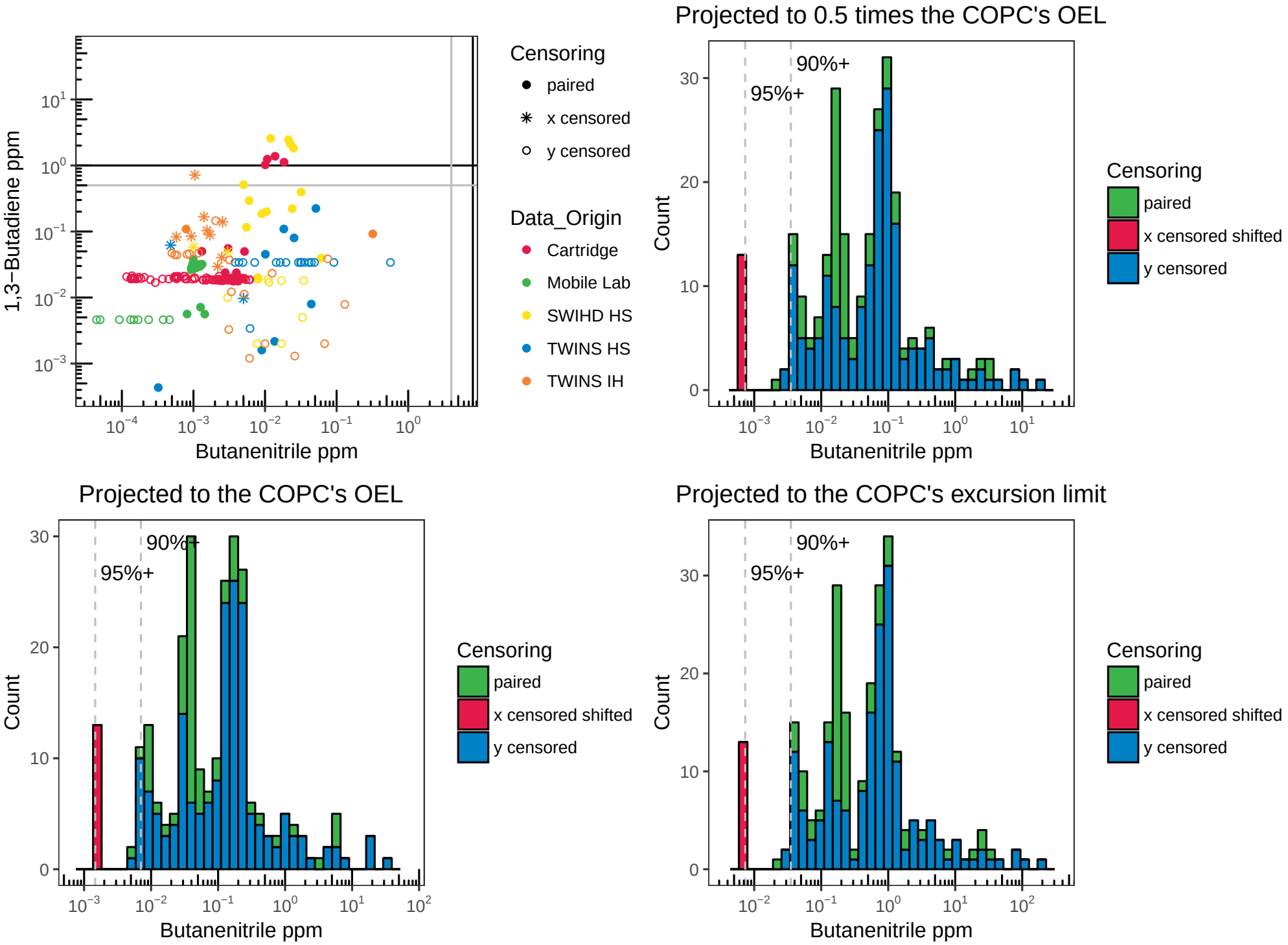


Figure C.1737: 1,3-Butadiene vs Butanenitrile

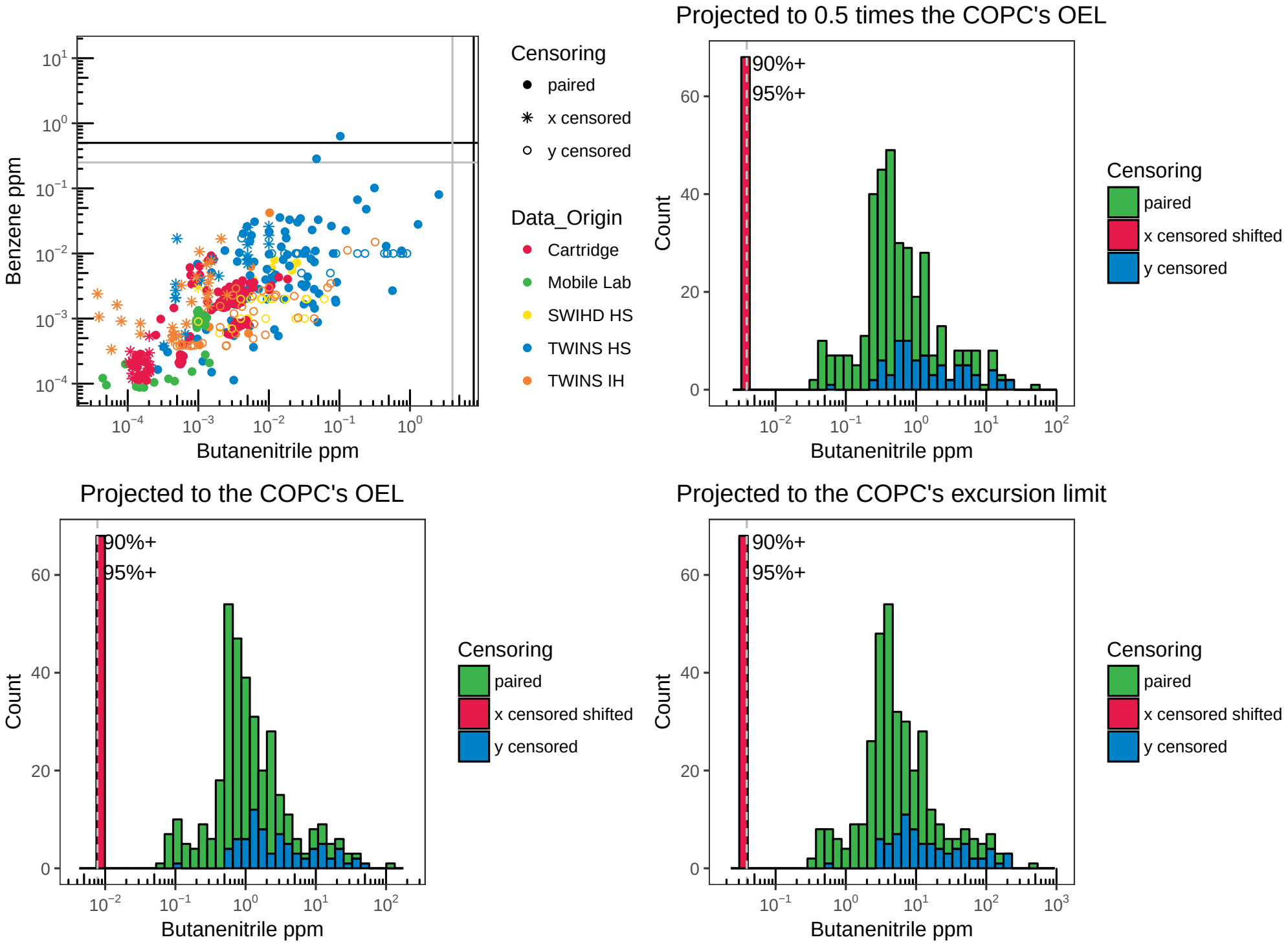


Figure C.1738: Benzene vs Butanenitrile

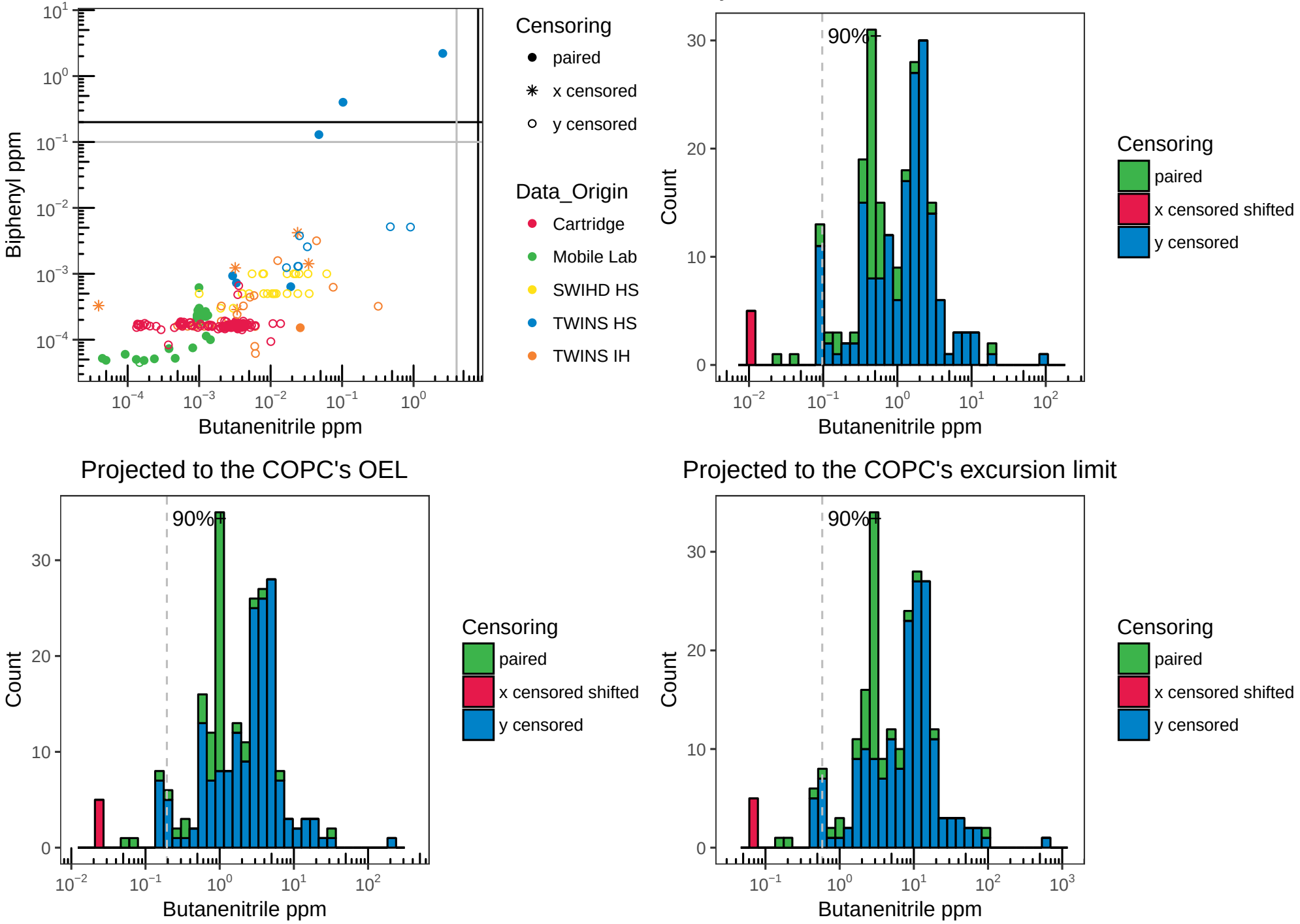


Figure C.1739: Biphenyl vs Butanenitrile

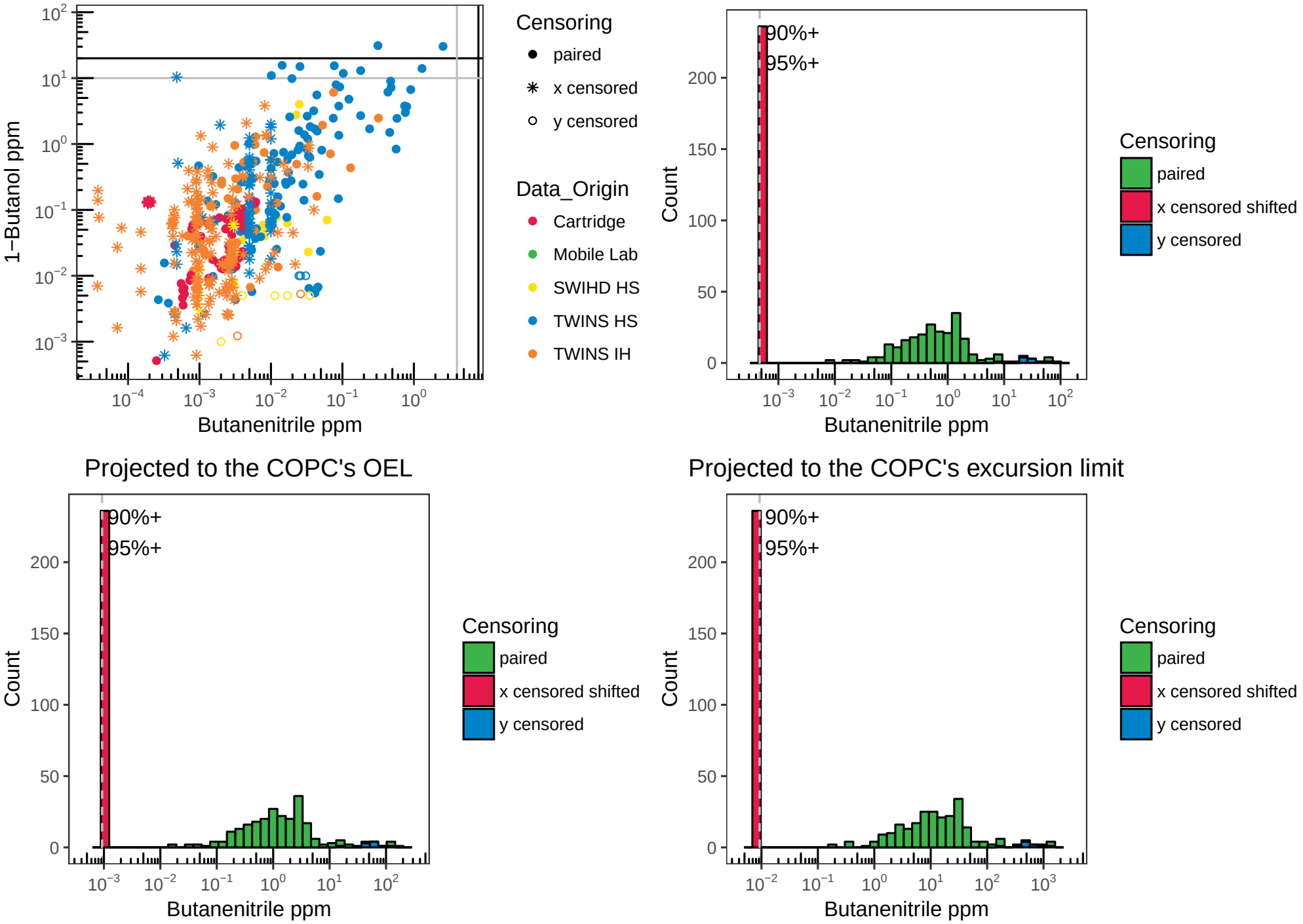


Figure C.1740: 1-Butanol vs Butanenitrile

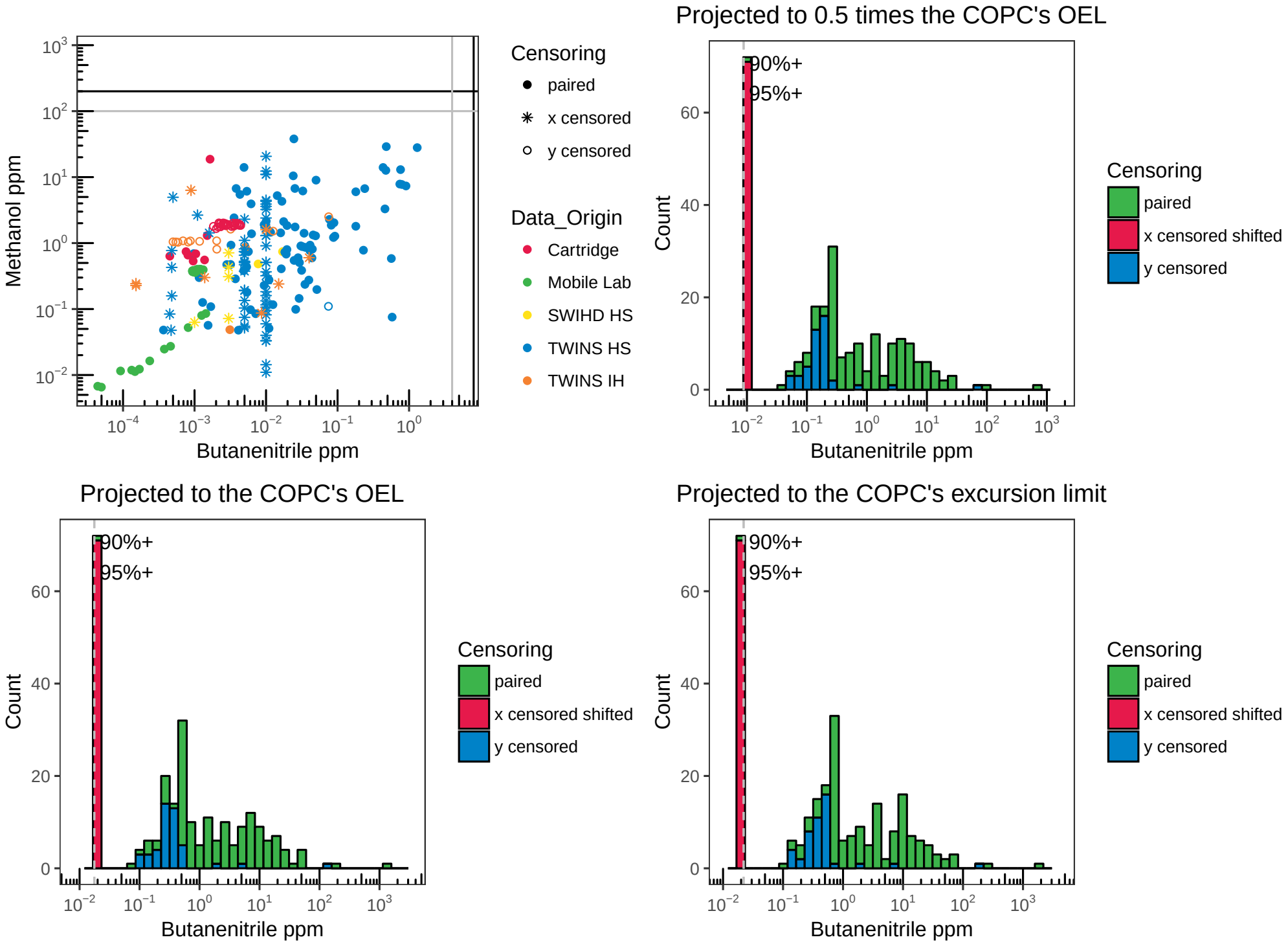


Figure C.1741: Methanol vs Butanenitrile

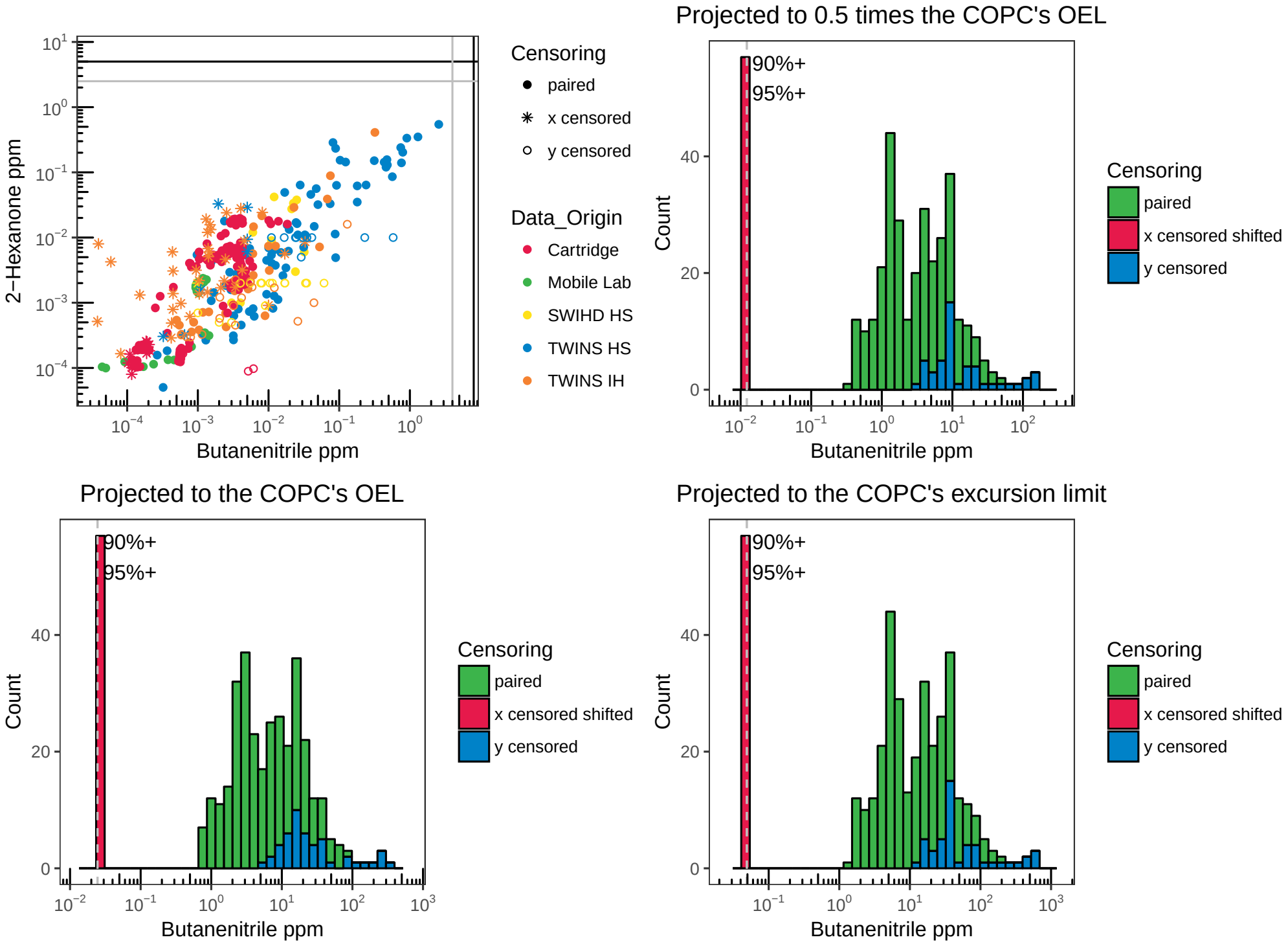


Figure C.1742: 2-Hexanone vs Butanenitrile

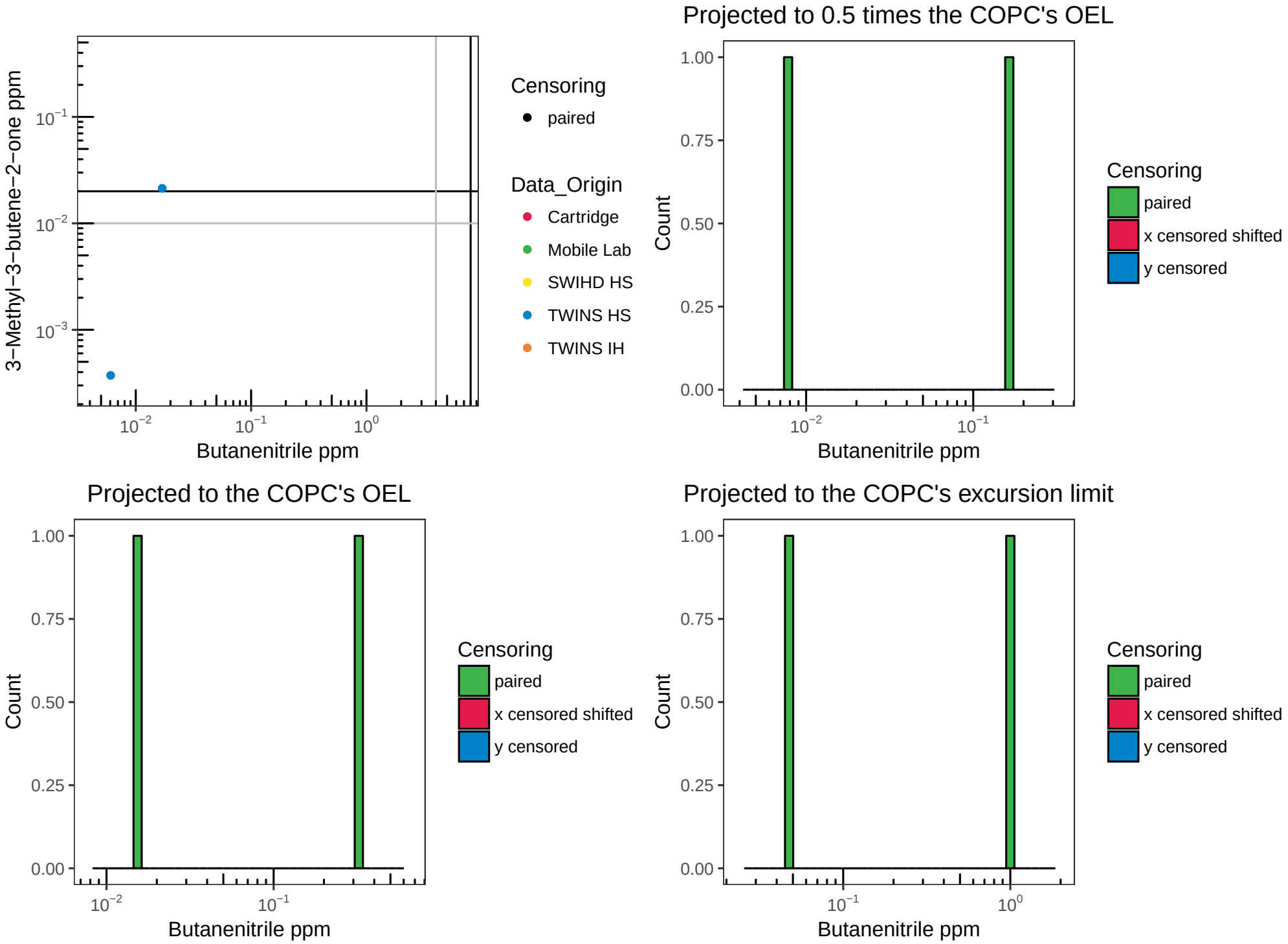


Figure C.1743: 3-Methyl-3-butene-2-one vs Butanenitrile

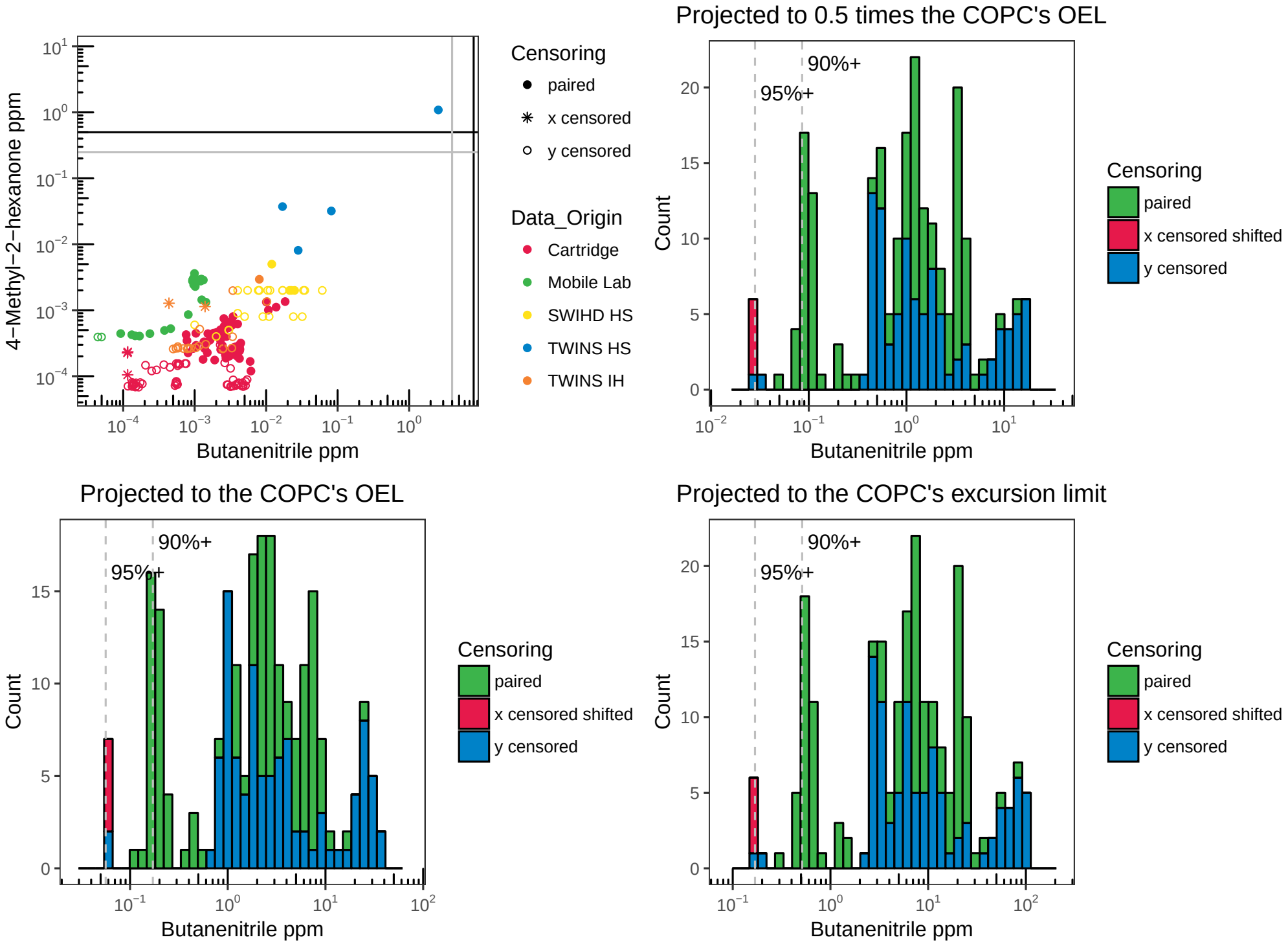


Figure C.1744: 4-Methyl-2-hexanone vs Butanenitrile

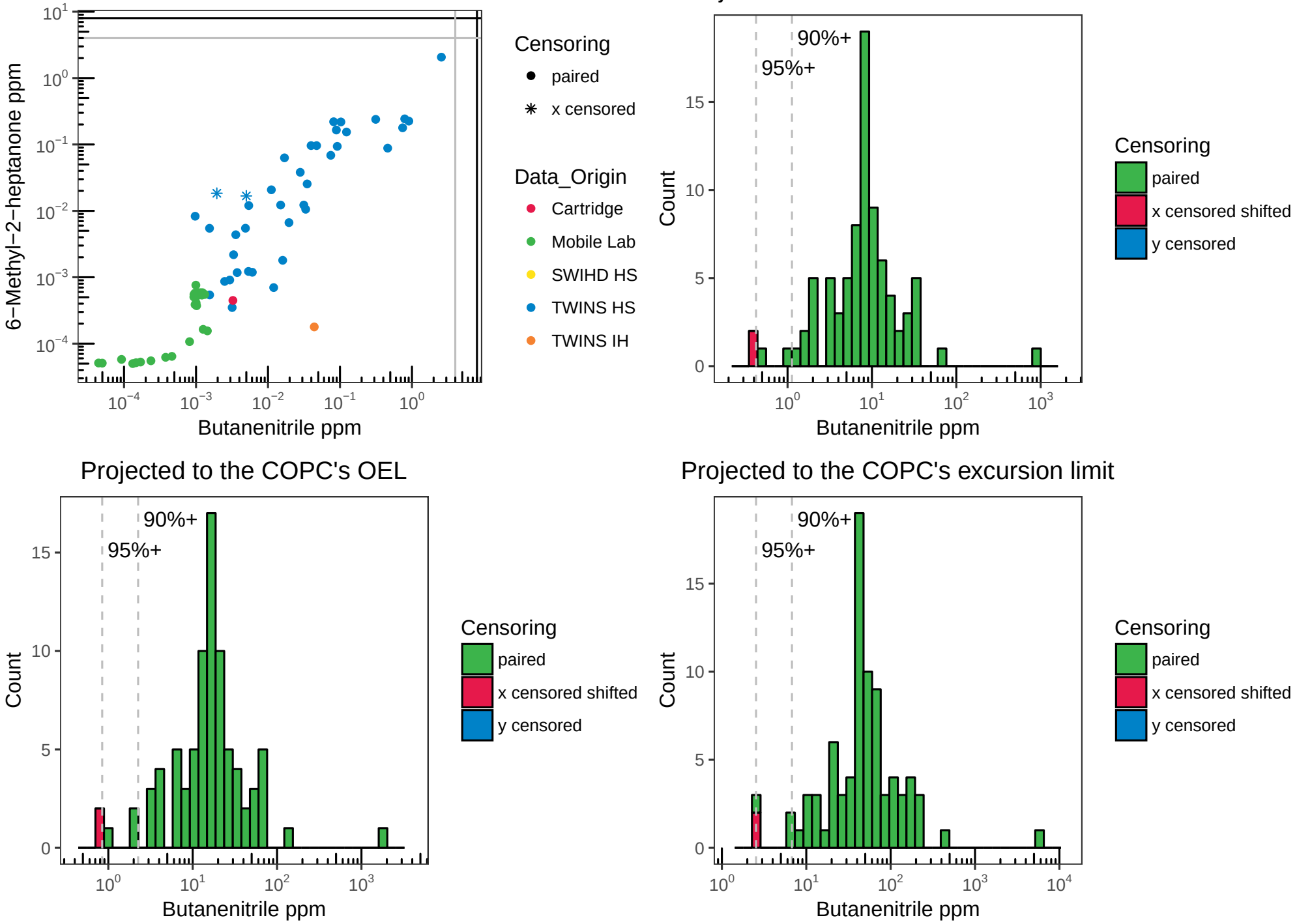


Figure C.1745: 6-Methyl-2-heptanone vs Butanenitrile

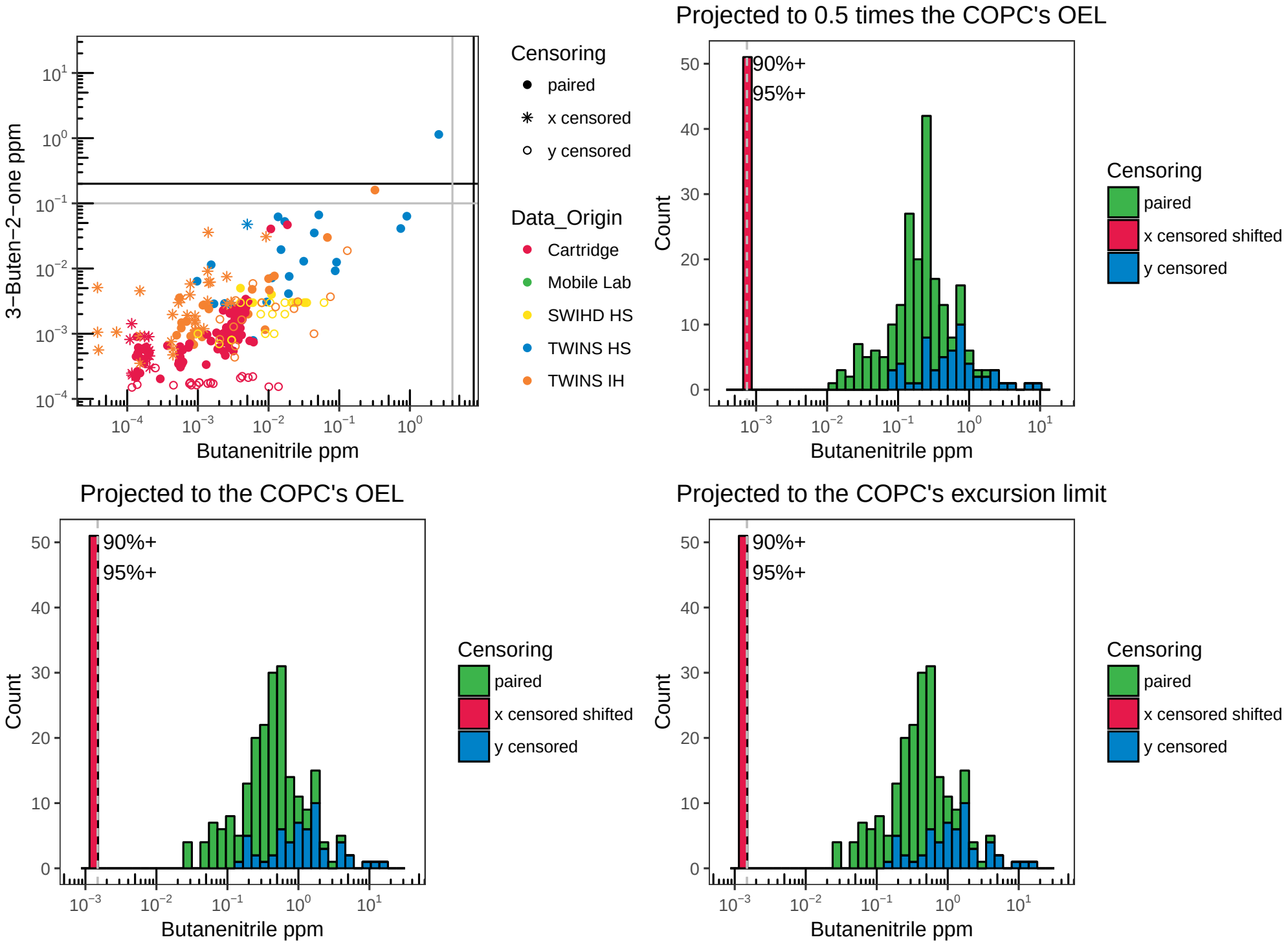


Figure C.1746: 3-Buten-2-one vs Butanenitrile

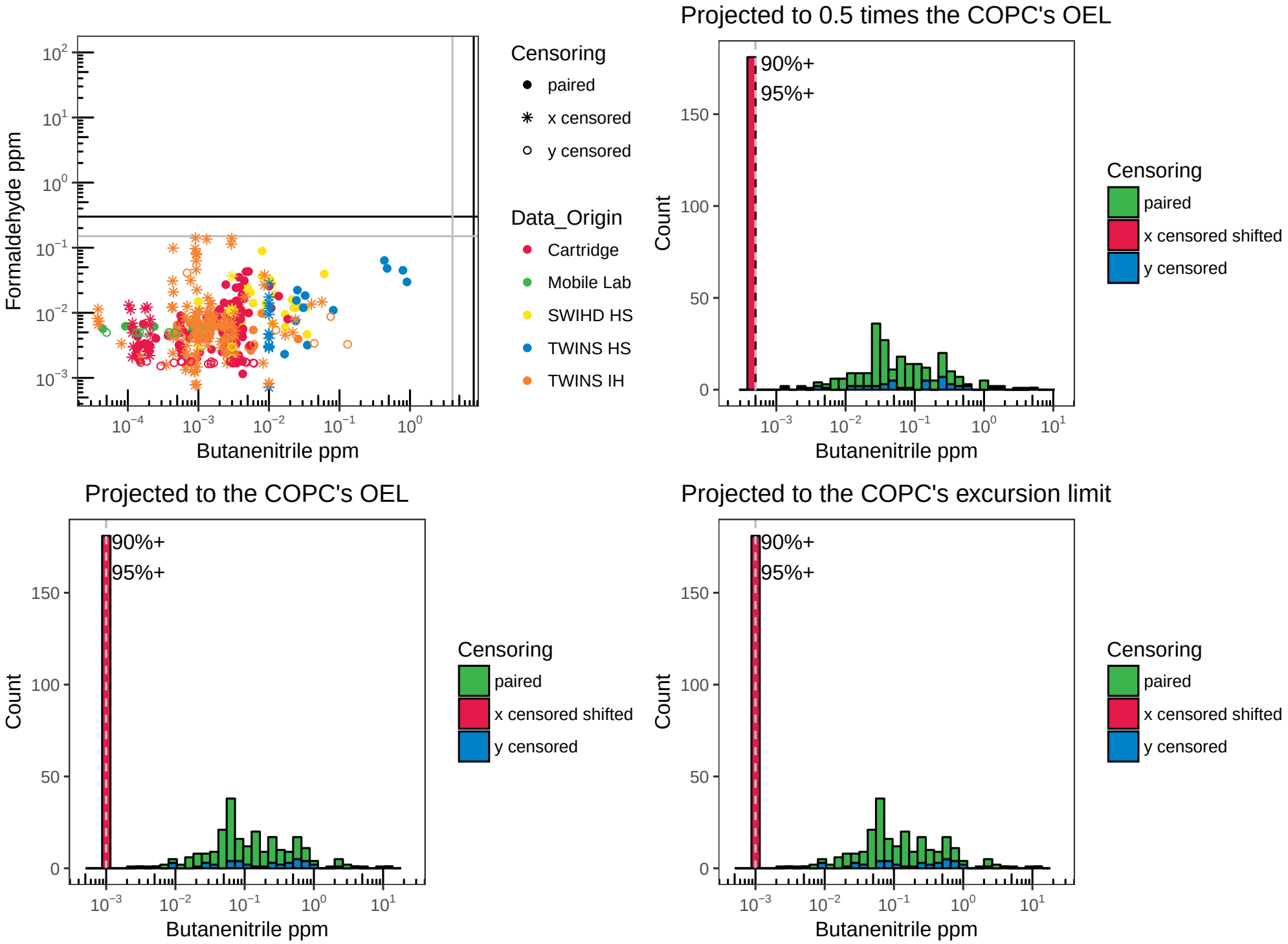


Figure C.1747: Formaldehyde vs Butanenitrile

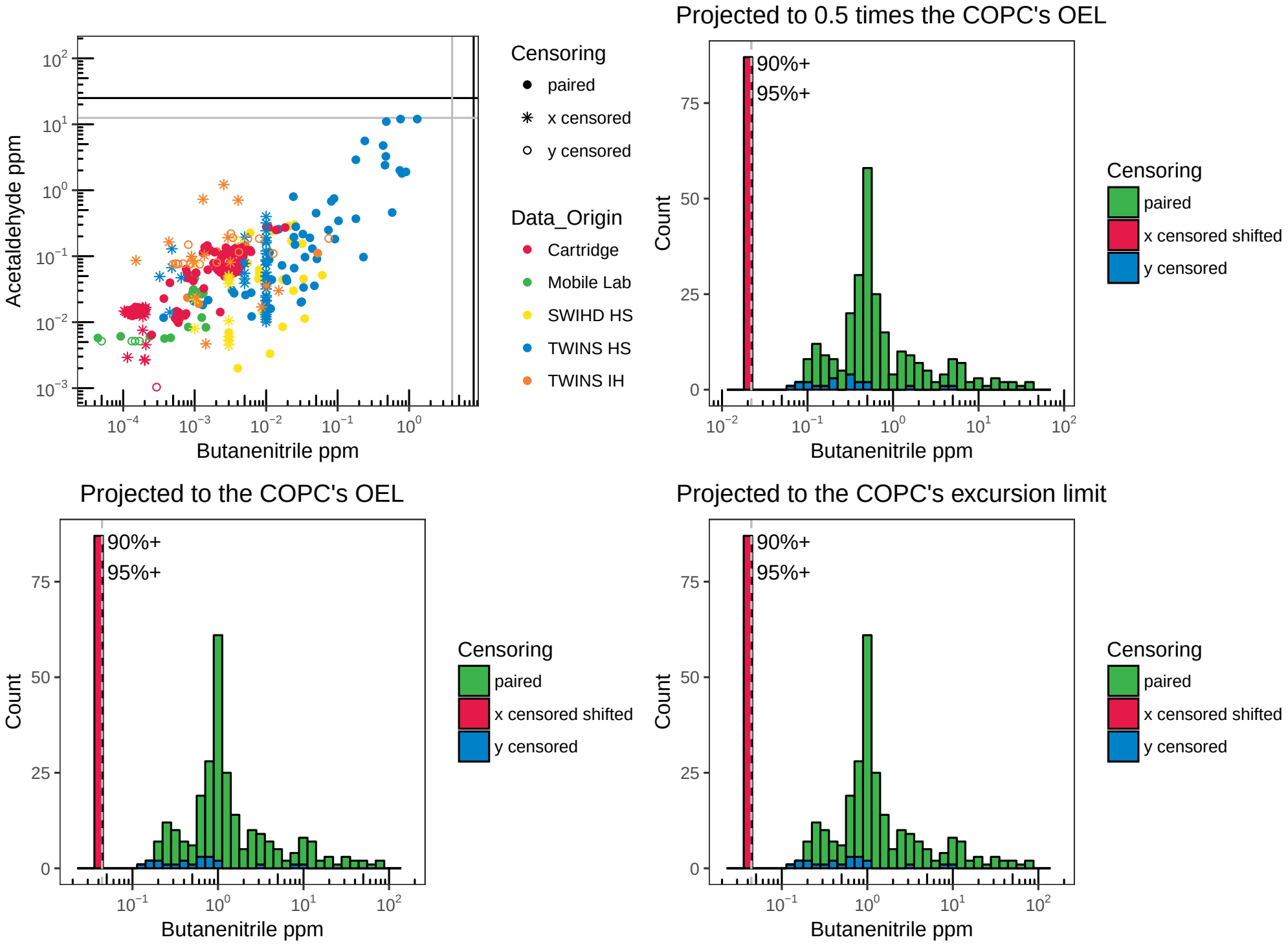


Figure C.1748: Acetaldehyde vs Butanenitrile

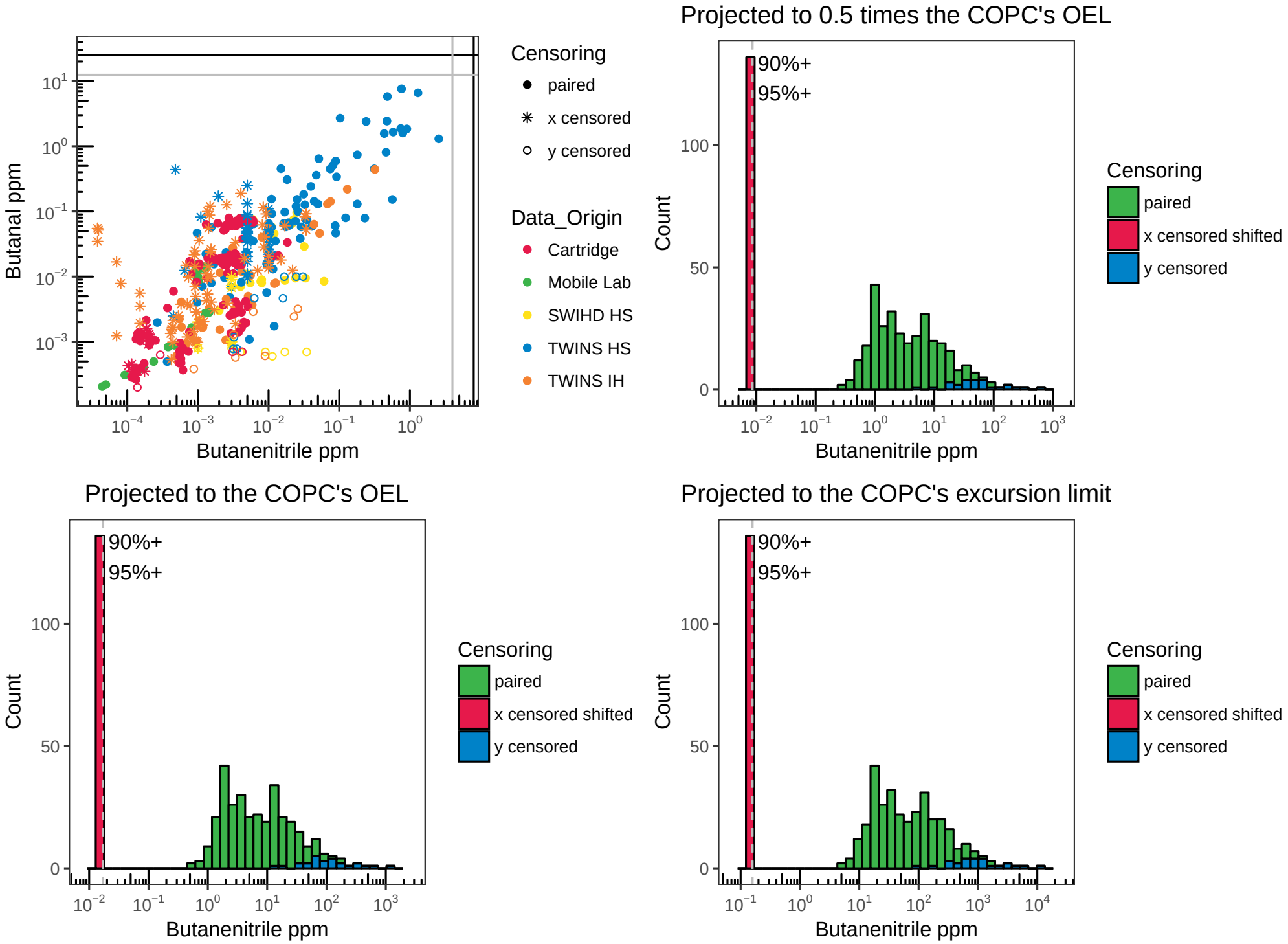


Figure C.1749: Butanal vs Butanenitrile

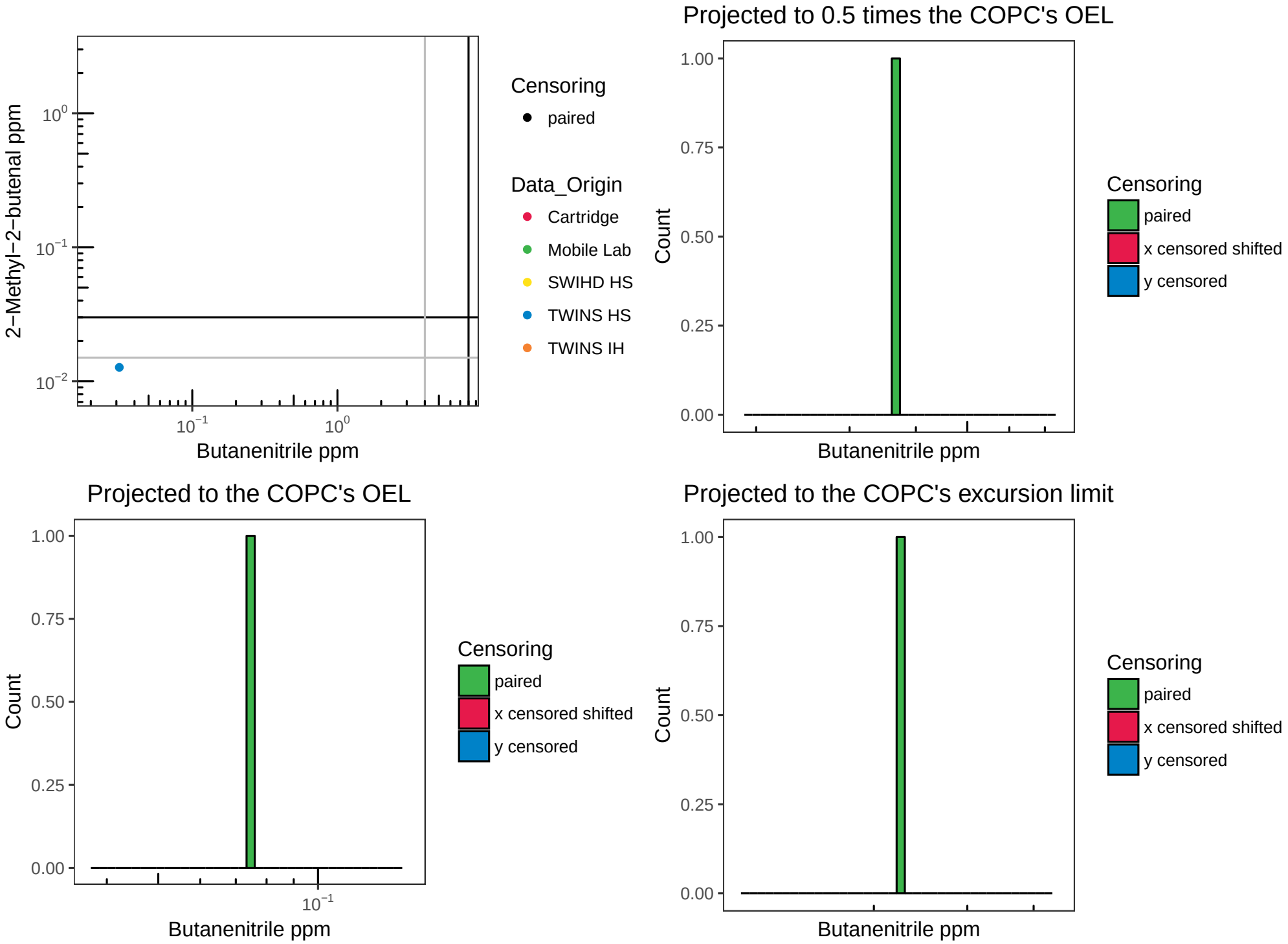


Figure C.1750: 2-Methyl-2-butenal vs Butanenitrile

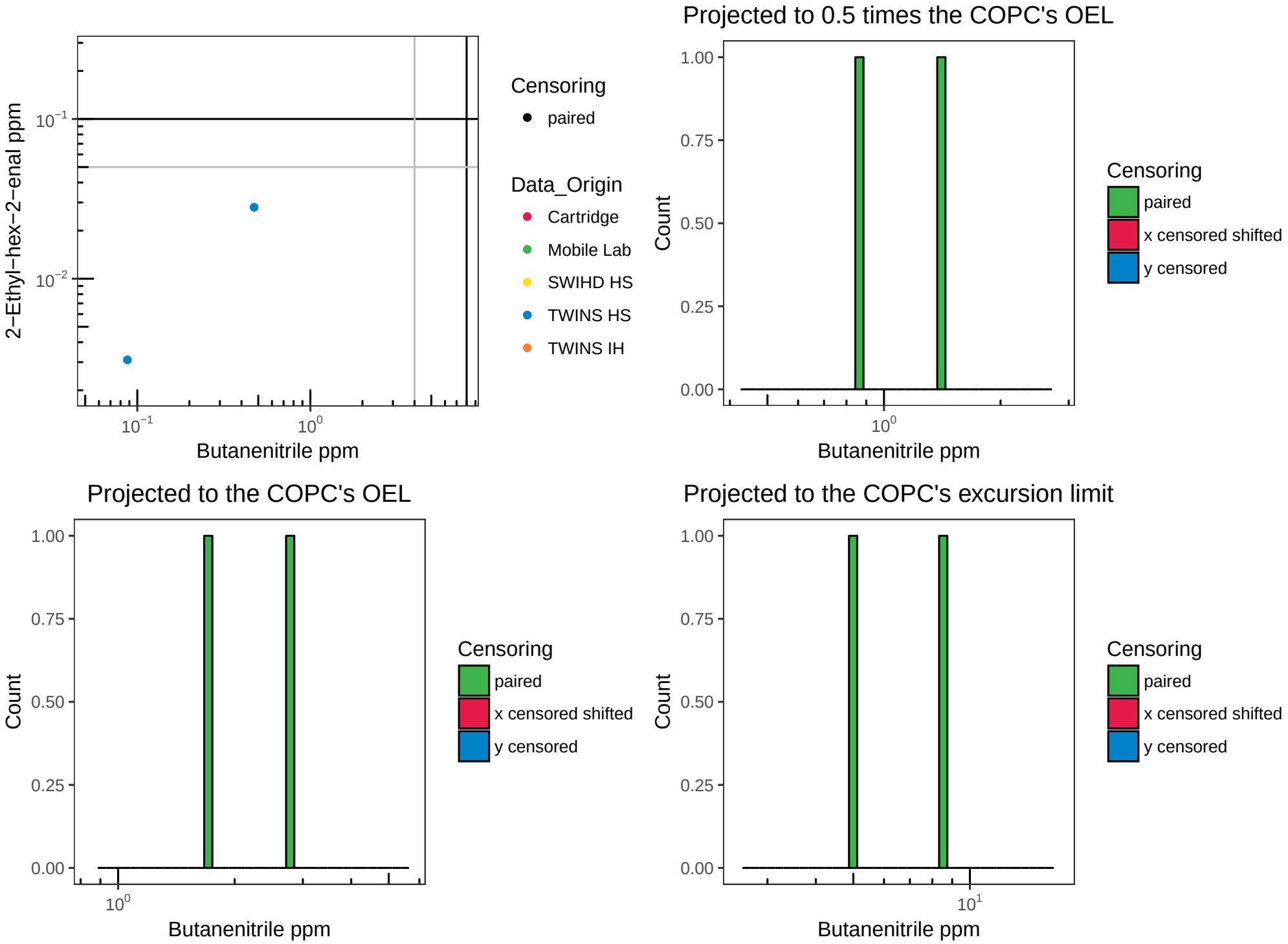


Figure C.1751: 2-Ethyl-hex-2-enal vs Butanenitrile

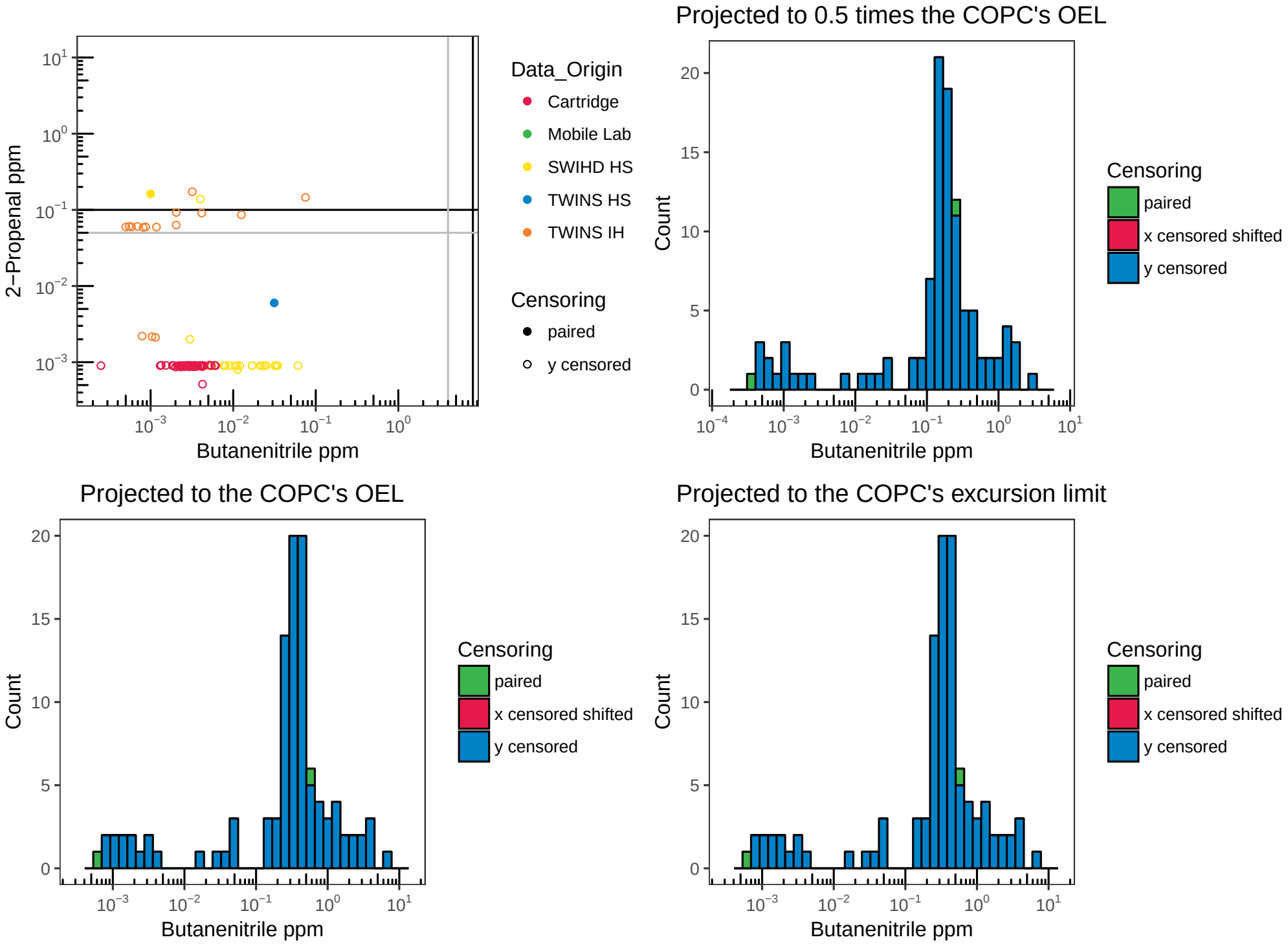


Figure C.1752: 2-Propenal vs Butanenitrile

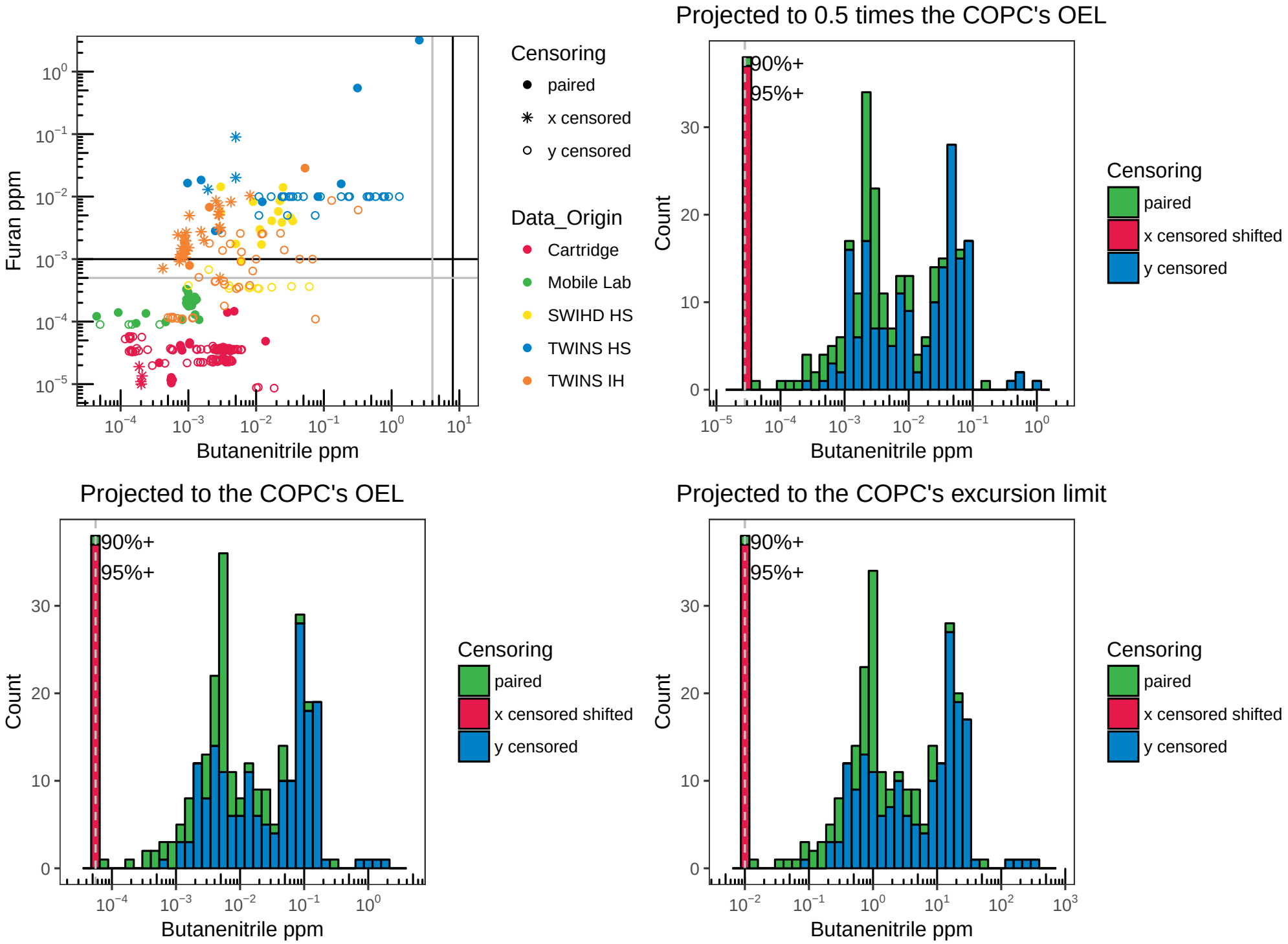


Figure C.1753: Furan vs Butanenitrile

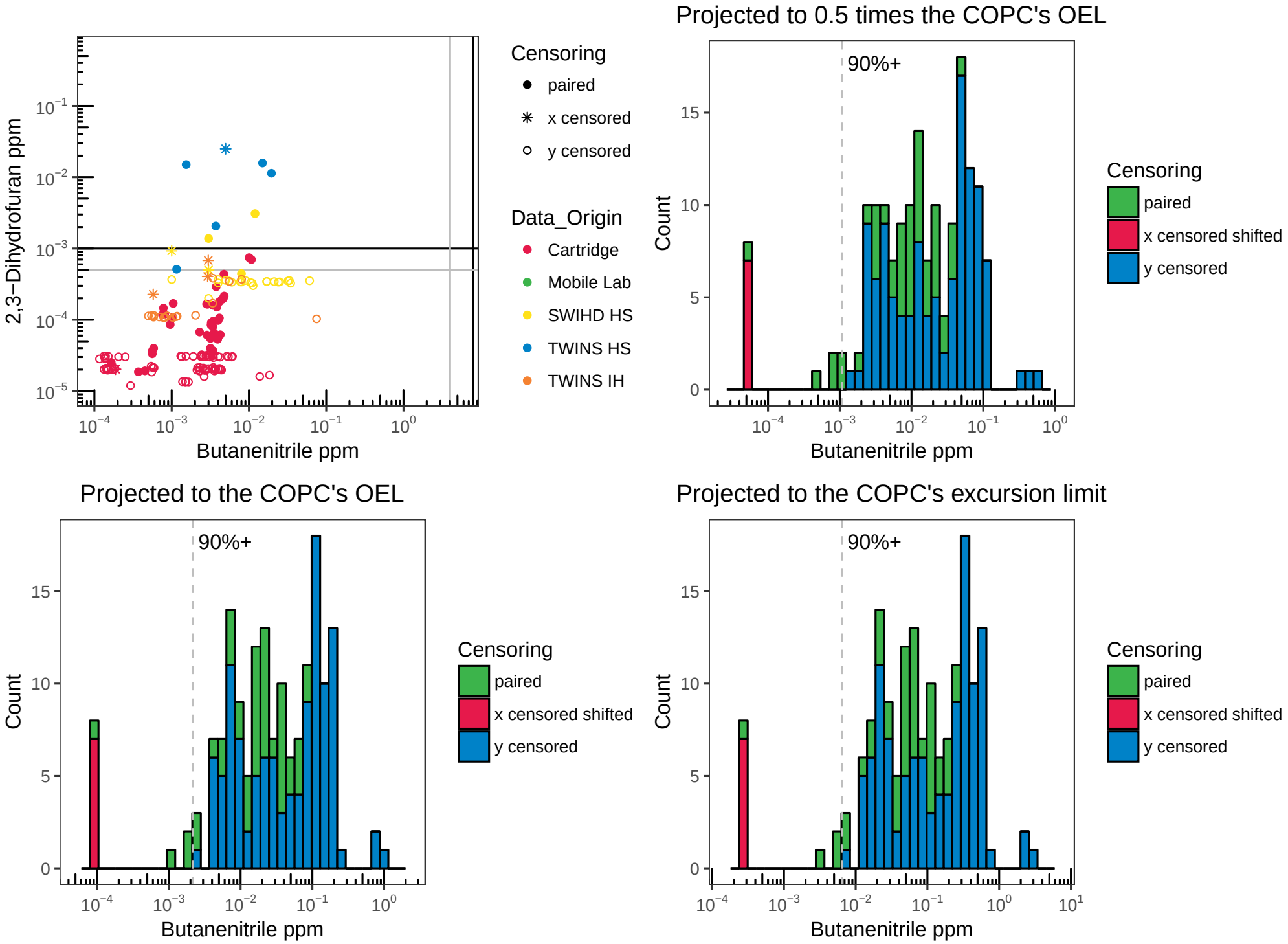


Figure C.1754: 2,3-Dihydrofuran vs Butanenitrile

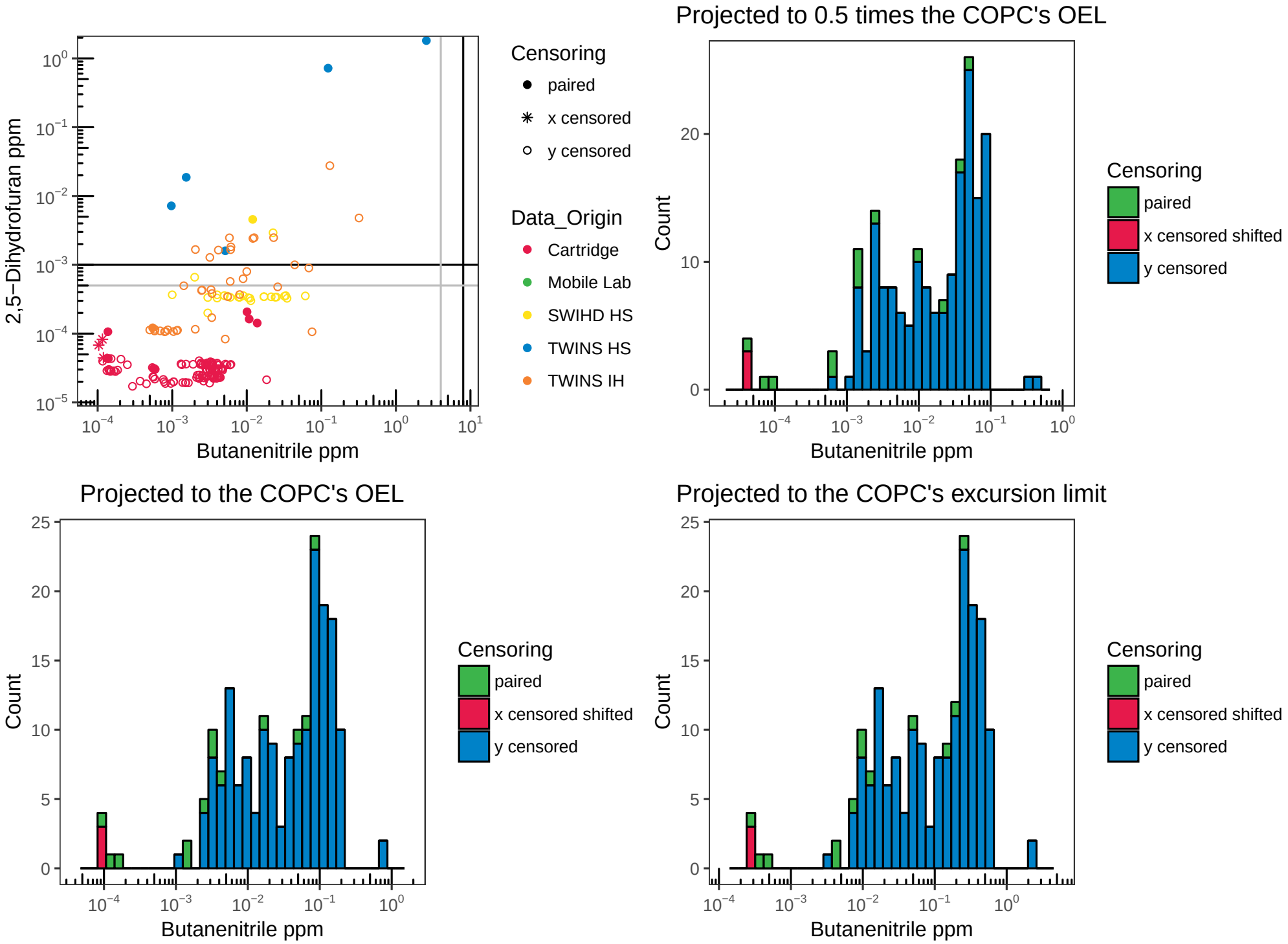


Figure C.1755: 2,5-Dihydrofuran vs Butanenitrile

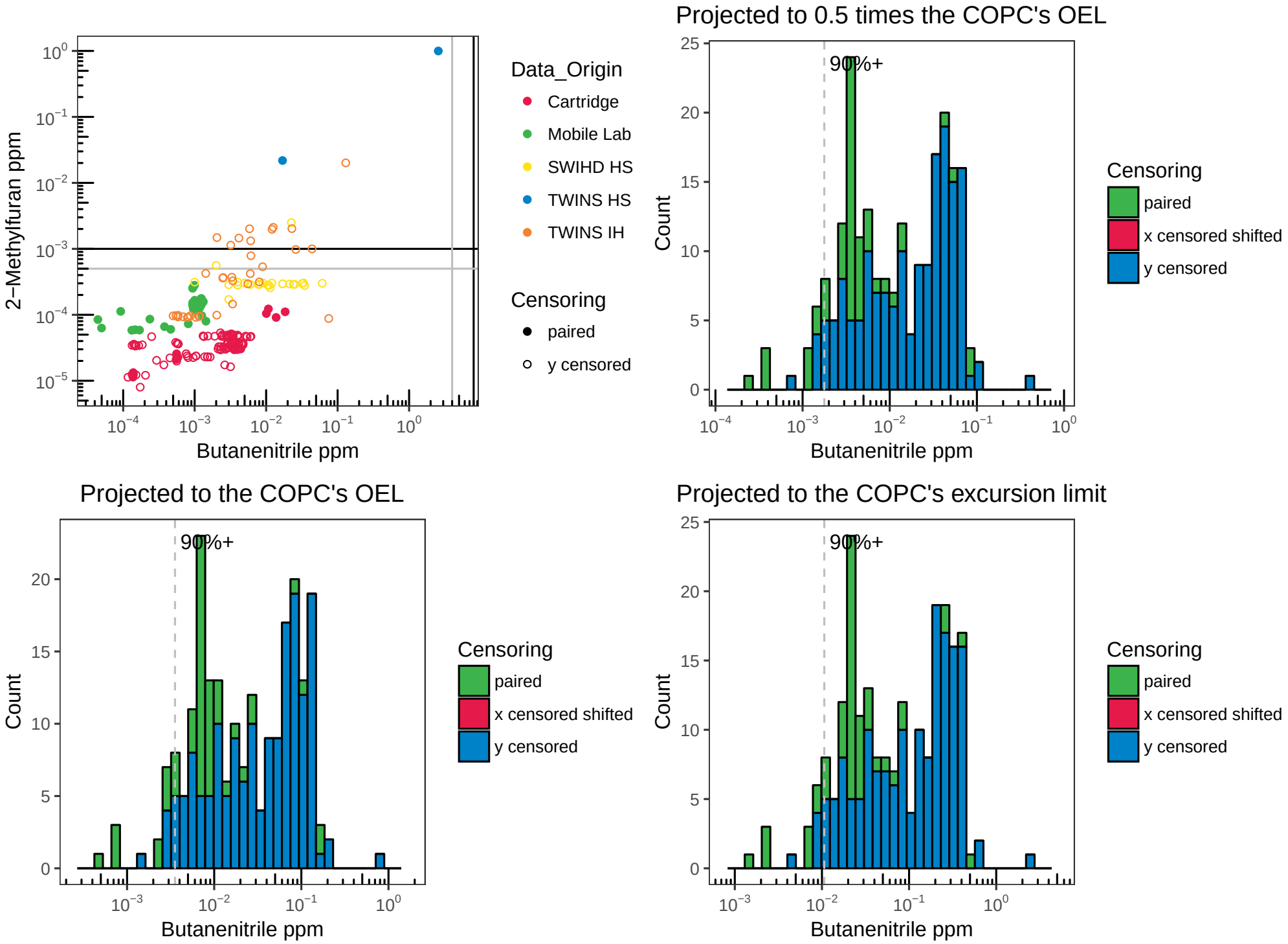


Figure C.1756: 2-Methylfuran vs Butanenitrile

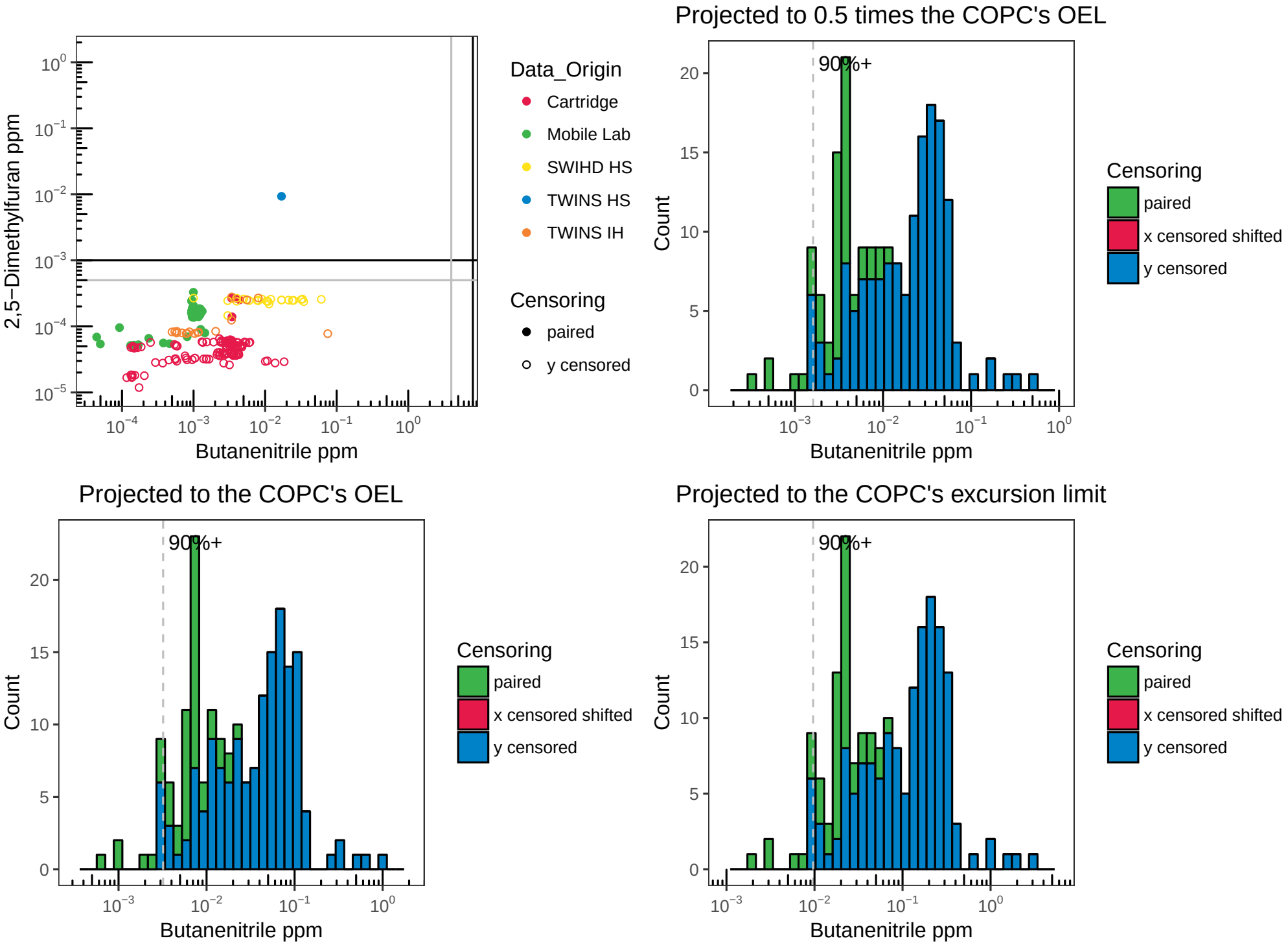


Figure C.1757: 2,5-Dimethylfuran vs Butanenitrile

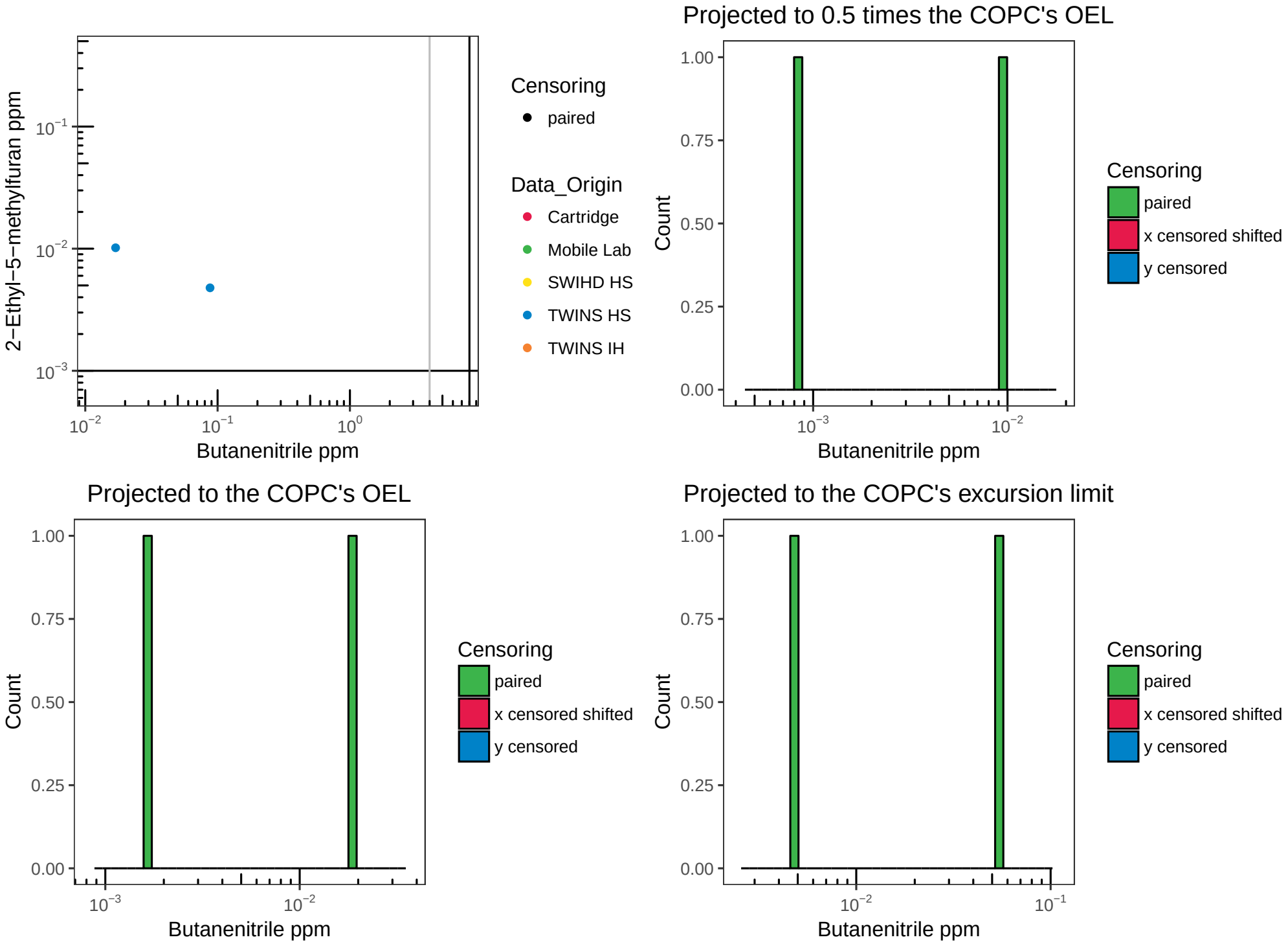


Figure C.1758: 2-Ethyl-5-methylfuran vs Butanenitrile

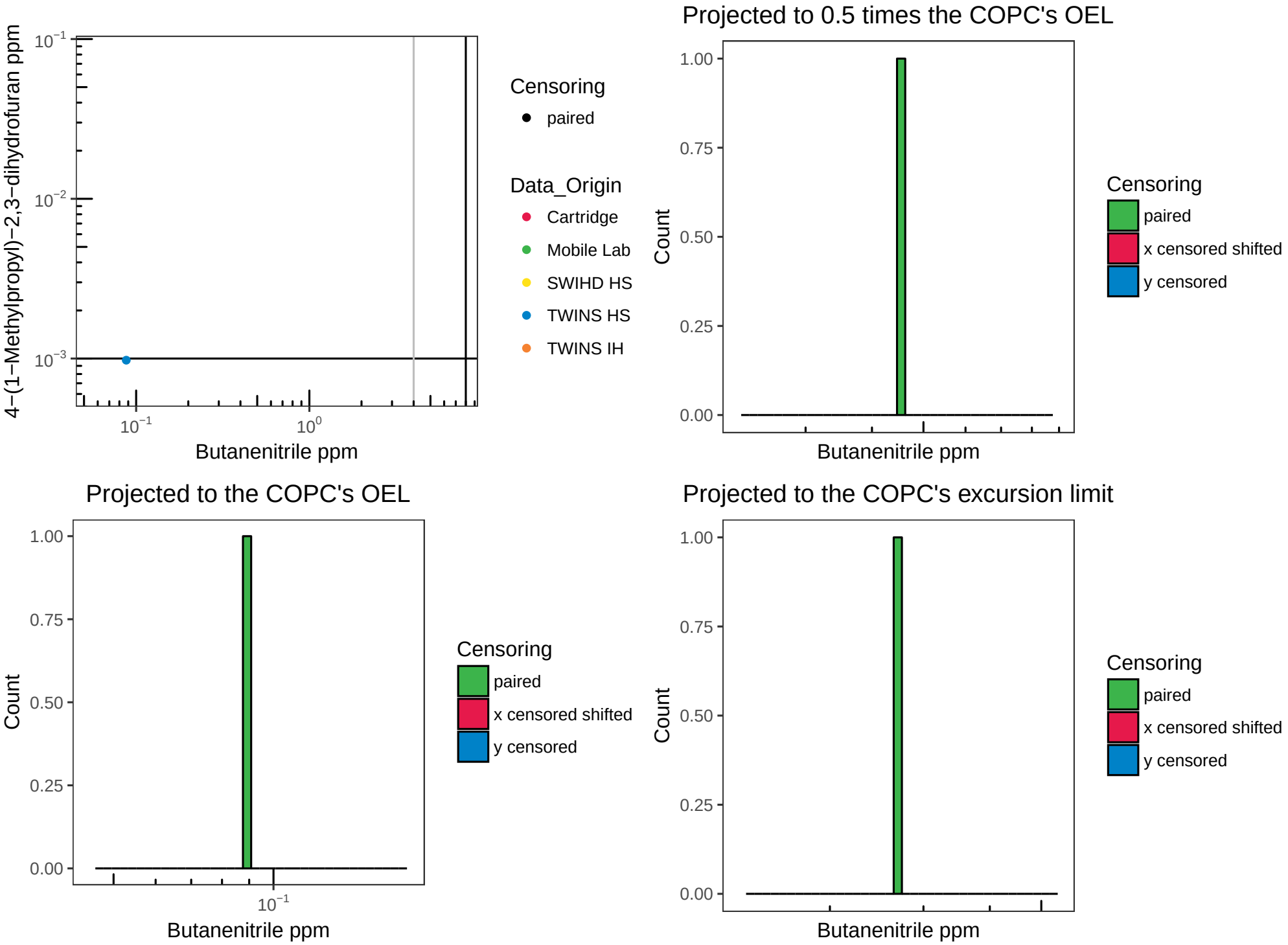


Figure C.1759: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Butanenitrile

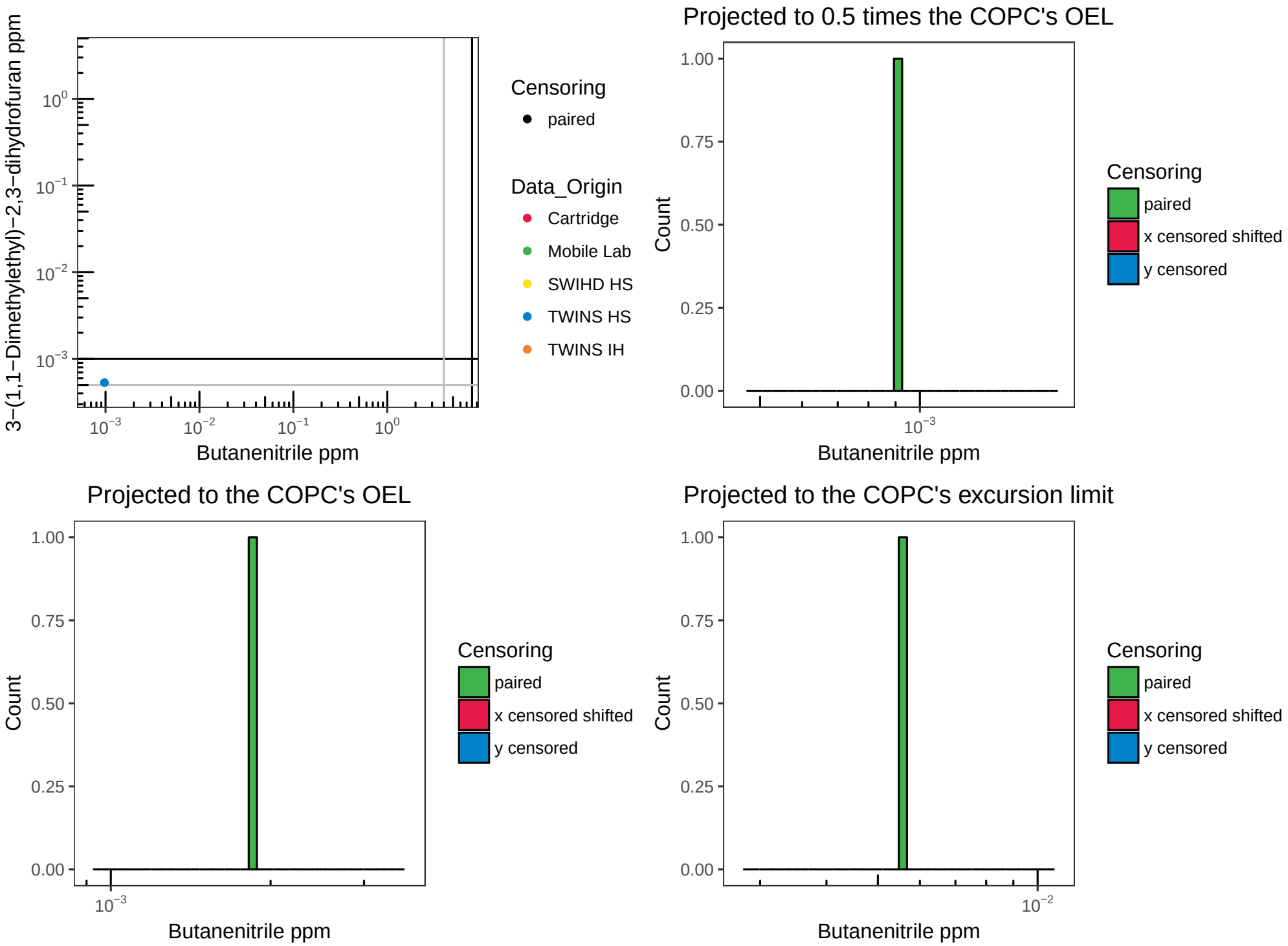


Figure C.1760: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Butanenitrile

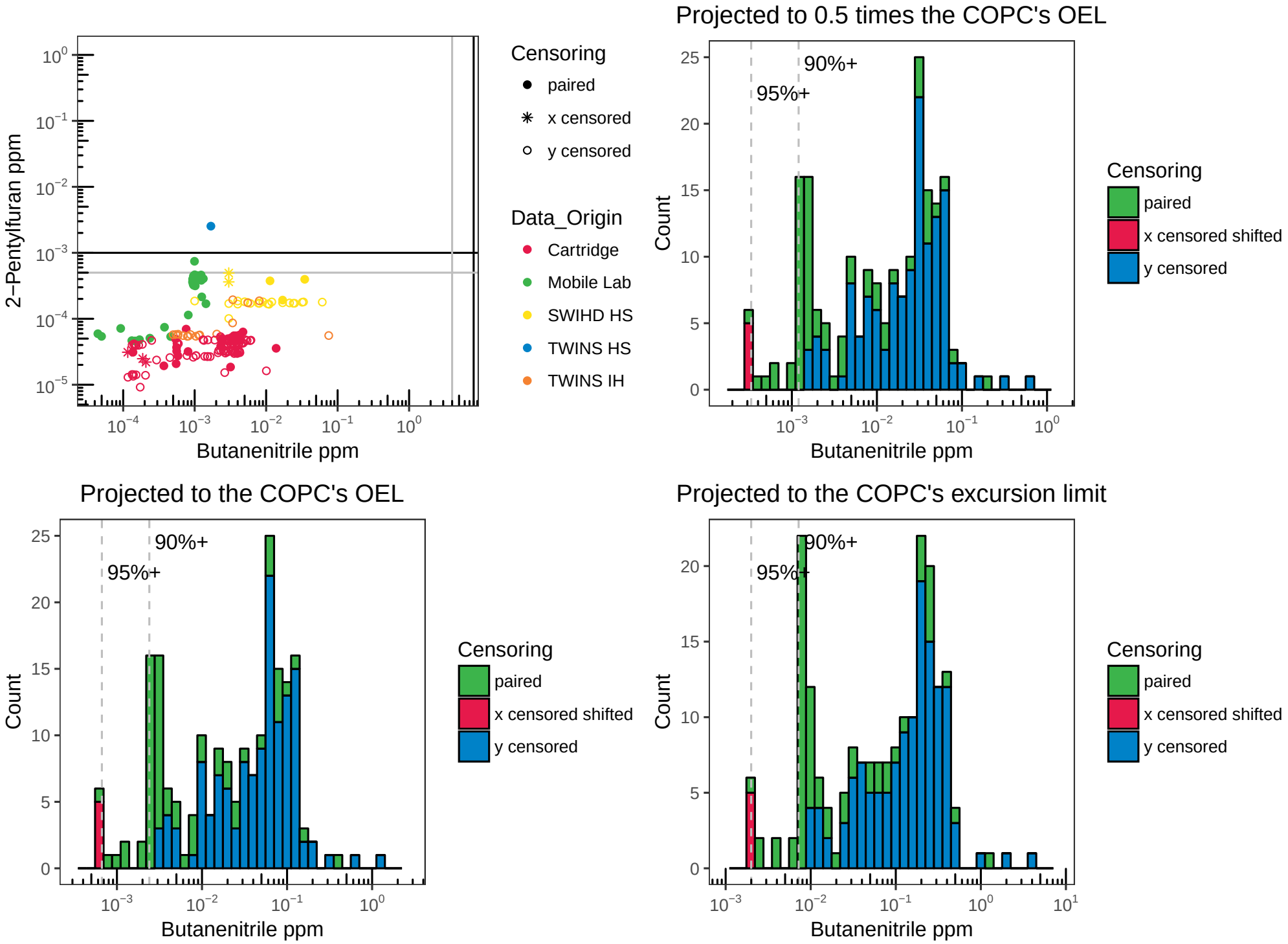


Figure C.1761: 2-Pentylfuran vs Butanenitrile

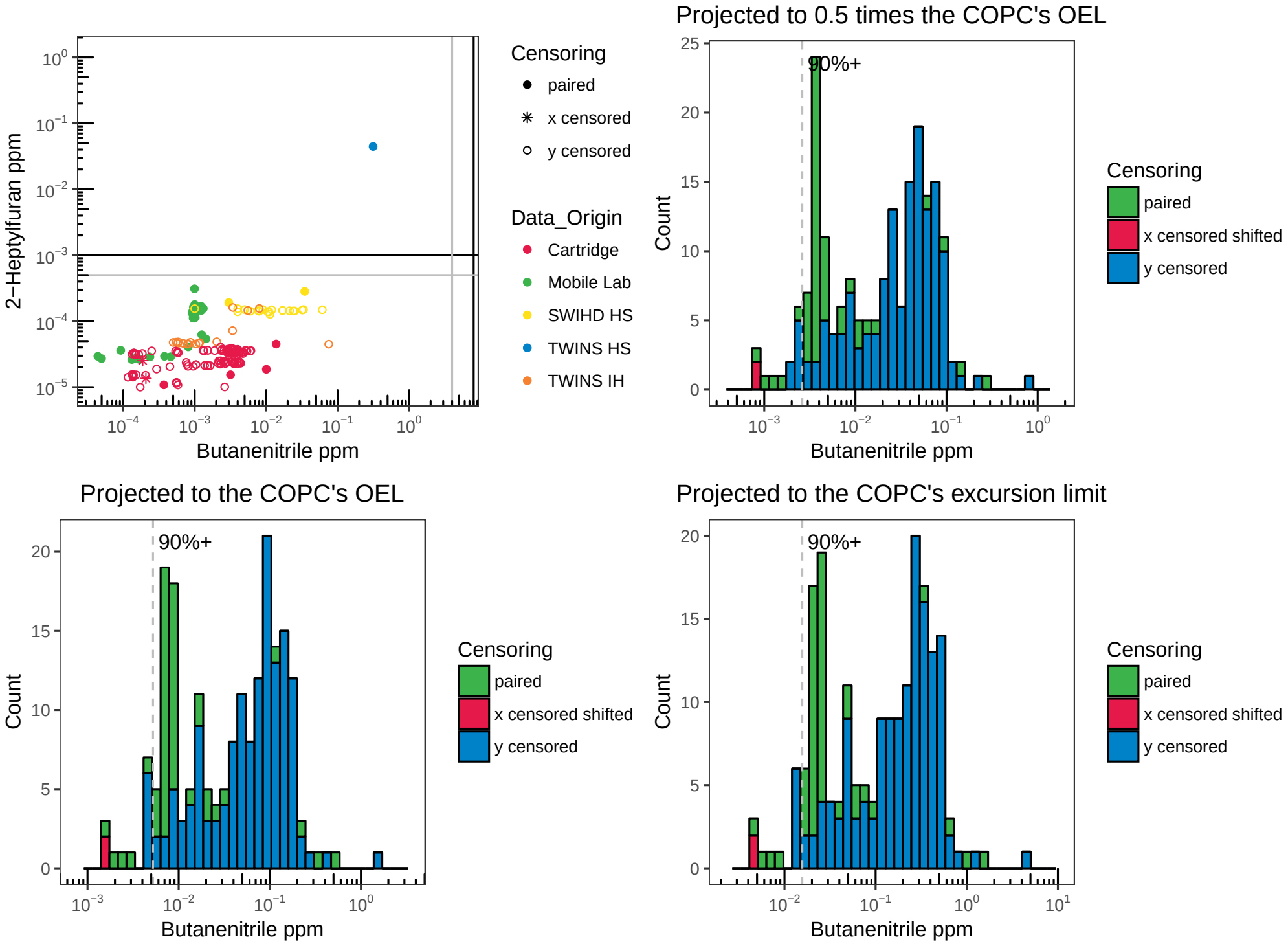


Figure C.1762: 2-Heptylfuran vs Butanenitrile

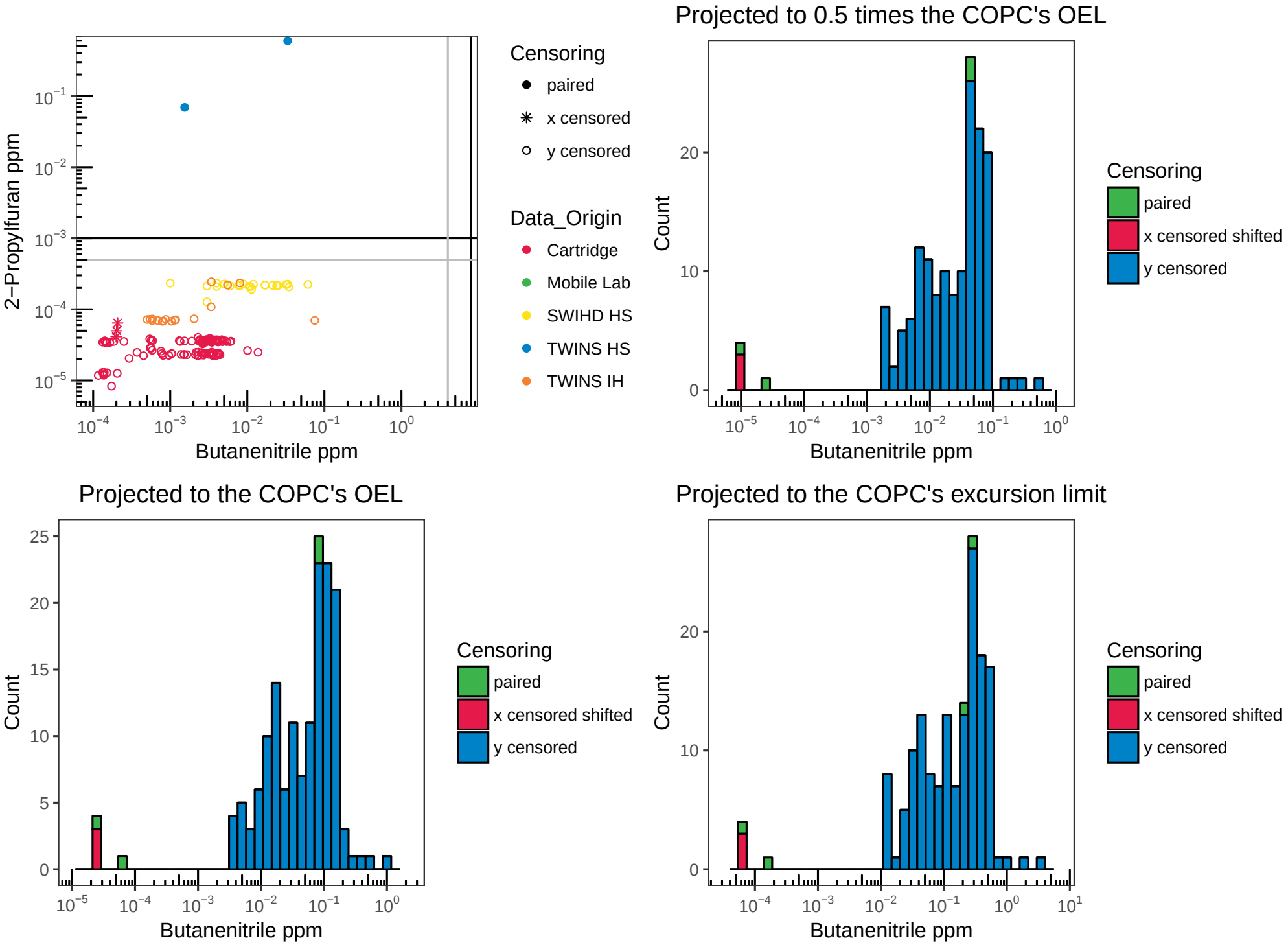


Figure C.1763: 2-Propylfuran vs Butanenitrile

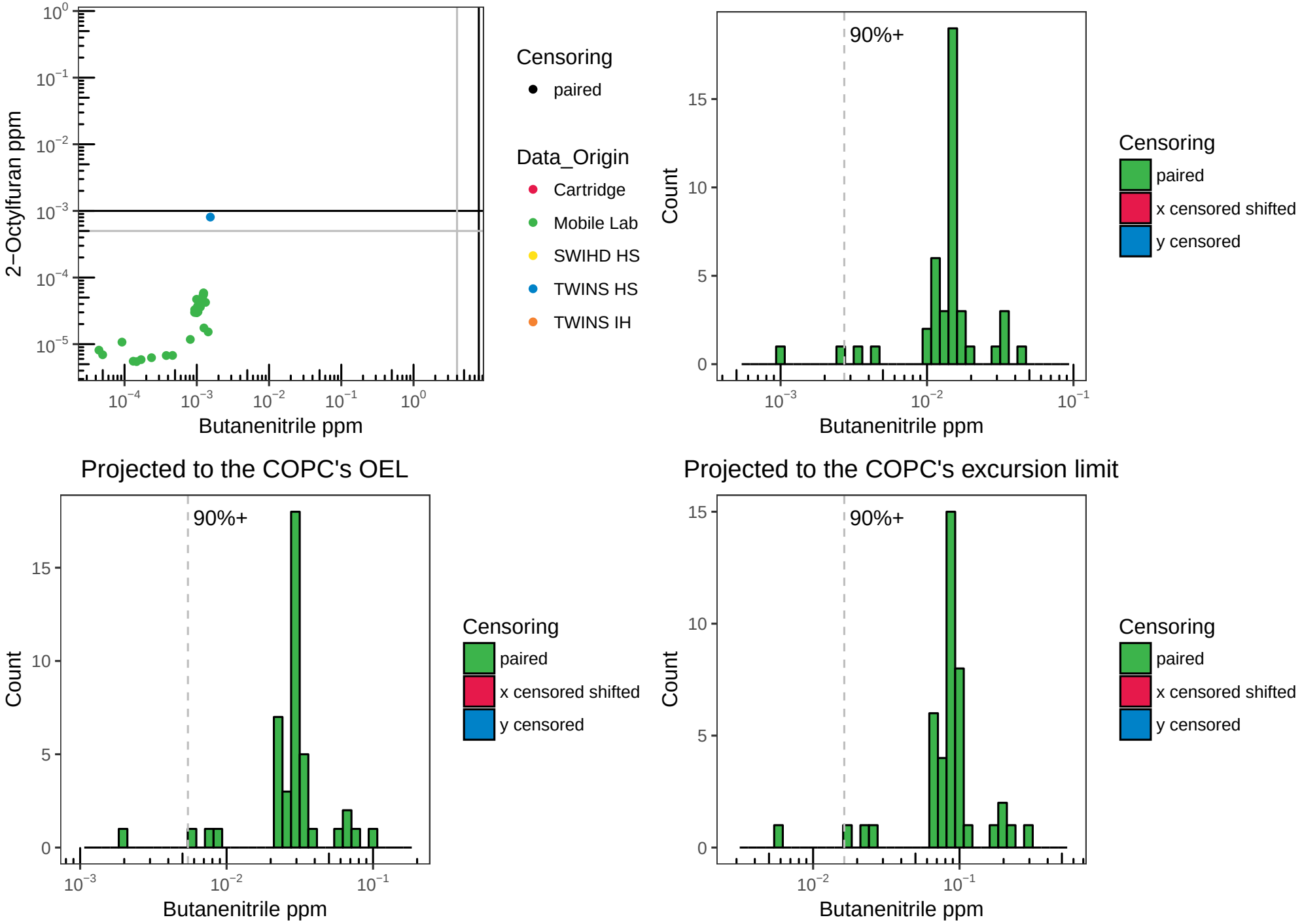


Figure C.1764: 2-Octylfuran vs Butanenitrile

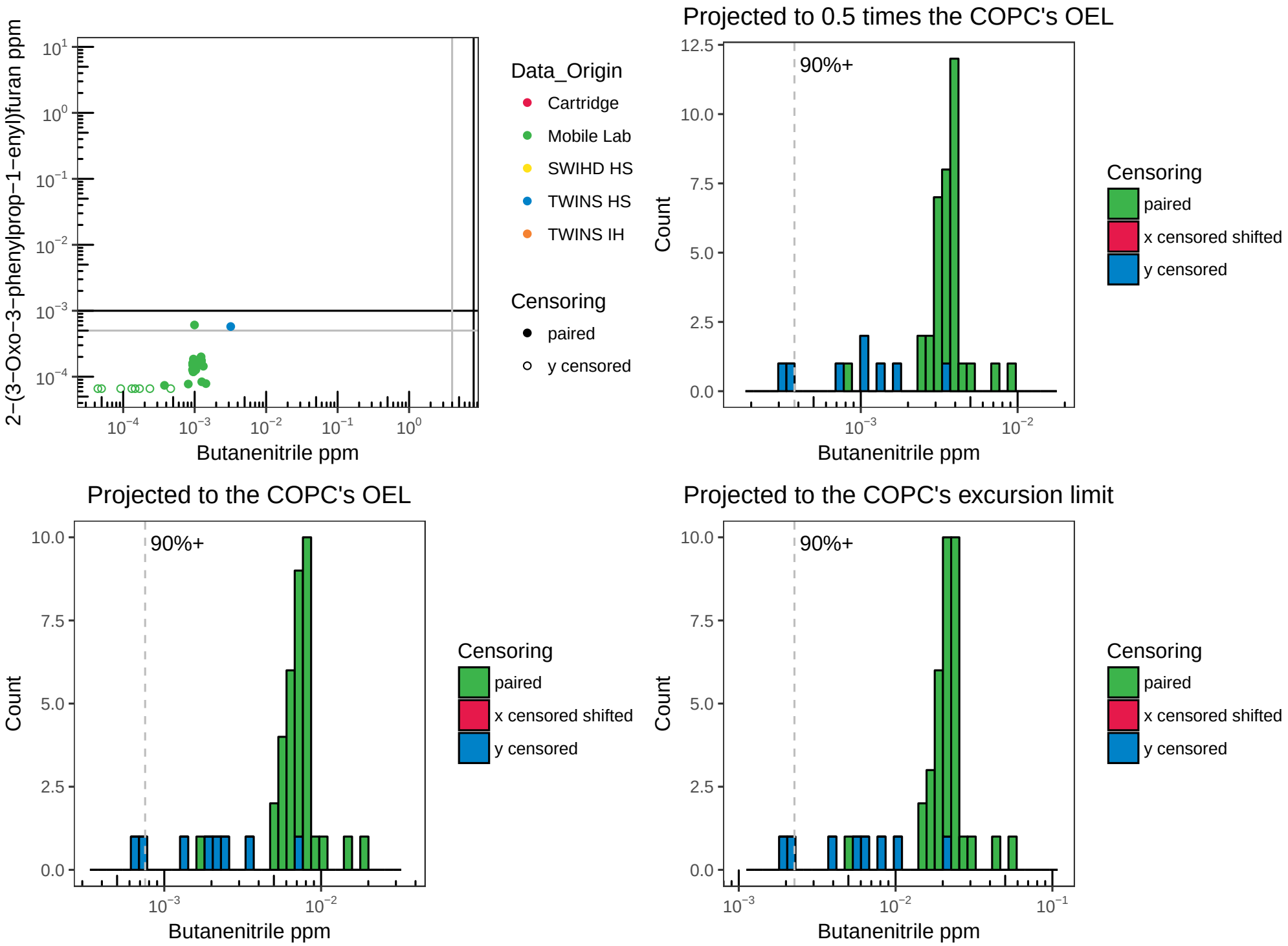


Figure C.1765: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Butanenitrile

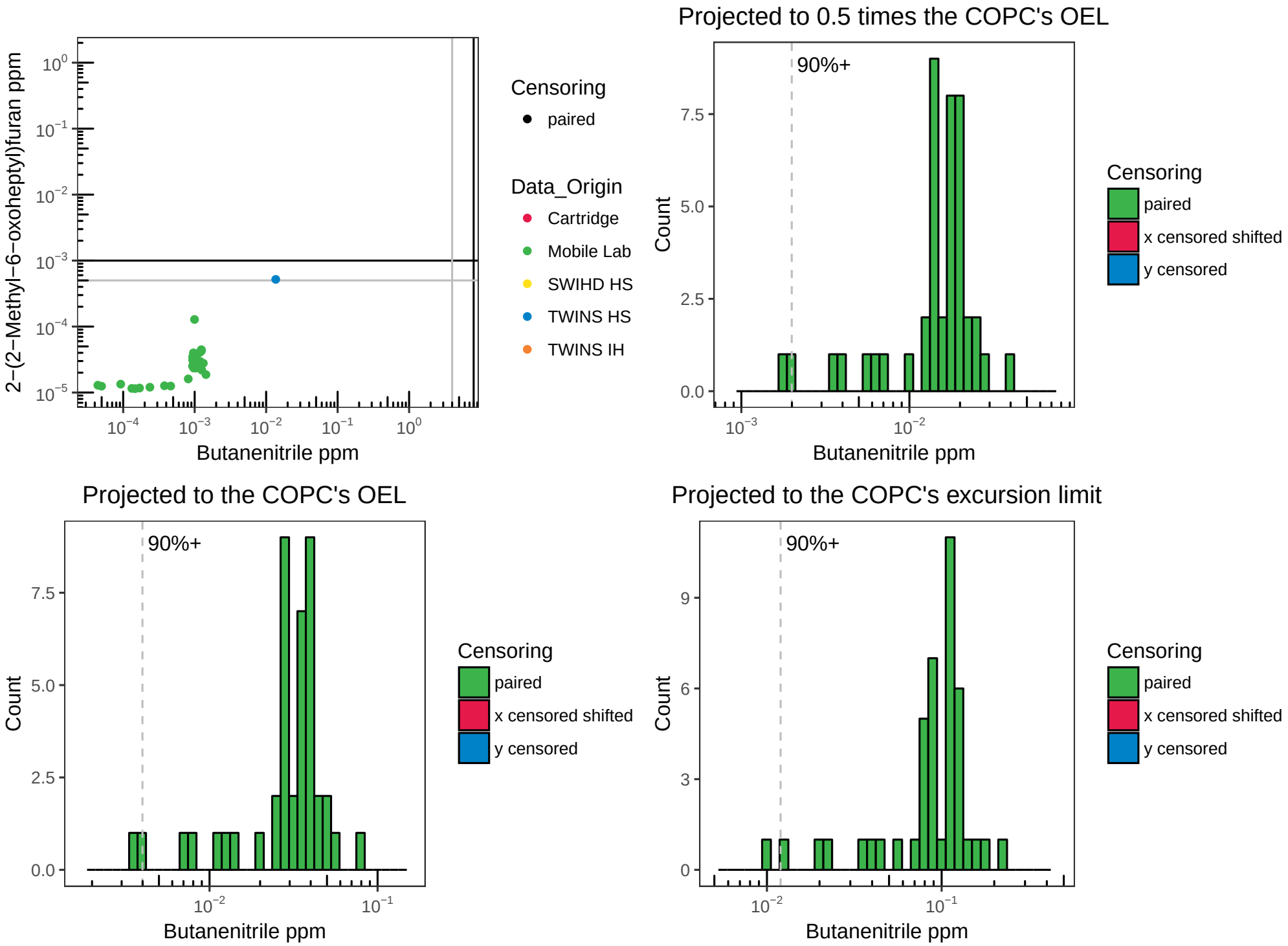


Figure C.1766: 2-(2-Methyl-6-oxoheptyl)furan vs Butanenitrile

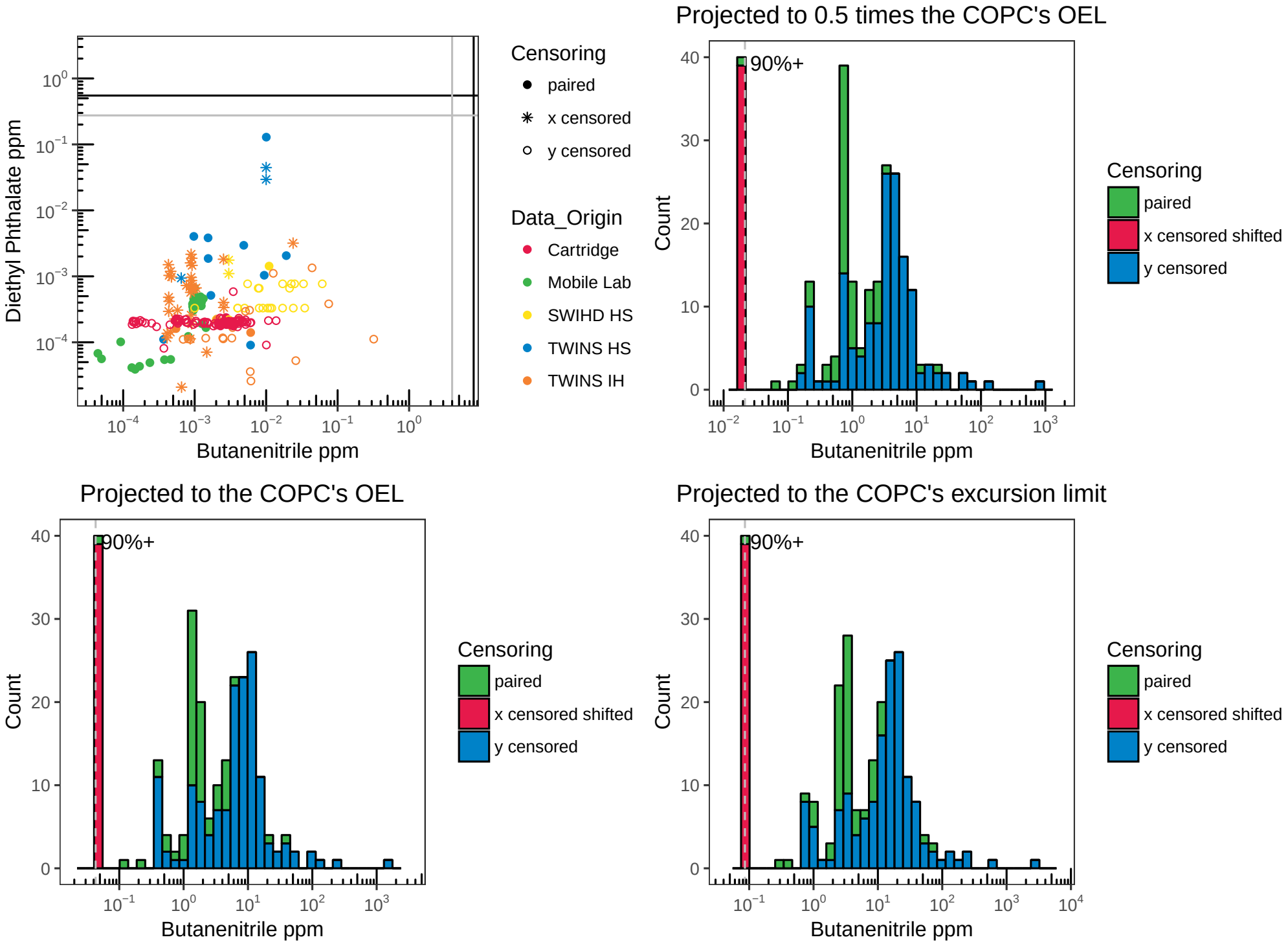


Figure C.1767: Diethyl Phthalate vs Butanenitrile

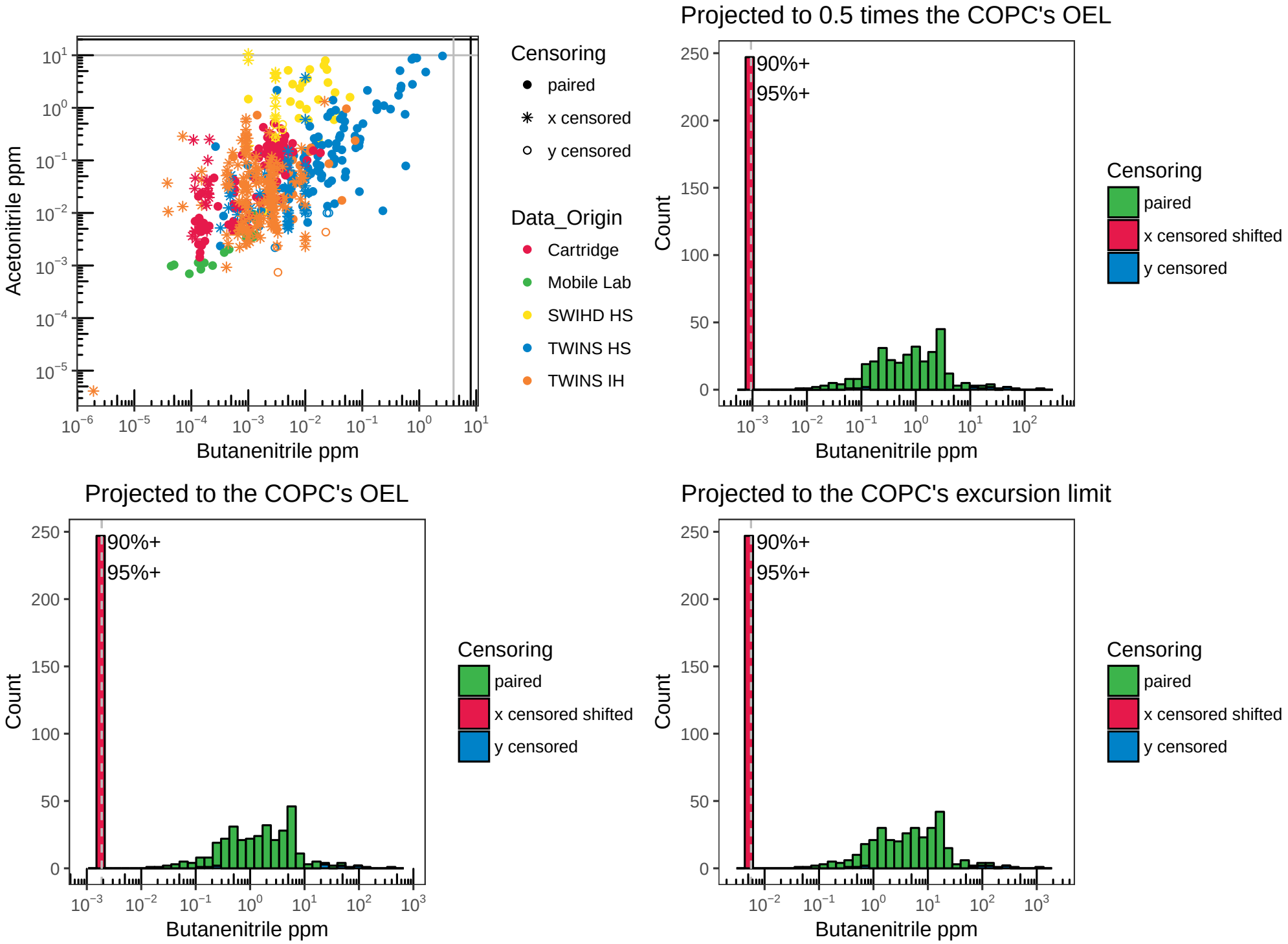


Figure C.1768: Acetonitrile vs Butanenitrile

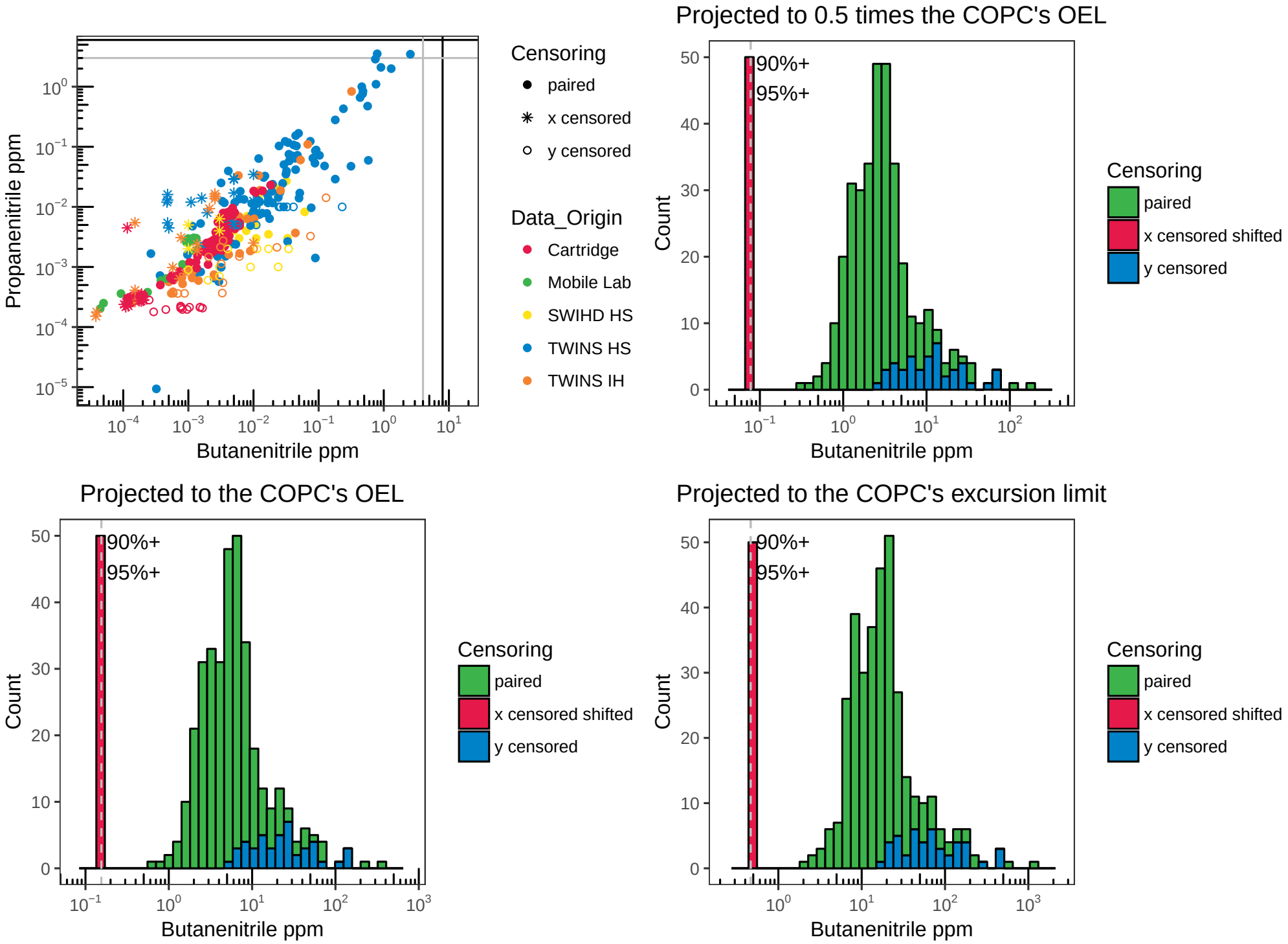


Figure C.1769: Propanenitrile vs Butanenitrile

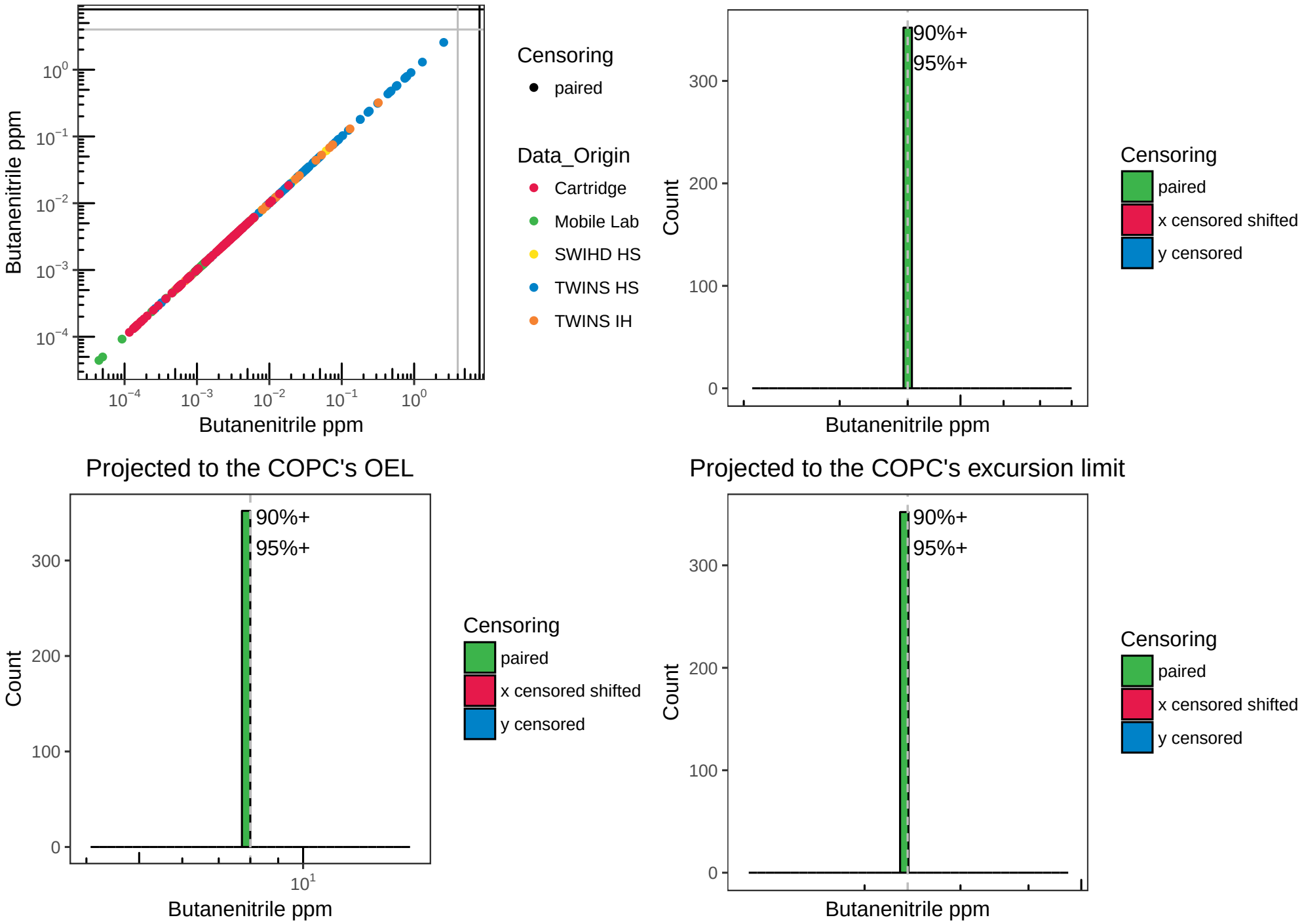


Figure C.1770: Butanenitrile vs Butanenitrile

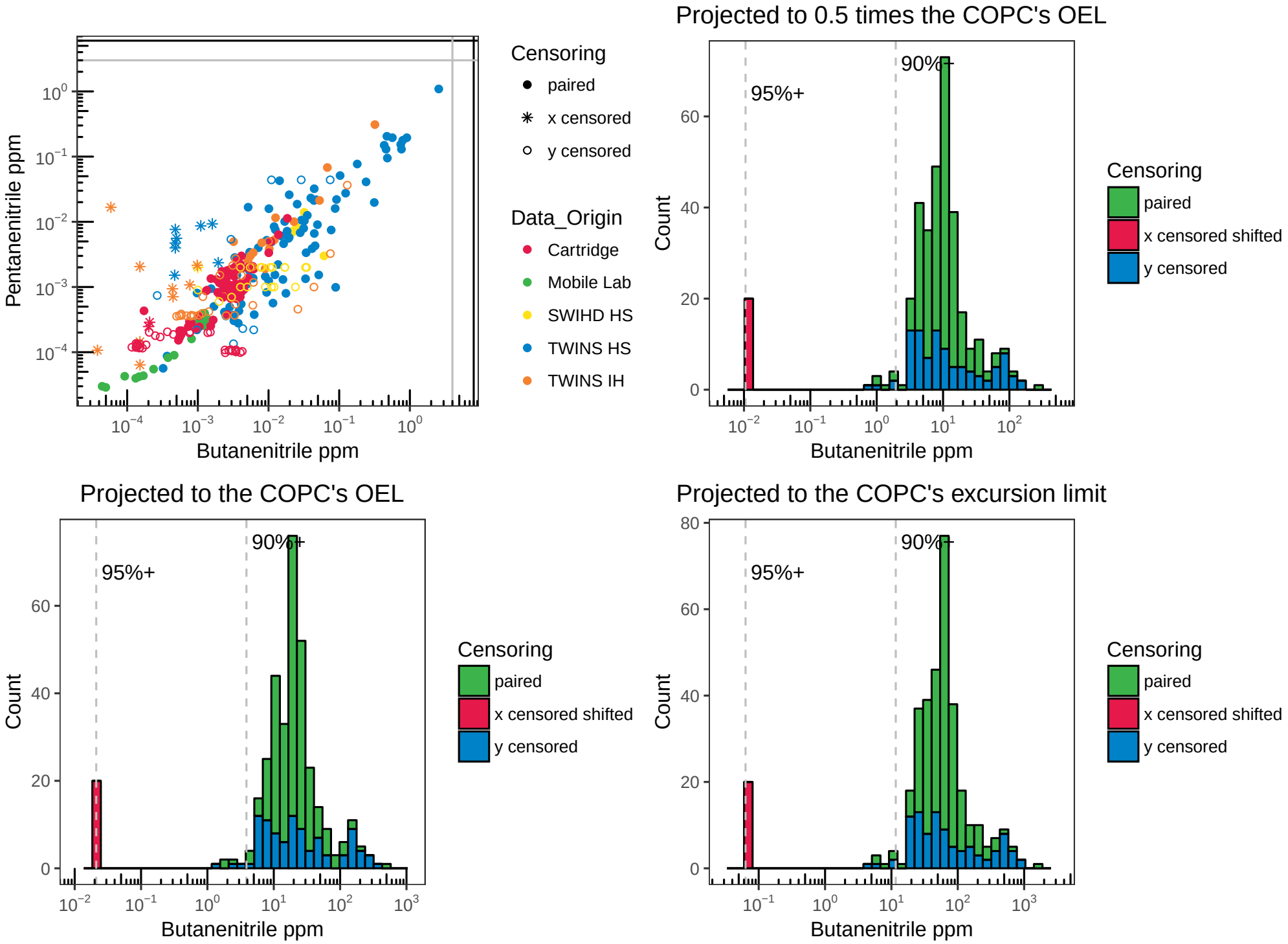


Figure C.1771: Pentanenitrile vs Butanenitrile

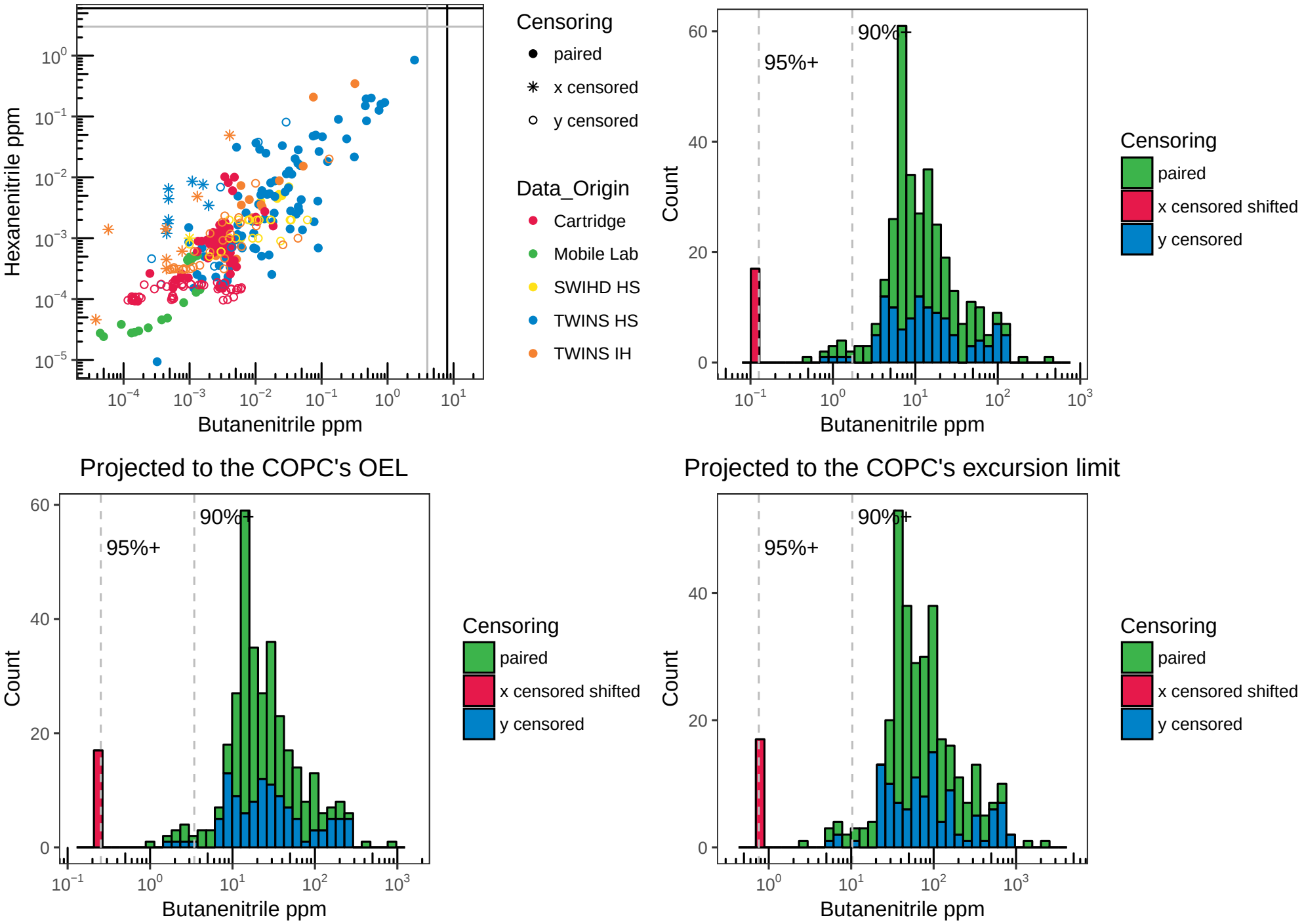


Figure C.1772: Hexanenitrile vs Butanenitrile

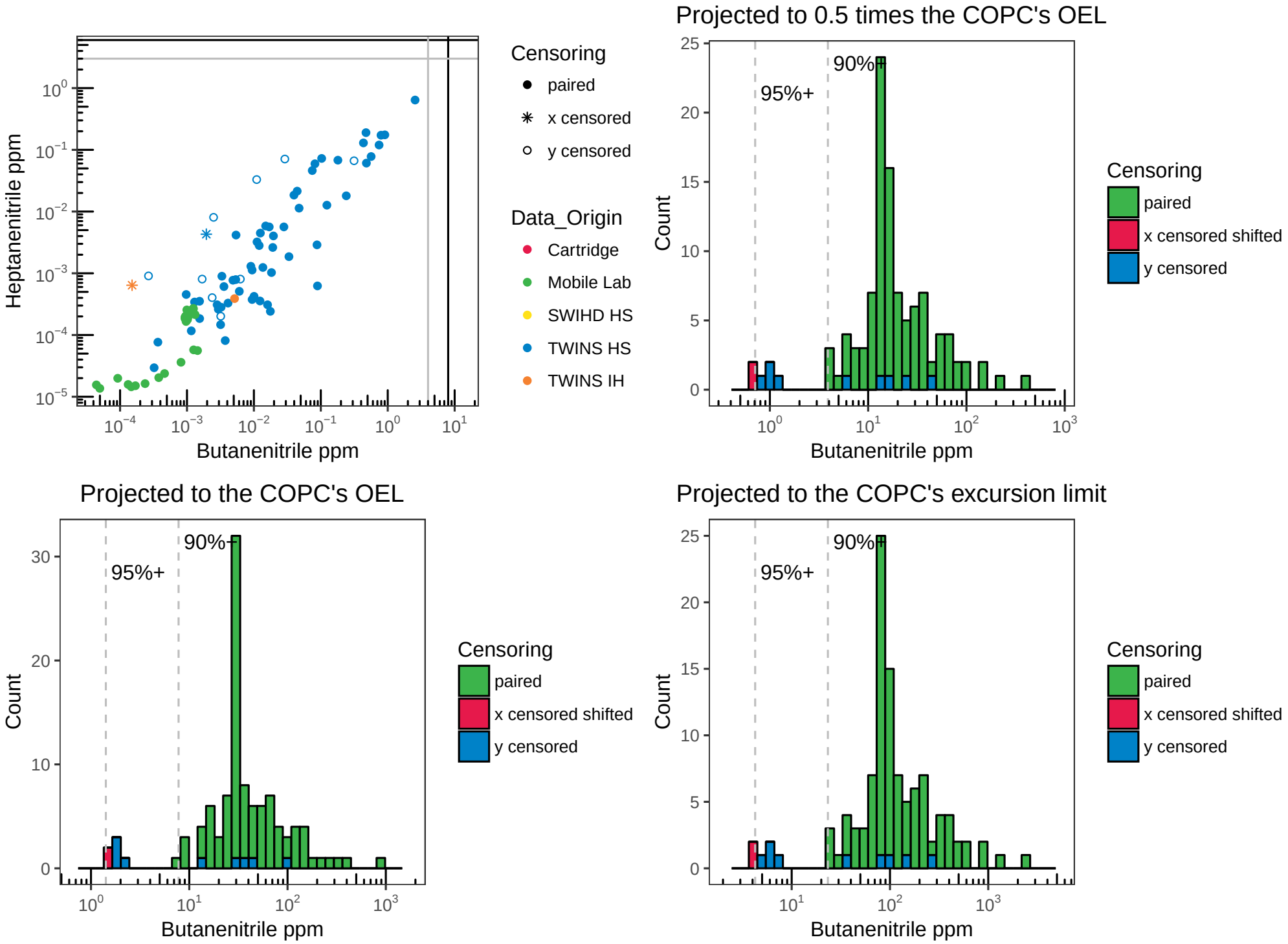


Figure C.1773: Heptanenitrile vs Butanenitrile

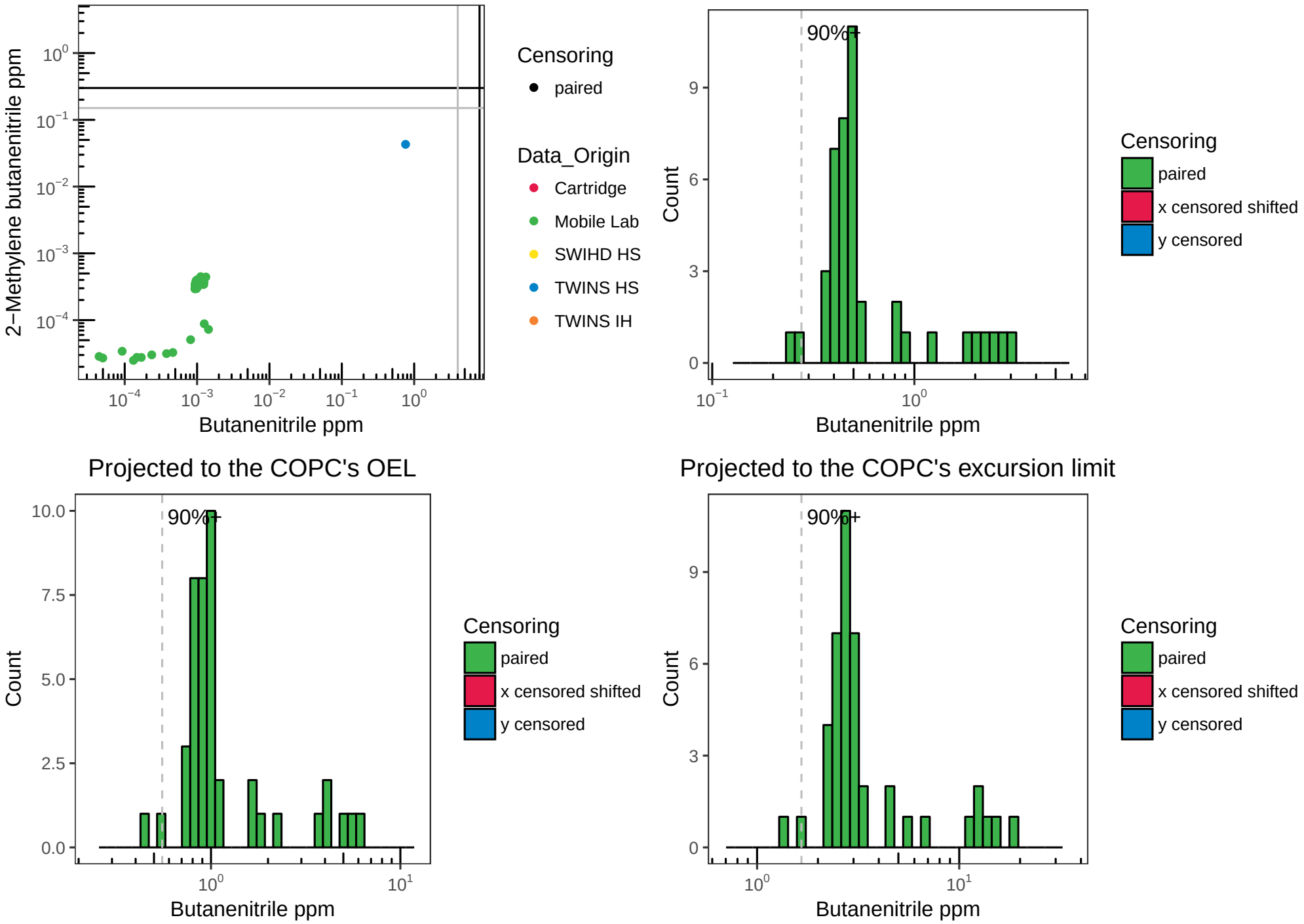


Figure C.1774: 2-Methylene butanenitrile vs Butanenitrile

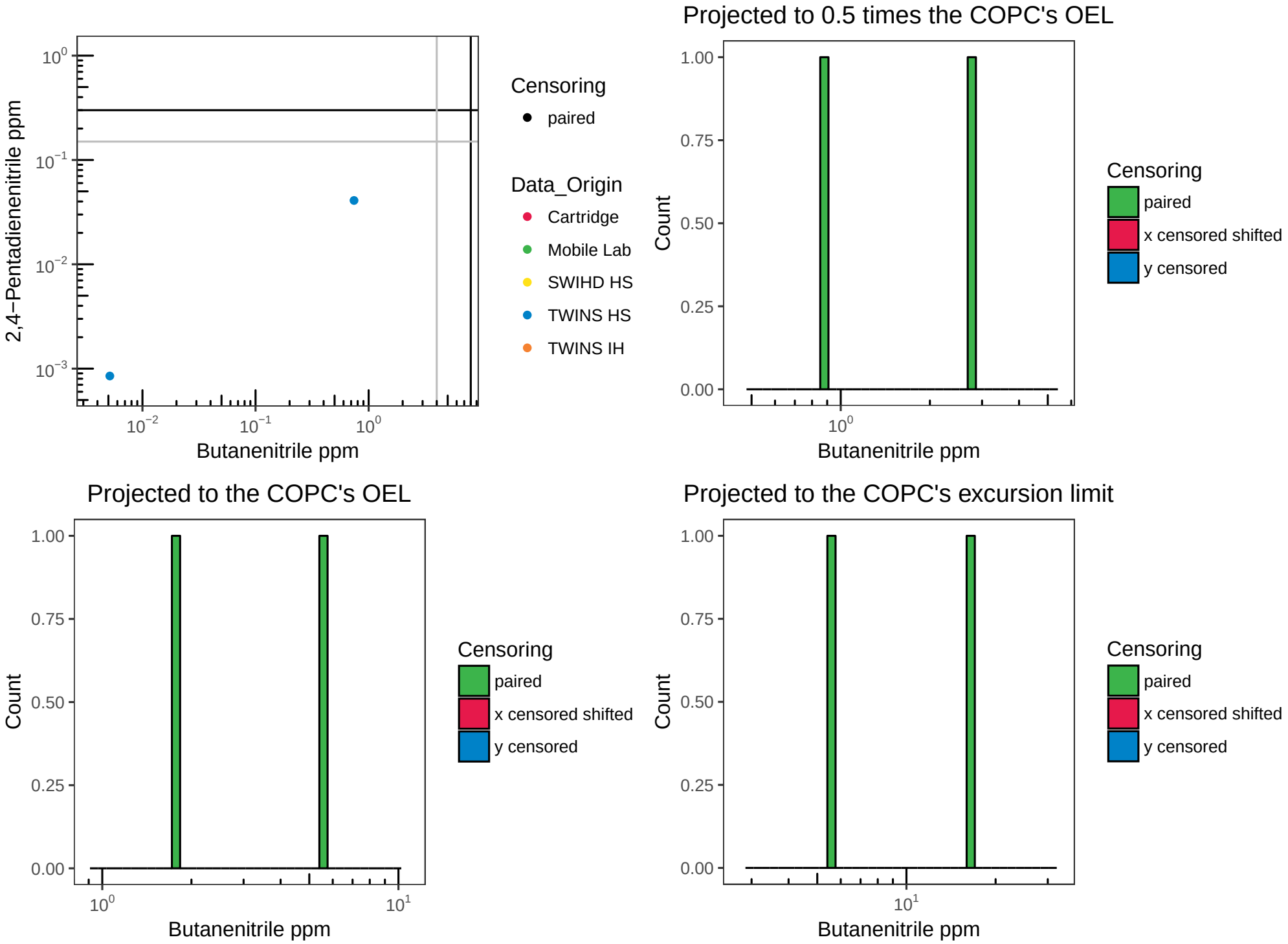


Figure C.1775: 2,4-Pentadienenitrile vs Butanenitrile

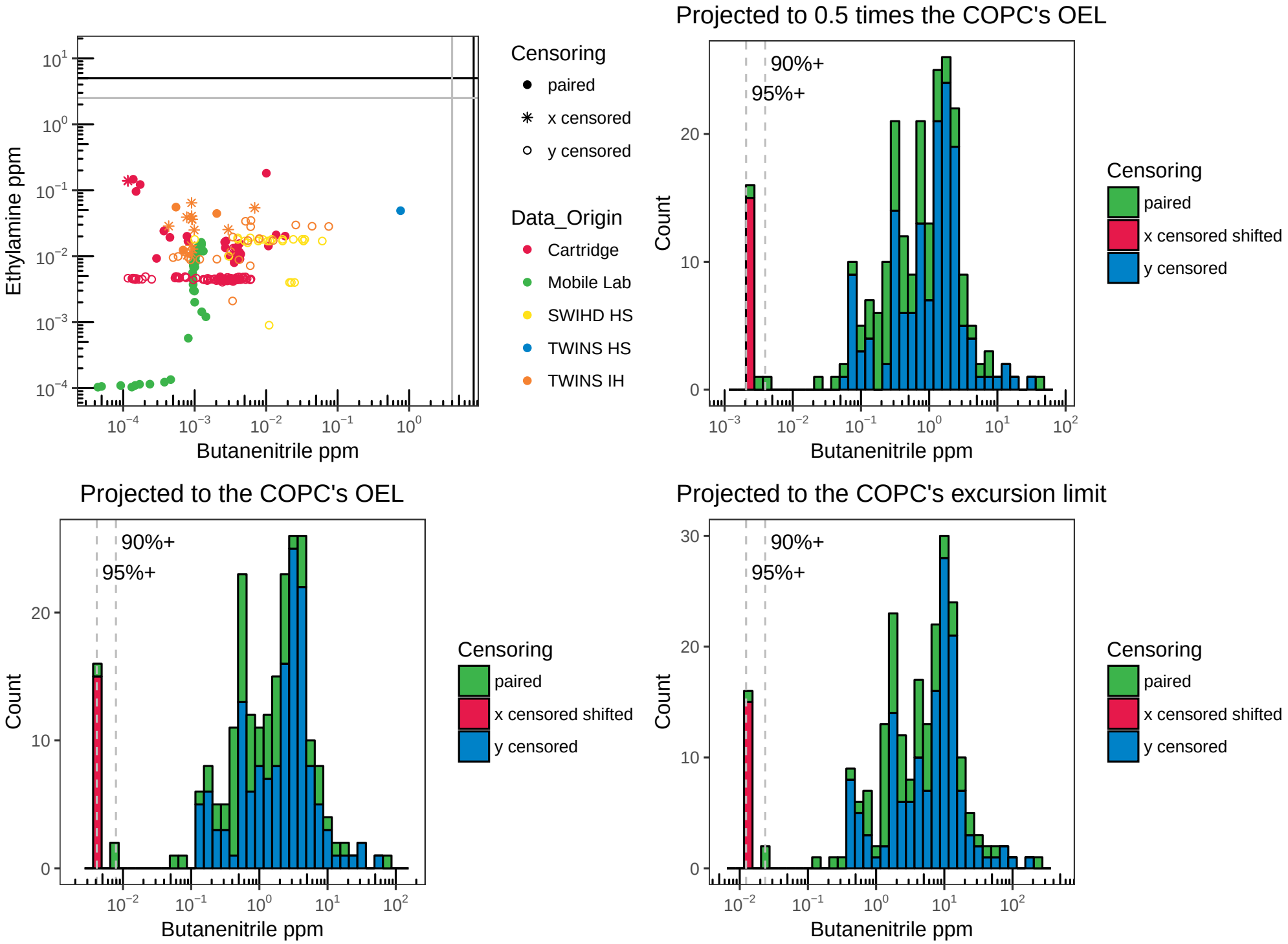


Figure C.1776: Ethylamine vs Butanenitrile

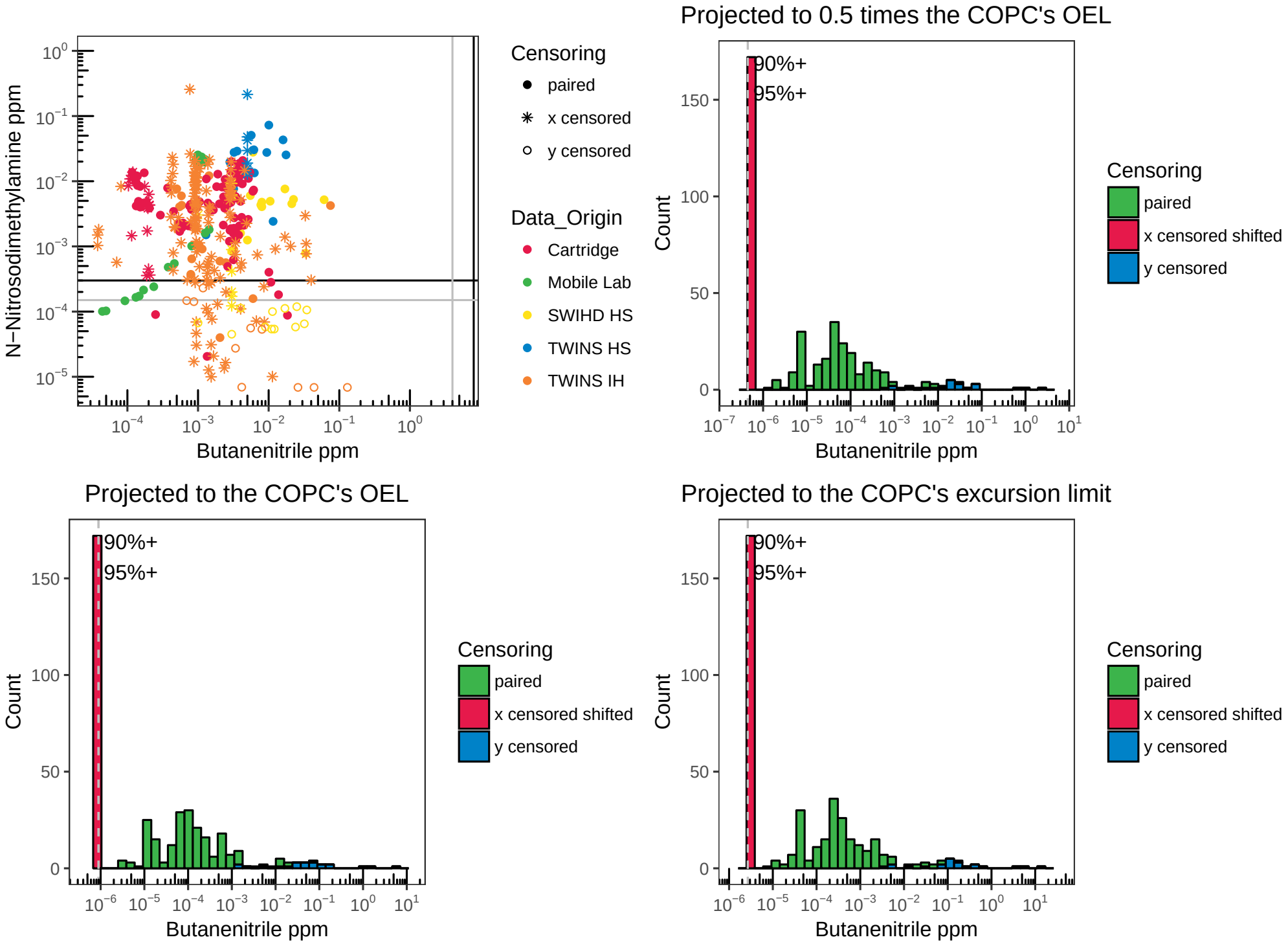


Figure C.1777: N-Nitrosodimethylamine vs Butanenitrile

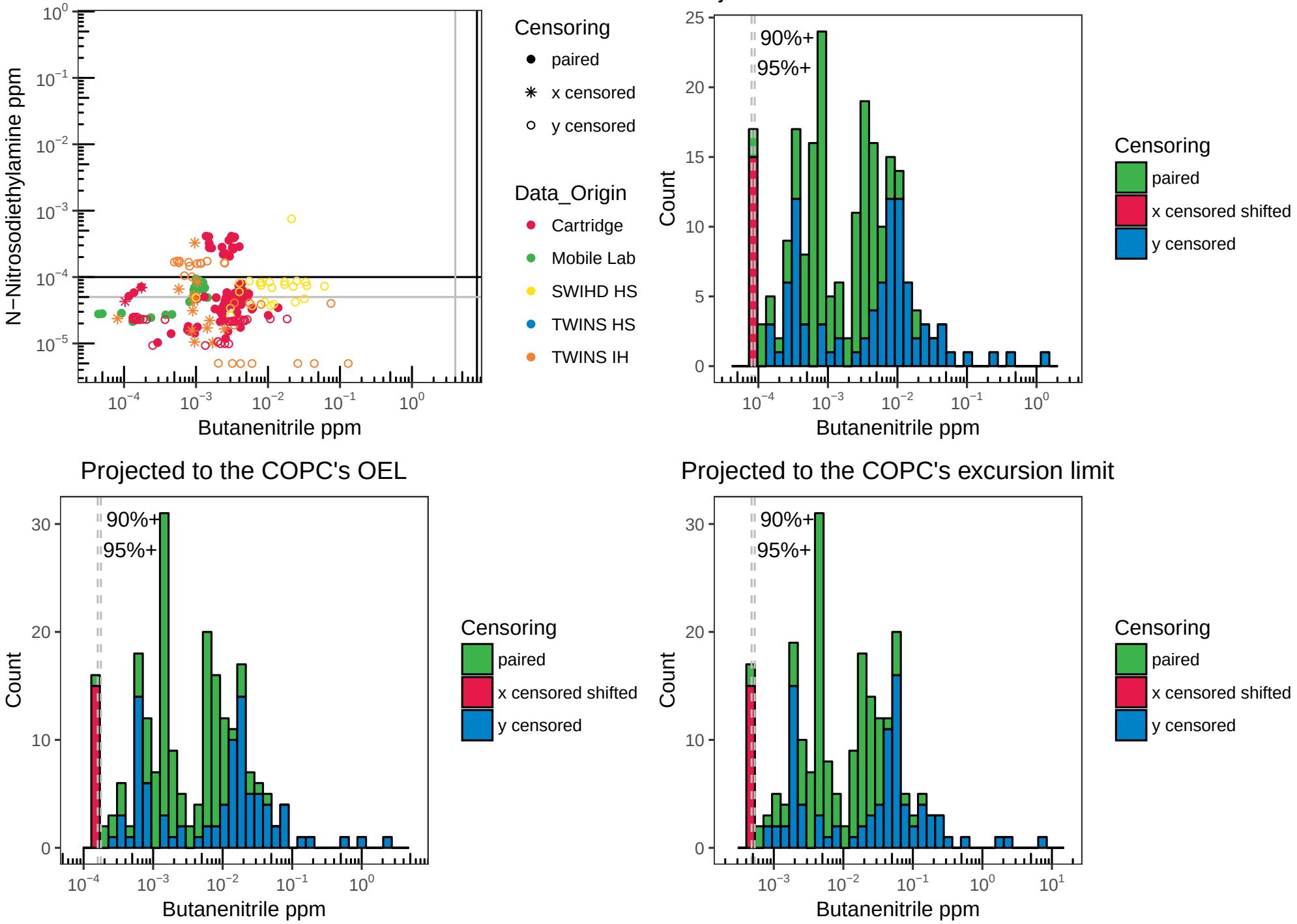


Figure C.1778: N-Nitrosodiethylamine vs Butanenitrile

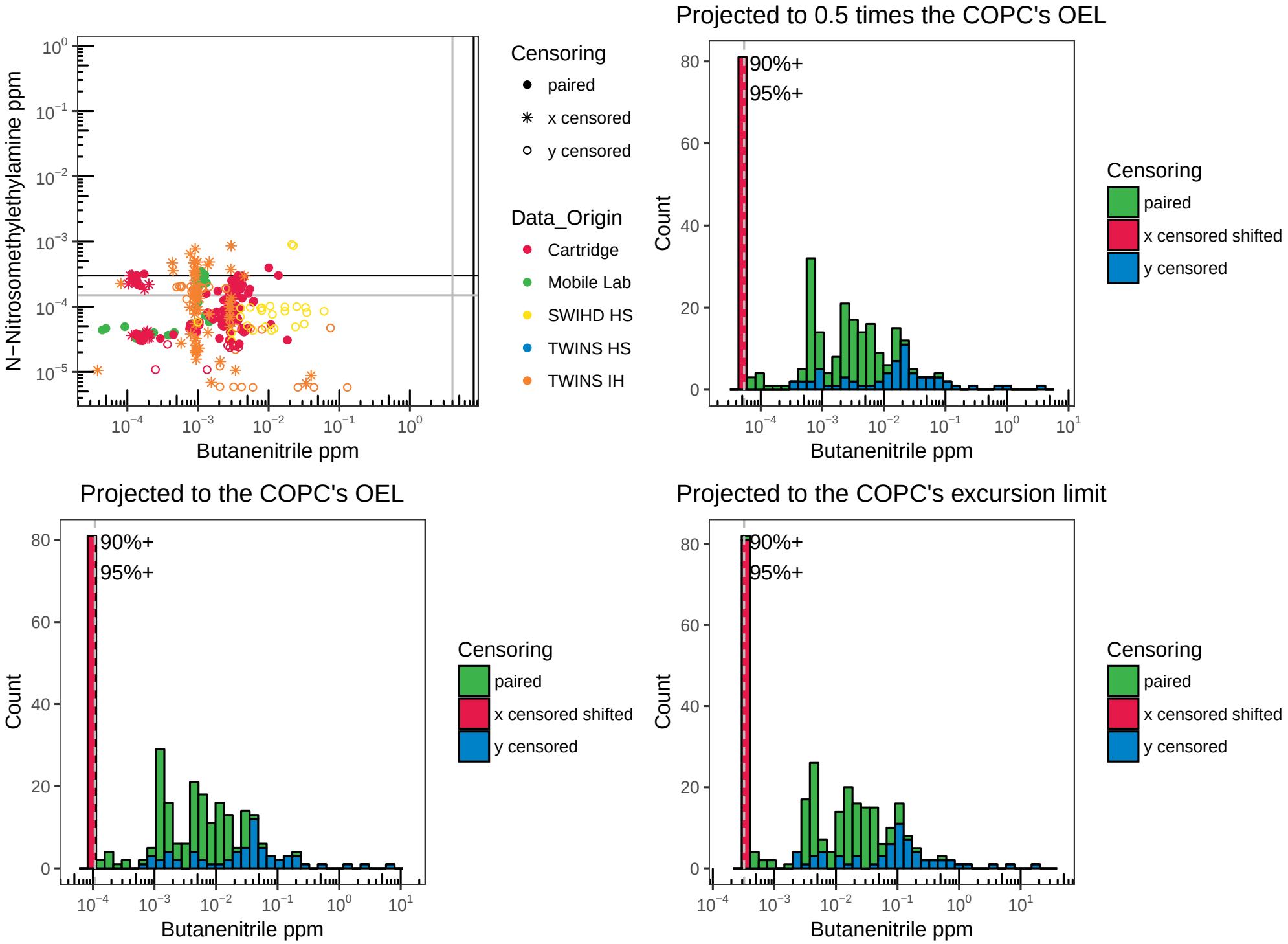


Figure C.1779: N-Nitrosomethylethylamine vs Butanenitrile

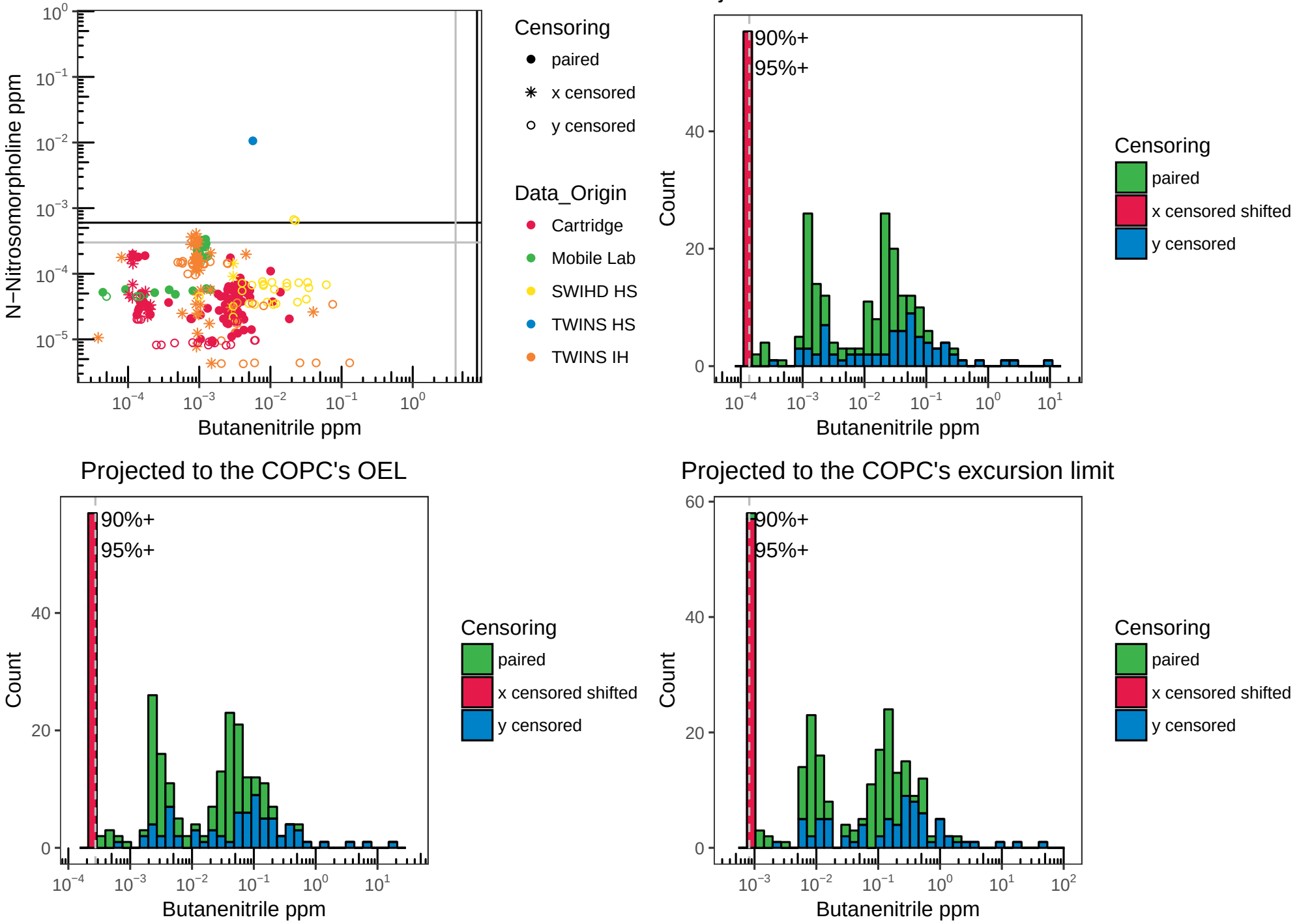


Figure C.1780: N-Nitrosomorpholine vs Butanenitrile

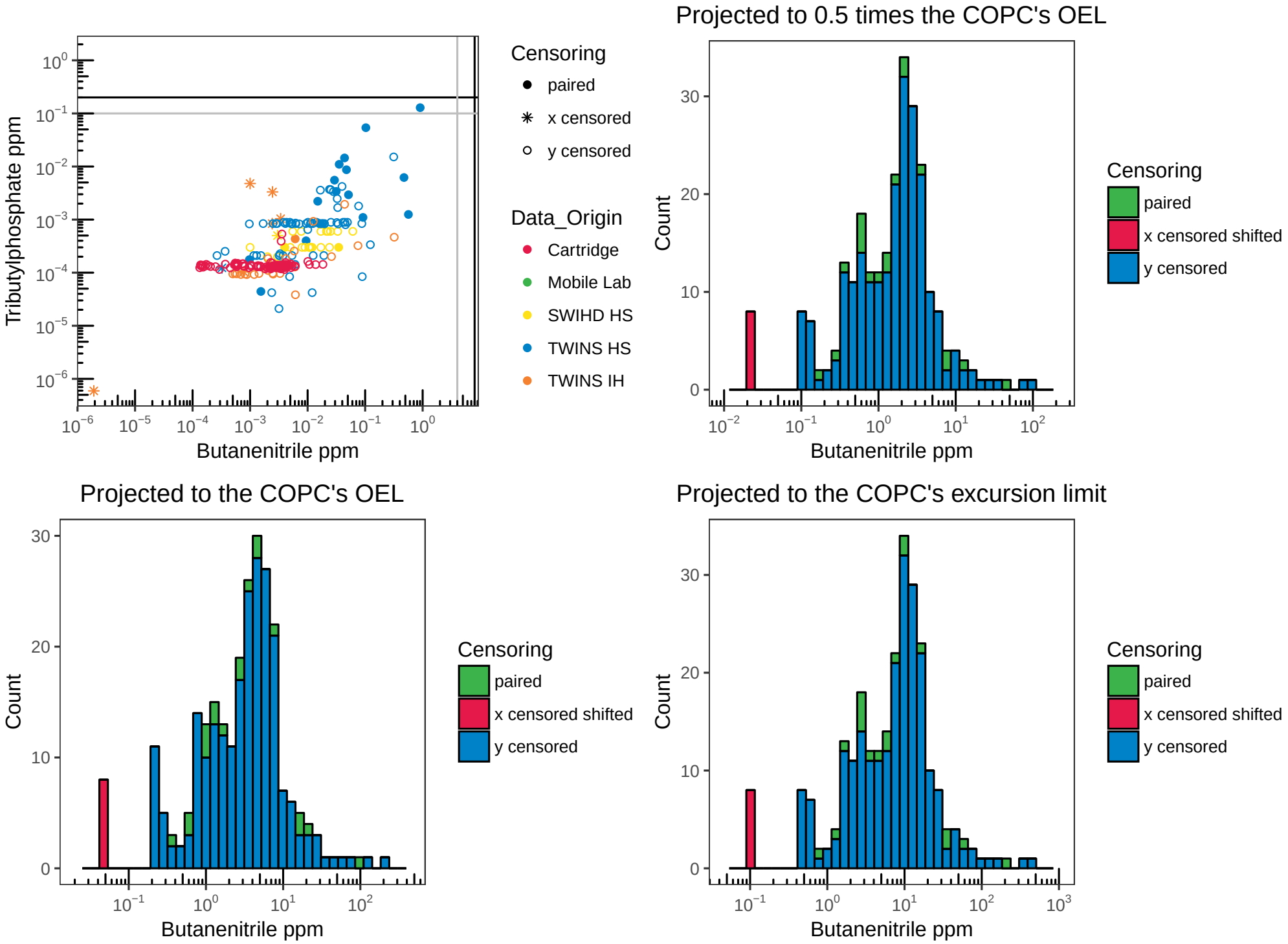


Figure C.1781: Tributylphosphate vs Butanenitrile

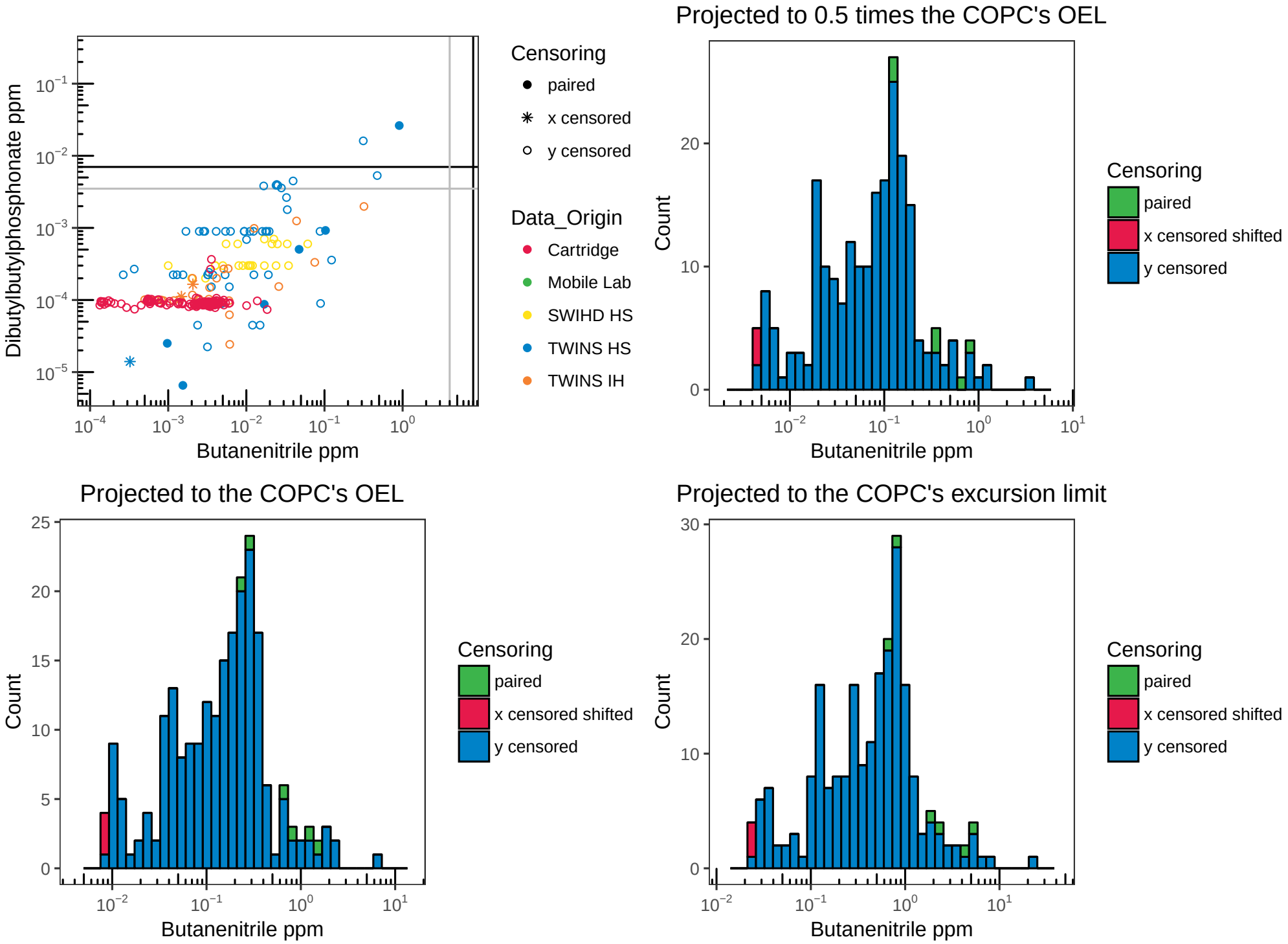


Figure C.1782: Dibutylbutylphosphonate vs Butanenitrile

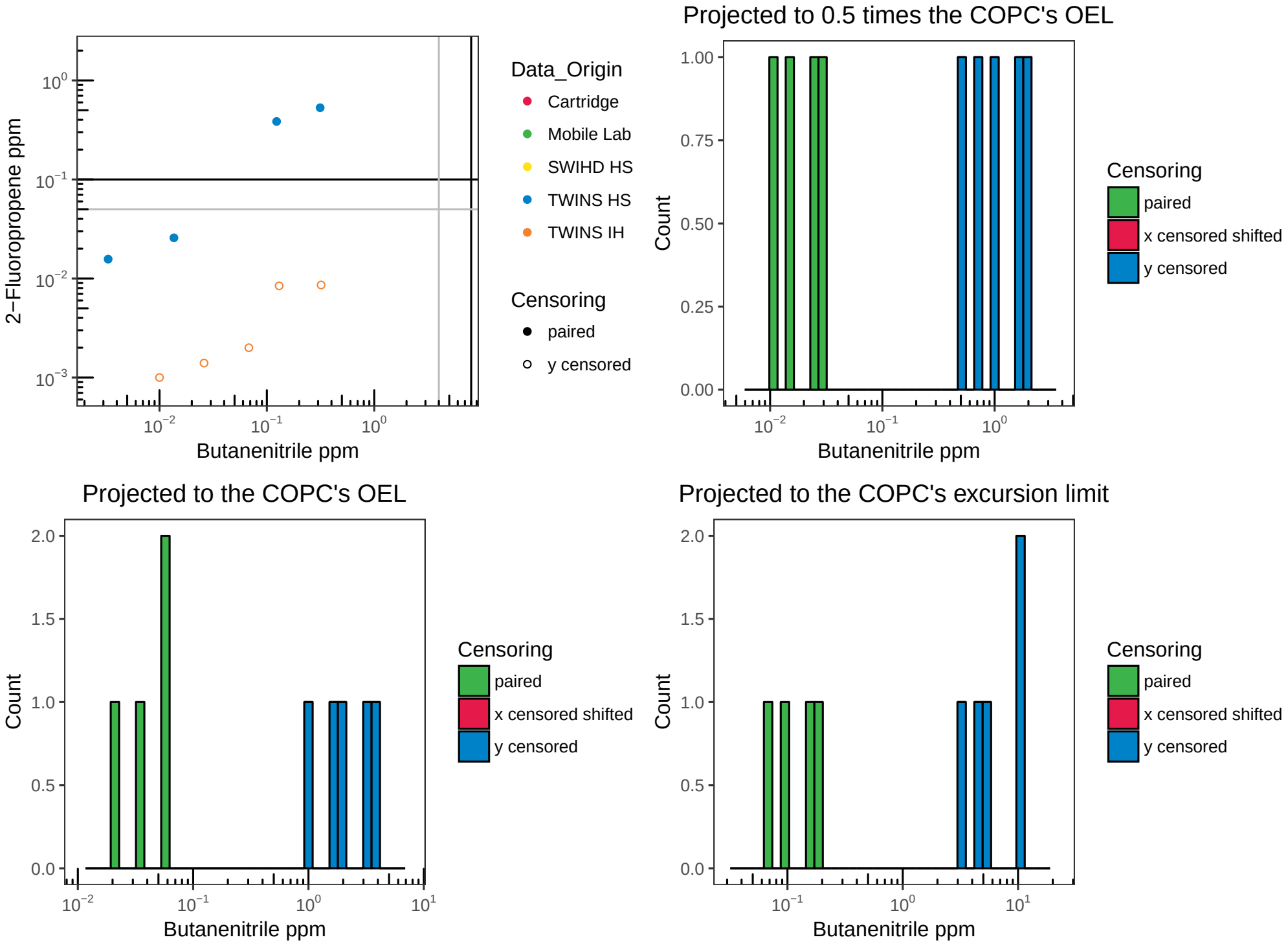


Figure C.1783: 2-Fluoropropene vs Butanenitrile

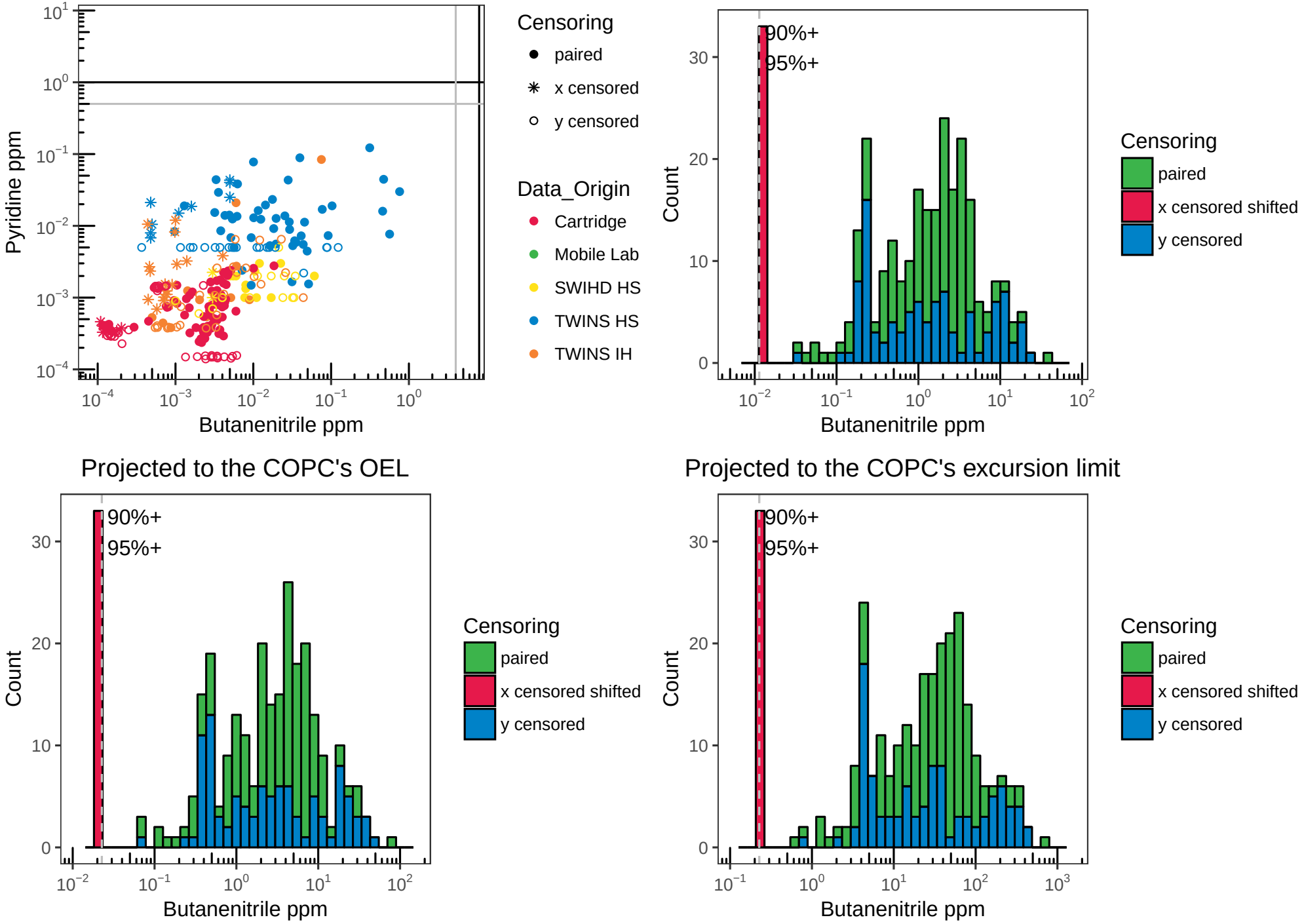


Figure C.1784: Pyridine vs Butanenitrile

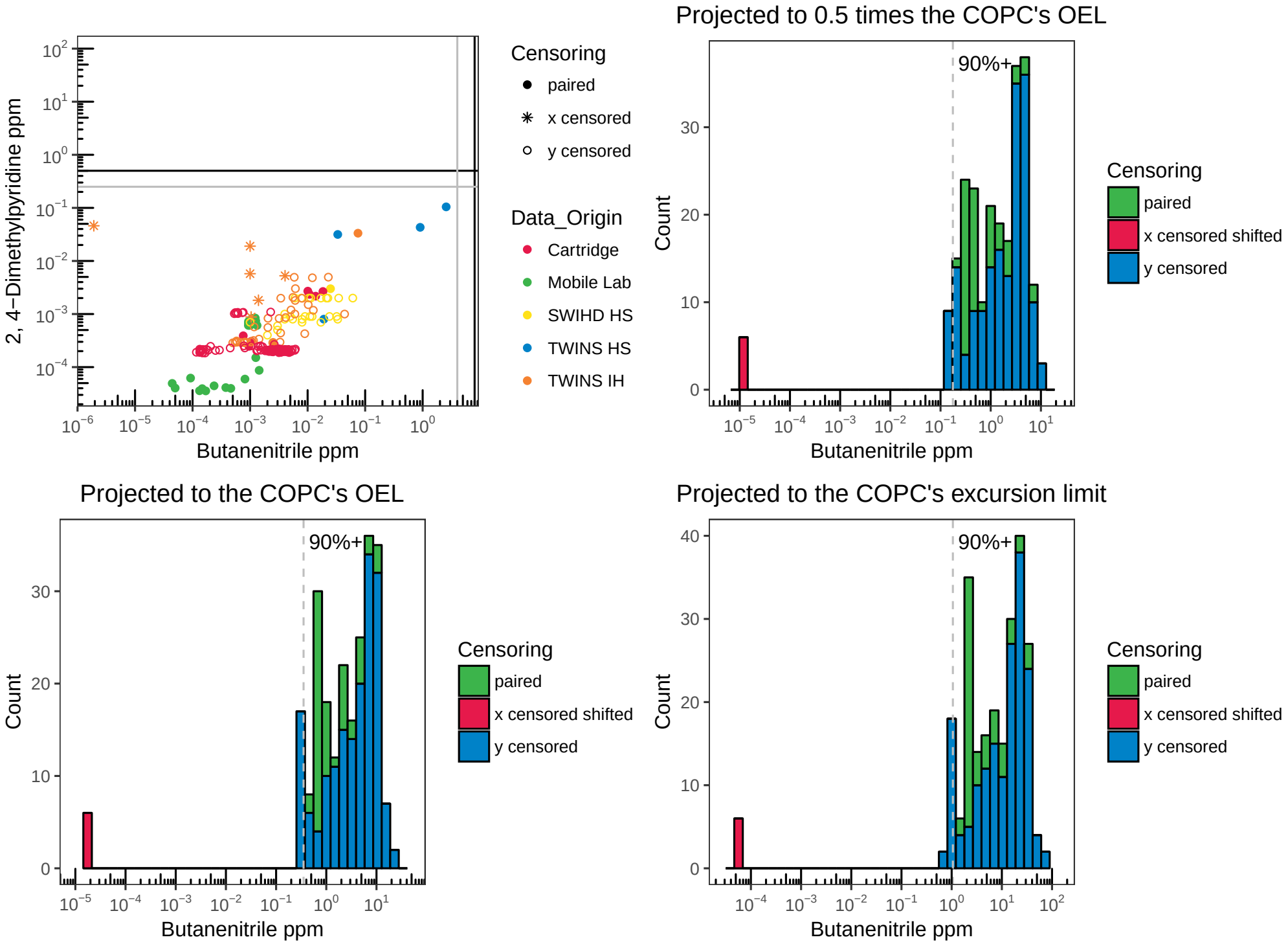


Figure C.1785: 2, 4-Dimethylpyridine vs Butanenitrile

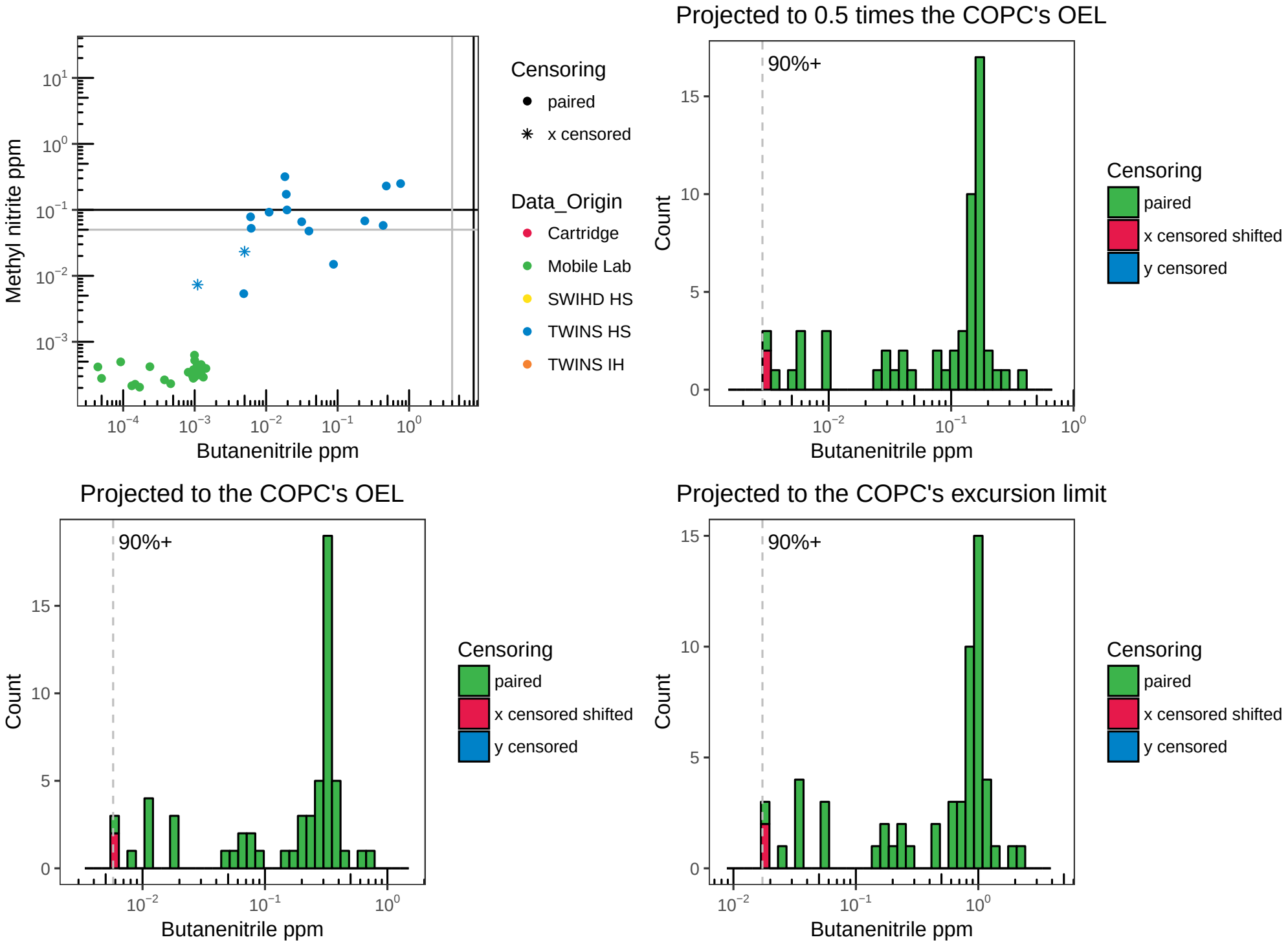


Figure C.1786: Methyl nitrite vs Butanenitrile

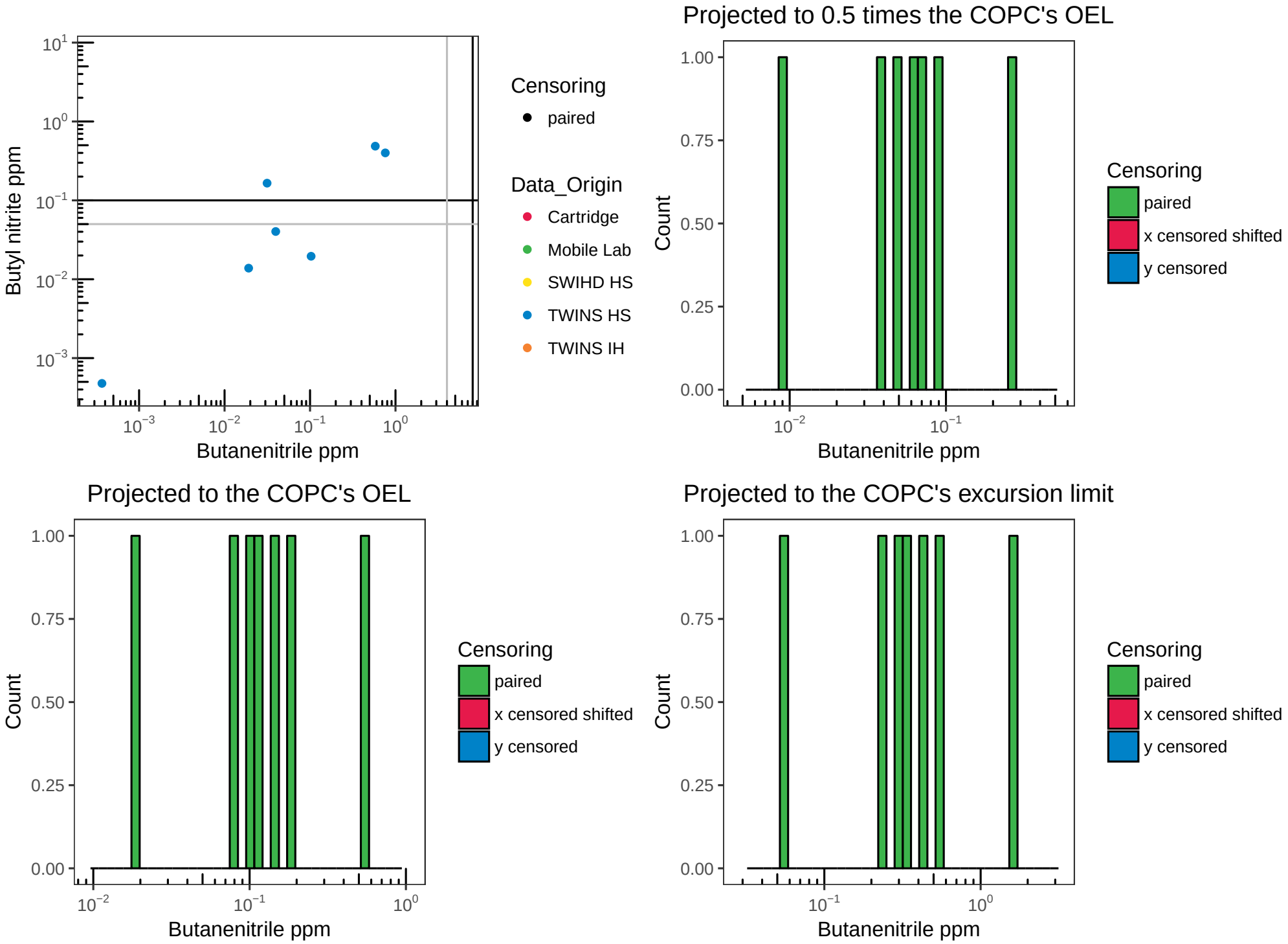


Figure C.1787: Butyl nitrite vs Butanenitrile

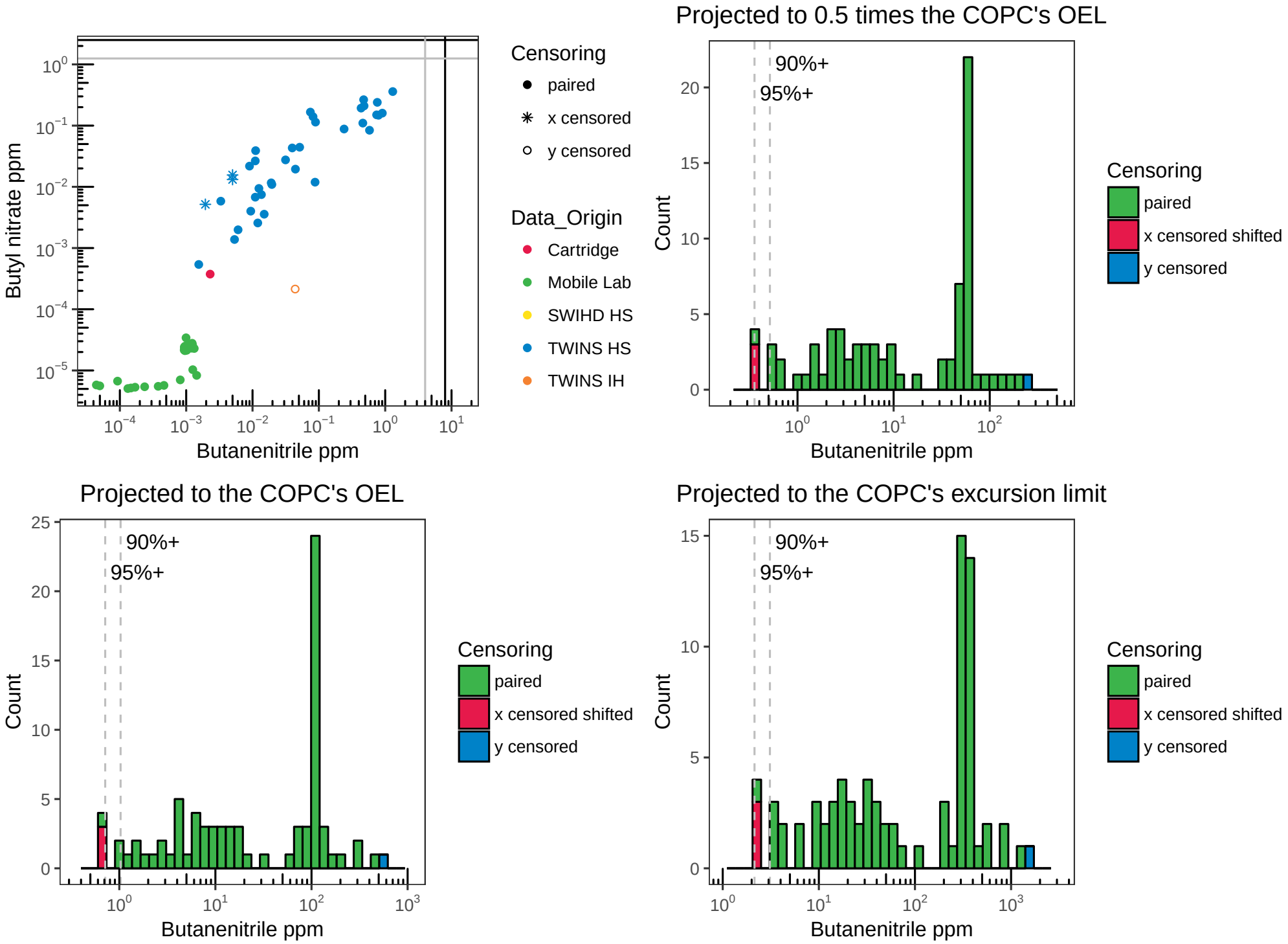


Figure C.1788: Butyl nitrate vs Butanenitrile

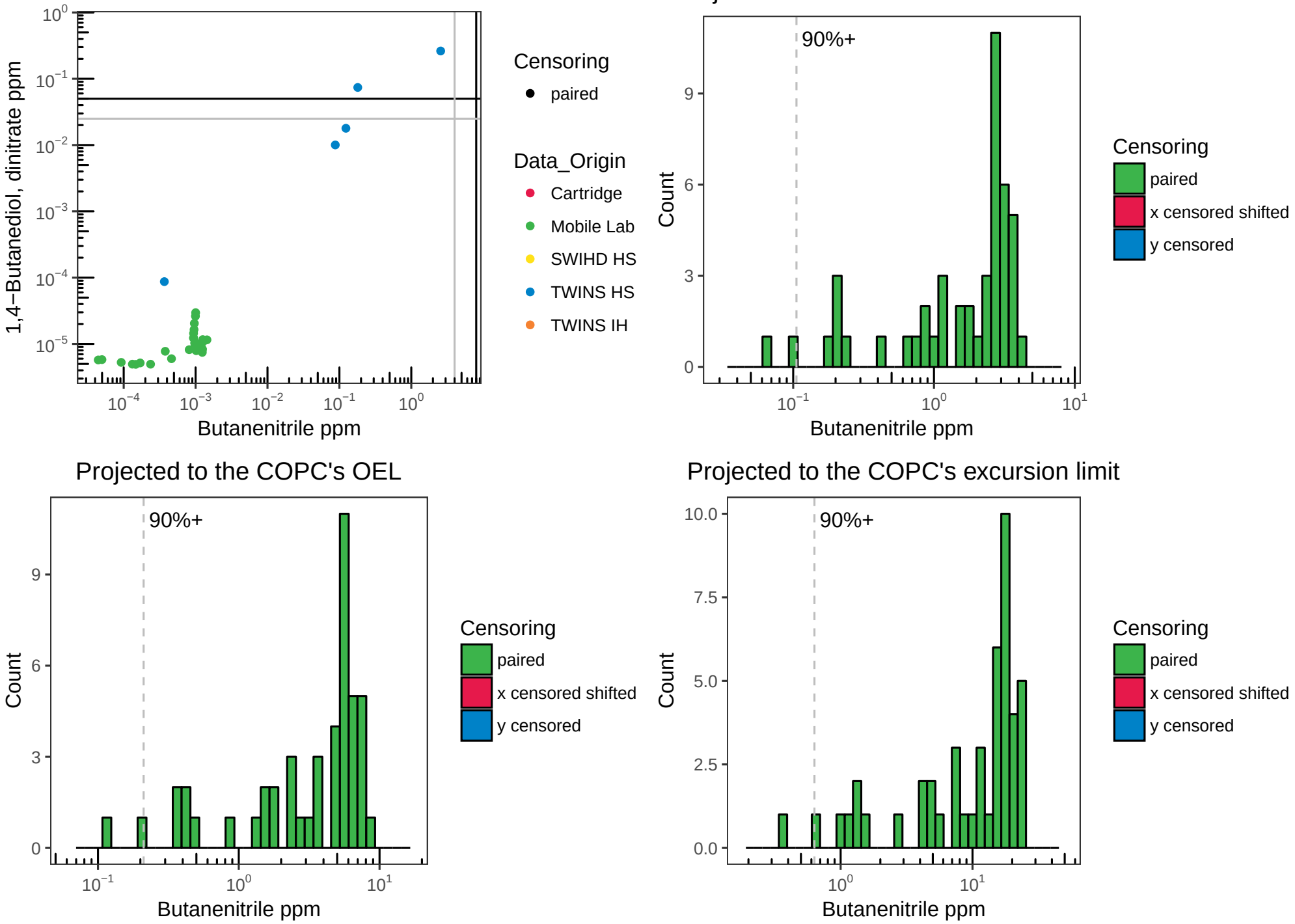


Figure C.1789: 1,4-Butanediol, dinitrate vs Butanenitrile

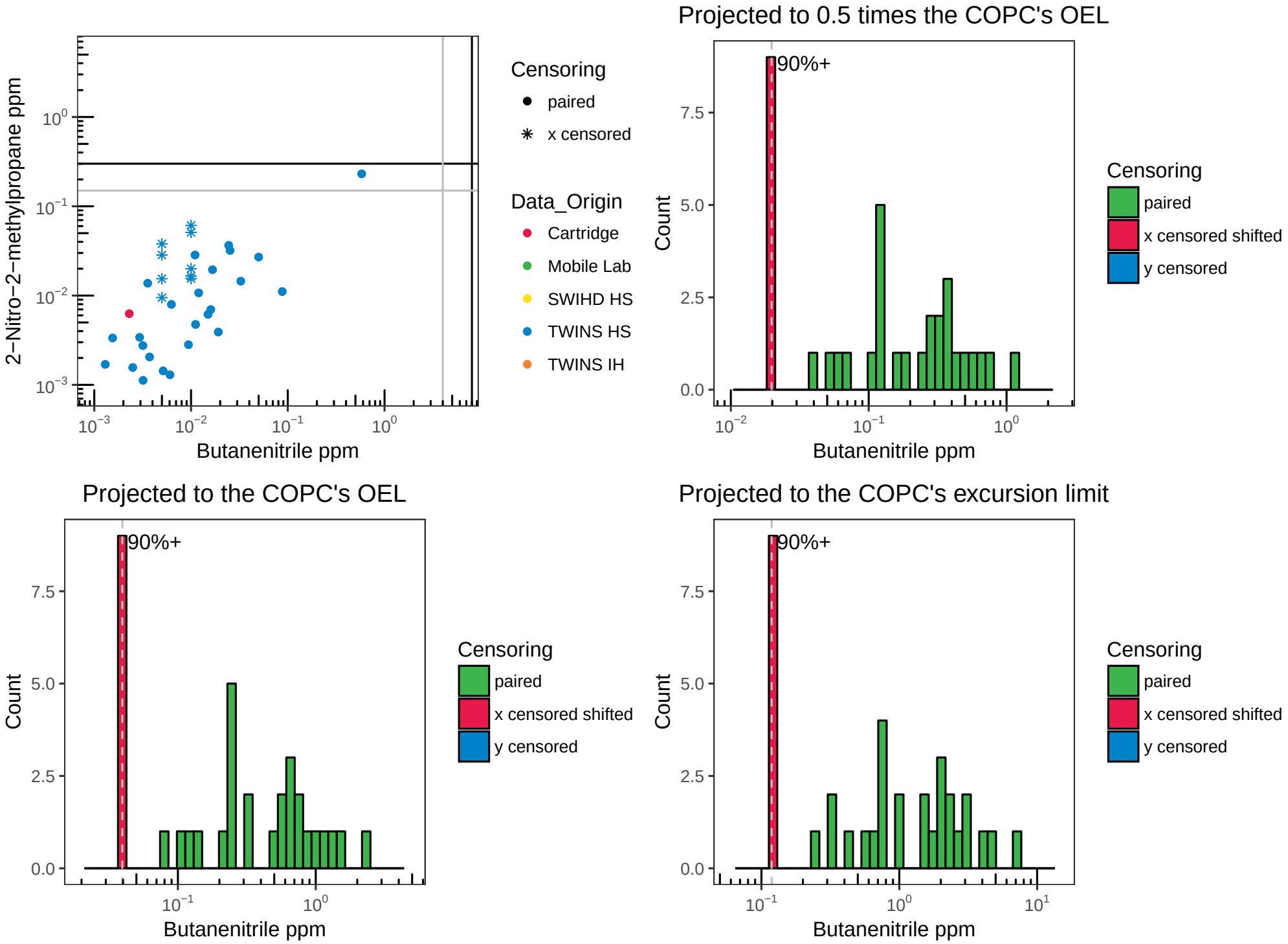


Figure C.1790: 2-Nitro-2-methylpropane vs Butanenitrile

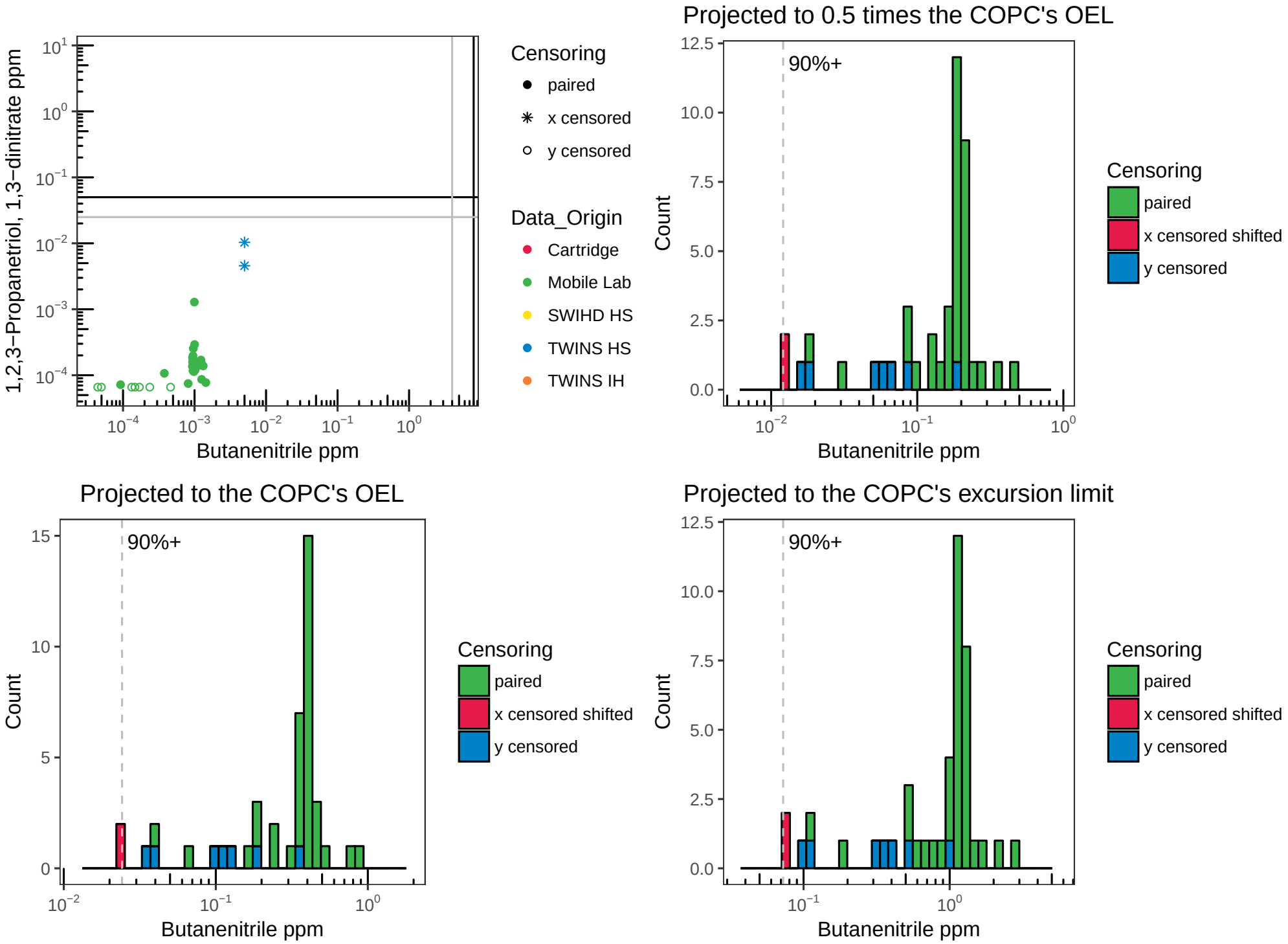


Figure C.1791: 1,2,3-Propanetriol, 1,3-dinitrate vs Butanenitrile

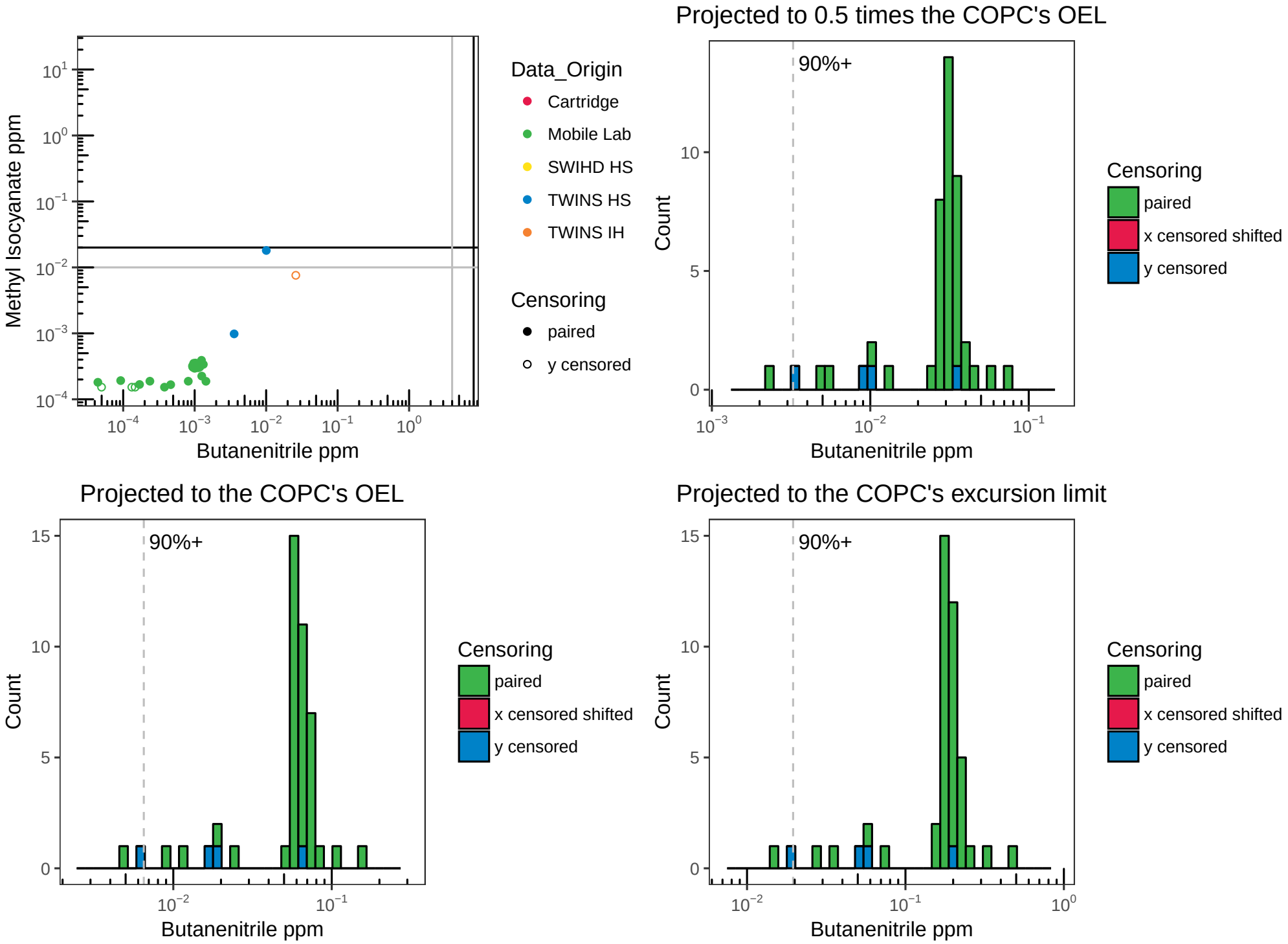


Figure C.1792: Methyl Isocyanate vs Butanenitrile

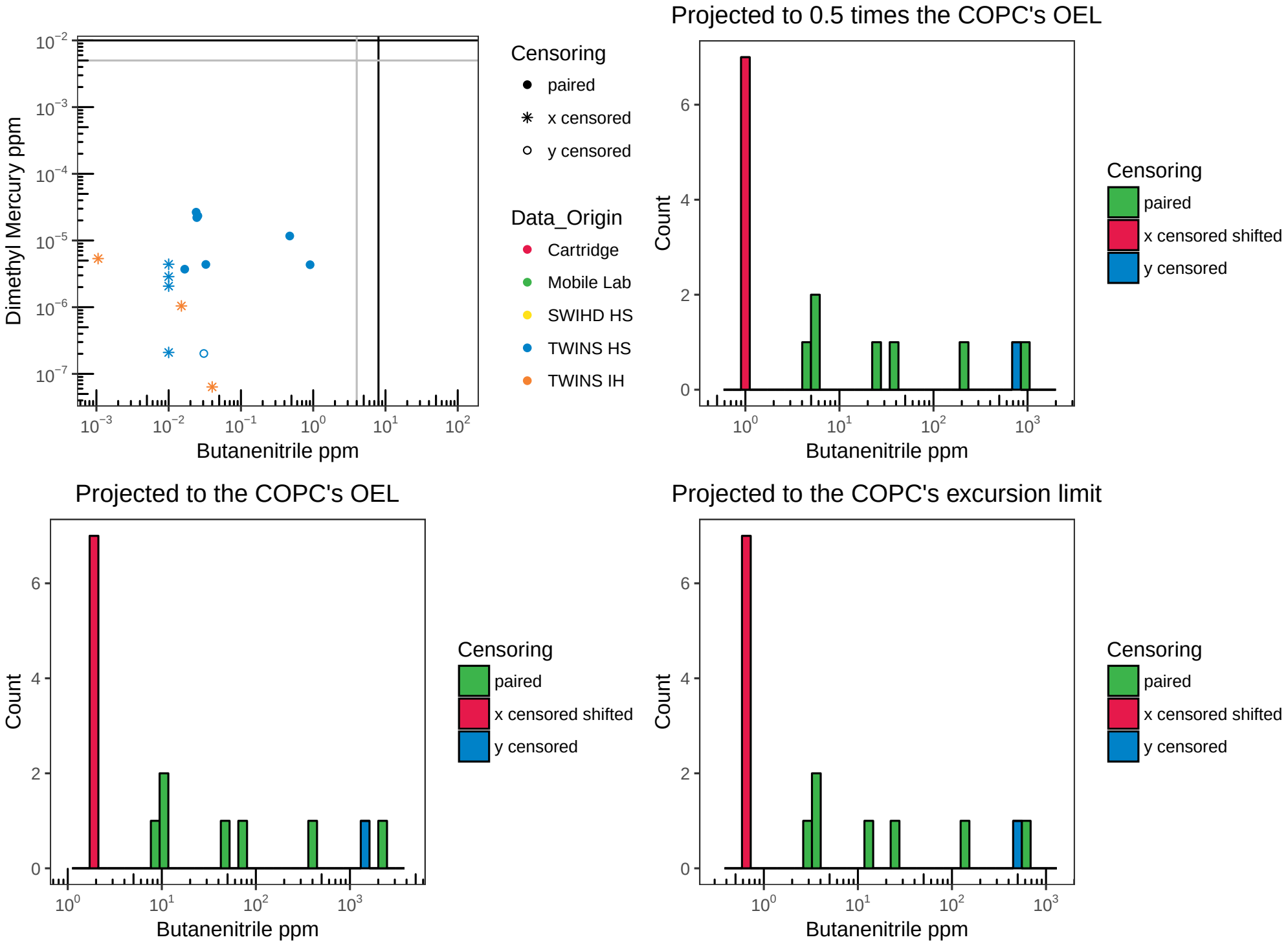


Figure C.1793: Dimethyl Mercury vs Butanenitrile

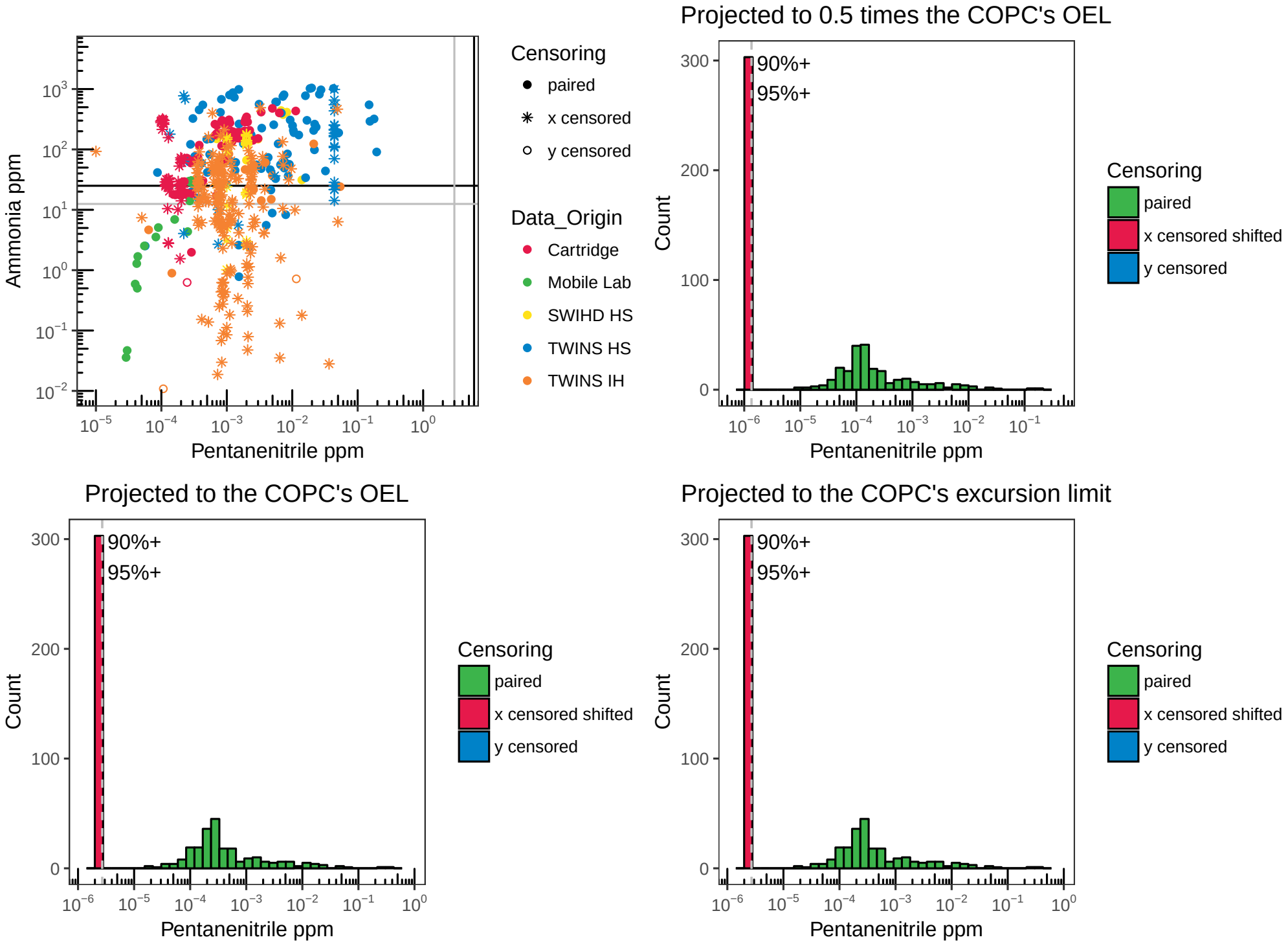


Figure C.1794: Ammonia vs Pentanenitrile

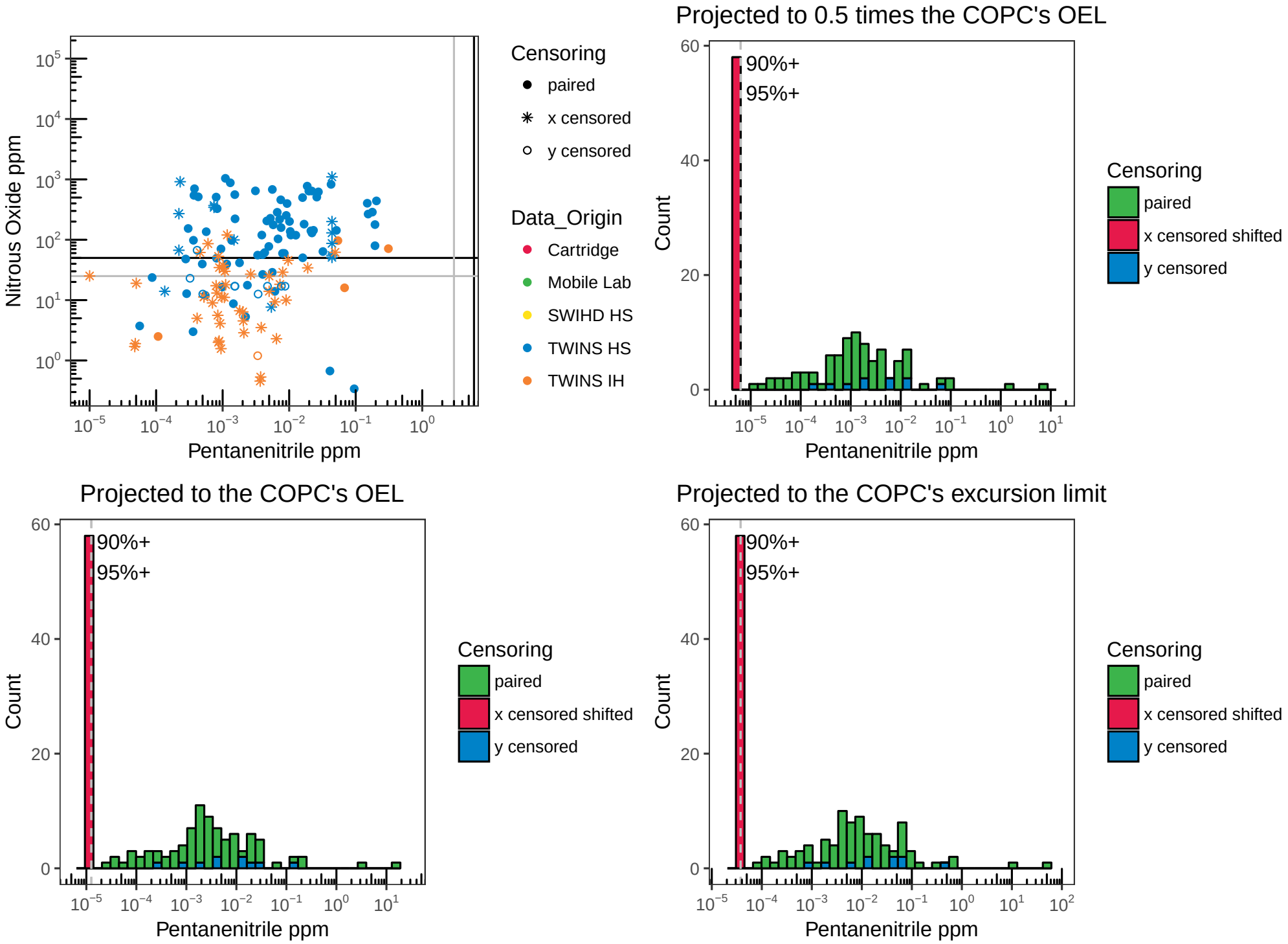


Figure C.1795: Nitrous Oxide vs Pentanenitrile

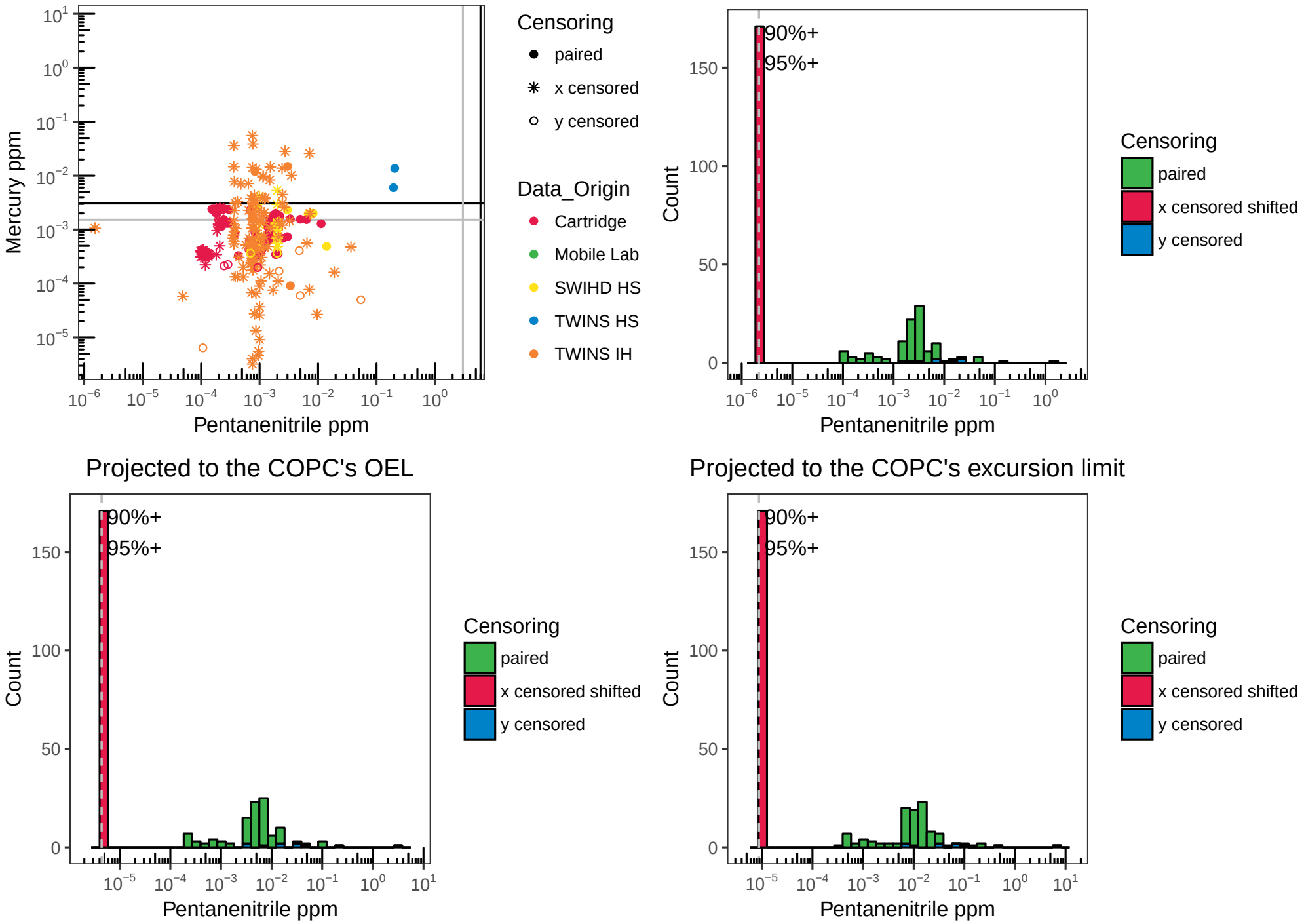


Figure C.1796: Mercury vs Pentanenitrile

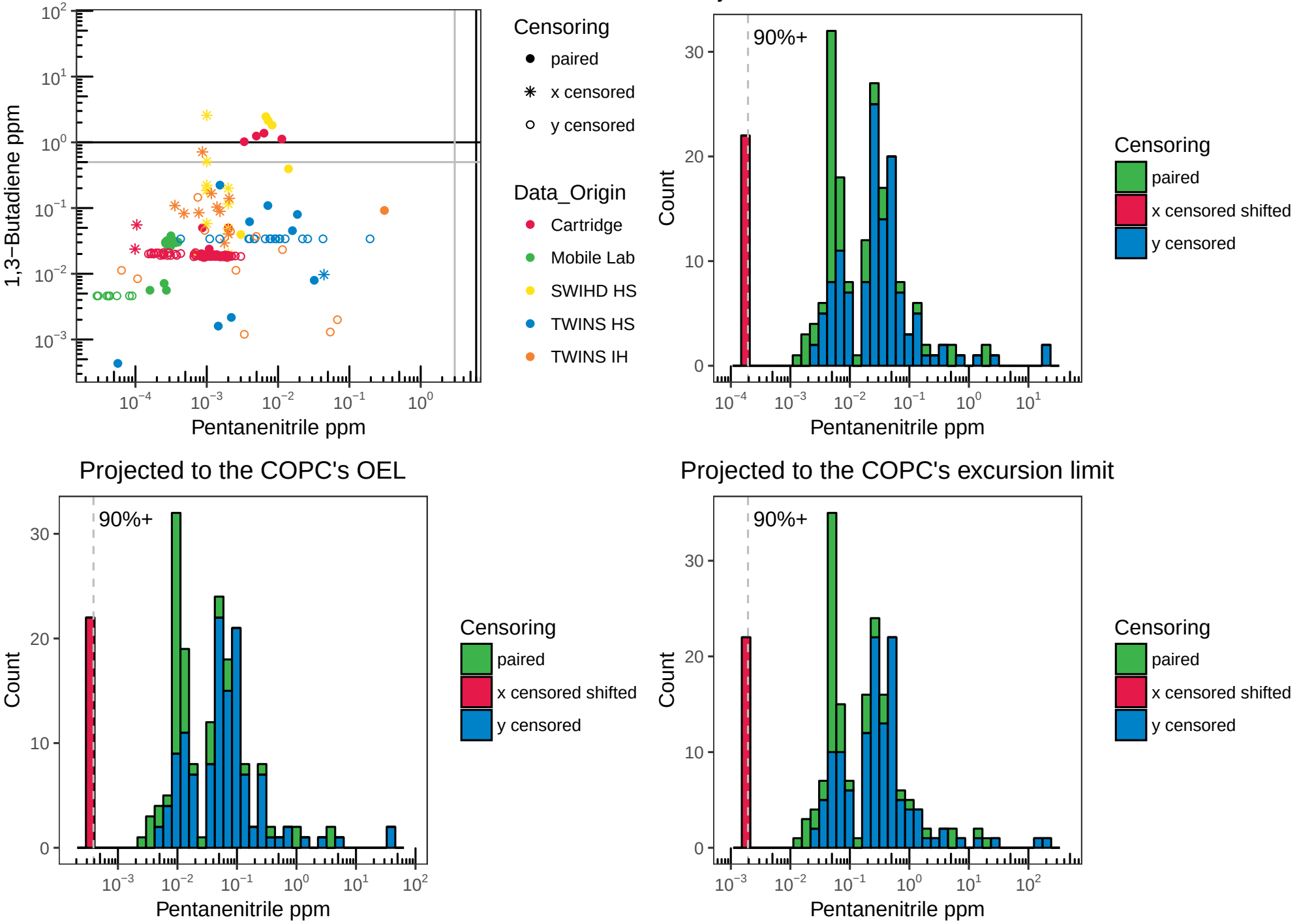


Figure C.1797: 1,3-Butadiene vs Pentanenitrile

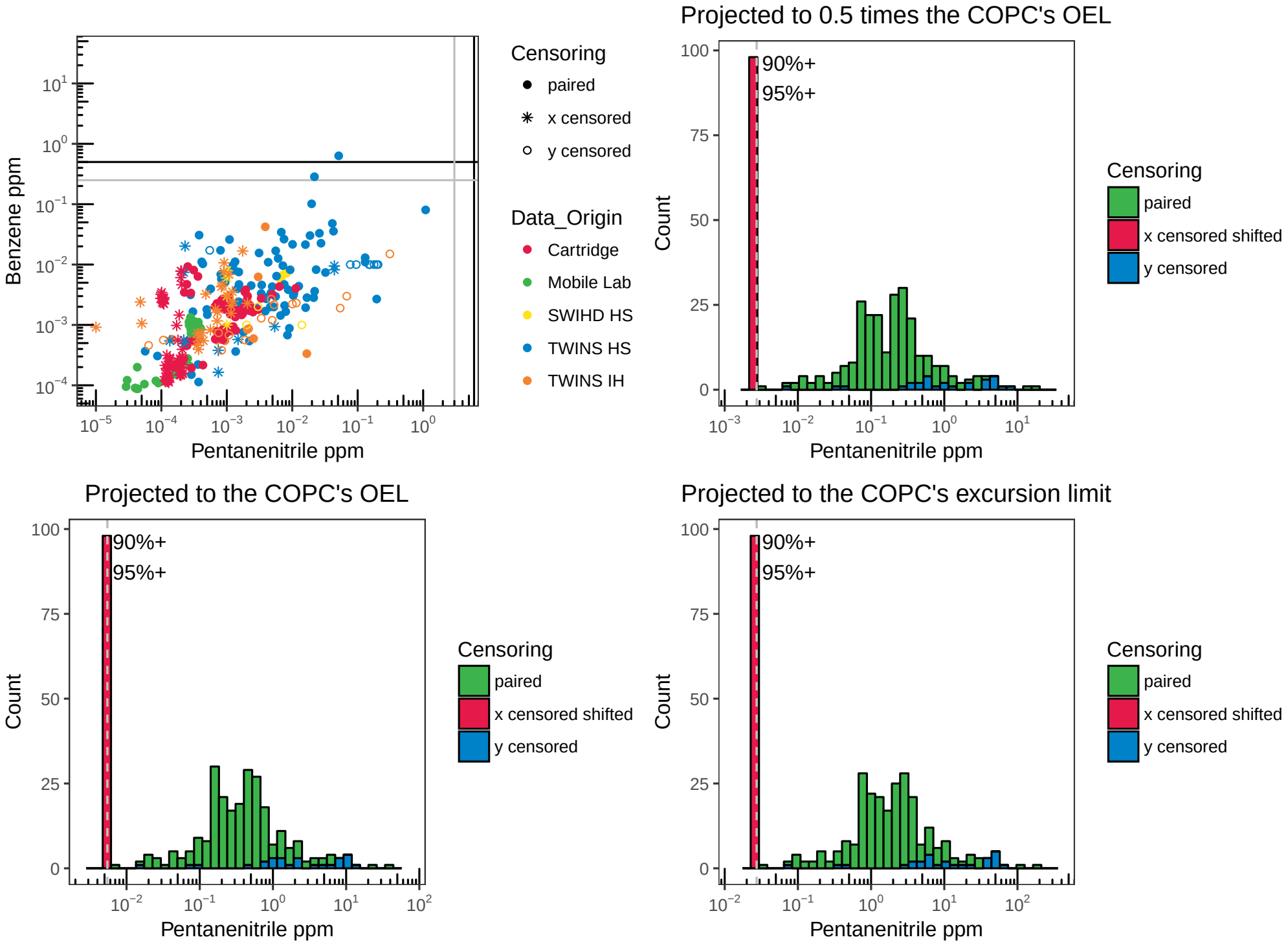


Figure C.1798: Benzene vs Pentanenitrile

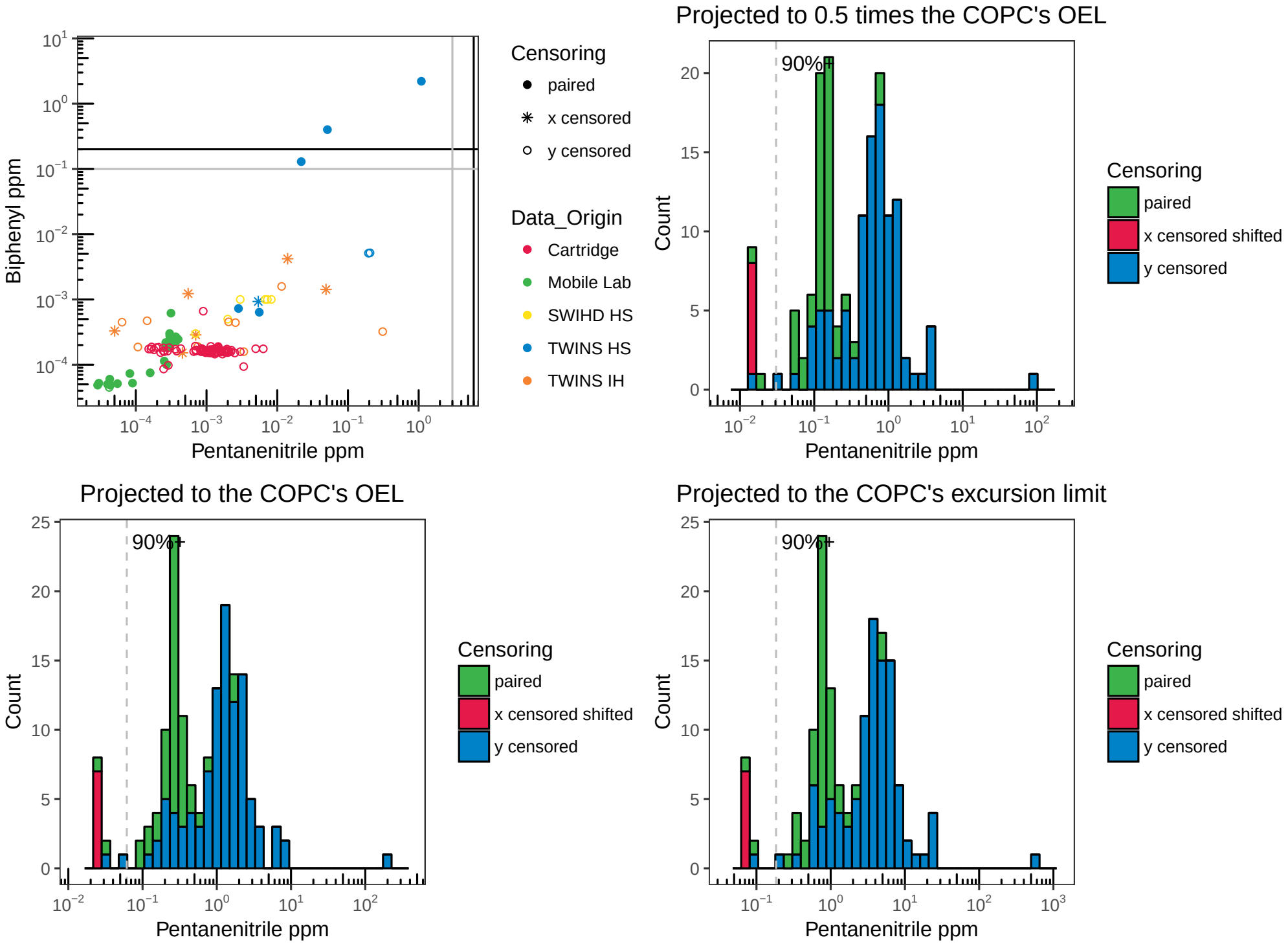


Figure C.1799: Biphenyl vs Pentanenitrile

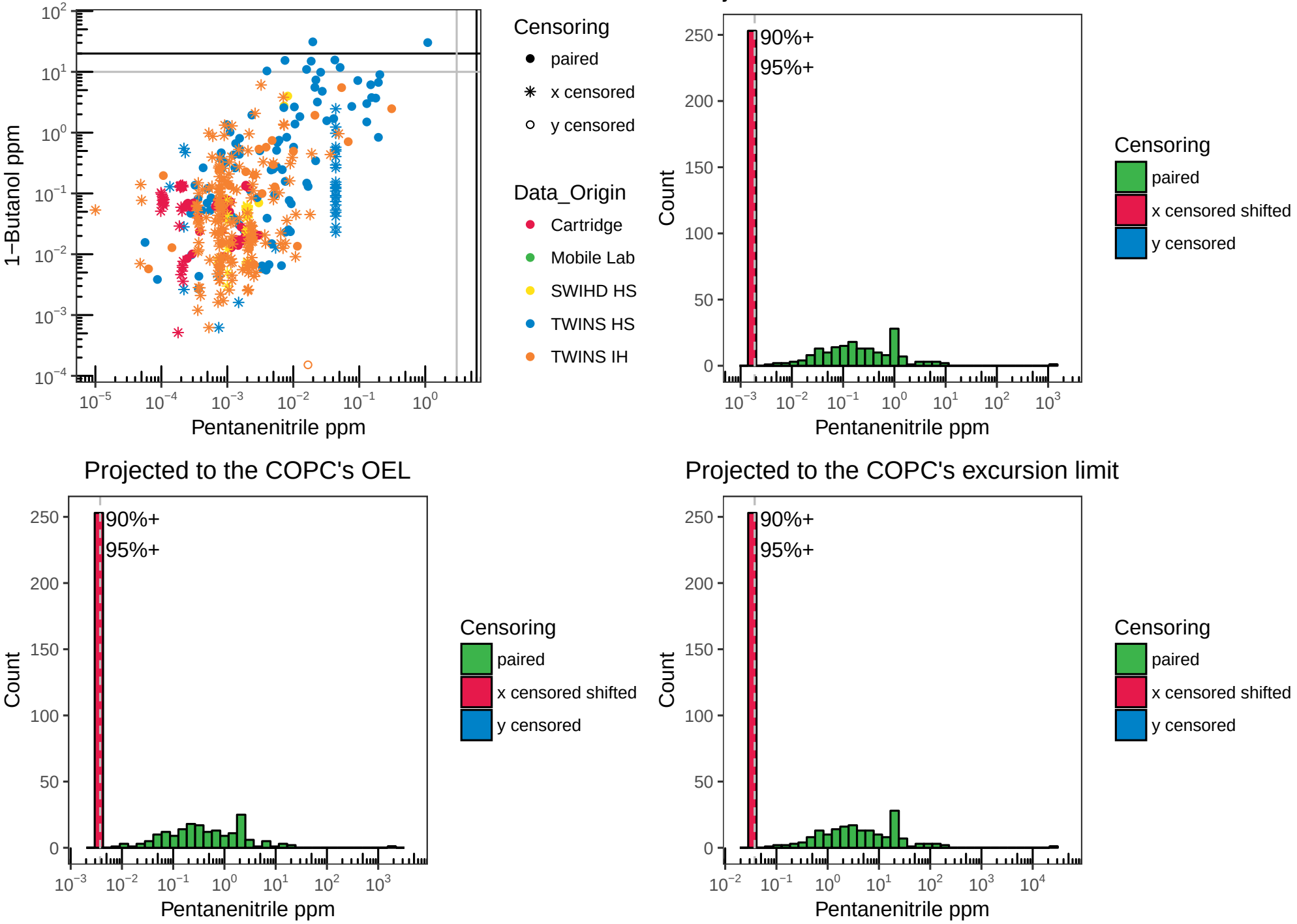


Figure C.1800: 1-Butanol vs Pentanenitrile

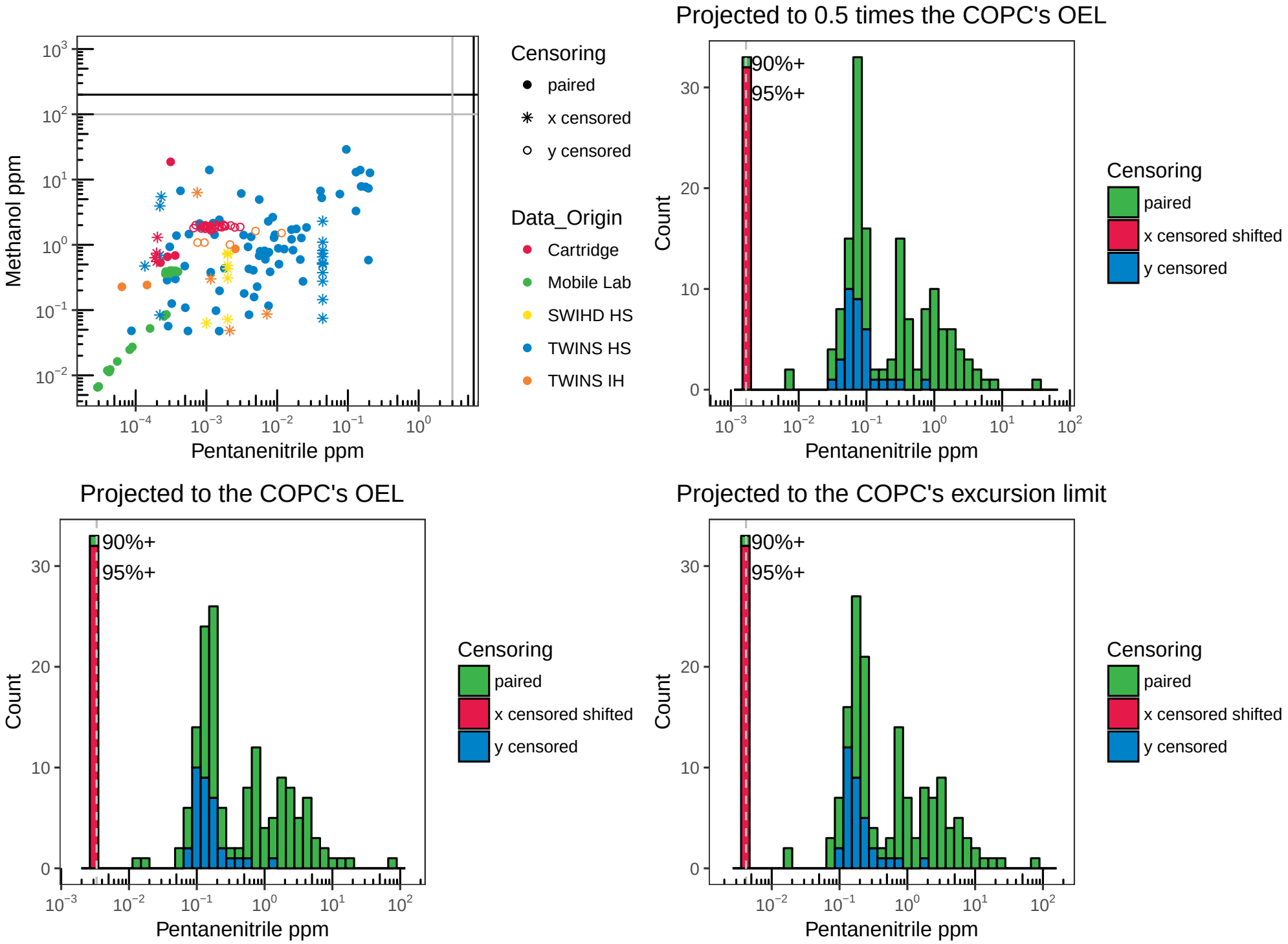


Figure C.1801: Methanol vs Pentanenitrile

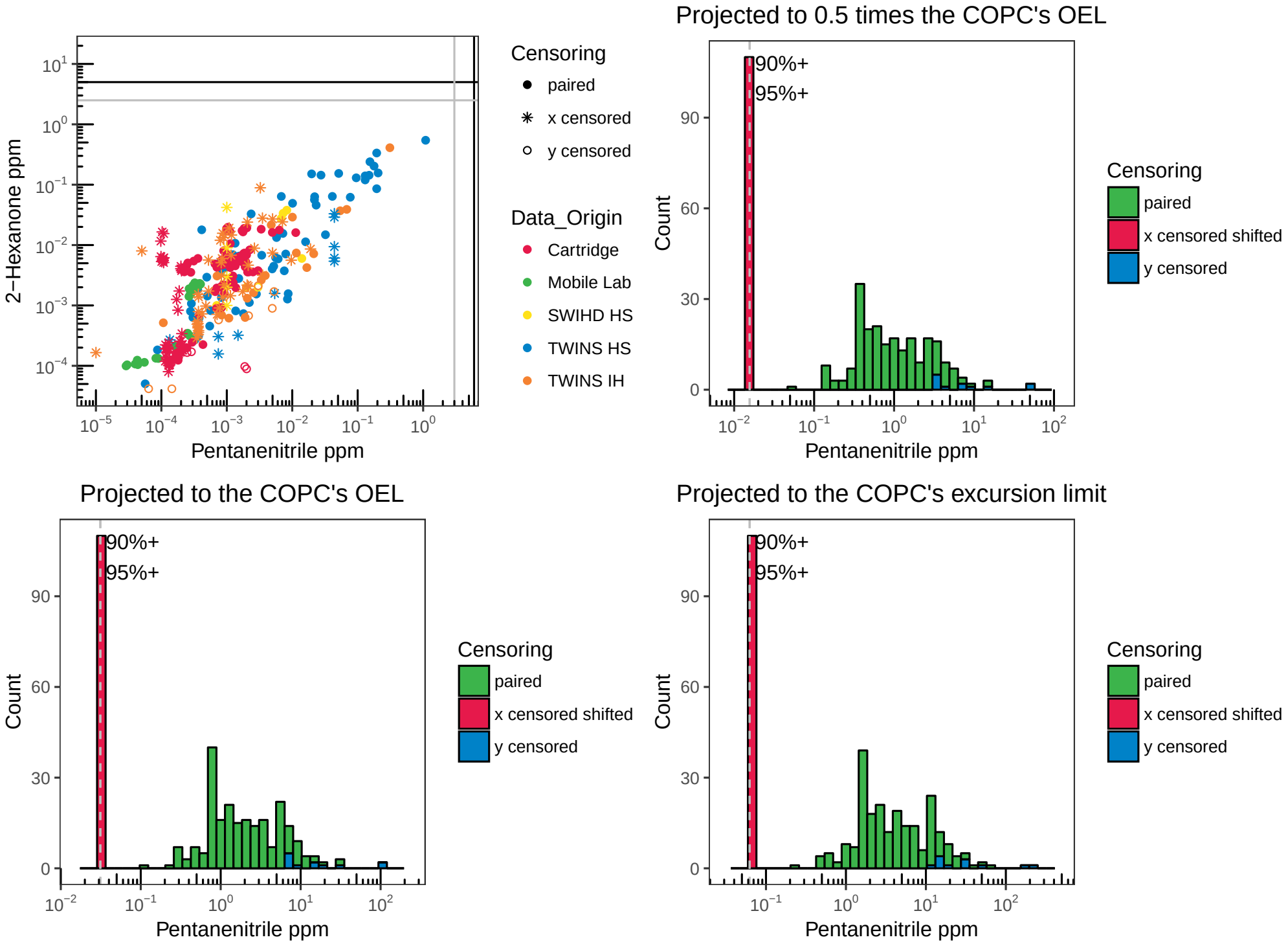


Figure C.1802: 2-Hexanone vs Pentanenitrile

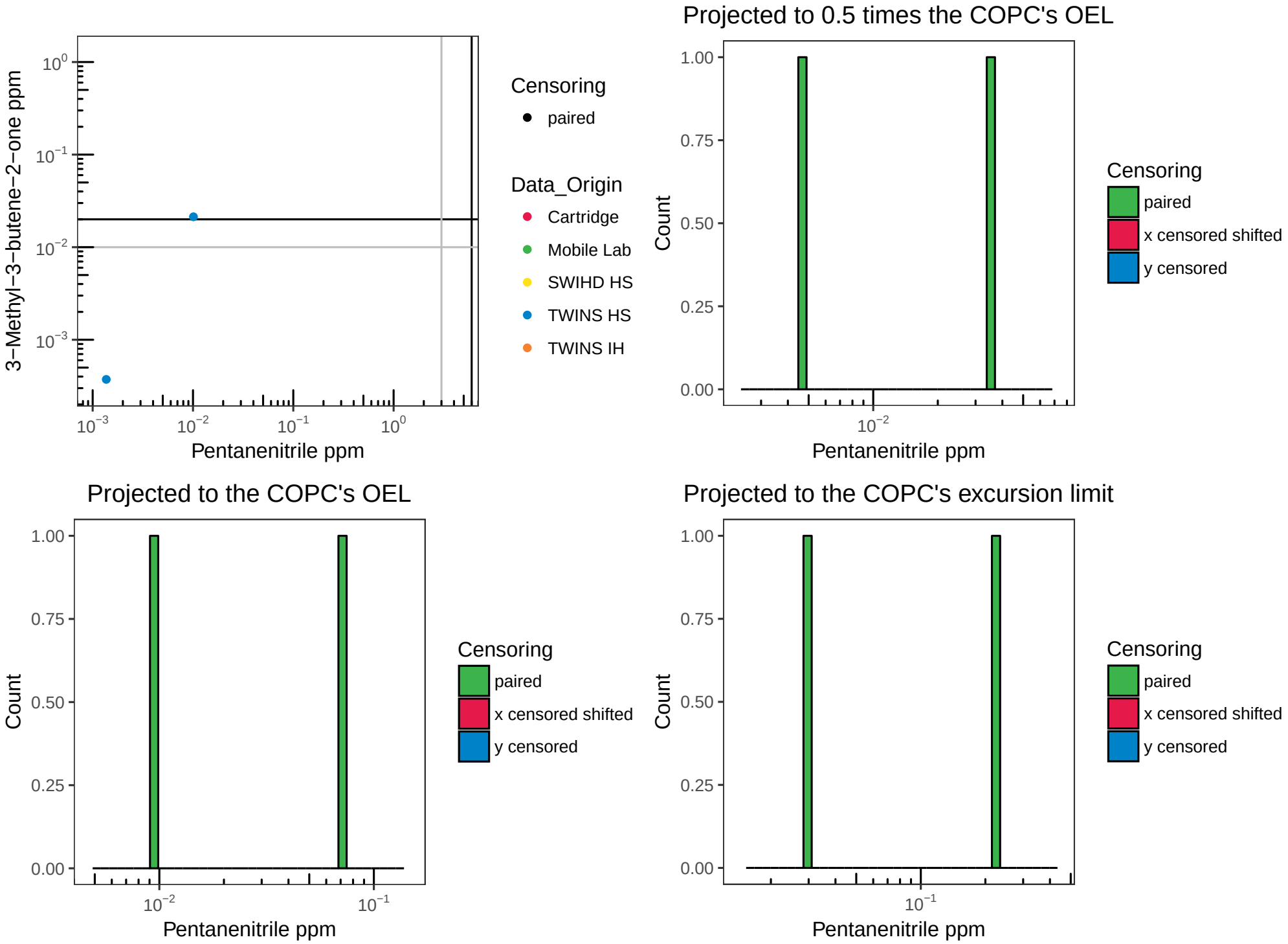


Figure C.1803: 3-Methyl-3-butene-2-one vs Pentanenitrile

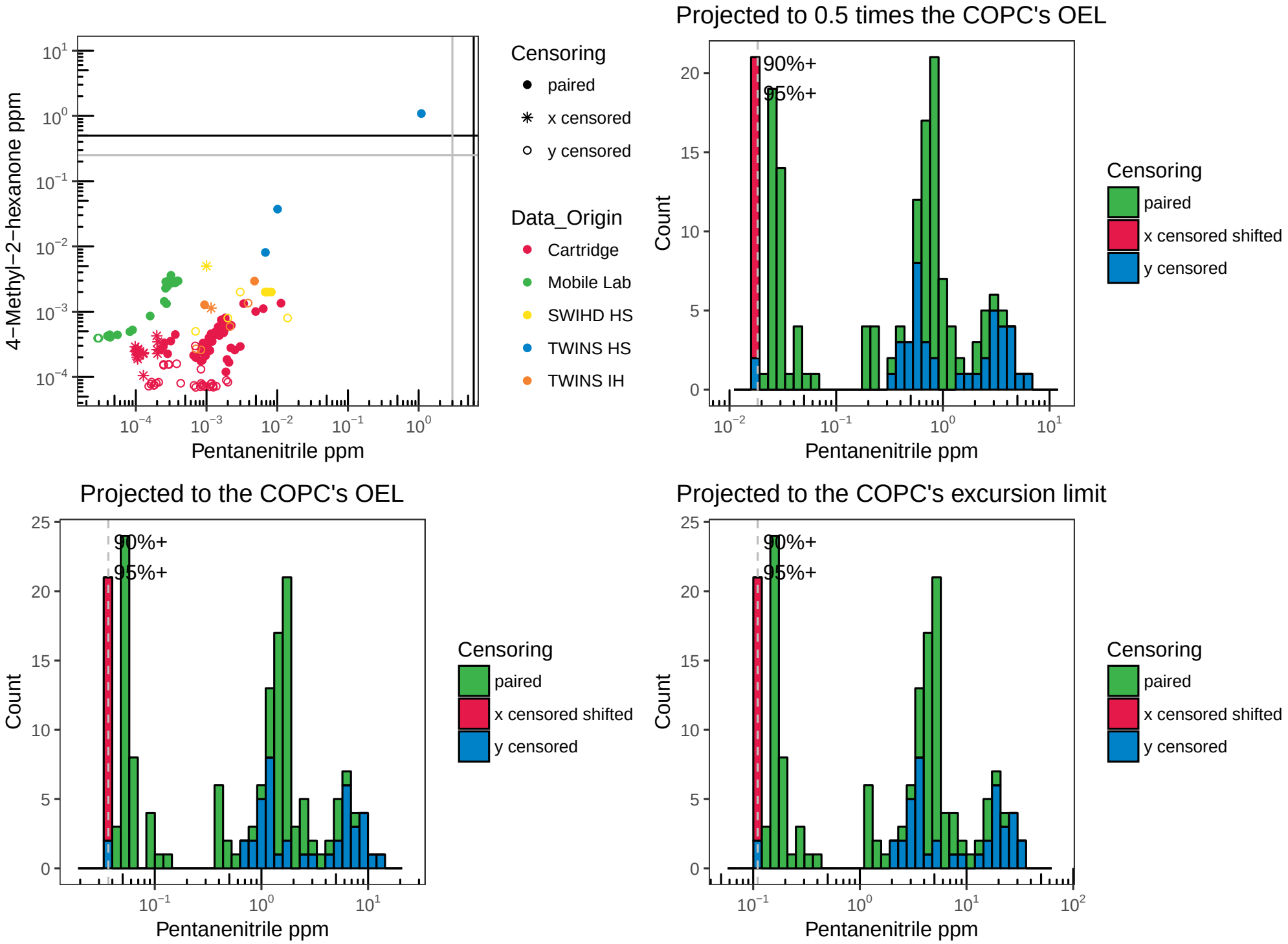


Figure C.1804: 4-Methyl-2-hexanone vs Pentanenitrile

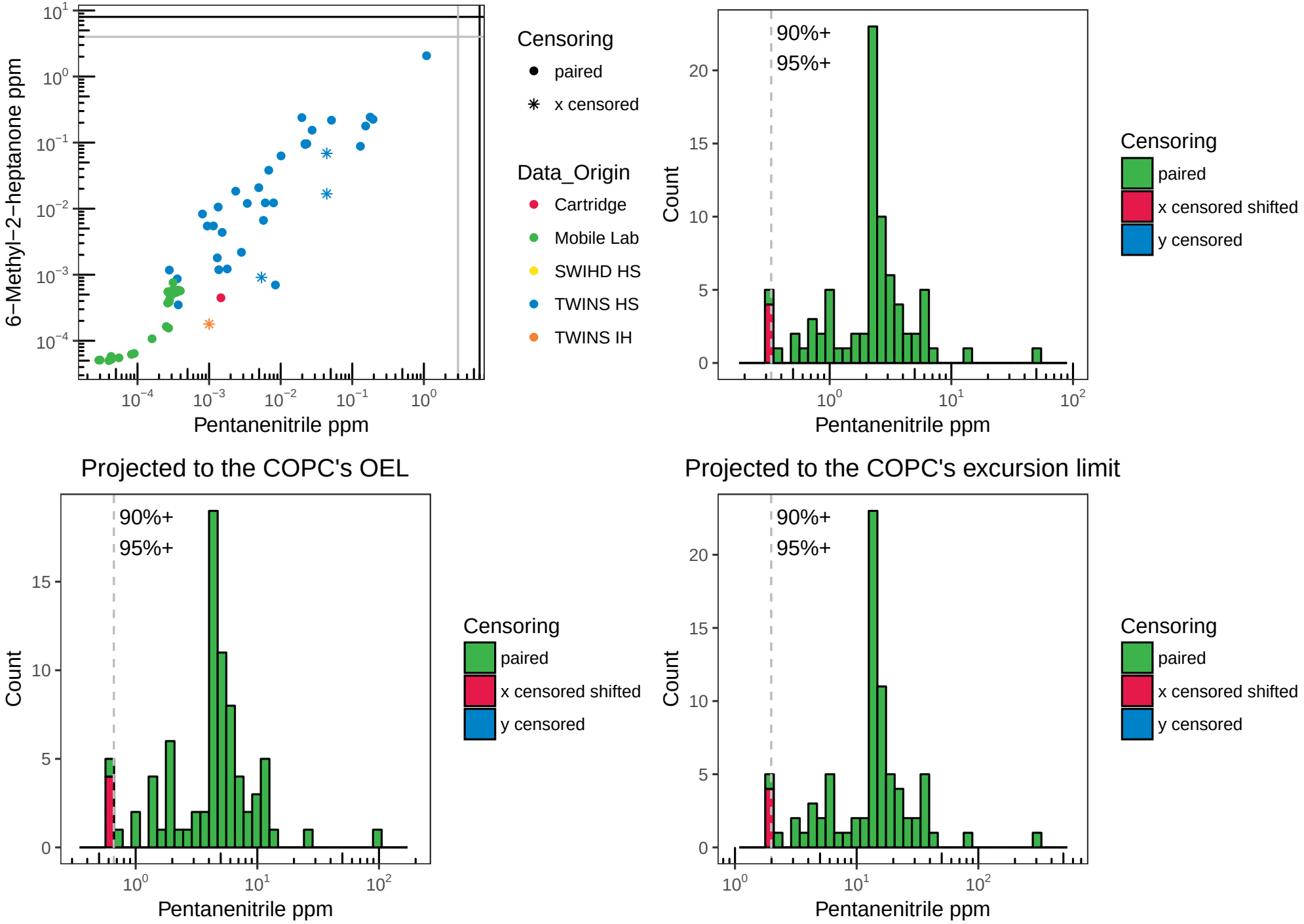


Figure C.1805: 6-Methyl-2-heptanone vs Pentanenitrile

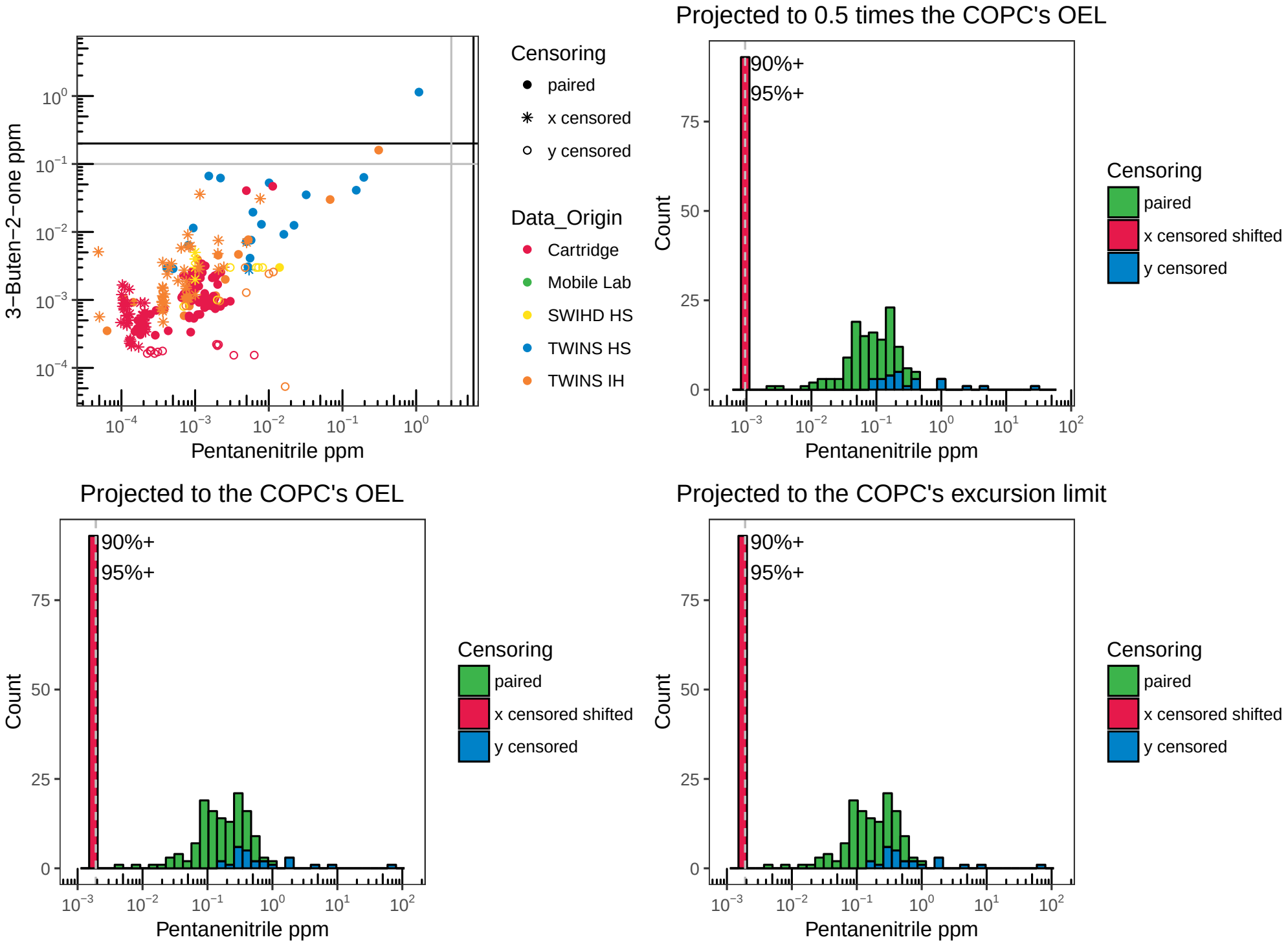


Figure C.1806: 3-Buten-2-one vs Pentanenitrile

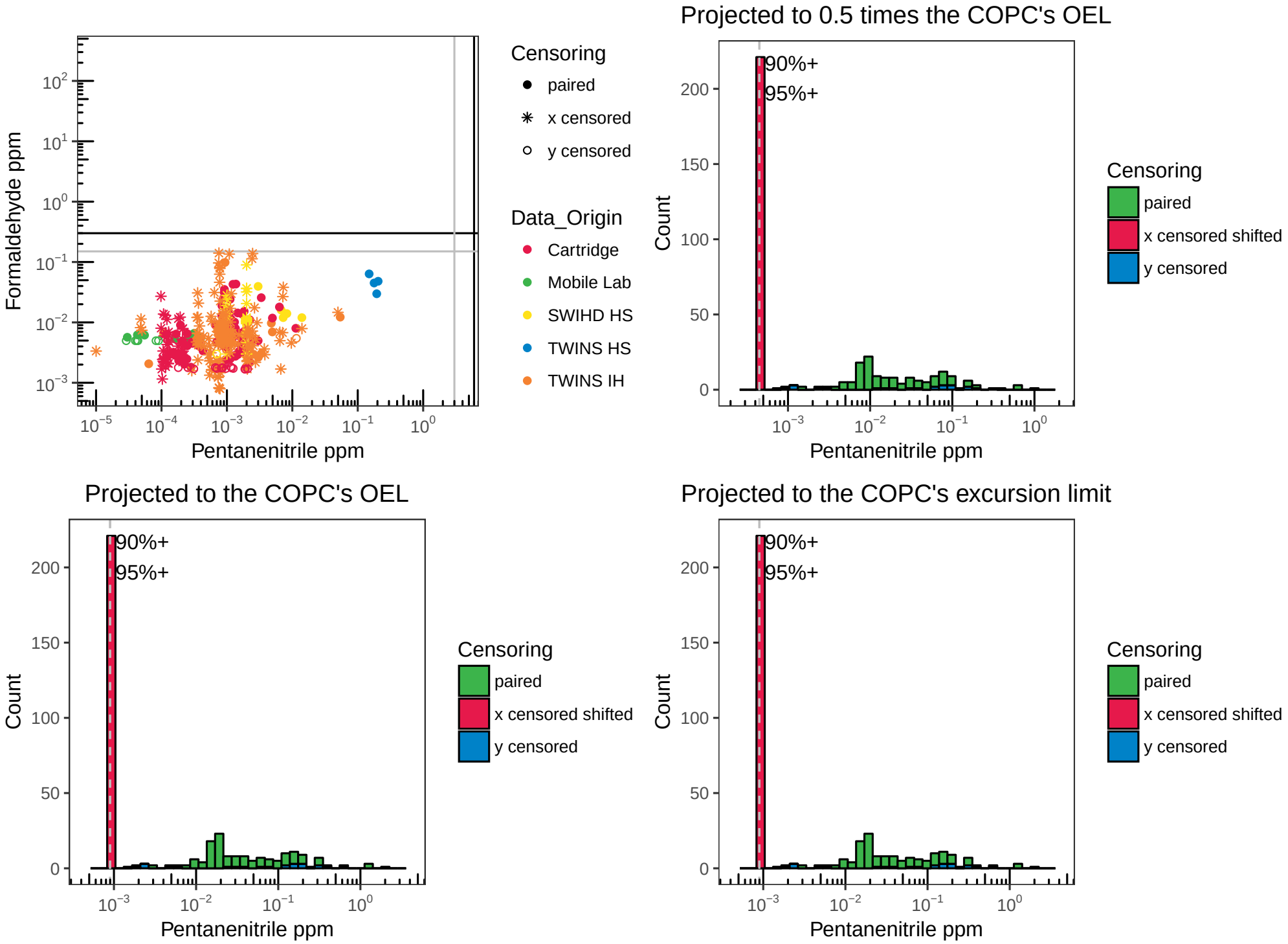


Figure C.1807: Formaldehyde vs Pentanenitrile

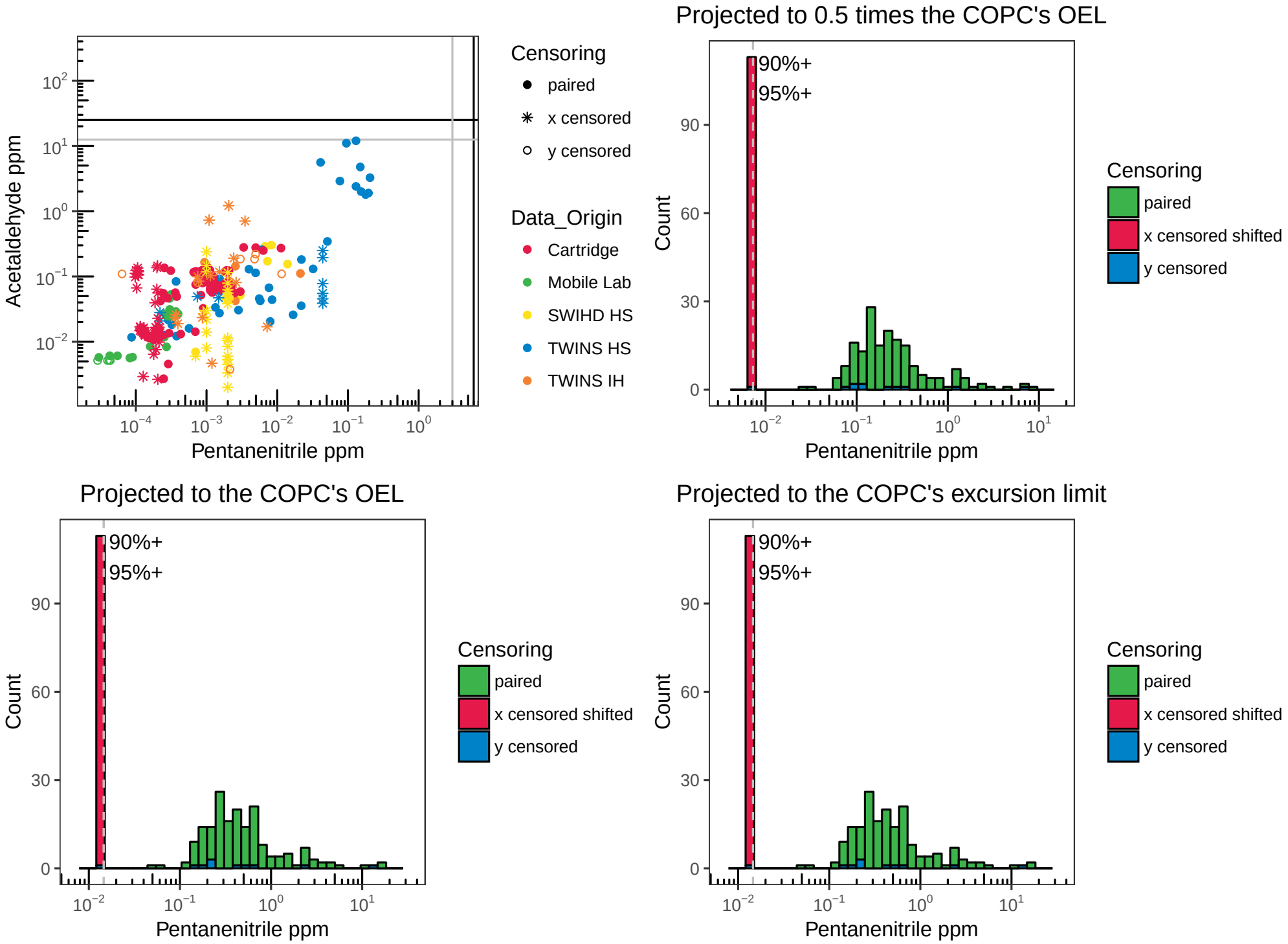


Figure C.1808: Acetaldehyde vs Pentanenitrile

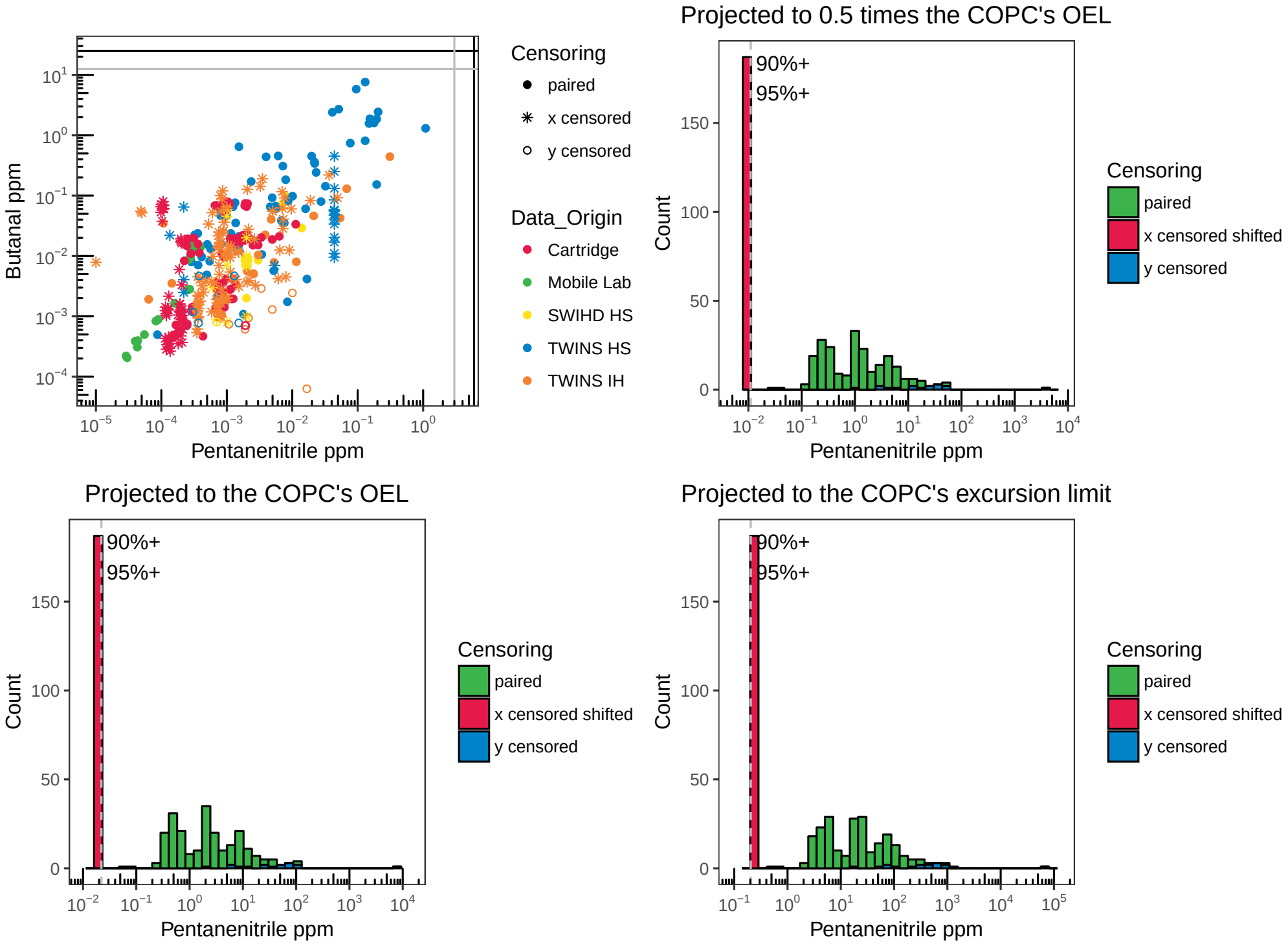


Figure C.1809: Butanal vs Pentanenitrile

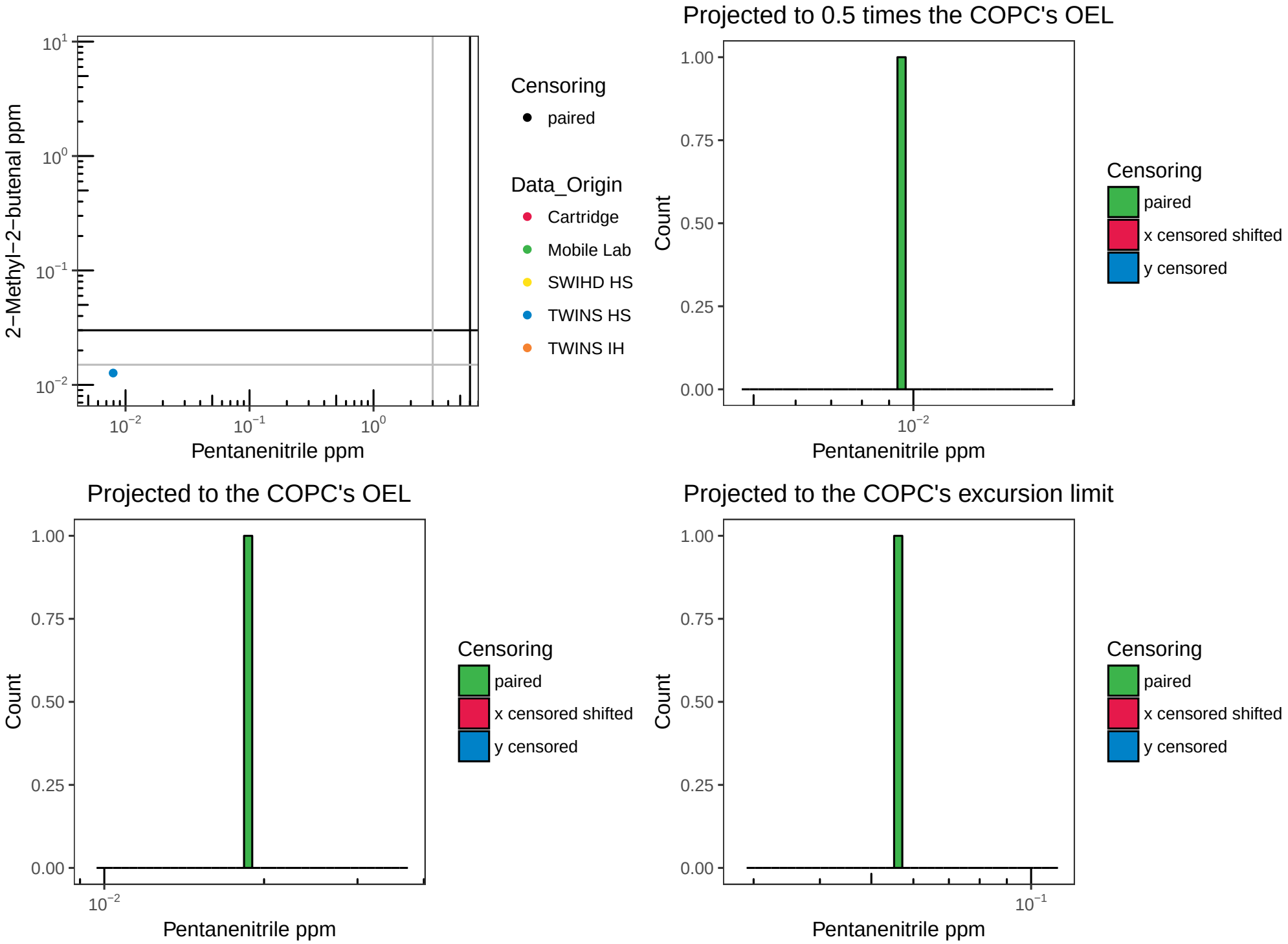


Figure C.1810: 2-Methyl-2-butenal vs Pentanenitrile

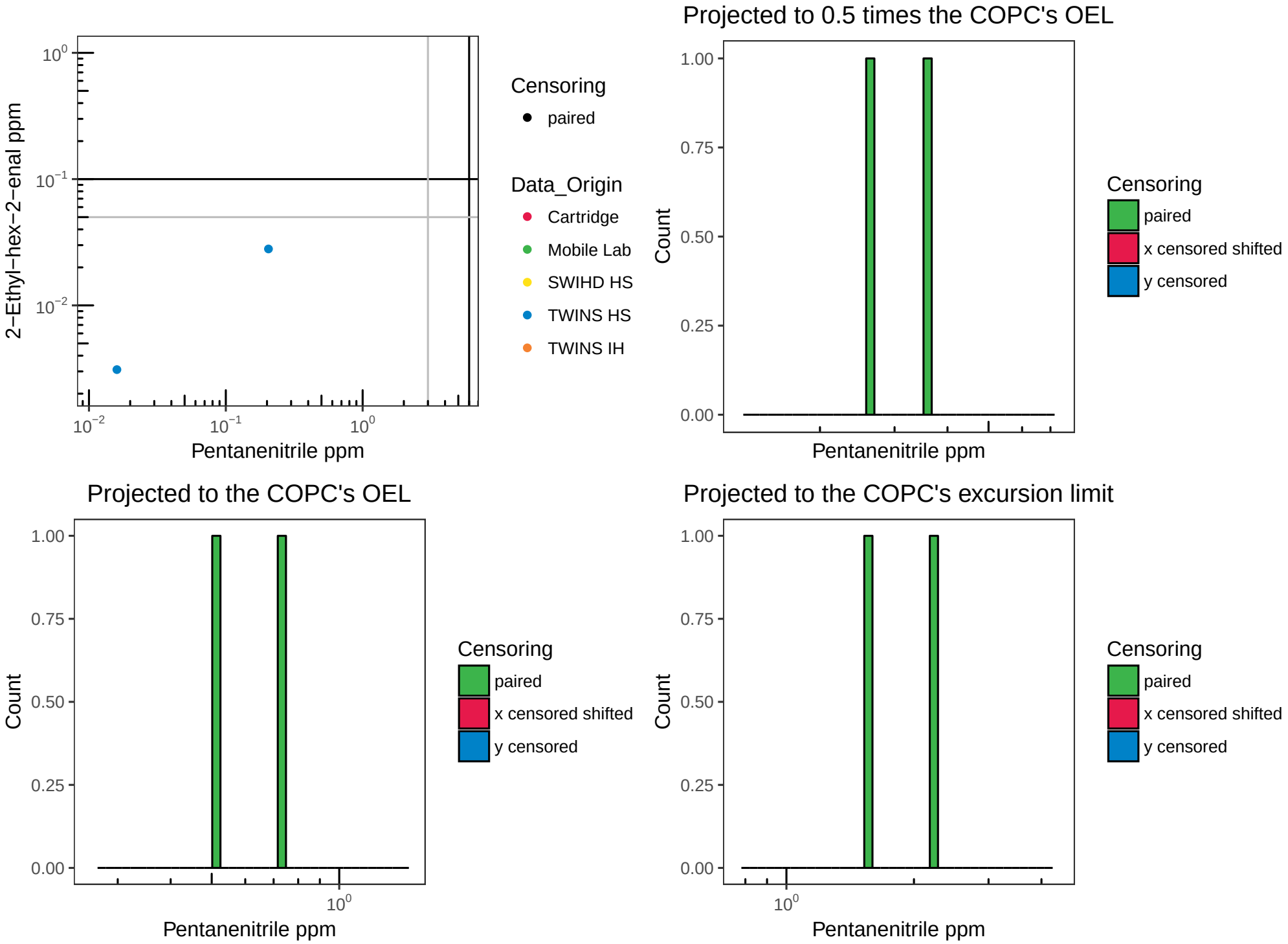


Figure C.1811: 2-Ethyl-hex-2-enal vs Pentanenitrile

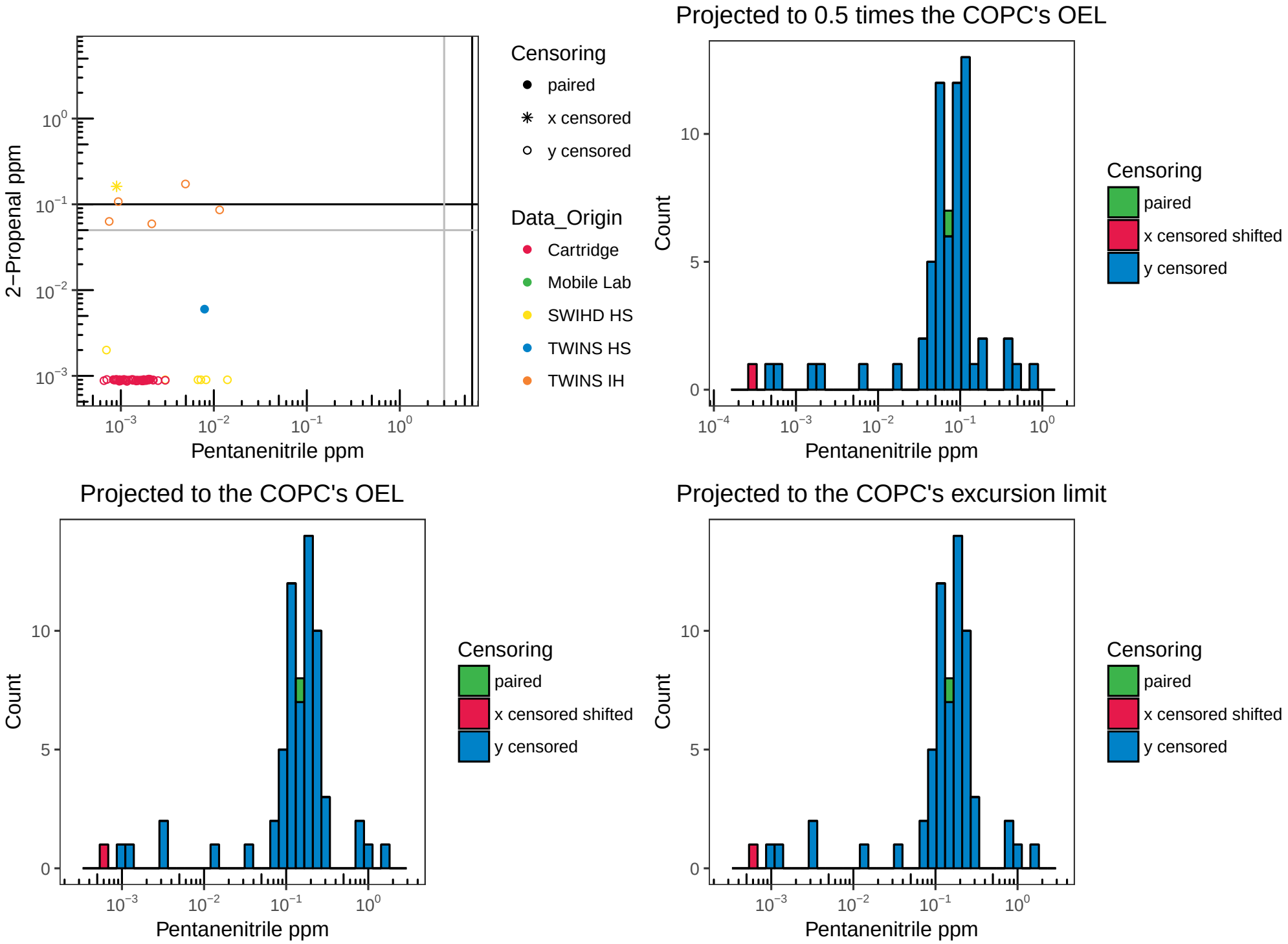


Figure C.1812: 2-Propenal vs Pentanenitrile

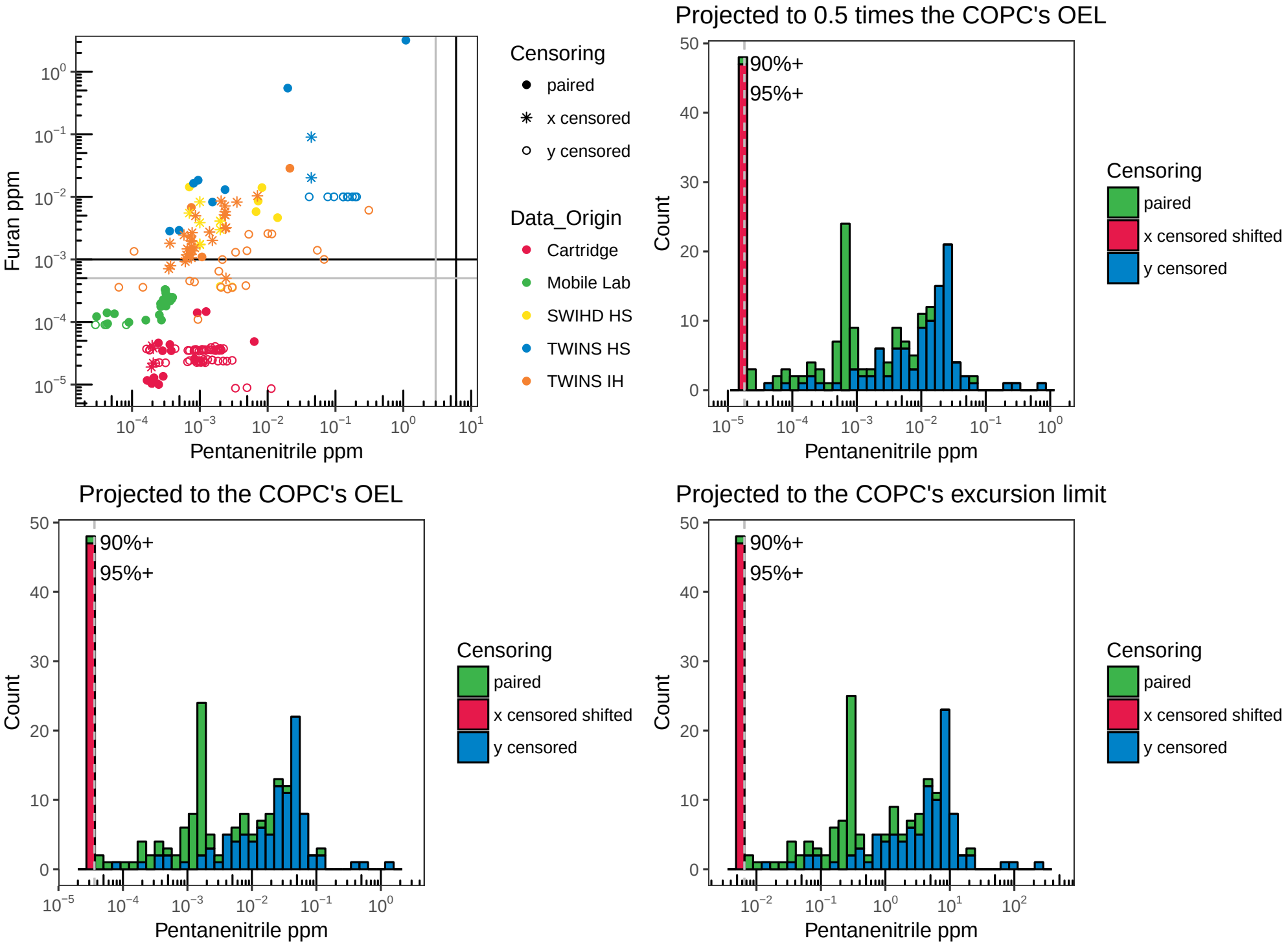


Figure C.1813: Furan vs Pentanenitrile

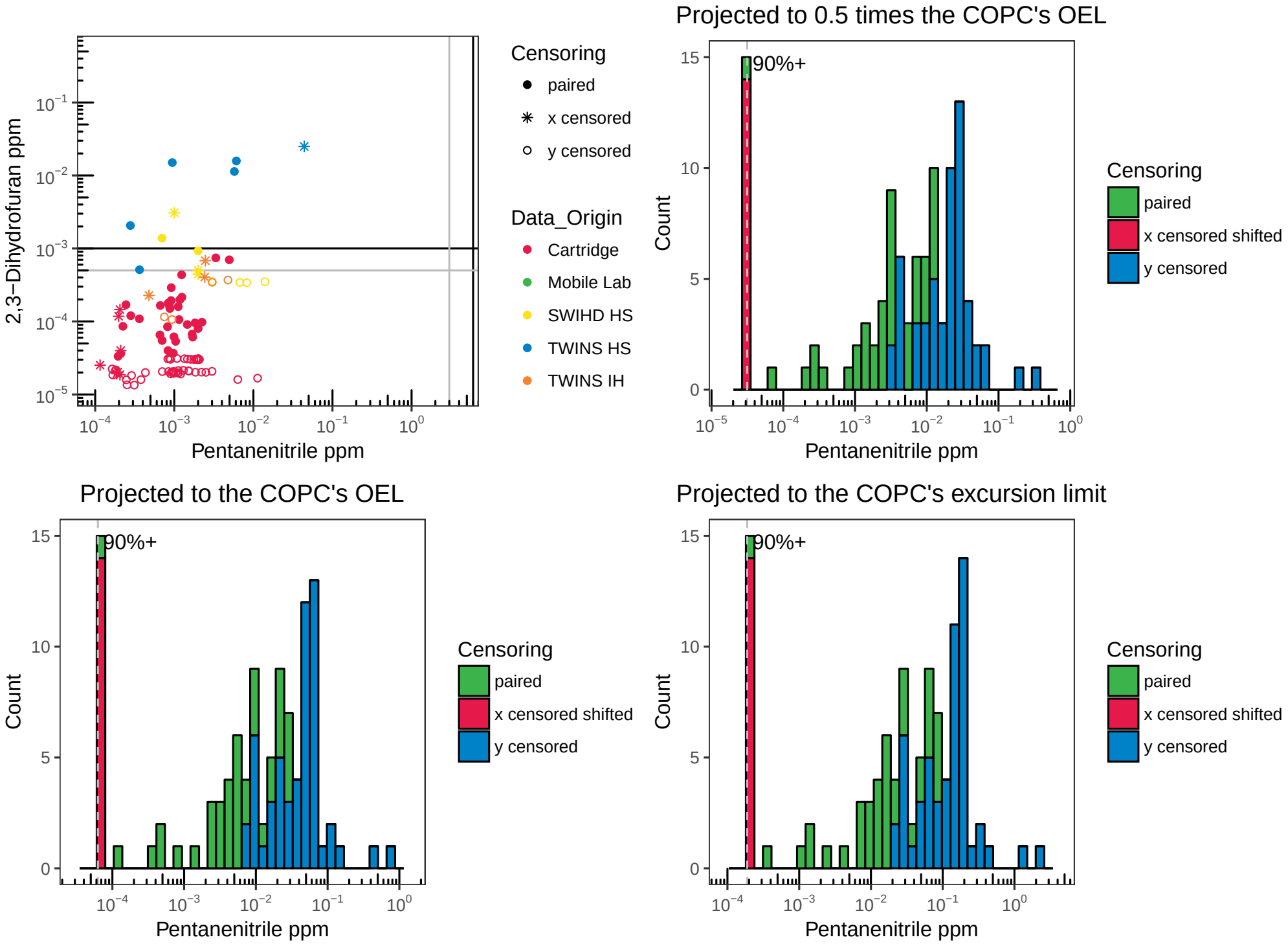


Figure C.1814: 2,3-Dihydrofuran vs Pentanenitrile

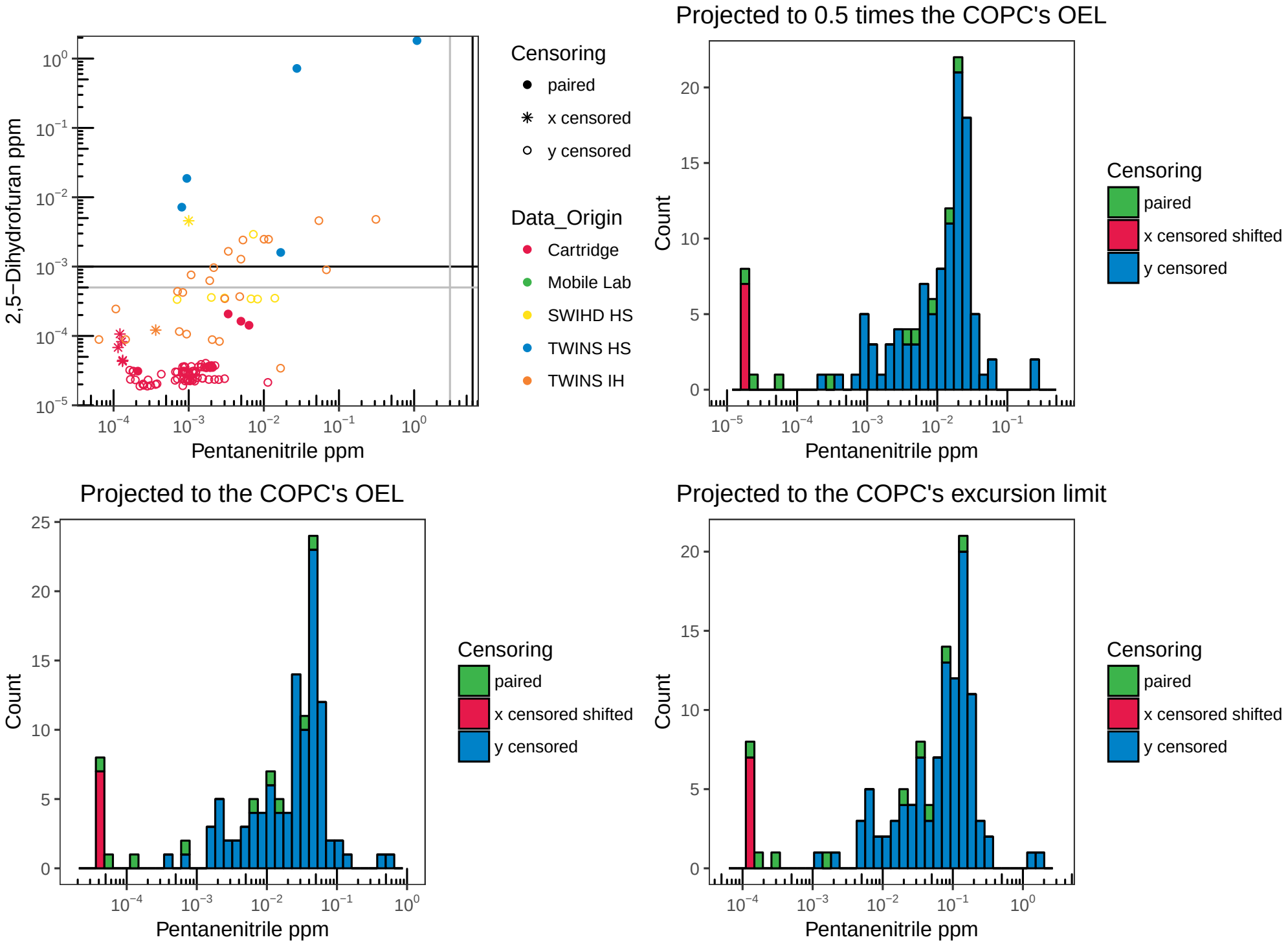


Figure C.1815: 2,5-Dihydrofuran vs Pentanenitrile

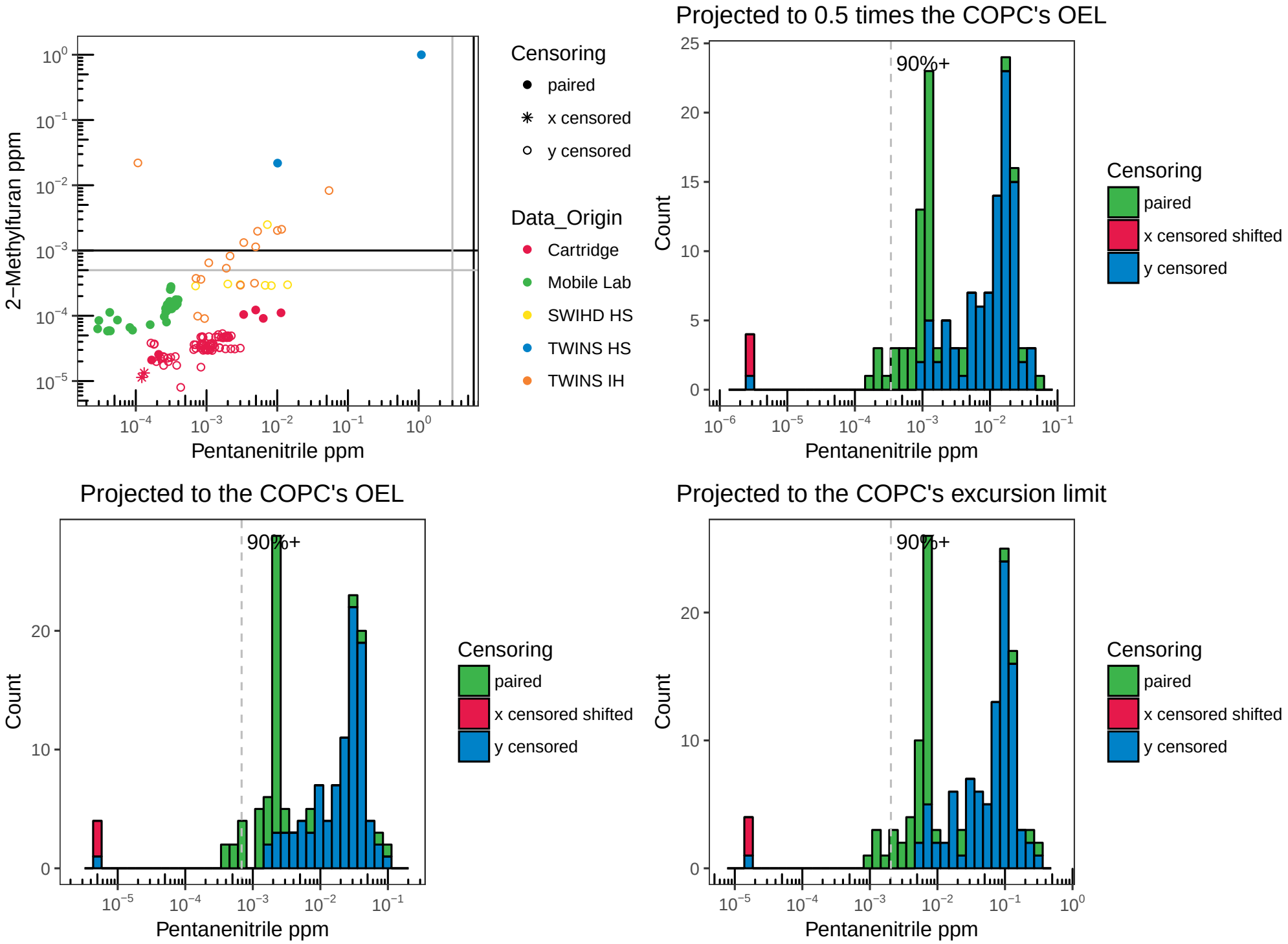


Figure C.1816: 2-Methylfuran vs Pentanenitrile

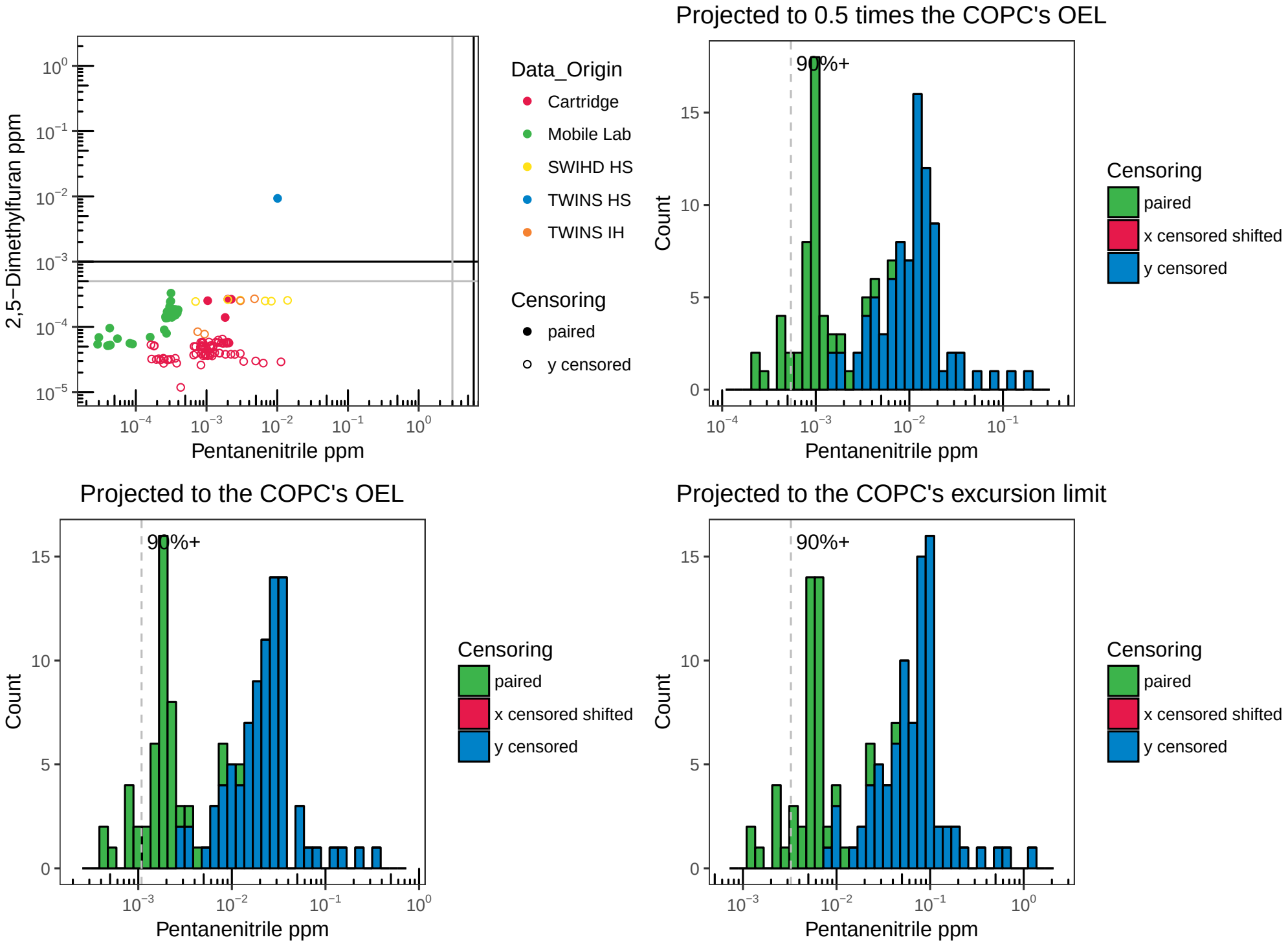


Figure C.1817: 2,5-Dimethylfuran vs Pentanenitrile

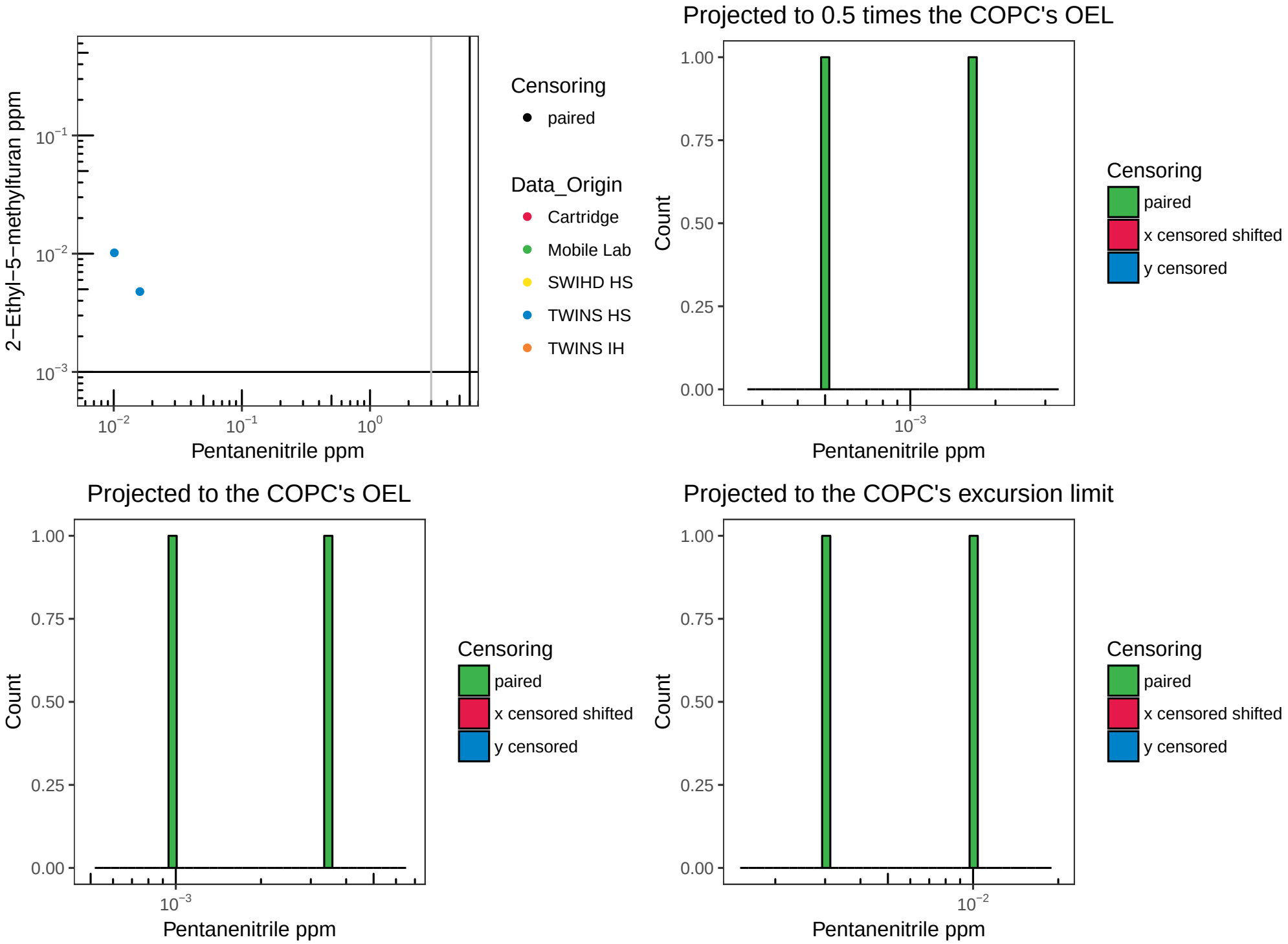


Figure C.1818: 2-Ethyl-5-methylfuran vs Pentanenitrile

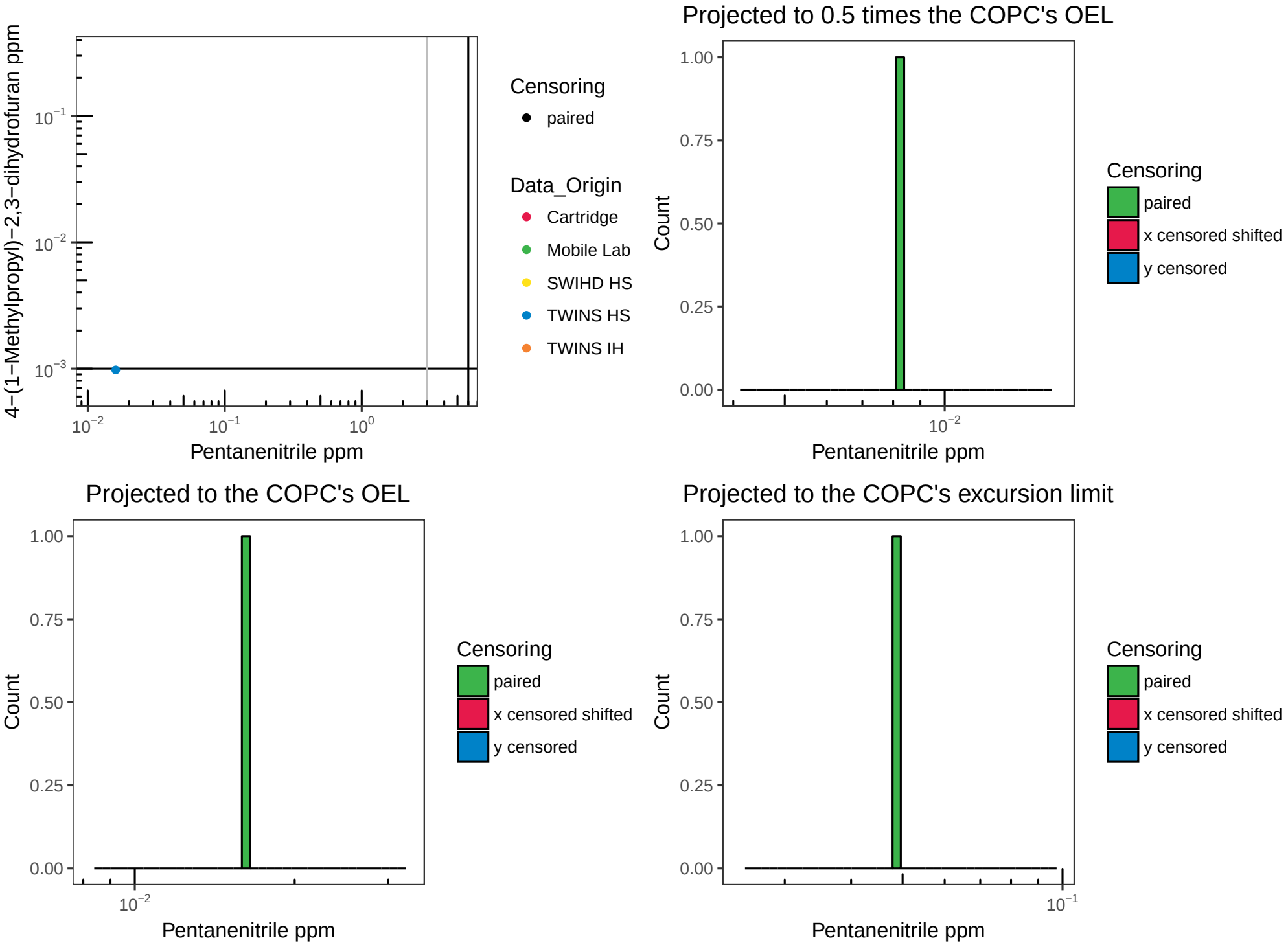


Figure C.1819: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Pentanenitrile

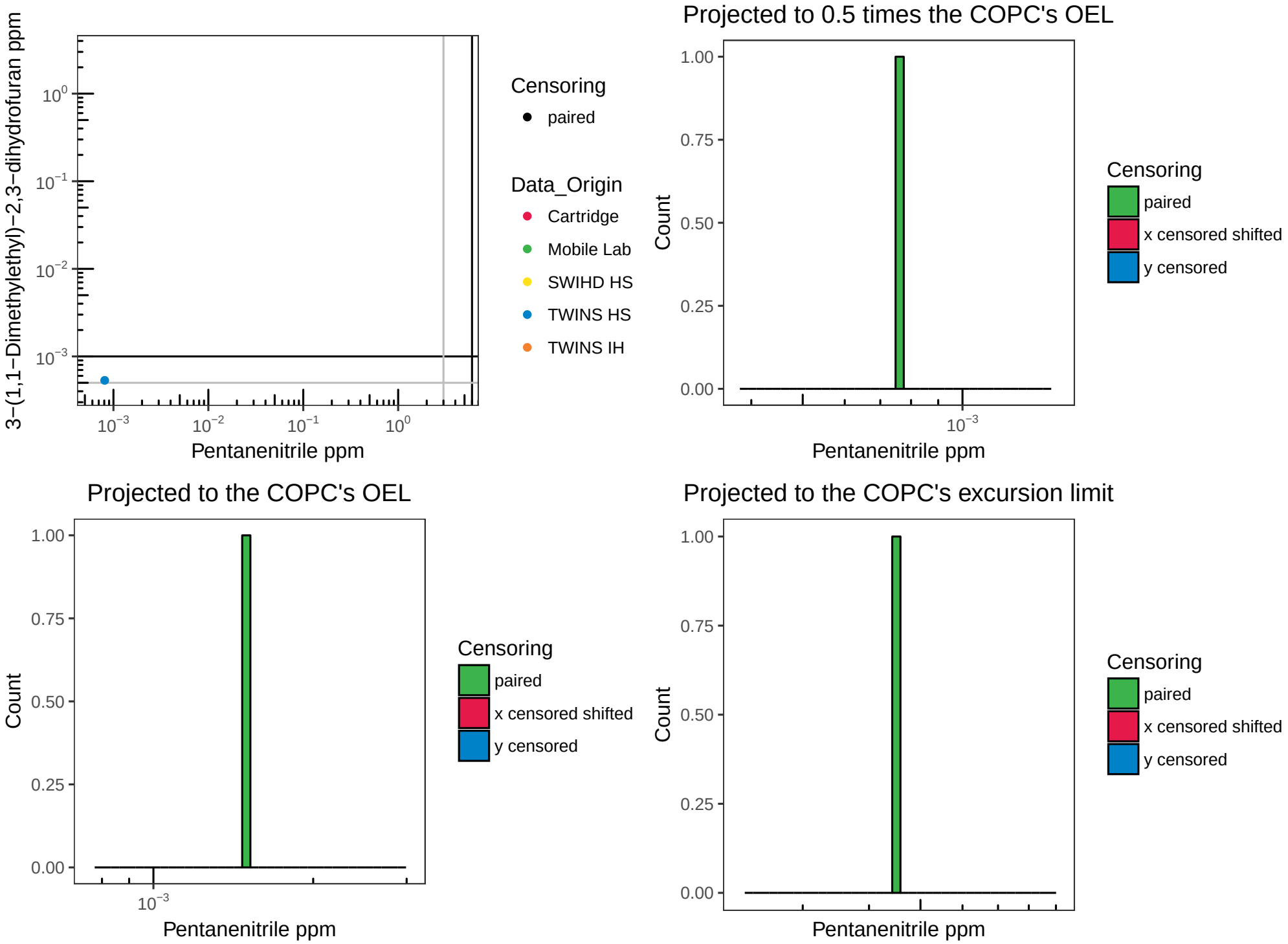


Figure C.1820: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Pentanenitrile

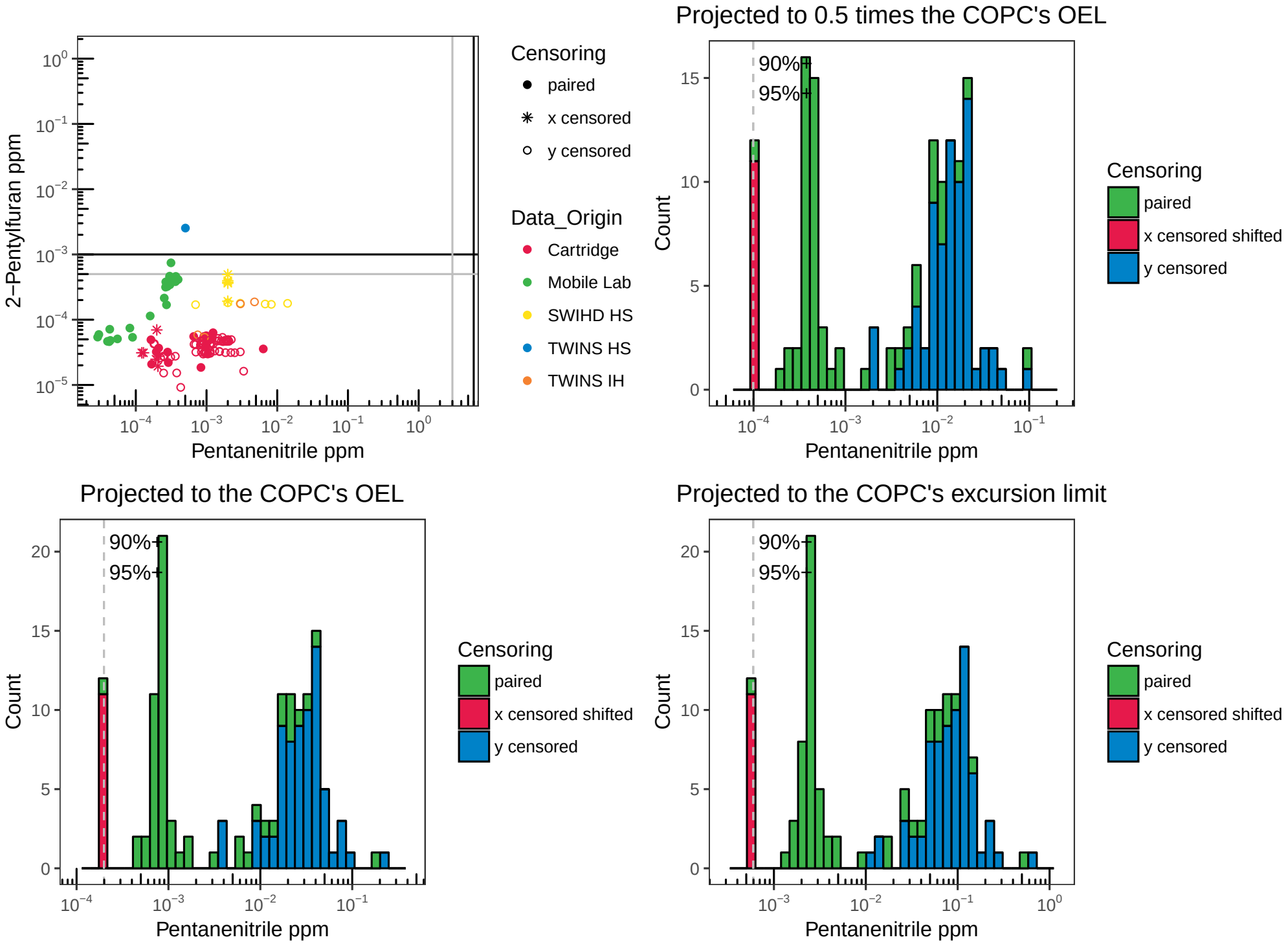


Figure C.1821: 2-Pentylfuran vs Pentanenitrile

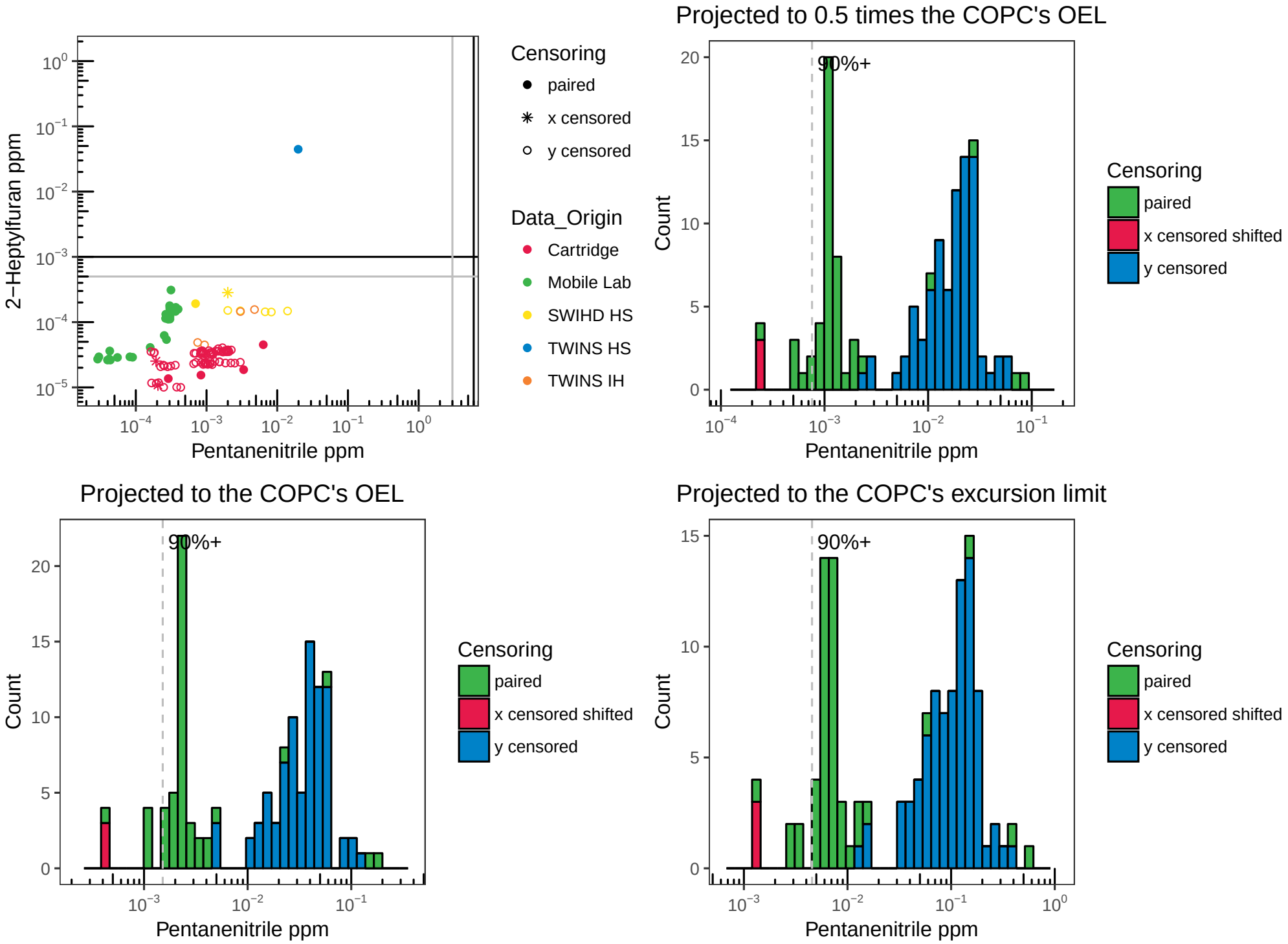


Figure C.1822: 2-Heptylfuran vs Pentanenitrile

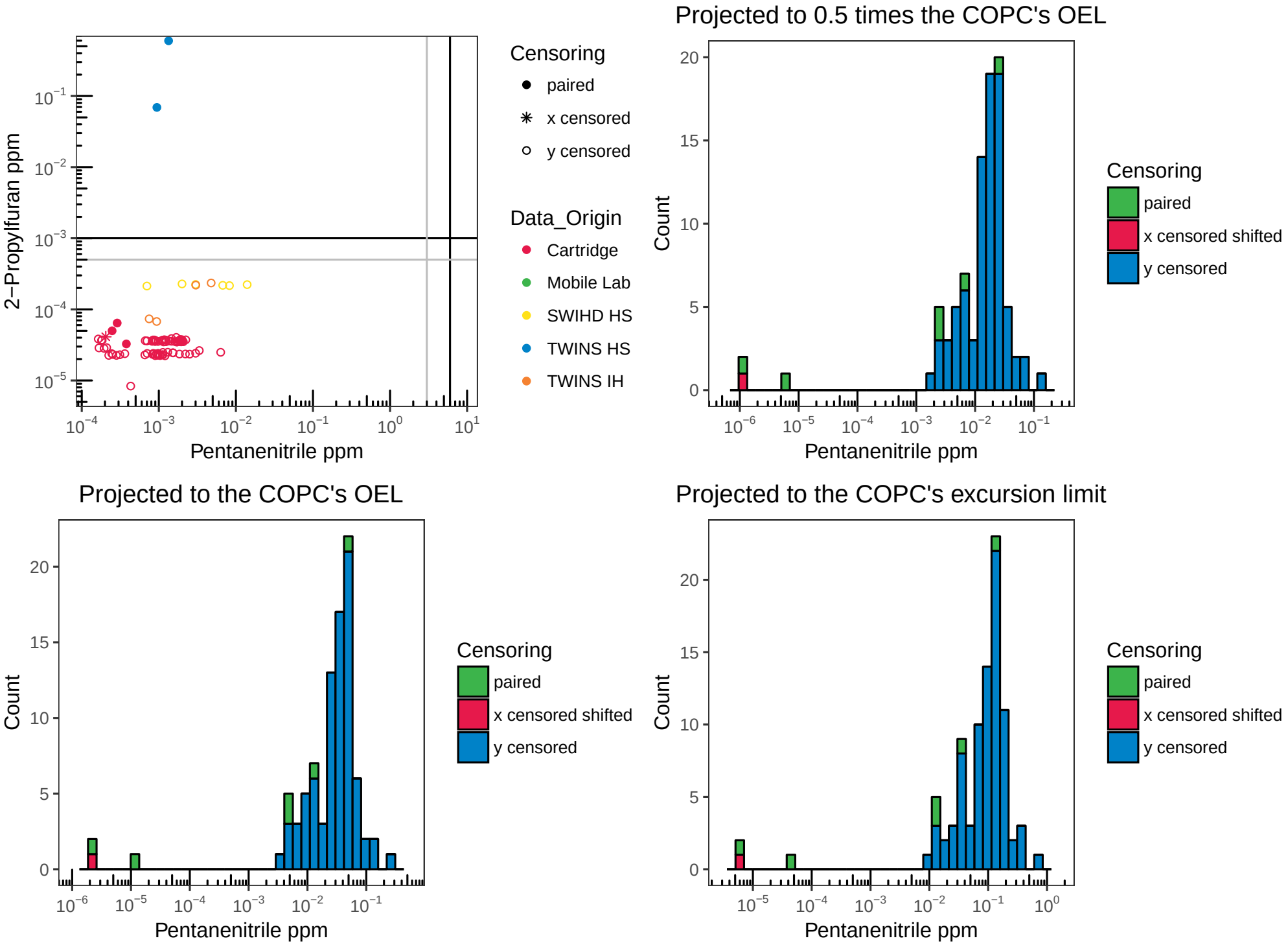


Figure C.1823: 2-Propylfuran vs Pentanenitrile

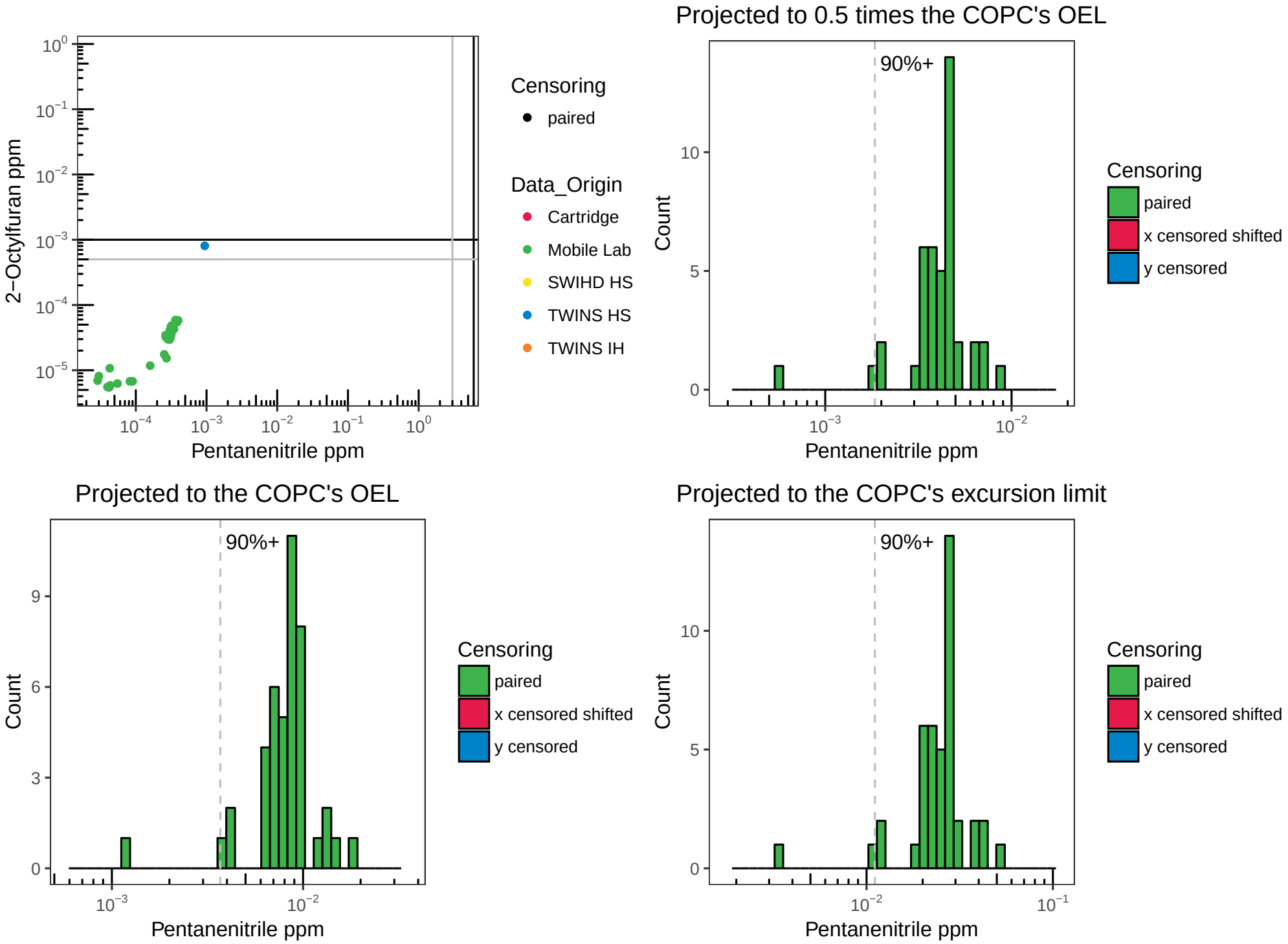


Figure C.1824: 2-Octylfuran vs Pentanenitrile

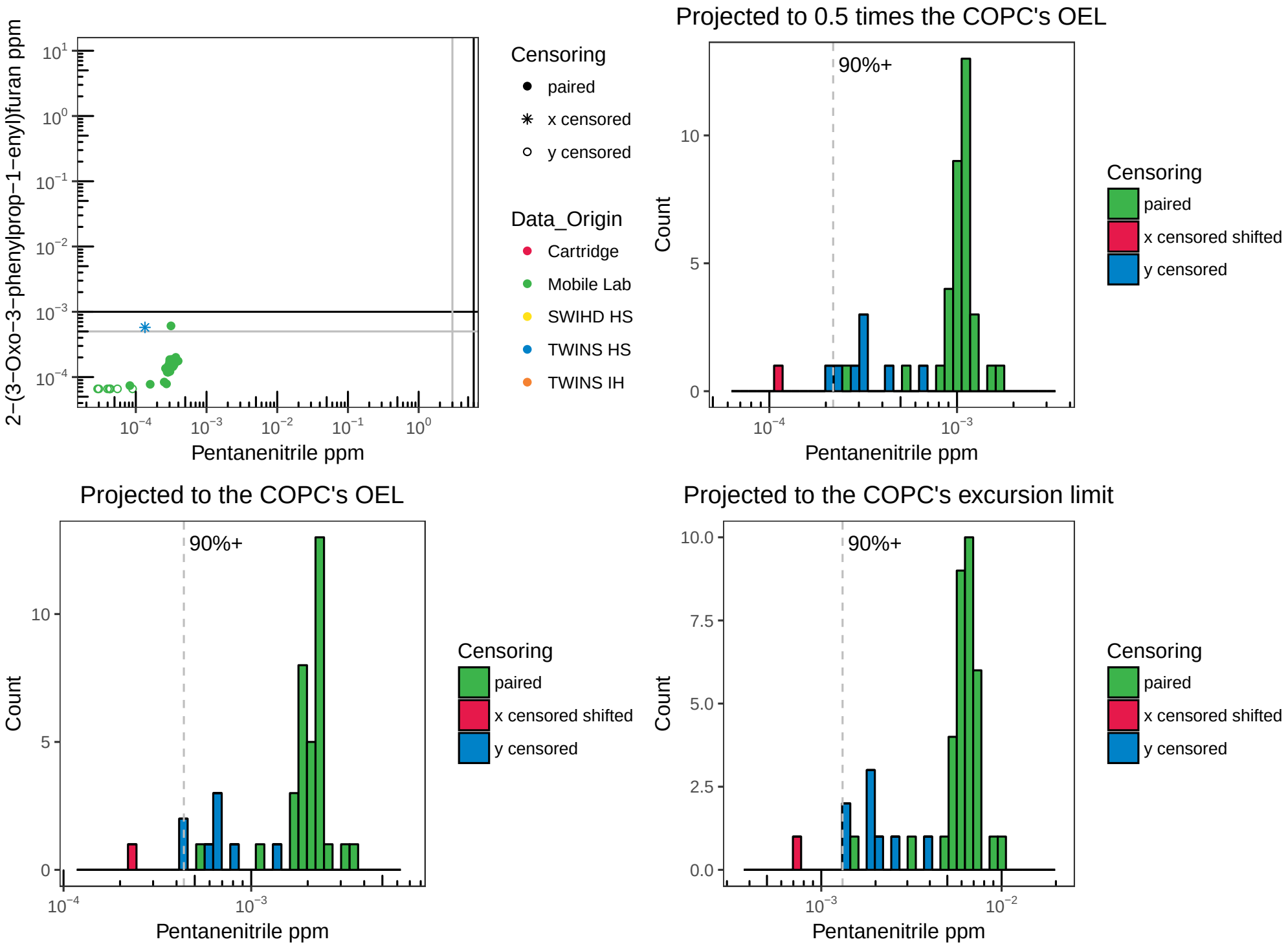


Figure C.1825: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Pentanenitrile

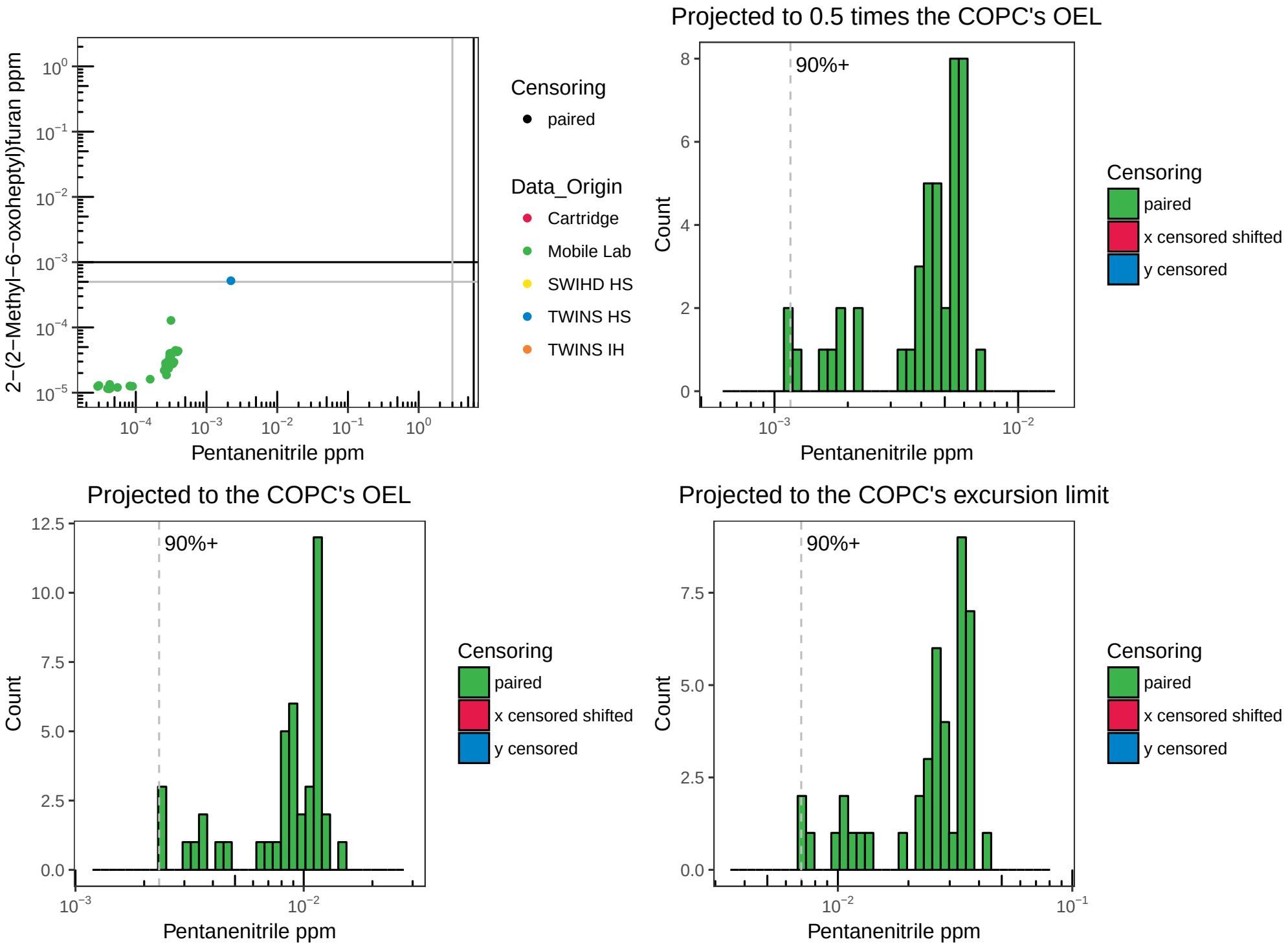


Figure C.1826: 2-(2-Methyl-6-oxoheptyl)furan vs Pentanenitrile

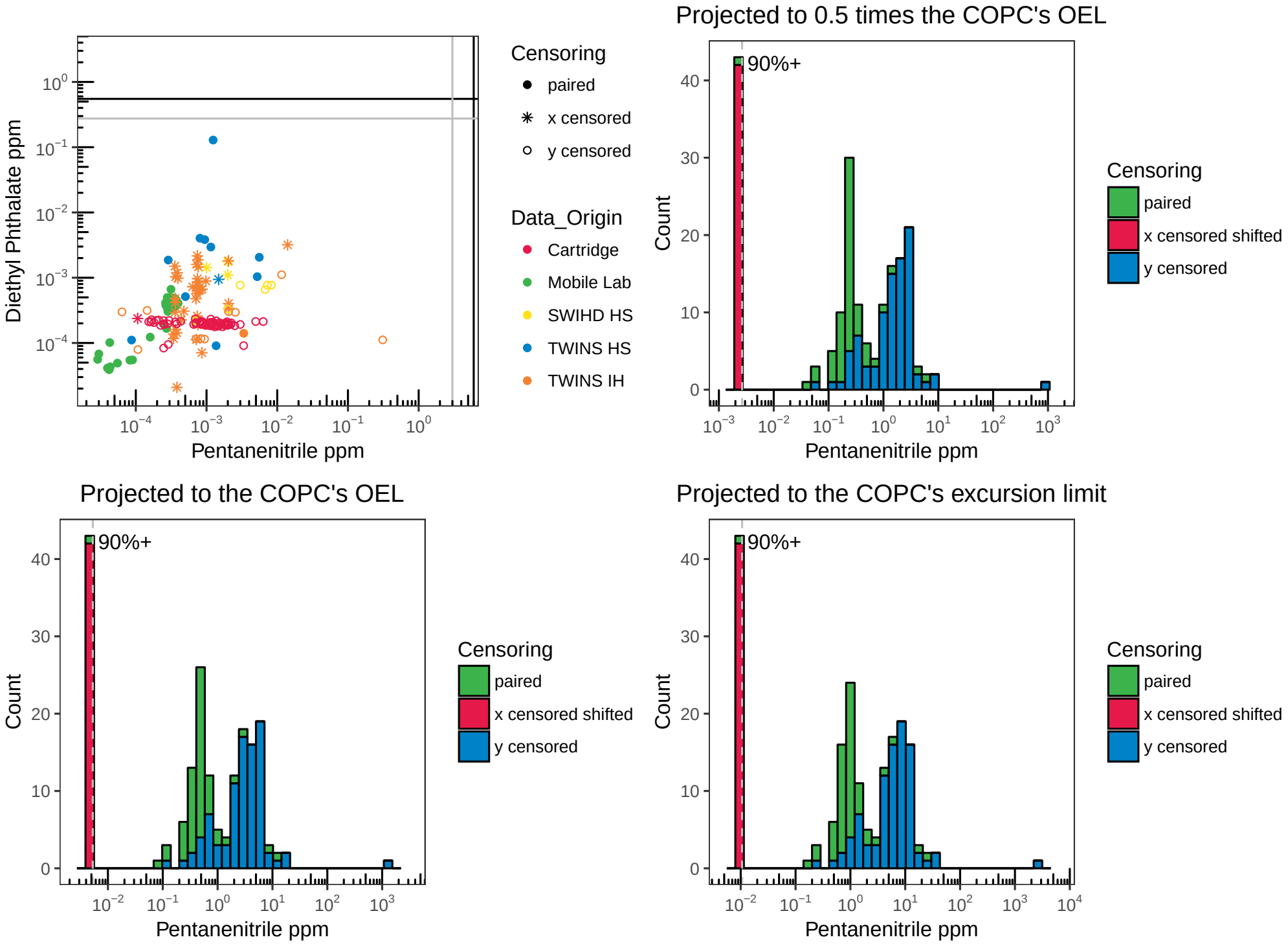


Figure C.1827: Diethyl Phthalate vs Pentanenitrile

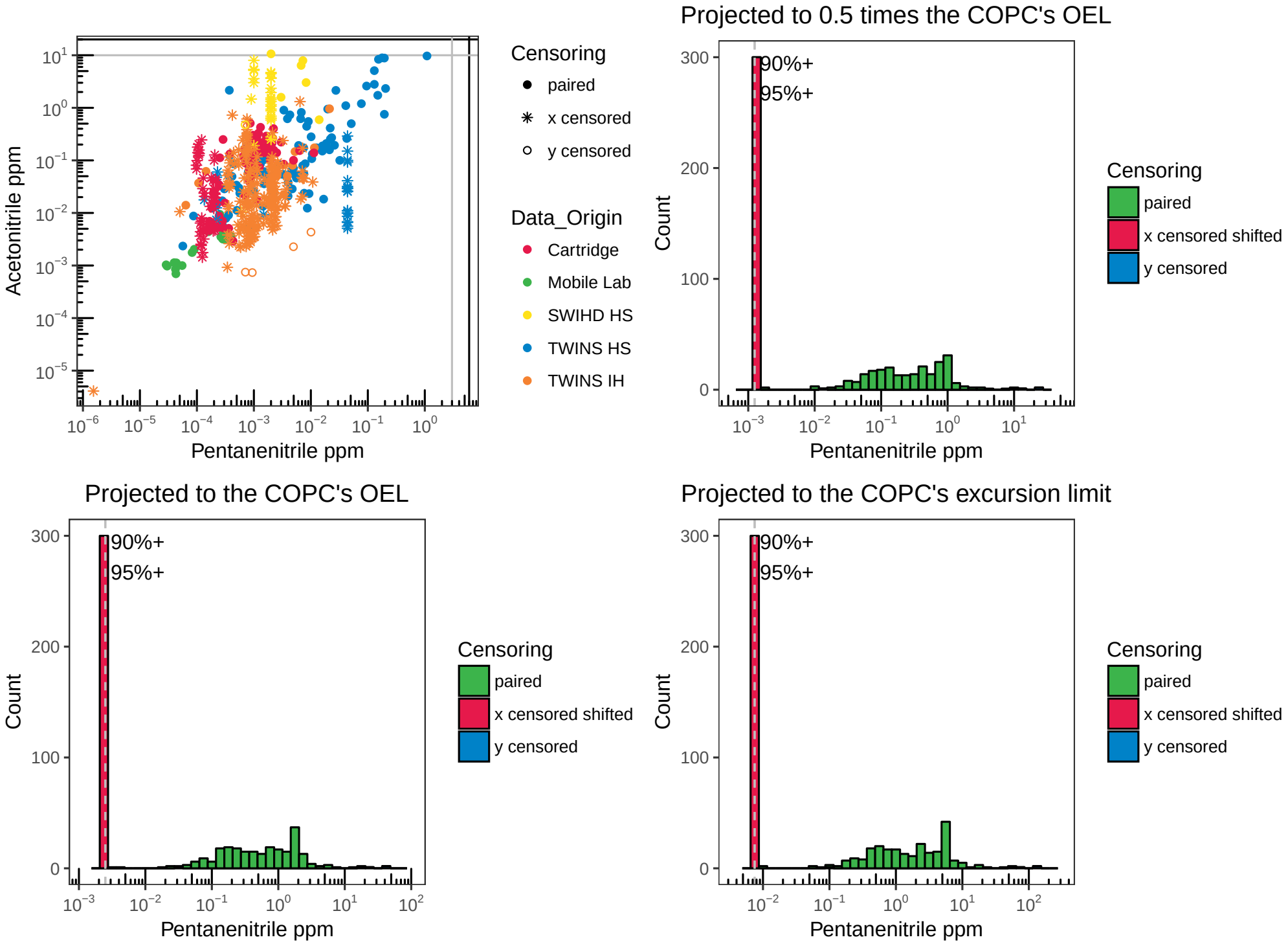


Figure C.1828: Acetonitrile vs Pentanenitrile

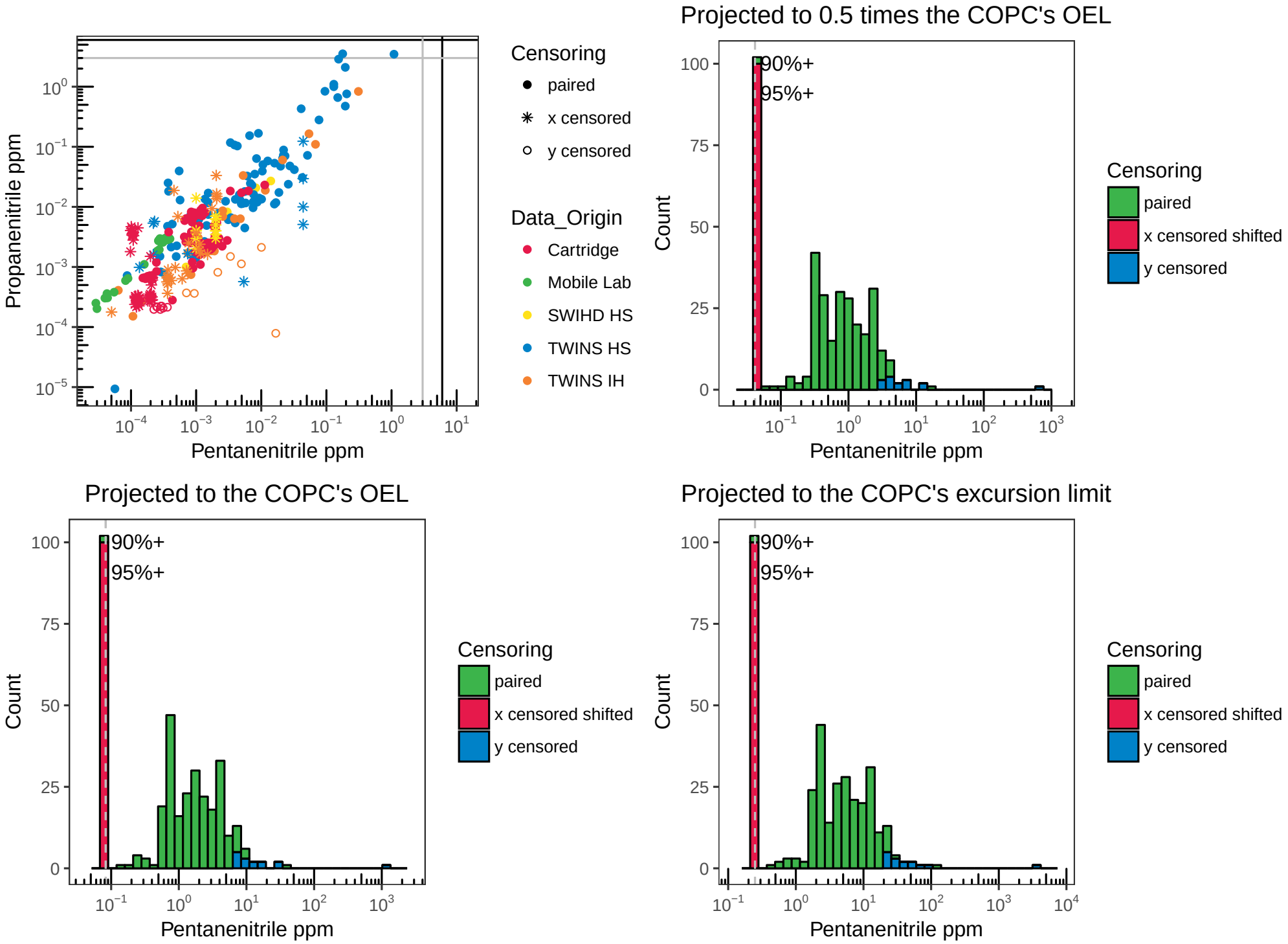


Figure C.1829: Propanenitrile vs Pentanenitrile

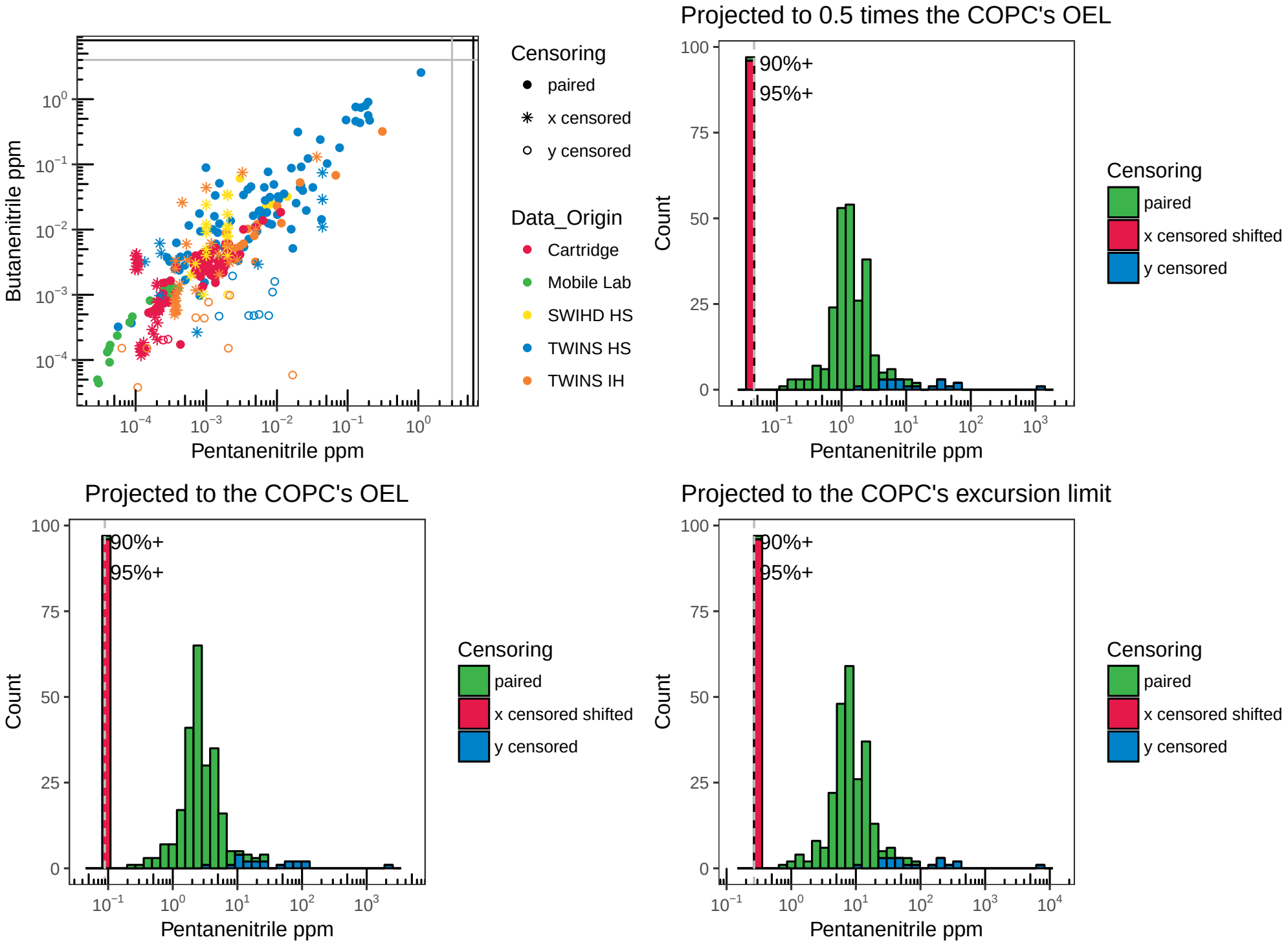


Figure C.1830: Butanenitrile vs Pentanenitrile

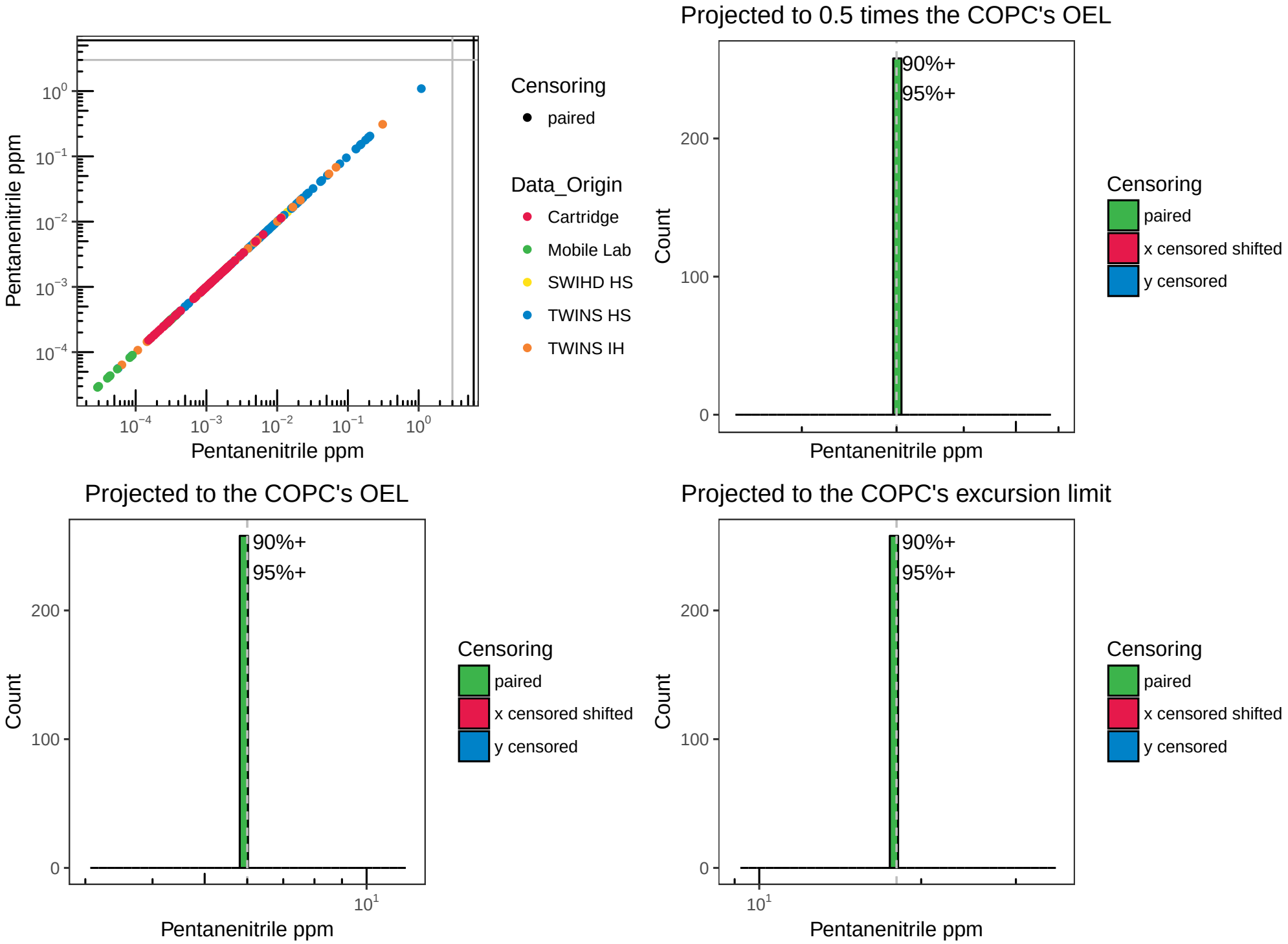


Figure C.1831: Pentanenitrile vs Pentanenitrile

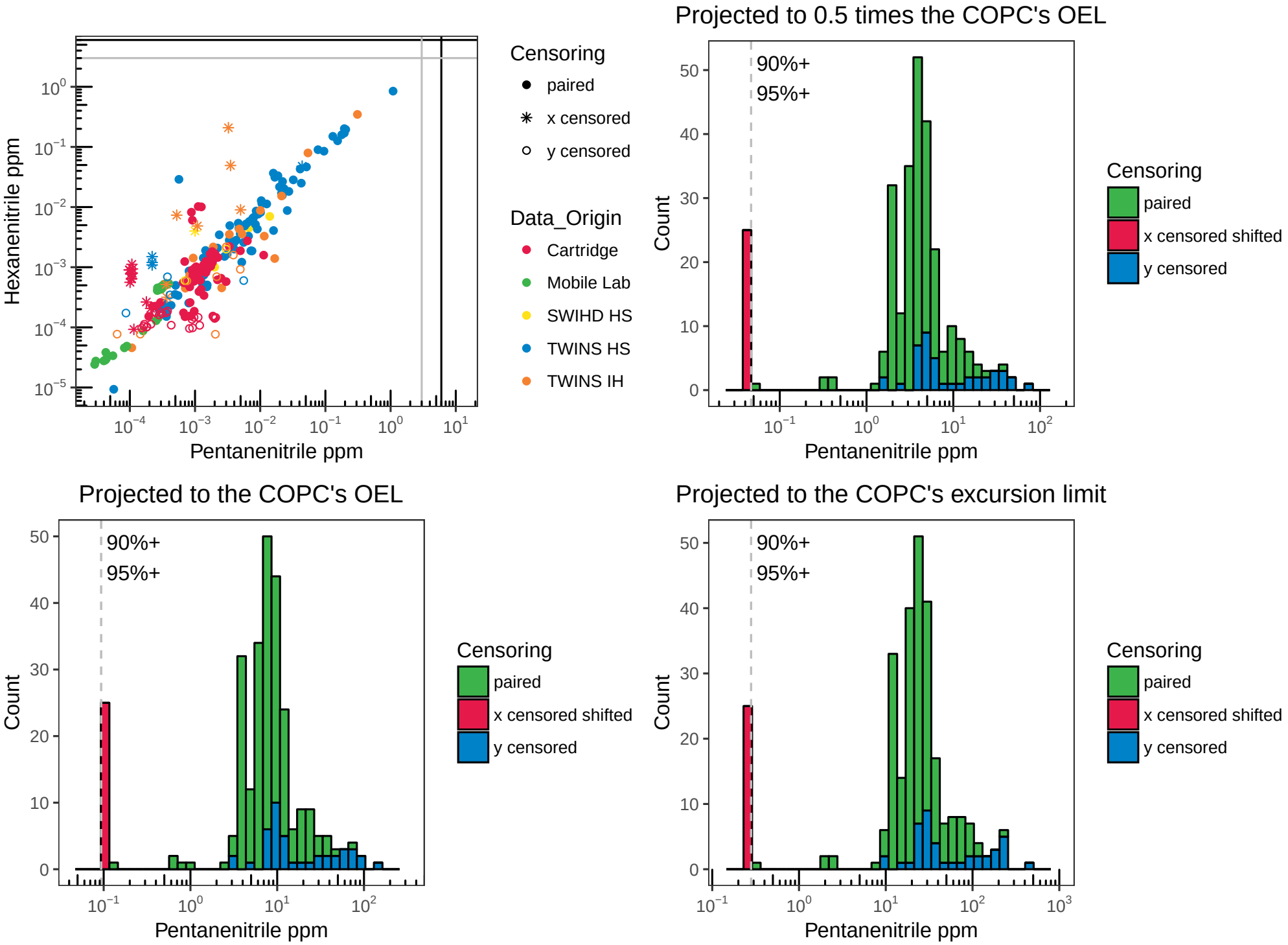


Figure C.1832: Hexanenitrile vs Pentanenitrile

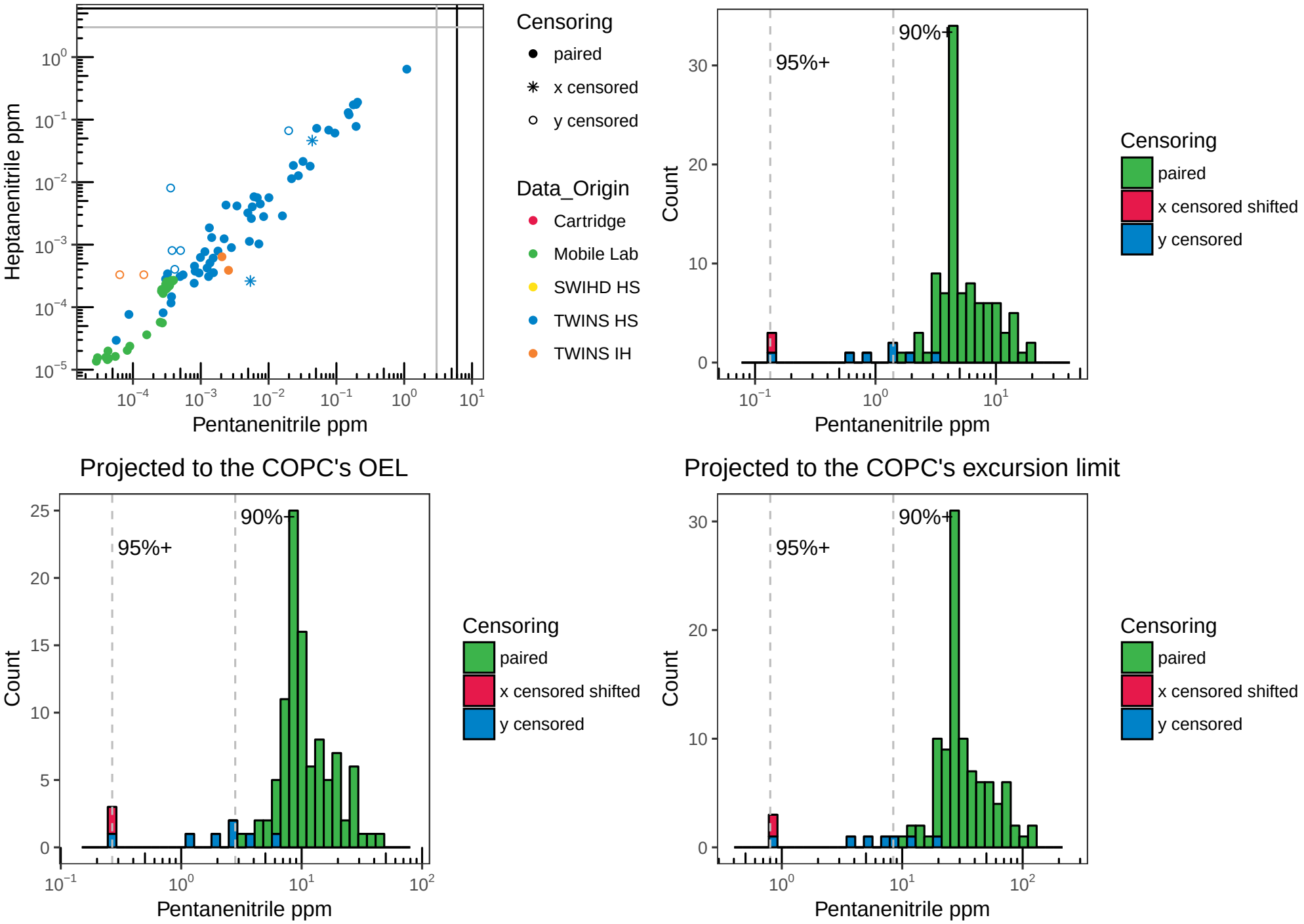


Figure C.1833: Heptanenitrile vs Pentanenitrile

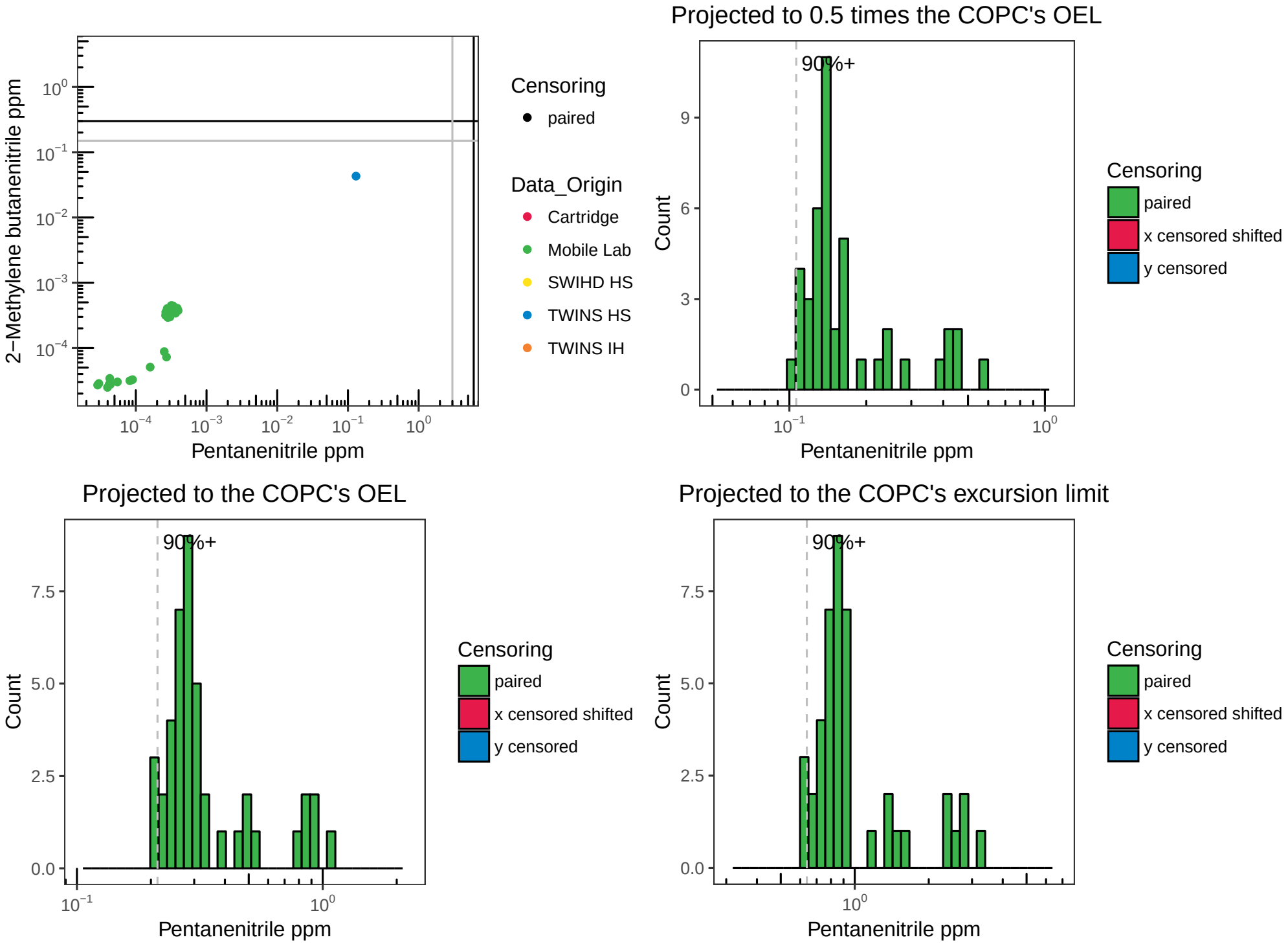


Figure C.1834: 2-Methylene butanenitrile vs Pentanenitrile

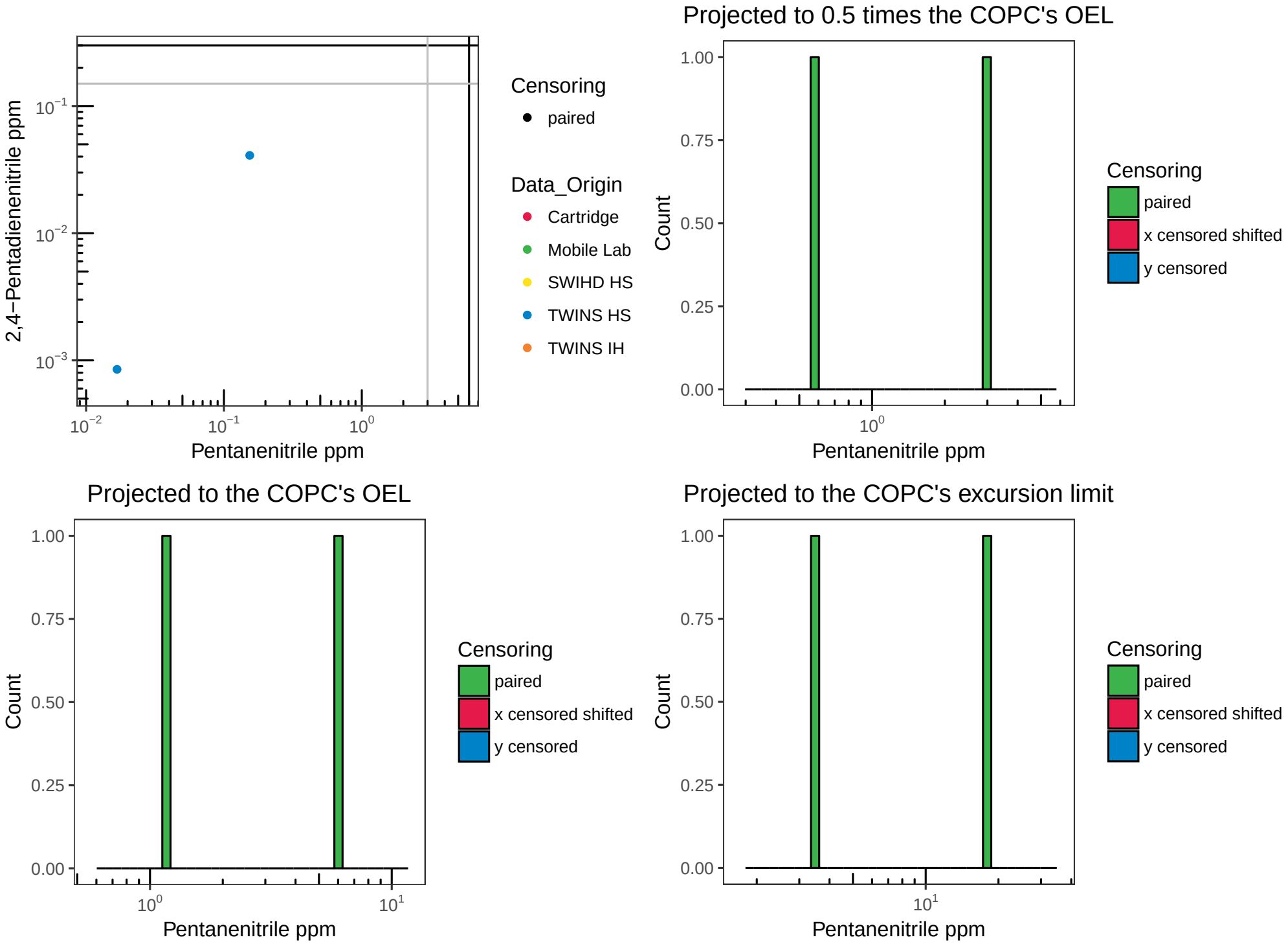


Figure C.1835: 2,4-Pentadienenitrile vs Pentanenitrile

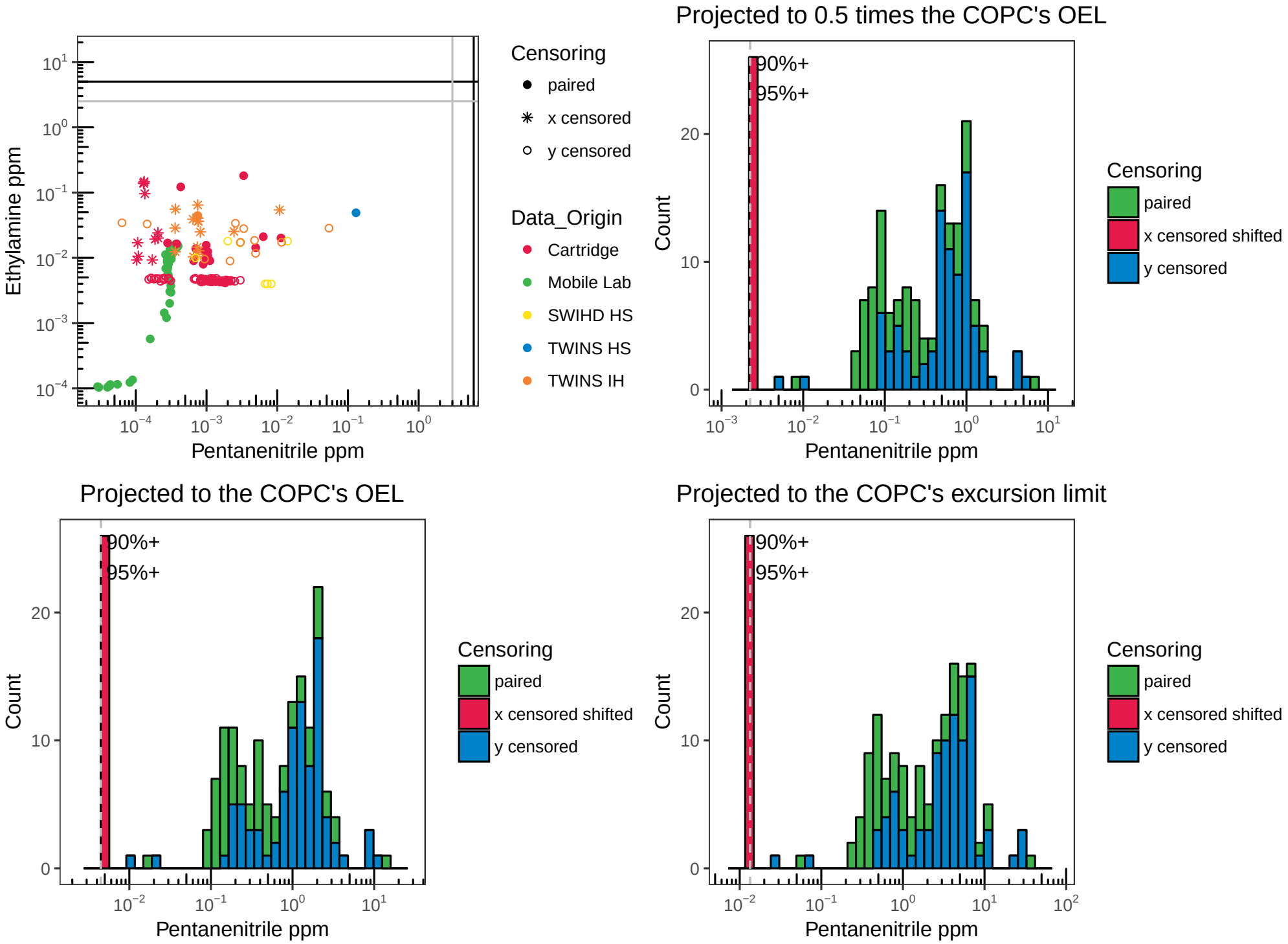


Figure C.1836: Ethylamine vs Pentanenitrile

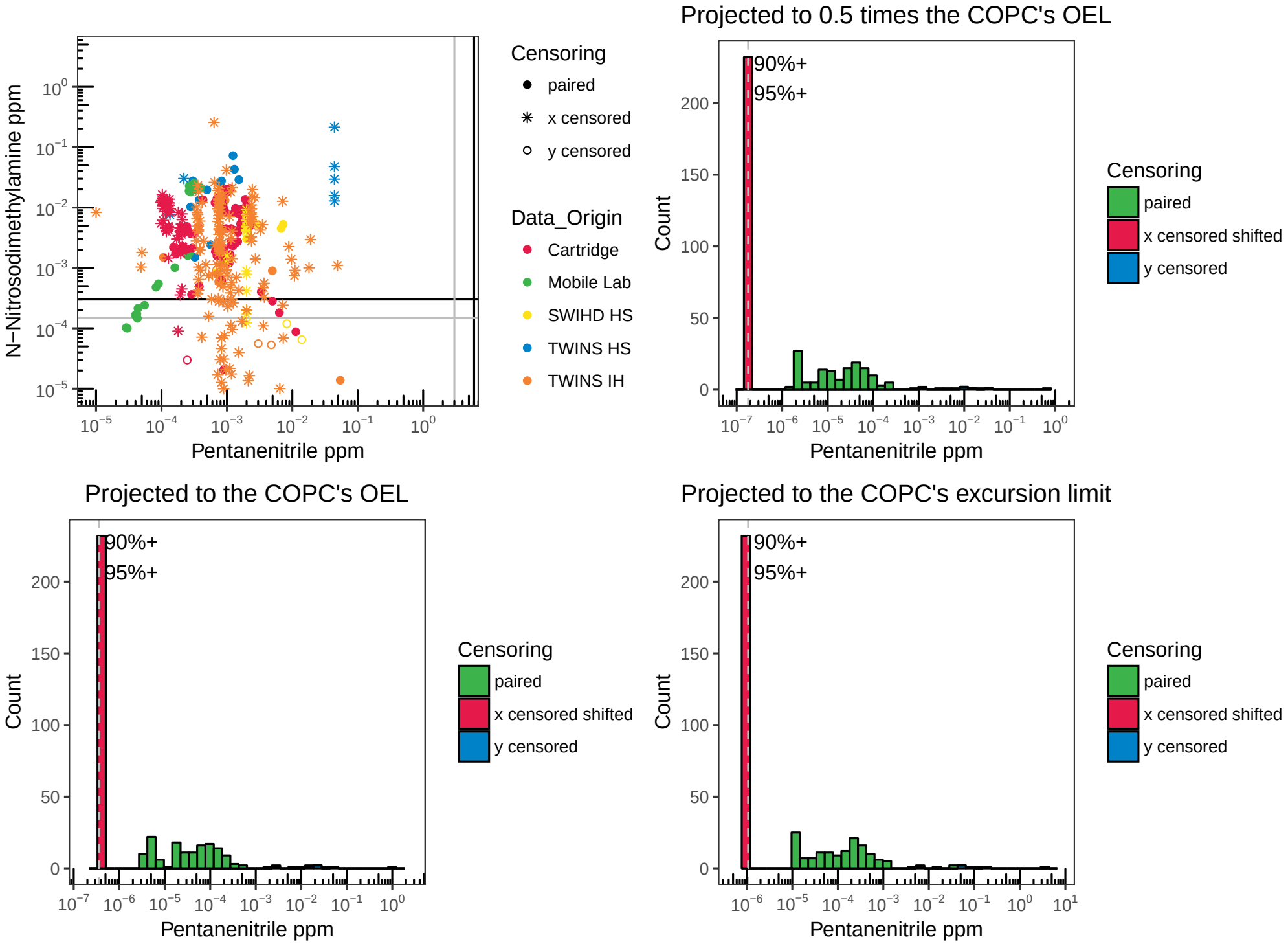


Figure C.1837: N-Nitrosodimethylamine vs Pentanenitrile

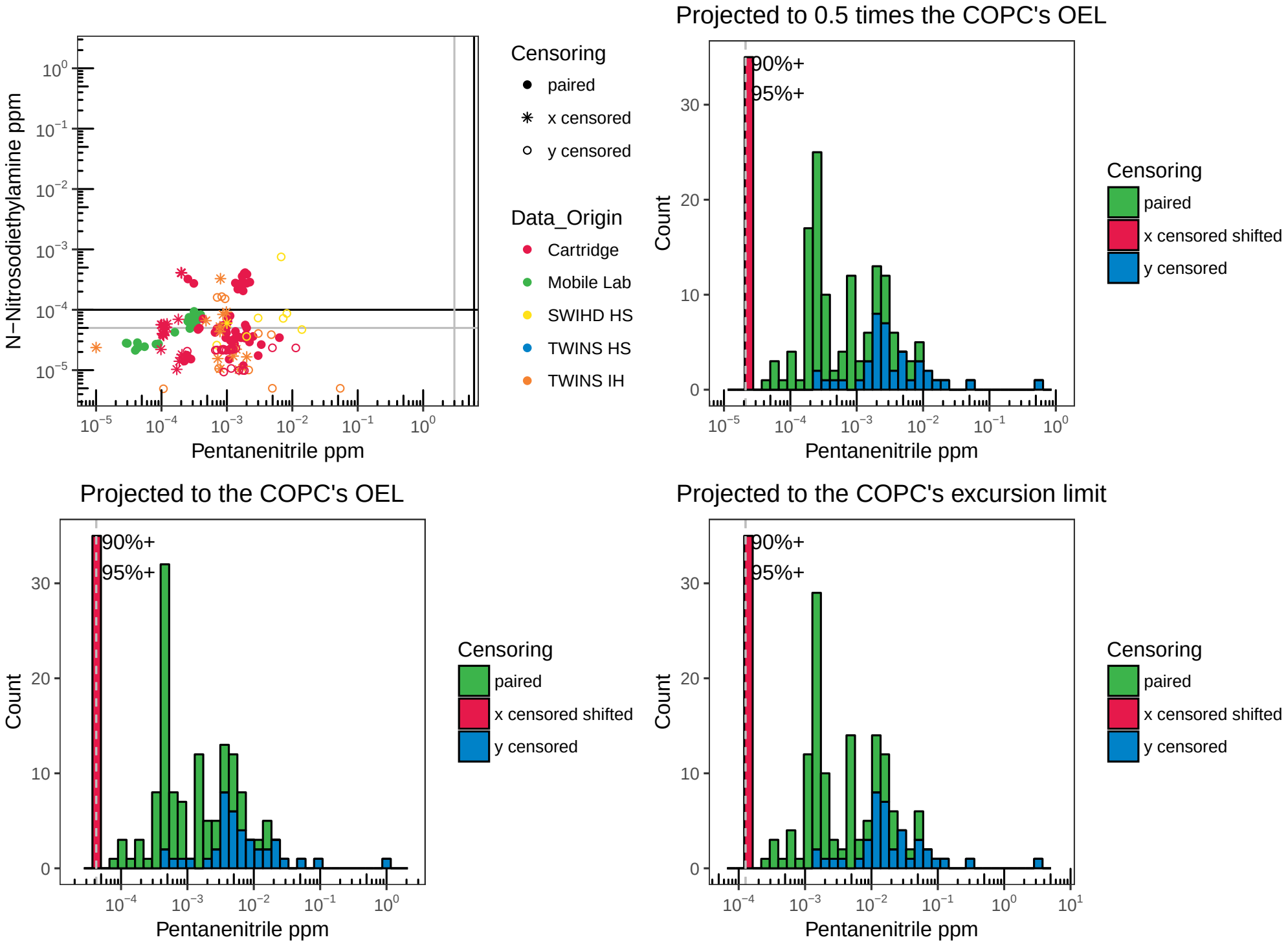


Figure C.1838: N-Nitrosodiethylamine vs Pentanenitrile

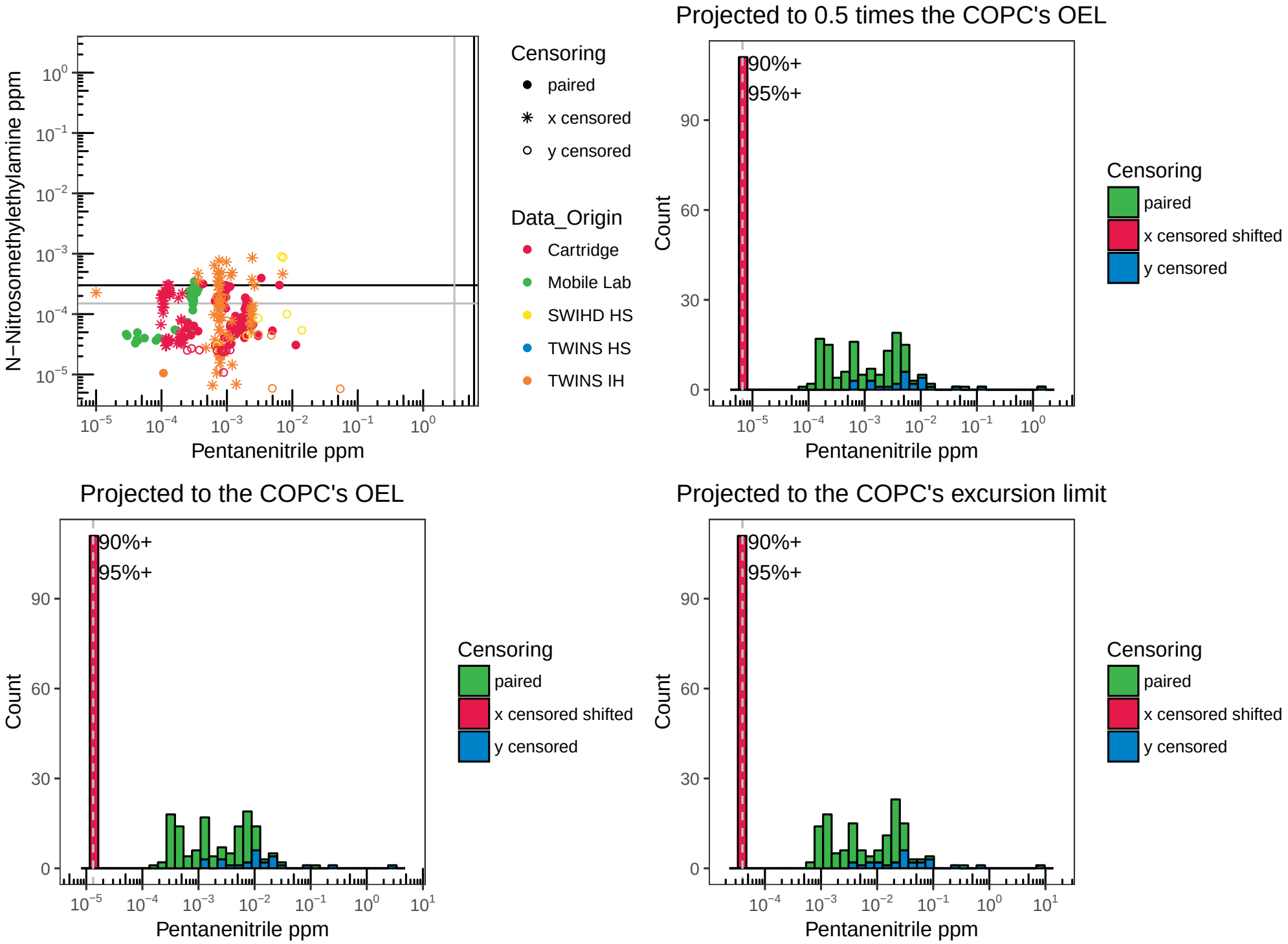


Figure C.1839: N-Nitrosomethylethylamine vs Pentanenitrile

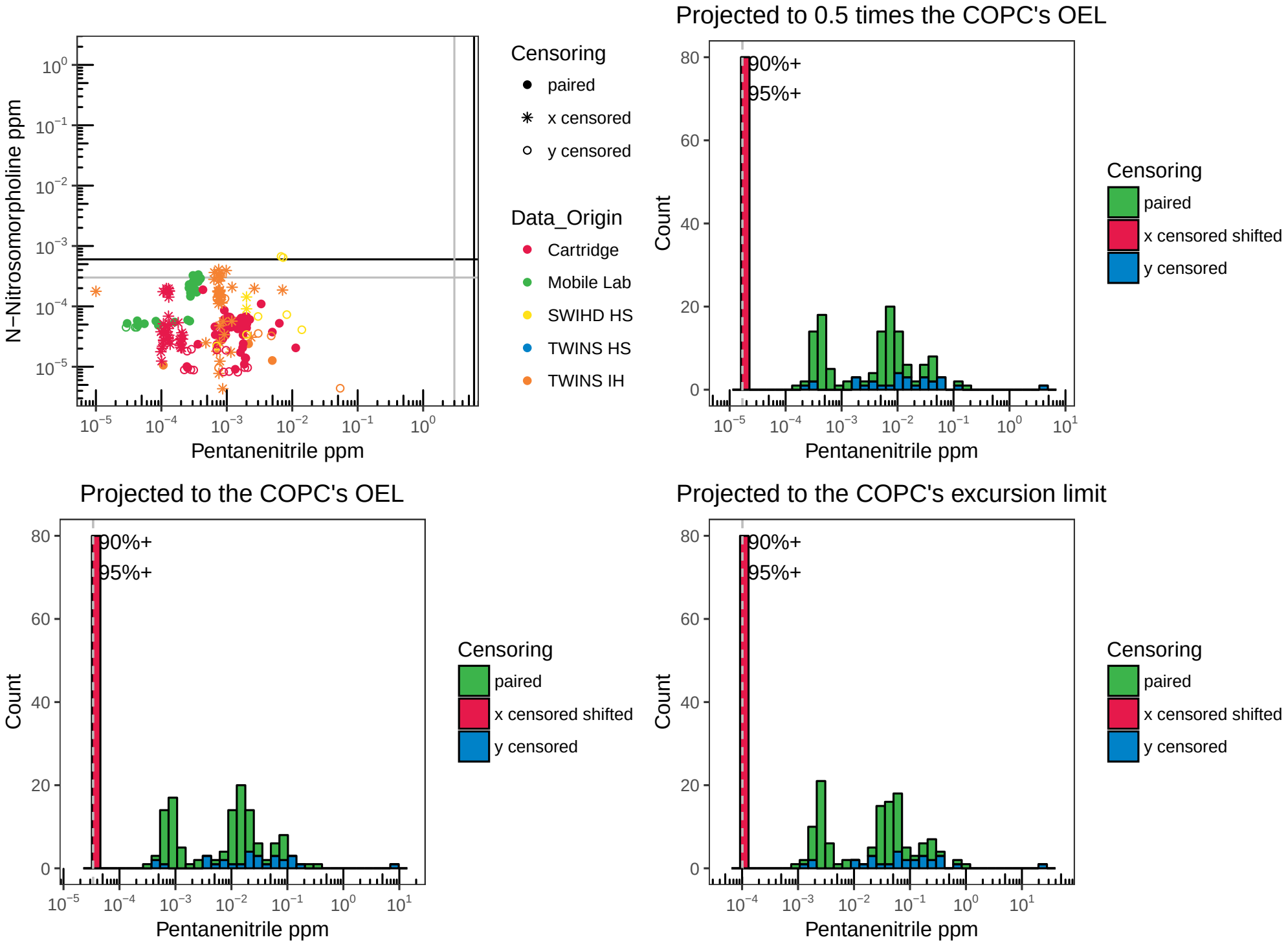


Figure C.1840: N-Nitrosomorpholine vs Pentanenitrile

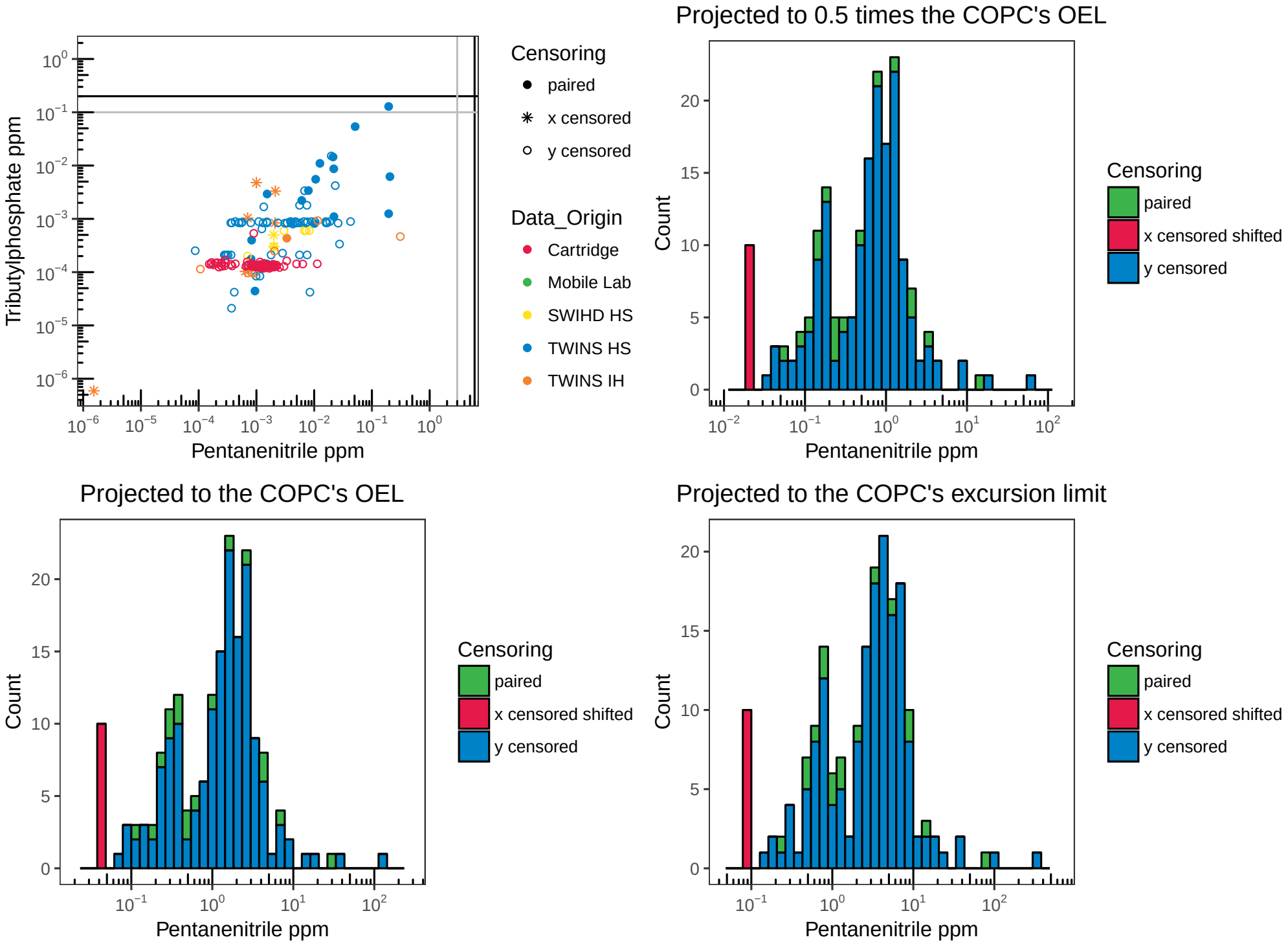


Figure C.1841: Tributylphosphate vs Pentanenitrile

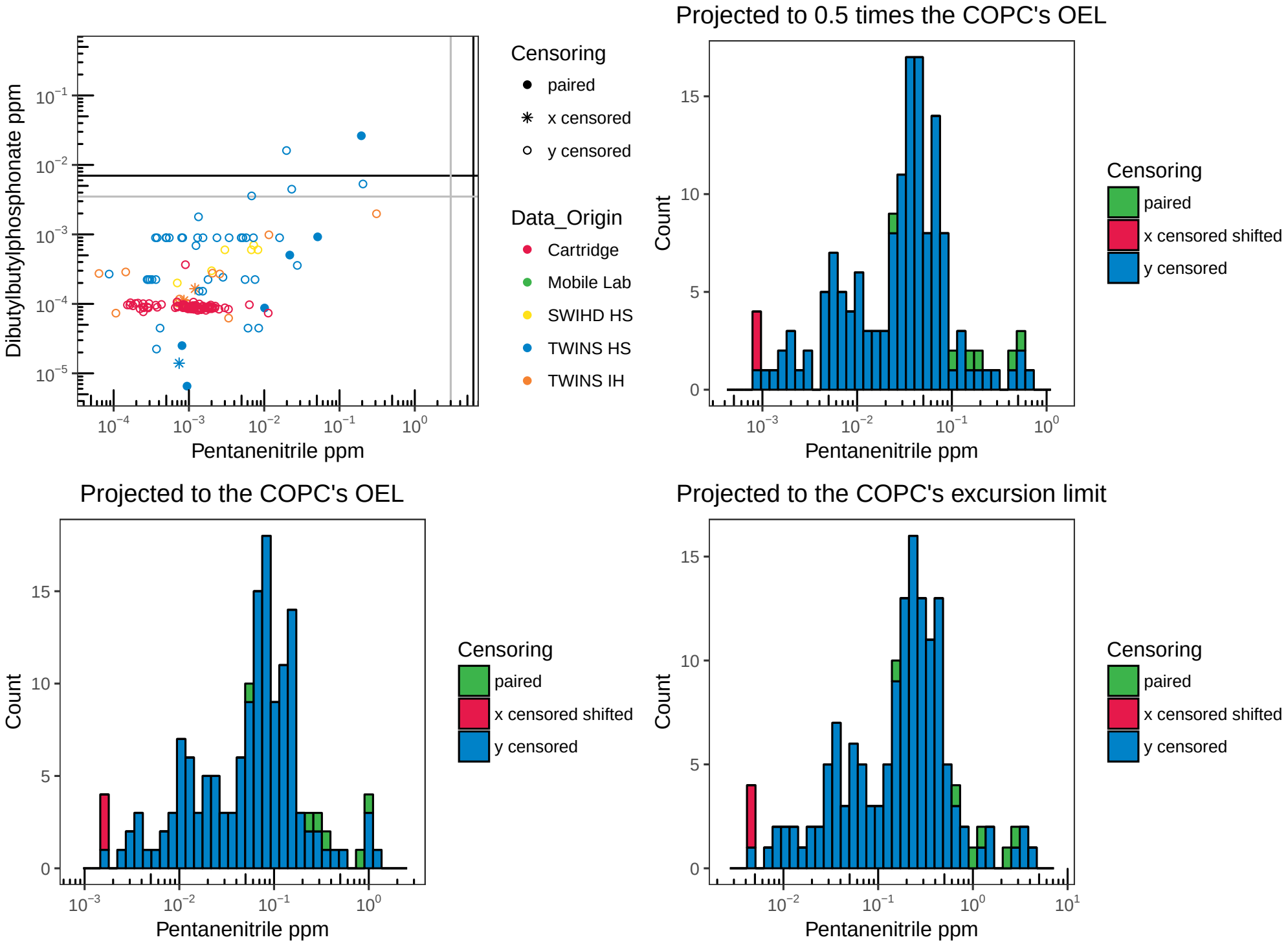


Figure C.1842: Dibutylbutylphosphonate vs Pentanenitrile

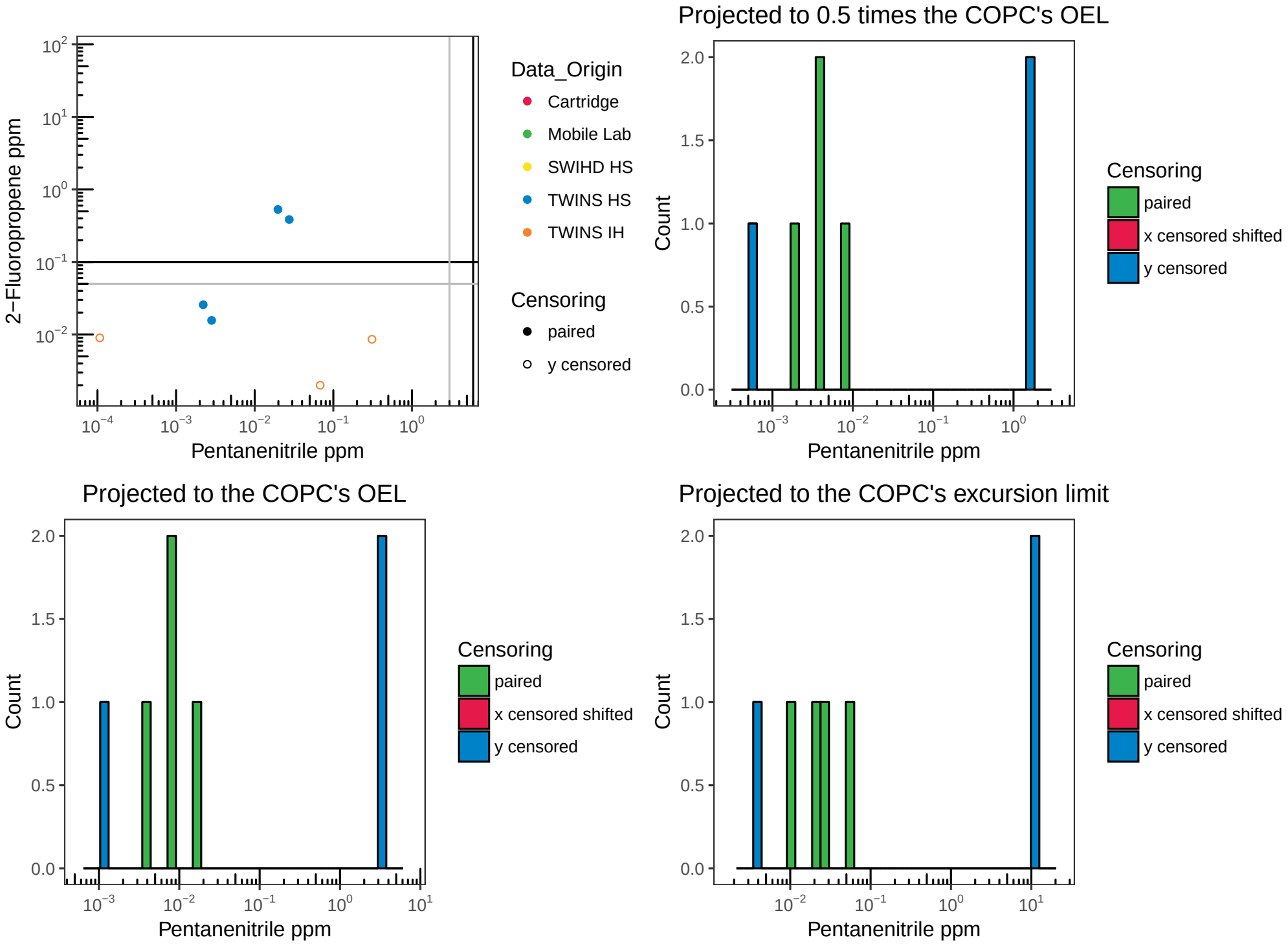


Figure C.1843: 2-Fluoropropene vs Pentanenitrile

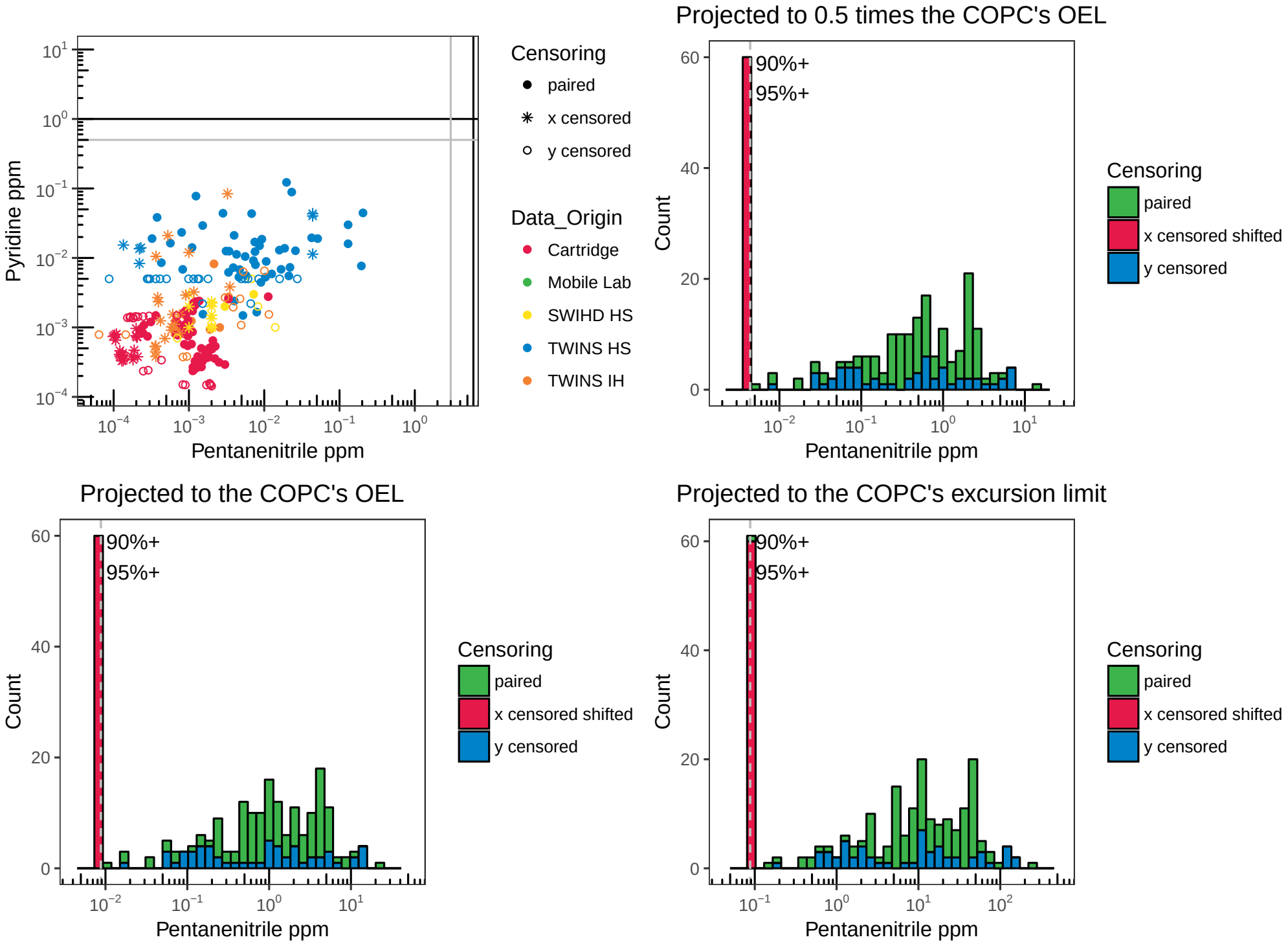


Figure C.1844: Pyridine vs Pentanenitrile

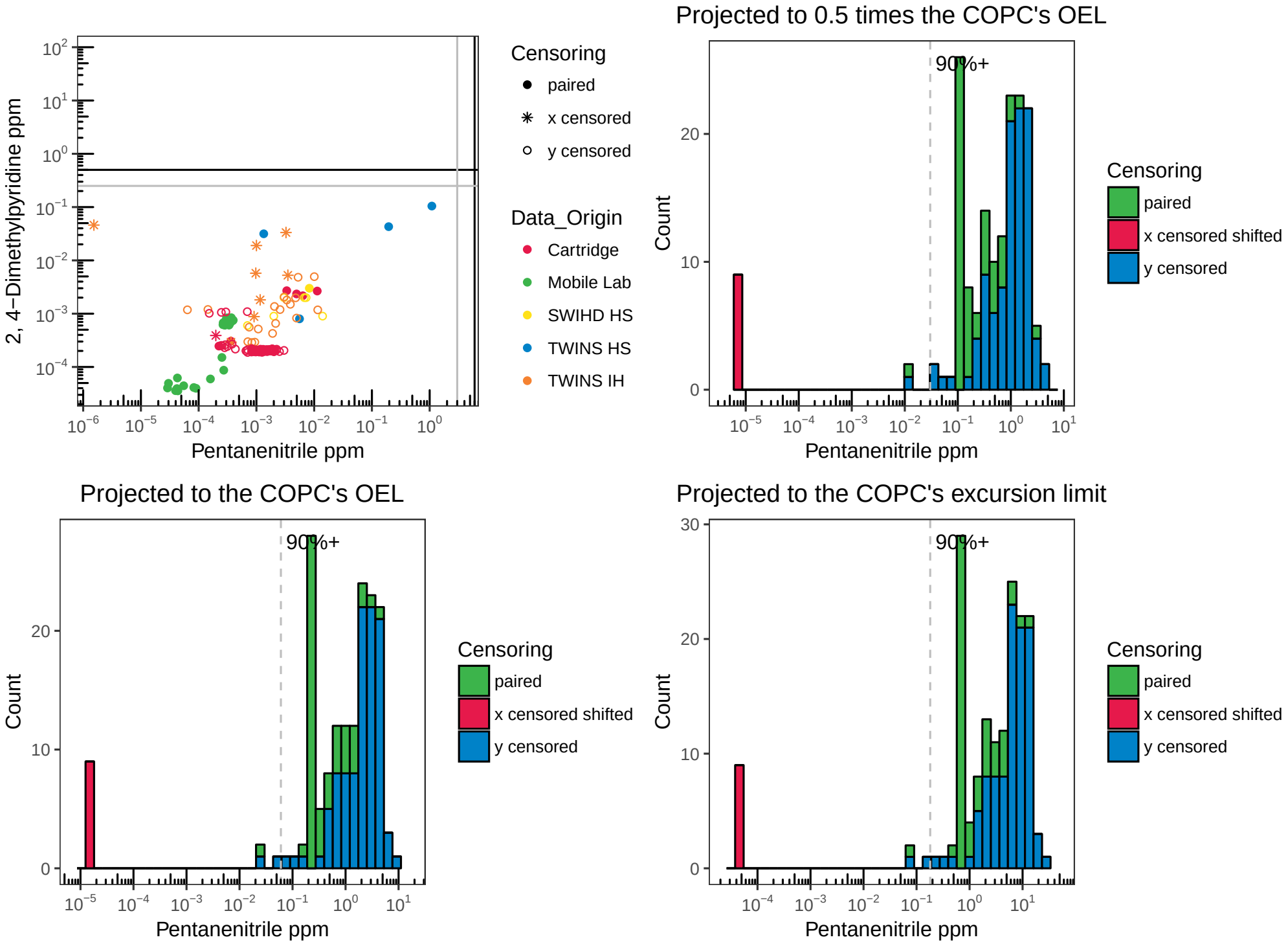


Figure C.1845: 2, 4-Dimethylpyridine vs Pentanenitrile

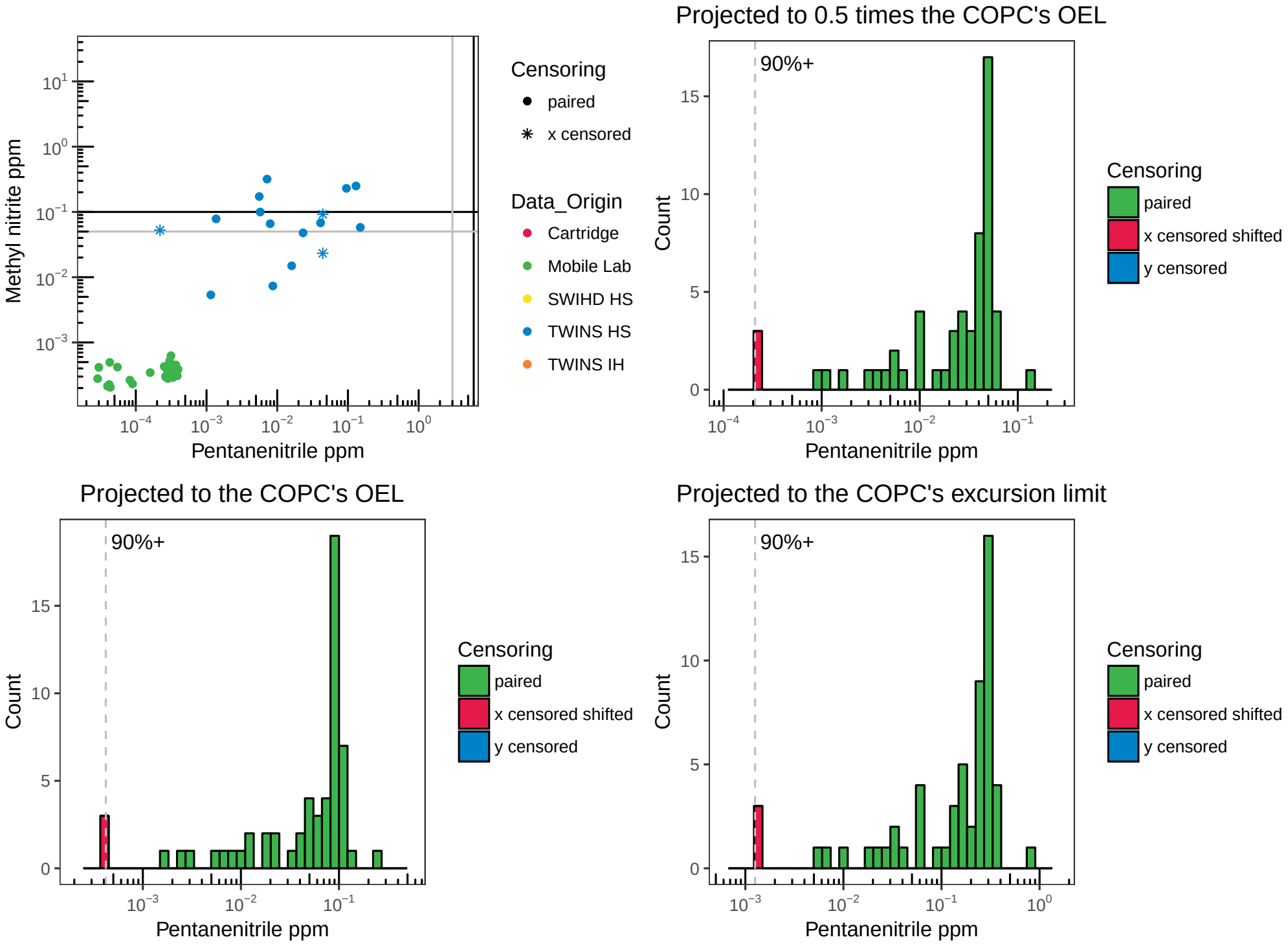


Figure C.1846: Methyl nitrite vs Pentanenitrile

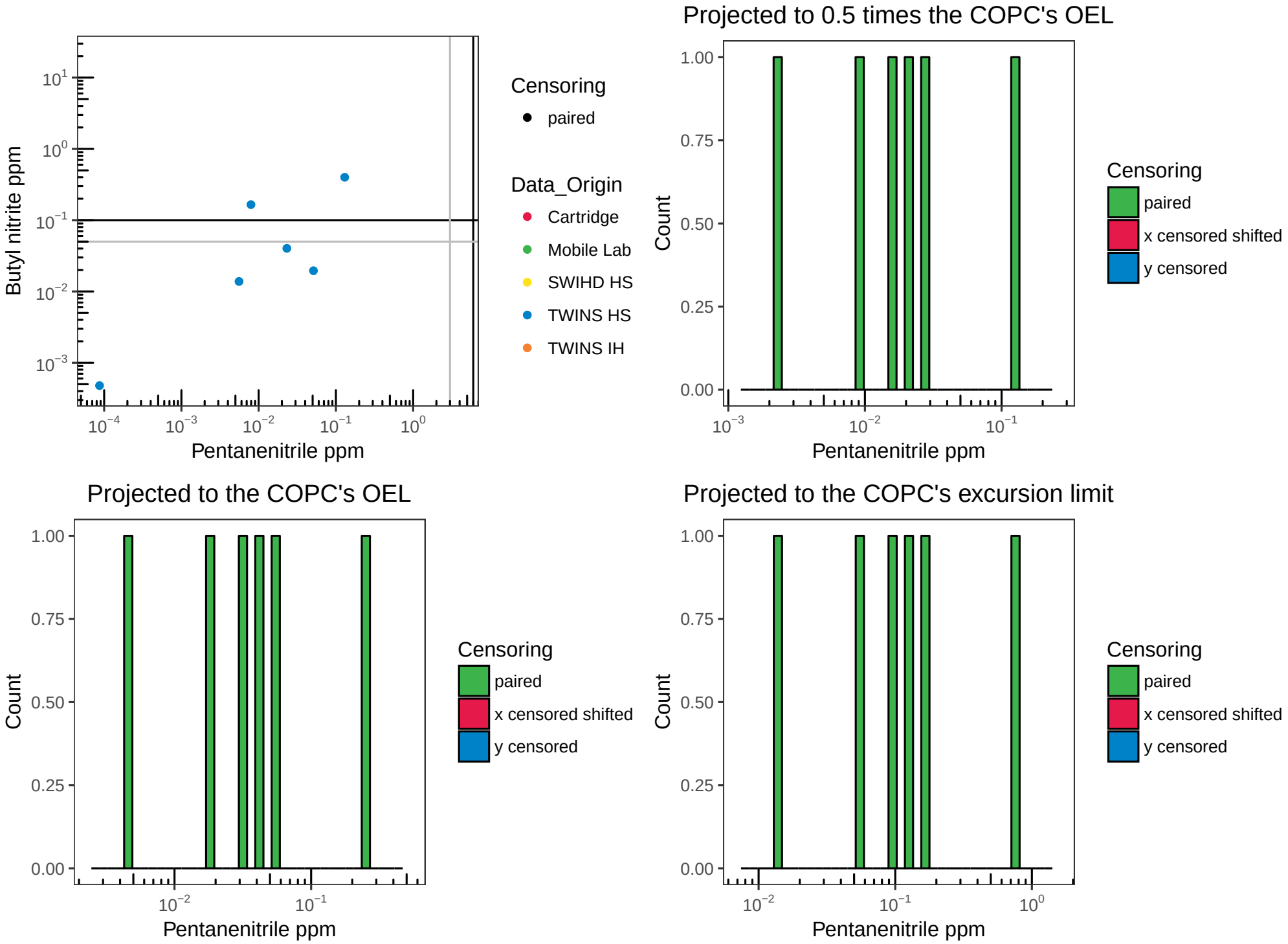


Figure C.1847: Butyl nitrite vs Pentanenitrile

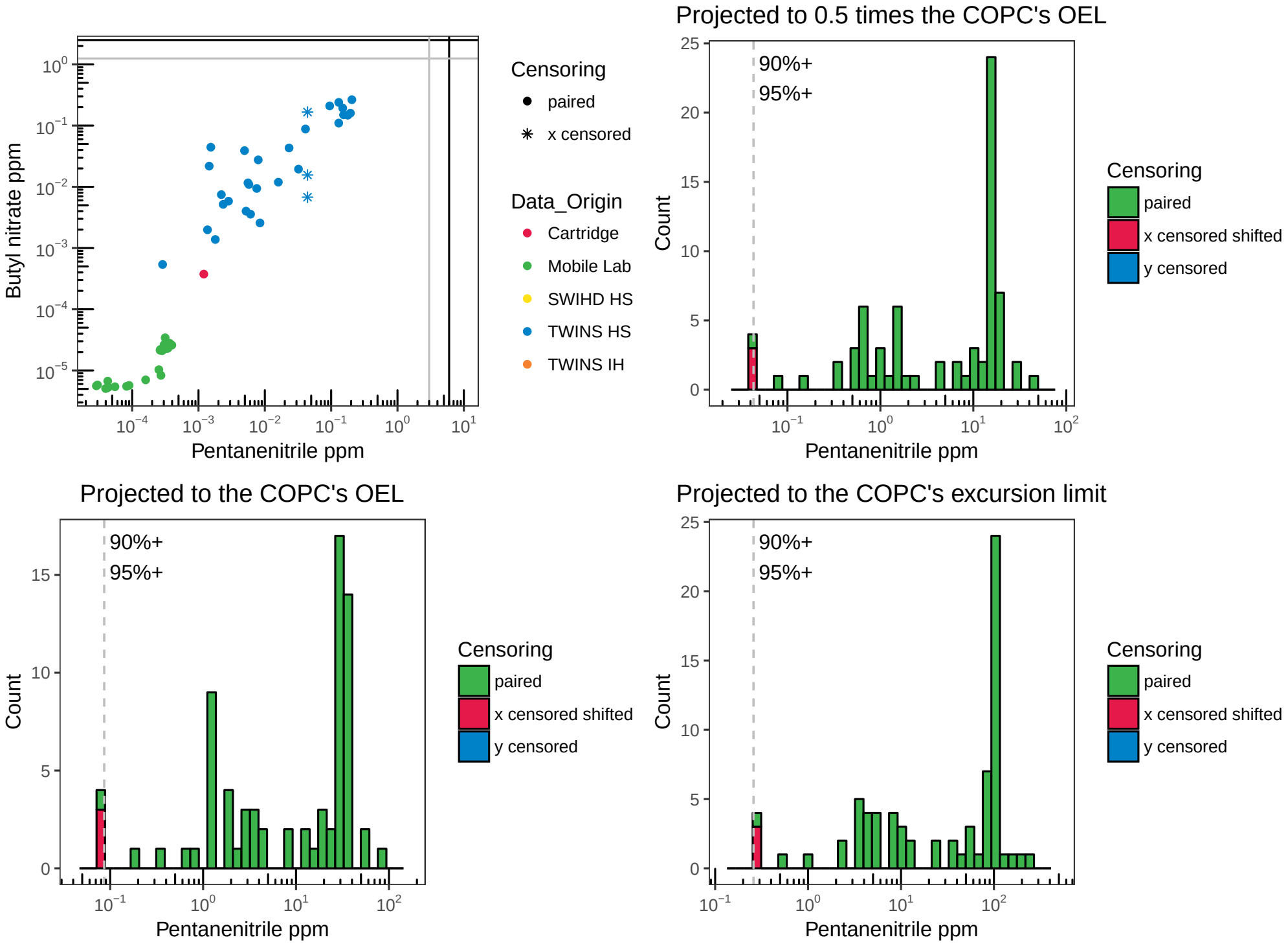


Figure C.1848: Butyl nitrate vs Pentanenitrile

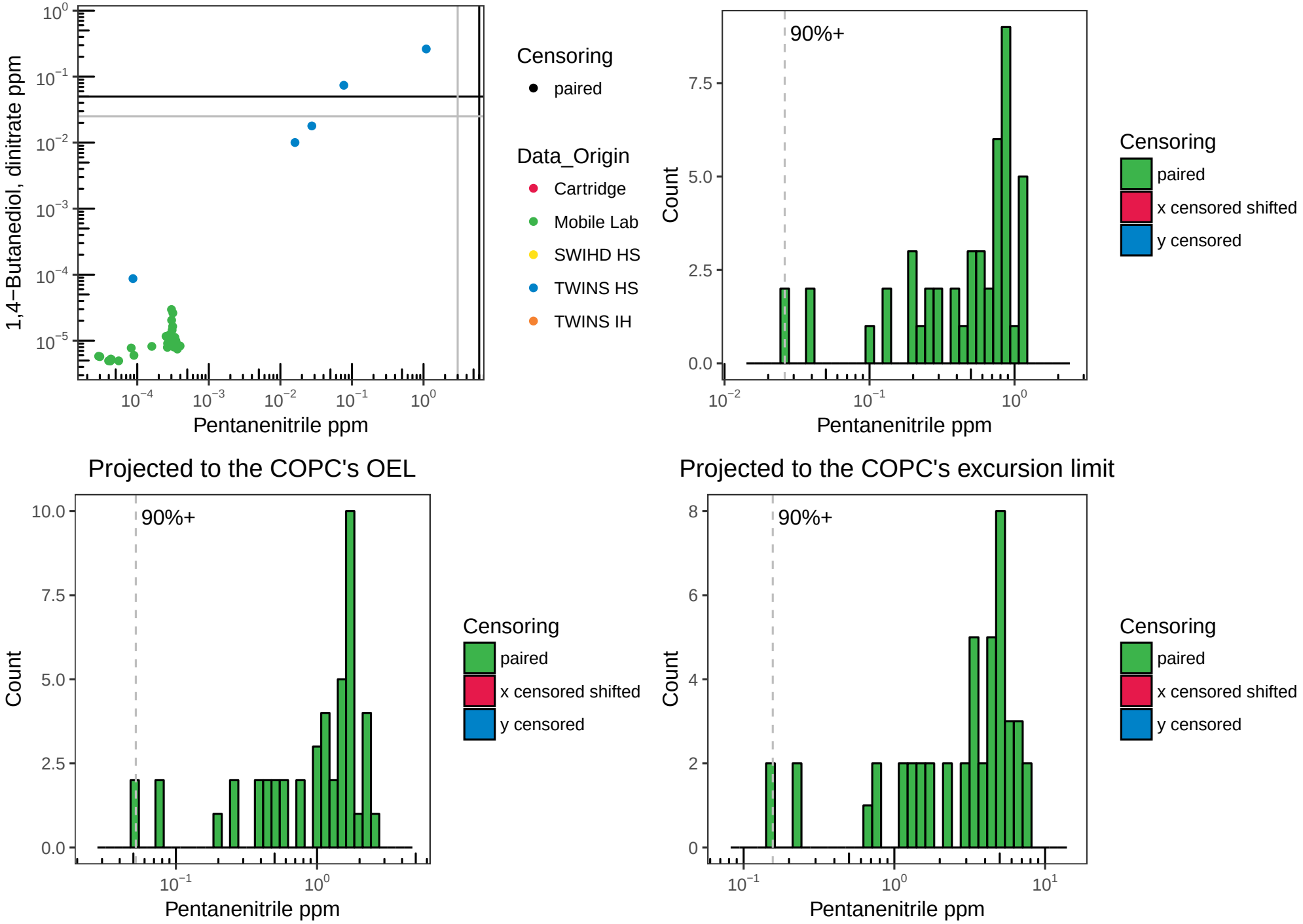


Figure C.1849: 1,4-Butanediol, dinitrate vs Pentanenitrile

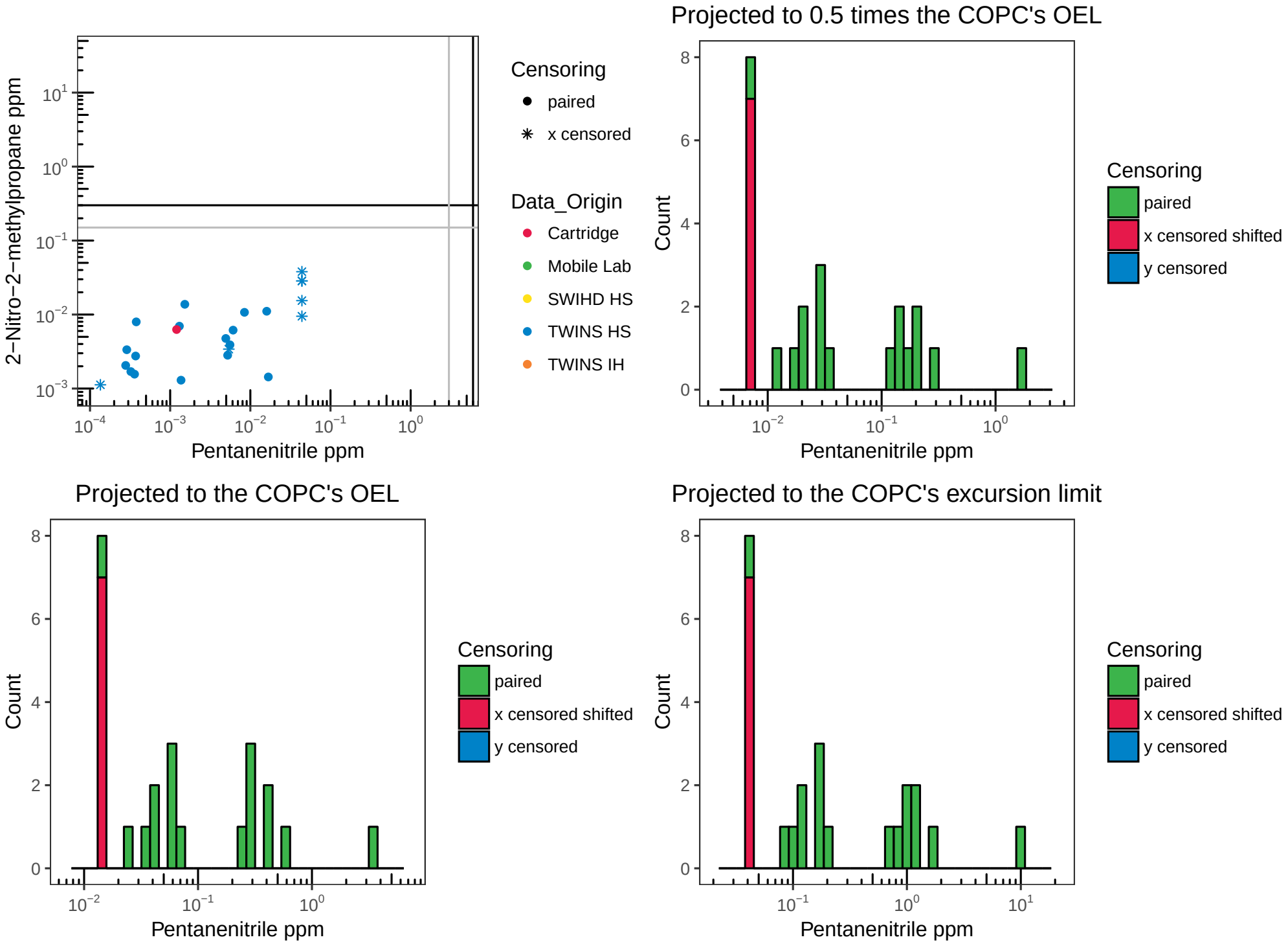


Figure C.1850: 2-Nitro-2-methylpropane vs Pentanenitrile

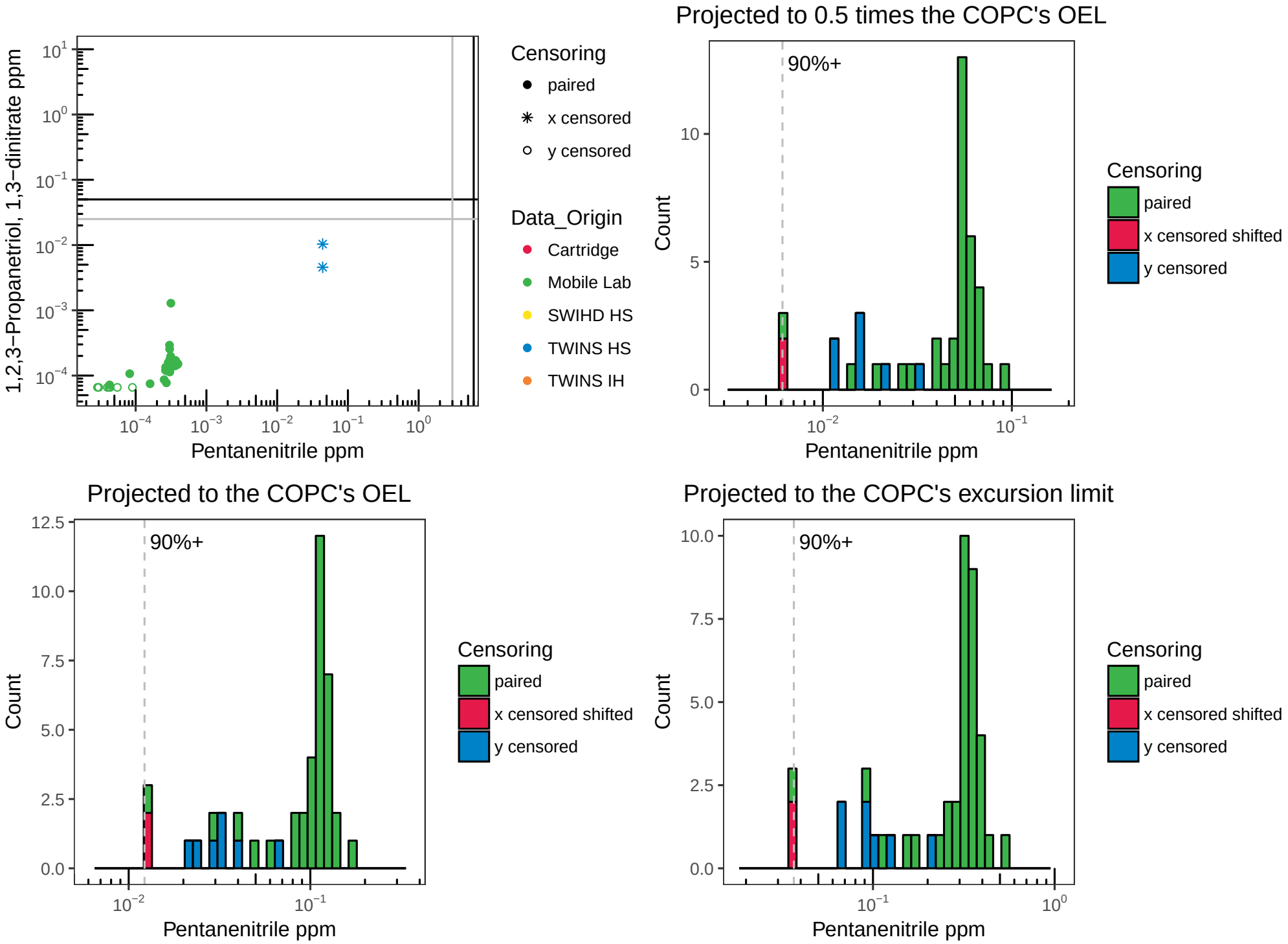


Figure C.1851: 1,2,3-Propanetriol, 1,3-dinitrate vs Pentanenitrile

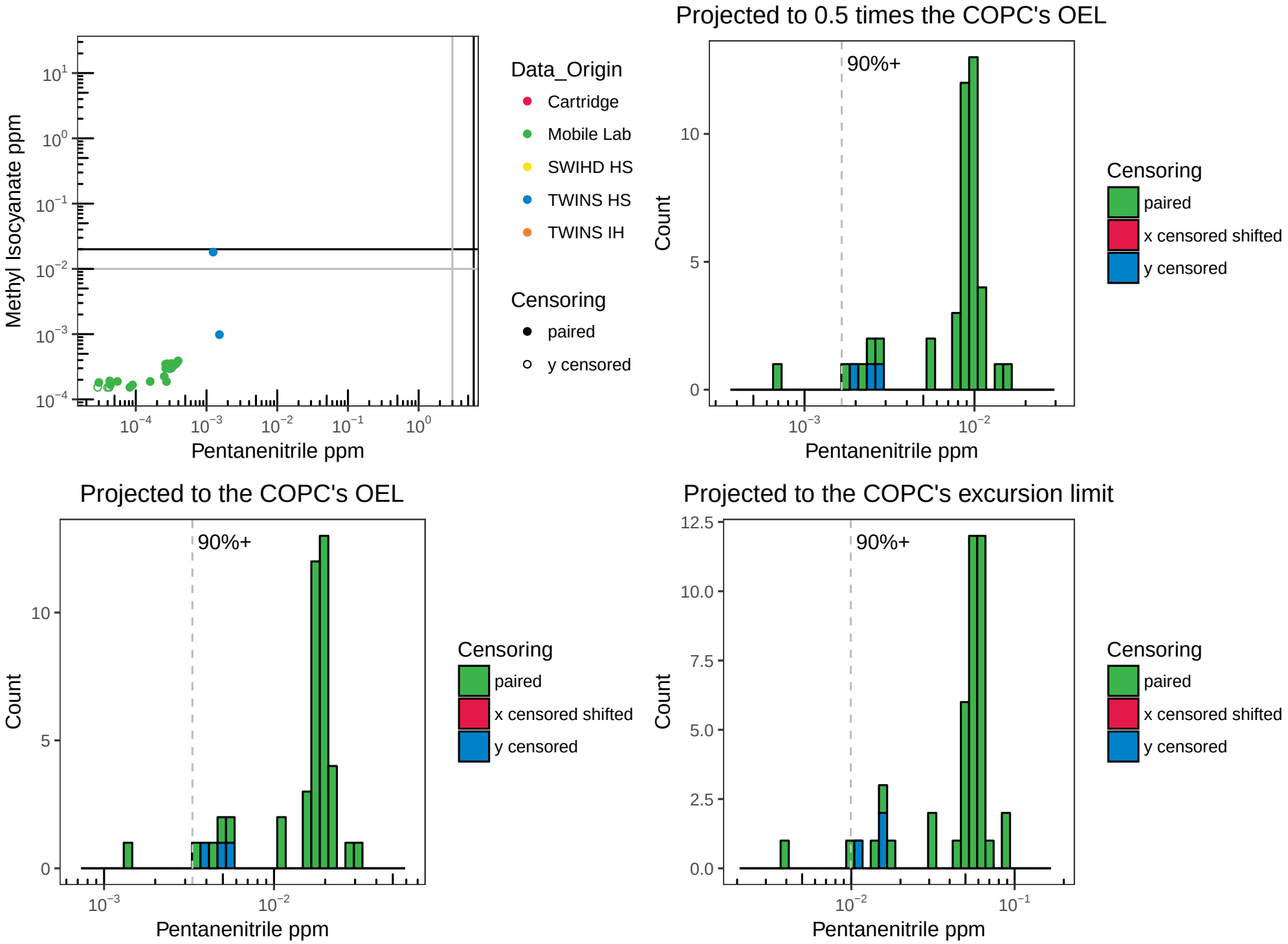


Figure C.1852: Methyl Isocyanate vs Pentanenitrile

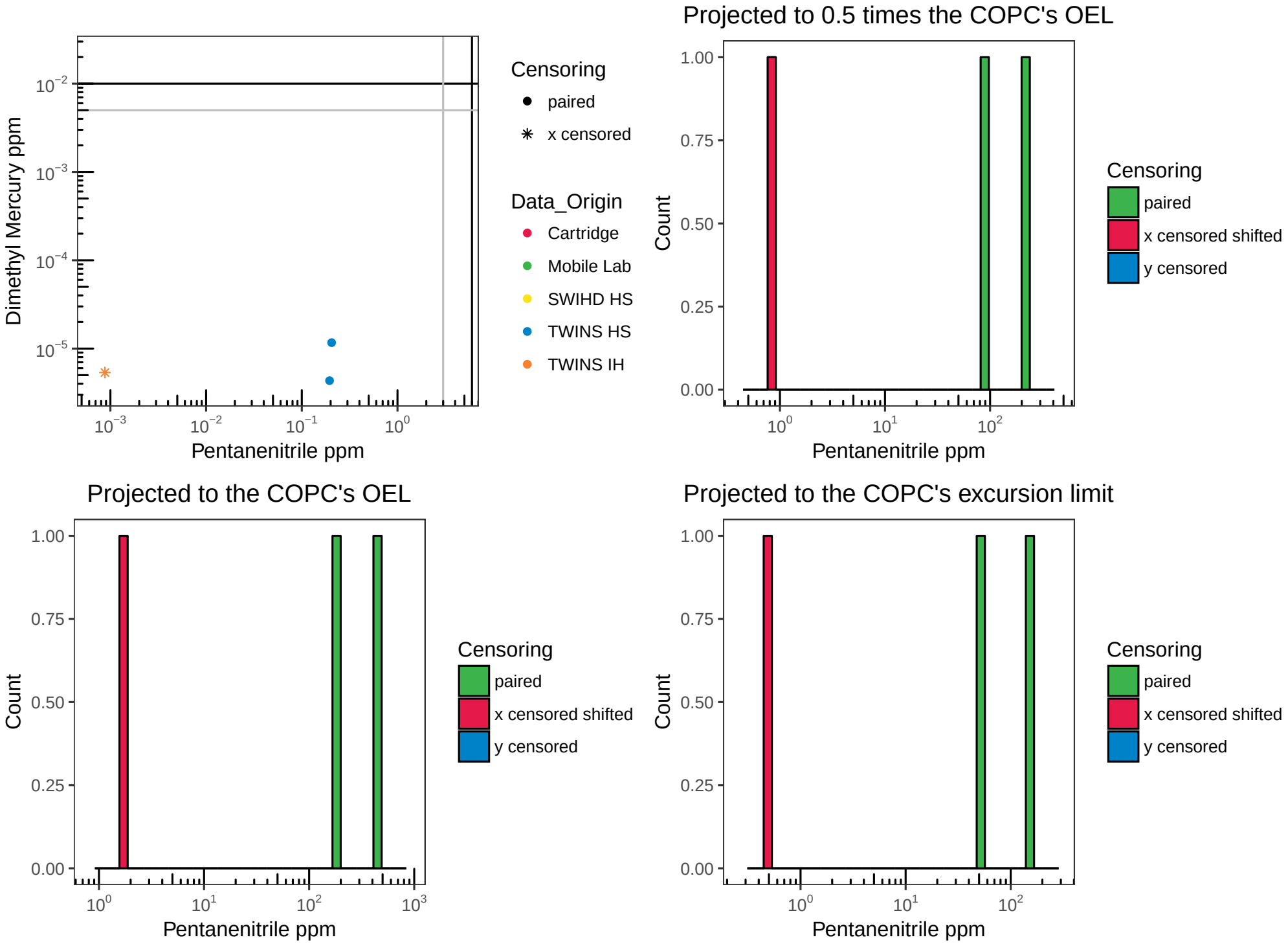


Figure C.1853: Dimethyl Mercury vs Pentanenitrile

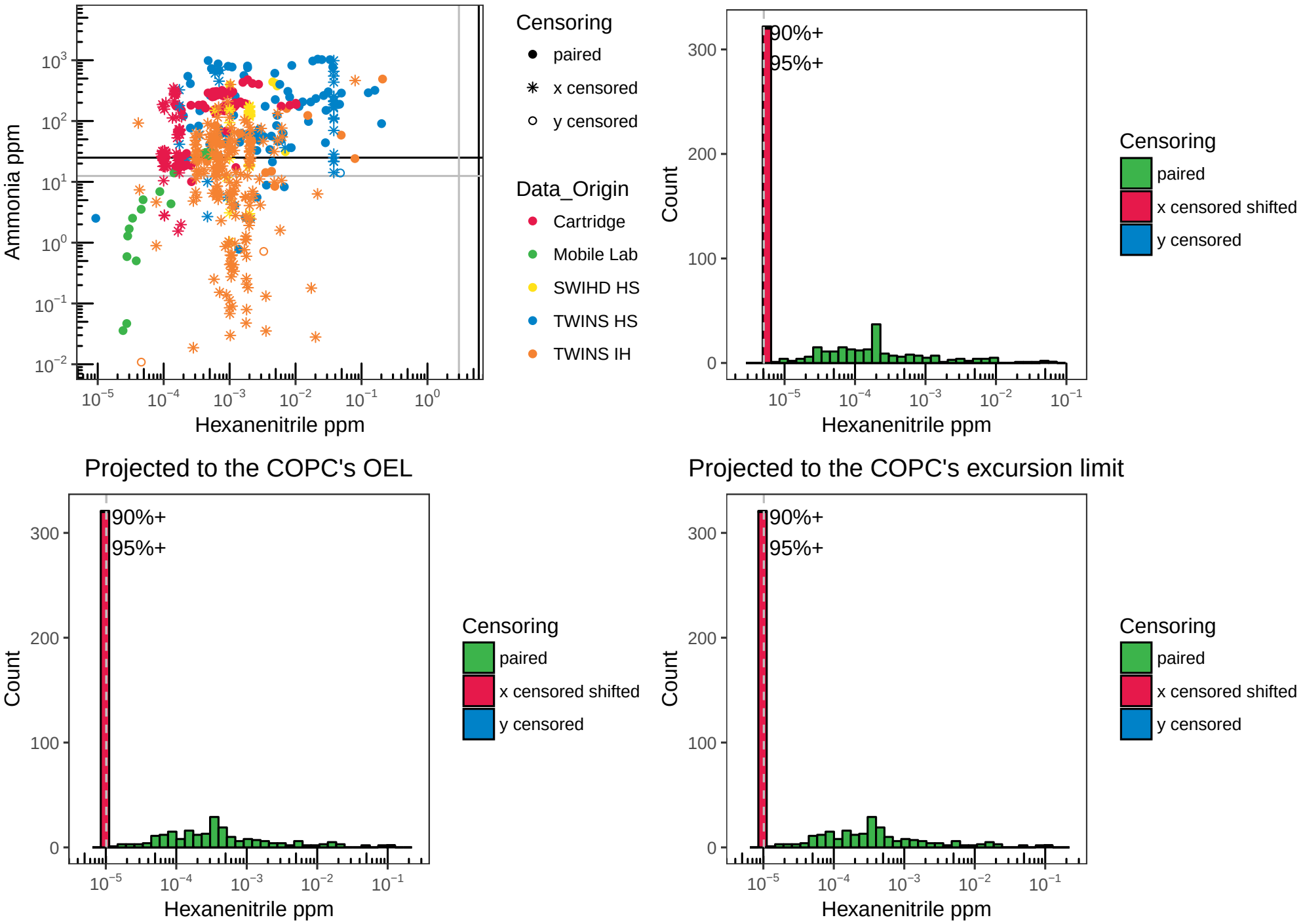


Figure C.1854: Ammonia vs Hexanenitrile

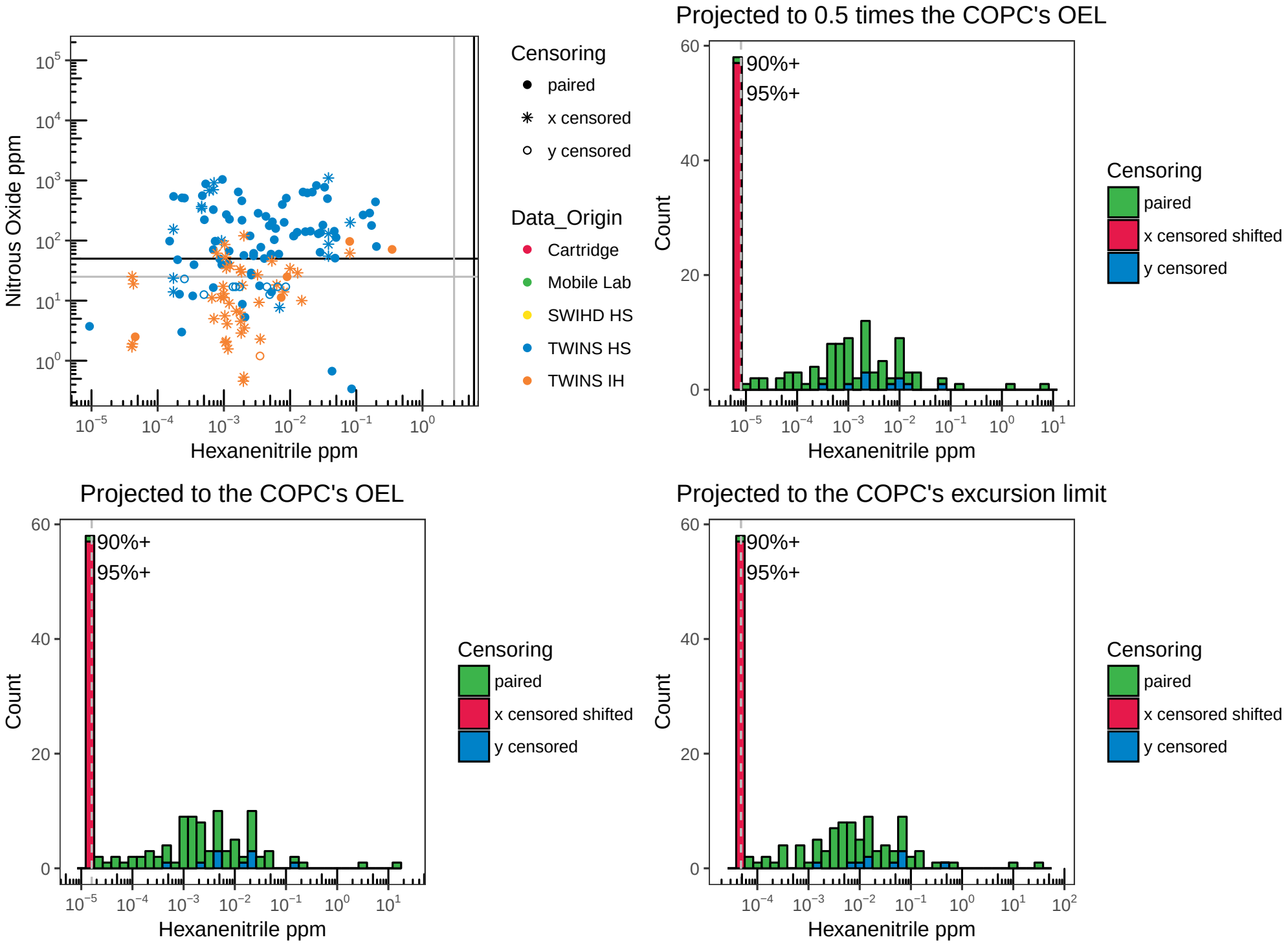


Figure C.1855: Nitrous Oxide vs Hexanenitrile

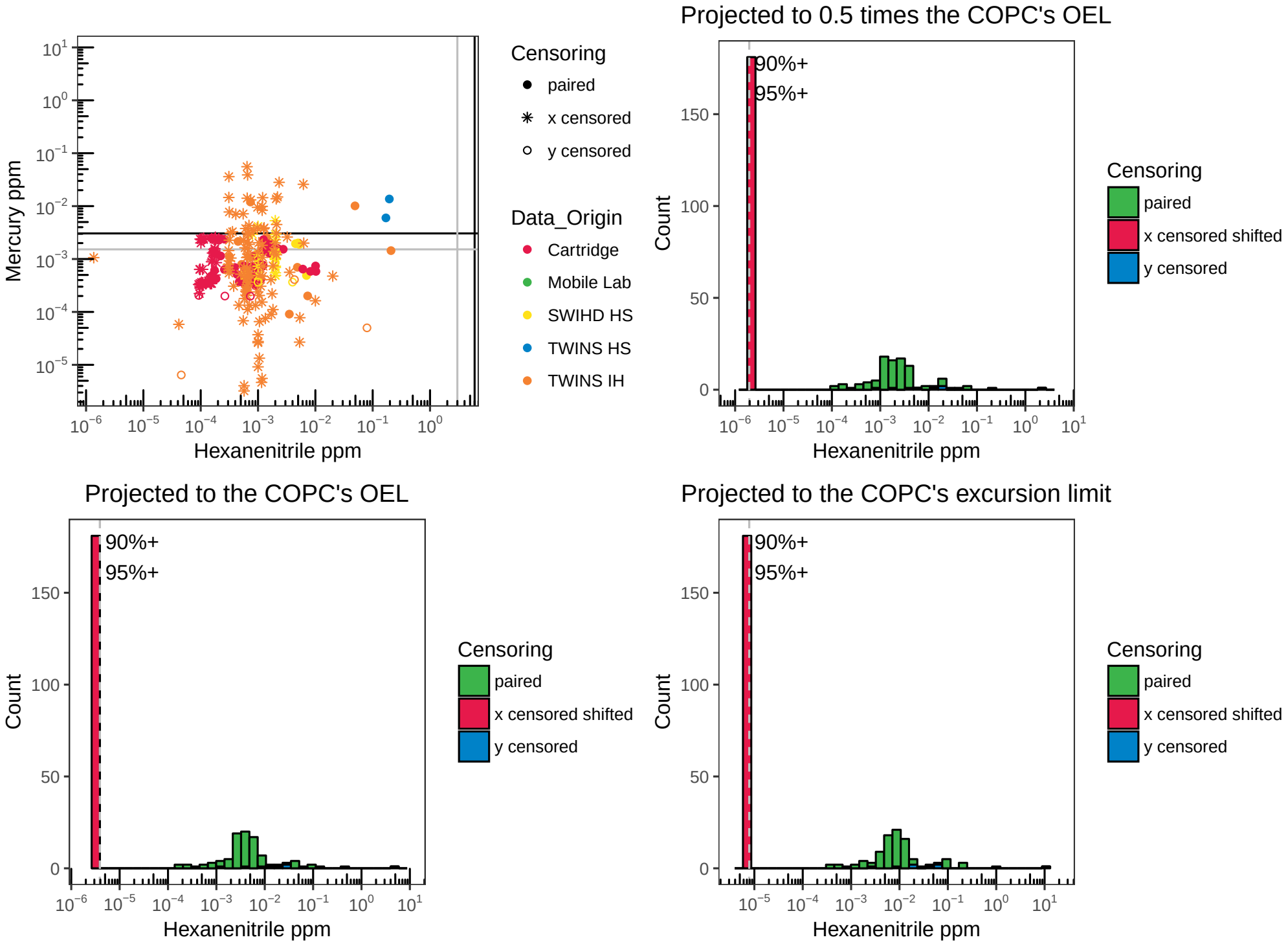


Figure C.1856: Mercury vs Hexanenitrile

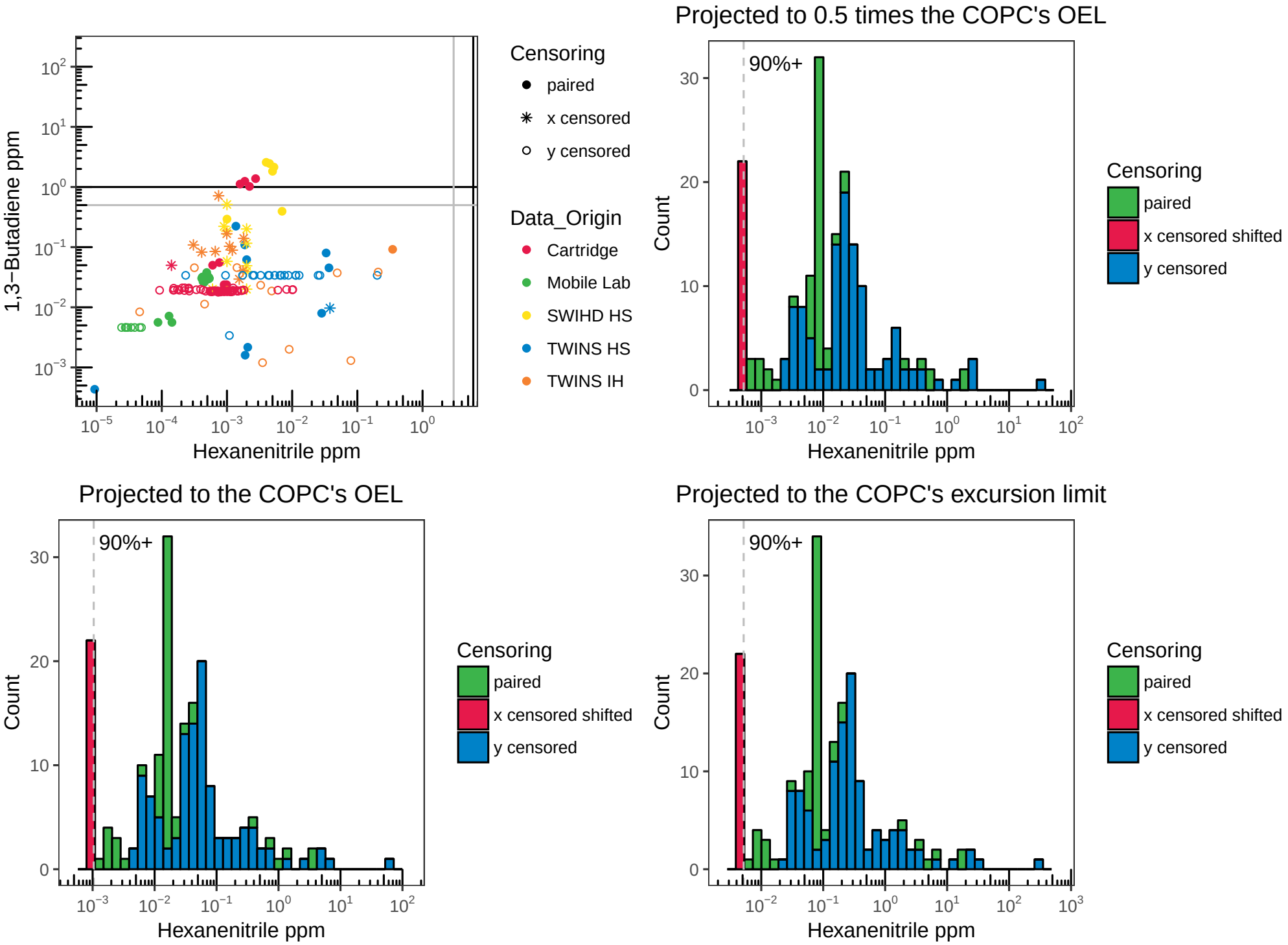


Figure C.1857: 1,3-Butadiene vs Hexanenitrile

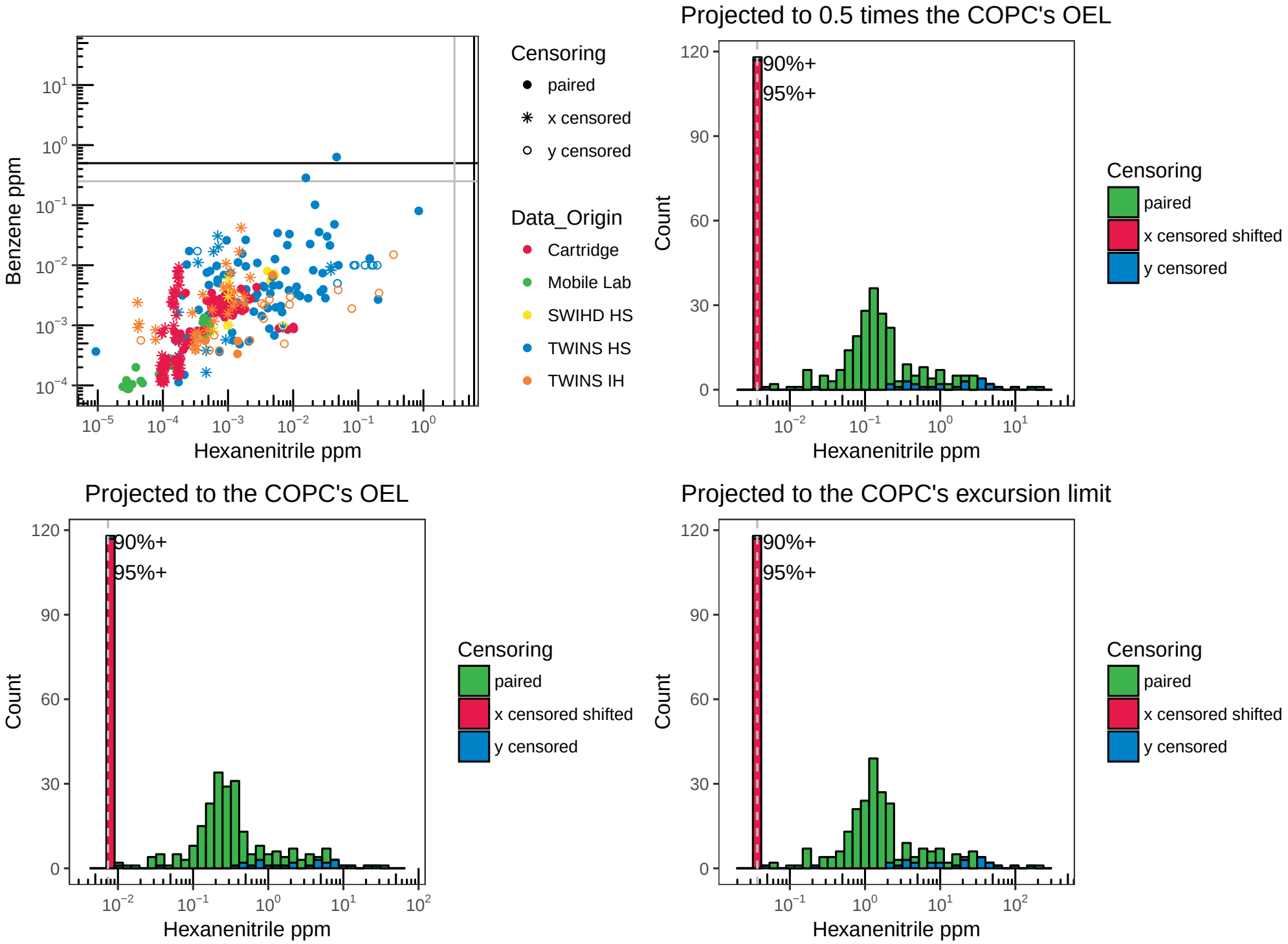


Figure C.1858: Benzene vs Hexanenitrile

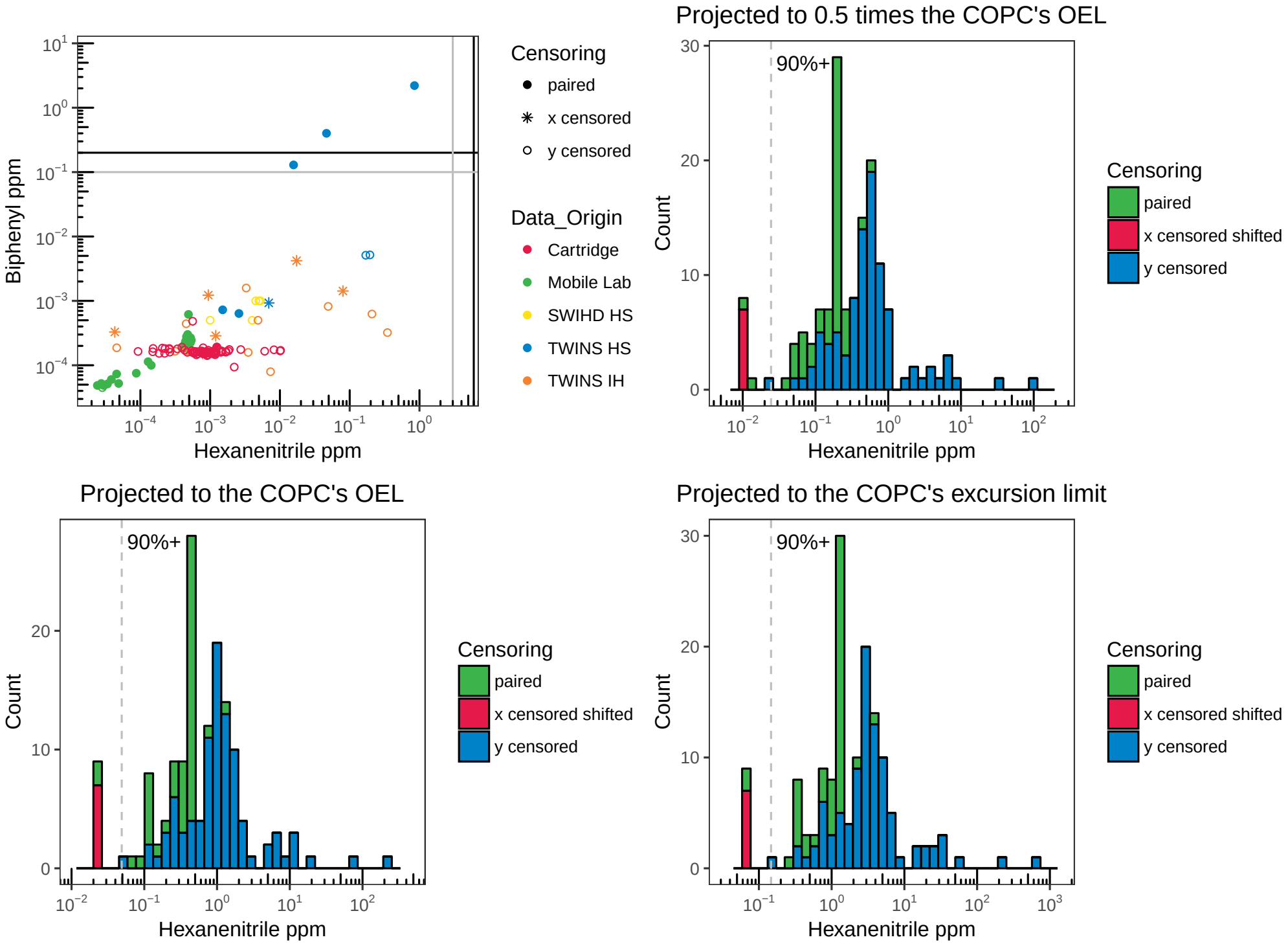


Figure C.1859: Biphenyl vs Hexanenitrile

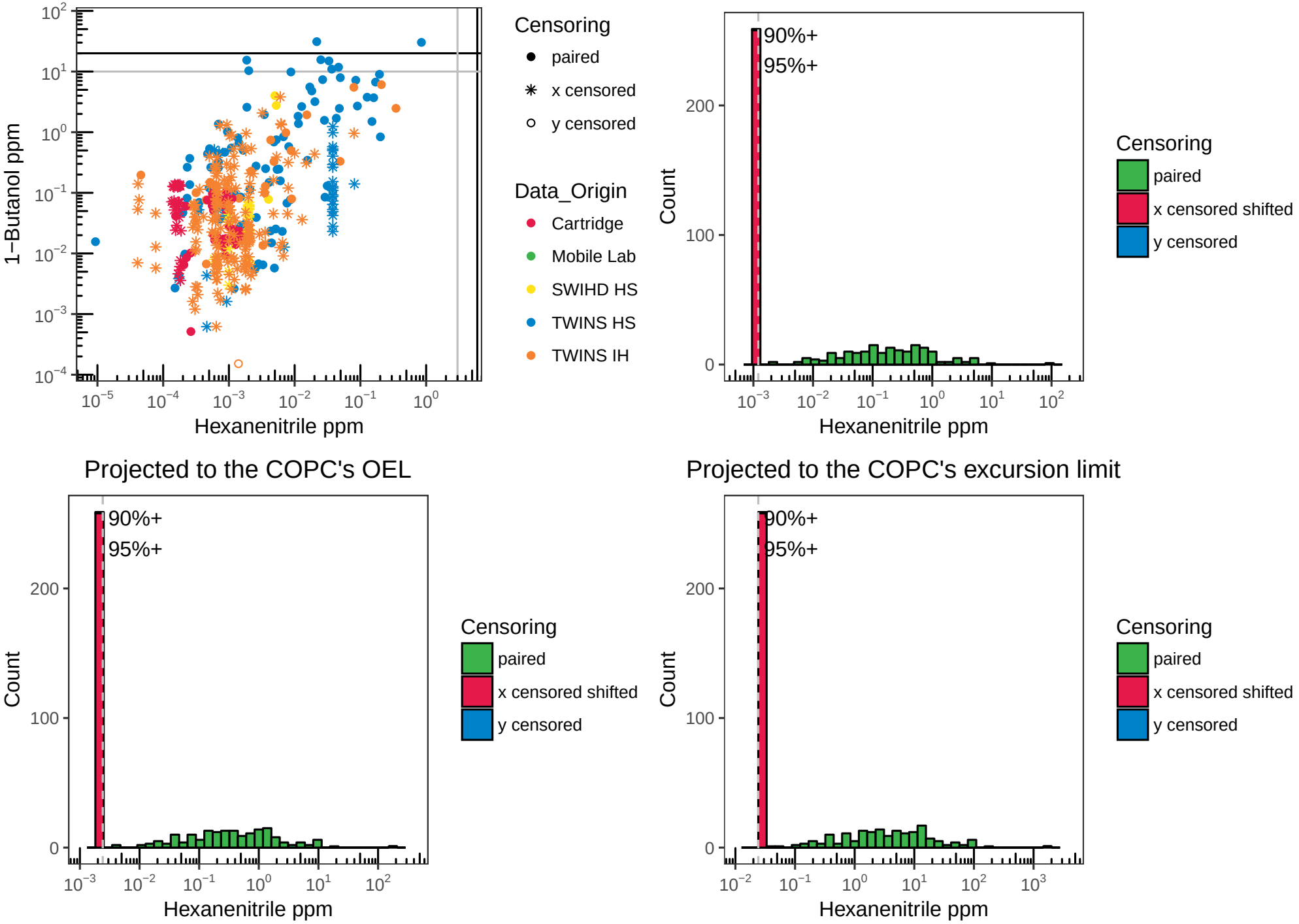


Figure C.1860: 1-Butanol vs Hexanenitrile

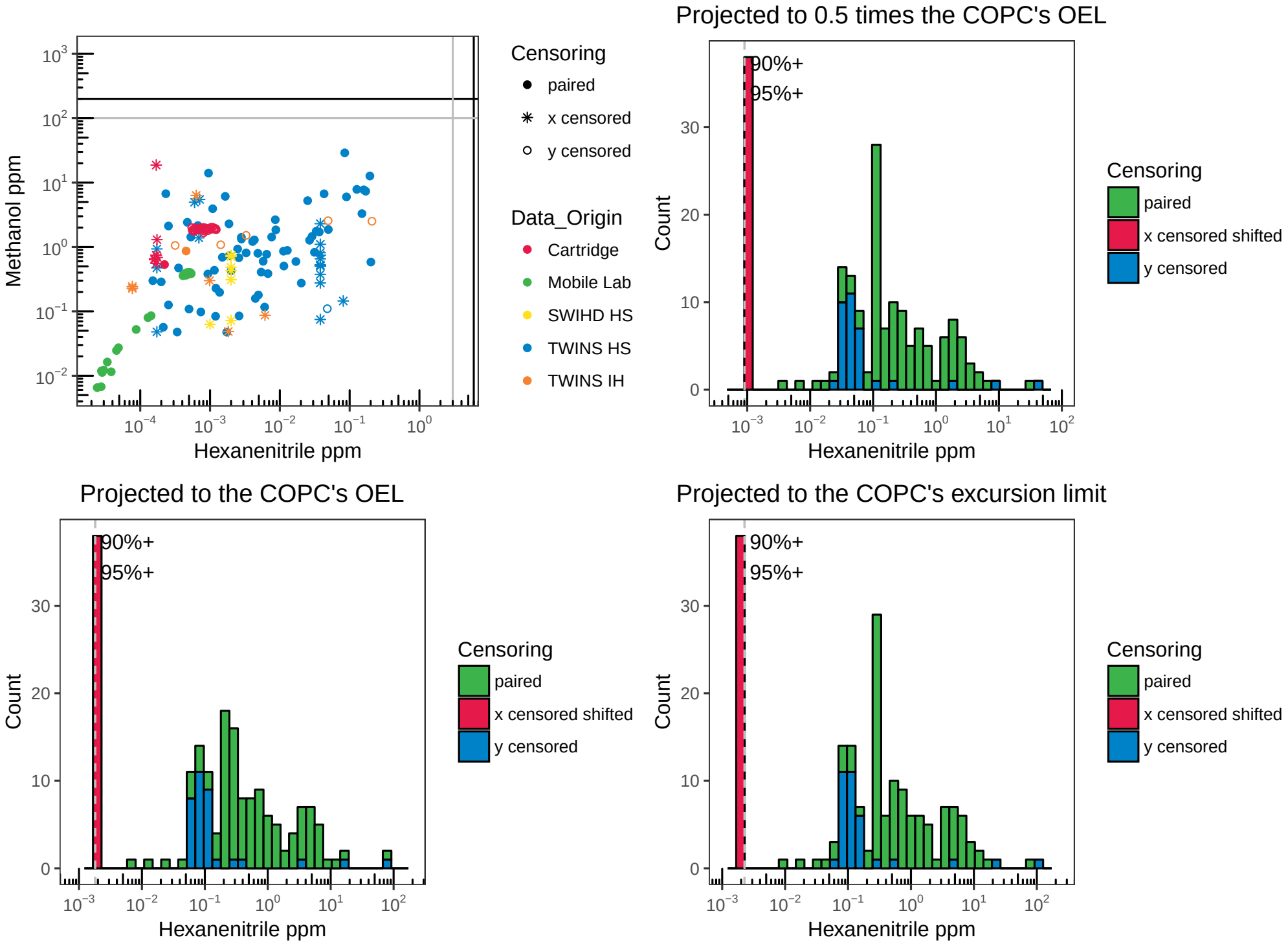


Figure C.1861: Methanol vs Hexanenitrile

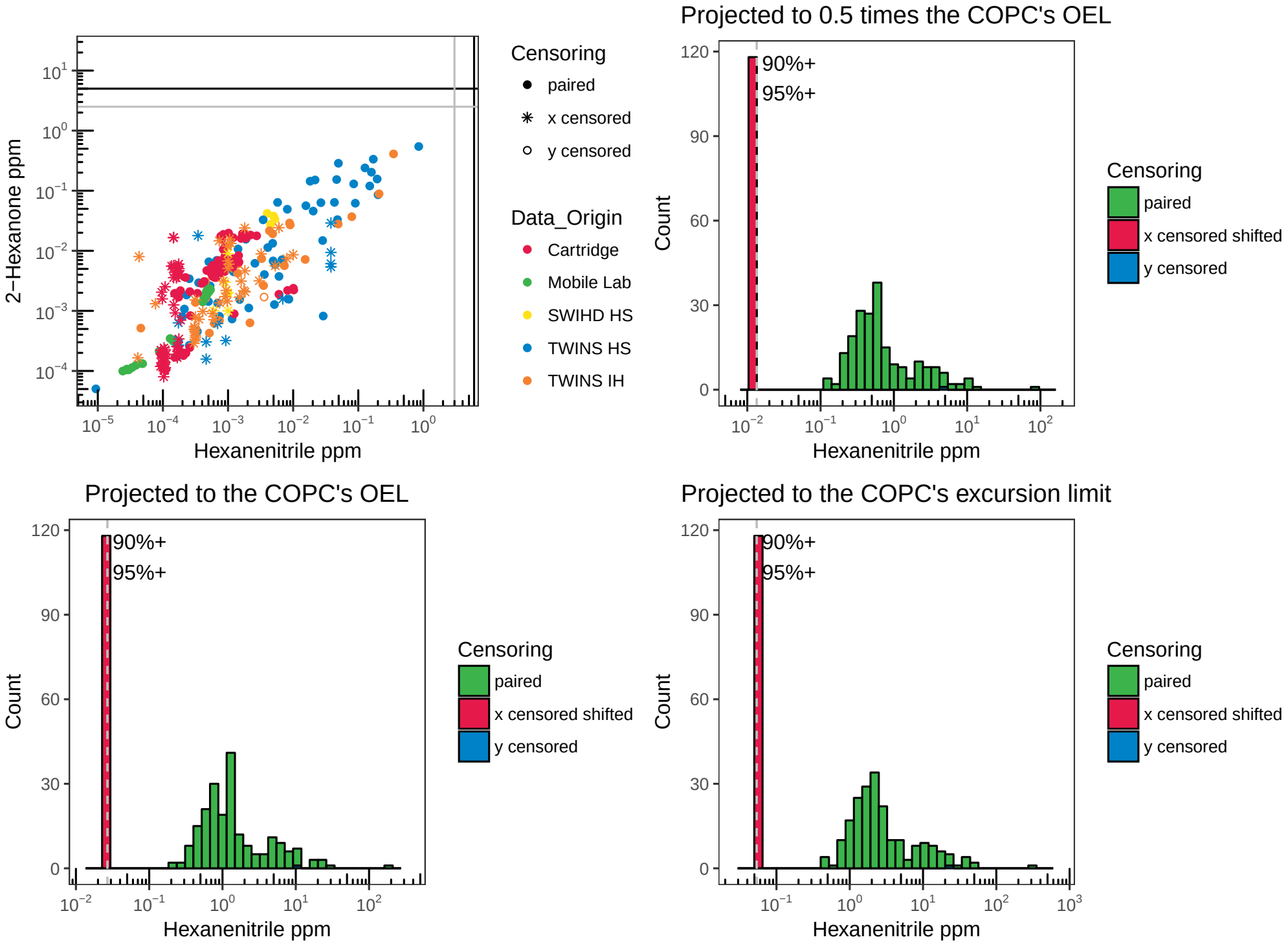


Figure C.1862: 2-Hexanone vs Hexanenitrile

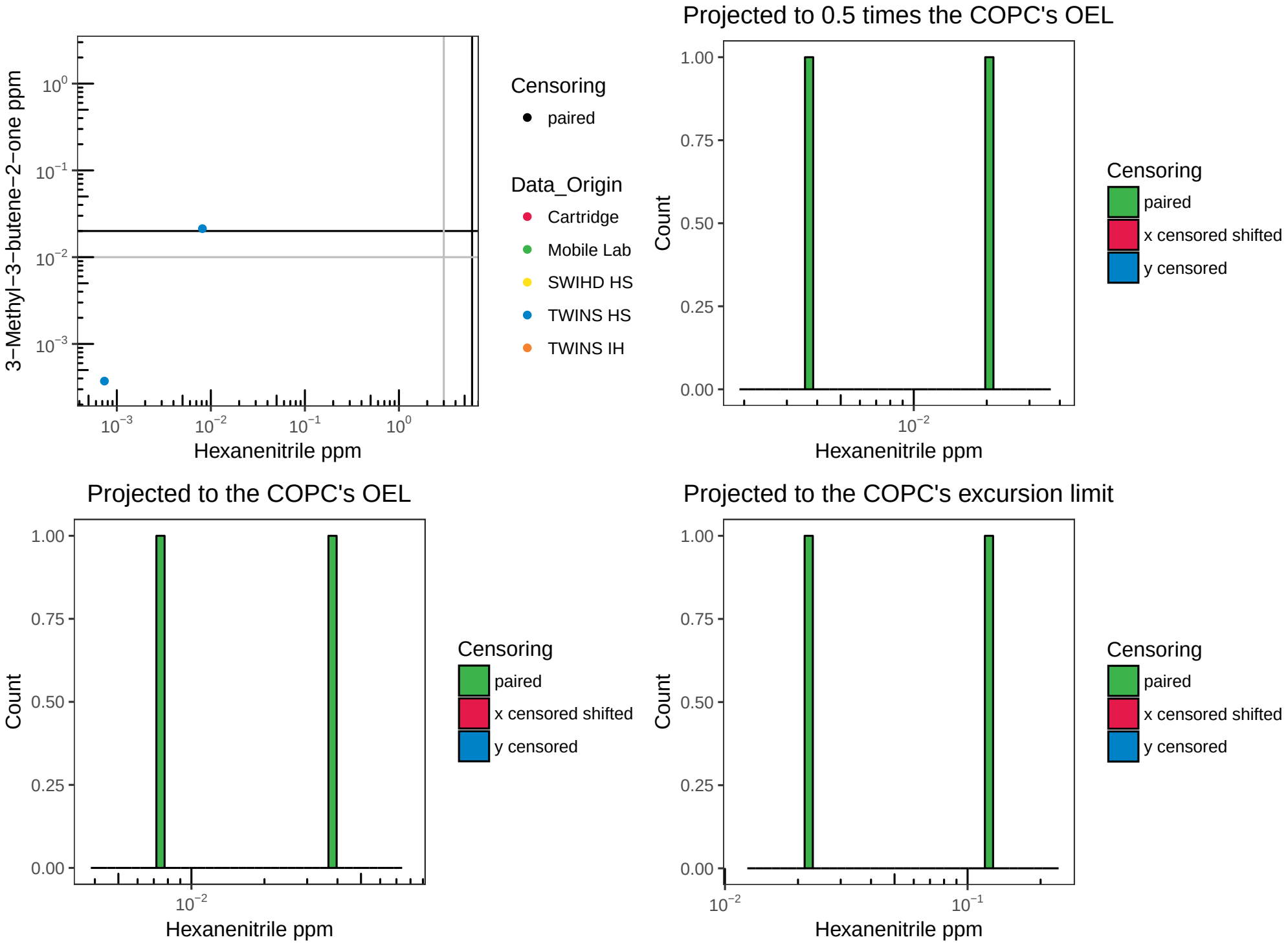


Figure C.1863: 3-Methyl-3-butene-2-one vs Hexanenitrile

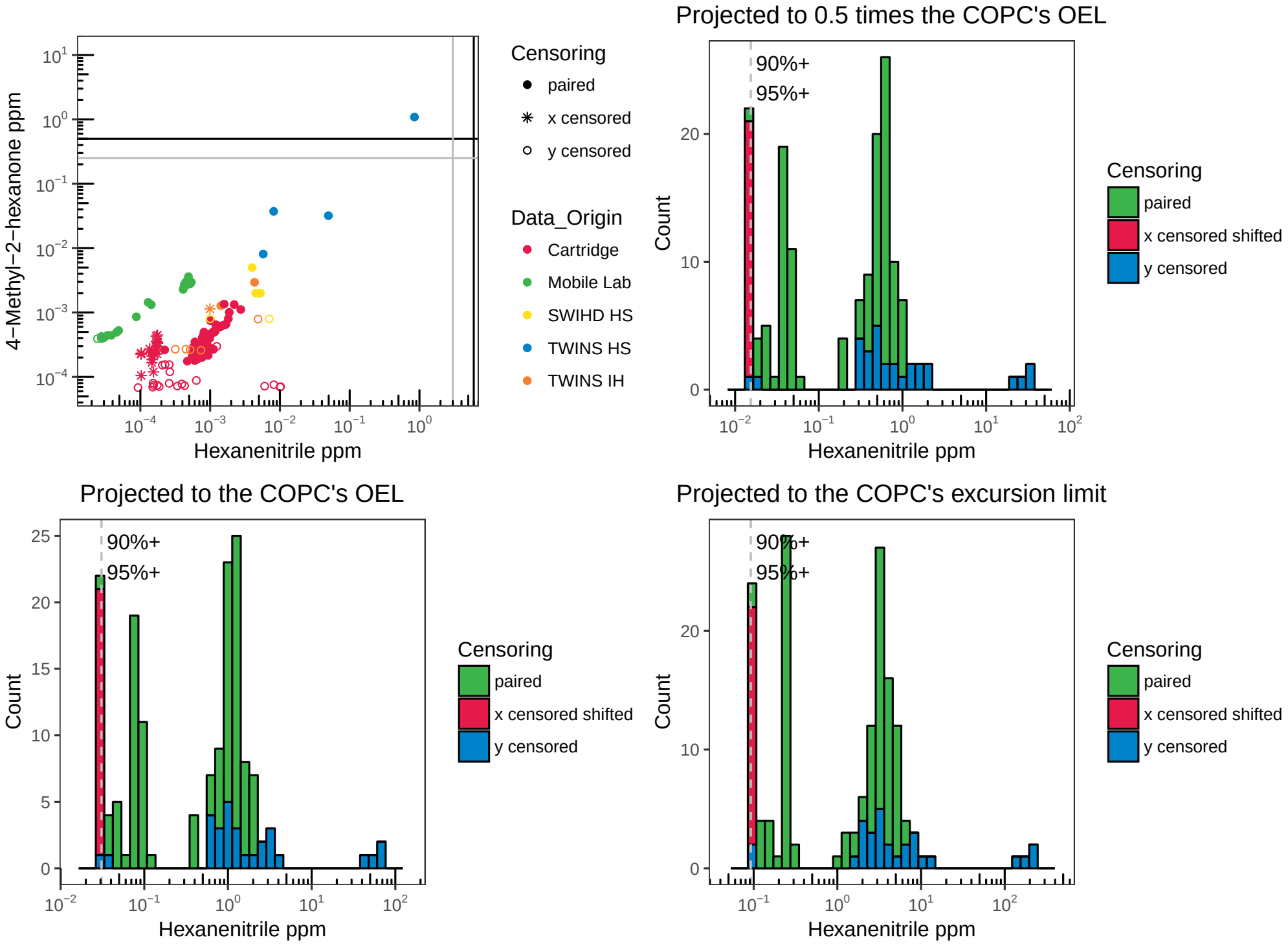


Figure C.1864: 4-Methyl-2-hexanone vs Hexanenitrile

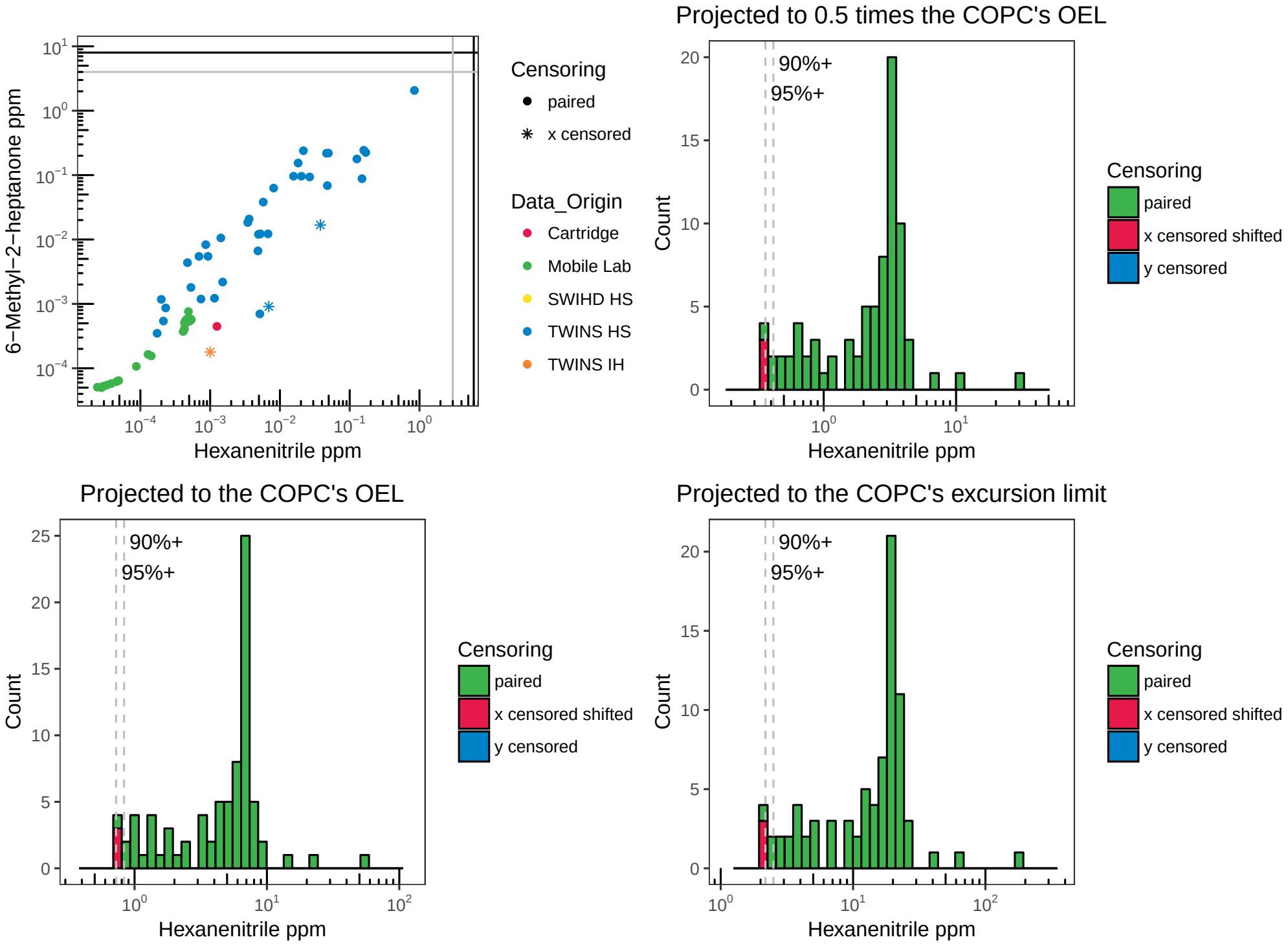


Figure C.1865: 6-Methyl-2-heptanone vs Hexanenitrile

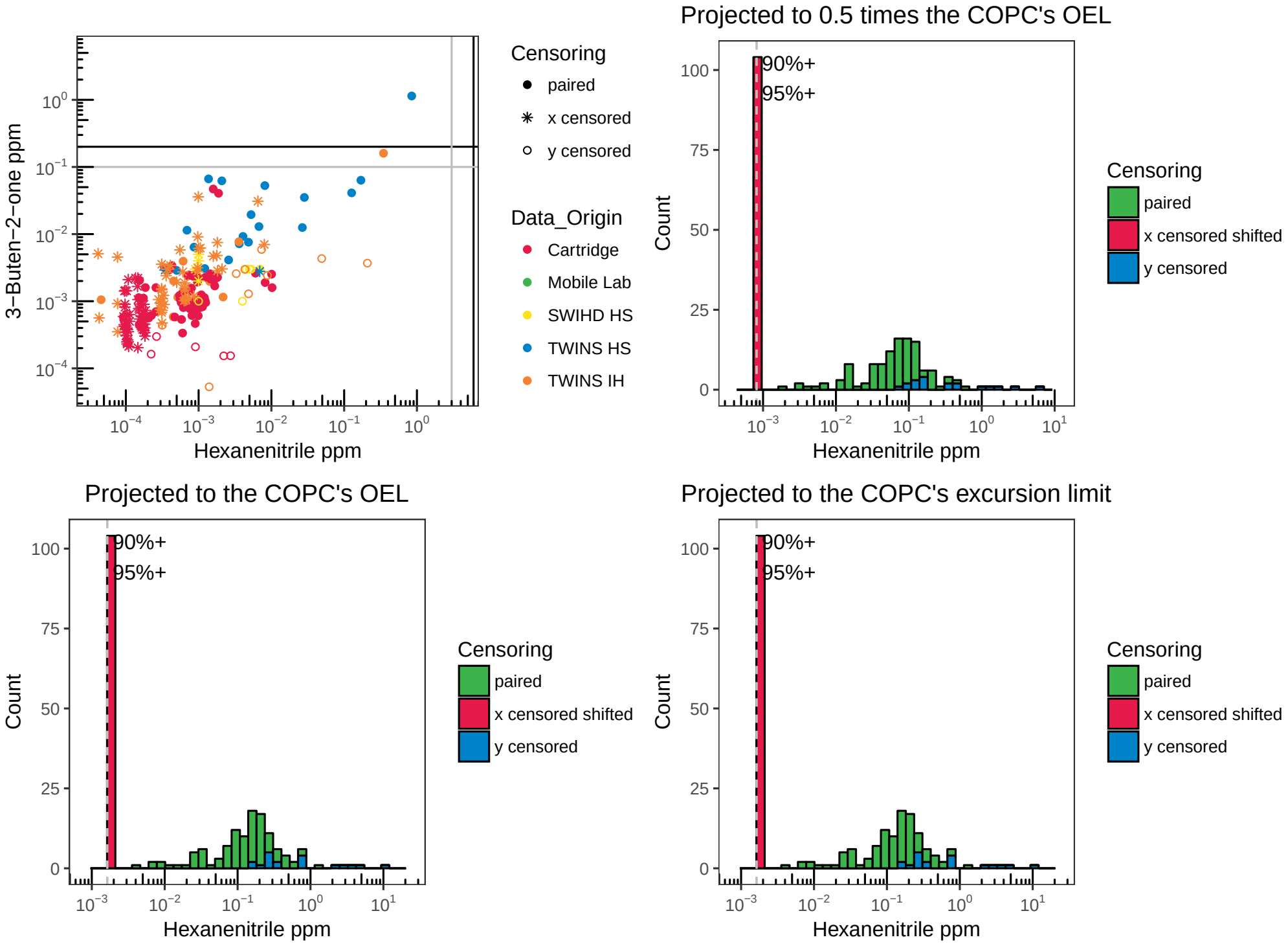


Figure C.1866: 3-Buten-2-one vs Hexanenitrile

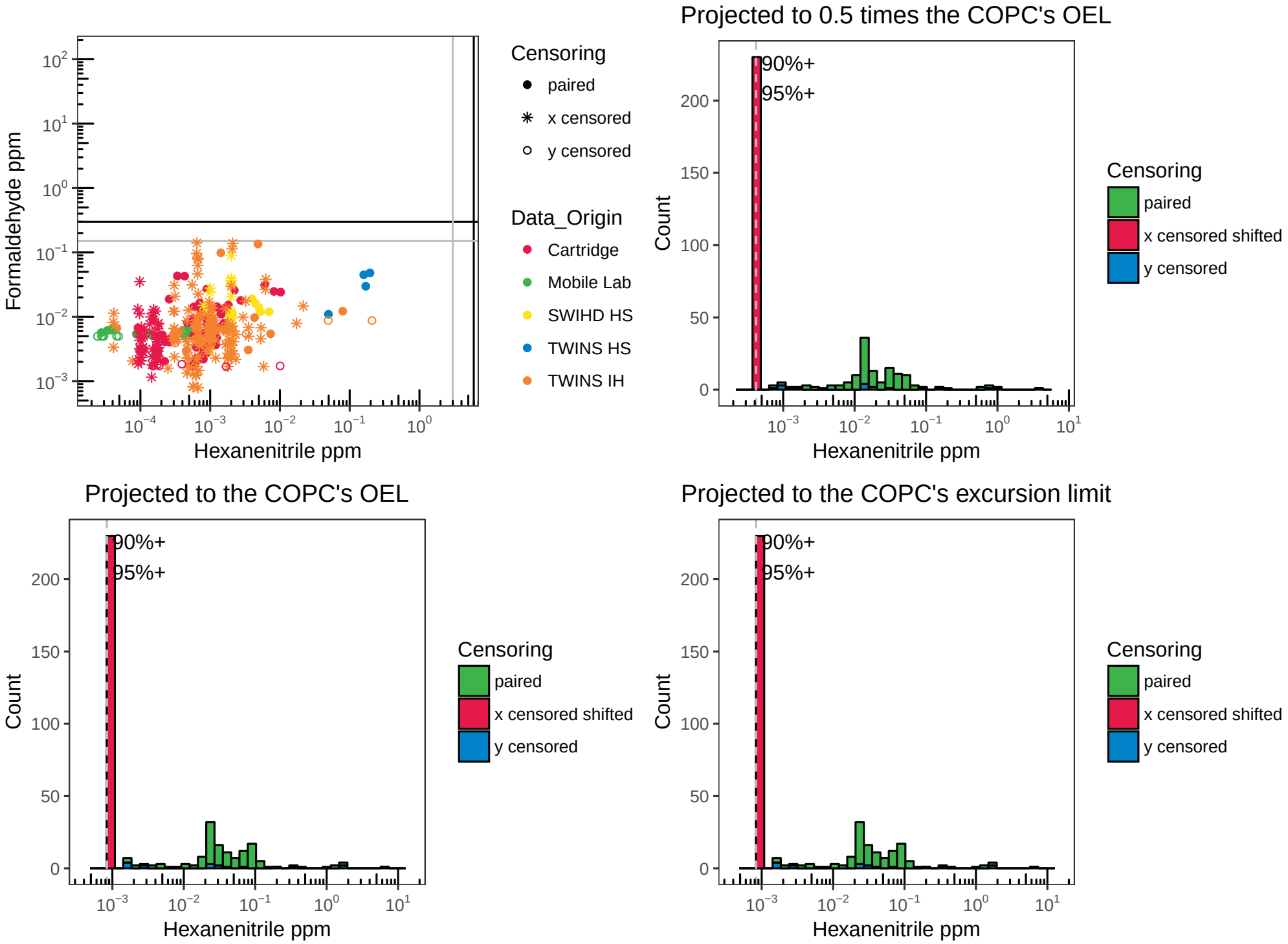


Figure C.1867: Formaldehyde vs Hexanenitrile

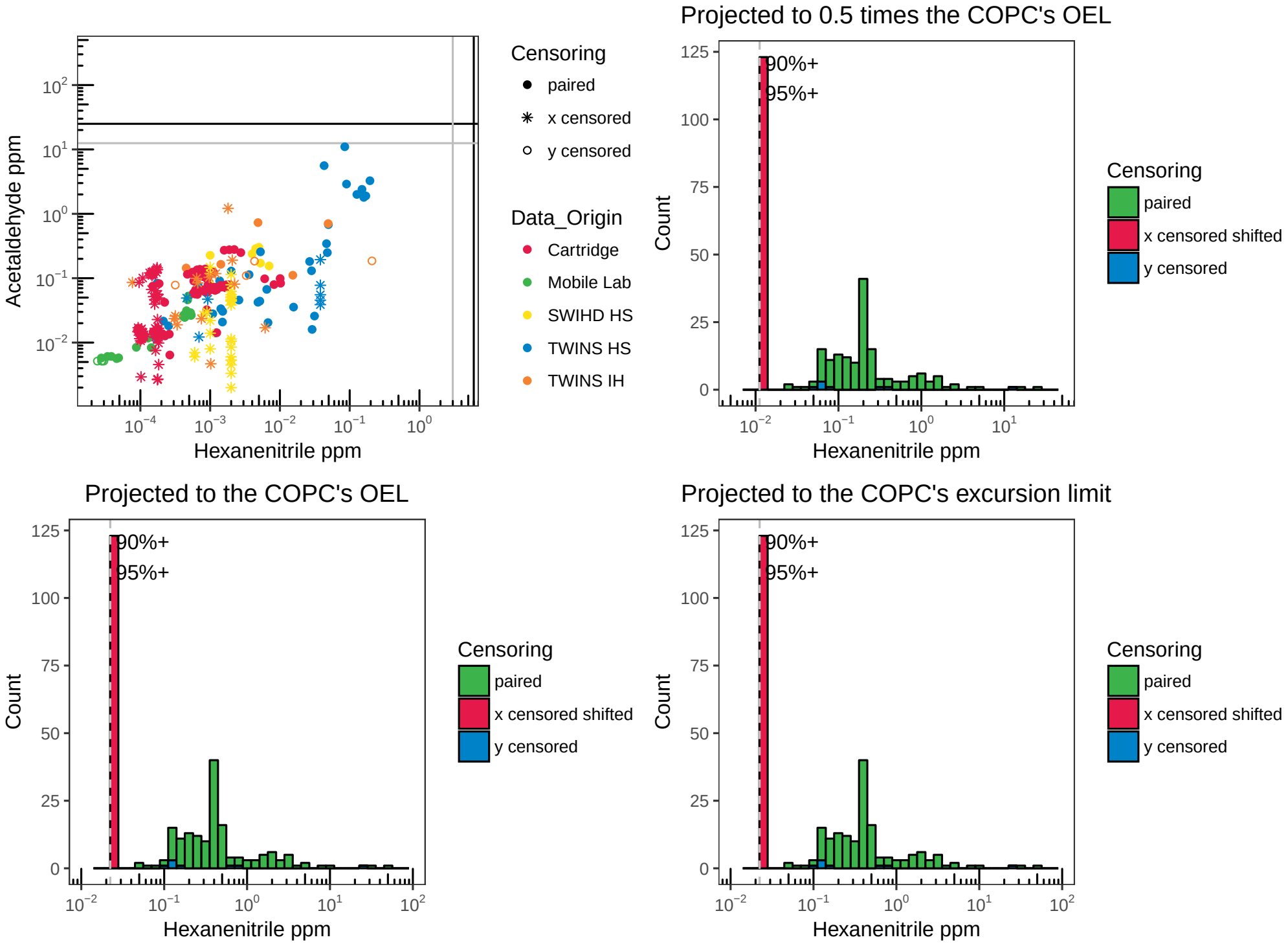


Figure C.1868: Acetaldehyde vs Hexanenitrile

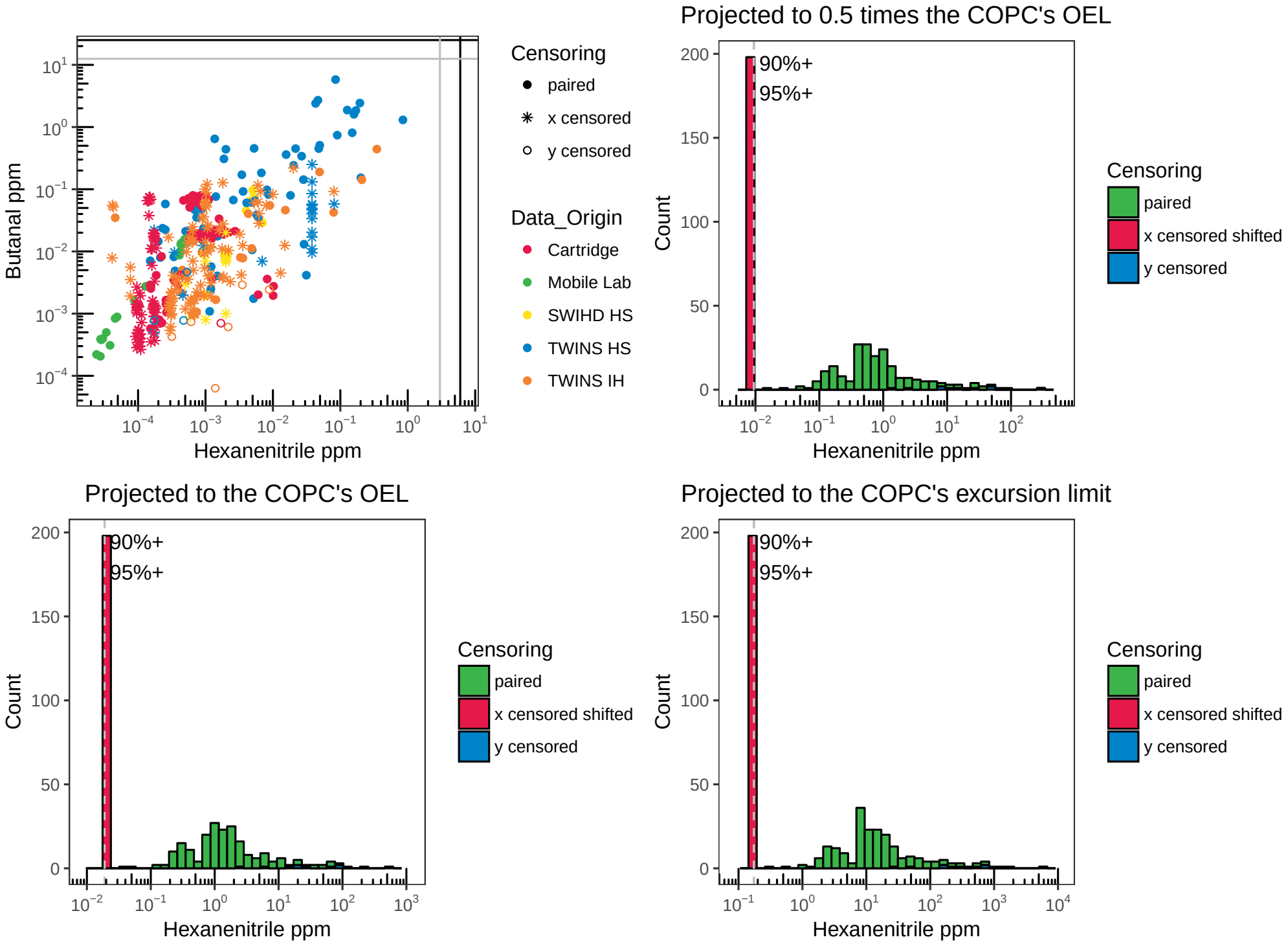


Figure C.1869: Butanal vs Hexanenitrile

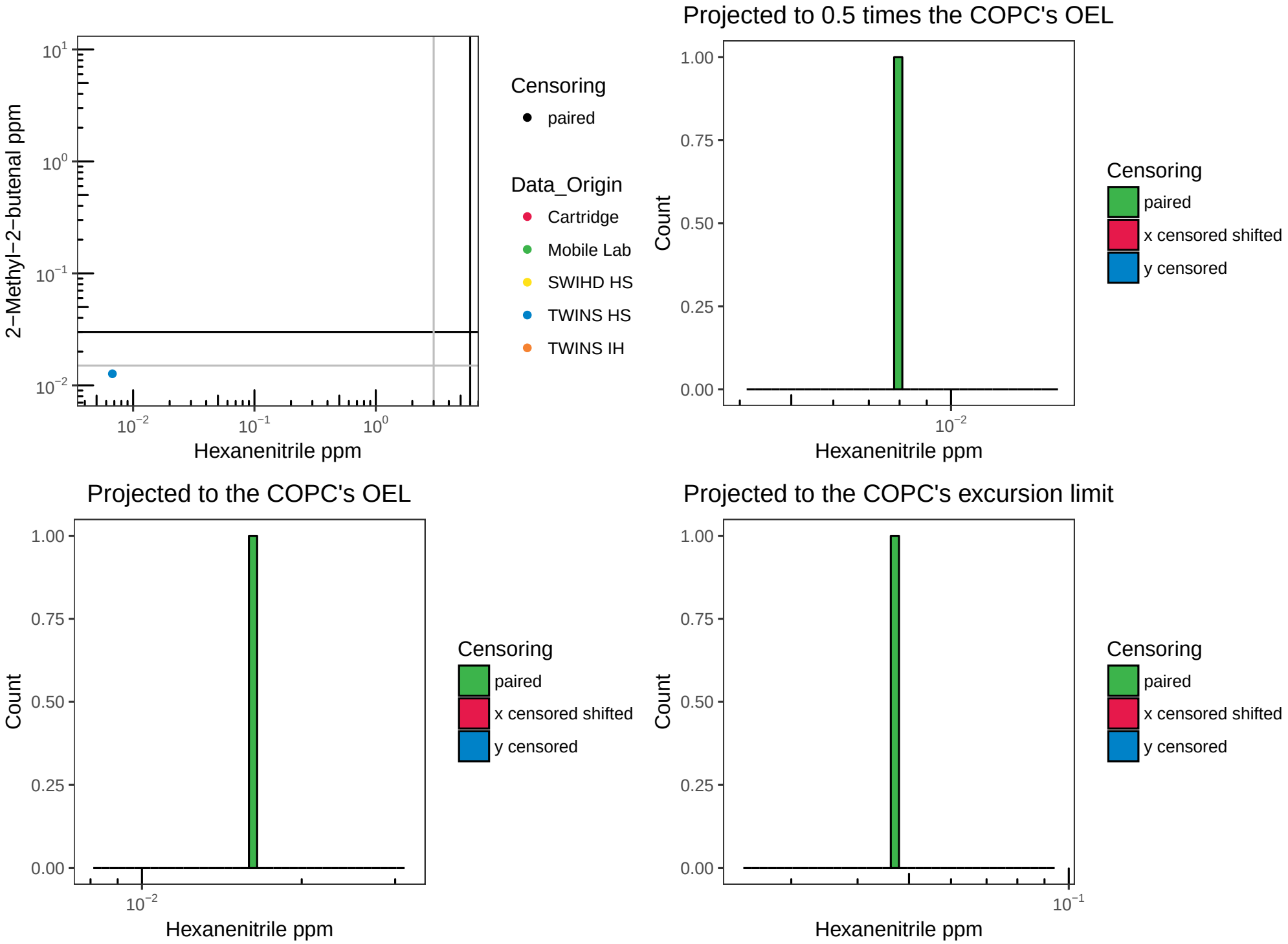


Figure C.1870: 2-Methyl-2-butenal vs Hexanenitrile

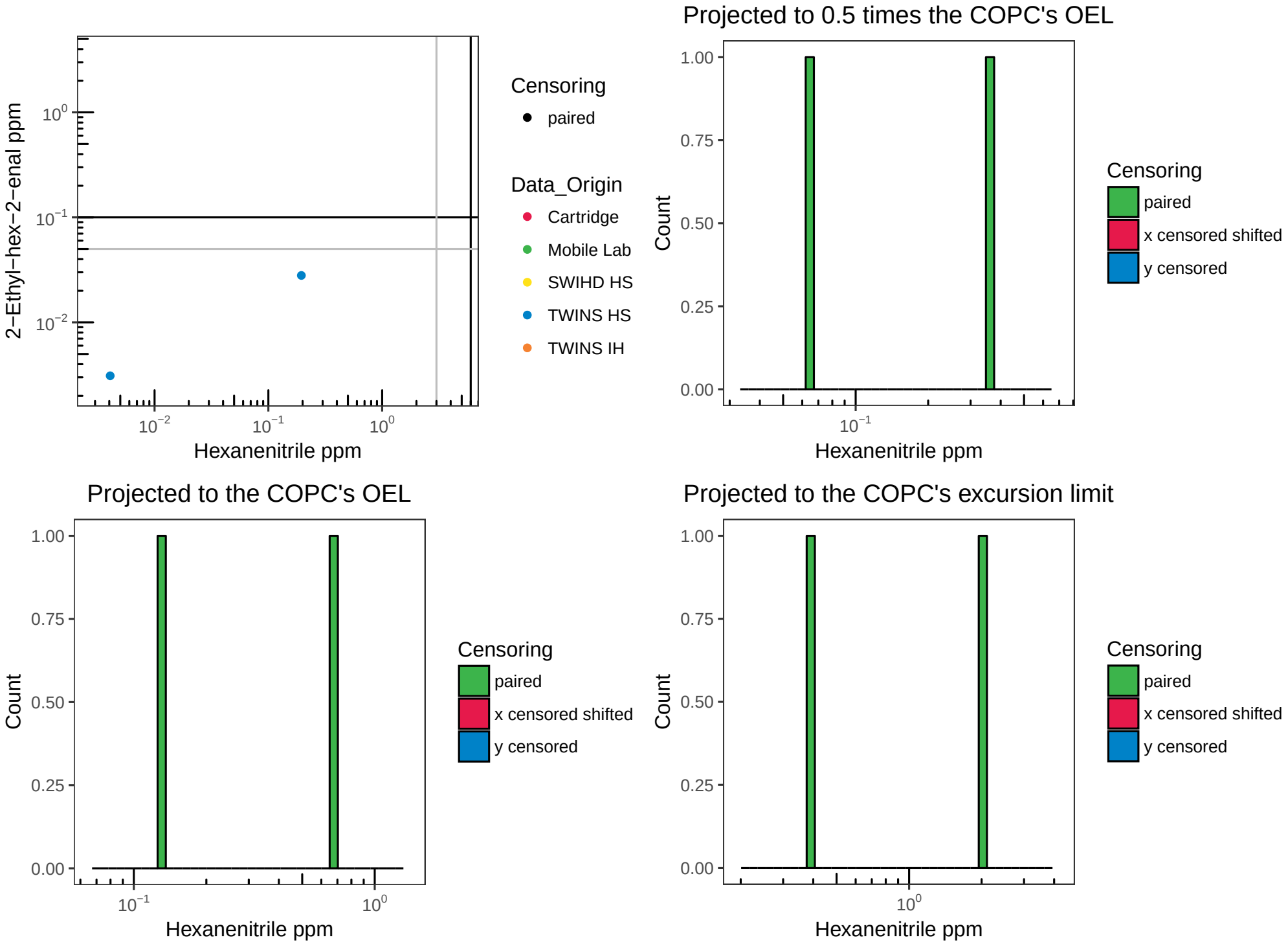


Figure C.1871: 2-Ethyl-hex-2-enal vs Hexanenitrile

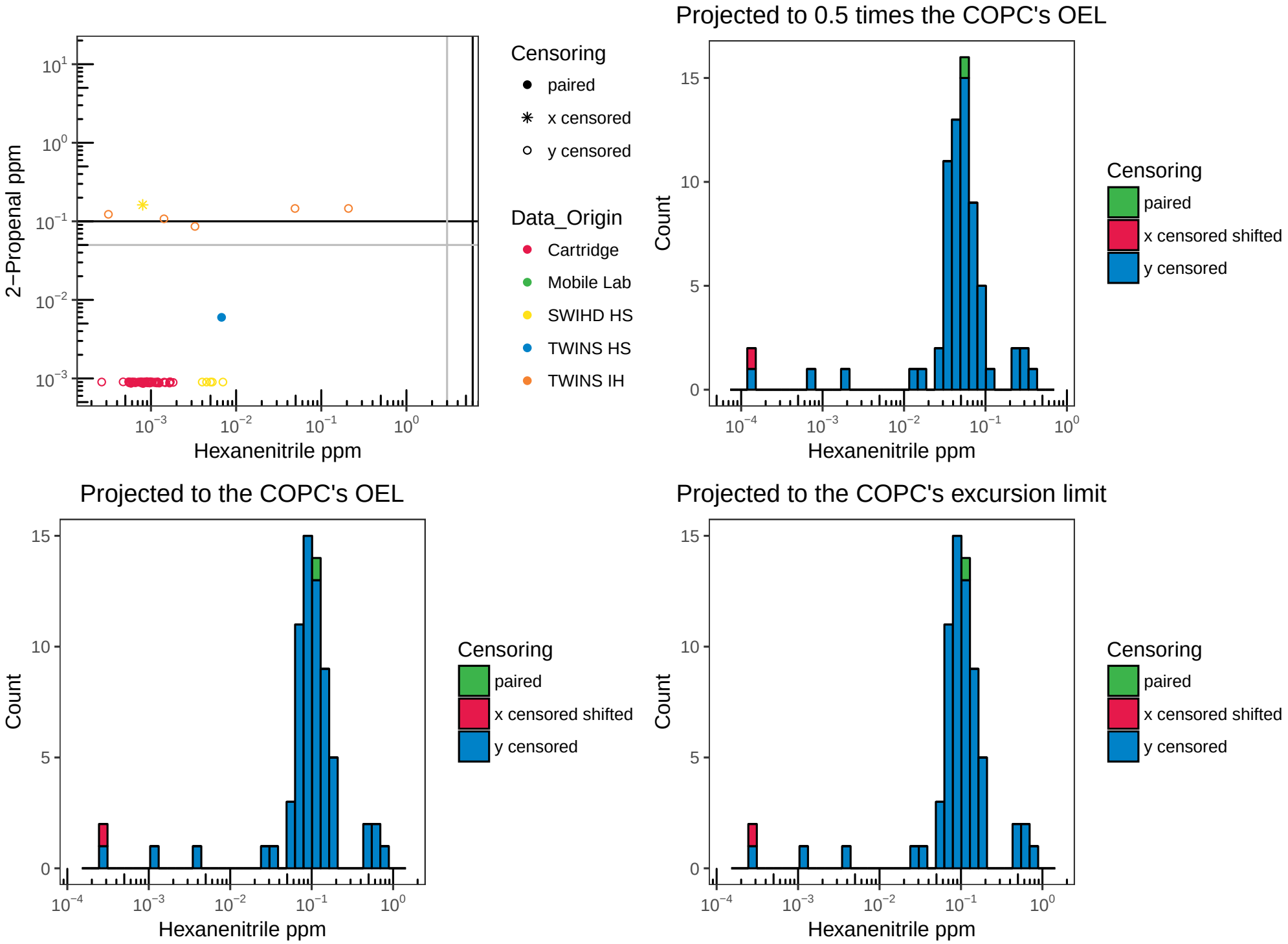


Figure C.1872: 2-Propenal vs Hexanenitrile

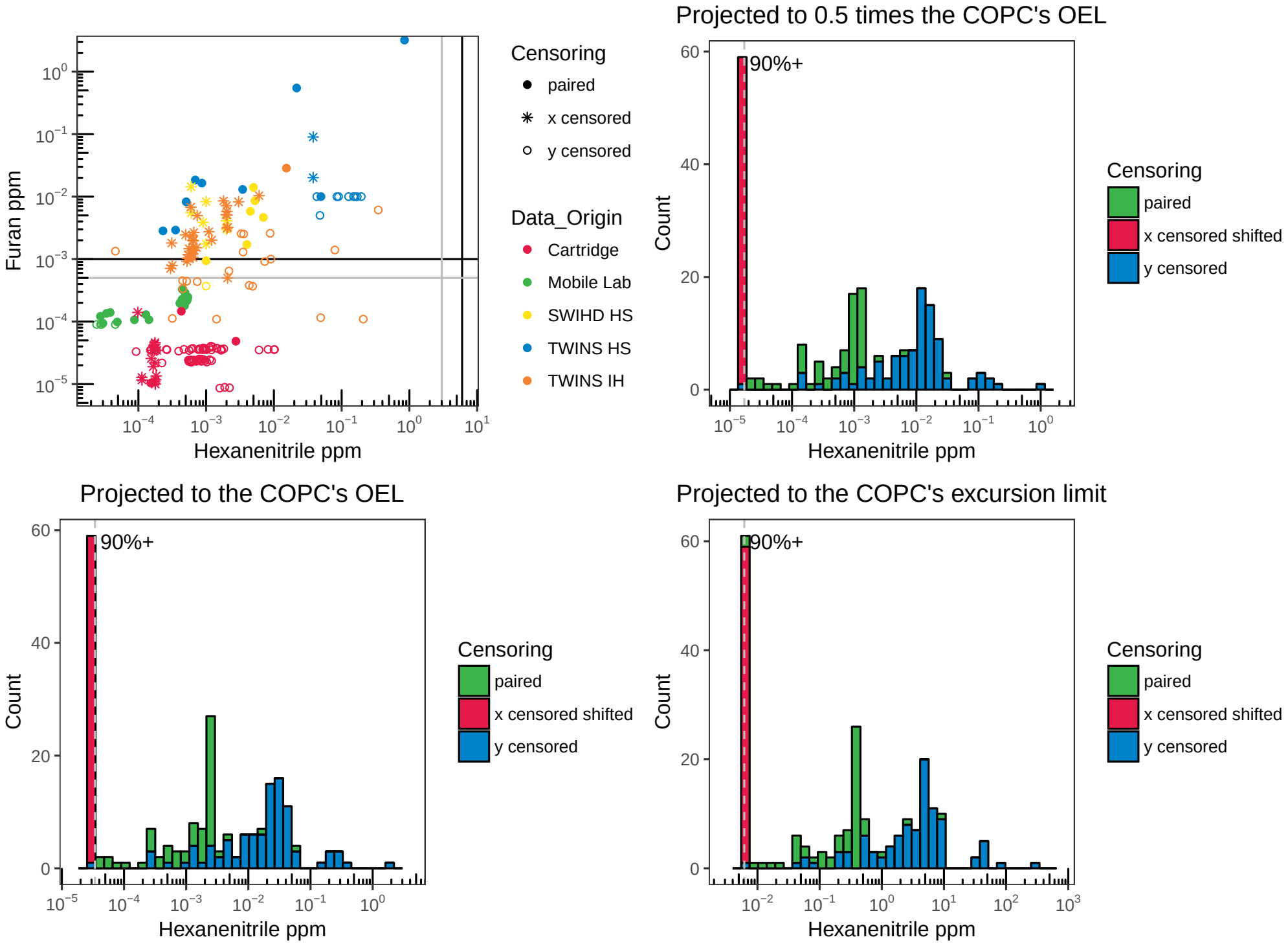


Figure C.1873: Furan vs Hexanenitrile

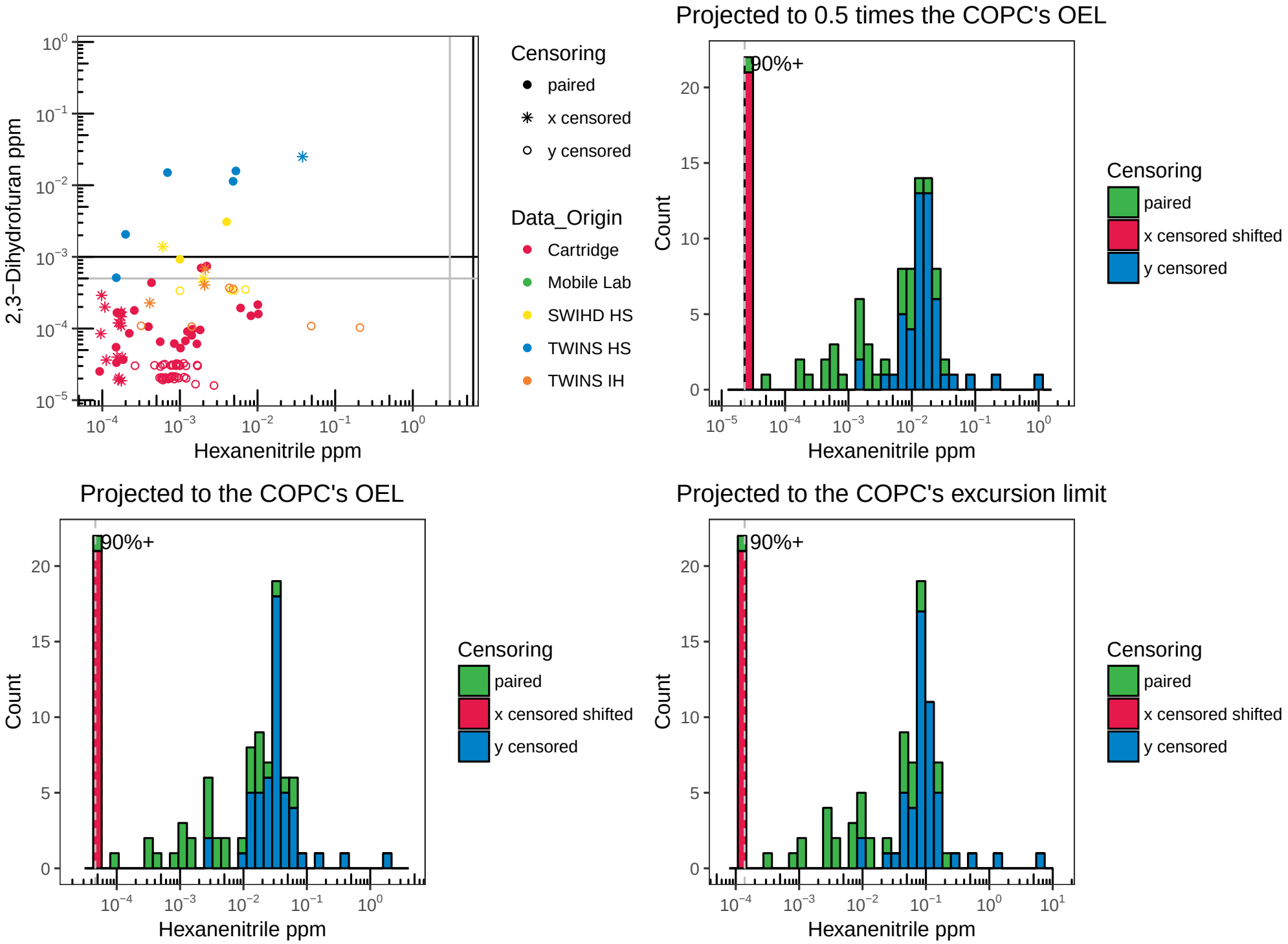


Figure C.1874: 2,3-Dihydrofuran vs Hexanenitrile

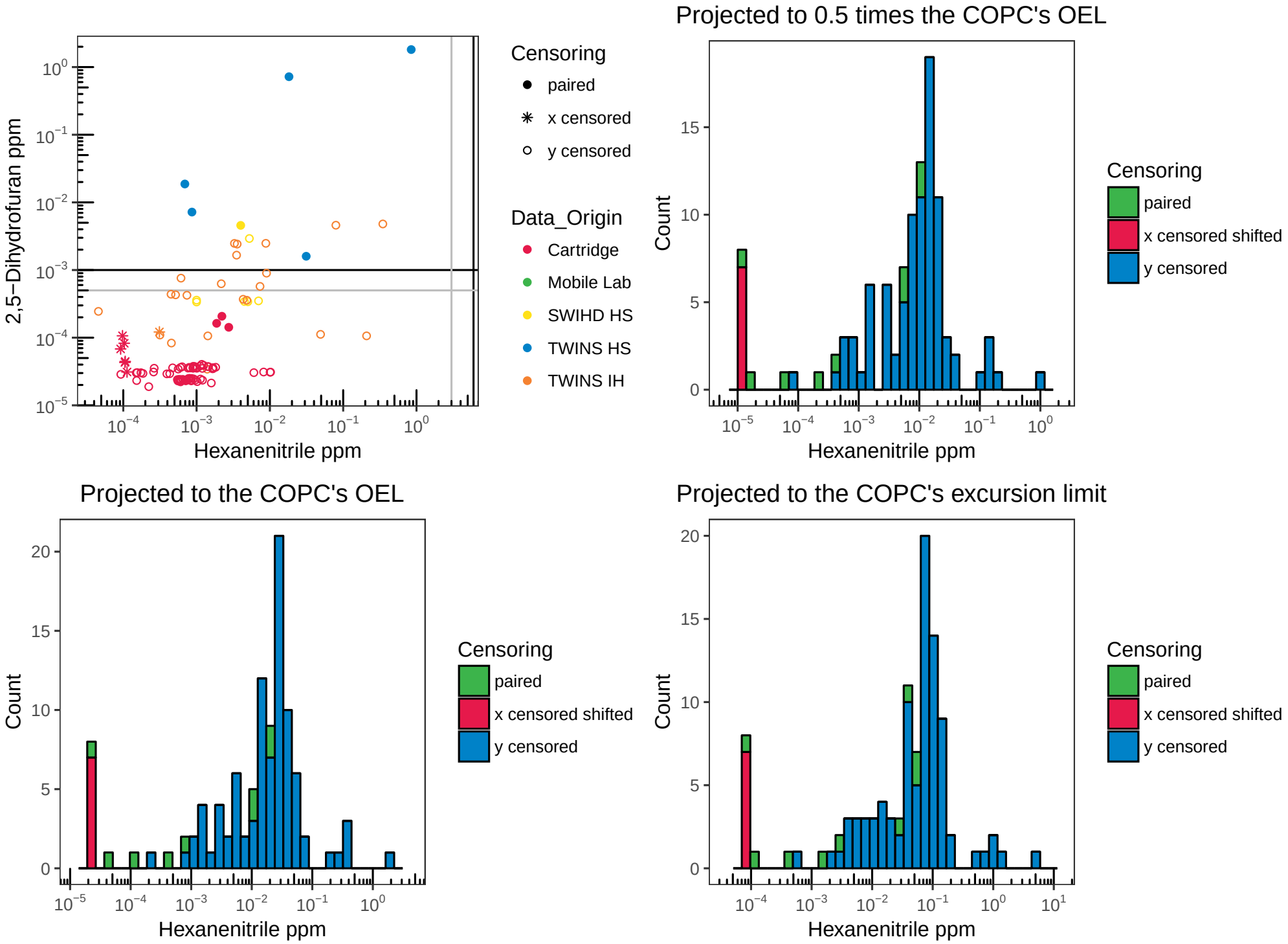


Figure C.1875: 2,5-Dihydrofuran vs Hexanenitrile

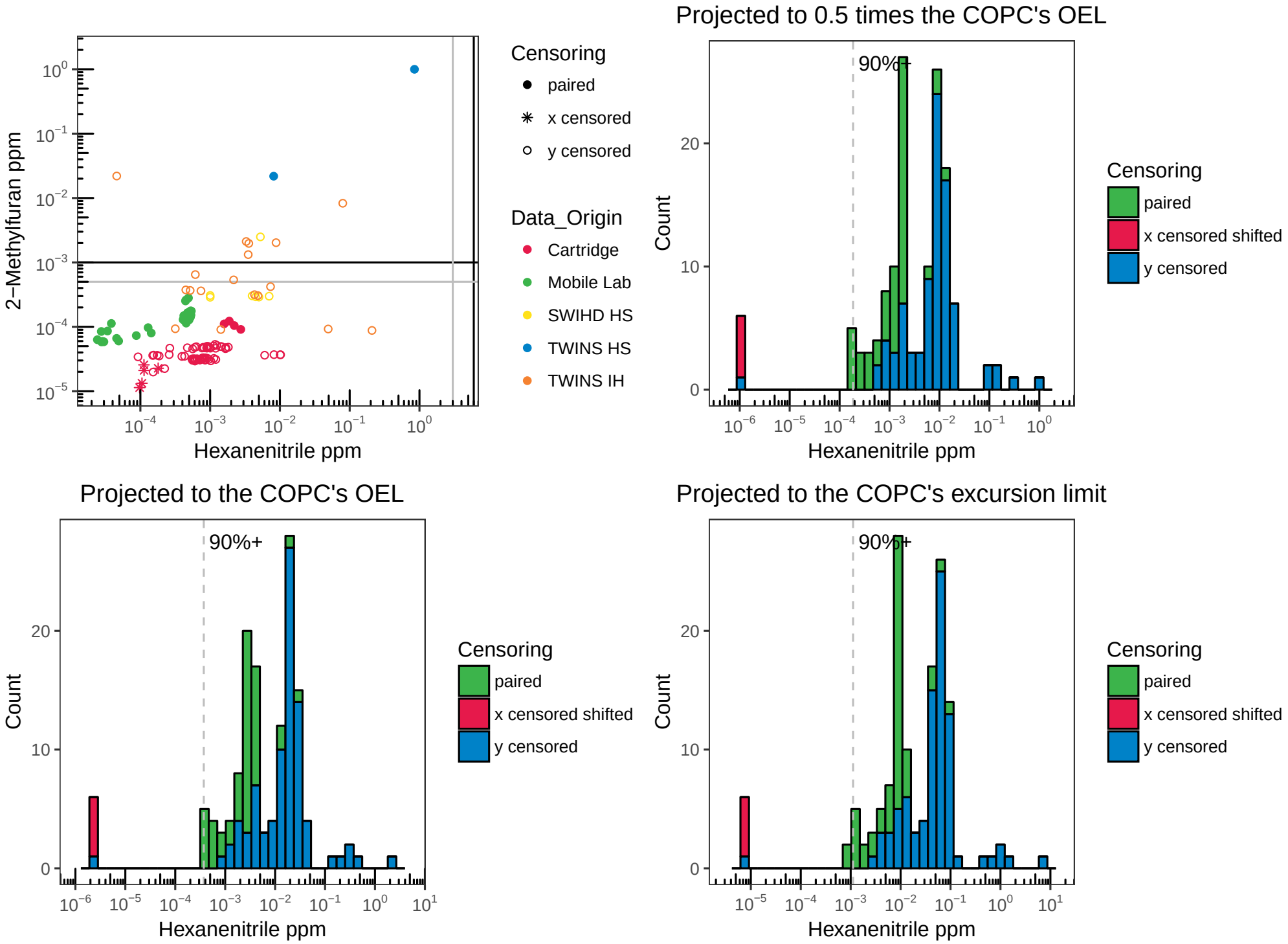


Figure C.1876: 2-Methylfuran vs Hexanenitrile

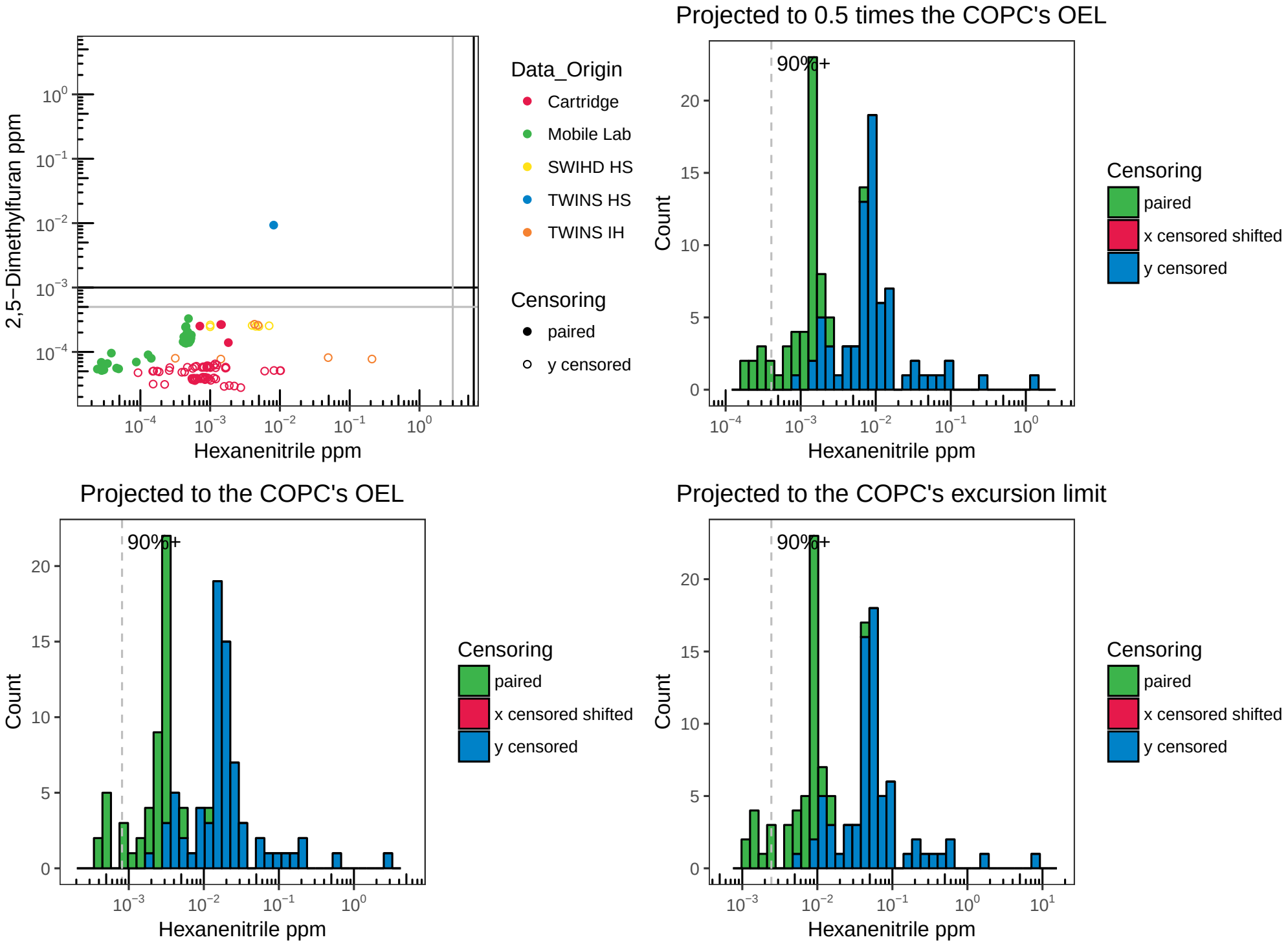


Figure C.1877: 2,5-Dimethylfuran vs Hexanenitrile

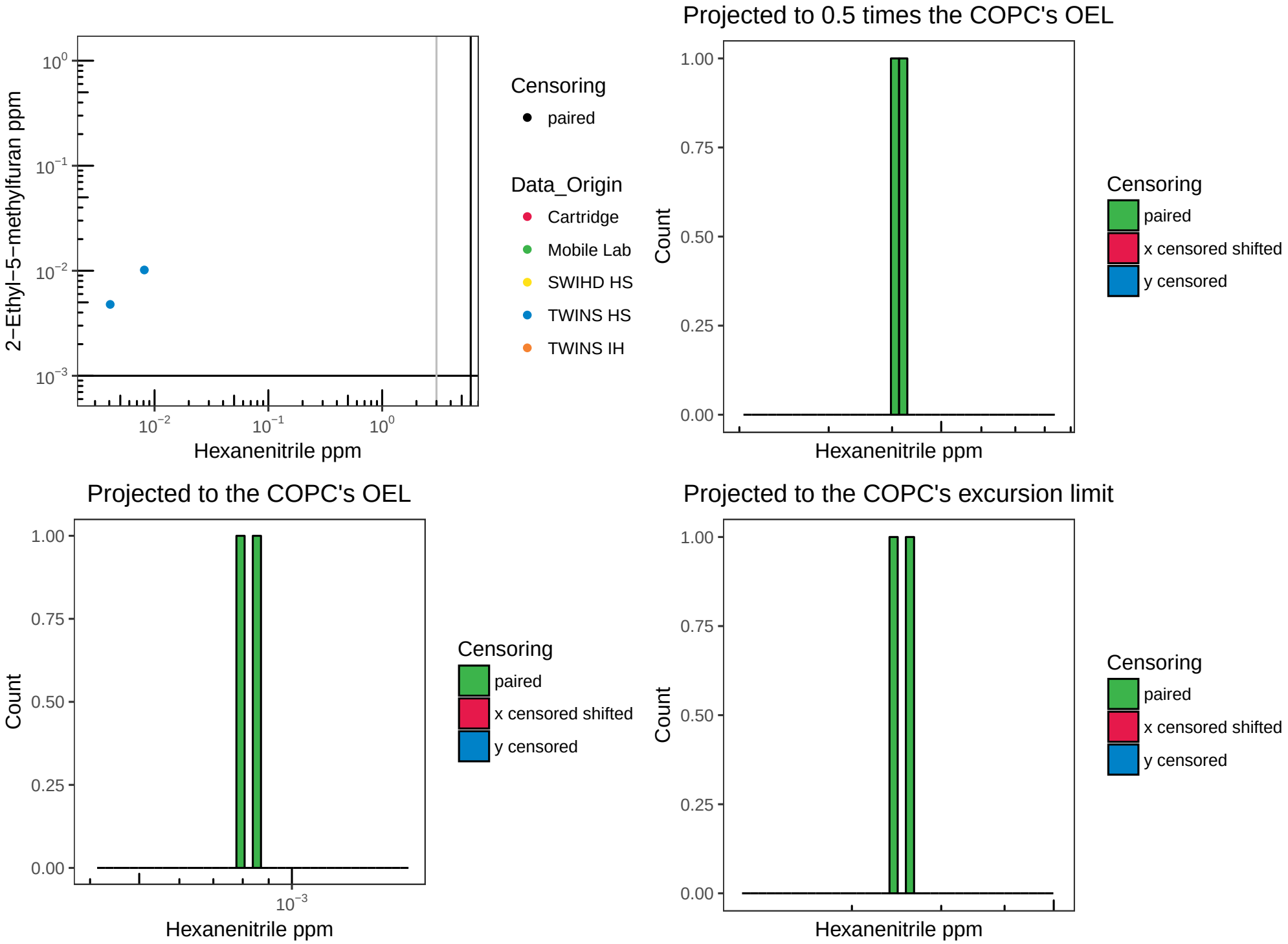


Figure C.1878: 2-Ethyl-5-methylfuran vs Hexanenitrile

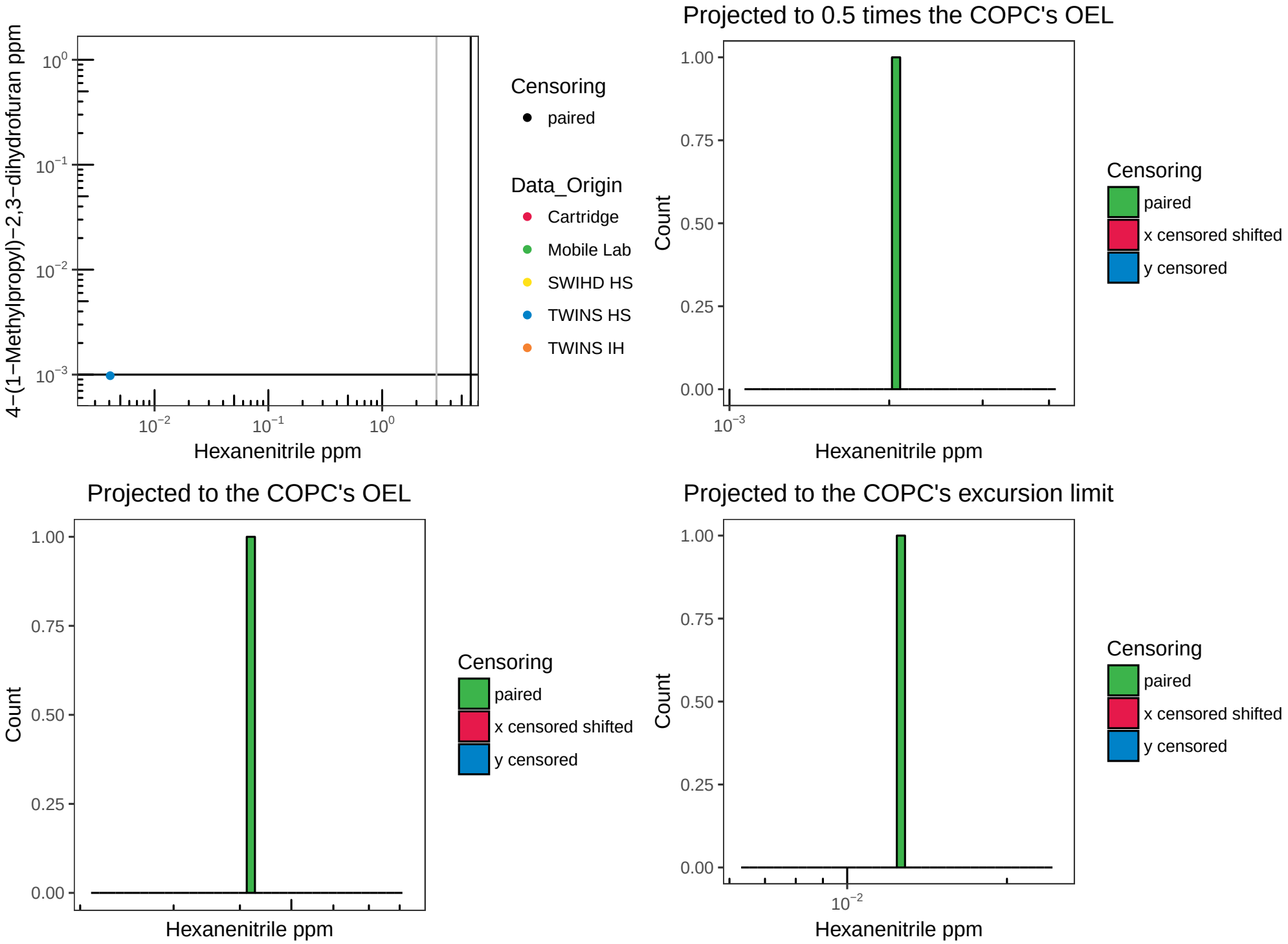


Figure C.1879: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Hexanenitrile

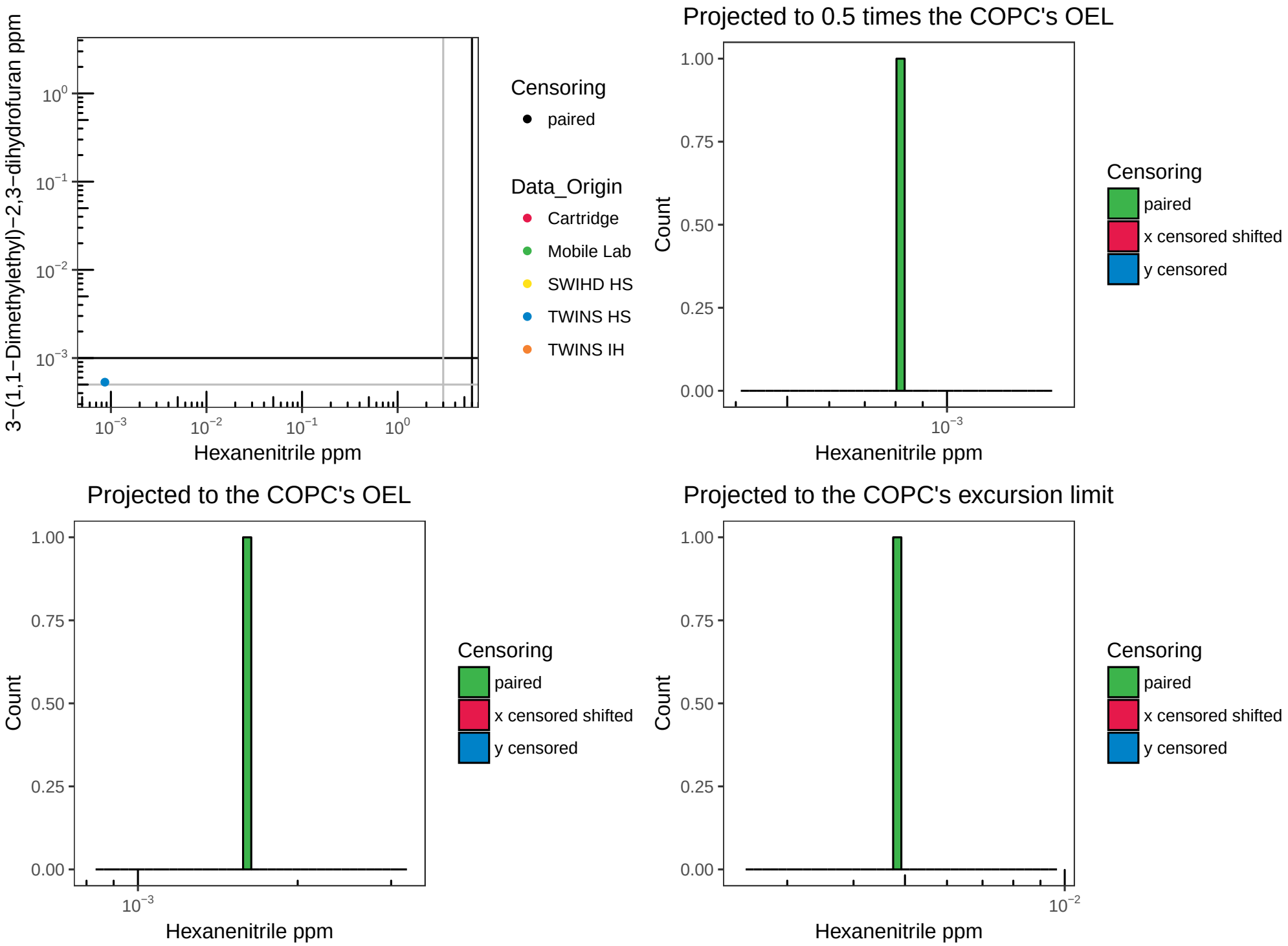


Figure C.1880: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Hexanenitrile

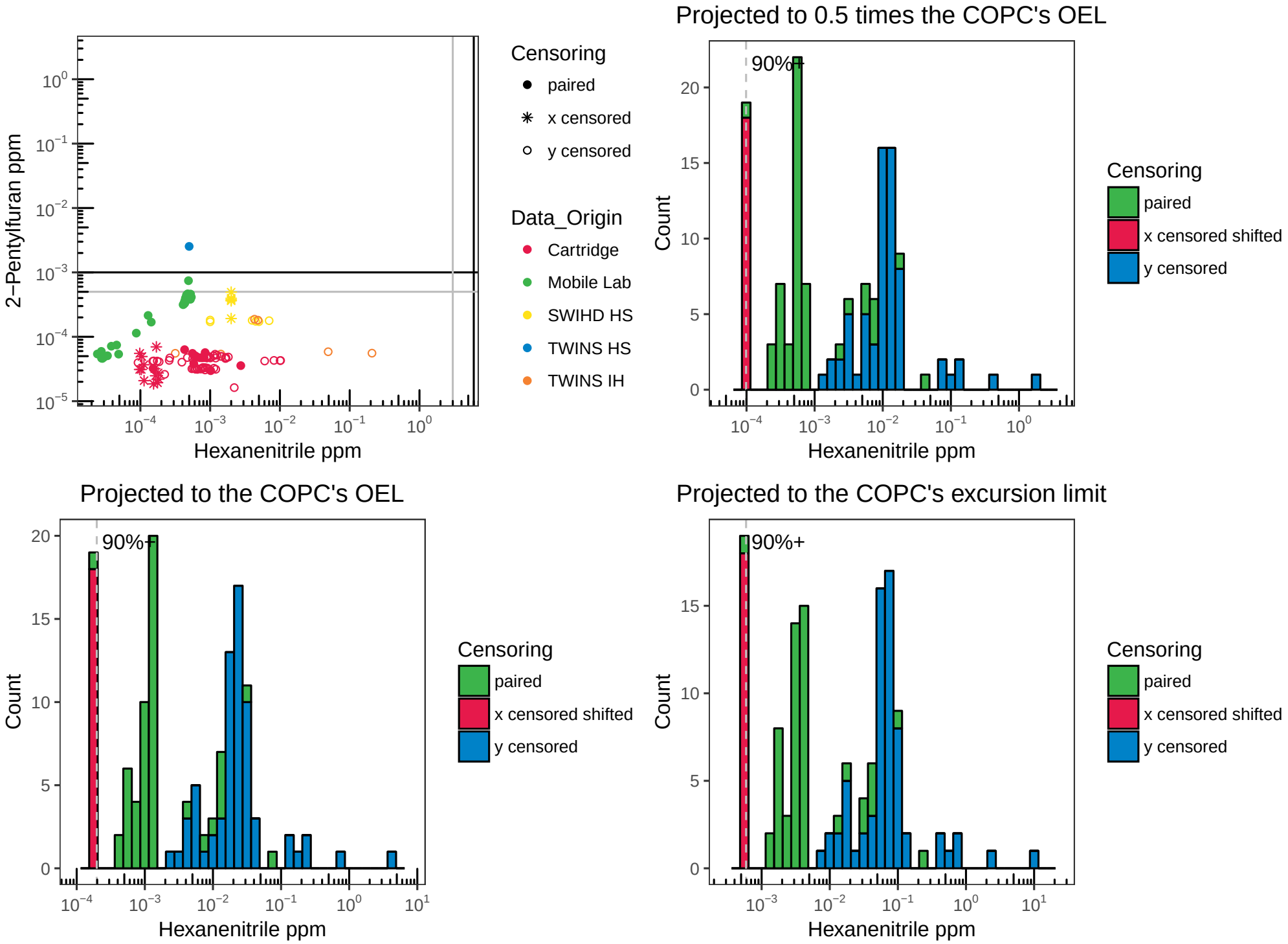


Figure C.1881: 2-Pentylfuran vs Hexanenitrile

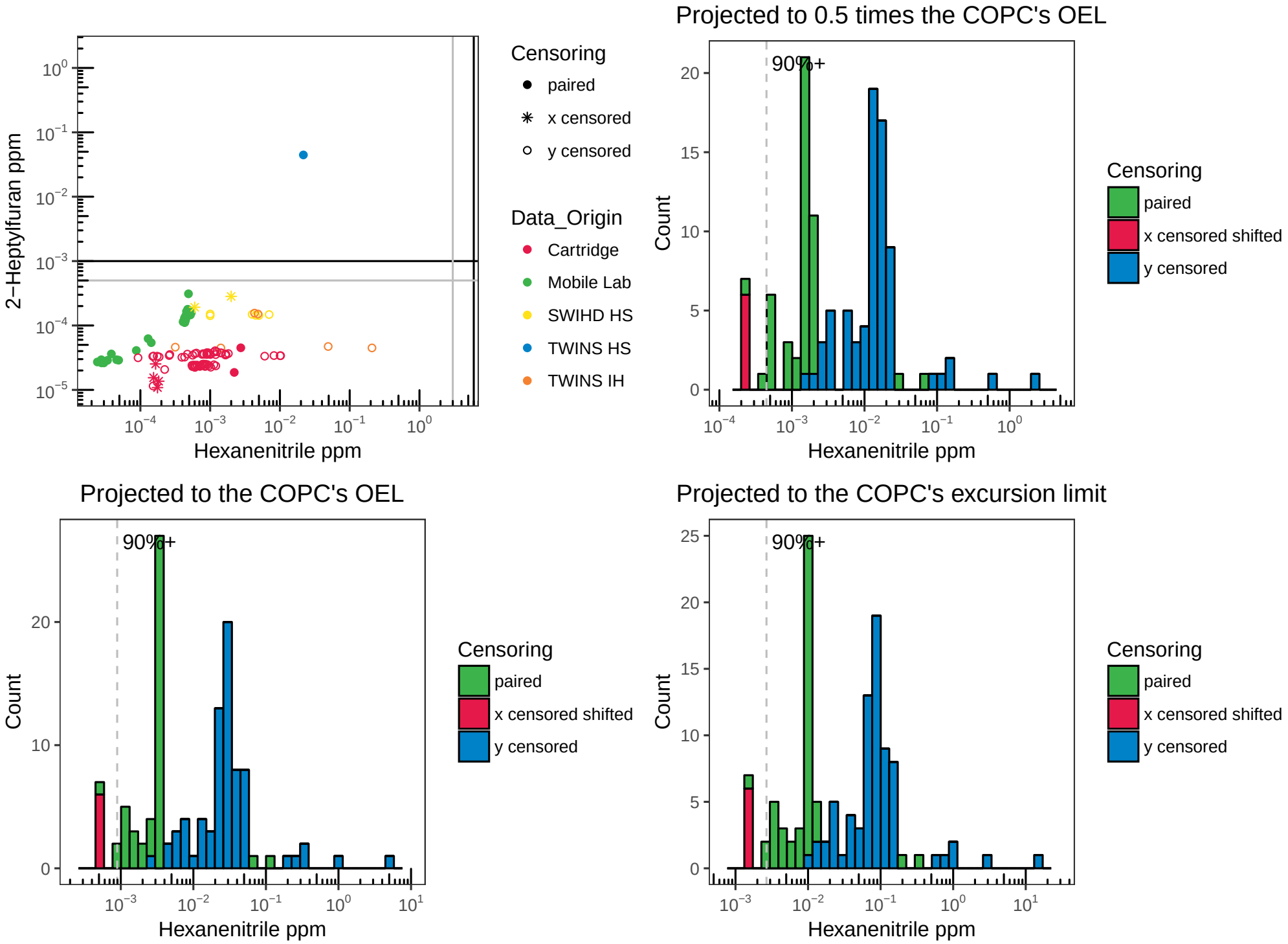


Figure C.1882: 2-Heptylfuran vs Hexanenitrile

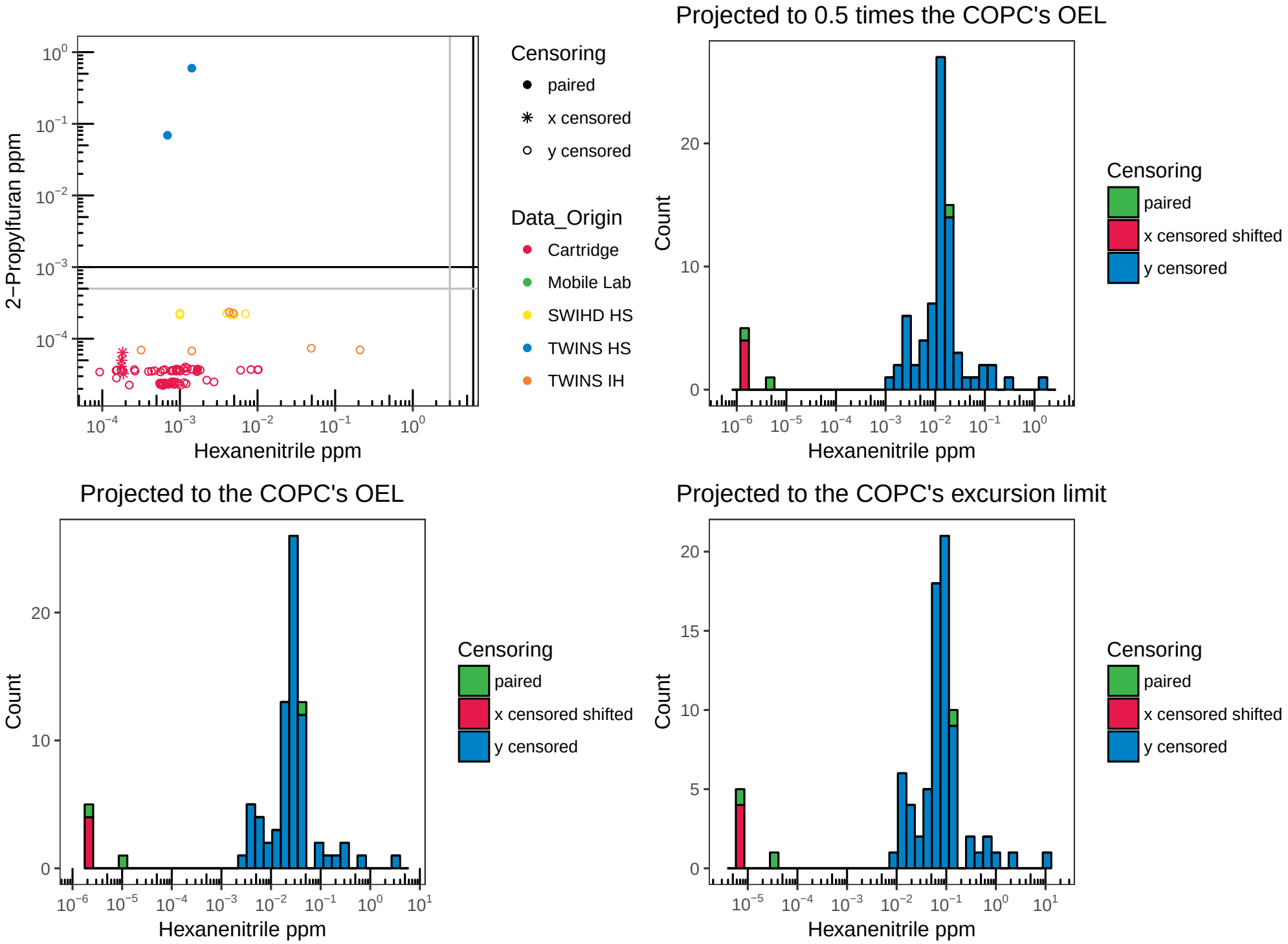


Figure C.1883: 2-Propylfuran vs Hexanenitrile

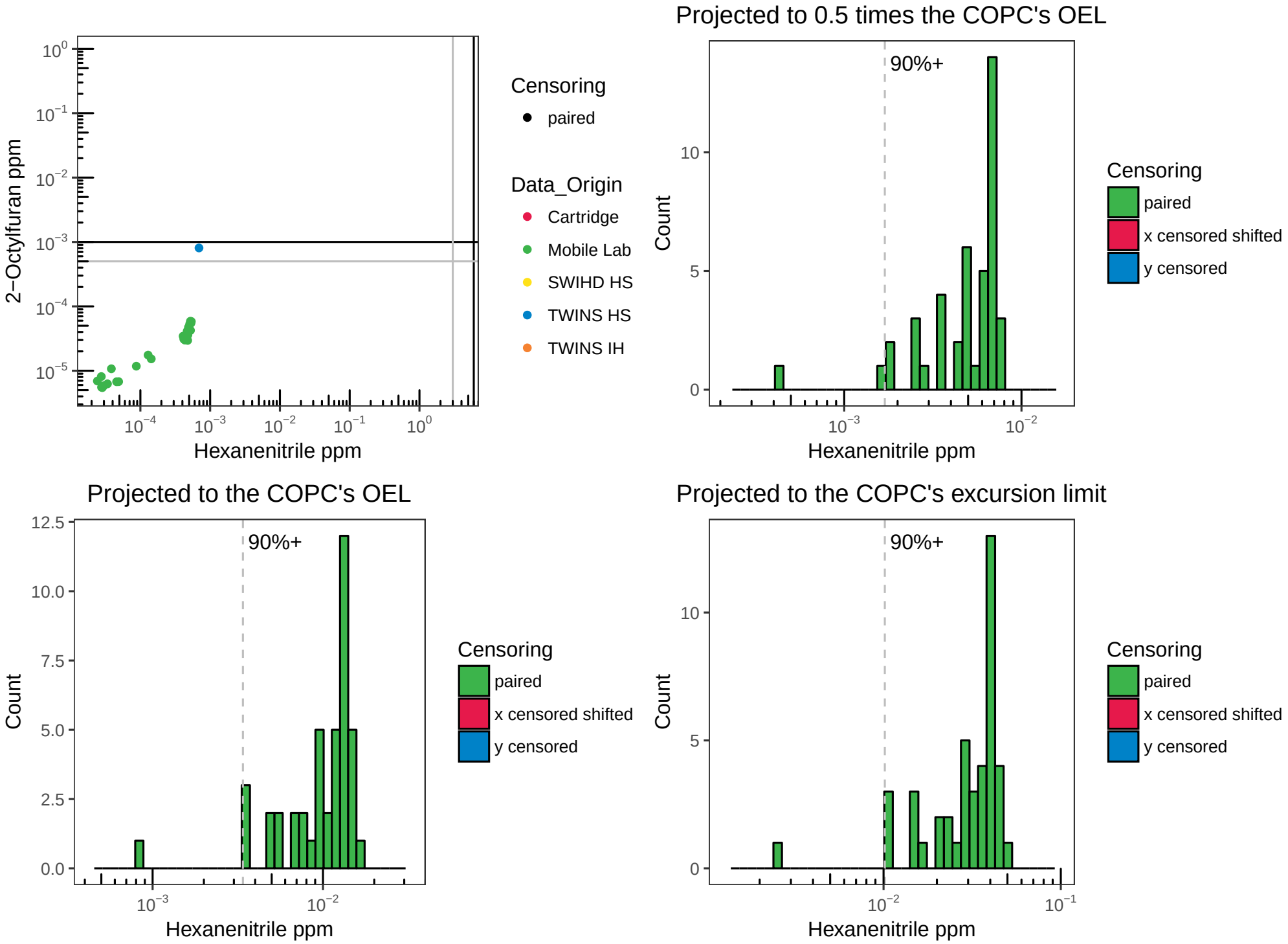


Figure C.1884: 2-Octylfuran vs Hexanenitrile

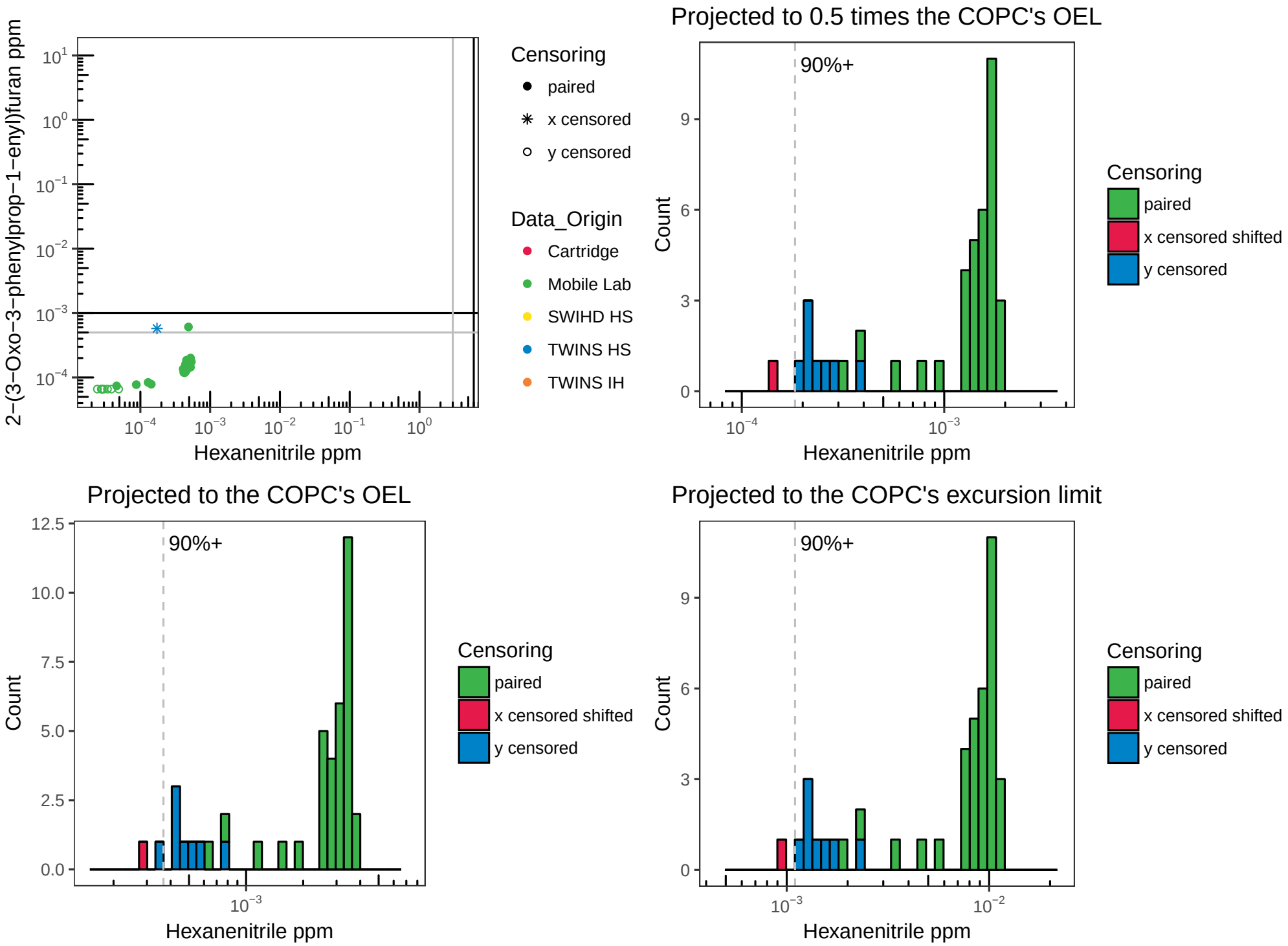


Figure C.1885: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Hexanenitrile

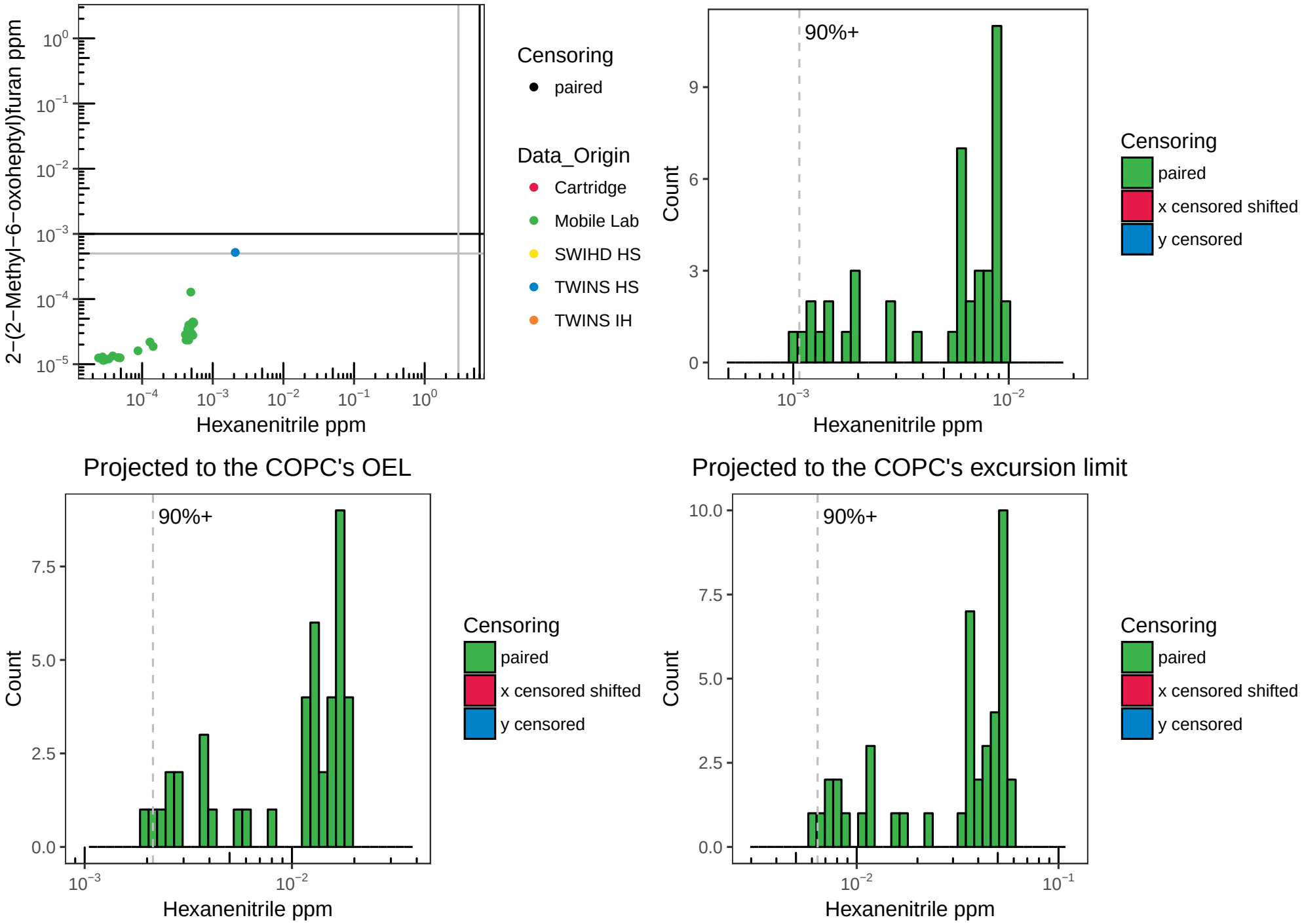


Figure C.1886: 2-(2-Methyl-6-oxoheptyl)furan vs Hexanenitrile

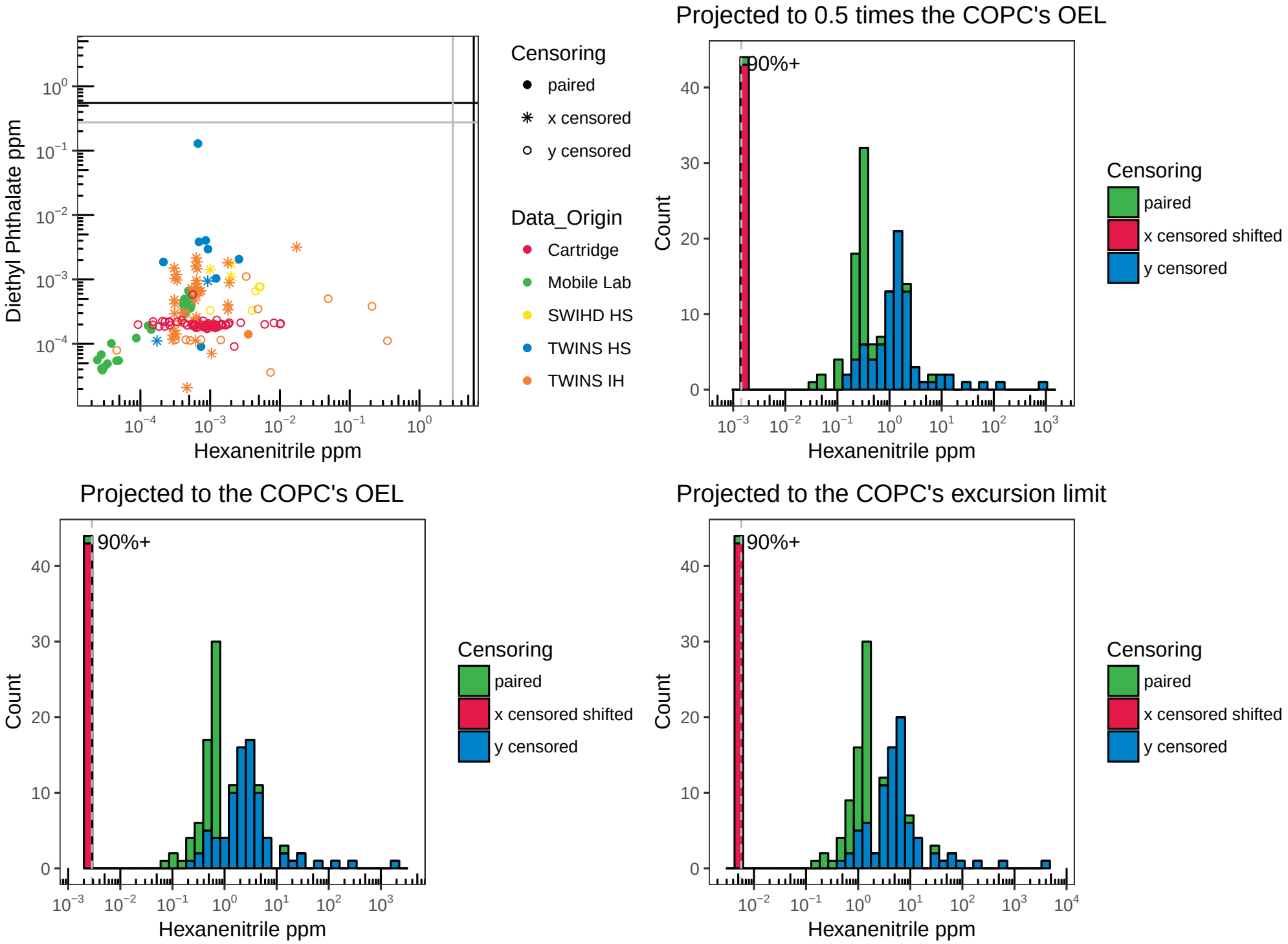


Figure C.1887: Diethyl Phthalate vs Hexanenitrile

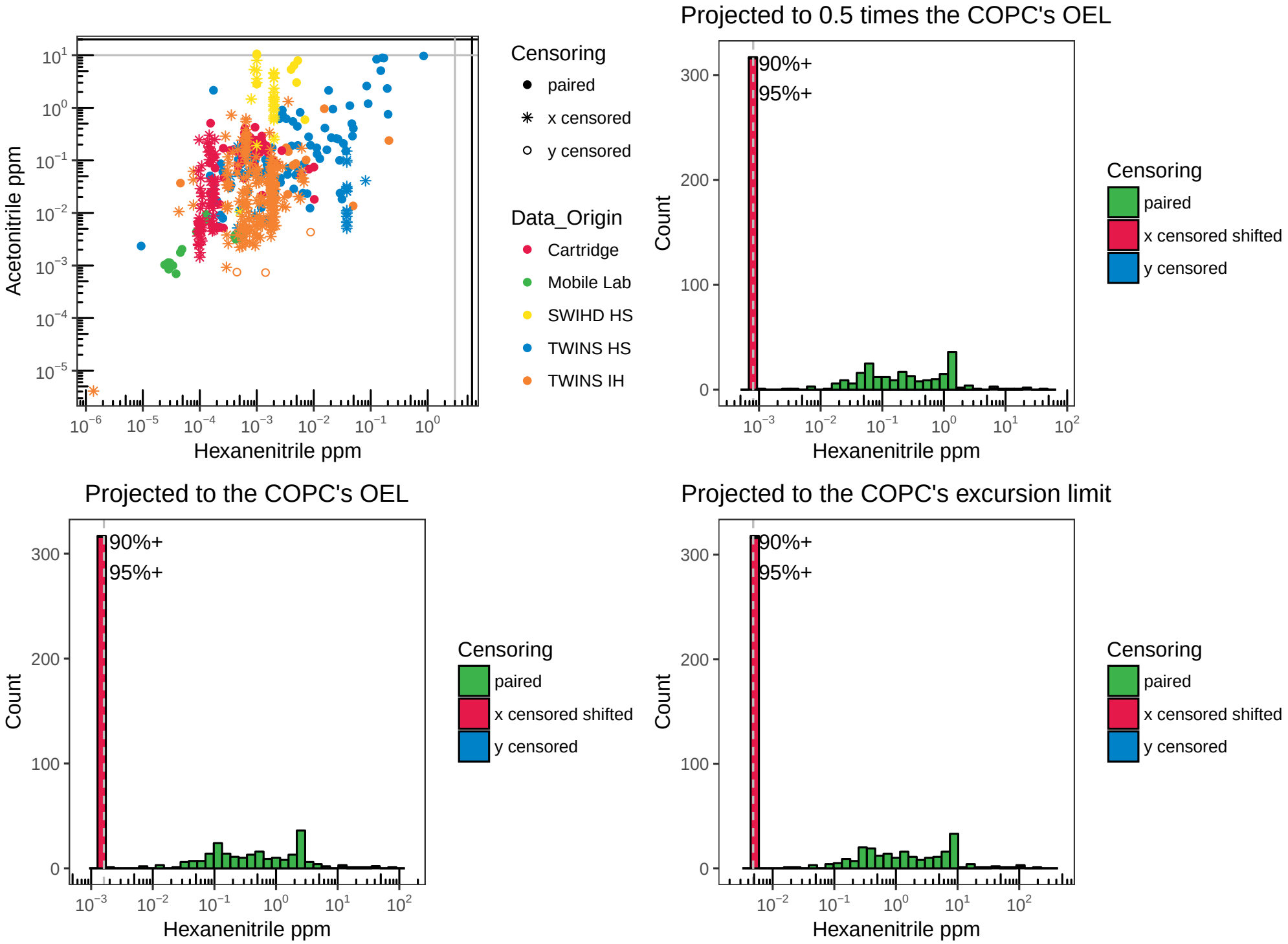


Figure C.1888: Acetonitrile vs Hexanenitrile

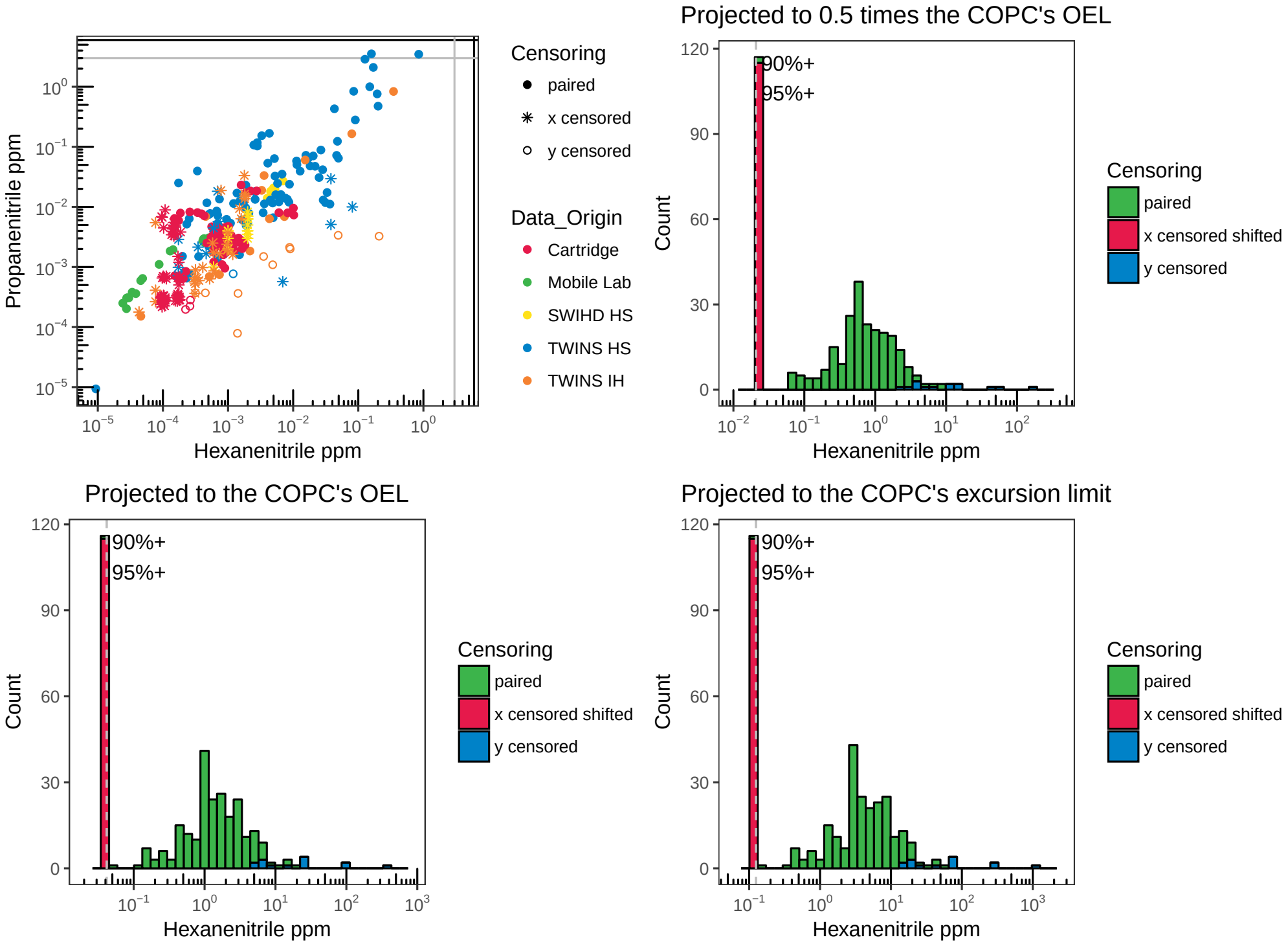


Figure C.1889: Propanenitrile vs Hexanenitrile

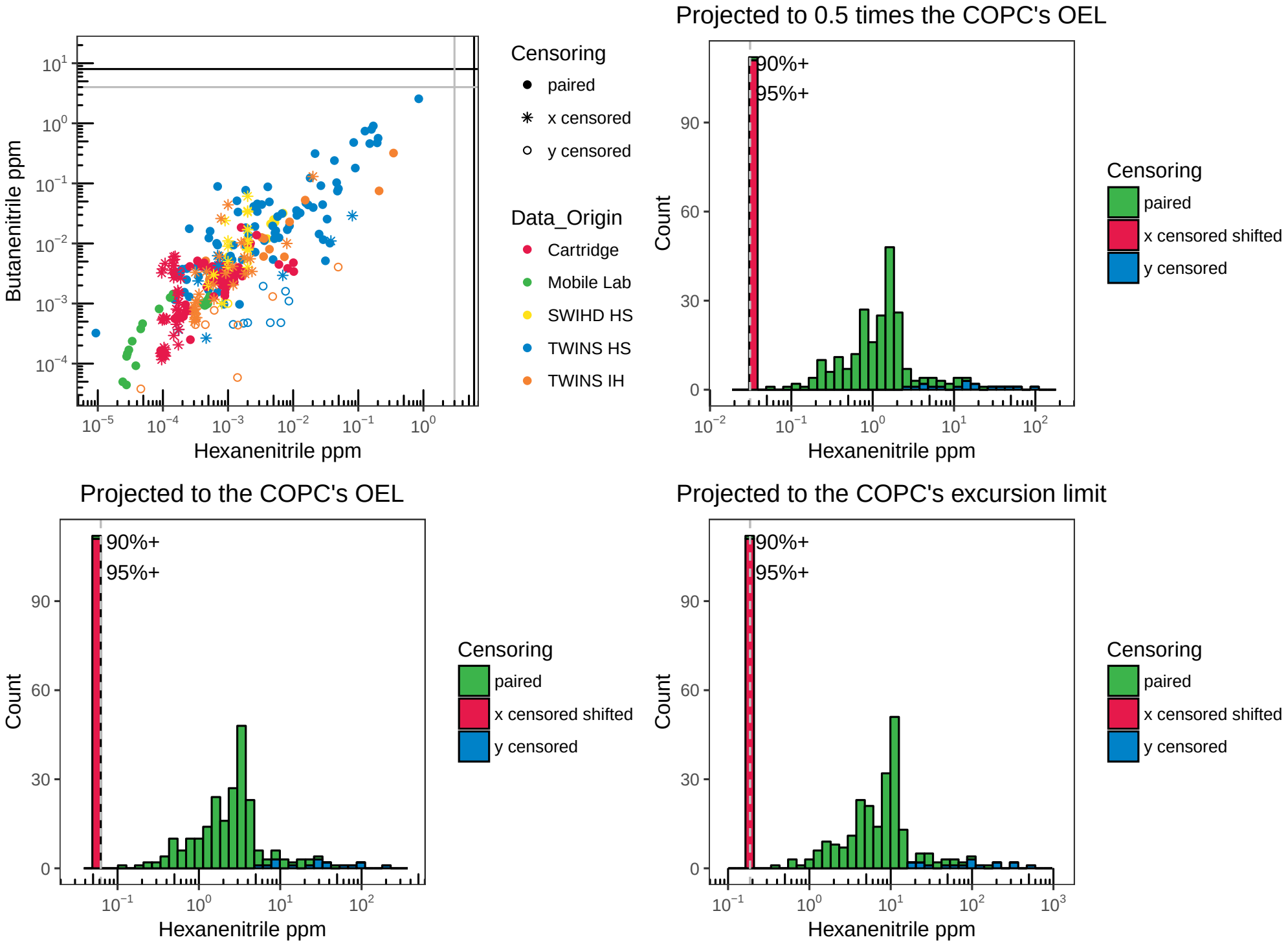


Figure C.1890: Butanenitrile vs Hexanenitrile

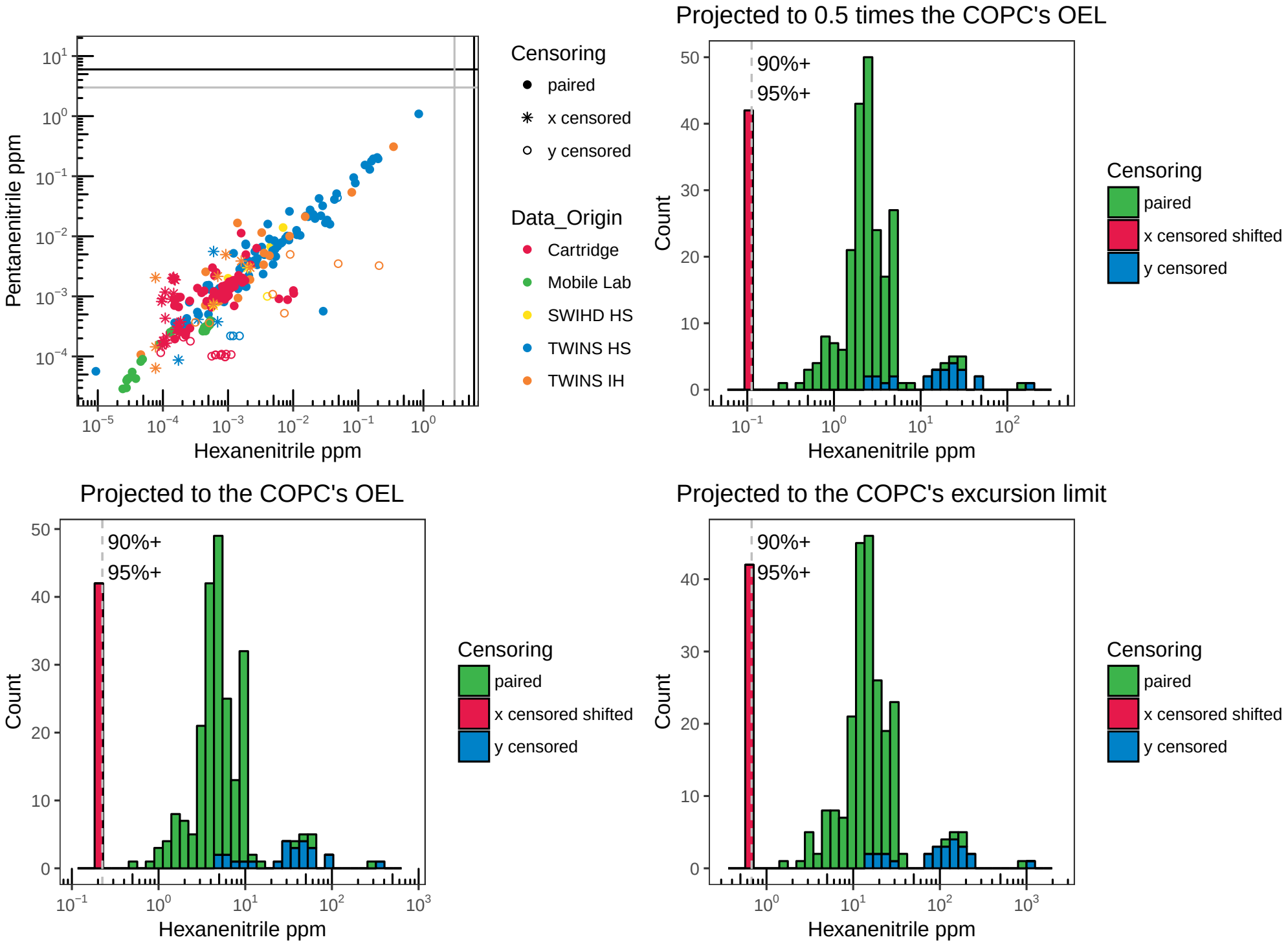


Figure C.1891: Pentanenitrile vs Hexanenitrile

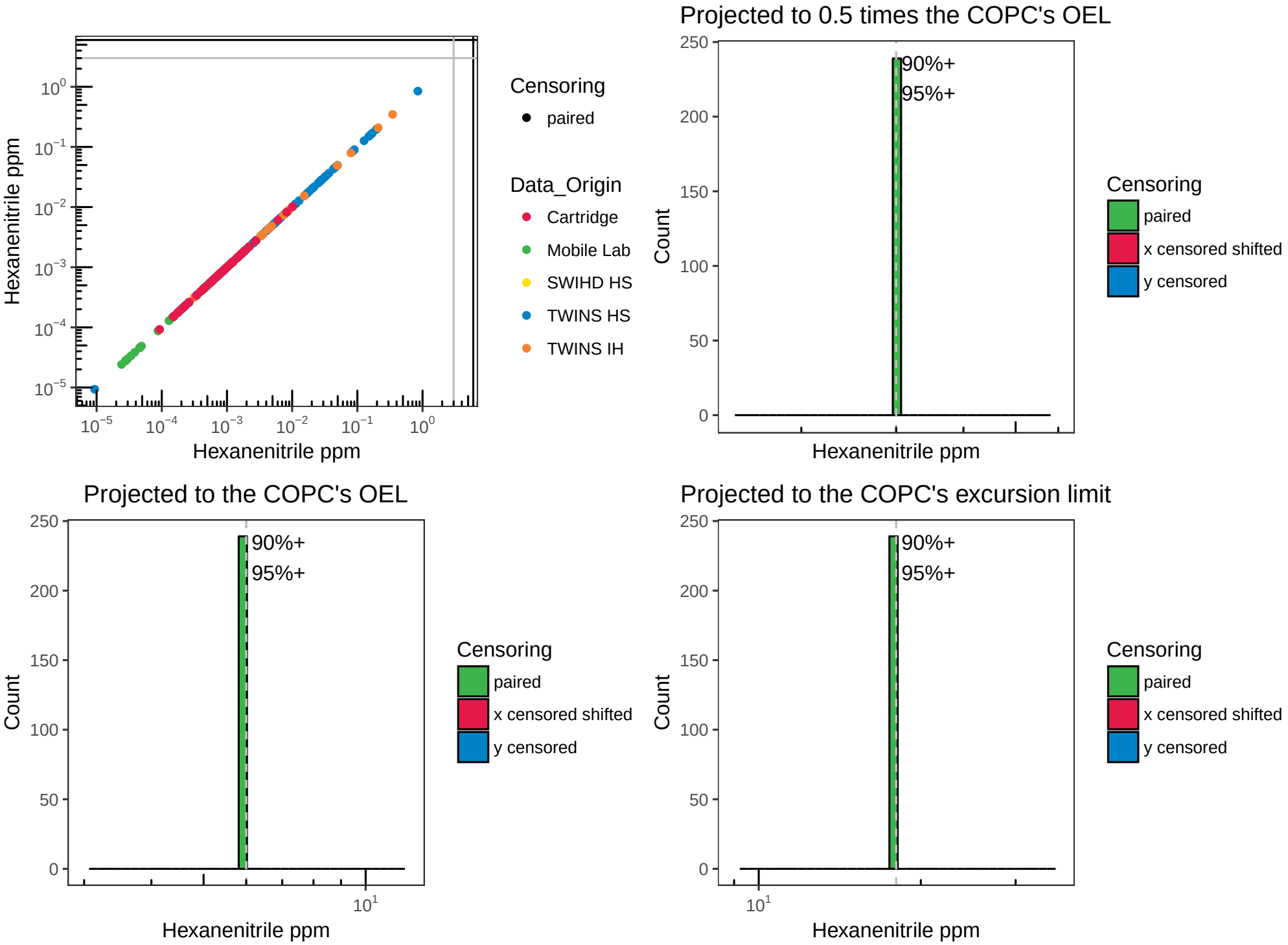


Figure C.1892: Hexanenitrile vs Hexanenitrile

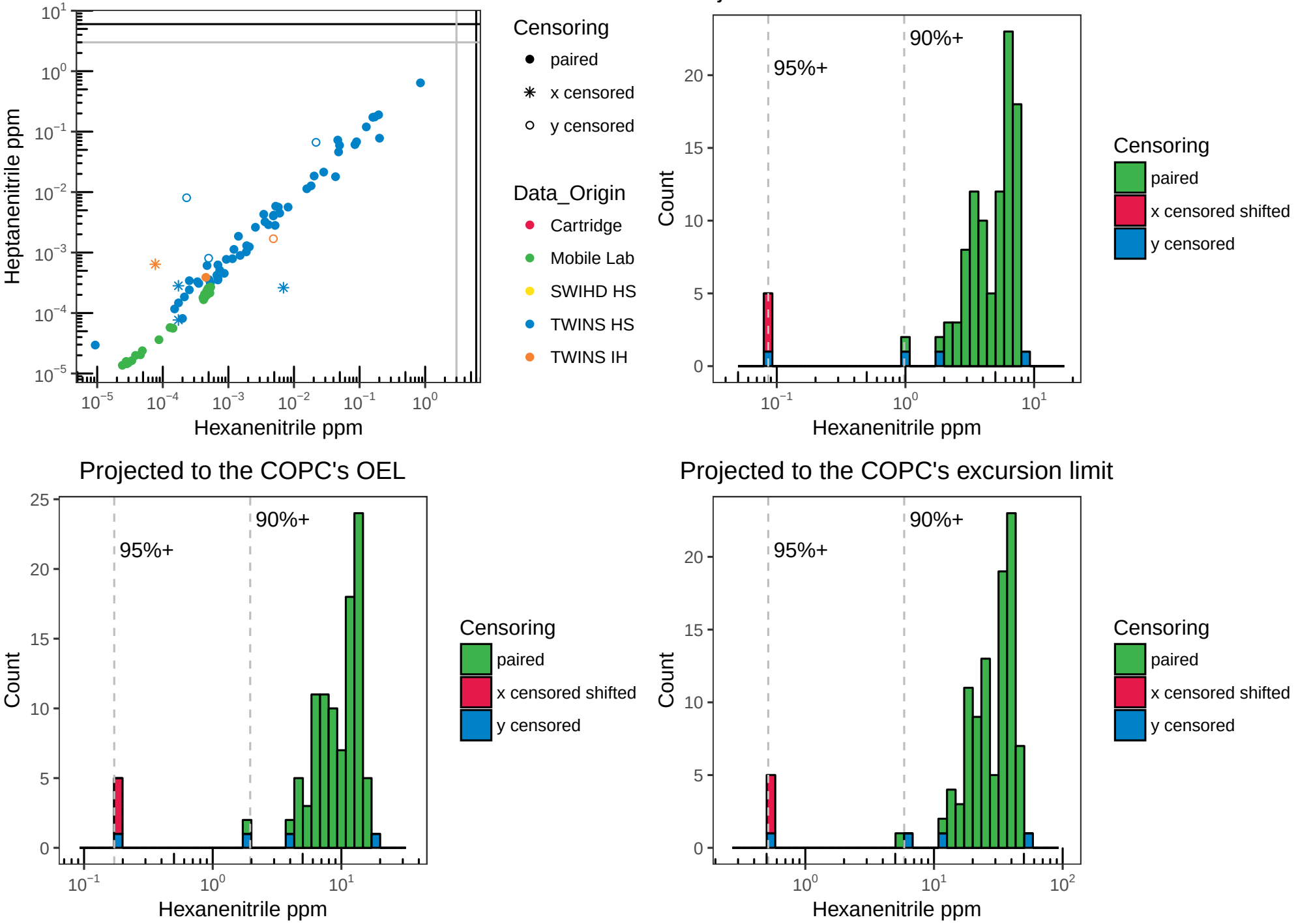


Figure C.1893: Heptanenitrile vs Hexanenitrile

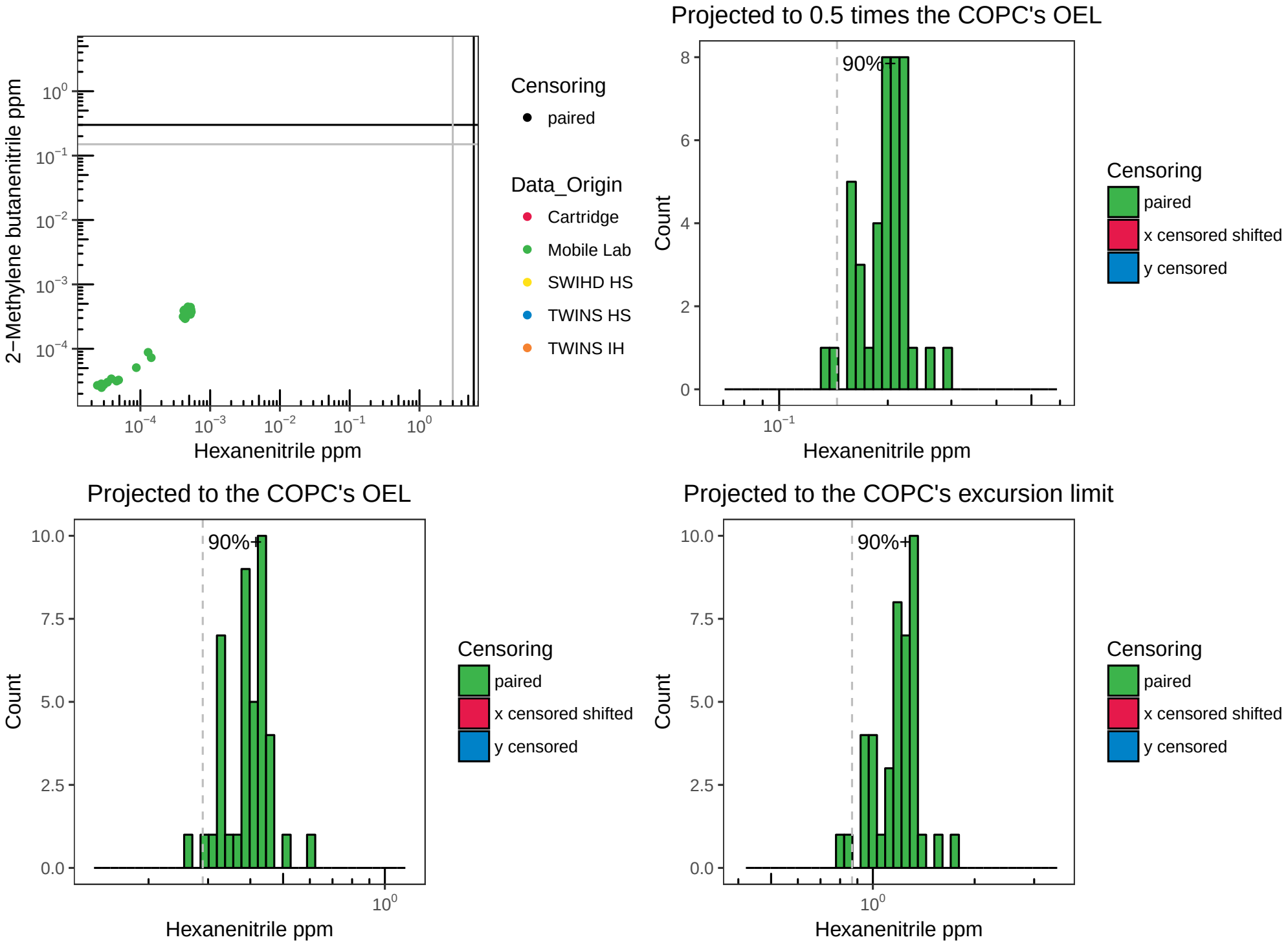


Figure C.1894: 2-Methylene butanenitrile vs Hexanenitrile

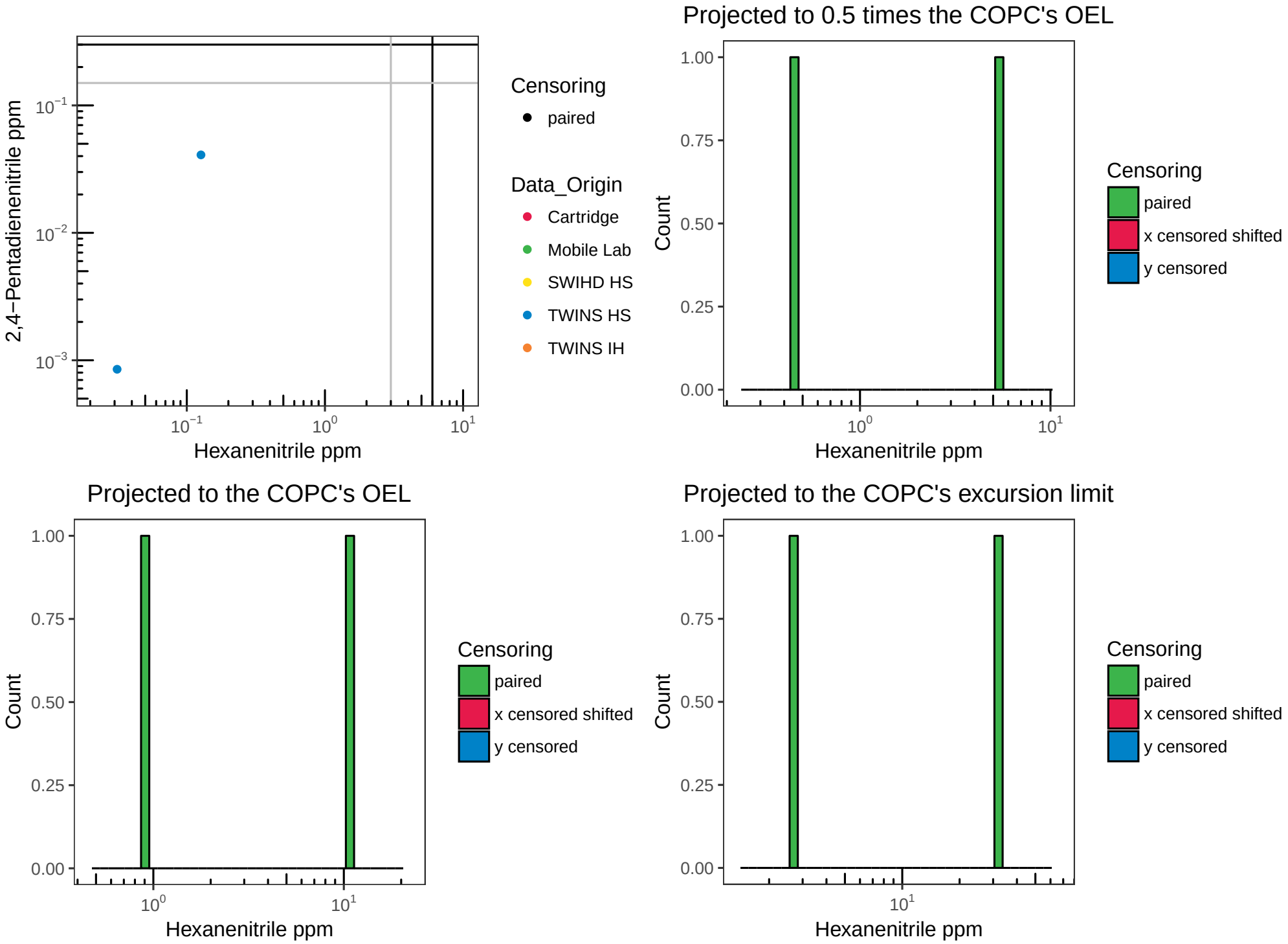


Figure C.1895: 2,4-Pentadienenitrile vs Hexanenitrile

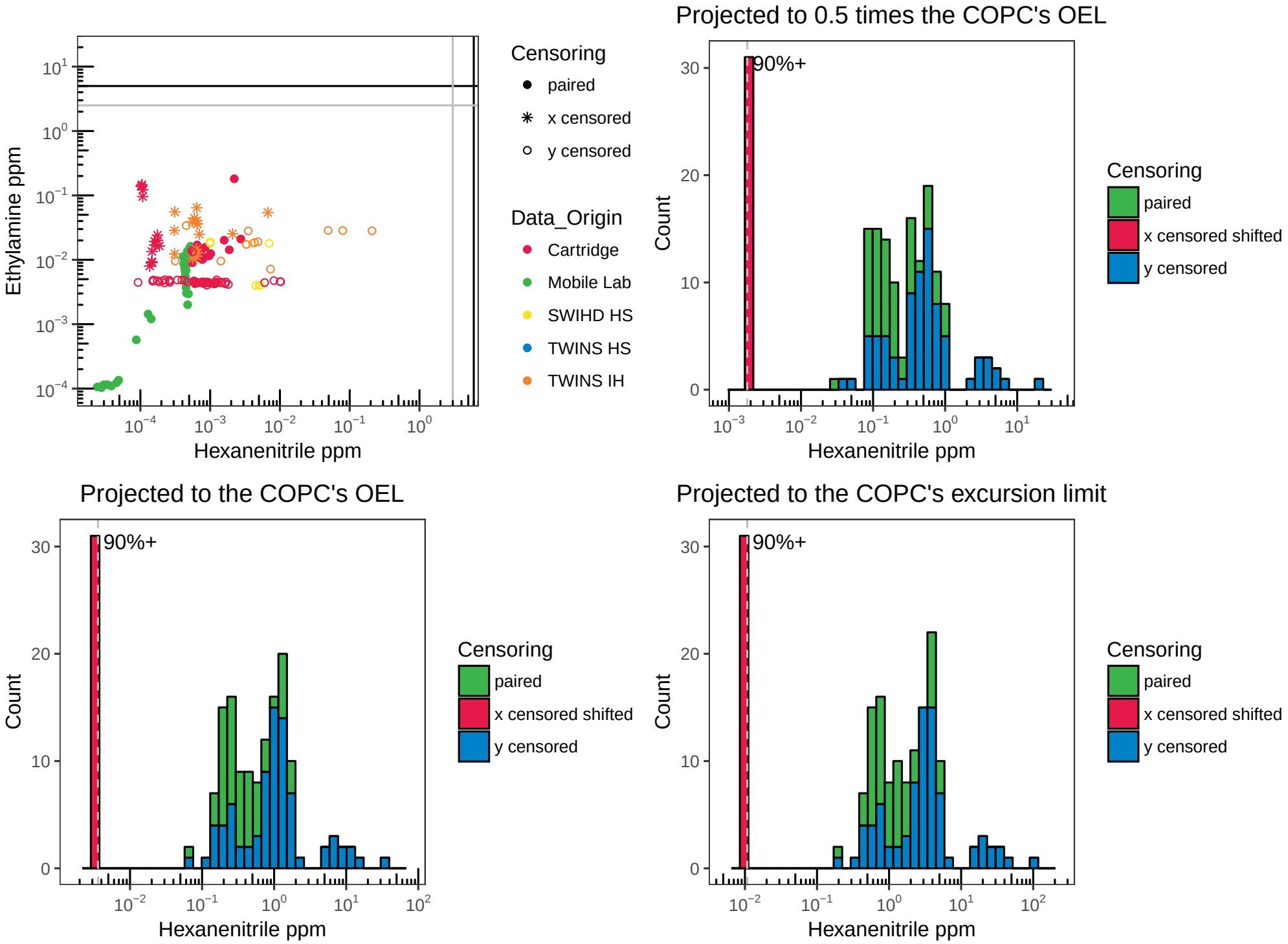


Figure C.1896: Ethylamine vs Hexanenitrile

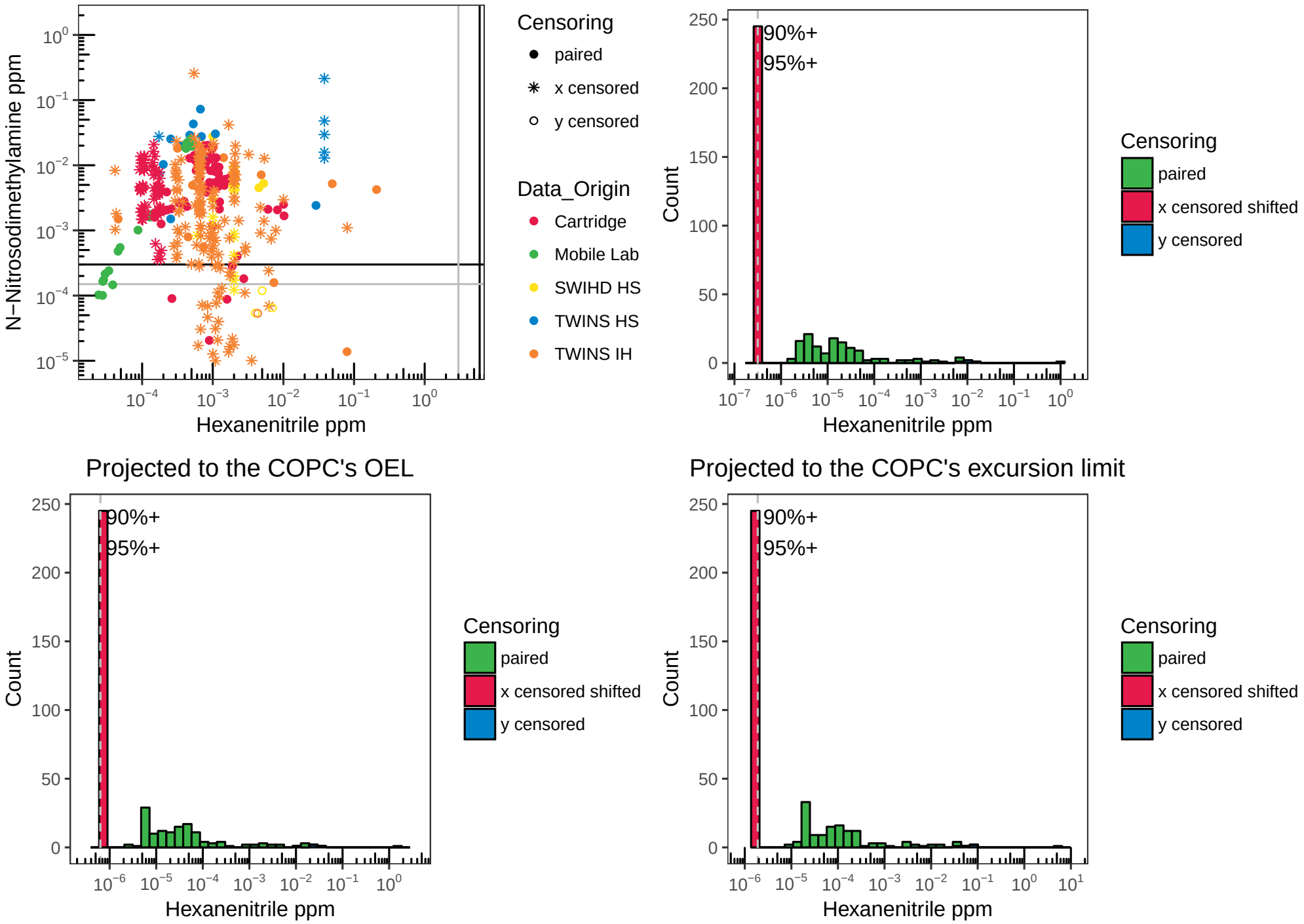


Figure C.1897: N-Nitrosodimethylamine vs Hexanenitrile

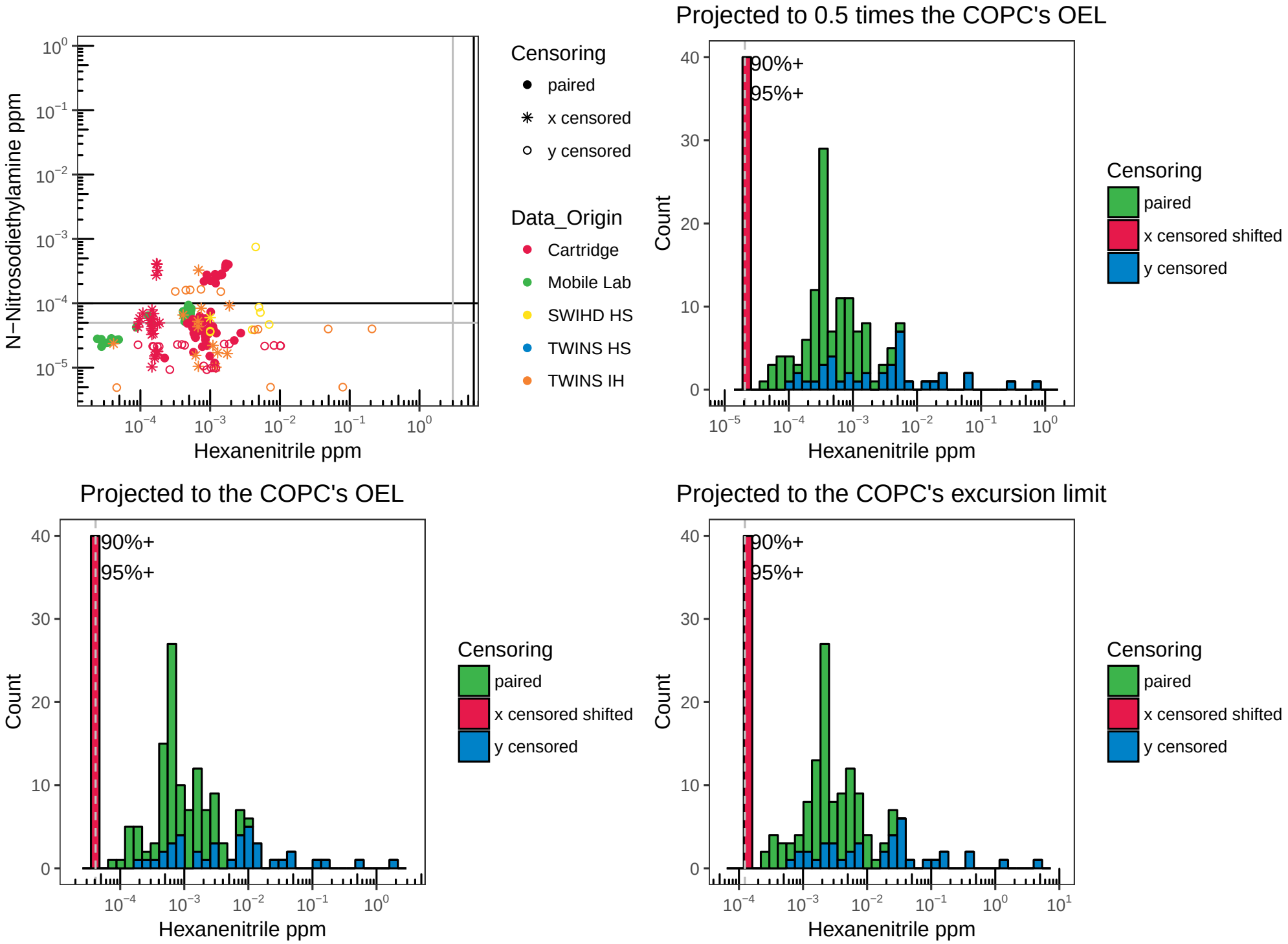


Figure C.1898: N-Nitrosodiethylamine vs Hexanenitrile

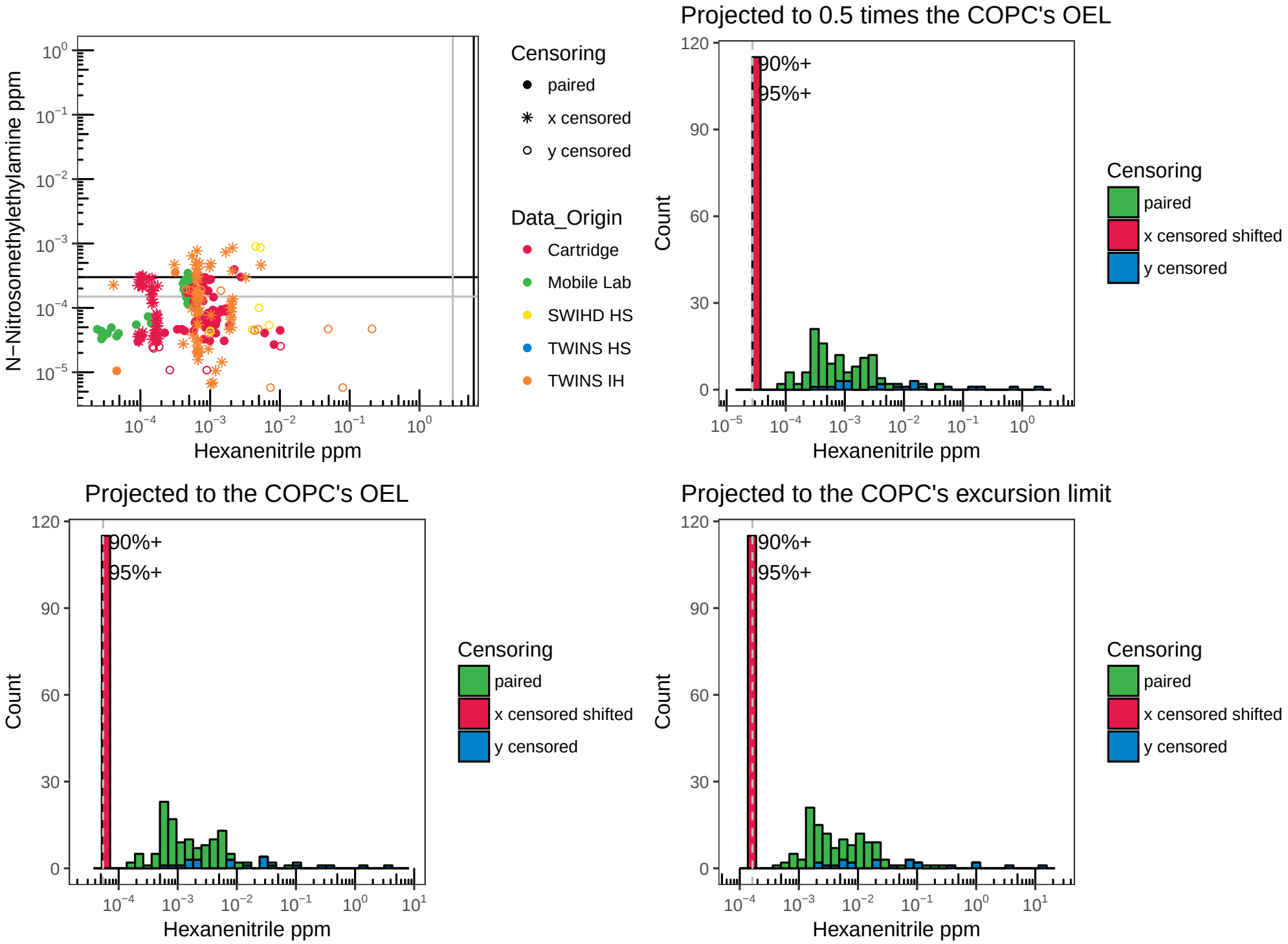


Figure C.1899: N-Nitrosomethylethylamine vs Hexanenitrile

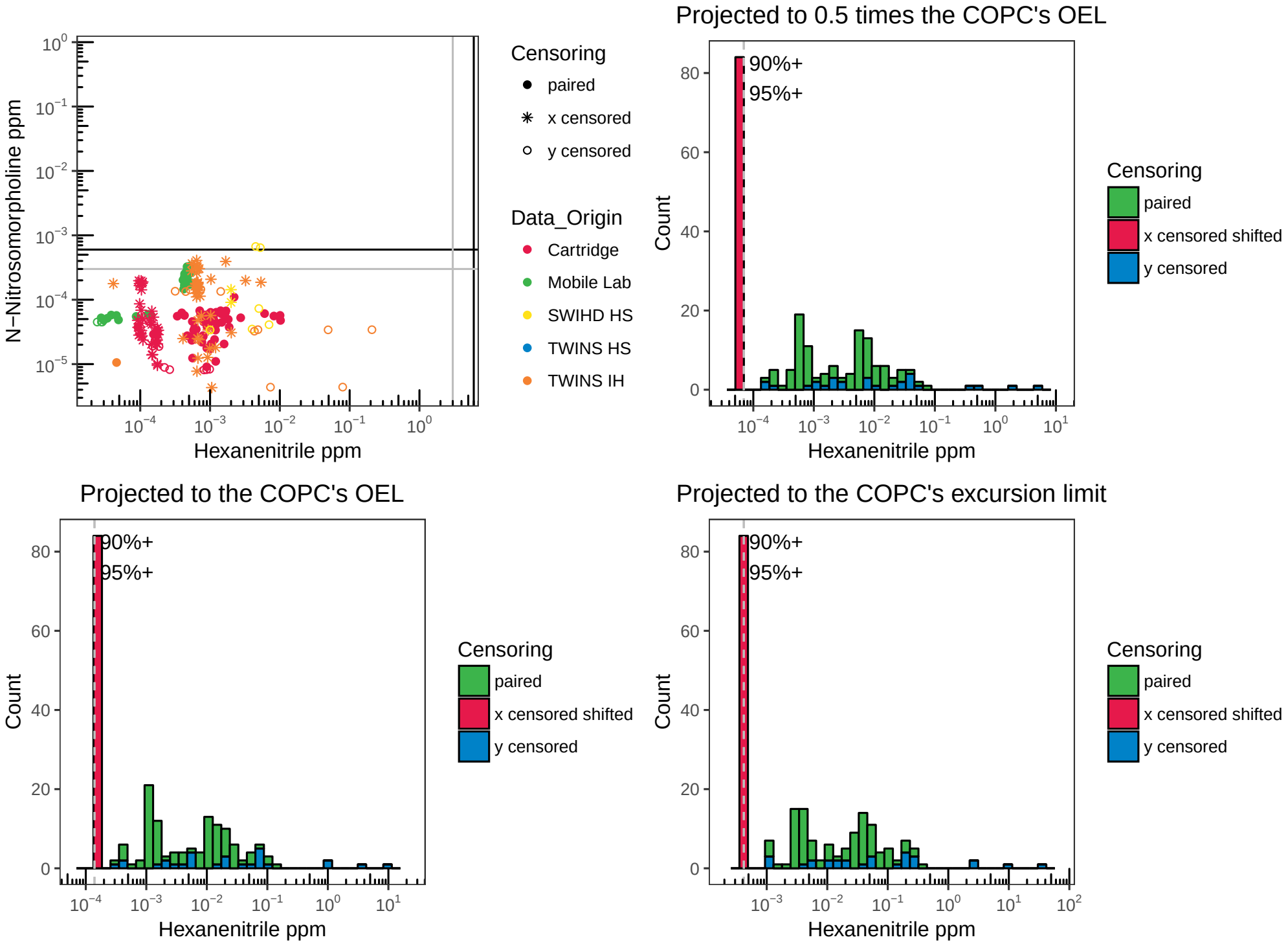


Figure C.1900: N-Nitrosomorpholine vs Hexanenitrile

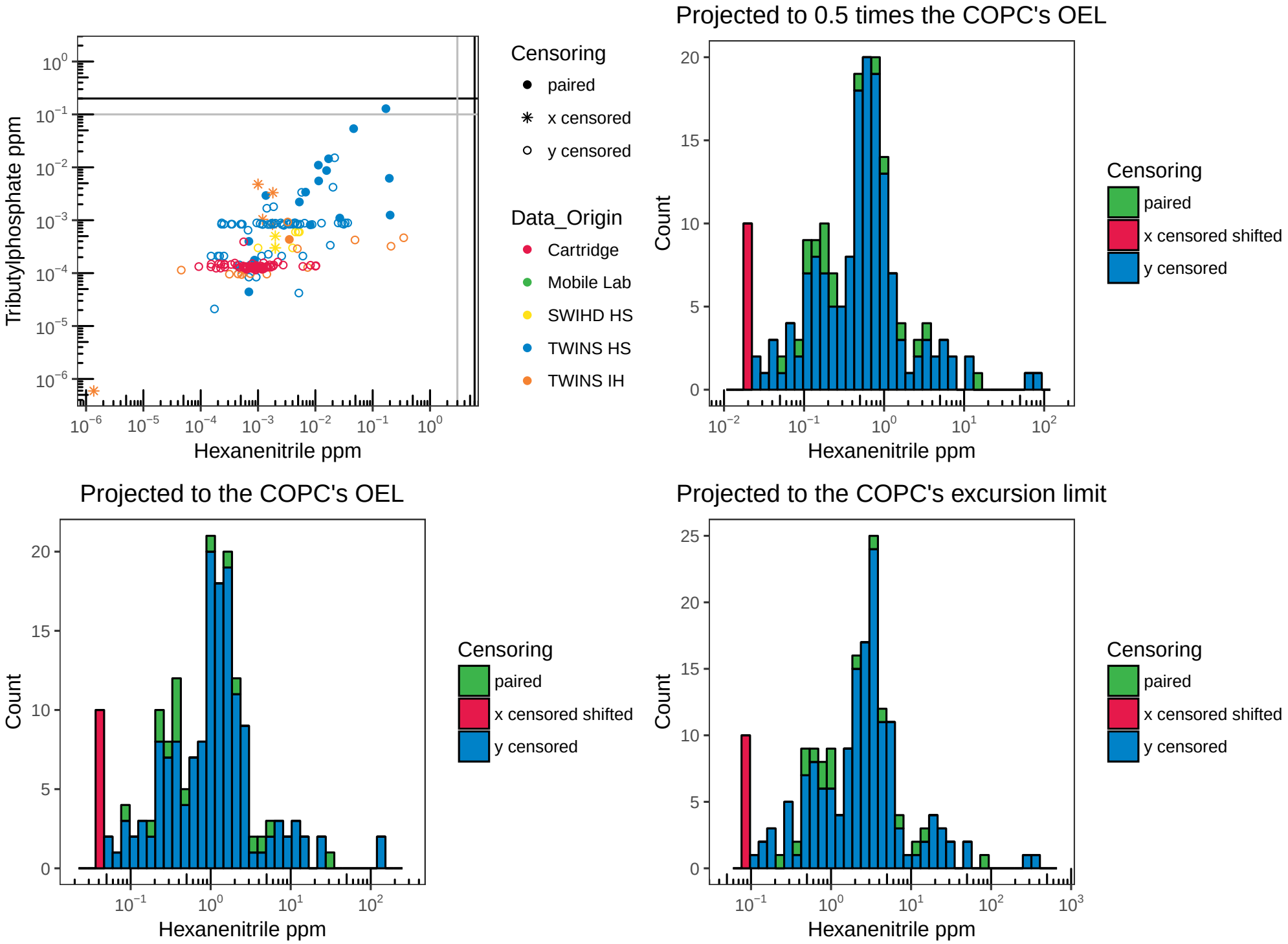


Figure C.1901: Tributylphosphate vs Hexanenitrile

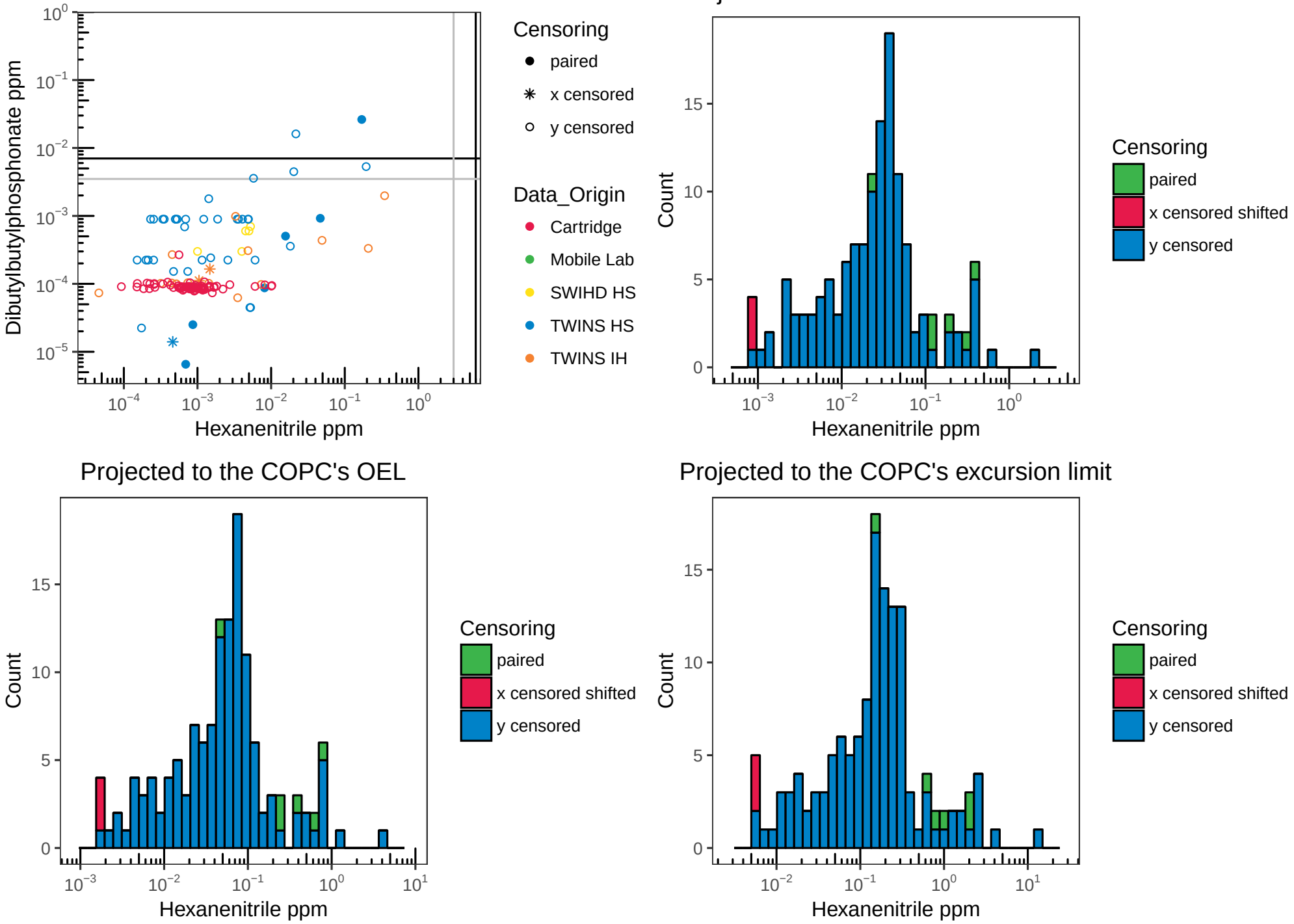


Figure C.1902: Dibutylbutylphosphonate vs Hexanenitrile

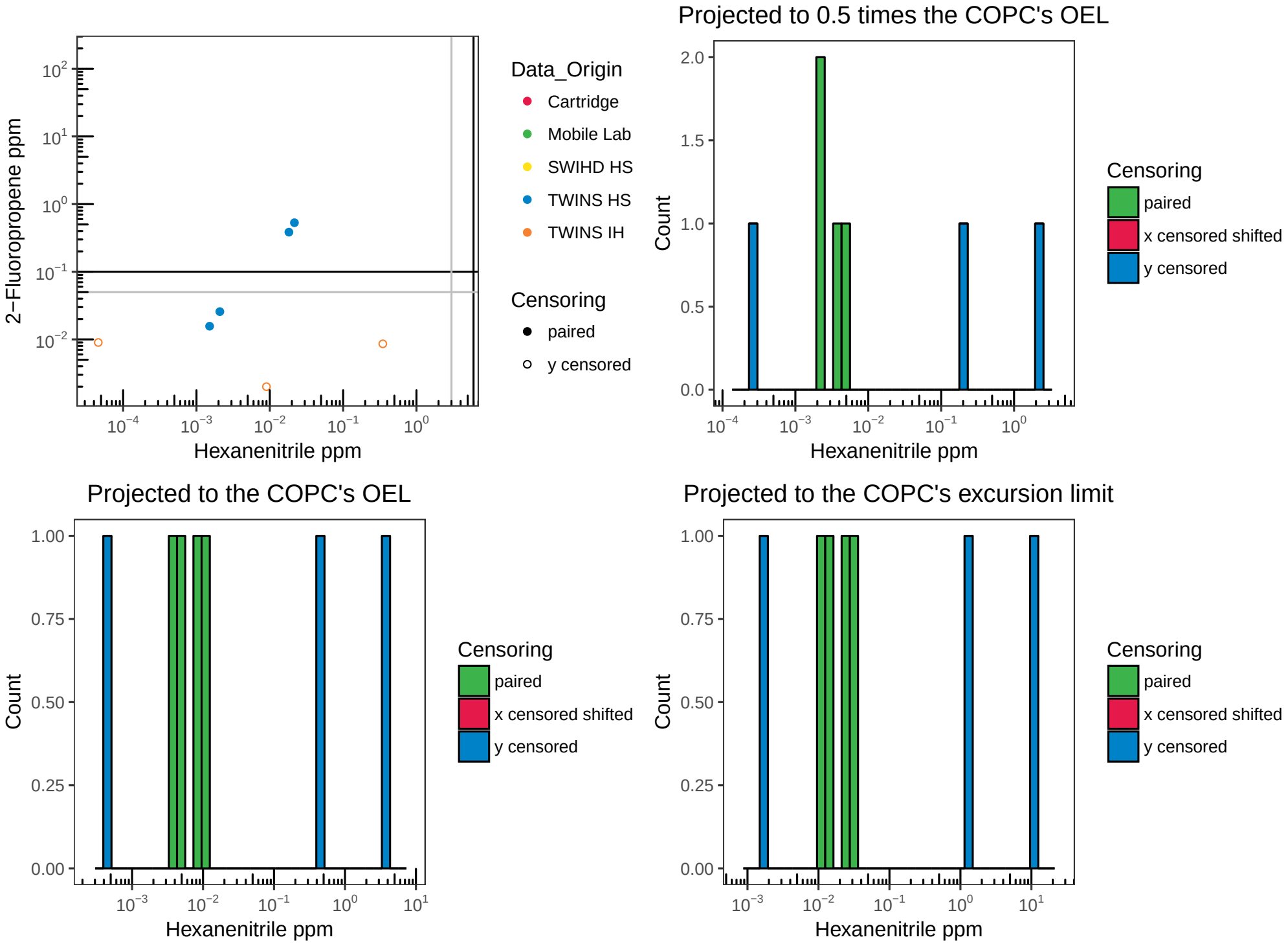


Figure C.1903: 2-Fluoropropene vs Hexanenitrile

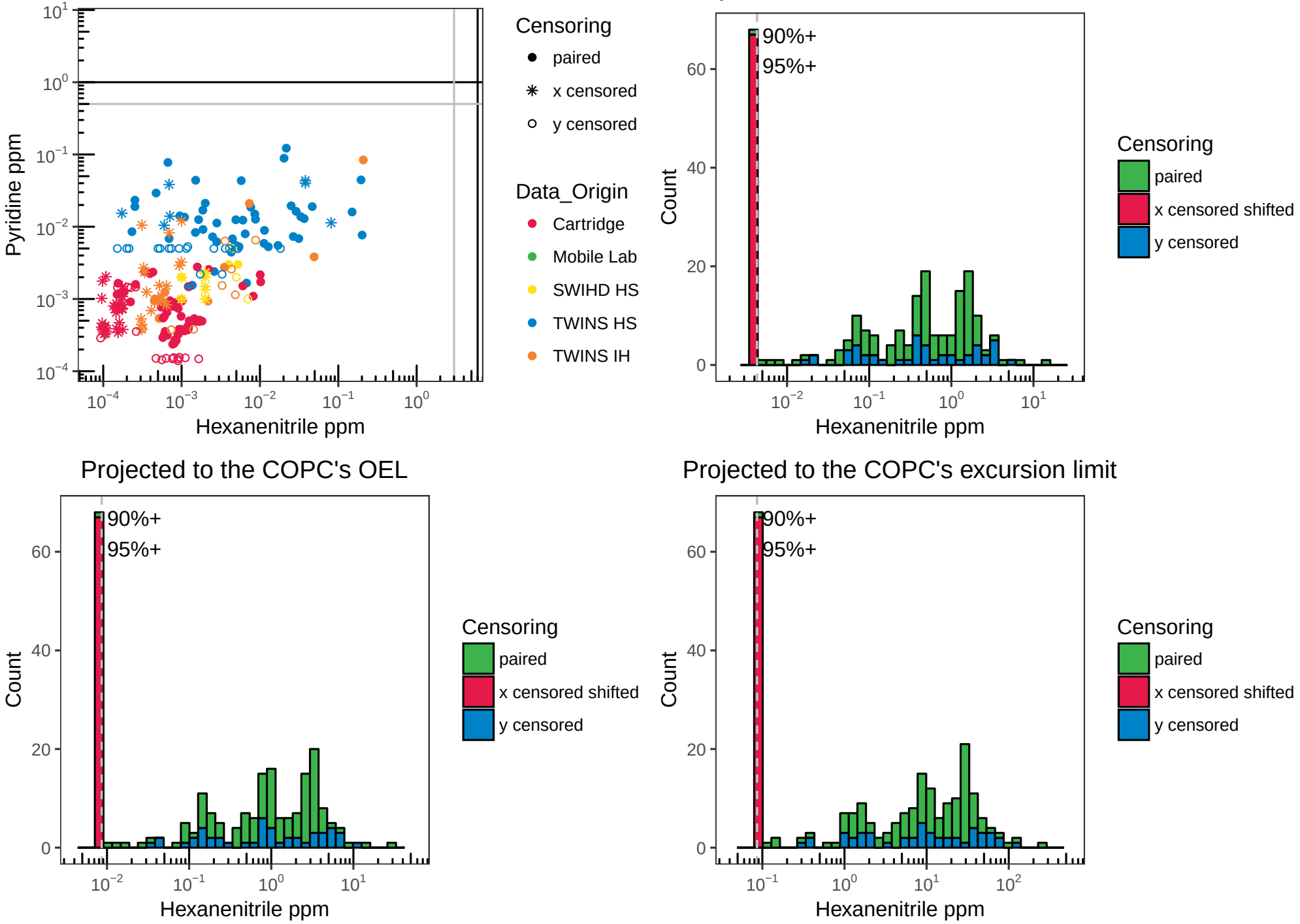


Figure C.1904: Pyridine vs Hexanenitrile

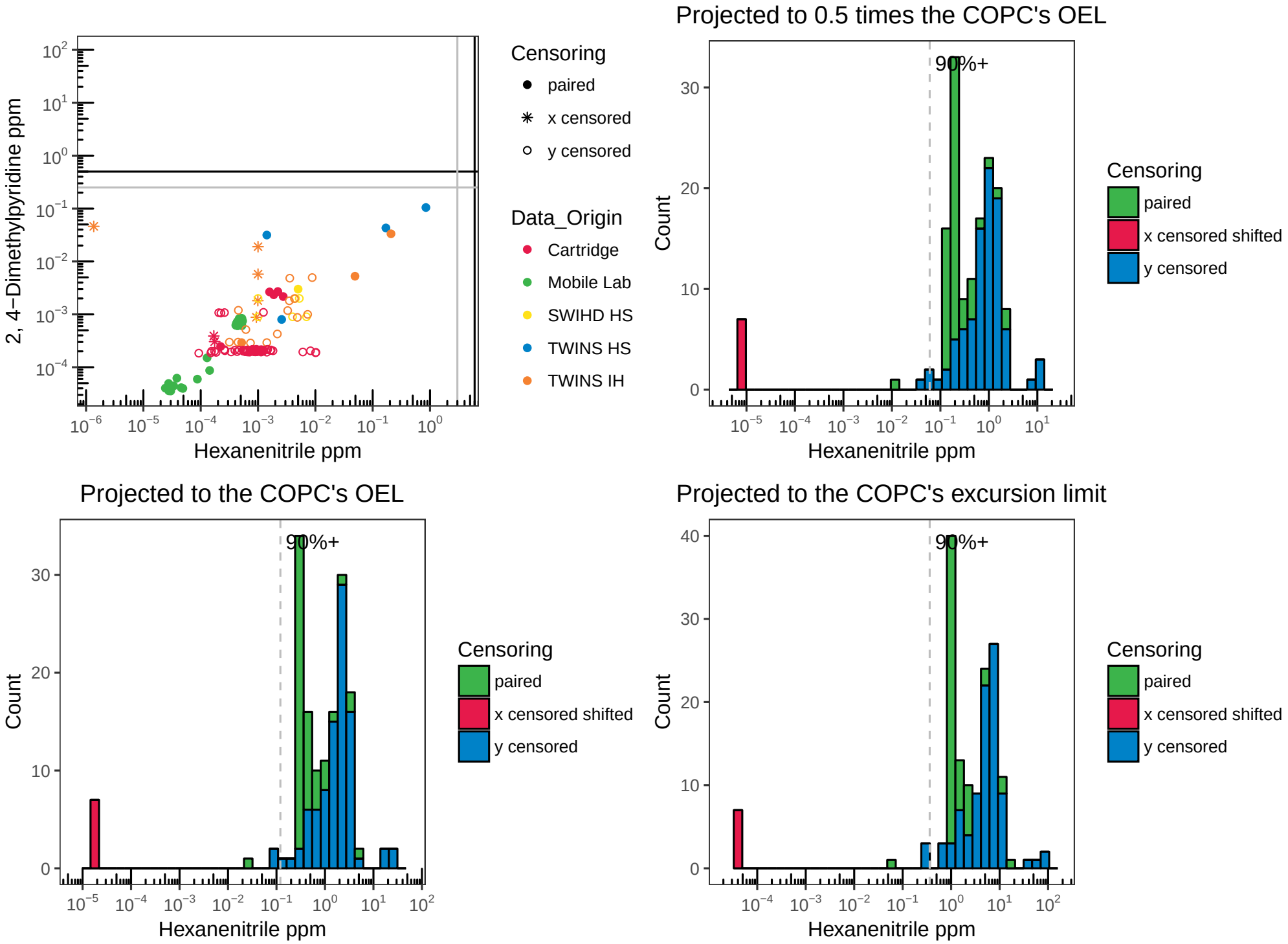


Figure C.1905: 2, 4-Dimethylpyridine vs Hexanenitrile

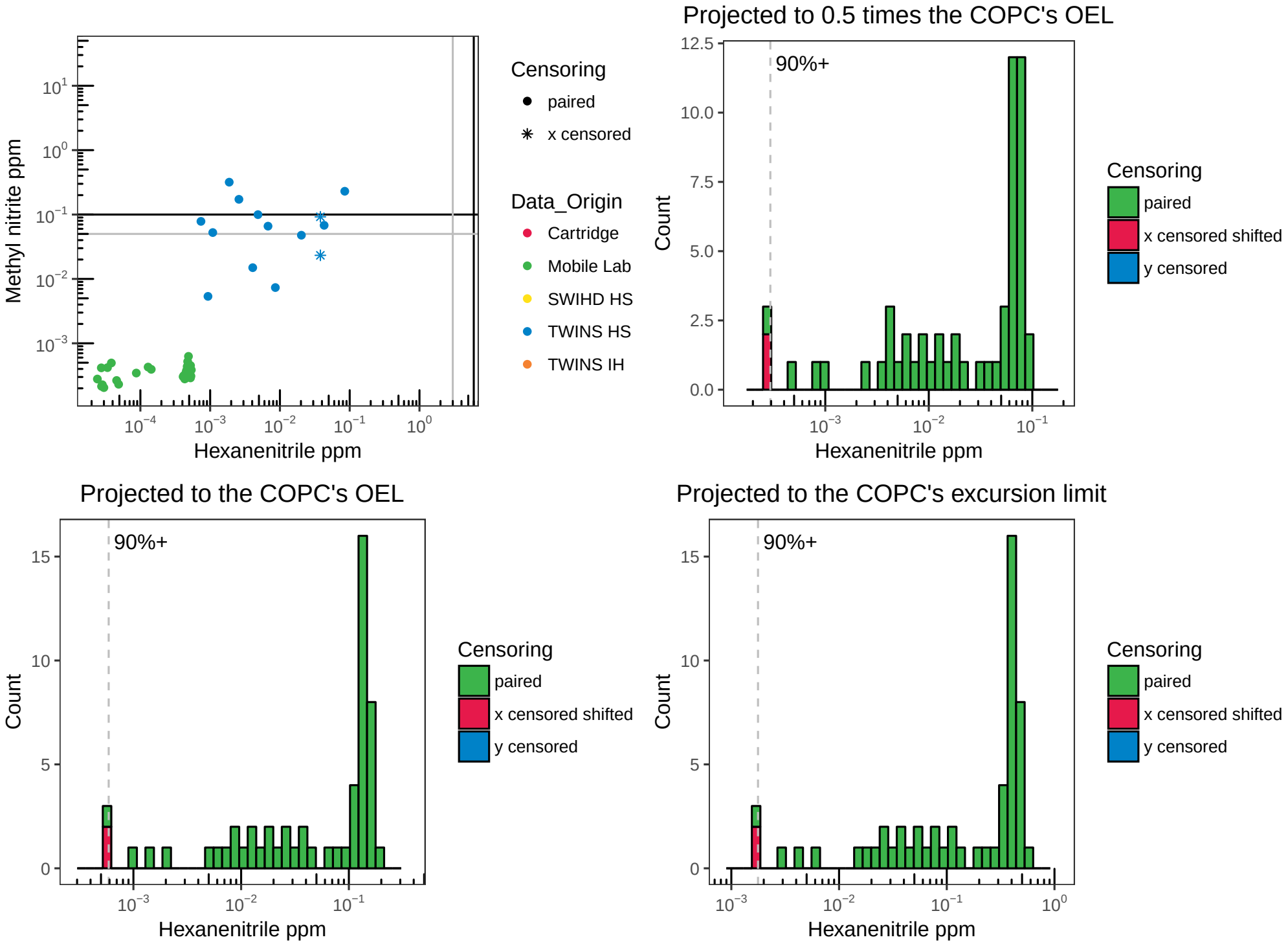


Figure C.1906: Methyl nitrite vs Hexanenitrile

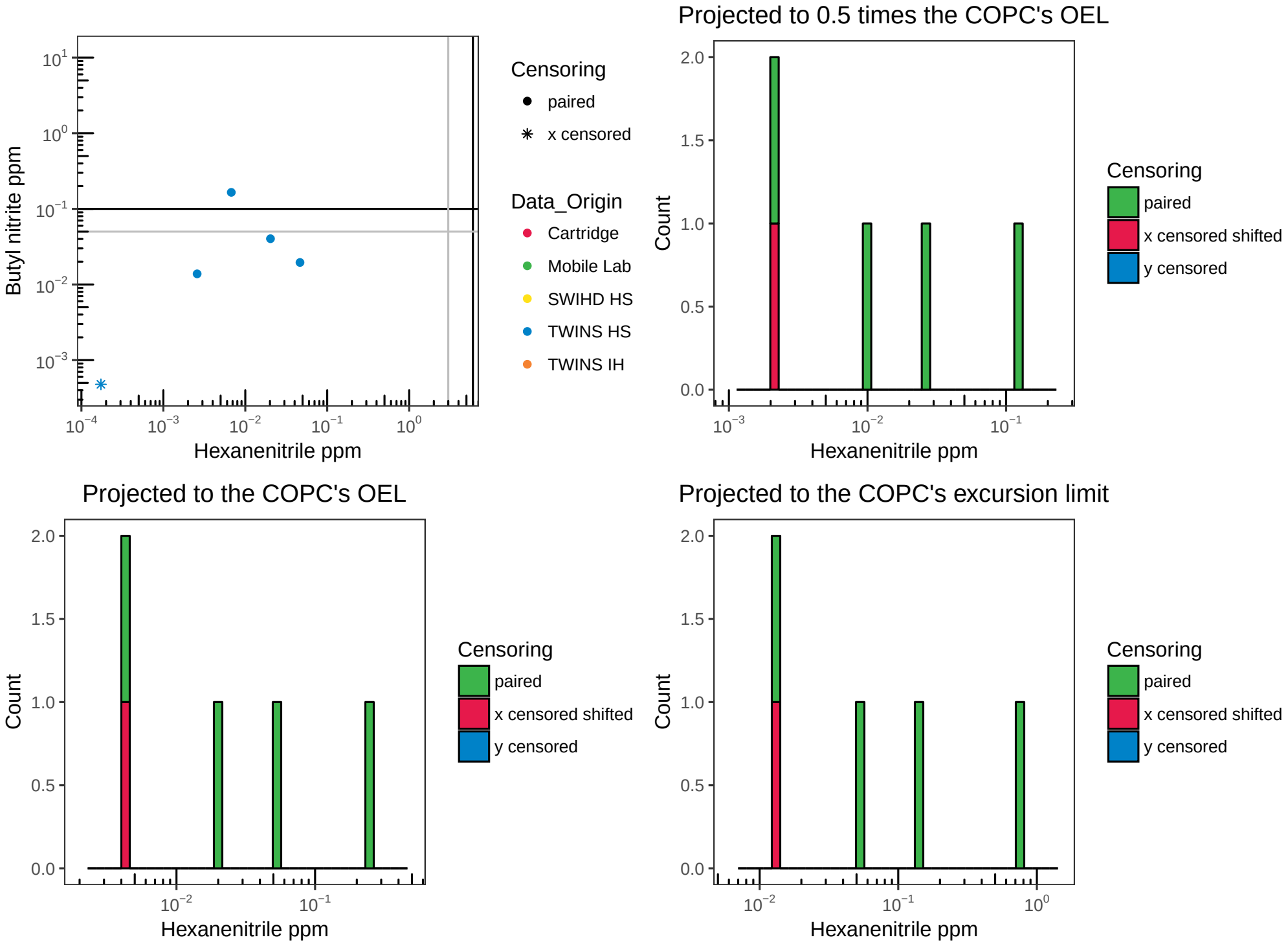


Figure C.1907: Butyl nitrite vs Hexanenitrile

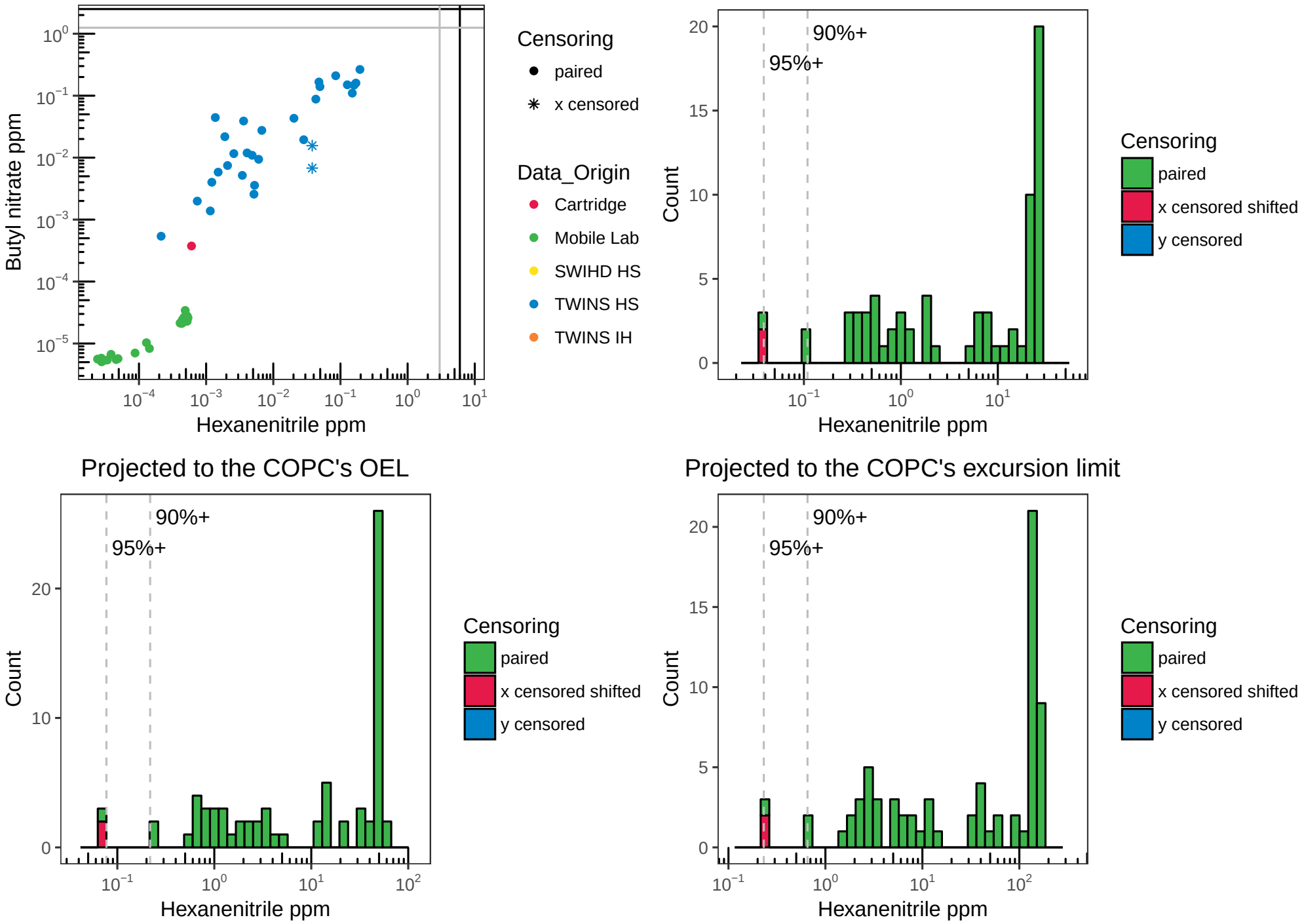


Figure C.1908: Butyl nitrate vs Hexanenitrile

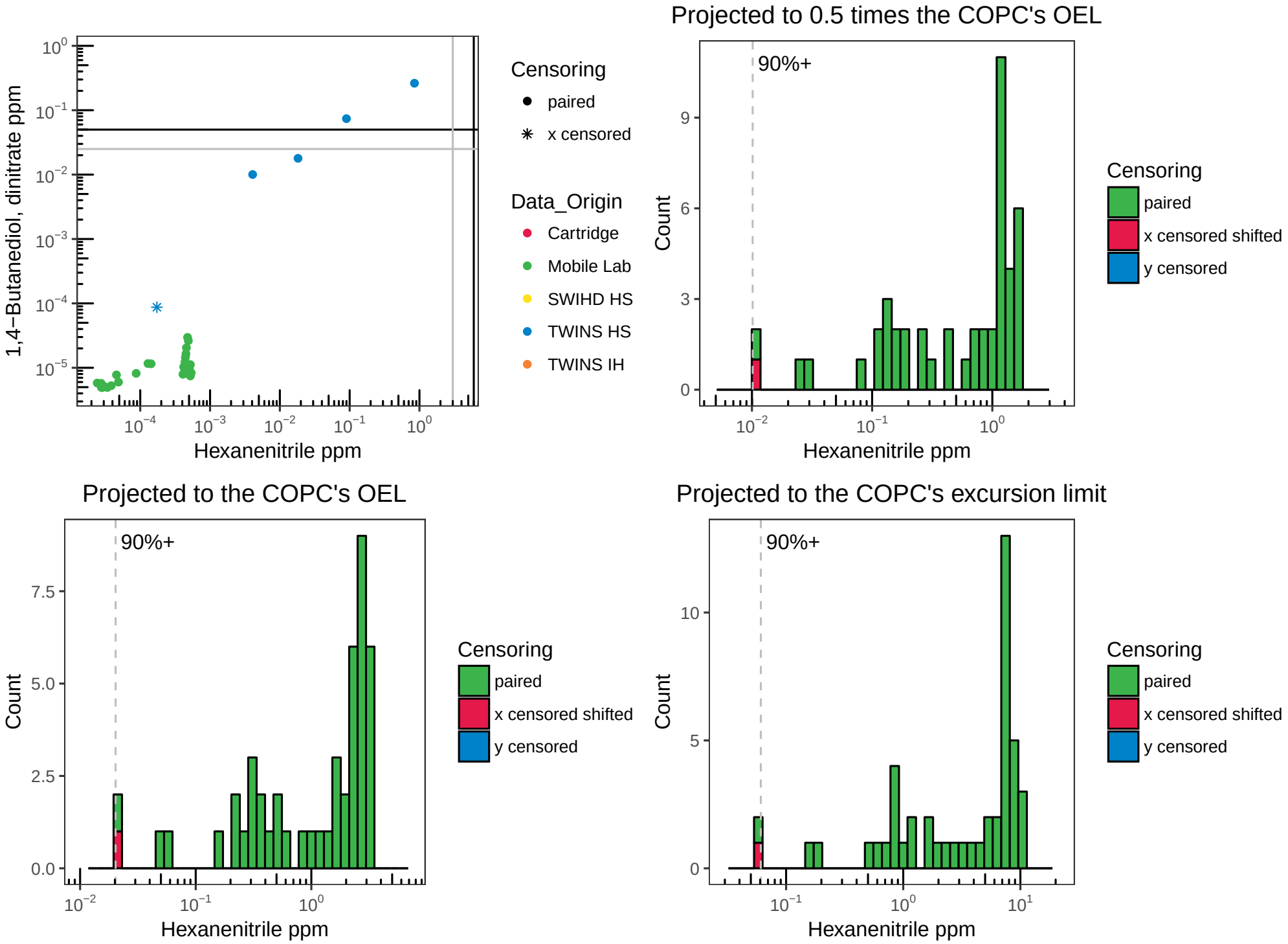


Figure C.1909: 1,4-Butanediol, dinitrate vs Hexanenitrile

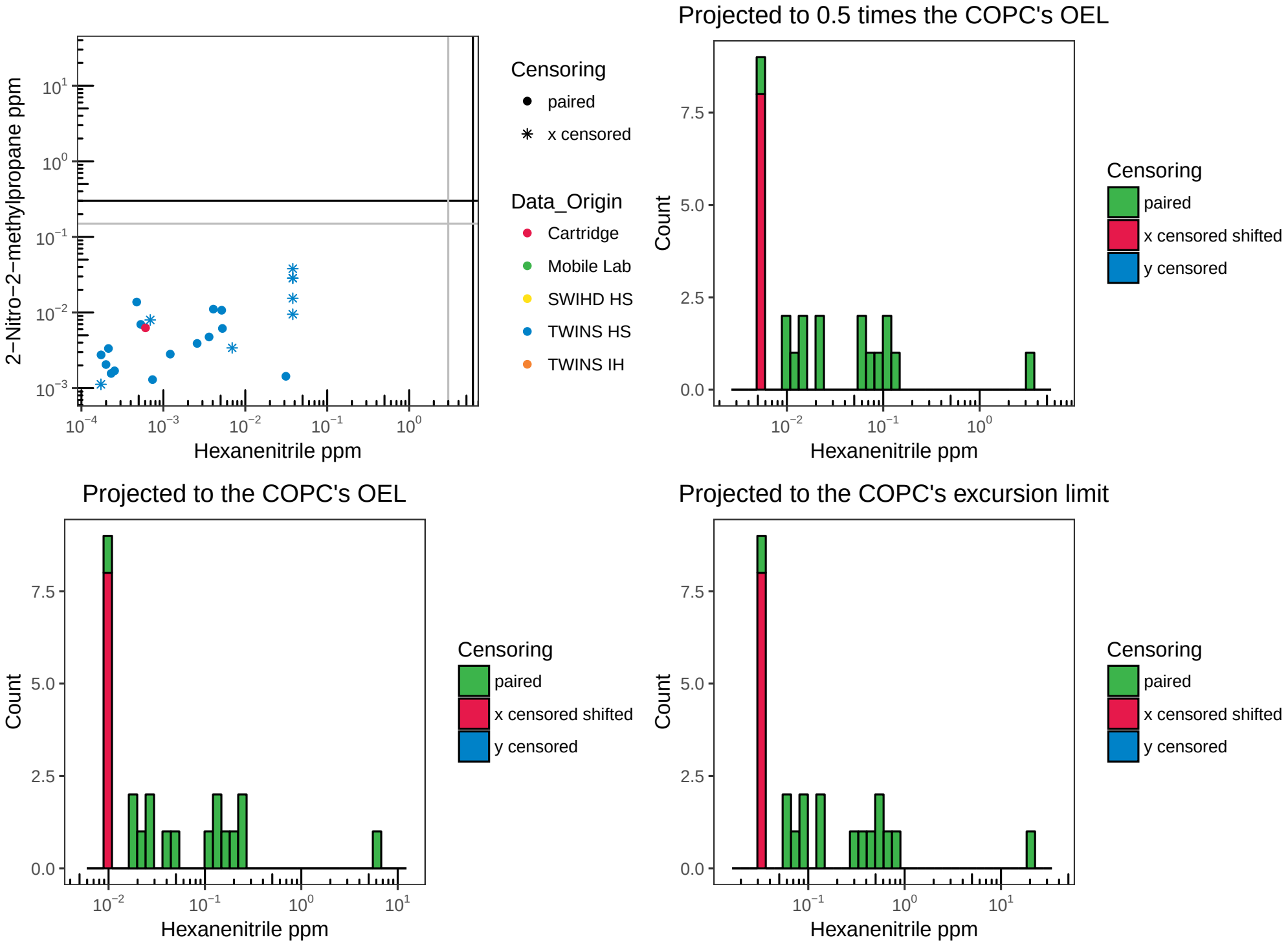


Figure C.1910: 2-Nitro-2-methylpropane vs Hexanenitrile

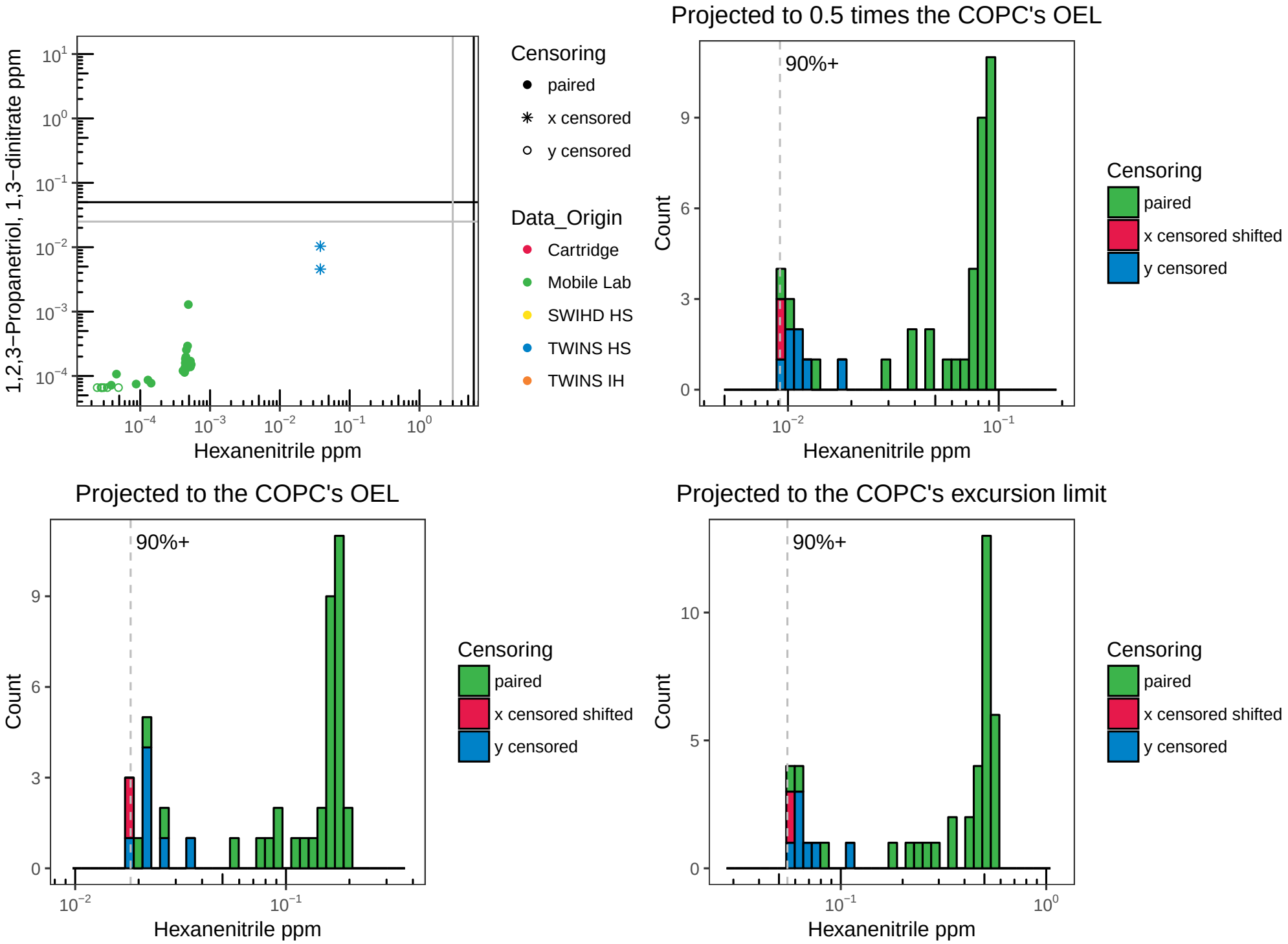


Figure C.1911: 1,2,3-Propanetriol, 1,3-dinitrate vs Hexanenitrile

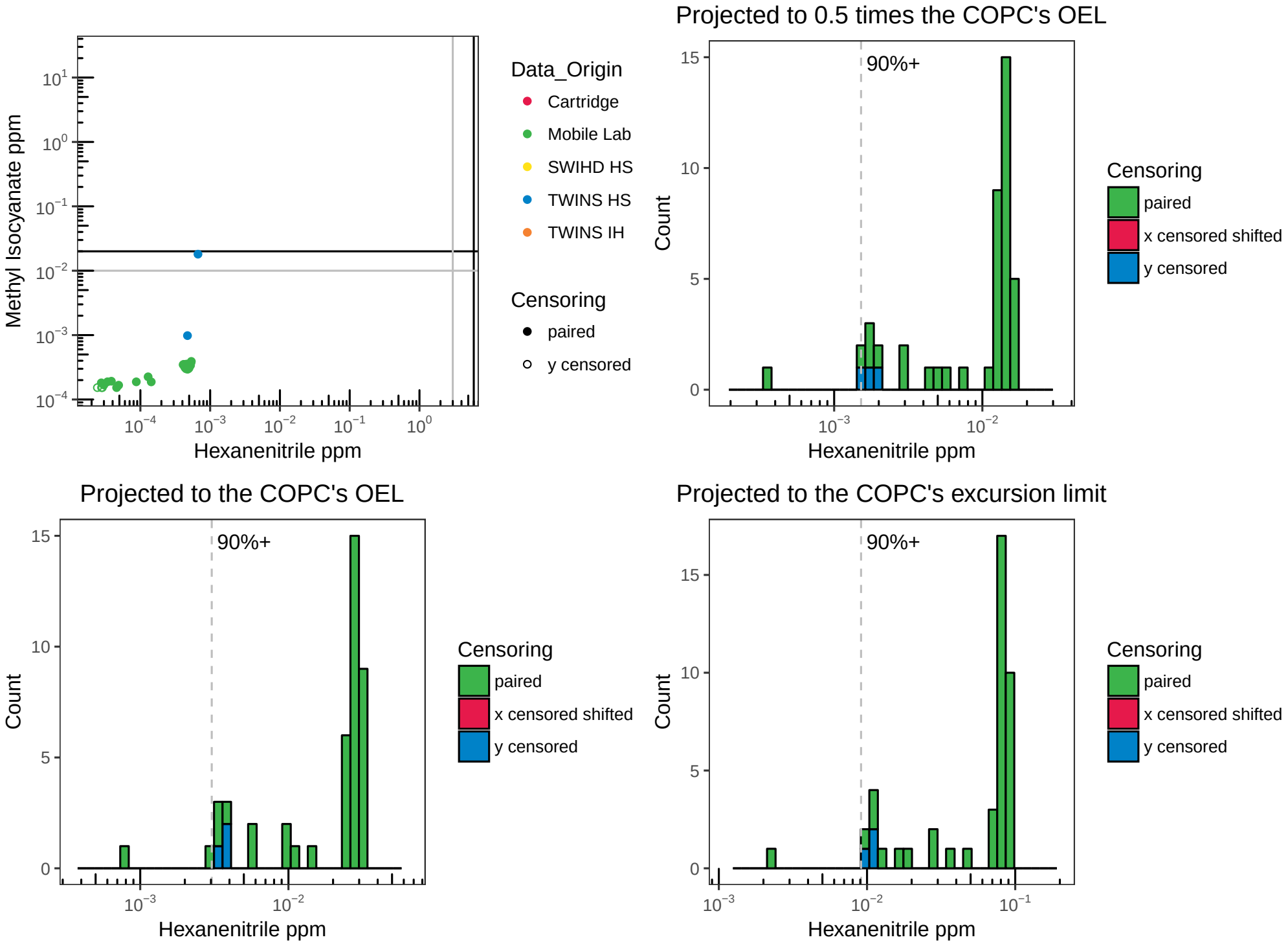


Figure C.1912: Methyl Isocyanate vs Hexanenitrile

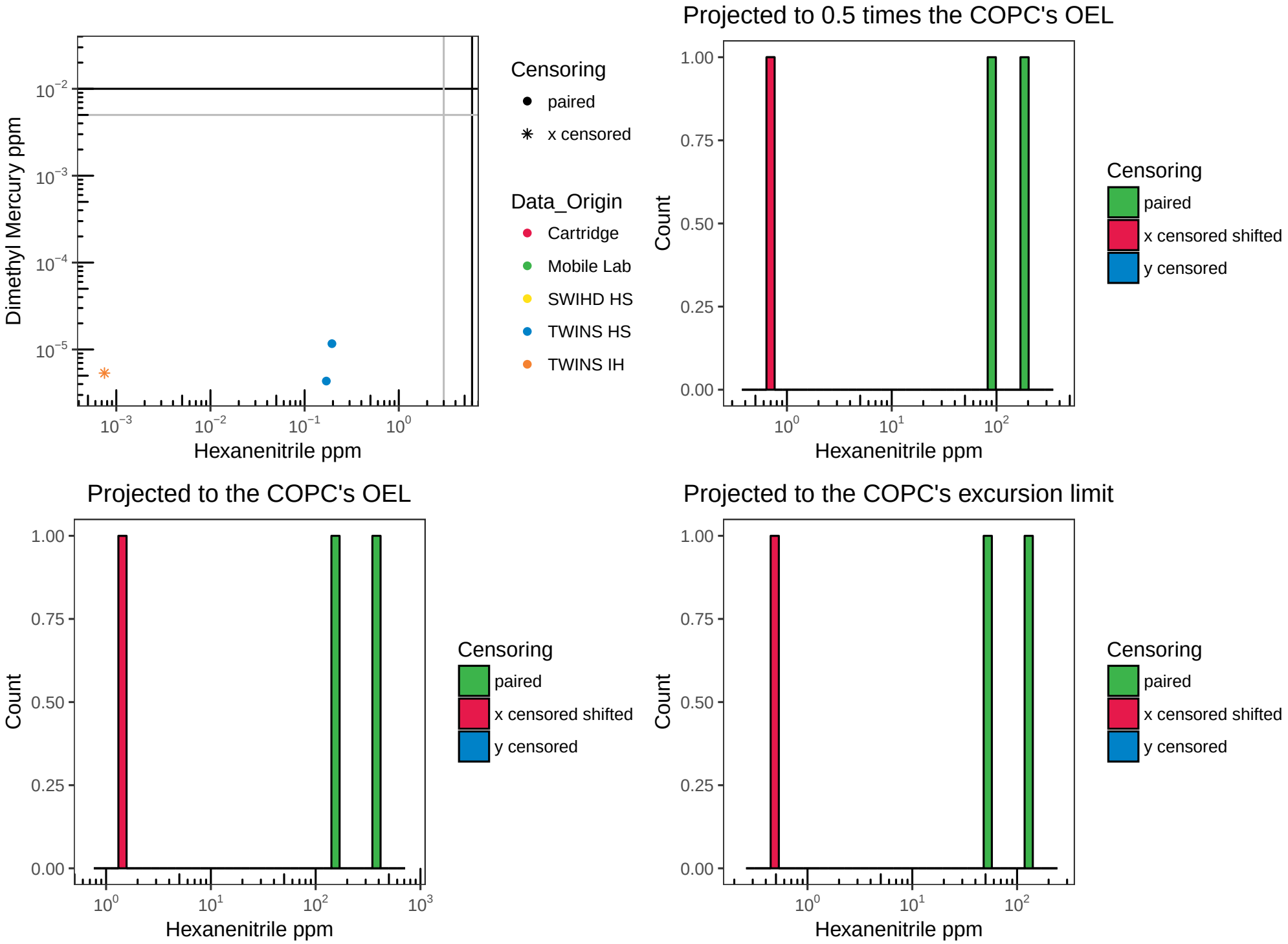


Figure C.1913: Dimethyl Mercury vs Hexanenitrile

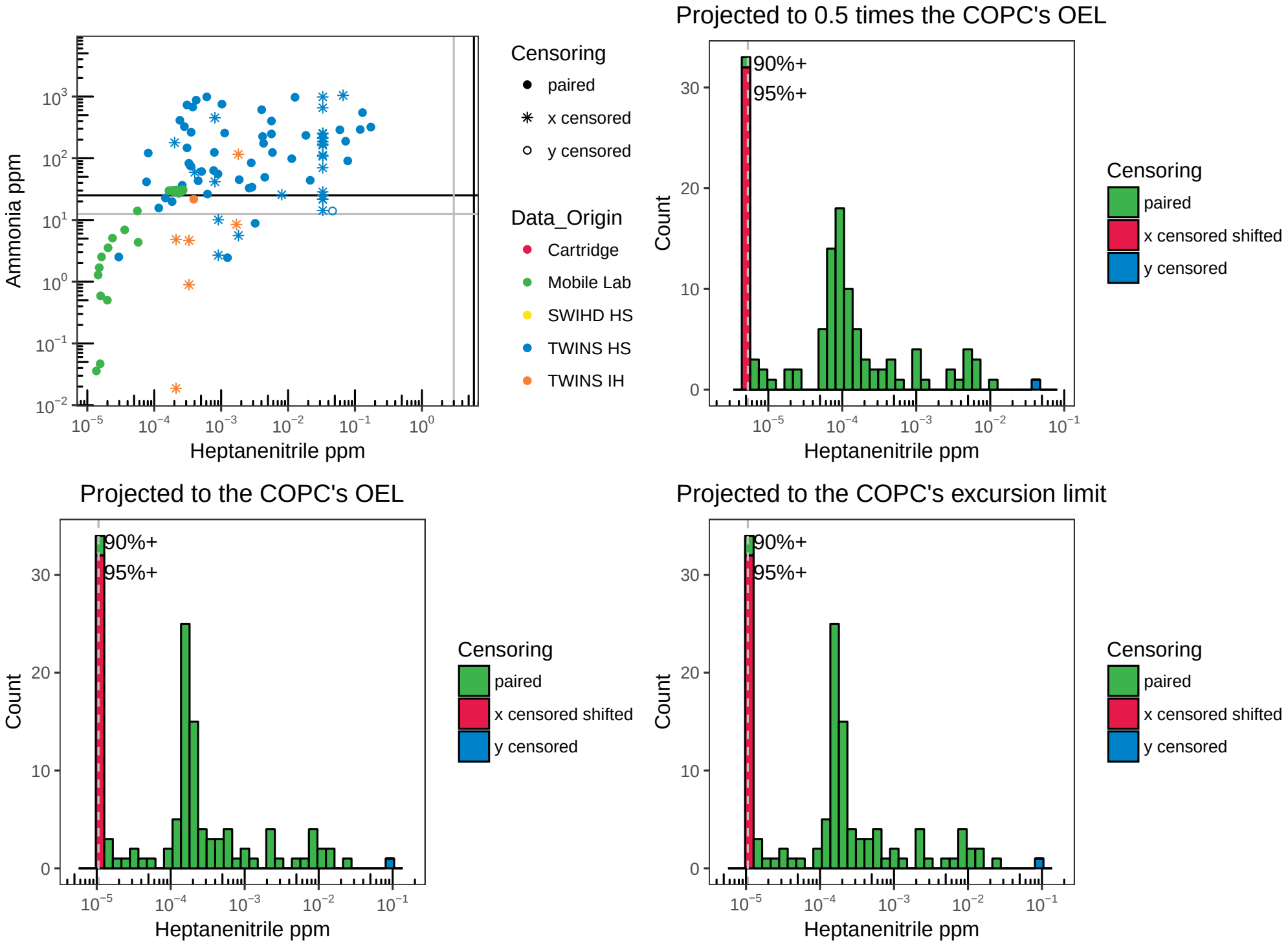


Figure C.1914: Ammonia vs Heptanenitrile

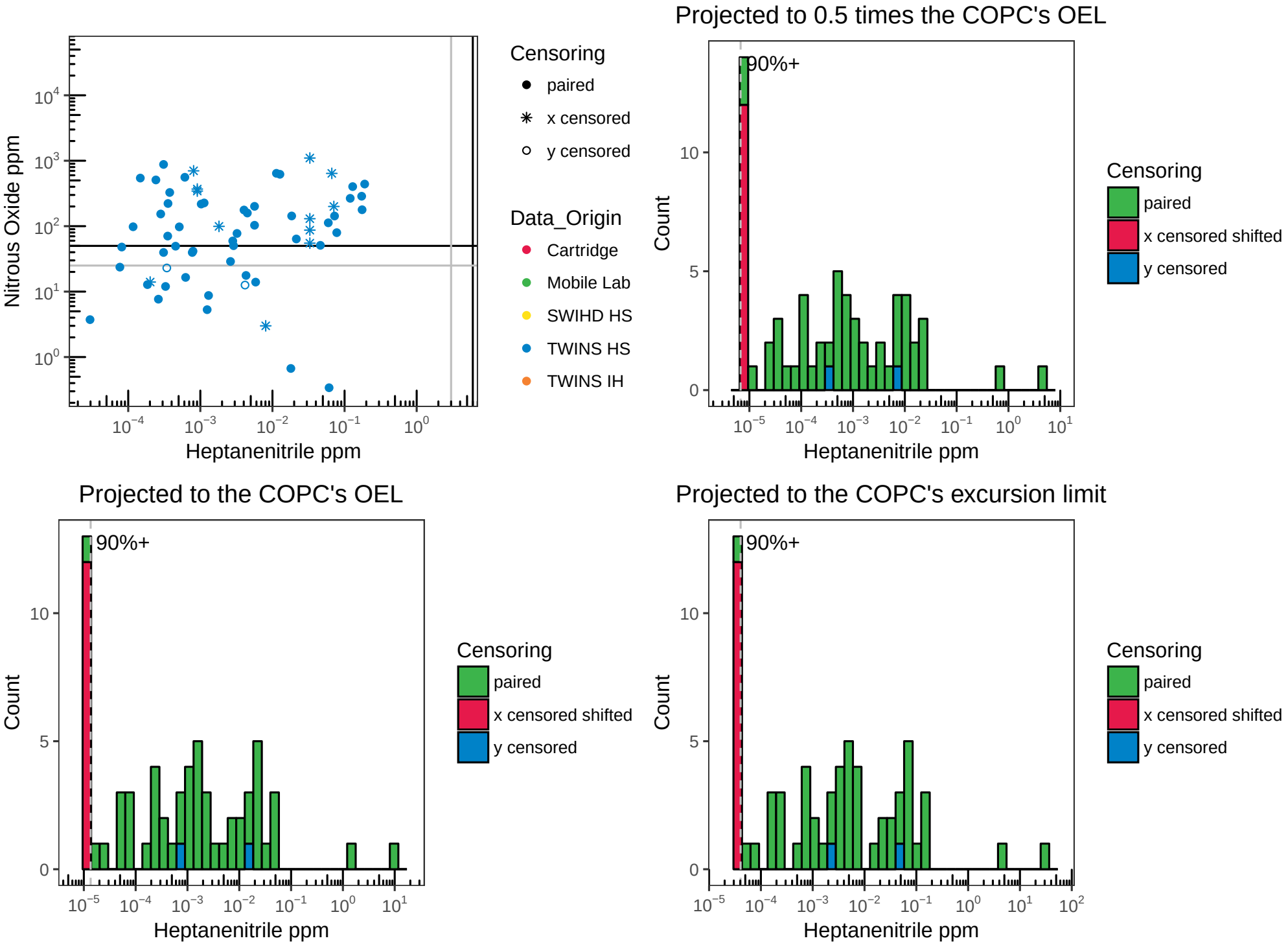


Figure C.1915: Nitrous Oxide vs Heptanenitrile

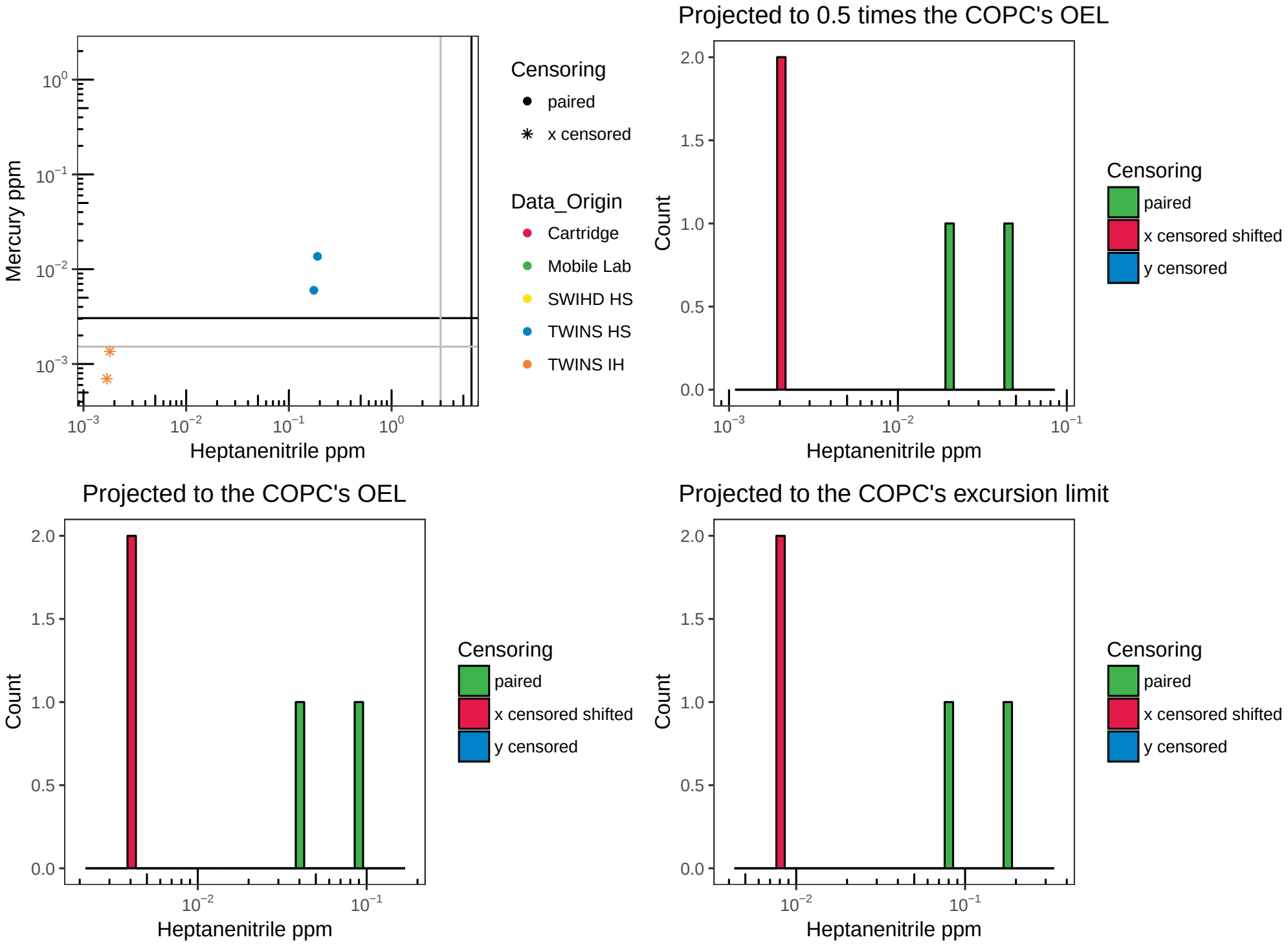


Figure C.1916: Mercury vs Heptanenitrile

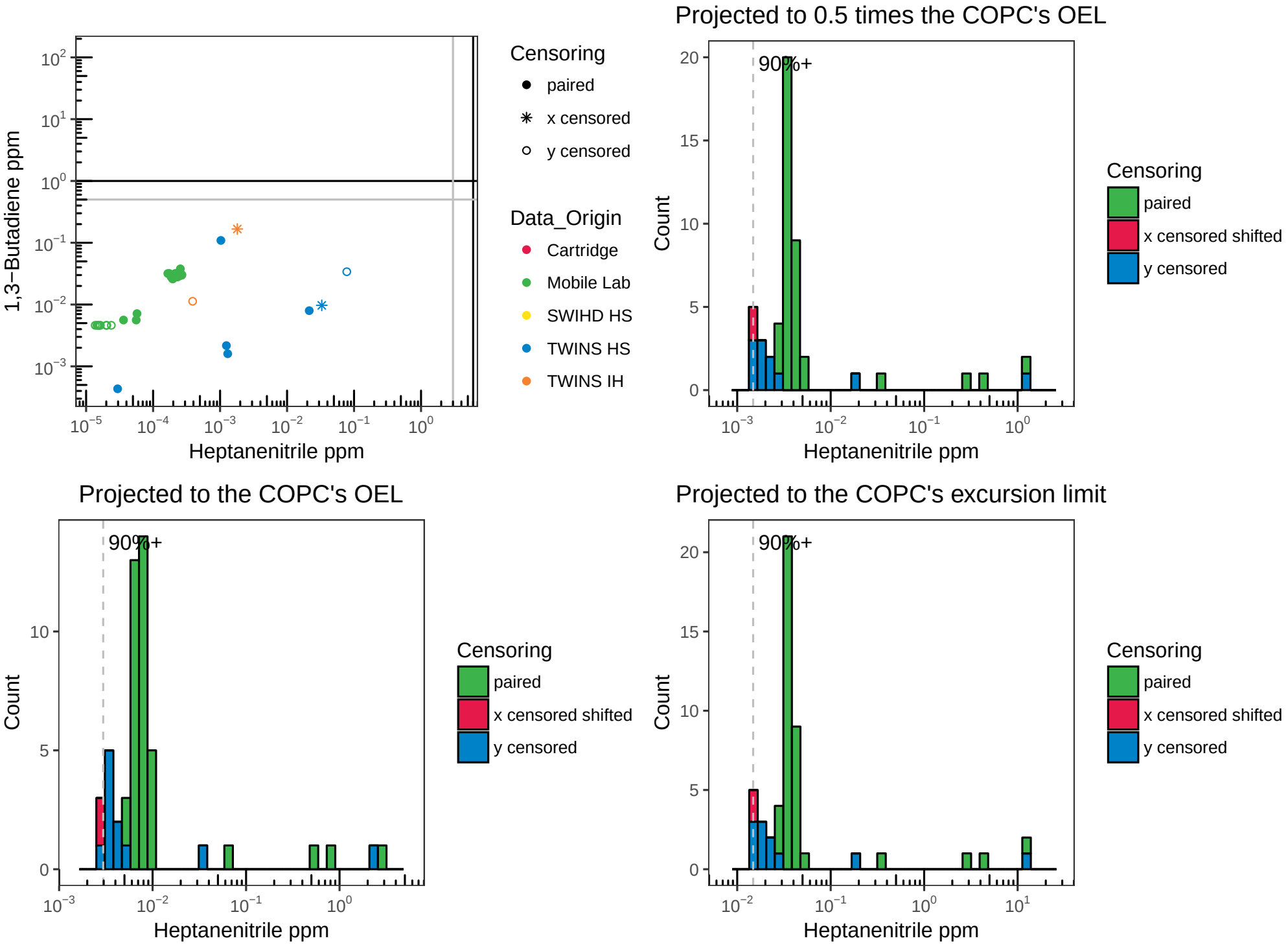


Figure C.1917: 1,3-Butadiene vs Heptanenitrile

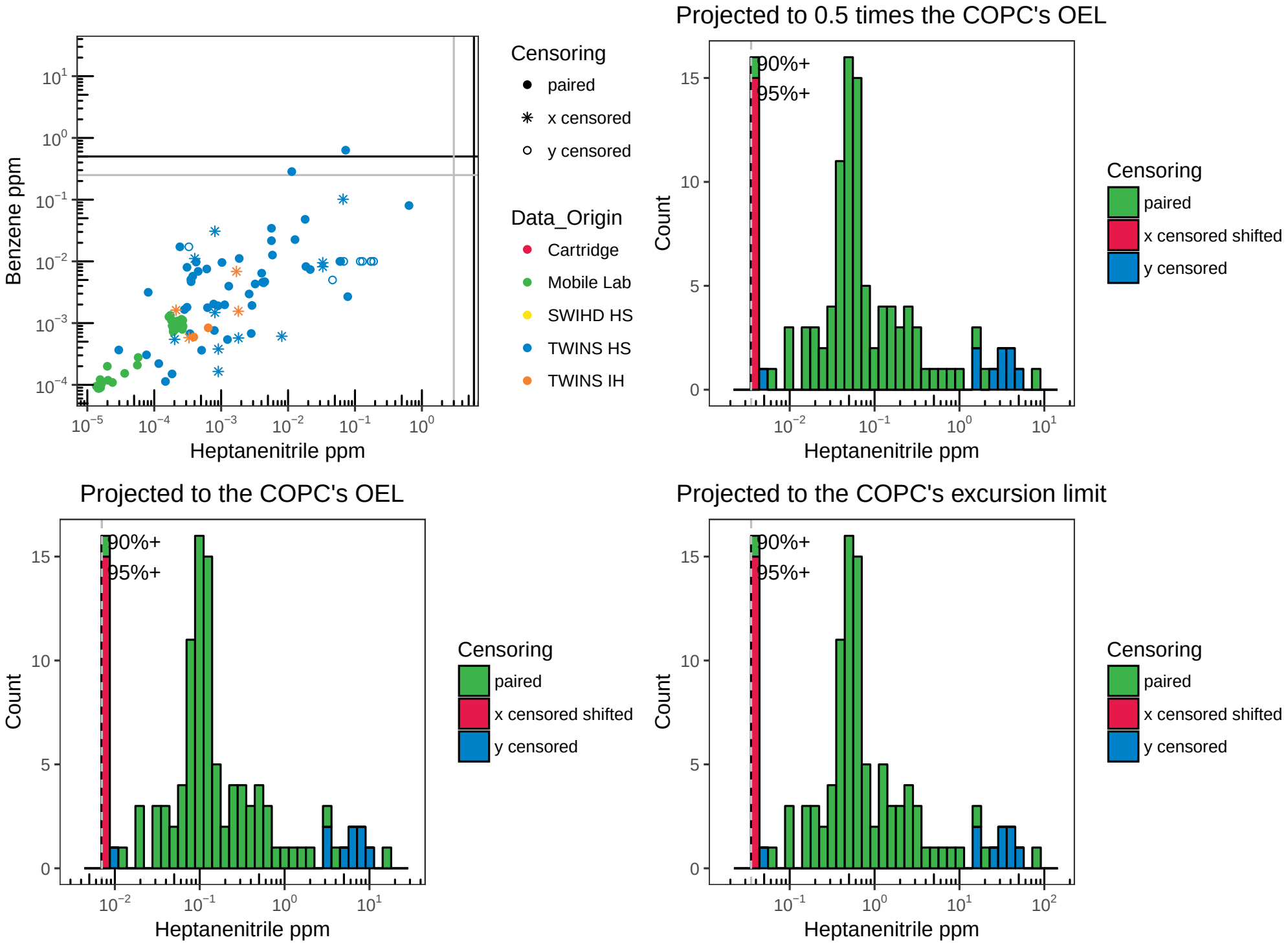


Figure C.1918: Benzene vs Heptanenitrile

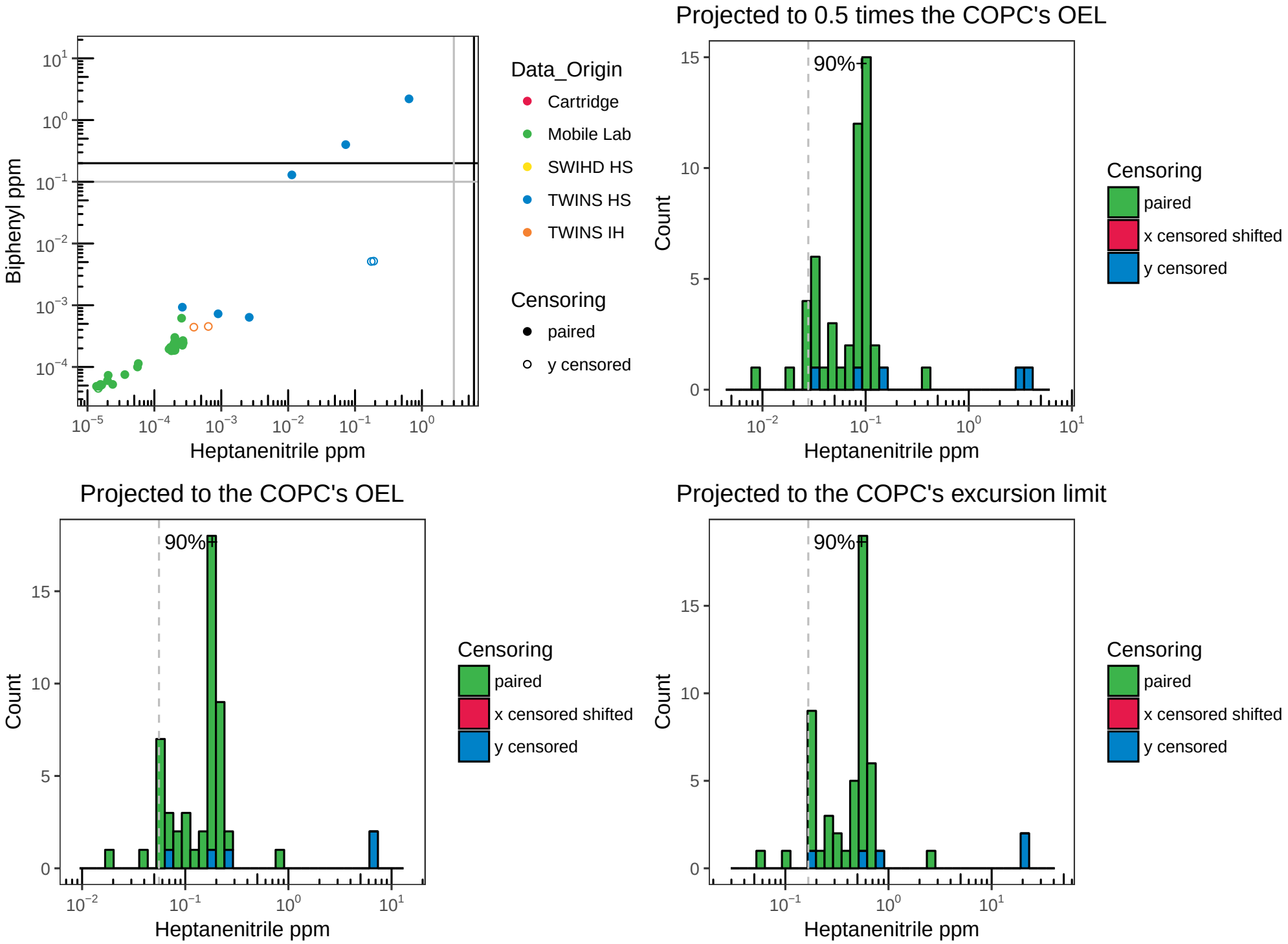


Figure C.1919: Biphenyl vs Heptanenitrile

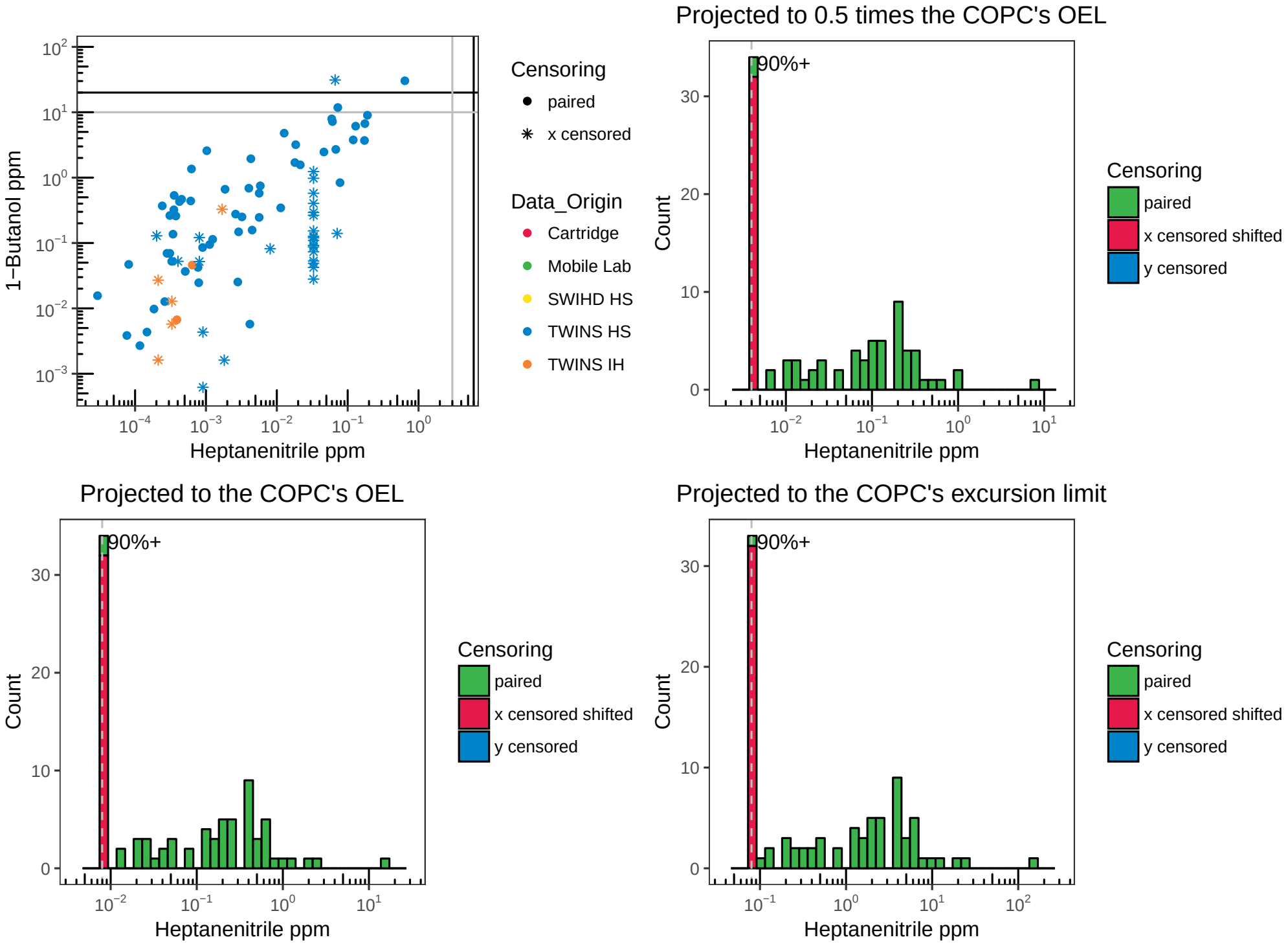


Figure C.1920: 1-Butanol vs Heptanenitrile

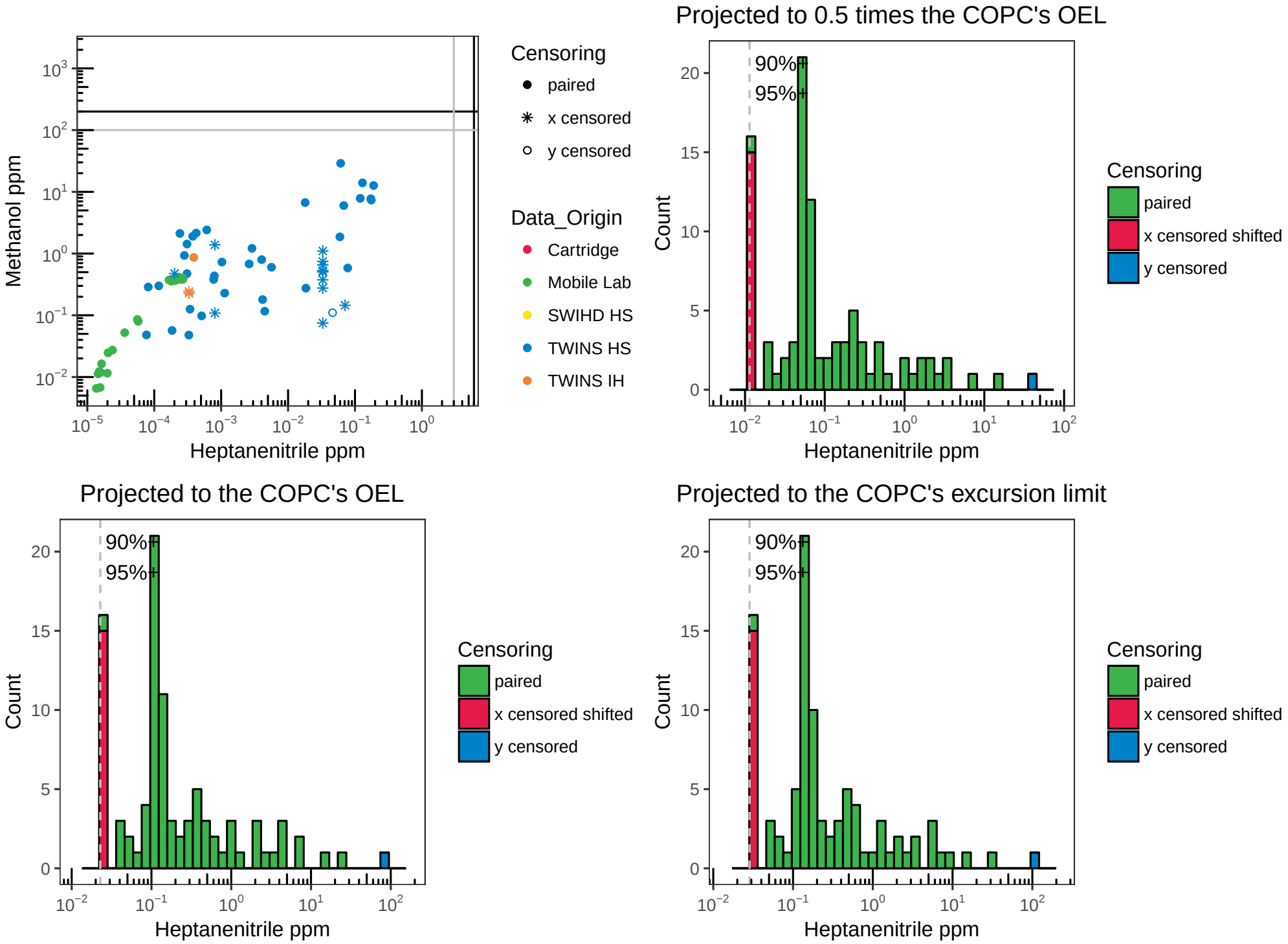


Figure C.1921: Methanol vs Heptanenitrile

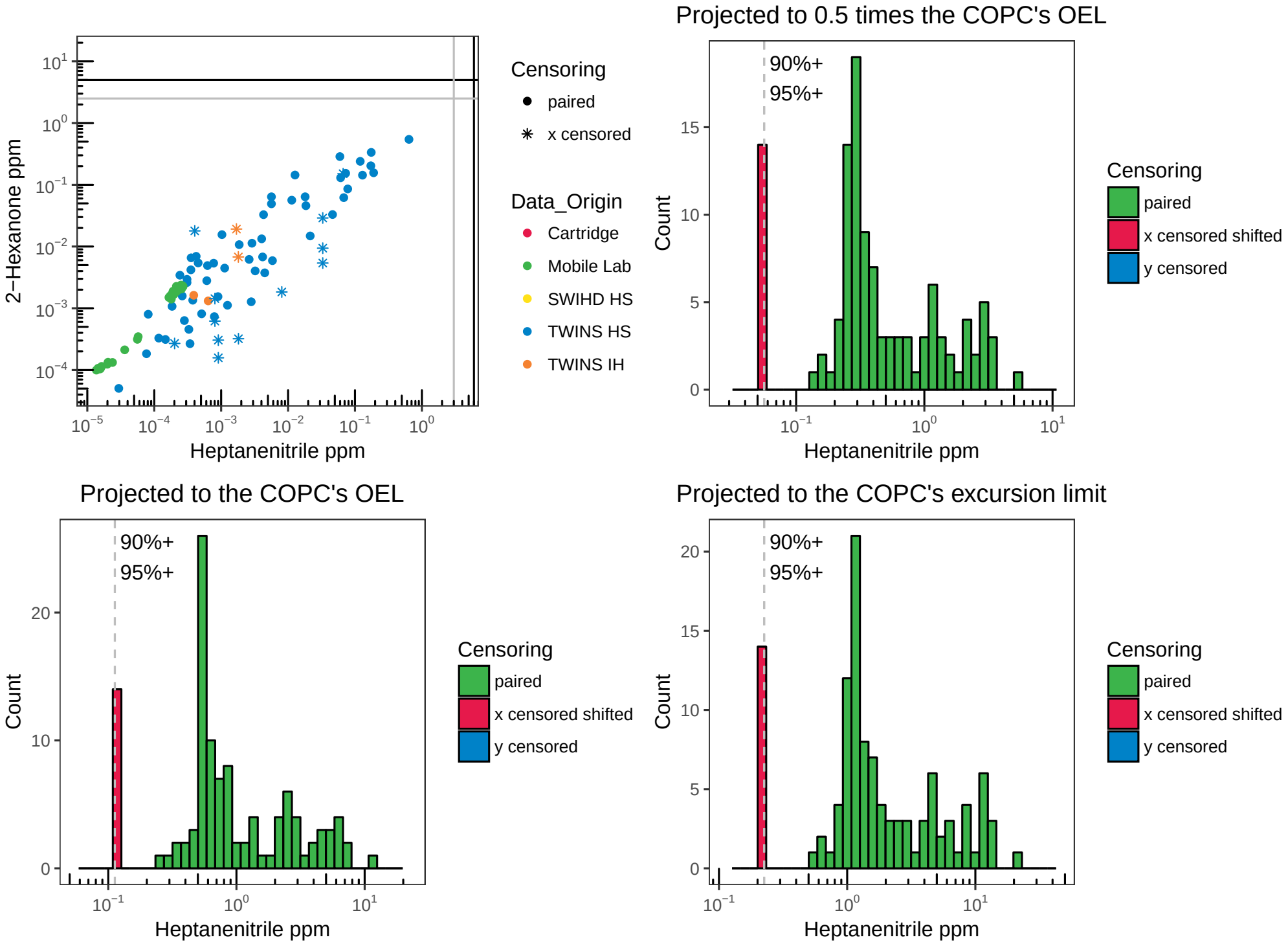


Figure C.1922: 2-Hexanone vs Heptanenitrile

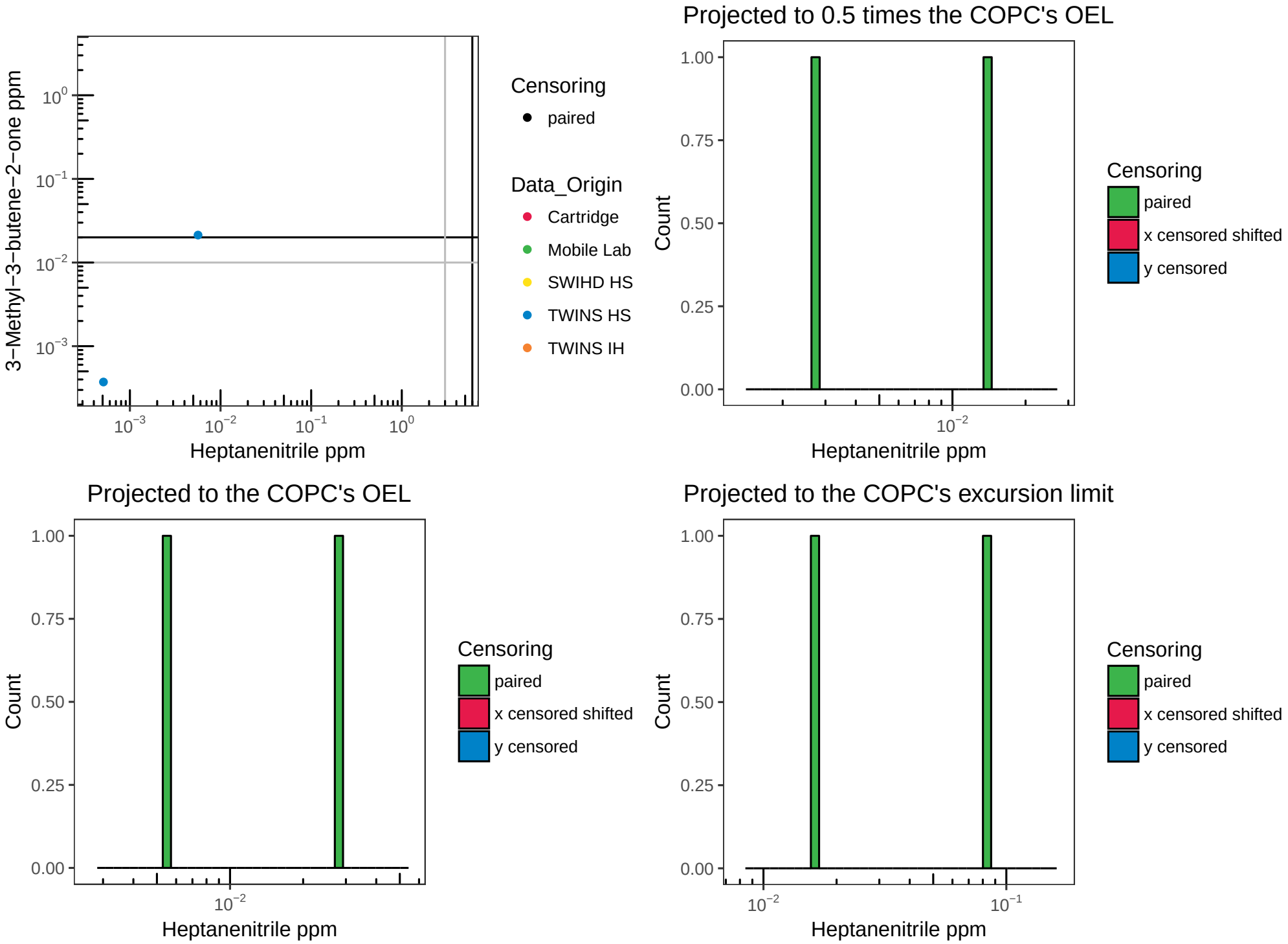


Figure C.1923: 3-Methyl-3-butene-2-one vs Heptanenitrile

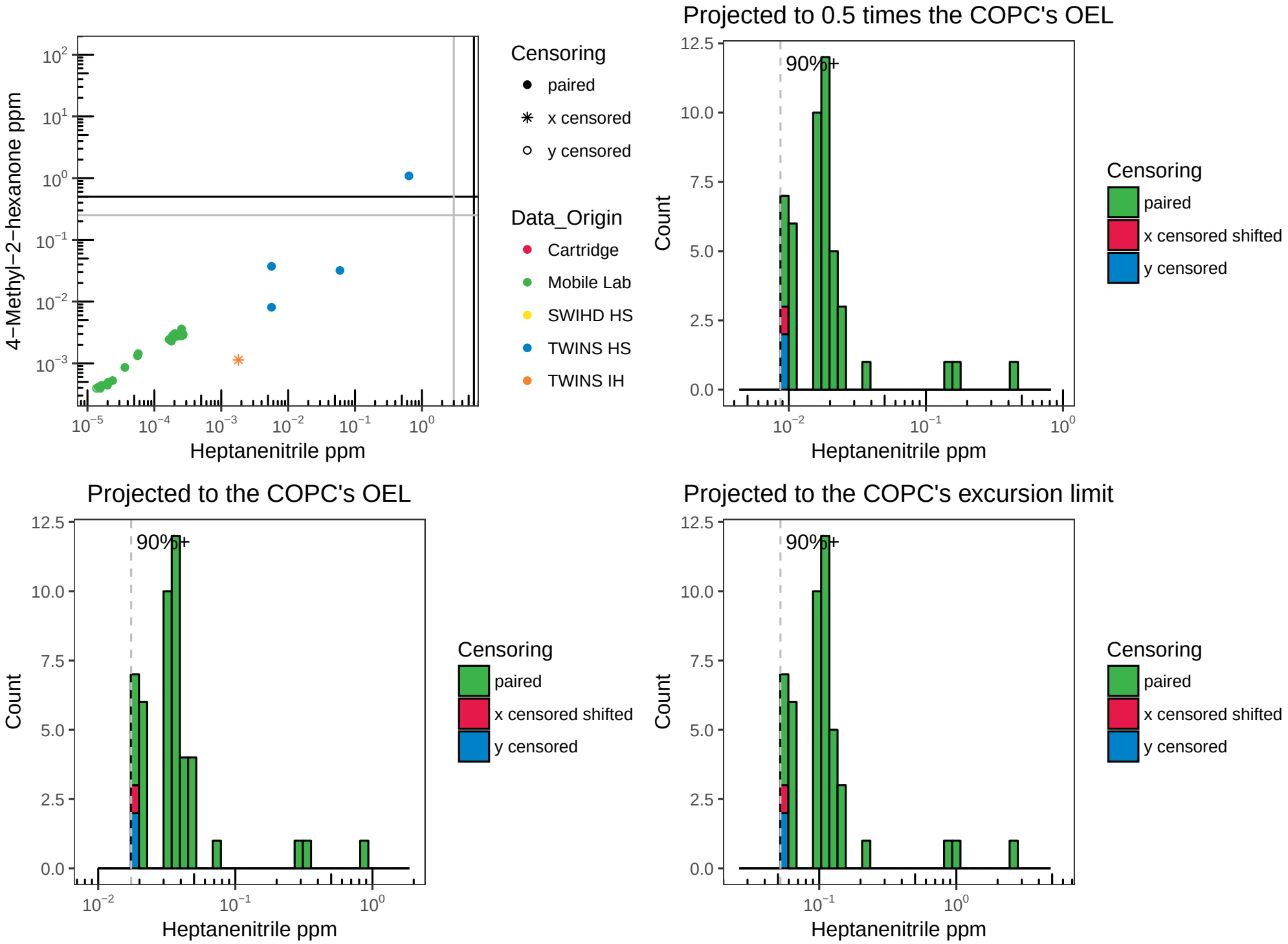


Figure C.1924: 4-Methyl-2-hexanone vs Heptanenitrile

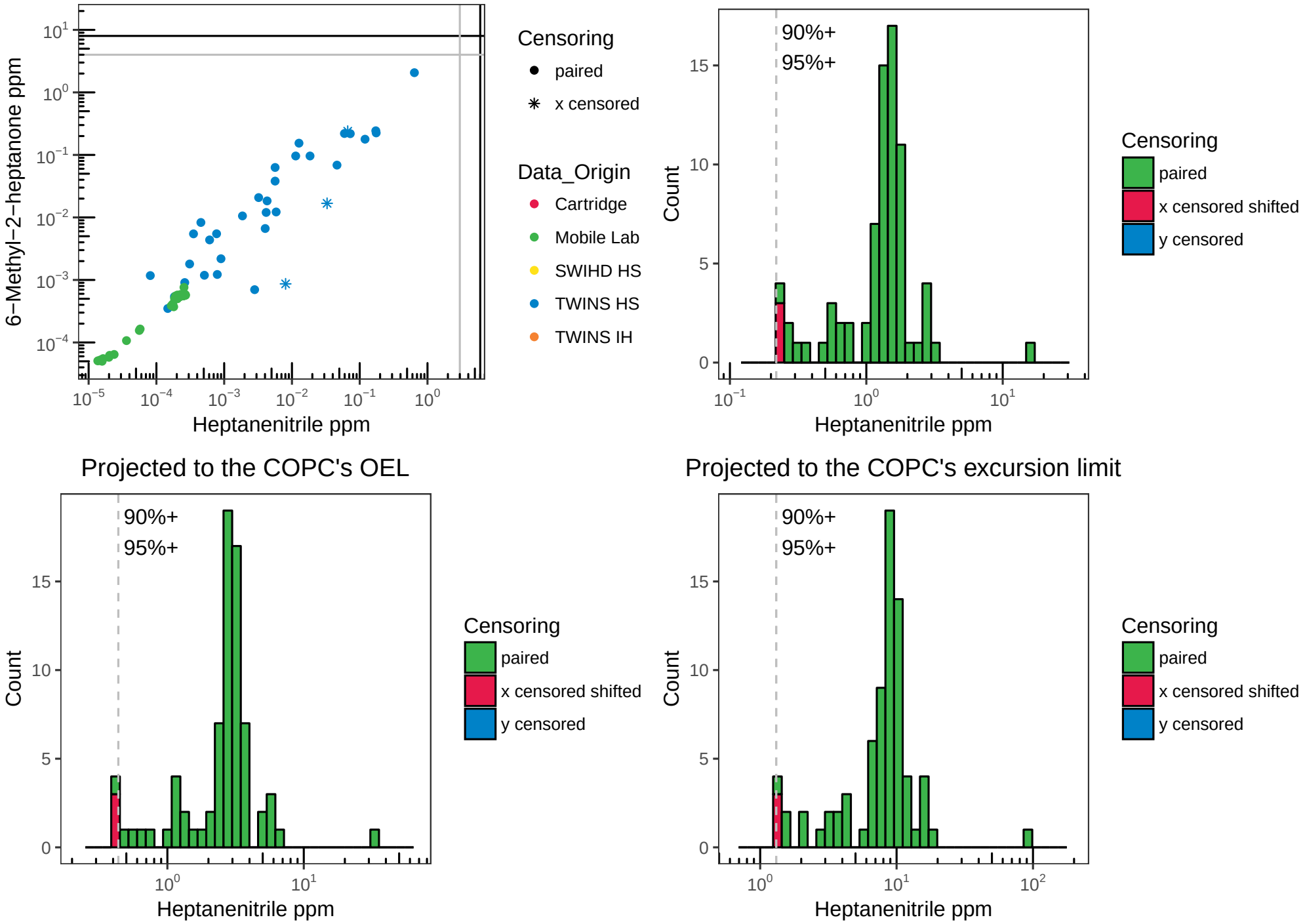


Figure C.1925: 6-Methyl-2-heptanone vs Heptanenitrile

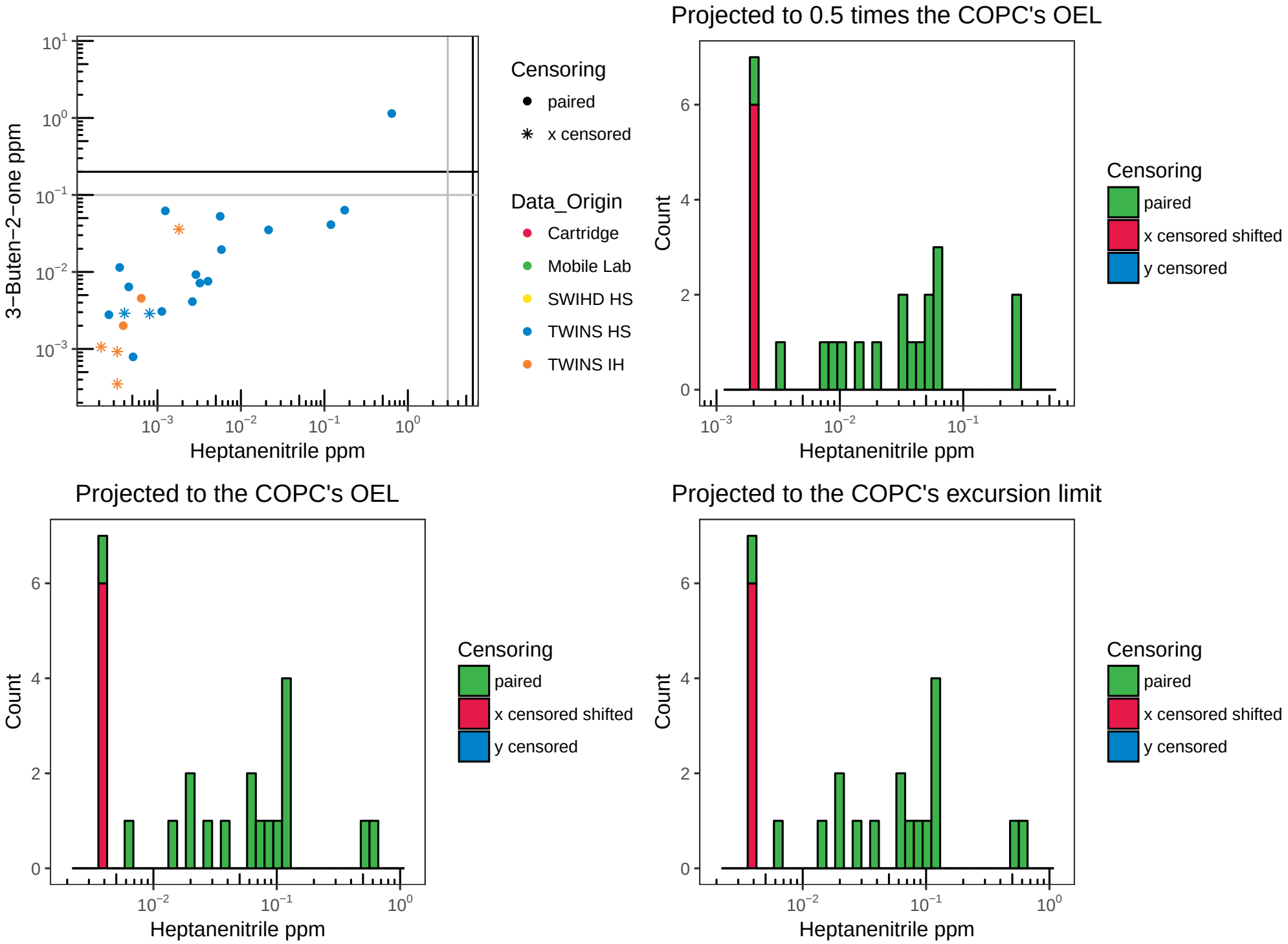


Figure C.1926: 3-Buten-2-one vs Heptanenitrile

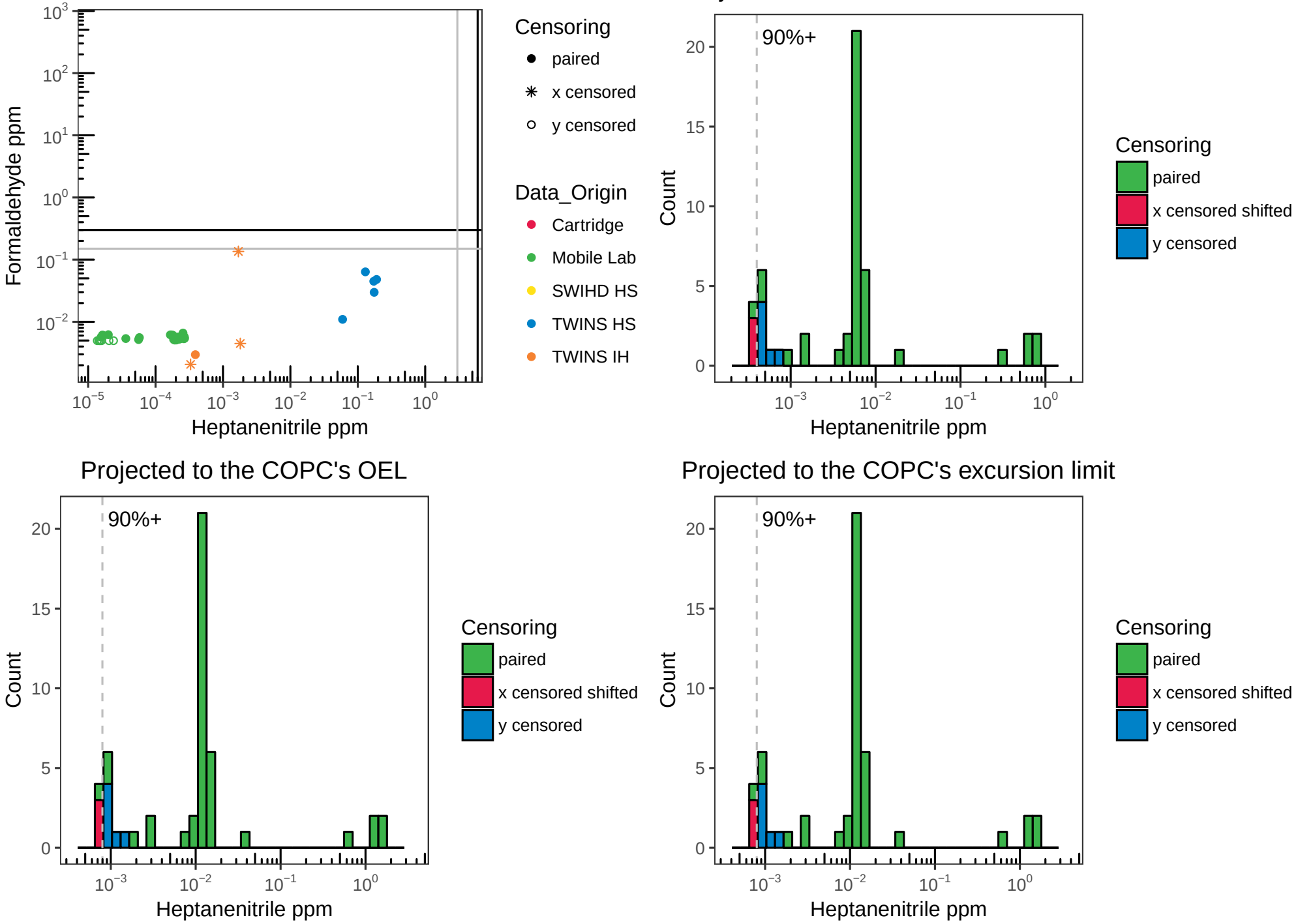


Figure C.1927: Formaldehyde vs Heptanenitrile

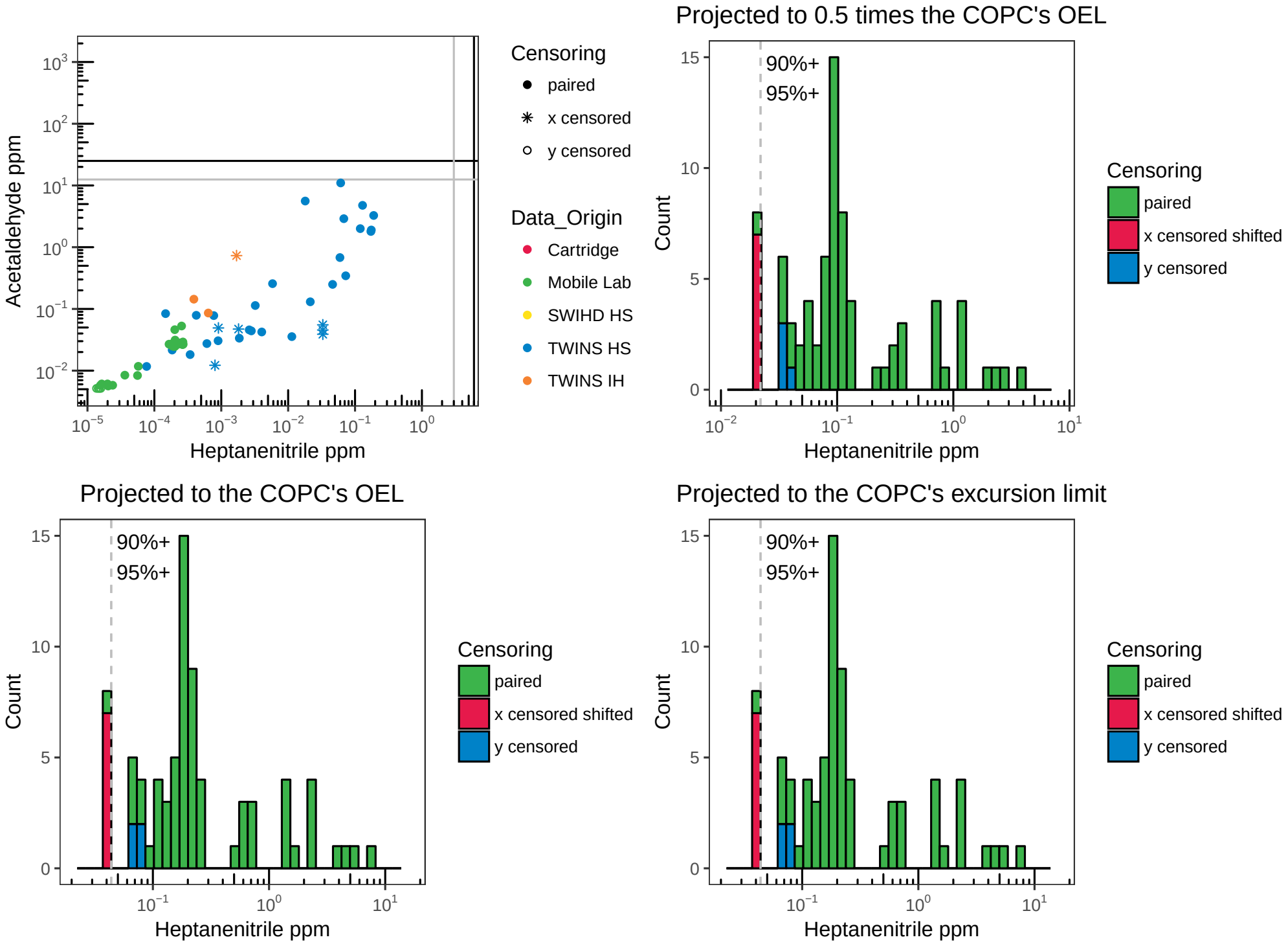


Figure C.1928: Acetaldehyde vs Heptanenitrile

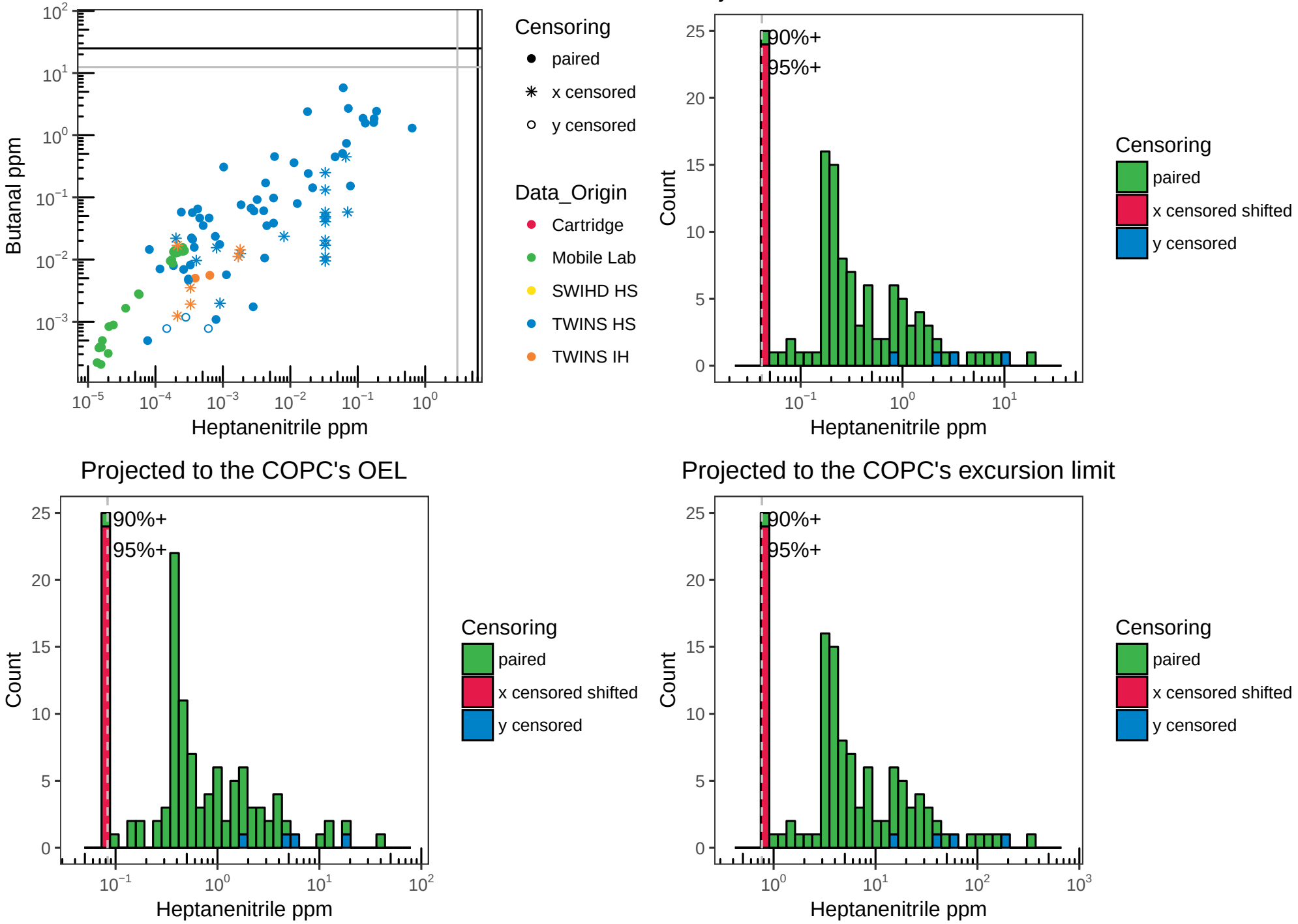


Figure C.1929: Butanal vs Heptanenitrile

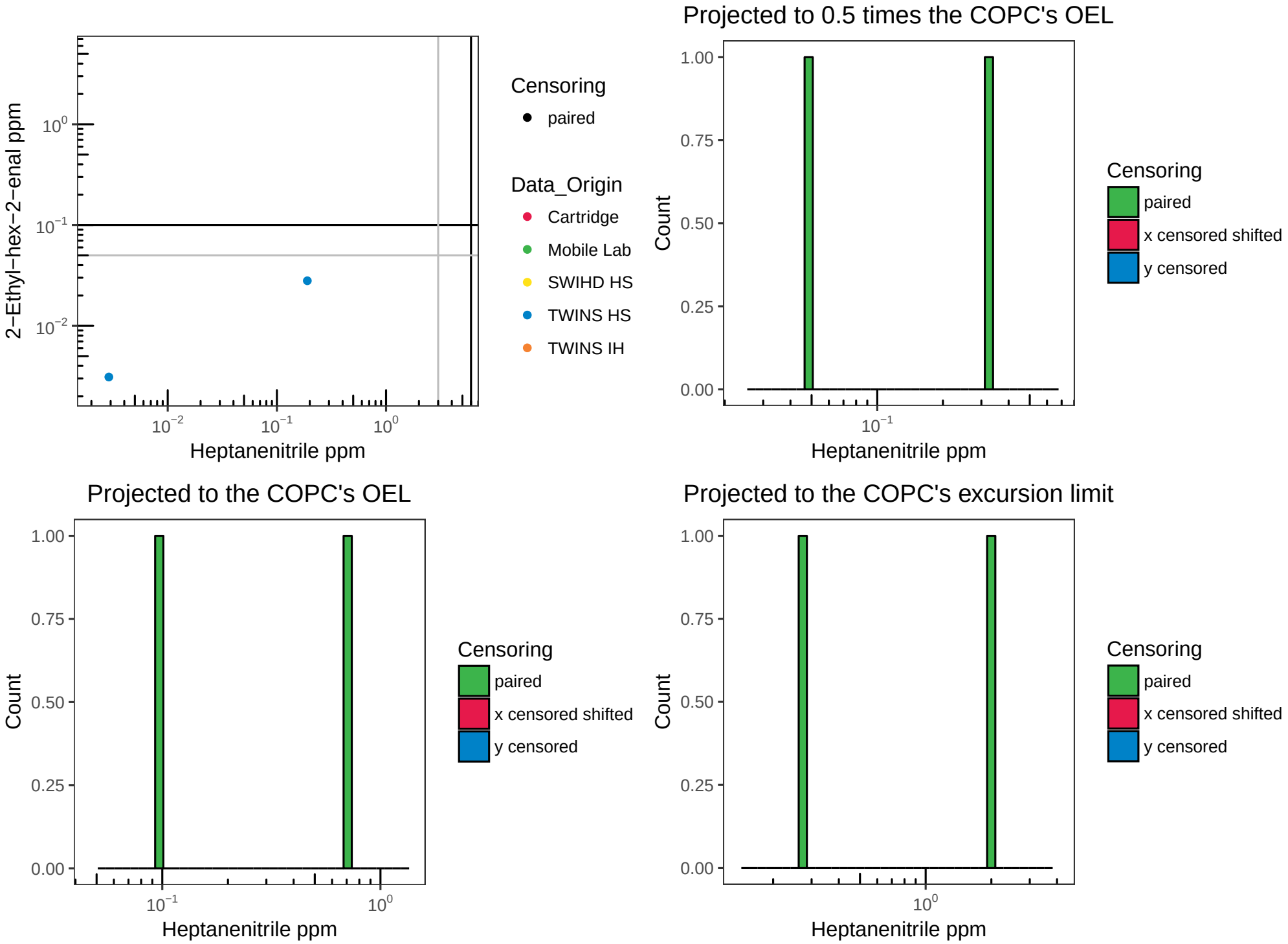


Figure C.1930: 2-Ethyl-hex-2-enal vs Heptanenitrile

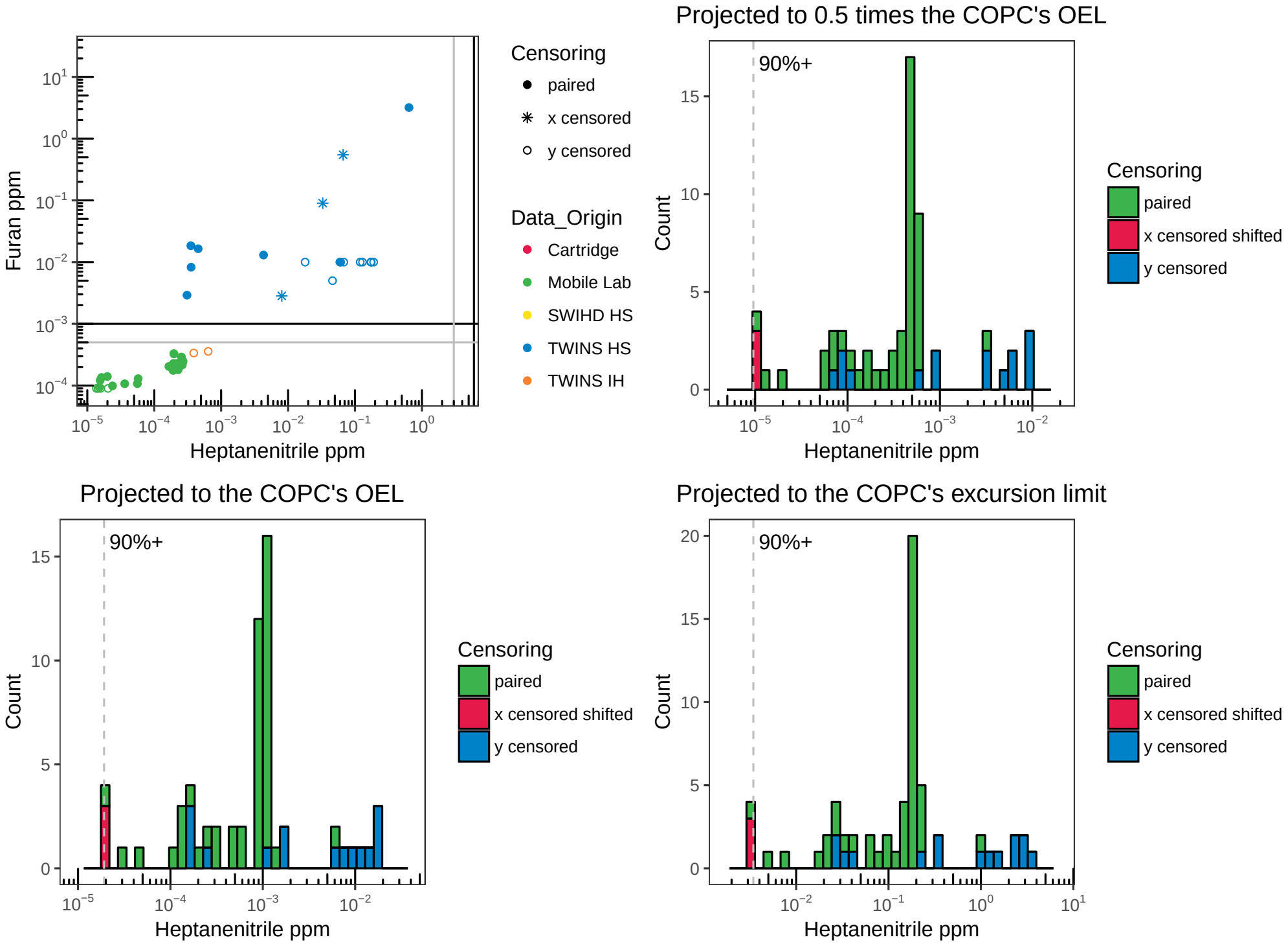


Figure C.1931: Furan vs Heptanenitrile

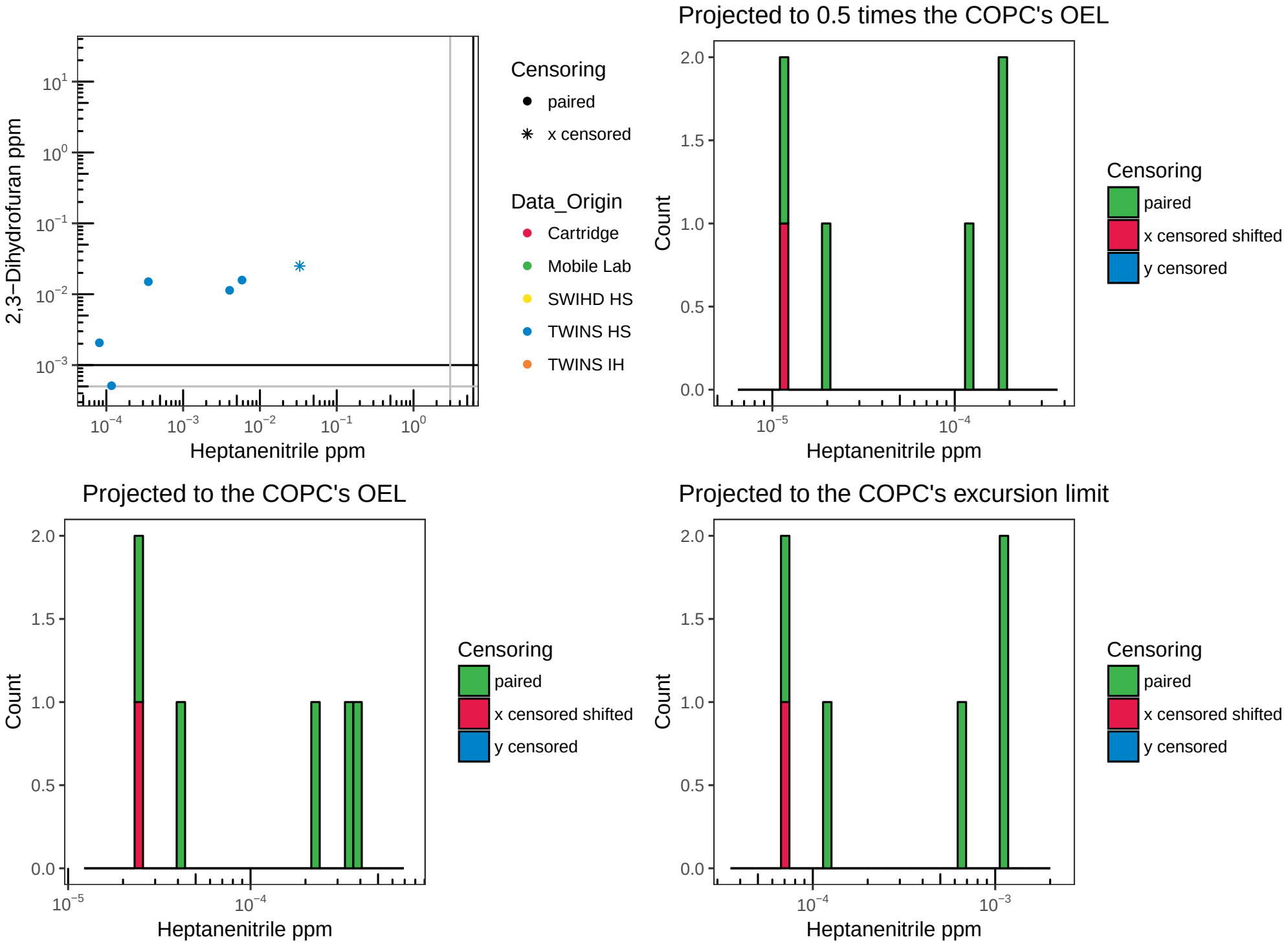


Figure C.1932: 2,3-Dihydrofuran vs Heptanenitrile

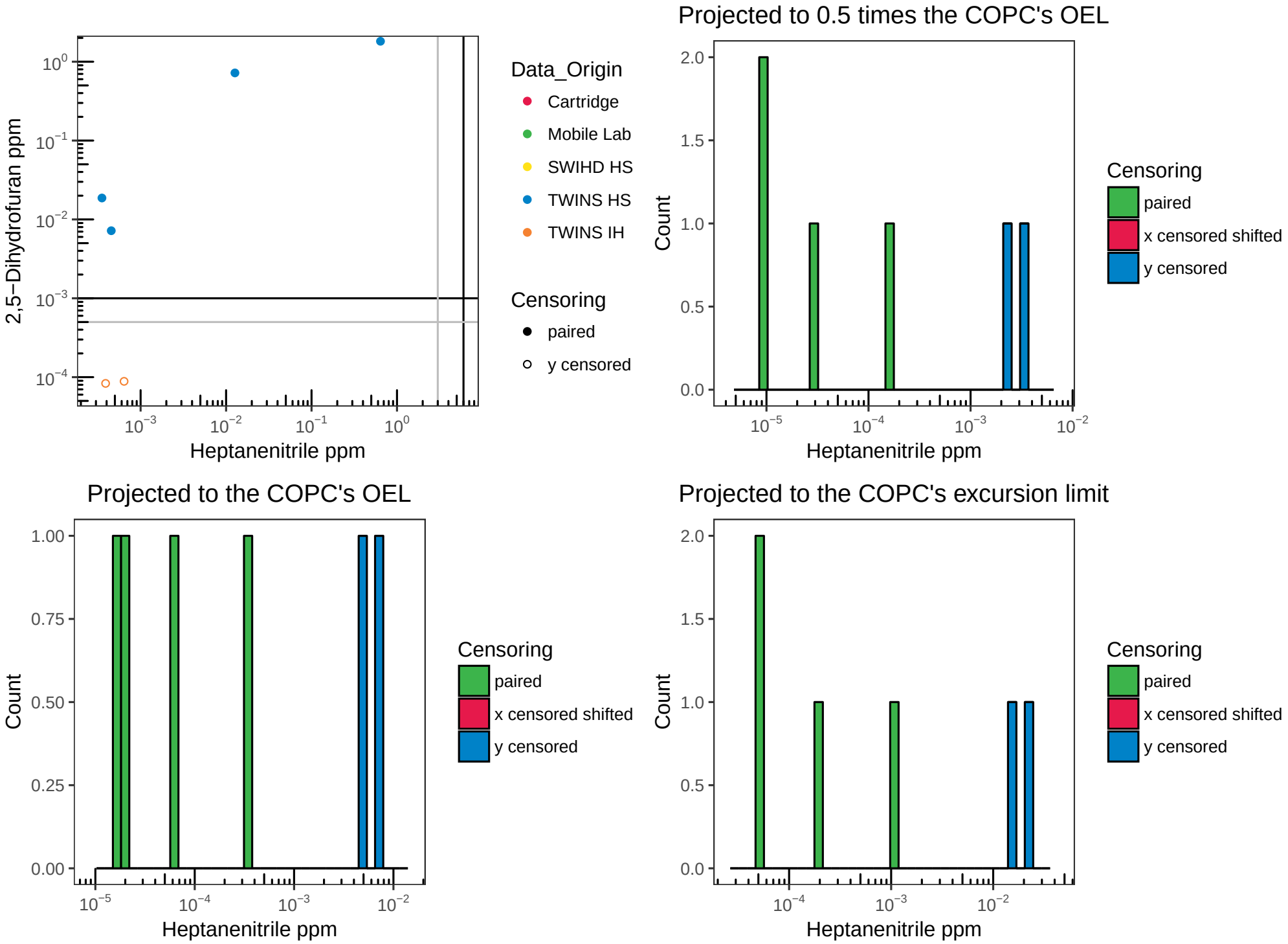


Figure C.1933: 2,5-Dihydrofuran vs Heptanenitrile

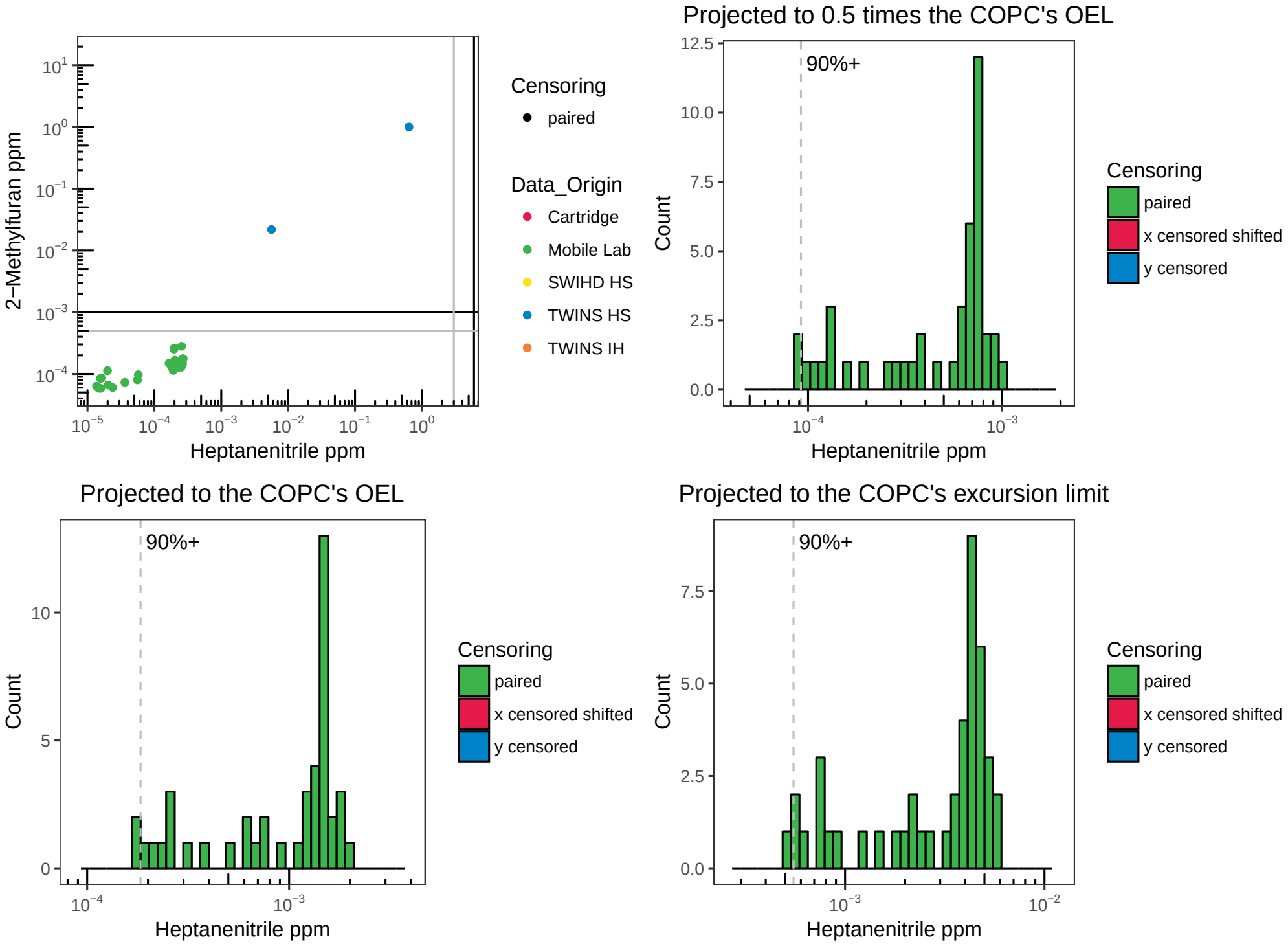


Figure C.1934: 2-Methylfuran vs Heptanenitrile

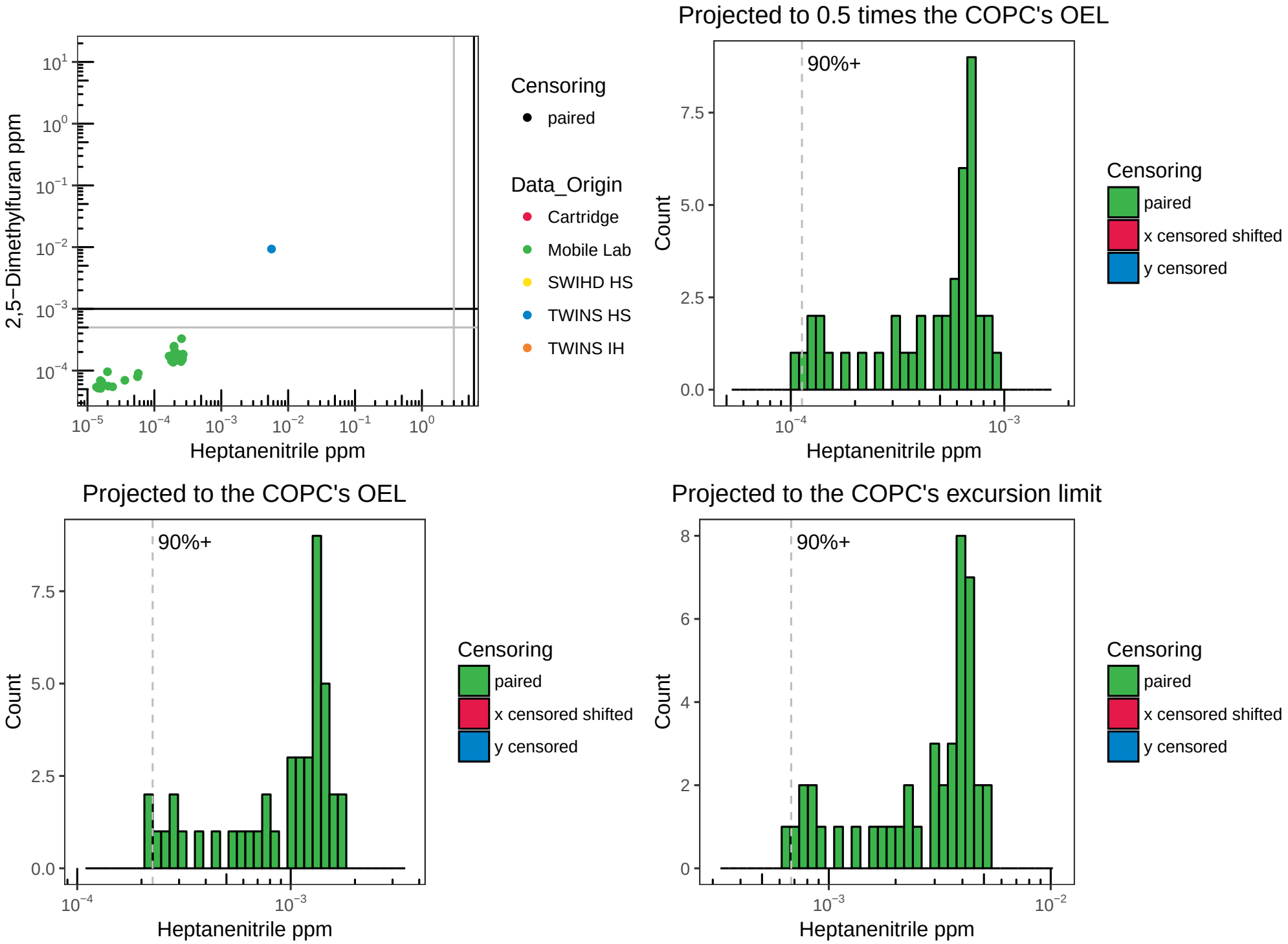


Figure C.1935: 2,5-Dimethylfuran vs Heptanenitrile

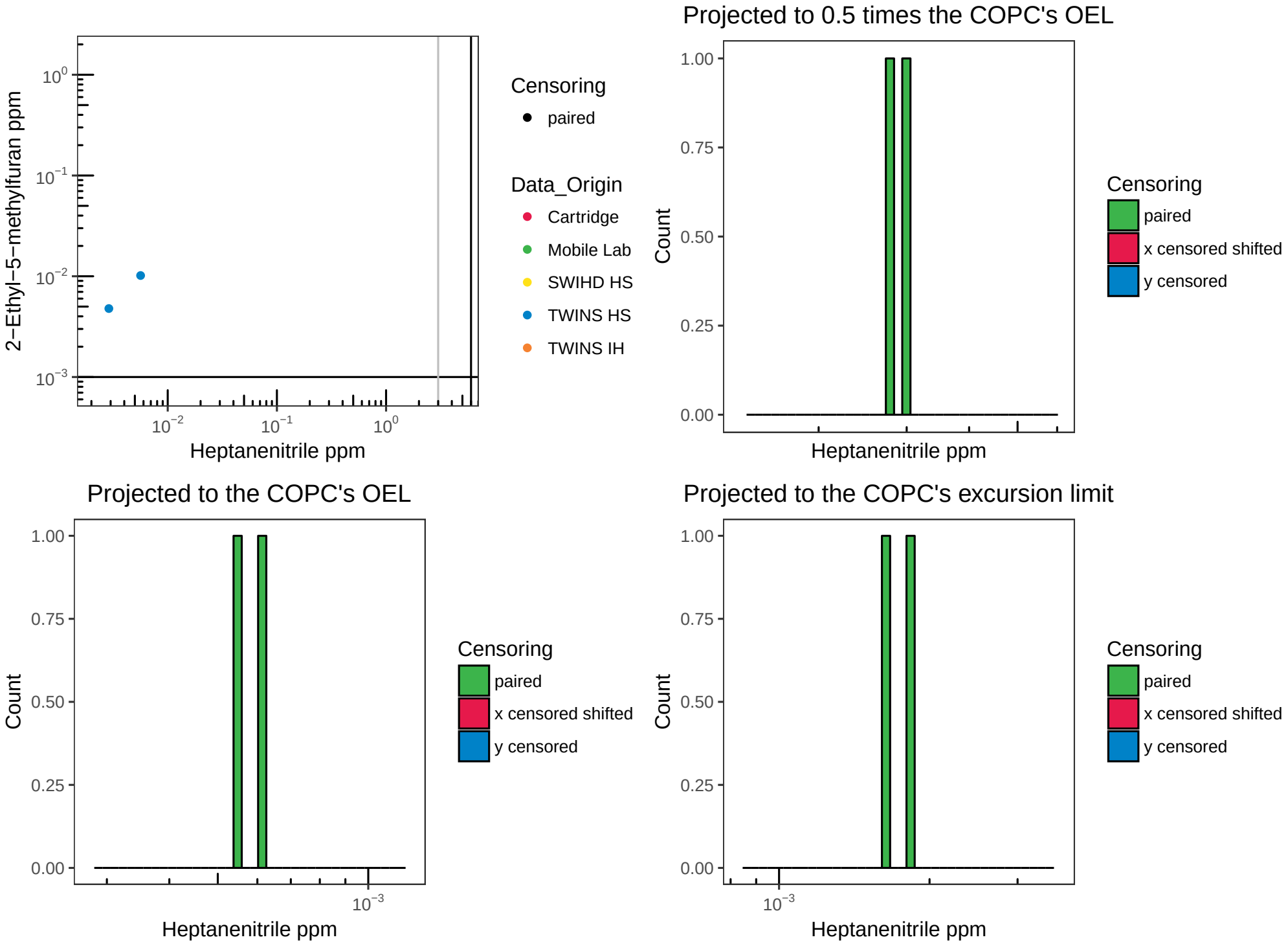


Figure C.1936: 2-Ethyl-5-methylfuran vs Heptanenitrile

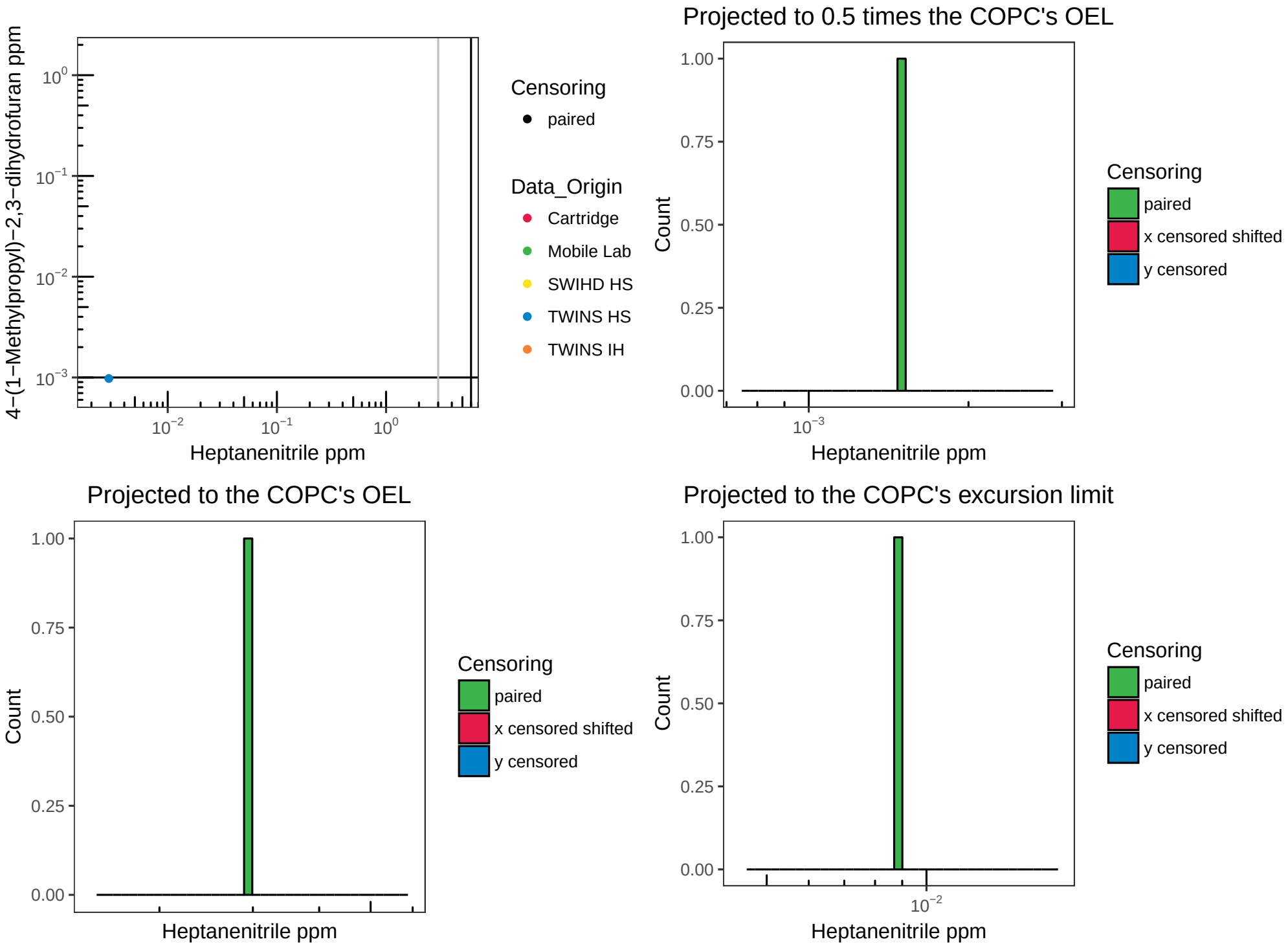


Figure C.1937: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Heptanenitrile

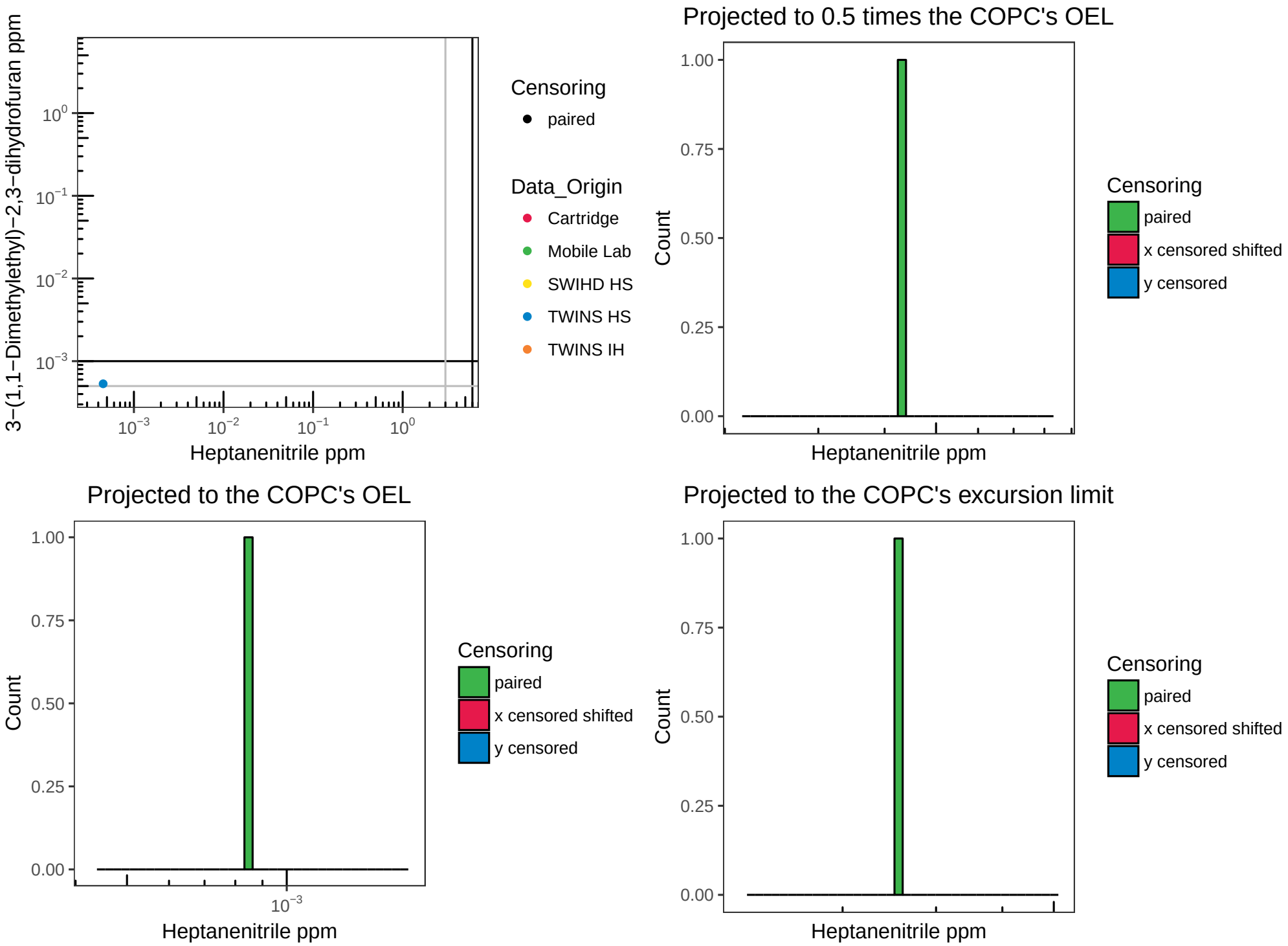


Figure C.1938: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Heptanenitrile

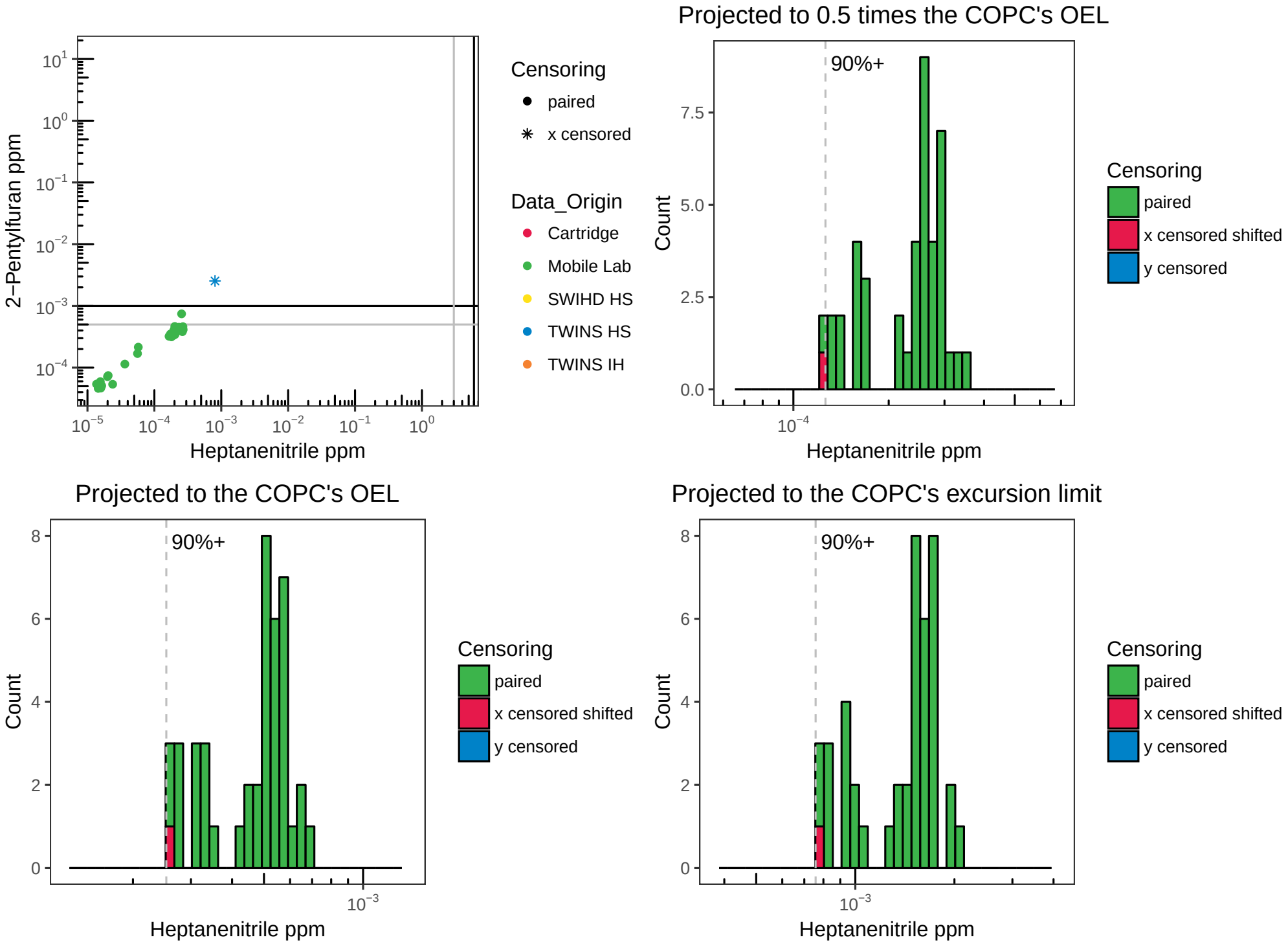


Figure C.1939: 2-Pentylfuran vs Heptanenitrile

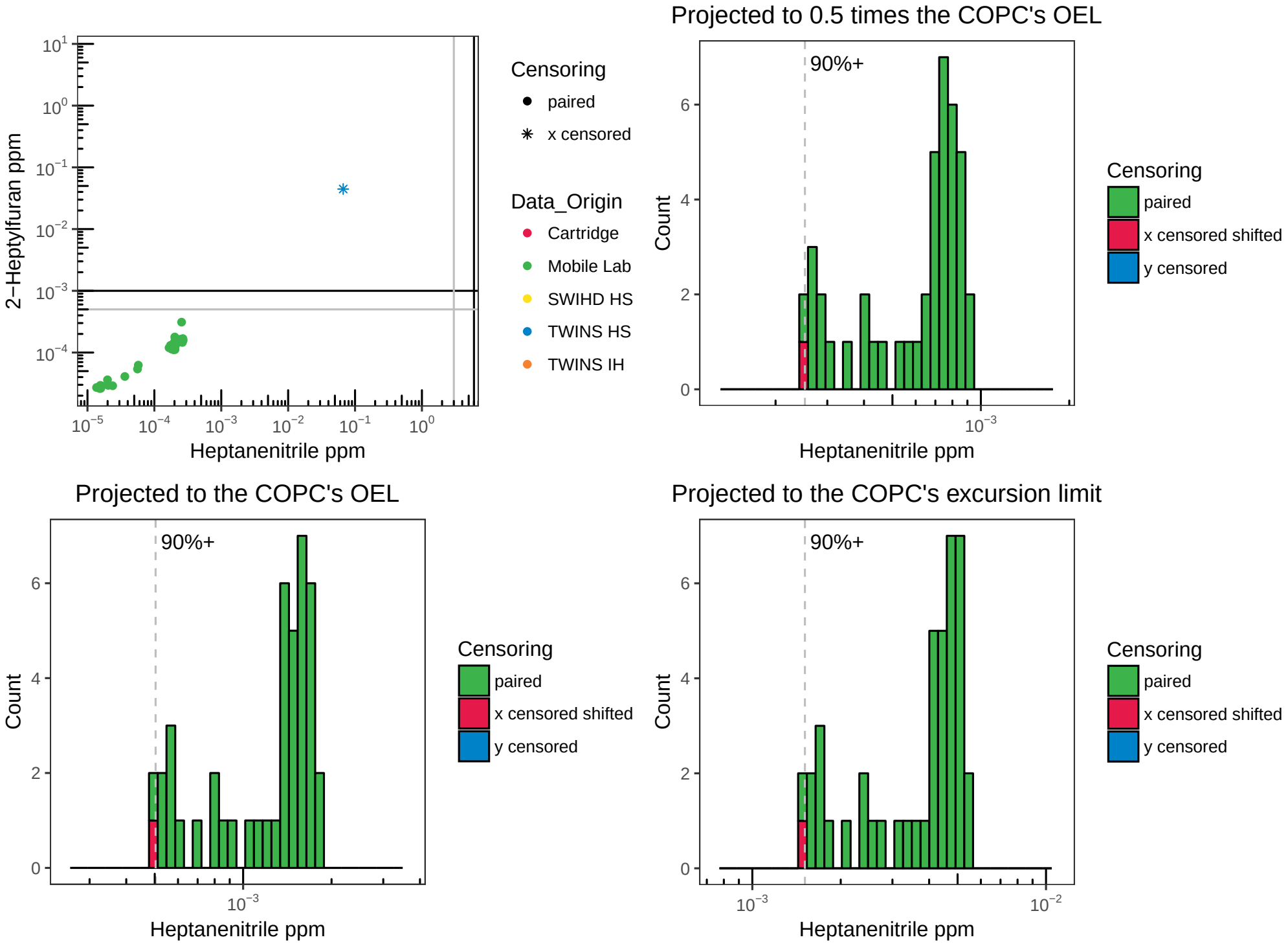


Figure C.1940: 2-Heptylfuran vs Heptanenitrile

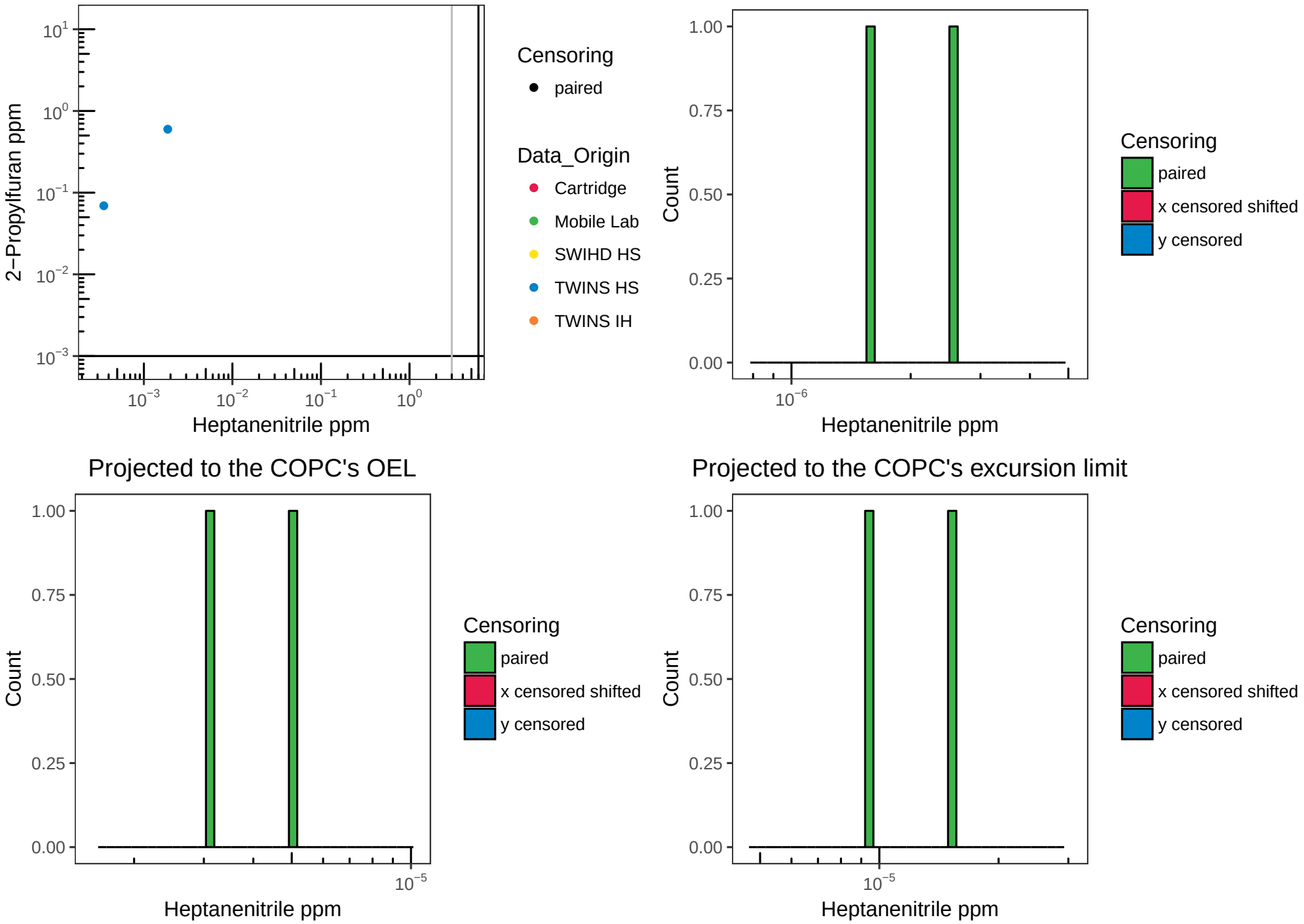


Figure C.1941: 2-Propylfuran vs Heptanenitrile

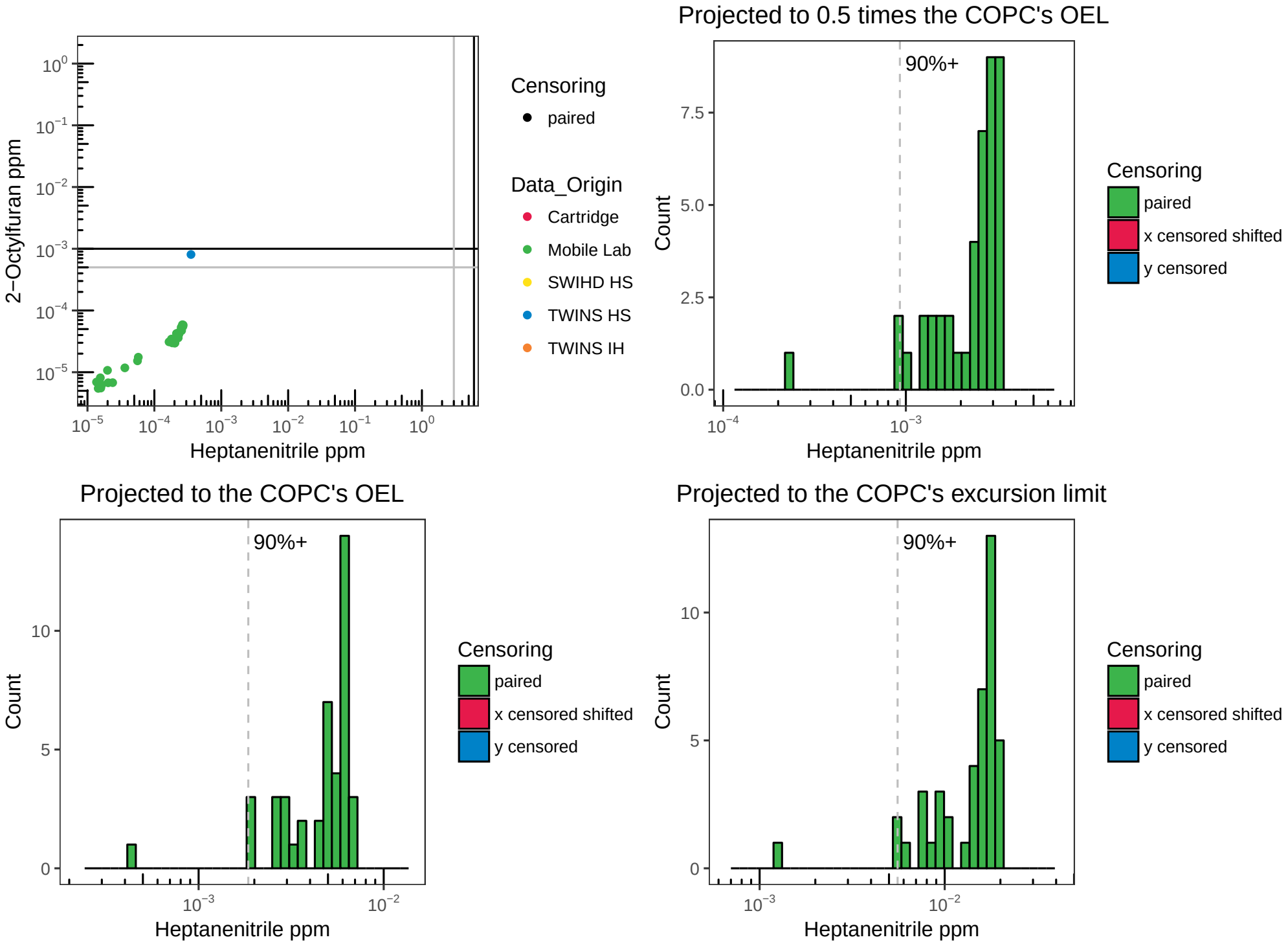


Figure C.1942: 2-Octylfuran vs Heptanenitrile

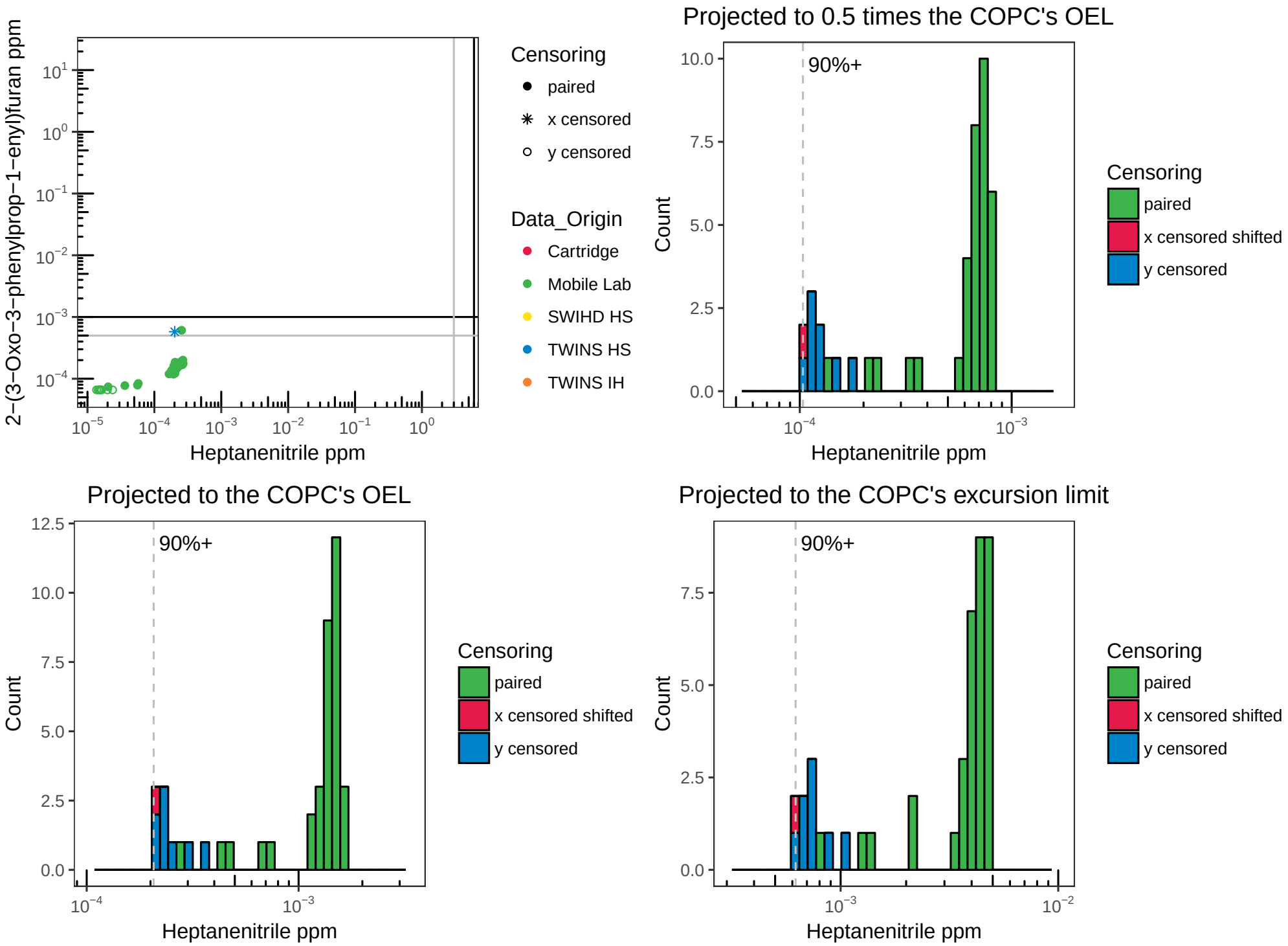


Figure C.1943: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Heptanenitrile

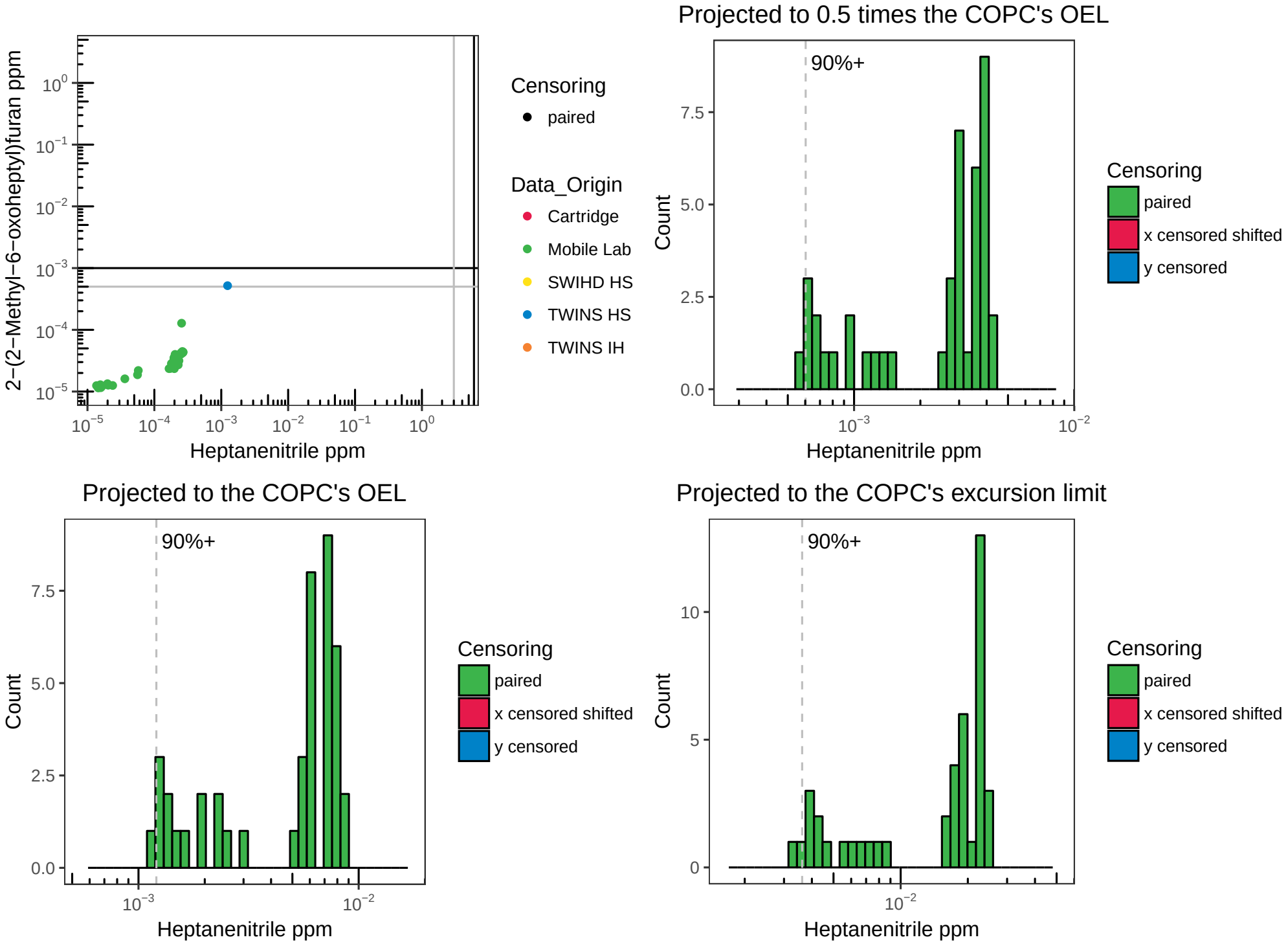


Figure C.1944: 2-(2-Methyl-6-oxoheptyl)furan vs Heptanenitrile

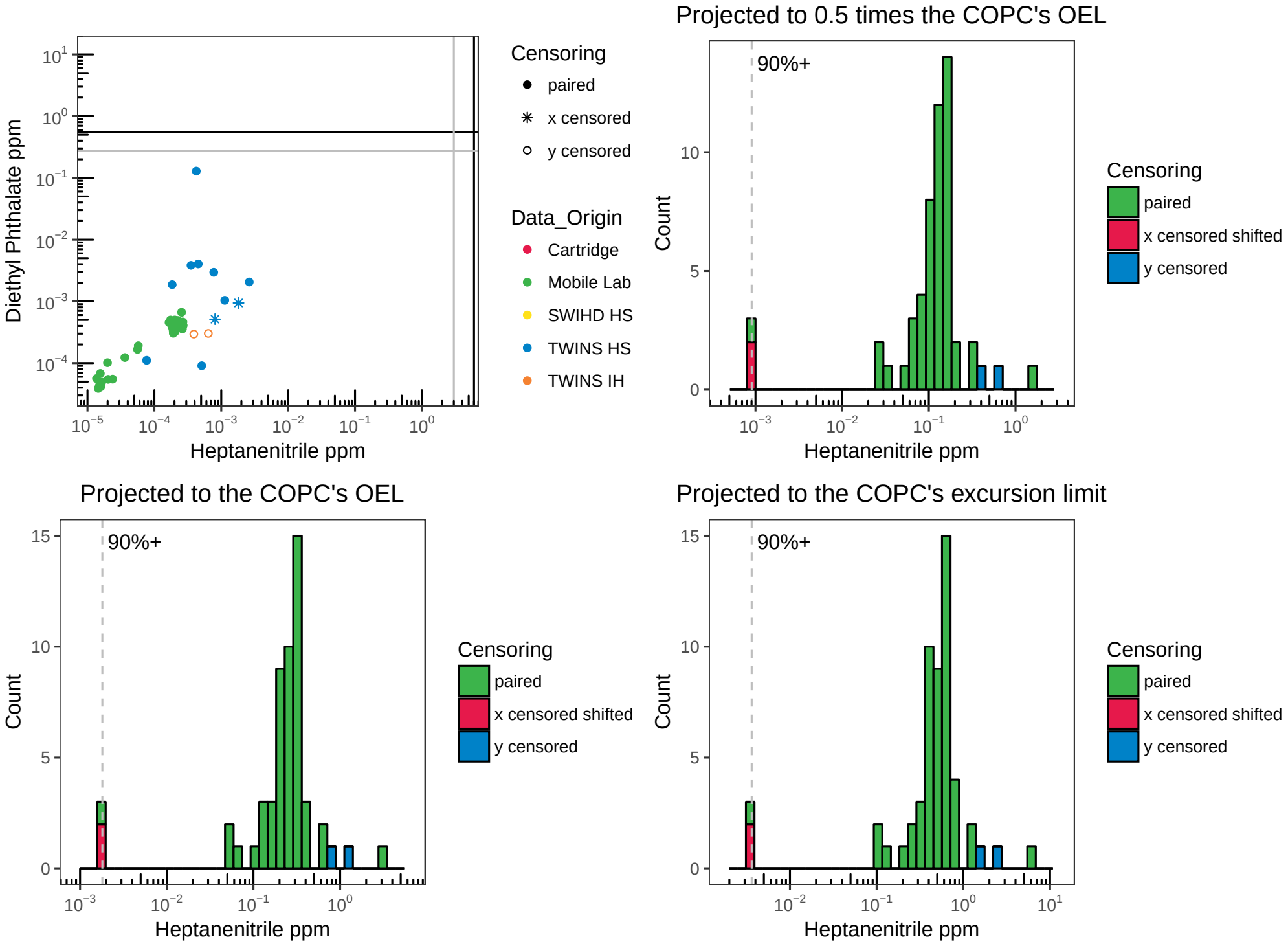


Figure C.1945: Diethyl Phthalate vs Heptanenitrile

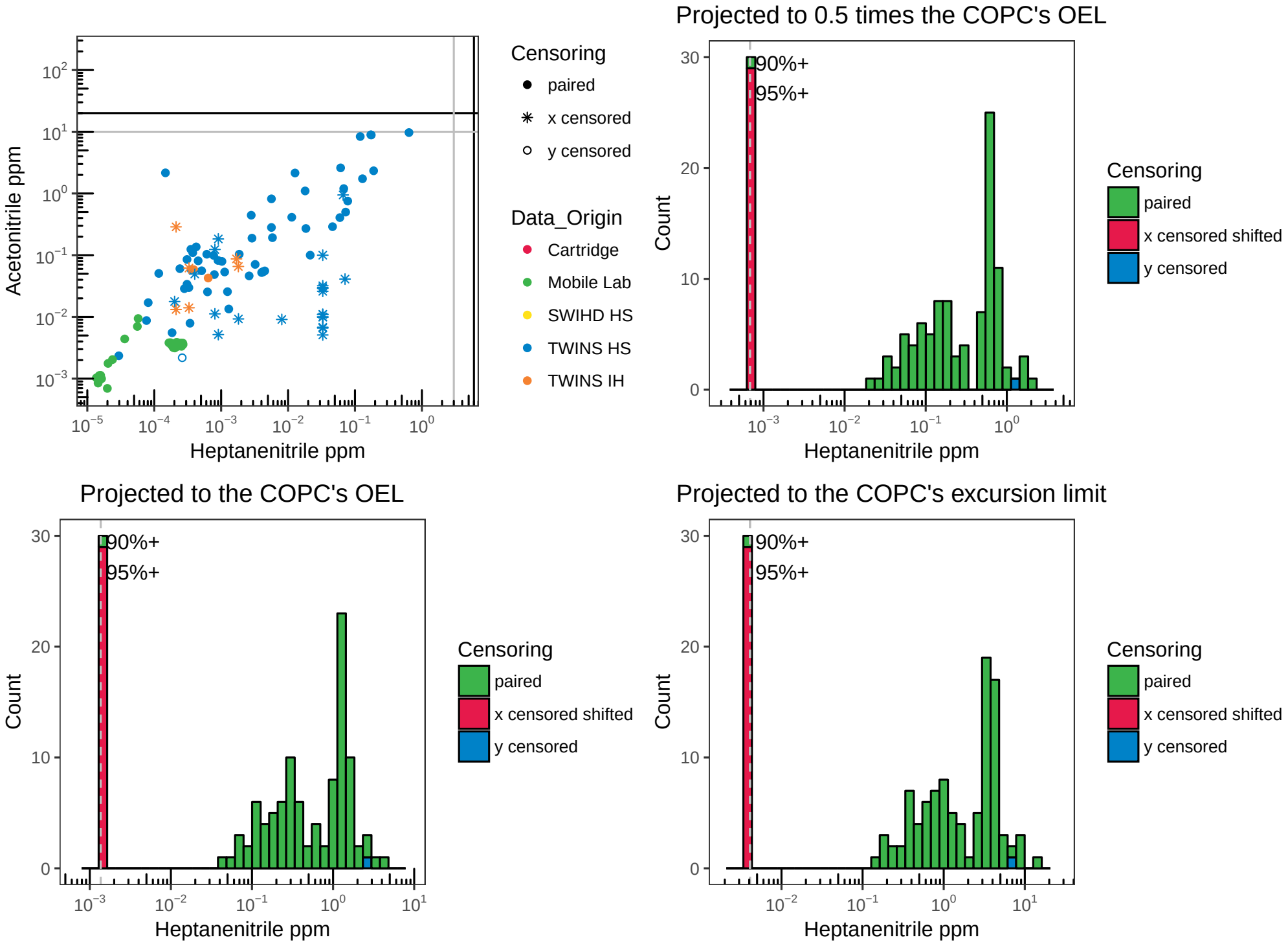


Figure C.1946: Acetonitrile vs Heptanenitrile

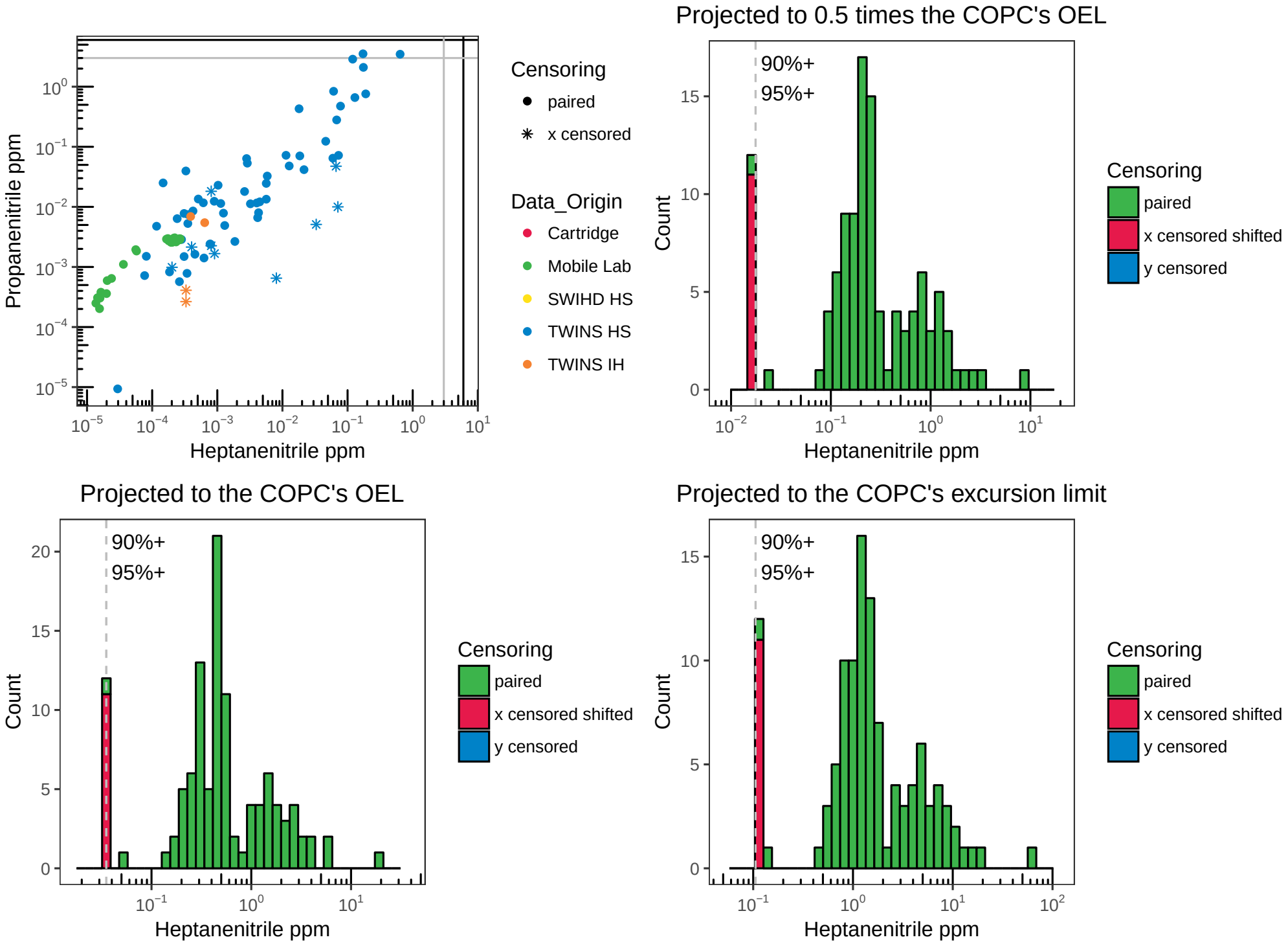


Figure C.1947: Propanenitrile vs Heptanenitrile

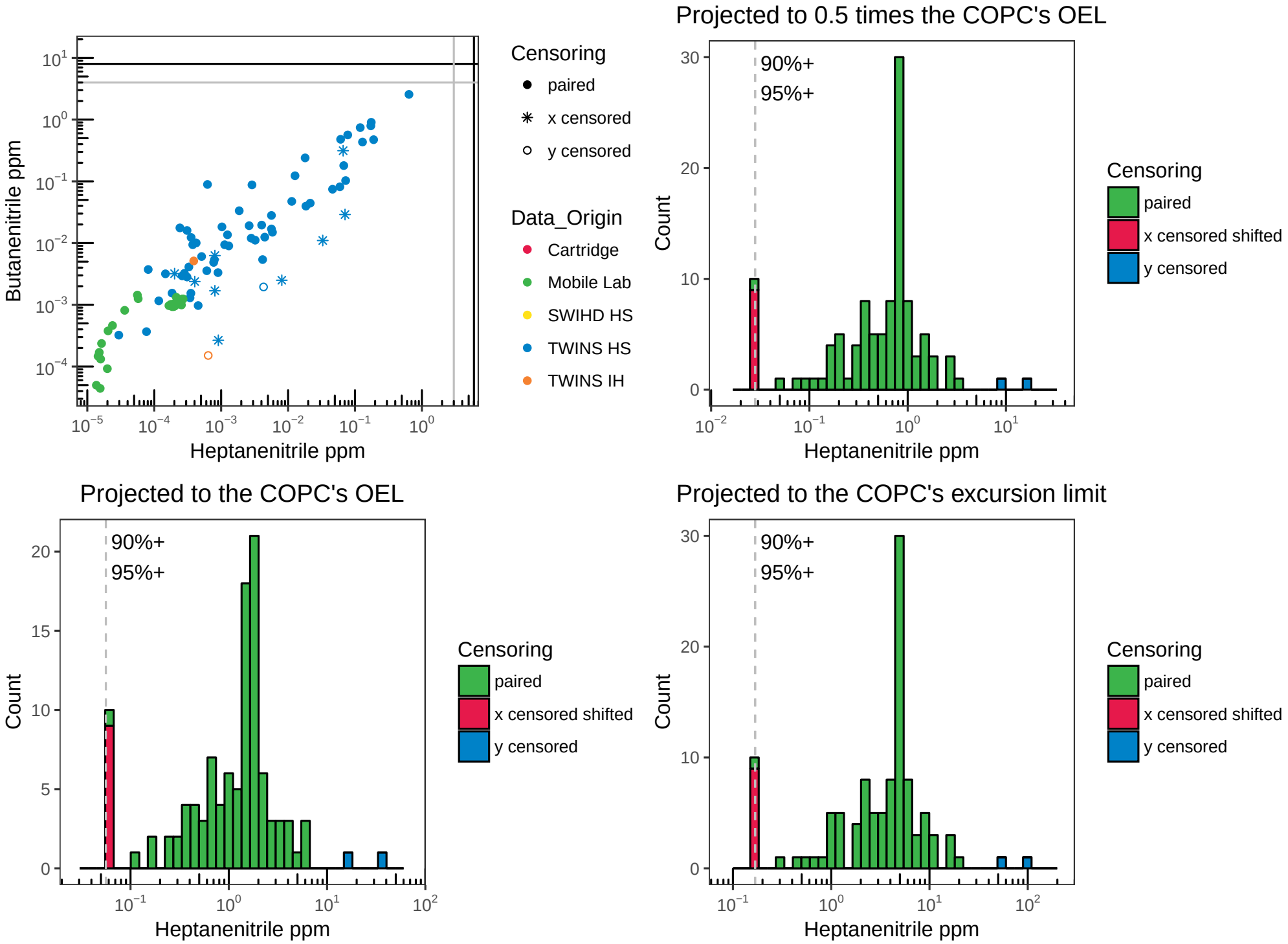


Figure C.1948: Butanenitrile vs Heptanenitrile

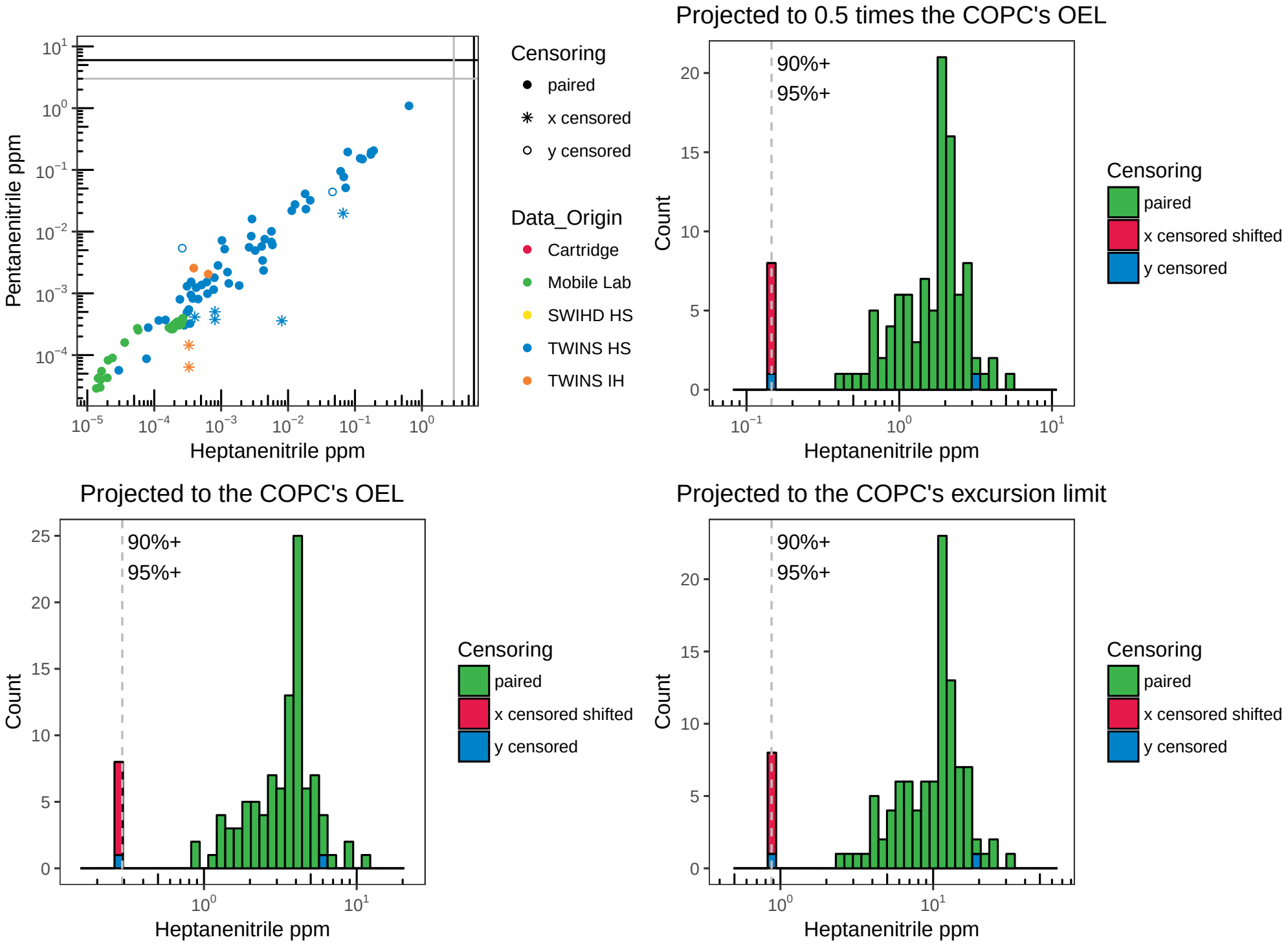


Figure C.1949: Pentanenitrile vs Heptanenitrile

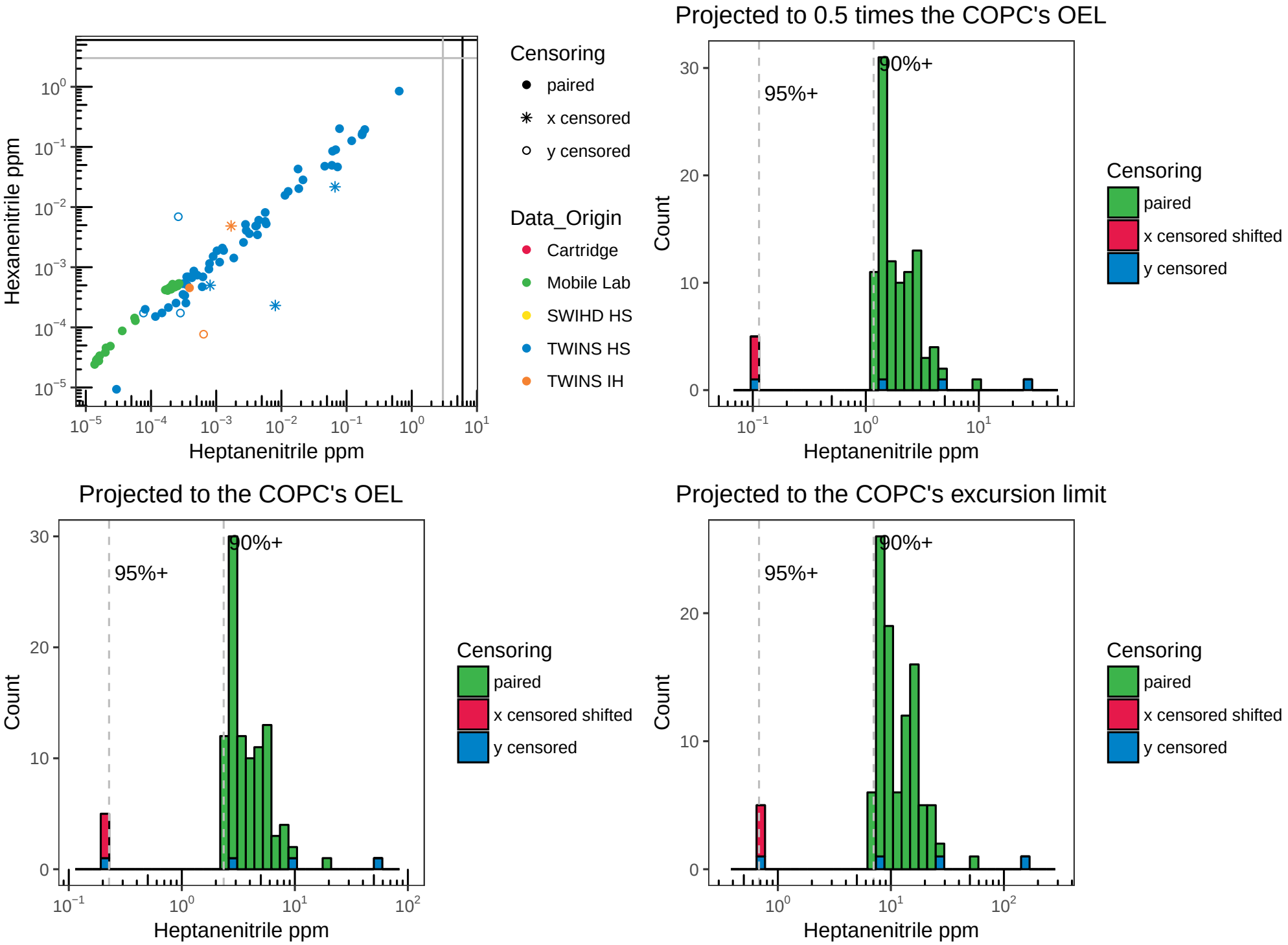


Figure C.1950: Hexanenitrile vs Heptanenitrile

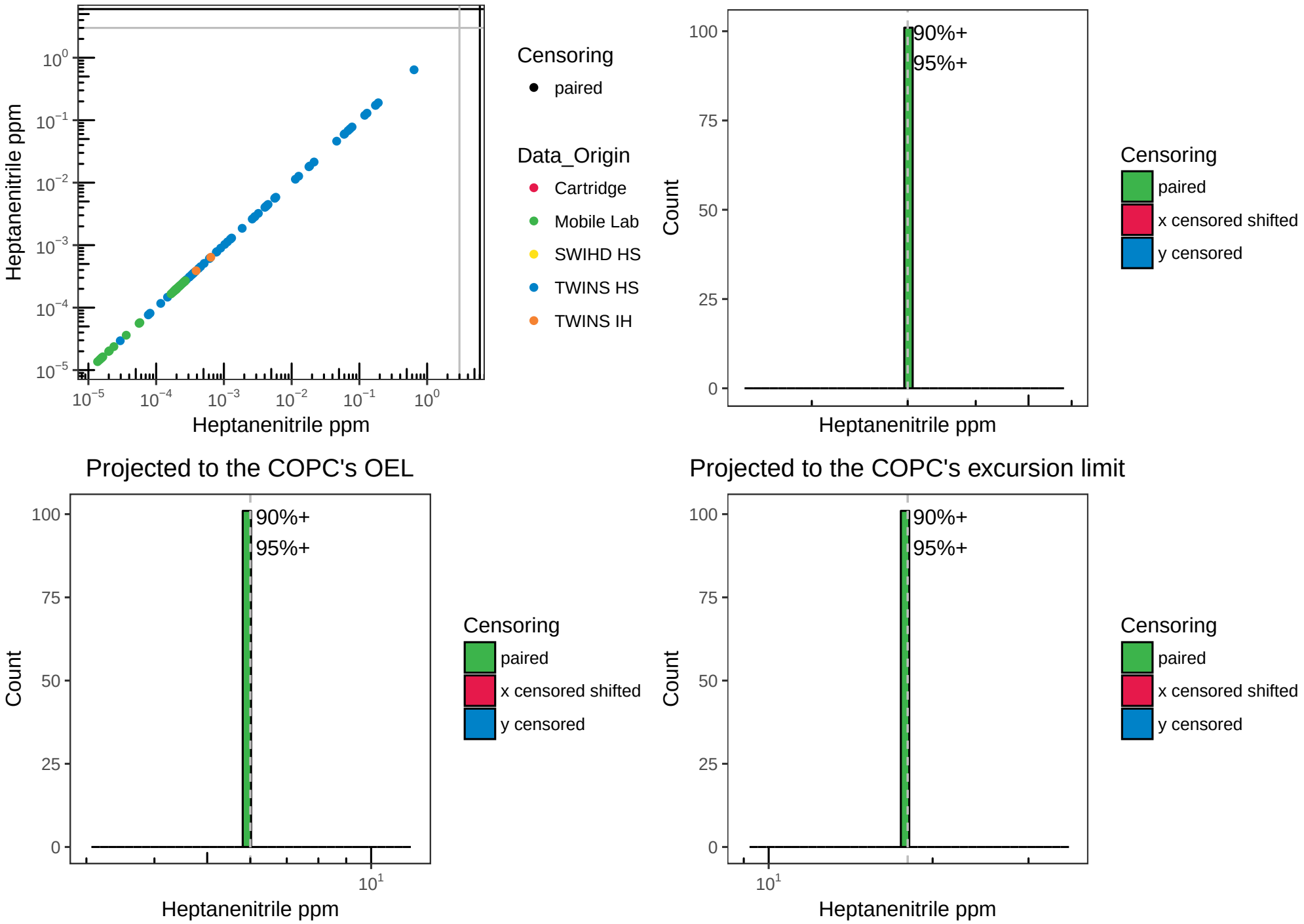


Figure C.1951: Heptanenitrile vs Heptanenitrile

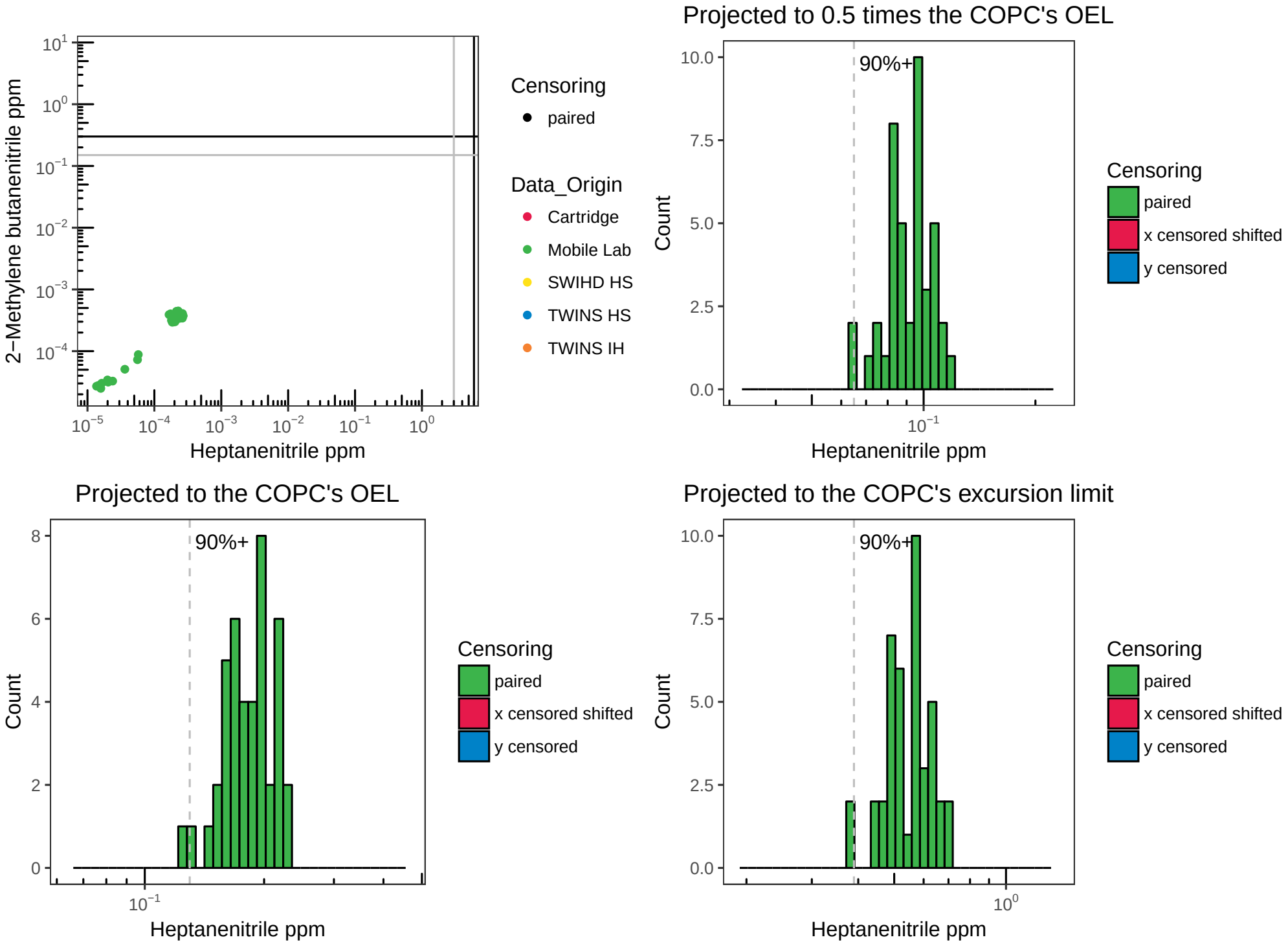


Figure C.1952: 2-Methylene butanenitrile vs Heptanenitrile

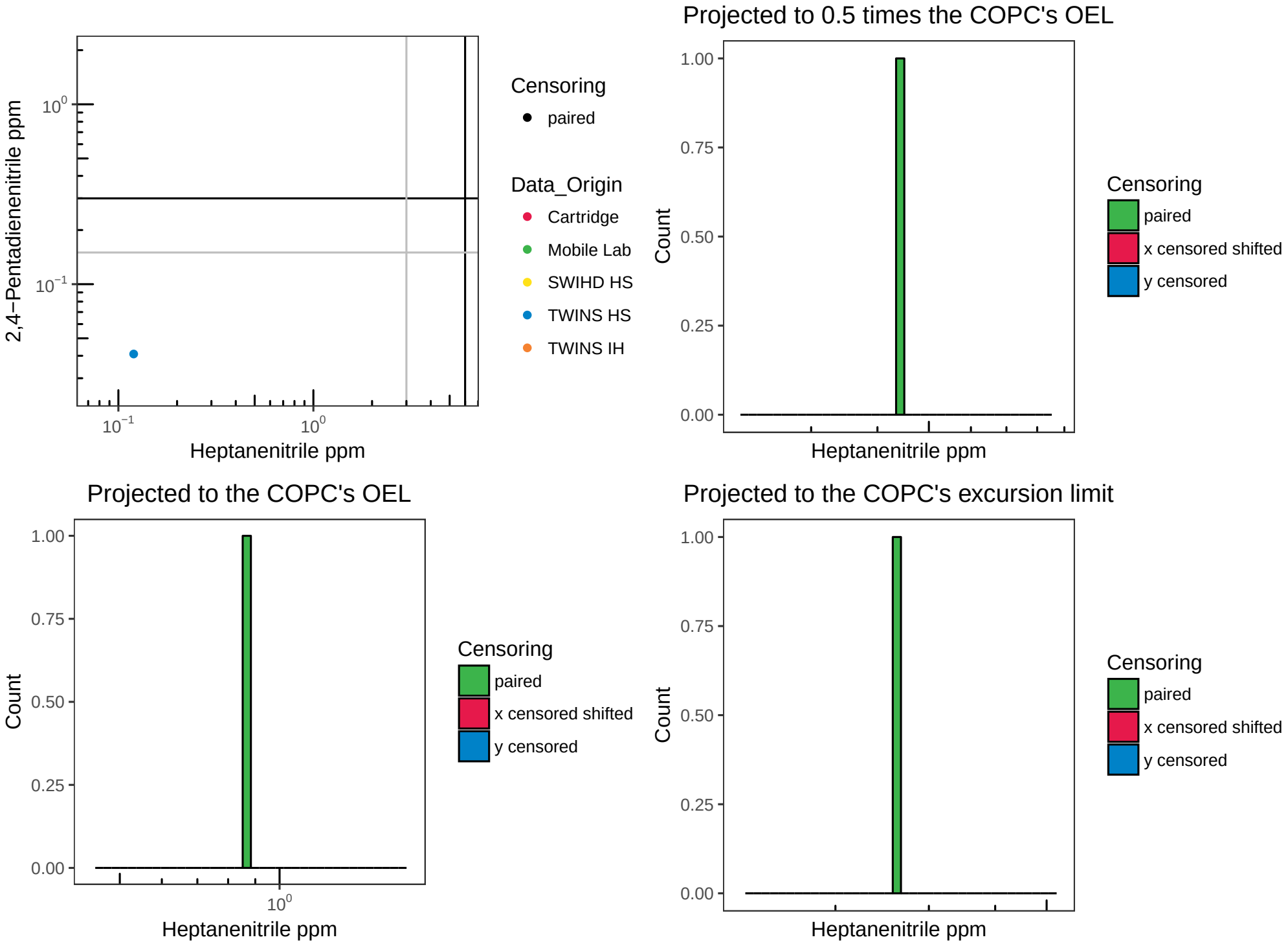


Figure C.1953: 2,4-Pentadienenitrile vs Heptanenitrile

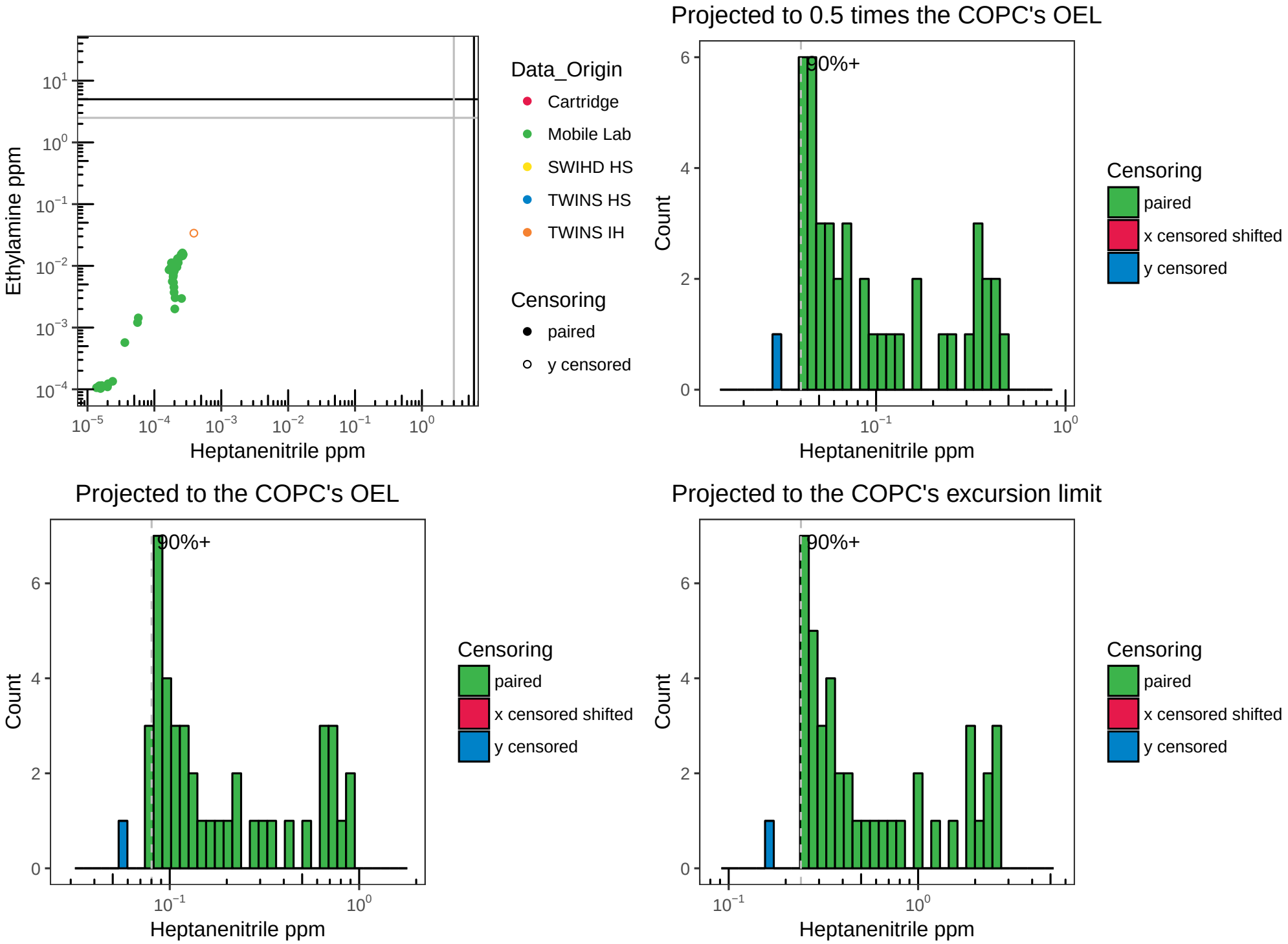


Figure C.1954: Ethylamine vs Heptanenitrile

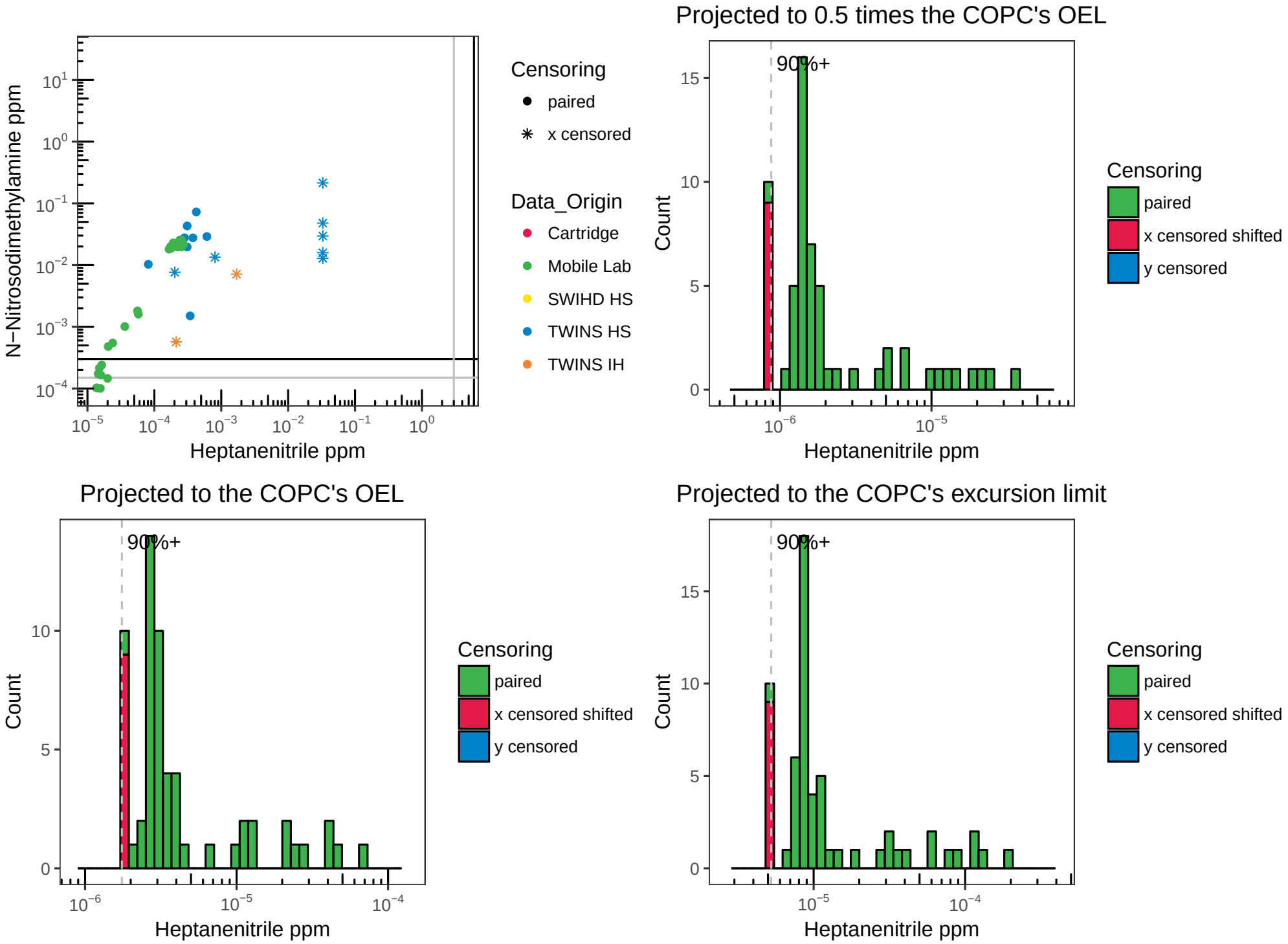


Figure C.1955: N-Nitrosodimethylamine vs Heptanenitrile

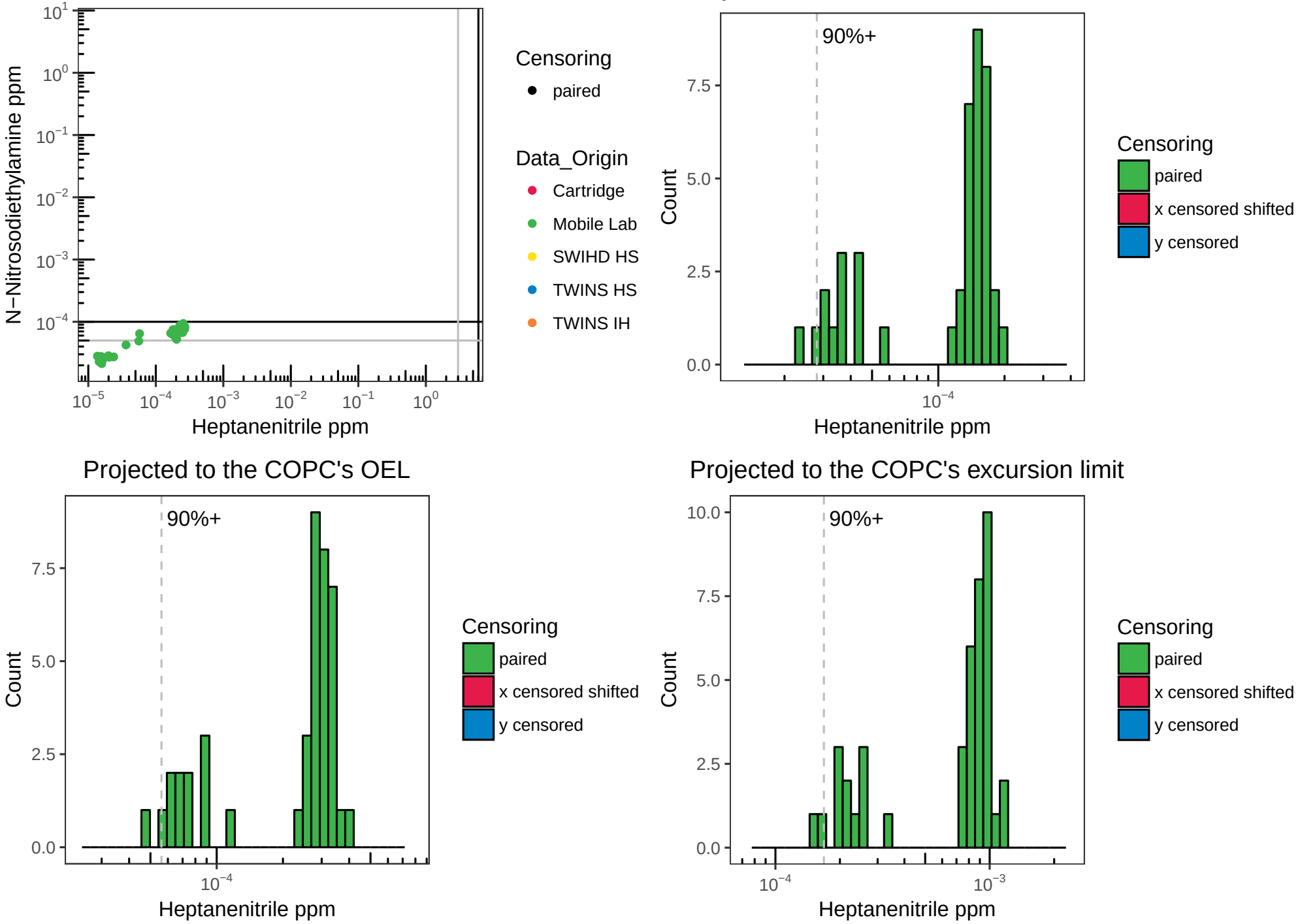


Figure C.1956: N-Nitrosodiethylamine vs Heptanenitrile

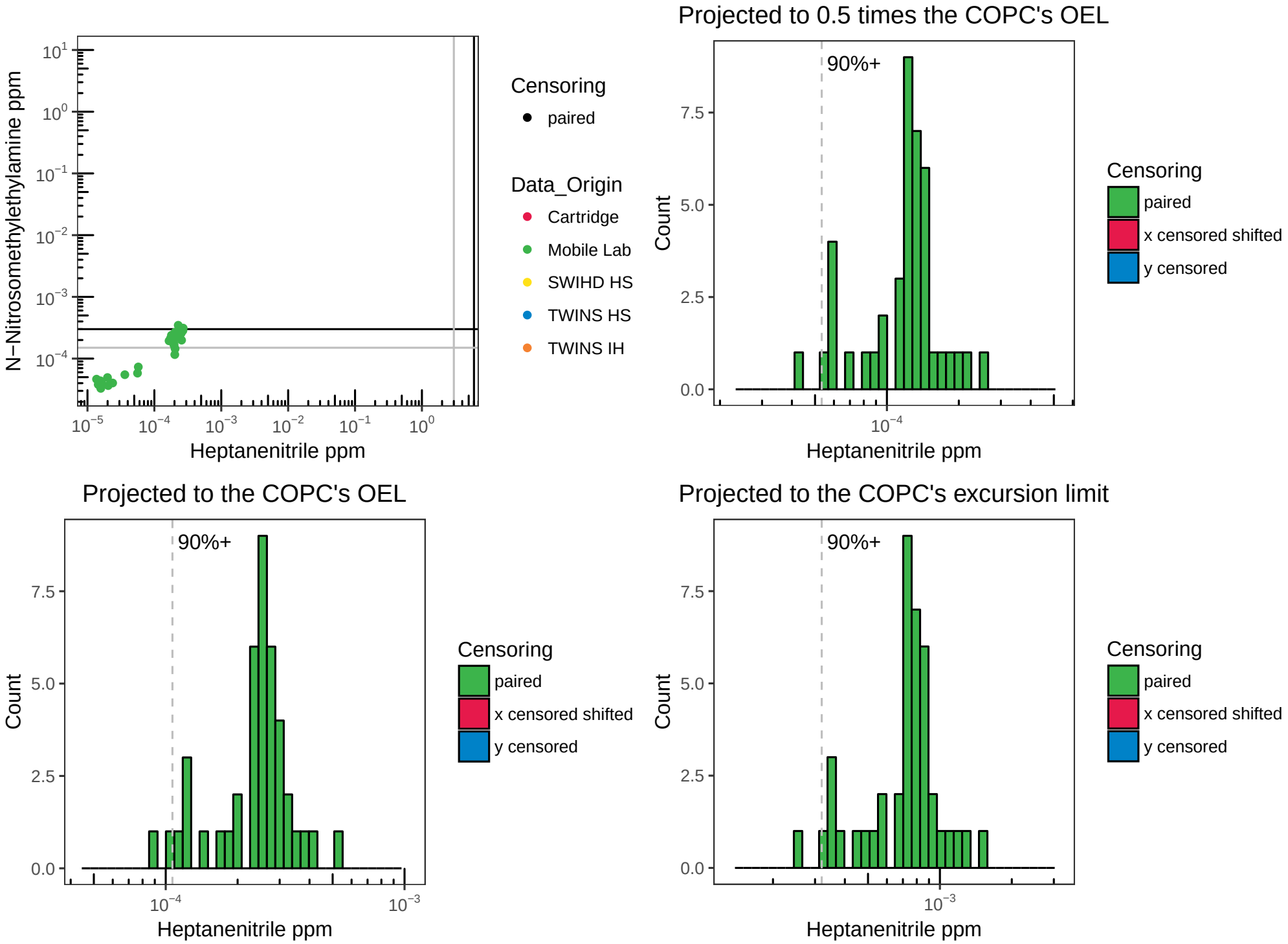


Figure C.1957: N-Nitrosomethylethylamine vs Heptanenitrile

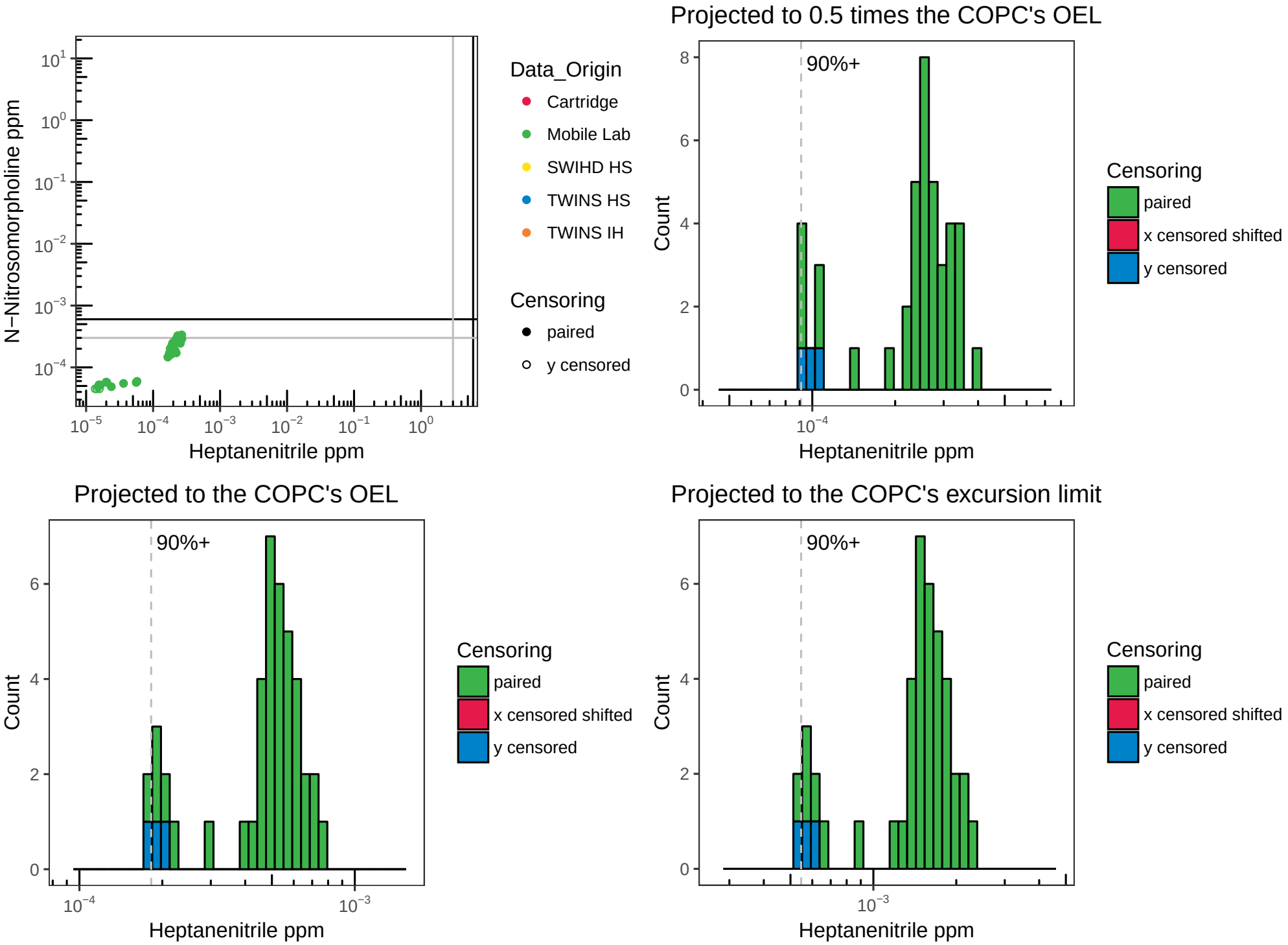


Figure C.1958: N-Nitrosomorpholine vs Heptanenitrile

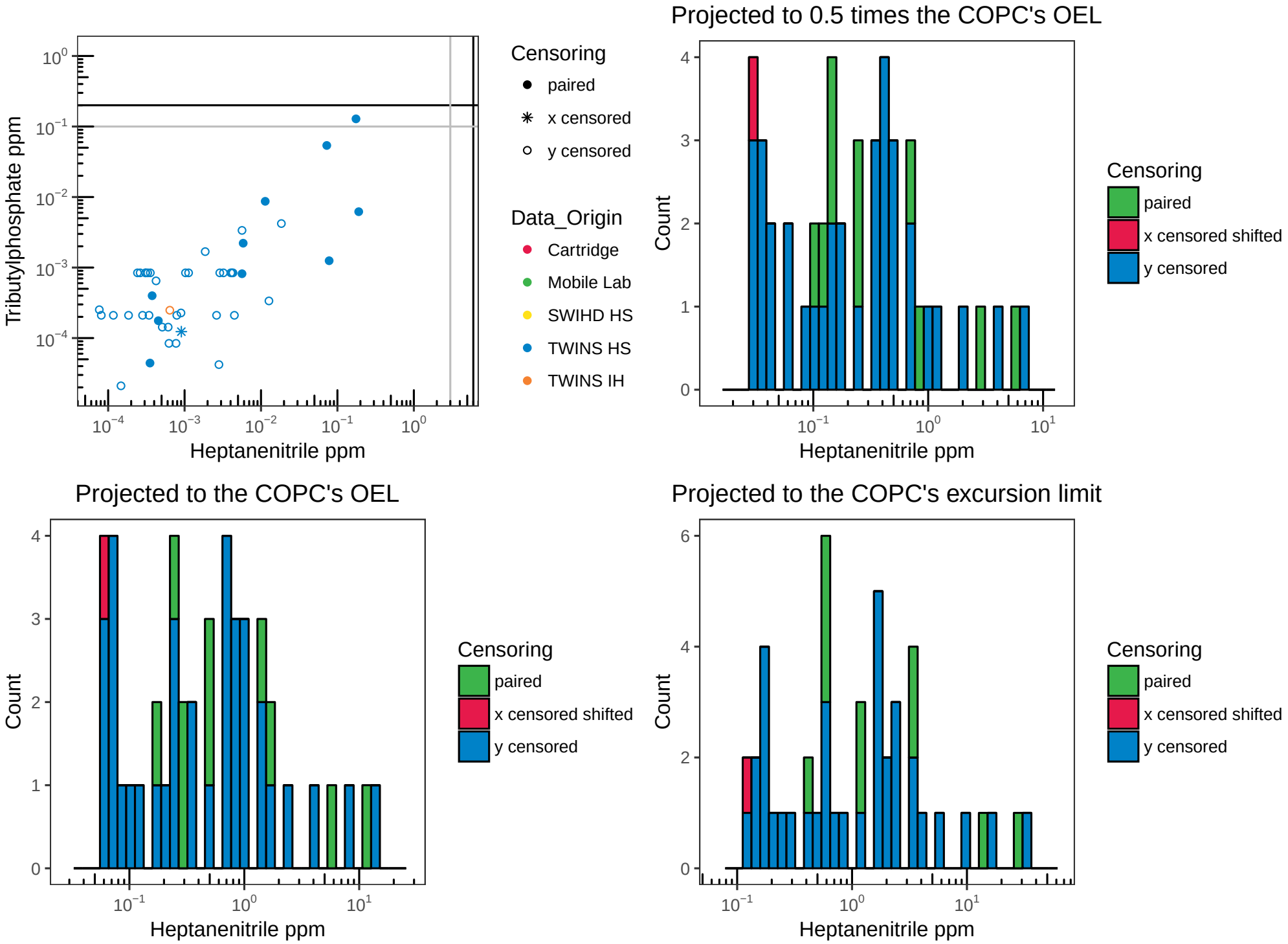


Figure C.1959: Tributylphosphate vs Heptanenitrile

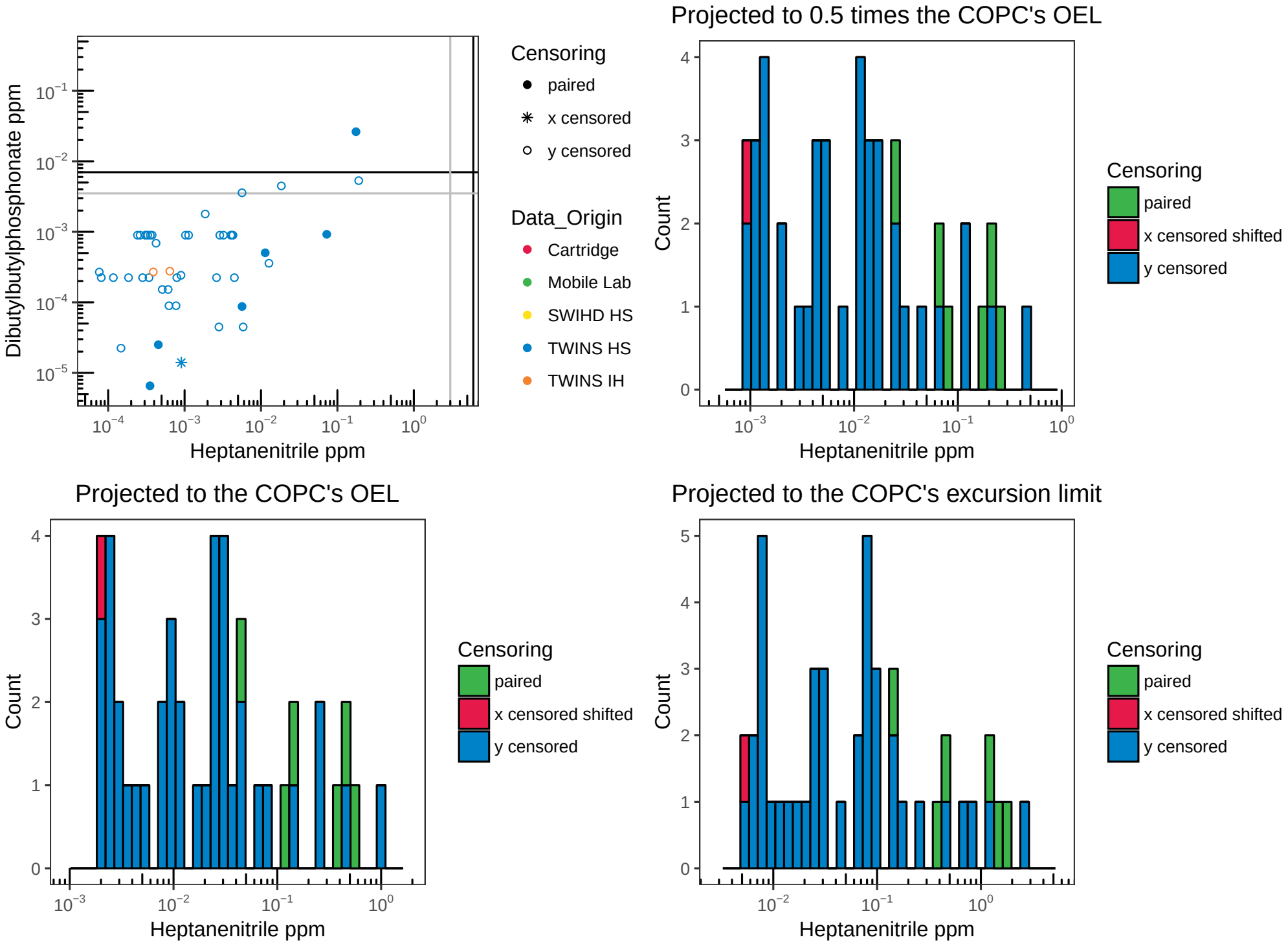


Figure C.1960: Dibutylbutylphosphonate vs Heptanenitrile

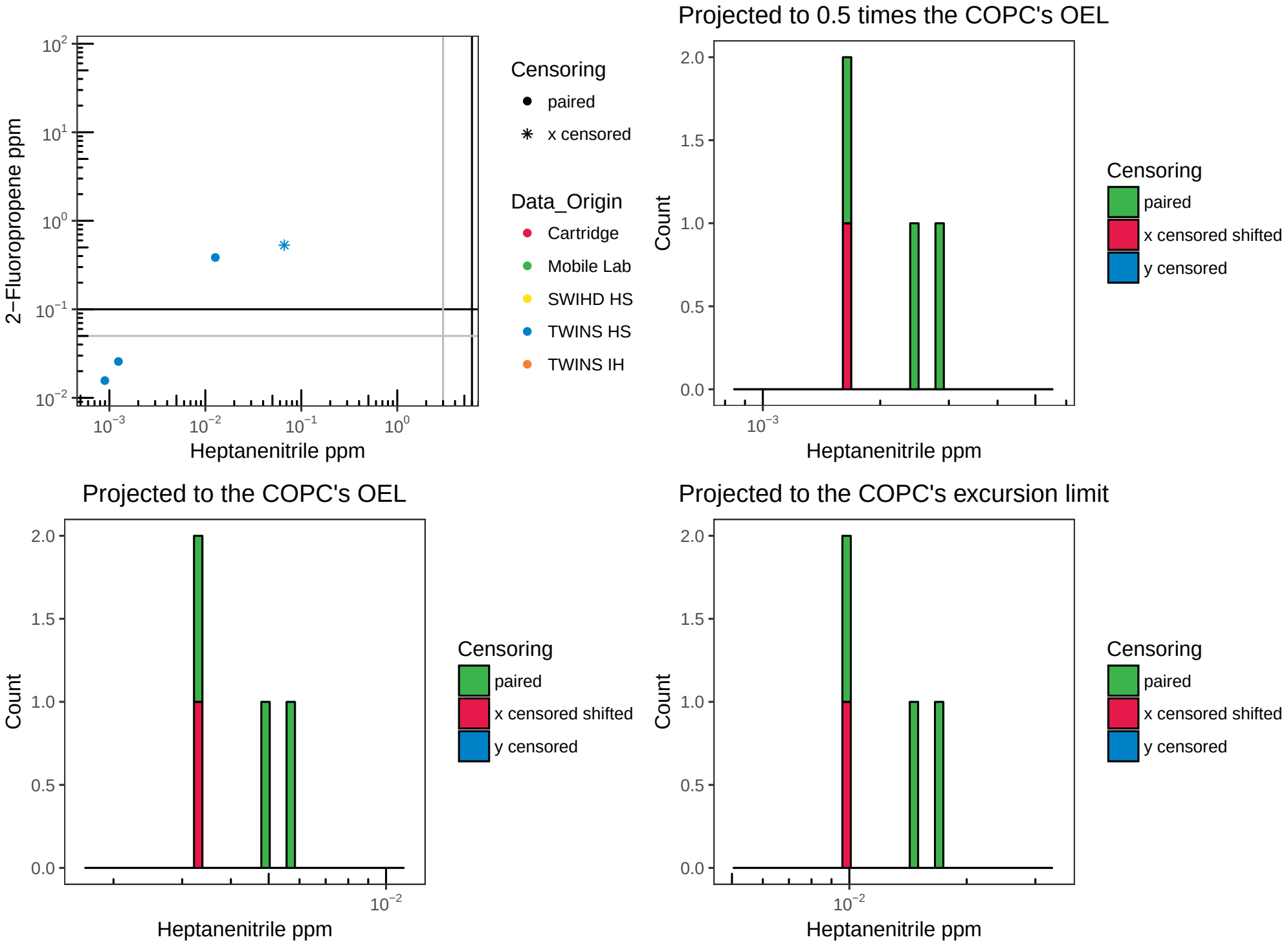


Figure C.1961: 2-Fluoropropene vs Heptanenitrile

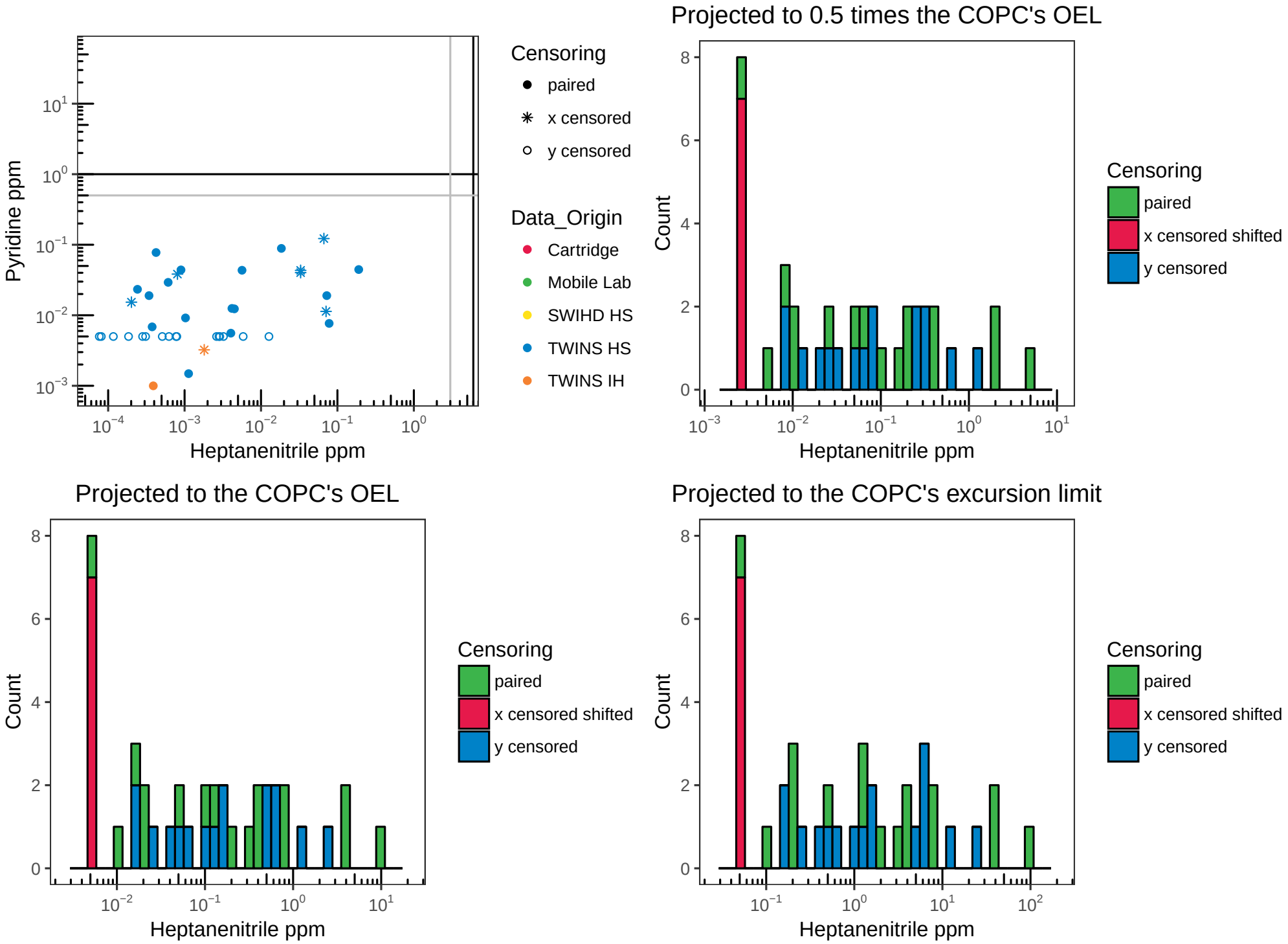


Figure C.1962: Pyridine vs Heptanenitrile

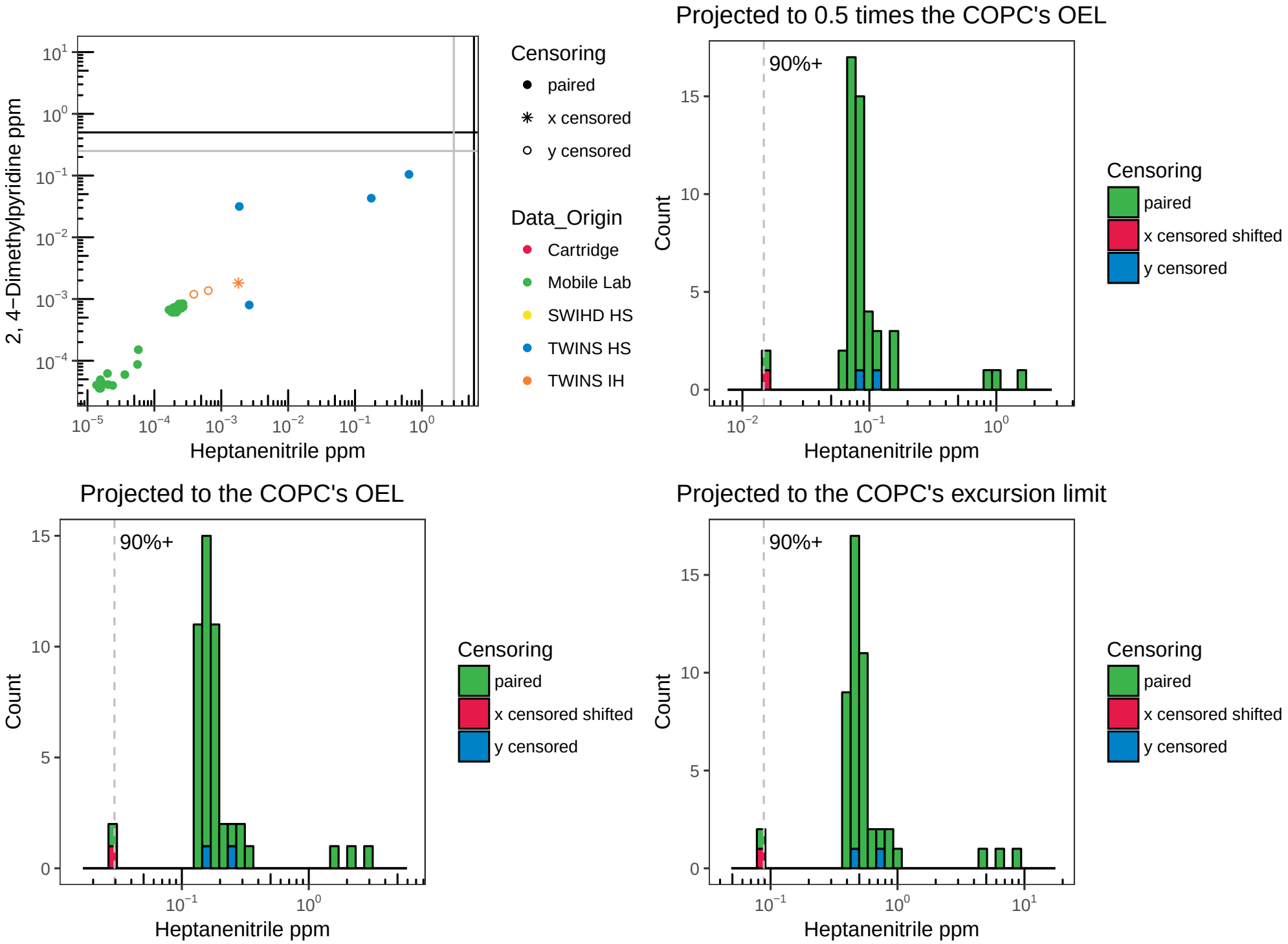


Figure C.1963: 2, 4-Dimethylpyridine vs Heptanenitrile

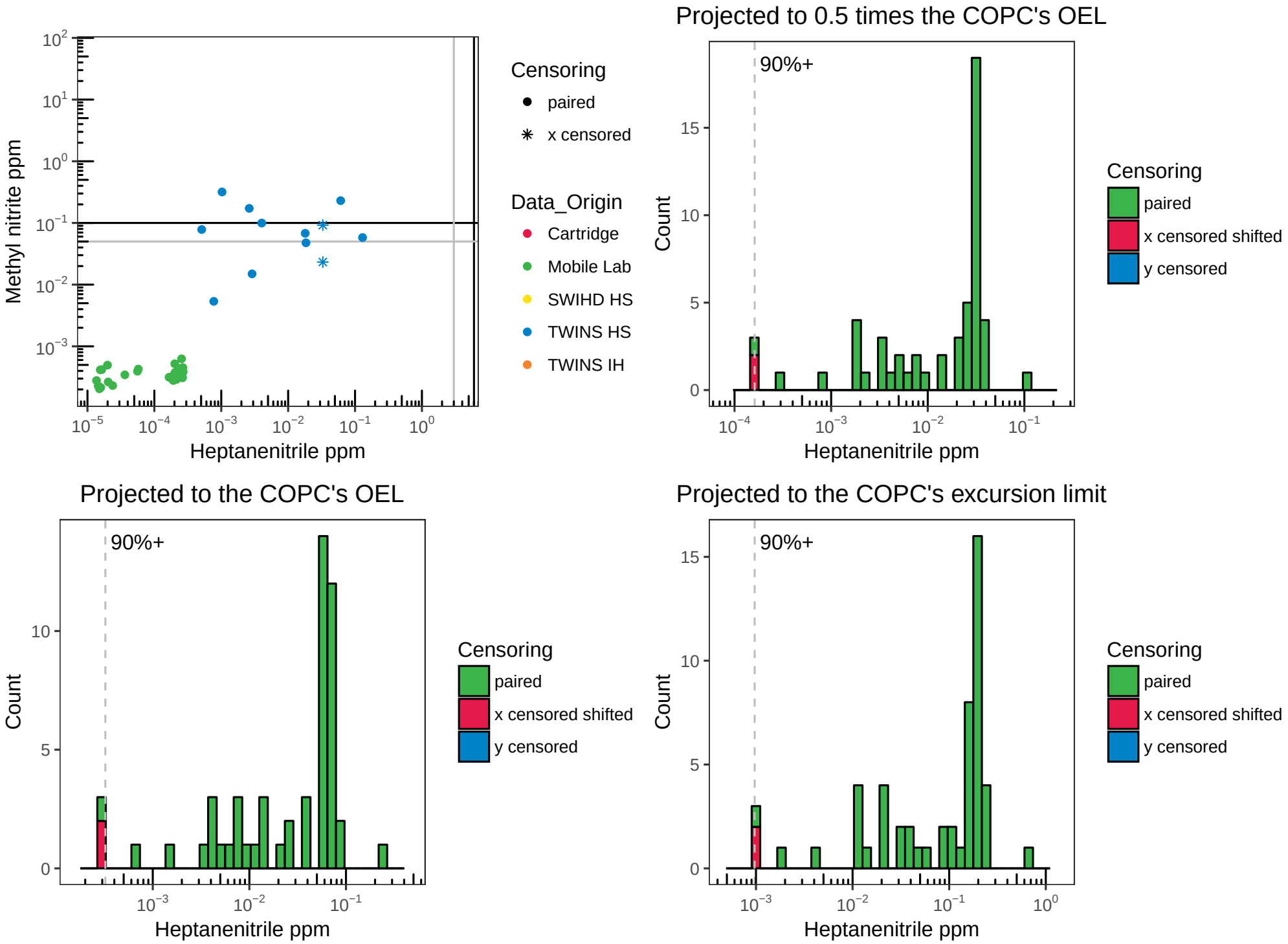


Figure C.1964: Methyl nitrite vs Heptanenitrile

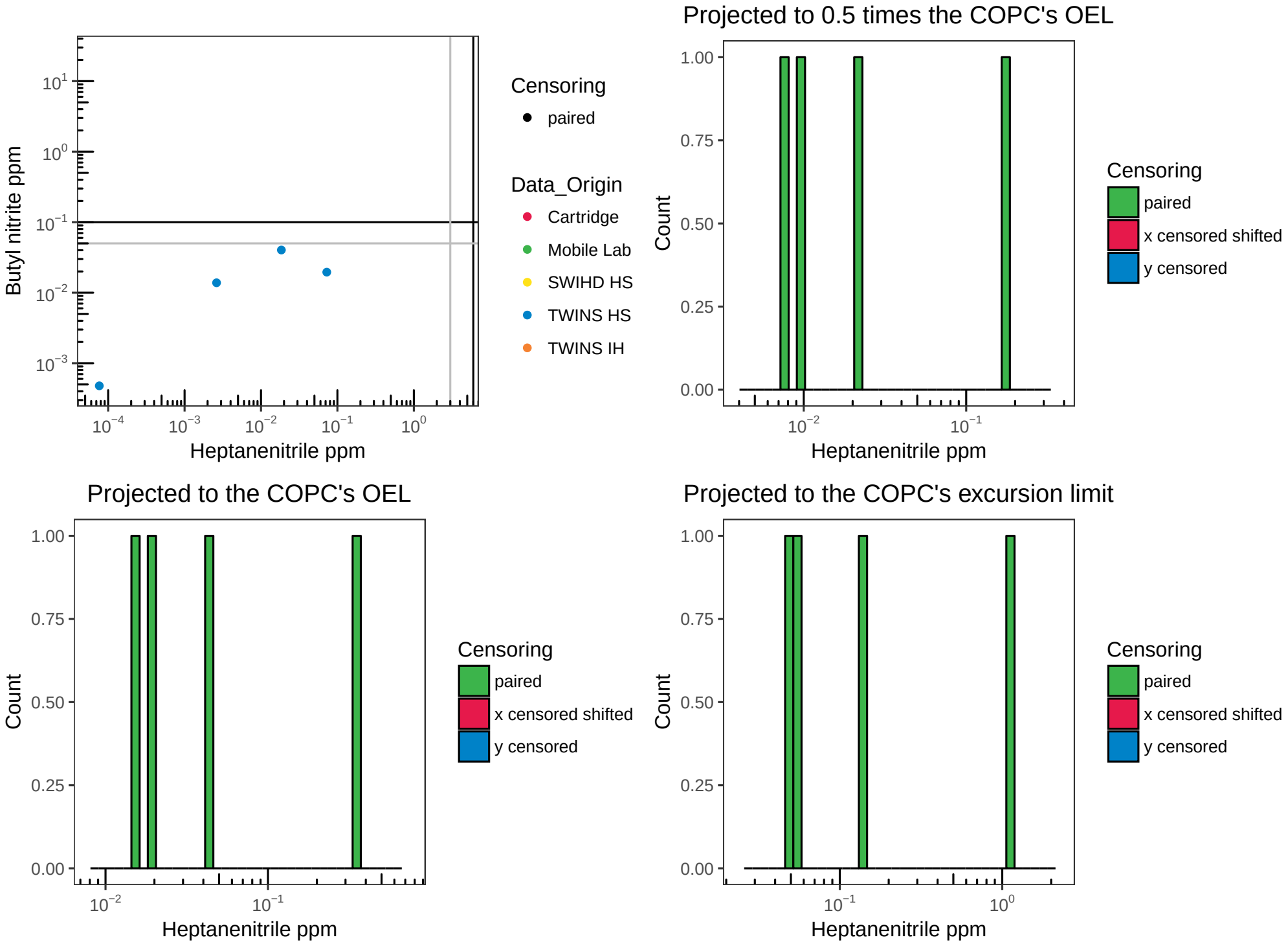


Figure C.1965: Butyl nitrite vs Heptanenitrile

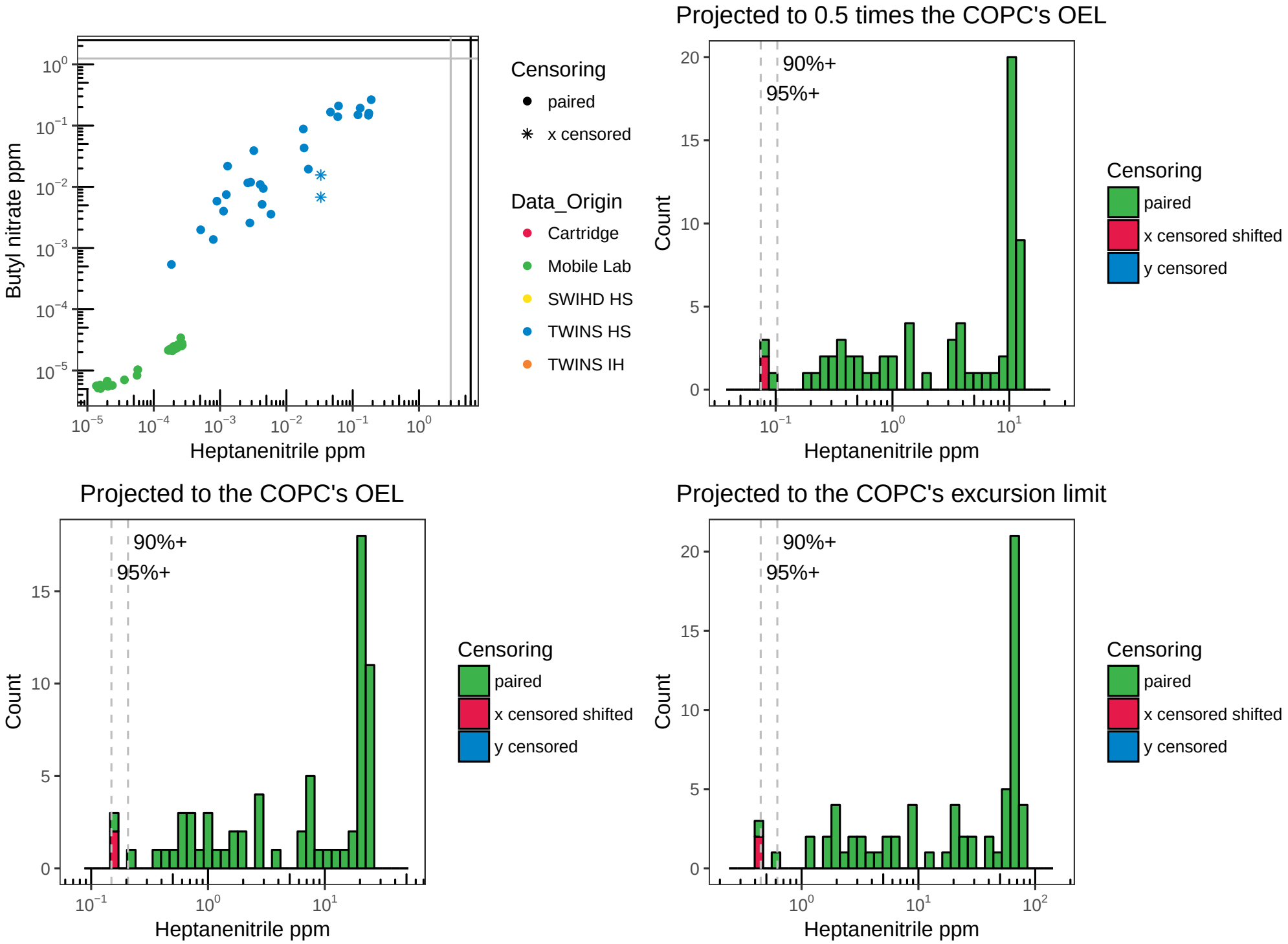


Figure C.1966: Butyl nitrate vs Heptanenitrile

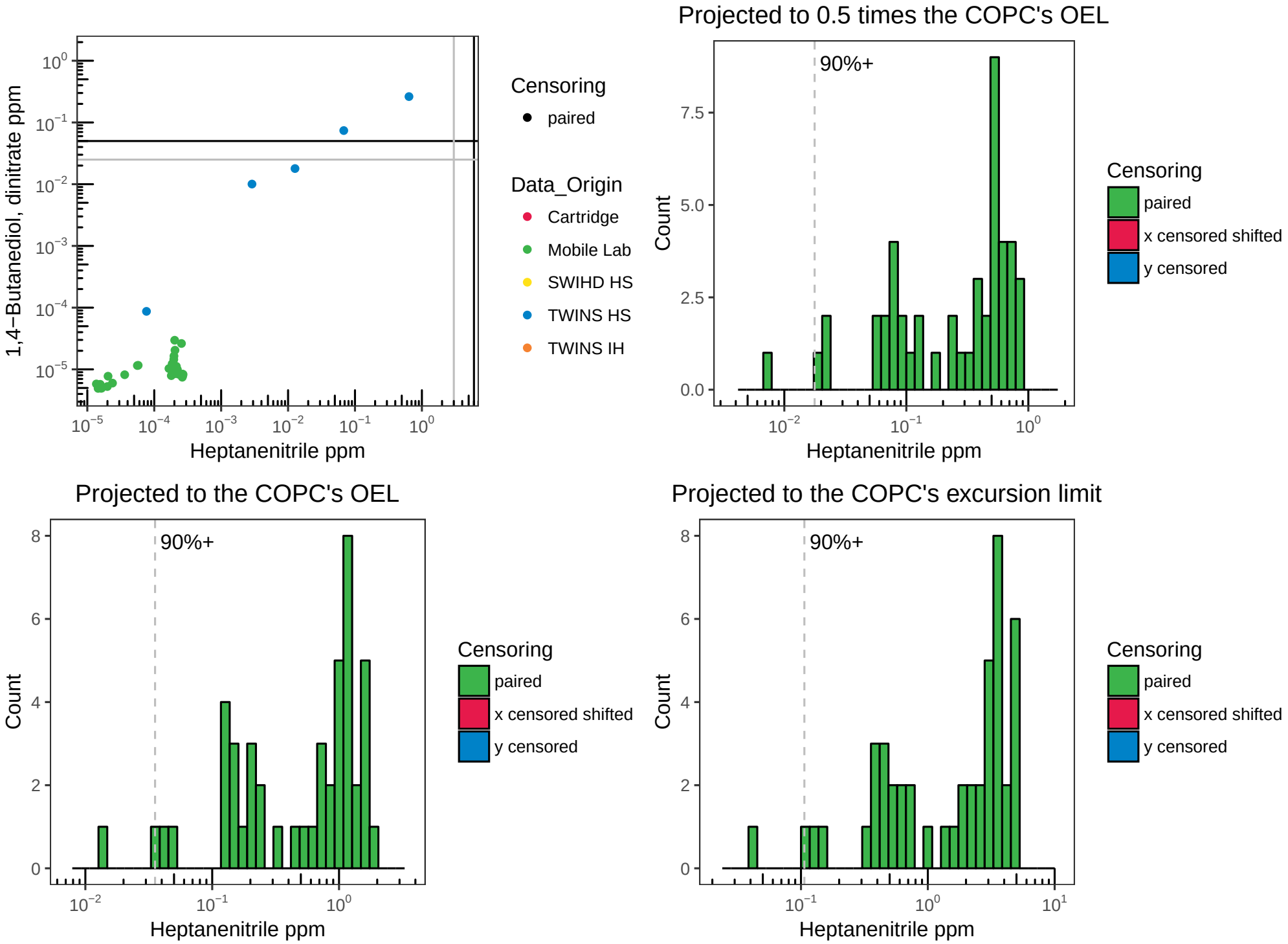


Figure C.1967: 1,4-Butanediol, dinitrate vs Heptanenitrile

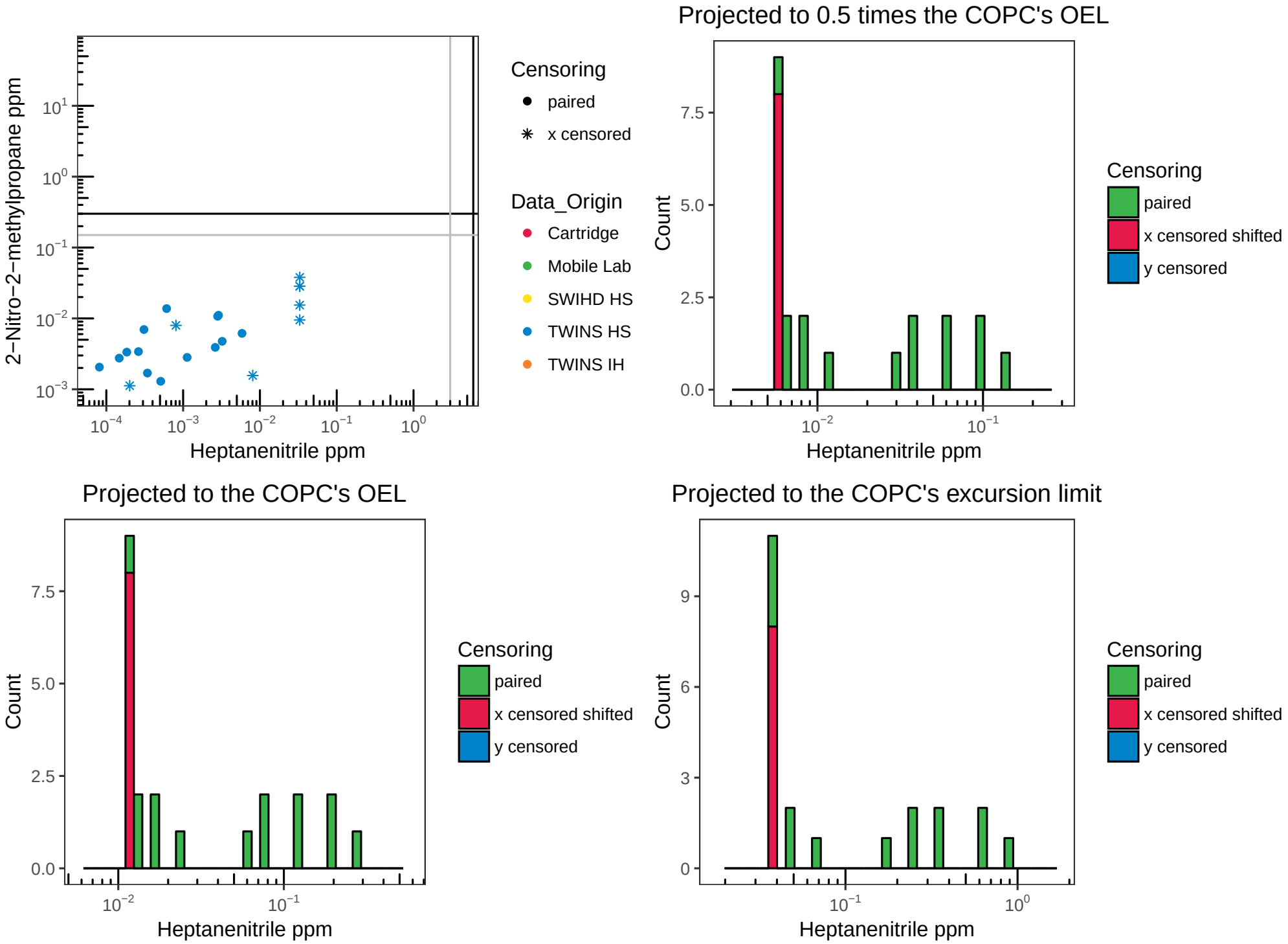


Figure C.1968: 2-Nitro-2-methylpropane vs Heptanenitrile

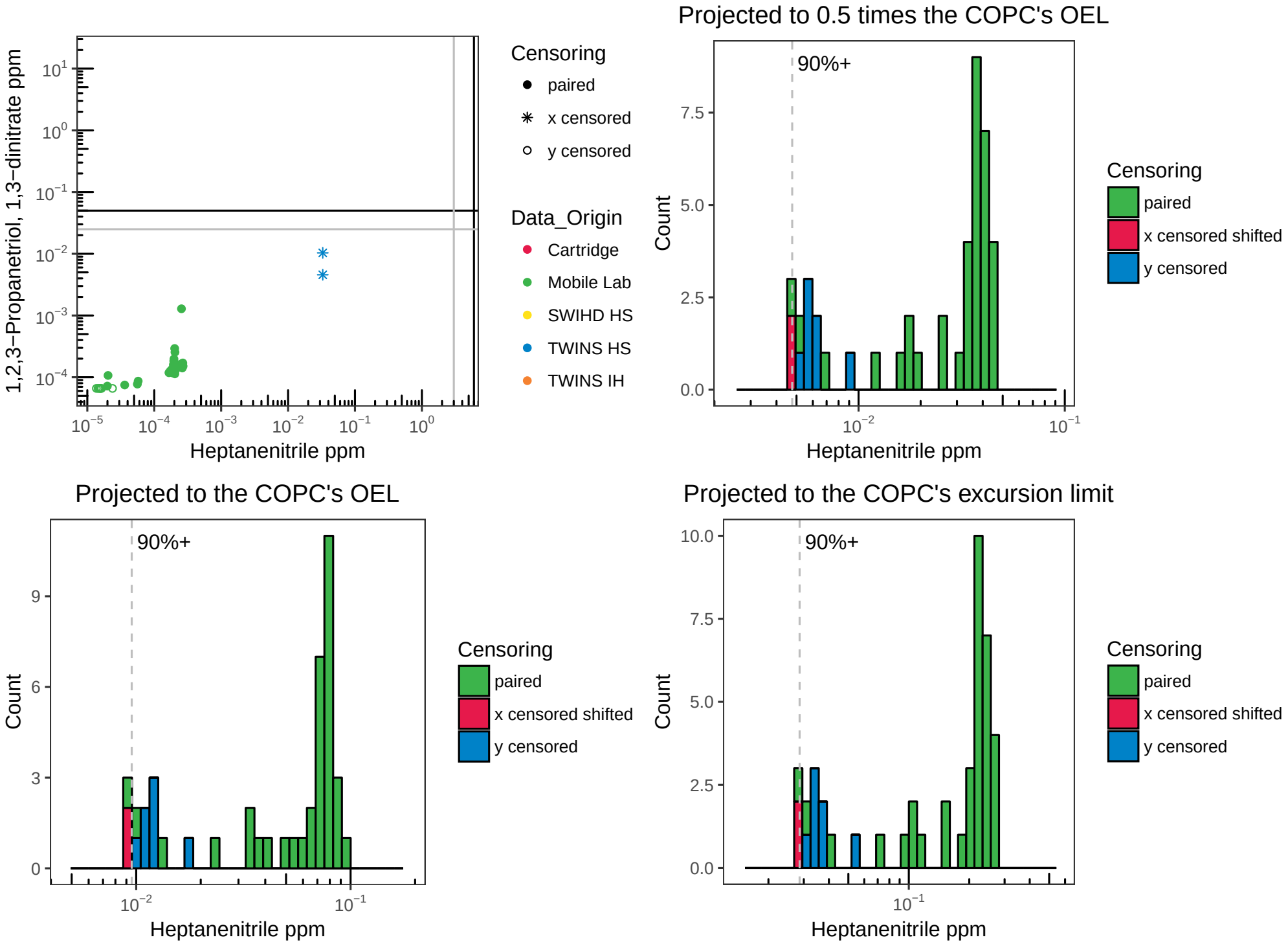


Figure C.1969: 1,2,3-Propanetriol, 1,3-dinitrate vs Heptanenitrile

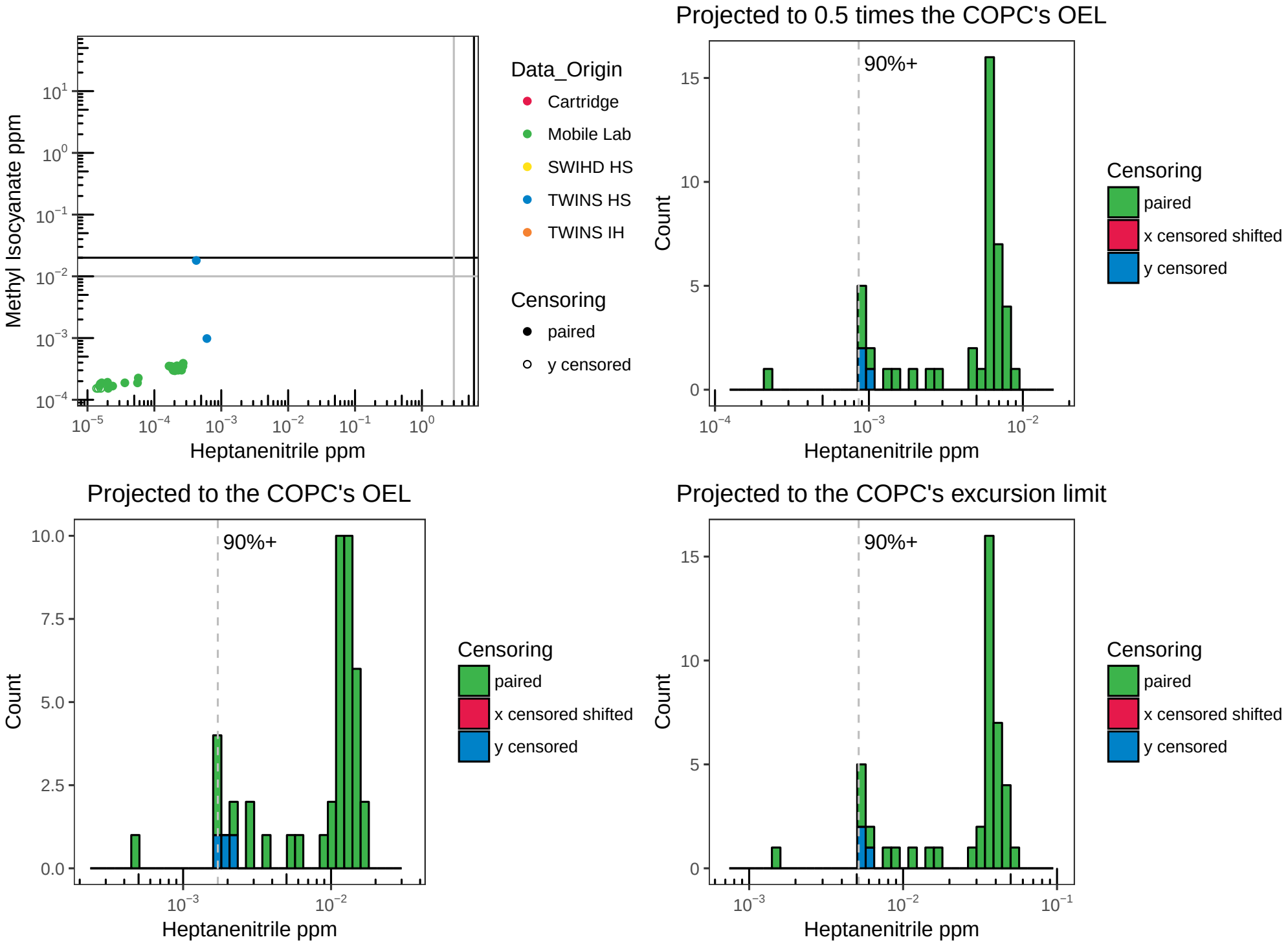


Figure C.1970: Methyl Isocyanate vs Heptanenitrile

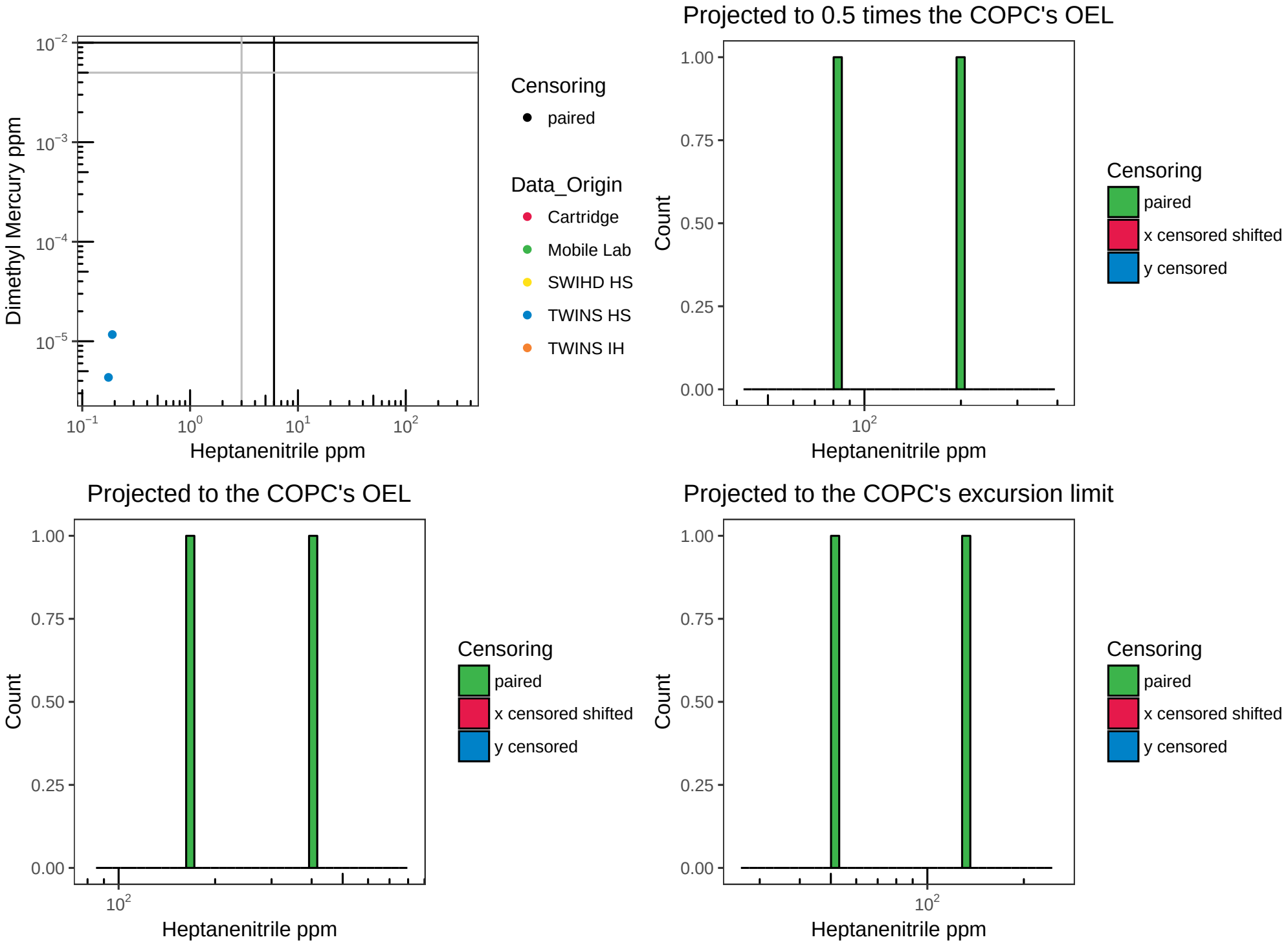


Figure C.1971: Dimethyl Mercury vs Heptanenitrile

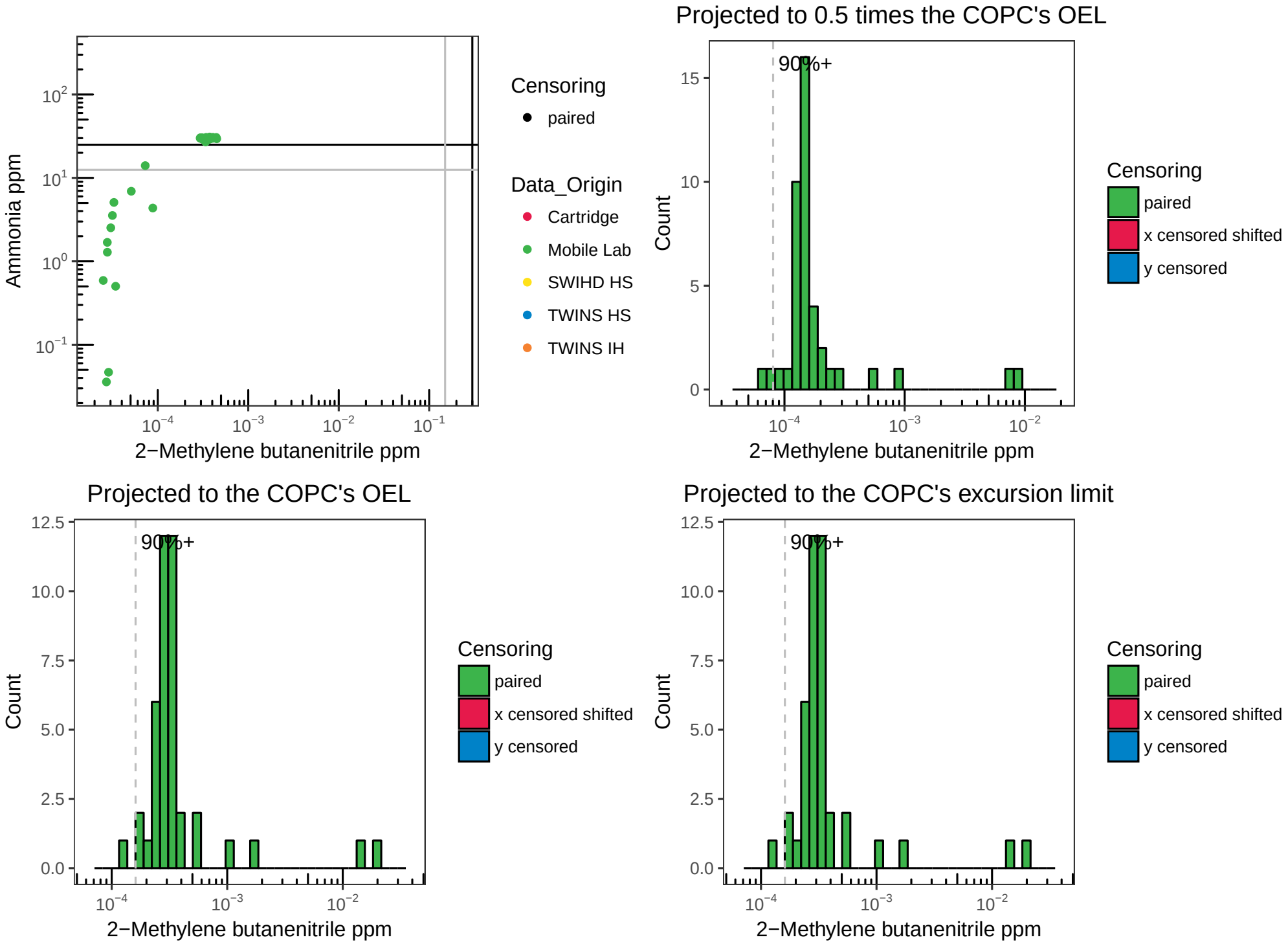


Figure C.1972: Ammonia vs 2-Methylene butanenitrile

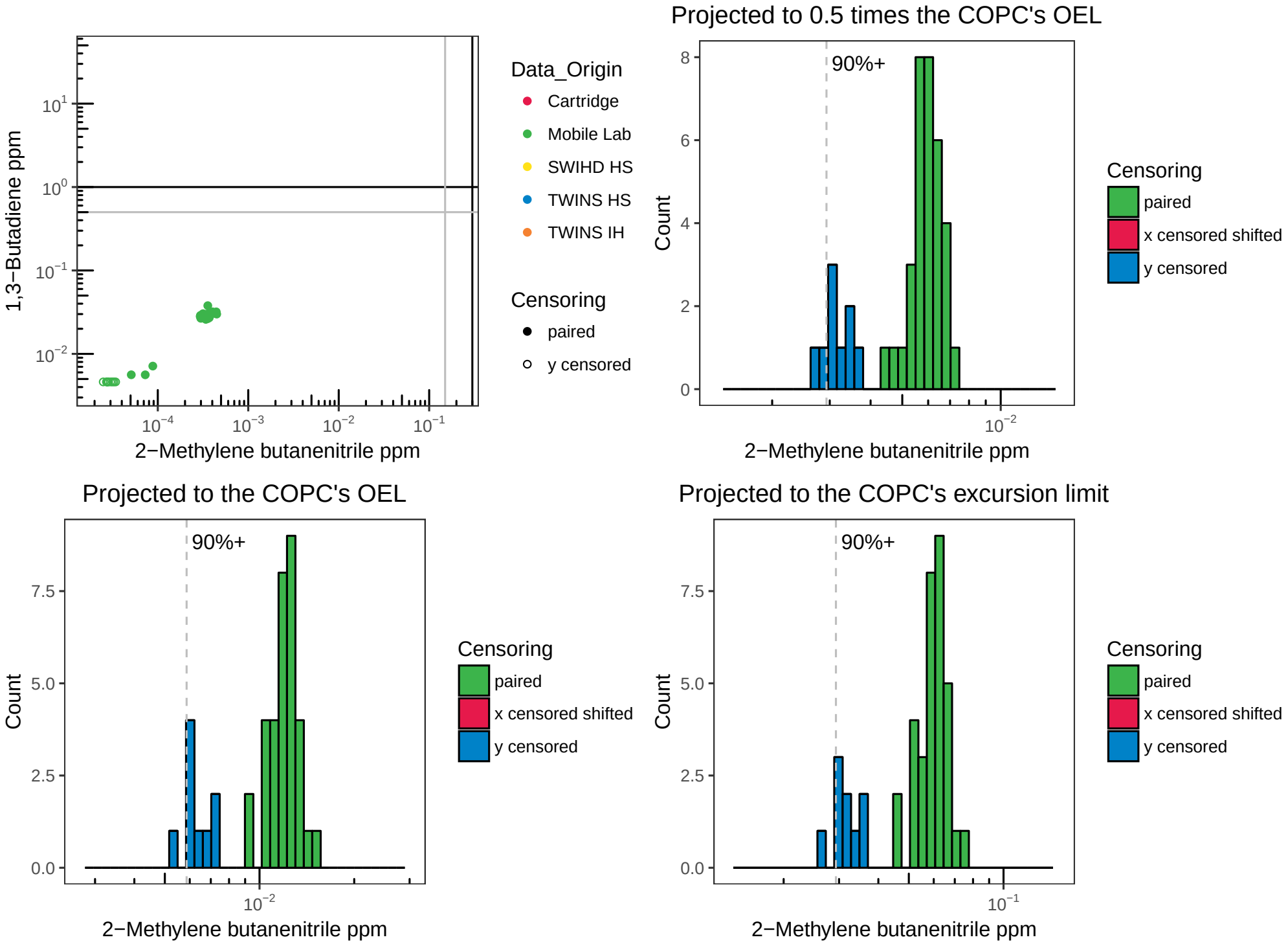


Figure C.1973: 1,3-Butadiene vs 2-Methylene butanenitrile

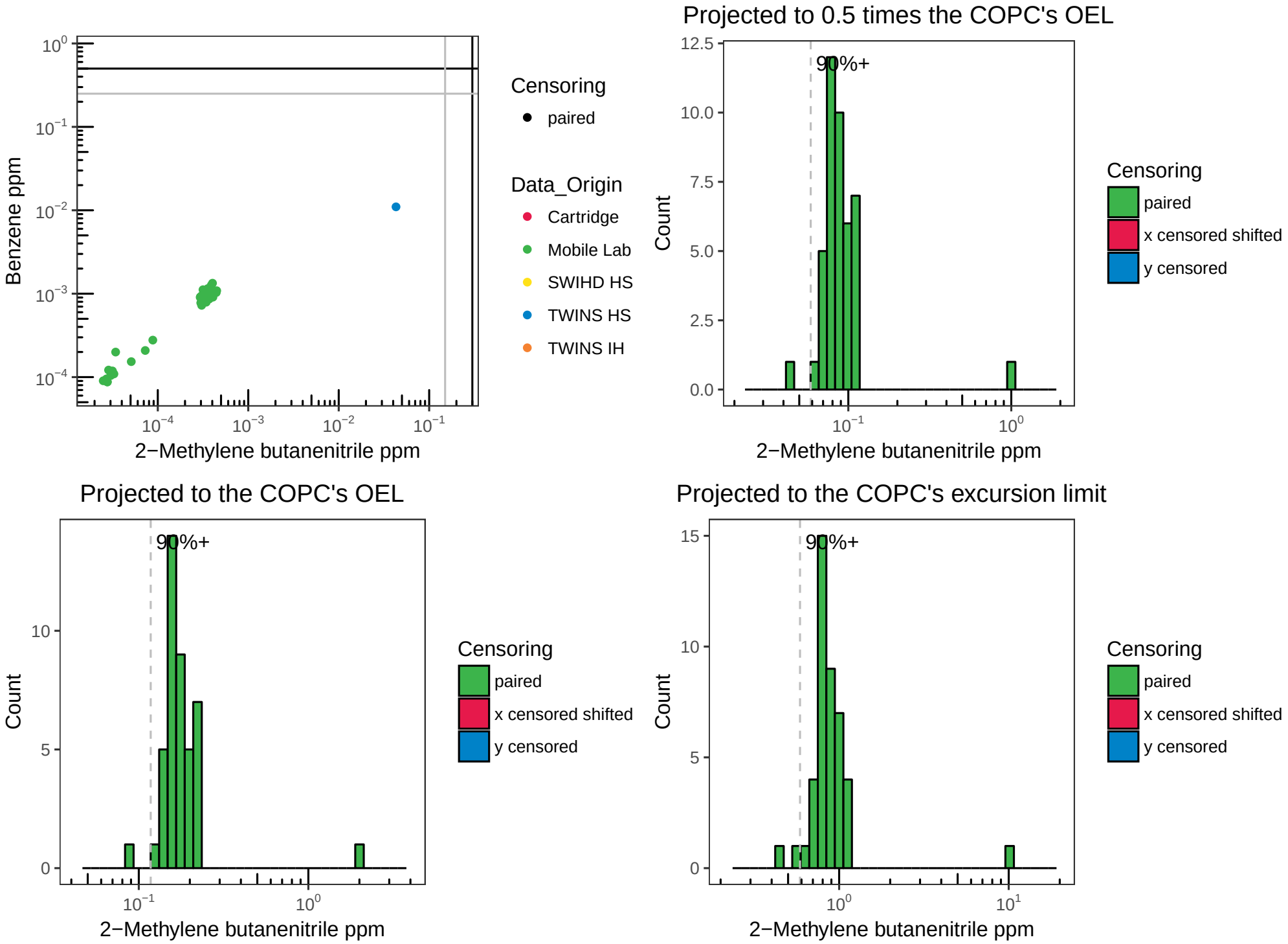


Figure C.1974: Benzene vs 2-Methylene butanenitrile

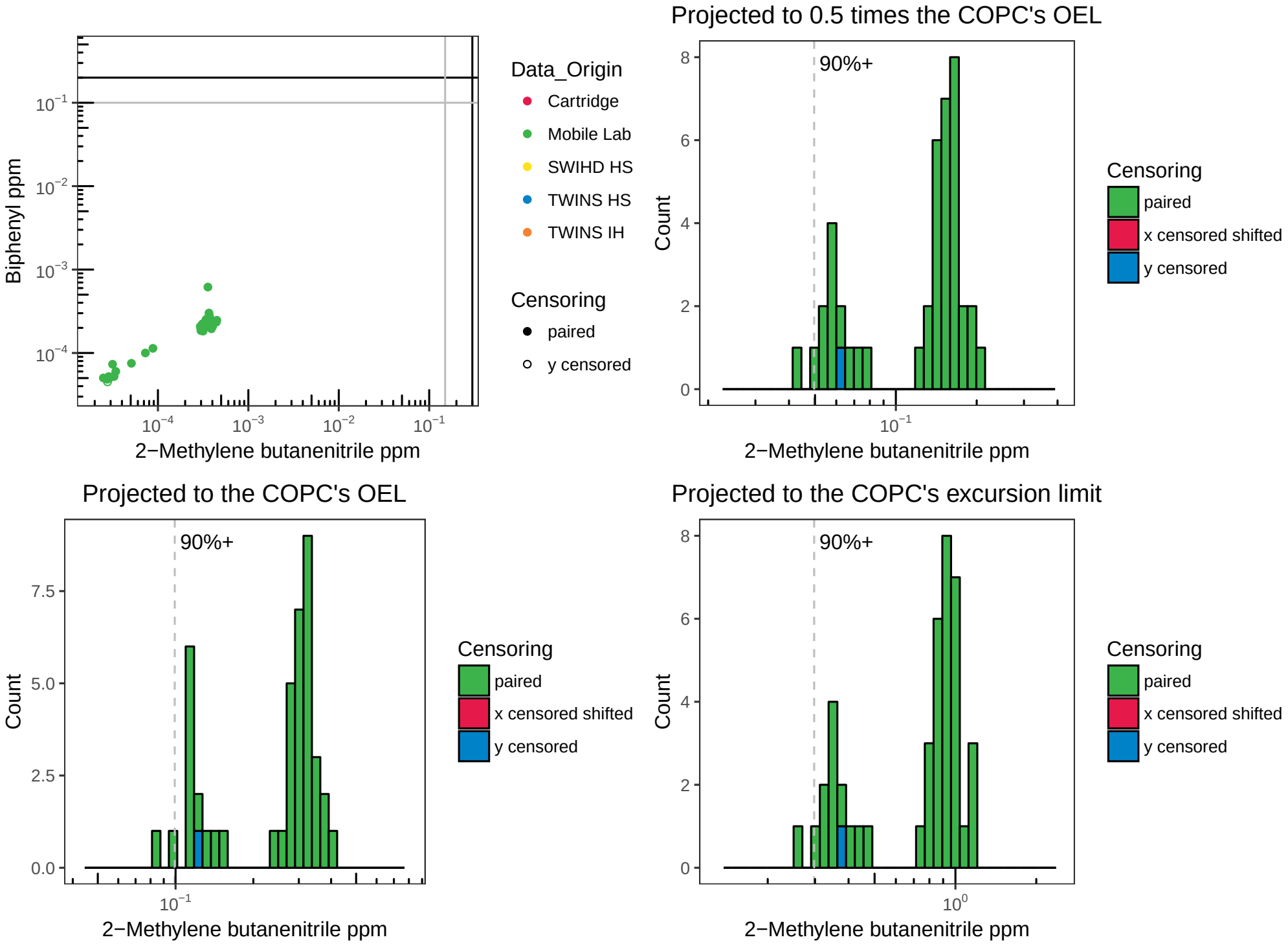


Figure C.1975: Biphenyl vs 2-Methylene butanenitrile

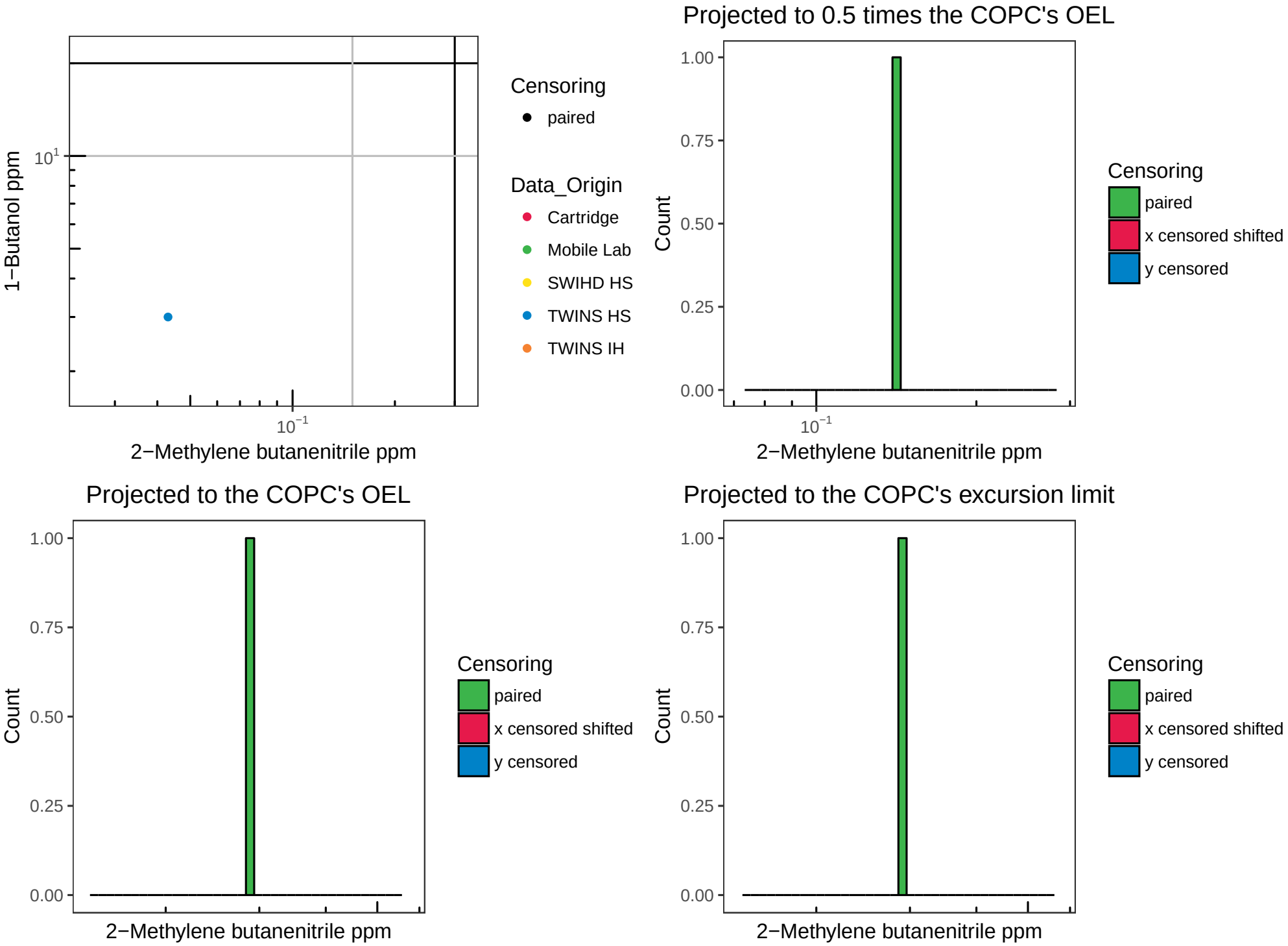


Figure C.1976: 1-Butanol vs 2-Methylene butanenitrile

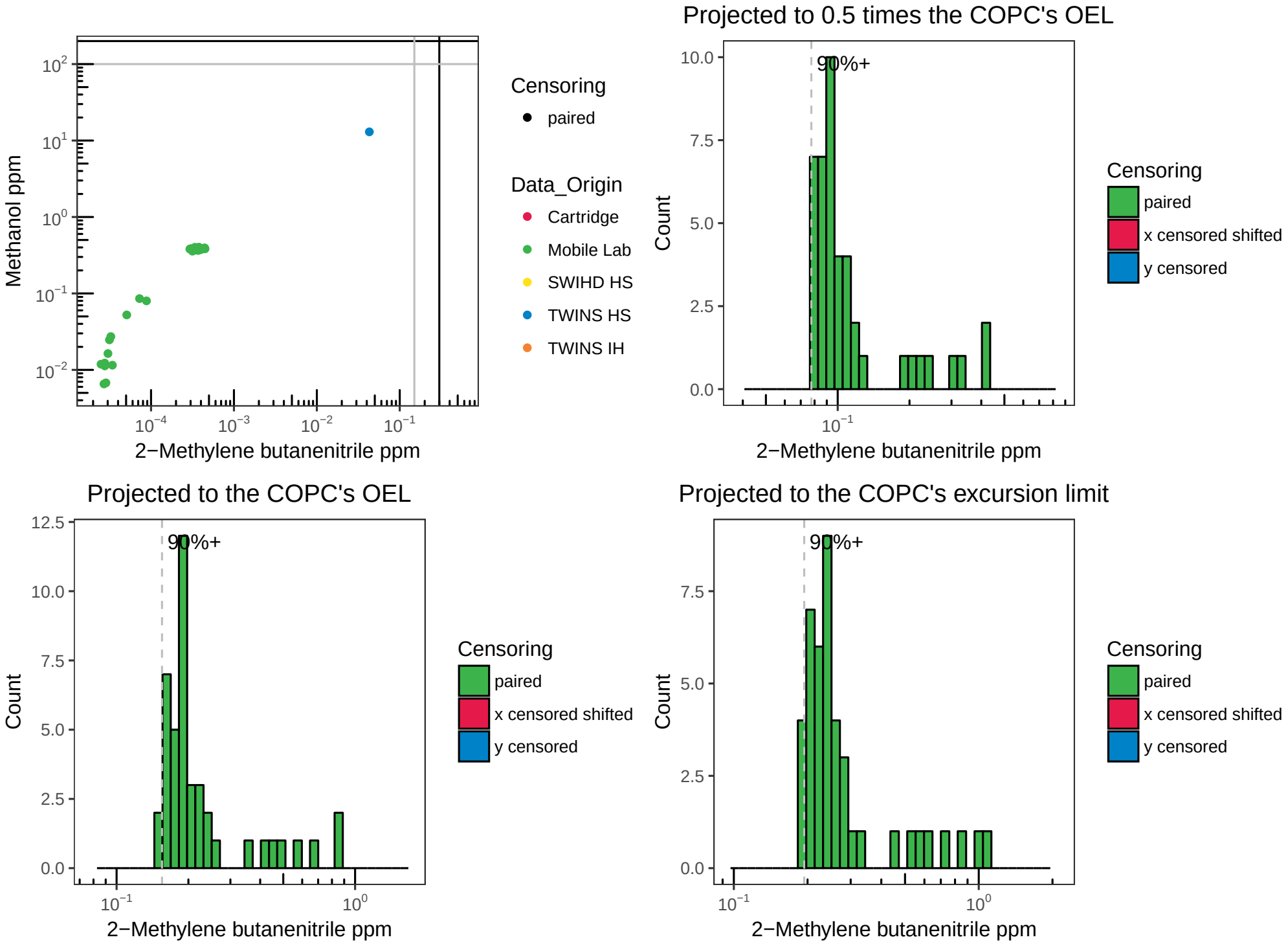


Figure C.1977: Methanol vs 2-Methylene butanenitrile

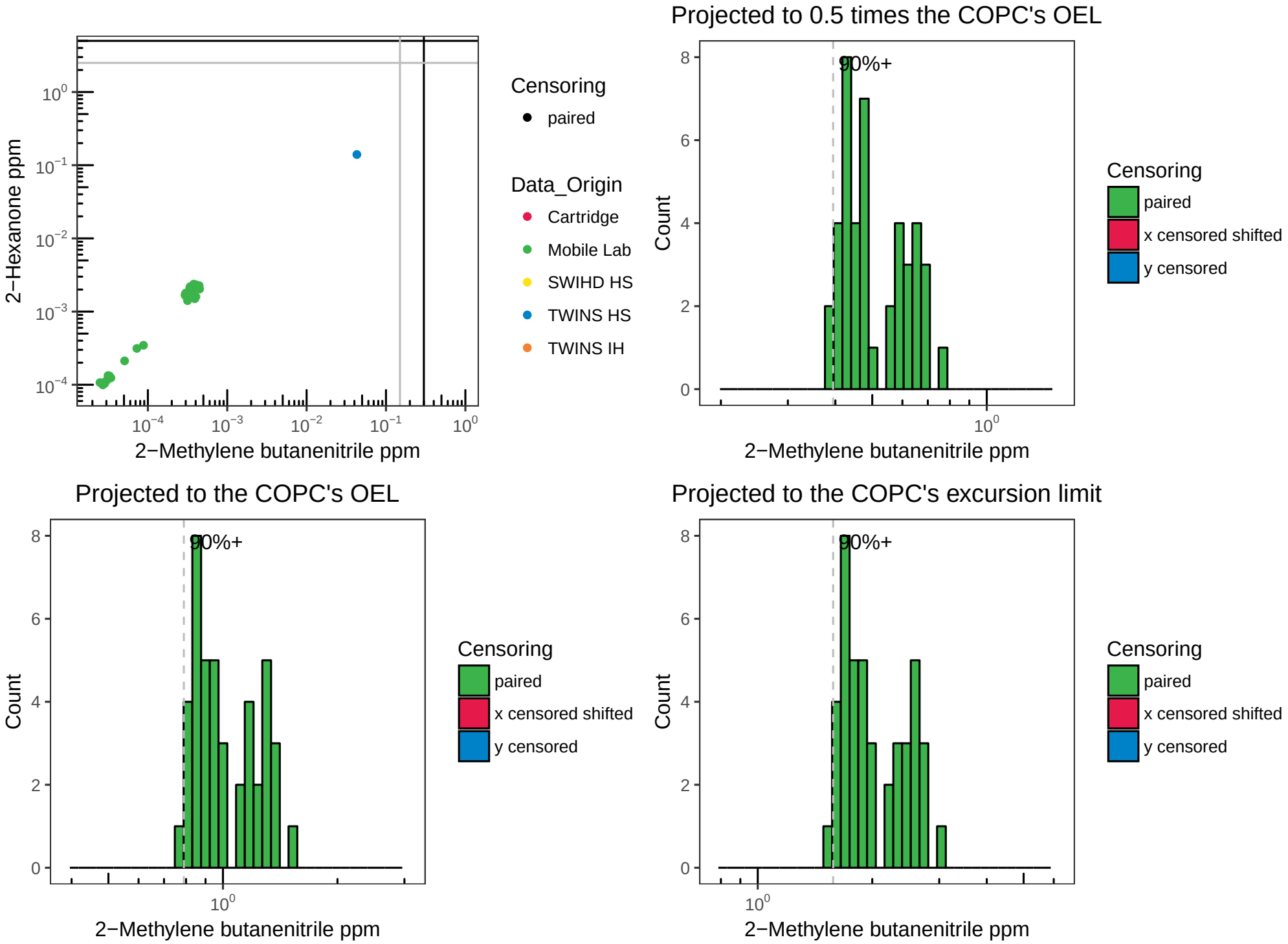


Figure C.1978: 2-Hexanone vs 2-Methylene butanenitrile

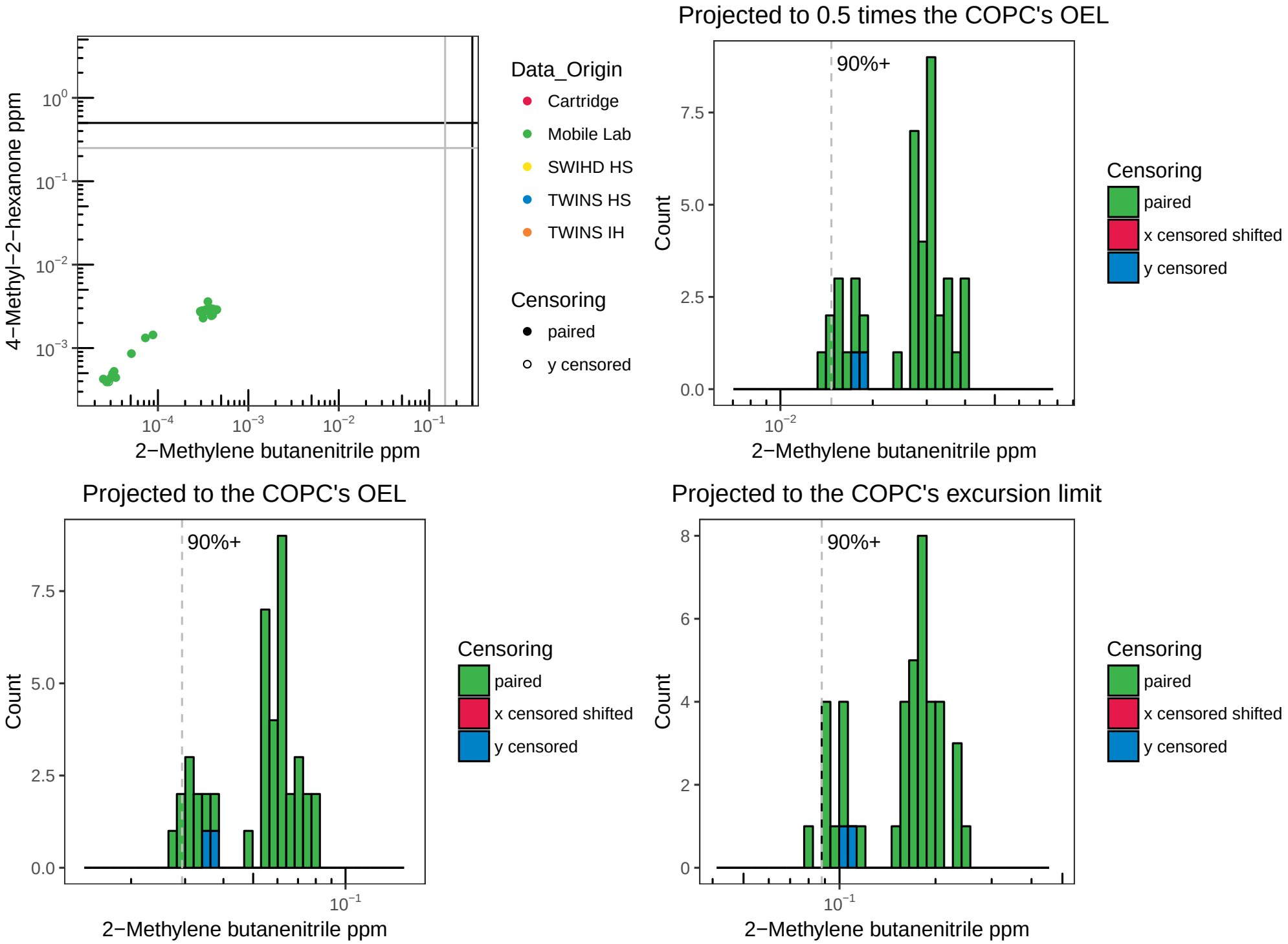


Figure C.1979: 4-Methyl-2-hexanone vs 2-Methylene butanenitrile

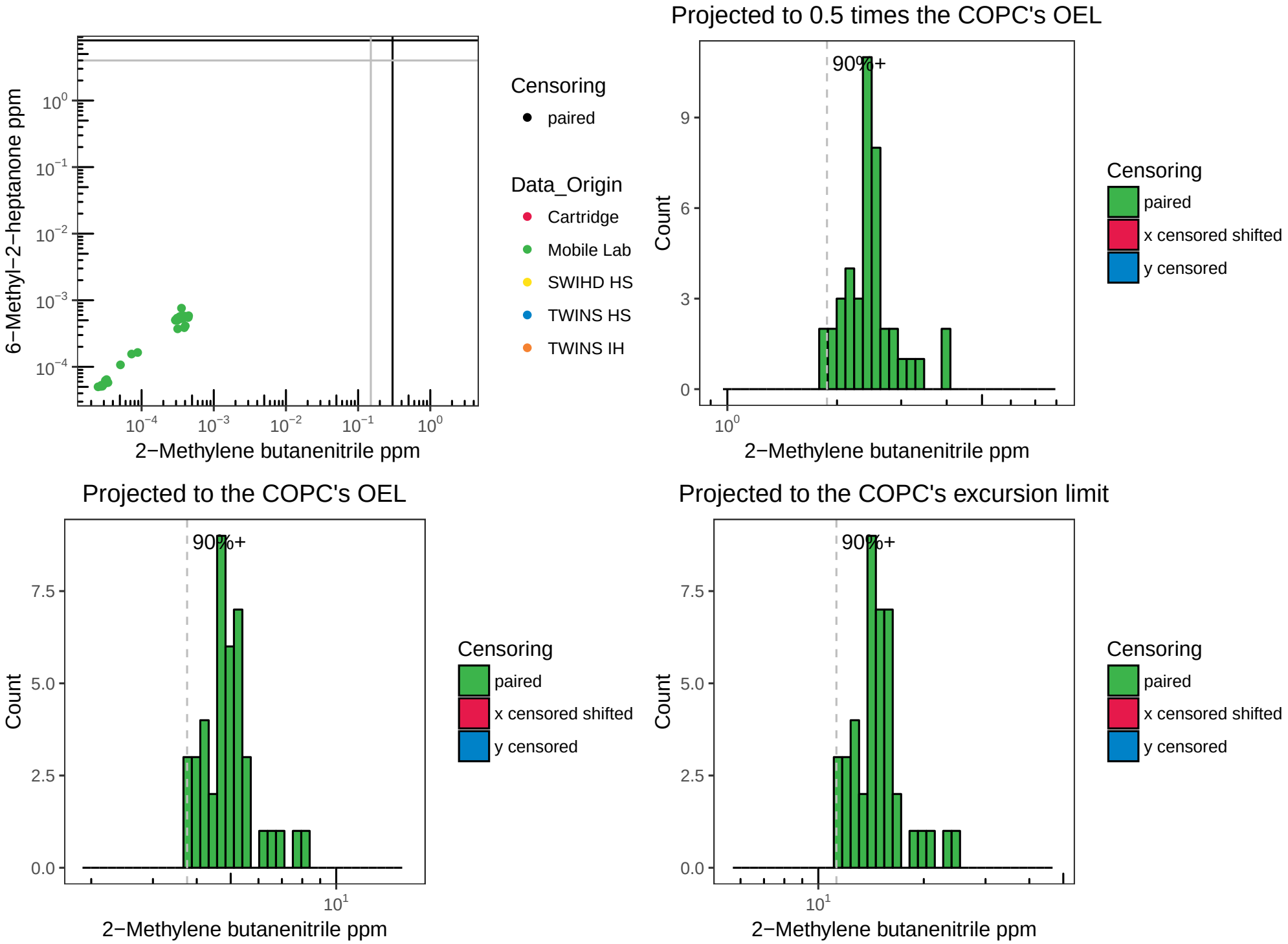


Figure C.1980: 6-Methyl-2-heptanone vs 2-Methylene butanenitrile

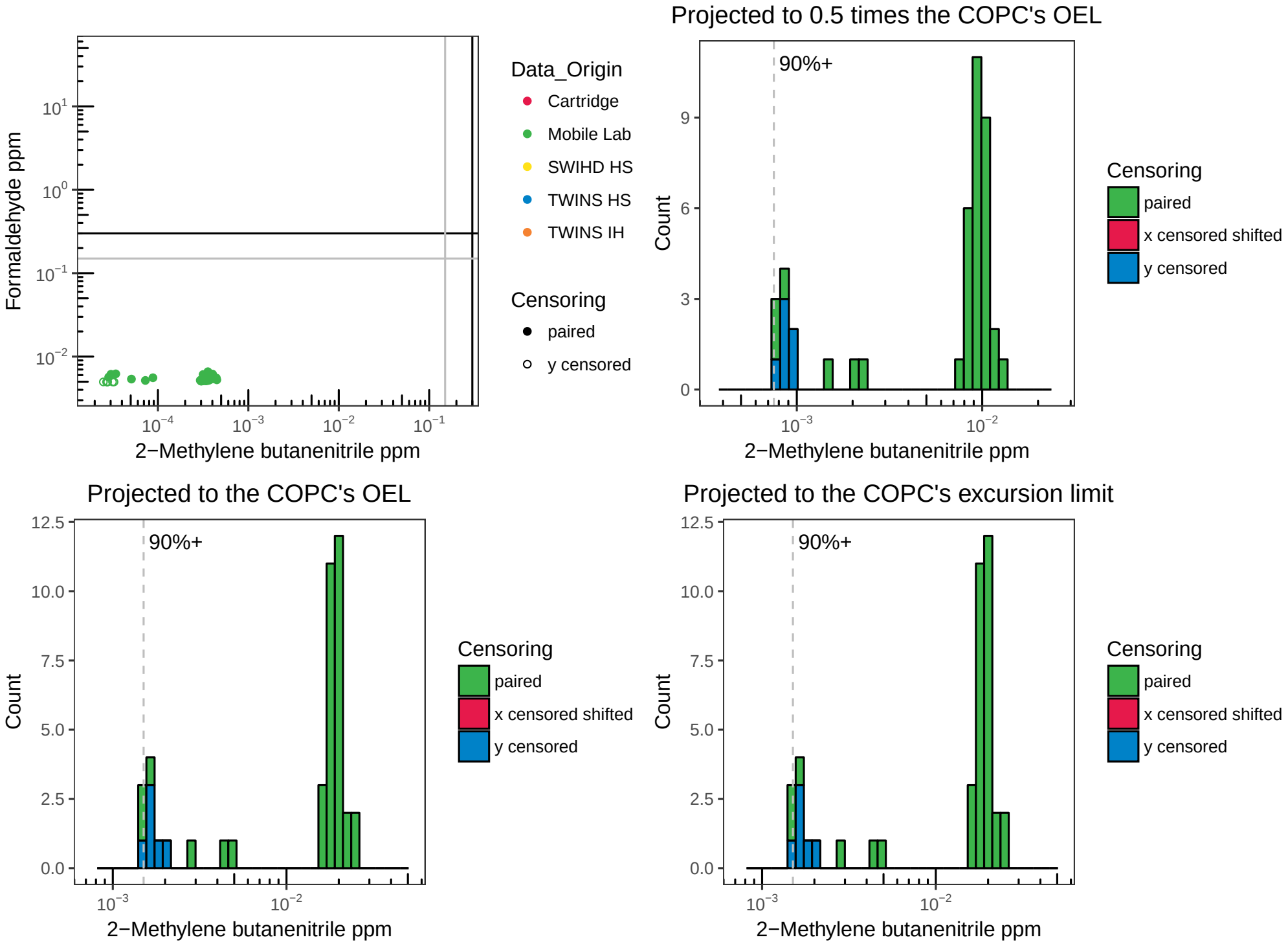


Figure C.1981: Formaldehyde vs 2-Methylene butanenitrile

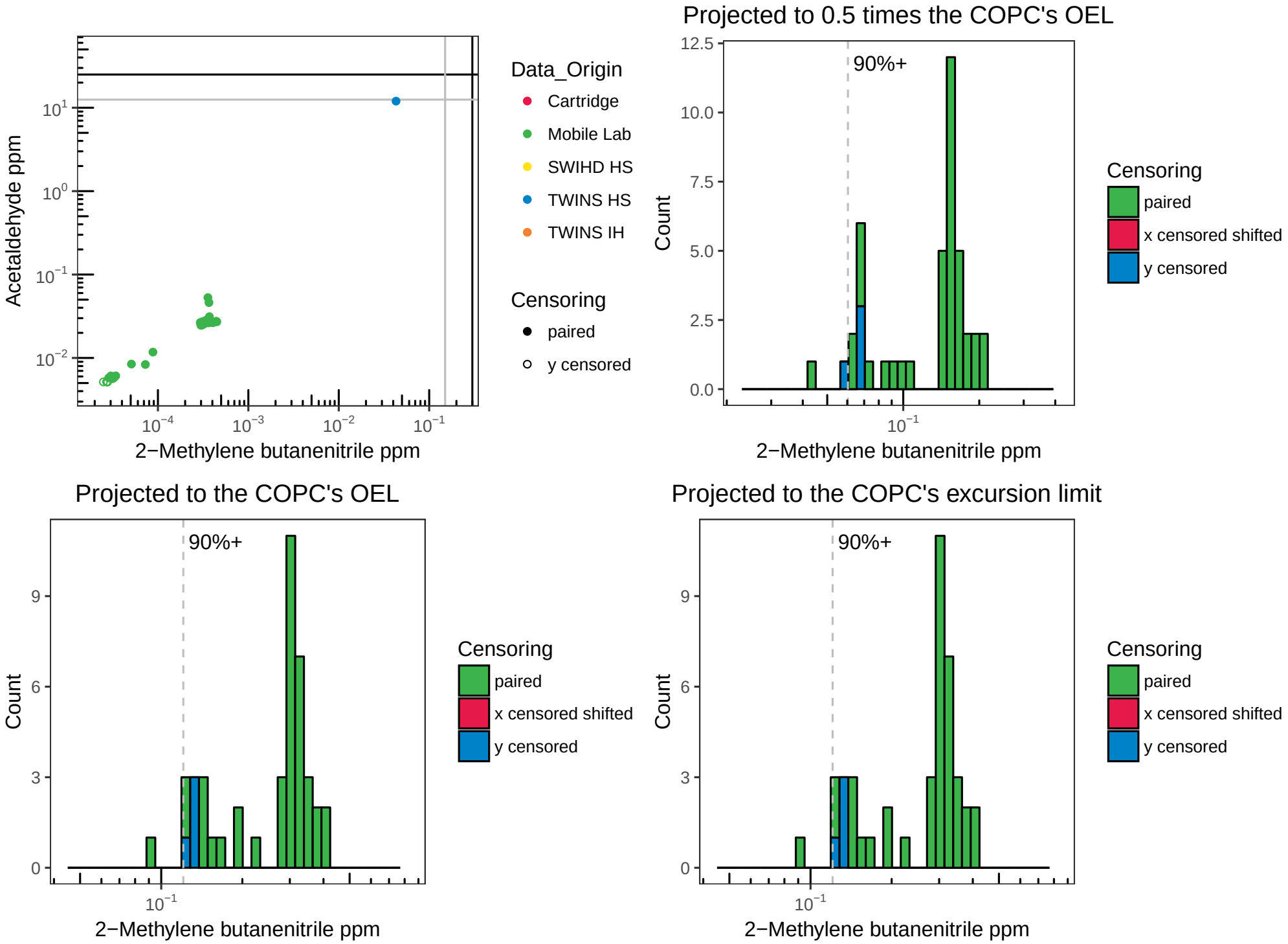


Figure C.1982: Acetaldehyde vs 2-Methylene butanenitrile

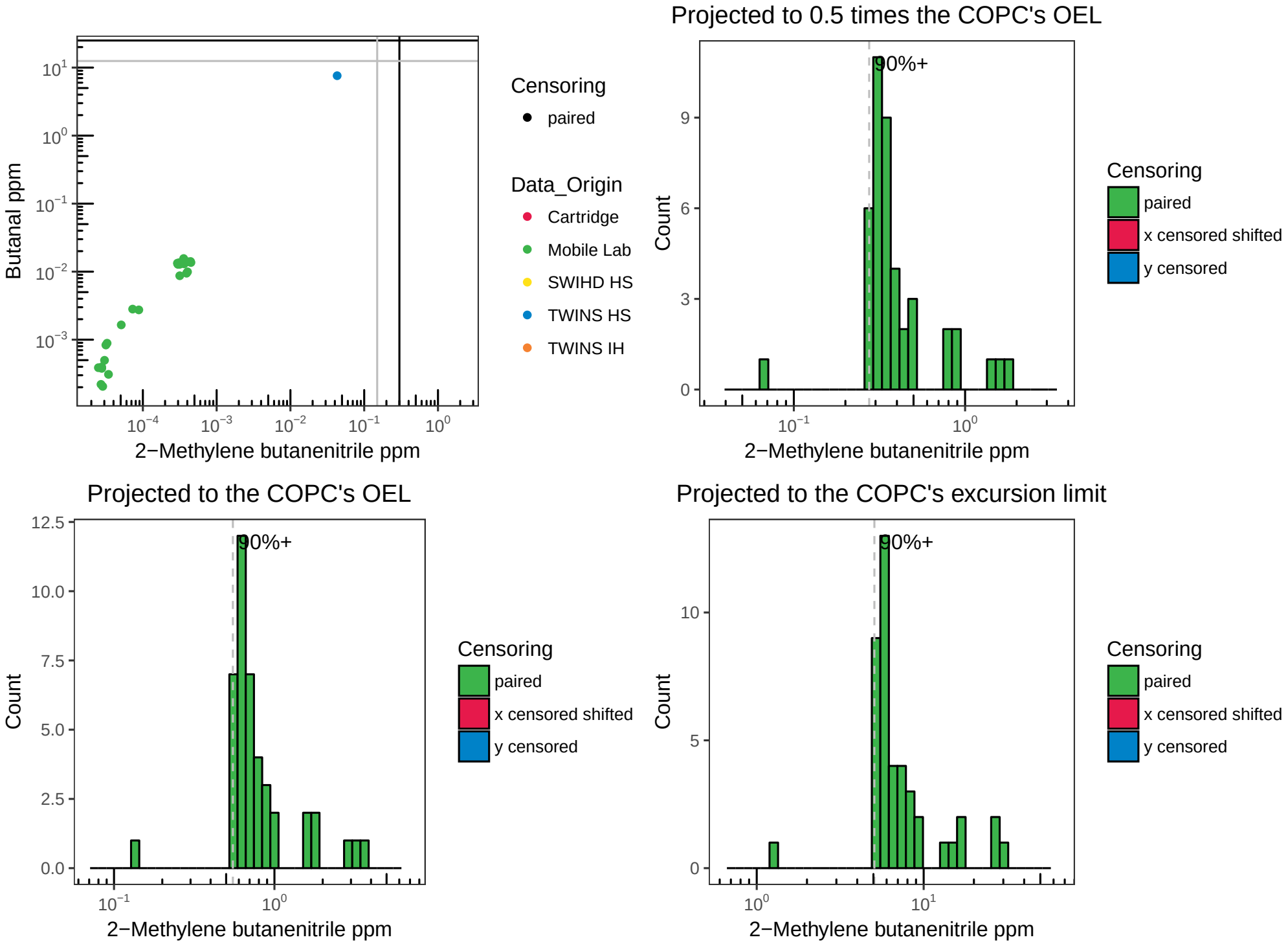


Figure C.1983: Butanal vs 2-Methylene butanenitrile

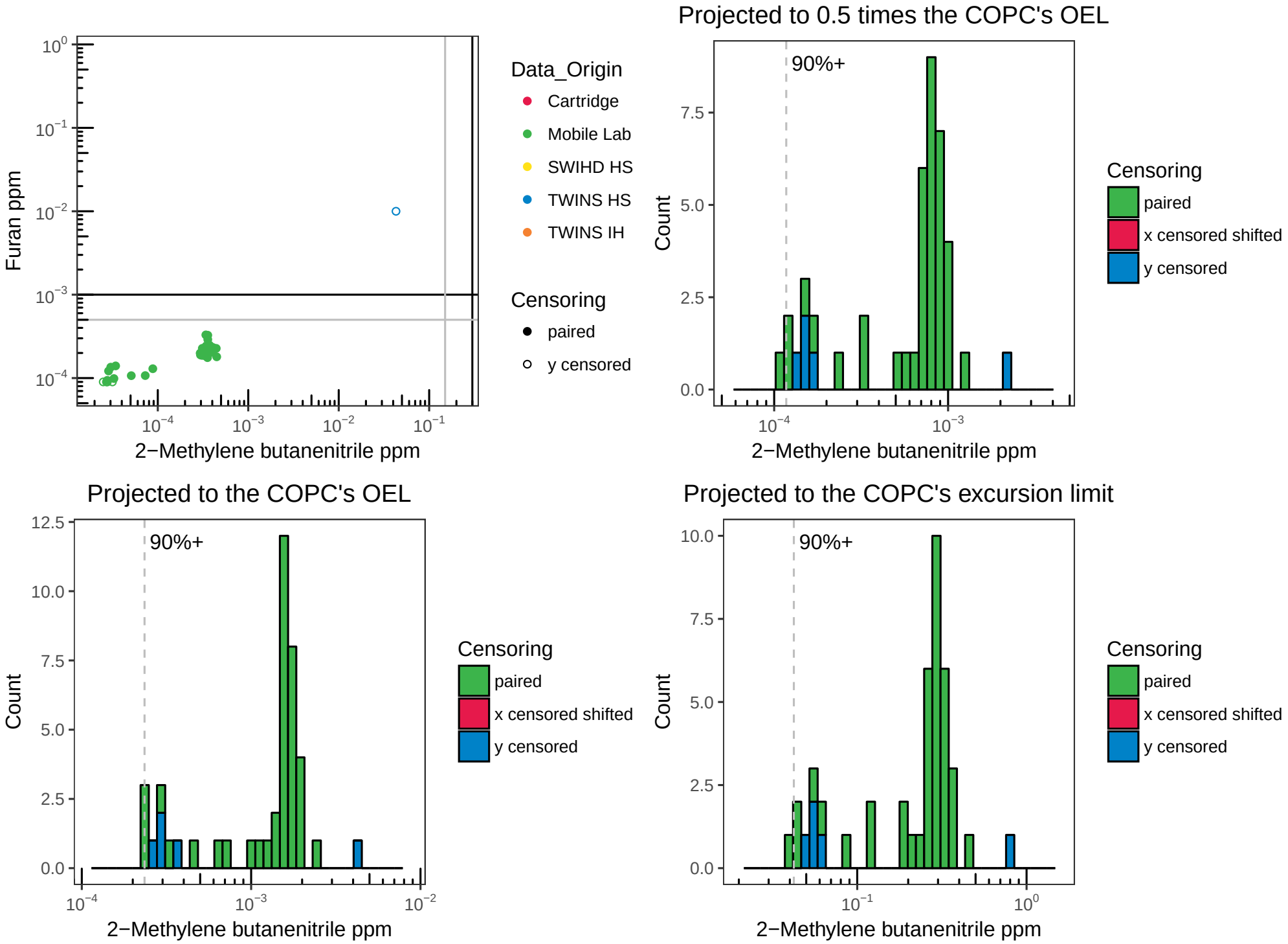


Figure C.1984: Furan vs 2-Methylene butanenitrile

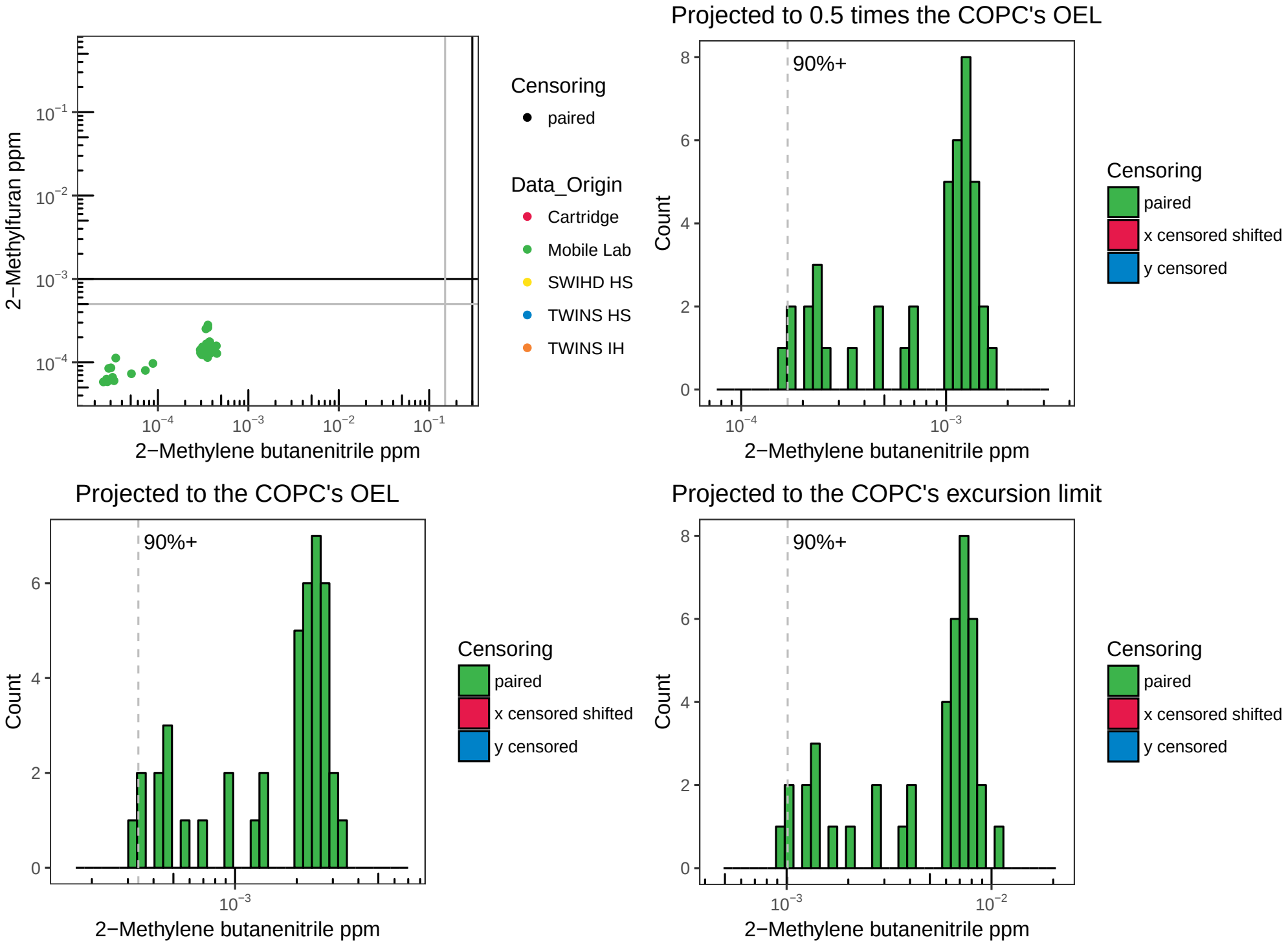


Figure C.1985: 2-Methylfuran vs 2-Methylene butanenitrile

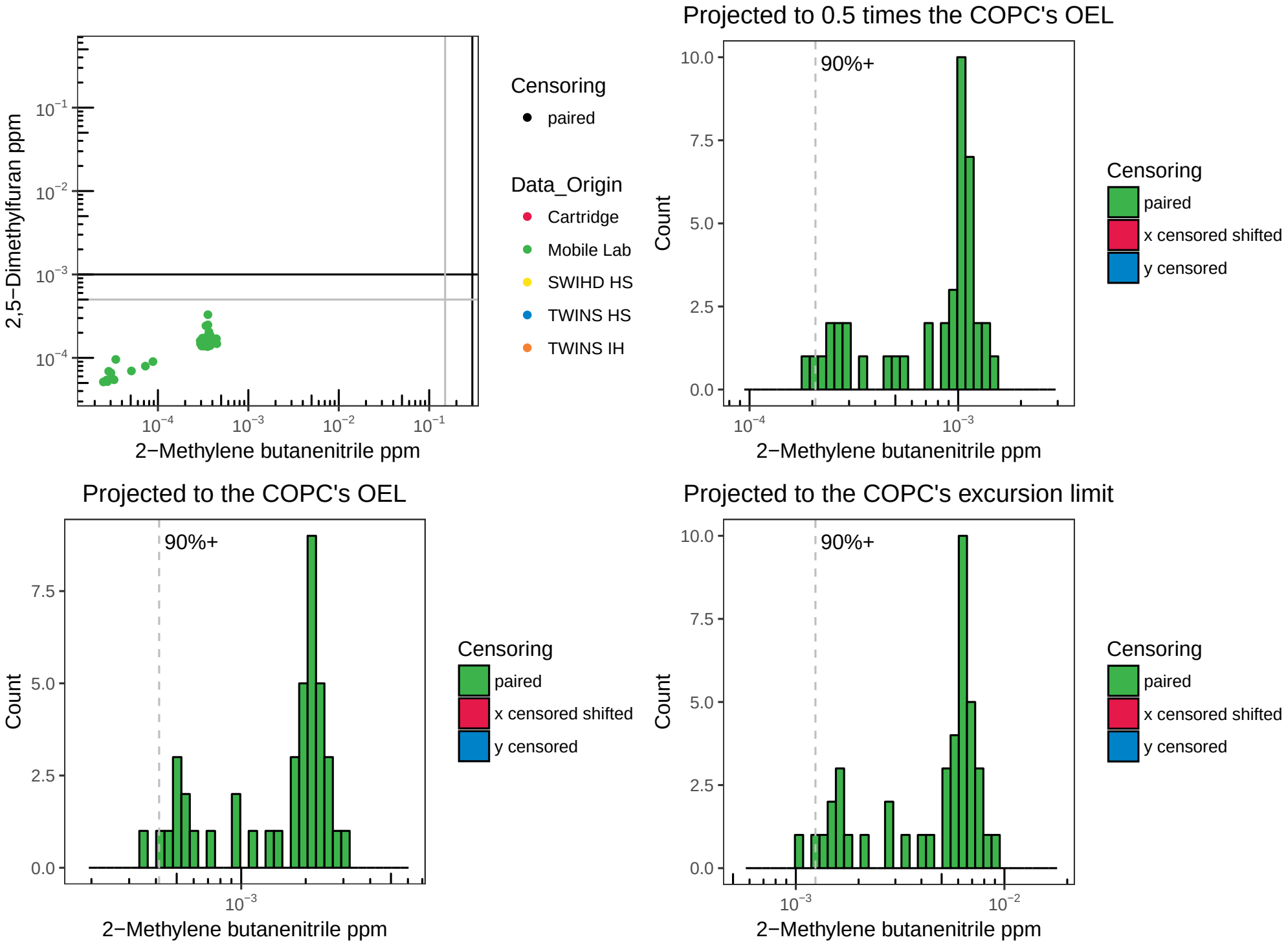


Figure C.1986: 2,5-Dimethylfuran vs 2-Methylene butanenitrile

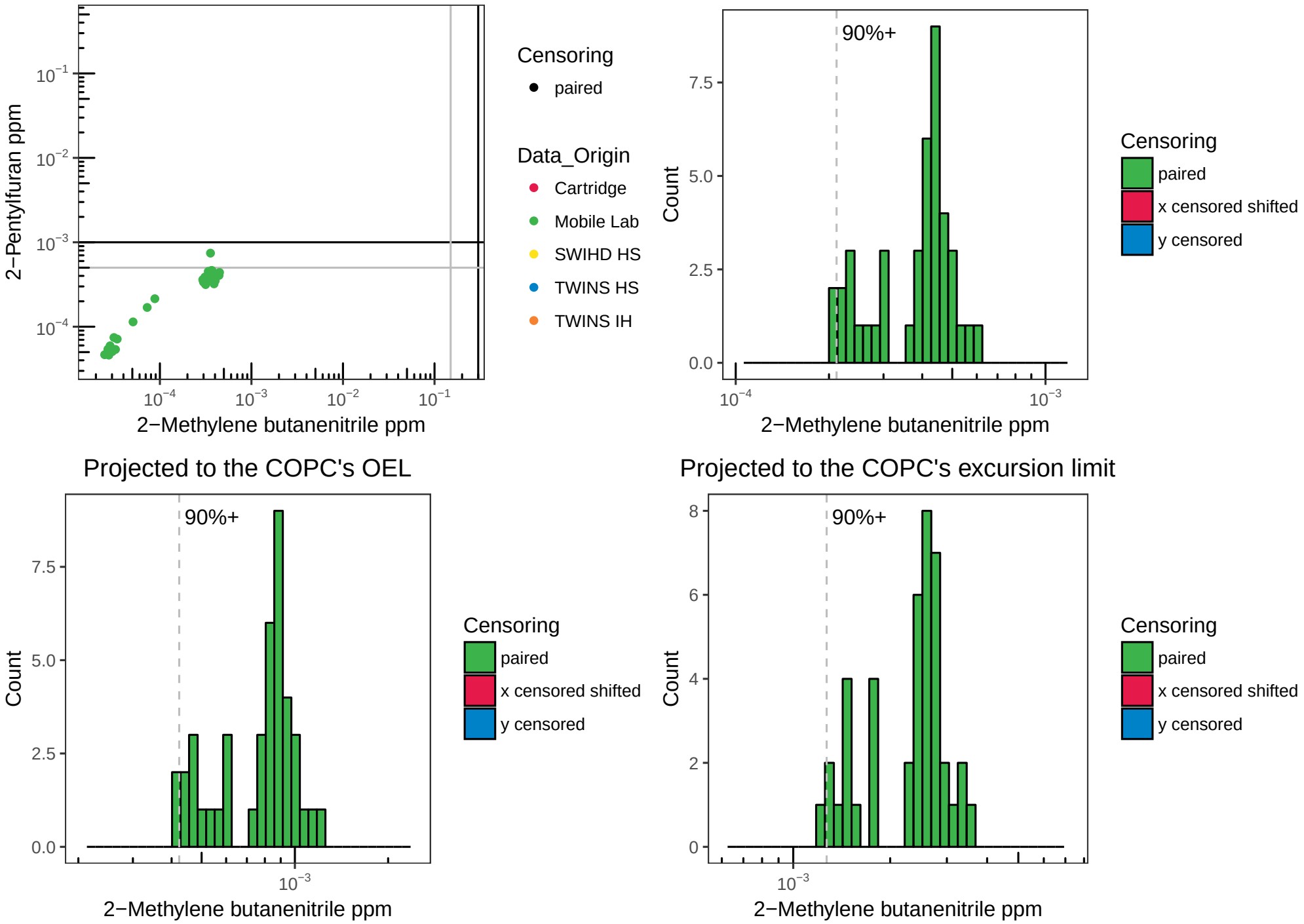


Figure C.1987: 2-Pentylfuran vs 2-Methylene butanenitrile

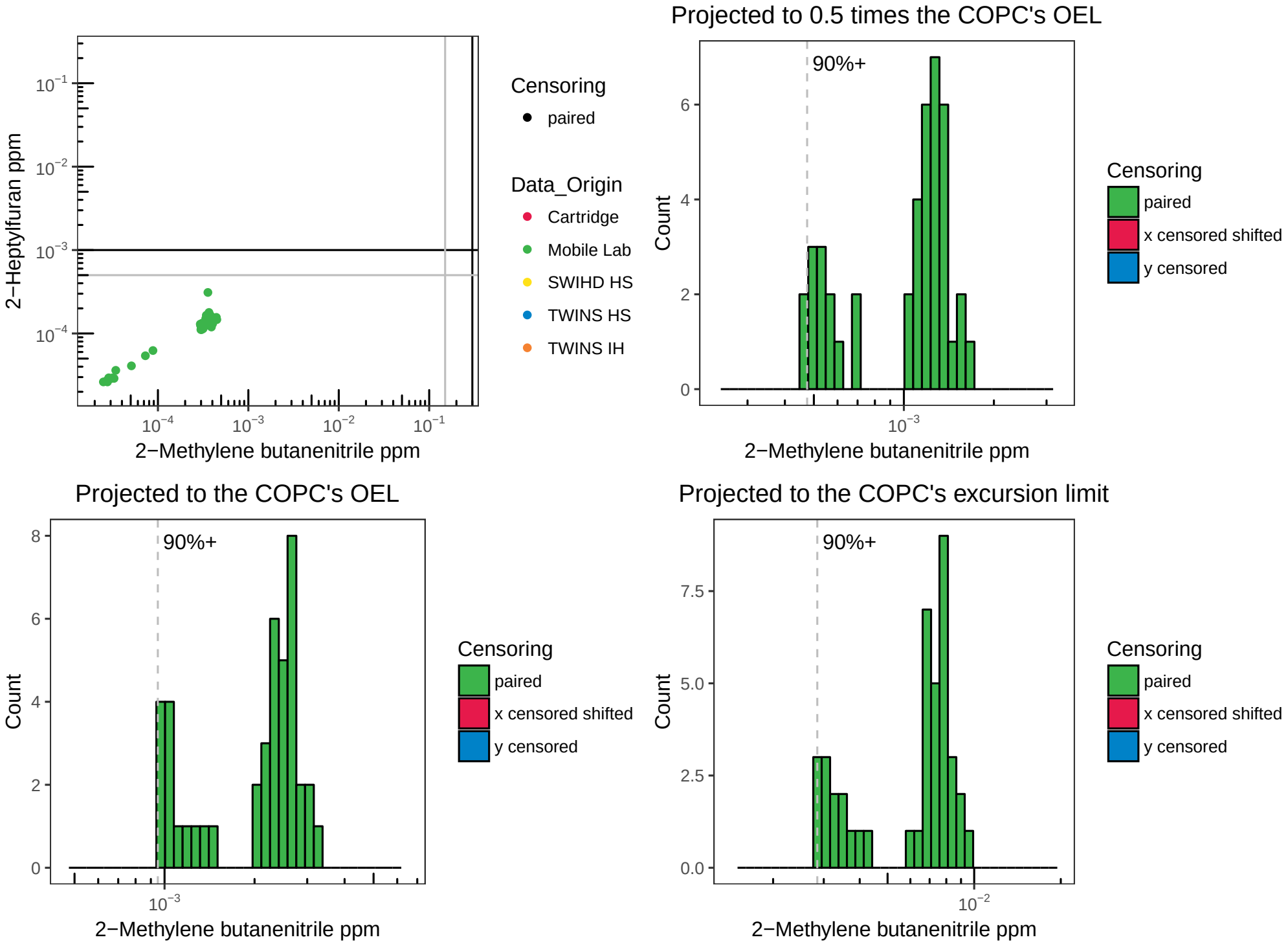


Figure C.1988: 2-Heptylfuran vs 2-Methylene butanenitrile

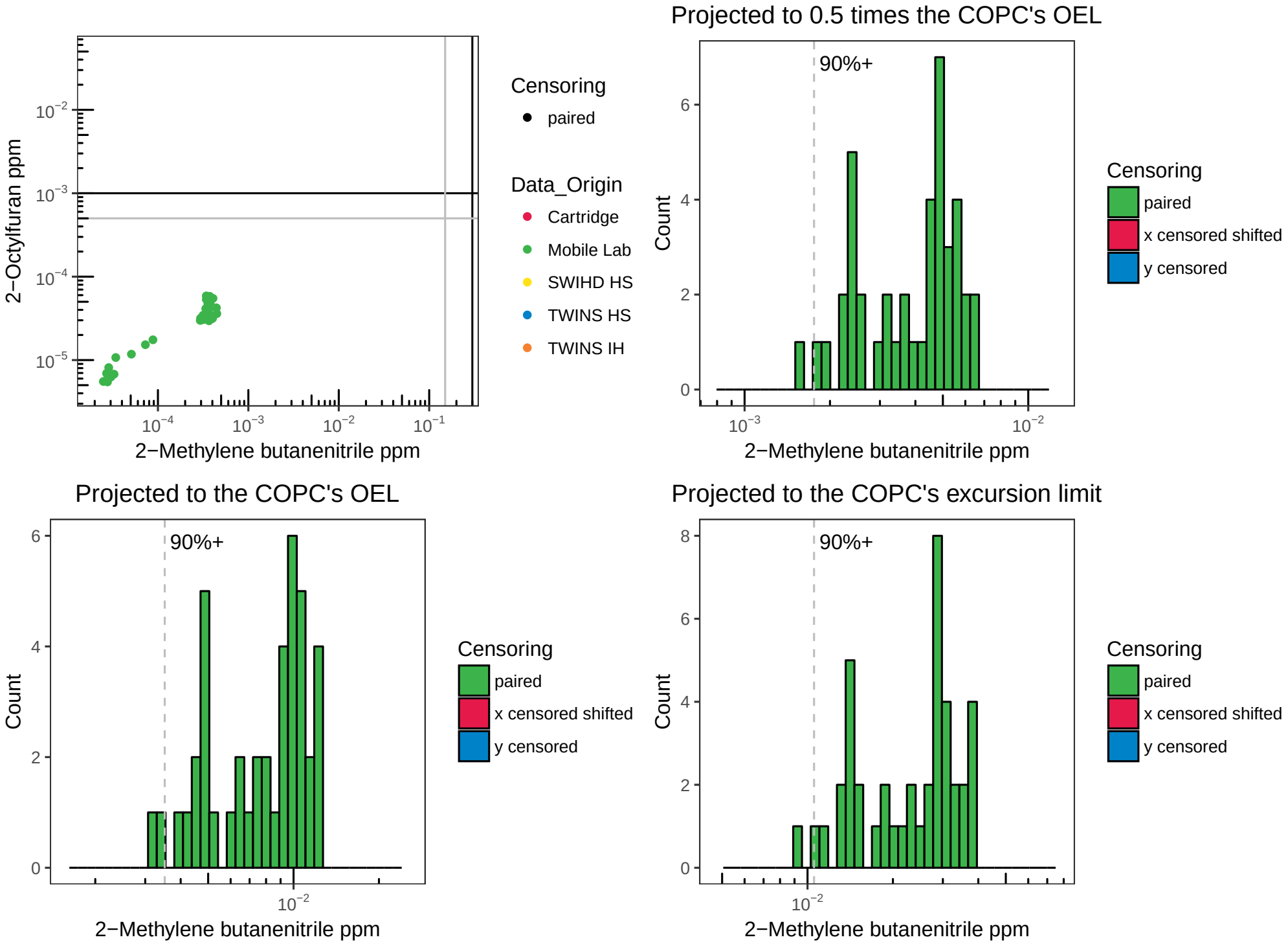


Figure C.1989: 2-Octylfuran vs 2-Methylene butanenitrile

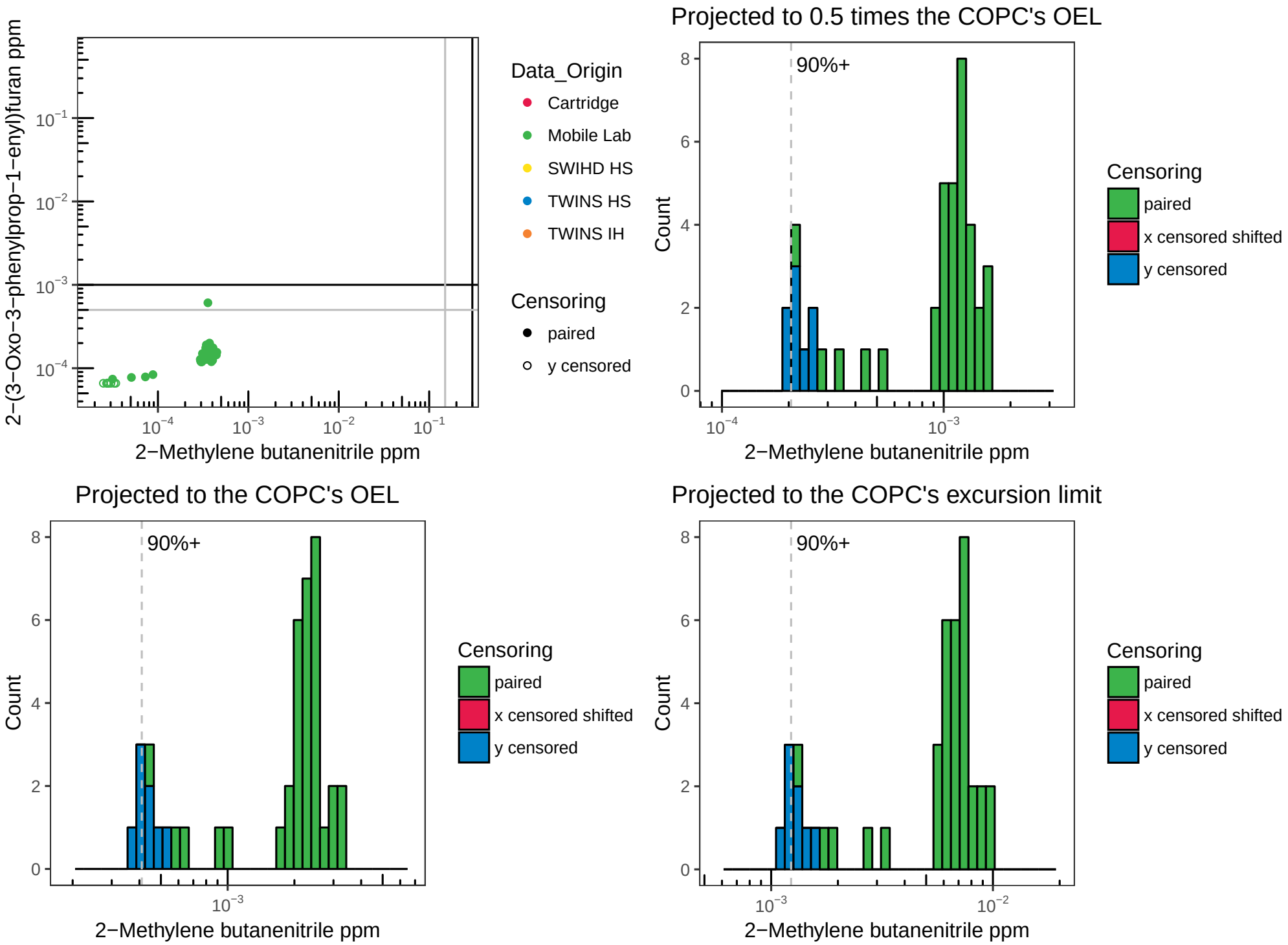


Figure C.1990: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2-Methylene butanenitrile

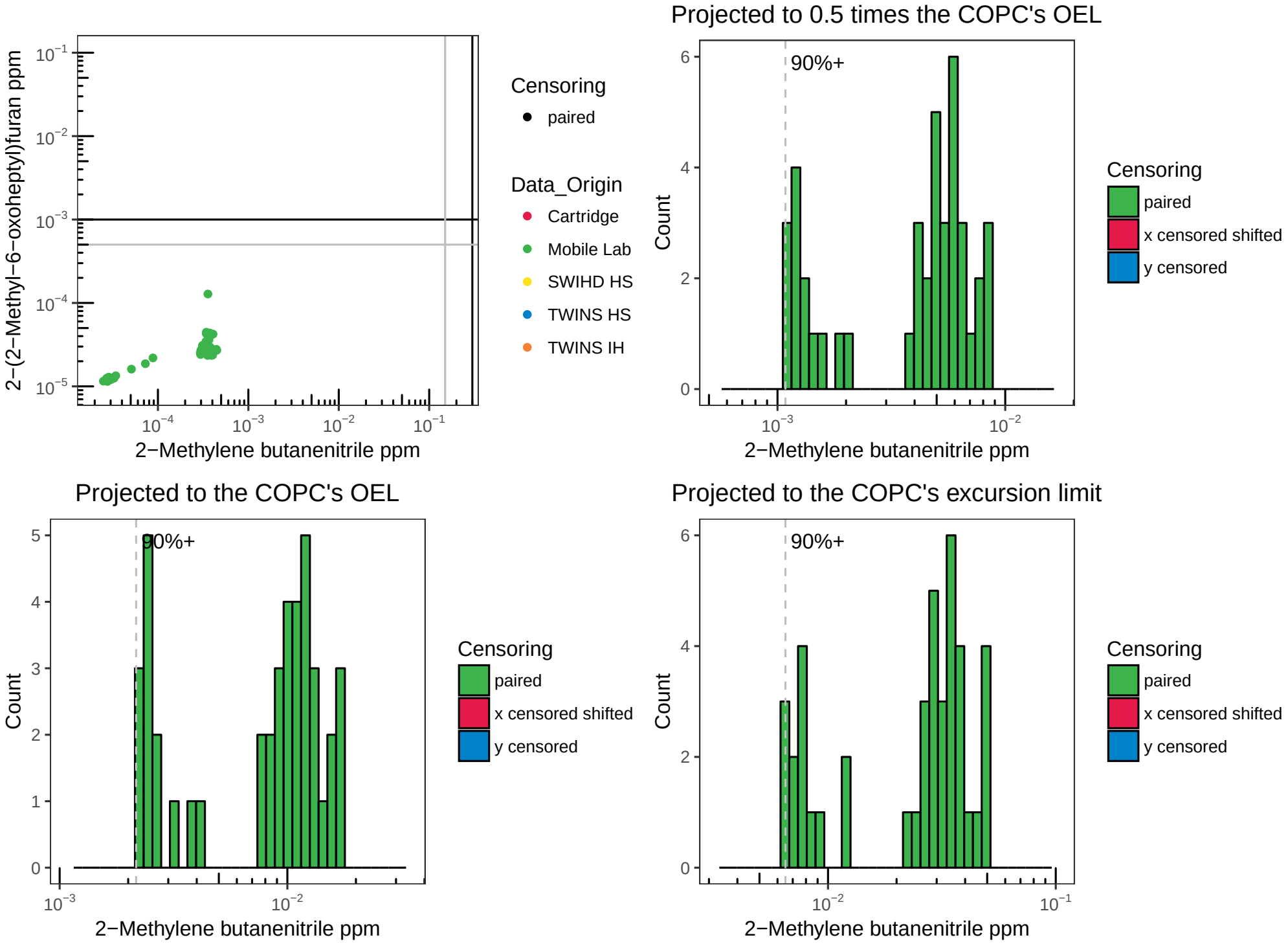


Figure C.1991: 2-(2-Methyl-6-oxoheptyl)furan vs 2-Methylene butanenitrile

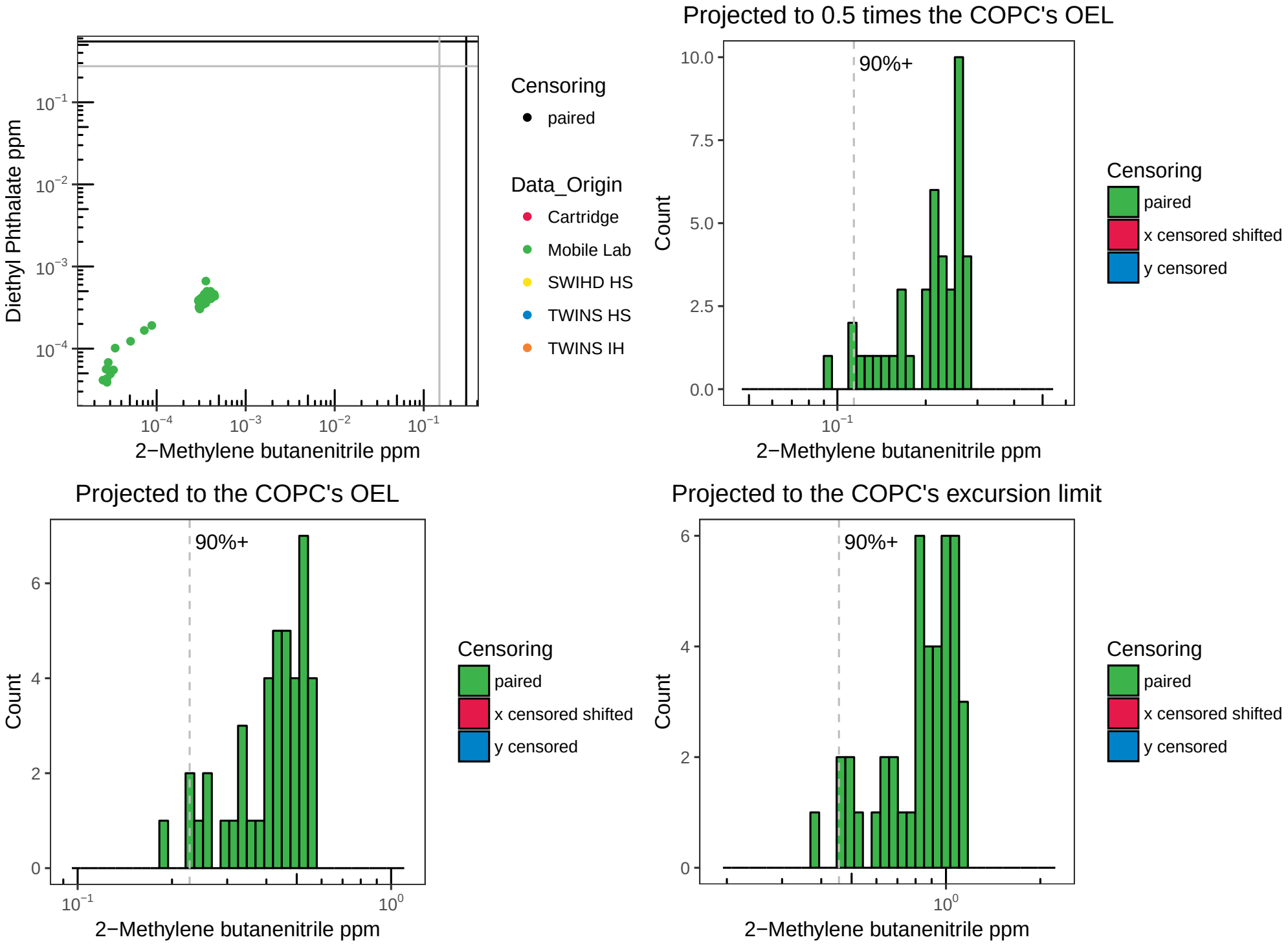


Figure C.1992: Diethyl Phthalate vs 2-Methylene butanenitrile

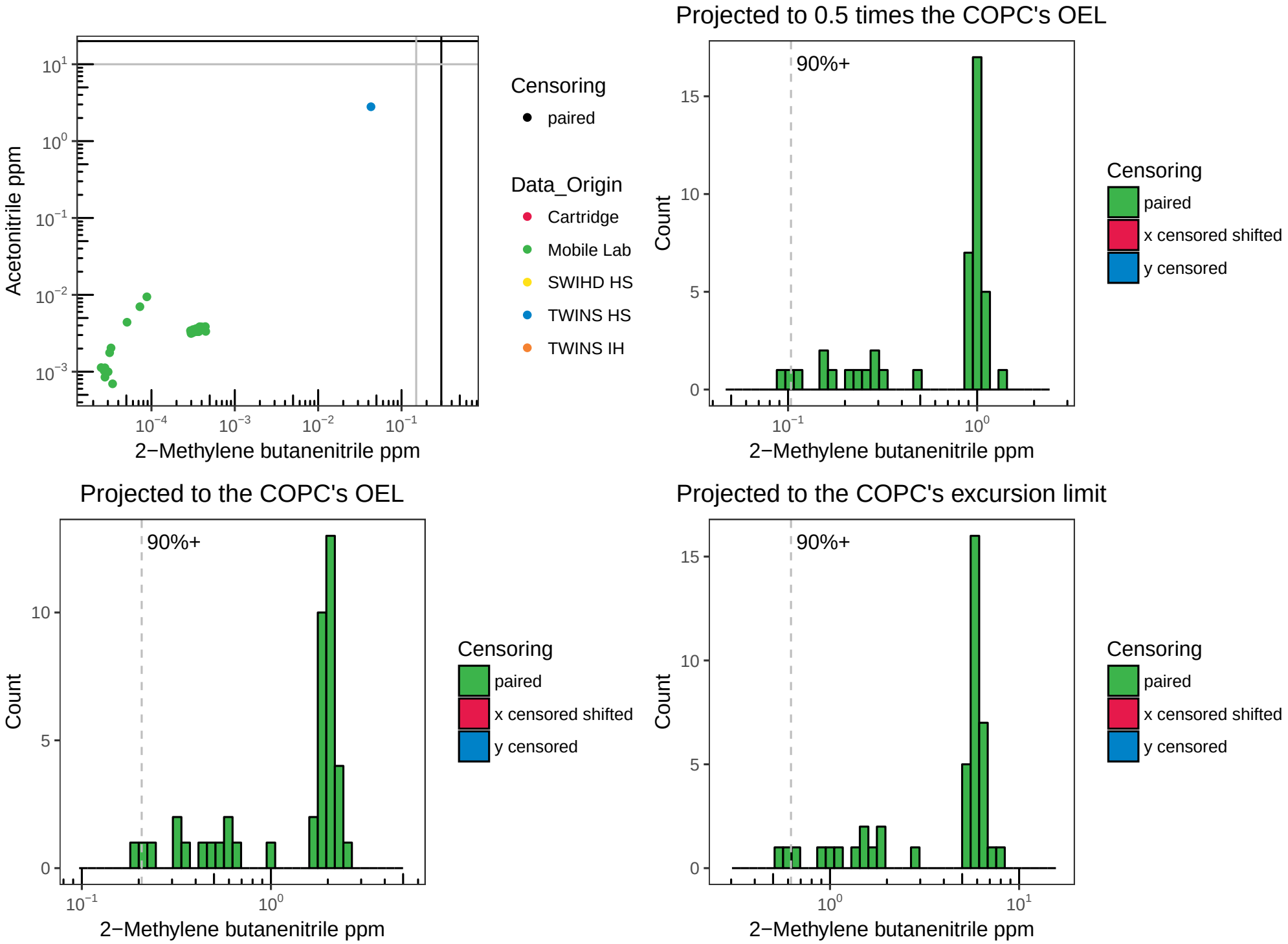


Figure C.1993: Acetonitrile vs 2-Methylene butanenitrile

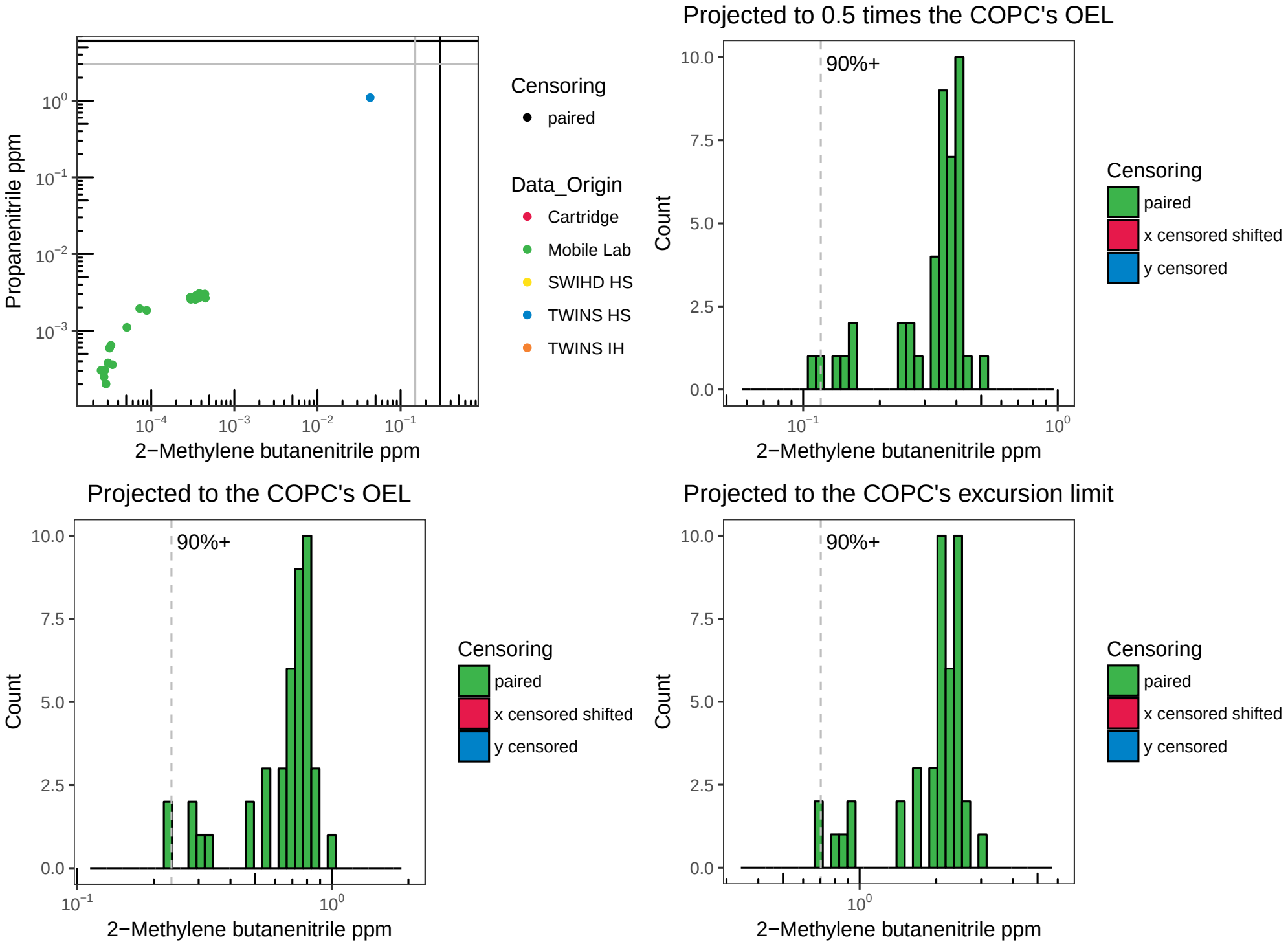


Figure C.1994: Propanenitrile vs 2-Methylene butanenitrile

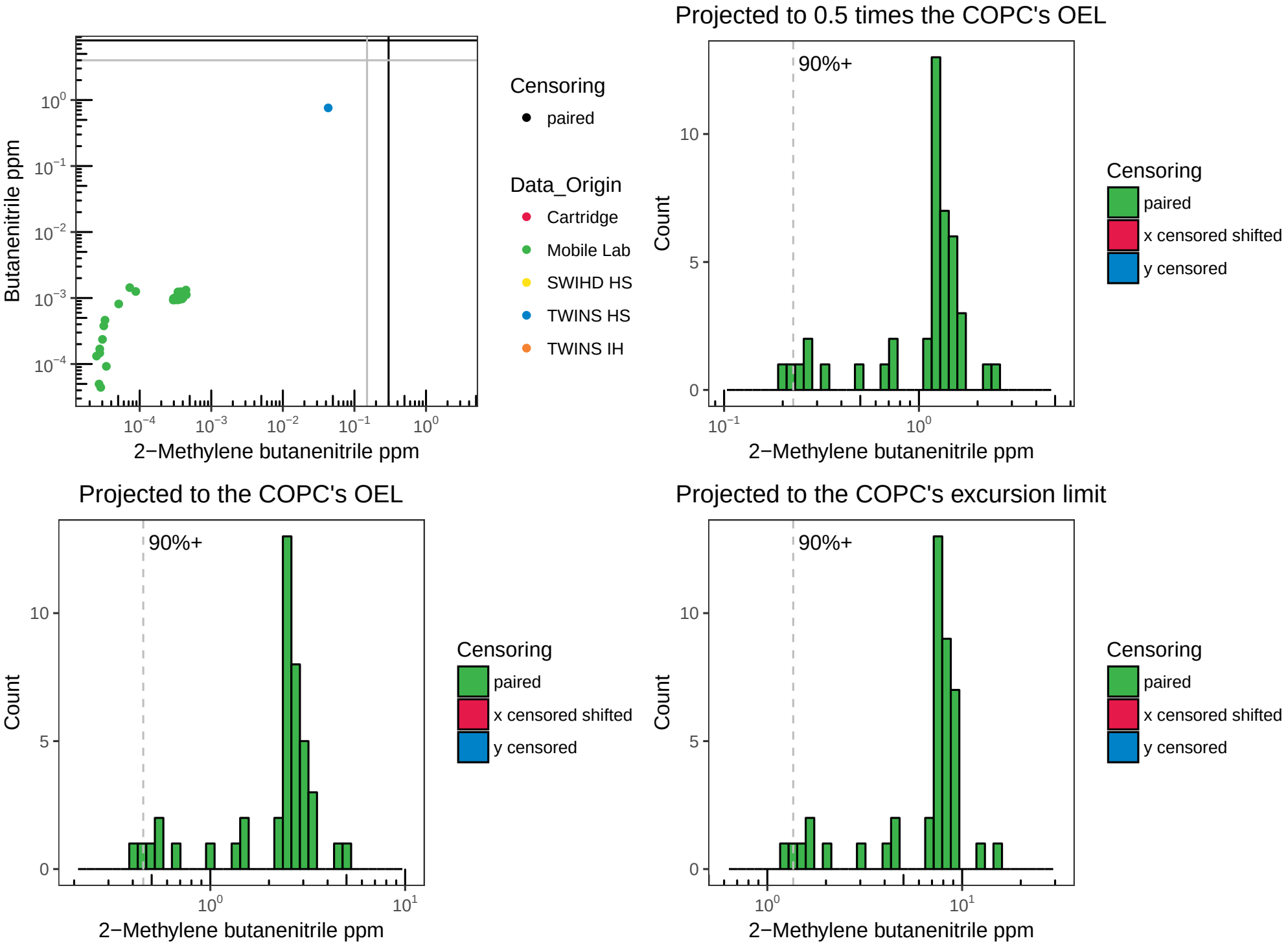


Figure C.1995: Butanenitrile vs 2-Methylene butanenitrile

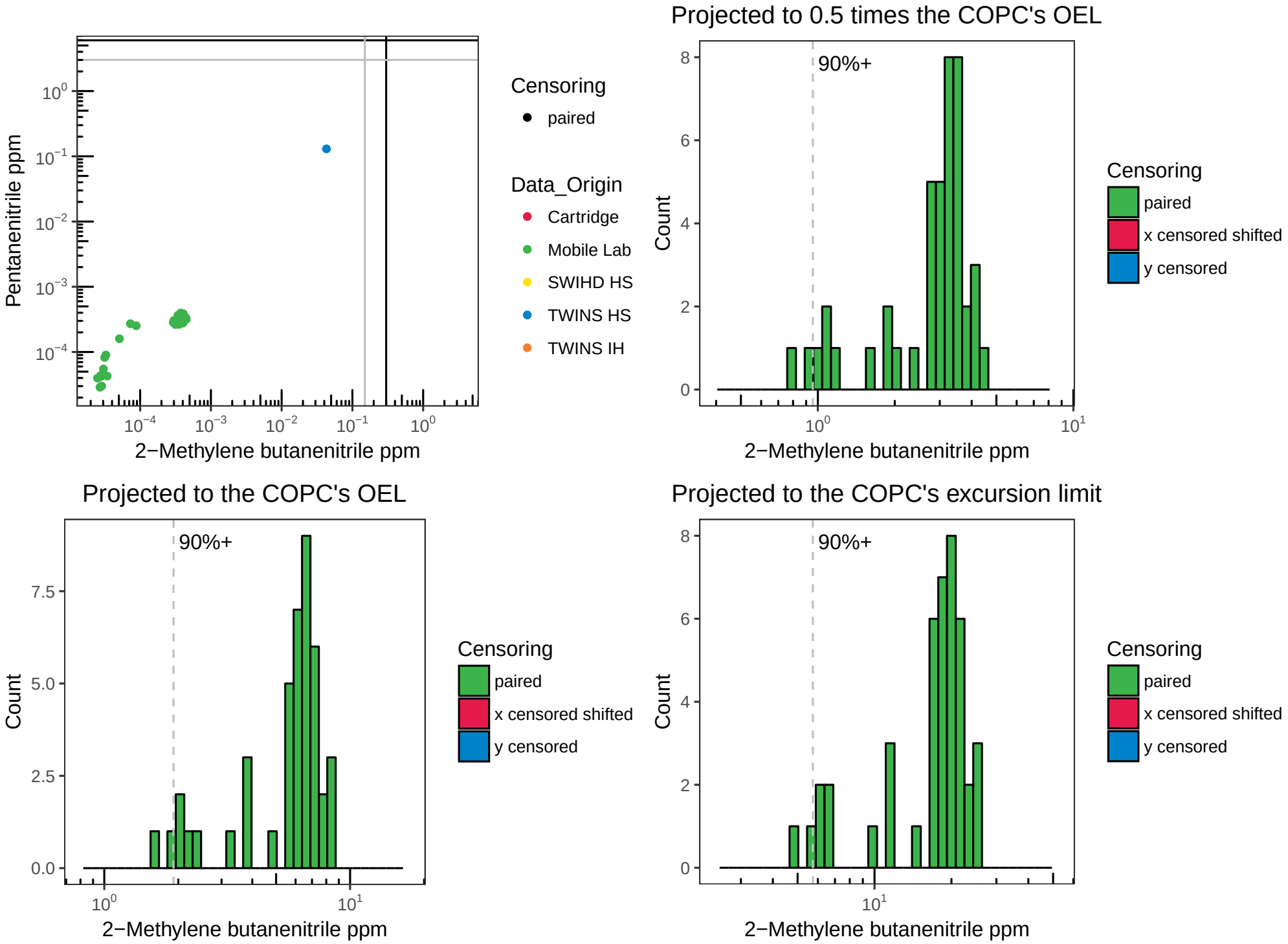


Figure C.1996: Pentanenitrile vs 2-Methylene butanenitrile

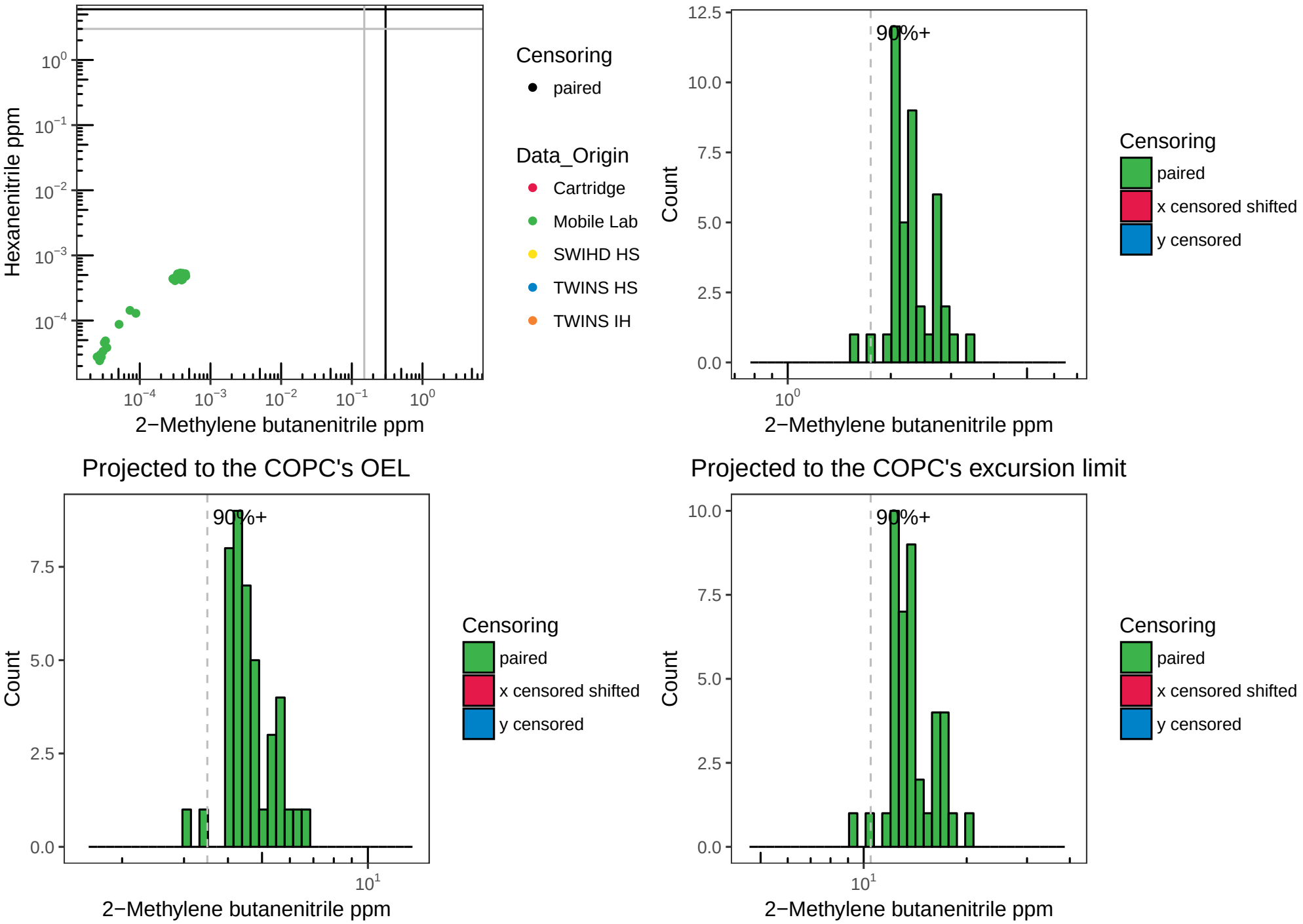


Figure C.1997: Hexanenitrile vs 2-Methylene butanenitrile

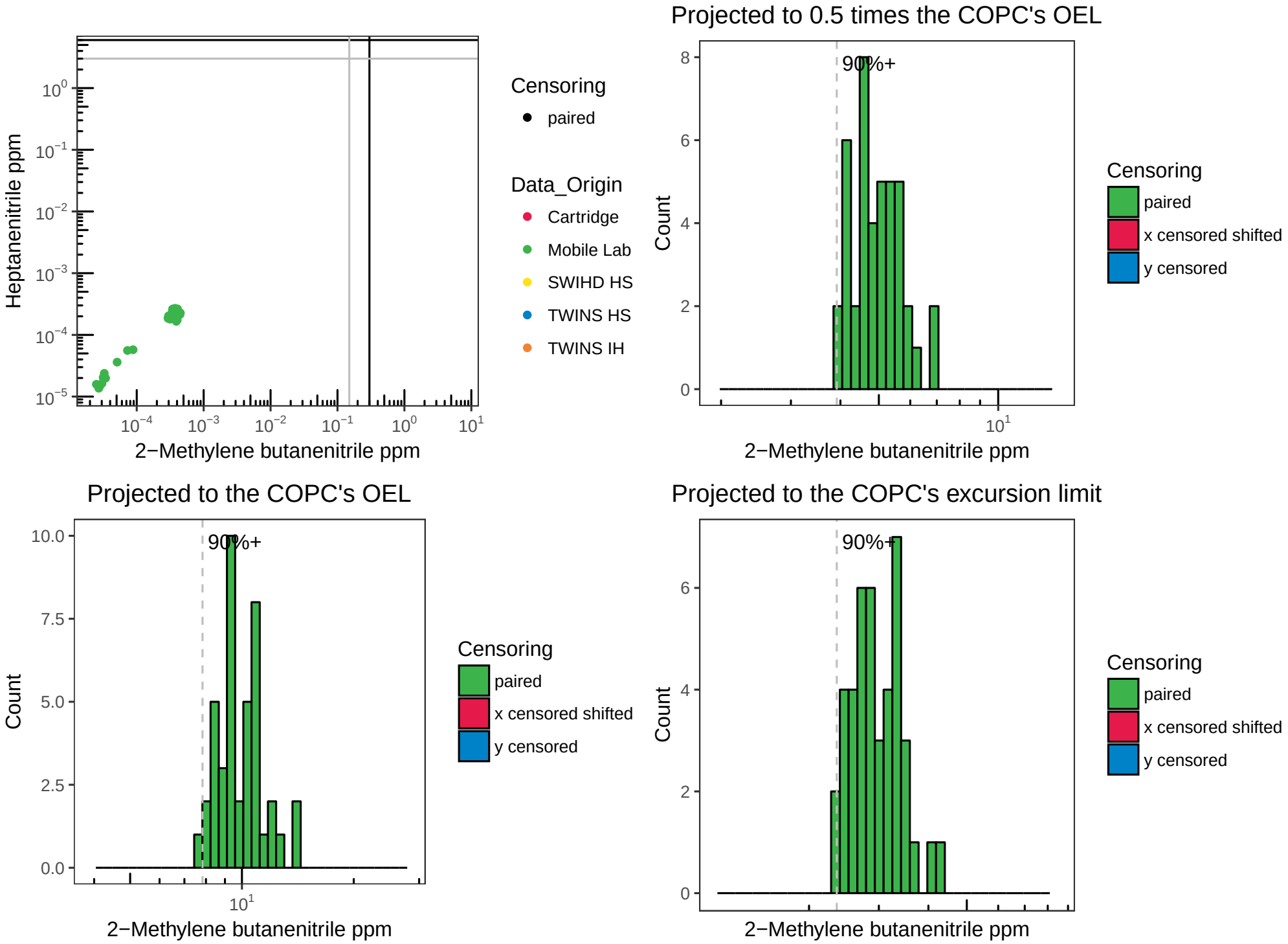


Figure C.1998: Heptanenitrile vs 2-Methylene butanenitrile

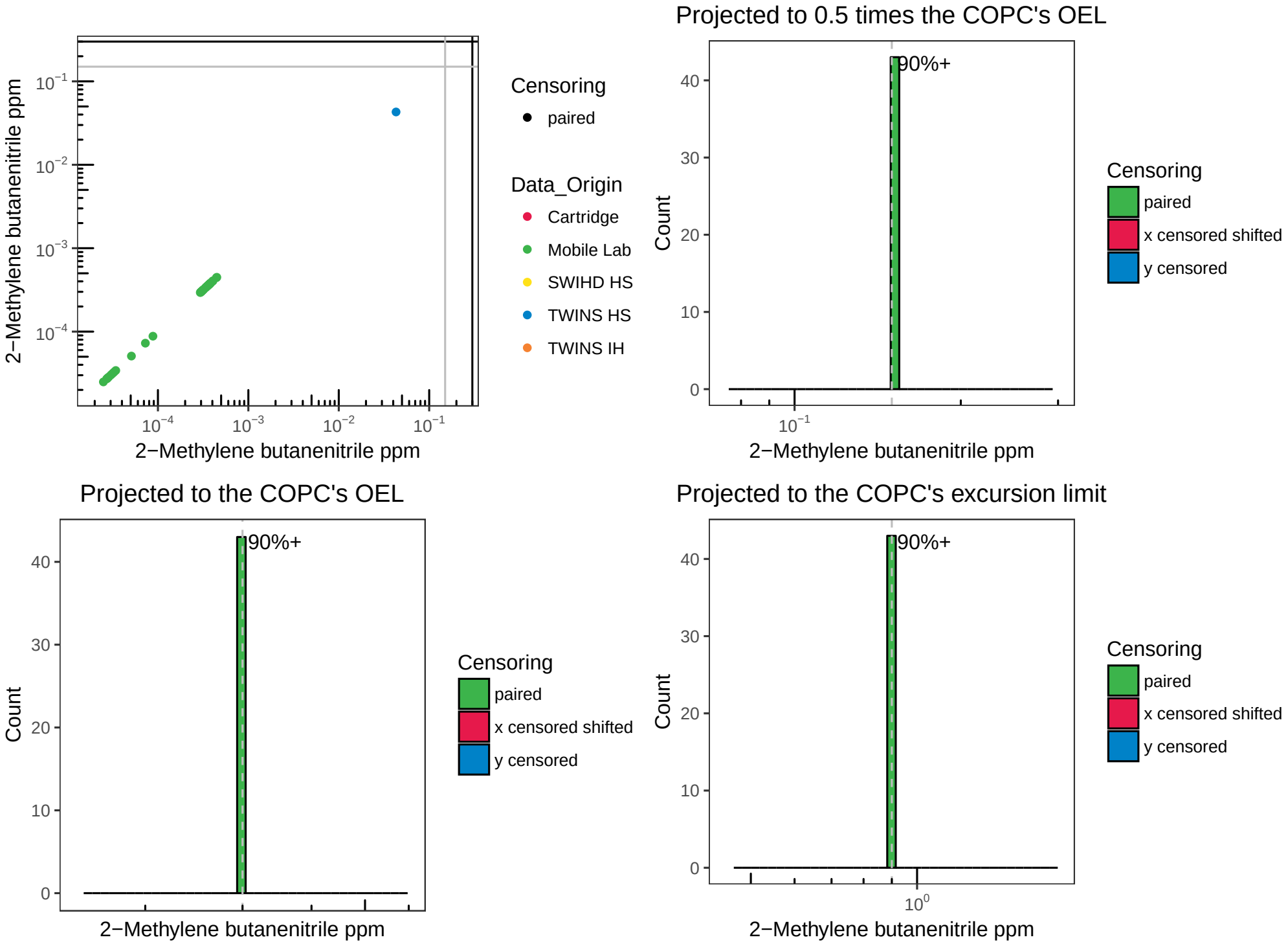


Figure C.1999: 2-Methylene butanenitrile vs 2-Methylene butanenitrile

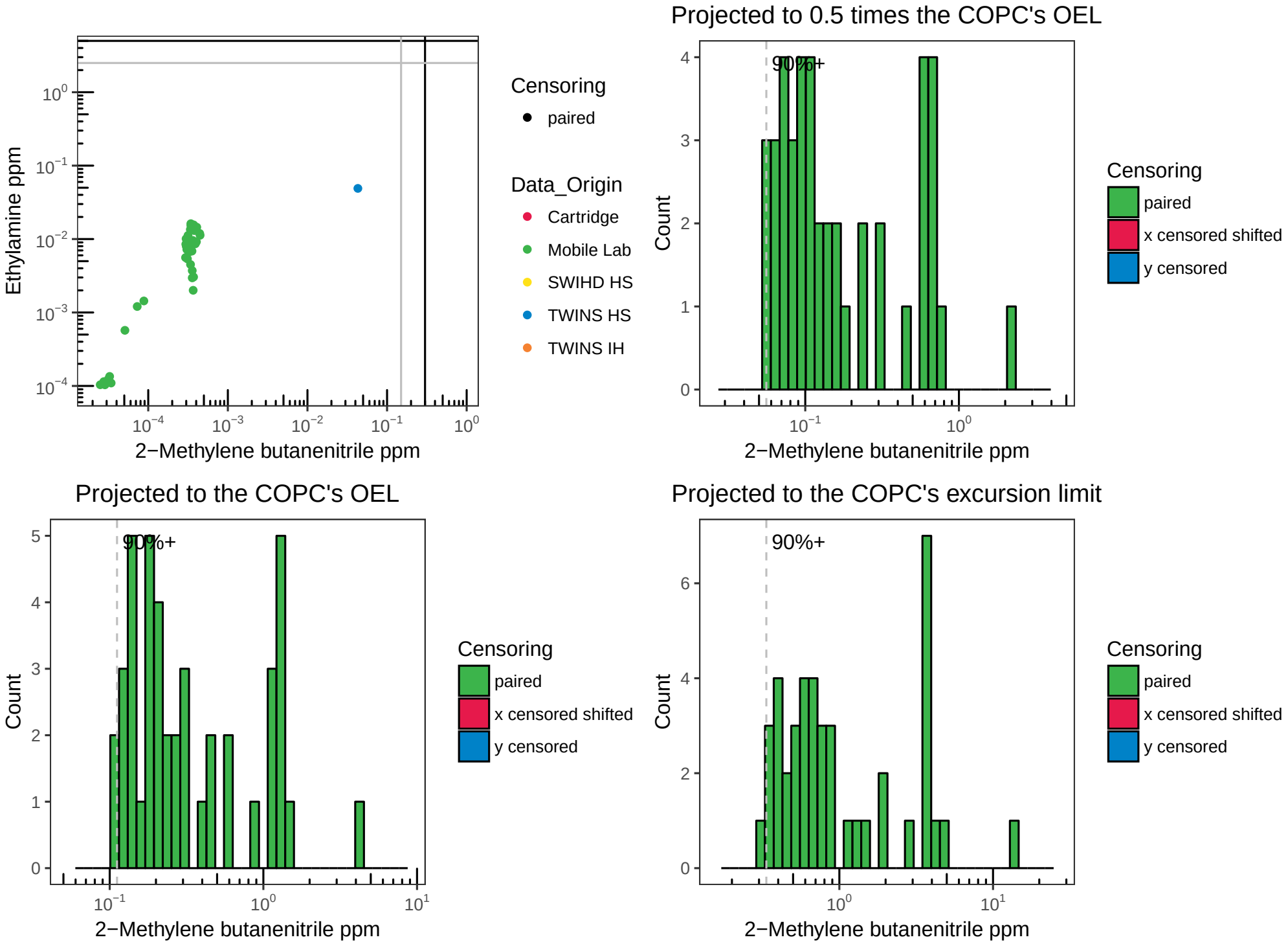


Figure C.2000: Ethylamine vs 2-Methylene butanenitrile

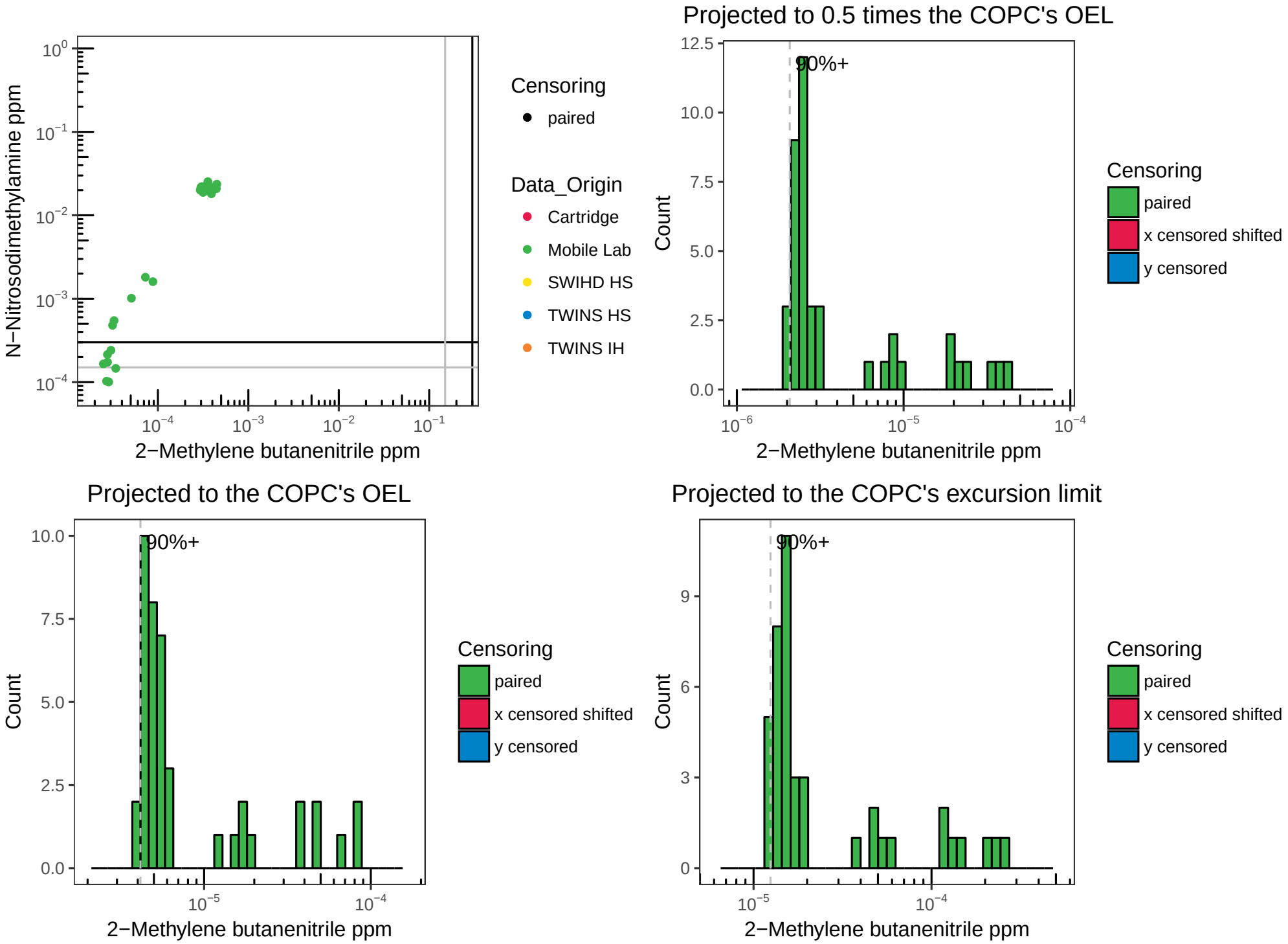


Figure C.2001: N-Nitrosodimethylamine vs 2-Methylene butanenitrile

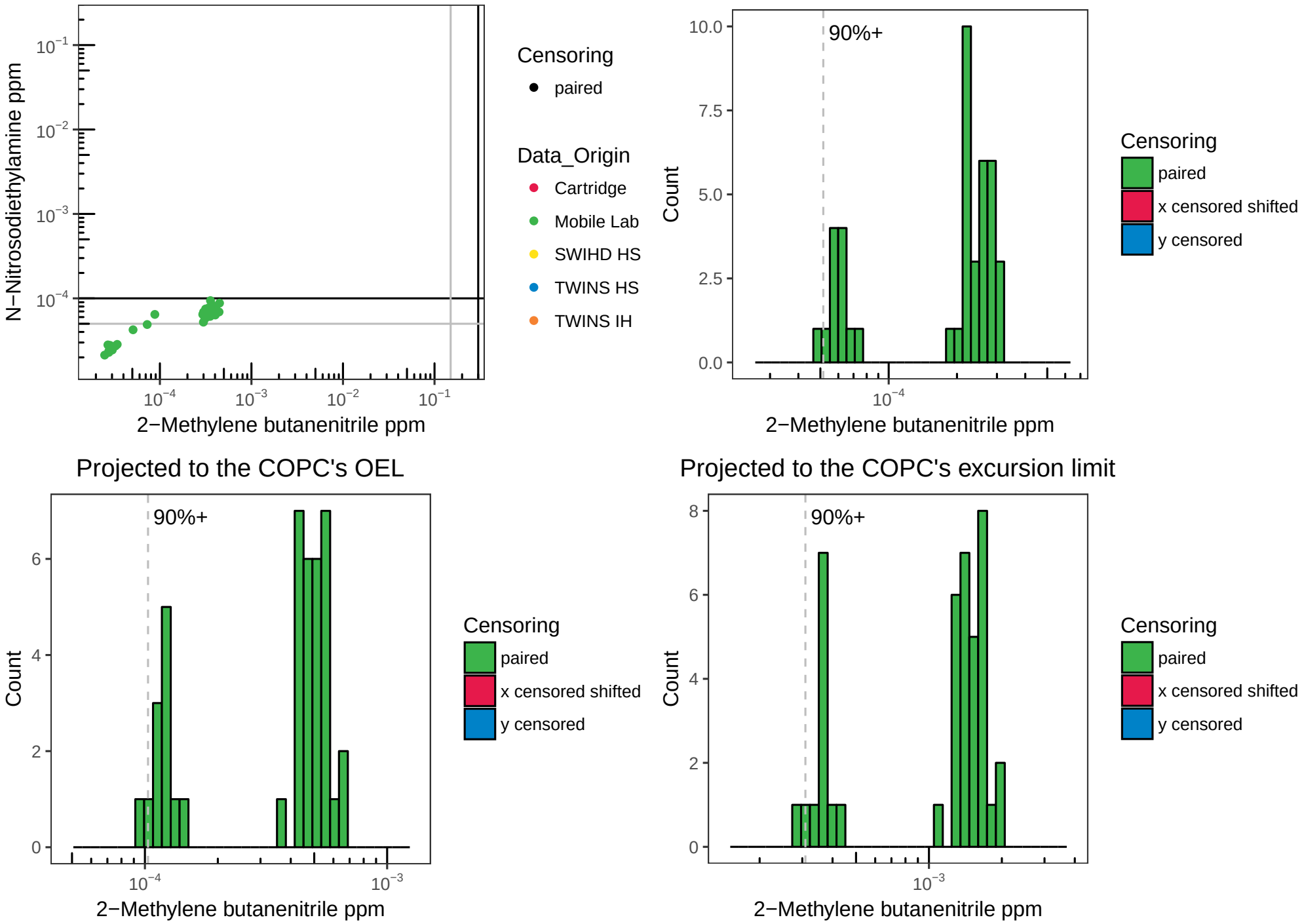


Figure C.2002: N-Nitrosodiethylamine vs 2-Methylene butanenitrile

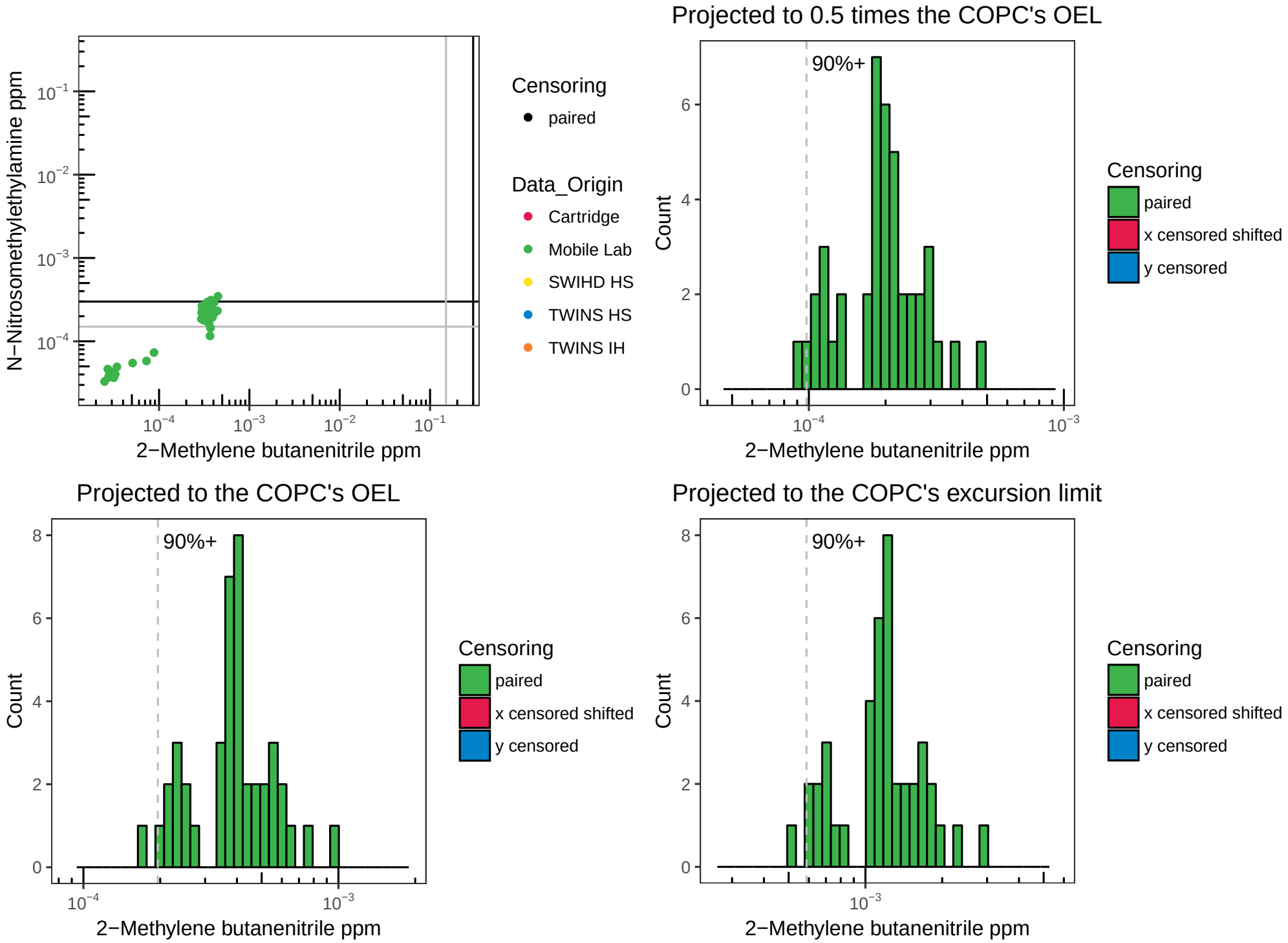


Figure C.2003: N-Nitrosomethylethylamine vs 2-Methylene butanenitrile

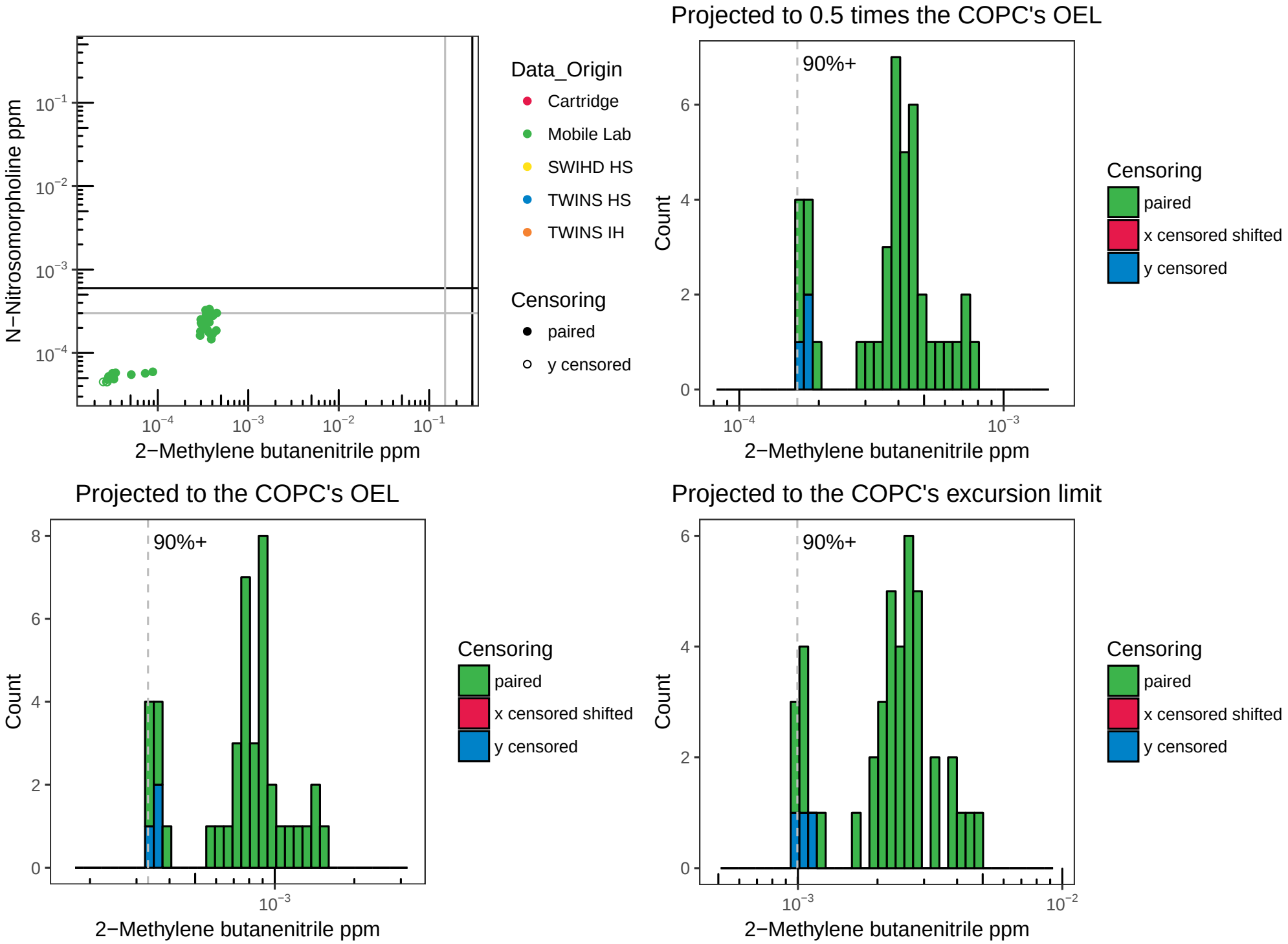


Figure C.2004: N-Nitrosomorpholine vs 2-Methylene butanenitrile

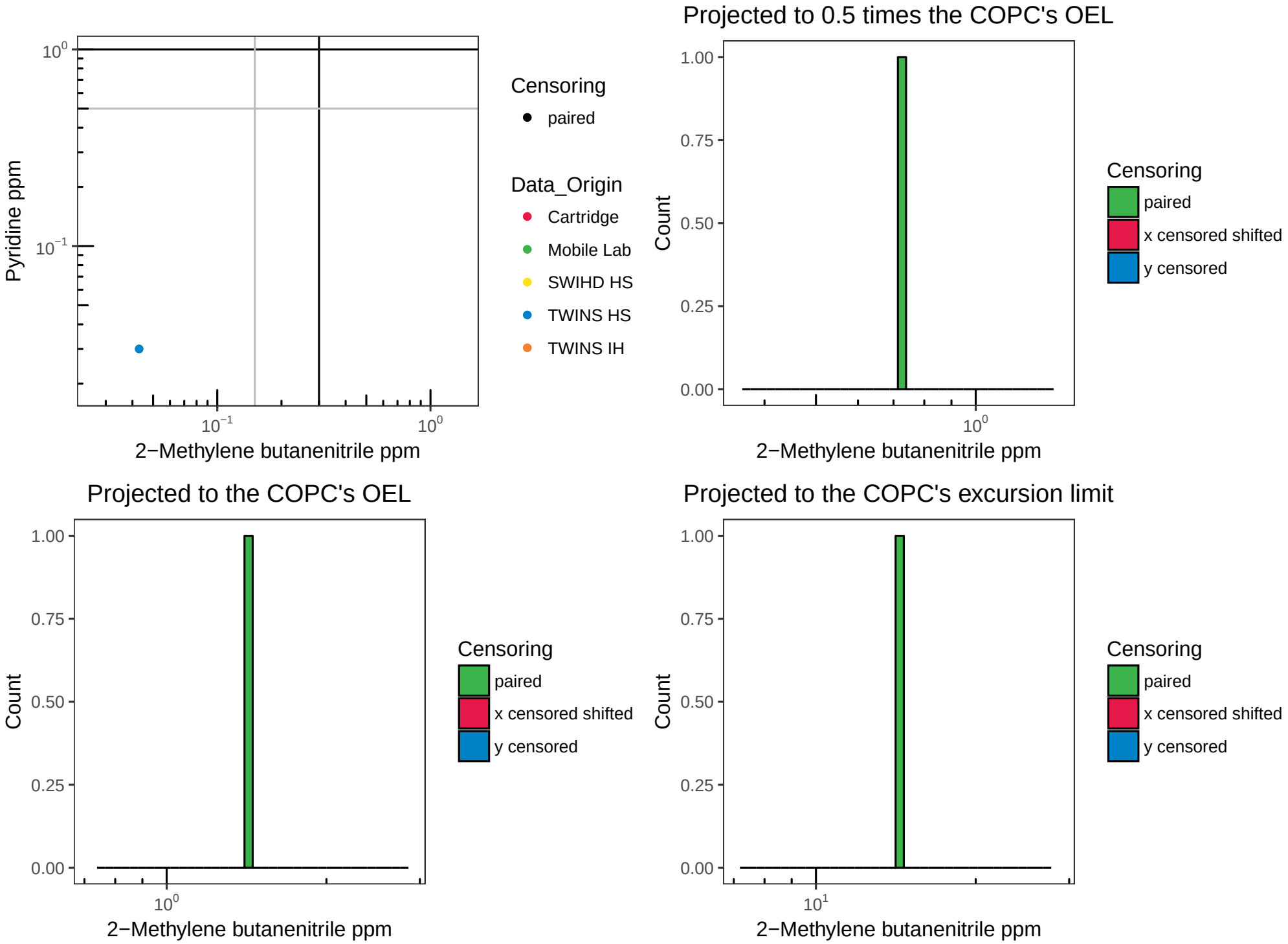


Figure C.2005: Pyridine vs 2-Methylene butanenitrile

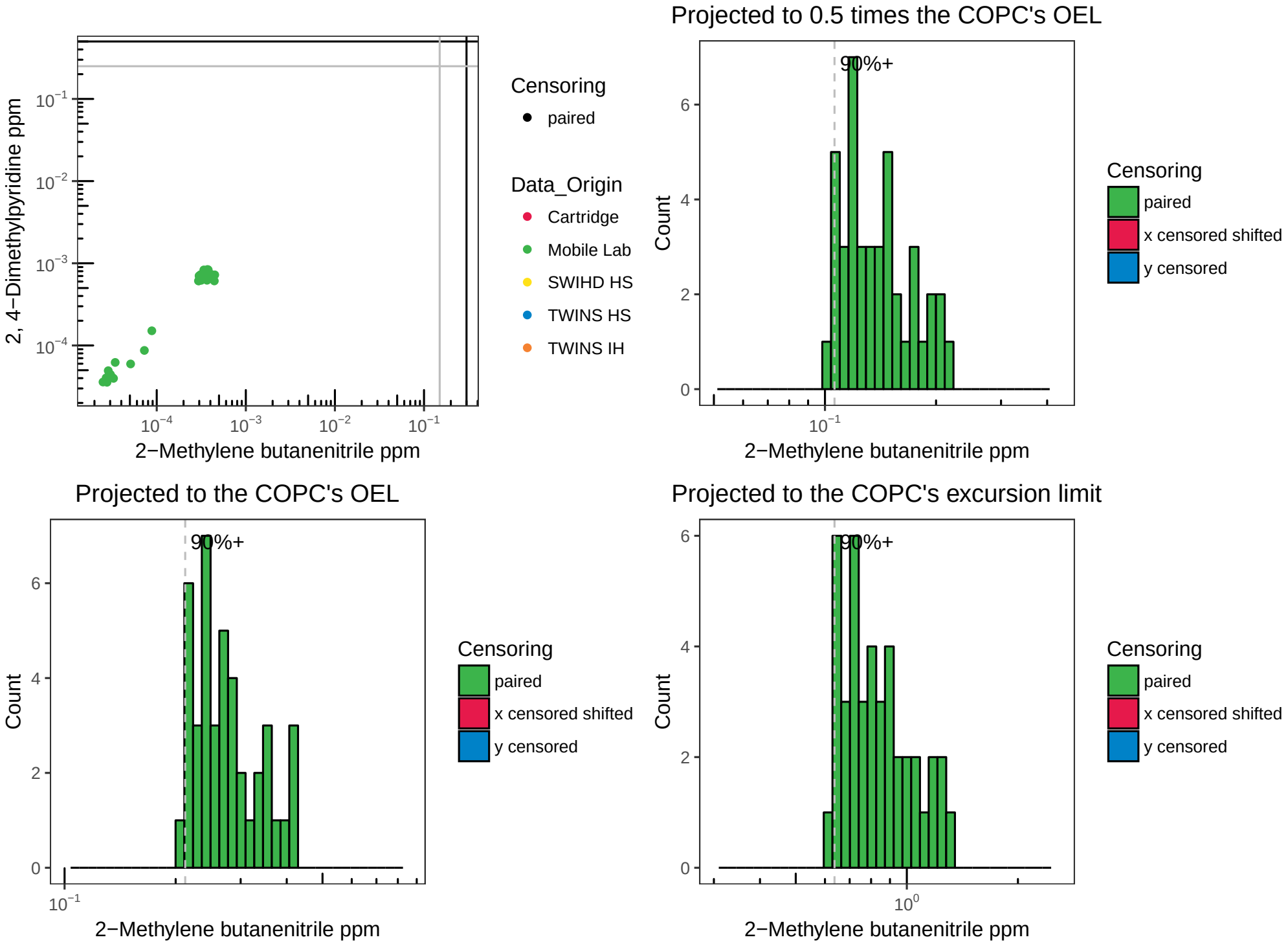


Figure C.2006: 2, 4-Dimethylpyridine vs 2-Methylene butanenitrile

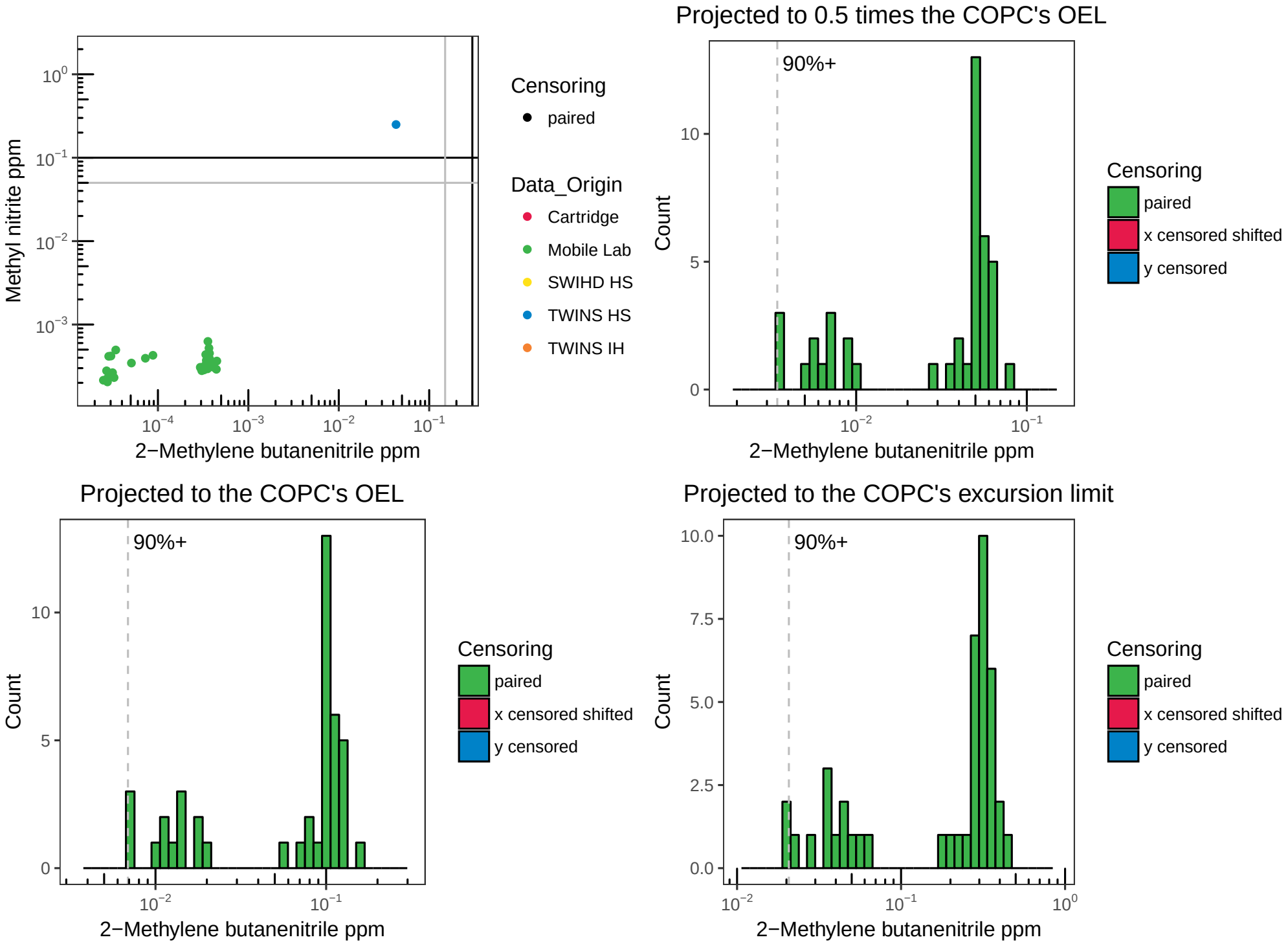


Figure C.2007: Methyl nitrite vs 2-Methylene butanenitrile

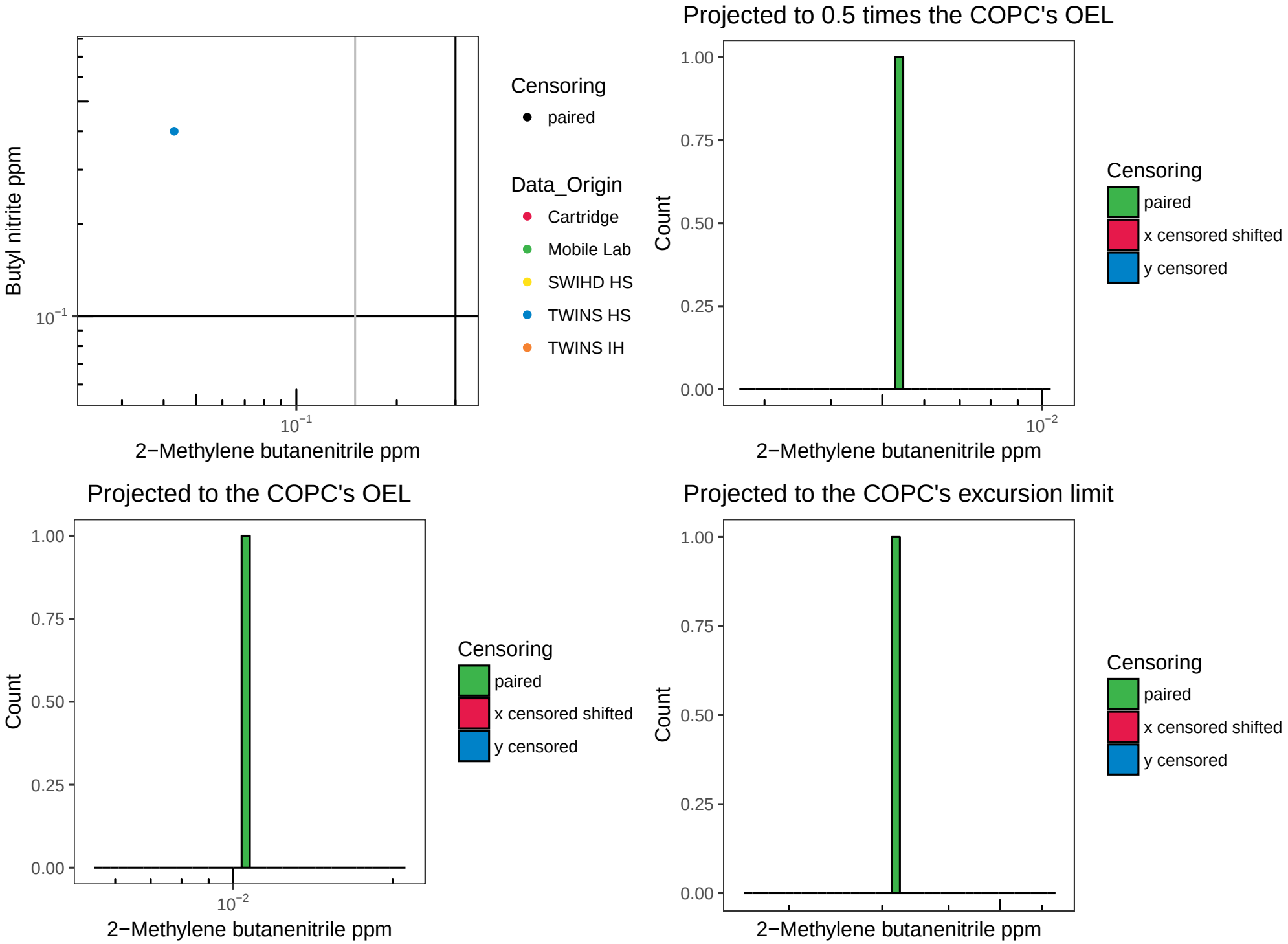


Figure C.2008: Butyl nitrite vs 2-Methylene butanenitrile

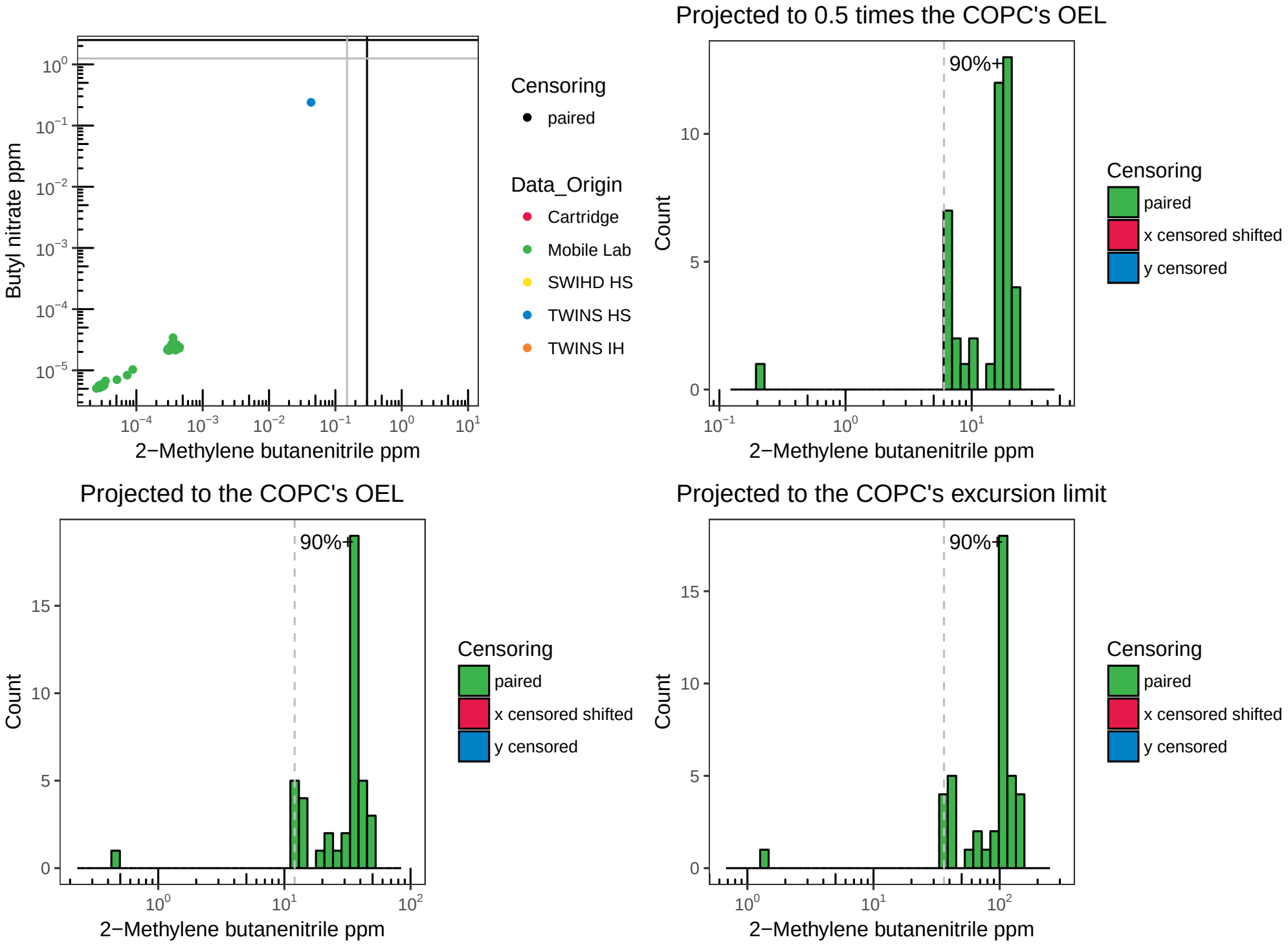


Figure C.2009: Butyl nitrate vs 2-Methylene butanenitrile

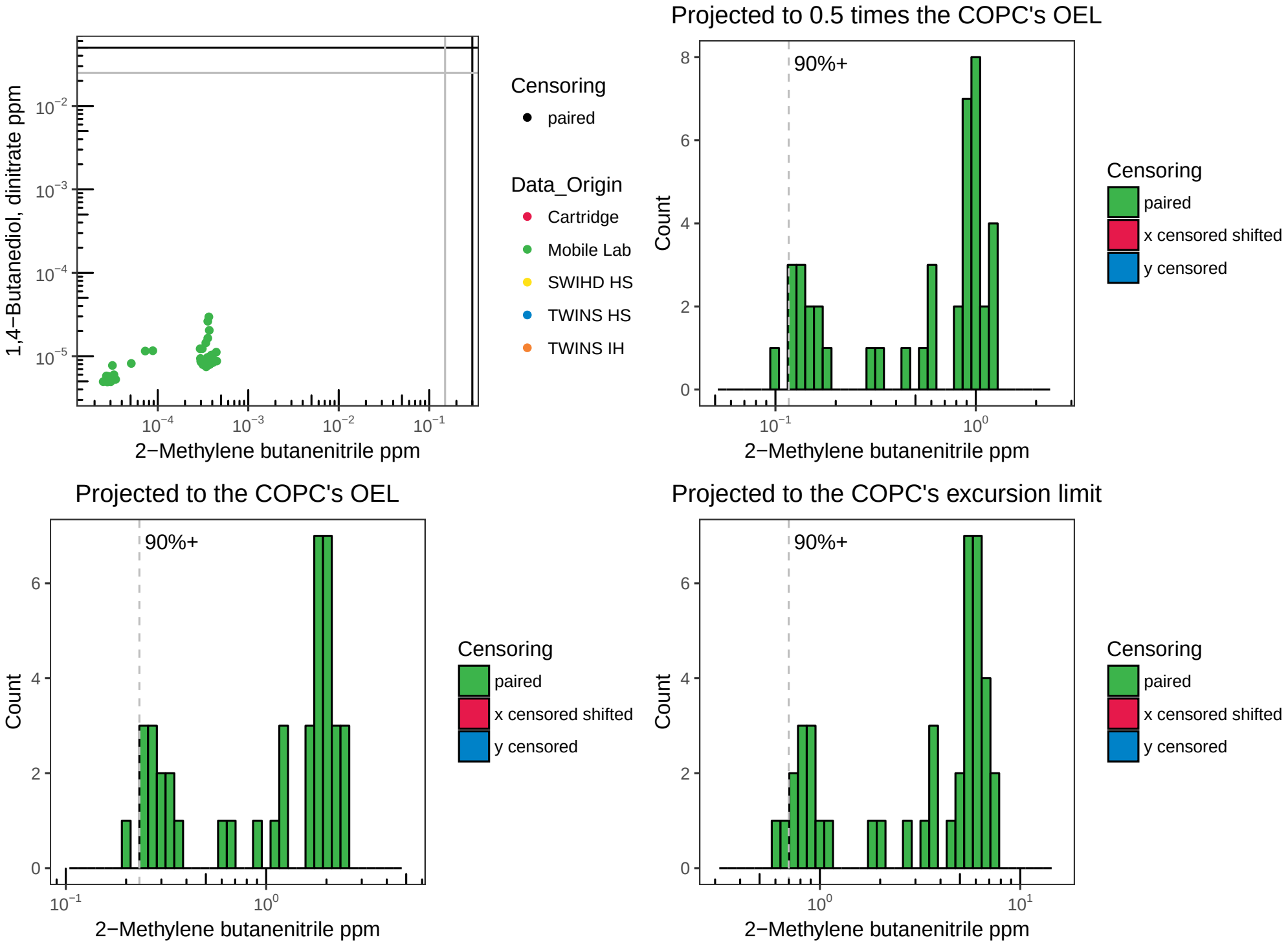


Figure C.2010: 1,4-Butanediol, dinitrate vs 2-Methylene butanenitrile

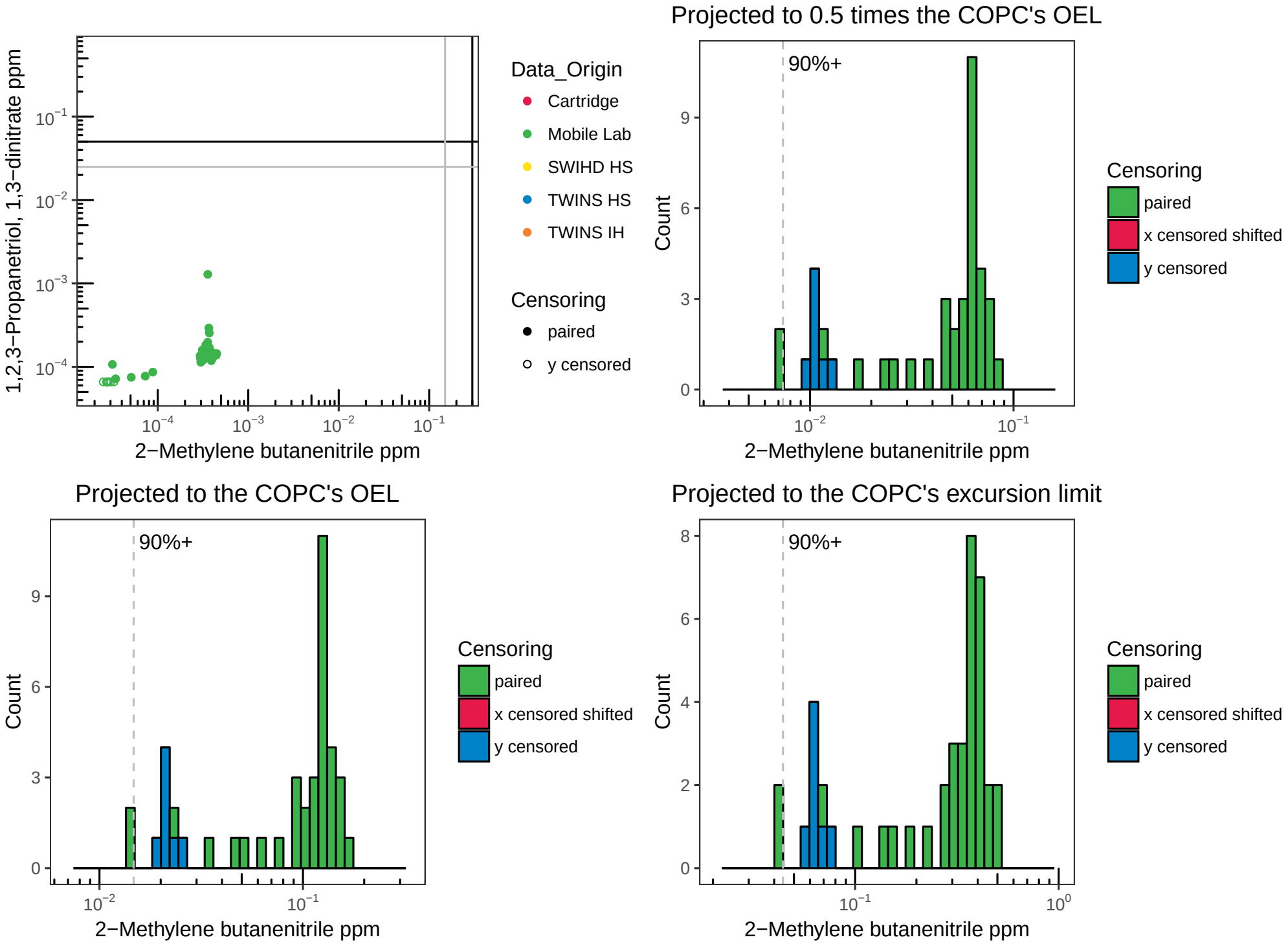


Figure C.2011: 1,2,3-Propanetriol, 1,3-dinitrate vs 2-Methylene butanenitrile

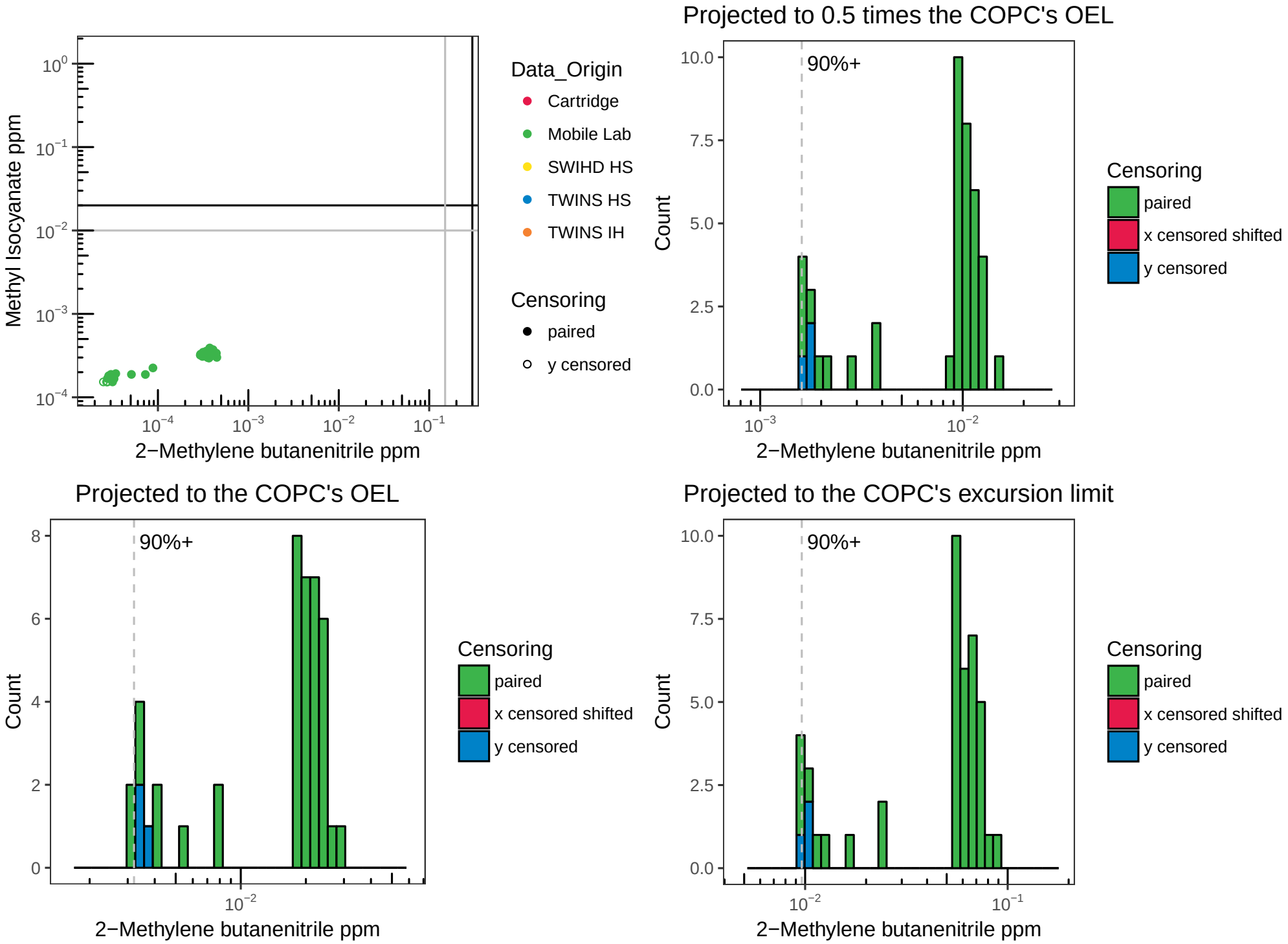


Figure C.2012: Methyl Isocyanate vs 2-Methylene butanenitrile

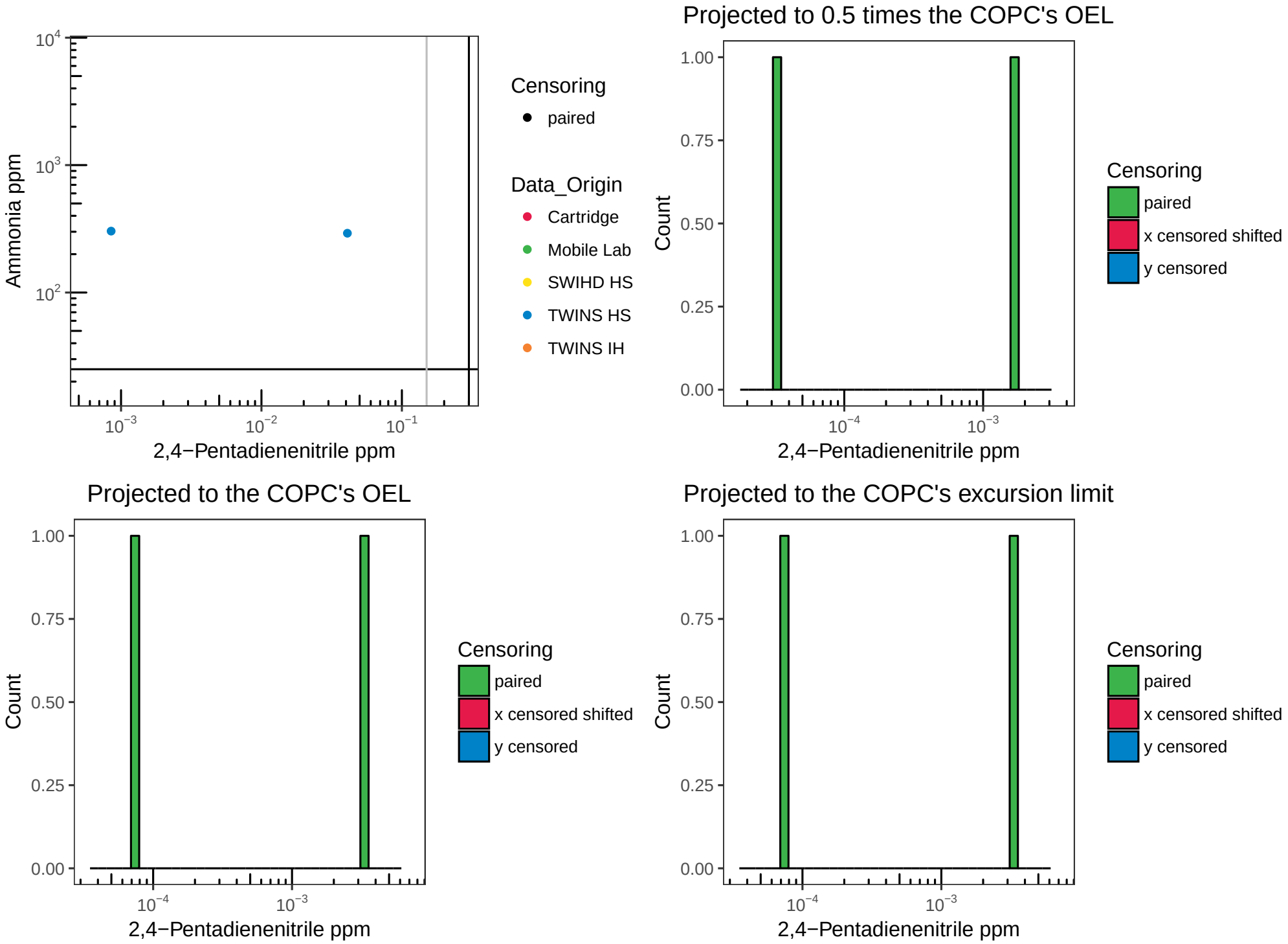


Figure C.2013: Ammonia vs 2,4-Pentadienenitrile

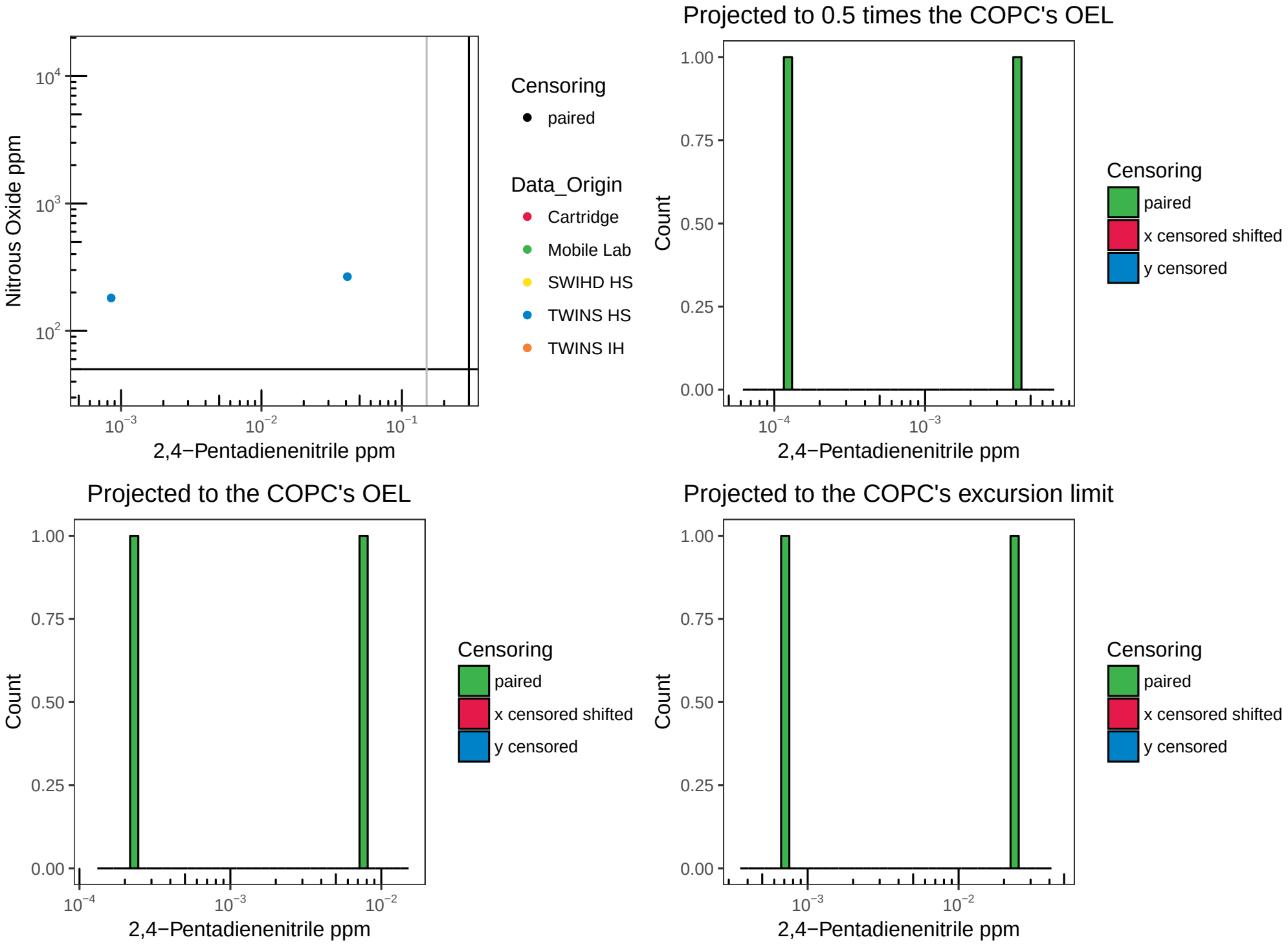


Figure C.2014: Nitrous Oxide vs 2,4-Pentadienenitrile

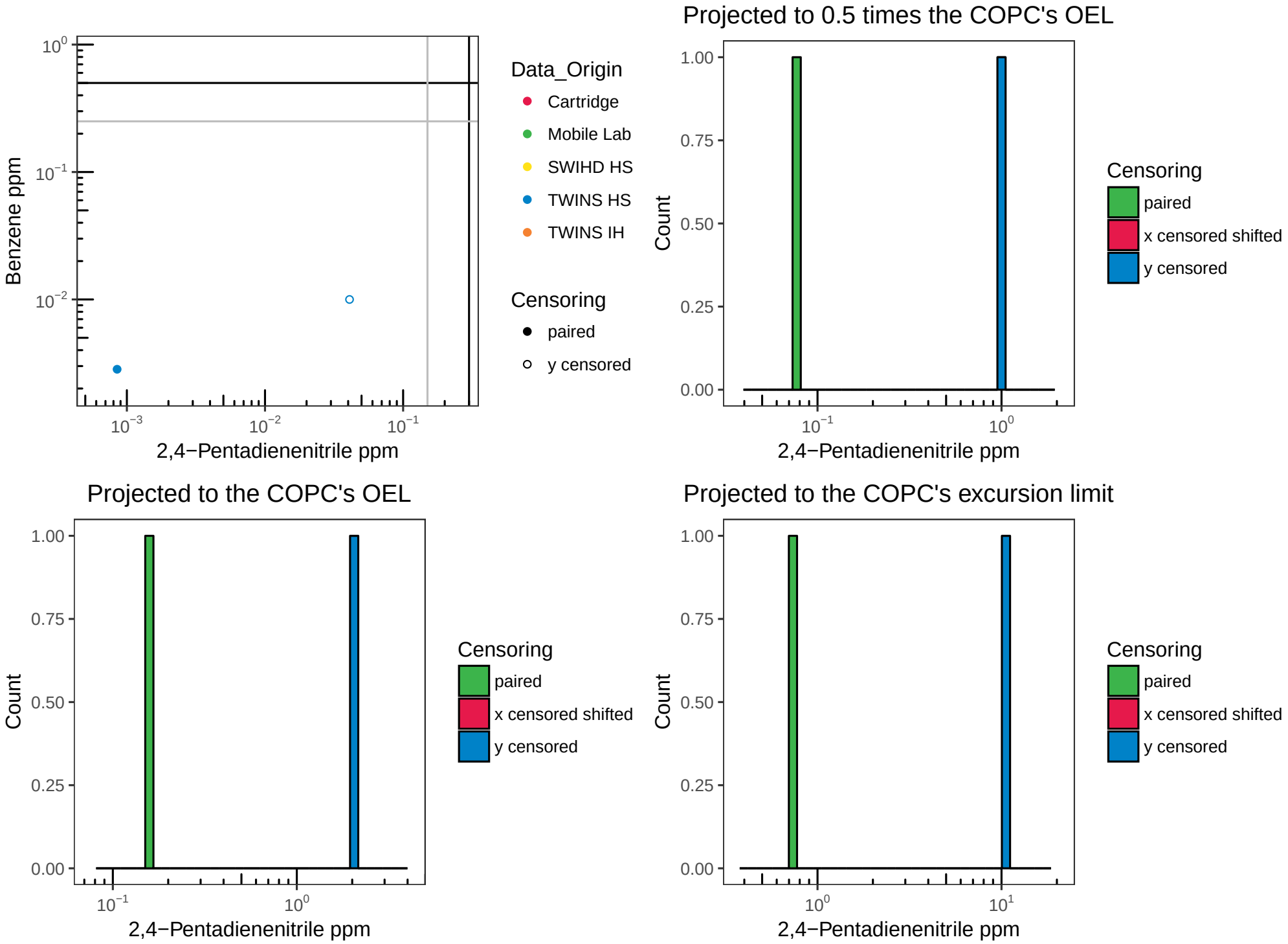


Figure C.2015: Benzene vs 2,4-Pentadienenitrile

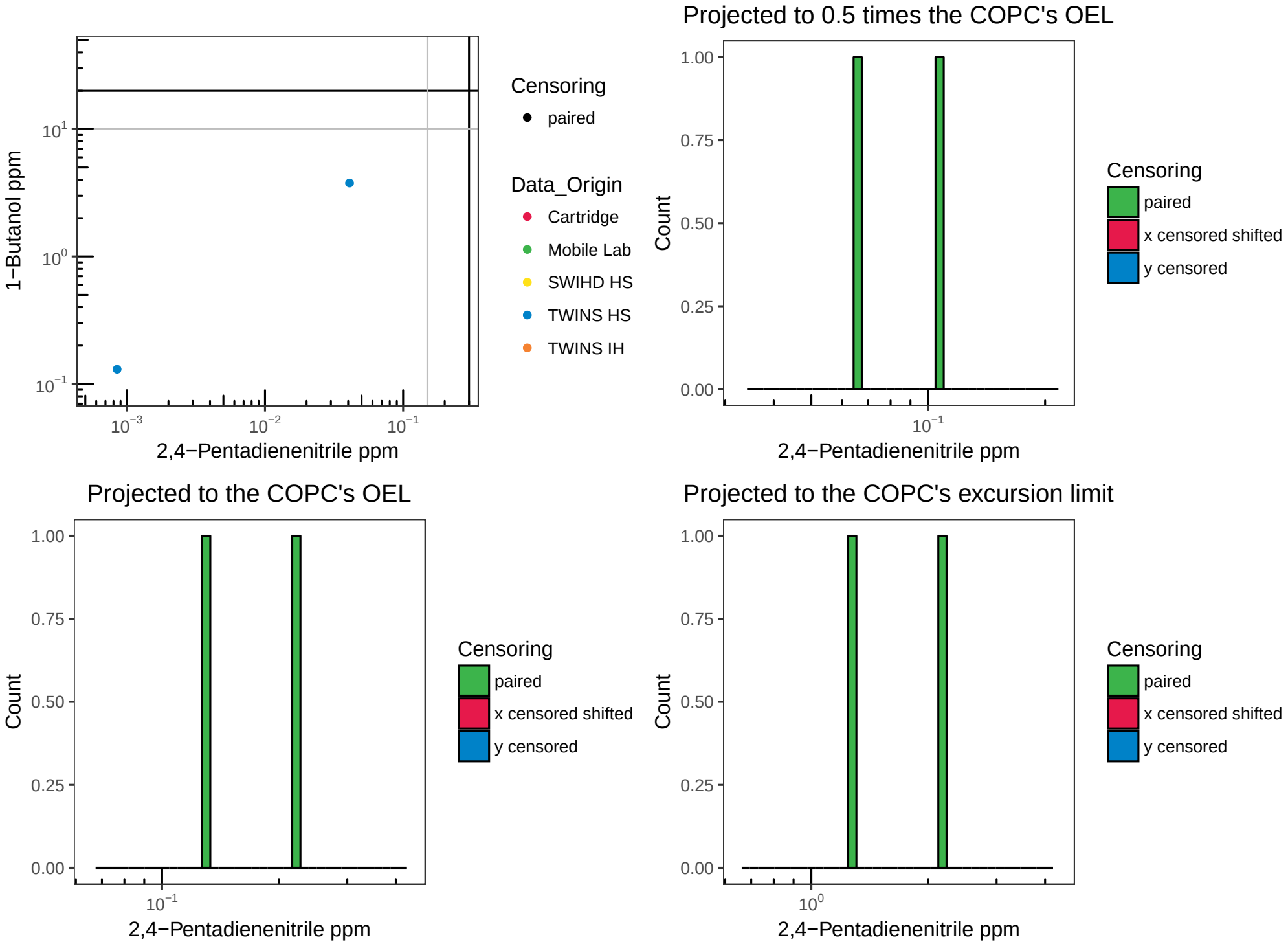


Figure C.2016: 1-Butanol vs 2,4-Pentadienenitrile

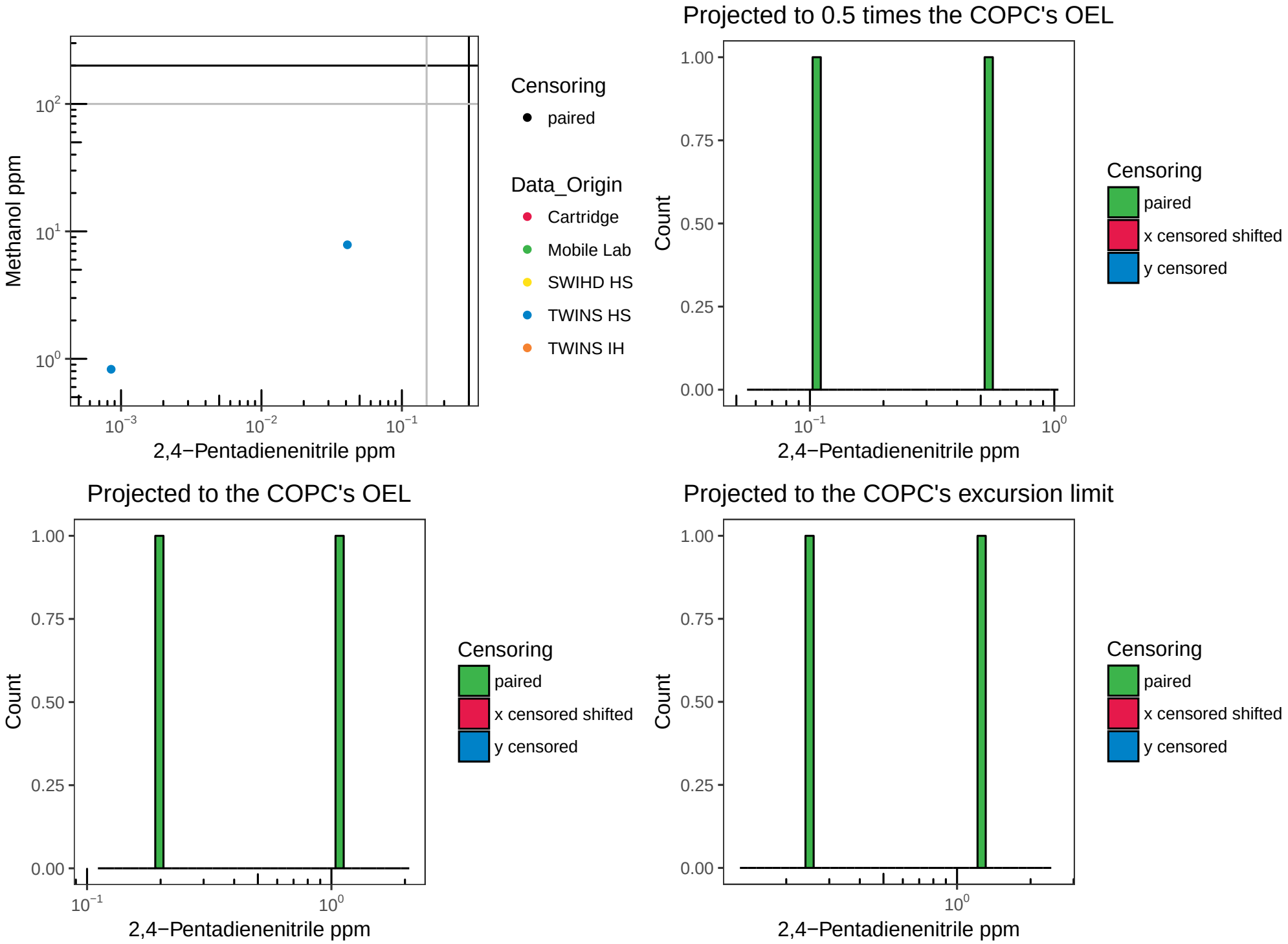


Figure C.2017: Methanol vs 2,4-Pentadienenitrile

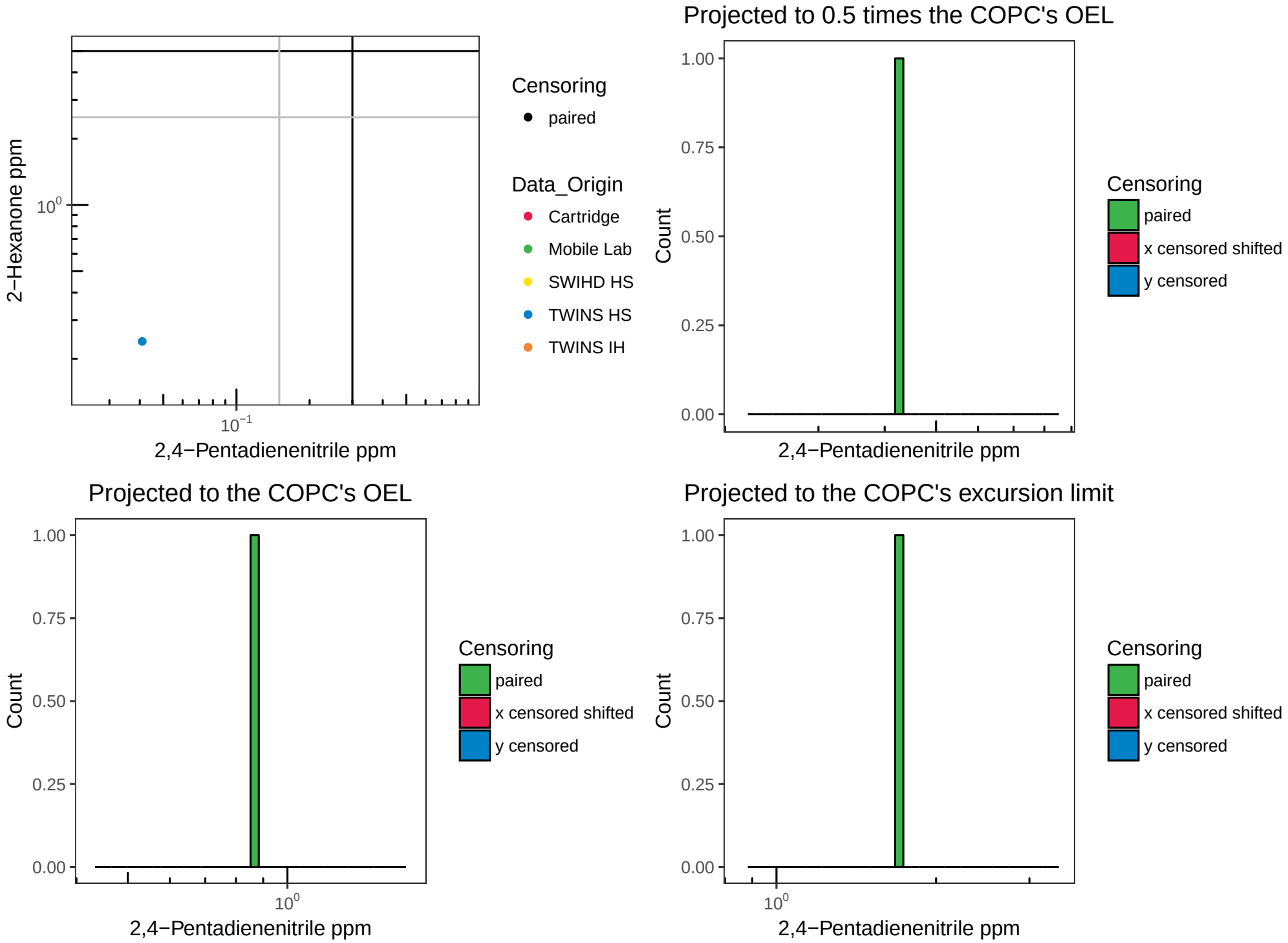


Figure C.2018: 2-Hexanone vs 2,4-Pentadienenitrile

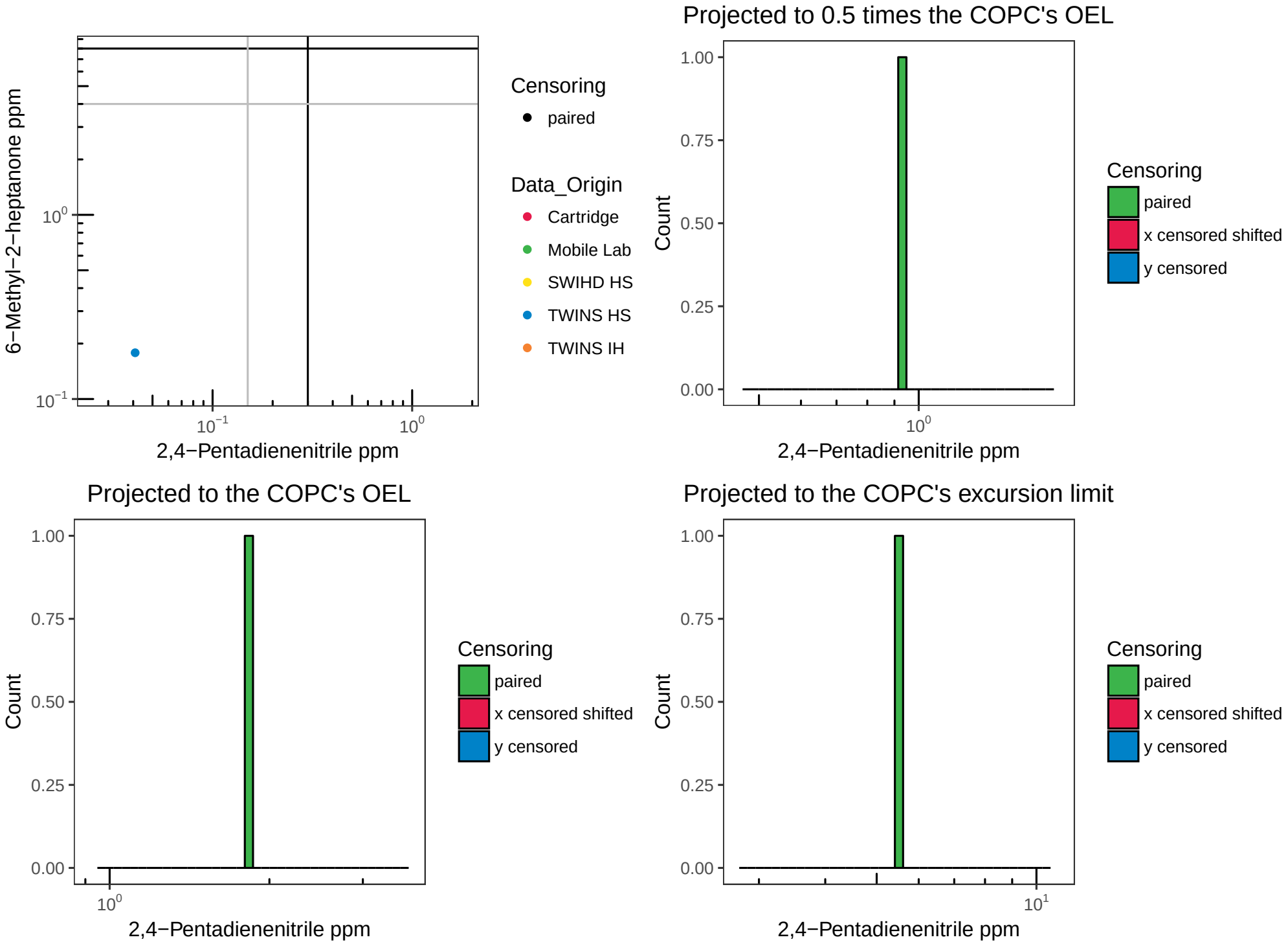


Figure C.2019: 6-Methyl-2-heptanone vs 2,4-Pentadienenitrile

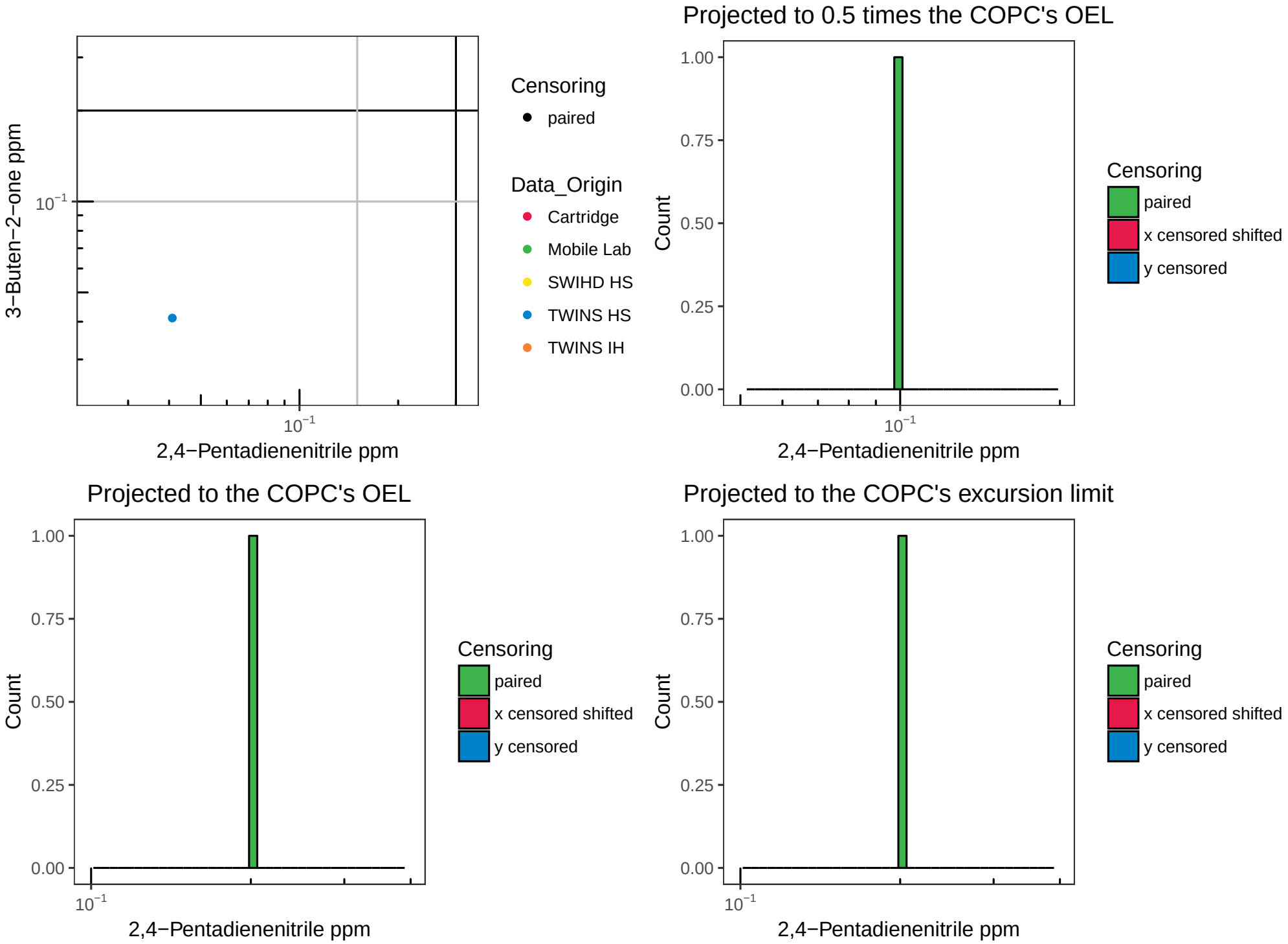


Figure C.2020: 3-Buten-2-one vs 2,4-Pentadienenitrile

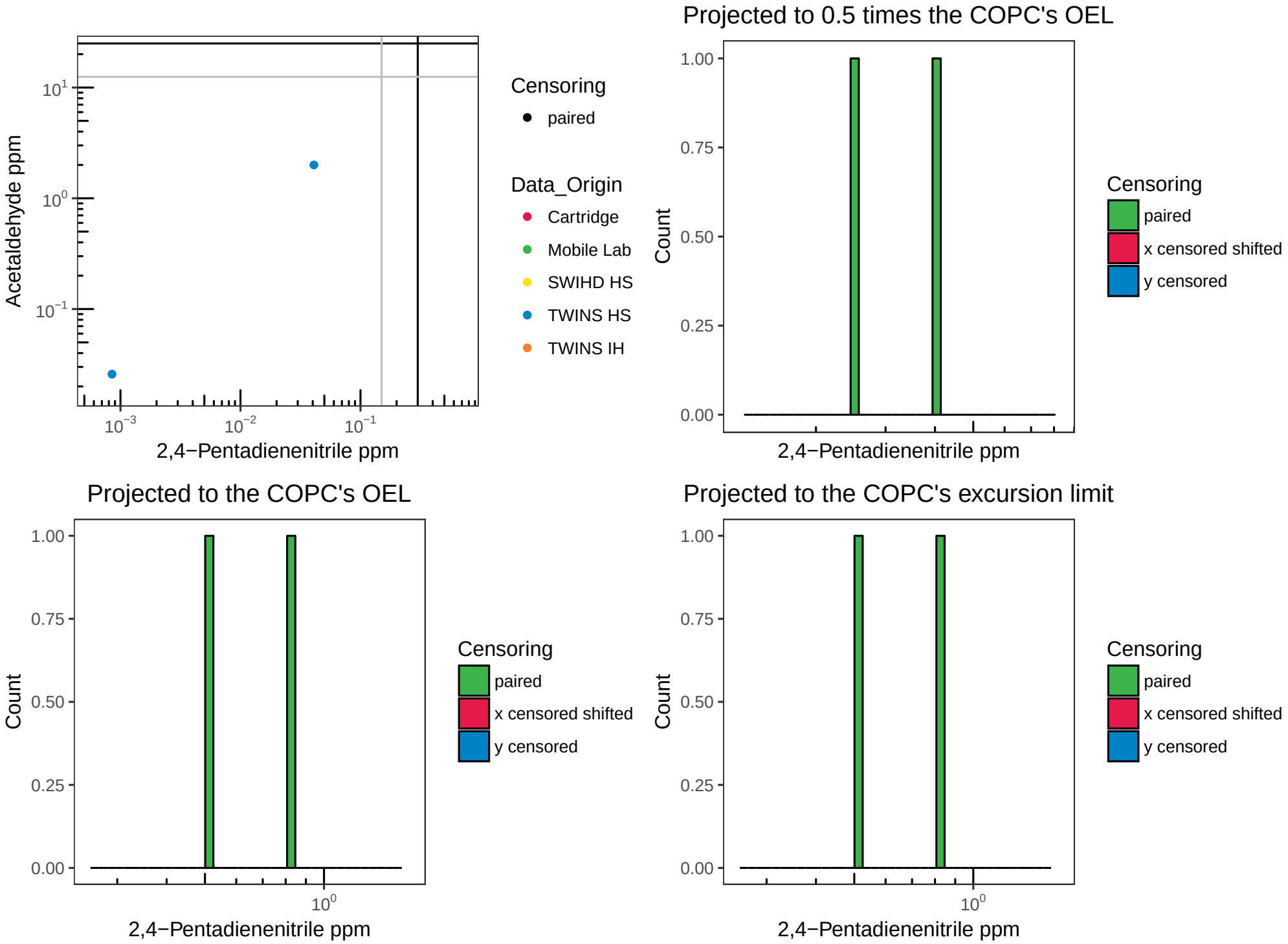


Figure C.2021: Acetaldehyde vs 2,4-Pentadienenitrile

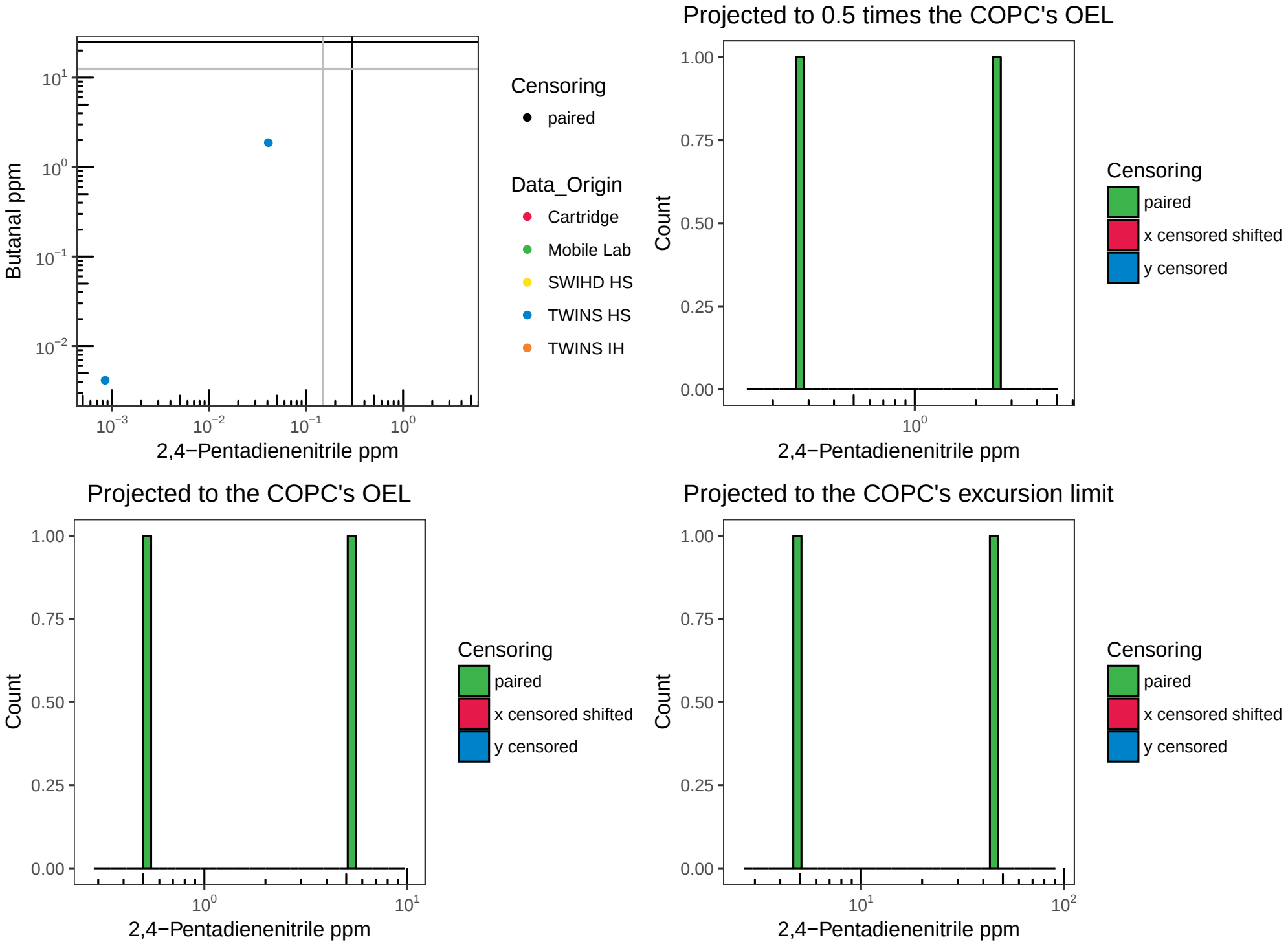


Figure C.2022: Butanal vs 2,4-Pentadienenitrile

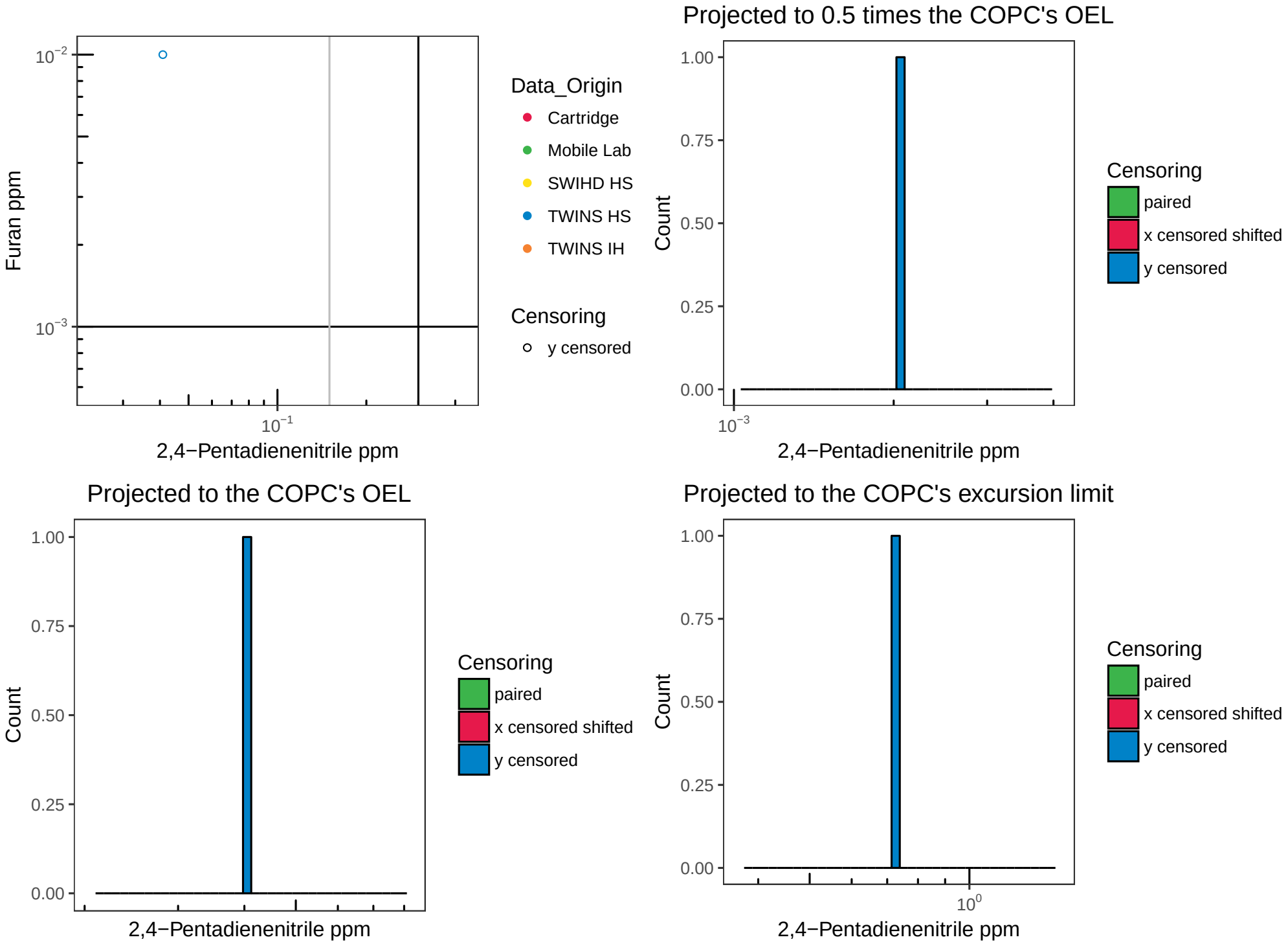


Figure C.2023: Furan vs 2,4-Pentadienenitrile

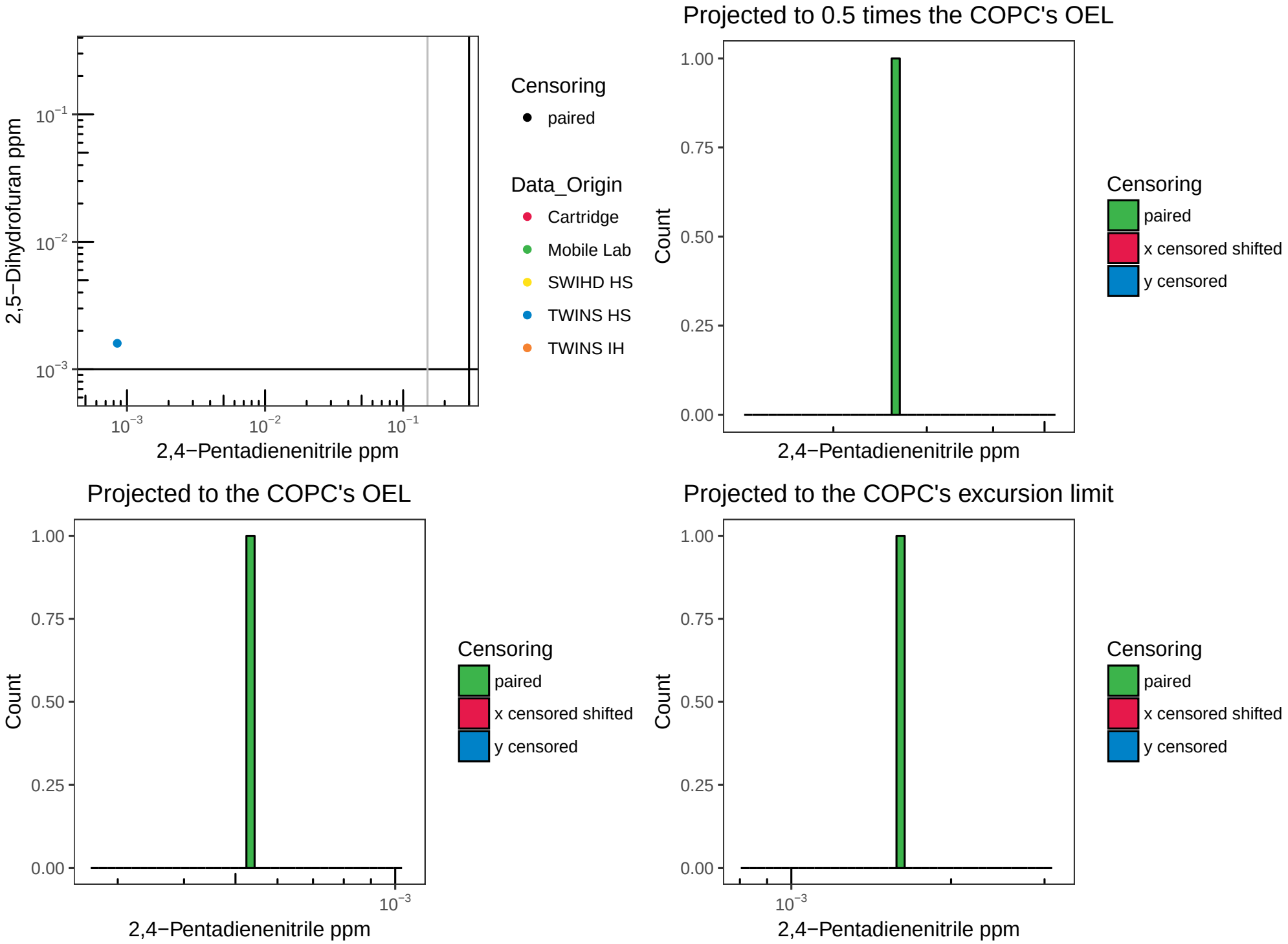


Figure C.2024: 2,5-Dihydrofuran vs 2,4-Pentadienenitrile

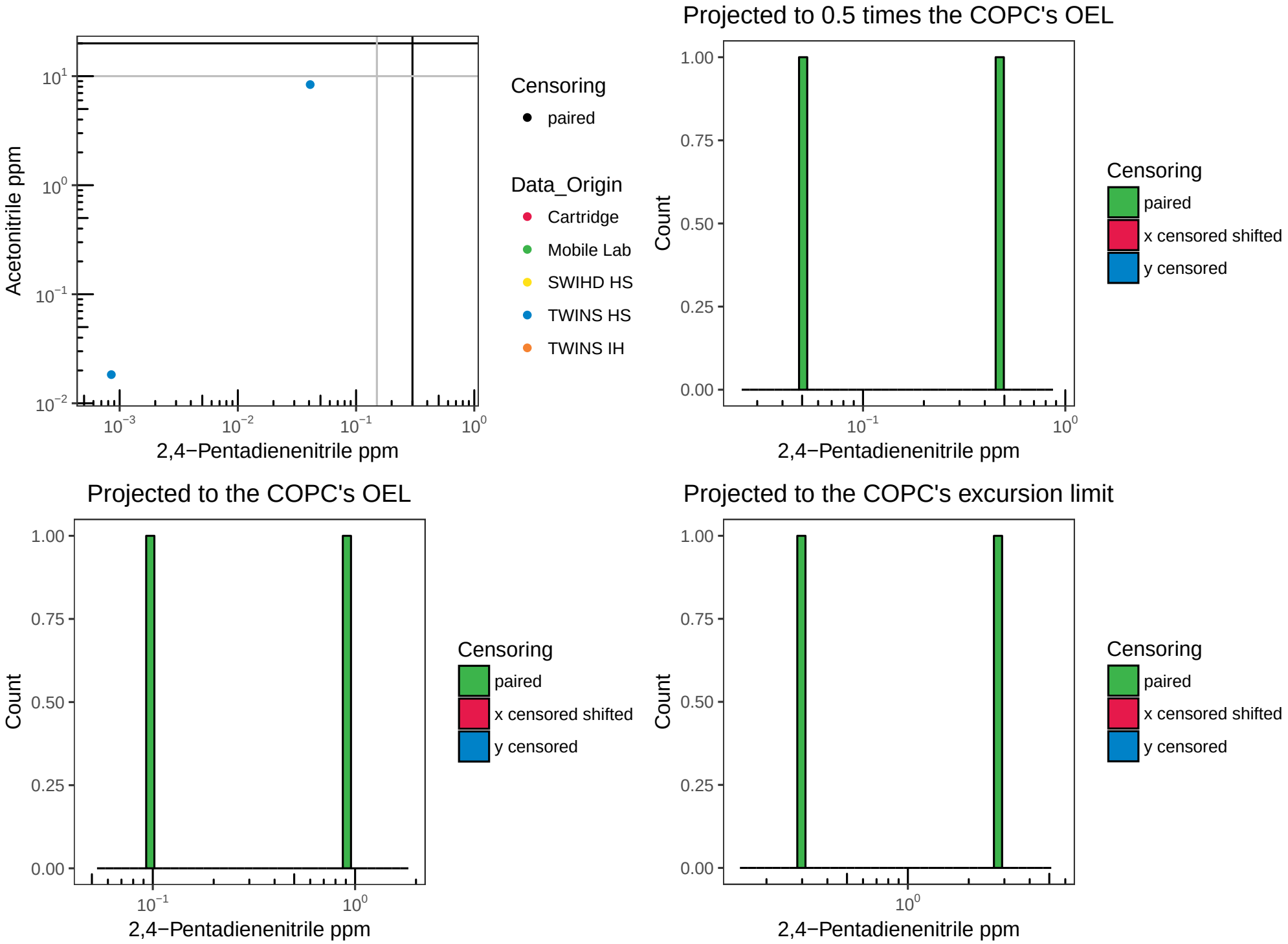


Figure C.2025: Acetonitrile vs 2,4-Pentadienenitrile

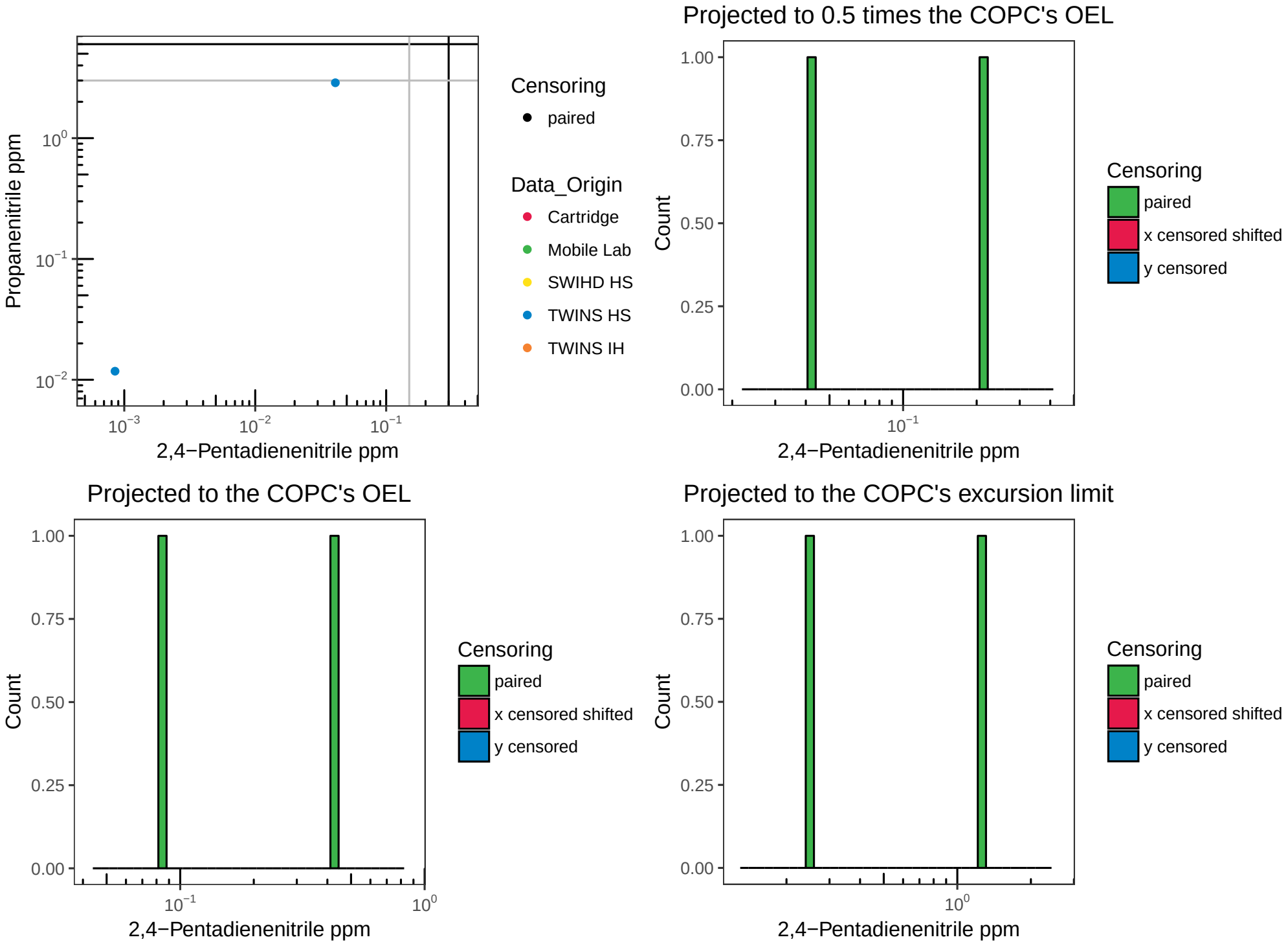


Figure C.2026: Propanenitrile vs 2,4-Pentadienenitrile

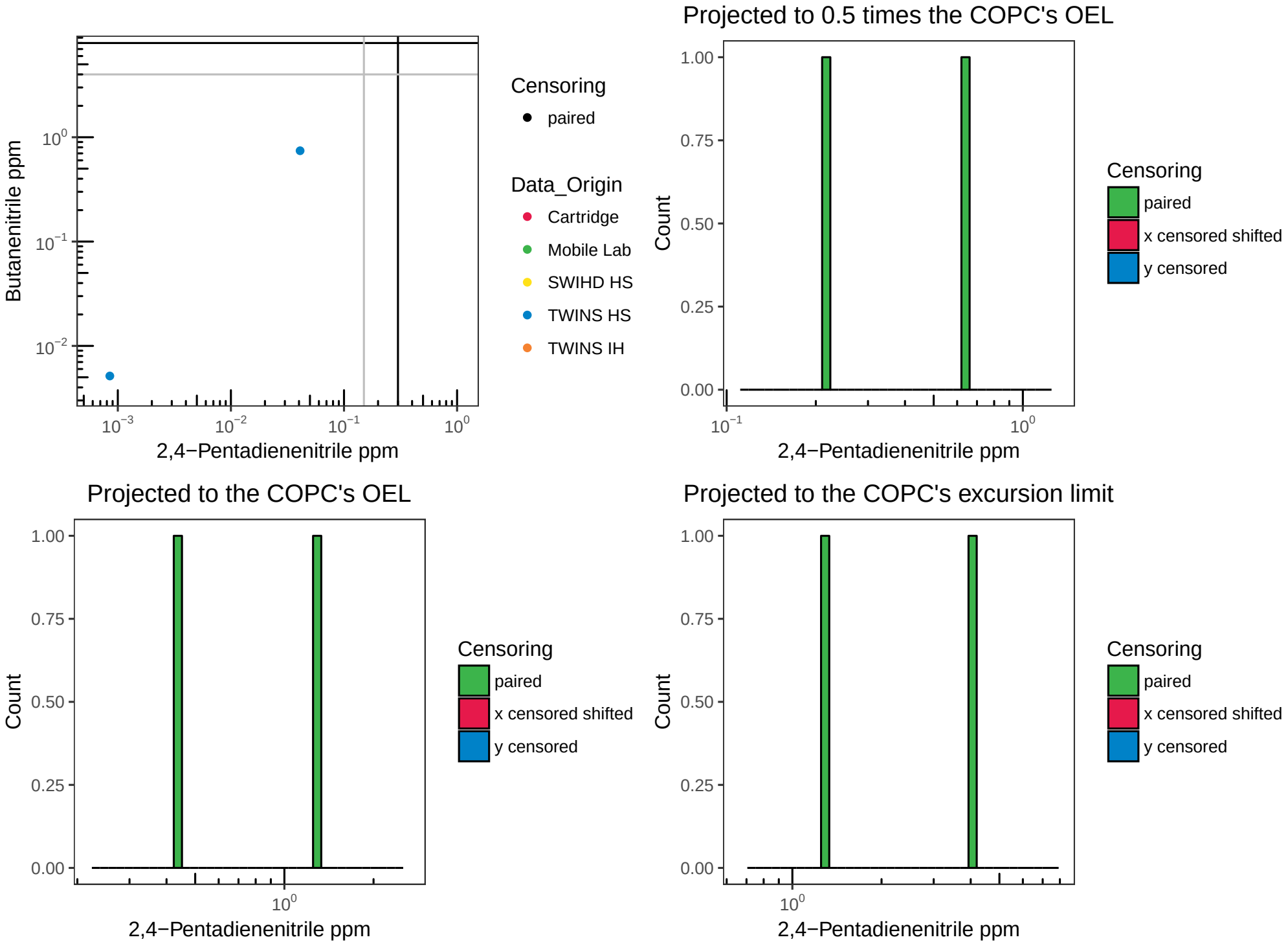


Figure C.2027: Butanenitrile vs 2,4-Pentadienenitrile

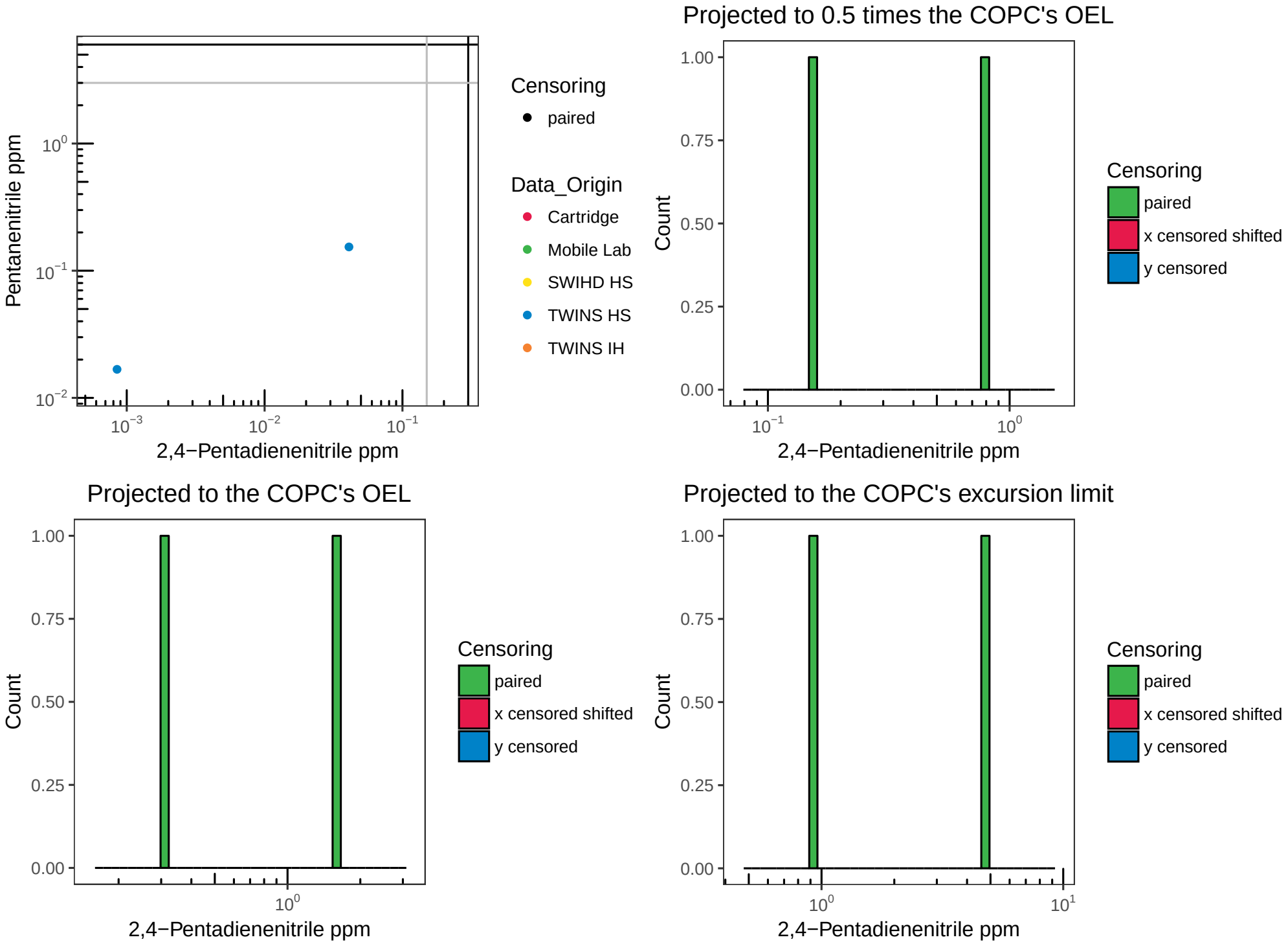


Figure C.2028: Pentanenitrile vs 2,4-Pentadienenitrile

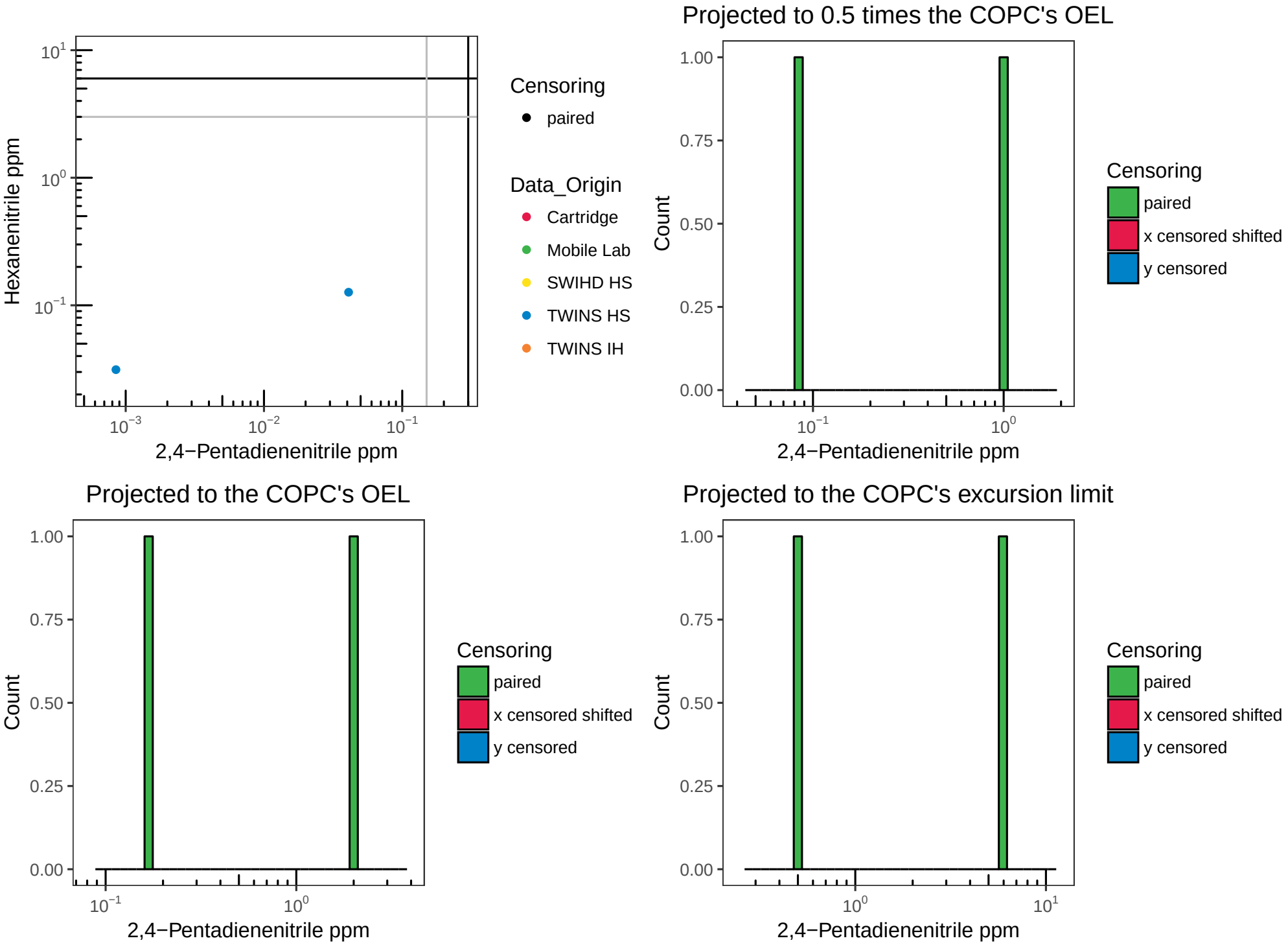


Figure C.2029: Hexanenitrile vs 2,4-Pentadienenitrile

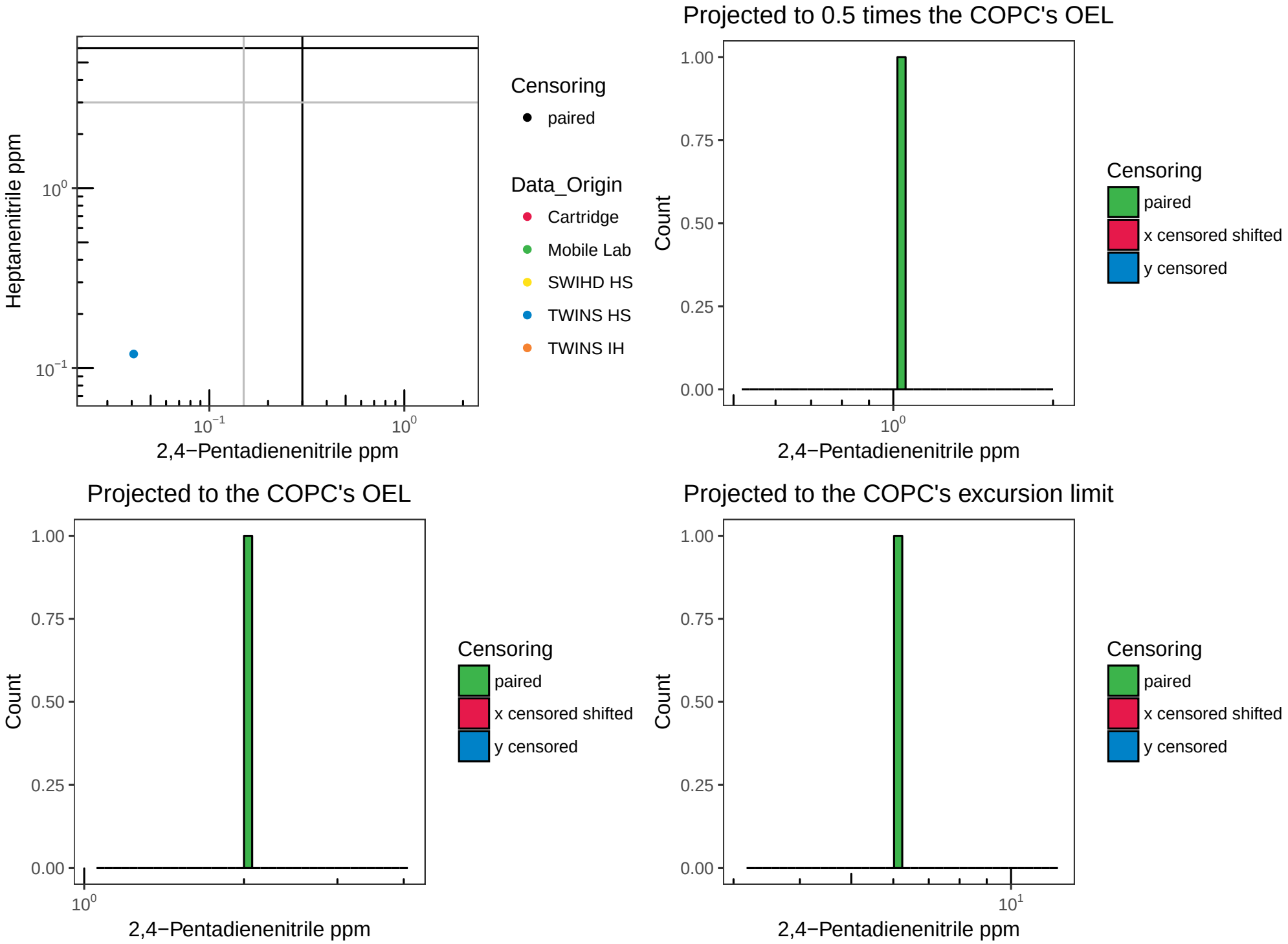


Figure C.2030: Heptanenitrile vs 2,4-Pentadienenitrile

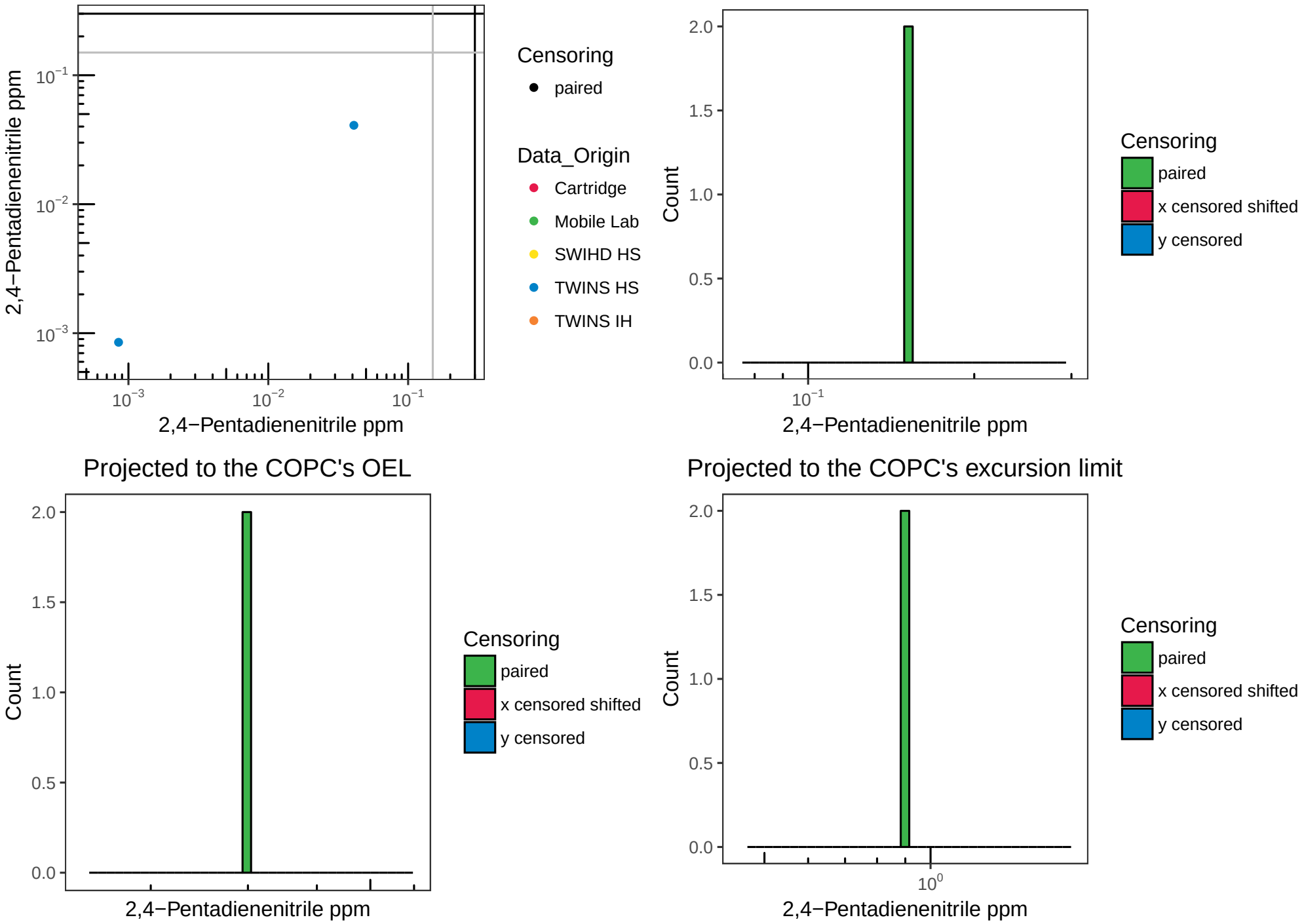


Figure C.2031: 2,4-Pentadienenitrile vs 2,4-Pentadienenitrile

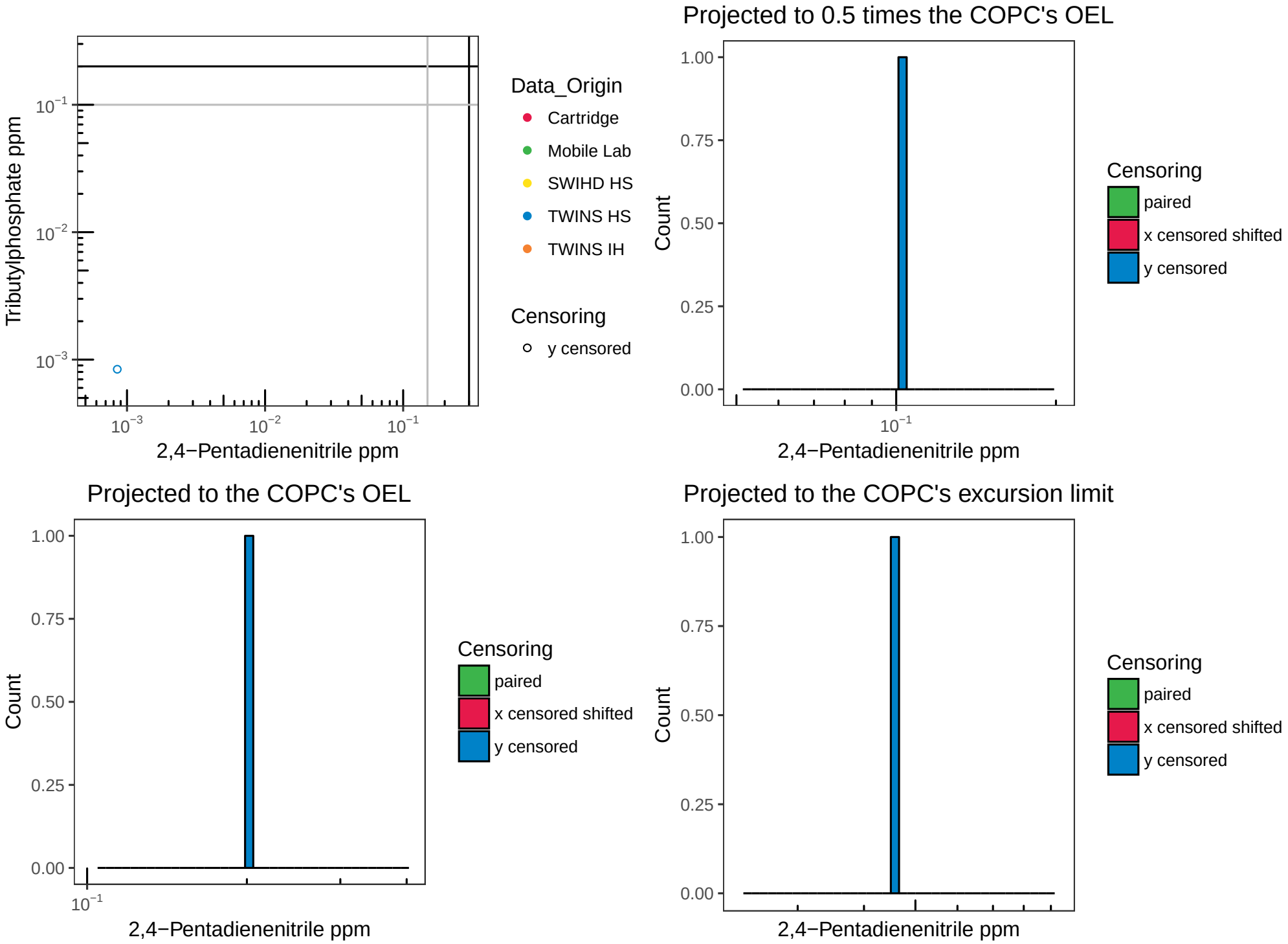


Figure C.2032: Tributylphosphate vs 2,4-Pentadienenitrile

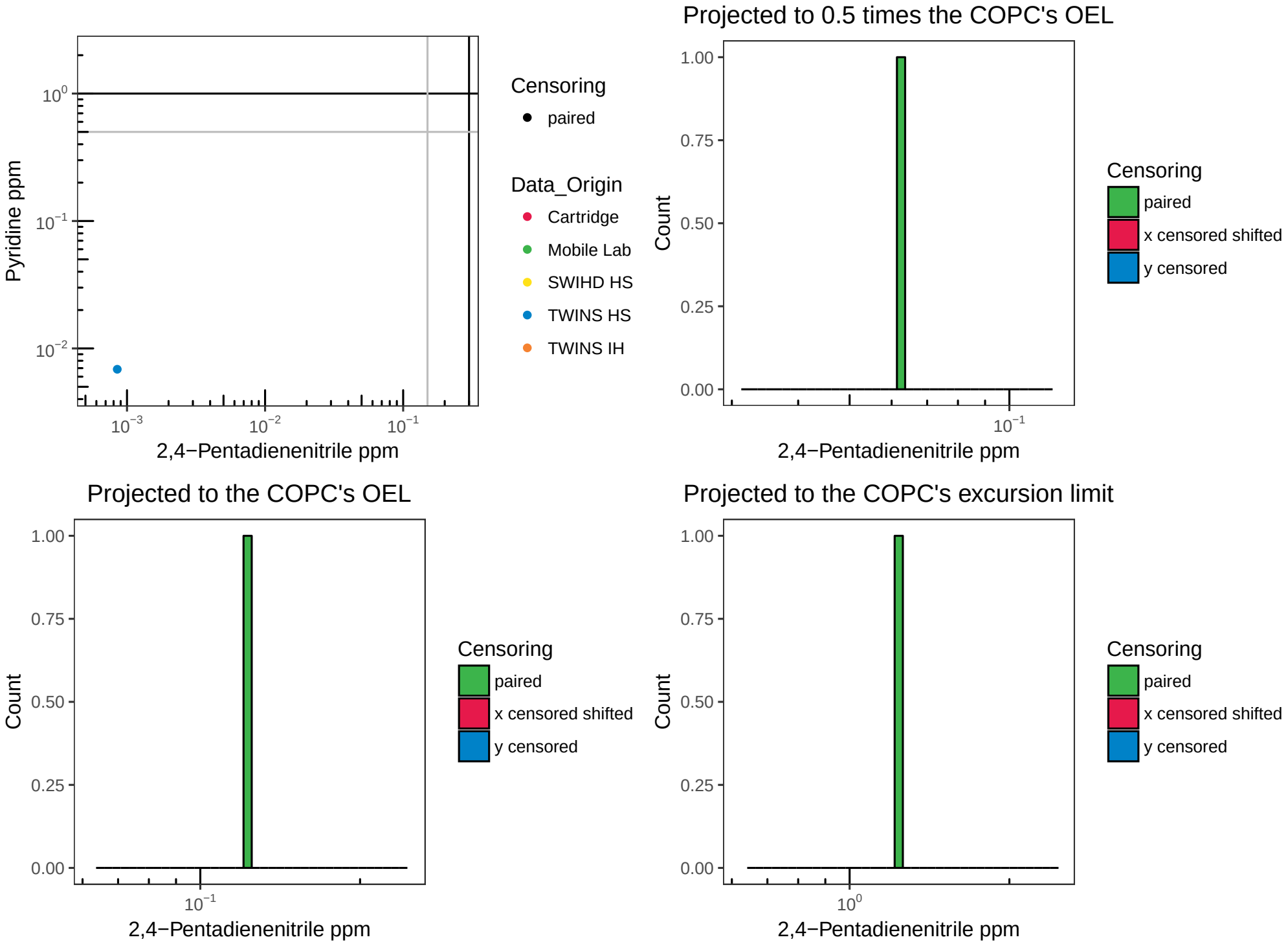


Figure C.2033: Pyridine vs 2,4-Pentadienenitrile

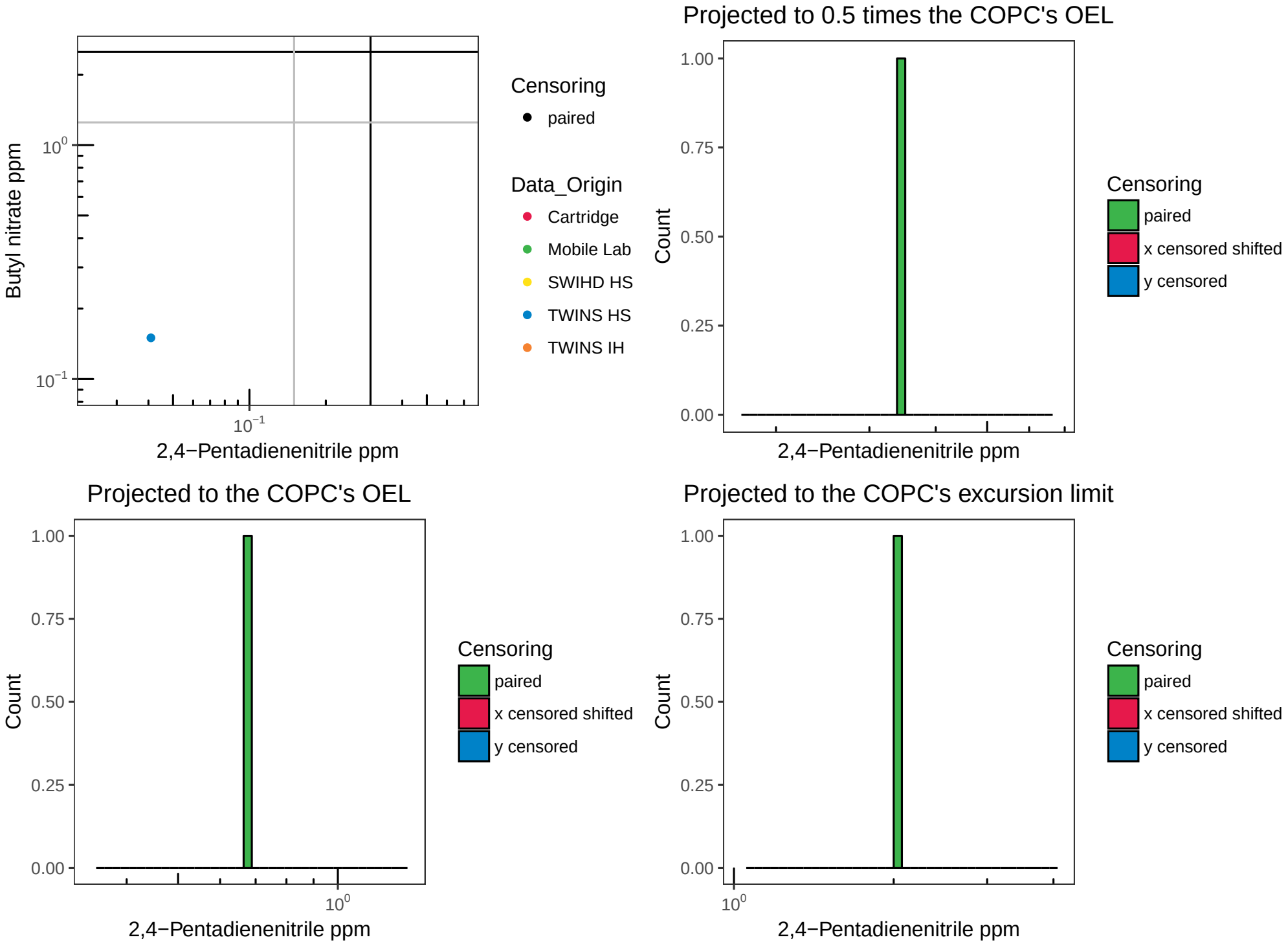


Figure C.2034: Butyl nitrate vs 2,4-Pentadienenitrile

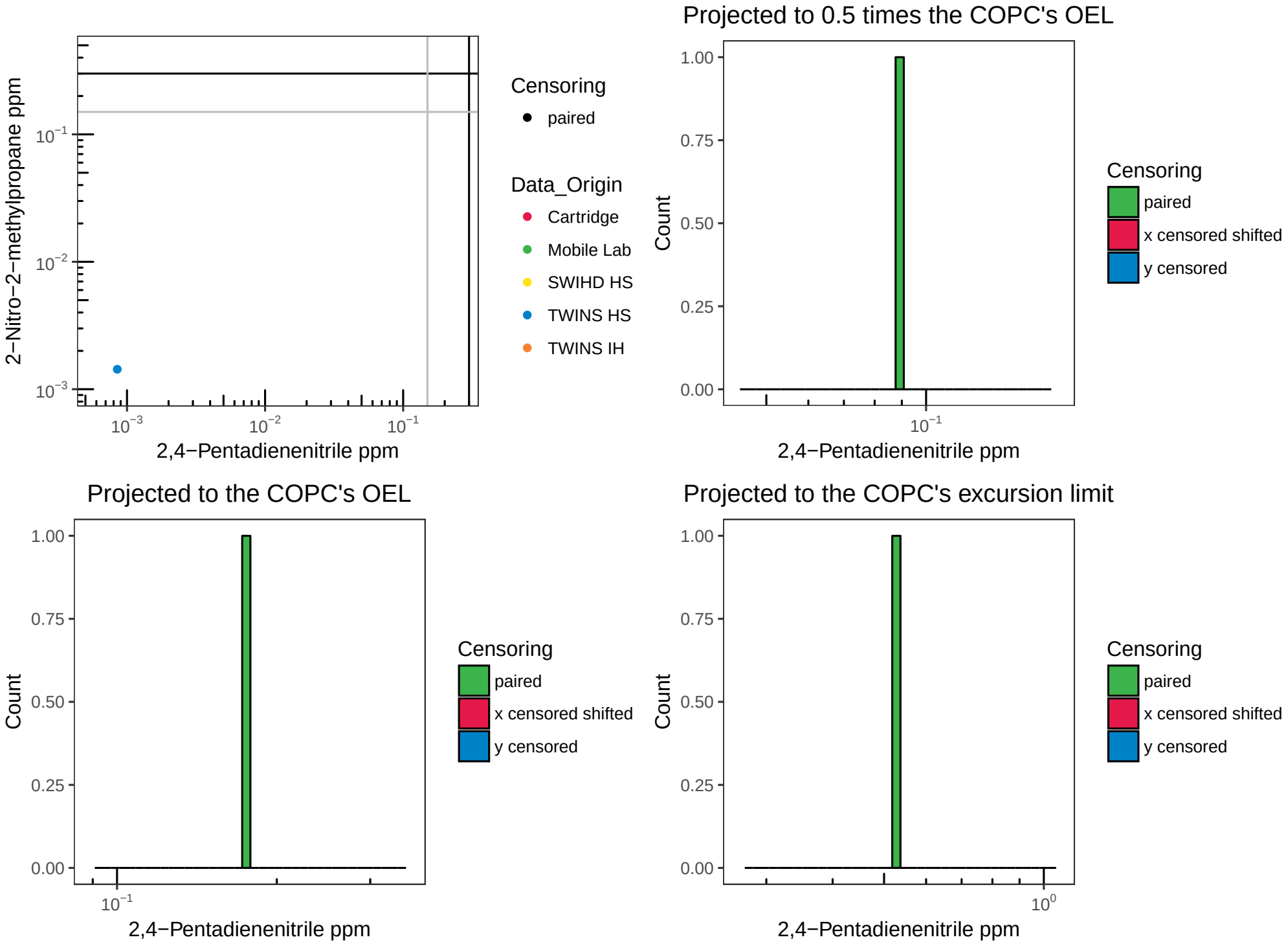


Figure C.2035: 2-Nitro-2-methylpropane vs 2,4-Pentadienenitrile

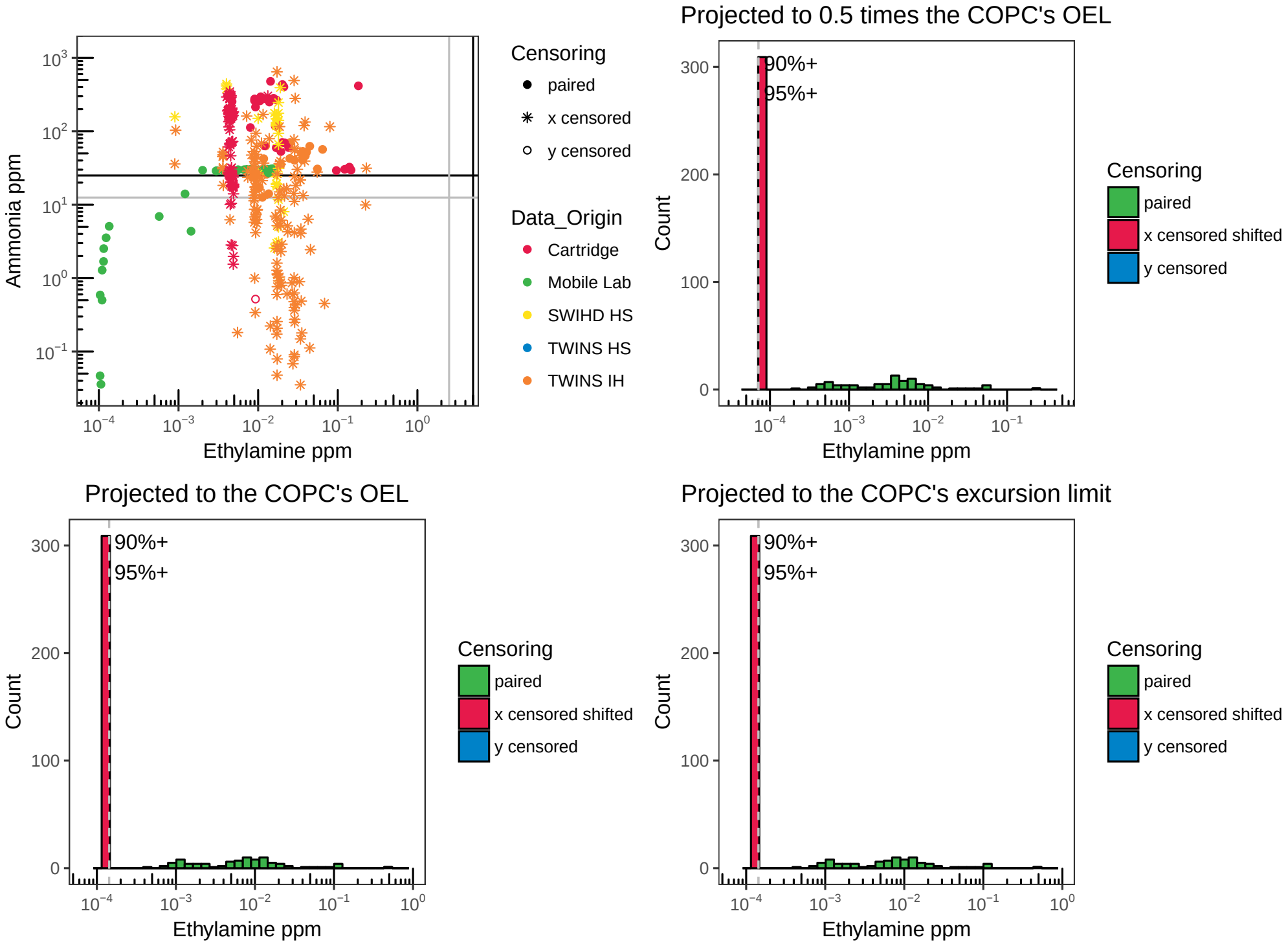


Figure C.2036: Ammonia vs Ethylamine

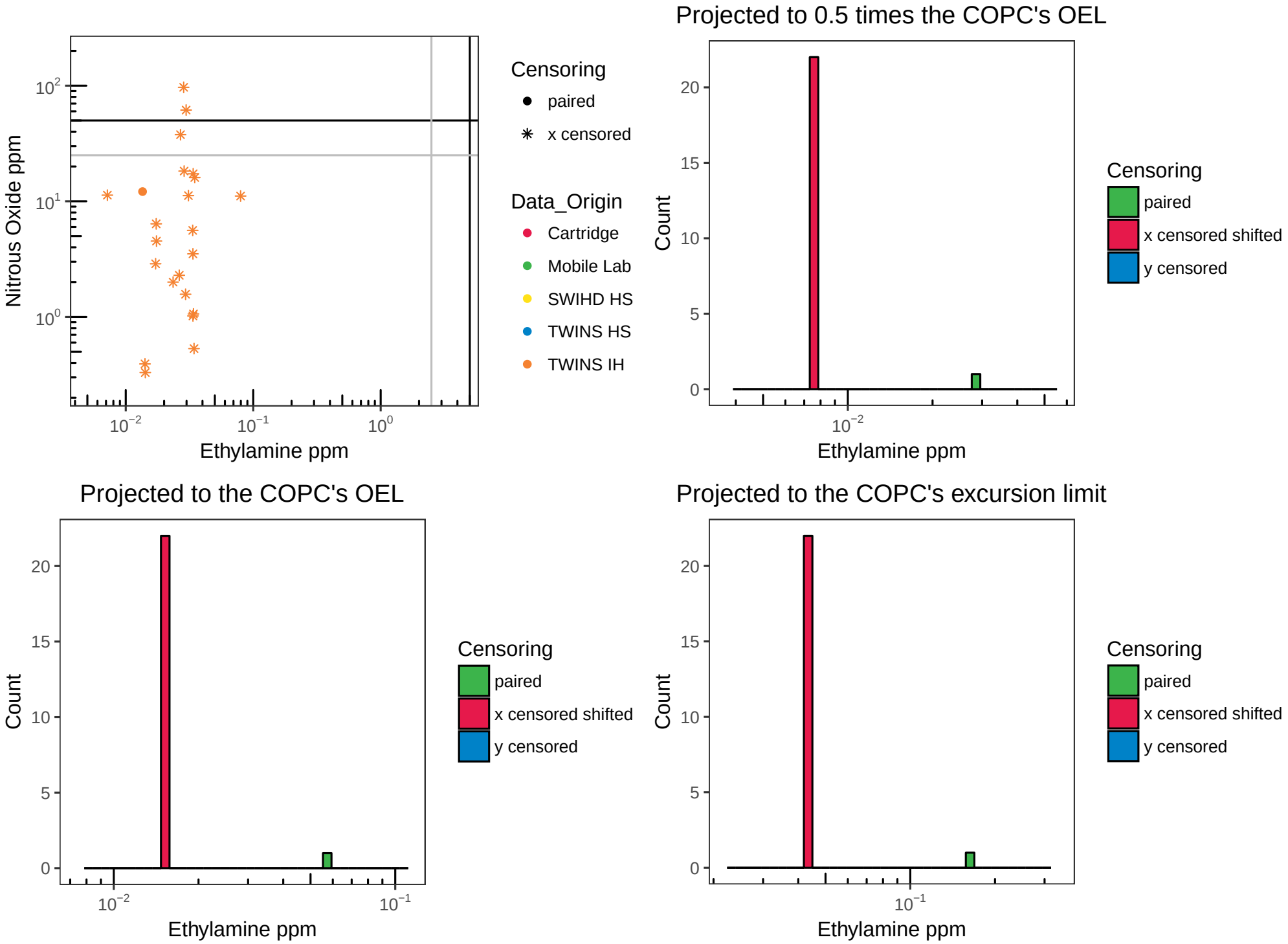


Figure C.2037: Nitrous Oxide vs Ethylamine

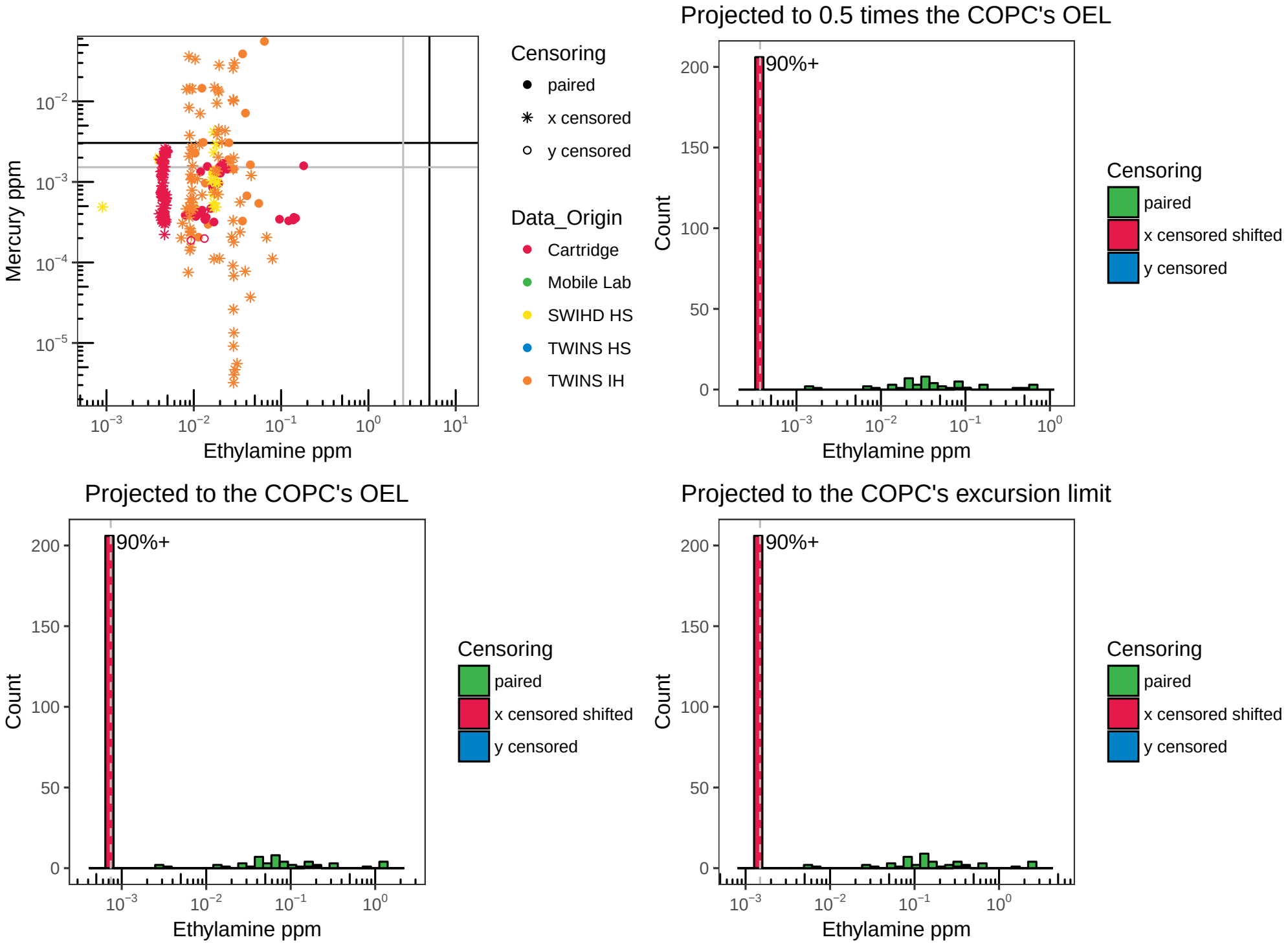


Figure C.2038: Mercury vs Ethylamine

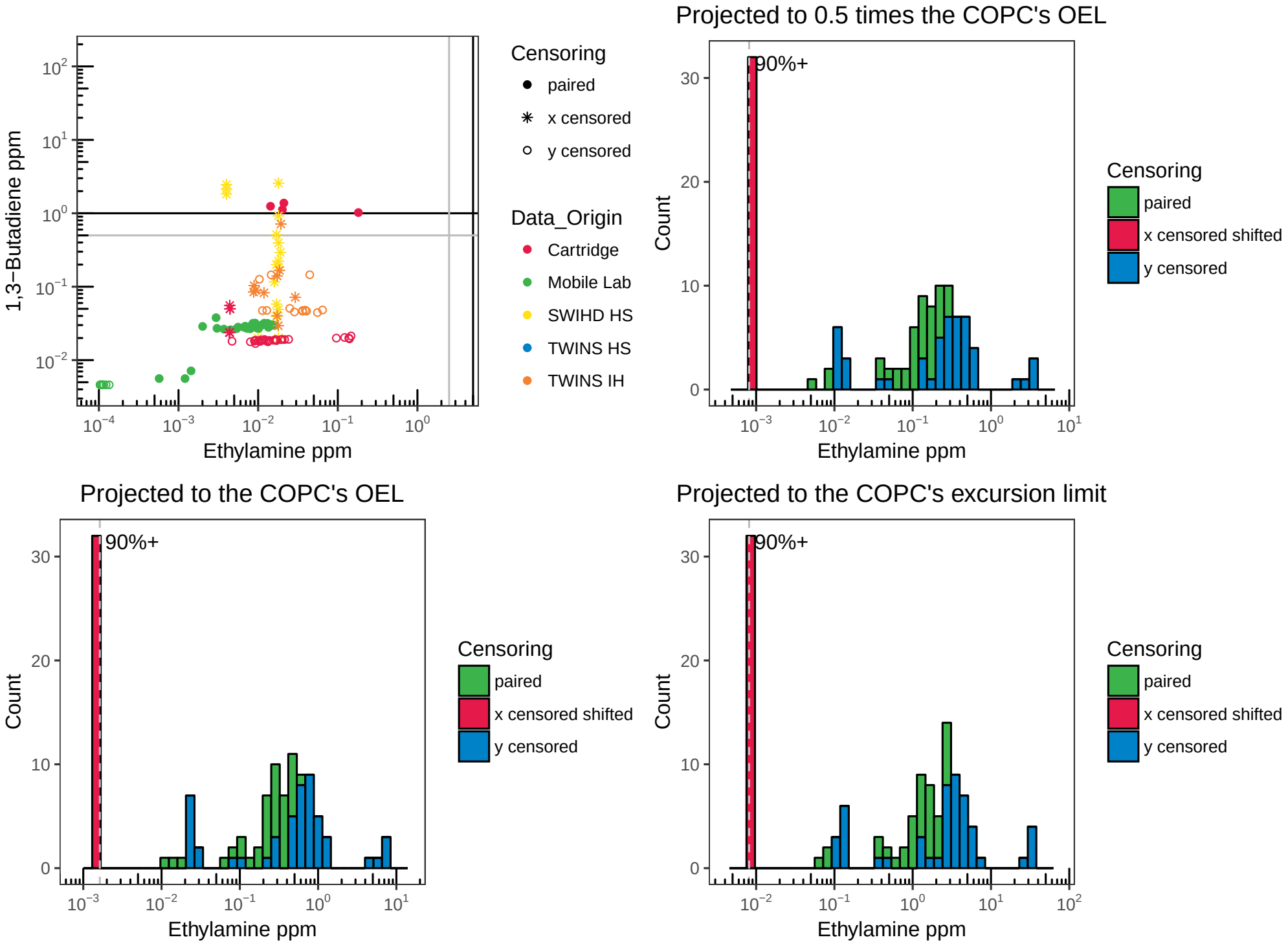


Figure C.2039: 1,3-Butadiene vs Ethylamine

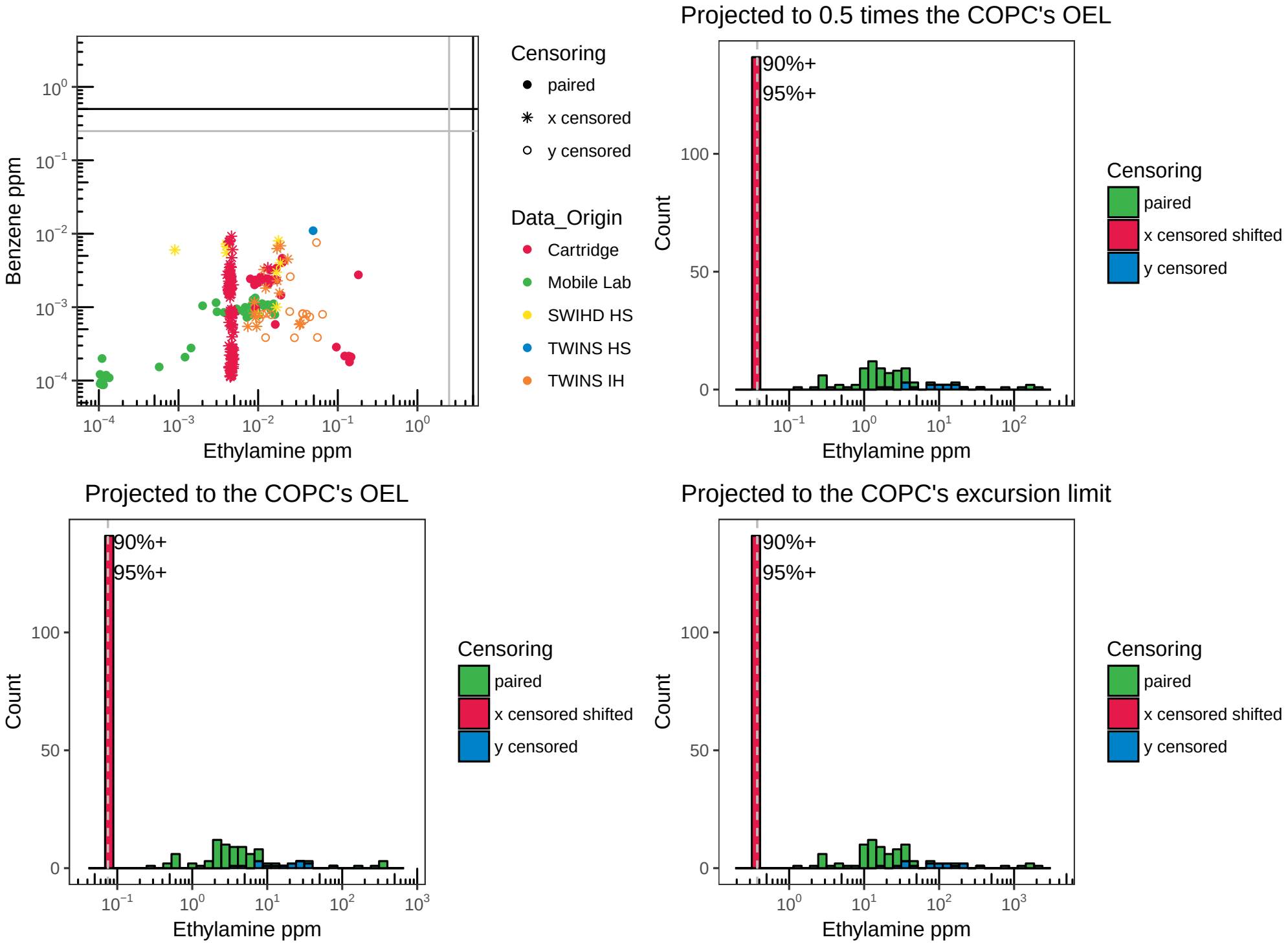


Figure C.2040: Benzene vs Ethylamine

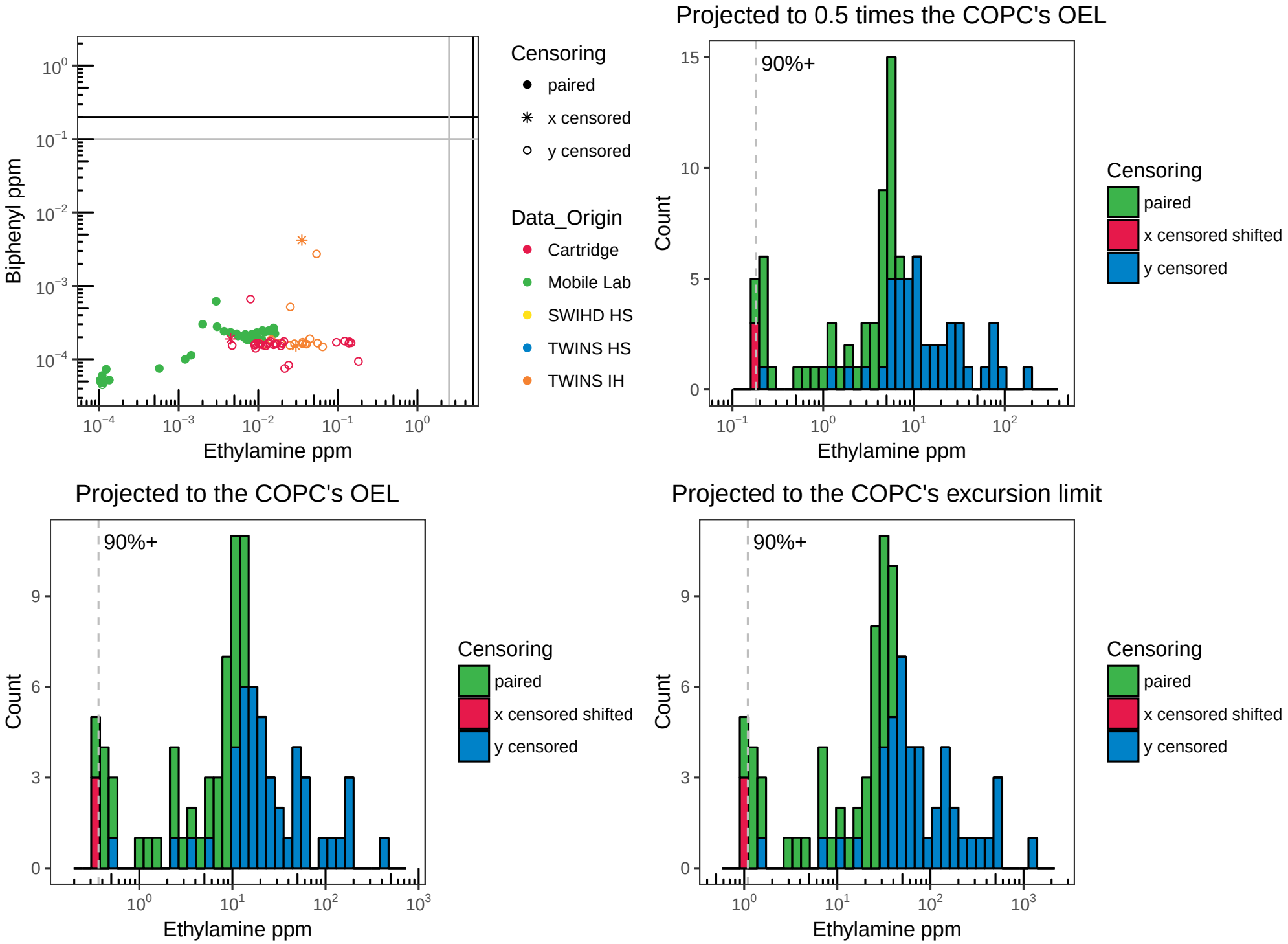


Figure C.2041: Biphenyl vs Ethylamine

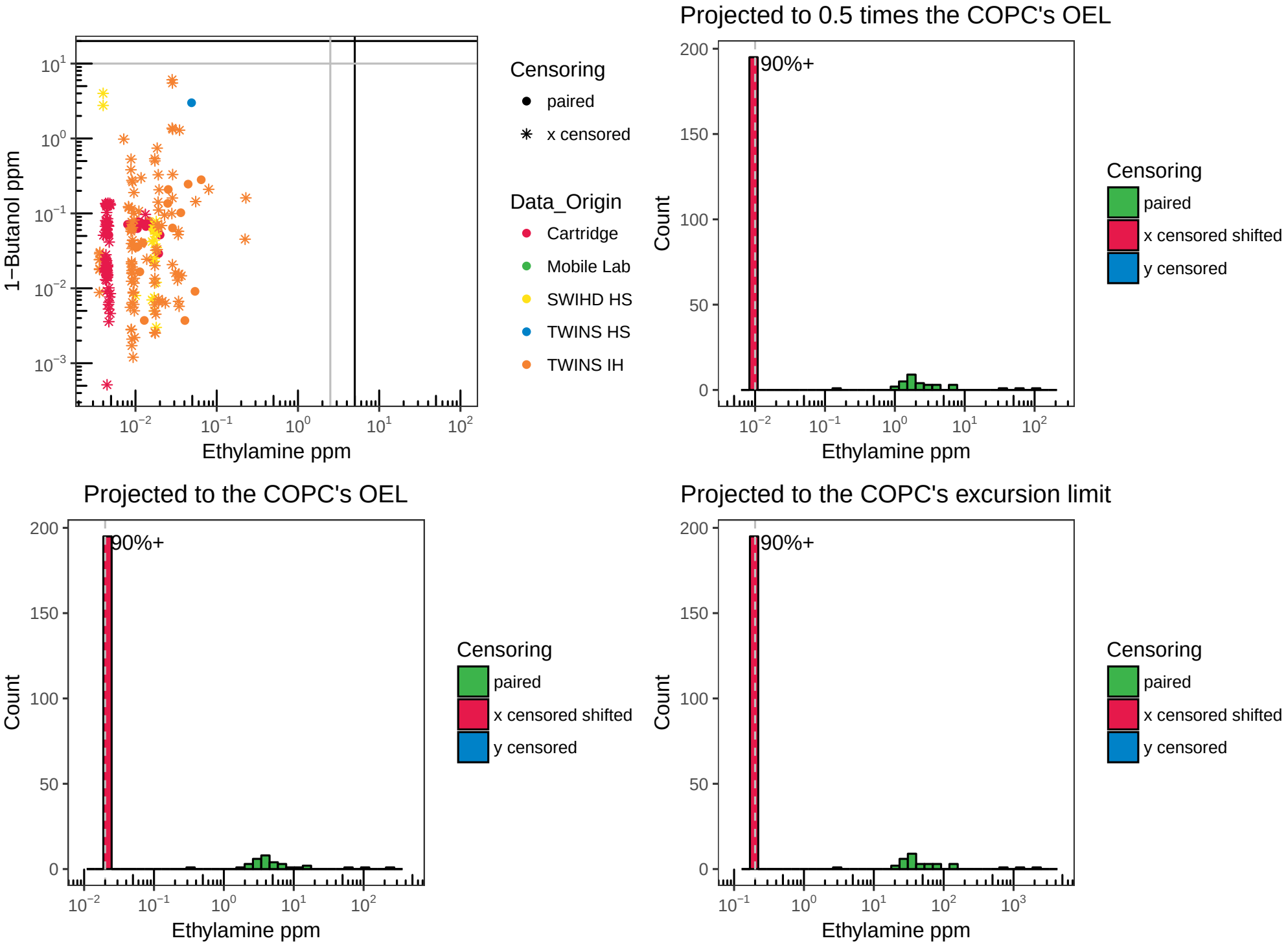


Figure C.2042: 1-Butanol vs Ethylamine

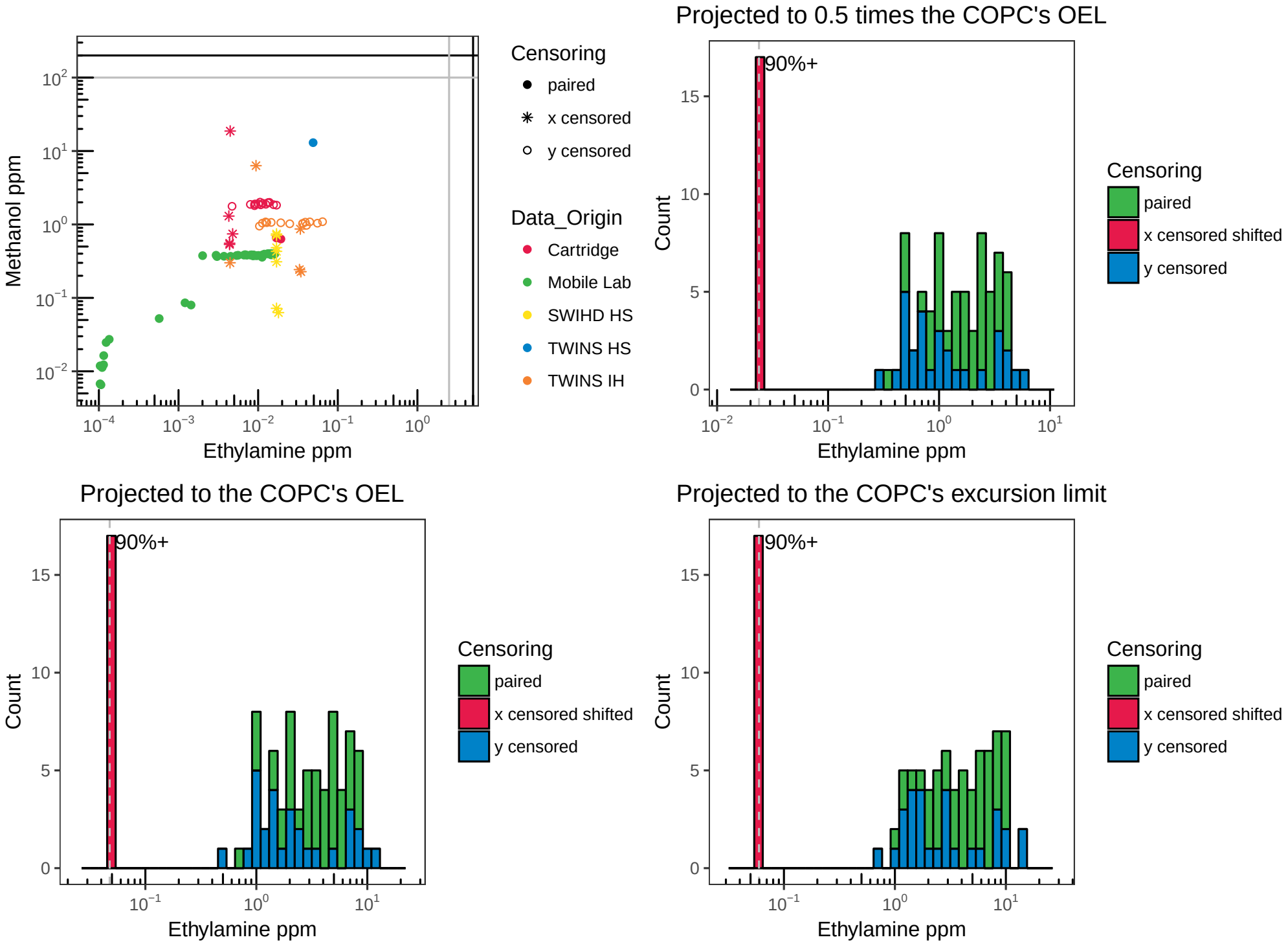


Figure C.2043: Methanol vs Ethylamine

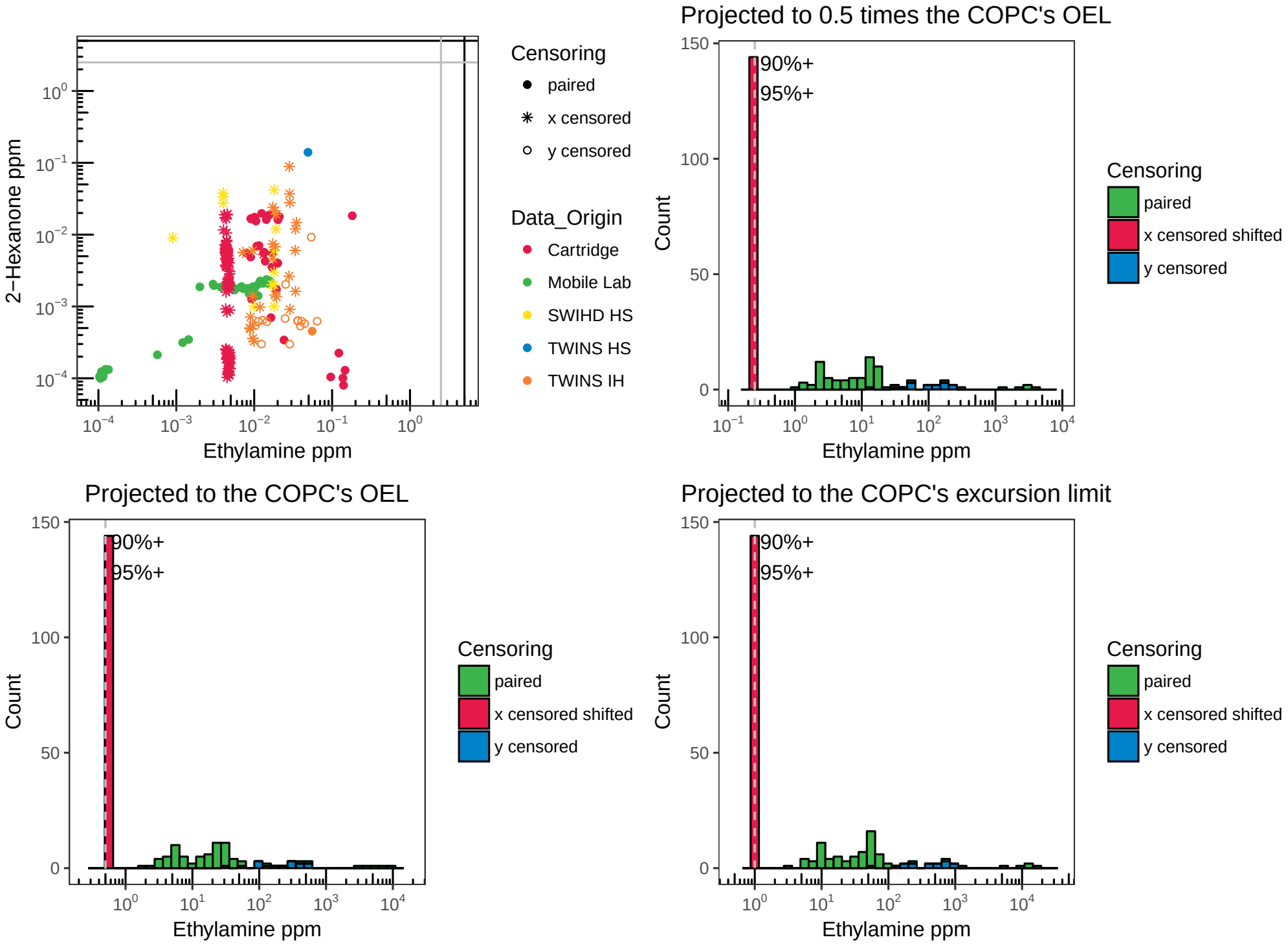


Figure C.2044: 2-Hexanone vs Ethylamine

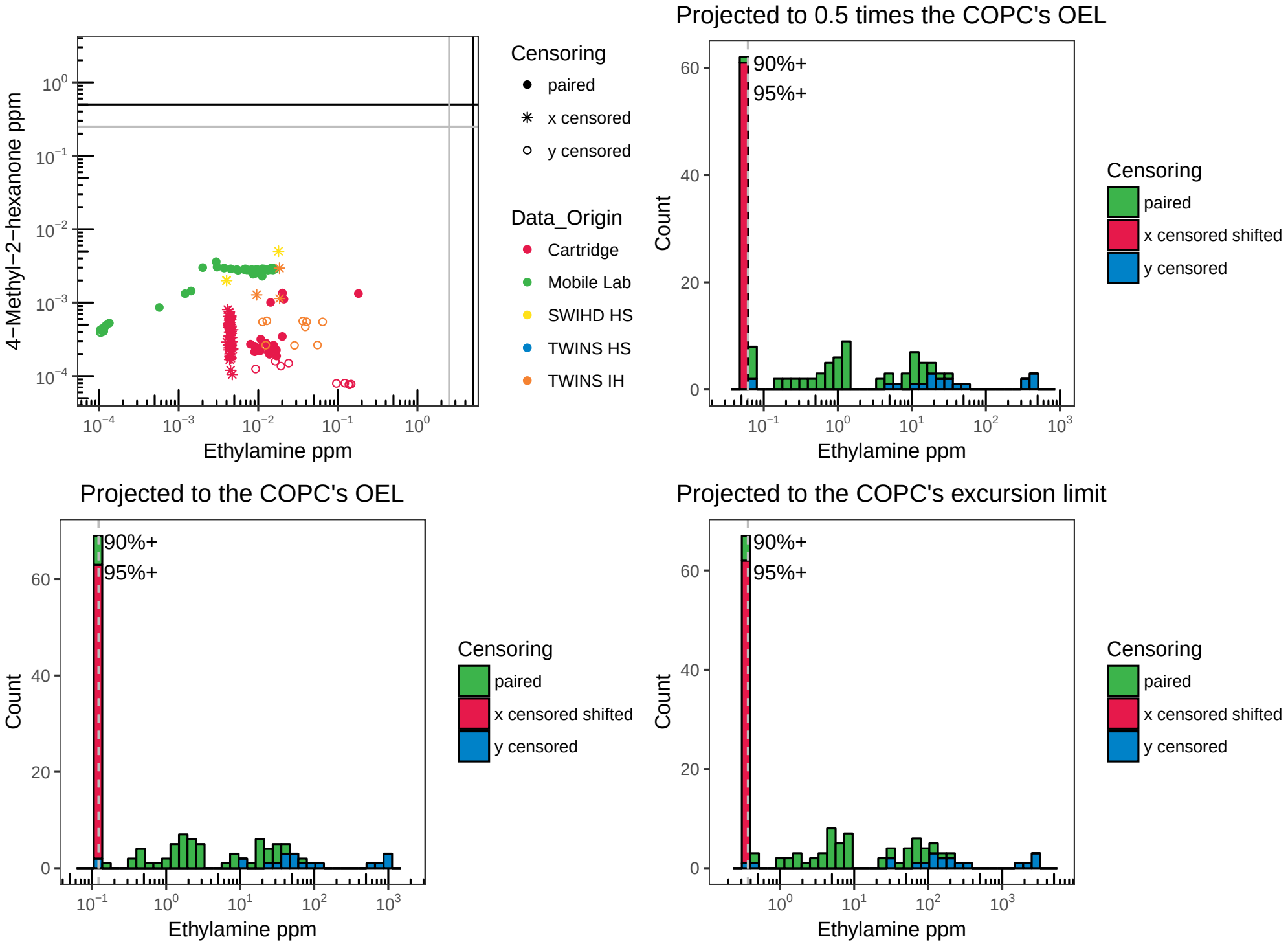


Figure C.2045: 4-Methyl-2-hexanone vs Ethylamine

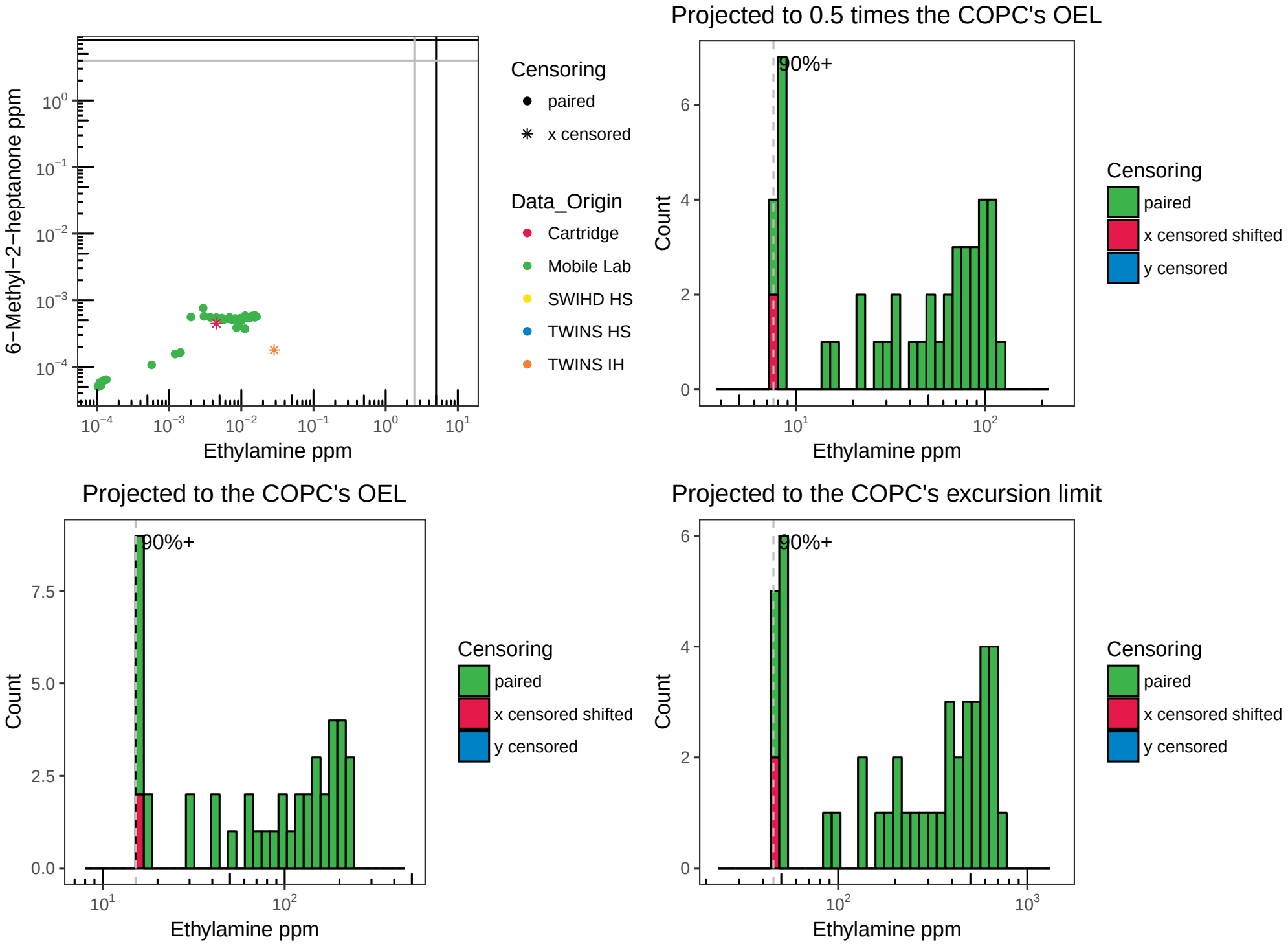


Figure C.2046: 6-Methyl-2-heptanone vs Ethylamine

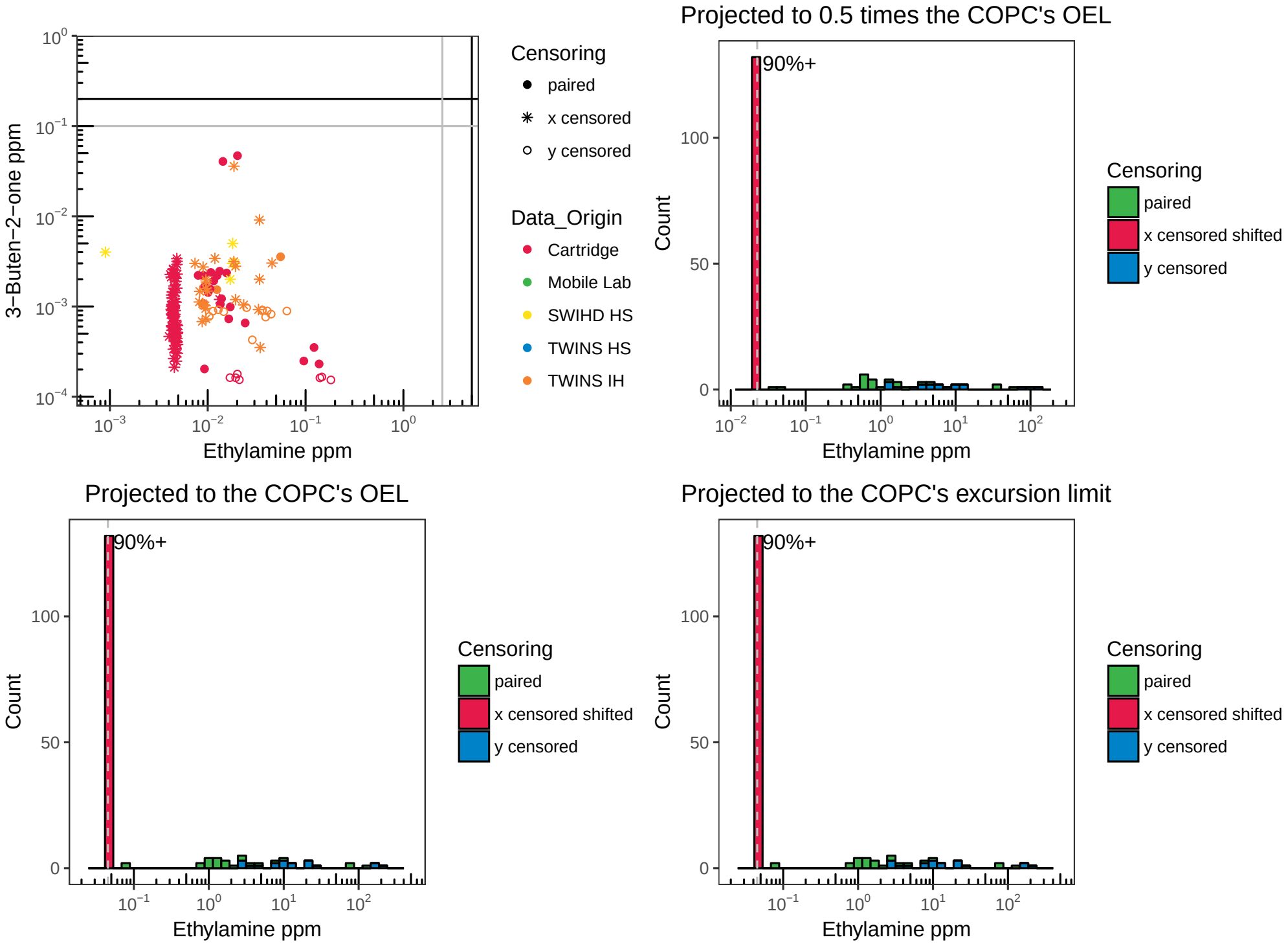


Figure C.2047: 3-Buten-2-one vs Ethylamine

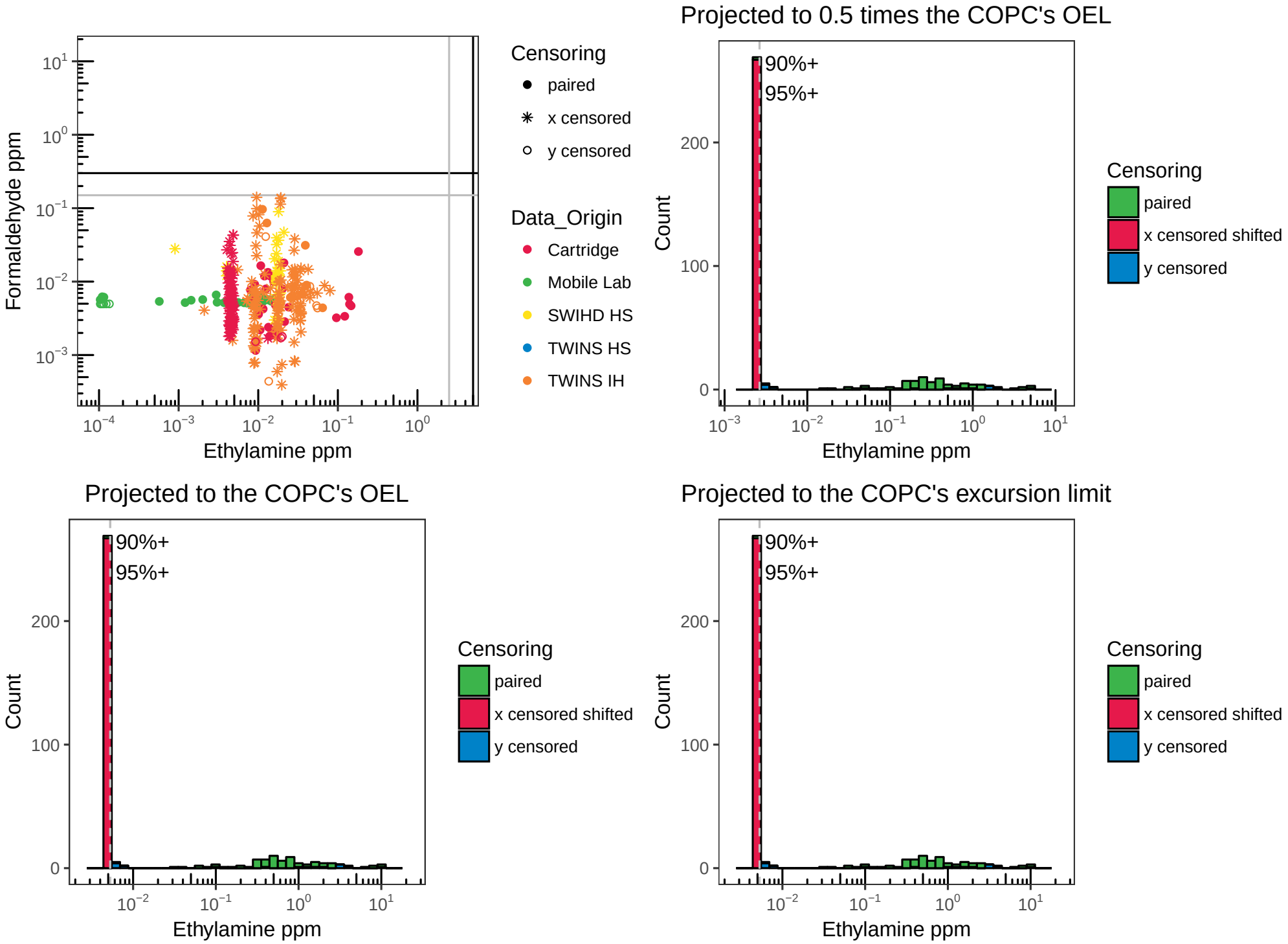


Figure C.2048: Formaldehyde vs Ethylamine

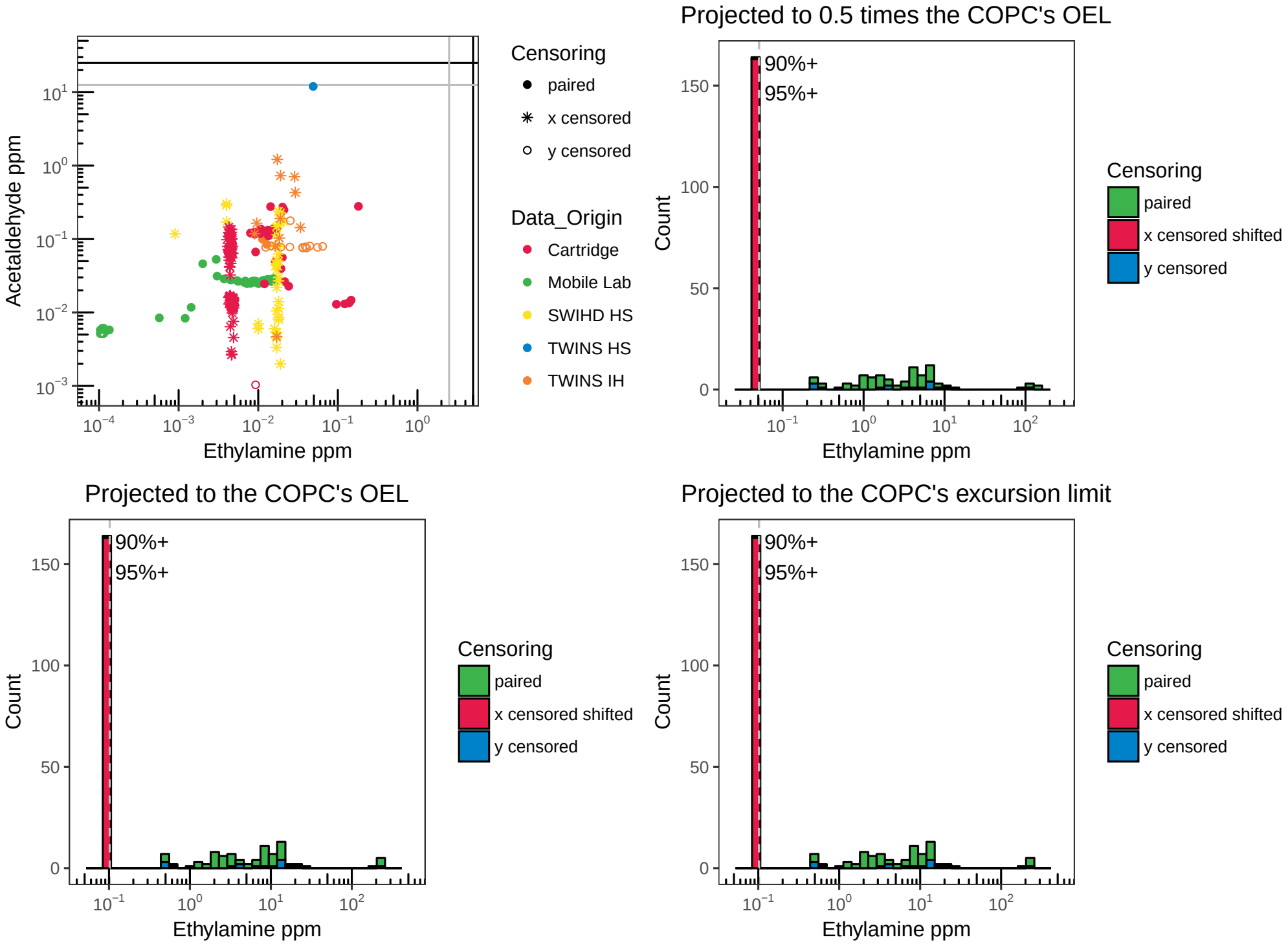


Figure C.2049: Acetaldehyde vs Ethylamine

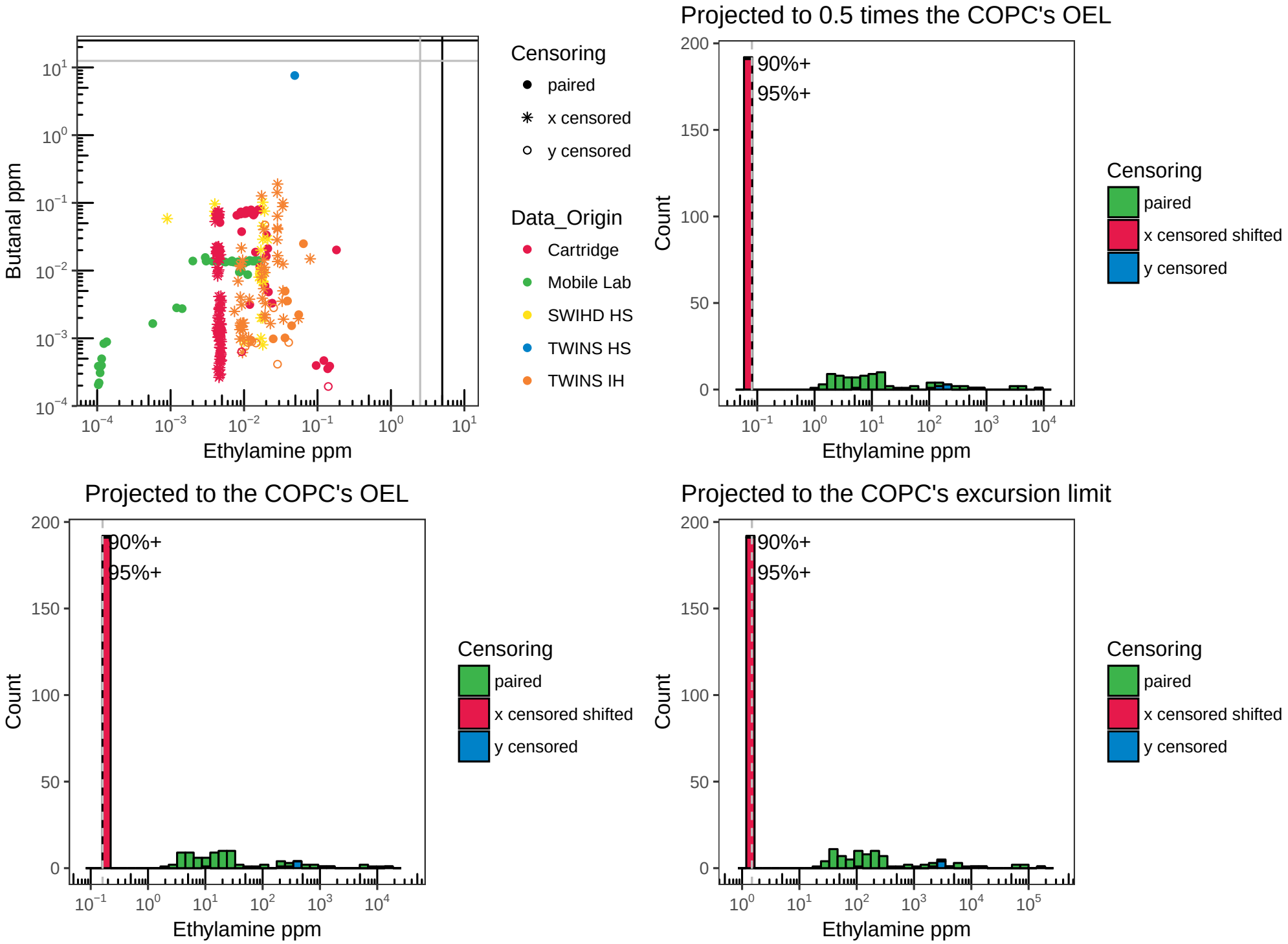


Figure C.2050: Butanal vs Ethylamine

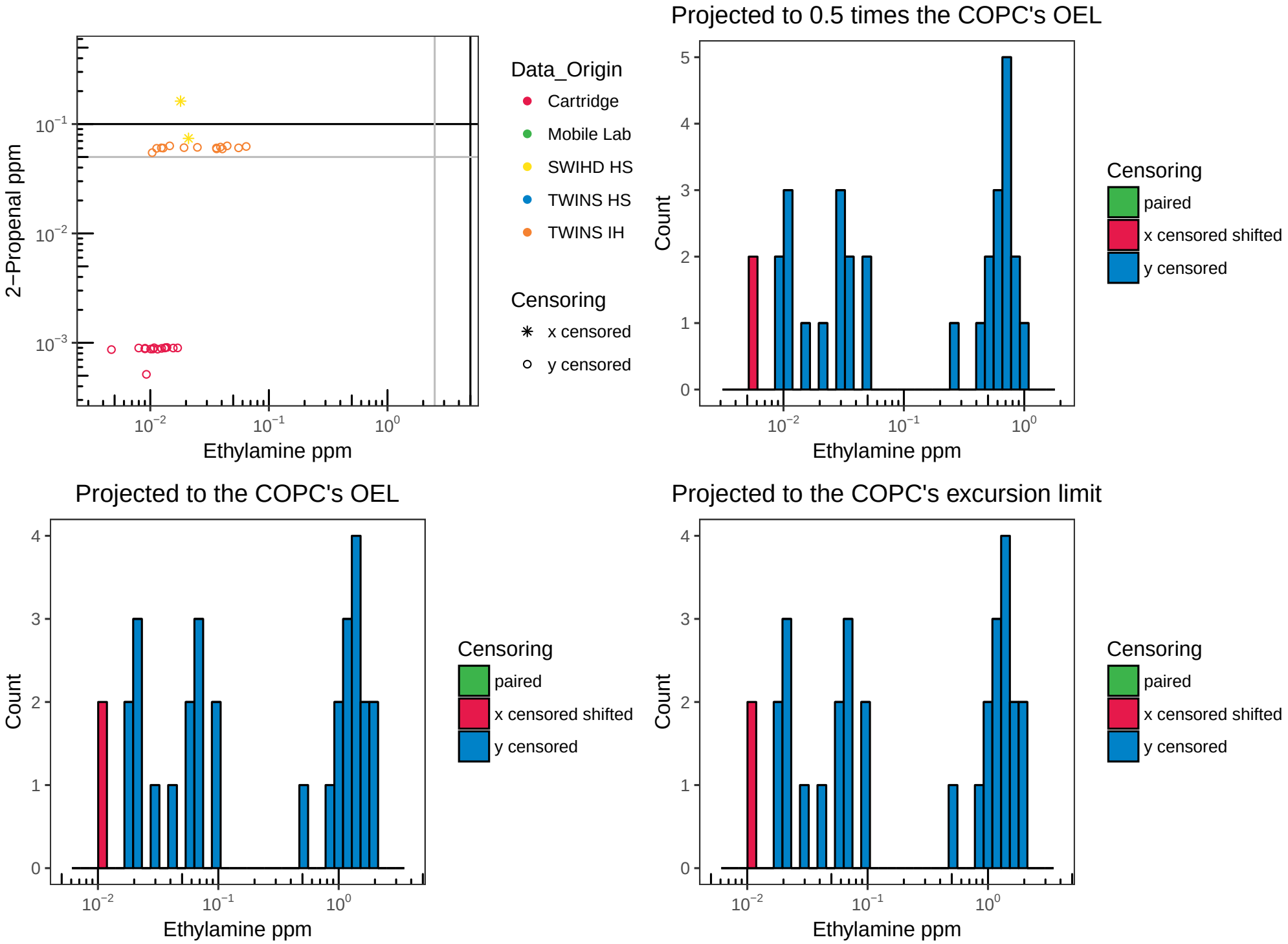


Figure C.2051: 2-Propenal vs Ethylamine

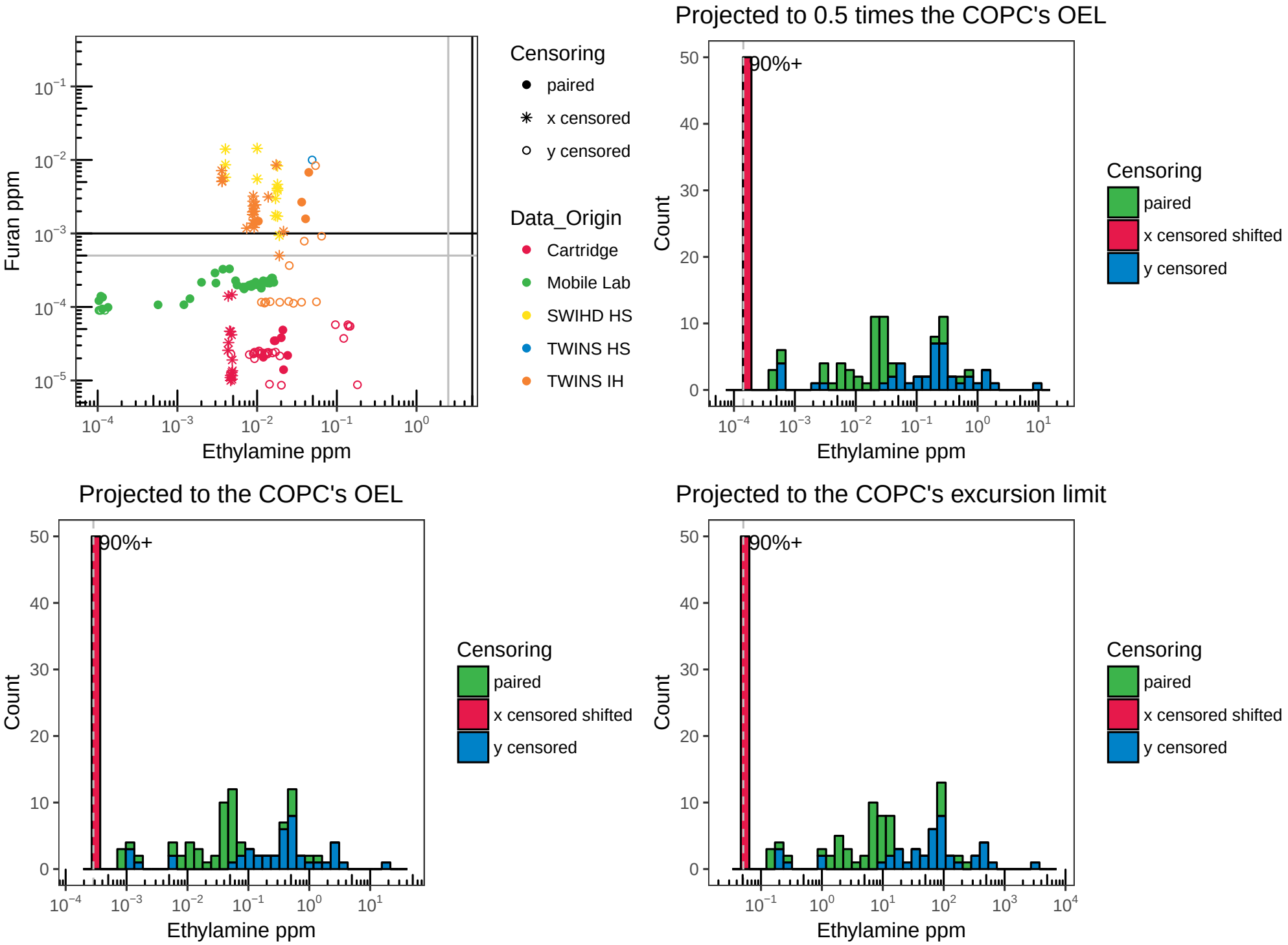


Figure C.2052: Furan vs Ethylamine

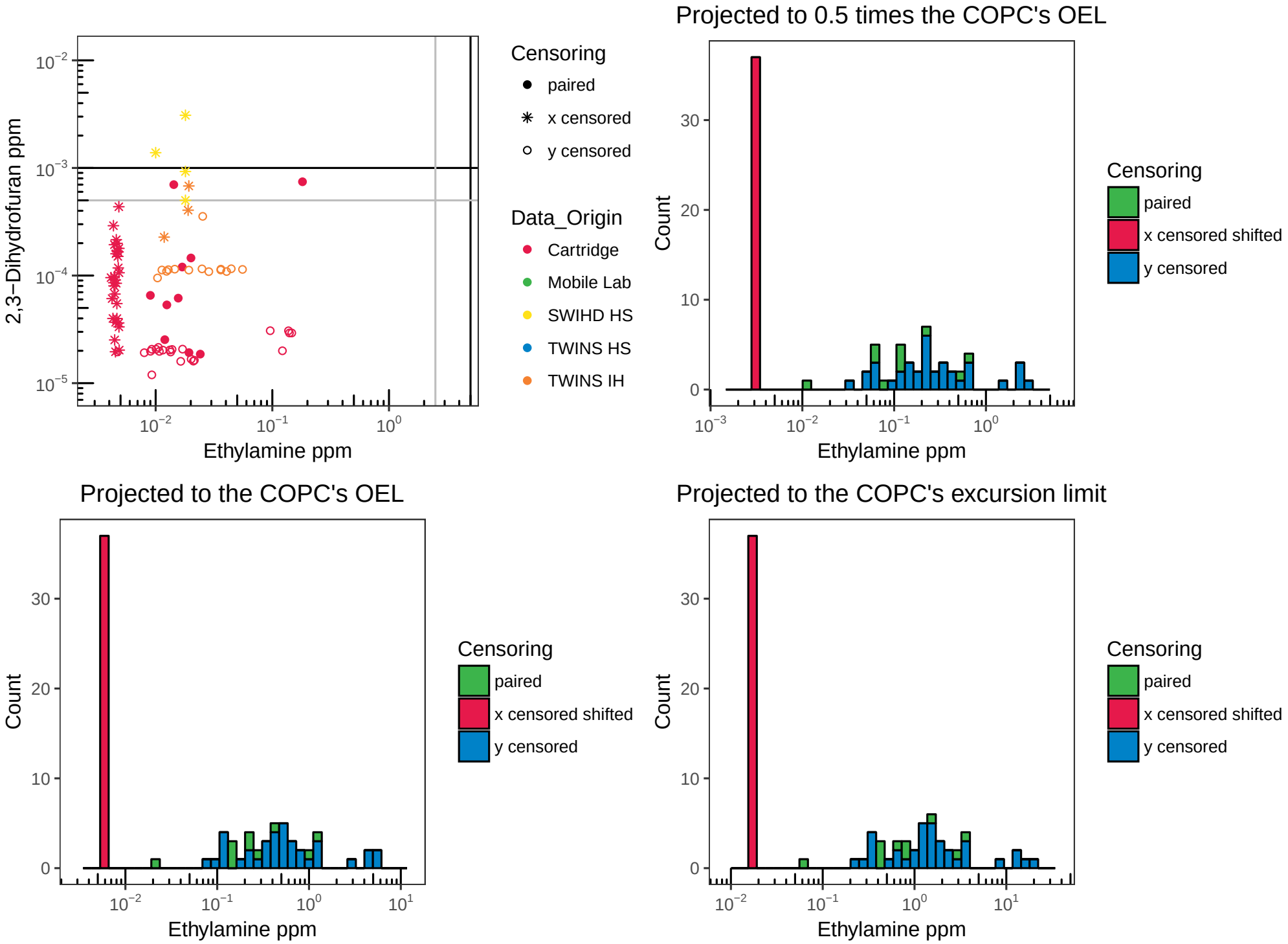


Figure C.2053: 2,3-Dihydrofuran vs Ethylamine

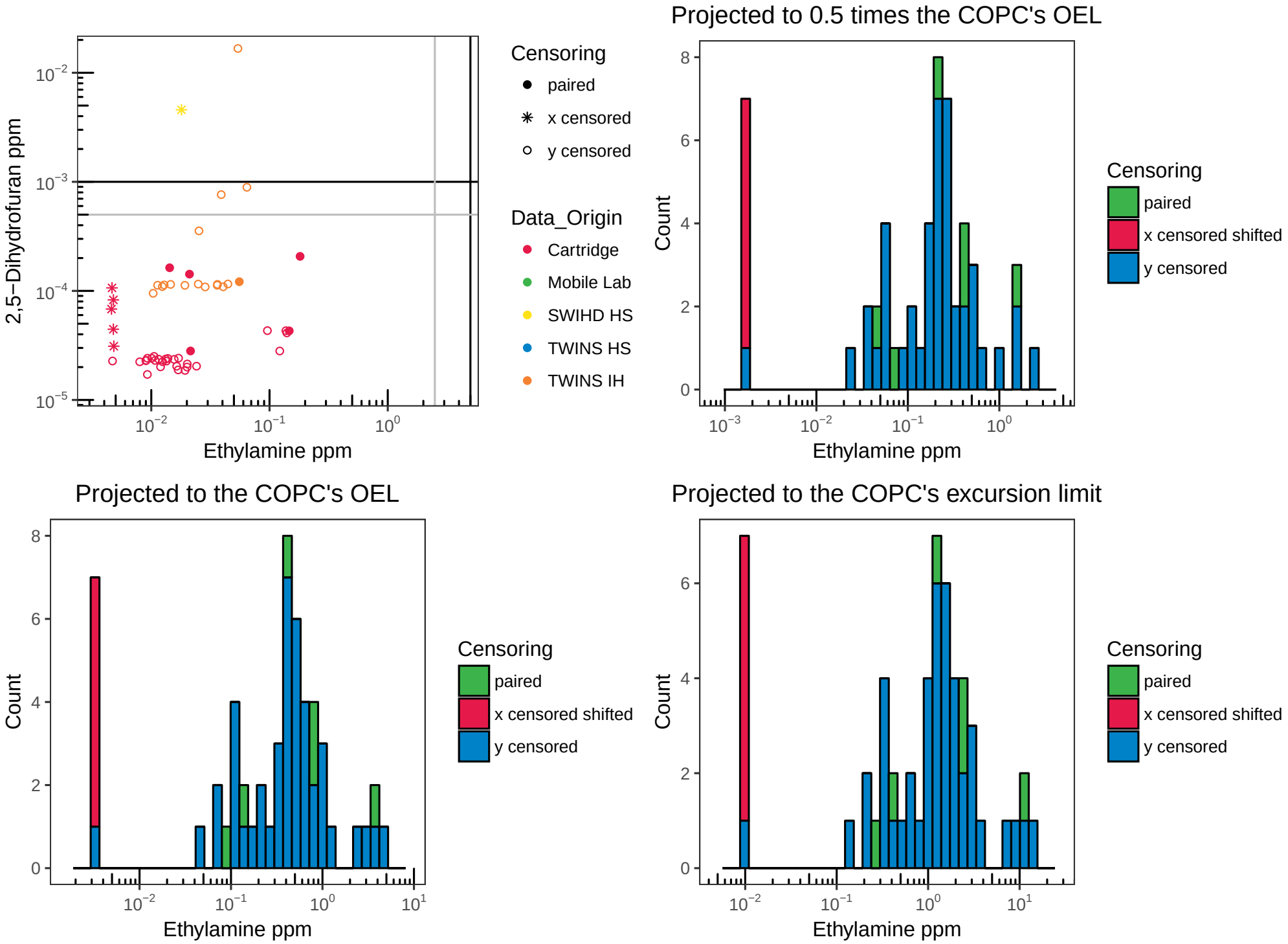


Figure C.2054: 2,5-Dihydrofuran vs Ethylamine

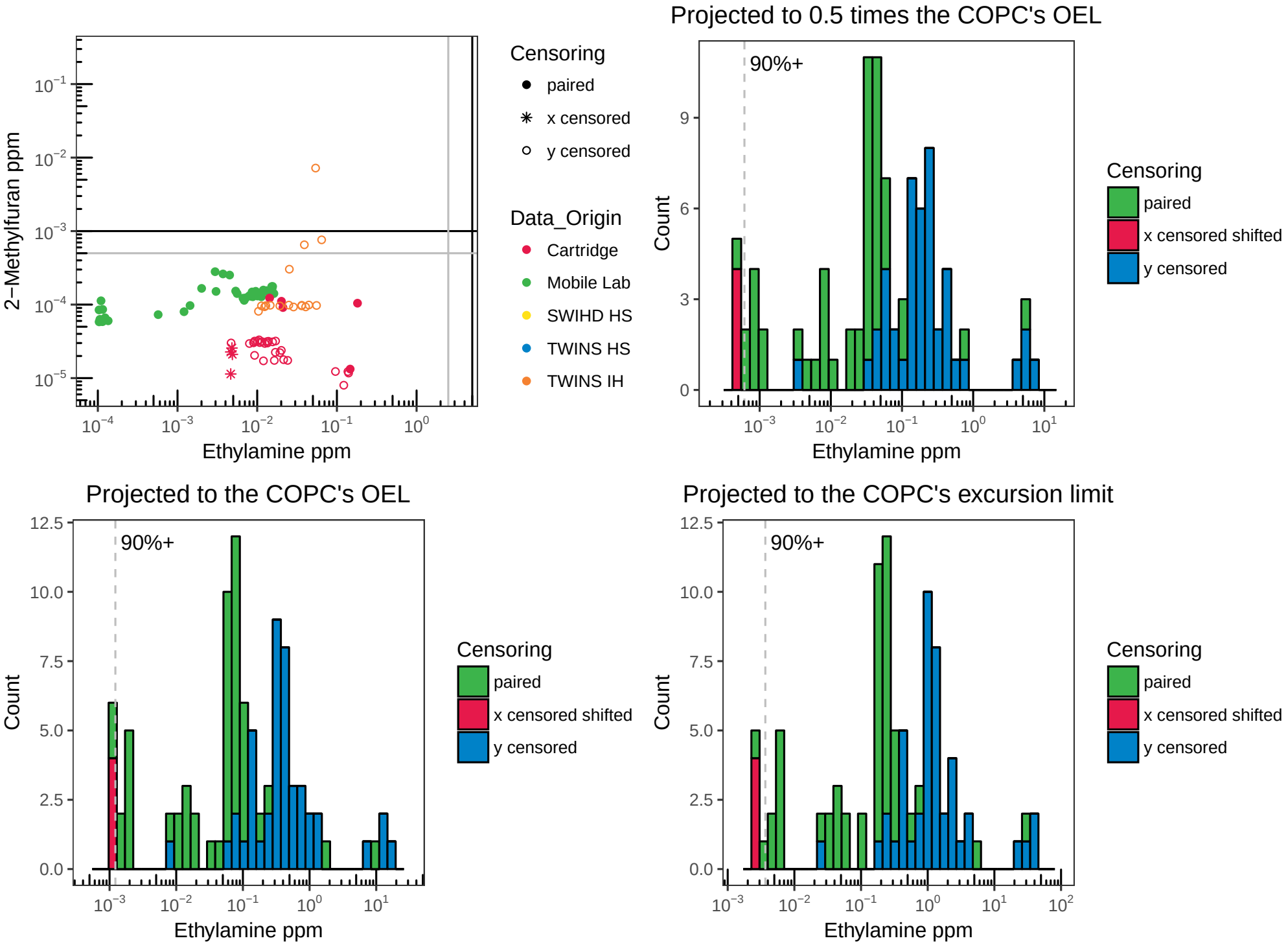


Figure C.2055: 2-Methylfuran vs Ethylamine

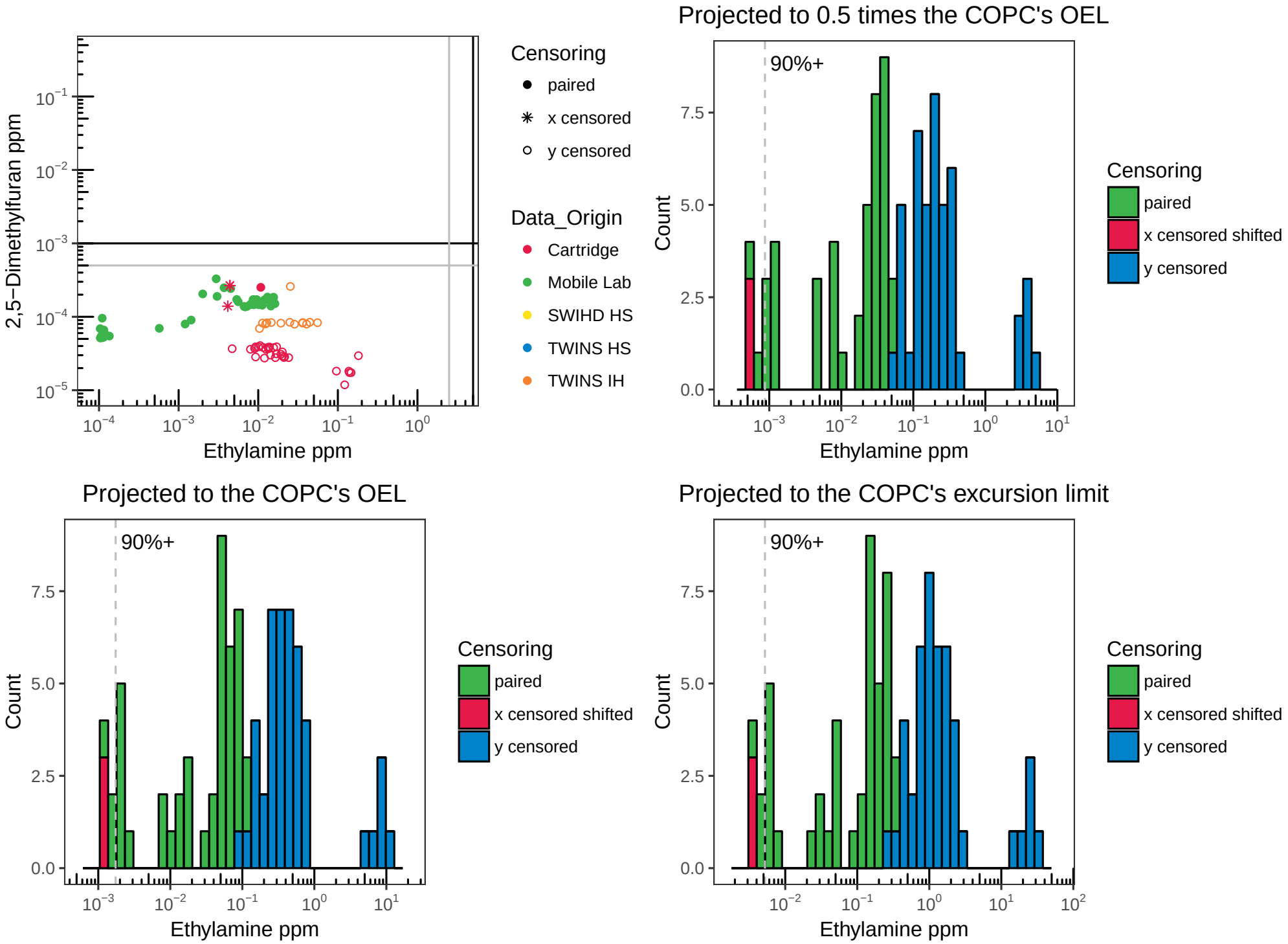


Figure C.2056: 2,5-Dimethylfuran vs Ethylamine

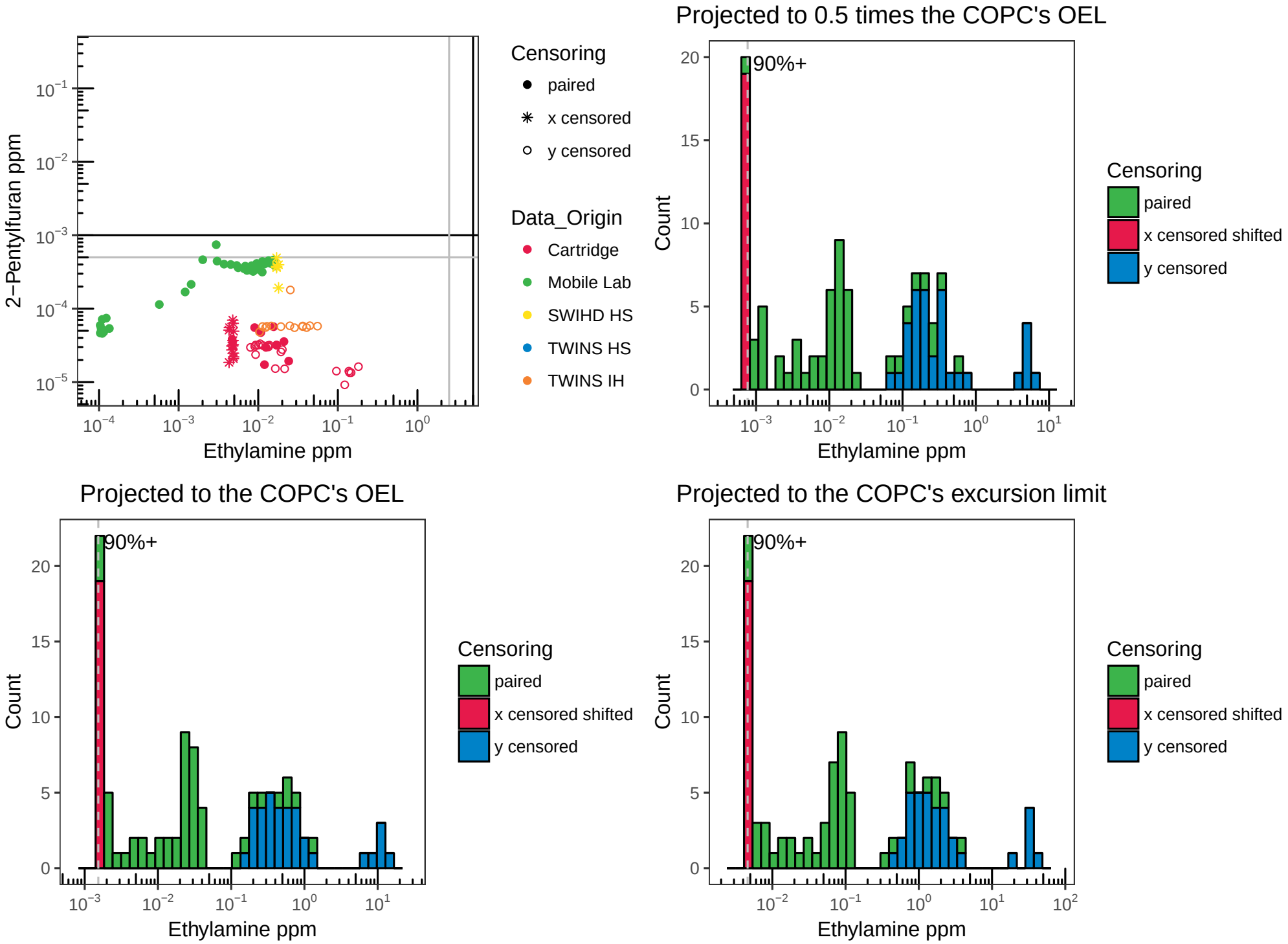


Figure C.2057: 2-Pentylfuran vs Ethylamine

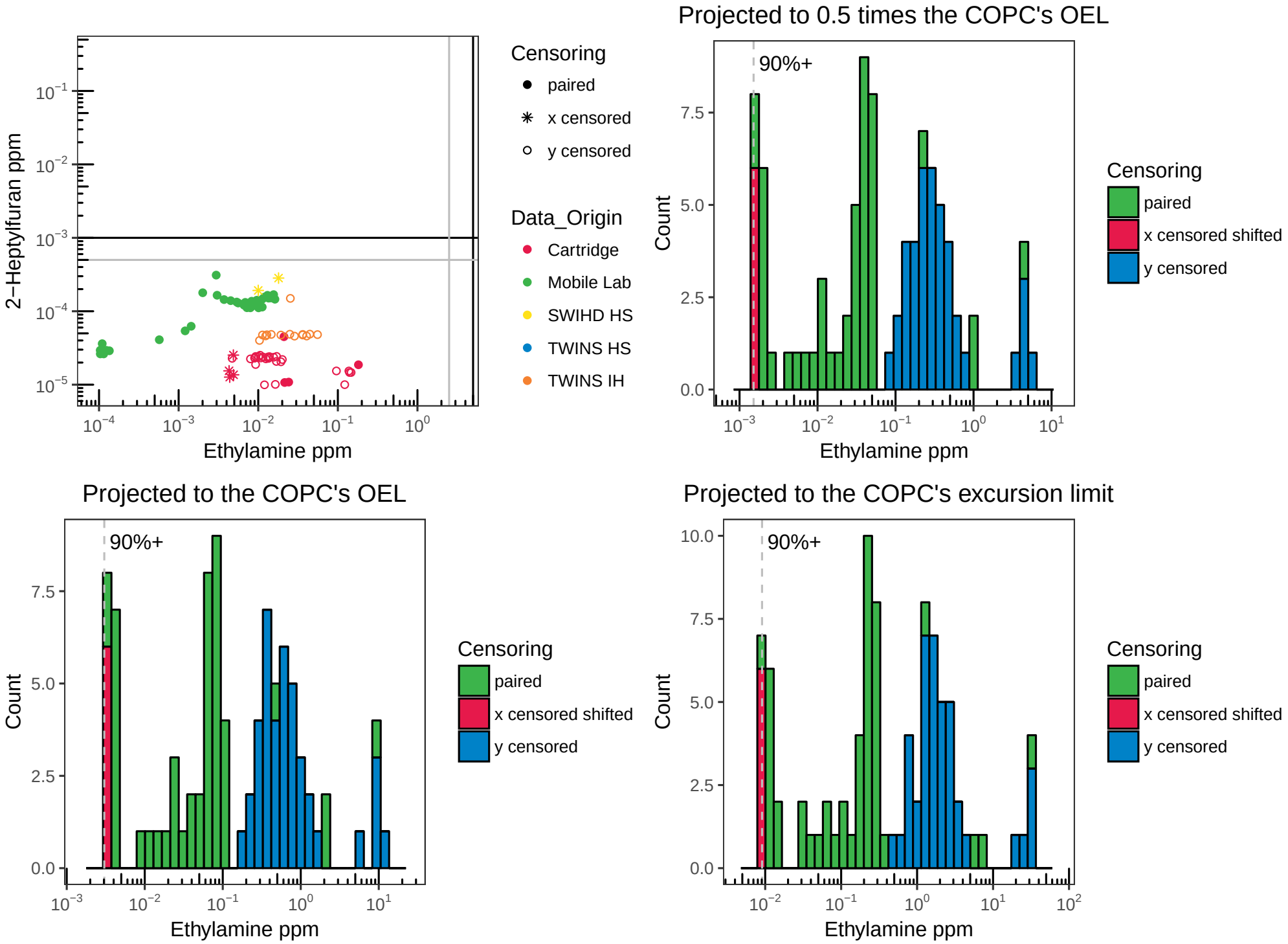


Figure C.2058: 2-Heptylfuran vs Ethylamine

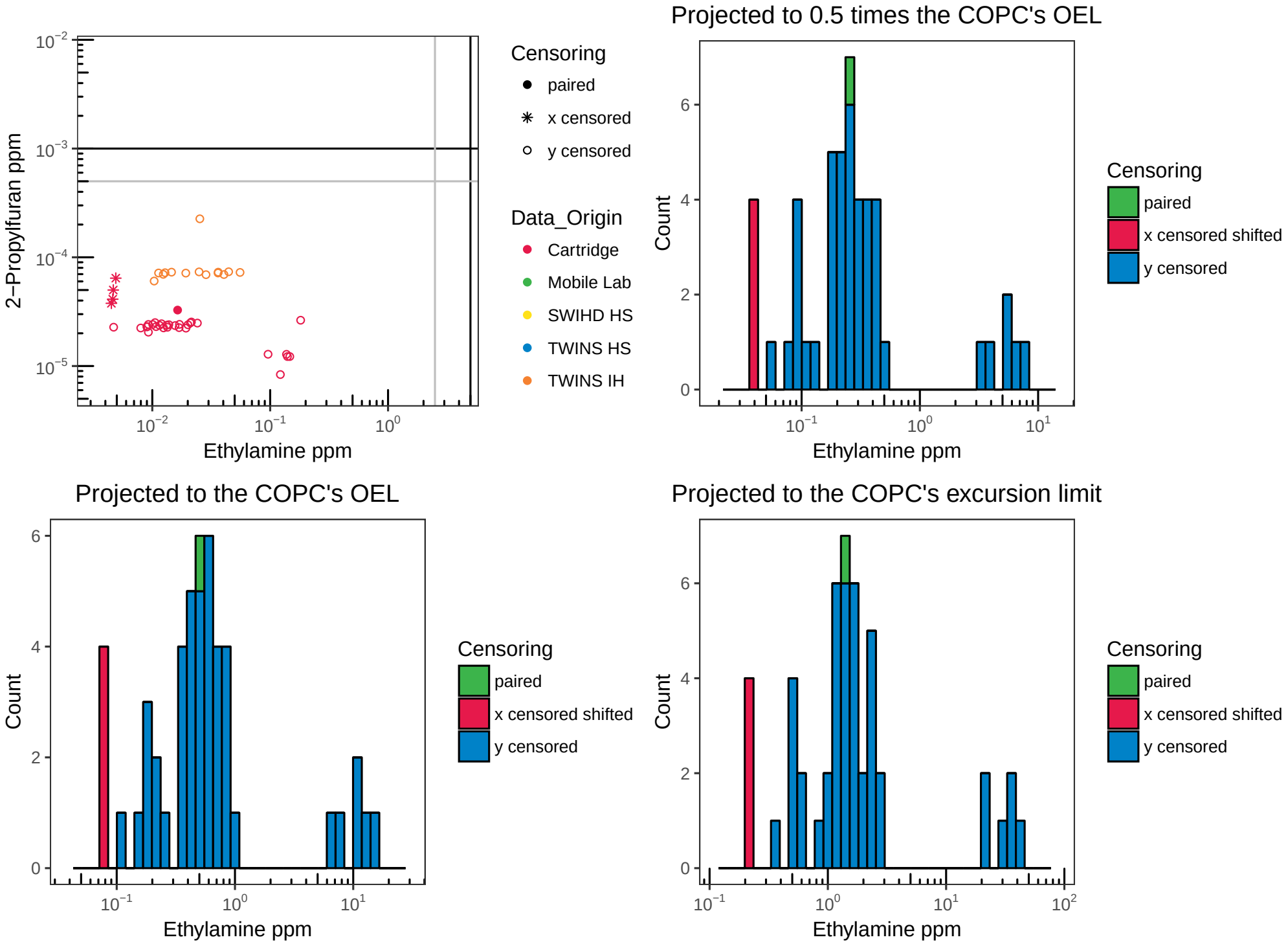


Figure C.2059: 2-Propylfuran vs Ethylamine

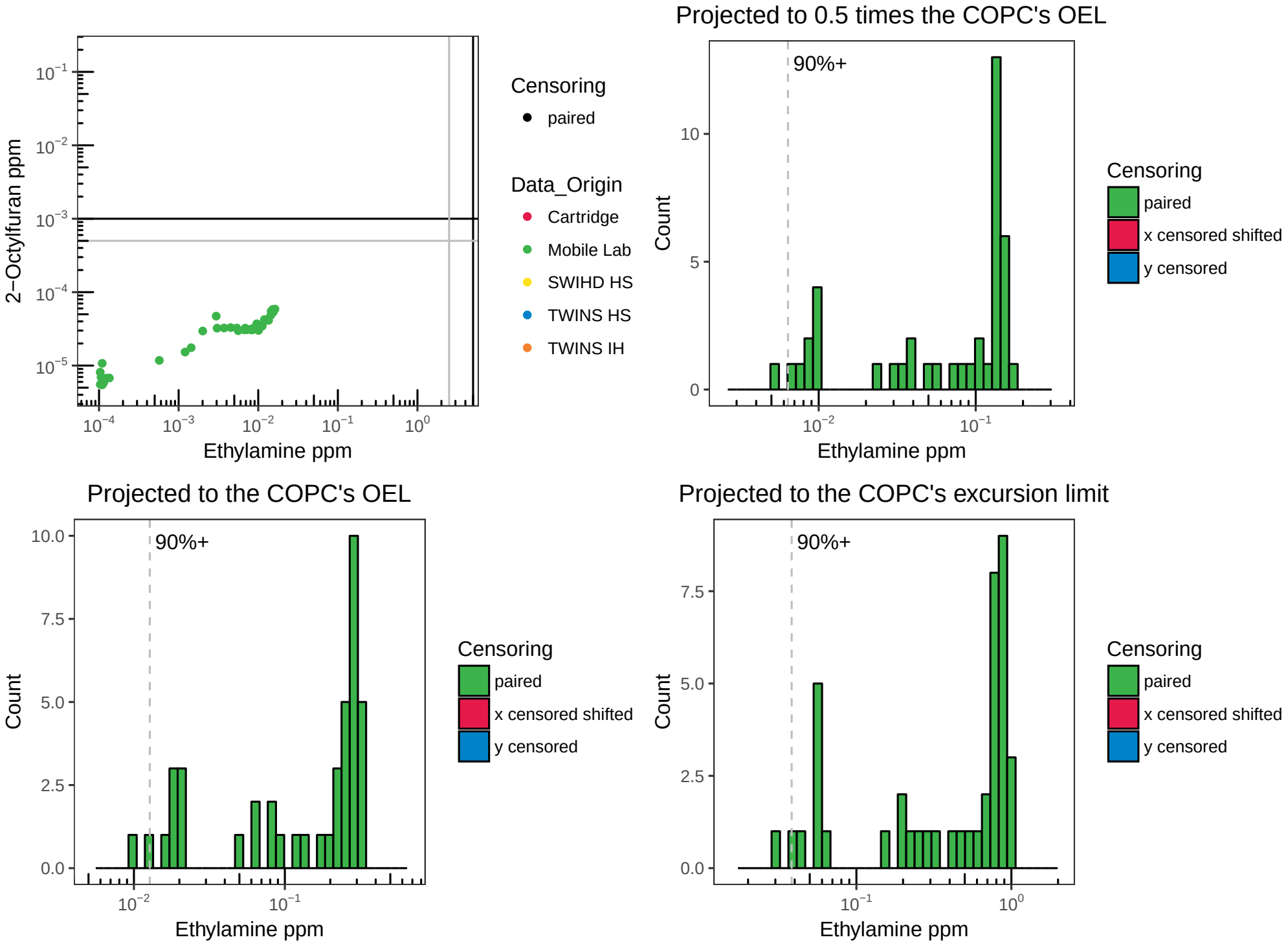


Figure C.2060: 2-Octylfuran vs Ethylamine

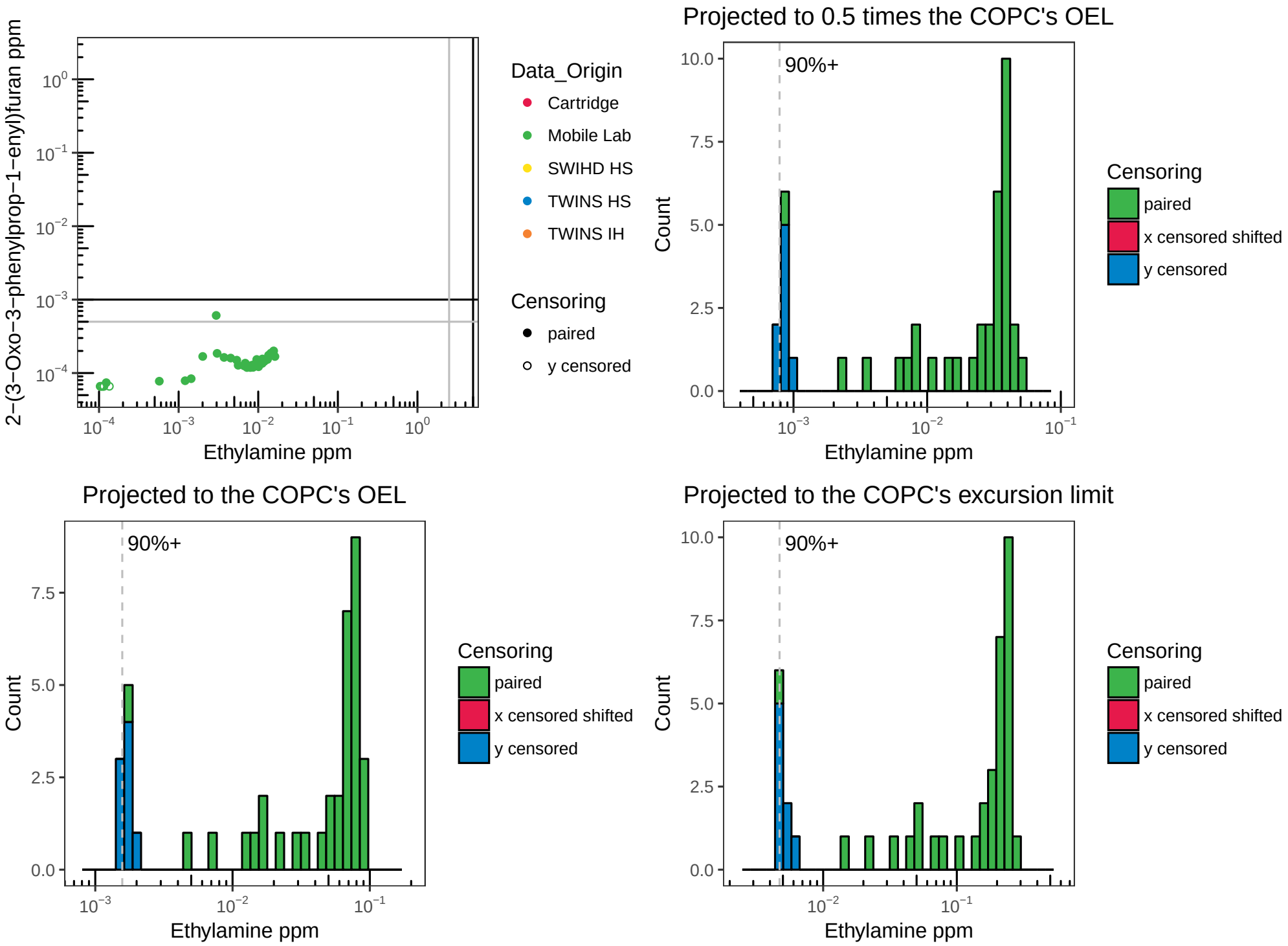


Figure C.2061: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Ethylamine

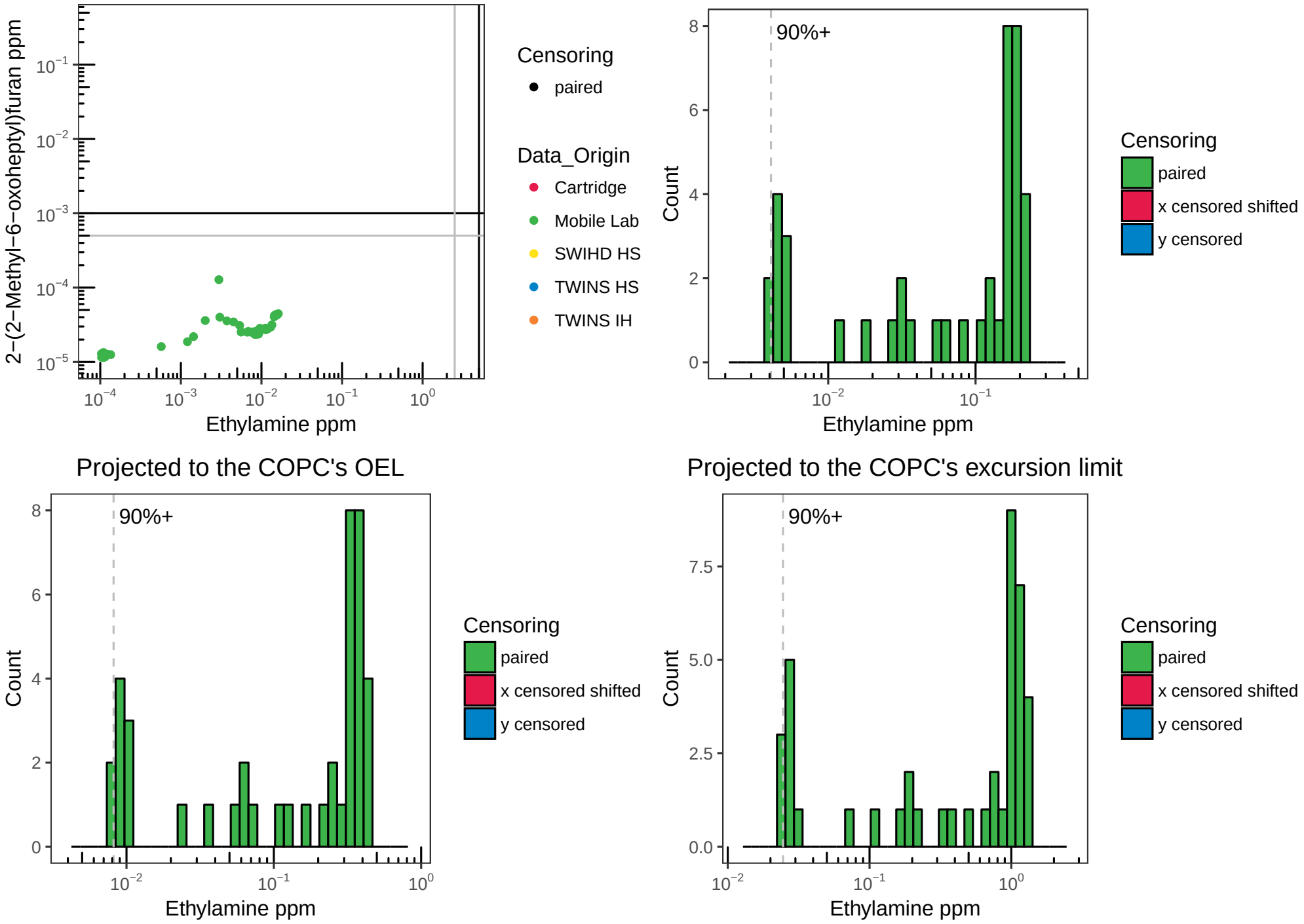


Figure C.2062: 2-(2-Methyl-6-oxoheptyl)furan vs Ethylamine

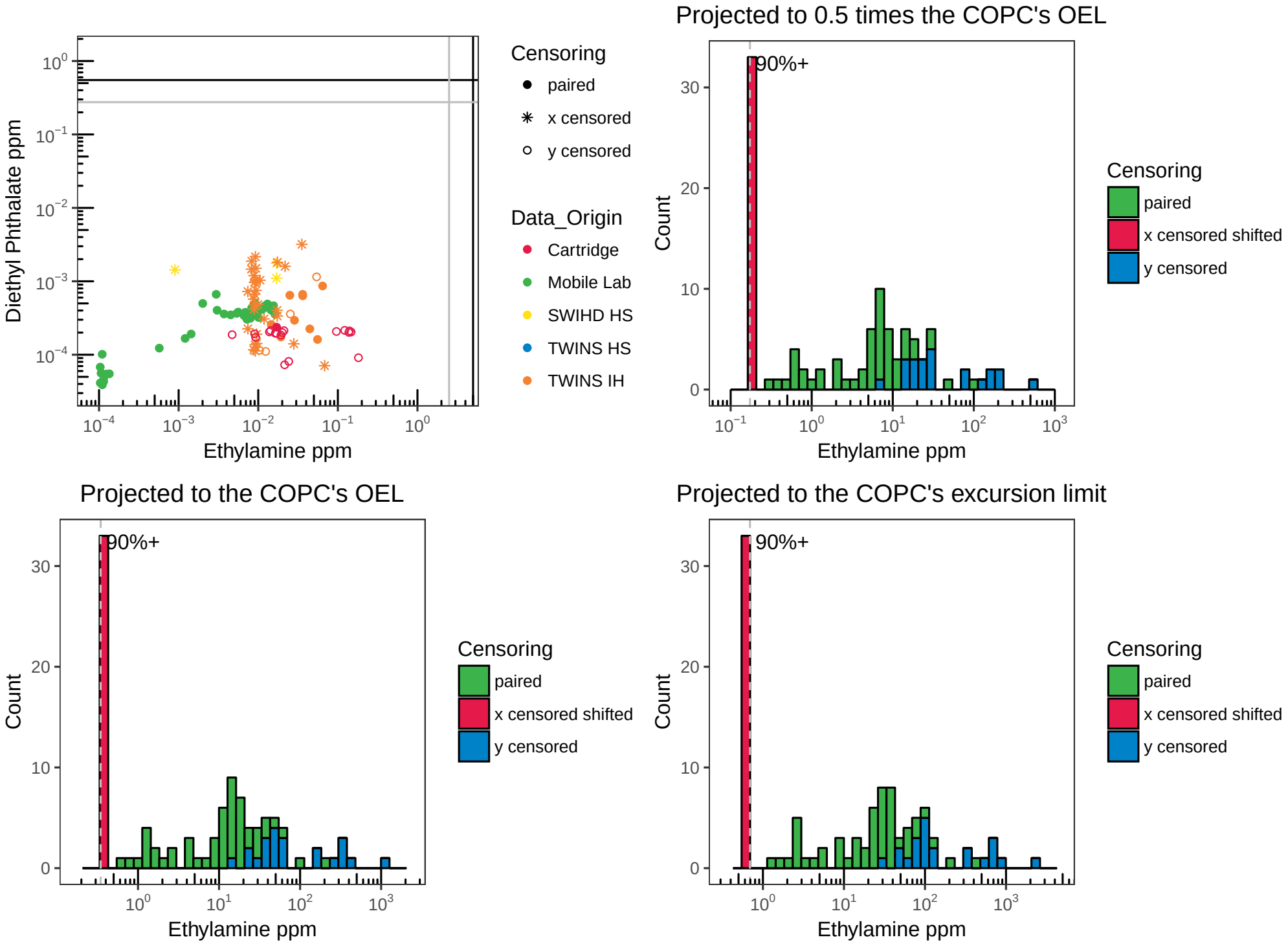


Figure C.2063: Diethyl Phthalate vs Ethylamine

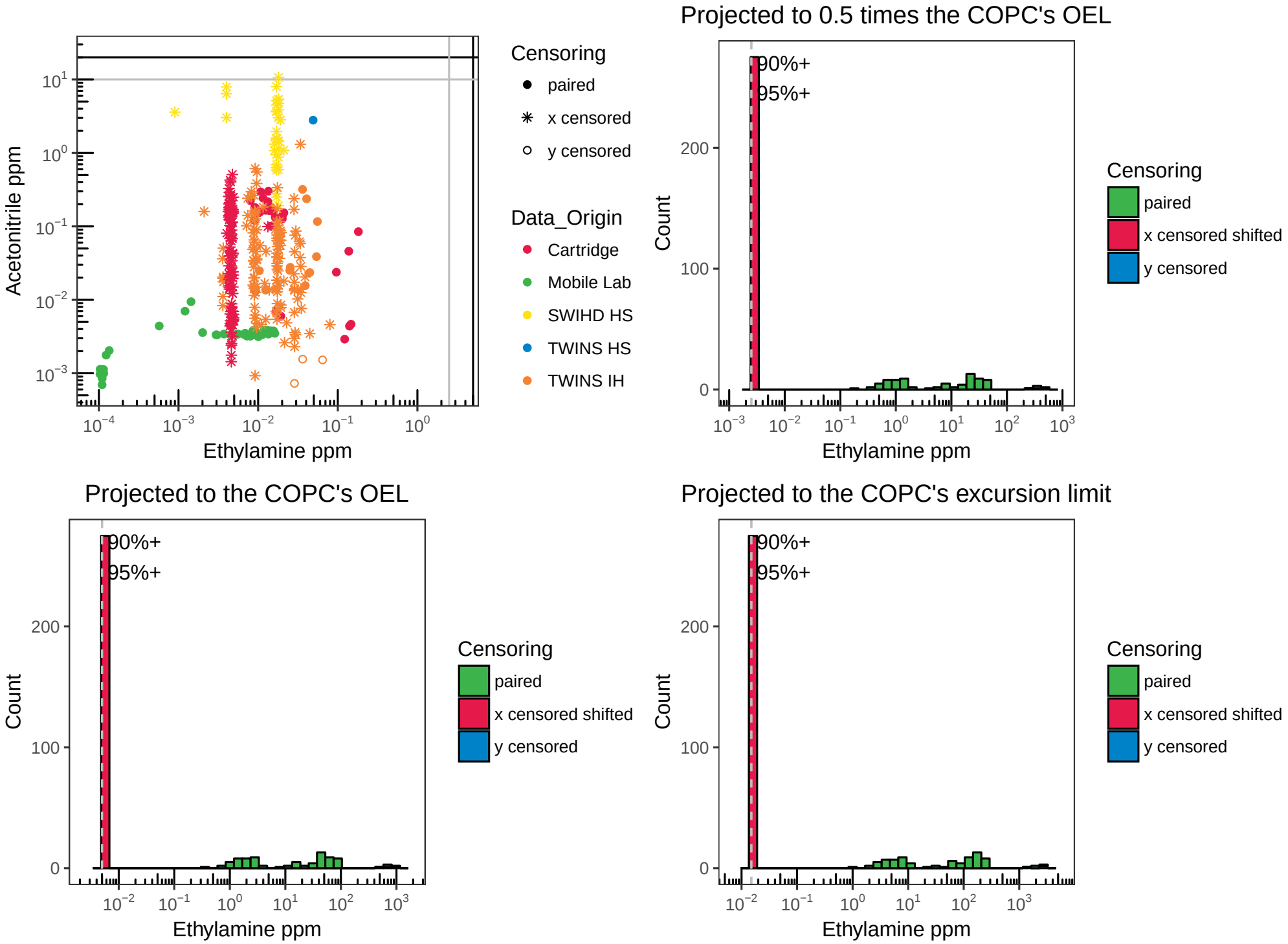


Figure C.2064: Acetonitrile vs Ethylamine

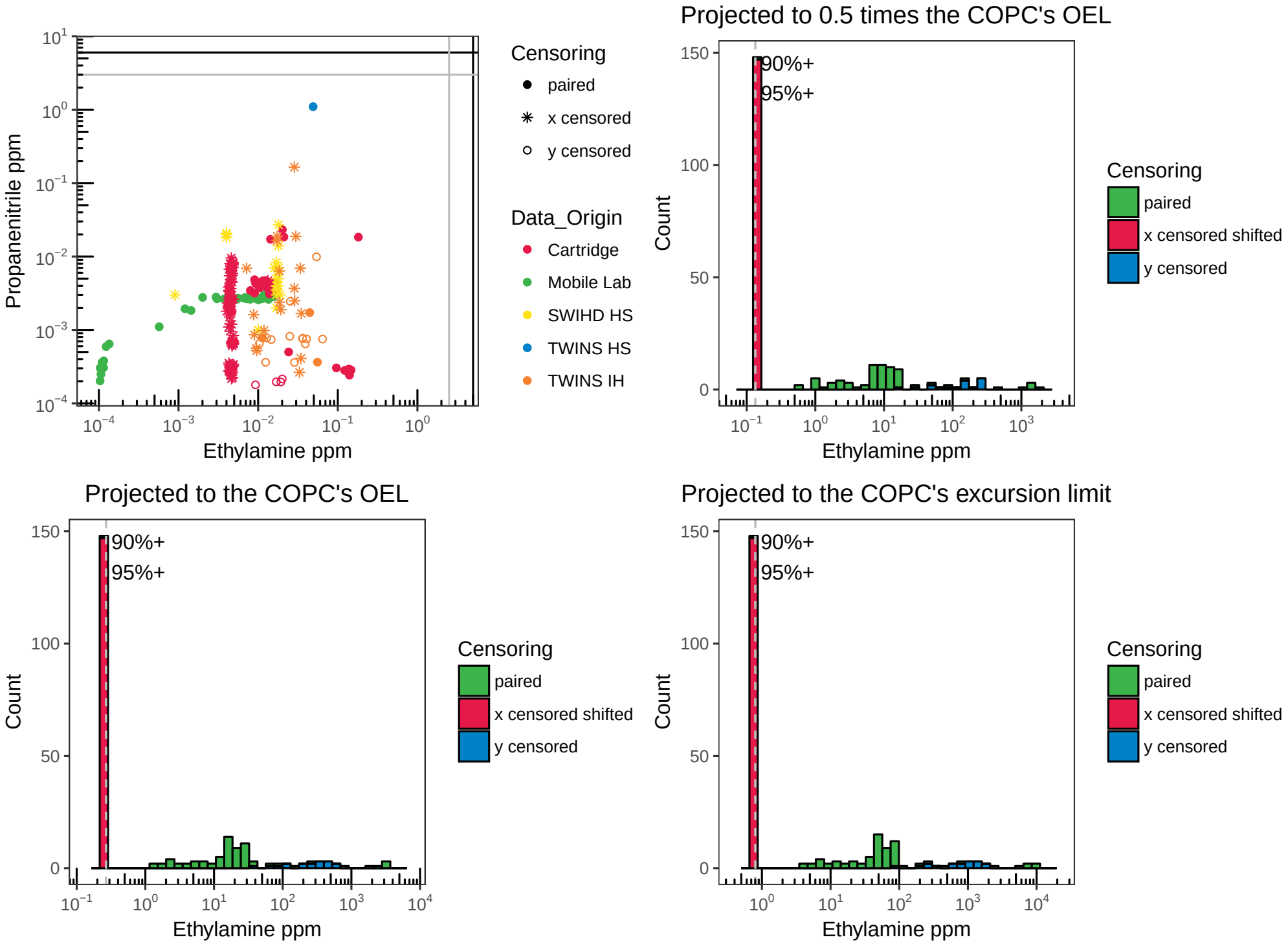


Figure C.2065: Propanenitrile vs Ethylamine

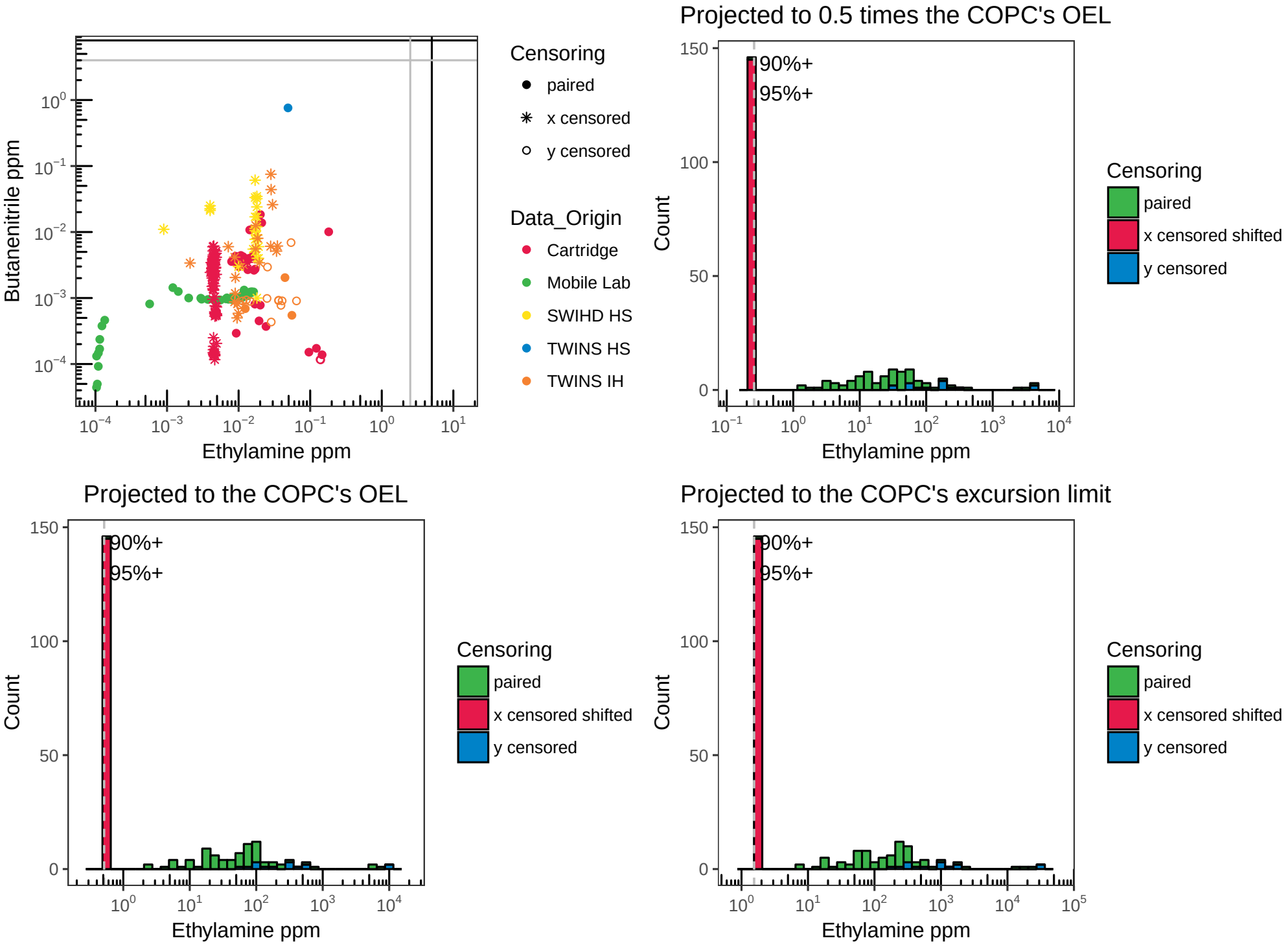


Figure C.2066: Butanenitrile vs Ethylamine

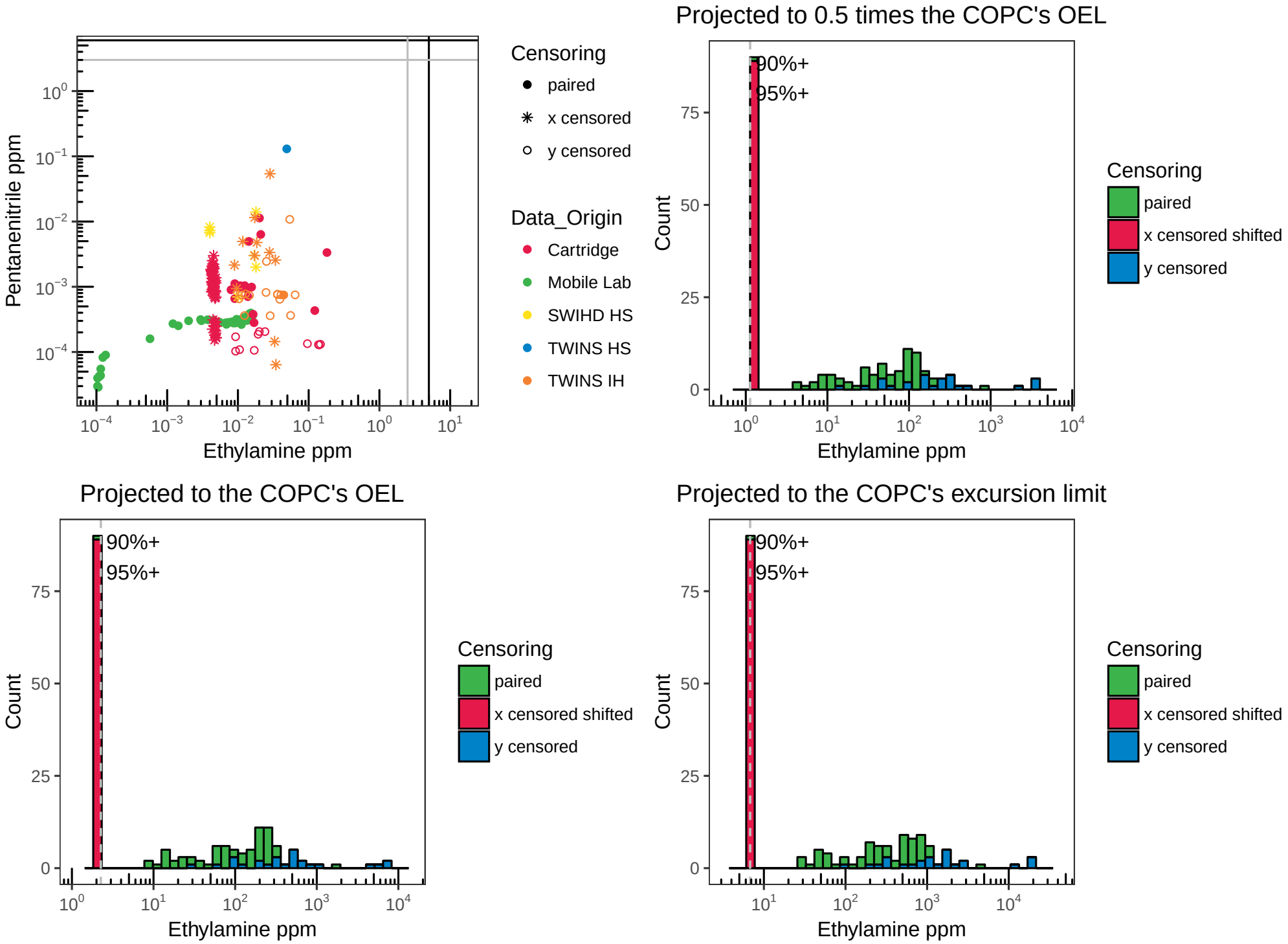


Figure C.2067: Pentanenitrile vs Ethylamine

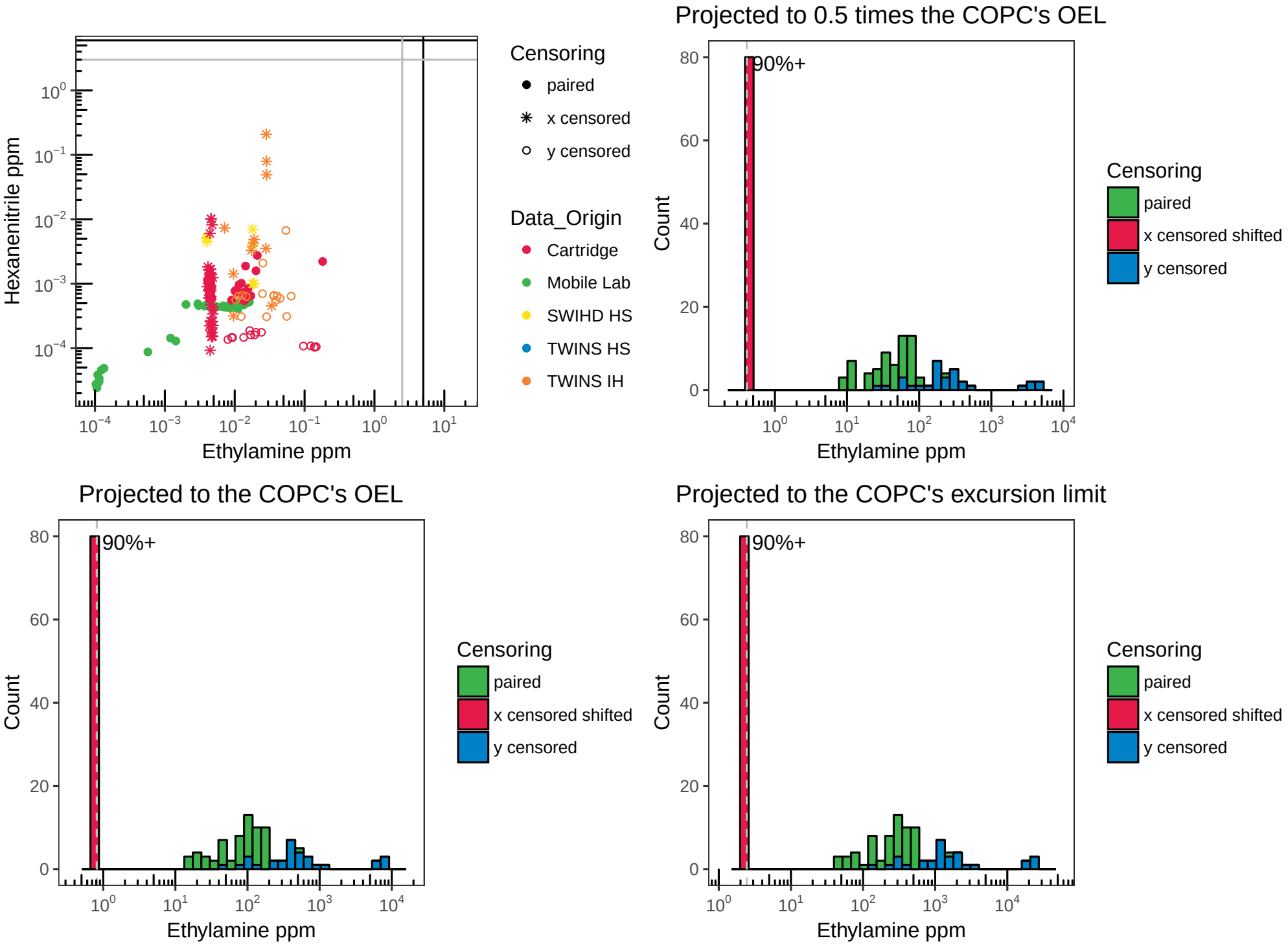


Figure C.2068: Hexanenitrile vs Ethylamine

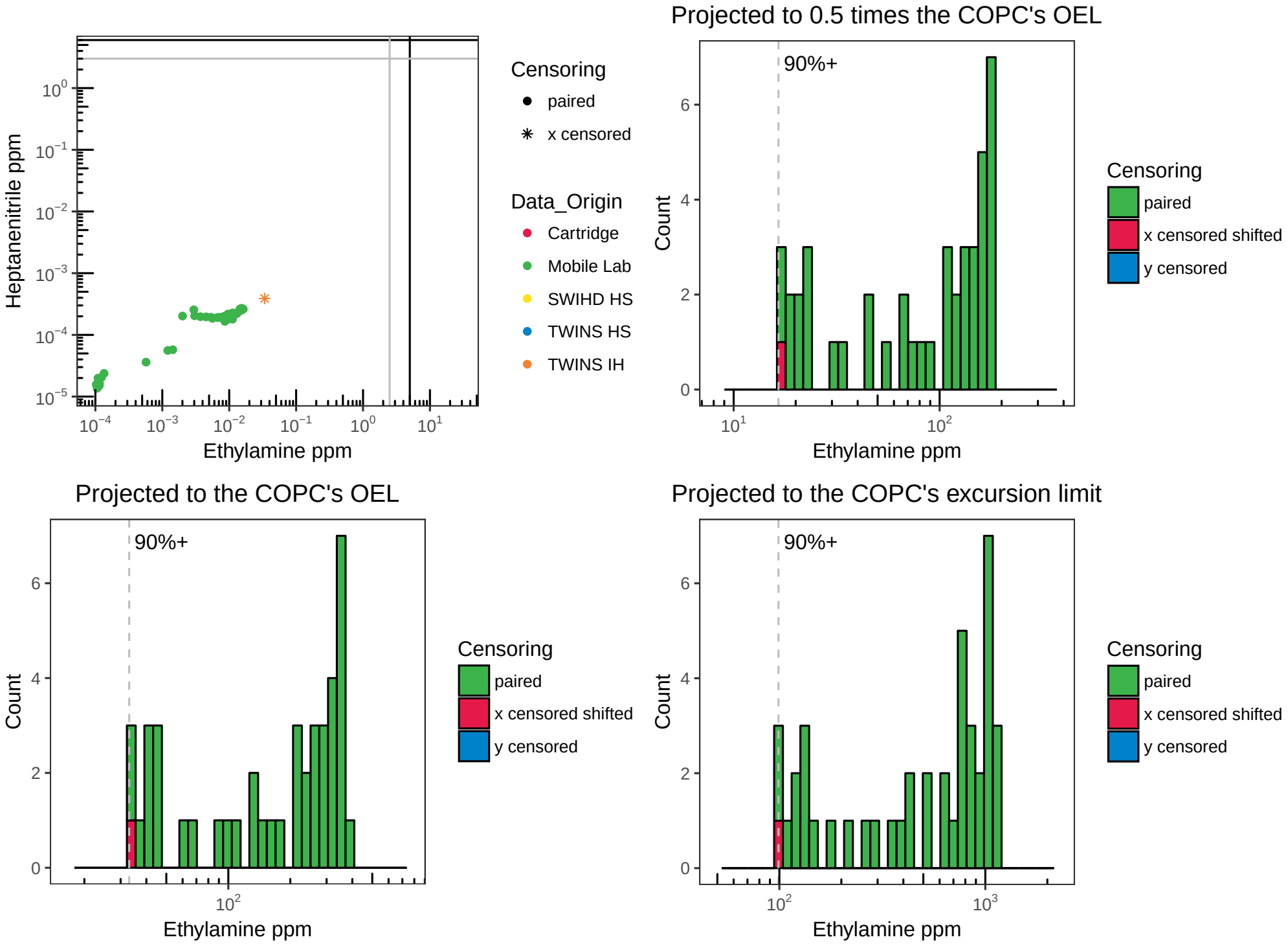


Figure C.2069: Heptanenitrile vs Ethylamine

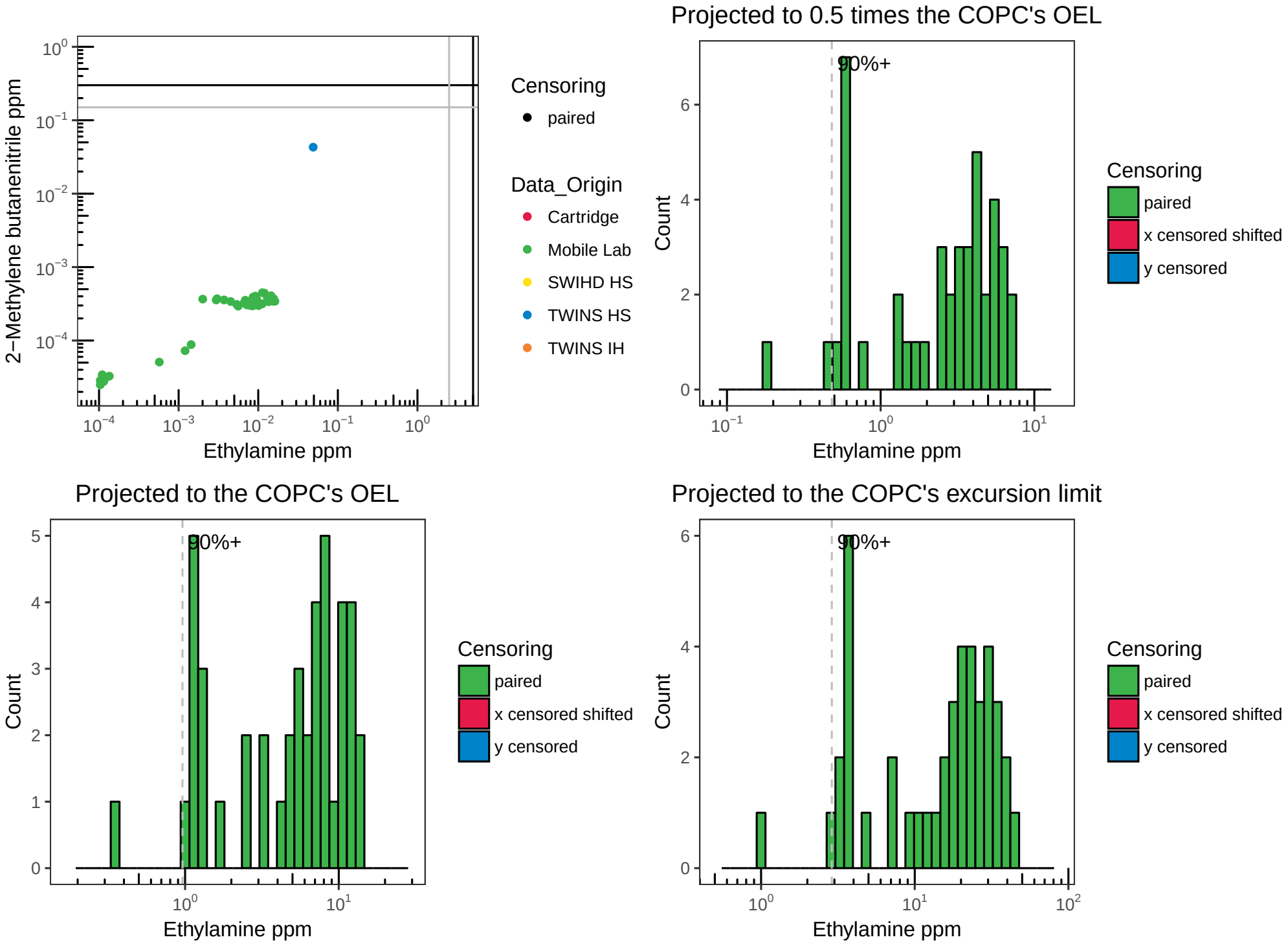


Figure C.2070: 2-Methylene butanenitrile vs Ethylamine

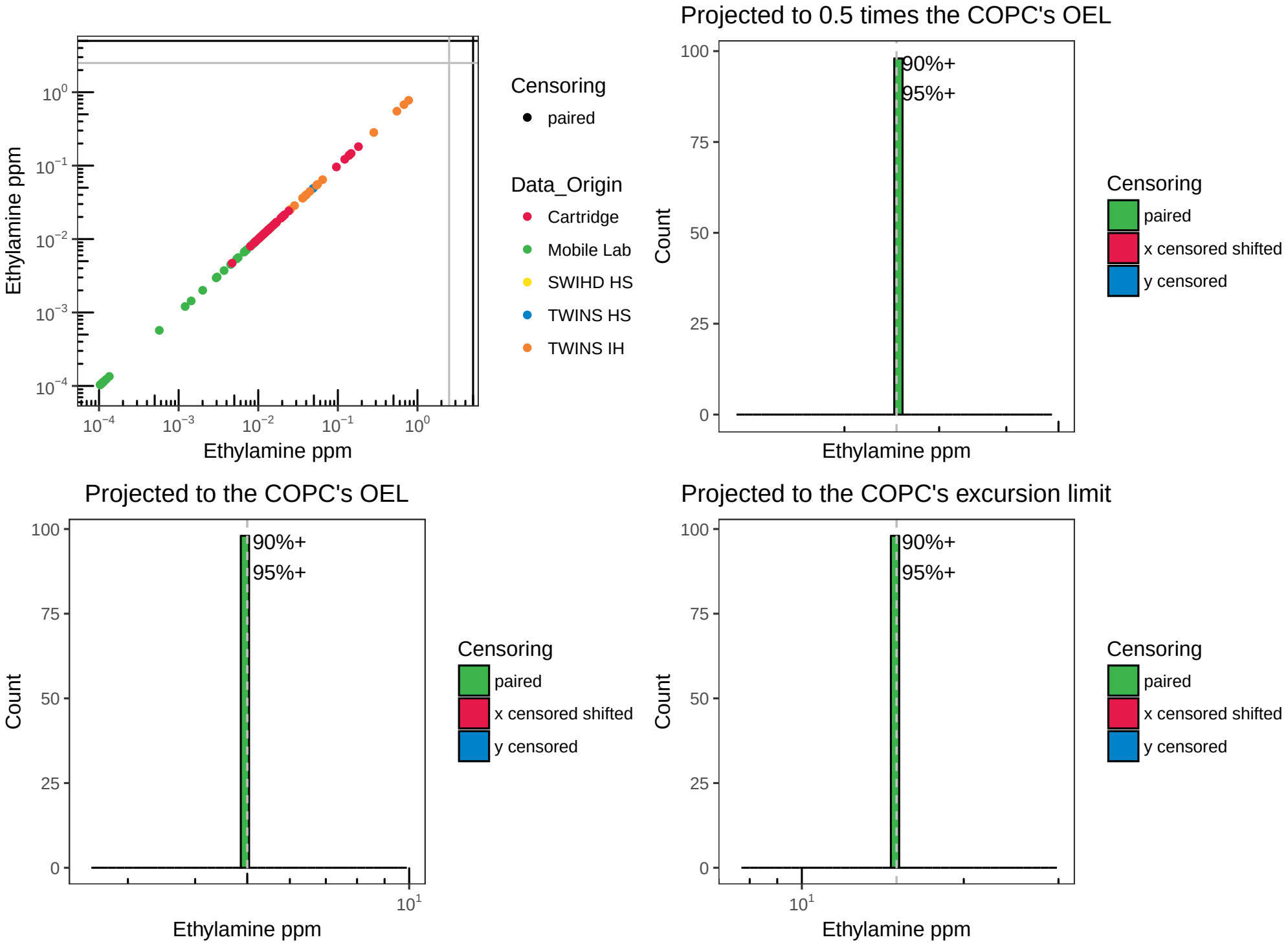


Figure C.2071: Ethylamine vs Ethylamine

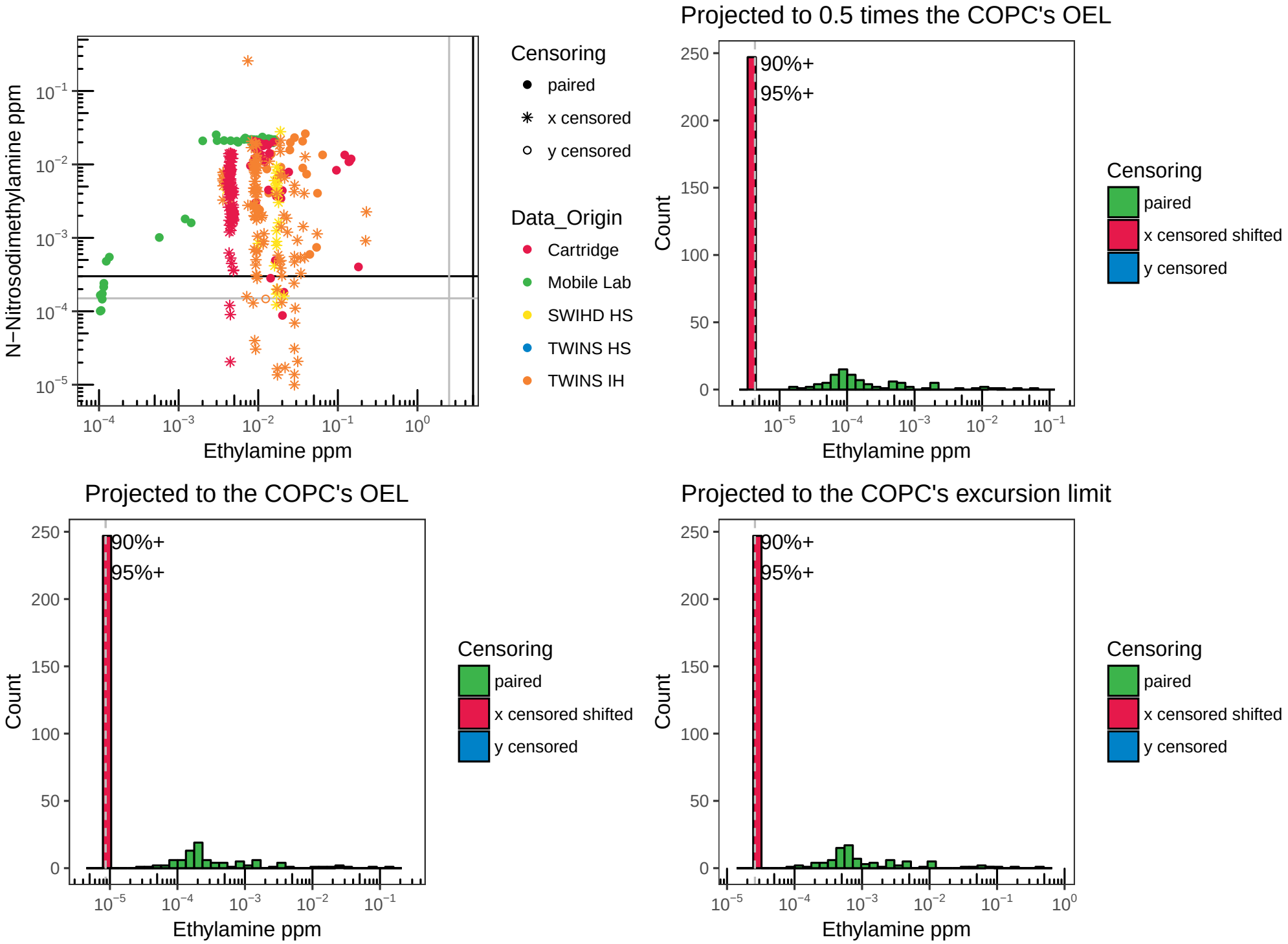


Figure C.2072: N-Nitrosodimethylamine vs Ethylamine

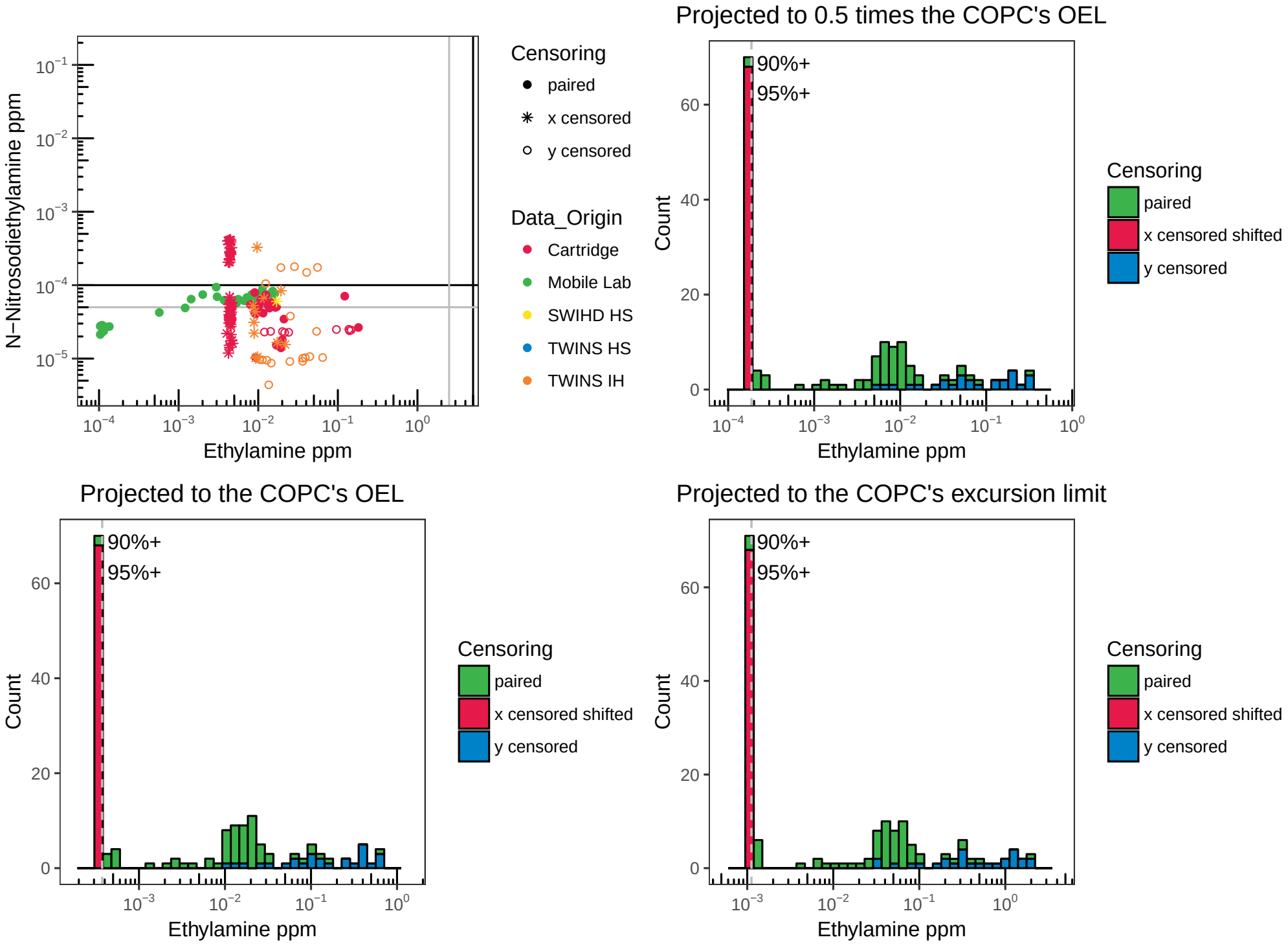


Figure C.2073: N-Nitrosodiethylamine vs Ethylamine

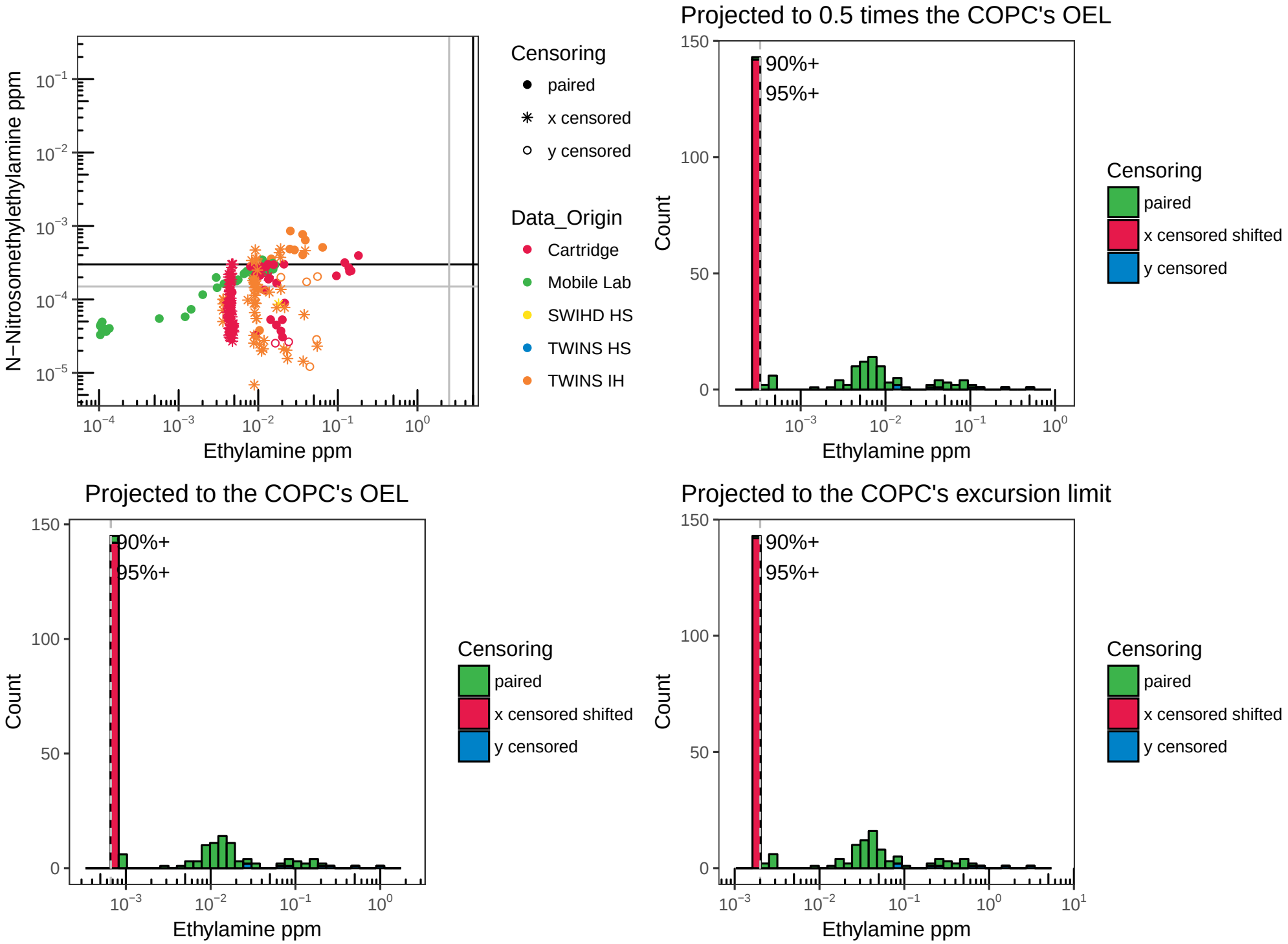


Figure C.2074: N-Nitrosomethylethylamine vs Ethylamine

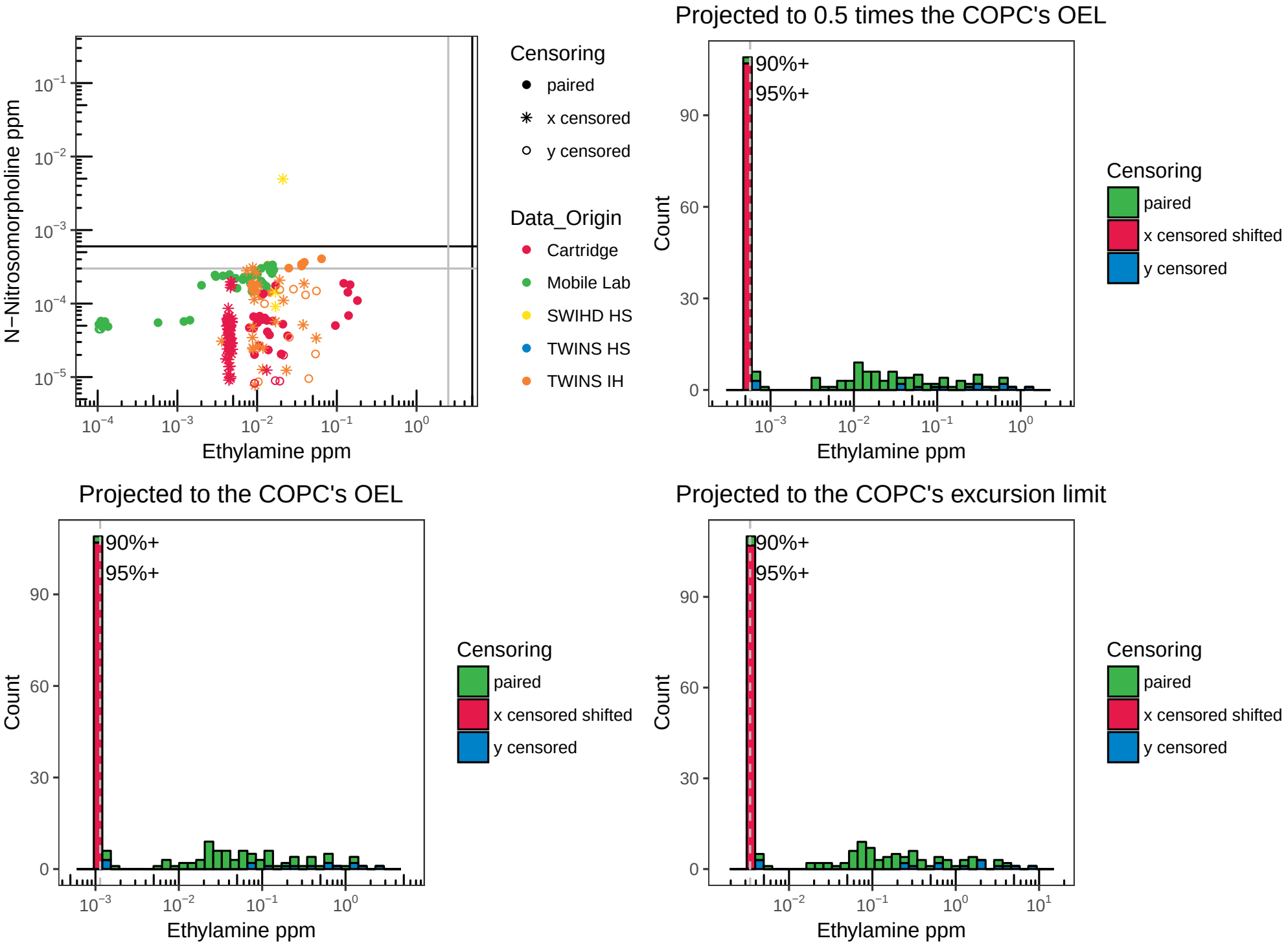


Figure C.2075: N-Nitrosomorpholine vs Ethylamine

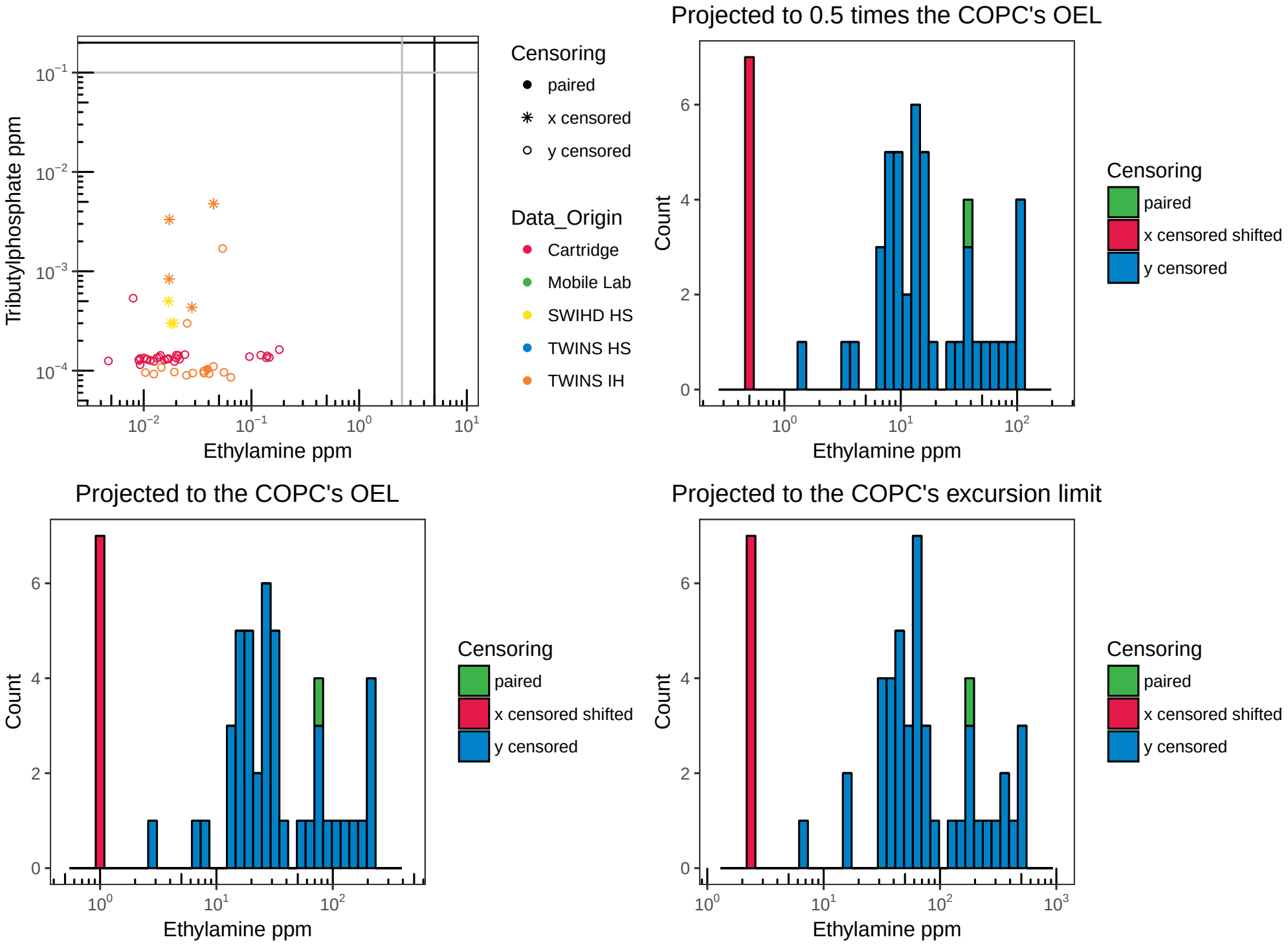


Figure C.2076: Tributylphosphate vs Ethylamine

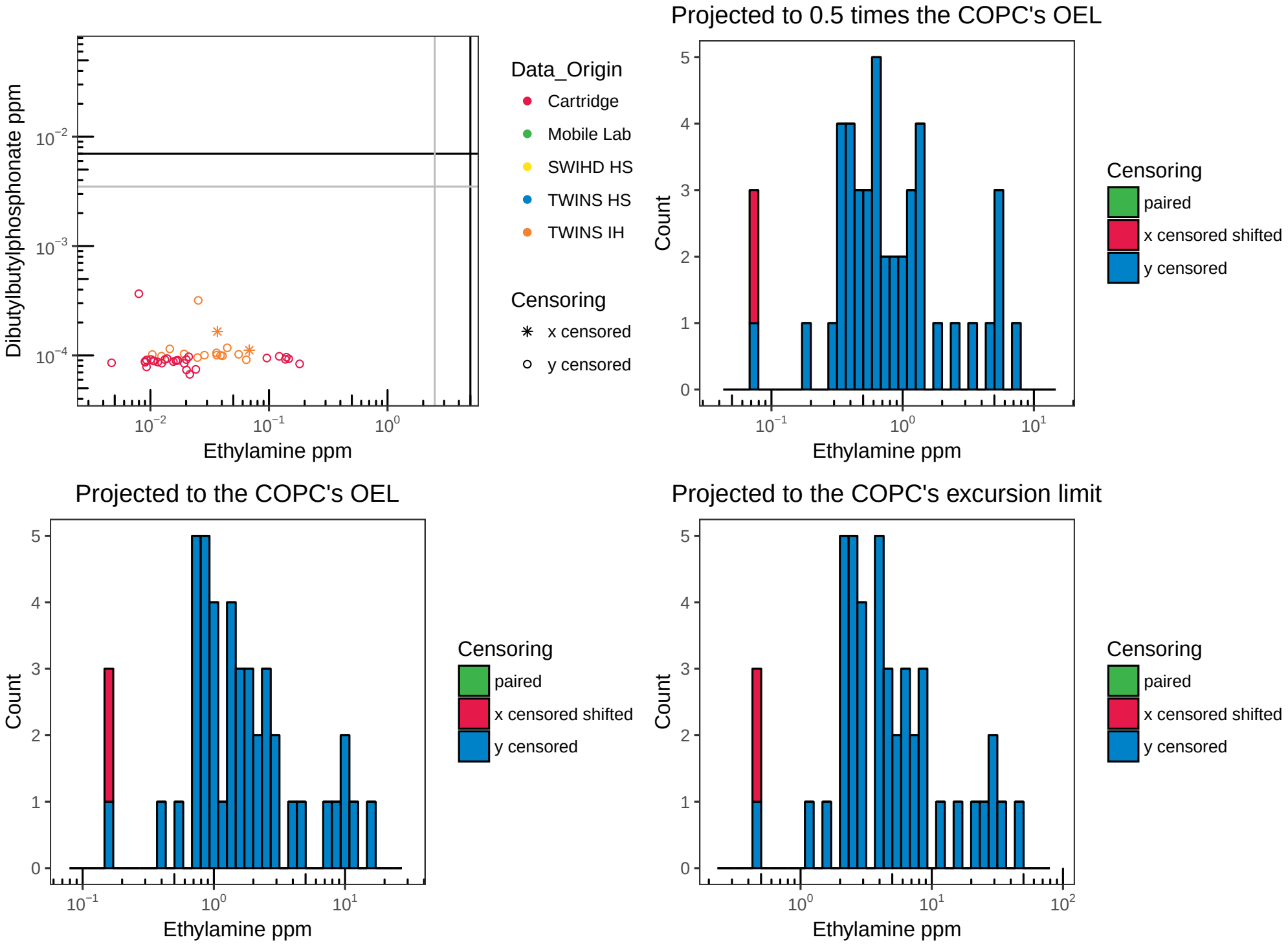


Figure C.2077: Dibutylbutylphosphonate vs Ethylamine

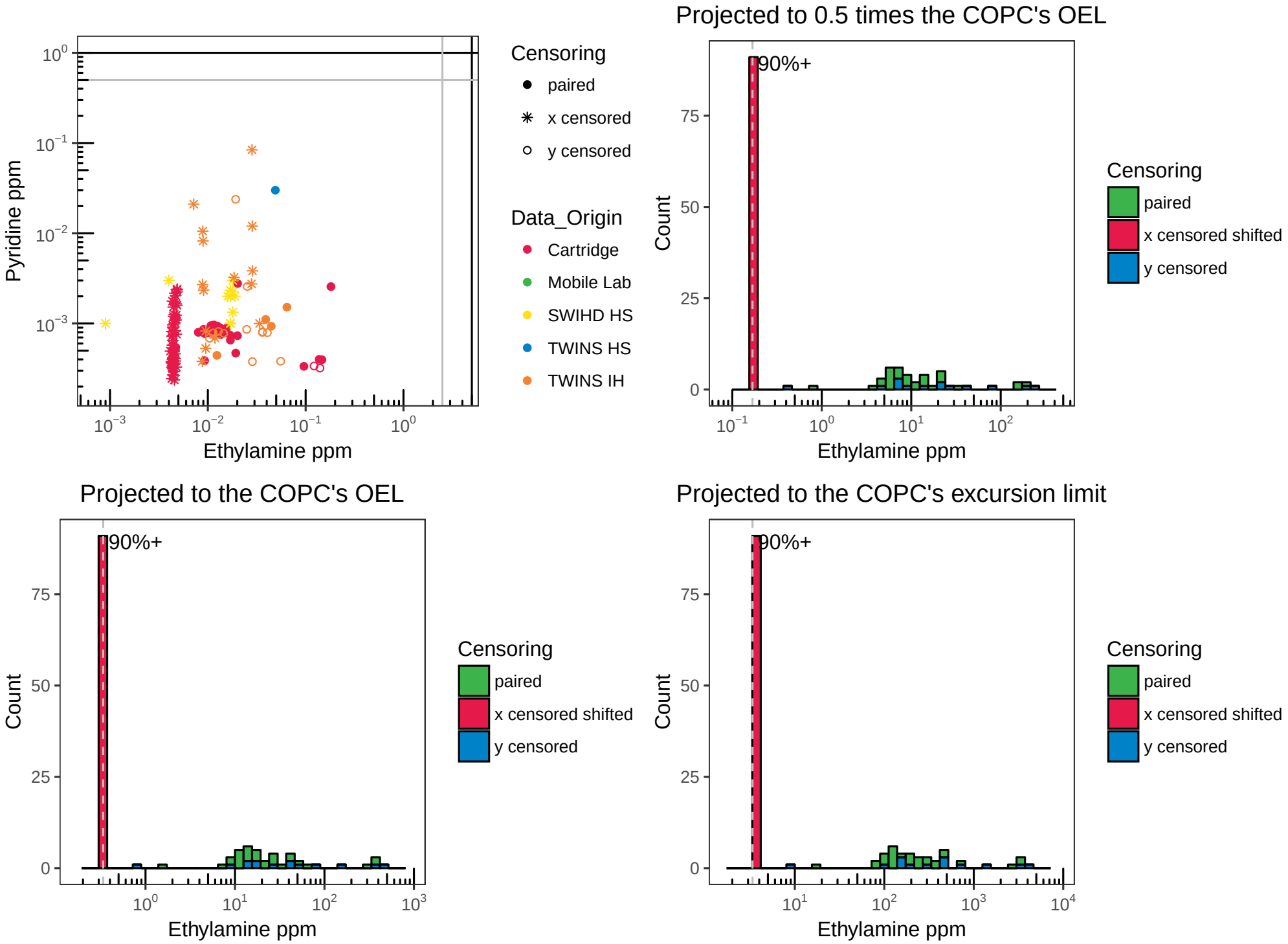


Figure C.2078: Pyridine vs Ethylamine

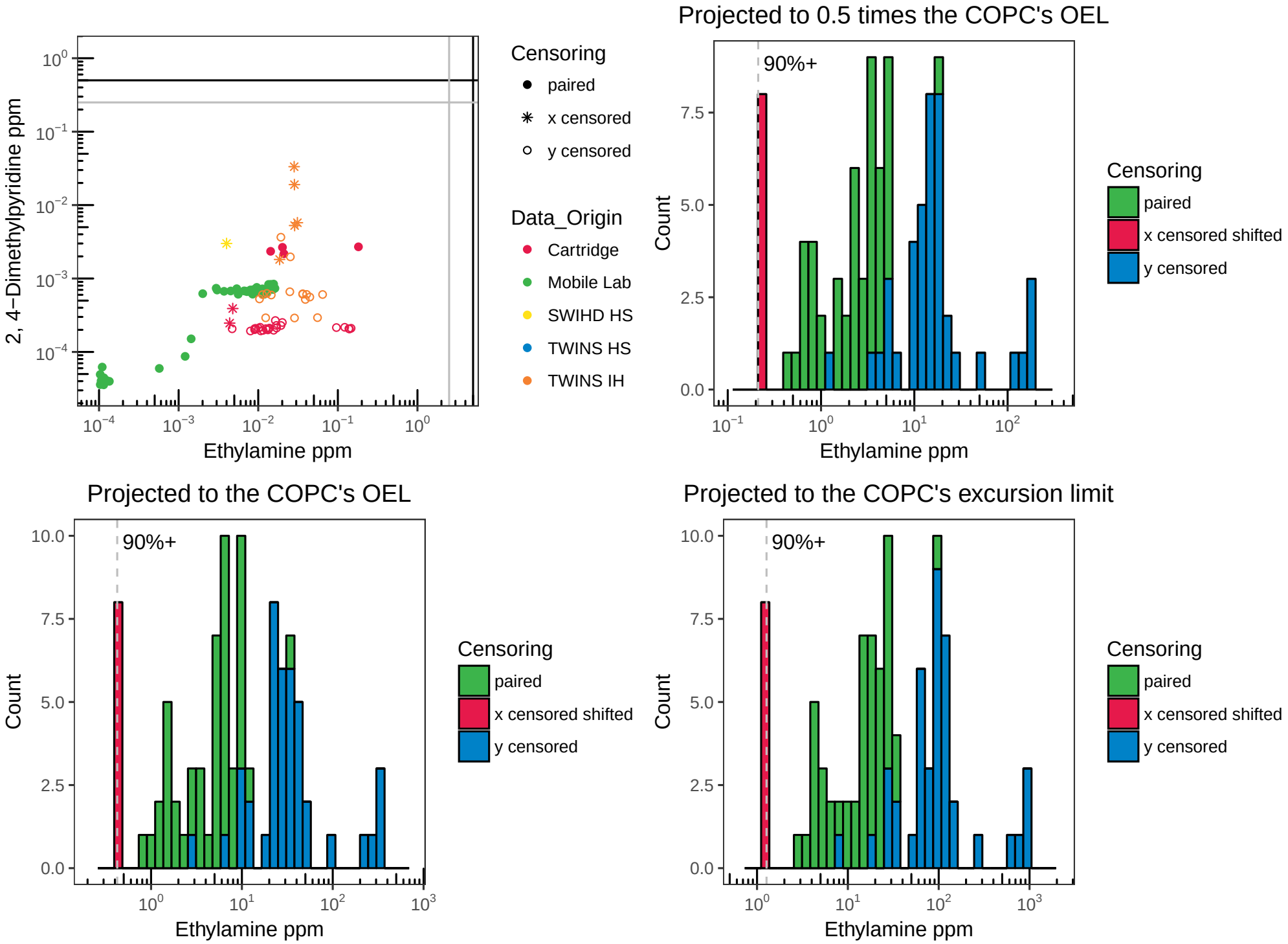


Figure C.2079: 2, 4-Dimethylpyridine vs Ethylamine

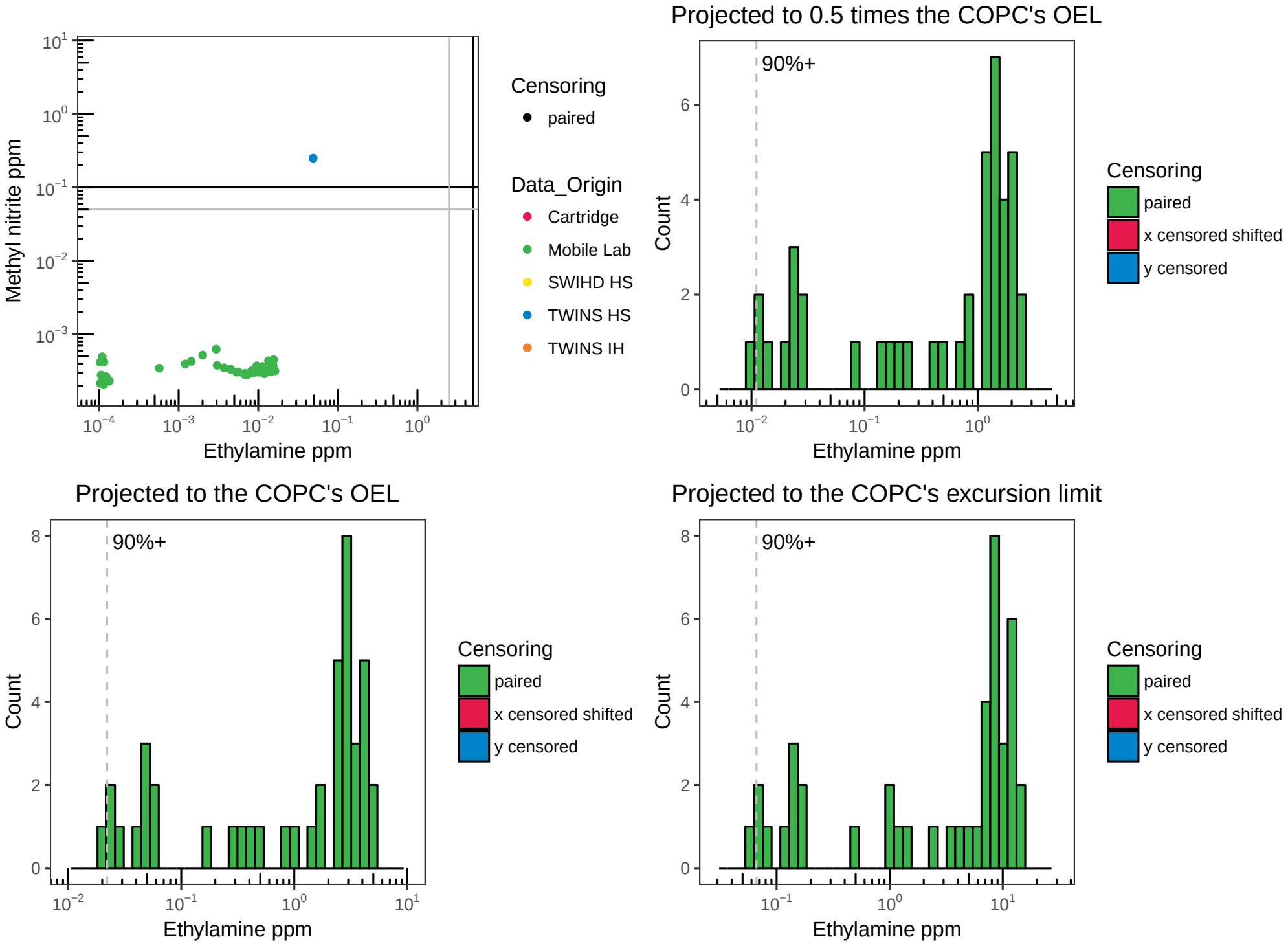


Figure C.2080: Methyl nitrite vs Ethylamine

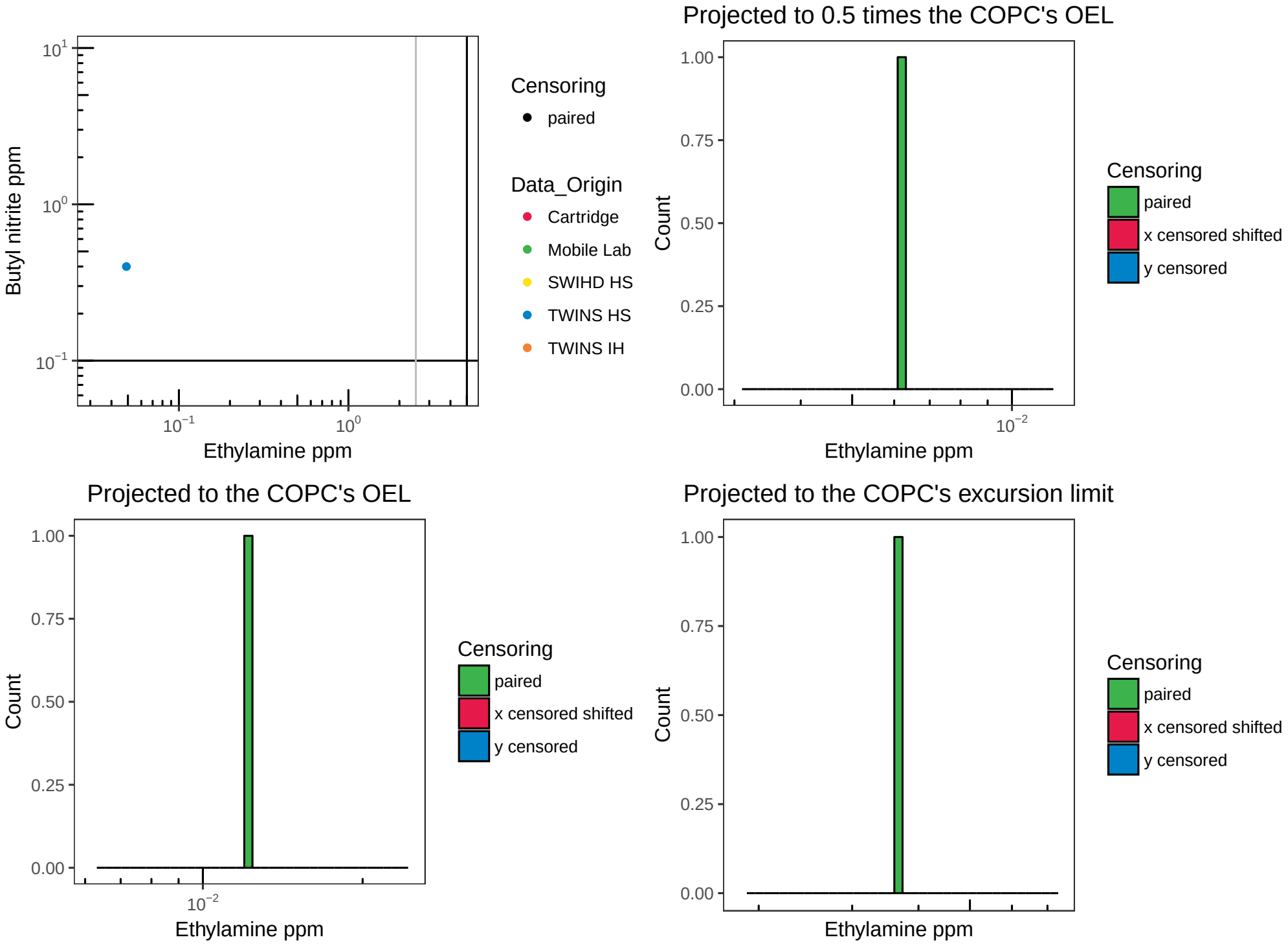


Figure C.2081: Butyl nitrite vs Ethylamine

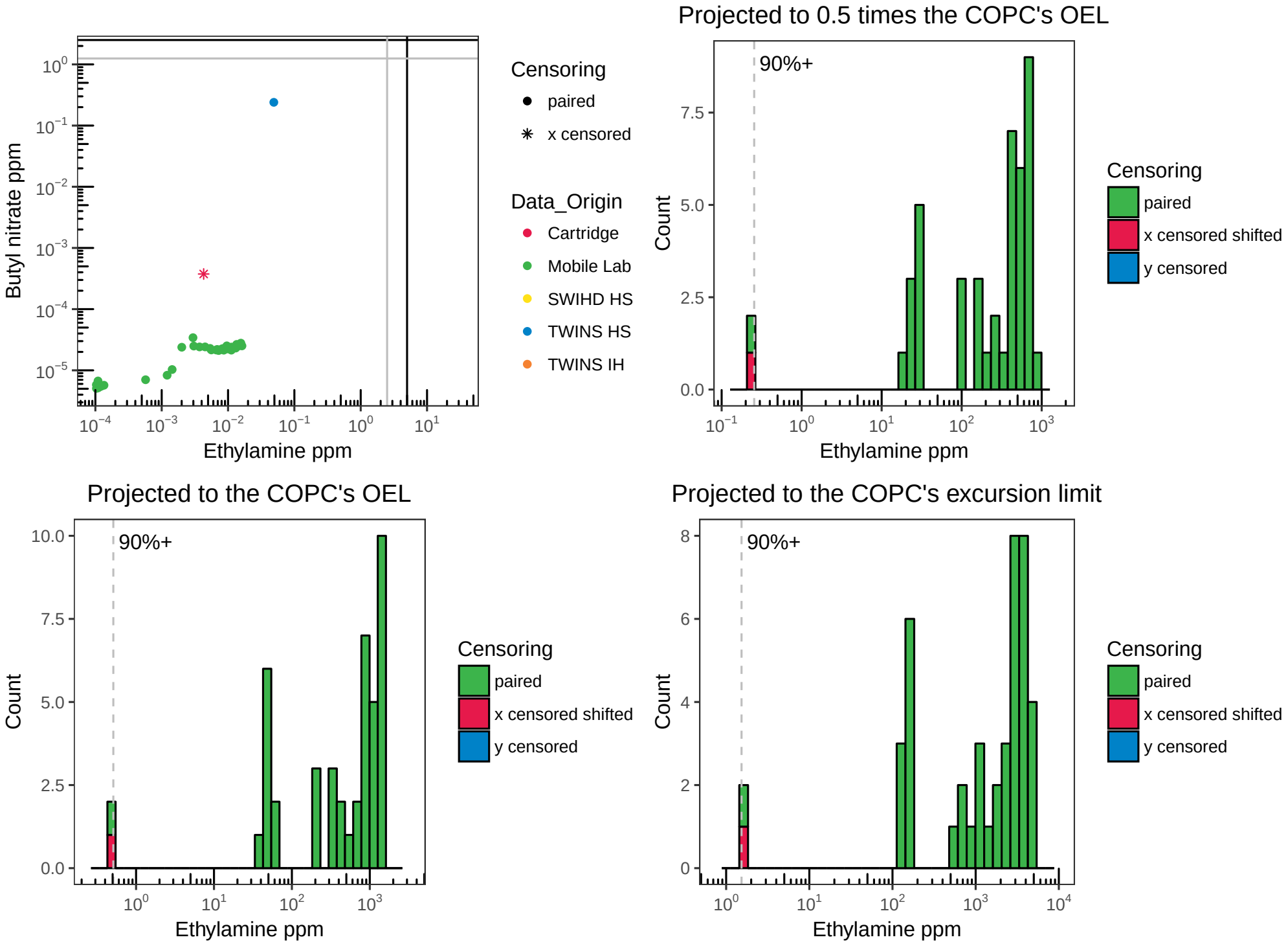


Figure C.2082: Butyl nitrate vs Ethylamine

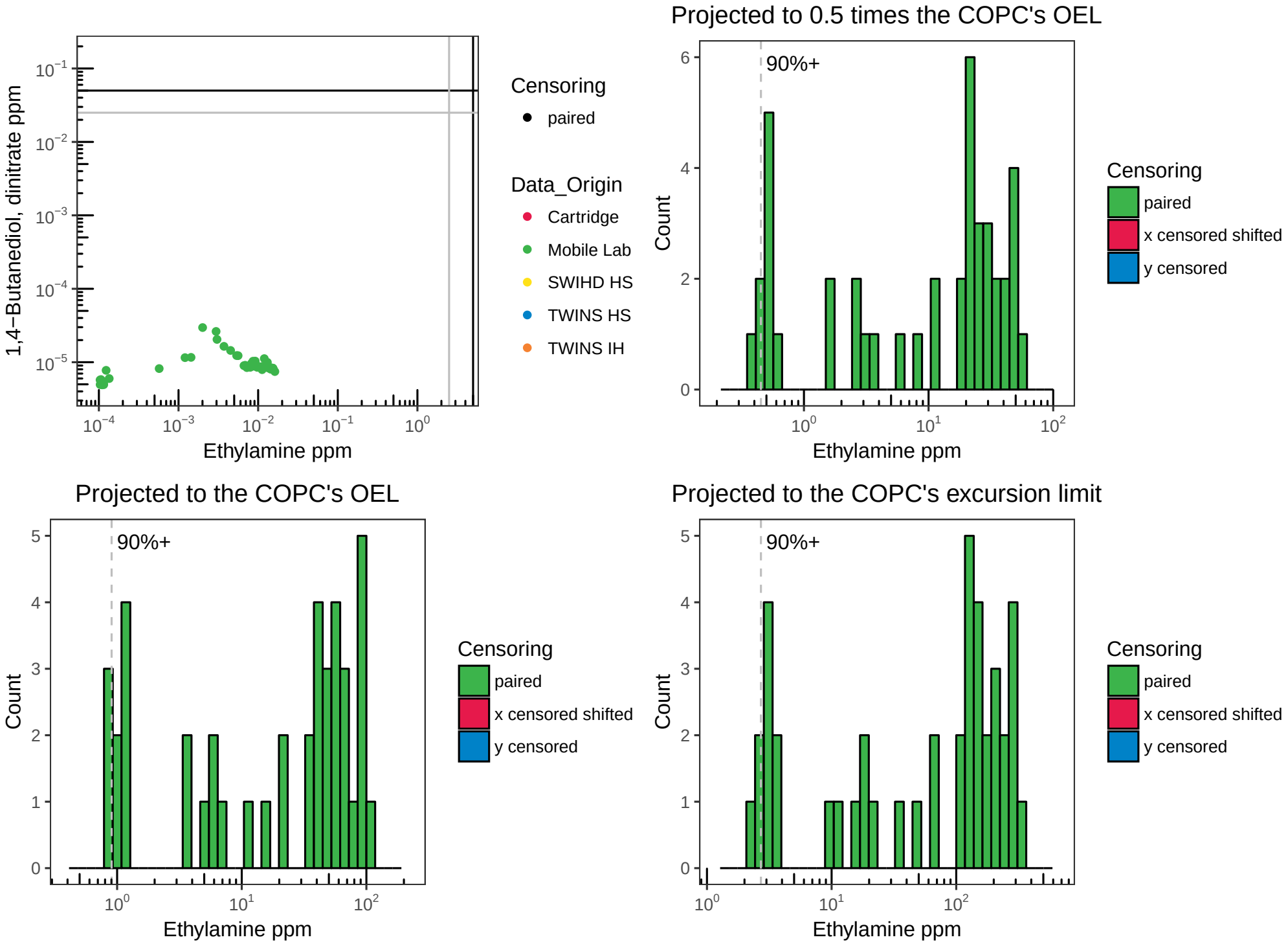


Figure C.2083: 1,4-Butanediol, dinitrate vs Ethylamine

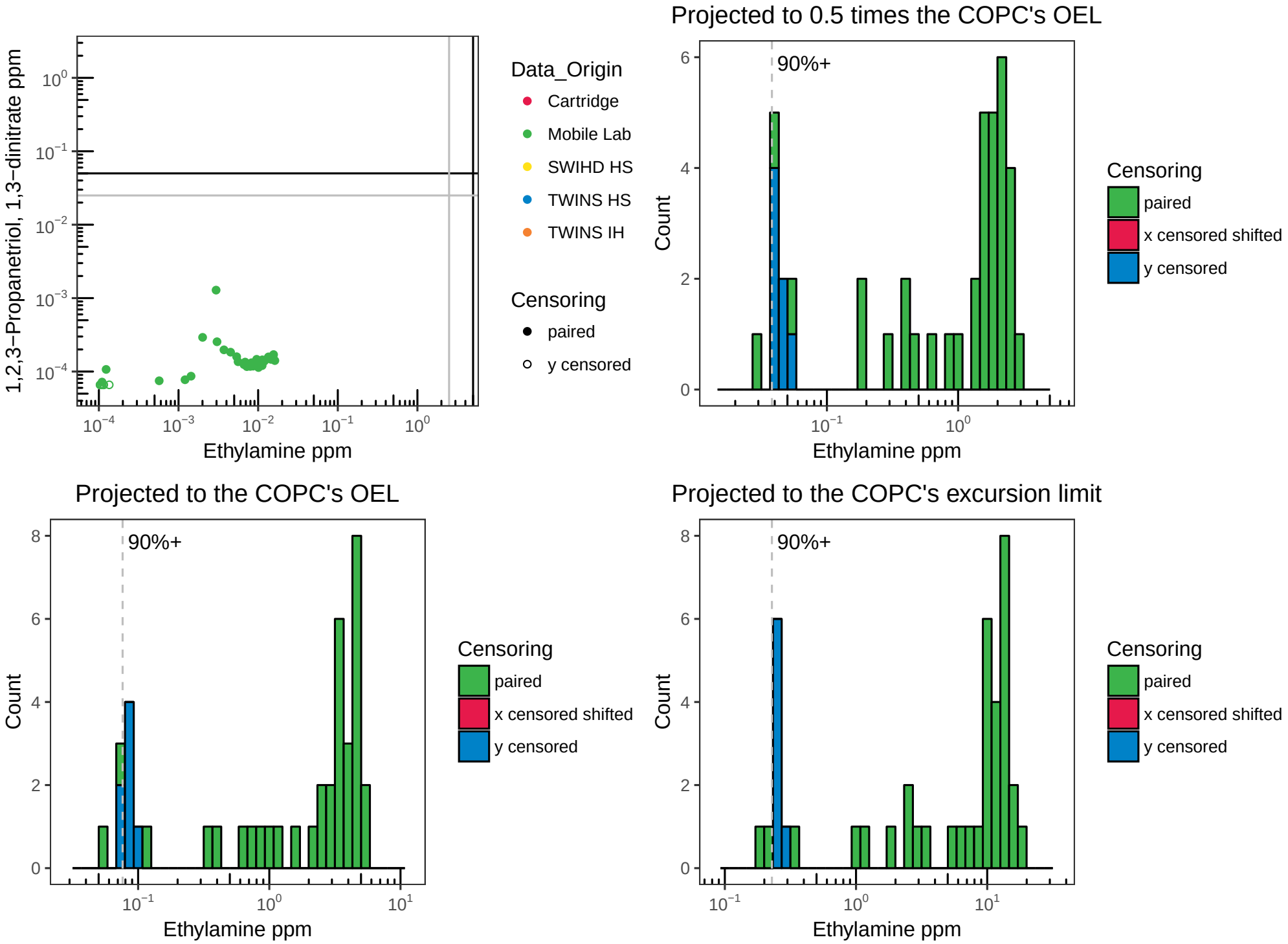


Figure C.2084: 1,2,3-Propanetriol, 1,3-dinitrate vs Ethylamine

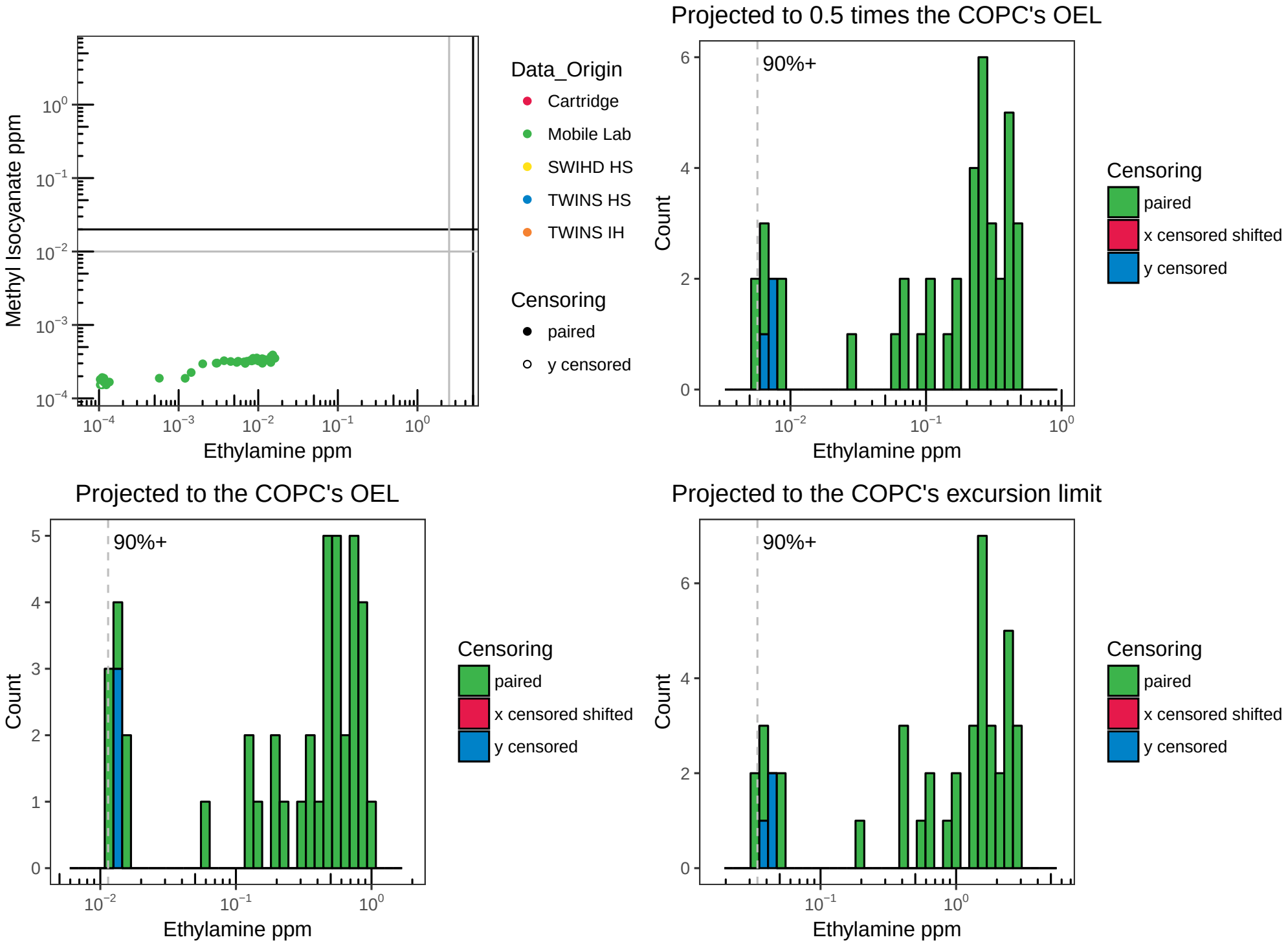


Figure C.2085: Methyl Isocyanate vs Ethylamine

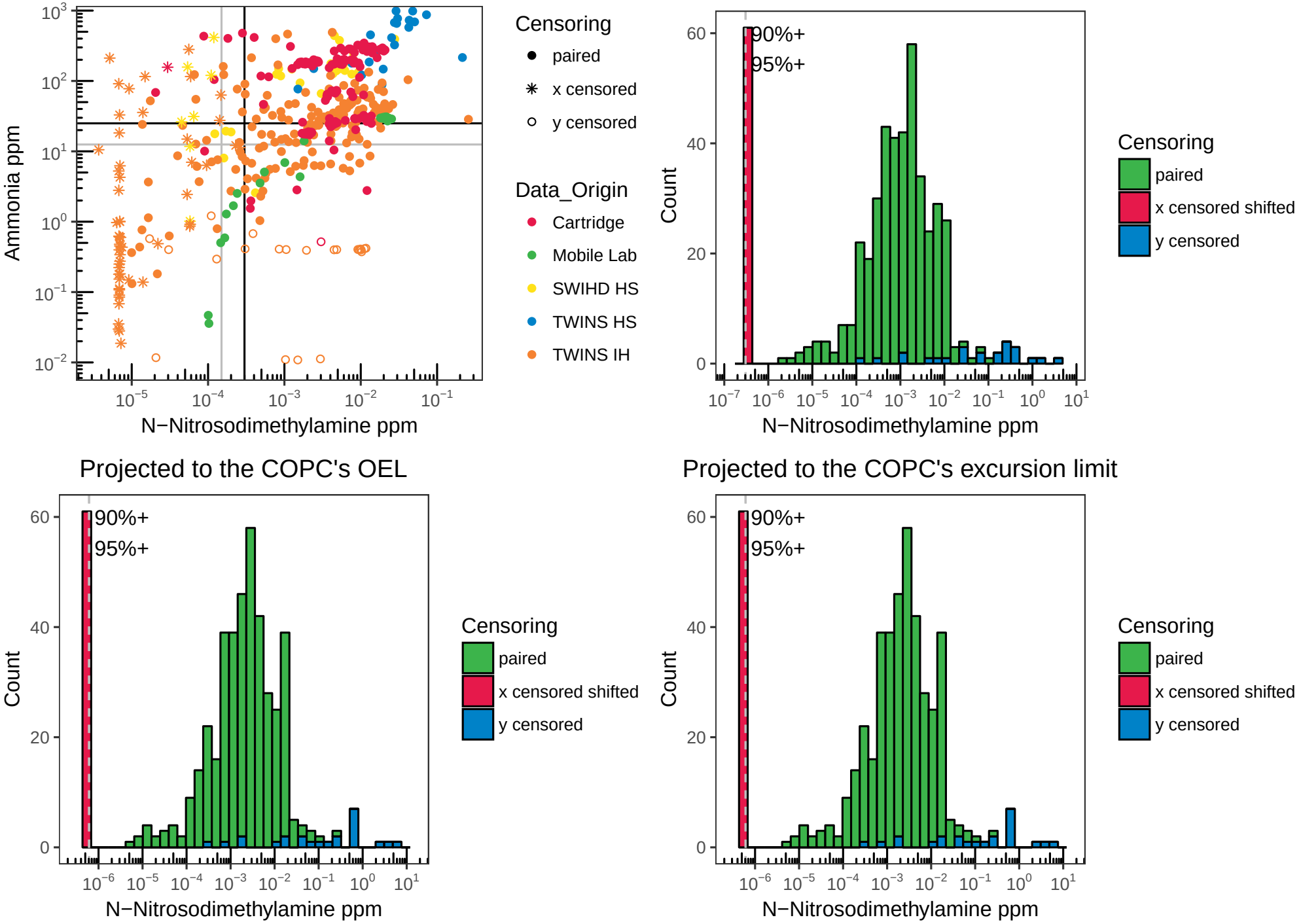


Figure C.2086: Ammonia vs N-Nitrosodimethylamine

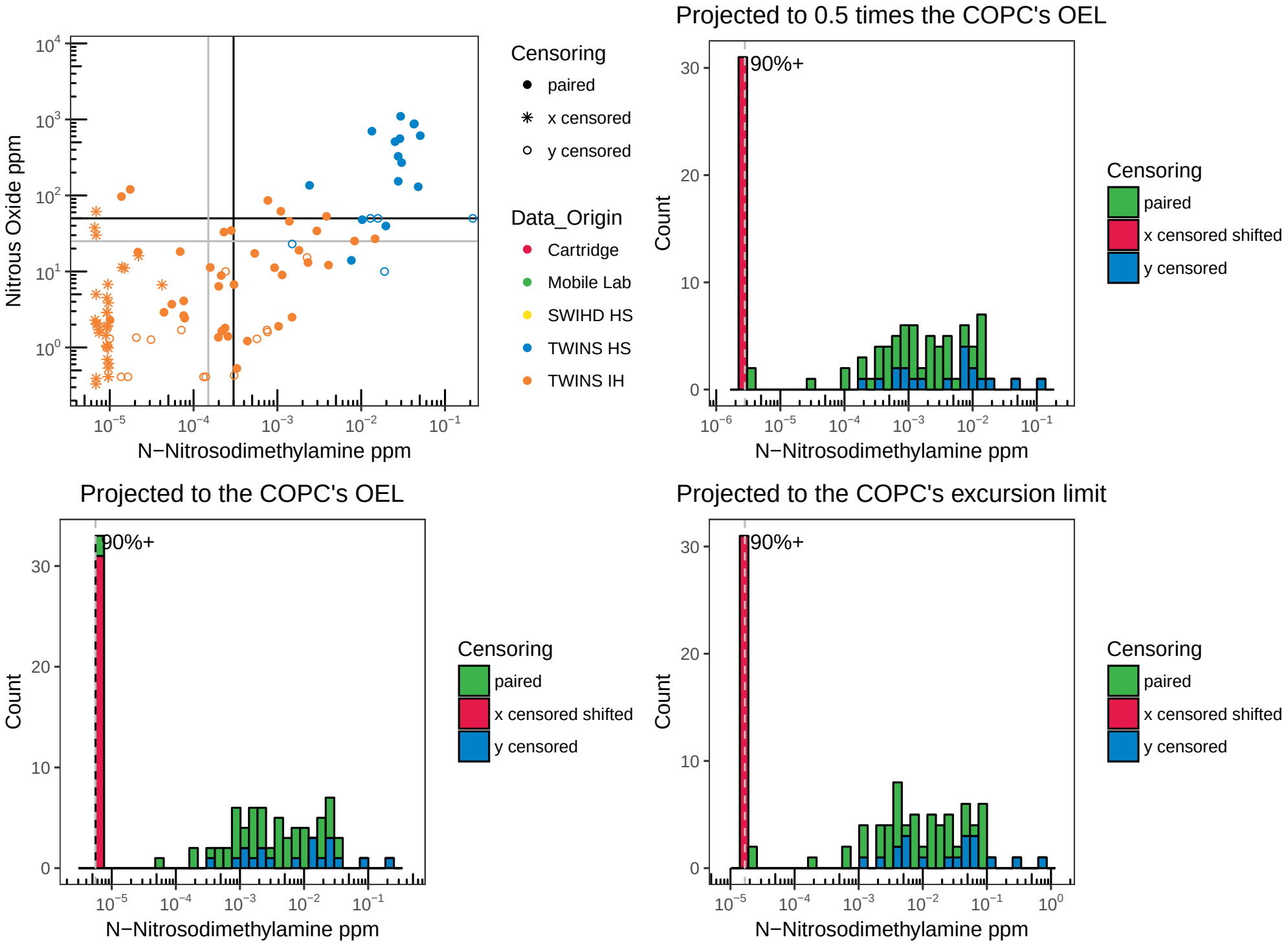


Figure C.2087: Nitrous Oxide vs N-Nitrosodimethylamine

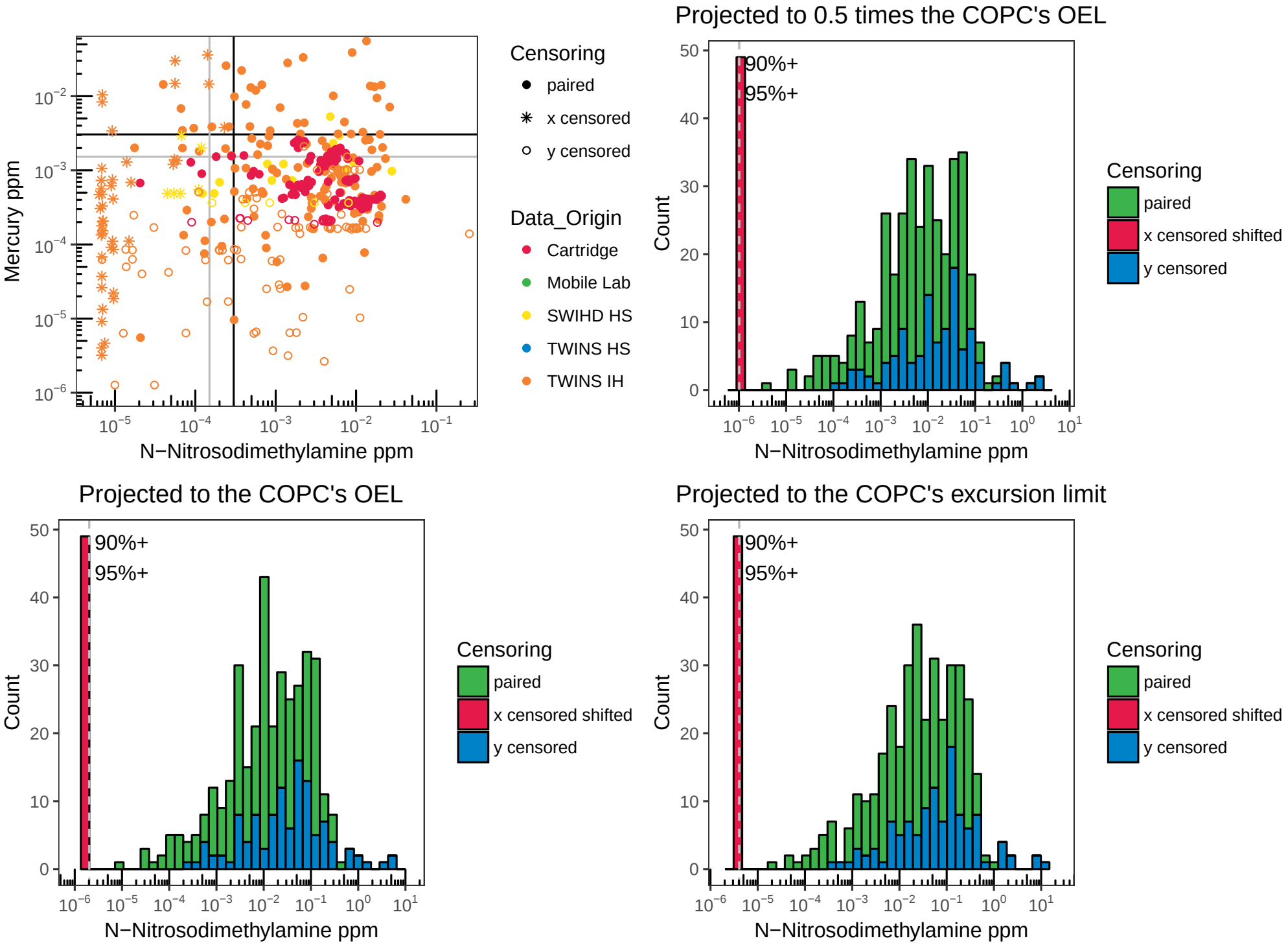


Figure C.2088: Mercury vs N-Nitrosodimethylamine

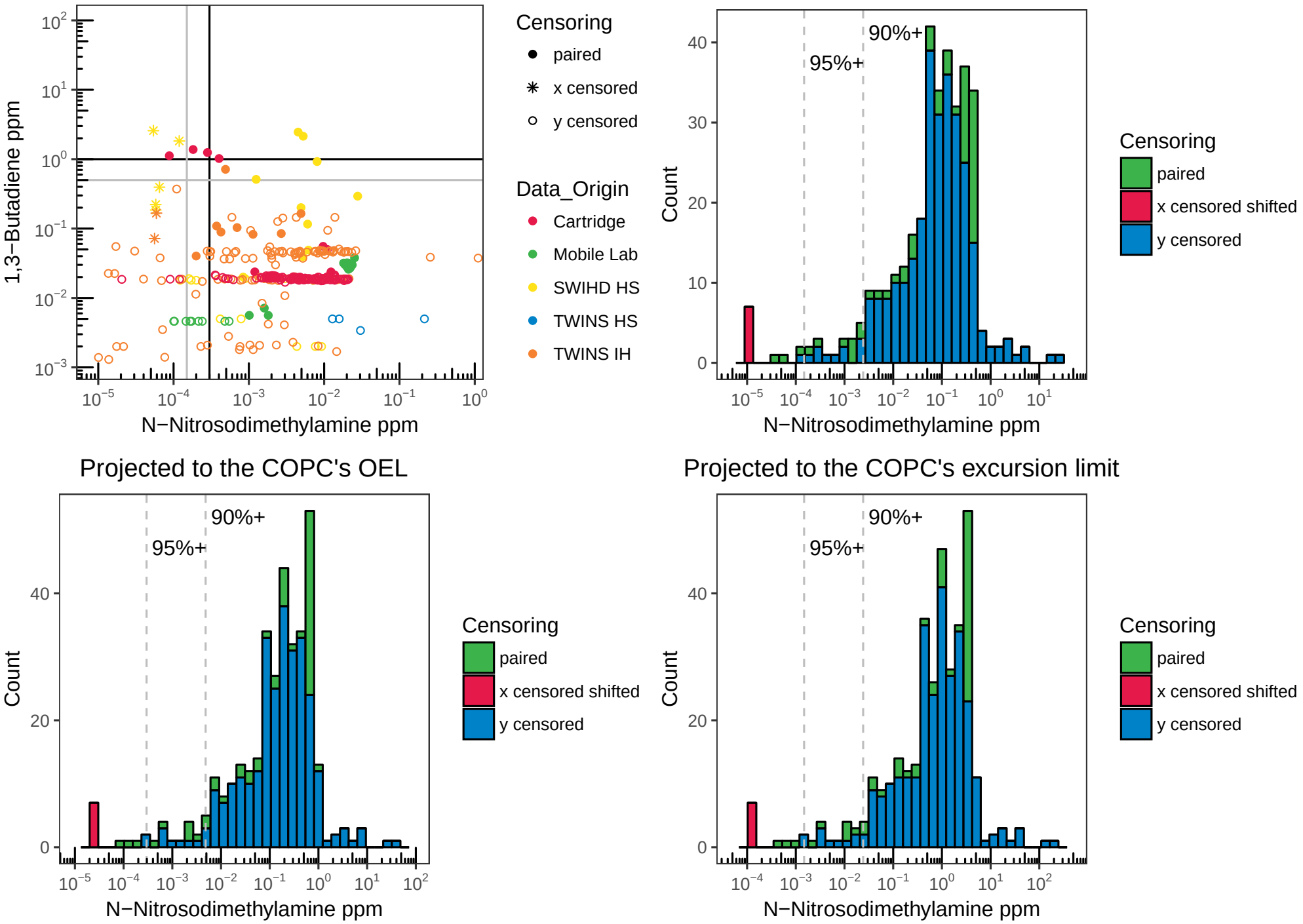


Figure C.2089: 1,3-Butadiene vs N-Nitrosodimethylamine

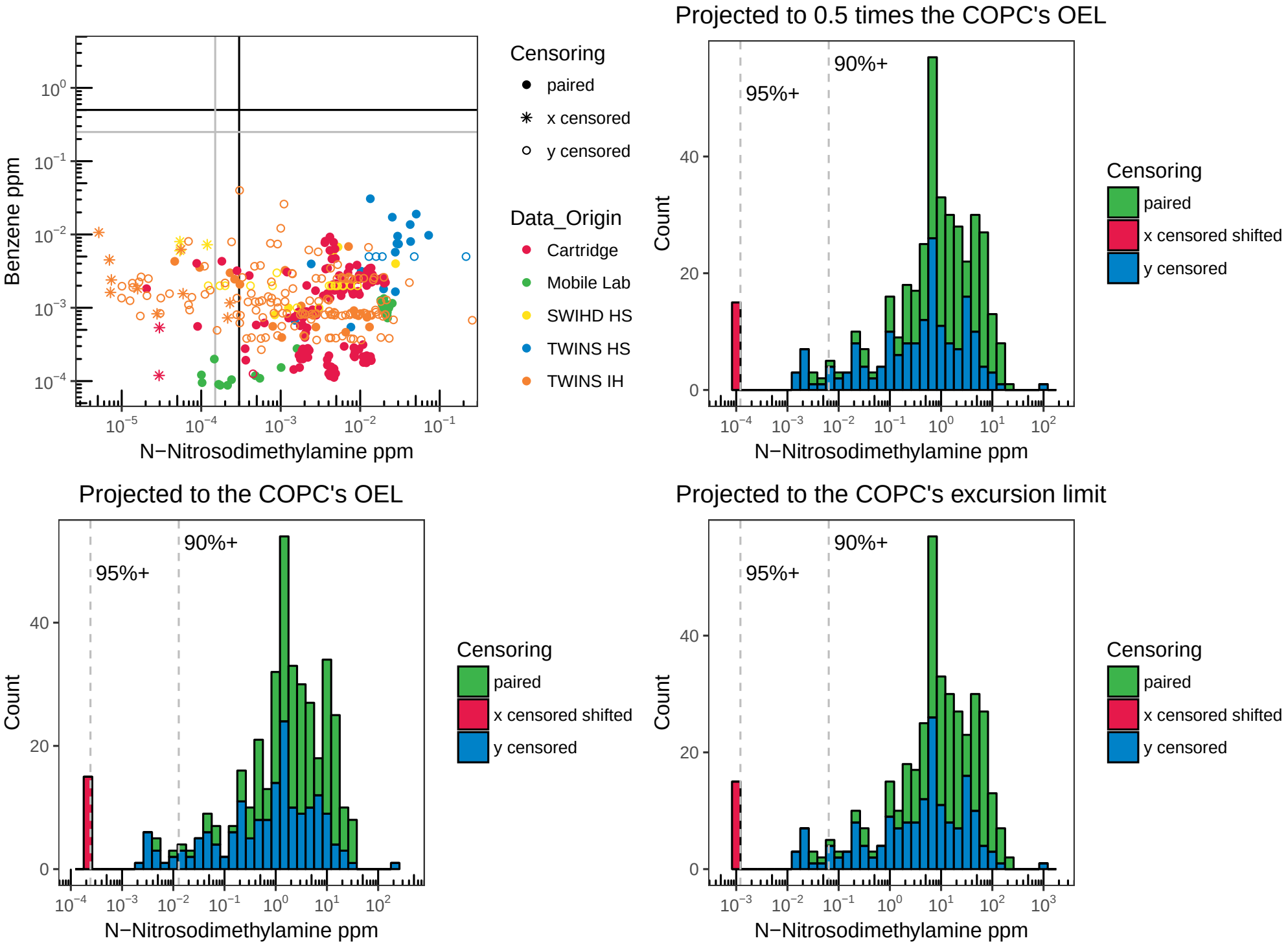


Figure C.2090: Benzene vs N-Nitrosodimethylamine

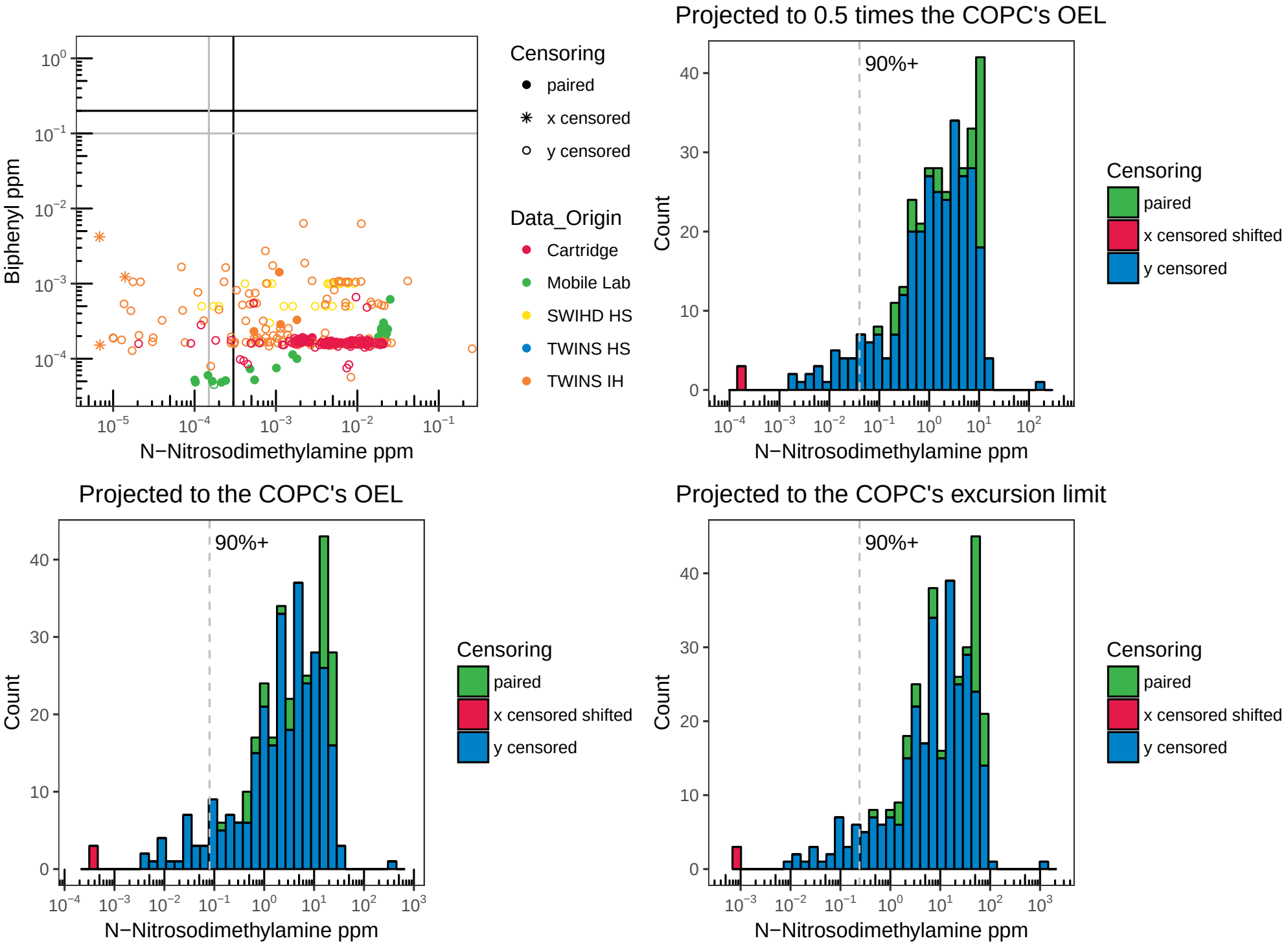


Figure C.2091: Biphenyl vs N-Nitrosodimethylamine

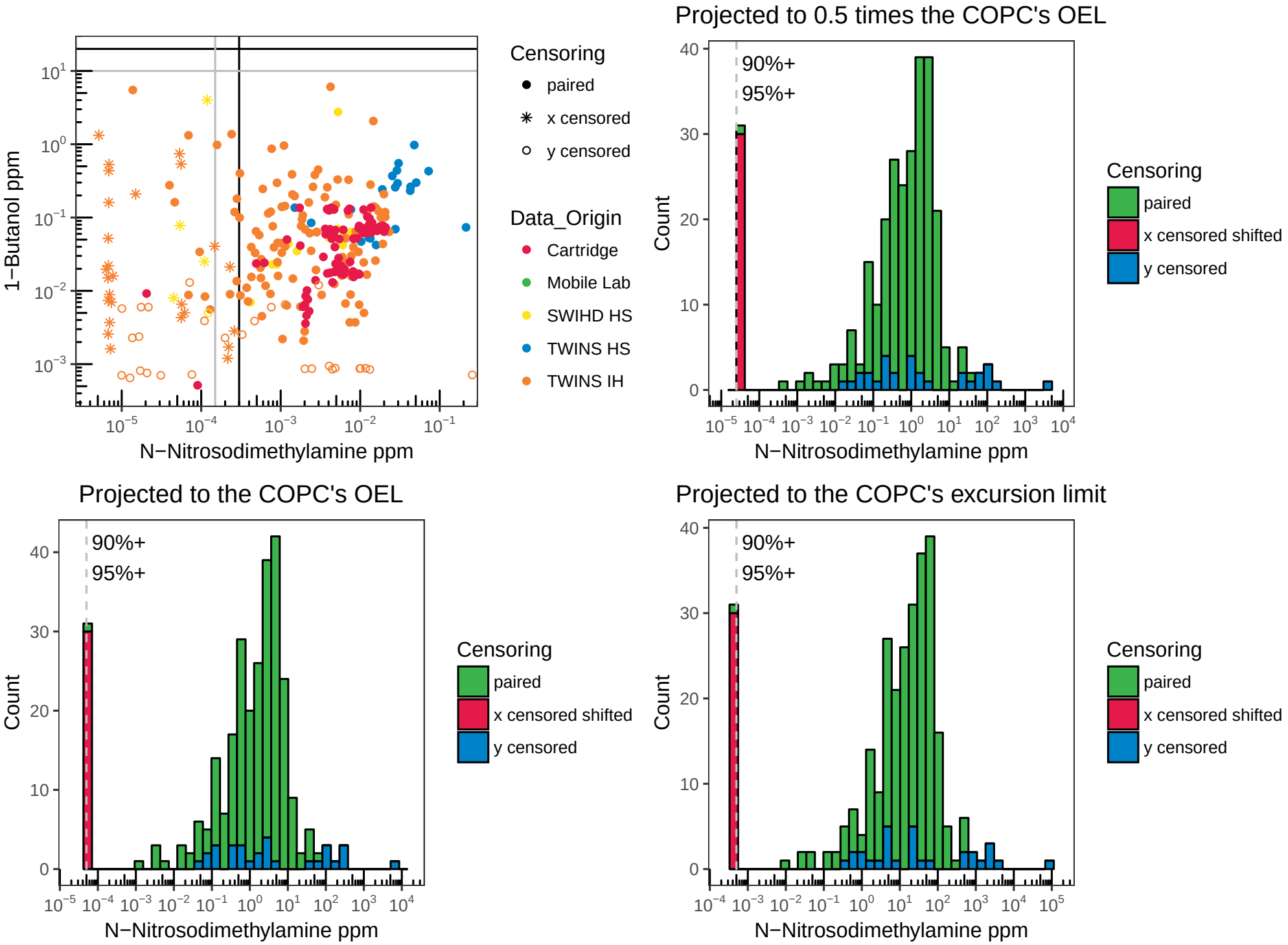


Figure C.2092: 1-Butanol vs N-Nitrosodimethylamine

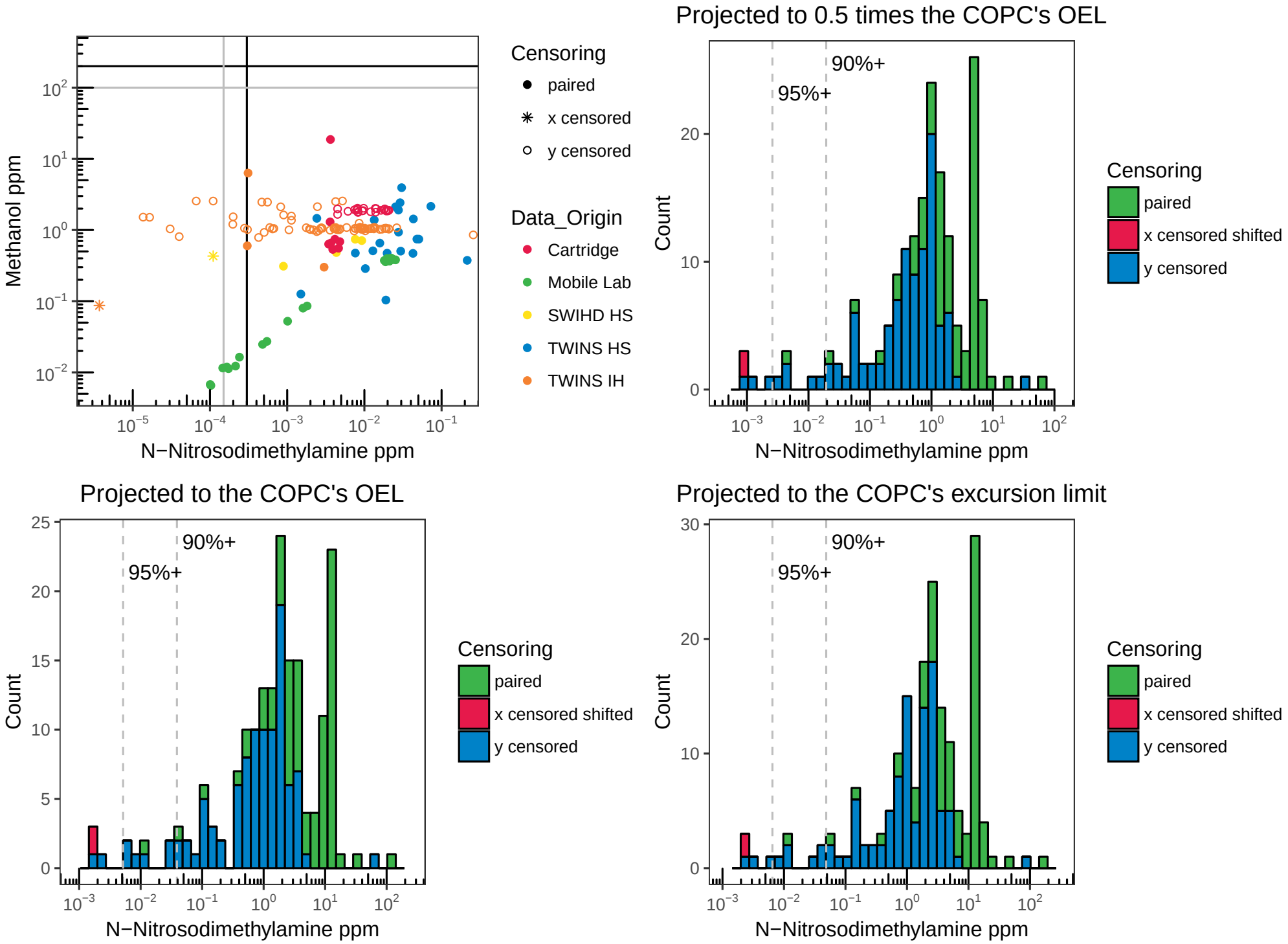


Figure C.2093: Methanol vs N-Nitrosodimethylamine

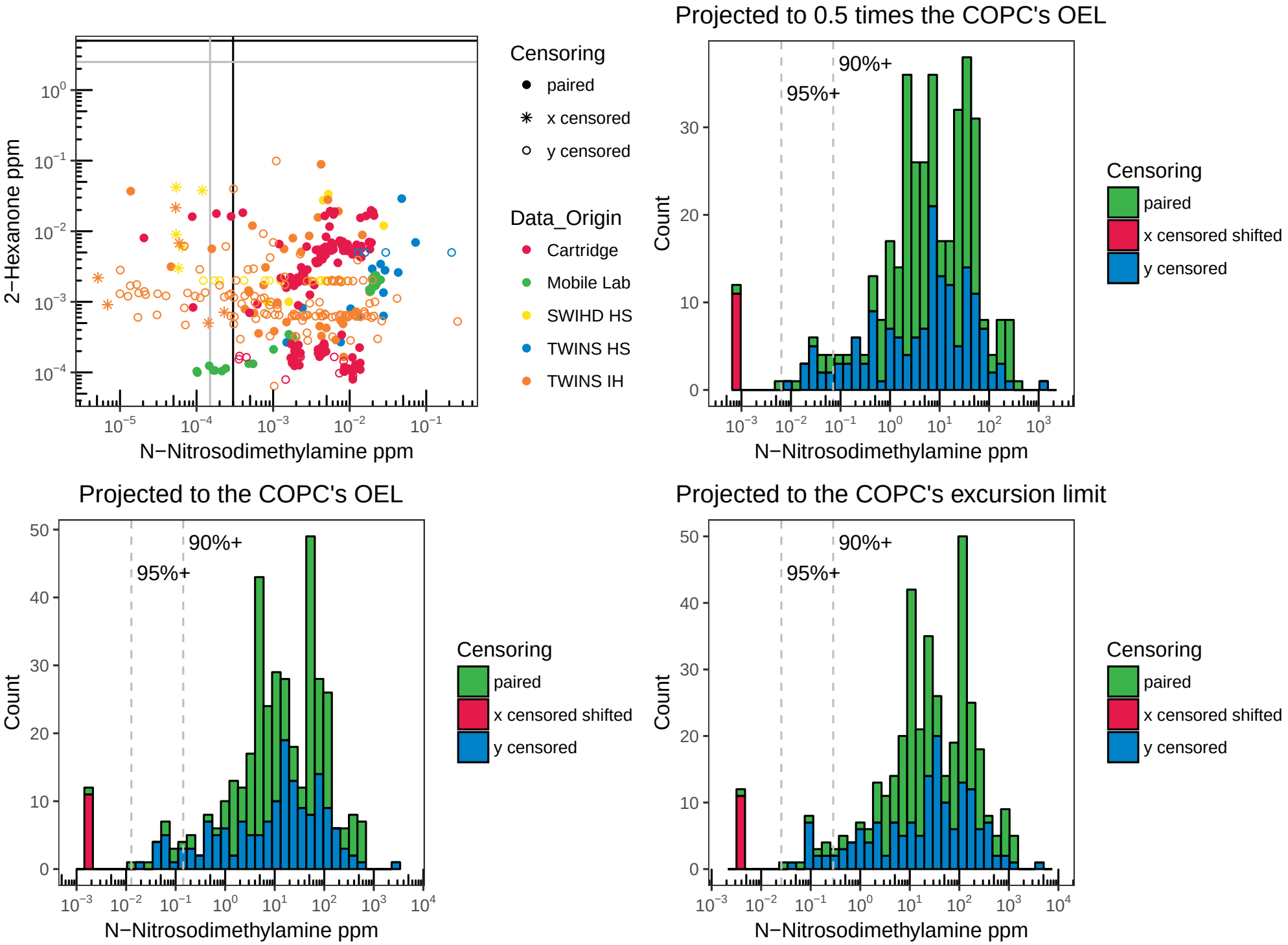


Figure C.2094: 2-Hexanone vs N-Nitrosodimethylamine

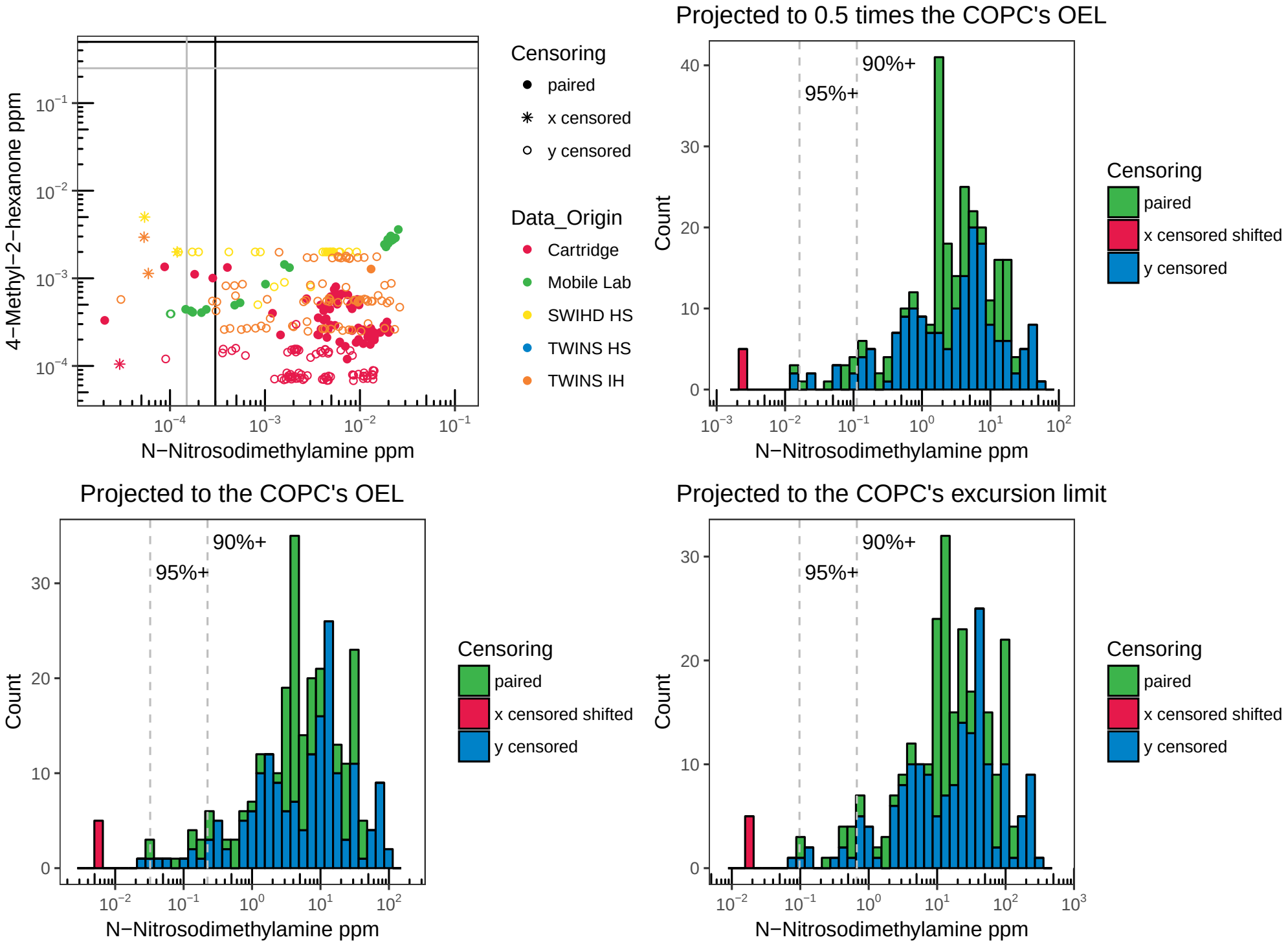


Figure C.2095: 4-Methyl-2-hexanone vs N-Nitrosodimethylamine

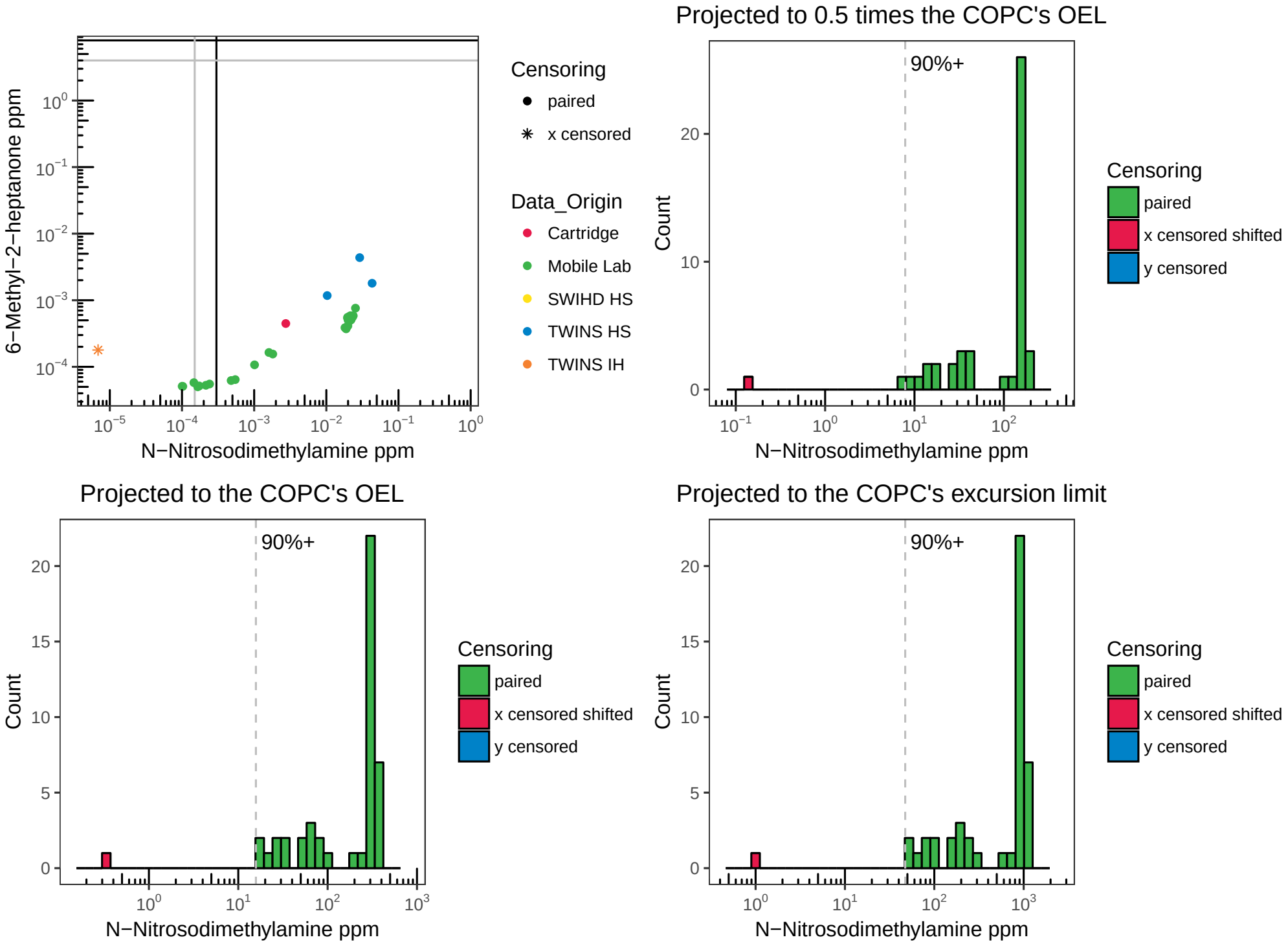


Figure C.2096: 6-Methyl-2-heptanone vs N-Nitrosodimethylamine

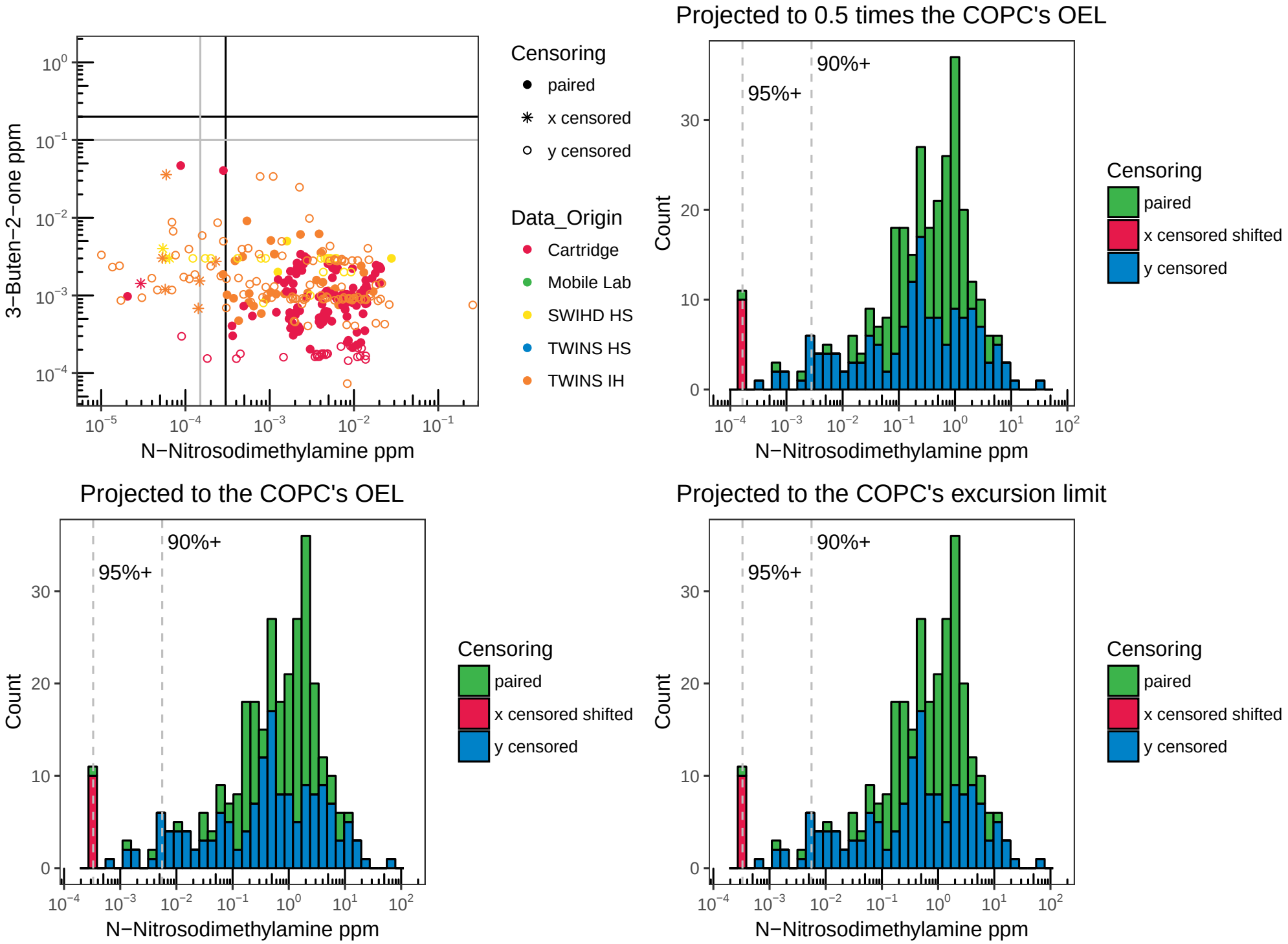


Figure C.2097: 3-Buten-2-one vs N-Nitrosodimethylamine

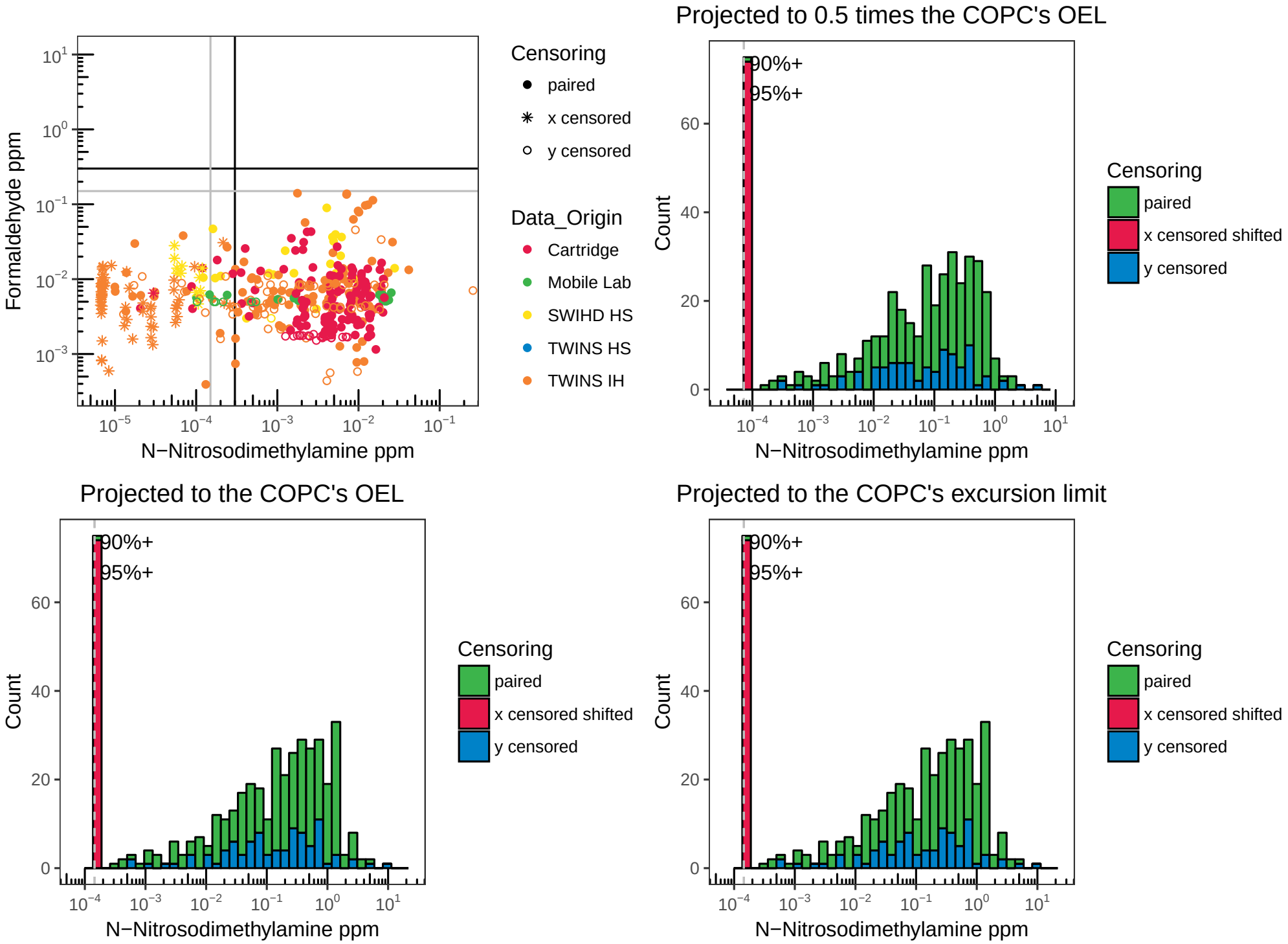


Figure C.2098: Formaldehyde vs N-Nitrosodimethylamine

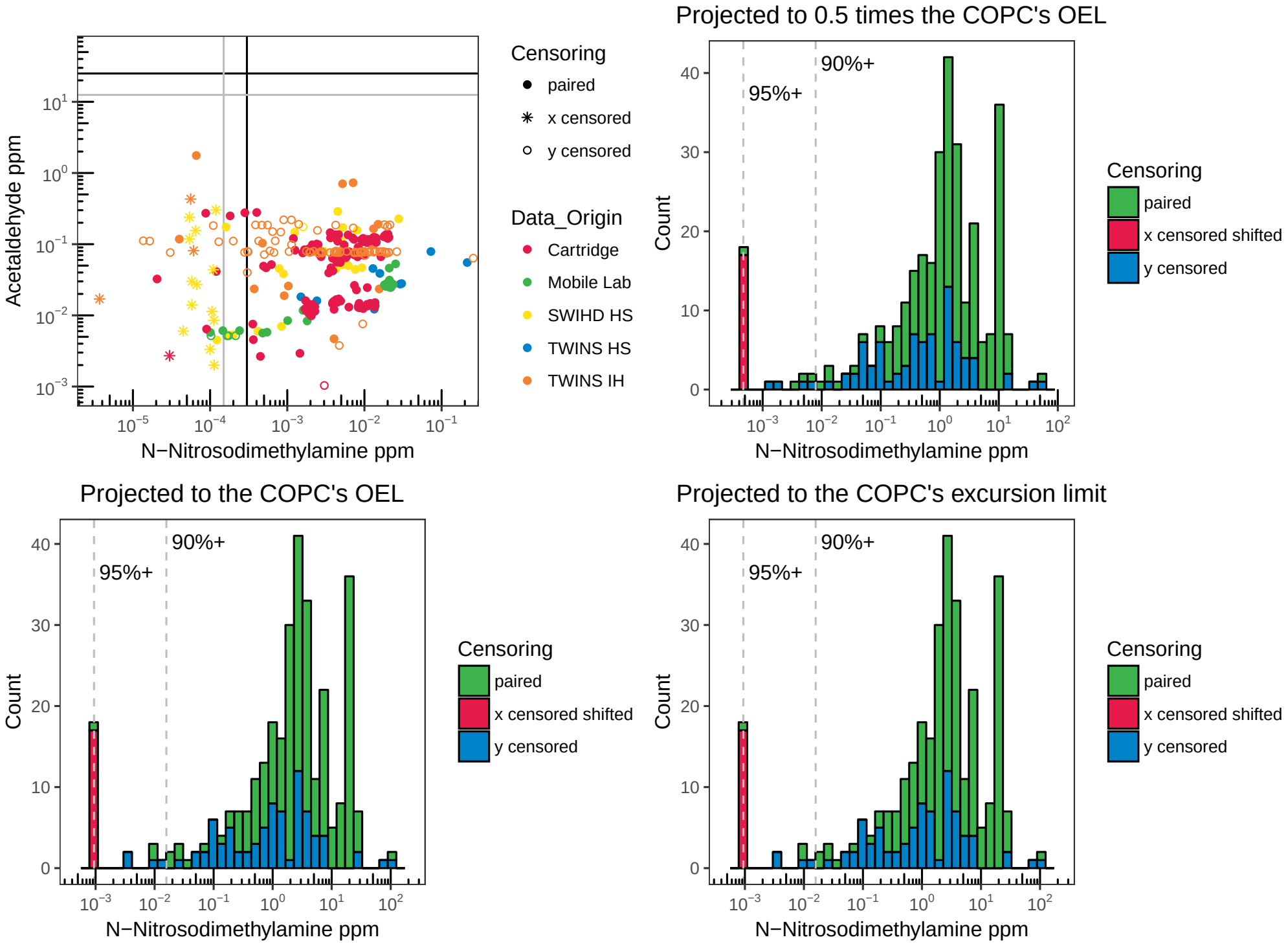


Figure C.2099: Acetaldehyde vs N-Nitrosodimethylamine

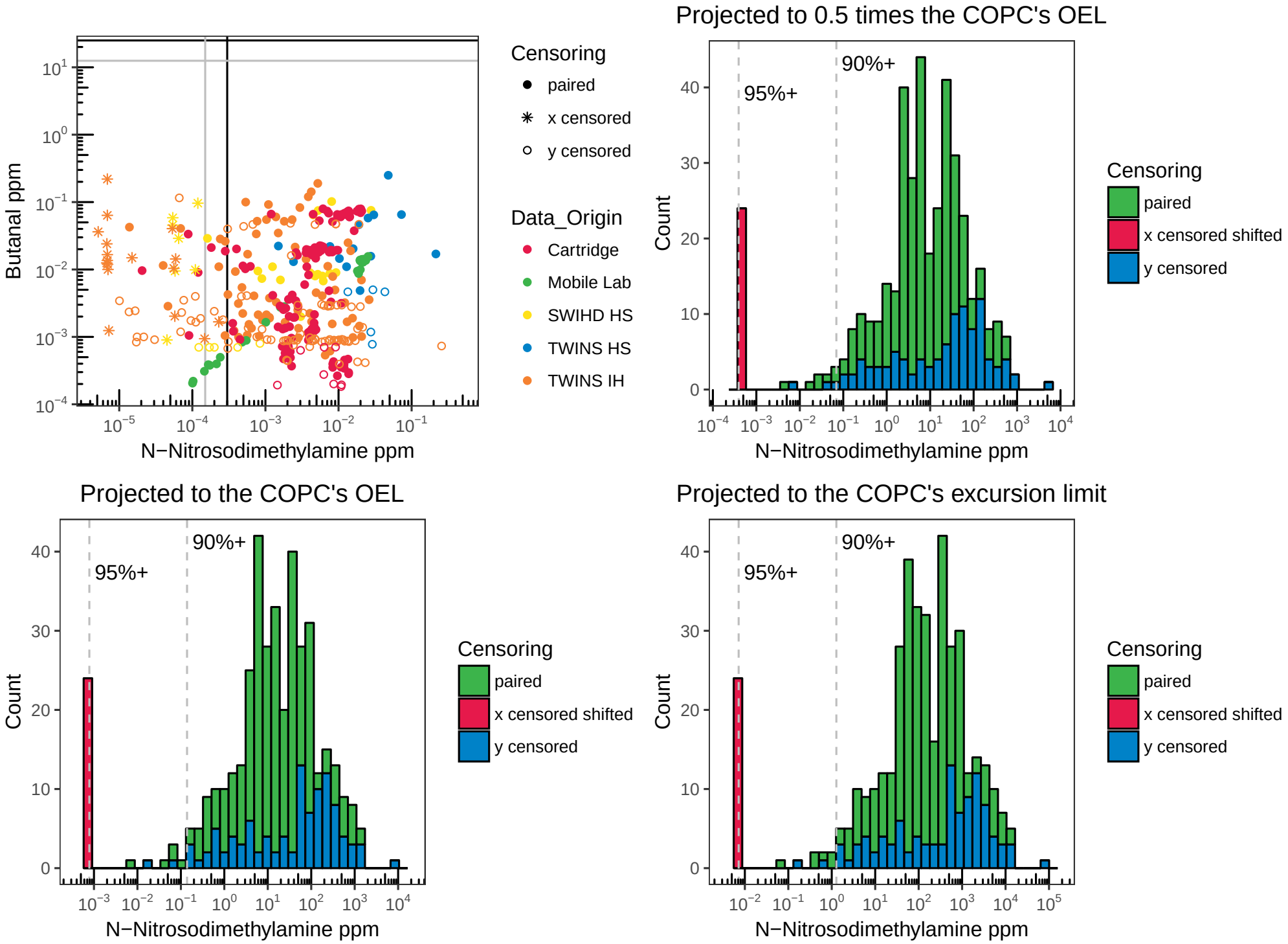


Figure C.2100: Butanal vs N-Nitrosodimethylamine

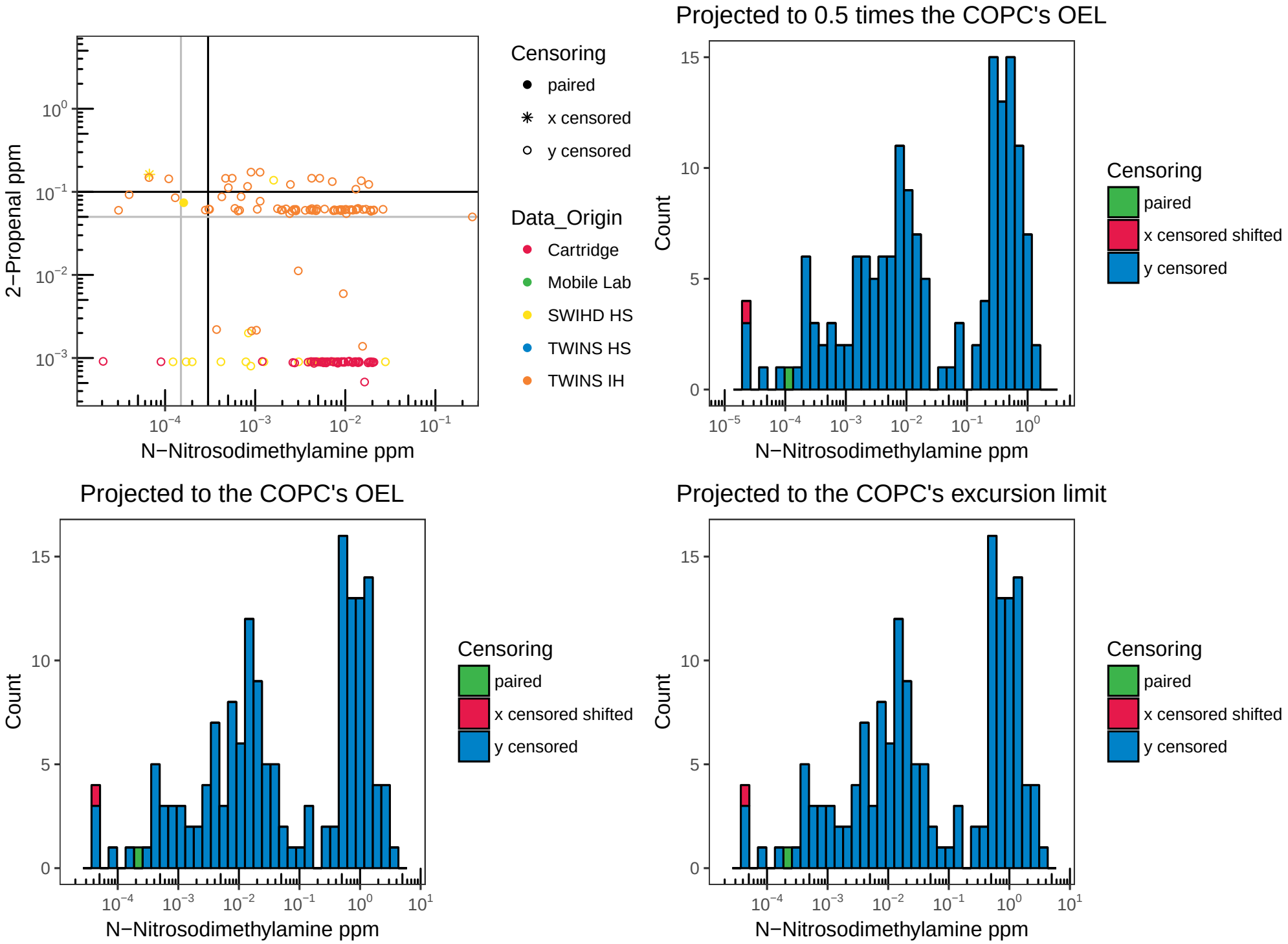


Figure C.2101: 2-Propenal vs N-Nitrosodimethylamine

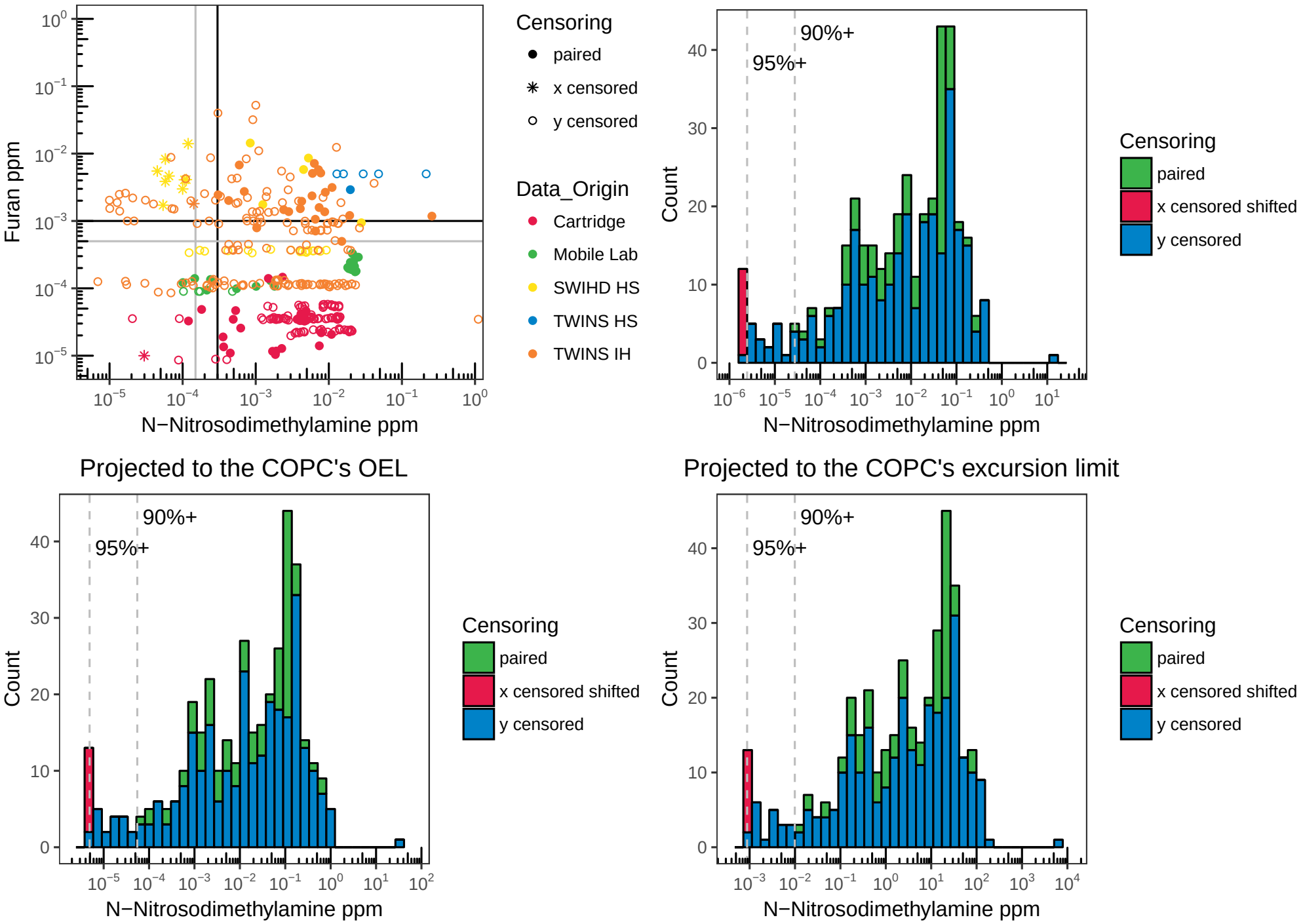


Figure C.2102: Furan vs N-Nitrosodimethylamine

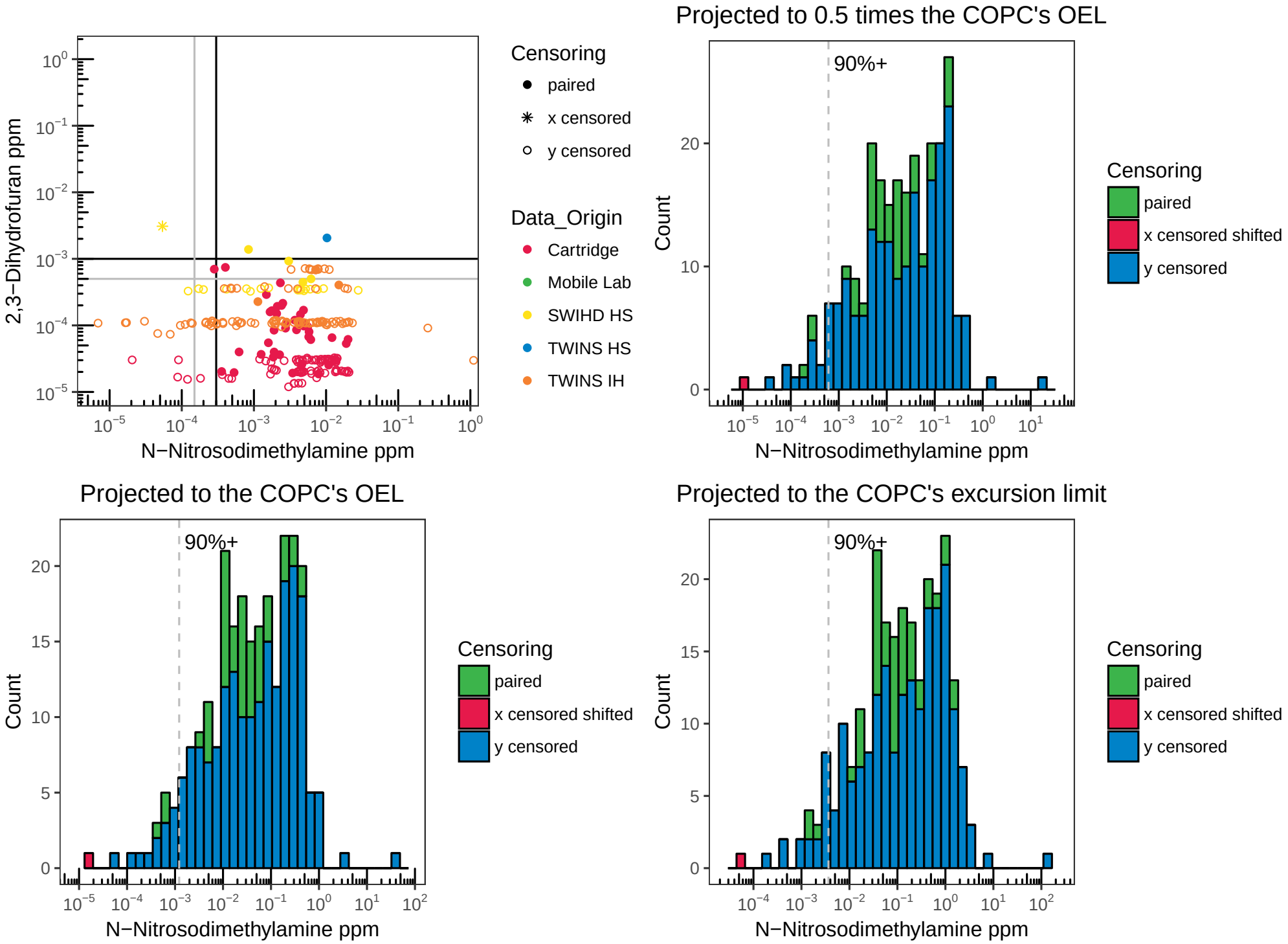


Figure C.2103: 2,3-Dihydrofuran vs N-Nitrosodimethylamine

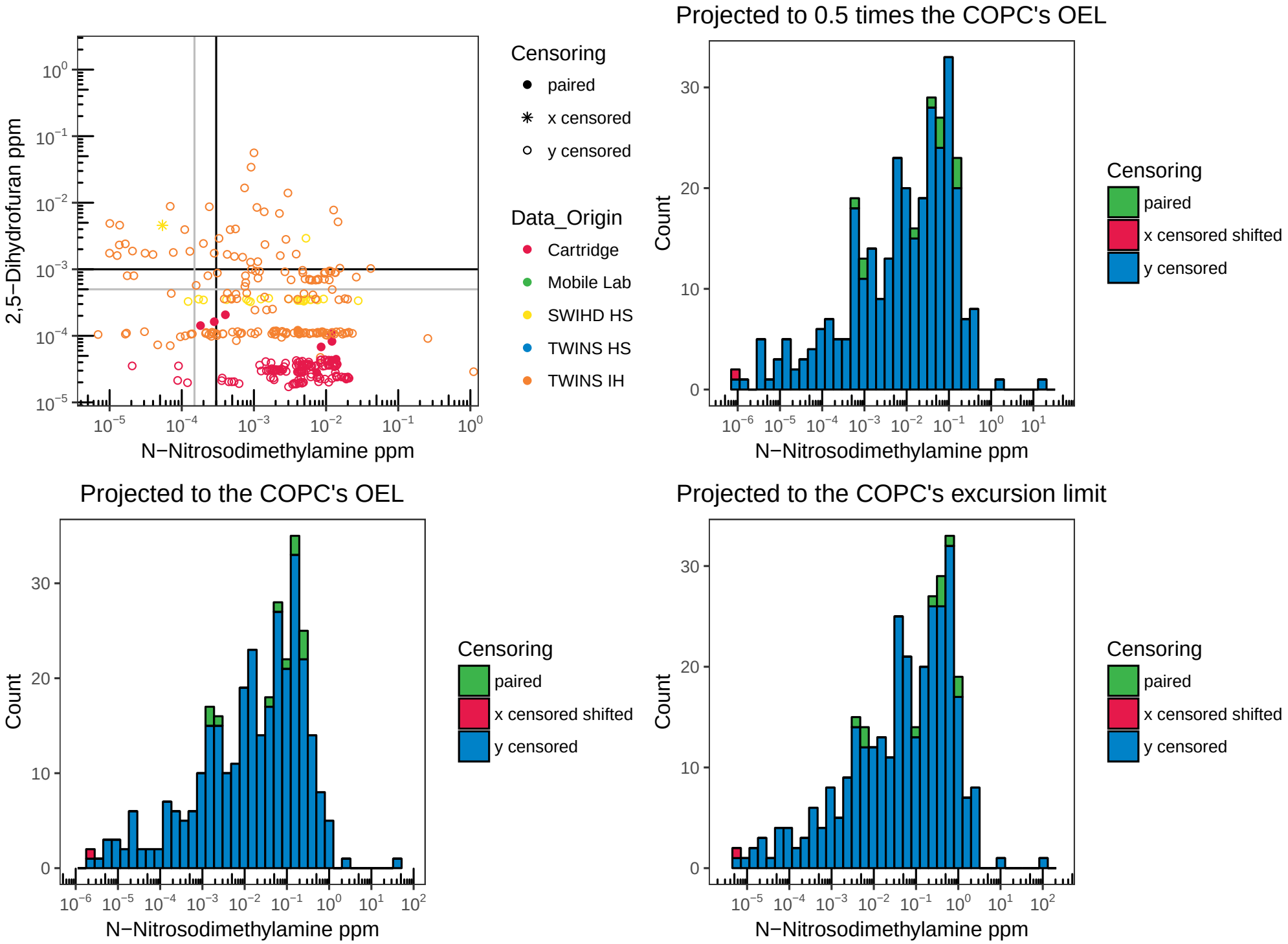


Figure C.2104: 2,5-Dihydrofuran vs N-Nitrosodimethylamine

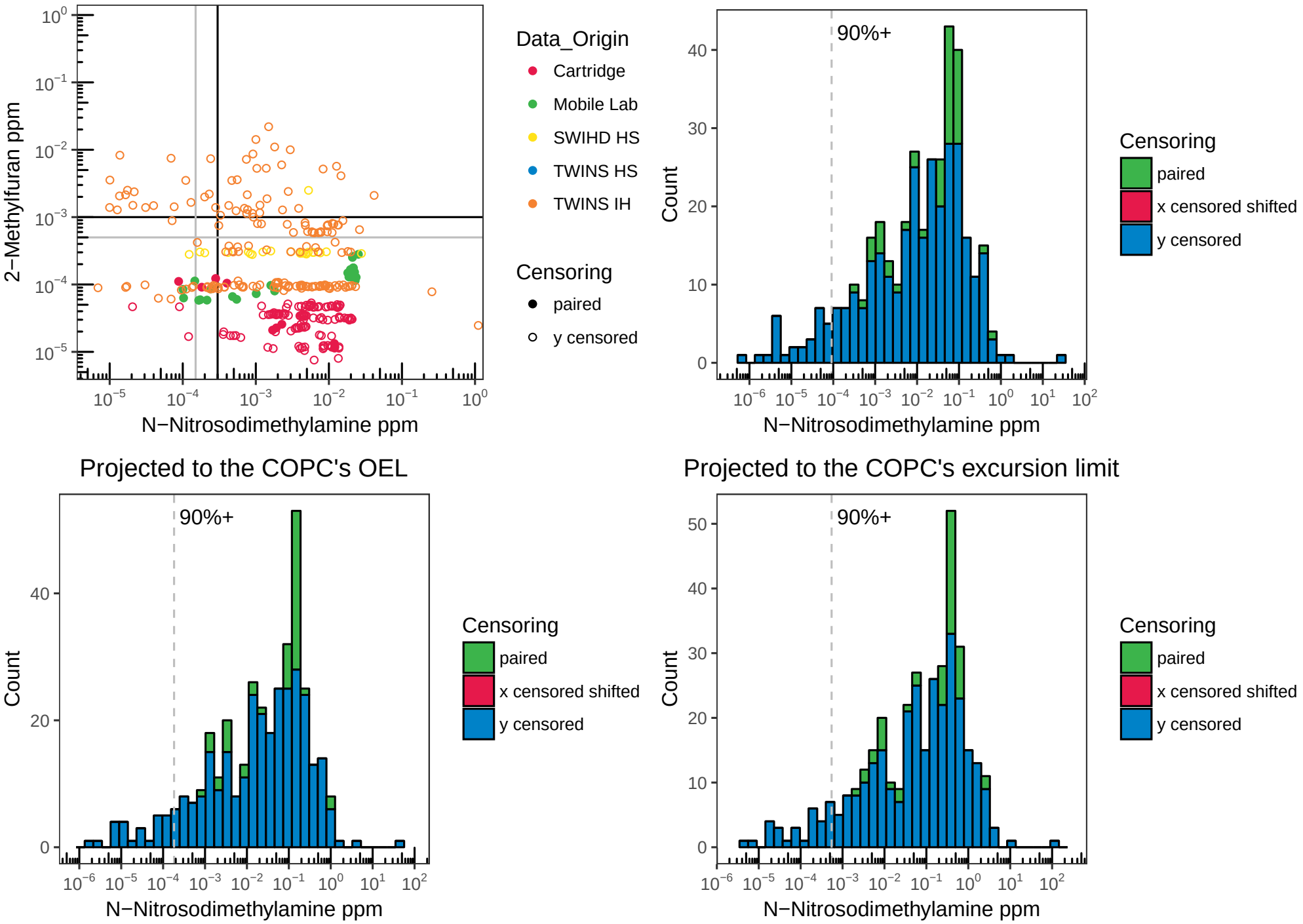


Figure C.2105: 2-Methylfuran vs N-Nitrosodimethylamine

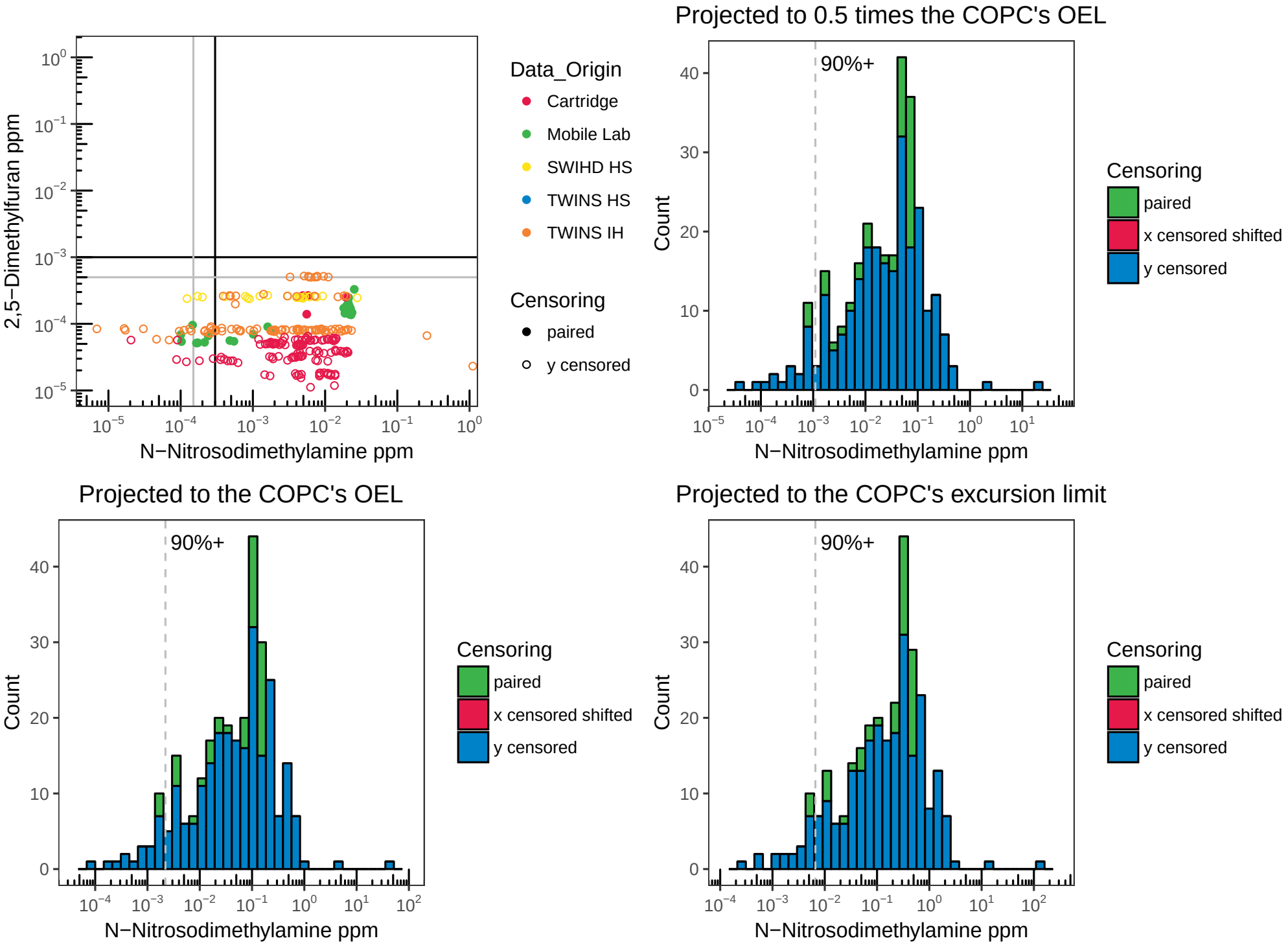


Figure C.2106: 2,5-Dimethylfuran vs N-Nitrosodimethylamine

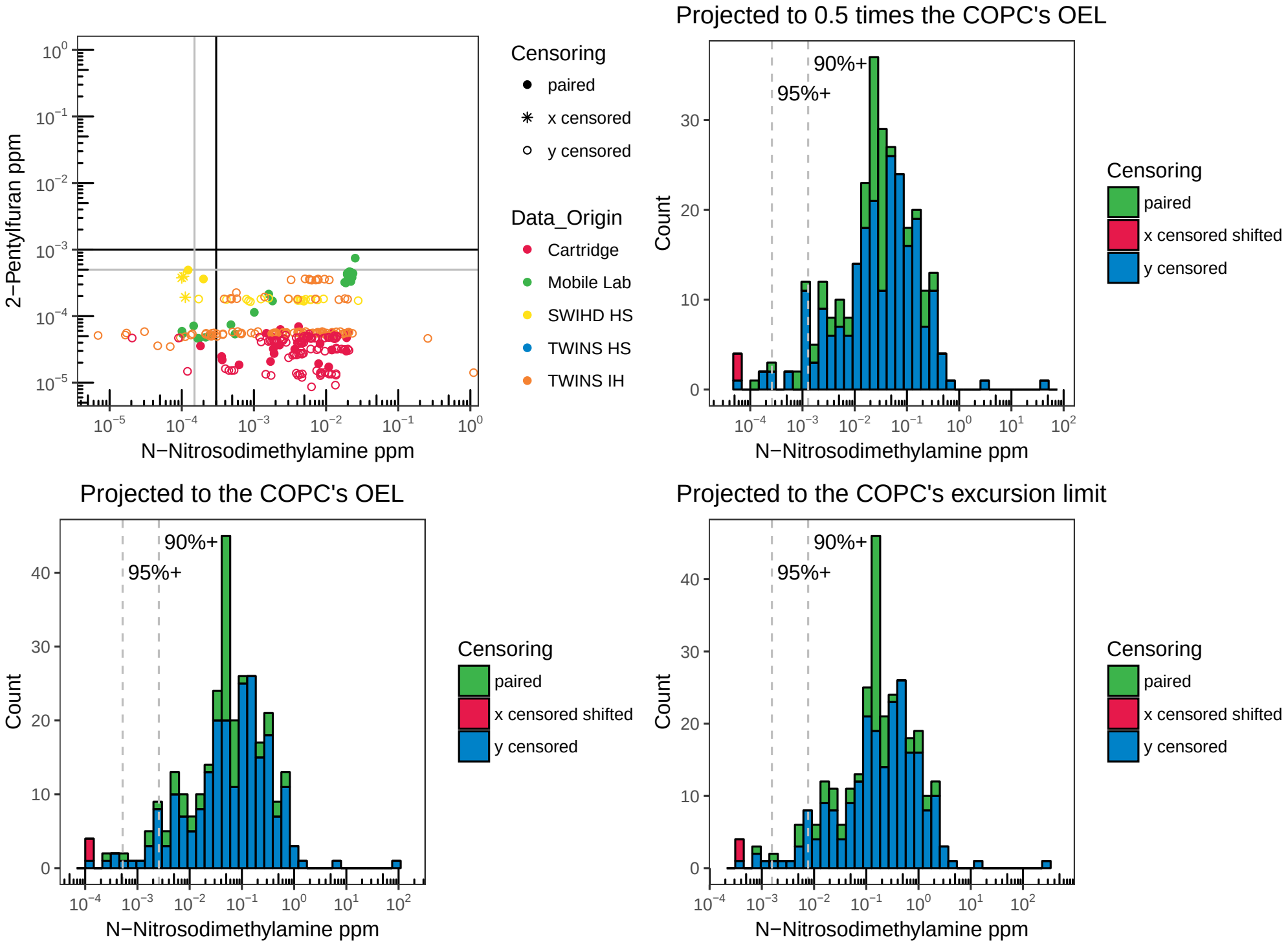


Figure C.2107: 2-Pentylfuran vs N-Nitrosodimethylamine

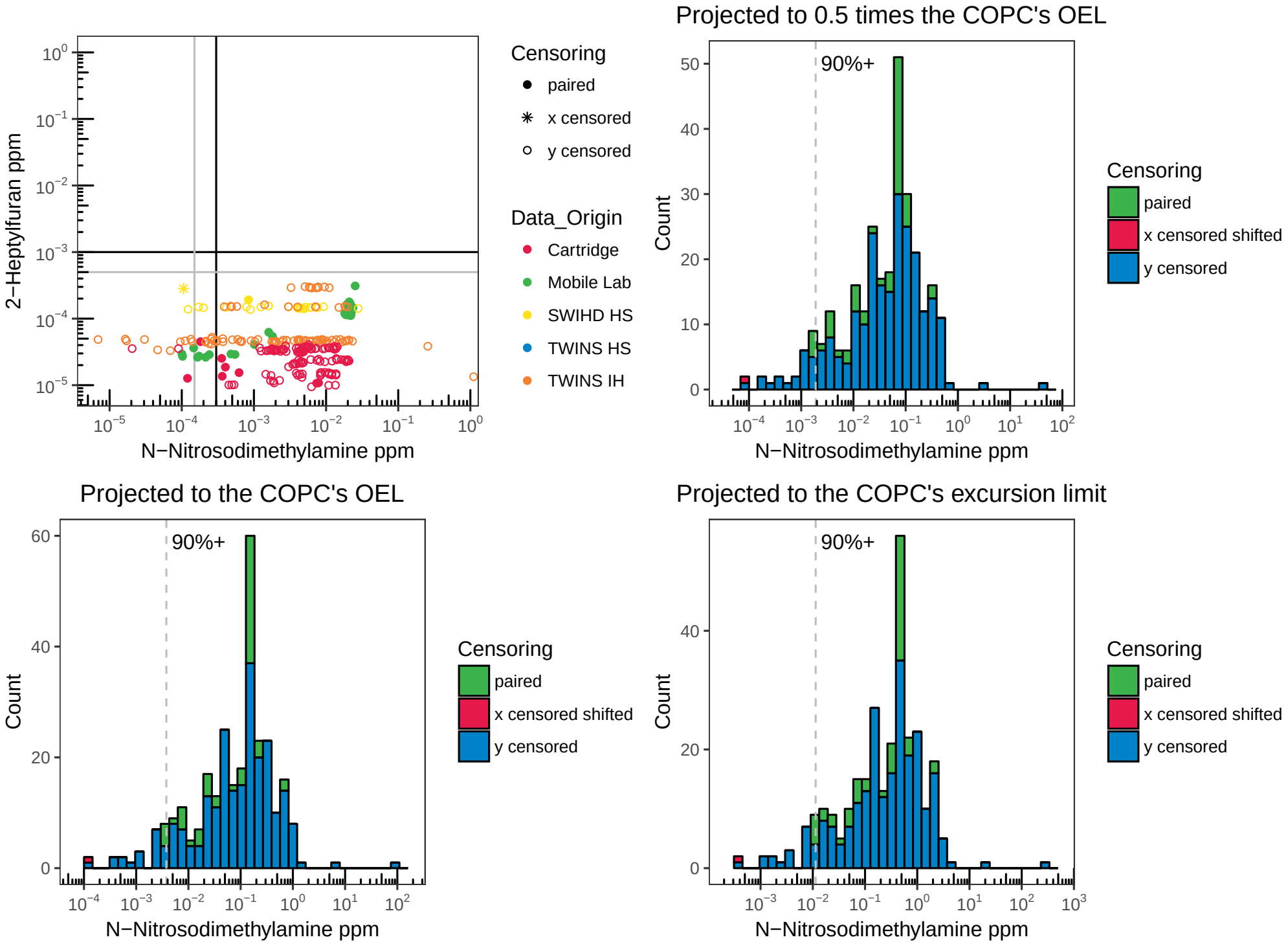


Figure C.2108: 2-Heptylfuran vs N-Nitrosodimethylamine

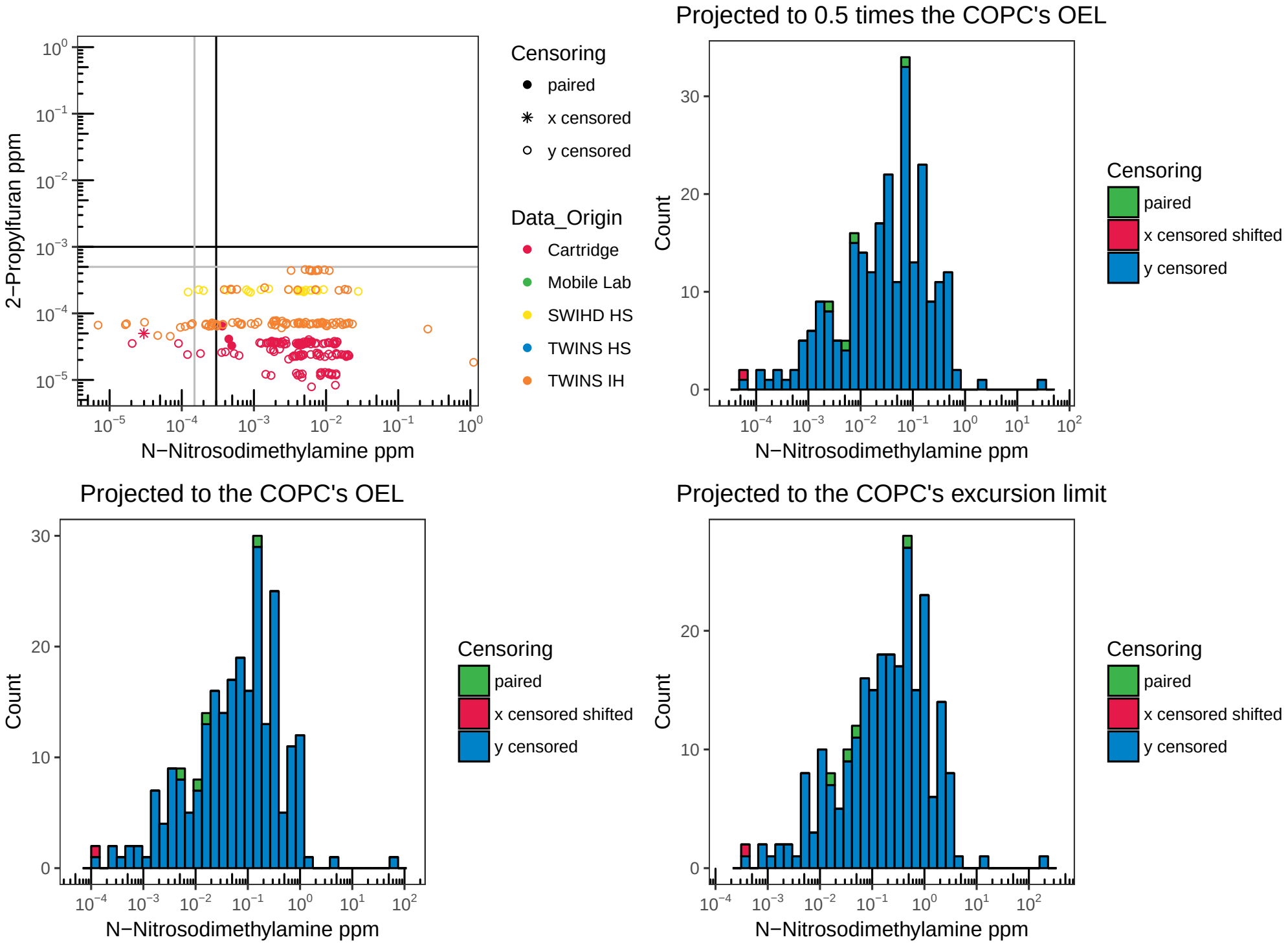


Figure C.2109: 2-Propylfuran vs N-Nitrosodimethylamine

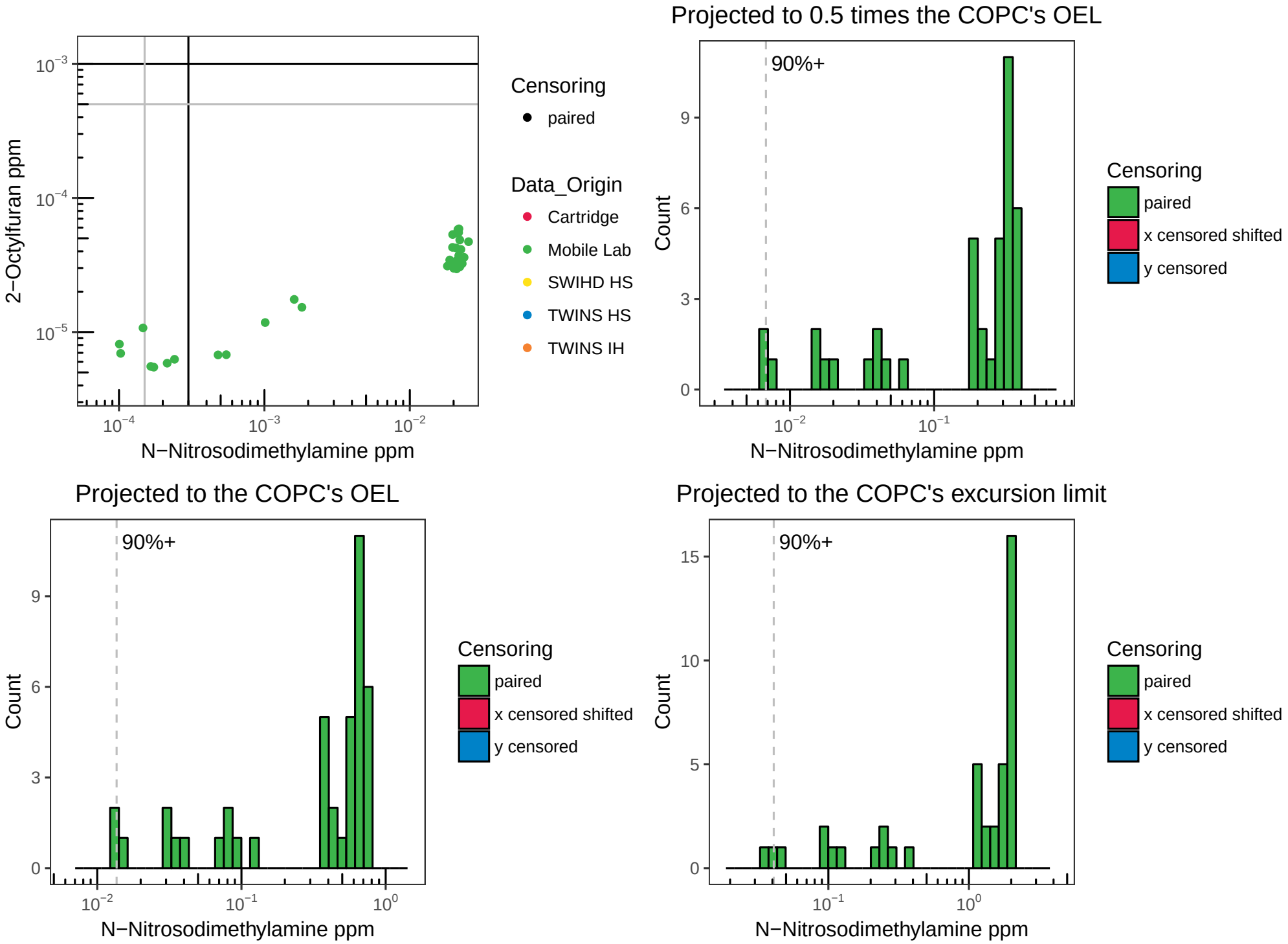


Figure C.2110: 2-Octylfuran vs N-Nitrosodimethylamine

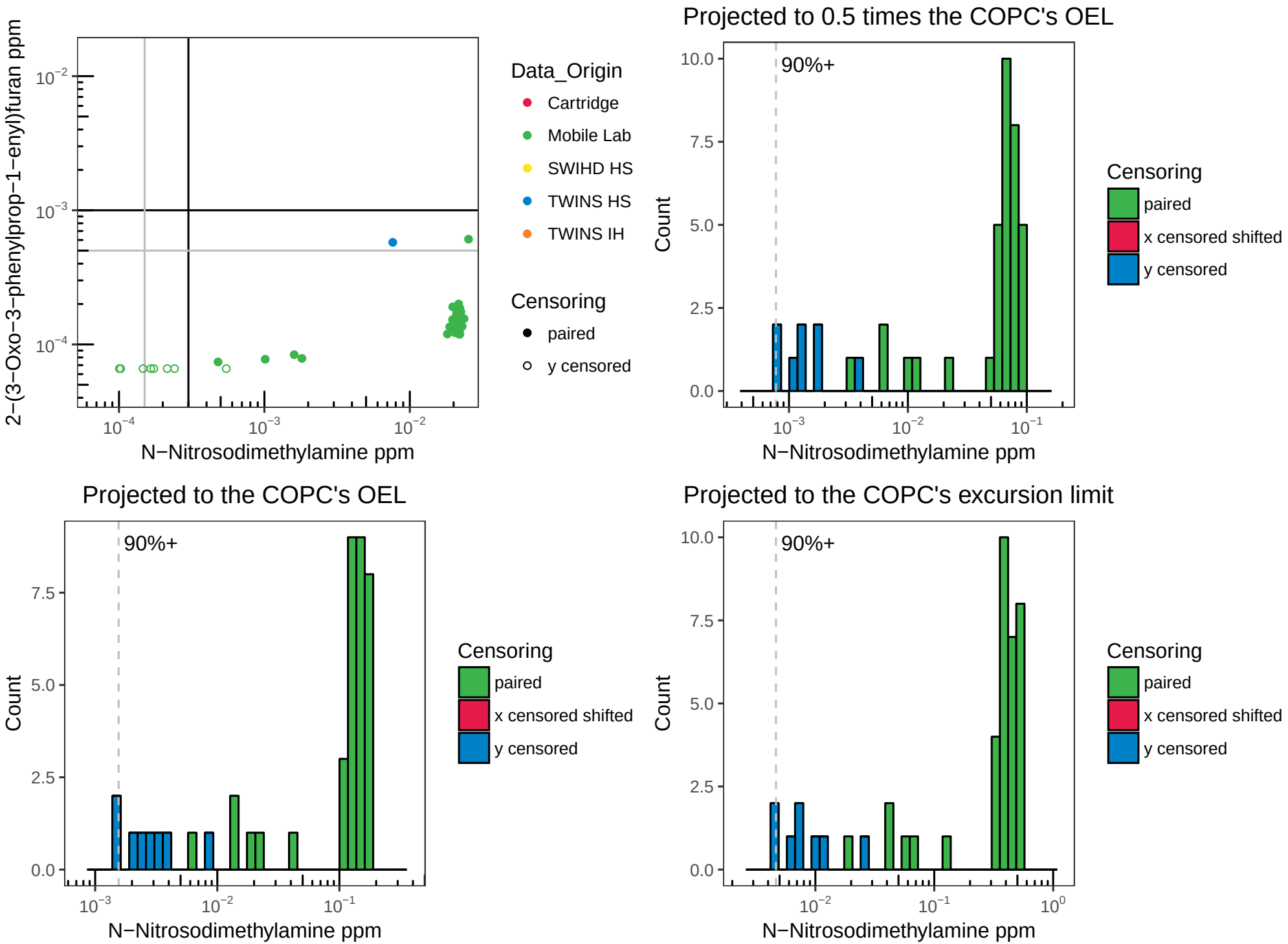


Figure C.2111: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs N-Nitrosodimethylamine

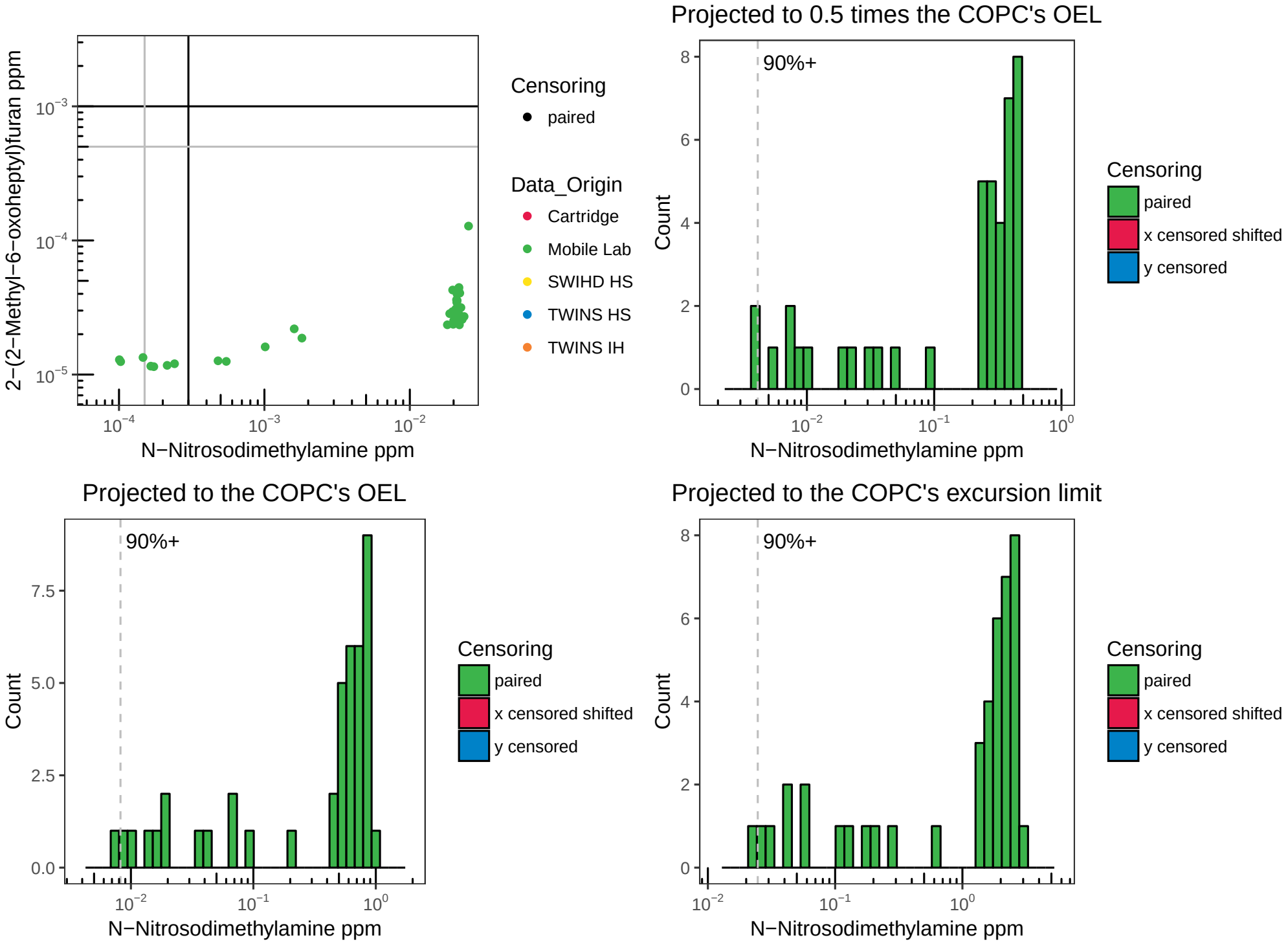


Figure C.2112: 2-(2-Methyl-6-oxoheptyl)furan vs N-Nitrosodimethylamine

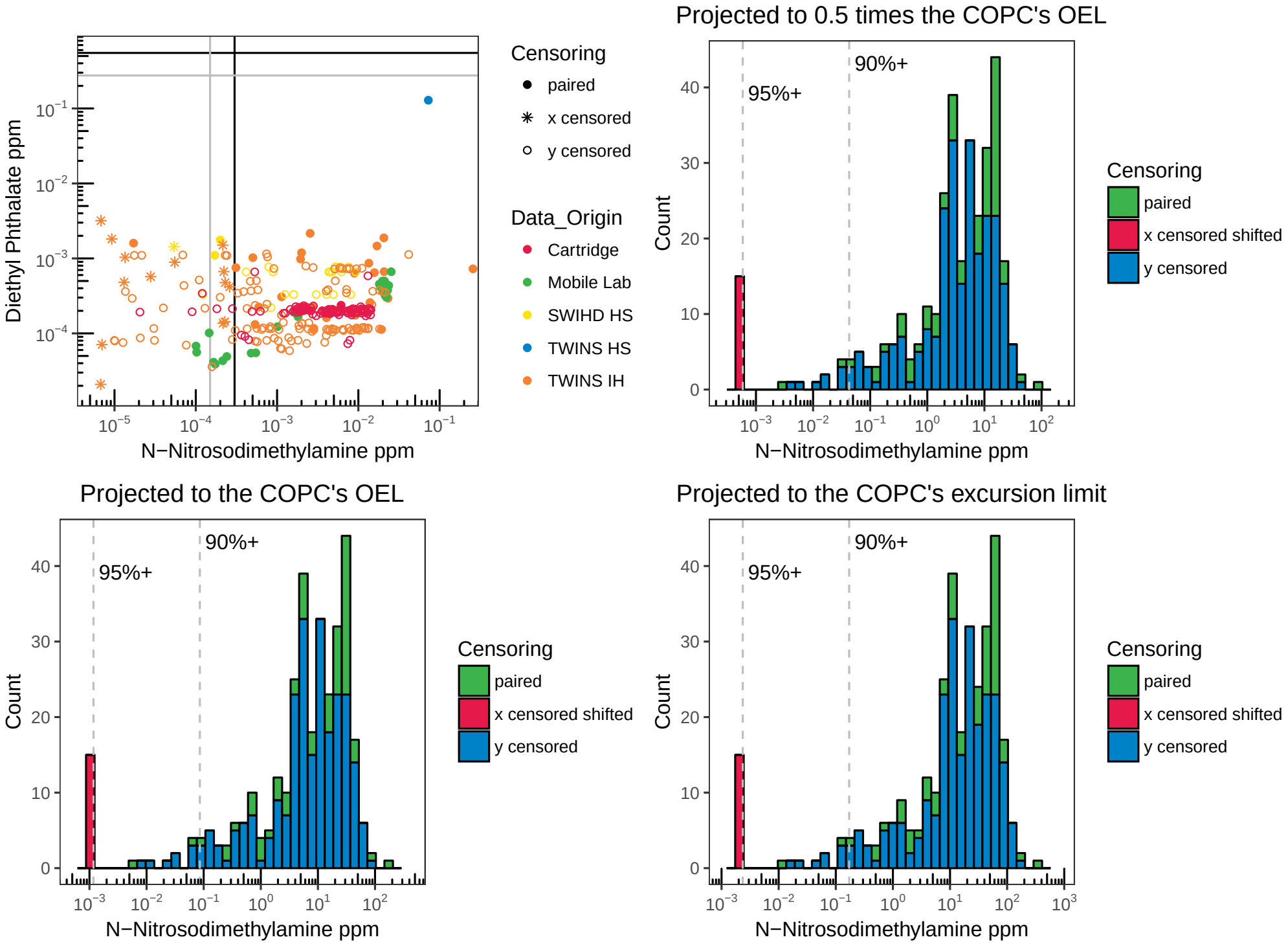


Figure C.2113: Diethyl Phthalate vs N-Nitrosodimethylamine

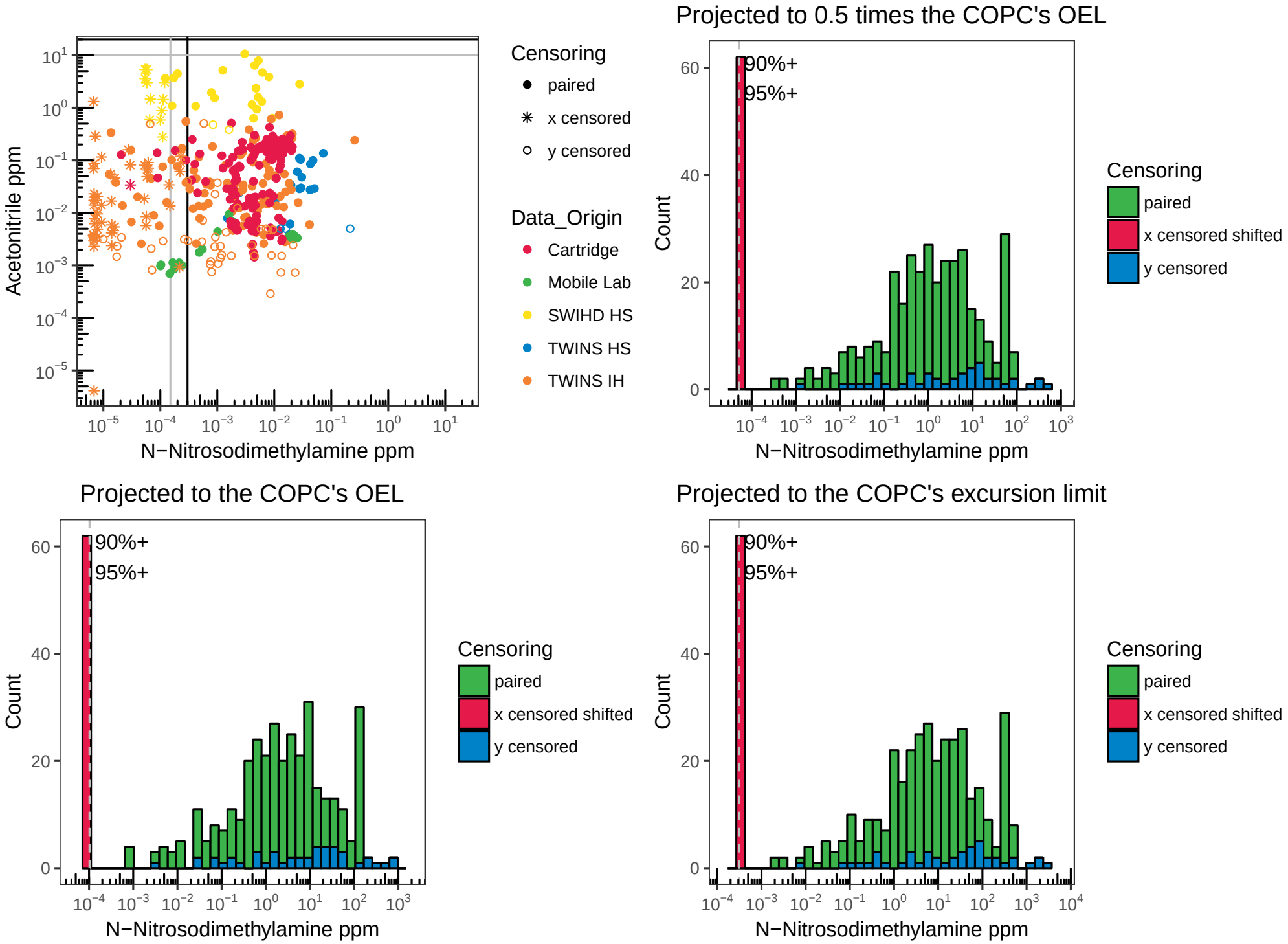


Figure C.2114: Acetonitrile vs N-Nitrosodimethylamine

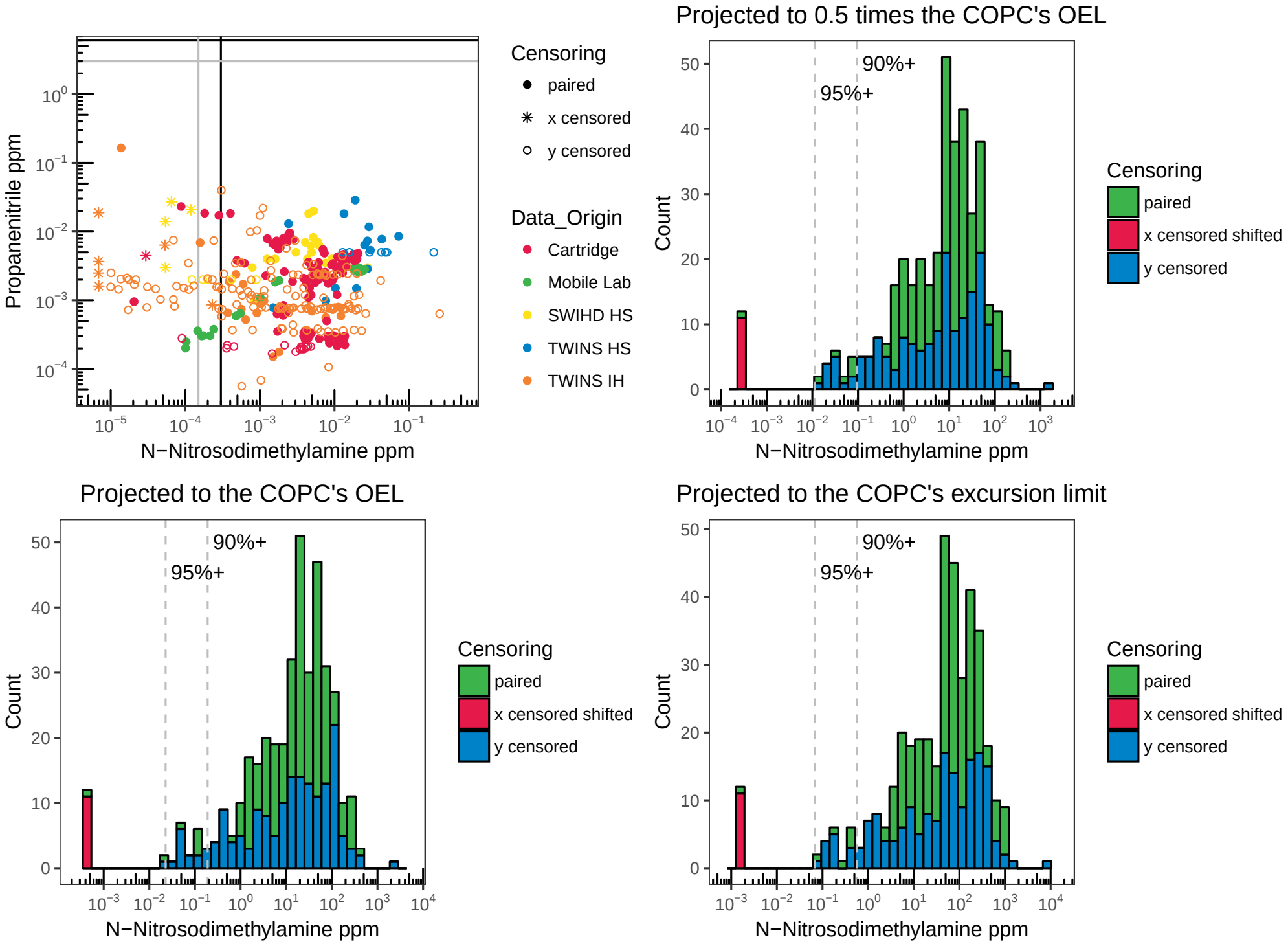


Figure C.2115: Propanenitrile vs N-Nitrosodimethylamine

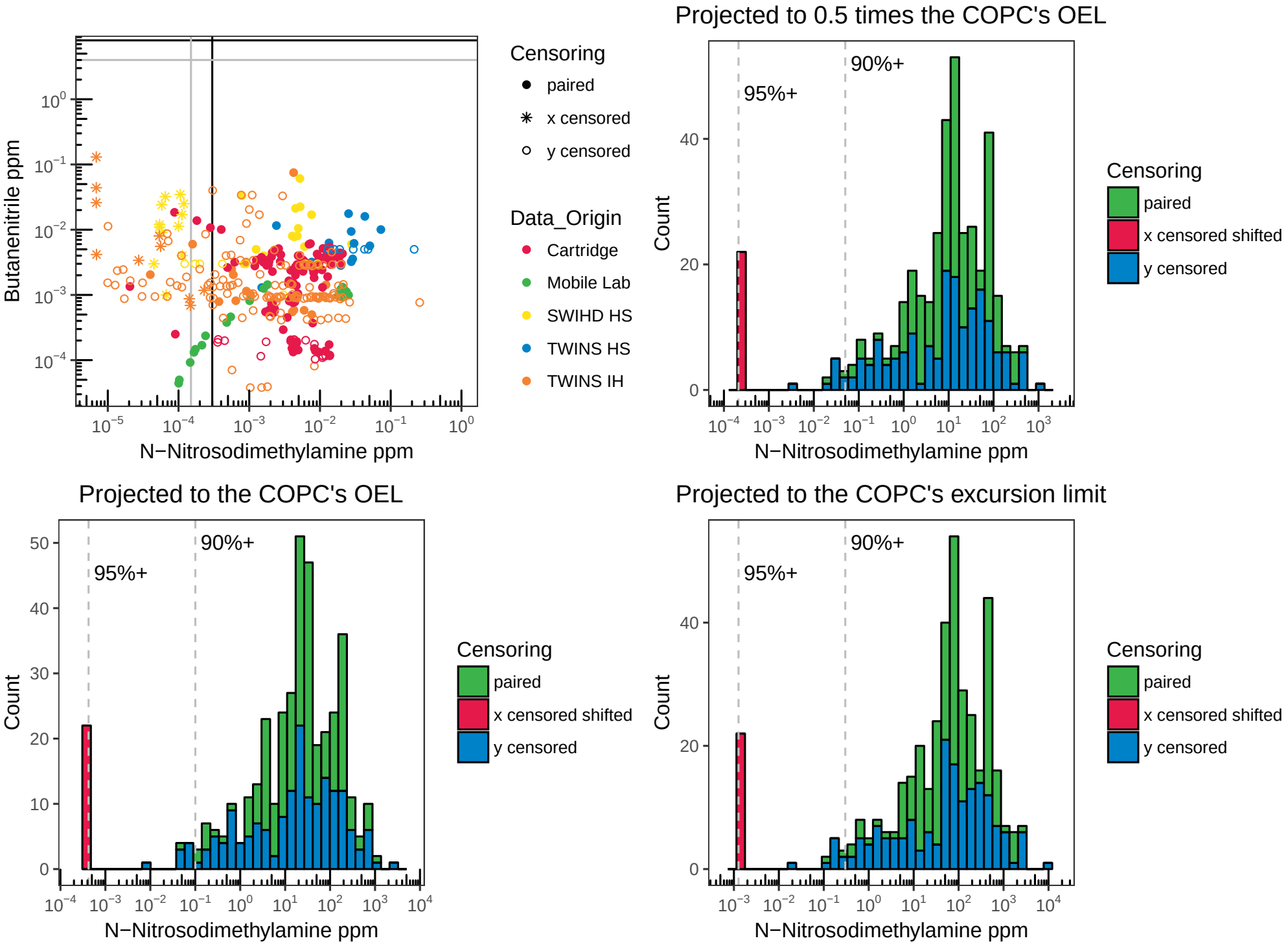


Figure C.2116: Butanenitrile vs N-Nitrosodimethylamine

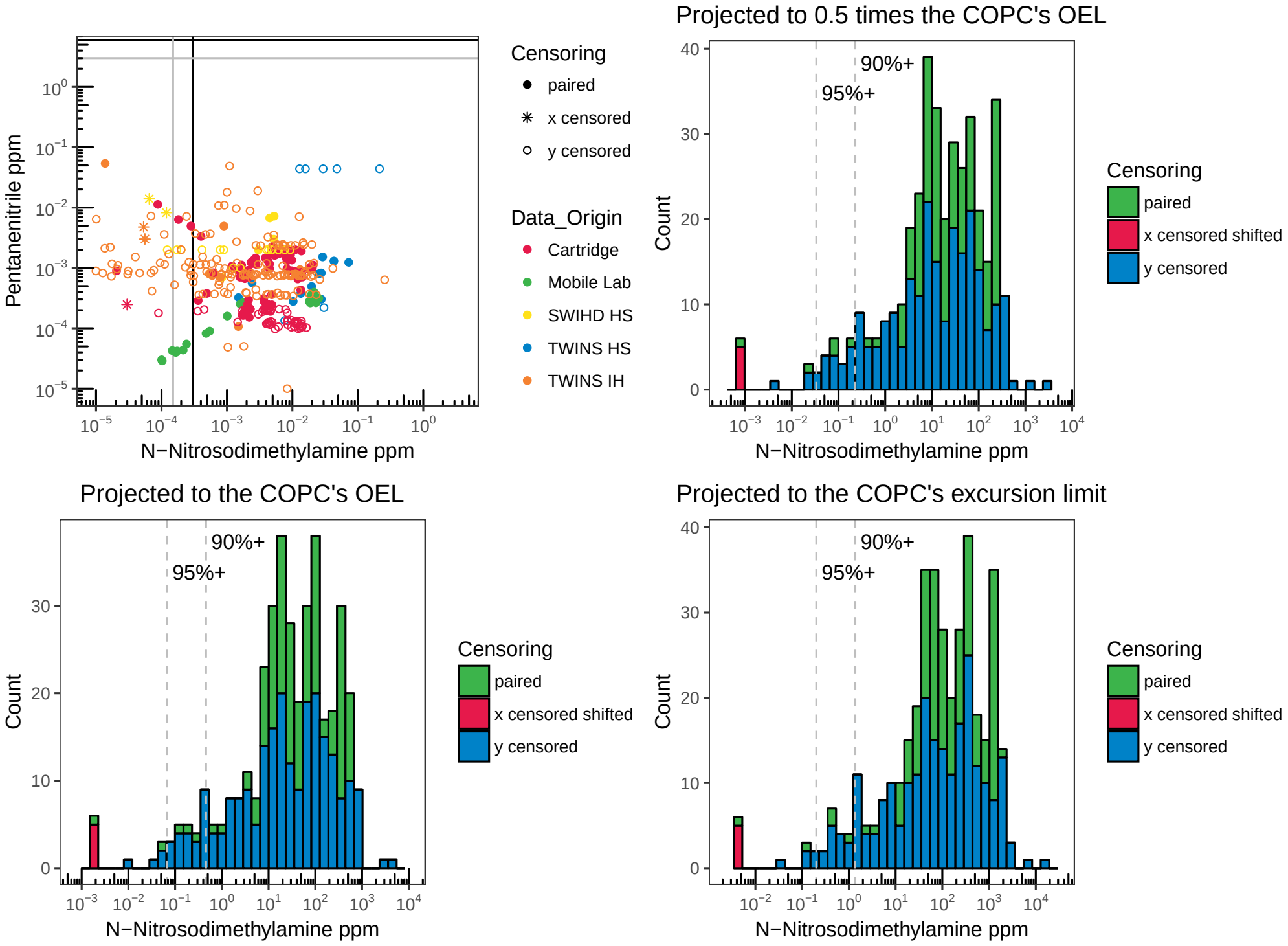


Figure C.2117: Pentanenitrile vs N-Nitrosodimethylamine

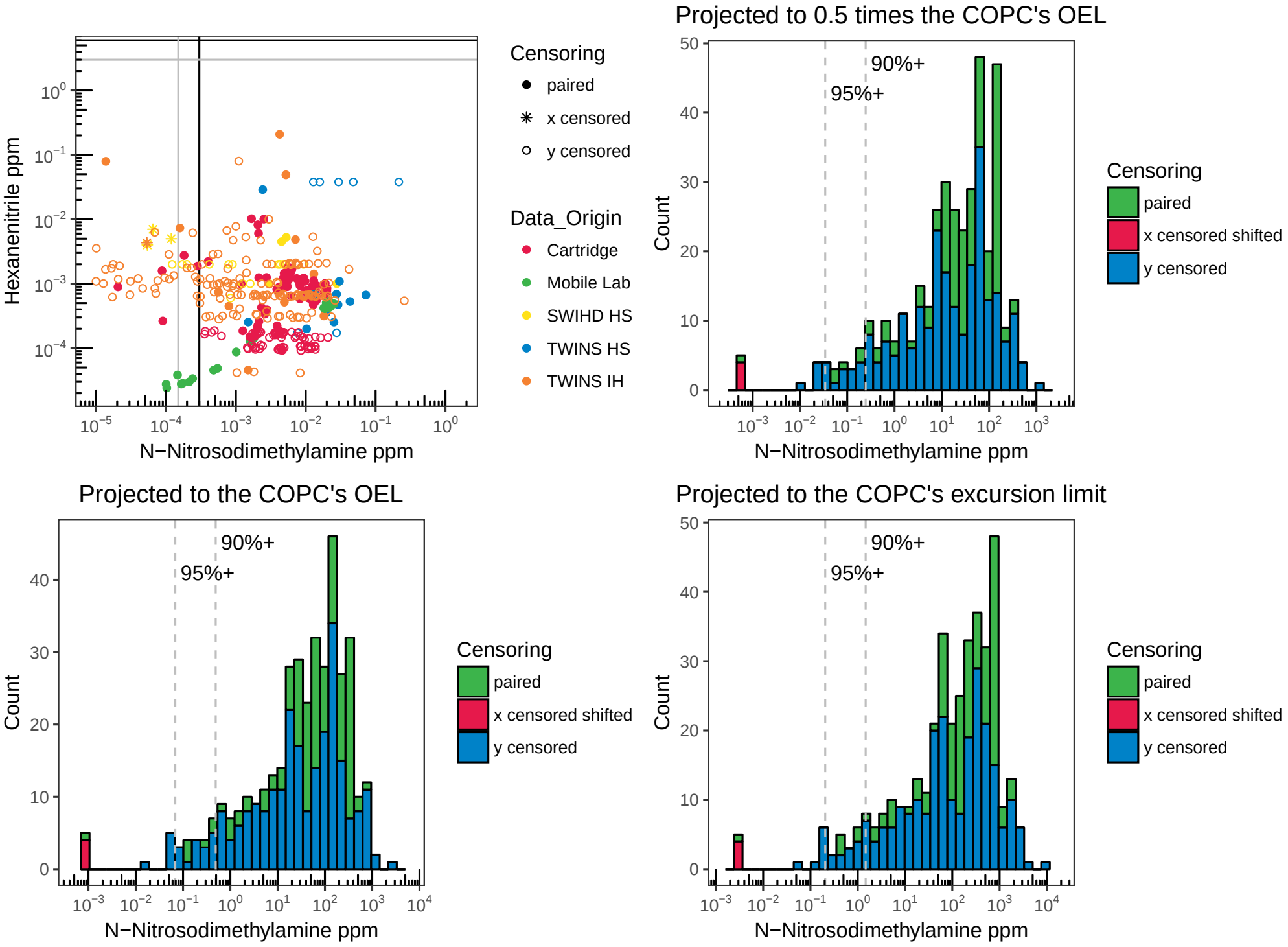


Figure C.2118: Hexanenitrile vs N-Nitrosodimethylamine

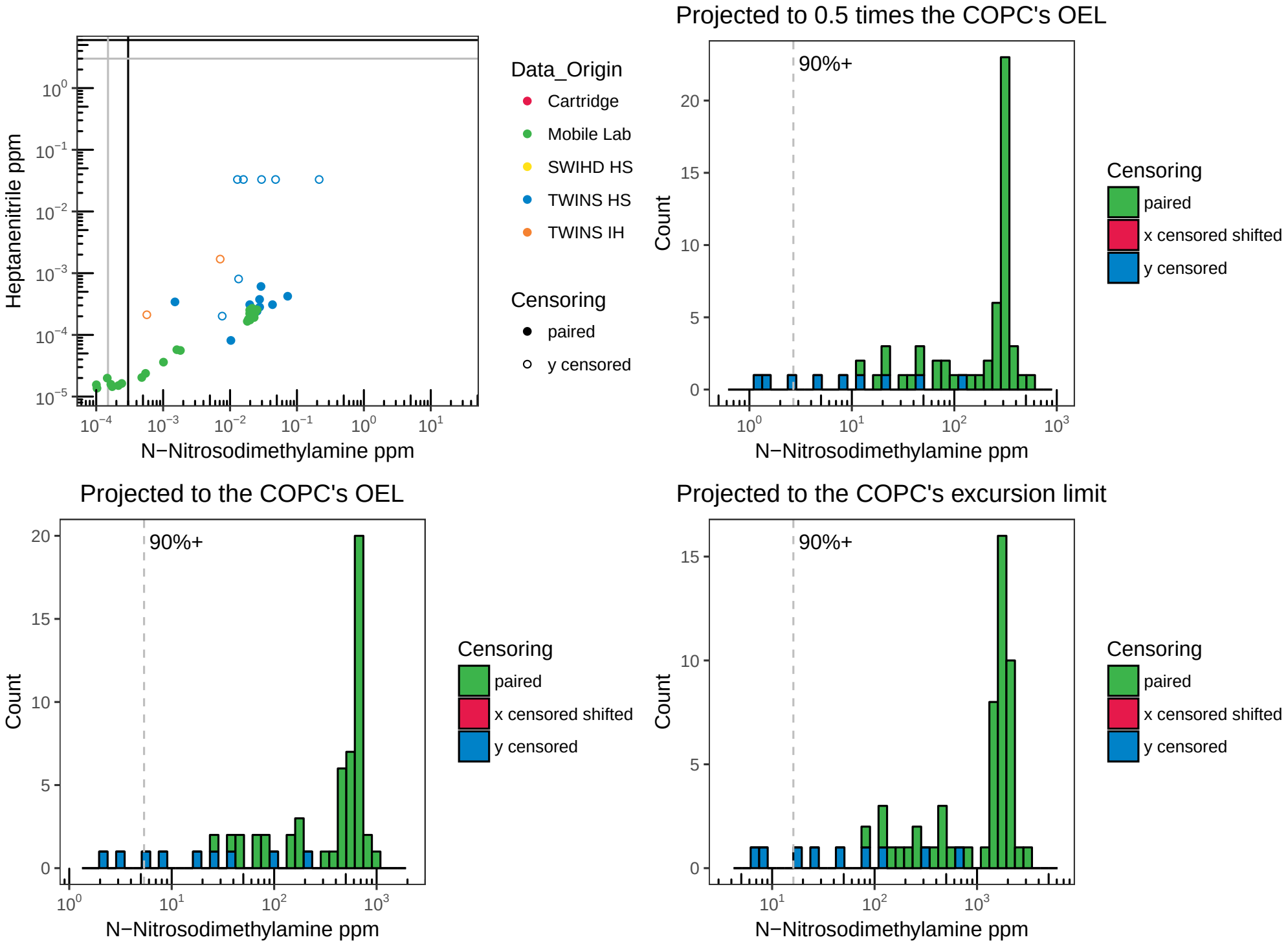


Figure C.2119: Heptanenitrile vs N-Nitrosodimethylamine

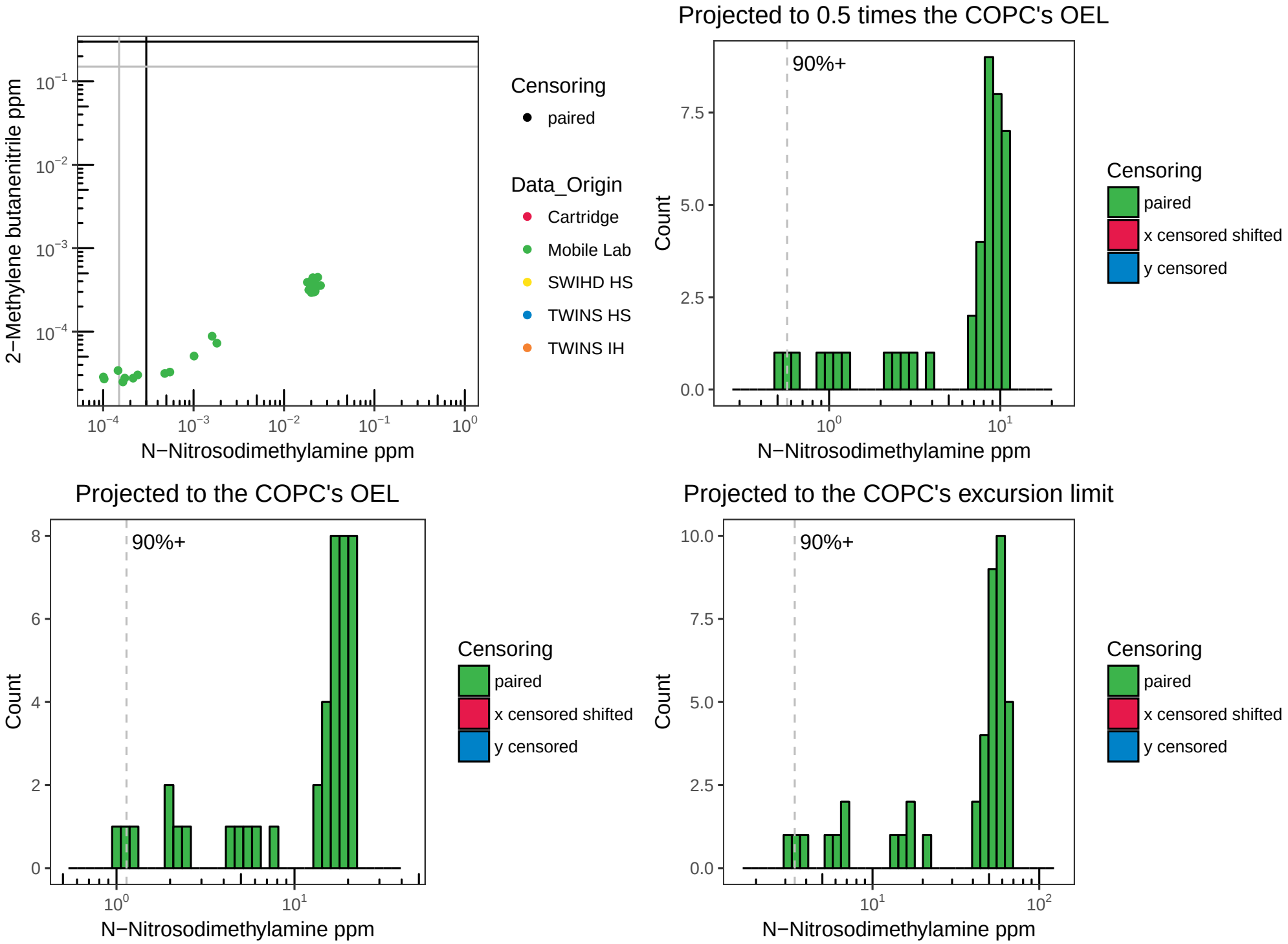


Figure C.2120: 2-Methylene butanenitrile vs N-Nitrosodimethylamine

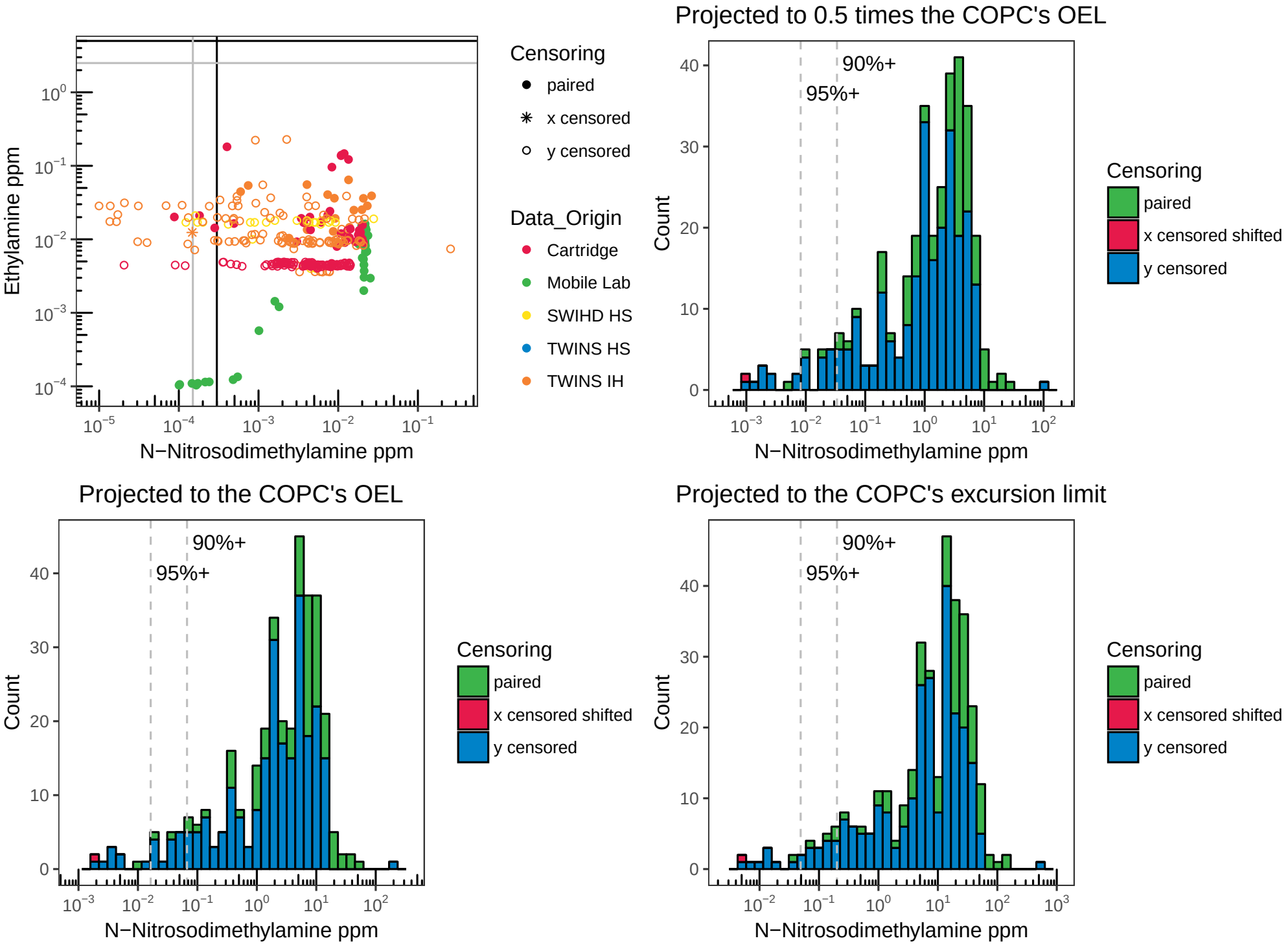


Figure C.2121: Ethylamine vs N-Nitrosodimethylamine

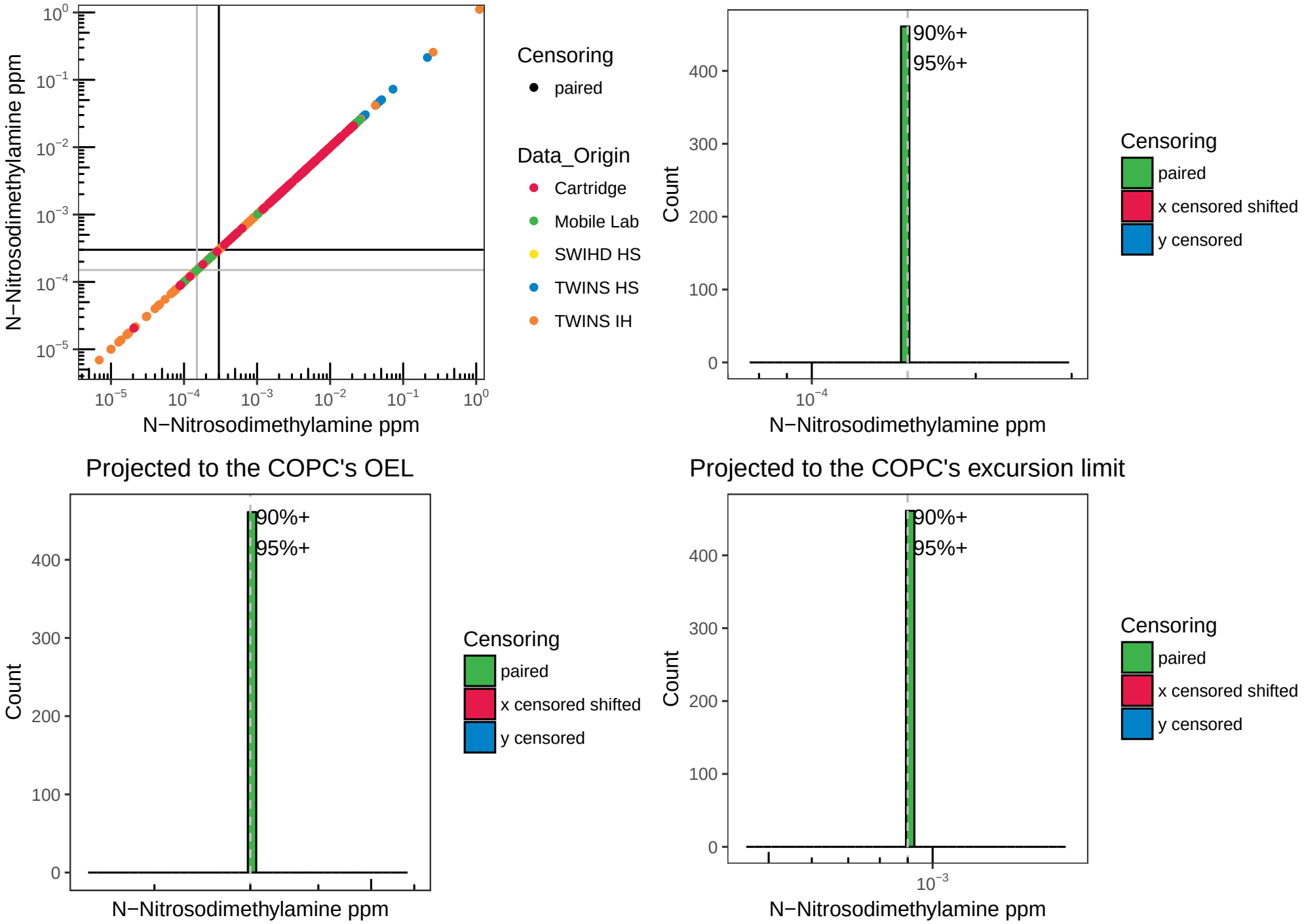


Figure C.2122: N-Nitrosodimethylamine vs N-Nitrosodimethylamine

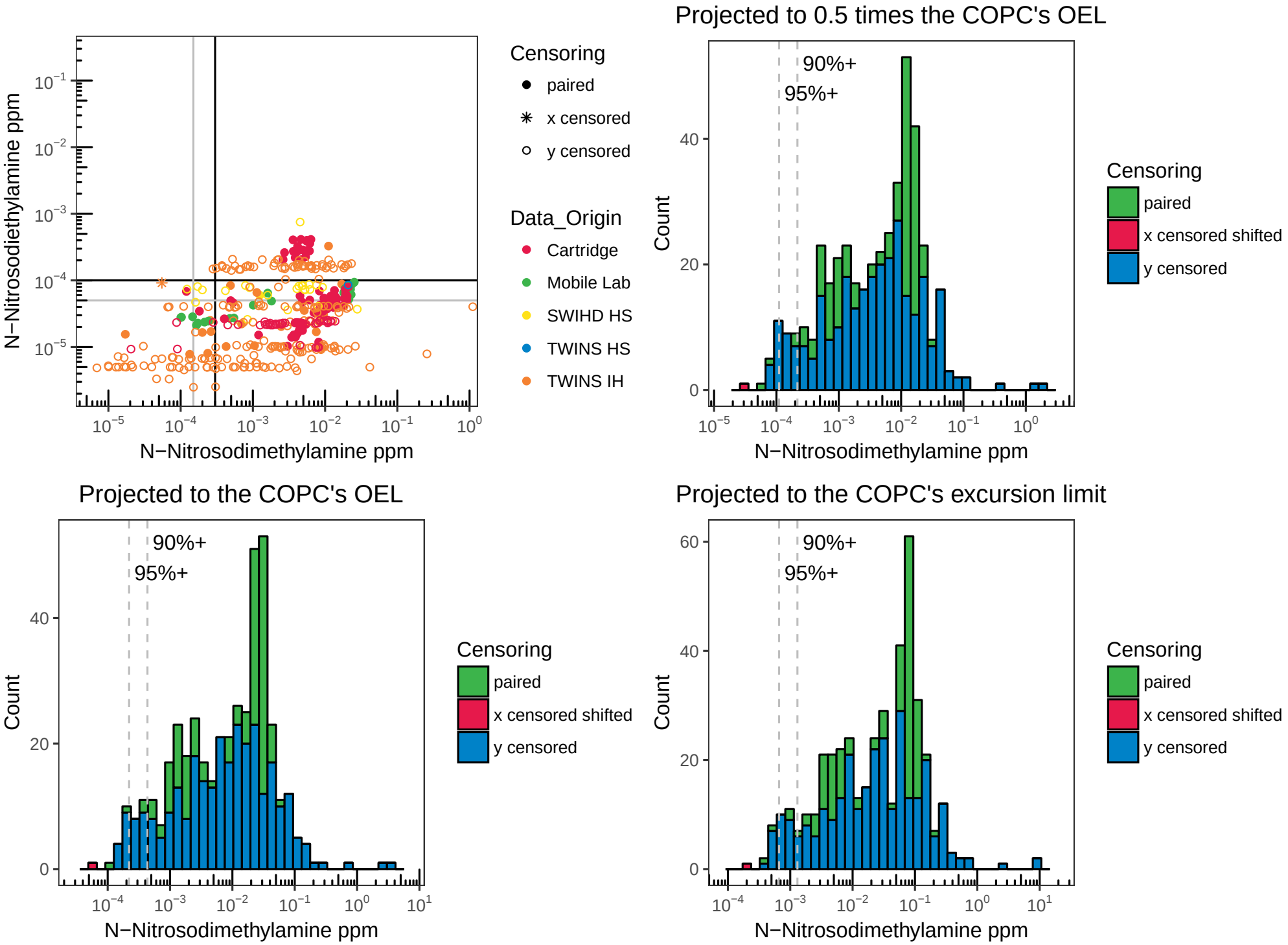


Figure C.2123: N-Nitrosodiethylamine vs N-Nitrosodimethylamine

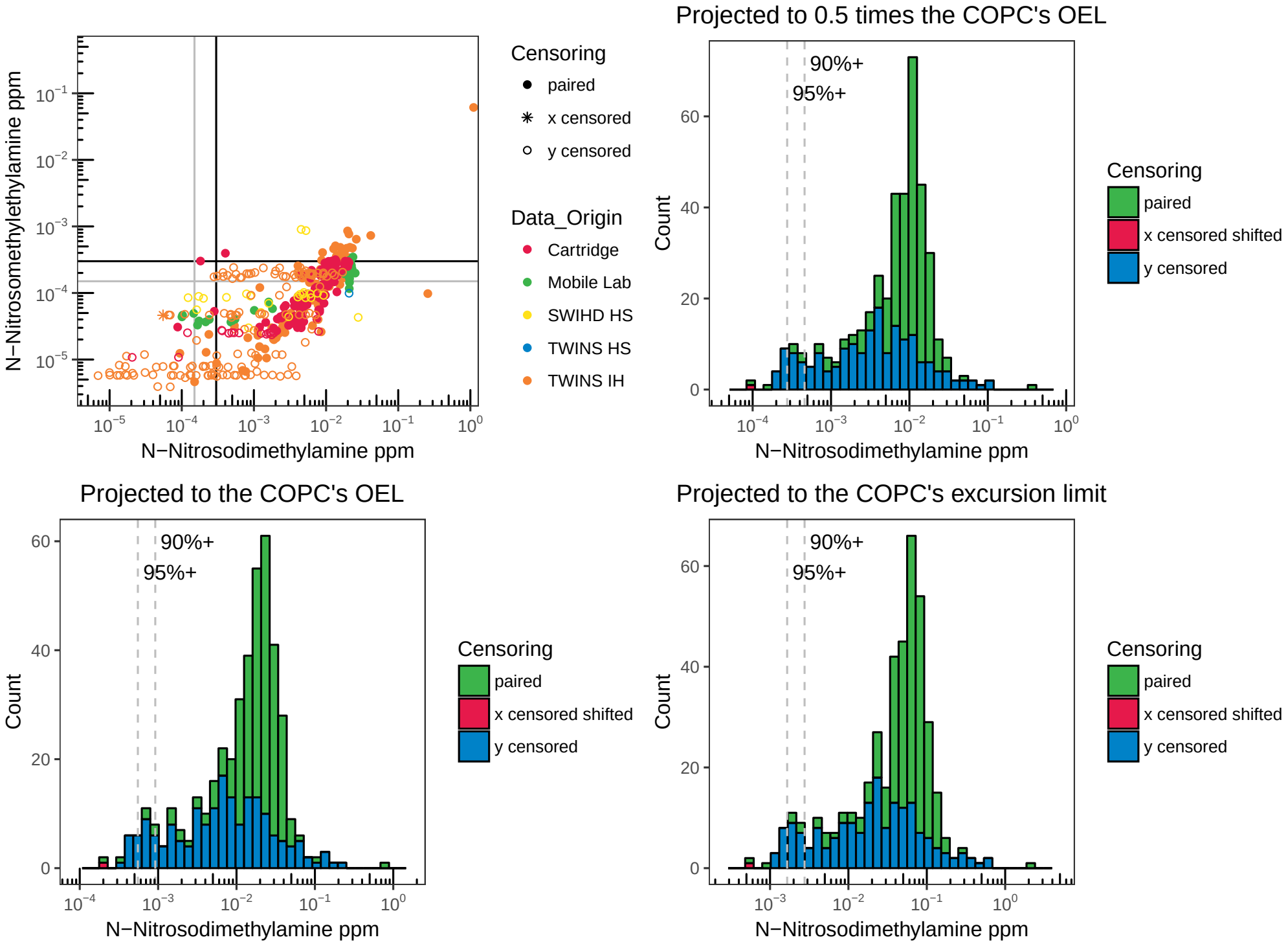


Figure C.2124: N-Nitrosomethylethylamine vs N-Nitrosodimethylamine

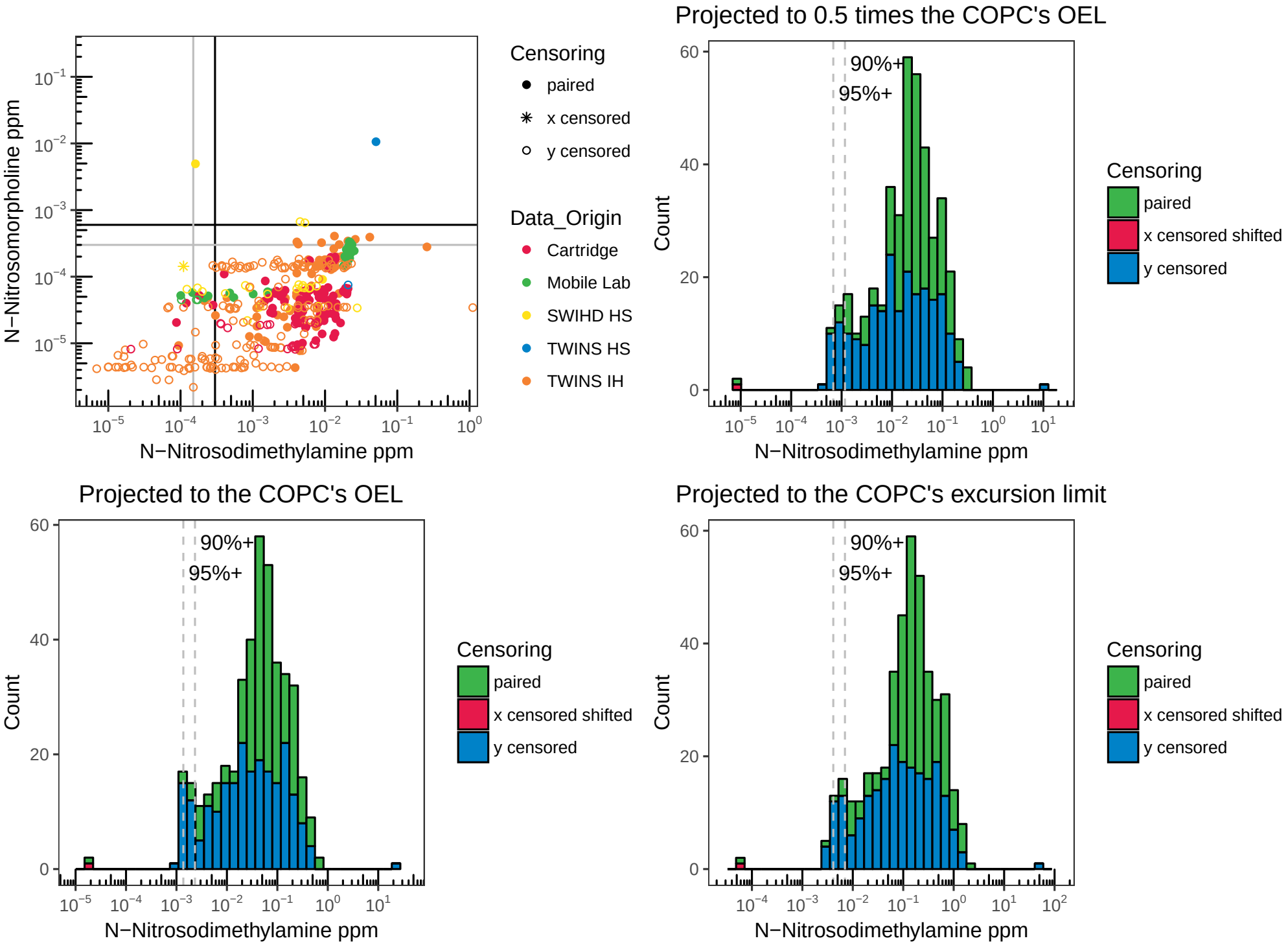


Figure C.2125: N-Nitrosomorpholine vs N-Nitrosodimethylamine

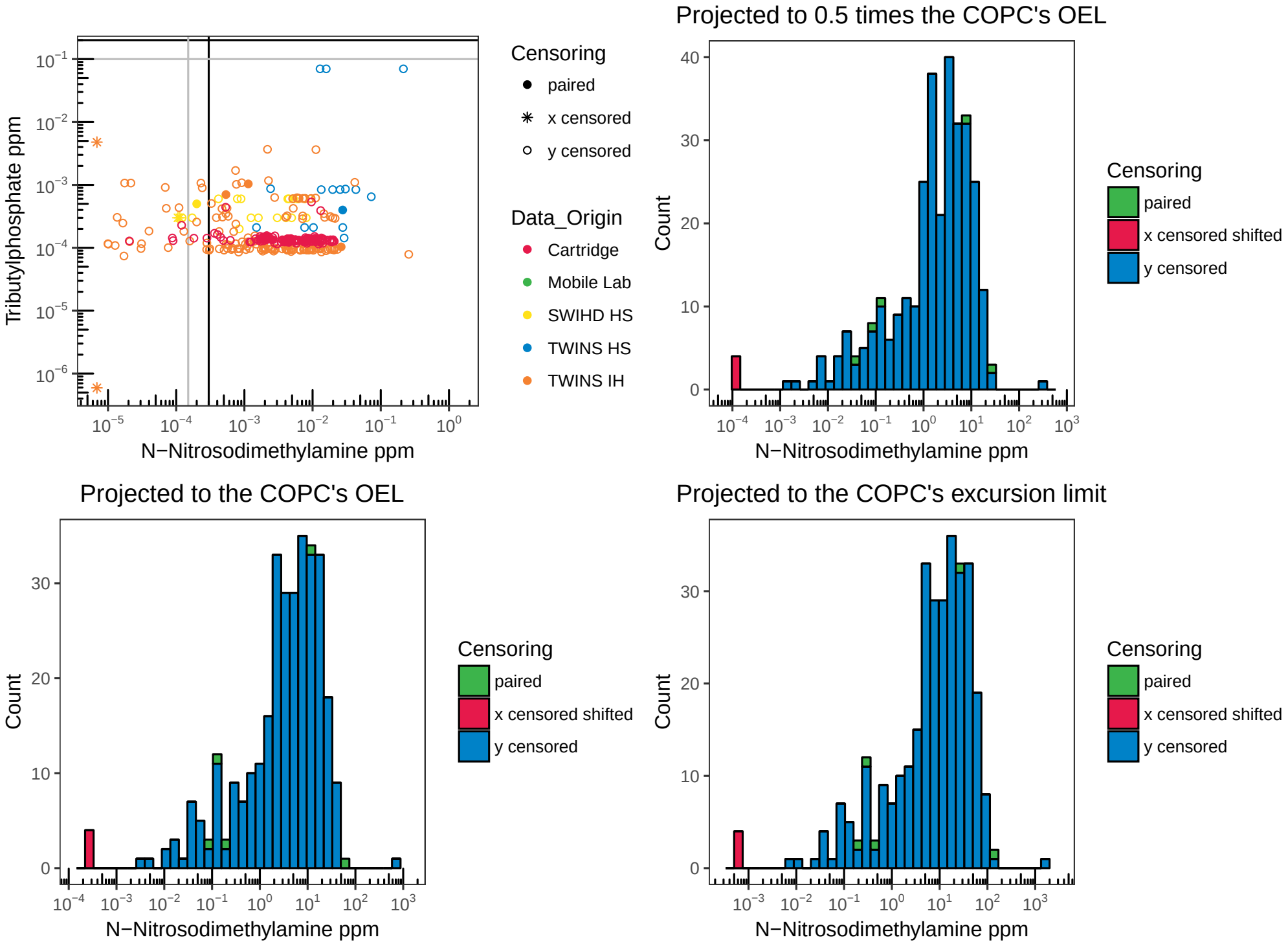


Figure C.2126: Tributylphosphate vs N-Nitrosodimethylamine

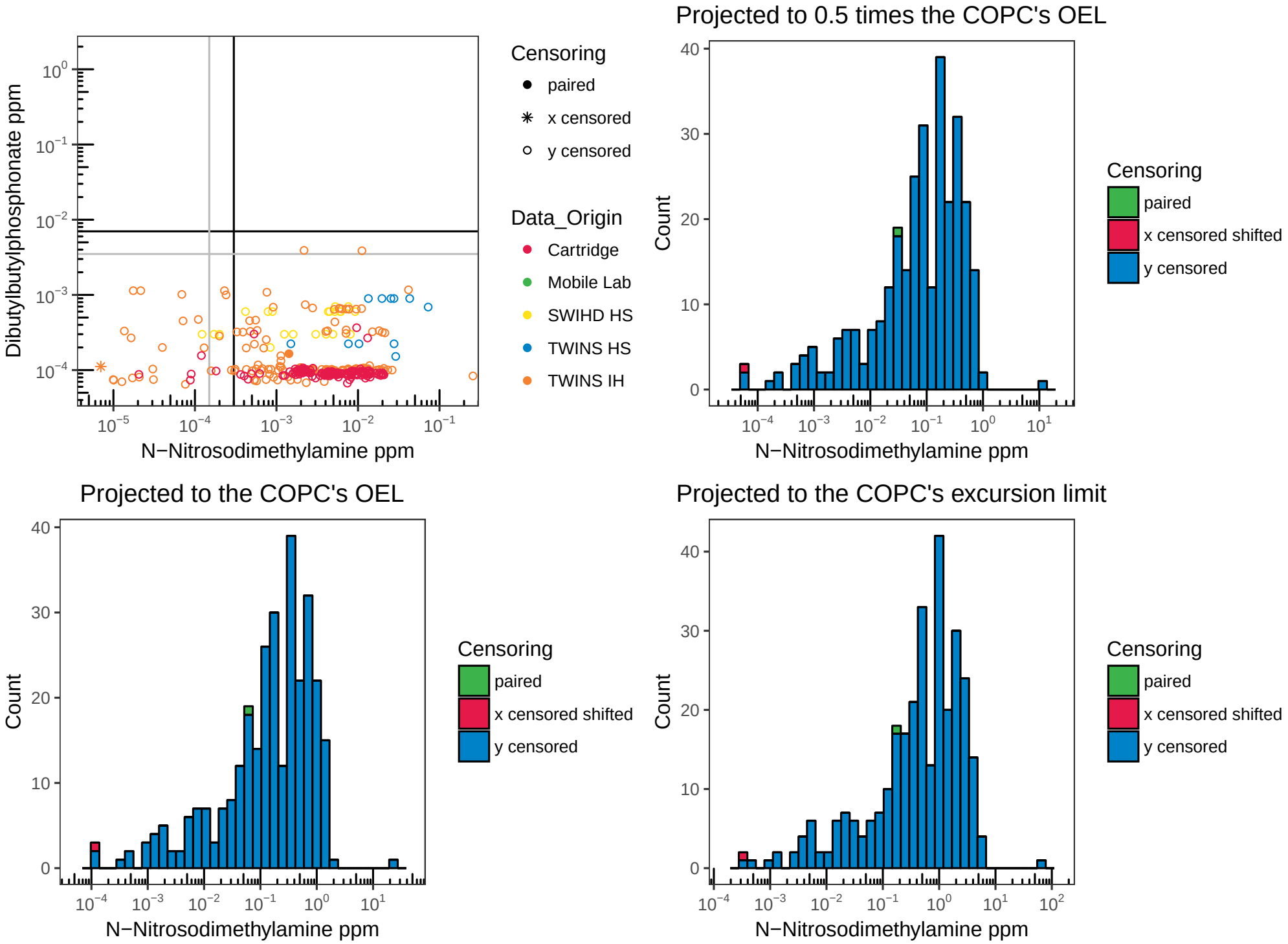


Figure C.2127: Dibutylbutylphosphonate vs N-Nitrosodimethylamine

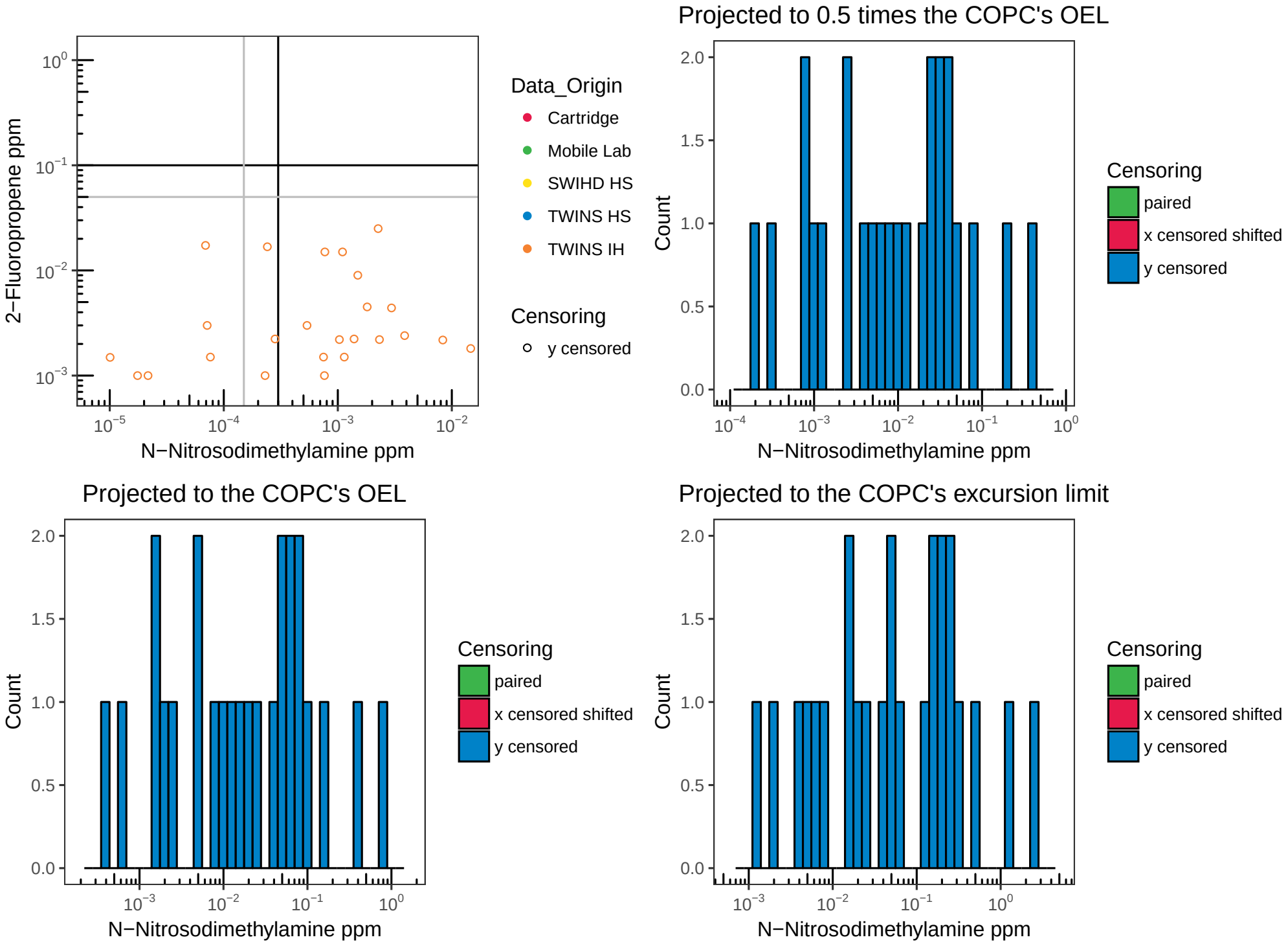


Figure C.2128: 2-Fluoropropene vs N-Nitrosodimethylamine

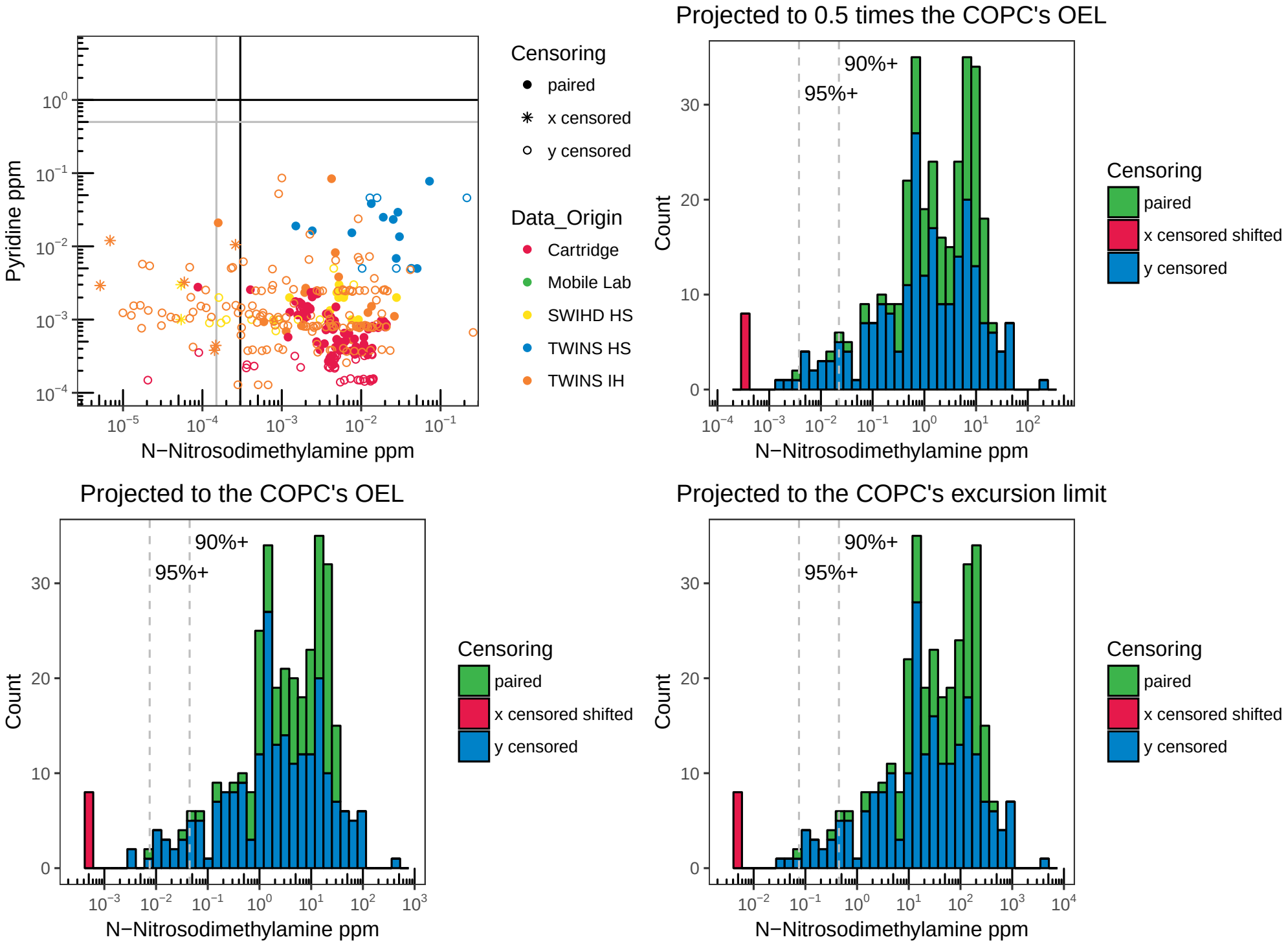


Figure C.2129: Pyridine vs N-Nitrosodimethylamine

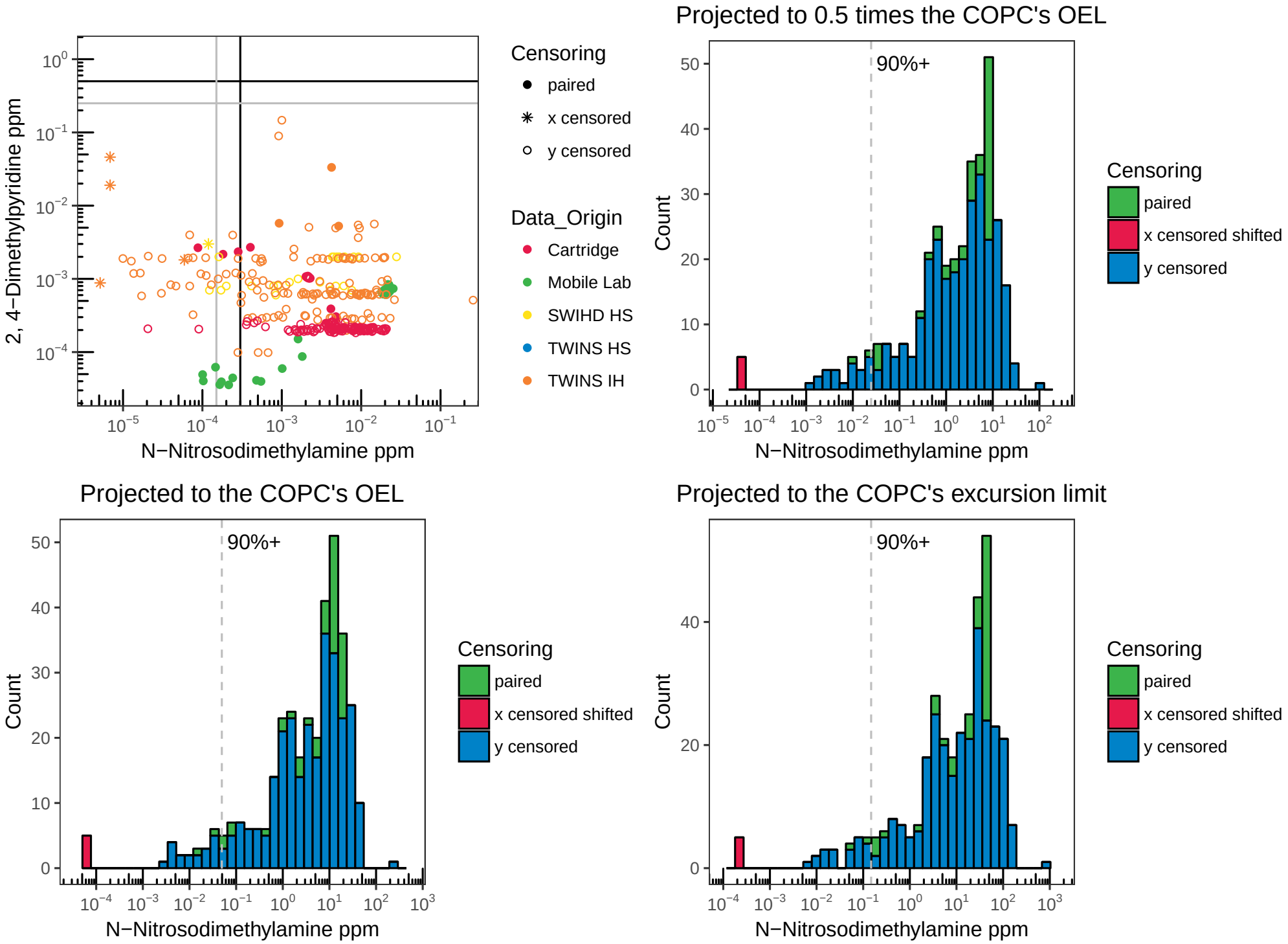


Figure C.2130: 2, 4-Dimethylpyridine vs N-Nitrosodimethylamine

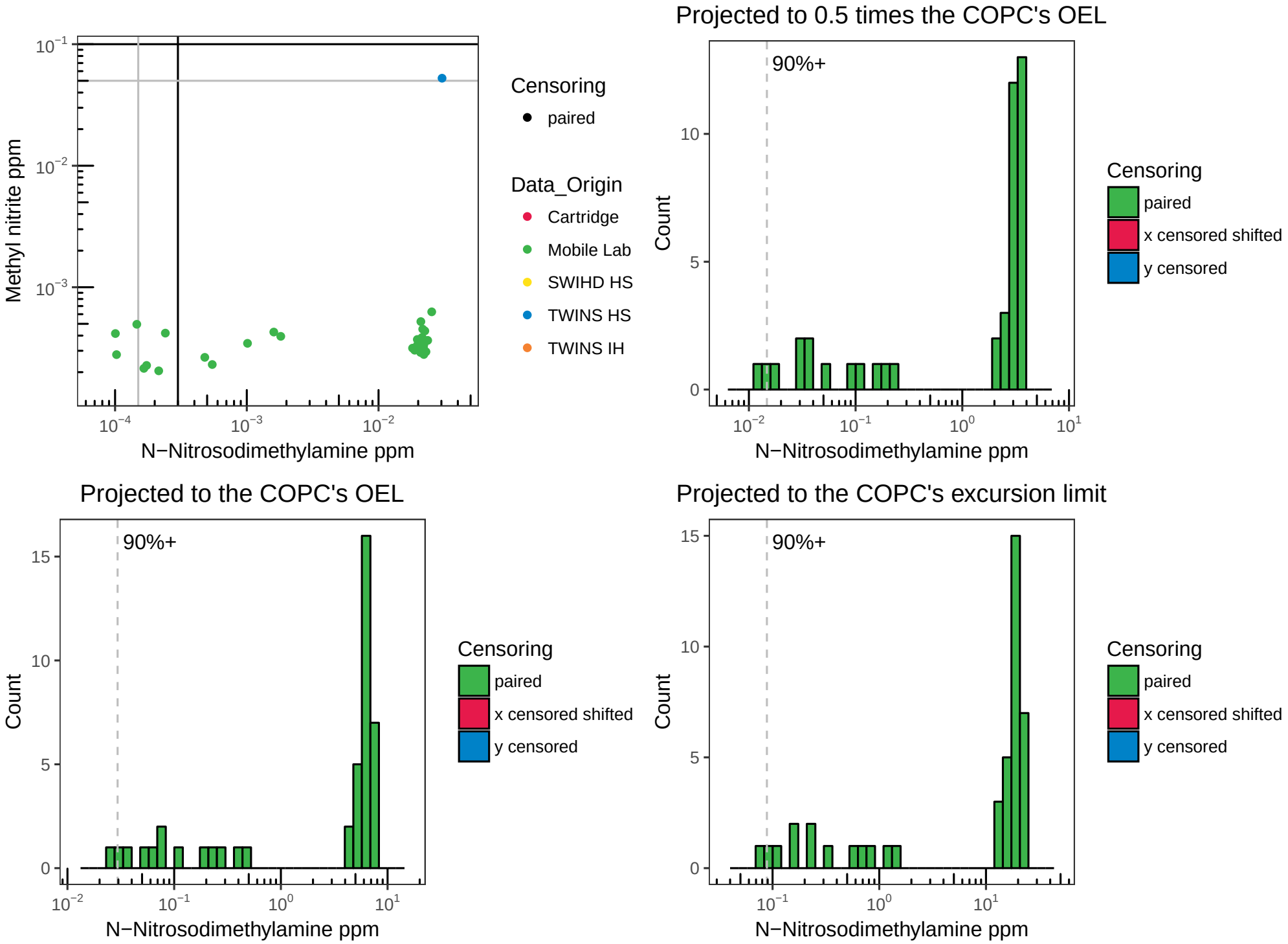


Figure C.2131: Methyl nitrite vs N-Nitrosodimethylamine

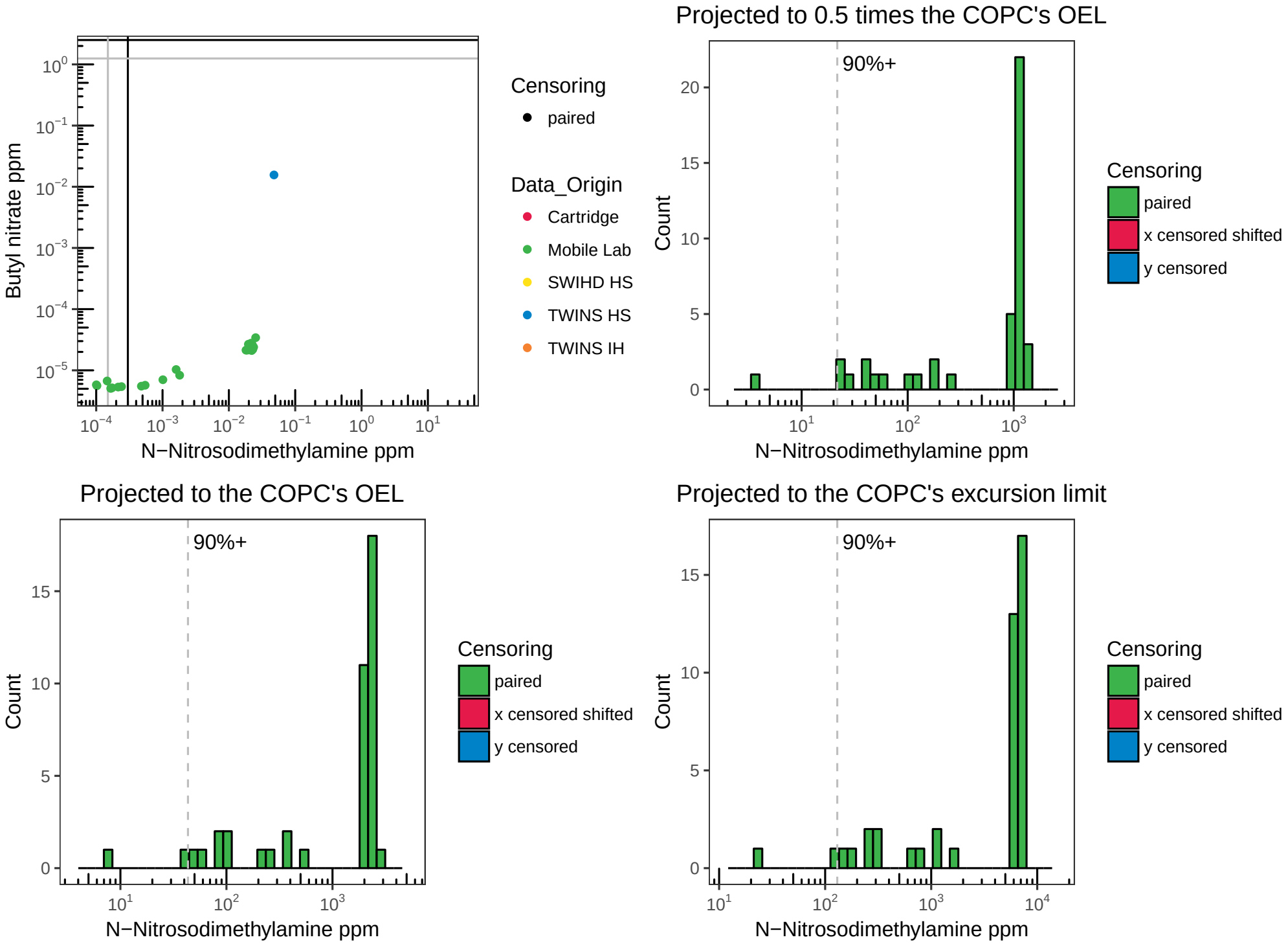


Figure C.2132: Butyl nitrate vs N-Nitrosodimethylamine

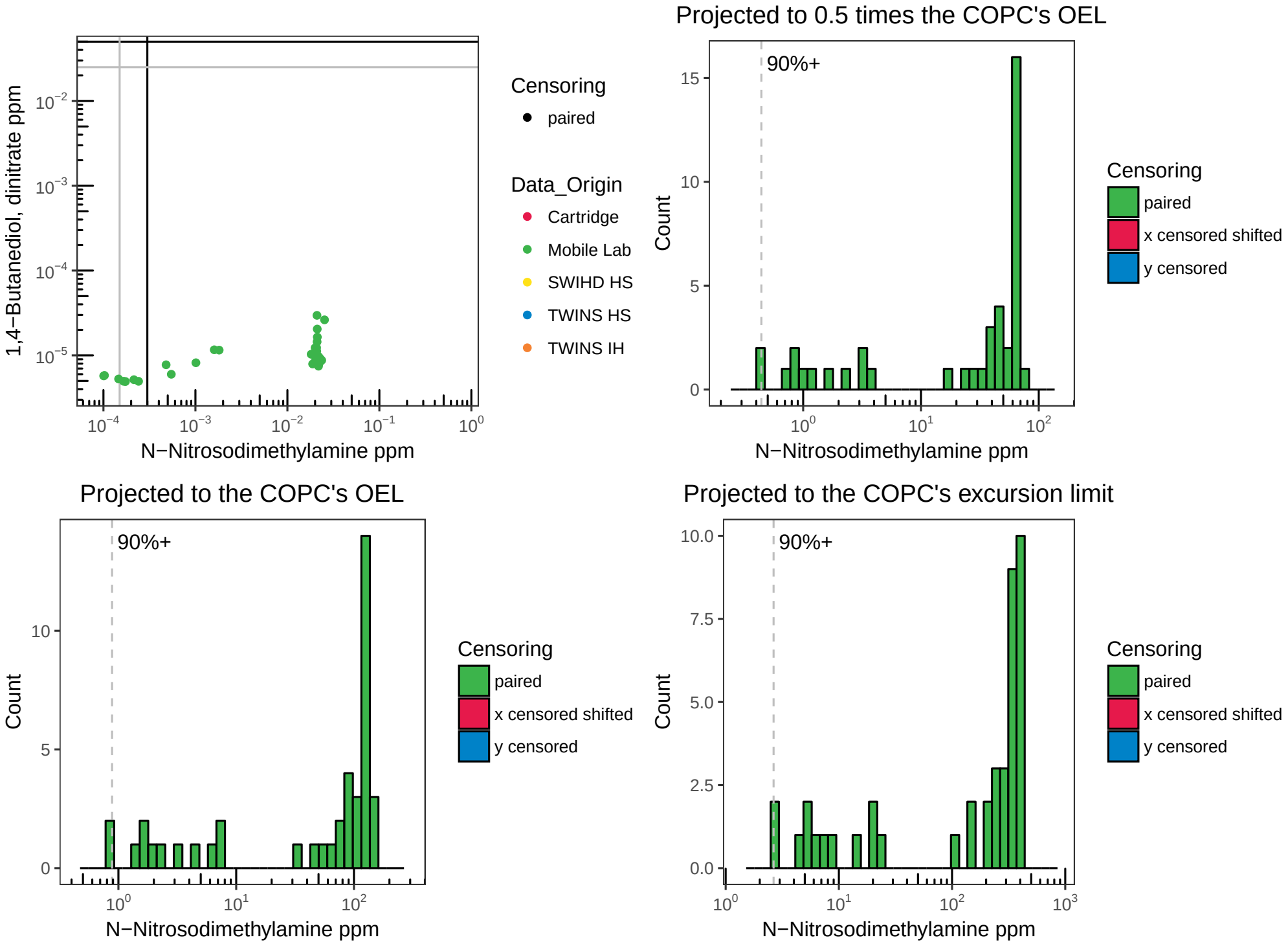


Figure C.2133: 1,4-Butanediol, dinitrate vs N-Nitrosodimethylamine

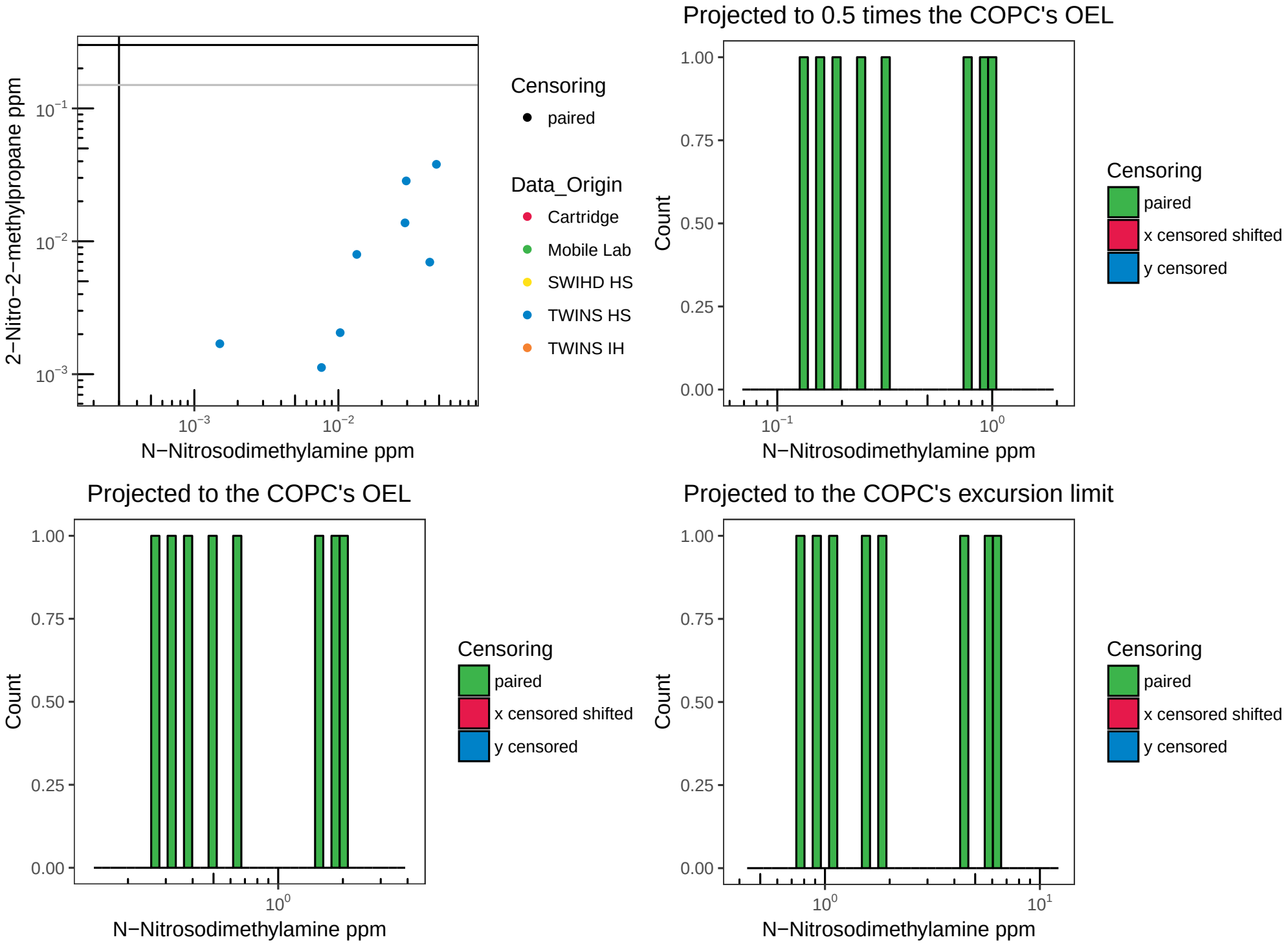


Figure C.2134: 2-Nitro-2-methylpropane vs N-Nitrosodimethylamine

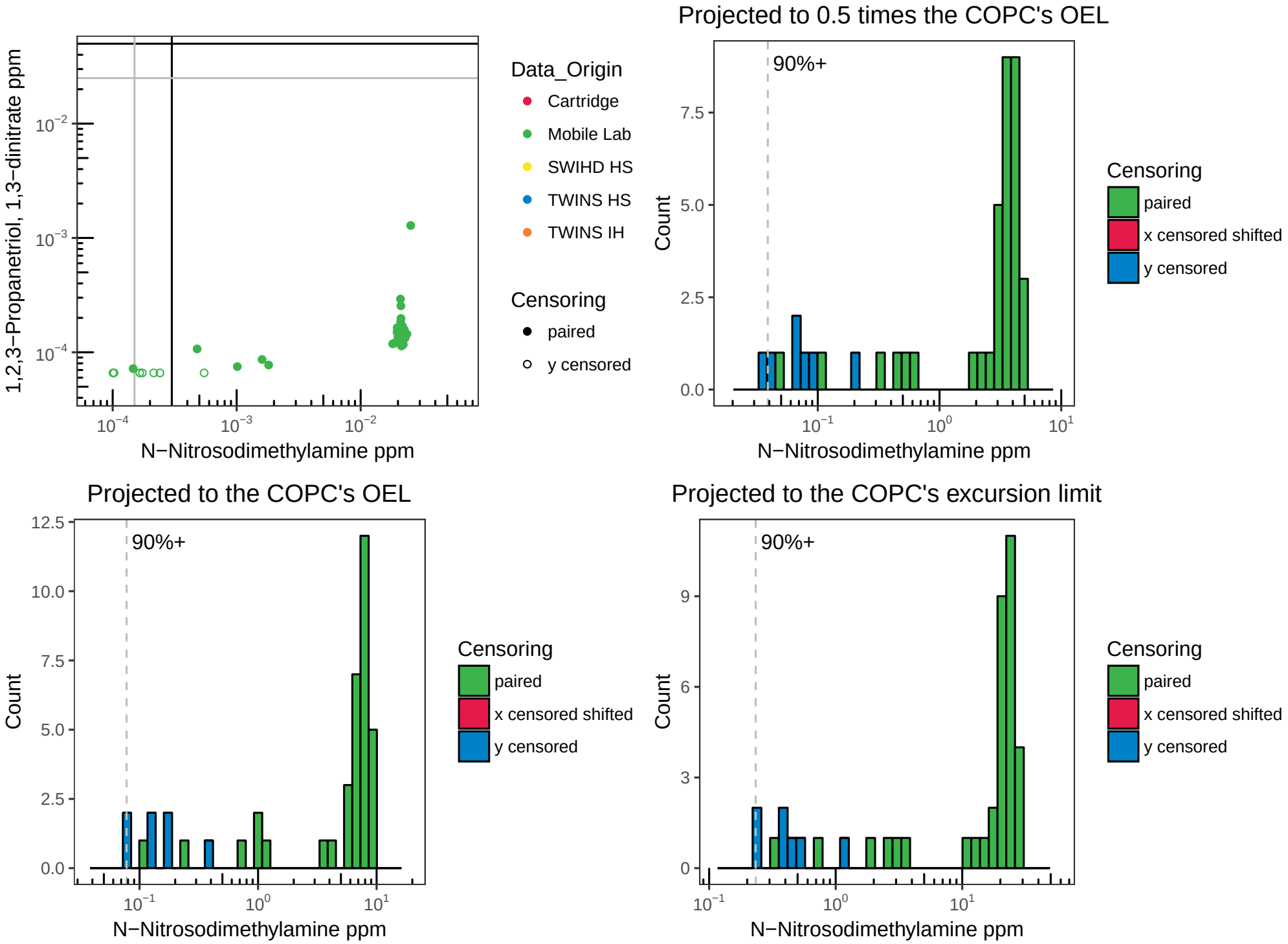


Figure C.2135: 1,2,3-Propanetriol, 1,3-dinitrate vs N-Nitrosodimethylamine

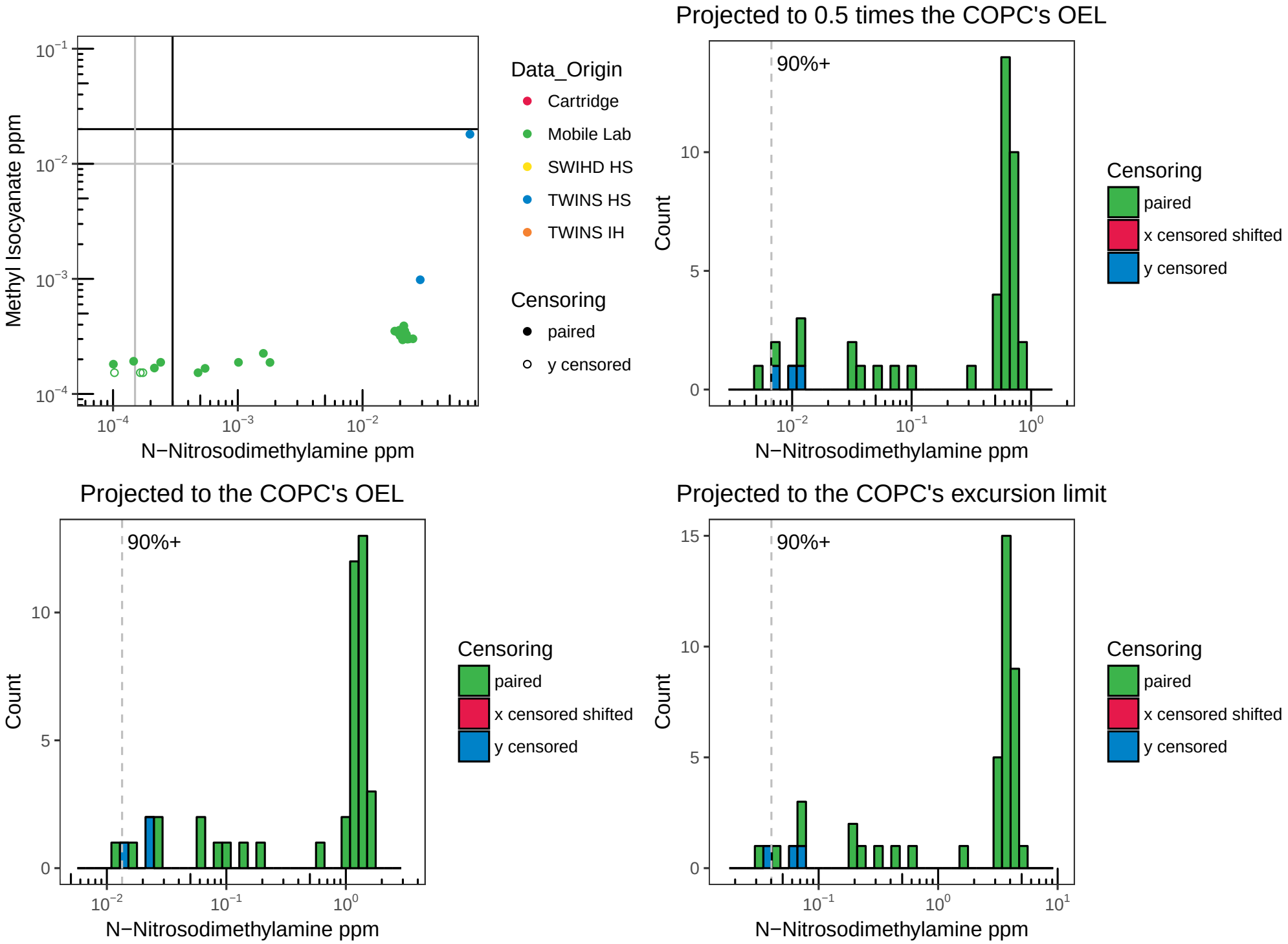


Figure C.2136: Methyl Isocyanate vs N-Nitrosodimethylamine

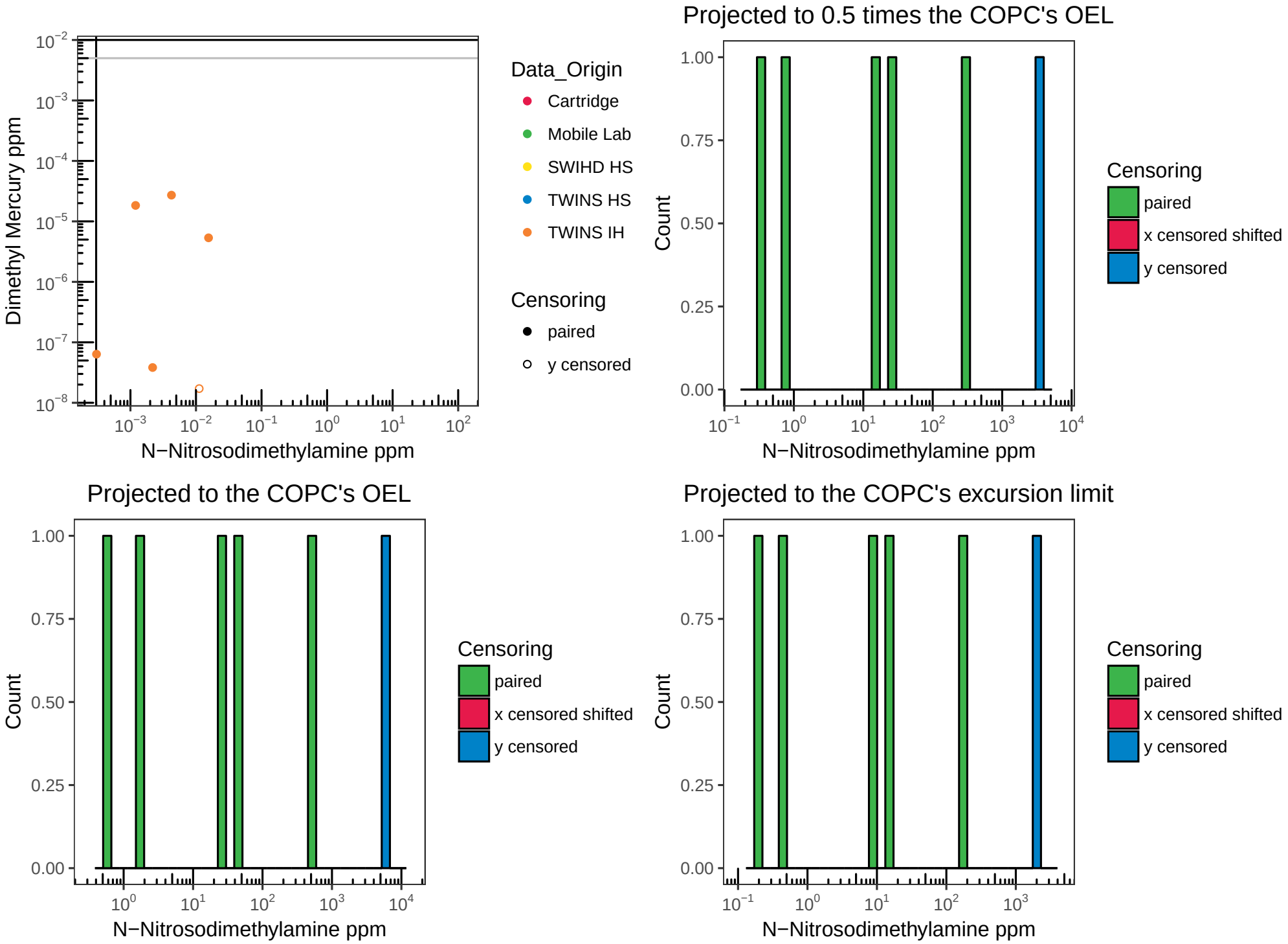


Figure C.2137: Dimethyl Mercury vs N-Nitrosodimethylamine

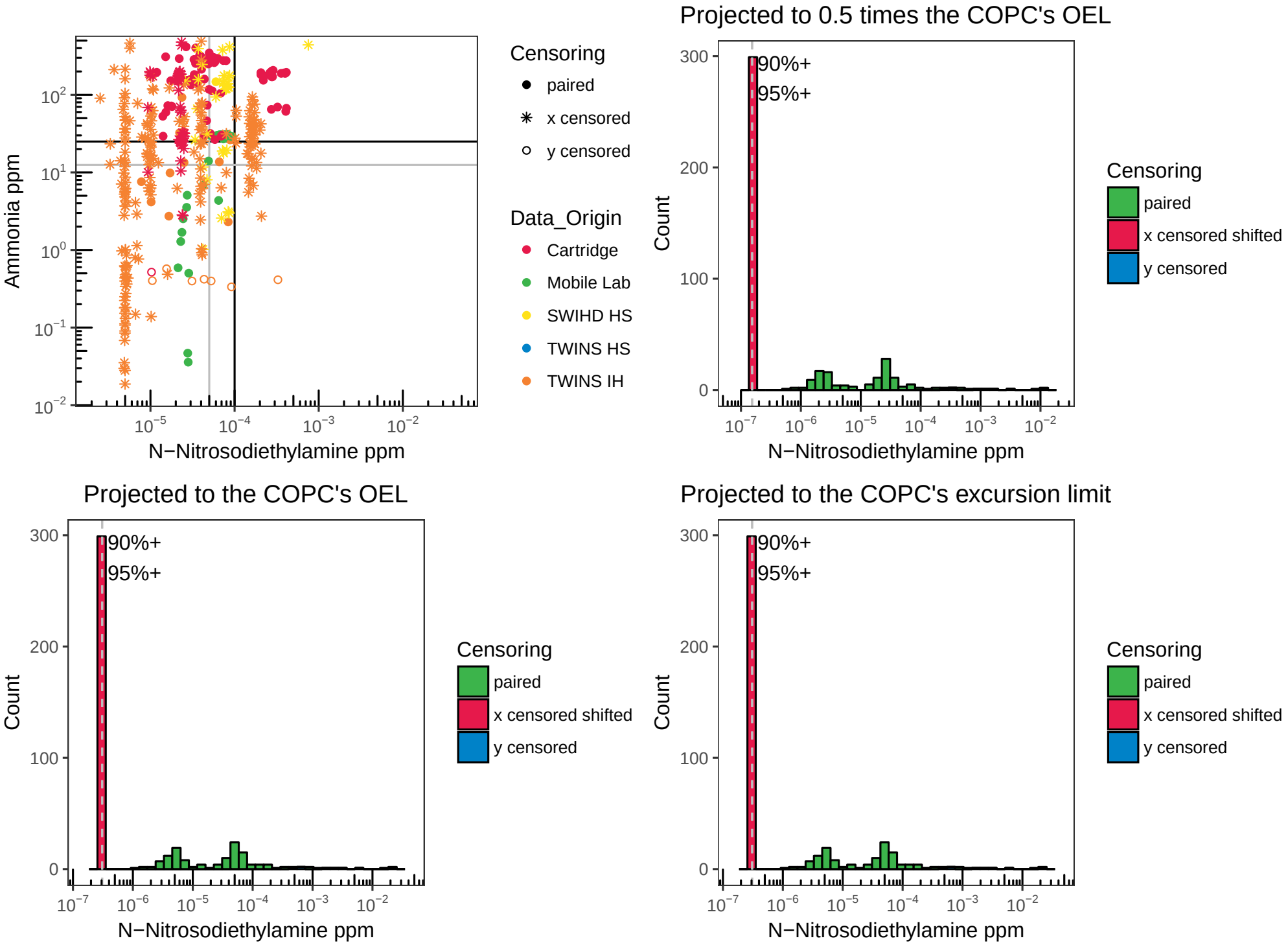


Figure C.2138: Ammonia vs N-Nitrosodiethylamine

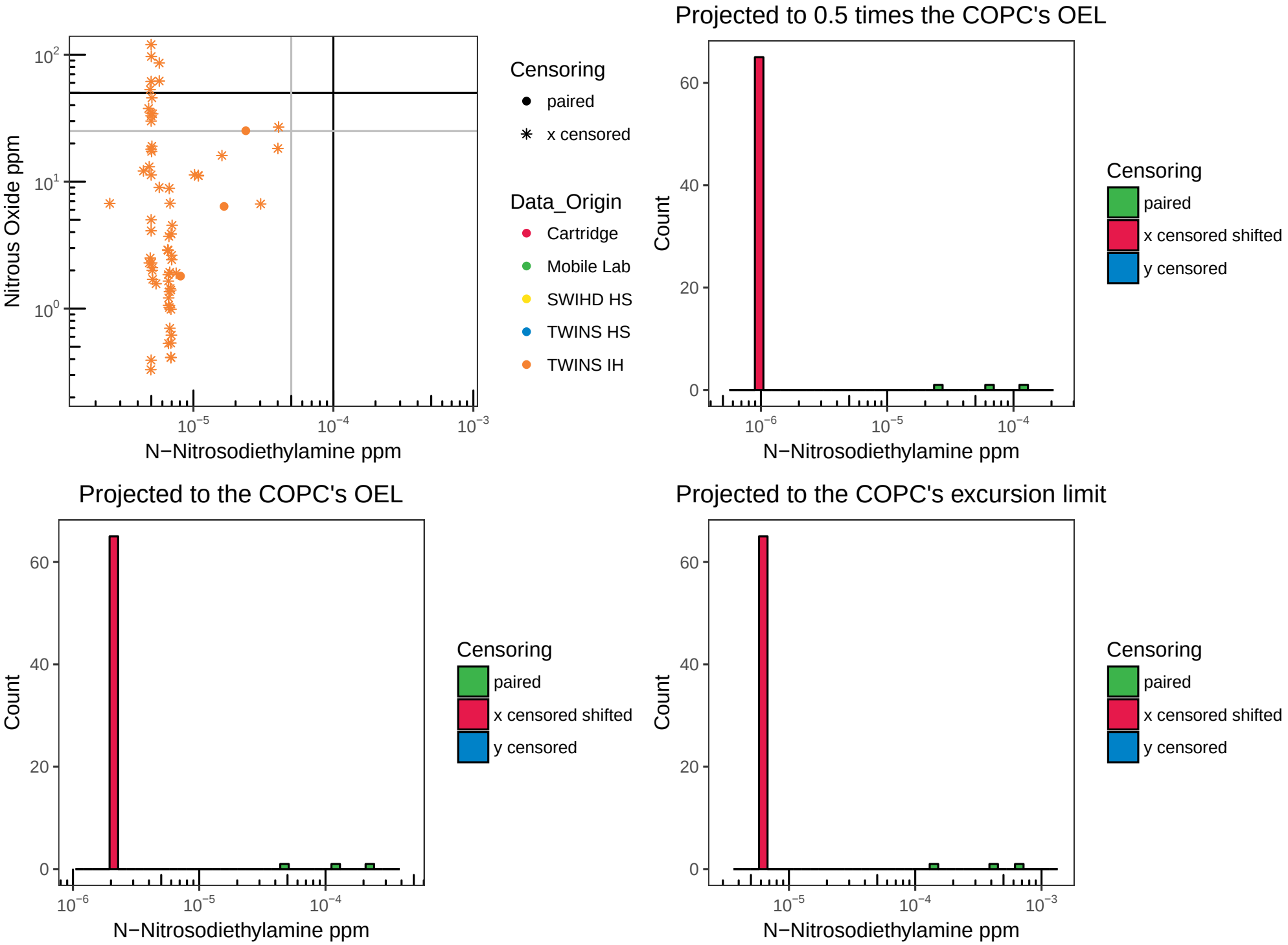


Figure C.2139: Nitrous Oxide vs N-Nitrosodiethylamine

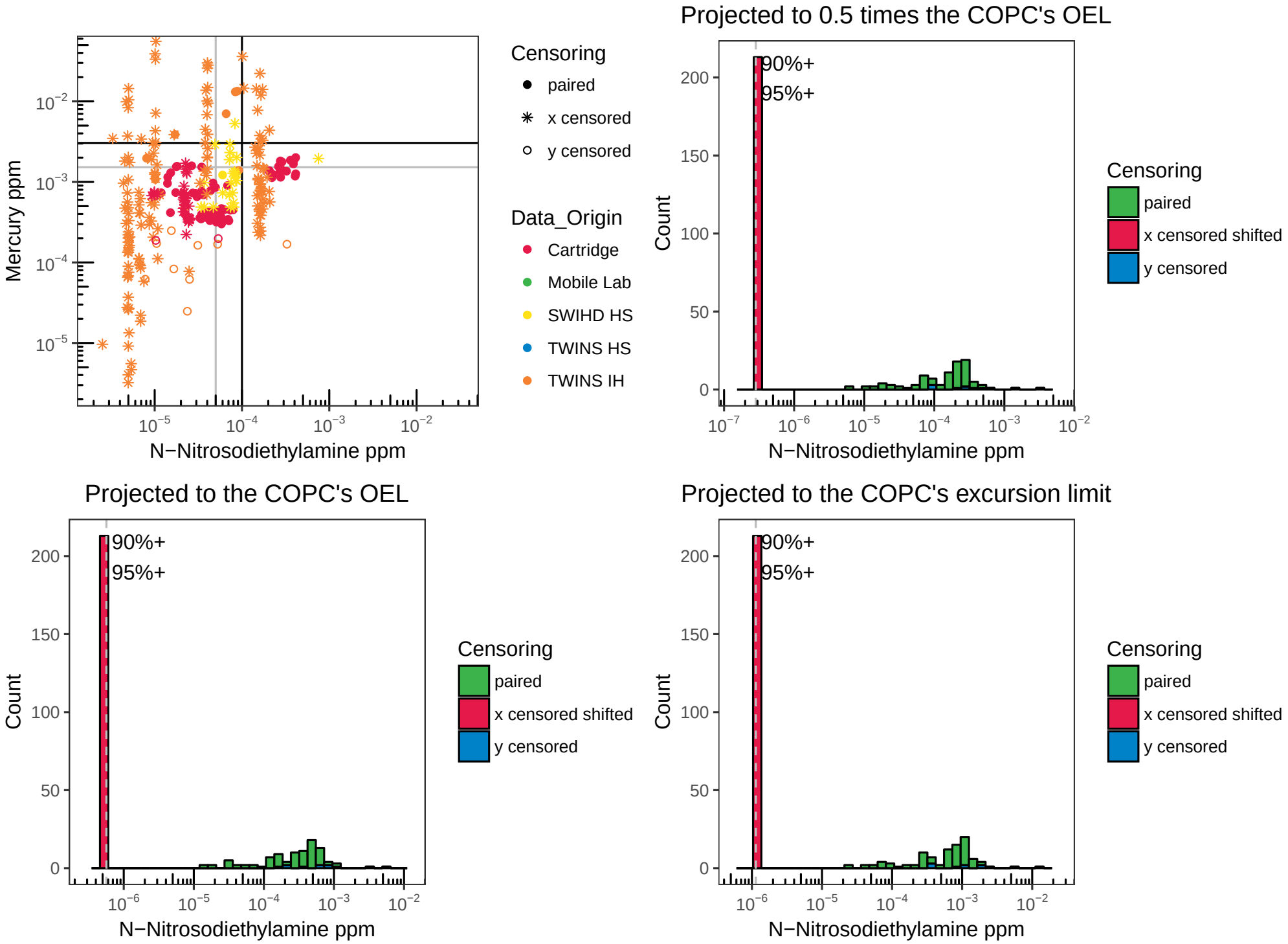


Figure C.2140: Mercury vs N-Nitrosodiethylamine

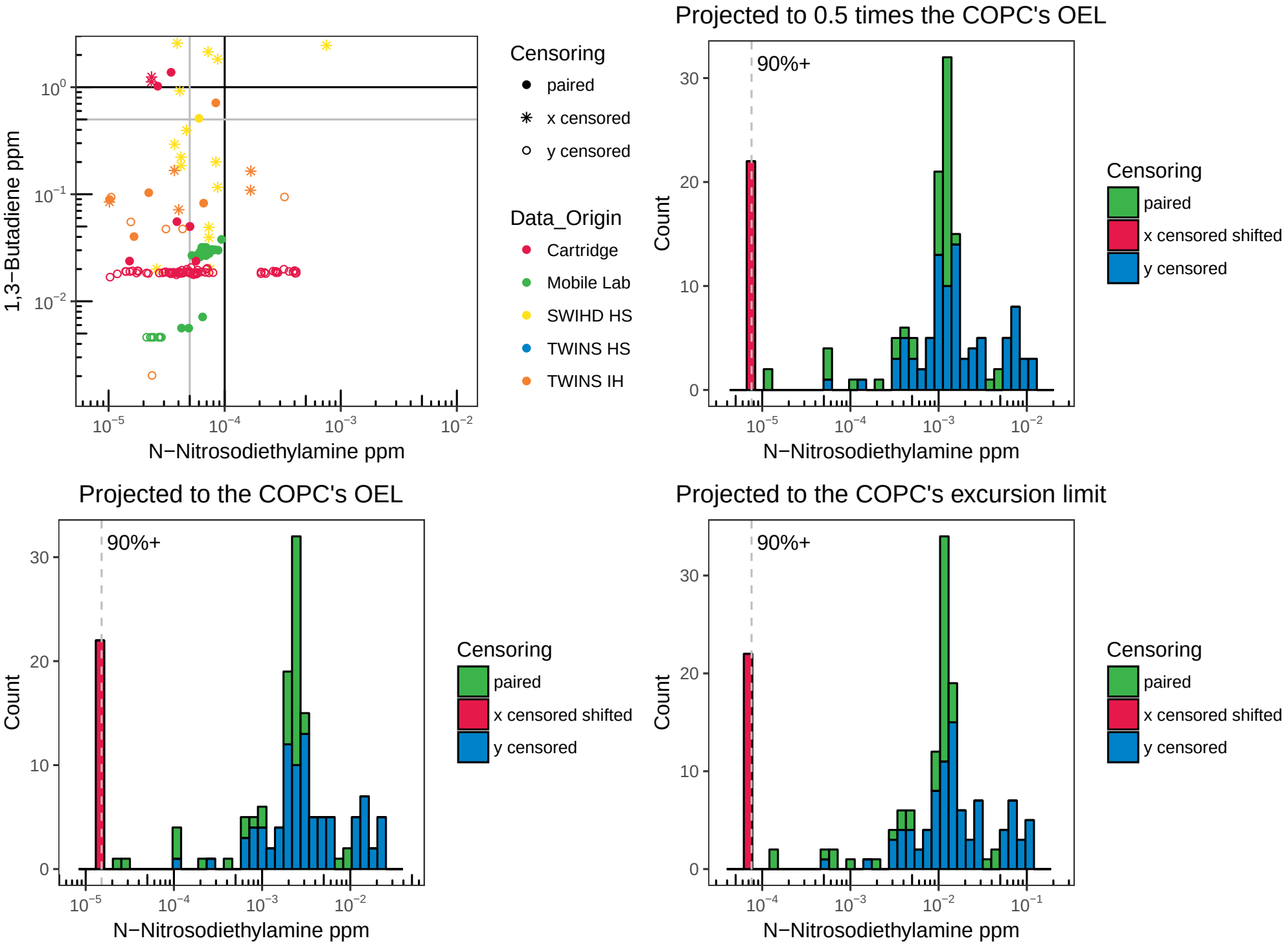


Figure C.2141: 1,3-Butadiene vs N-Nitrosodiethylamine

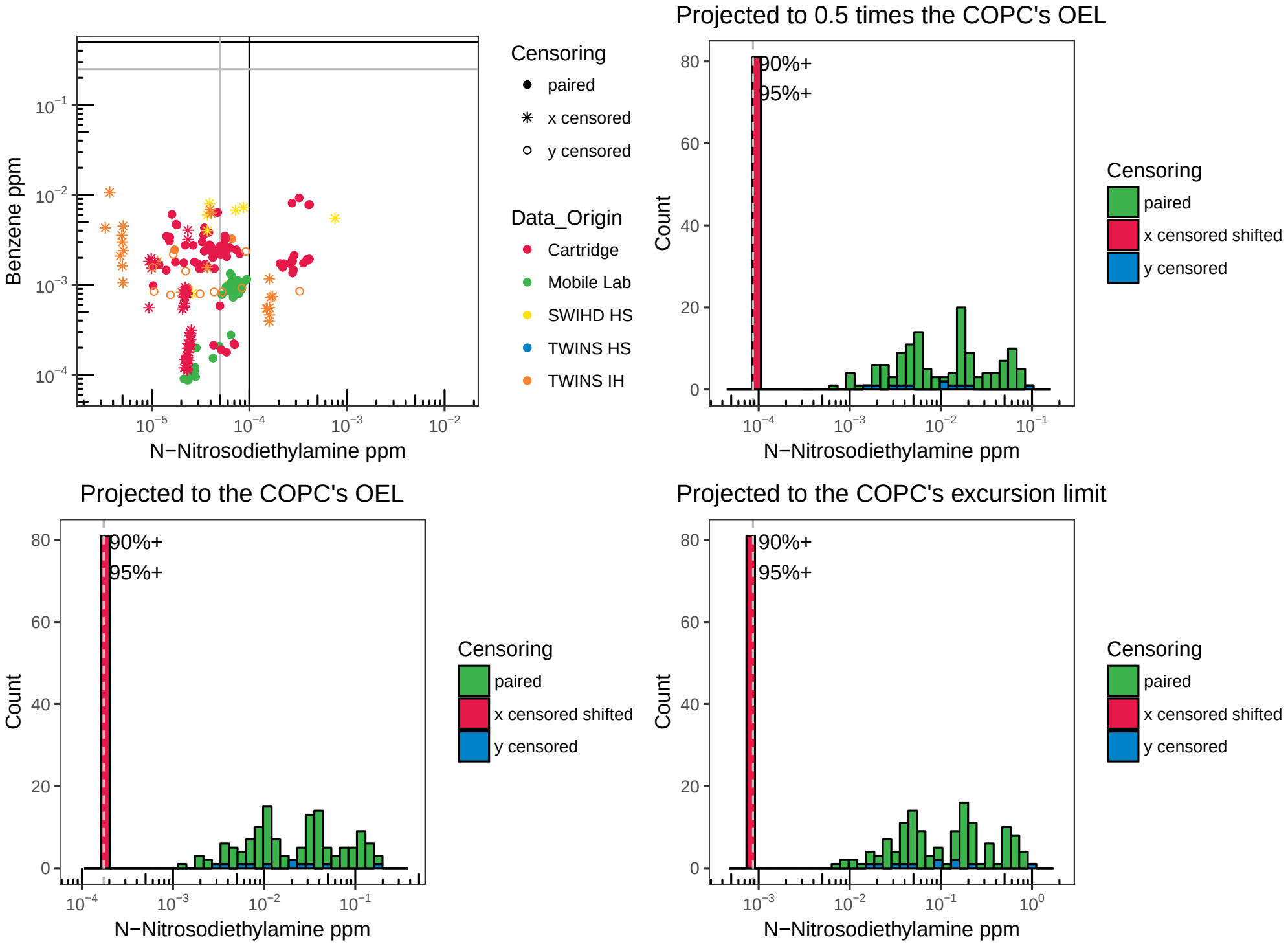


Figure C.2142: Benzene vs N-Nitrosodiethylamine

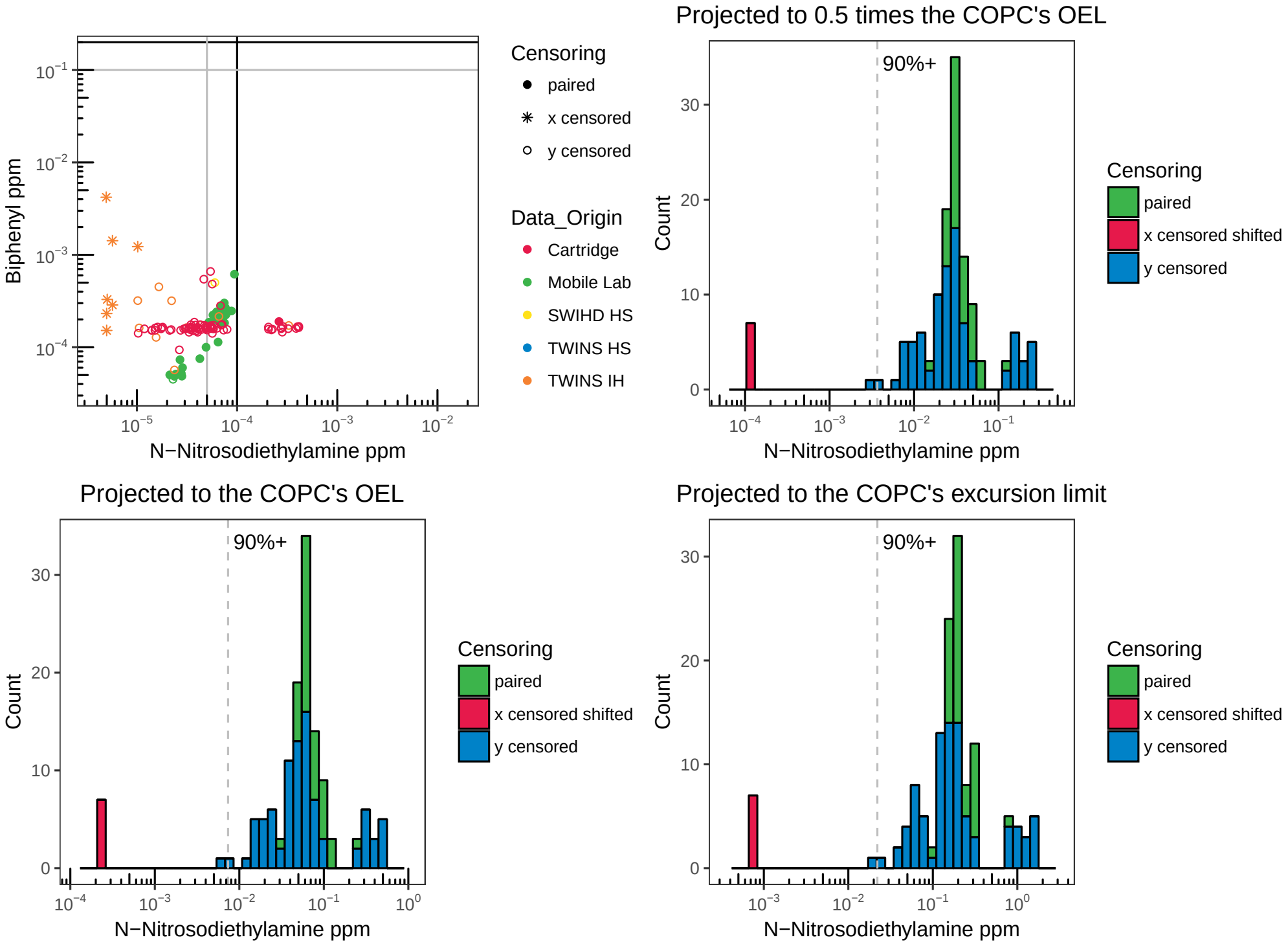


Figure C.2143: Biphenyl vs N-Nitrosodiethylamine

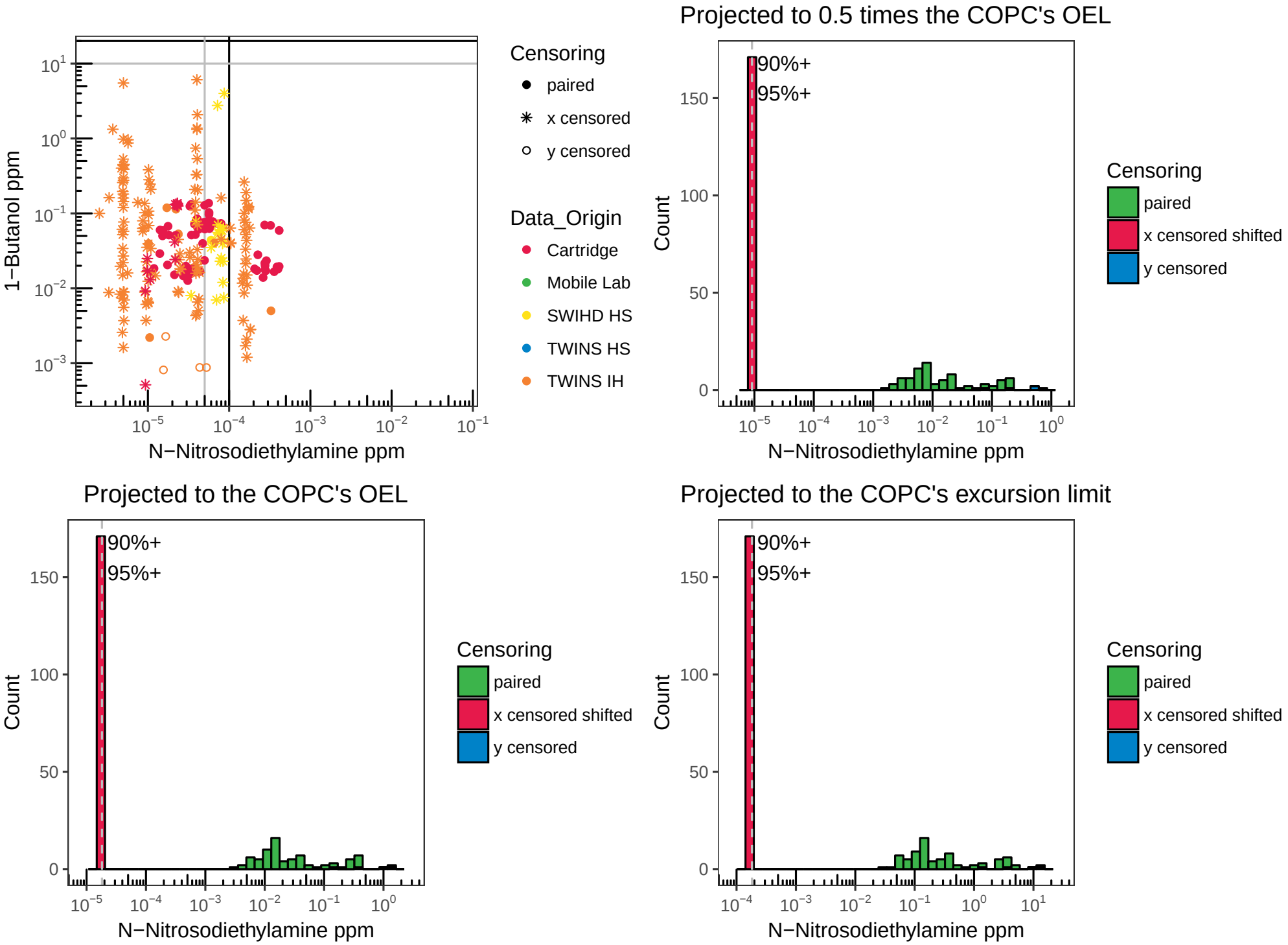


Figure C.2144: 1-Butanol vs N-Nitrosodiethylamine

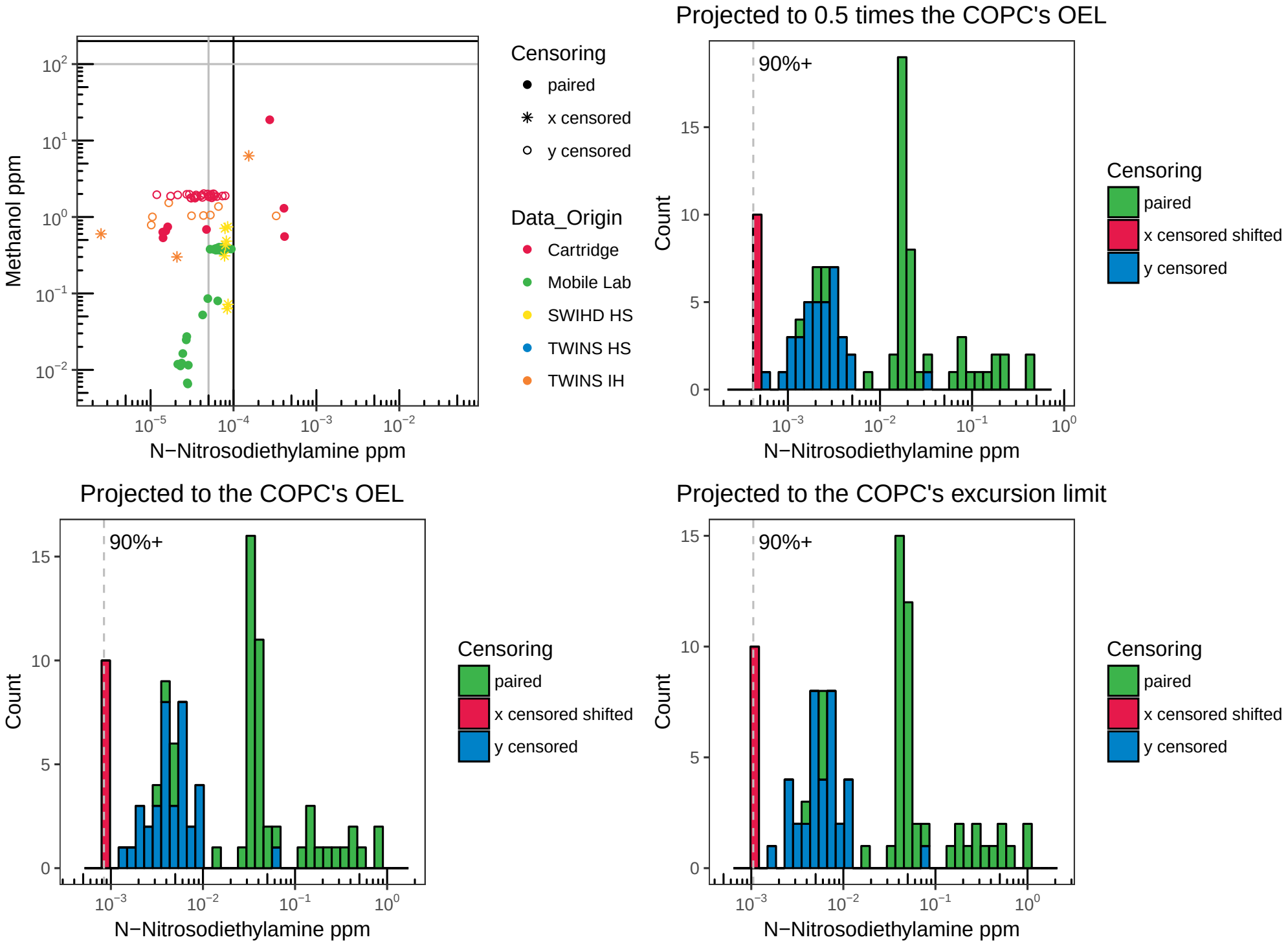


Figure C.2145: Methanol vs N-Nitrosodiethylamine

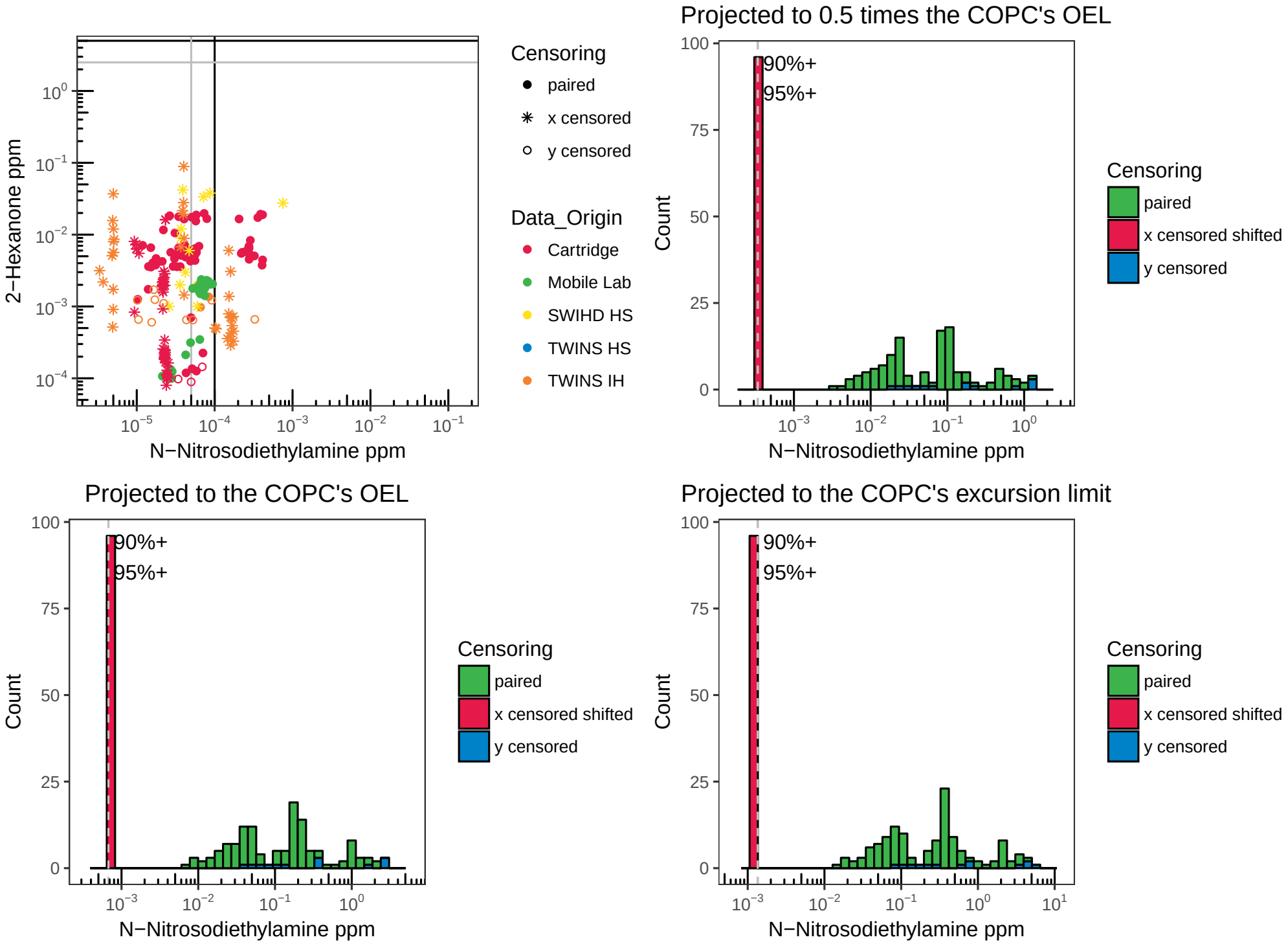


Figure C.2146: 2-Hexanone vs N-Nitrosodiethylamine

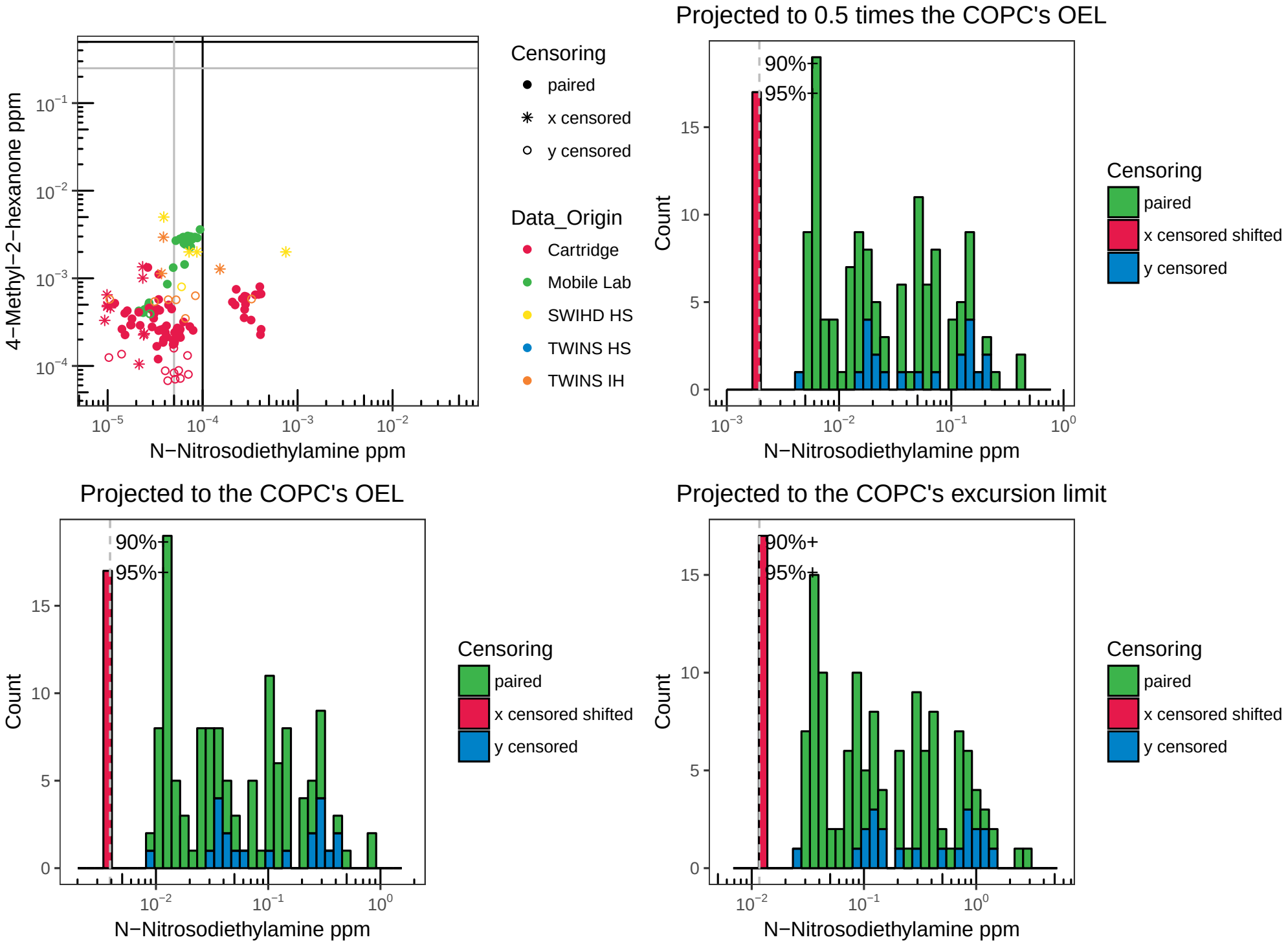


Figure C.2147: 4-Methyl-2-hexanone vs N-Nitrosodiethylamine

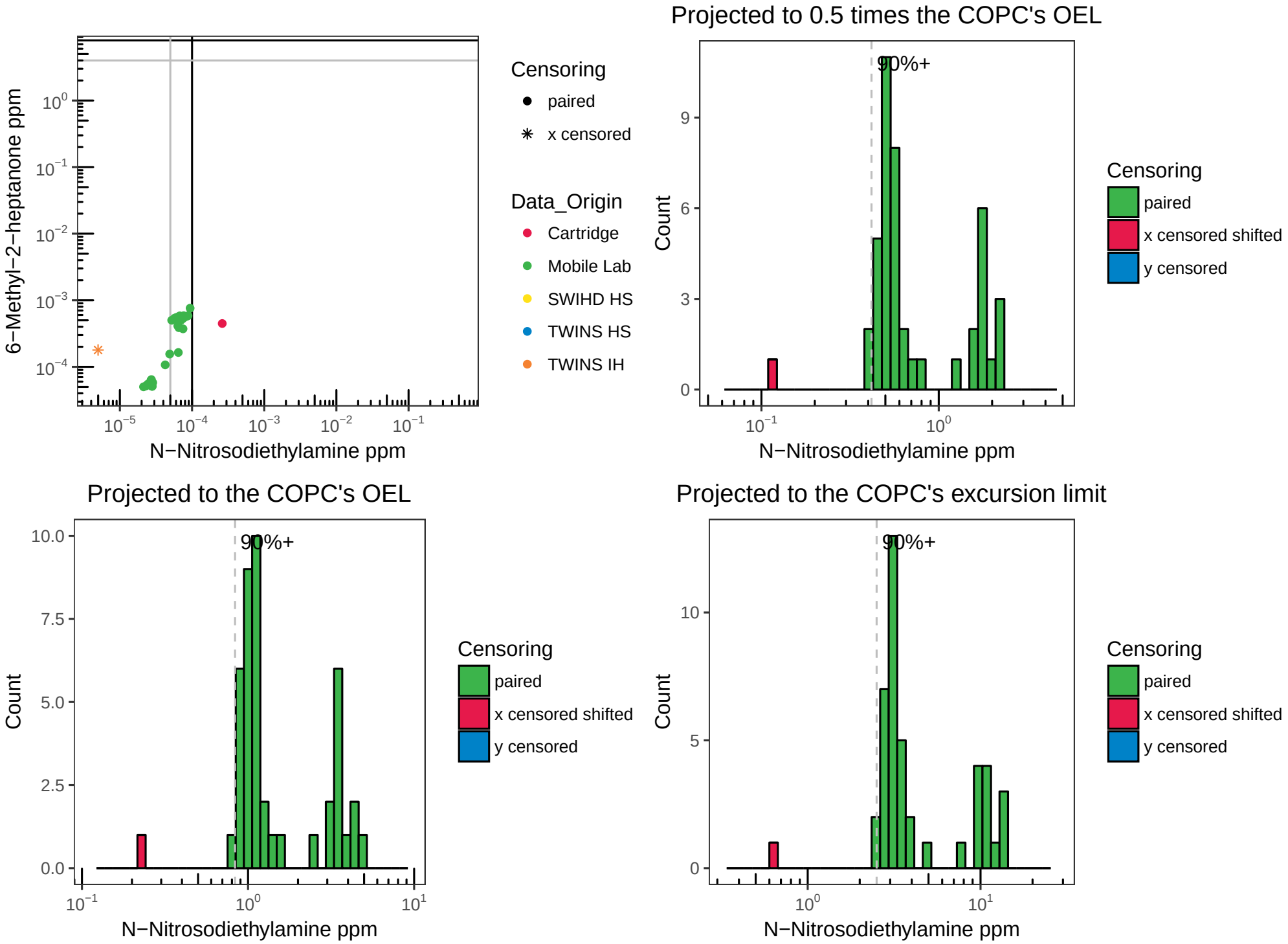


Figure C.2148: 6-Methyl-2-heptanone vs N-Nitrosodiethylamine

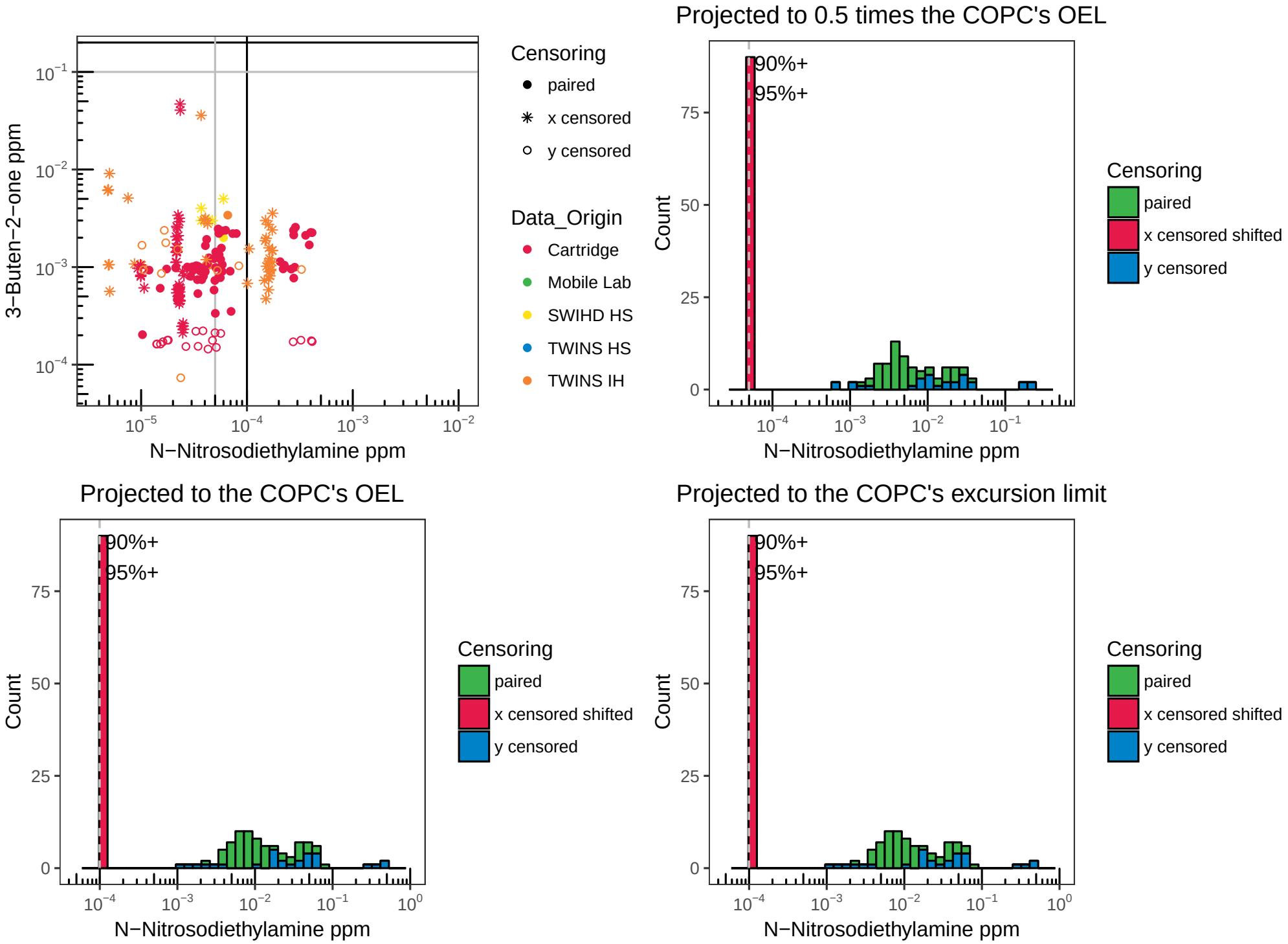


Figure C.2149: 3-Buten-2-one vs N-Nitrosodiethylamine

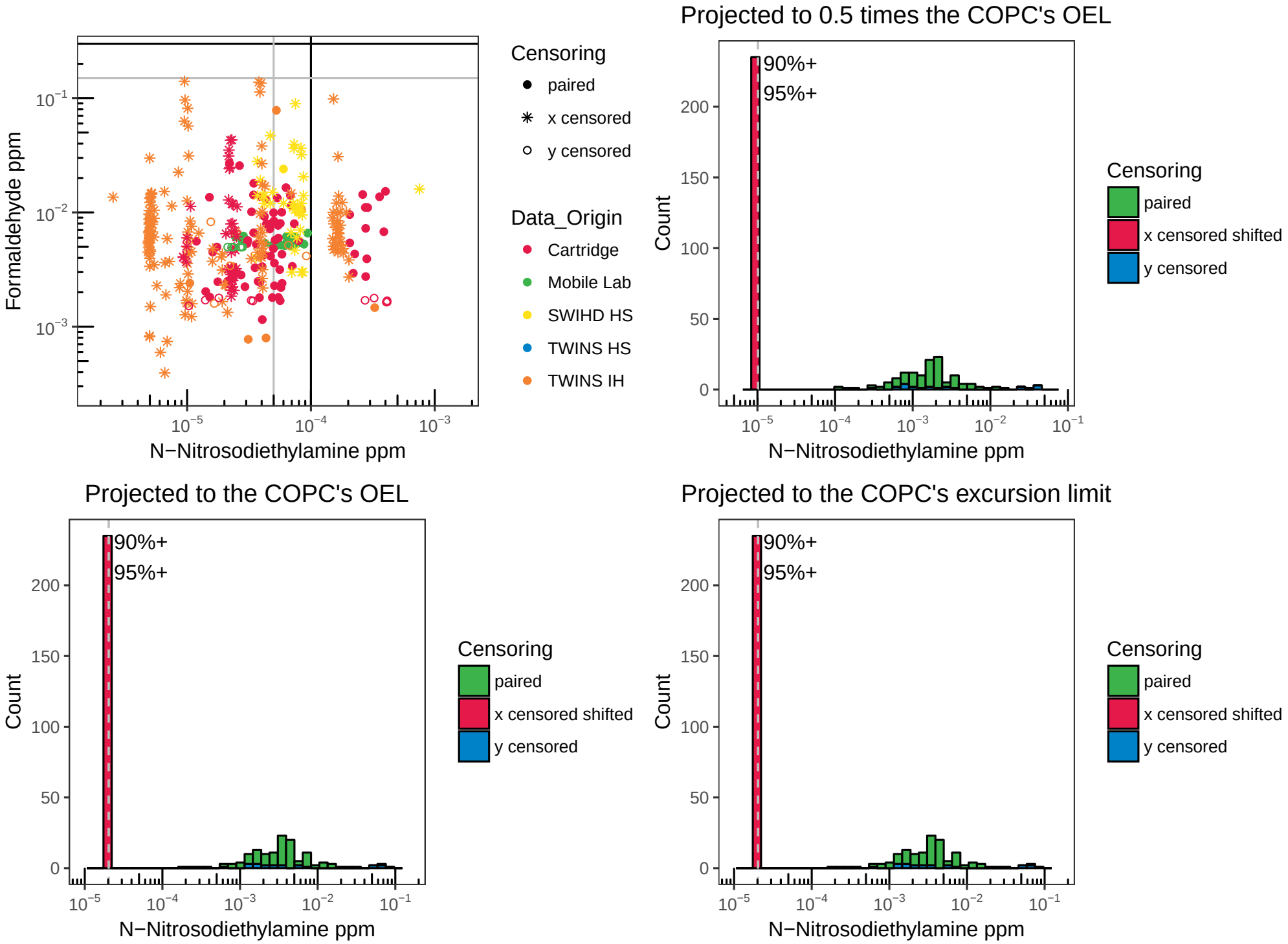


Figure C.2150: Formaldehyde vs N-Nitrosodiethylamine

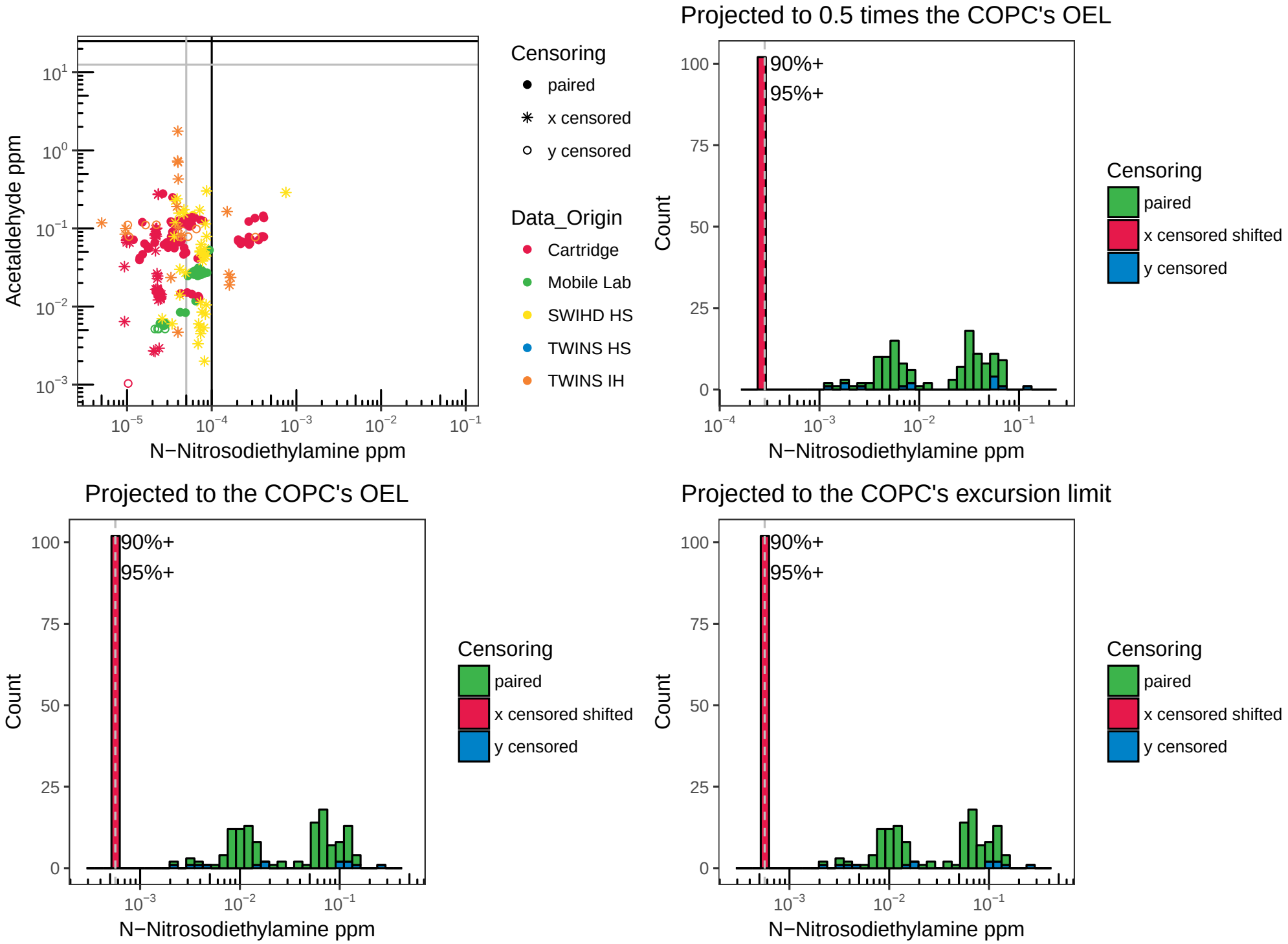


Figure C.2151: Acetaldehyde vs N-Nitrosodiethylamine

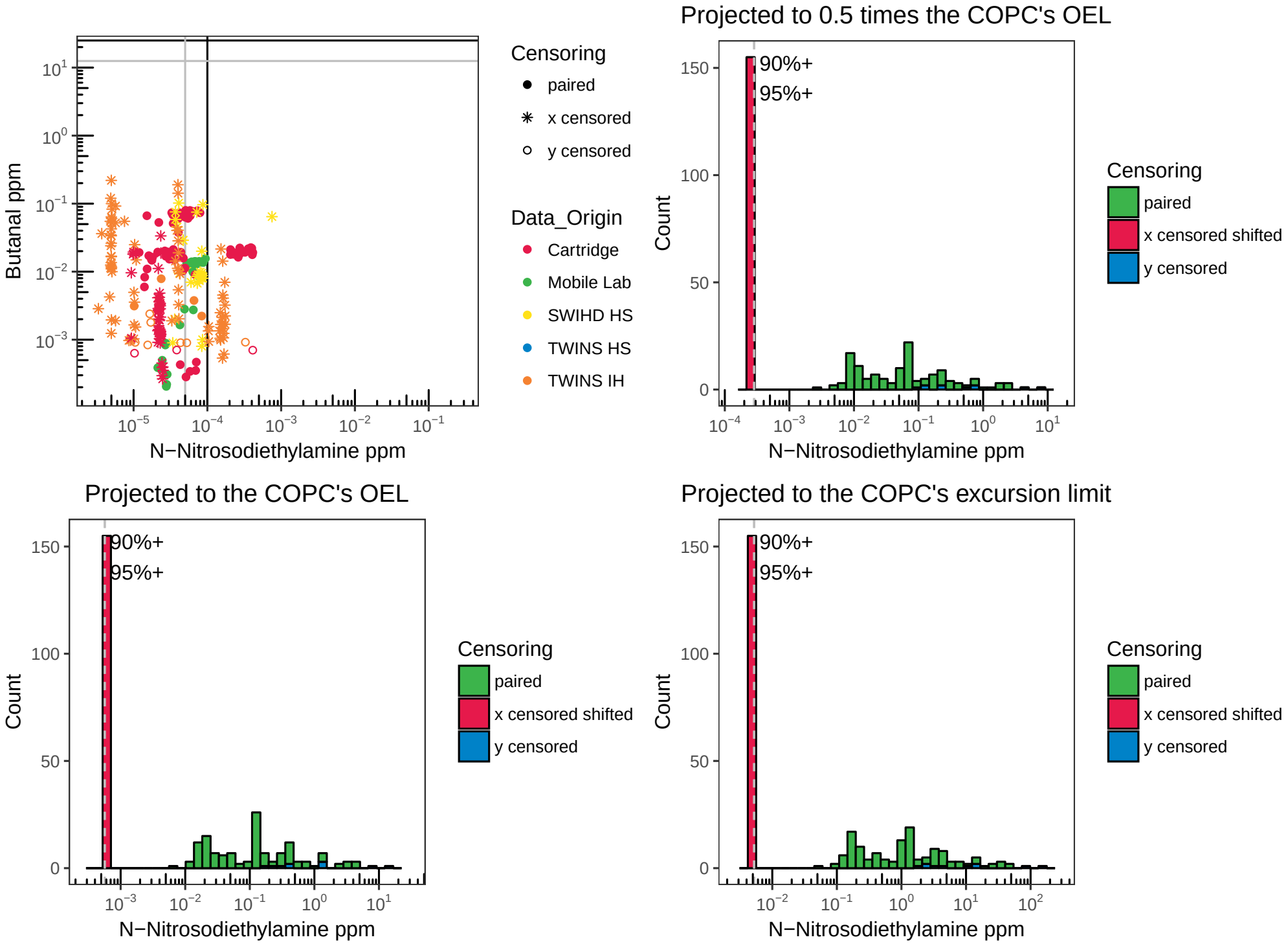


Figure C.2152: Butanal vs N-Nitrosodiethylamine

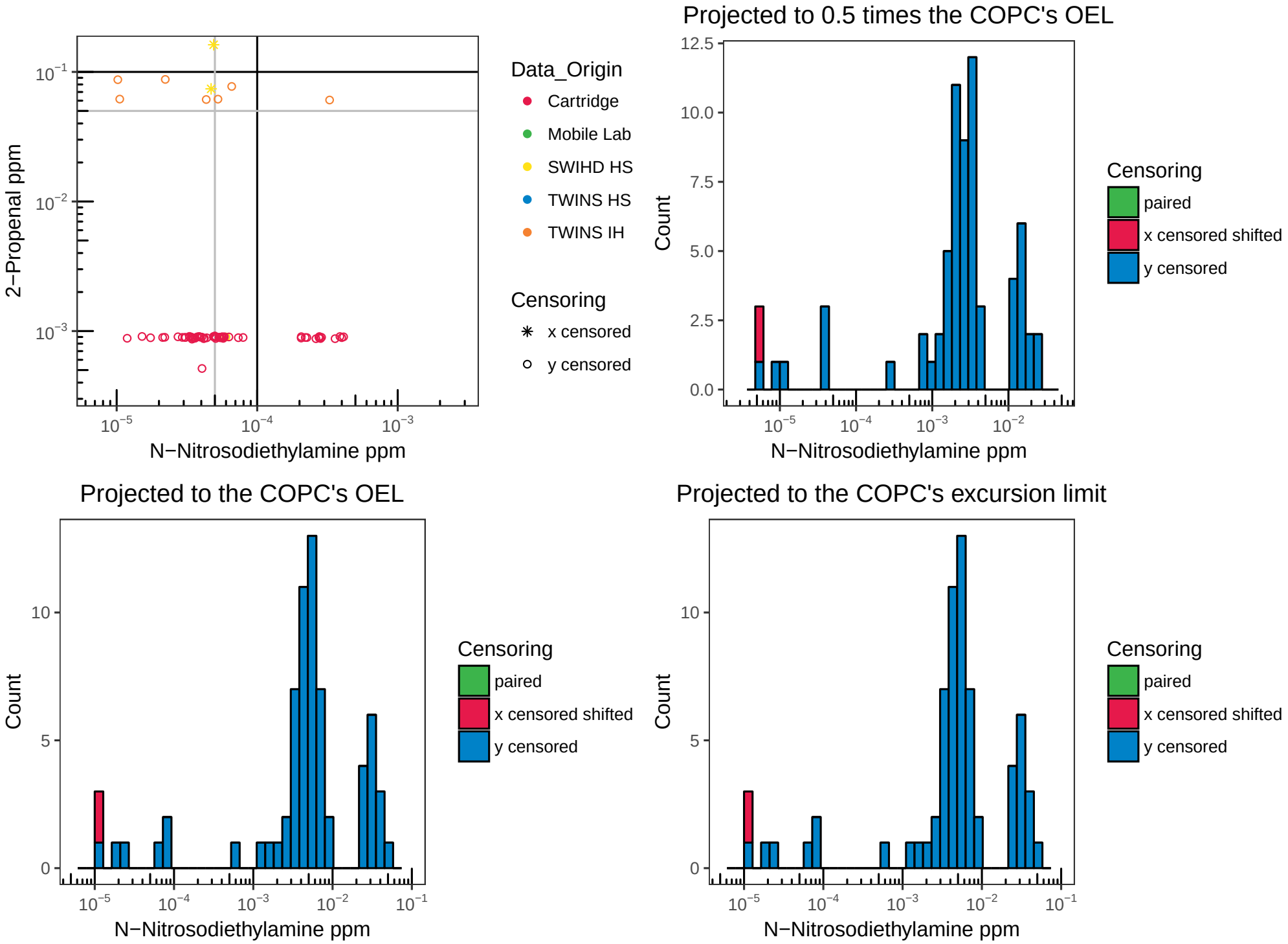


Figure C.2153: 2-Propenal vs N-Nitrosodiethylamine

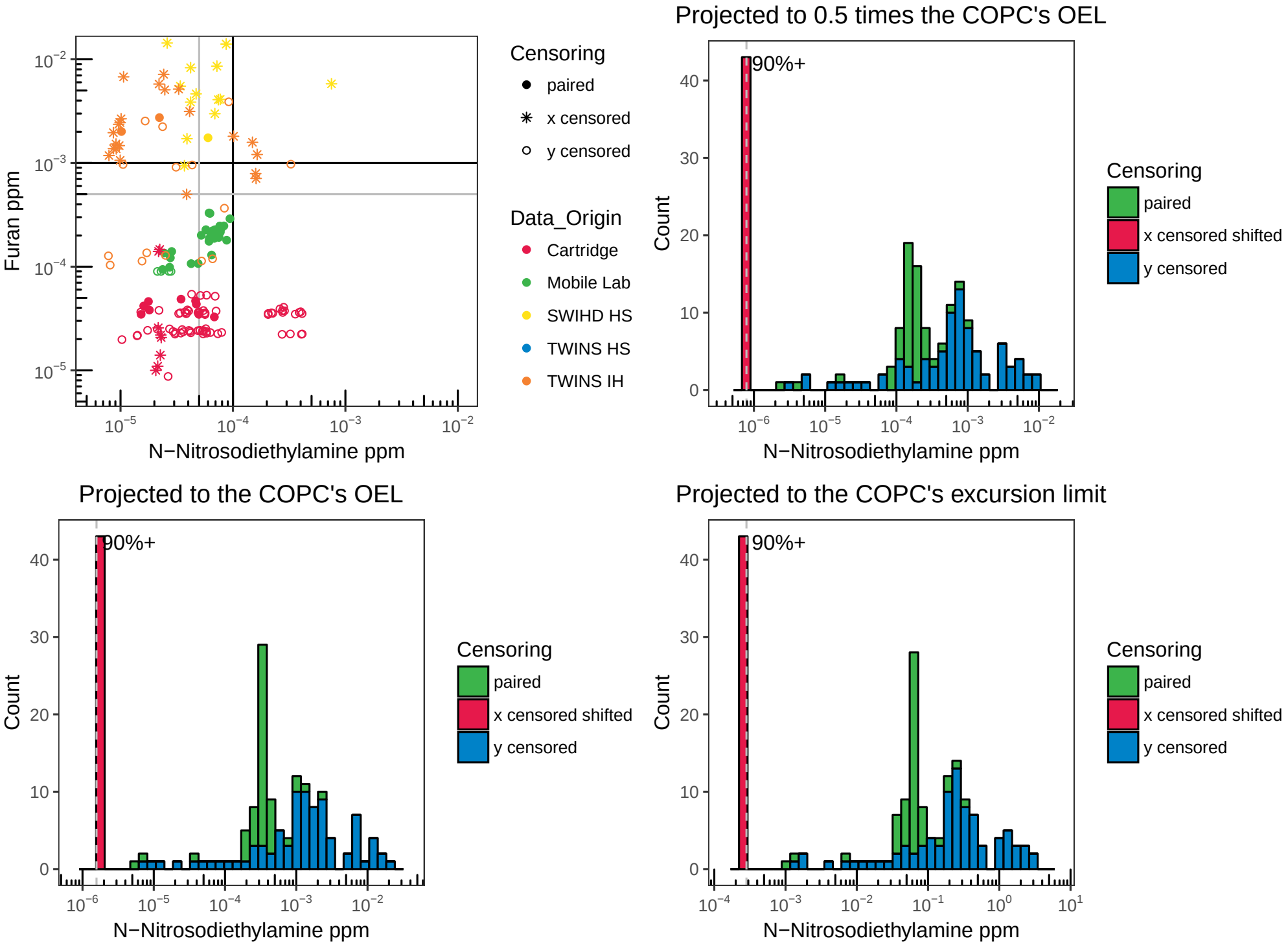


Figure C.2154: Furan vs N-Nitrosodiethylamine

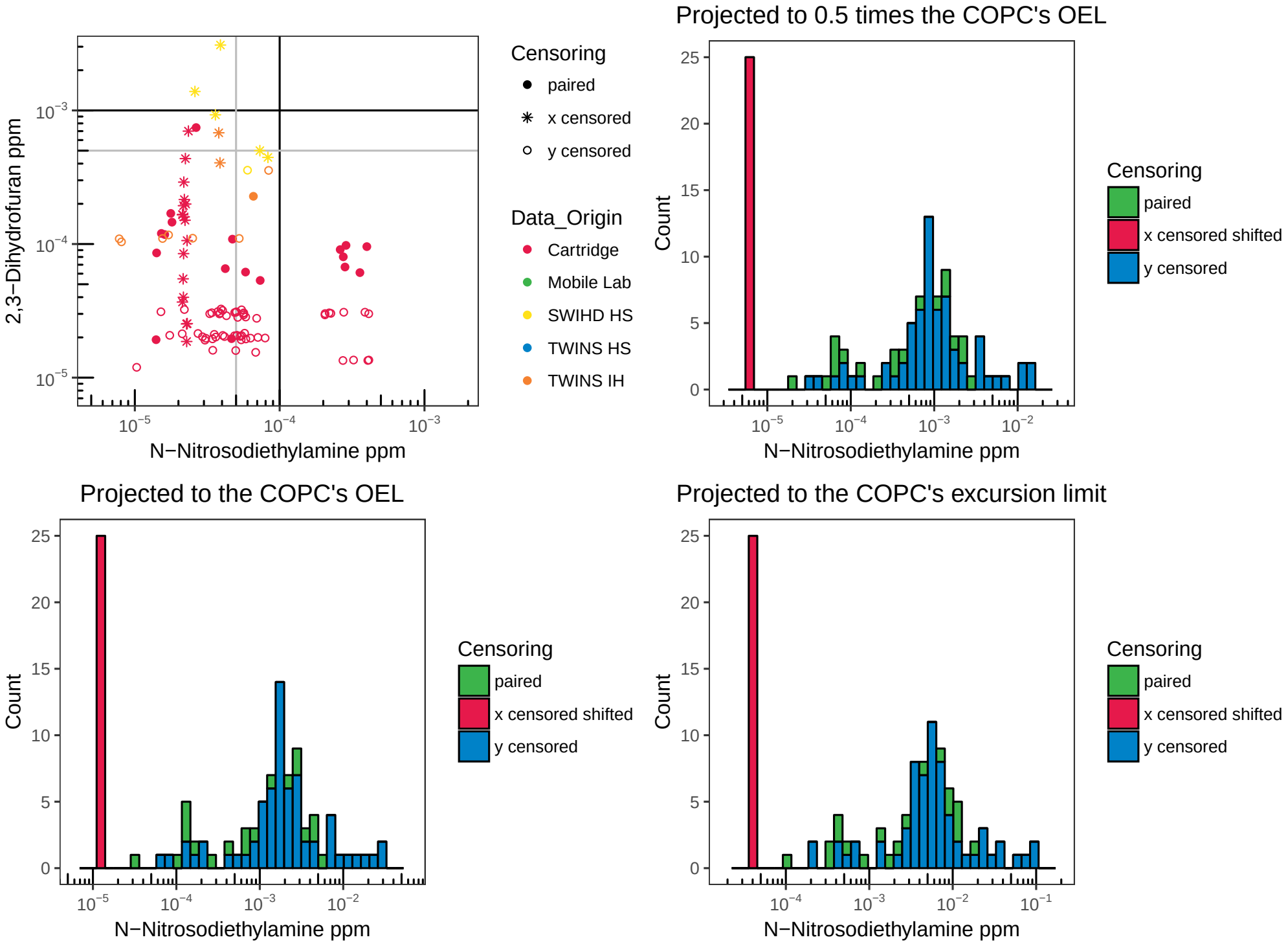


Figure C.2155: 2,3-Dihydrofuran vs N-Nitrosodiethylamine

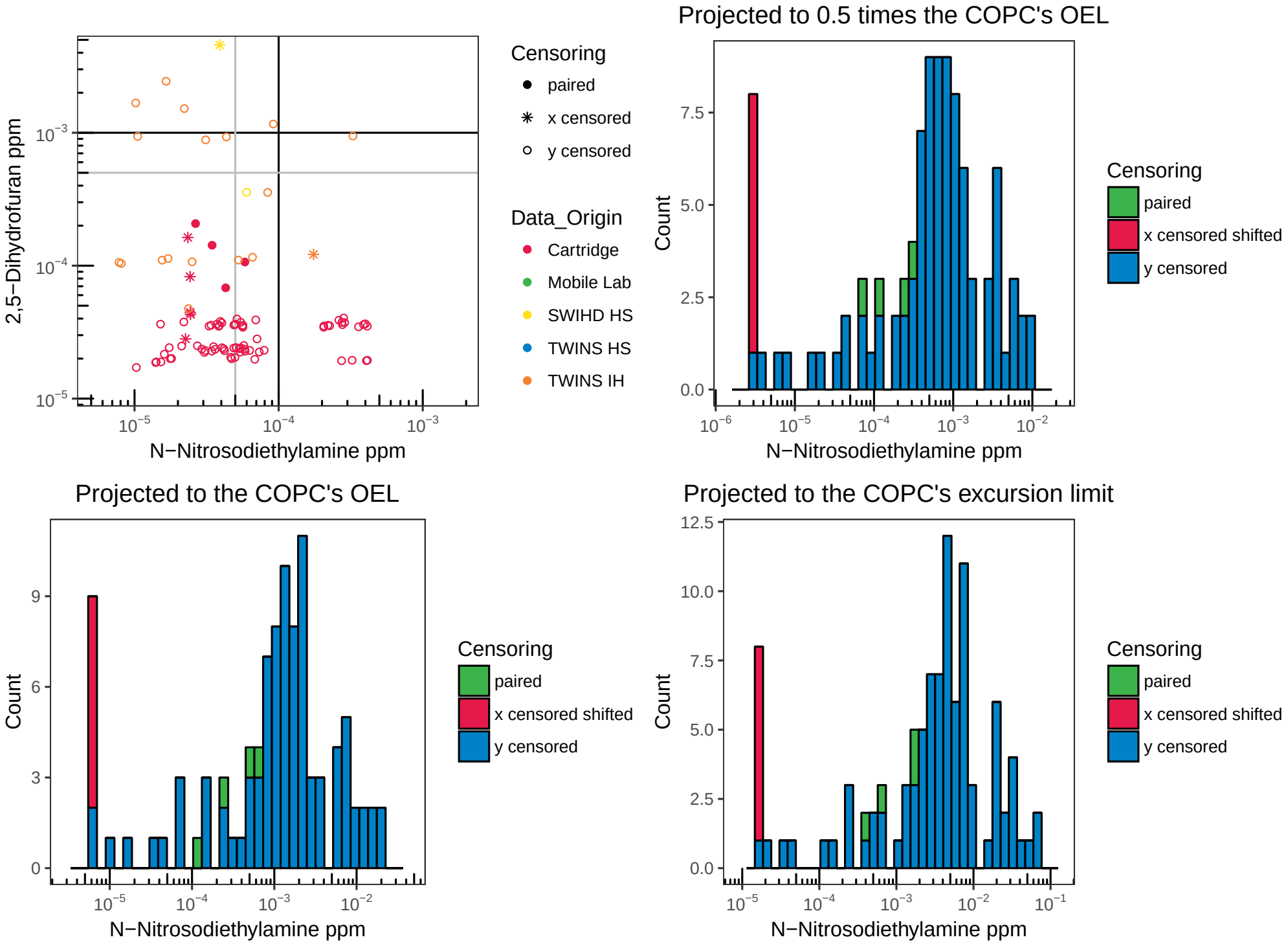


Figure C.2156: 2,5-Dihydrofuran vs N-Nitrosodiethylamine

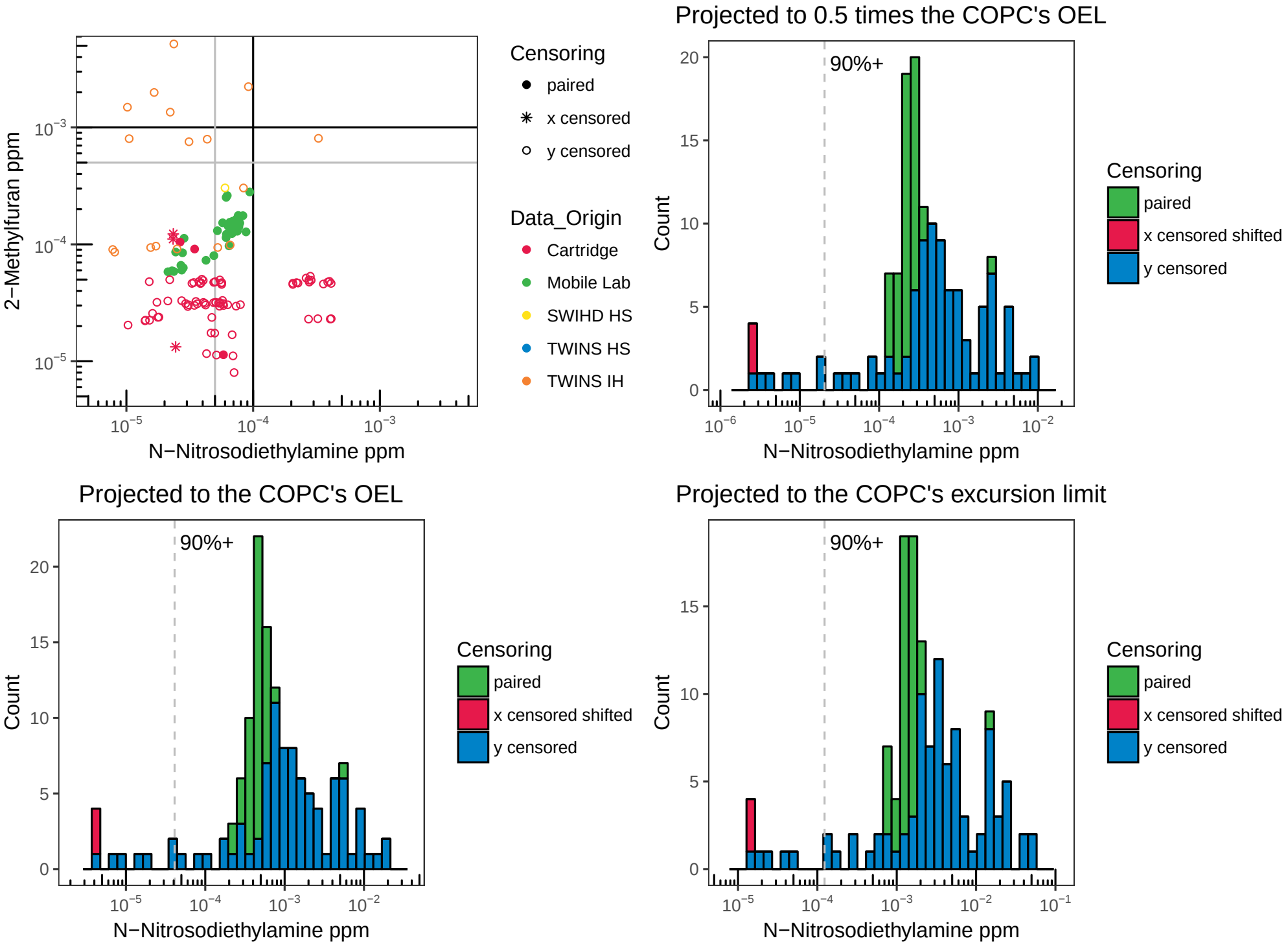


Figure C.2157: 2-Methylfuran vs N-Nitrosodiethylamine

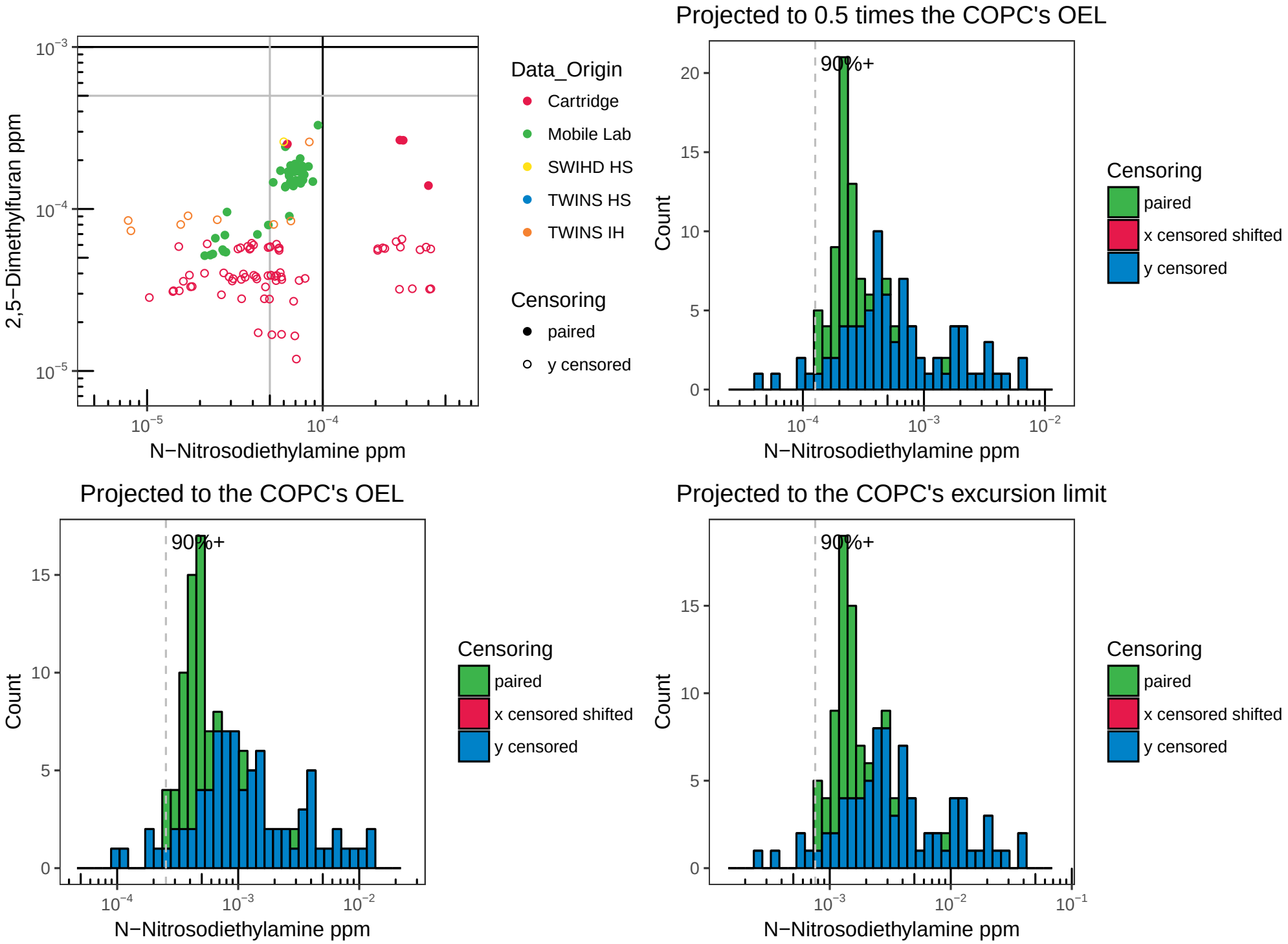


Figure C.2158: 2,5-Dimethylfuran vs N-Nitrosodiethylamine

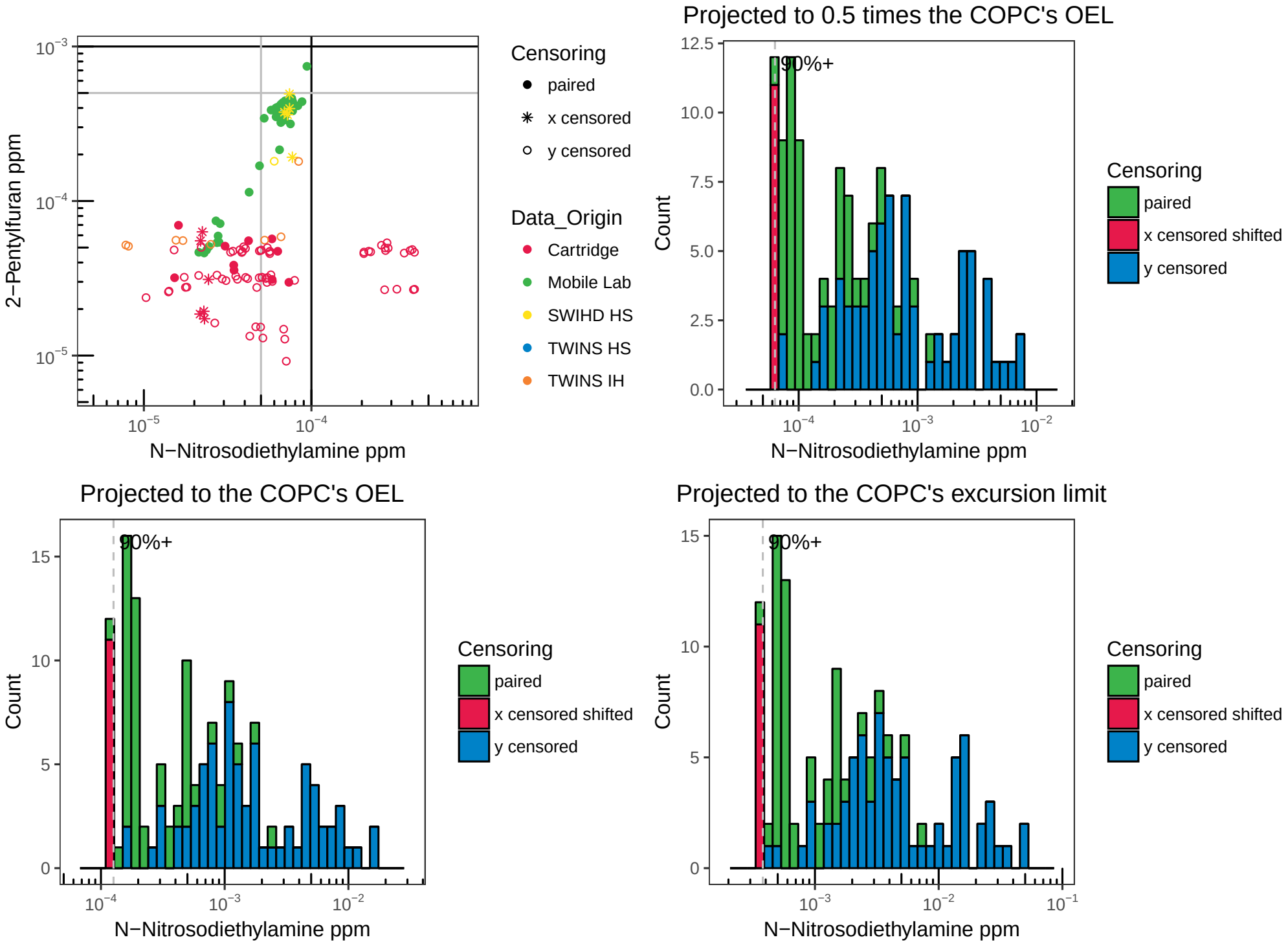


Figure C.2159: 2-Pentylfuran vs N-Nitrosodiethylamine

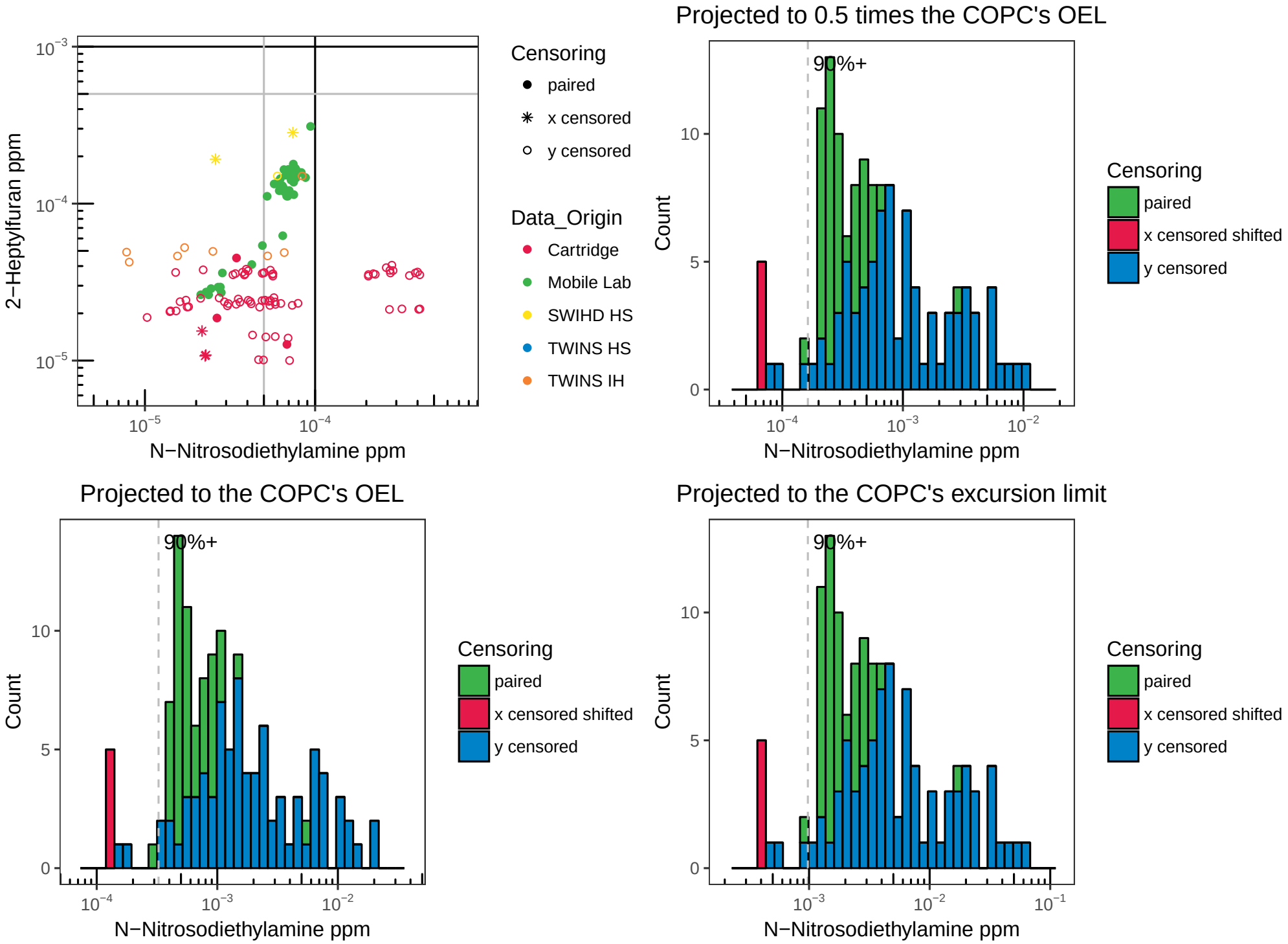


Figure C.2160: 2-Heptylfuran vs N-Nitrosodiethylamine

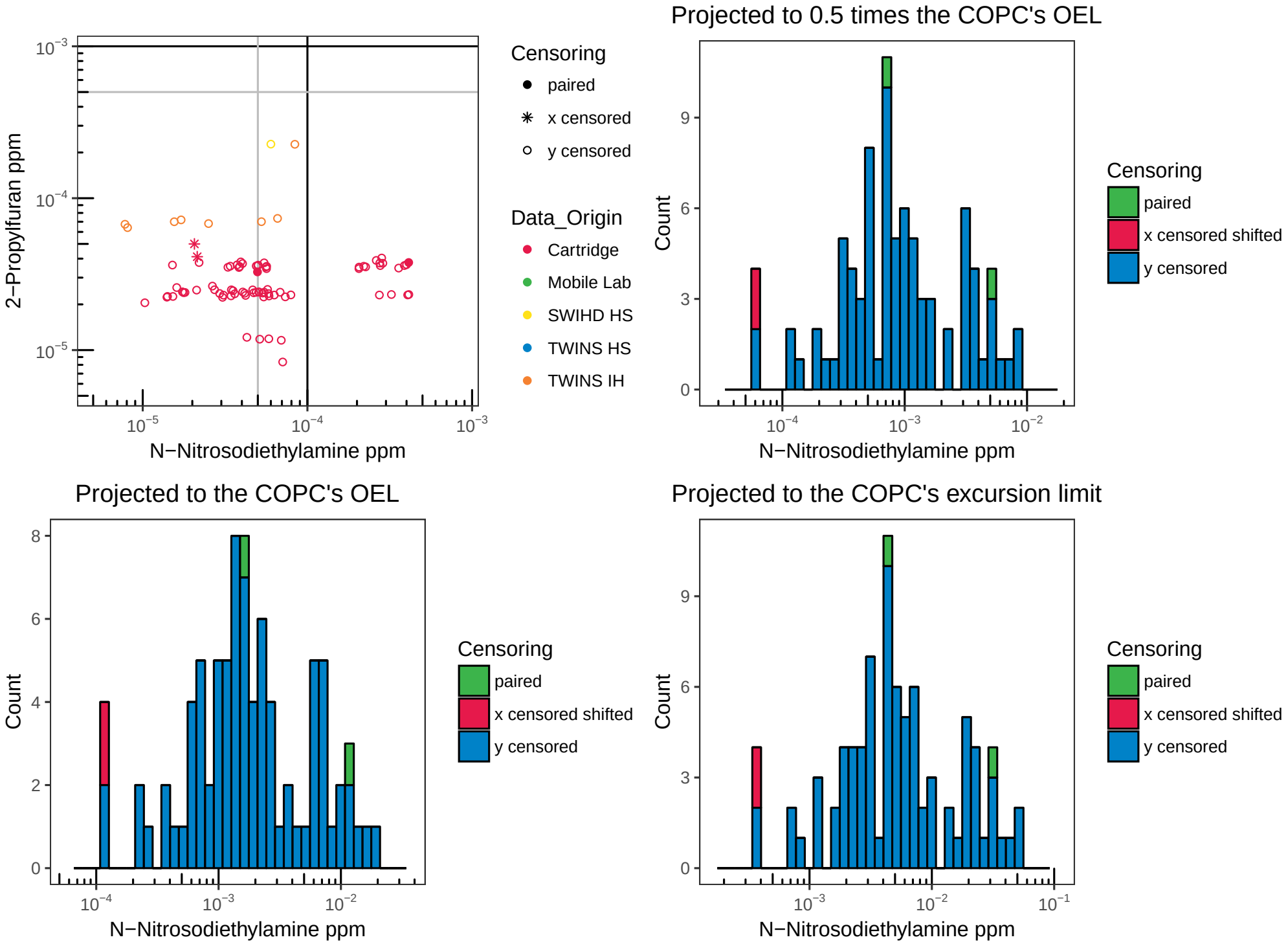


Figure C.2161: 2-Propylfuran vs N-Nitrosodiethylamine

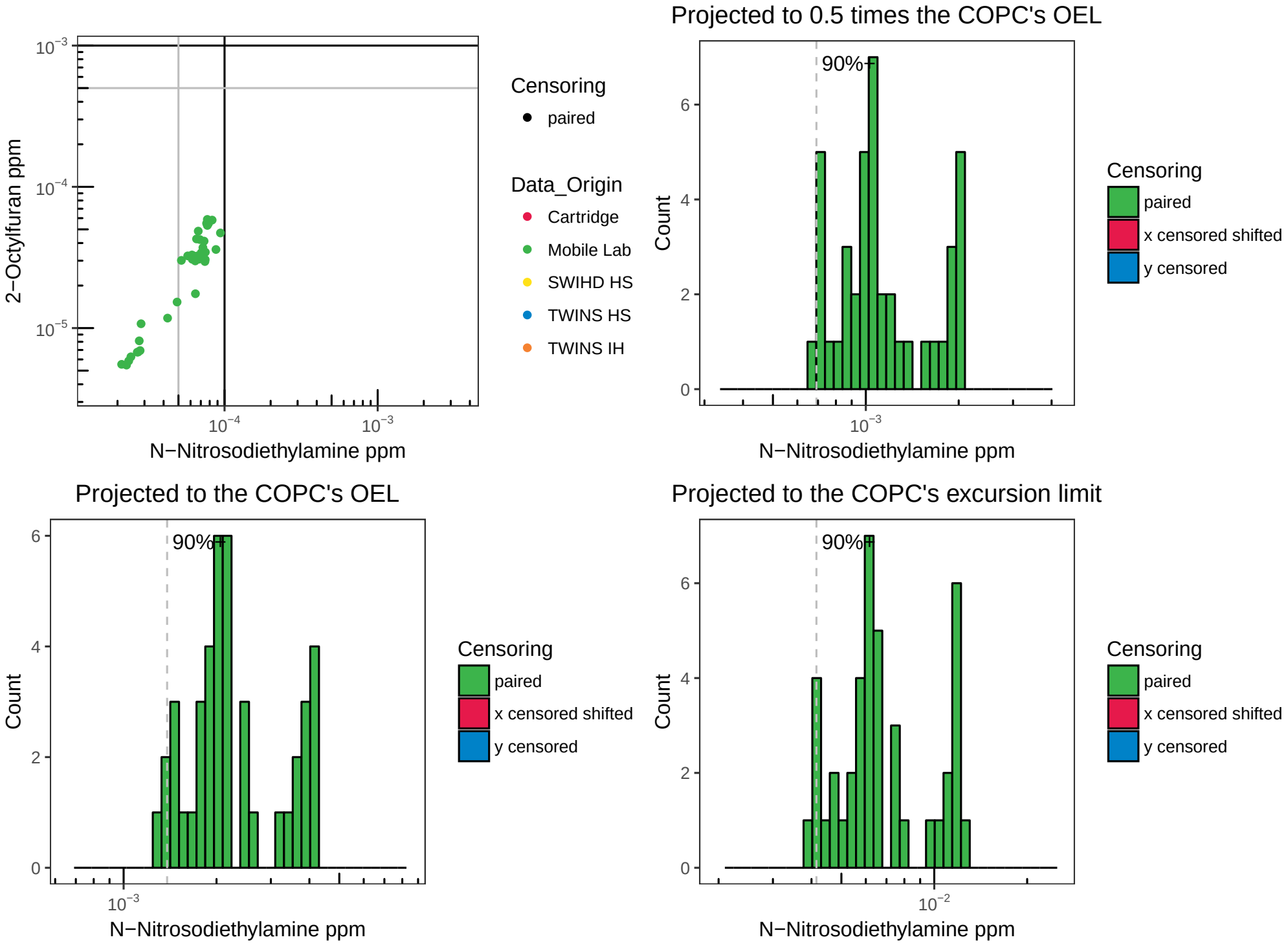


Figure C.2162: 2-Octylfuran vs N-Nitrosodiethylamine

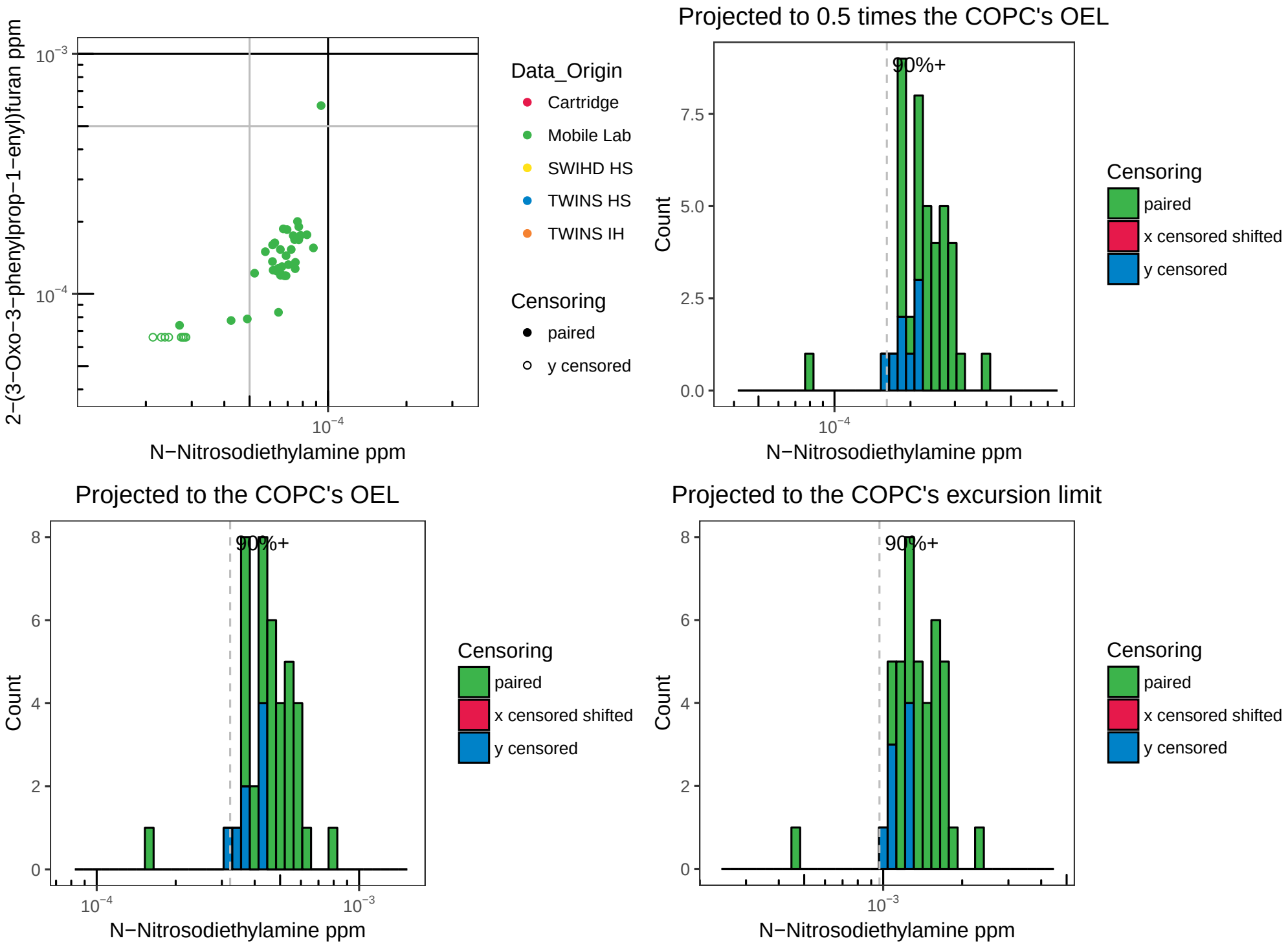


Figure C.2163: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs N-Nitrosodiethylamine

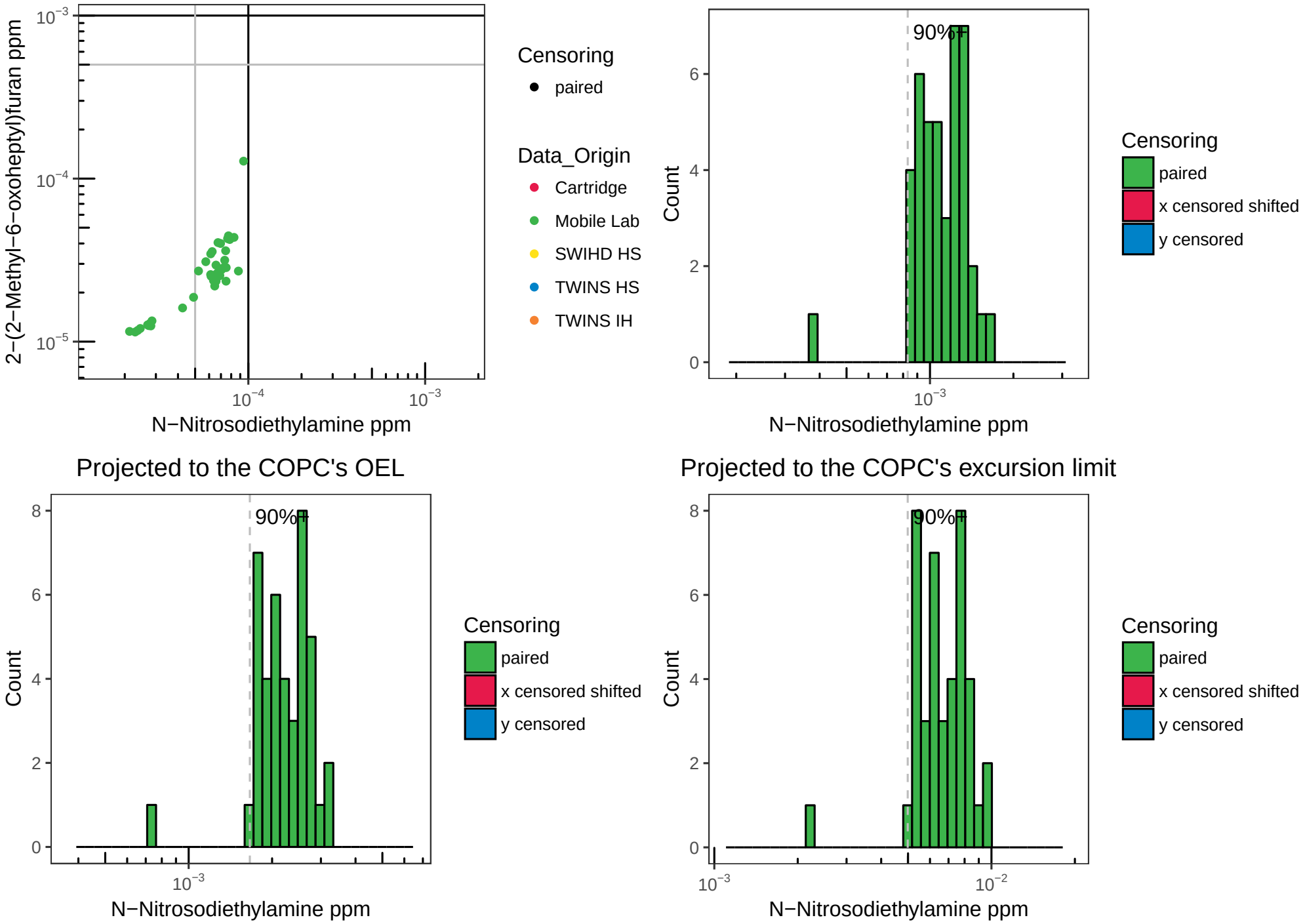


Figure C.2164: 2-(2-Methyl-6-oxoheptyl)furan vs N-Nitrosodiethylamine

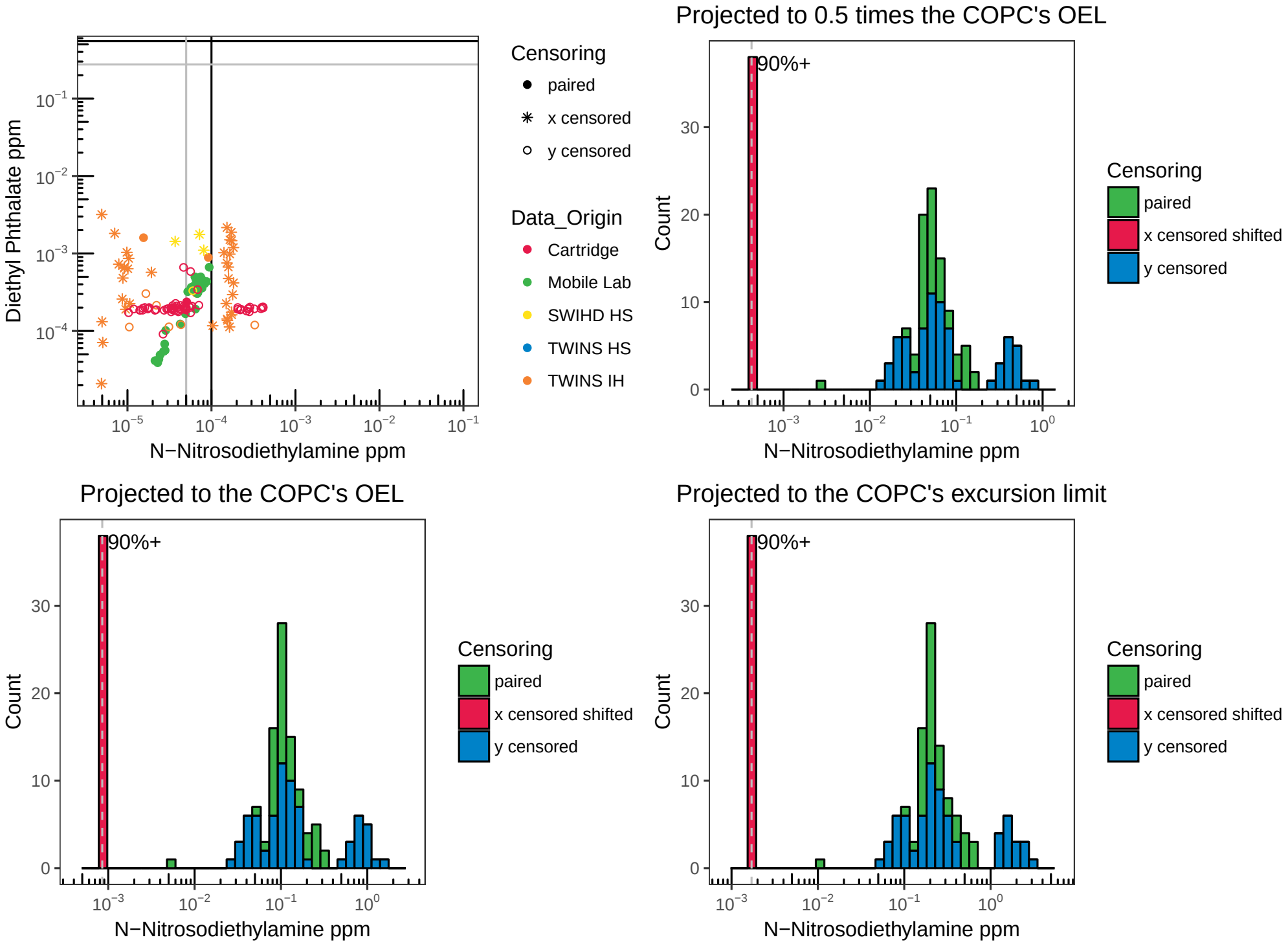


Figure C.2165: Diethyl Phthalate vs N-Nitrosodiethylamine

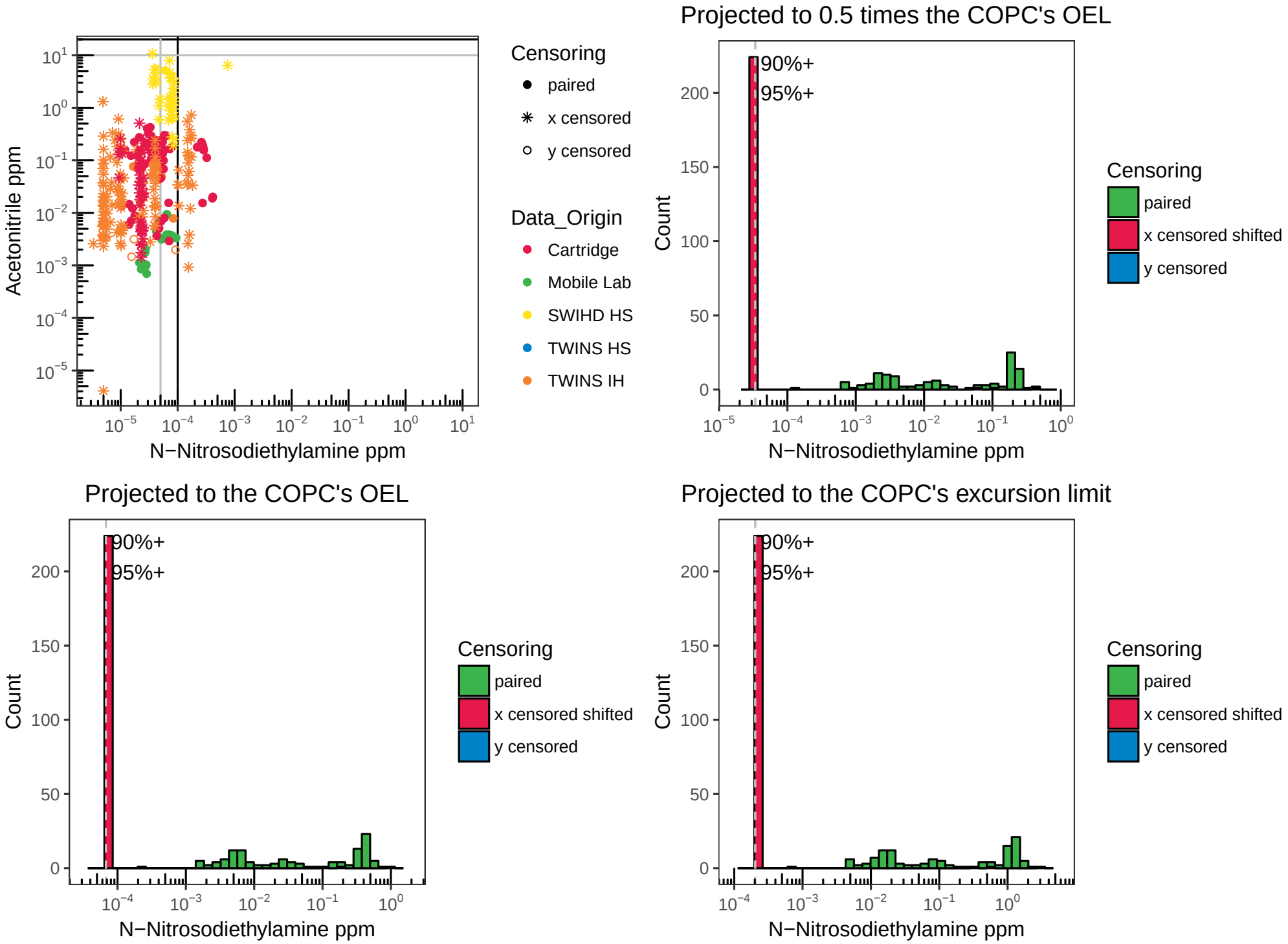


Figure C.2166: Acetonitrile vs N-Nitrosodiethylamine

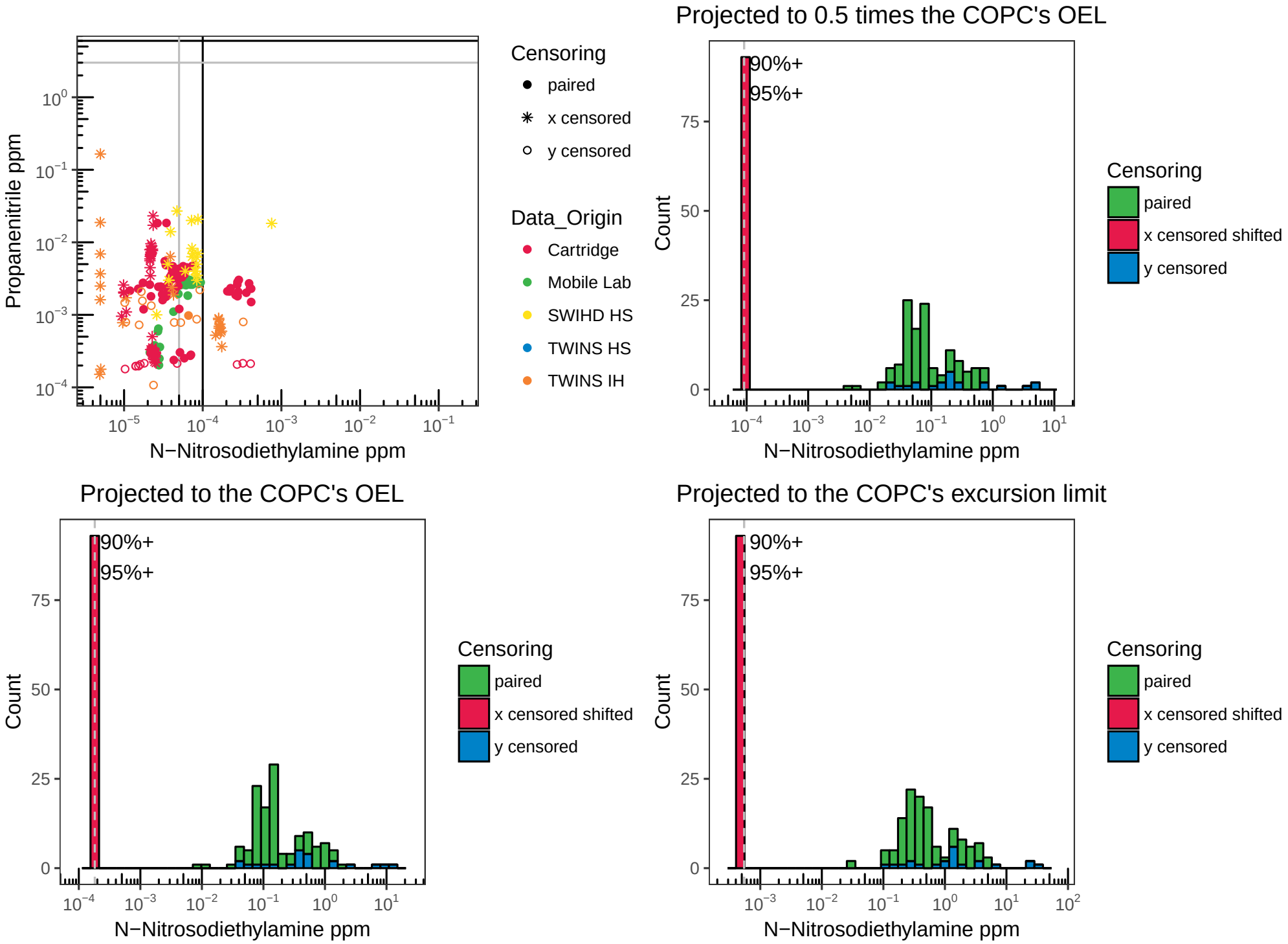


Figure C.2167: Propanenitrile vs N-Nitrosodiethylamine

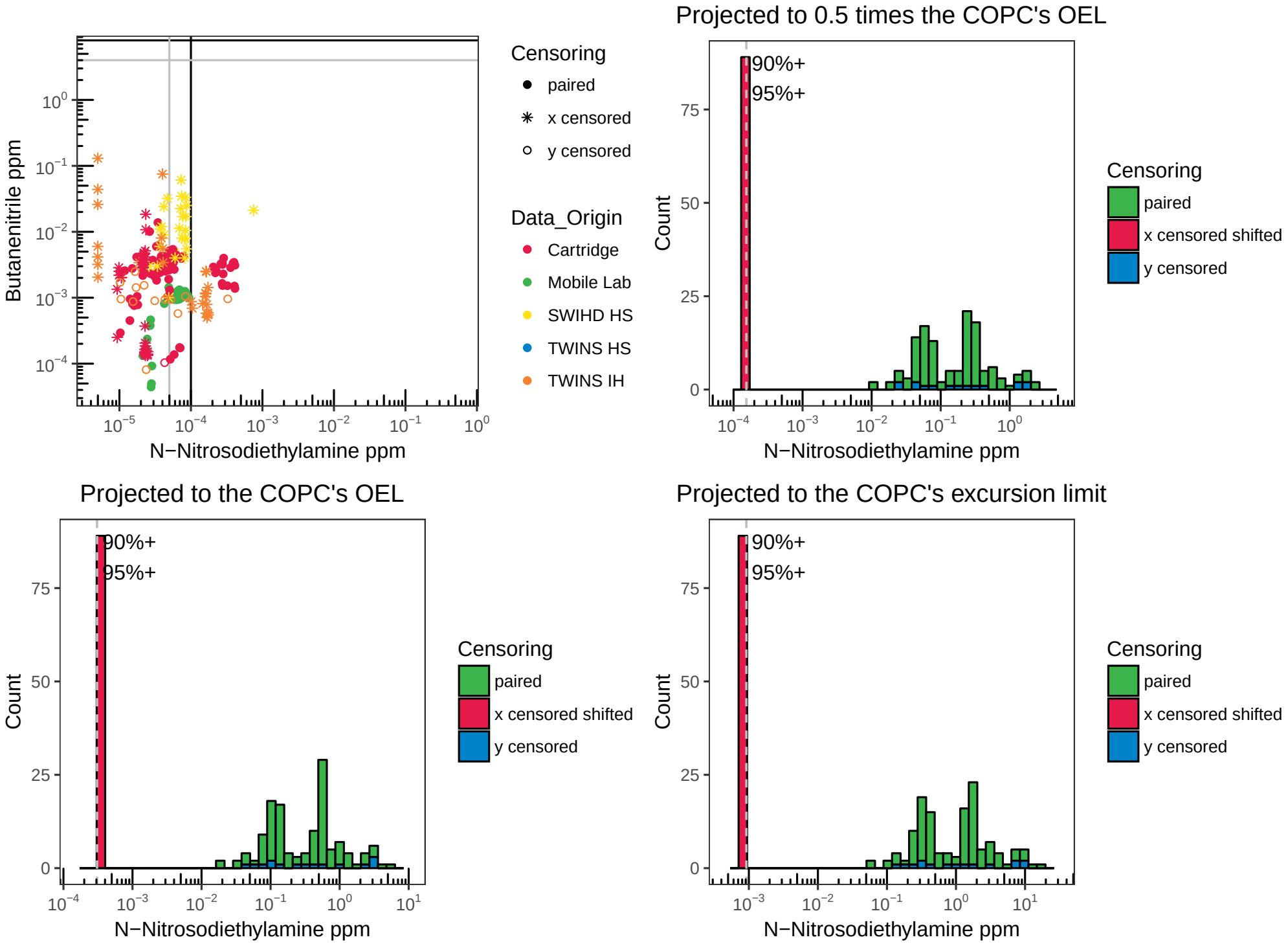


Figure C.2168: Butanenitrile vs N-Nitrosodiethylamine

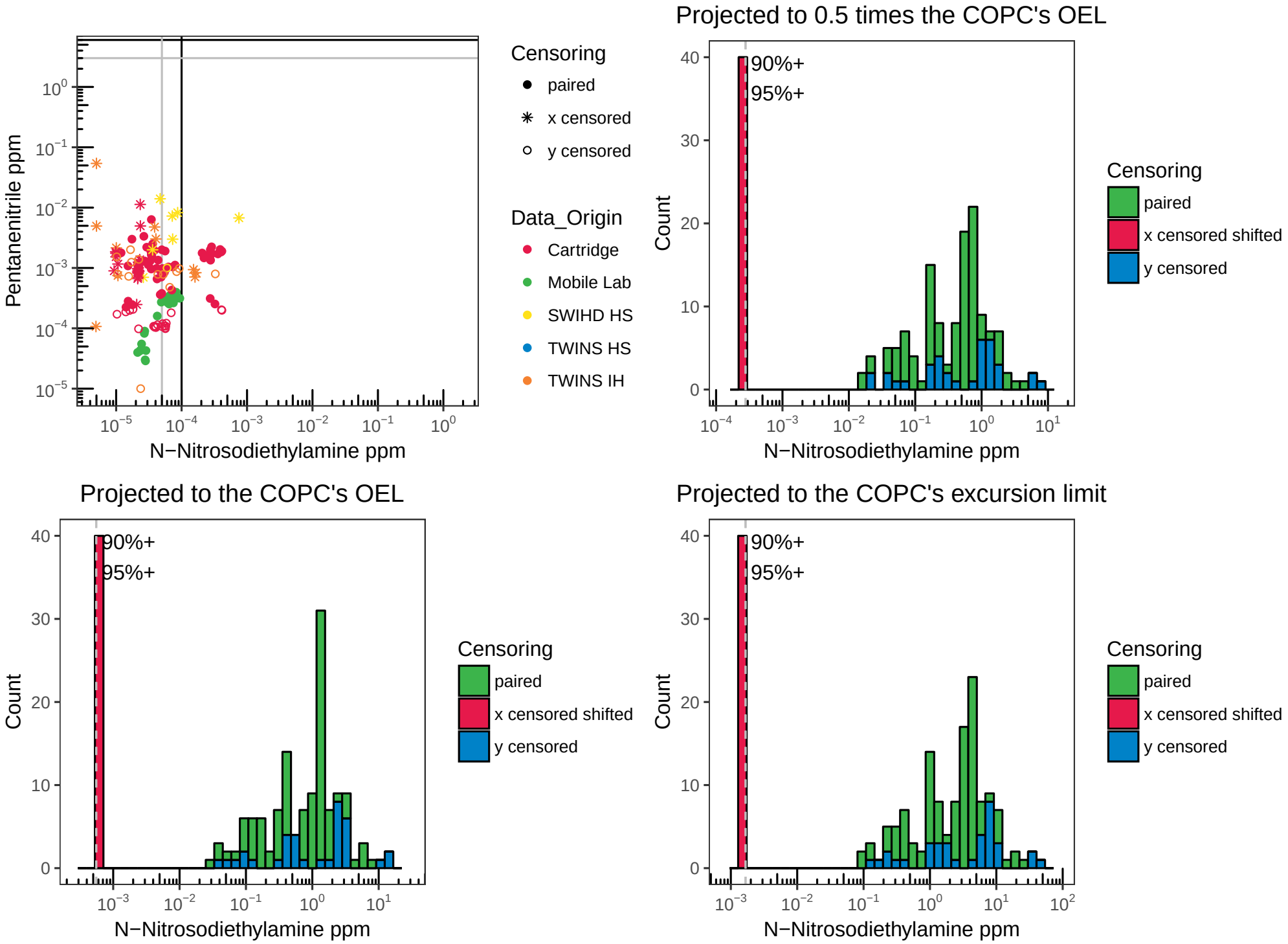


Figure C.2169: Pentanenitrile vs N-Nitrosodiethylamine

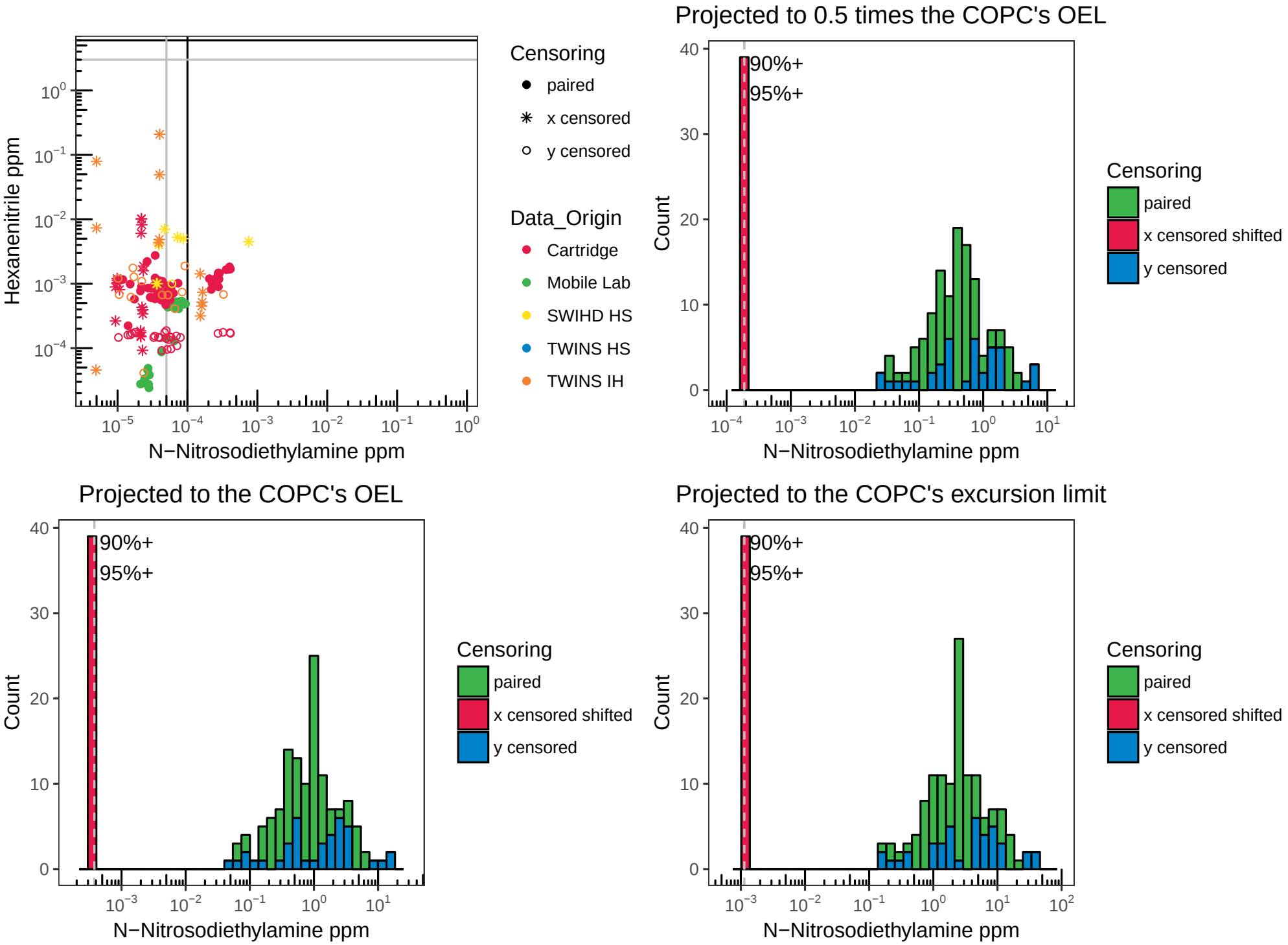


Figure C.2170: Hexanenitrile vs N-Nitrosodiethylamine

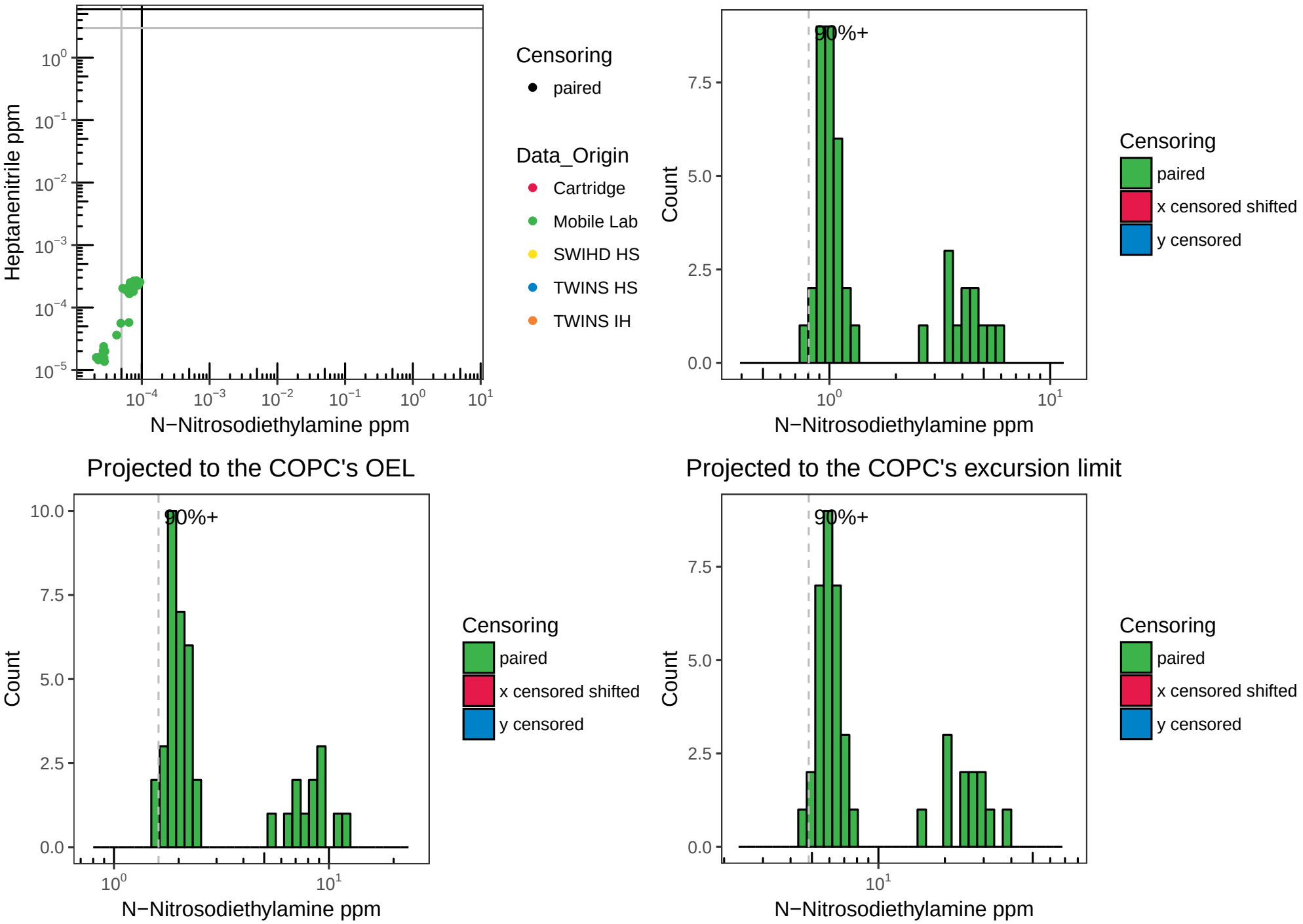


Figure C.2171: Heptanenitrile vs N-Nitrosodiethylamine

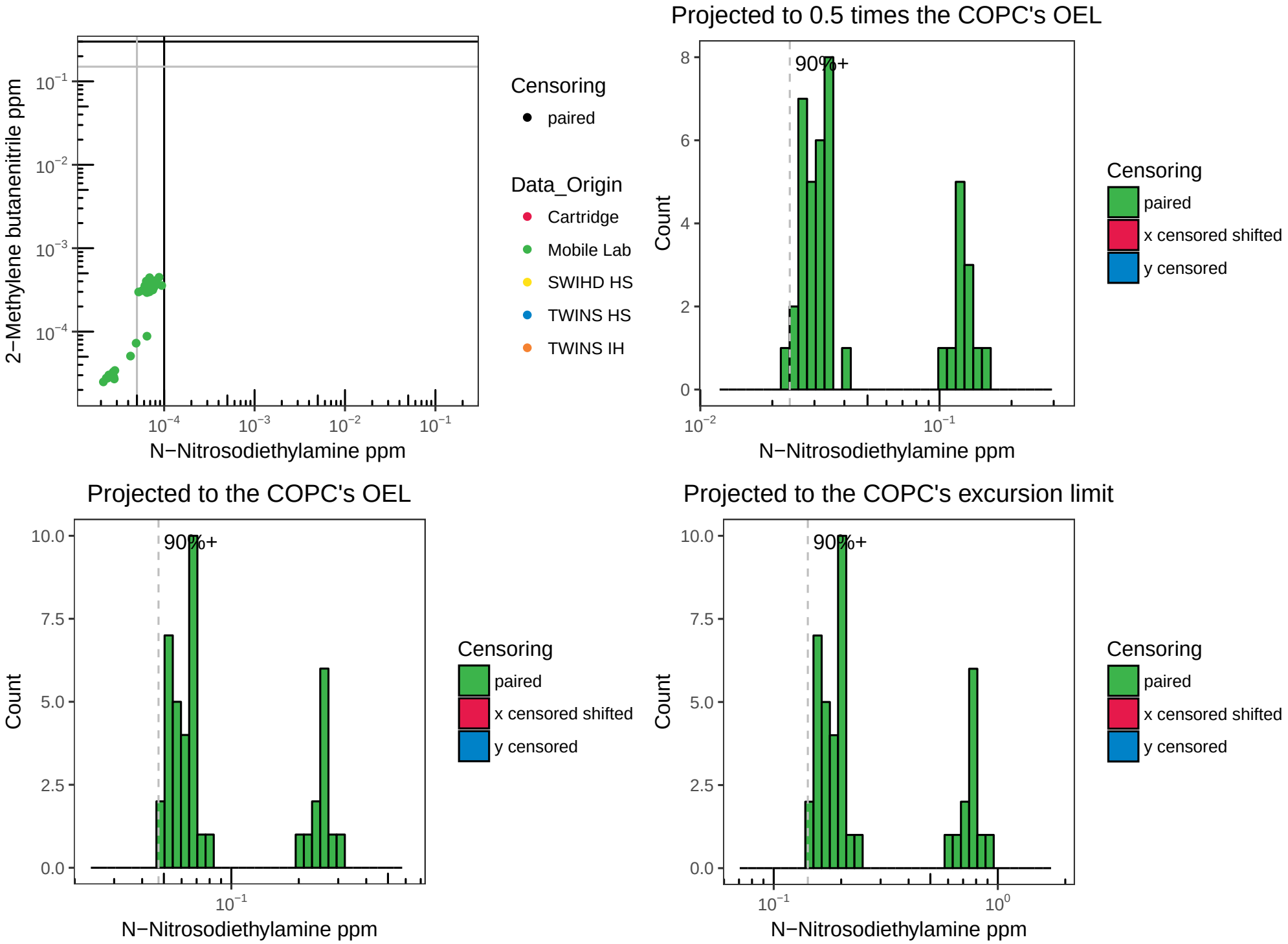


Figure C.2172: 2-Methylene butanenitrile vs N-Nitrosodiethylamine

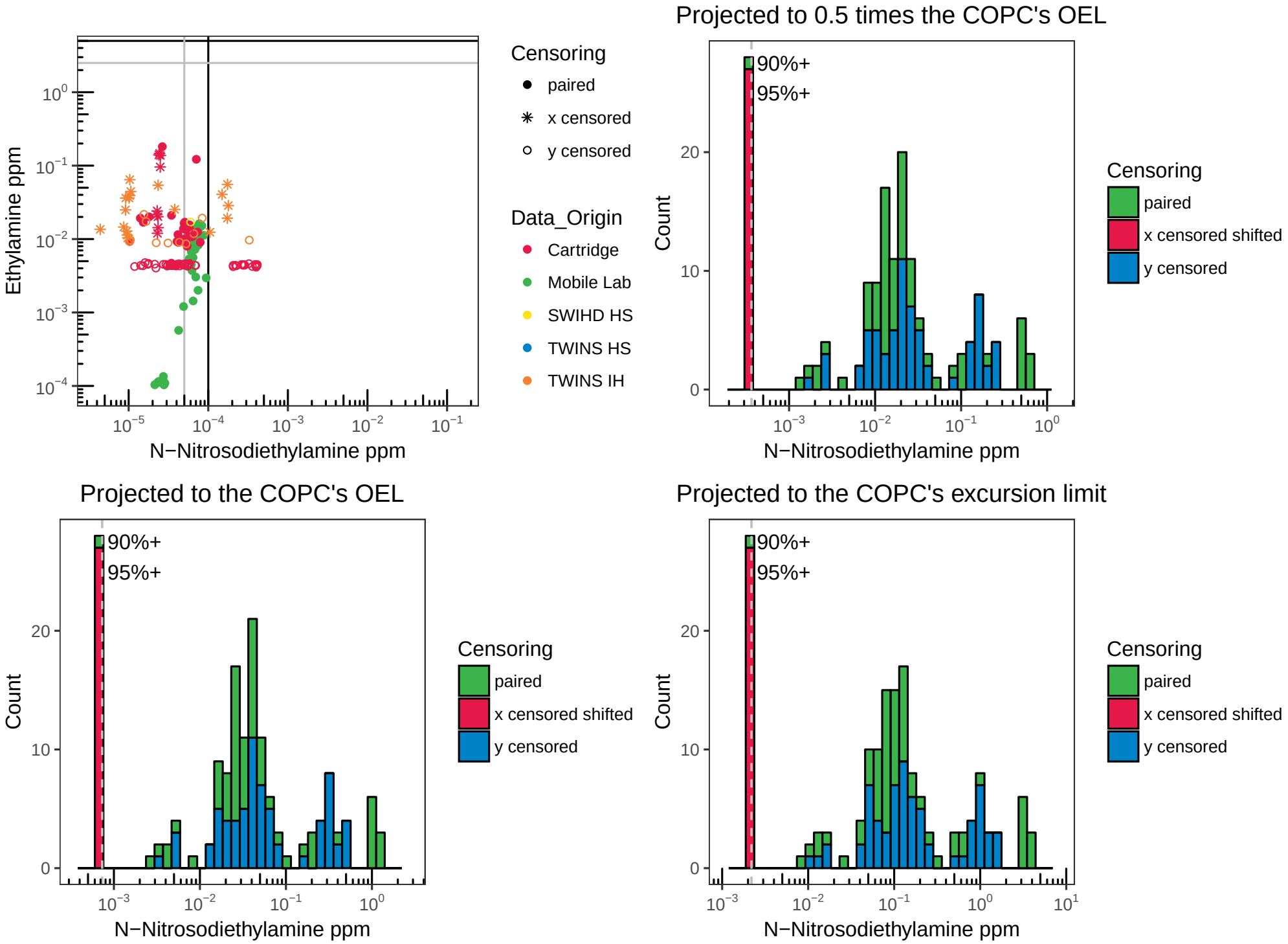


Figure C.2173: Ethylamine vs N-Nitrosodiethylamine

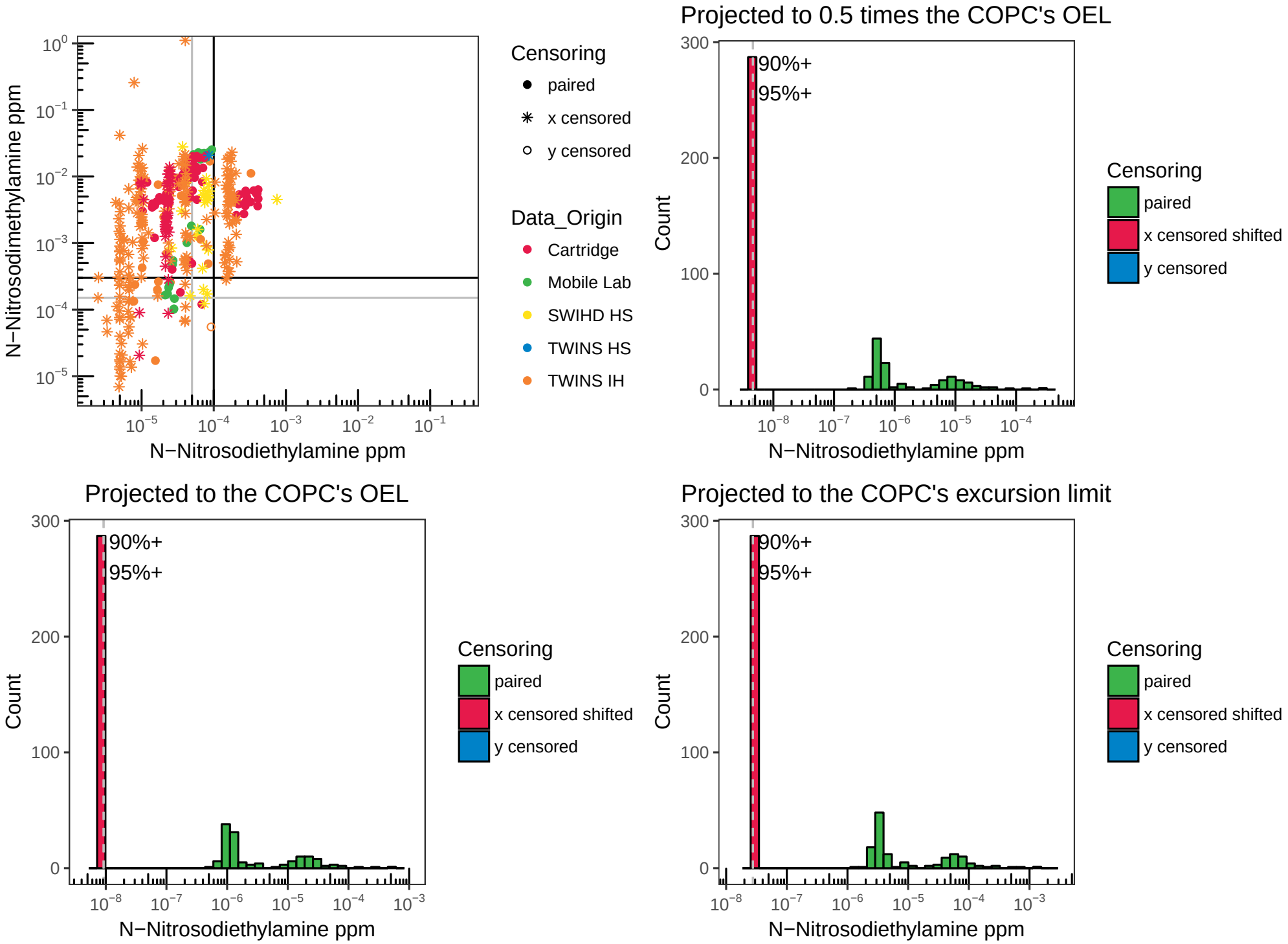


Figure C.2174: N-Nitrosodimethylamine vs N-Nitrosodiethylamine

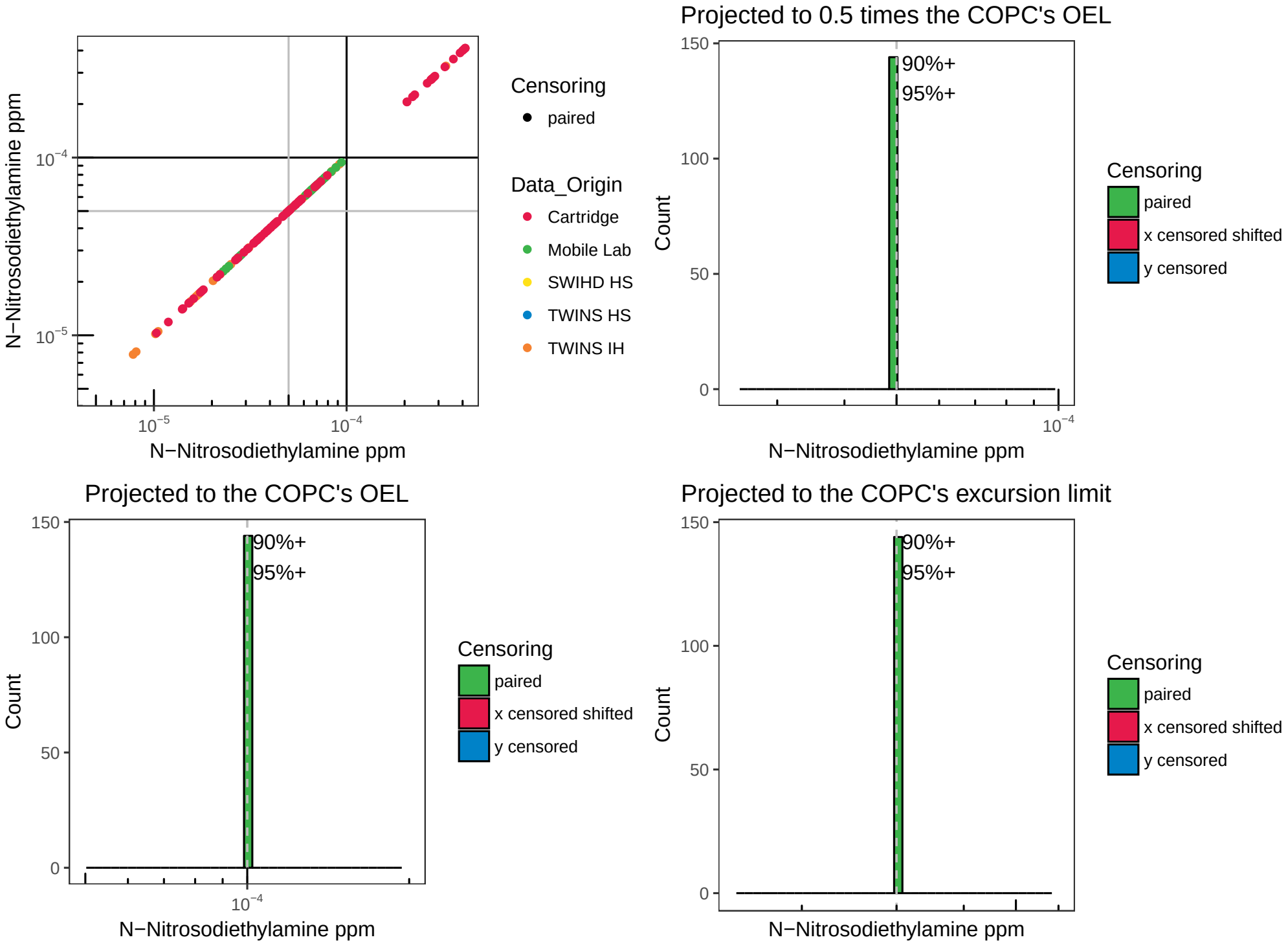


Figure C.2175: N-Nitrosodiethylamine vs N-Nitrosodiethylamine

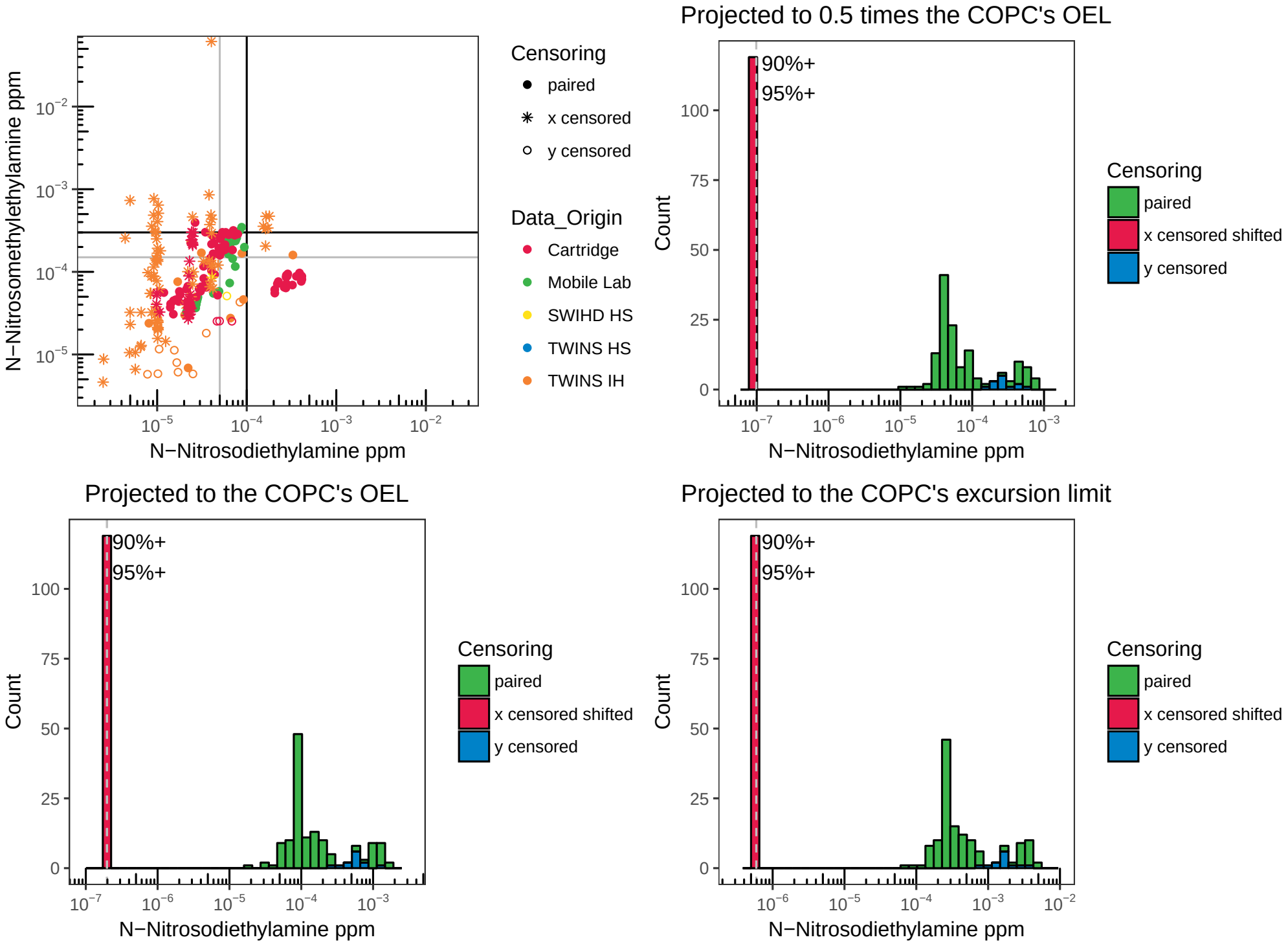


Figure C.2176: N-Nitrosomethylethylamine vs N-Nitrosodiethylamine

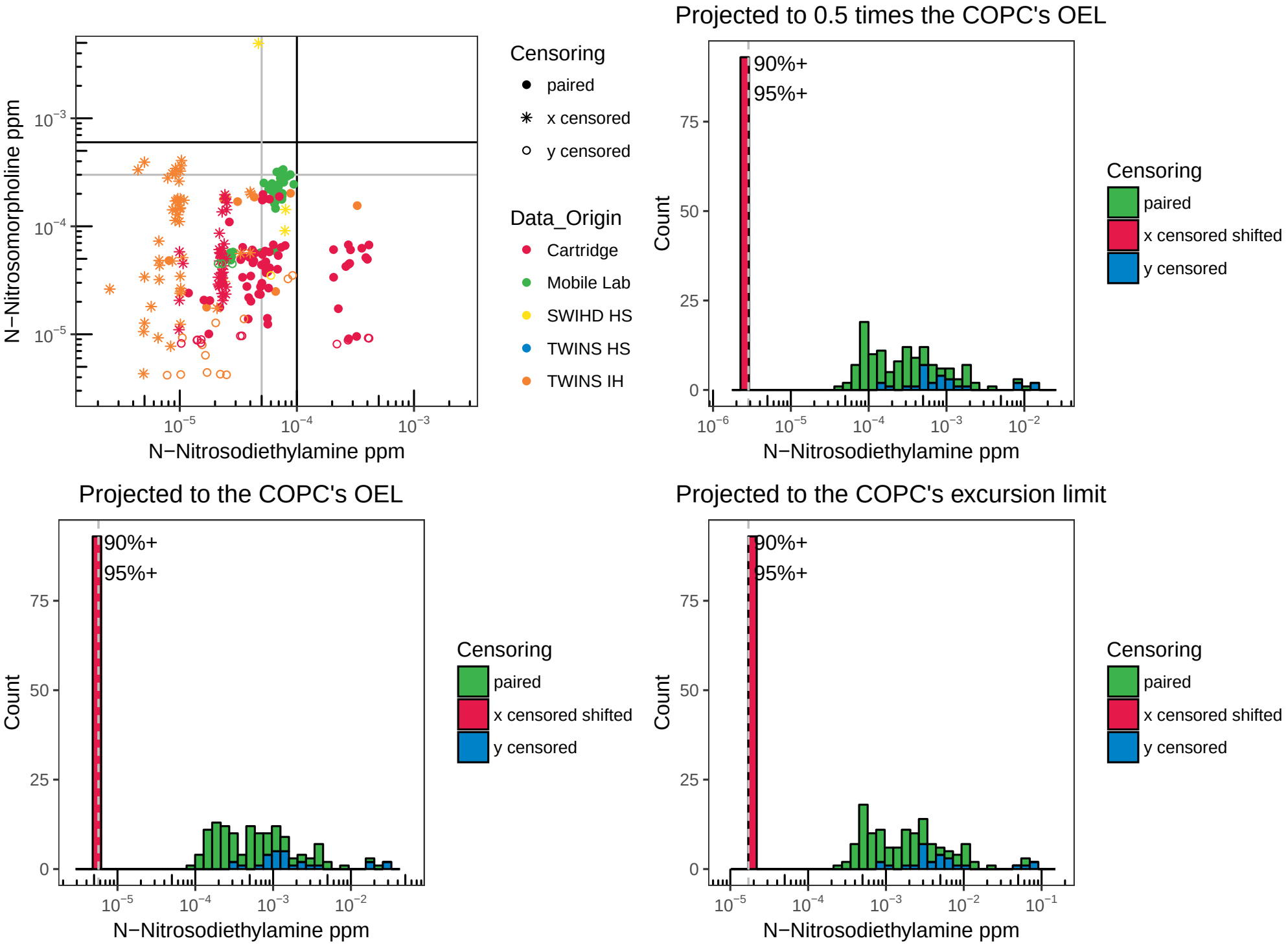


Figure C.2177: N-Nitrosomorpholine vs N-Nitrosodiethylamine

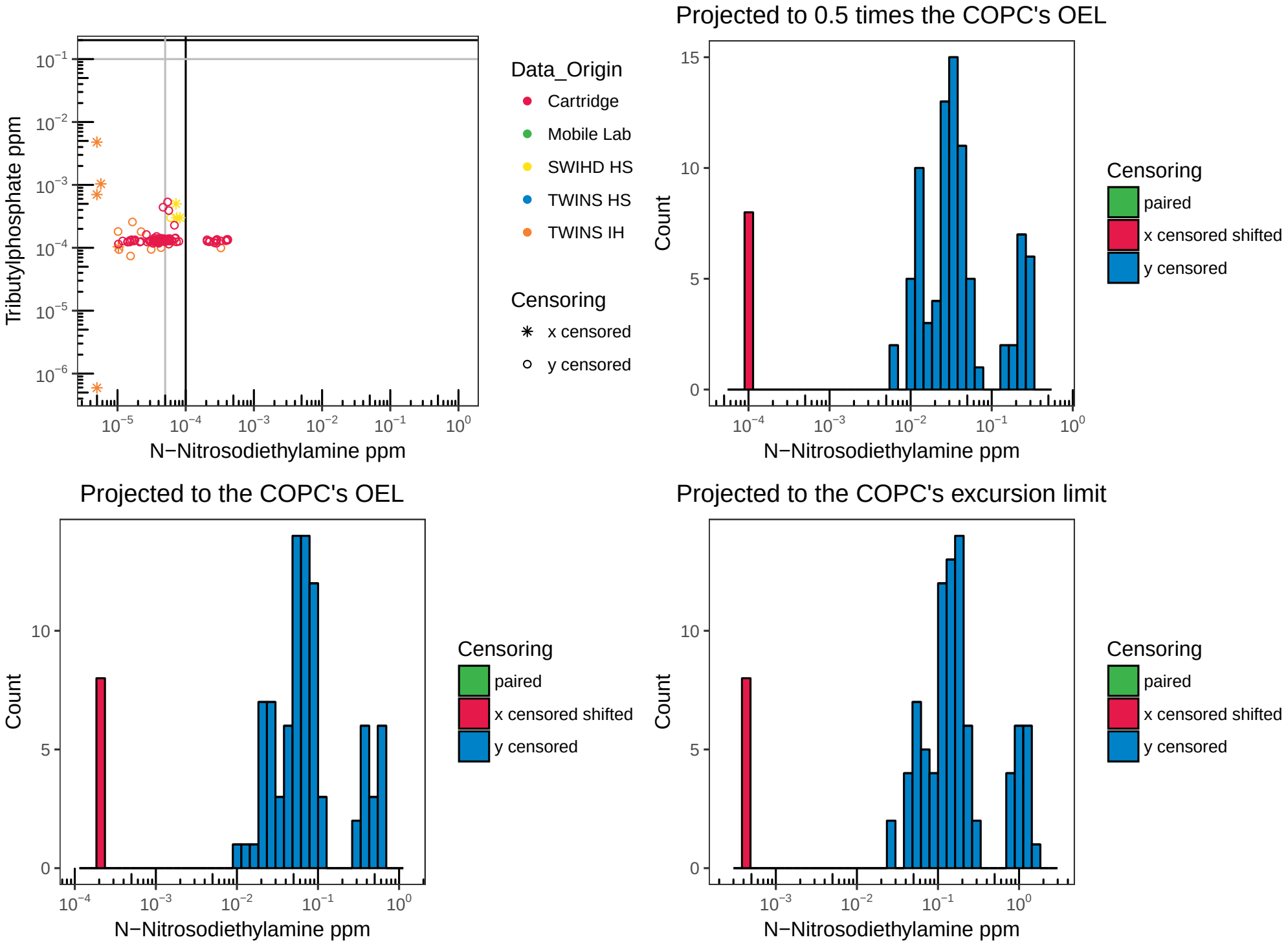


Figure C.2178: Tributylphosphate vs N-Nitrosodiethylamine

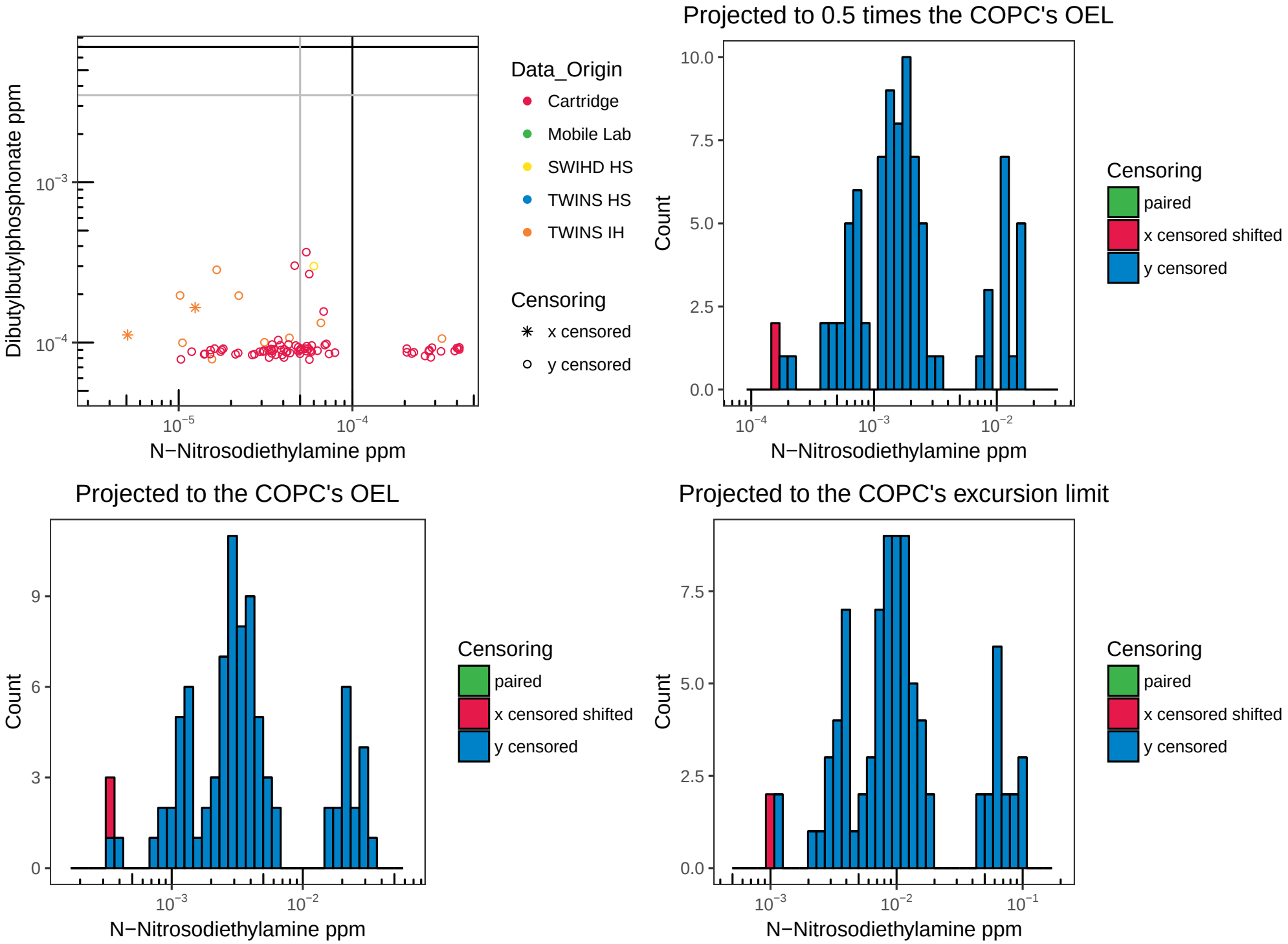


Figure C.2179: Dibutylbutylphosphonate vs N-Nitrosodiethylamine

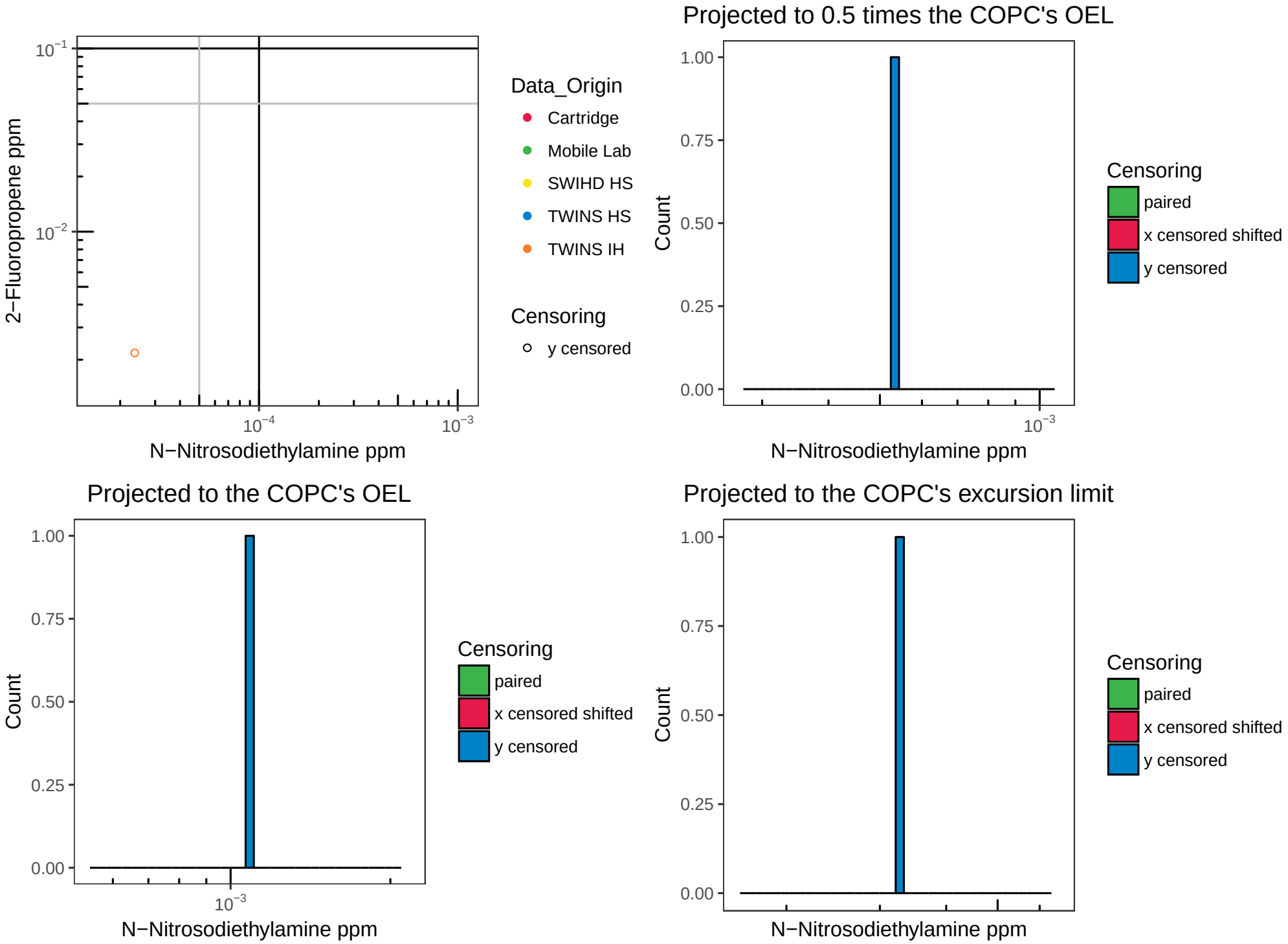


Figure C.2180: 2-Fluoropropene vs N-Nitrosodiethylamine

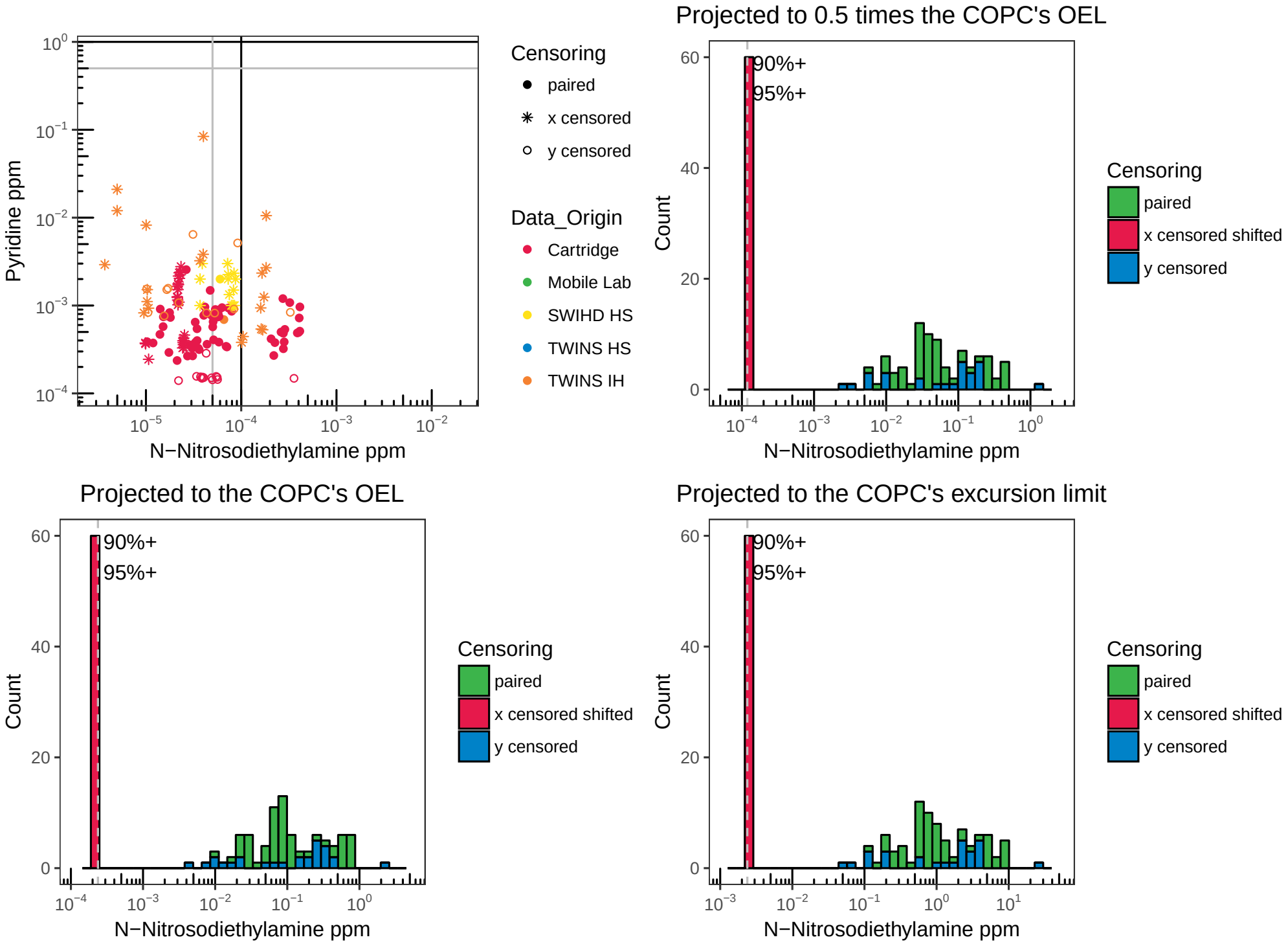


Figure C.2181: Pyridine vs N-Nitrosodiethylamine

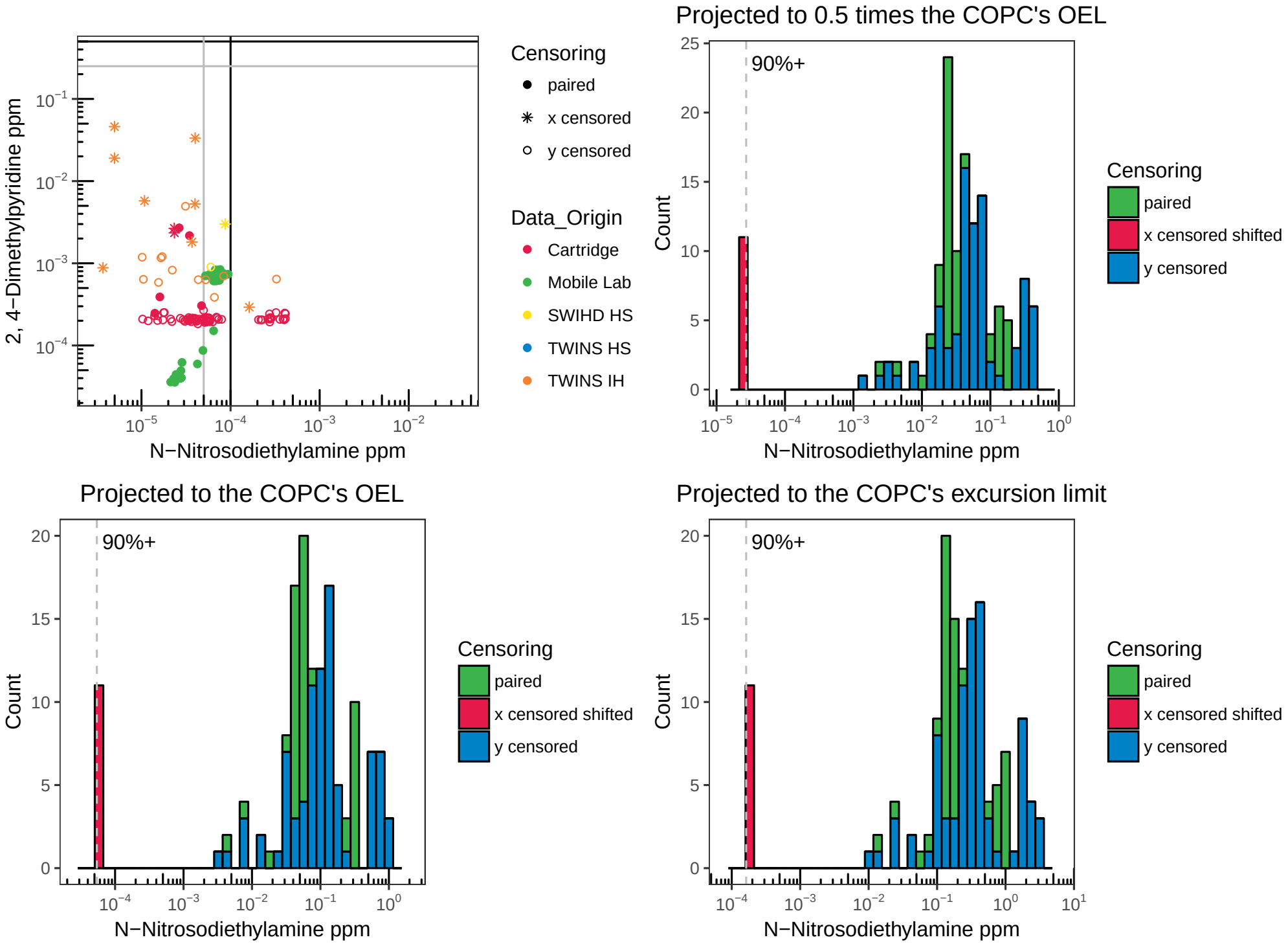


Figure C.2182: 2, 4-Dimethylpyridine vs N-Nitrosodiethylamine

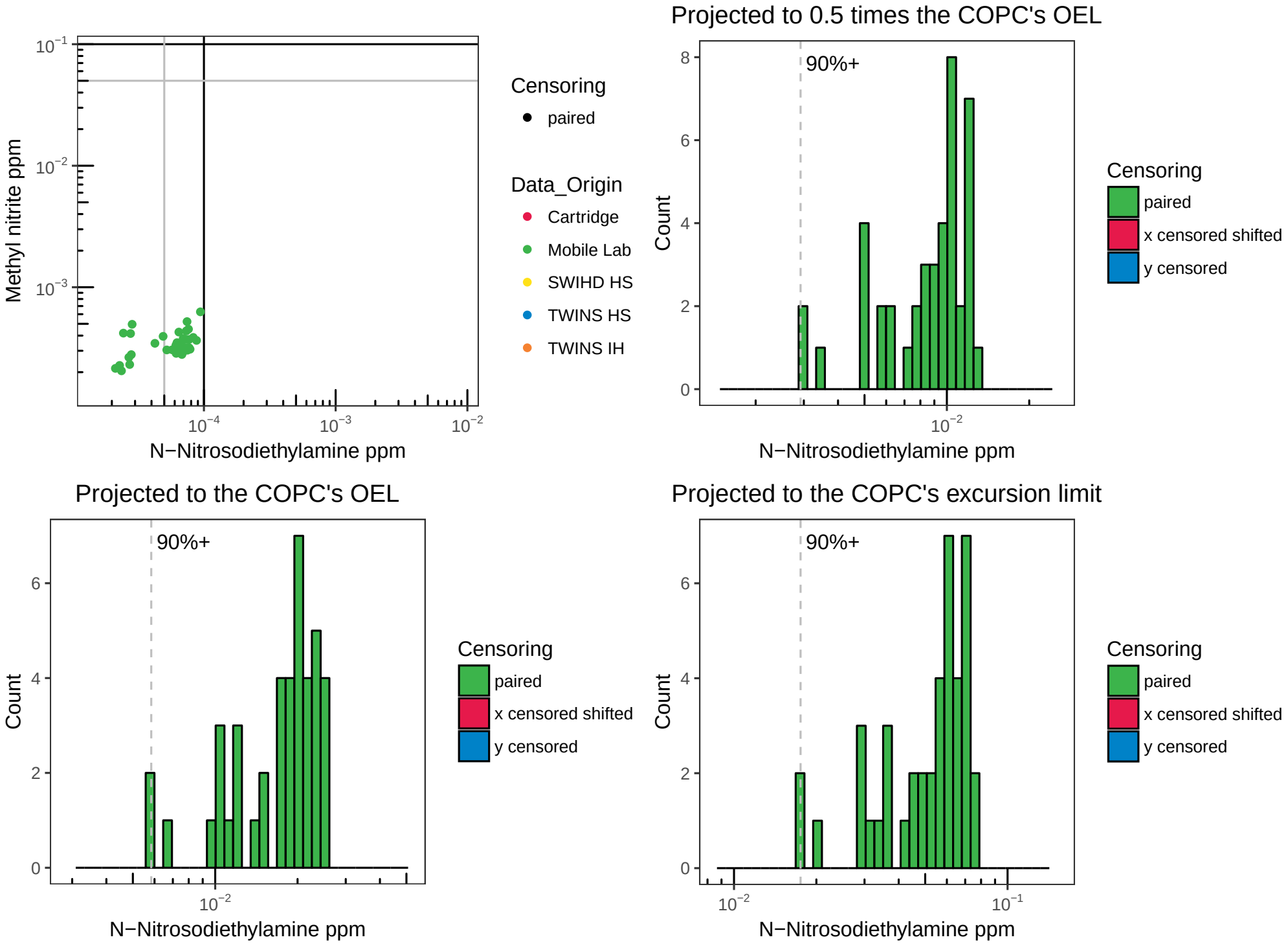


Figure C.2183: Methyl nitrite vs N-Nitrosodiethylamine

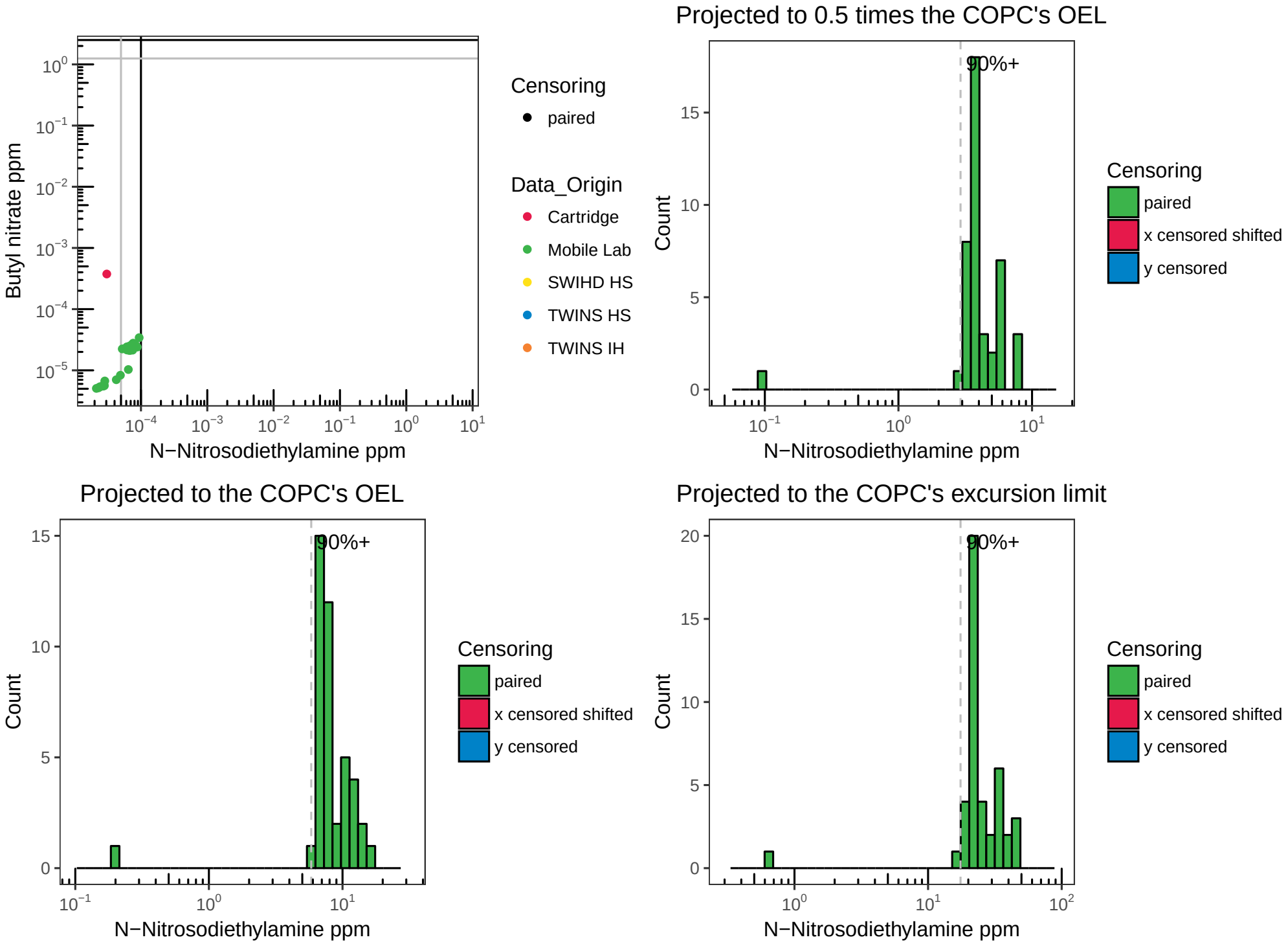


Figure C.2184: Butyl nitrate vs N-Nitrosodiethylamine

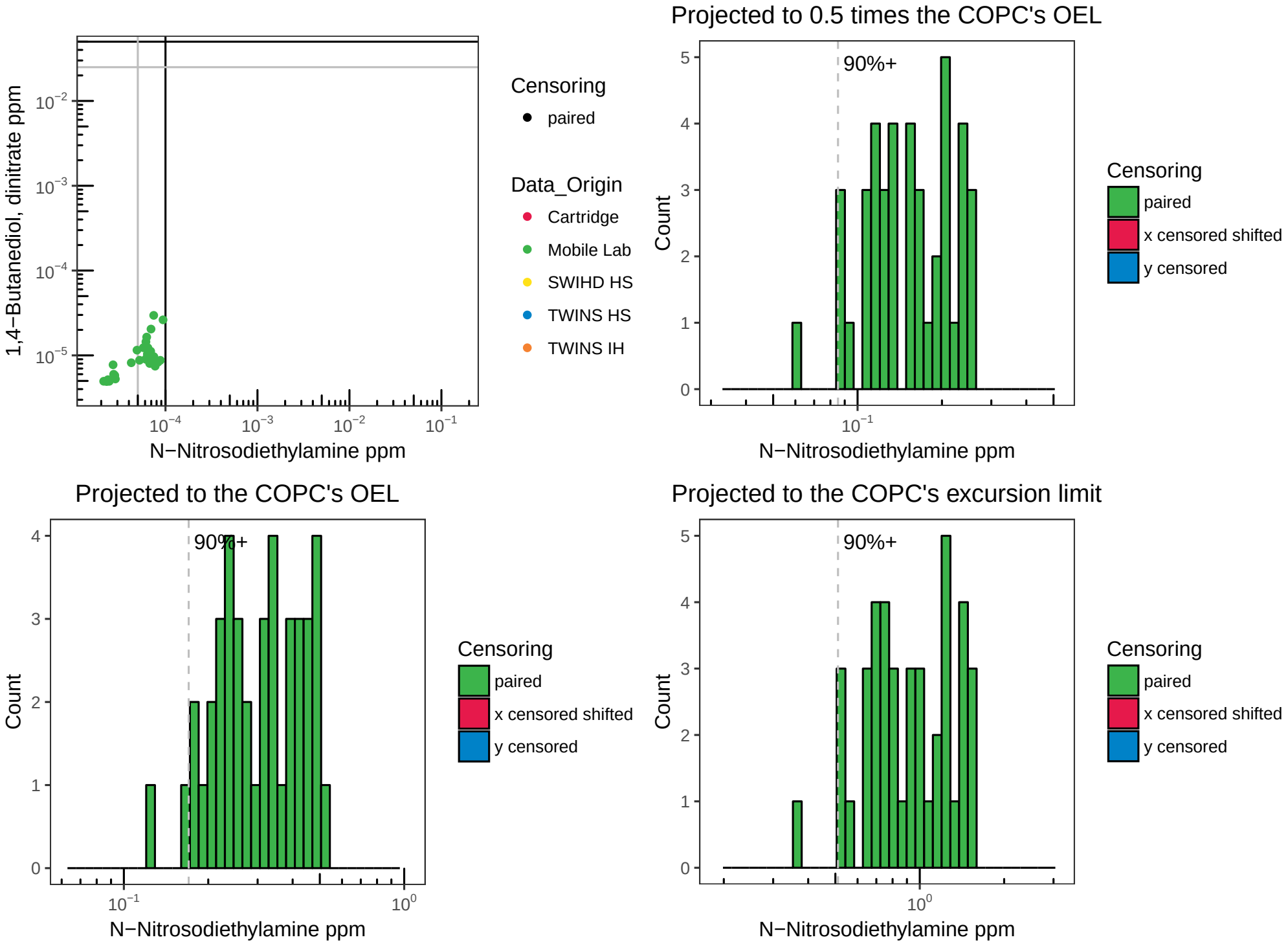


Figure C.2185: 1,4-Butanediol, dinitrate vs N-Nitrosodiethylamine

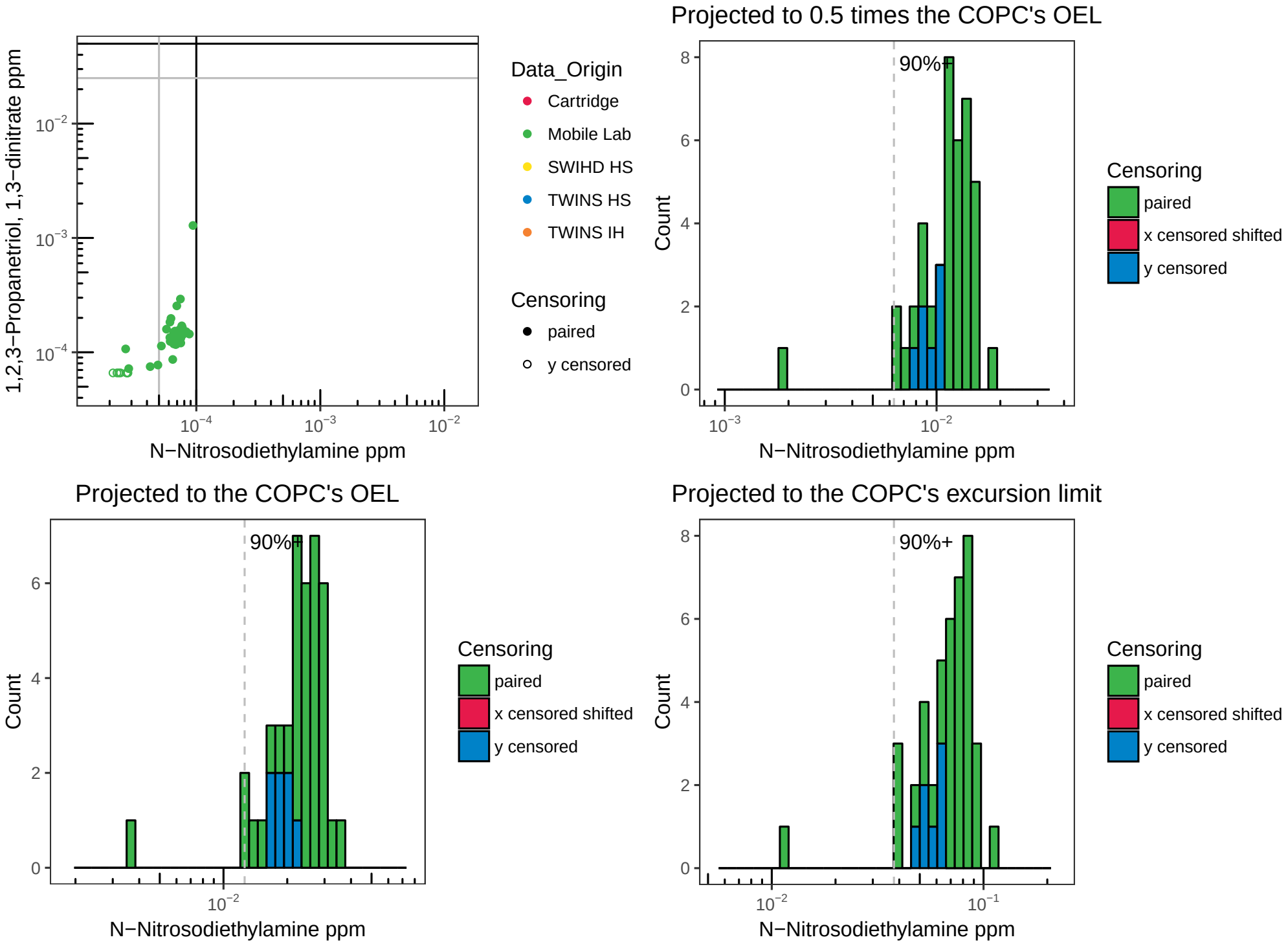


Figure C.2186: 1,2,3-Propanetriol, 1,3-dinitrate vs N-Nitrosodiethylamine

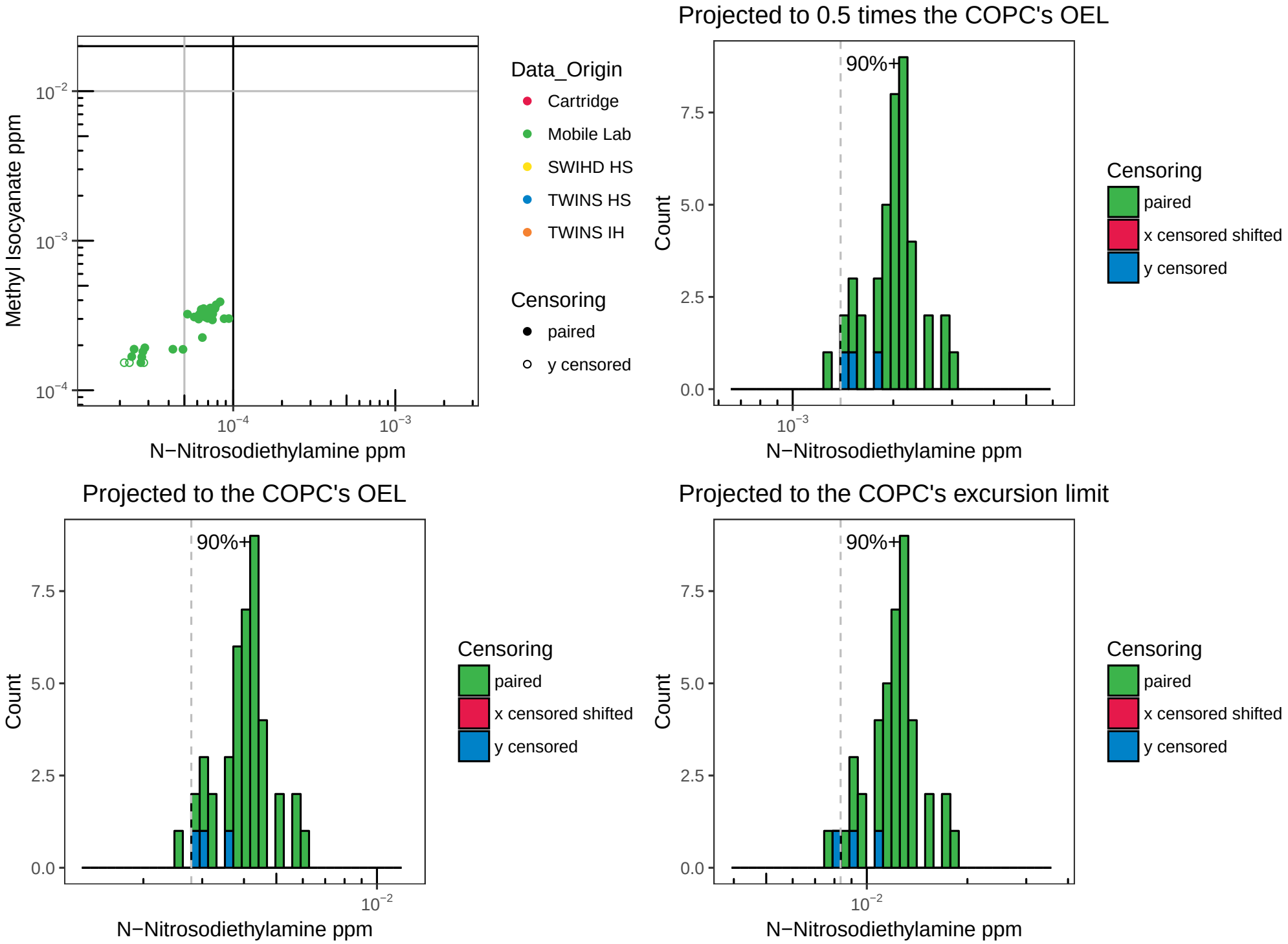


Figure C.2187: Methyl Isocyanate vs N-Nitrosodiethylamine

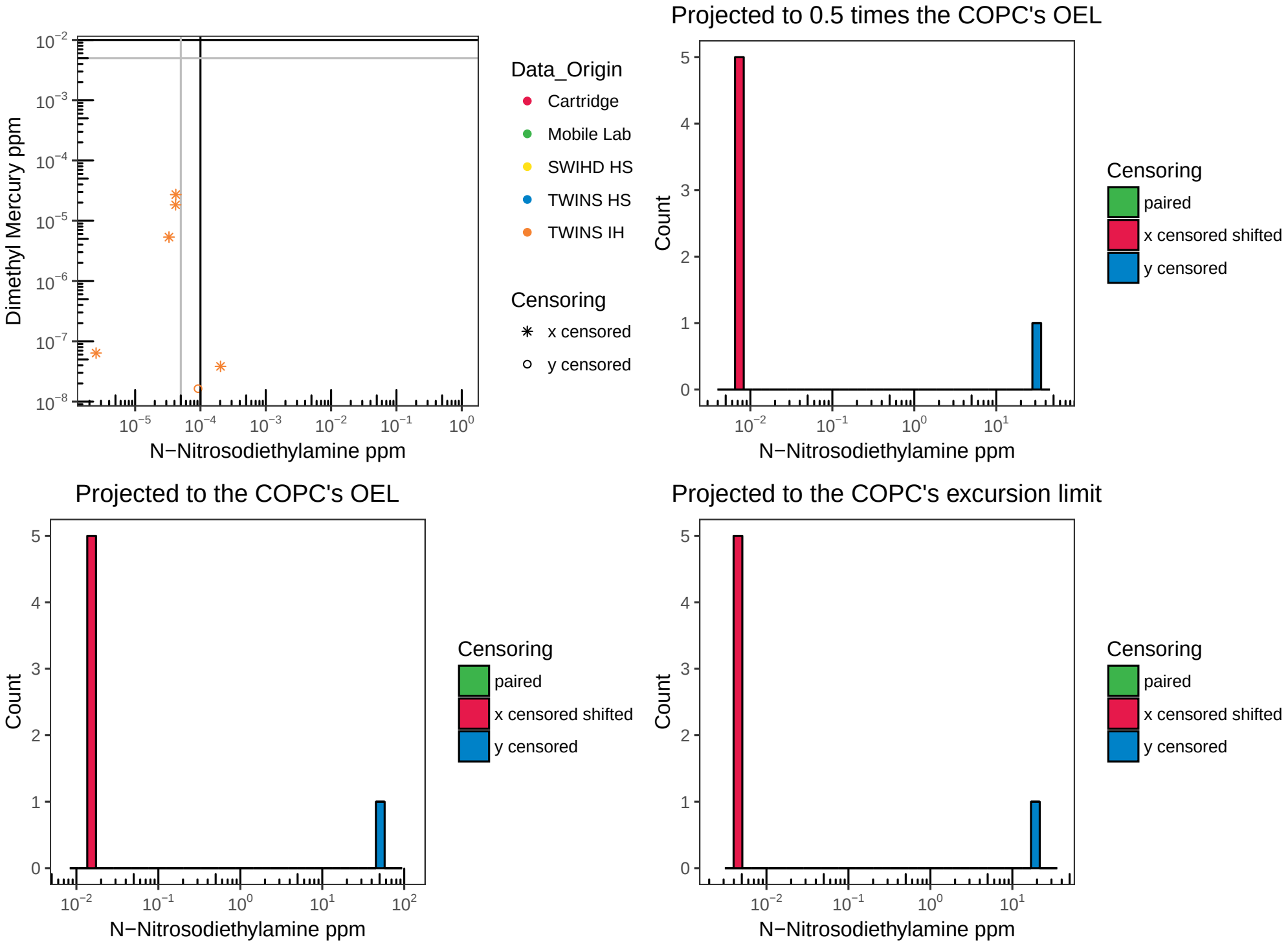


Figure C.2188: Dimethyl Mercury vs N-Nitrosodiethylamine

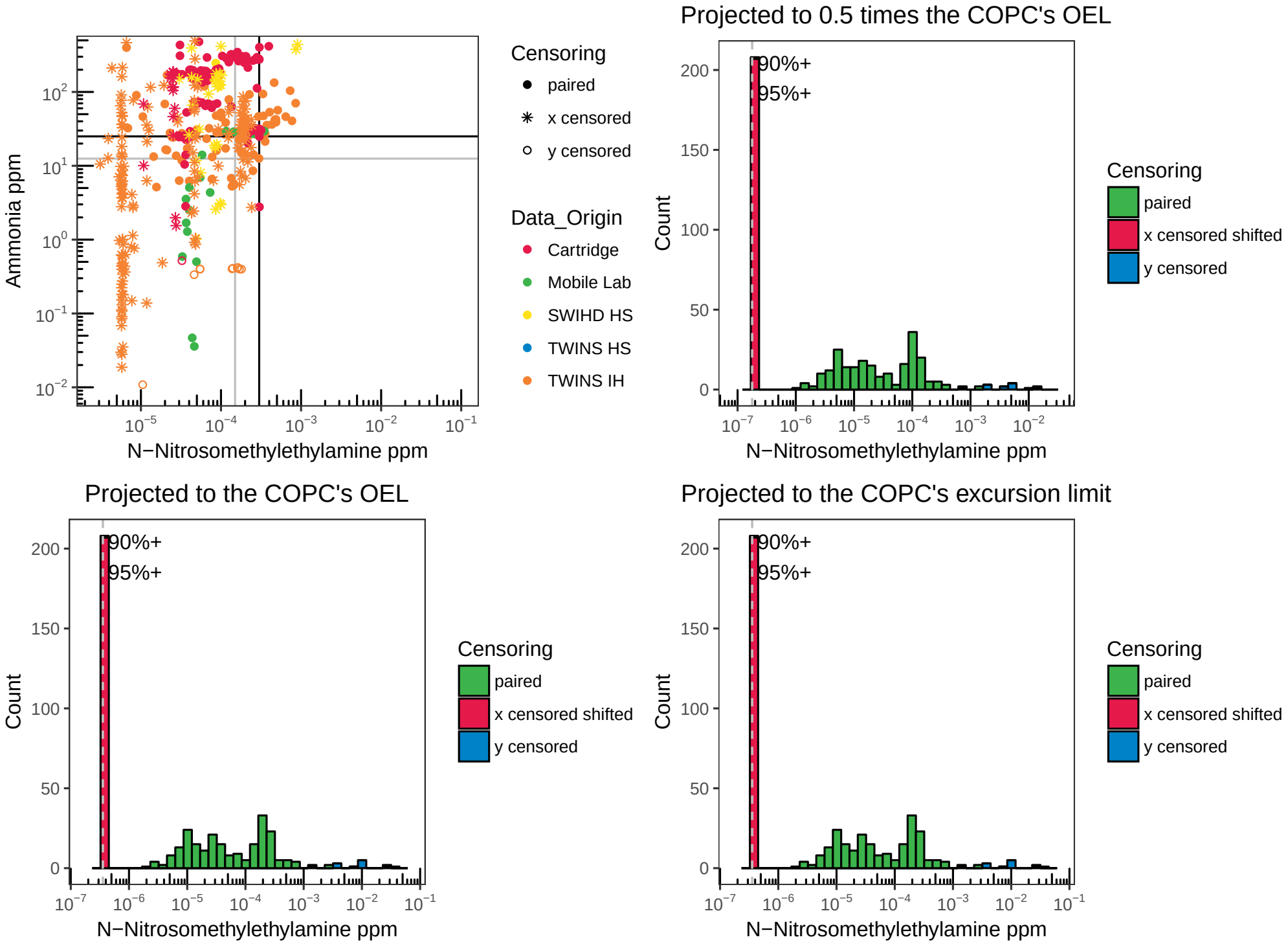


Figure C.2189: Ammonia vs N-Nitrosomethylethylamine

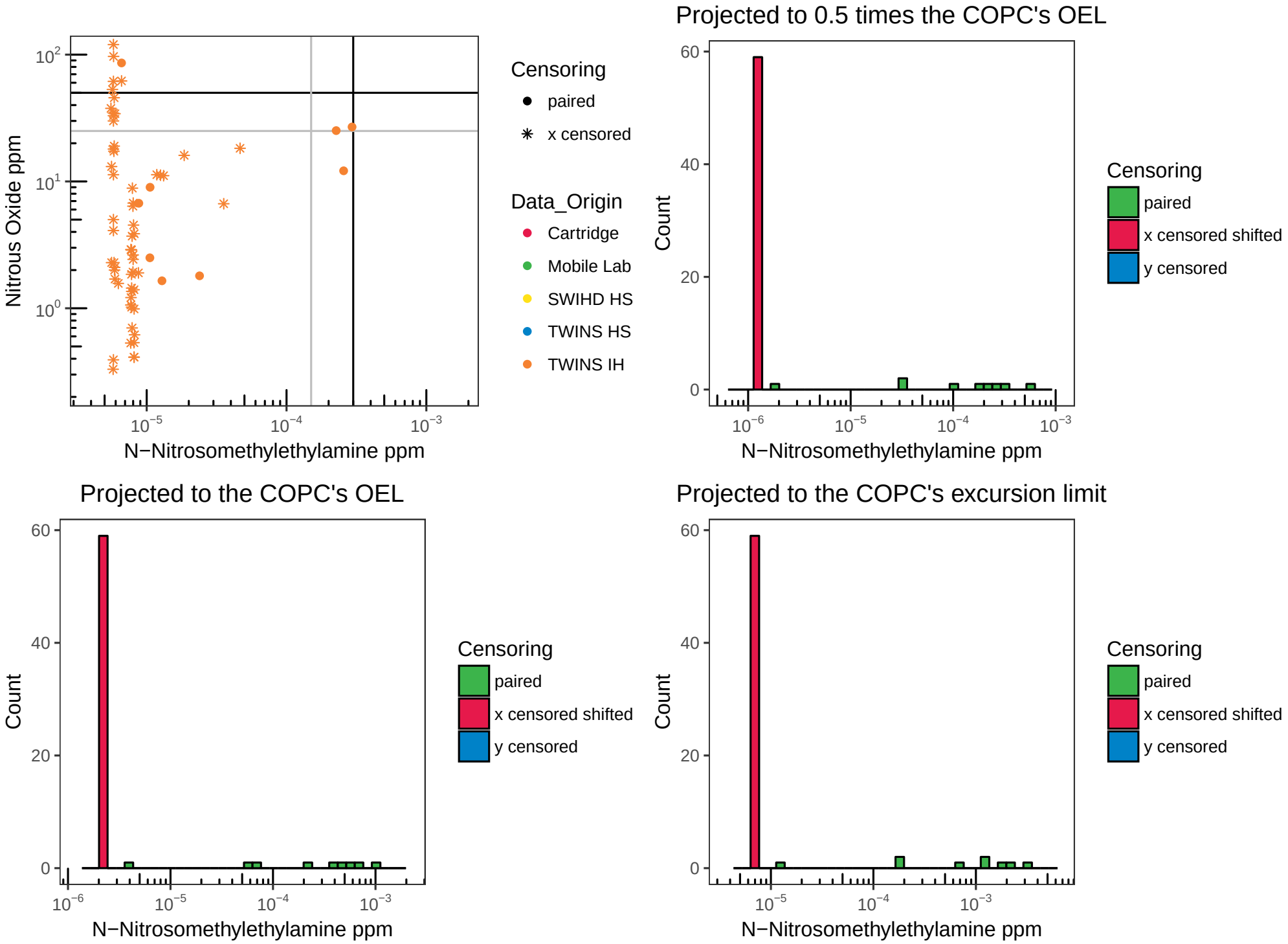


Figure C.2190: Nitrous Oxide vs N-Nitrosomethylethylamine

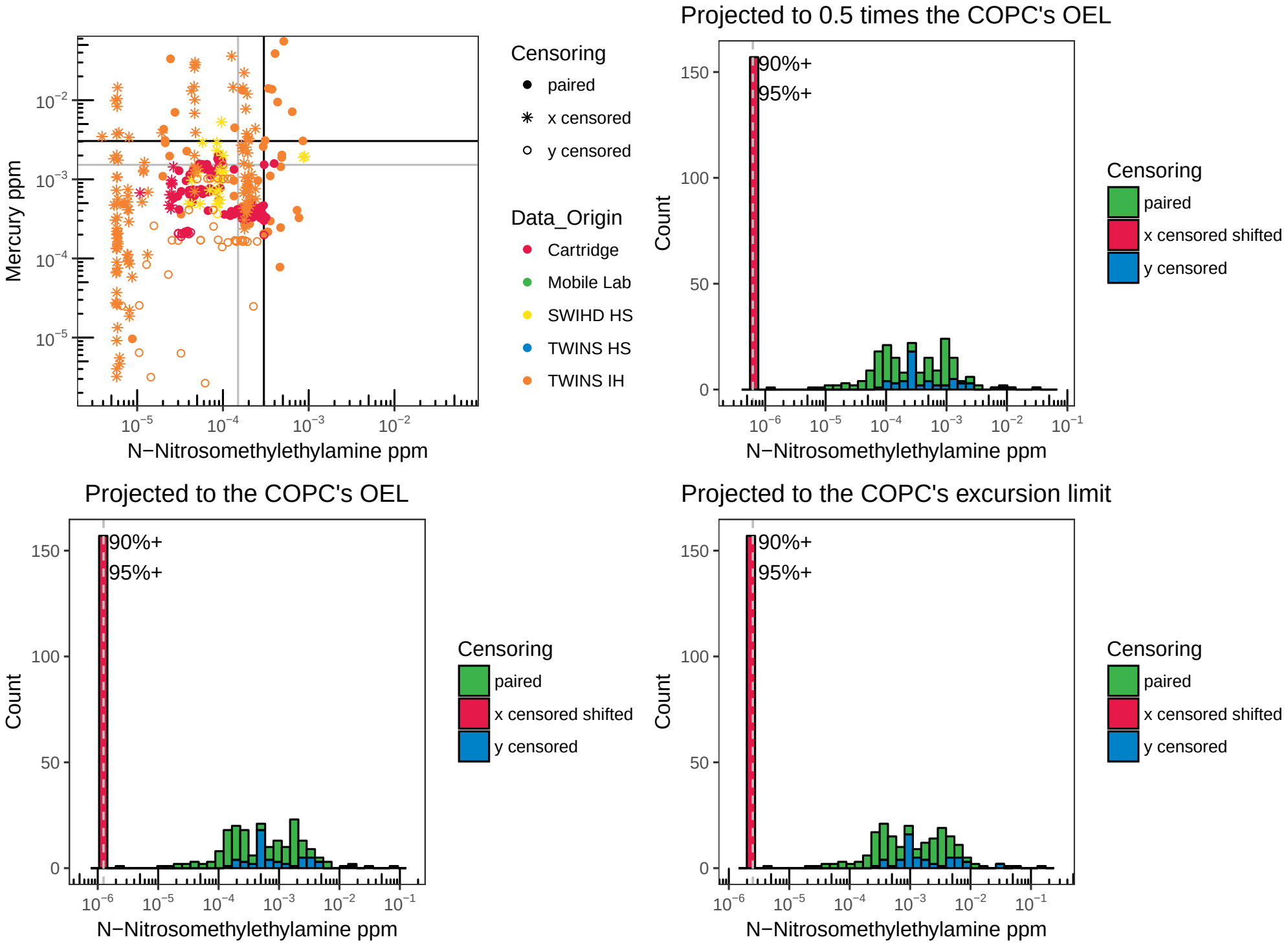


Figure C.2191: Mercury vs N-Nitrosomethylethylamine

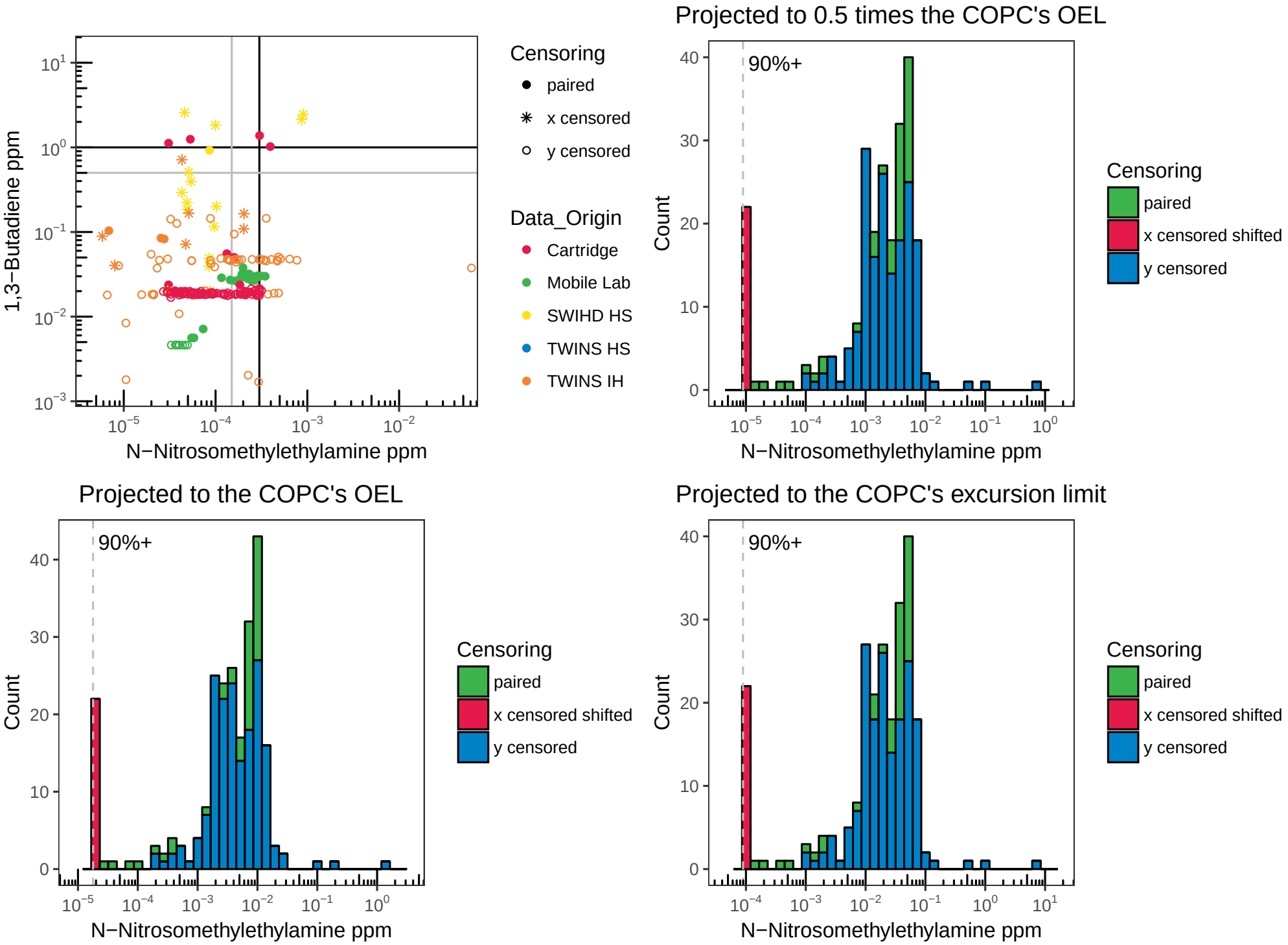


Figure C.2192: 1,3-Butadiene vs N-Nitrosomethylethylamine

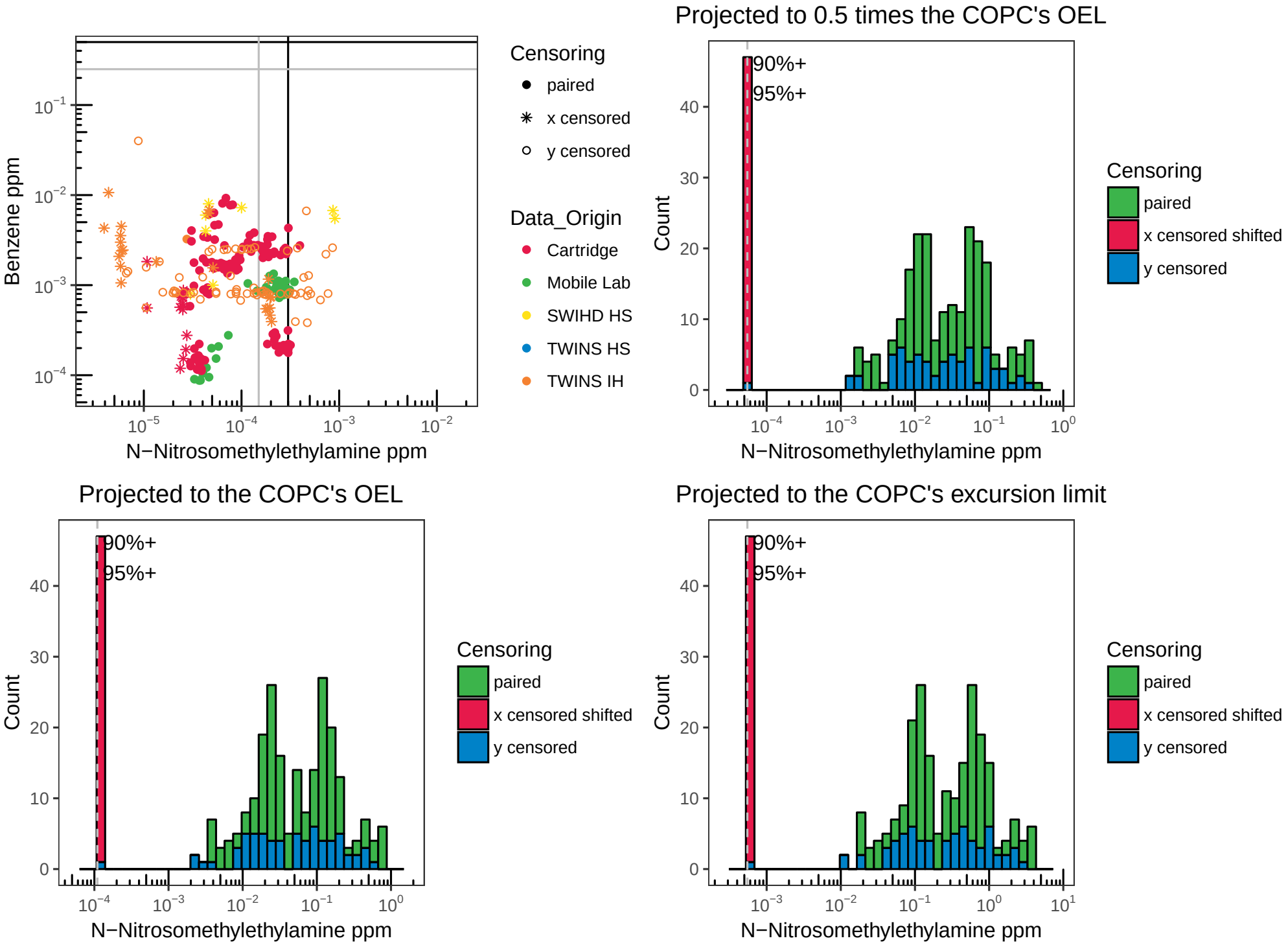


Figure C.2193: Benzene vs N-Nitrosomethylethylamine

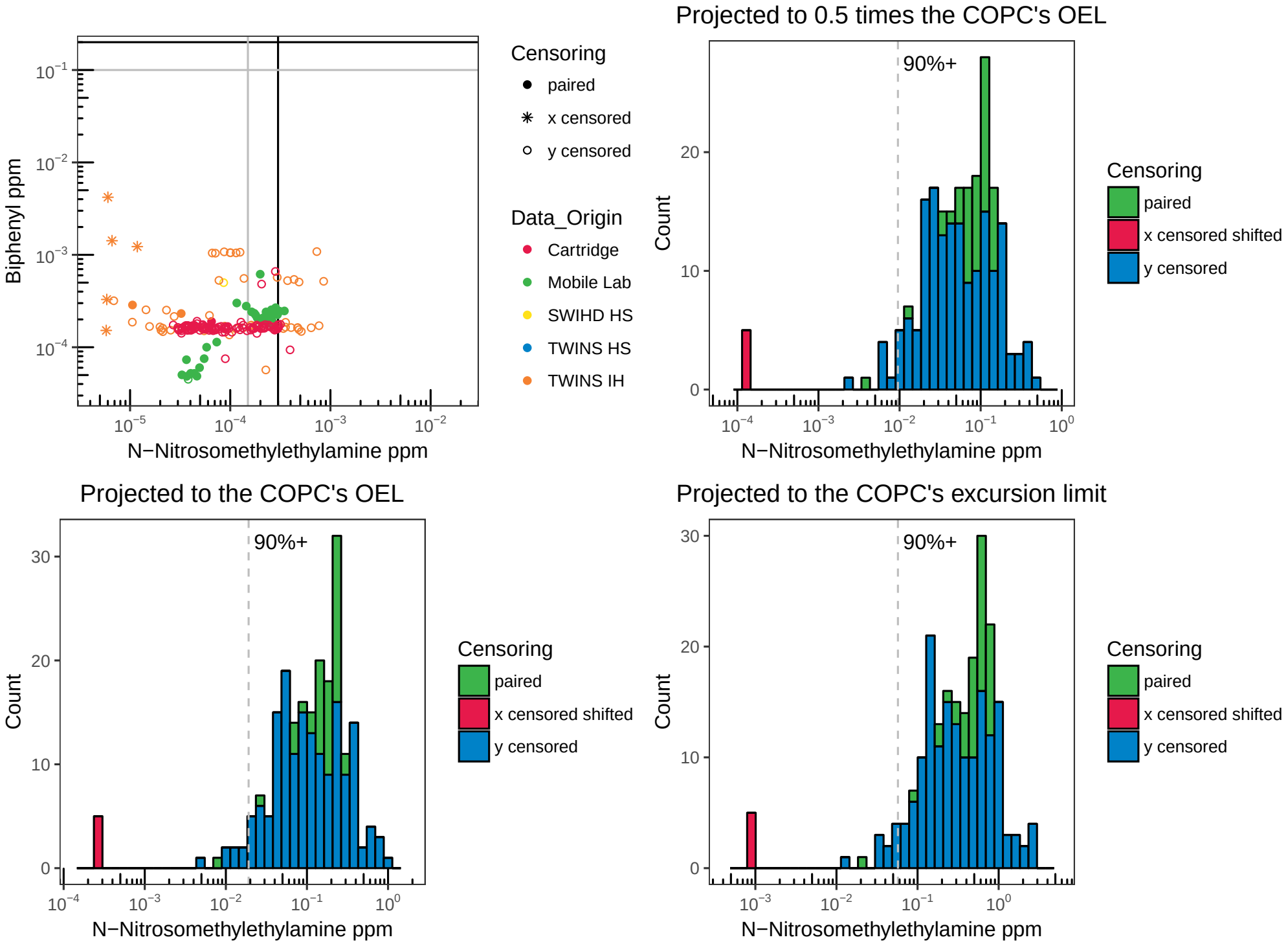


Figure C.2194: Biphenyl vs N-Nitrosomethylethylamine

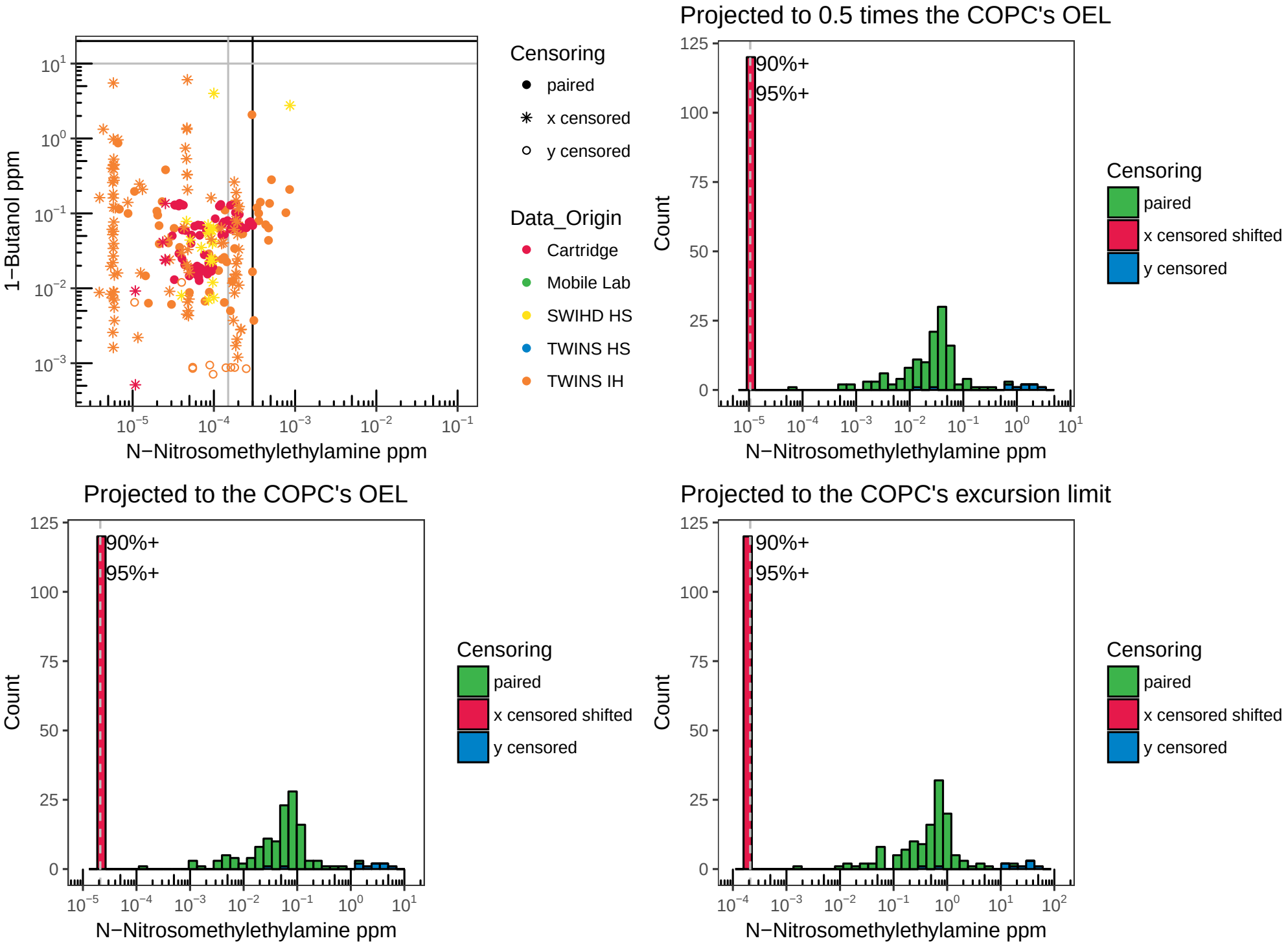


Figure C.2195: 1-Butanol vs N-Nitrosomethylethylamine

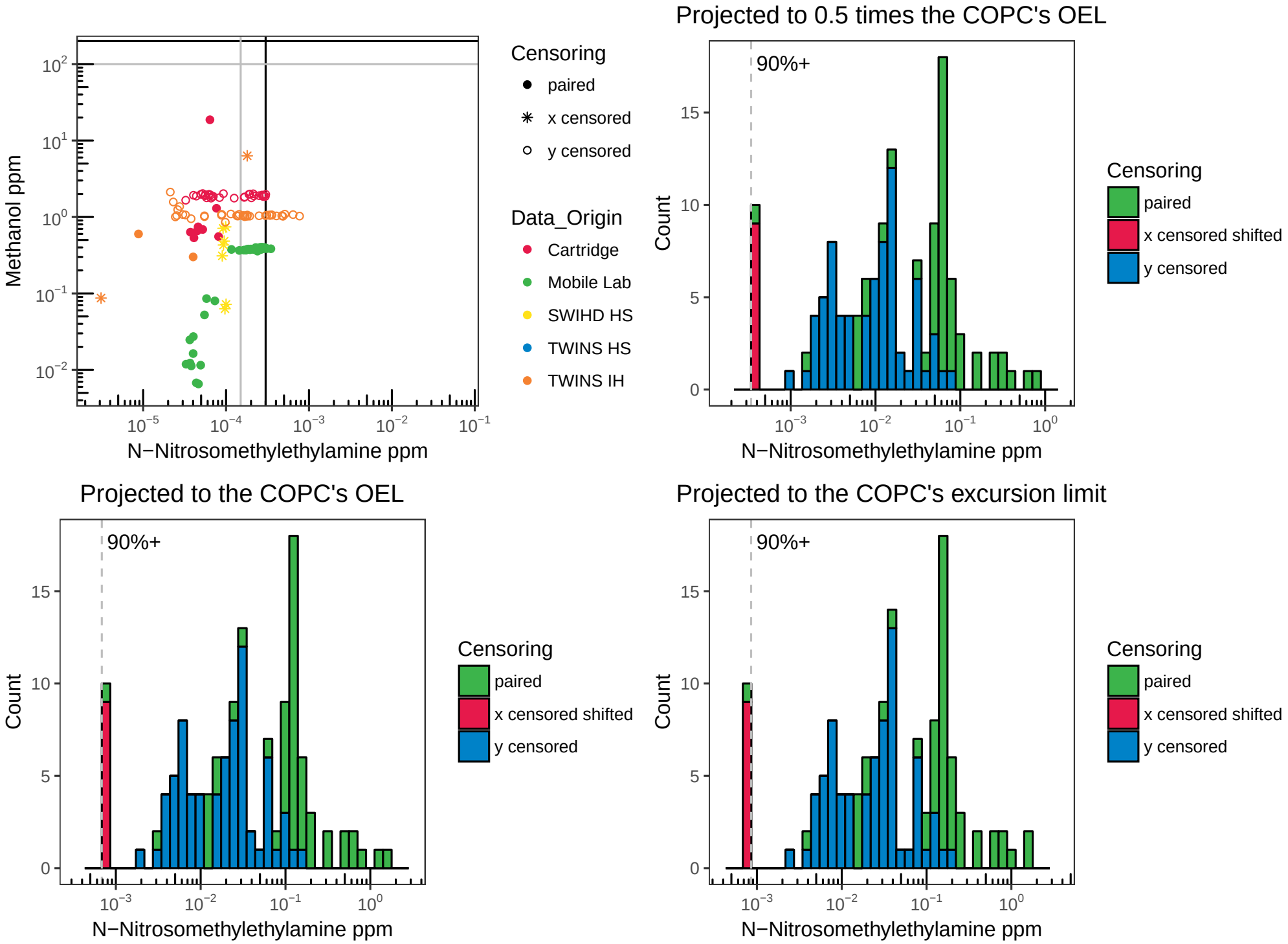


Figure C.2196: Methanol vs N-Nitrosomethylethylamine

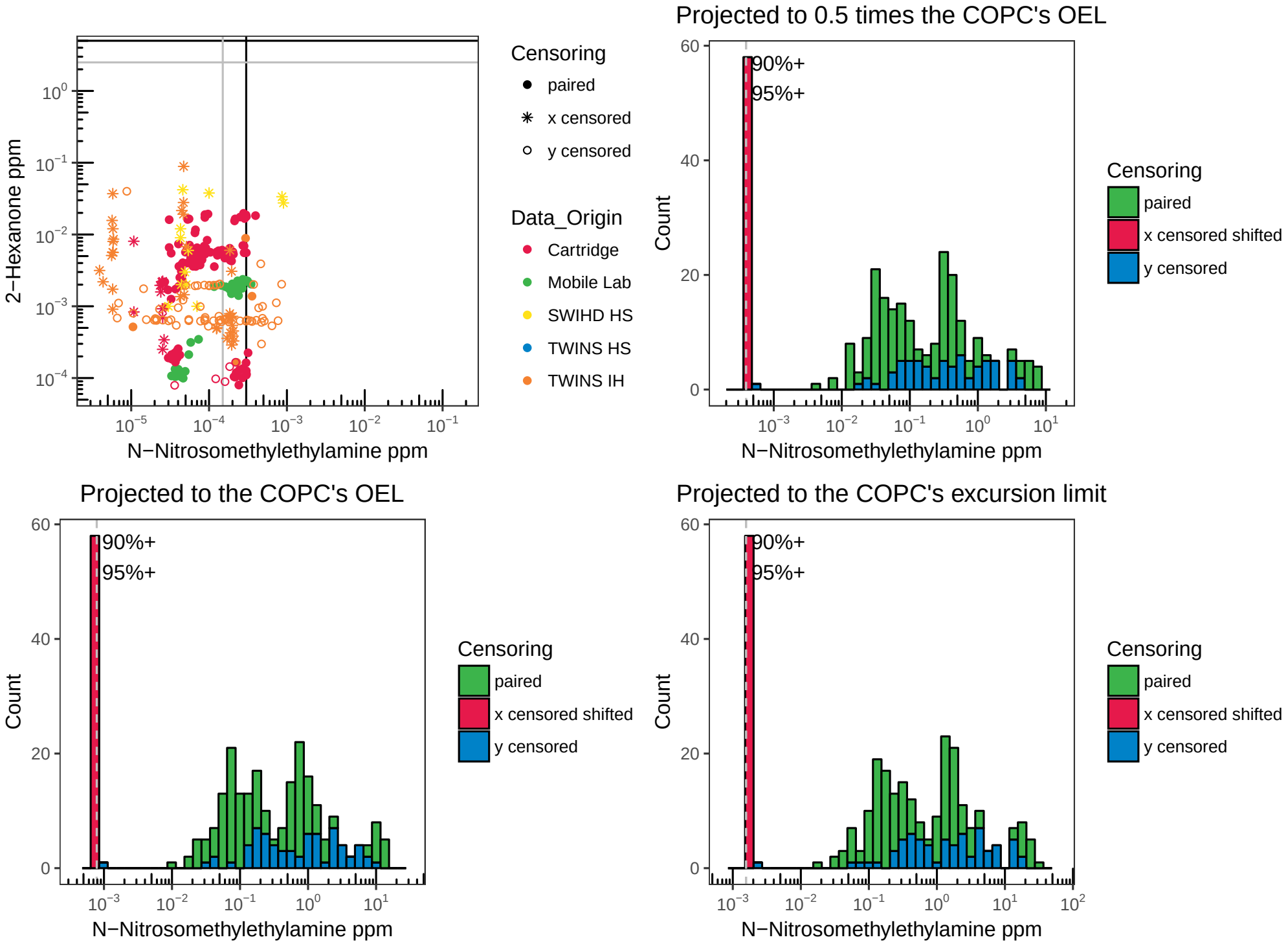


Figure C.2197: 2-Hexanone vs N-Nitrosomethylethylamine

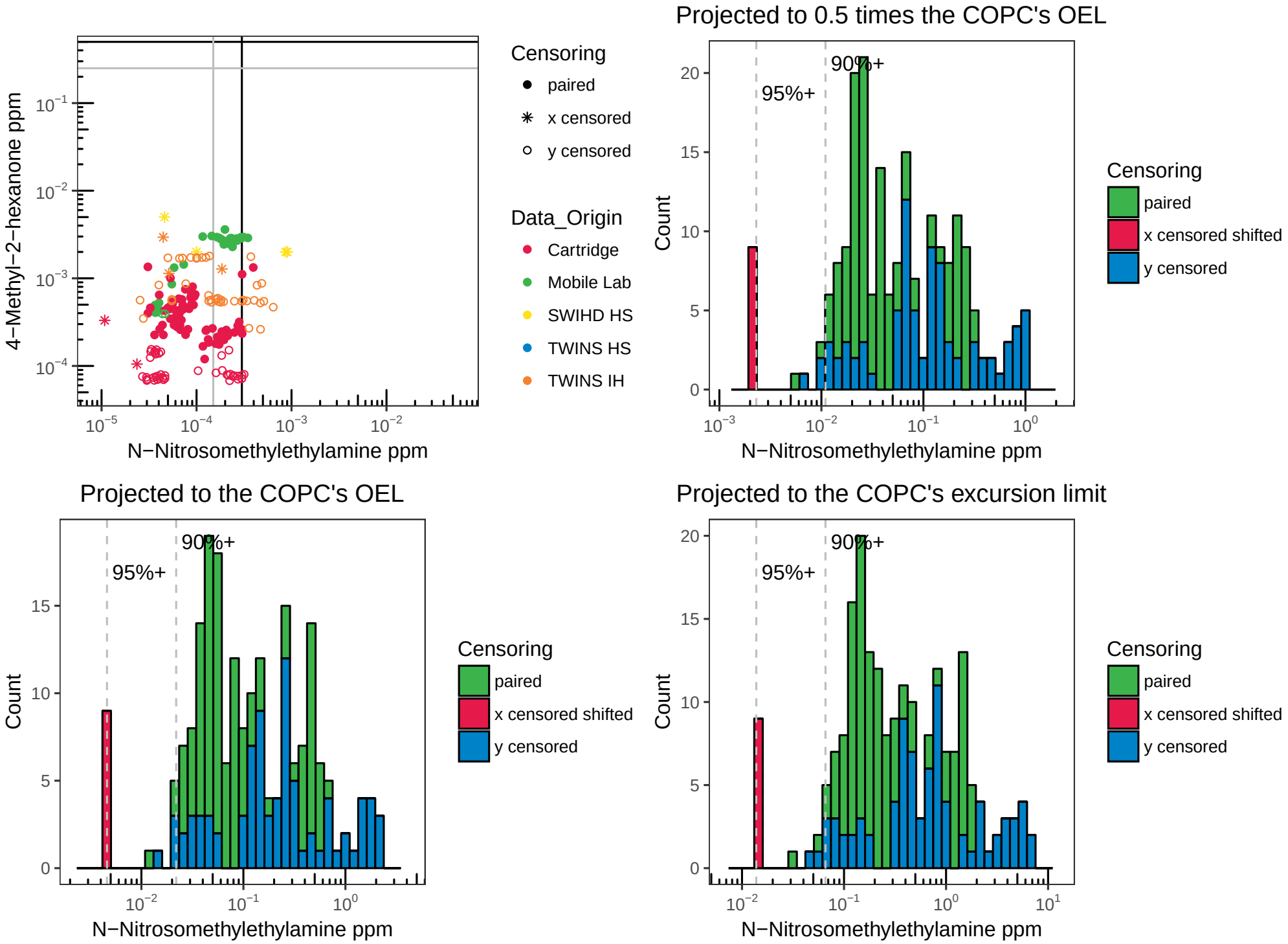


Figure C.2198: 4-Methyl-2-hexanone vs N-Nitrosomethylethylamine

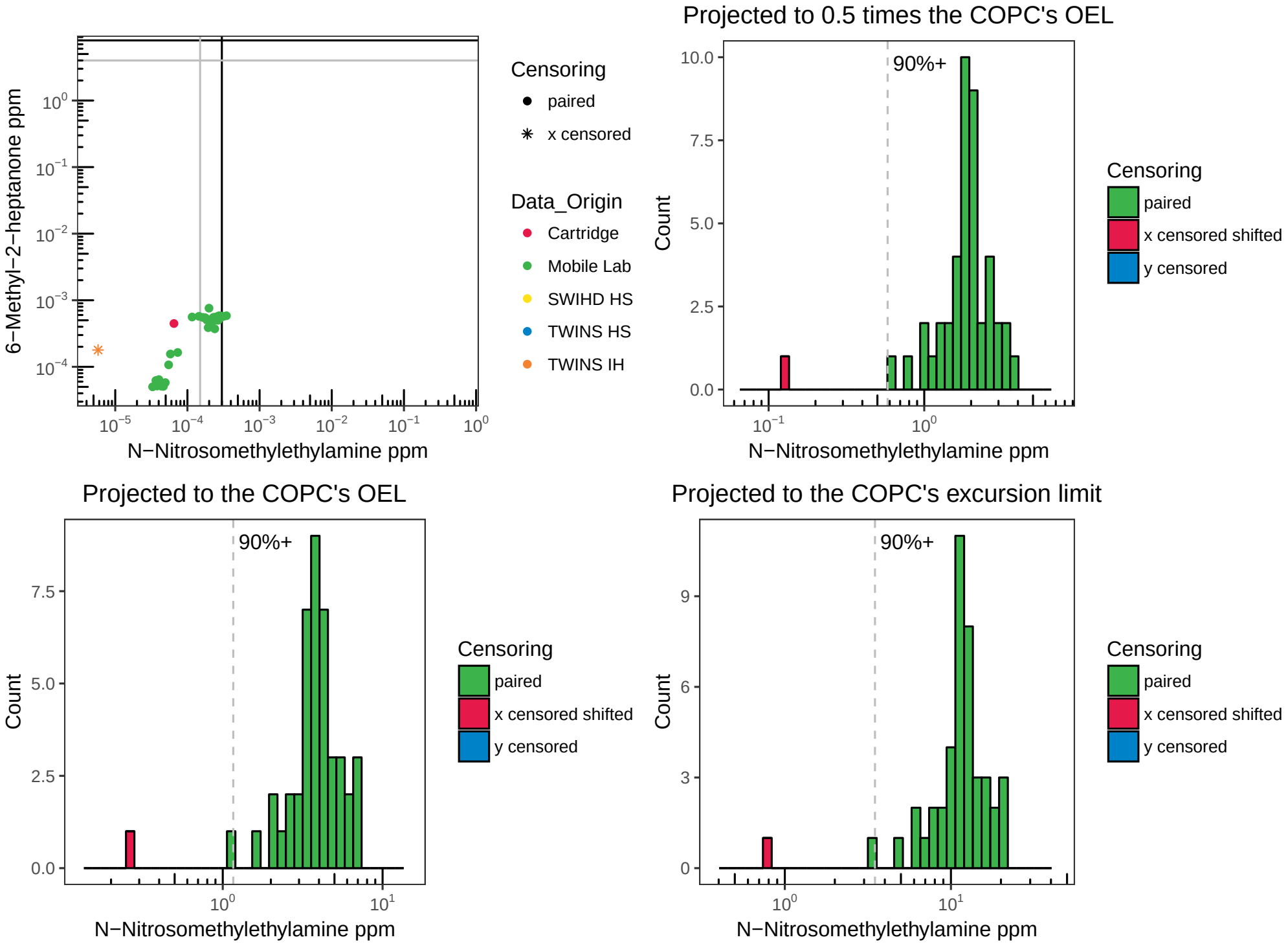


Figure C.2199: 6-Methyl-2-heptanone vs N-Nitrosomethylethylamine

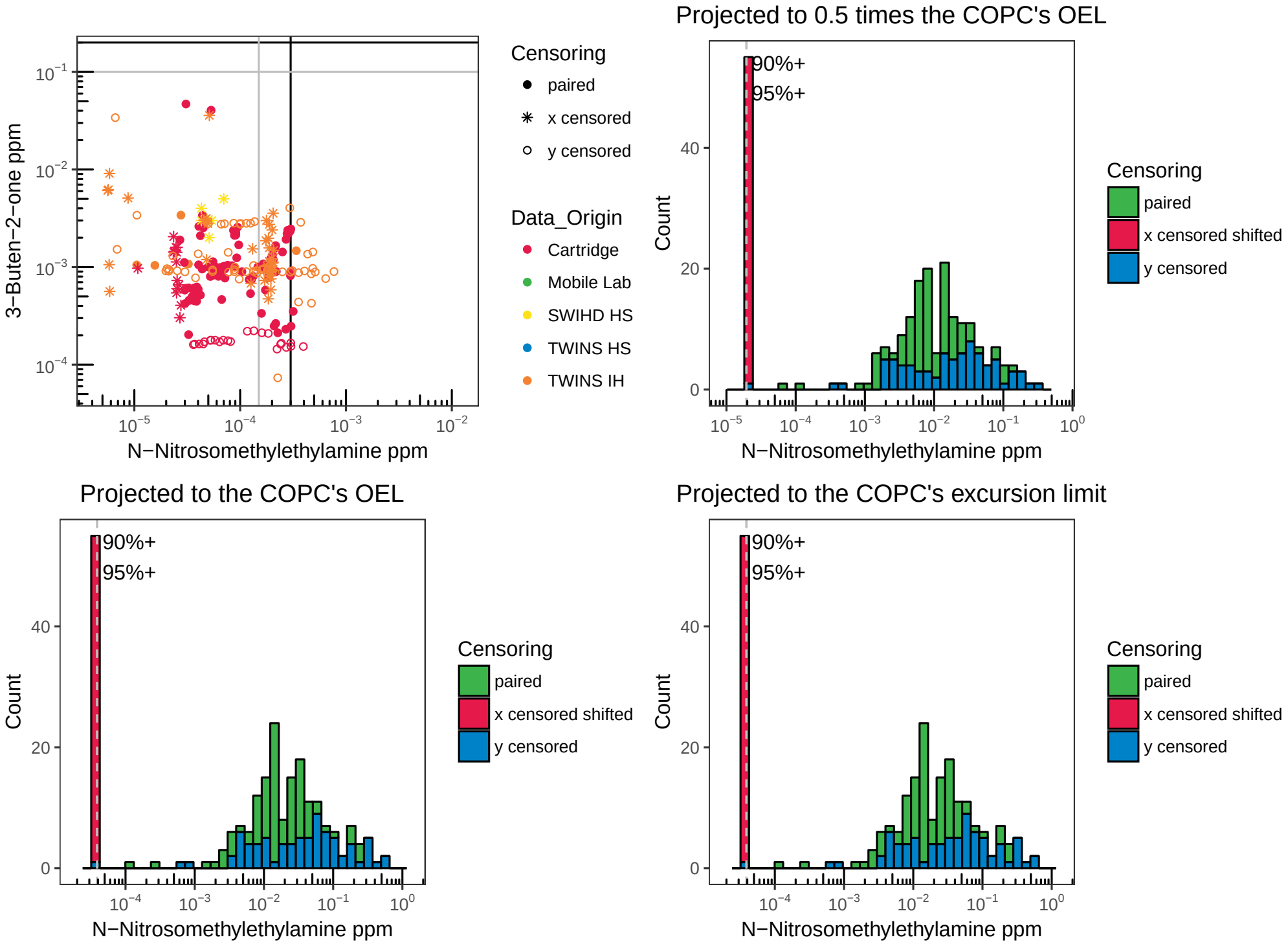


Figure C.2200: 3-Buten-2-one vs N-Nitrosomethylethylamine

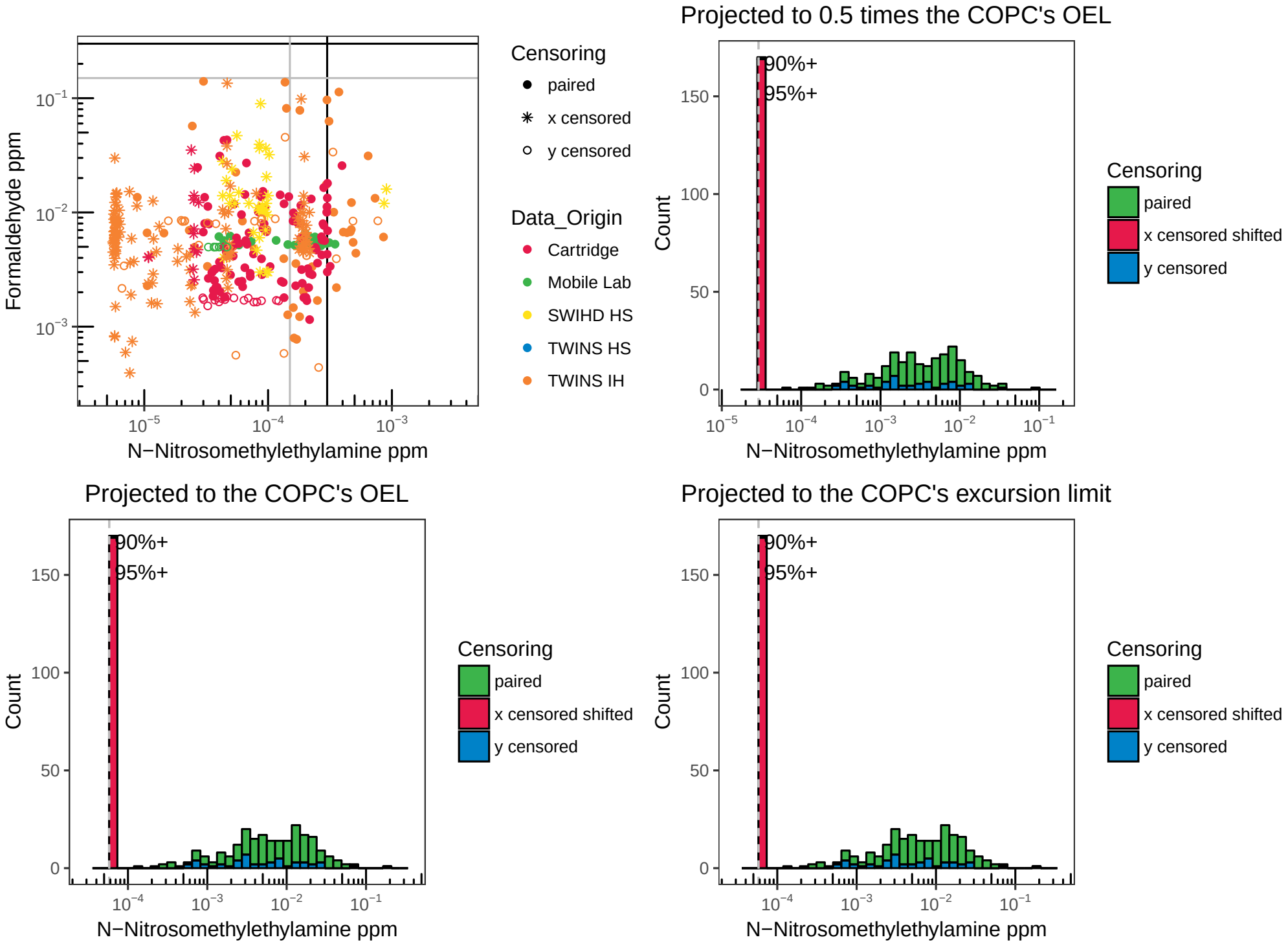


Figure C.2201: Formaldehyde vs N-Nitrosomethylethylamine

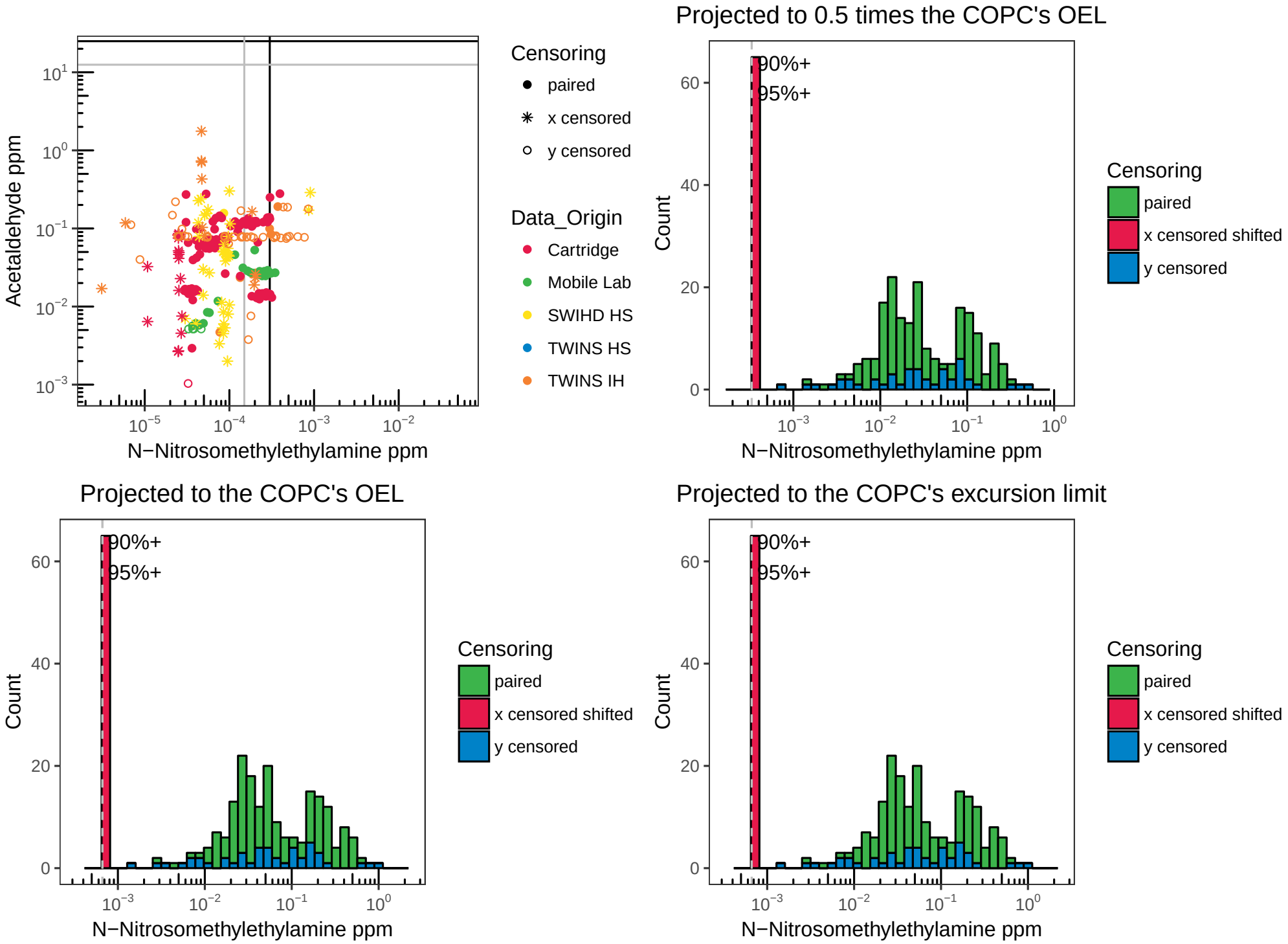


Figure C.2202: Acetaldehyde vs N-Nitrosomethylethylamine

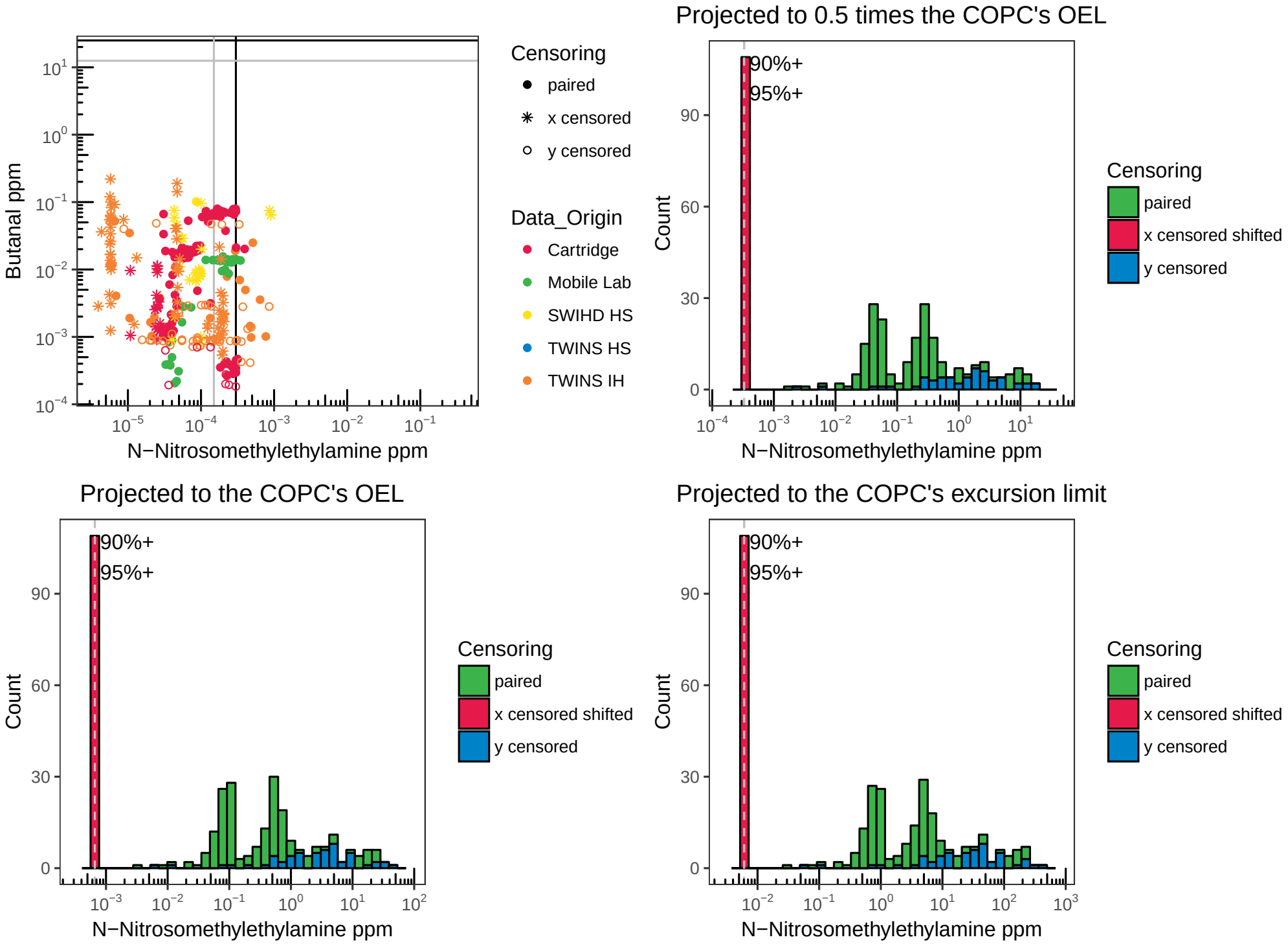


Figure C.2203: Butanal vs N-Nitrosomethylethylamine

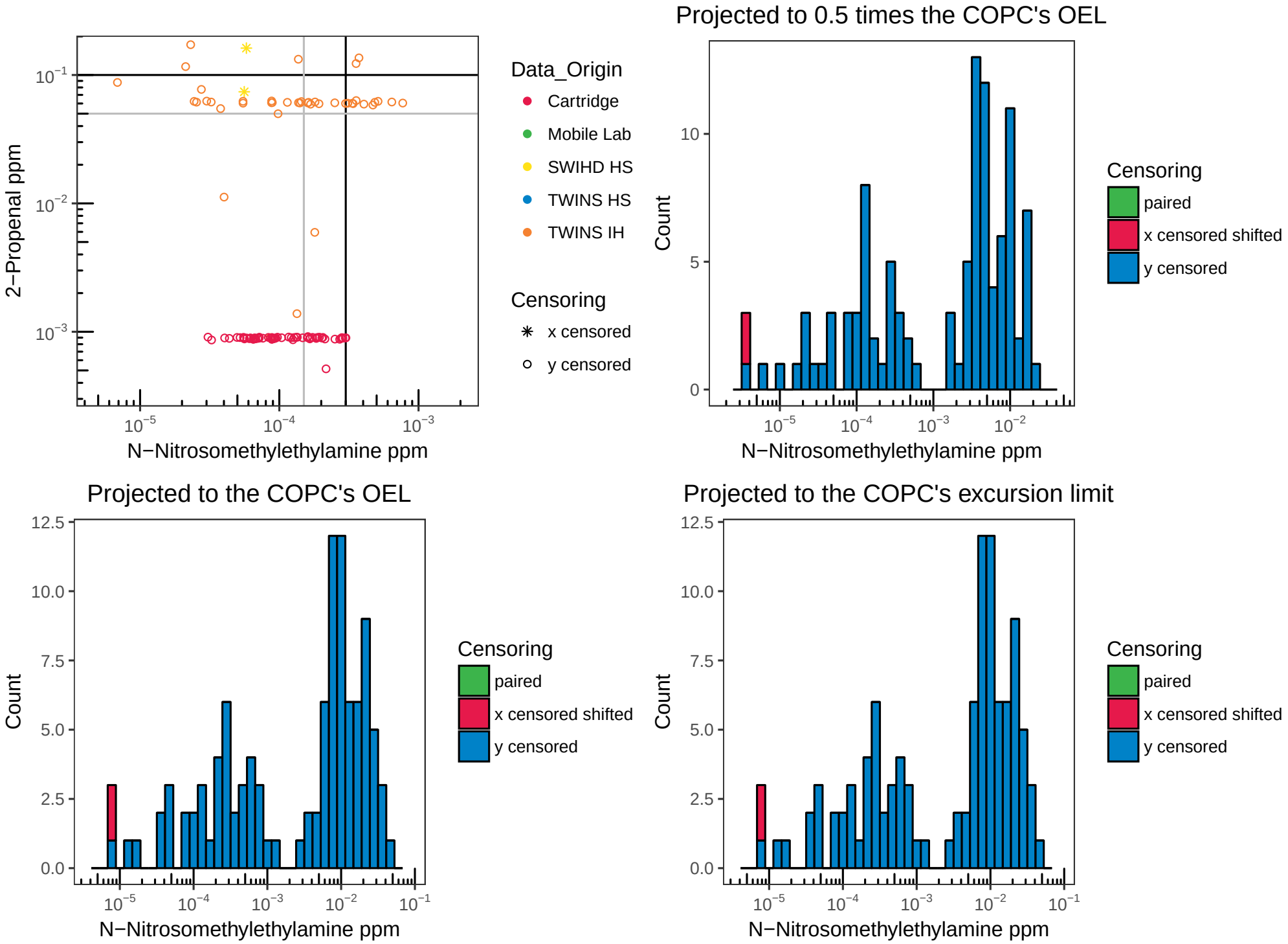


Figure C.2204: 2-Propenal vs N-Nitrosomethylethylamine

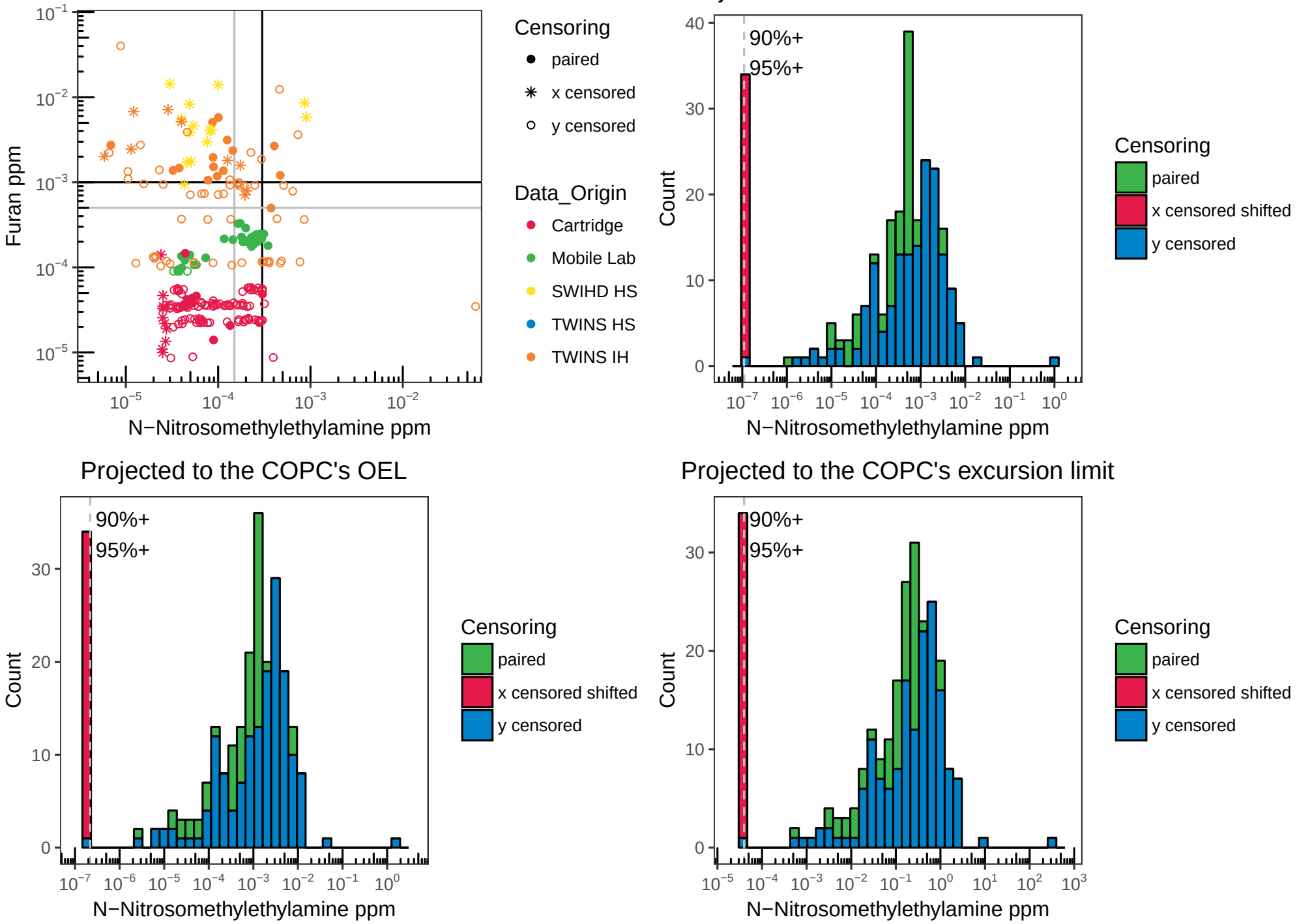


Figure C.2205: Furan vs N-Nitrosomethylethylamine

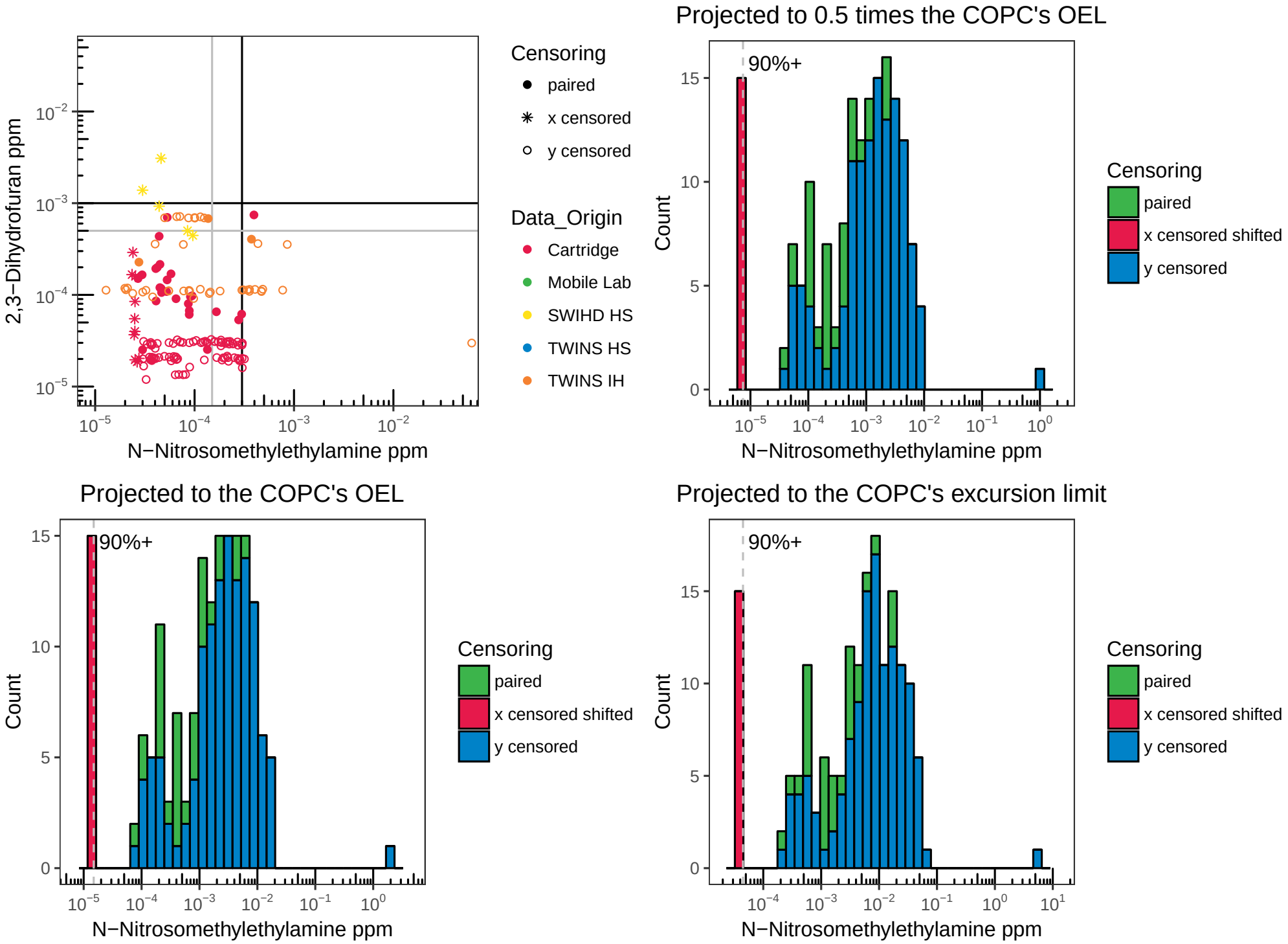


Figure C.2206: 2,3-Dihydrofuran vs N-Nitrosomethylethylamine

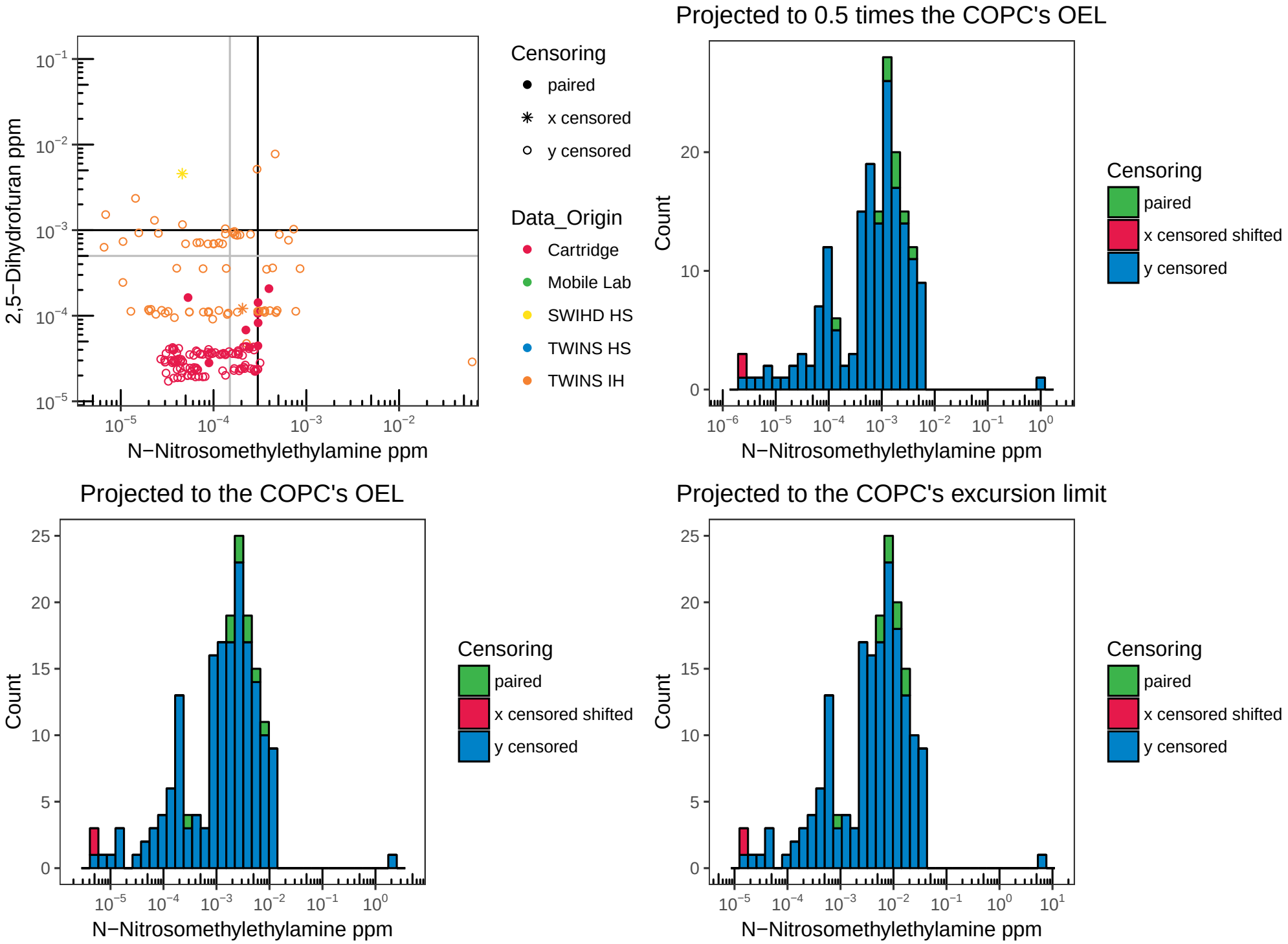


Figure C.2207: 2,5-Dihydrofuran vs N-Nitrosomethylethylamine

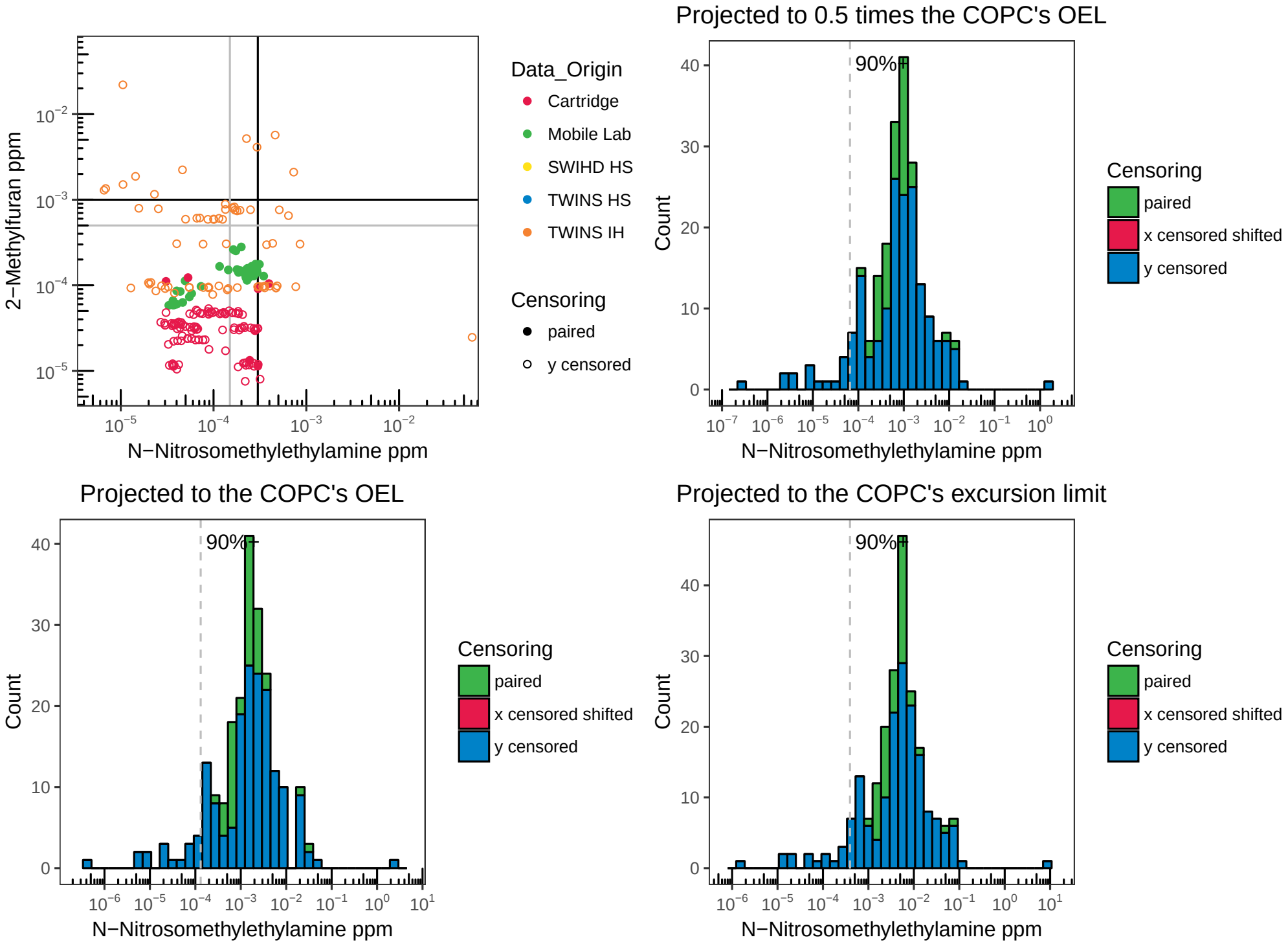


Figure C.2208: 2-Methylfuran vs N-Nitrosomethylethylamine

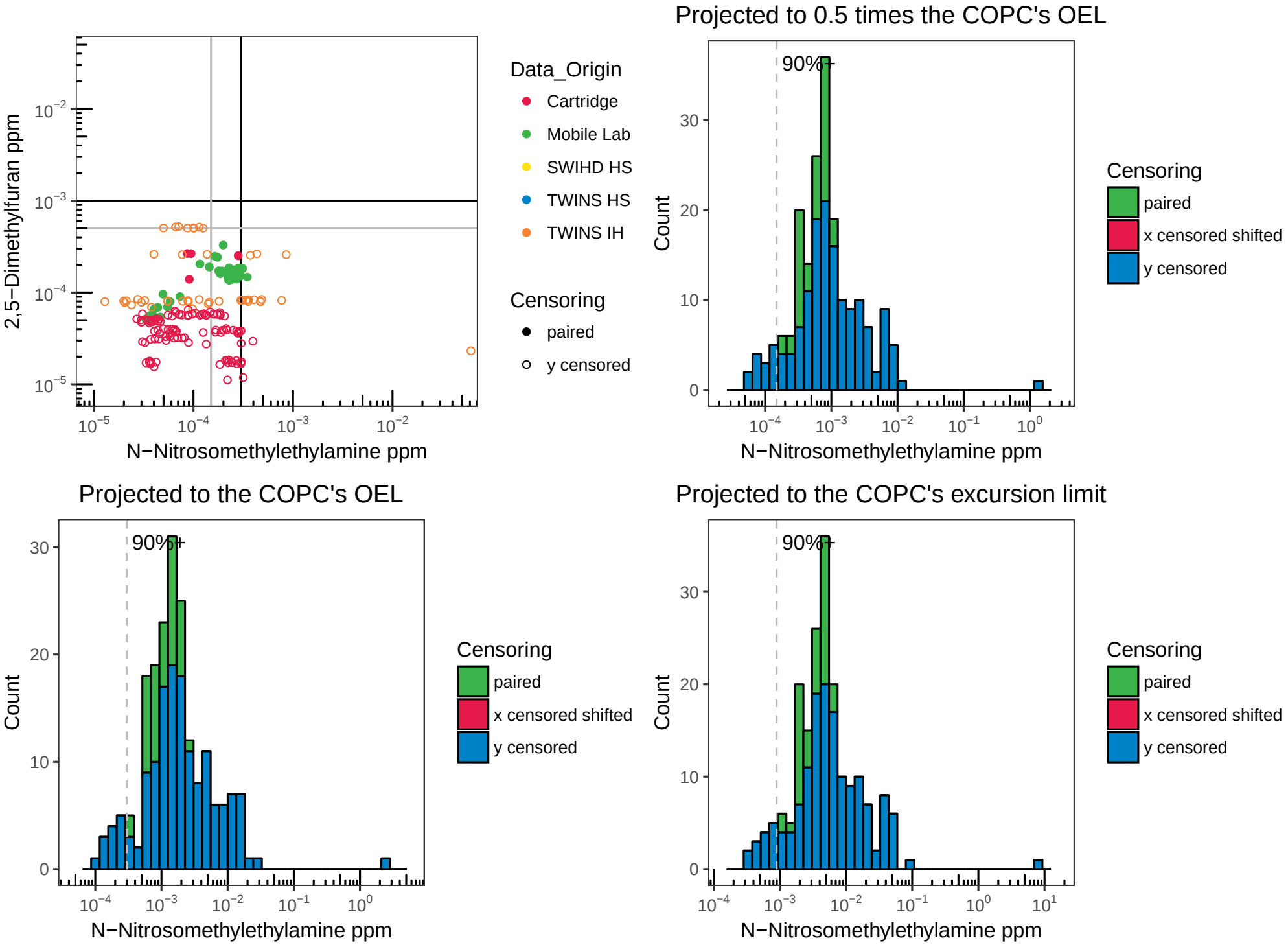


Figure C.2209: 2,5-Dimethylfuran vs N-Nitrosomethylethylamine

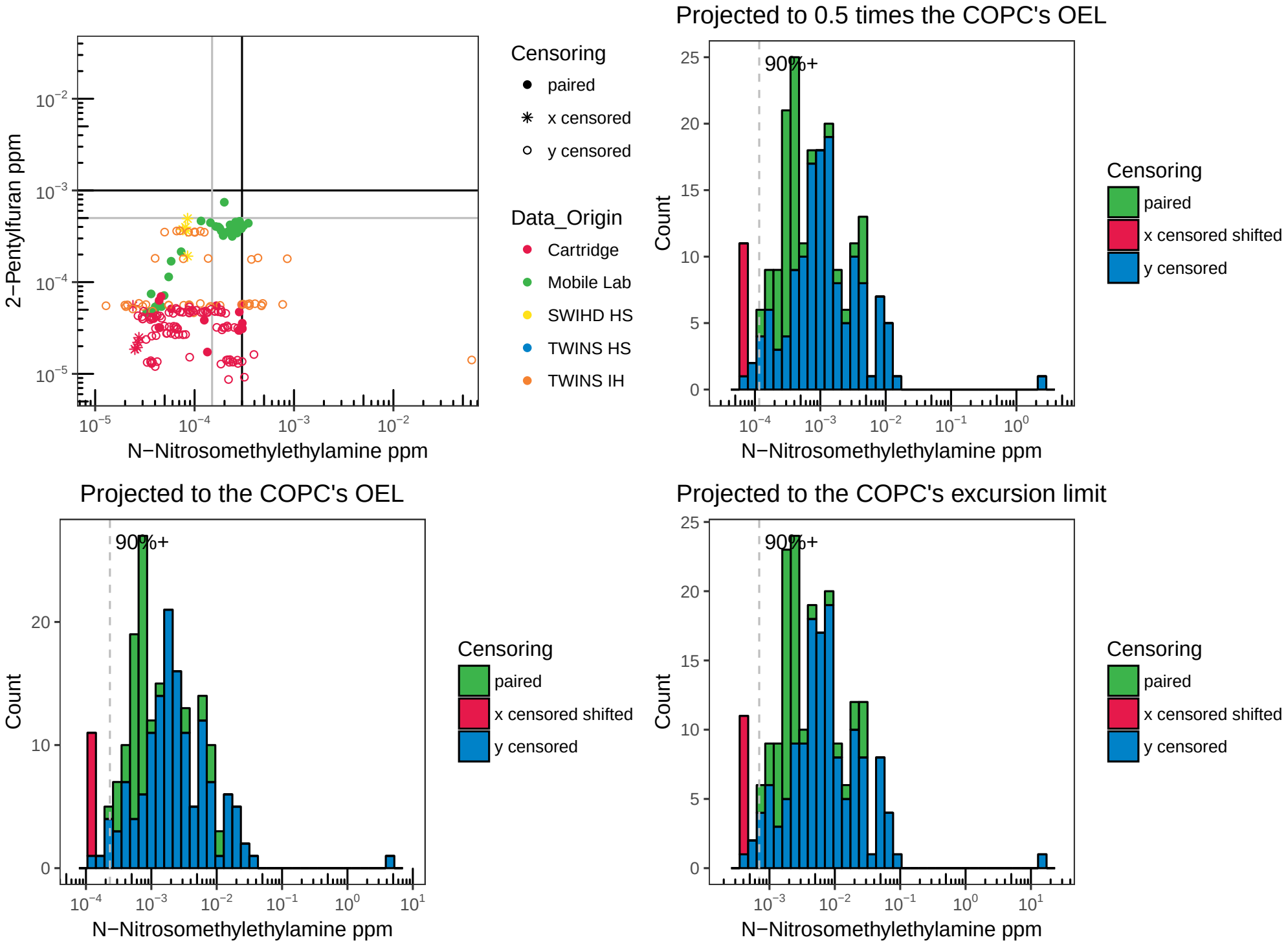


Figure C.2210: 2-Pentylfuran vs N-Nitrosomethylethylamine

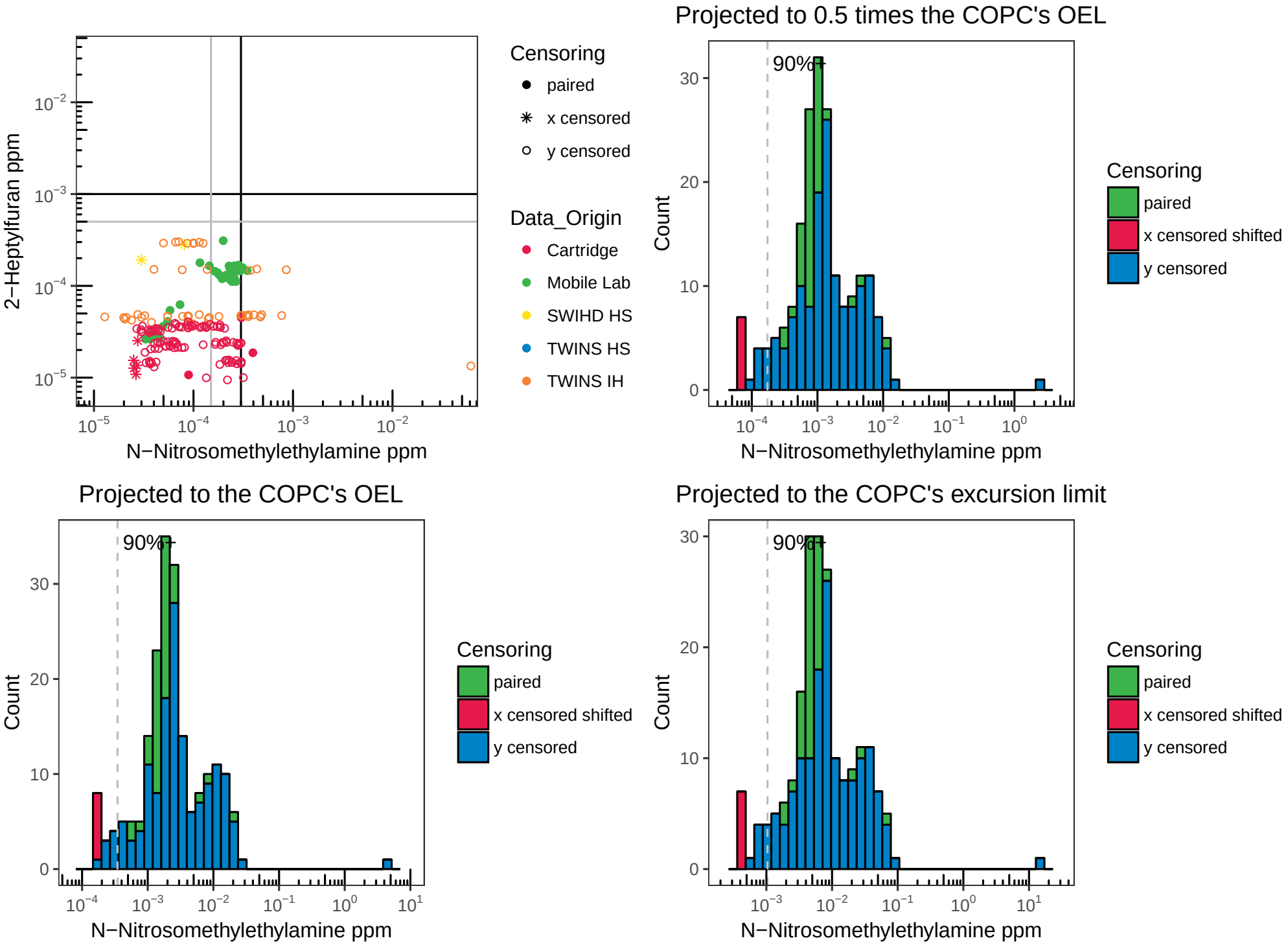


Figure C.2211: 2-Heptylfuran vs N-Nitrosomethylethylamine

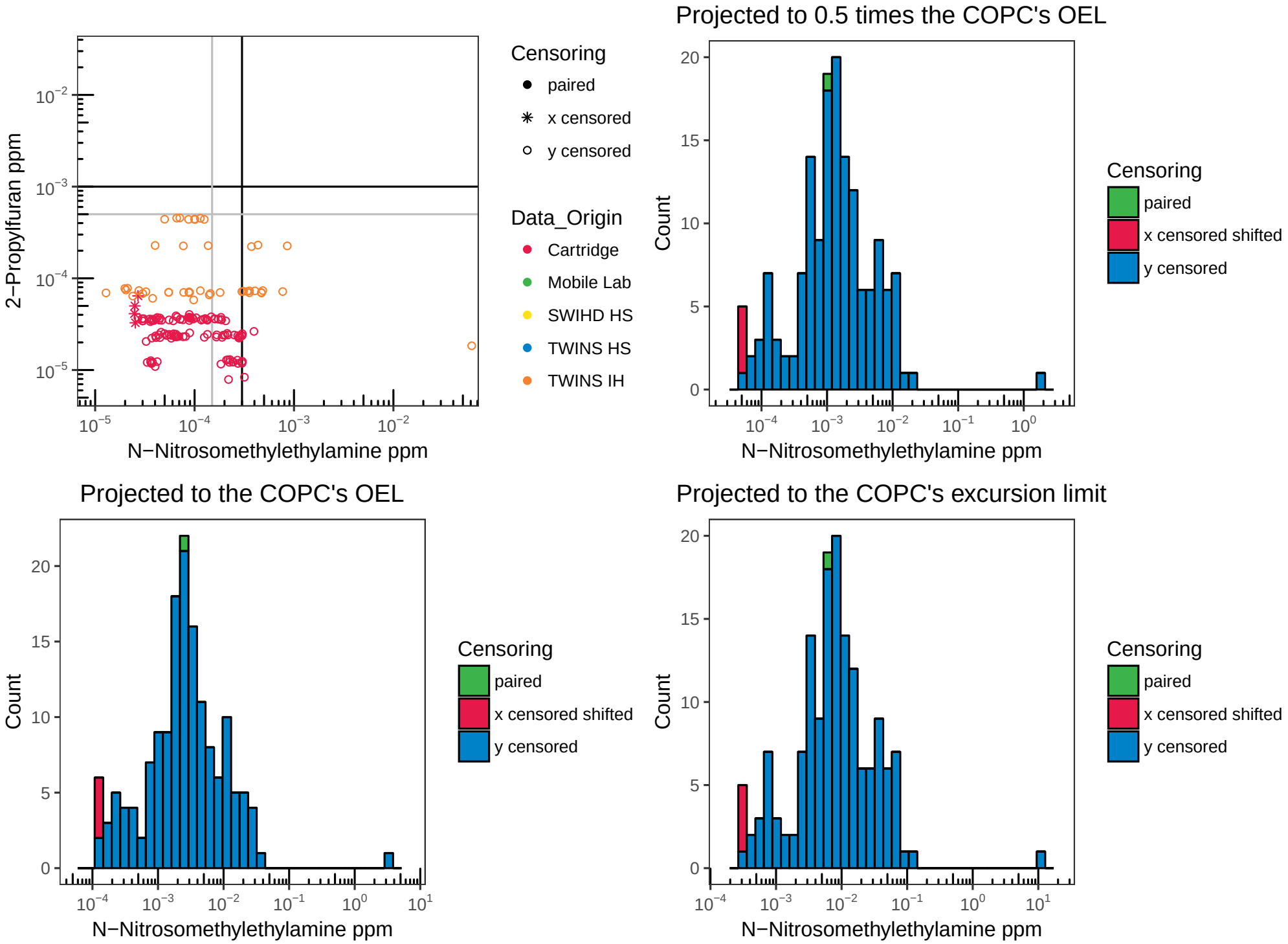


Figure C.2212: 2-Propylfuran vs N-Nitrosomethylethylamine

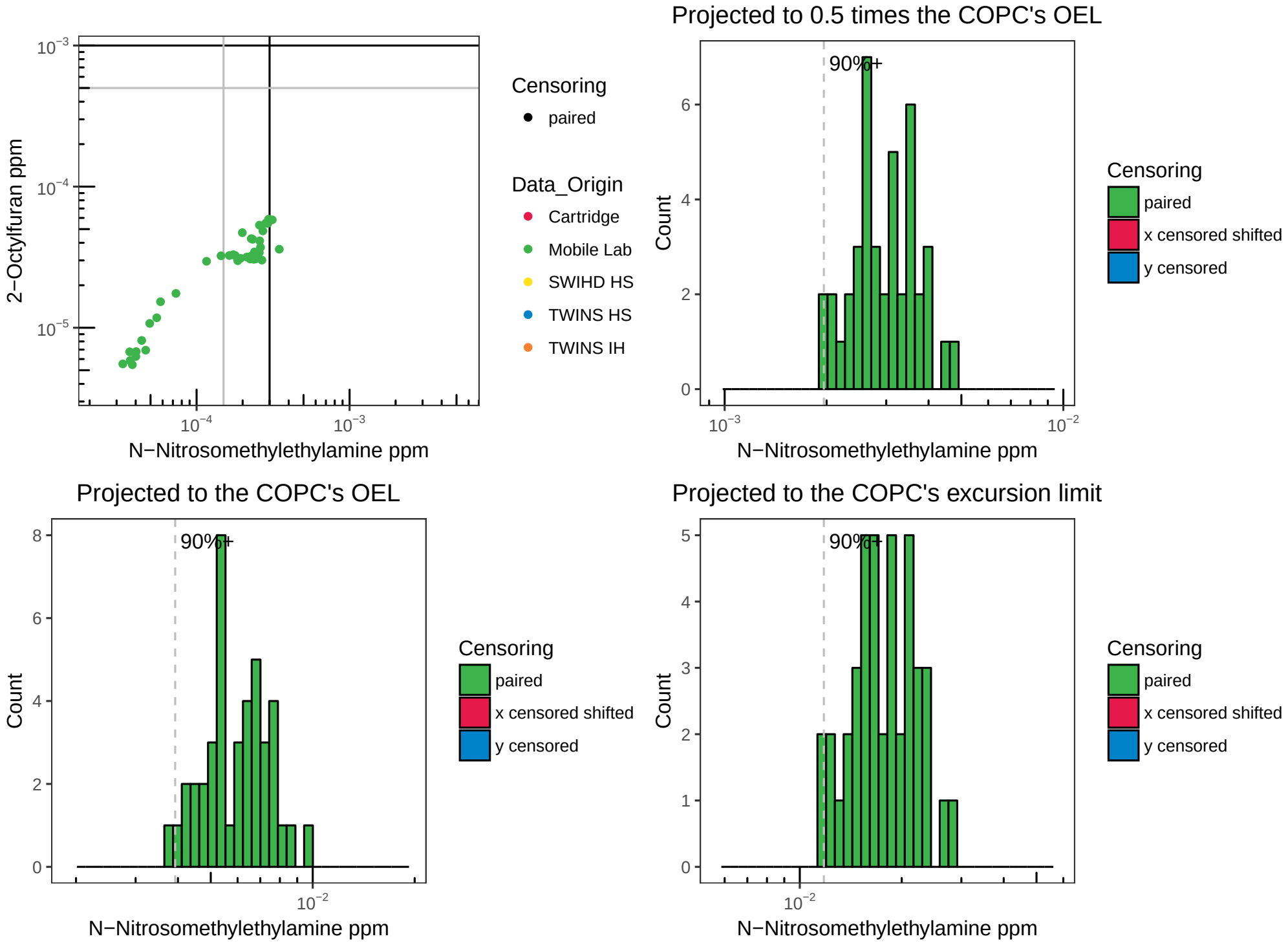


Figure C.2213: 2-Octylfuran vs N-Nitrosomethylethylamine

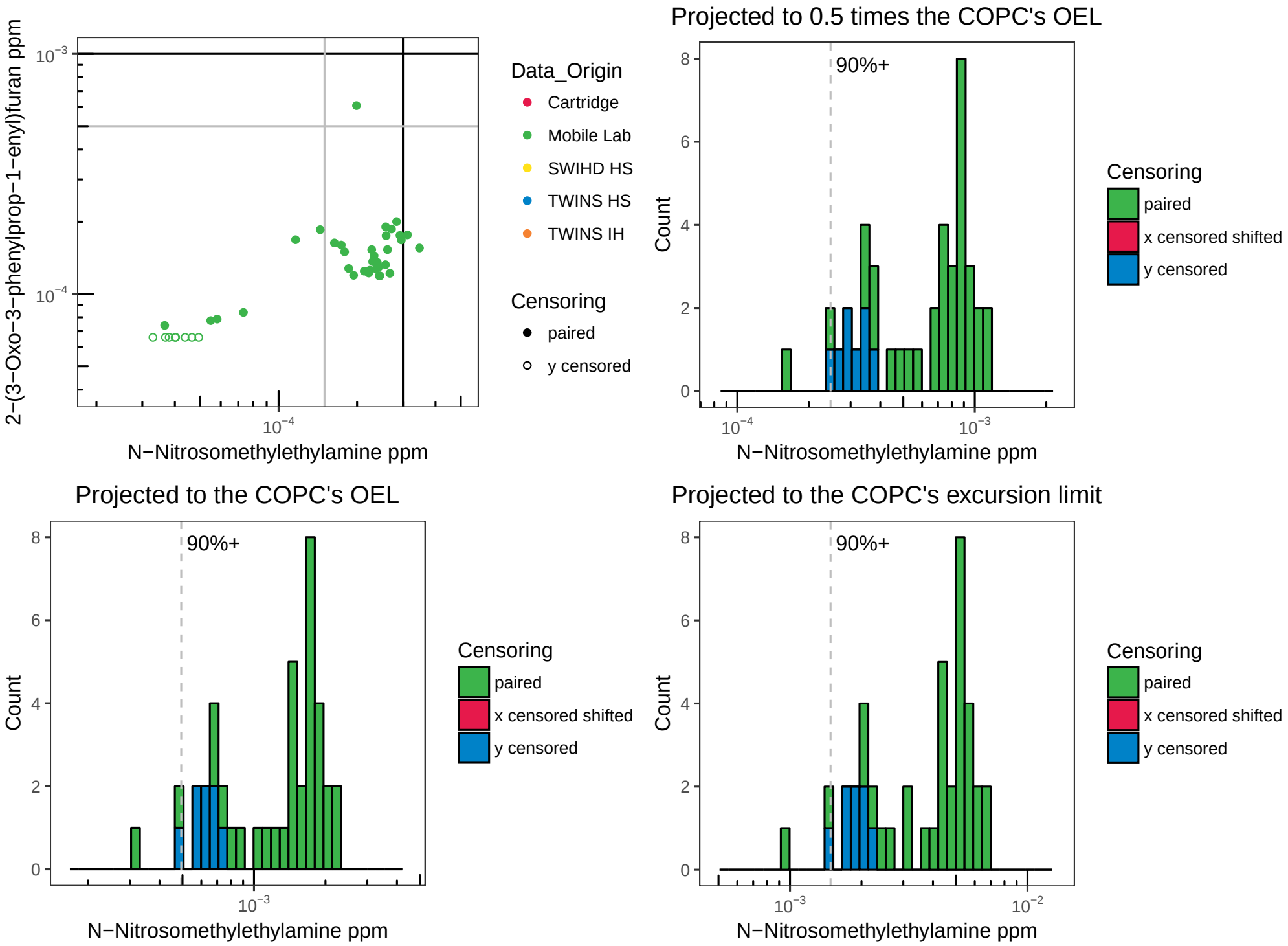


Figure C.2214: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs N-Nitrosomethylethylamine

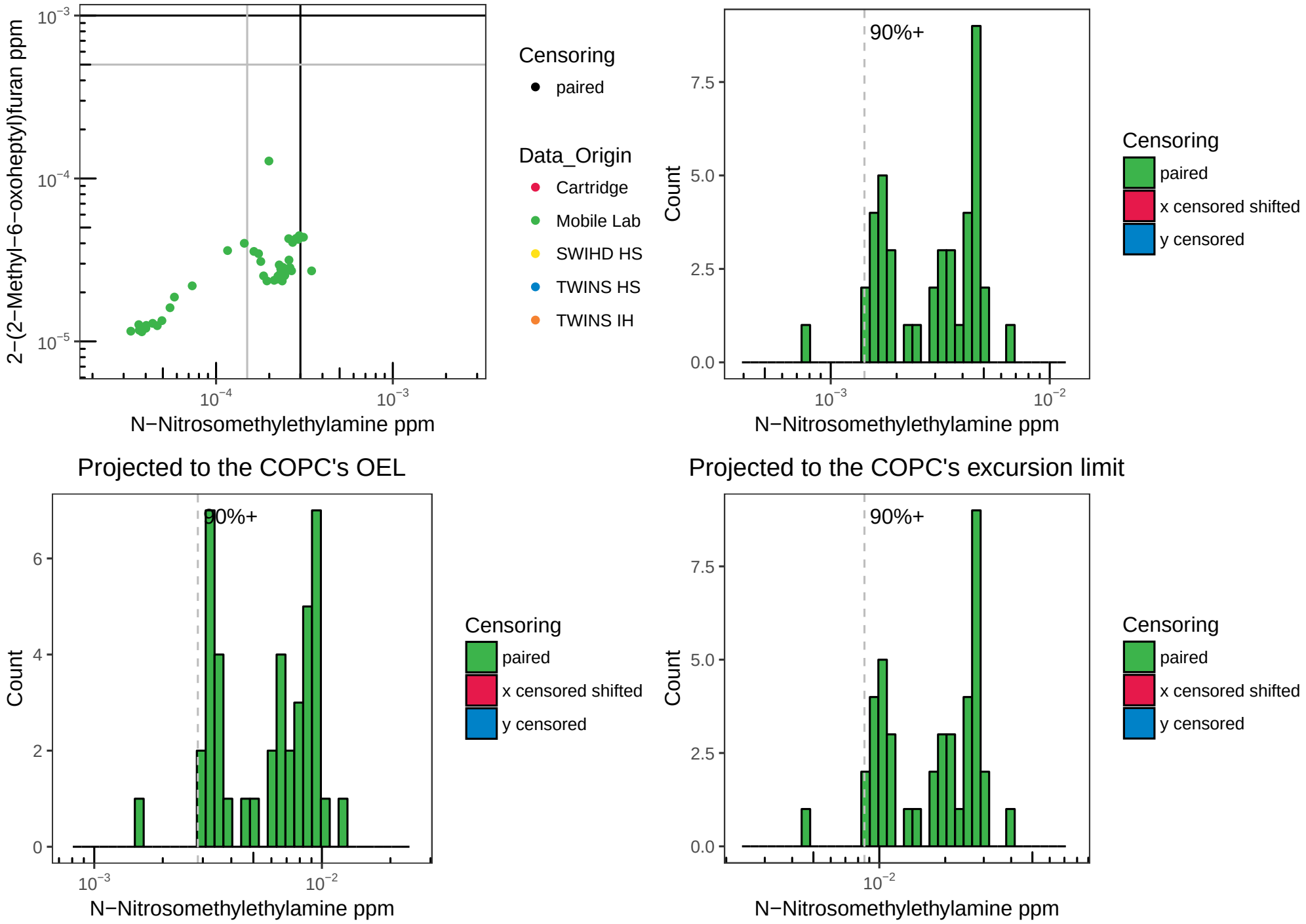


Figure C.2215: 2-(2-Methyl-6-oxoheptyl)furan vs N-Nitrosomethylethylamine

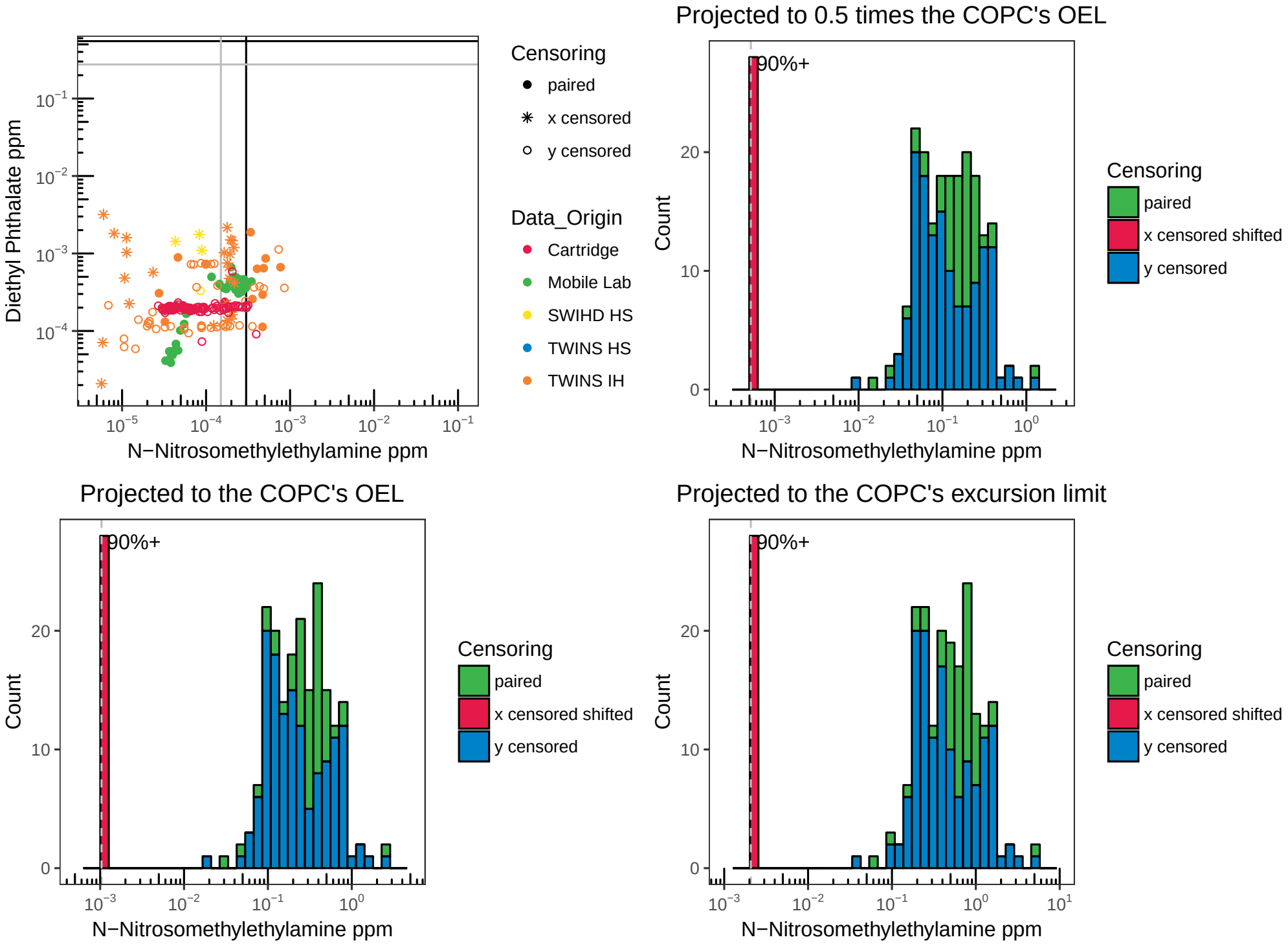


Figure C.2216: Diethyl Phthalate vs N-Nitrosomethylethylamine

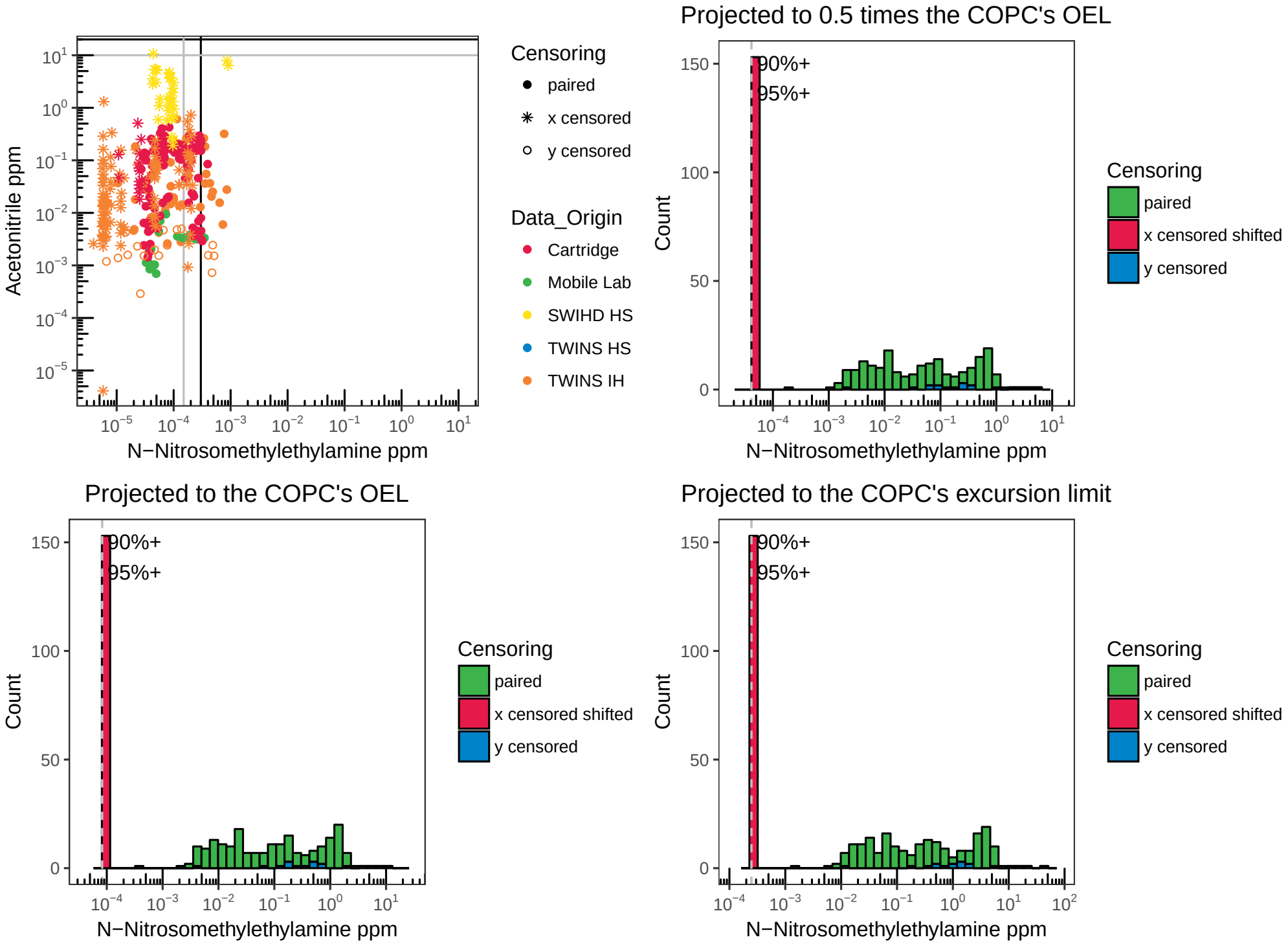


Figure C.2217: Acetonitrile vs N-Nitrosomethylethylamine

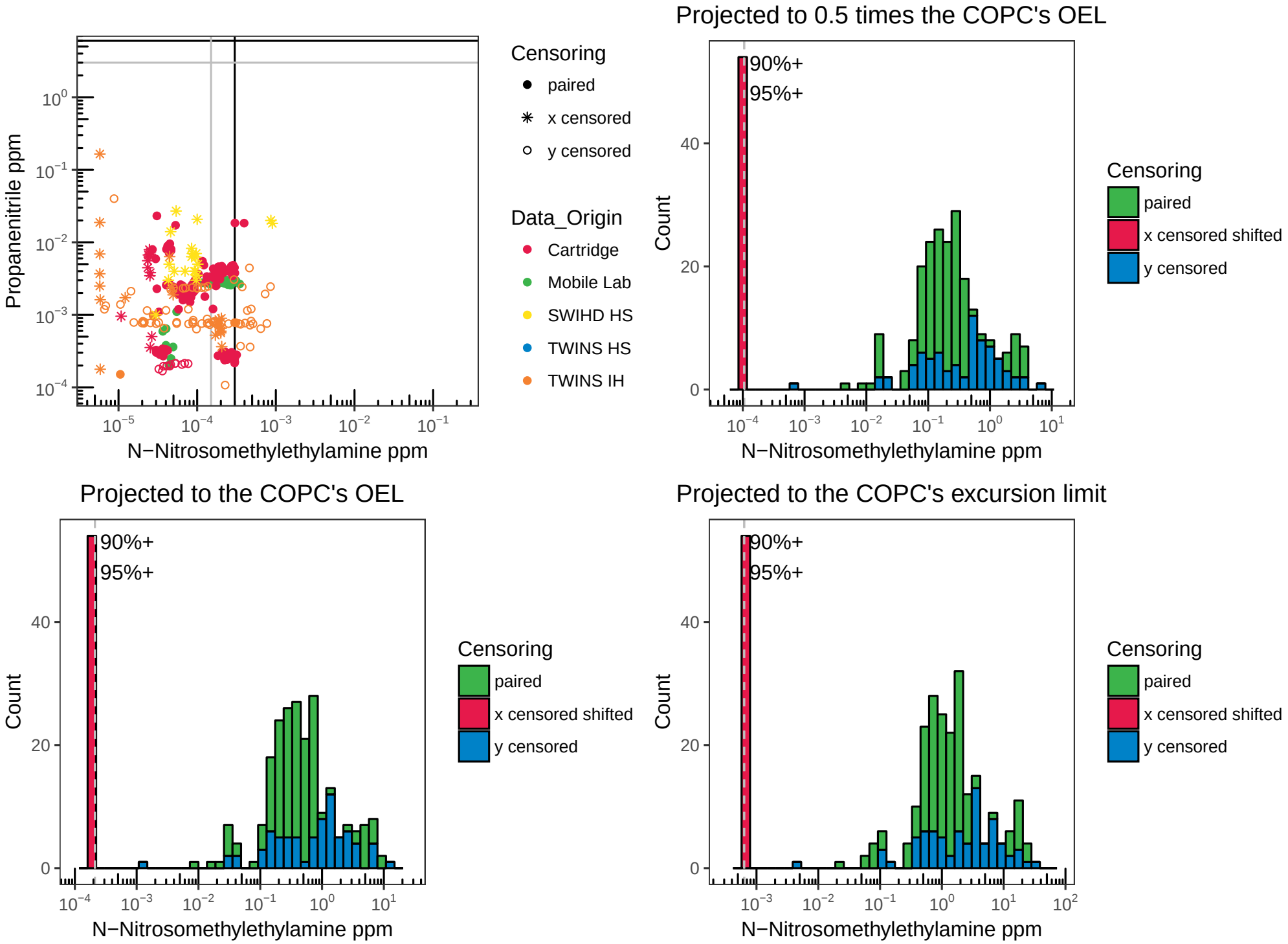


Figure C.2218: Propanenitrile vs N-Nitrosomethylethylamine

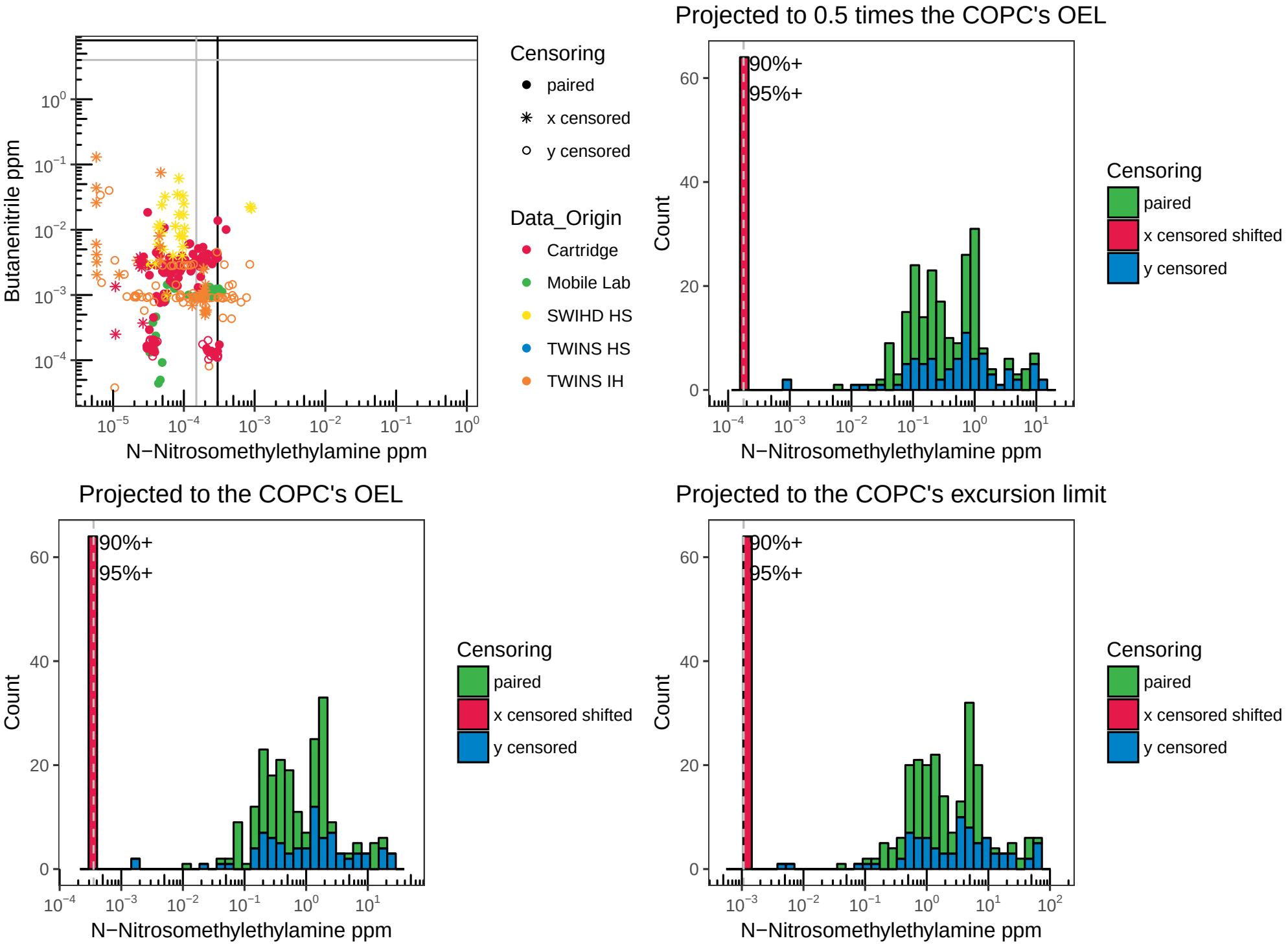


Figure C.2219: Butanenitrile vs N-Nitrosomethylethylamine

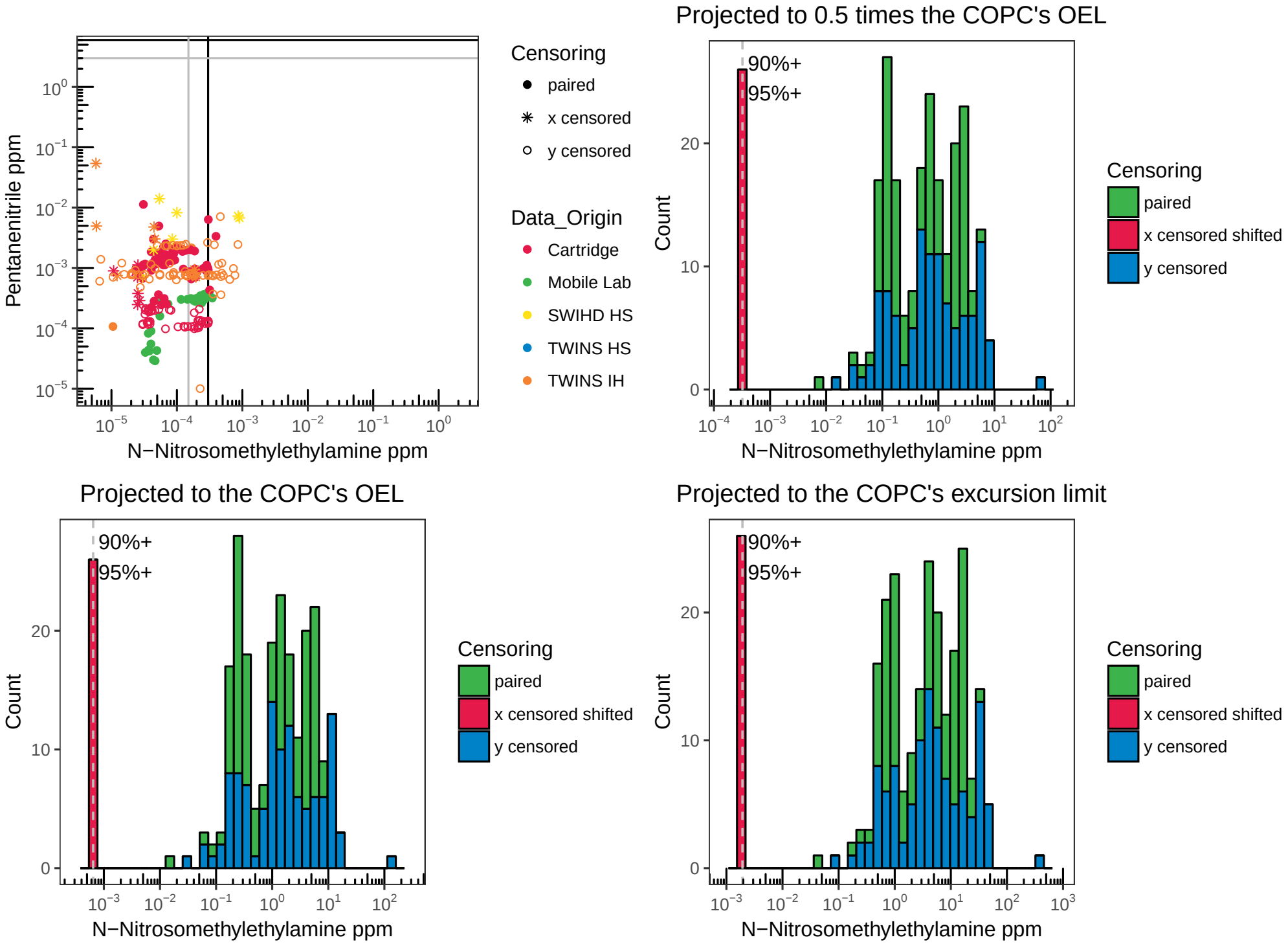


Figure C.2220: Pentanenitrile vs N-Nitrosomethylethylamine

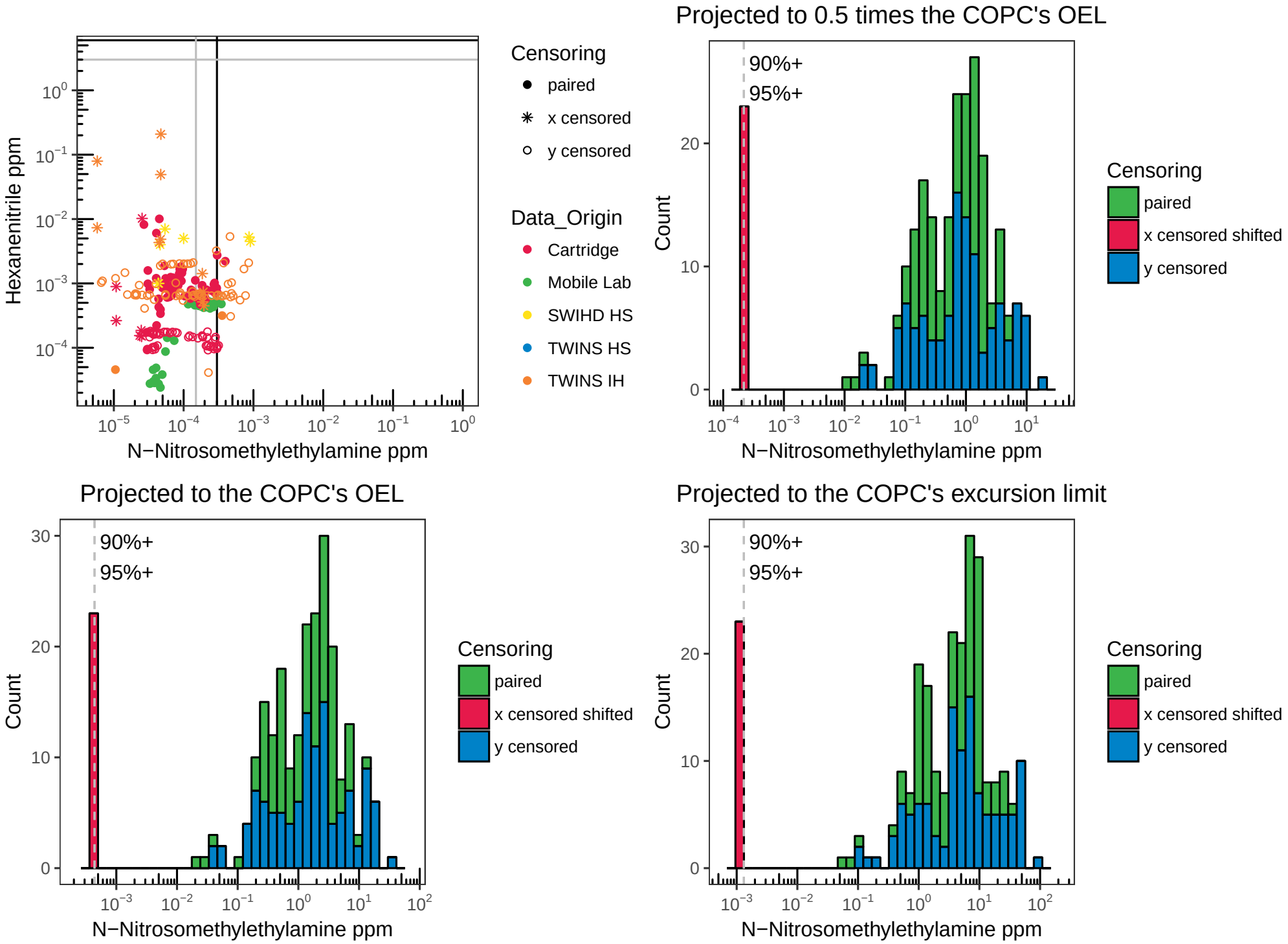


Figure C.2221: Hexanenitrile vs N-Nitrosomethylethylamine

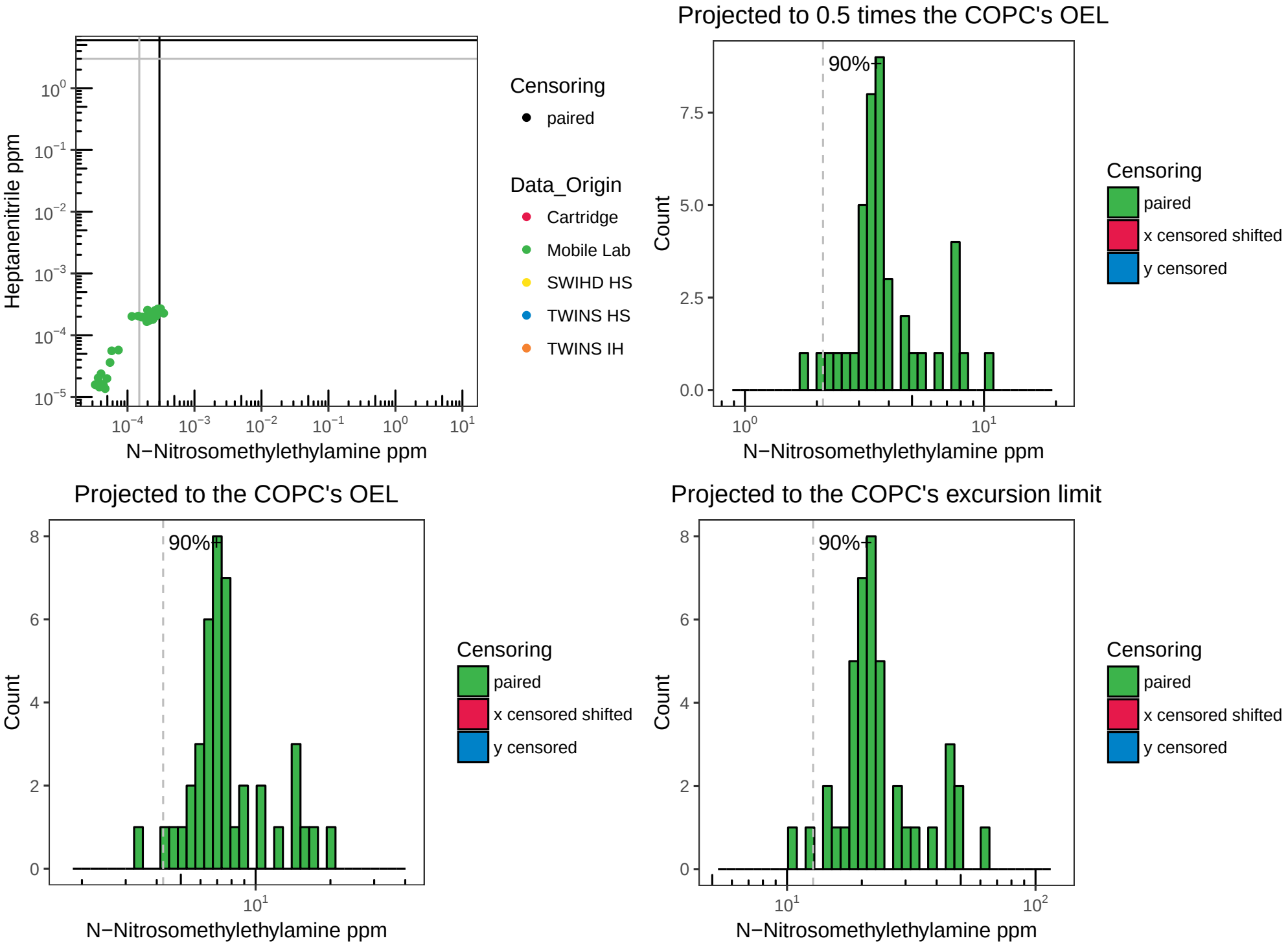


Figure C.2222: Heptanenitrile vs N-Nitrosomethylethylamine

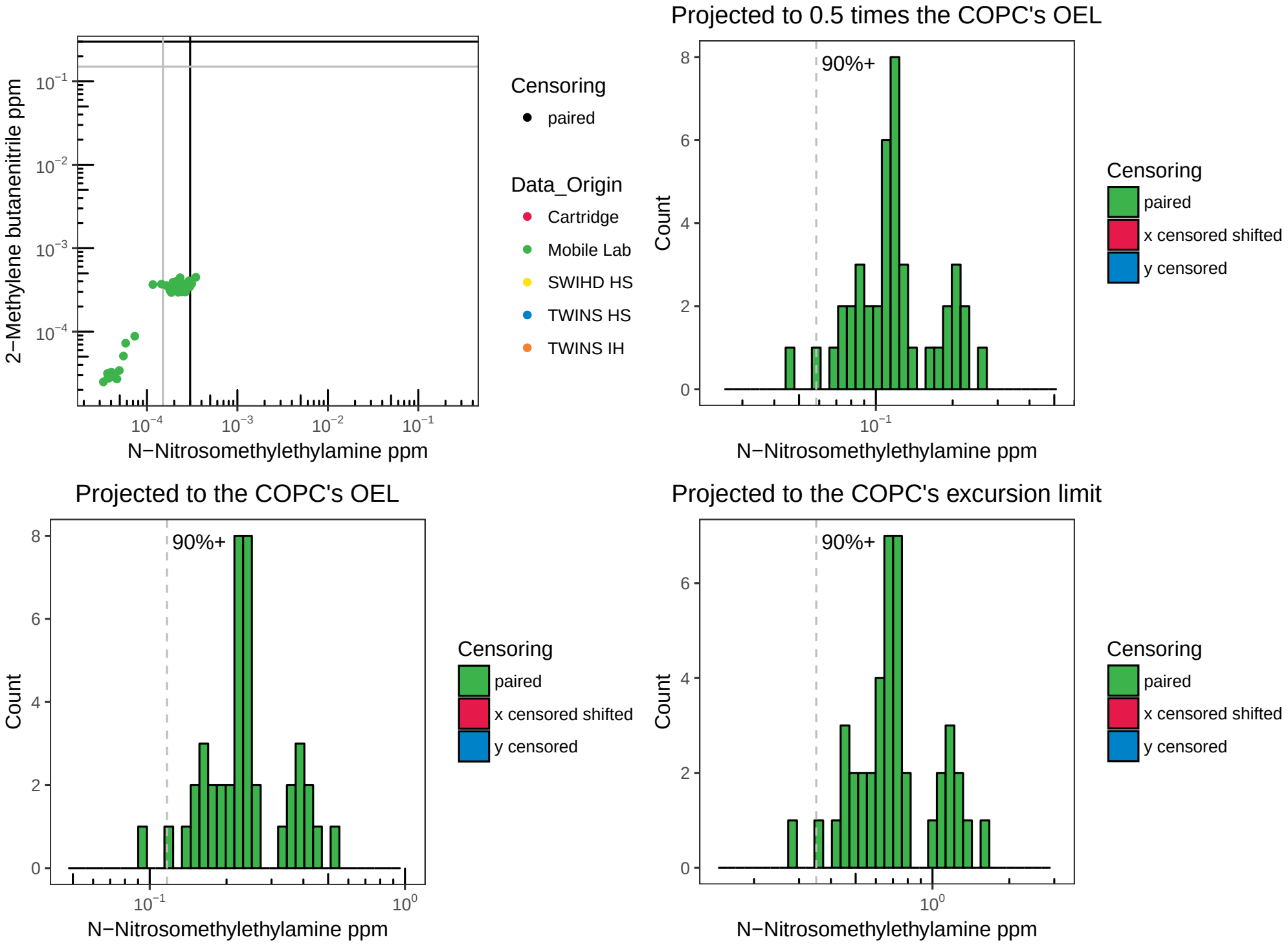


Figure C.2223: 2-Methylene butanenitrile vs N-Nitrosomethylethylamine

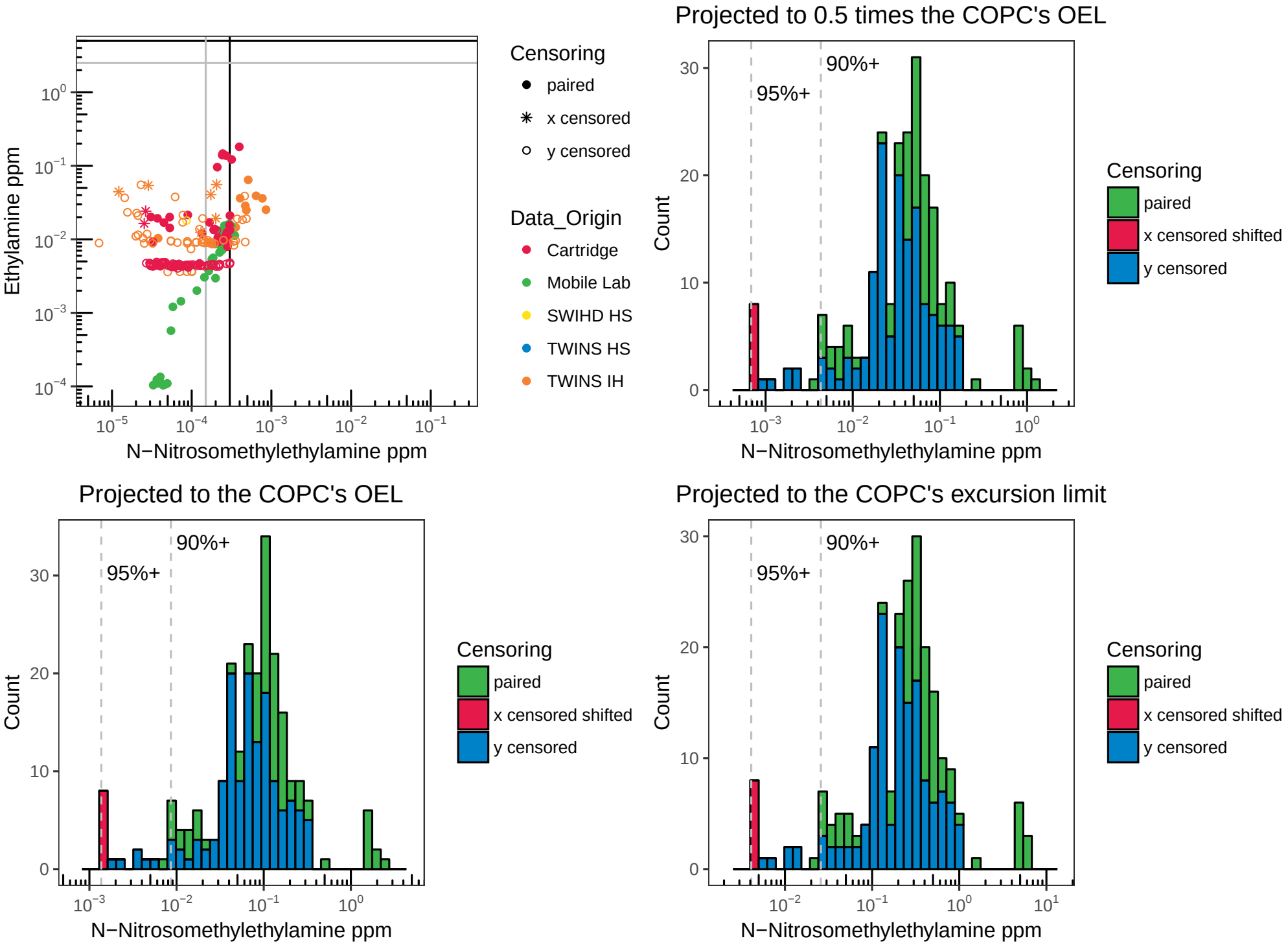


Figure C.2224: Ethylamine vs N-Nitrosomethylethylamine

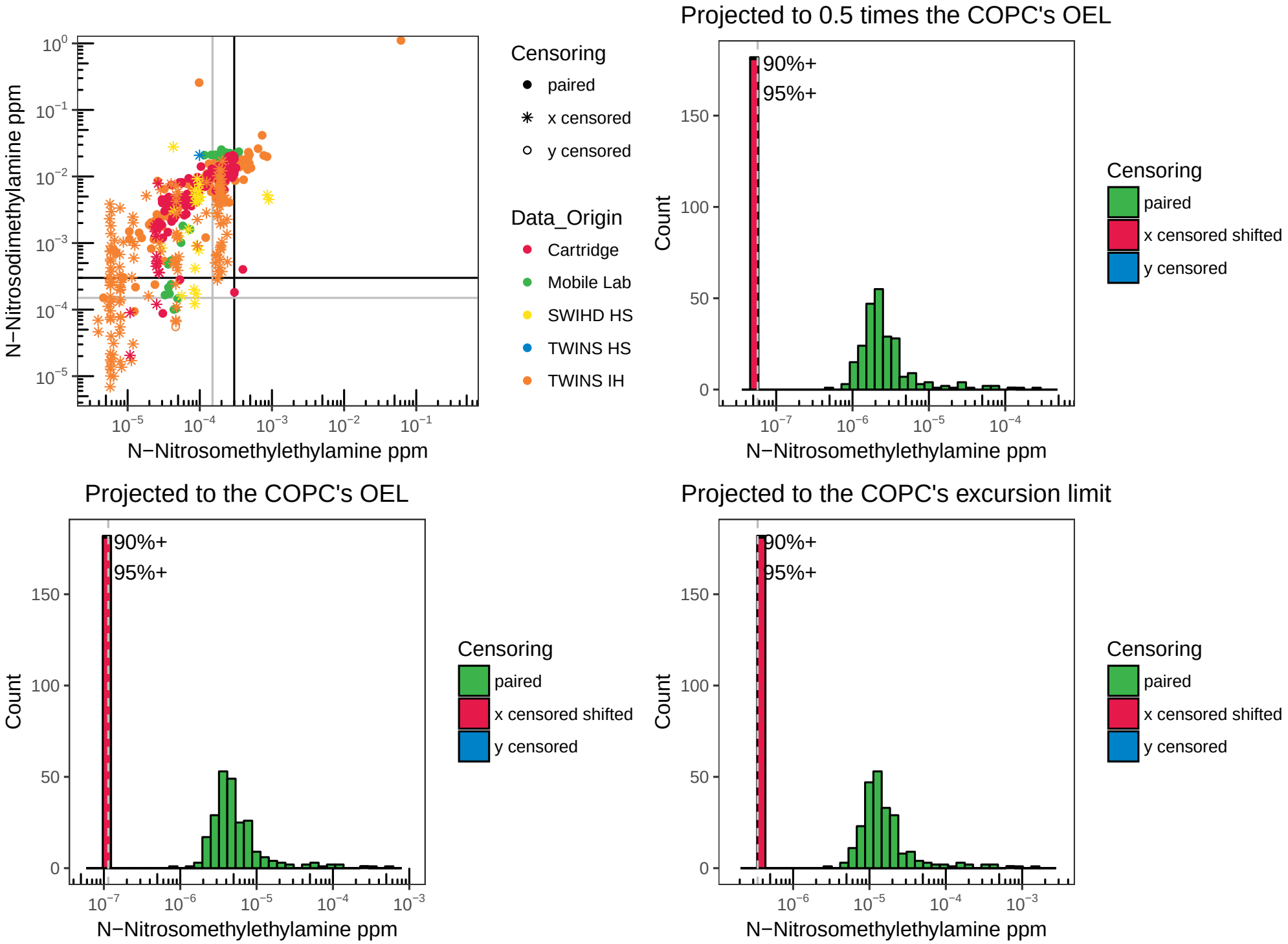


Figure C.2225: N-Nitrosodimethylamine vs N-Nitrosomethylethylamine

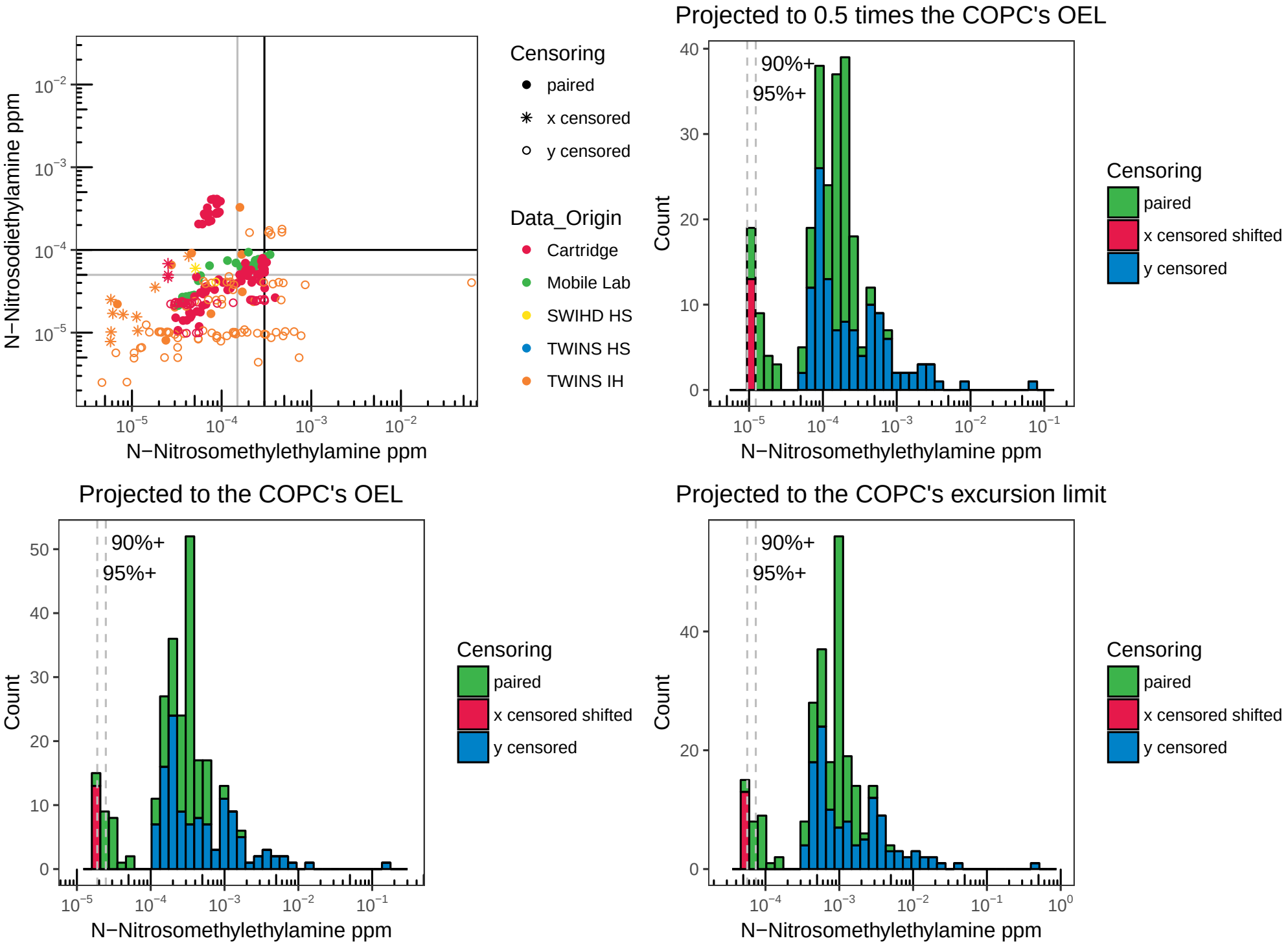


Figure C.2226: N-Nitrosodiethylamine vs N-Nitrosomethylethylamine

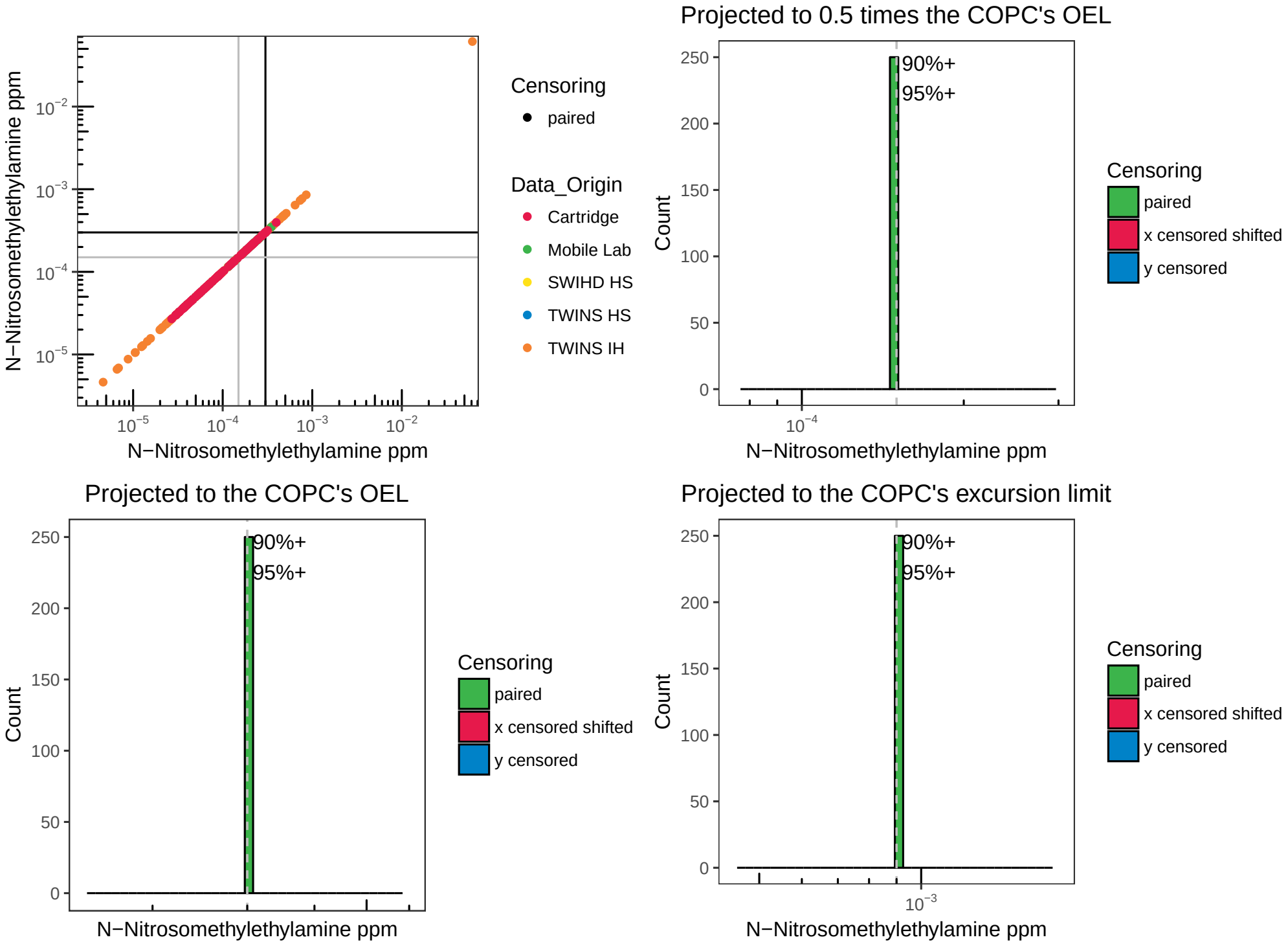


Figure C.2227: N-Nitrosomethylethylamine vs N-Nitrosomethylethylamine

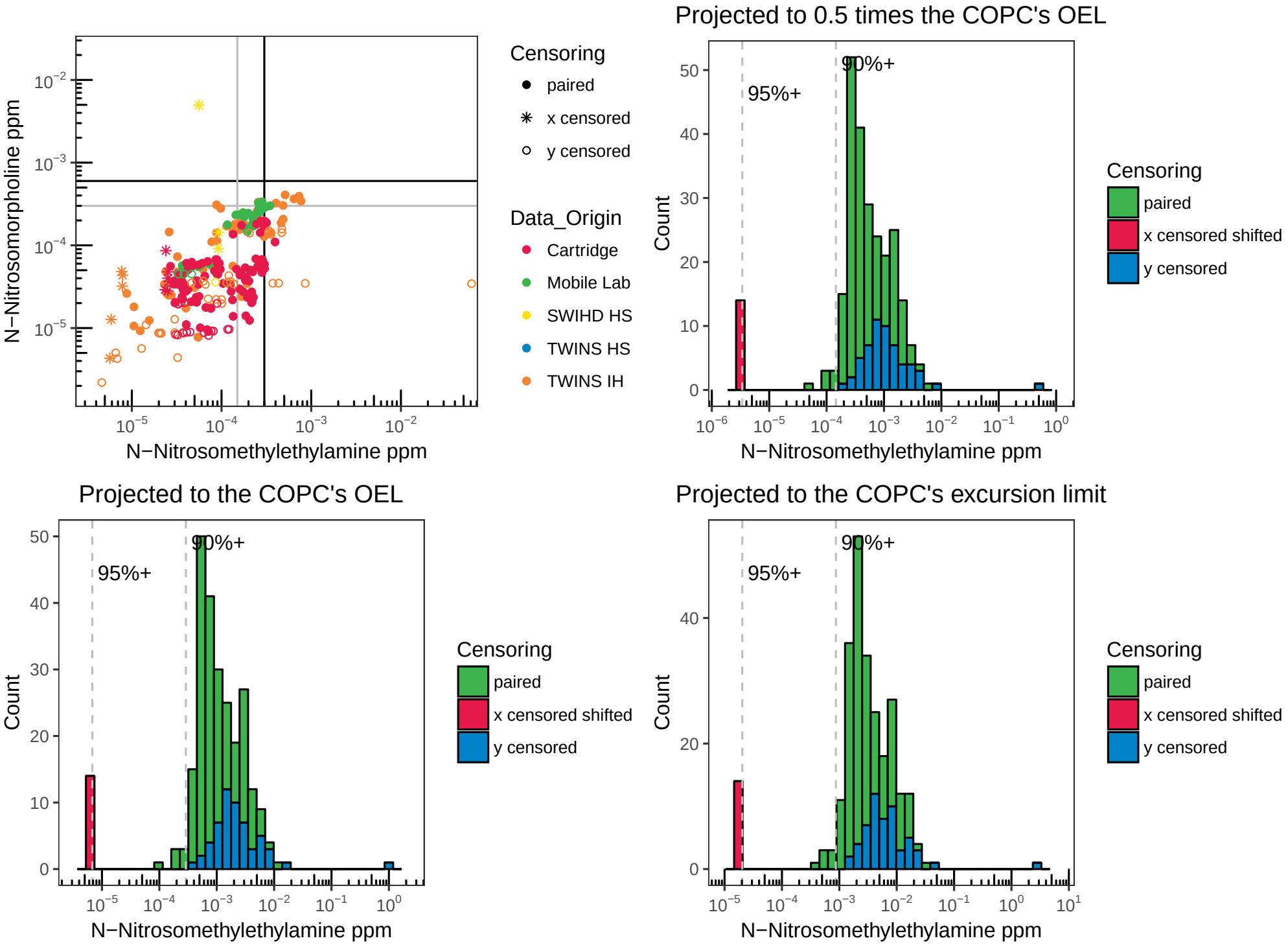


Figure C.2228: N-Nitrosomorpholine vs N-Nitrosomethylethylamine

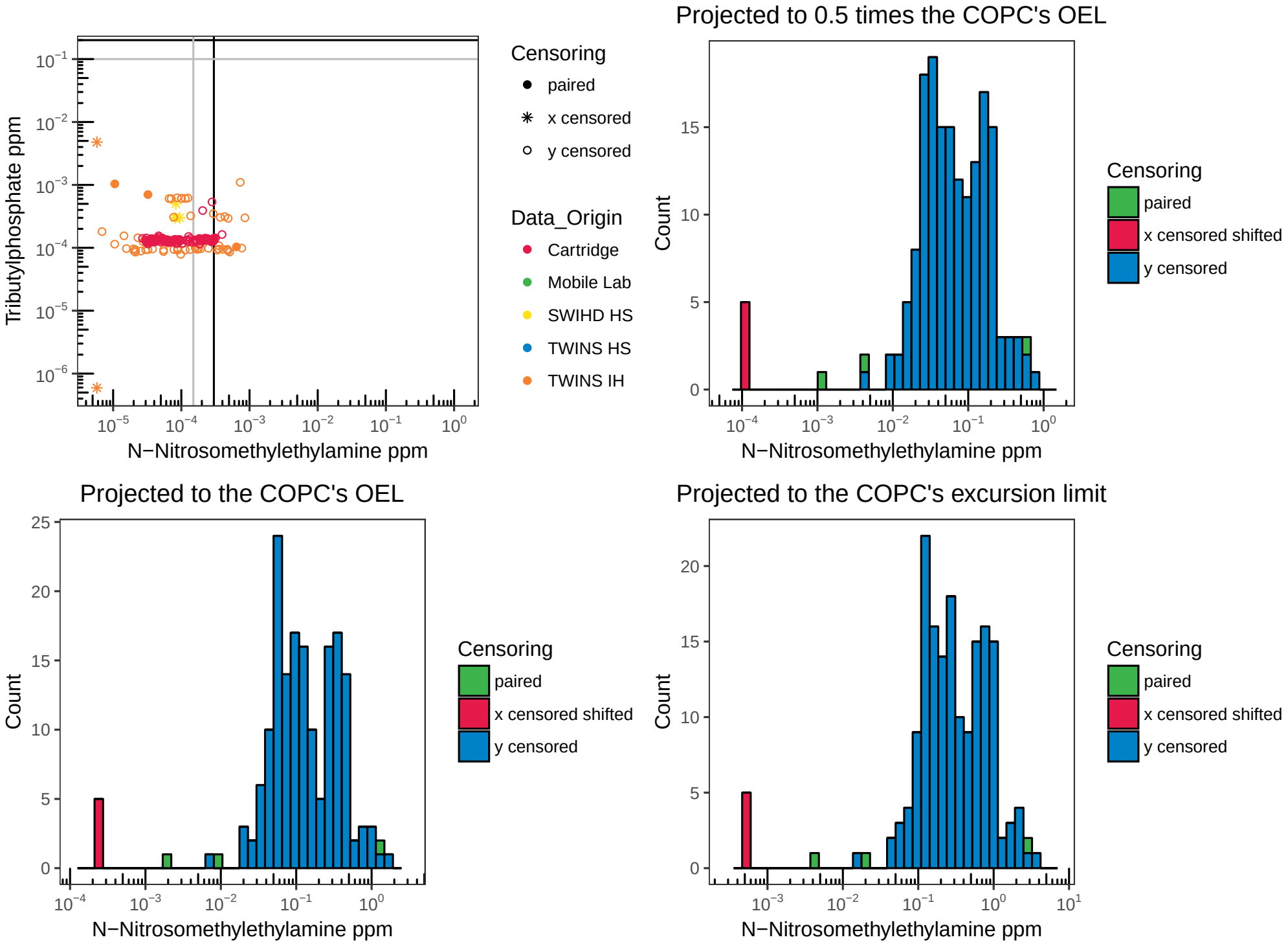


Figure C.2229: Tributylphosphate vs N-Nitrosomethylethylamine

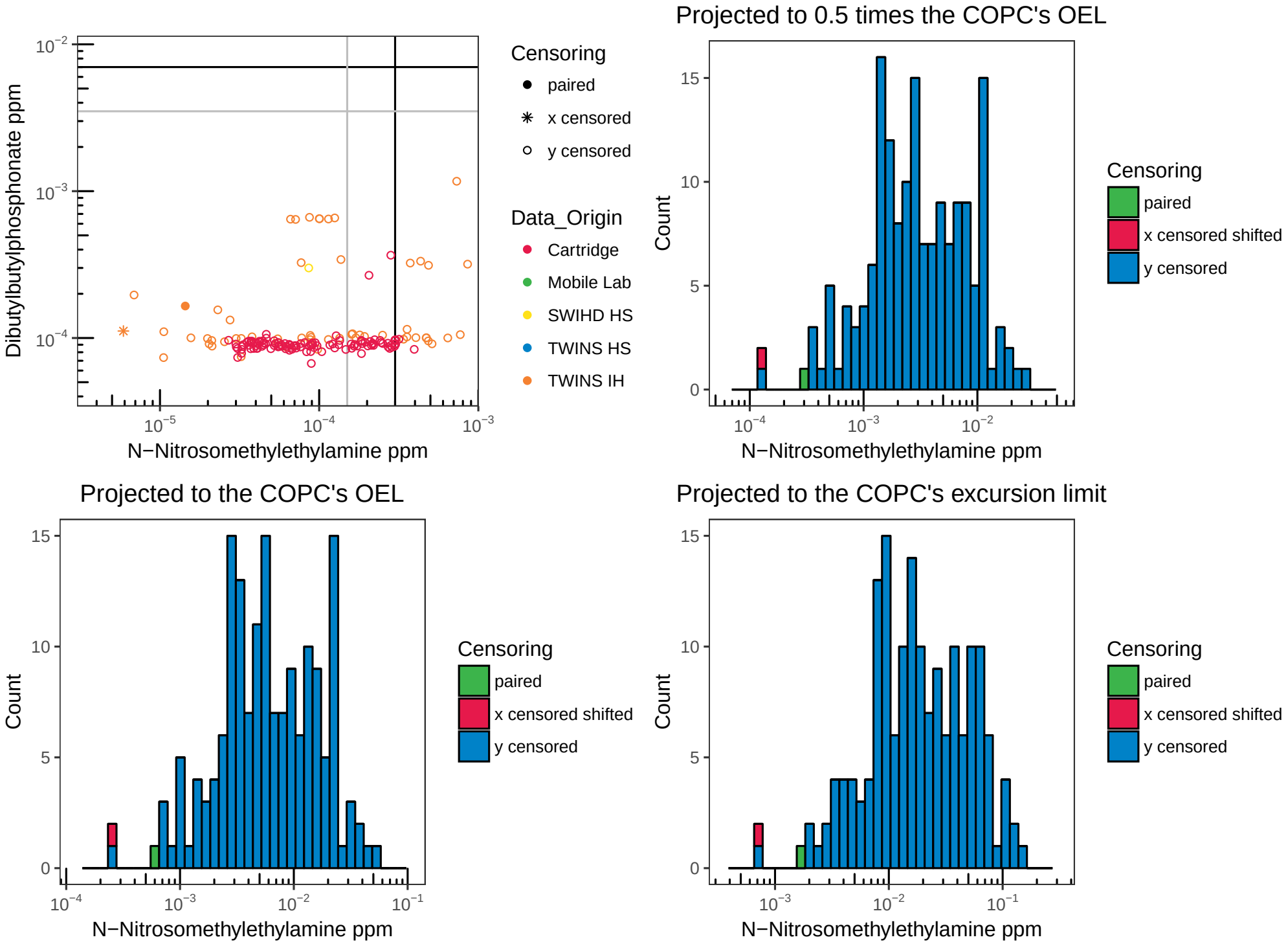


Figure C.2230: Dibutylbutylphosphonate vs N-Nitrosomethylethylamine

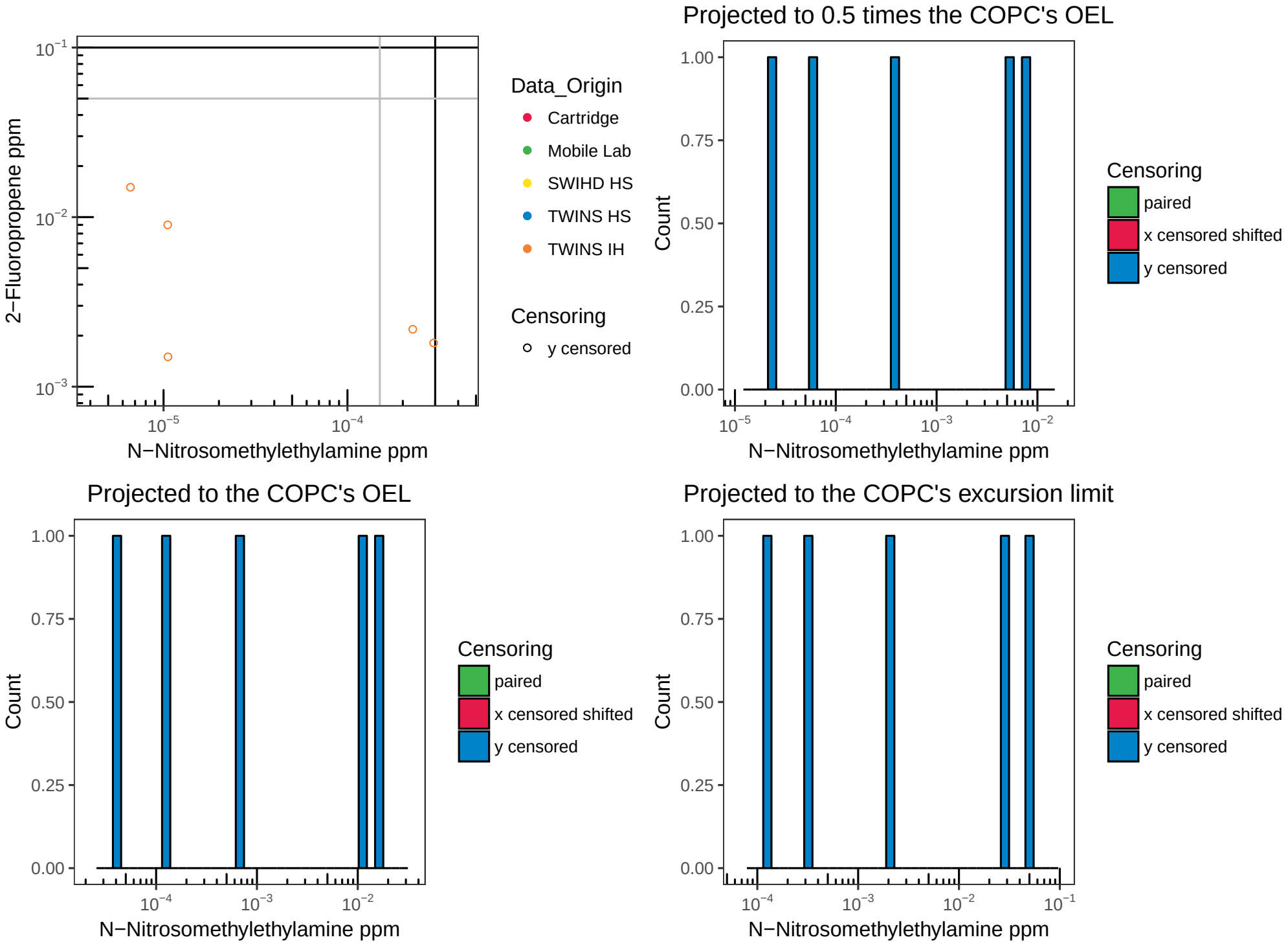


Figure C.2231: 2-Fluoropropene vs N-Nitrosomethylethylamine

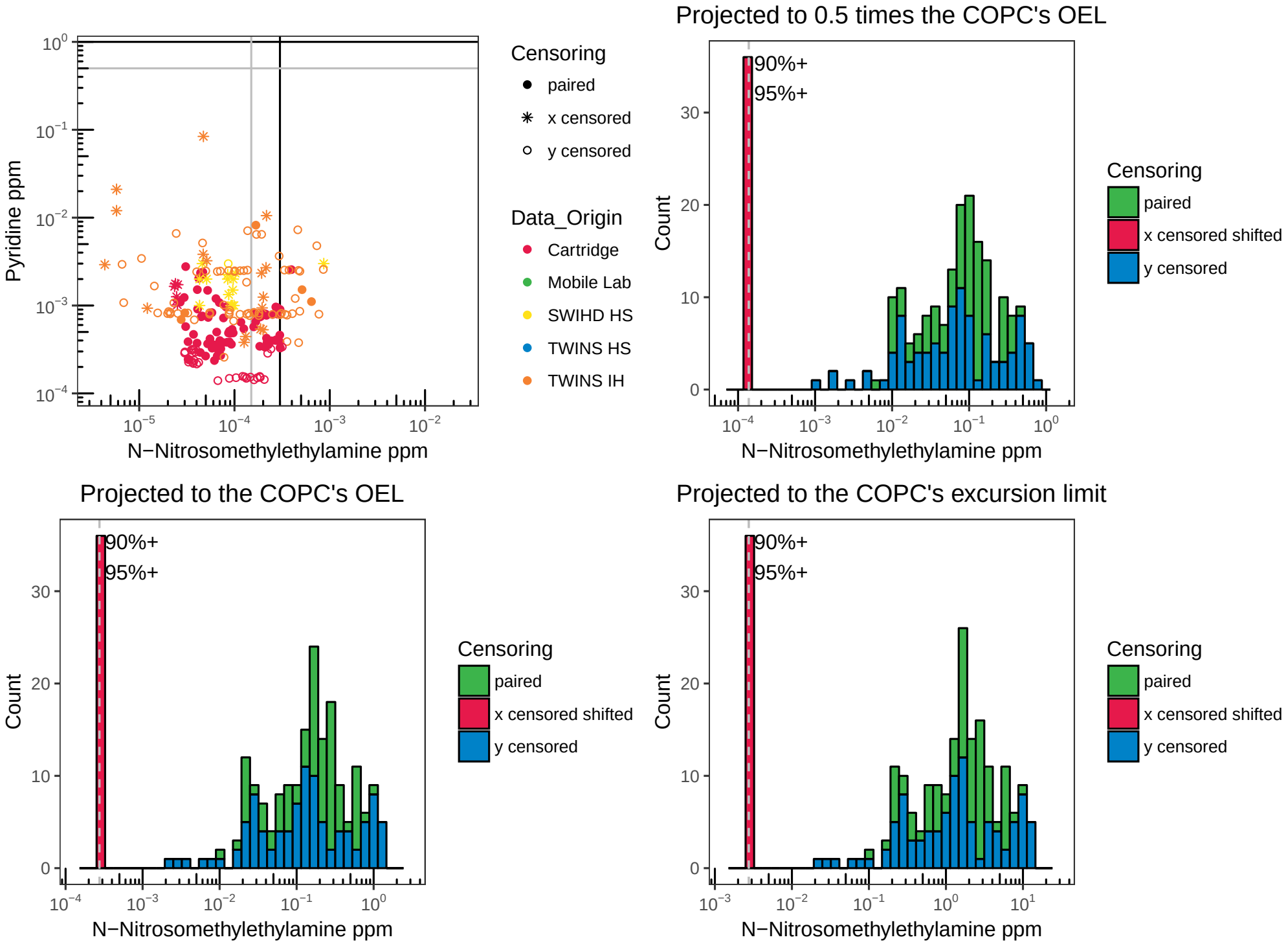


Figure C.2232: Pyridine vs N-Nitrosomethylethylamine

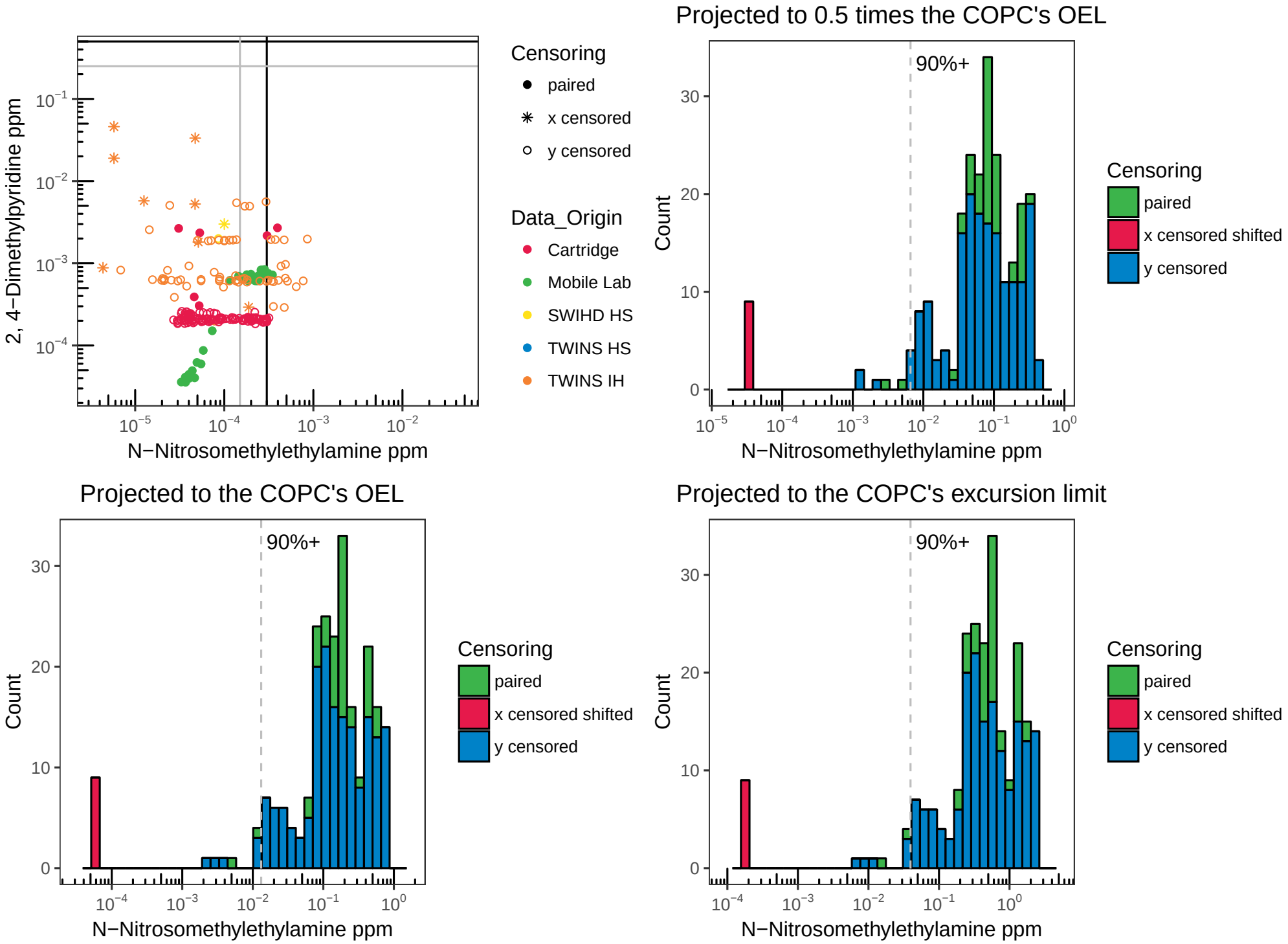


Figure C.2233: 2, 4-Dimethylpyridine vs N-Nitrosomethylethylamine

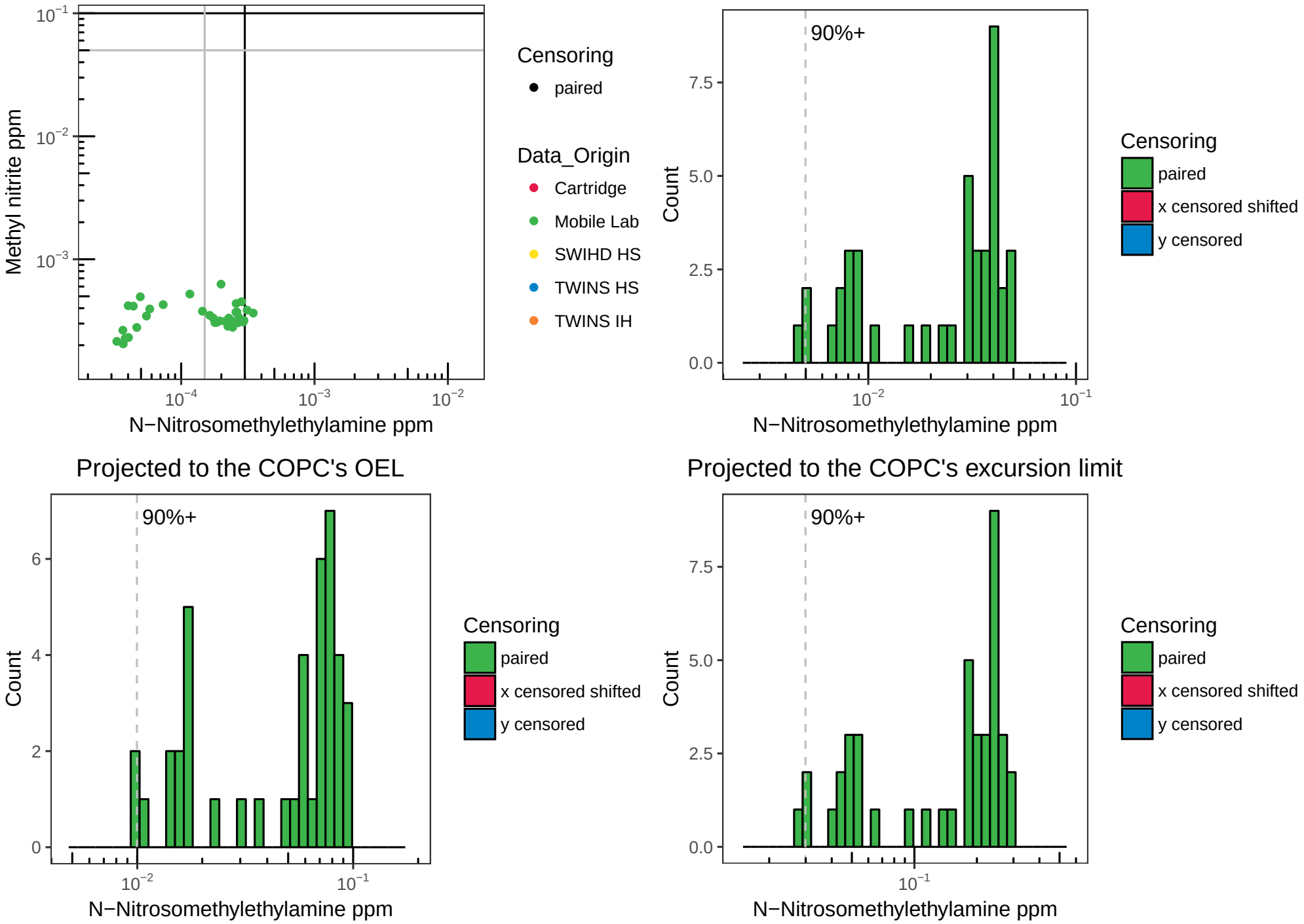


Figure C.2234: Methyl nitrite vs N-Nitrosomethylethylamine

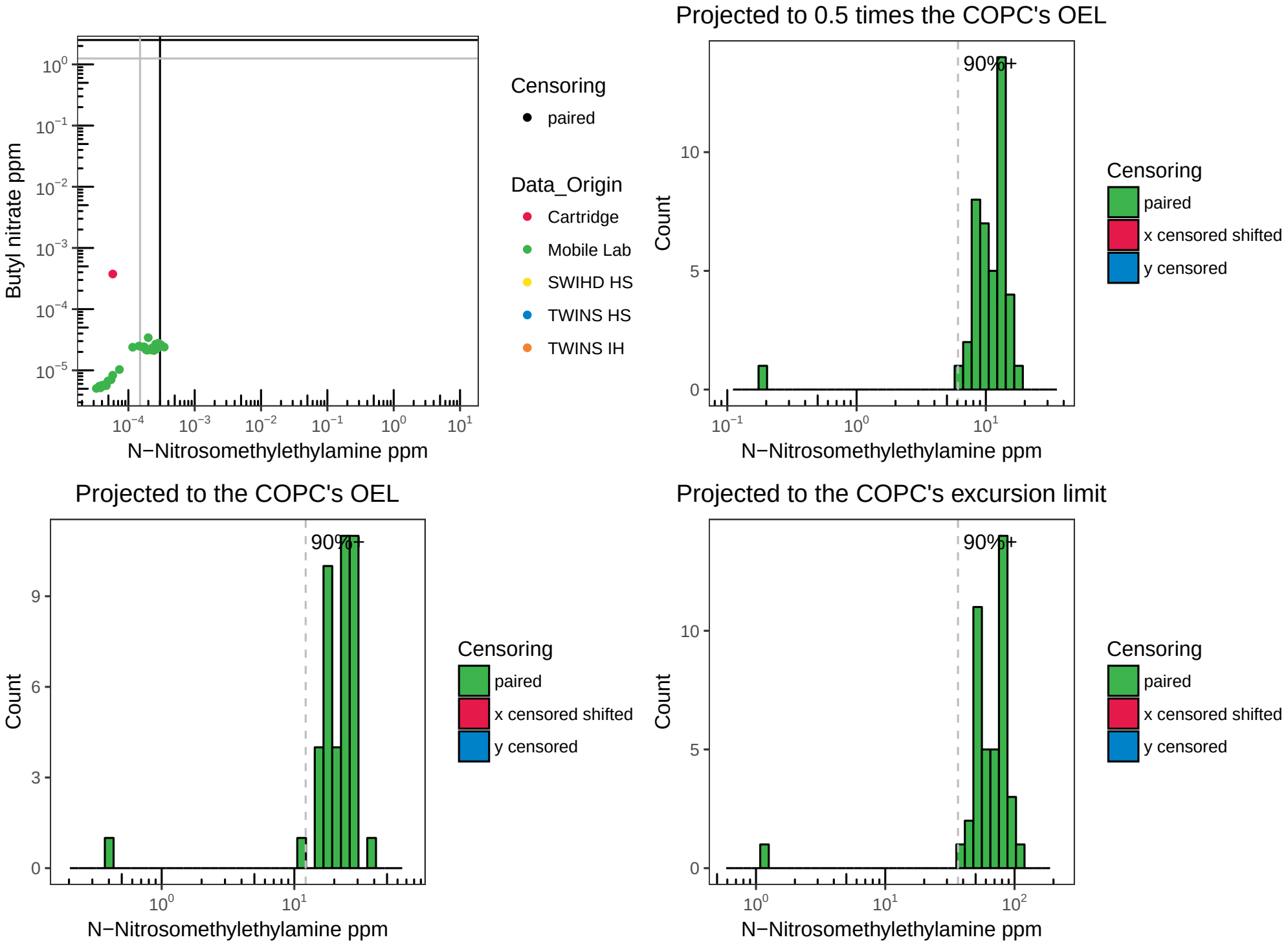


Figure C.2235: Butyl nitrate vs N-Nitrosomethylethylamine

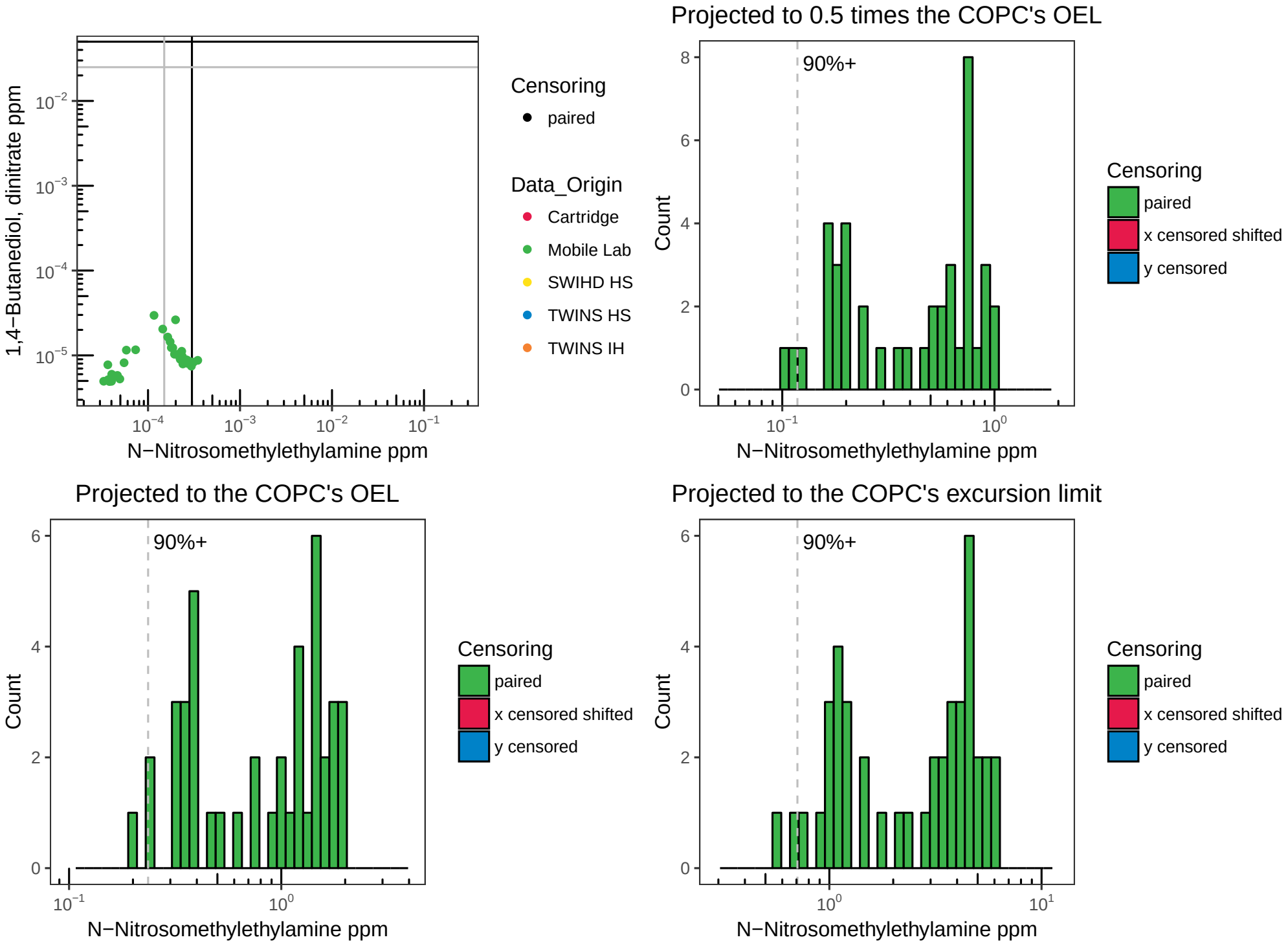


Figure C.2236: 1,4-Butanediol, dinitrate vs N-Nitrosomethylethylamine

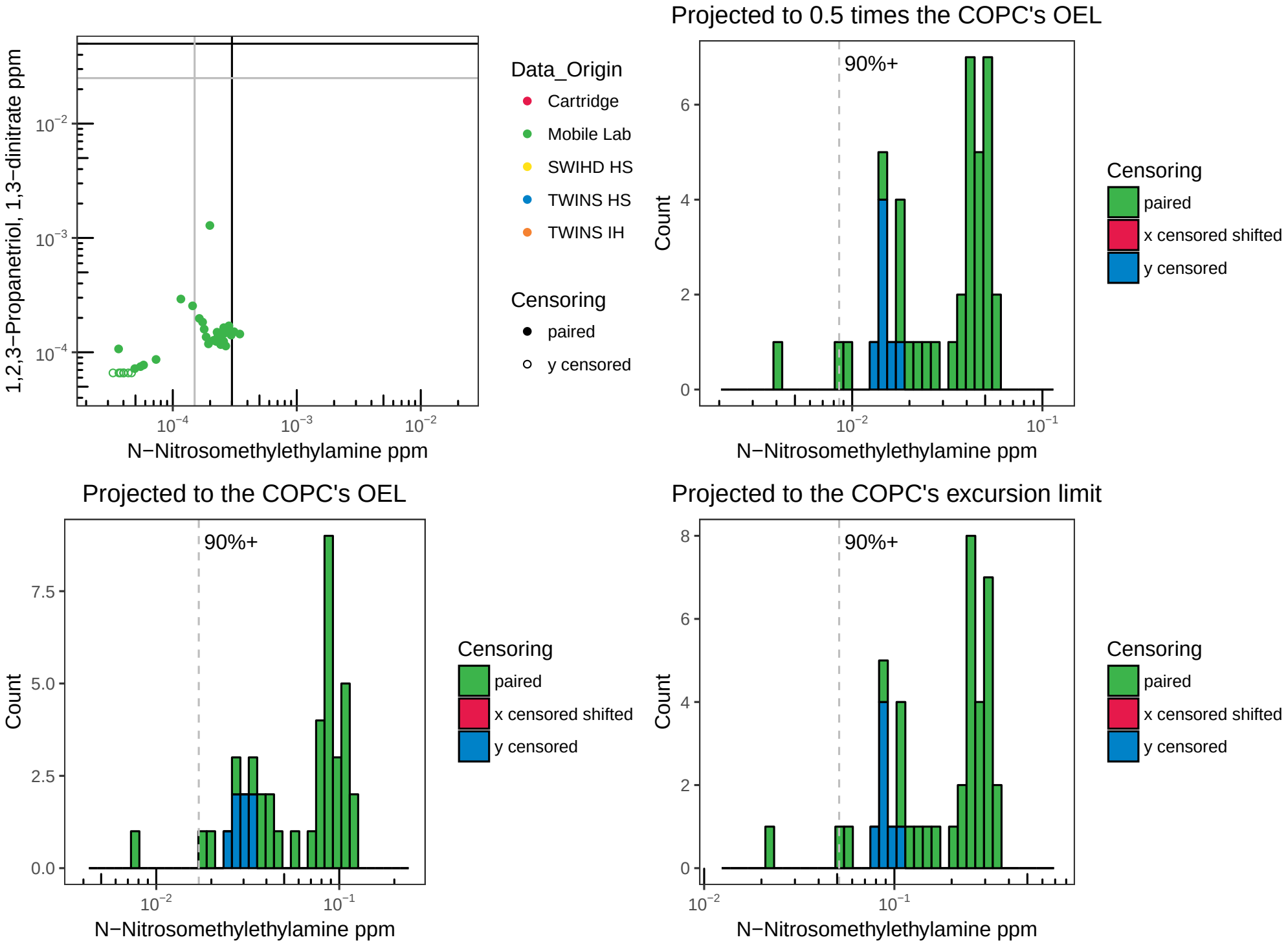


Figure C.2237: 1,2,3-Propanetriol, 1,3-dinitrate vs N-Nitrosomethylethylamine

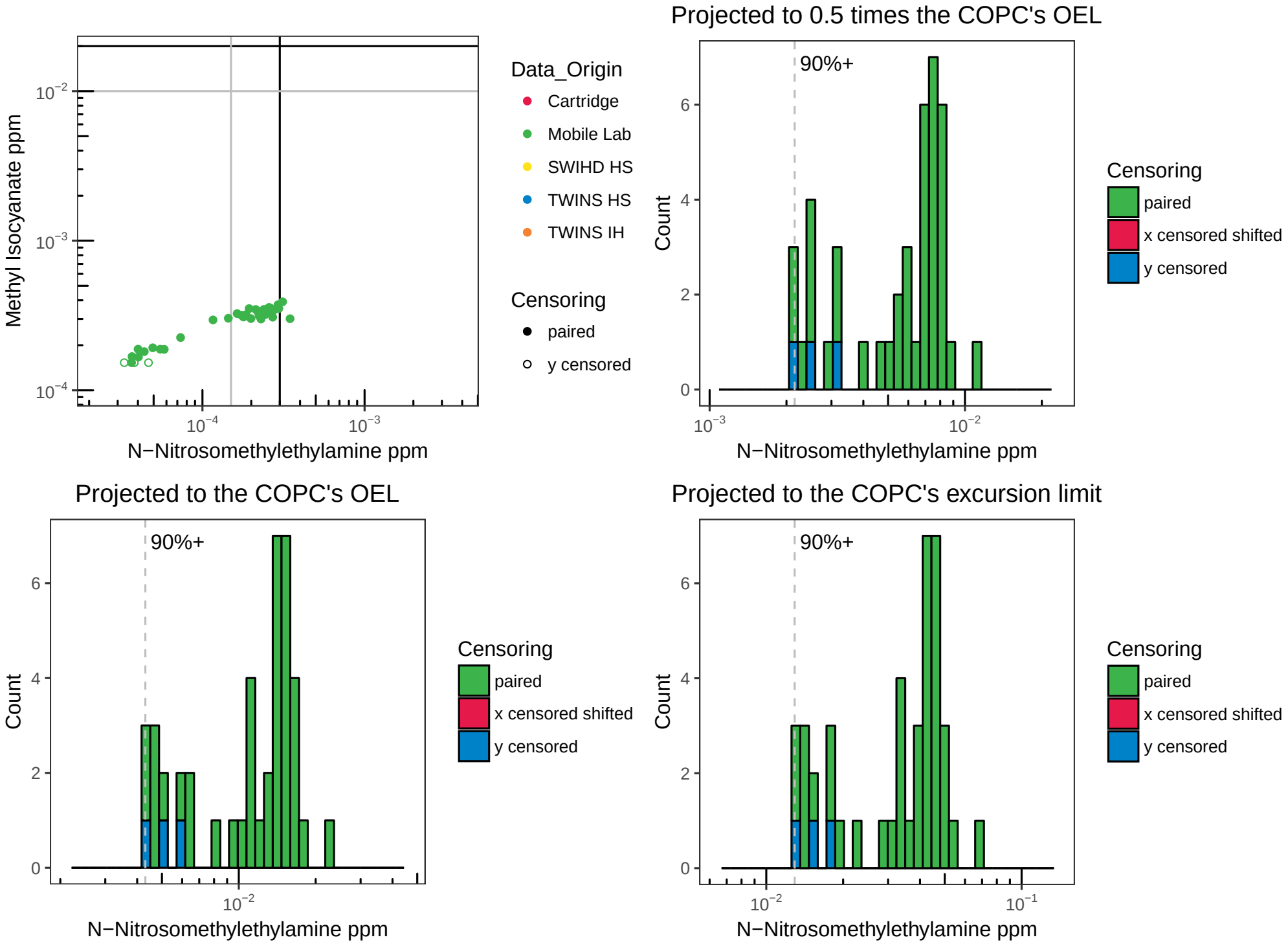


Figure C.2238: Methyl Isocyanate vs N-Nitrosomethylethylamine

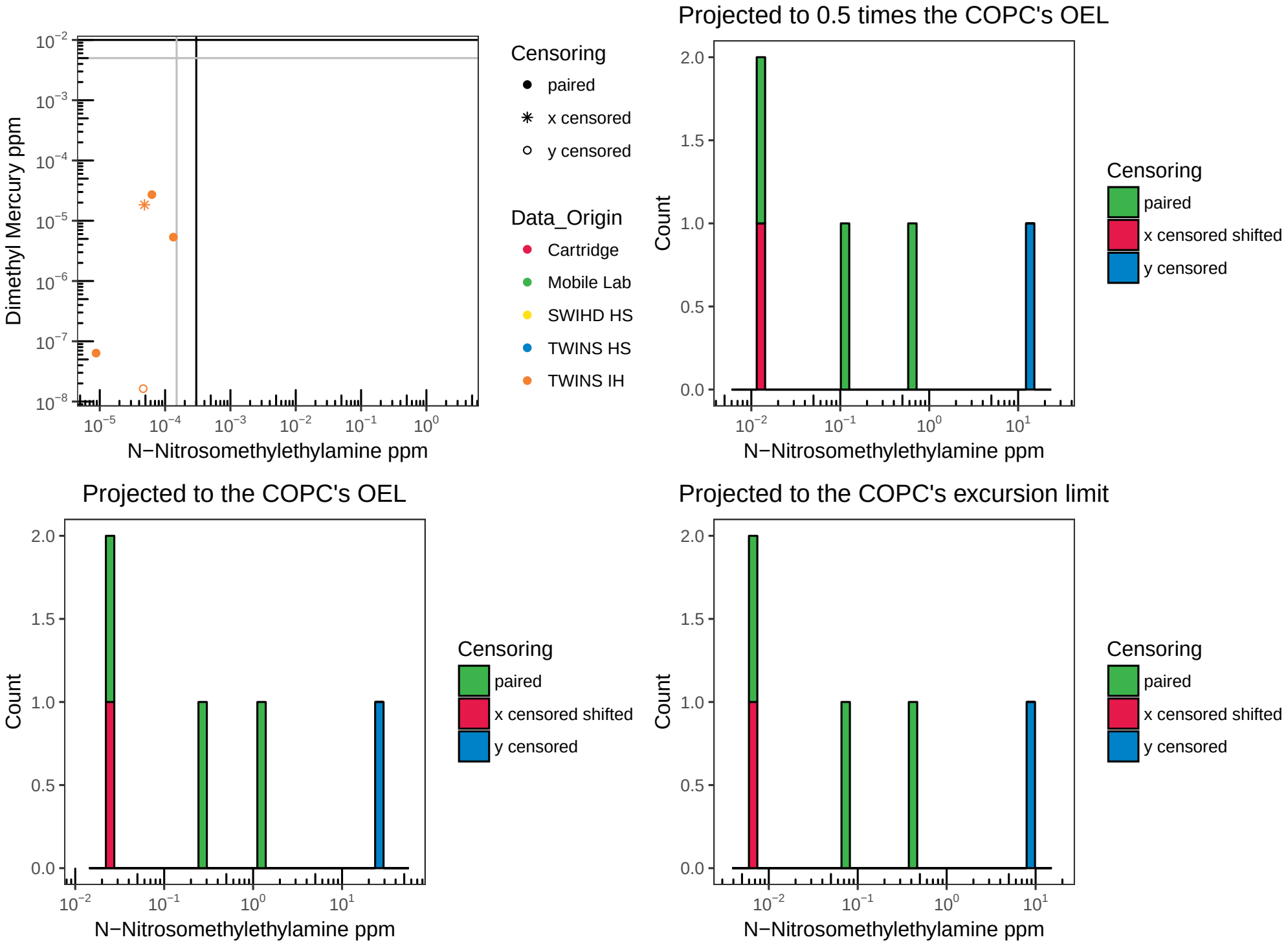


Figure C.2239: Dimethyl Mercury vs N-Nitrosomethylethylamine

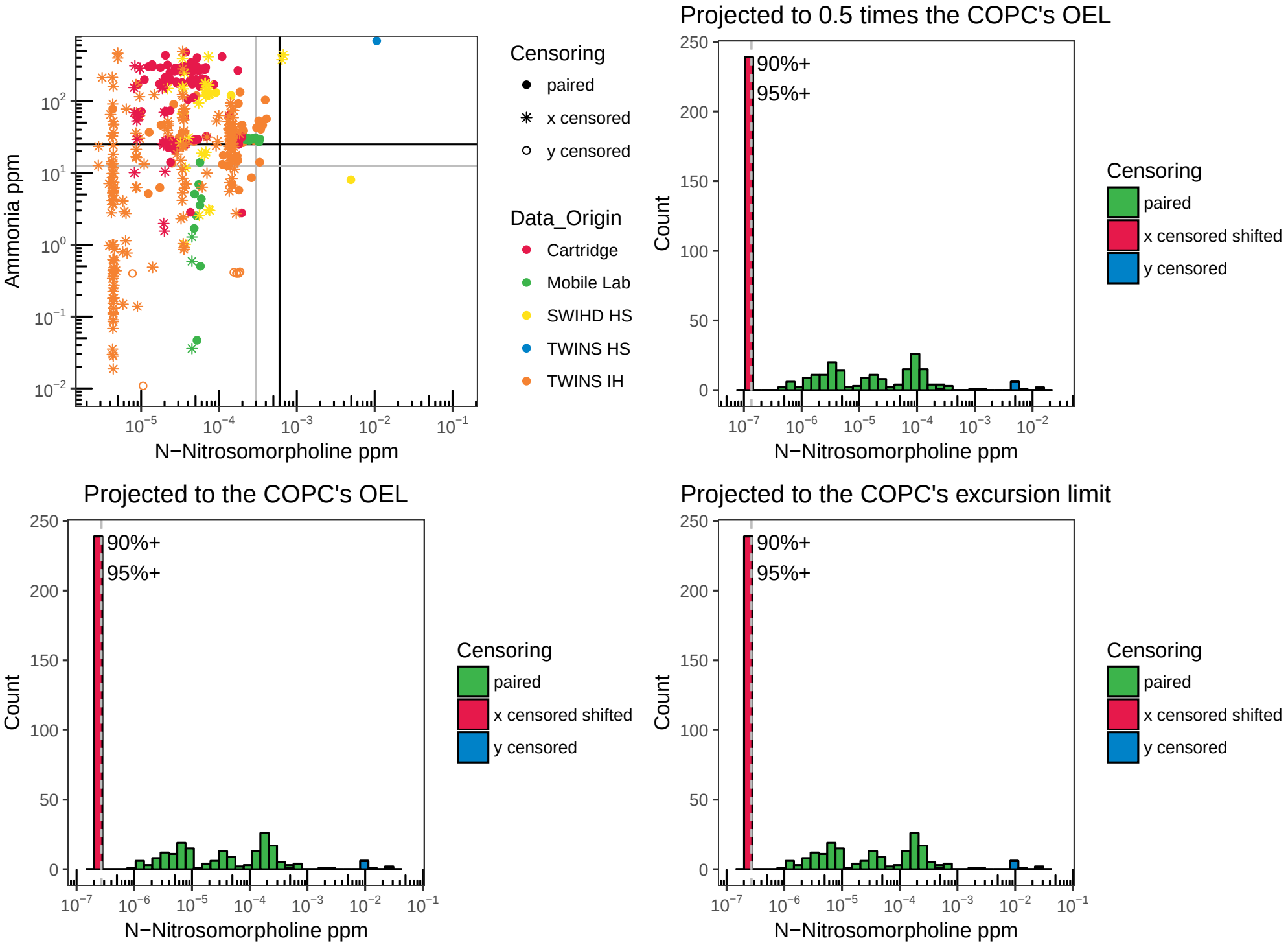


Figure C.2240: Ammonia vs N-Nitrosomorpholine

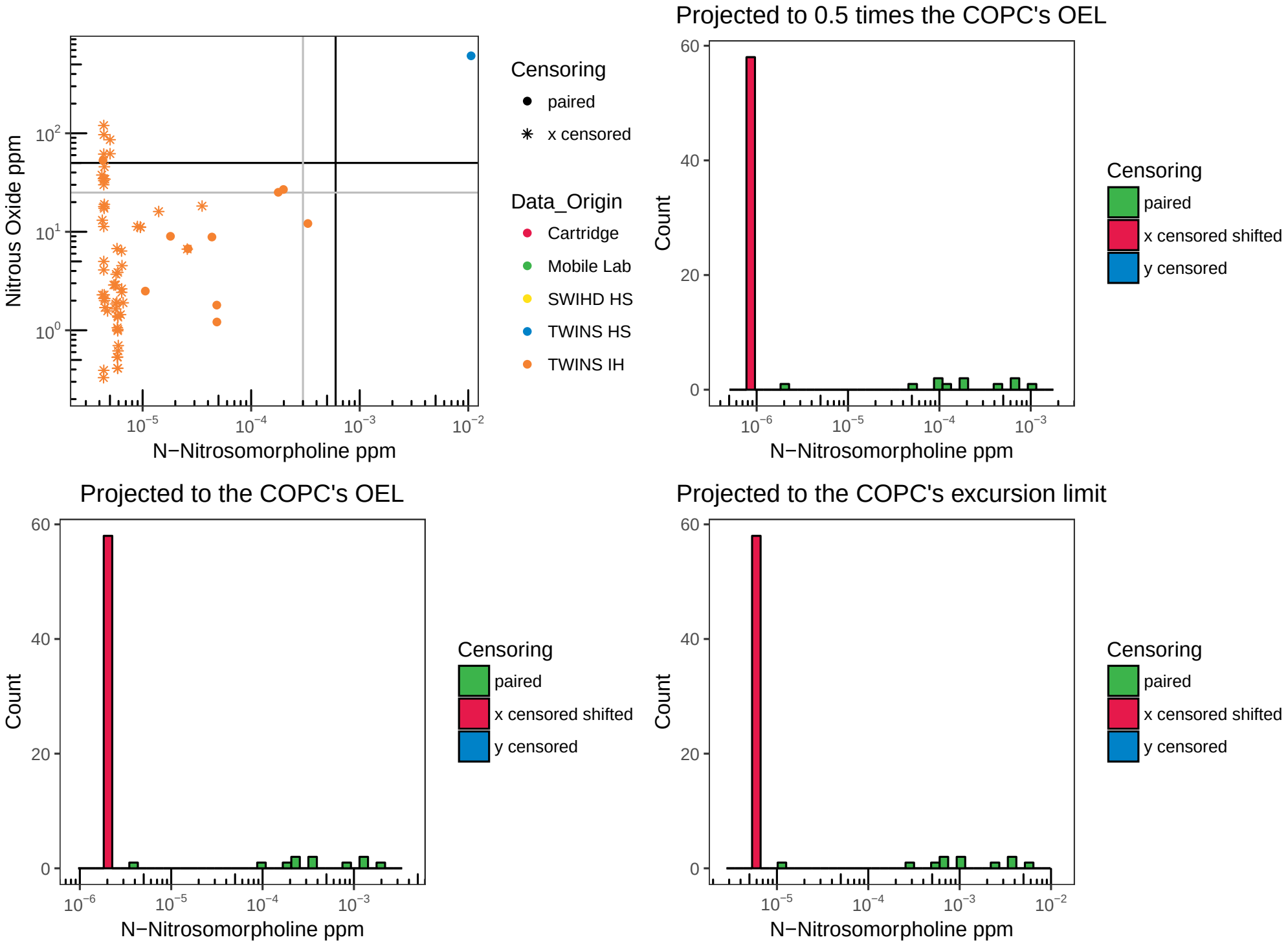


Figure C.2241: Nitrous Oxide vs N-Nitrosomorpholine

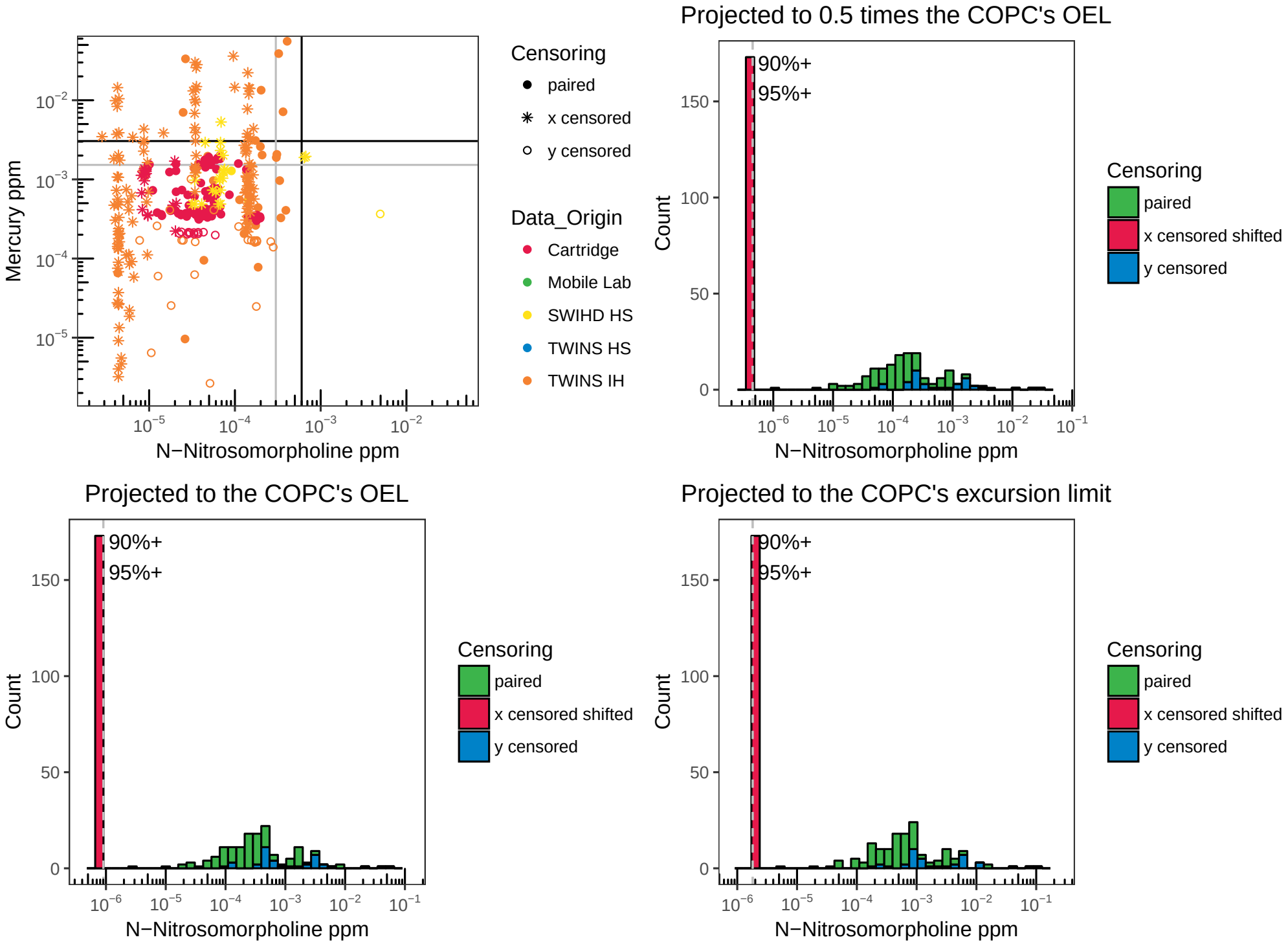


Figure C.2242: Mercury vs N-Nitrosomorpholine

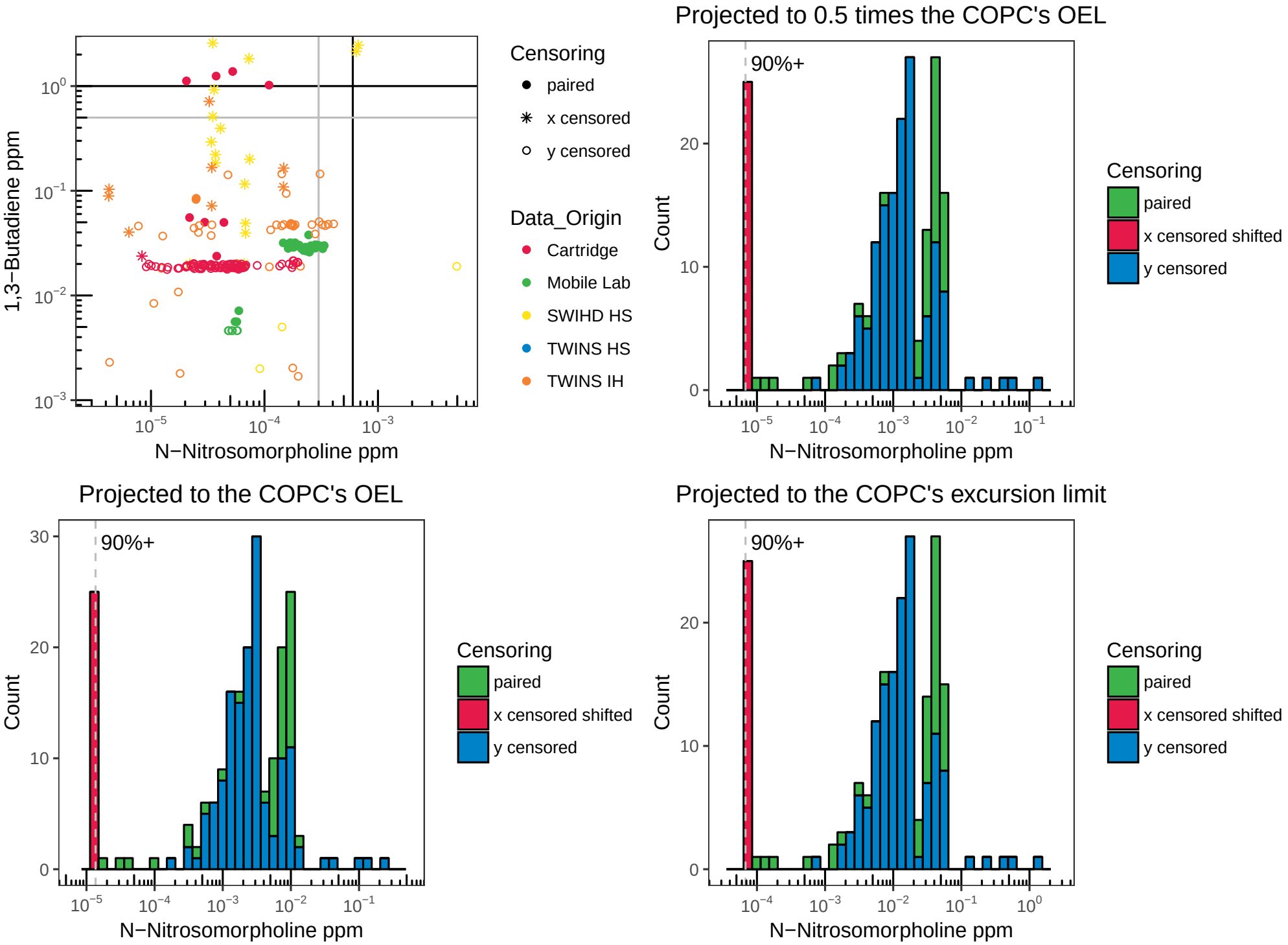


Figure C.2243: 1,3-Butadiene vs N-Nitrosomorpholine

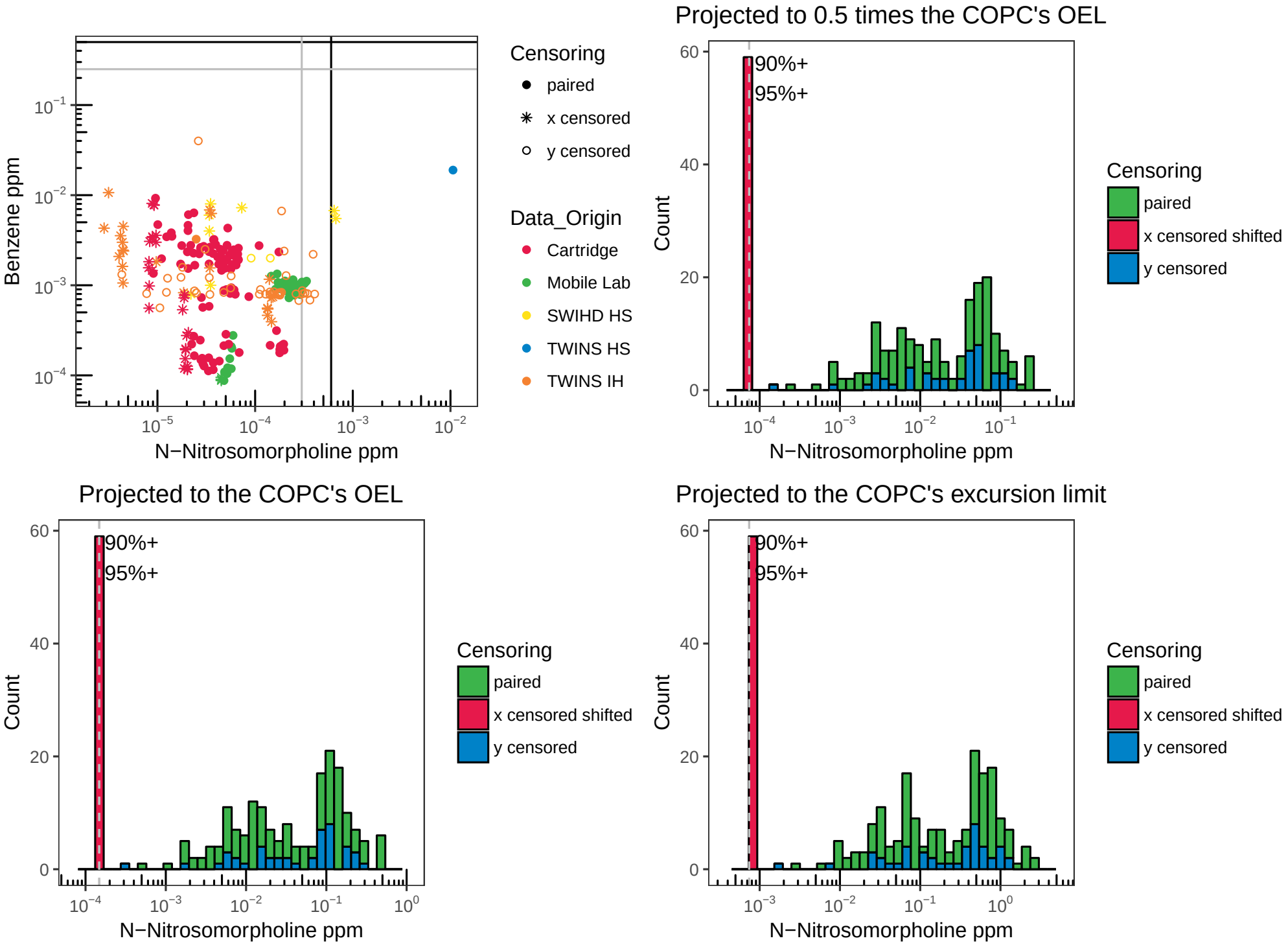


Figure C.2244: Benzene vs N-Nitrosomorpholine

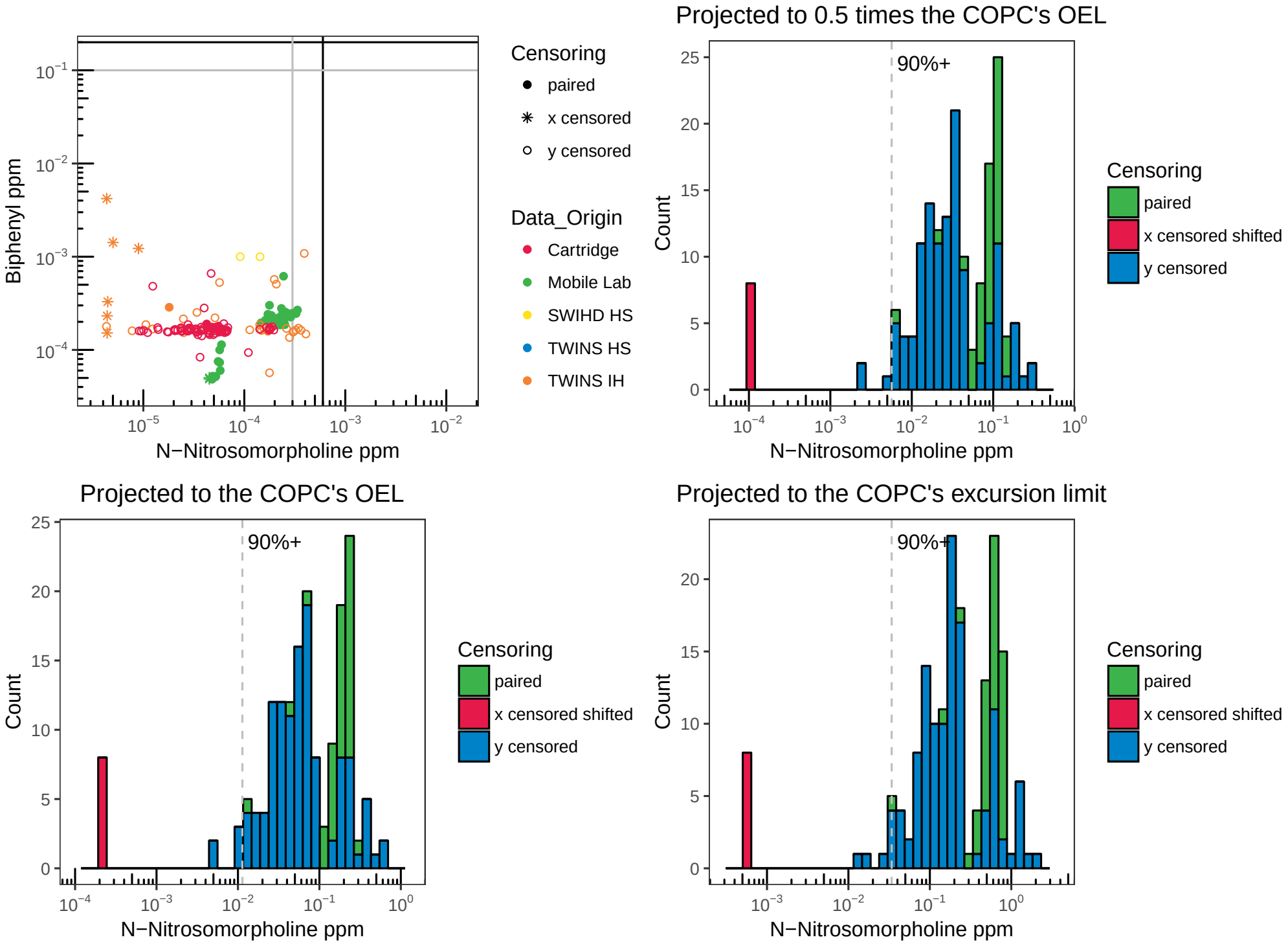


Figure C.2245: Biphenyl vs N-Nitrosomorpholine

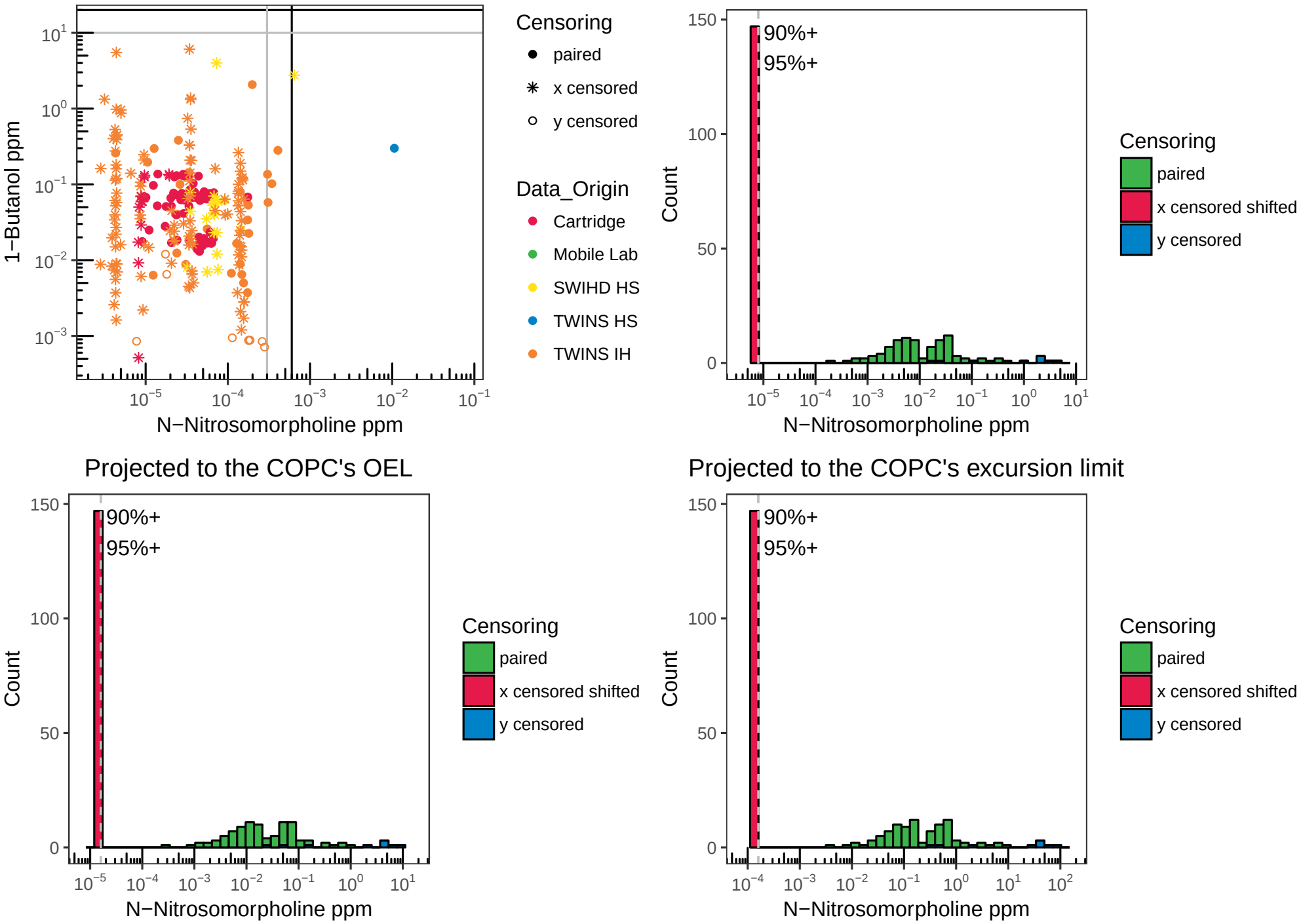


Figure C.2246: 1-Butanol vs N-Nitrosomorpholine

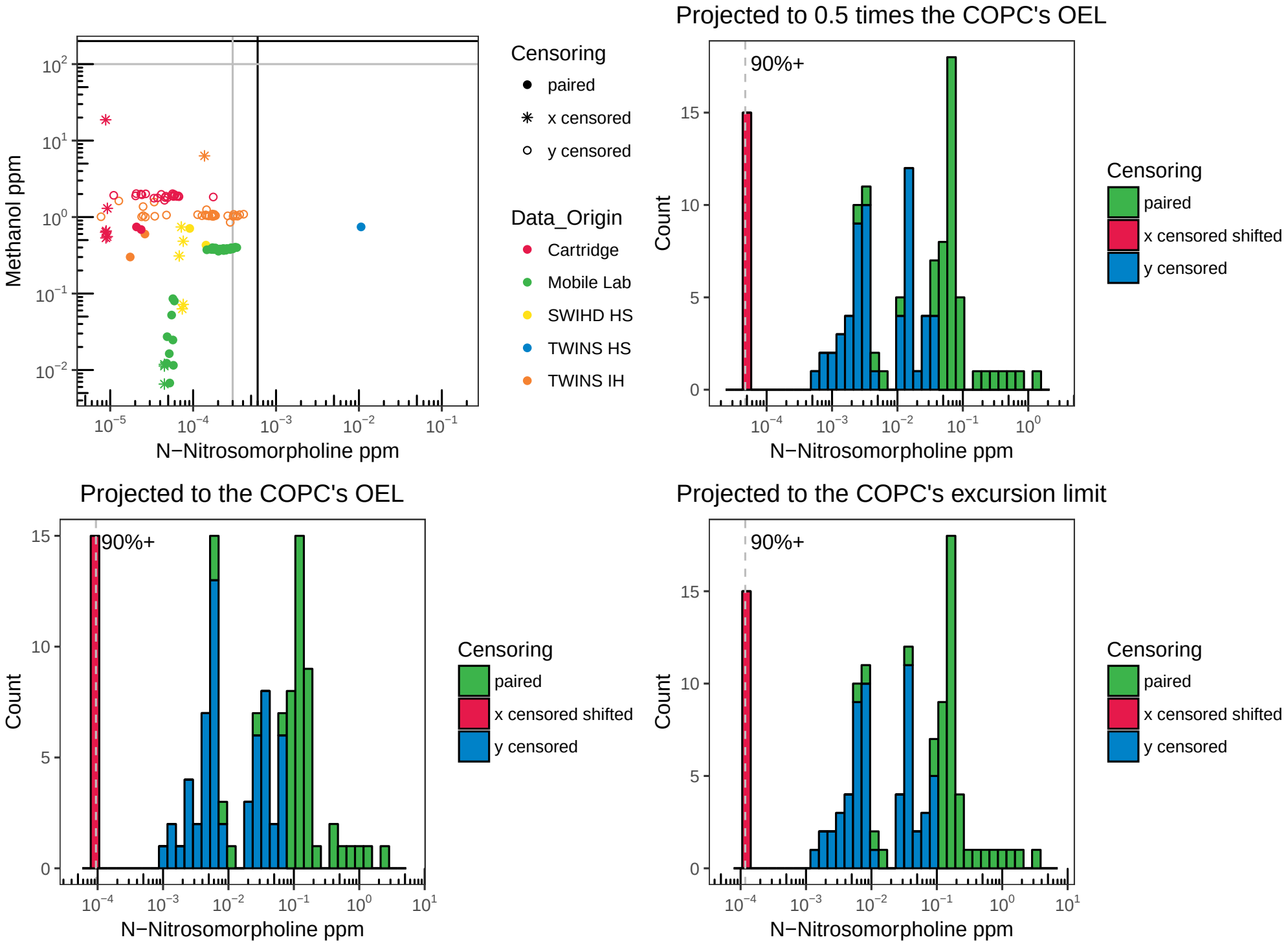


Figure C.2247: Methanol vs N-Nitrosomorpholine

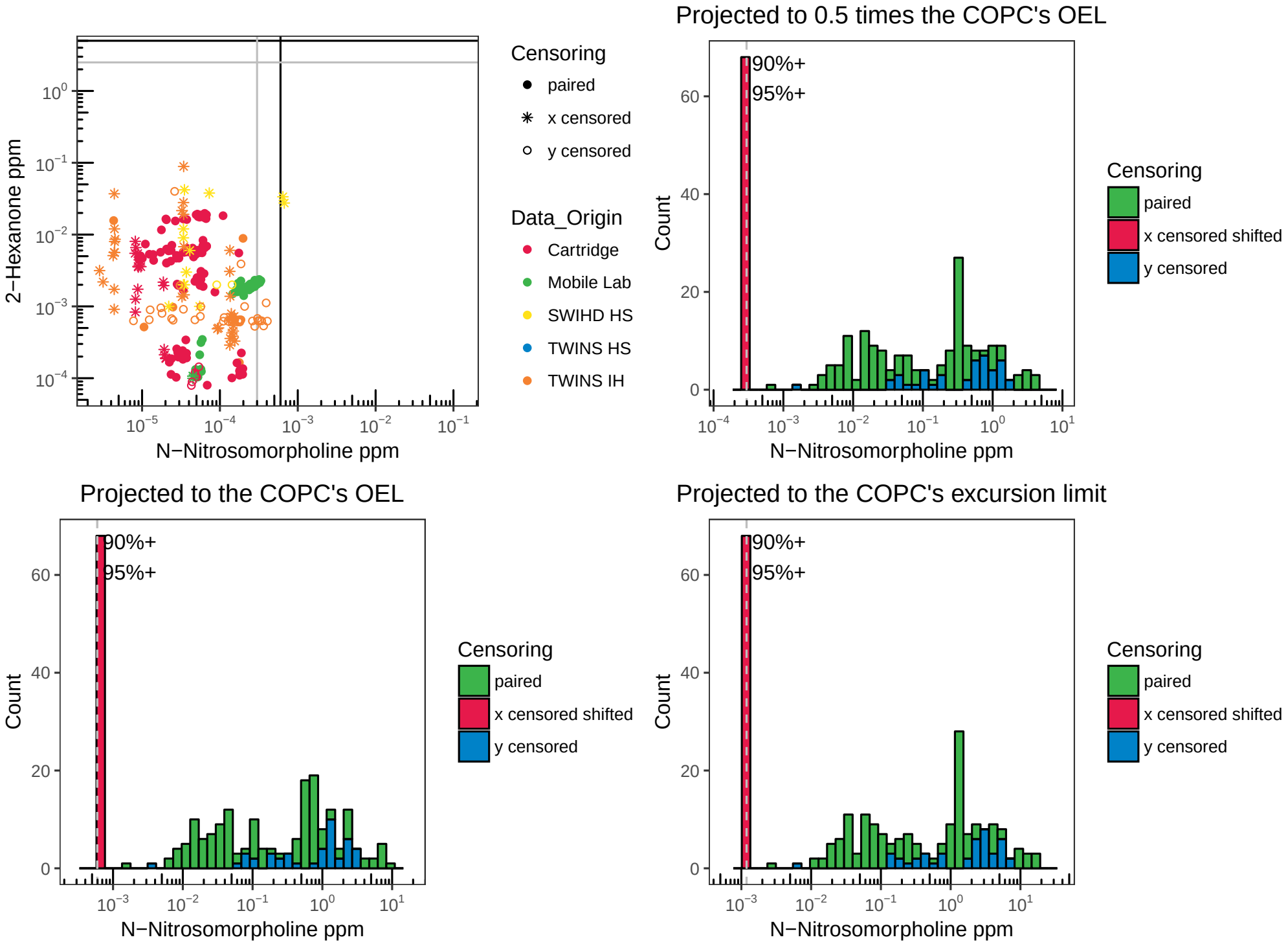


Figure C.2248: 2-Hexanone vs N-Nitrosomorpholine

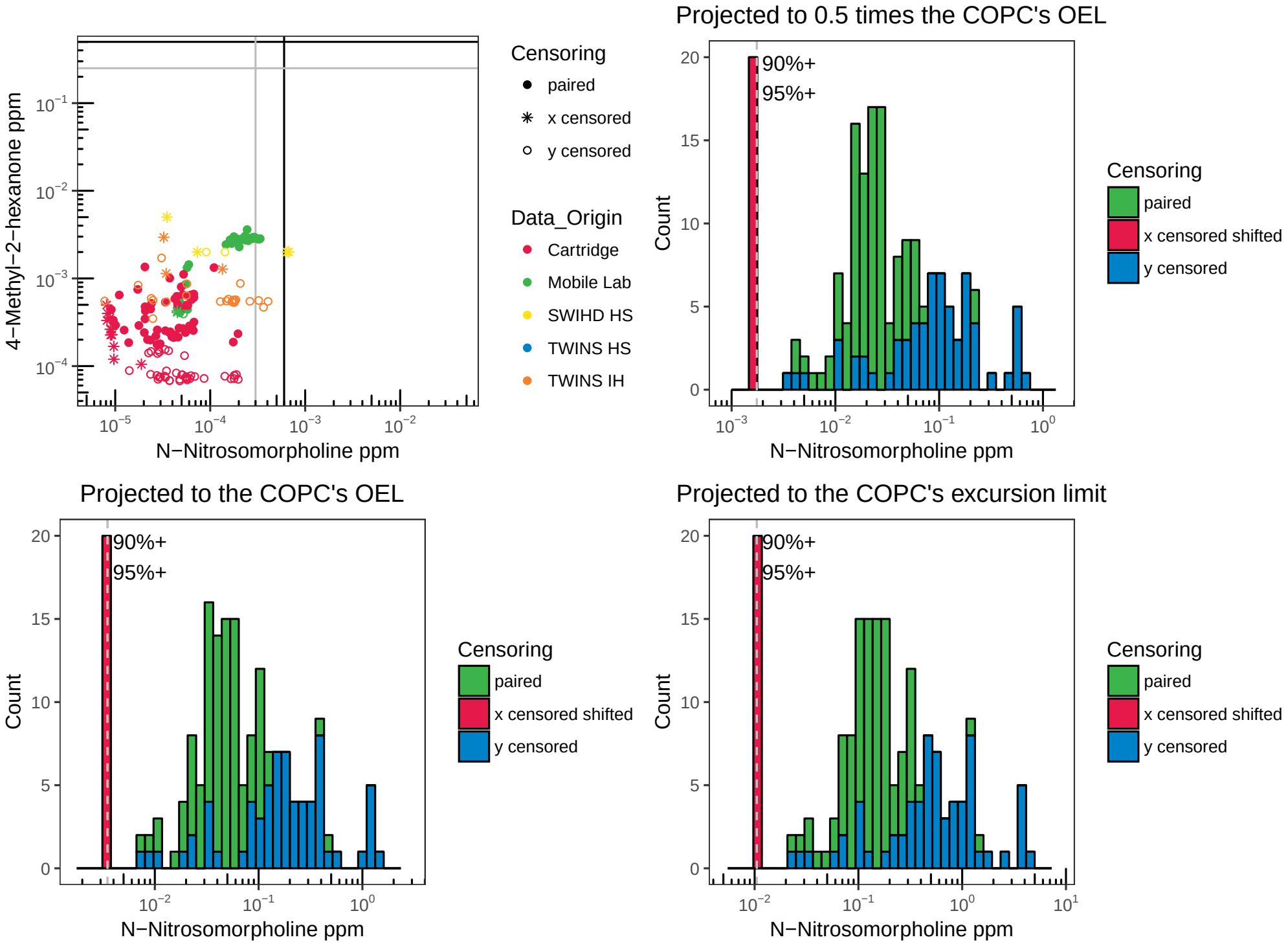


Figure C.2249: 4-Methyl-2-hexanone vs N-Nitrosomorpholine

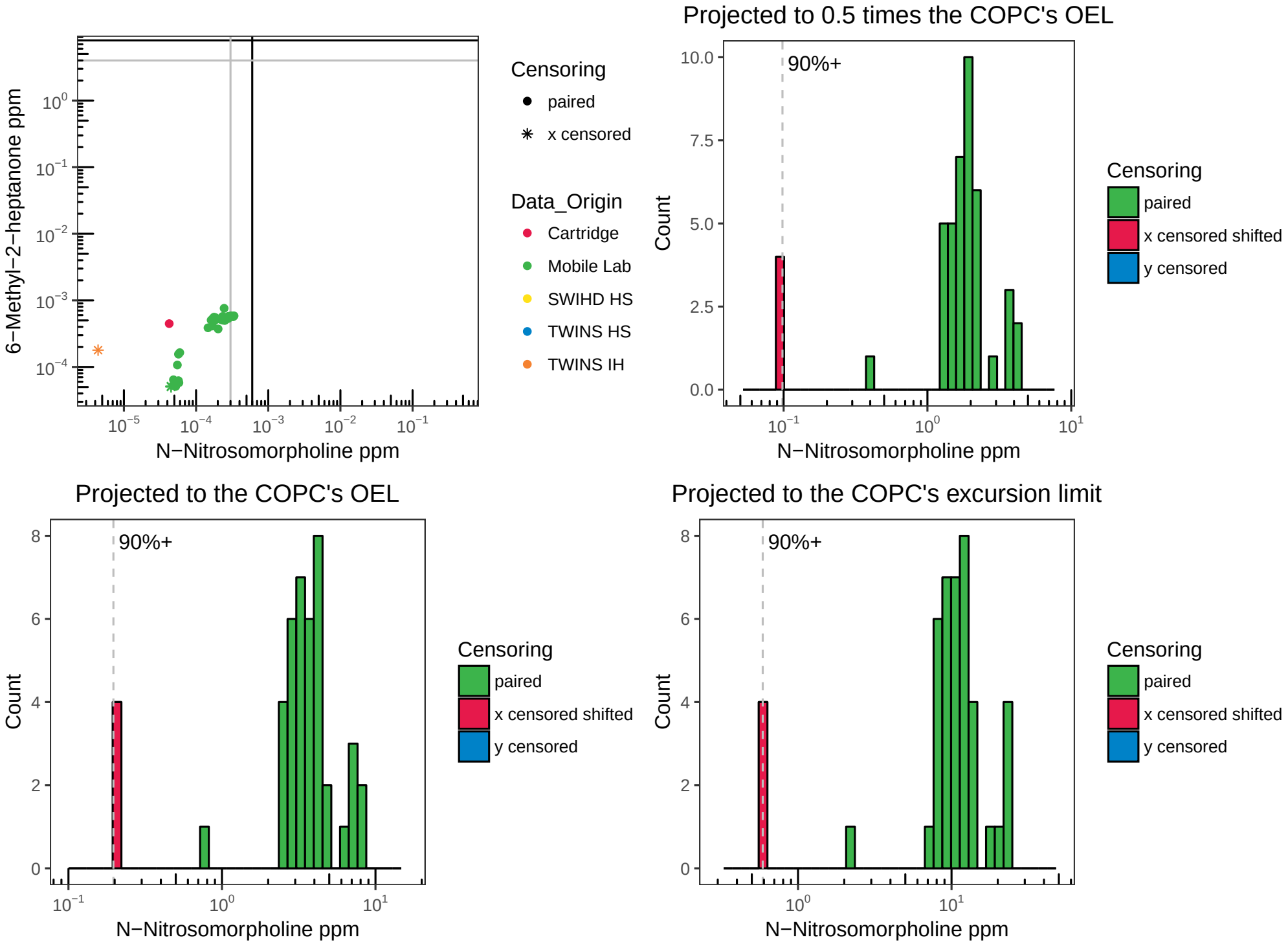


Figure C.2250: 6-Methyl-2-heptanone vs N-Nitrosomorpholine

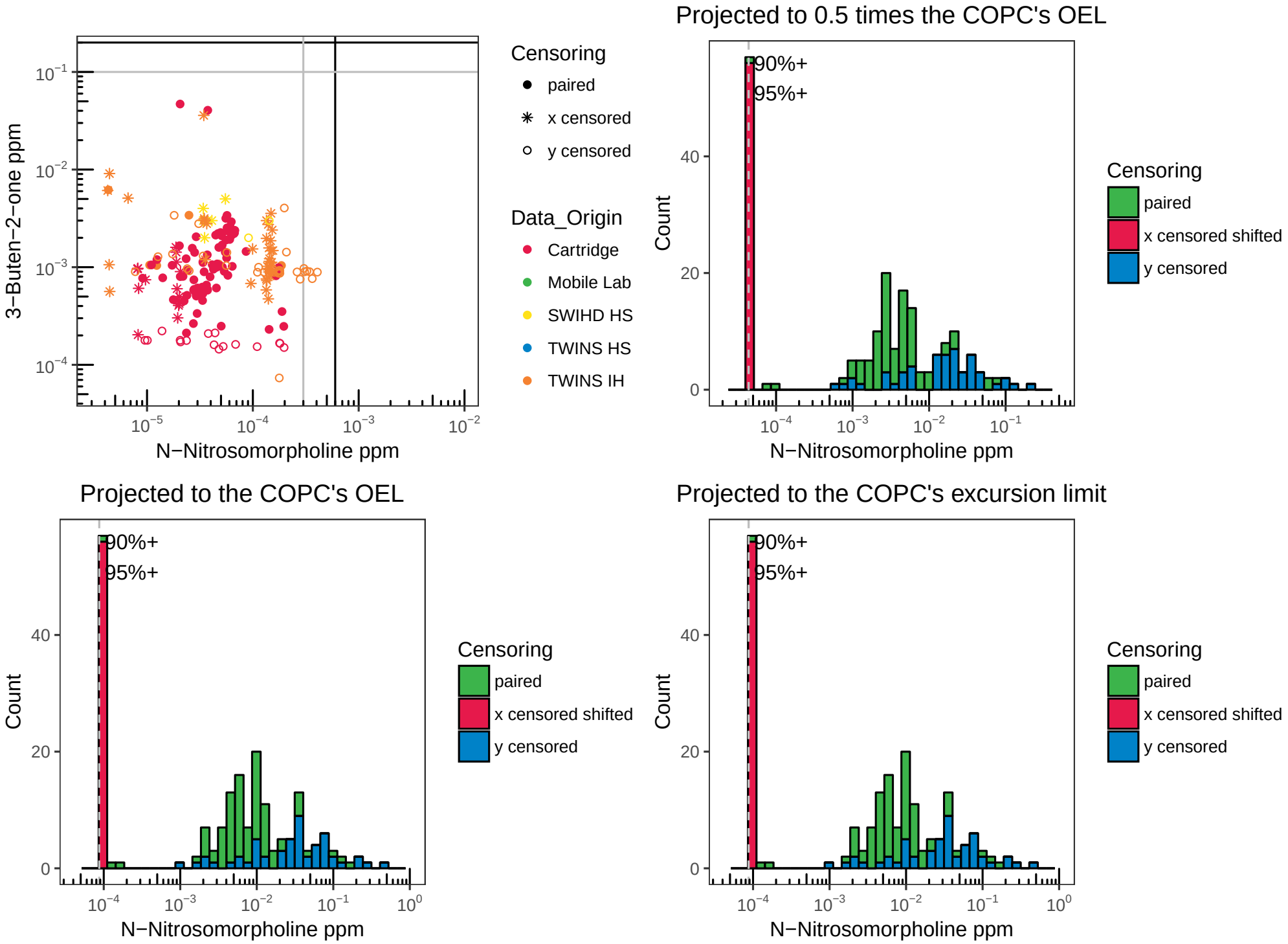


Figure C.2251: 3-Buten-2-one vs N-Nitrosomorpholine

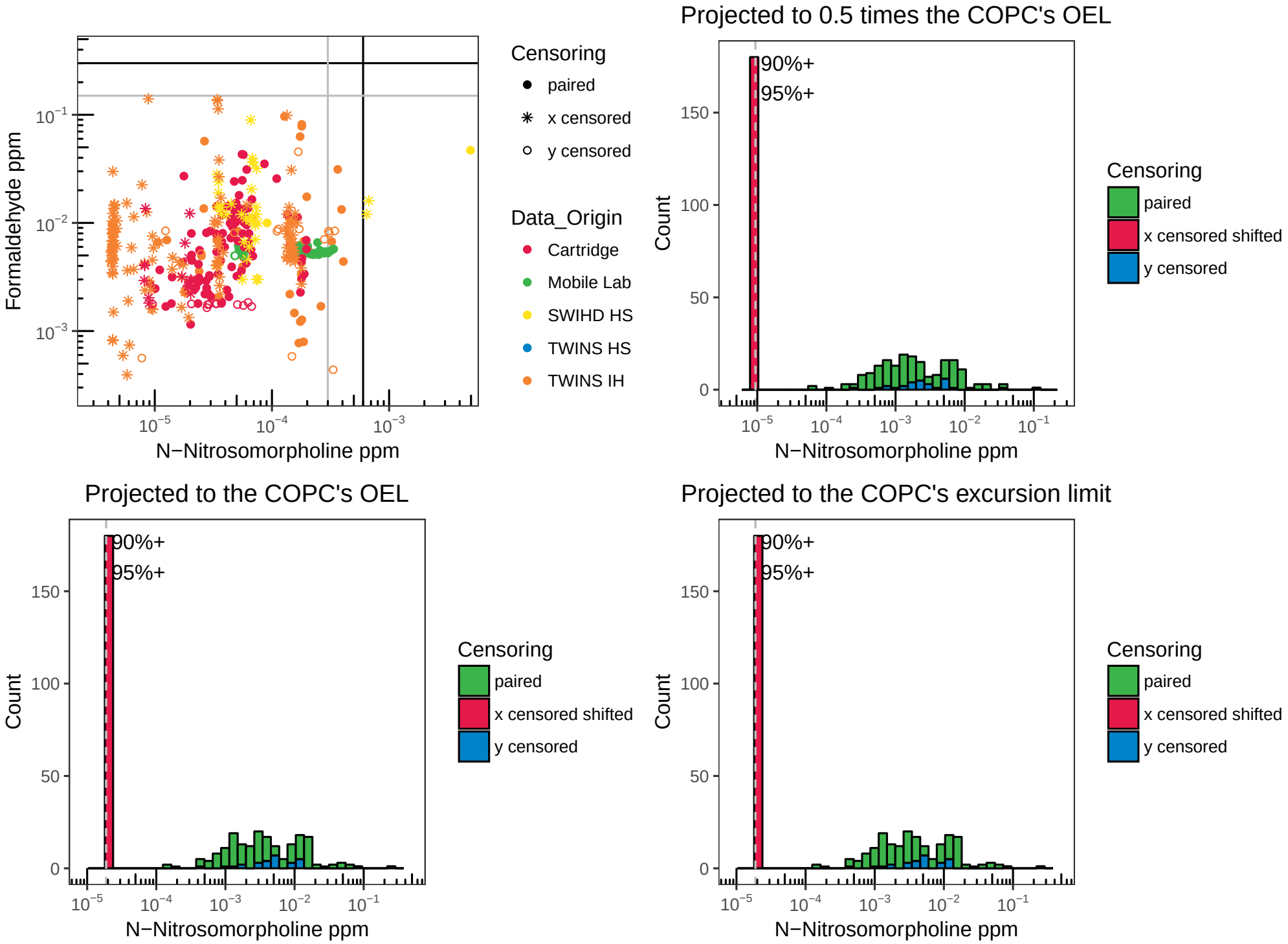


Figure C.2252: Formaldehyde vs N-Nitrosomorpholine

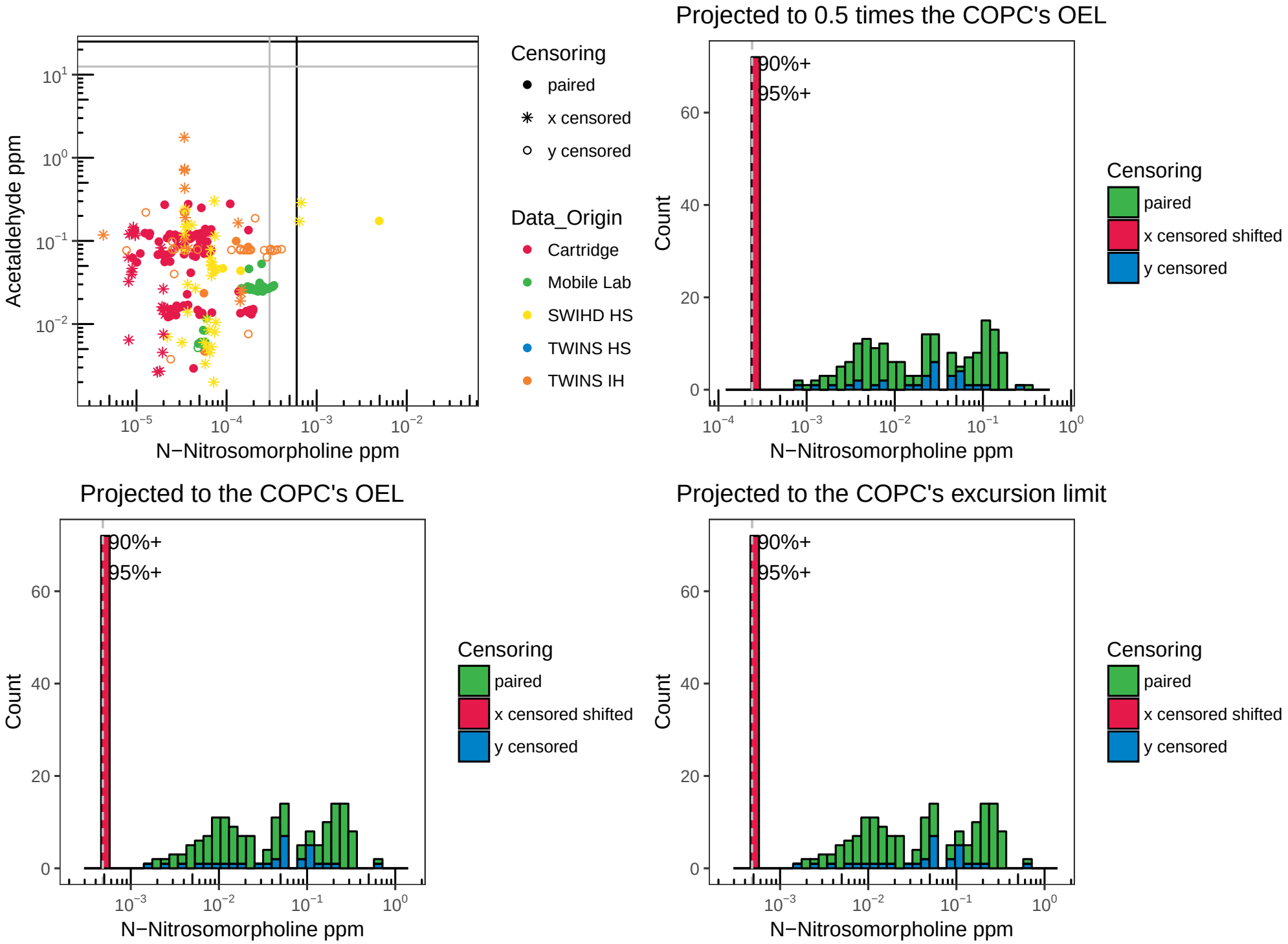


Figure C.2253: Acetaldehyde vs N-Nitrosomorpholine

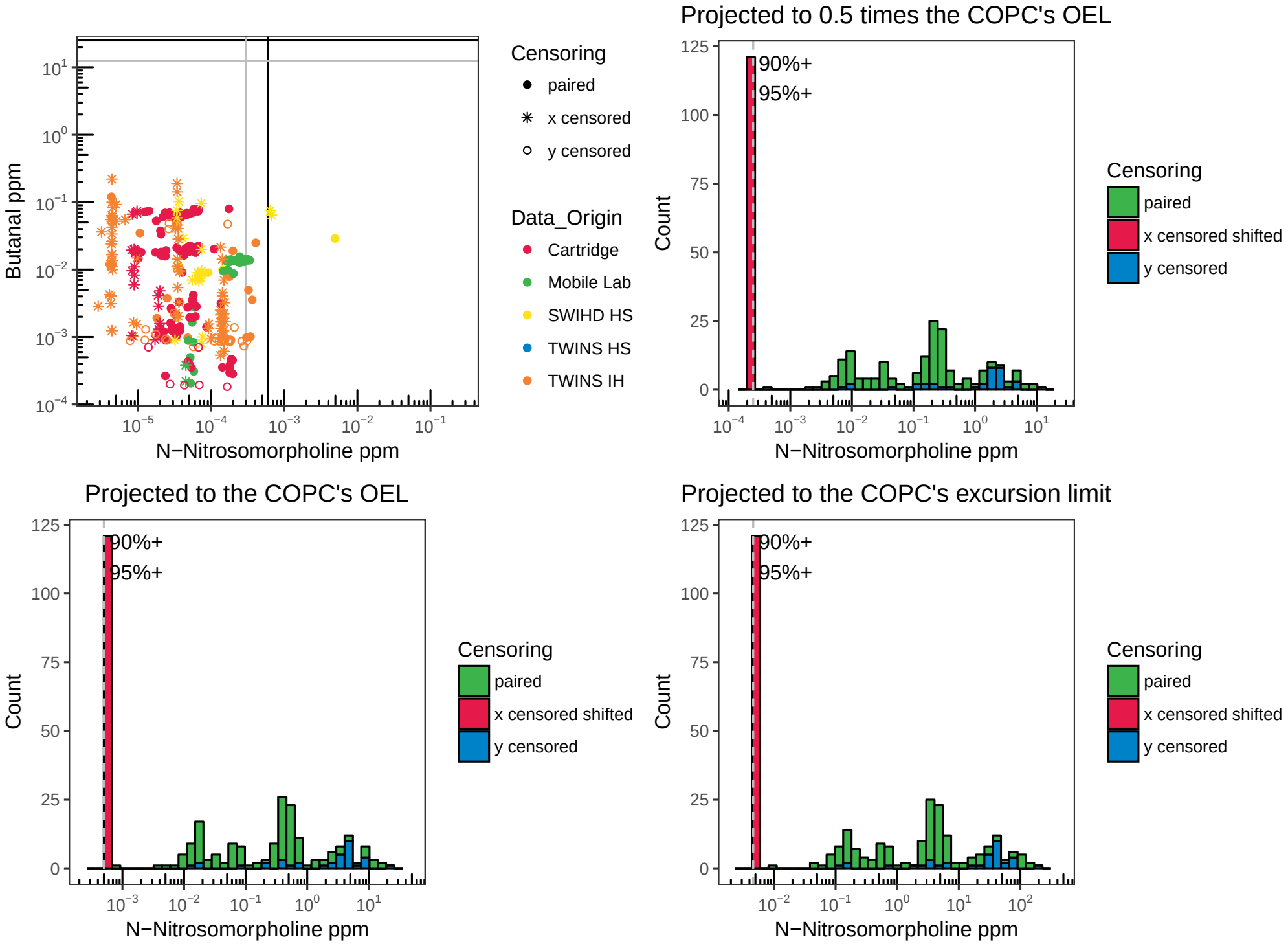


Figure C.2254: Butanal vs N-Nitrosomorpholine

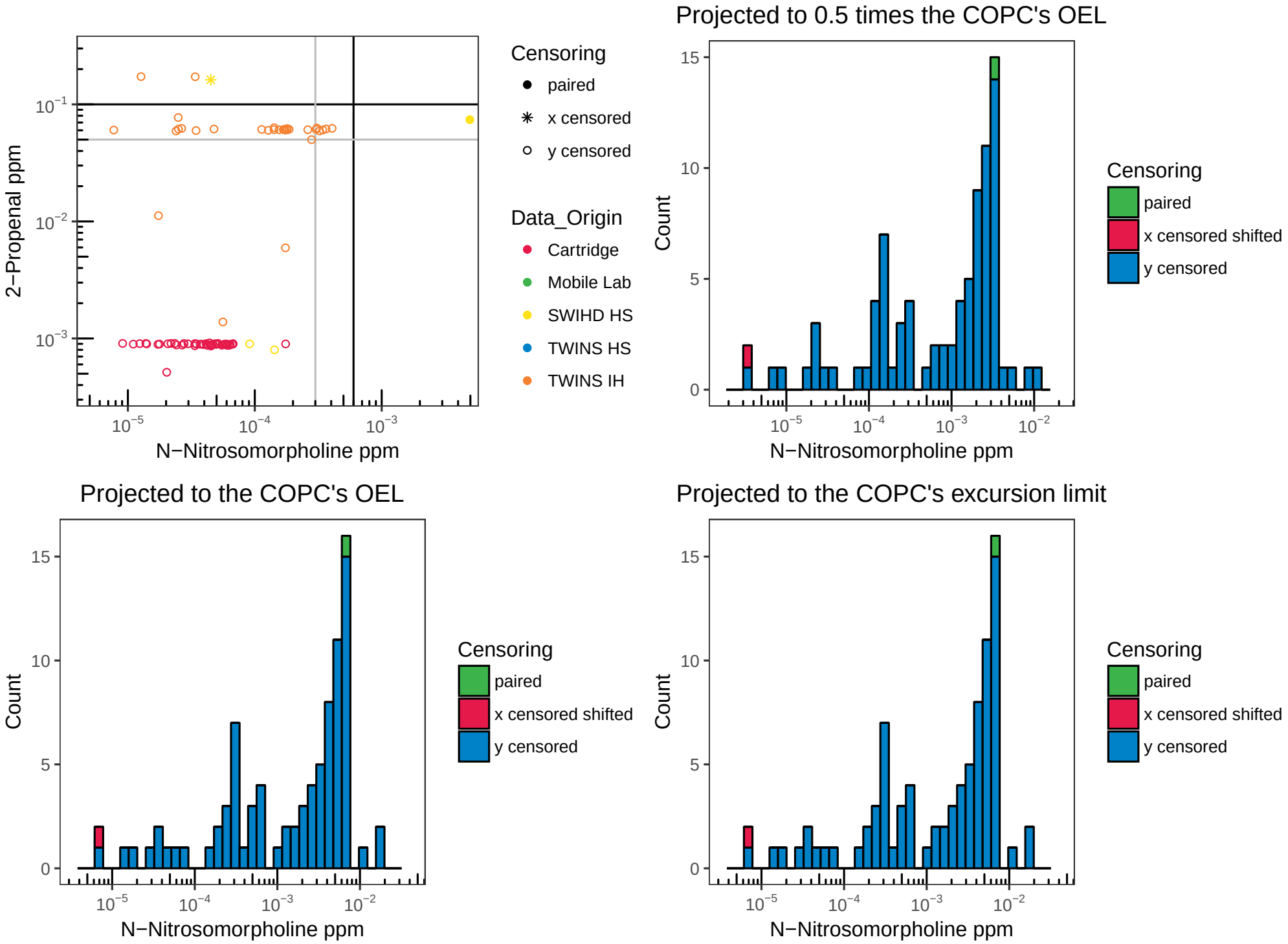


Figure C.2255: 2-Propenal vs N-Nitrosomorpholine

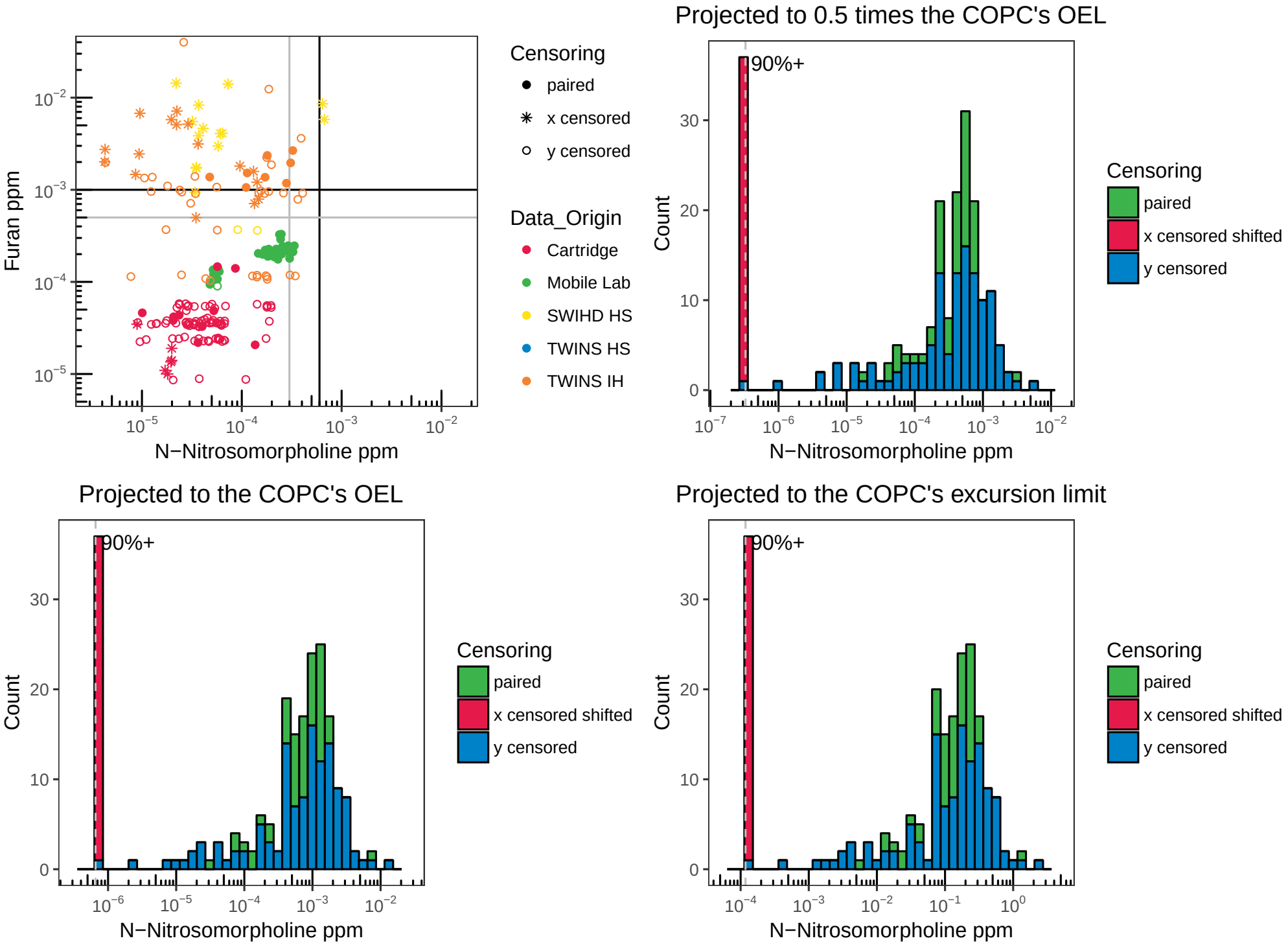


Figure C.2256: Furan vs N-Nitrosomorpholine

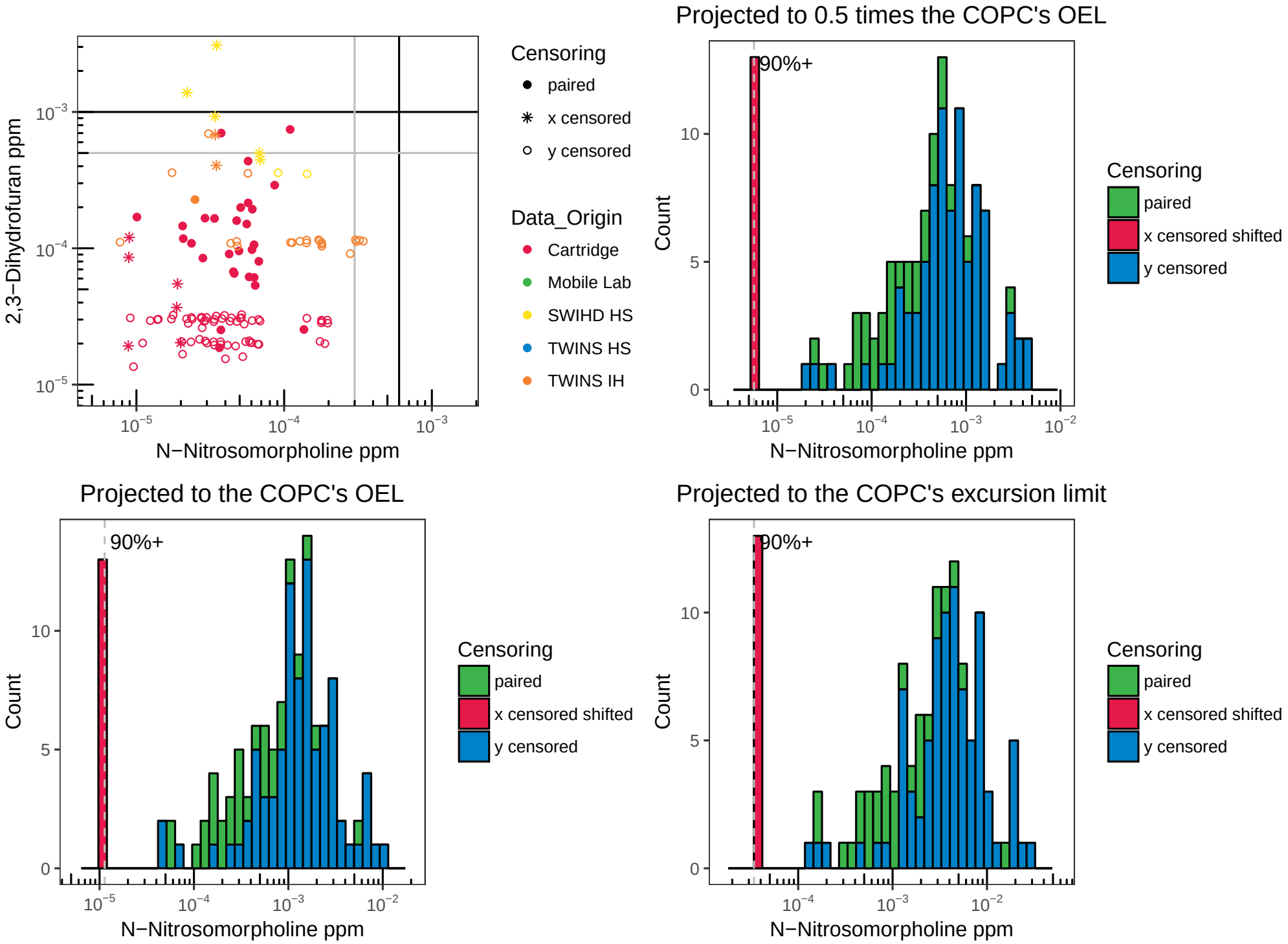


Figure C.2257: 2,3-Dihydrofuran vs N-Nitrosomorpholine

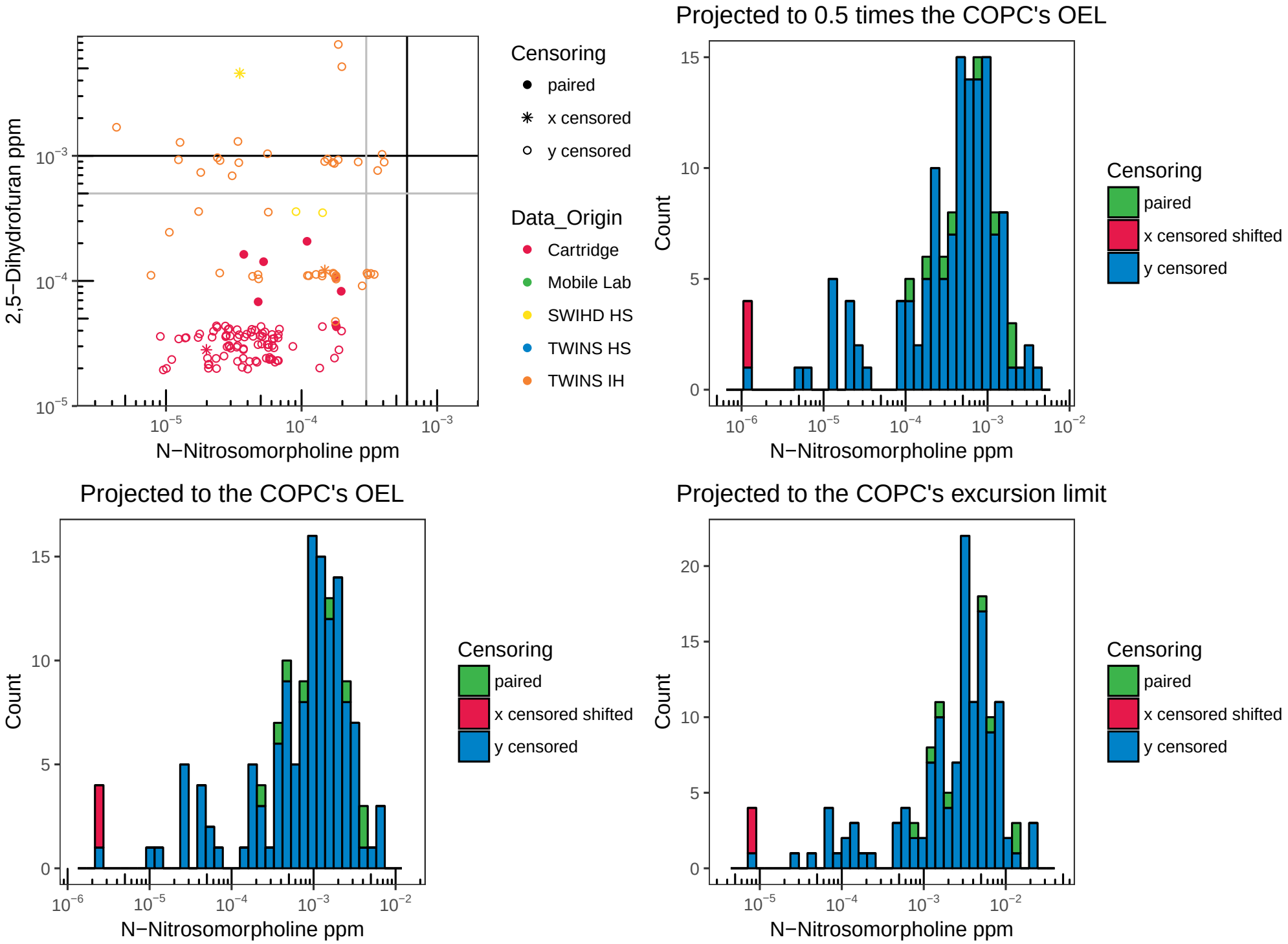


Figure C.2258: 2,5-Dihydrofuran vs N-Nitrosomorpholine

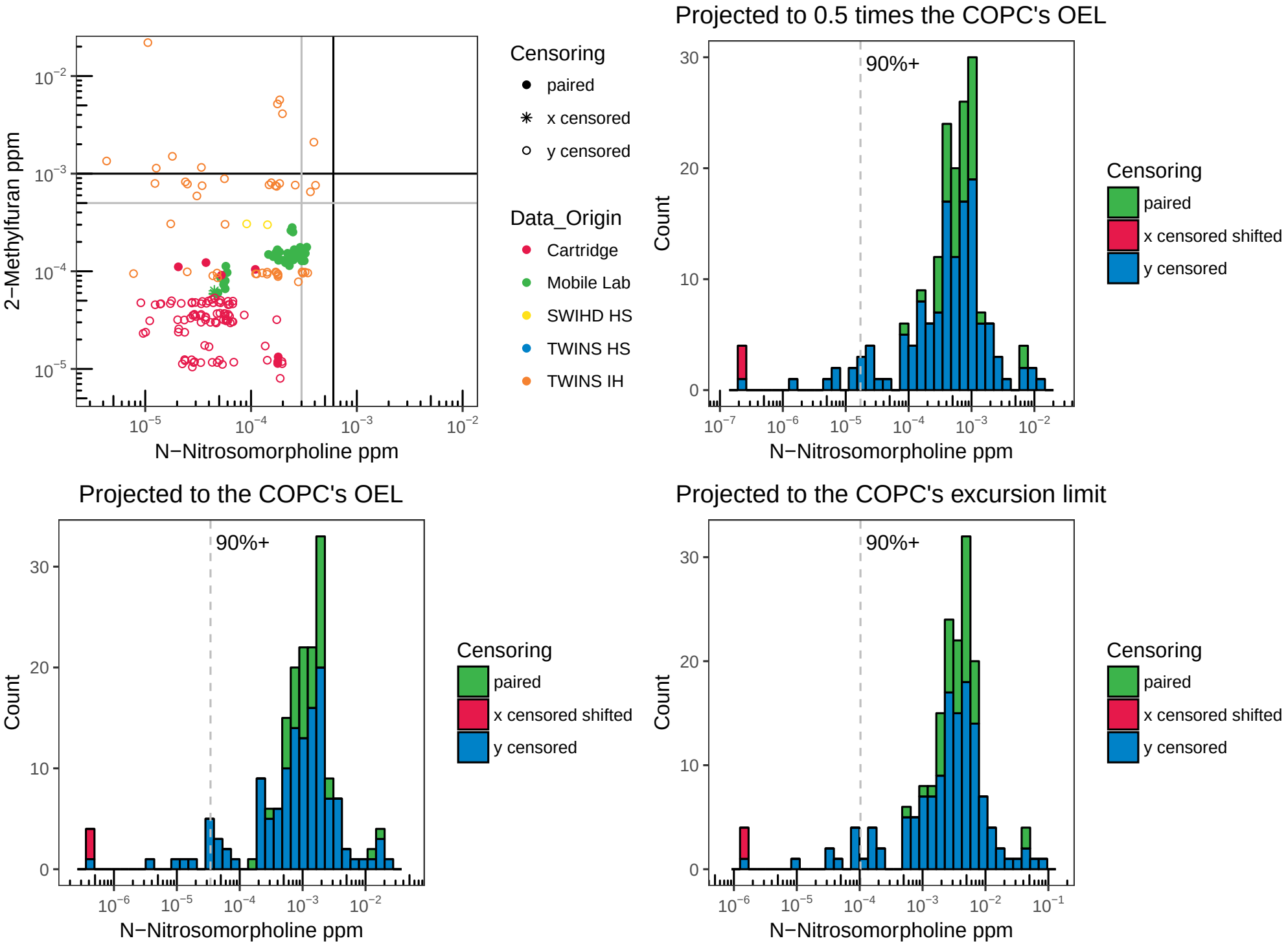


Figure C.2259: 2-Methylfuran vs N-Nitrosomorpholine

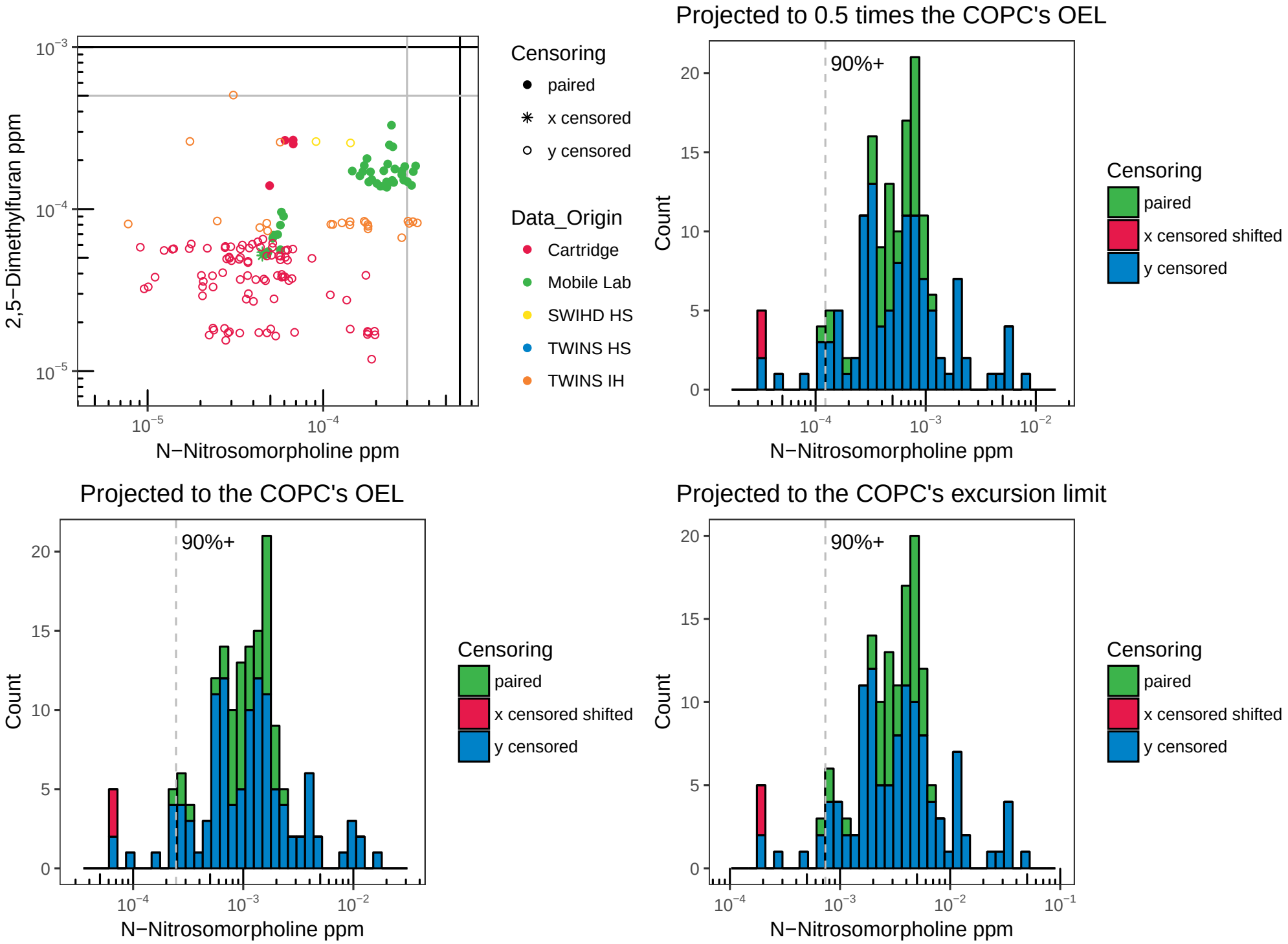


Figure C.2260: 2,5-Dimethylfuran vs N-Nitrosomorpholine

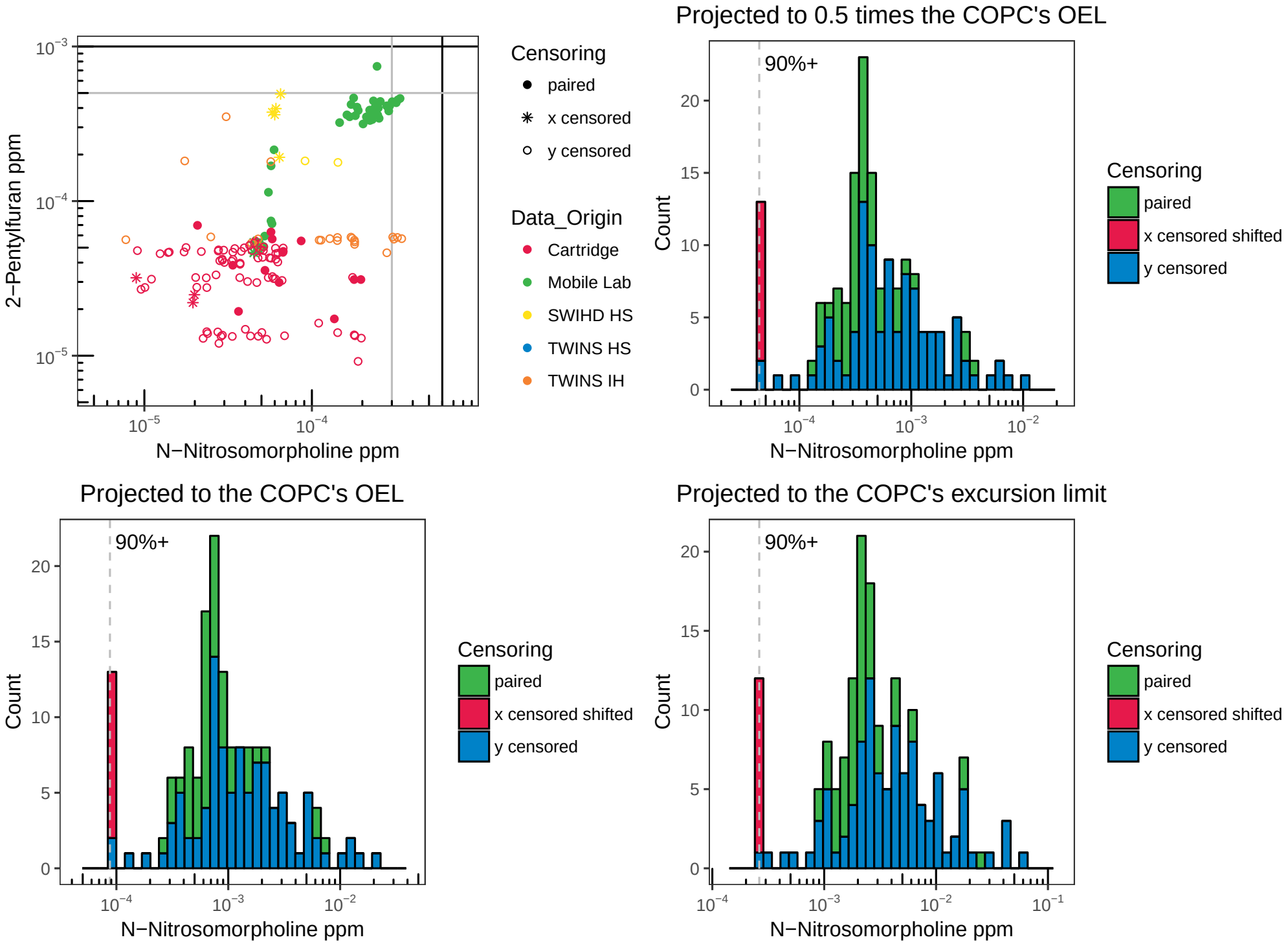


Figure C.2261: 2-Pentylfuran vs N-Nitrosomorpholine

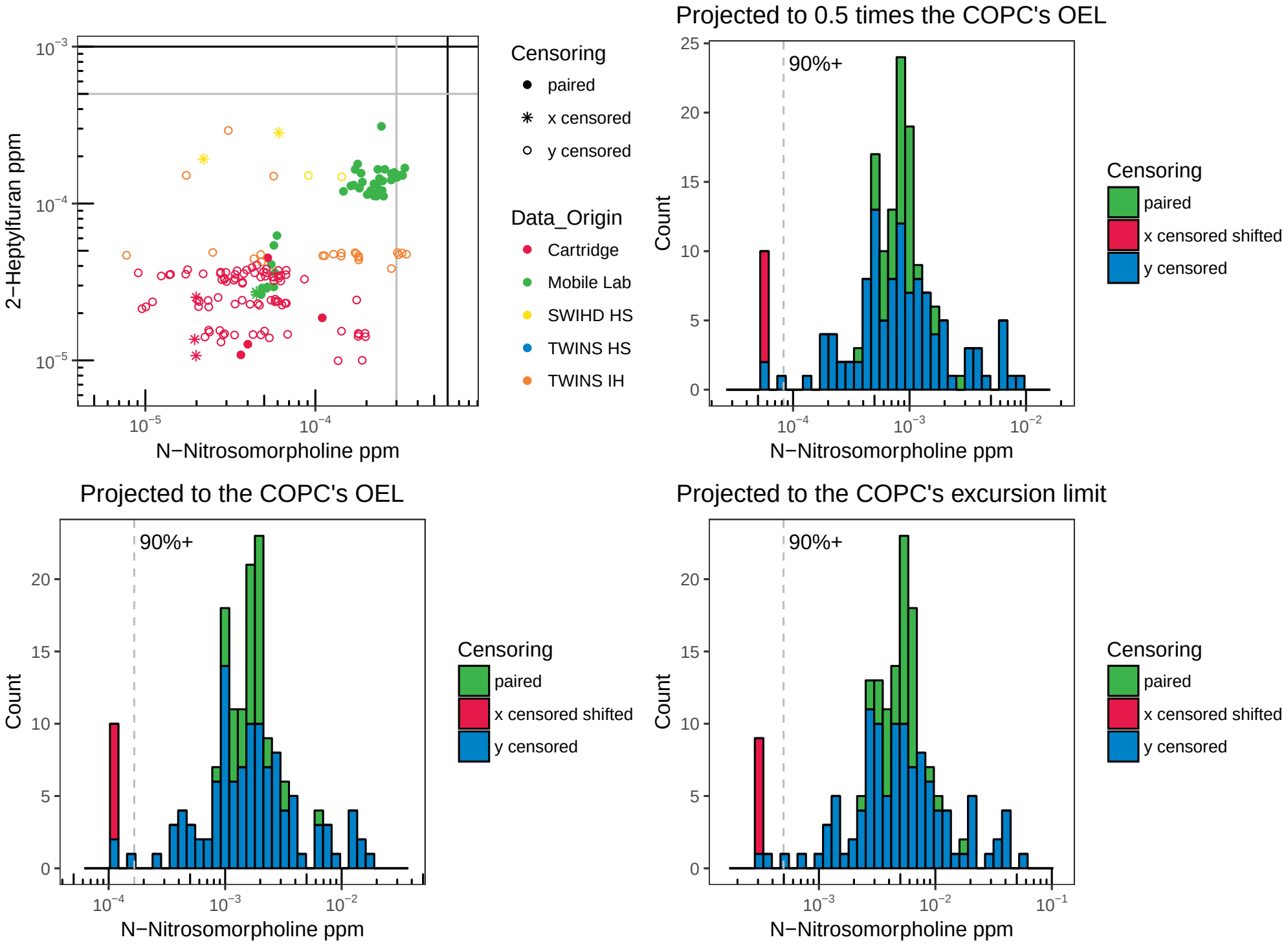


Figure C.2262: 2-Heptylfuran vs N-Nitrosomorpholine

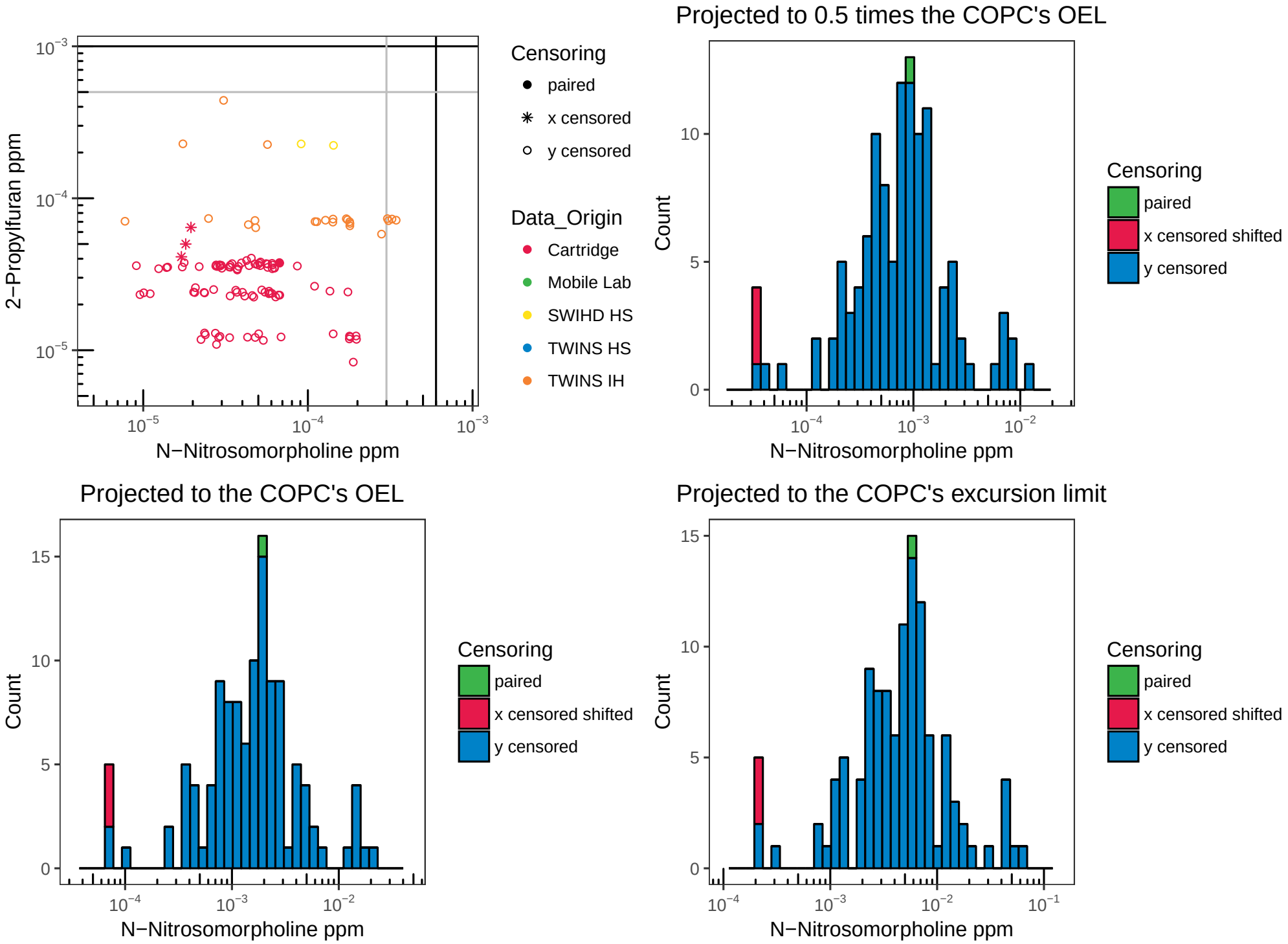


Figure C.2263: 2-Propylfuran vs N-Nitrosomorpholine

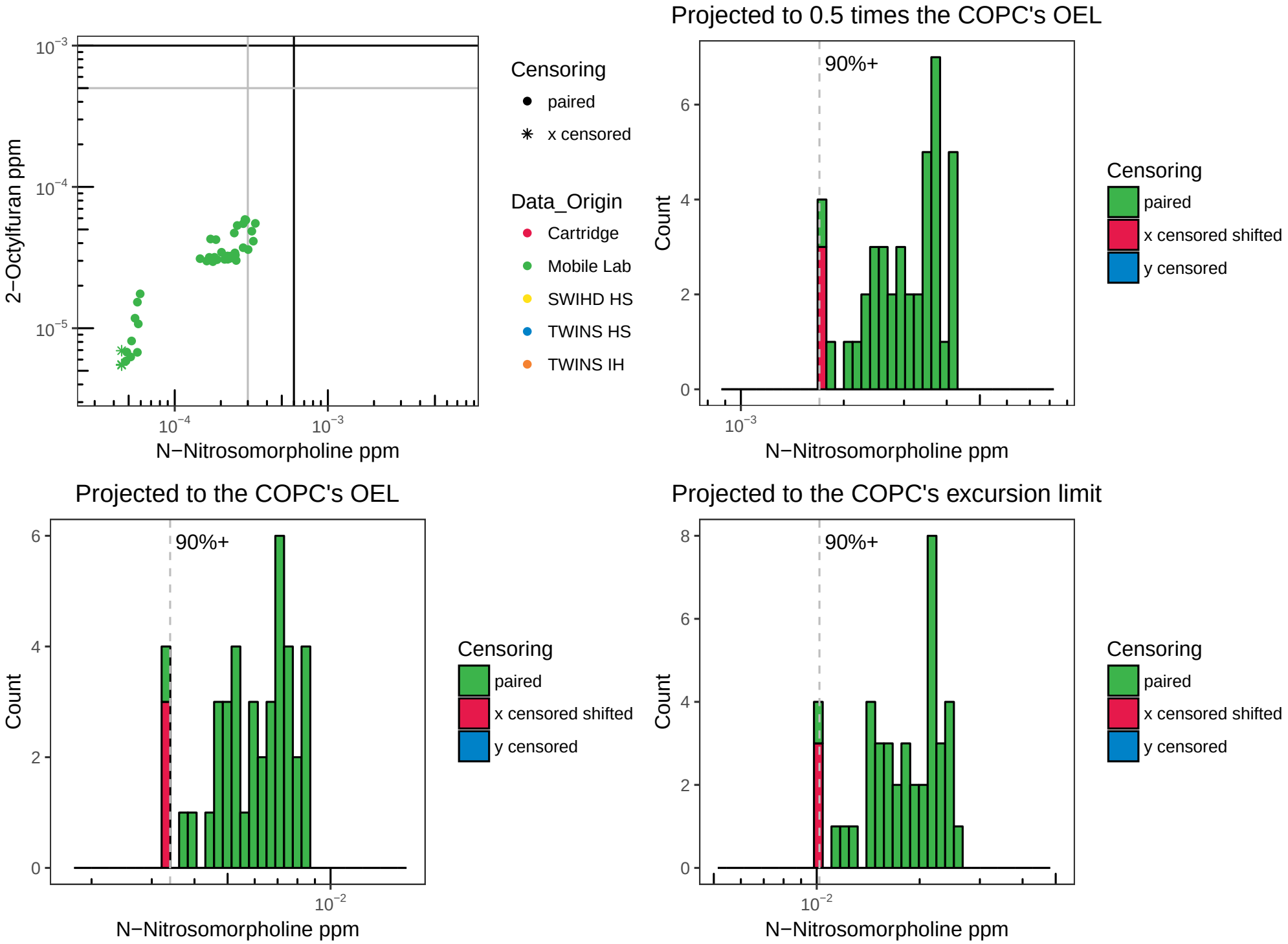


Figure C.2264: 2-Octylfuran vs N-Nitrosomorpholine

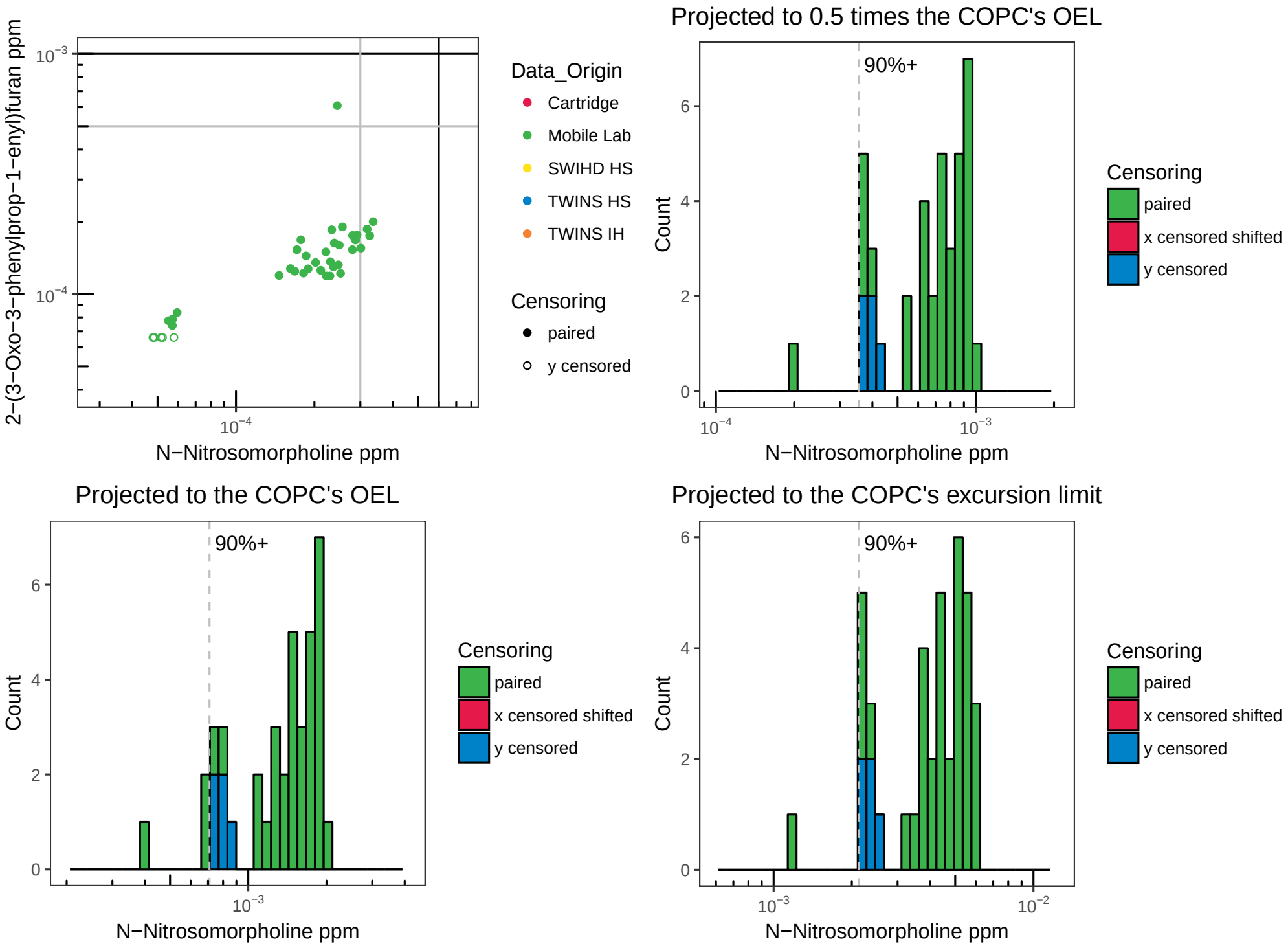


Figure C.2265: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs N-Nitrosomorpholine

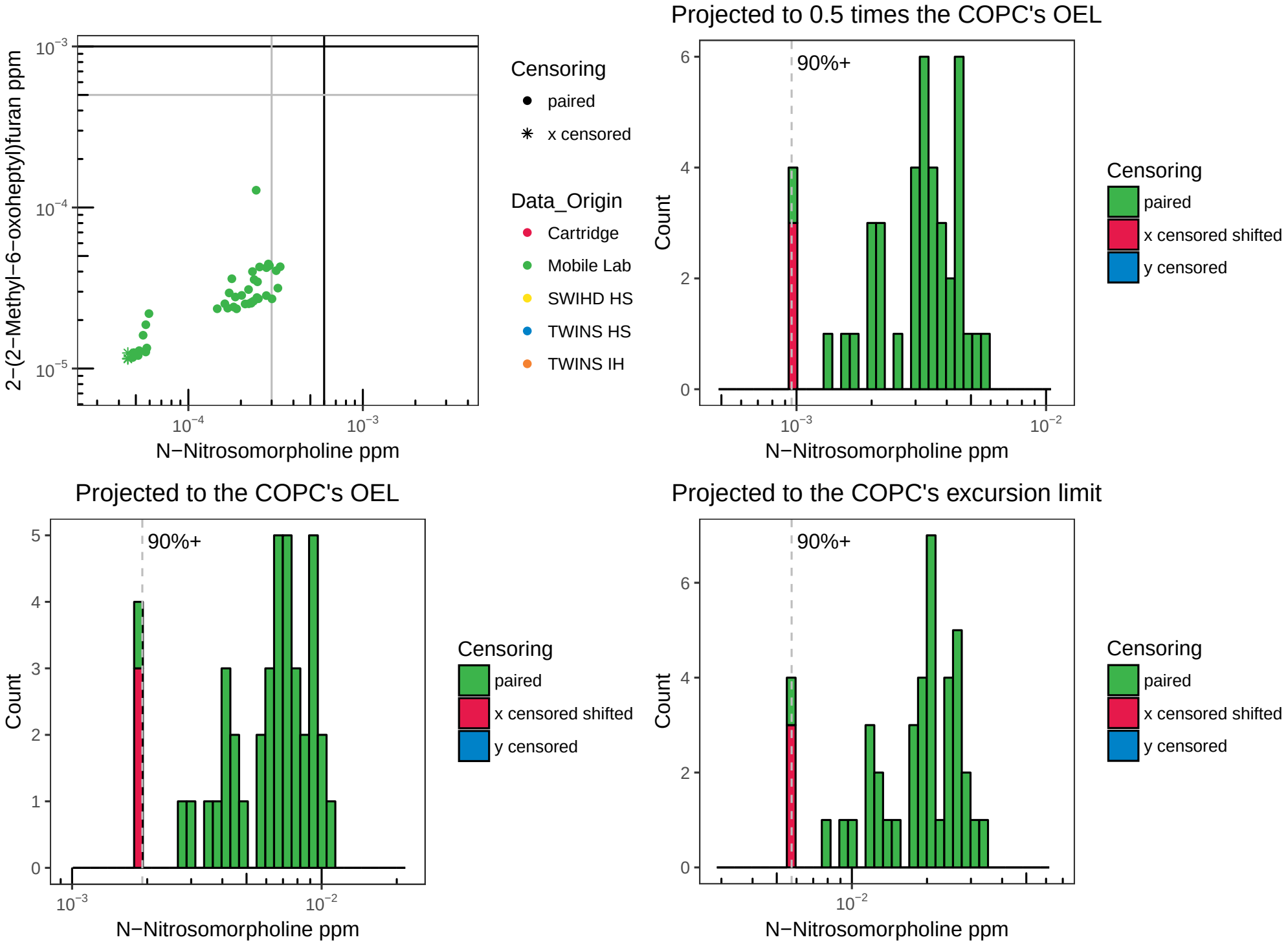


Figure C.2266: 2-(2-Methyl-6-oxoheptyl)furan vs N-Nitrosomorpholine

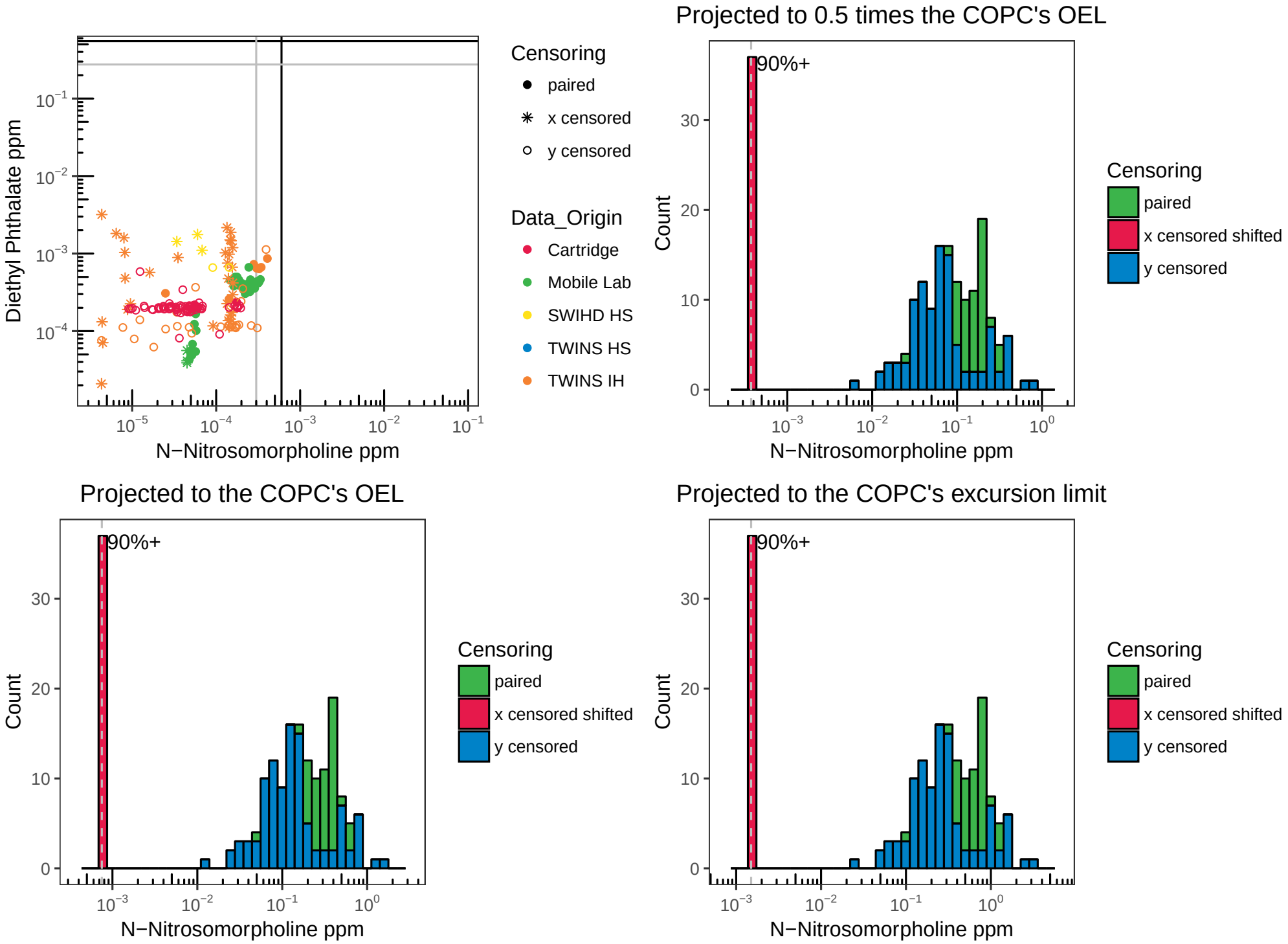


Figure C.2267: Diethyl Phthalate vs N-Nitrosomorpholine

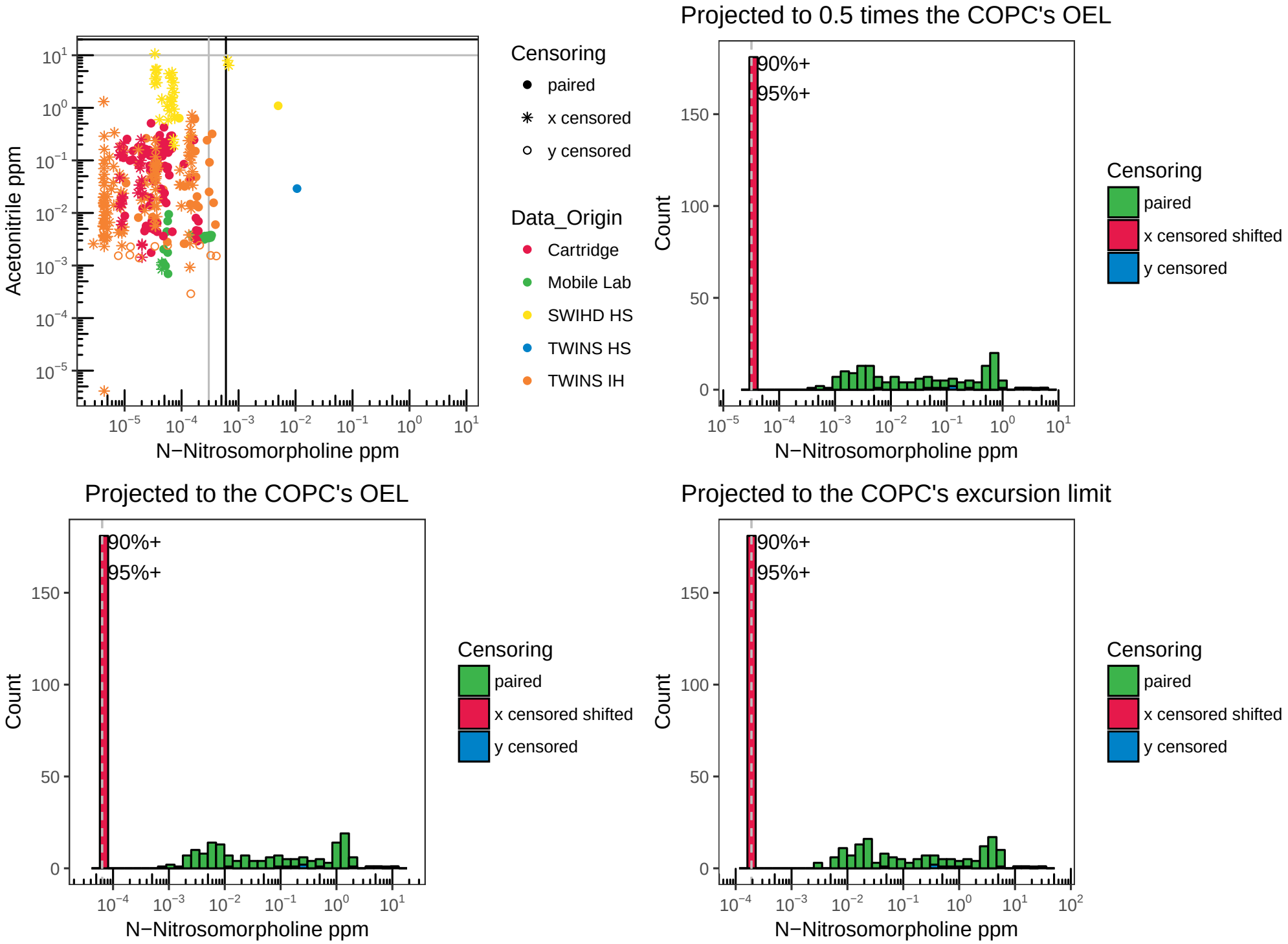


Figure C.2268: Acetonitrile vs N-Nitrosomorpholine

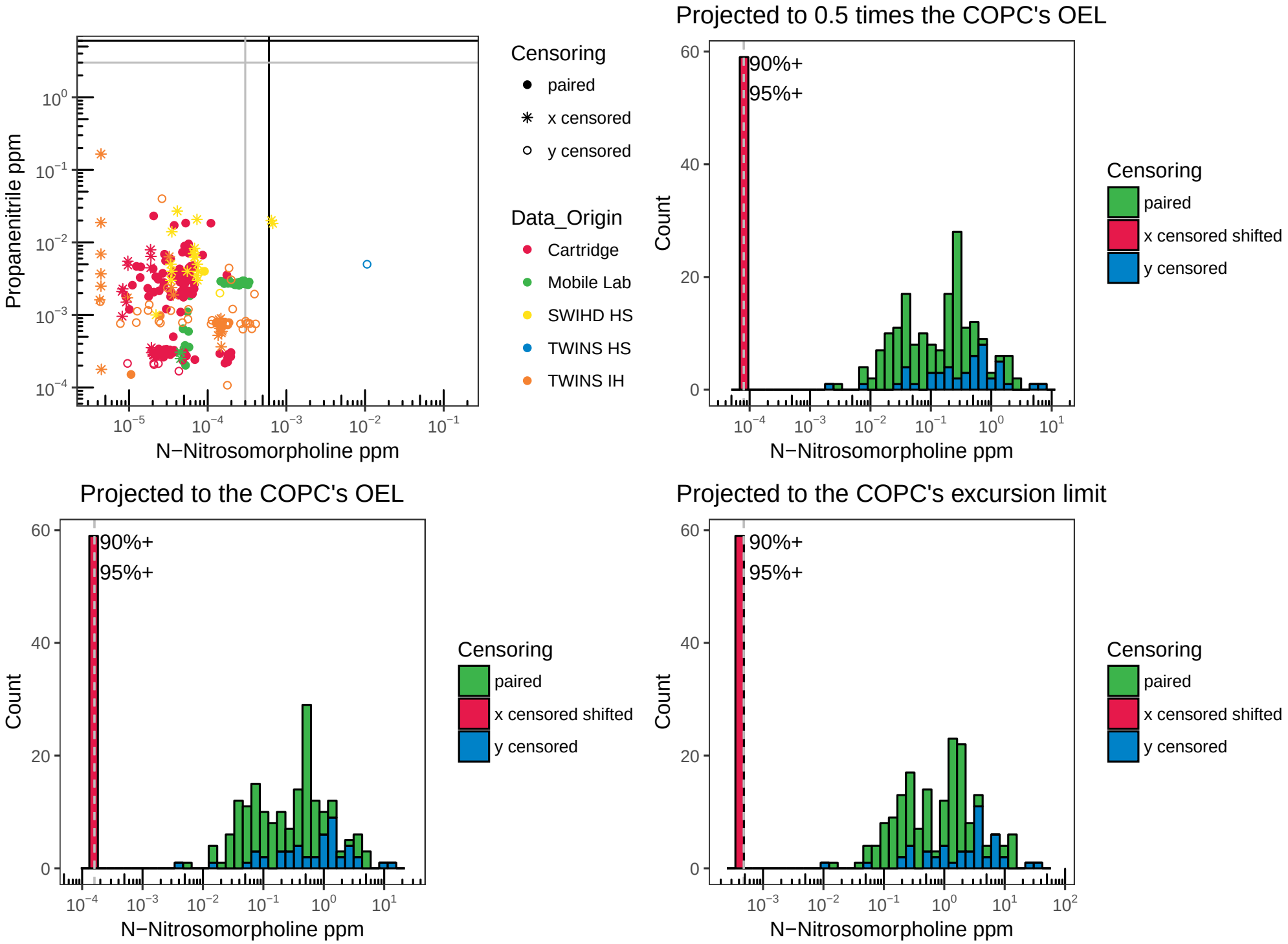


Figure C.2269: Propanenitrile vs N-Nitrosomorpholine

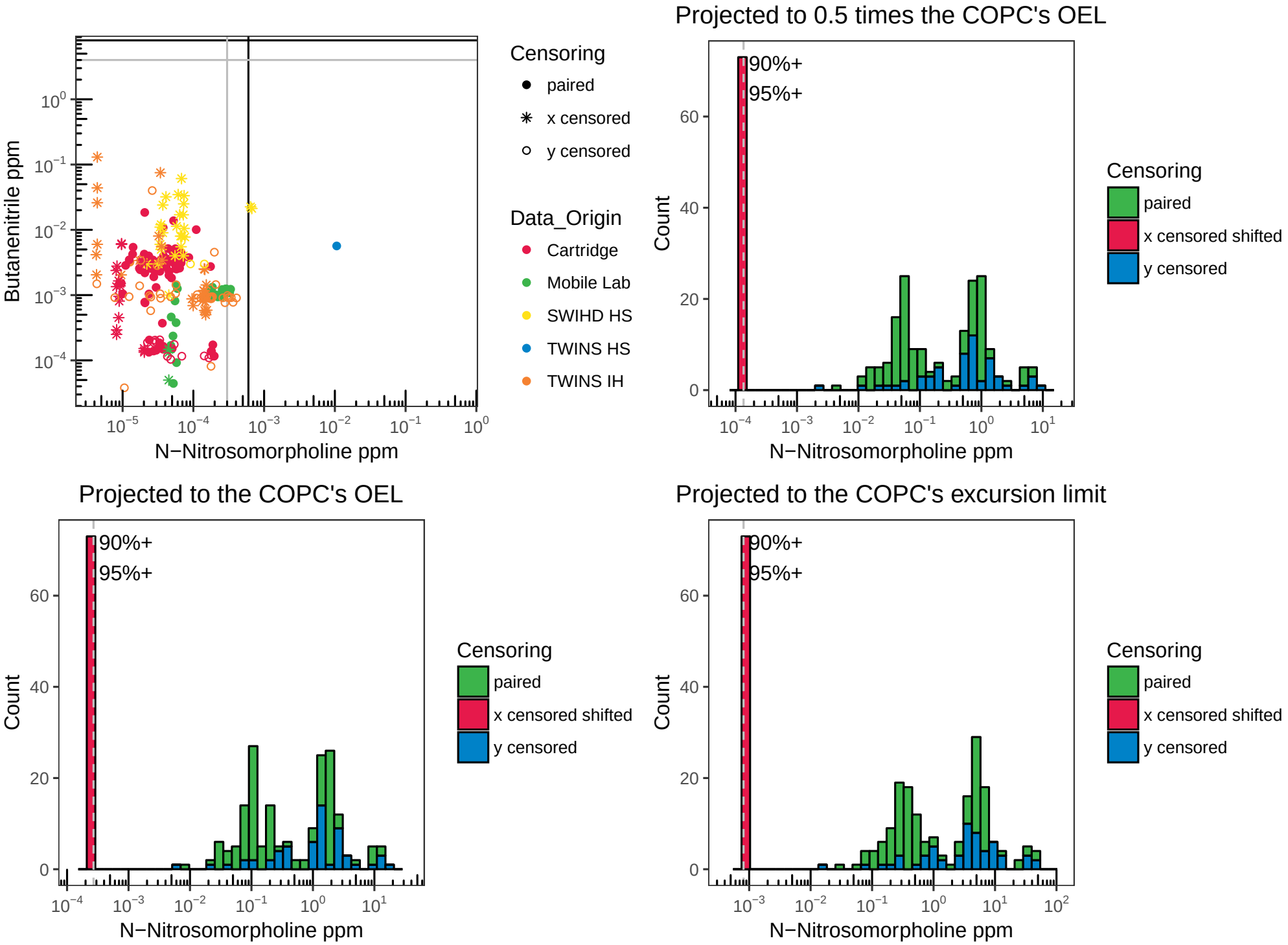


Figure C.2270: Butanenitrile vs N-Nitrosomorpholine

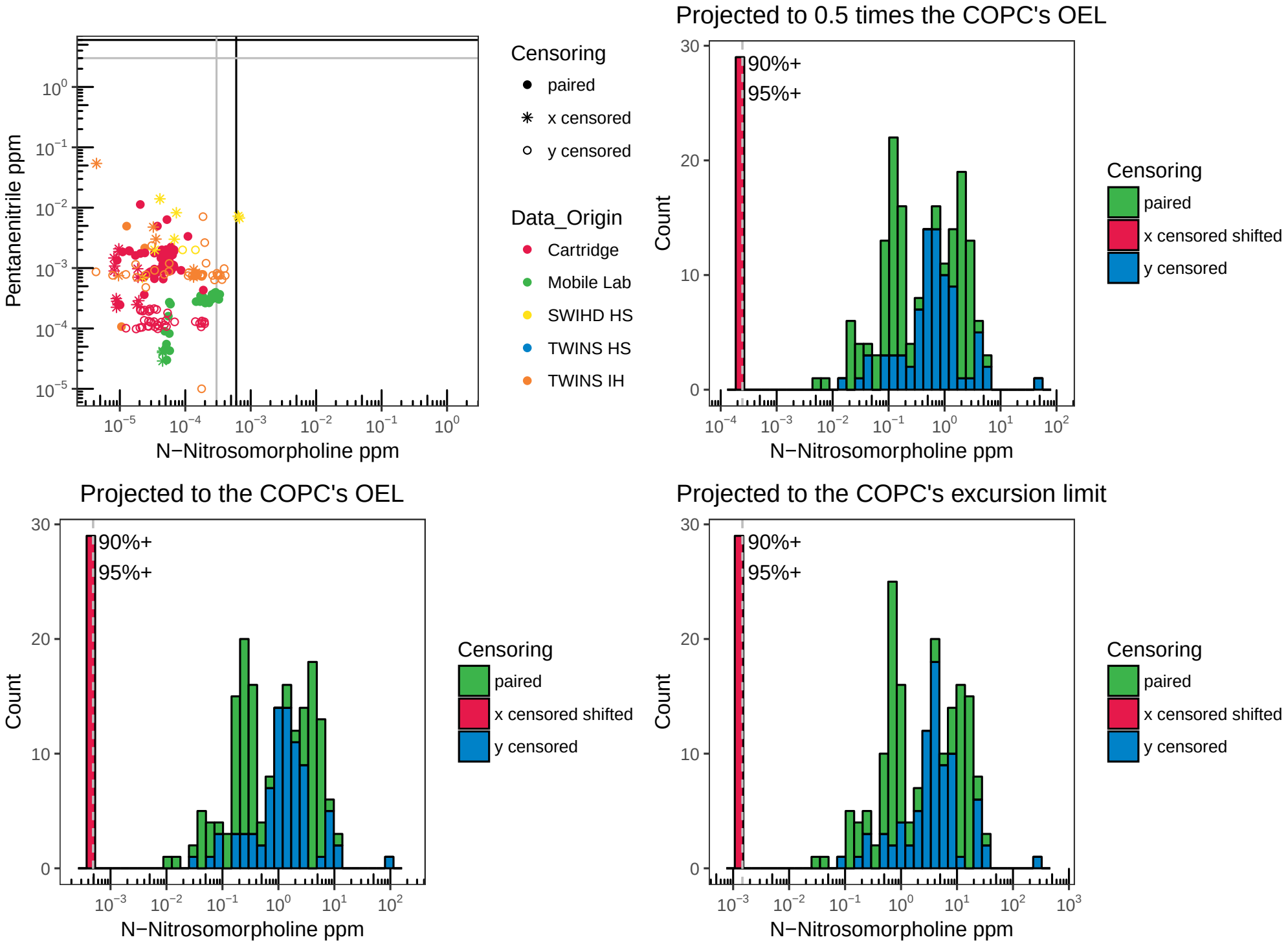


Figure C.2271: Pentanenitrile vs N-Nitrosomorpholine

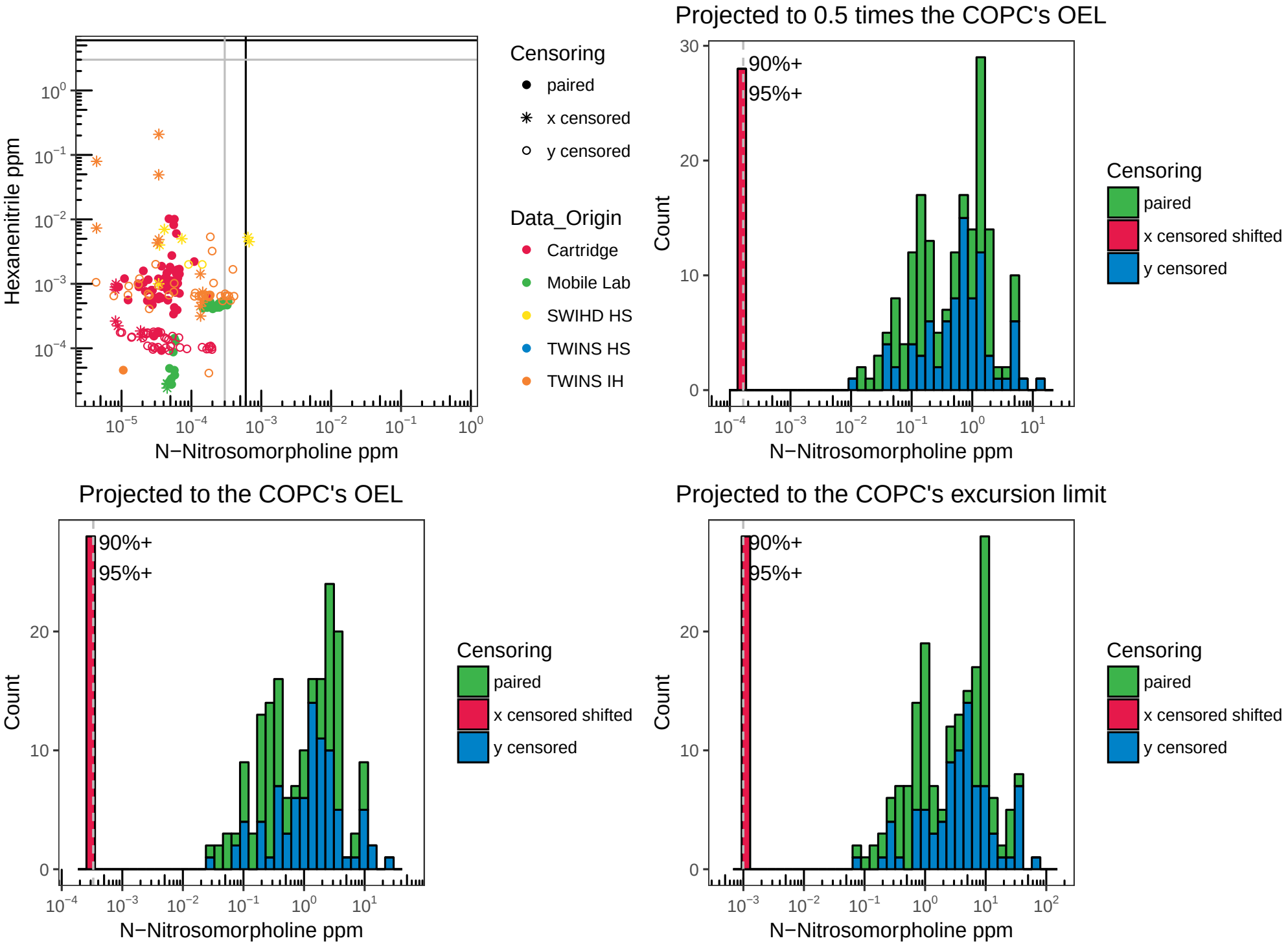


Figure C.2272: Hexanenitrile vs N-Nitrosomorpholine

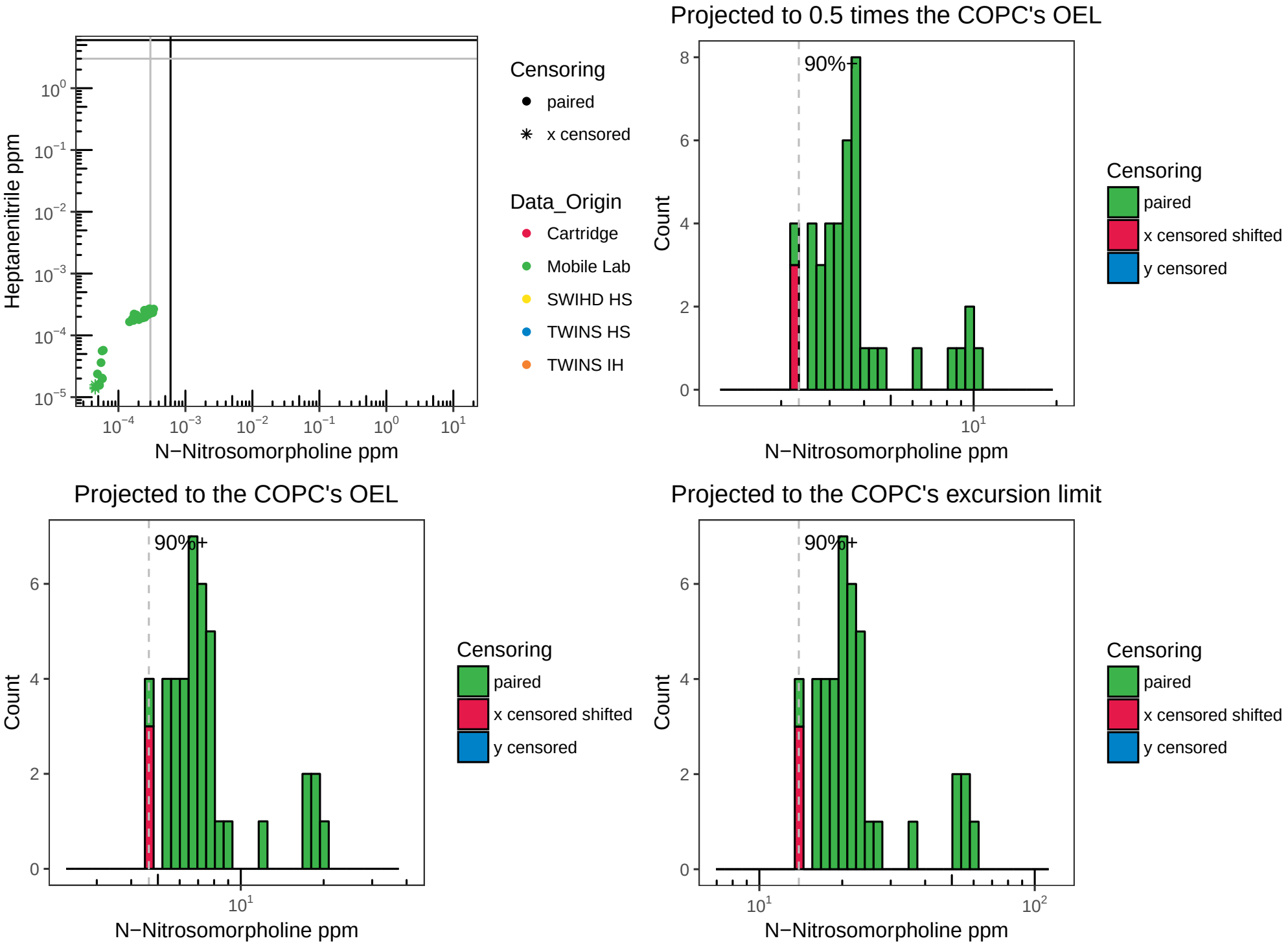


Figure C.2273: Heptanenitrile vs N-Nitrosomorpholine

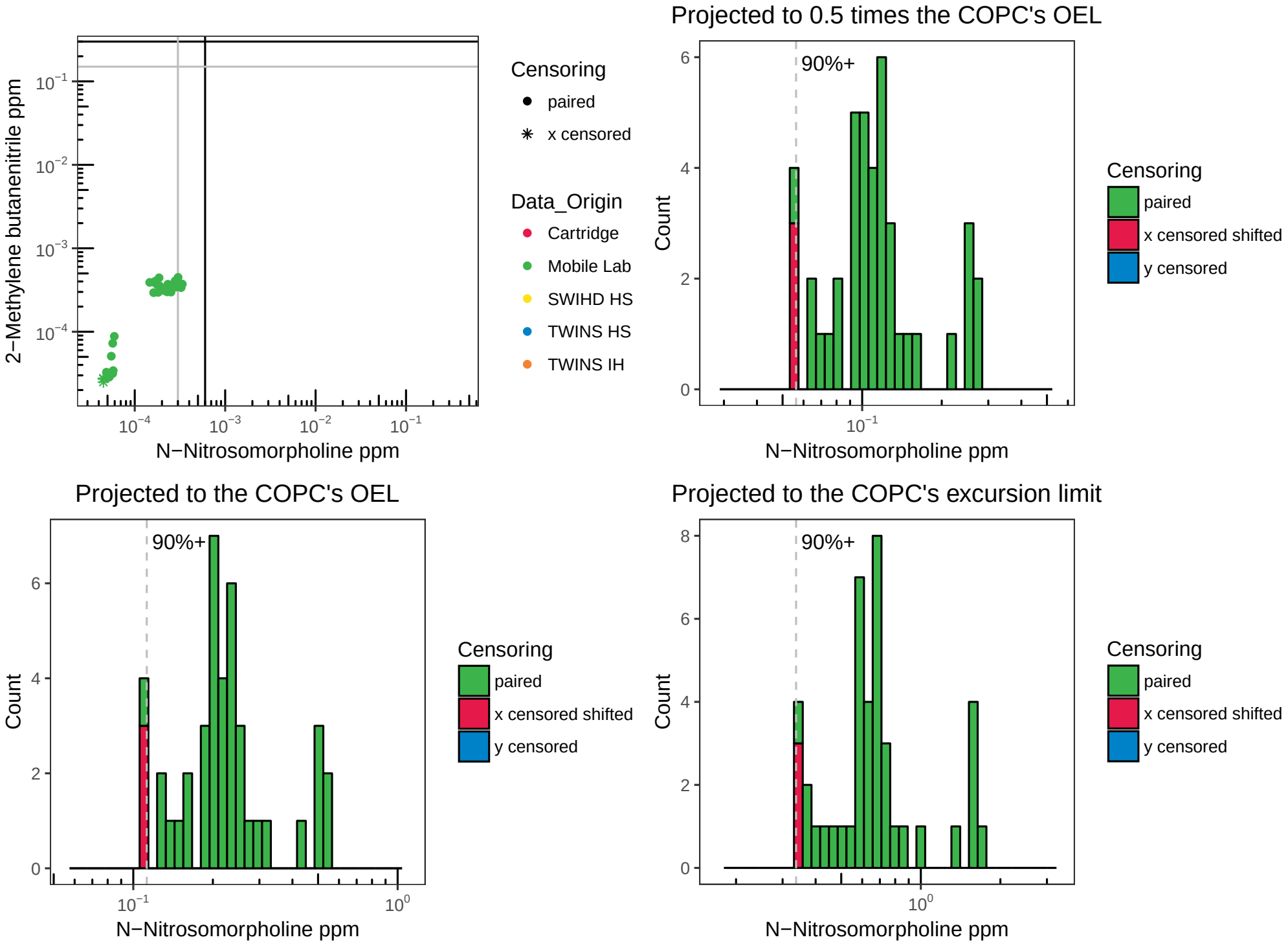


Figure C.2274: 2-Methylene butanenitrile vs N-Nitrosomorpholine

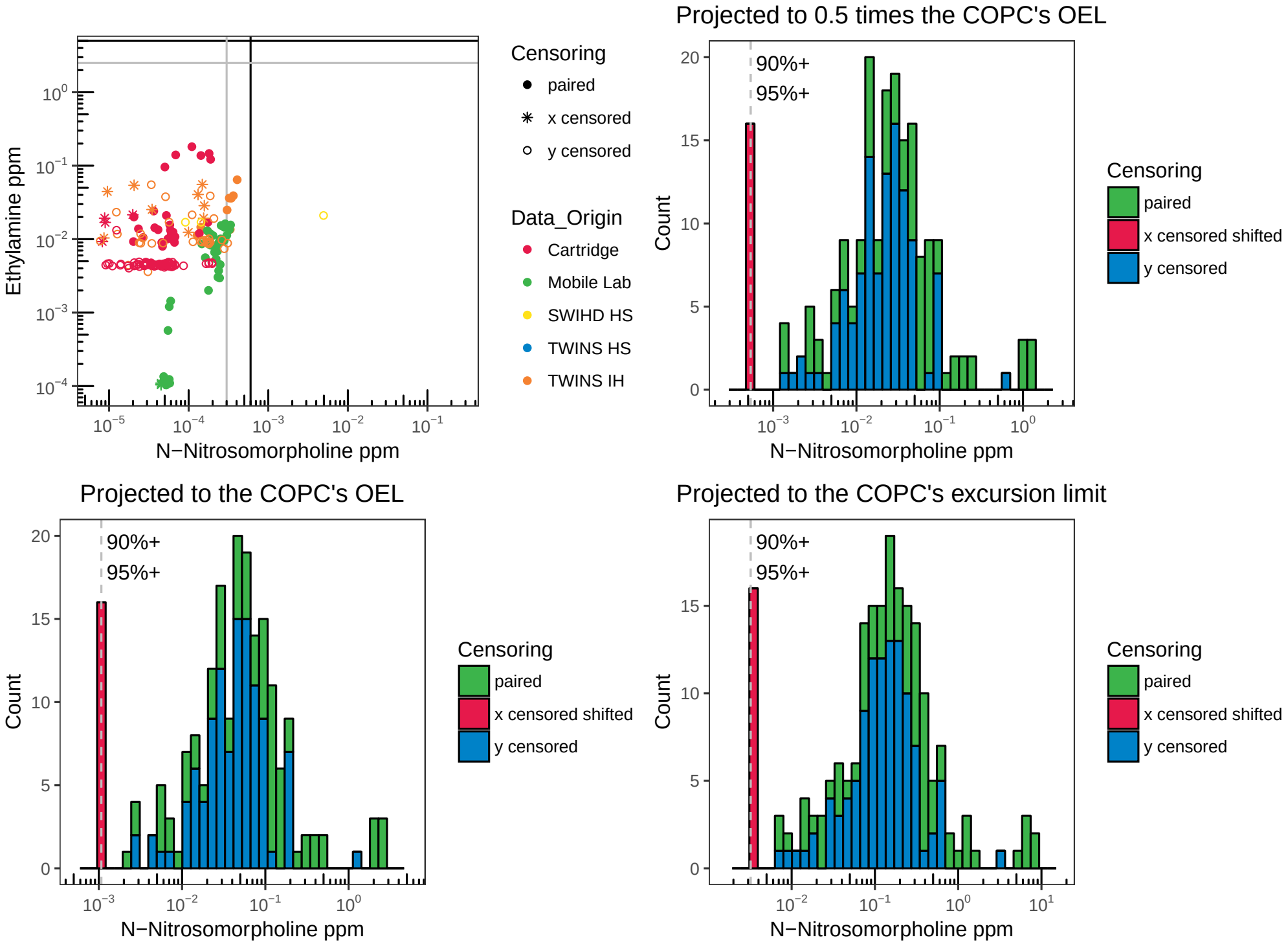


Figure C.2275: Ethylamine vs N-Nitrosomorpholine

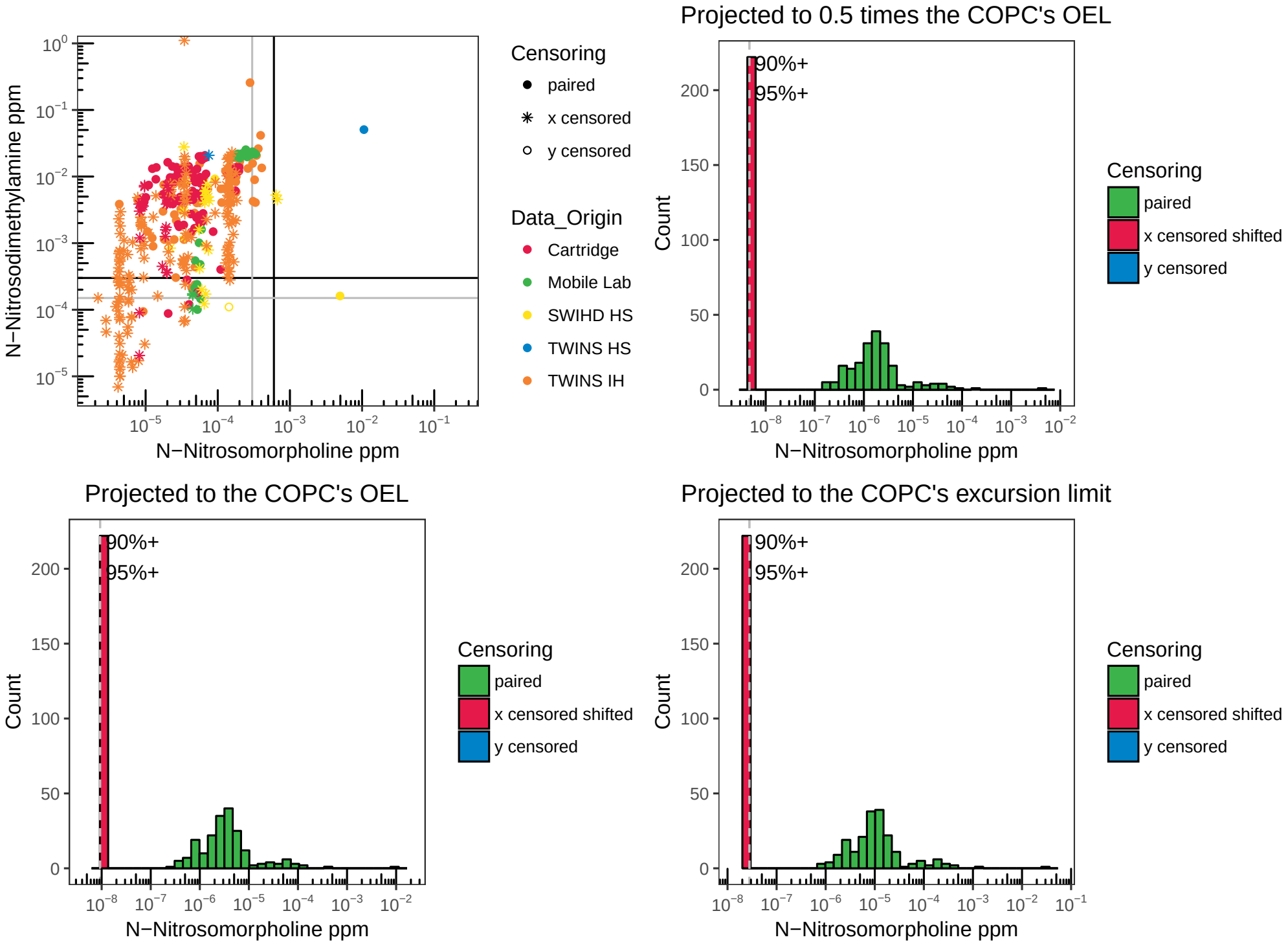


Figure C.2276: N-Nitrosodimethylamine vs N-Nitrosomorpholine

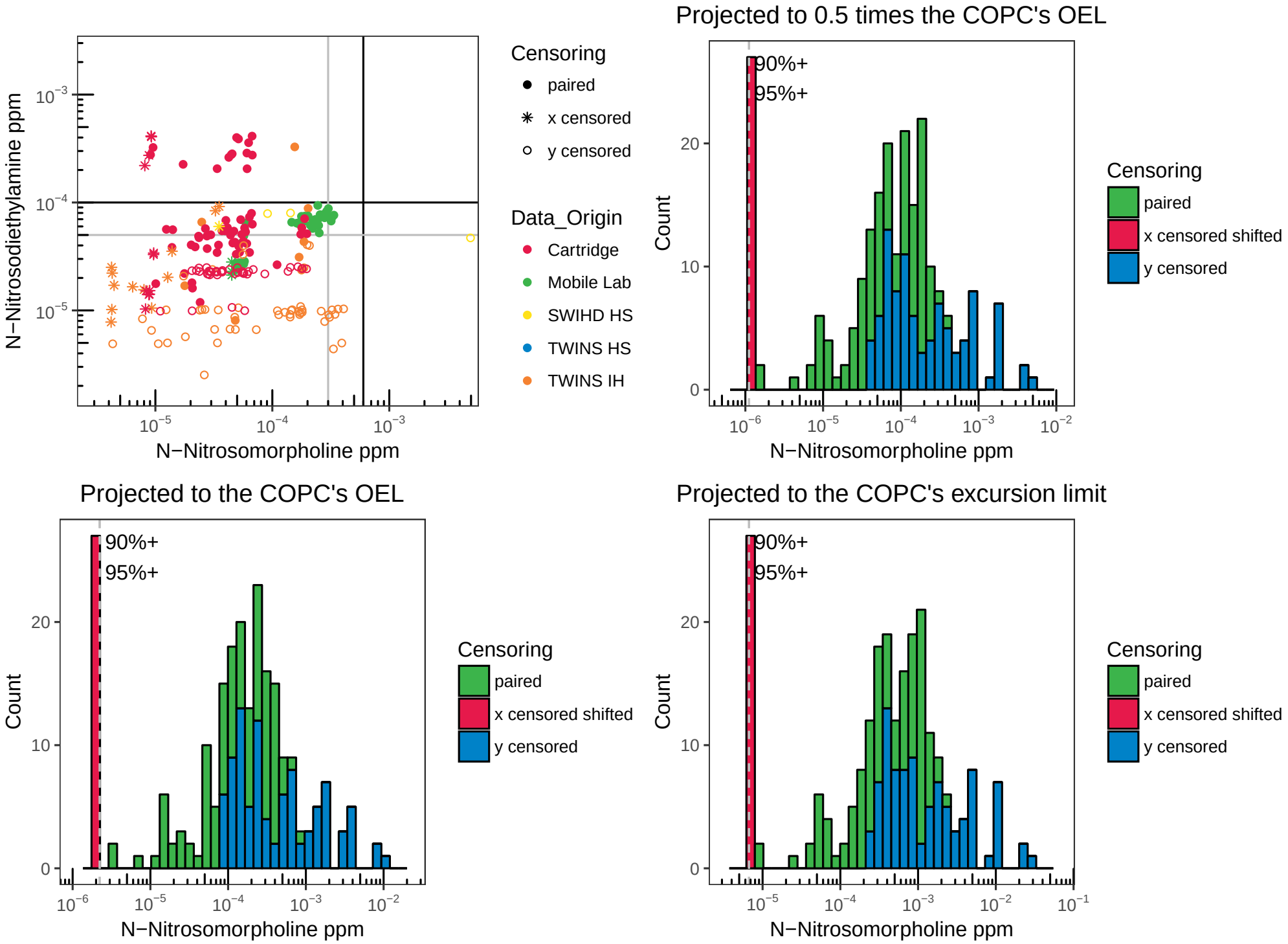


Figure C.2277: N-Nitrosodiethylamine vs N-Nitrosomorpholine

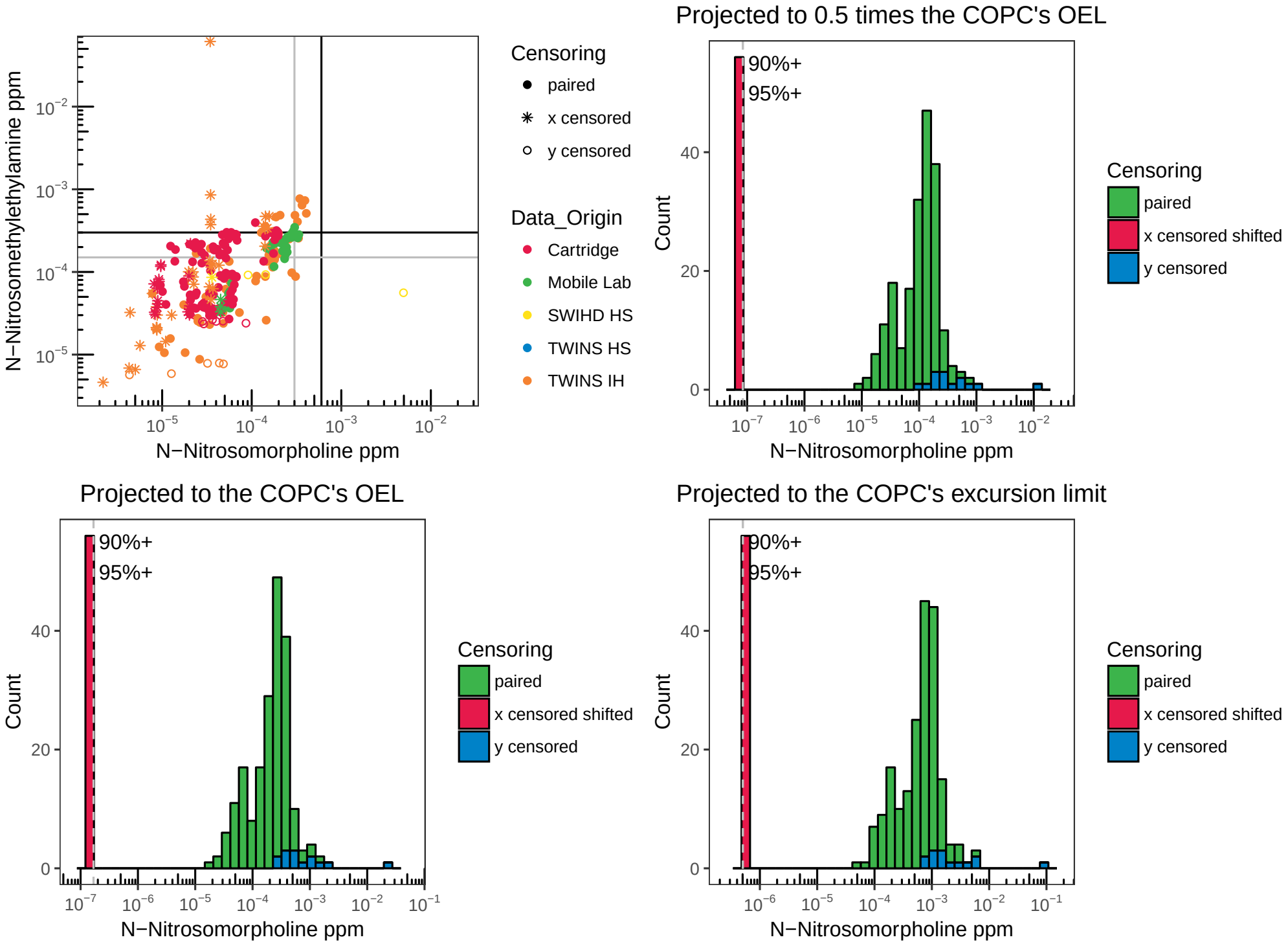


Figure C.2278: N-Nitrosomethylethylamine vs N-Nitrosomorpholine

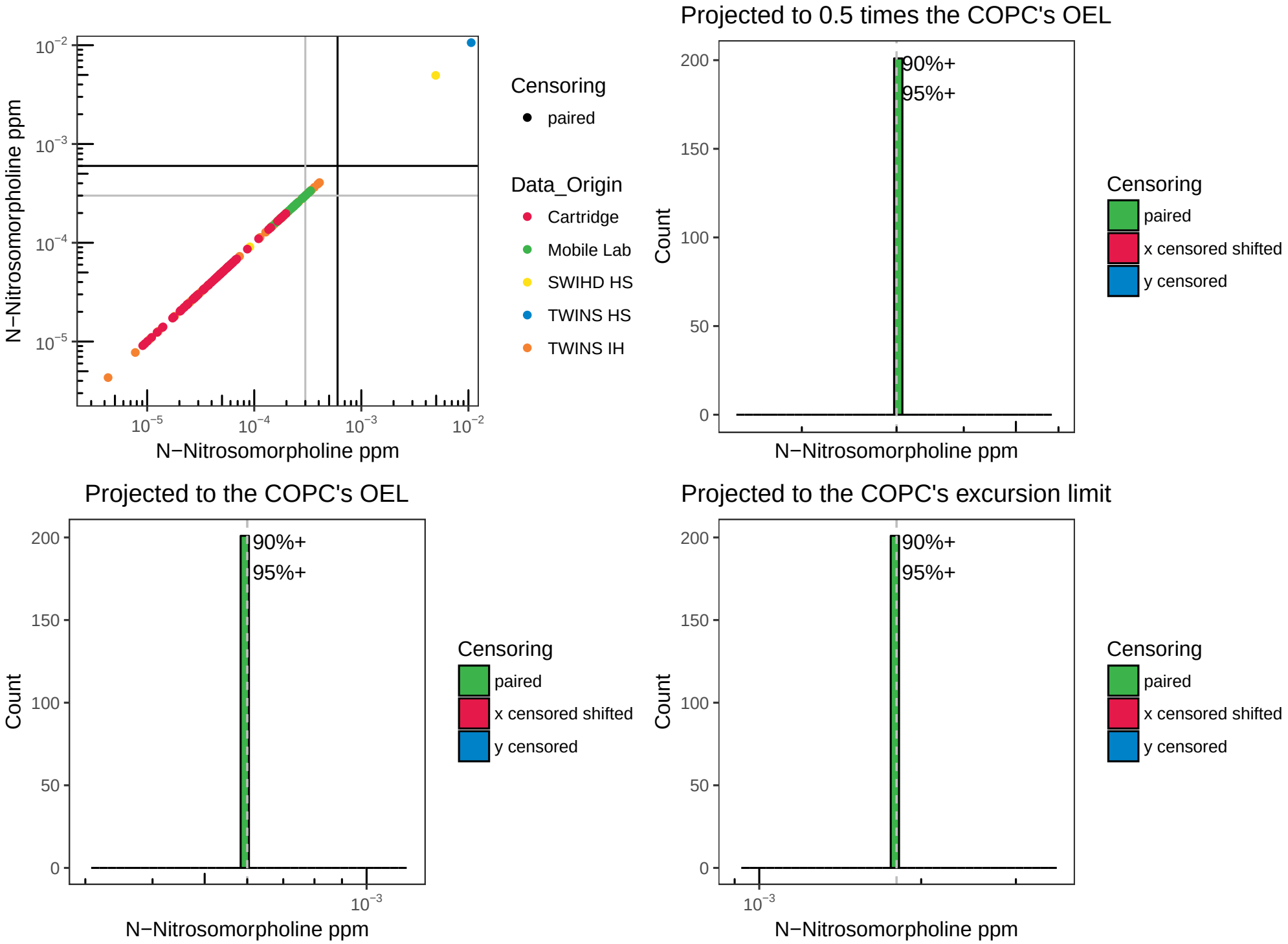


Figure C.2279: N-Nitrosomorpholine vs N-Nitrosomorpholine

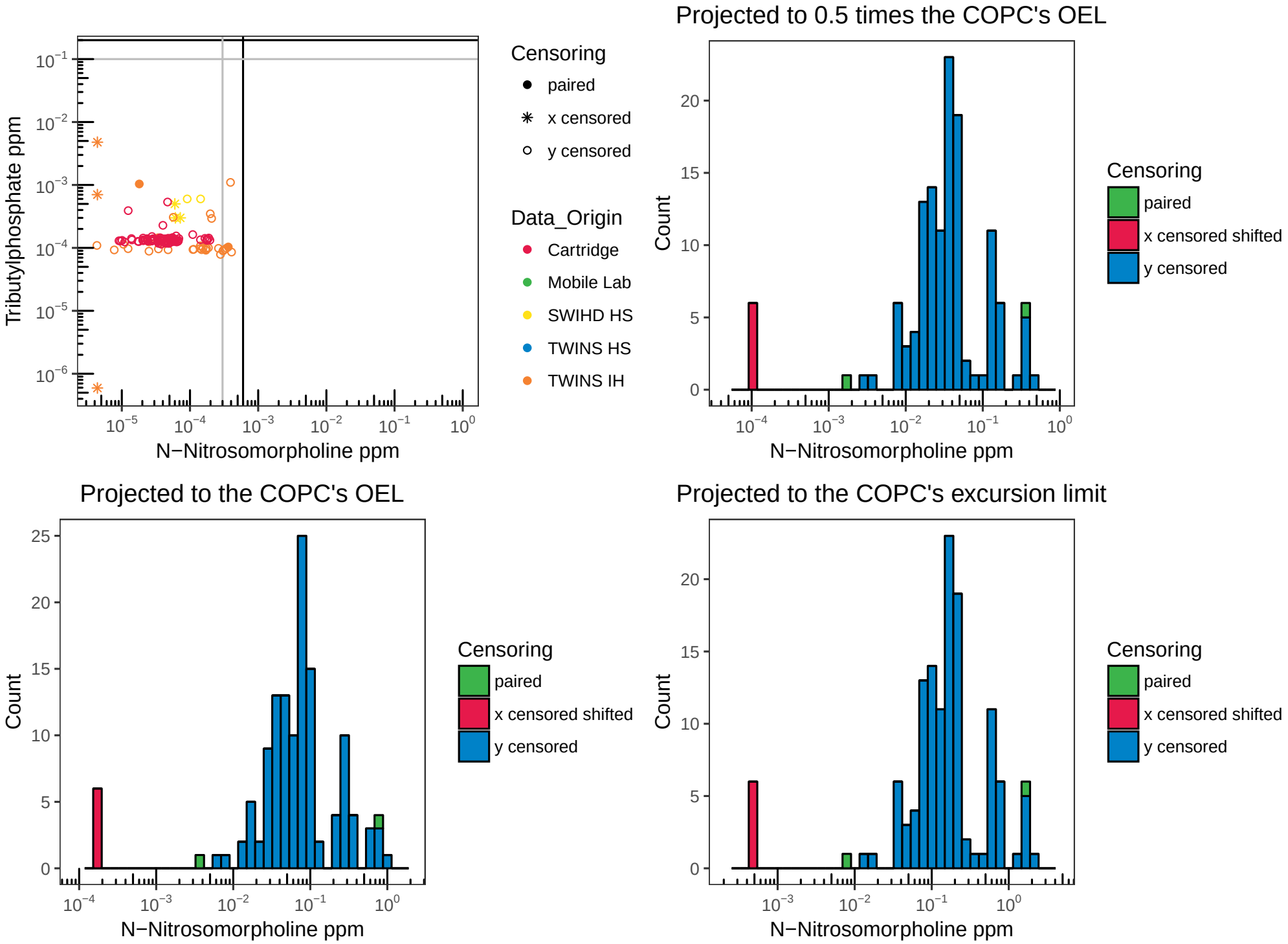


Figure C.2280: Tributylphosphate vs N-Nitrosomorpholine

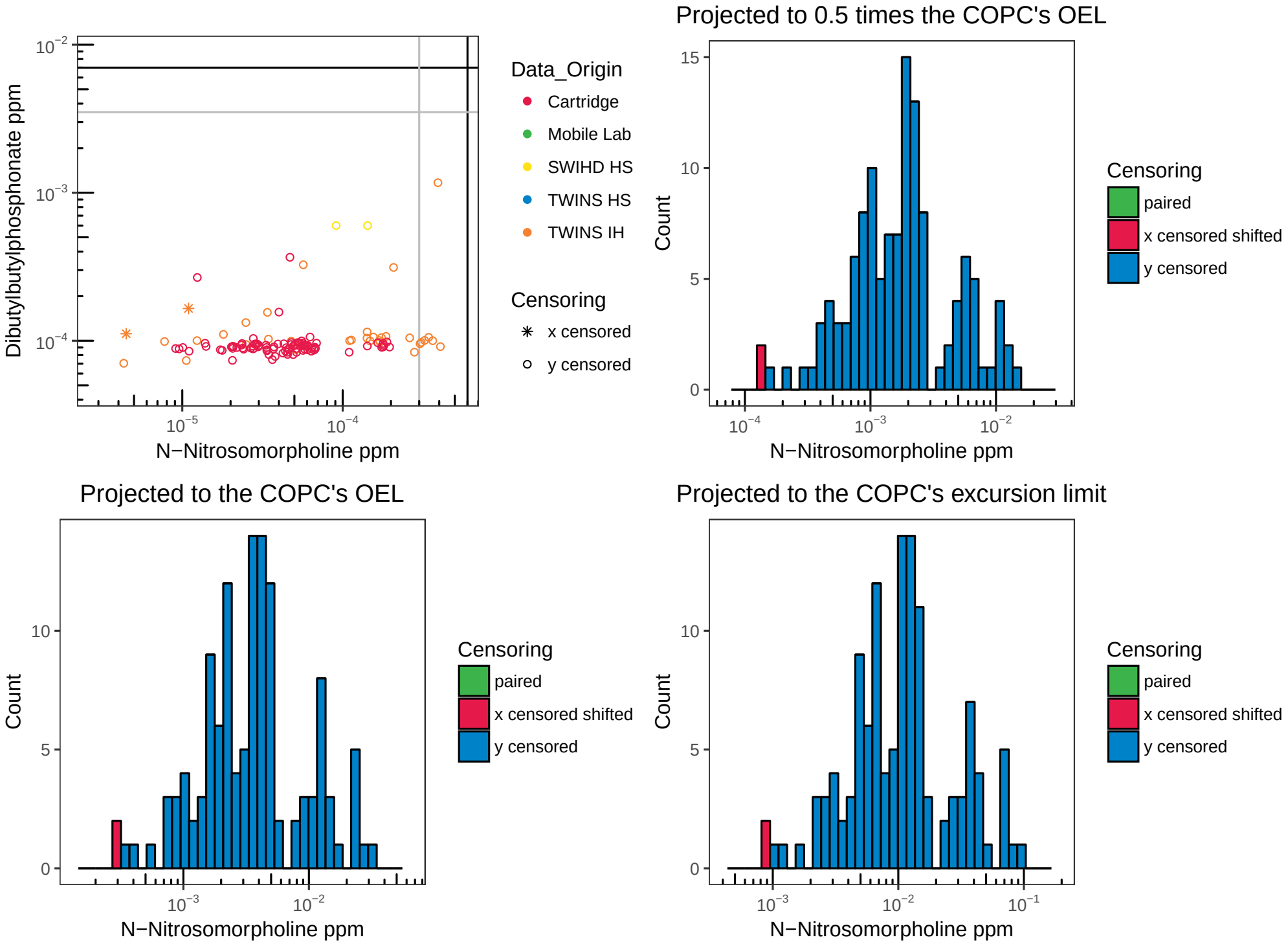


Figure C.2281: Dibutylbutylphosphonate vs N-Nitrosomorpholine

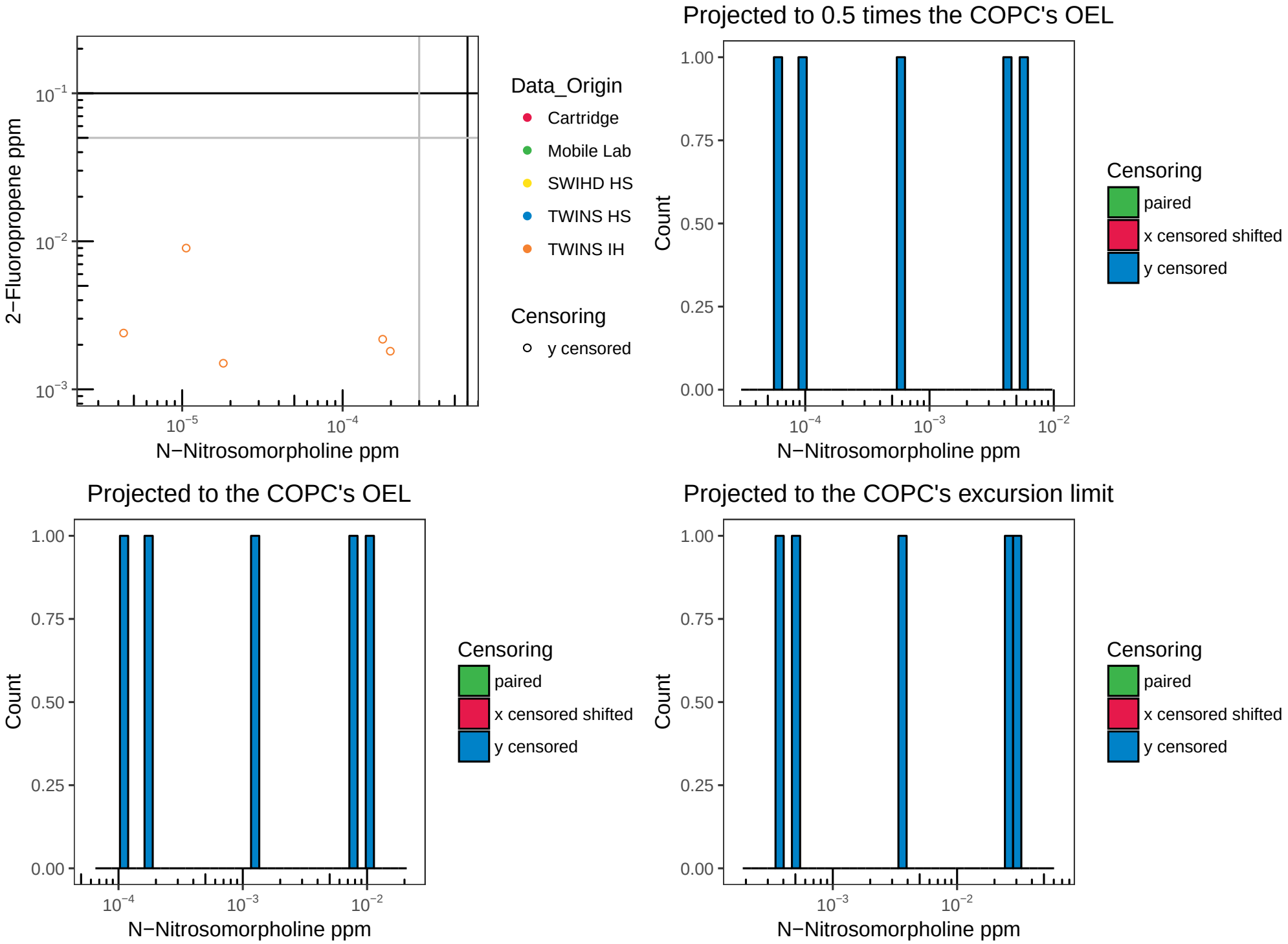


Figure C.2282: 2-Fluoropropene vs N-Nitrosomorpholine

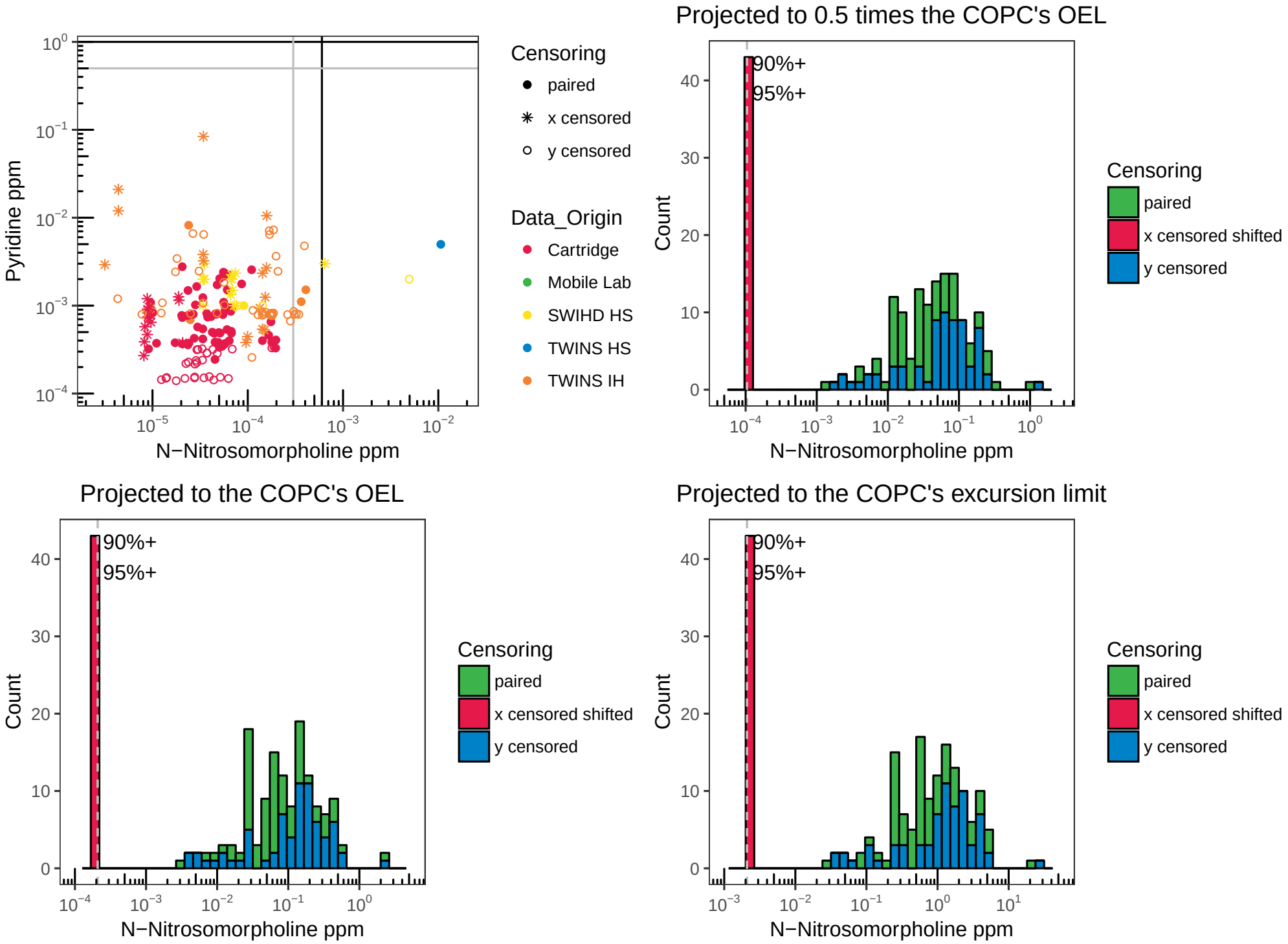


Figure C.2283: Pyridine vs N-Nitrosomorpholine

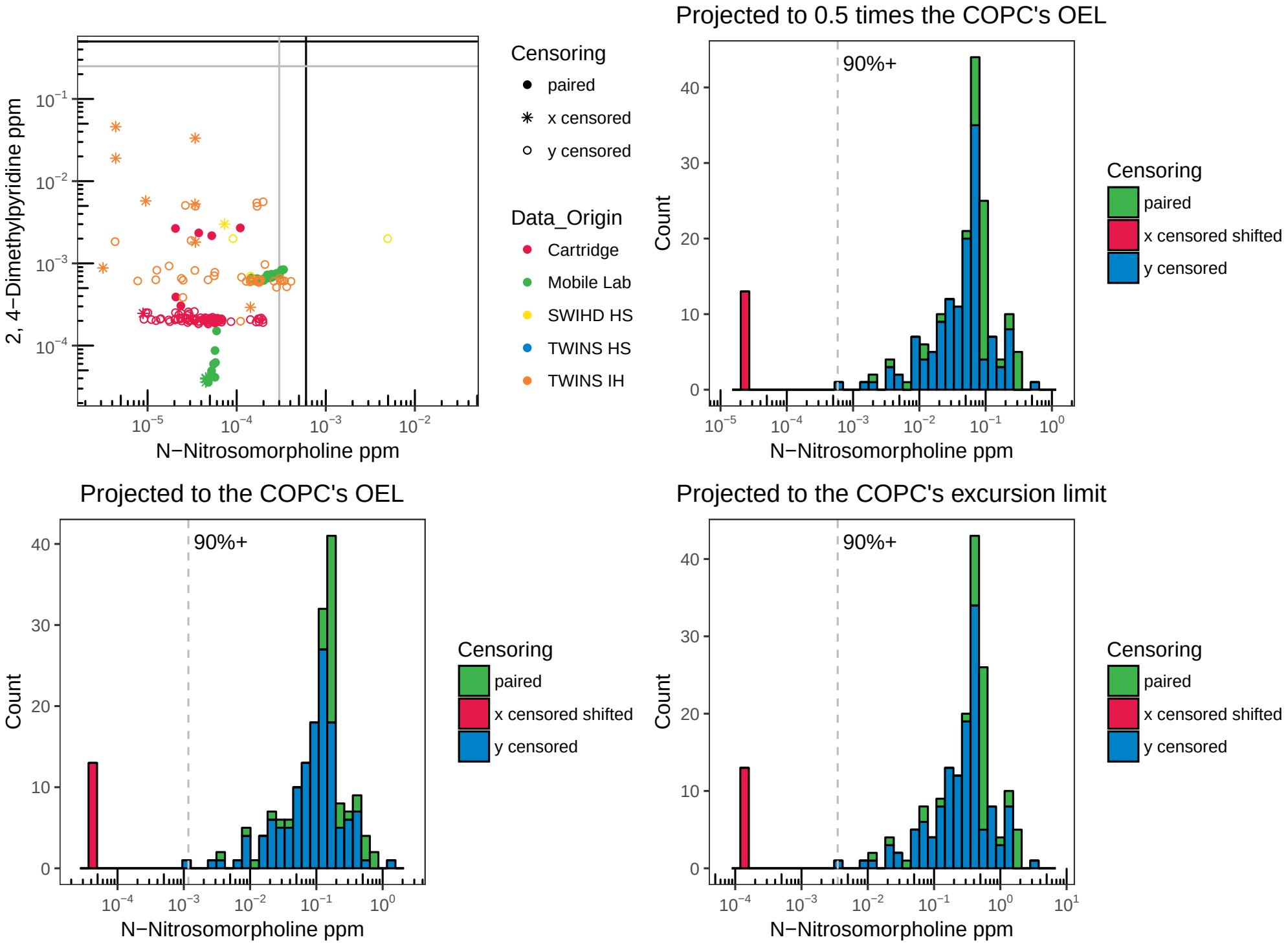


Figure C.2284: 2, 4-Dimethylpyridine vs N-Nitrosomorpholine

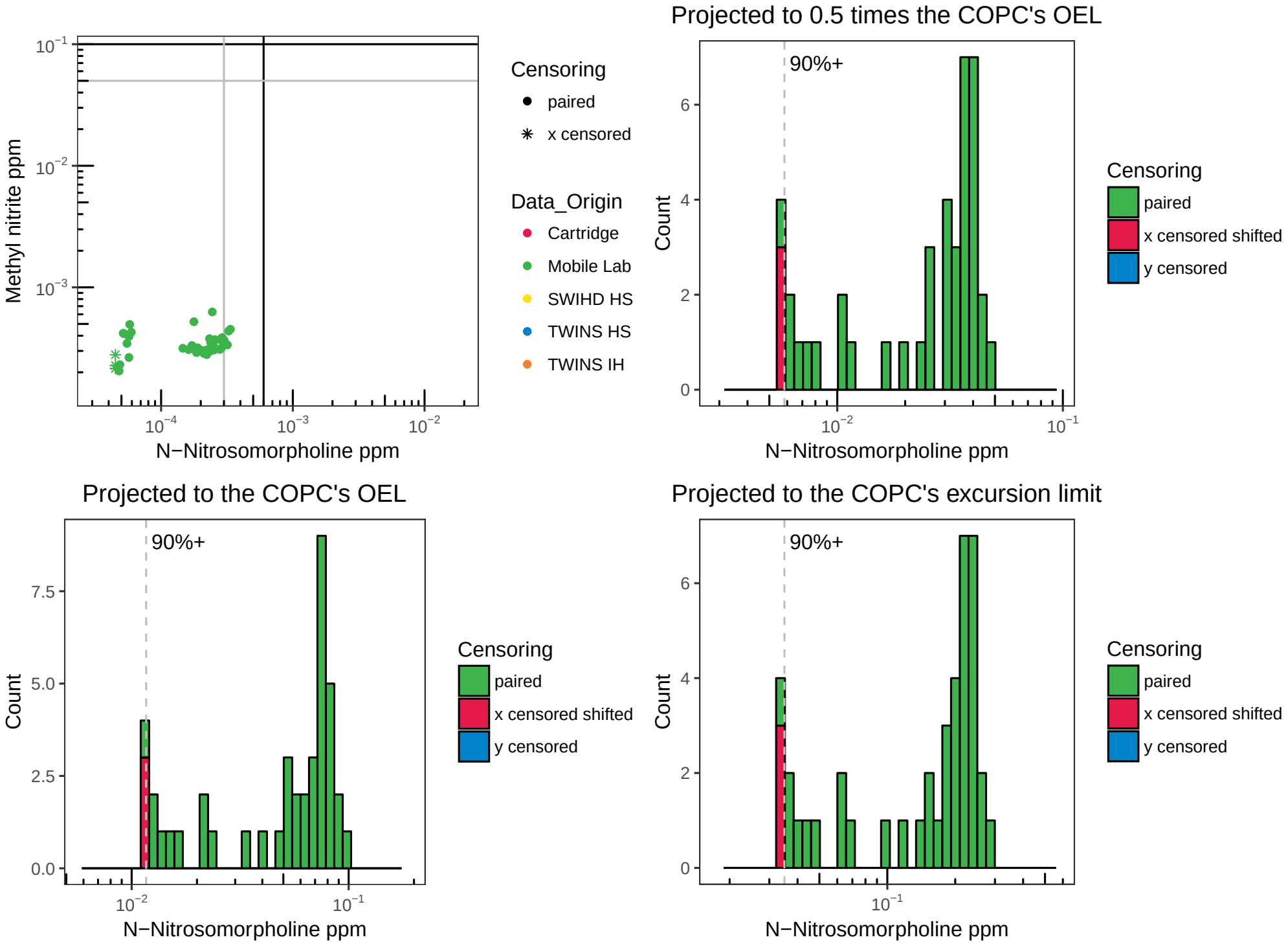


Figure C.2285: Methyl nitrite vs N-Nitrosomorpholine

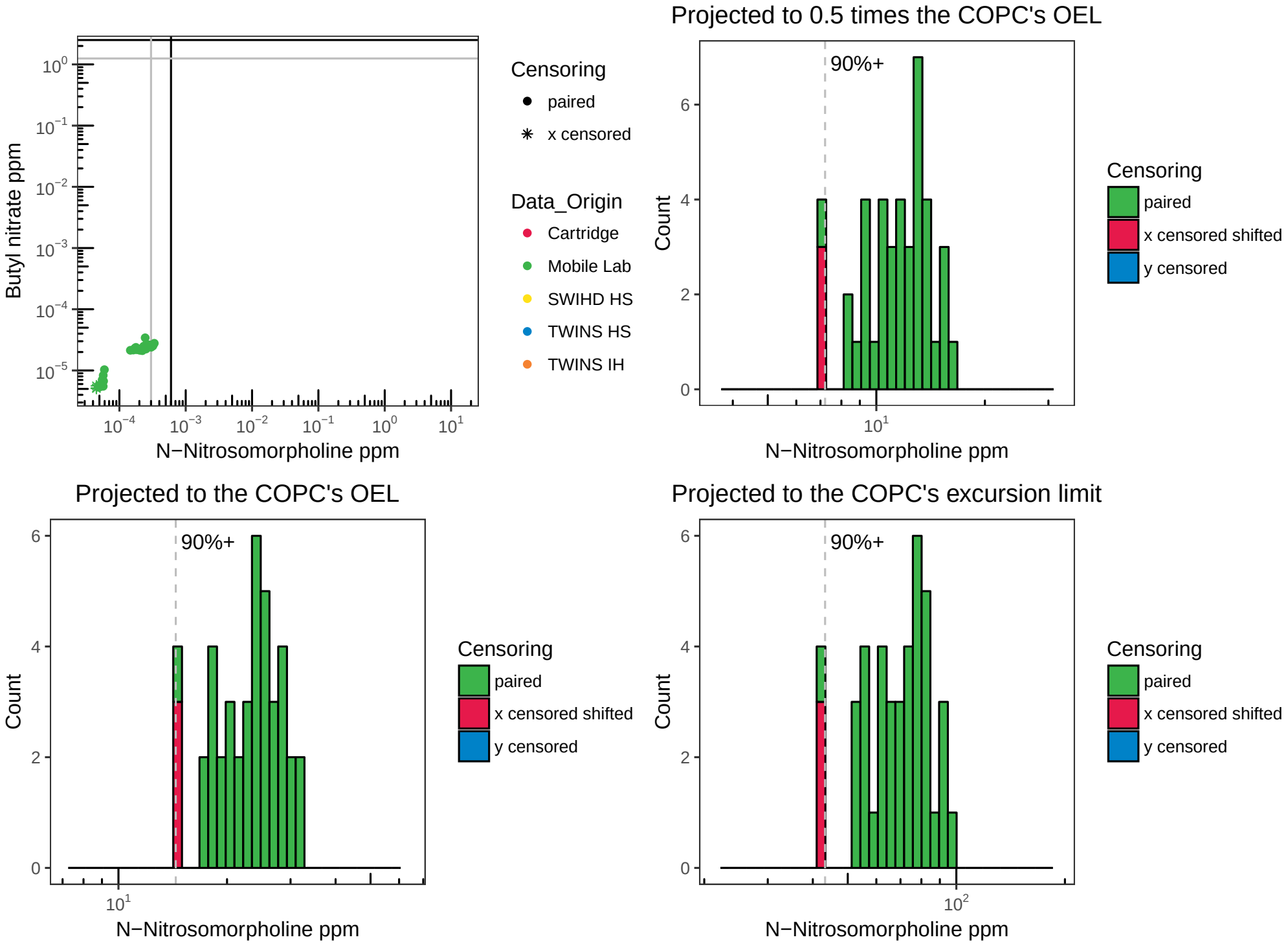


Figure C.2286: Butyl nitrate vs N-Nitrosomorpholine

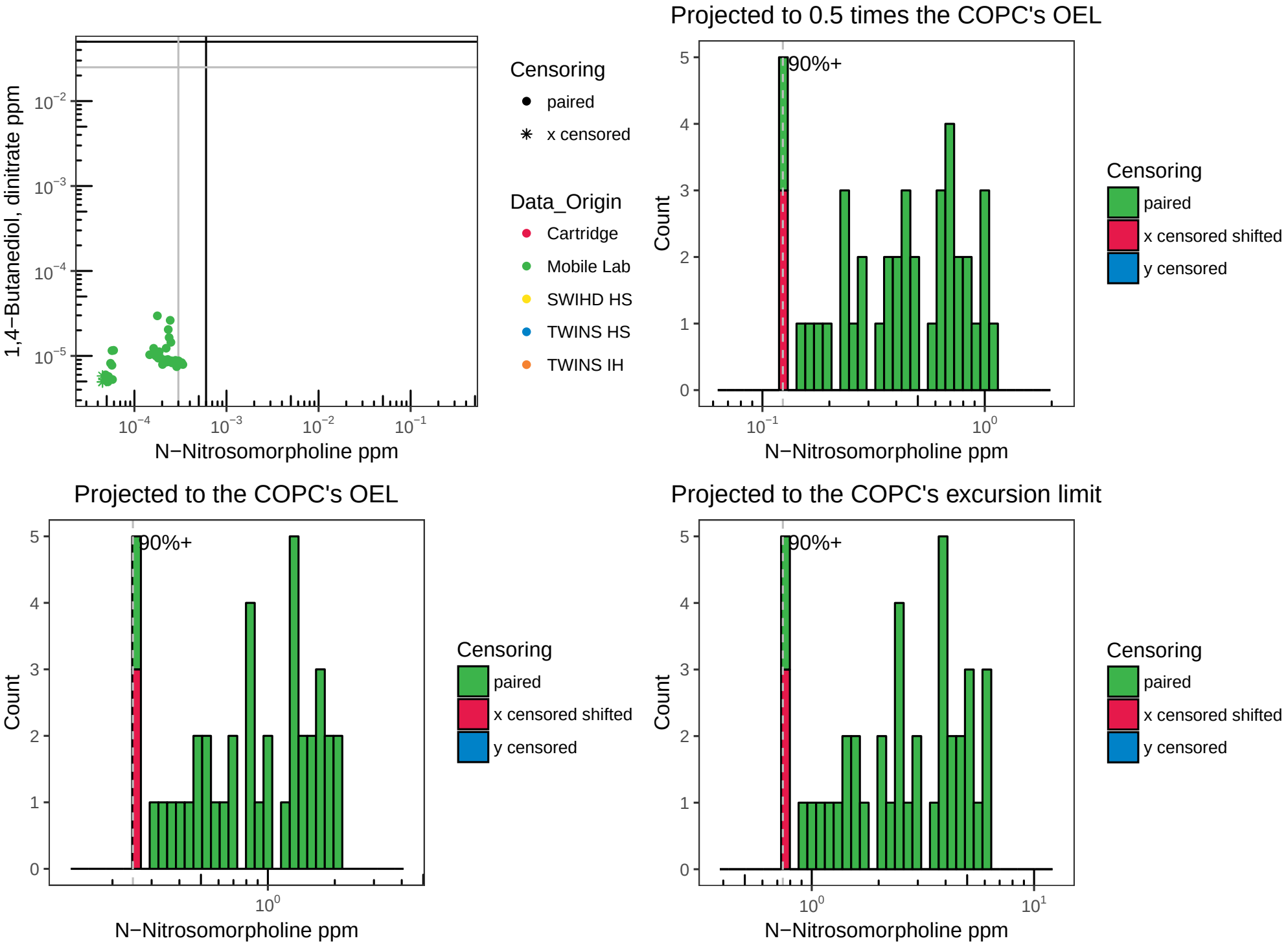


Figure C.2287: 1,4-Butanediol, dinitrate vs N-Nitrosomorpholine

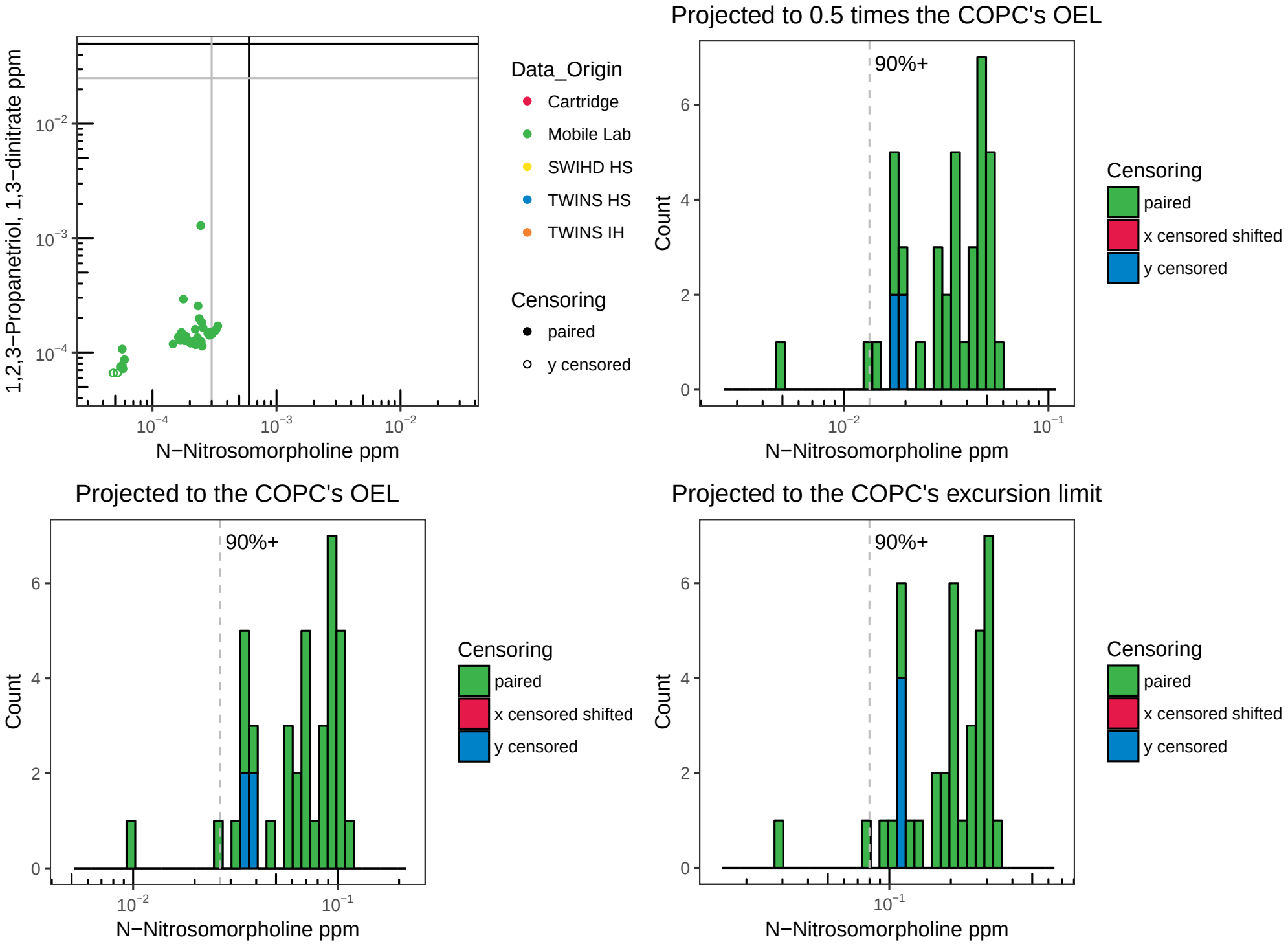


Figure C.2288: 1,2,3-Propanetriol, 1,3-dinitrate vs N-Nitrosomorpholine

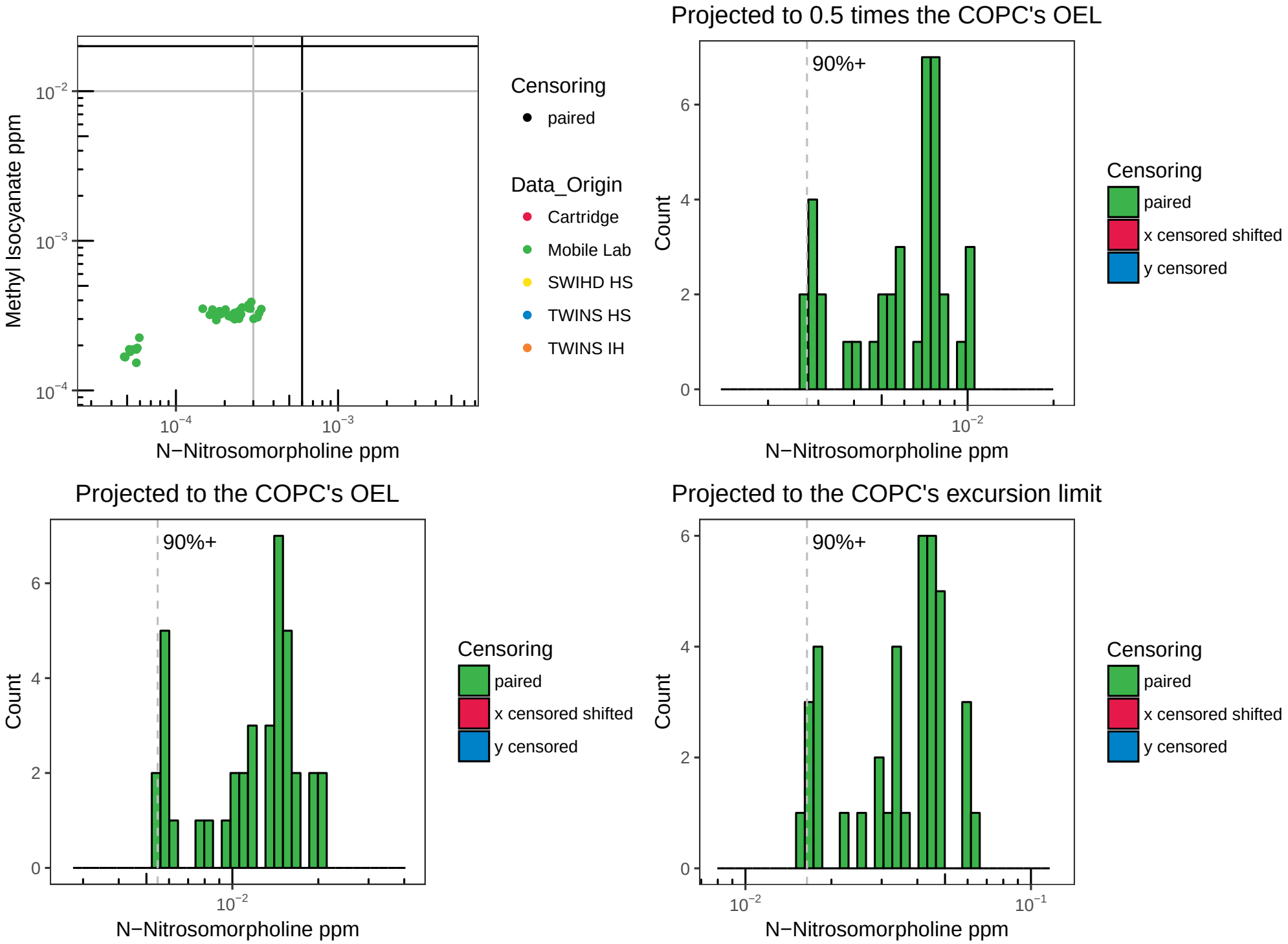


Figure C.2289: Methyl Isocyanate vs N-Nitrosomorpholine

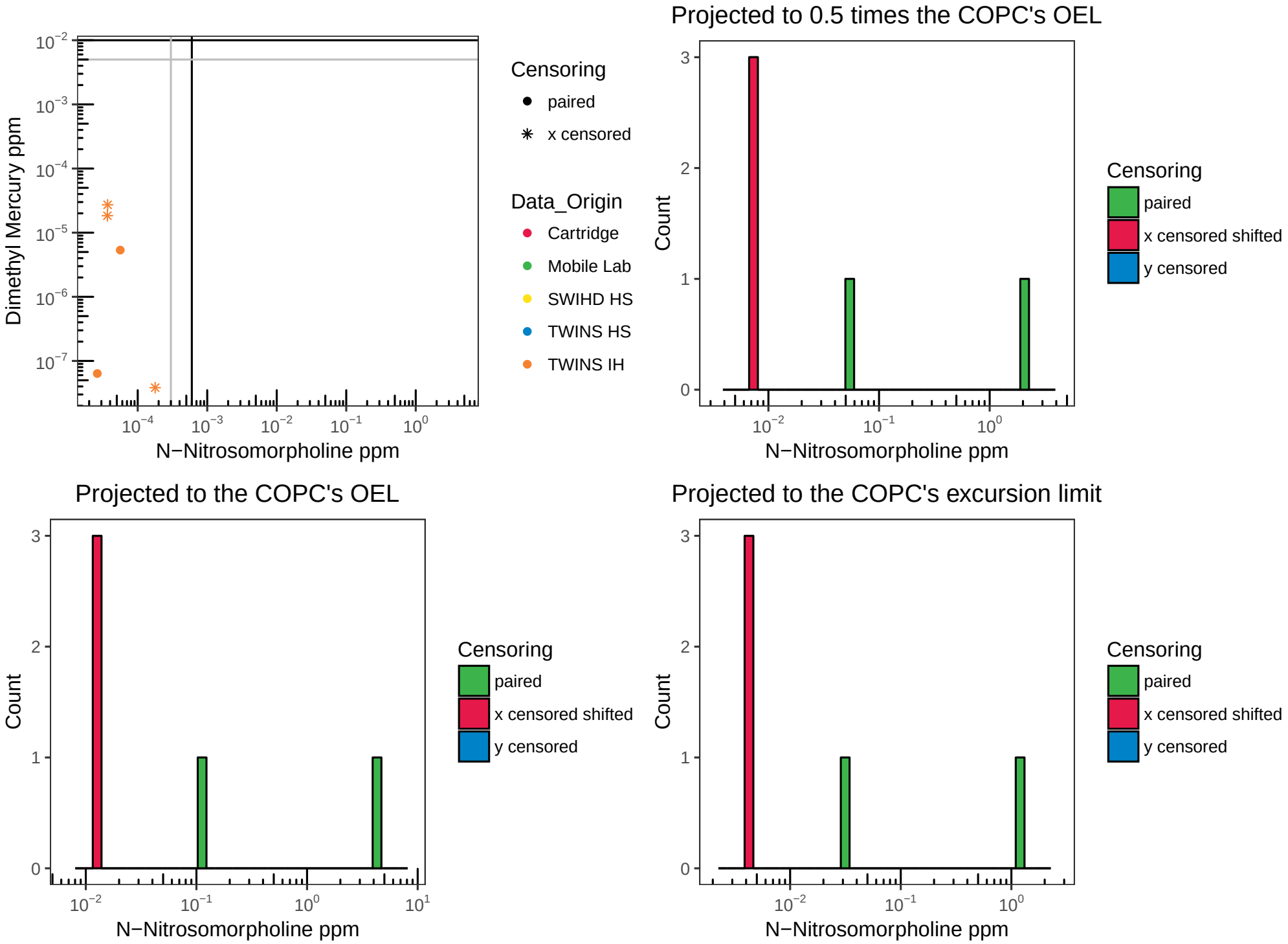


Figure C.2290: Dimethyl Mercury vs N-Nitrosomorpholine

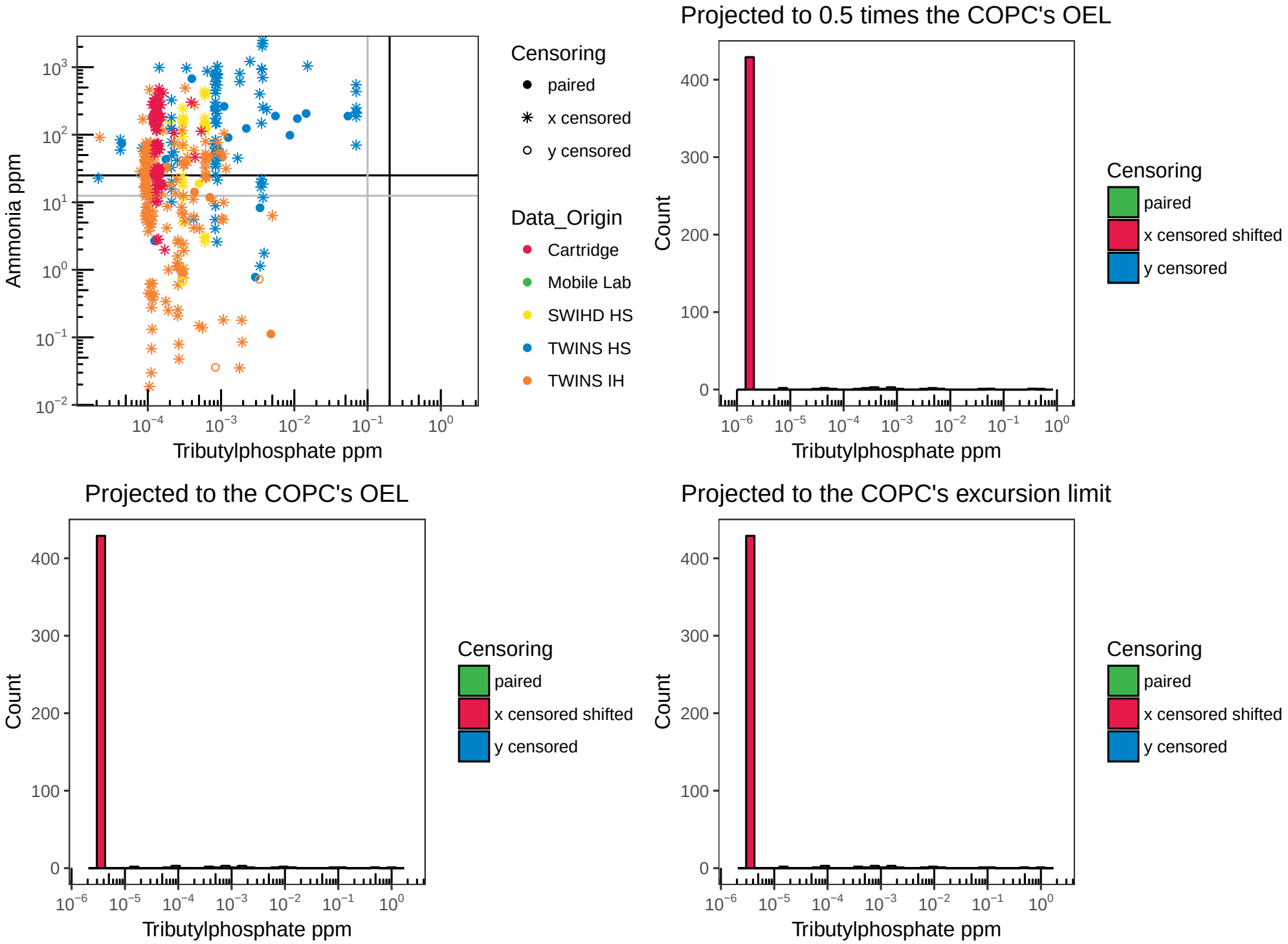


Figure C.2291: Ammonia vs Tributylphosphate

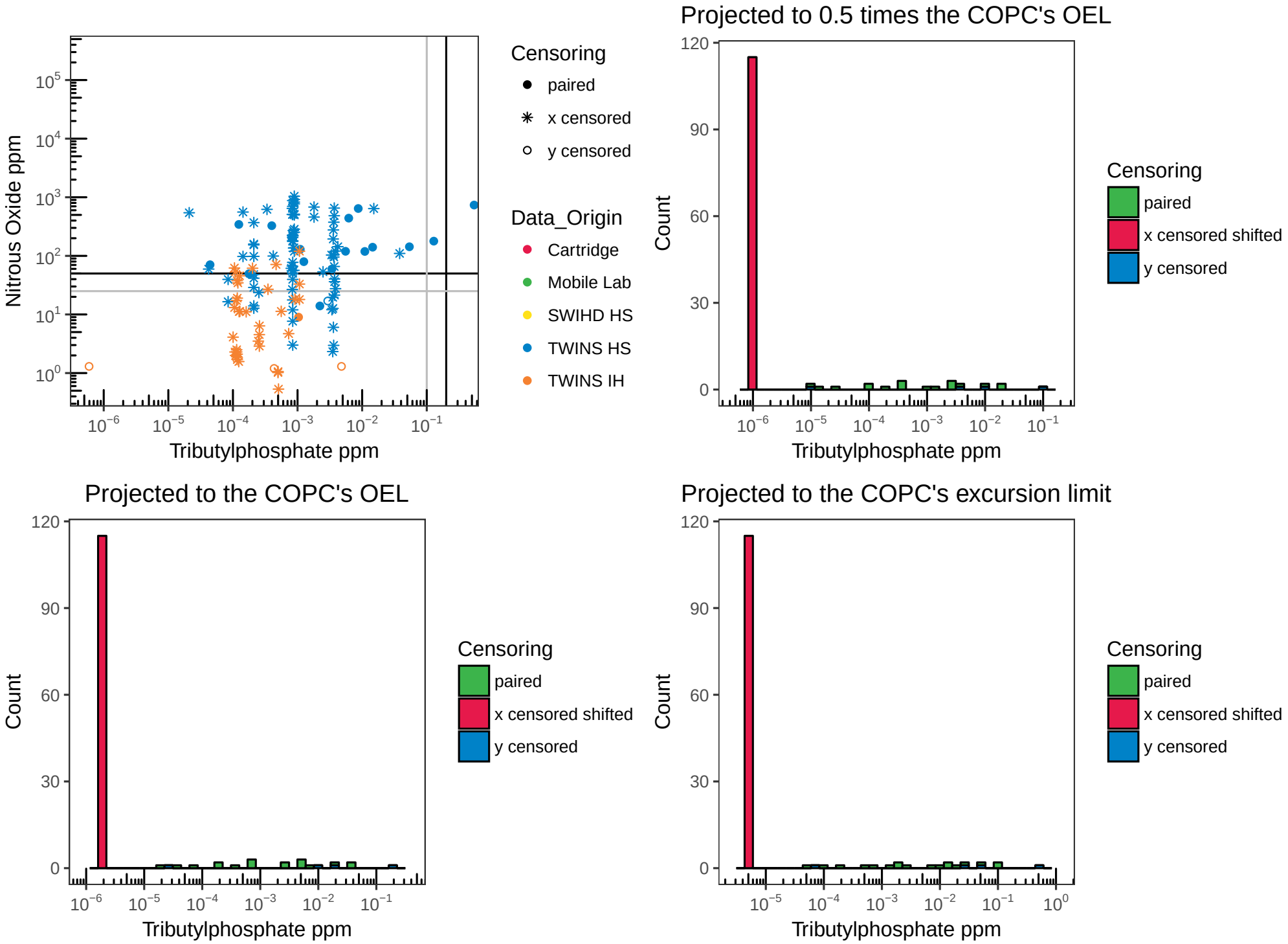


Figure C.2292: Nitrous Oxide vs Tributylphosphate

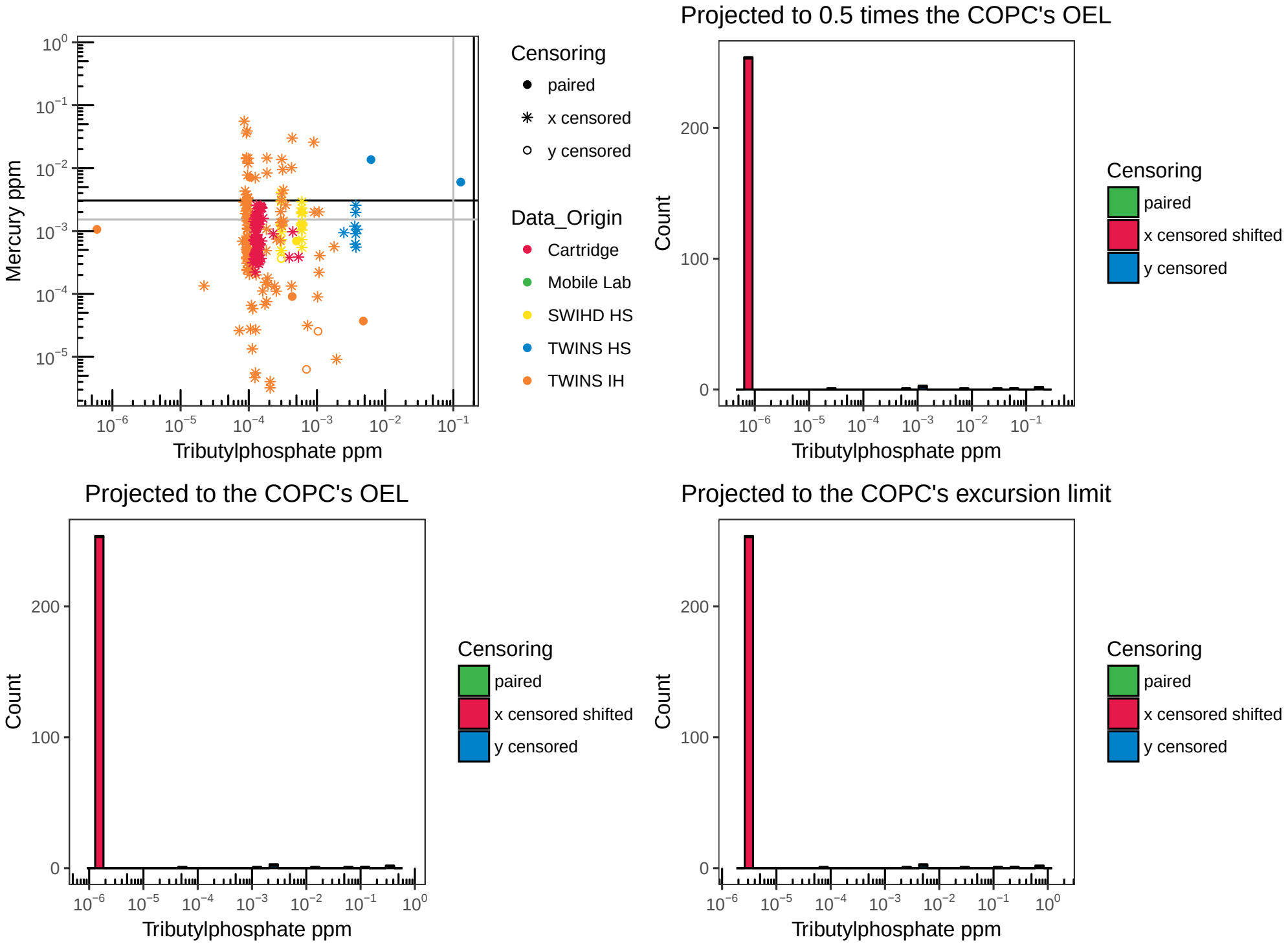


Figure C.2293: Mercury vs Tributylphosphate

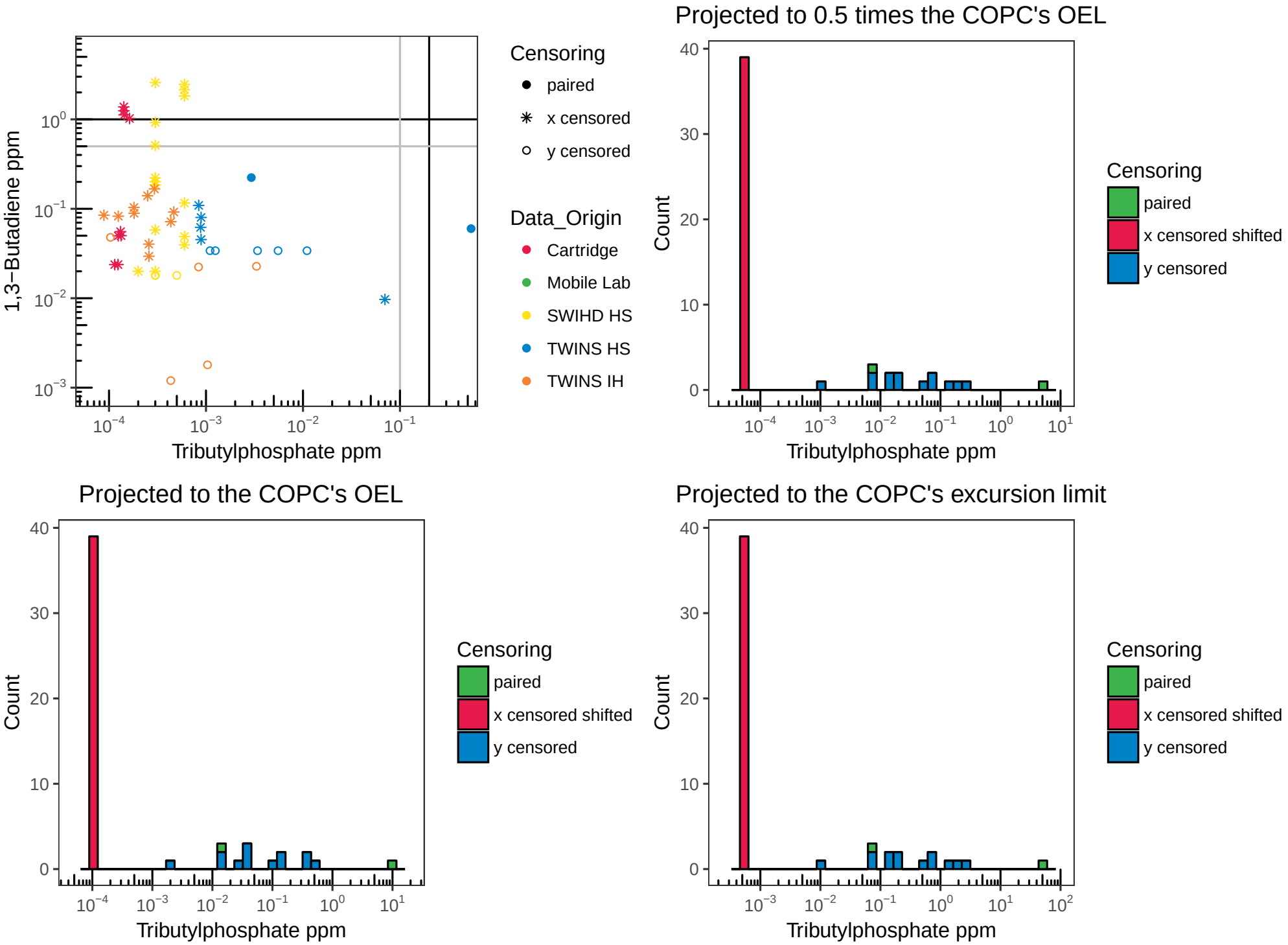


Figure C.2294: 1,3-Butadiene vs Tributylphosphate

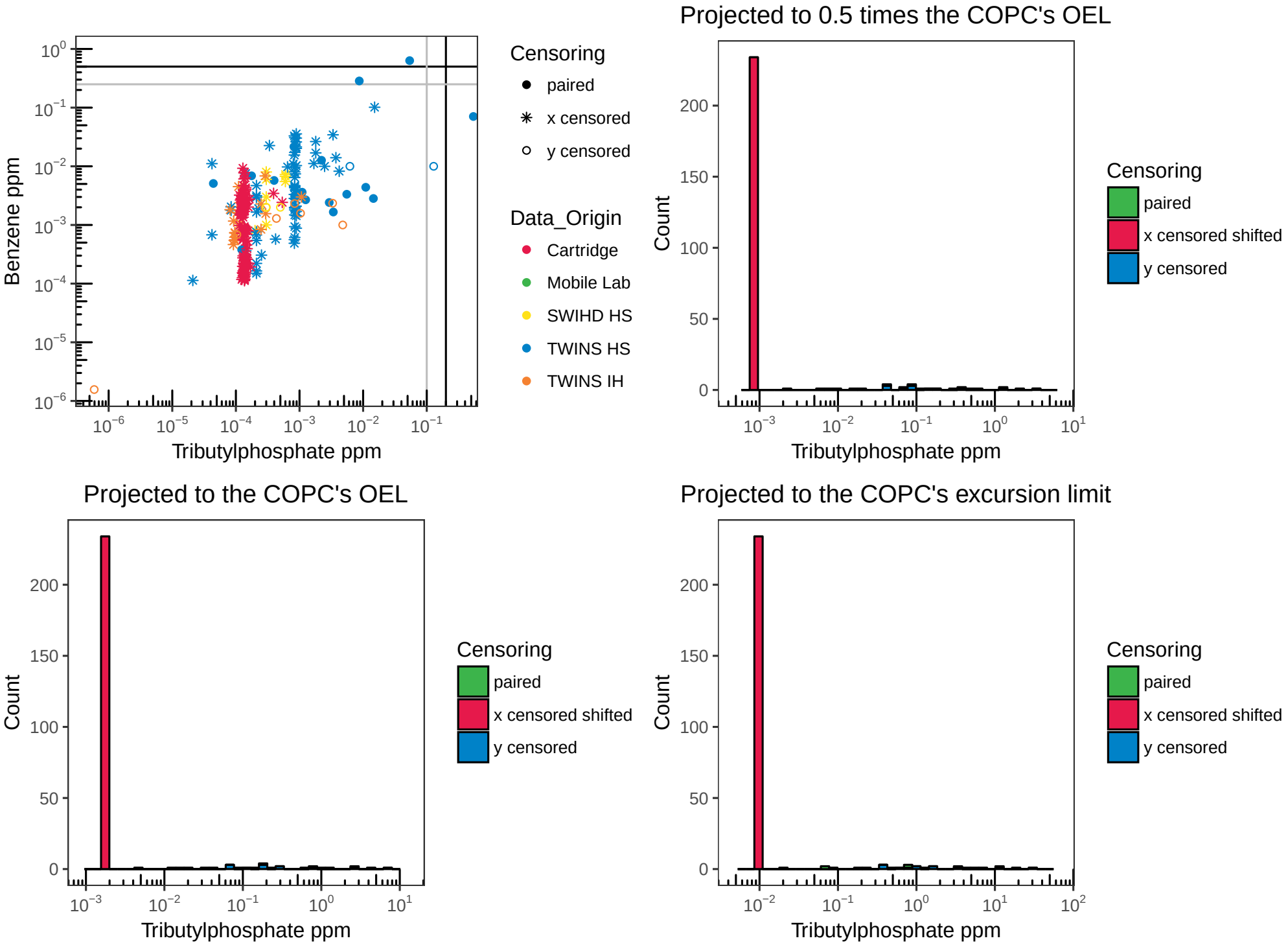


Figure C.2295: Benzene vs Tributylphosphate

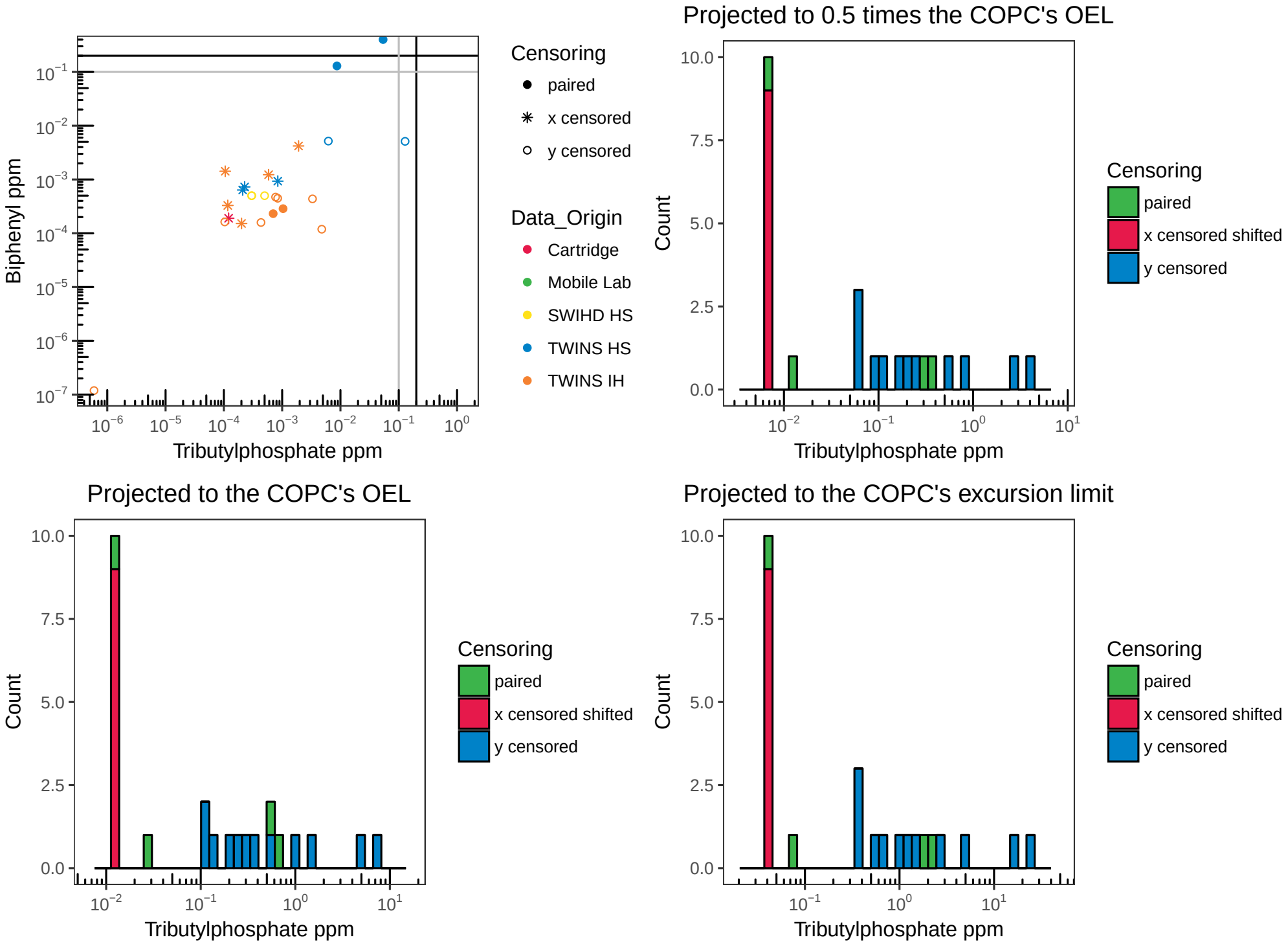


Figure C.2296: Biphenyl vs Tributylphosphate

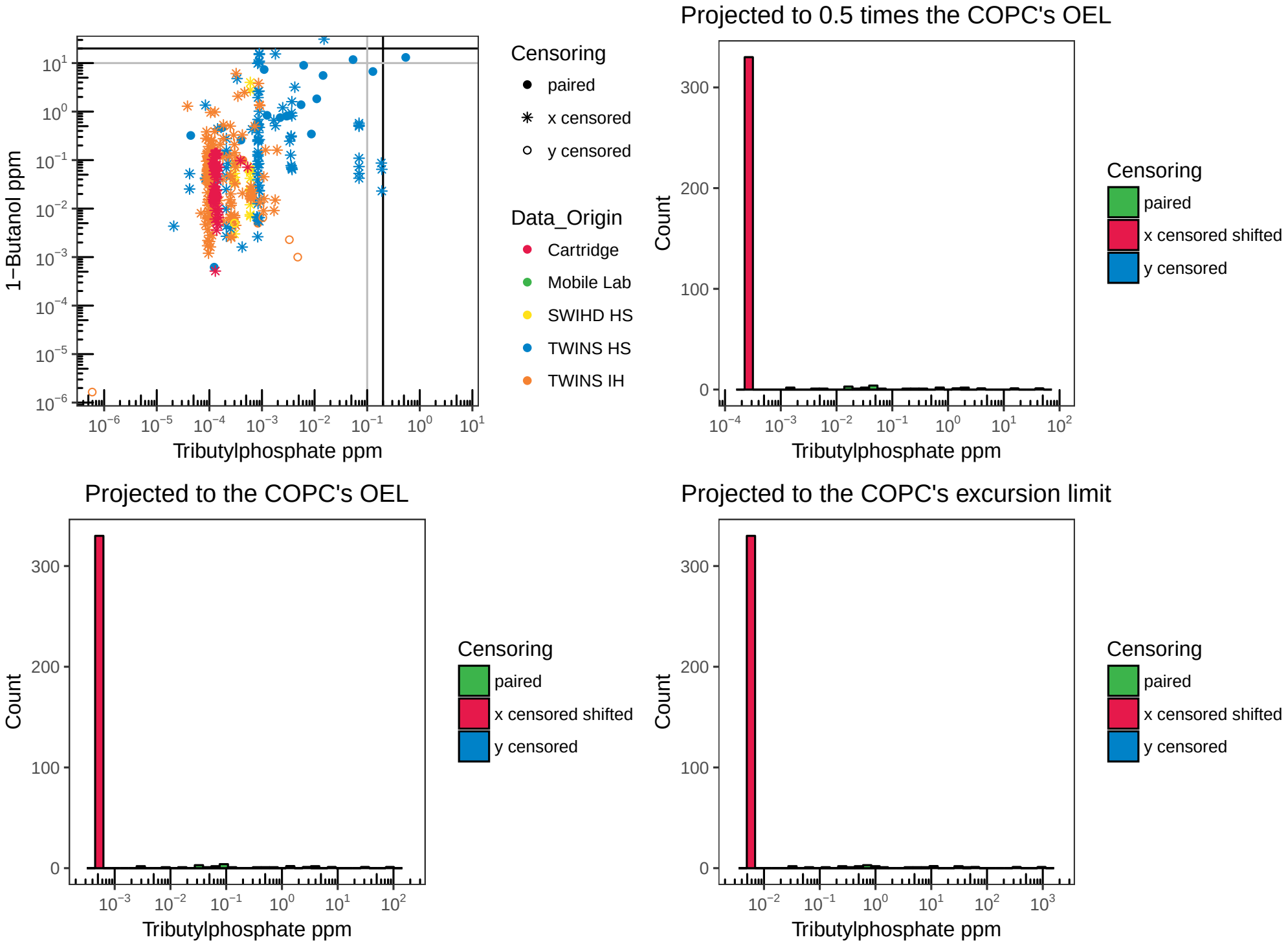


Figure C.2297: 1-Butanol vs Tributylphosphate

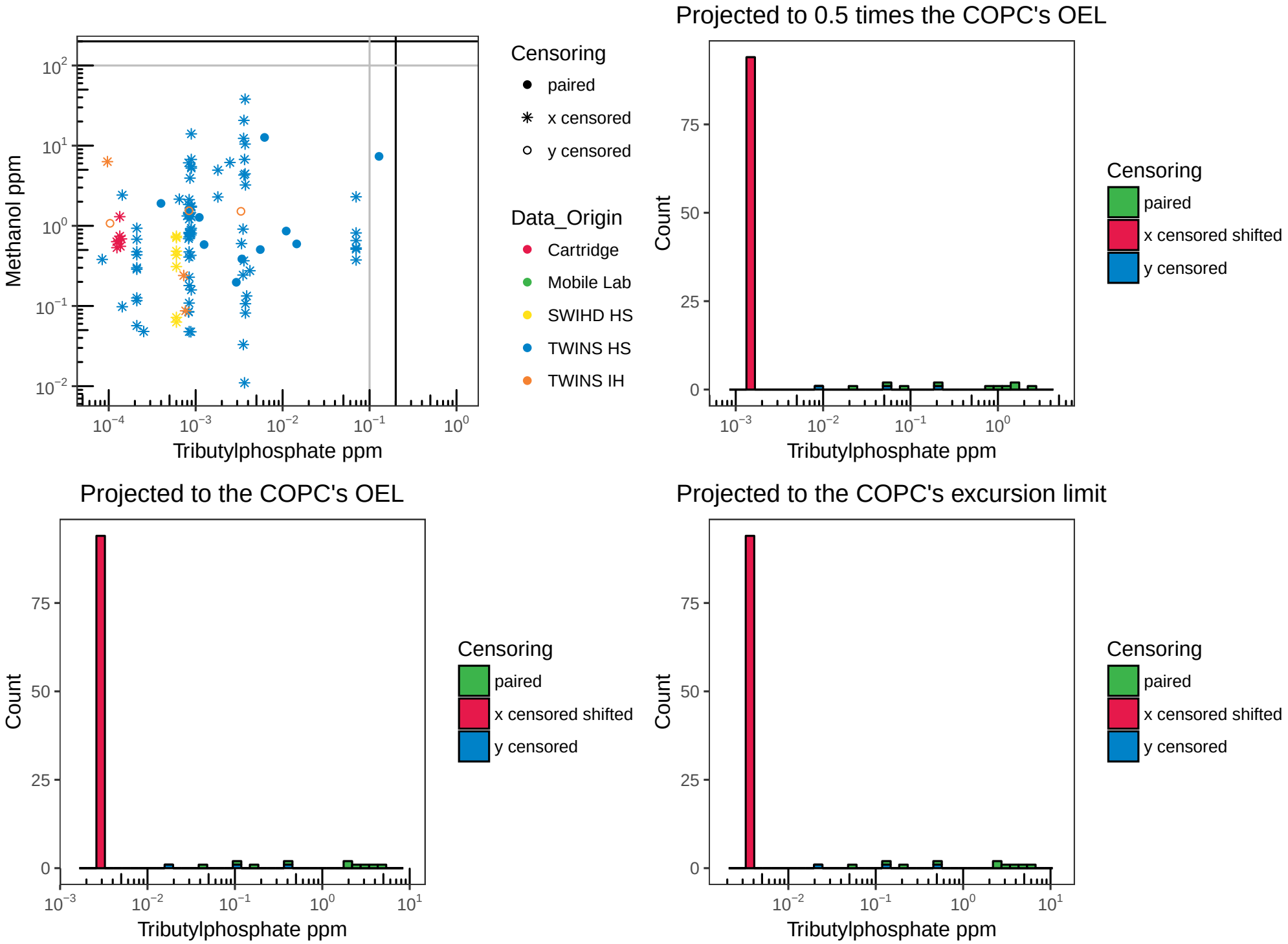


Figure C.2298: Methanol vs Tributylphosphate

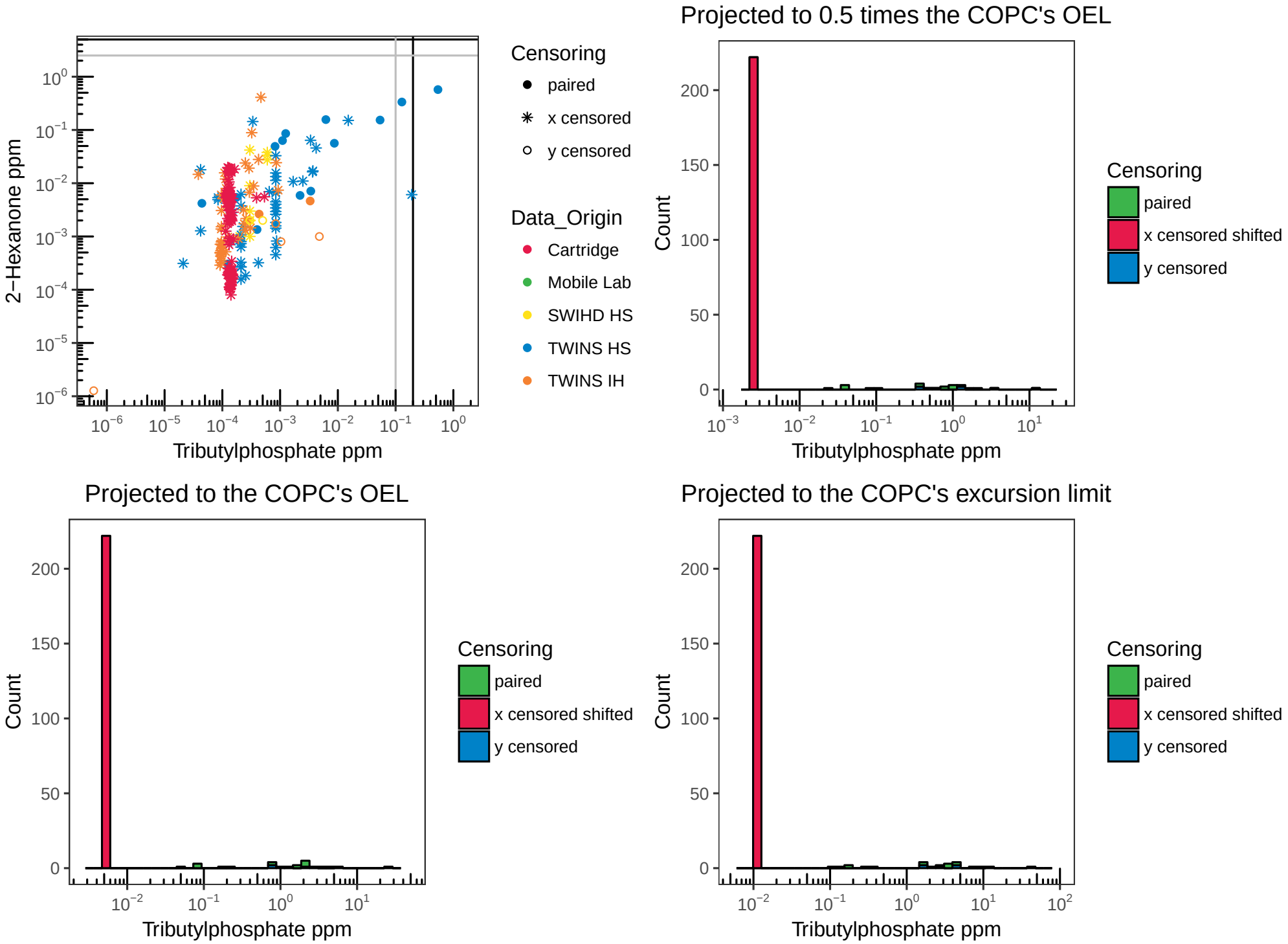


Figure C.2299: 2-Hexanone vs Tributylphosphate

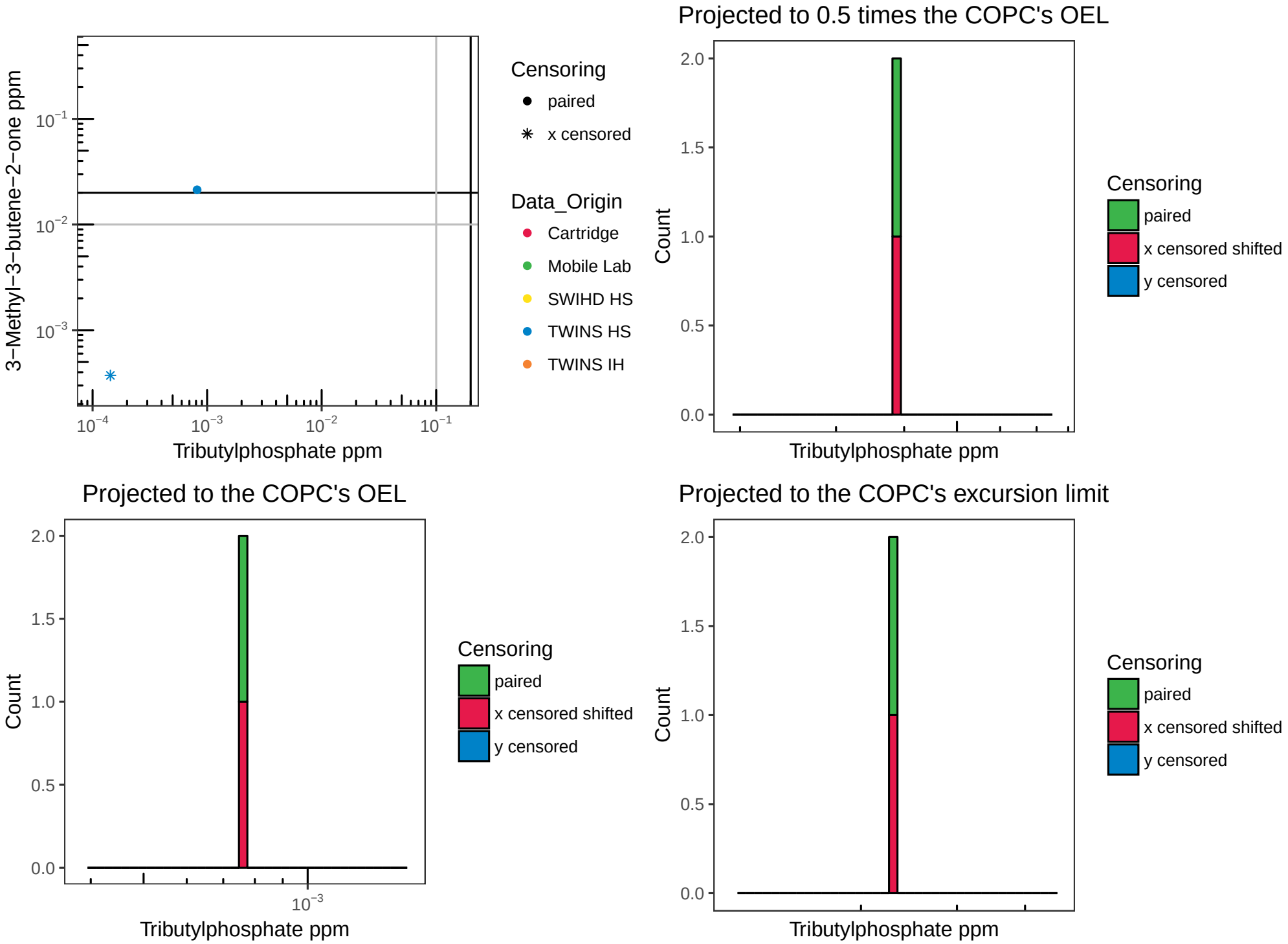


Figure C.2300: 3-Methyl-3-butene-2-one vs Tributylphosphate

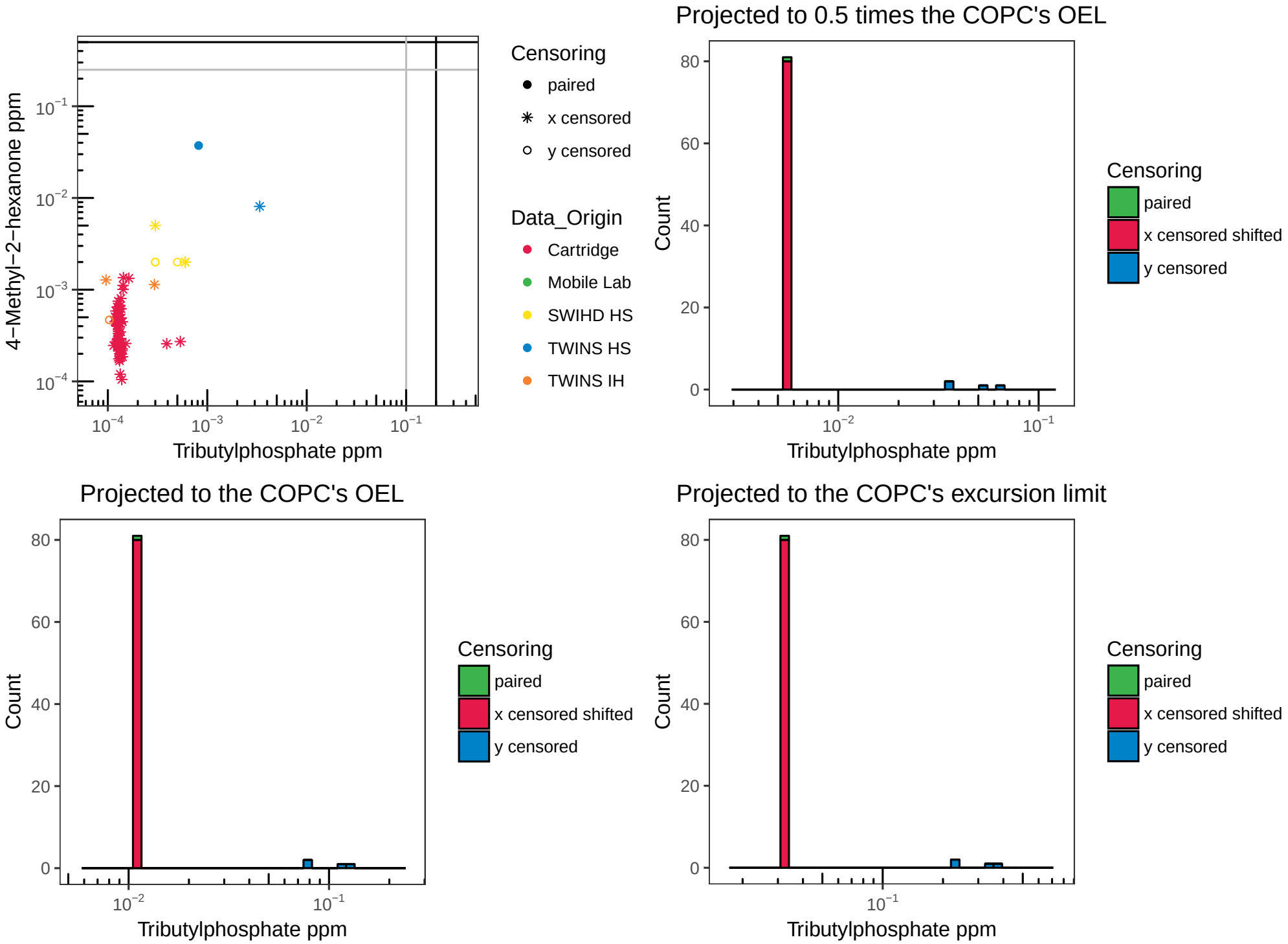


Figure C.2301: 4-Methyl-2-hexanone vs Tributylphosphate

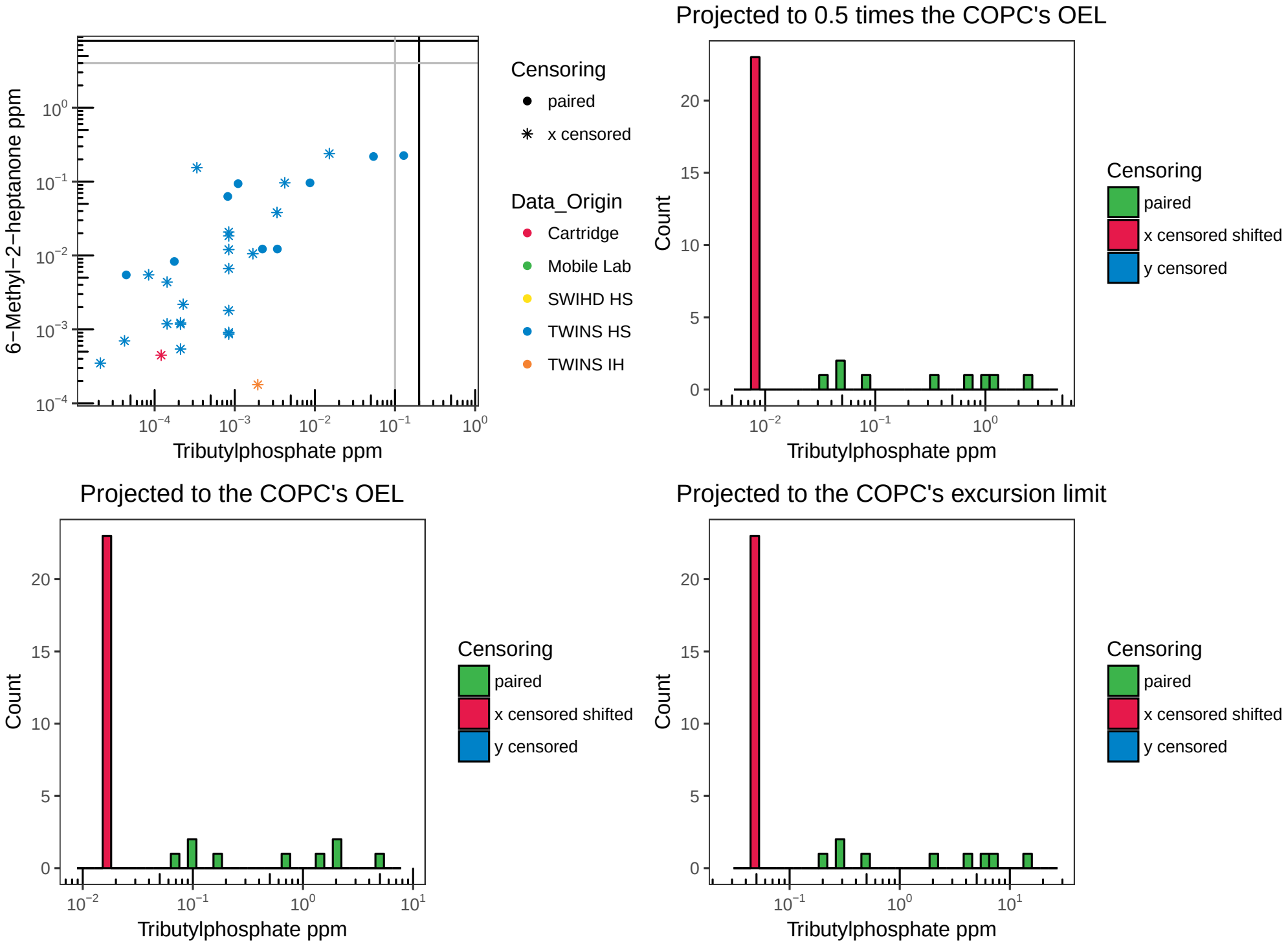


Figure C.2302: 6-Methyl-2-heptanone vs Tributylphosphate

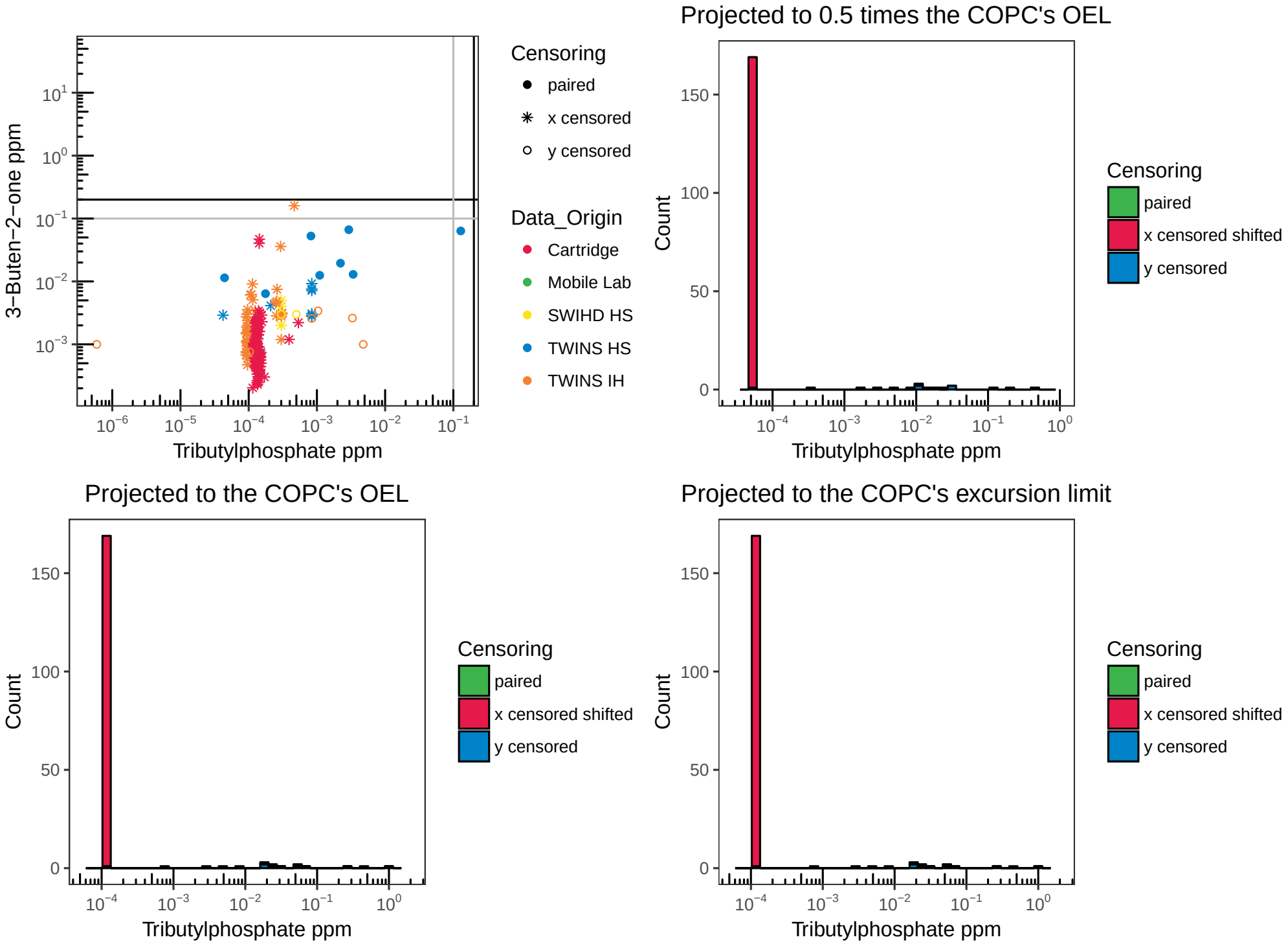


Figure C.2303: 3-Buten-2-one vs Tributylphosphate

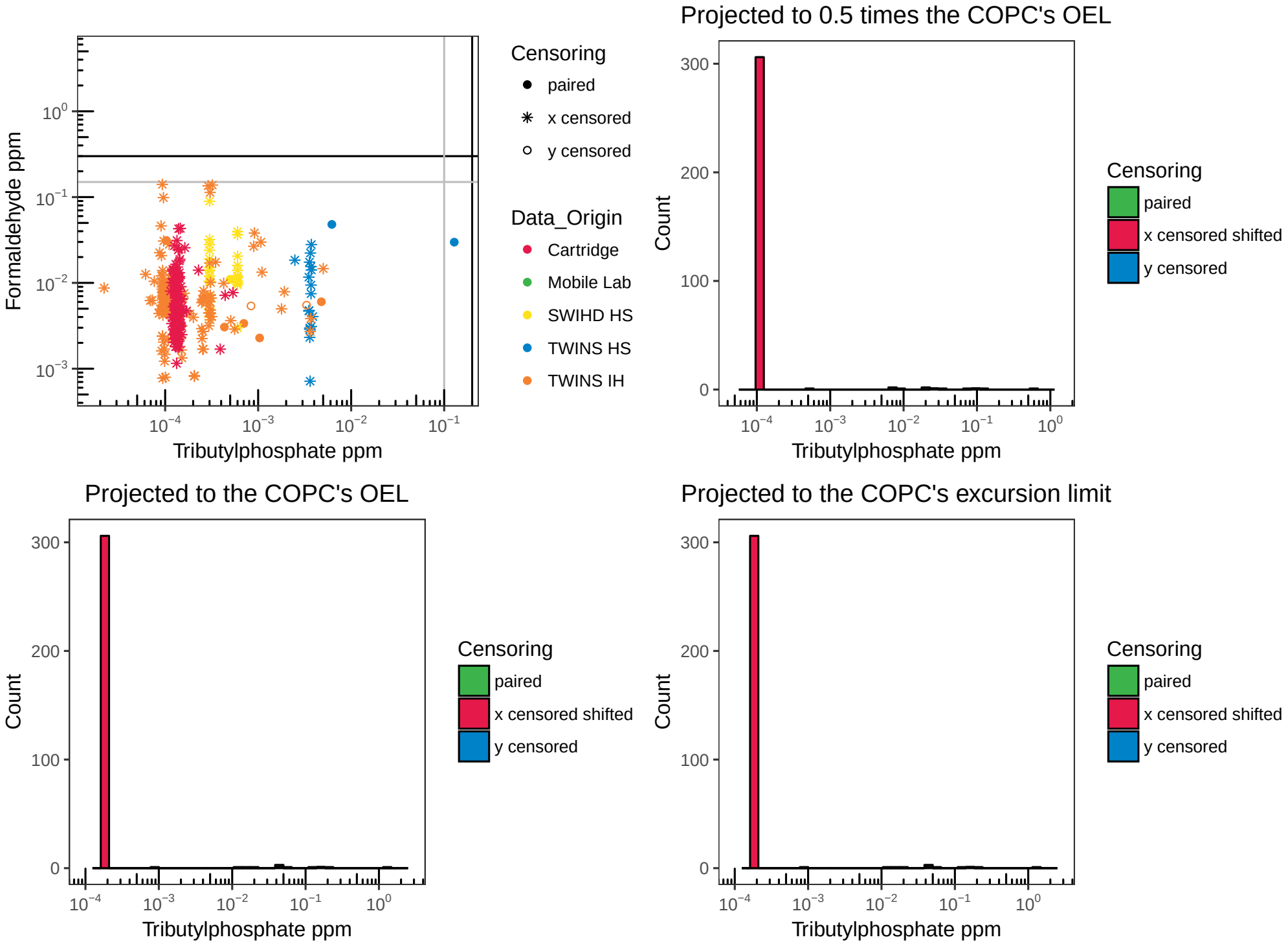


Figure C.2304: Formaldehyde vs Tributylphosphate

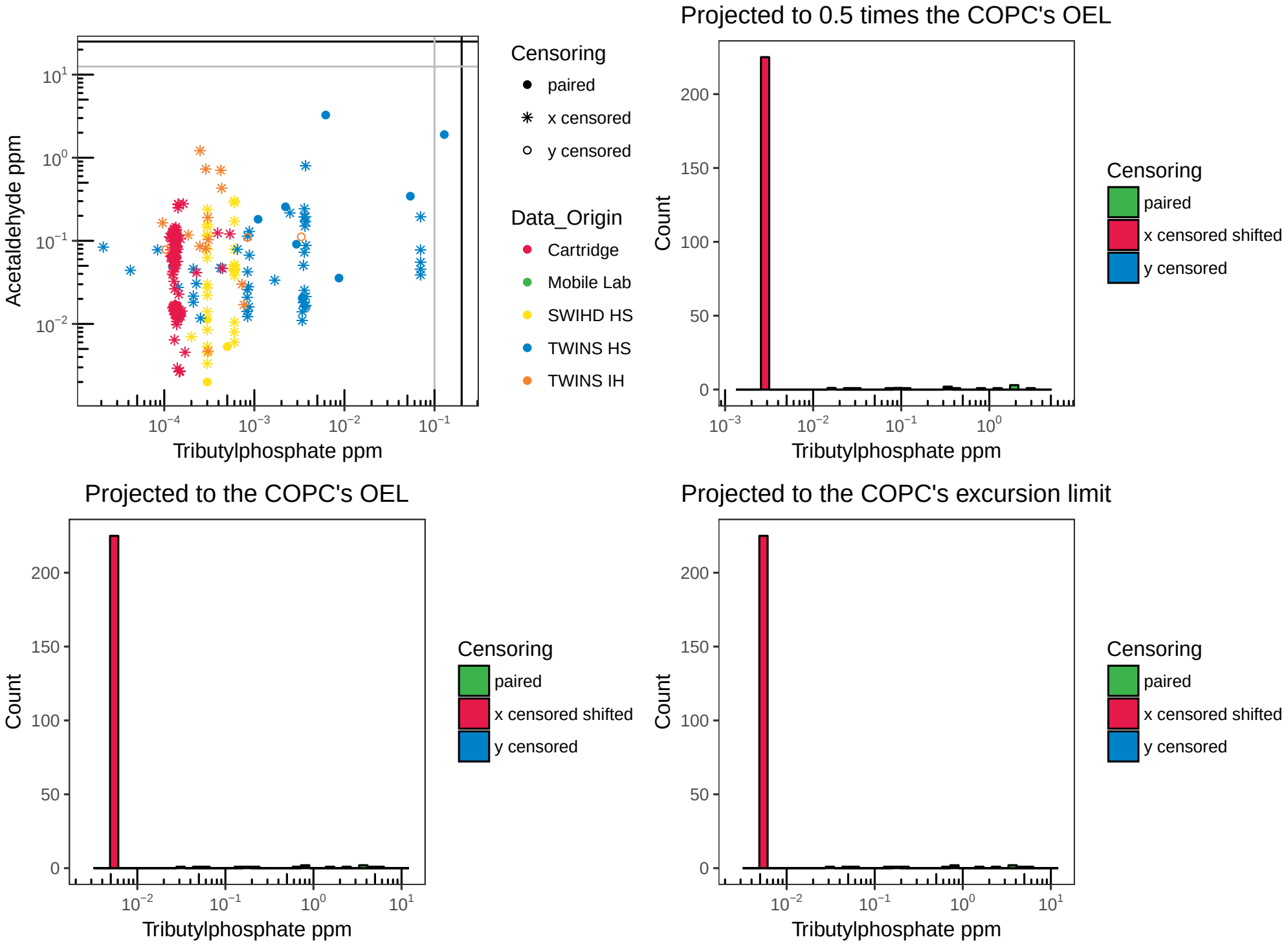


Figure C.2305: Acetaldehyde vs Tributylphosphate

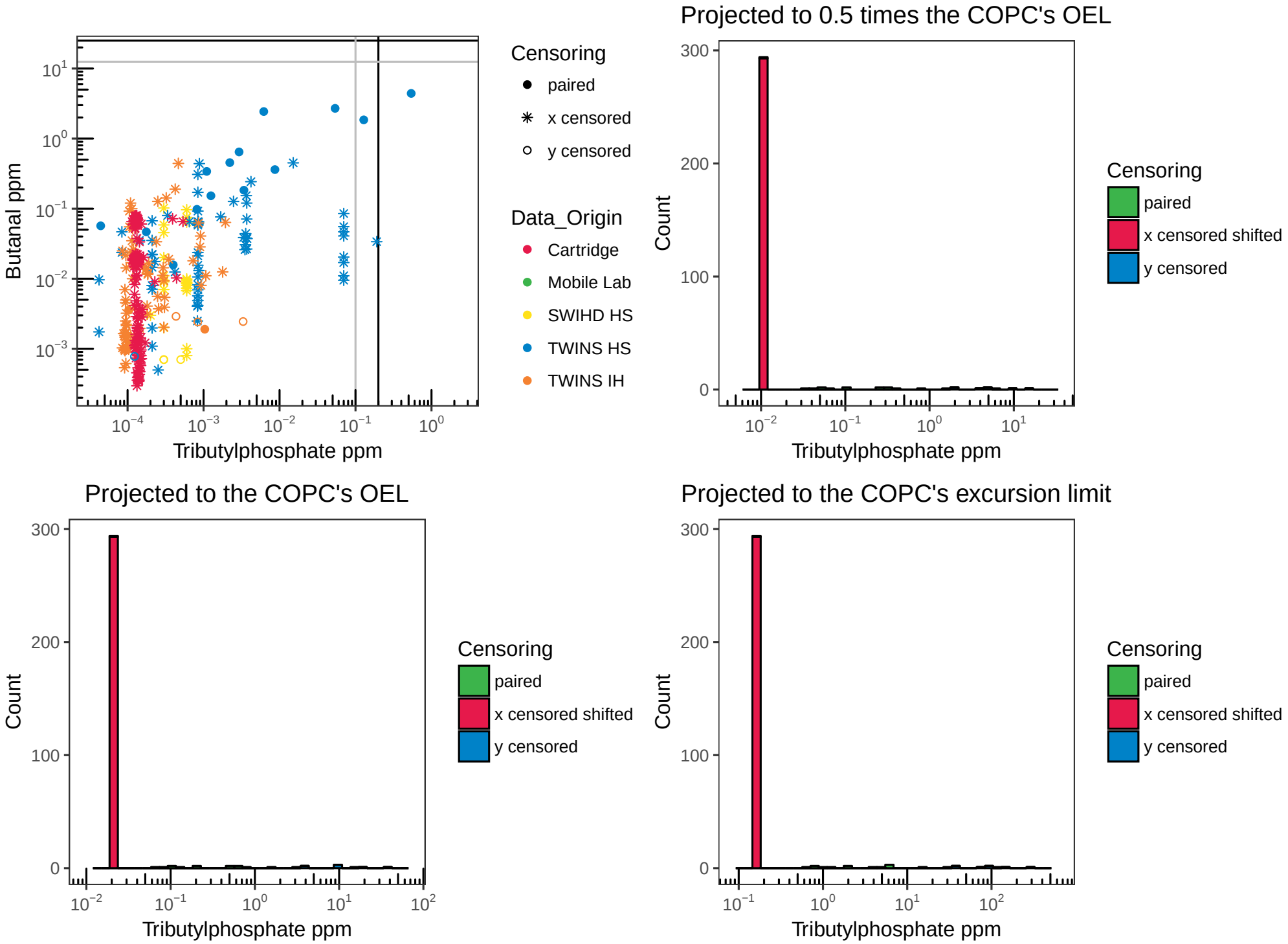


Figure C.2306: Butanal vs Tributylphosphate

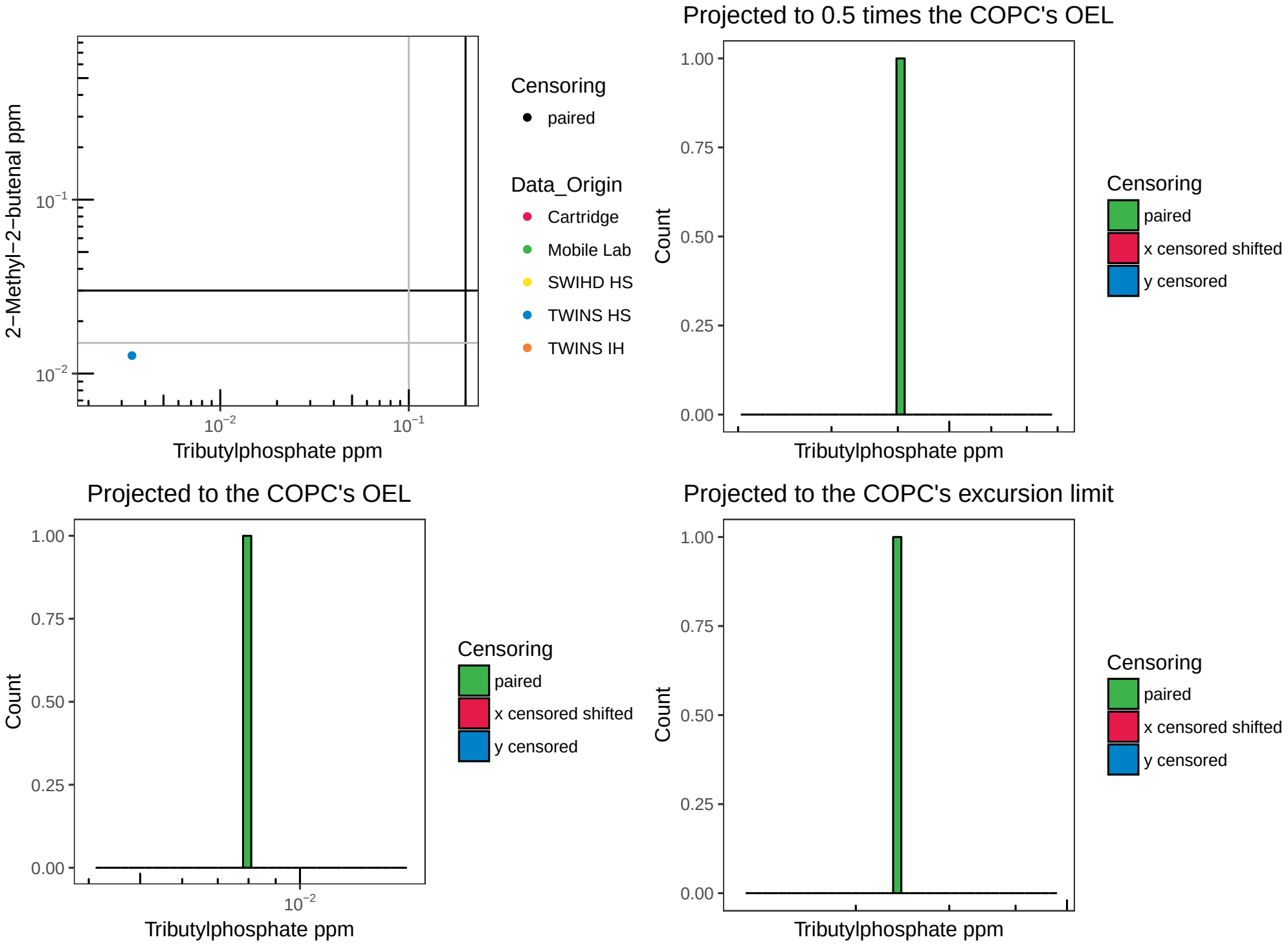


Figure C.2307: 2-Methyl-2-butenal vs Tributylphosphate

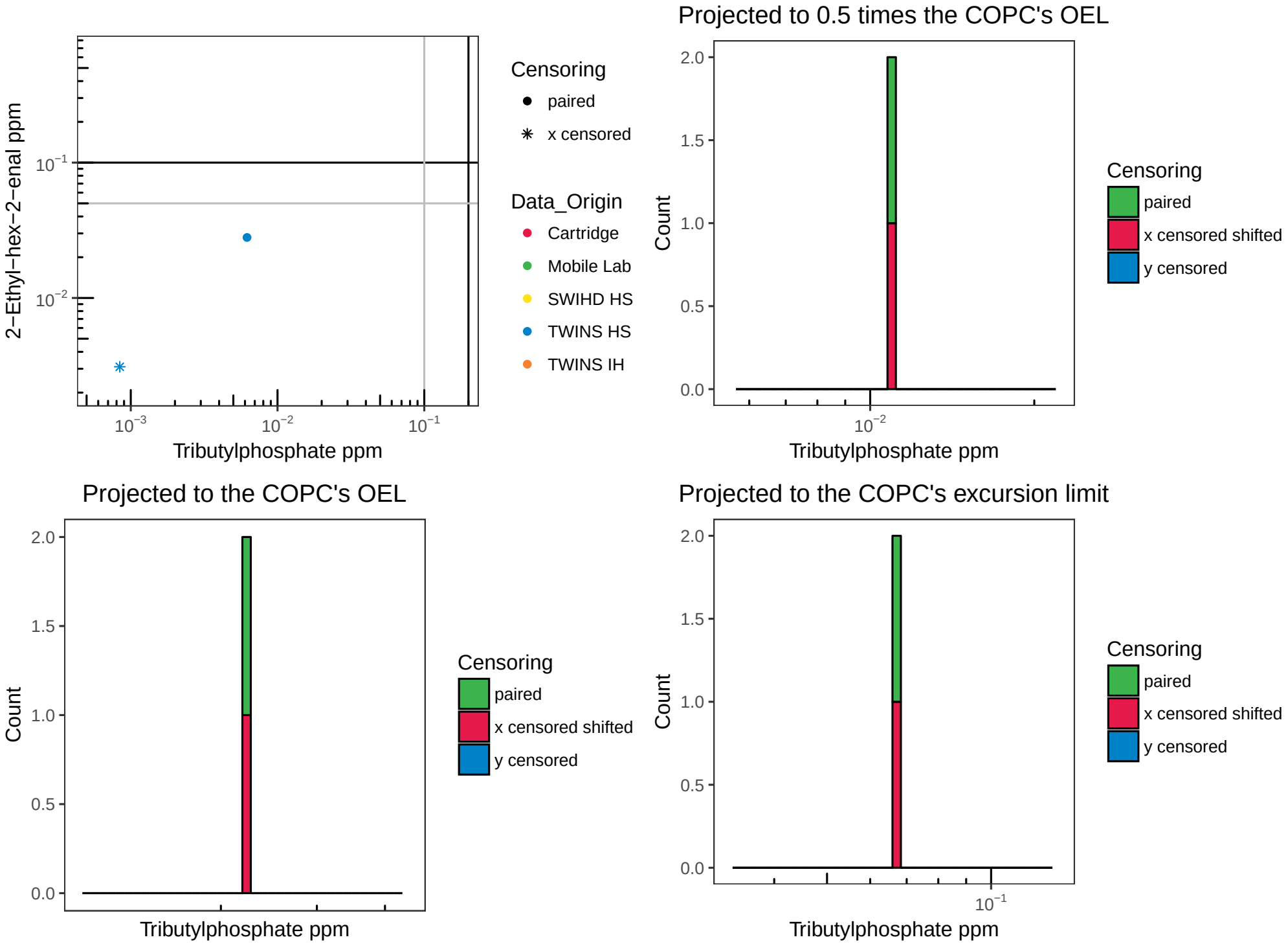


Figure C.2308: 2-Ethyl-hex-2-enal vs Tributylphosphate

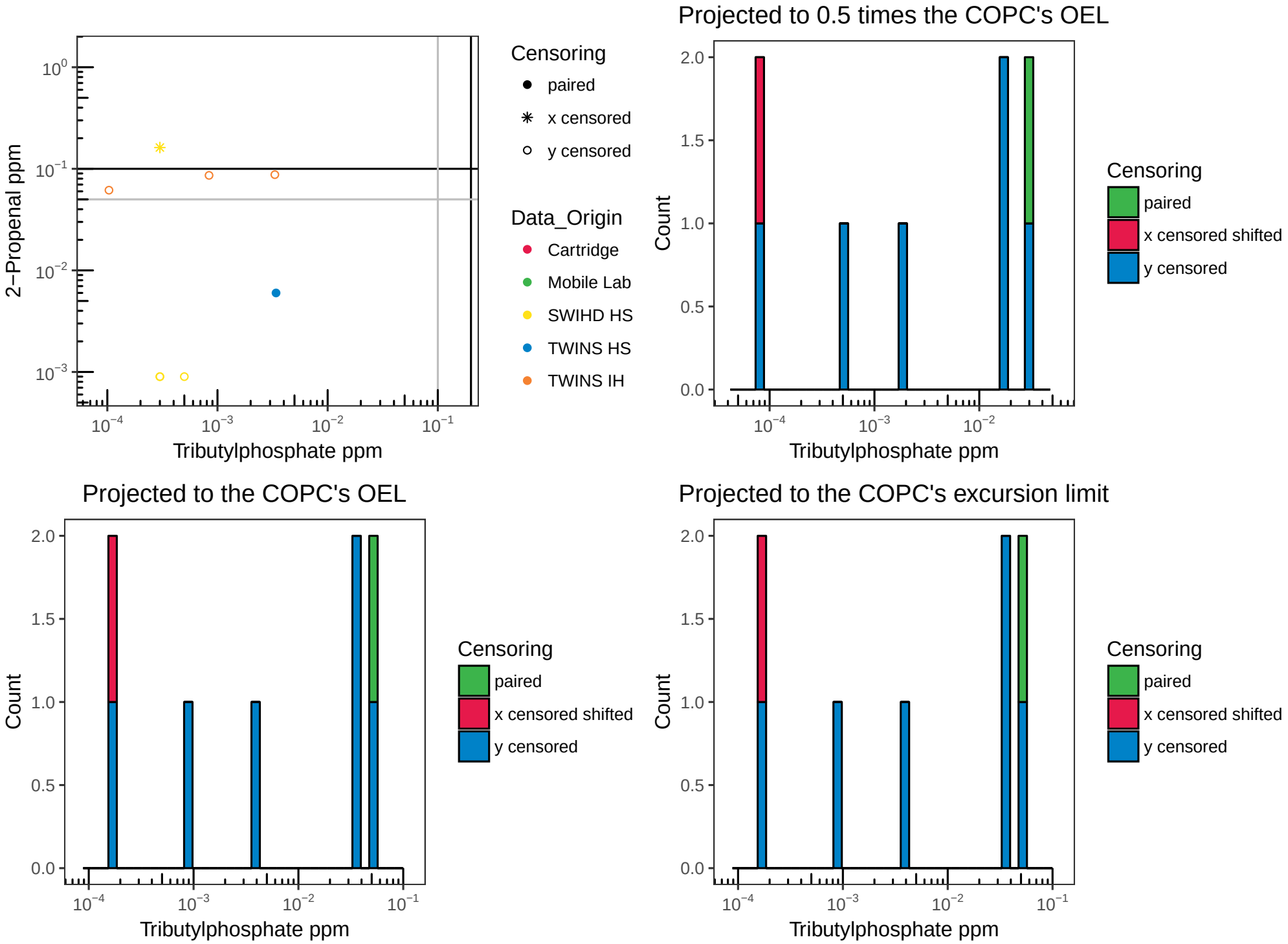


Figure C.2309: 2-Propenal vs Tributylphosphate

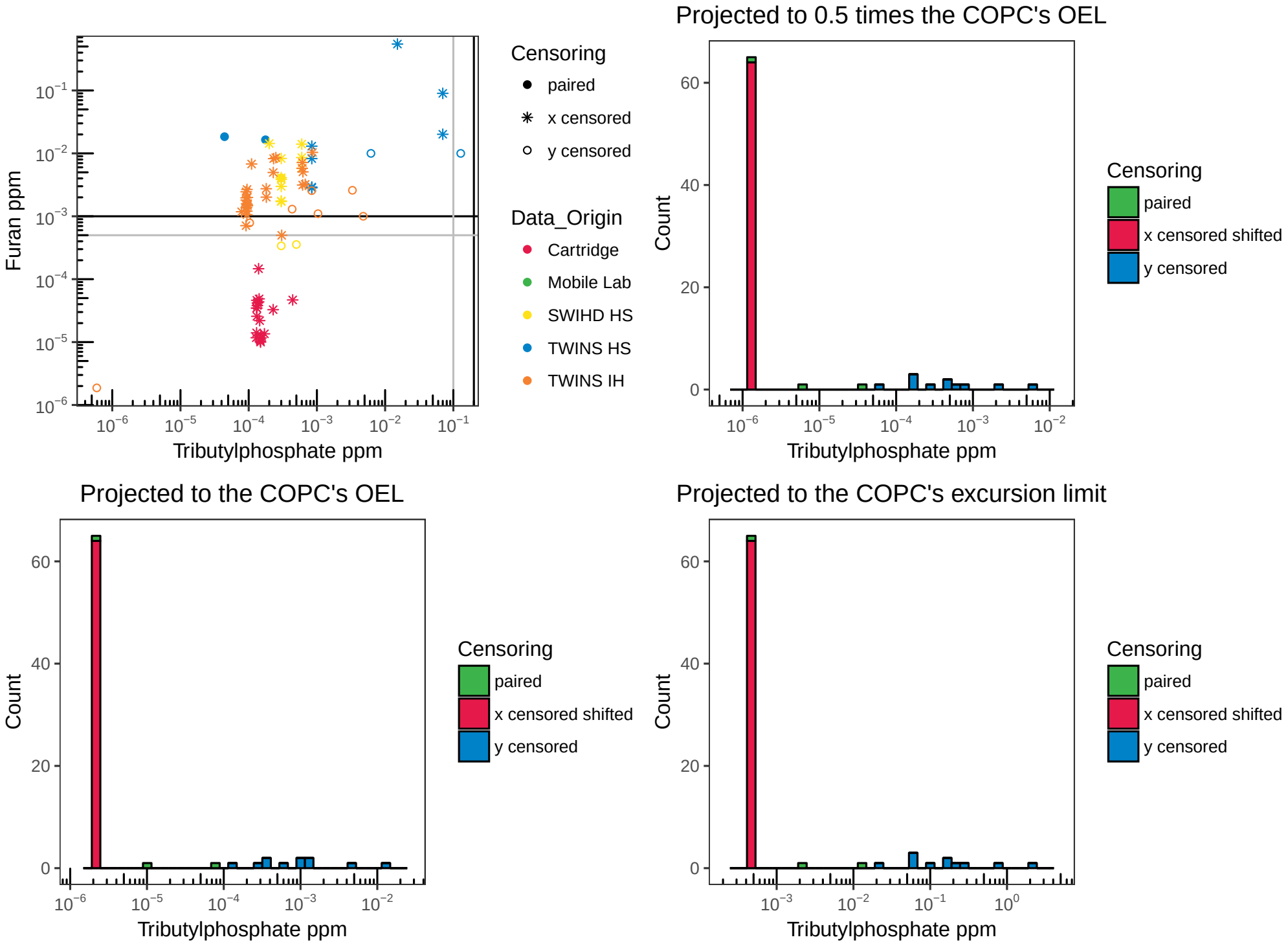


Figure C.2310: Furan vs Tributylphosphate

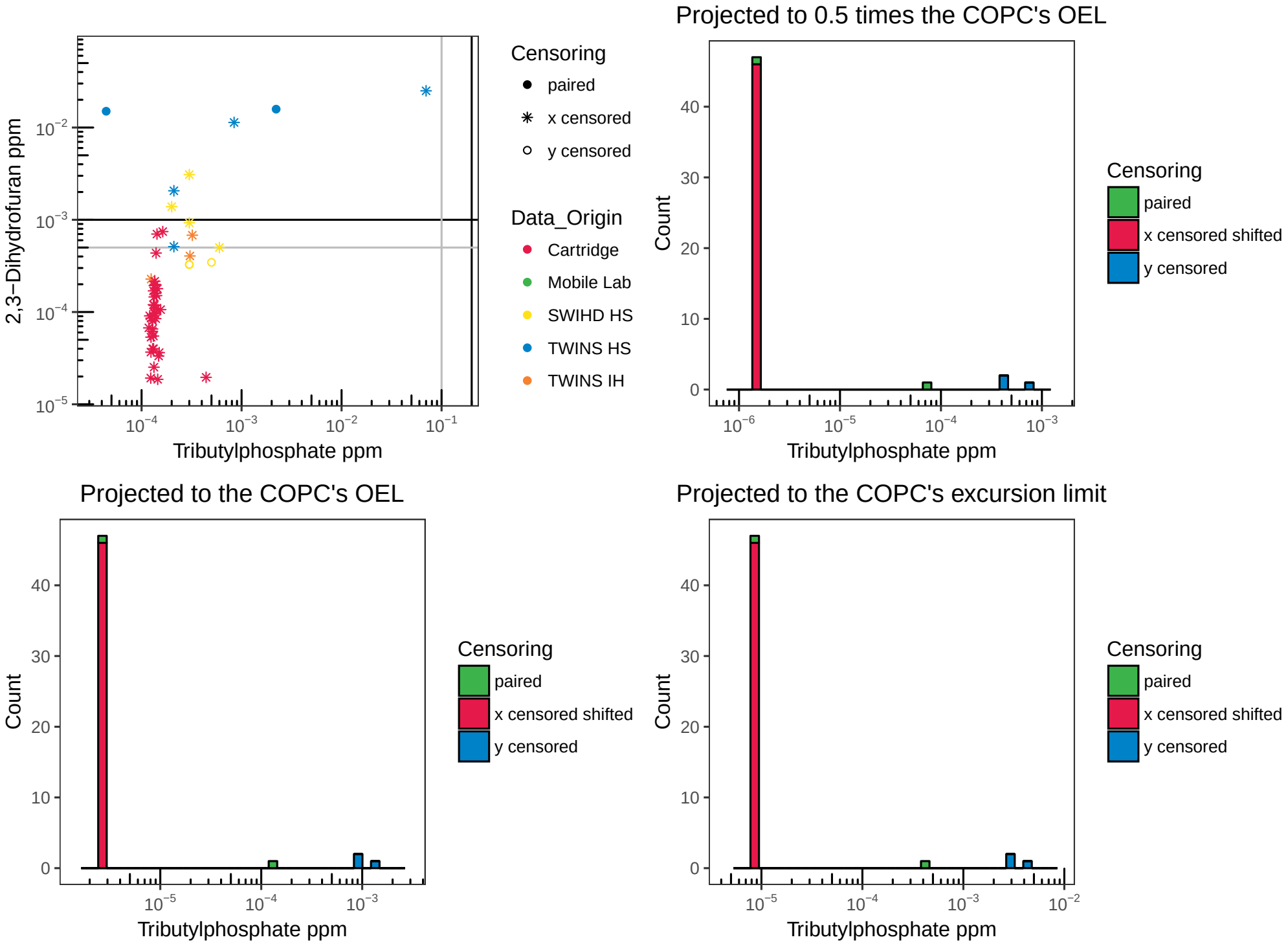


Figure C.2311: 2,3-Dihydrofuran vs Tributylphosphate

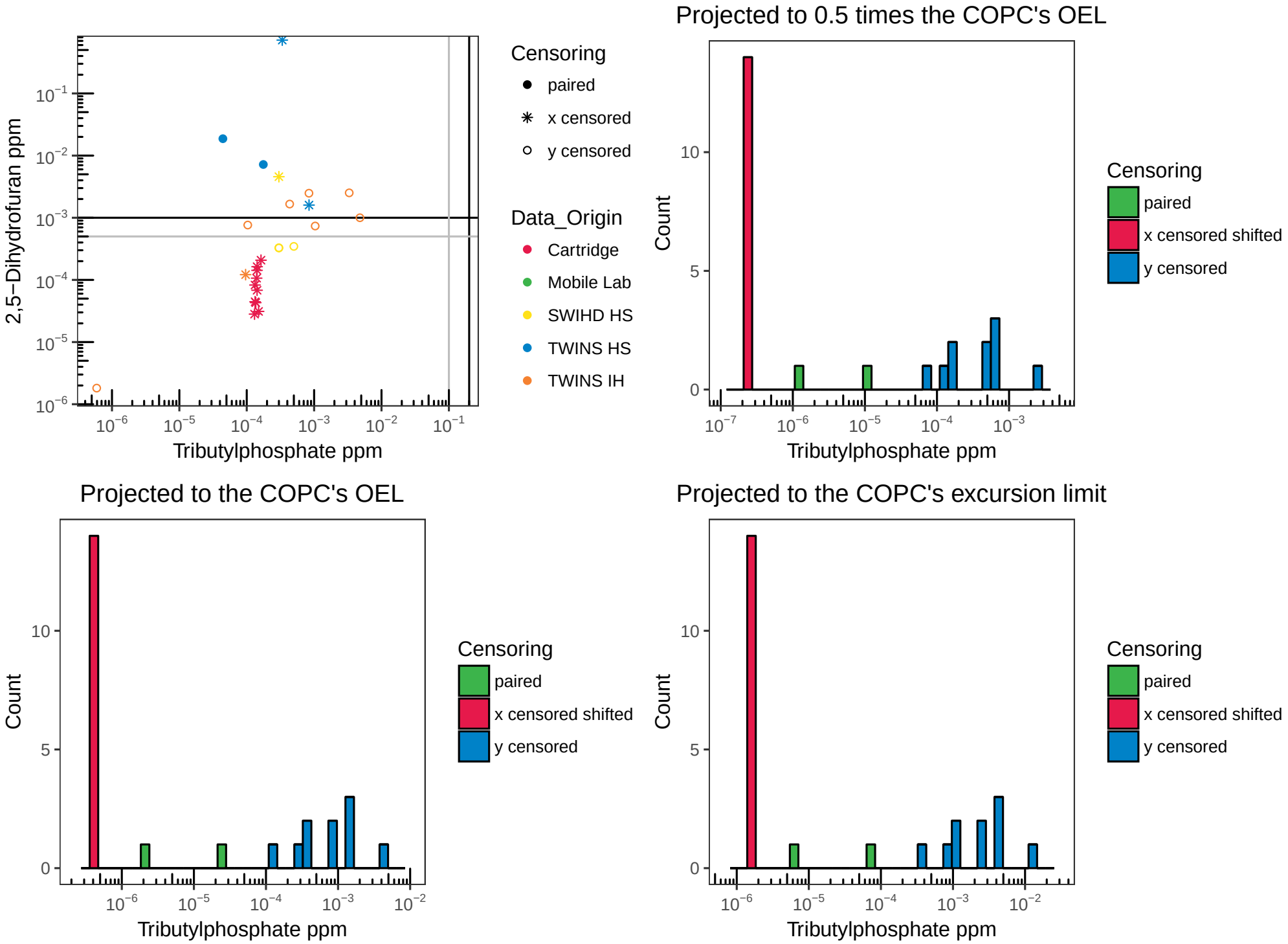


Figure C.2312: 2,5-Dihydrofuran vs Tributylphosphate

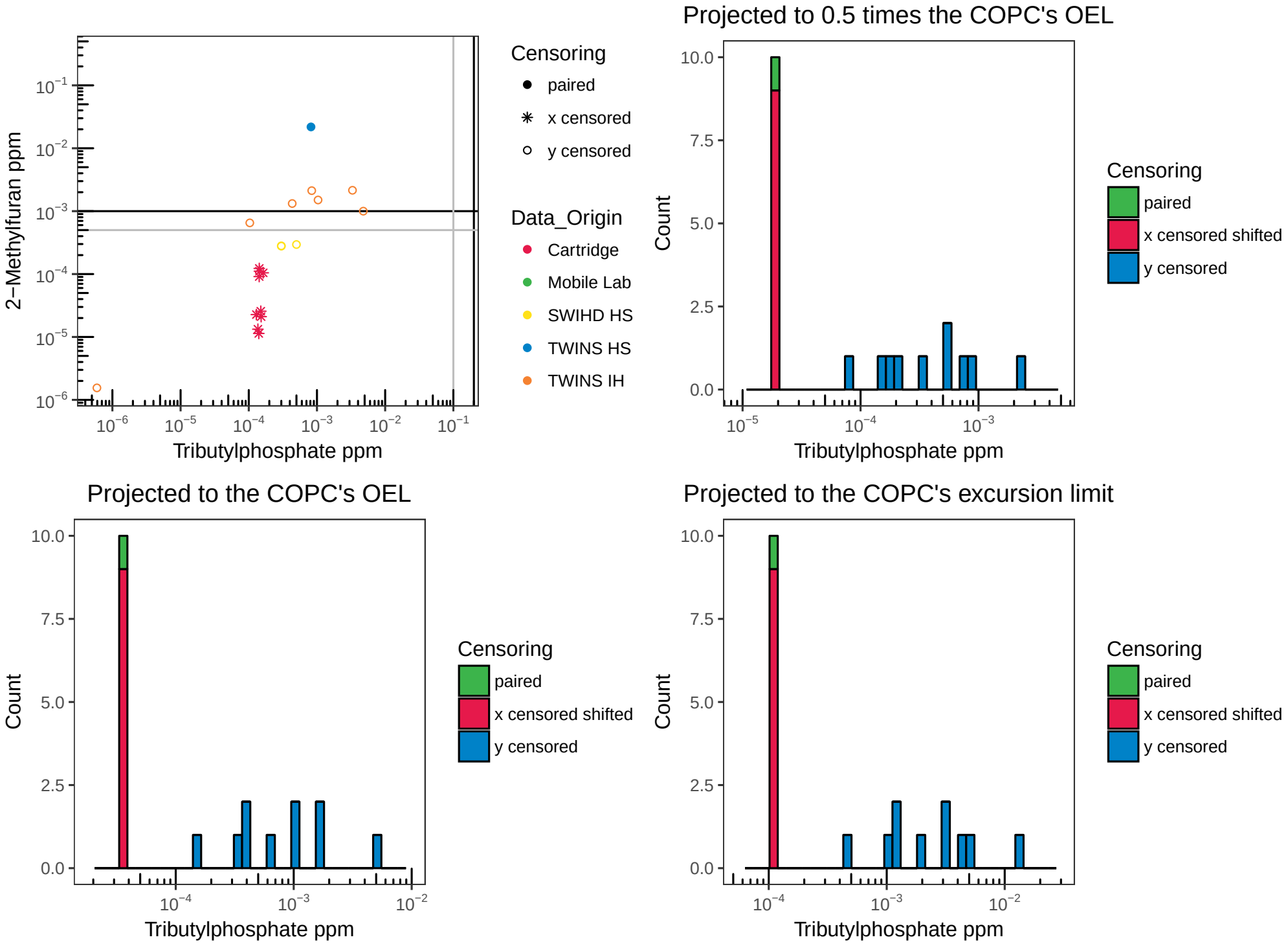


Figure C.2313: 2-Methylfuran vs Tributylphosphate

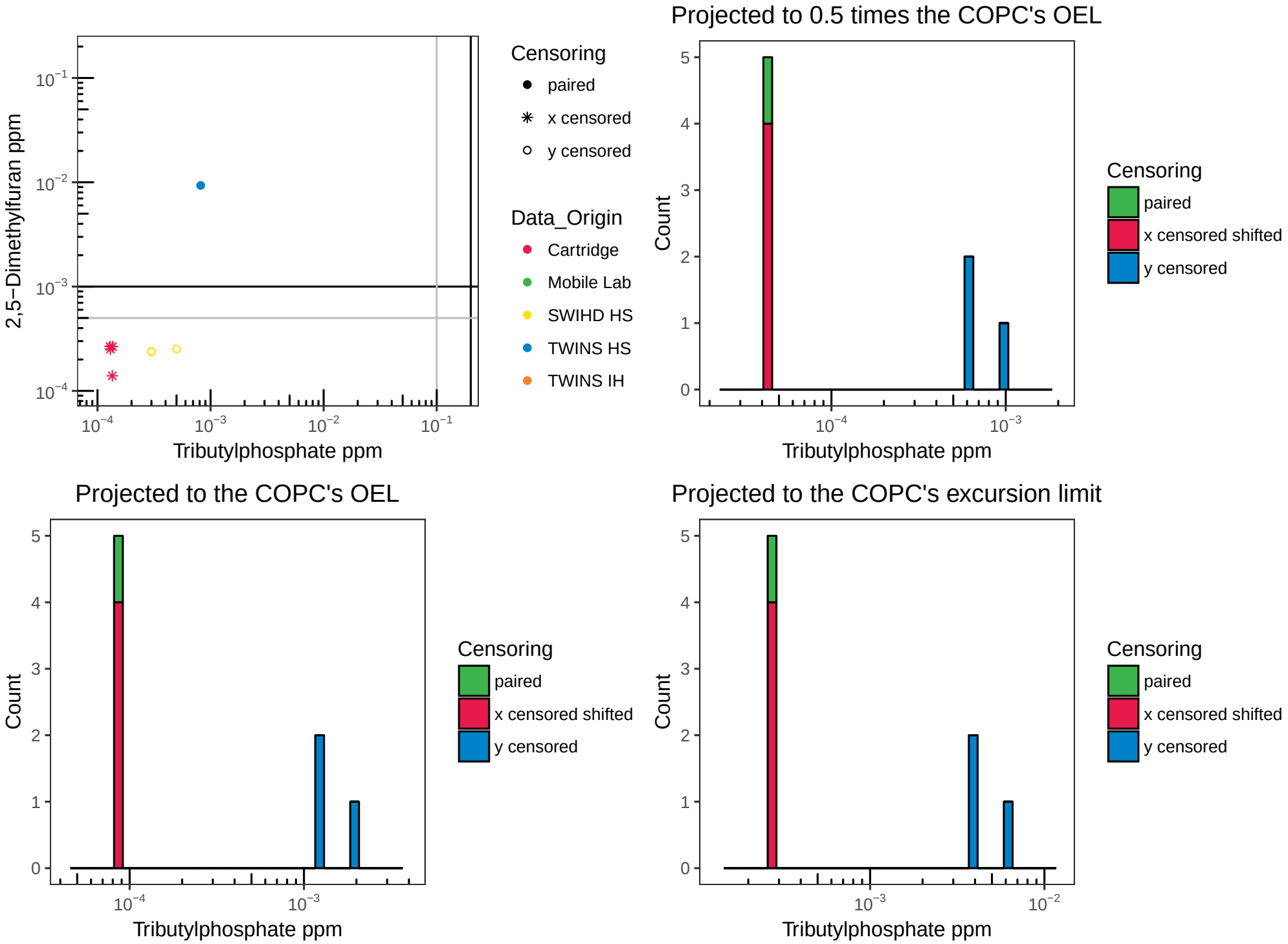


Figure C.2314: 2,5-Dimethylfuran vs Tributylphosphate

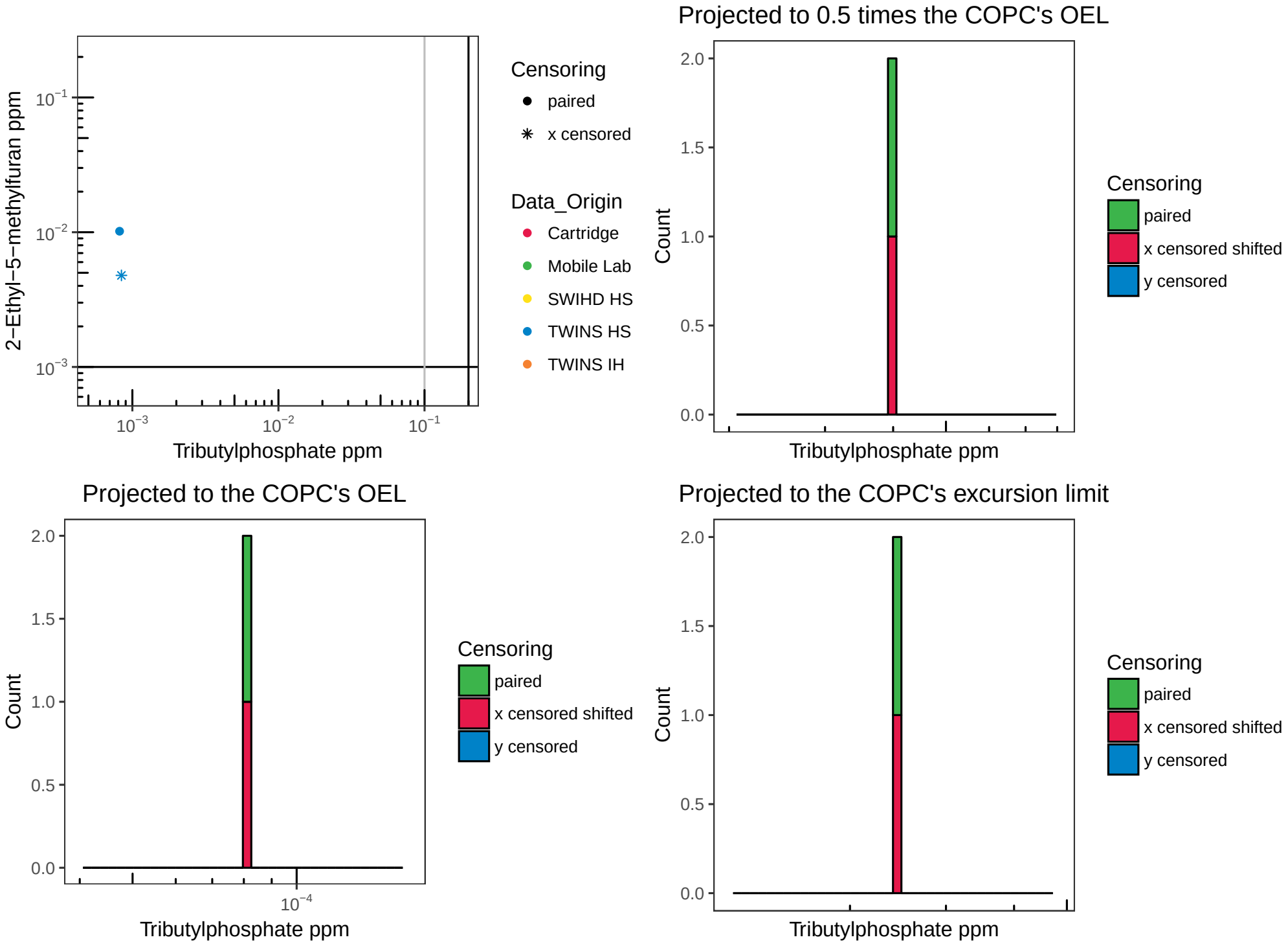


Figure C.2315: 2-Ethyl-5-methylfuran vs Tributylphosphate

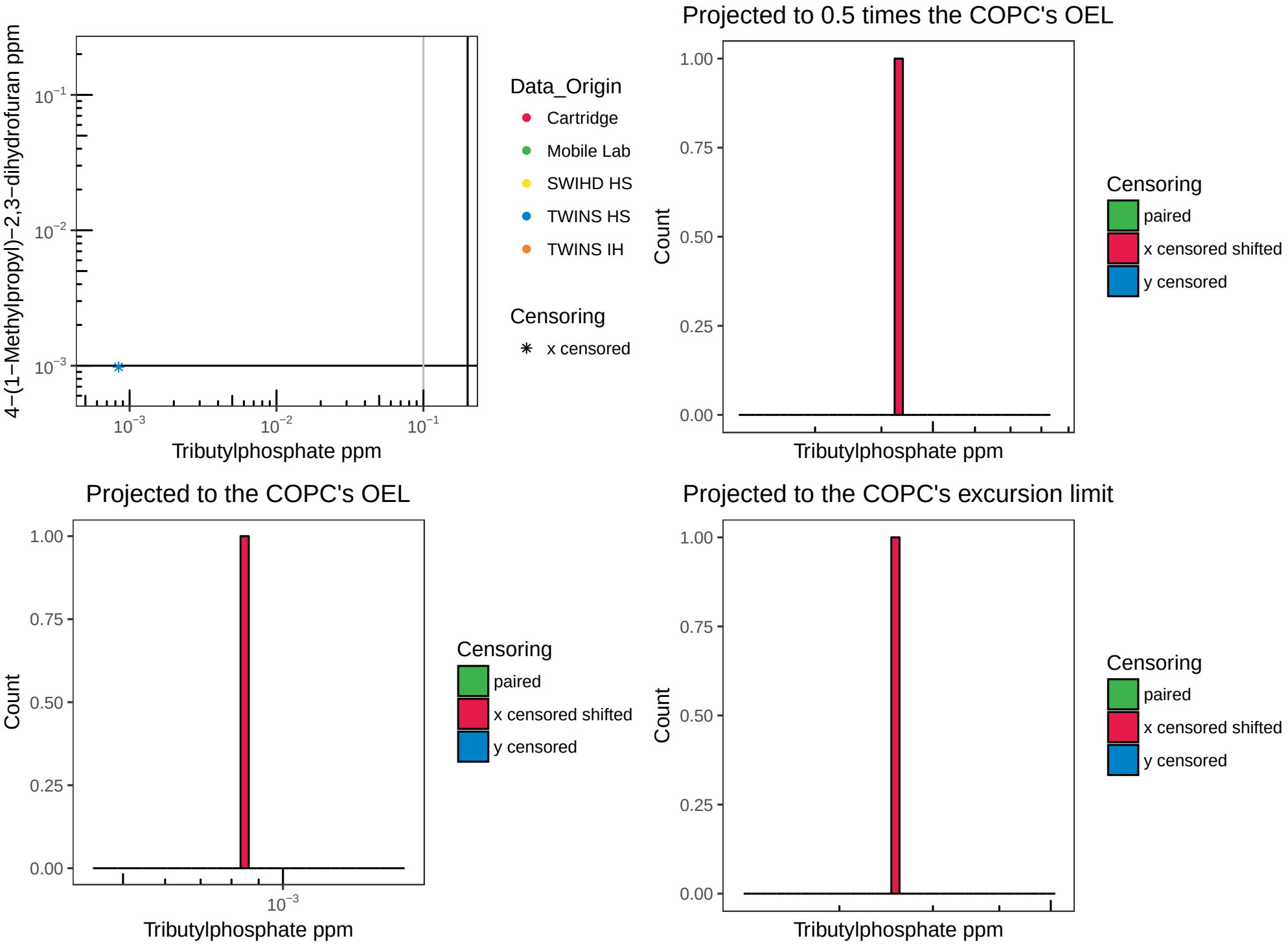


Figure C.2316: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Tributylphosphate

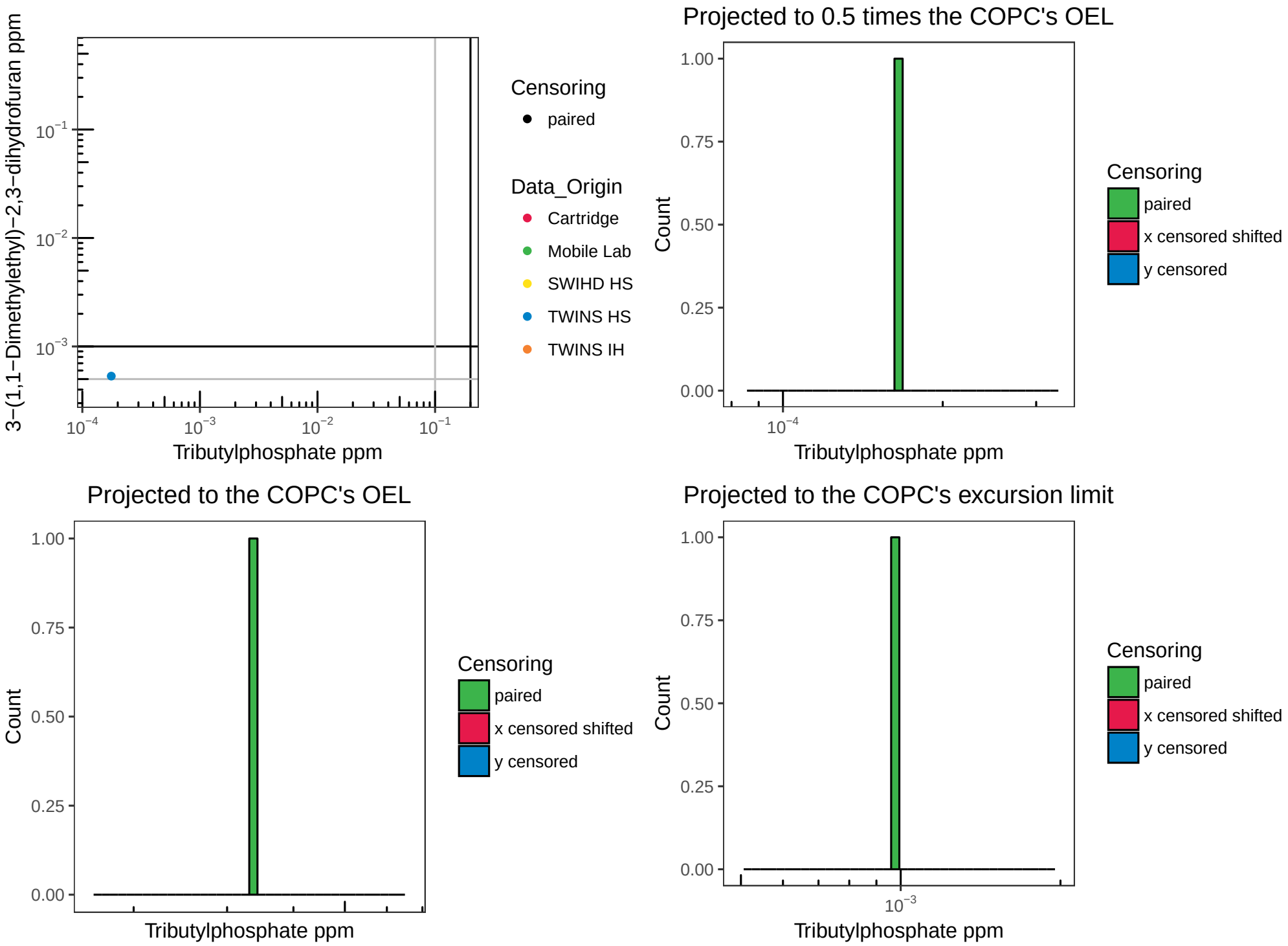


Figure C.2317: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Tributylphosphate

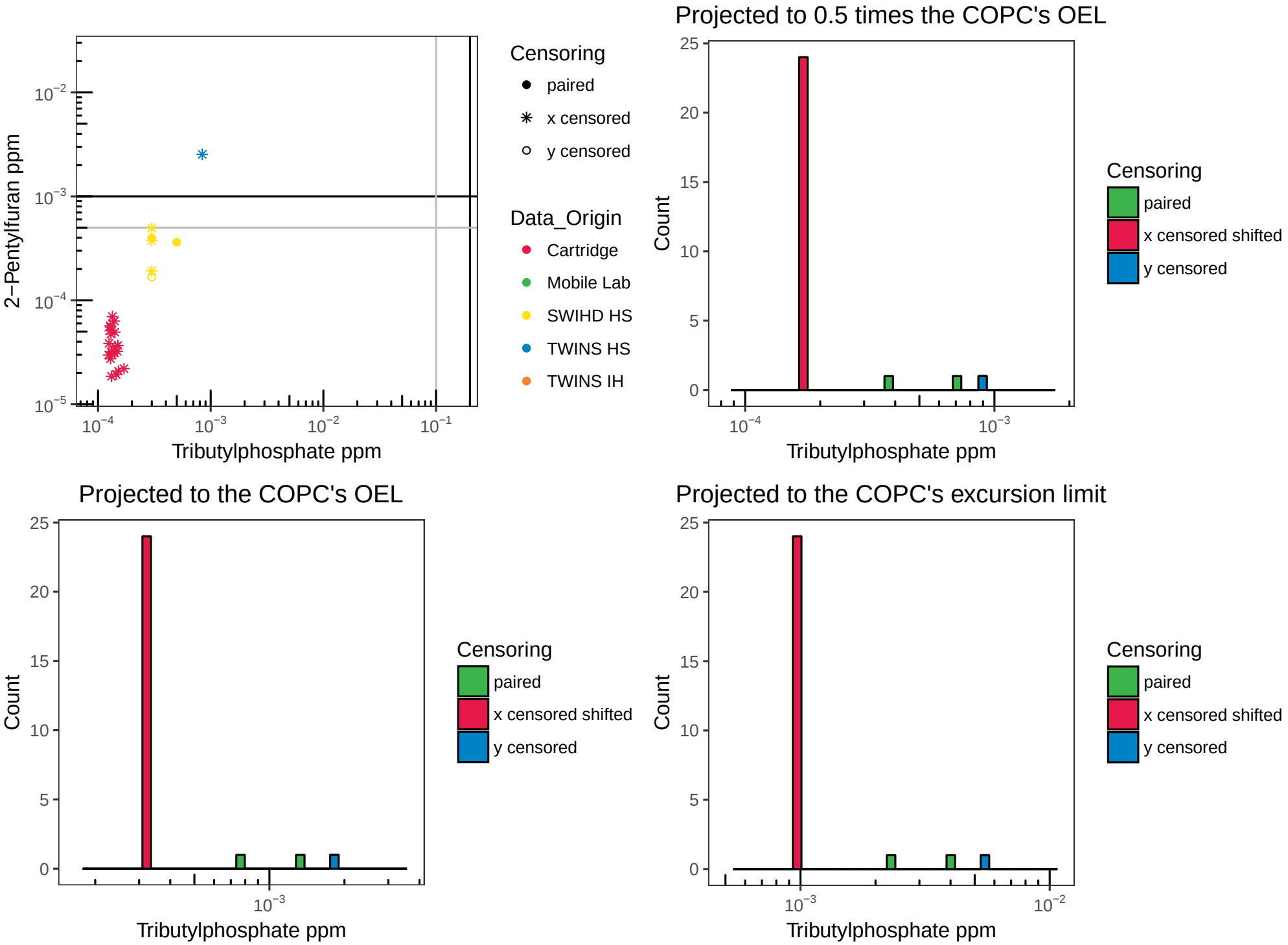


Figure C.2318: 2-Pentylfuran vs Tributylphosphate

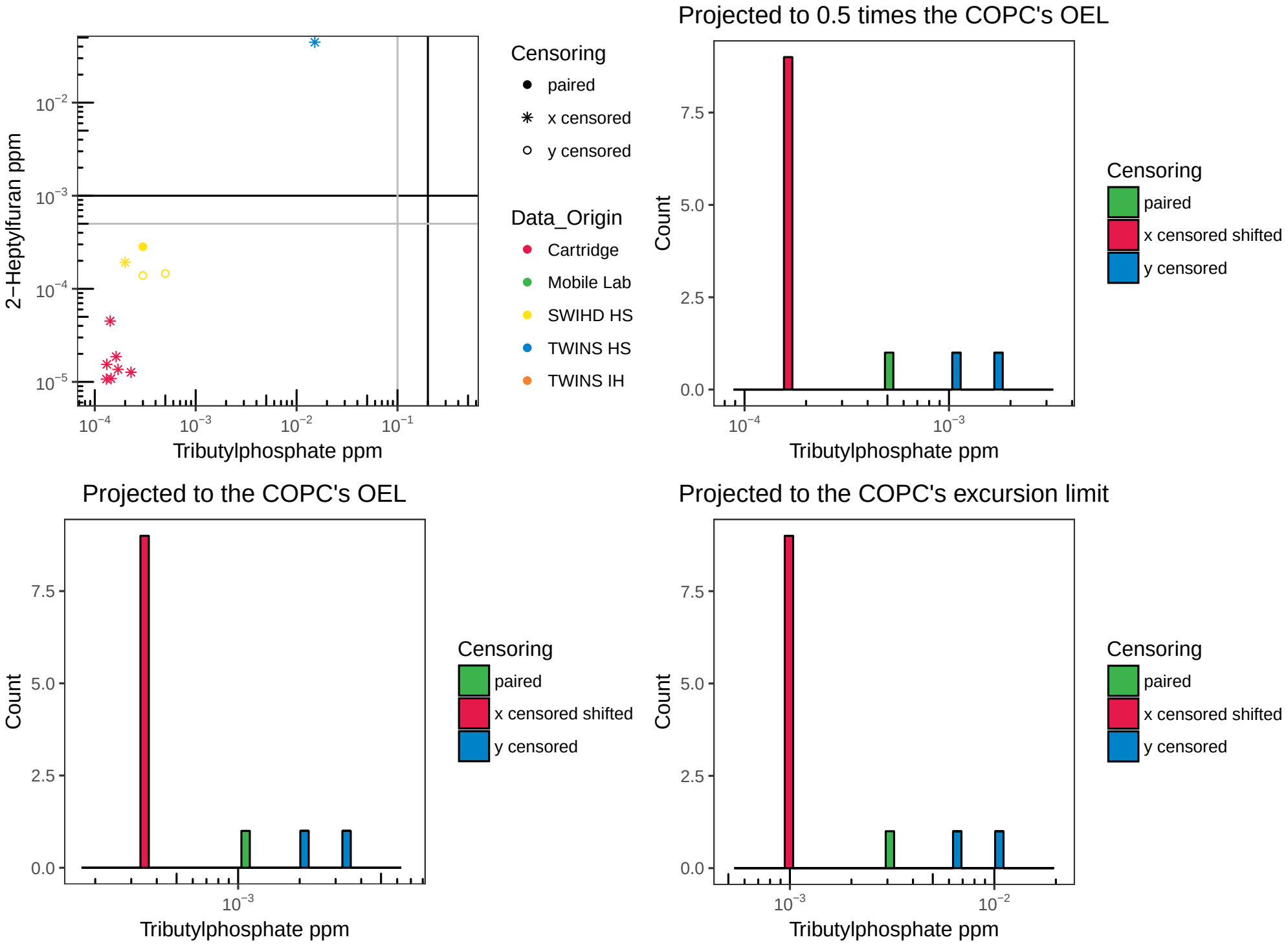


Figure C.2319: 2-Heptylfuran vs Tributylphosphate

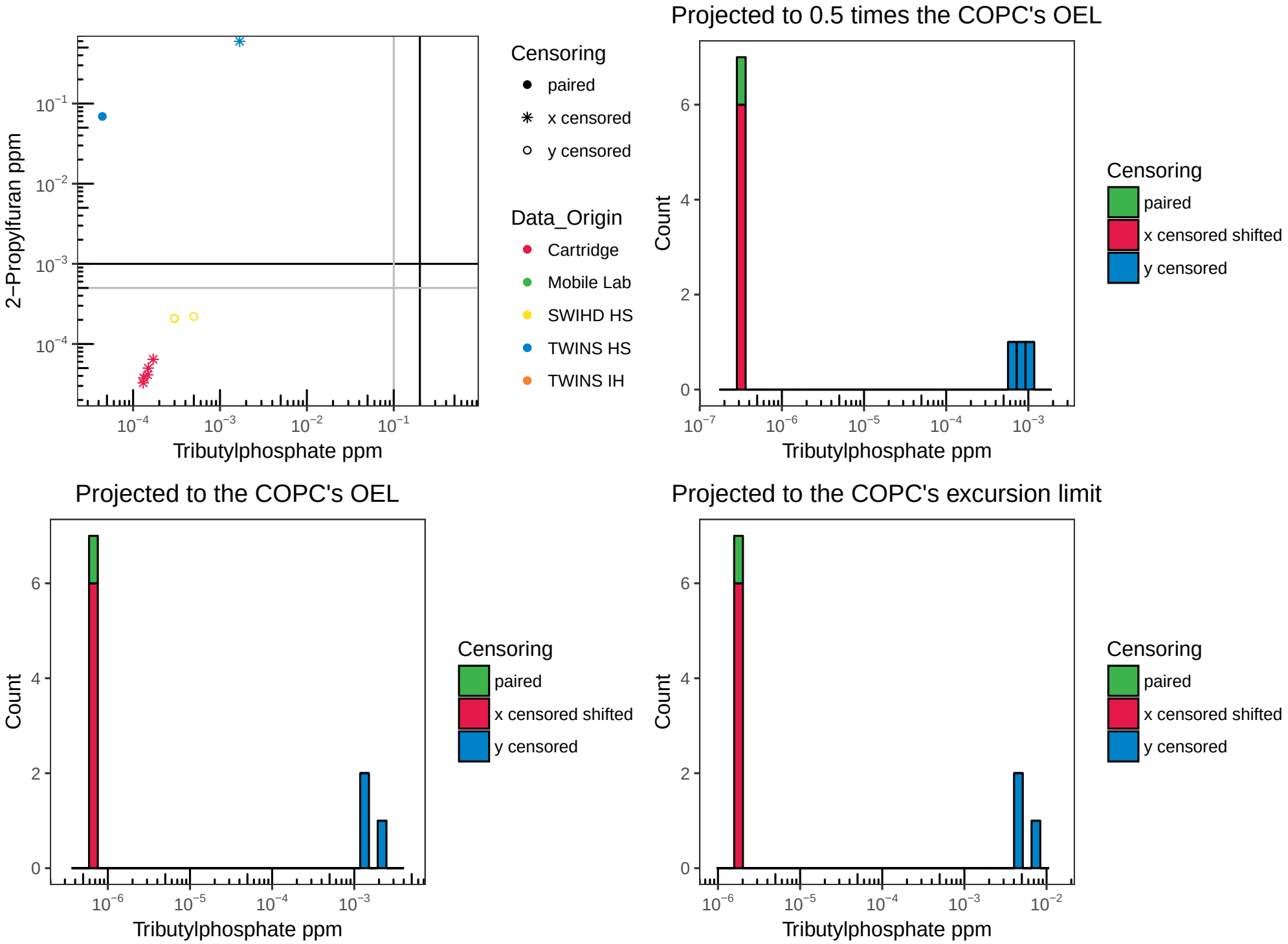


Figure C.2320: 2-Propylfuran vs Tributylphosphate

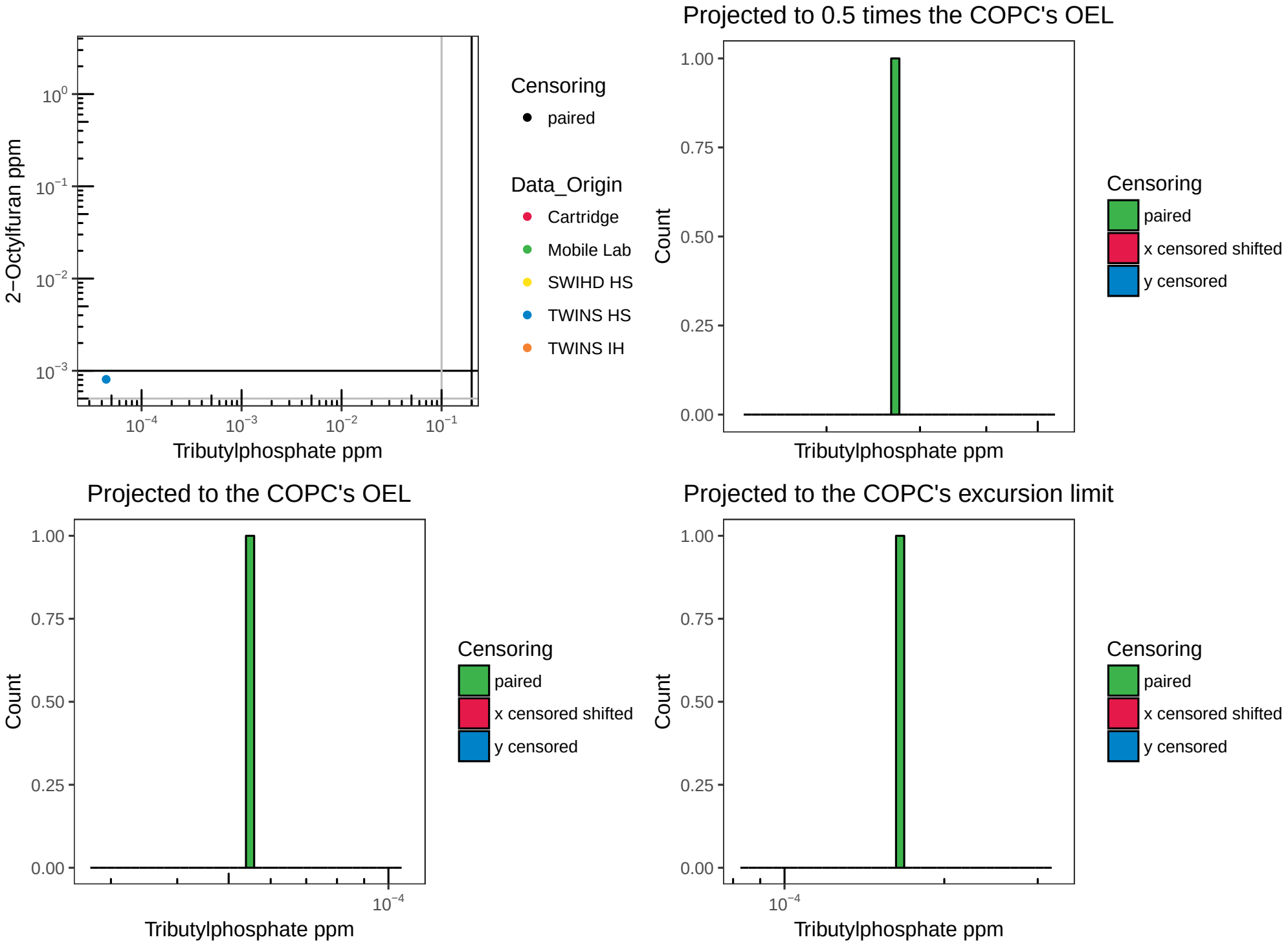


Figure C.2321: 2-Octylfuran vs Tributylphosphate

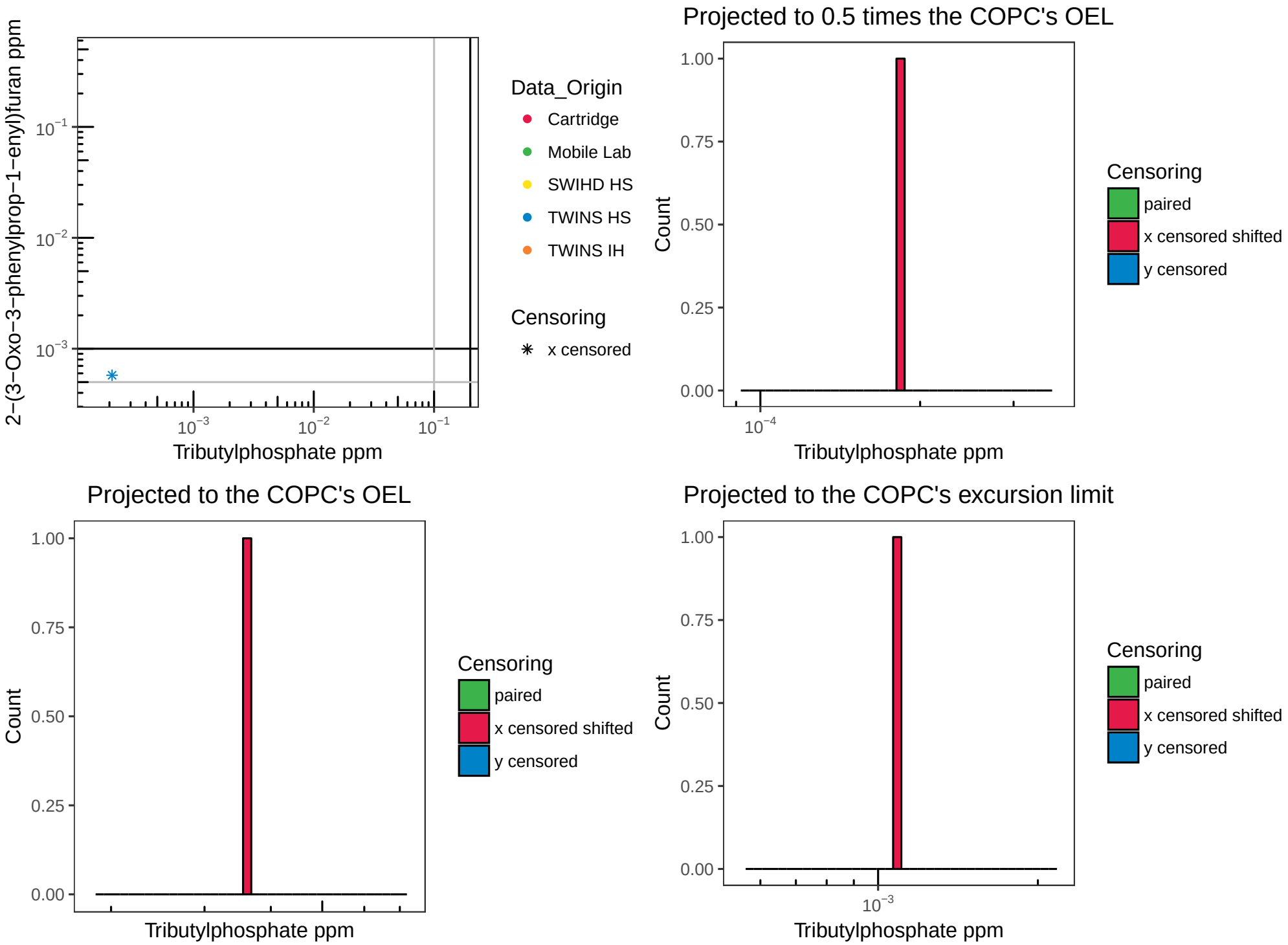


Figure C.2322: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Tributylphosphate

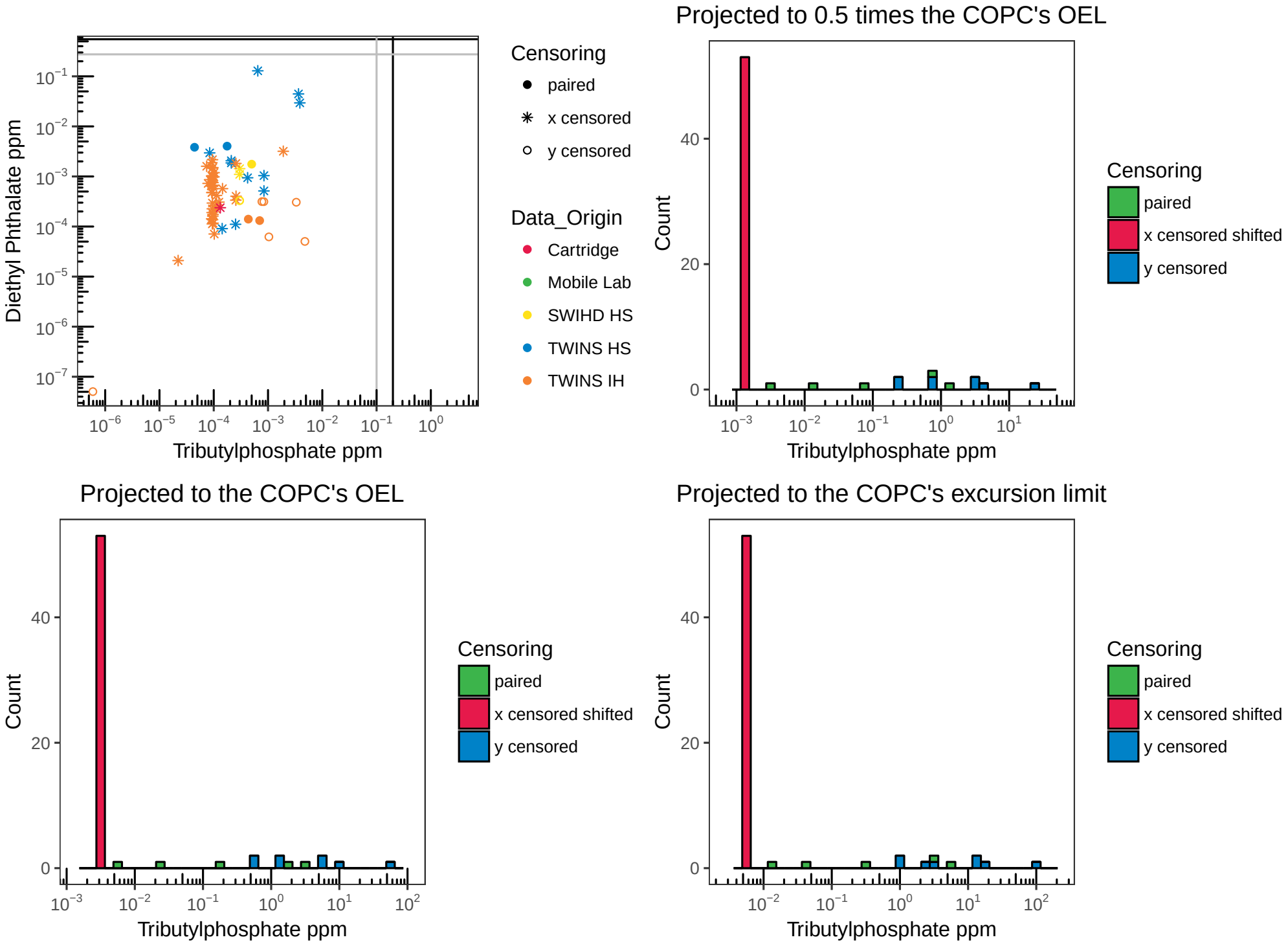


Figure C.2323: Diethyl Phthalate vs Tributylphosphate

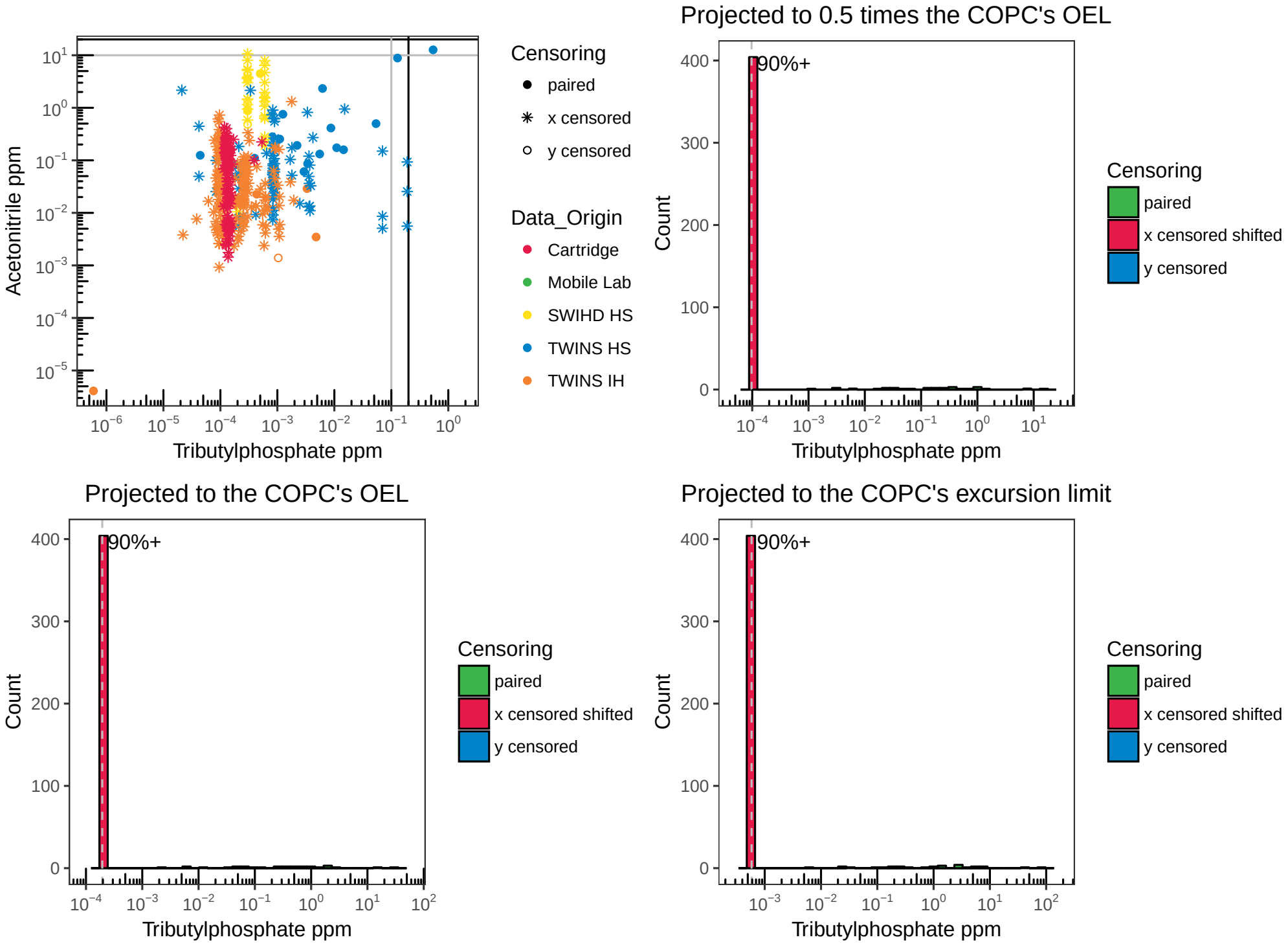


Figure C.2324: Acetonitrile vs Tributylphosphate

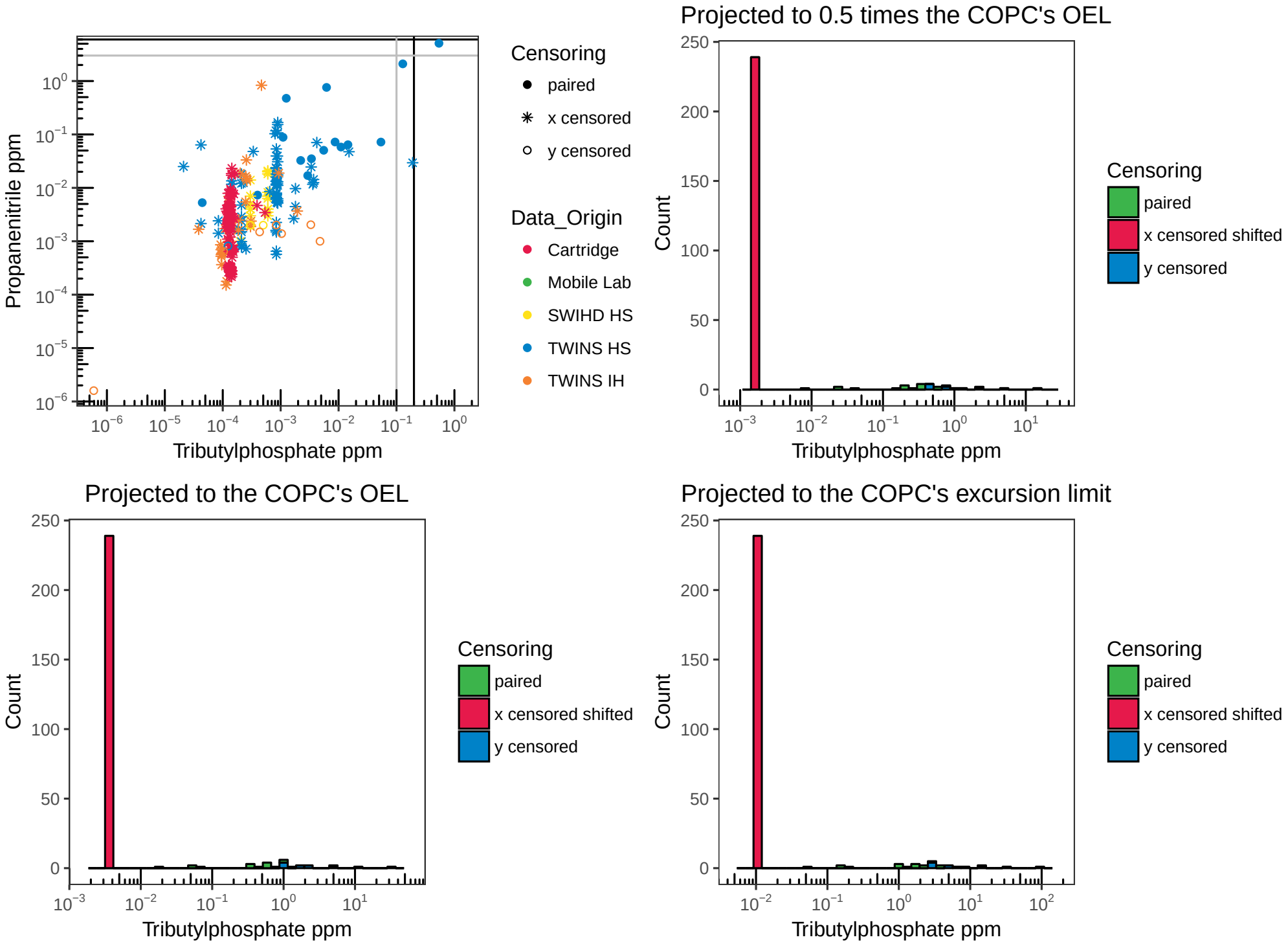


Figure C.2325: Propanenitrile vs Tributylphosphate

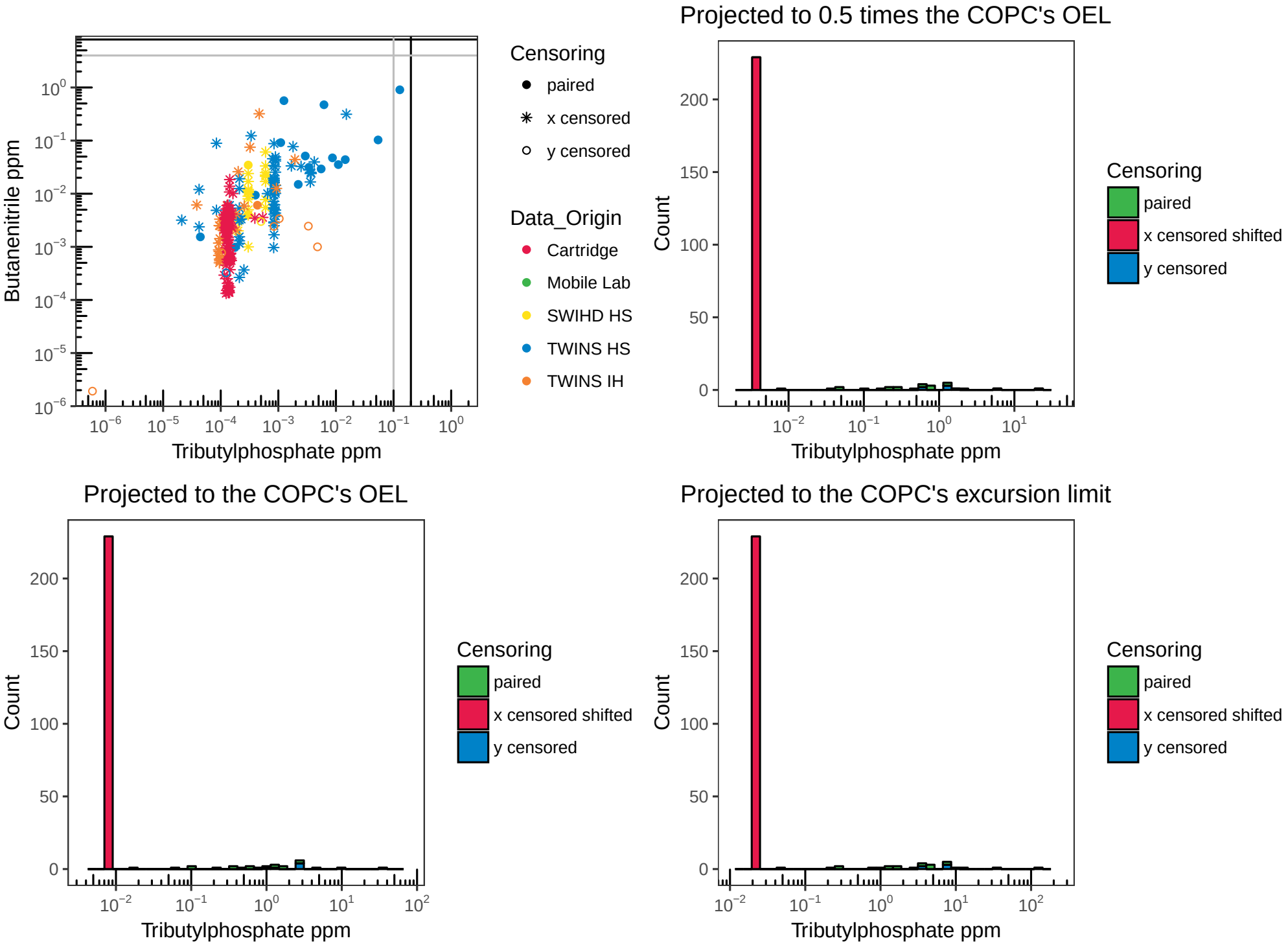


Figure C.2326: Butanenitrile vs Tributylphosphate

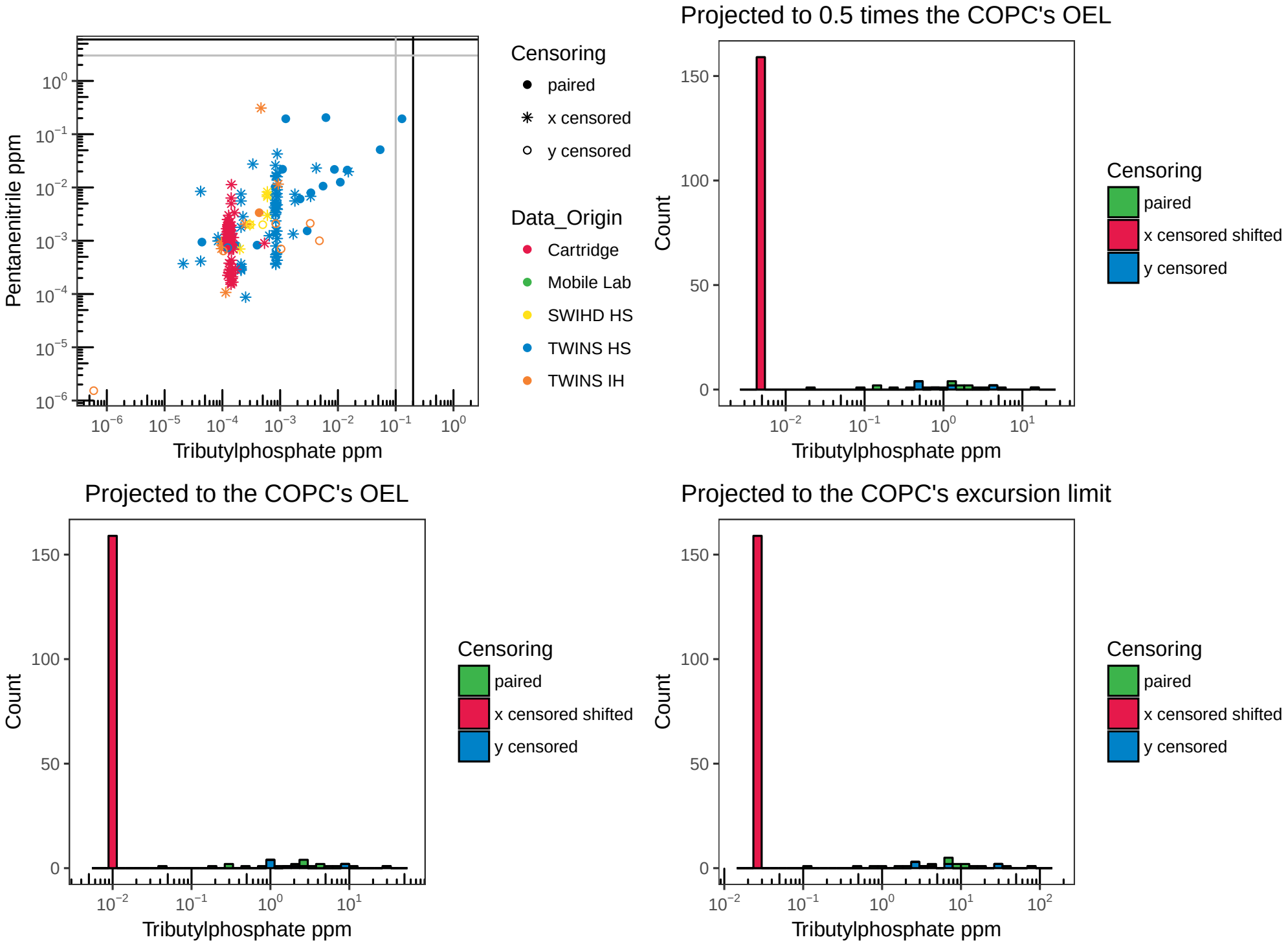


Figure C.2327: Pentanenitrile vs Tributylphosphate

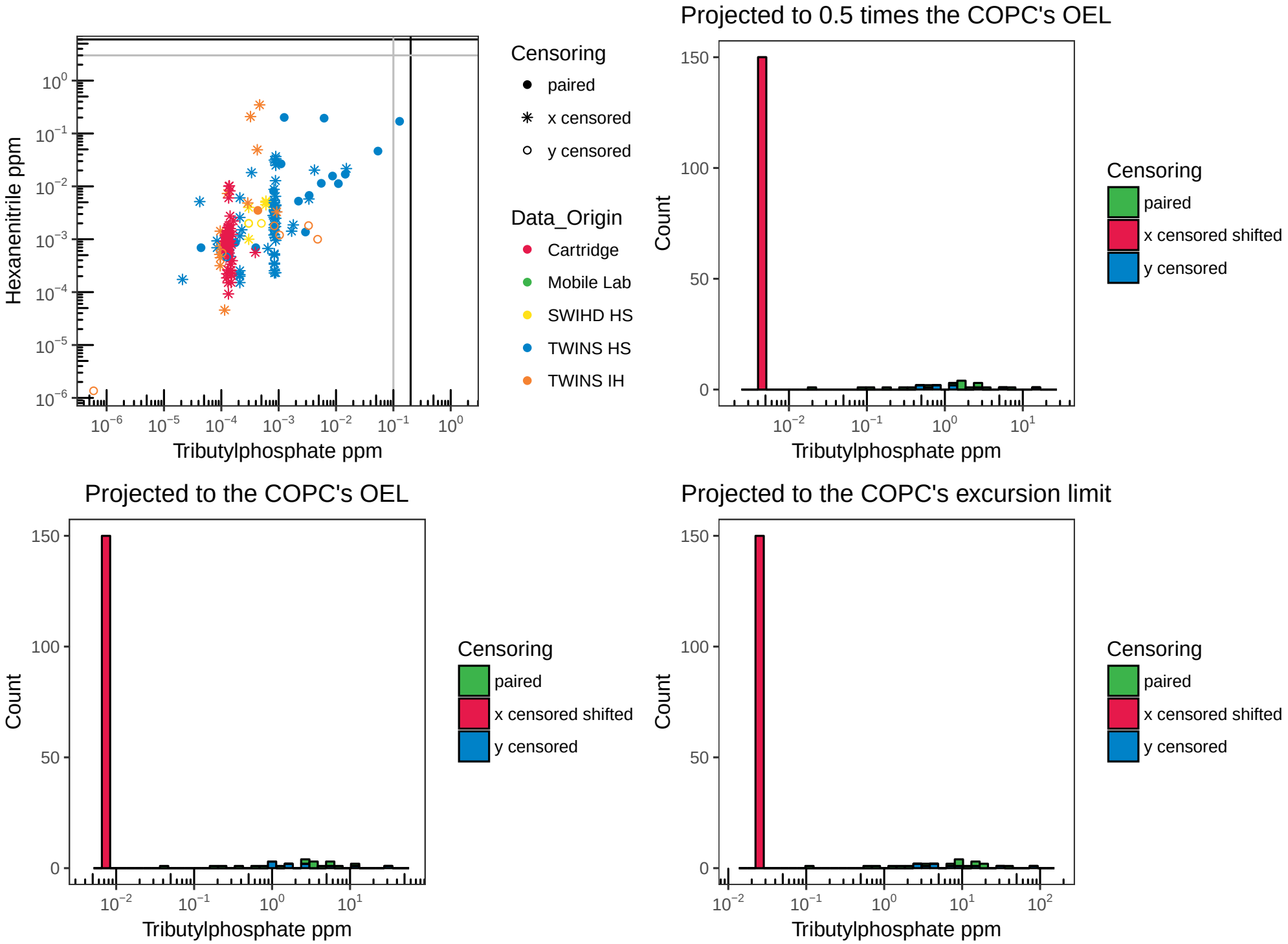


Figure C.2328: Hexanenitrile vs Tributylphosphate

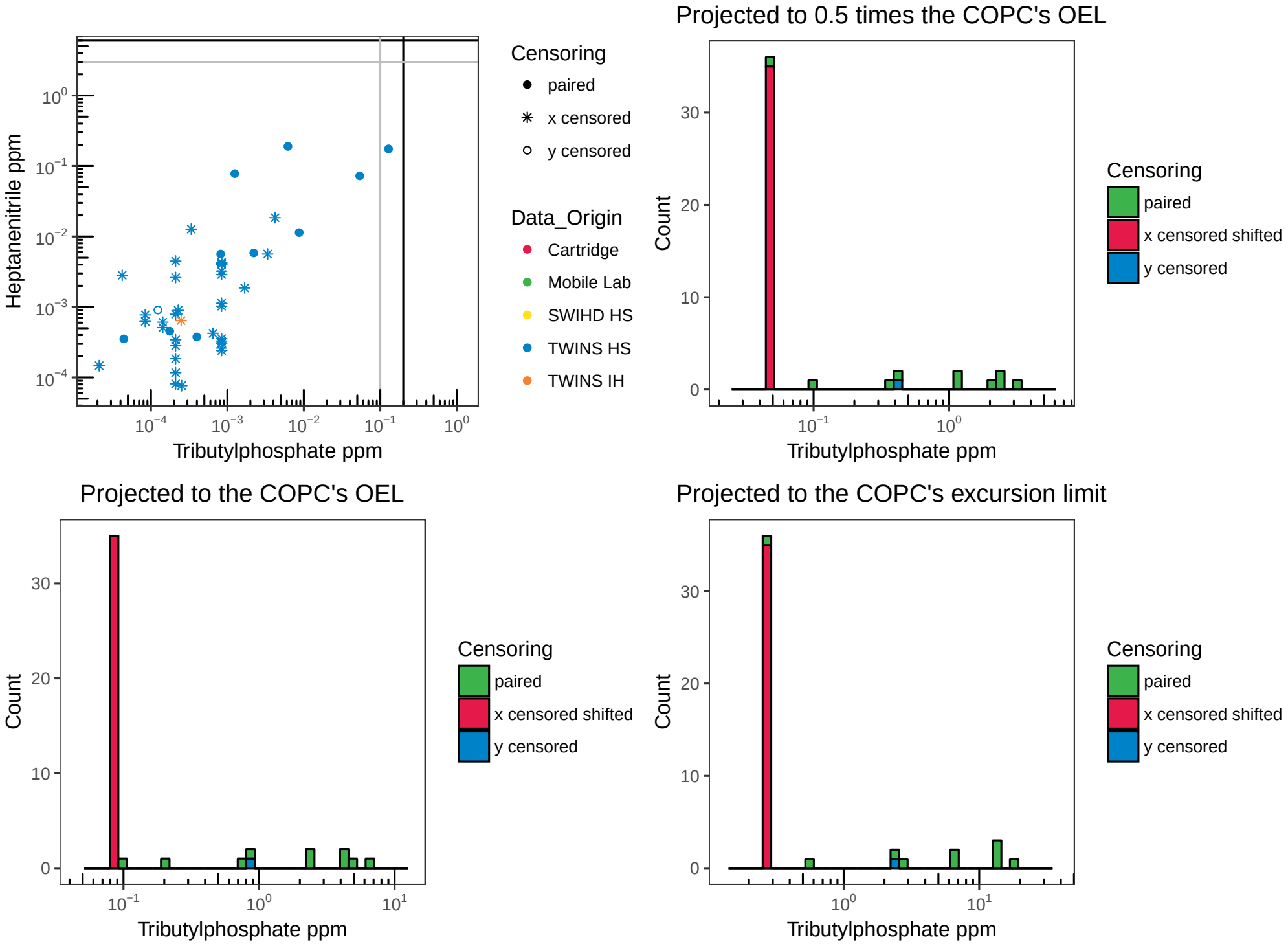


Figure C.2329: Heptanenitrile vs Tributylphosphate

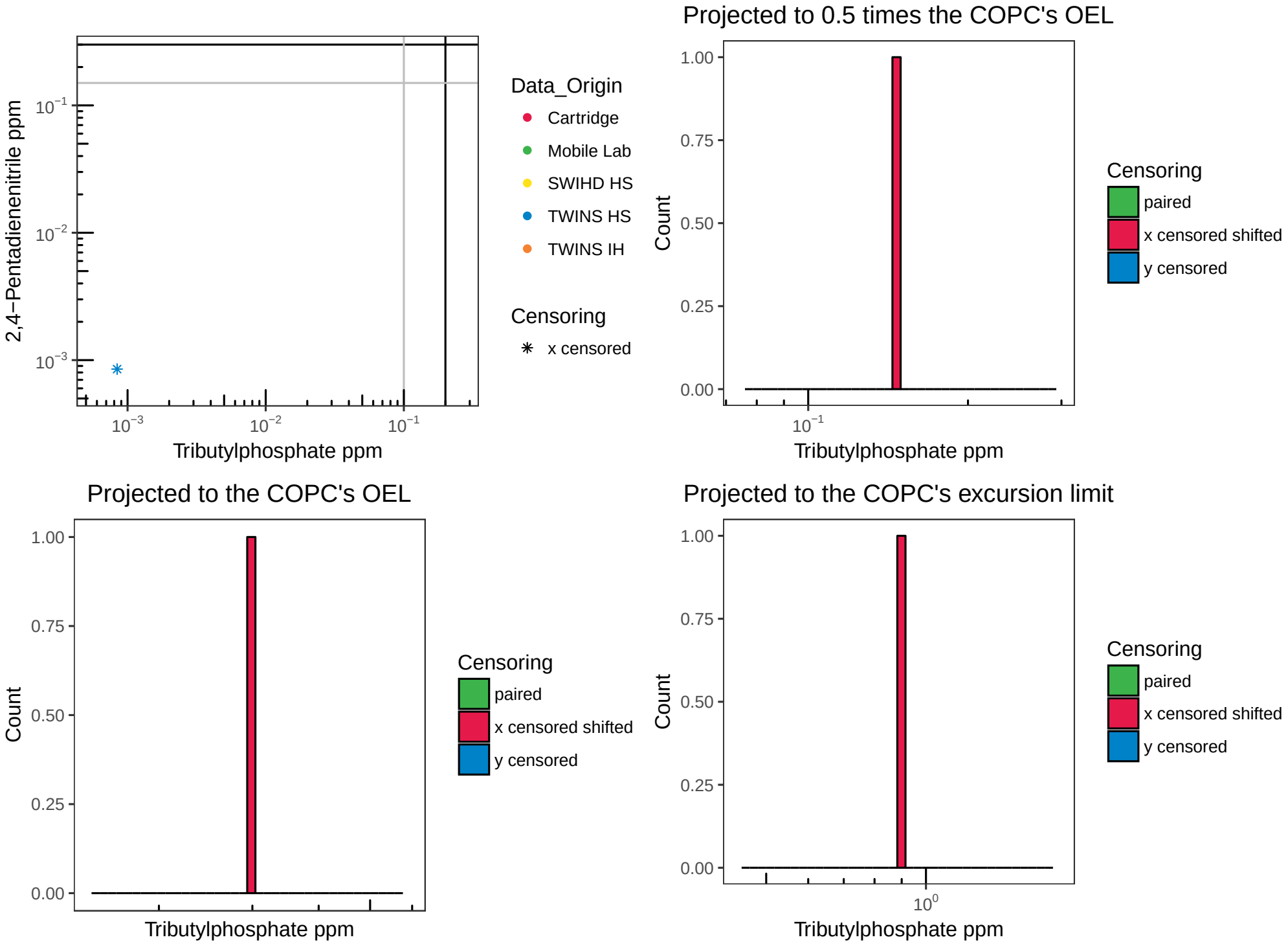


Figure C.2330: 2,4-Pentadienenitrile vs Tributylphosphate

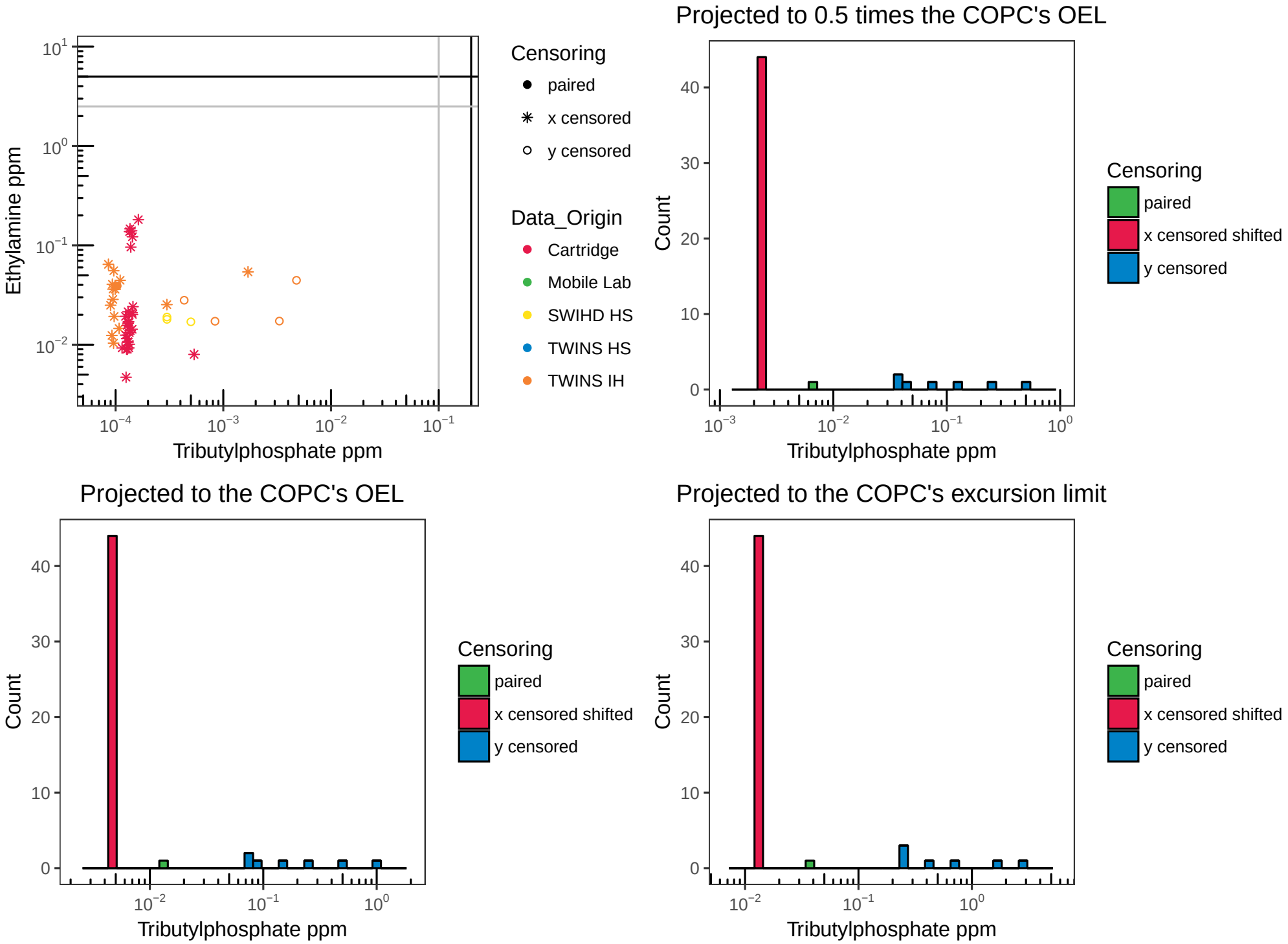


Figure C.2331: Ethylamine vs Tributylphosphate

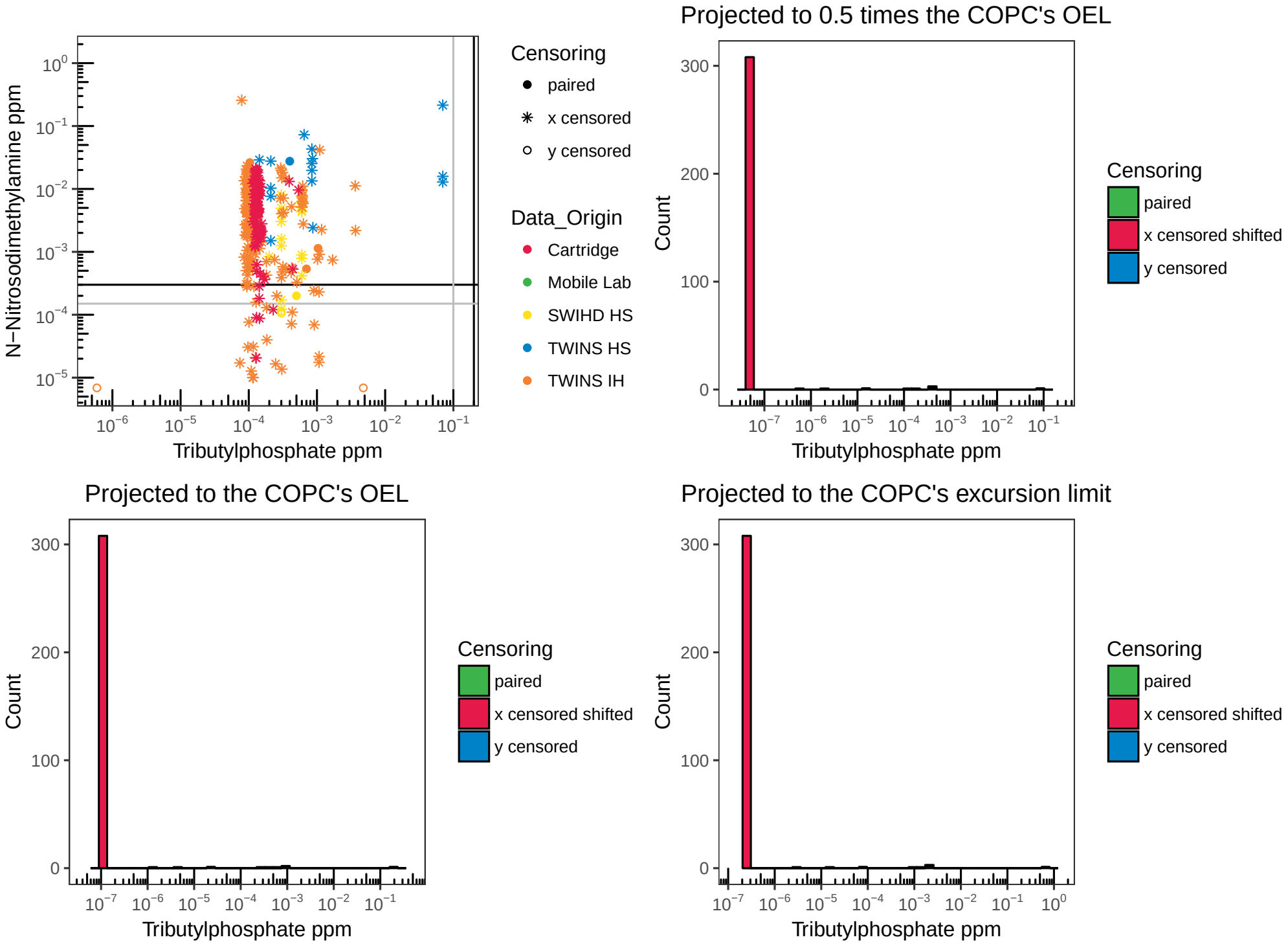


Figure C.2332: N-Nitrosodimethylamine vs Tributylphosphate

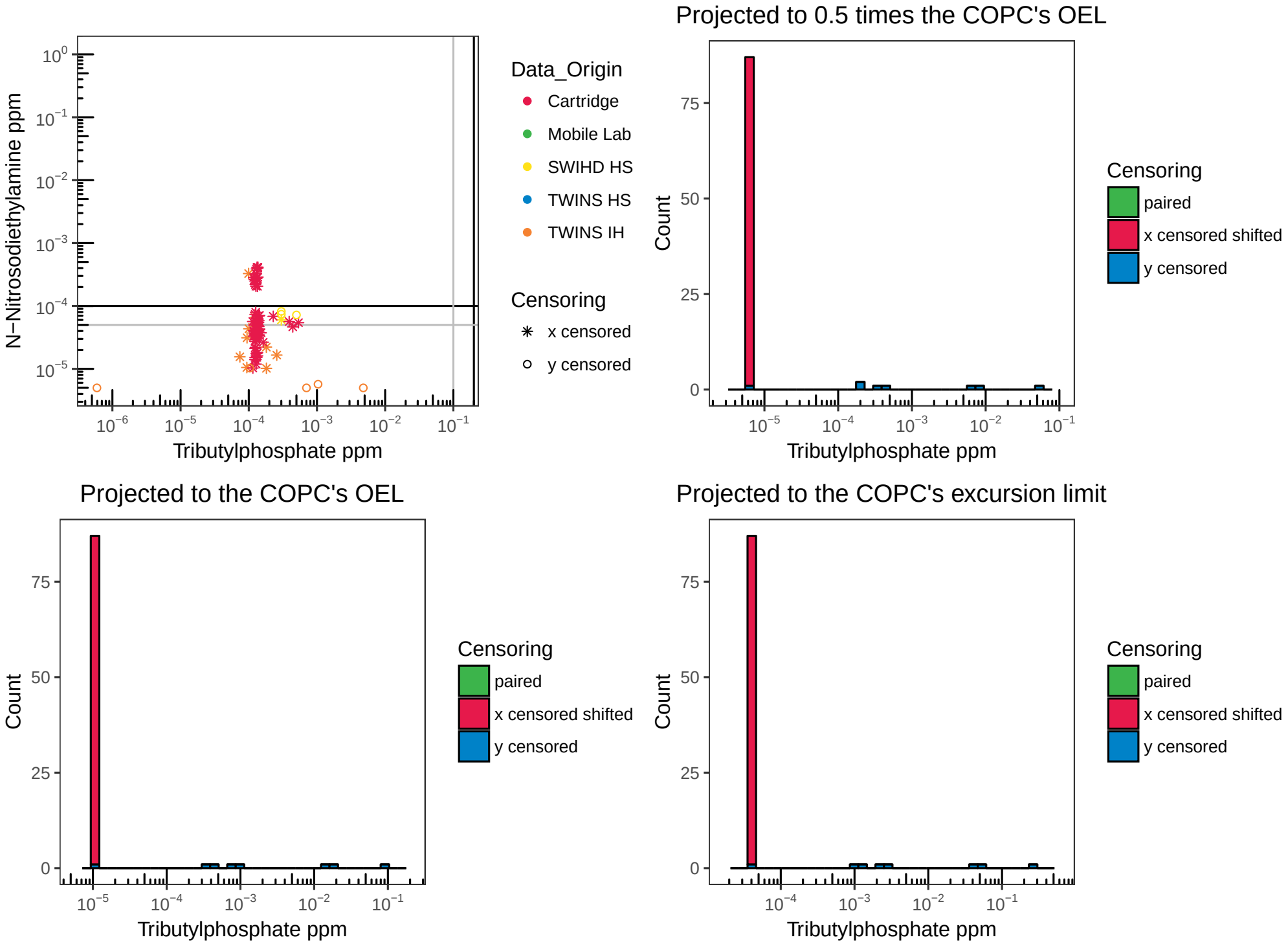


Figure C.2333: N-Nitrosodiethylamine vs Tributylphosphate

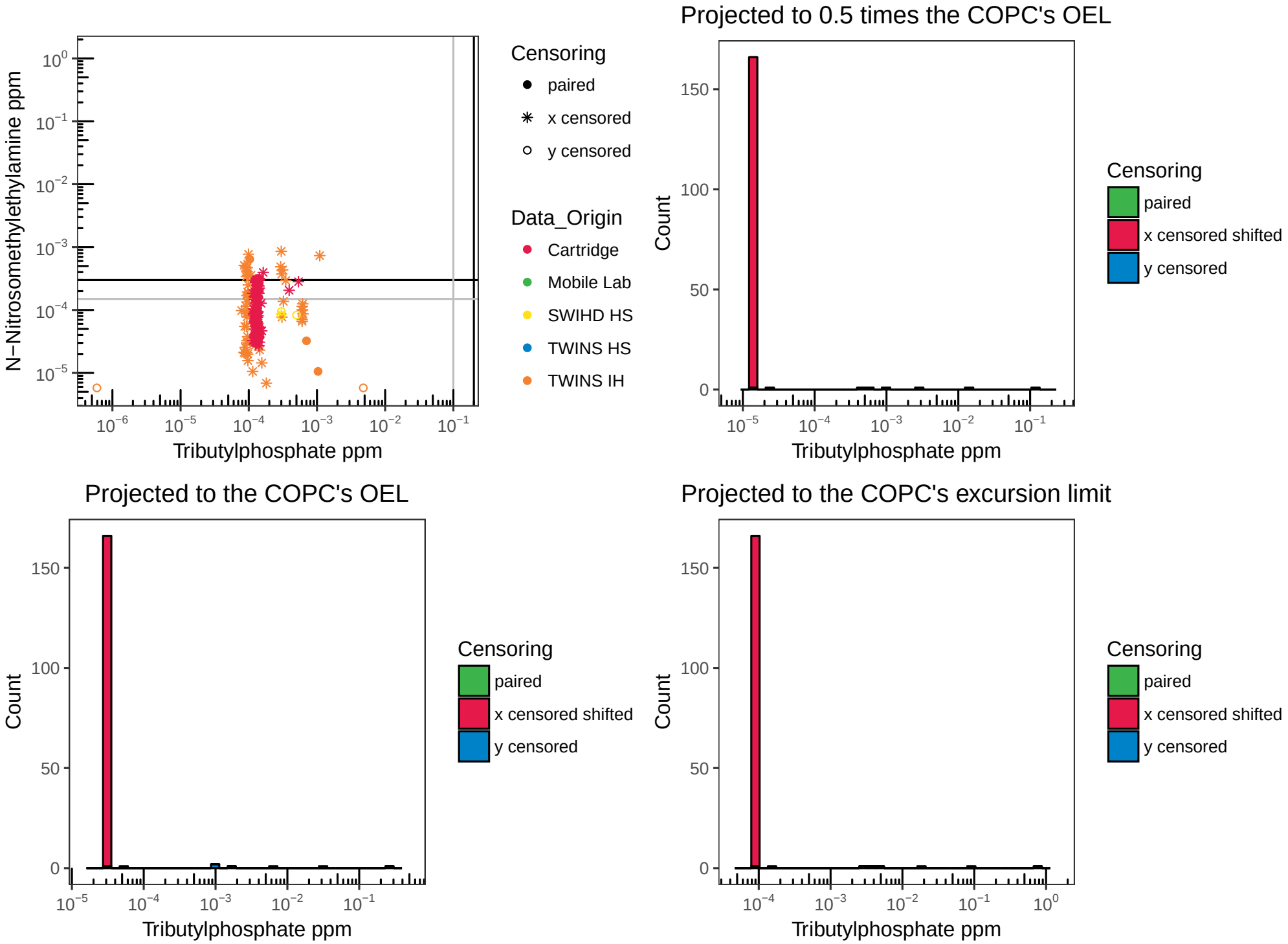


Figure C.2334: N-Nitrosomethylethylamine vs Tributylphosphate

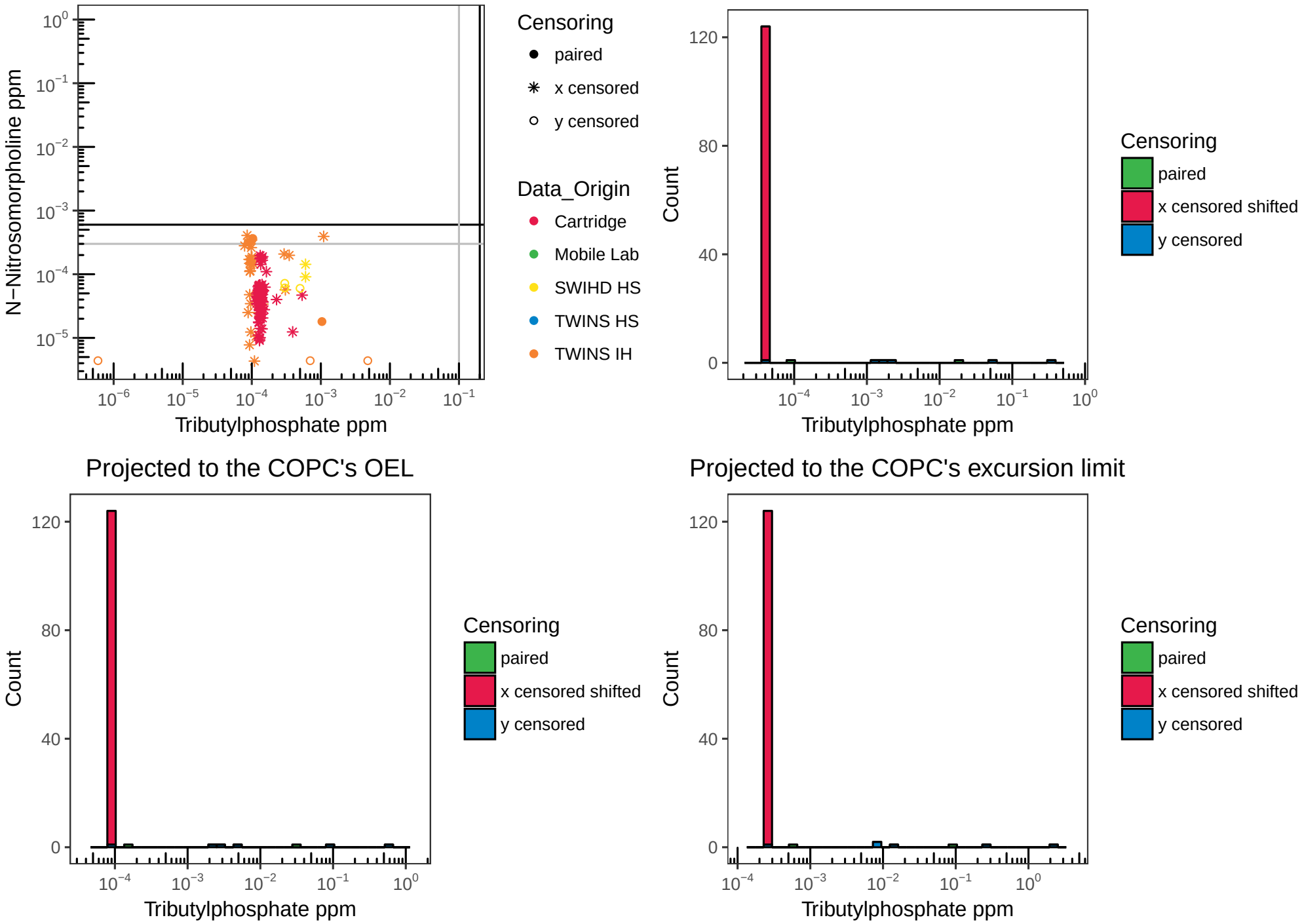


Figure C.2335: N-Nitrosomorpholine vs Tributylphosphate

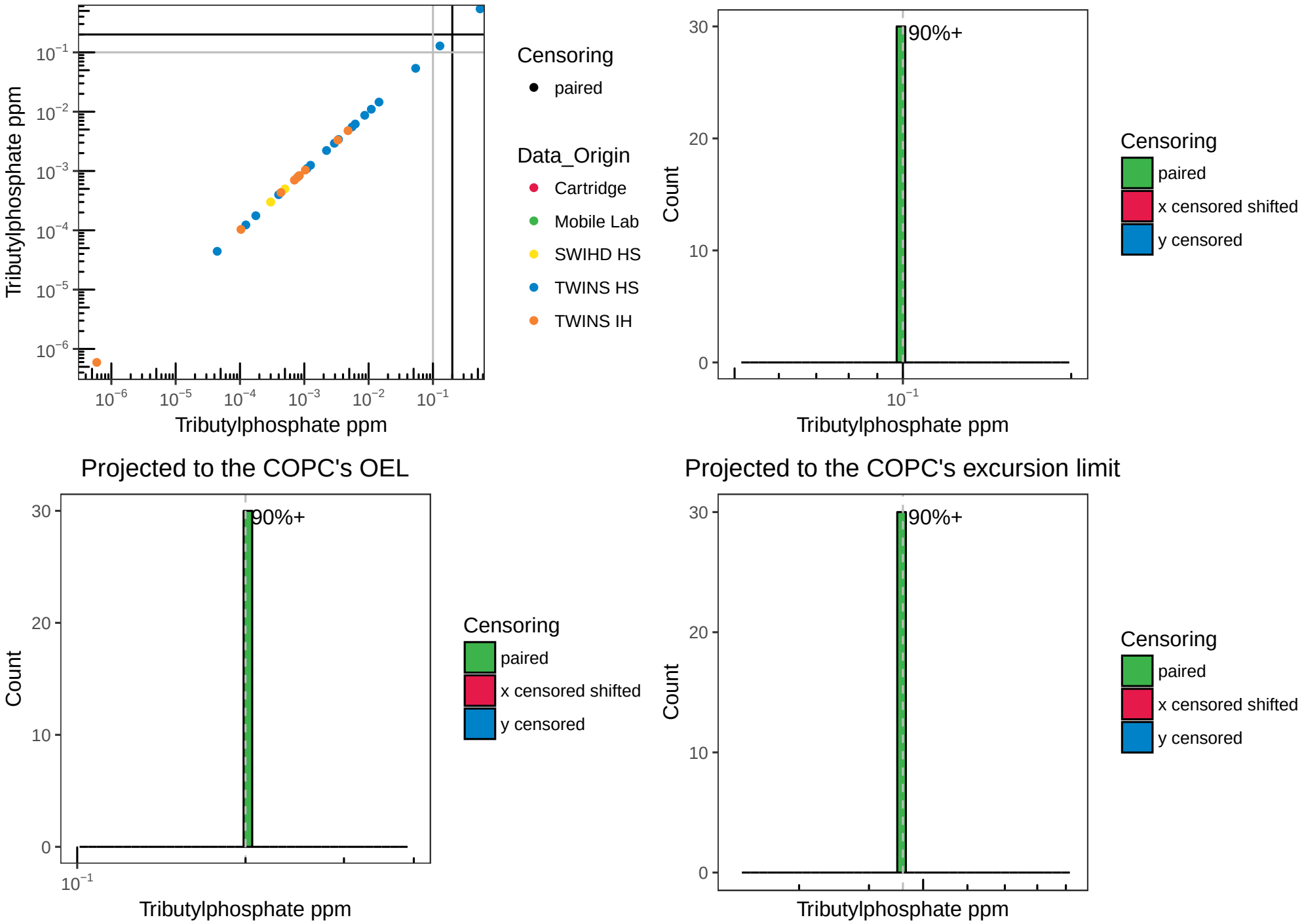


Figure C.2336: Tributylphosphate vs Tributylphosphate

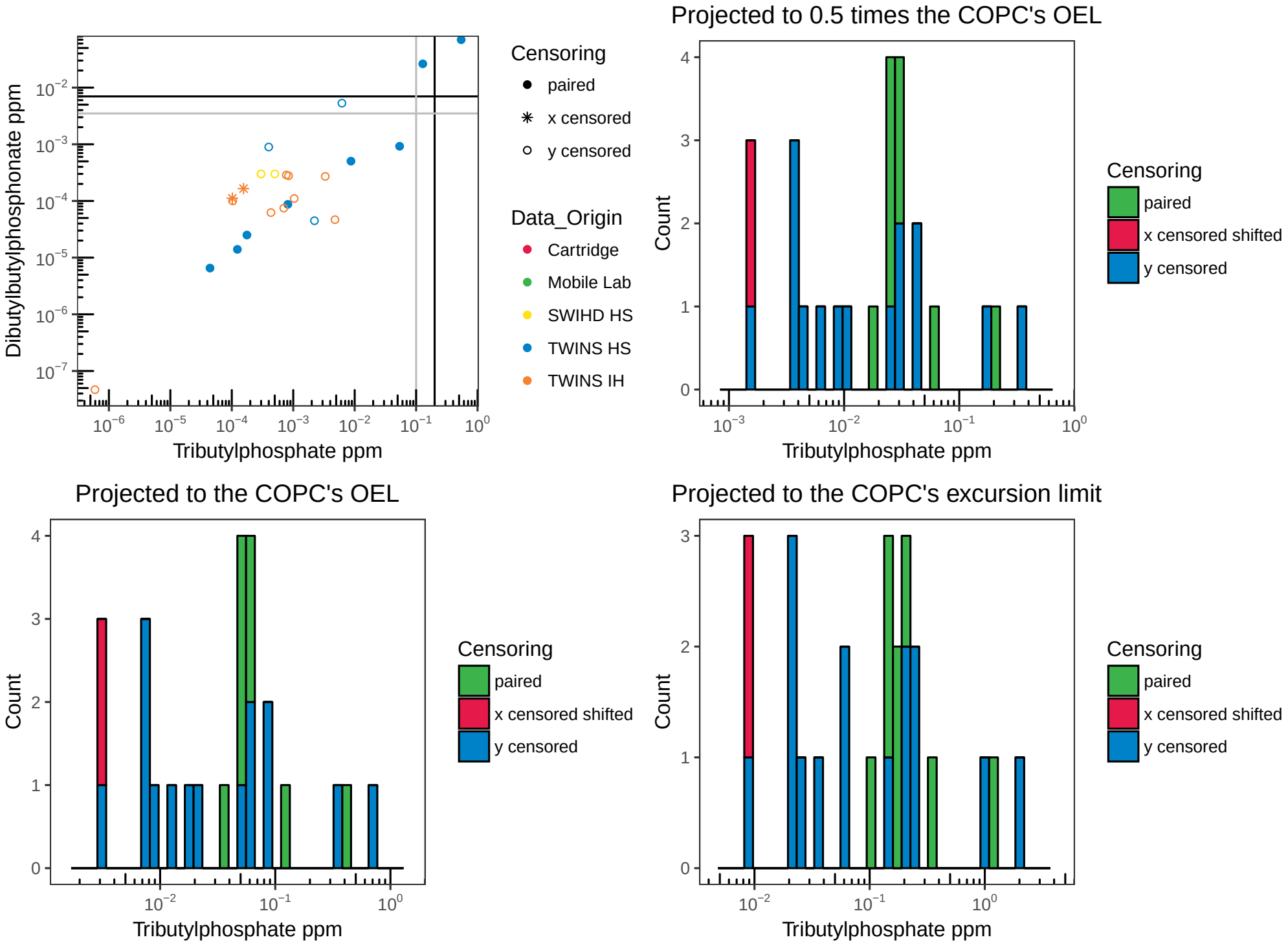


Figure C.2337: Dibutylbutylphosphonate vs Tributylphosphate

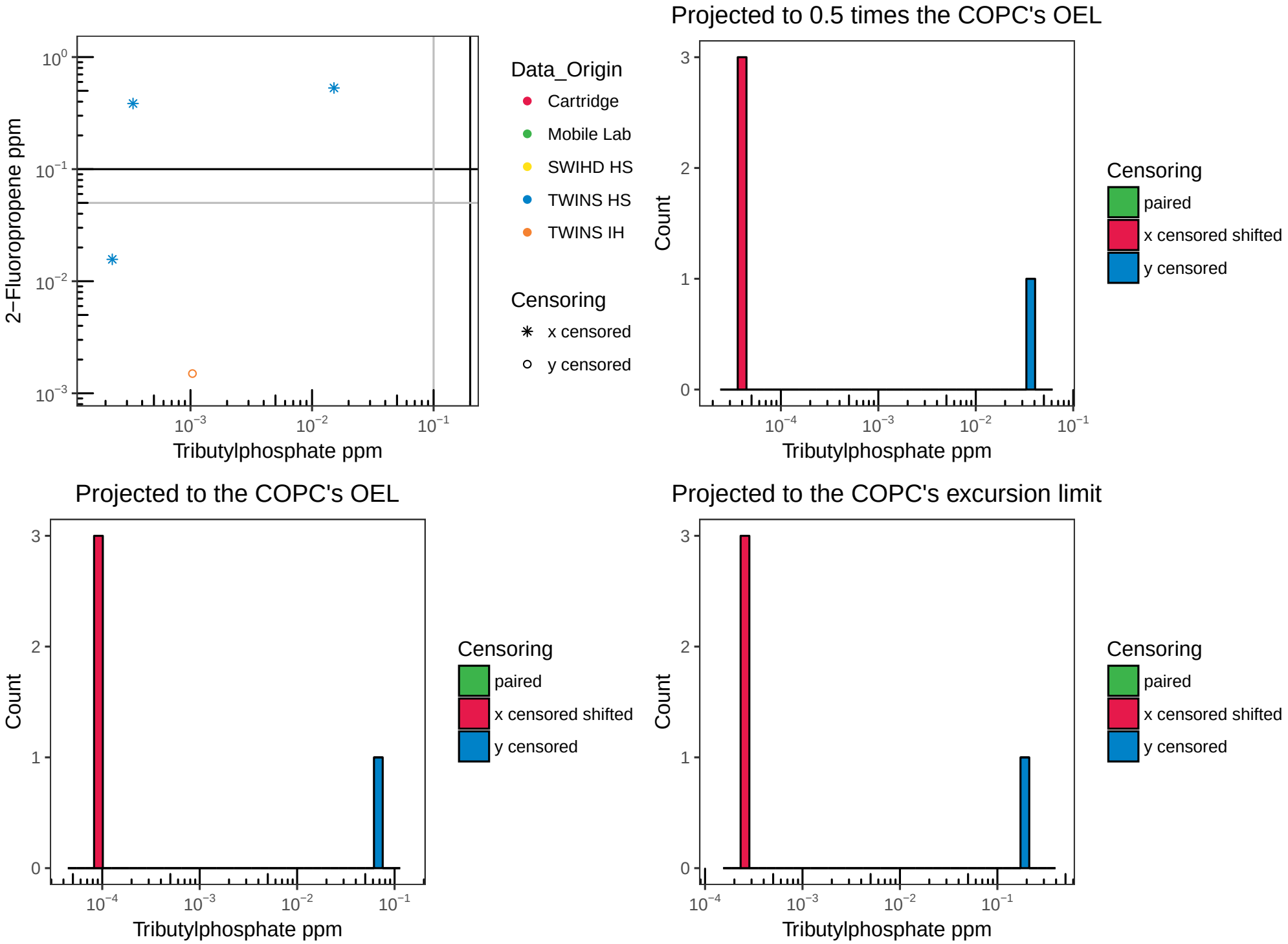


Figure C.2338: 2-Fluoropropene vs Tributylphosphate

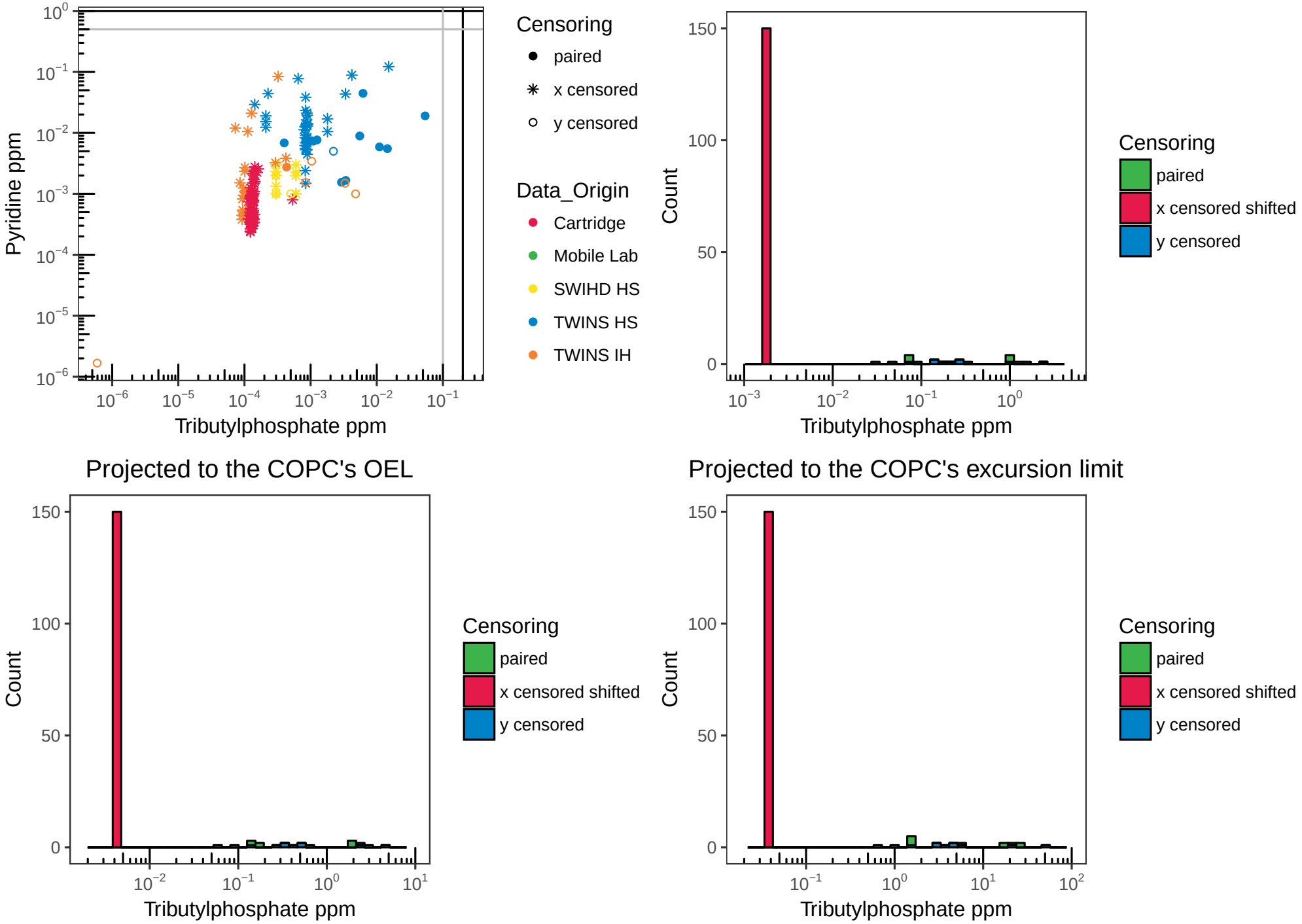


Figure C.2339: Pyridine vs Tributylphosphate

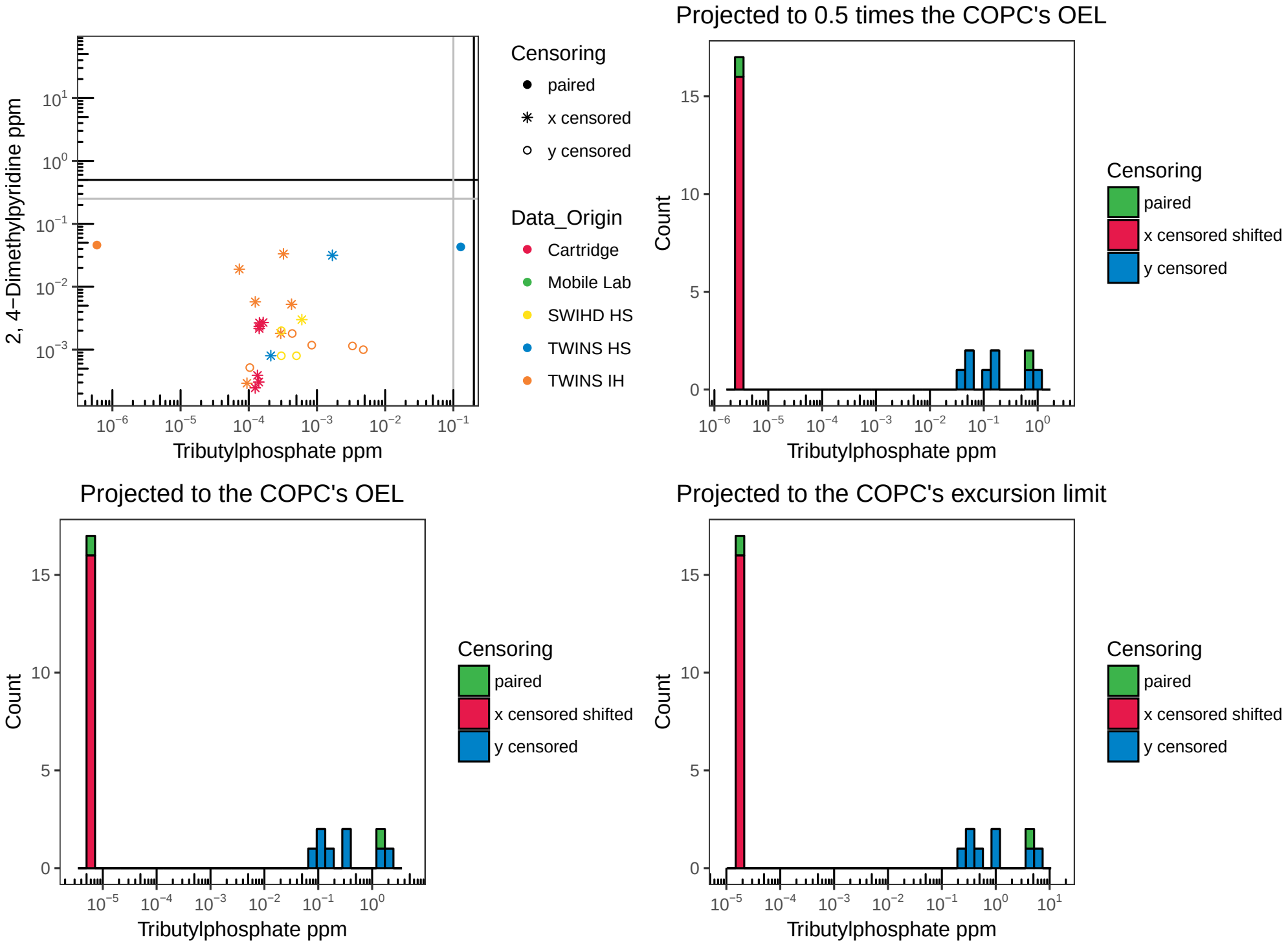


Figure C.2340: 2, 4-Dimethylpyridine vs Tributylphosphate

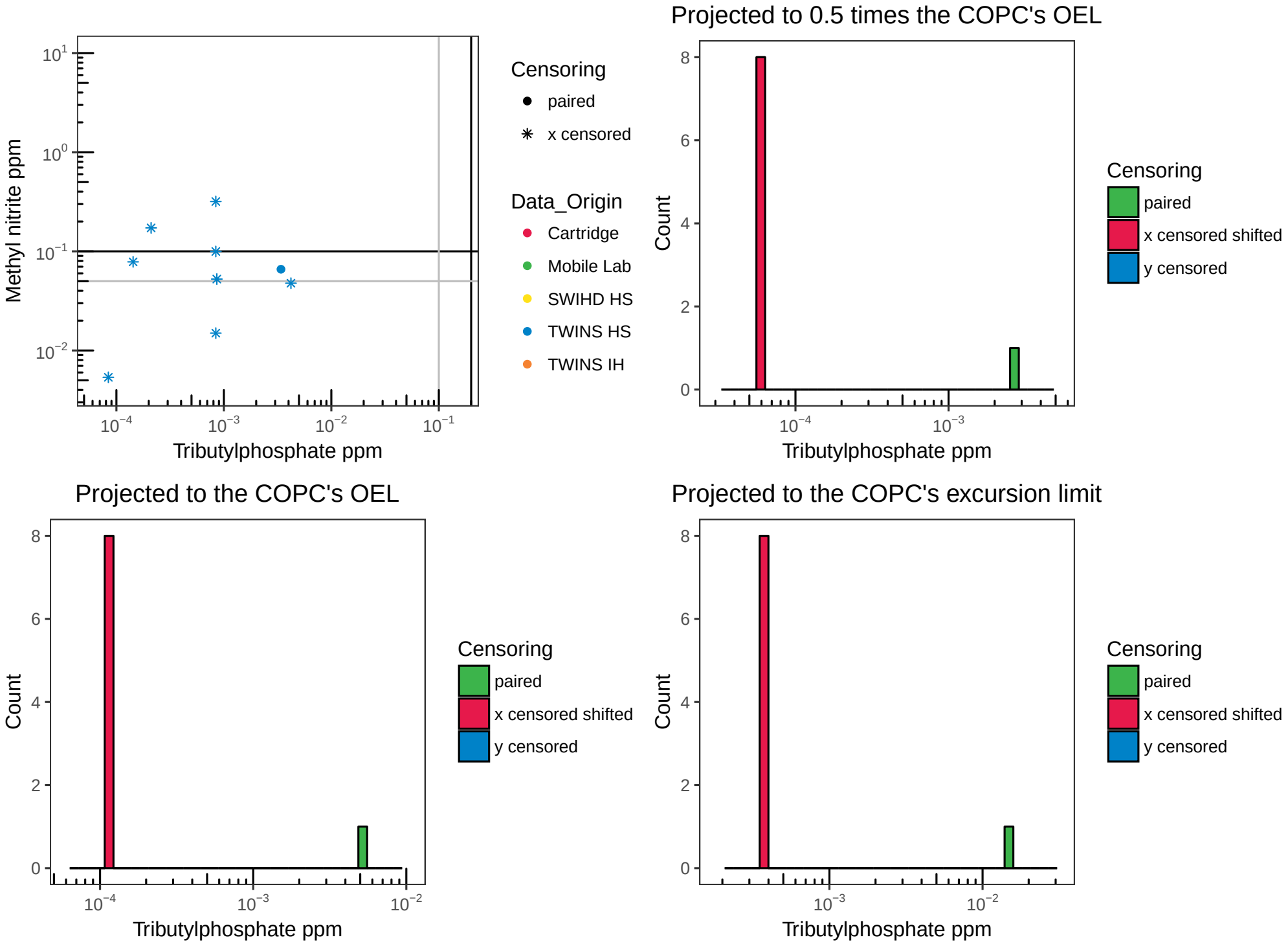


Figure C.2341: Methyl nitrite vs Tributylphosphate

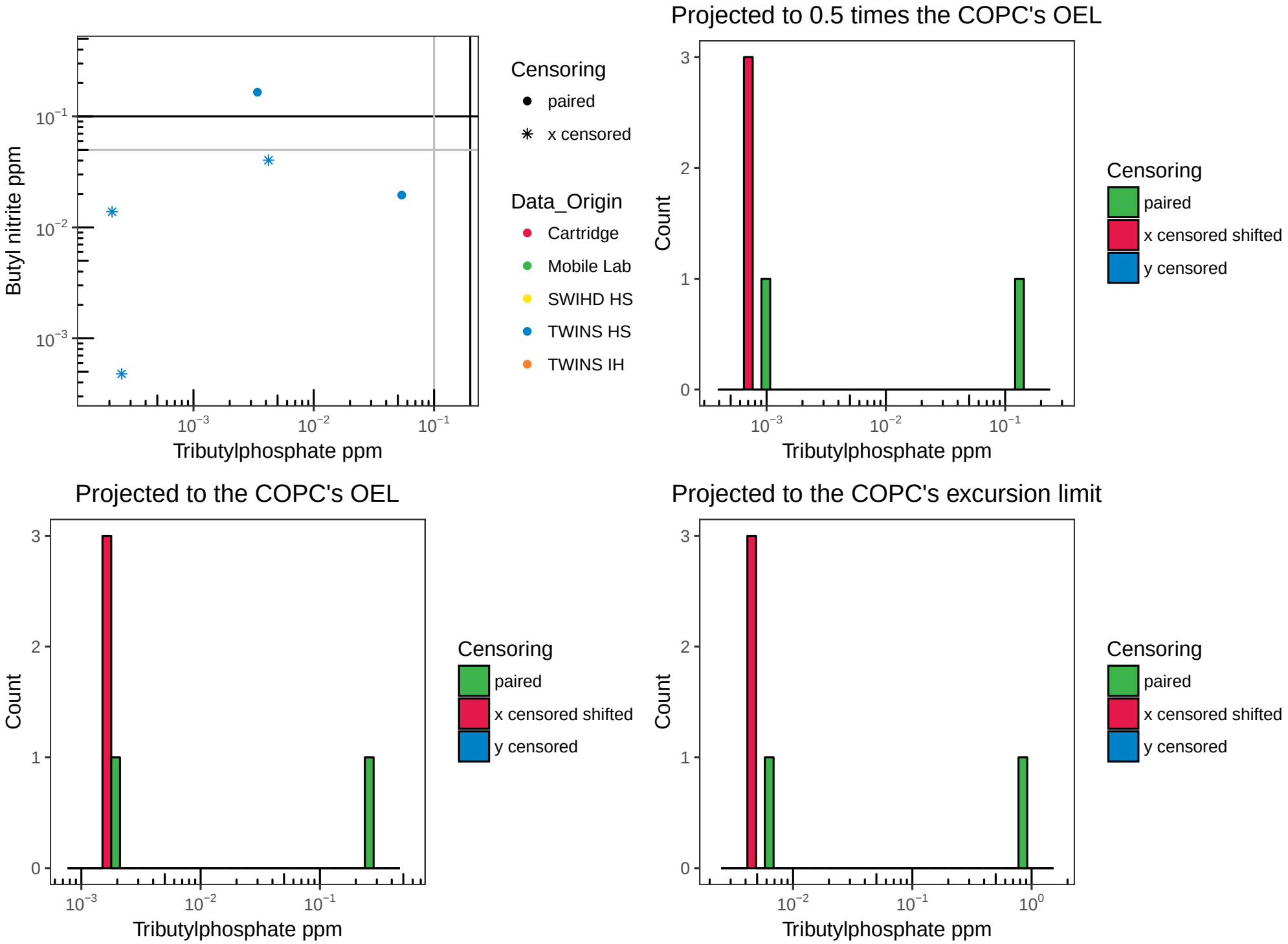


Figure C.2342: Butyl nitrite vs Tributylphosphate

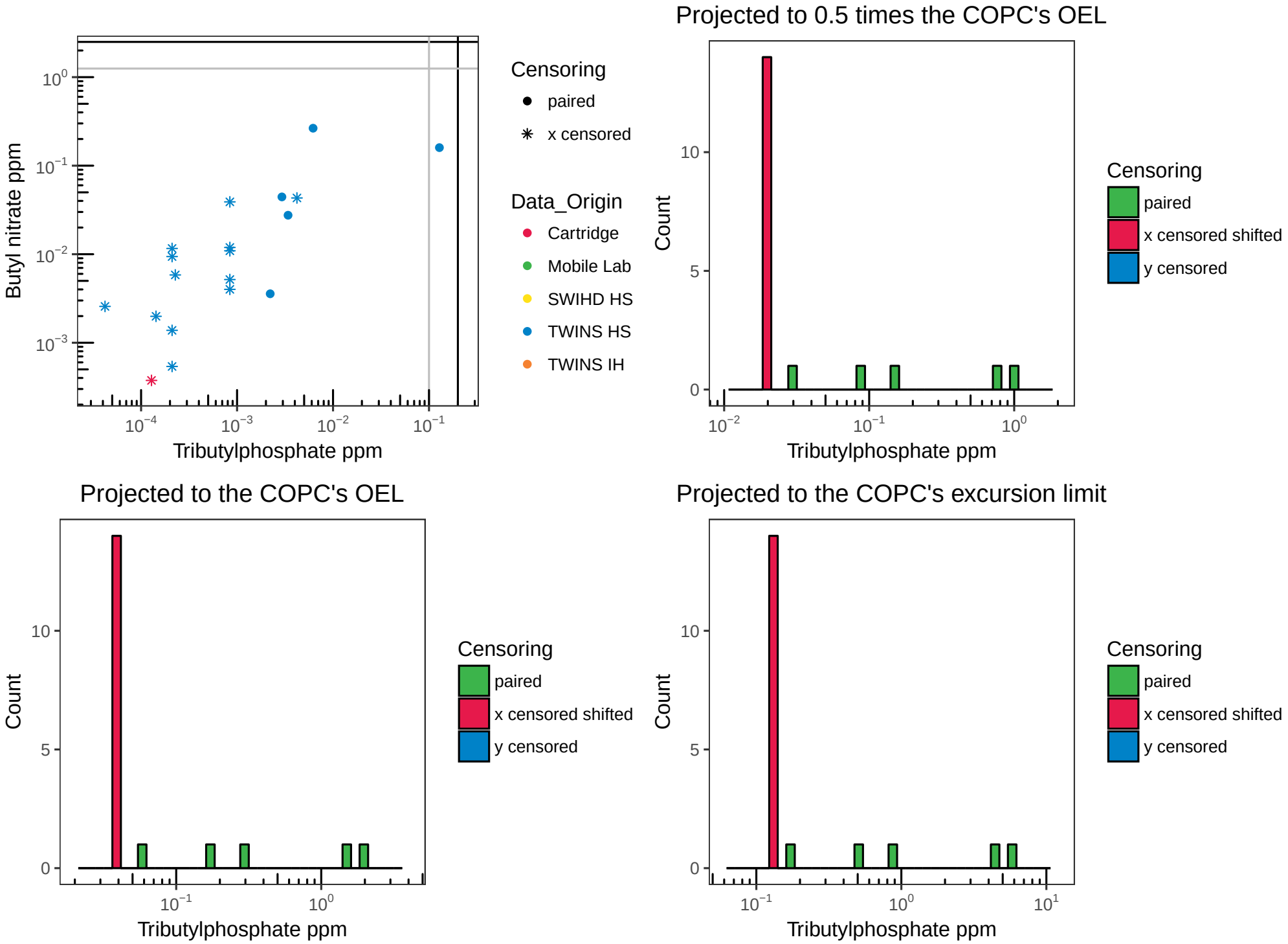


Figure C.2343: Butyl nitrate vs Tributylphosphate

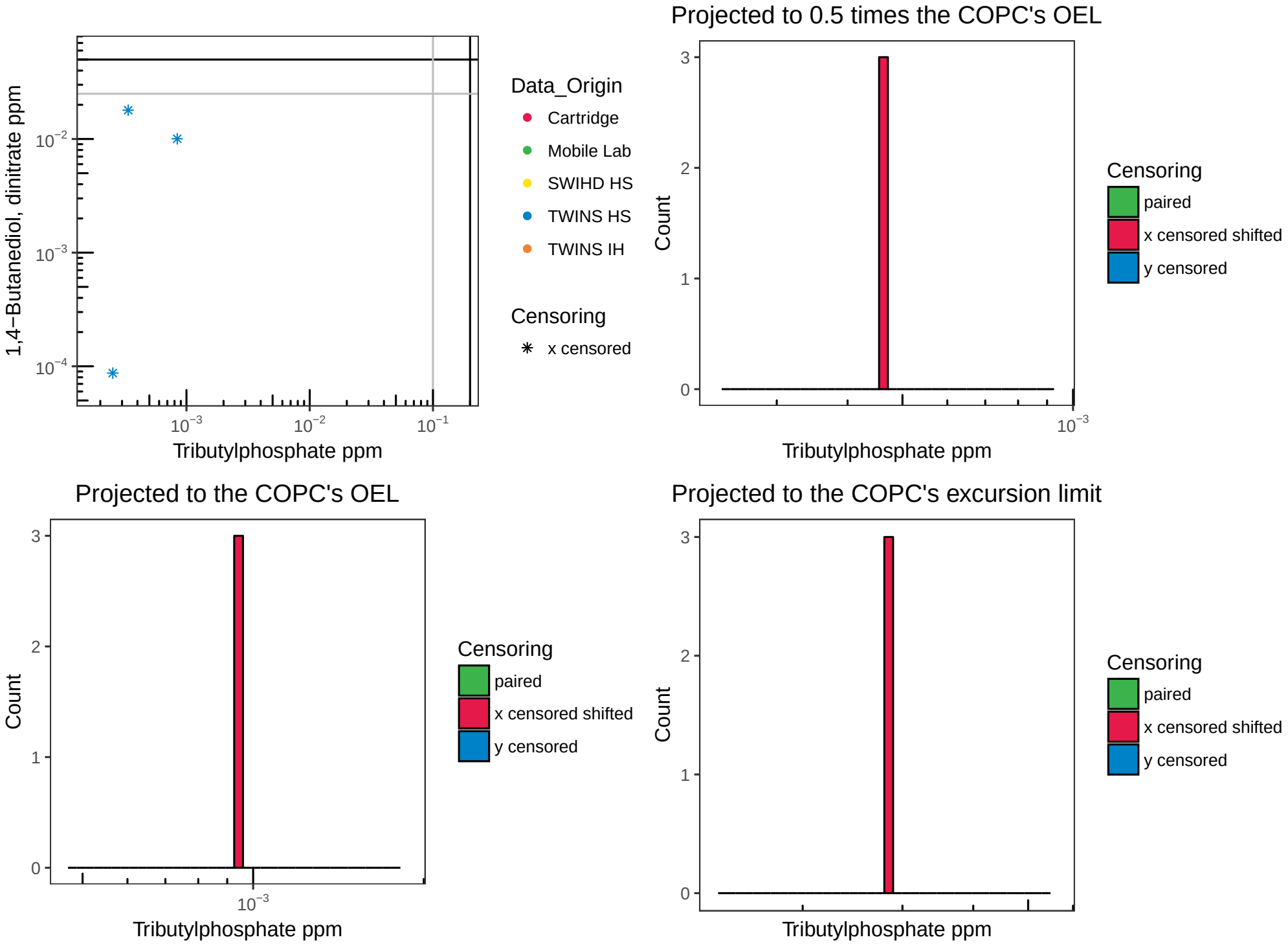


Figure C.2344: 1,4-Butanediol, dinitrate vs Tributylphosphate

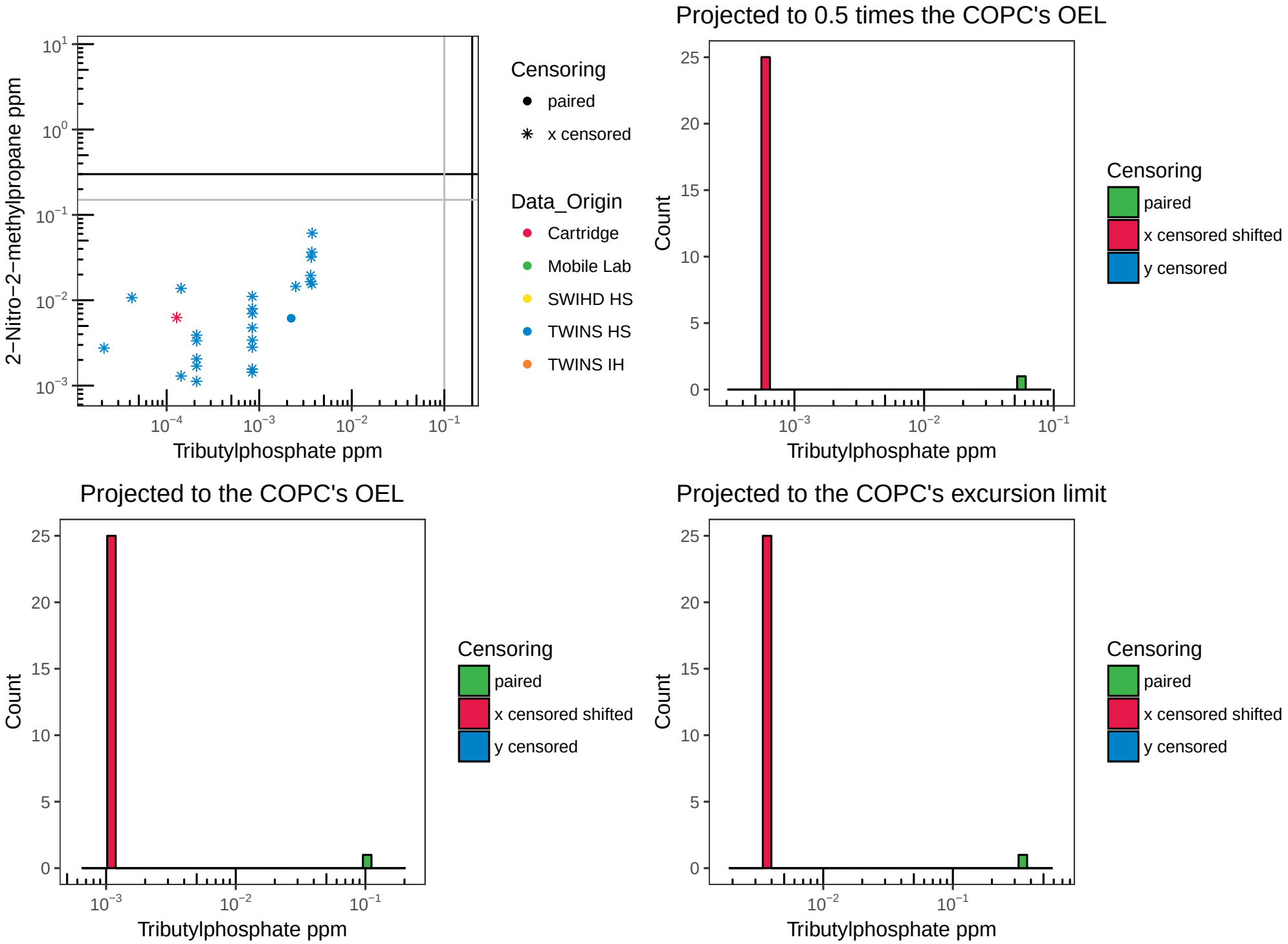


Figure C.2345: 2-Nitro-2-methylpropane vs Tributylphosphate

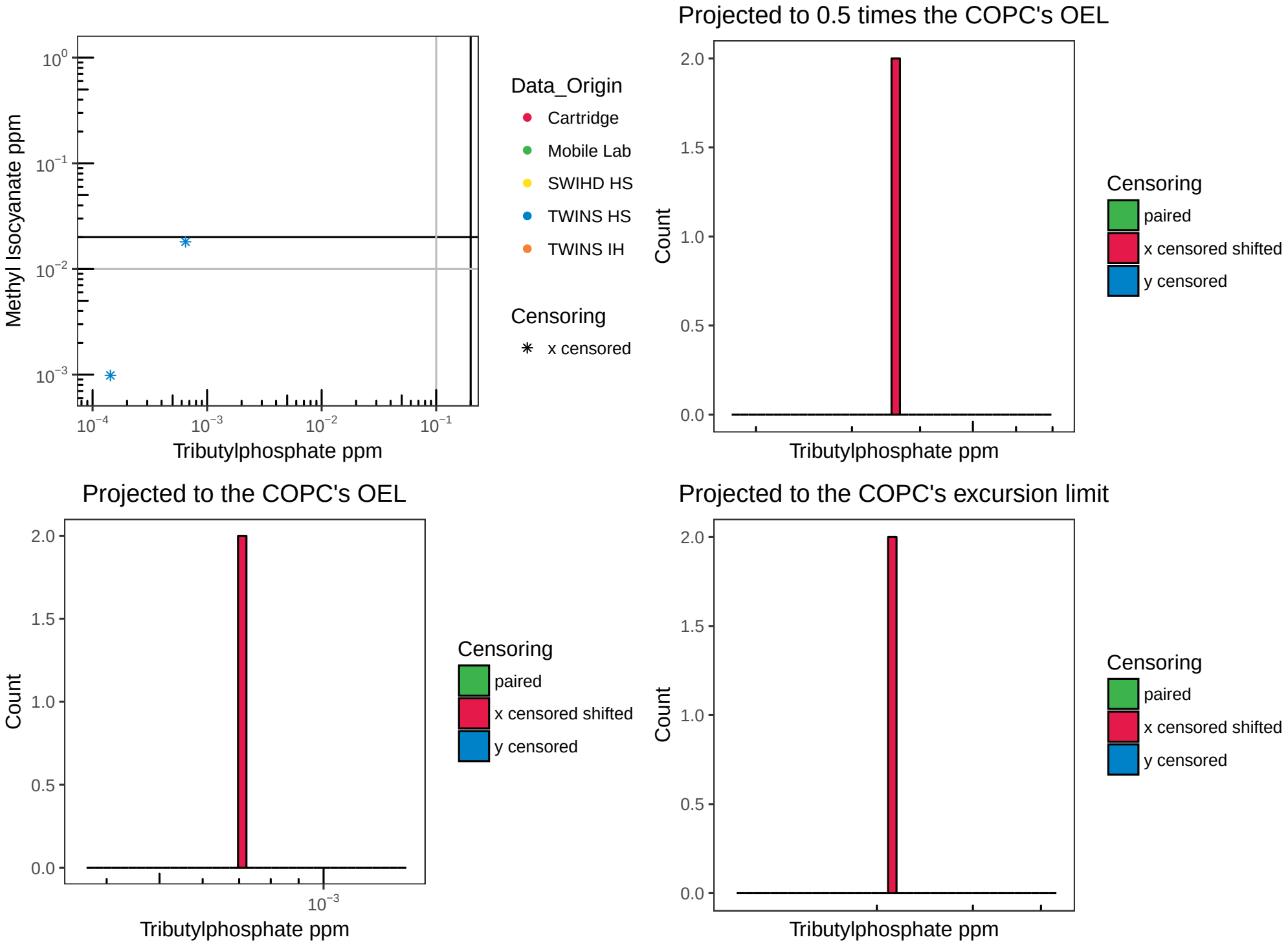


Figure C.2346: Methyl Isocyanate vs Tributylphosphate

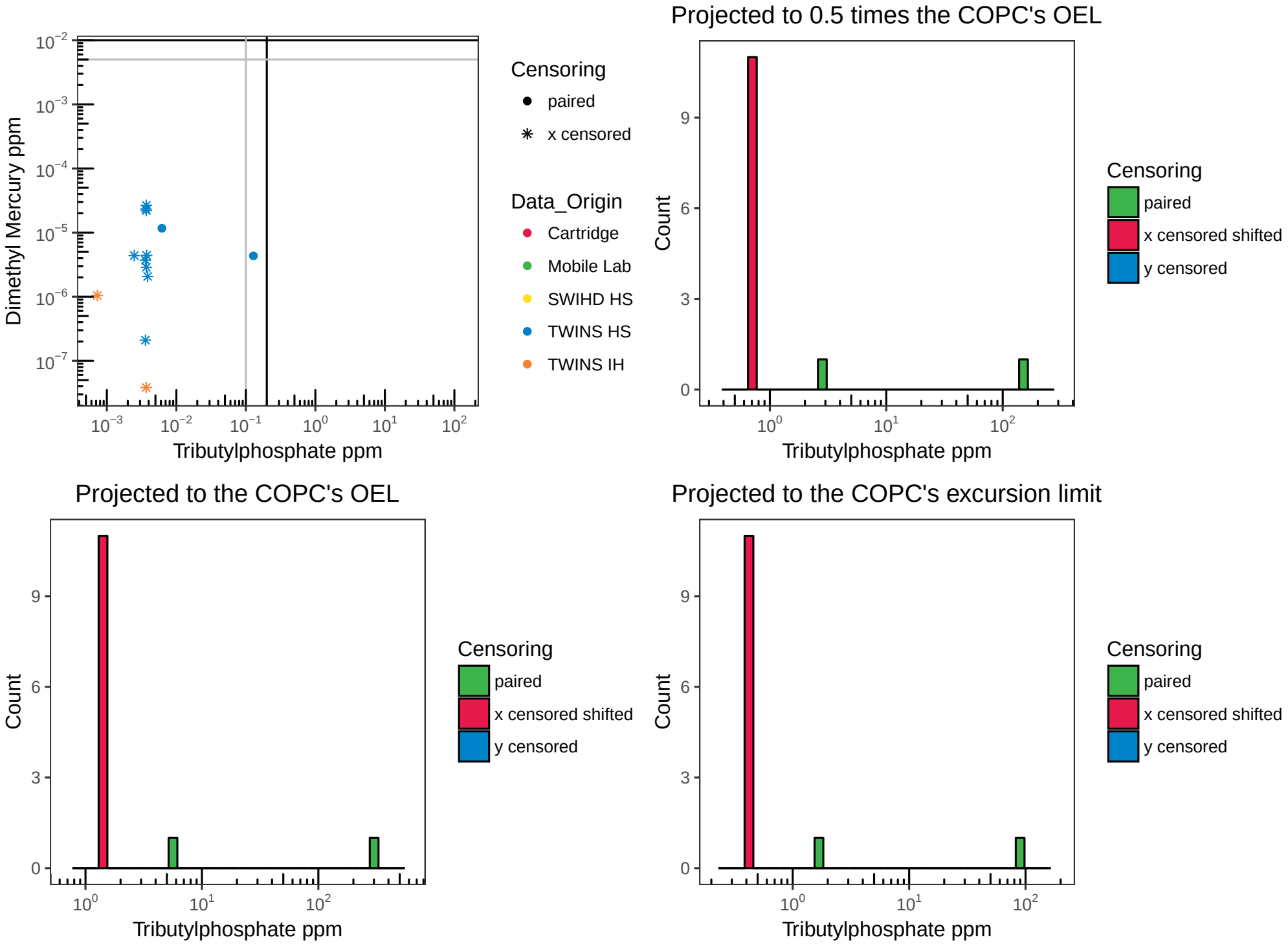


Figure C.2347: Dimethyl Mercury vs Tributylphosphate

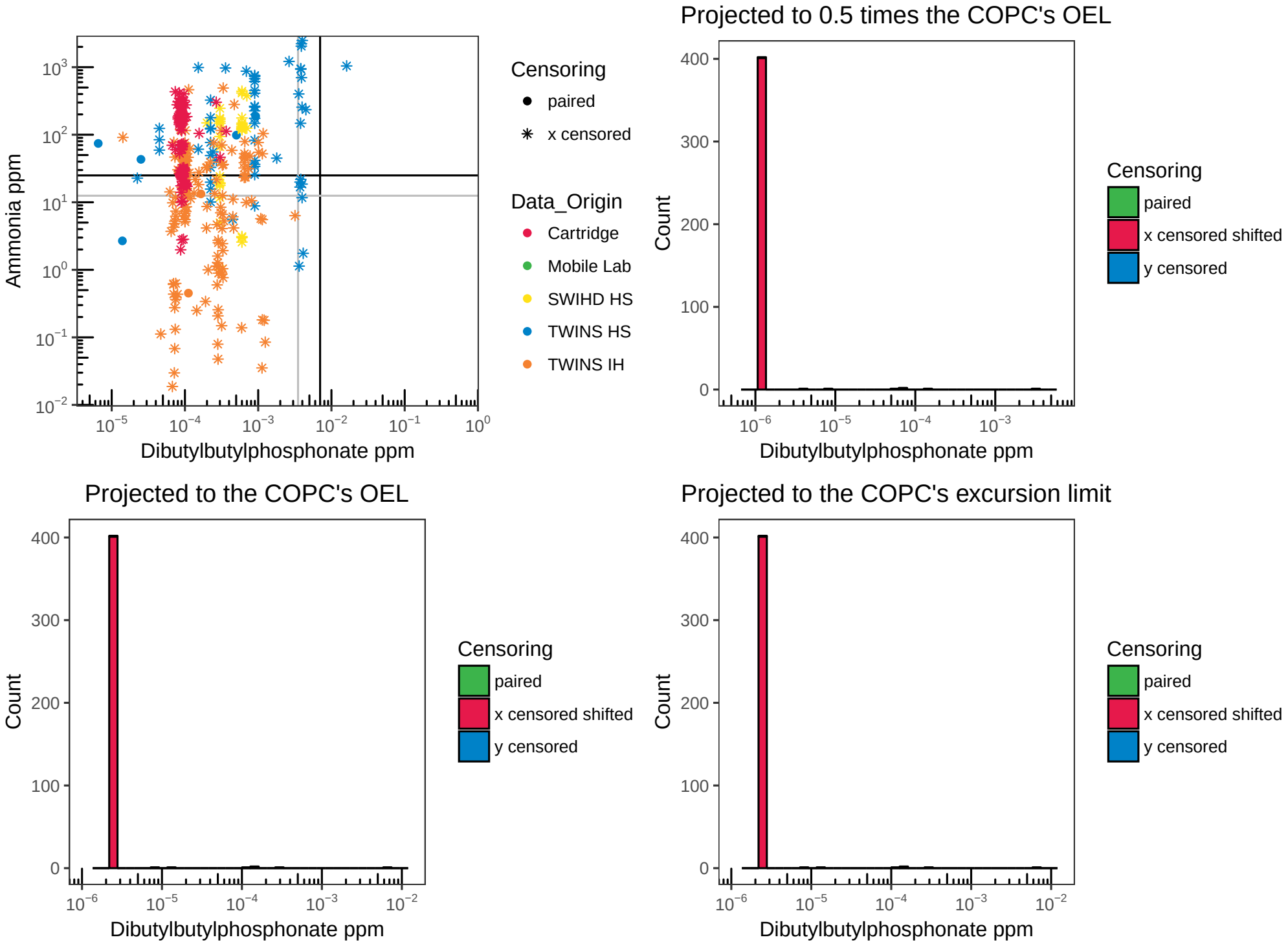


Figure C.2348: Ammonia vs Dibutylbutylphosphonate

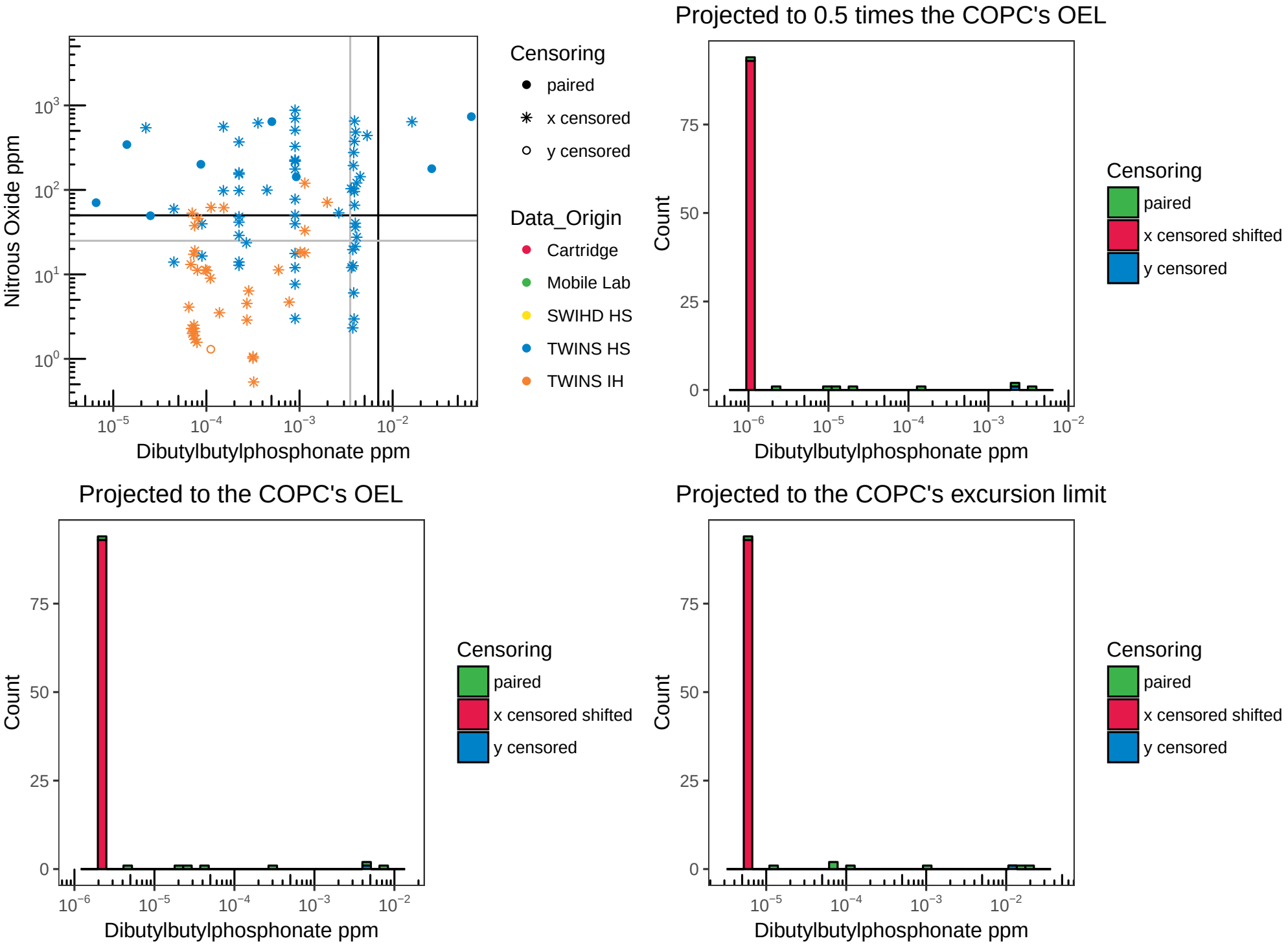


Figure C.2349: Nitrous Oxide vs Dibutylbutylphosphonate

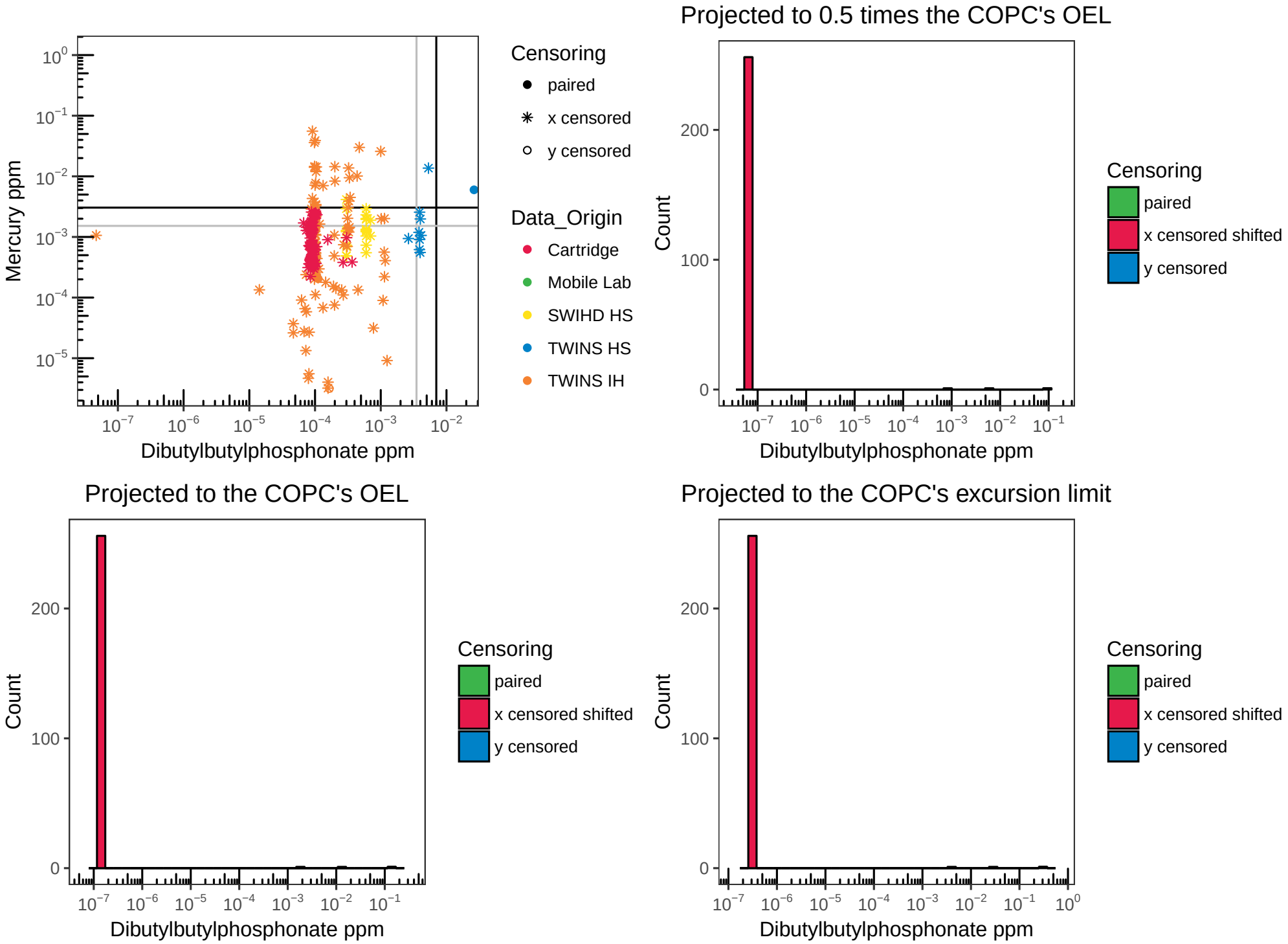


Figure C.2350: Mercury vs Dibutylbutylphosphonate

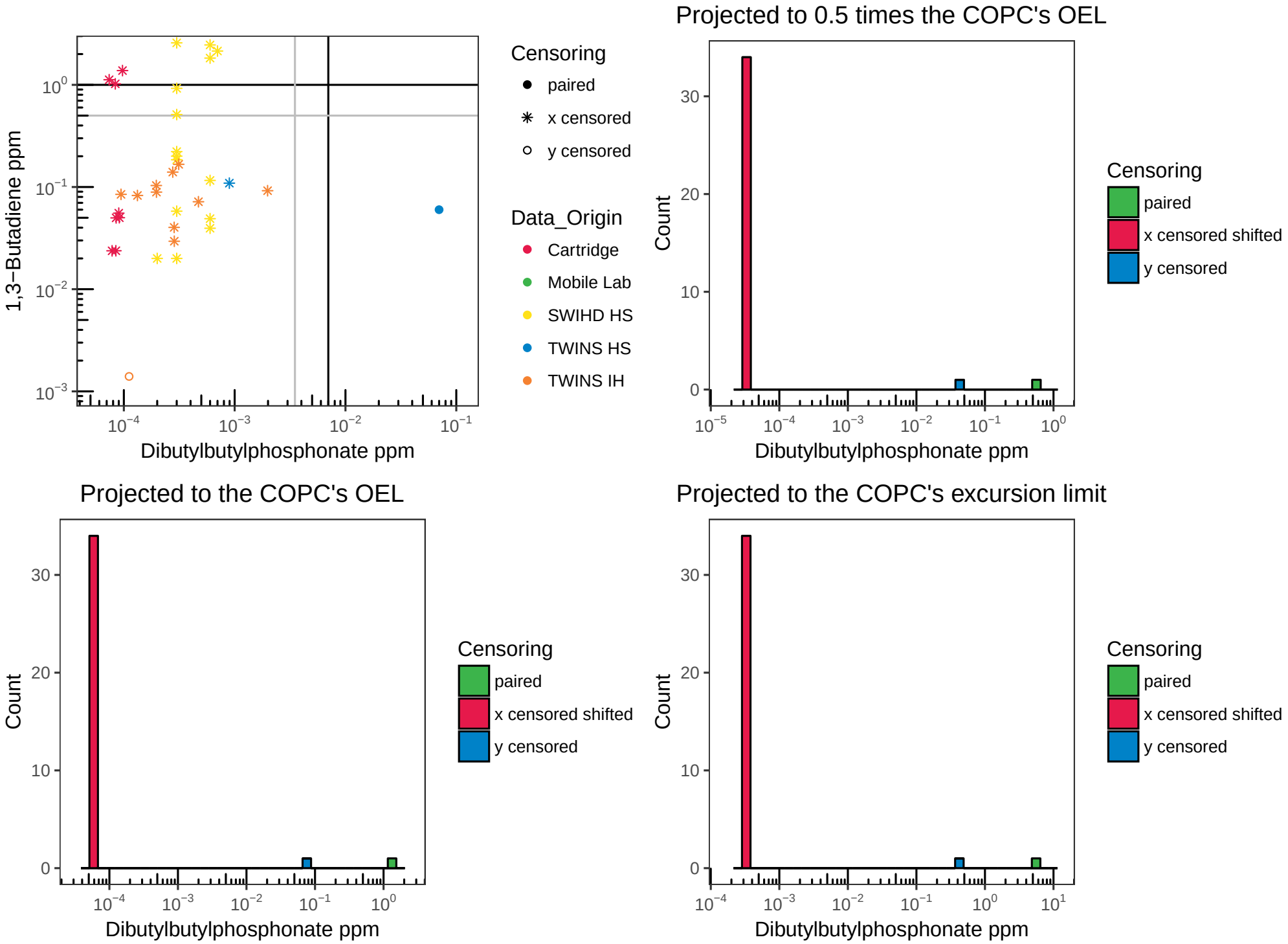


Figure C.2351: 1,3-Butadiene vs Dibutylbutylphosphonate

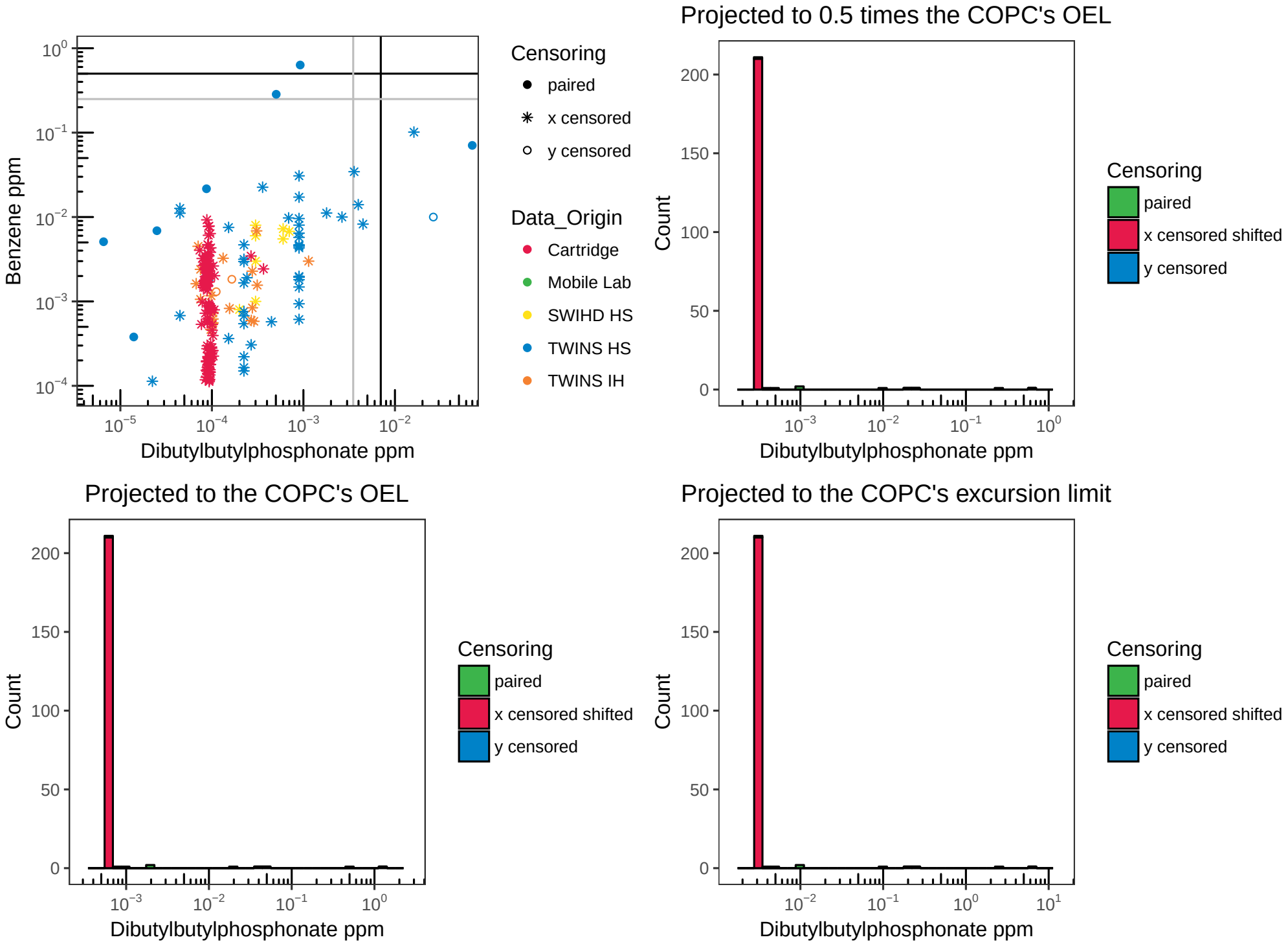


Figure C.2352: Benzene vs Dibutylbutylphosphonate

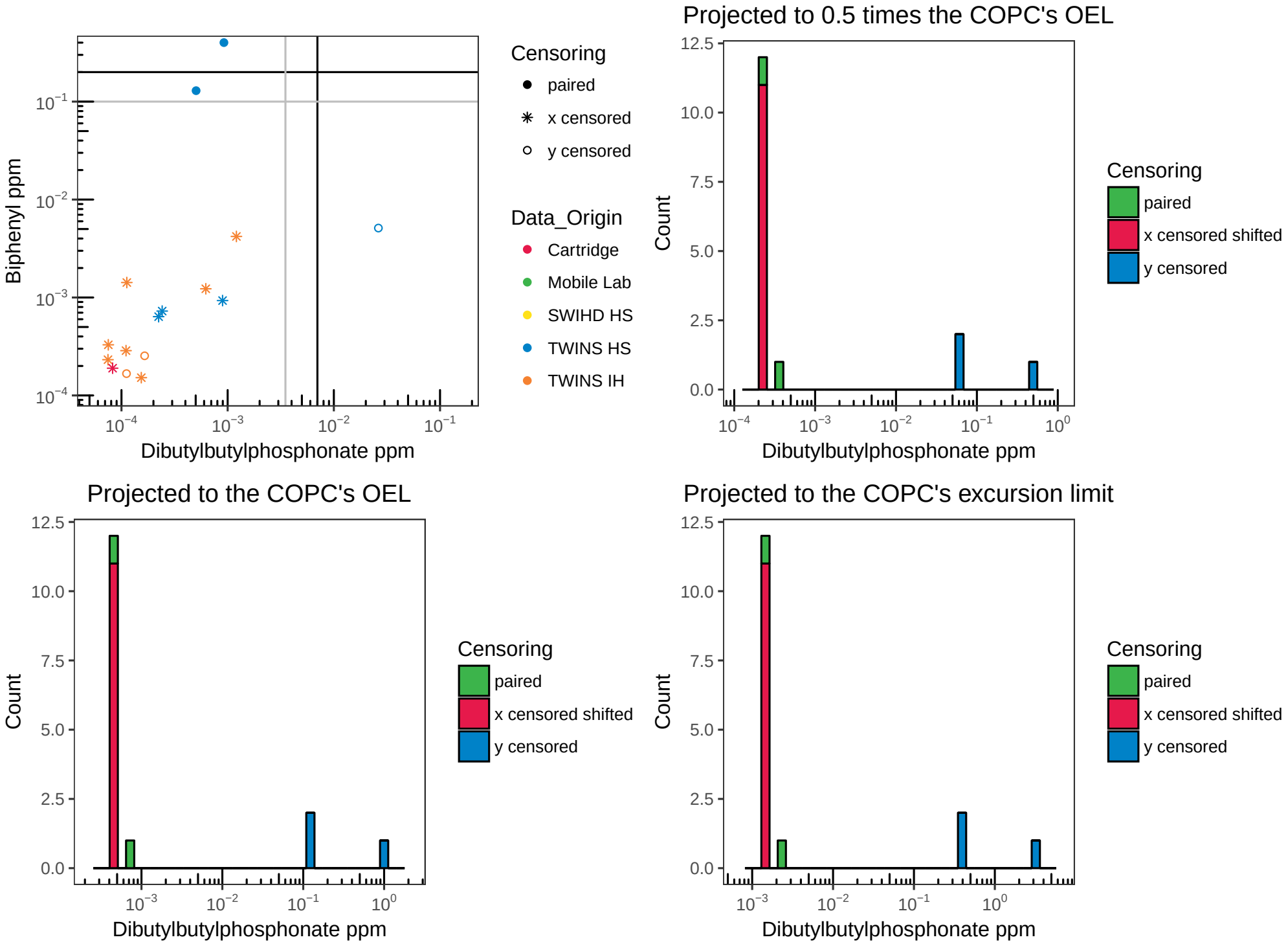


Figure C.2353: Biphenyl vs Dibutylbutylphosphonate

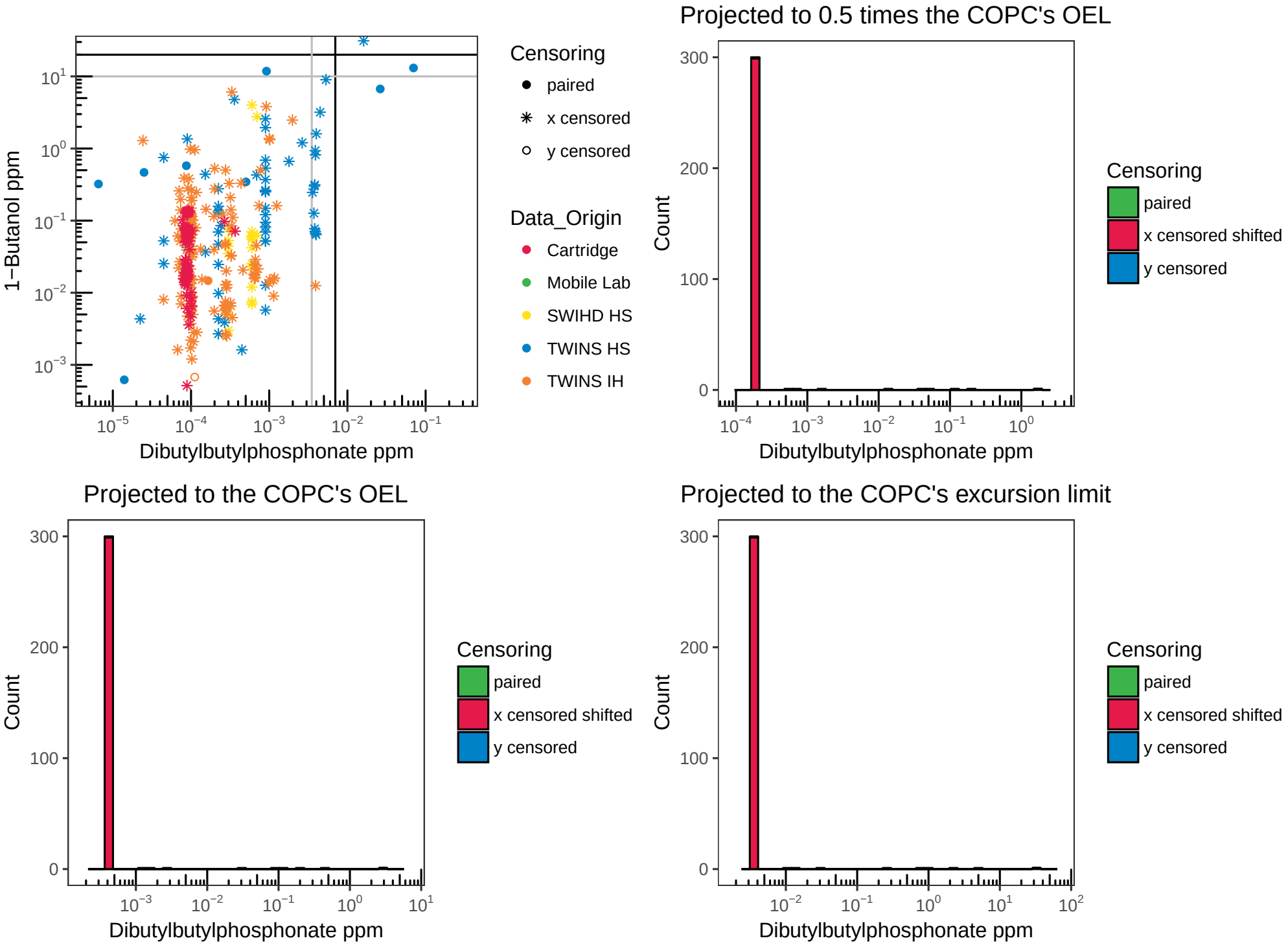


Figure C.2354: 1-Butanol vs Dibutylbutylphosphonate

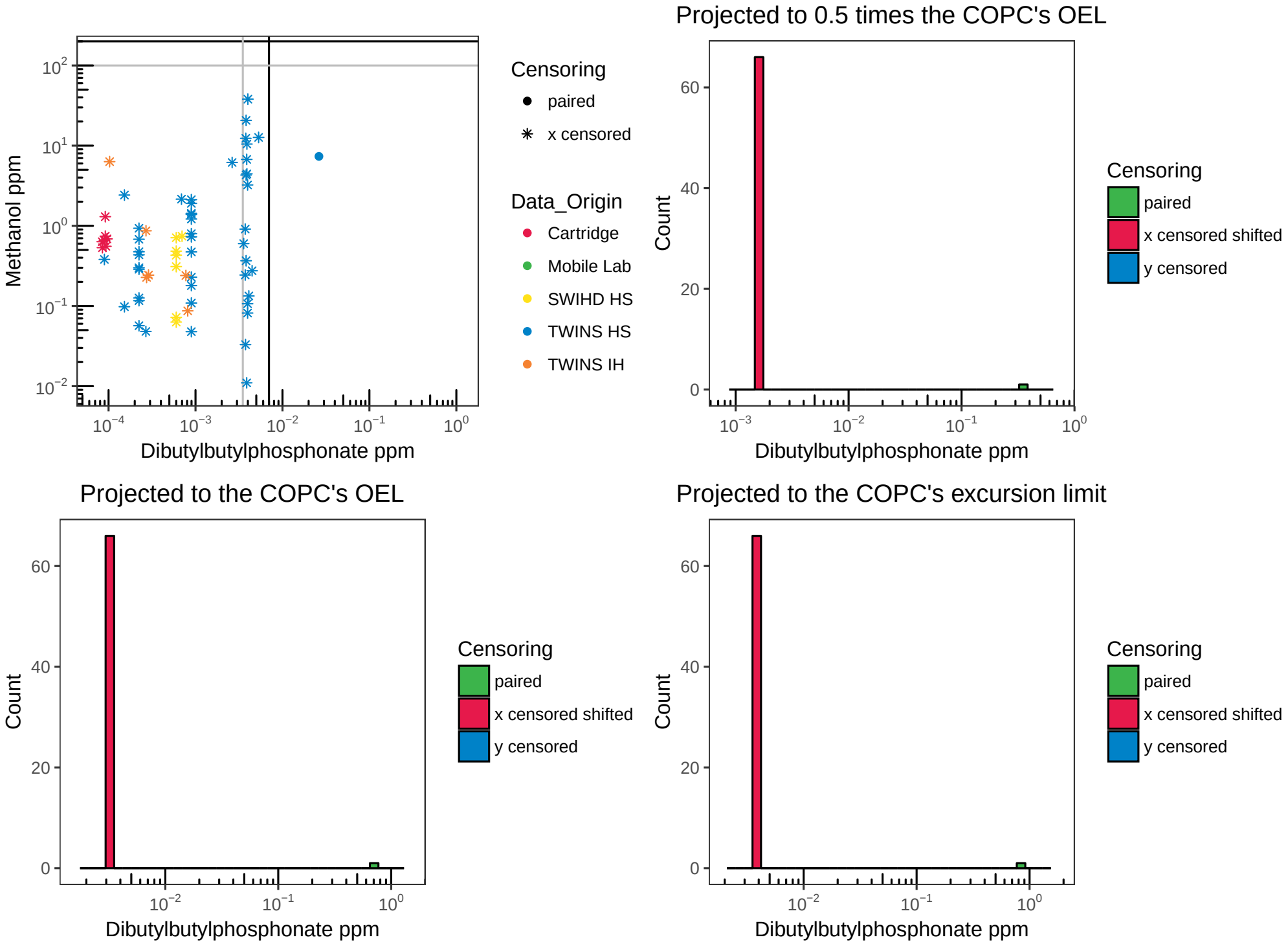


Figure C.2355: Methanol vs Dibutylbutylphosphonate

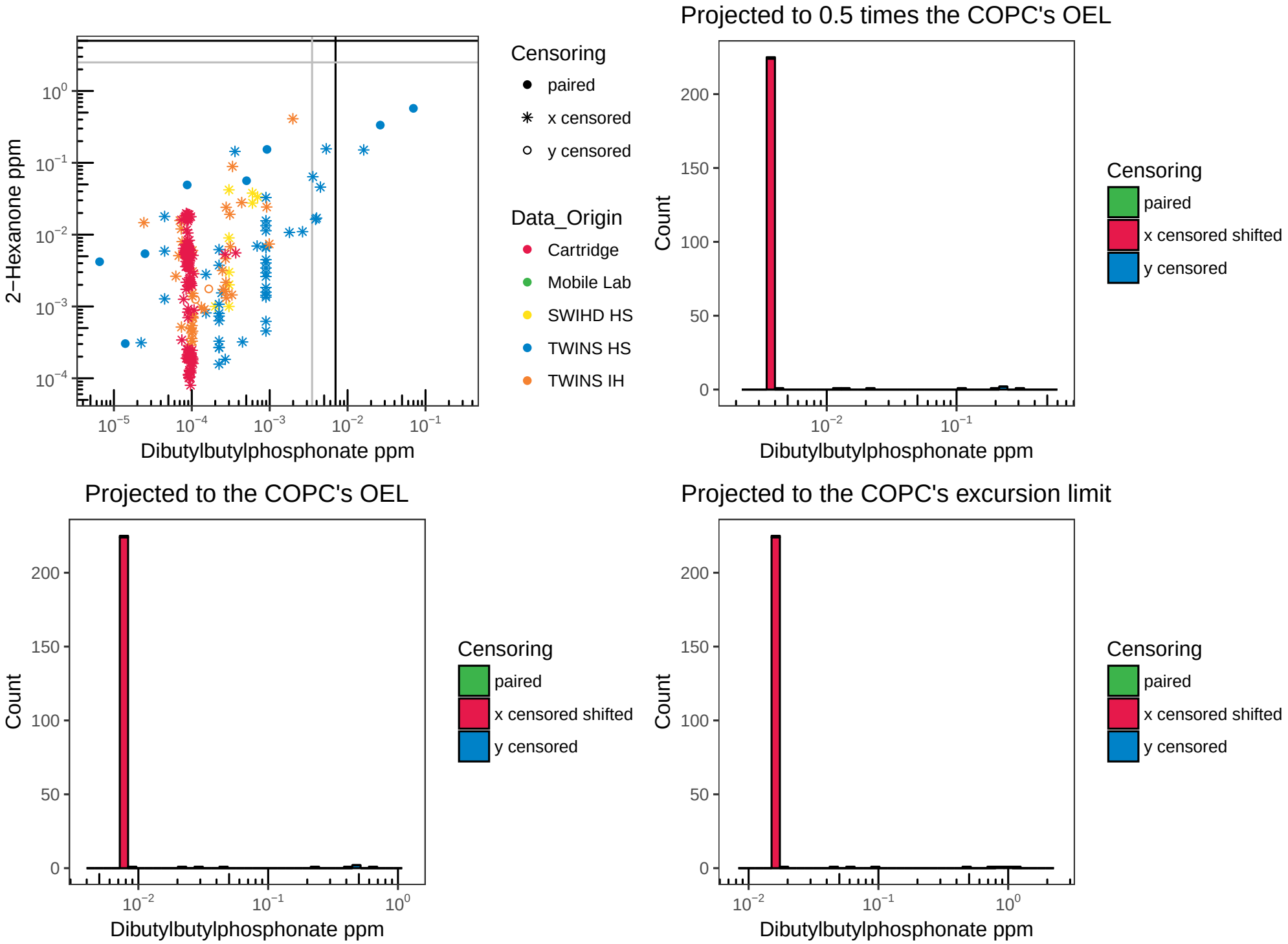


Figure C.2356: 2-Hexanone vs Dibutylbutylphosphonate

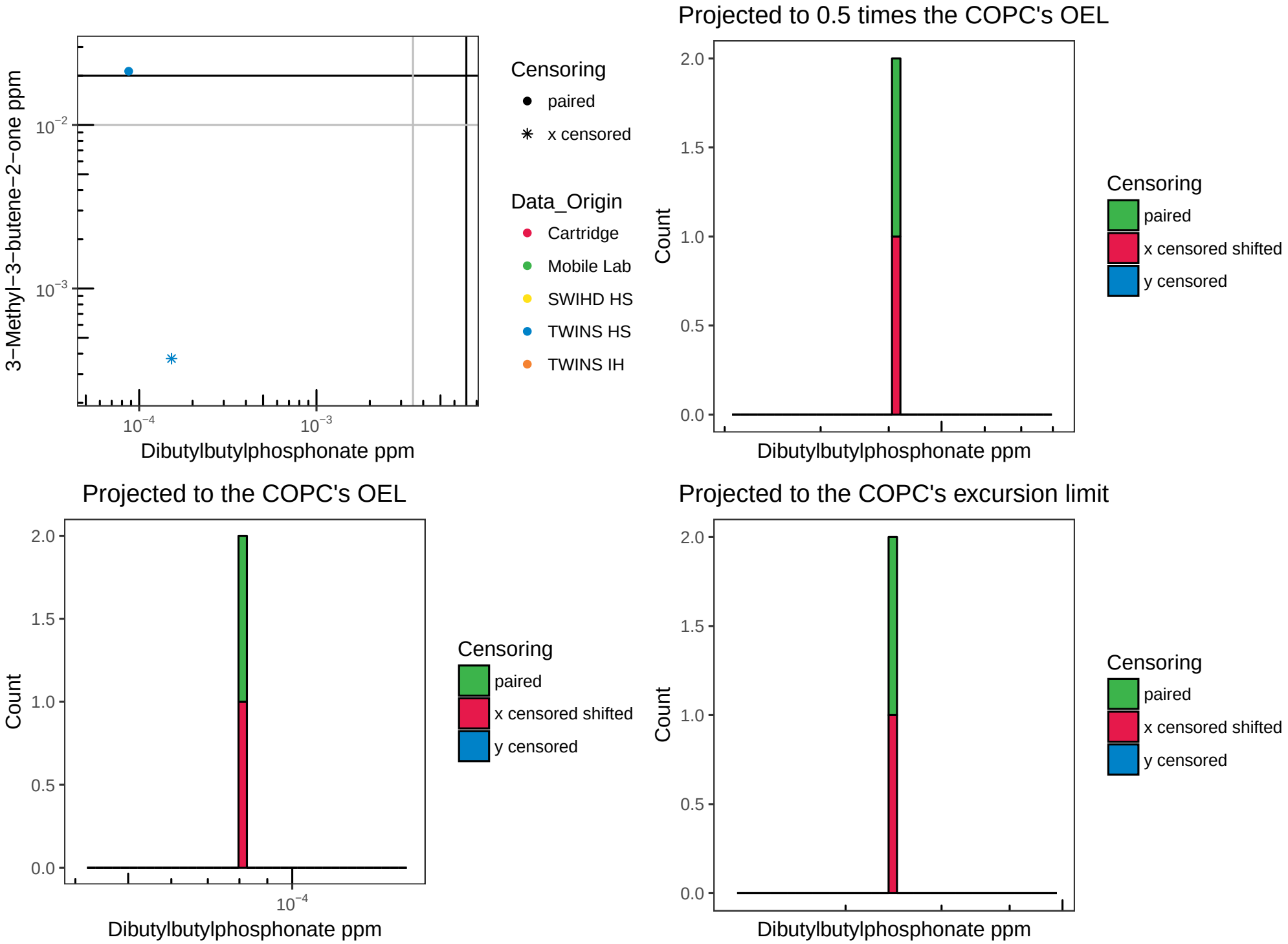


Figure C.2357: 3-Methyl-3-butene-2-one vs Dibutylbutylphosphonate

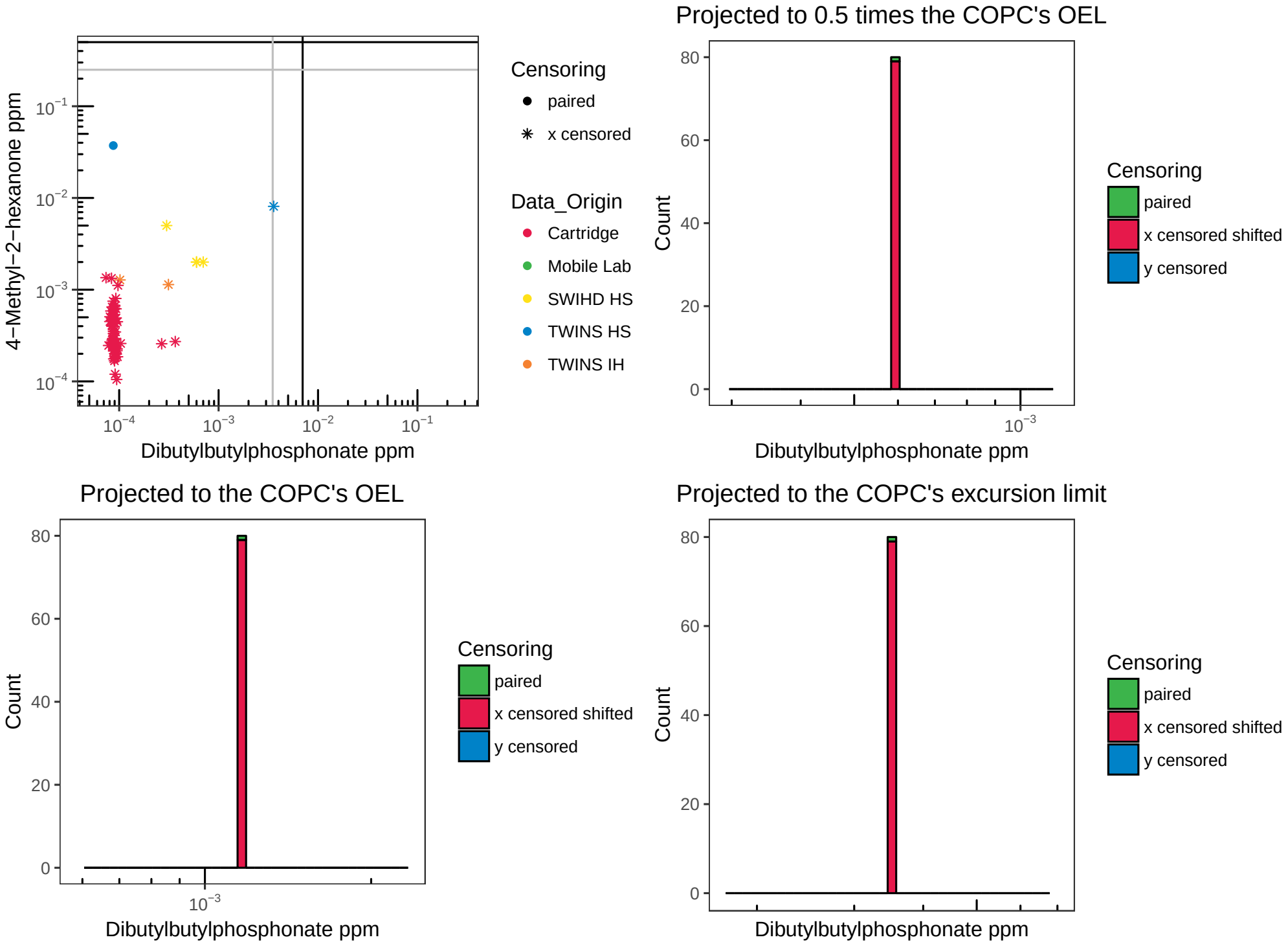


Figure C.2358: 4-Methyl-2-hexanone vs Dibutylbutylphosphonate

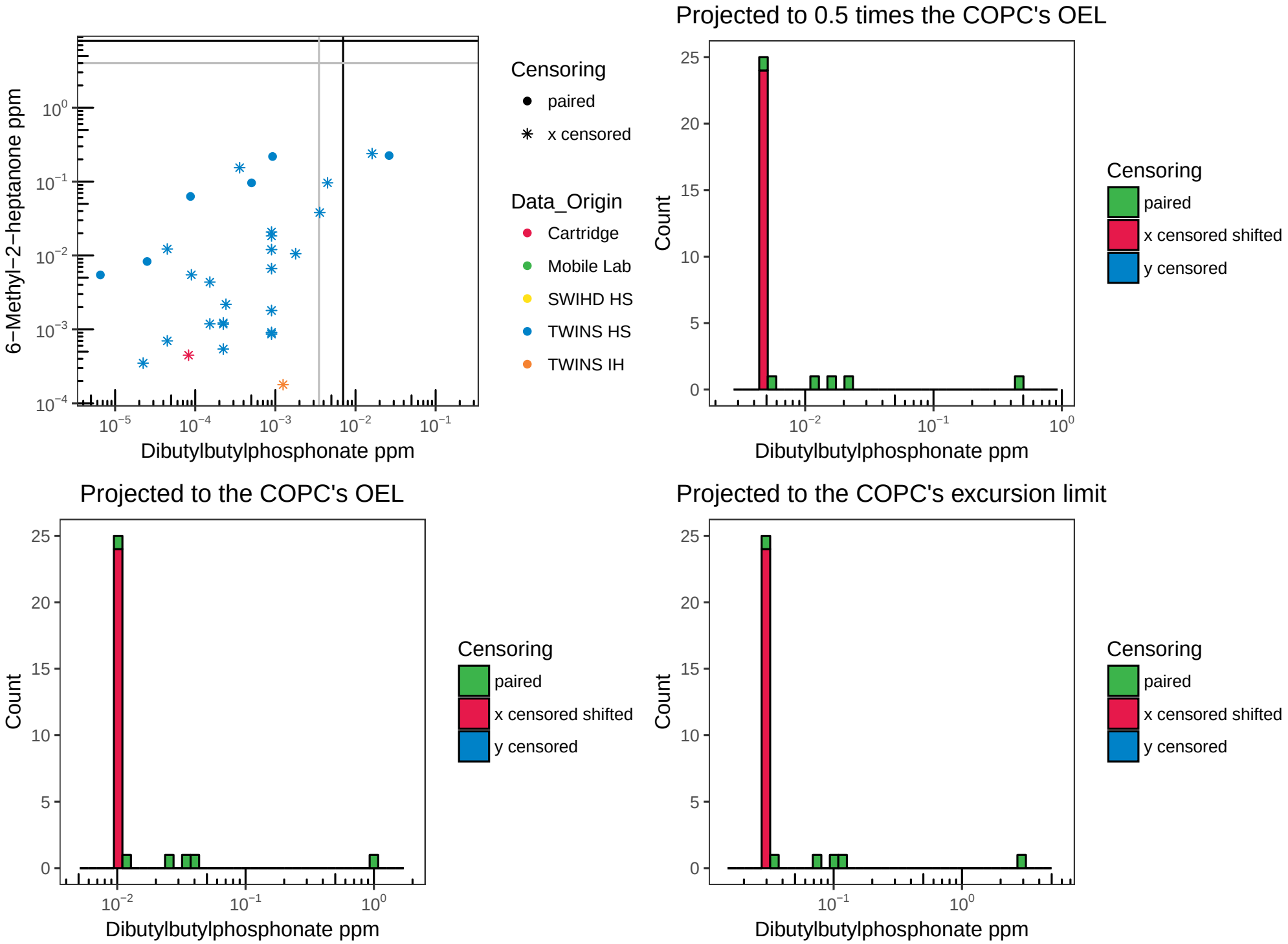


Figure C.2359: 6-Methyl-2-heptanone vs Dibutylbutylphosphonate

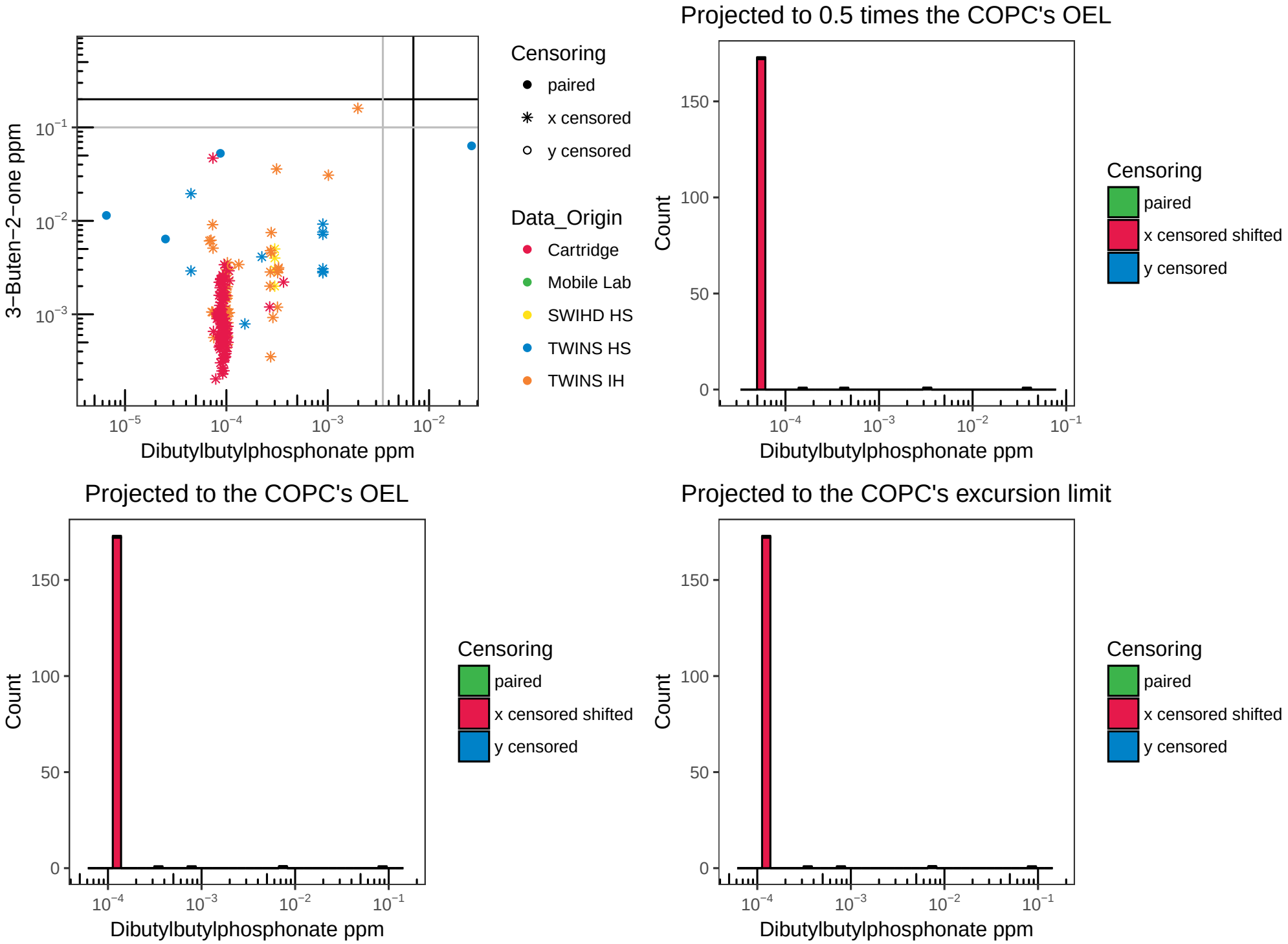


Figure C.2360: 3-Buten-2-one vs Dibutylbutylphosphonate

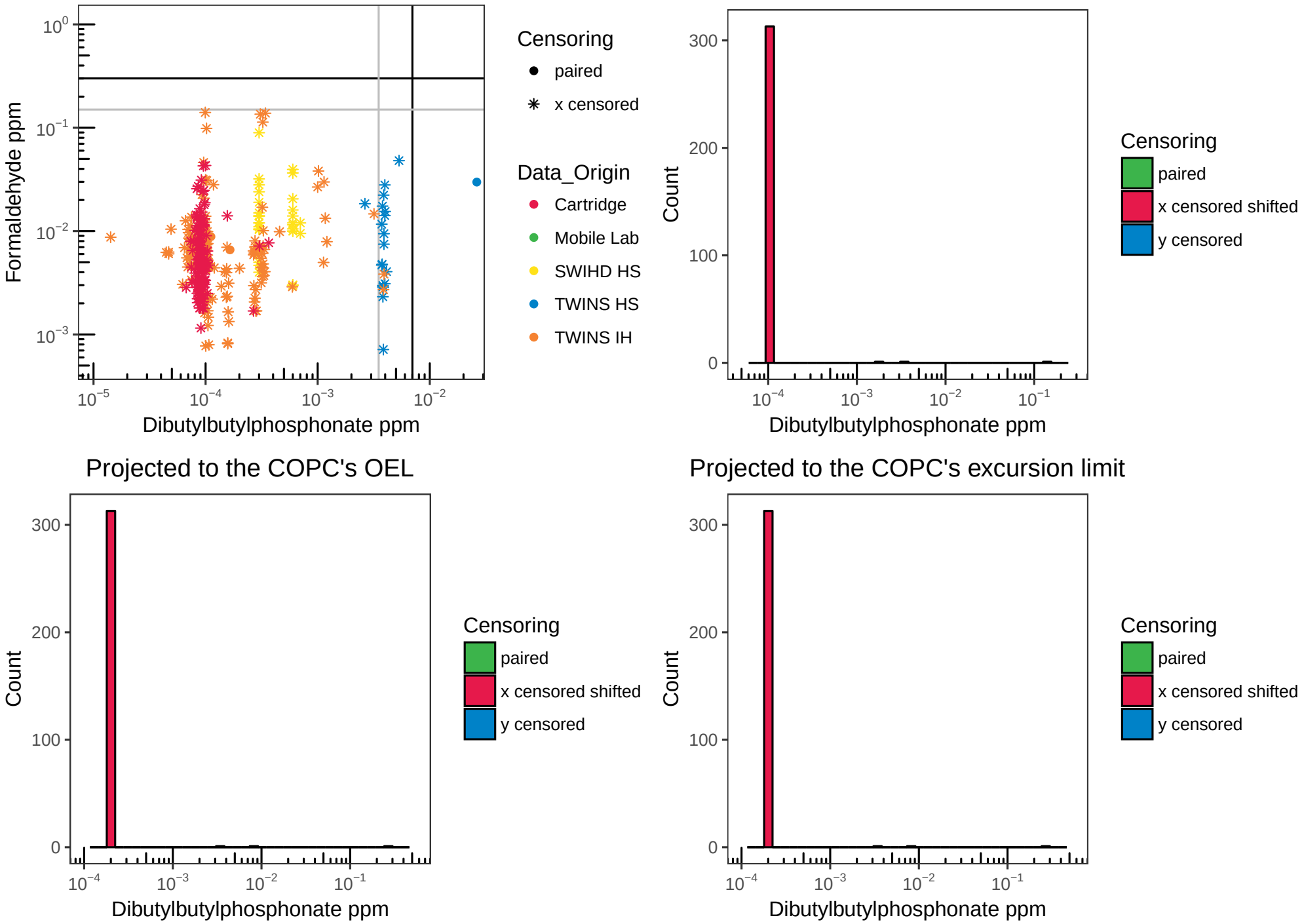


Figure C.2361: Formaldehyde vs Dibutylbutylphosphonate

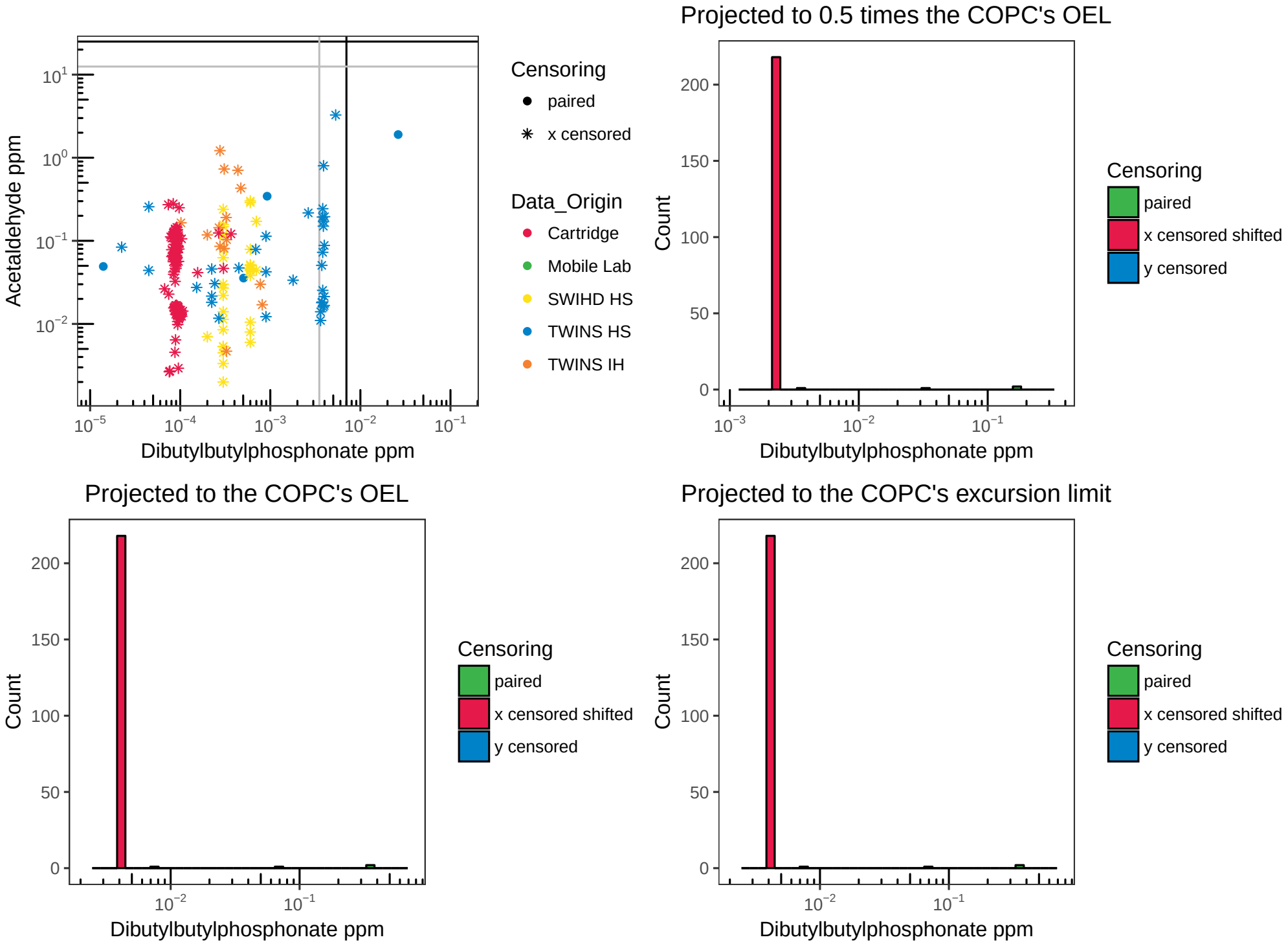


Figure C.2362: Acetaldehyde vs Dibutylbutylphosphonate

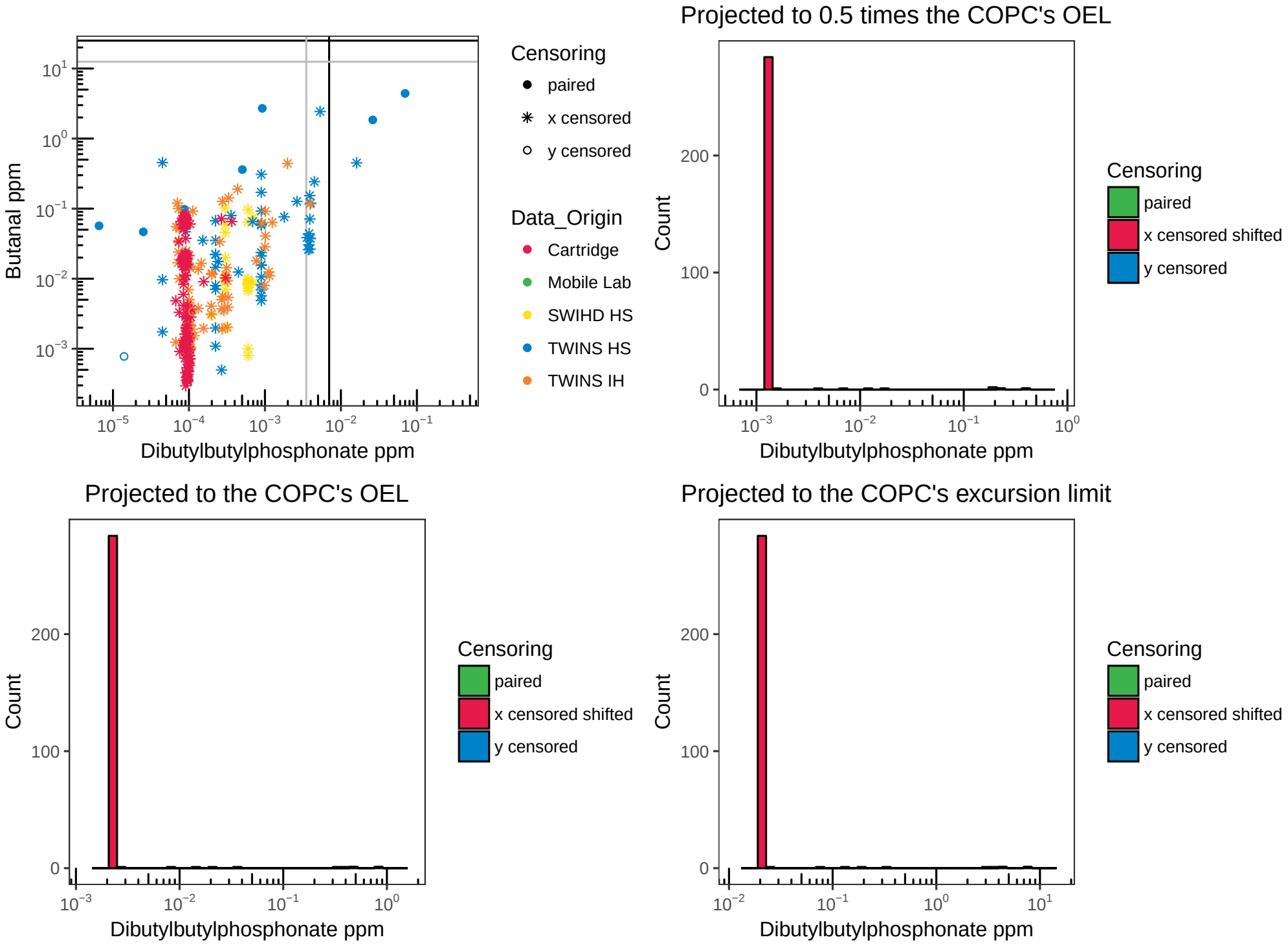


Figure C.2363: Butanal vs Dibutylbutylphosphonate

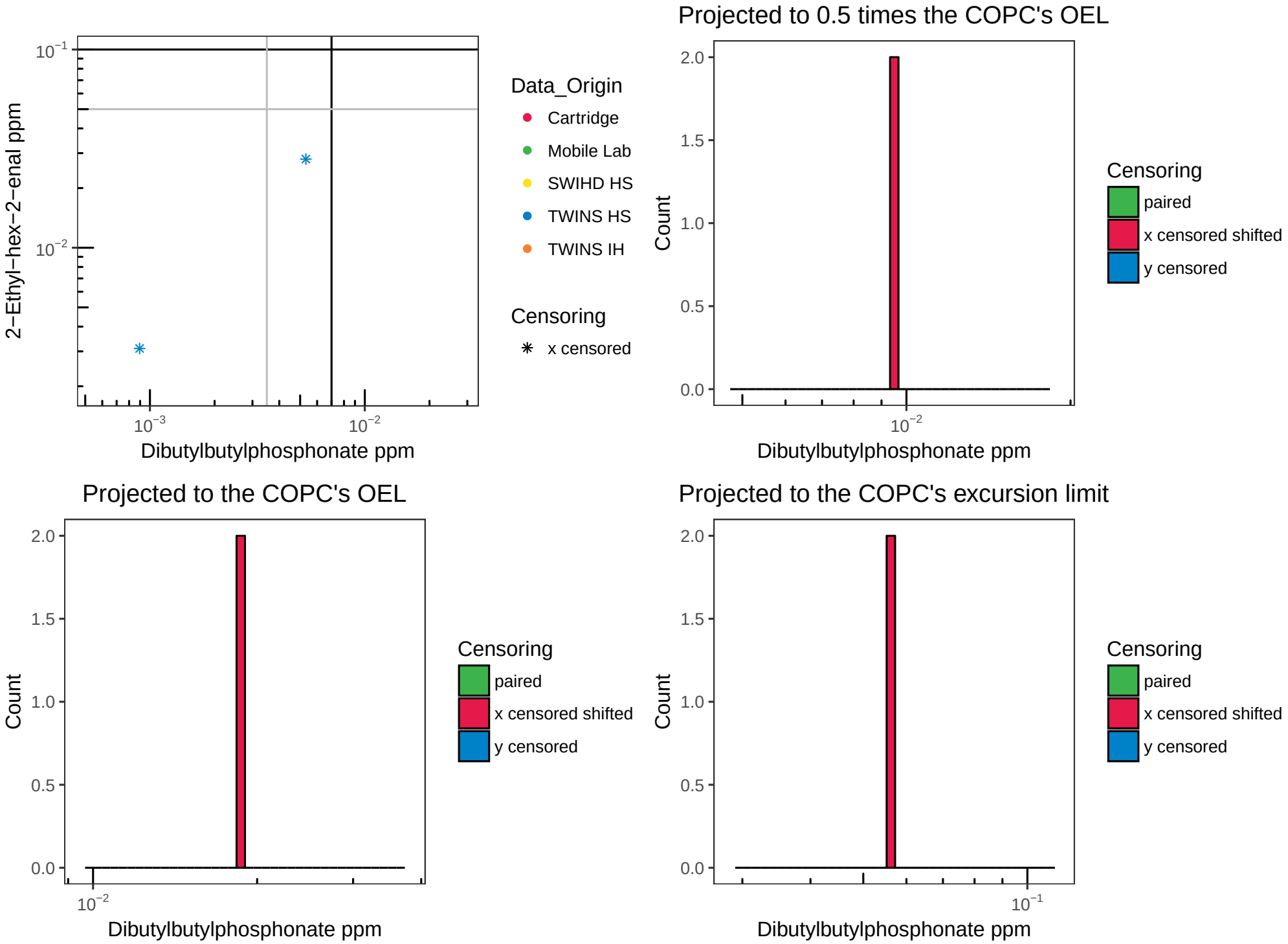


Figure C.2364: 2-Ethyl-hex-2-enal vs Dibutylbutylphosphonate

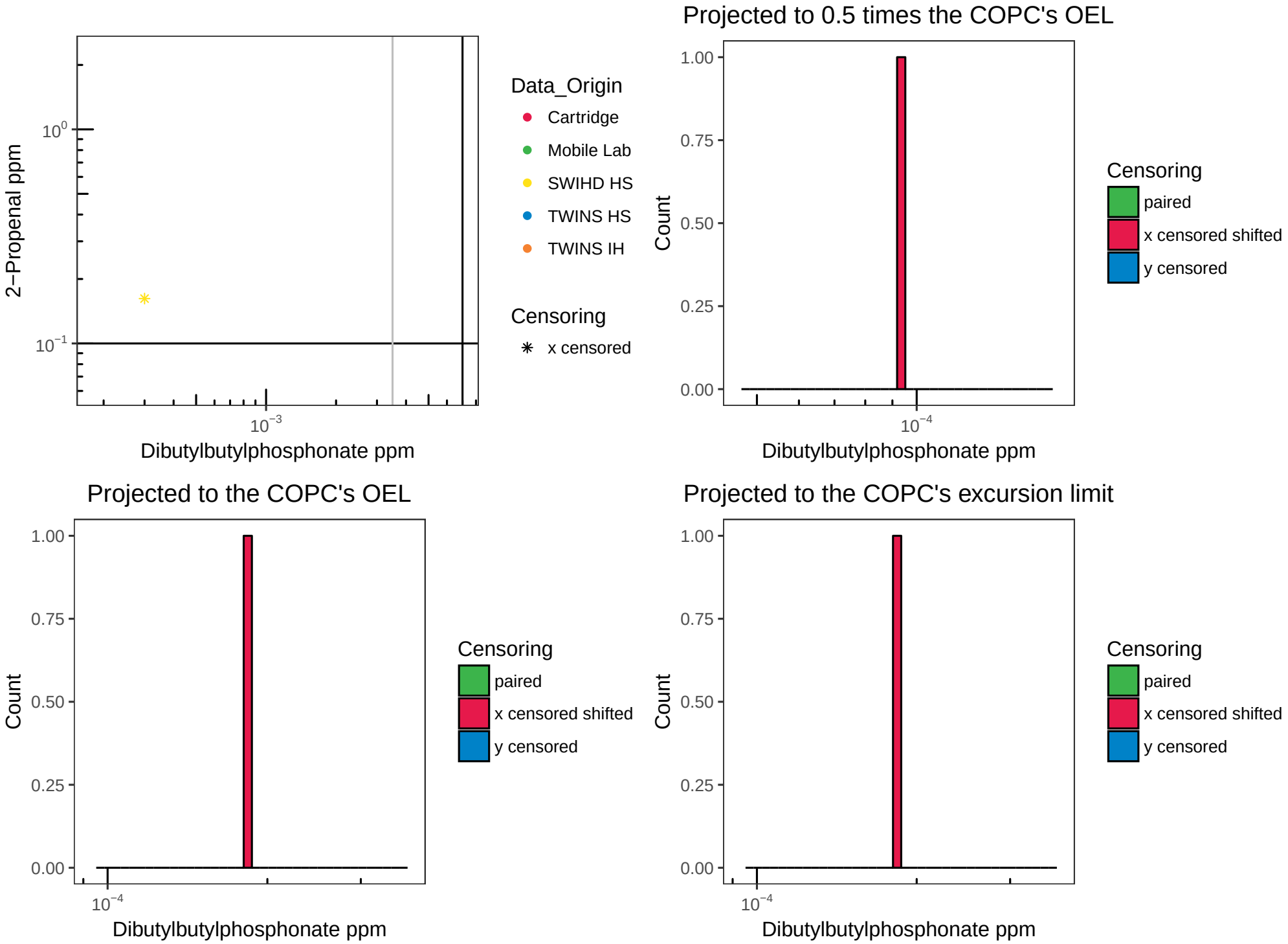


Figure C.2365: 2-Propenal vs Dibutylbutylphosphonate

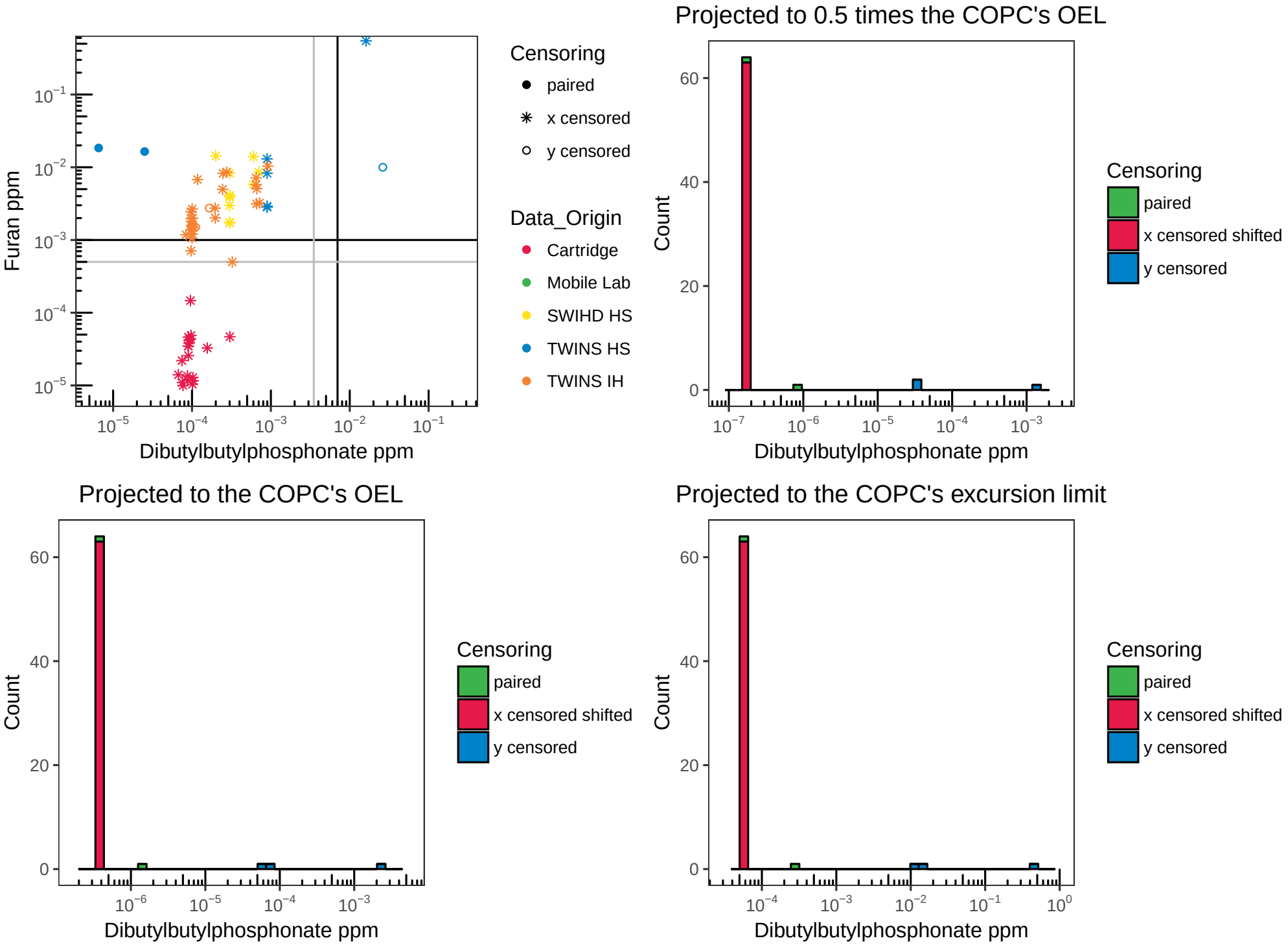


Figure C.2366: Furan vs Dibutylbutylphosphonate

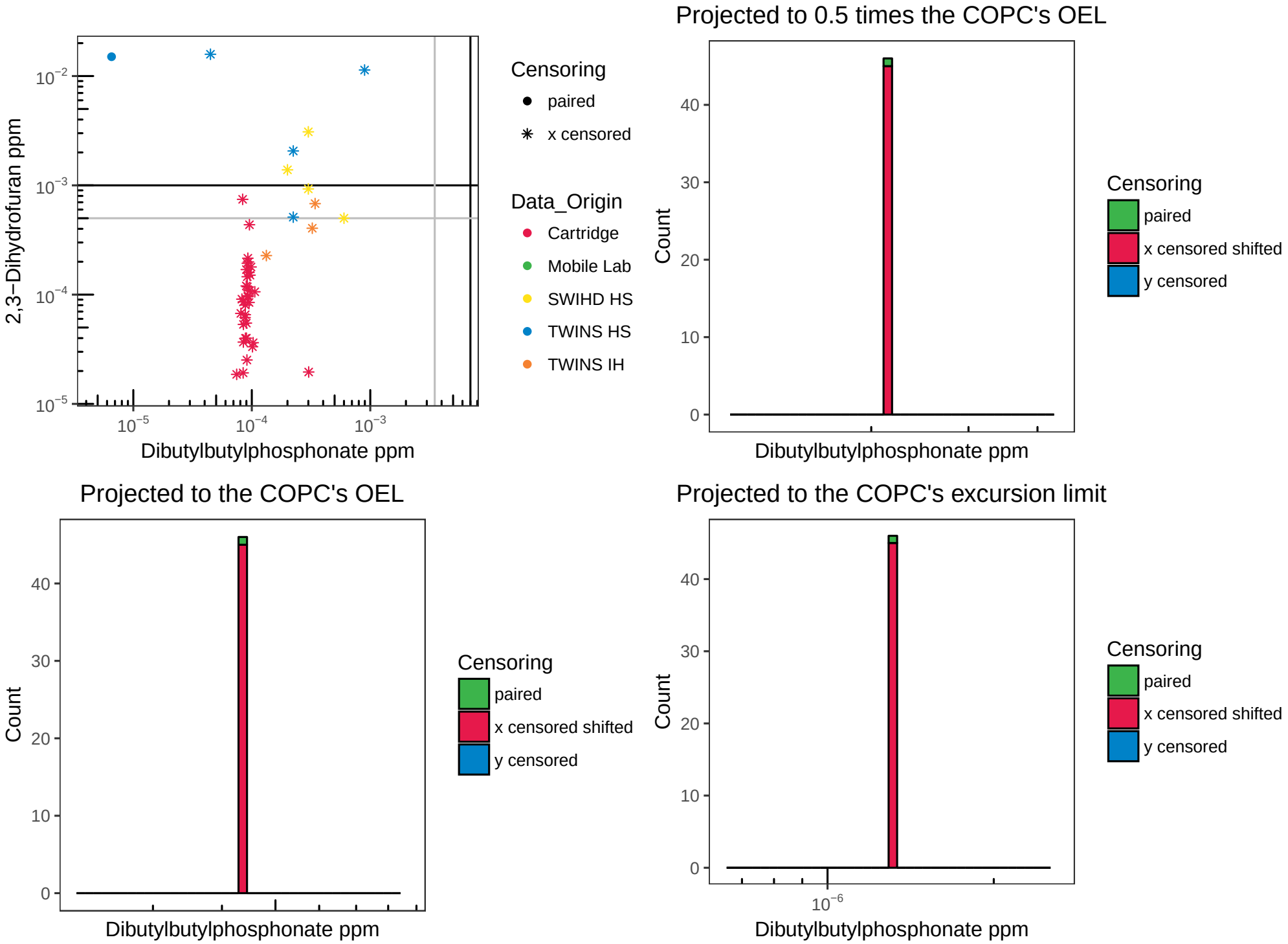


Figure C.2367: 2,3-Dihydrofuran vs Dibutylbutylphosphonate

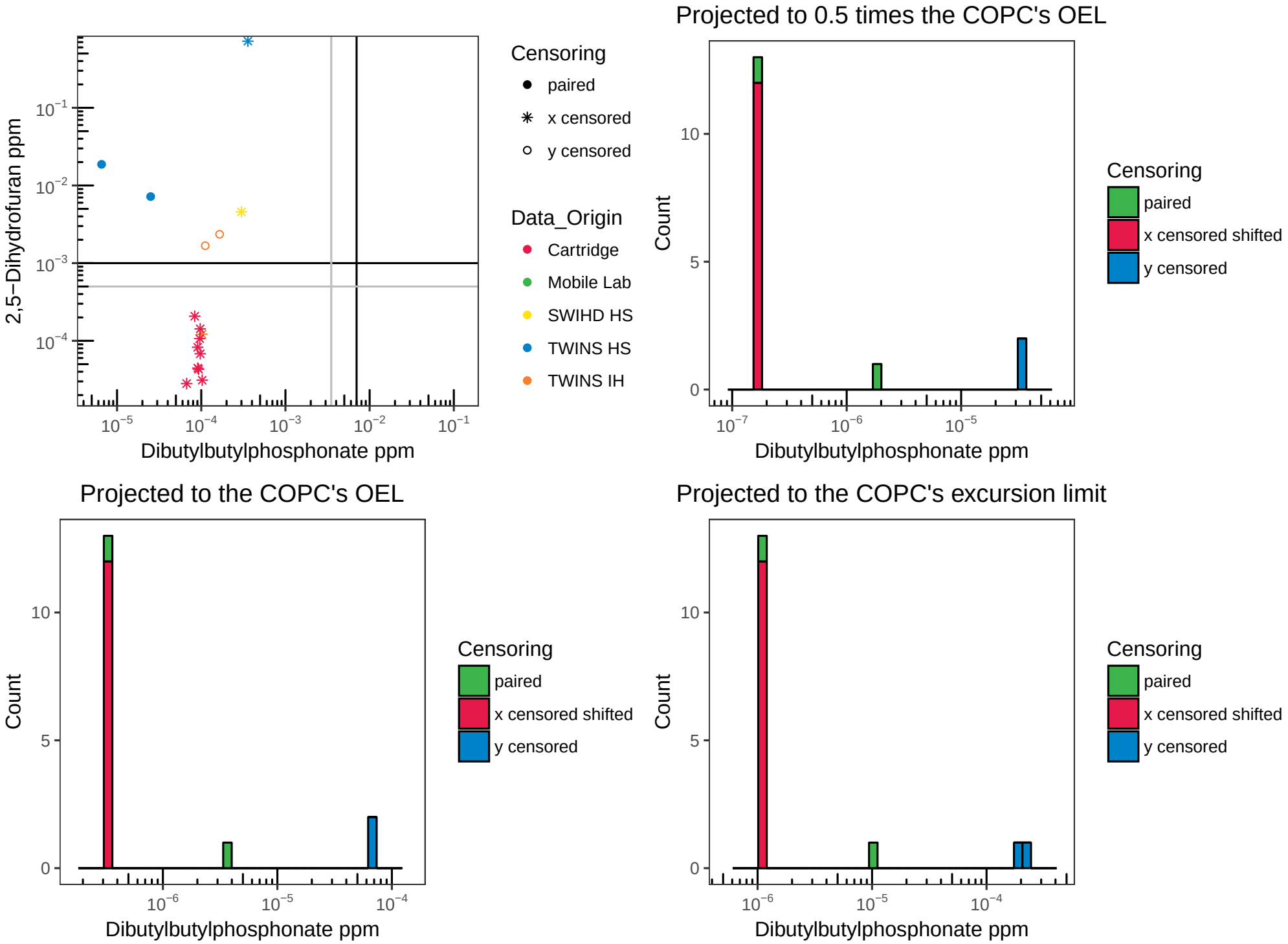


Figure C.2368: 2,5-Dihydrofuran vs Dibutylbutylphosphonate

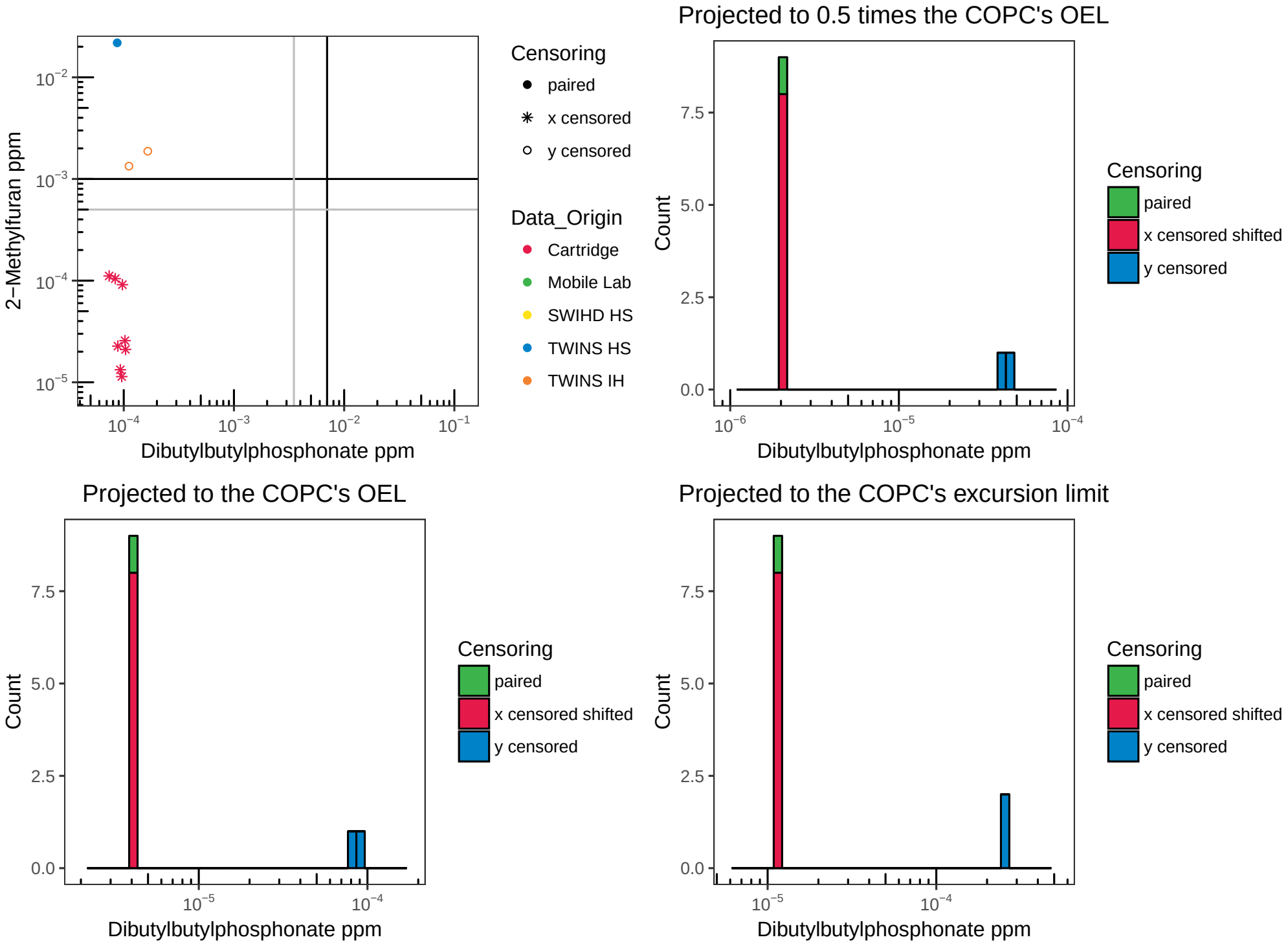


Figure C.2369: 2-Methylfuran vs Dibutylbutylphosphonate

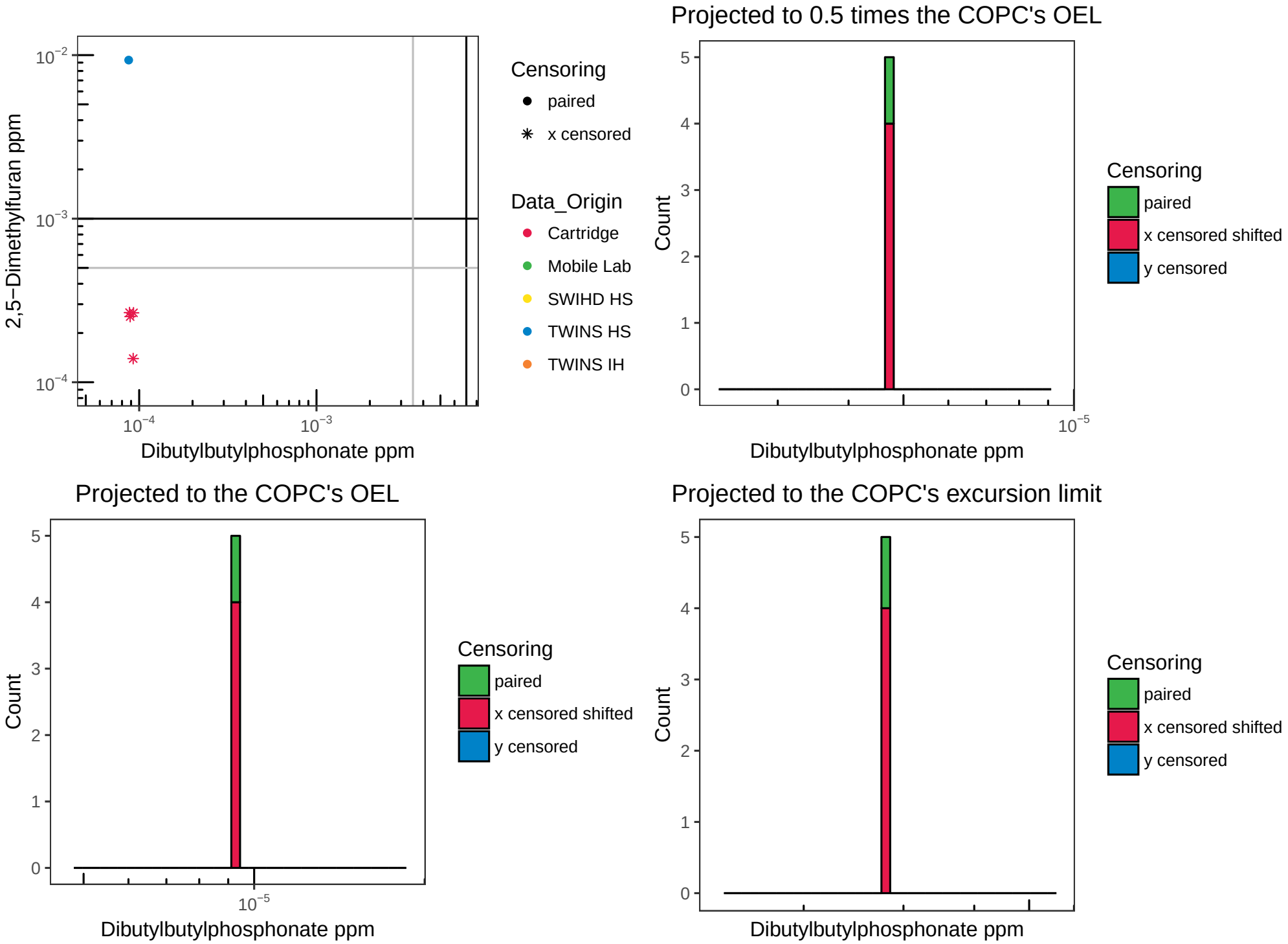


Figure C.2370: 2,5-Dimethylfuran vs Dibutylbutylphosphonate

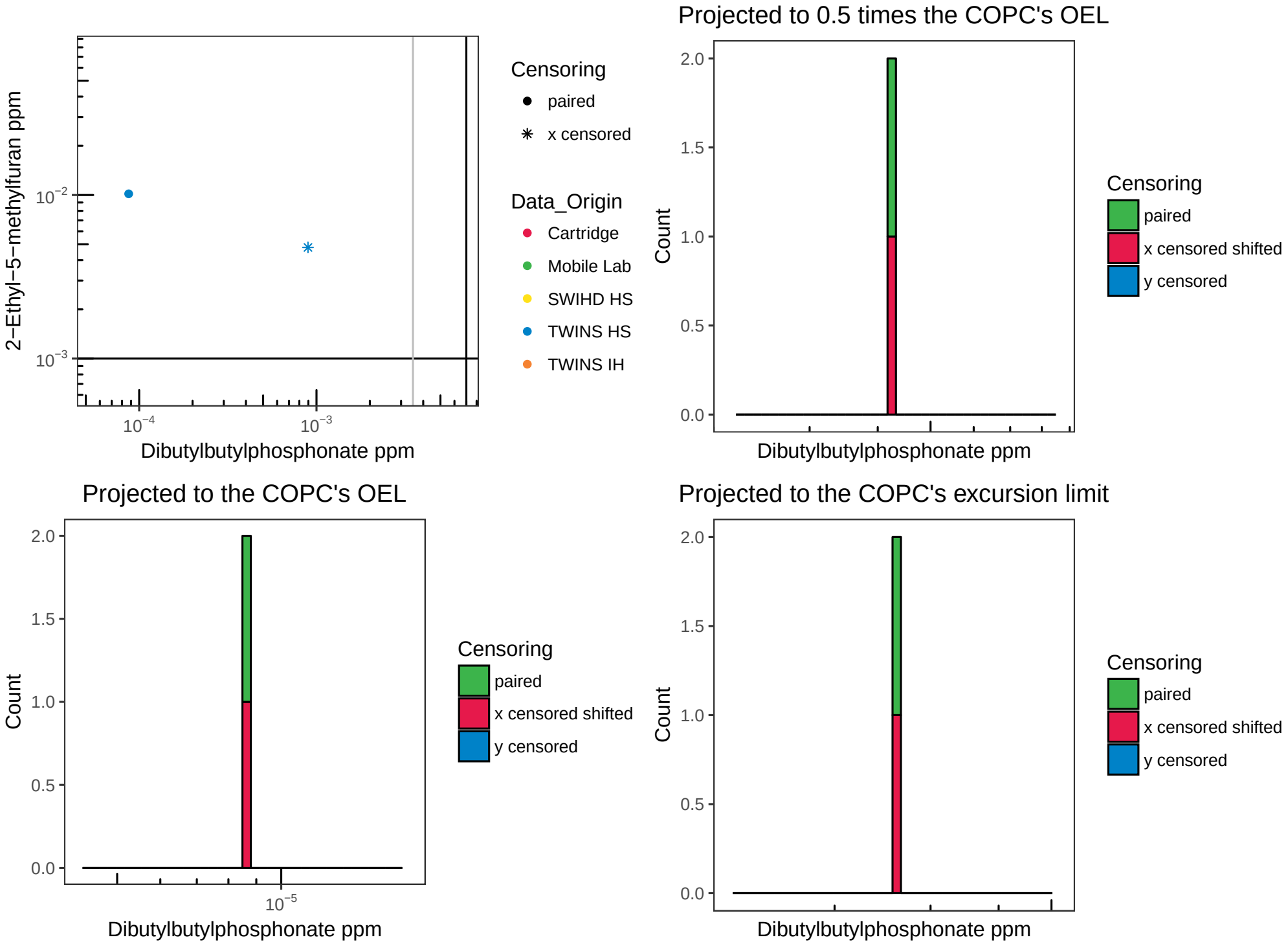


Figure C.2371: 2-Ethyl-5-methylfuran vs Dibutylbutylphosphonate

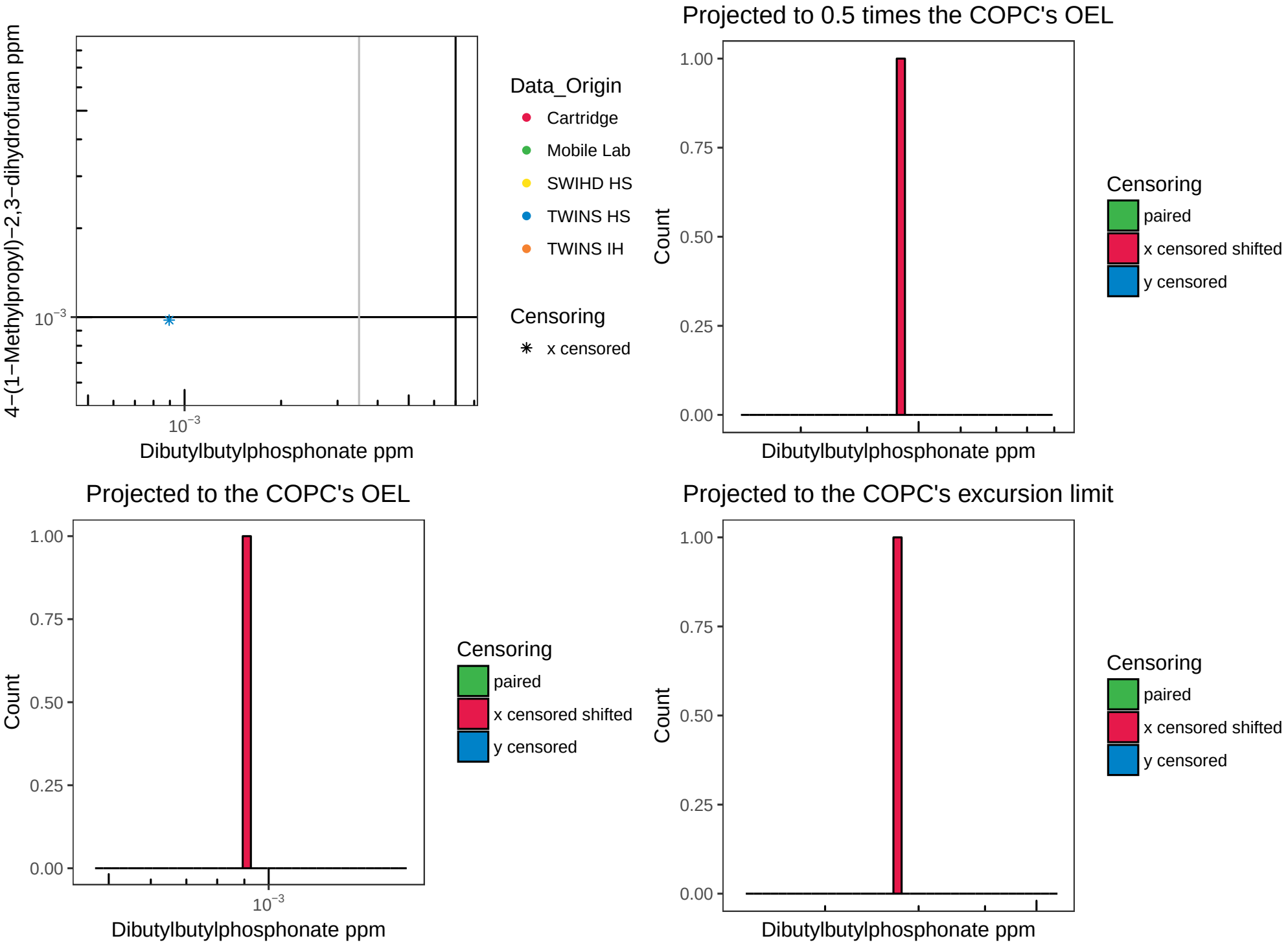


Figure C.2372: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Dibutylbutylphosphonate

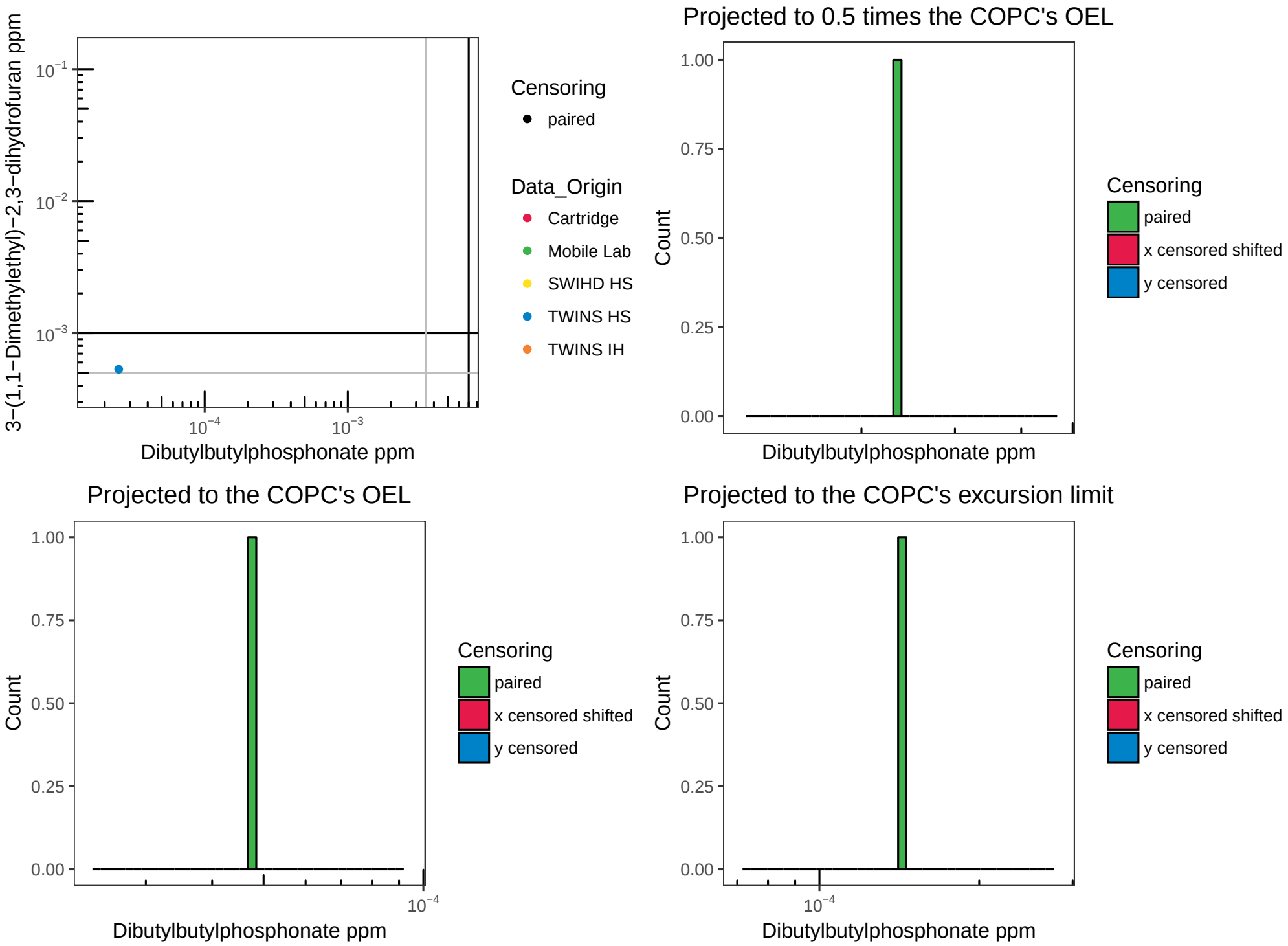


Figure C.2373: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran vs Dibutylbutylphosphonate

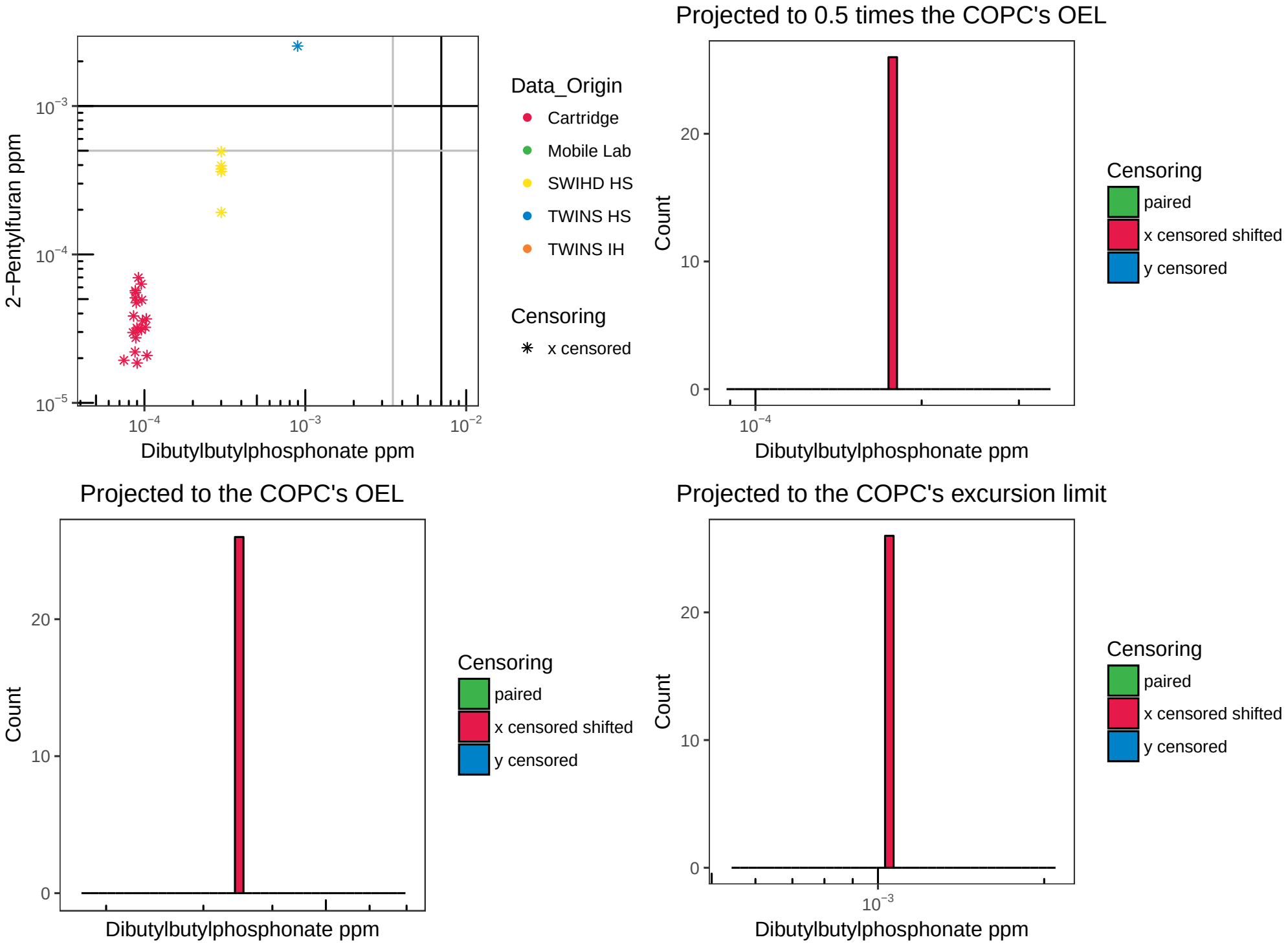


Figure C.2374: 2-Pentylfuran vs Dibutylbutylphosphonate

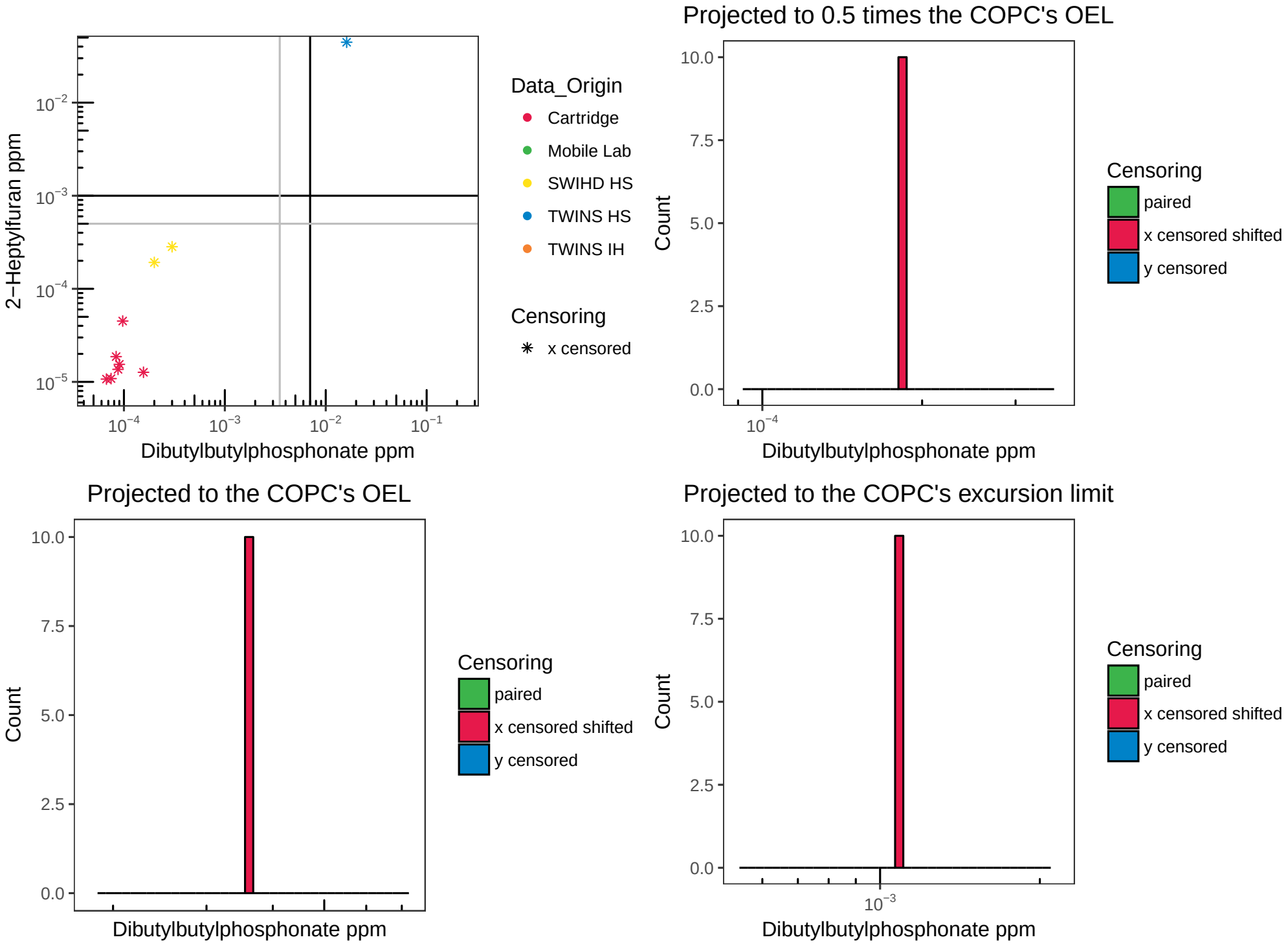


Figure C.2375: 2-Heptylfuran vs Dibutylbutylphosphonate

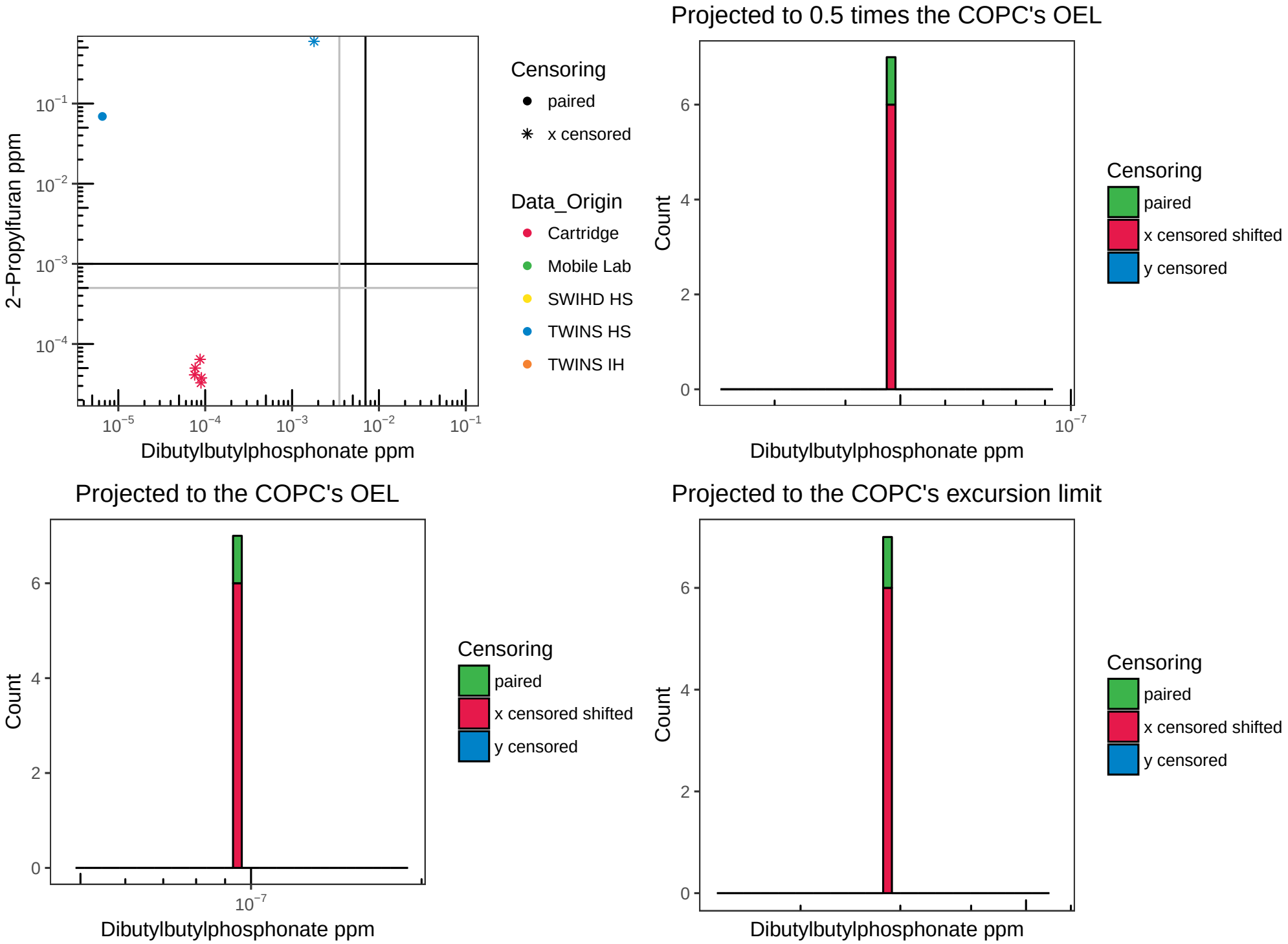


Figure C.2376: 2-Propylfuran vs Dibutylbutylphosphonate

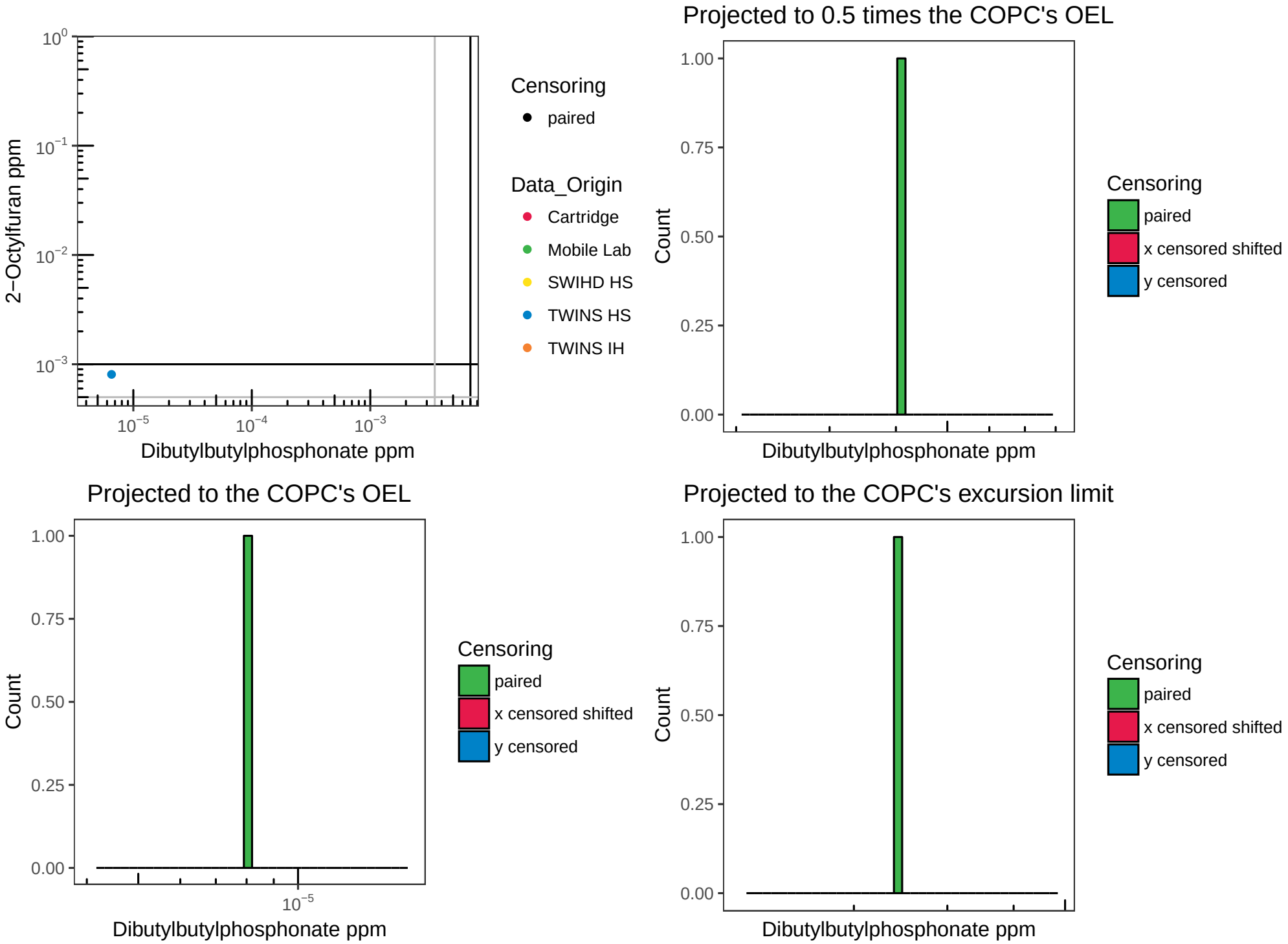


Figure C.2377: 2-Octylfuran vs Dibutylbutylphosphonate

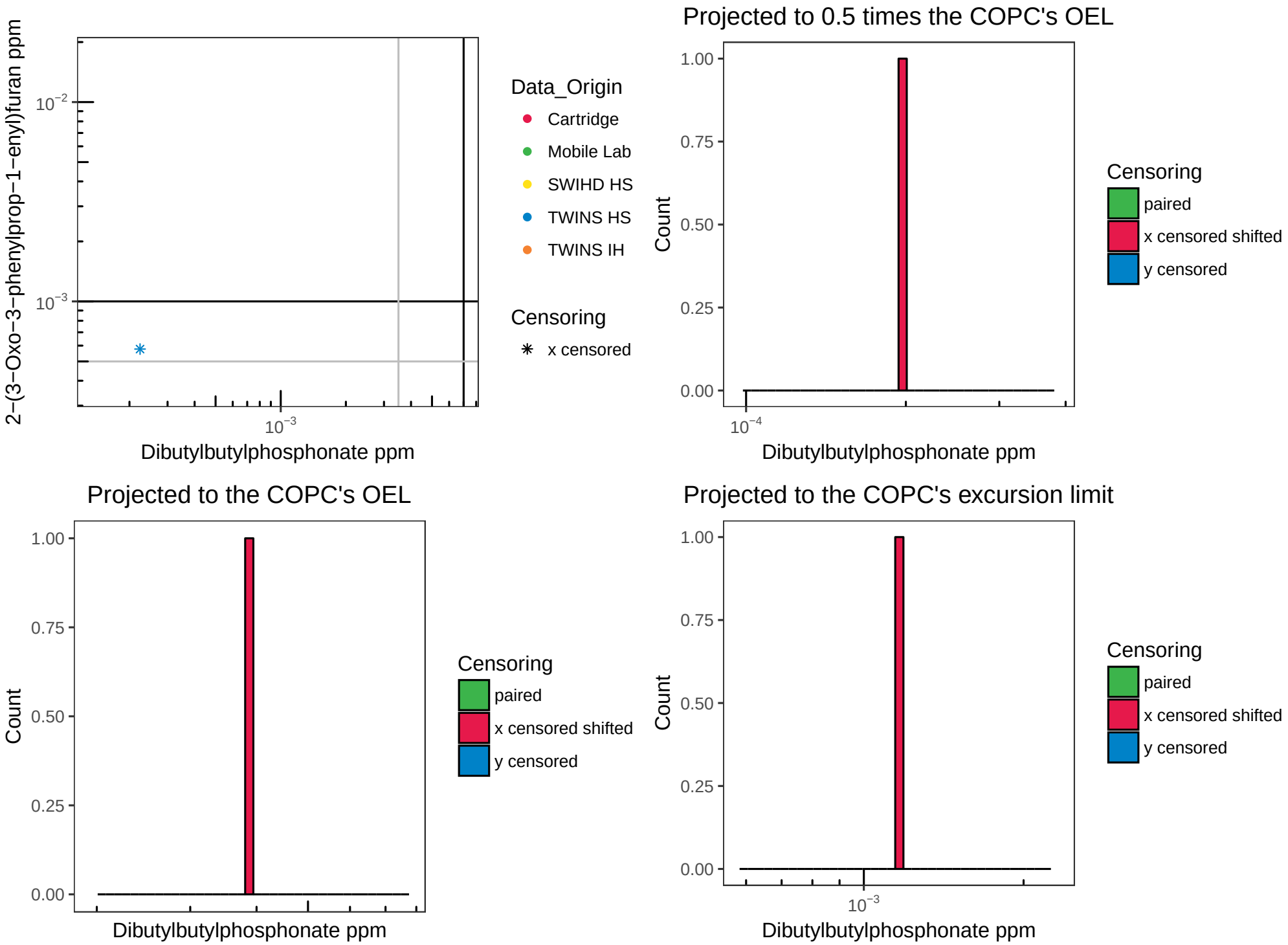


Figure C.2378: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Dibutylbutylphosphonate

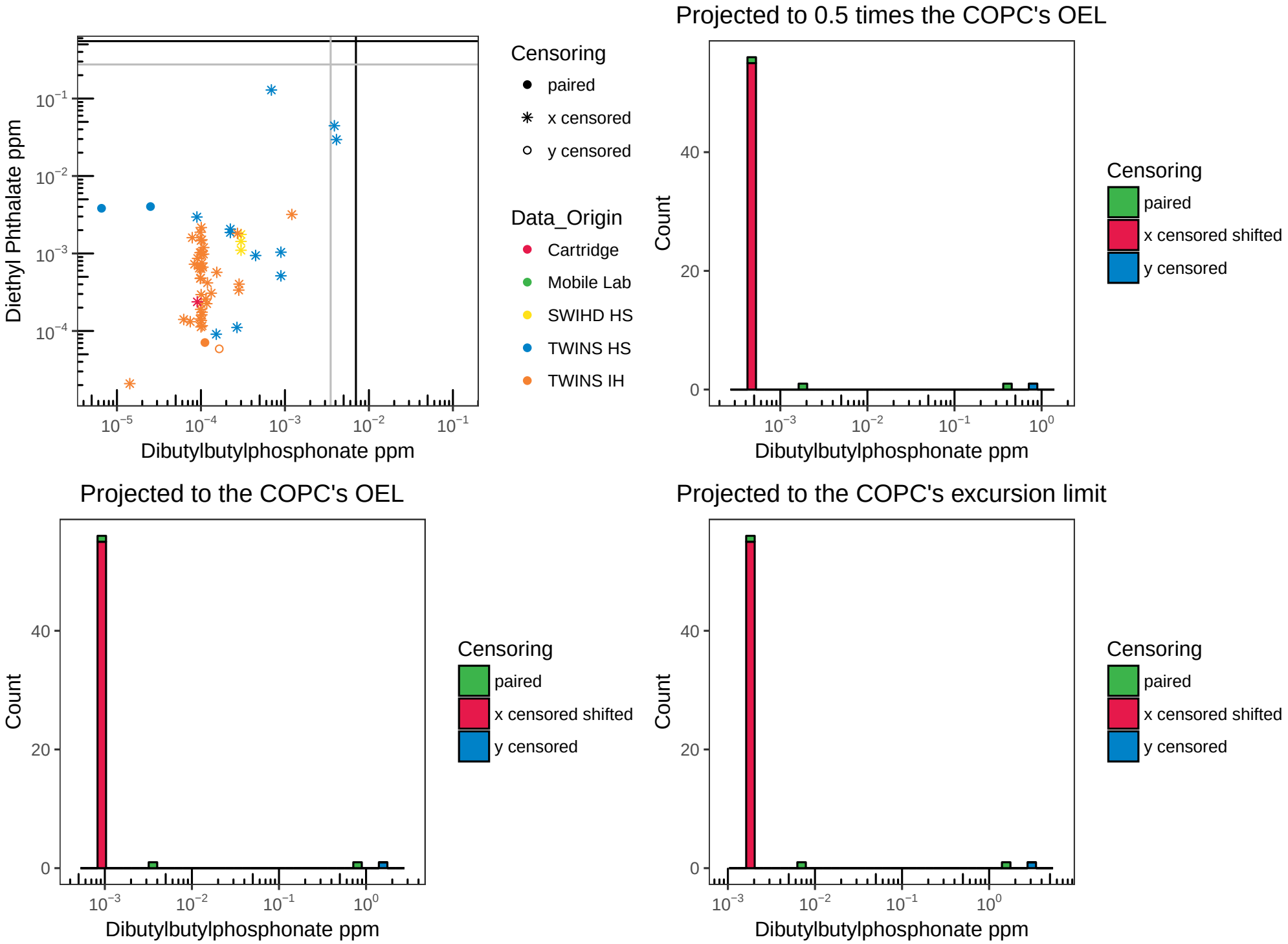


Figure C.2379: Diethyl Phthalate vs Dibutylbutylphosphonate

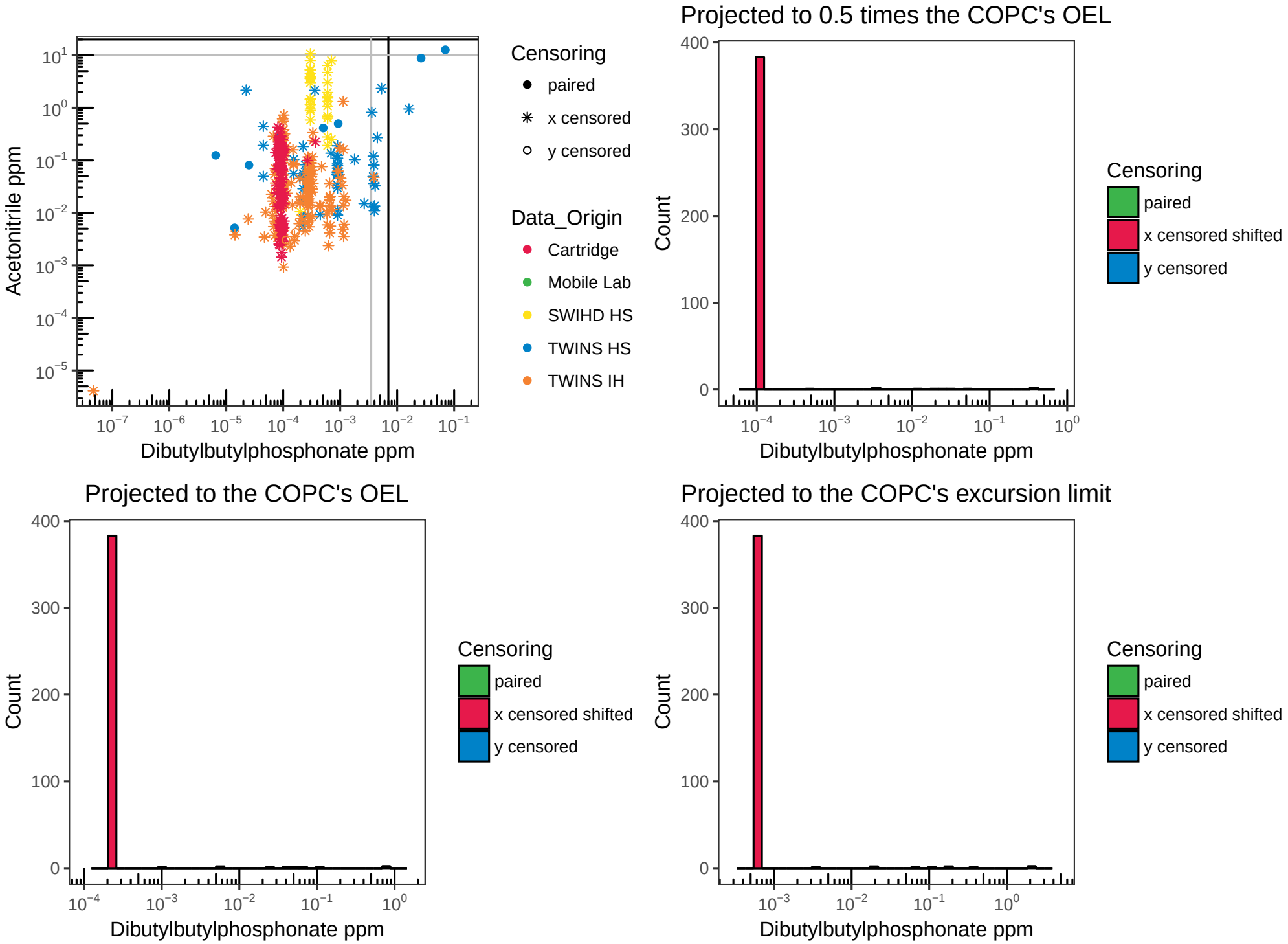


Figure C.2380: Acetonitrile vs Dibutylbutylphosphonate

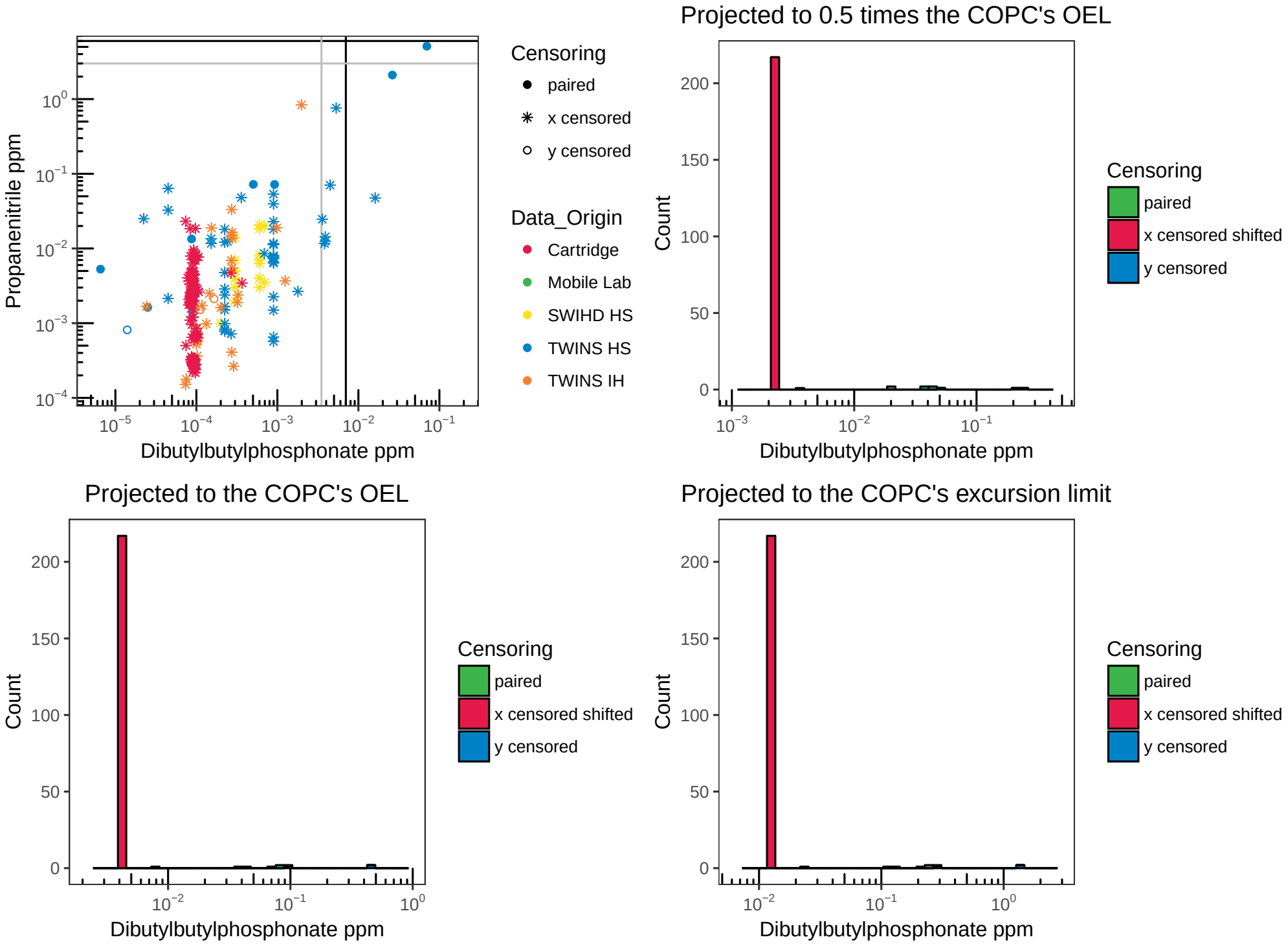


Figure C.2381: Propanenitrile vs Dibutylbutylphosphonate

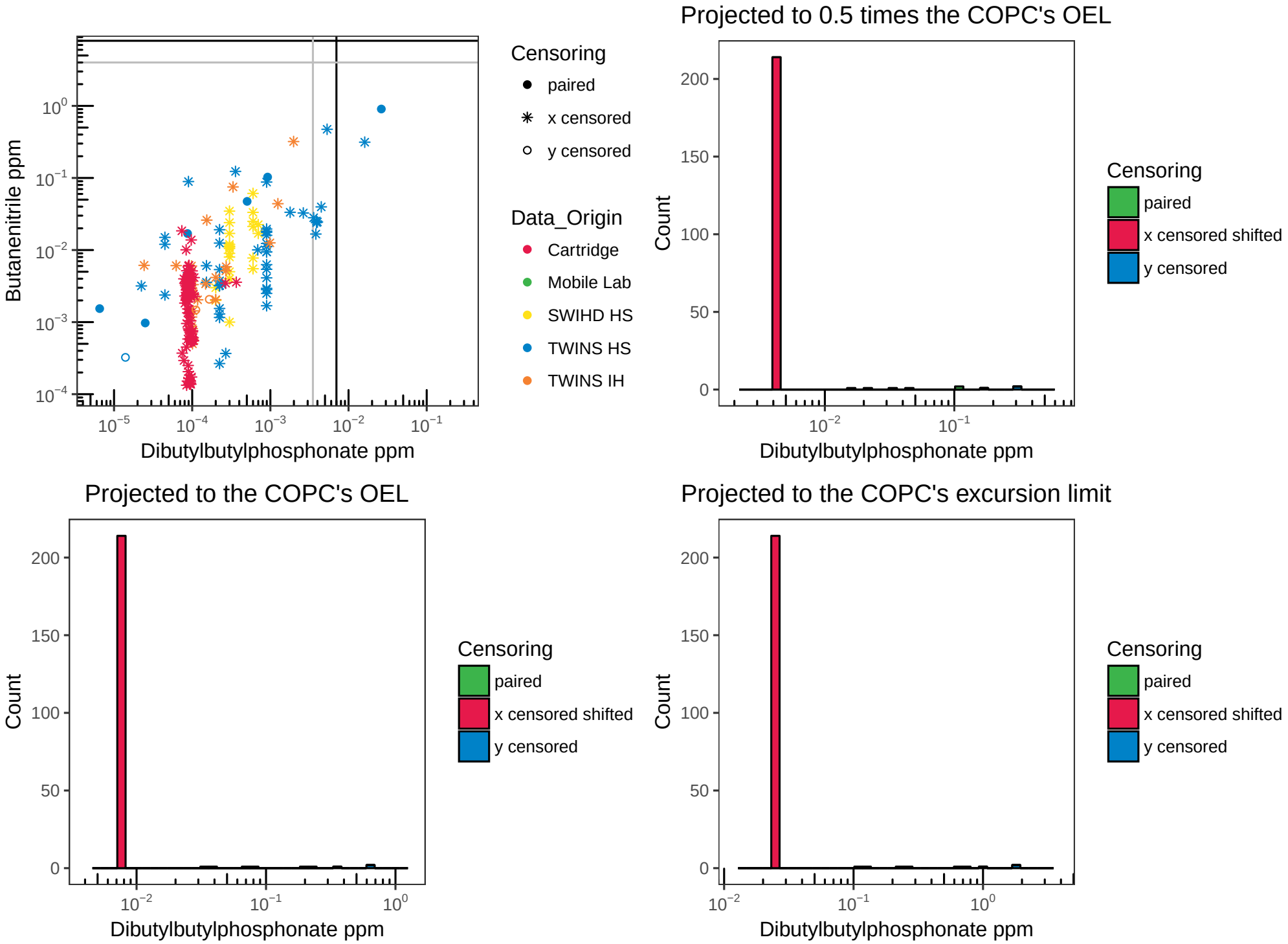


Figure C.2382: Butanenitrile vs Dibutylbutylphosphonate

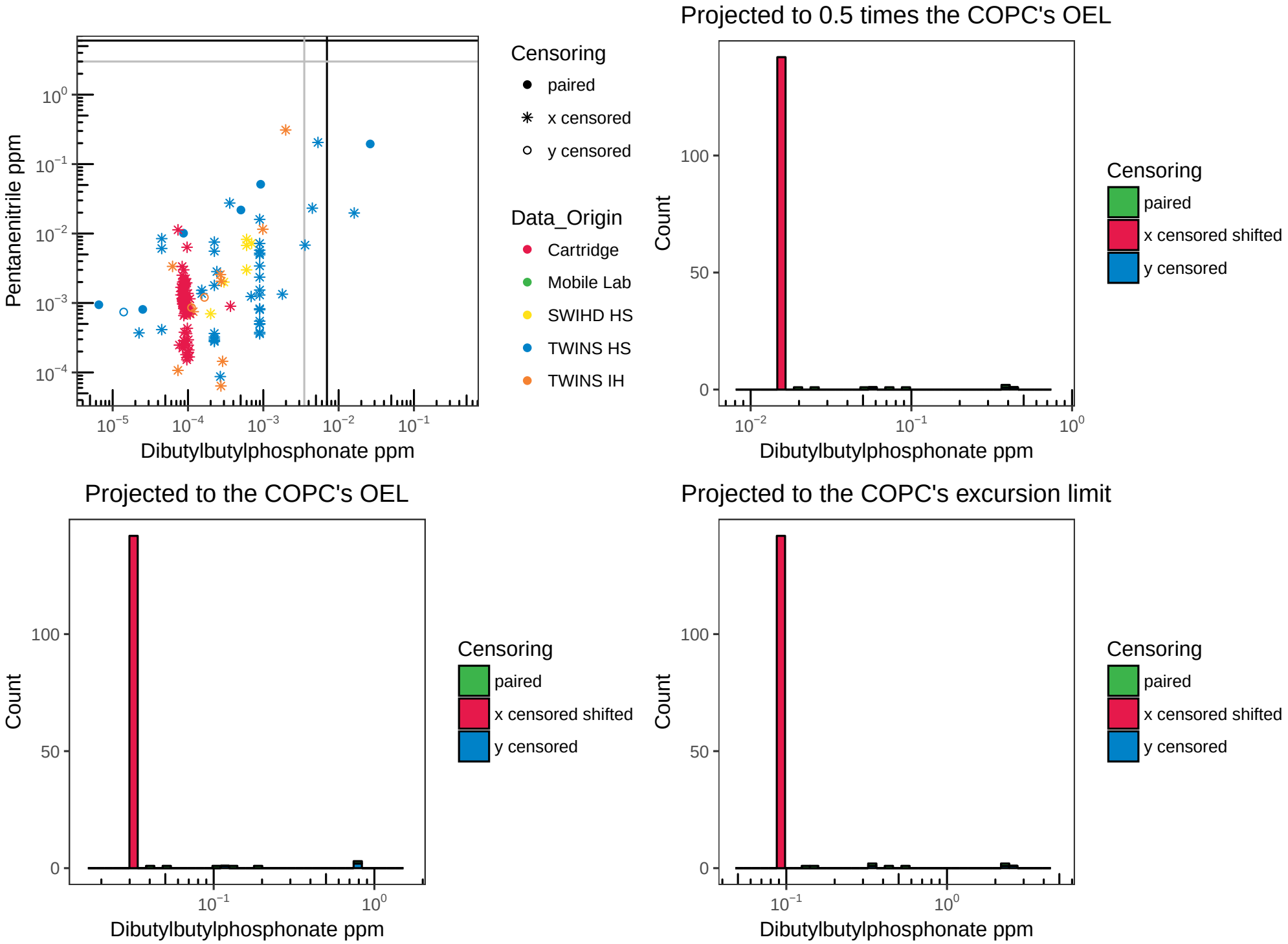


Figure C.2383: Pentanenitrile vs Dibutylbutylphosphonate

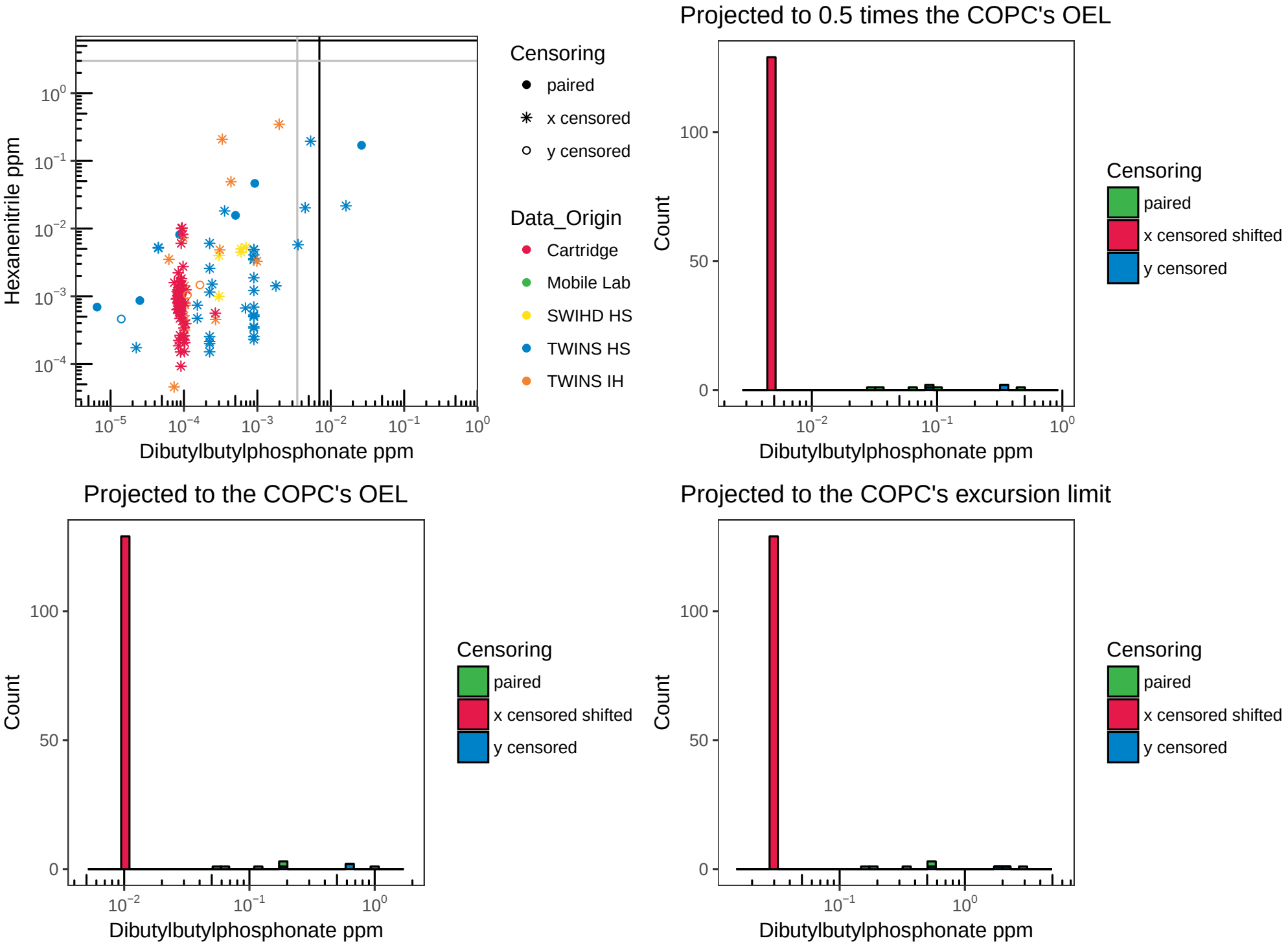


Figure C.2384: Hexanenitrile vs Dibutylbutylphosphonate

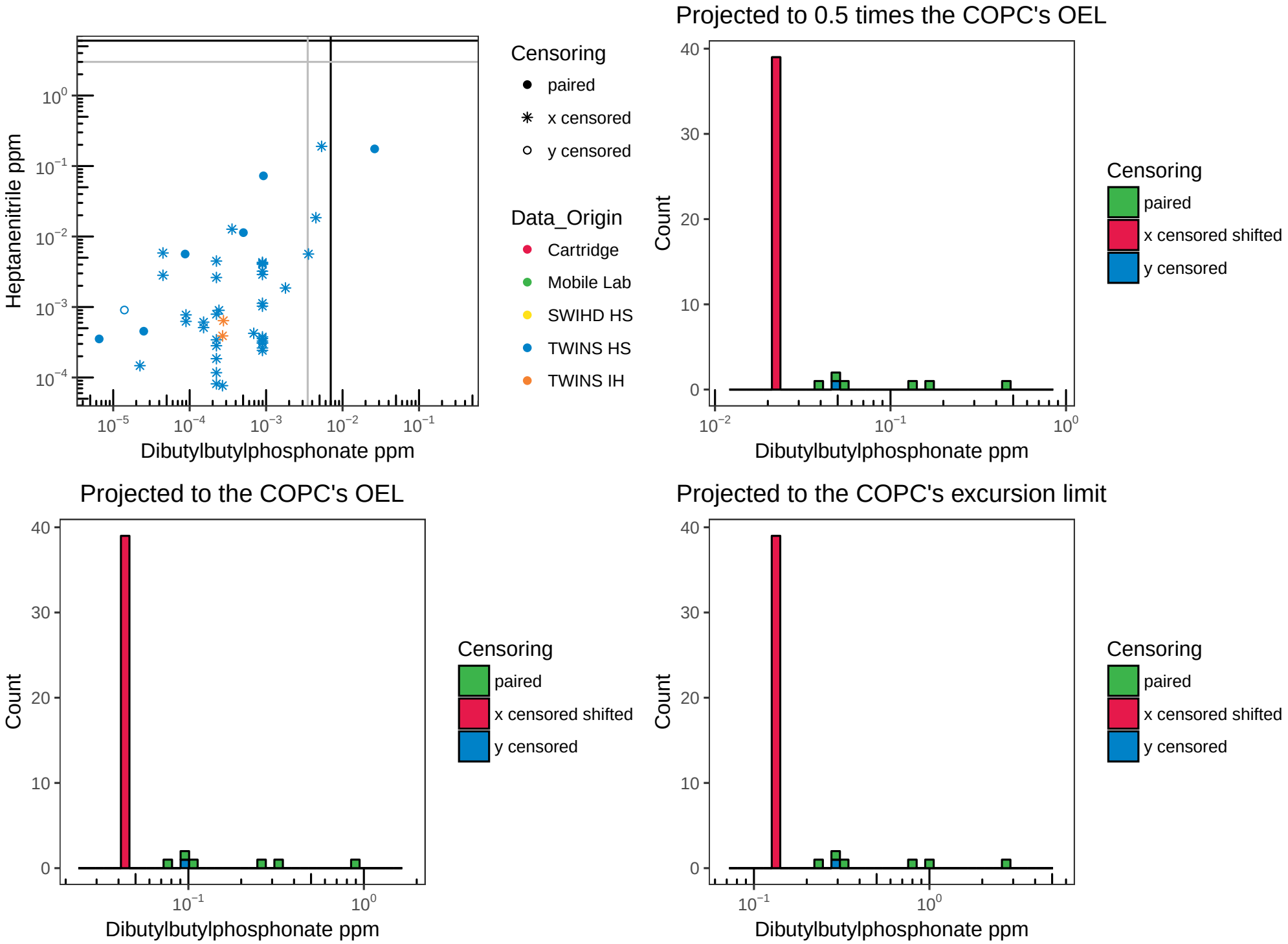


Figure C.2385: Heptanenitrile vs Dibutylbutylphosphonate

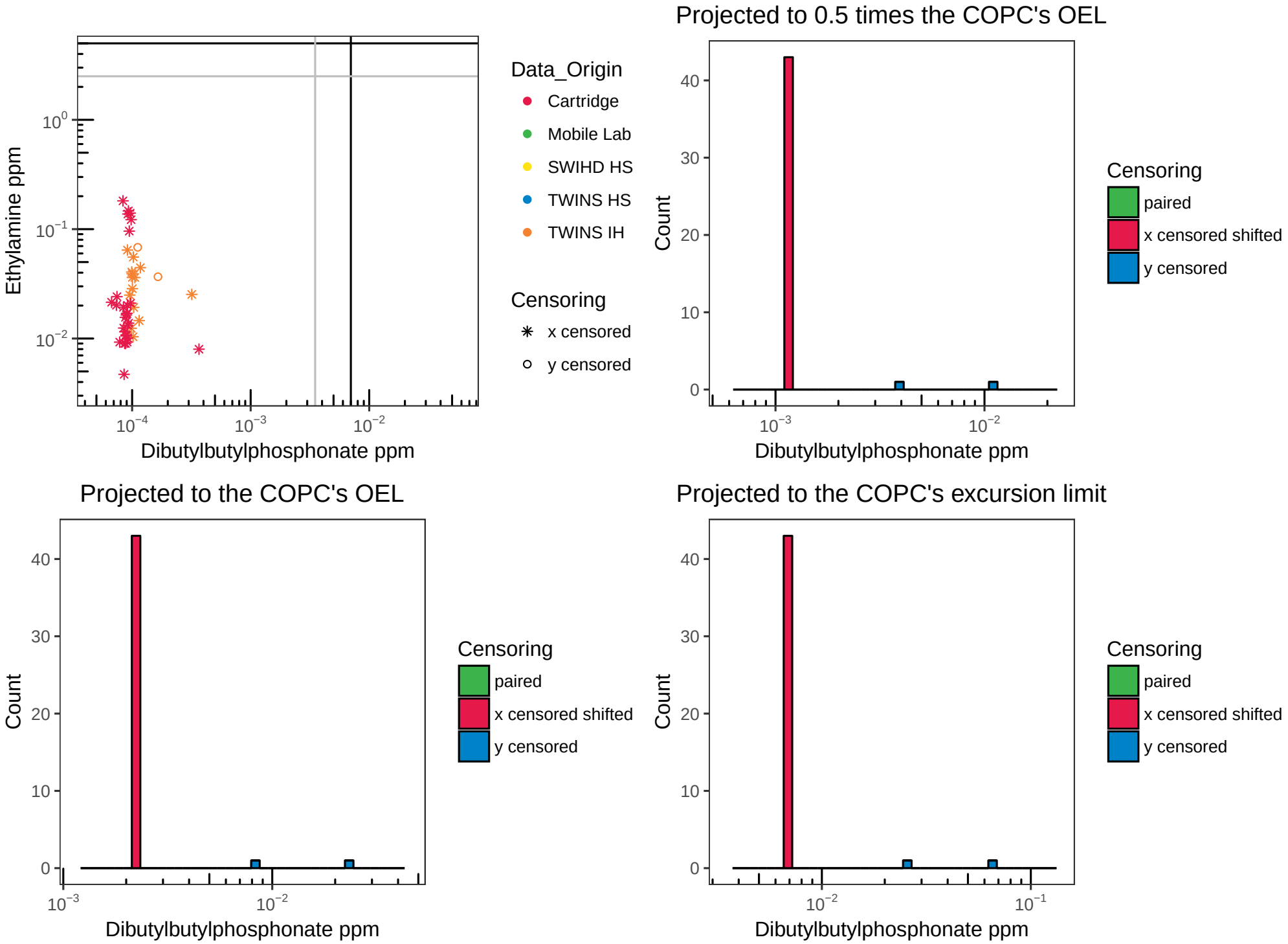


Figure C.2386: Ethylamine vs Dibutylbutylphosphonate

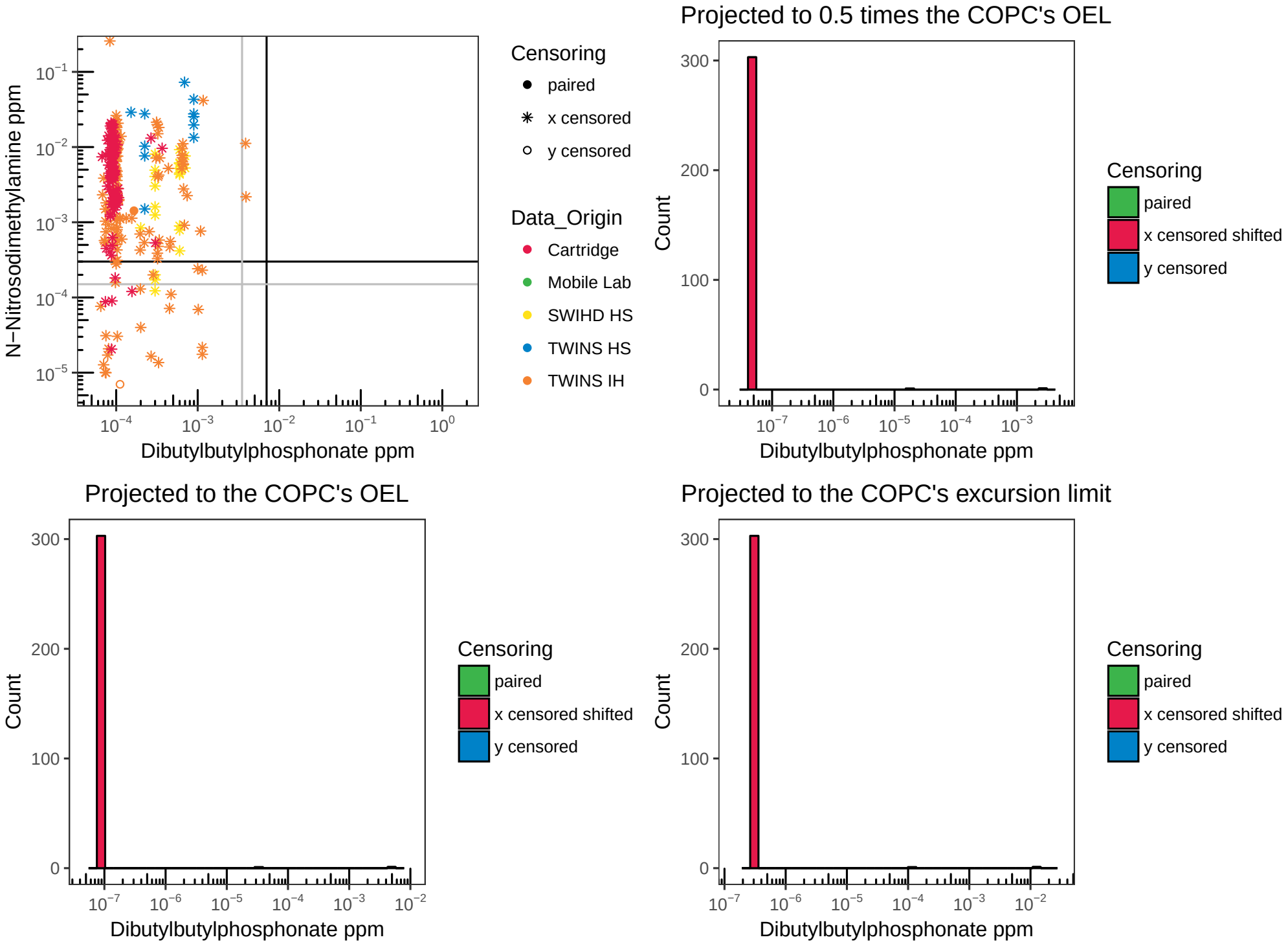


Figure C.2387: N-Nitrosodimethylamine vs Dibutylbutylphosphonate

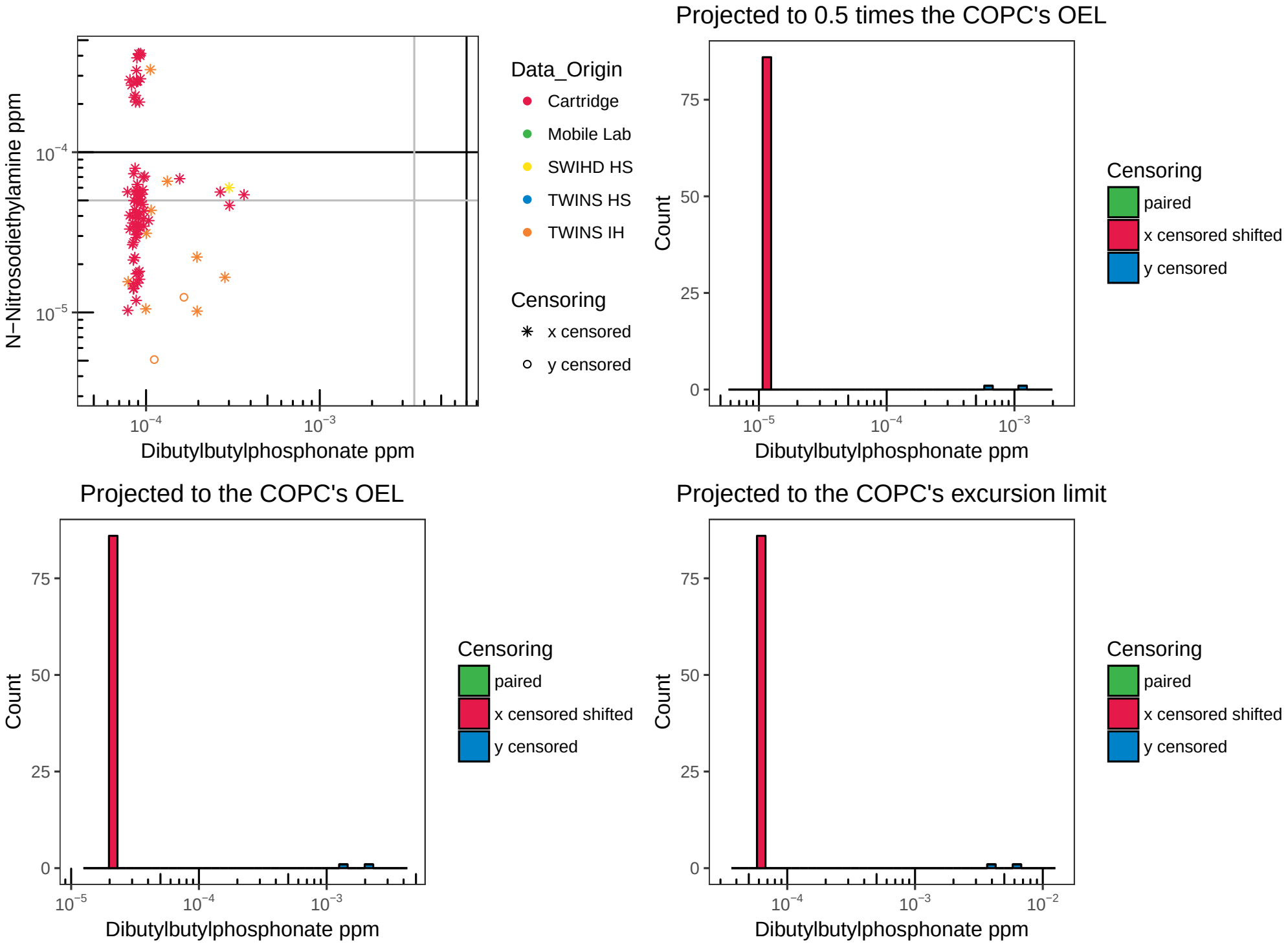


Figure C.2388: N-Nitrosodiethylamine vs Dibutylbutylphosphonate

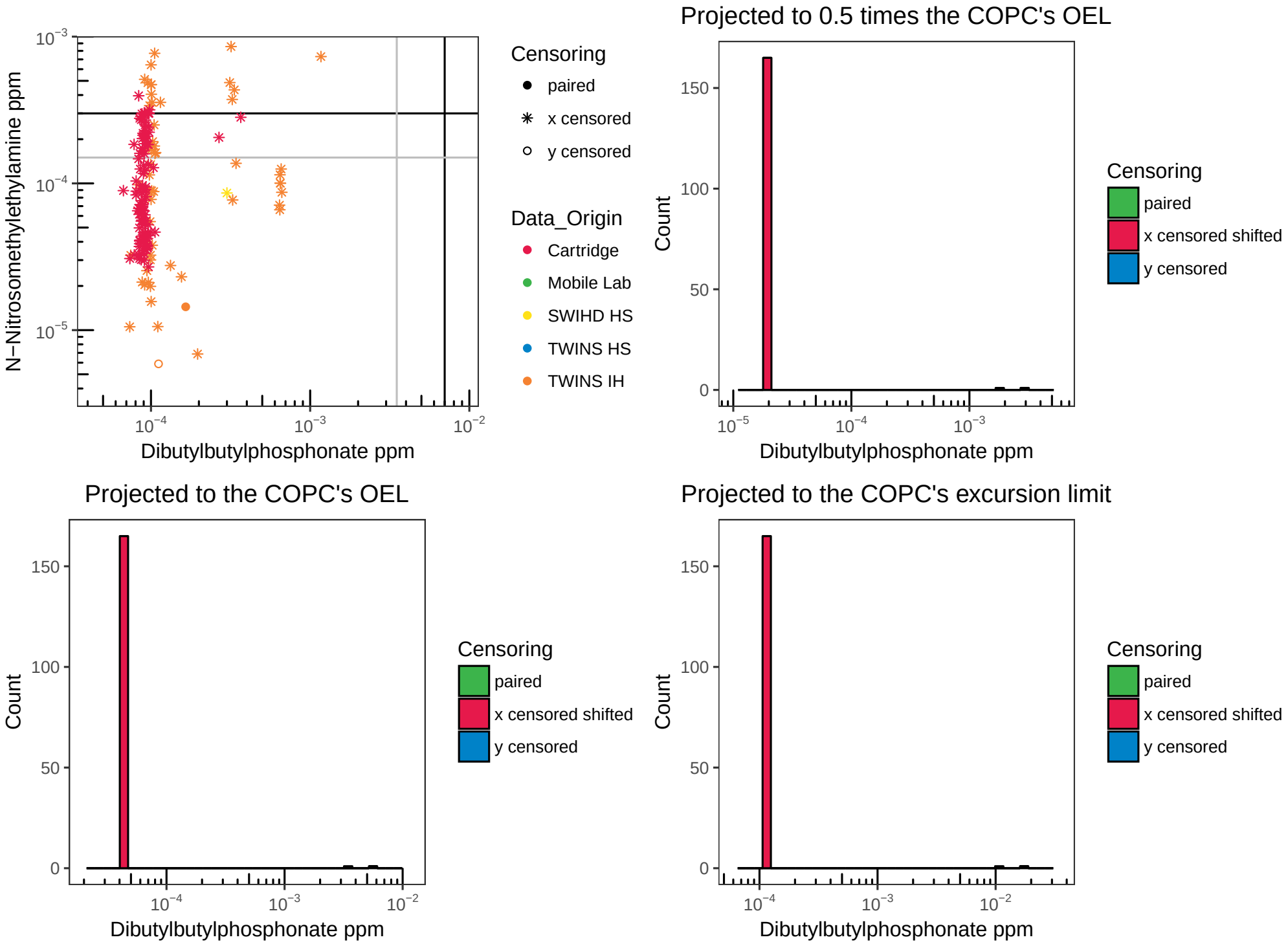


Figure C.2389: N-Nitrosomethylethylamine vs Dibutylbutylphosphonate

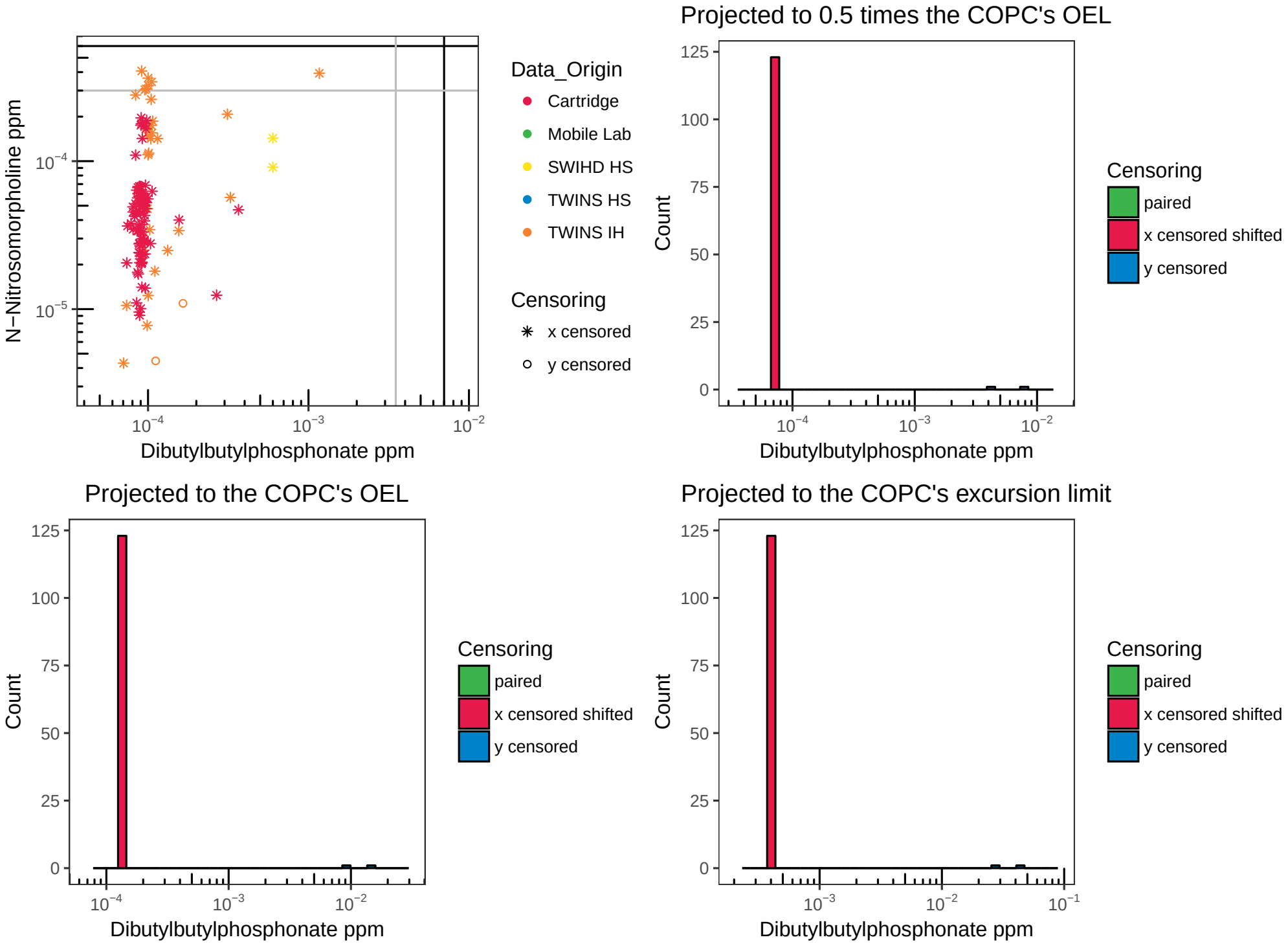


Figure C.2390: N-Nitrosomorpholine vs Dibutylbutylphosphonate

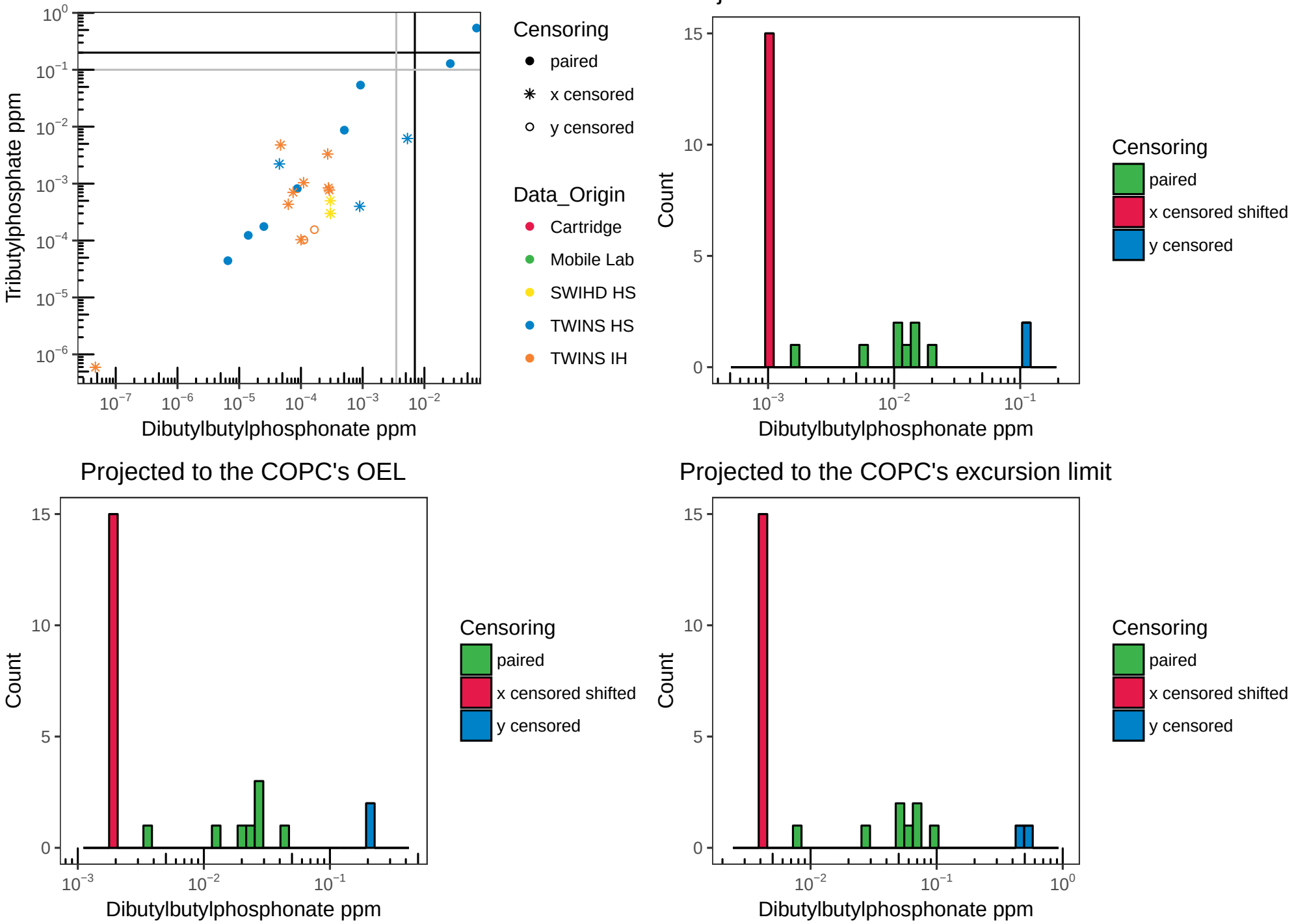


Figure C.2391: Tributylphosphate vs Dibutylbutylphosphonate

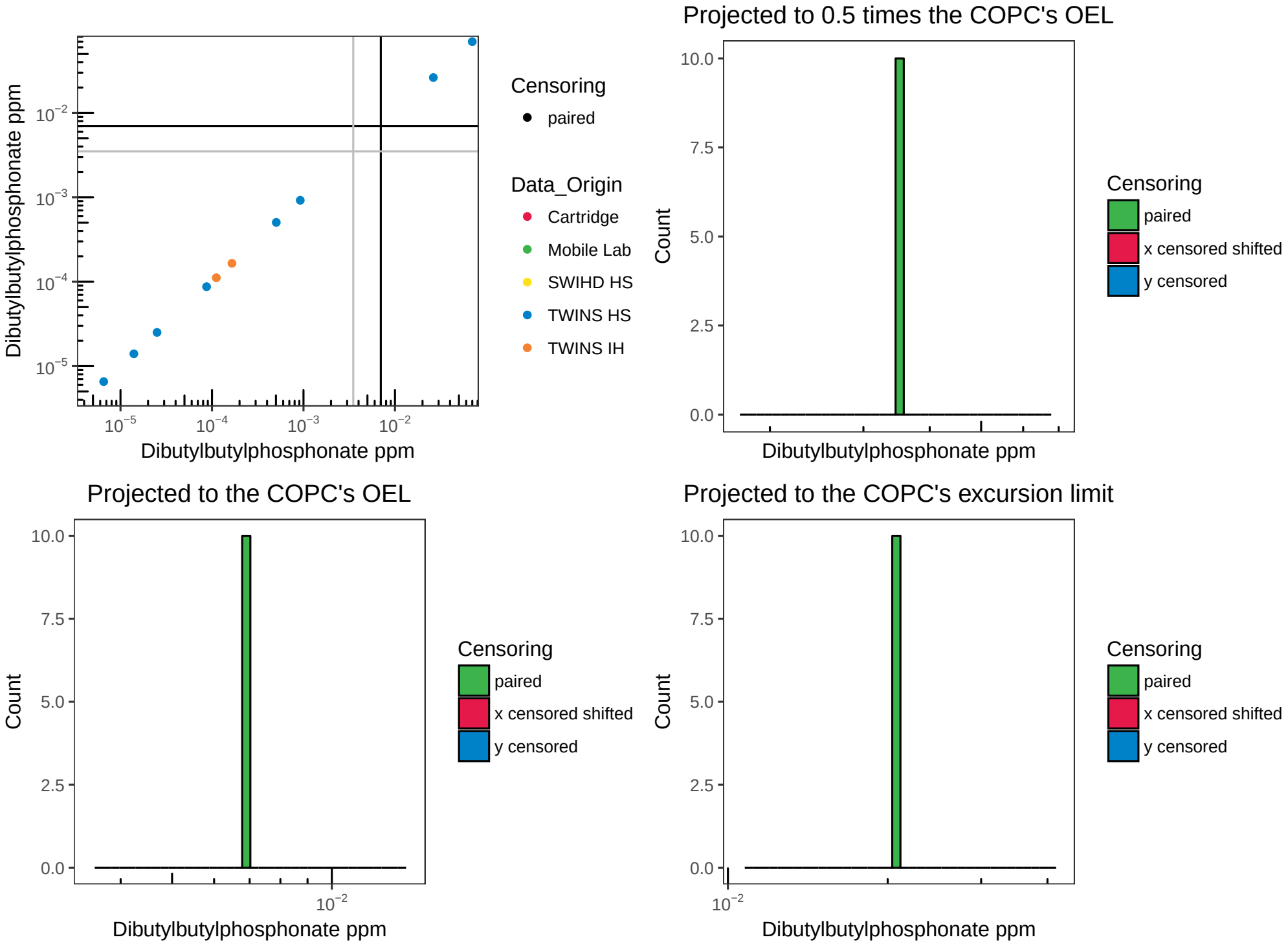


Figure C.2392: Dibutylbutylphosphonate vs Dibutylbutylphosphonate

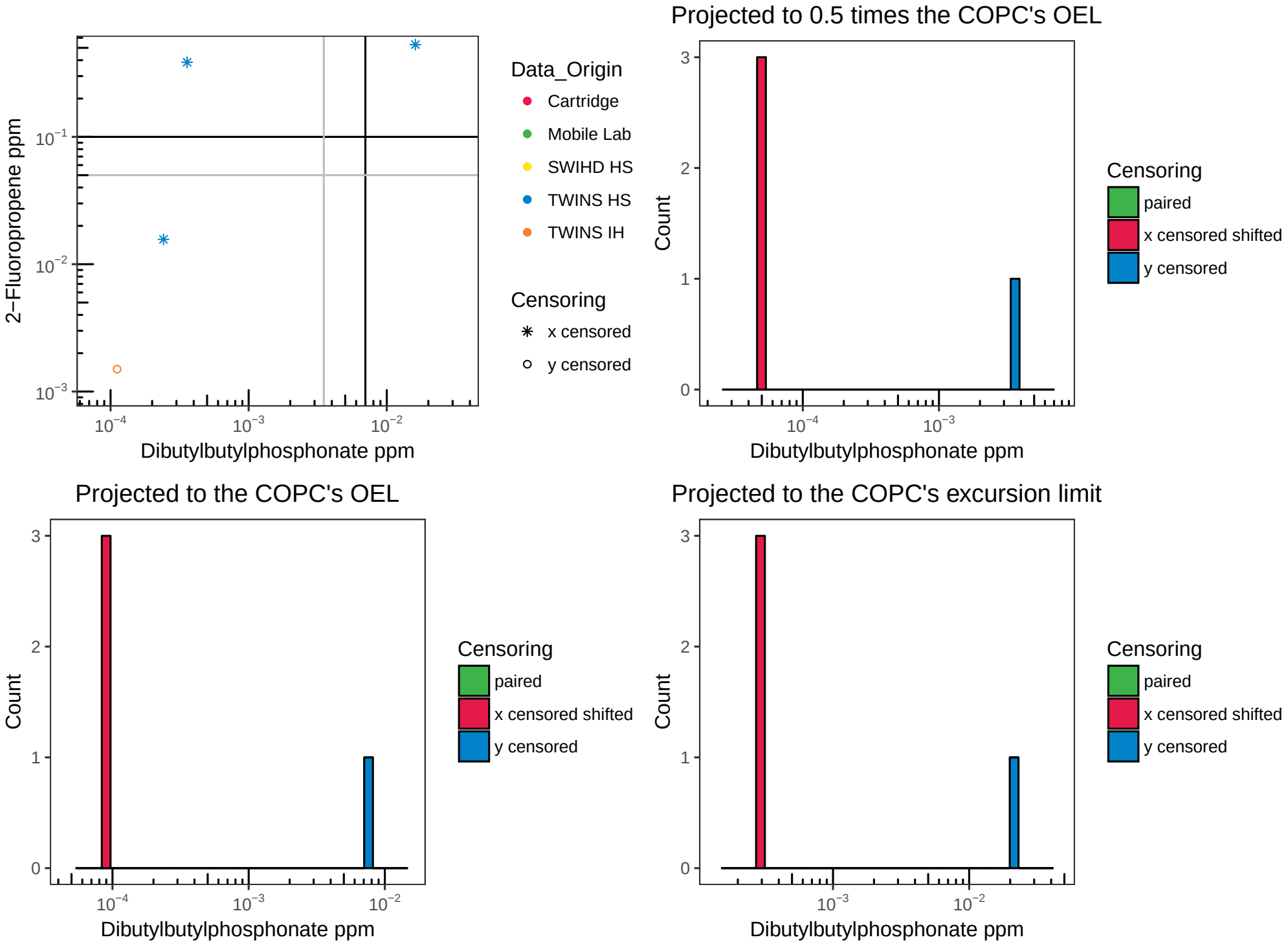


Figure C.2393: 2-Fluoropropene vs Dibutylbutylphosphonate

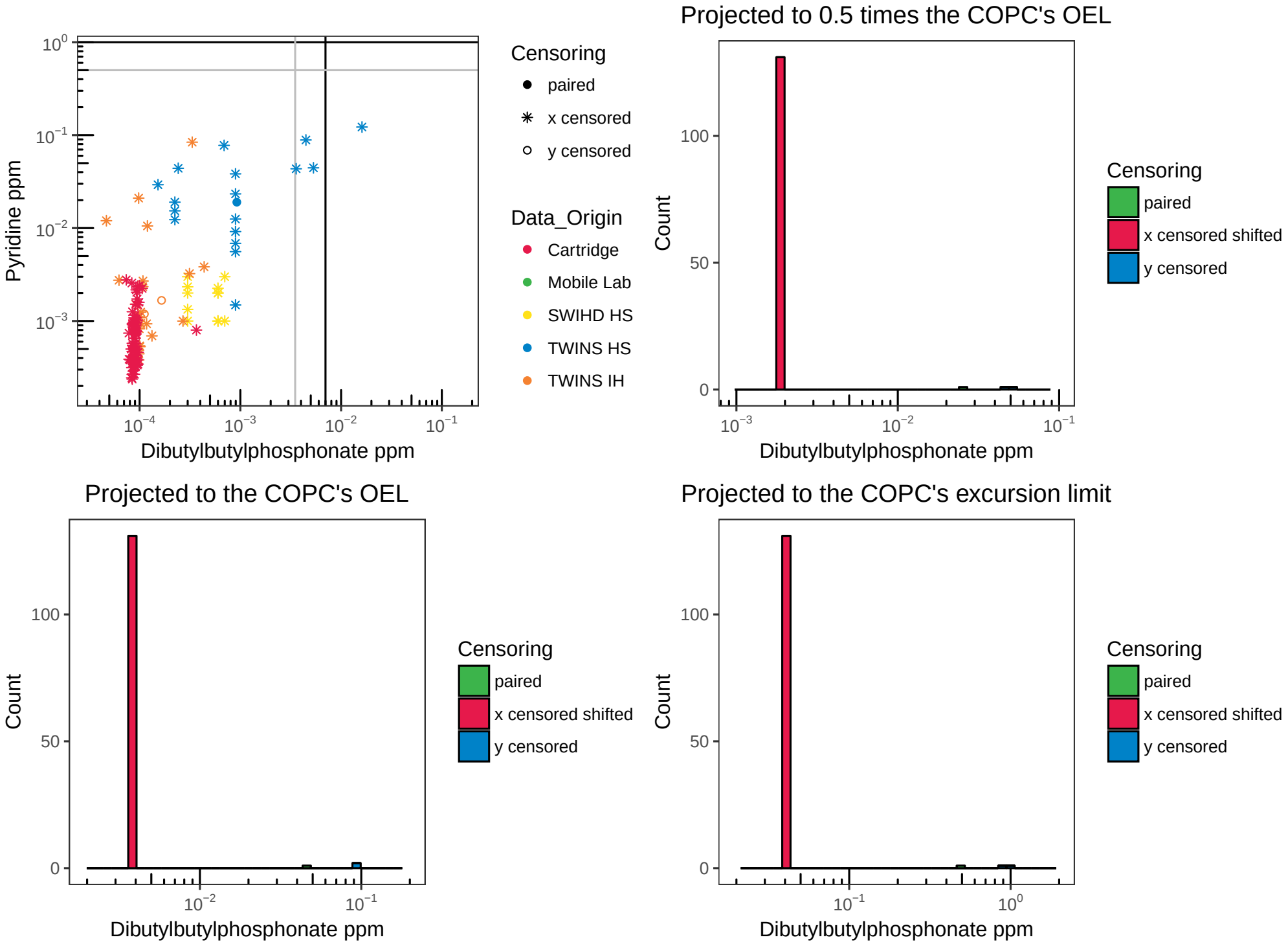


Figure C.2394: Pyridine vs Dibutylbutylphosphonate

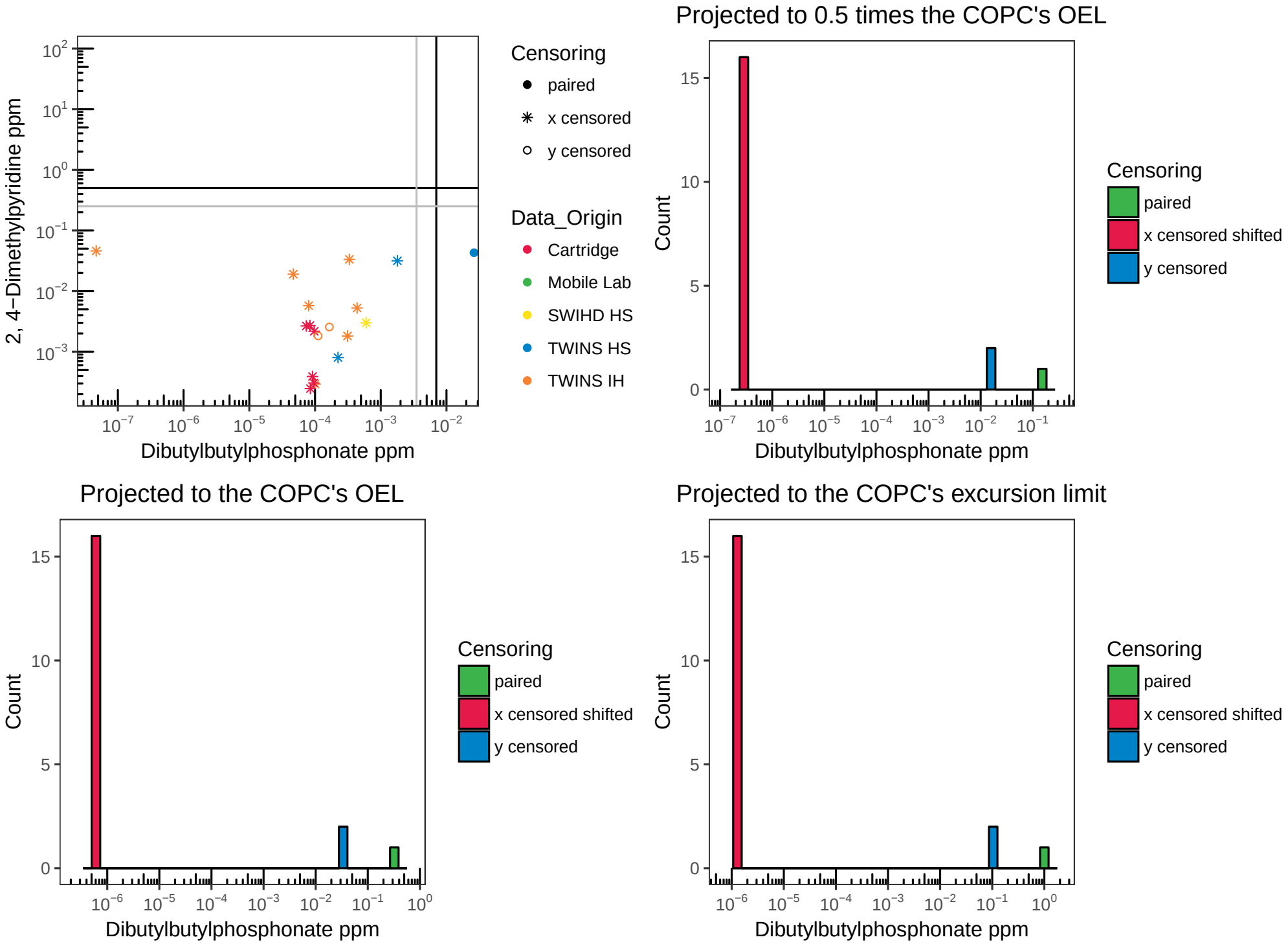


Figure C.2395: 2, 4-Dimethylpyridine vs Dibutylbutylphosphonate

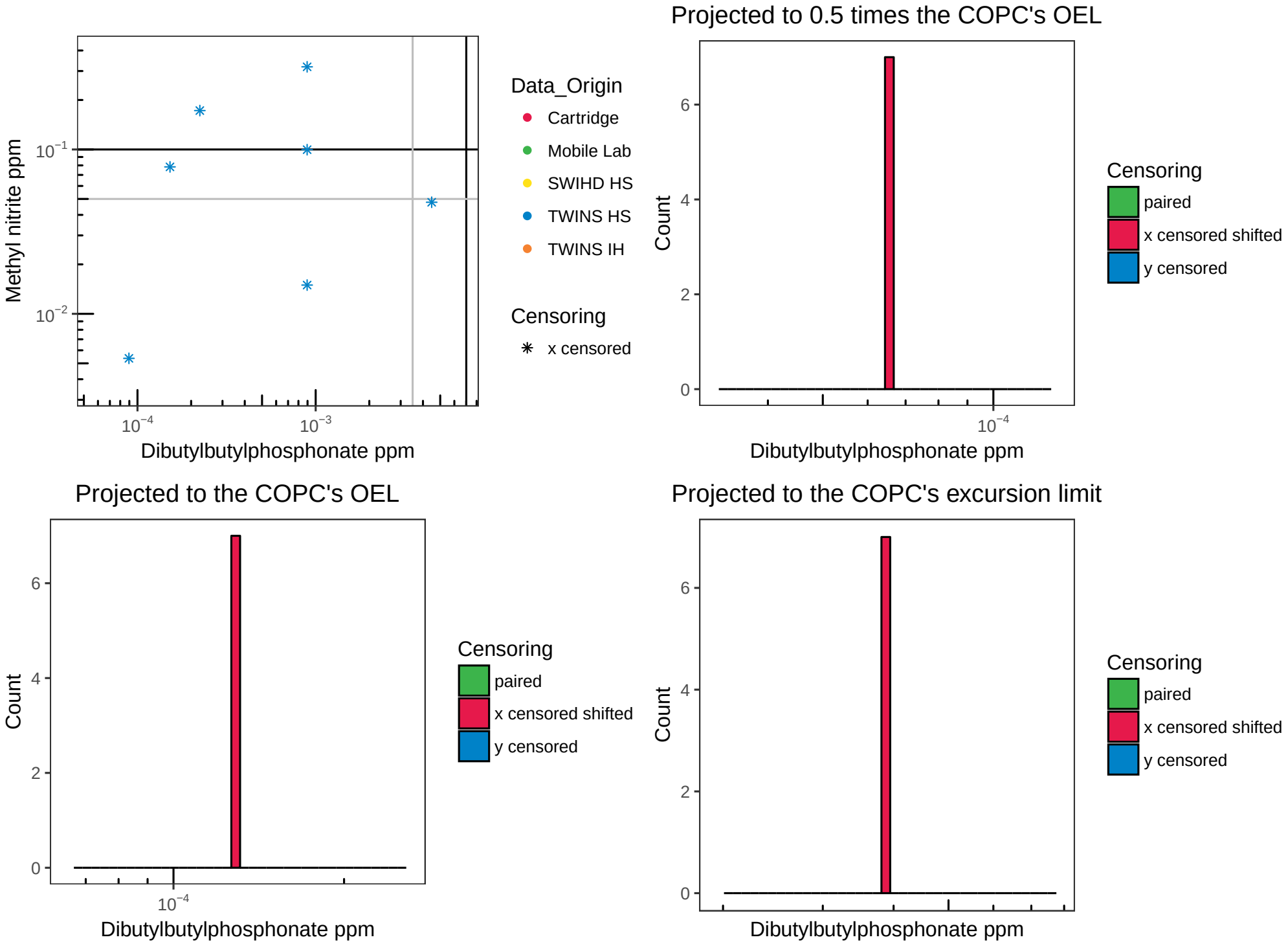


Figure C.2396: Methyl nitrite vs Dibutylbutylphosphonate

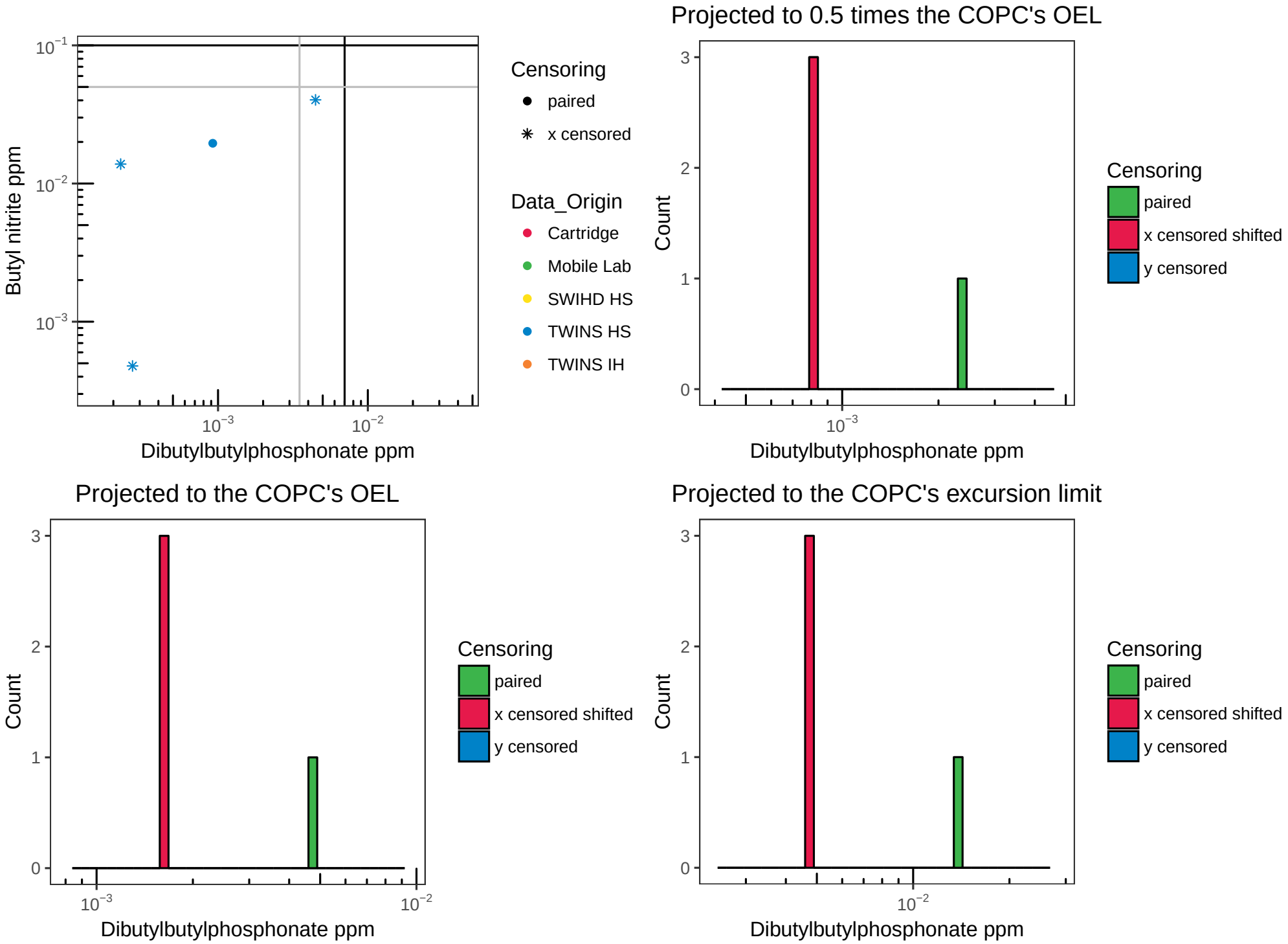


Figure C.2397: Butyl nitrite vs Dibutylbutylphosphonate

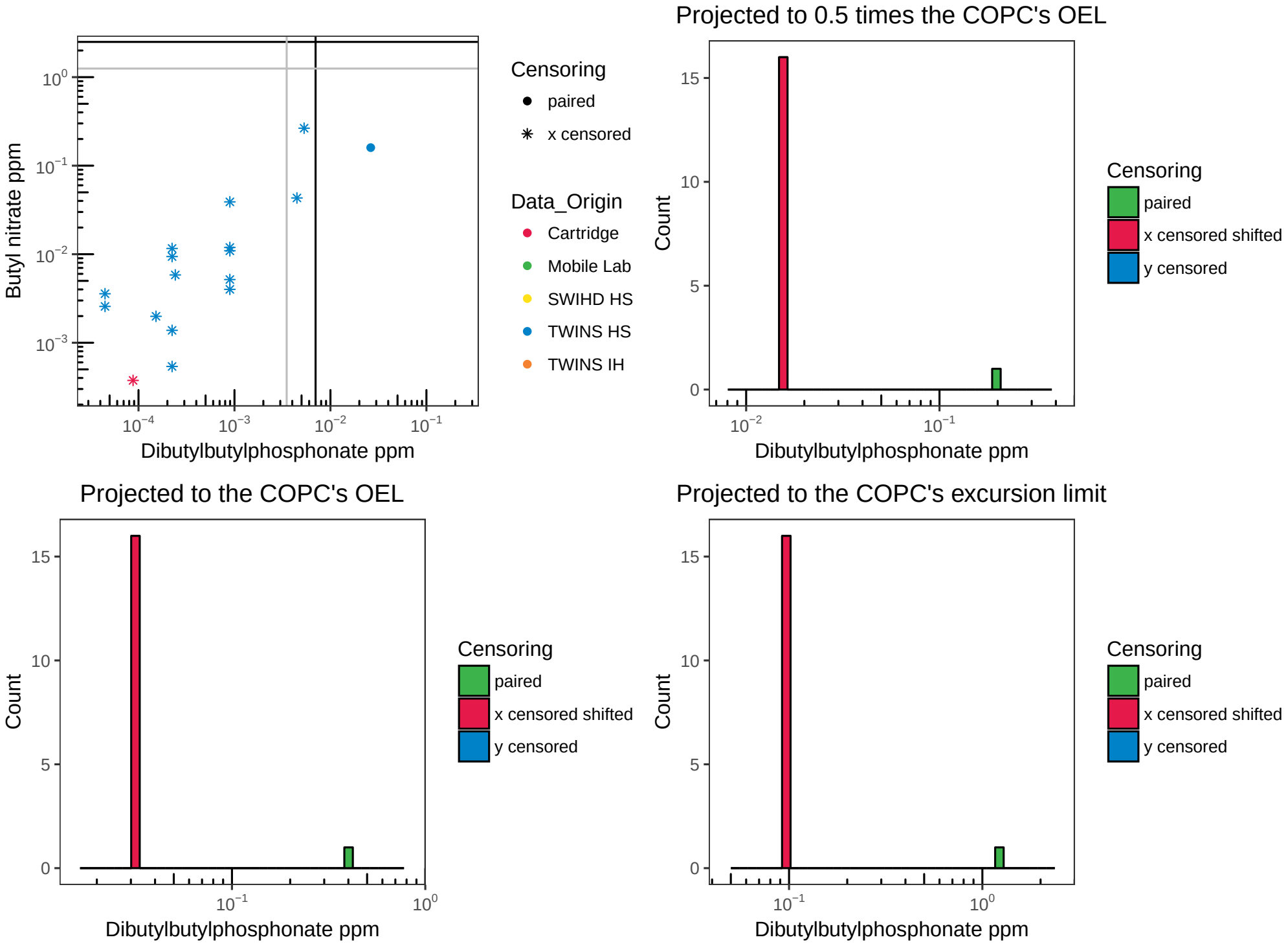


Figure C.2398: Butyl nitrate vs Dibutylbutylphosphonate

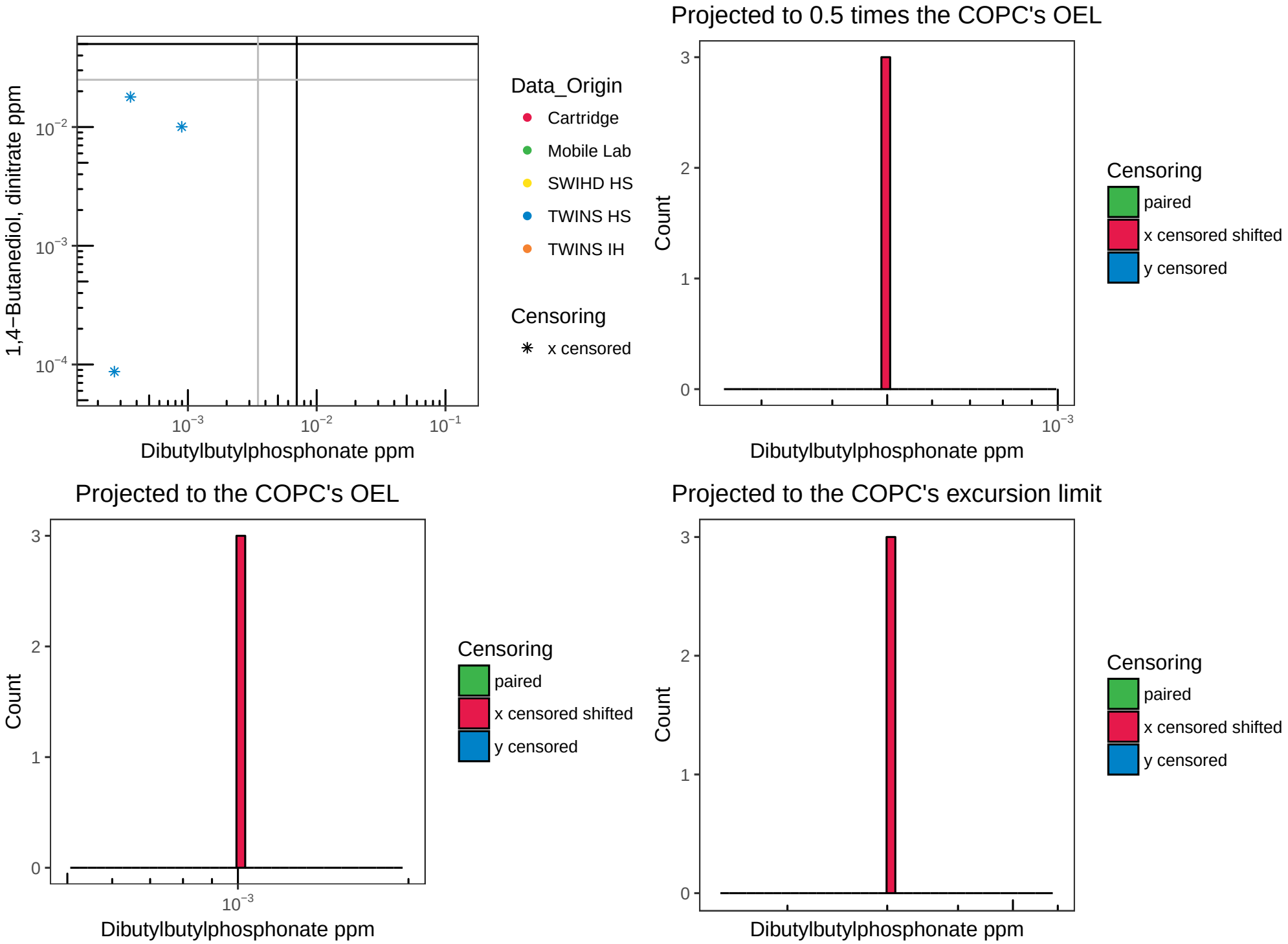


Figure C.2399: 1,4-Butanediol, dinitrate vs Dibutylbutylphosphonate

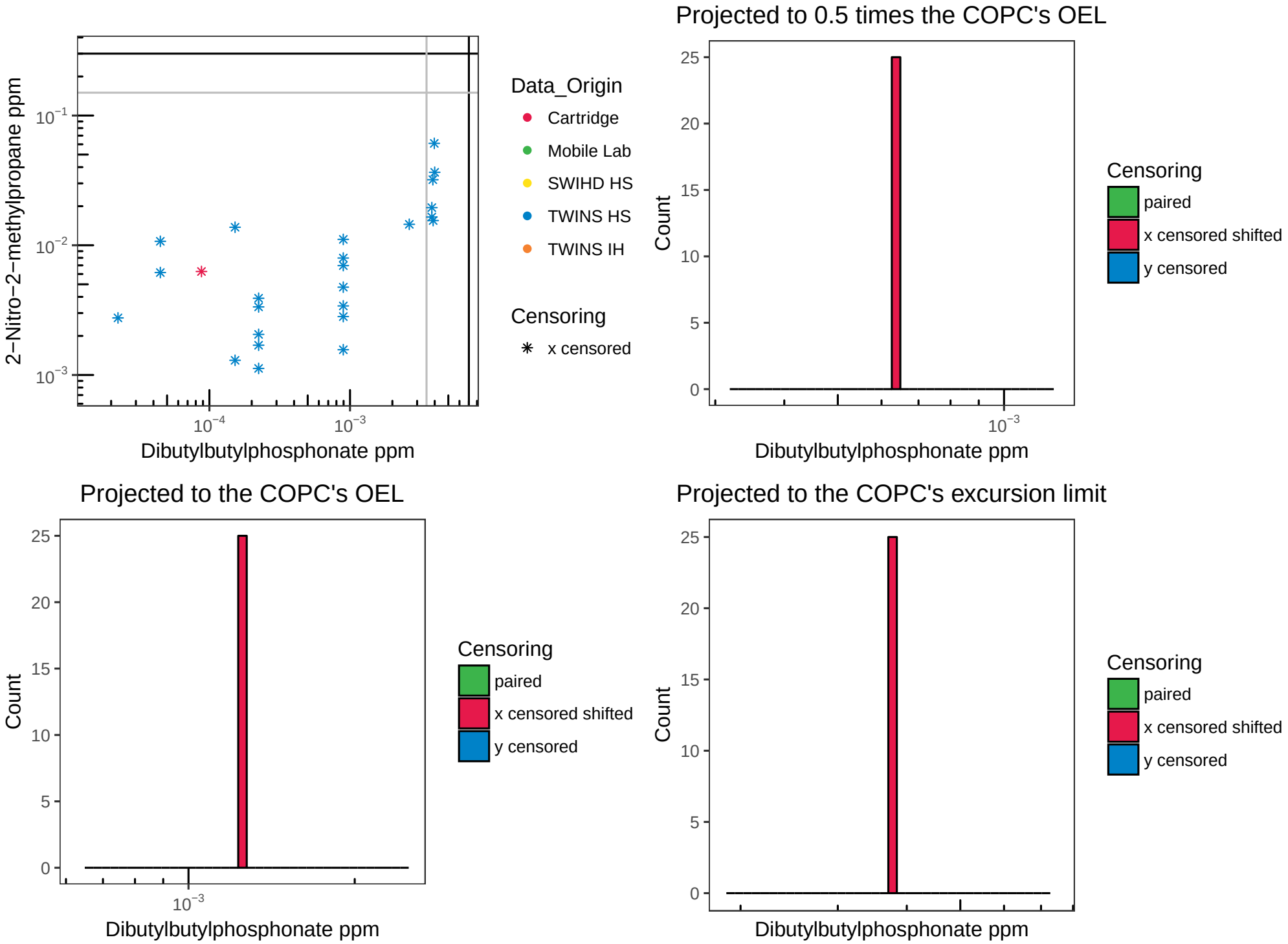


Figure C.2400: 2-Nitro-2-methylpropane vs Dibutylbutylphosphonate

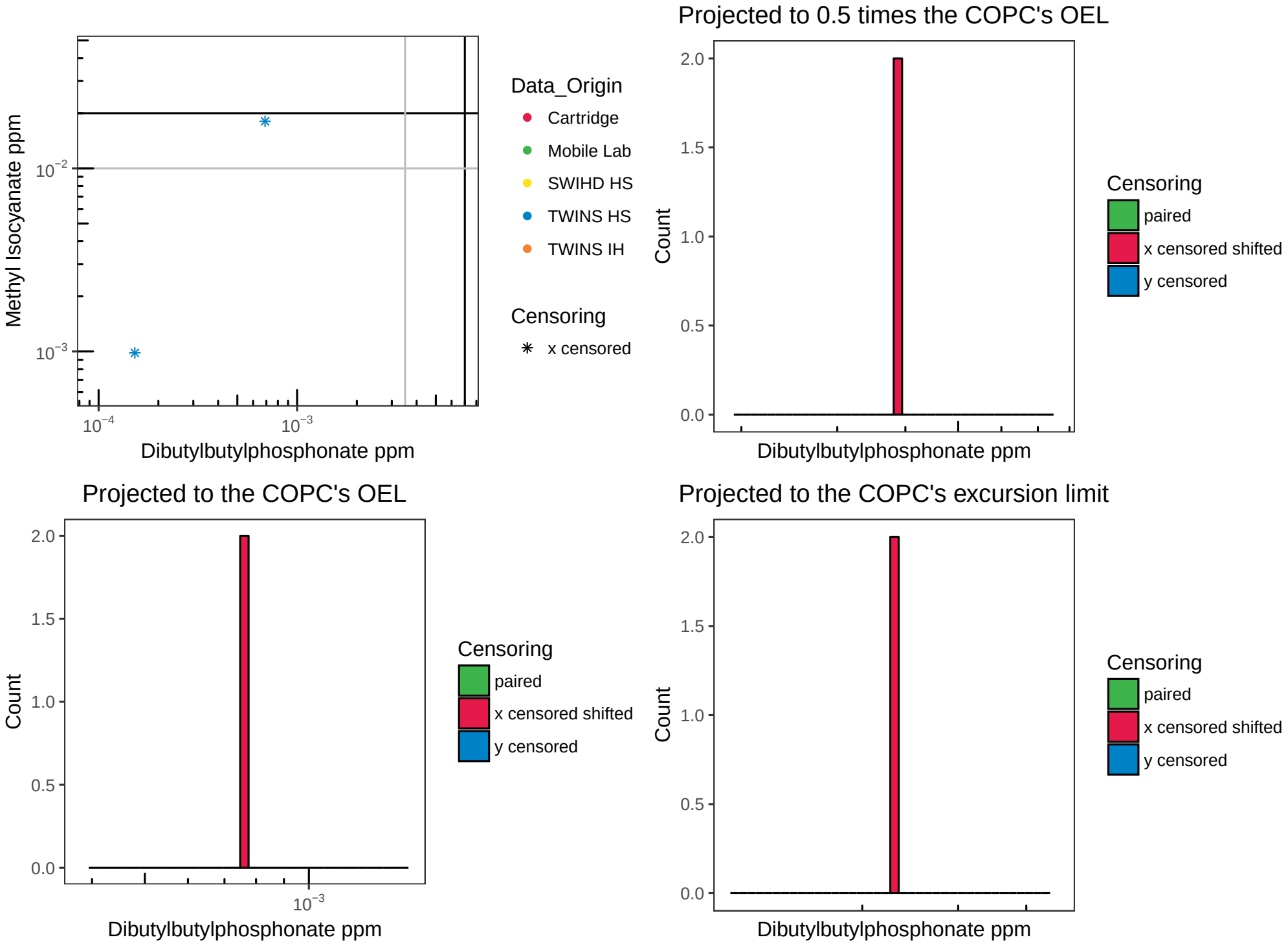


Figure C.2401: Methyl Isocyanate vs Dibutylbutylphosphonate

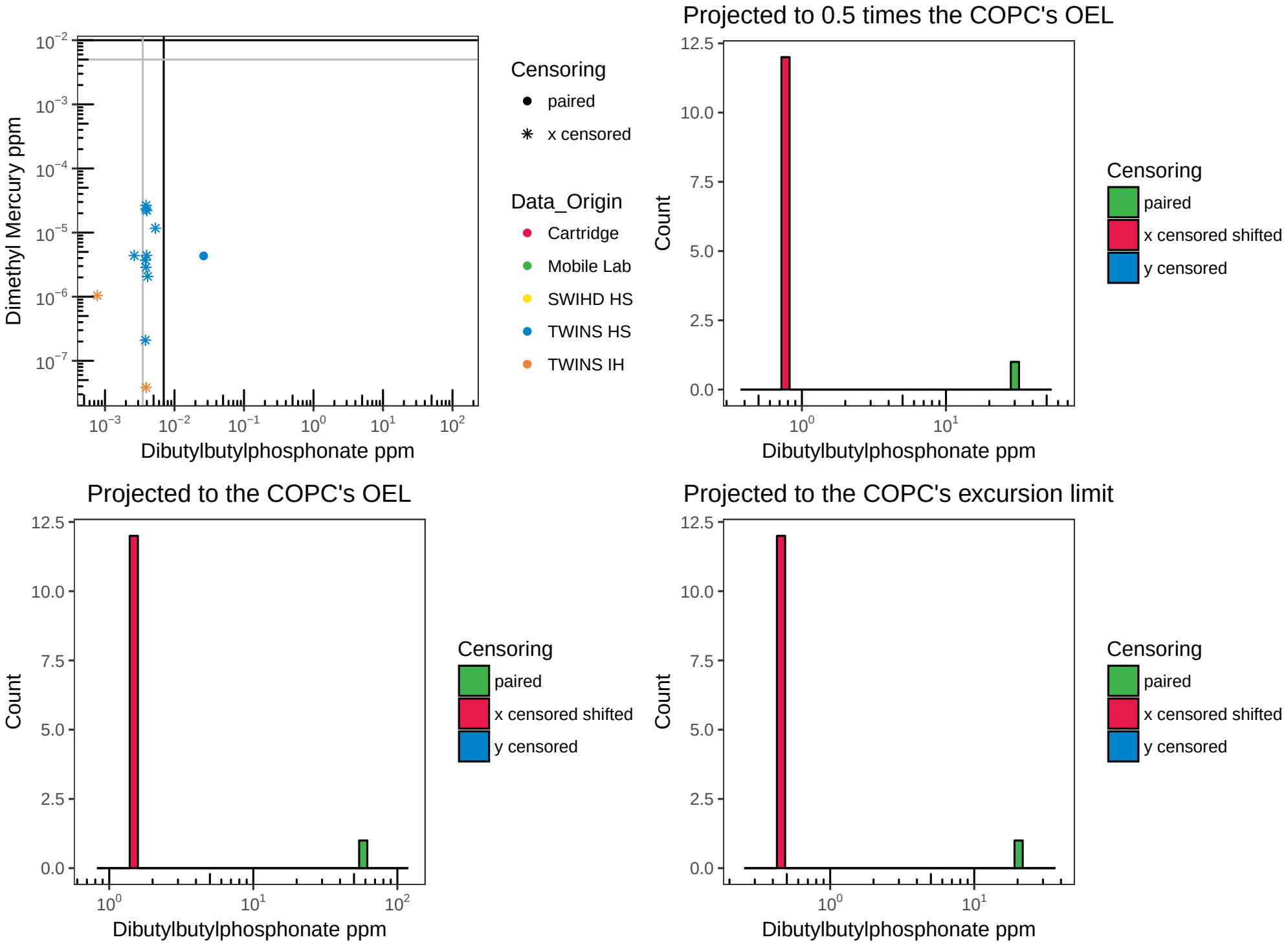


Figure C.2402: Dimethyl Mercury vs Dibutylbutylphosphonate

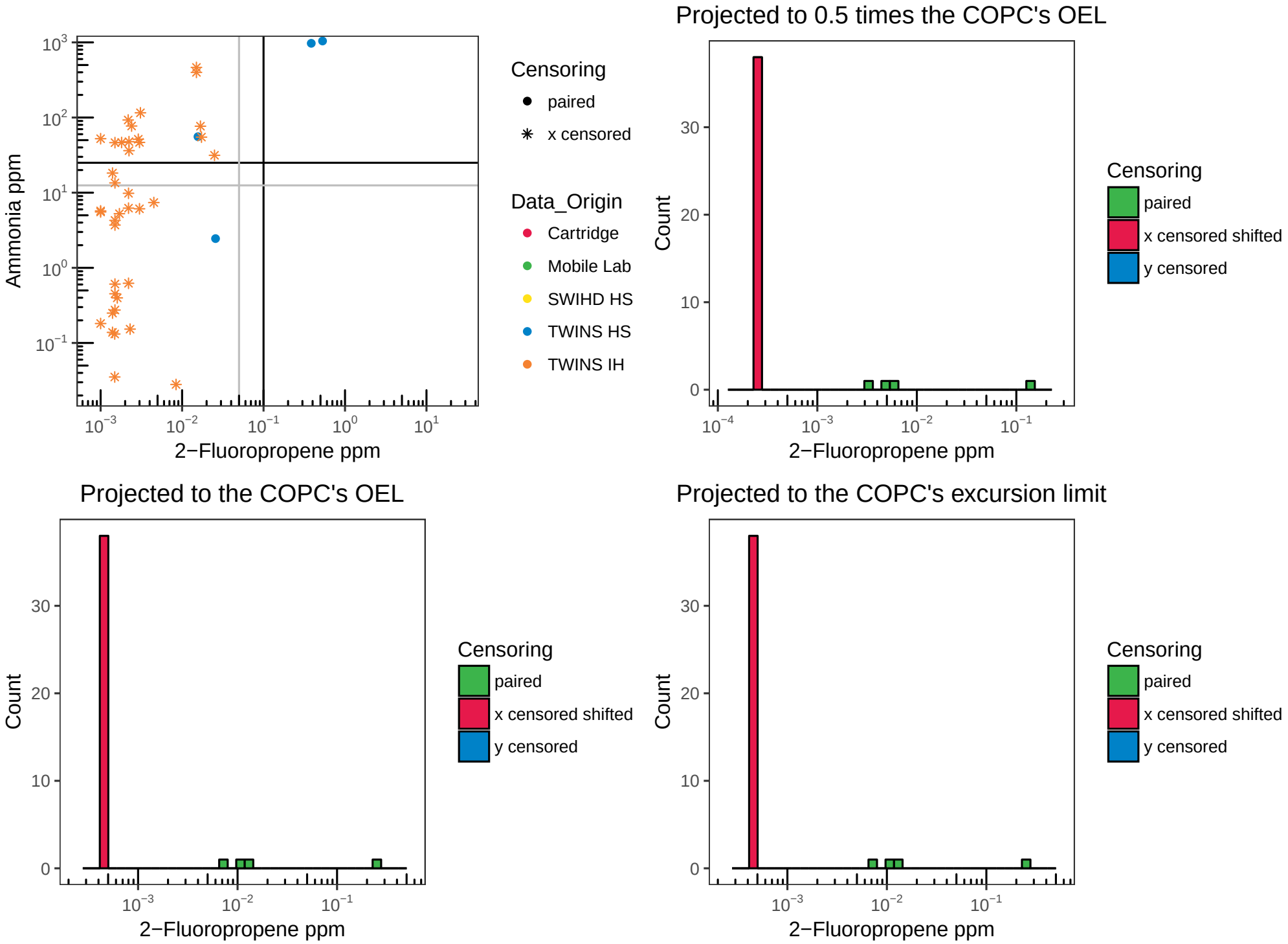


Figure C.2403: Ammonia vs 2-Fluoropropene

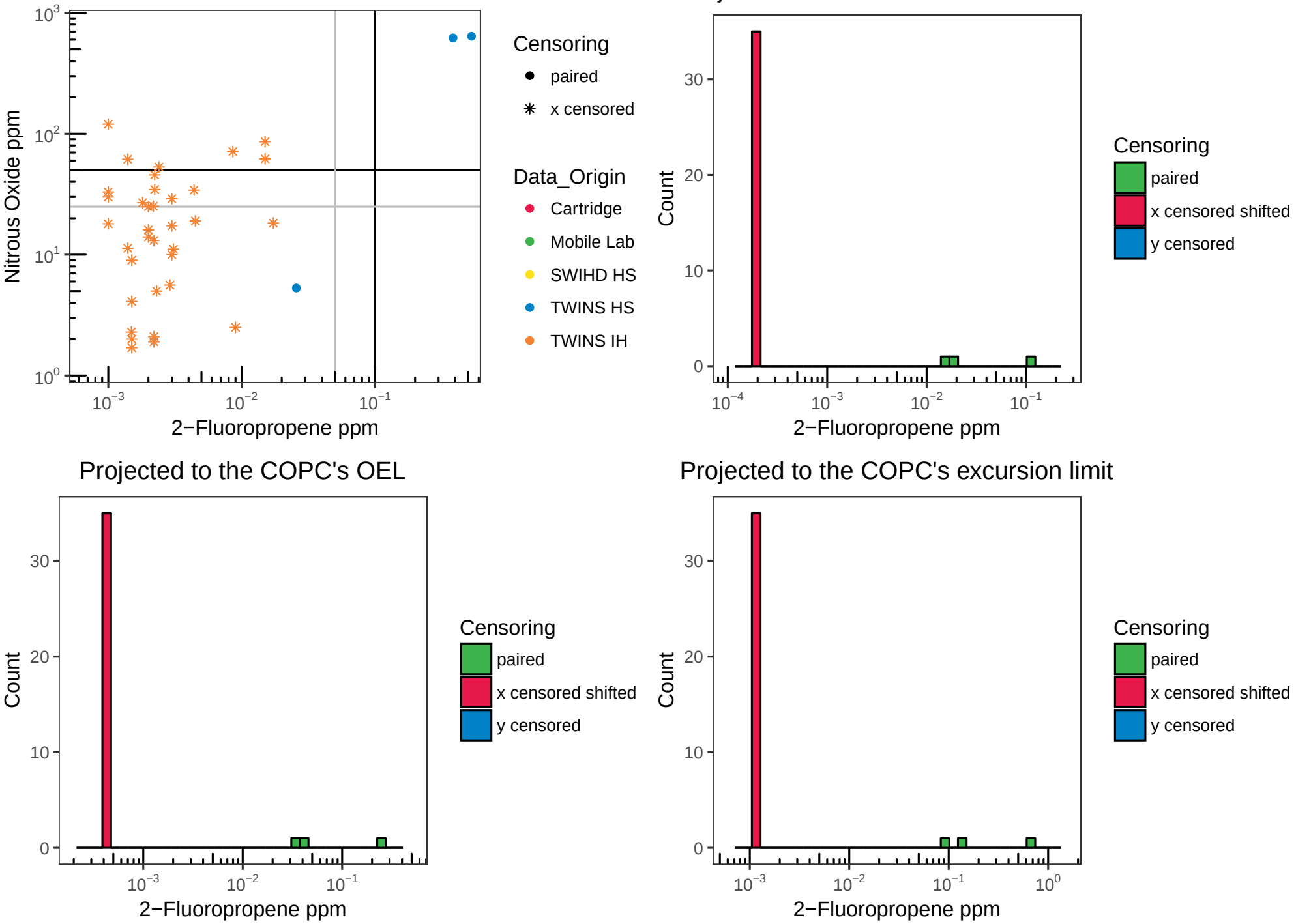


Figure C.2404: Nitrous Oxide vs 2-Fluoropropene

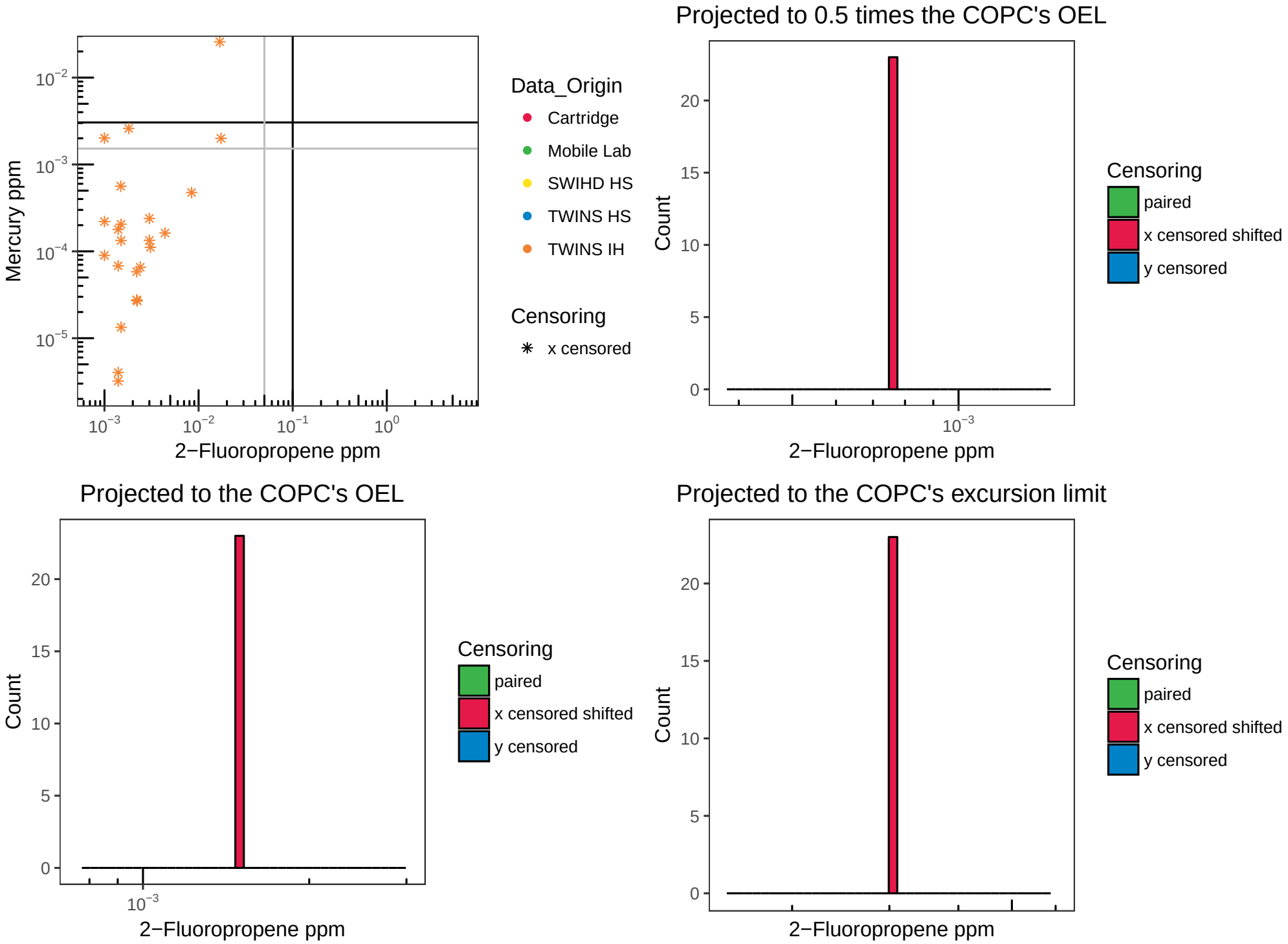


Figure C.2405: Mercury vs 2-Fluoropropene

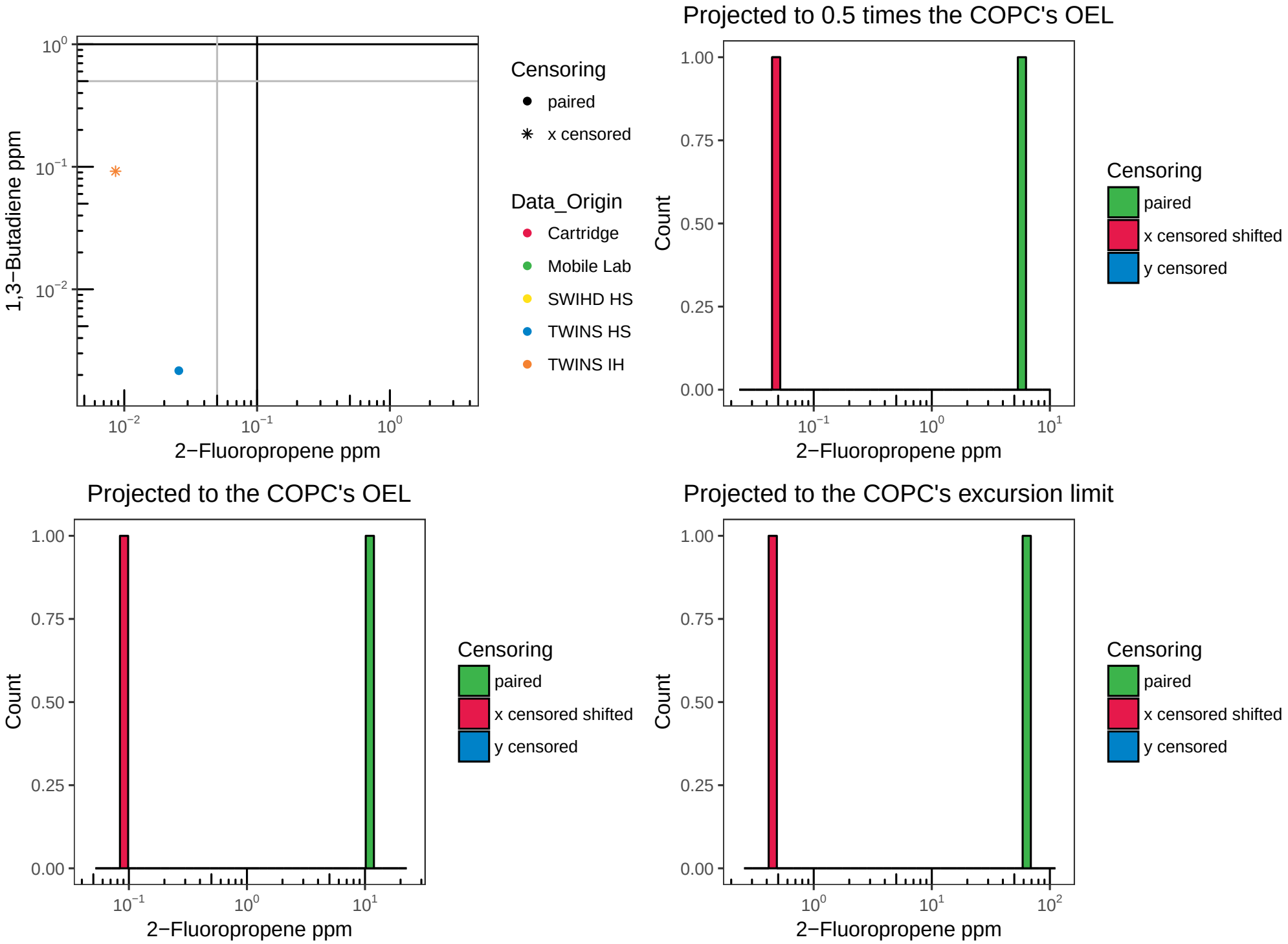


Figure C.2406: 1,3-Butadiene vs 2-Fluoropropene

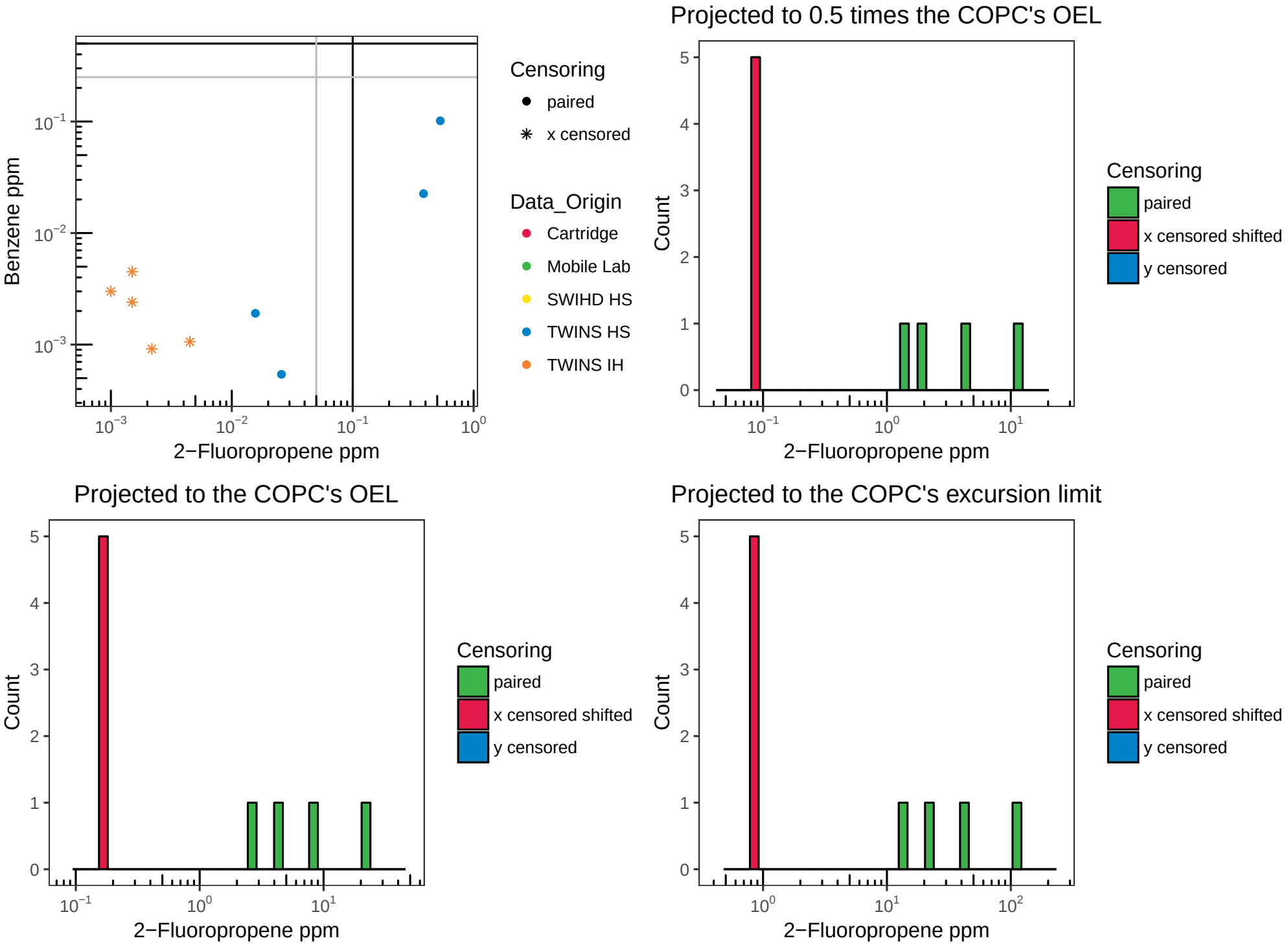


Figure C.2407: Benzene vs 2-Fluoropropene

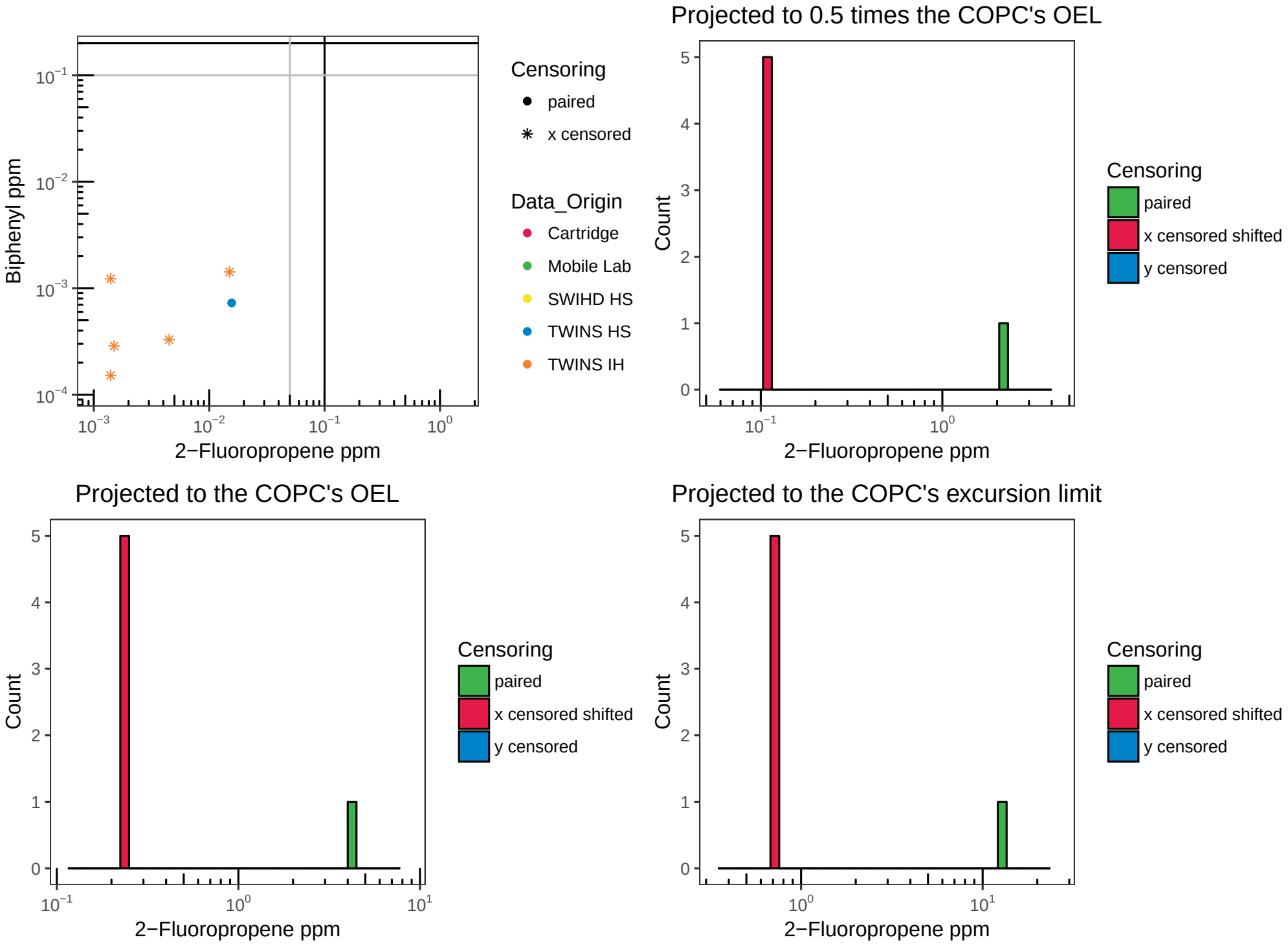


Figure C.2408: Biphenyl vs 2-Fluoropropene

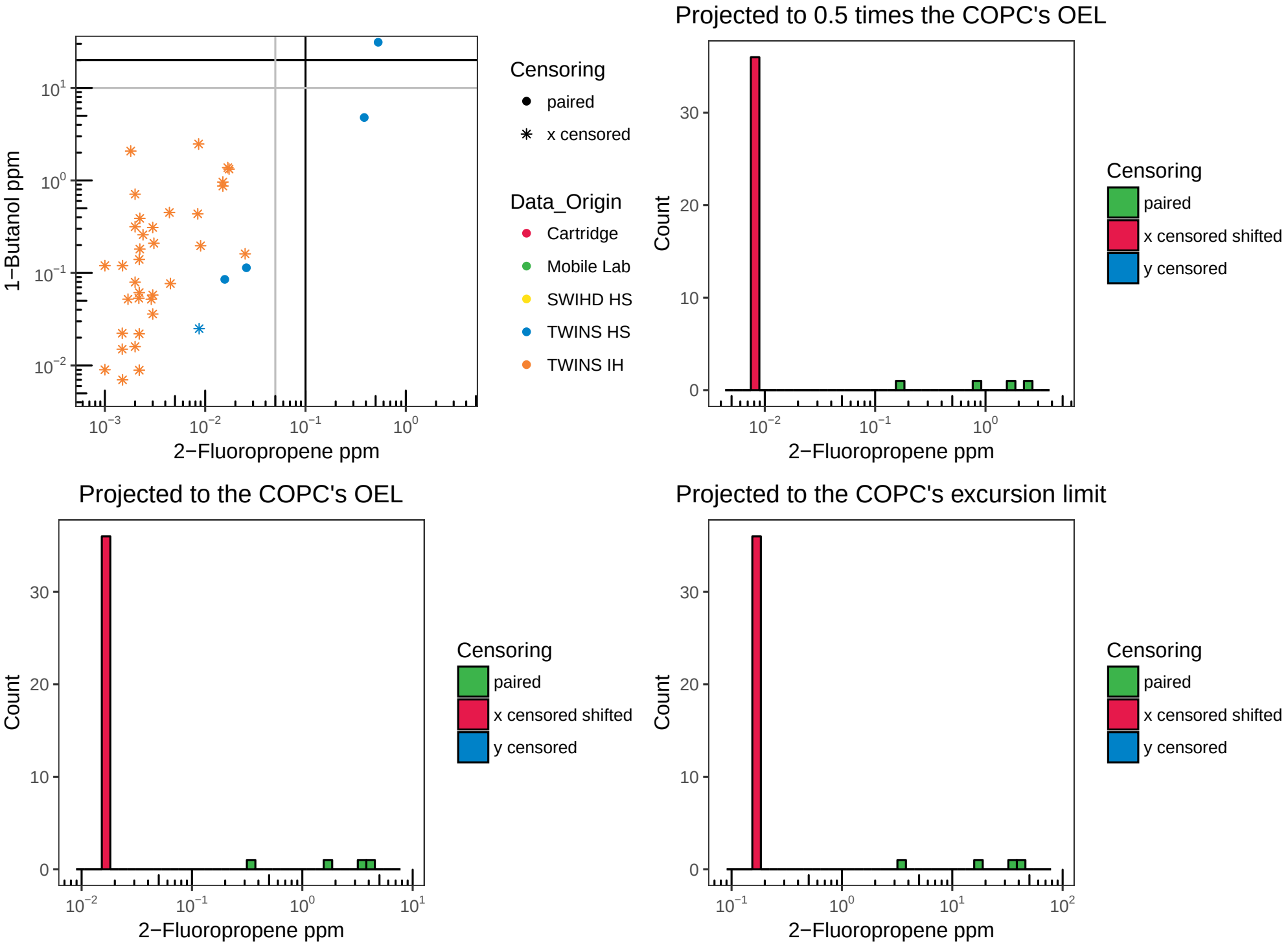


Figure C.2409: 1-Butanol vs 2-Fluoropropene

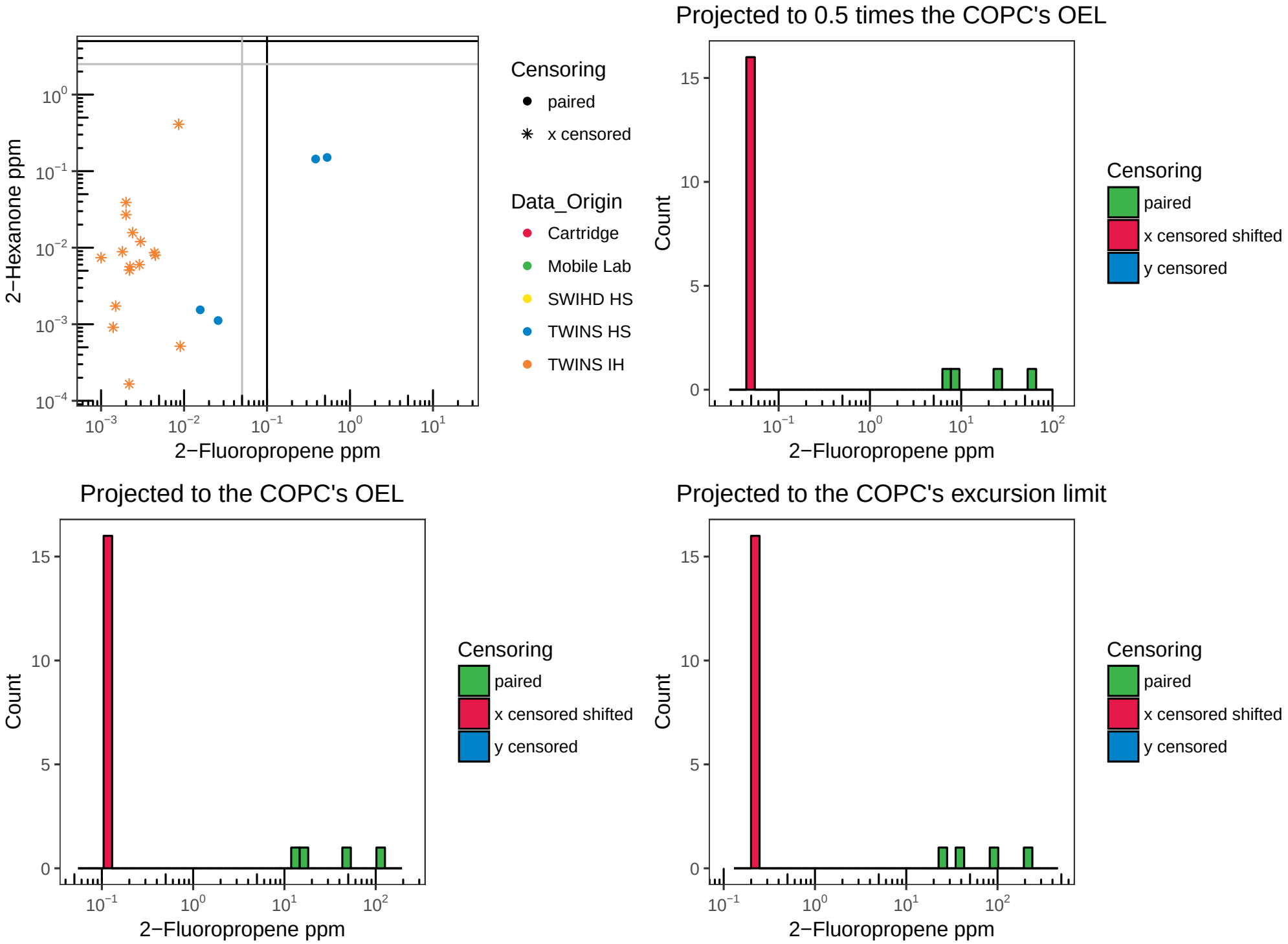


Figure C.2410: 2-Hexanone vs 2-Fluoropropene

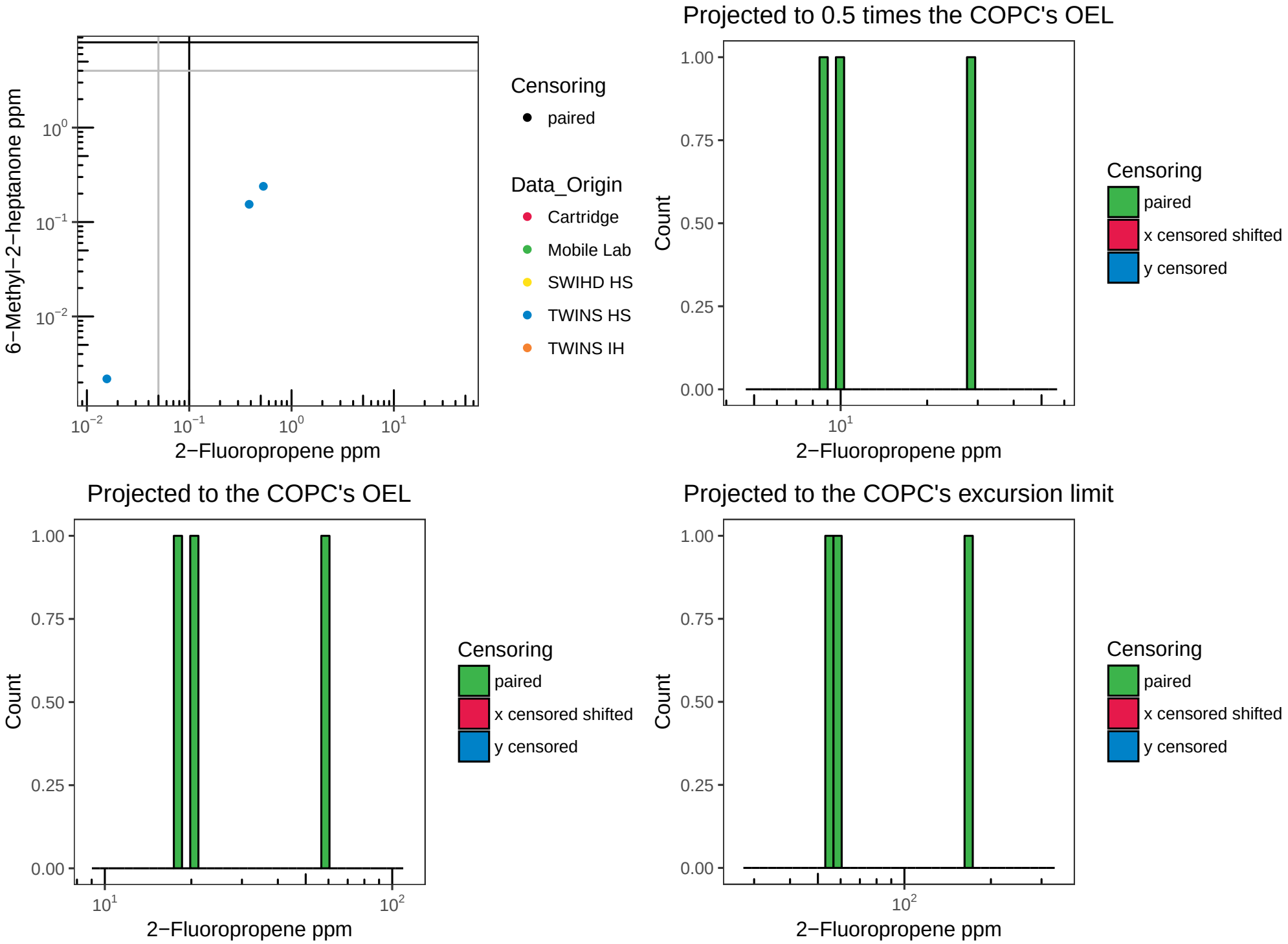


Figure C.2411: 6-Methyl-2-heptanone vs 2-Fluoropropene

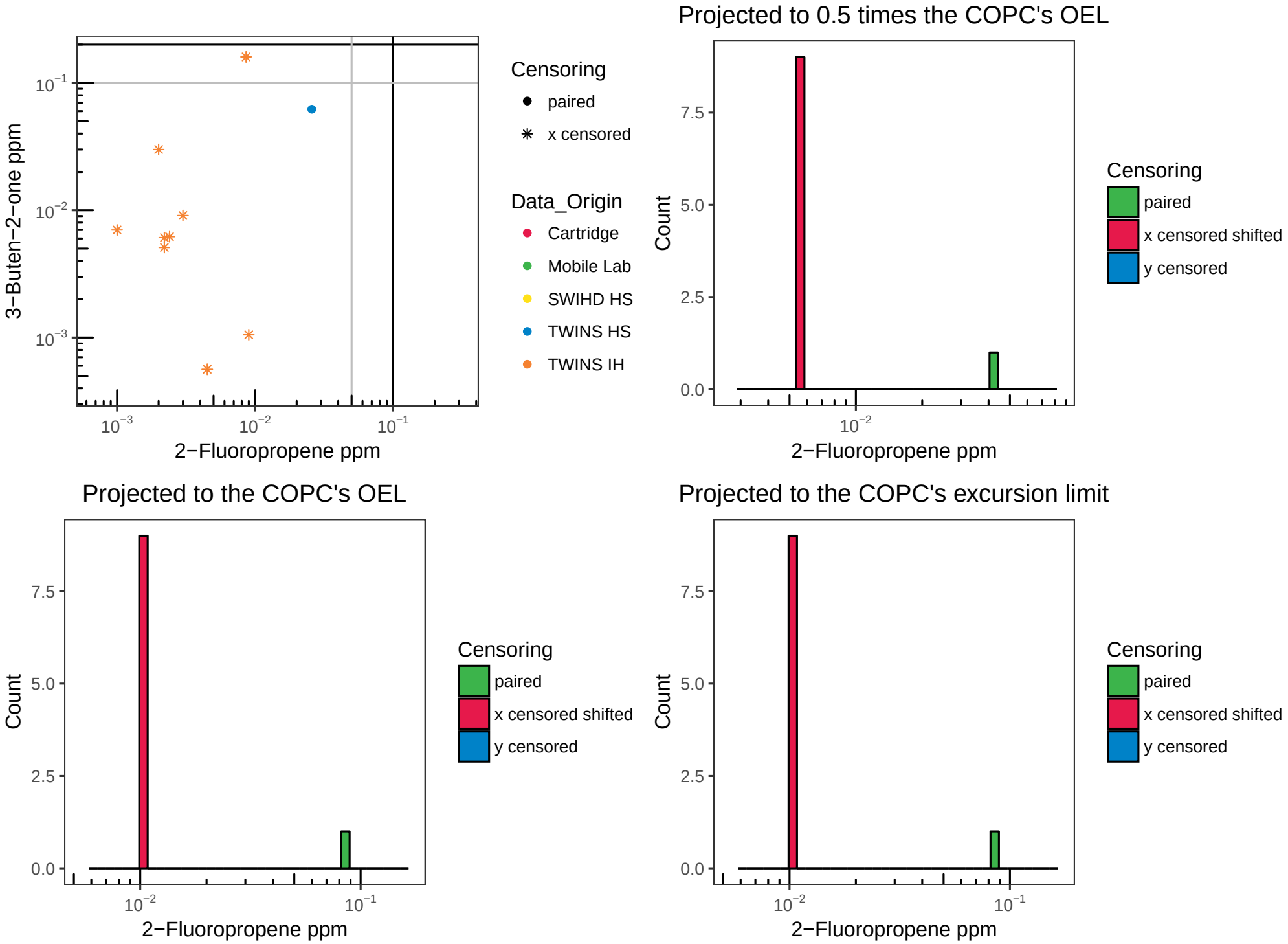


Figure C.2412: 3-Buten-2-one vs 2-Fluoropropene

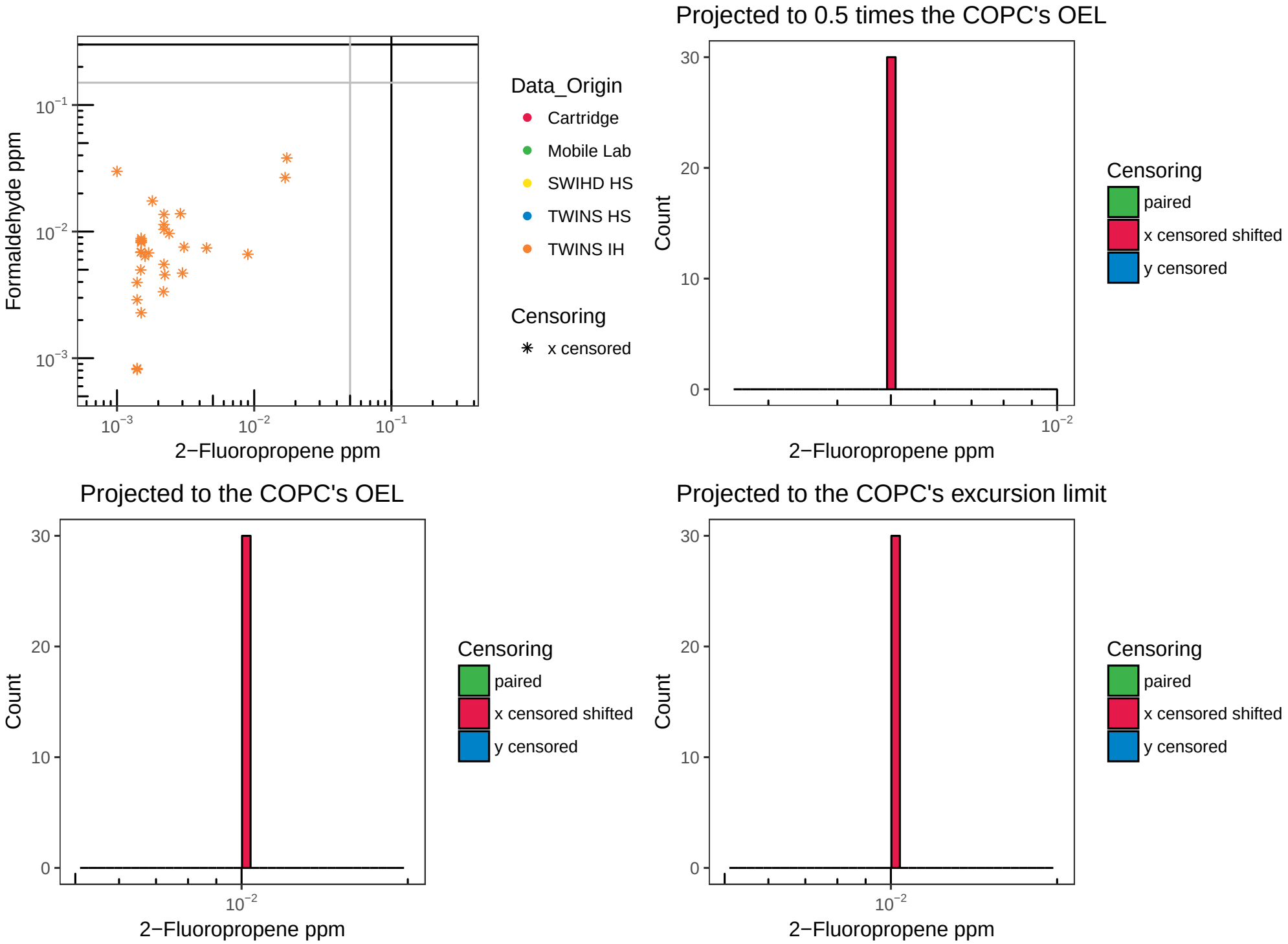


Figure C.2413: Formaldehyde vs 2-Fluoropropene

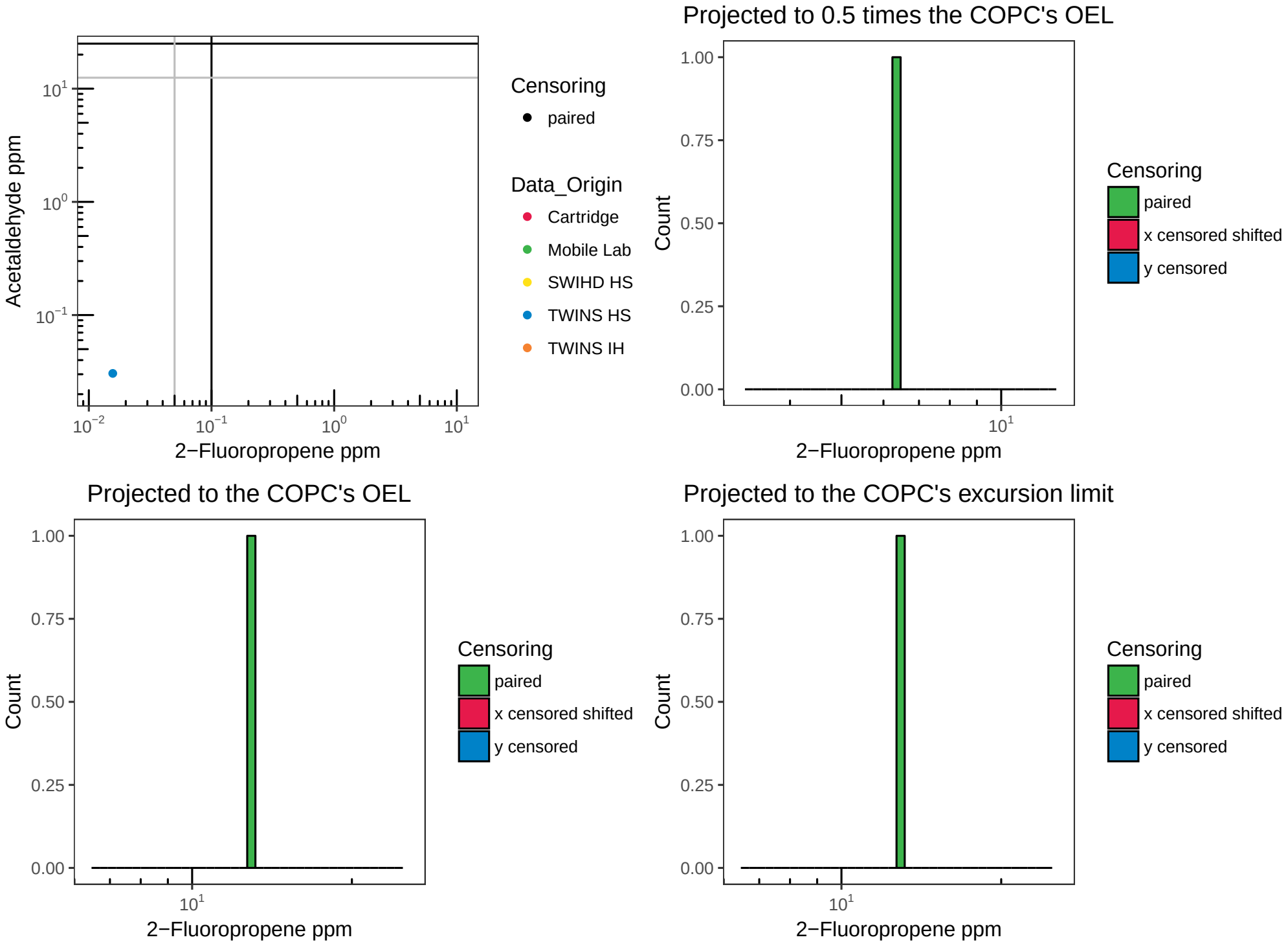


Figure C.2414: Acetaldehyde vs 2-Fluoropropene

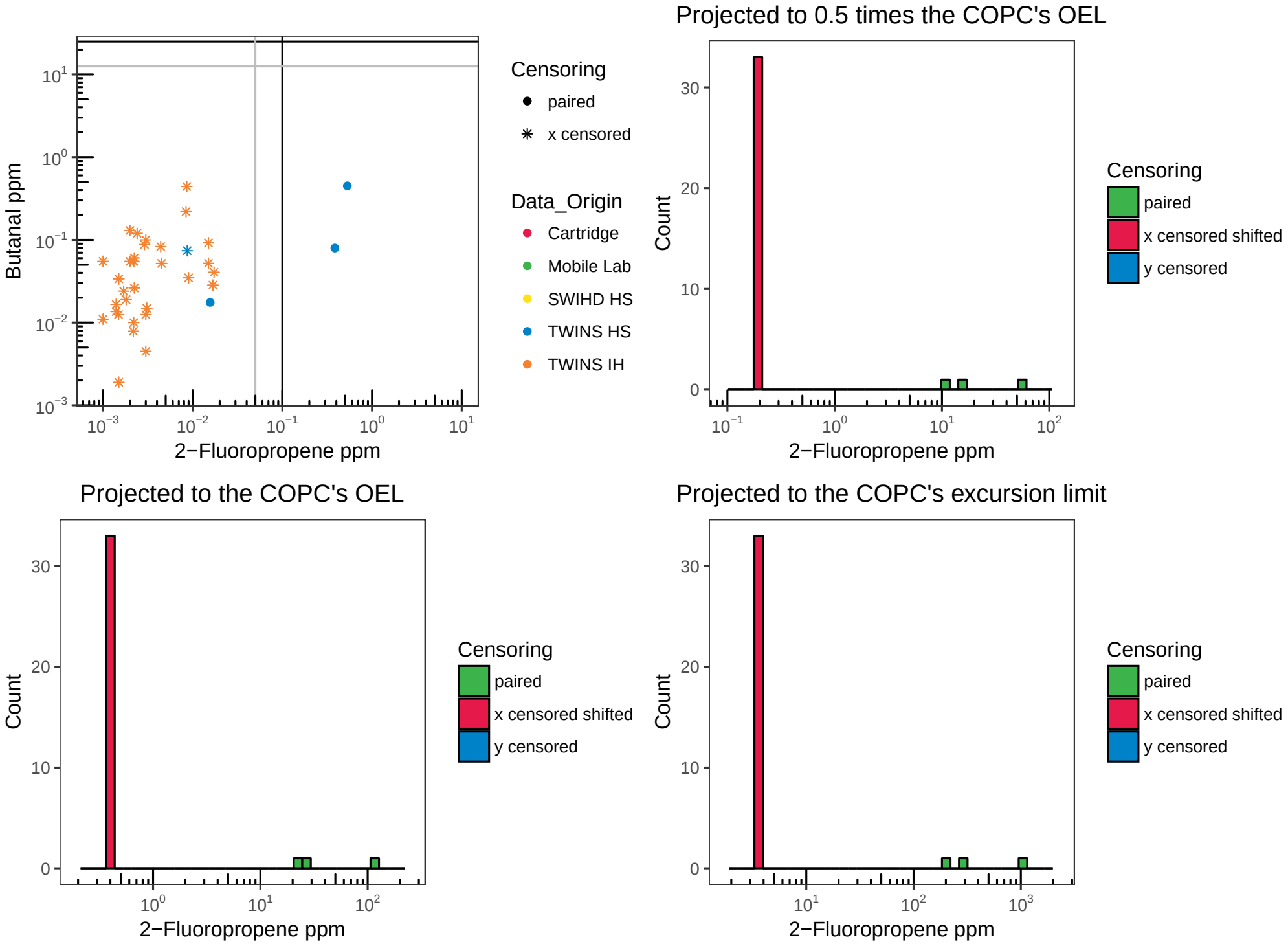


Figure C.2415: Butanal vs 2-Fluoropropene

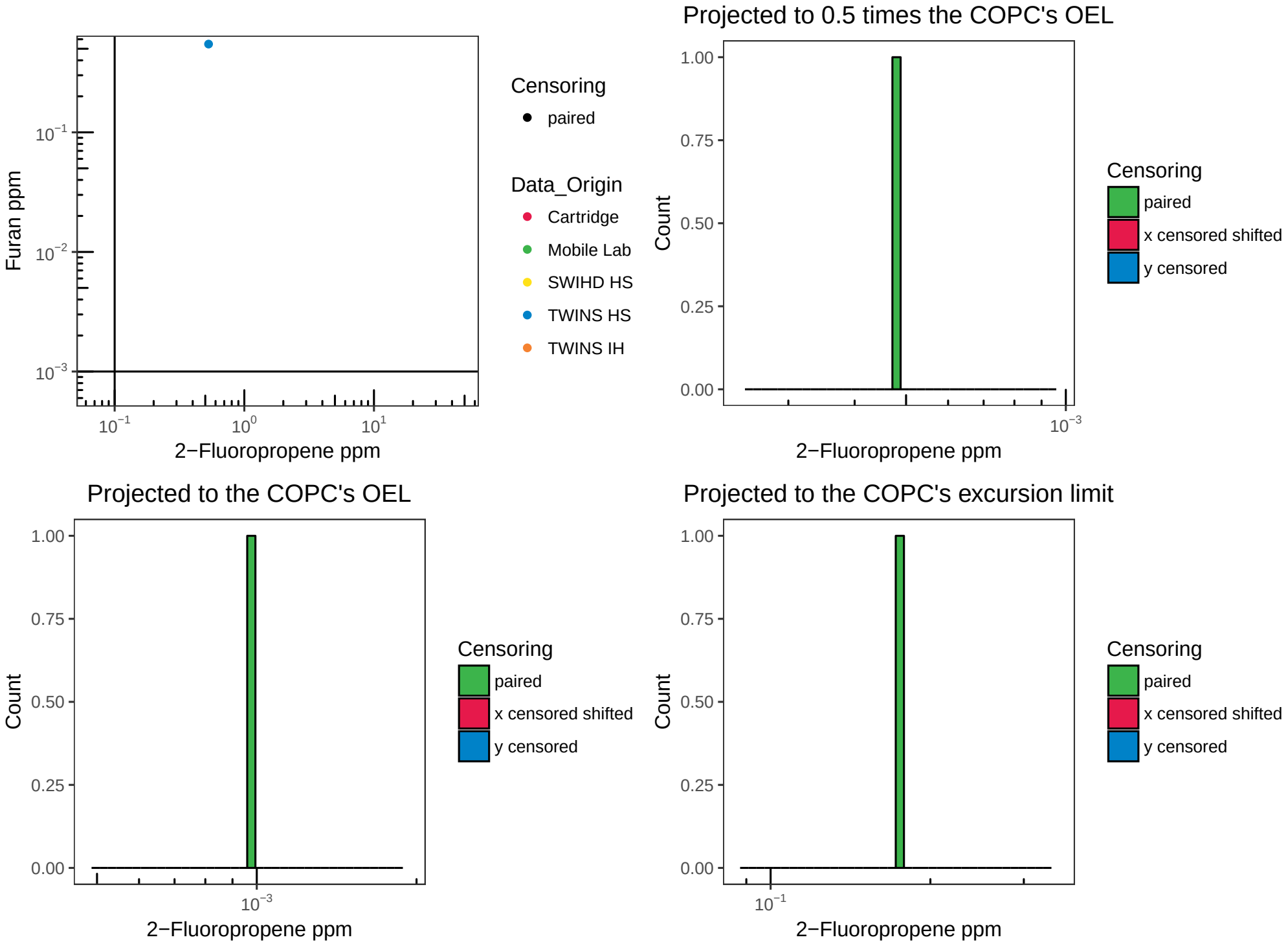


Figure C.2416: Furan vs 2-Fluoropropene

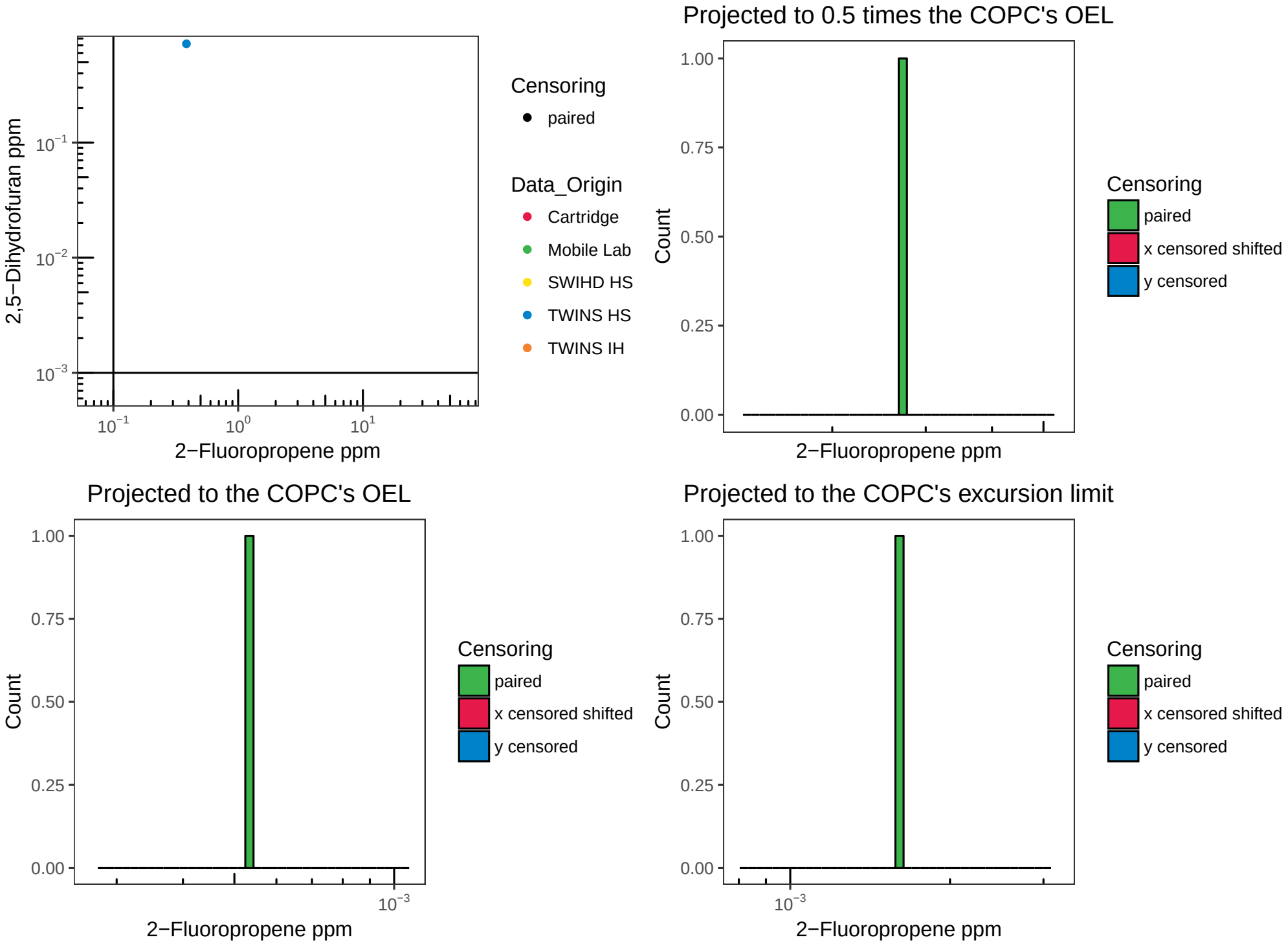


Figure C.2417: 2,5-Dihydrofuran vs 2-Fluoropropene

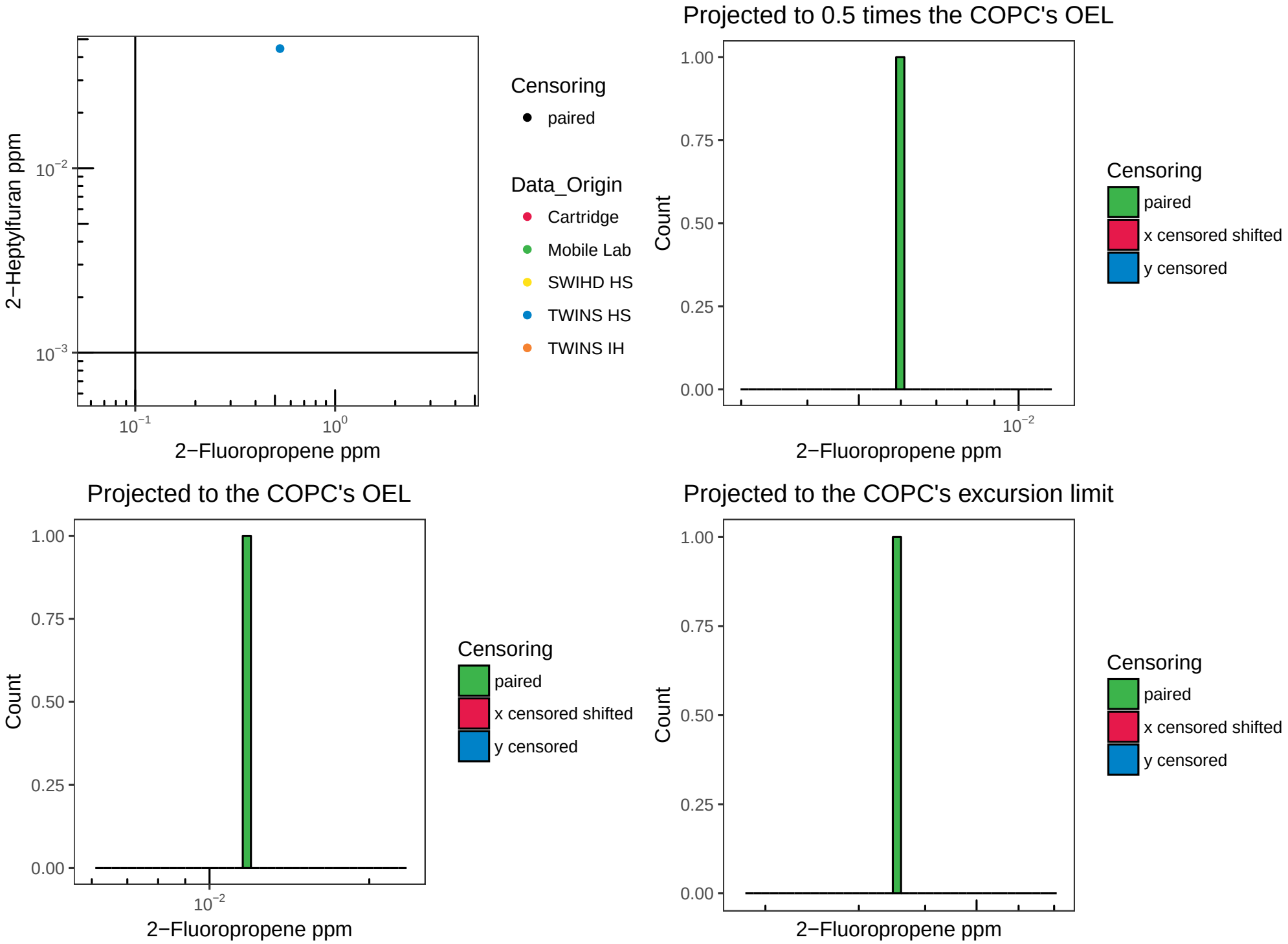


Figure C.2418: 2-Heptylfuran vs 2-Fluoropropene

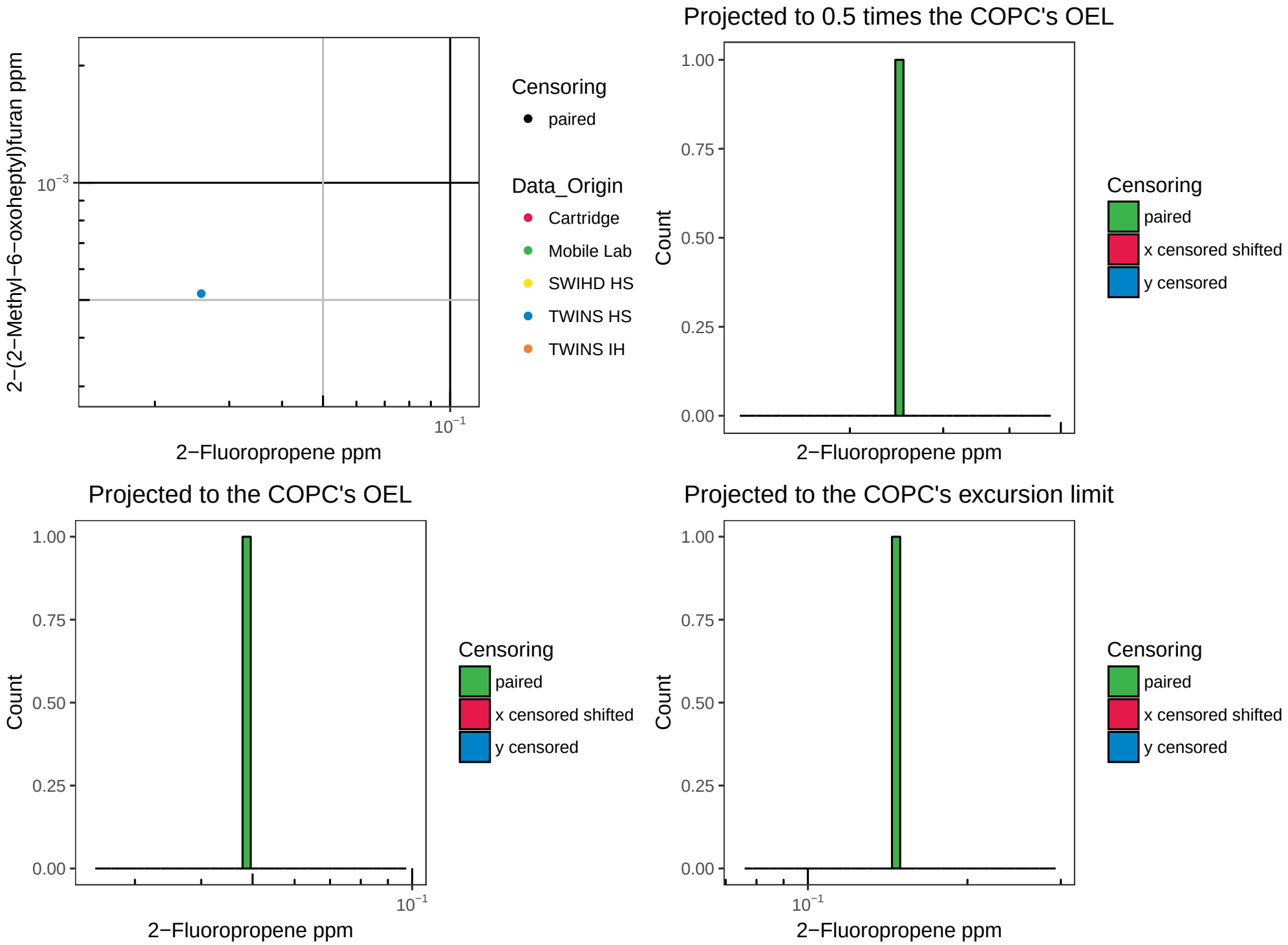


Figure C.2419: 2-(2-Methyl-6-oxoheptyl)furan vs 2-Fluoropropene

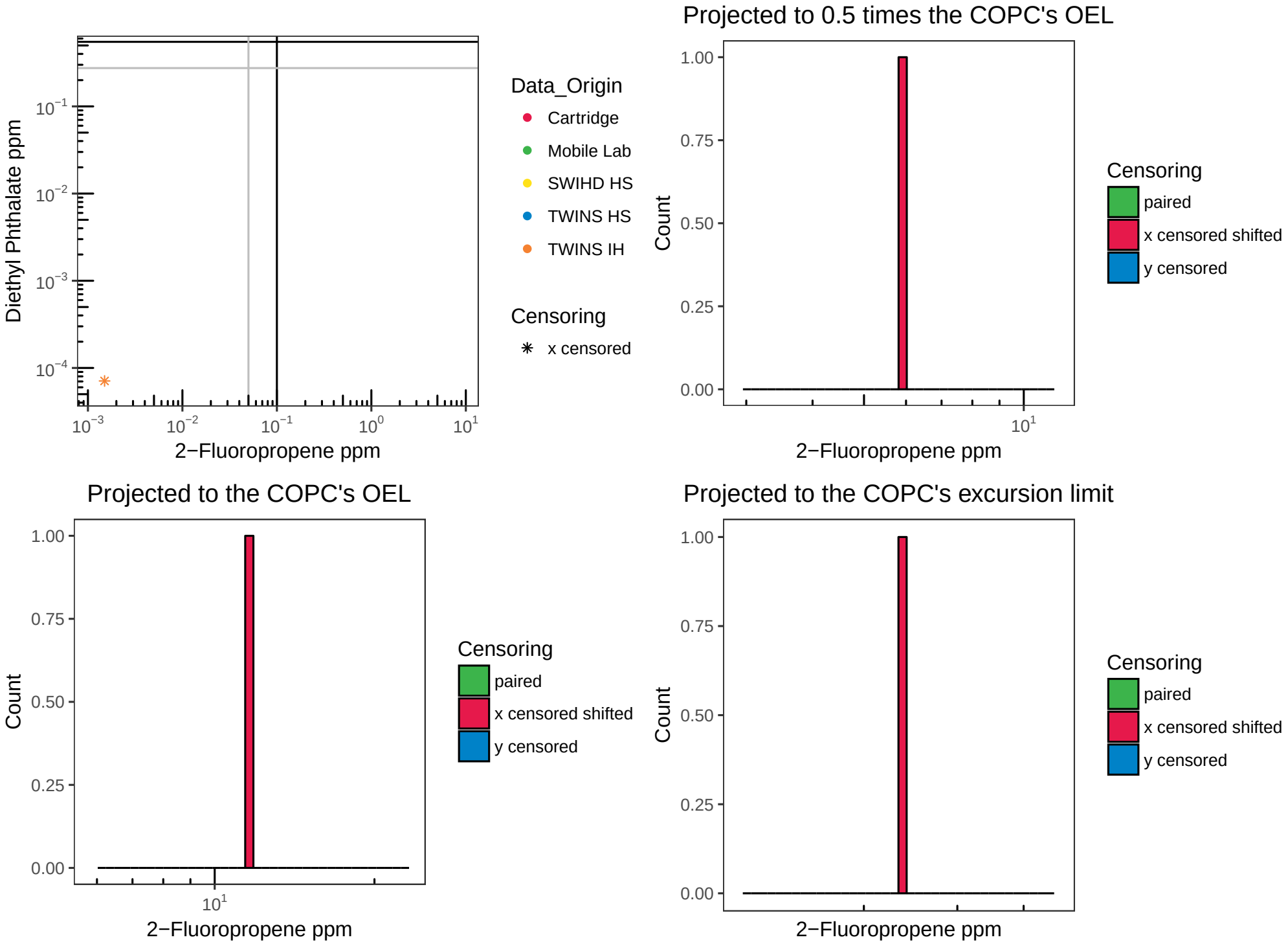


Figure C.2420: Diethyl Phthalate vs 2-Fluoropropene

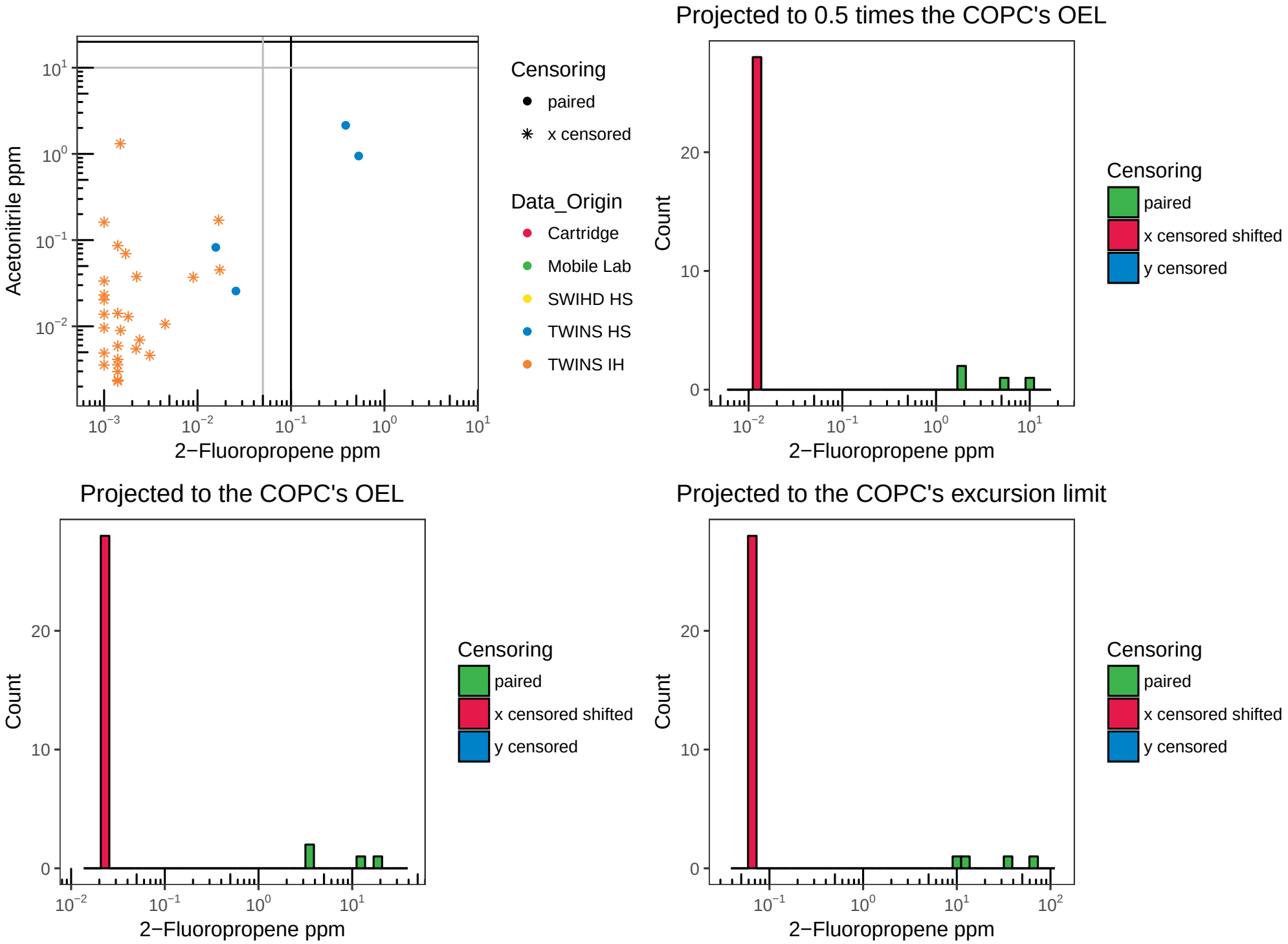


Figure C.2421: Acetonitrile vs 2-Fluoropropene

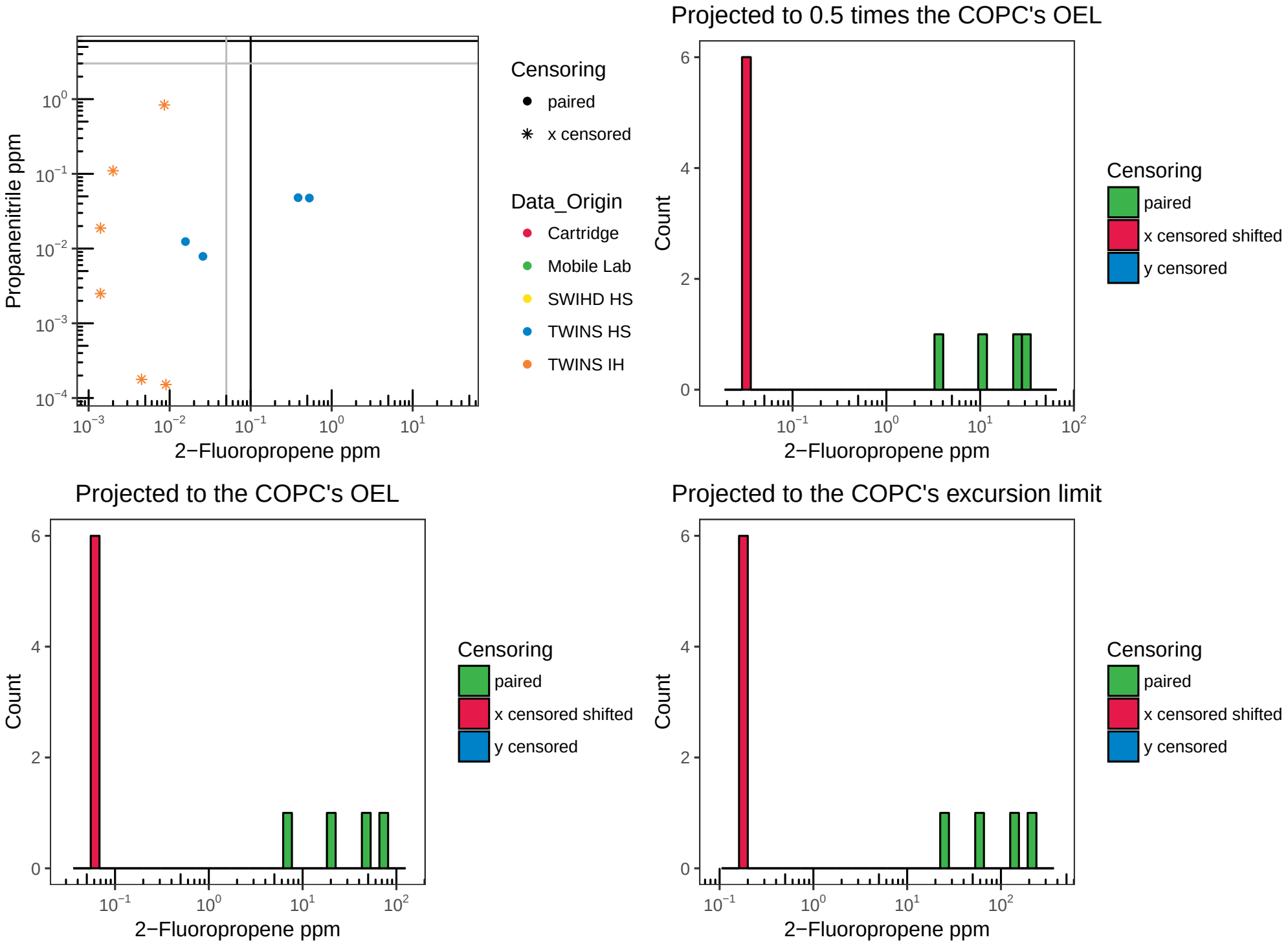


Figure C.2422: Propanenitrile vs 2-Fluoropropene

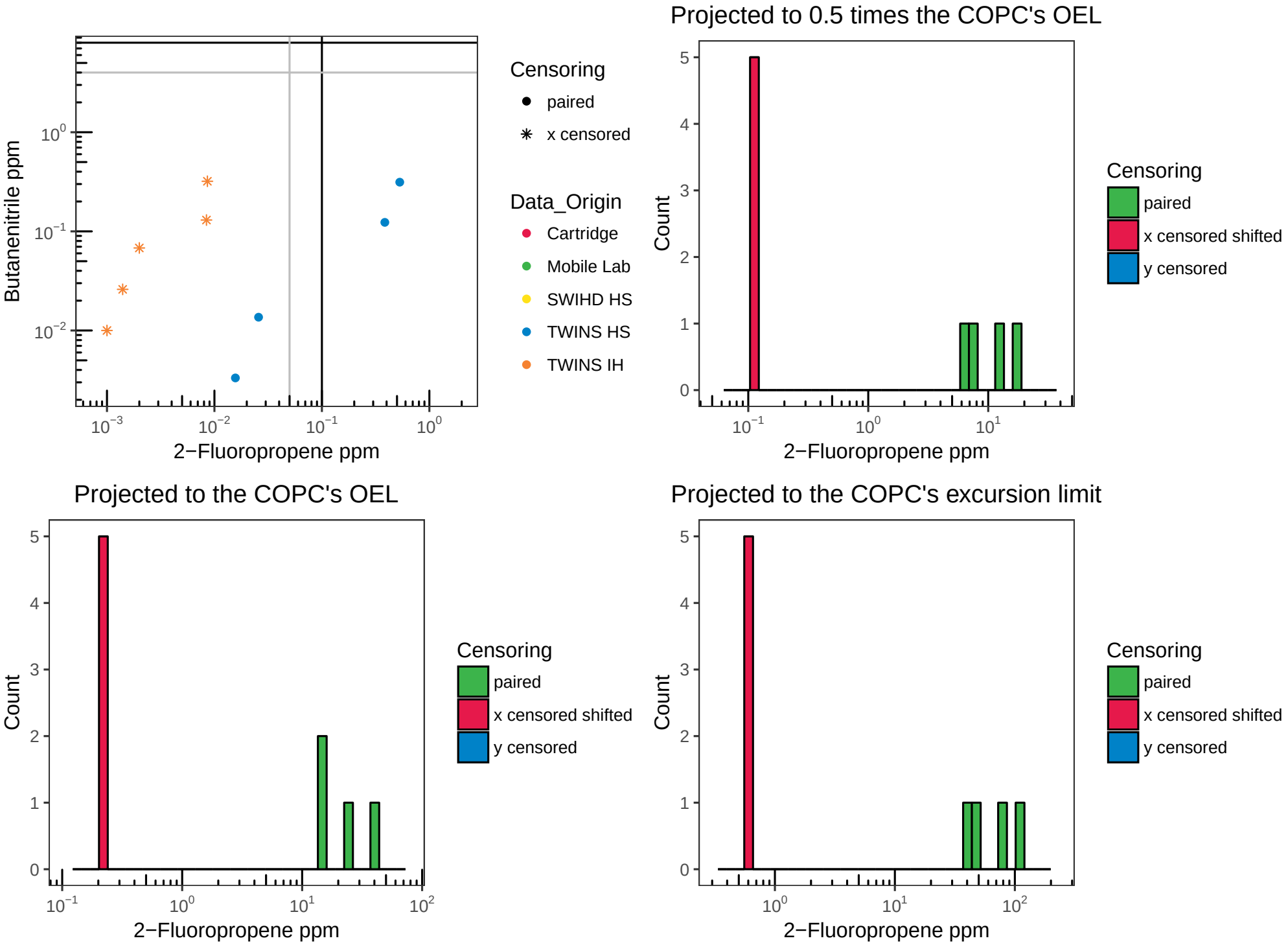


Figure C.2423: Butanenitrile vs 2-Fluoropropene

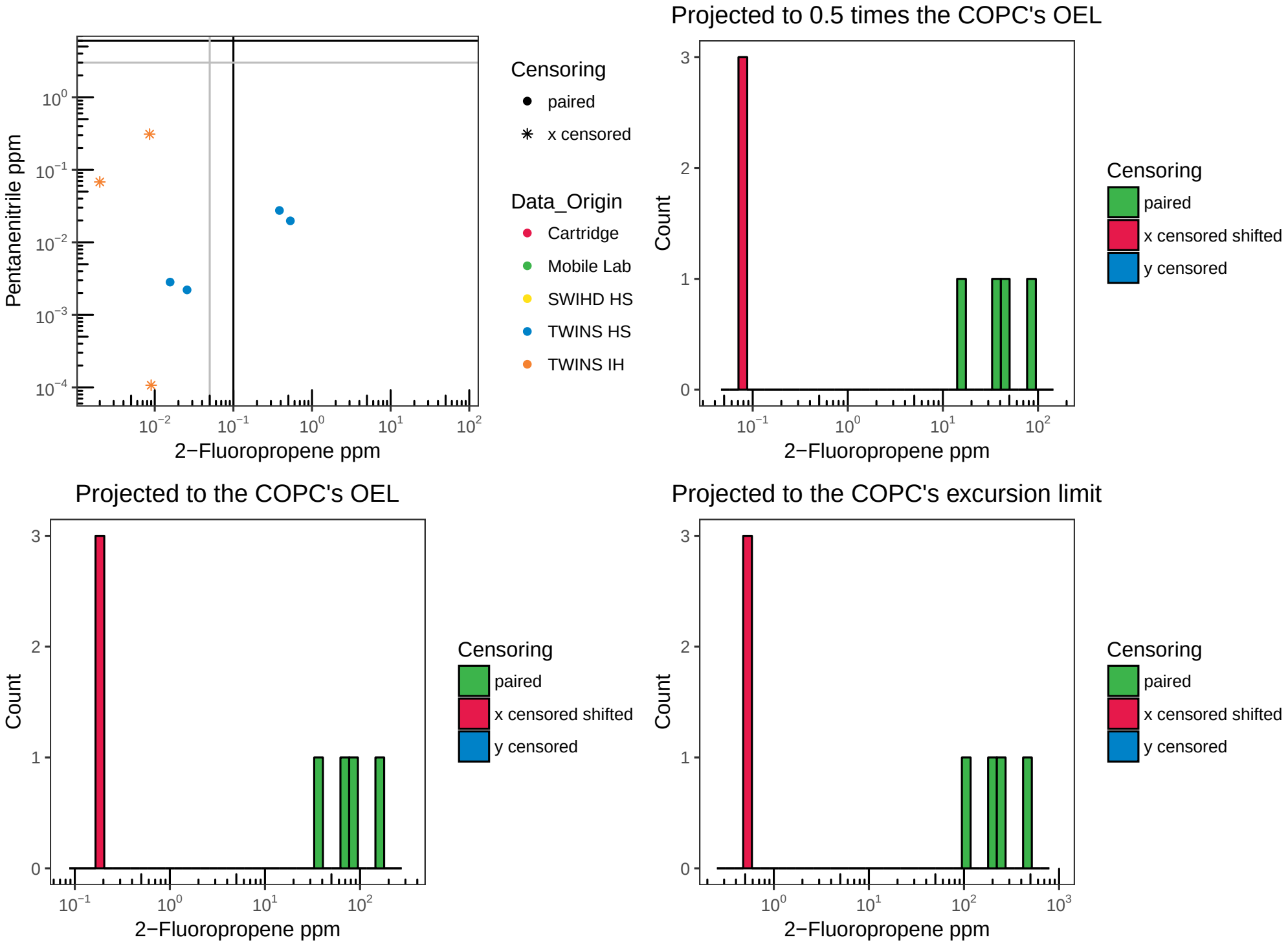


Figure C.2424: Pentanenitrile vs 2-Fluoropropene

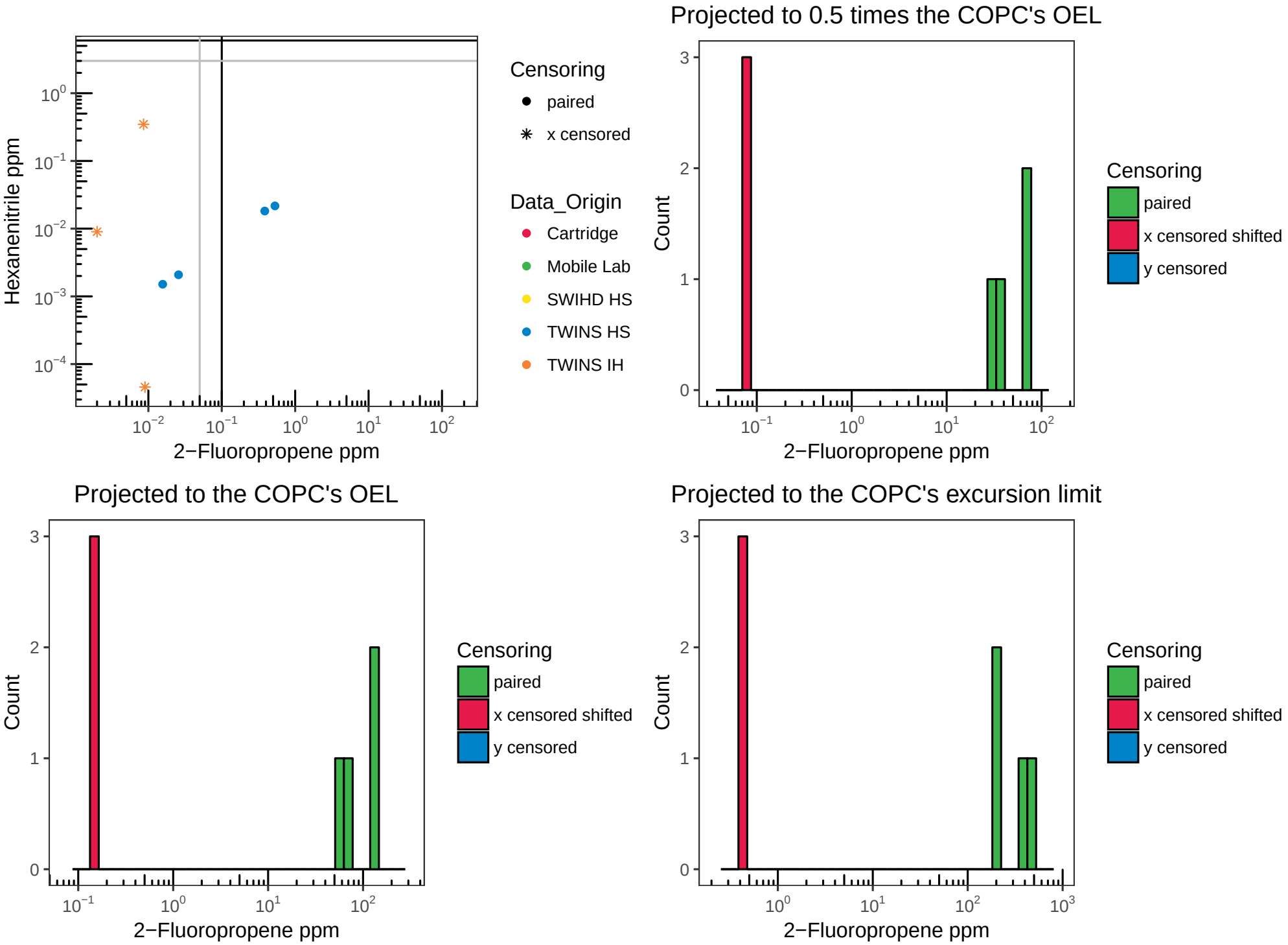


Figure C.2425: Hexanenitrile vs 2-Fluoropropene

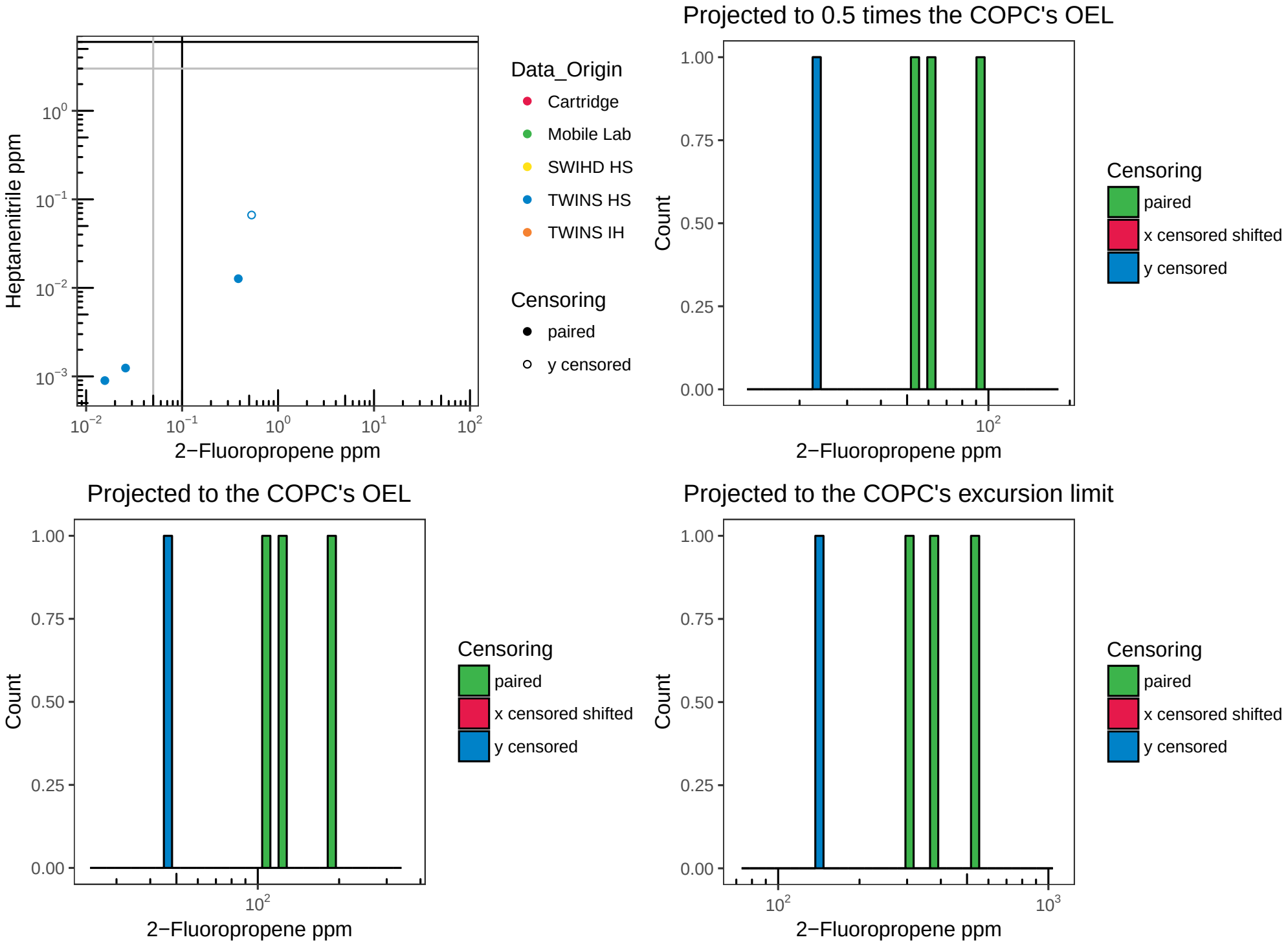


Figure C.2426: Heptanenitrile vs 2-Fluoropropene

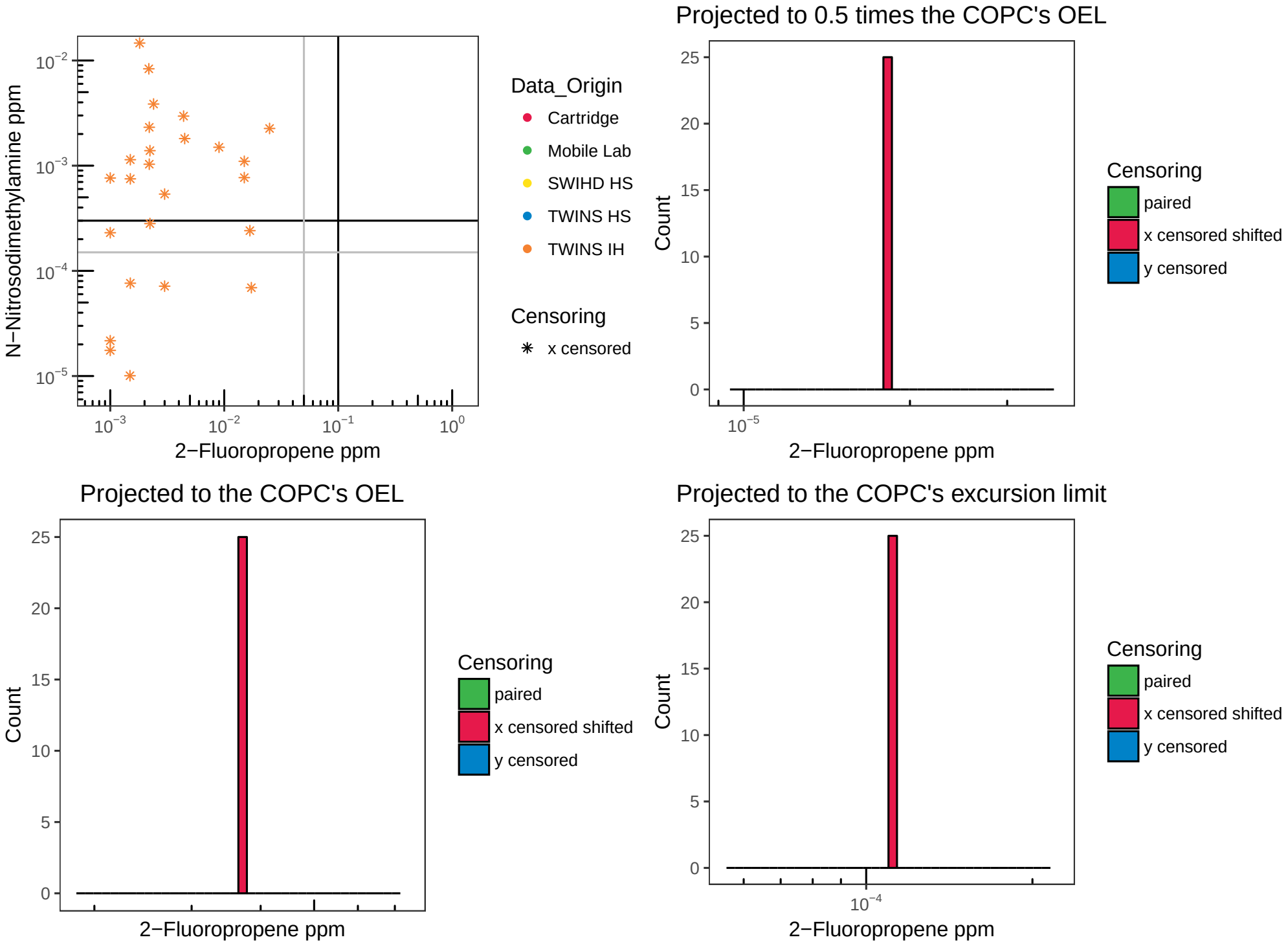


Figure C.2427: N-Nitrosodimethylamine vs 2-Fluoropropene

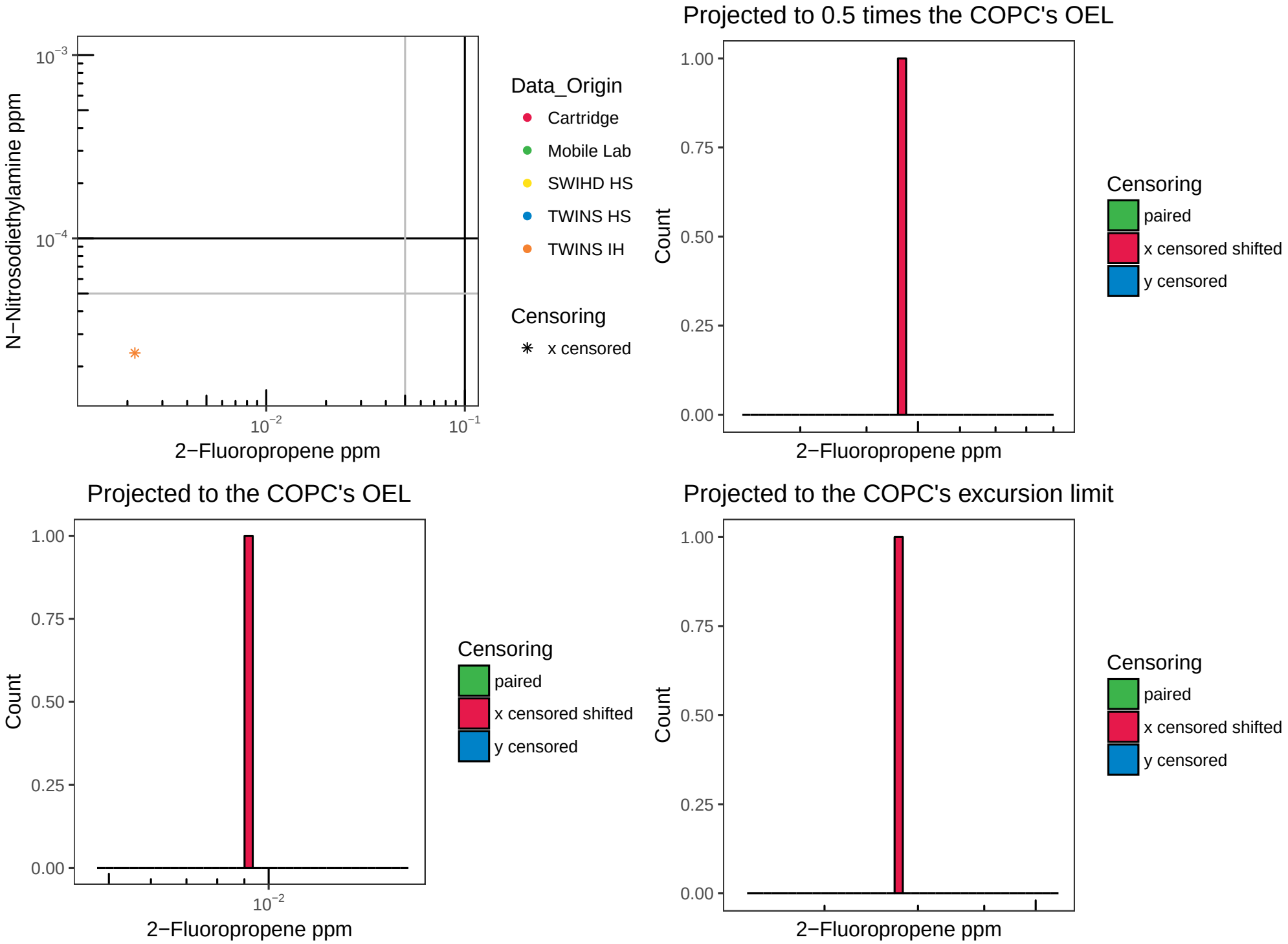


Figure C.2428: N-Nitrosodiethylamine vs 2-Fluoropropene

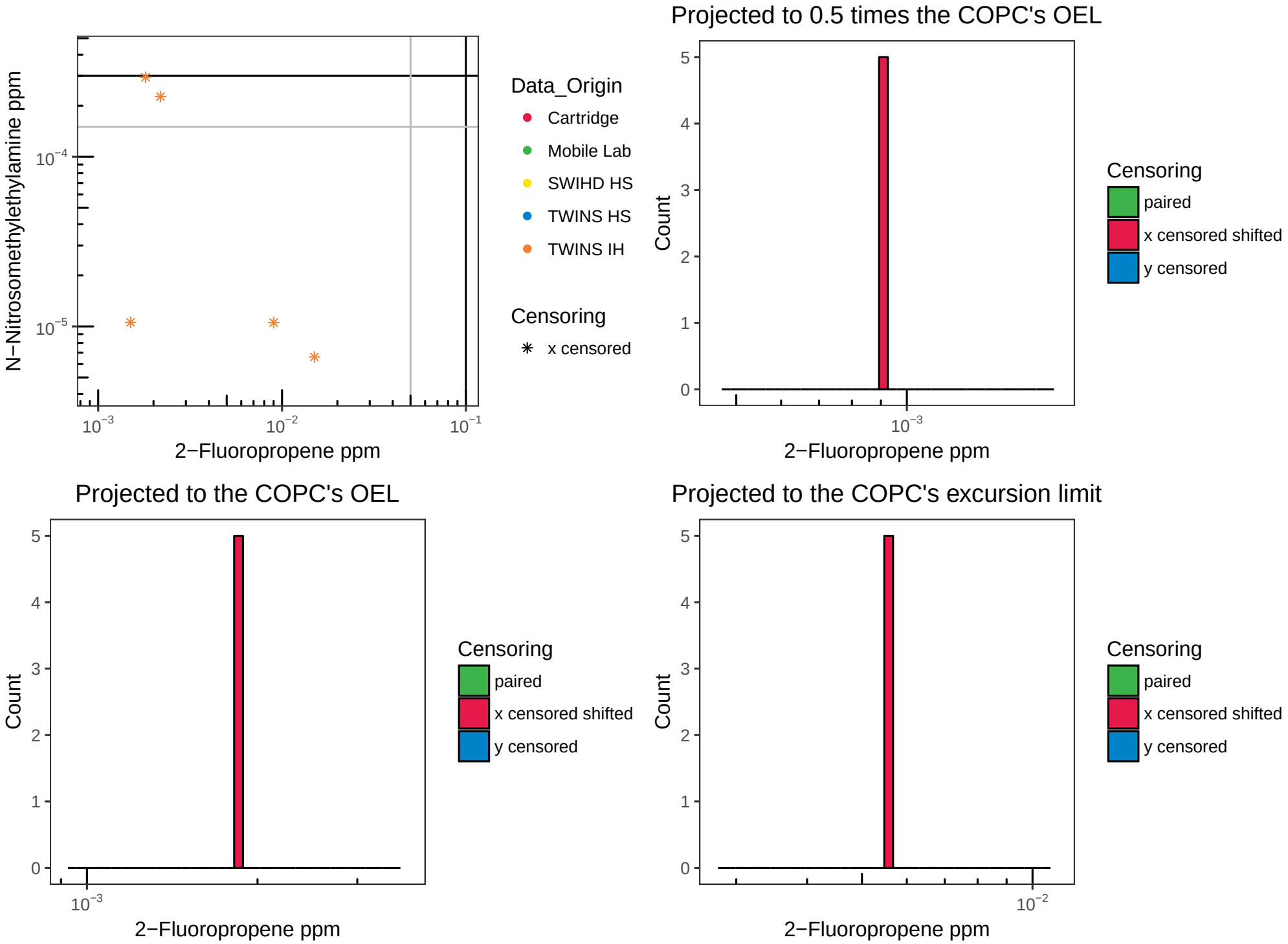


Figure C.2429: N-Nitrosomethylethylamine vs 2-Fluoropropene

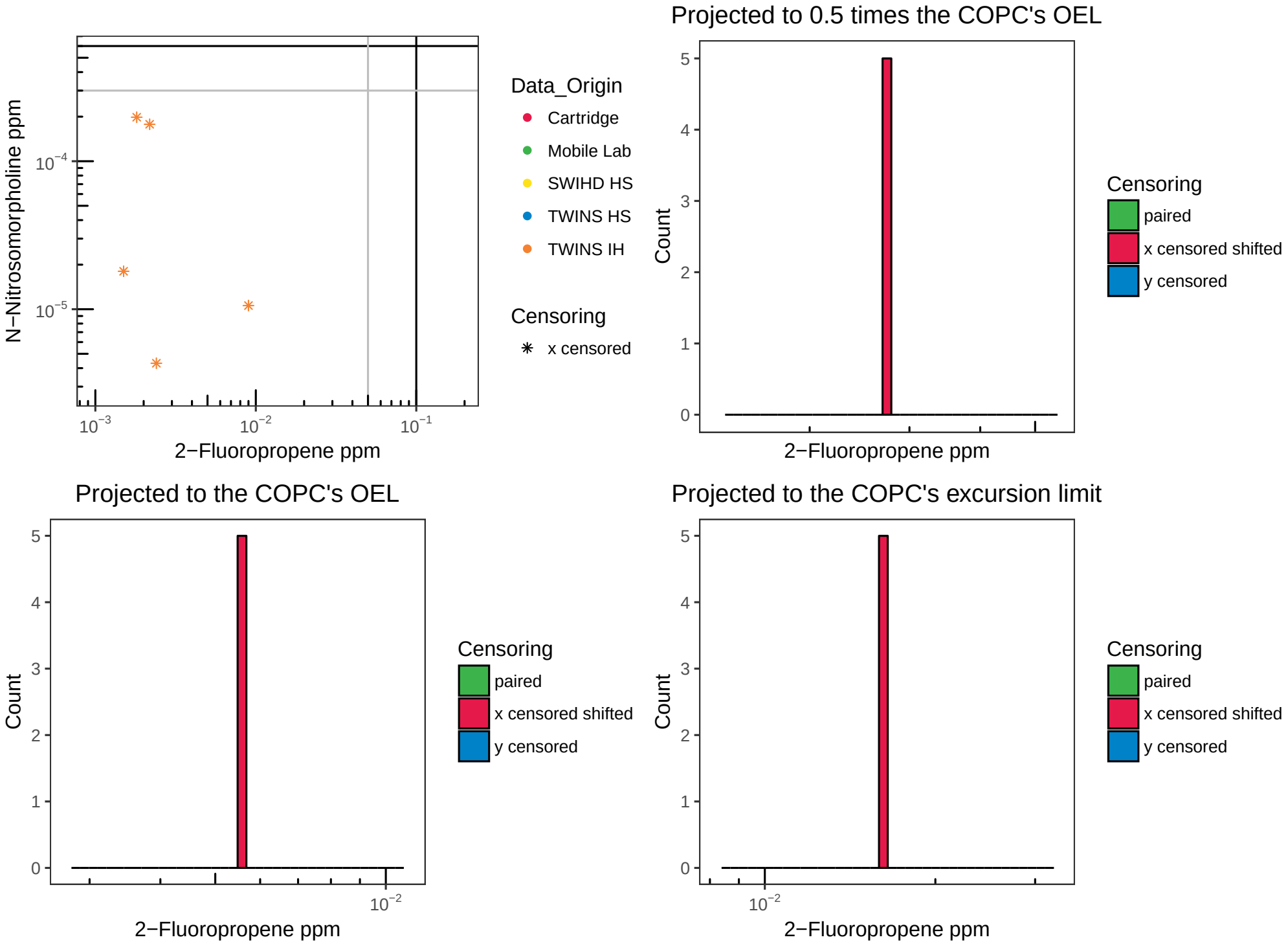


Figure C.2430: N-Nitrosomorpholine vs 2-Fluoropropene

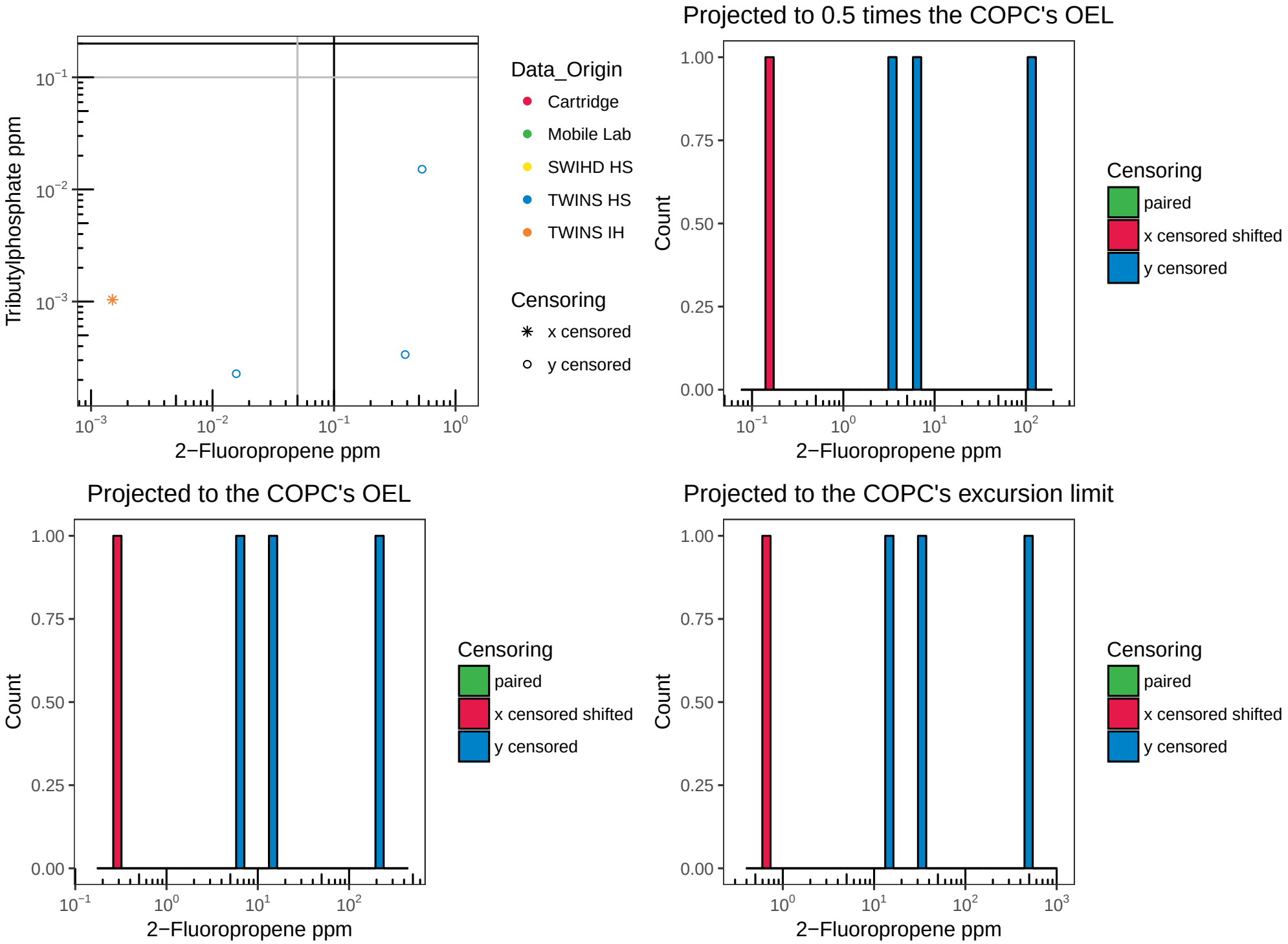


Figure C.2431: Tributylphosphate vs 2-Fluoropropene

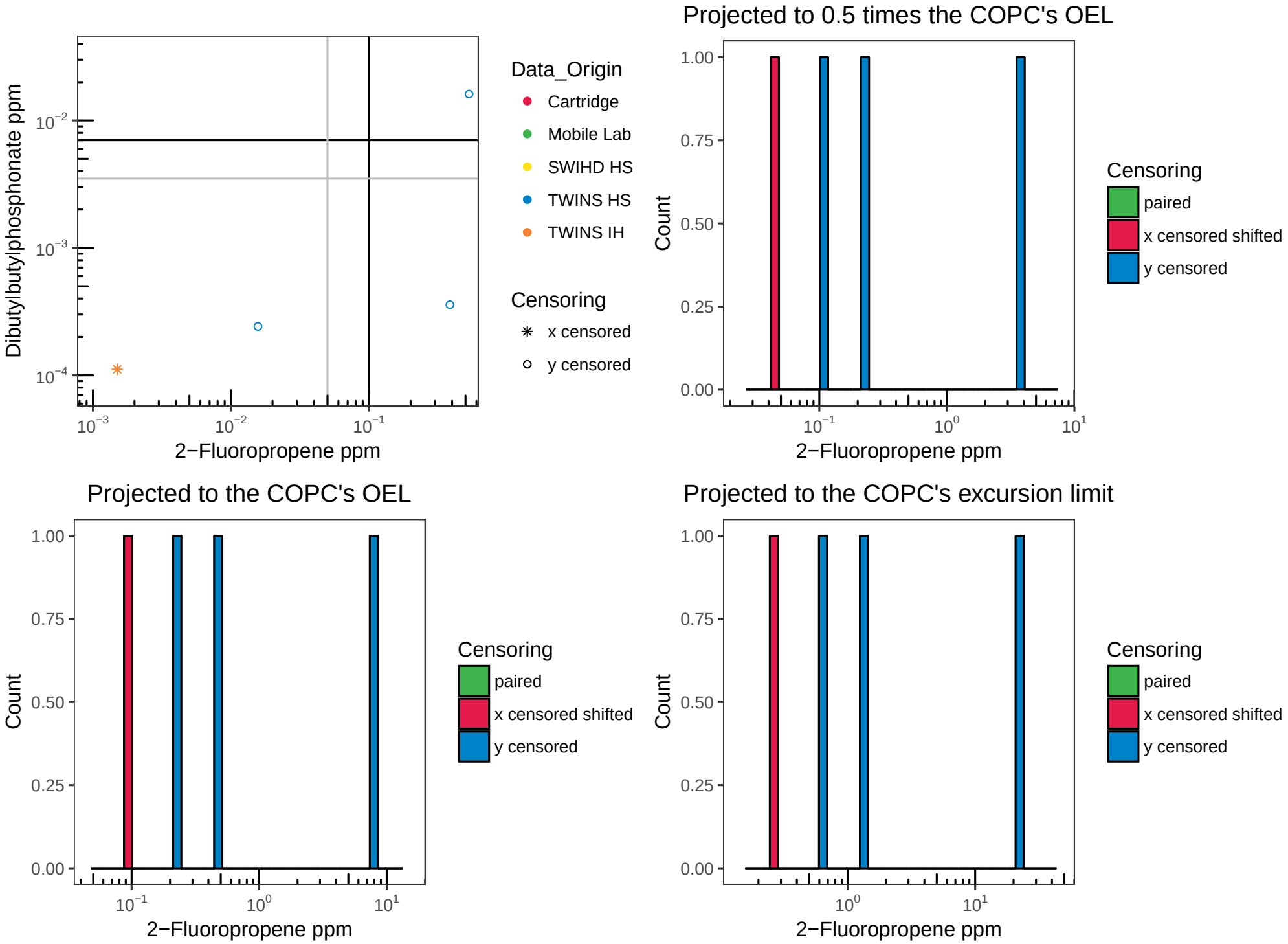


Figure C.2432: Dibutylbutylphosphonate vs 2-Fluoropropene

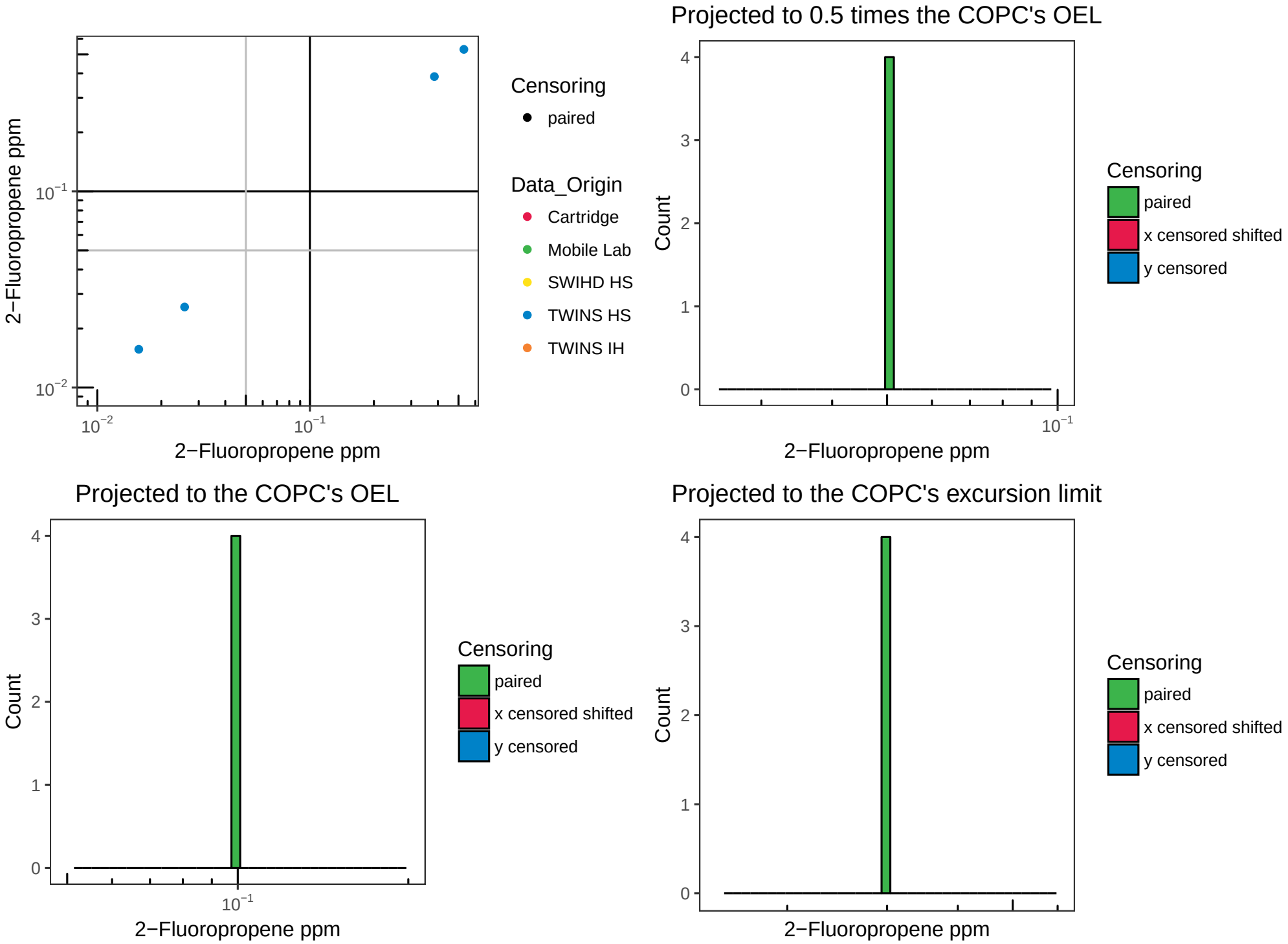


Figure C.2433: 2-Fluoropropene vs 2-Fluoropropene

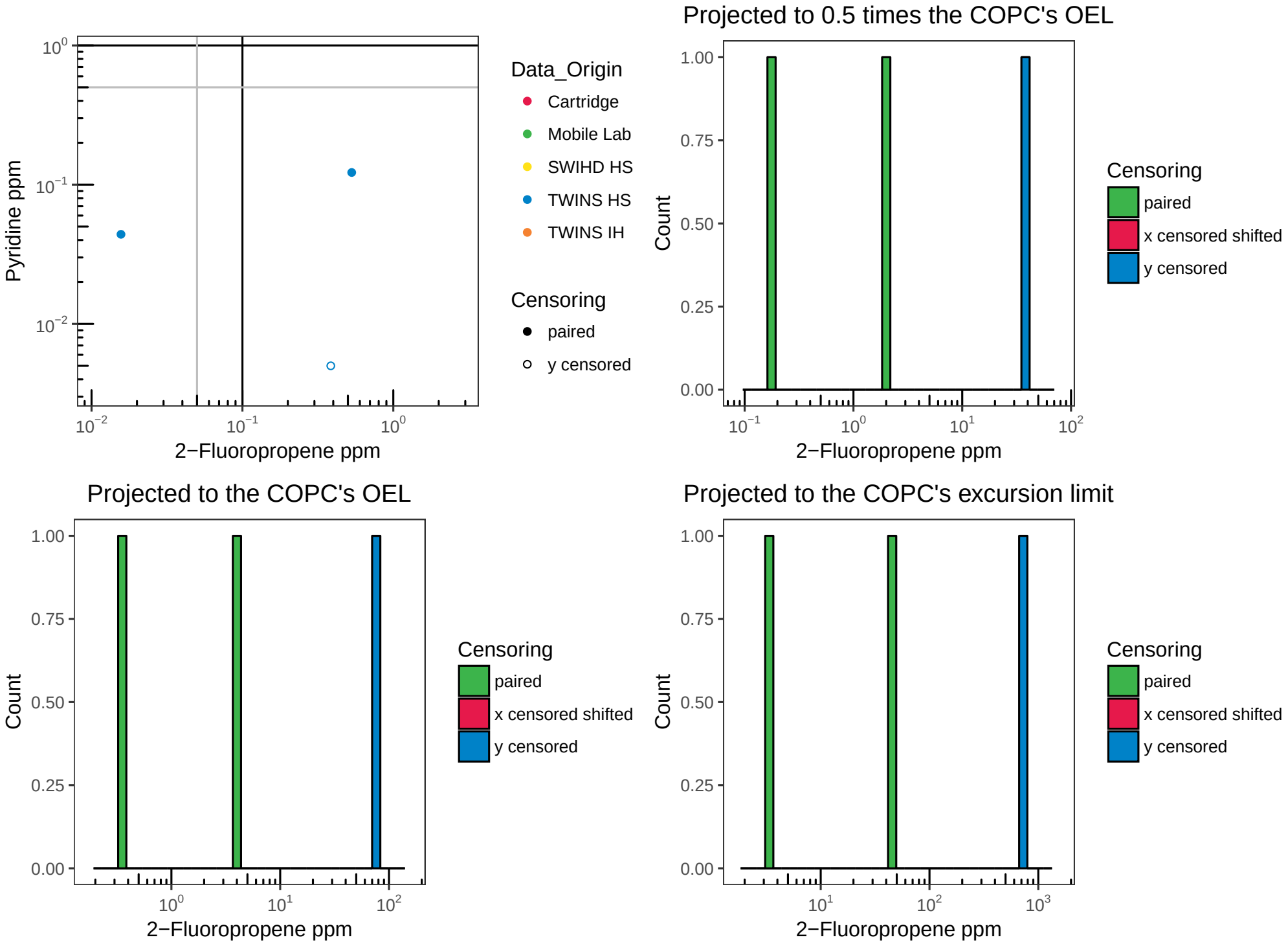


Figure C.2434: Pyridine vs 2-Fluoropropene

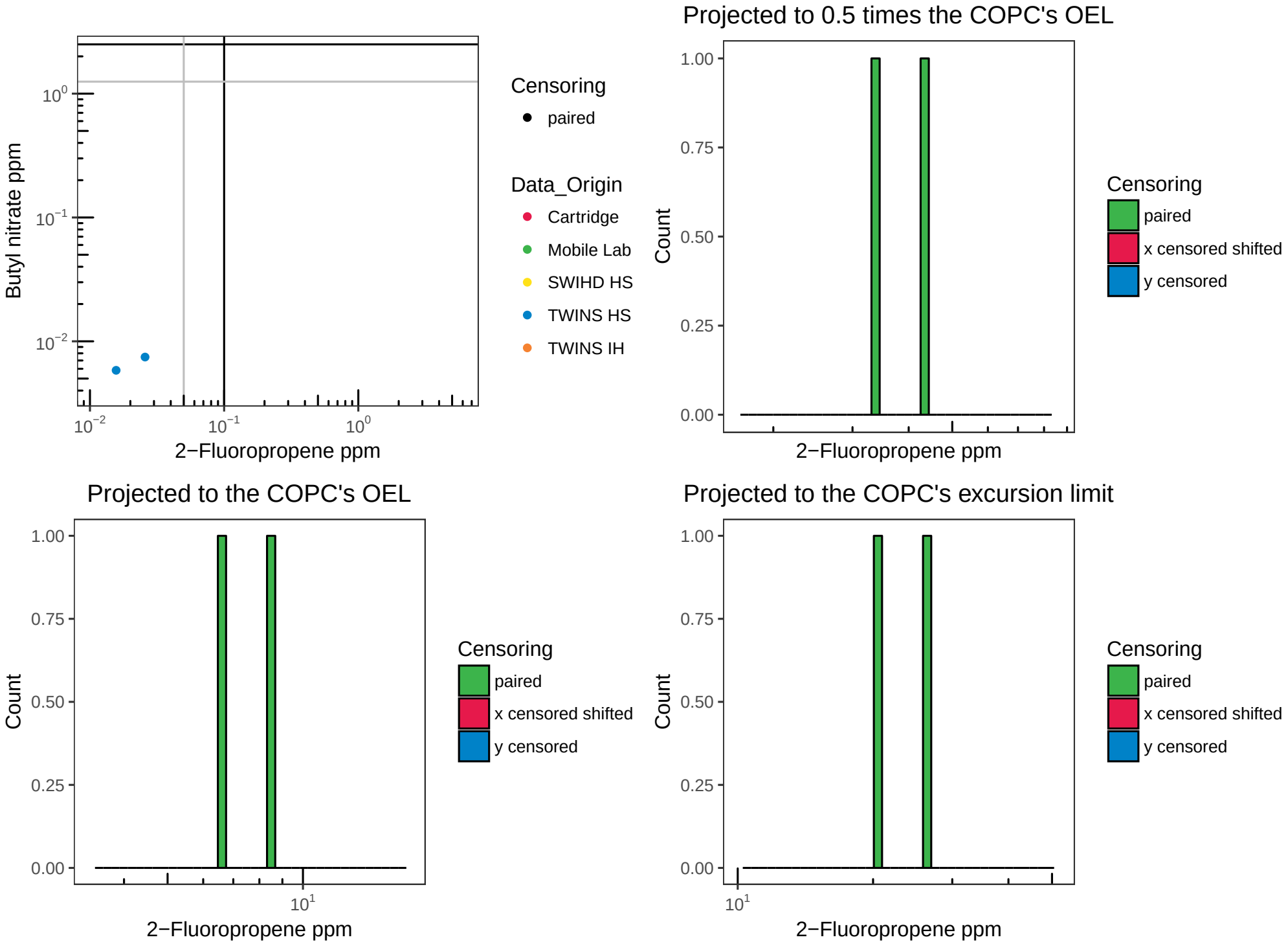


Figure C.2435: Butyl nitrate vs 2-Fluoropropene

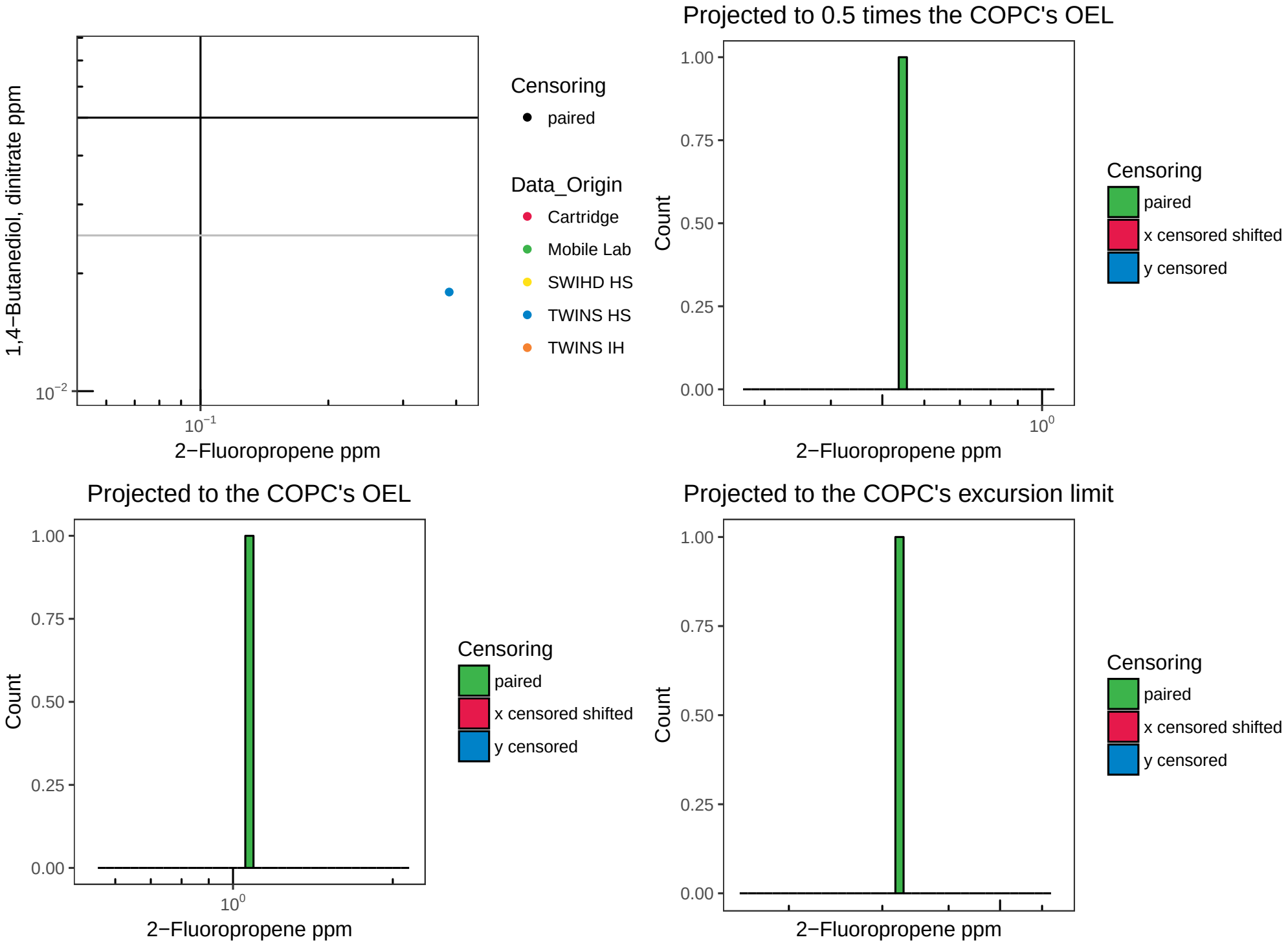


Figure C.2436: 1,4-Butanediol, dinitrate vs 2-Fluoropropene

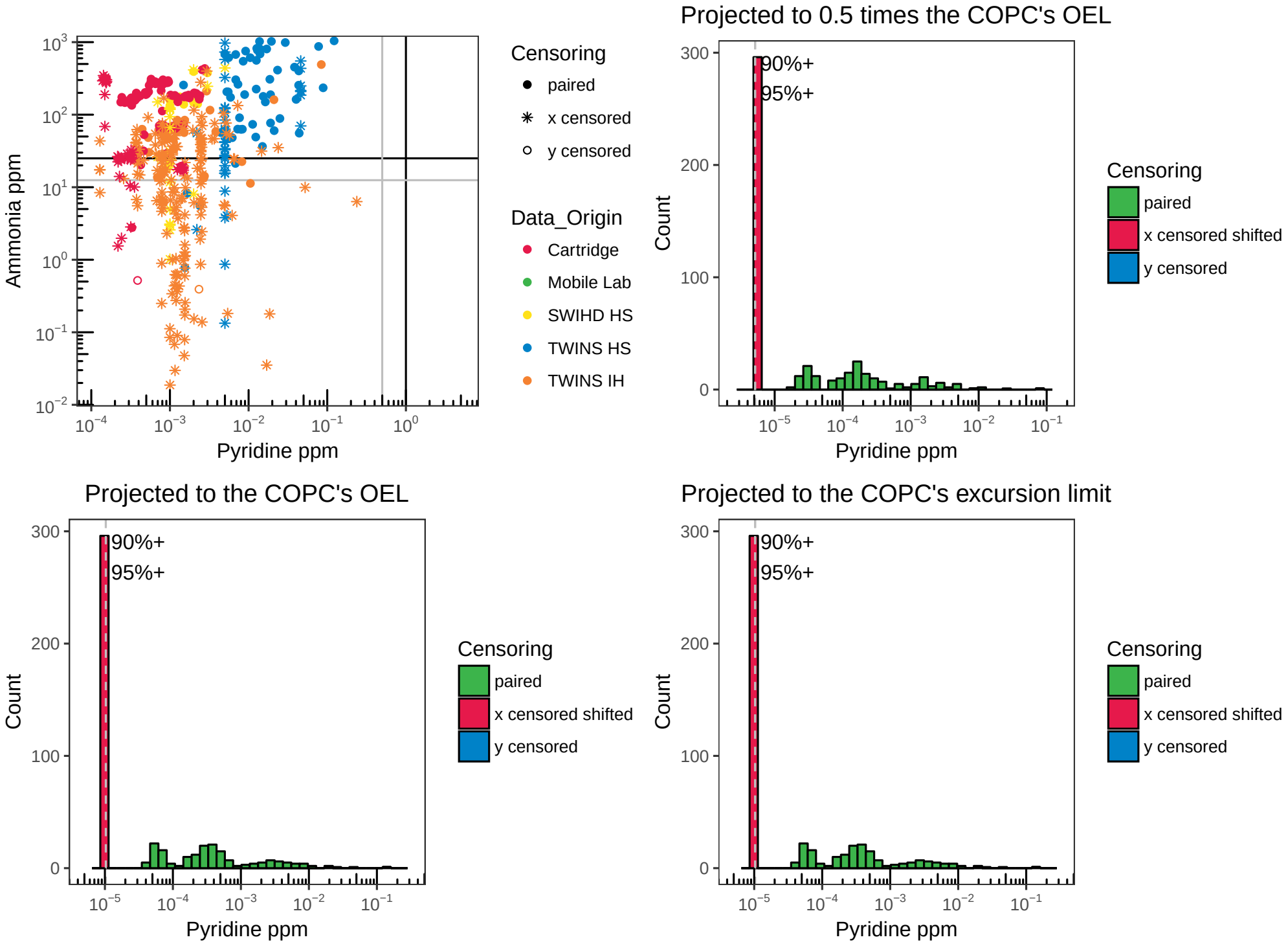


Figure C.2437: Ammonia vs Pyridine

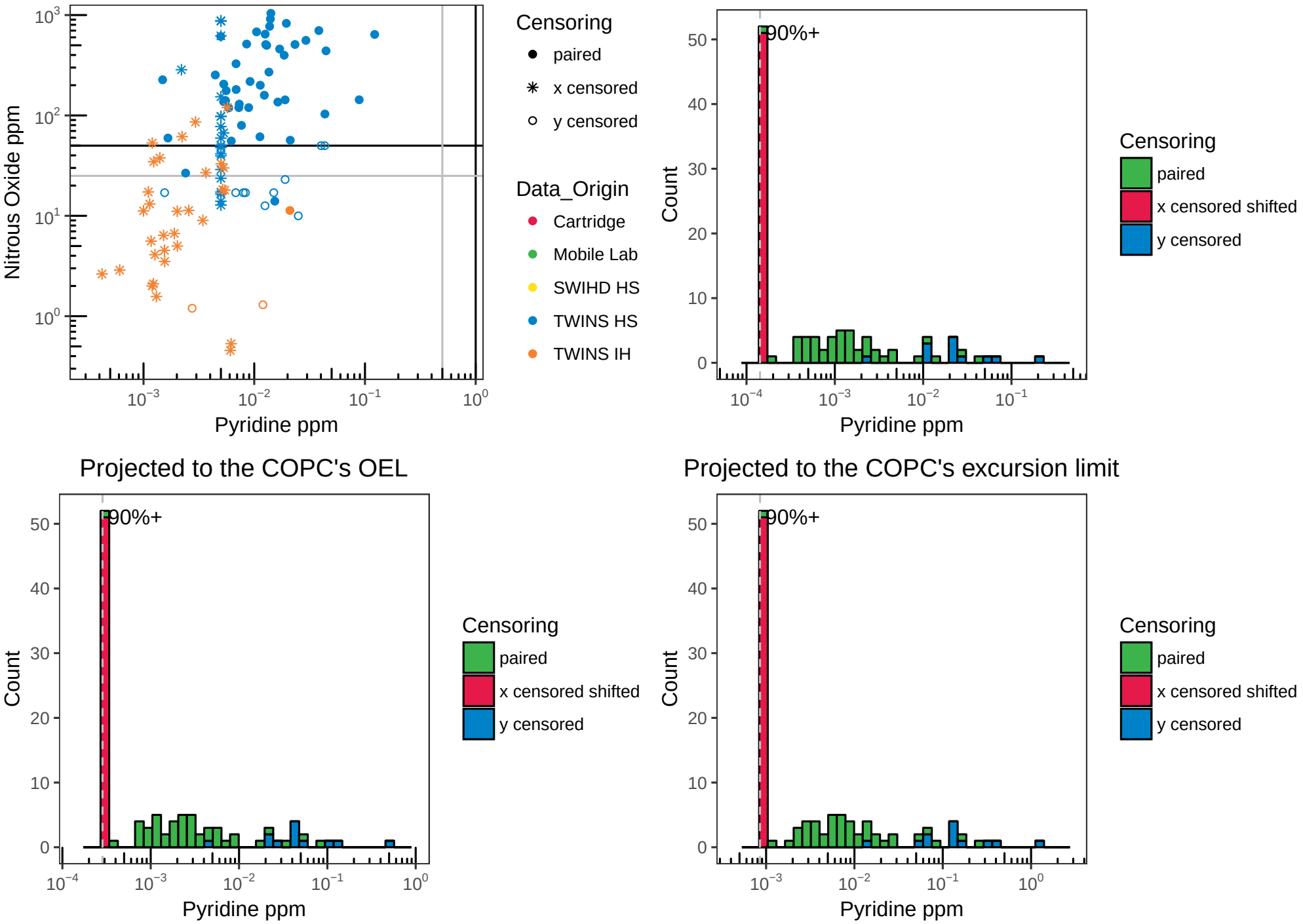


Figure C.2438: Nitrous Oxide vs Pyridine

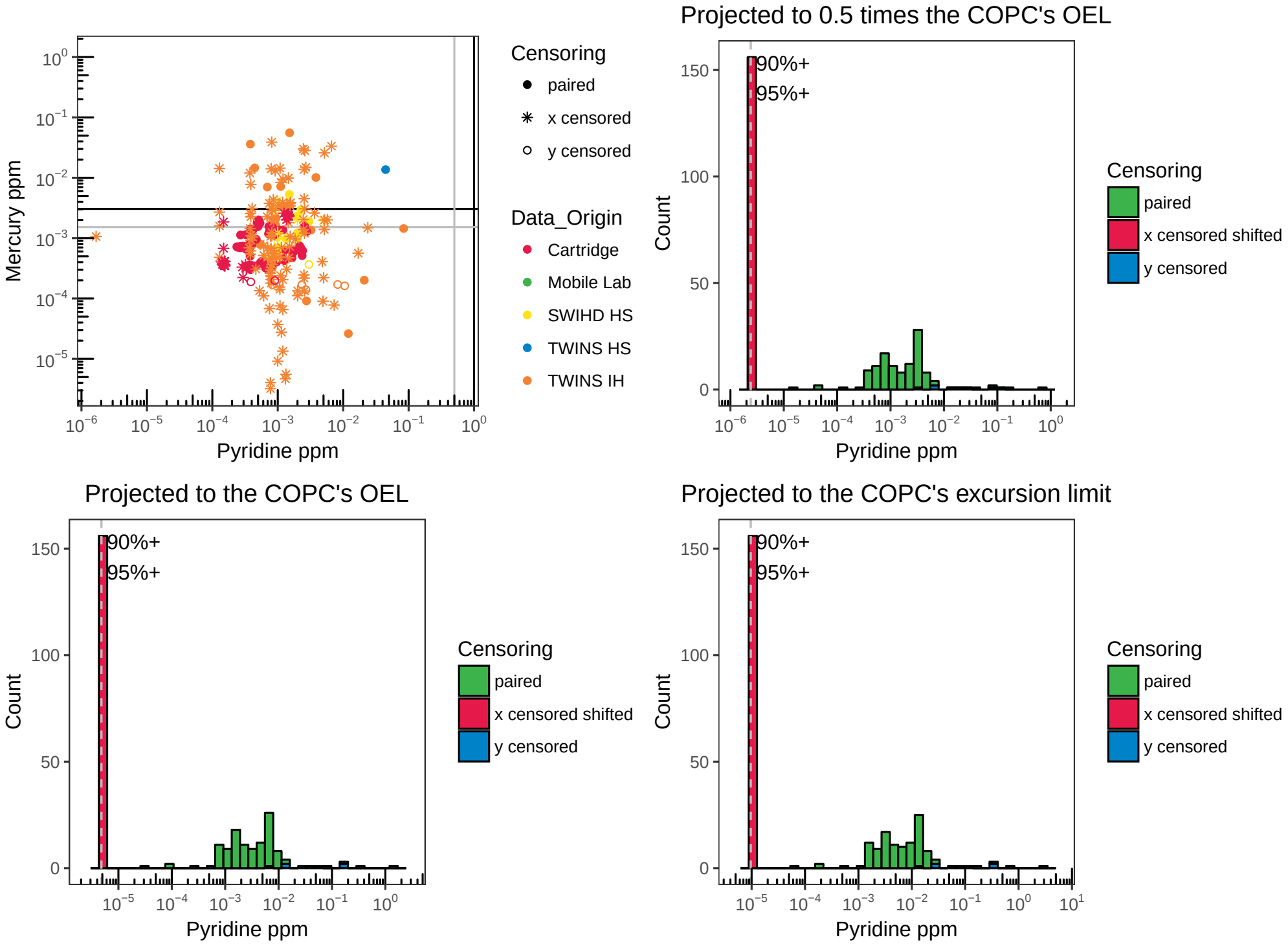


Figure C.2439: Mercury vs Pyridine

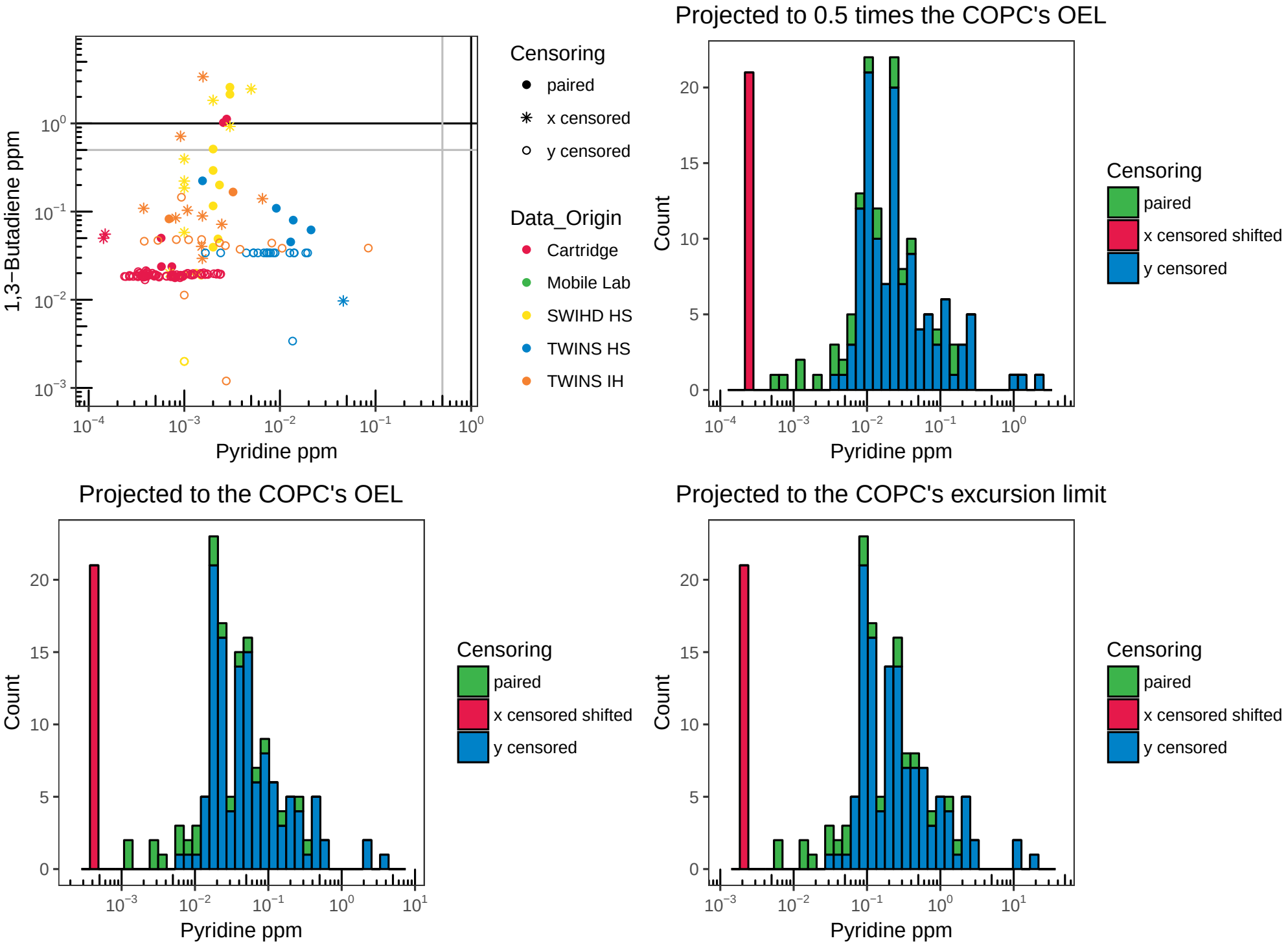


Figure C.2440: 1,3-Butadiene vs Pyridine

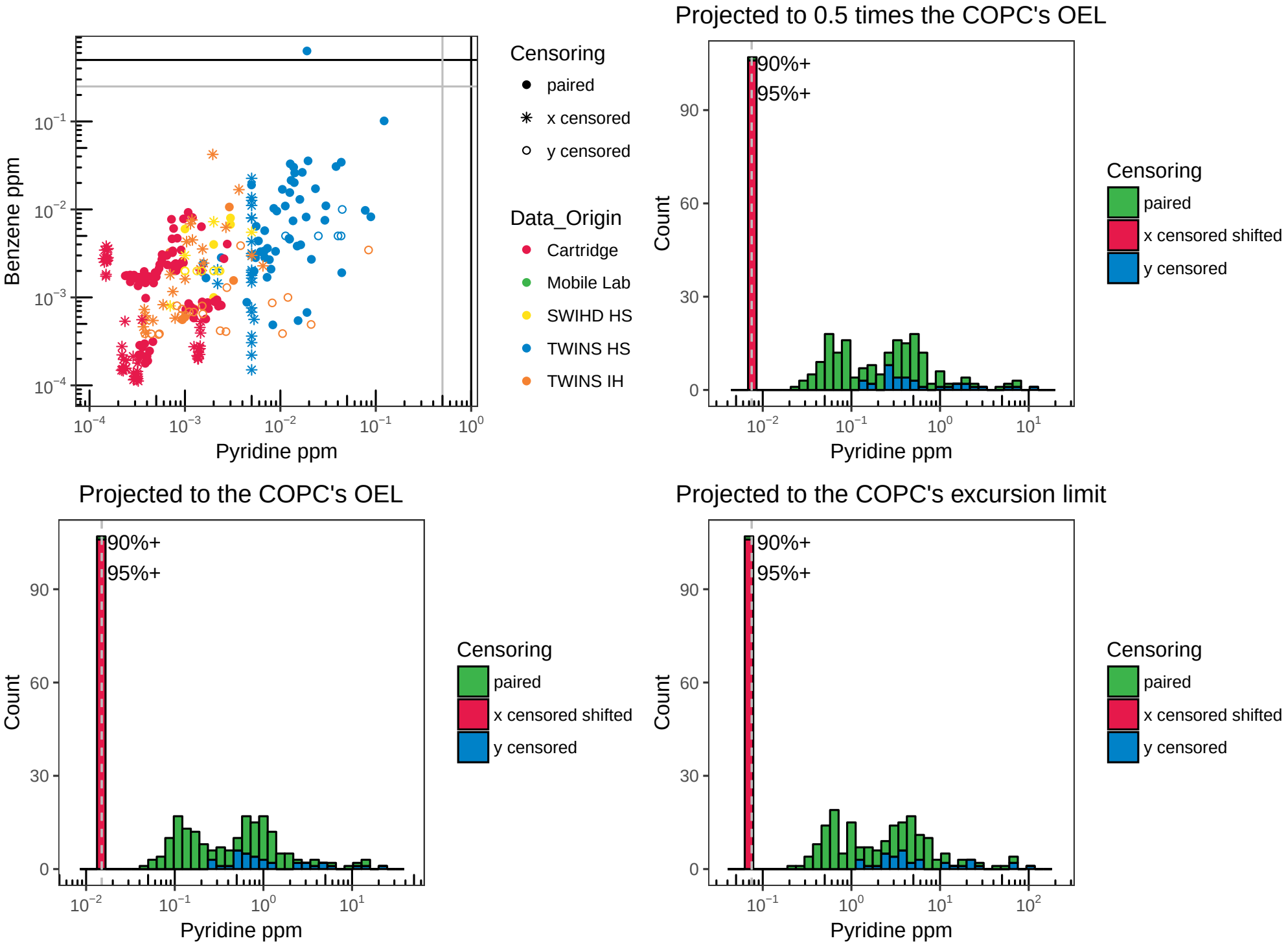


Figure C.2441: Benzene vs Pyridine

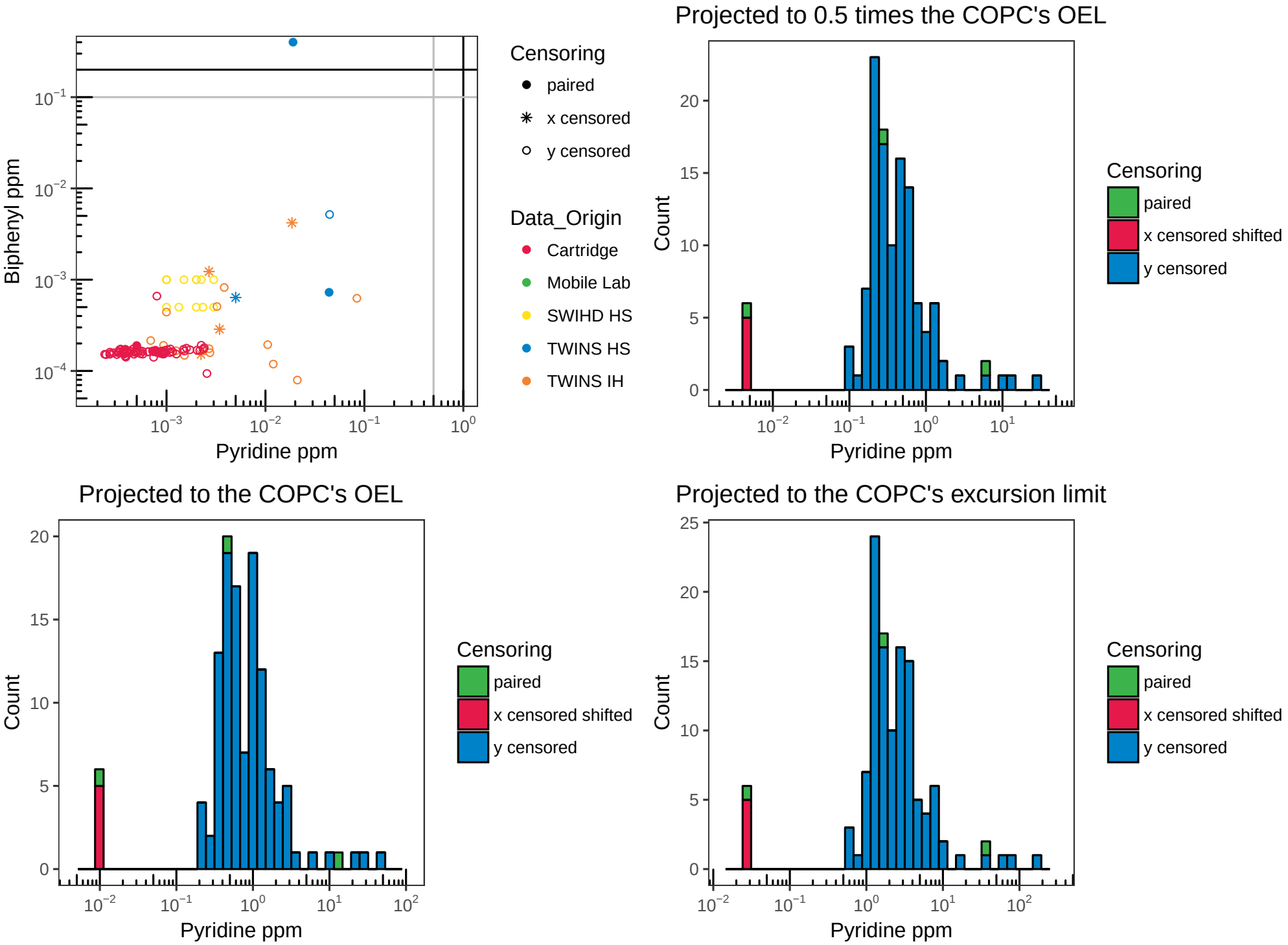


Figure C.2442: Biphenyl vs Pyridine

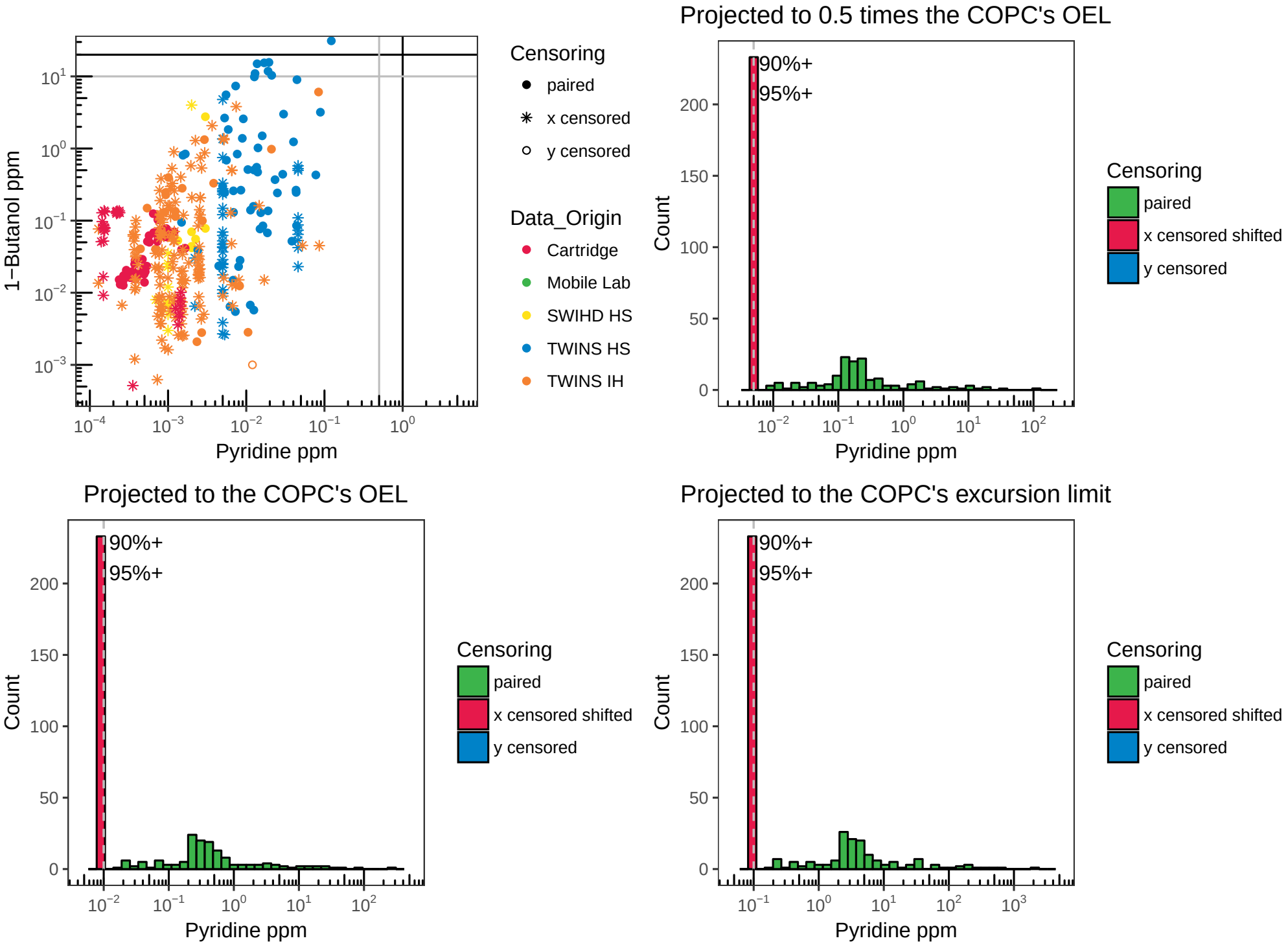


Figure C.2443: 1-Butanol vs Pyridine

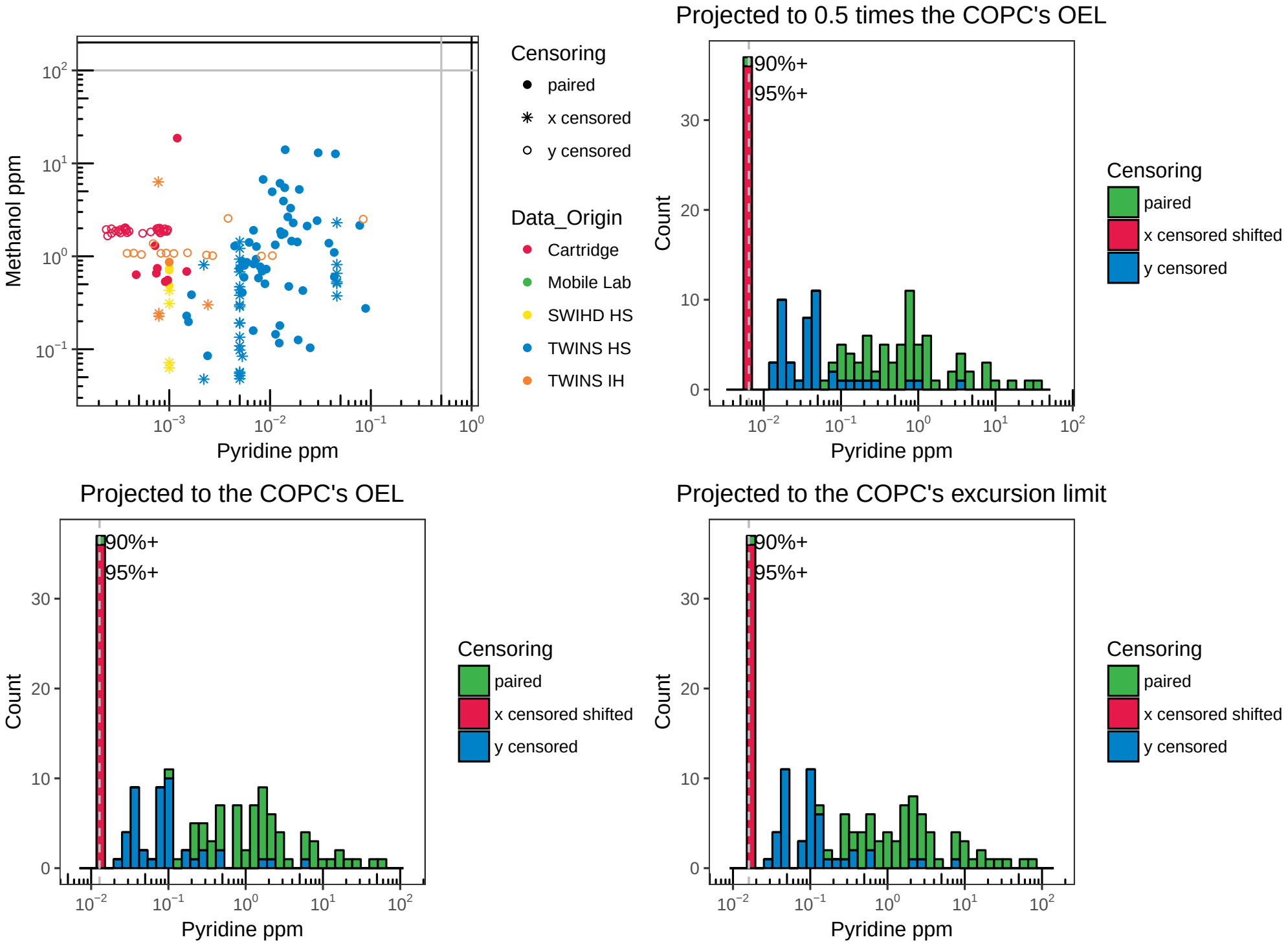


Figure C.2444: Methanol vs Pyridine

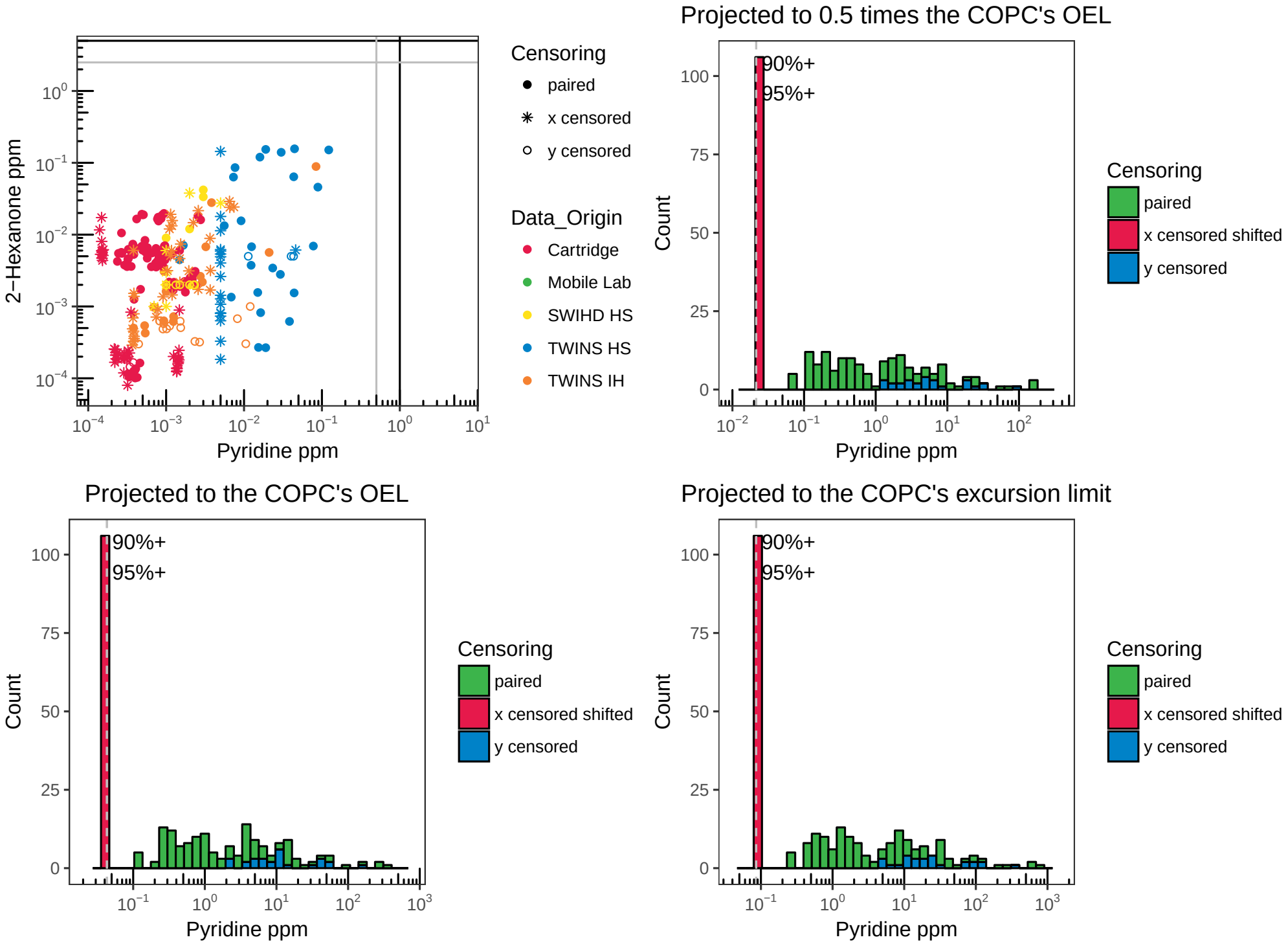


Figure C.2445: 2-Hexanone vs Pyridine

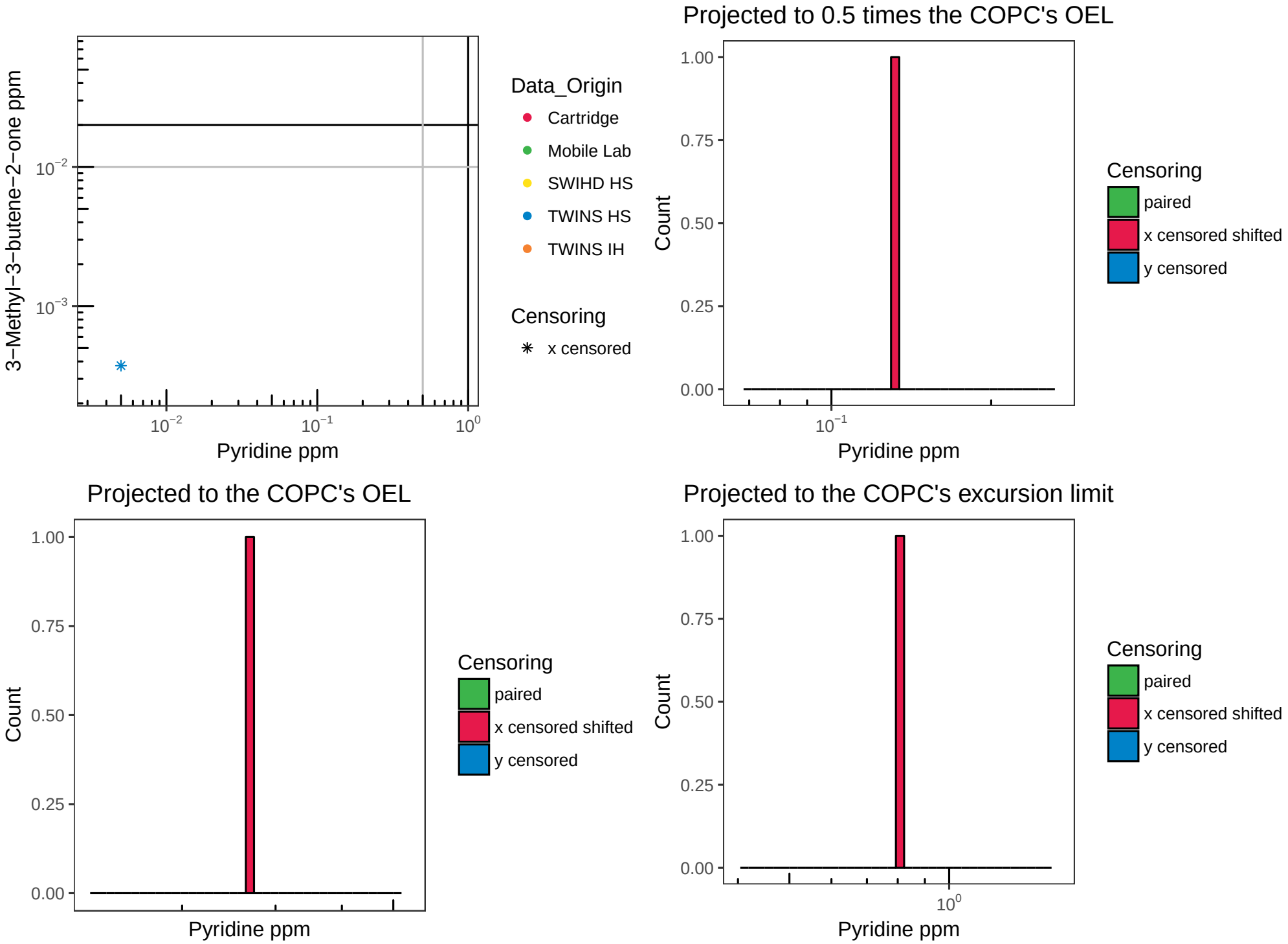


Figure C.2446: 3-Methyl-3-butene-2-one vs Pyridine

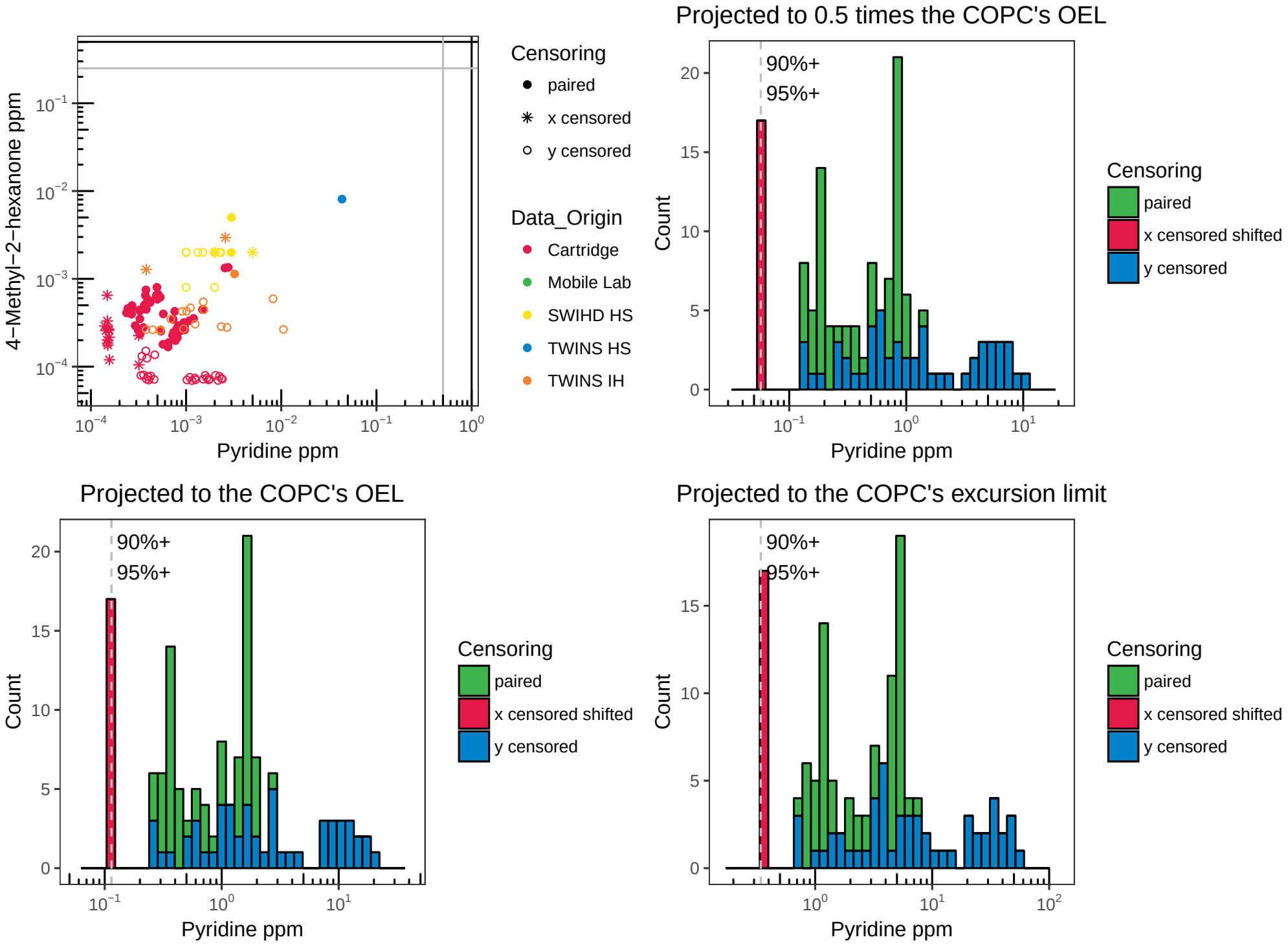


Figure C.2447: 4-Methyl-2-hexanone vs Pyridine

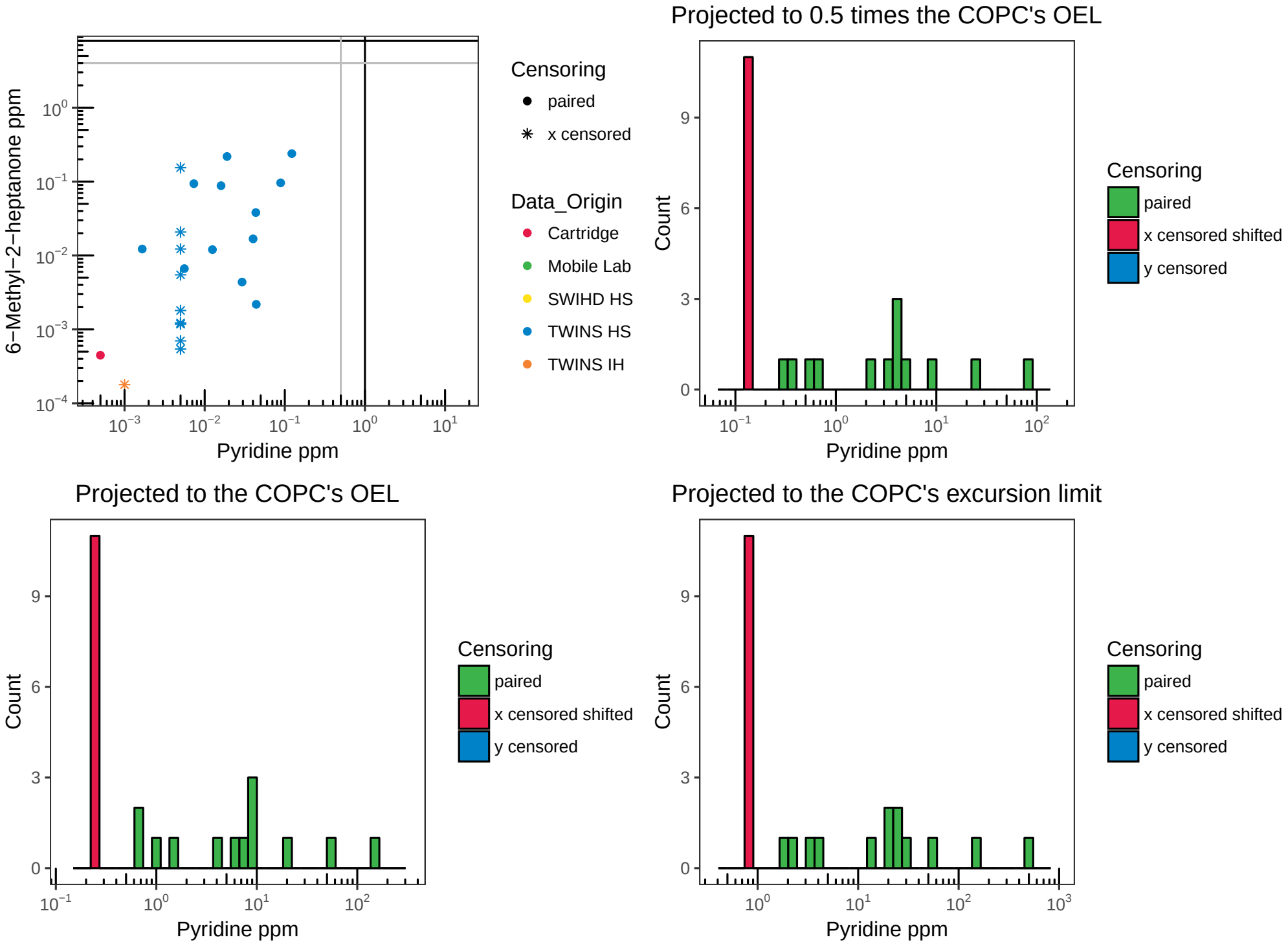


Figure C.2448: 6-Methyl-2-heptanone vs Pyridine

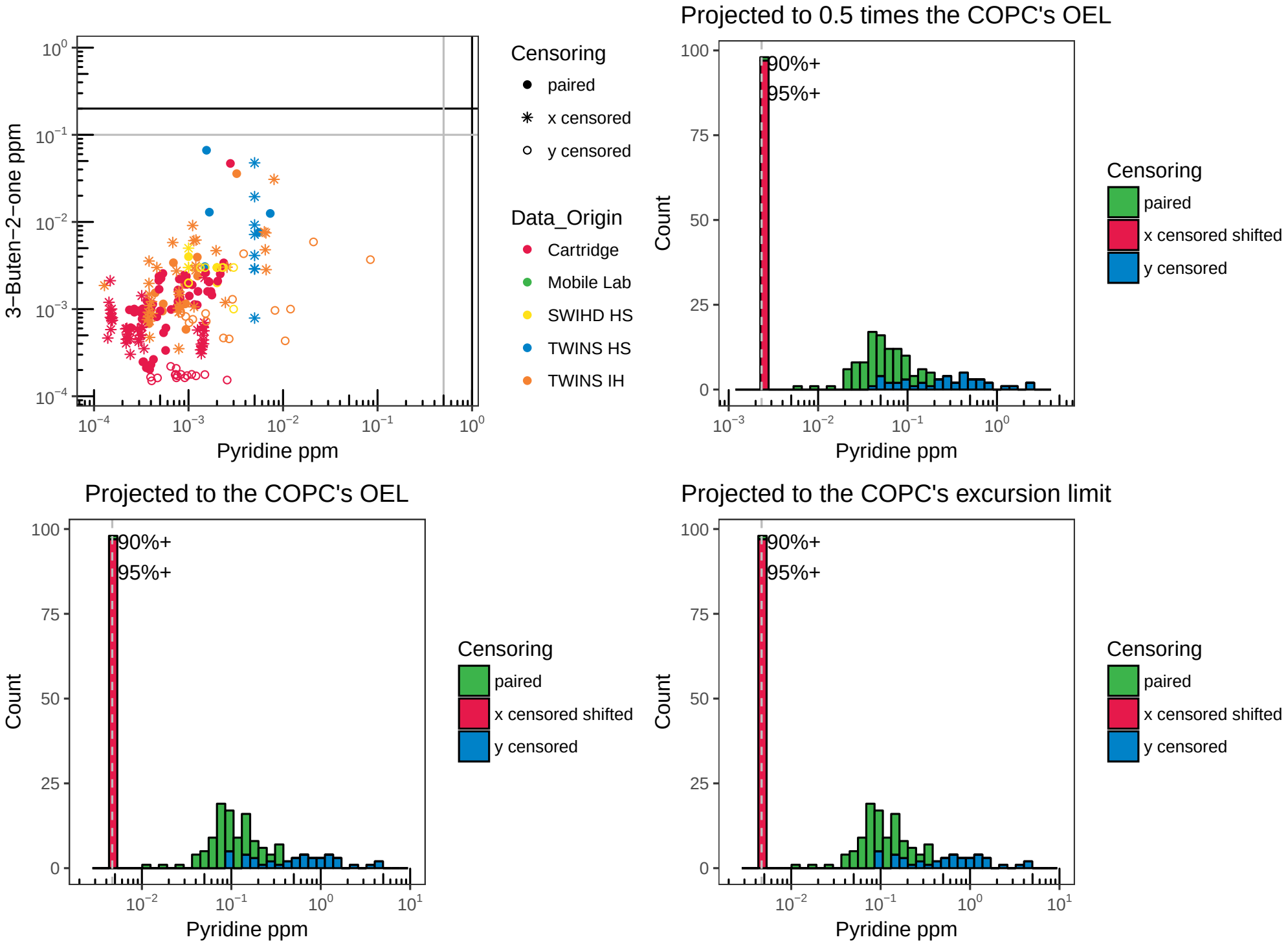


Figure C.2449: 3-Buten-2-one vs Pyridine

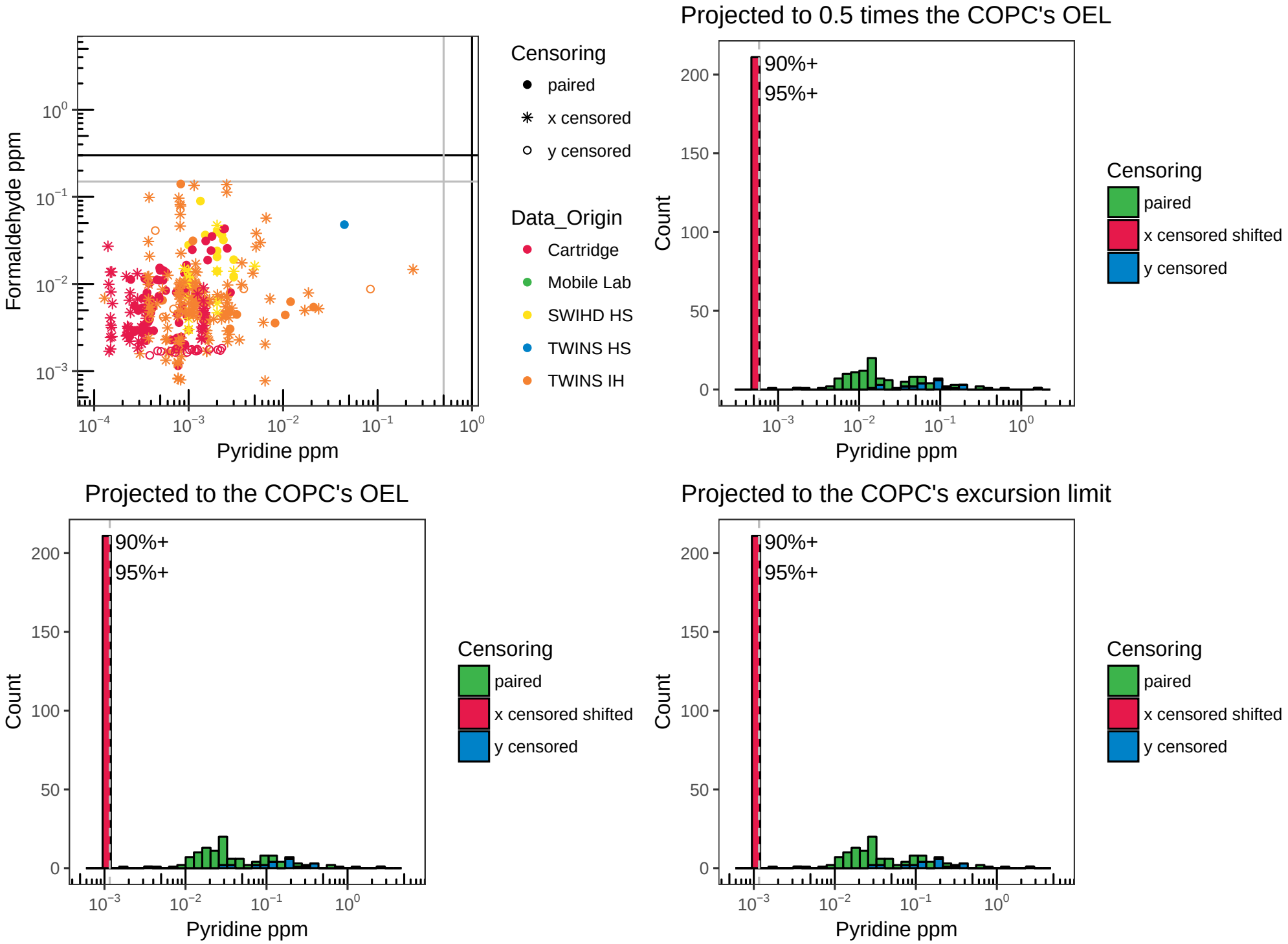


Figure C.2450: Formaldehyde vs Pyridine

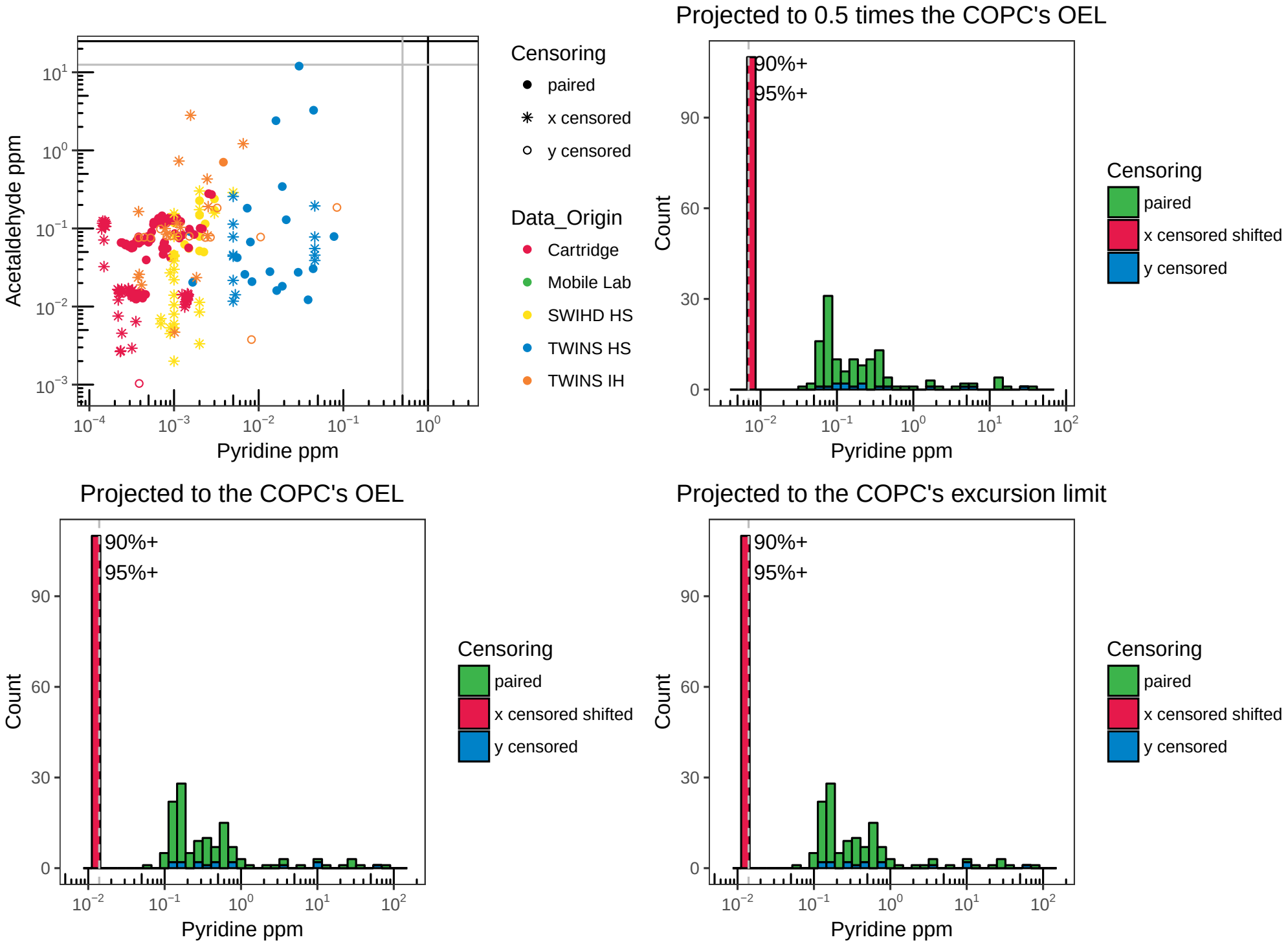


Figure C.2451: Acetaldehyde vs Pyridine

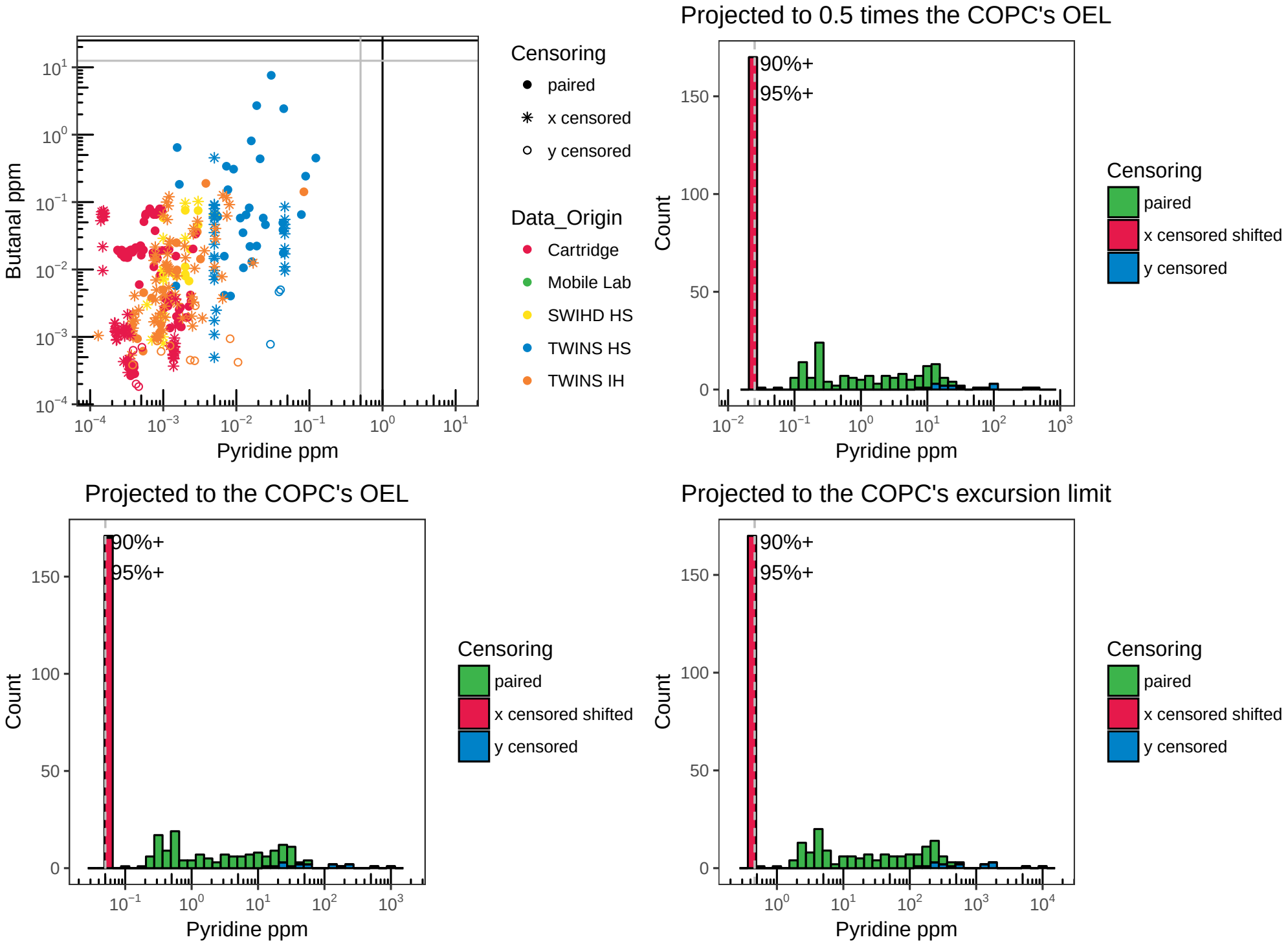


Figure C.2452: Butanal vs Pyridine

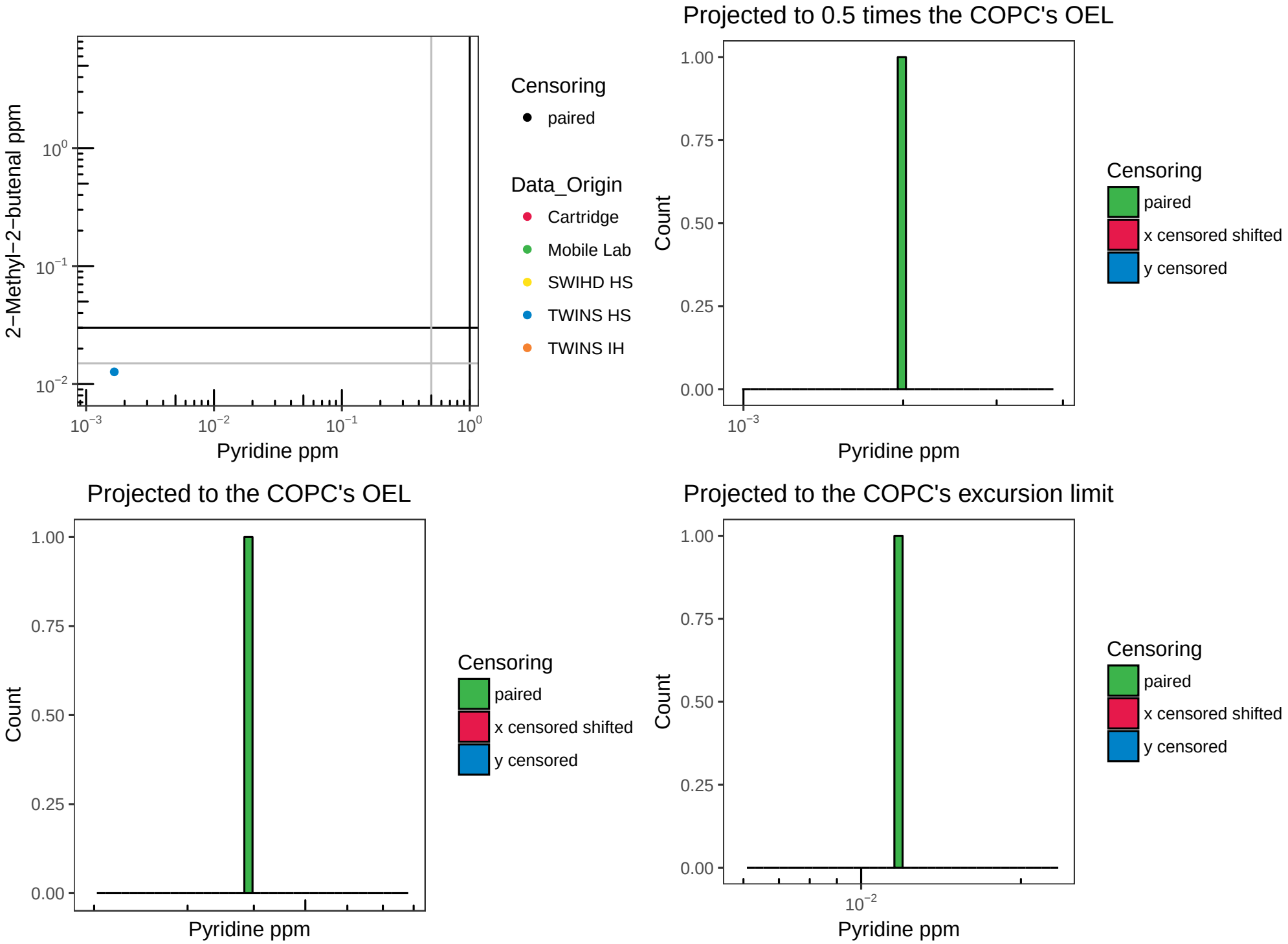


Figure C.2453: 2-Methyl-2-butenal vs Pyridine

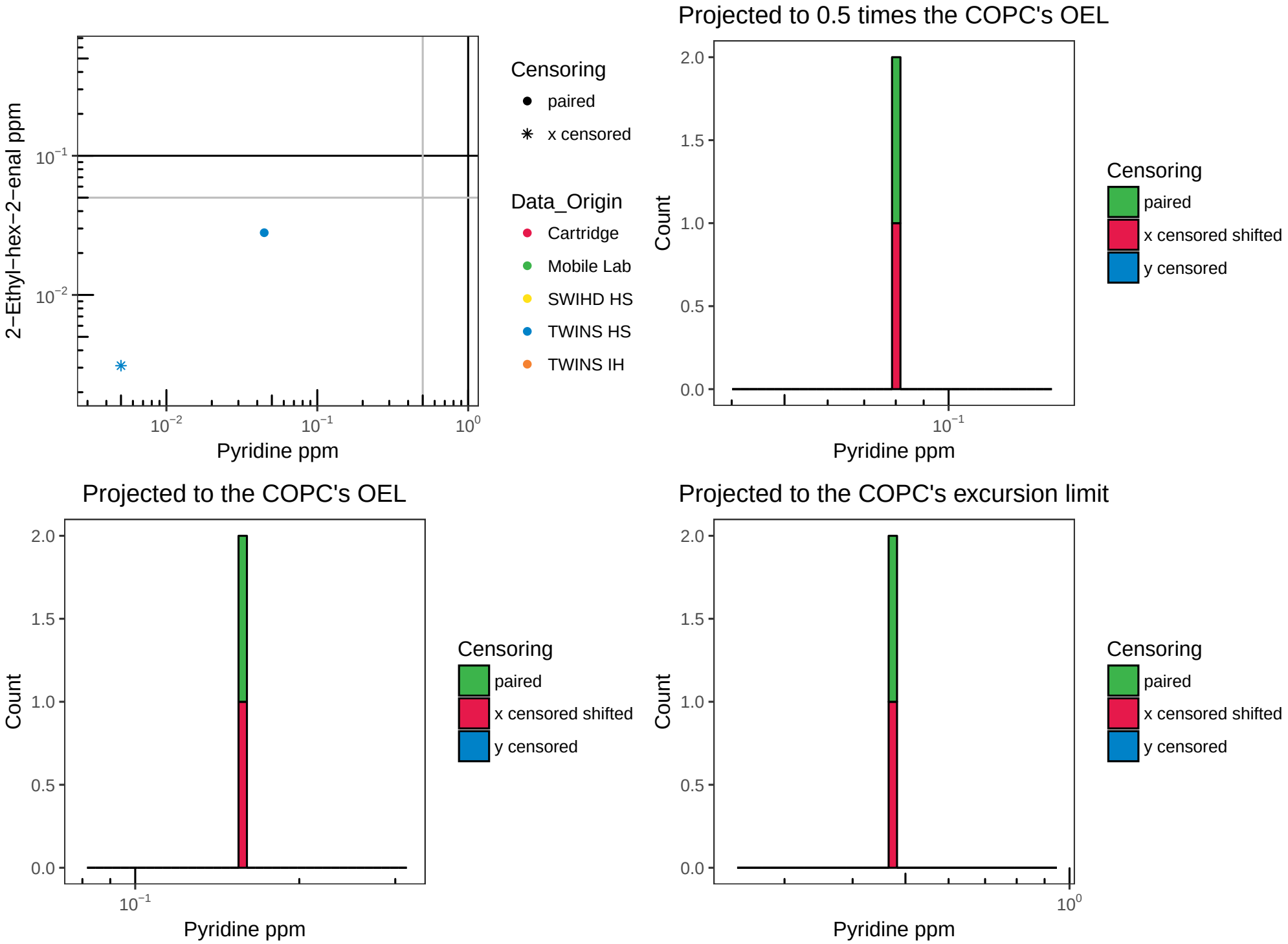


Figure C.2454: 2-Ethyl-hex-2-enal vs Pyridine

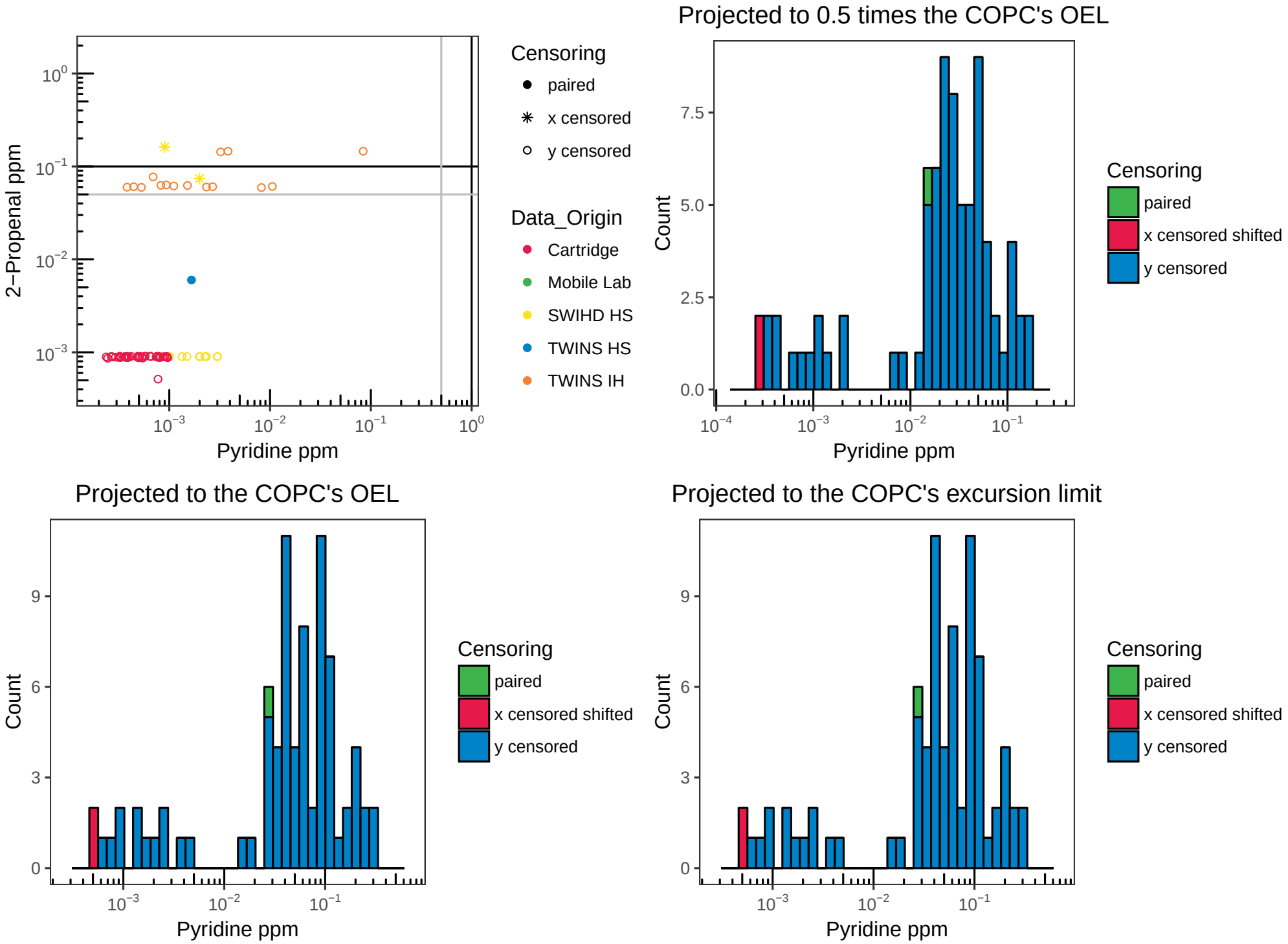


Figure C.2455: 2-Propenal vs Pyridine

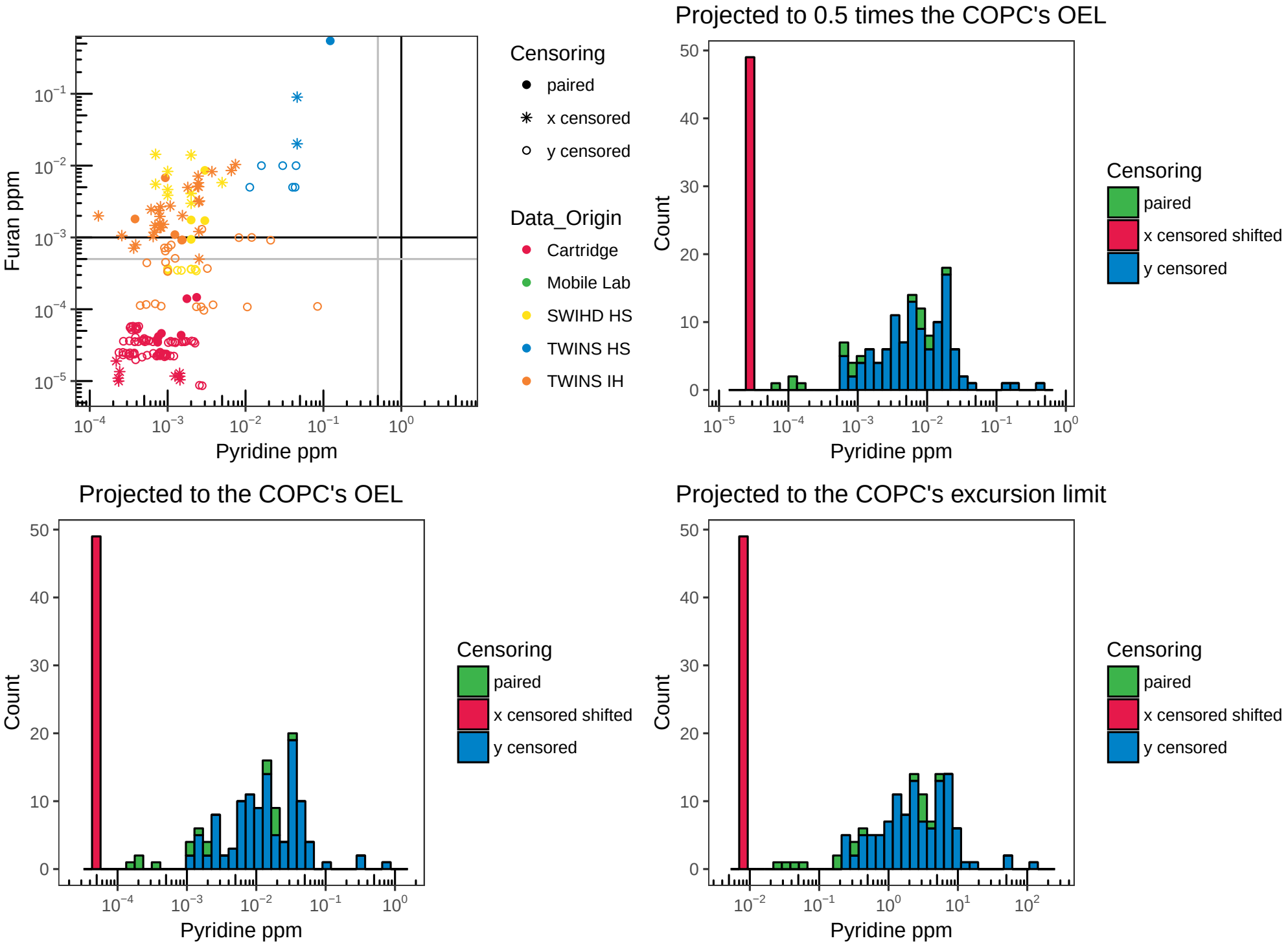


Figure C.2456: Furan vs Pyridine

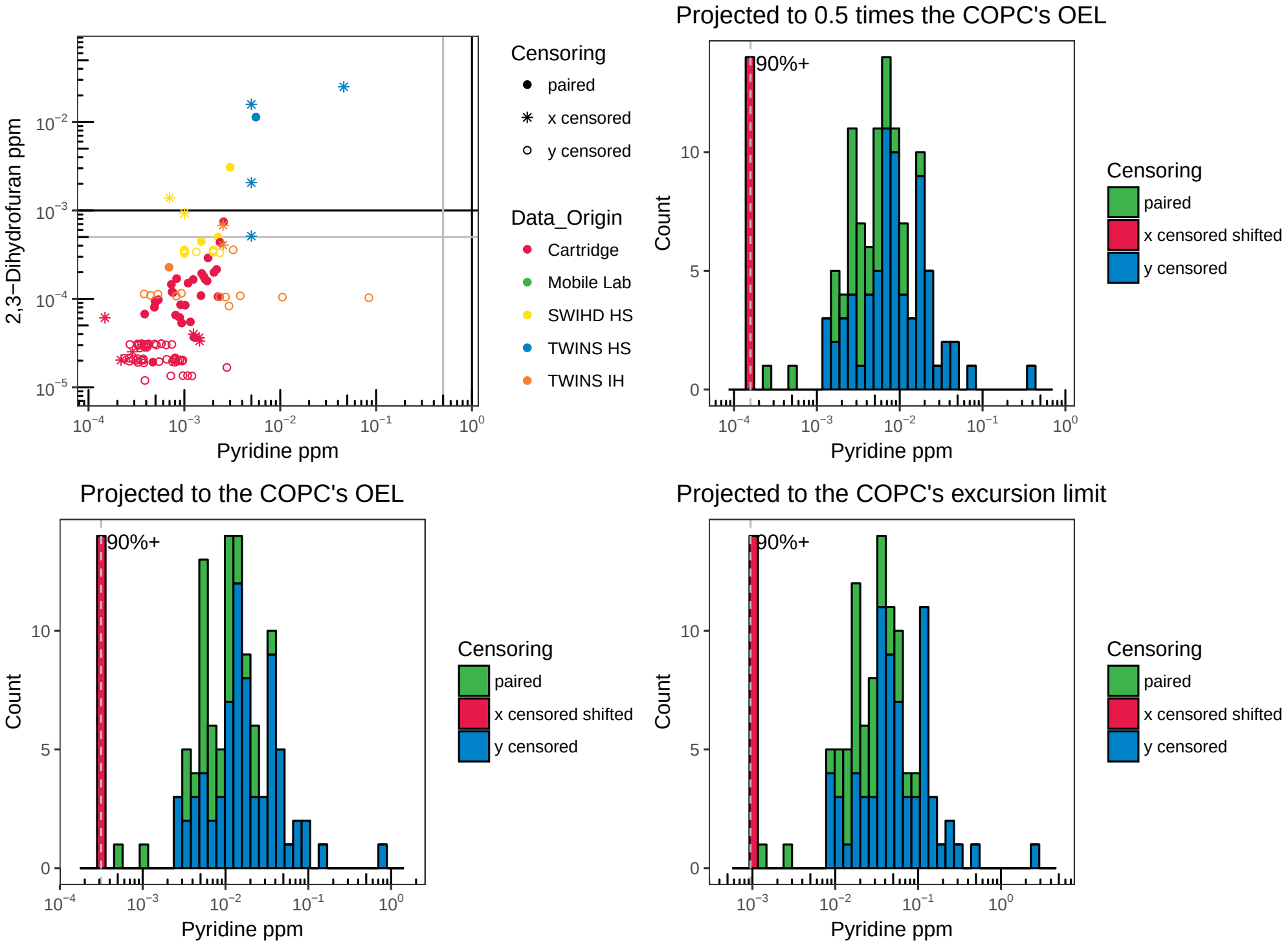


Figure C.2457: 2,3-Dihydrofuran vs Pyridine

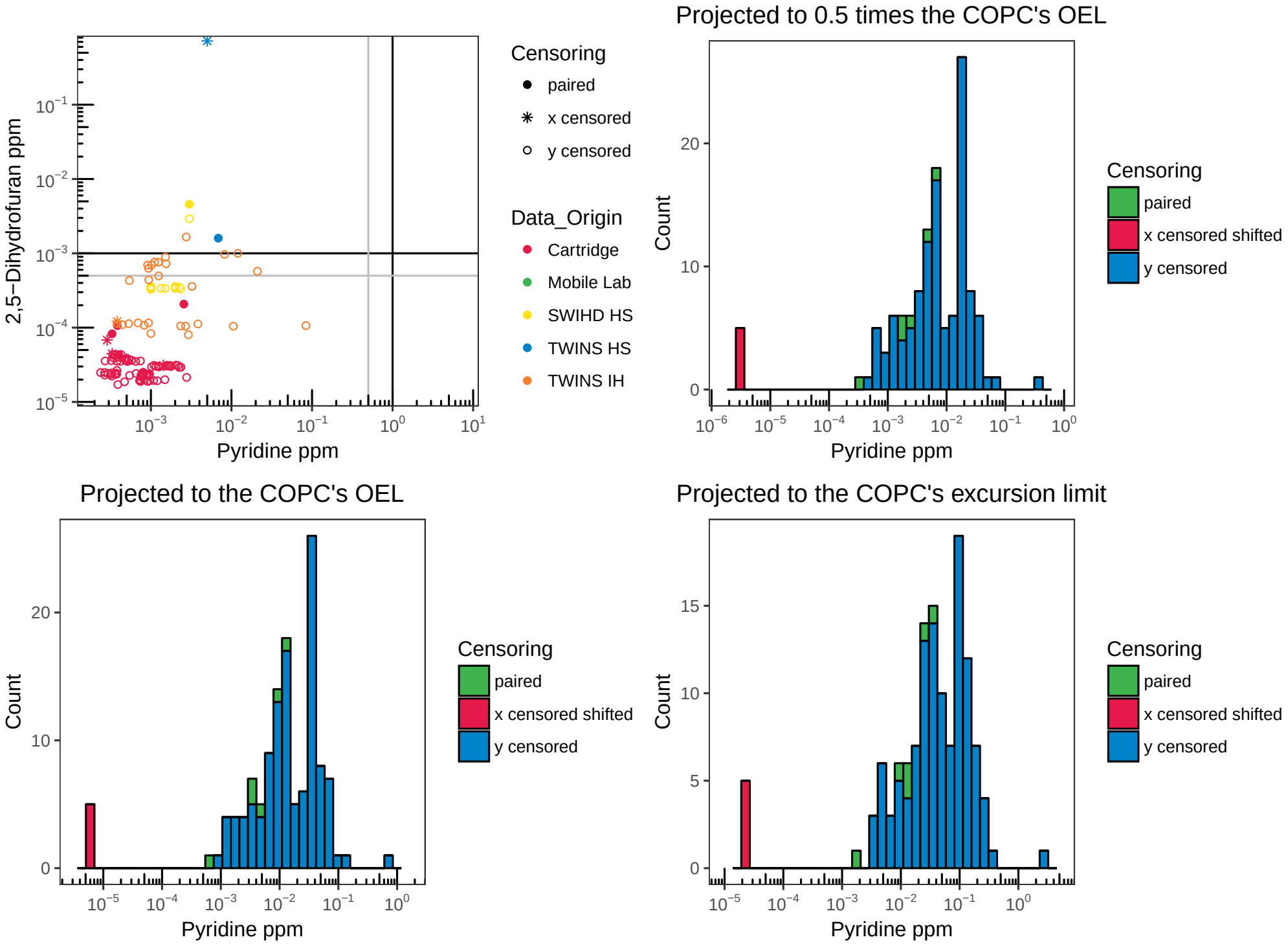


Figure C.2458: 2,5-Dihydrofuran vs Pyridine

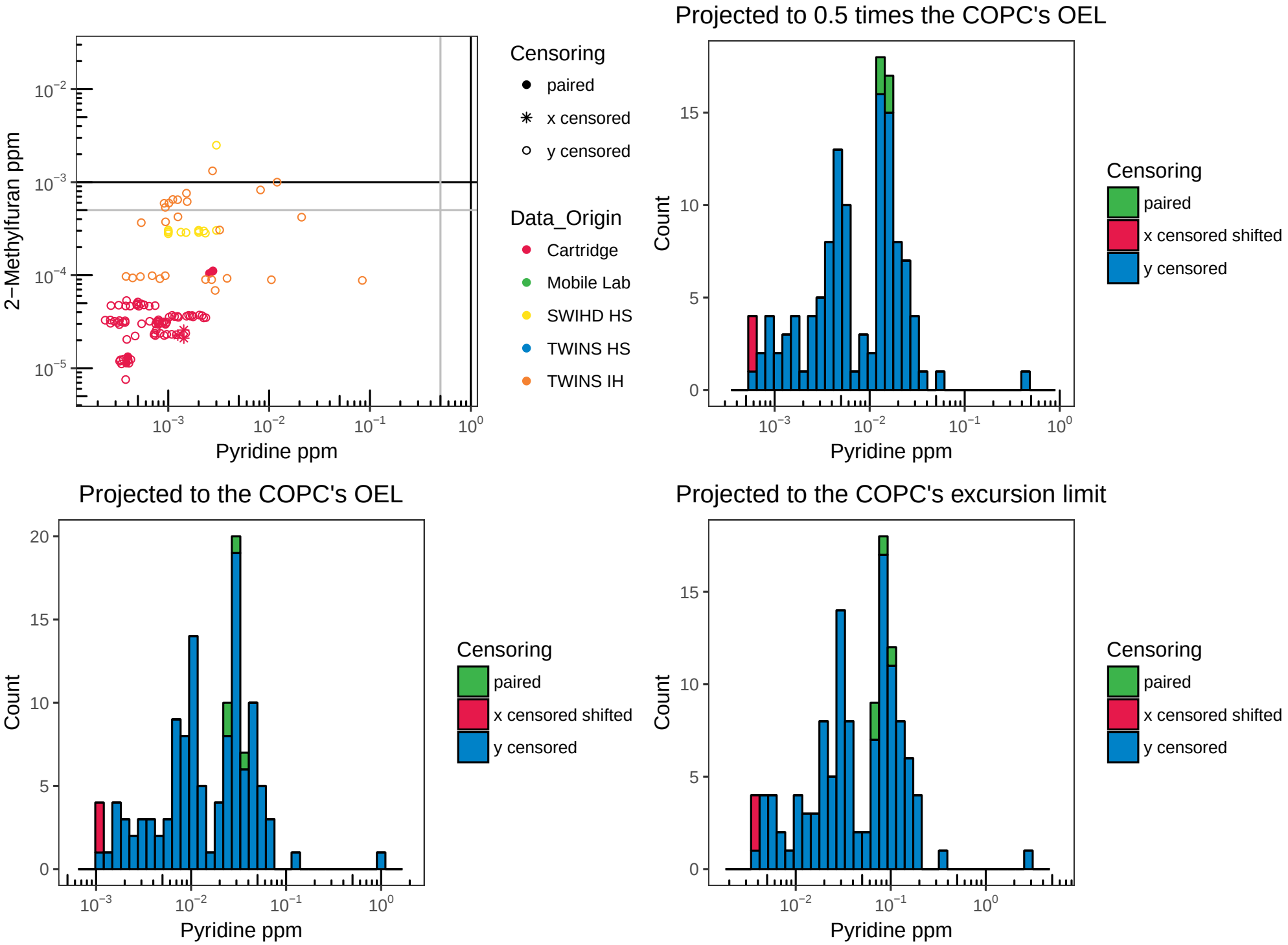


Figure C.2459: 2-Methylfuran vs Pyridine

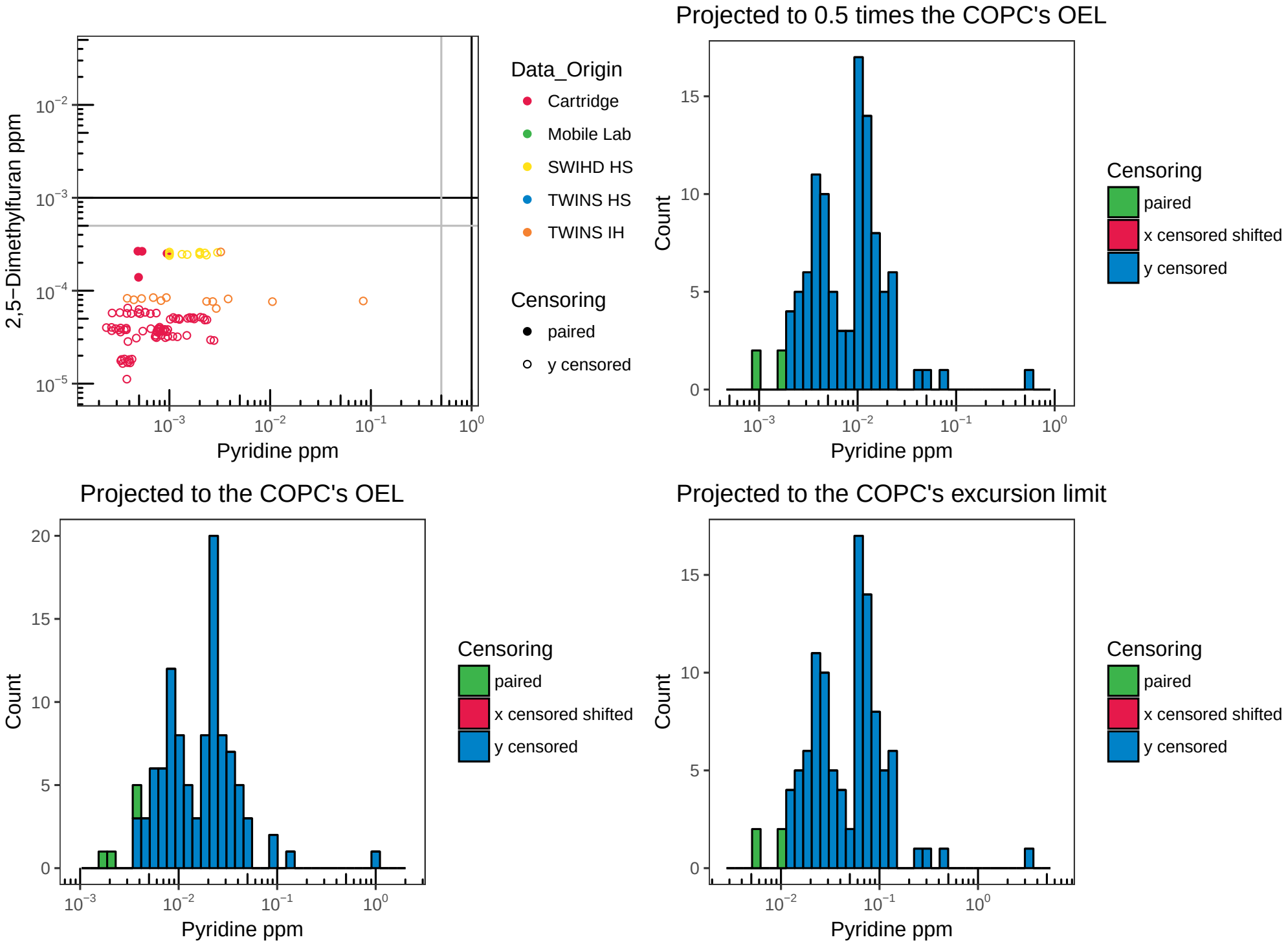


Figure C.2460: 2,5-Dimethylfuran vs Pyridine

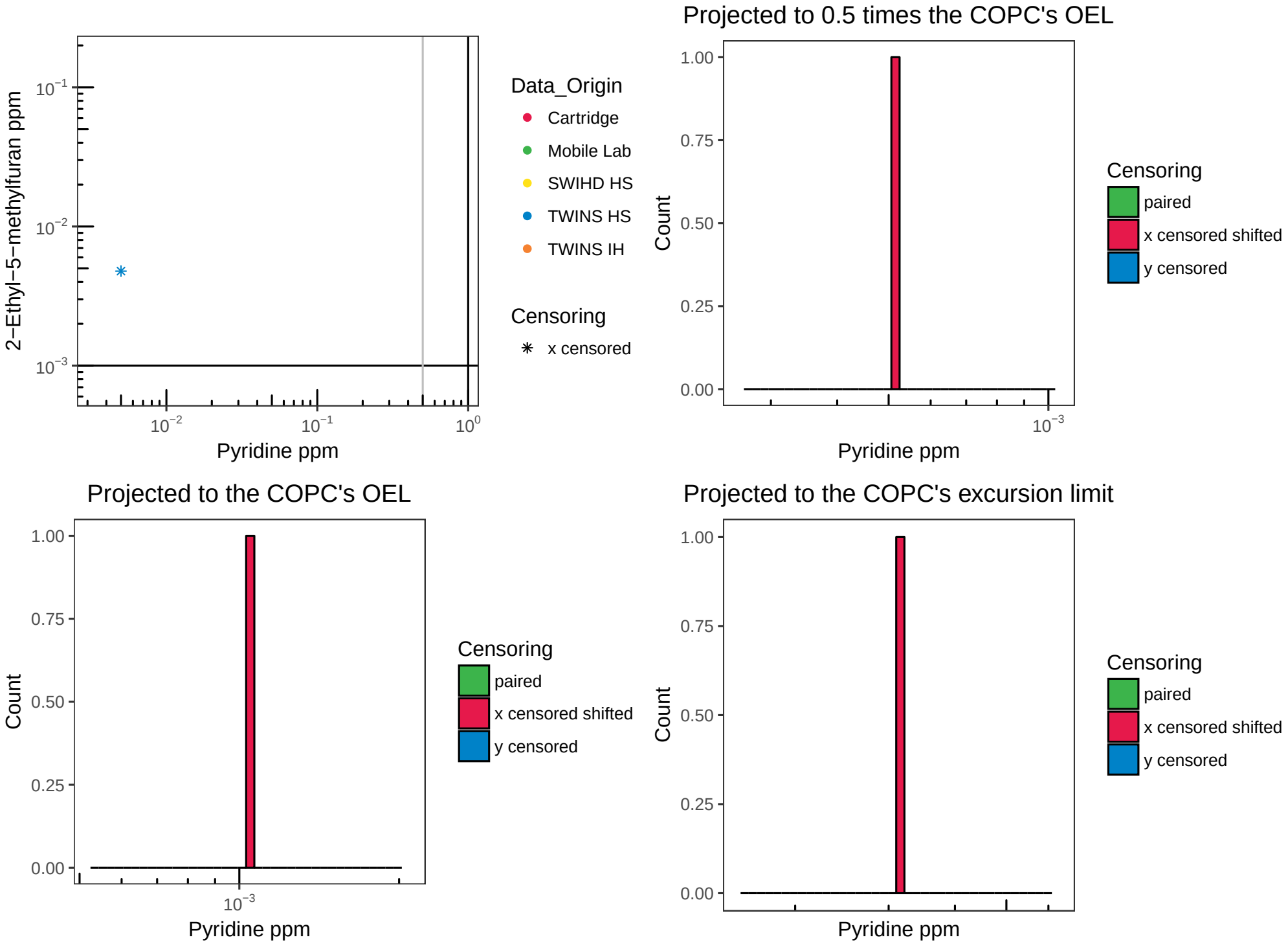


Figure C.2461: 2-Ethyl-5-methylfuran vs Pyridine

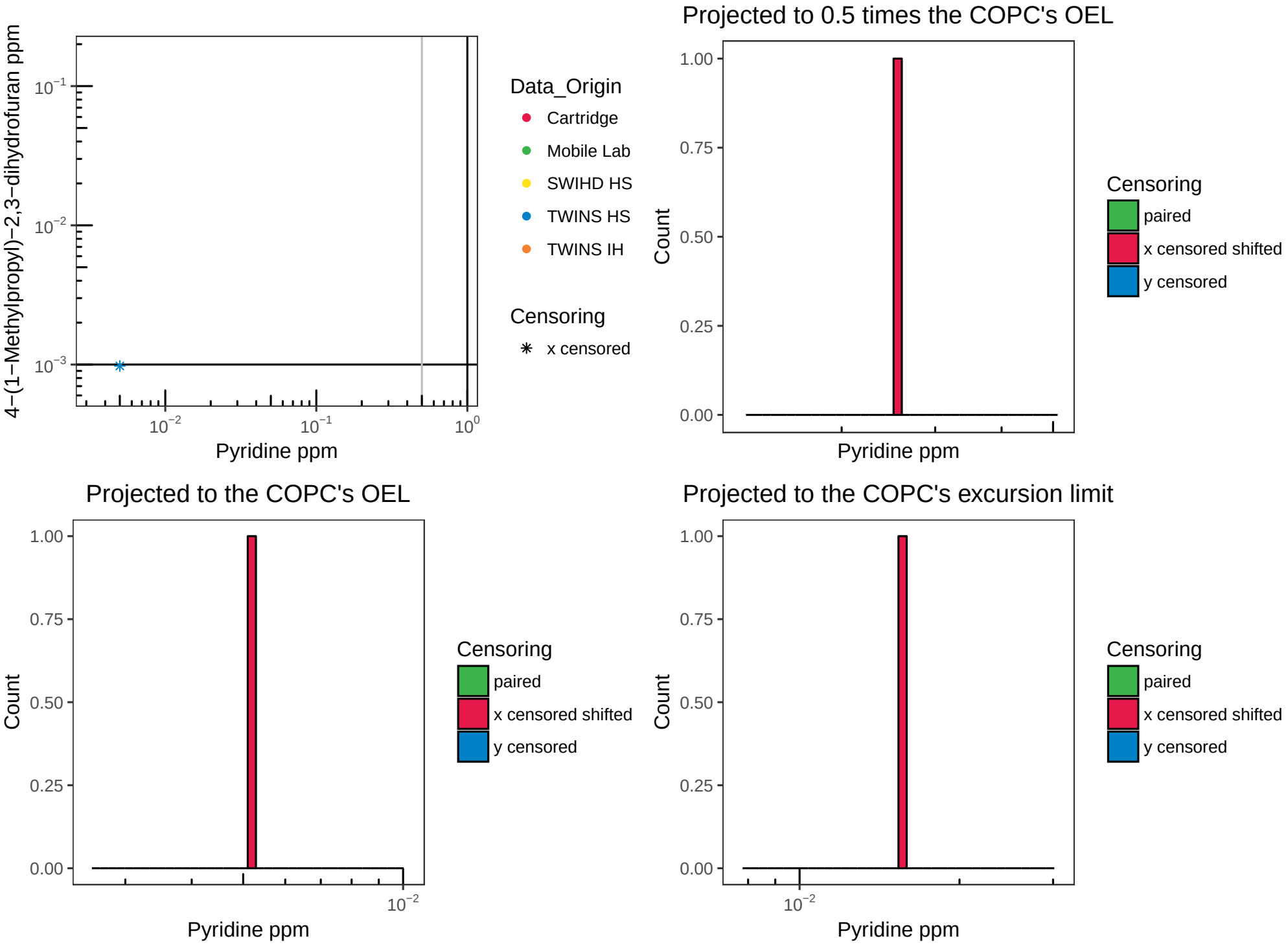


Figure C.2462: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Pyridine

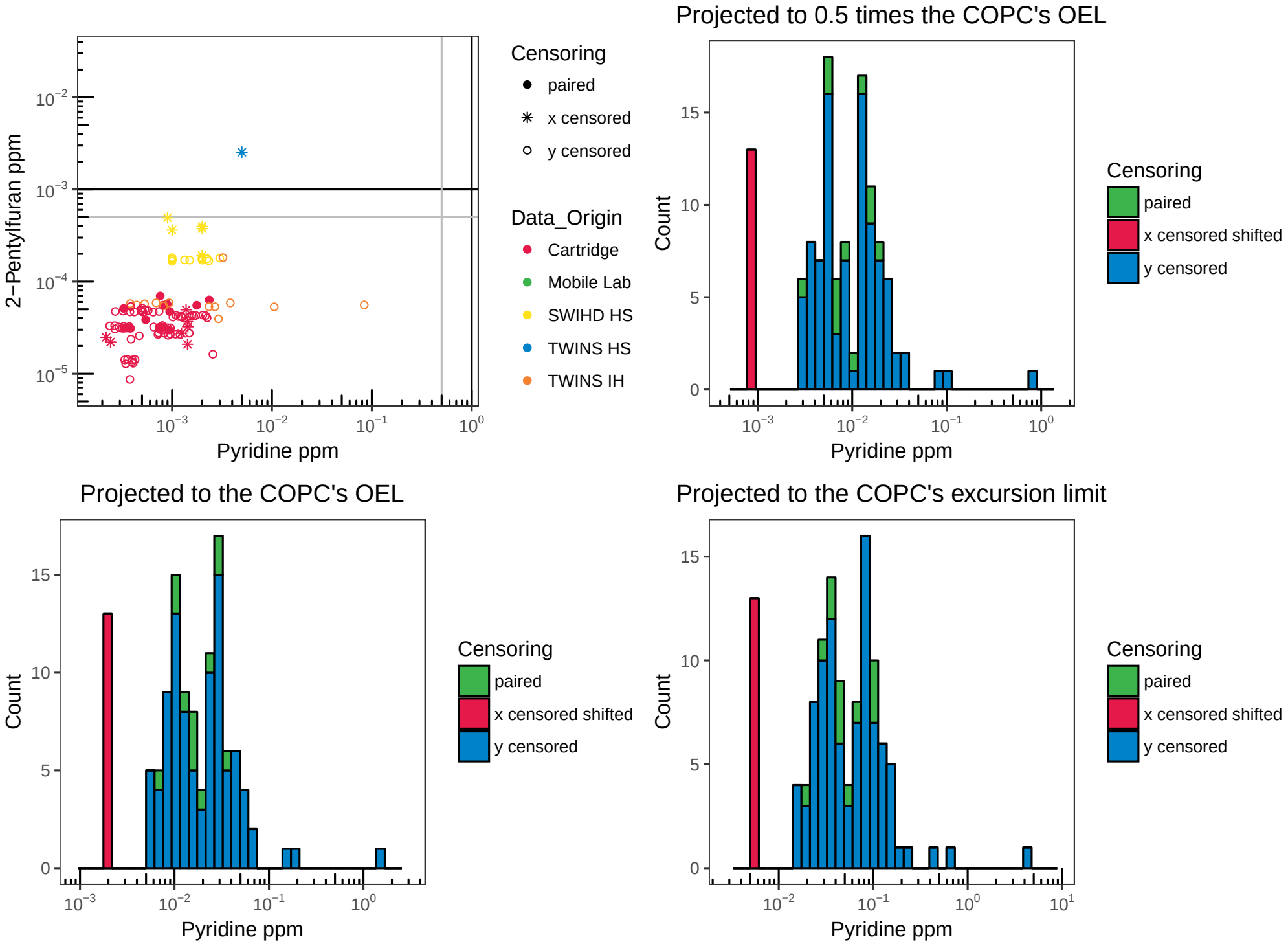


Figure C.2463: 2-Pentylfuran vs Pyridine

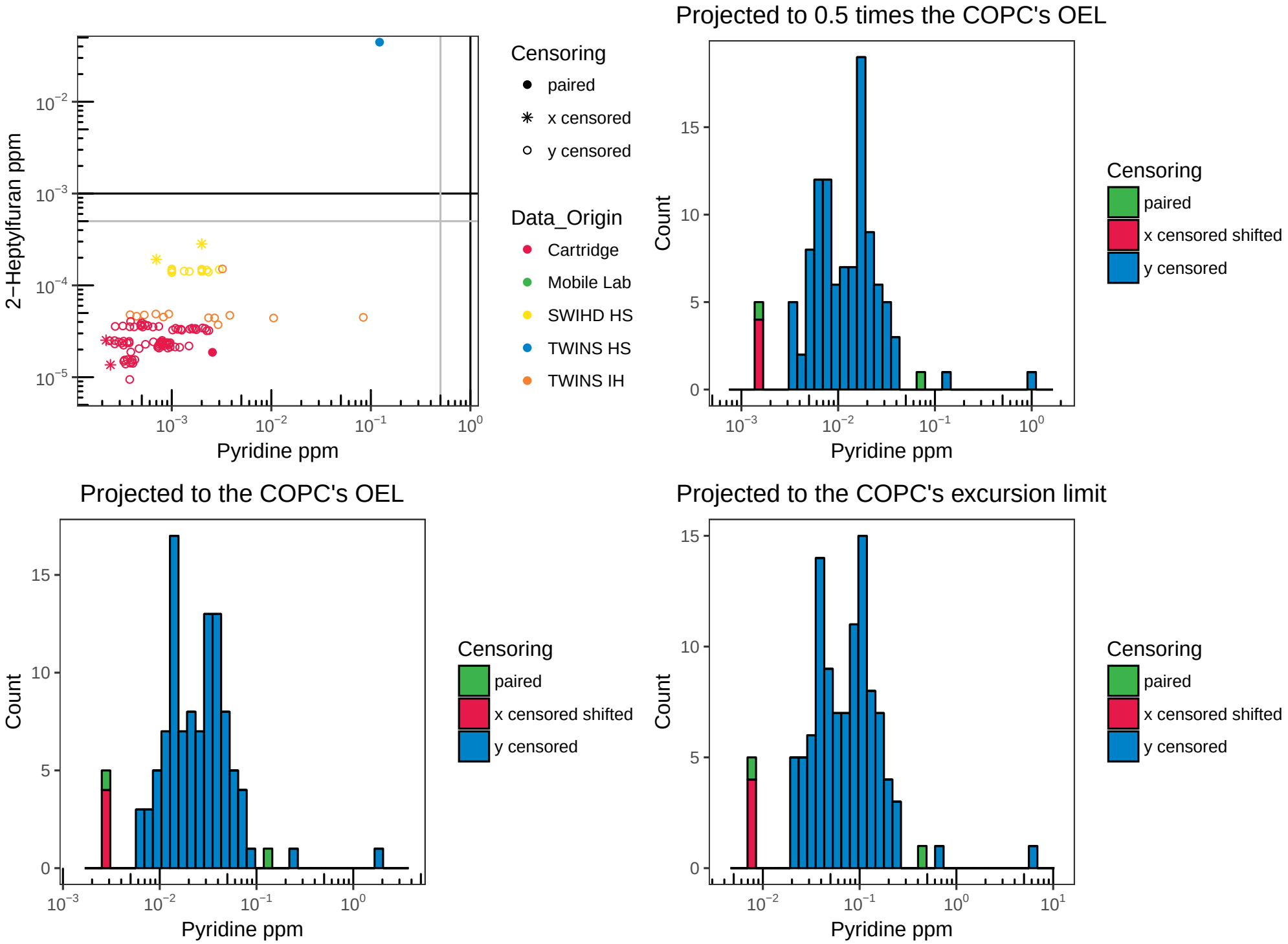


Figure C.2464: 2-Heptylfuran vs Pyridine

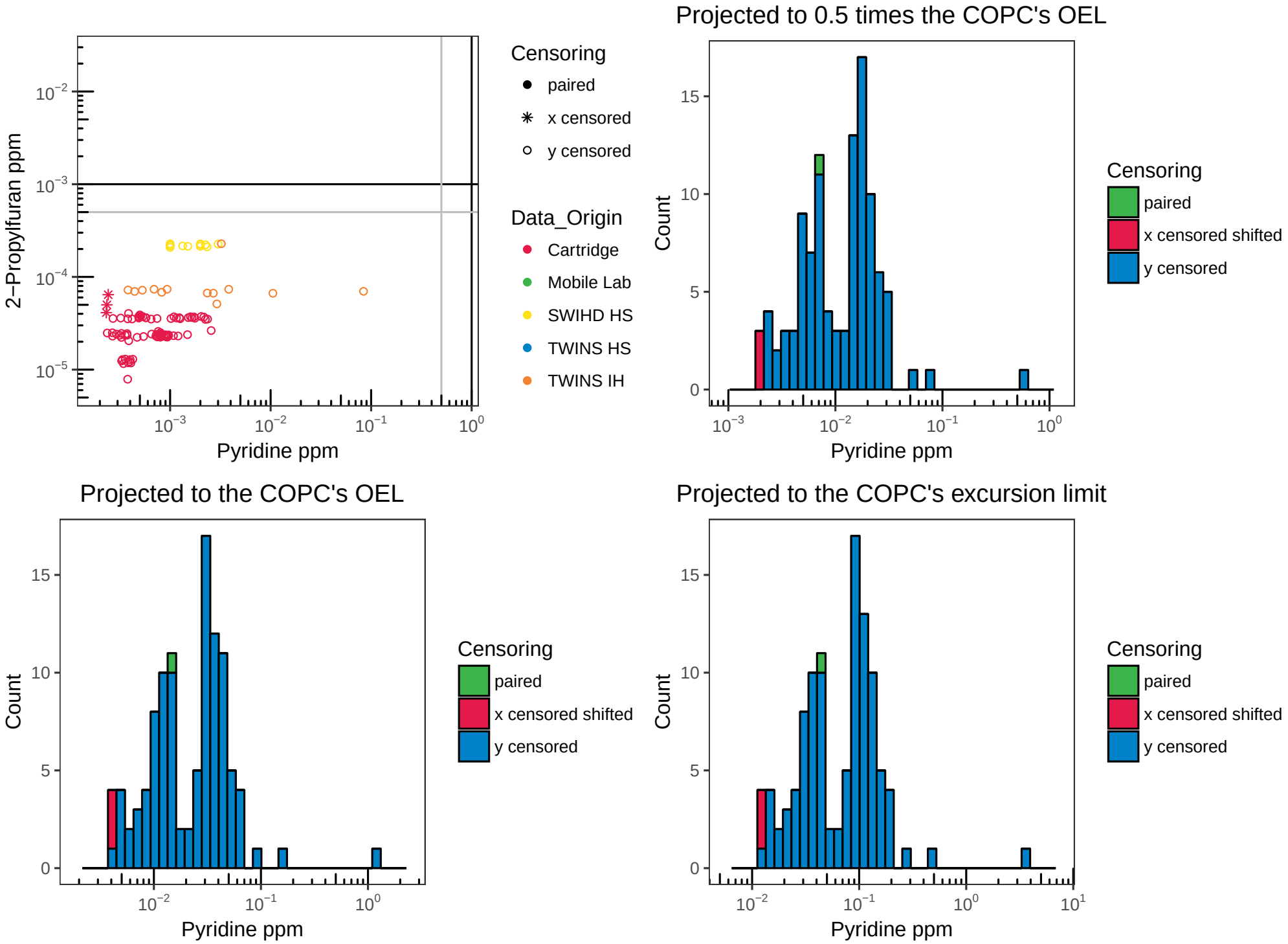


Figure C.2465: 2-Propylfuran vs Pyridine

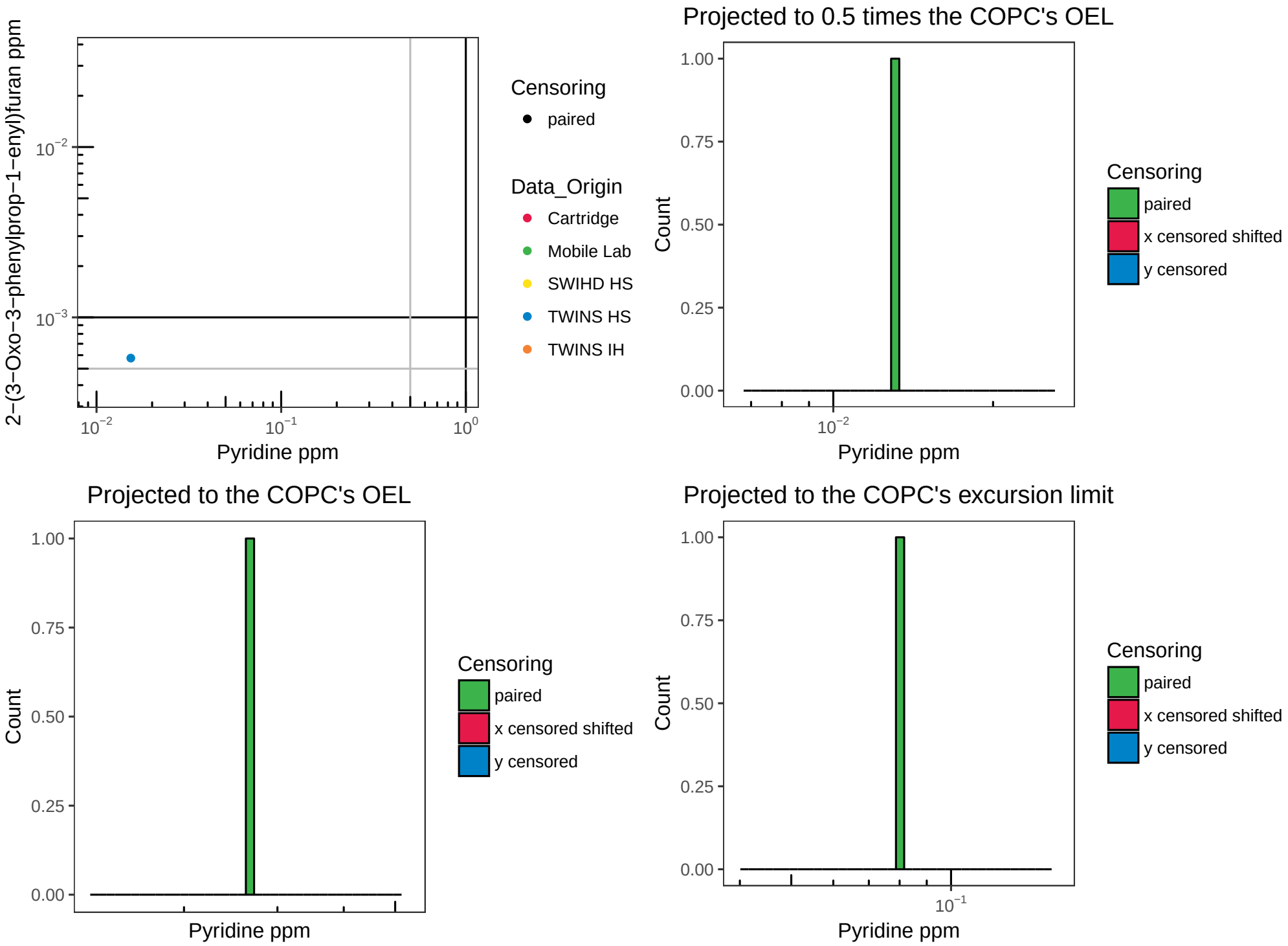


Figure C.2466: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Pyridine

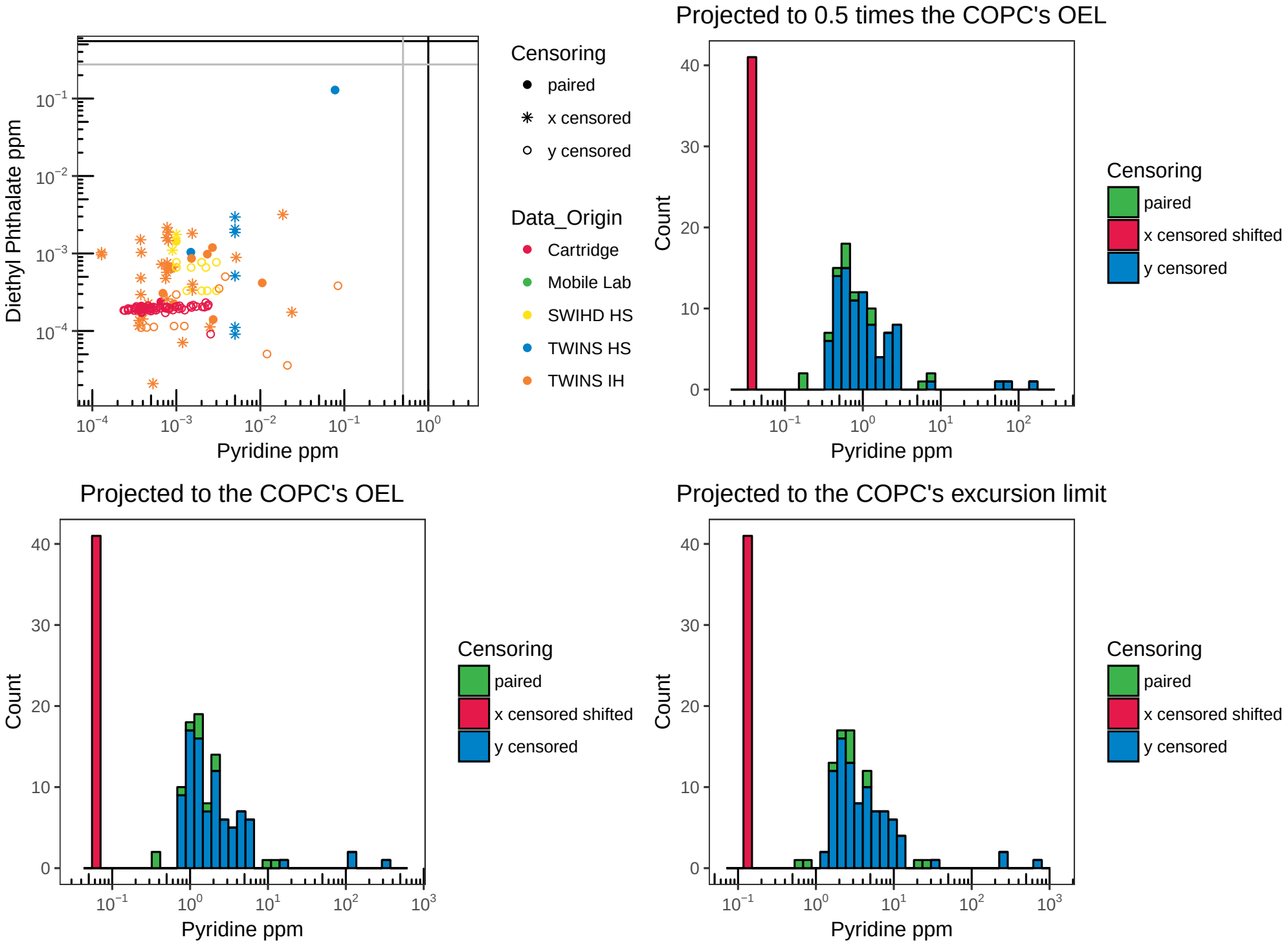


Figure C.2467: Diethyl Phthalate vs Pyridine

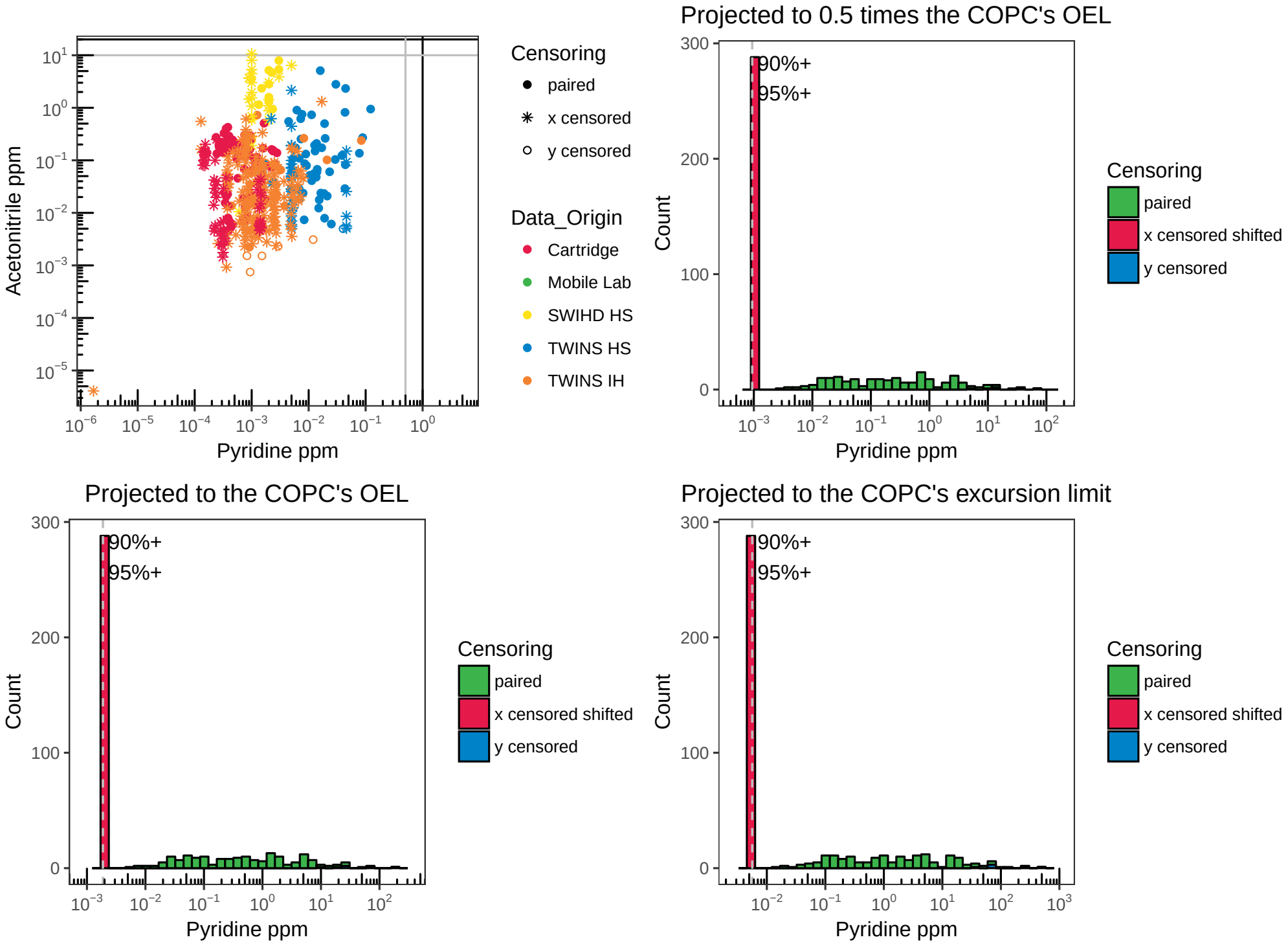


Figure C.2468: Acetonitrile vs Pyridine

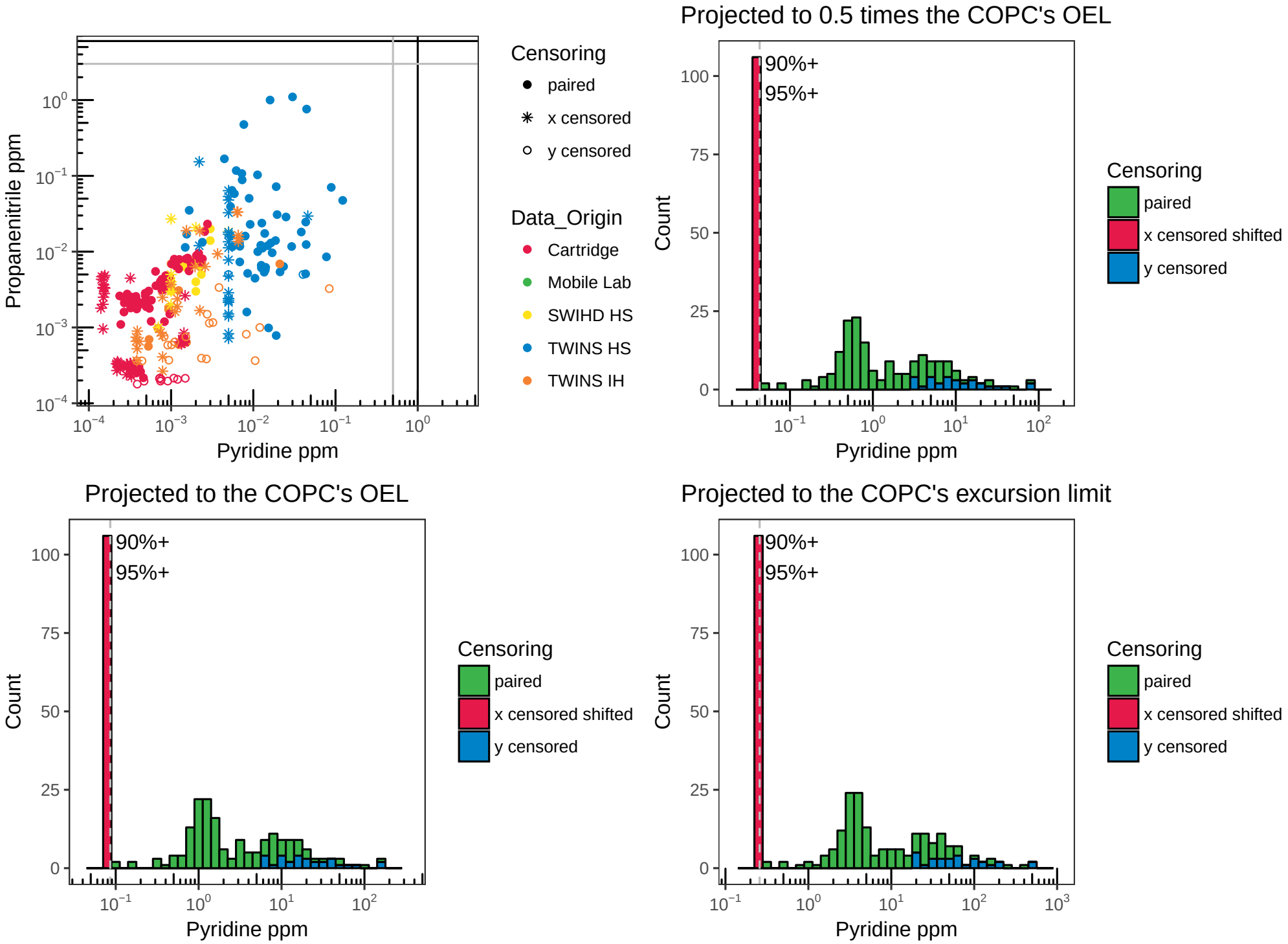


Figure C.2469: Propanenitrile vs Pyridine

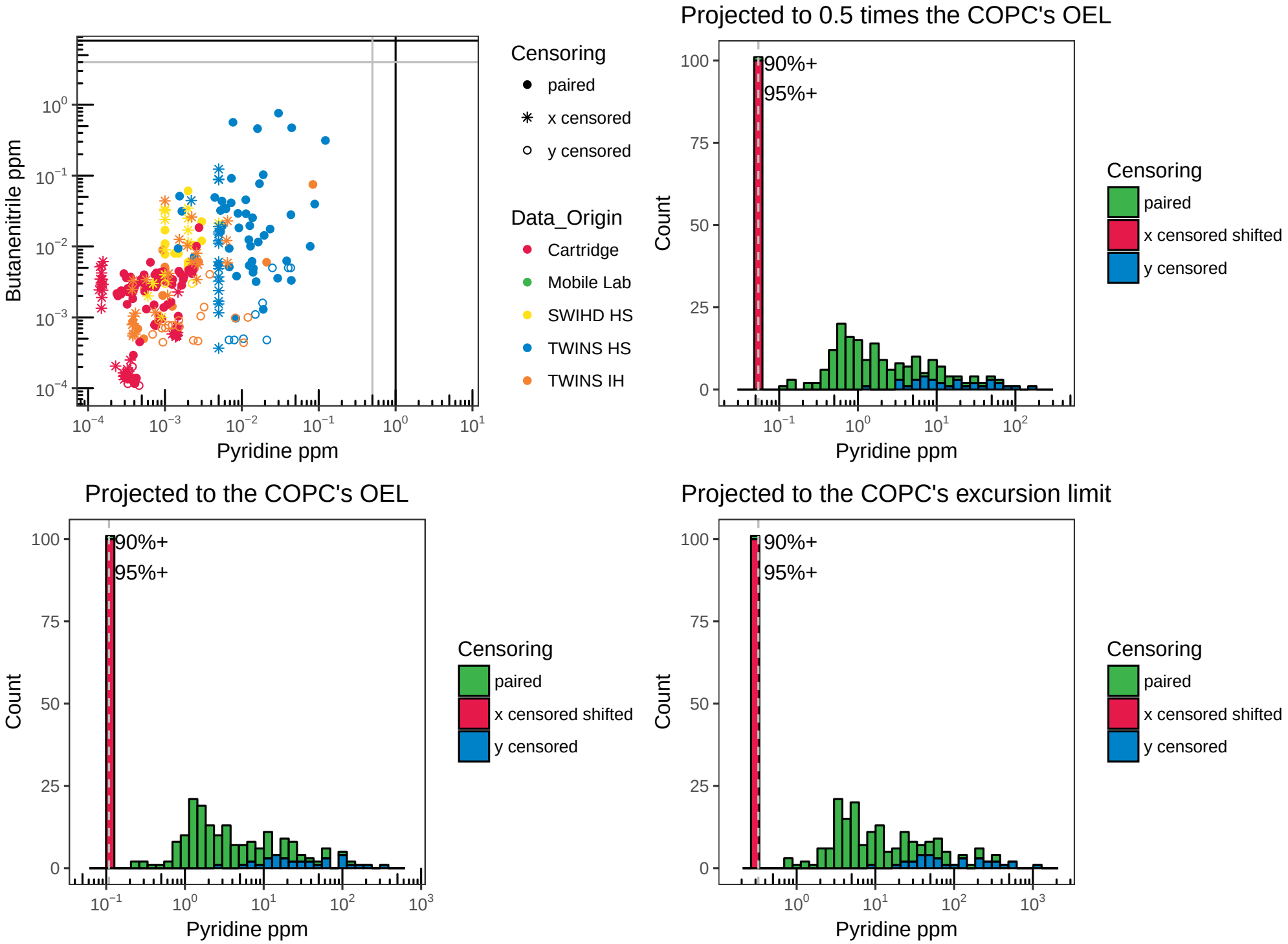


Figure C.2470: Butanenitrile vs Pyridine

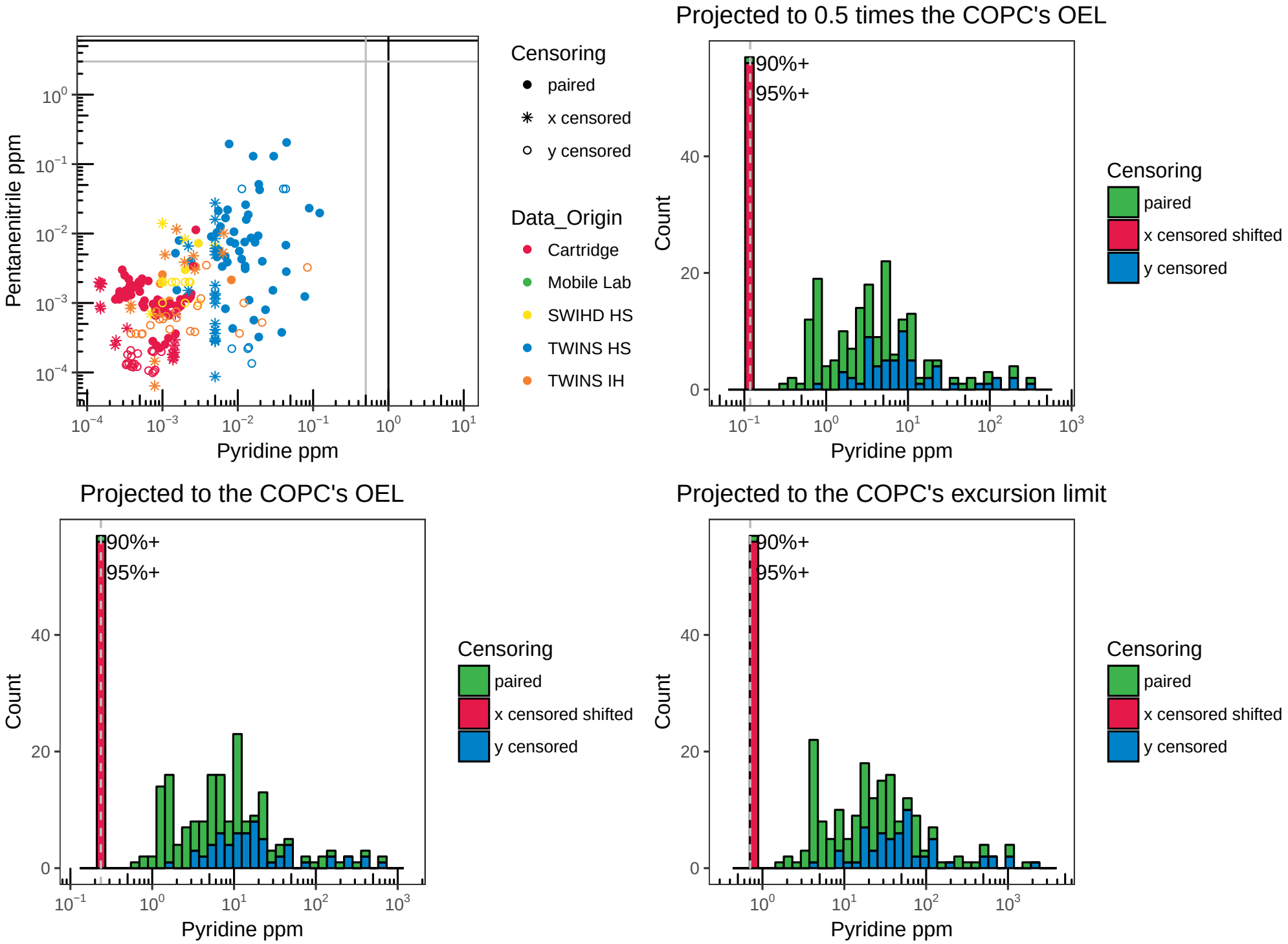


Figure C.2471: Pentanenitrile vs Pyridine

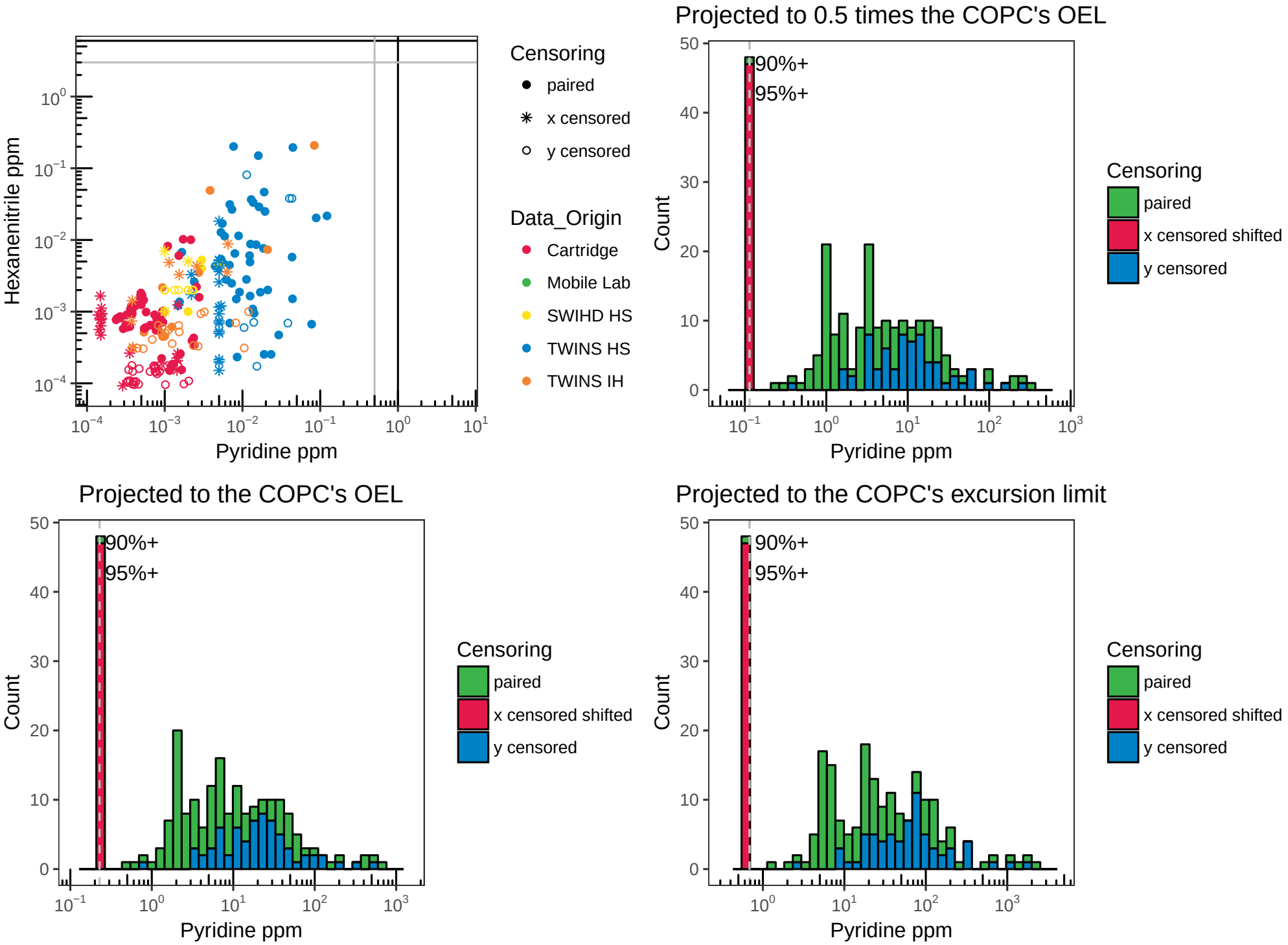


Figure C.2472: Hexanenitrile vs Pyridine

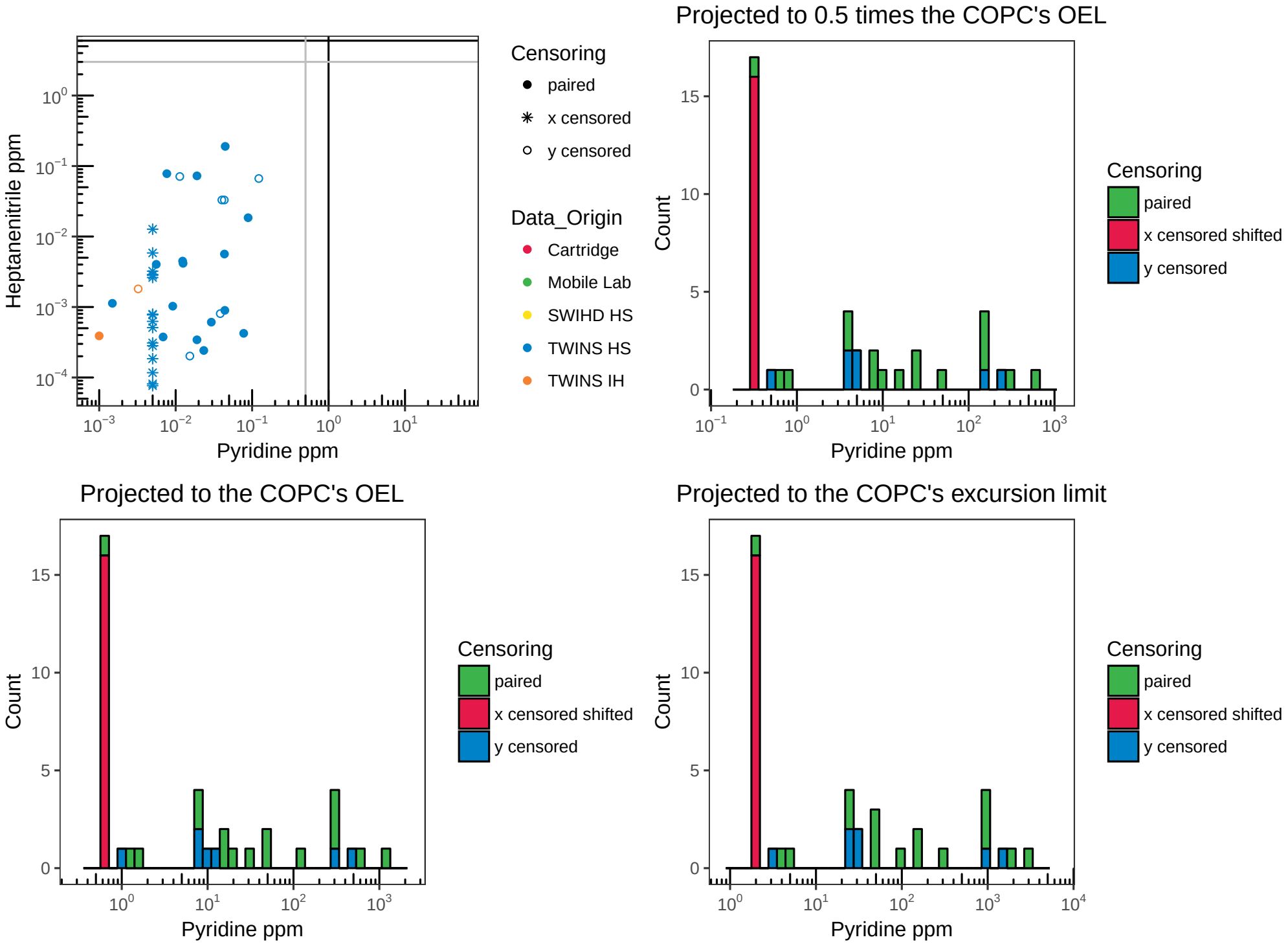


Figure C.2473: Heptanenitrile vs Pyridine

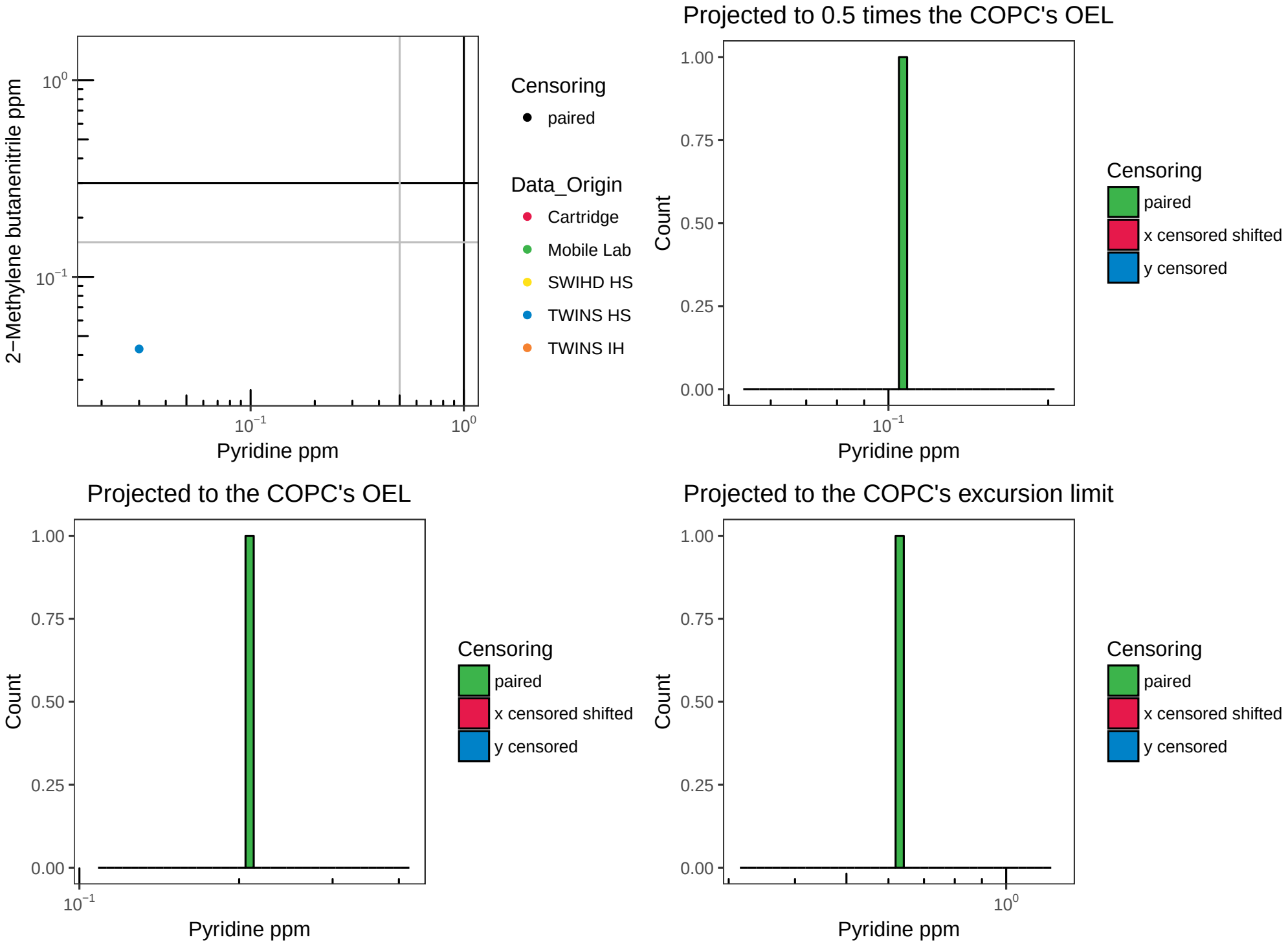


Figure C.2474: 2-Methylene butanenitrile vs Pyridine

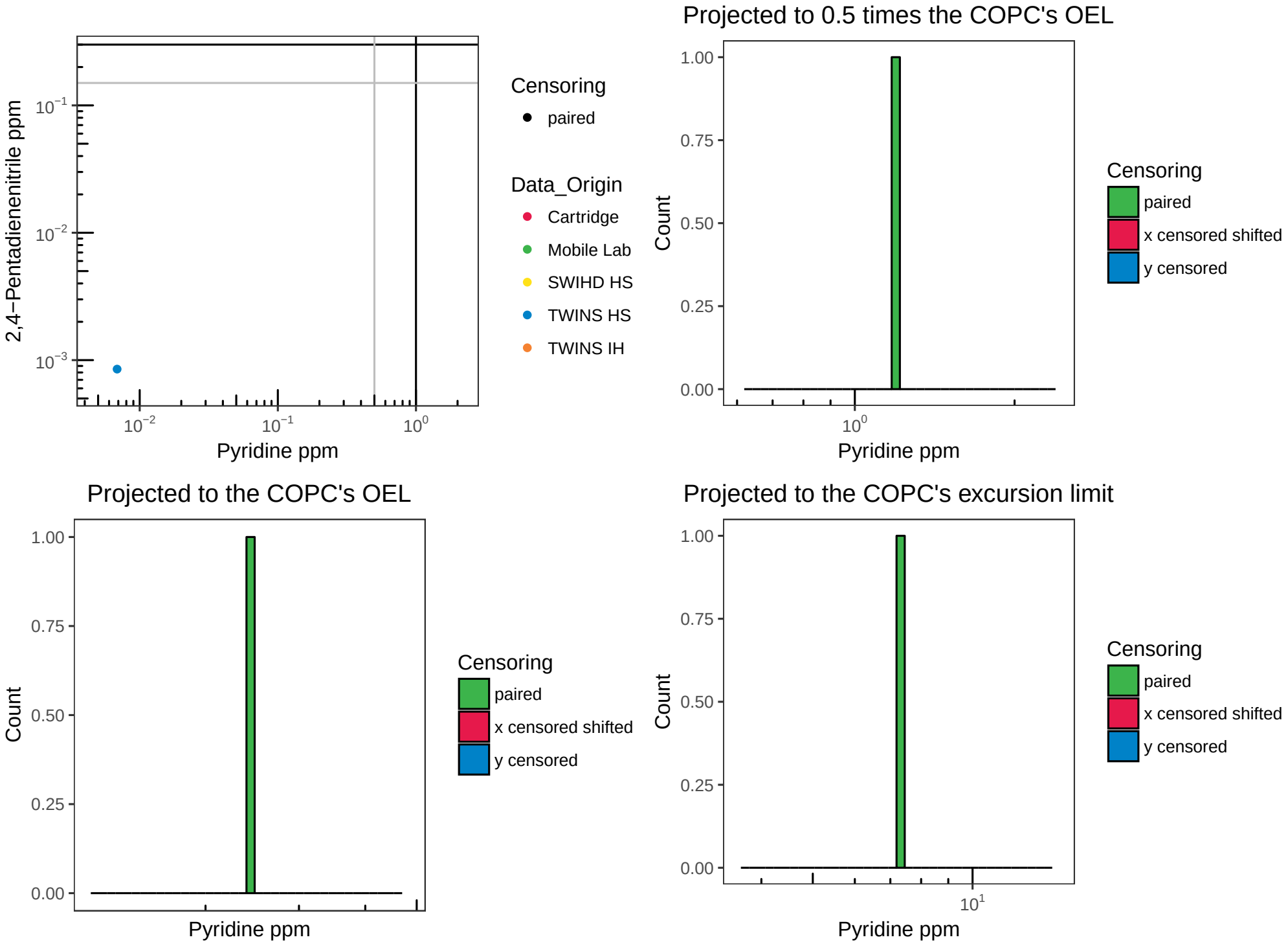


Figure C.2475: 2,4-Pentadienenitrile vs Pyridine

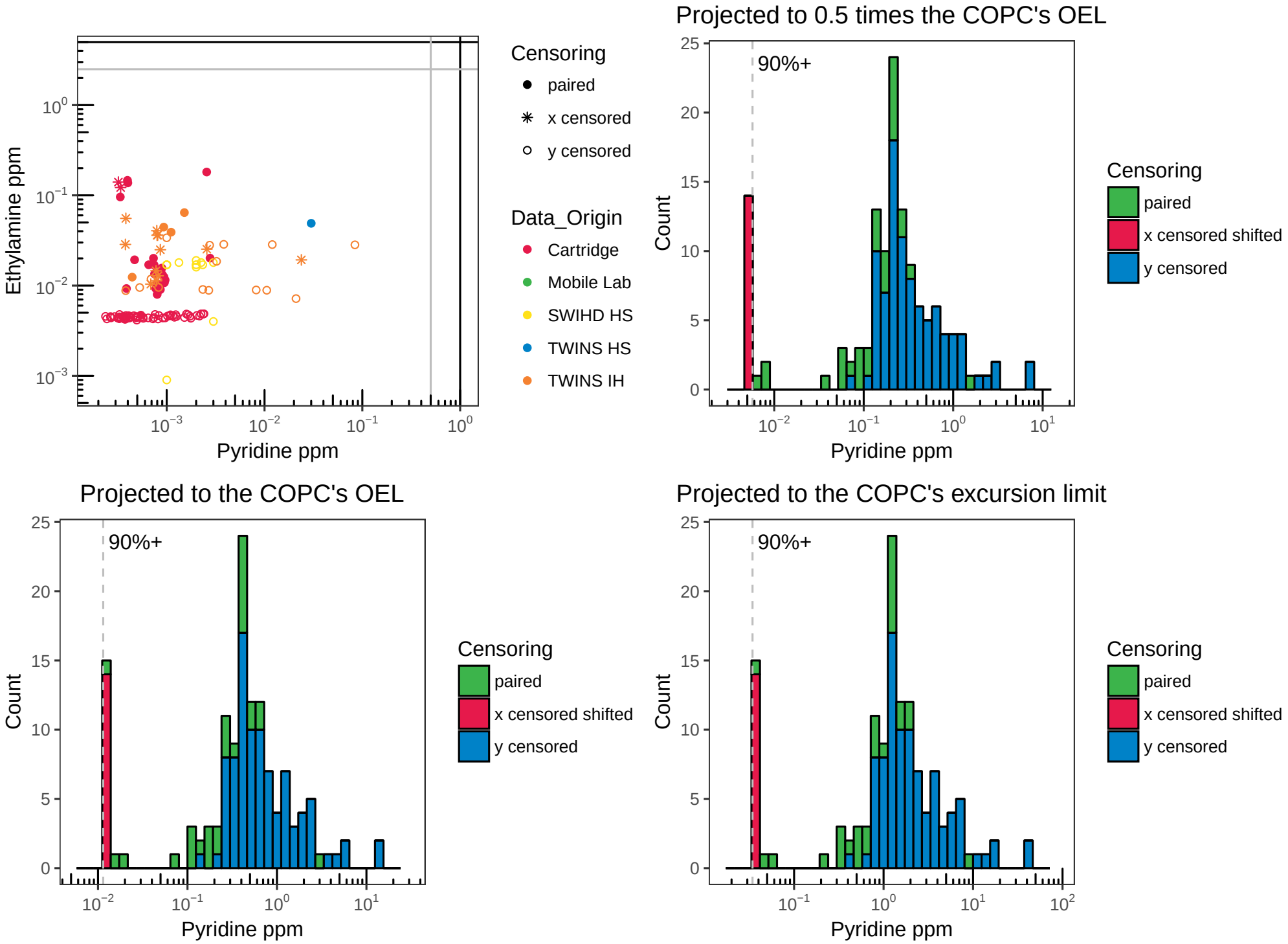


Figure C.2476: Ethylamine vs Pyridine

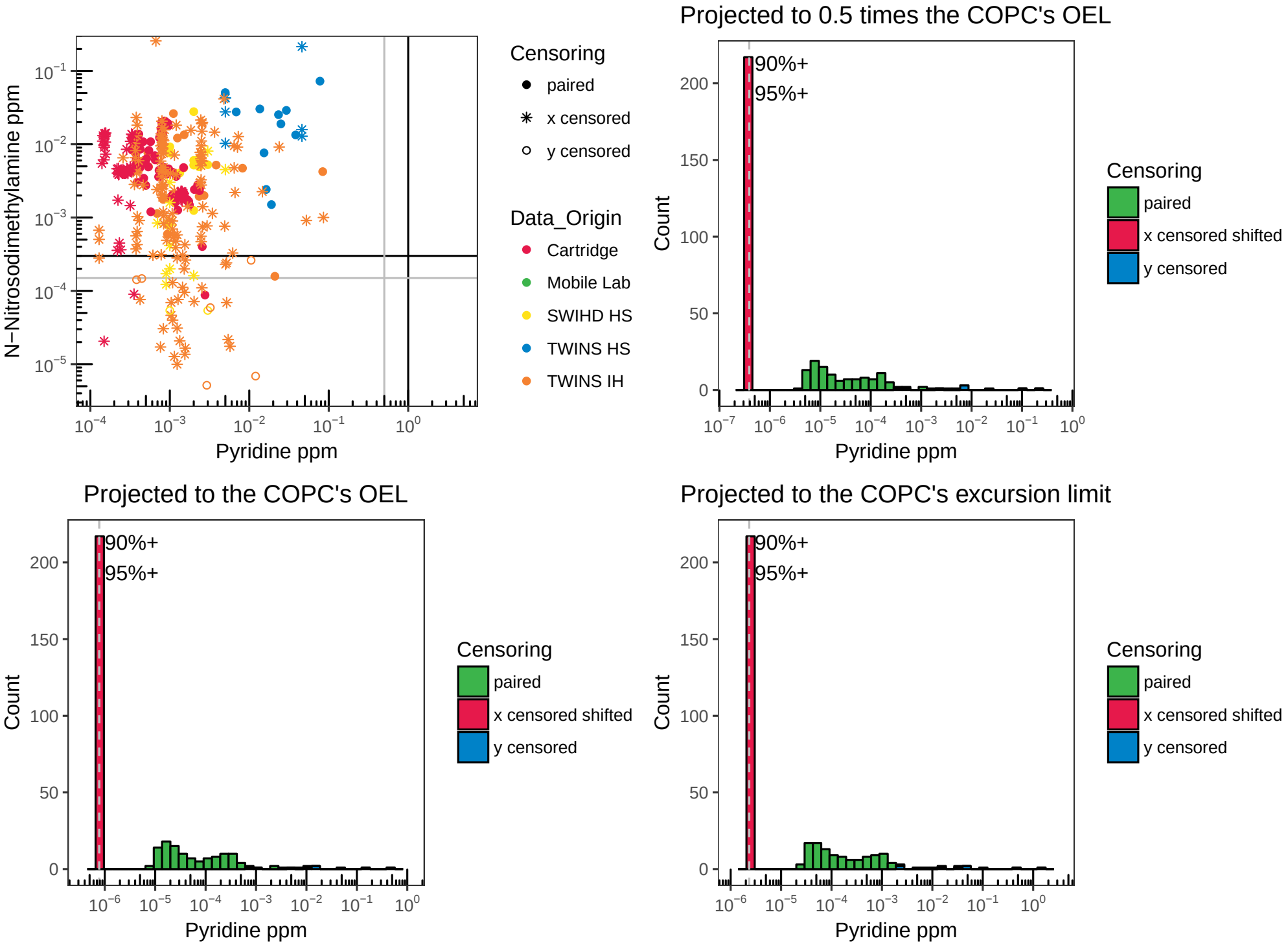


Figure C.2477: N-Nitrosodimethylamine vs Pyridine

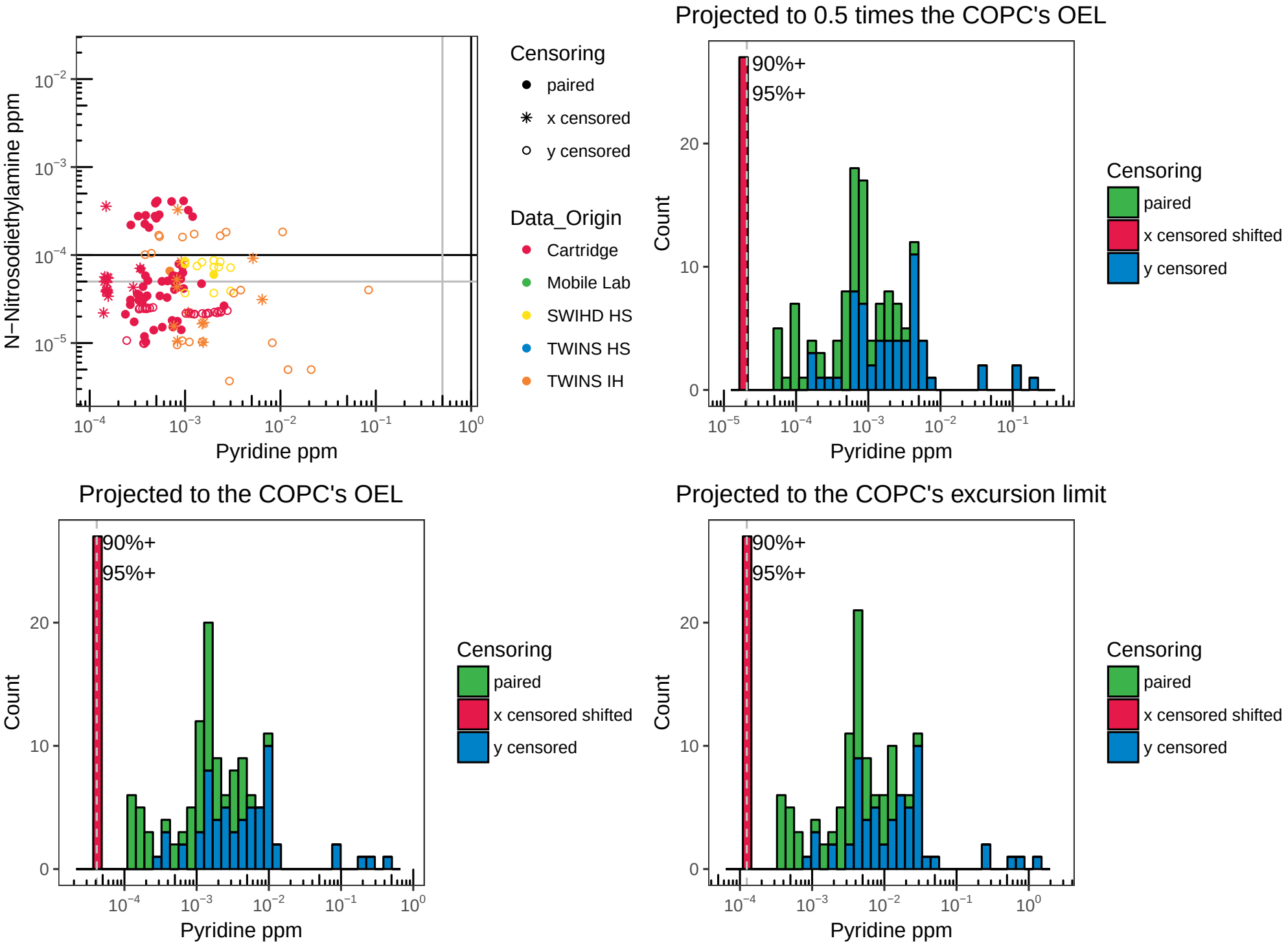


Figure C.2478: N-Nitrosodiethylamine vs Pyridine

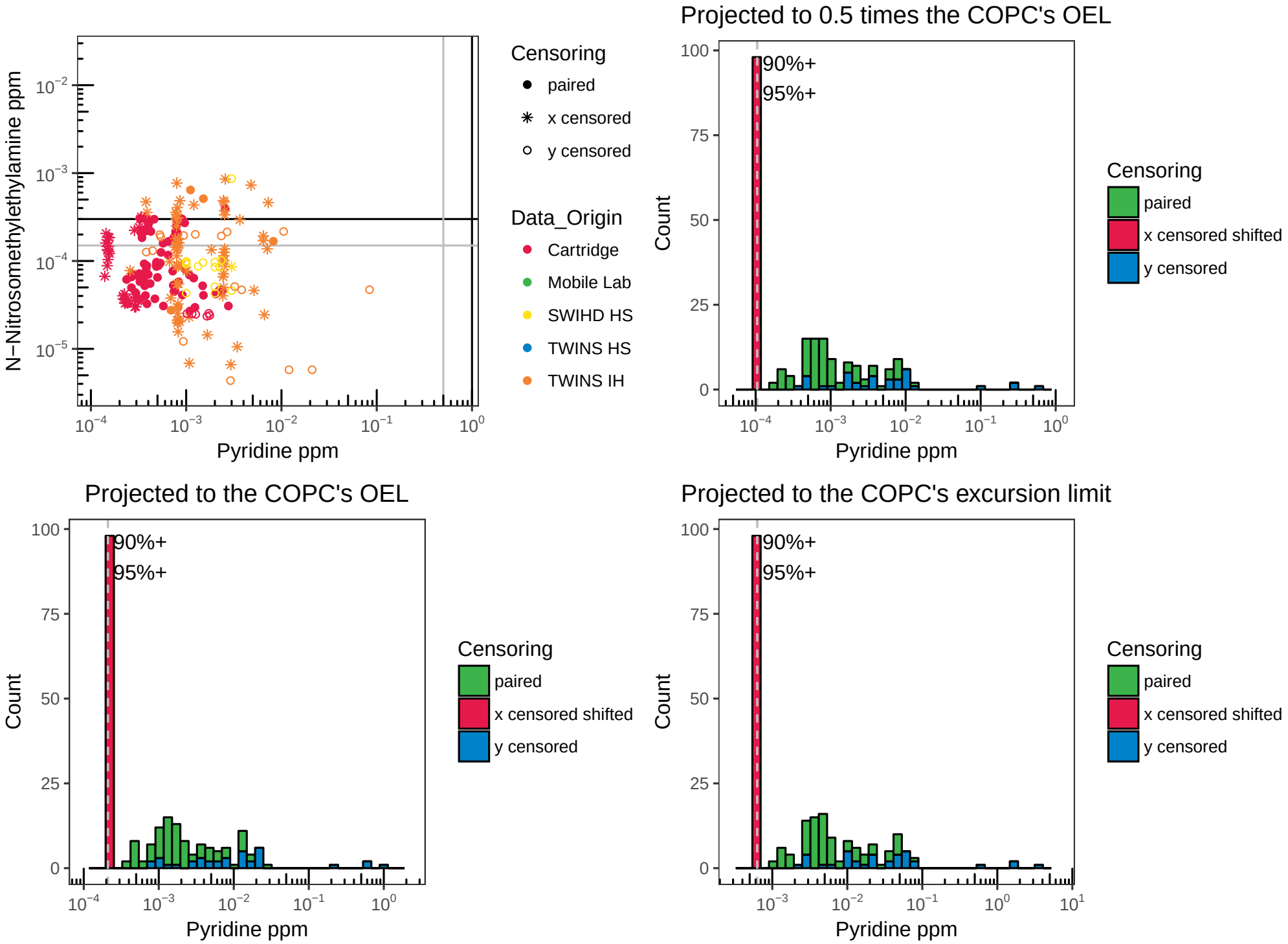


Figure C.2479: N-Nitrosomethylethylamine vs Pyridine

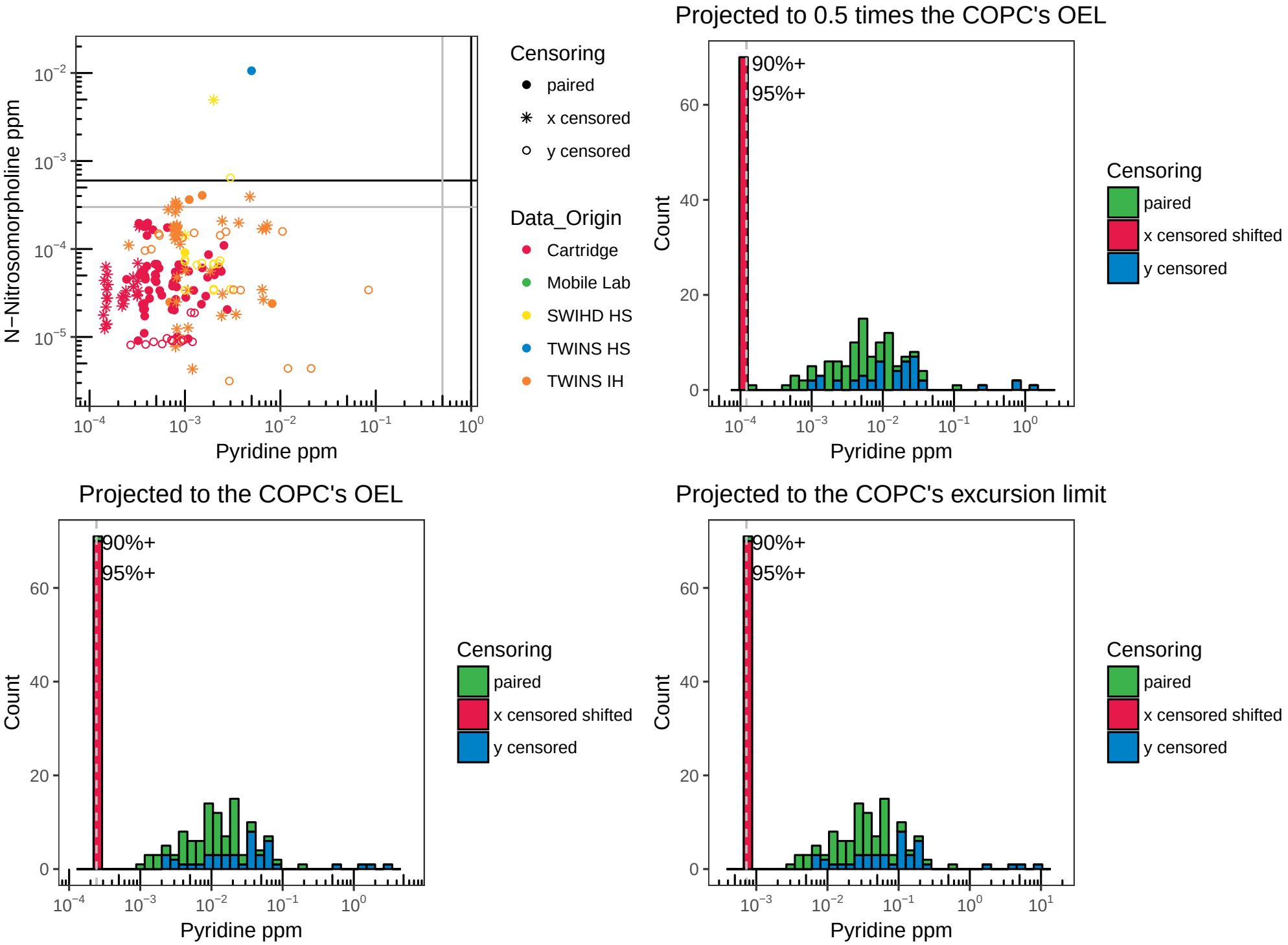


Figure C.2480: N-Nitrosomorpholine vs Pyridine

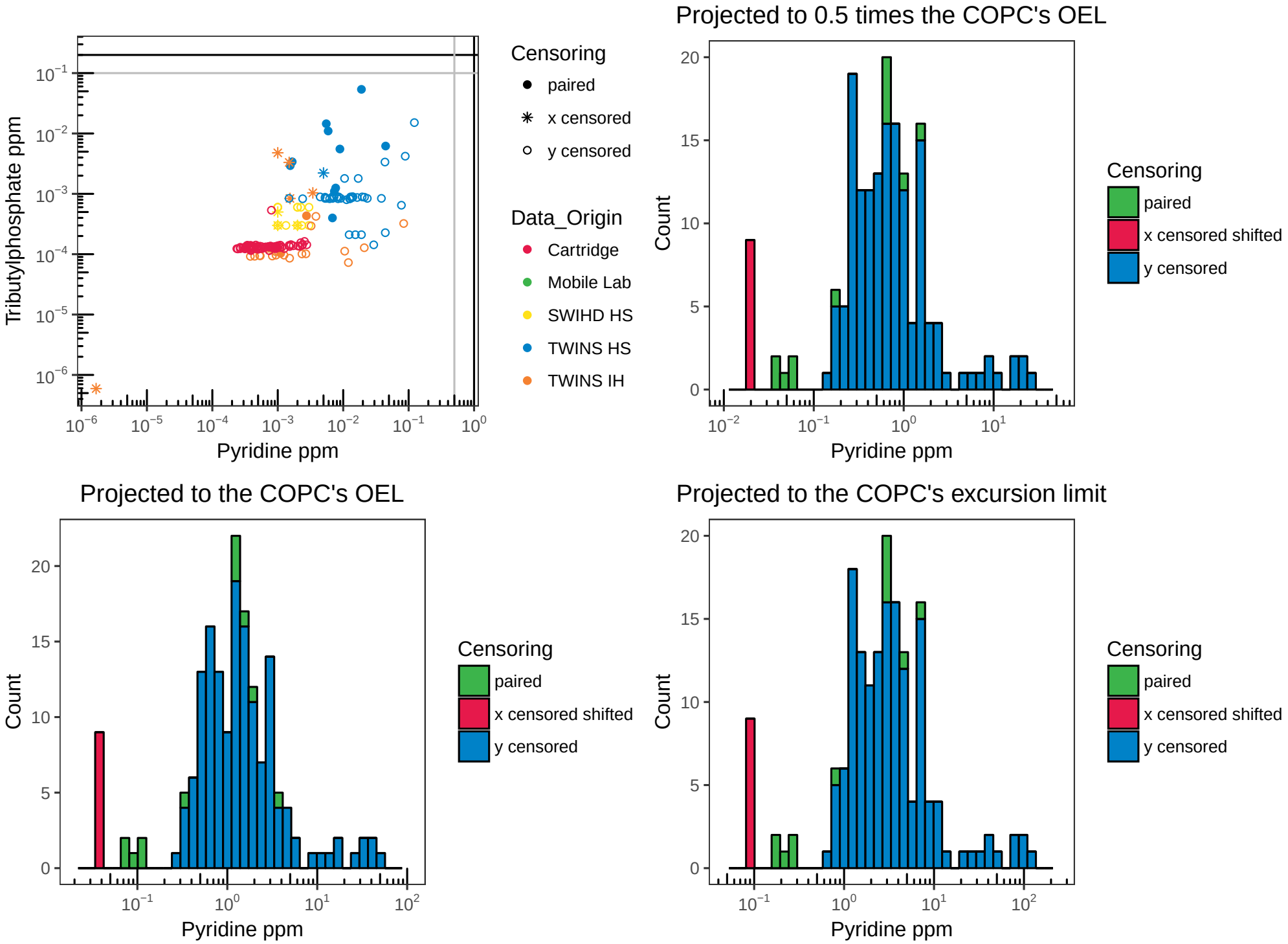


Figure C.2481: Tributylphosphate vs Pyridine

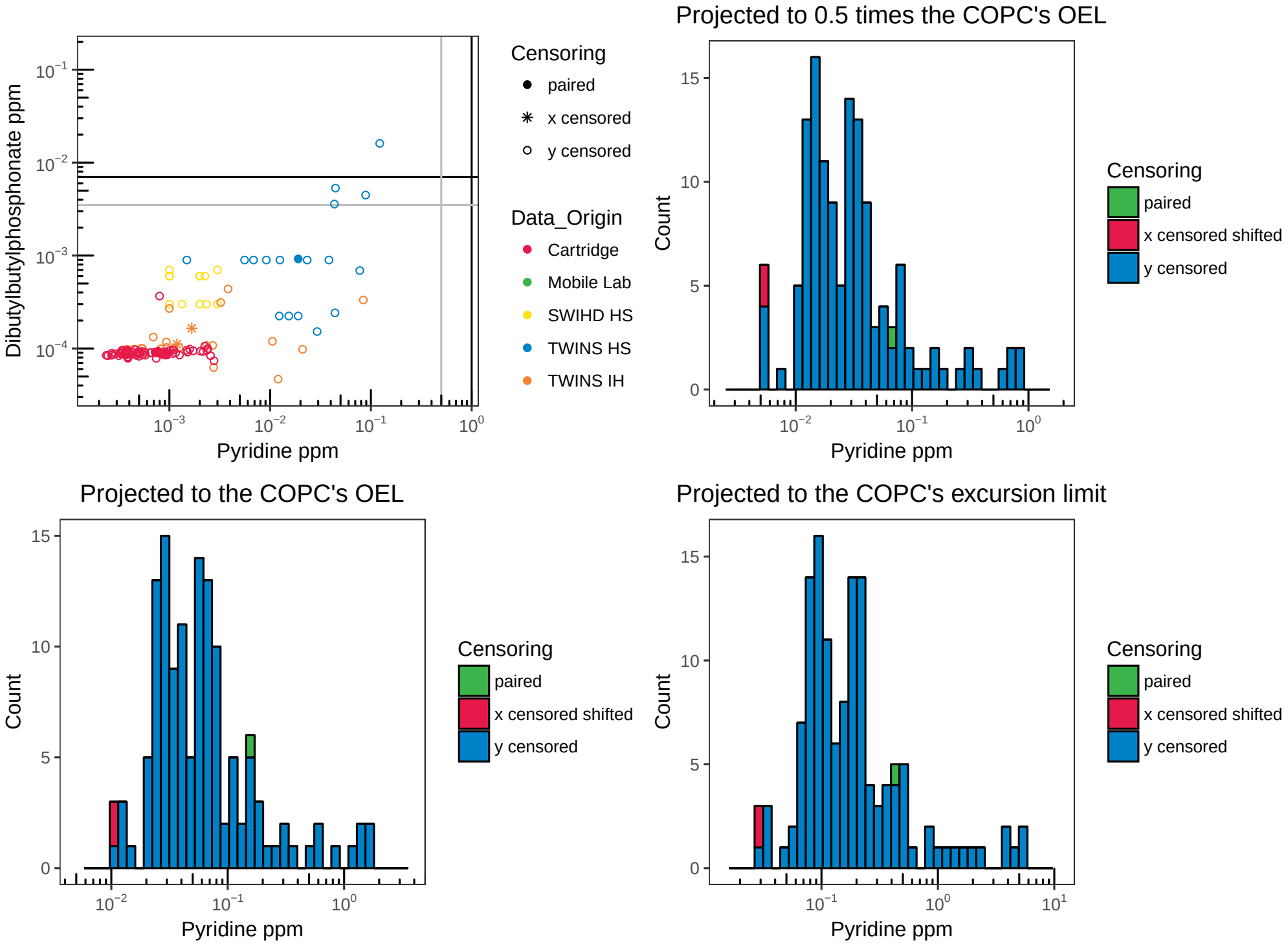


Figure C.2482: Dibutylbutylphosphonate vs Pyridine

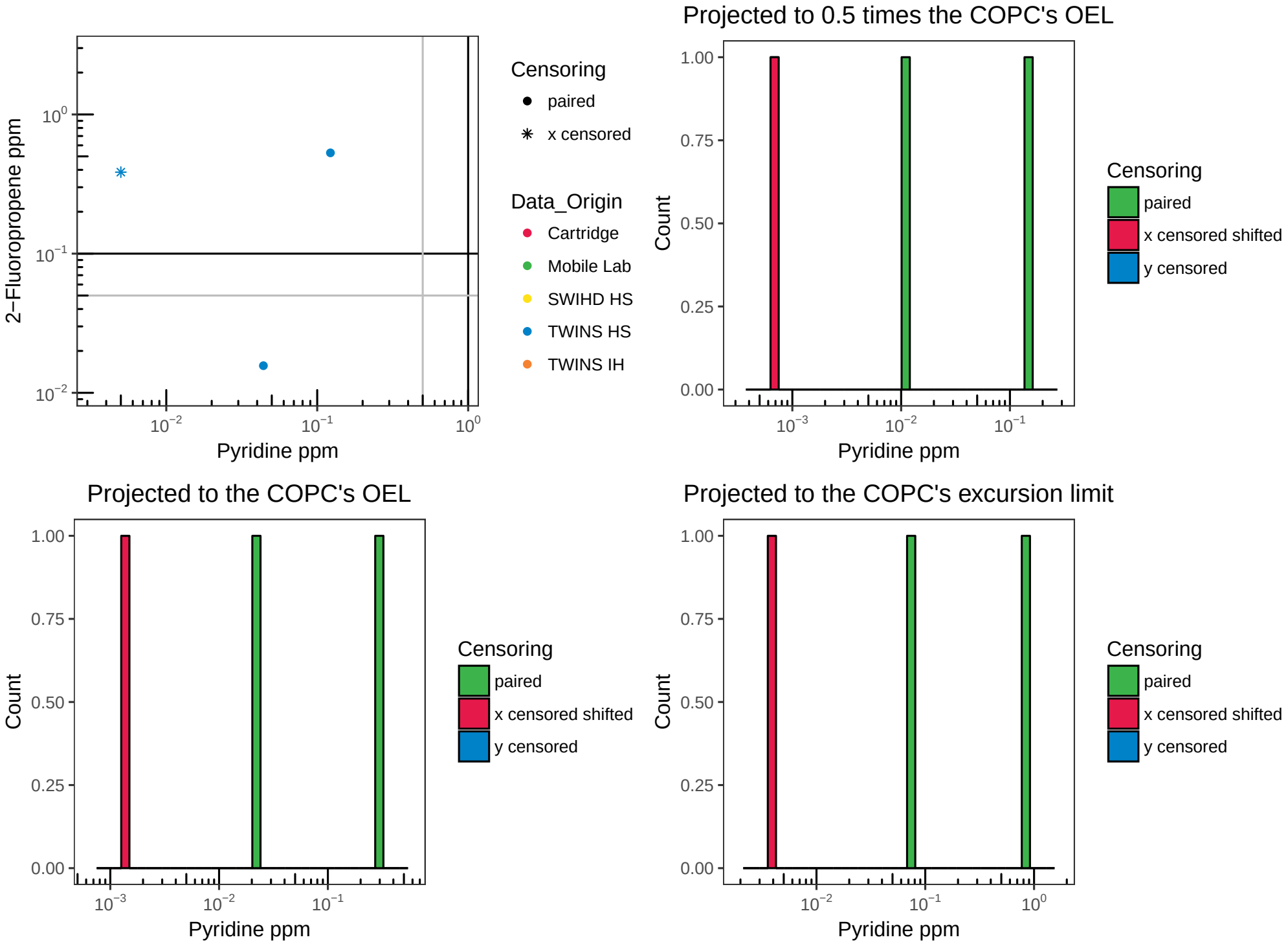


Figure C.2483: 2-Fluoropropene vs Pyridine

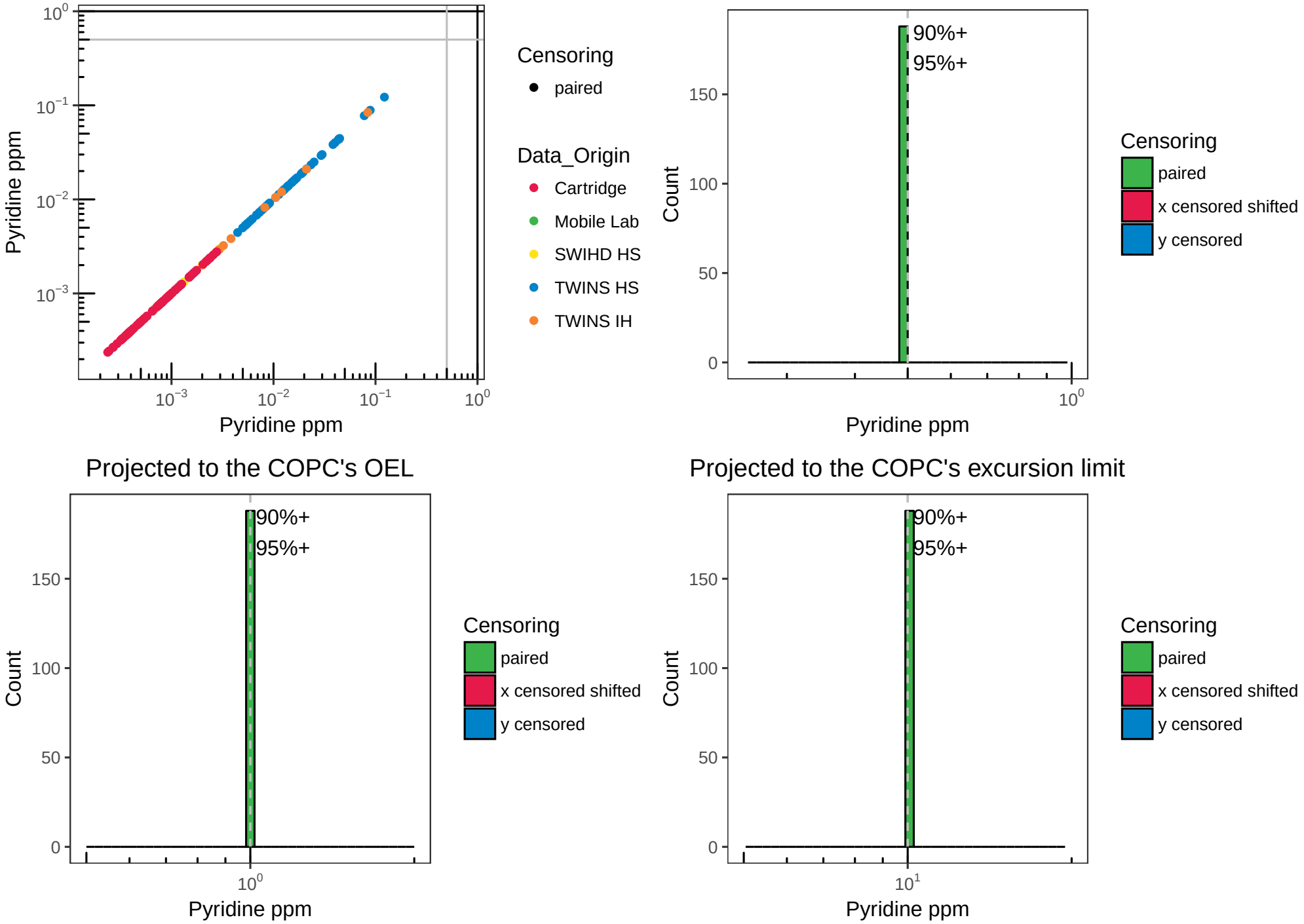


Figure C.2484: Pyridine vs Pyridine

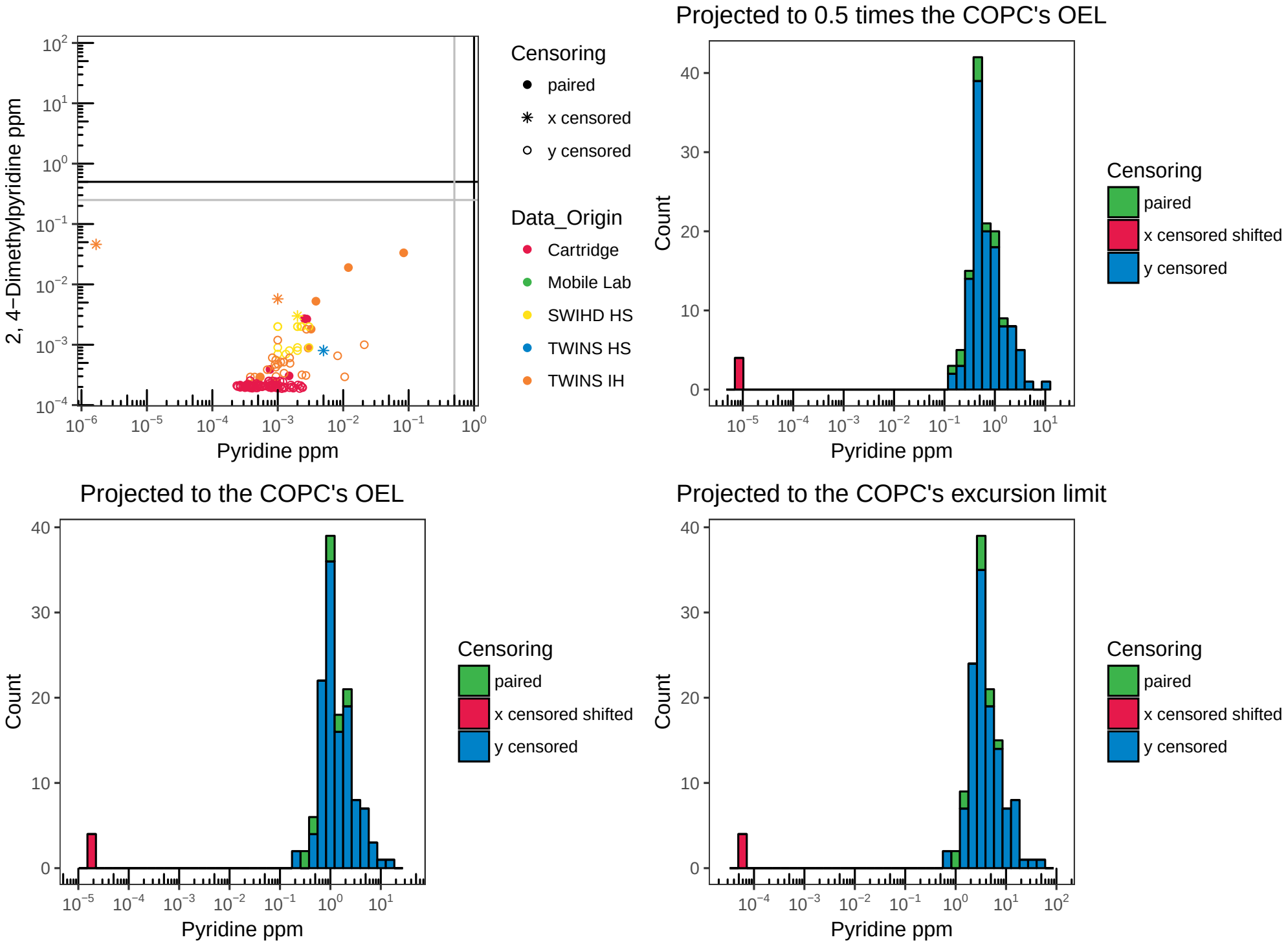


Figure C.2485: 2, 4-Dimethylpyridine vs Pyridine

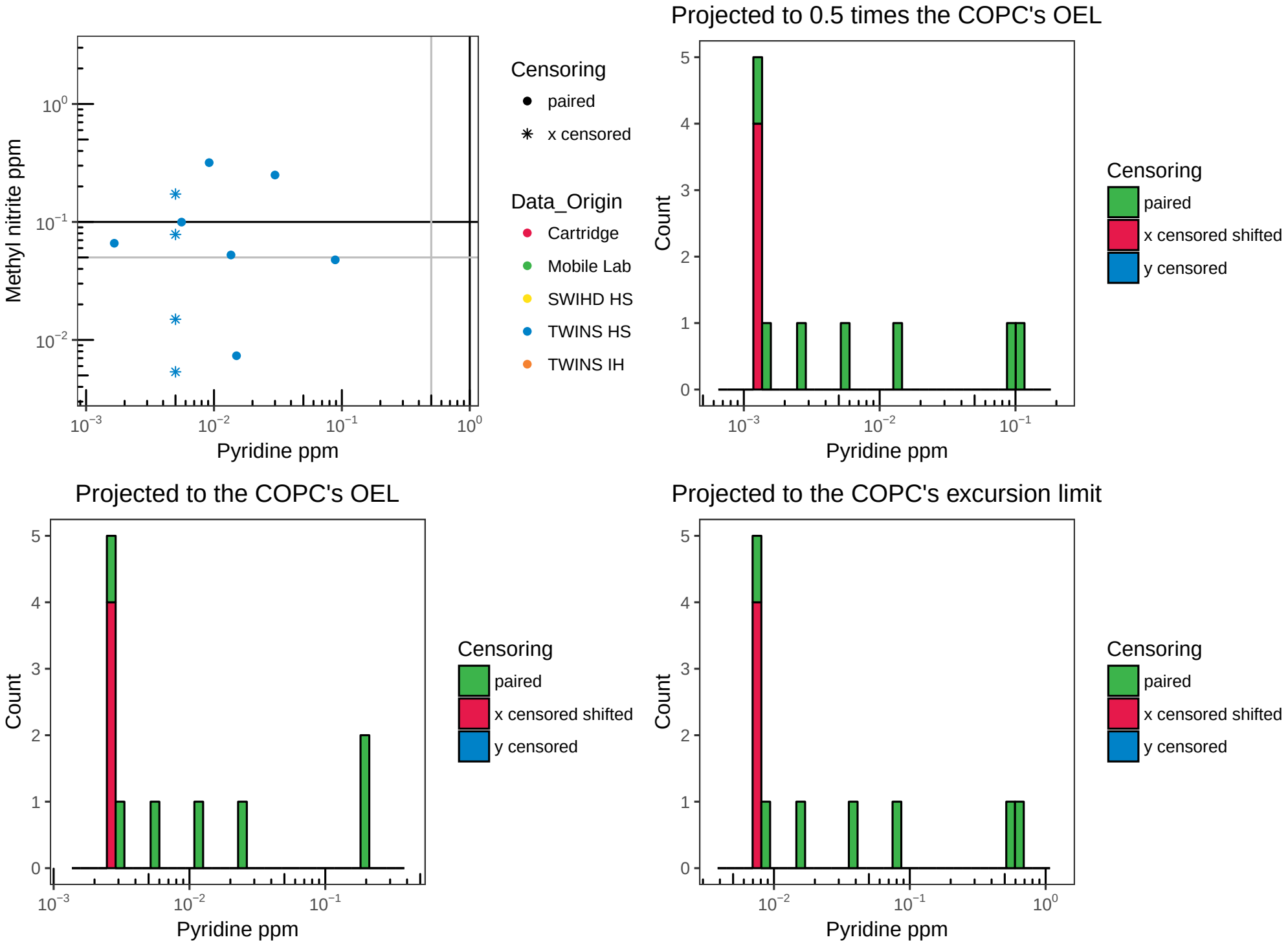


Figure C.2486: Methyl nitrite vs Pyridine

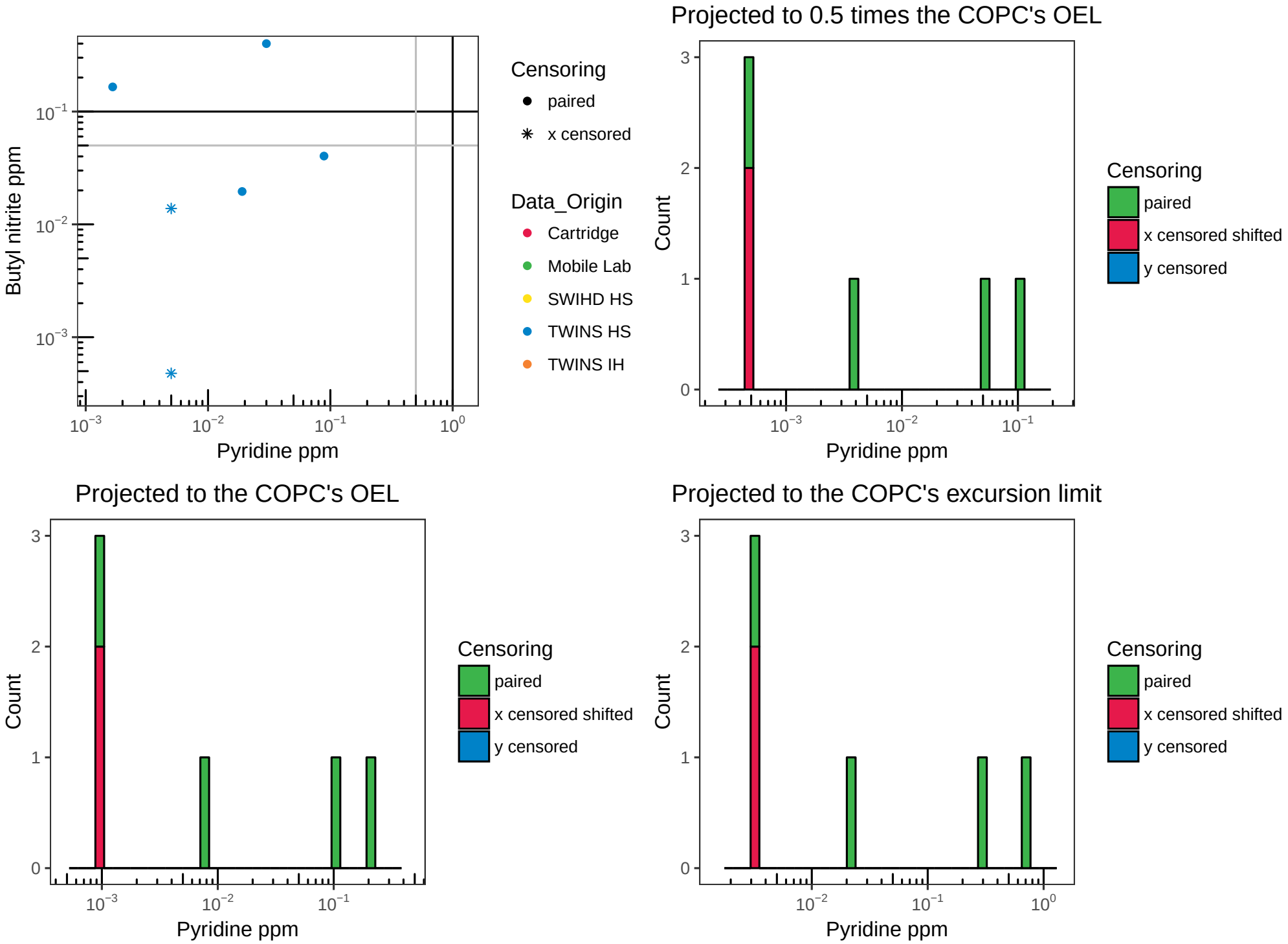


Figure C.2487: Butyl nitrite vs Pyridine

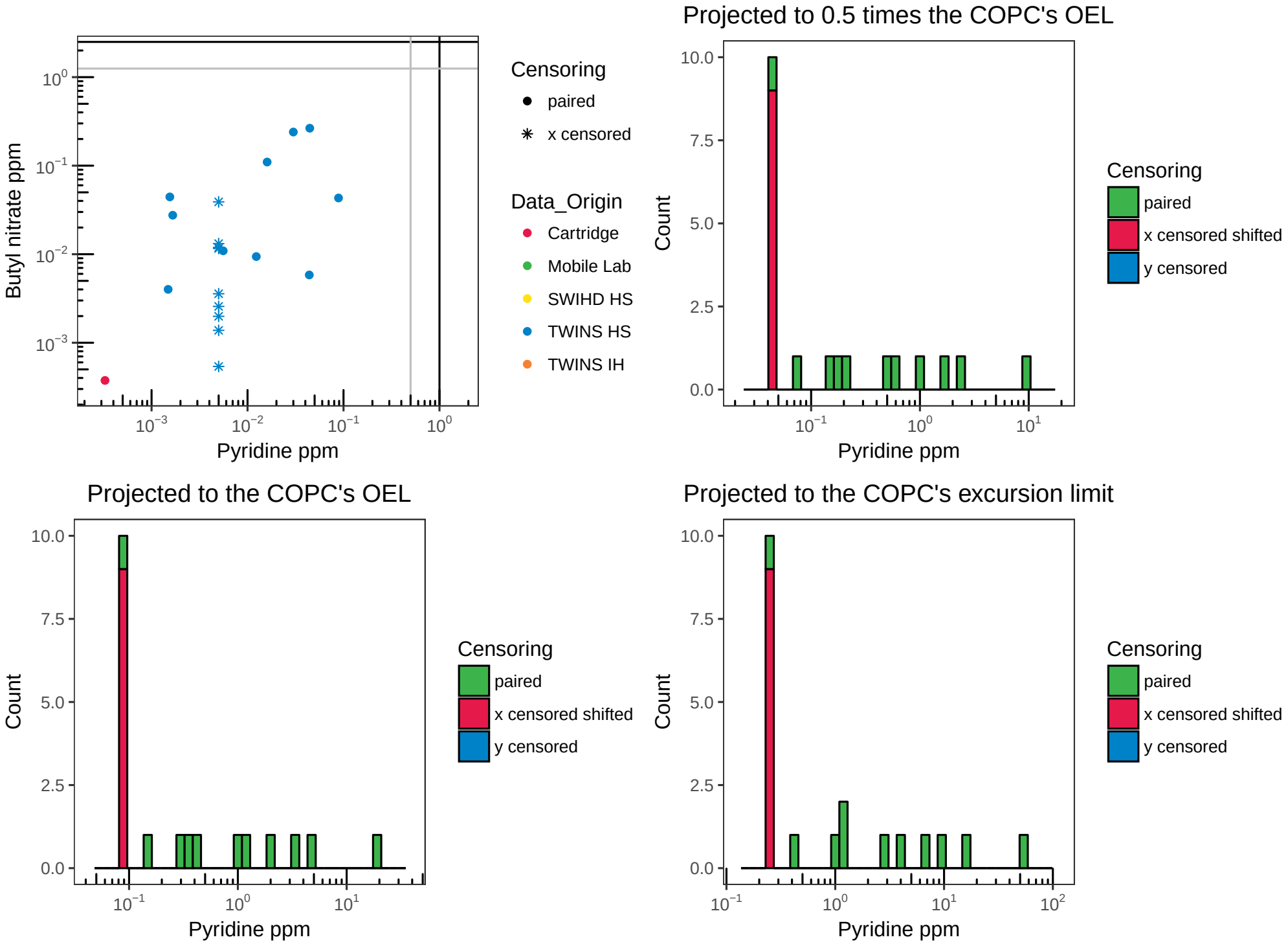


Figure C.2488: Butyl nitrate vs Pyridine

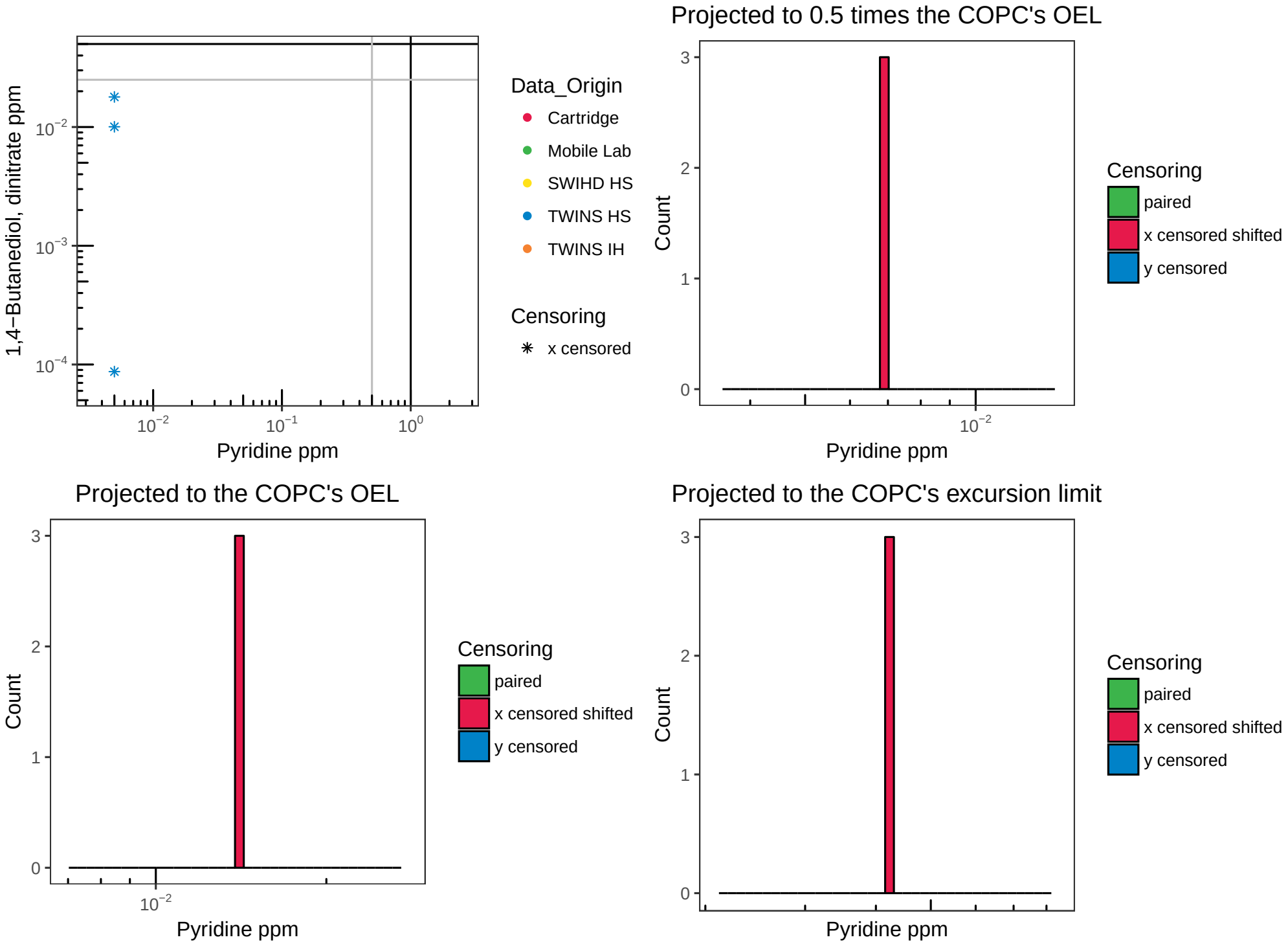


Figure C.2489: 1,4-Butanediol, dinitrate vs Pyridine

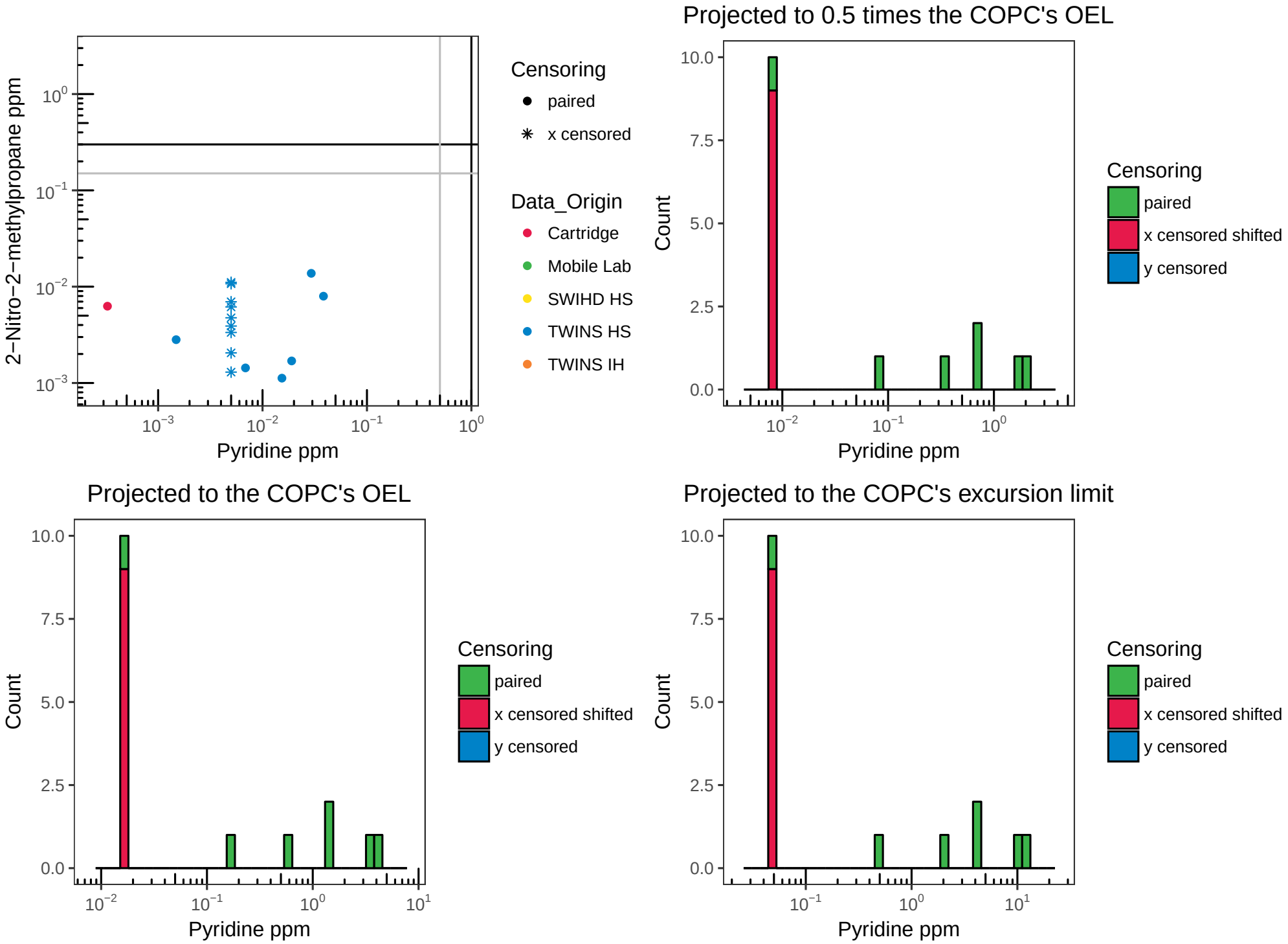


Figure C.2490: 2-Nitro-2-methylpropane vs Pyridine

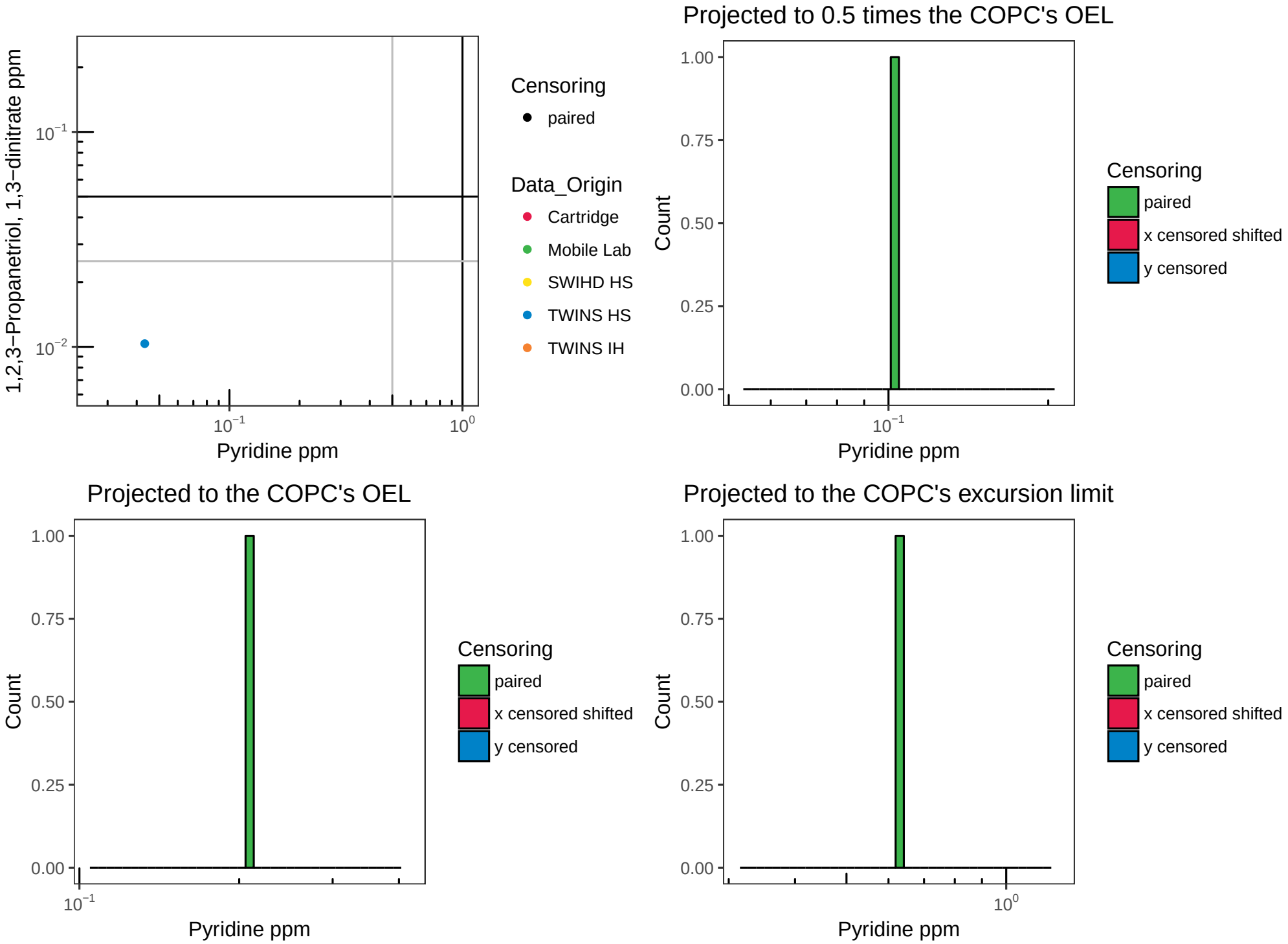


Figure C.2491: 1,2,3-Propanetriol, 1,3-dinitrate vs Pyridine

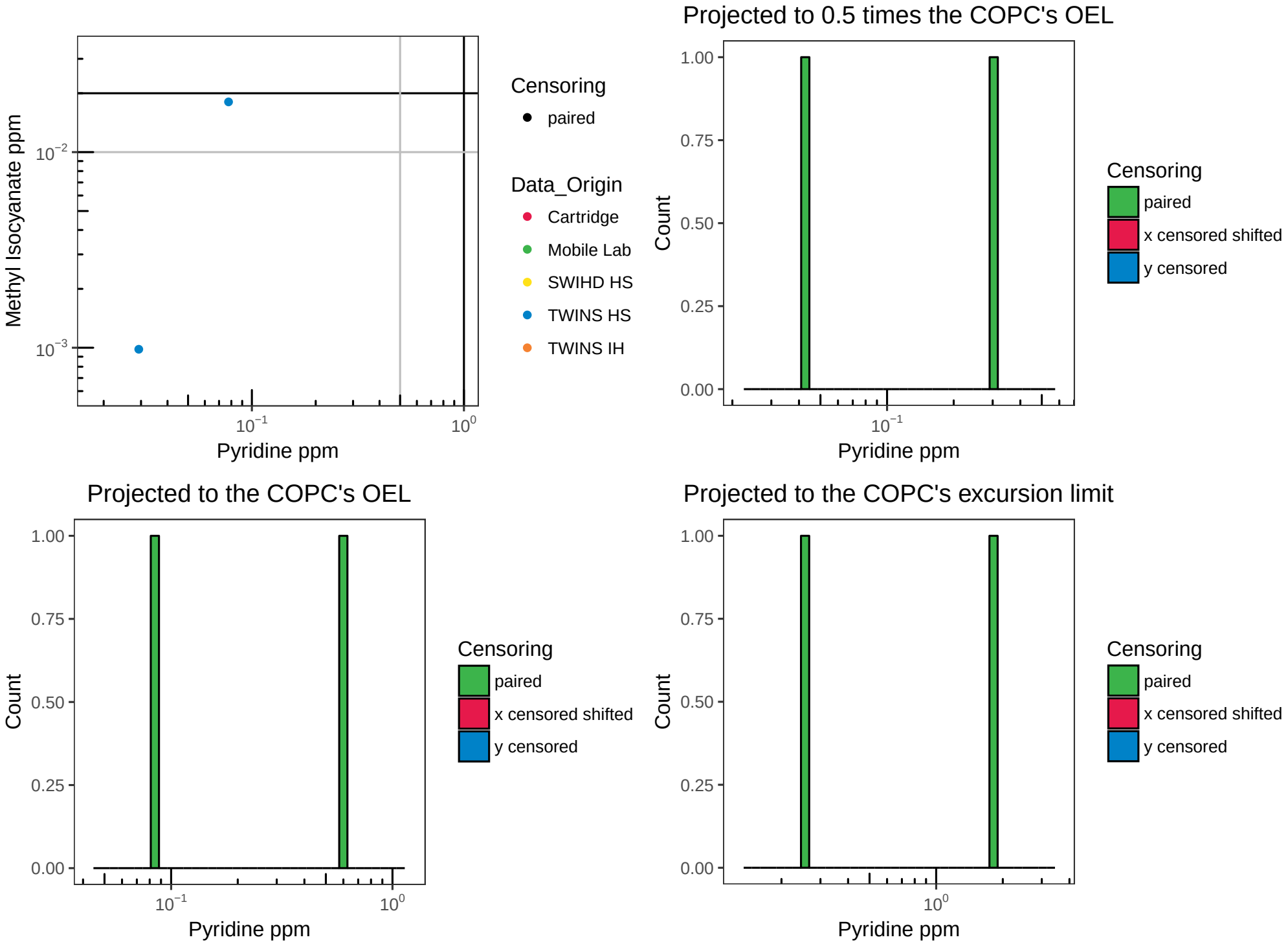


Figure C.2492: Methyl Isocyanate vs Pyridine

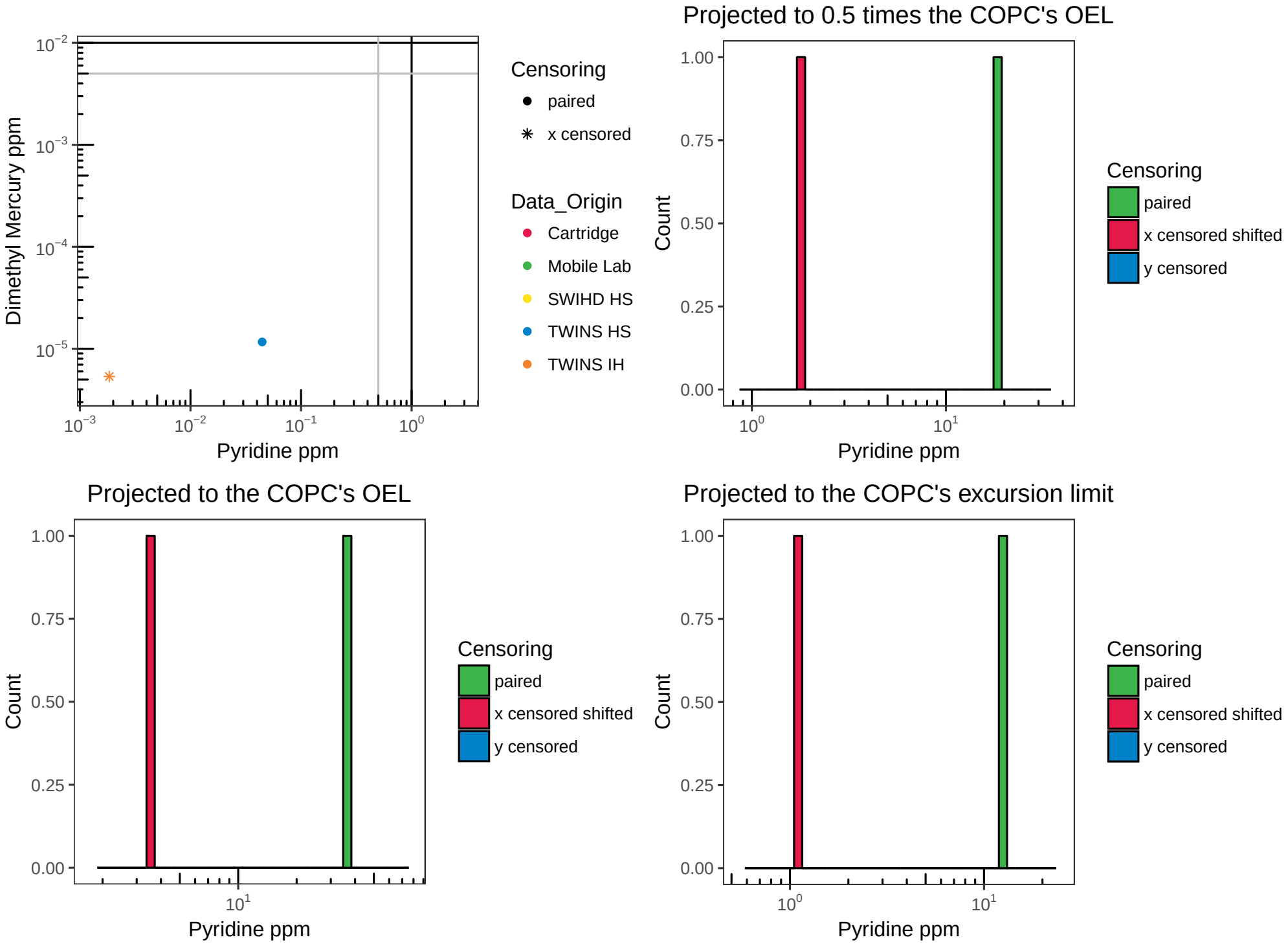


Figure C.2493: Dimethyl Mercury vs Pyridine

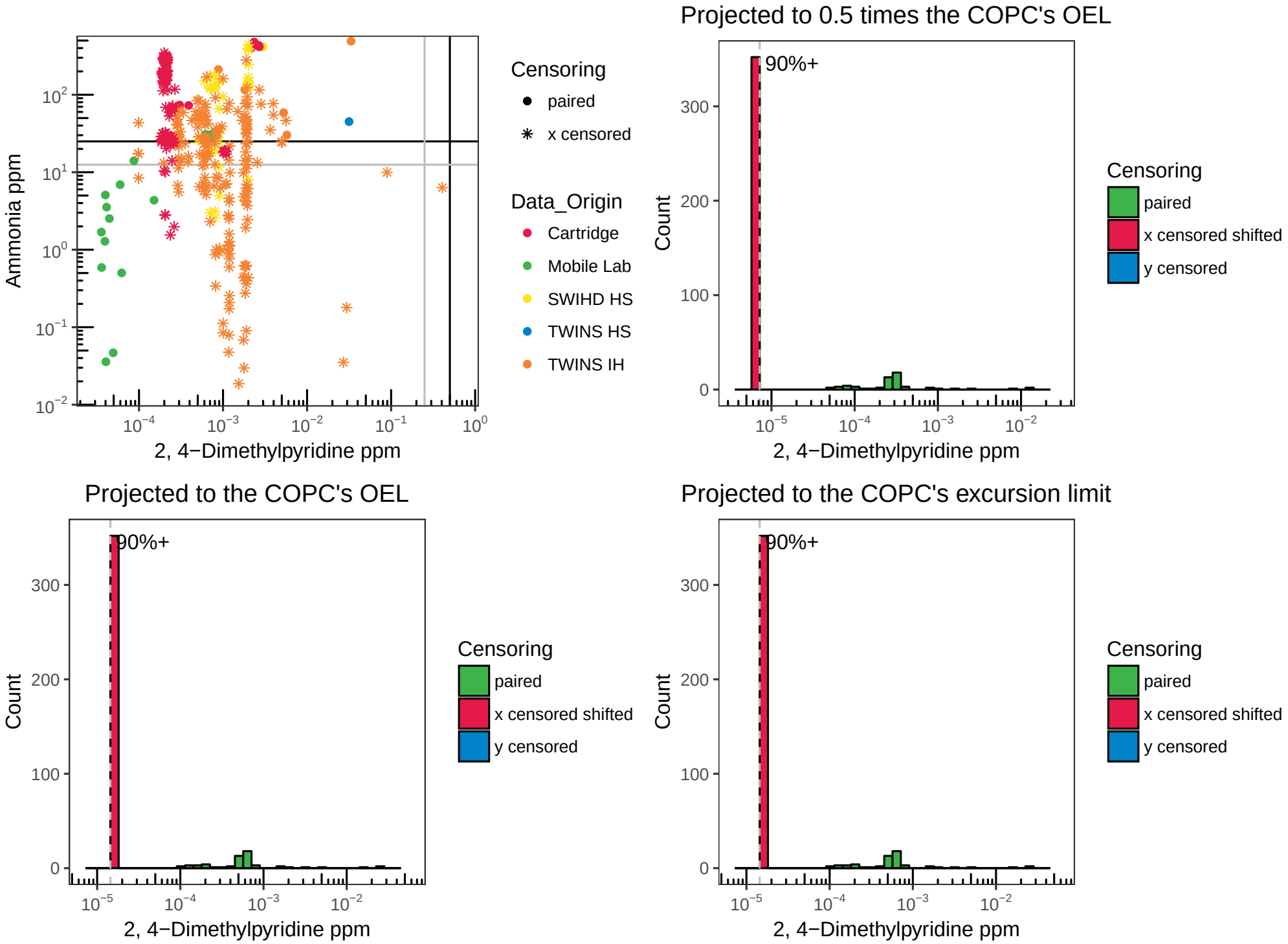


Figure C.2494: Ammonia vs 2, 4-Dimethylpyridine

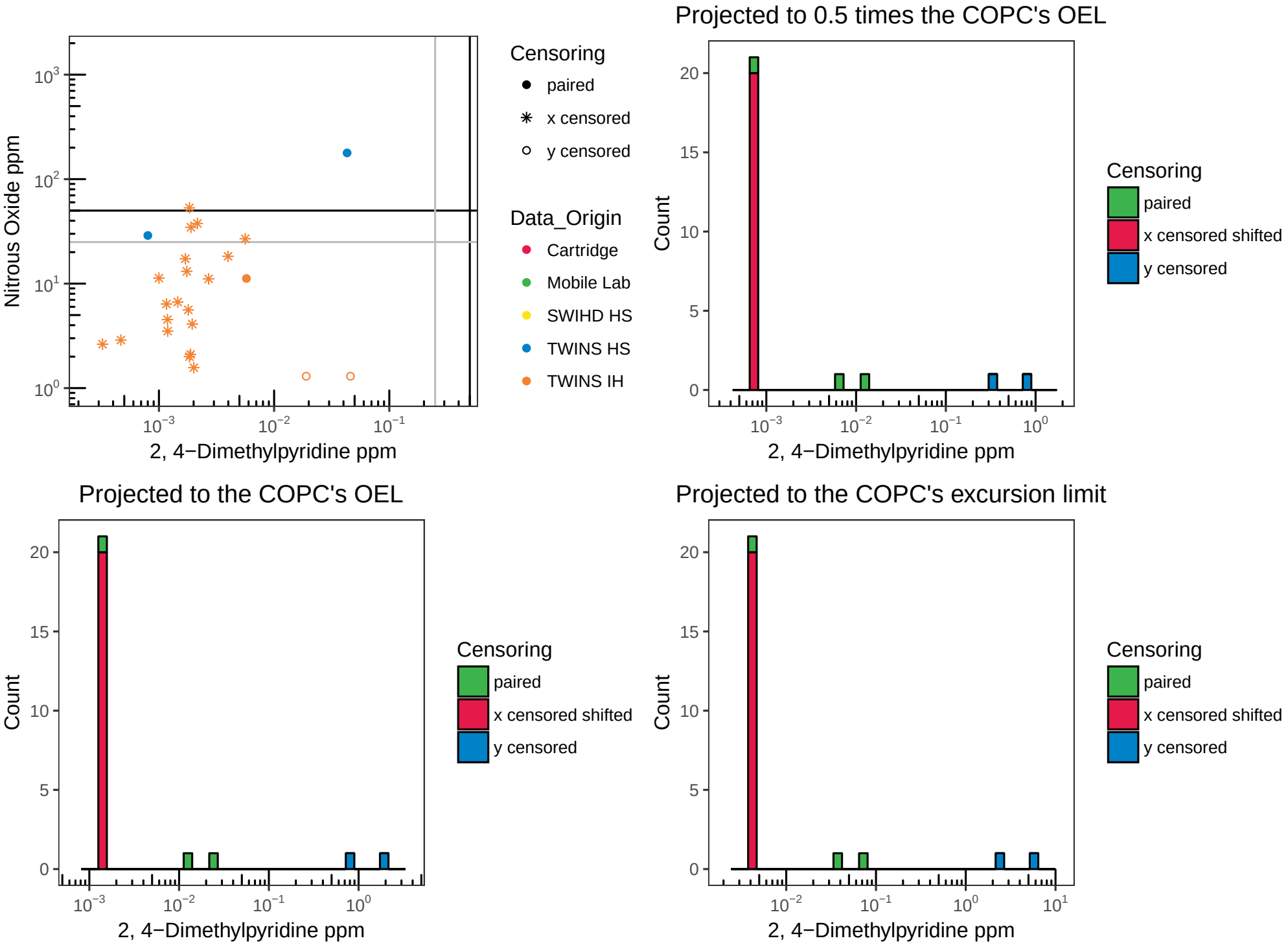


Figure C.2495: Nitrous Oxide vs 2, 4-Dimethylpyridine

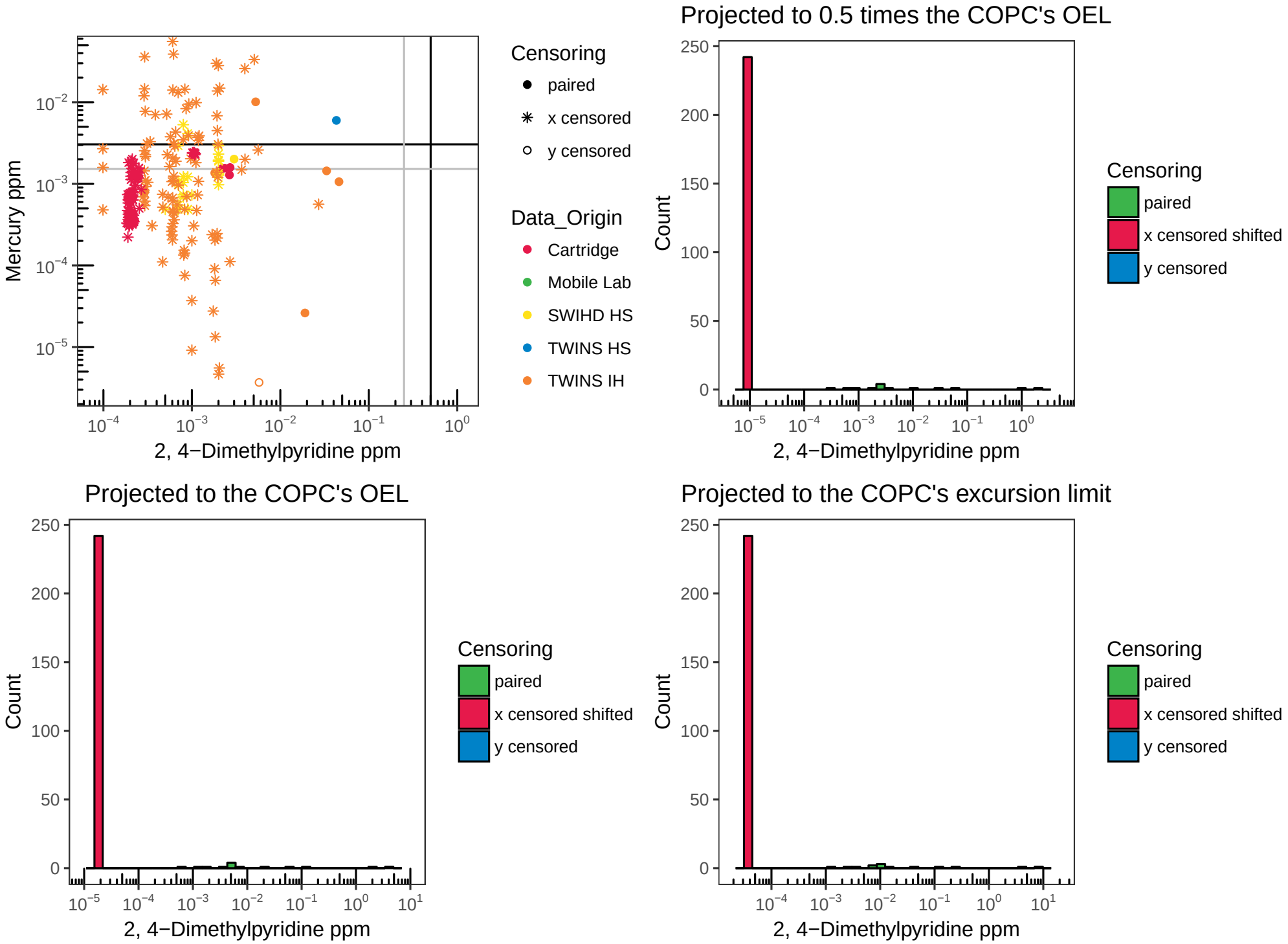


Figure C.2496: Mercury vs 2, 4-Dimethylpyridine

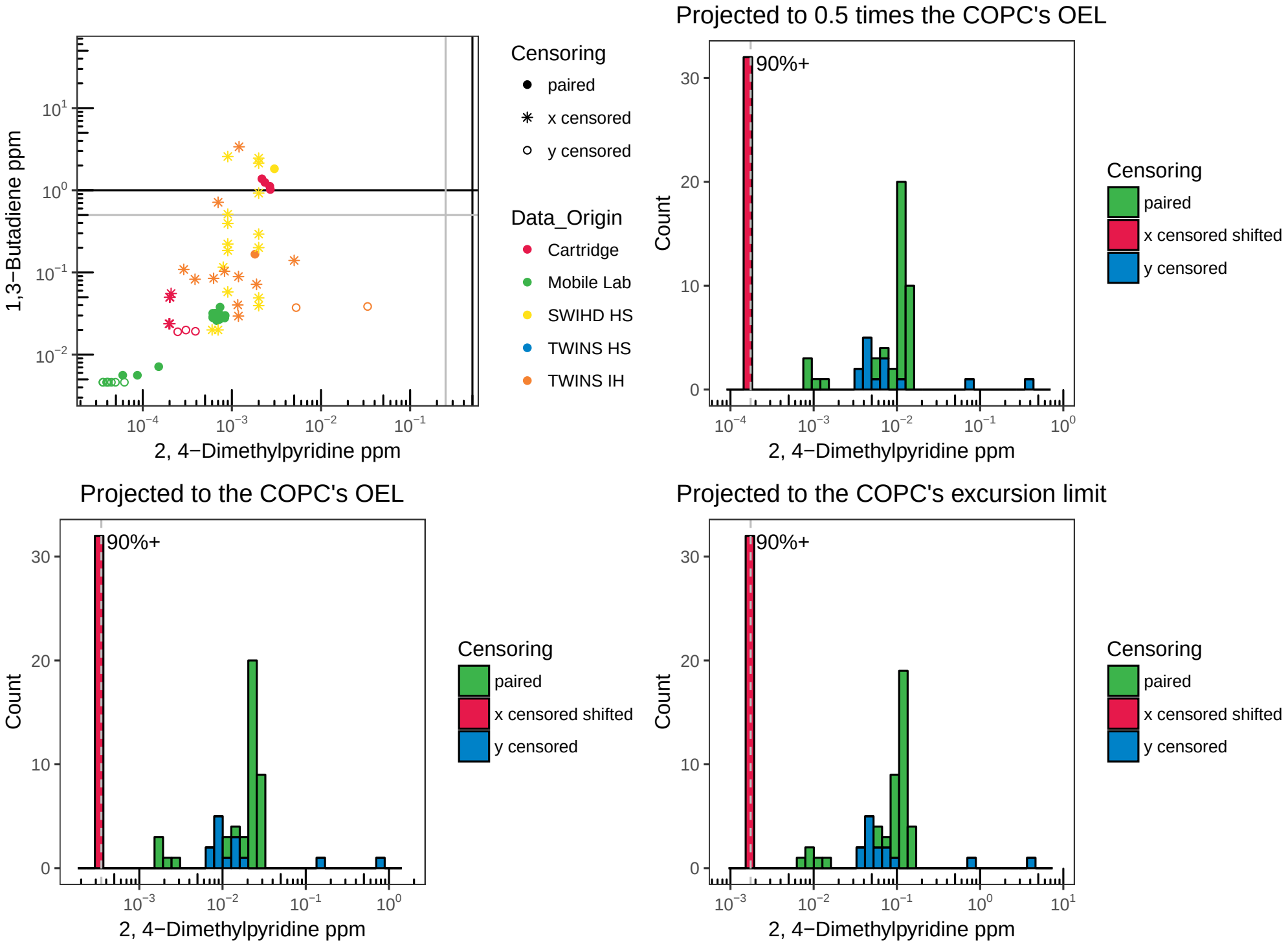


Figure C.2497: 1,3-Butadiene vs 2, 4-Dimethylpyridine

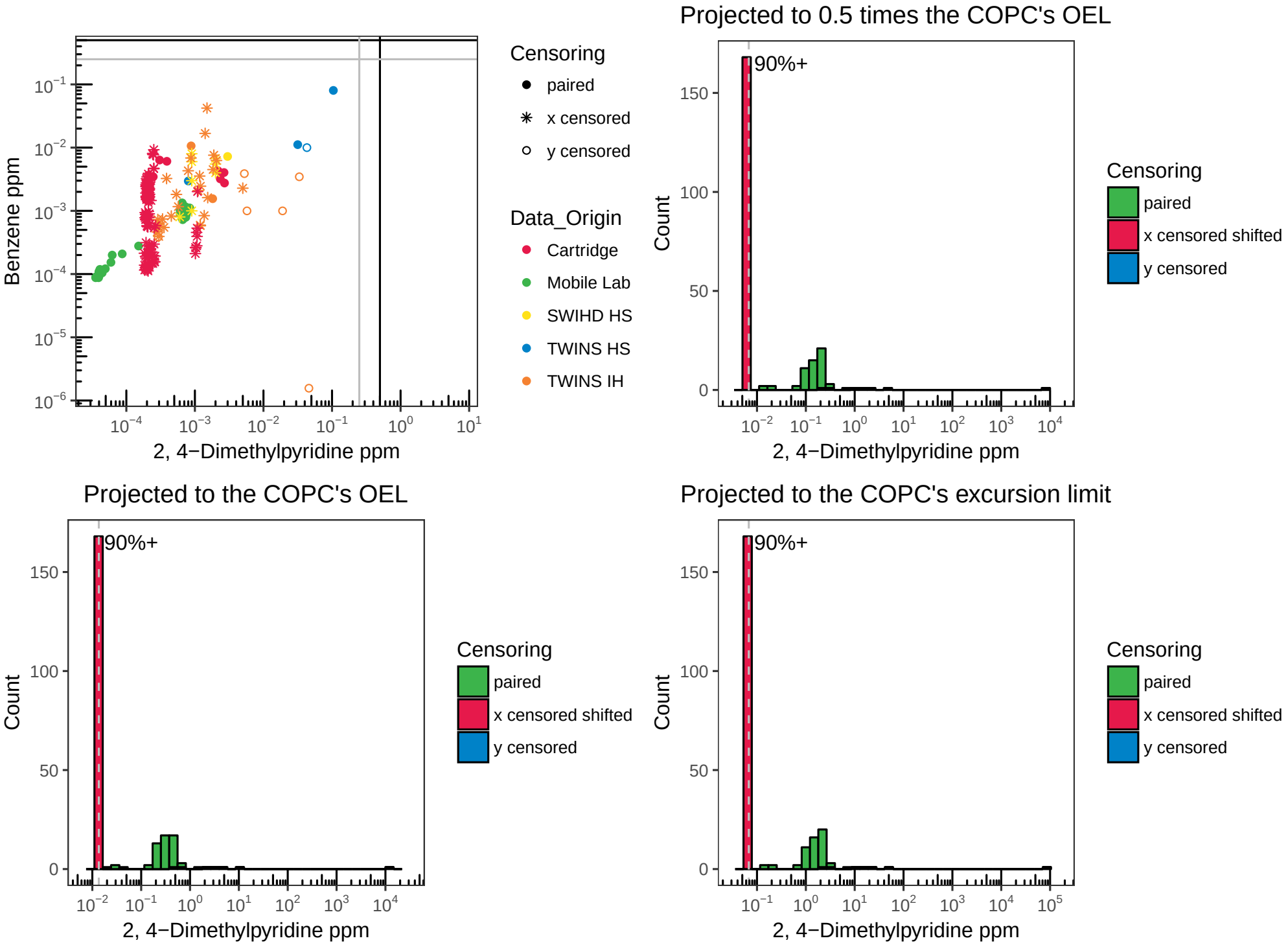


Figure C.2498: Benzene vs 2, 4-Dimethylpyridine

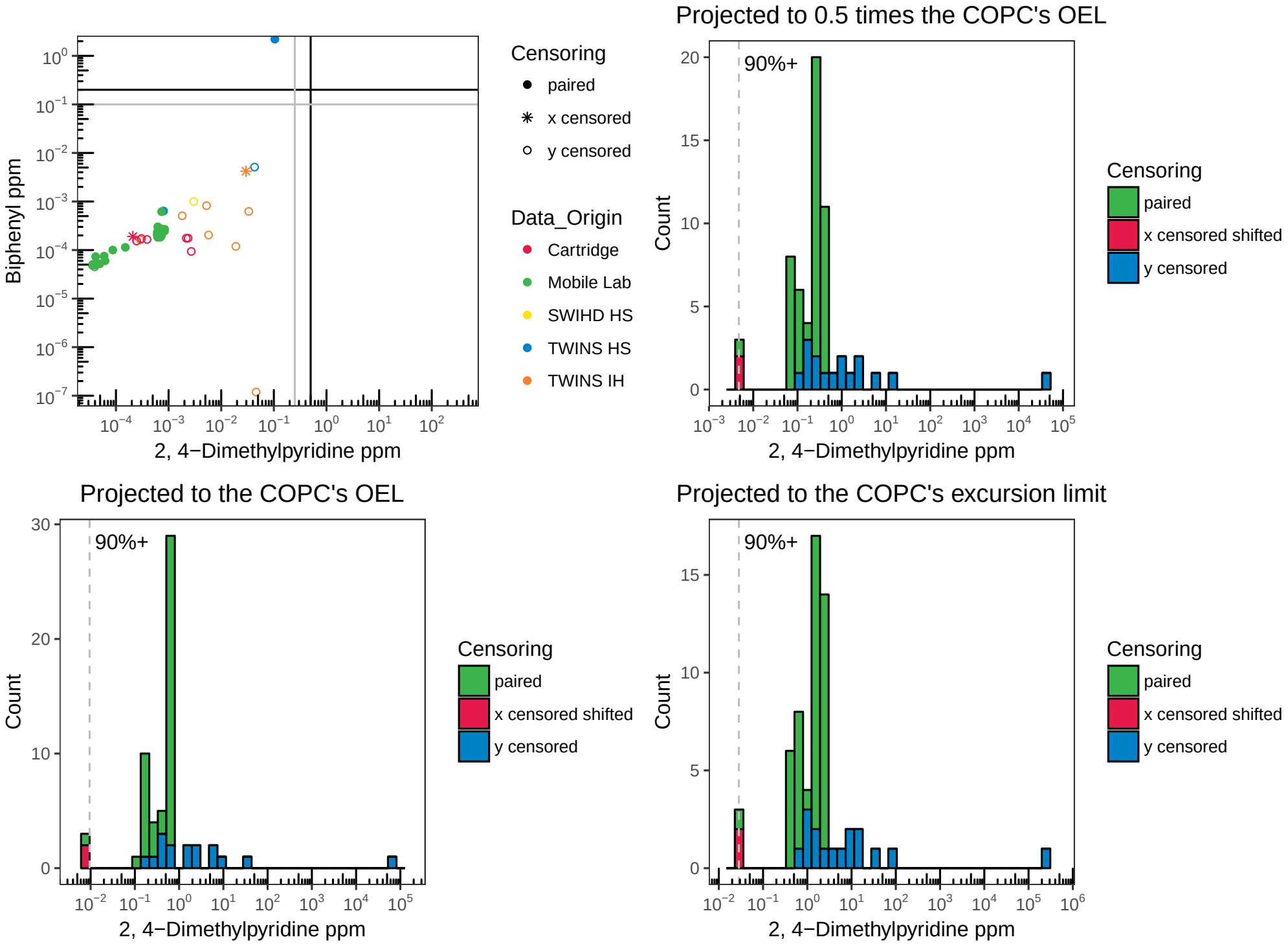


Figure C.2499: Biphenyl vs 2, 4-Dimethylpyridine

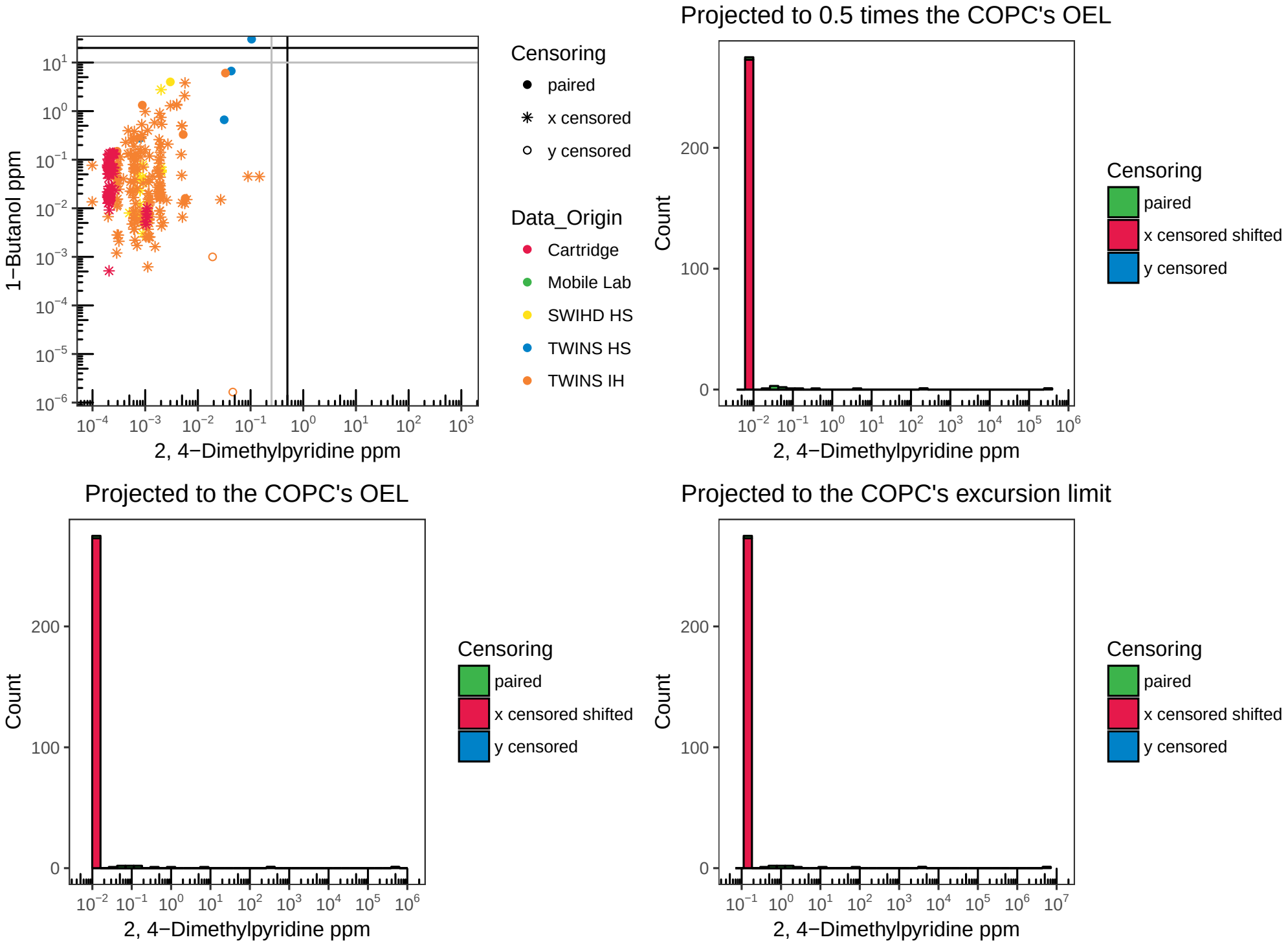


Figure C.2500: 1-Butanol vs 2, 4-Dimethylpyridine

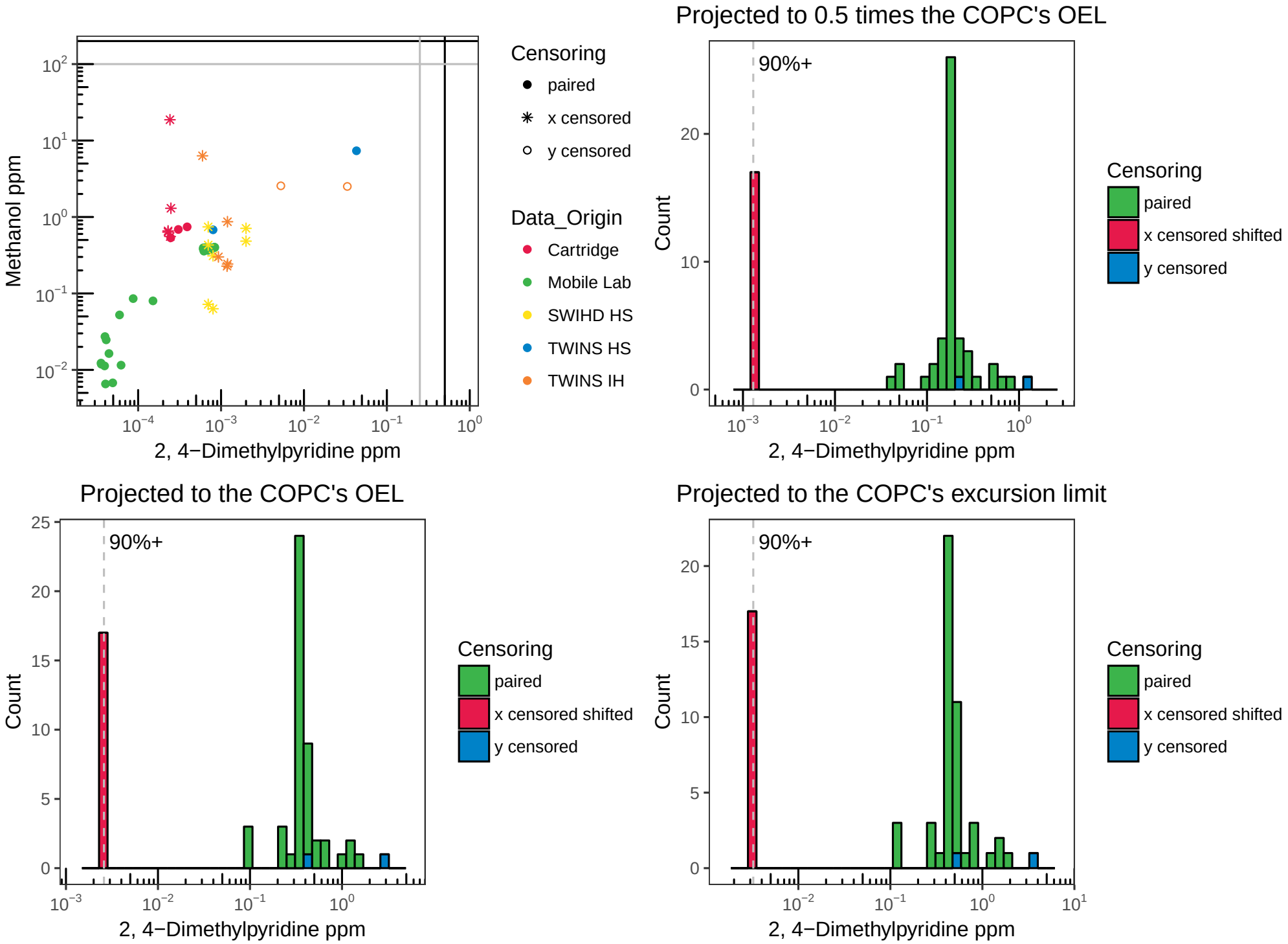


Figure C.2501: Methanol vs 2, 4-Dimethylpyridine

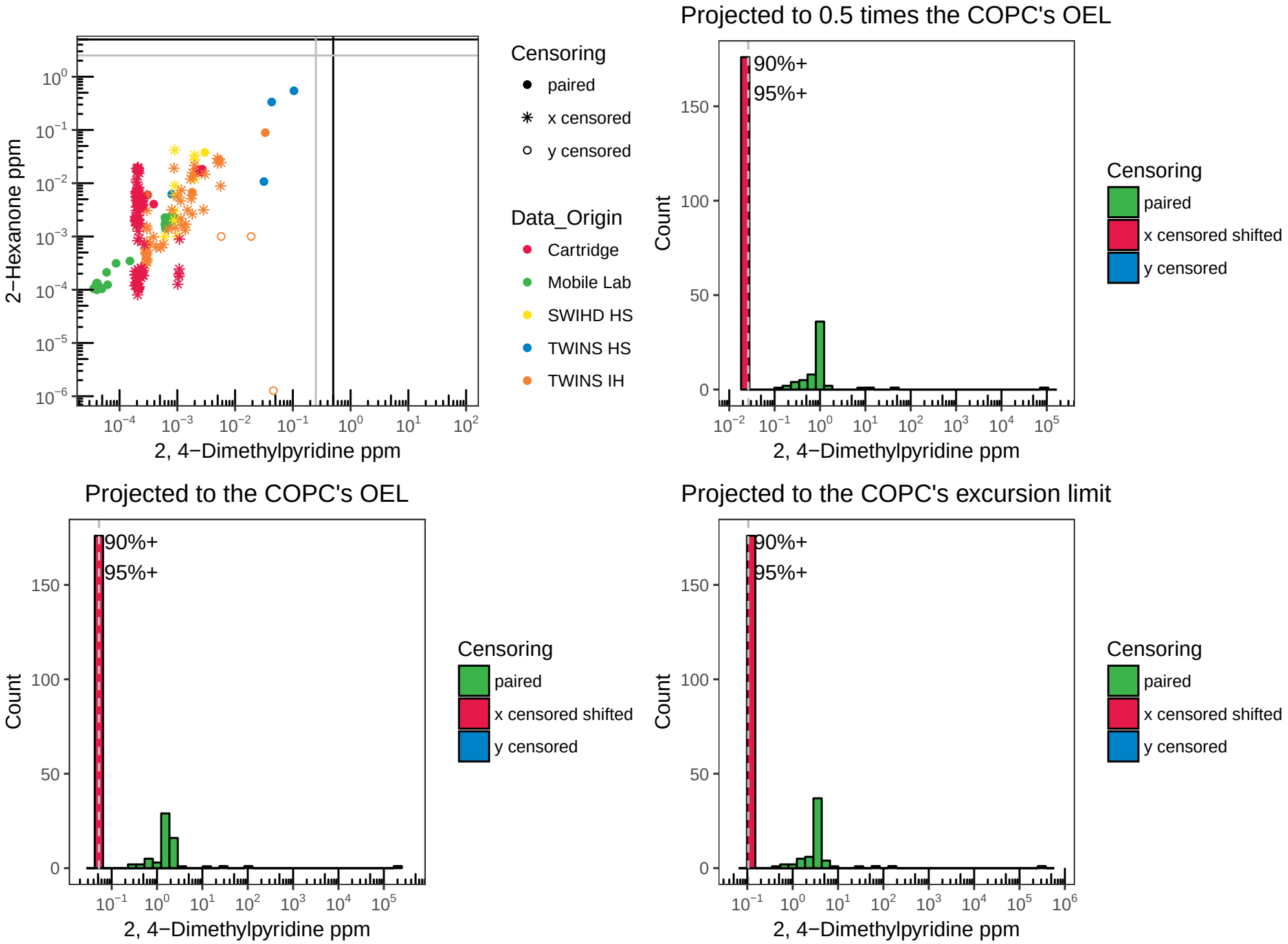


Figure C.2502: 2-Hexanone vs 2, 4-Dimethylpyridine

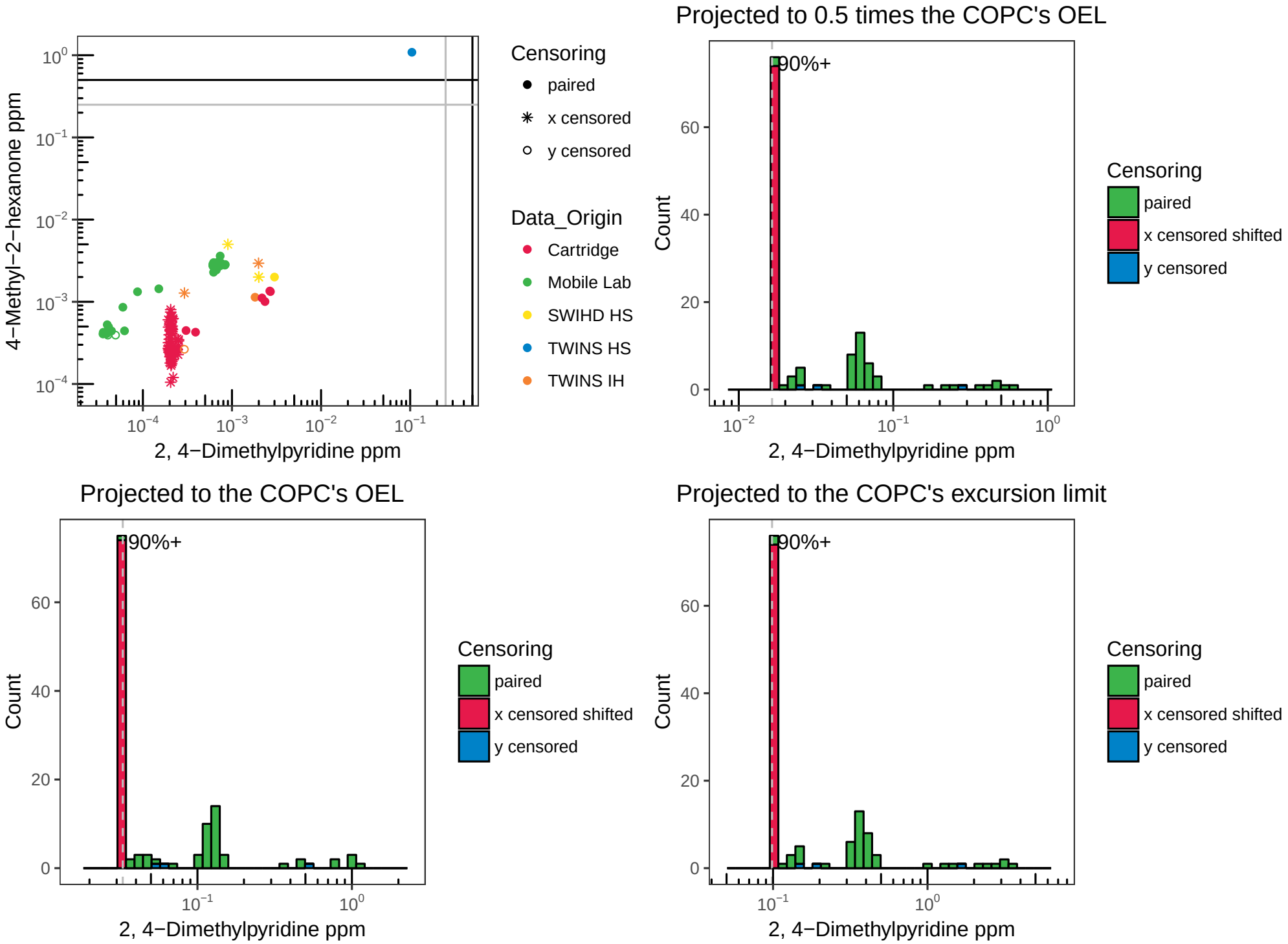


Figure C.2503: 4-Methyl-2-hexanone vs 2, 4-Dimethylpyridine

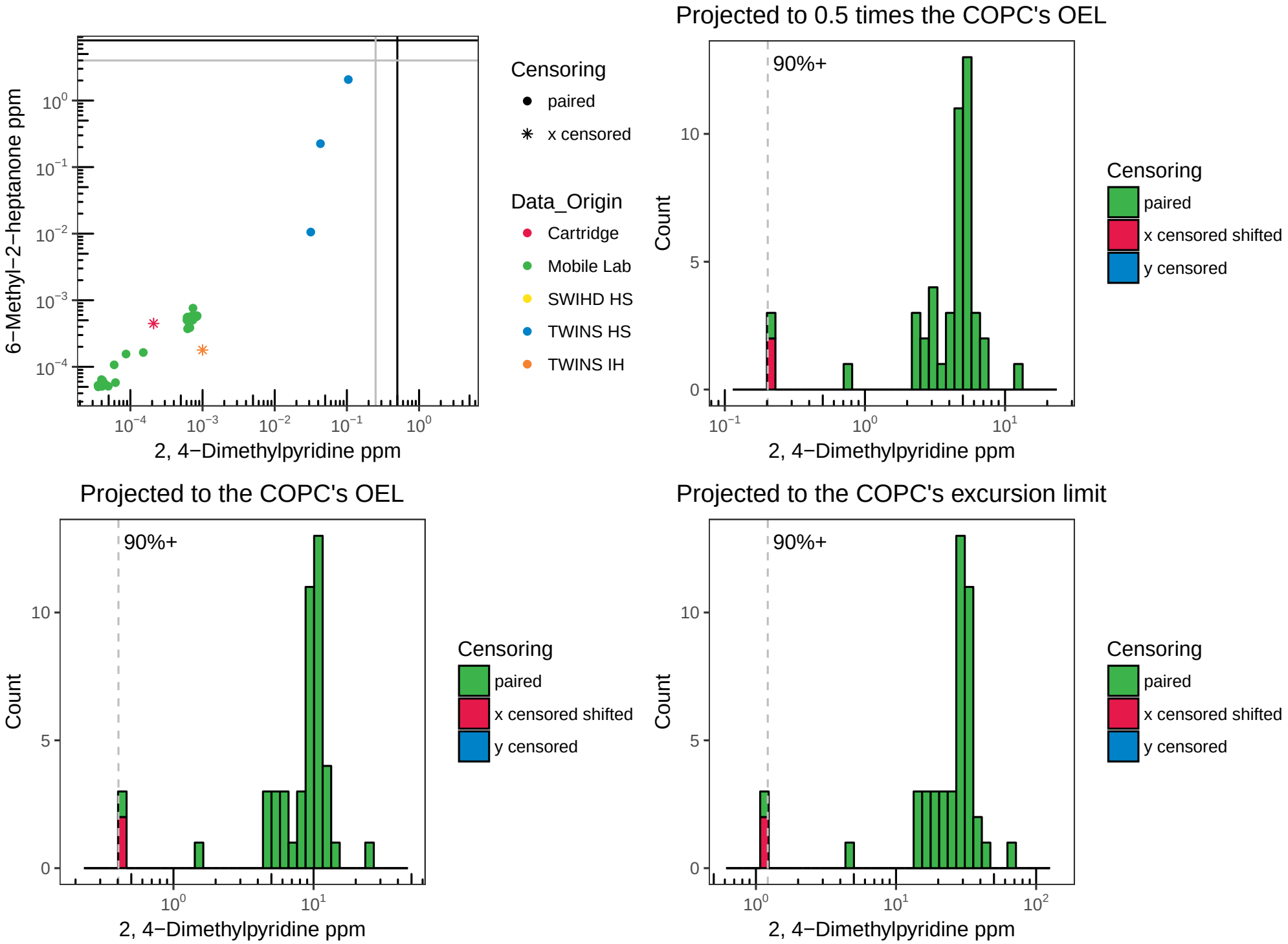


Figure C.2504: 6-Methyl-2-heptanone vs 2, 4-Dimethylpyridine

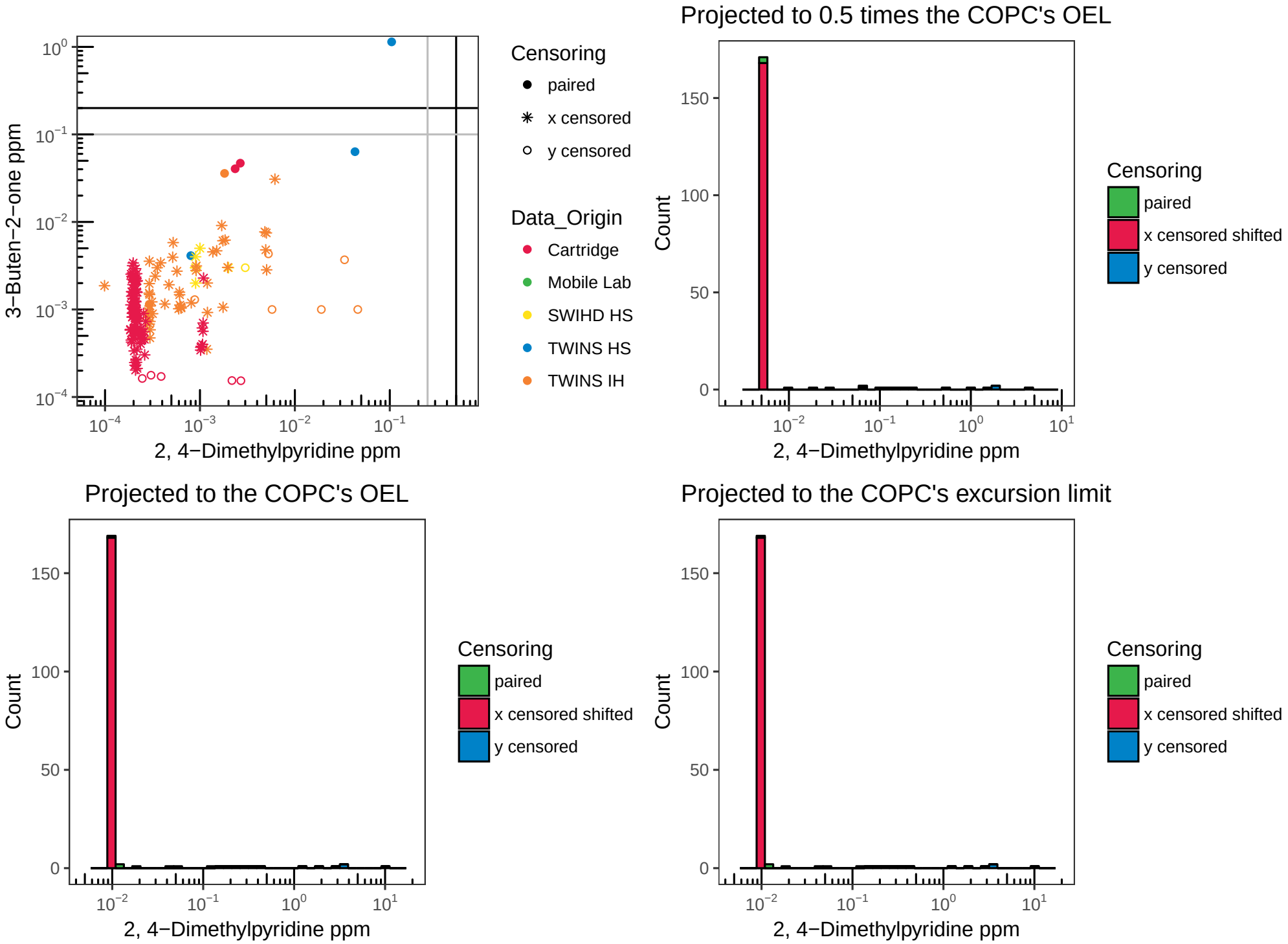


Figure C.2505: 3-Buten-2-one vs 2, 4-Dimethylpyridine

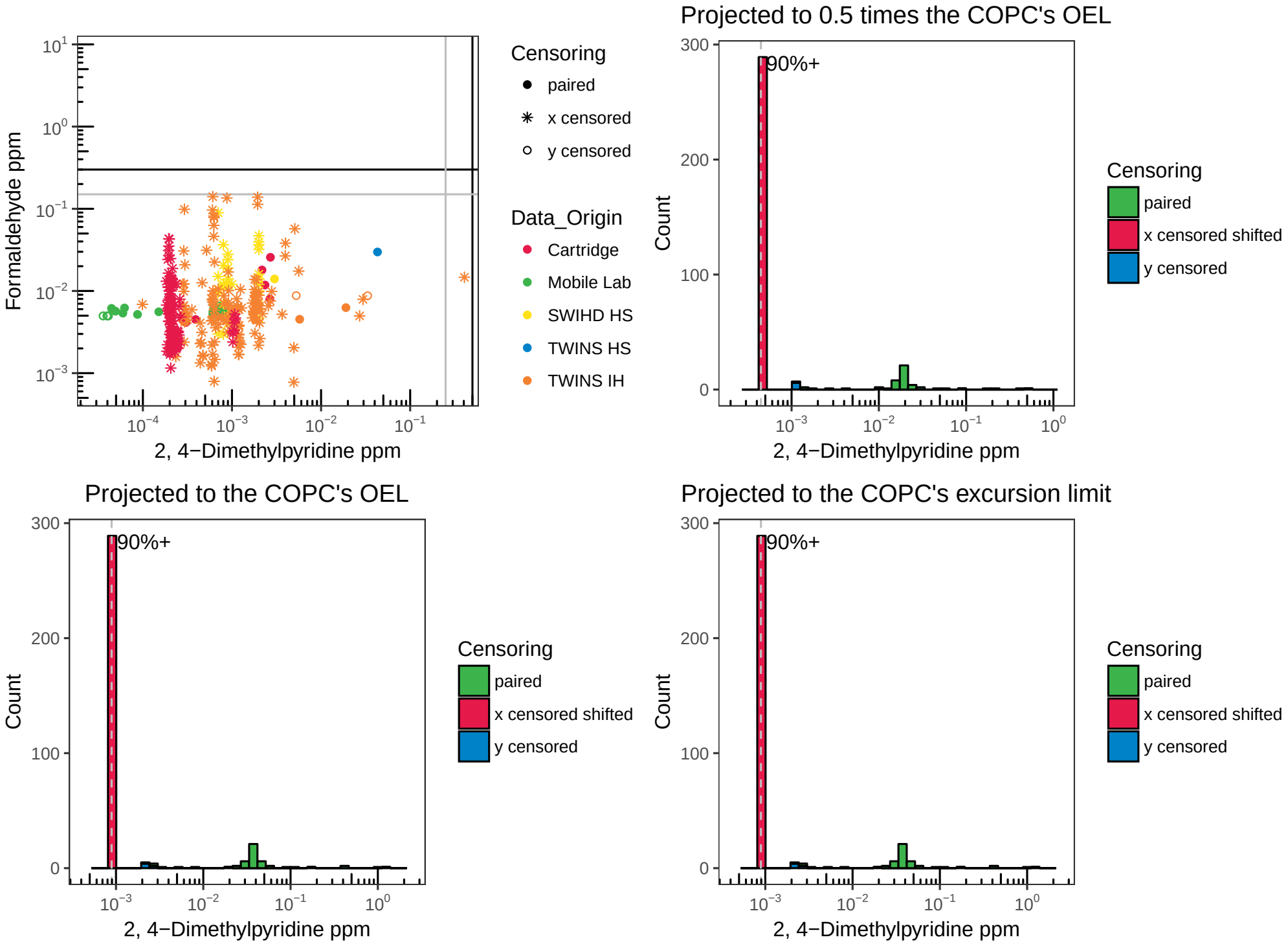


Figure C.2506: Formaldehyde vs 2, 4-Dimethylpyridine

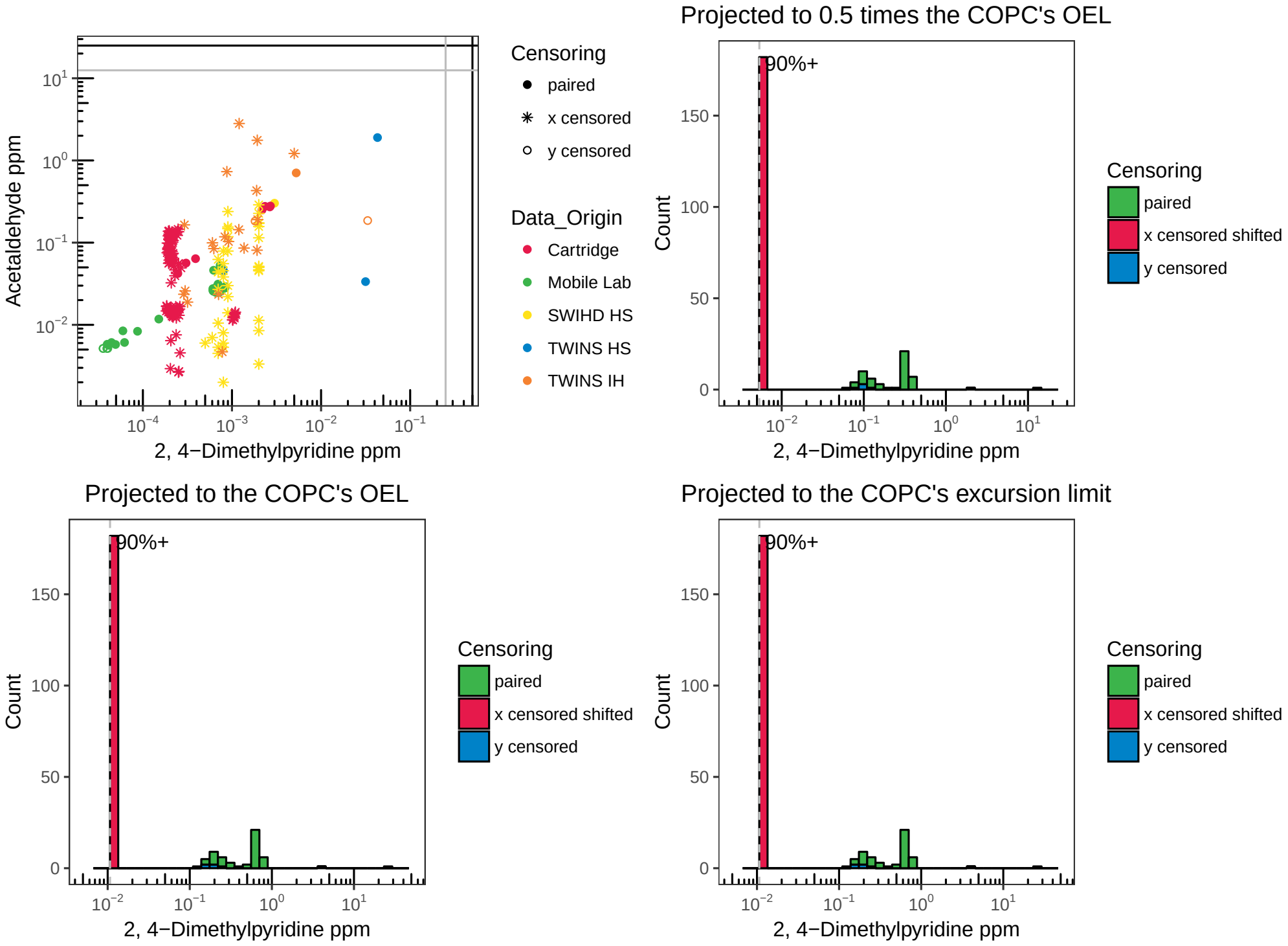


Figure C.2507: Acetaldehyde vs 2, 4-Dimethylpyridine

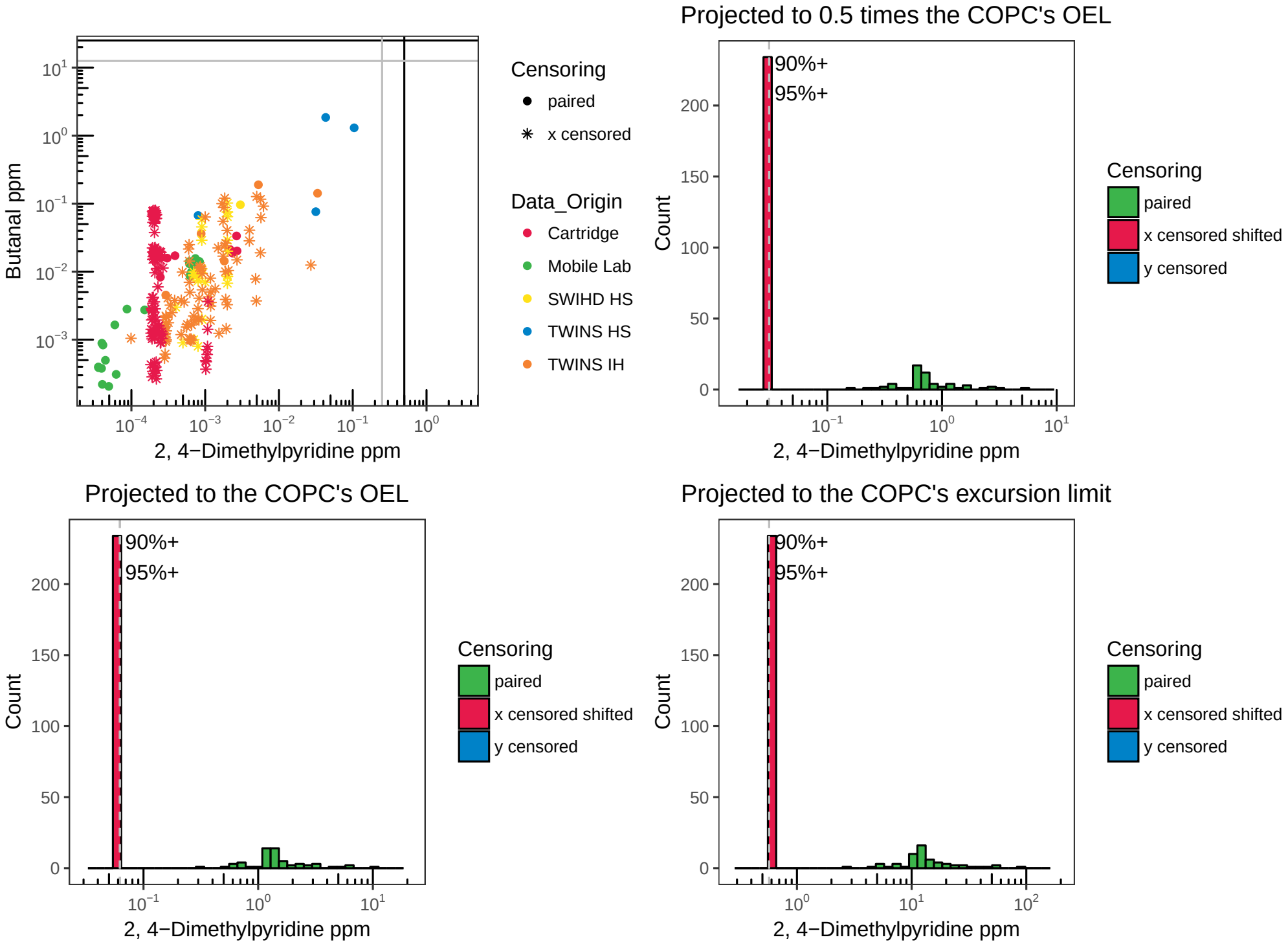


Figure C.2508: Butanal vs 2, 4-Dimethylpyridine

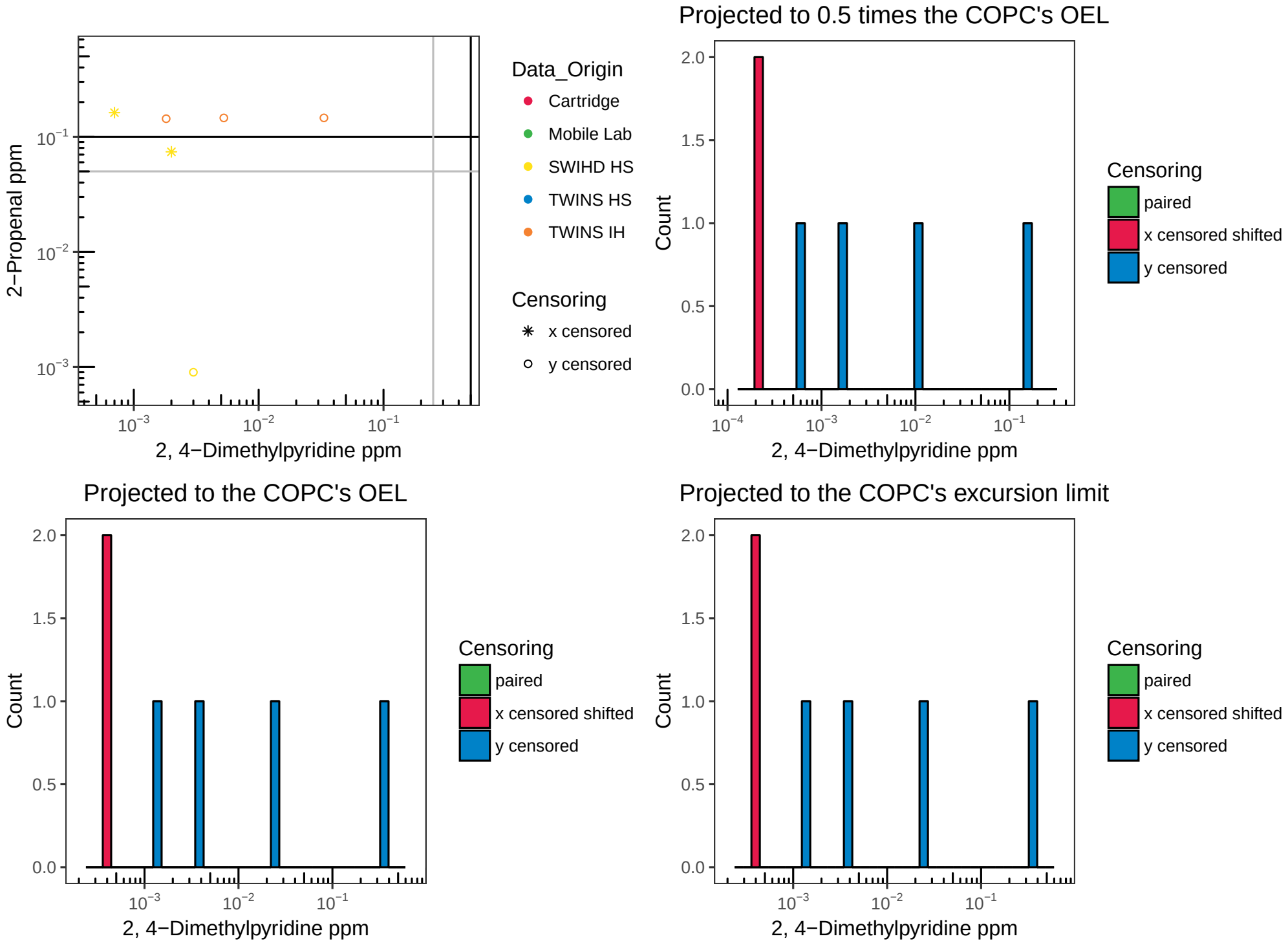


Figure C.2509: 2-Propenal vs 2, 4-Dimethylpyridine

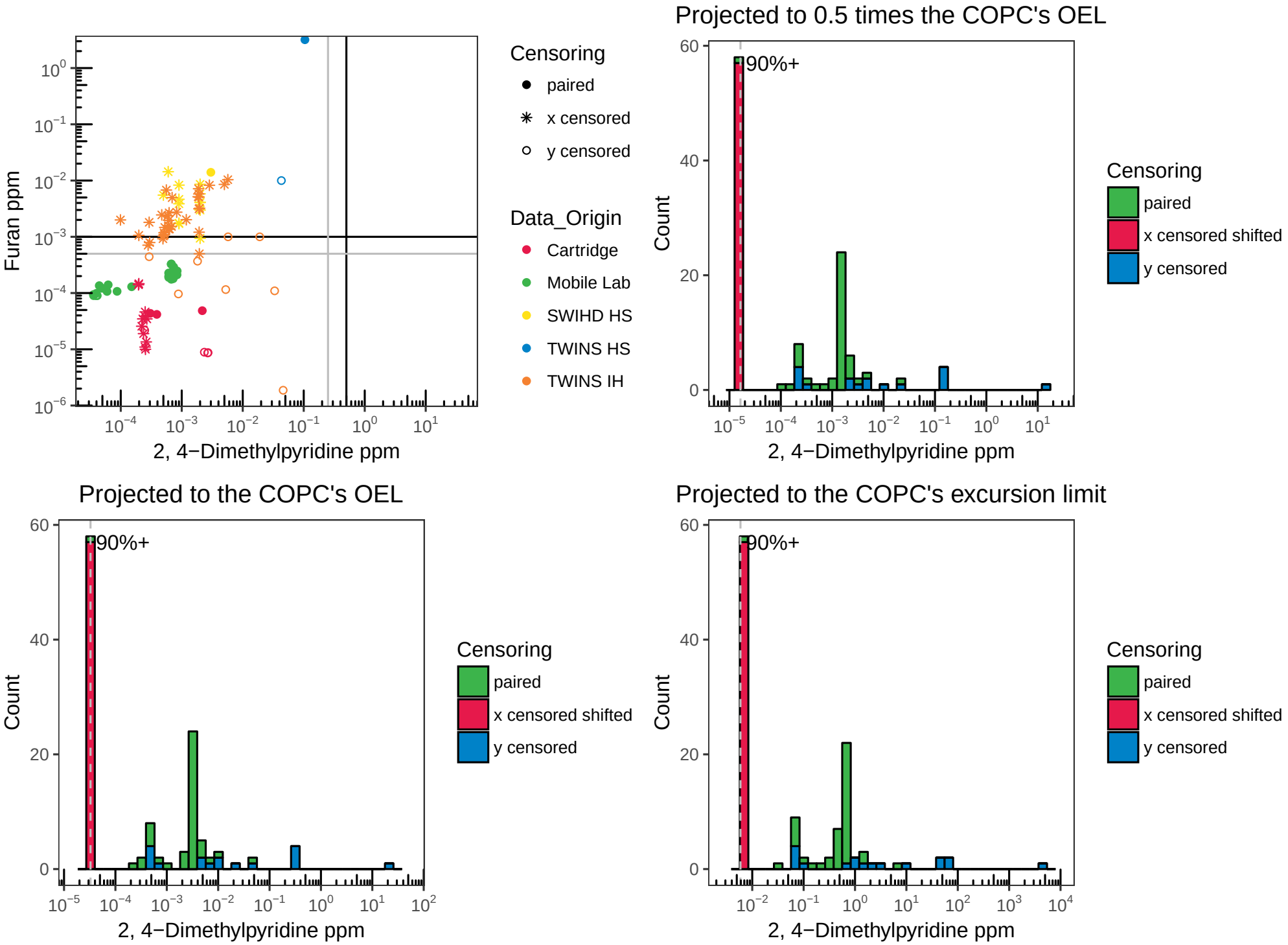


Figure C.2510: Furan vs 2, 4-Dimethylpyridine

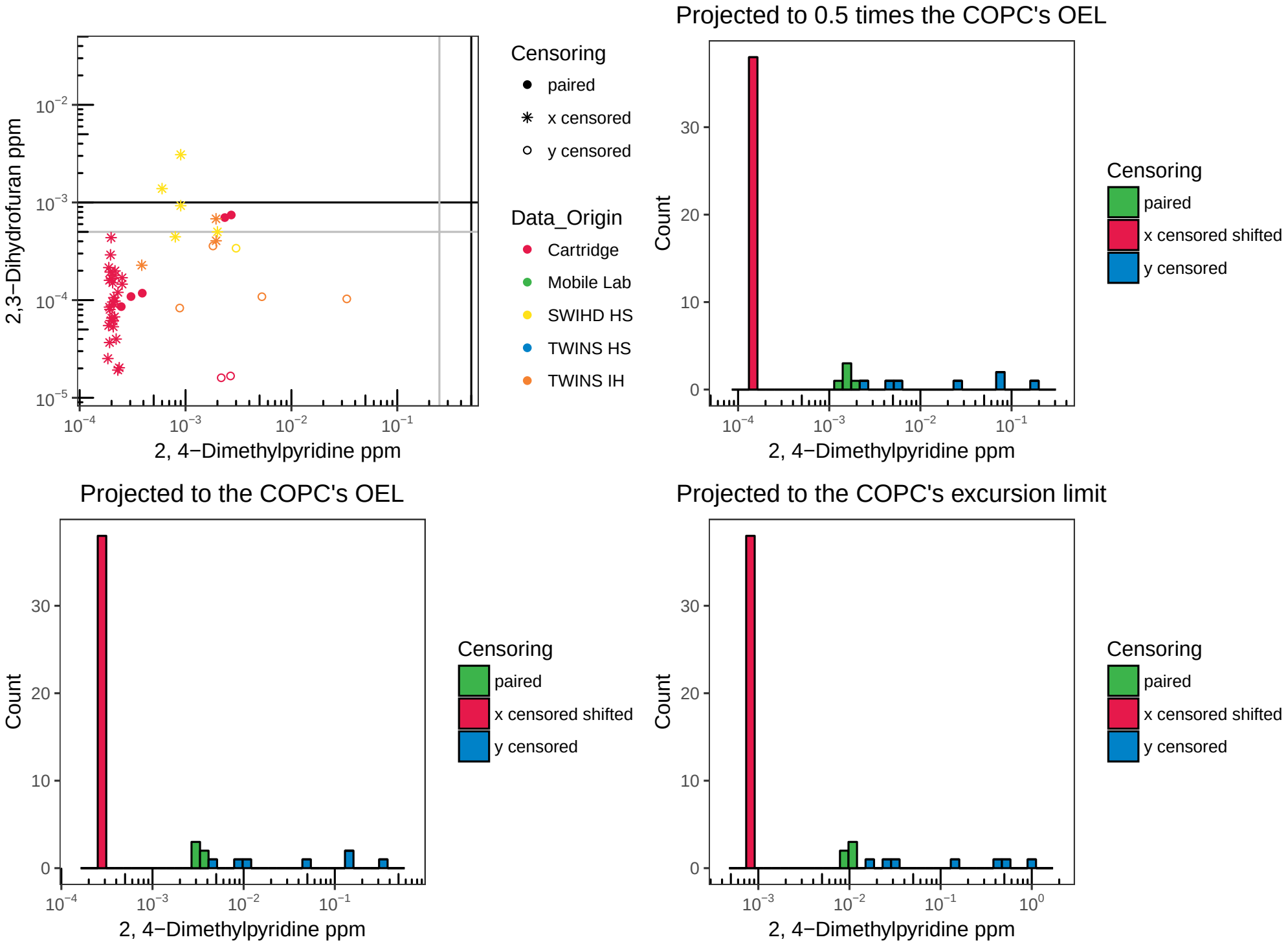


Figure C.2511: 2,3-Dihydrofuran vs 2, 4-Dimethylpyridine

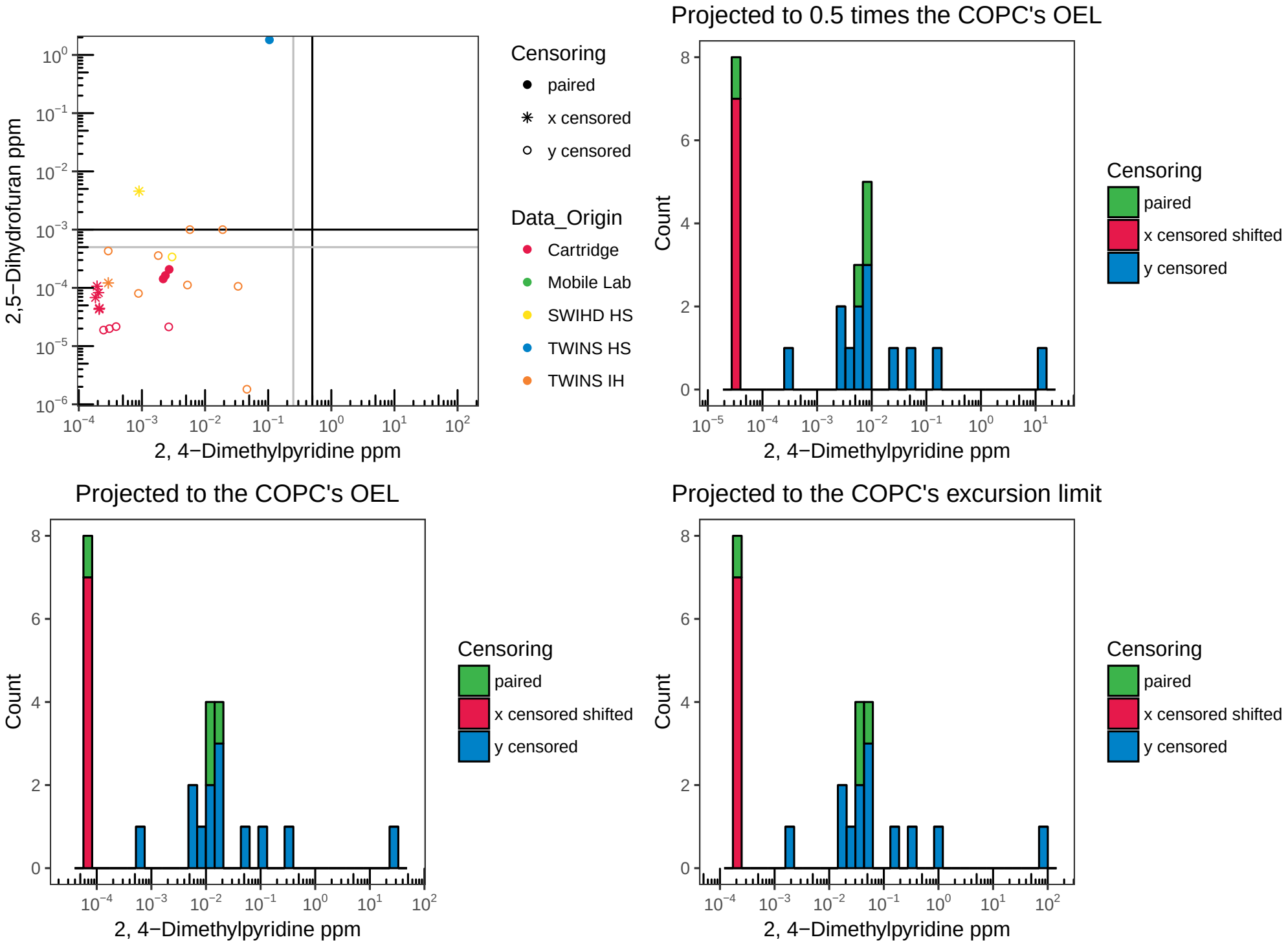


Figure C.2512: 2,5-Dihydrofuran vs 2, 4-Dimethylpyridine

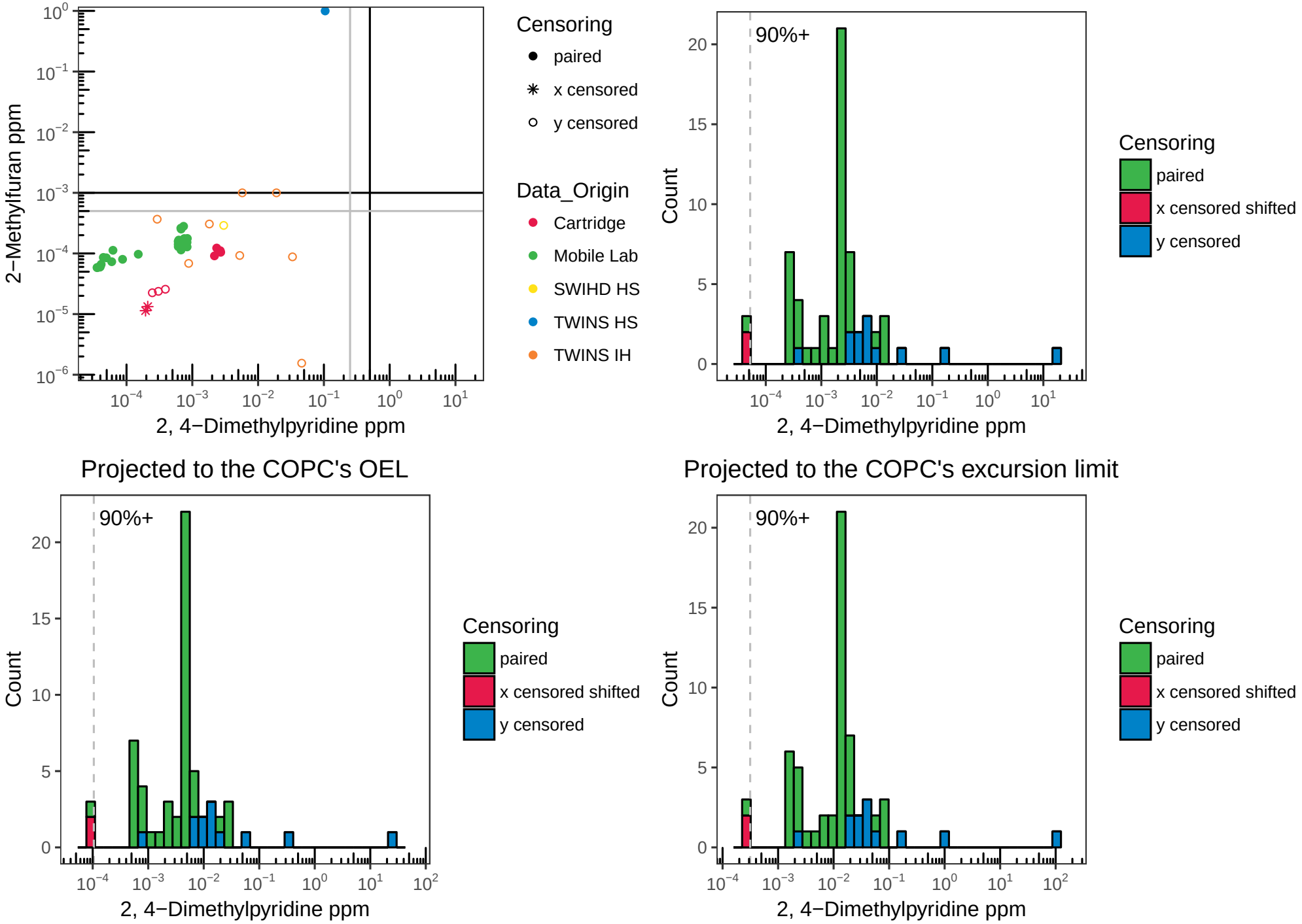


Figure C.2513: 2-Methylfuran vs 2, 4-Dimethylpyridine

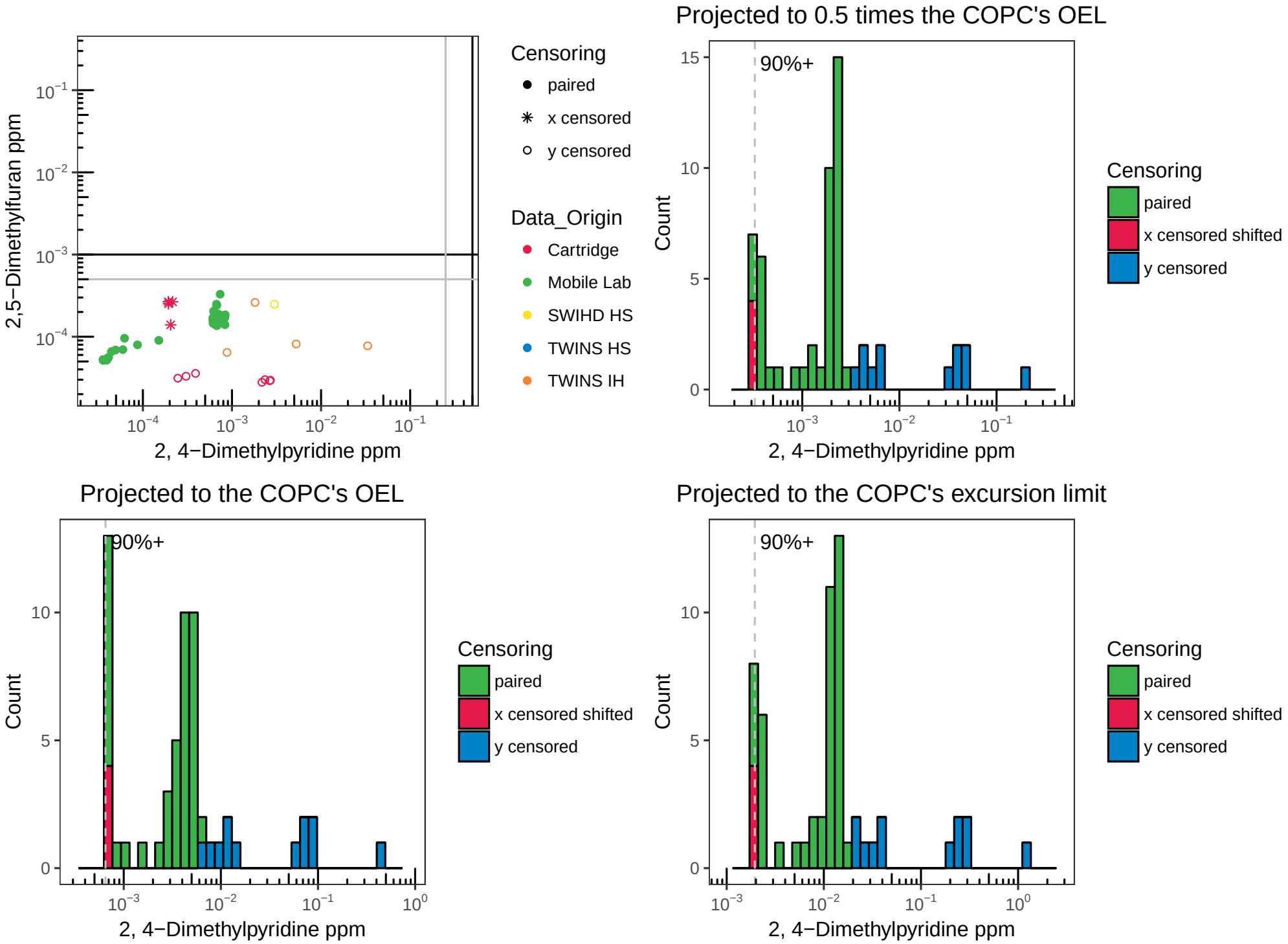


Figure C.2514: 2,5-Dimethylfuran vs 2, 4-Dimethylpyridine

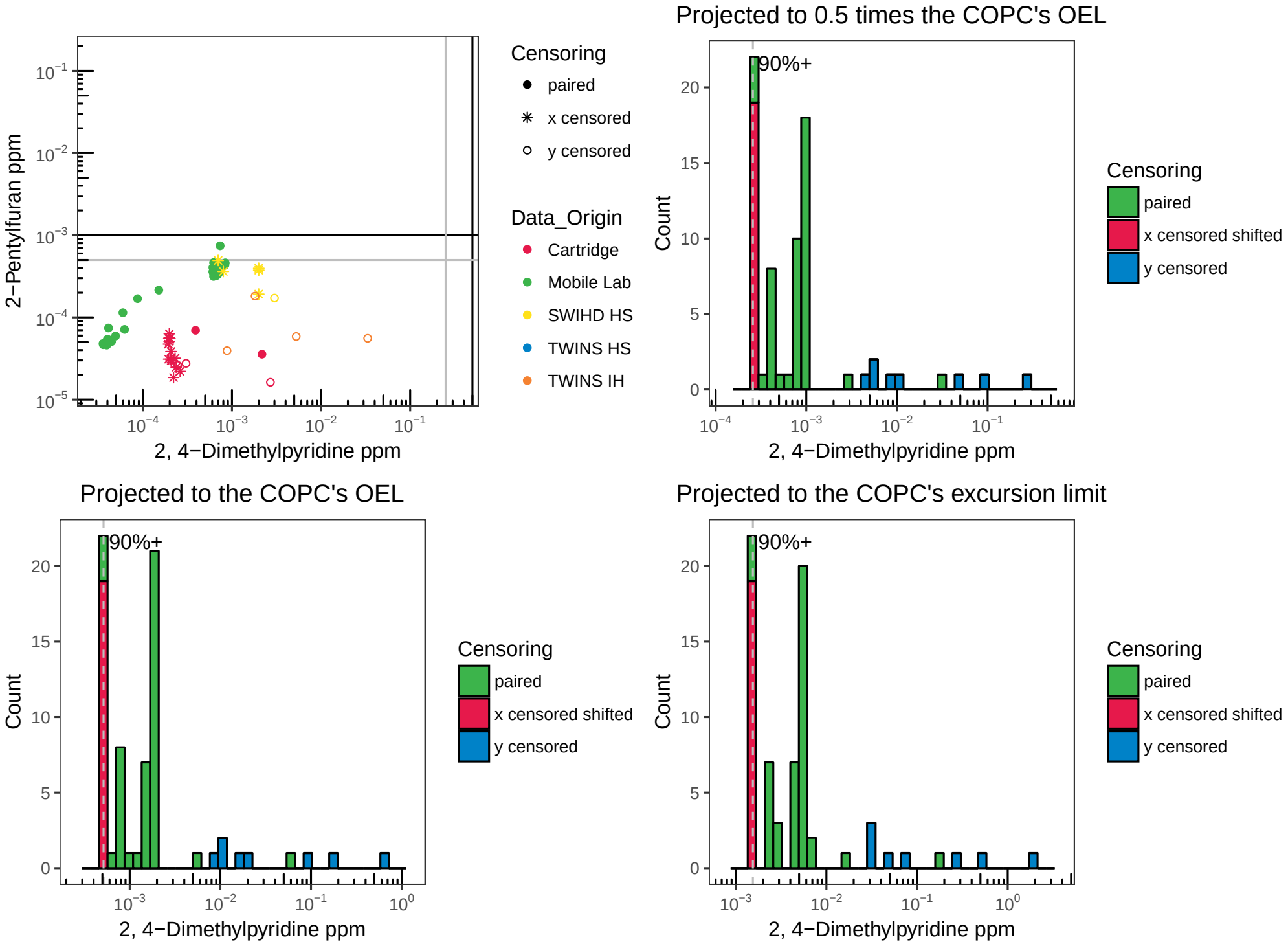


Figure C.2515: 2-Pentylfuran vs 2, 4-Dimethylpyridine

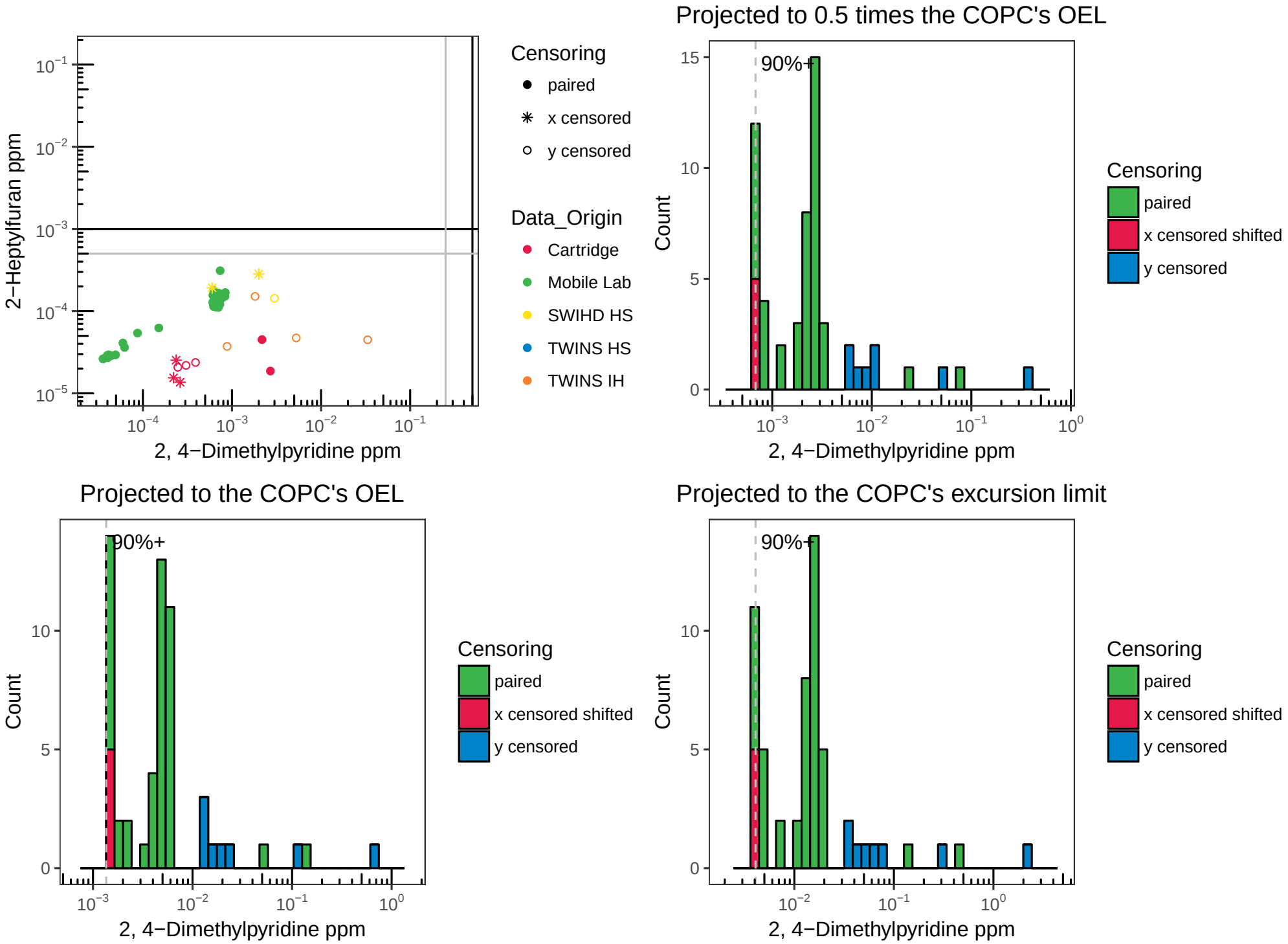


Figure C.2516: 2-Heptylfuran vs 2, 4-Dimethylpyridine

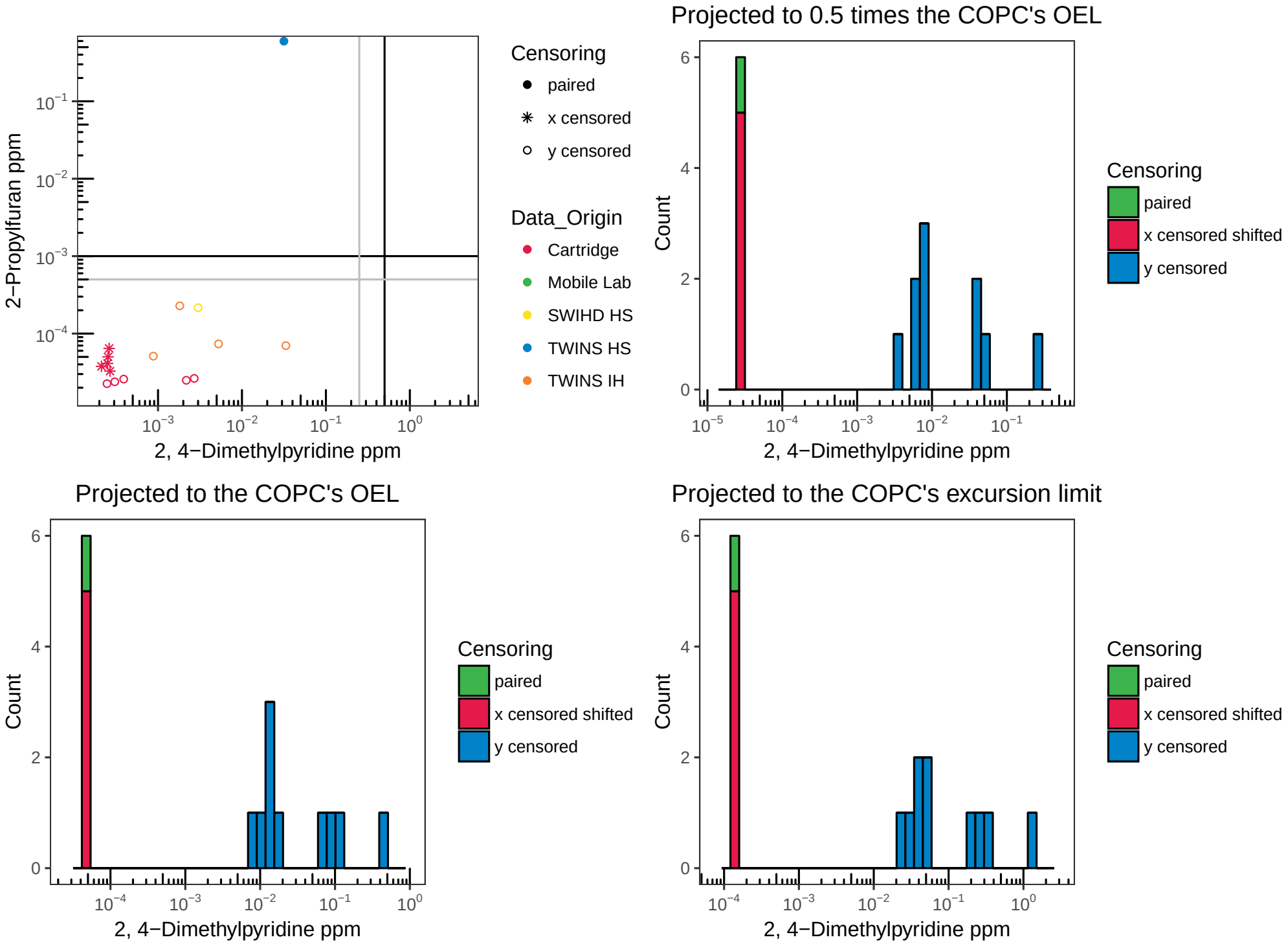


Figure C.2517: 2-Propylfuran vs 2, 4-Dimethylpyridine

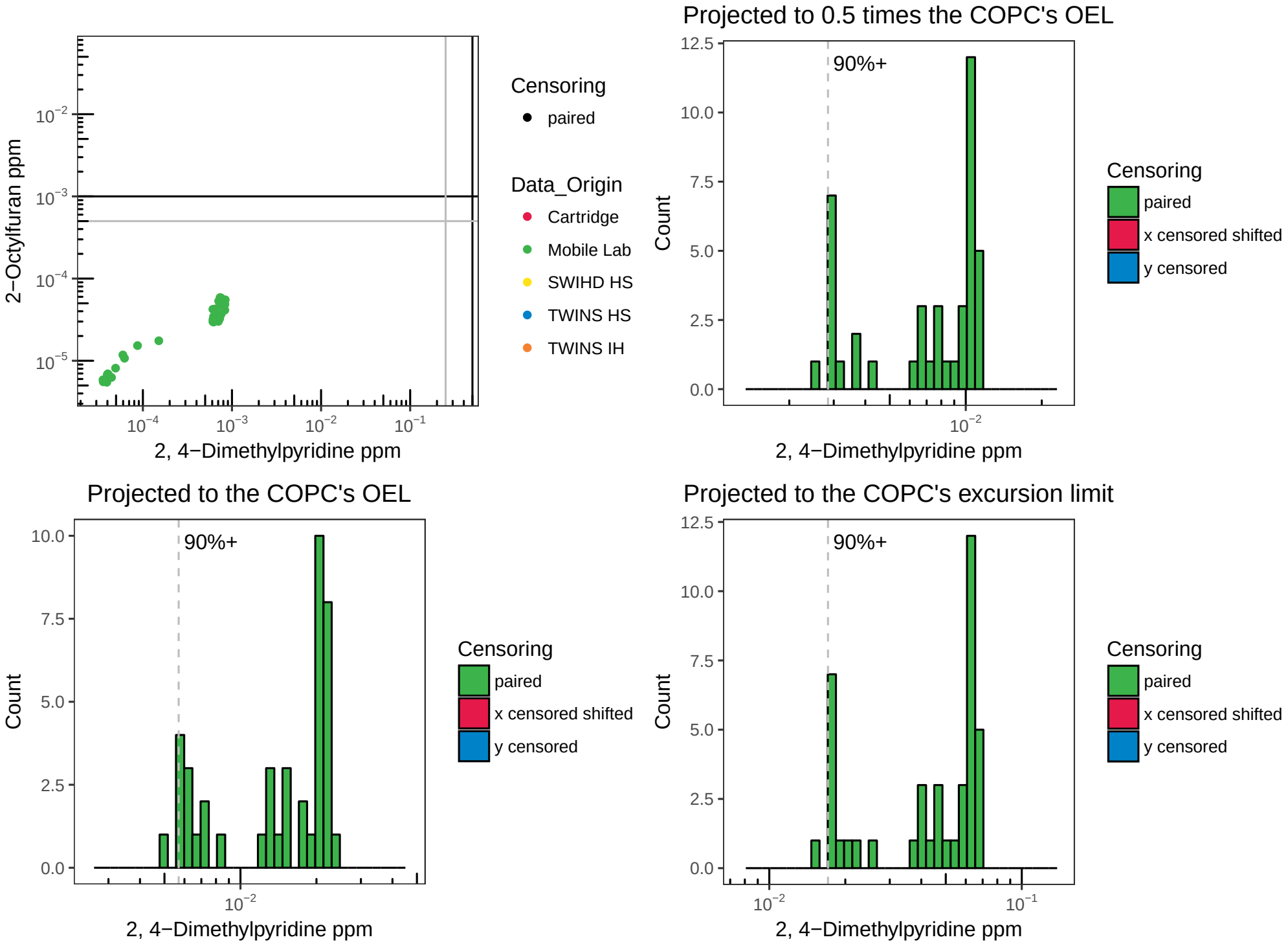


Figure C.2518: 2-Octylfuran vs 2, 4-Dimethylpyridine

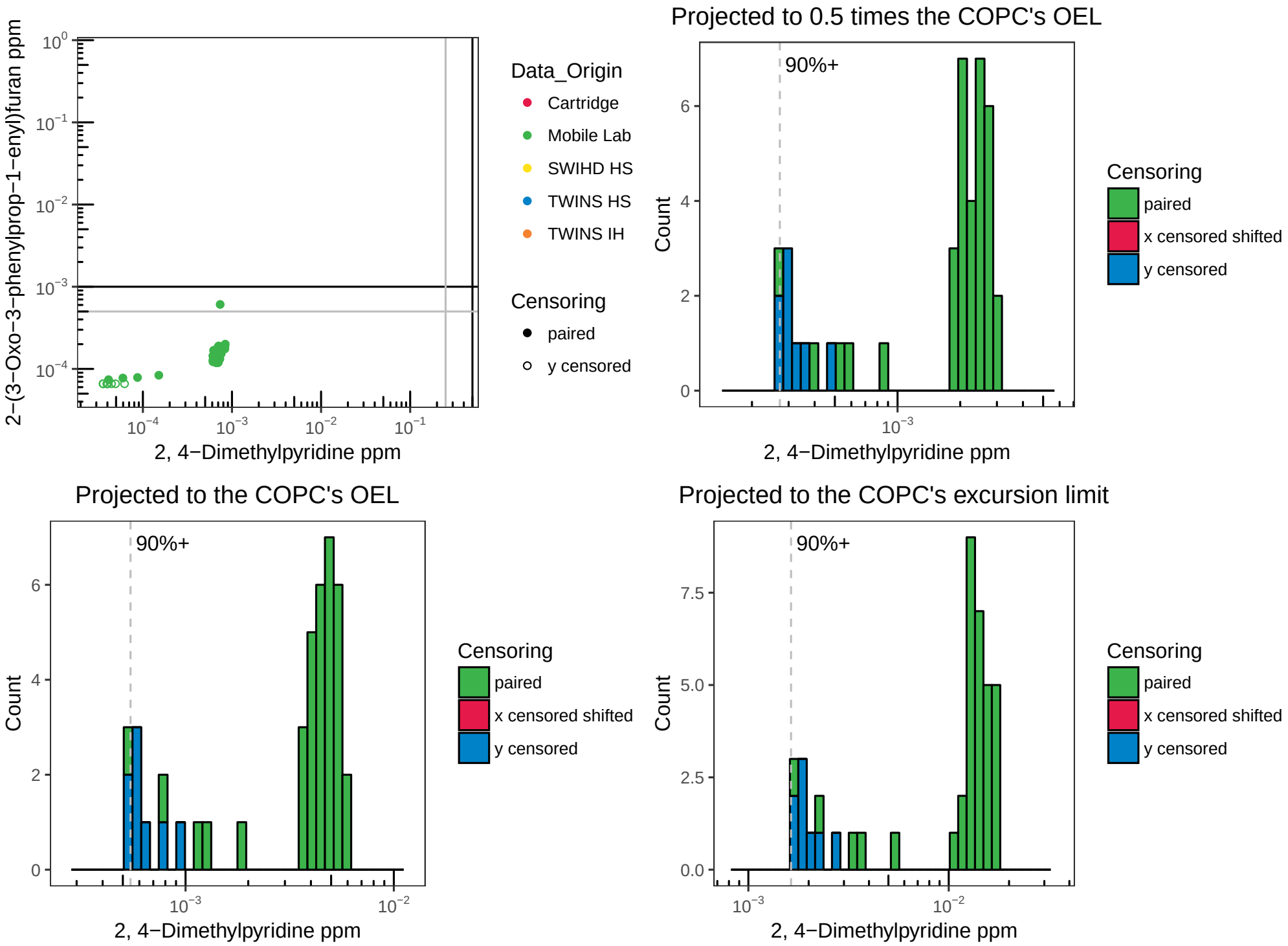


Figure C.2519: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2, 4-Dimethylpyridine

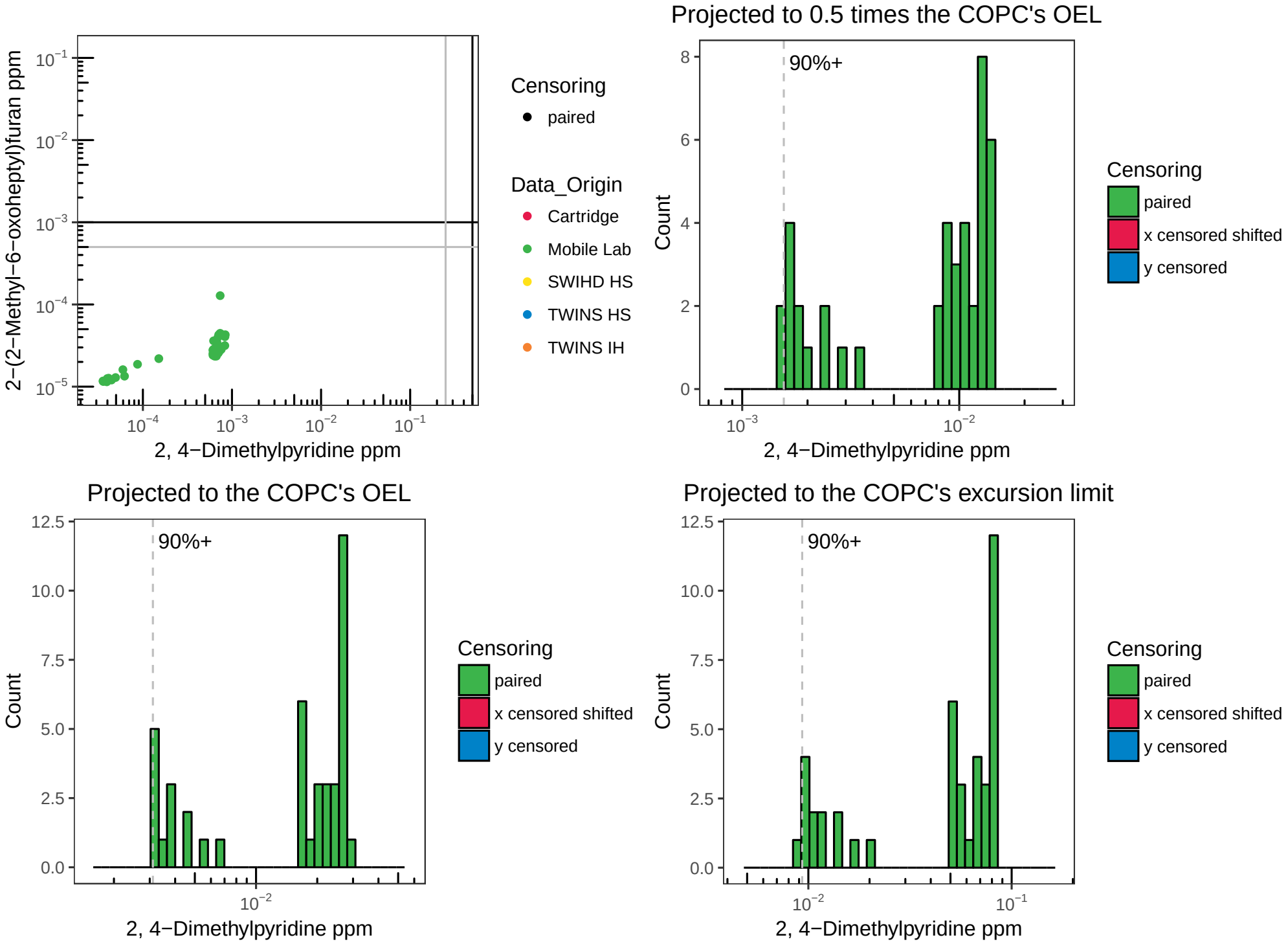


Figure C.2520: 2-(2-Methyl-6-oxoheptyl)furan vs 2, 4-Dimethylpyridine

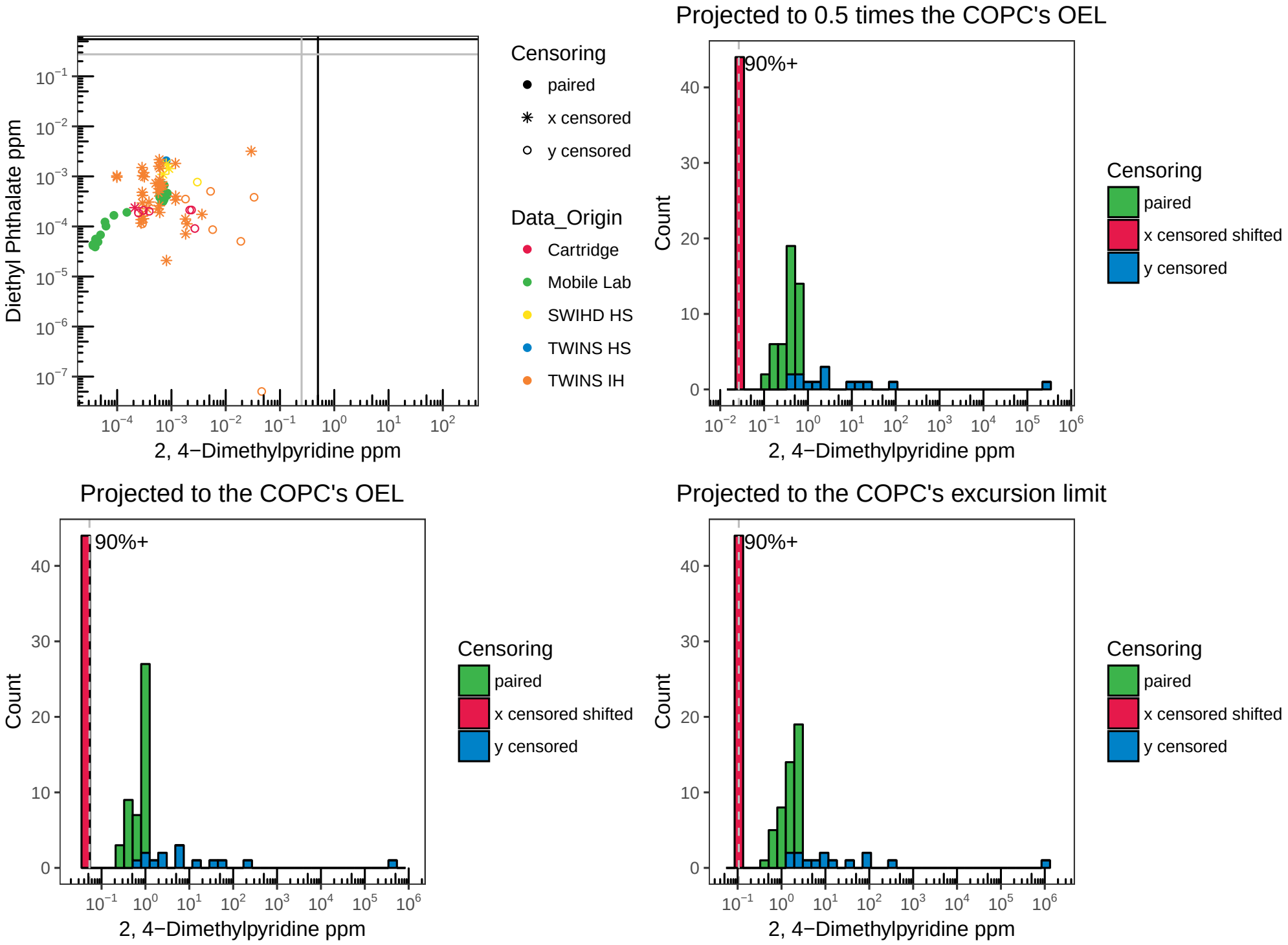


Figure C.2521: Diethyl Phthalate vs 2, 4-Dimethylpyridine

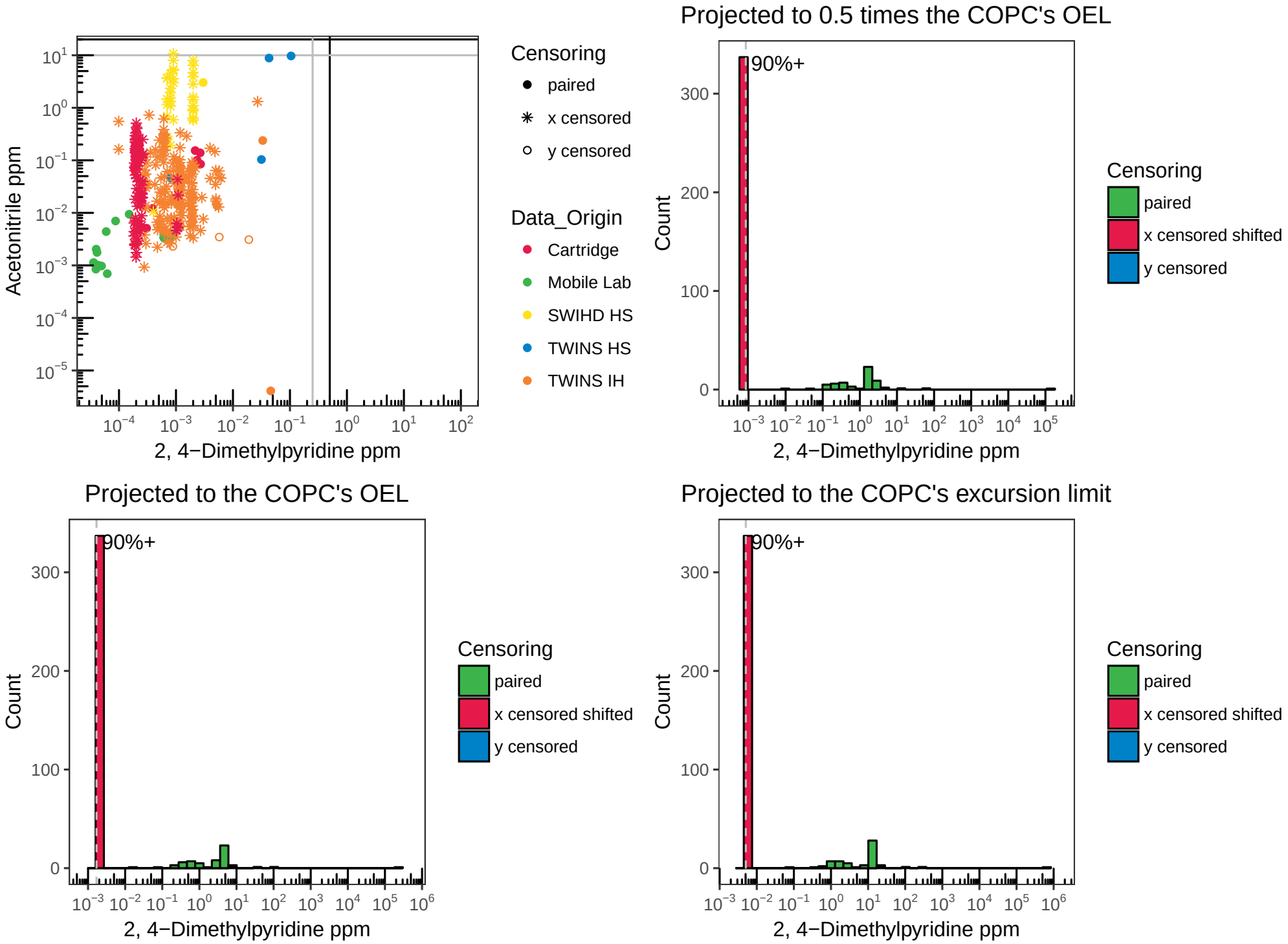


Figure C.2522: Acetonitrile vs 2, 4-Dimethylpyridine

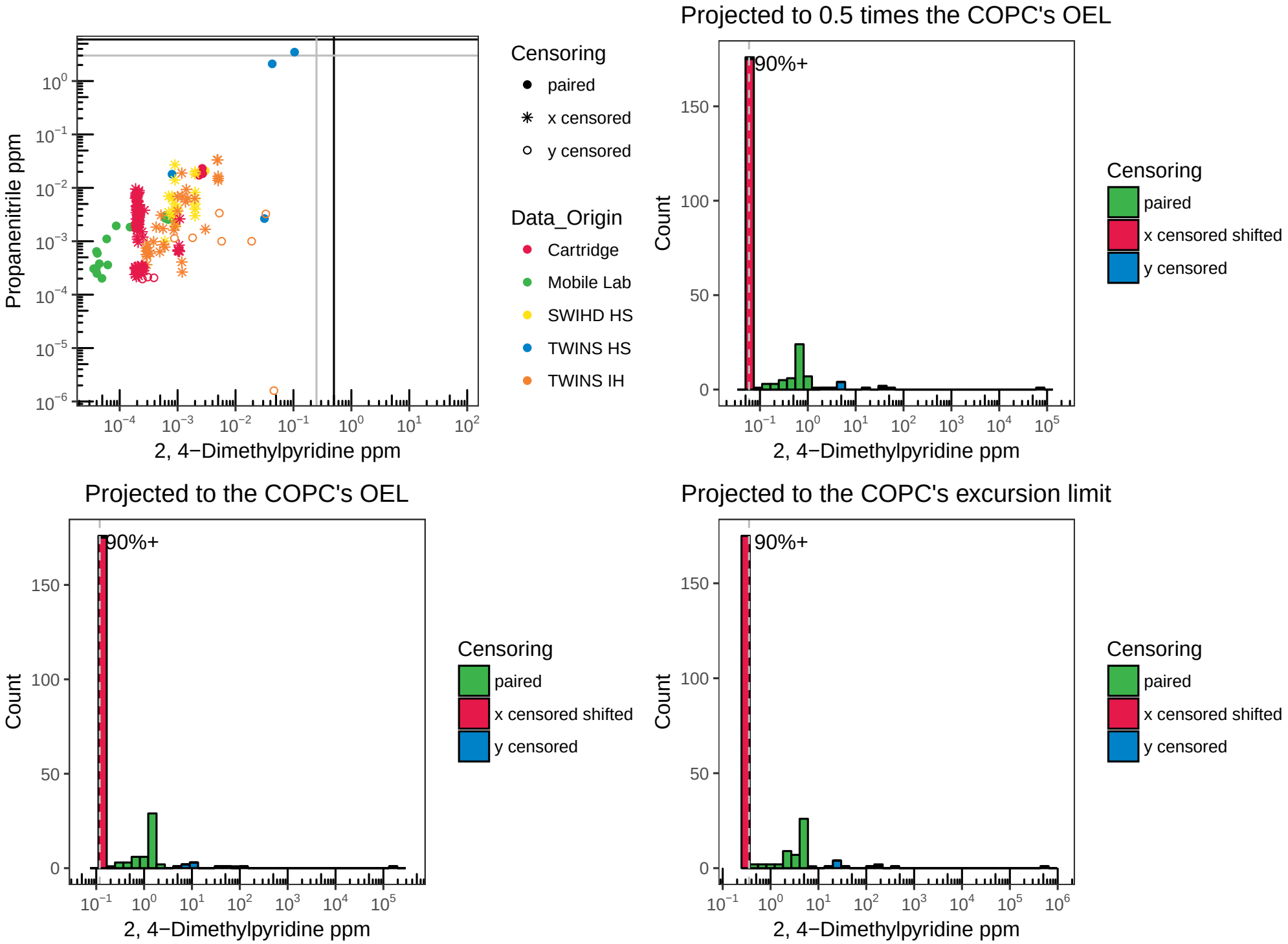


Figure C.2523: Propanenitrile vs 2, 4-Dimethylpyridine

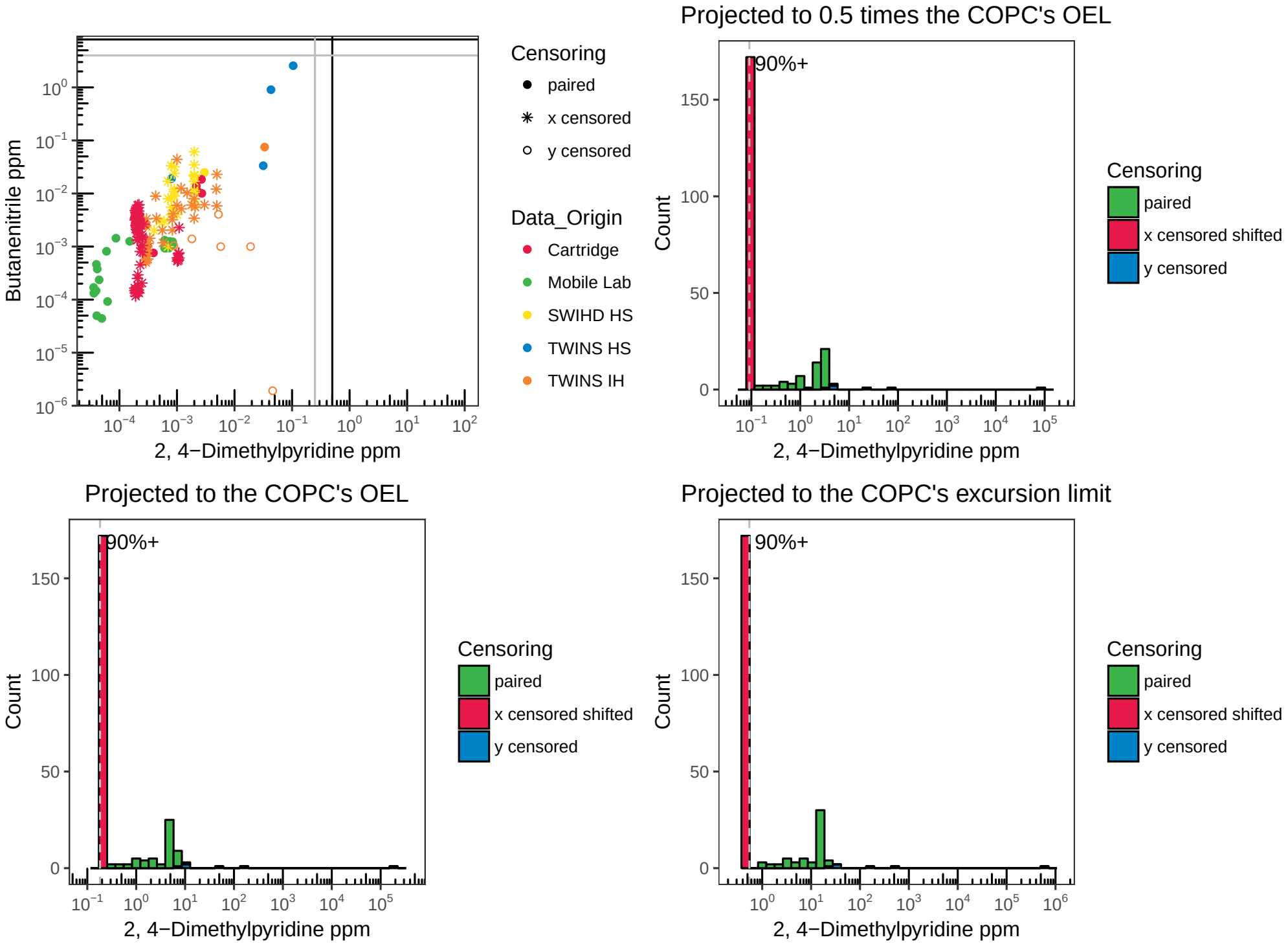


Figure C.2524: Butanenitrile vs 2, 4-Dimethylpyridine

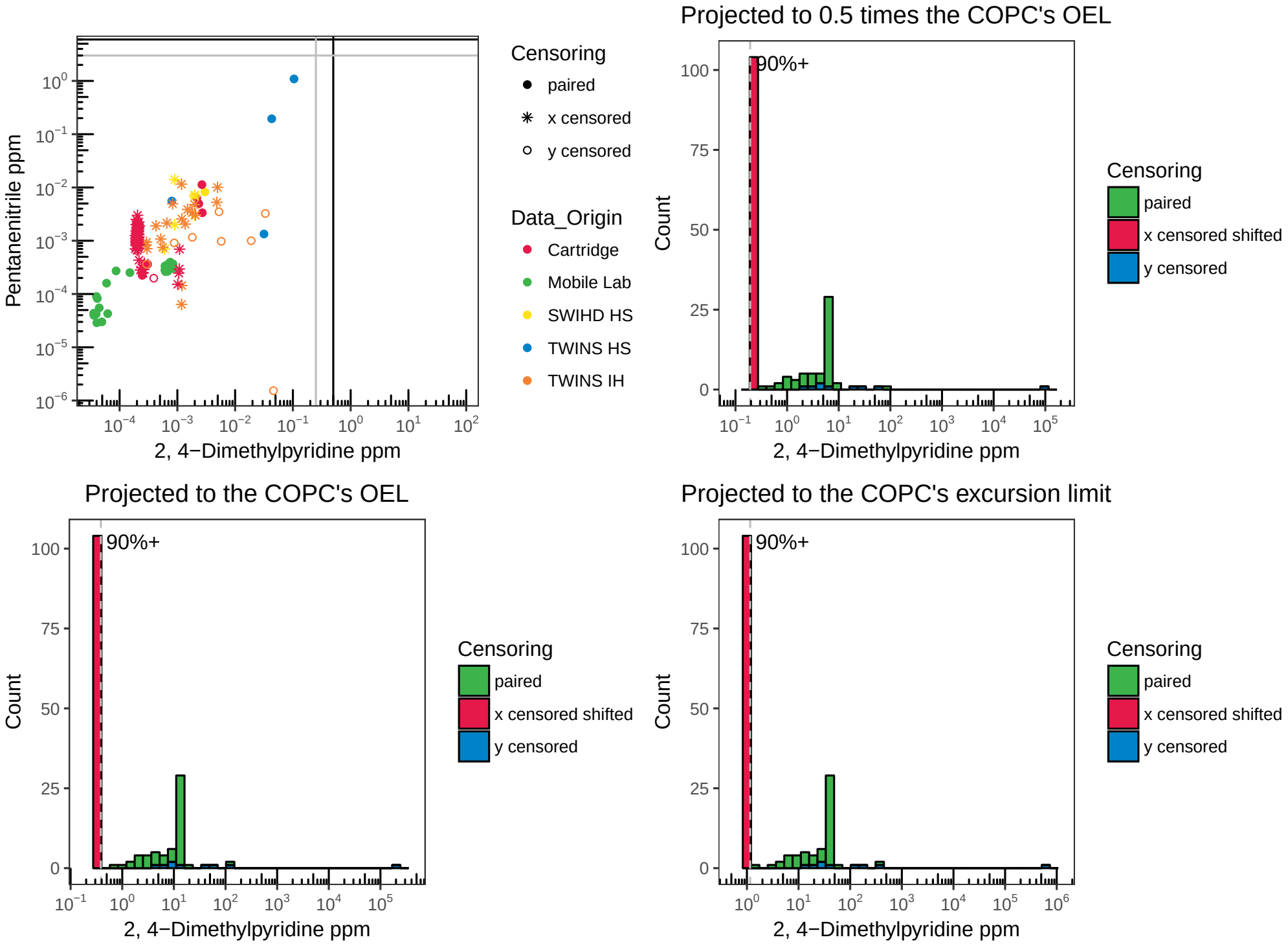


Figure C.2525: Pentanenitrile vs 2, 4-Dimethylpyridine

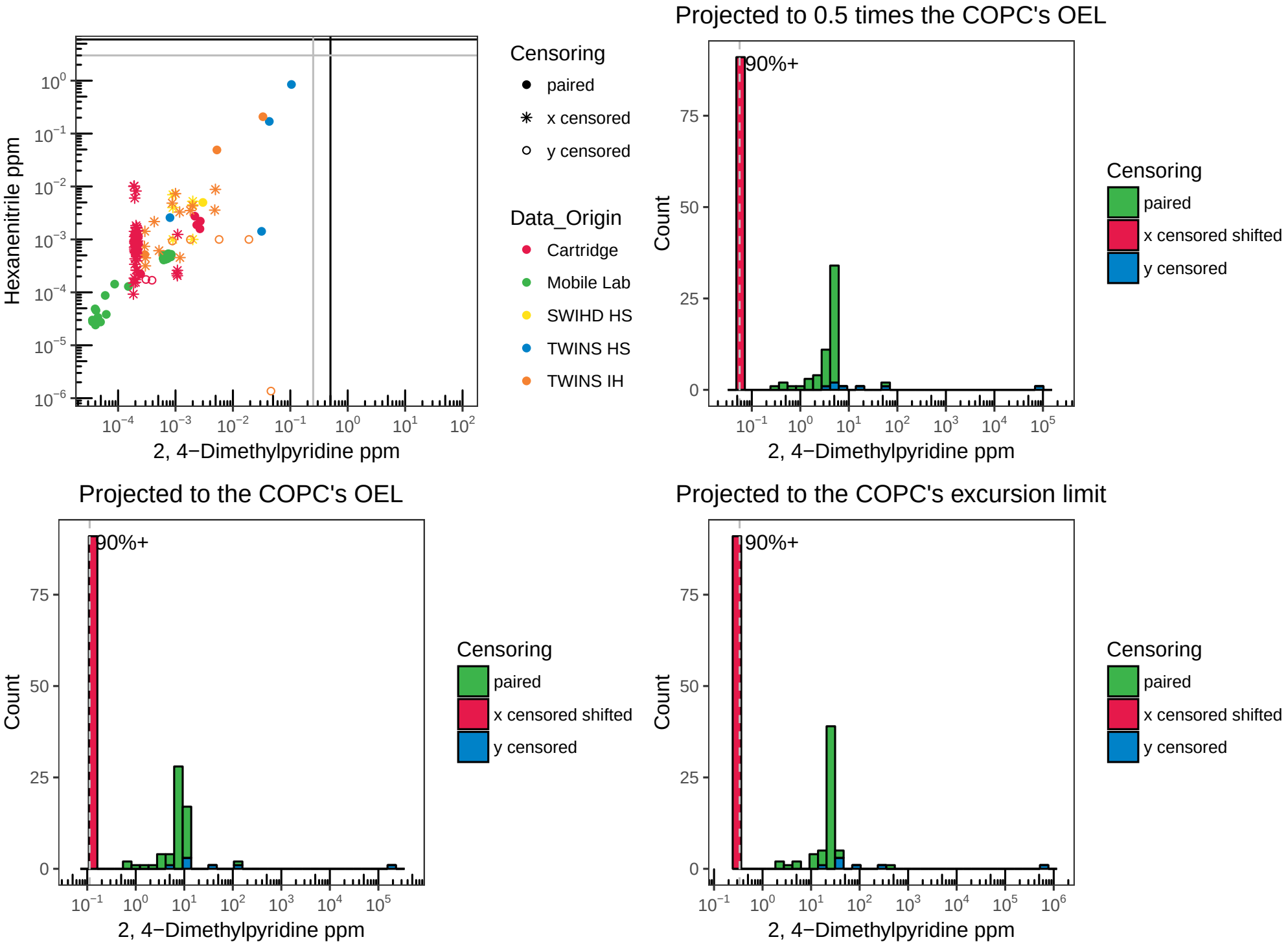


Figure C.2526: Hexanenitrile vs 2, 4-Dimethylpyridine

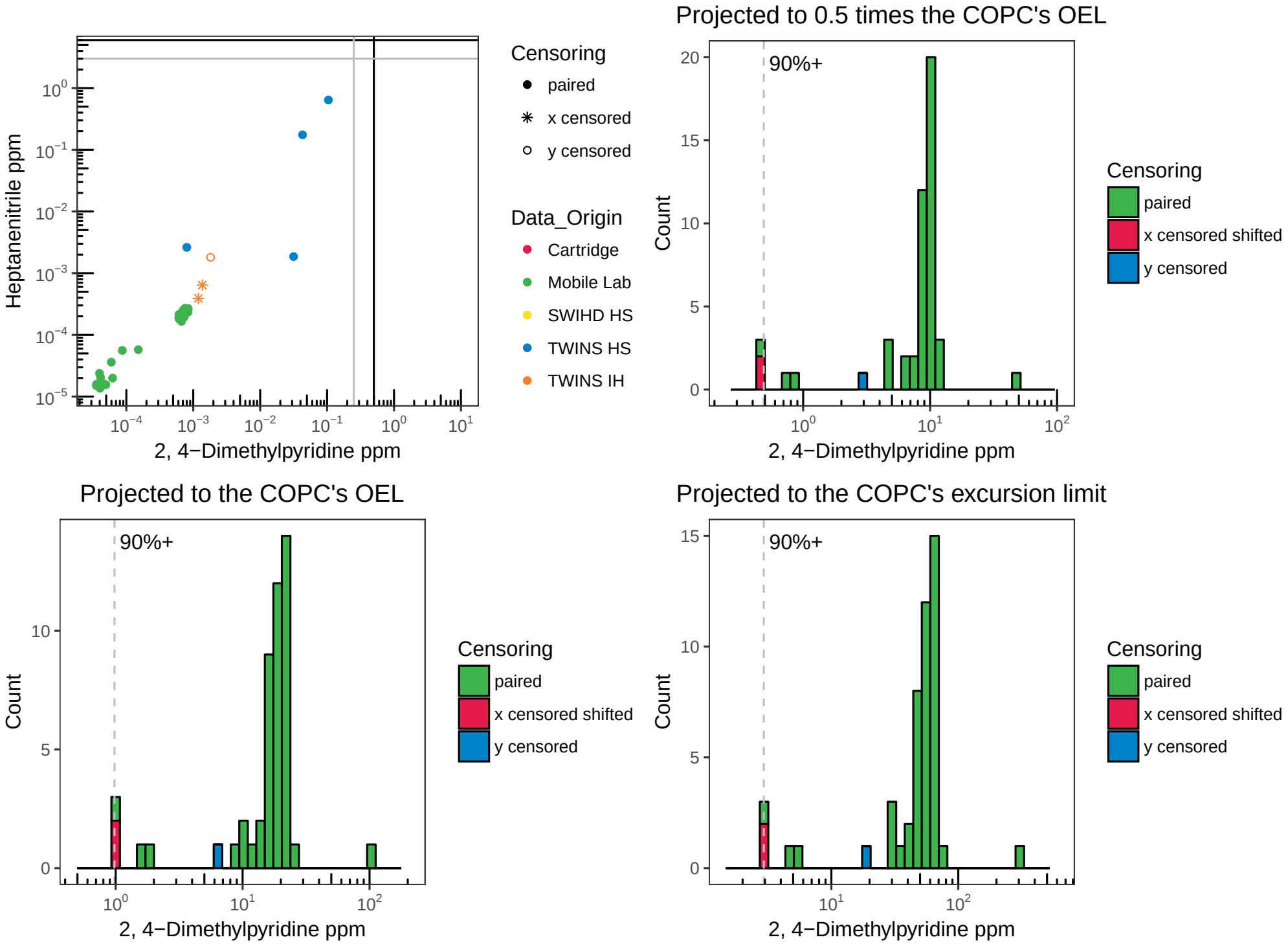


Figure C.2527: Heptanenitrile vs 2, 4-Dimethylpyridine

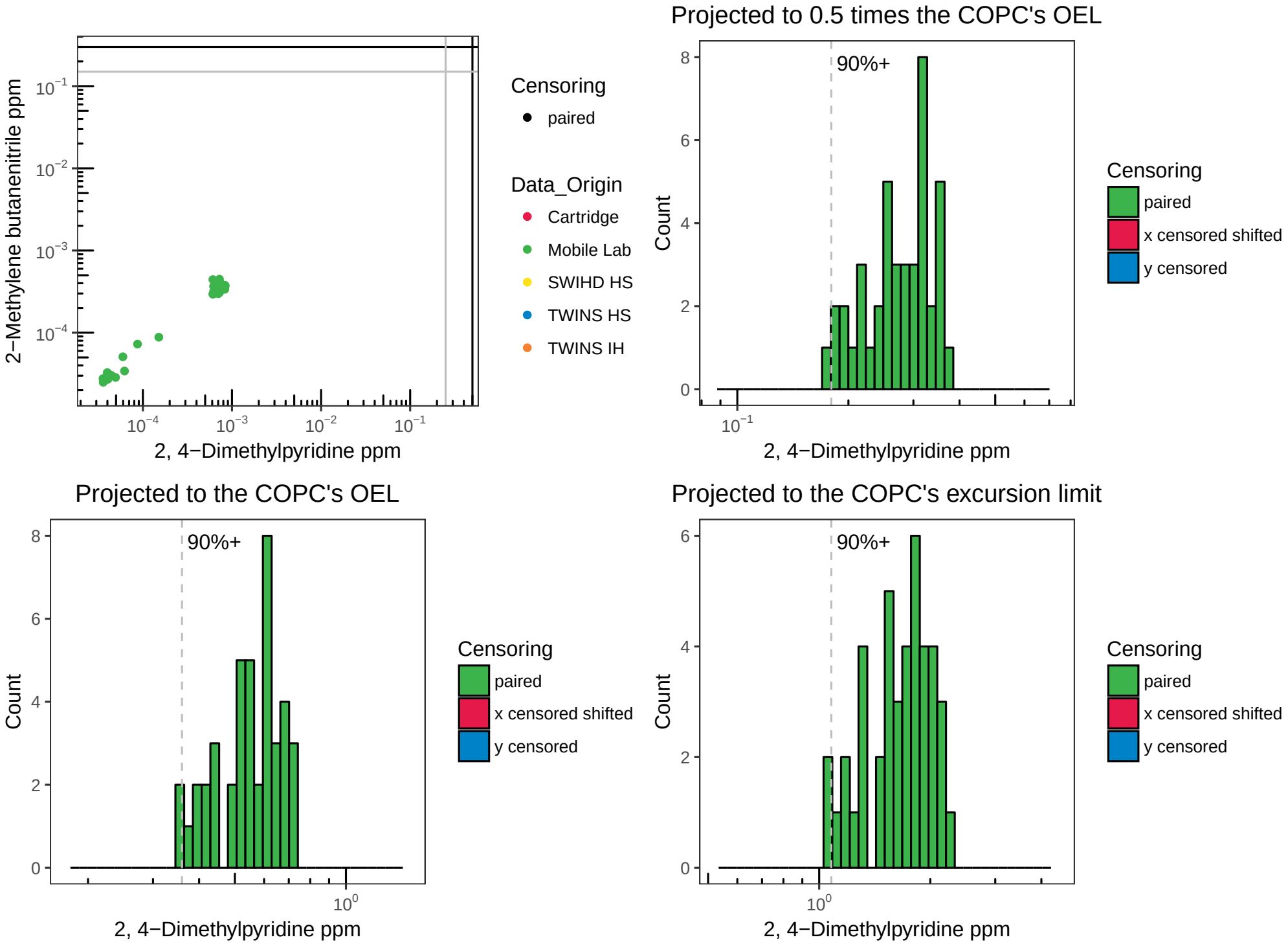


Figure C.2528: 2-Methylene butanenitrile vs 2, 4-Dimethylpyridine

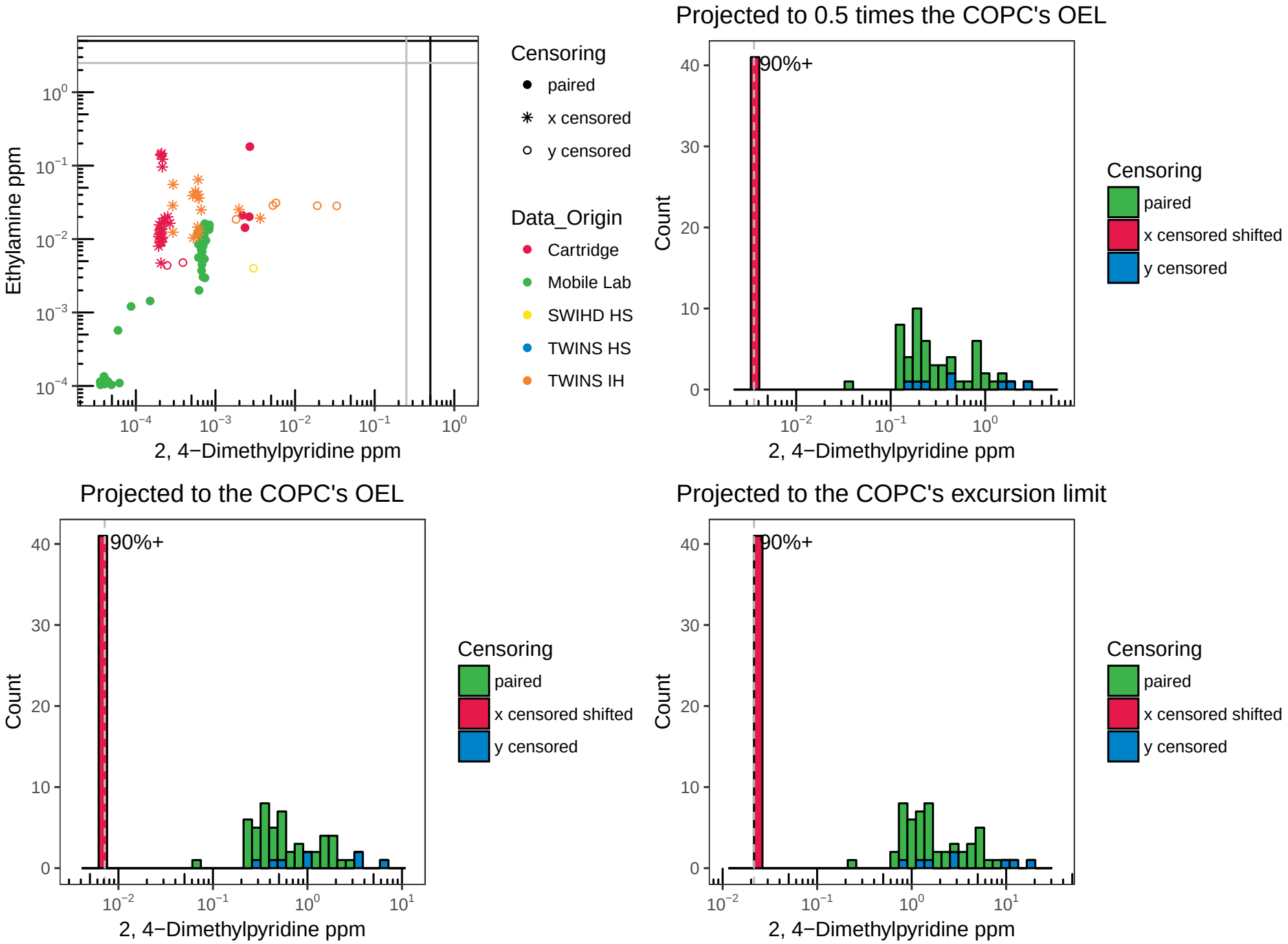


Figure C.2529: Ethylamine vs 2, 4-Dimethylpyridine

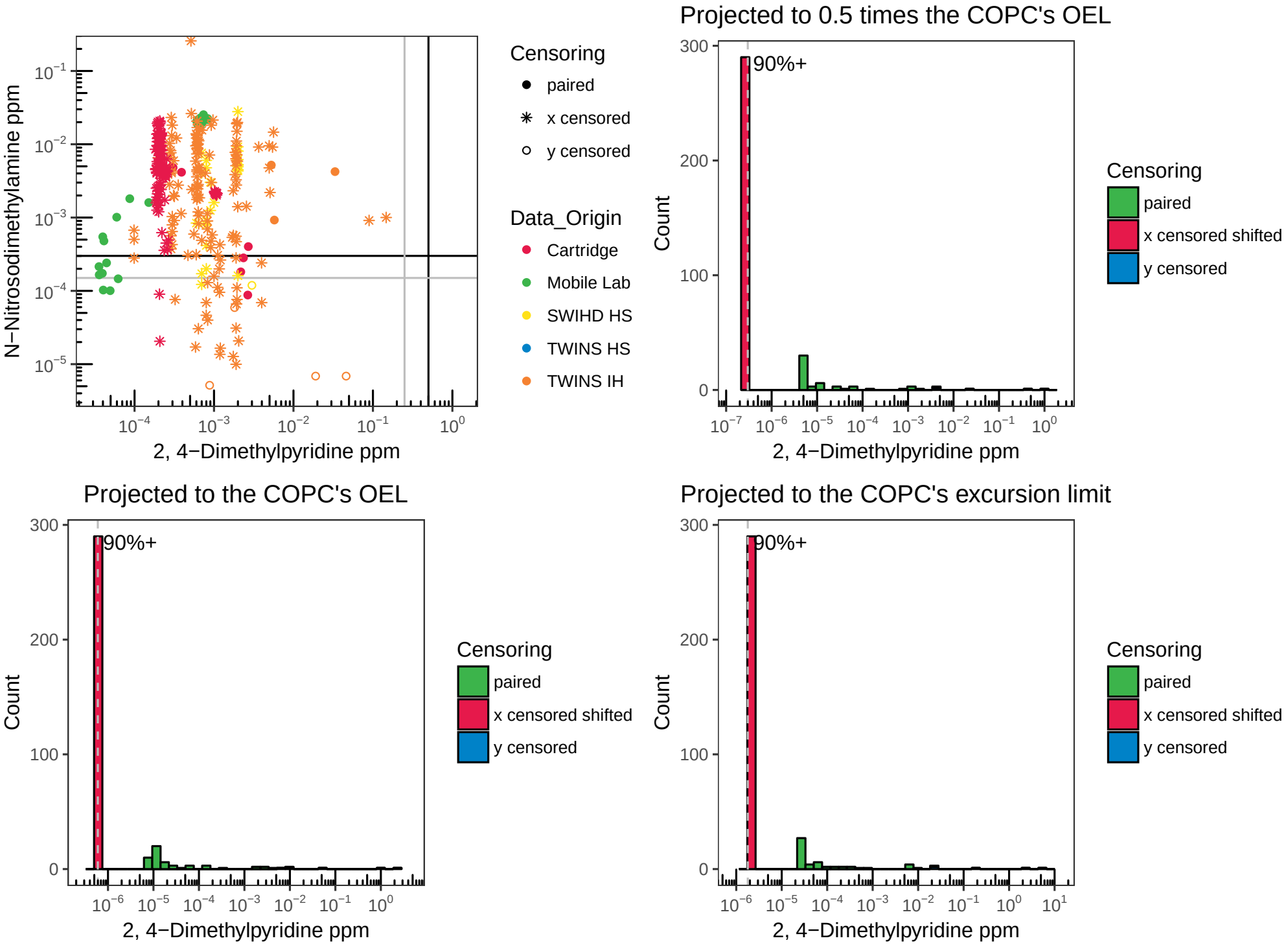


Figure C.2530: N-Nitrosodimethylamine vs 2, 4-Dimethylpyridine

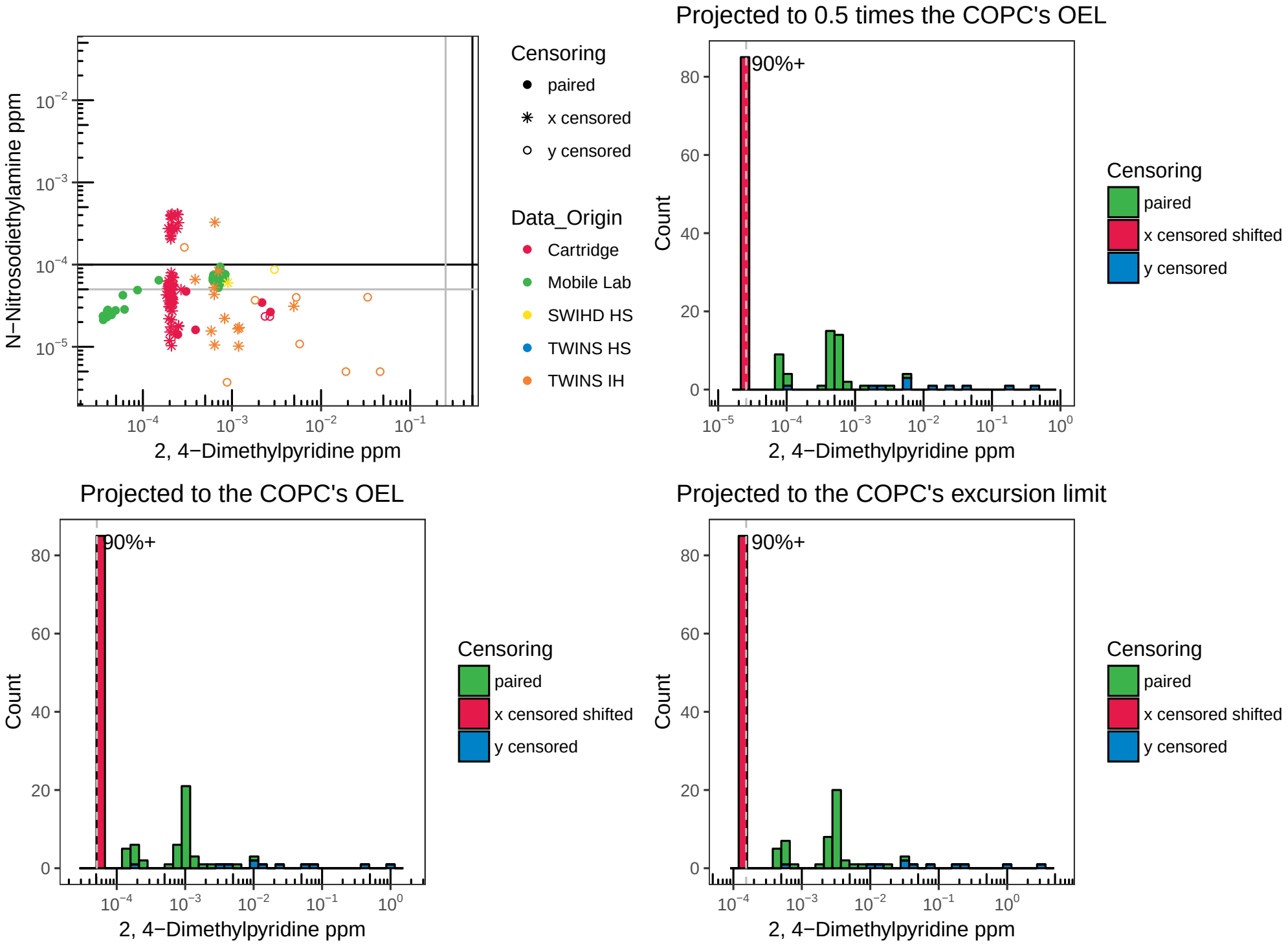


Figure C.2531: N-Nitrosodiethylamine vs 2, 4-Dimethylpyridine

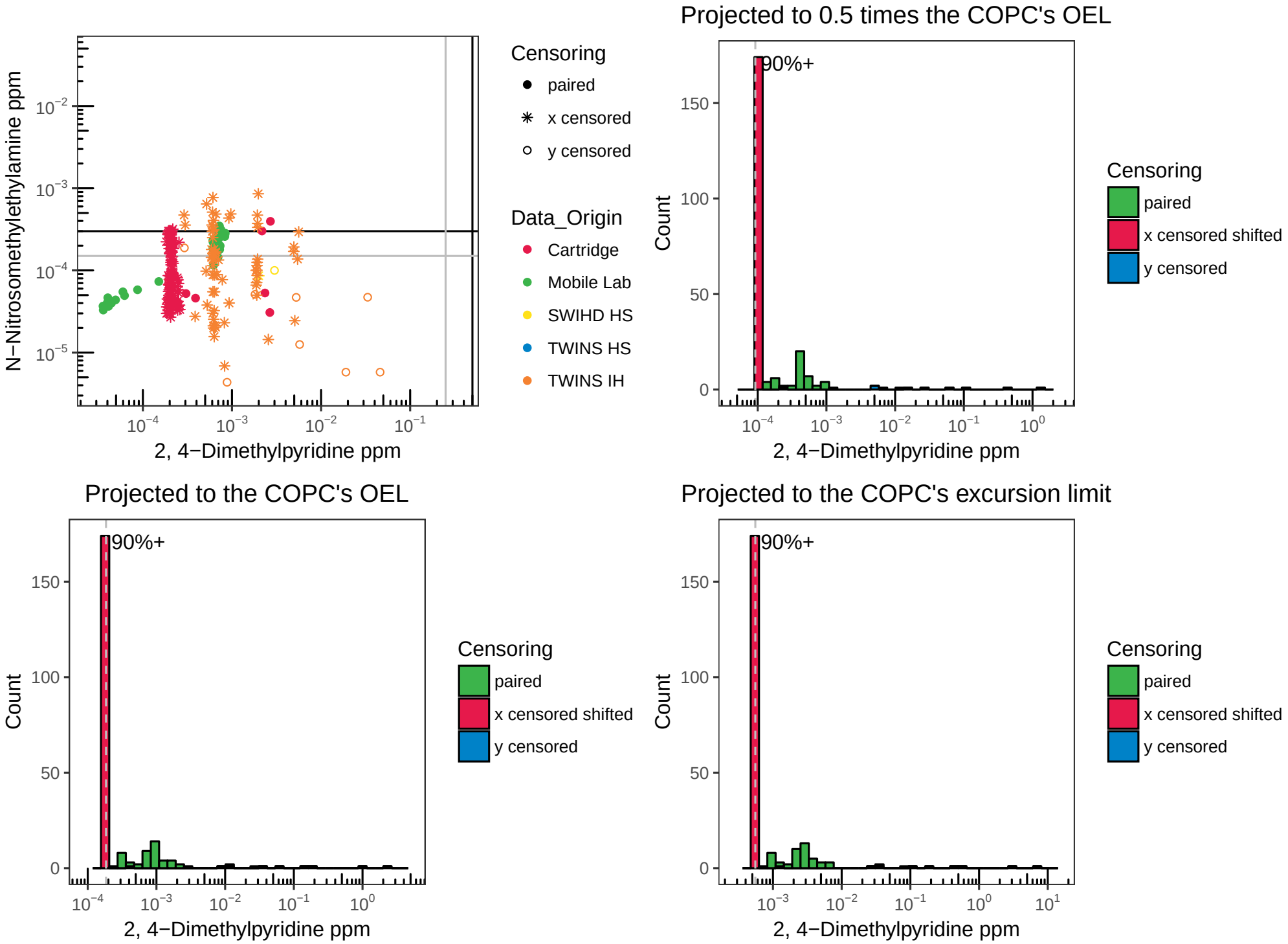


Figure C.2532: N-Nitrosomethylethylamine vs 2, 4-Dimethylpyridine

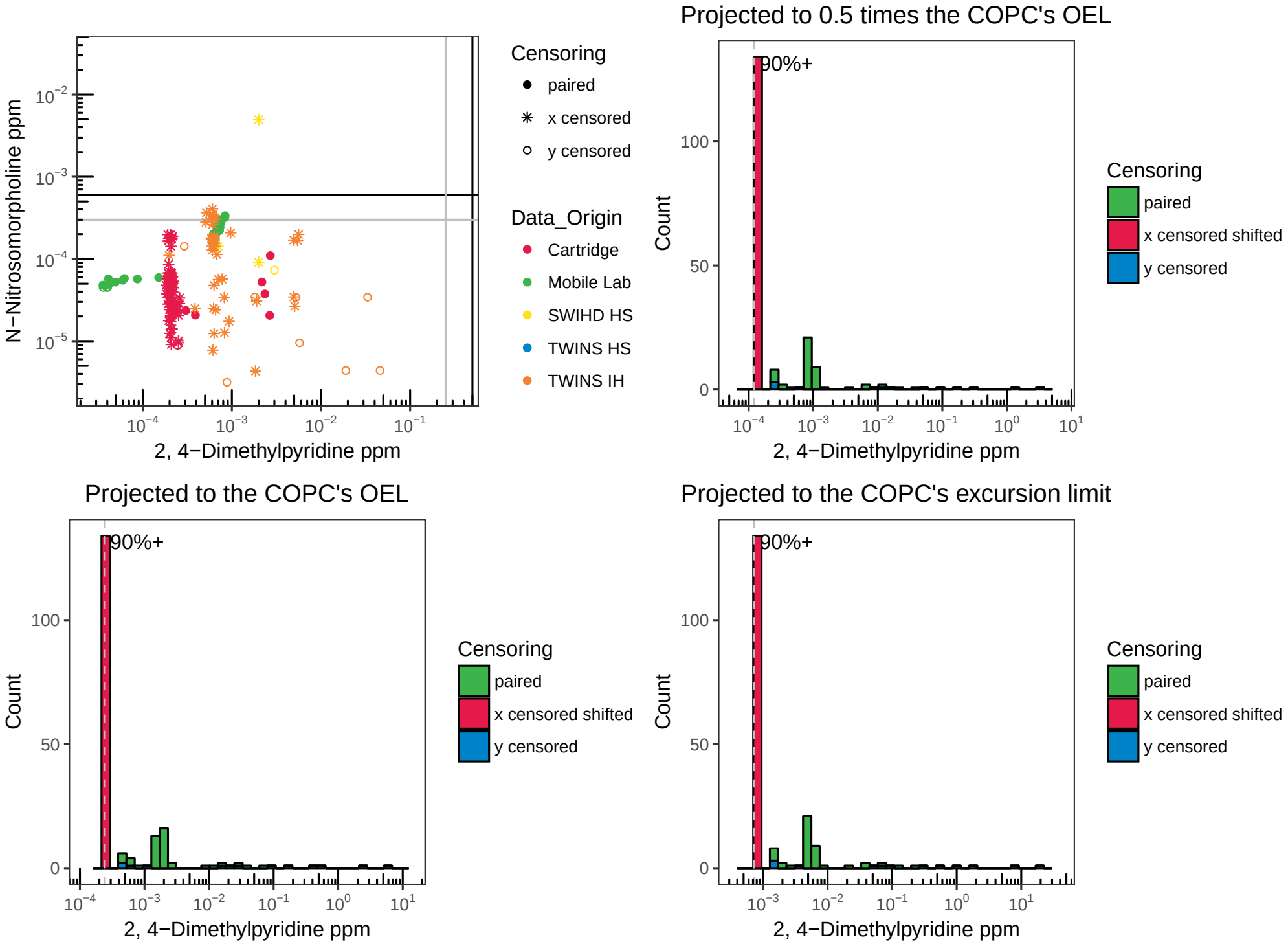


Figure C.2533: N-Nitrosomorpholine vs 2, 4-Dimethylpyridine

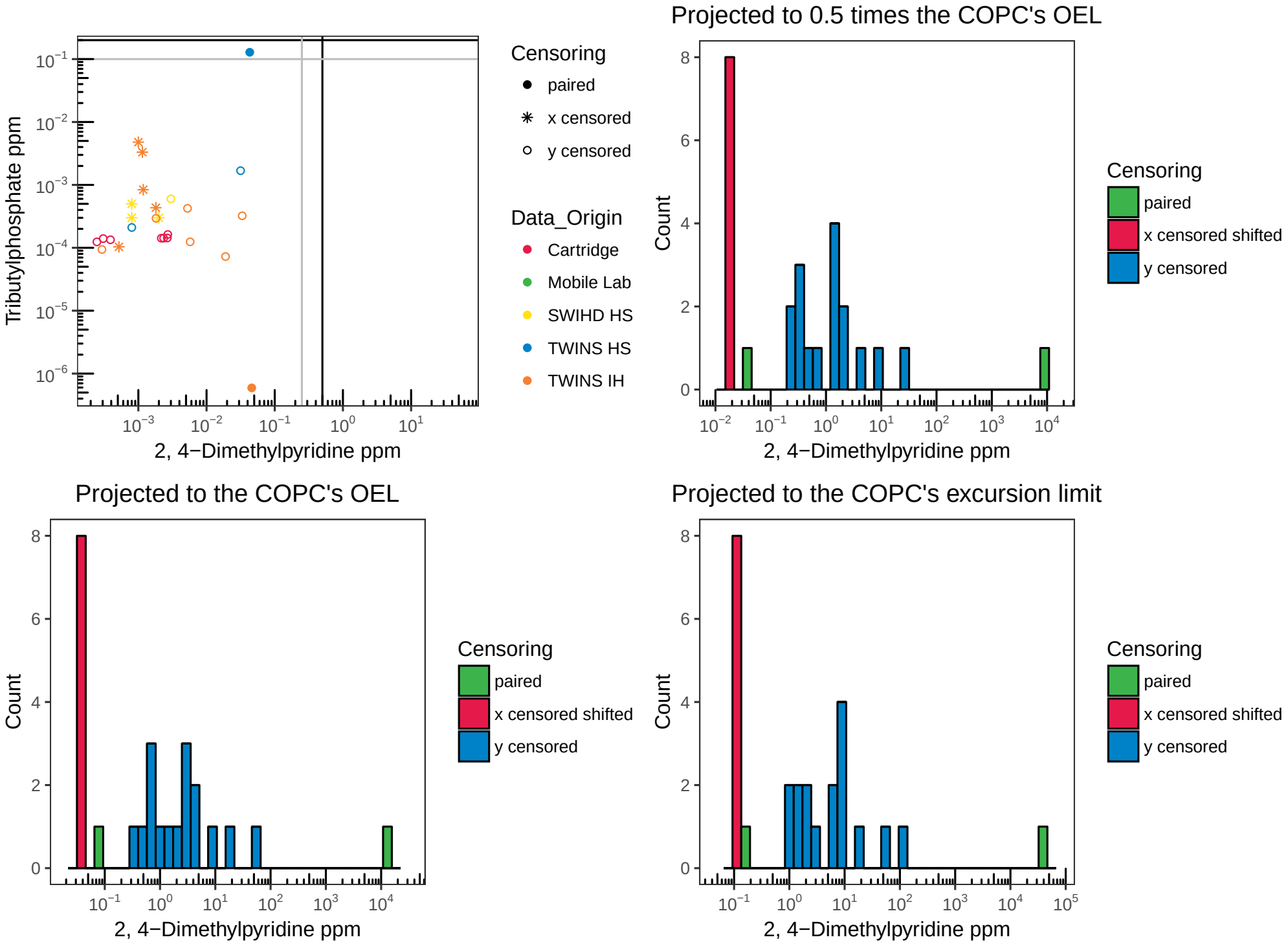


Figure C.2534: Tributylphosphate vs 2, 4-Dimethylpyridine

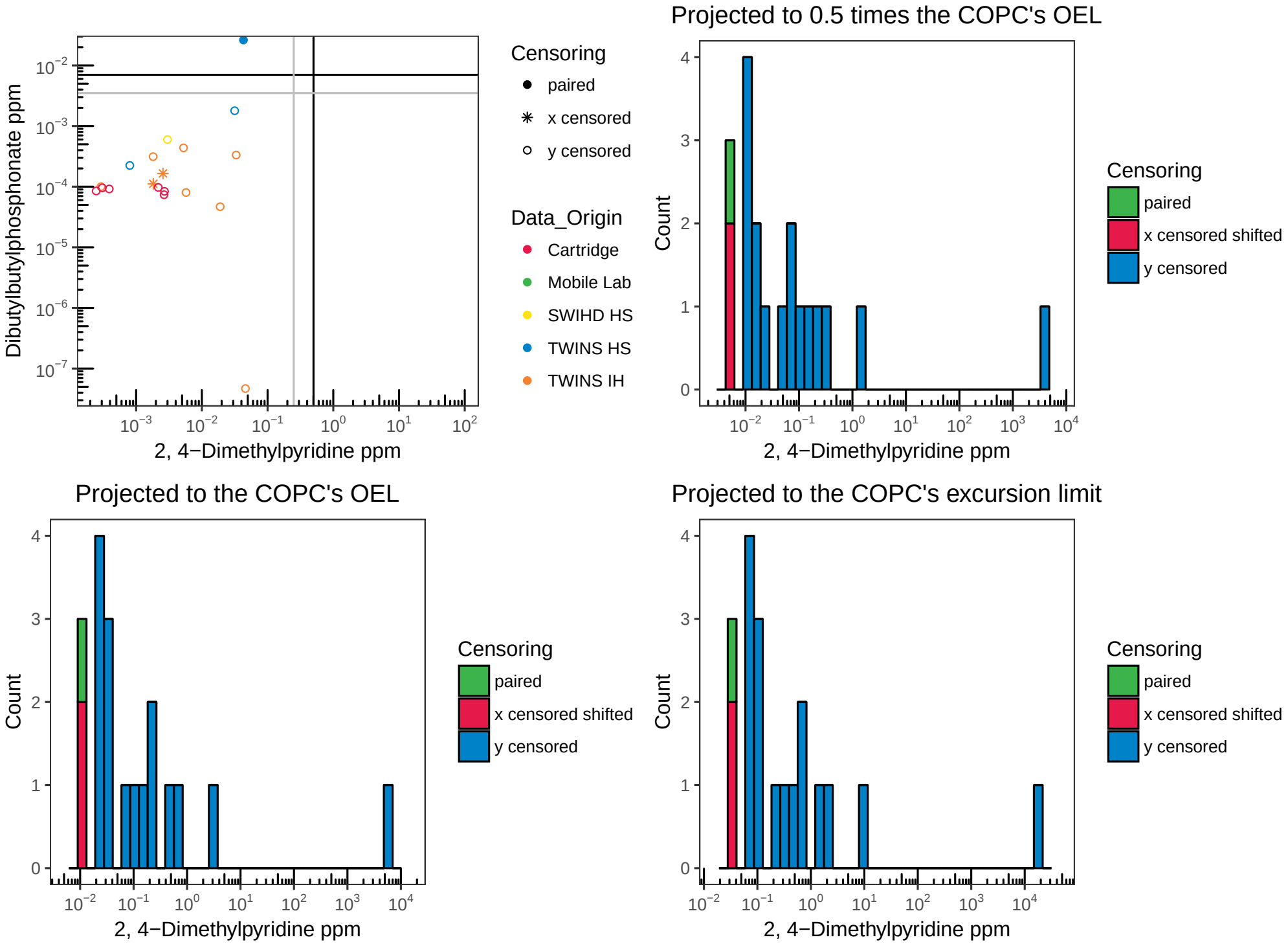


Figure C.2535: Dibutylbutylphosphonate vs 2, 4-Dimethylpyridine

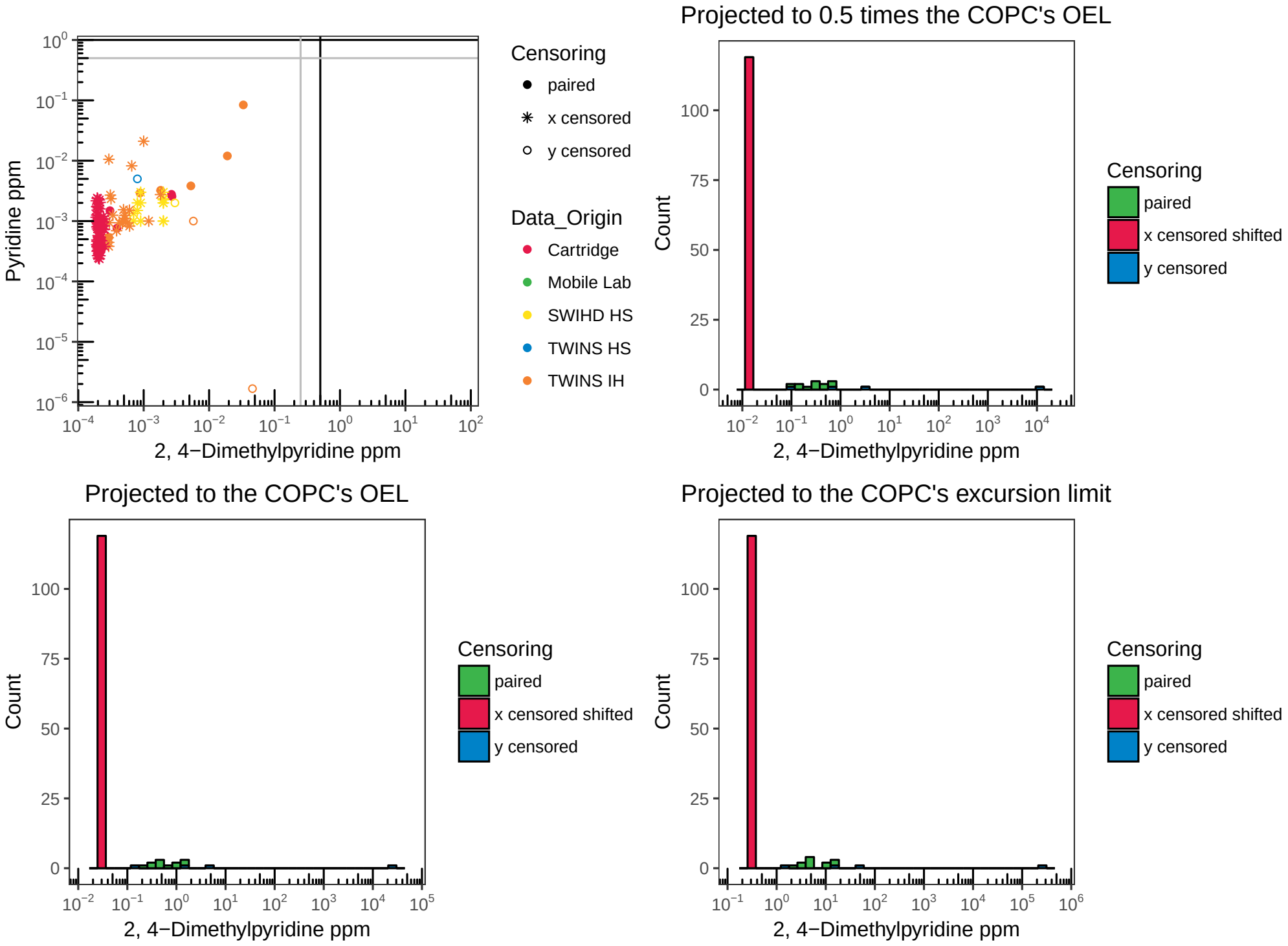


Figure C.2536: Pyridine vs 2, 4-Dimethylpyridine

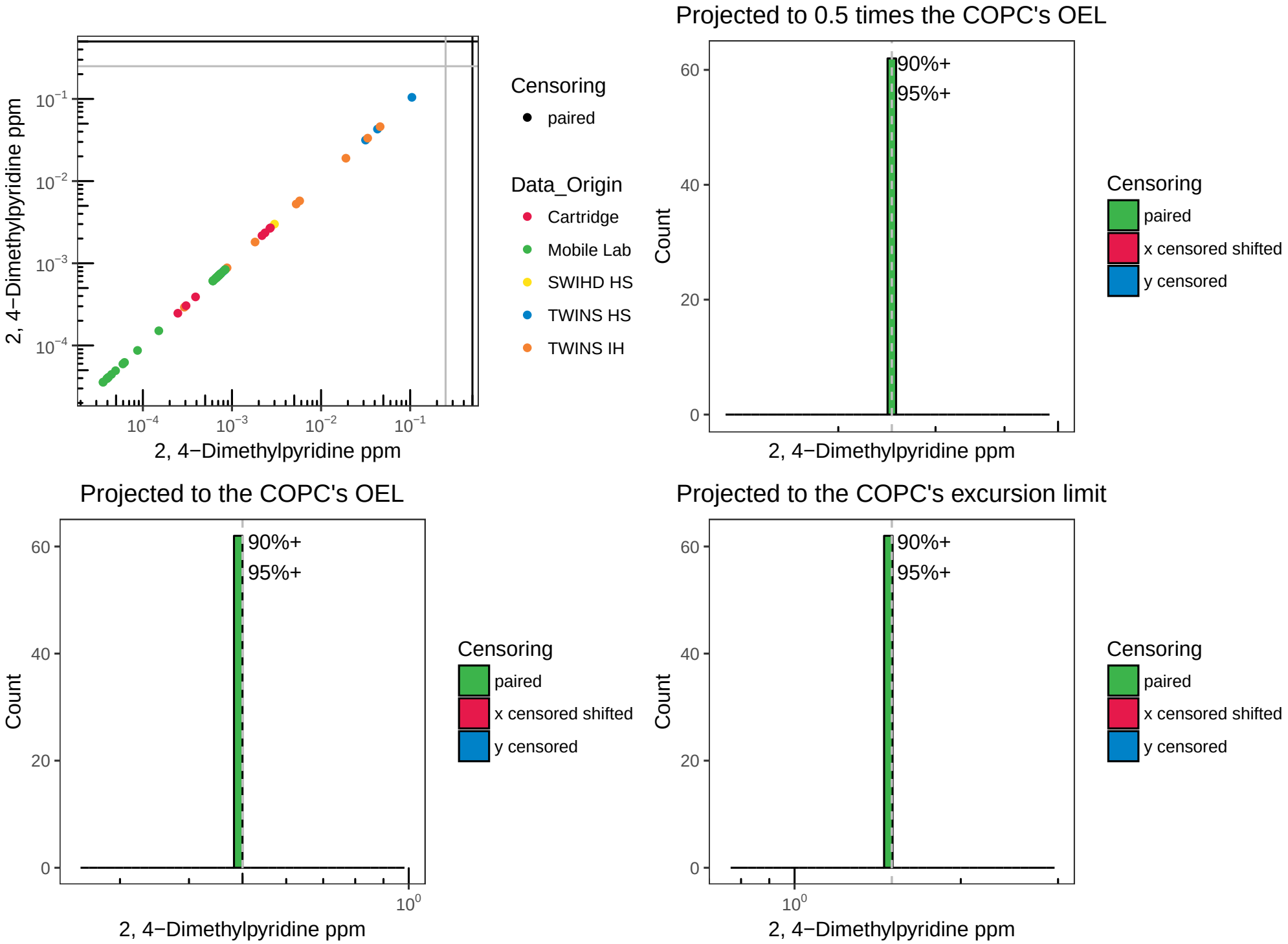


Figure C.2537: 2, 4-Dimethylpyridine vs 2, 4-Dimethylpyridine

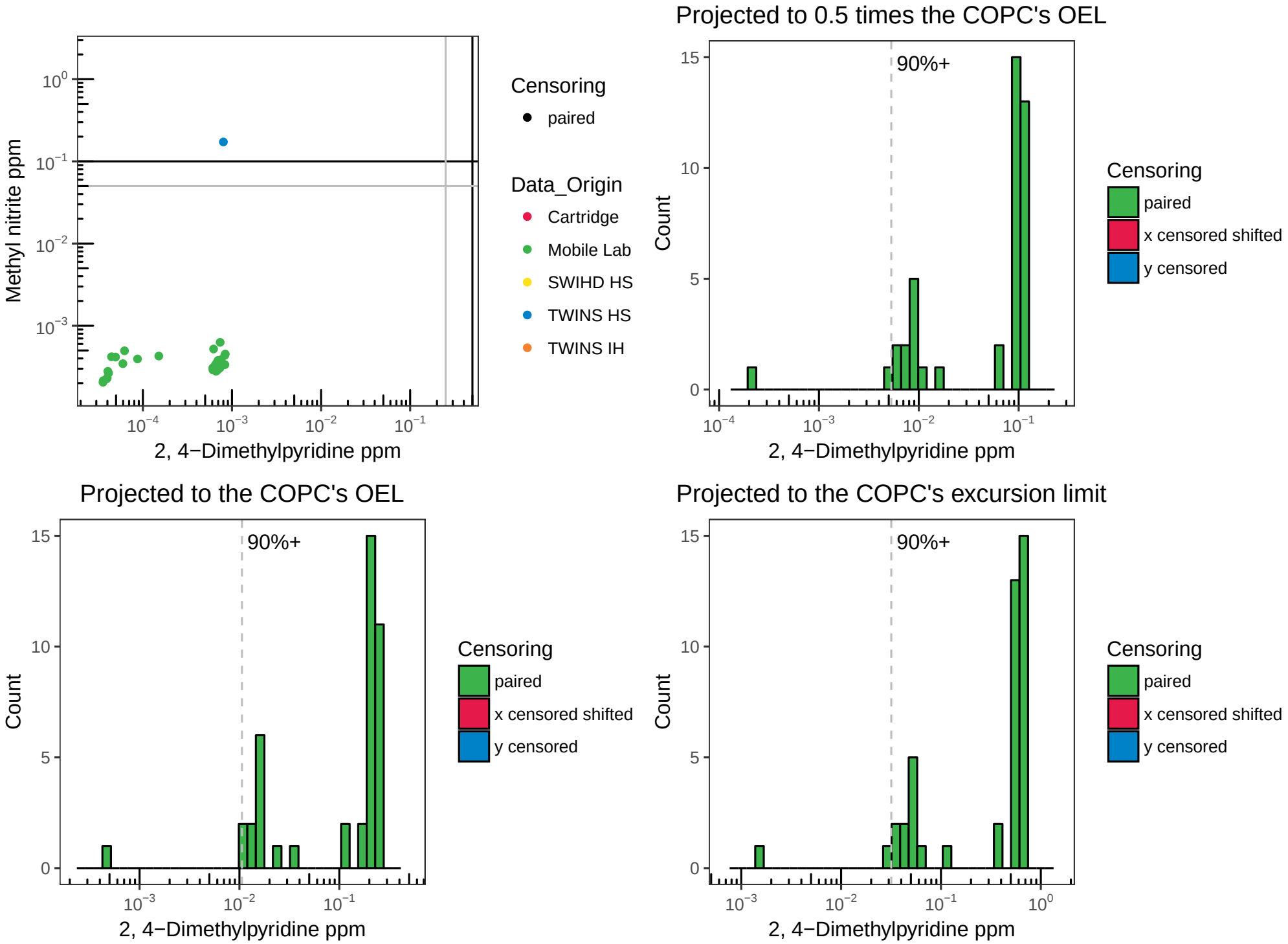


Figure C.2538: Methyl nitrite vs 2, 4-Dimethylpyridine

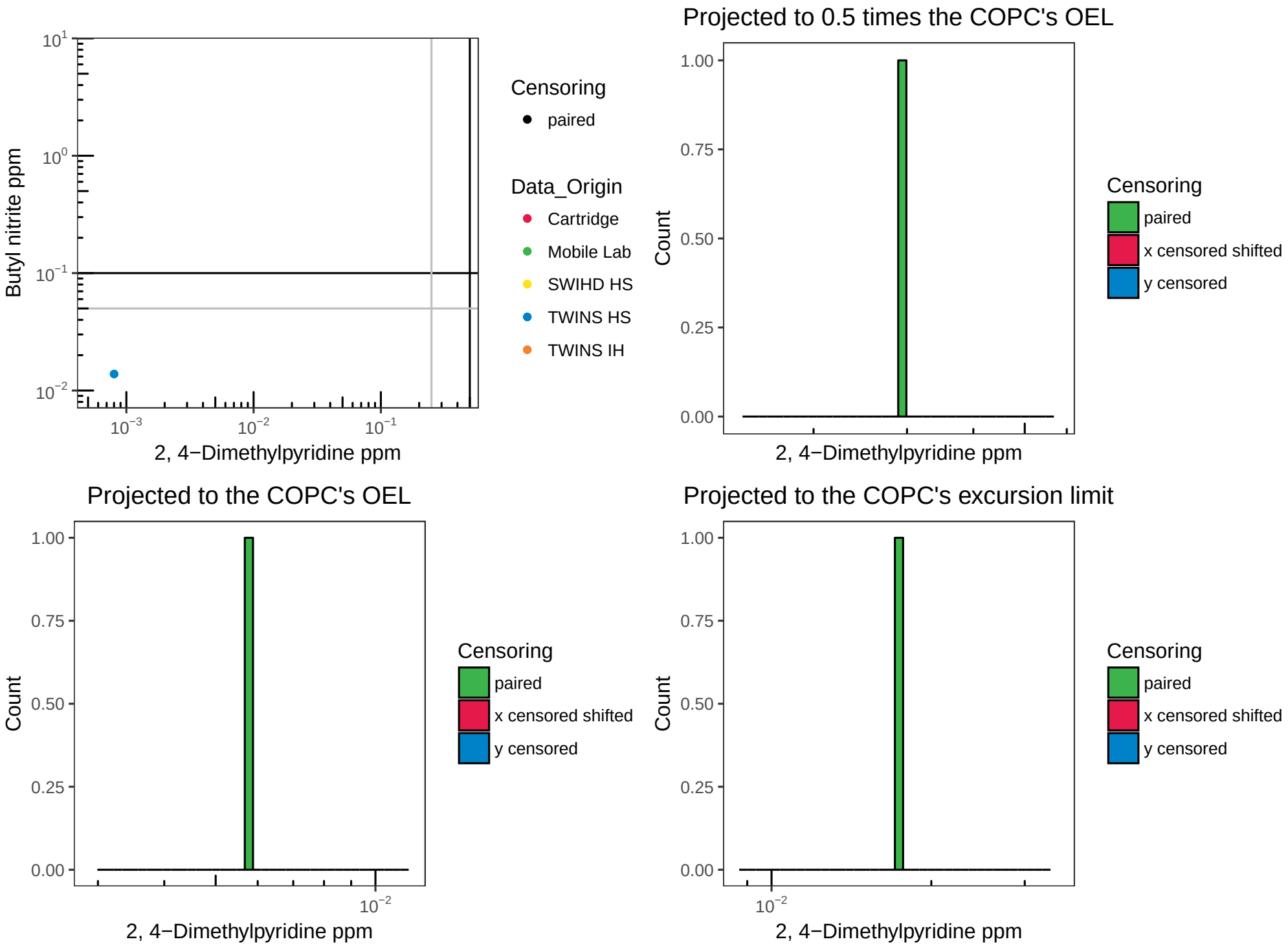


Figure C.2539: Butyl nitrite vs 2, 4-Dimethylpyridine

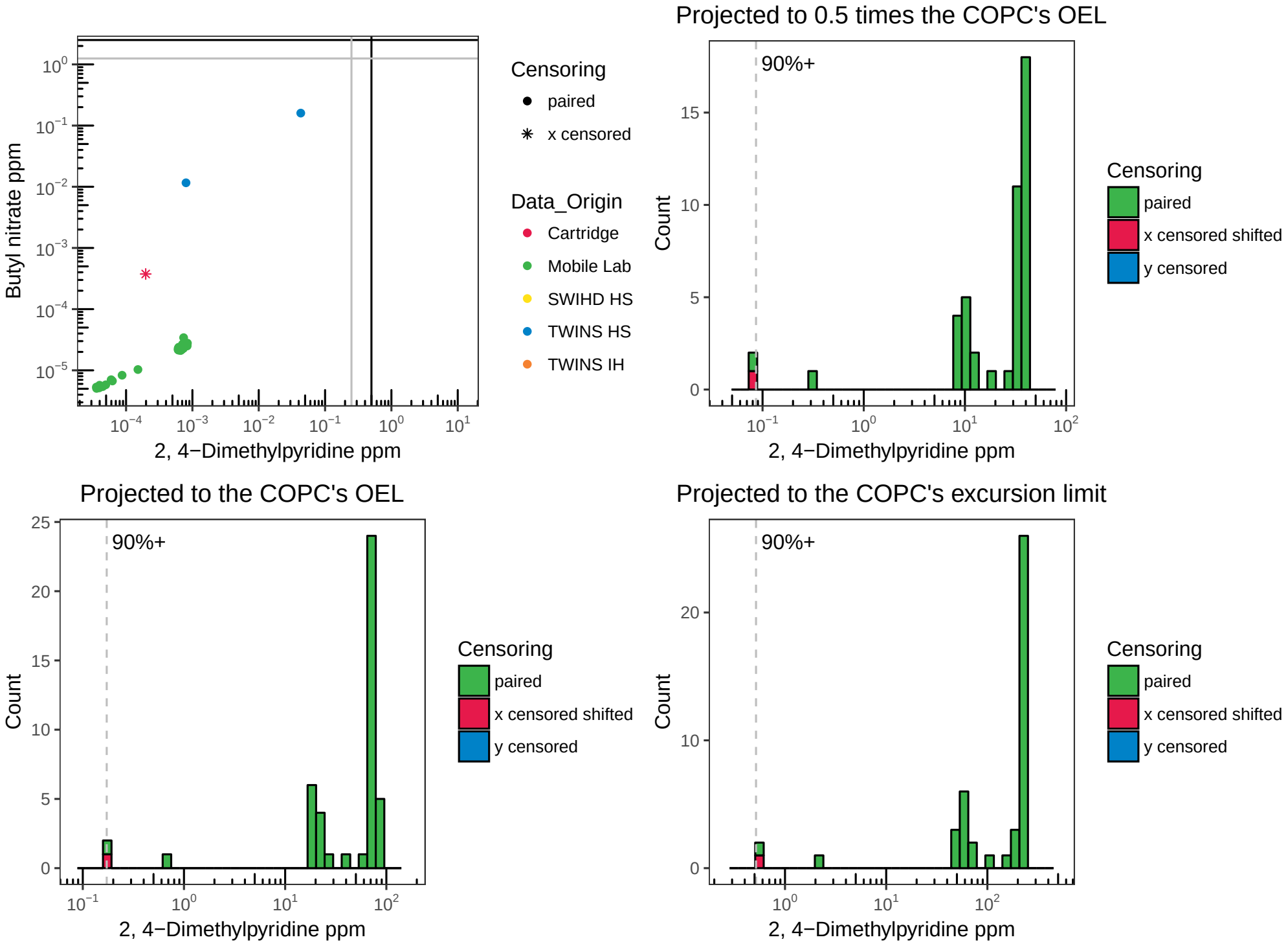


Figure C.2540: Butyl nitrate vs 2, 4-Dimethylpyridine

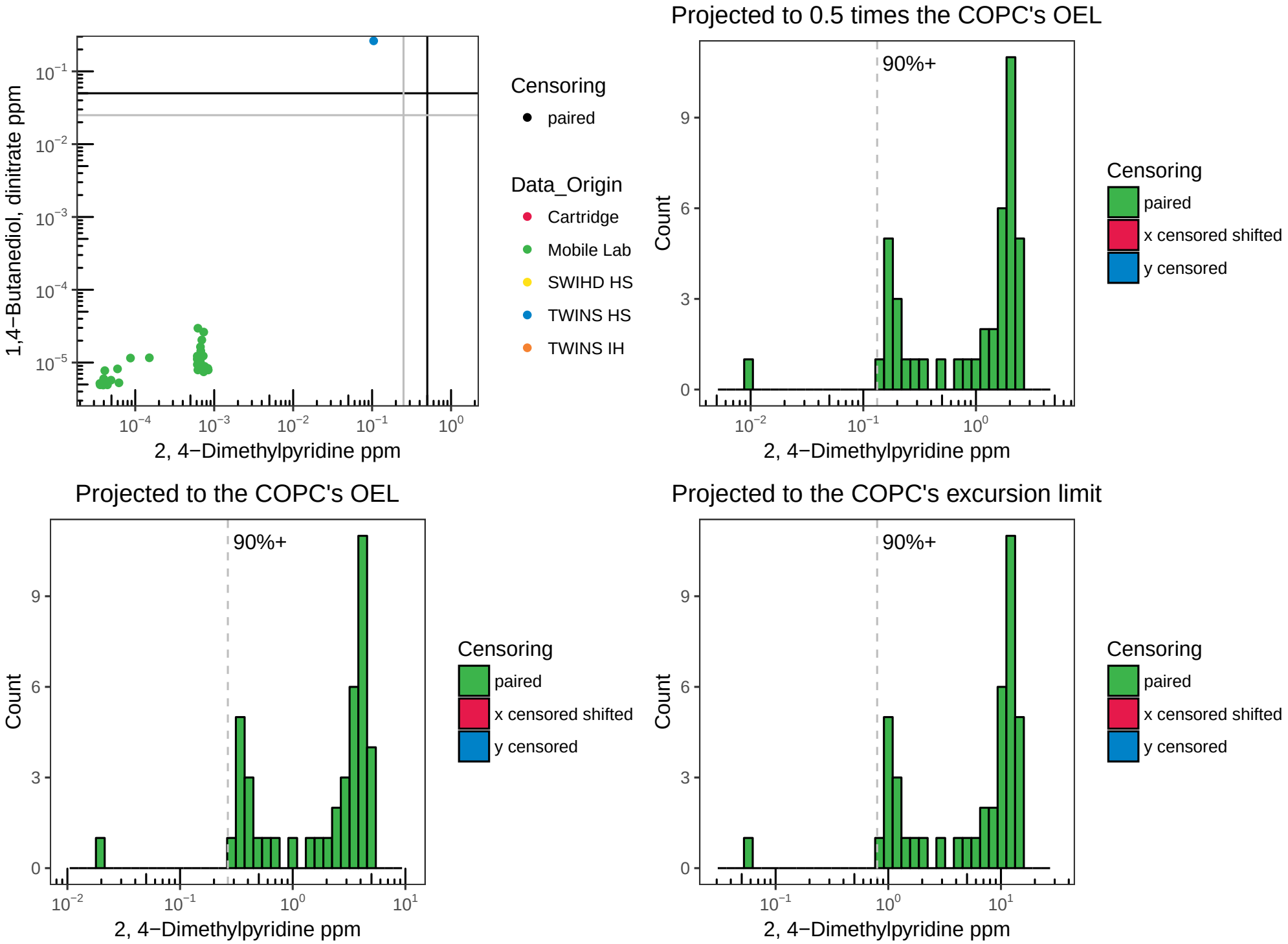


Figure C.2541: 1,4-Butanediol, dinitrate vs 2, 4-Dimethylpyridine

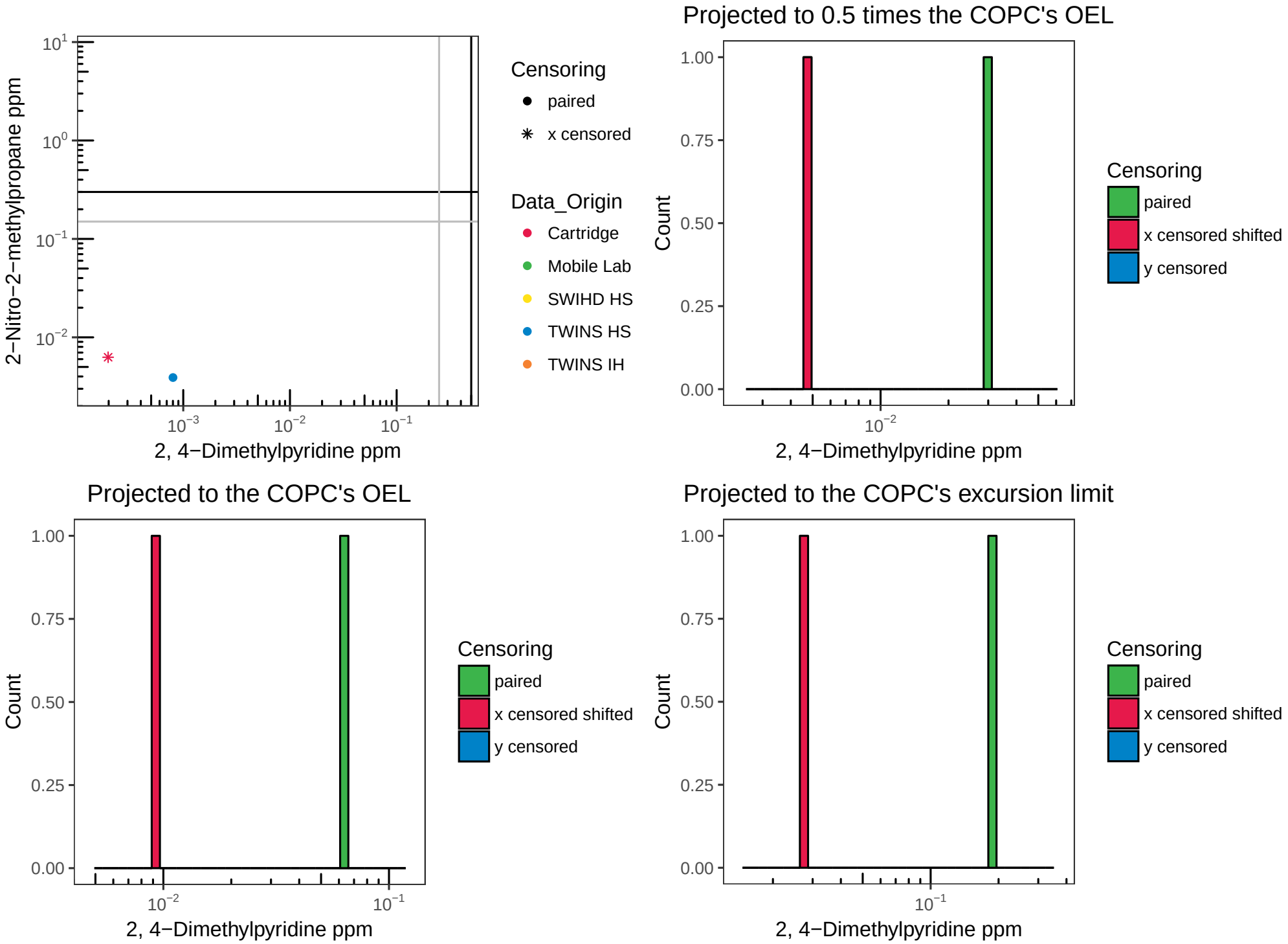


Figure C.2542: 2-Nitro-2-methylpropane vs 2, 4-Dimethylpyridine

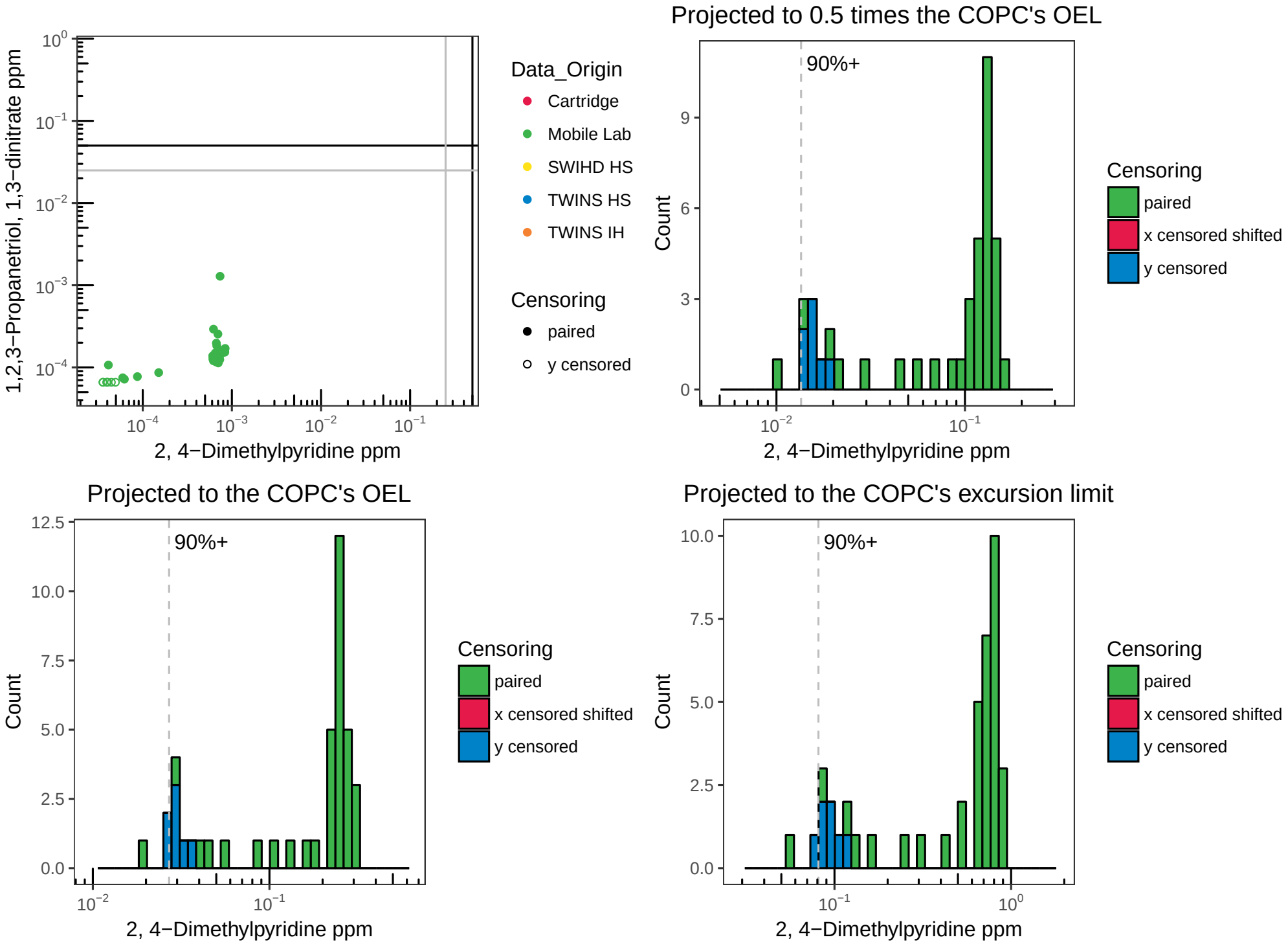


Figure C.2543: 1,2,3-Propanetriol, 1,3-dinitrate vs 2, 4-Dimethylpyridine

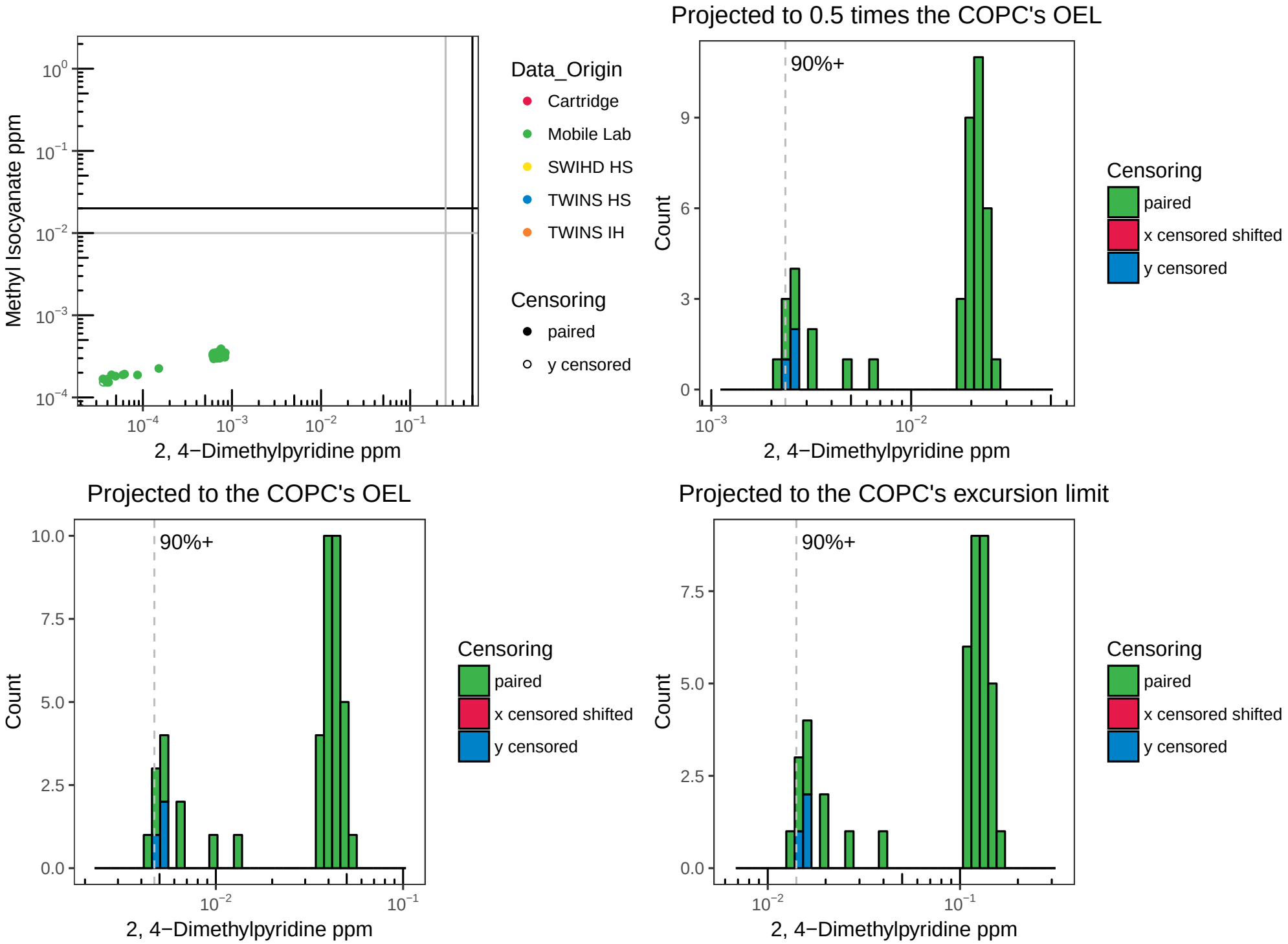


Figure C.2544: Methyl Isocyanate vs 2, 4-Dimethylpyridine

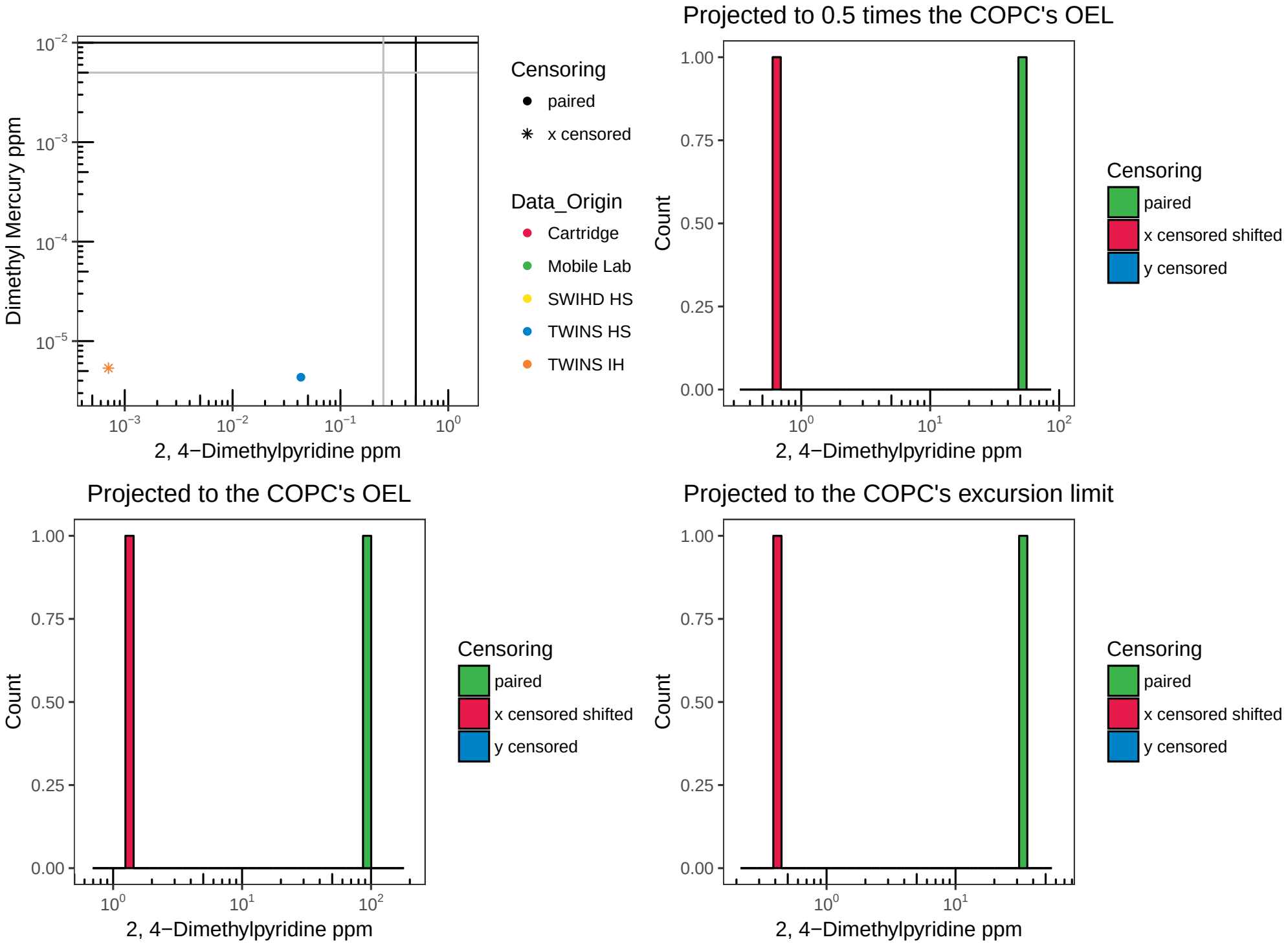


Figure C.2545: Dimethyl Mercury vs 2, 4-Dimethylpyridine

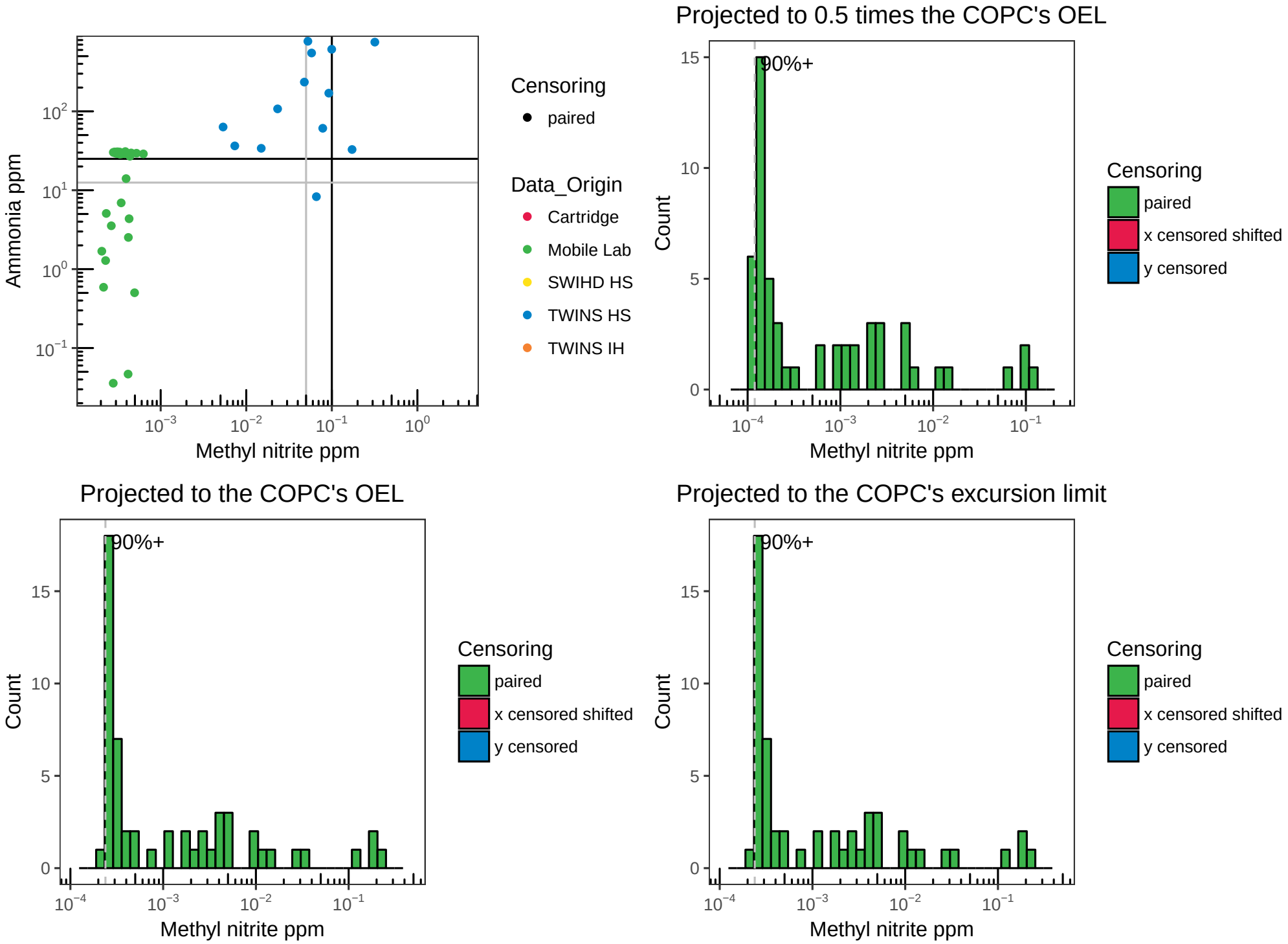


Figure C.2546: Ammonia vs Methyl nitrite

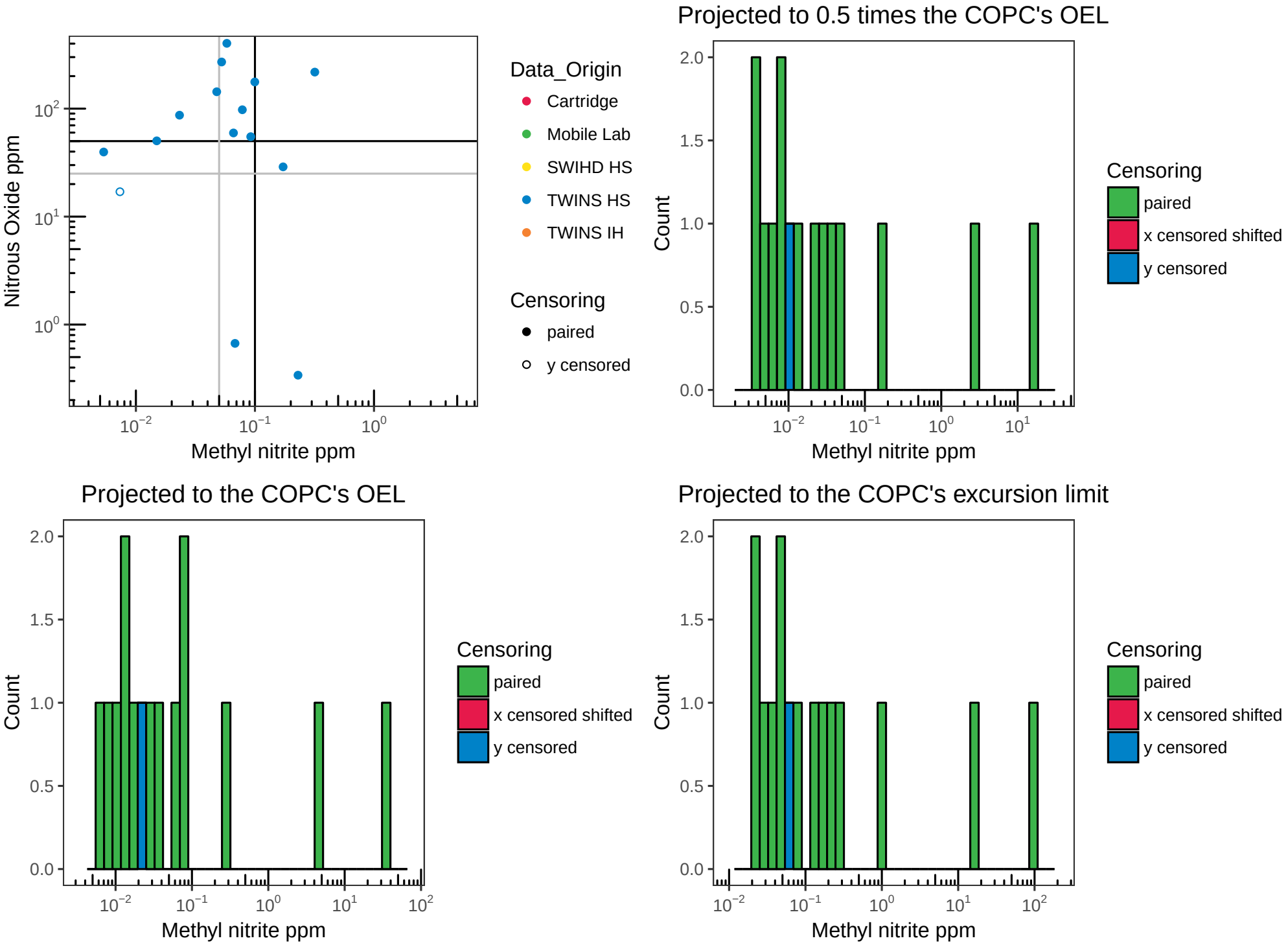


Figure C.2547: Nitrous Oxide vs Methyl nitrite

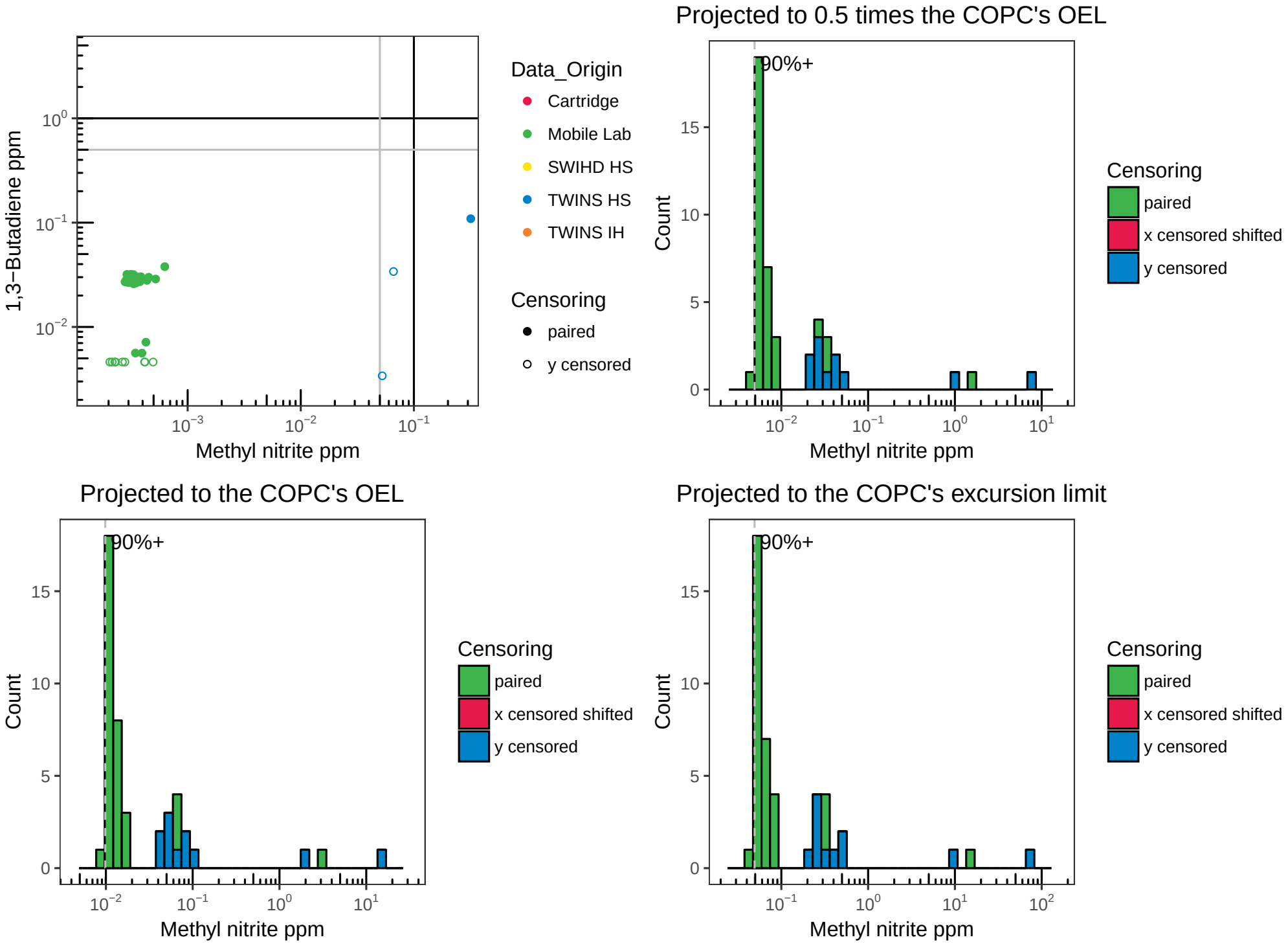


Figure C.2548: 1,3-Butadiene vs Methyl nitrite

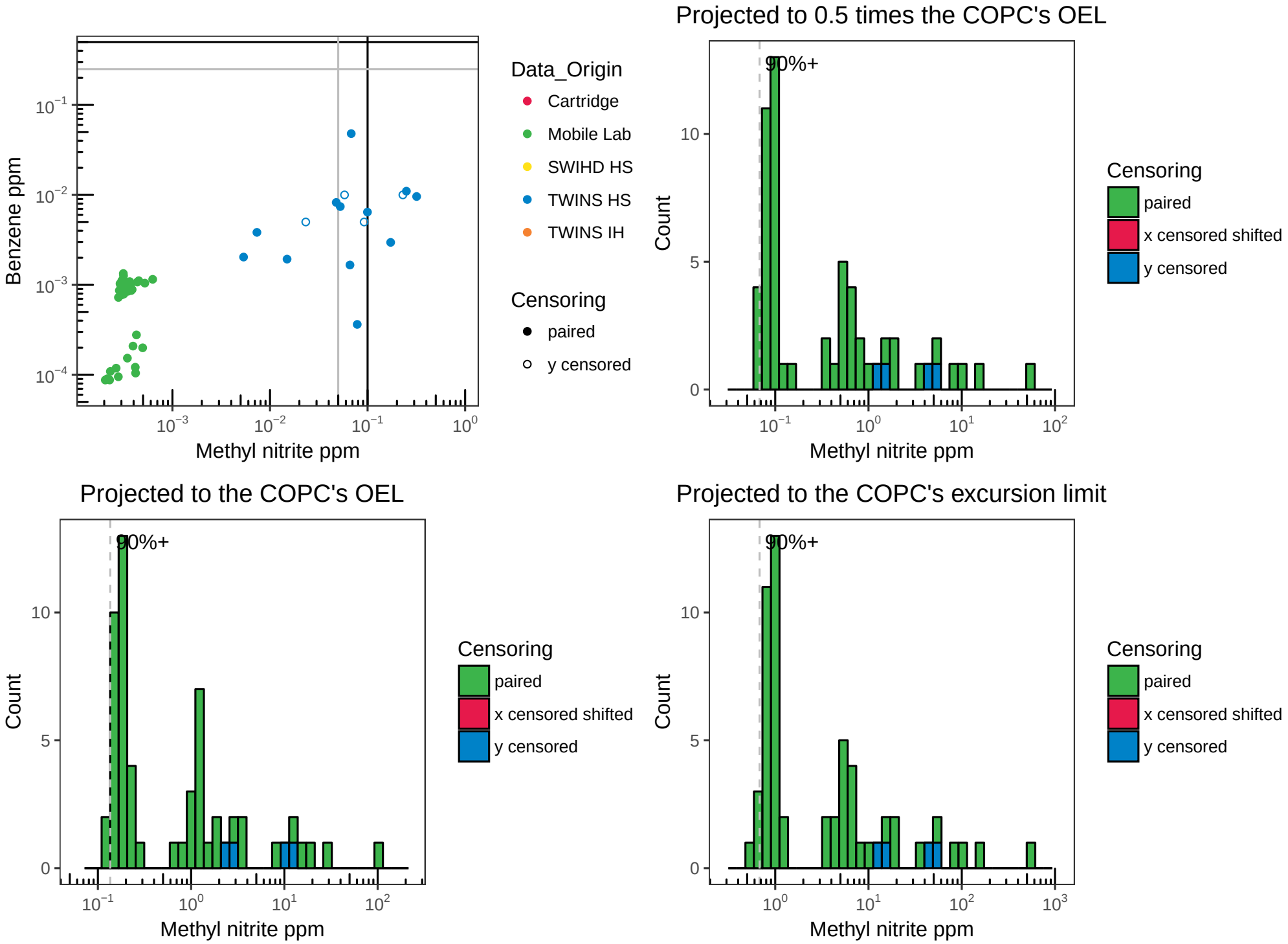


Figure C.2549: Benzene vs Methyl nitrite

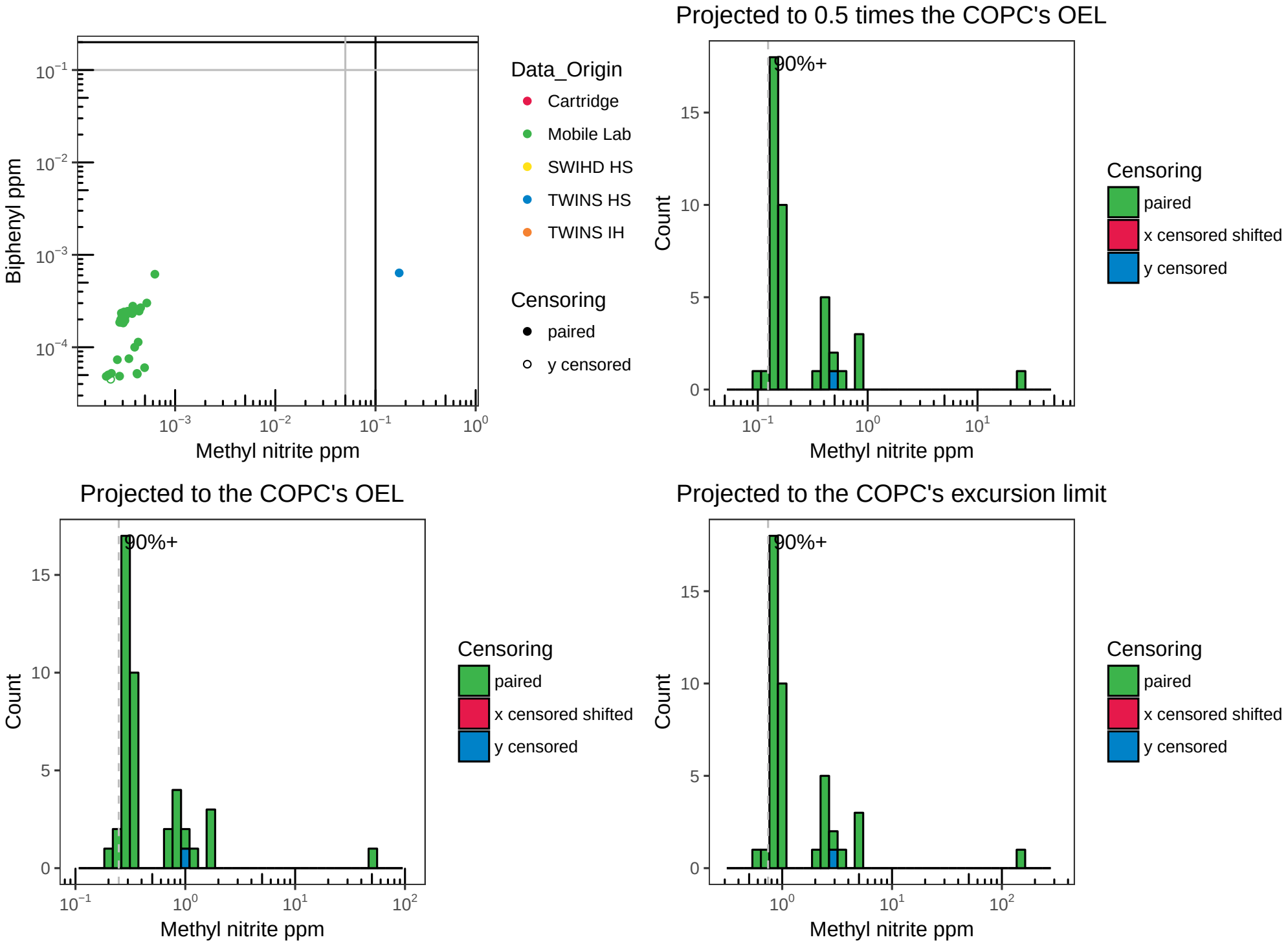


Figure C.2550: Biphenyl vs Methyl nitrite

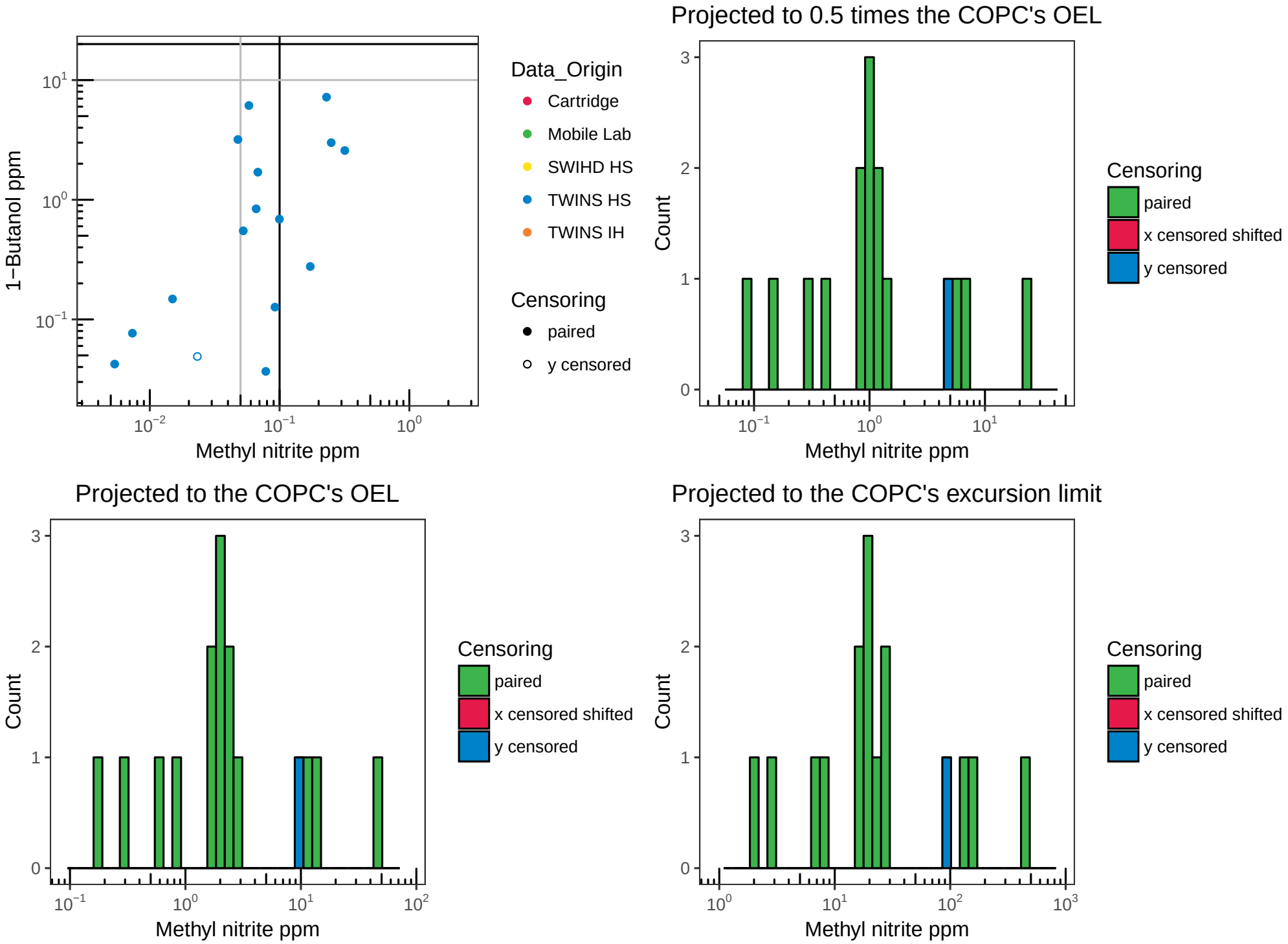


Figure C.2551: 1-Butanol vs Methyl nitrite

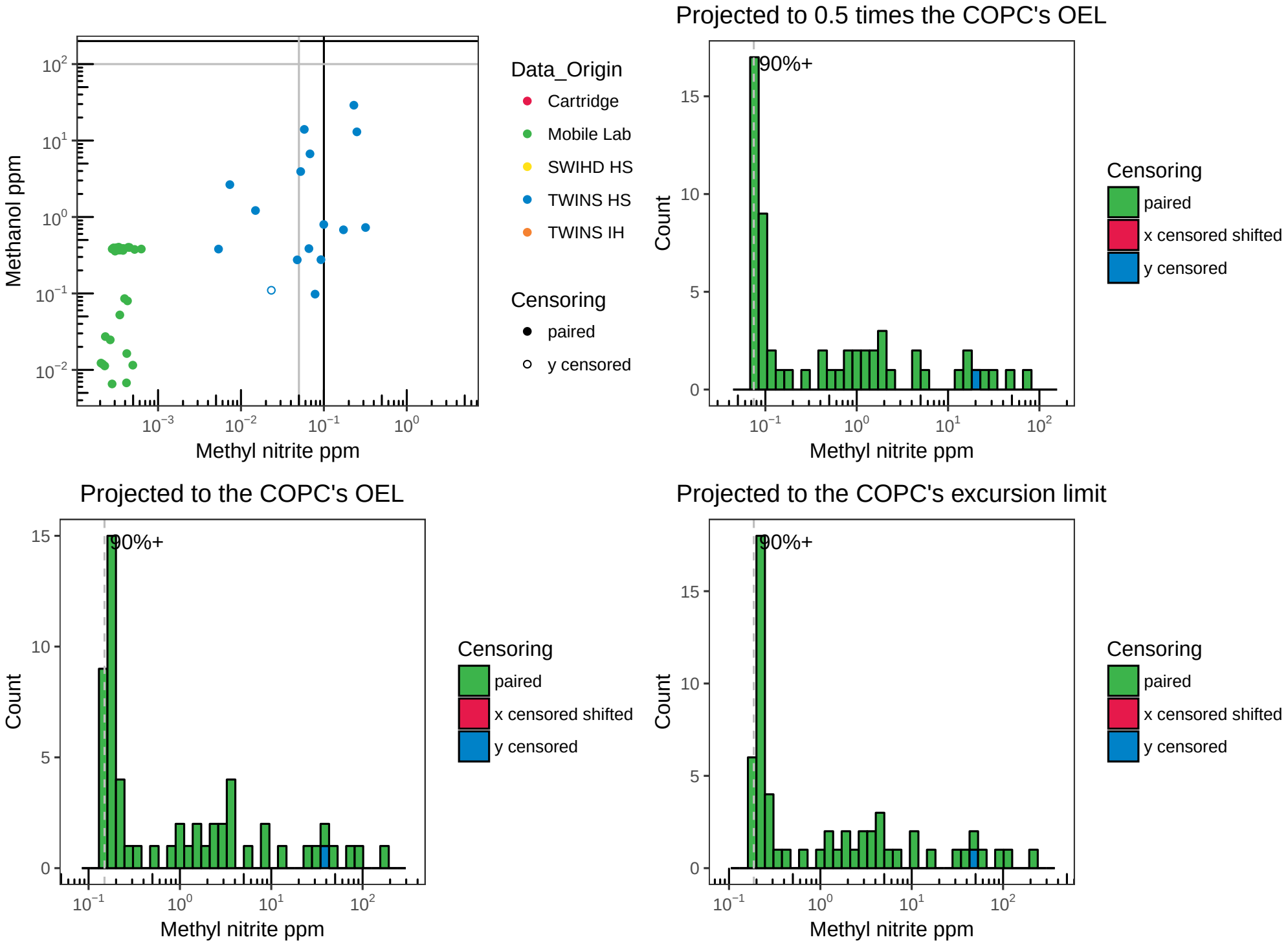


Figure C.2552: Methanol vs Methyl nitrite

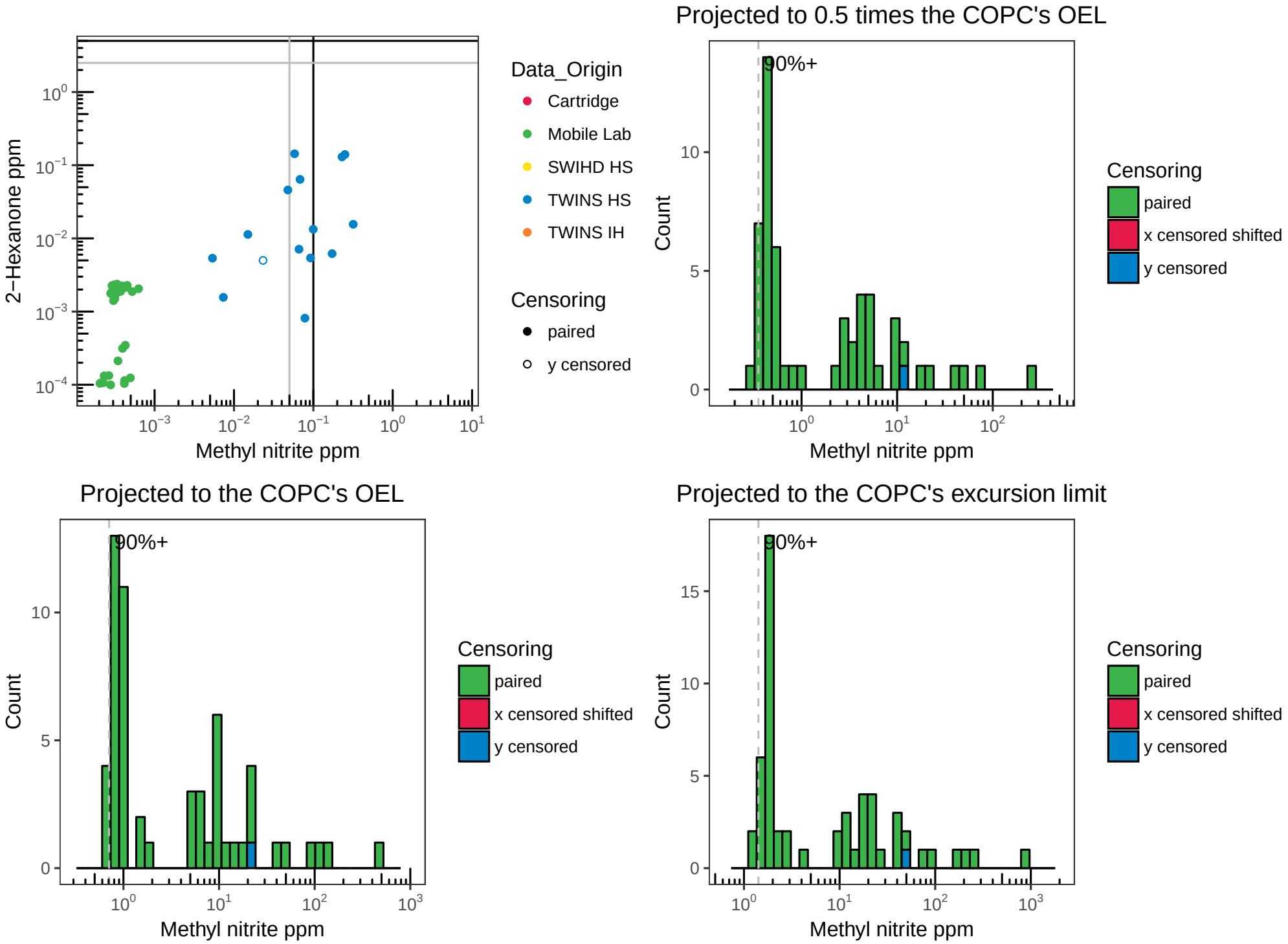


Figure C.2553: 2-Hexanone vs Methyl nitrite

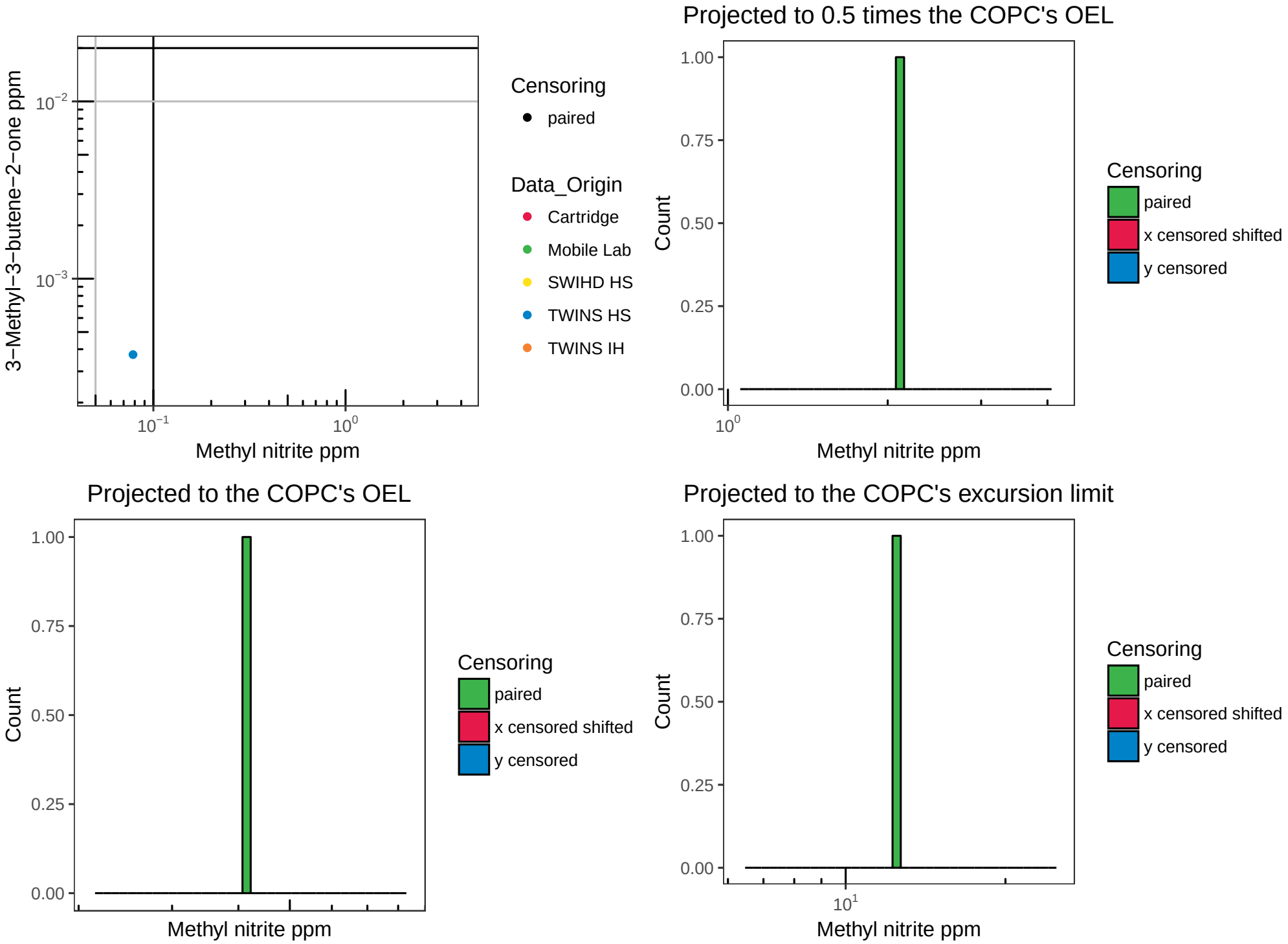


Figure C.2554: 3-Methyl-3-butene-2-one vs Methyl nitrite

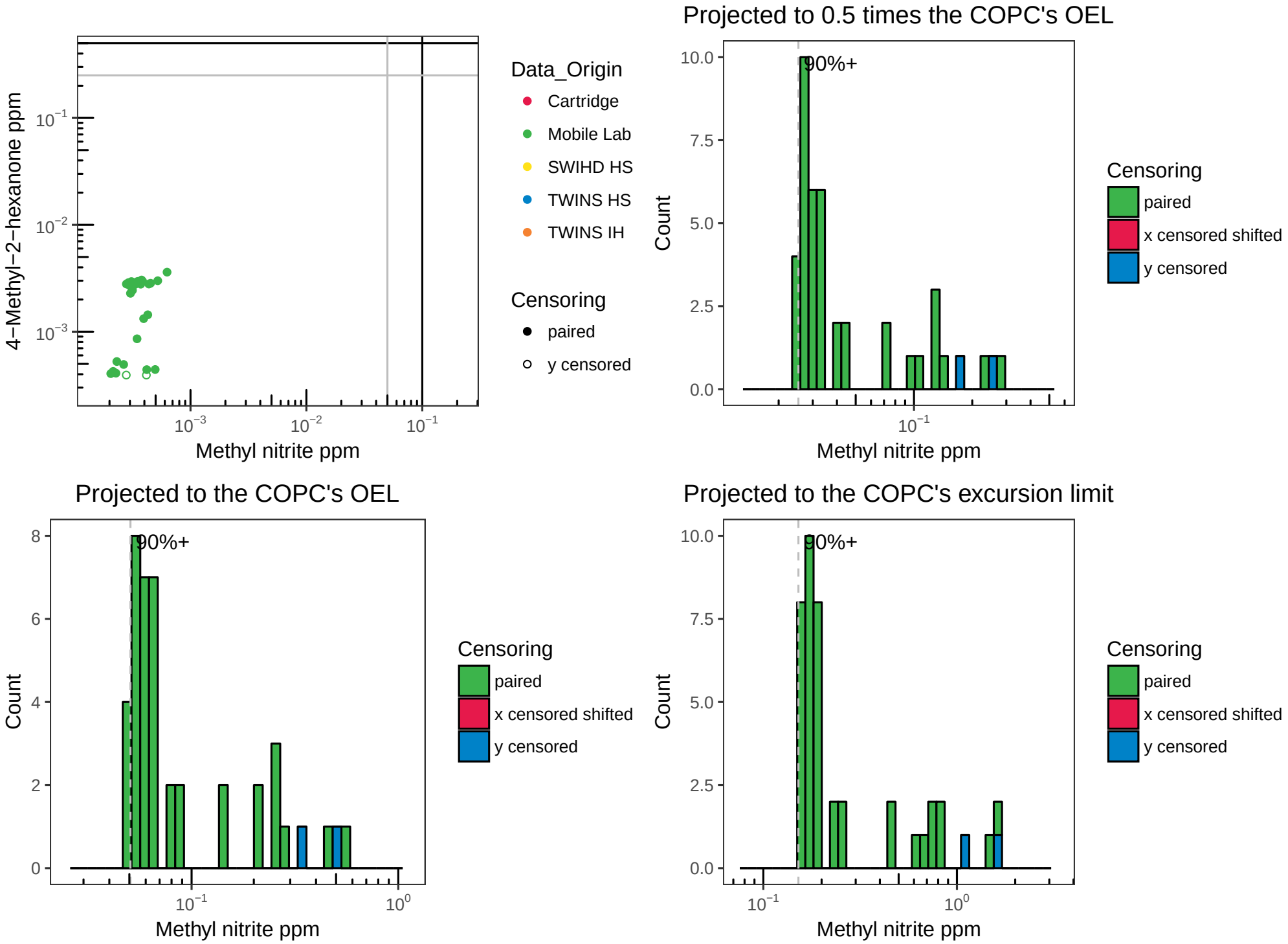


Figure C.2555: 4-Methyl-2-hexanone vs Methyl nitrite

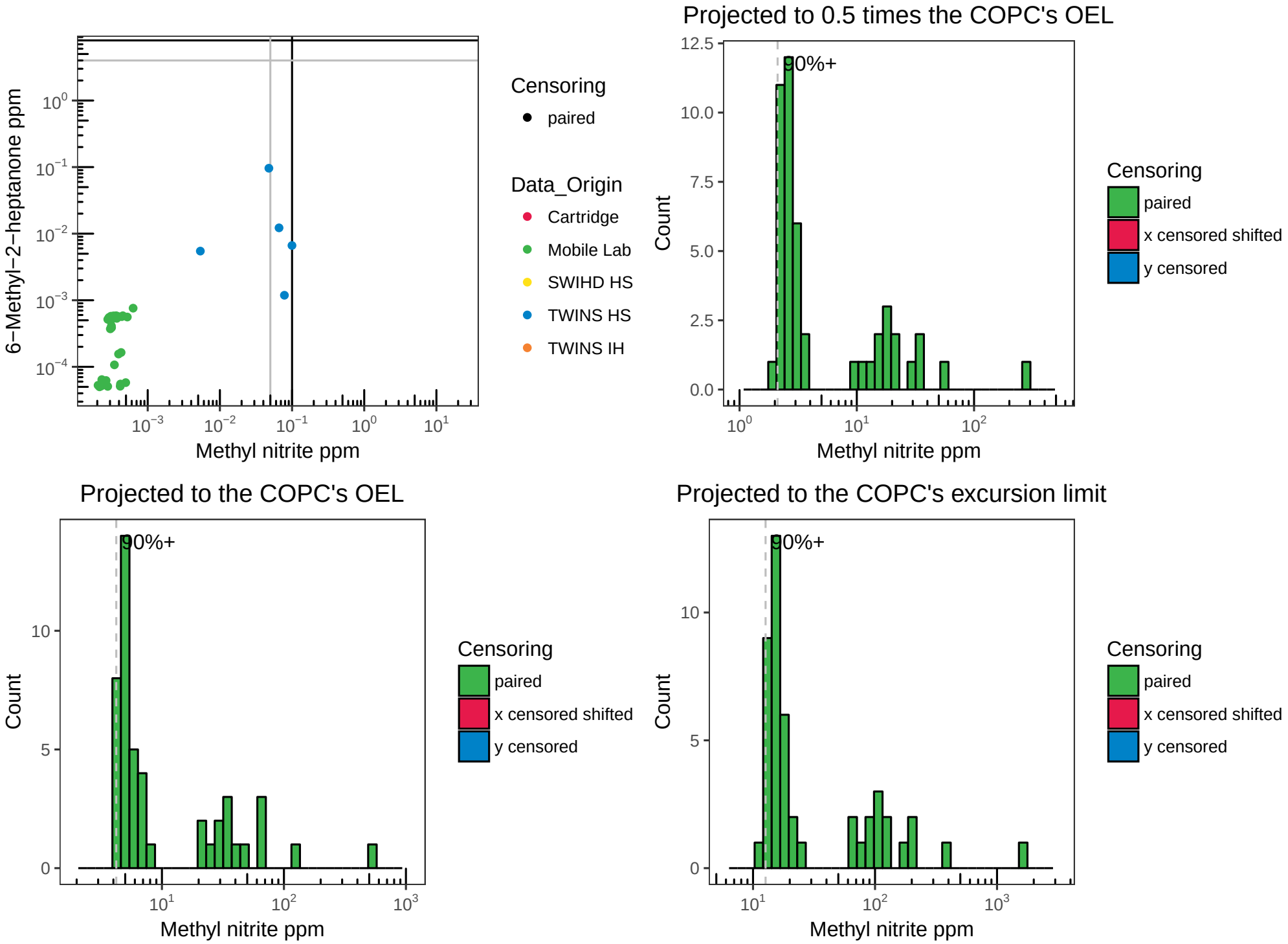


Figure C.2556: 6-Methyl-2-heptanone vs Methyl nitrite

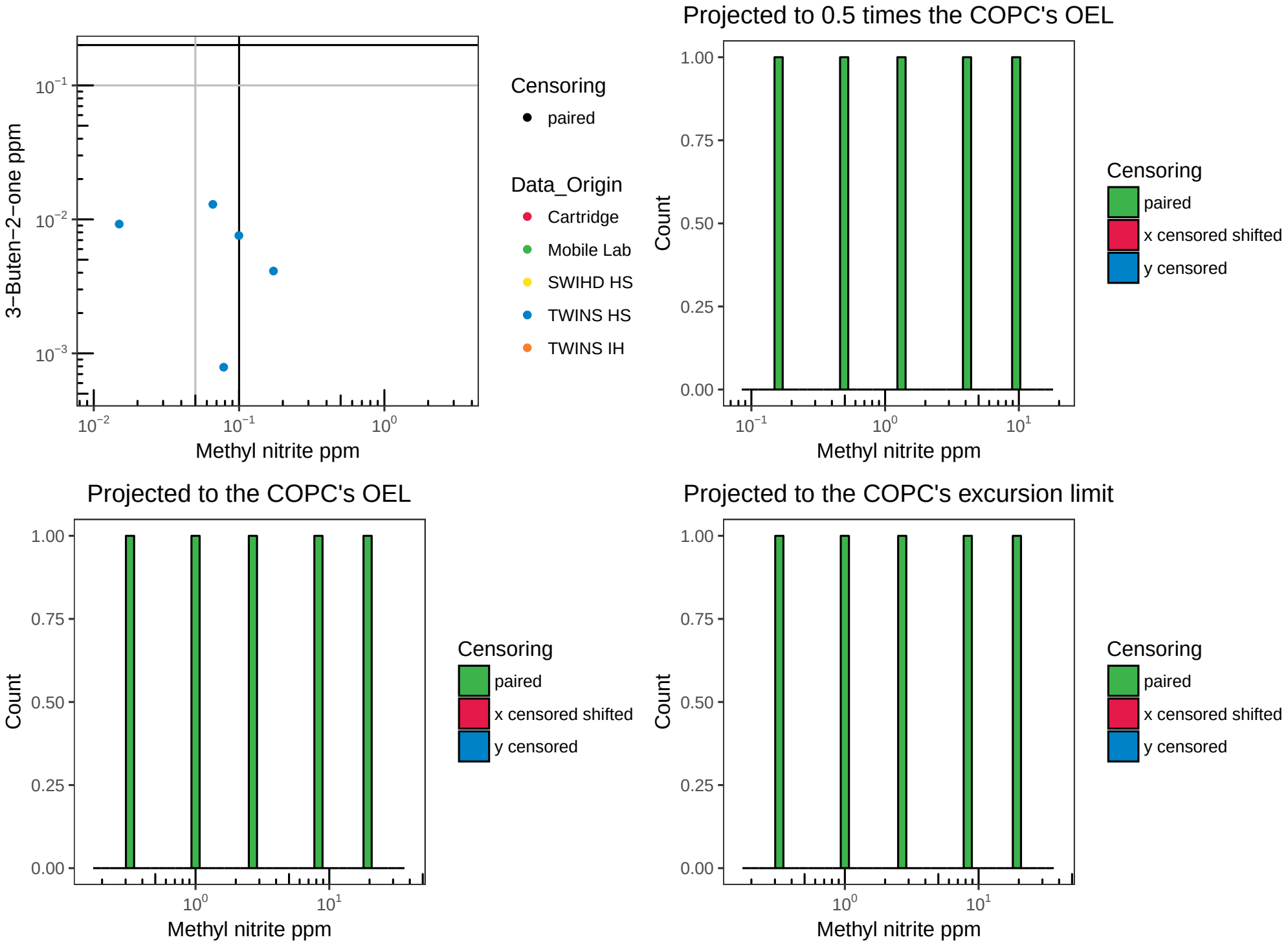


Figure C.2557: 3-Buten-2-one vs Methyl nitrite

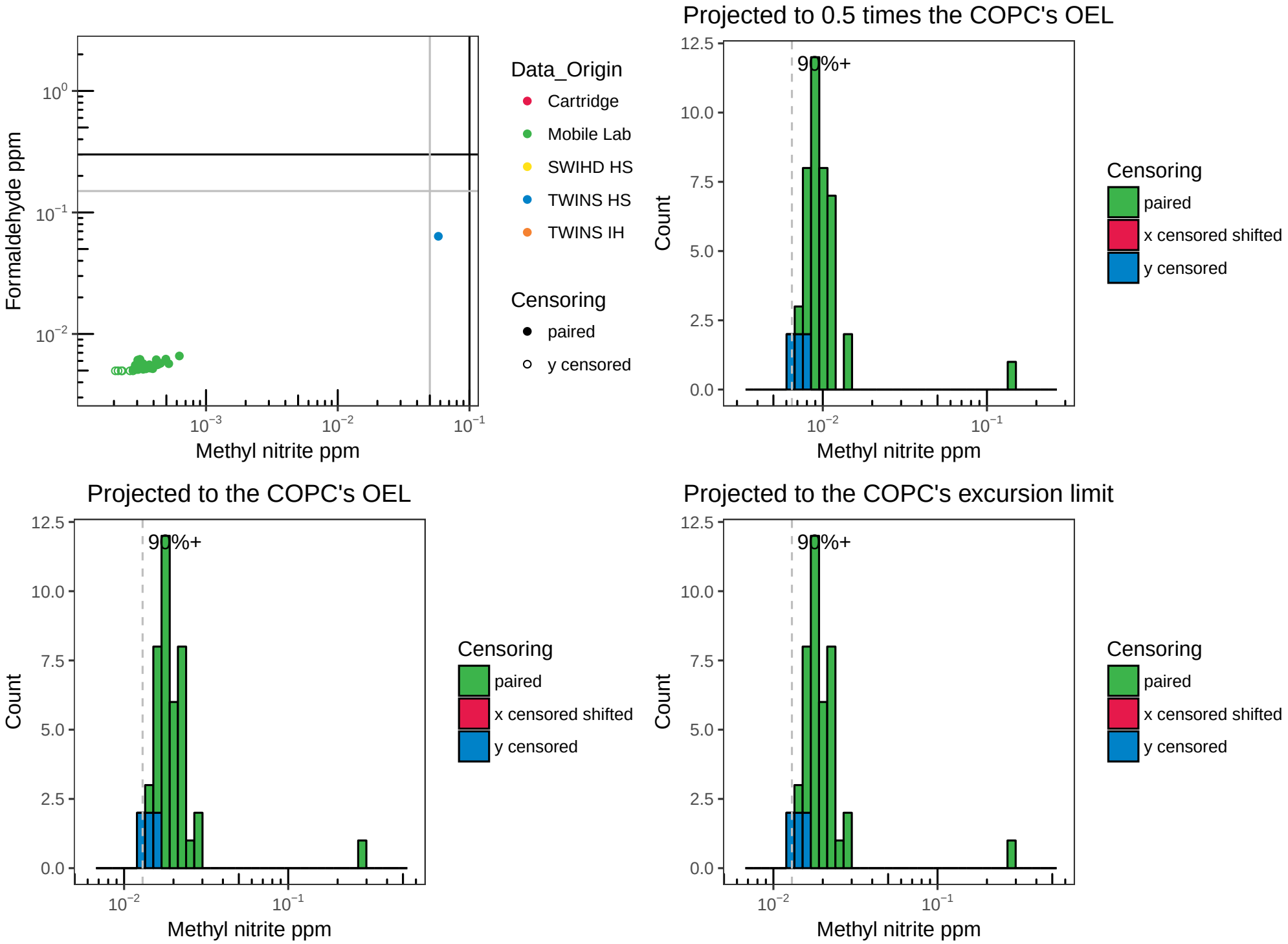


Figure C.2558: Formaldehyde vs Methyl nitrite

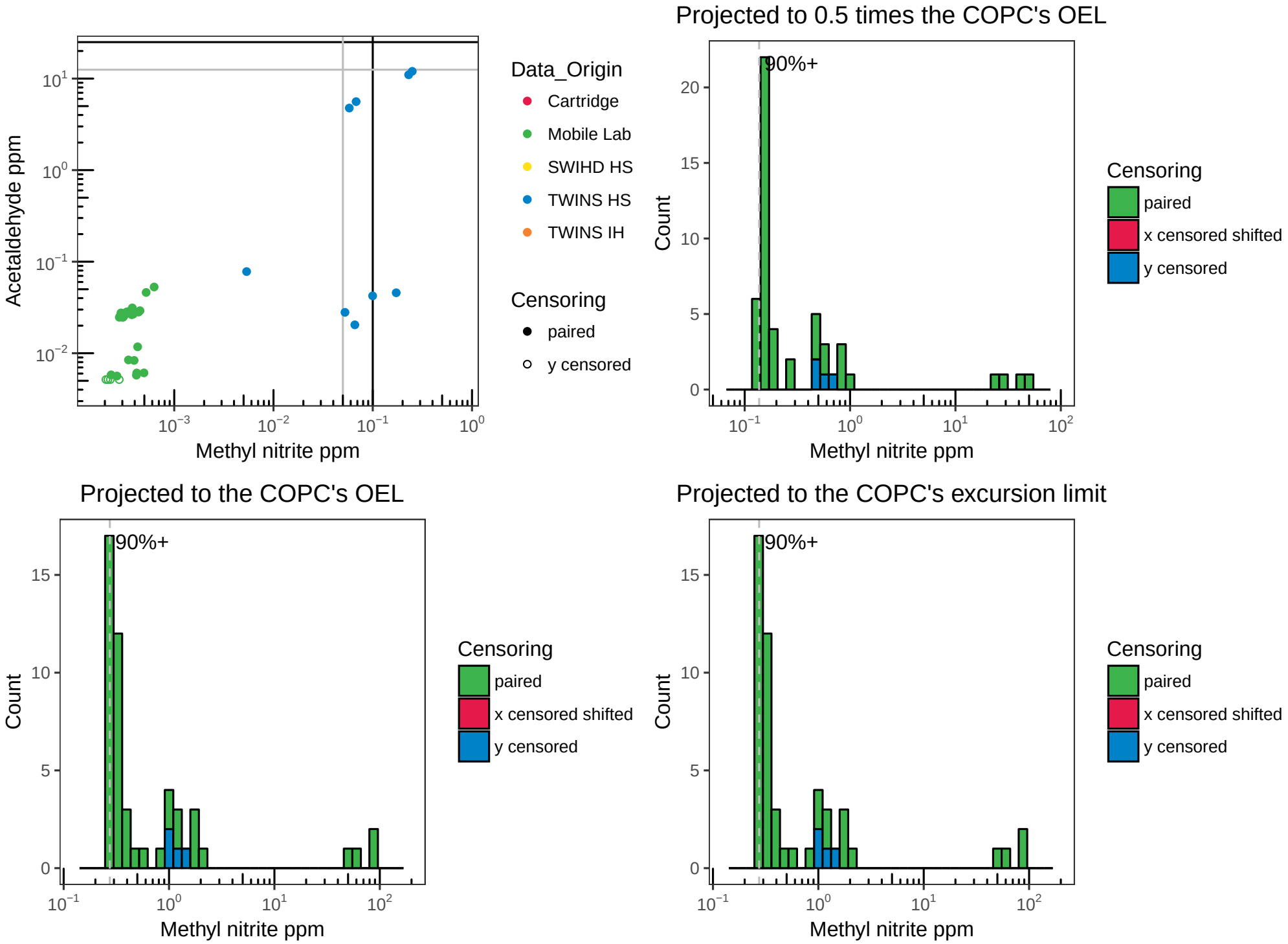


Figure C.2559: Acetaldehyde vs Methyl nitrite

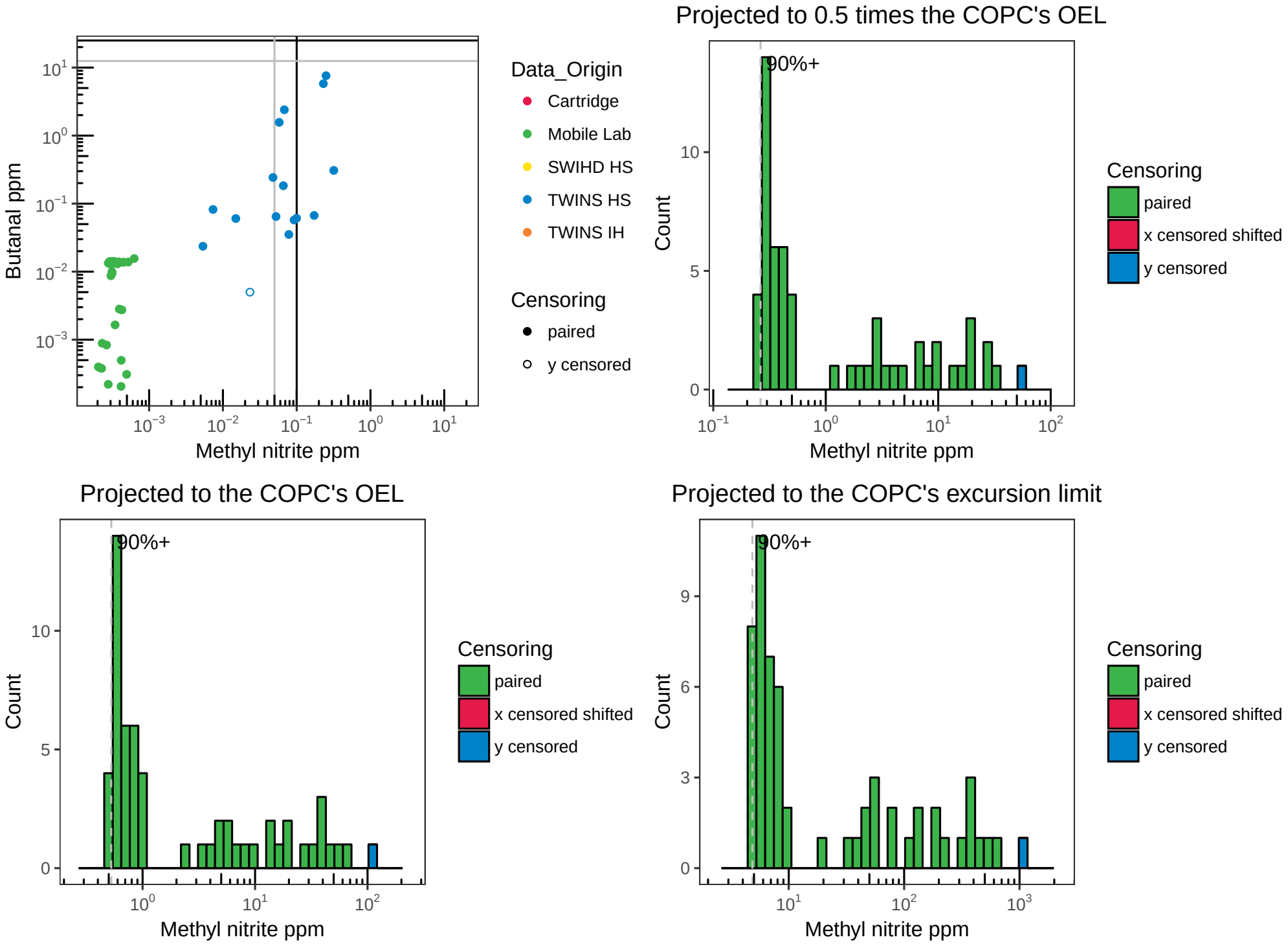


Figure C.2560: Butanal vs Methyl nitrite

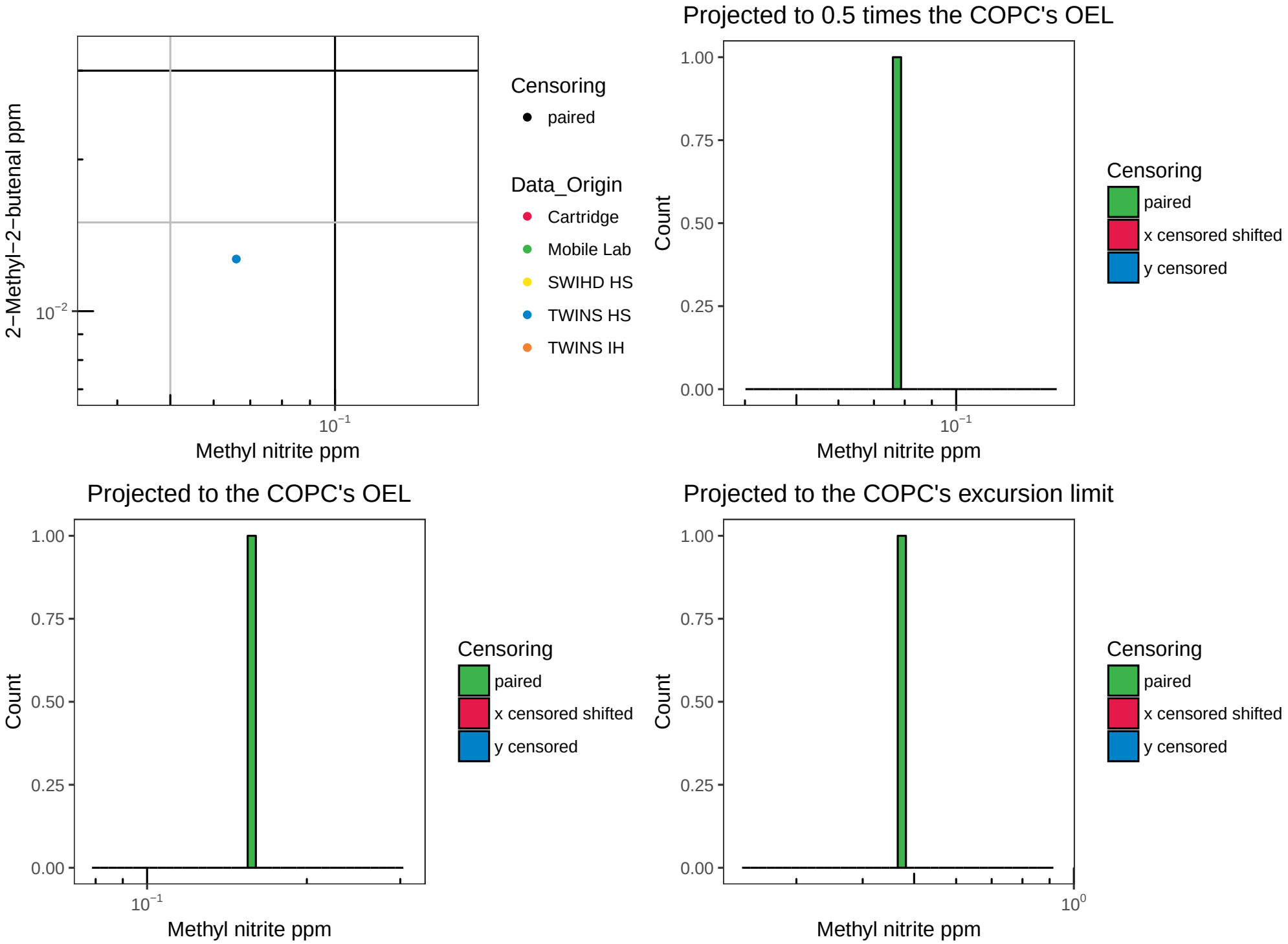


Figure C.2561: 2-Methyl-2-butenal vs Methyl nitrite

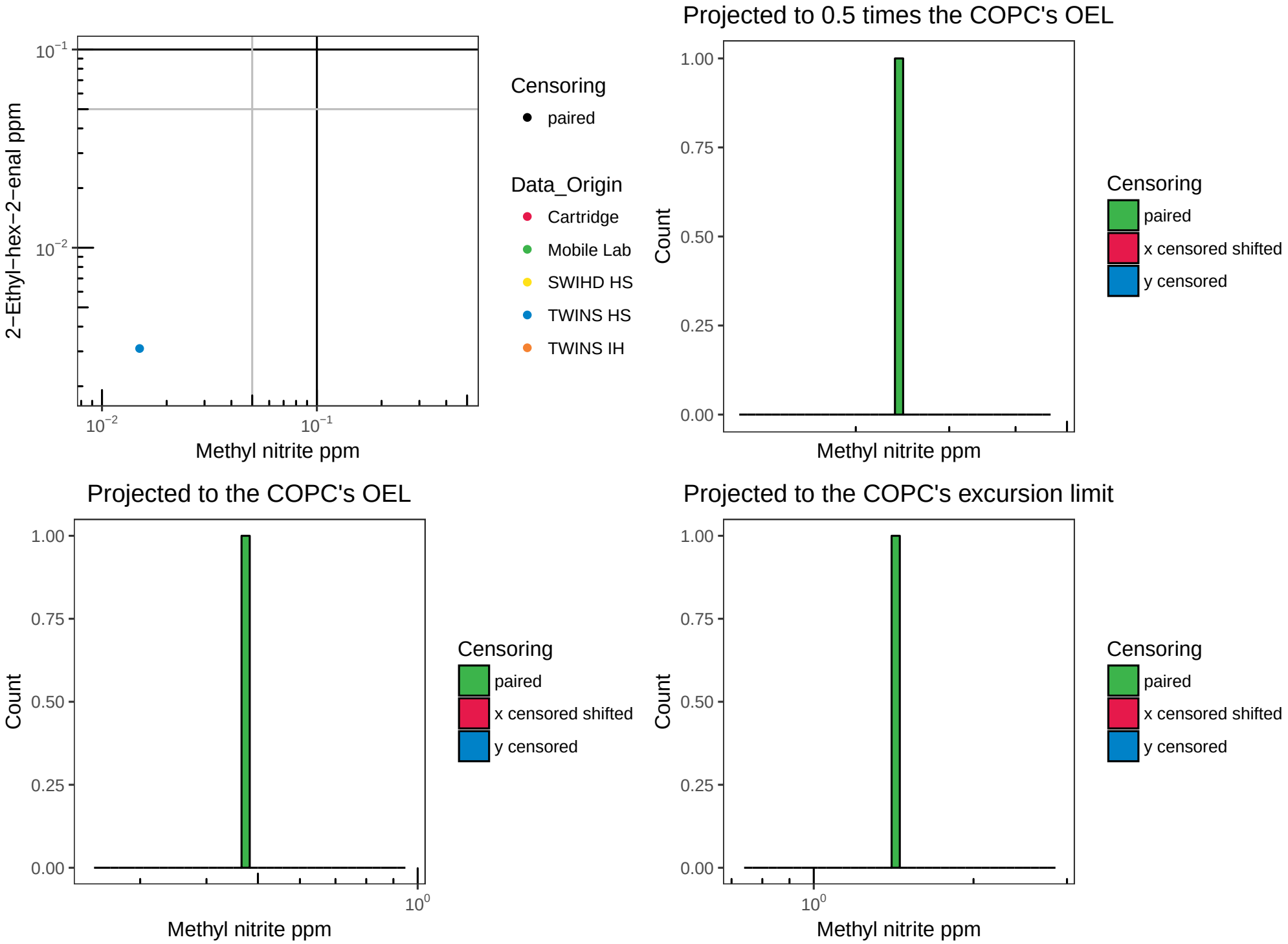


Figure C.2562: 2-Ethyl-hex-2-enal vs Methyl nitrite

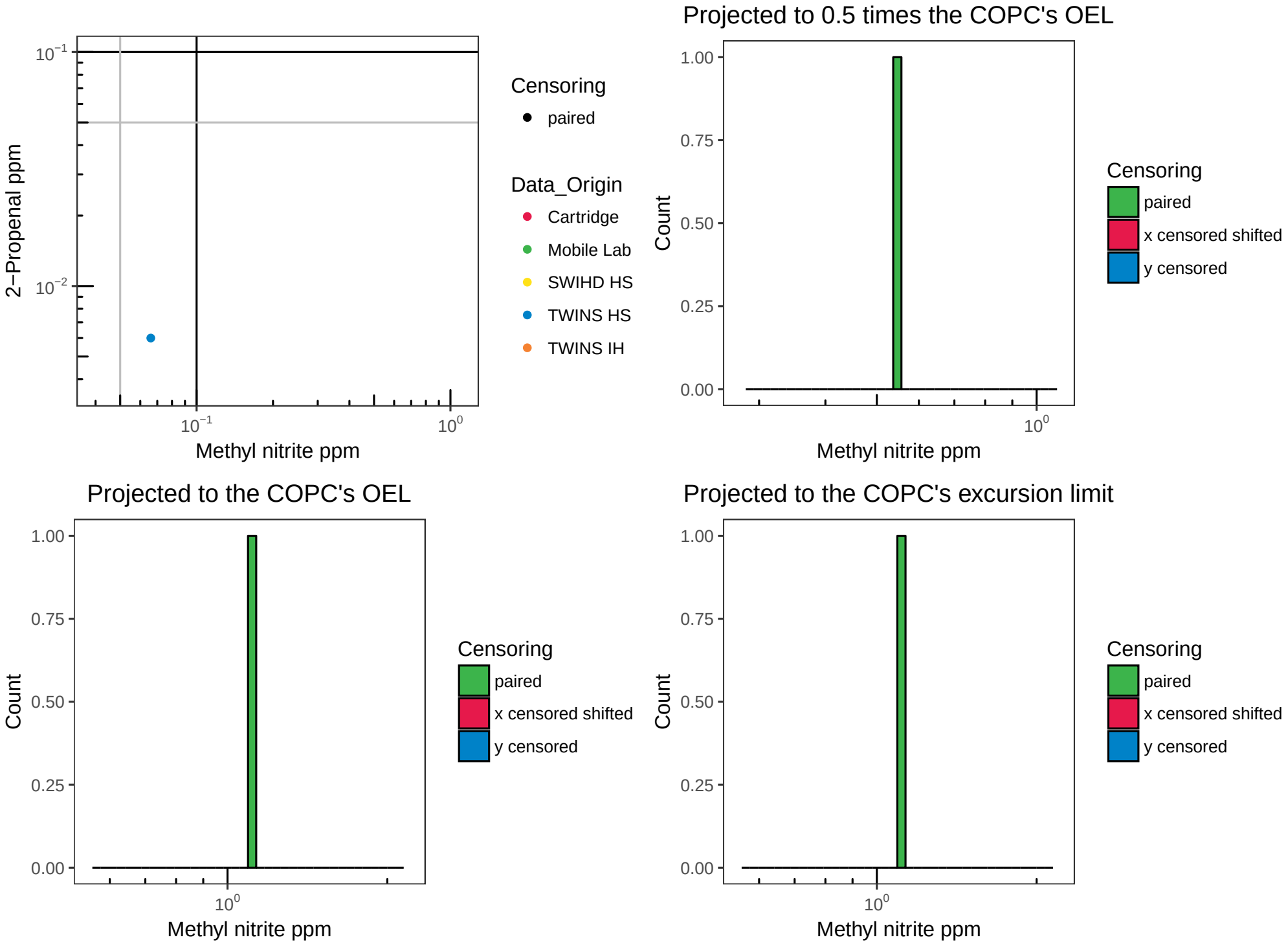


Figure C.2563: 2-Propenal vs Methyl nitrite

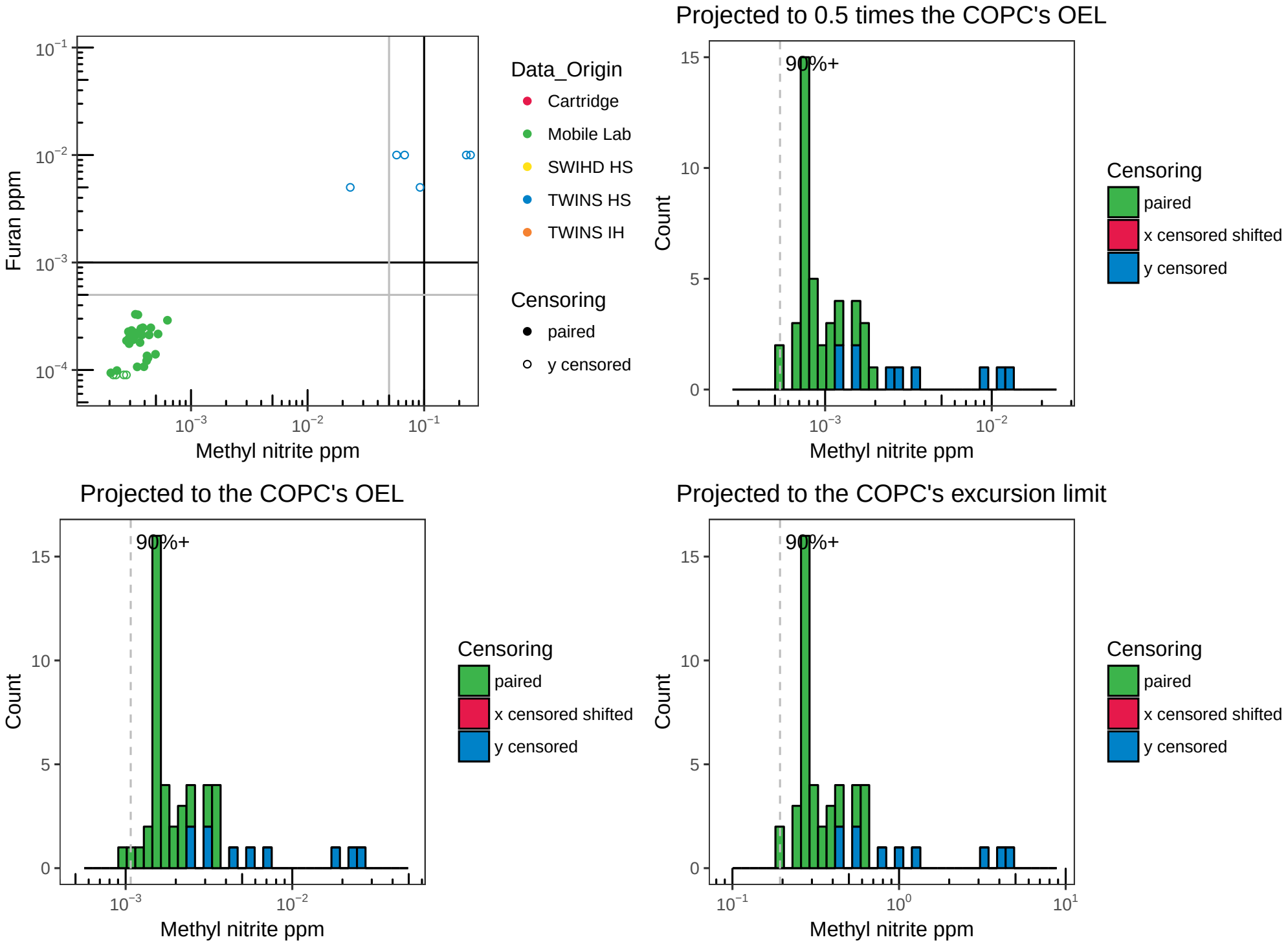


Figure C.2564: Furan vs Methyl nitrite

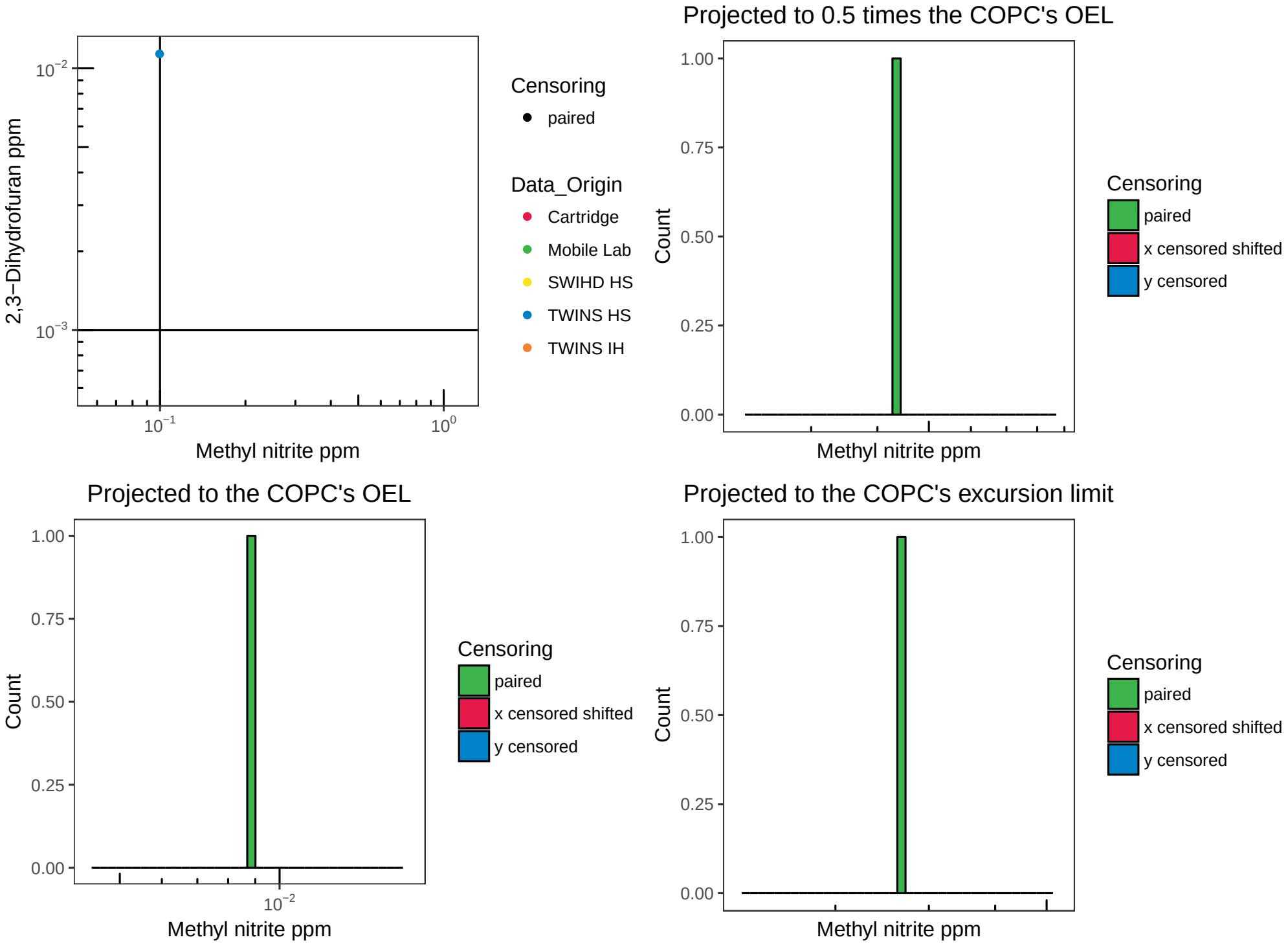


Figure C.2565: 2,3-Dihydrofuran vs Methyl nitrite

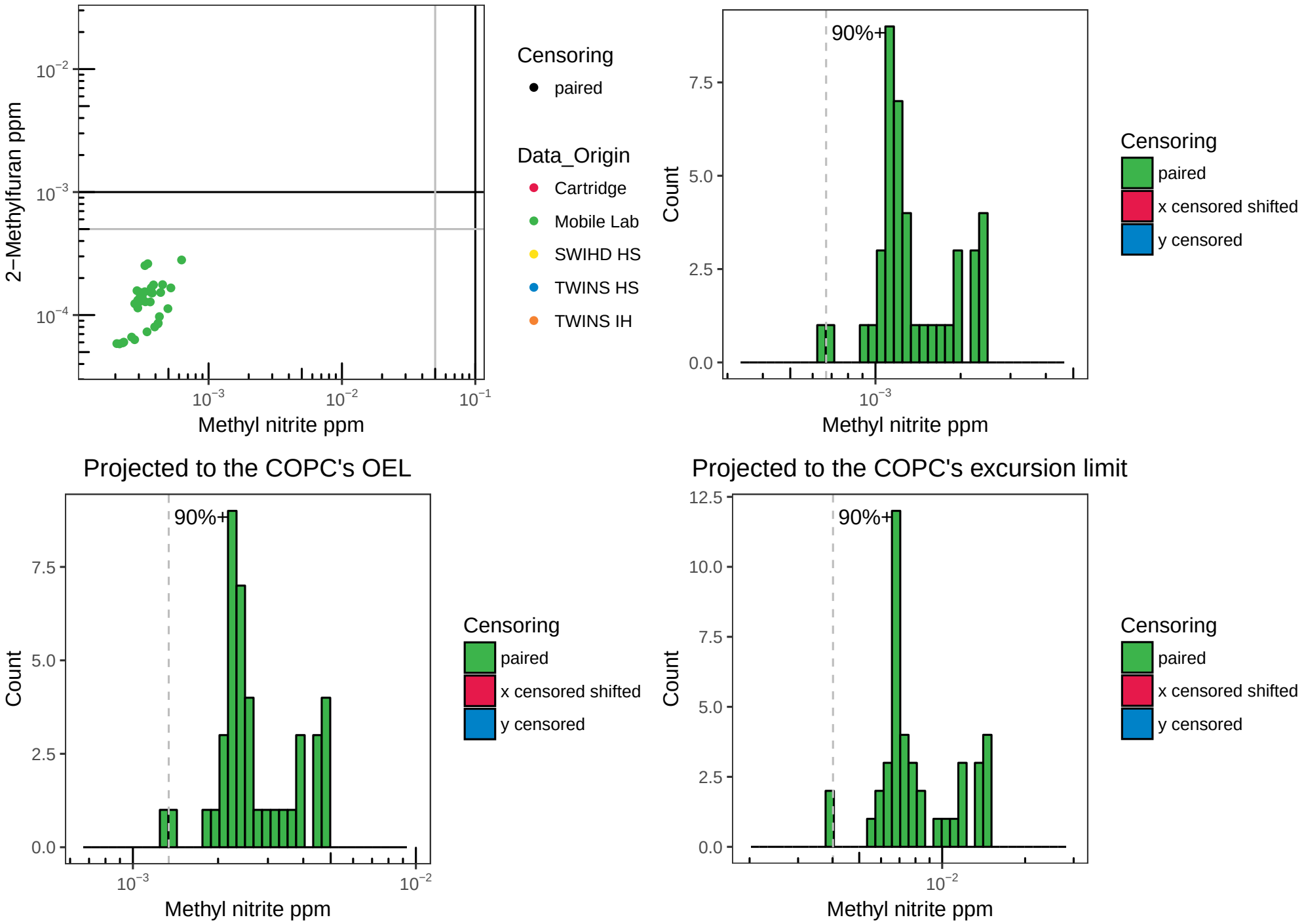


Figure C.2566: 2-Methylfuran vs Methyl nitrite

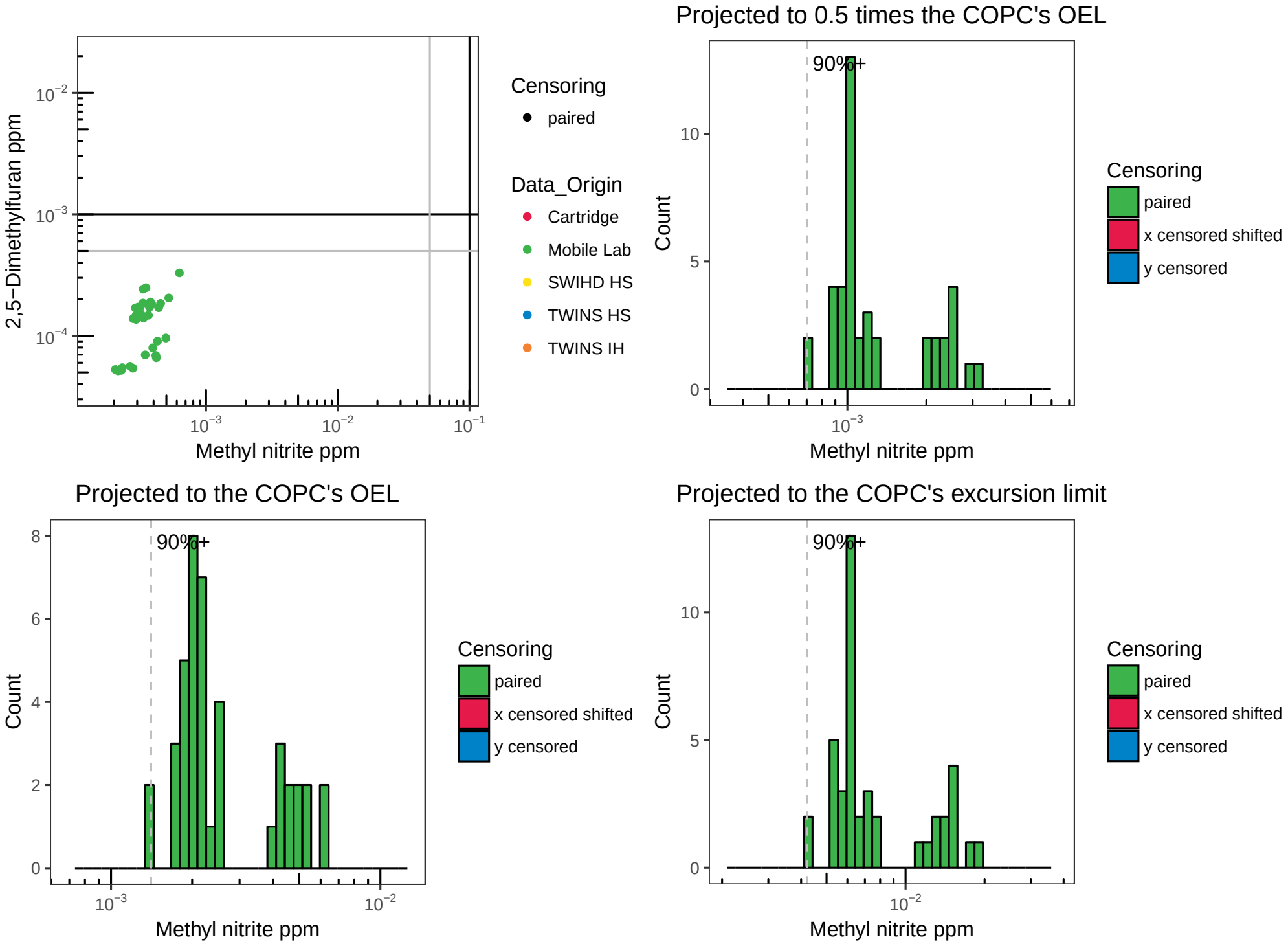


Figure C.2567: 2,5-Dimethylfuran vs Methyl nitrite

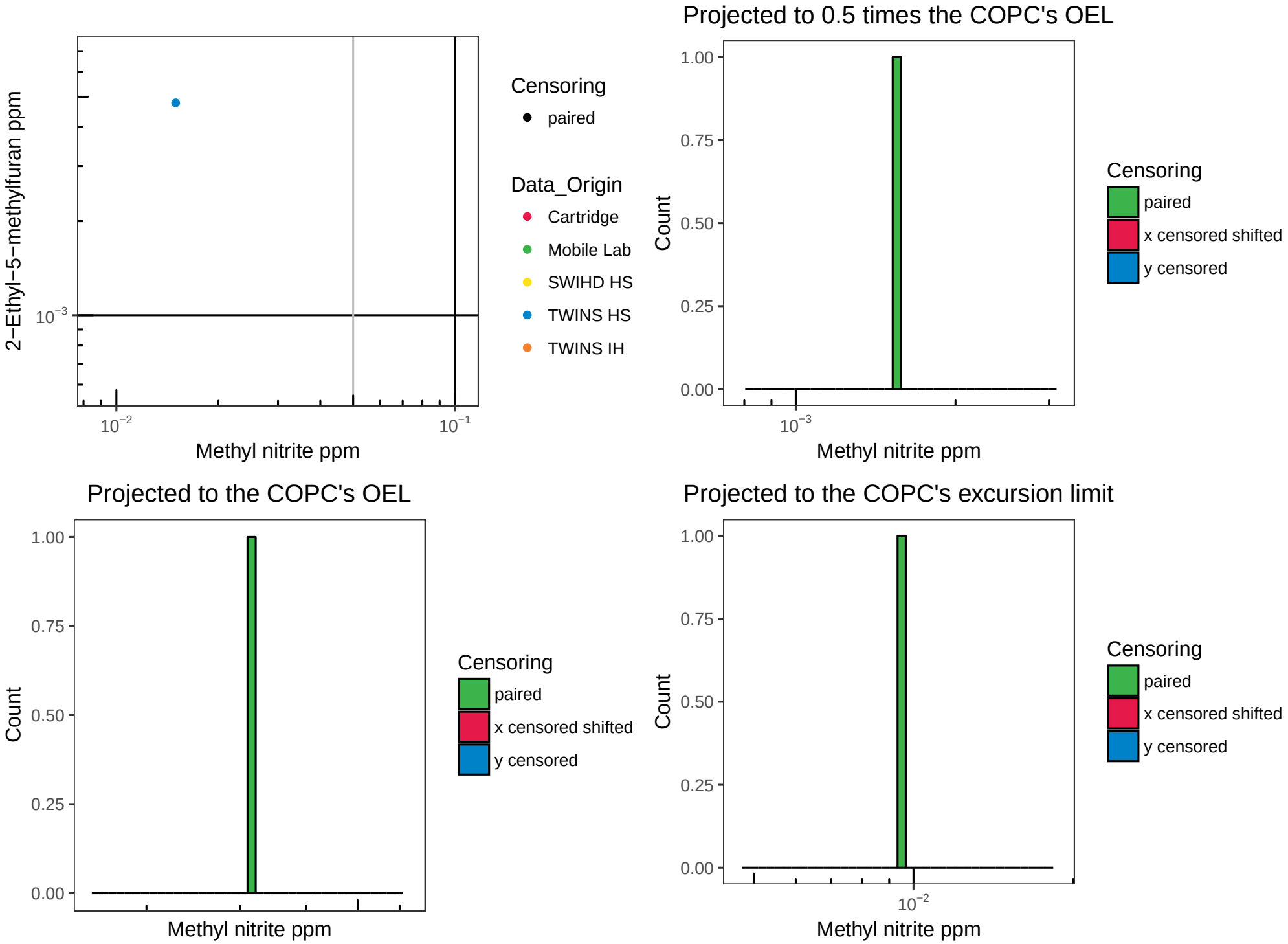


Figure C.2568: 2-Ethyl-5-methylfuran vs Methyl nitrite

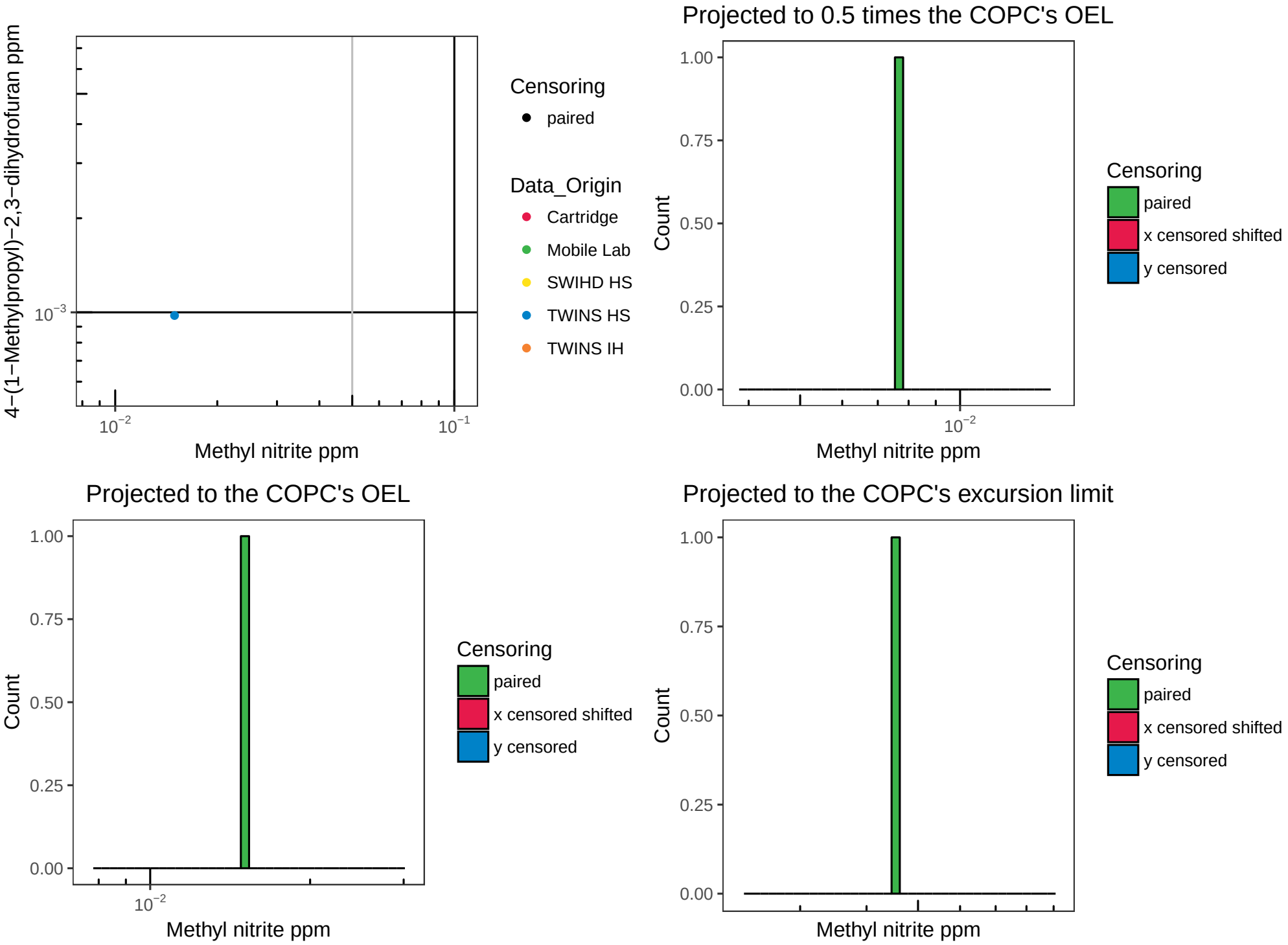


Figure C.2569: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Methyl nitrite

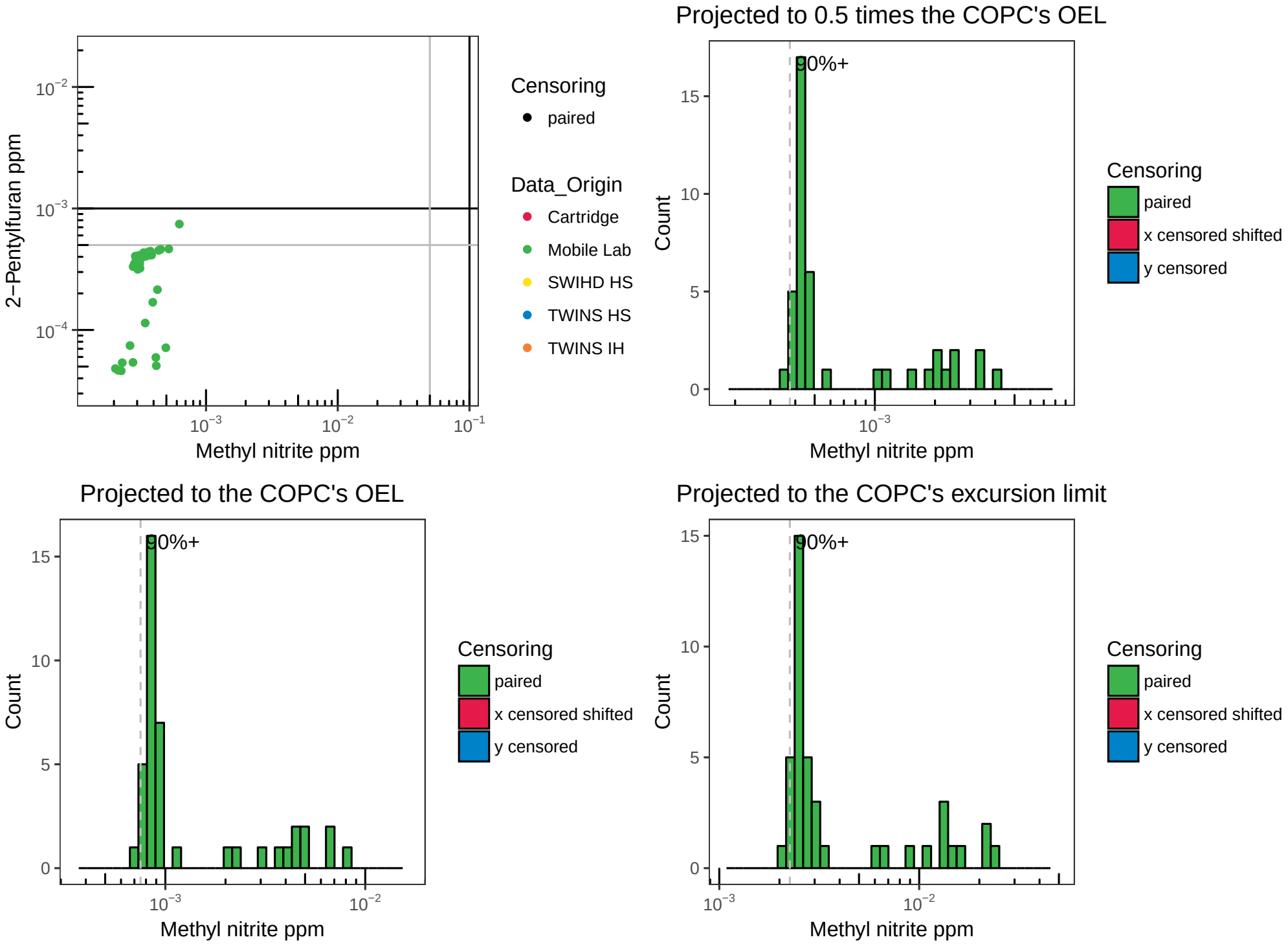


Figure C.2570: 2-Pentylfuran vs Methyl nitrite

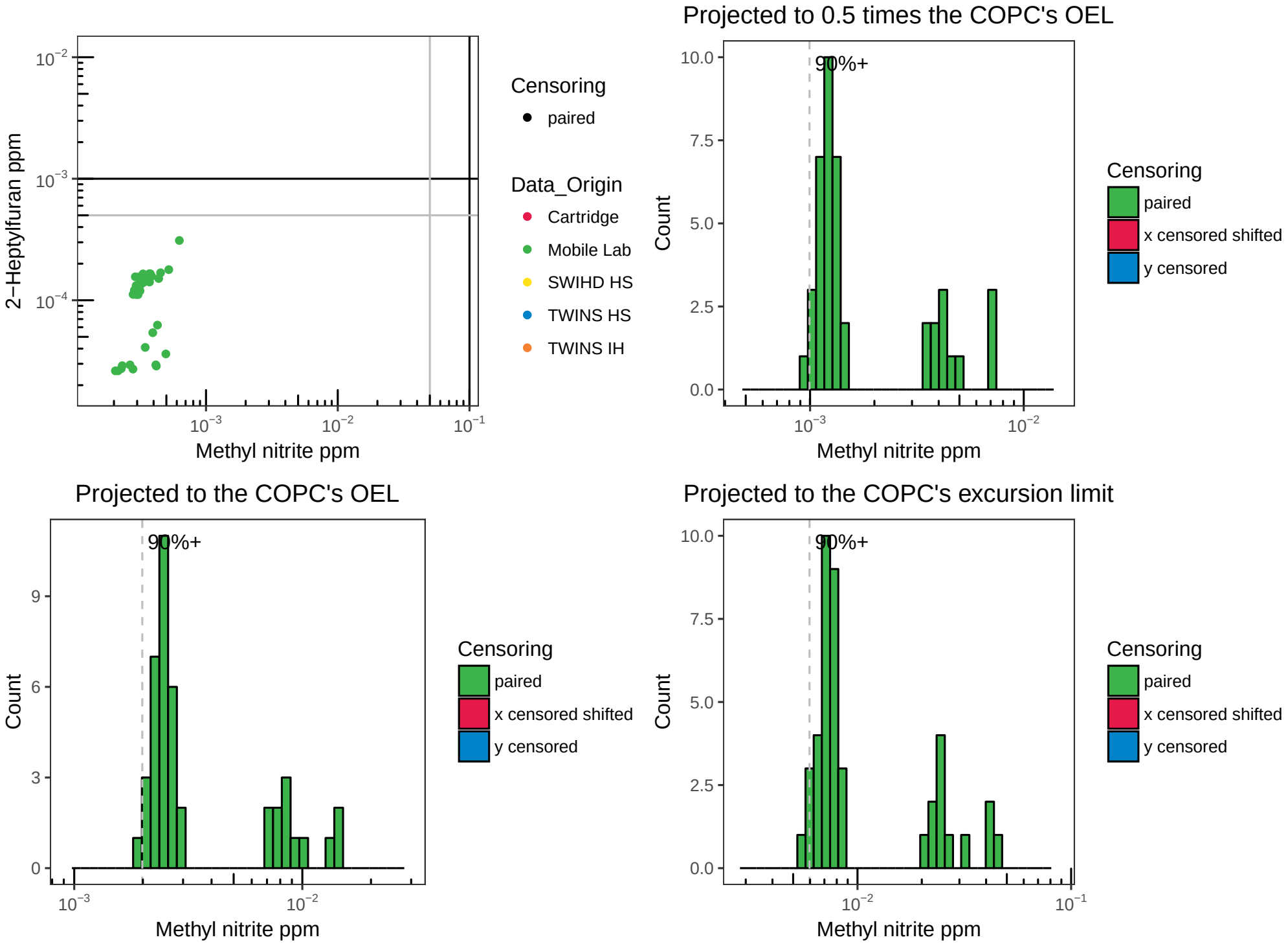


Figure C.2571: 2-Heptylfuran vs Methyl nitrite

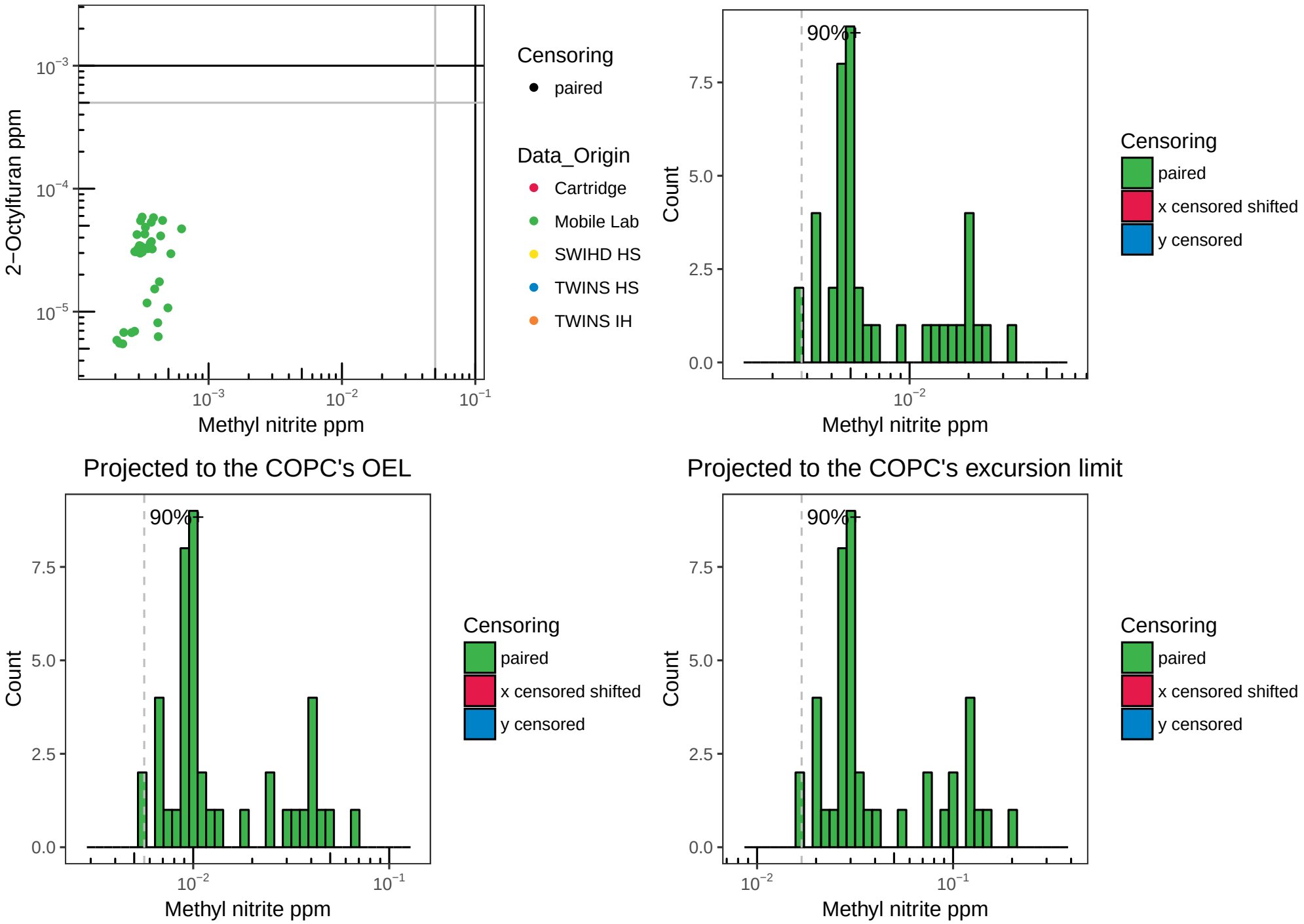


Figure C.2572: 2-Octylfuran vs Methyl nitrite

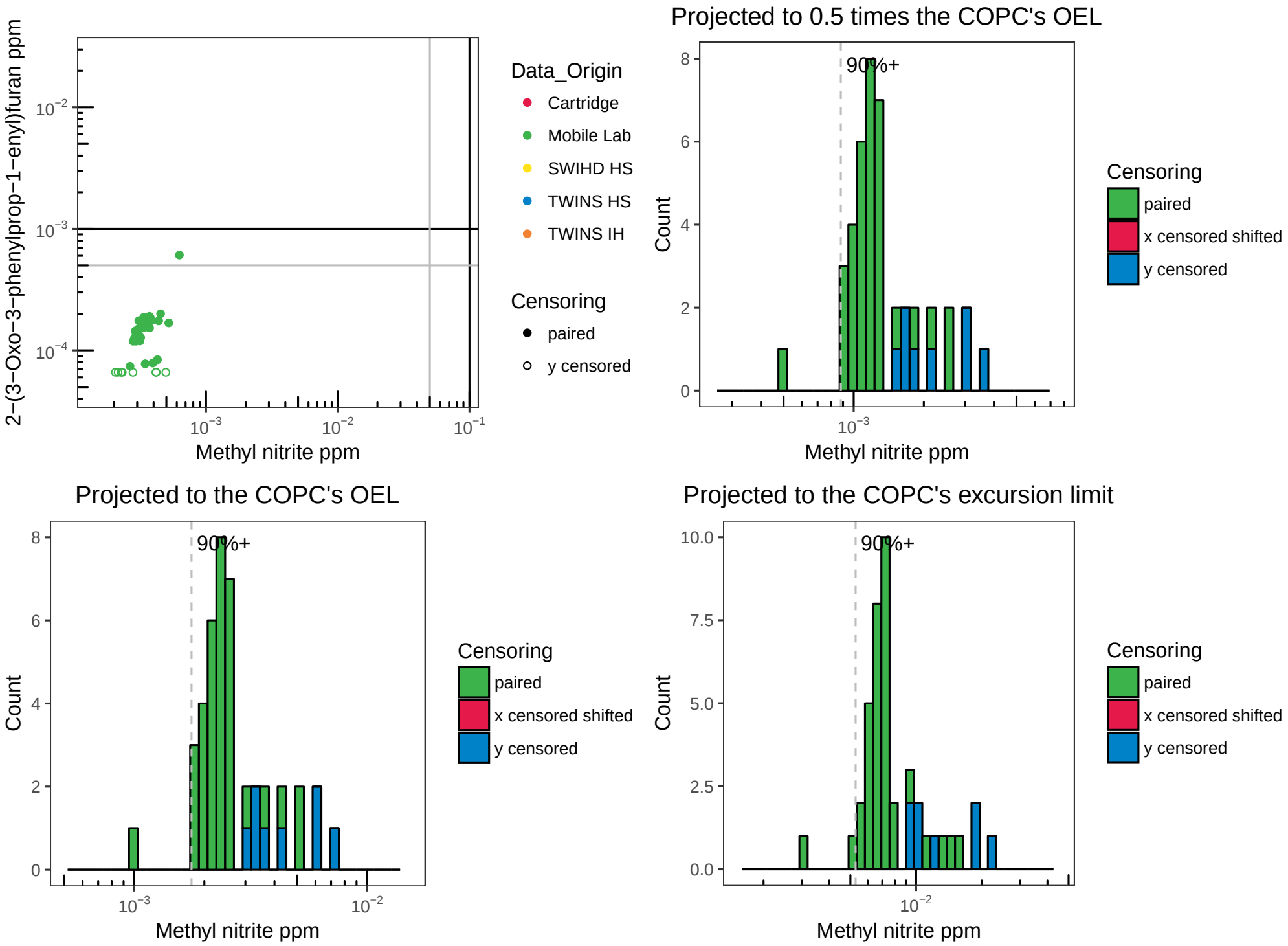


Figure C.2573: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Methyl nitrite

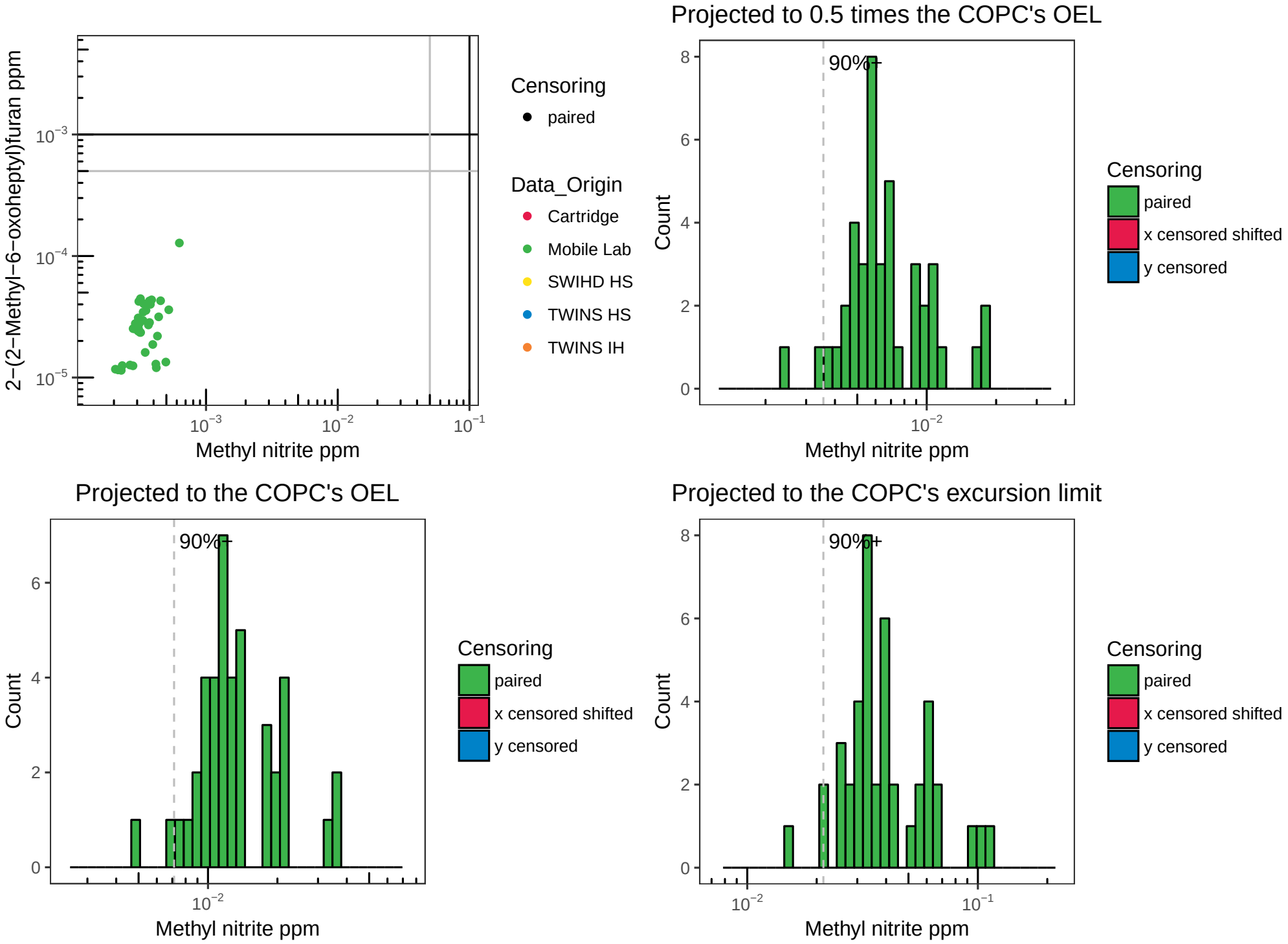


Figure C.2574: 2-(2-Methyl-6-oxoheptyl)furan vs Methyl nitrite

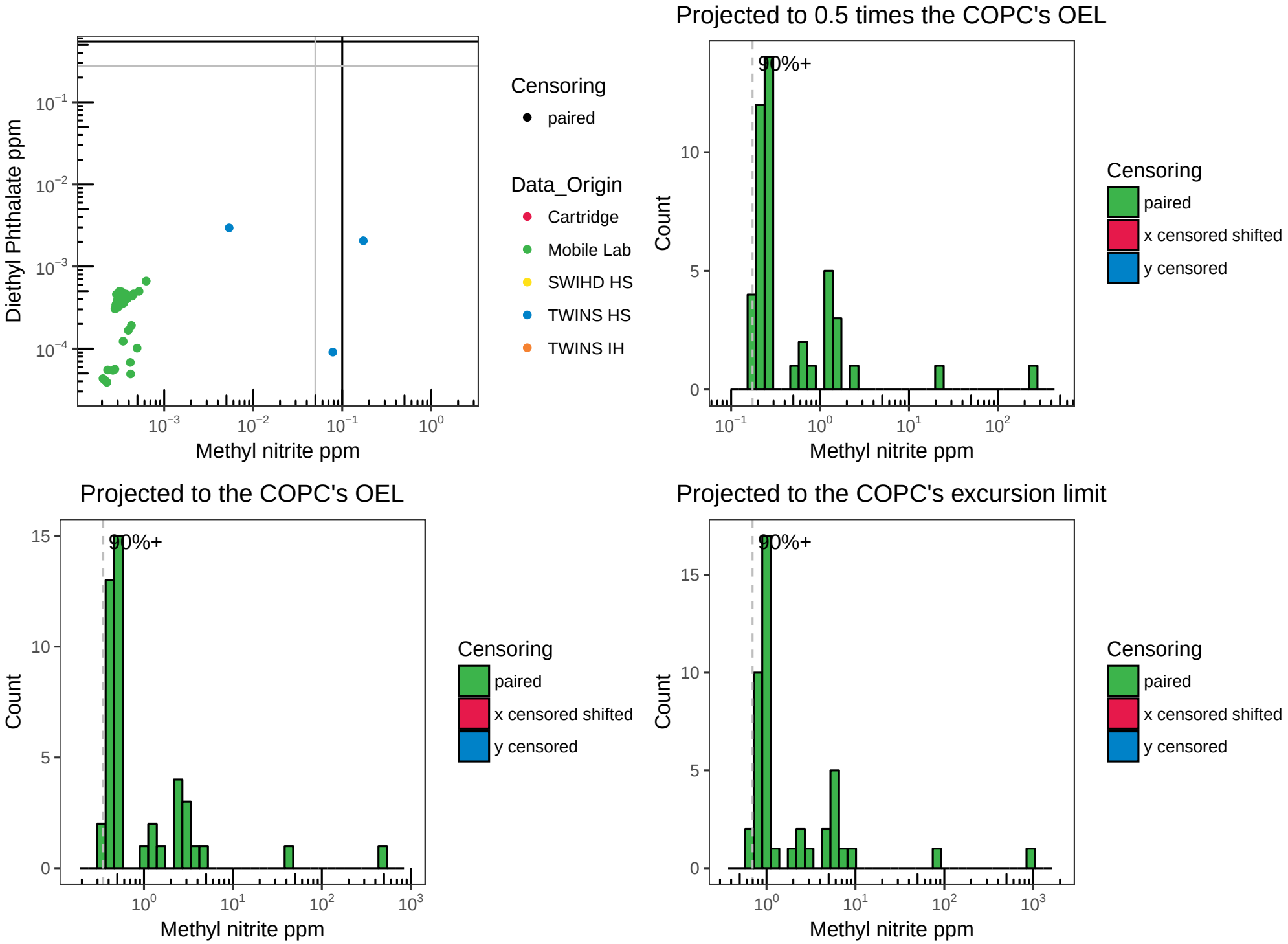


Figure C.2575: Diethyl Phthalate vs Methyl nitrite

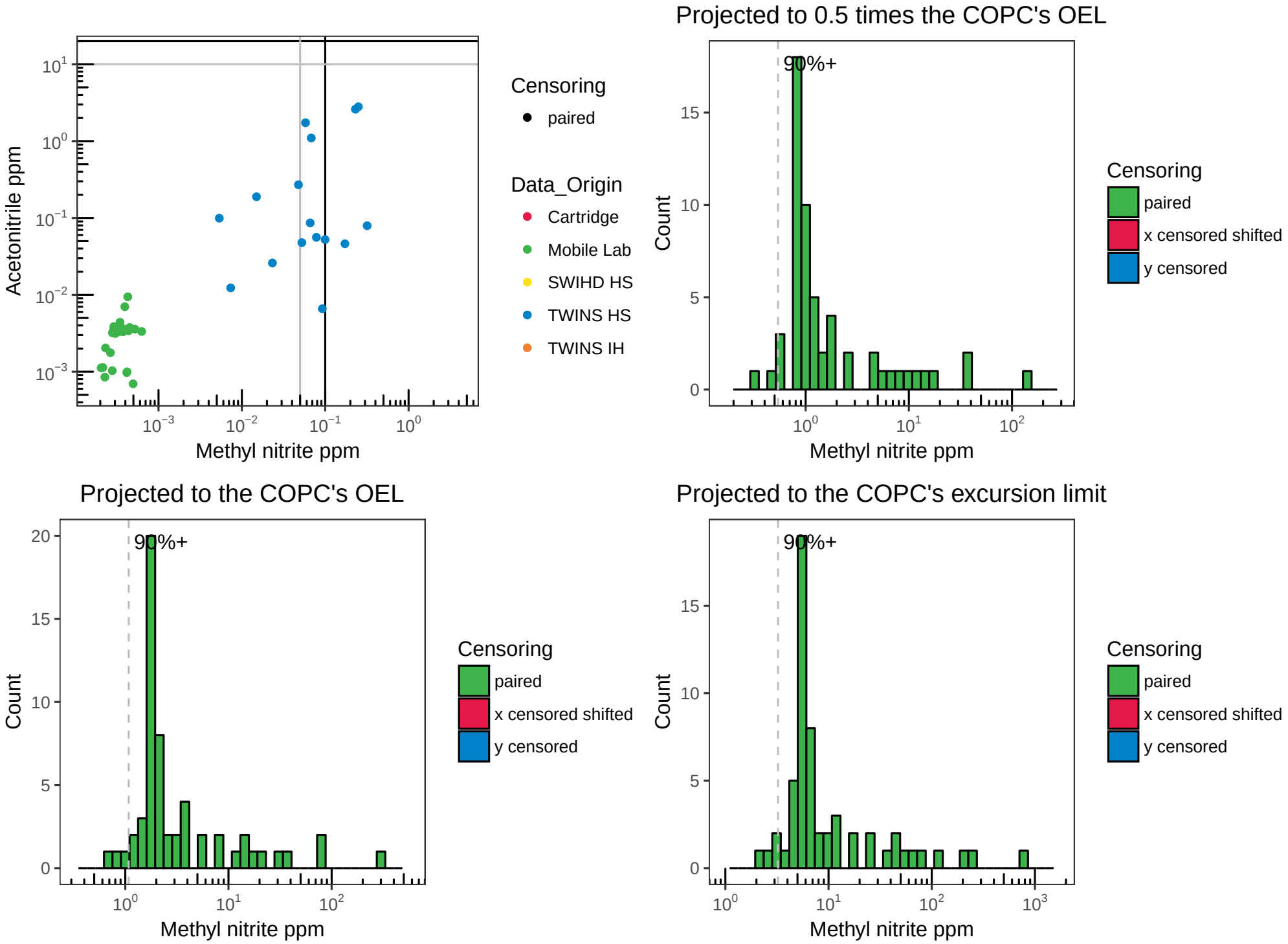


Figure C.2576: Acetonitrile vs Methyl nitrite

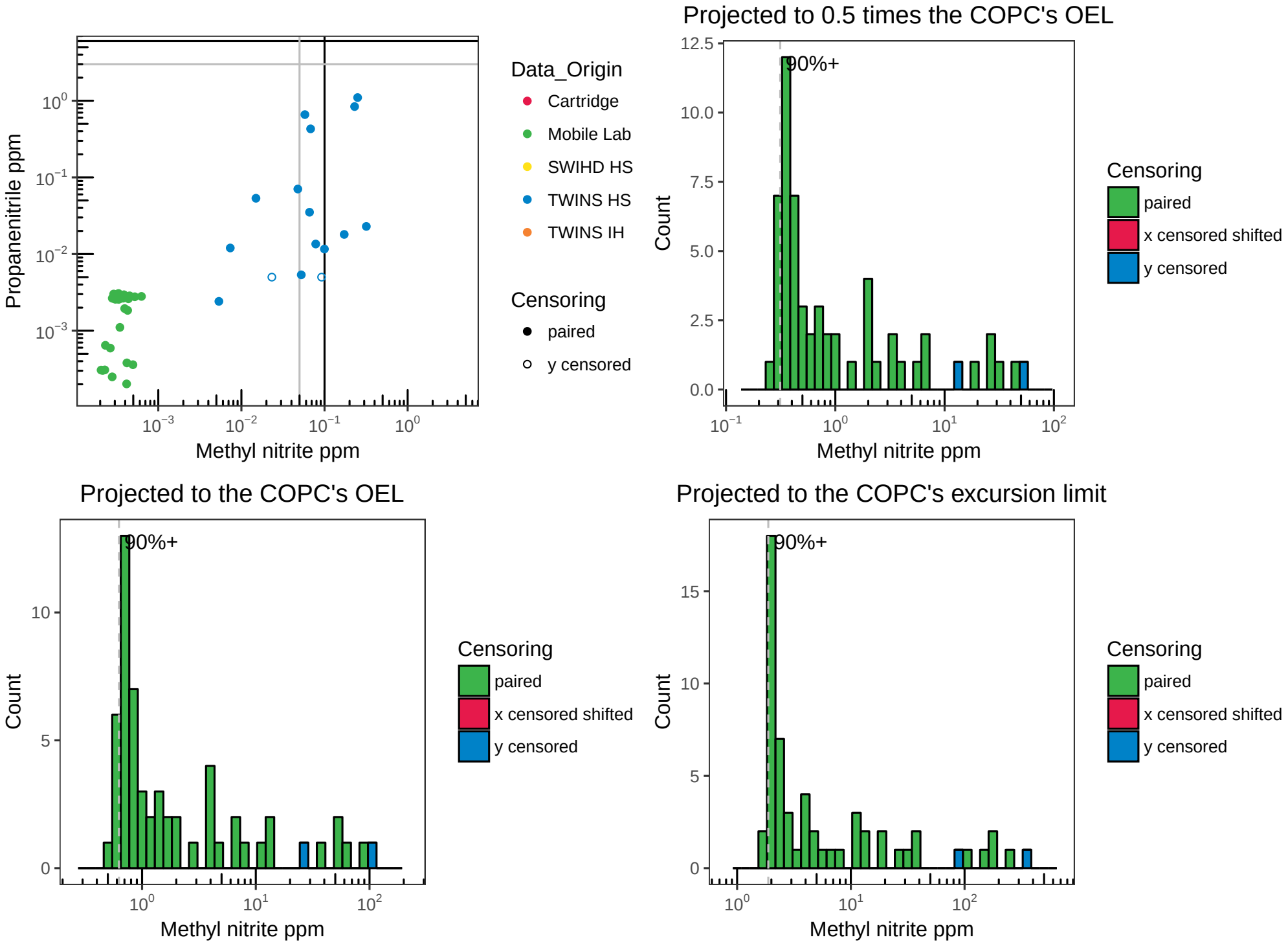


Figure C.2577: Propanenitrile vs Methyl nitrite

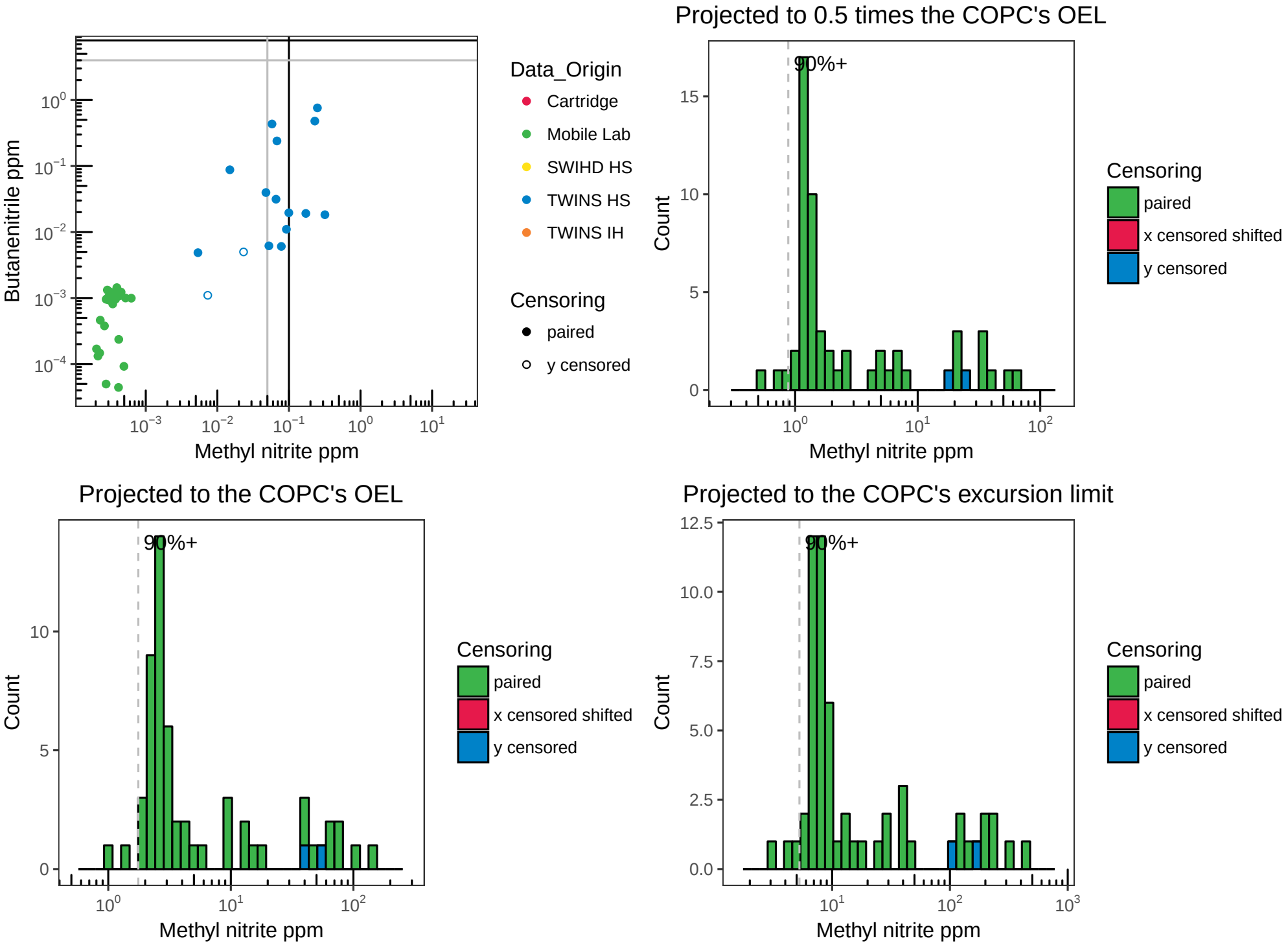


Figure C.2578: Butanenitrile vs Methyl nitrite

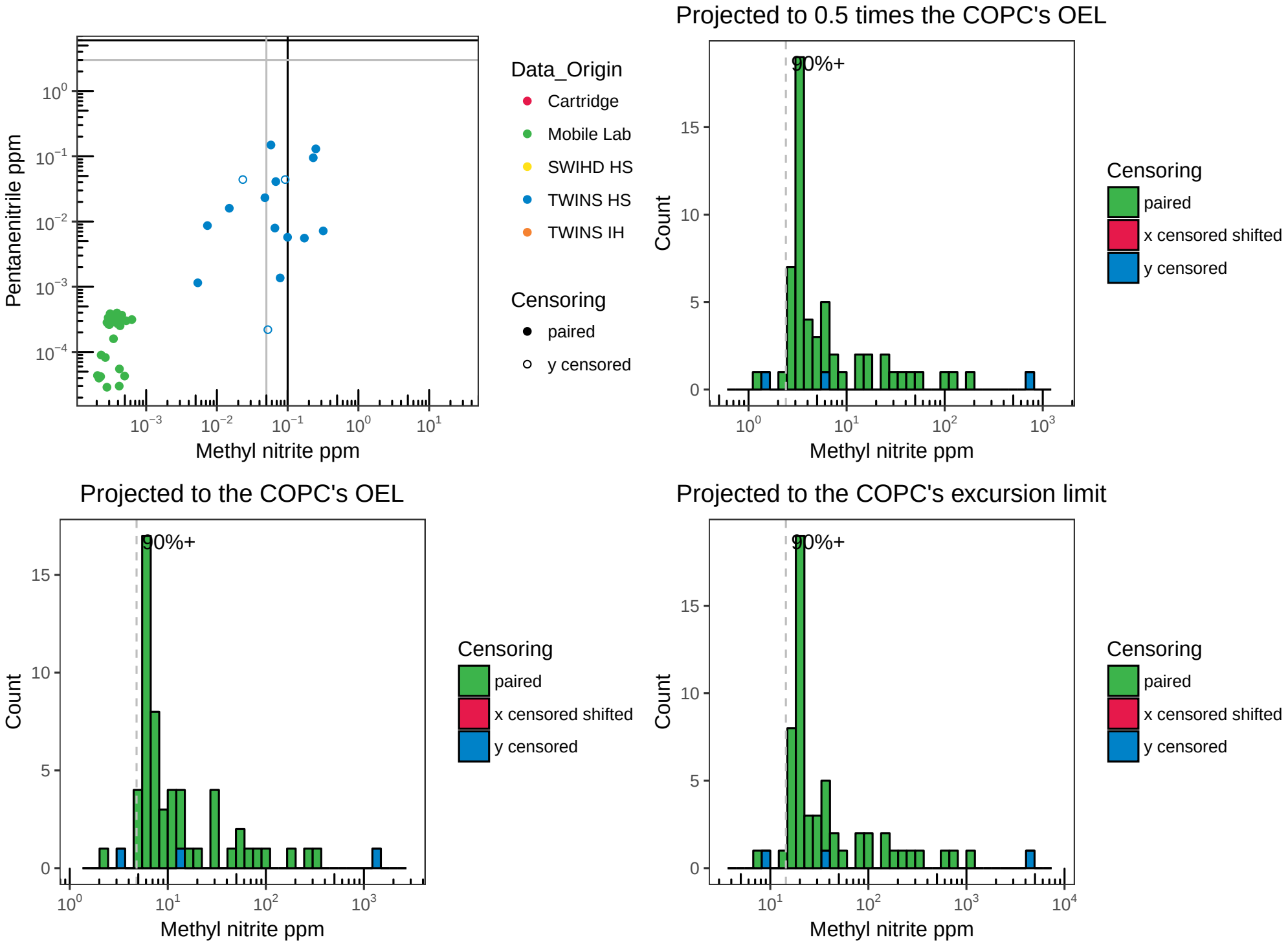


Figure C.2579: Pentanenitrile vs Methyl nitrite

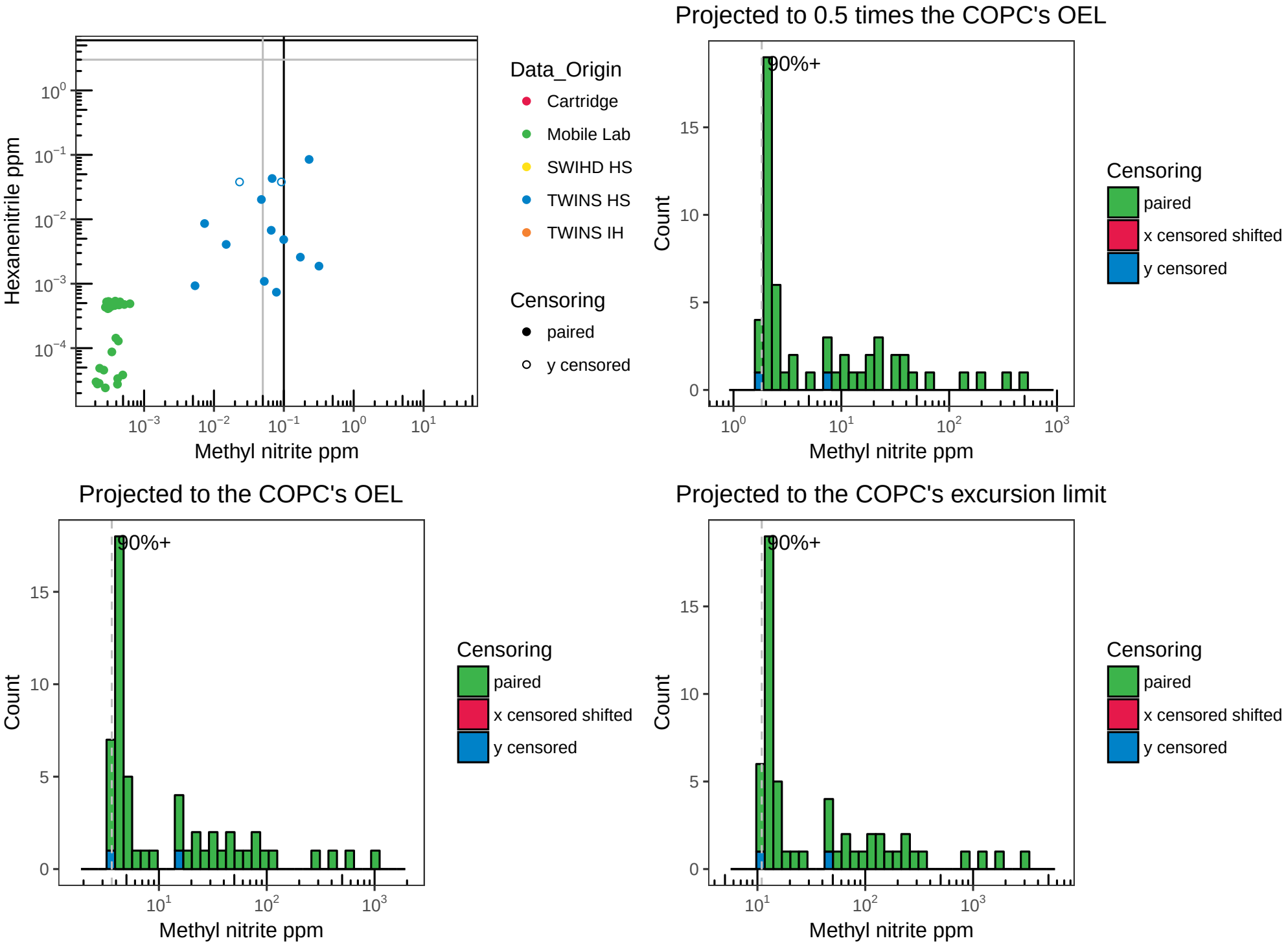


Figure C.2580: Hexanenitrile vs Methyl nitrite

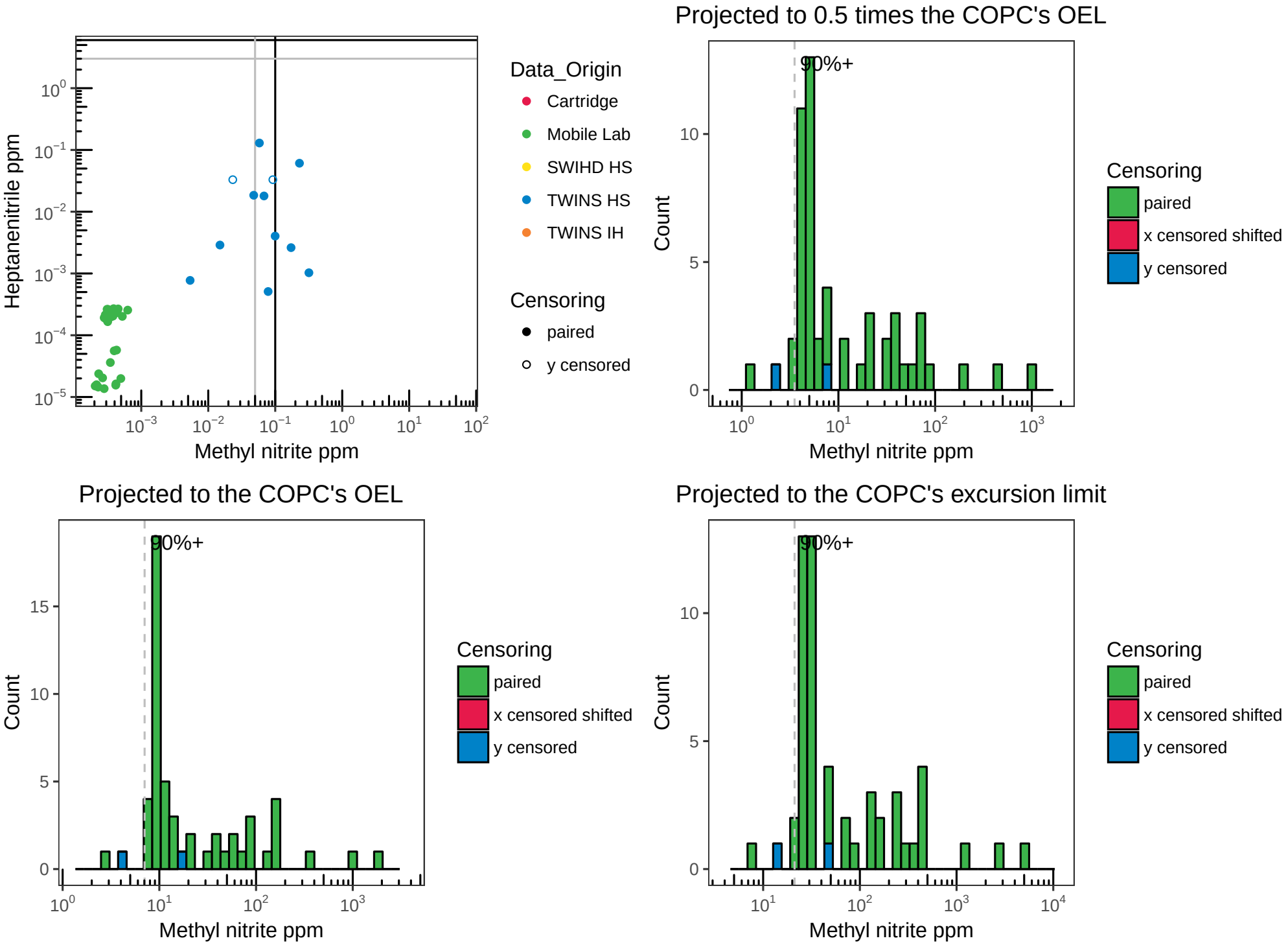


Figure C.2581: Heptanenitrile vs Methyl nitrite

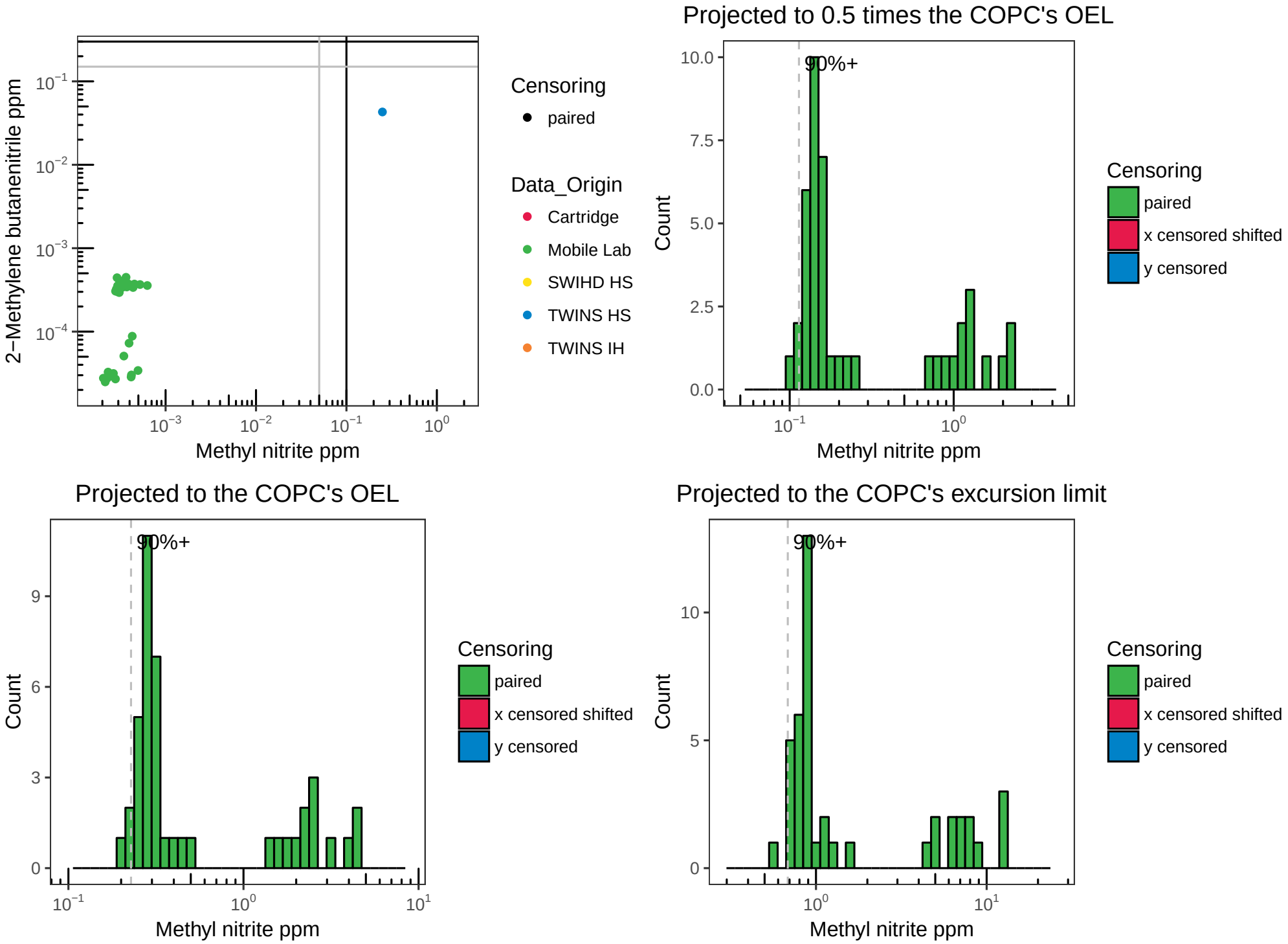


Figure C.2582: 2-Methylene butanenitrile vs Methyl nitrite

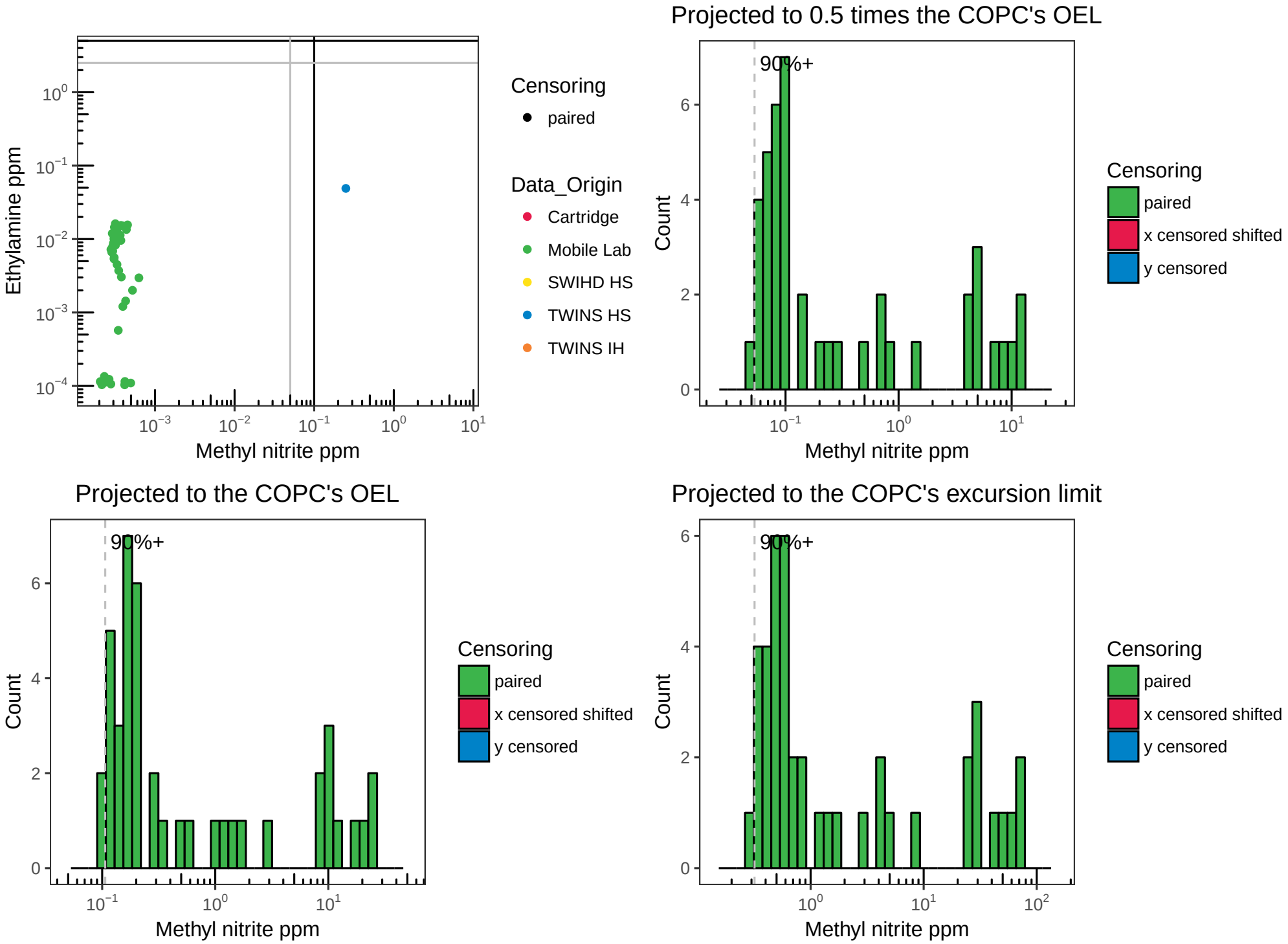


Figure C.2583: Ethylamine vs Methyl nitrite

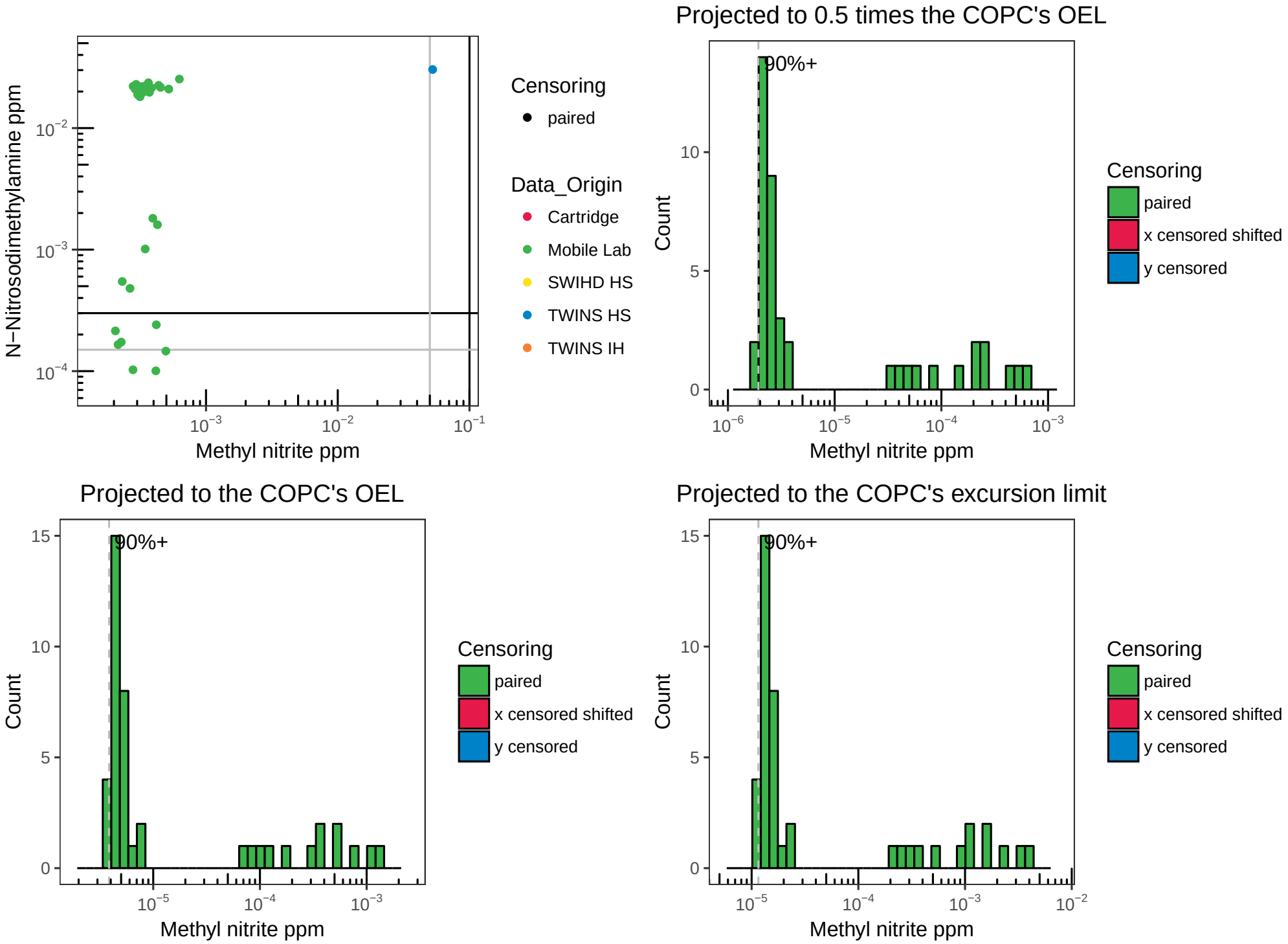


Figure C.2584: N-Nitrosodimethylamine vs Methyl nitrite

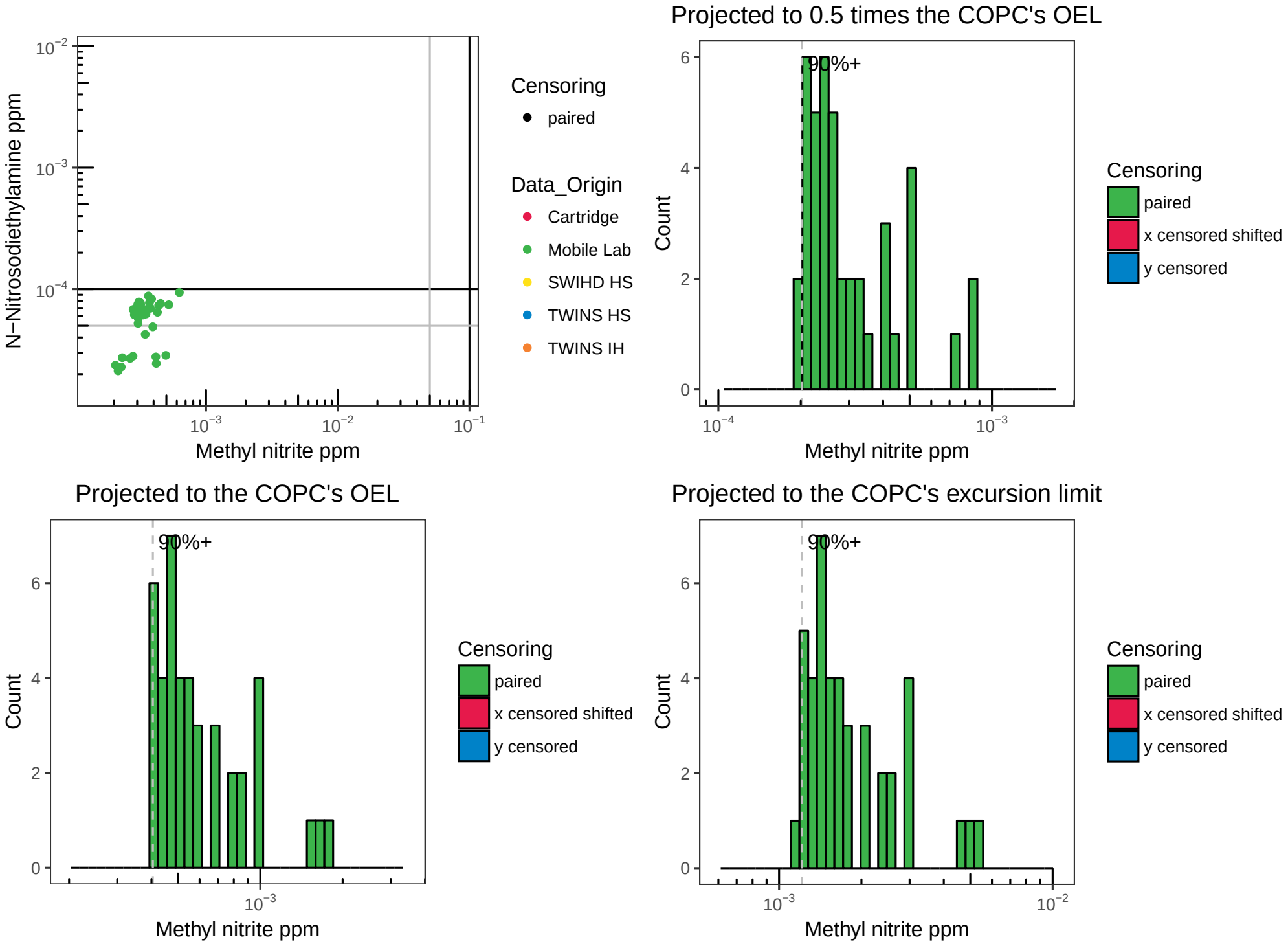


Figure C.2585: N-Nitrosodiethylamine vs Methyl nitrite

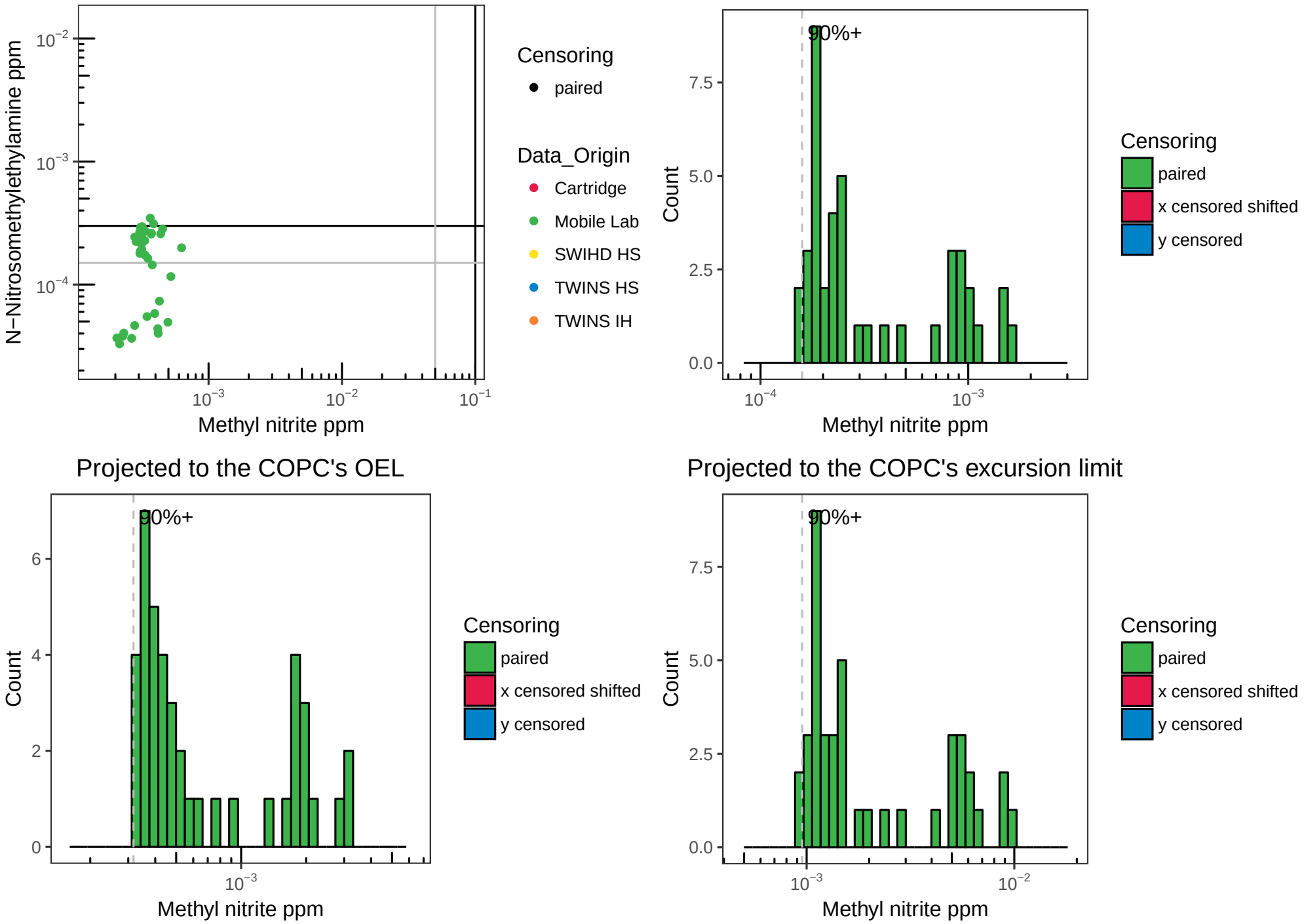


Figure C.2586: N-Nitrosomethylethylamine vs Methyl nitrite

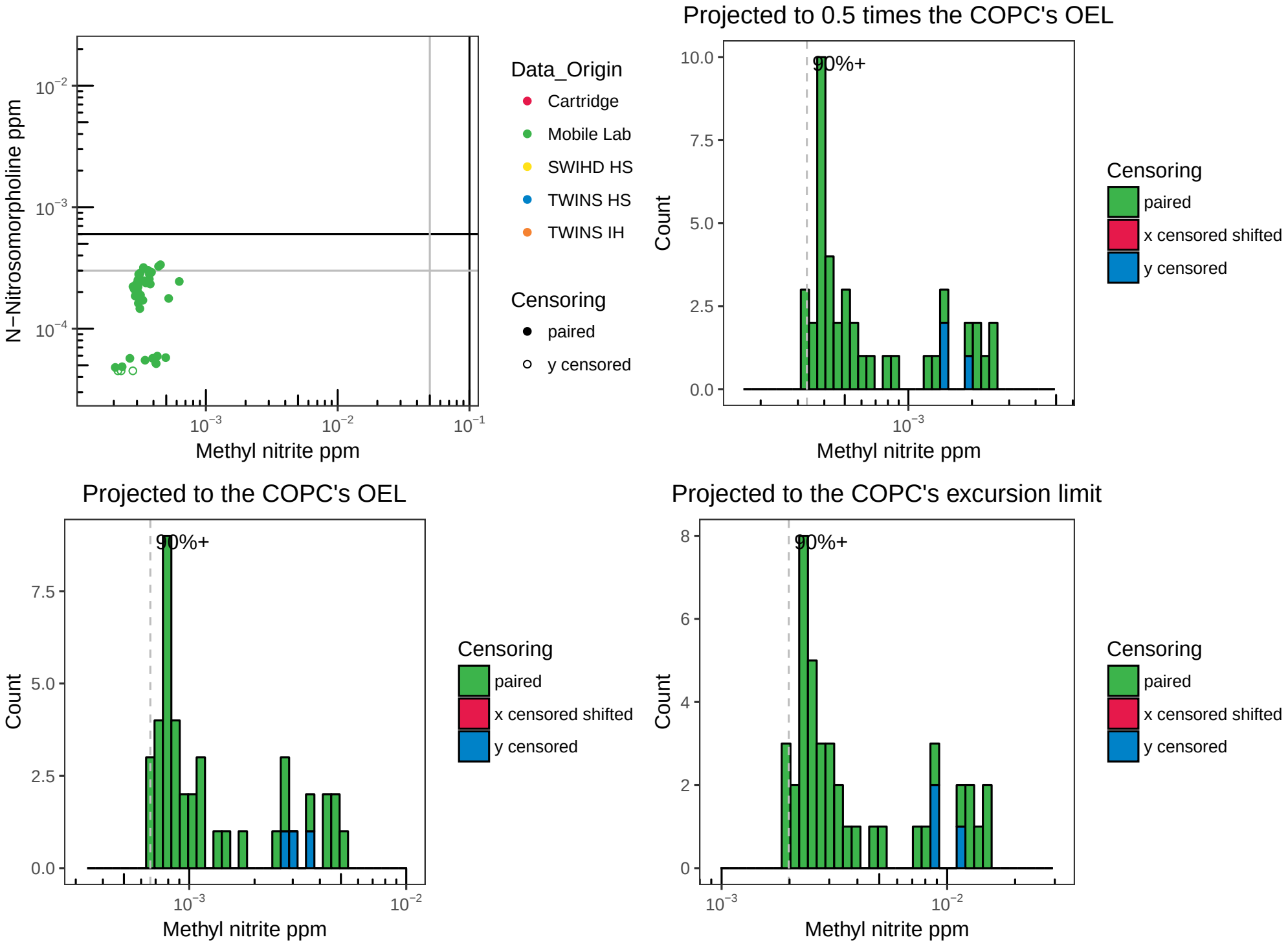


Figure C.2587: N-Nitrosomorpholine vs Methyl nitrite

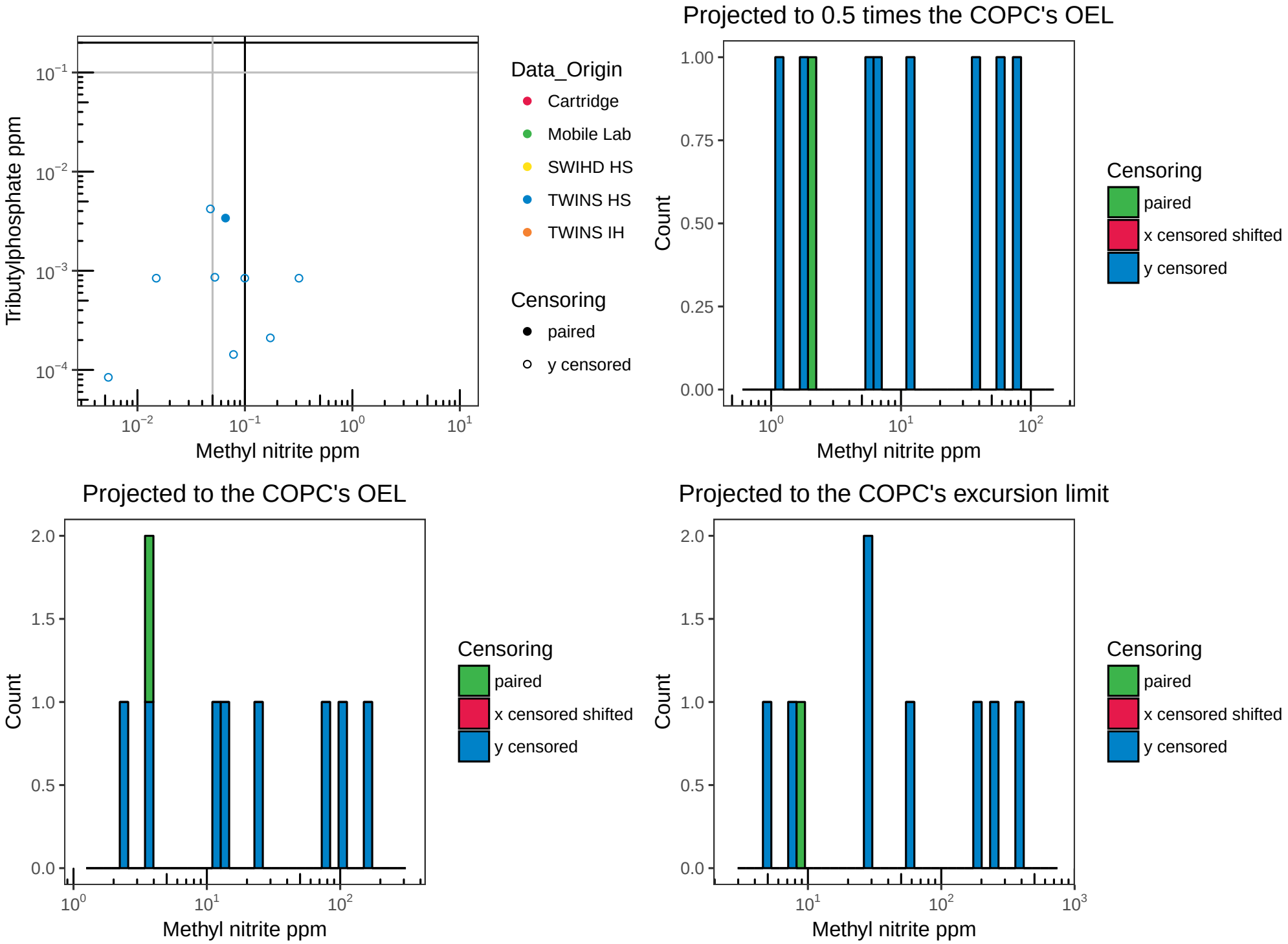


Figure C.2588: Tributylphosphate vs Methyl nitrite

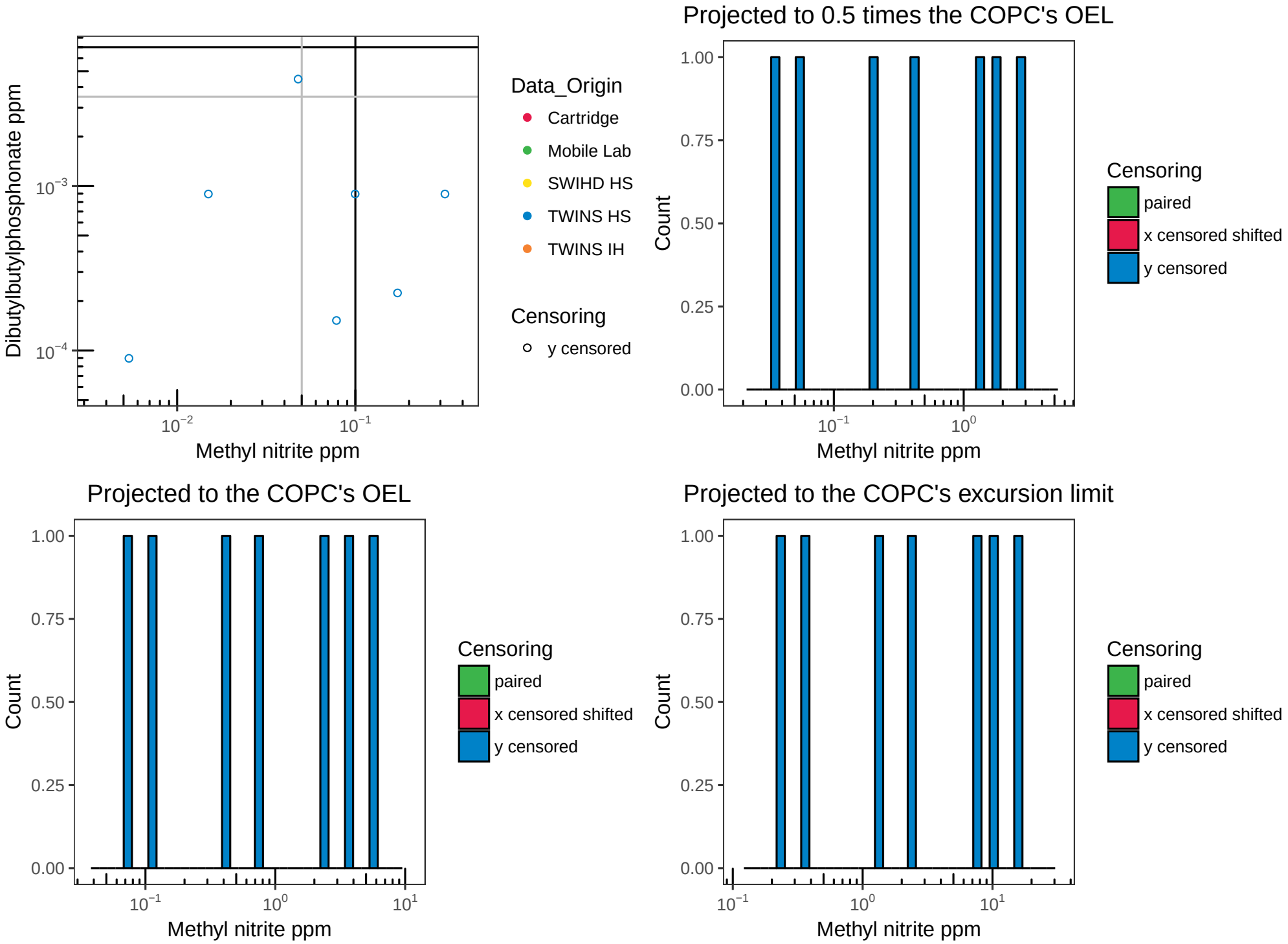


Figure C.2589: Dibutylbutylphosphonate vs Methyl nitrite

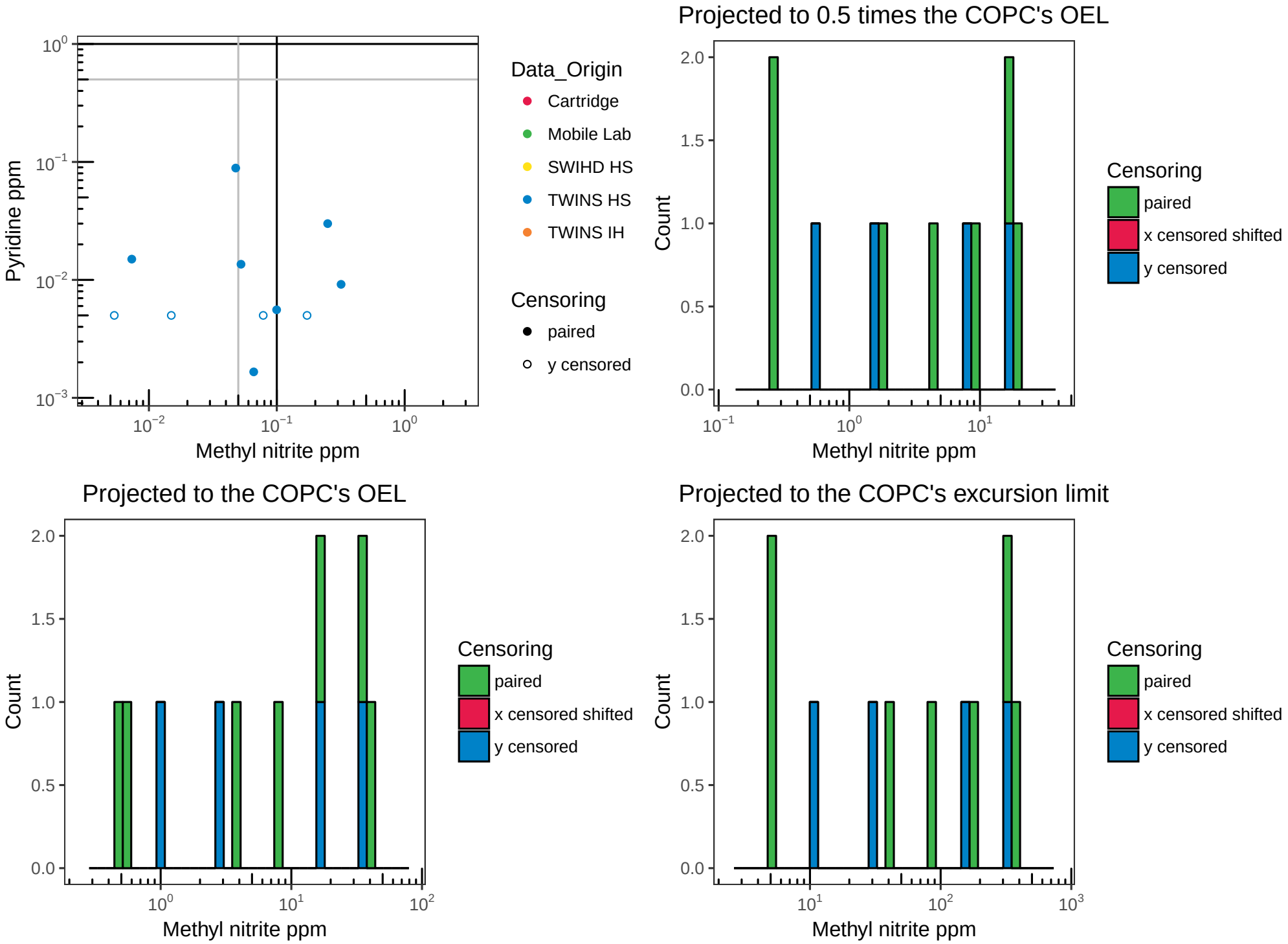


Figure C.2590: Pyridine vs Methyl nitrite

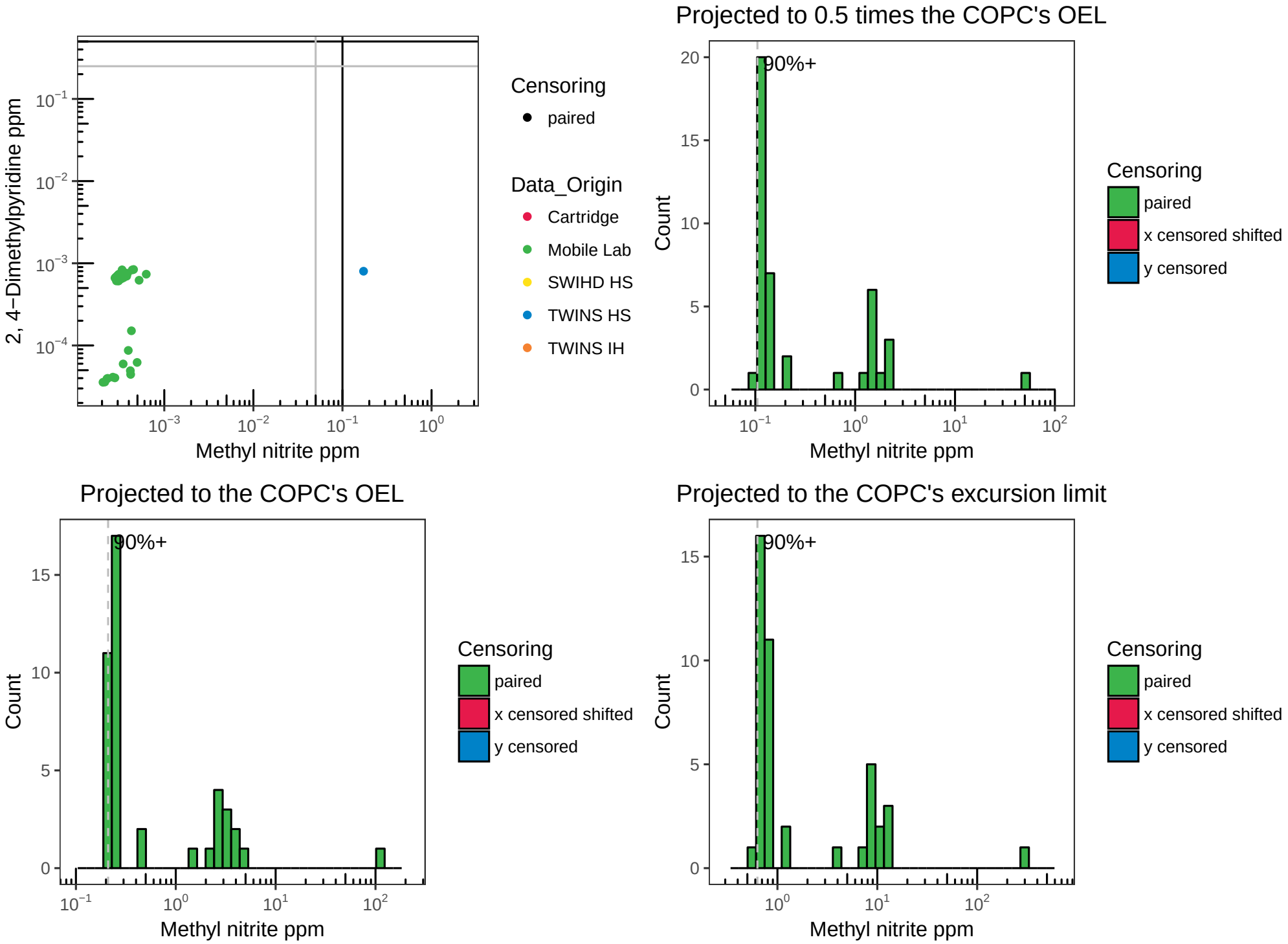


Figure C.2591: 2, 4-Dimethylpyridine vs Methyl nitrite

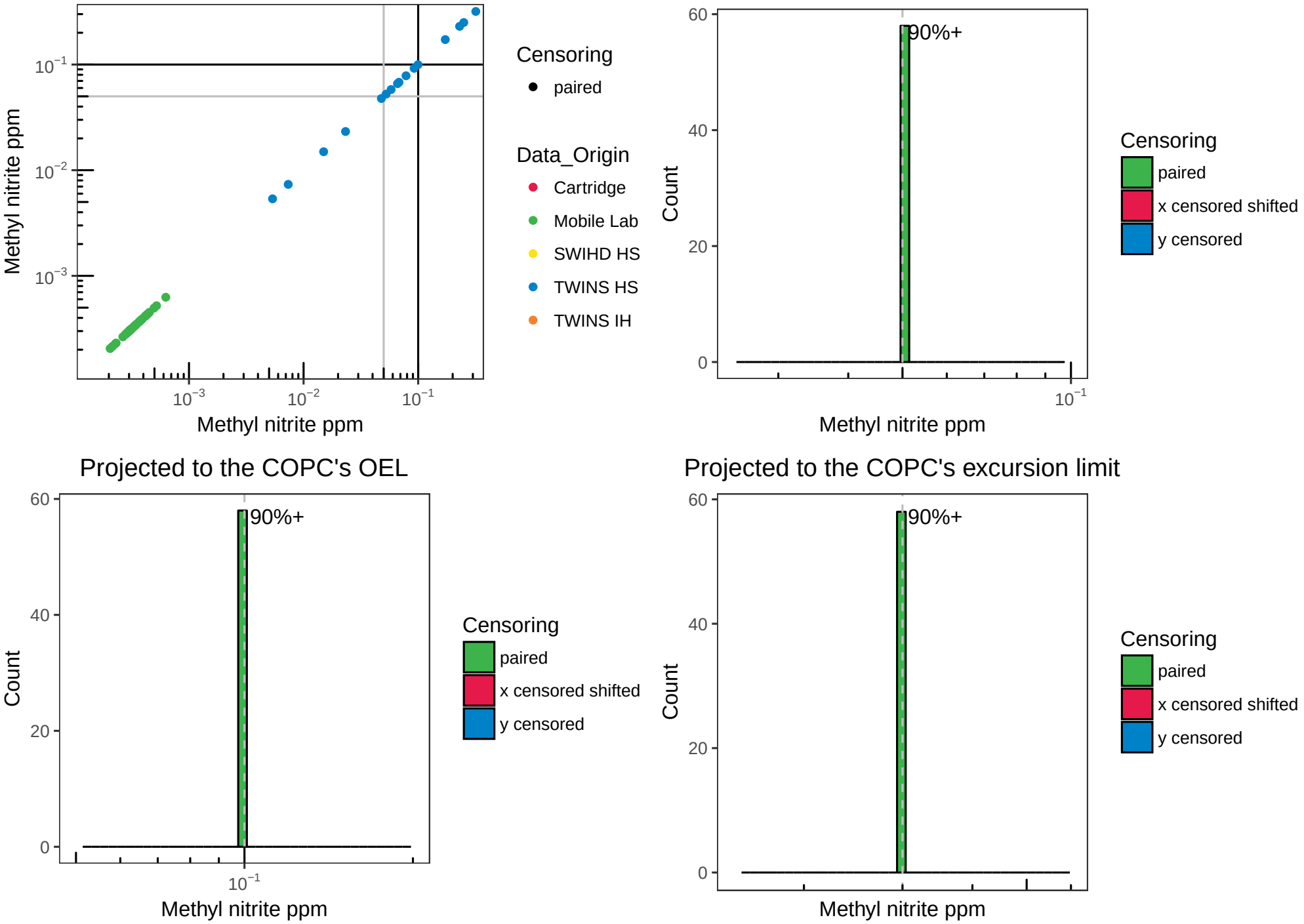


Figure C.2592: Methyl nitrite vs Methyl nitrite

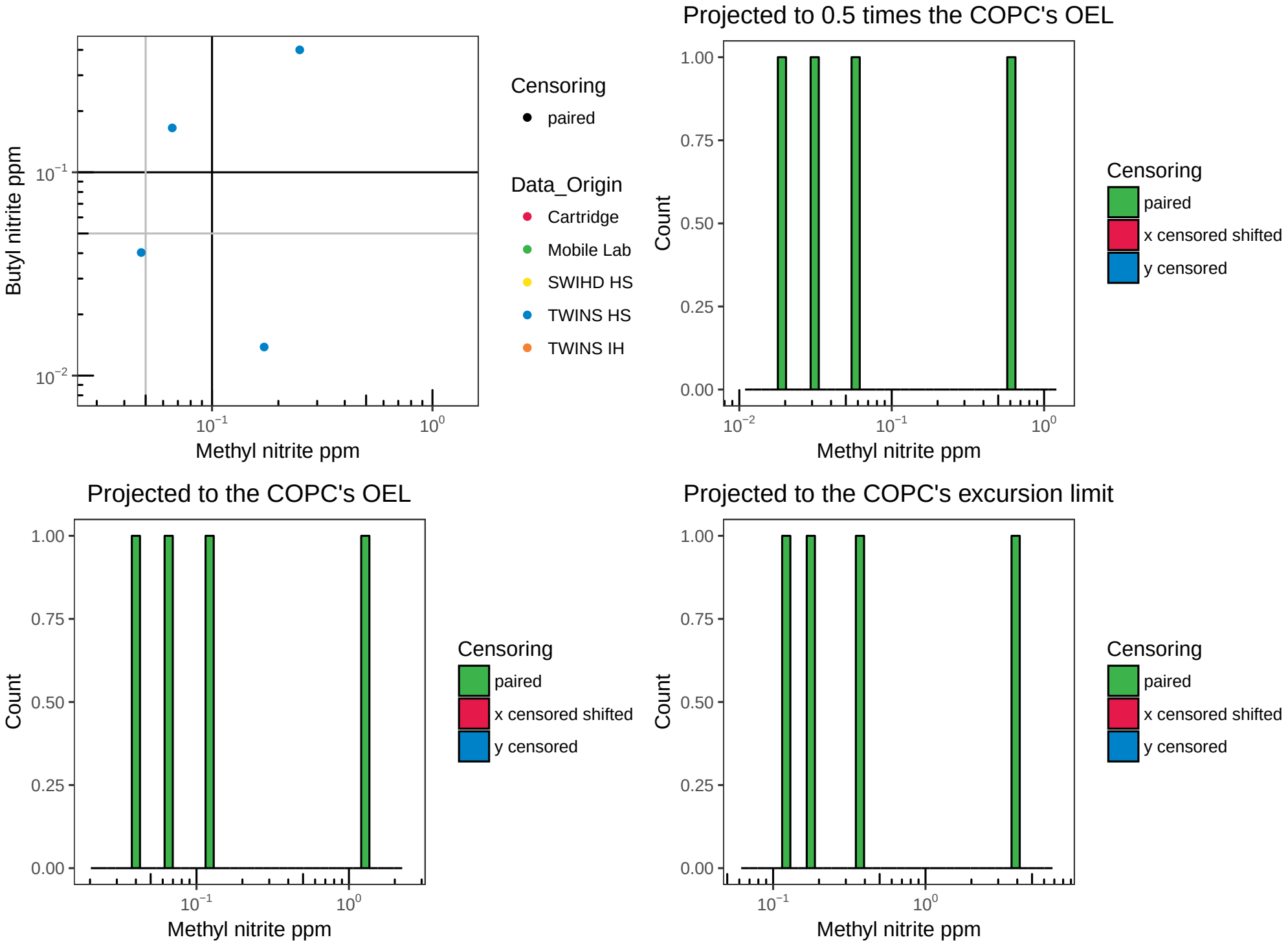


Figure C.2593: Butyl nitrite vs Methyl nitrite

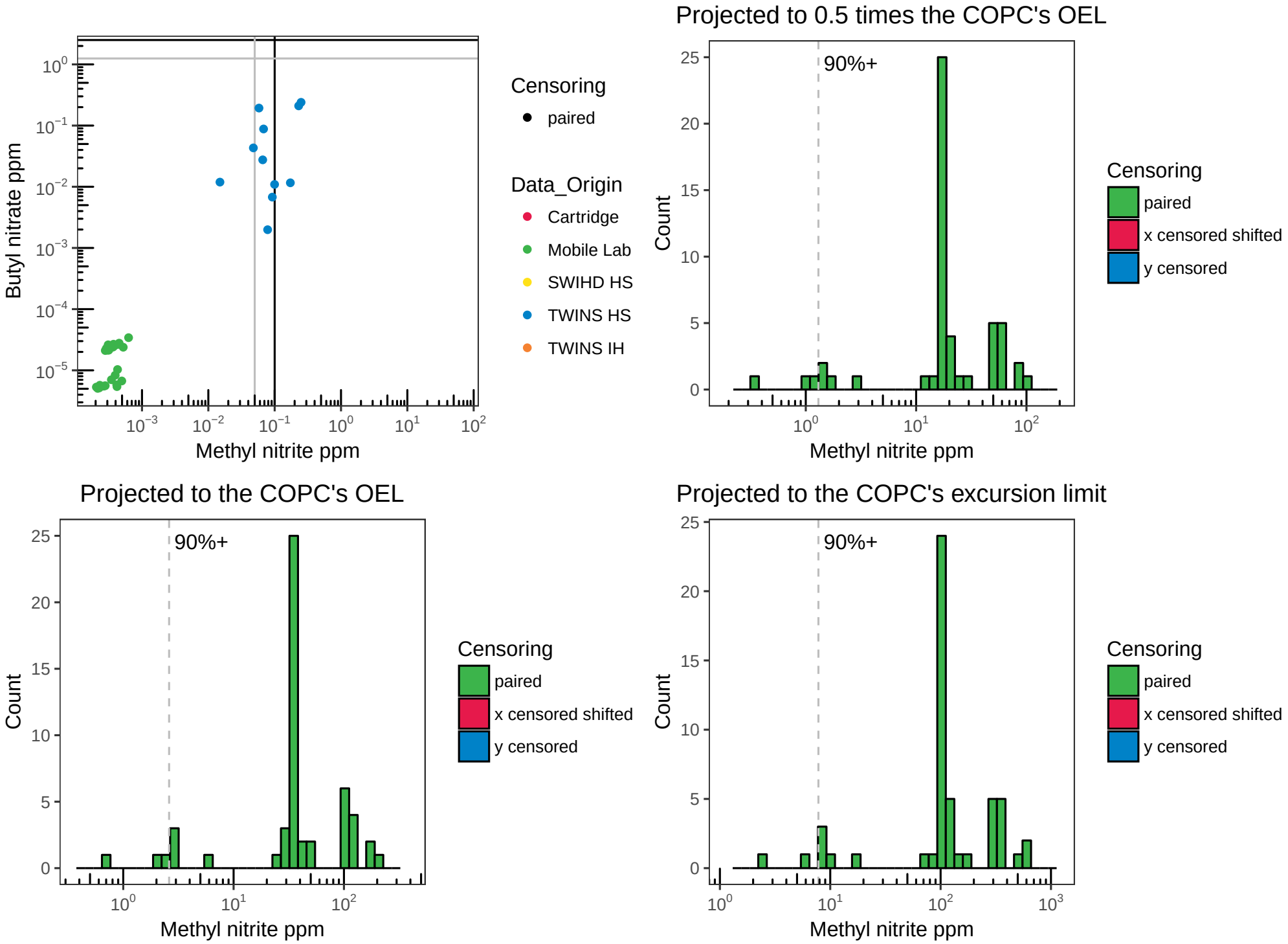


Figure C.2594: Butyl nitrate vs Methyl nitrite

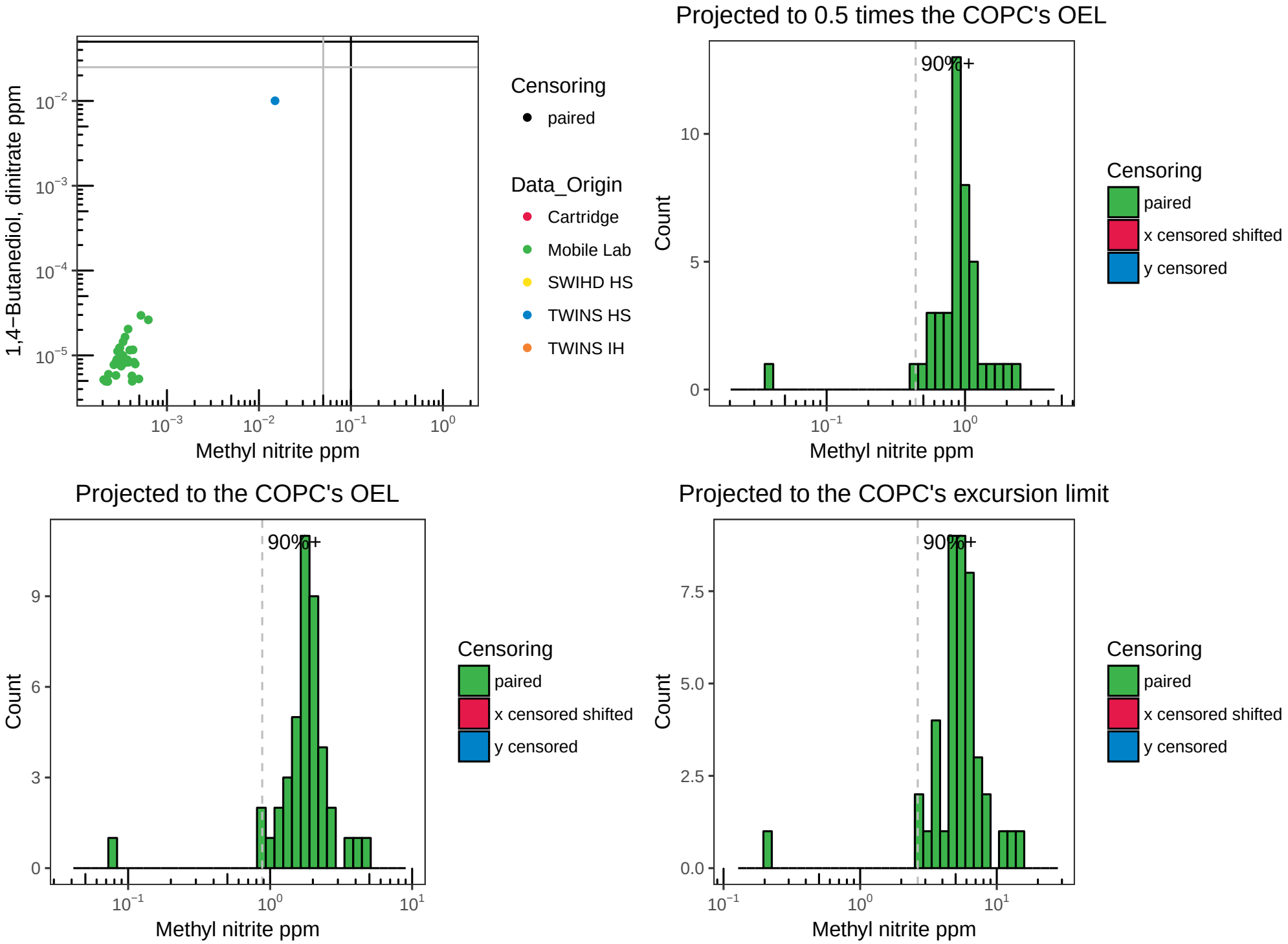


Figure C.2595: 1,4-Butanediol, dinitrate vs Methyl nitrite

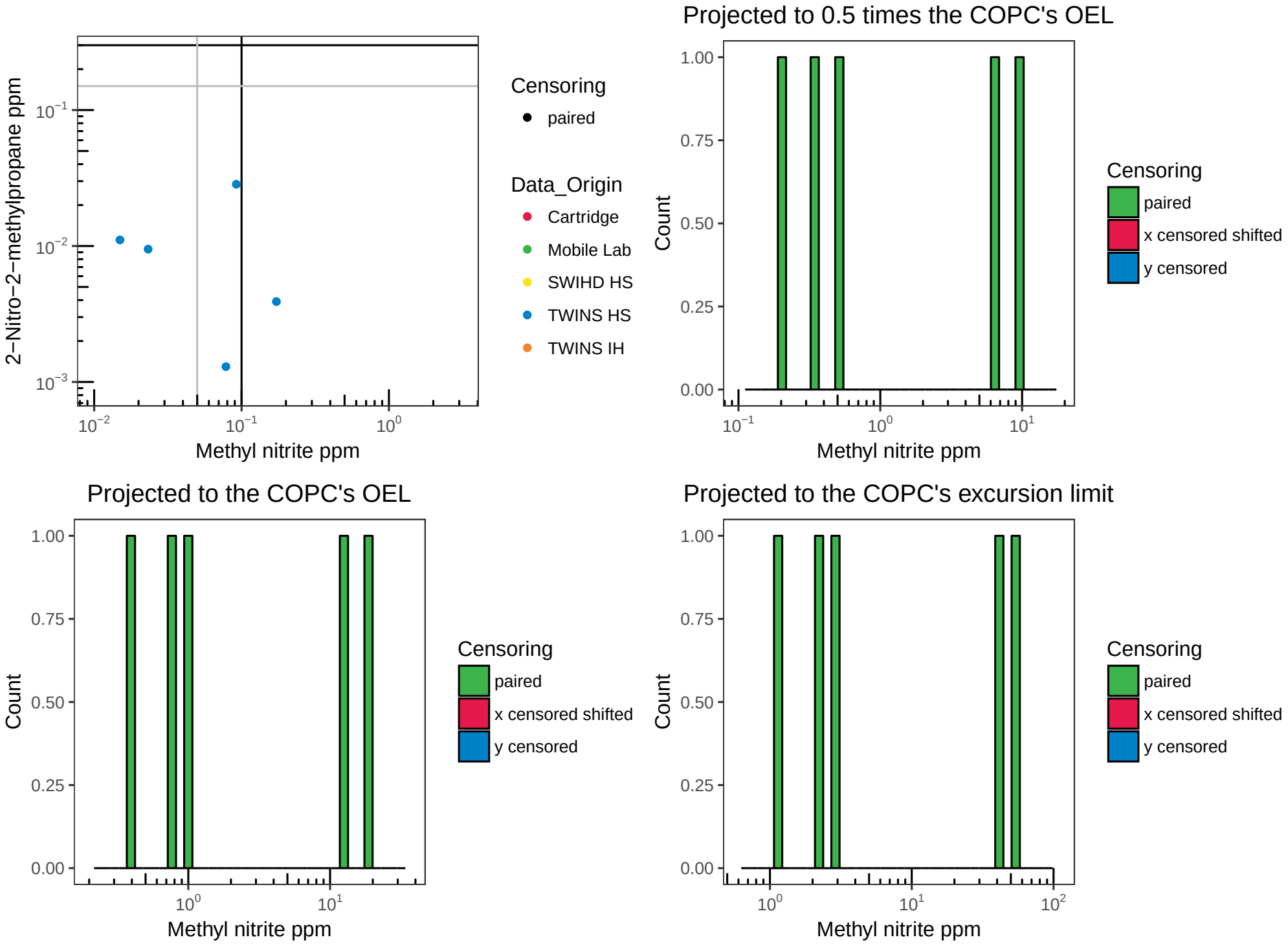


Figure C.2596: 2-Nitro-2-methylpropane vs Methyl nitrite

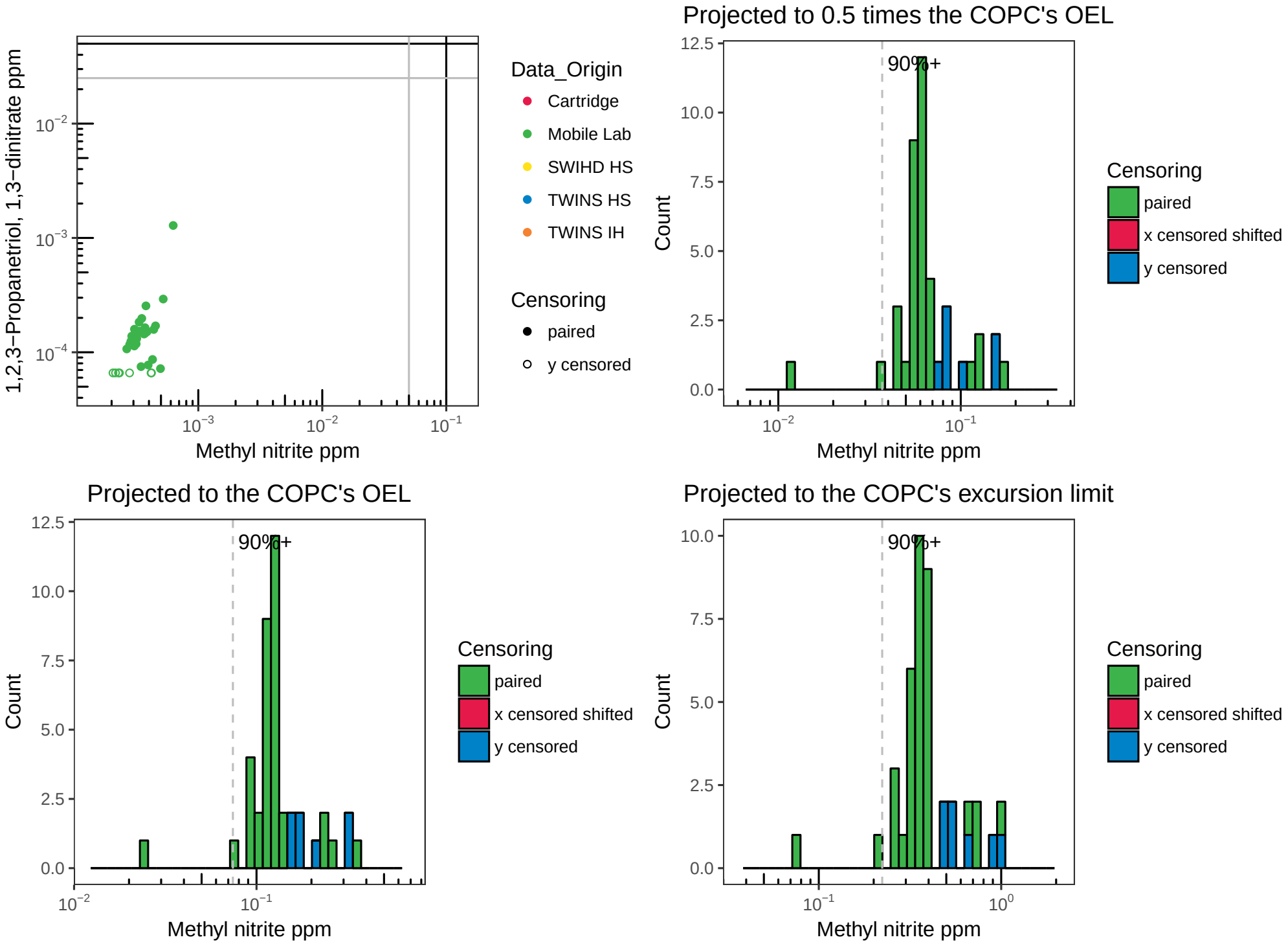


Figure C.2597: 1,2,3-Propanetriol, 1,3-dinitrate vs Methyl nitrite

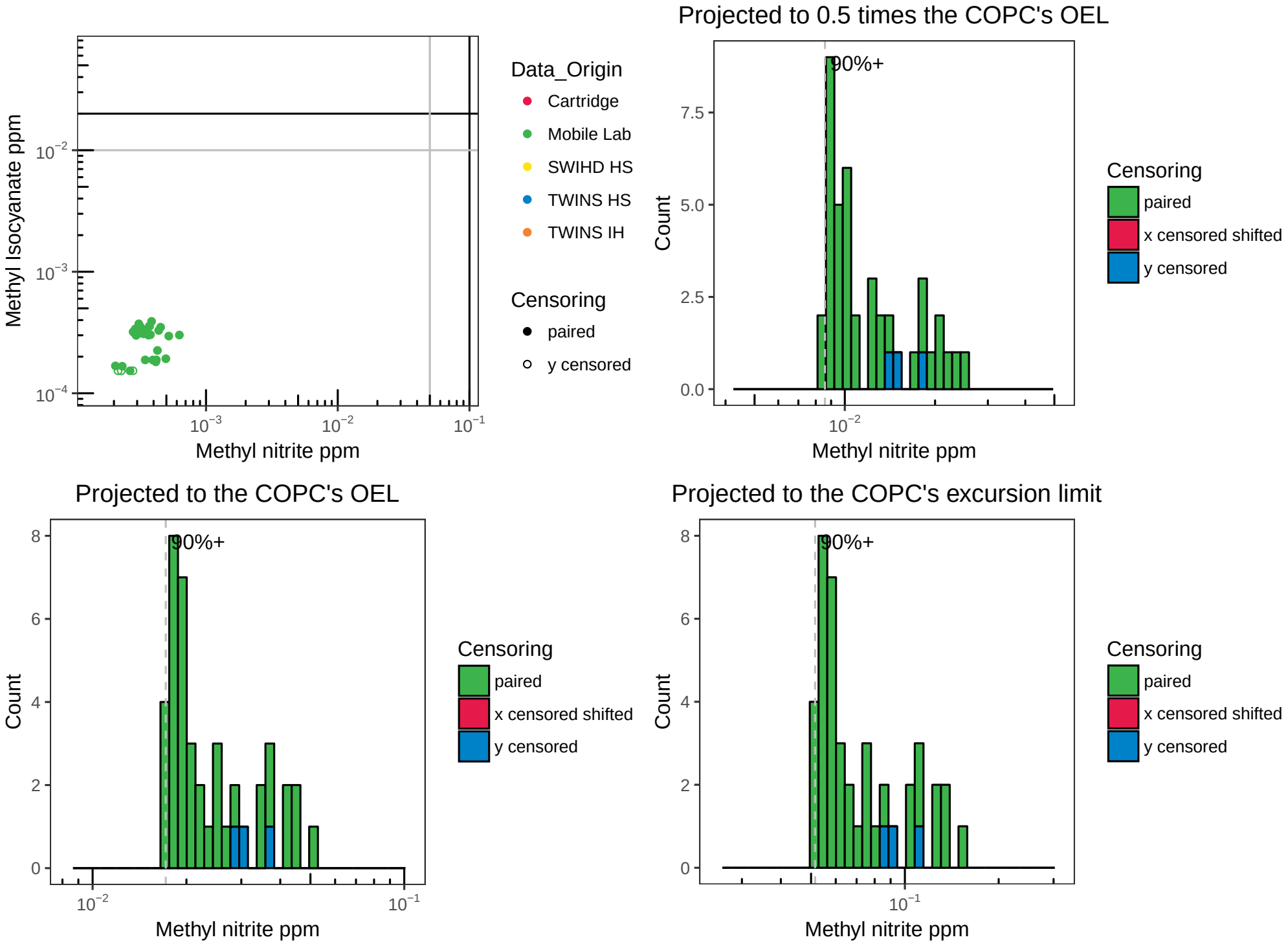


Figure C.2598: Methyl Isocyanate vs Methyl nitrite

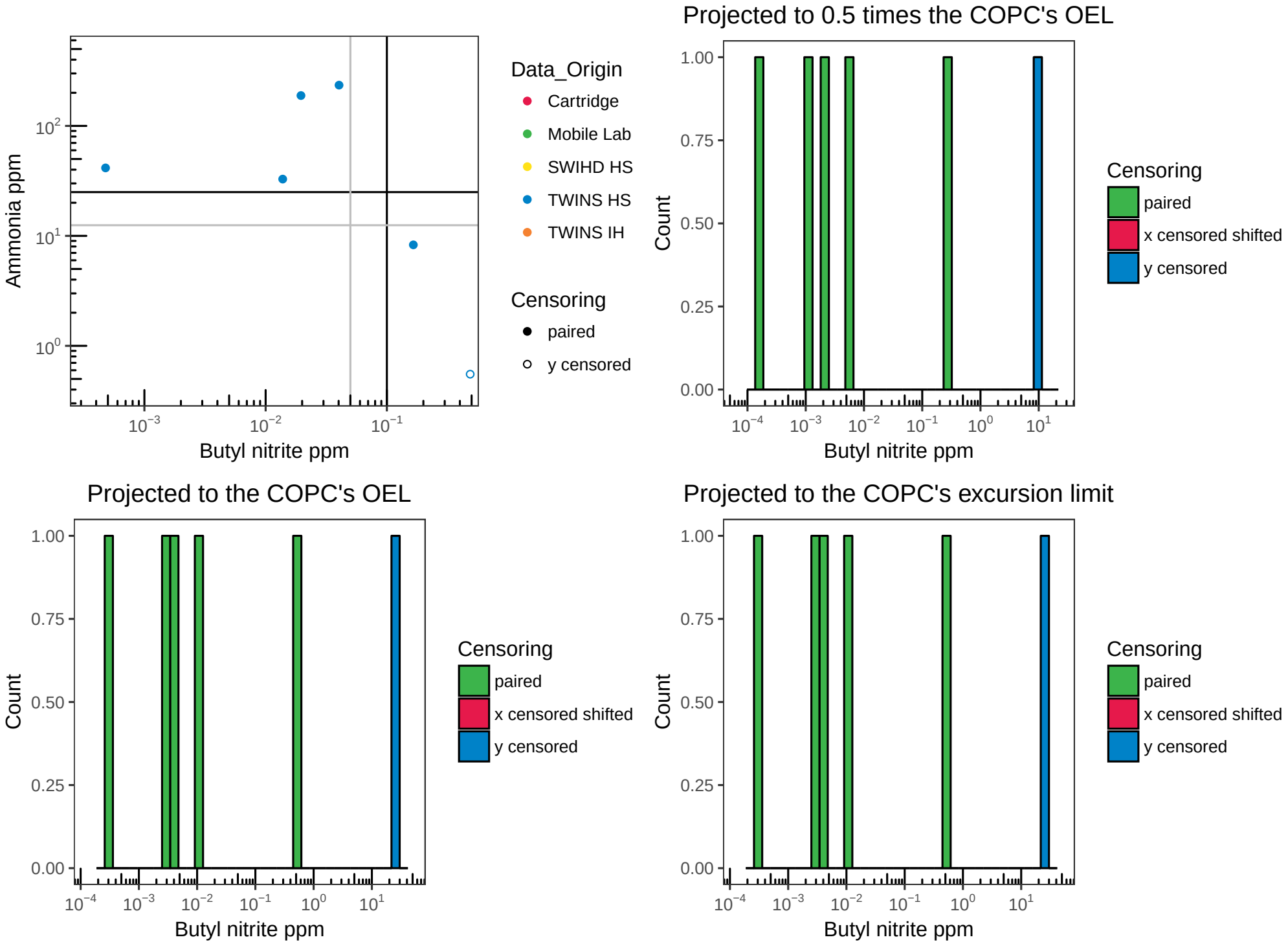


Figure C.2599: Ammonia vs Butyl nitrite

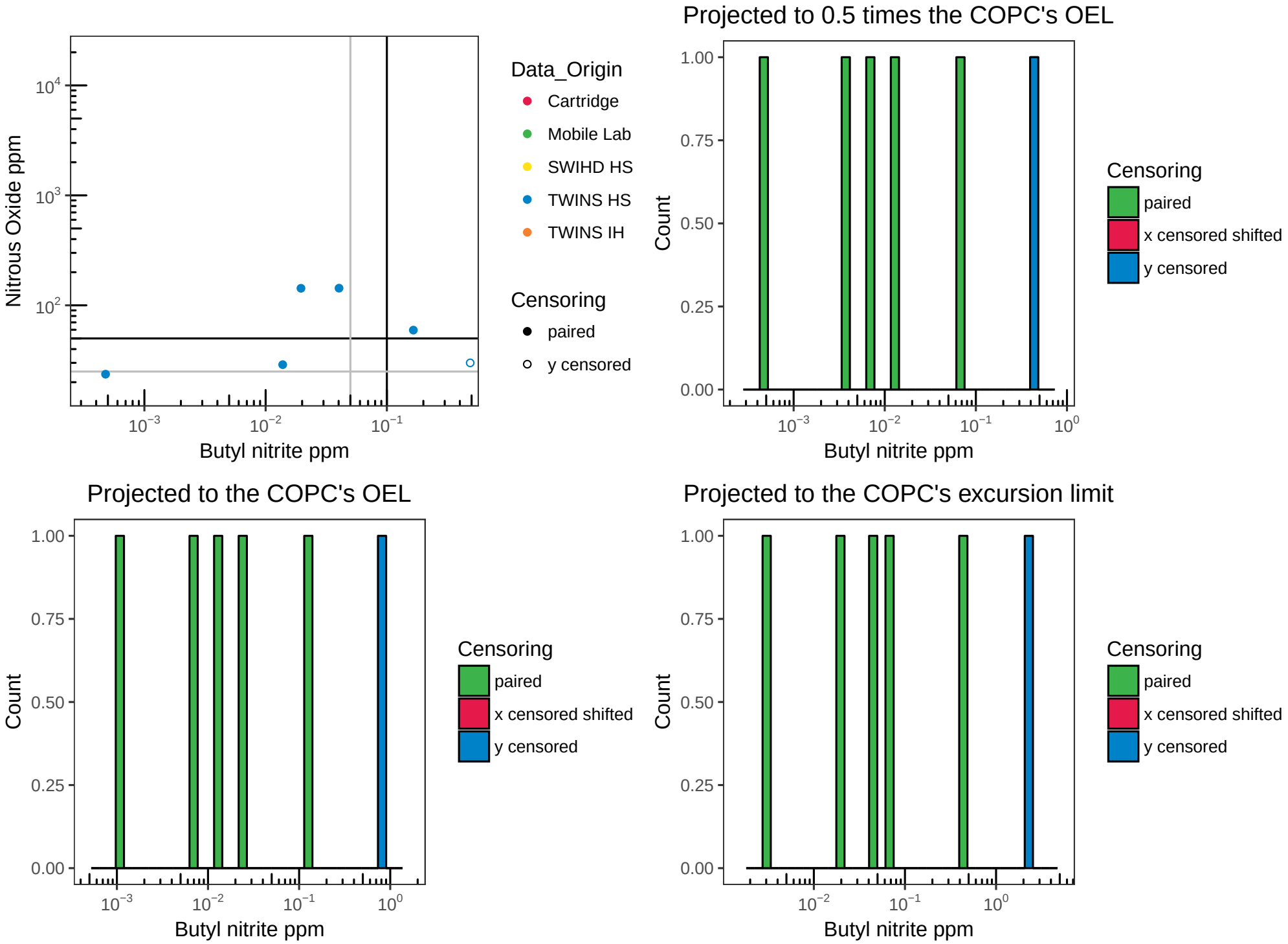


Figure C.2600: Nitrous Oxide vs Butyl nitrite

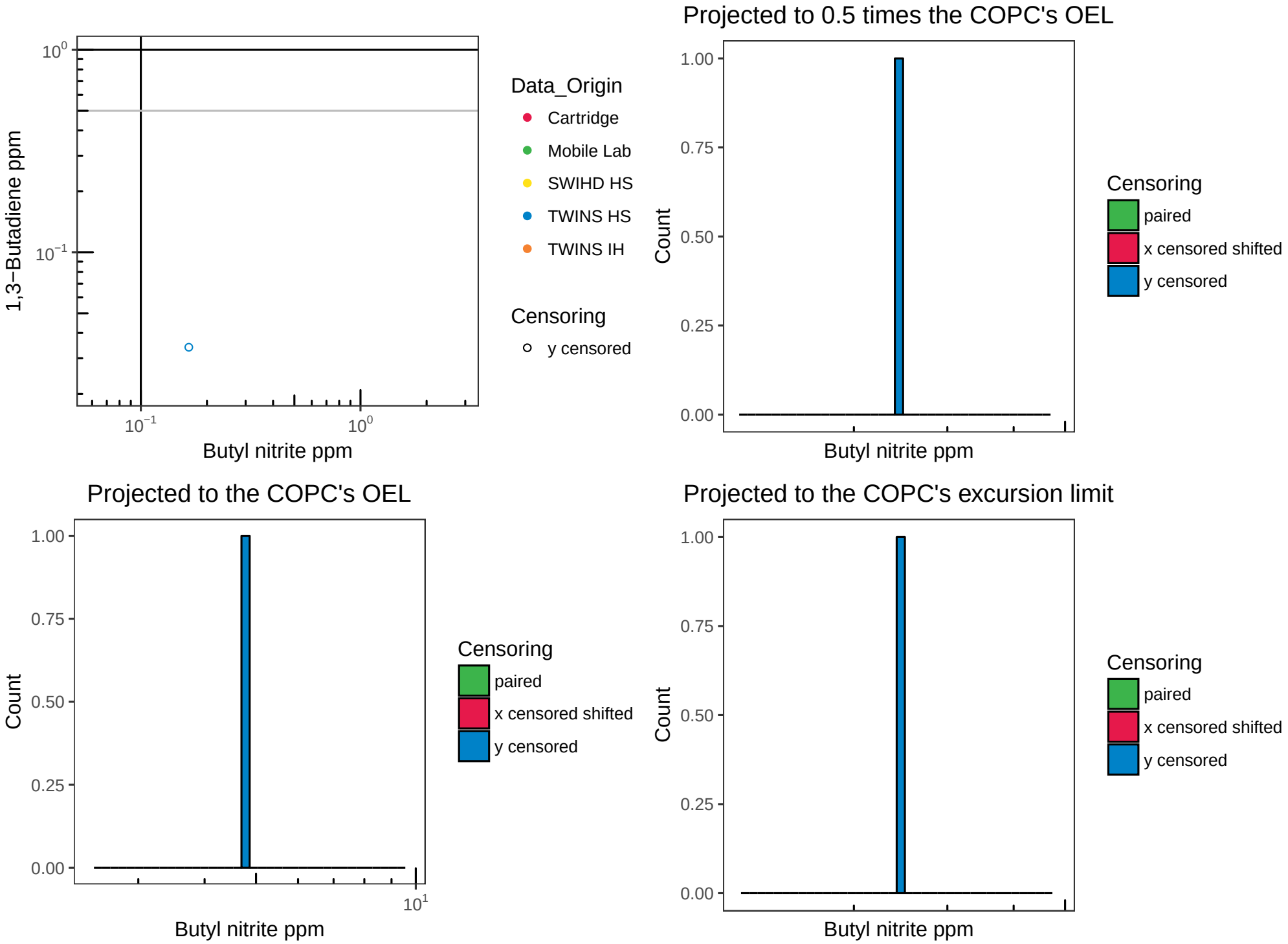


Figure C.2601: 1,3-Butadiene vs Butyl nitrite

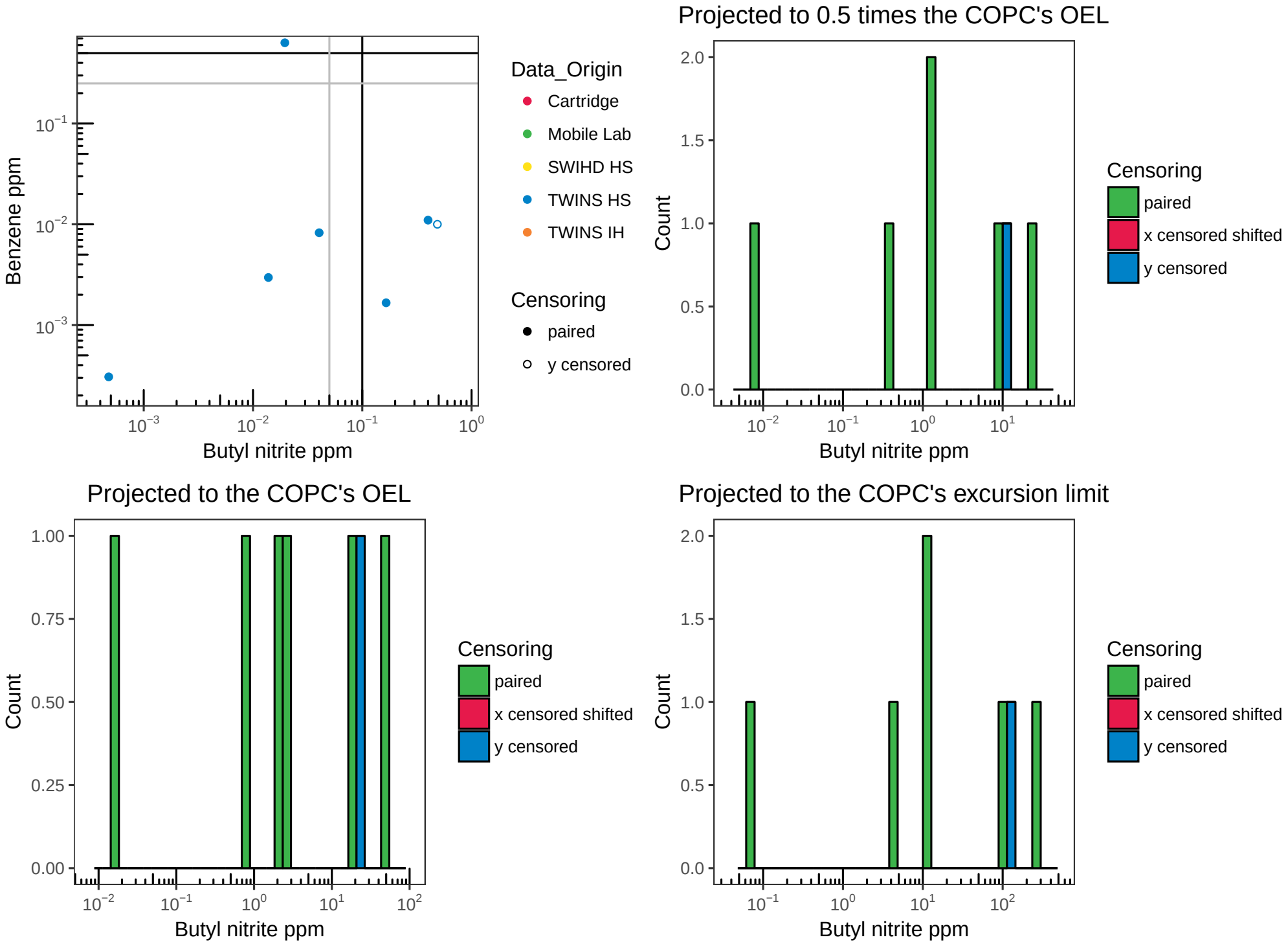


Figure C.2602: Benzene vs Butyl nitrite

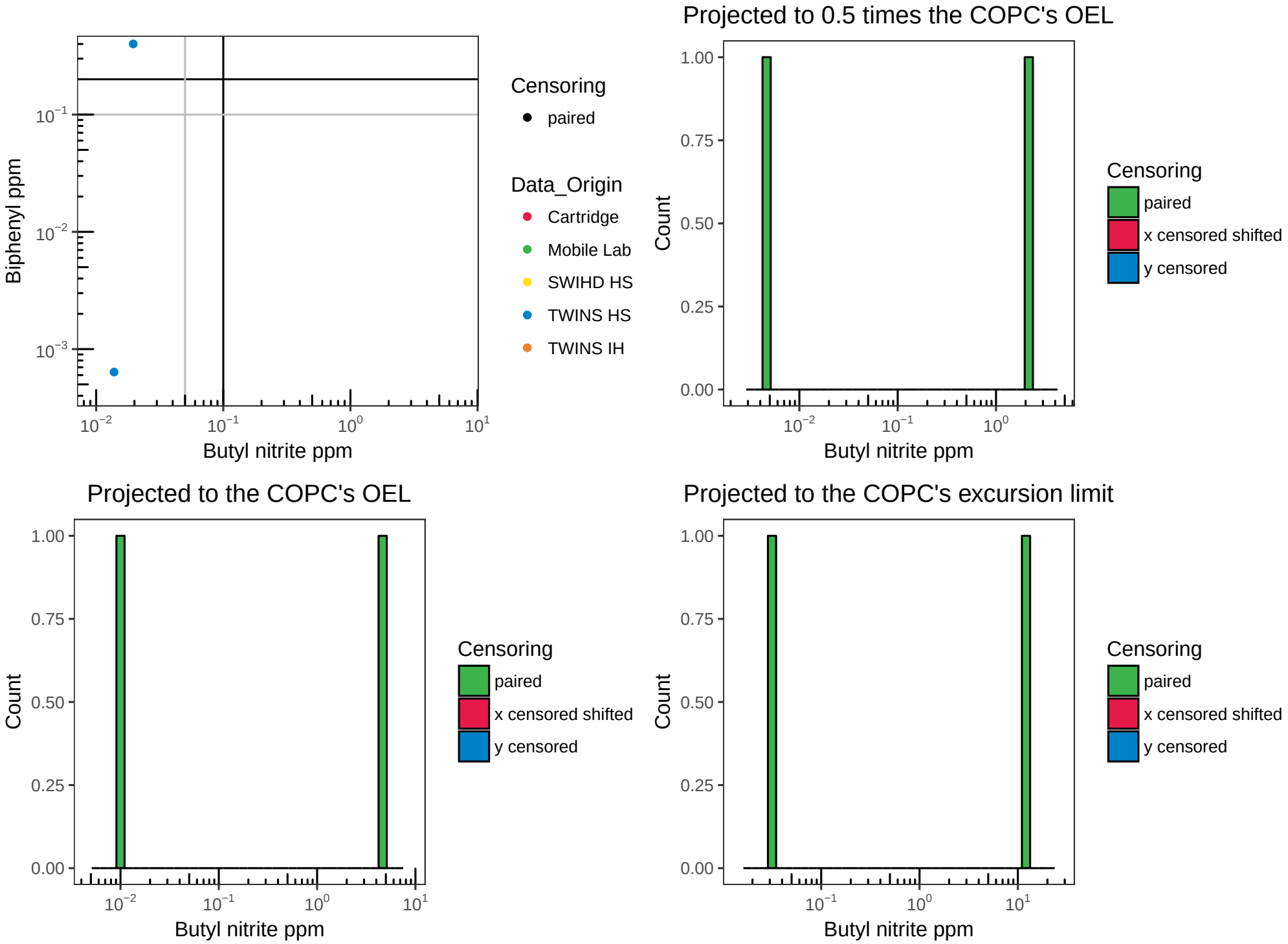


Figure C.2603: Biphenyl vs Butyl nitrite

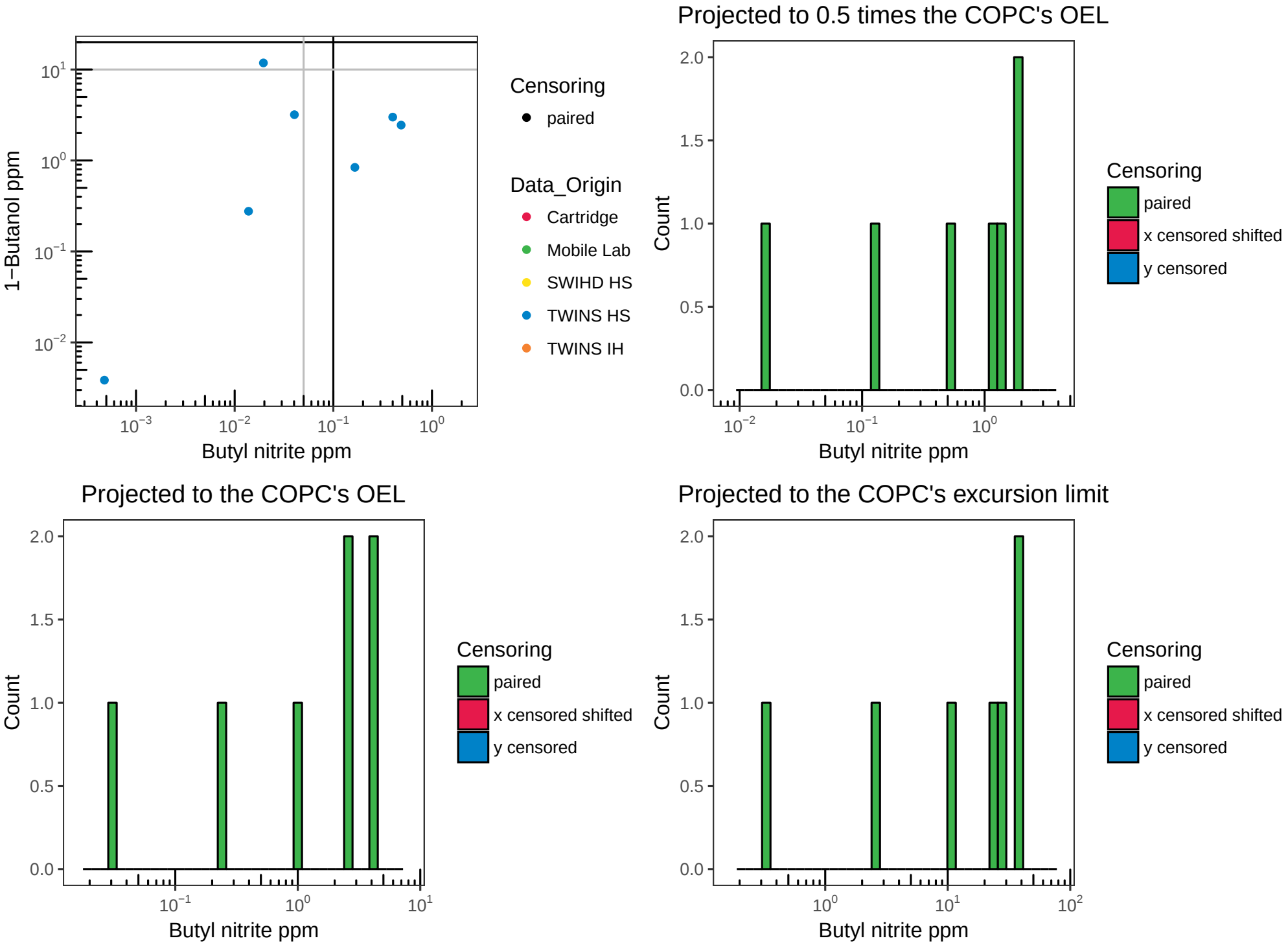


Figure C.2604: 1-Butanol vs Butyl nitrite

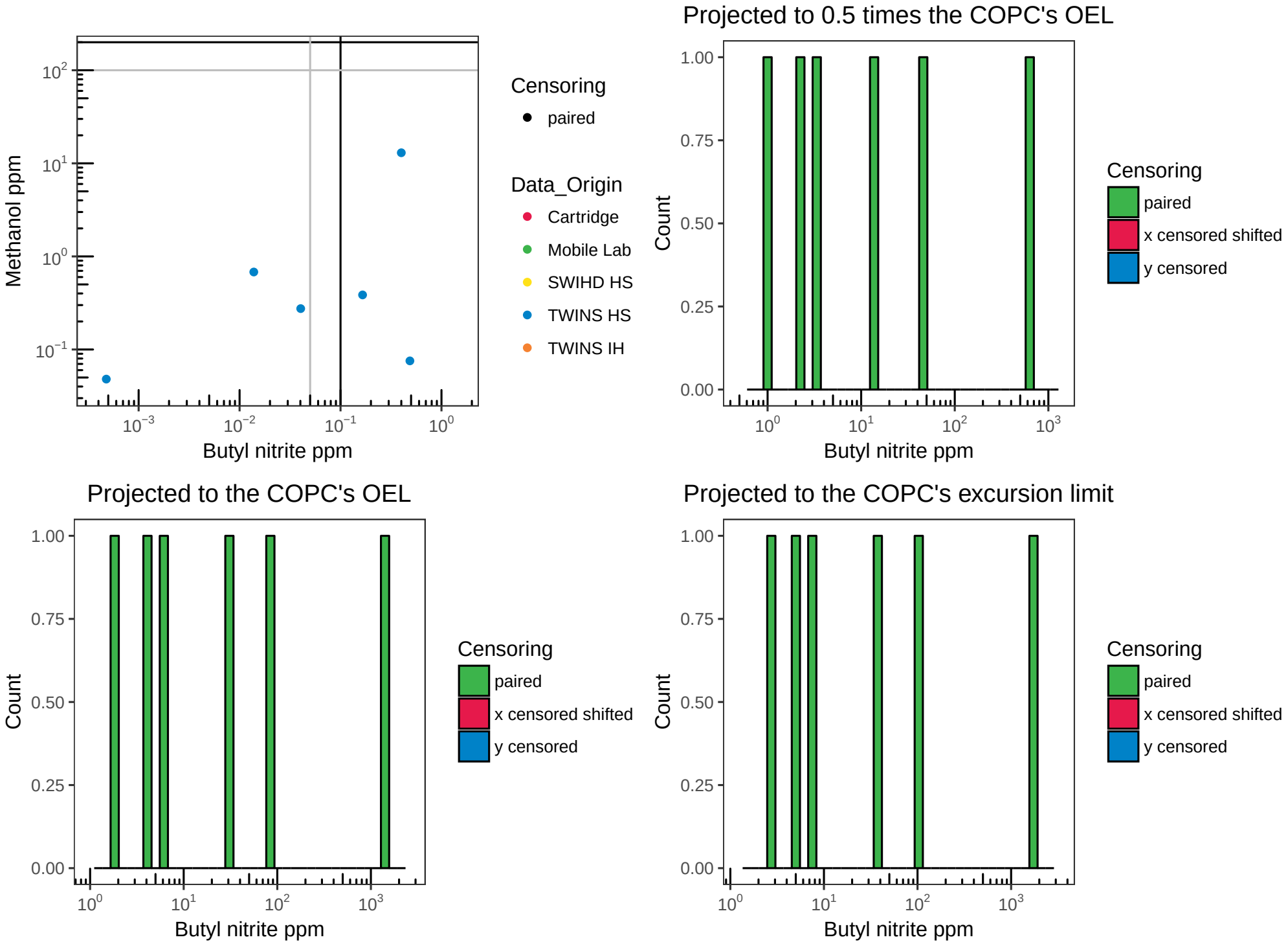


Figure C.2605: Methanol vs Butyl nitrite

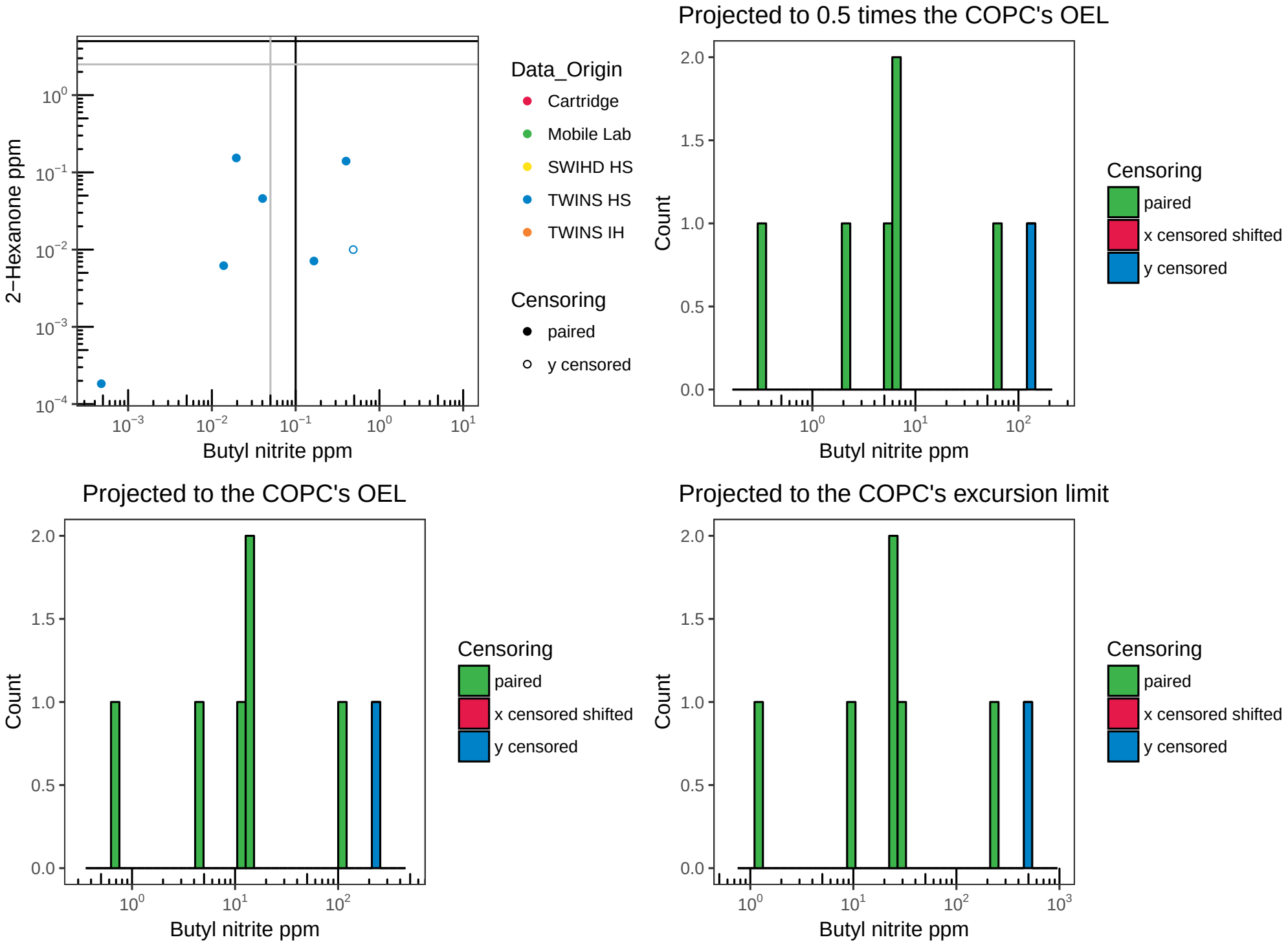


Figure C.2606: 2-Hexanone vs Butyl nitrite

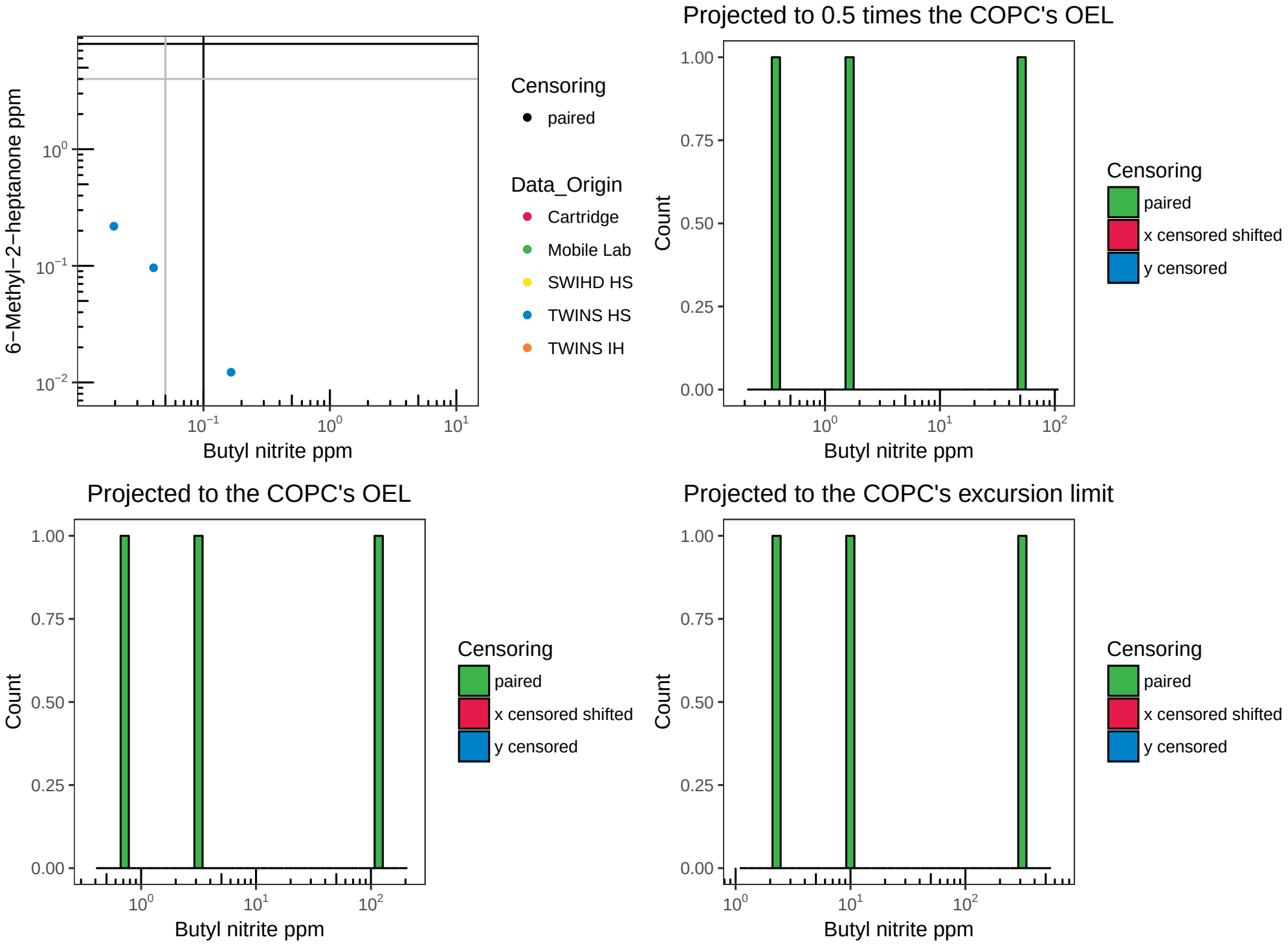


Figure C.2607: 6-Methyl-2-heptanone vs Butyl nitrite

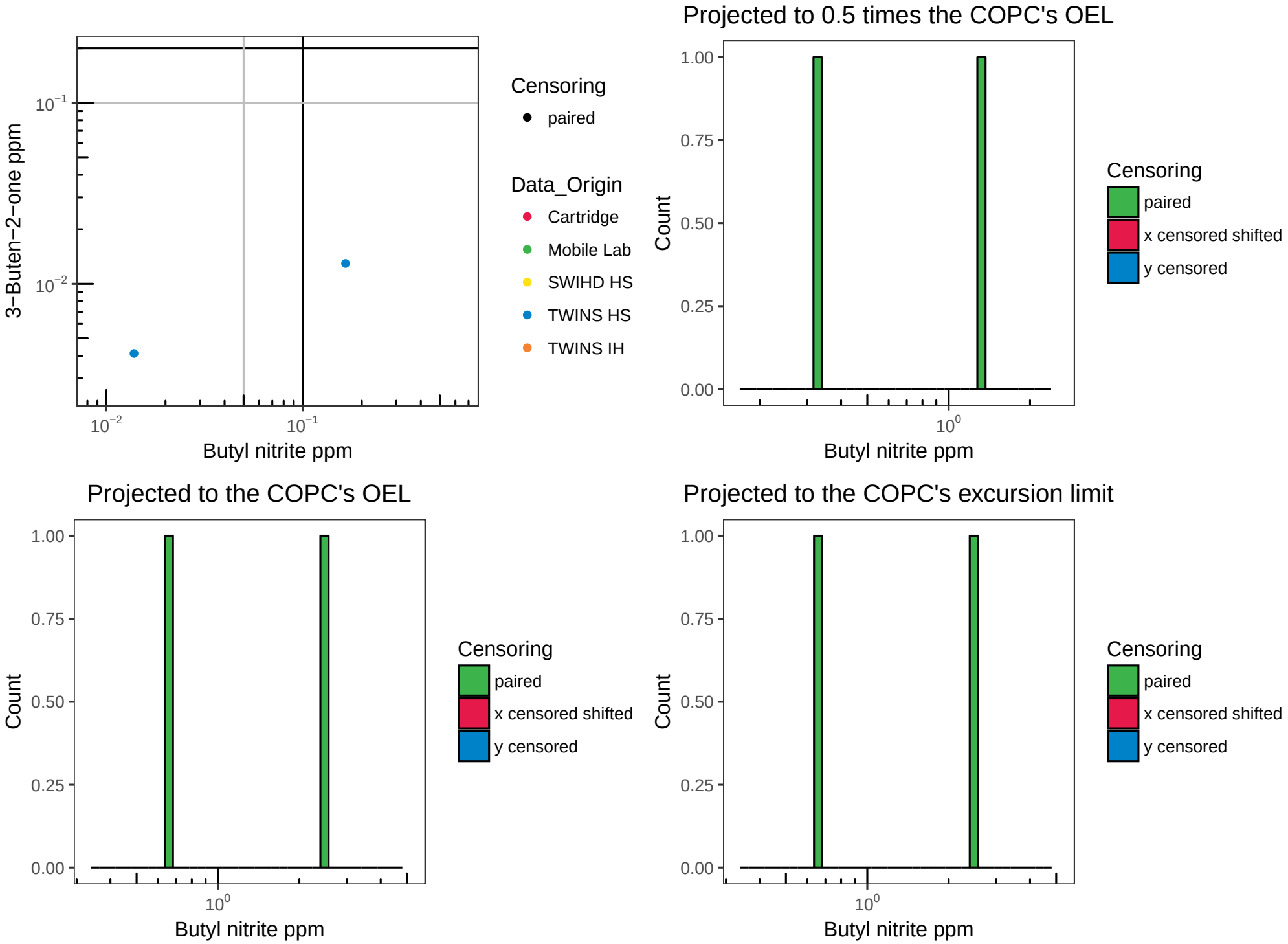


Figure C.2608: 3-Buten-2-one vs Butyl nitrite

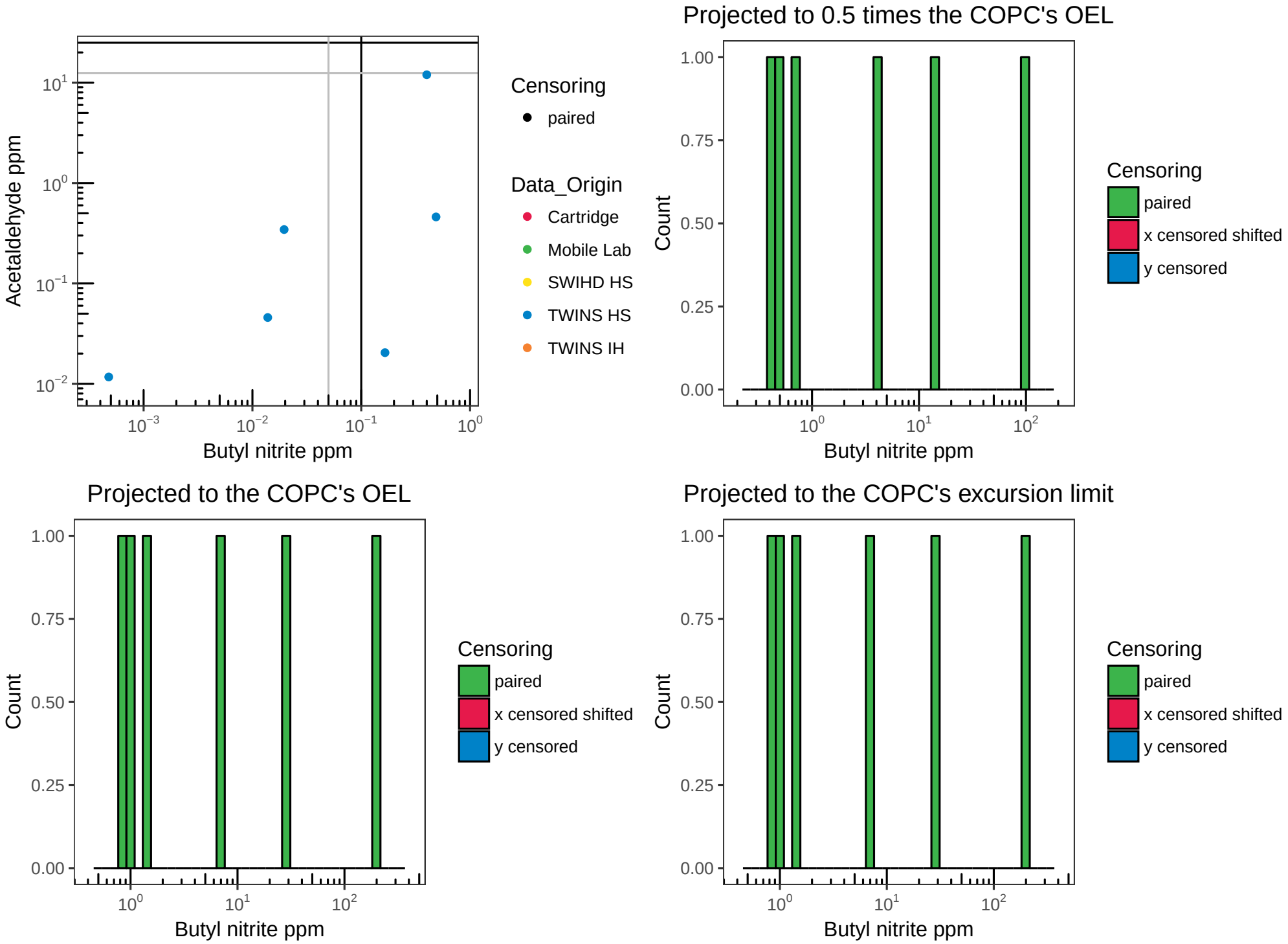


Figure C.2609: Acetaldehyde vs Butyl nitrite

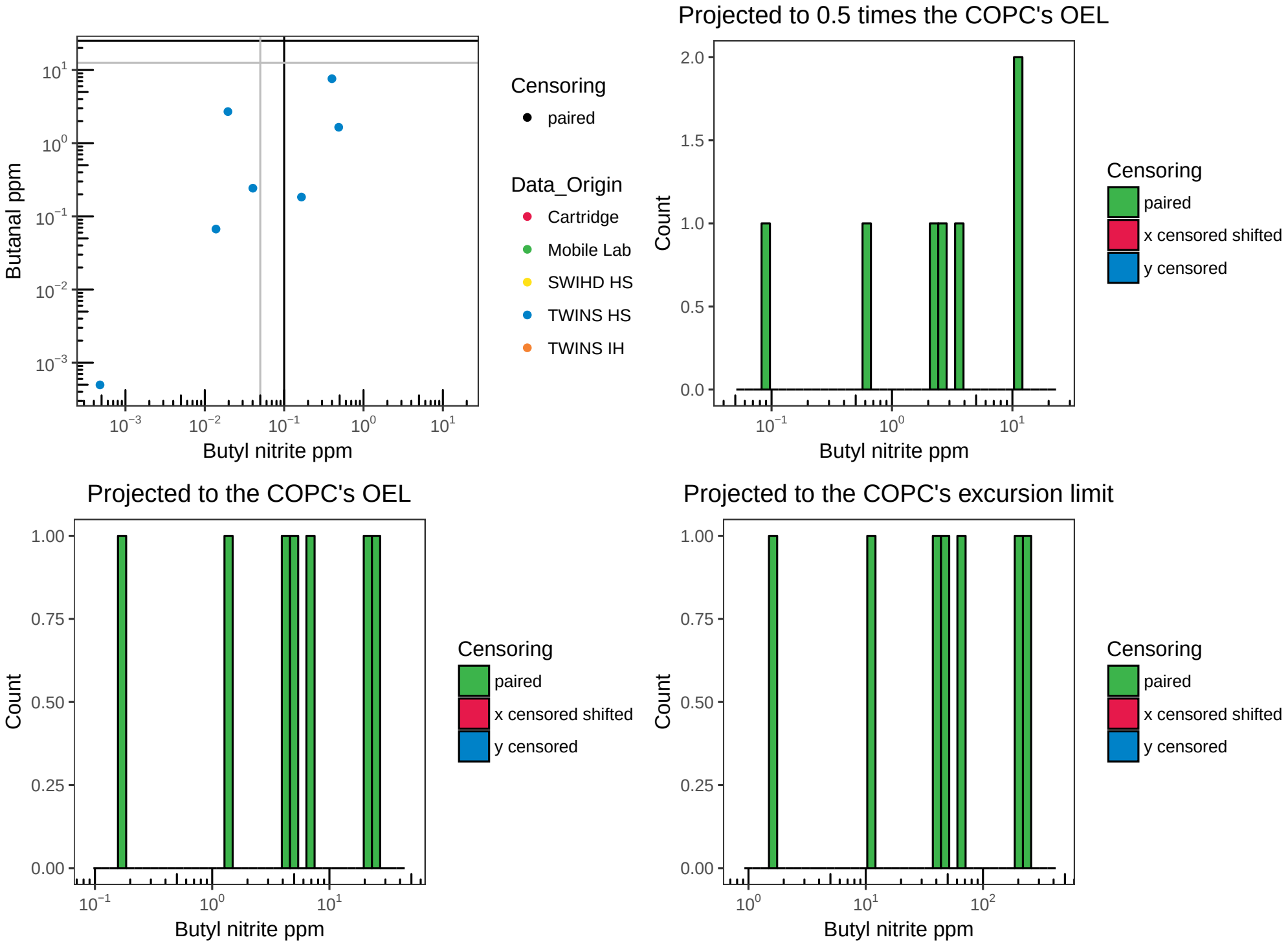


Figure C.2610: Butanal vs Butyl nitrite

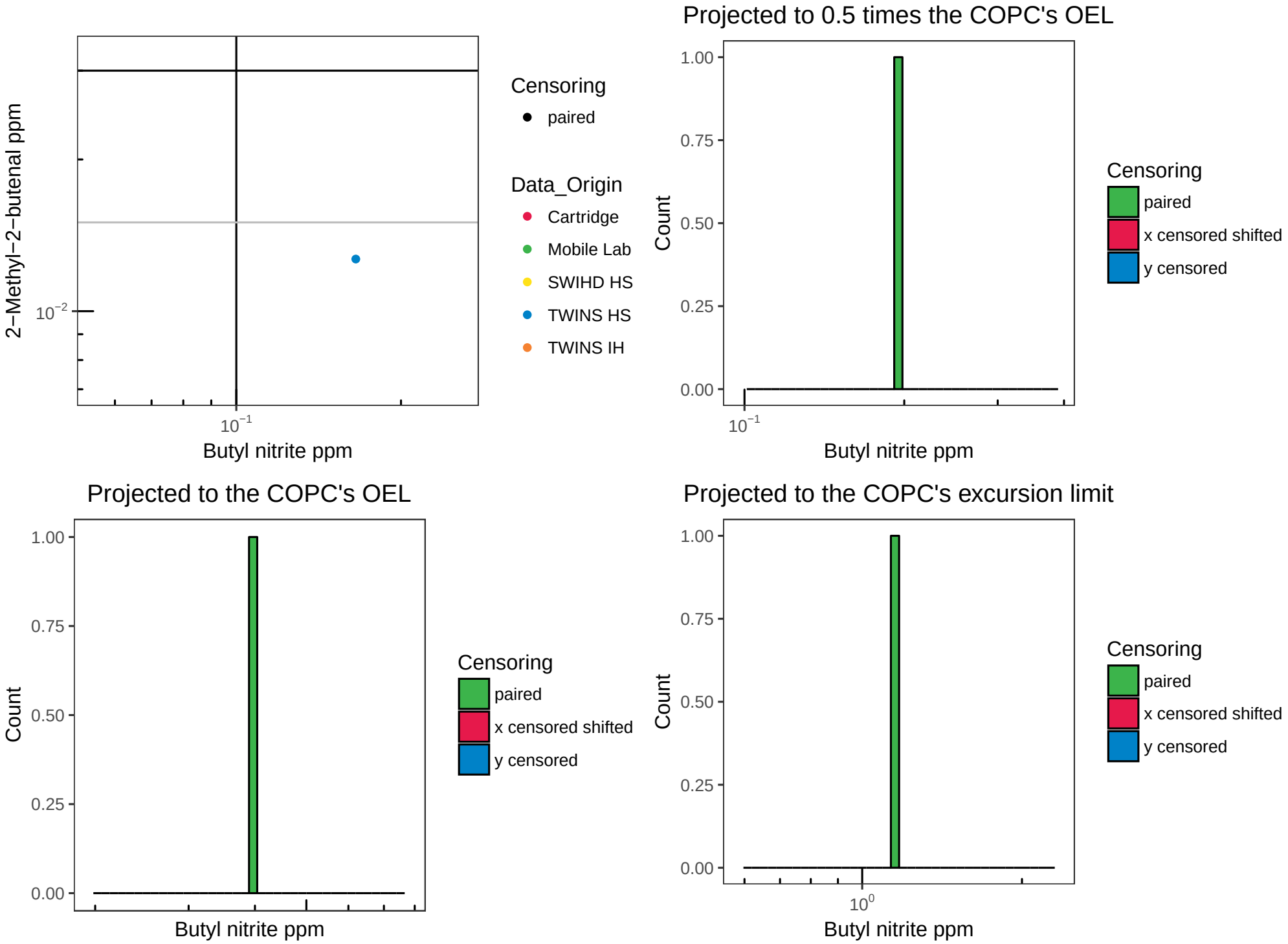


Figure C.2611: 2-Methyl-2-butenal vs Butyl nitrite

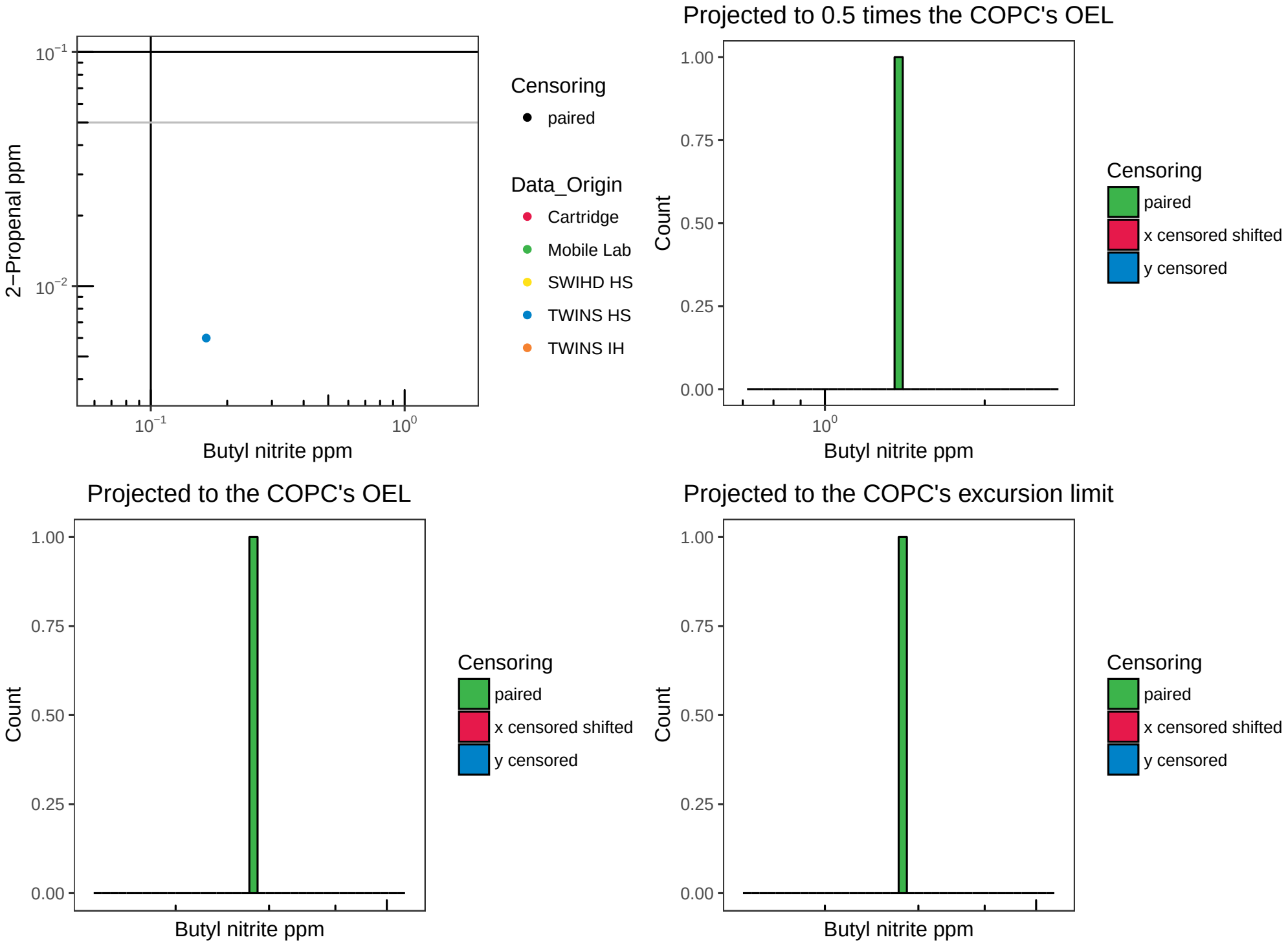


Figure C.2612: 2-Propenal vs Butyl nitrite

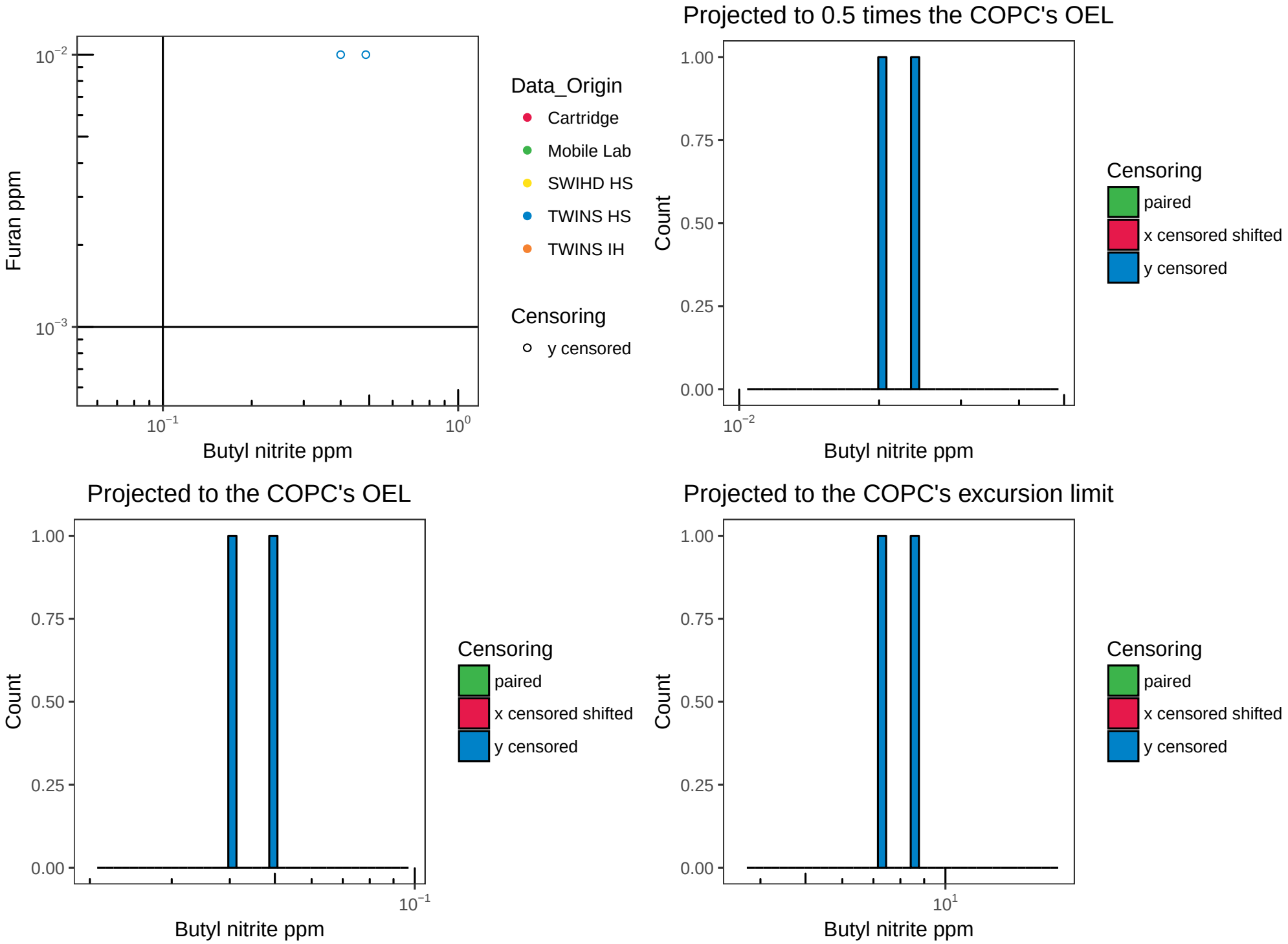


Figure C.2613: Furan vs Butyl nitrite

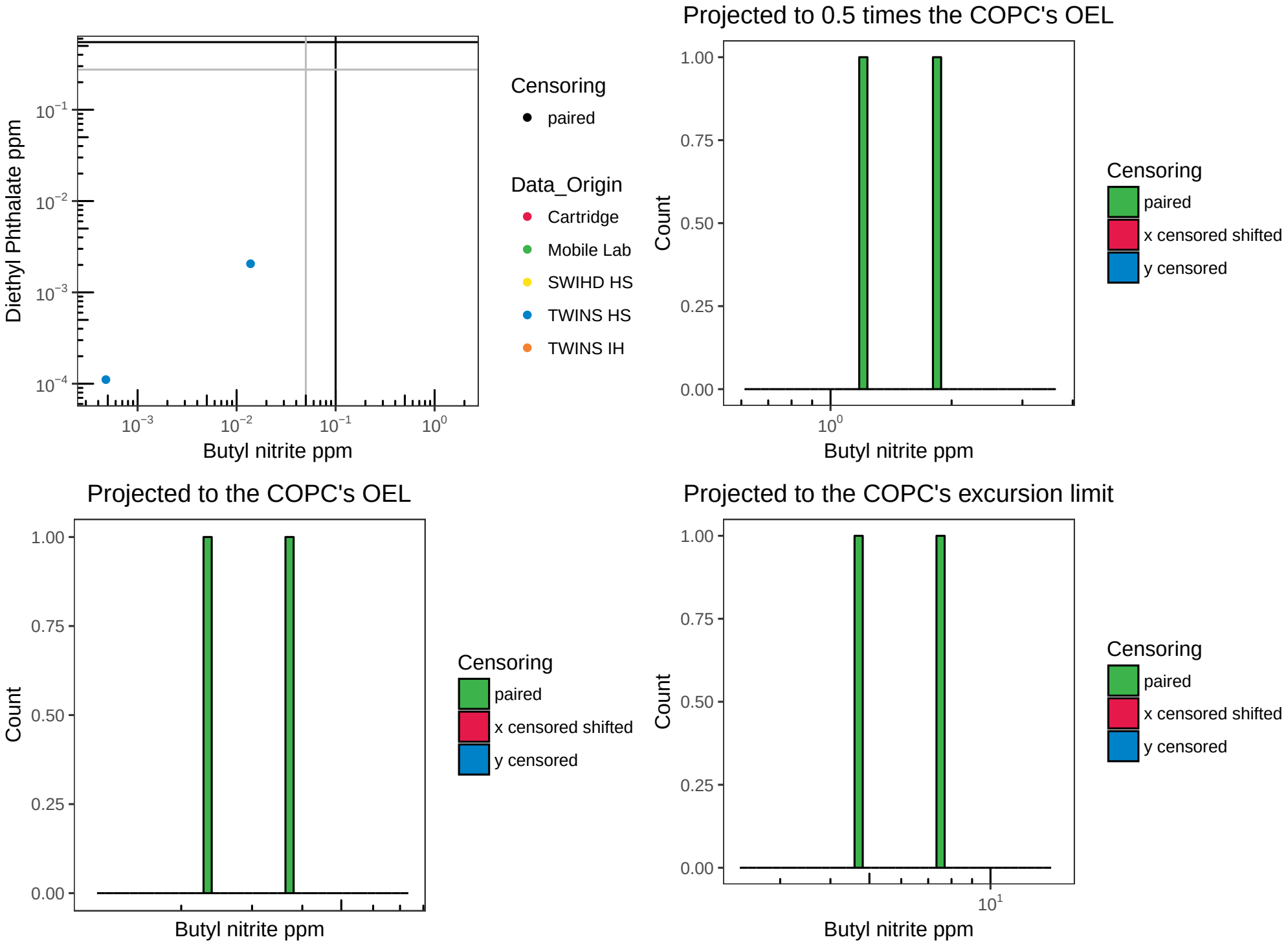


Figure C.2614: Diethyl Phthalate vs Butyl nitrite

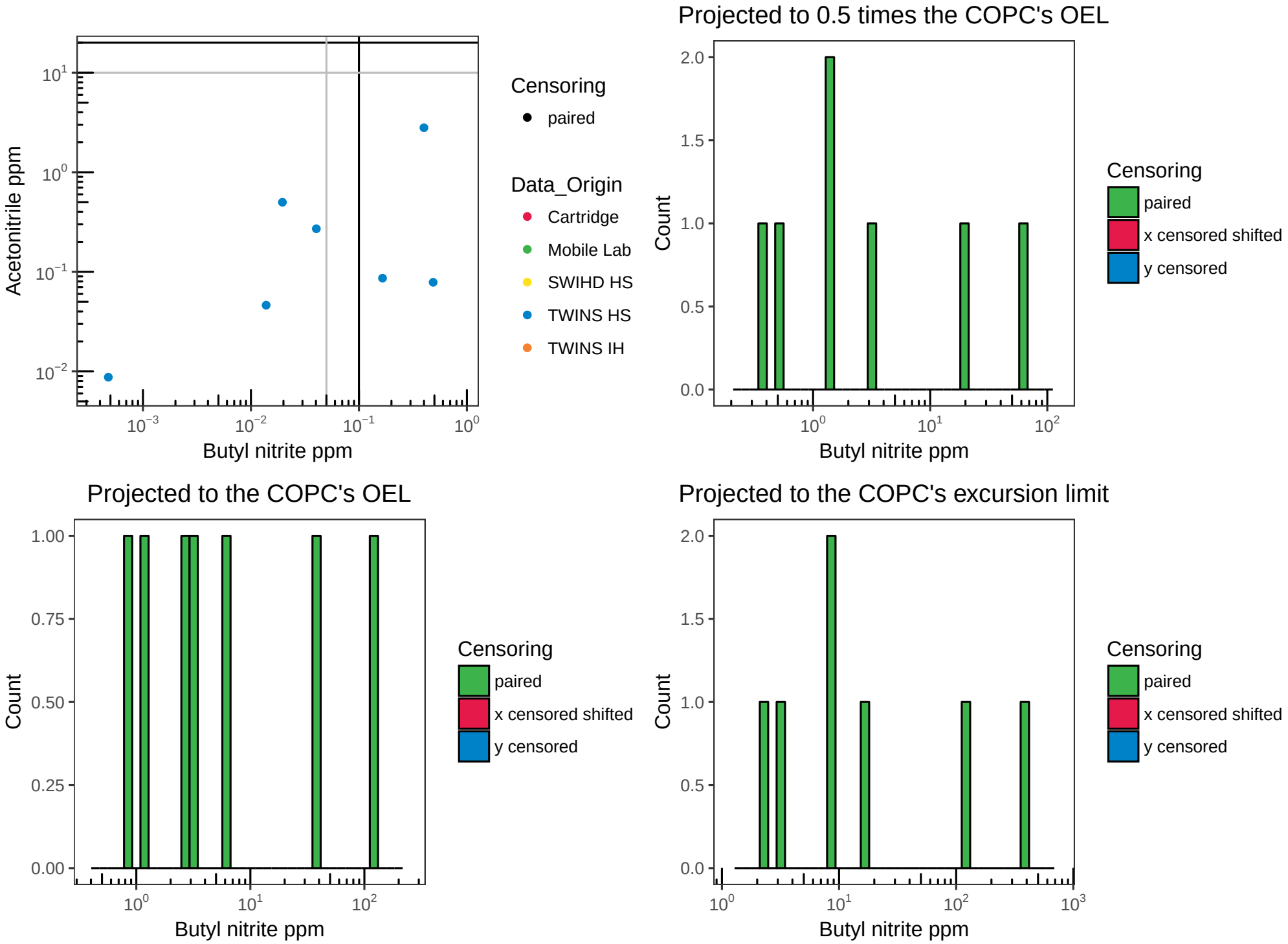


Figure C.2615: Acetonitrile vs Butyl nitrite

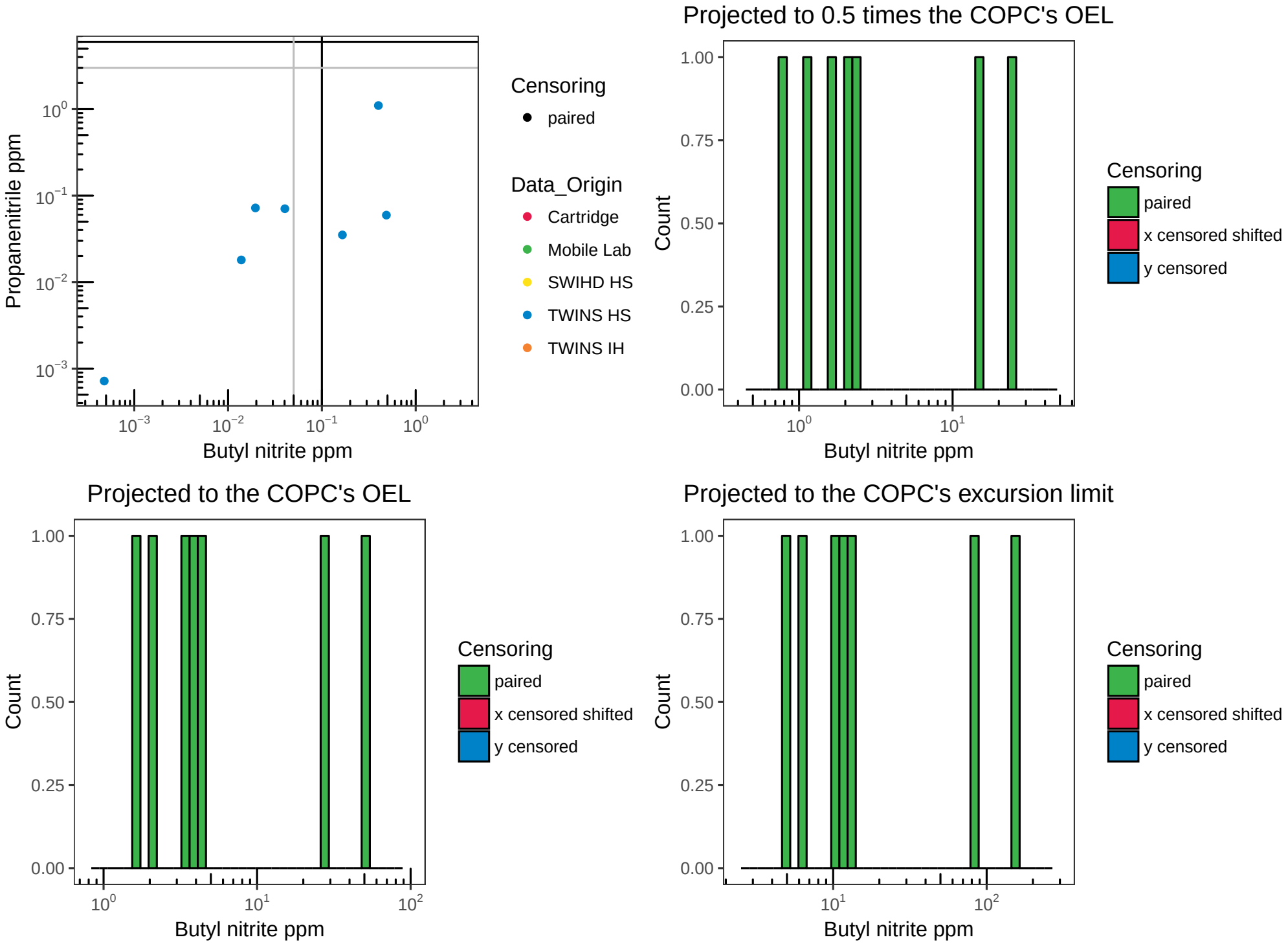


Figure C.2616: Propanenitrile vs Butyl nitrite

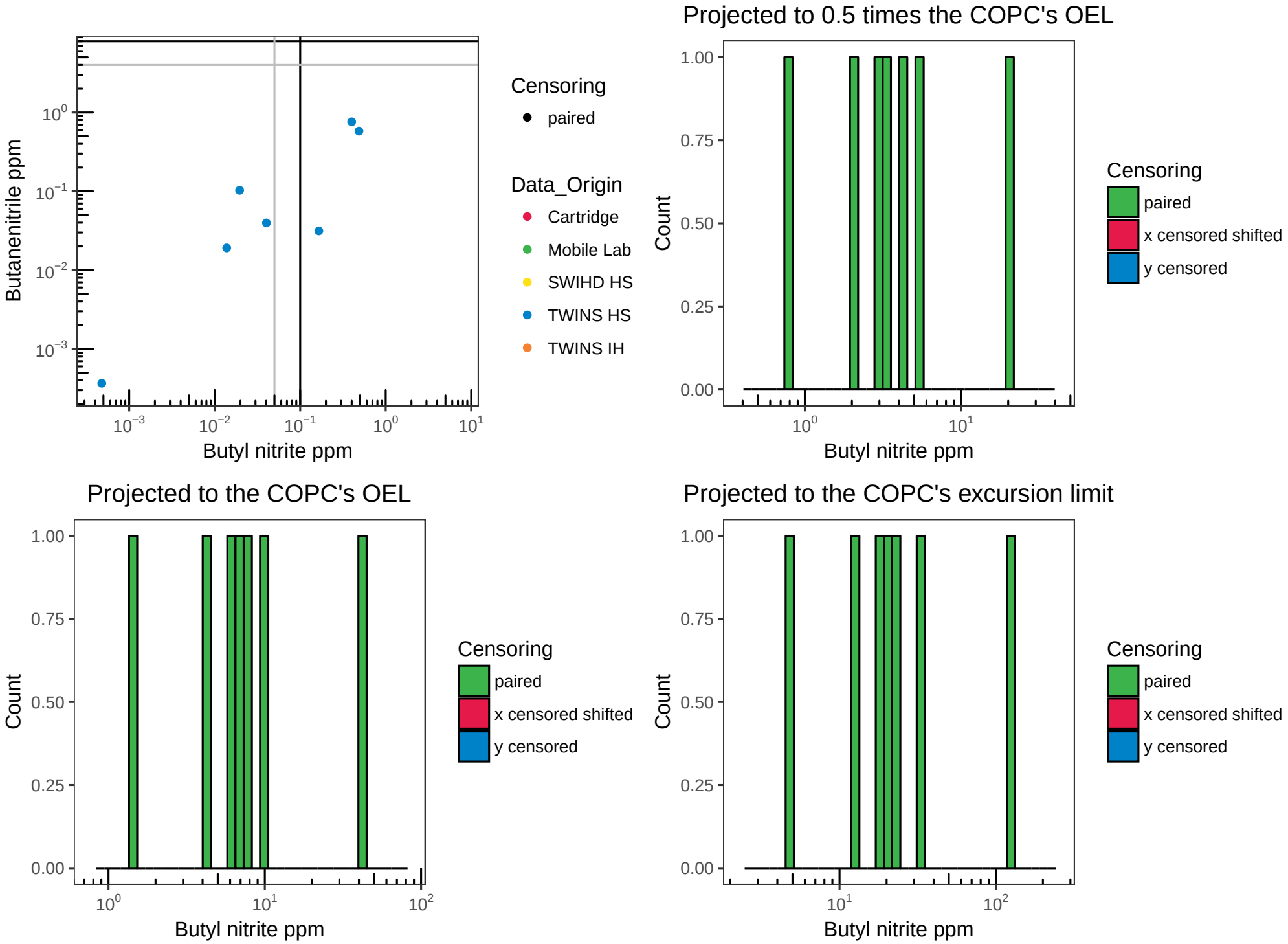


Figure C.2617: Butanenitrile vs Butyl nitrite

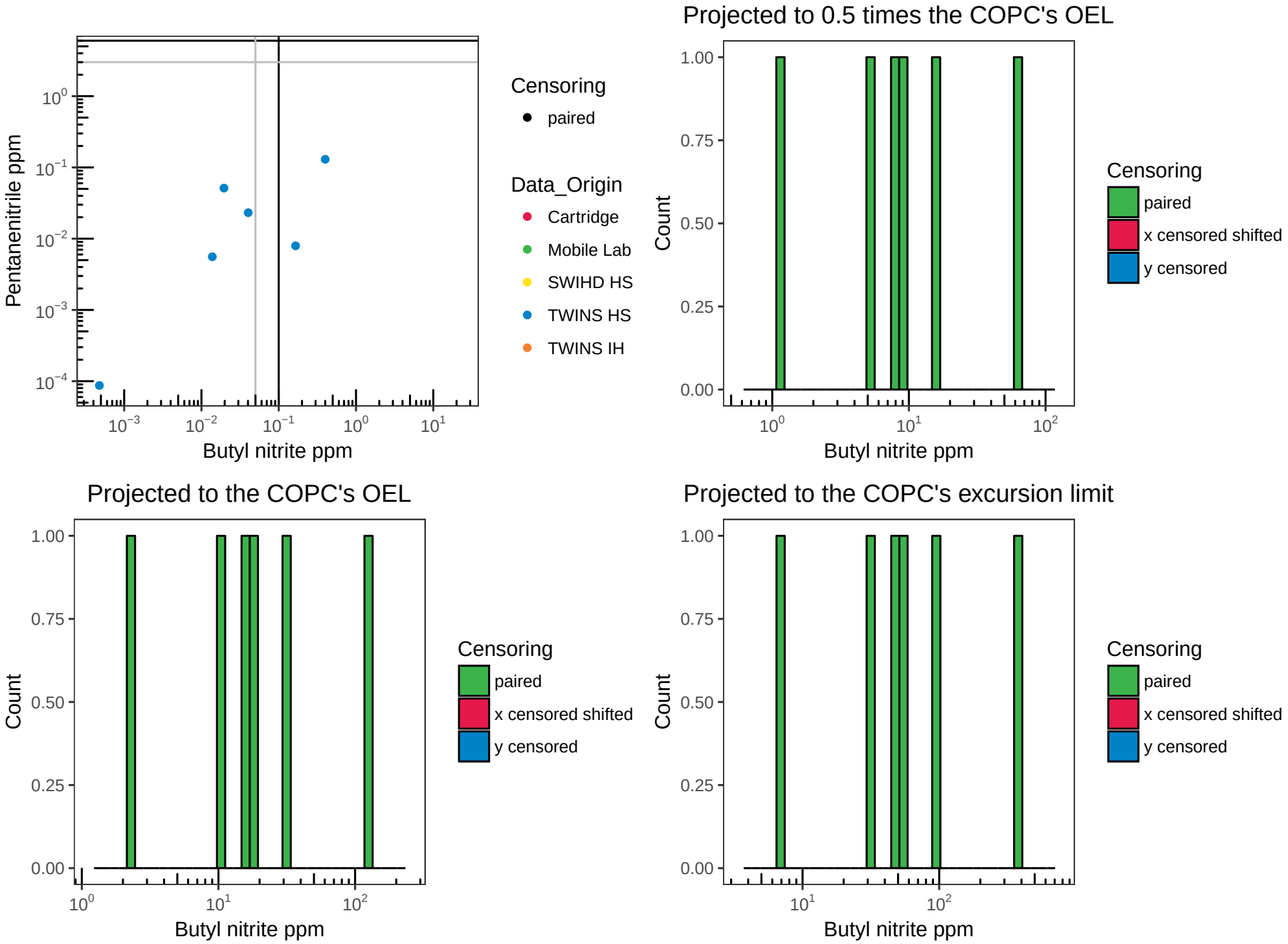


Figure C.2618: Pentanenitrile vs Butyl nitrite

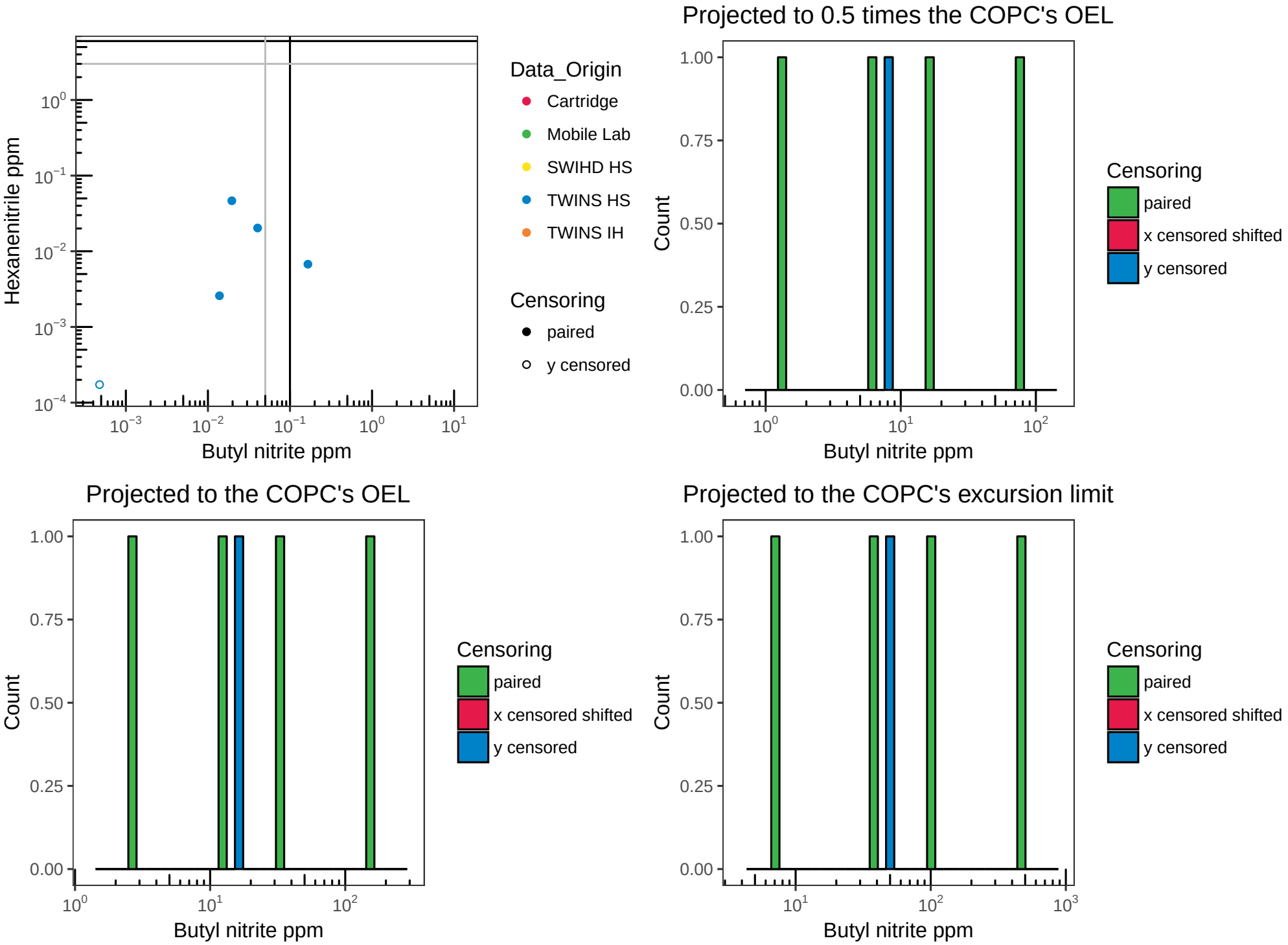


Figure C.2619: Hexanenitrile vs Butyl nitrite

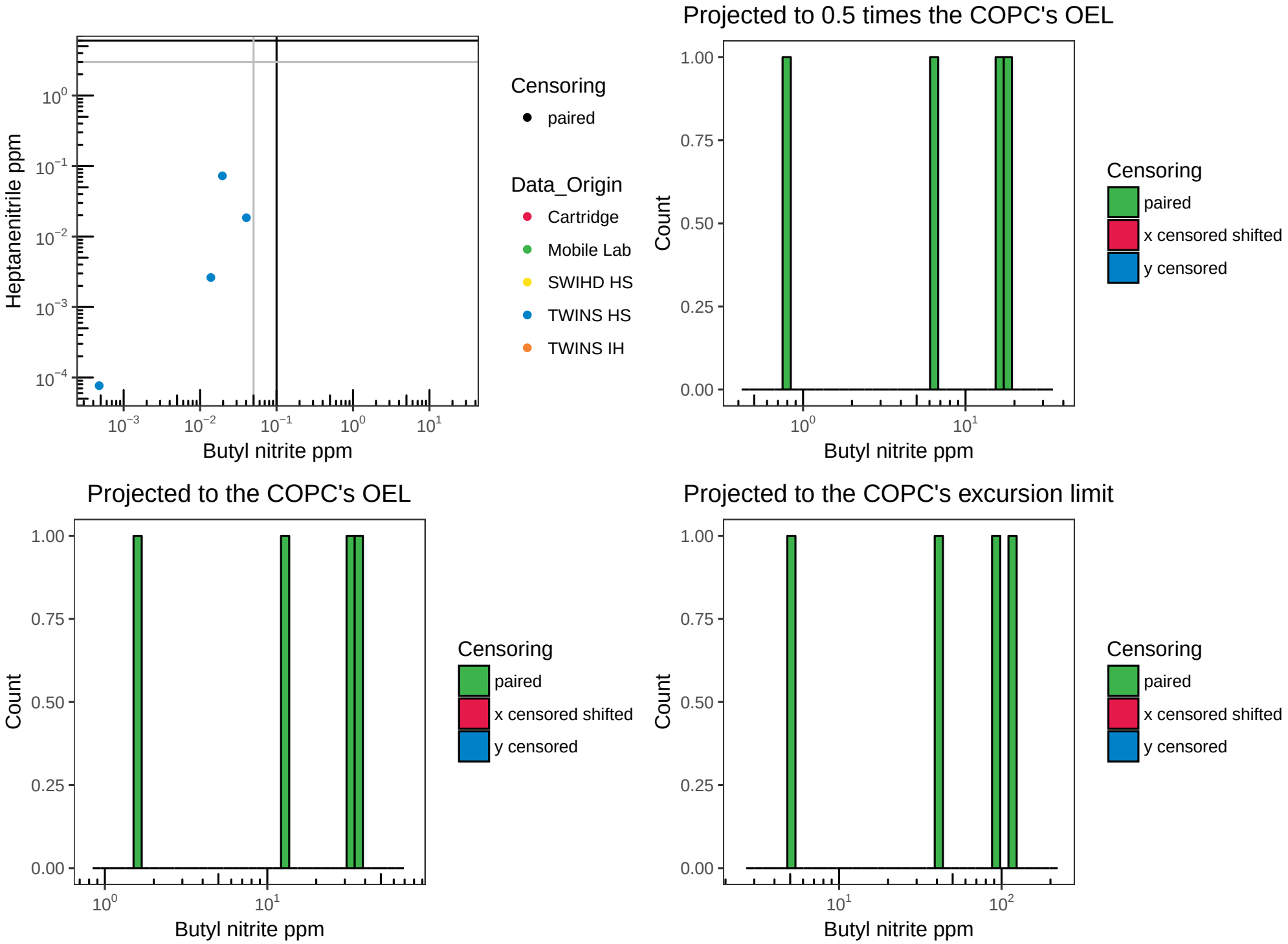


Figure C.2620: Heptanenitrile vs Butyl nitrite

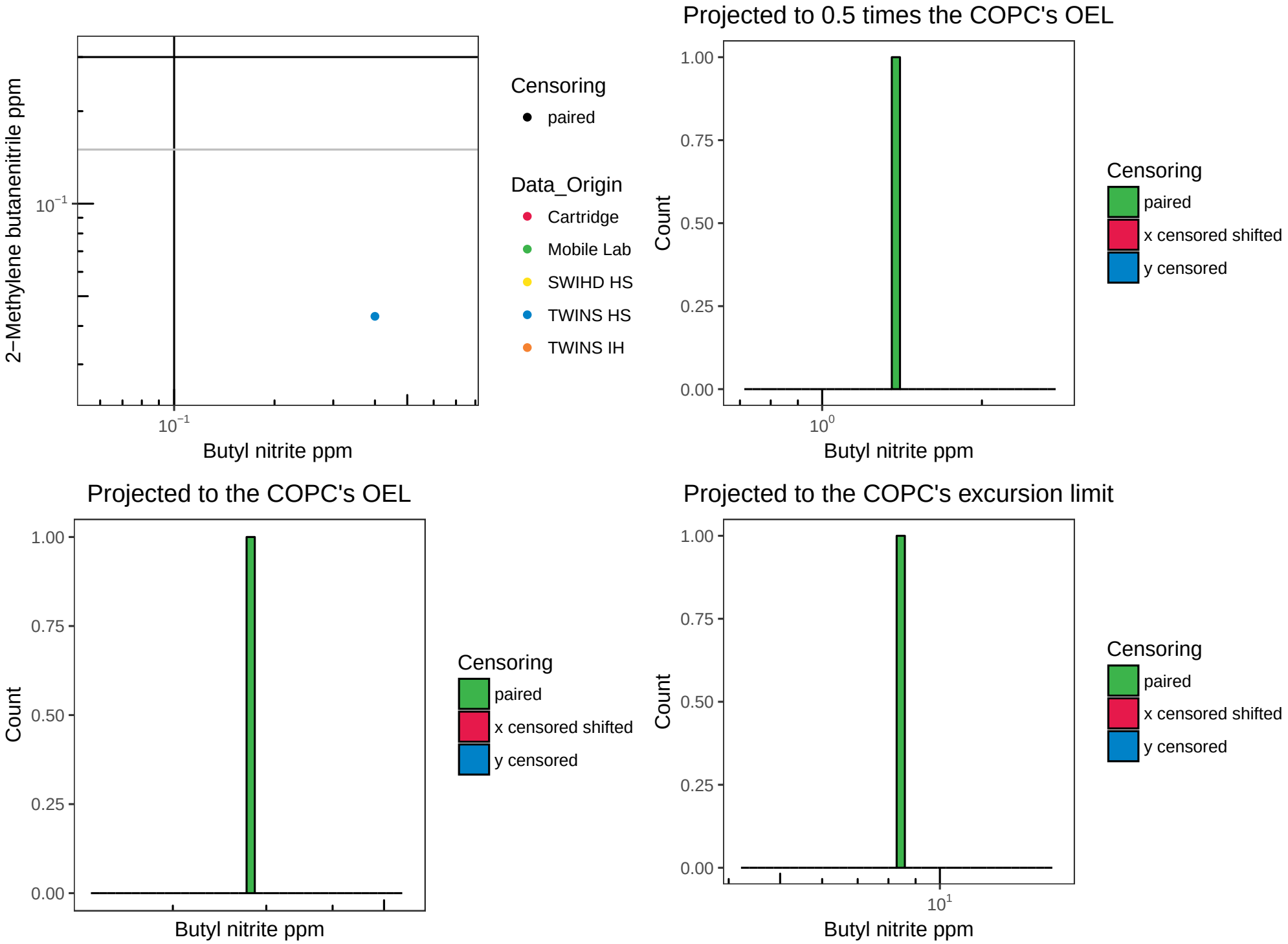


Figure C.2621: 2-Methylene butanenitrile vs Butyl nitrite

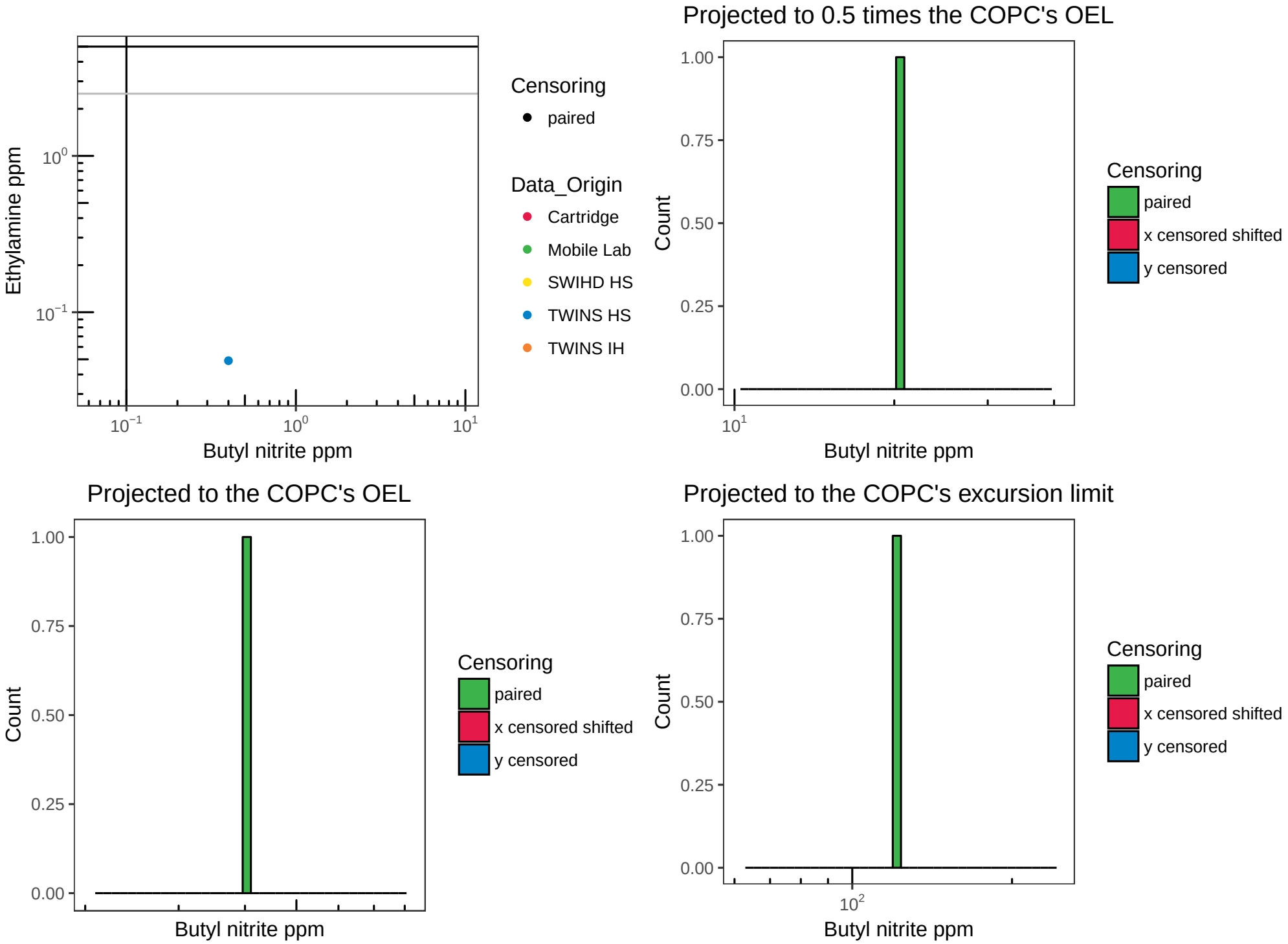


Figure C.2622: Ethylamine vs Butyl nitrite

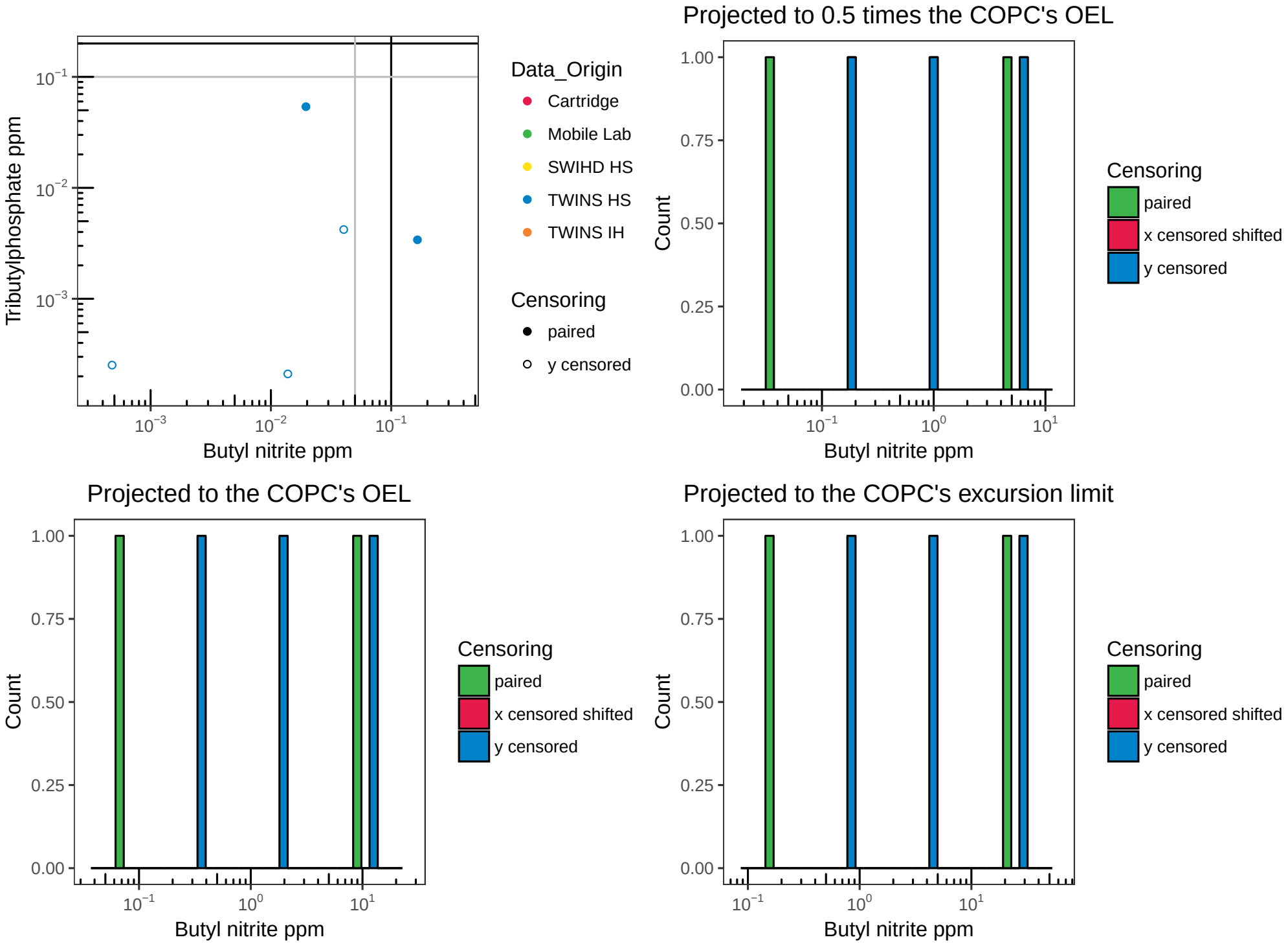


Figure C.2623: Tributylphosphate vs Butyl nitrite

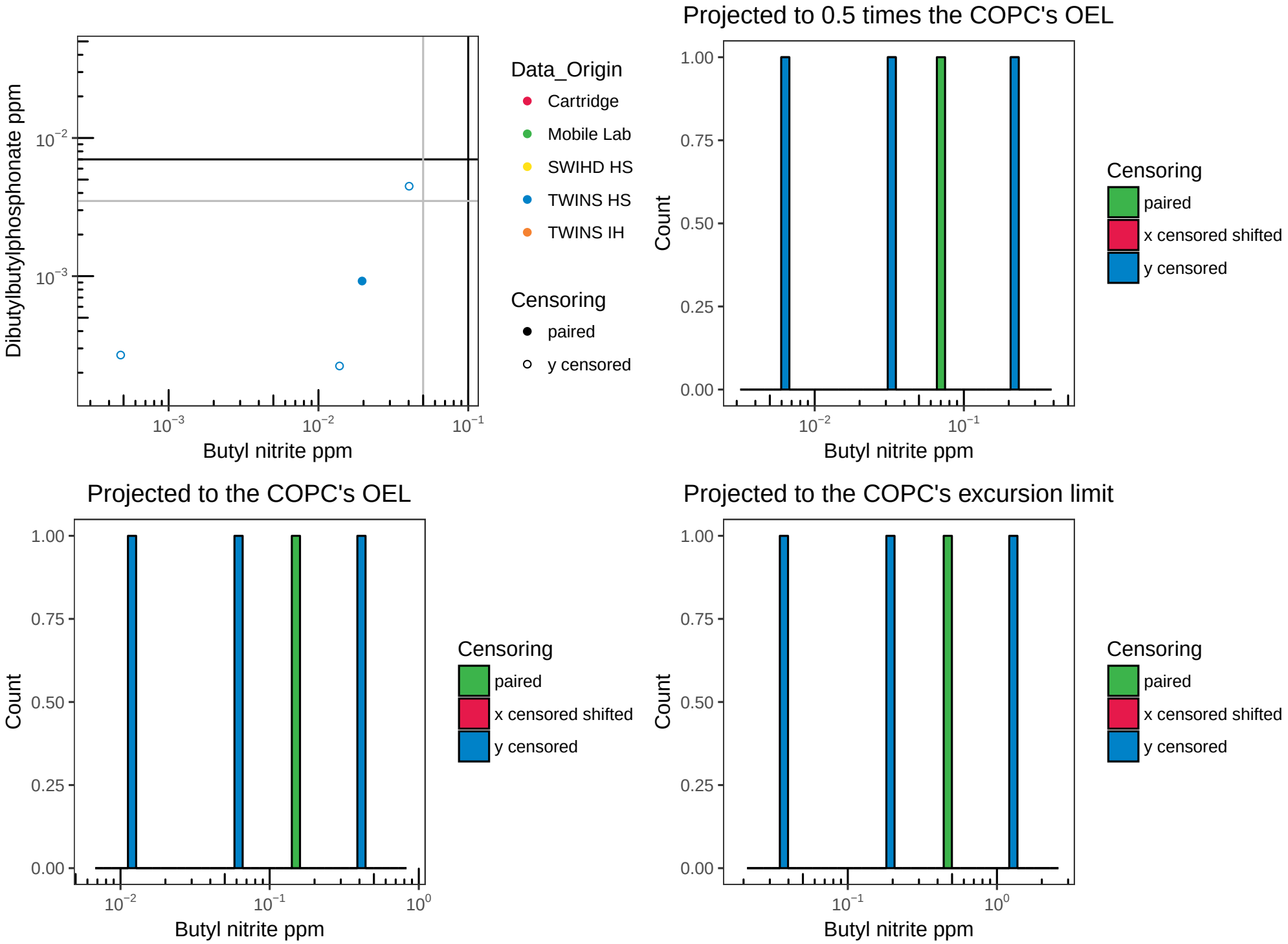


Figure C.2624: Dibutylbutylphosphonate vs Butyl nitrite

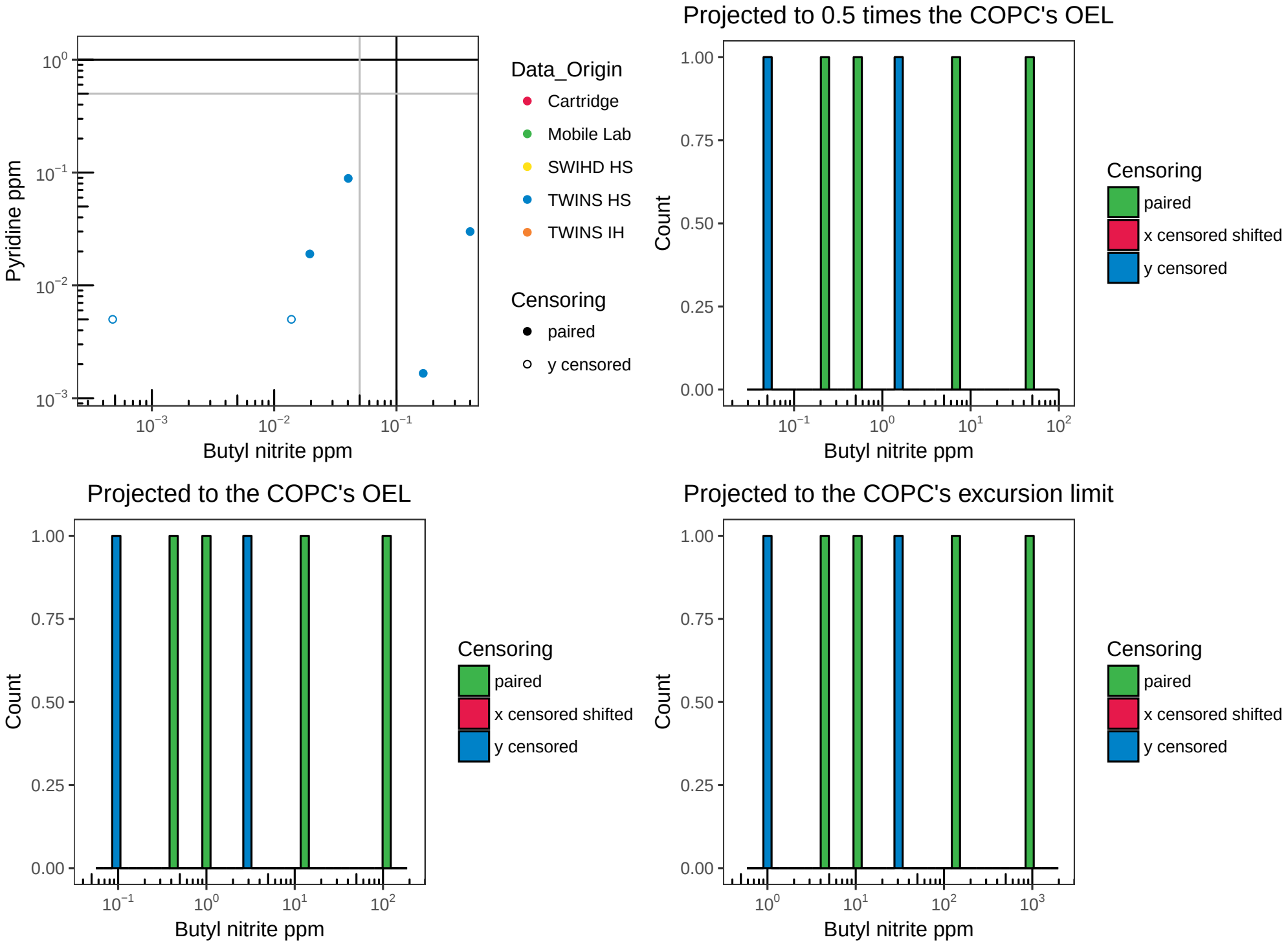


Figure C.2625: Pyridine vs Butyl nitrite

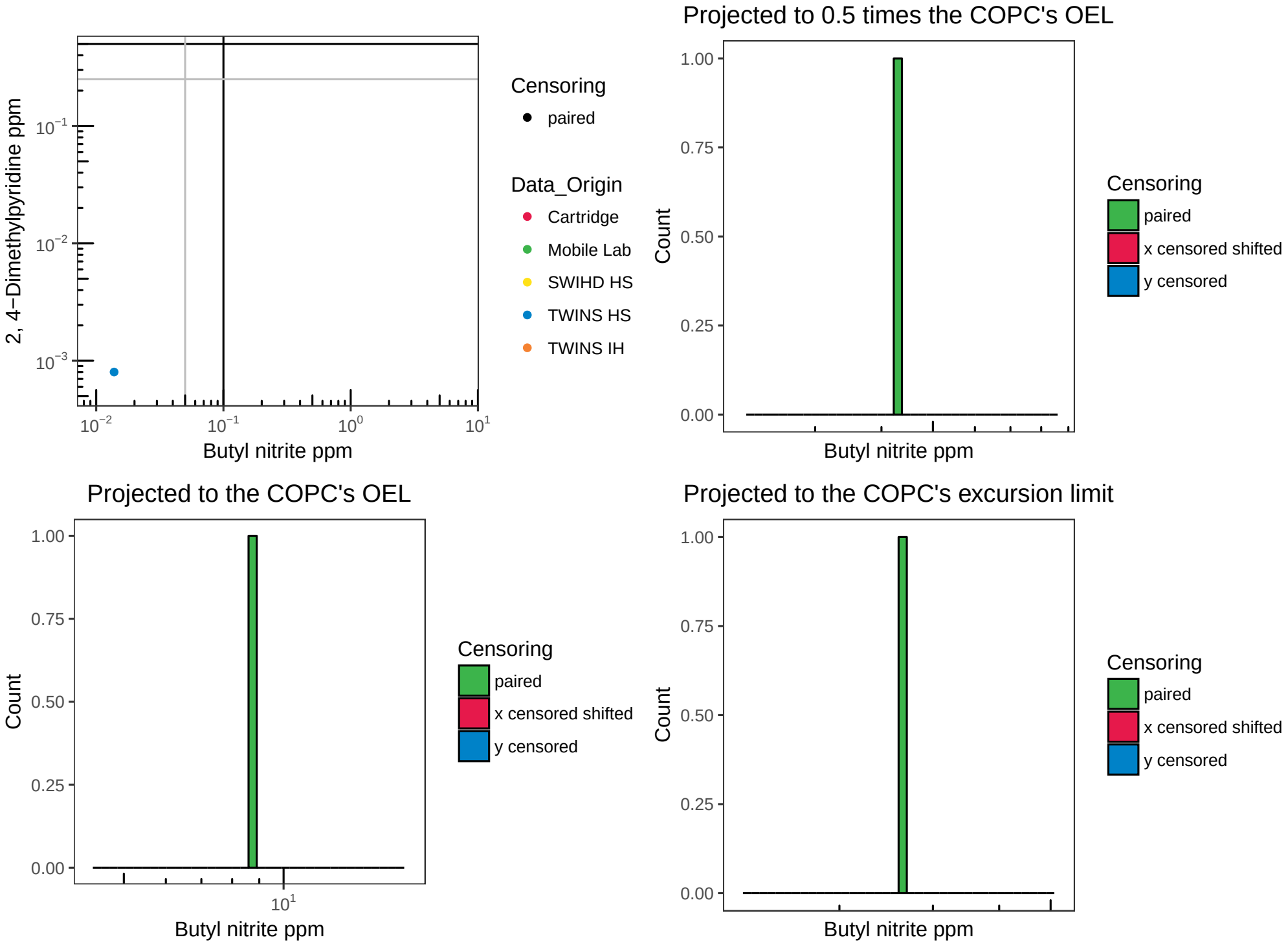


Figure C.2626: 2, 4-Dimethylpyridine vs Butyl nitrite

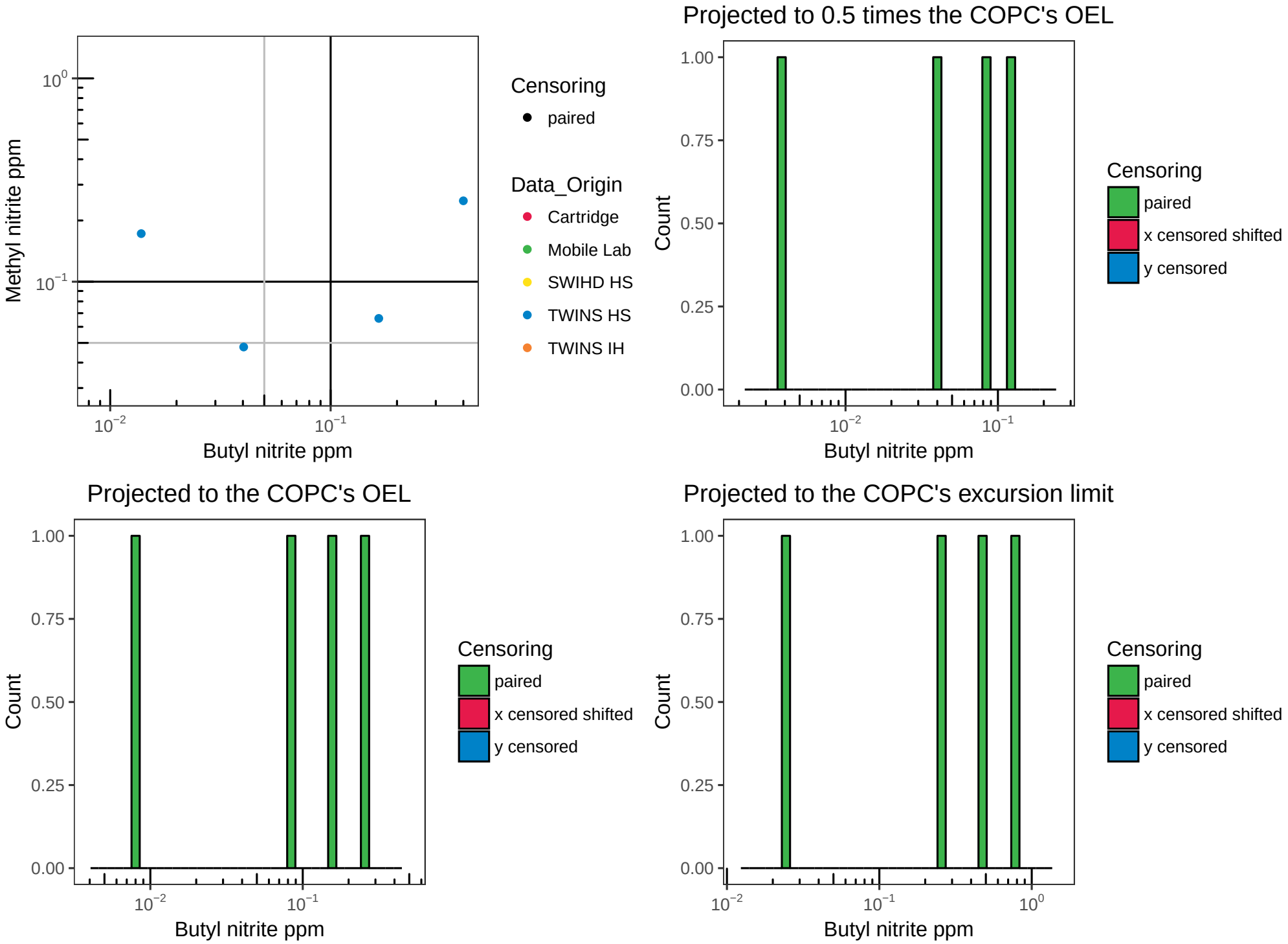


Figure C.2627: Methyl nitrite vs Butyl nitrite

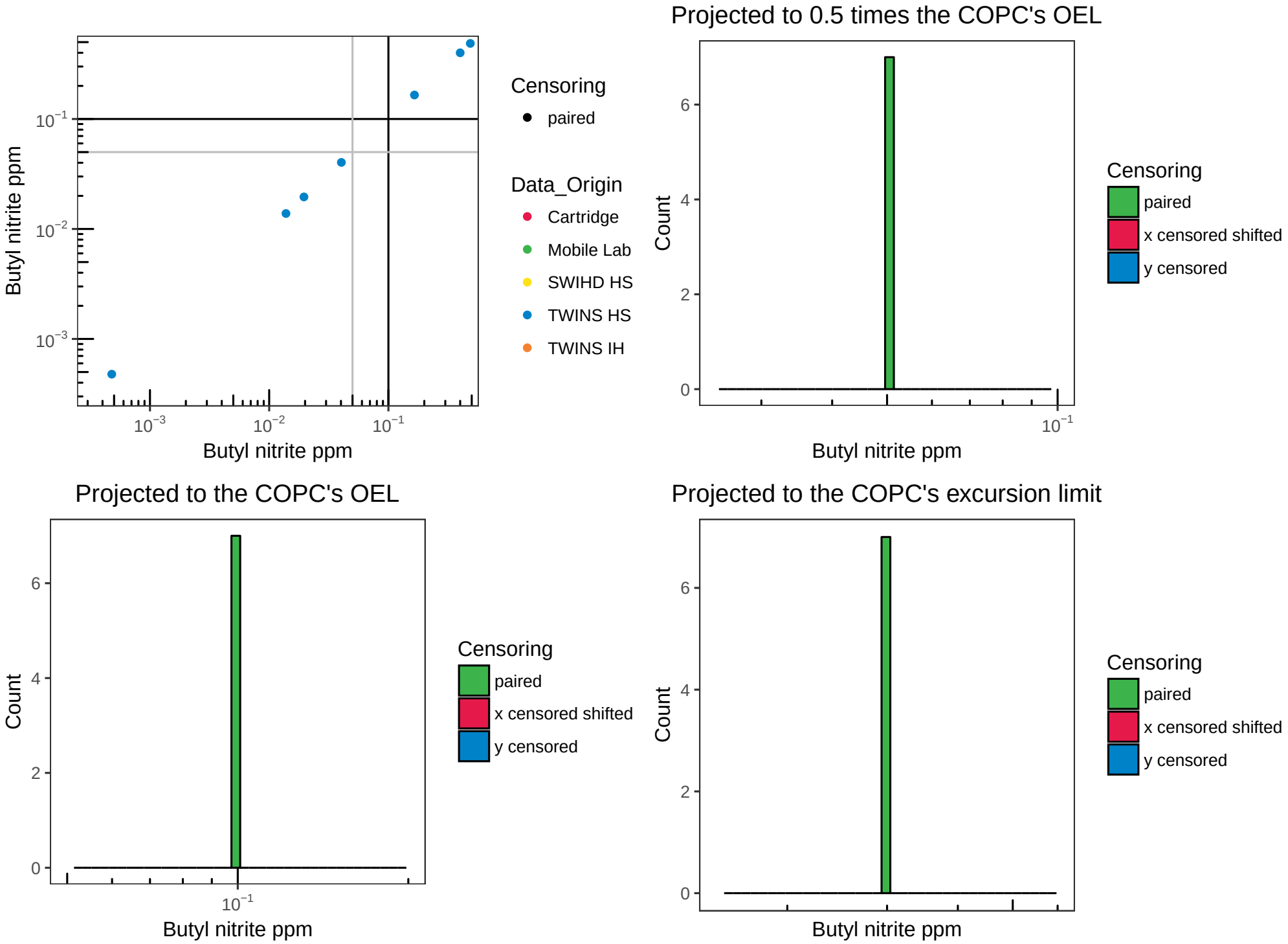


Figure C.2628: Butyl nitrite vs Butyl nitrite

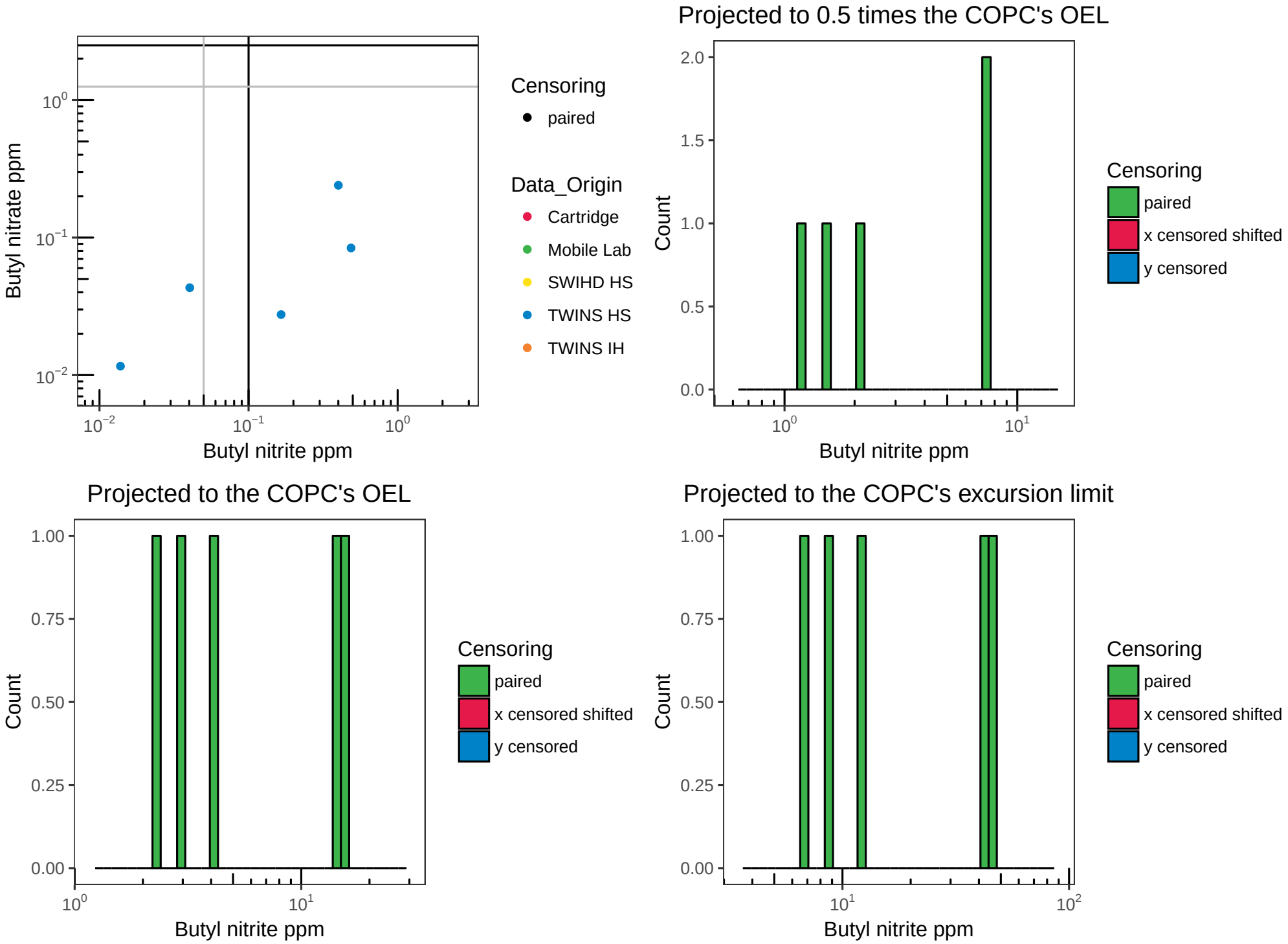


Figure C.2629: Butyl nitrate vs Butyl nitrite

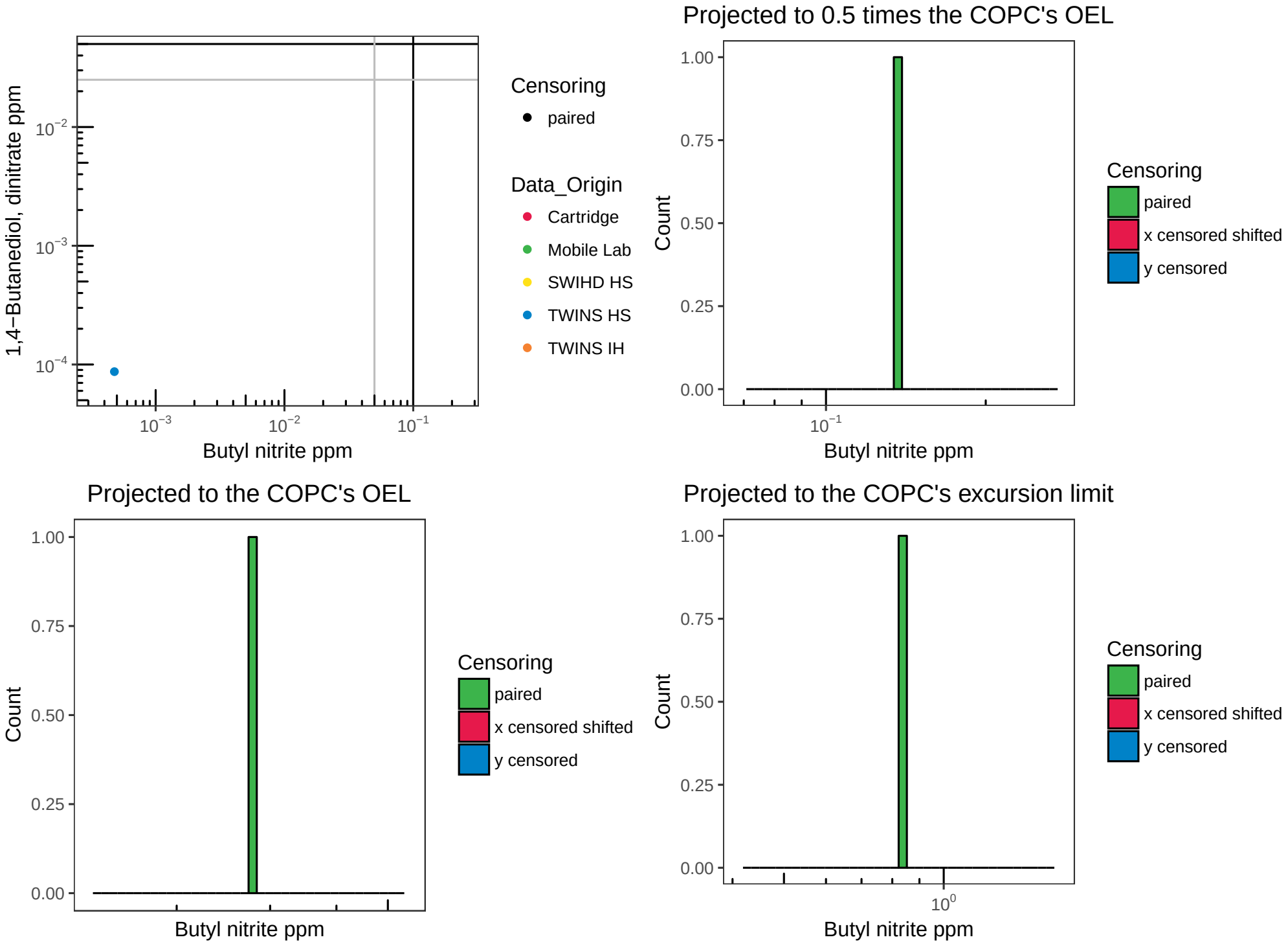


Figure C.2630: 1,4-Butanediol, dinitrate vs Butyl nitrite

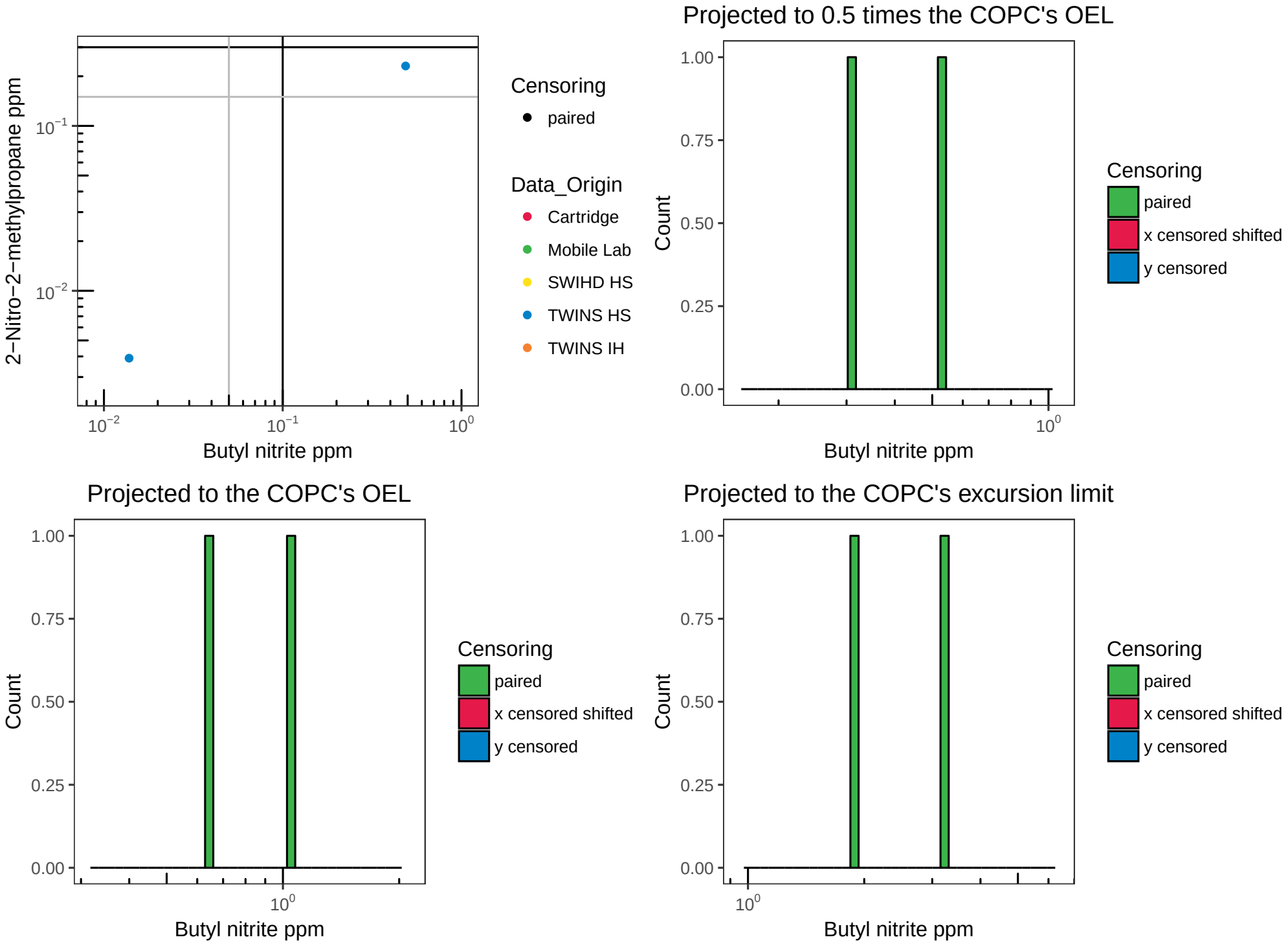


Figure C.2631: 2-Nitro-2-methylpropane vs Butyl nitrite

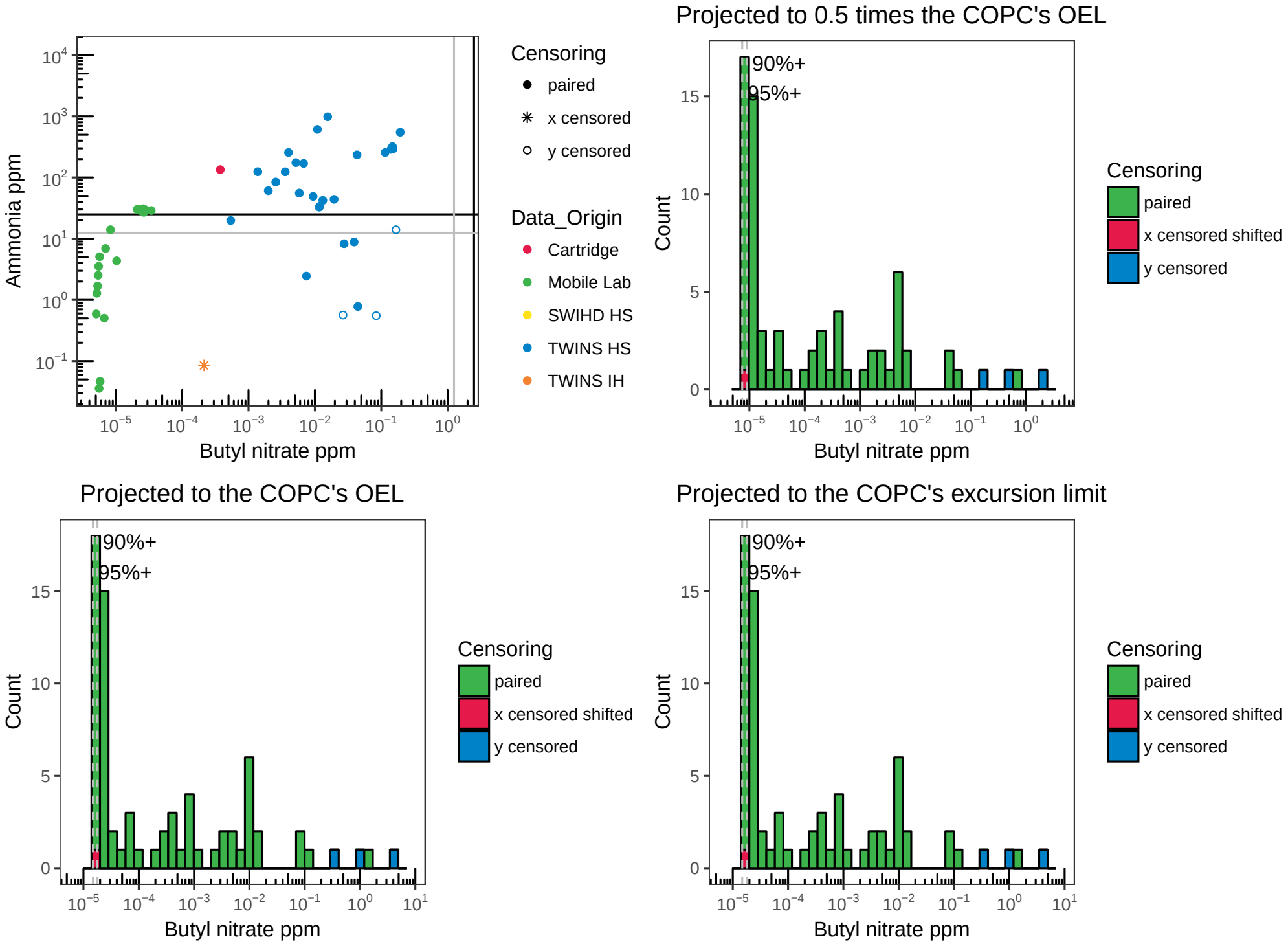


Figure C.2632: Ammonia vs Butyl nitrate

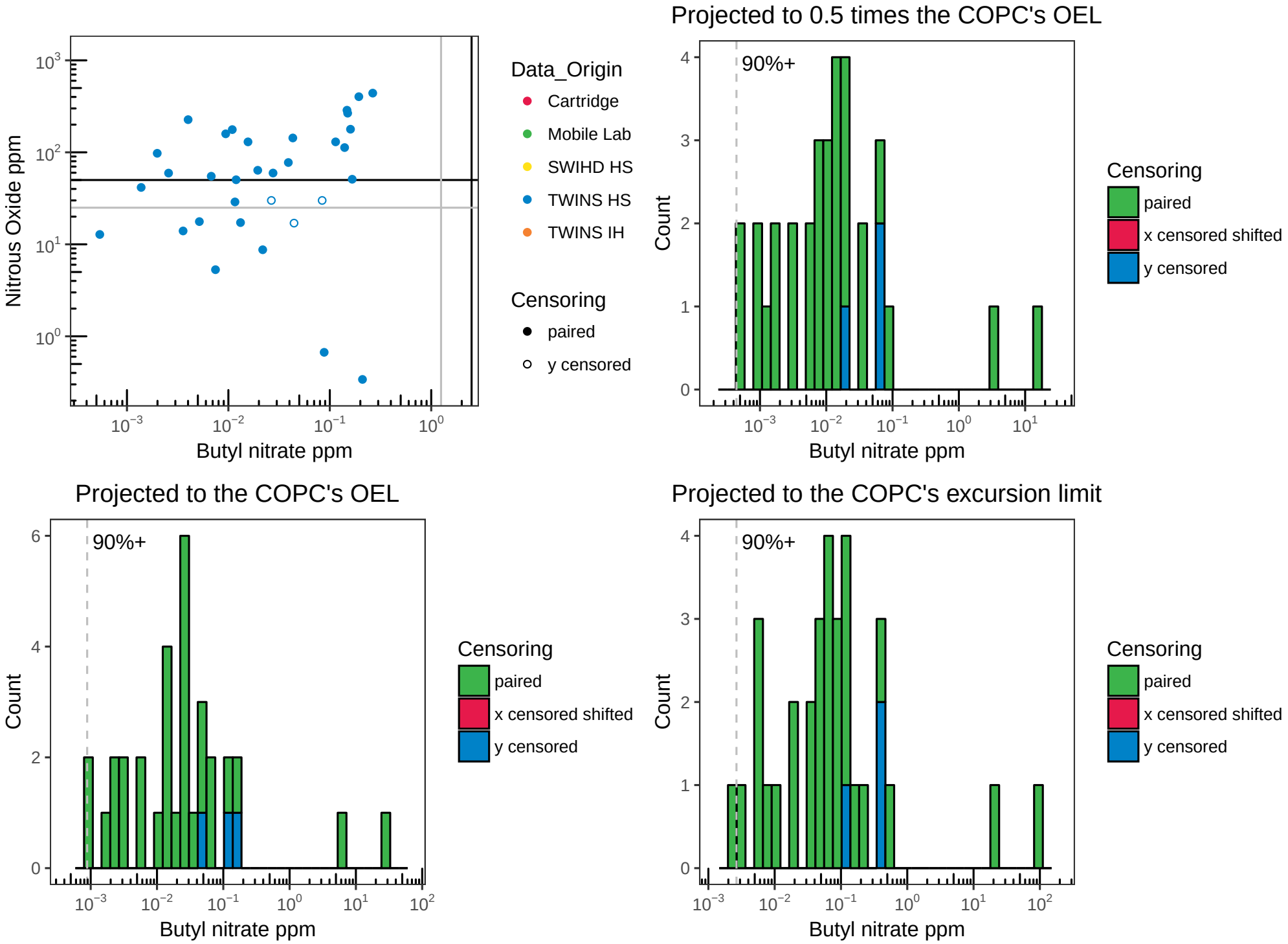


Figure C.2633: Nitrous Oxide vs Butyl nitrate

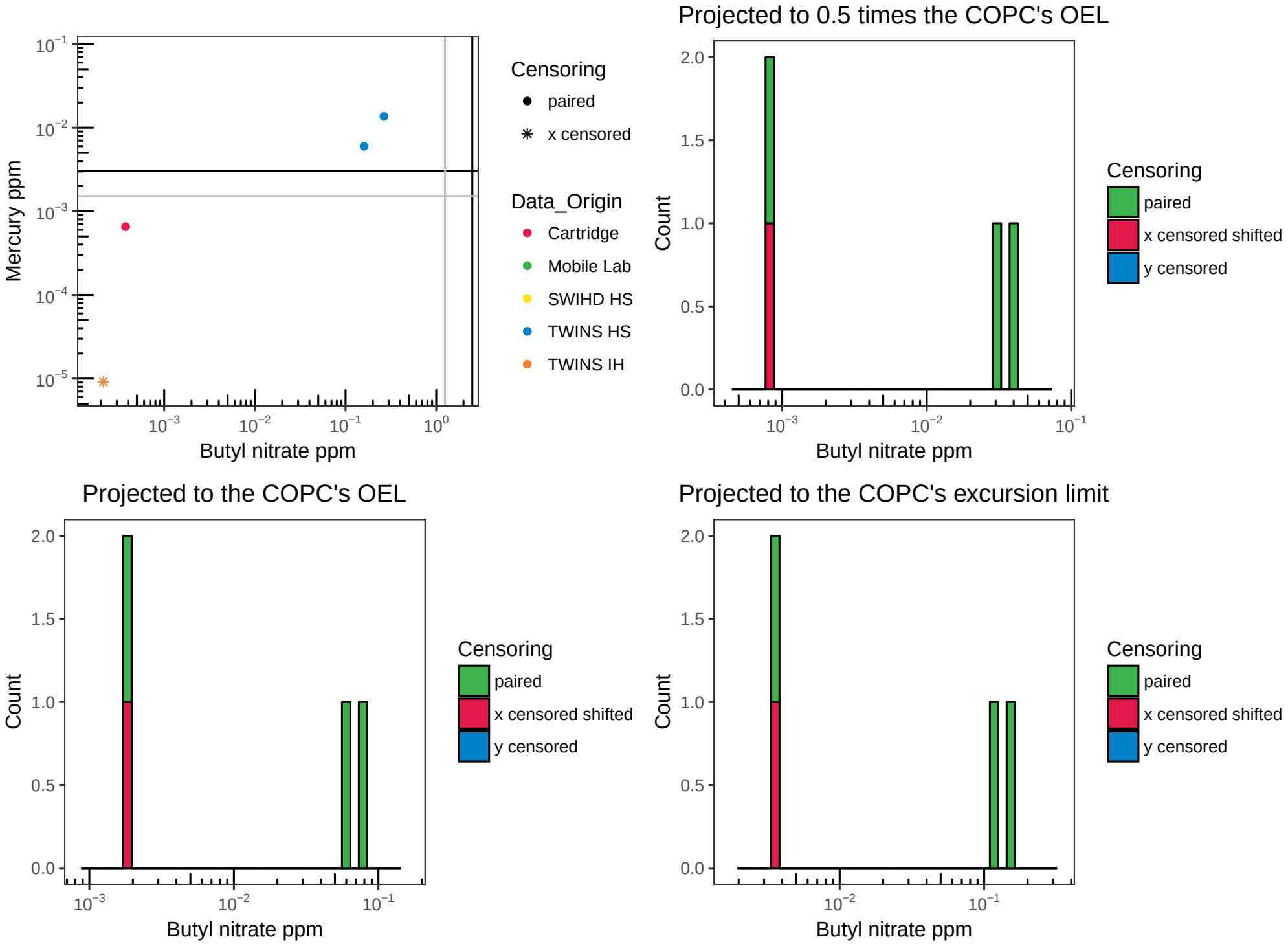


Figure C.2634: Mercury vs Butyl nitrate

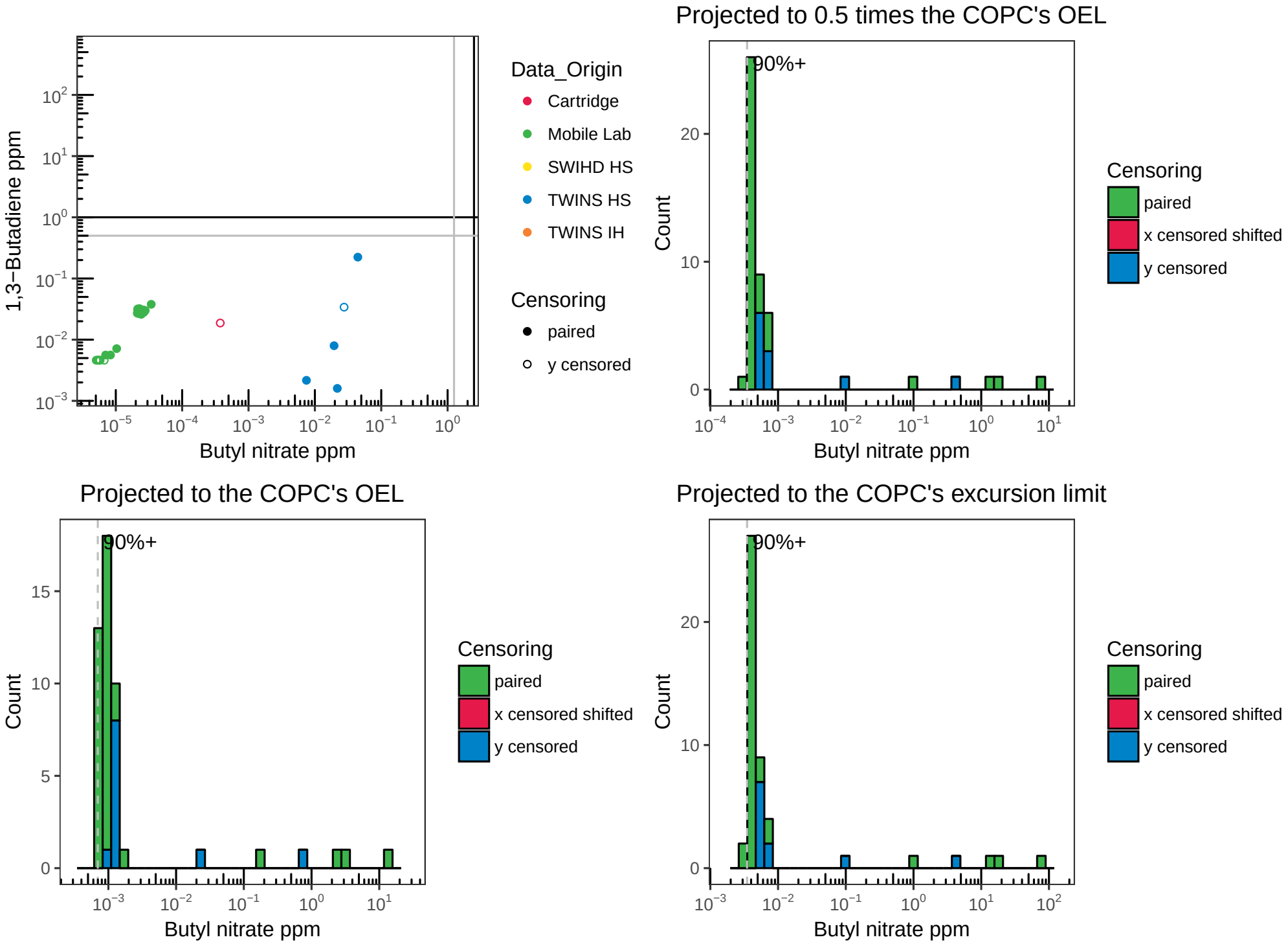


Figure C.2635: 1,3-Butadiene vs Butyl nitrate

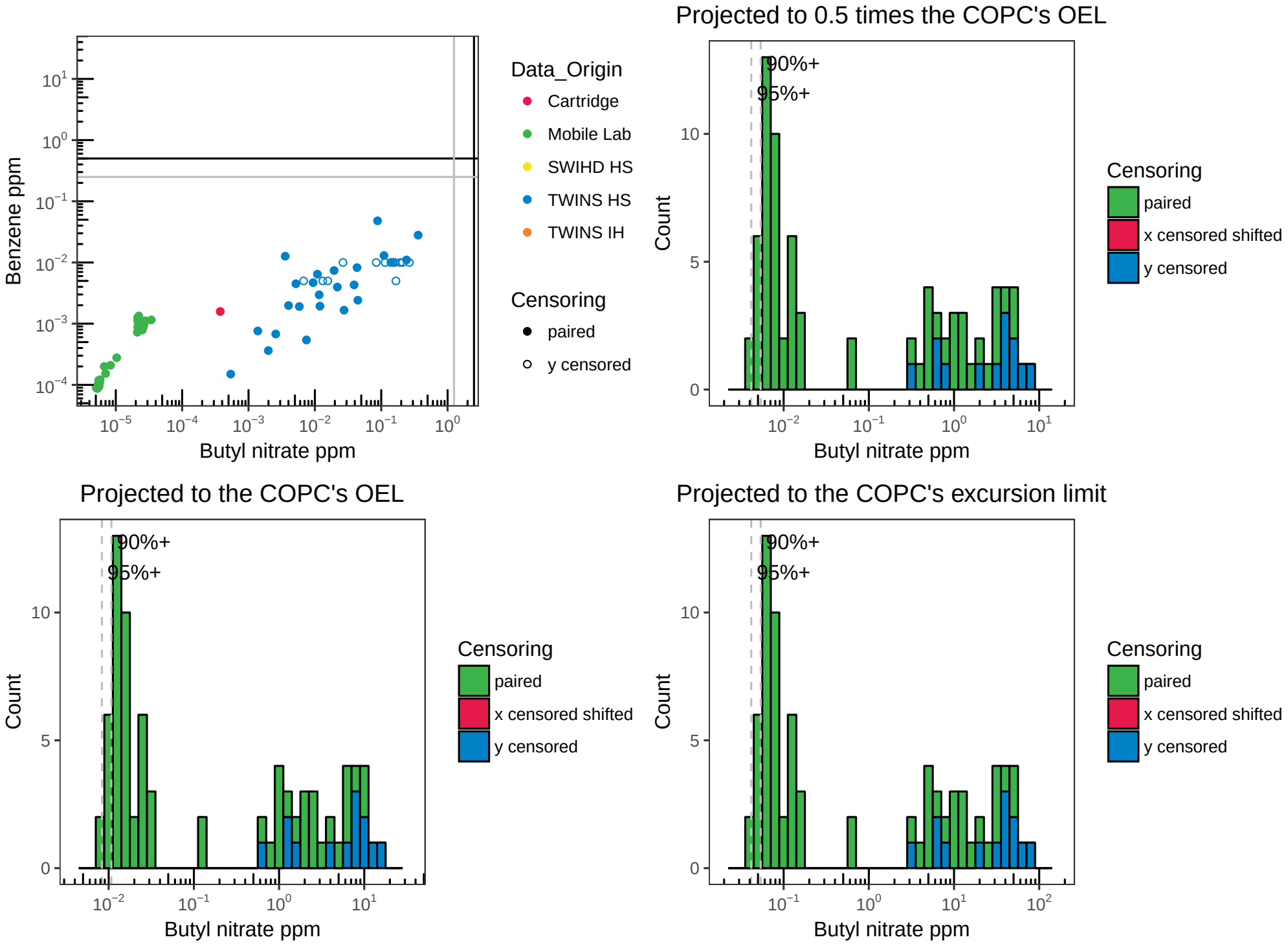


Figure C.2636: Benzene vs Butyl nitrate

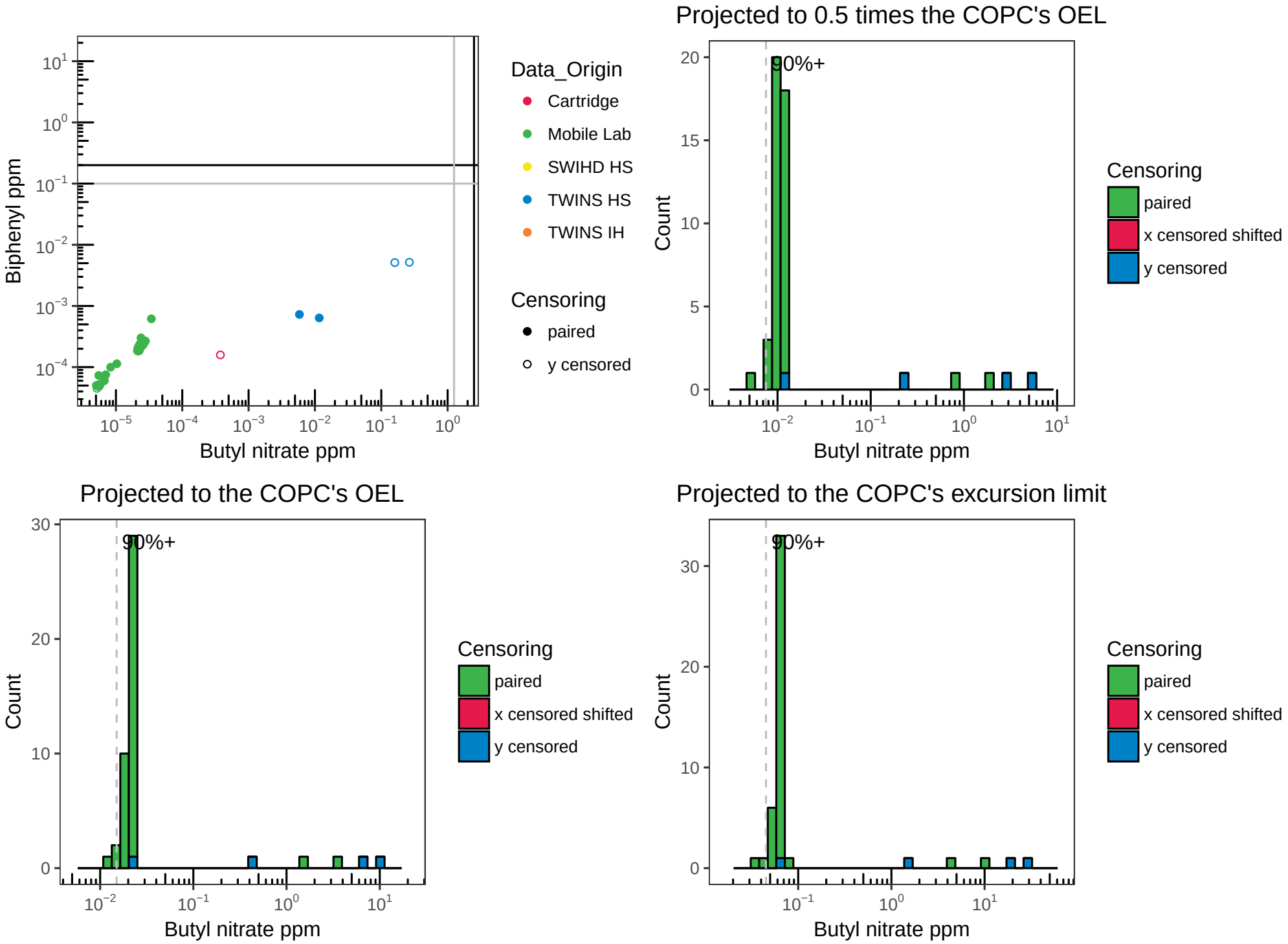


Figure C.2637: Biphenyl vs Butyl nitrate

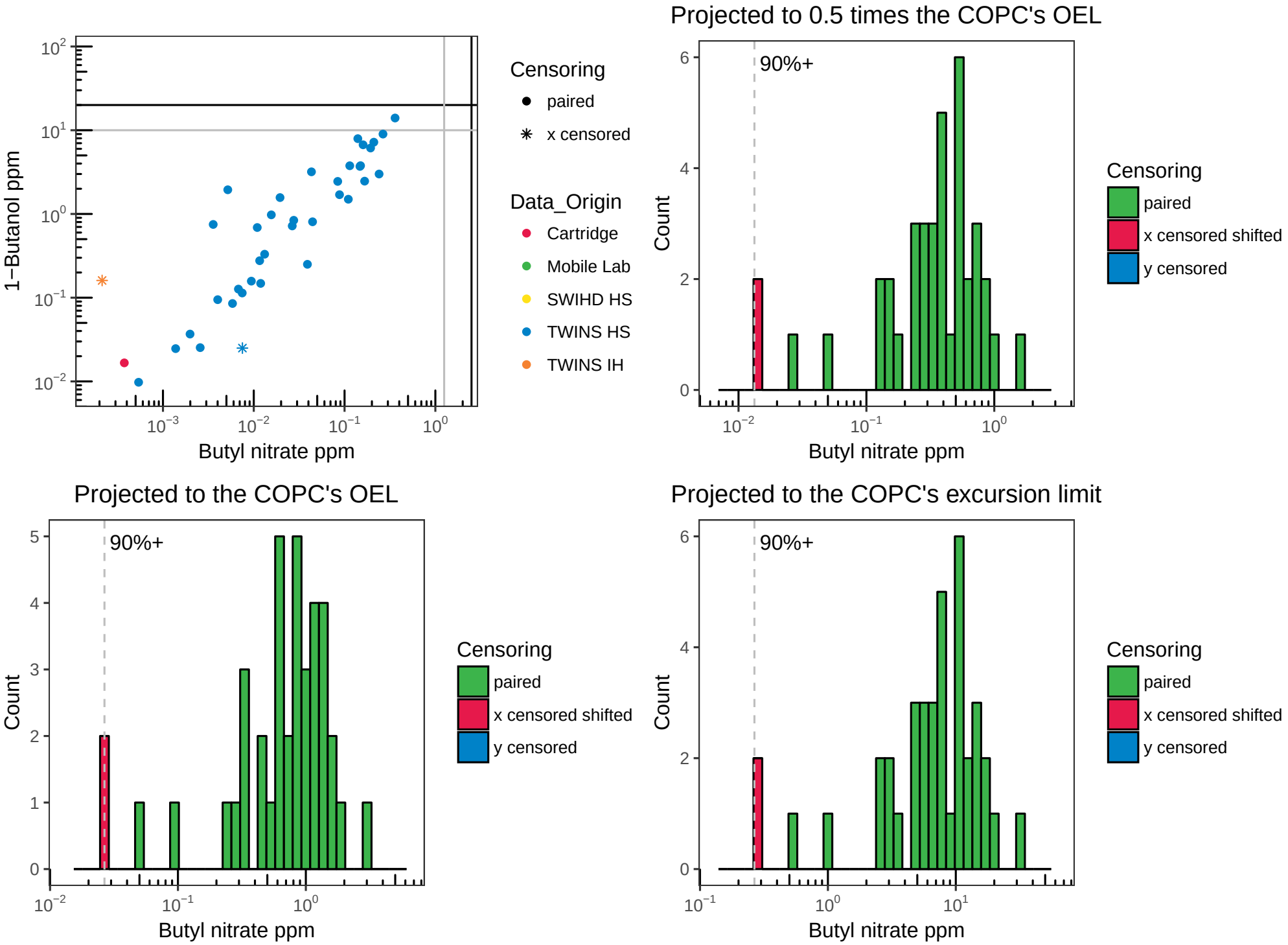


Figure C.2638: 1-Butanol vs Butyl nitrate

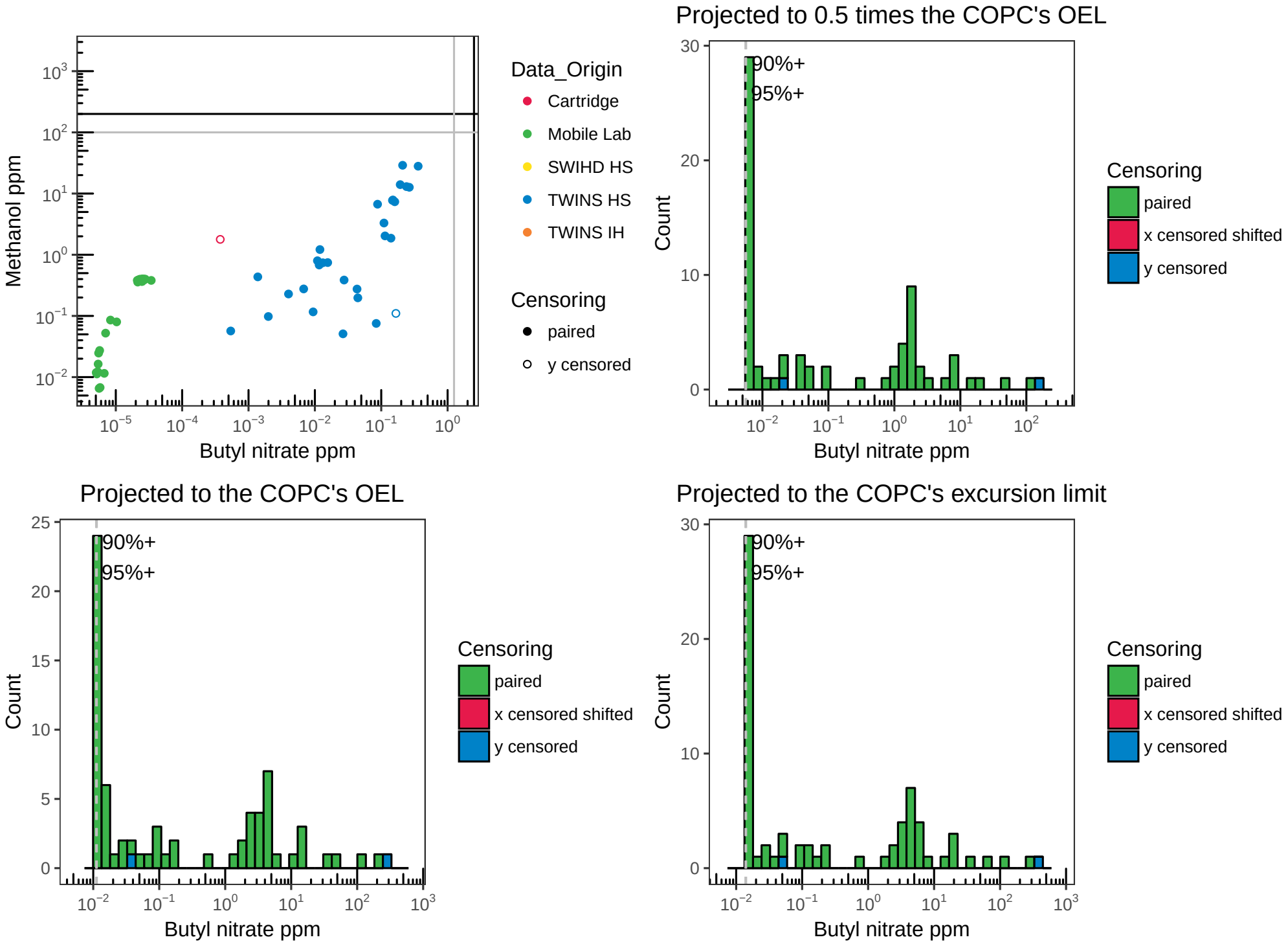


Figure C.2639: Methanol vs Butyl nitrate

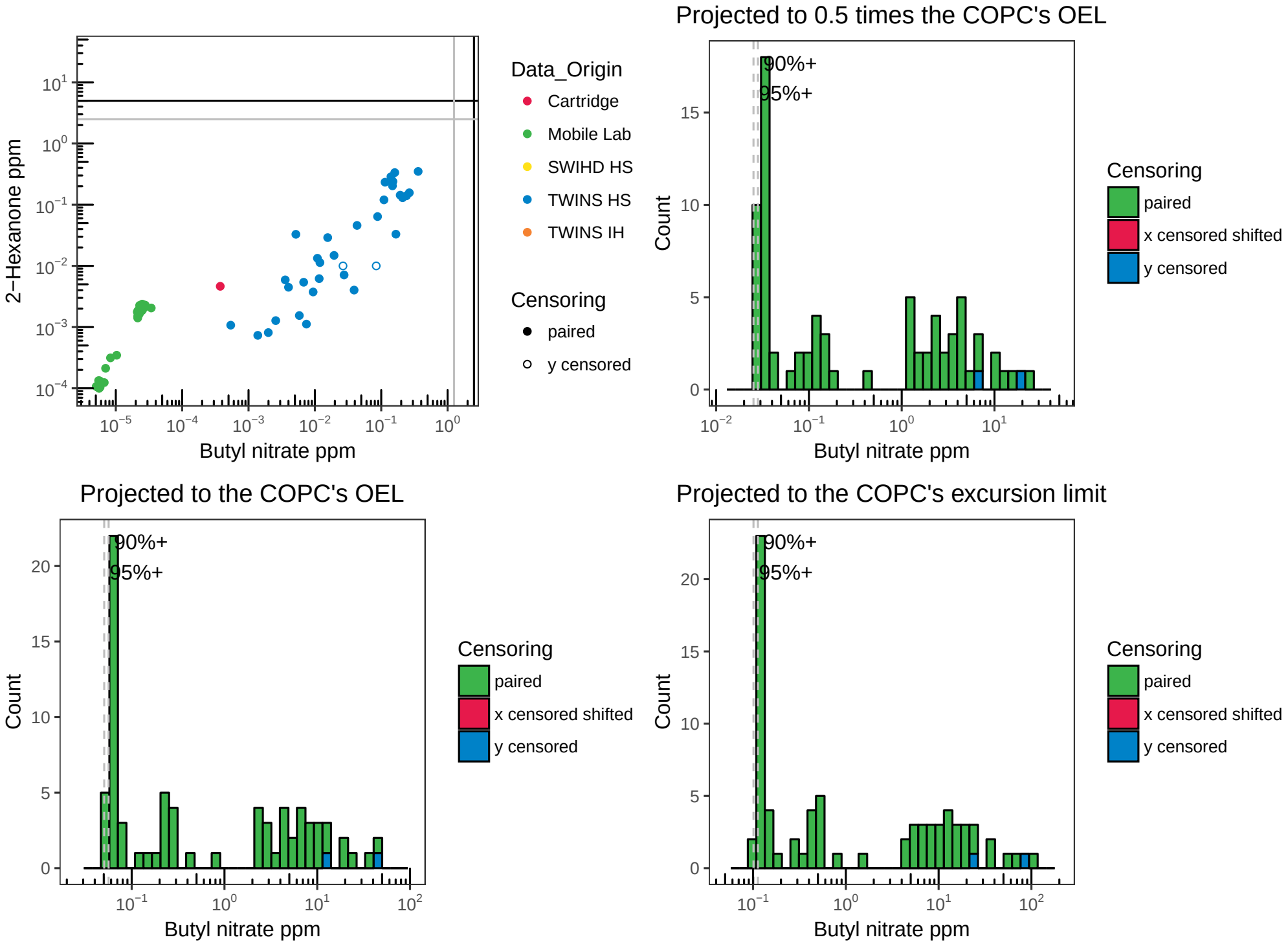


Figure C.2640: 2-Hexanone vs Butyl nitrate

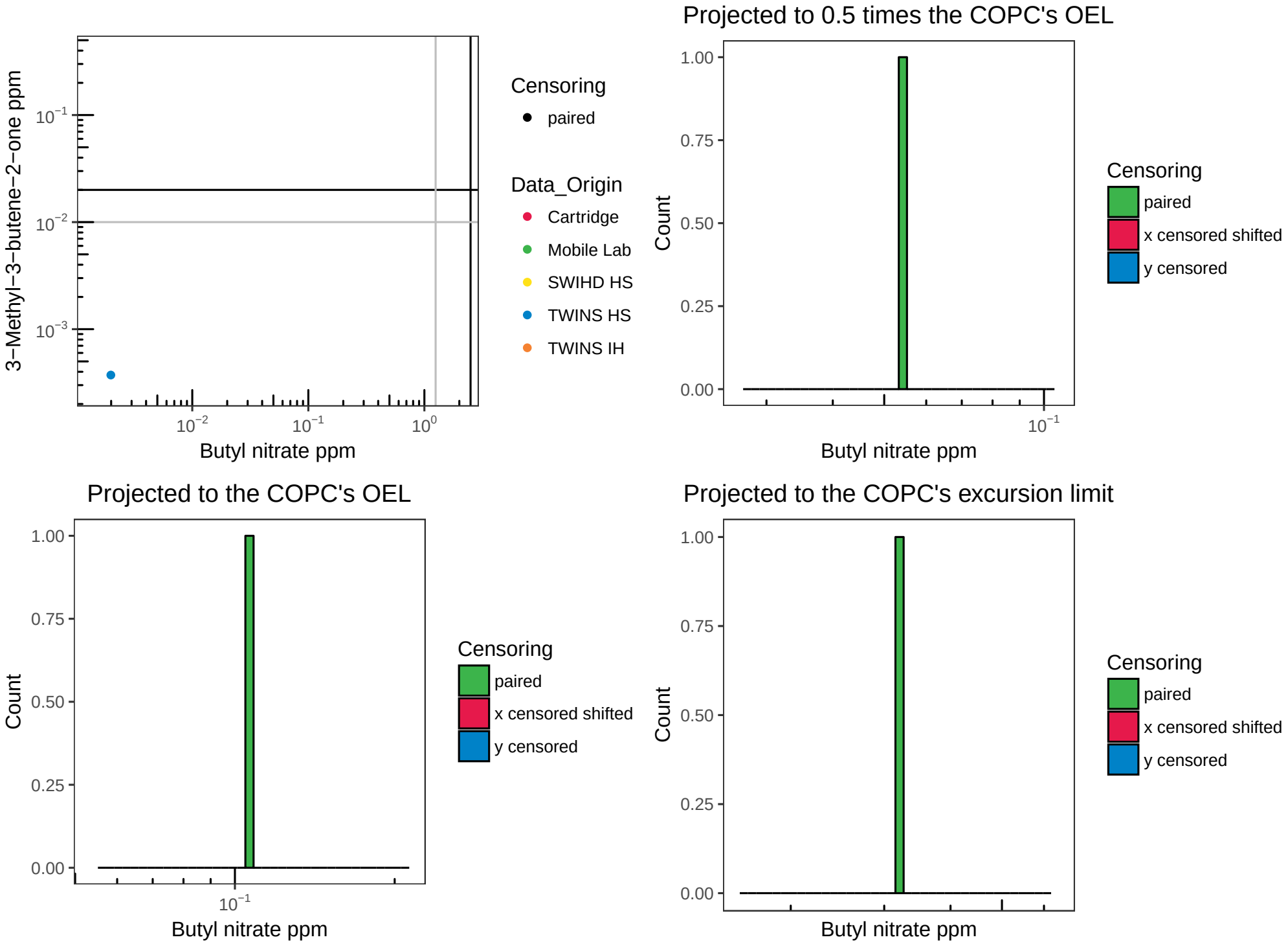


Figure C.2641: 3-Methyl-3-butene-2-one vs Butyl nitrate

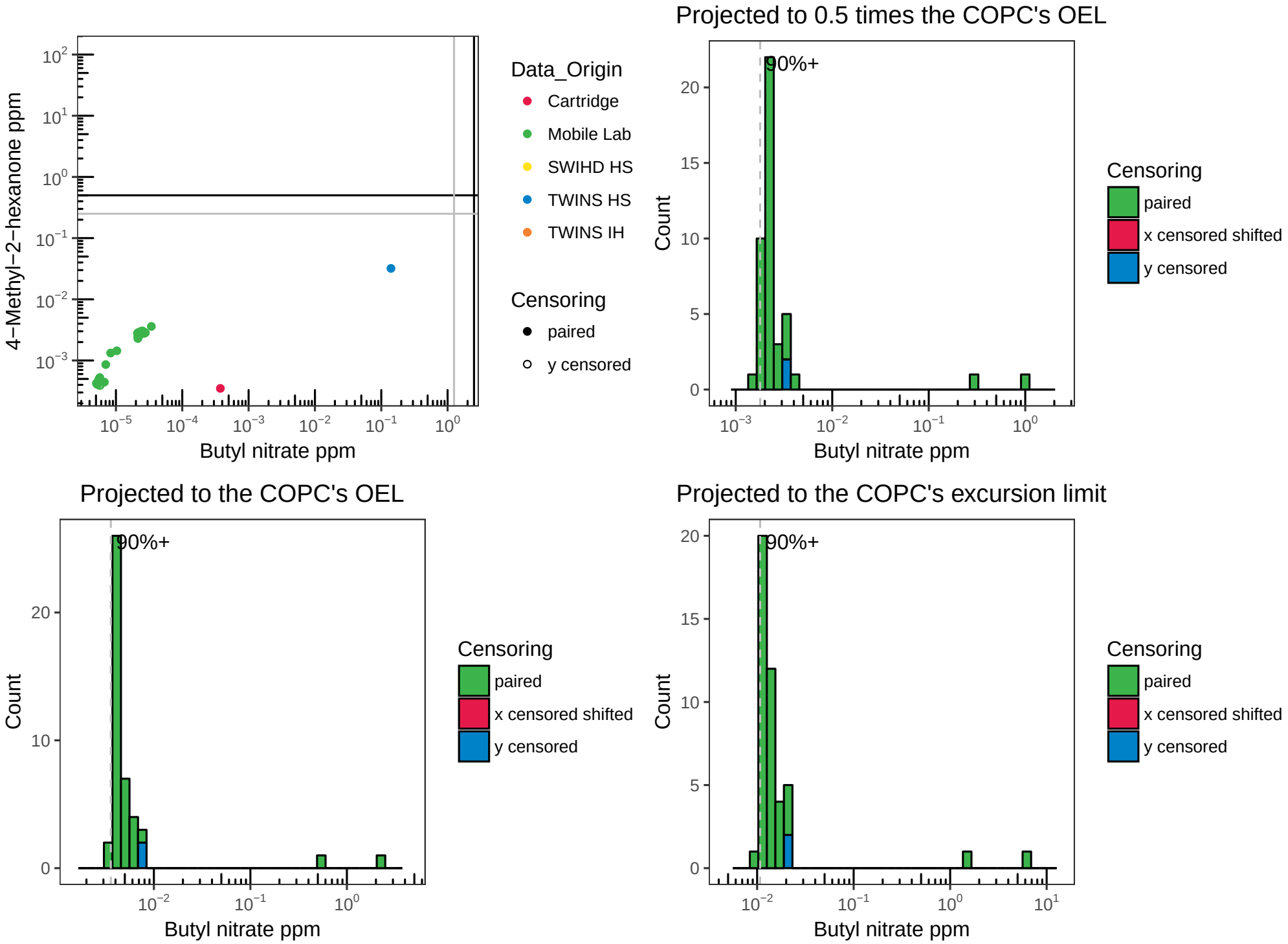


Figure C.2642: 4-Methyl-2-hexanone vs Butyl nitrate

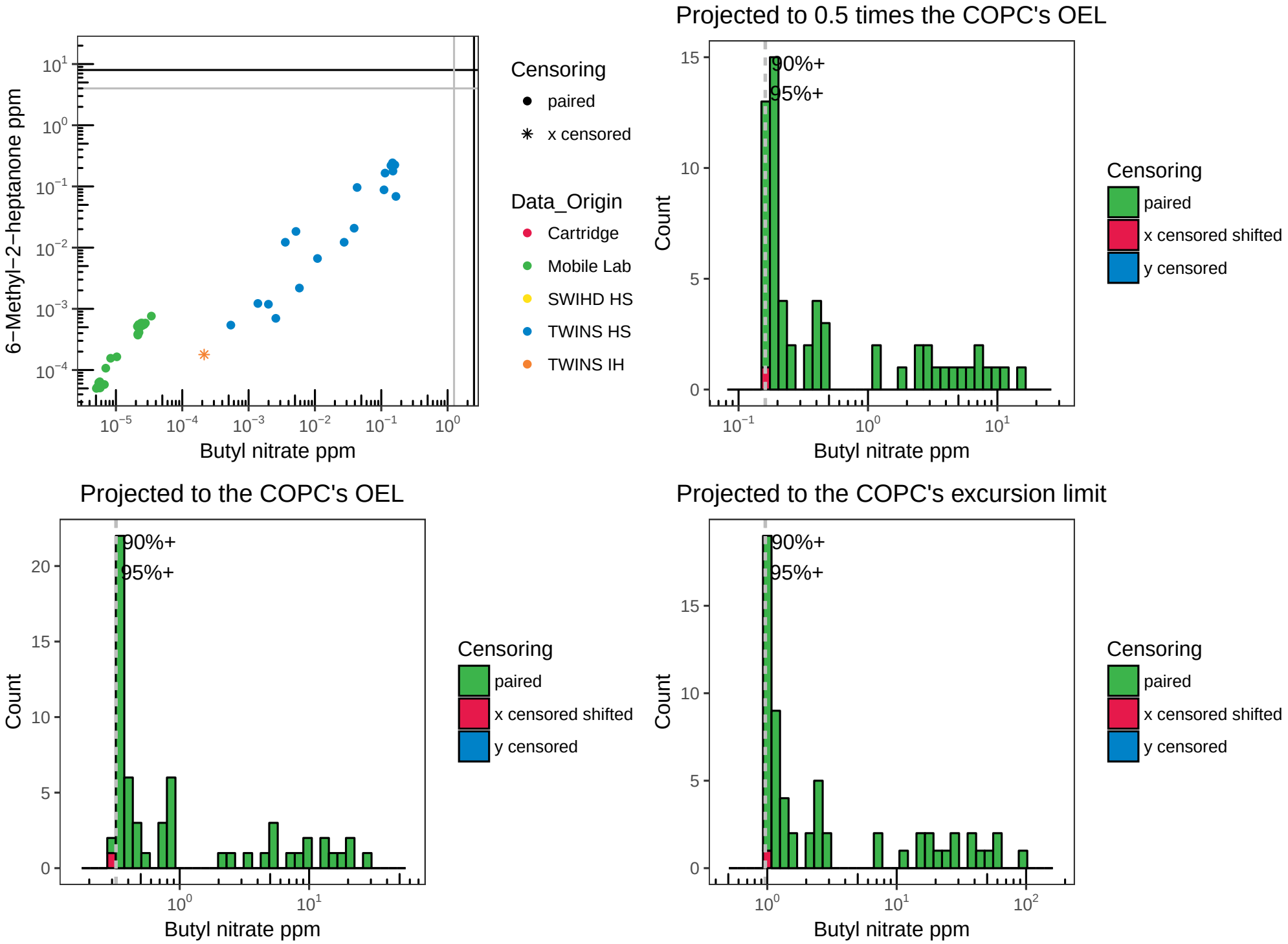


Figure C.2643: 6-Methyl-2-heptanone vs Butyl nitrate

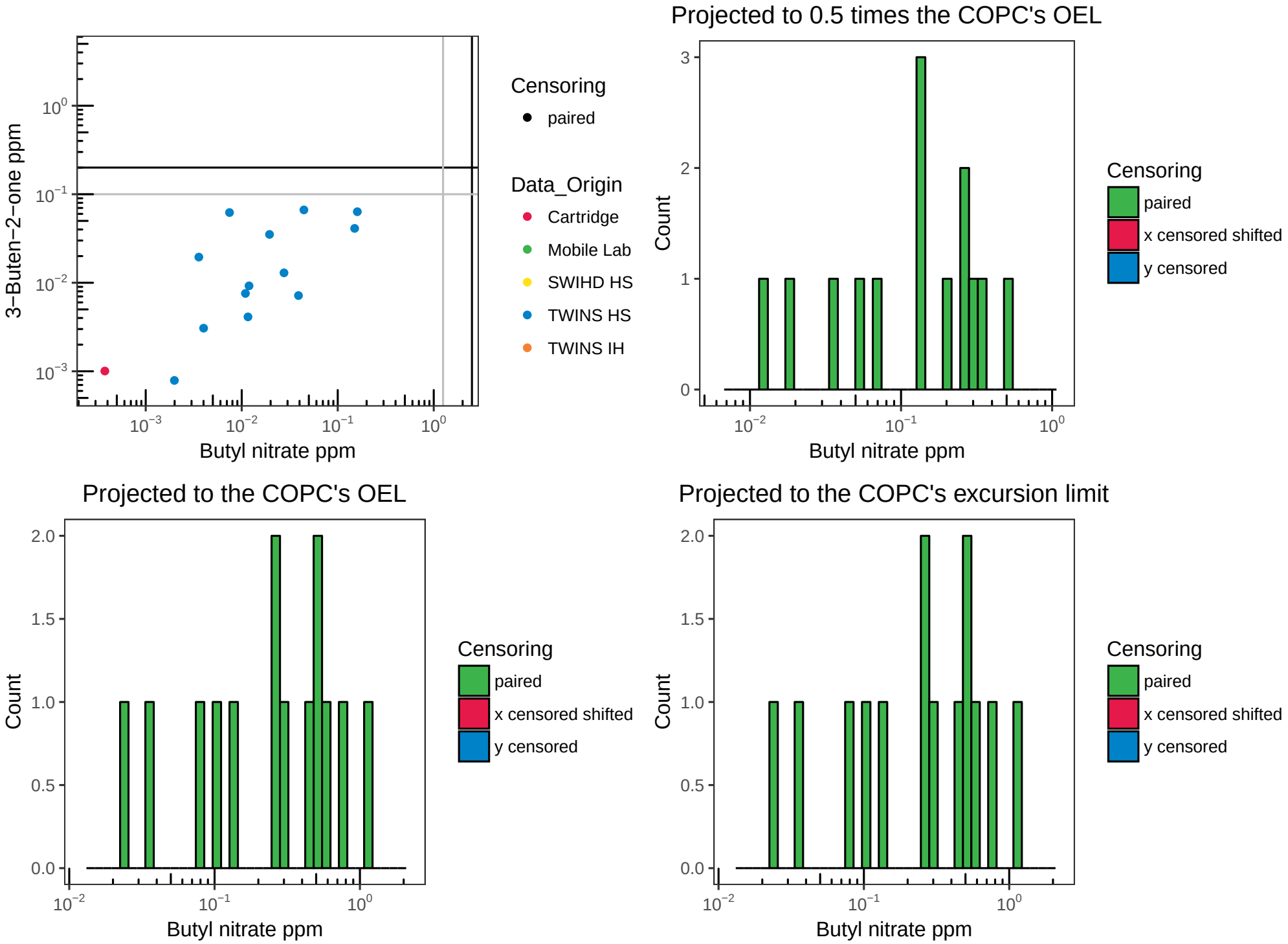


Figure C.2644: 3-Buten-2-one vs Butyl nitrate

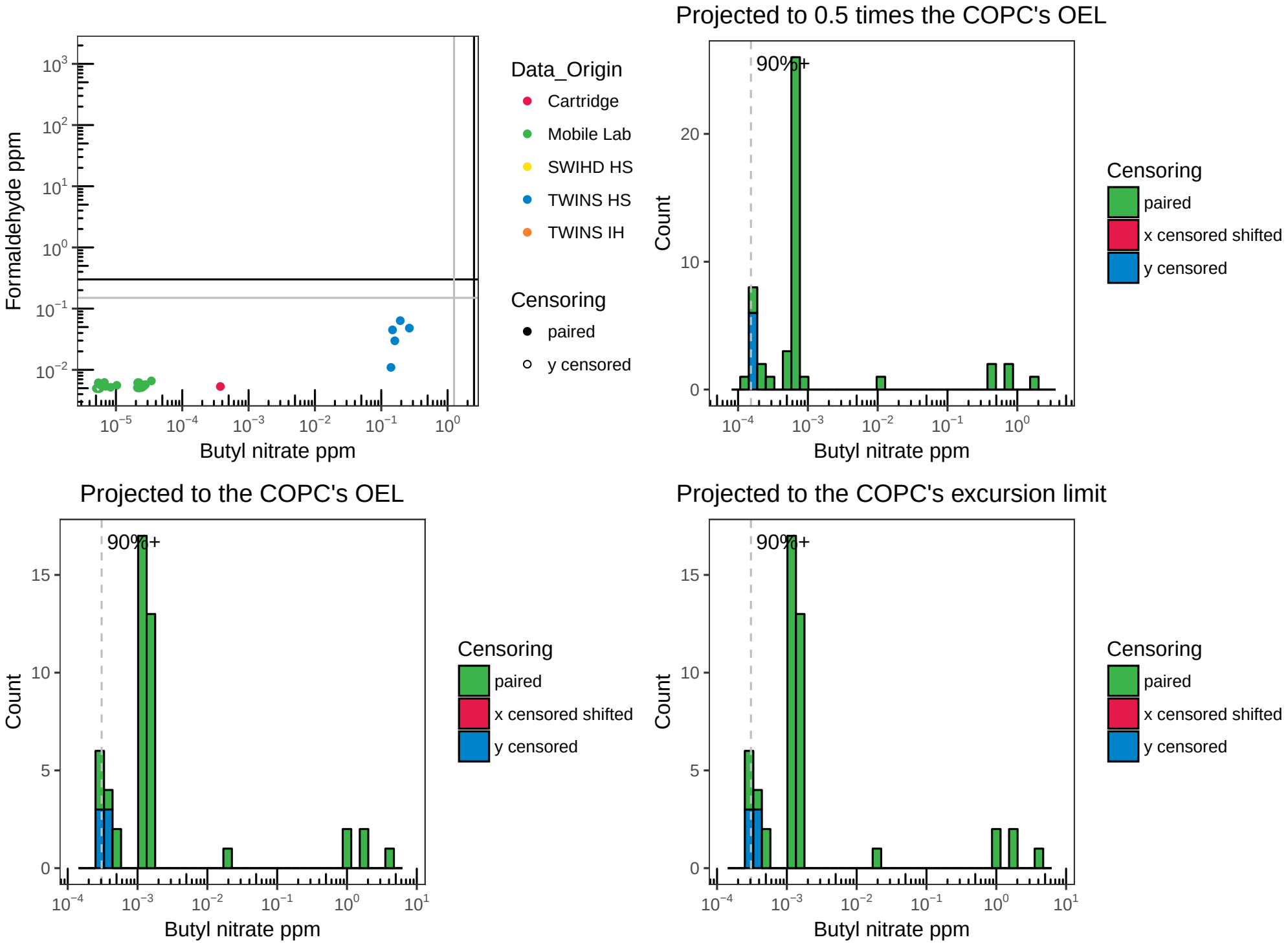


Figure C.2645: Formaldehyde vs Butyl nitrate

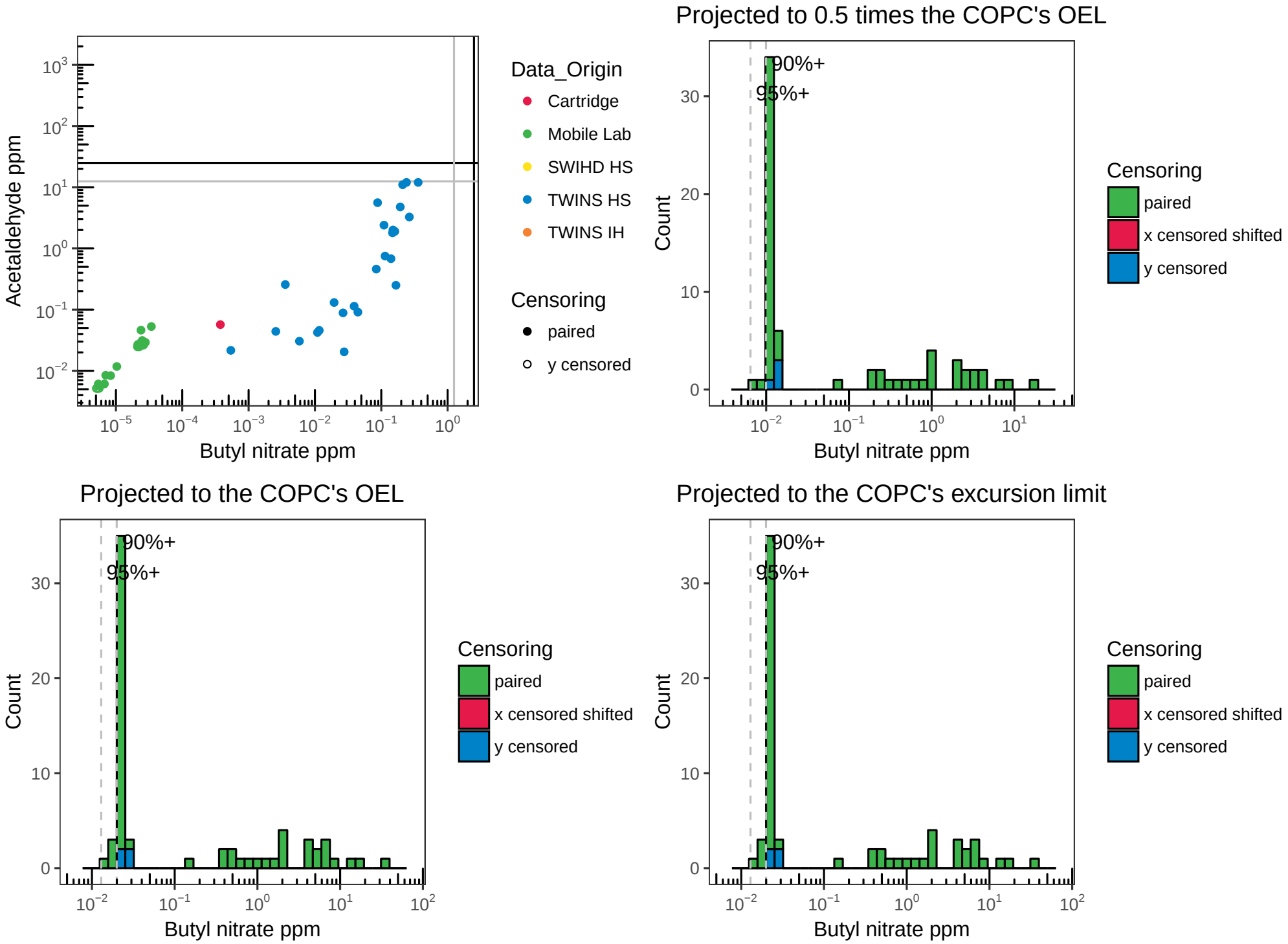


Figure C.2646: Acetaldehyde vs Butyl nitrate

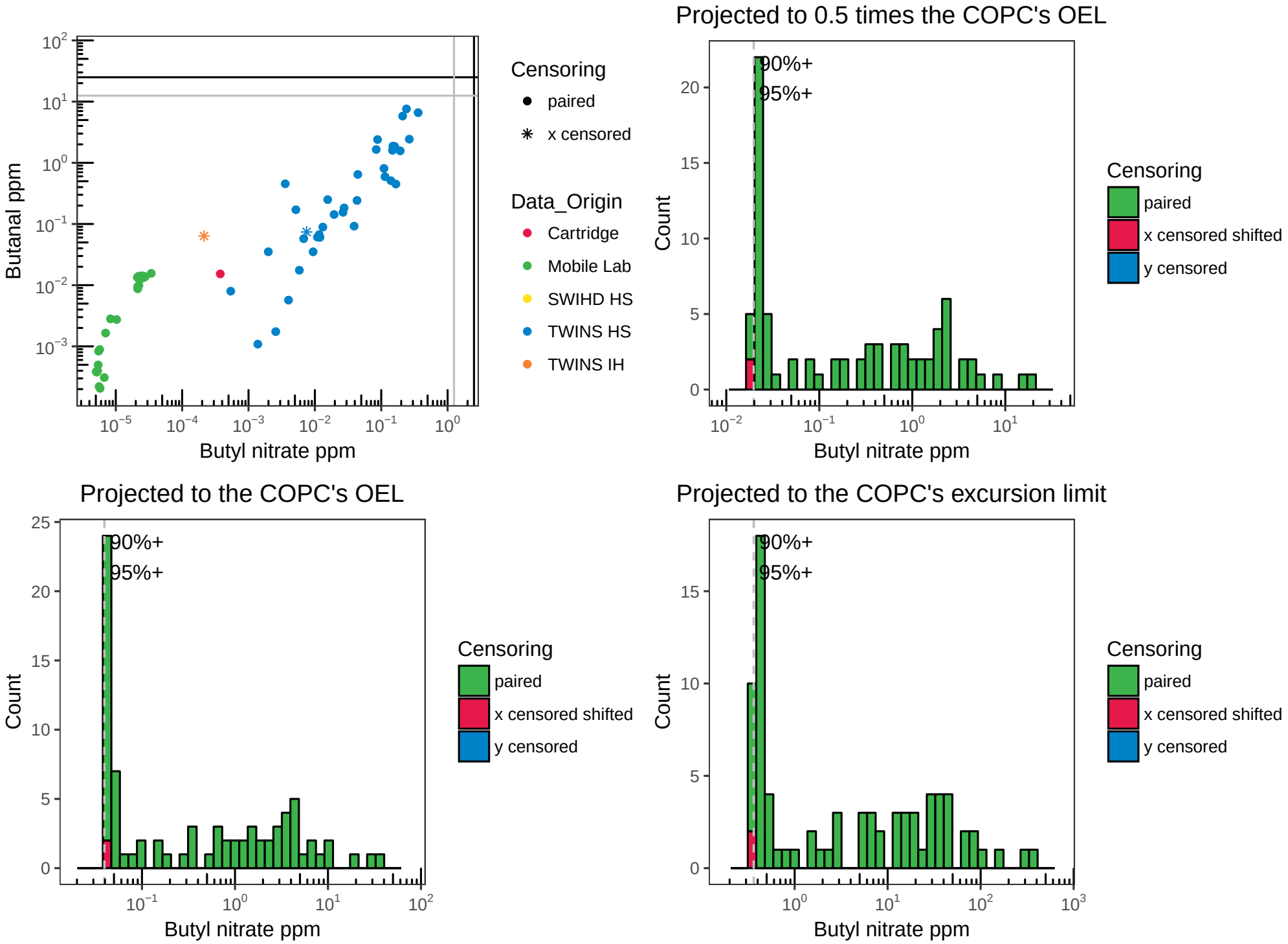


Figure C.2647: Butanal vs Butyl nitrate

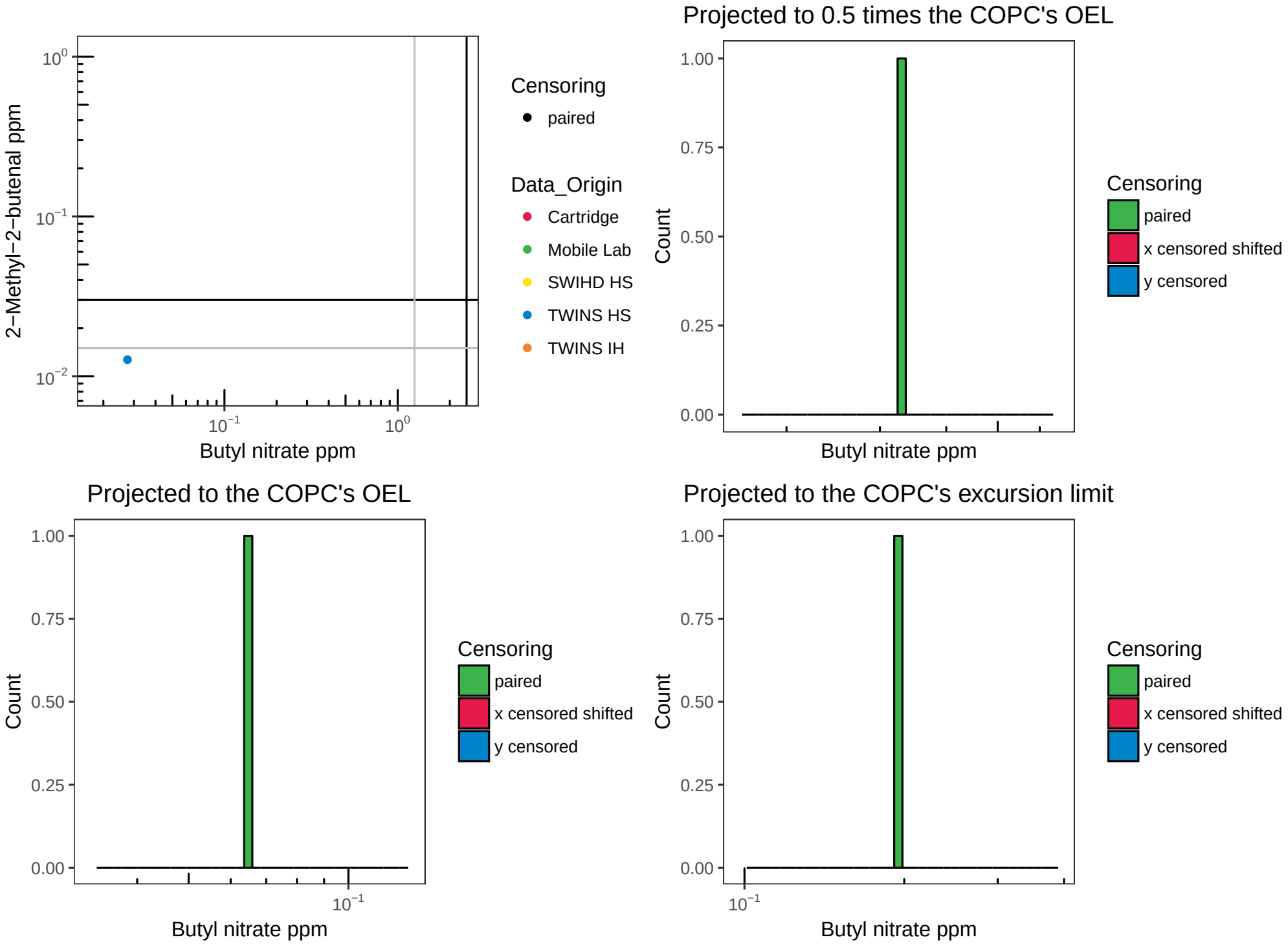


Figure C.2648: 2-Methyl-2-butenal vs Butyl nitrate

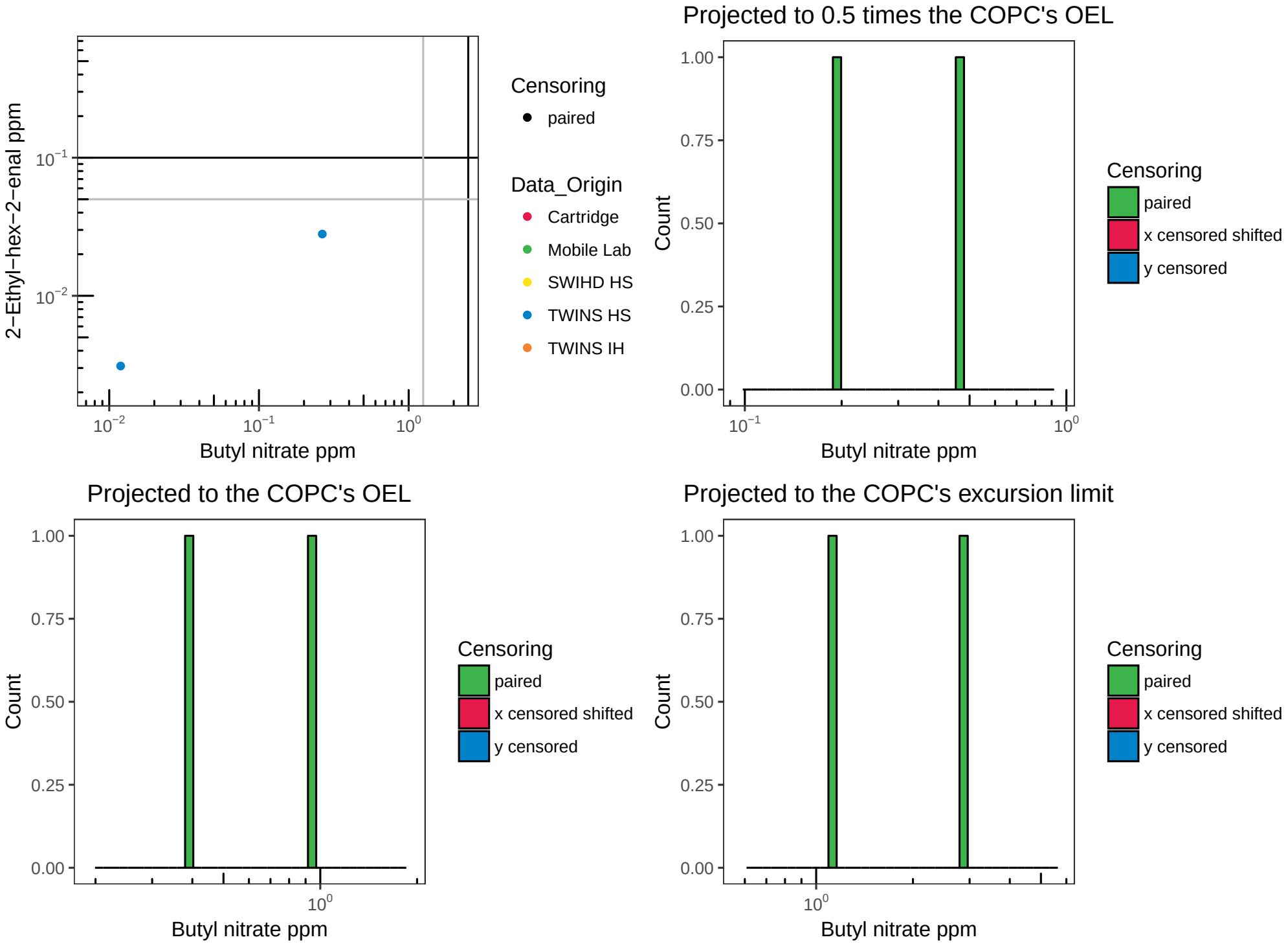


Figure C.2649: 2-Ethyl-hex-2-enal vs Butyl nitrate

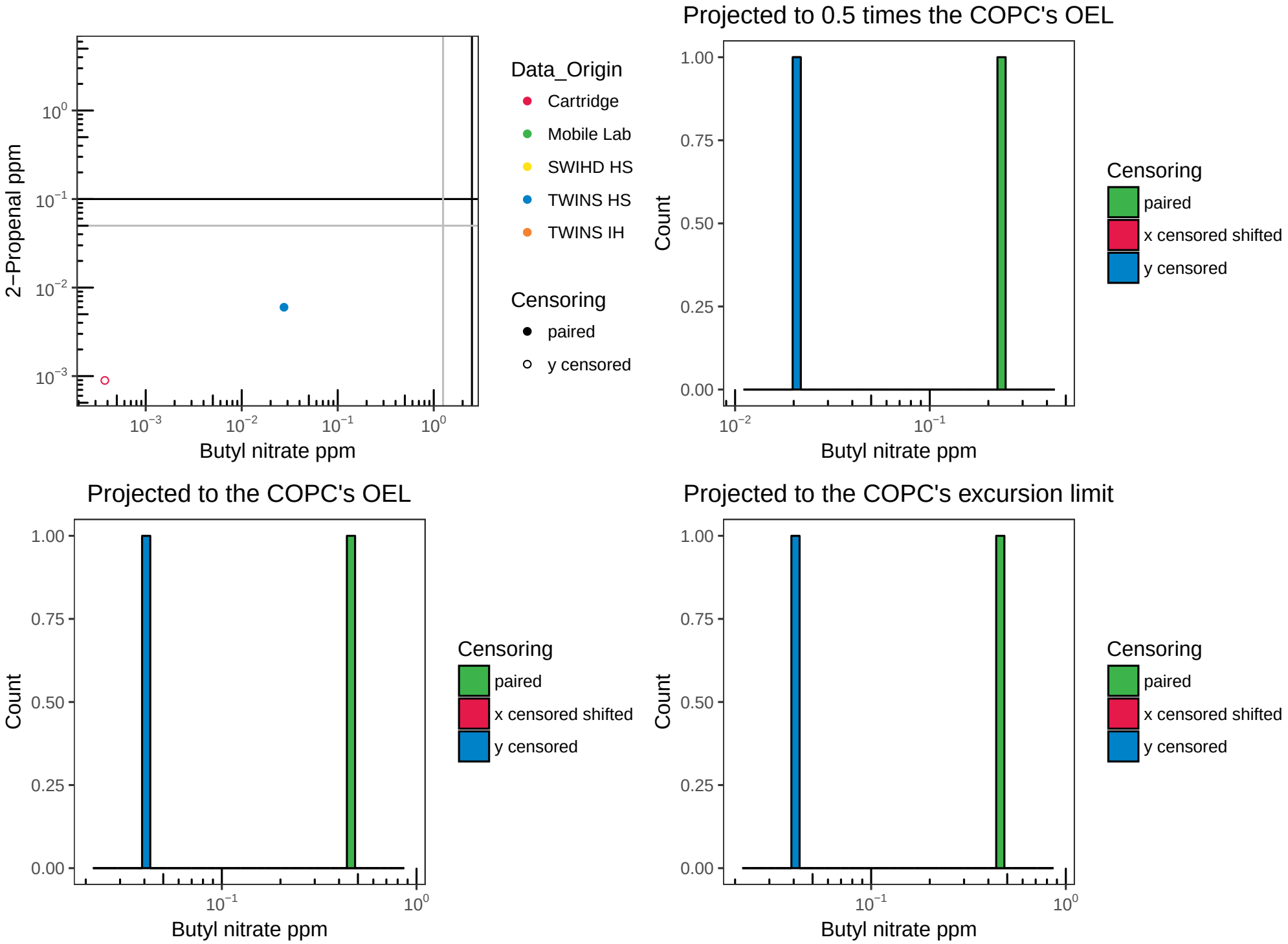


Figure C.2650: 2-Propenal vs Butyl nitrate

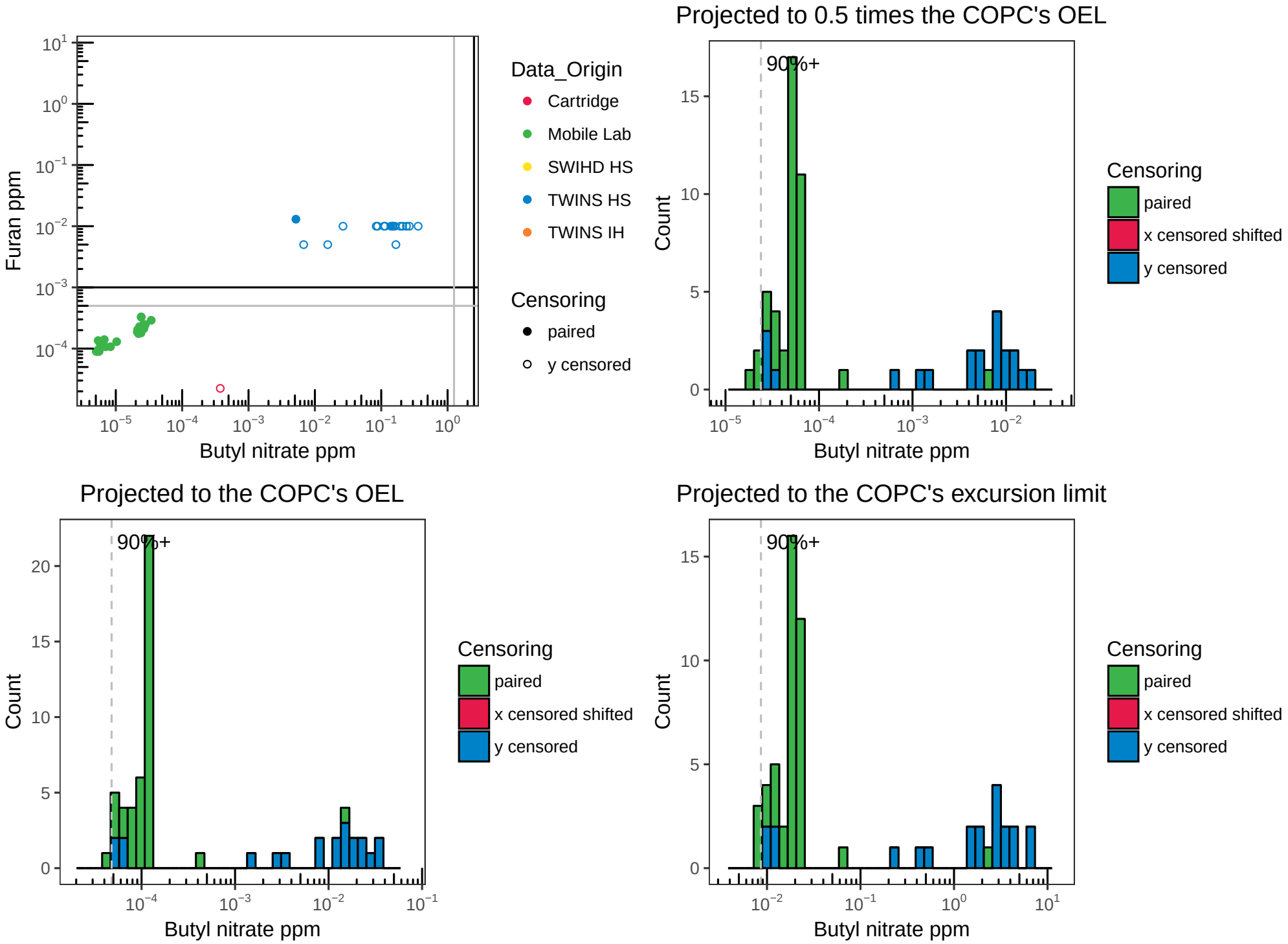


Figure C.2651: Furan vs Butyl nitrate

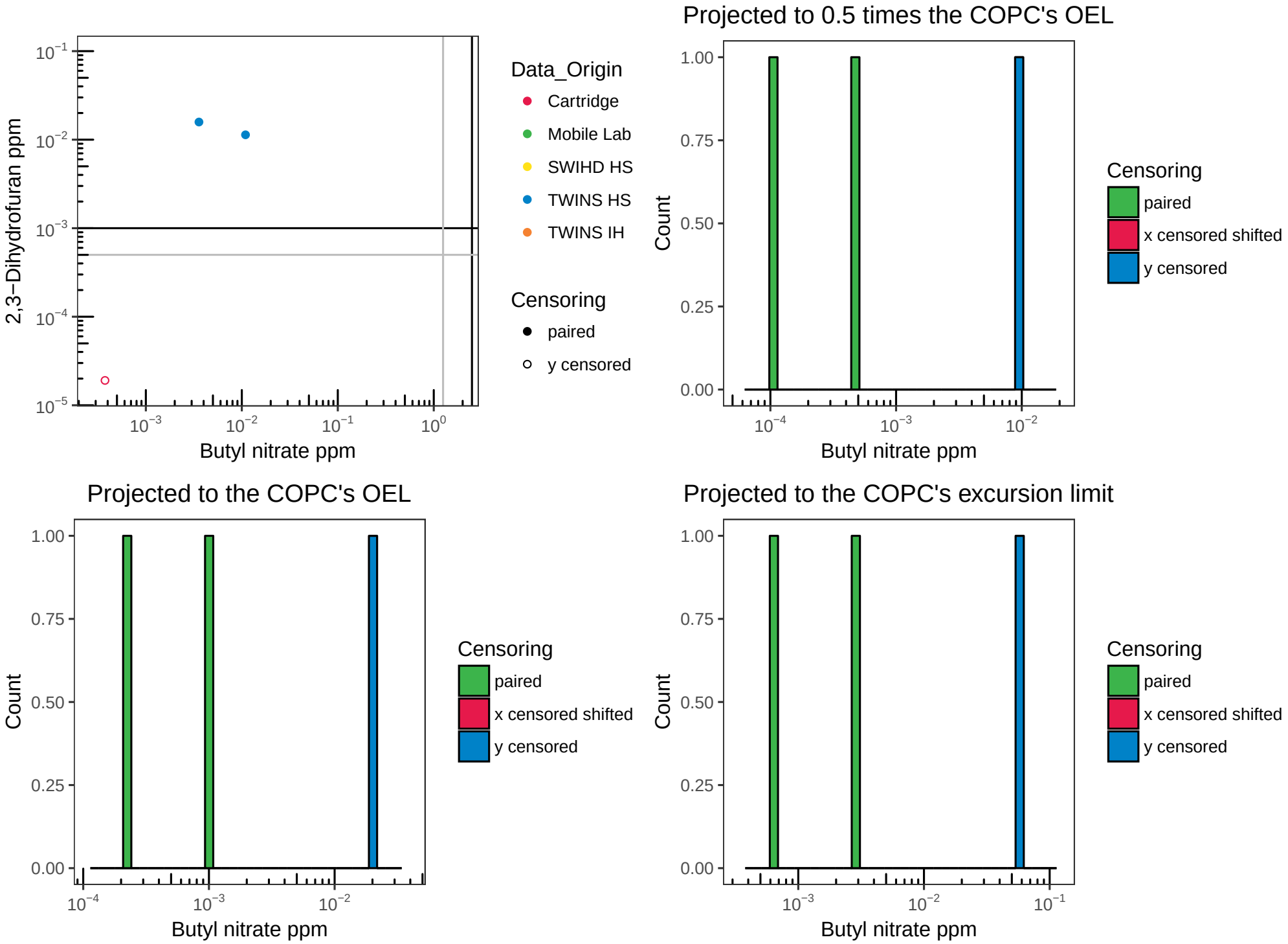


Figure C.2652: 2,3-Dihydrofuran vs Butyl nitrate

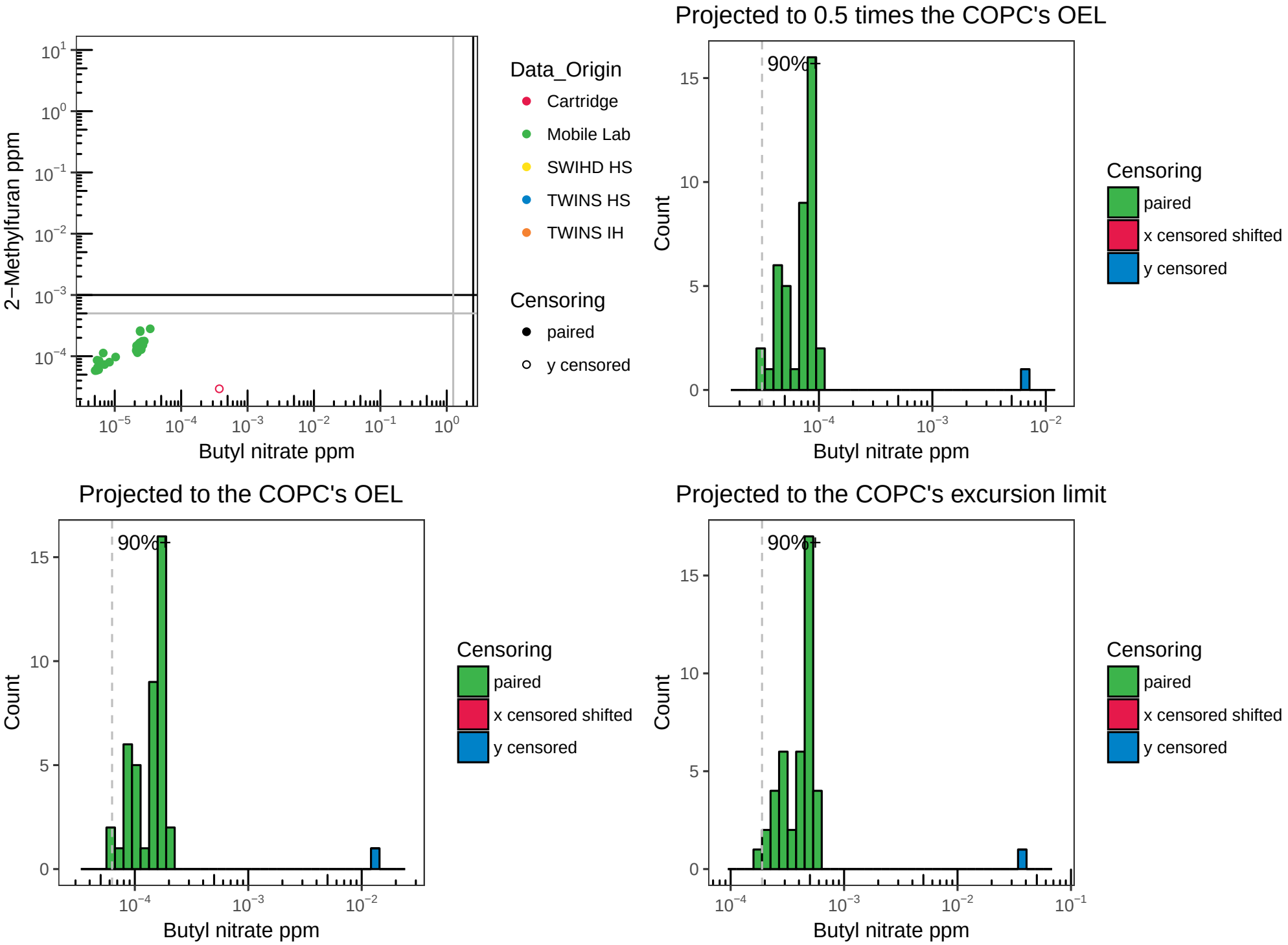


Figure C.2653: 2-Methylfuran vs Butyl nitrate

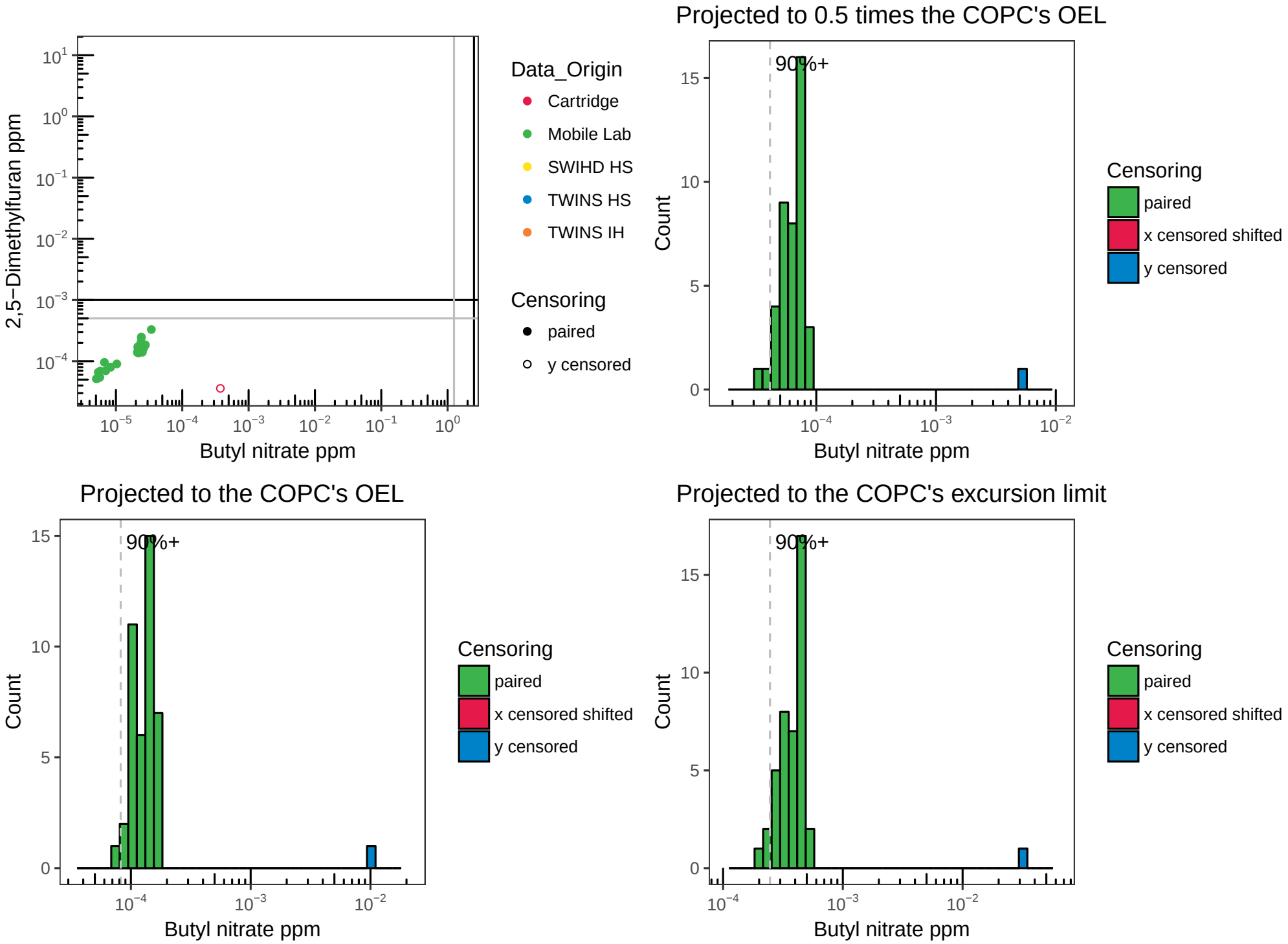


Figure C.2654: 2,5-Dimethylfuran vs Butyl nitrate

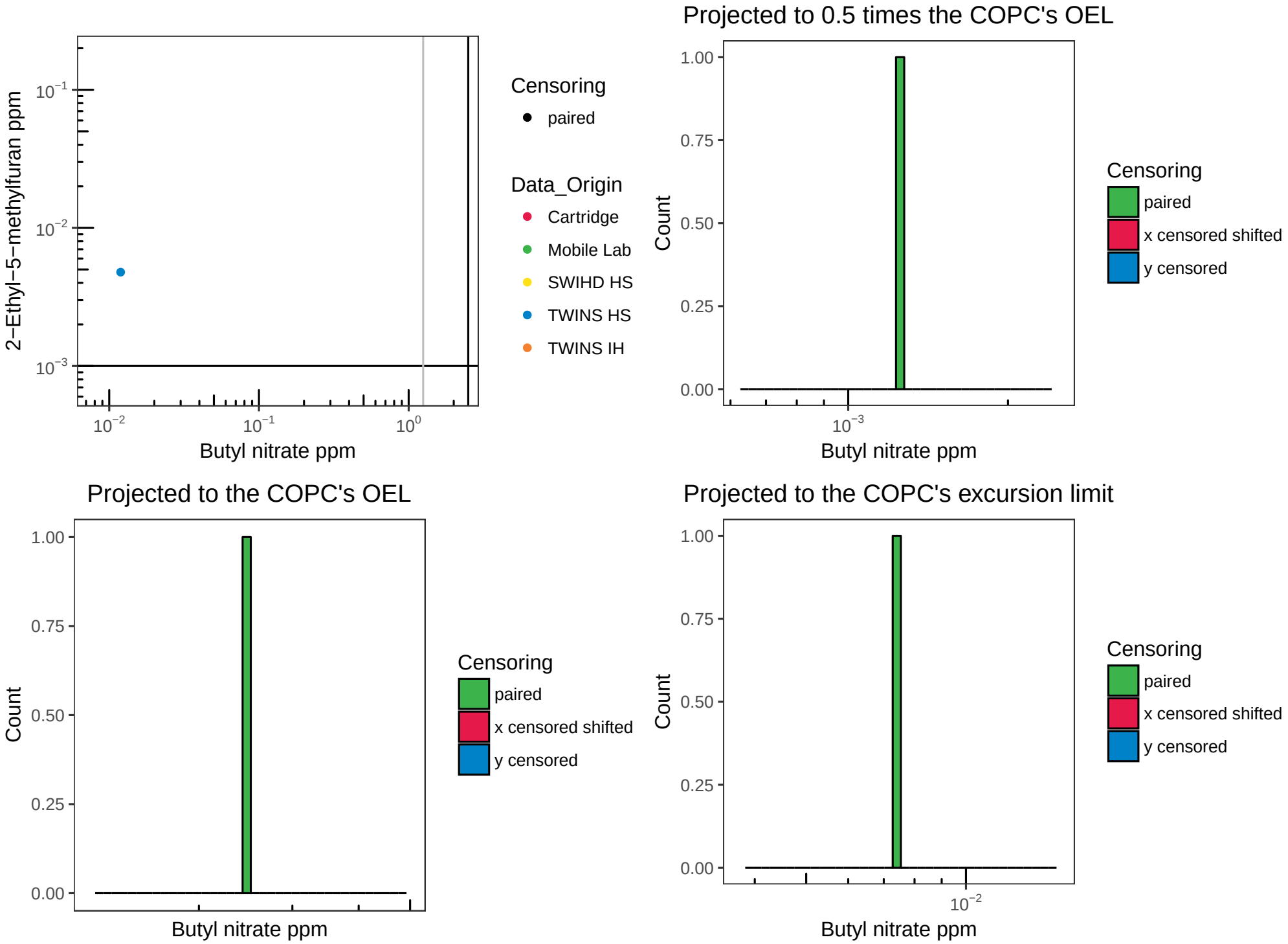


Figure C.2655: 2-Ethyl-5-methylfuran vs Butyl nitrate

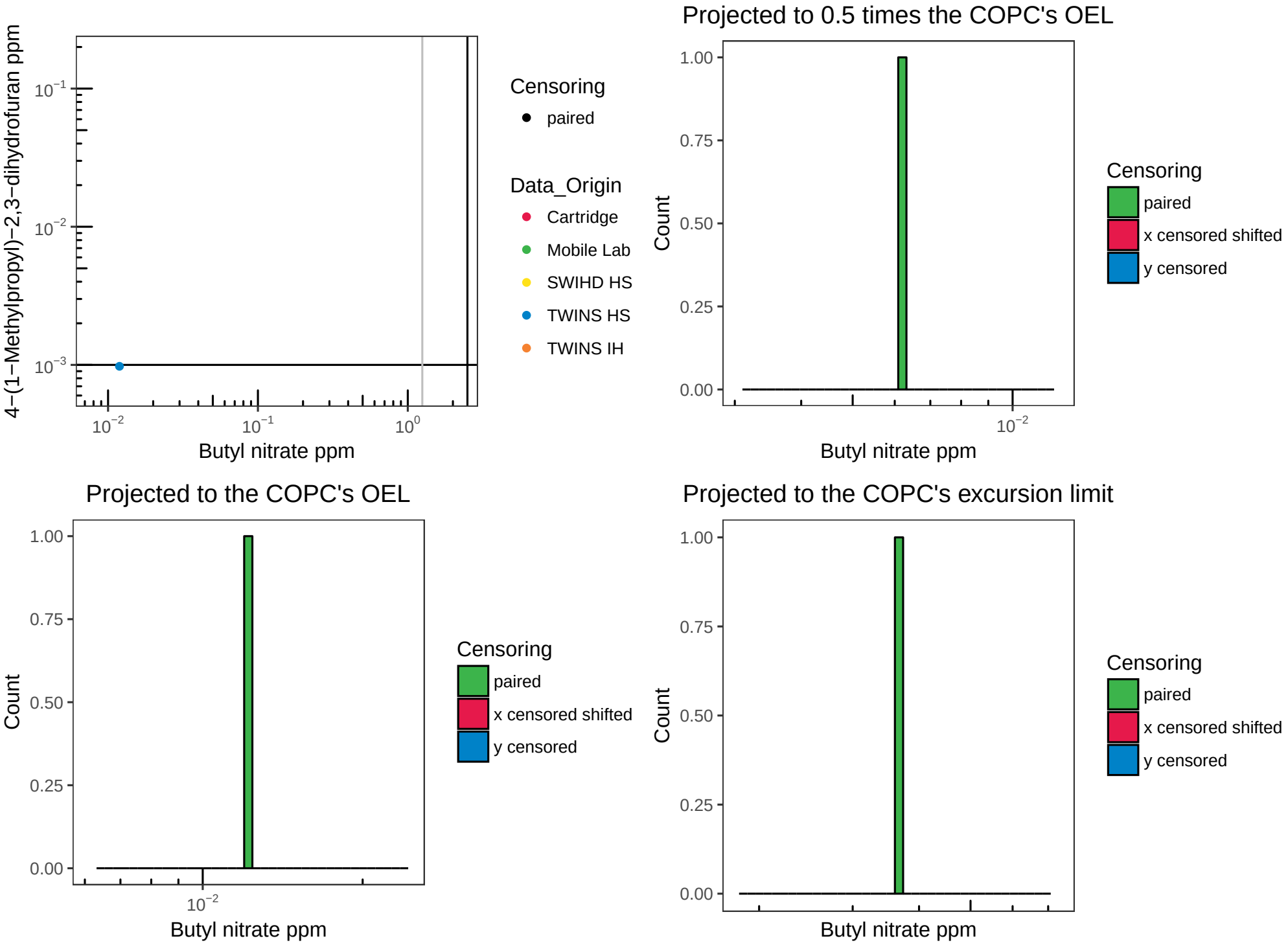


Figure C.2656: 4-(1-Methylpropyl)-2,3-dihydrofuran vs Butyl nitrate

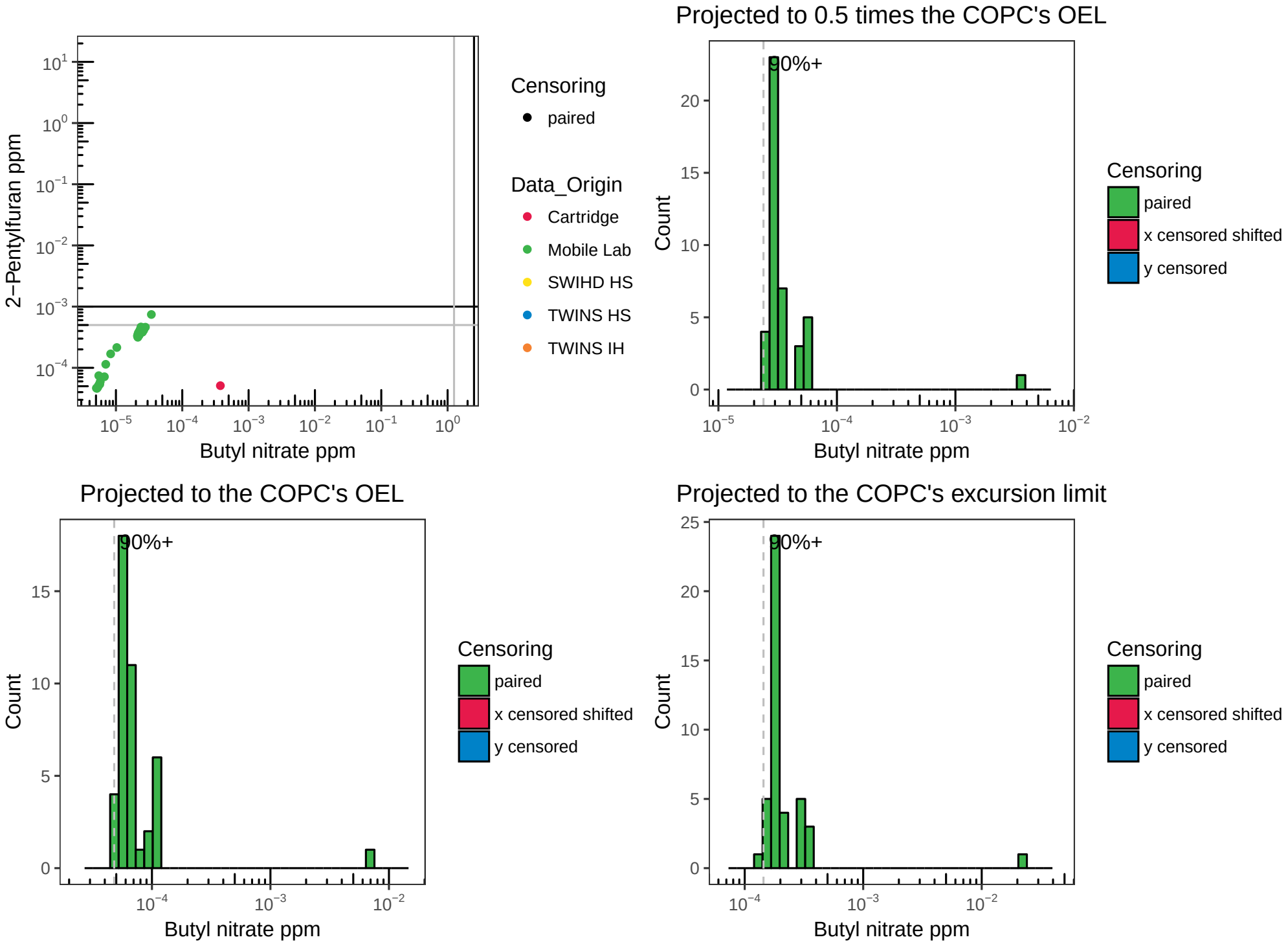


Figure C.2657: 2-Pentylfuran vs Butyl nitrate

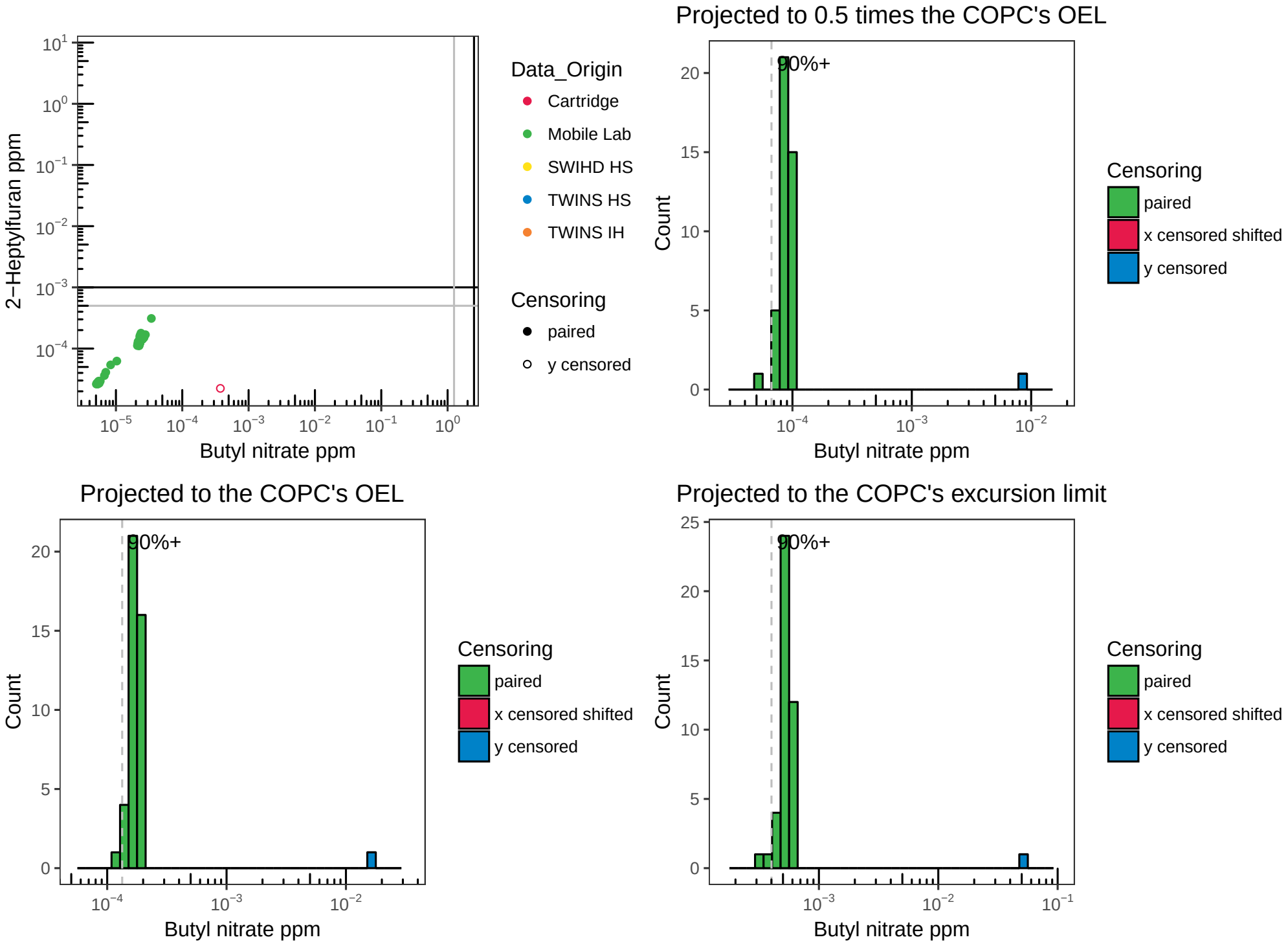


Figure C.2658: 2-Heptylfuran vs Butyl nitrate

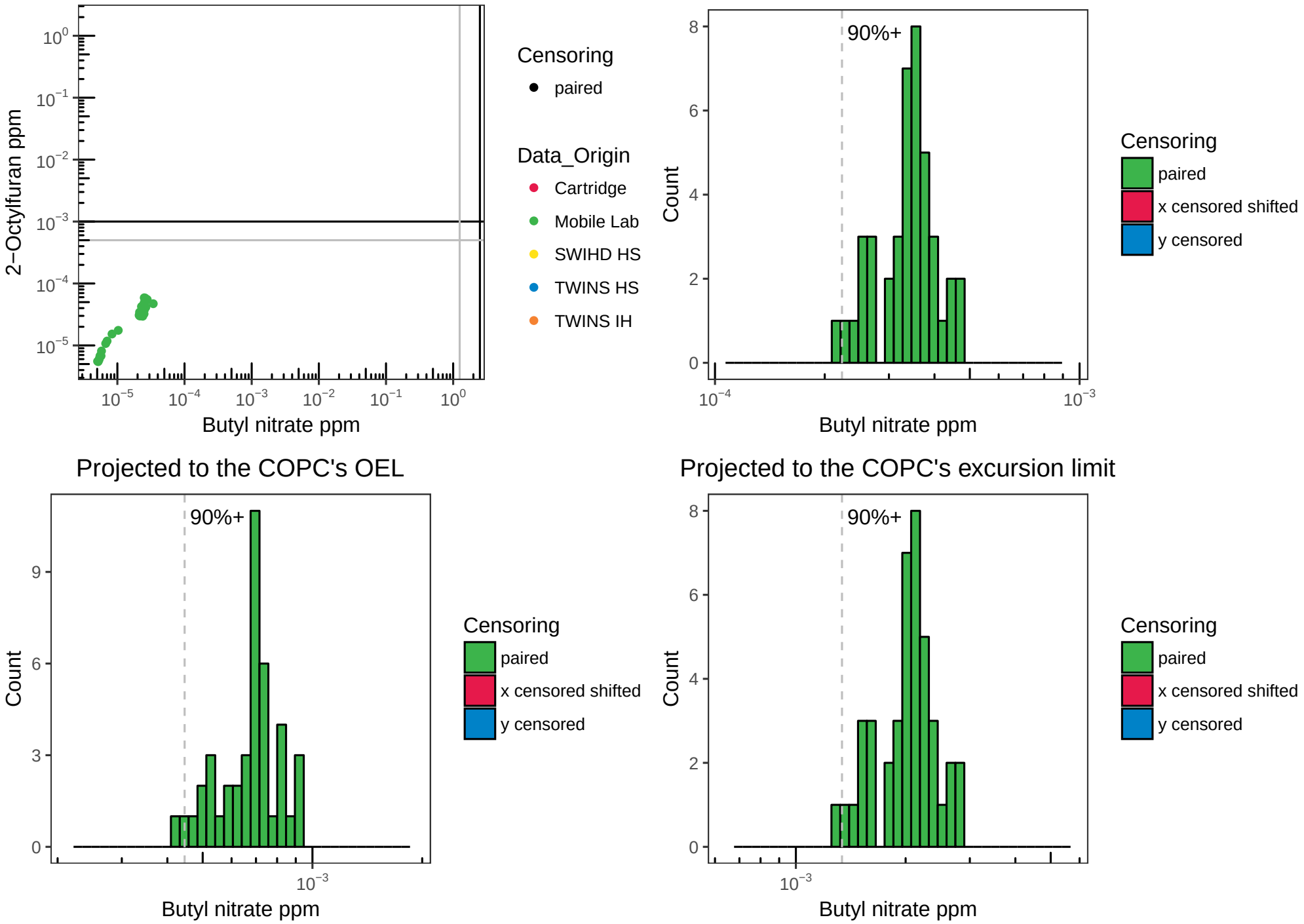


Figure C.2659: 2-Octylfuran vs Butyl nitrate

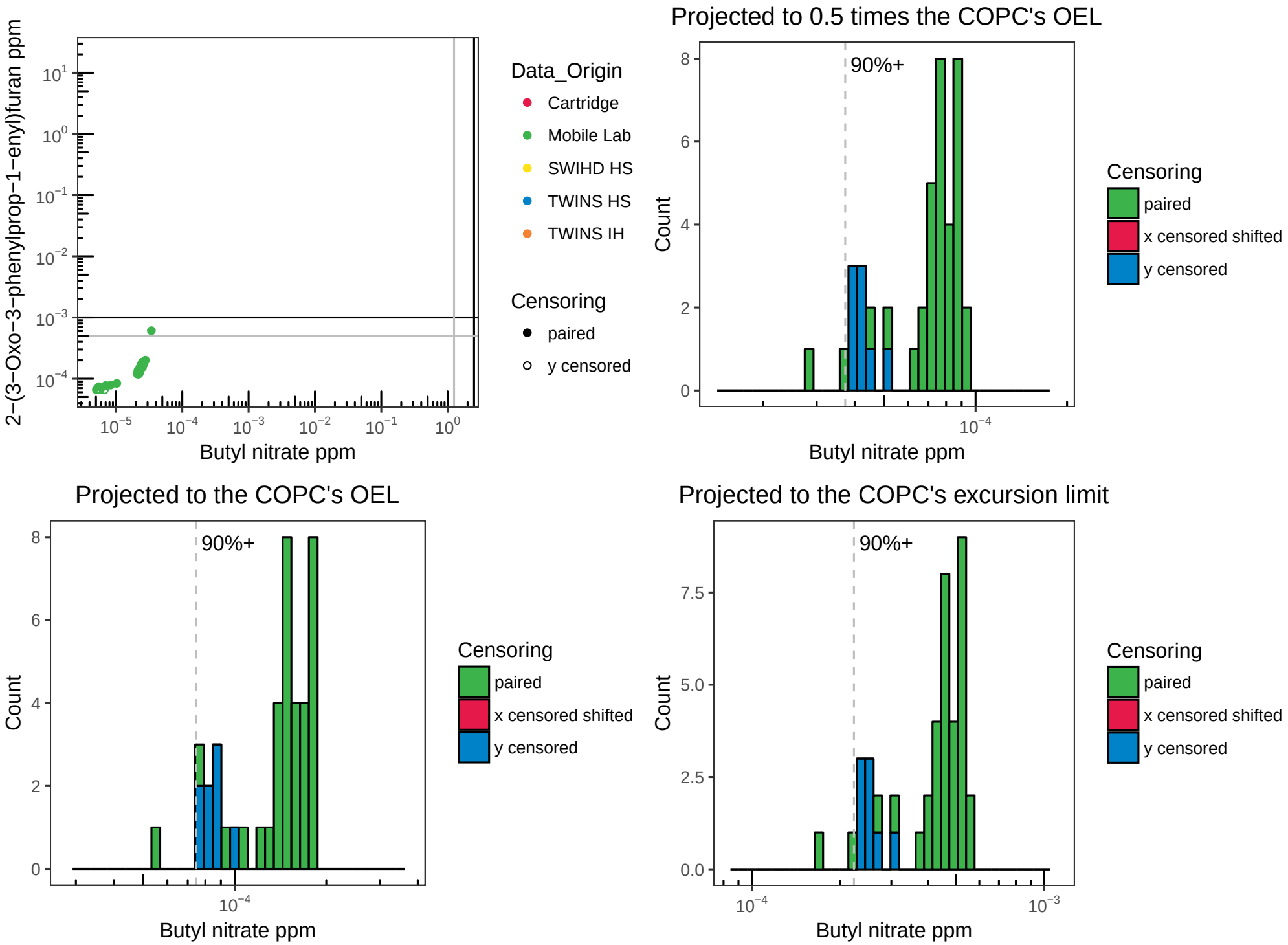


Figure C.2660: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Butyl nitrate

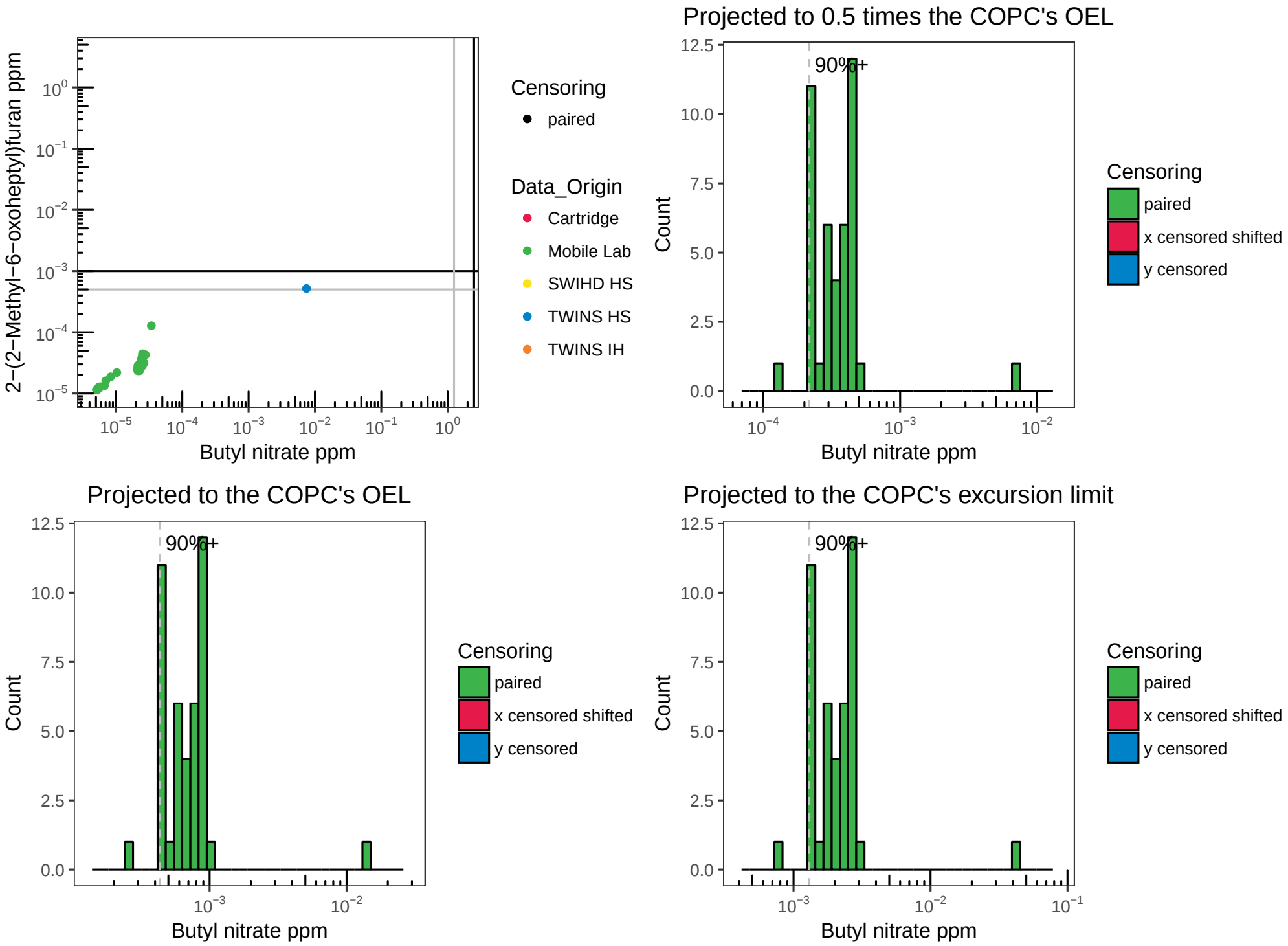


Figure C.2661: 2-(2-Methyl-6-oxoheptyl)furan vs Butyl nitrate

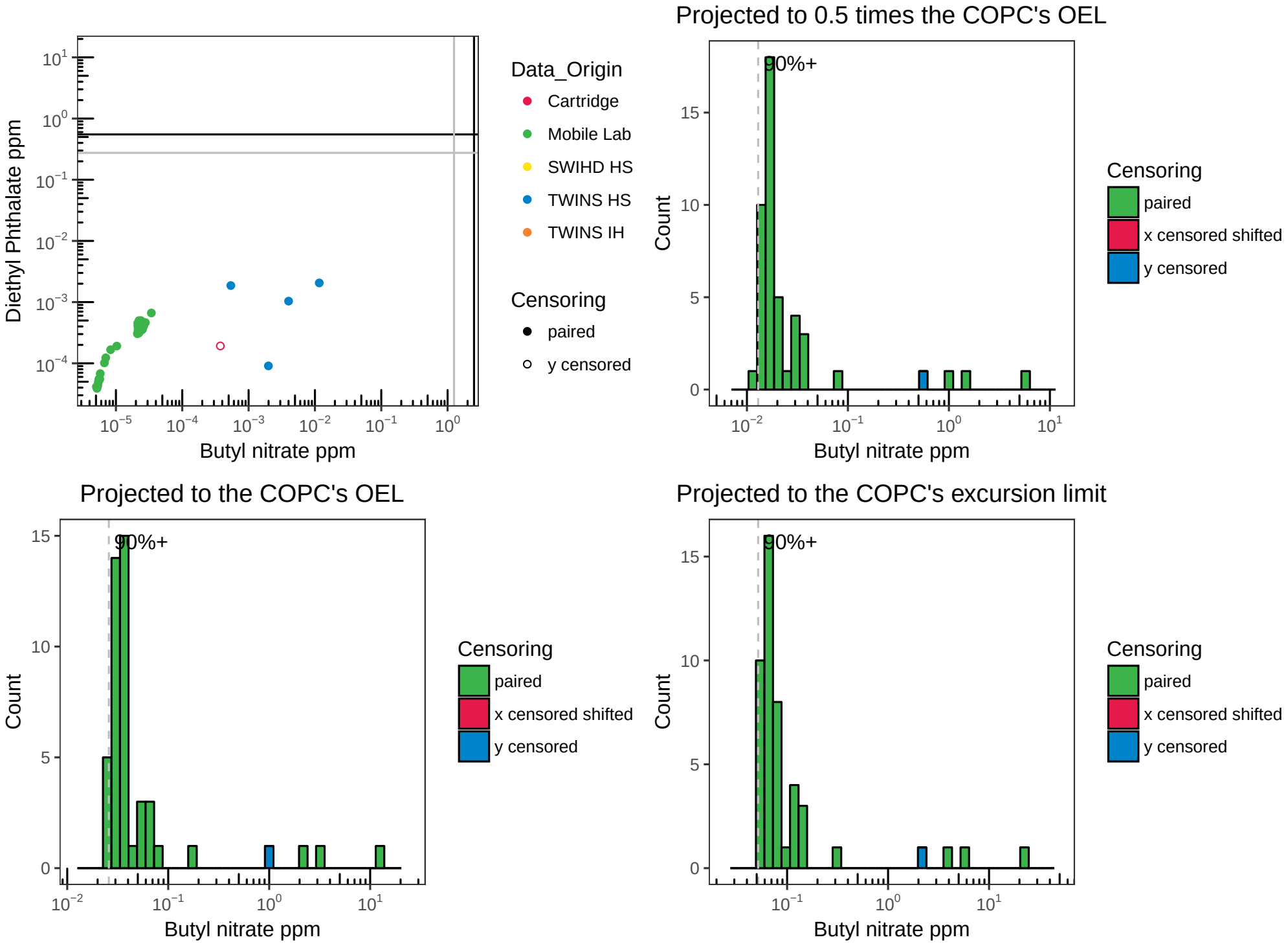


Figure C.2662: Diethyl Phthalate vs Butyl nitrate

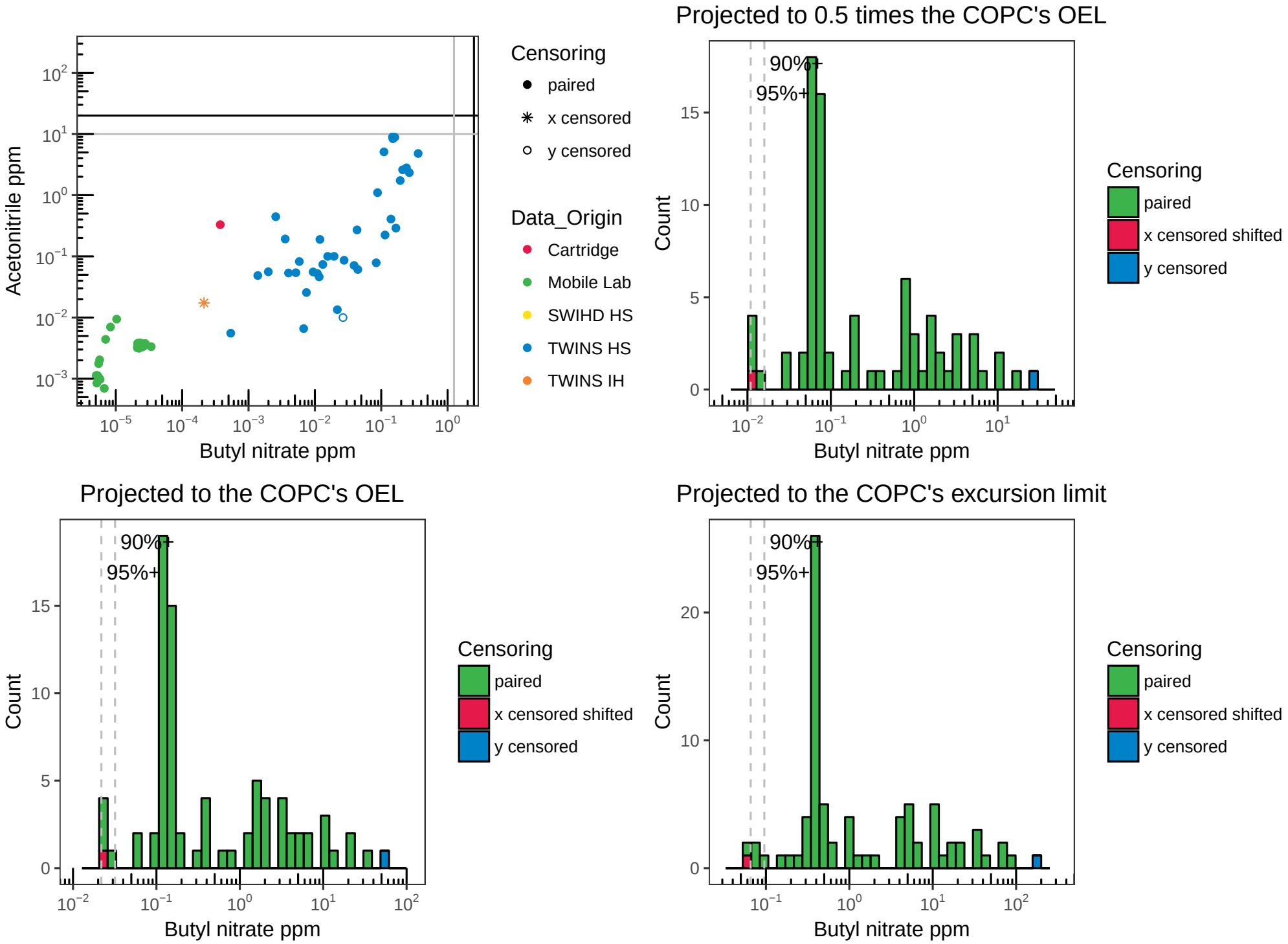


Figure C.2663: Acetonitrile vs Butyl nitrate

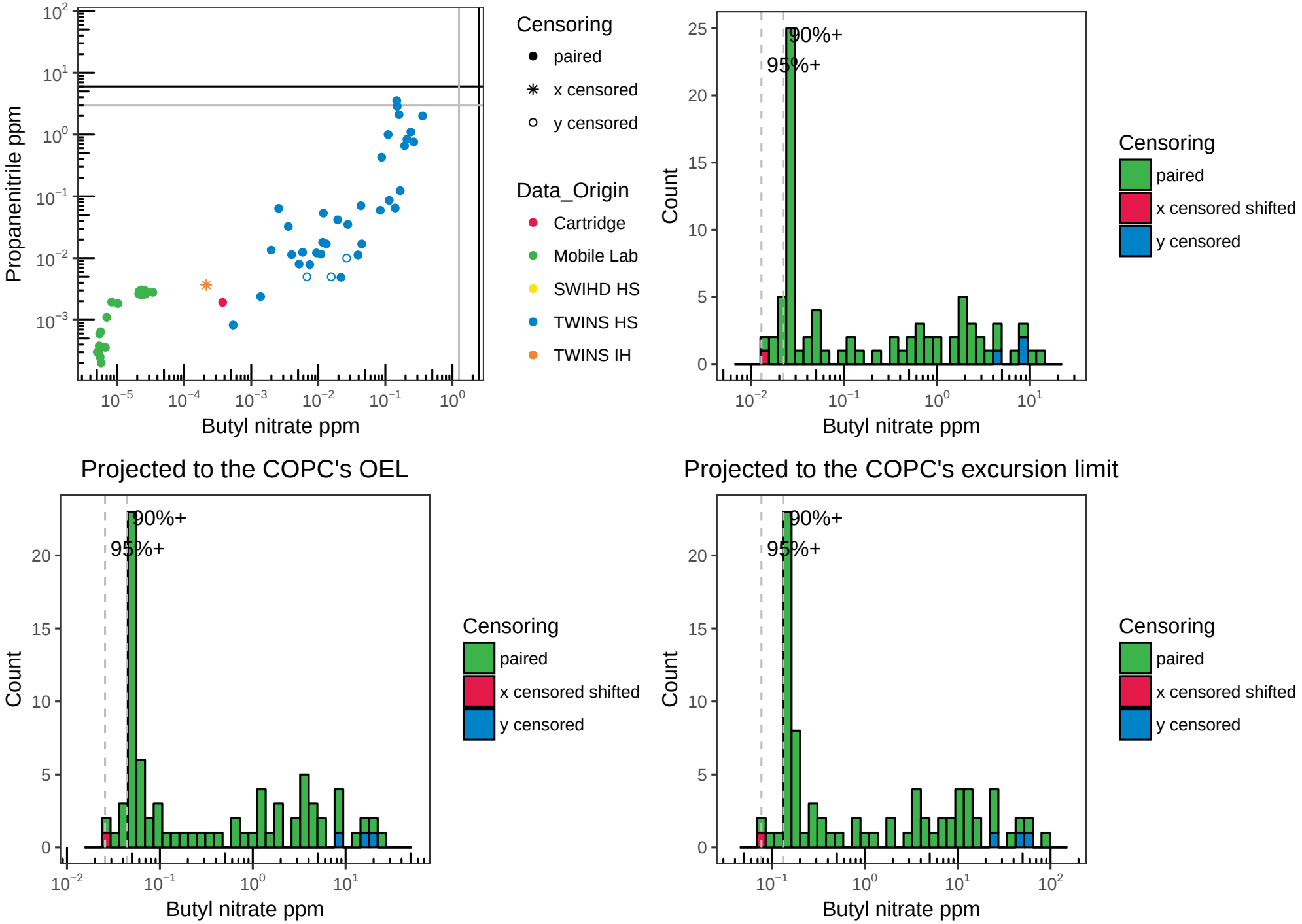


Figure C.2664: Propanenitrile vs Butyl nitrate

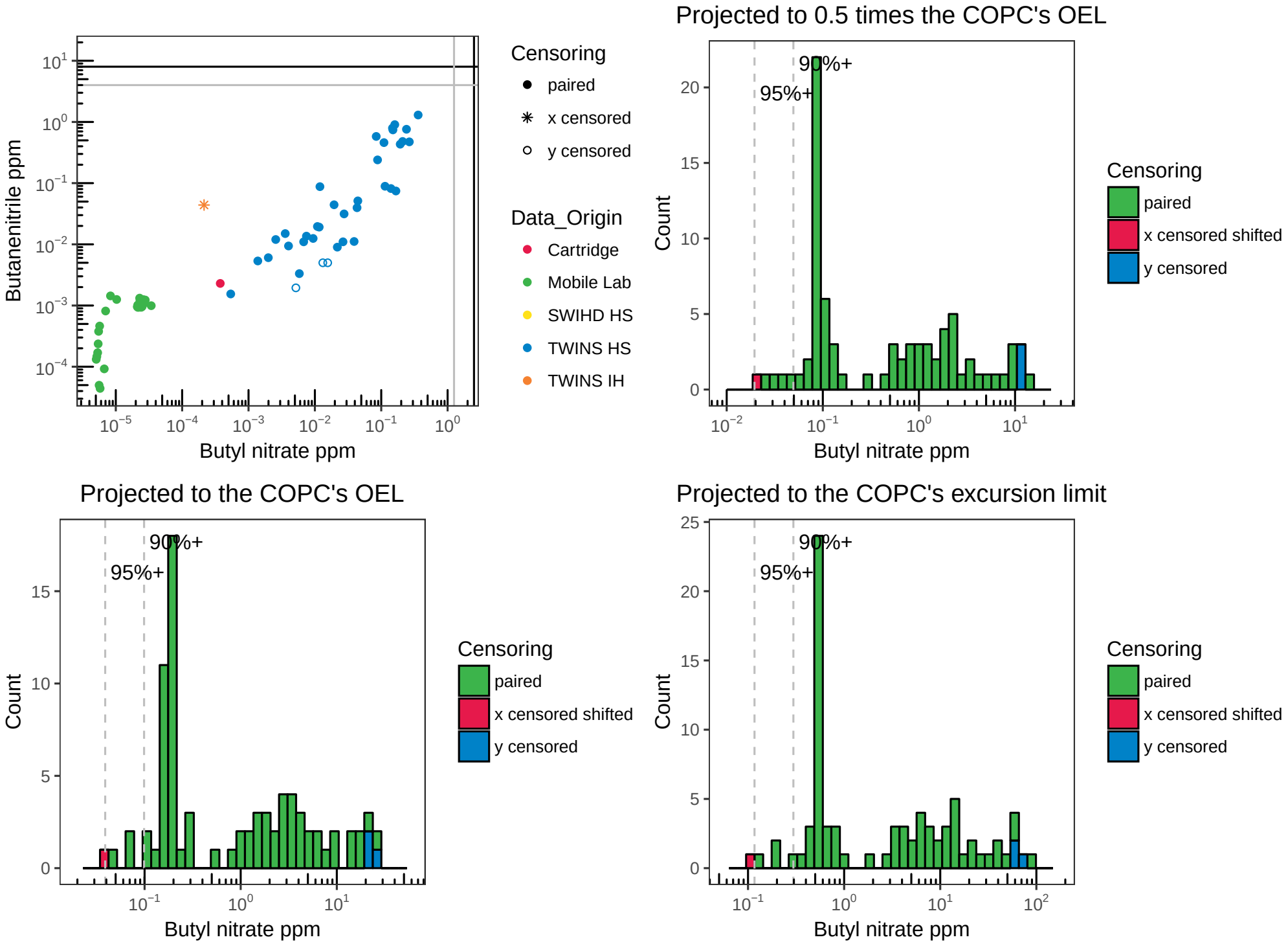


Figure C.2665: Butanenitrile vs Butyl nitrate

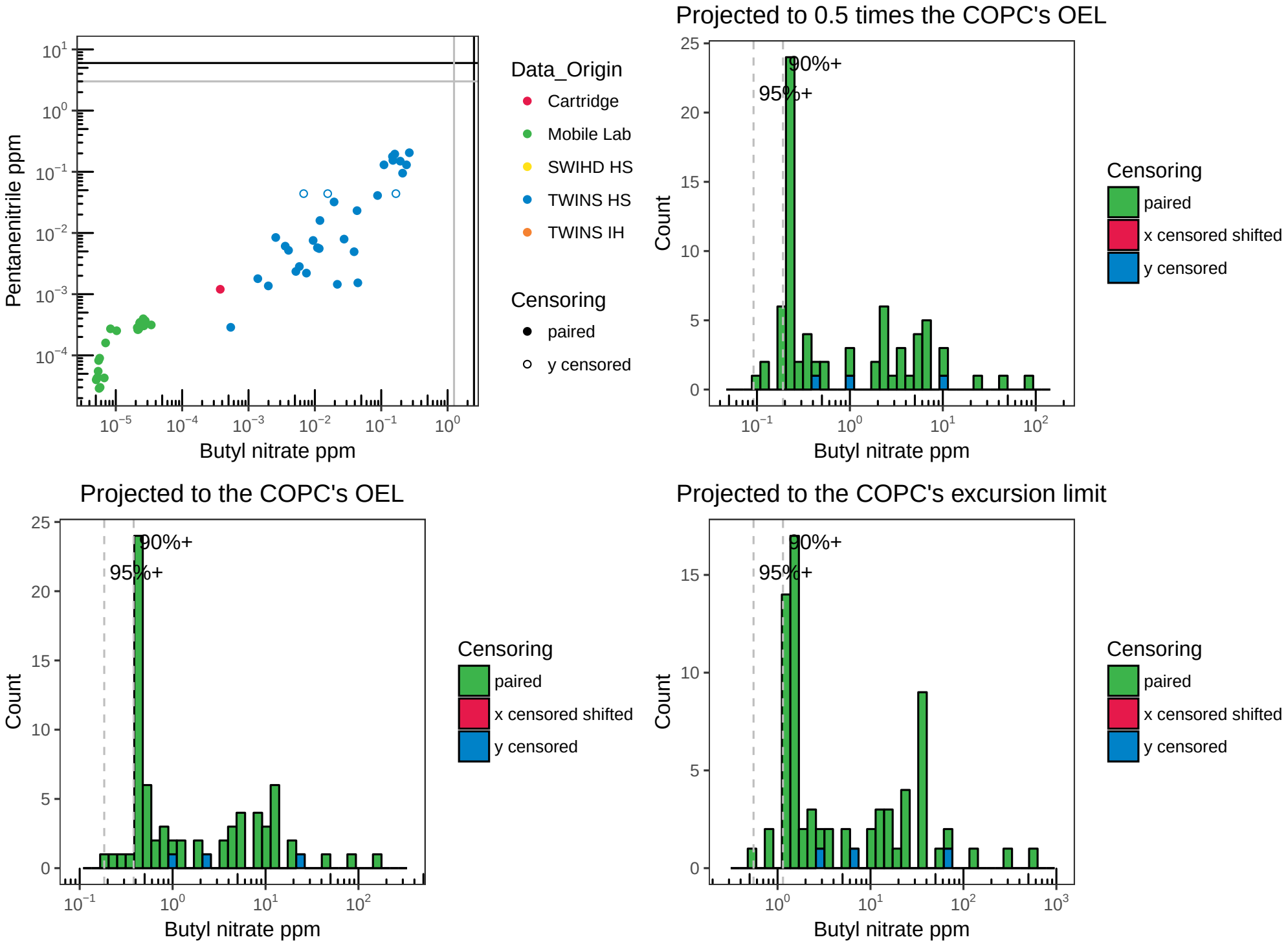


Figure C.2666: Pentanenitrile vs Butyl nitrate

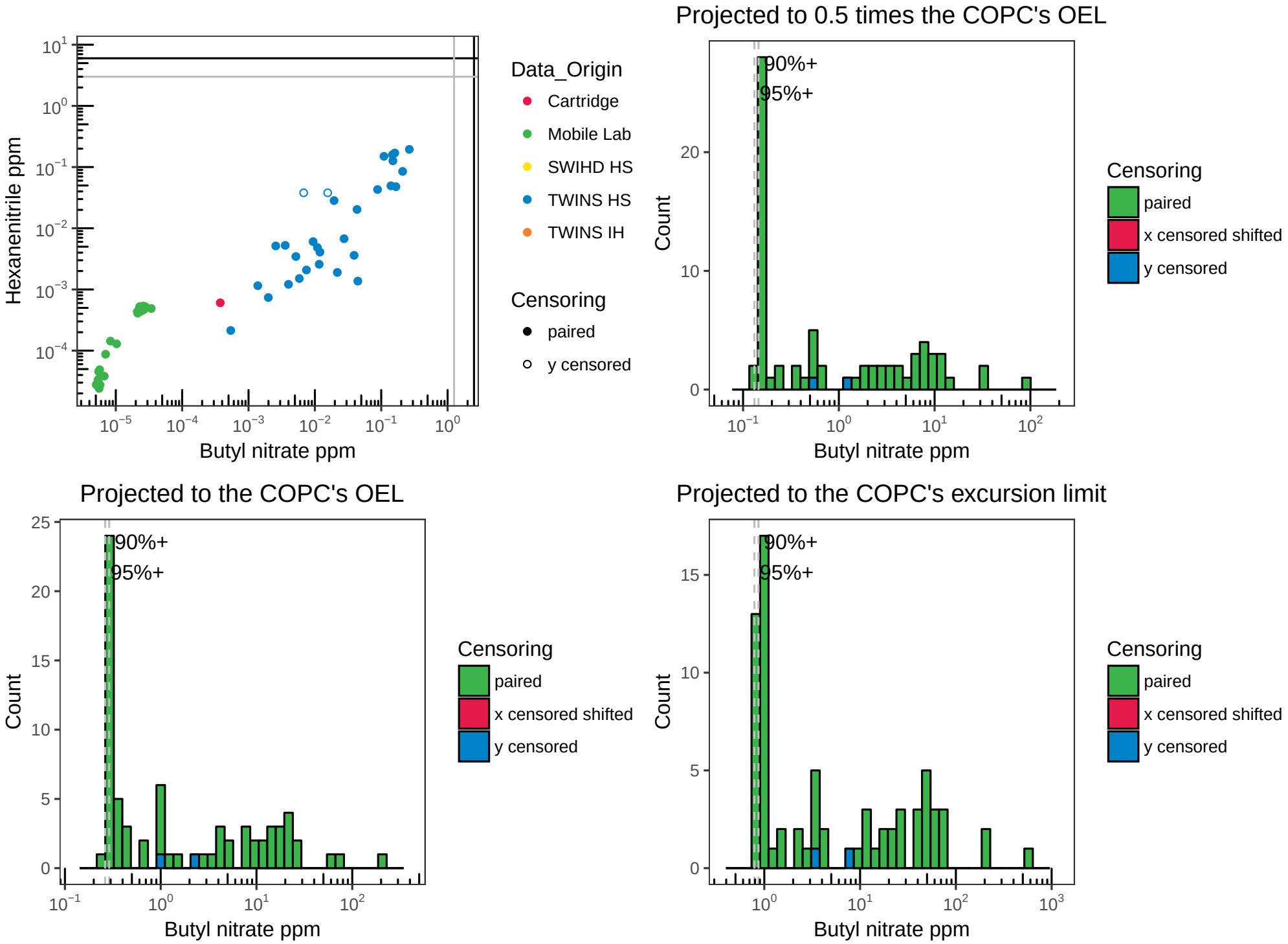


Figure C.2667: Hexanenitrile vs Butyl nitrate

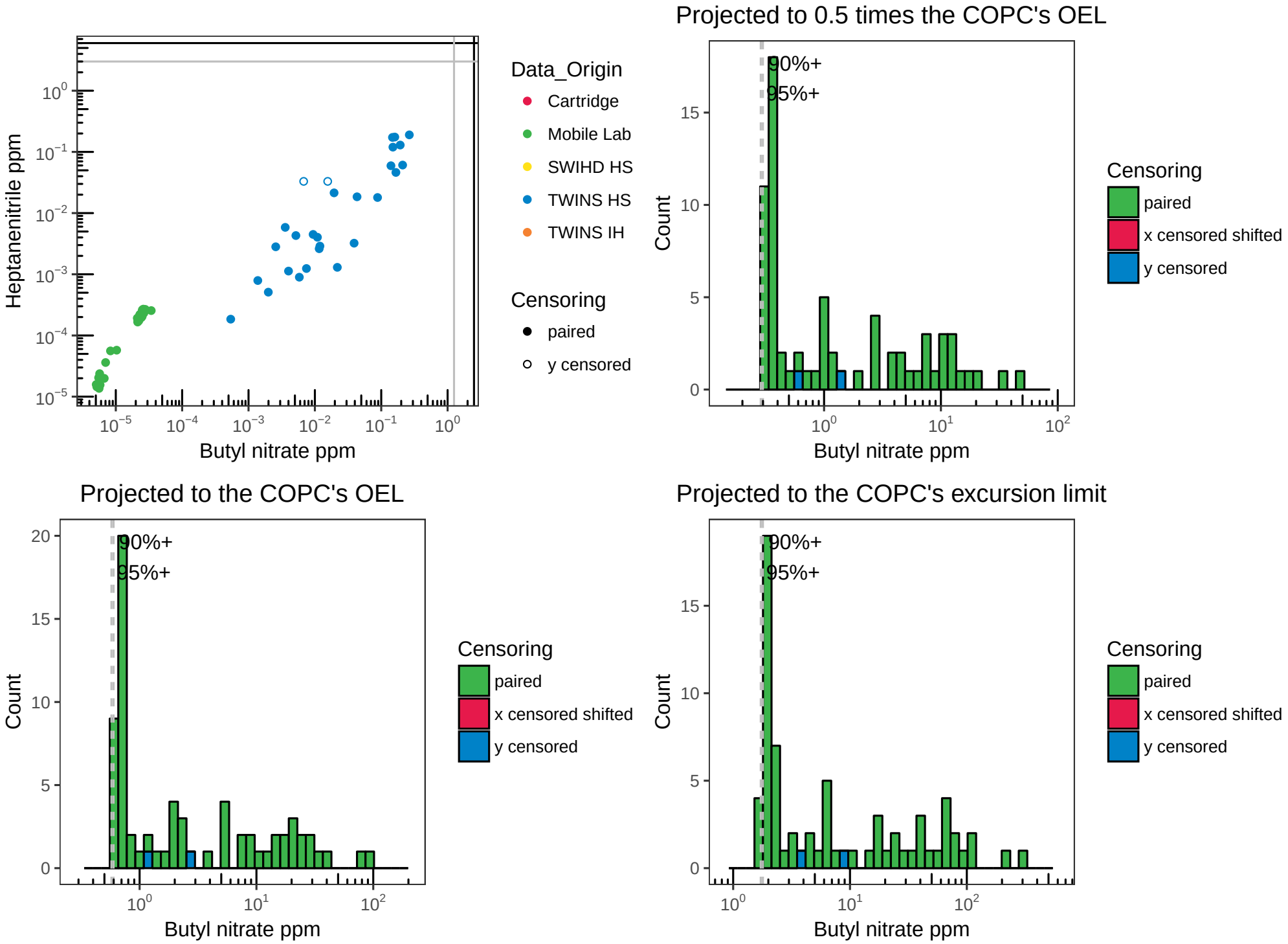


Figure C.2668: Heptanenitrile vs Butyl nitrate

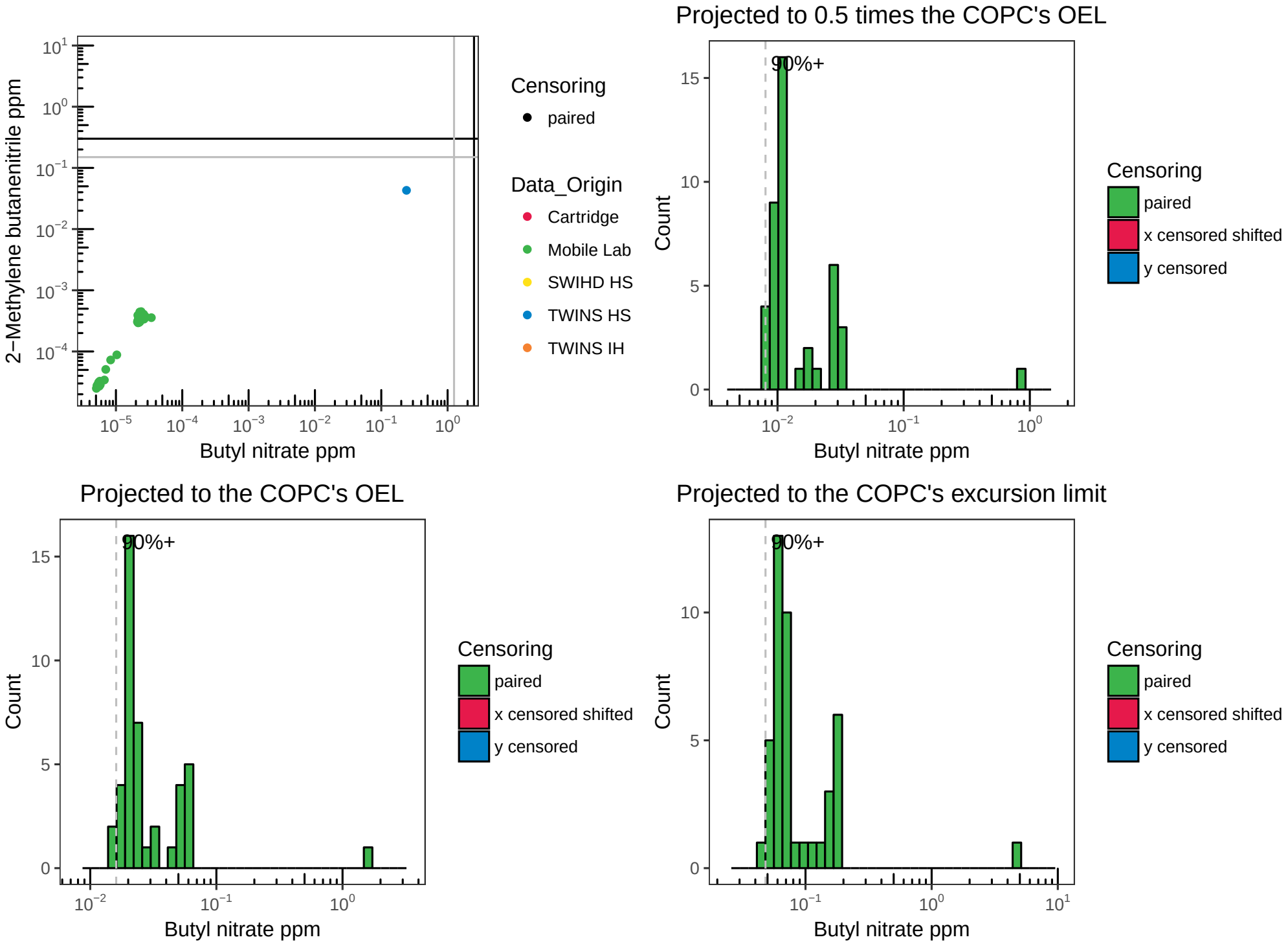


Figure C.2669: 2-Methylene butanenitrile vs Butyl nitrate

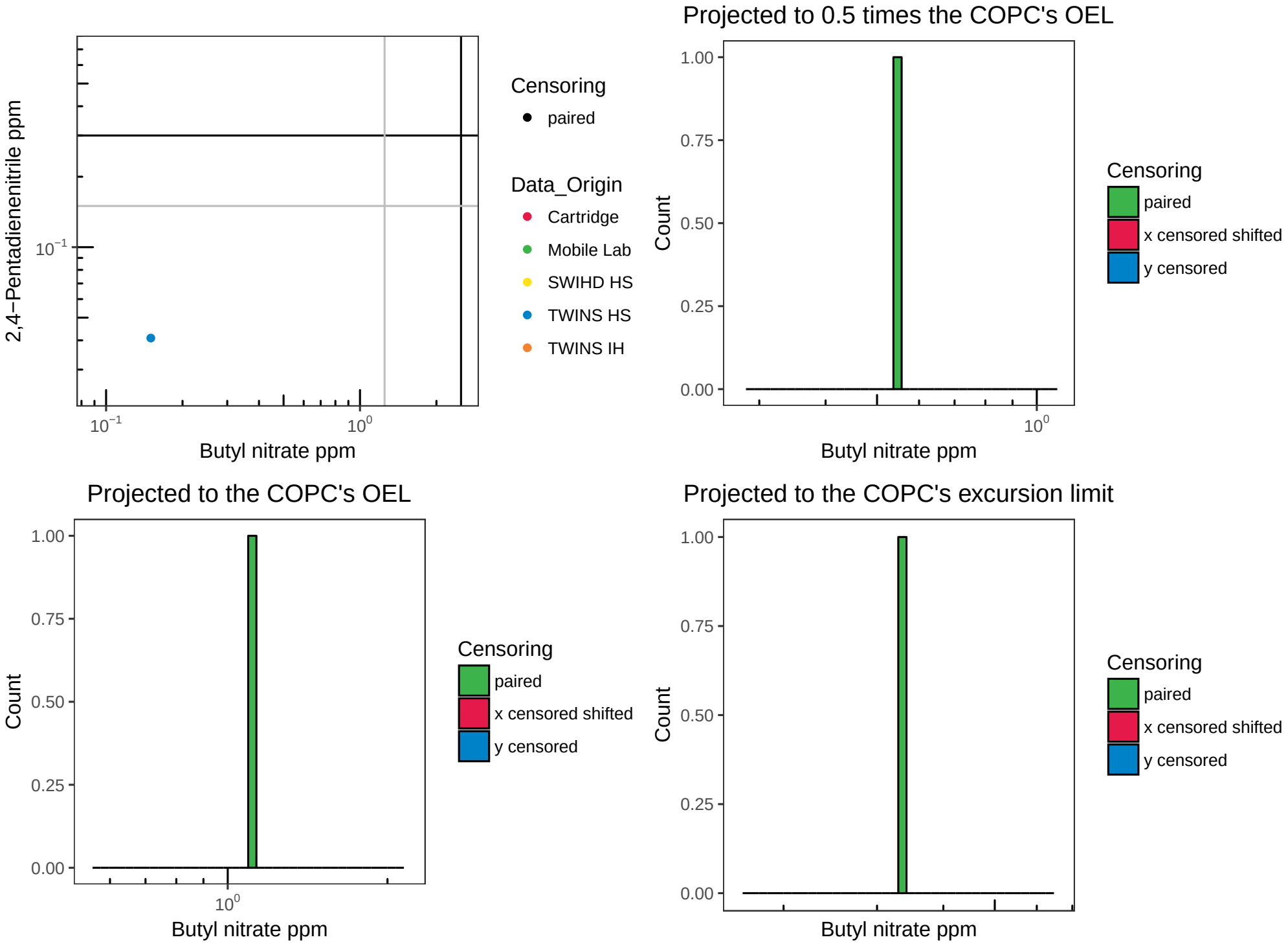


Figure C.2670: 2,4-Pentadienenitrile vs Butyl nitrate

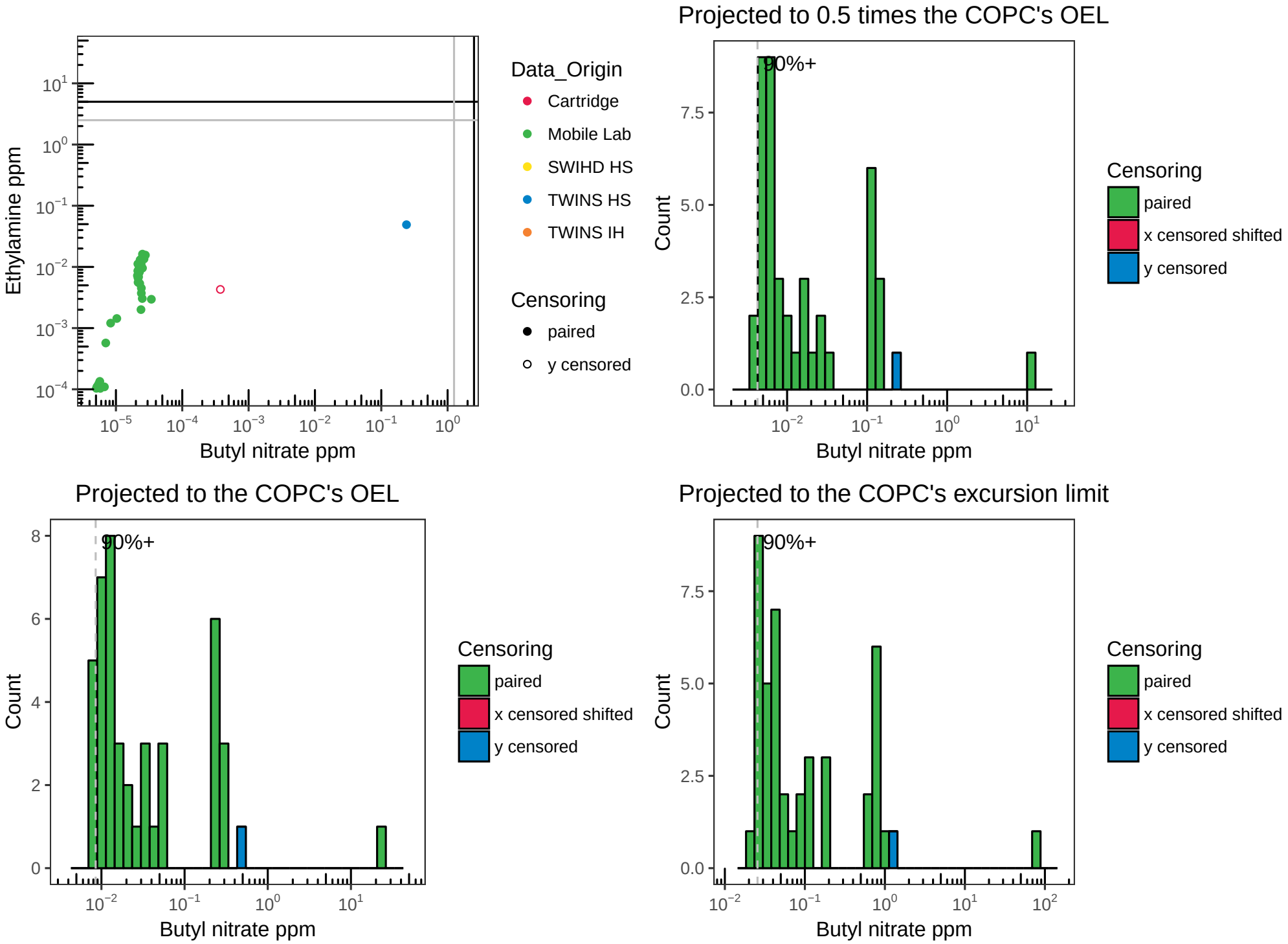


Figure C.2671: Ethylamine vs Butyl nitrate

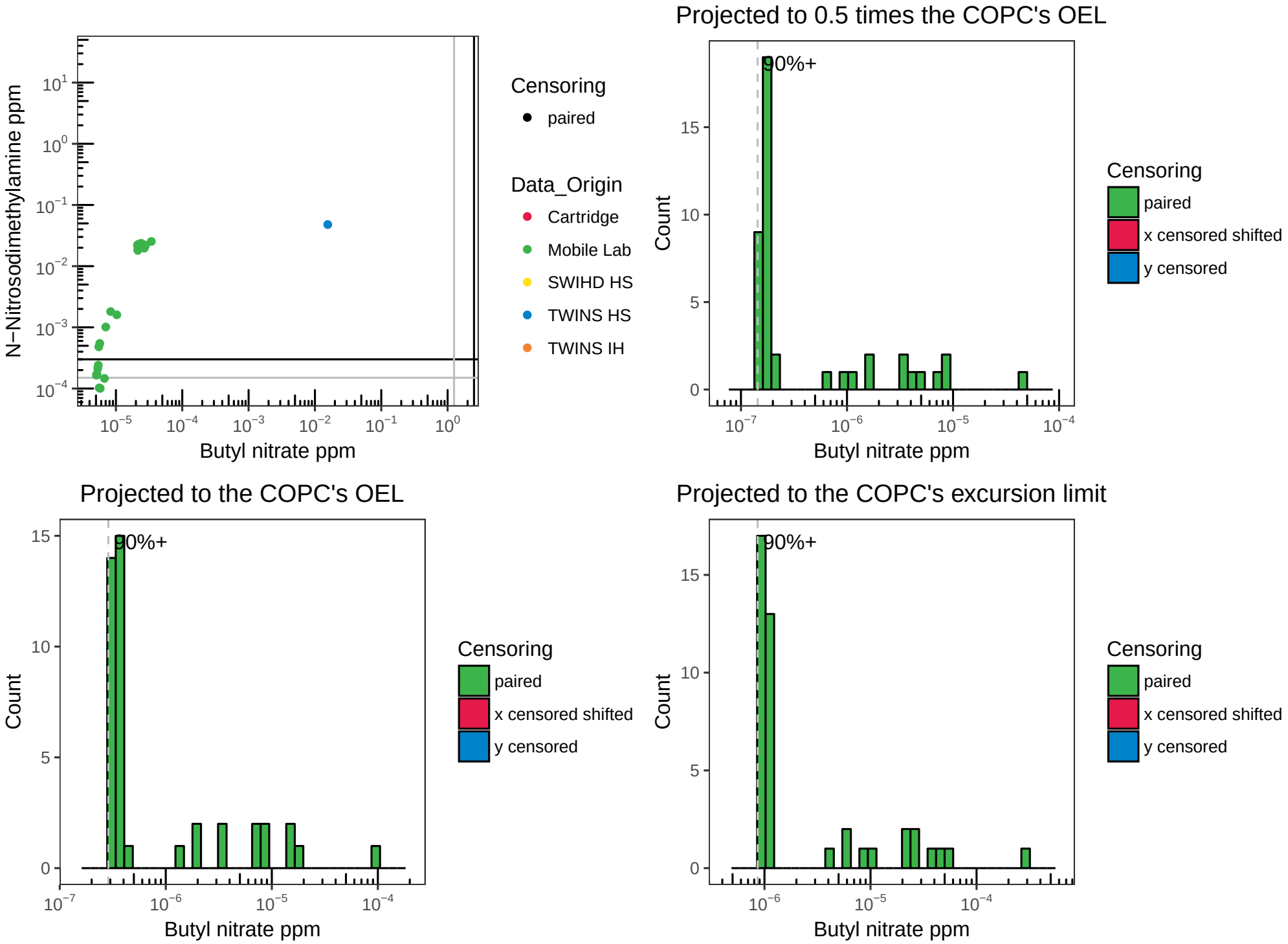


Figure C.2672: N-Nitrosodimethylamine vs Butyl nitrate

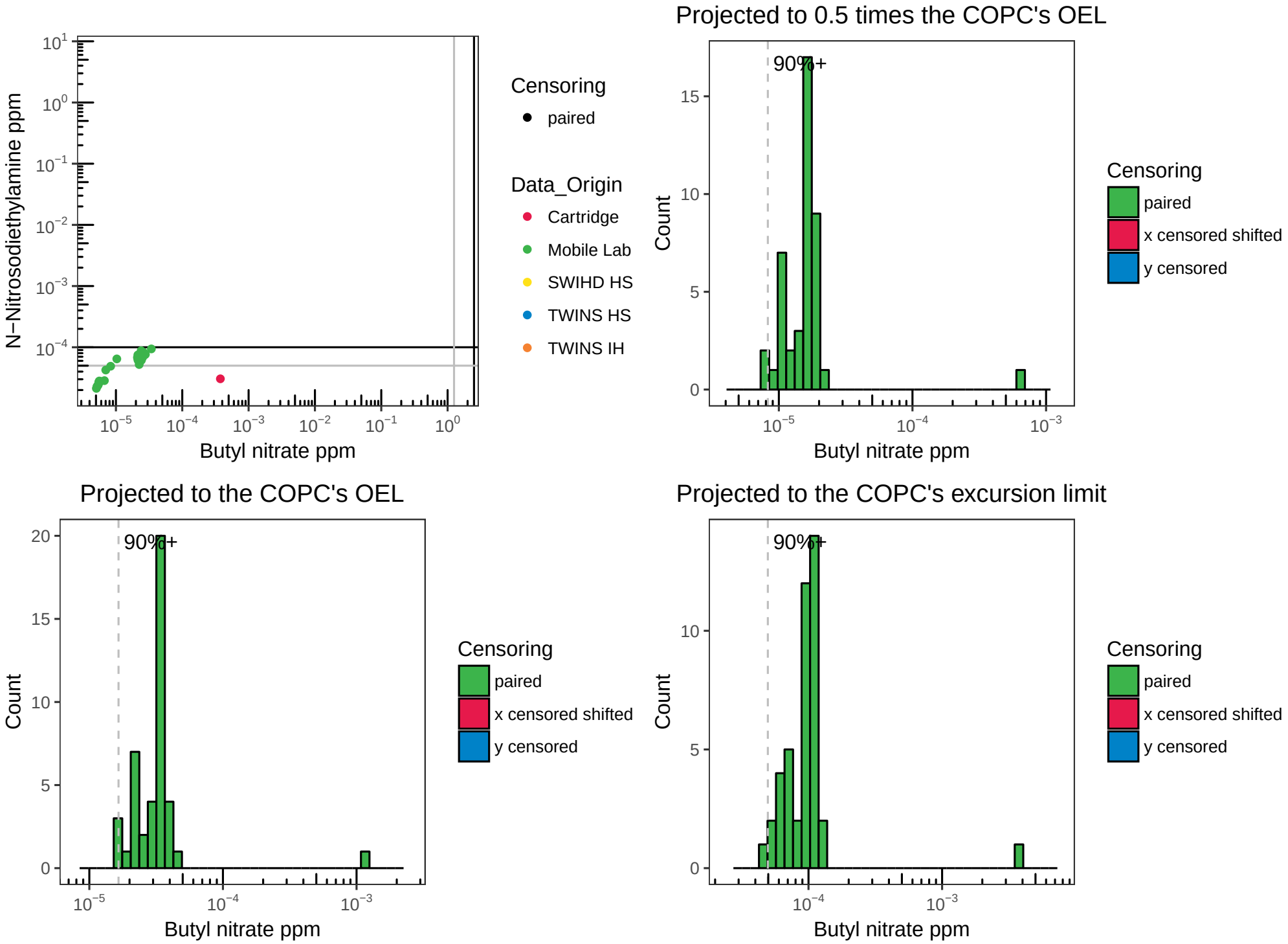


Figure C.2673: N-Nitrosodiethylamine vs Butyl nitrate

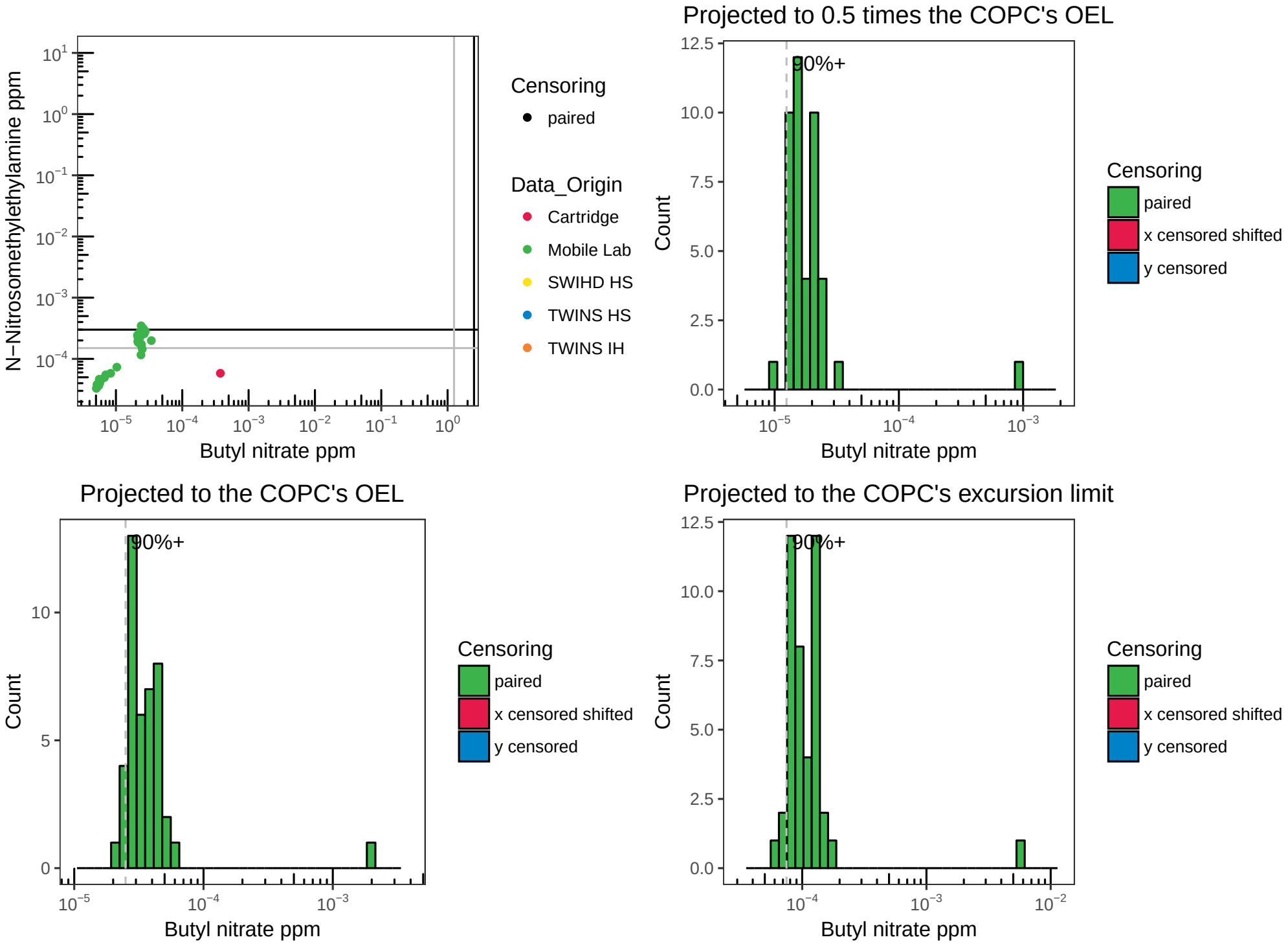


Figure C.2674: N-Nitrosomethylethylamine vs Butyl nitrate

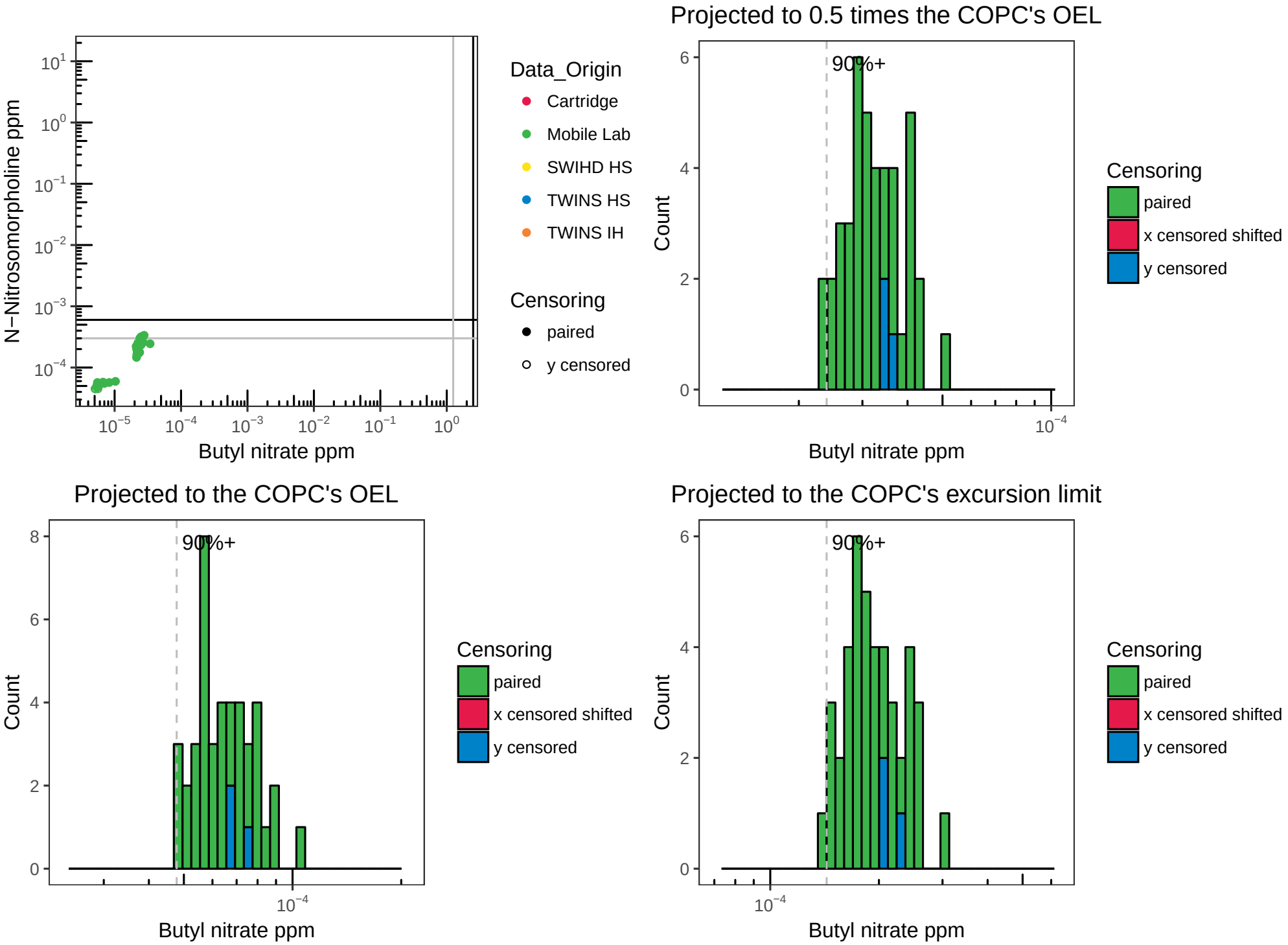


Figure C.2675: N-Nitrosomorpholine vs Butyl nitrate

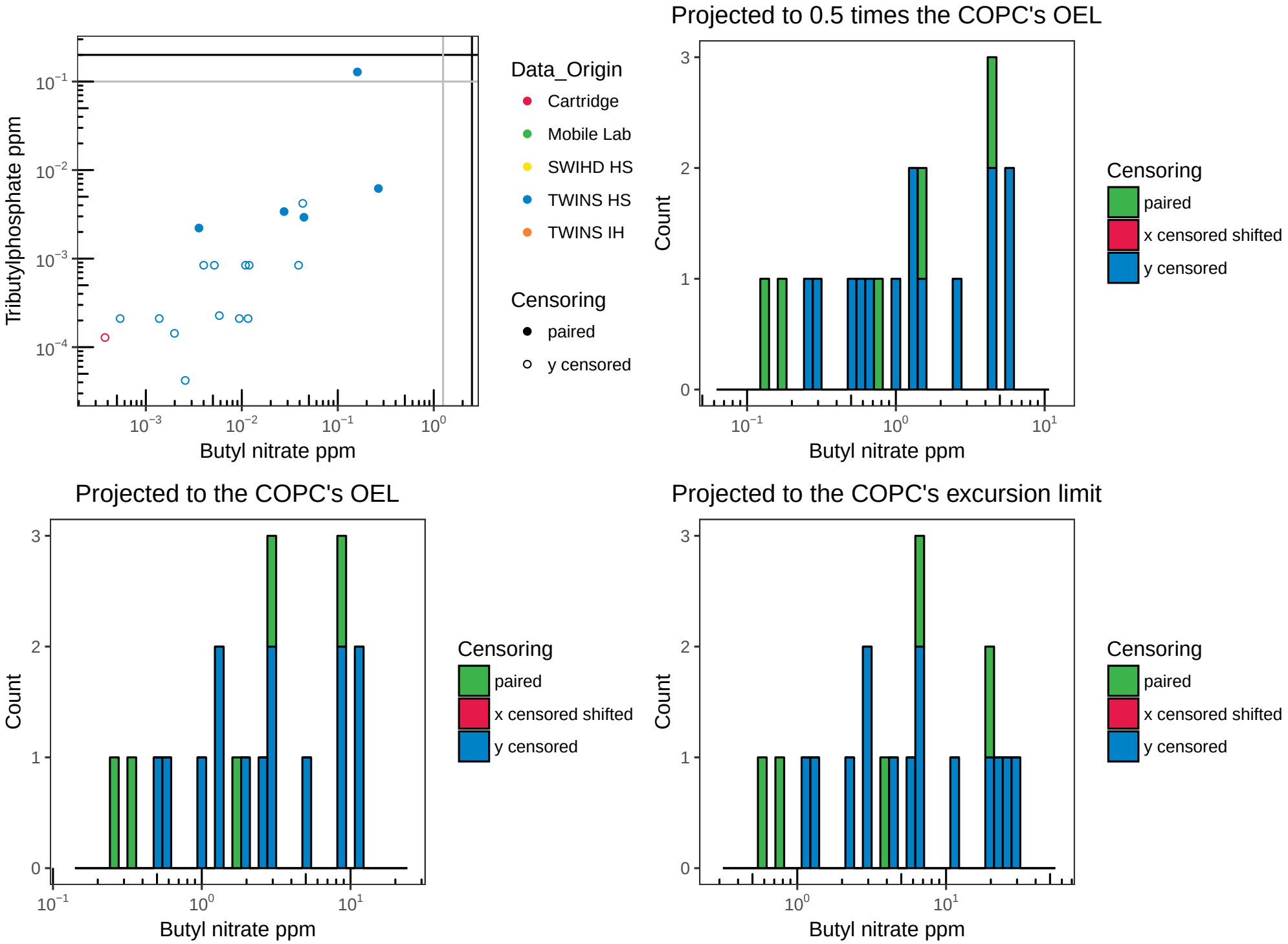


Figure C.2676: Tributylphosphate vs Butyl nitrate

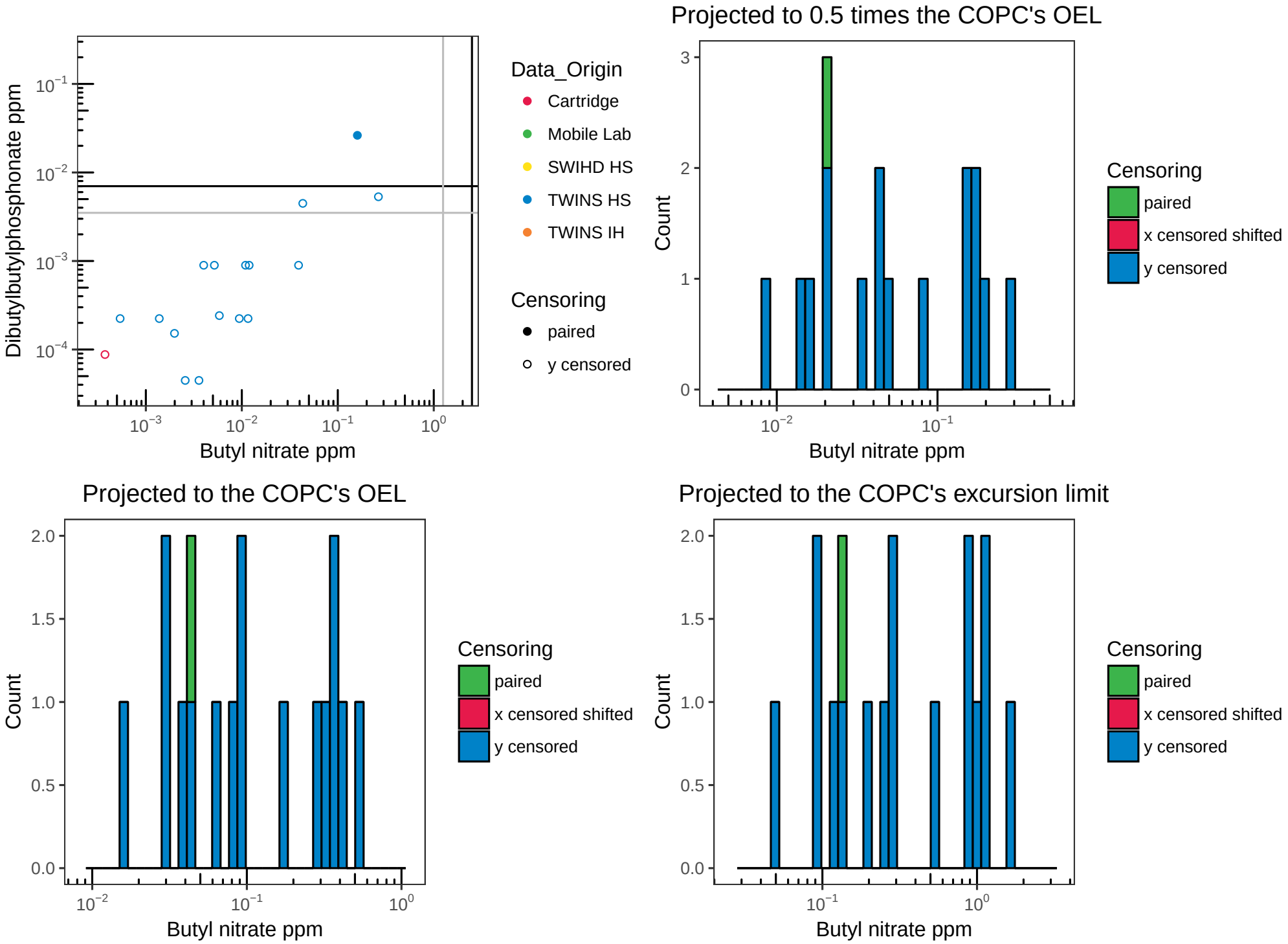


Figure C.2677: Dibutylbutylphosphonate vs Butyl nitrate

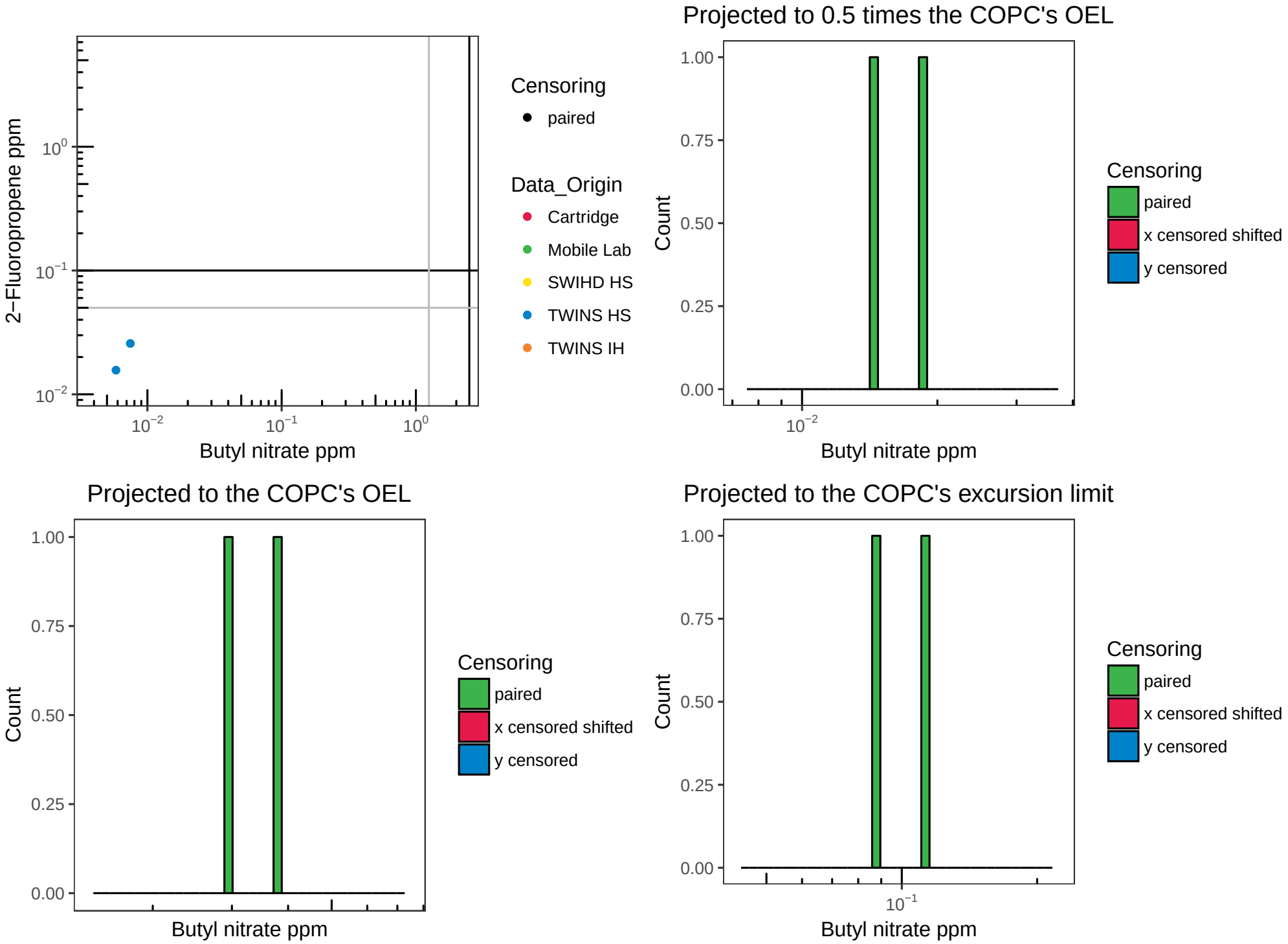


Figure C.2678: 2-Fluoropropene vs Butyl nitrate

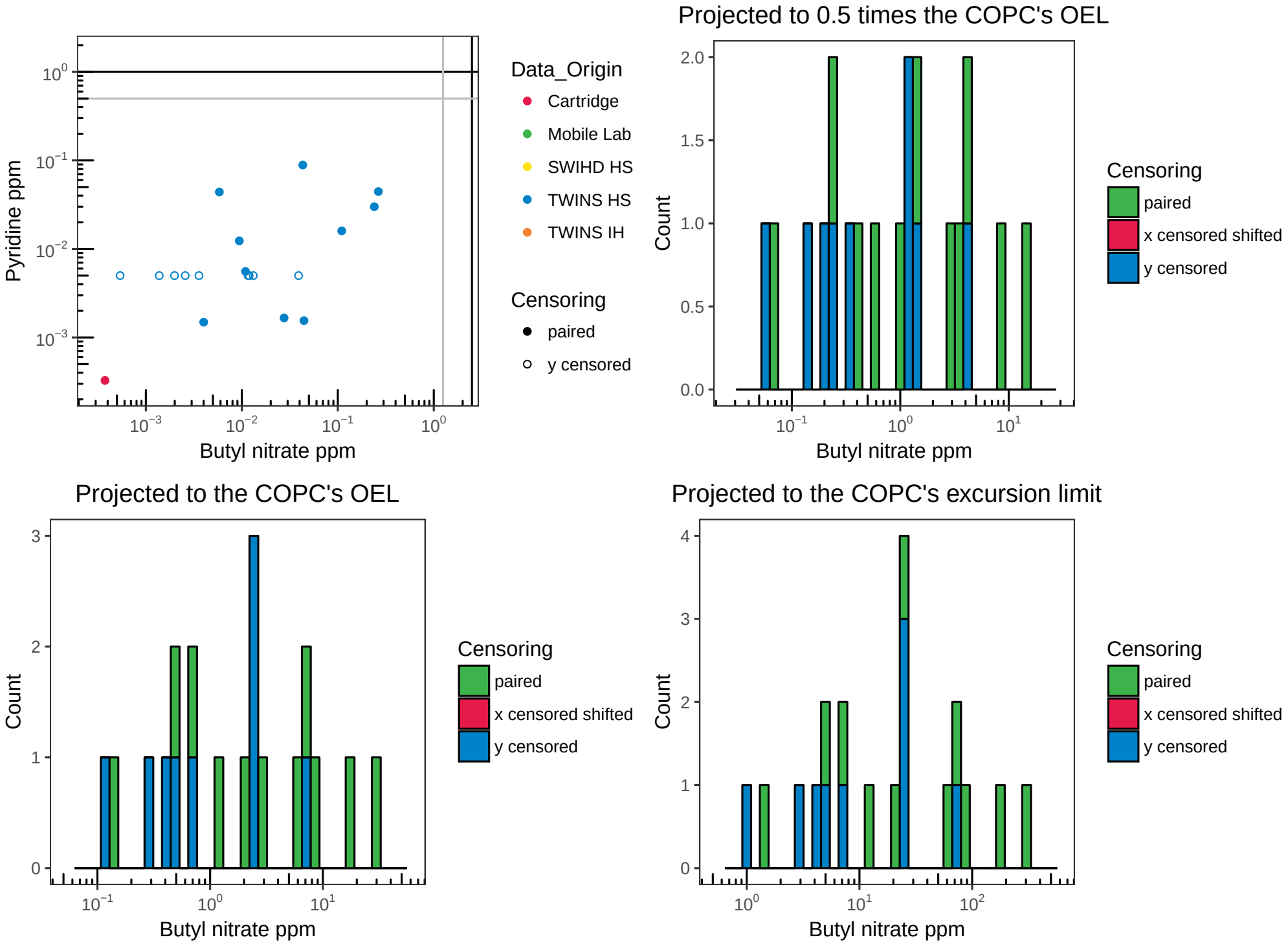


Figure C.2679: Pyridine vs Butyl nitrate

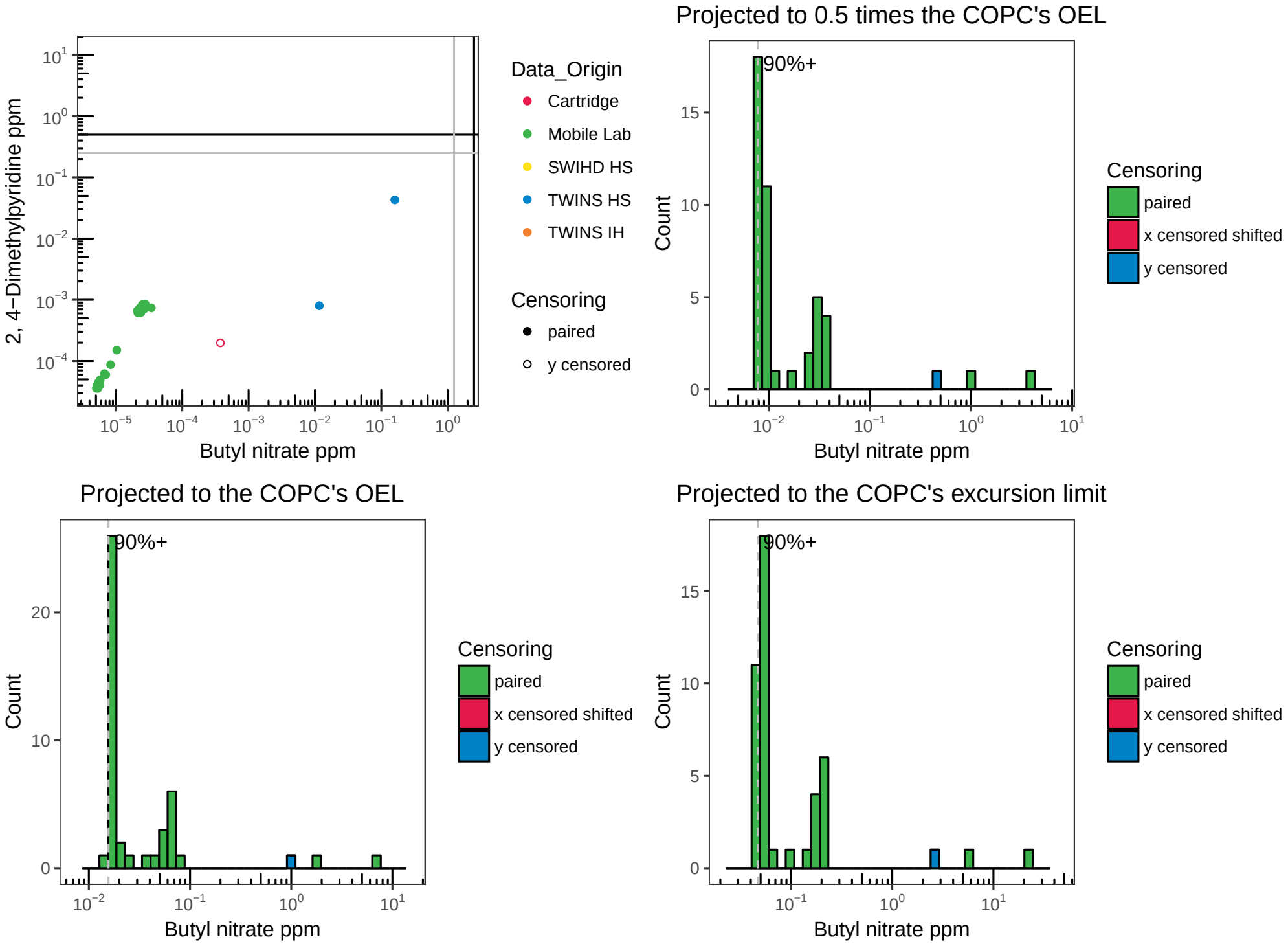


Figure C.2680: 2, 4-Dimethylpyridine vs Butyl nitrate

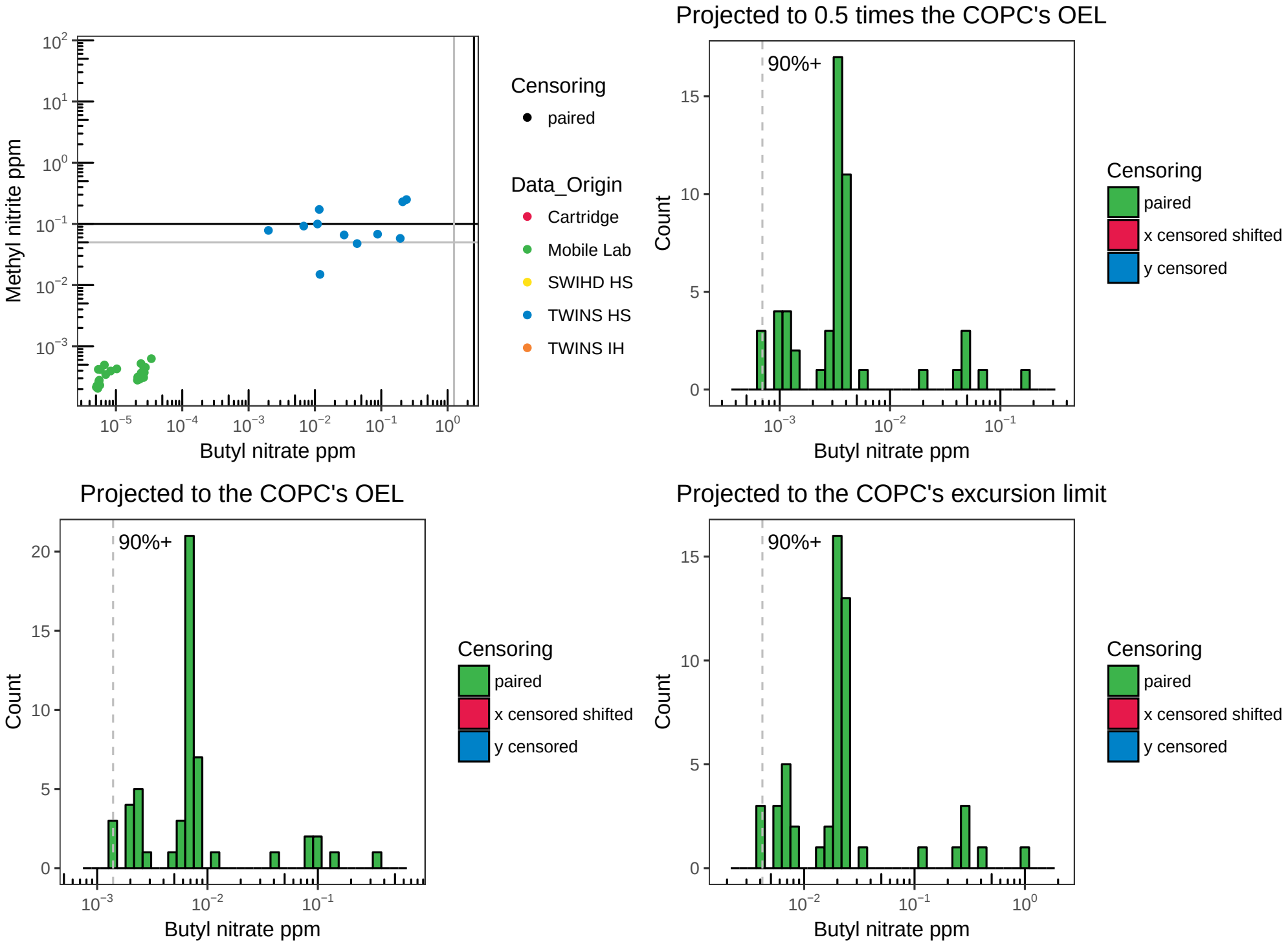


Figure C.2681: Methyl nitrite vs Butyl nitrate

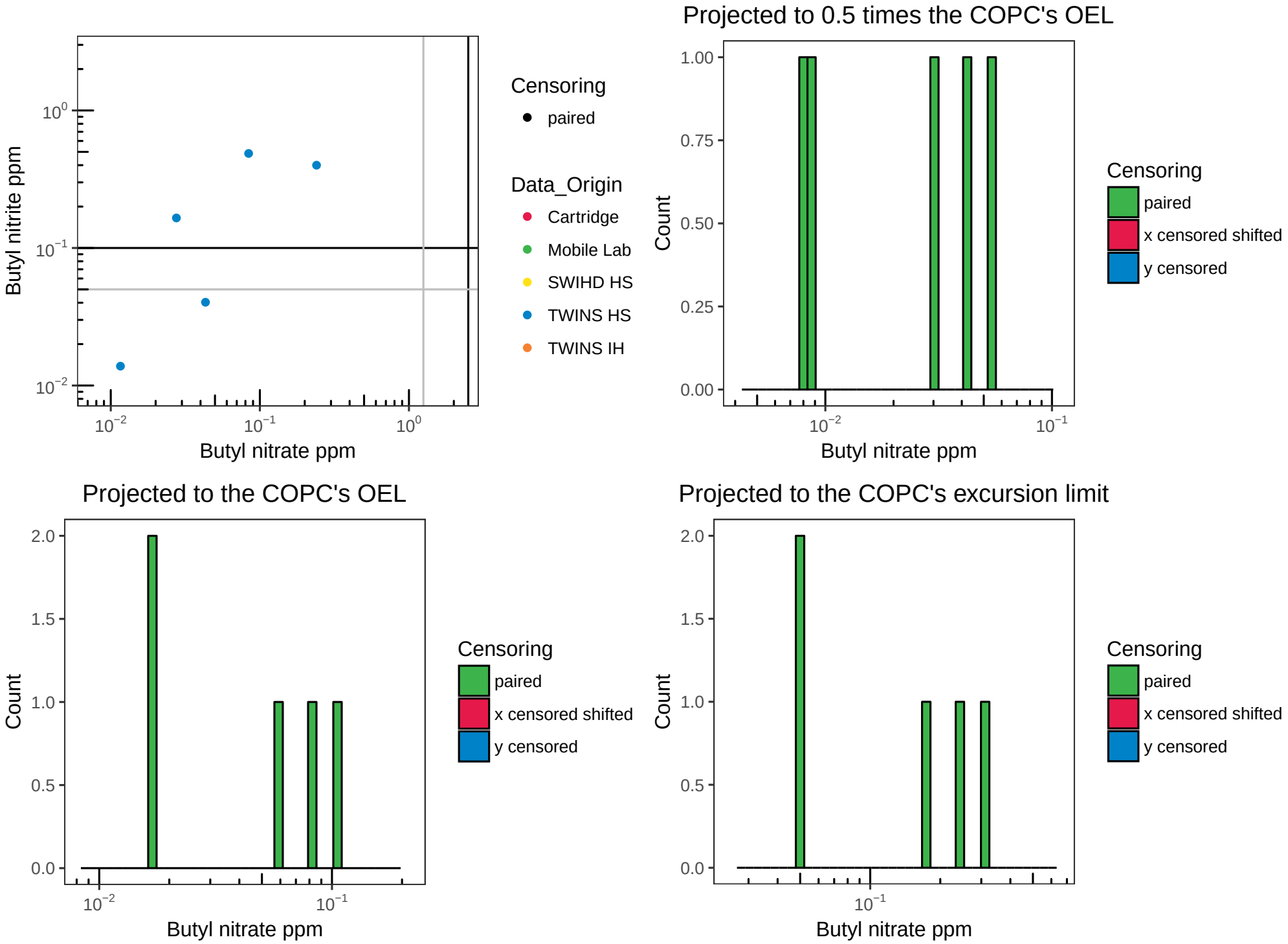


Figure C.2682: Butyl nitrite vs Butyl nitrate

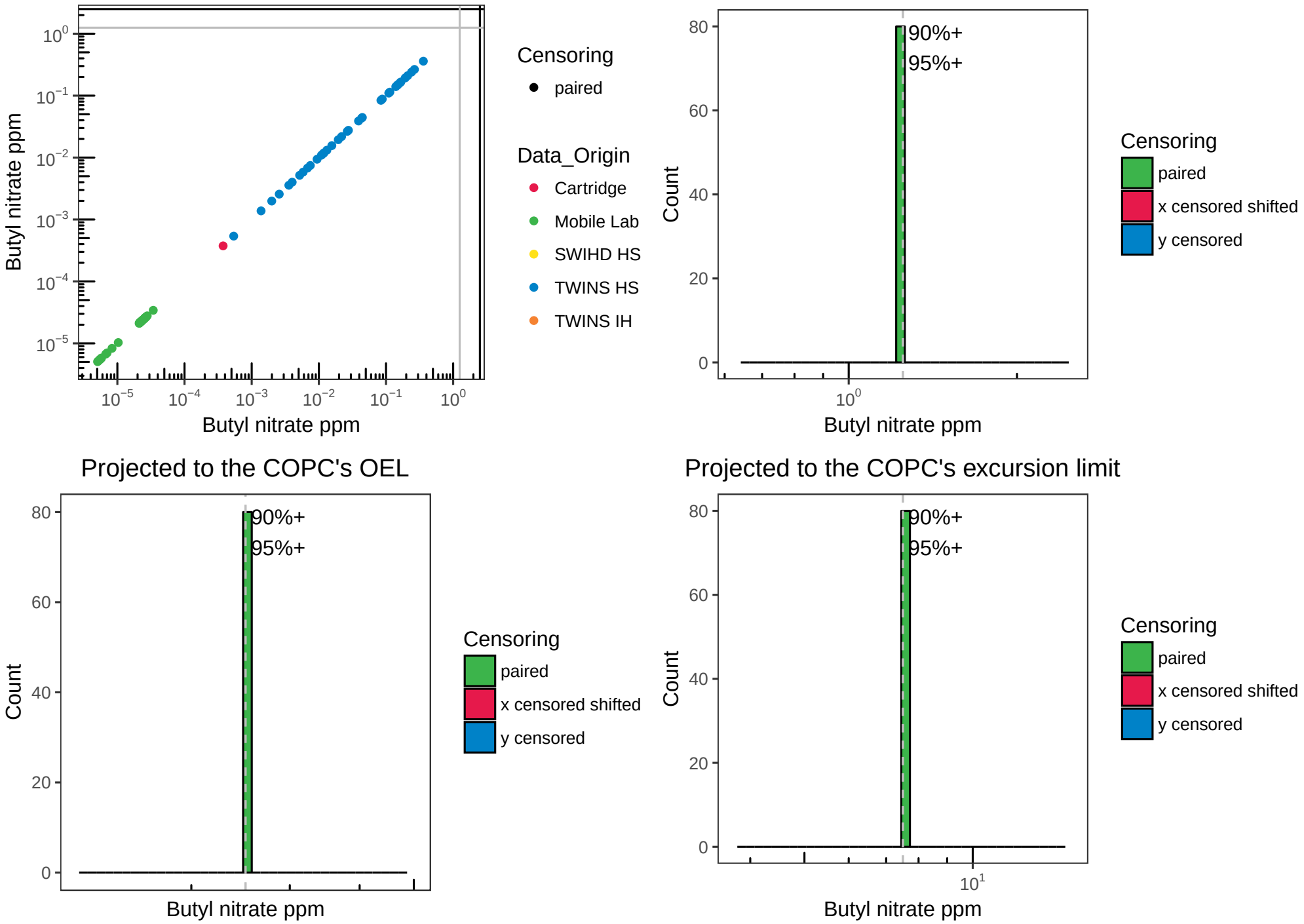


Figure C.2683: Butyl nitrate vs Butyl nitrate

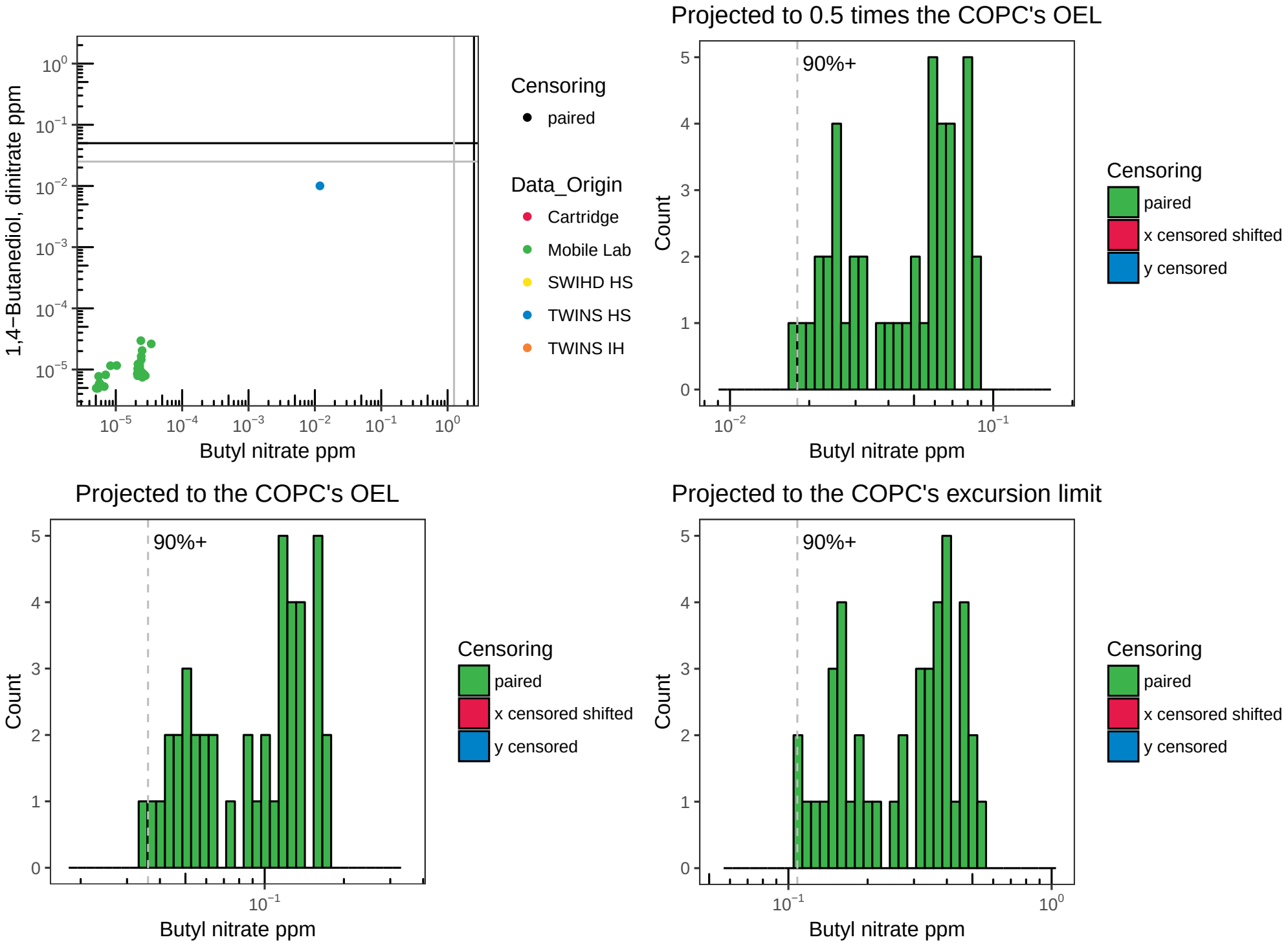


Figure C.2684: 1,4-Butanediol, dinitrate vs Butyl nitrate

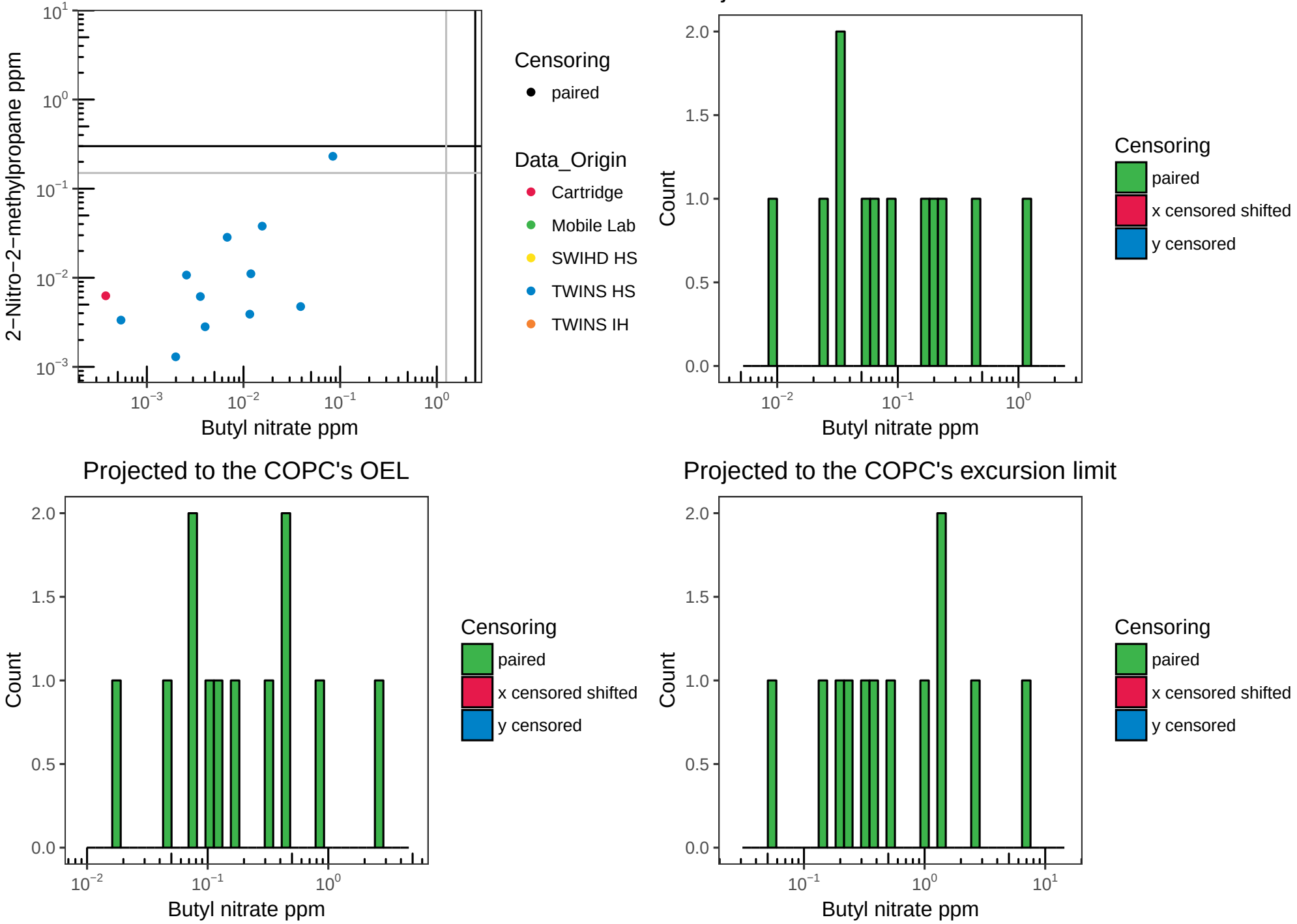


Figure C.2685: 2-Nitro-2-methylpropane vs Butyl nitrate

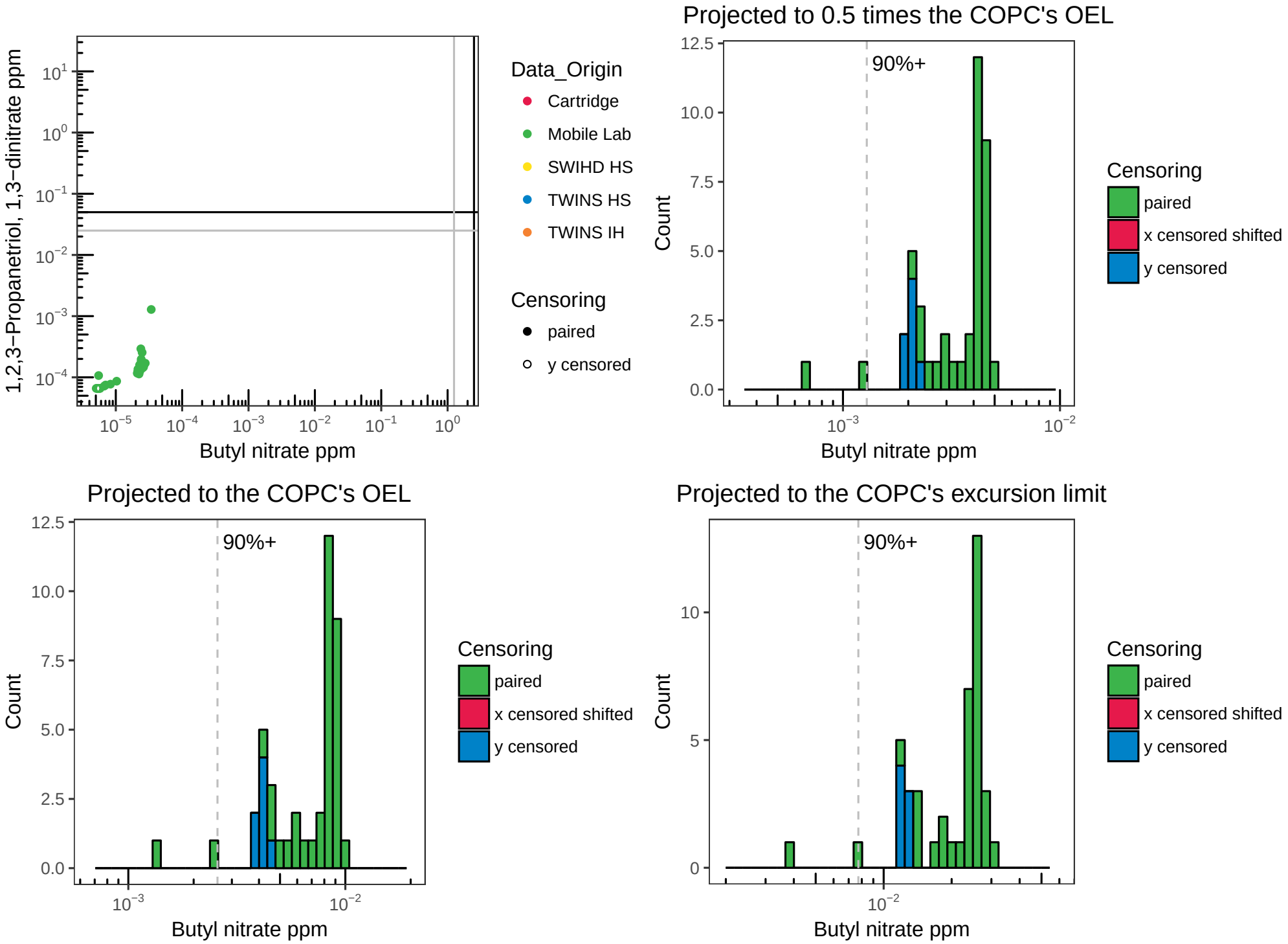


Figure C.2686: 1,2,3-Propanetriol, 1,3-dinitrate vs Butyl nitrate

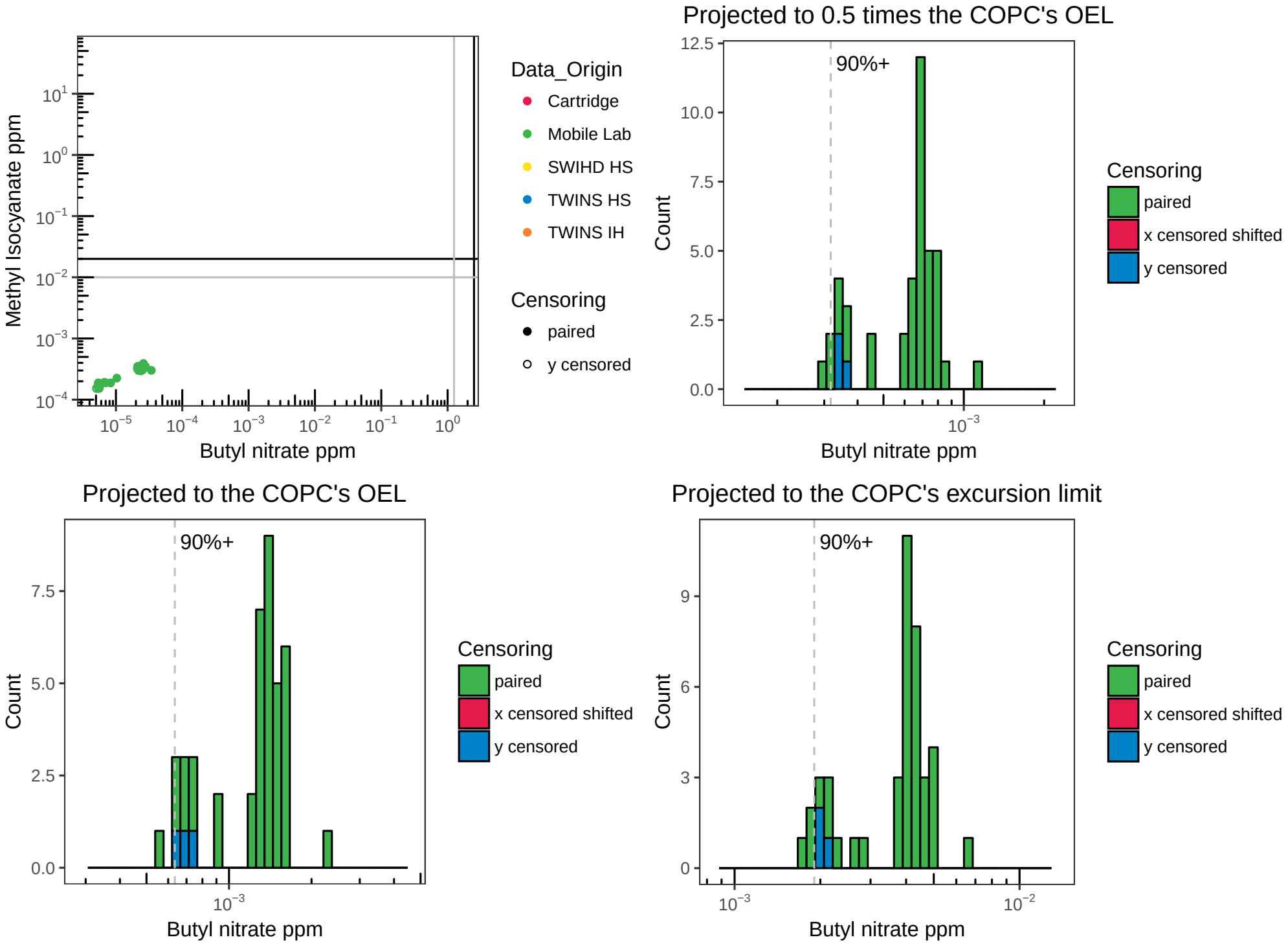


Figure C.2687: Methyl Isocyanate vs Butyl nitrate

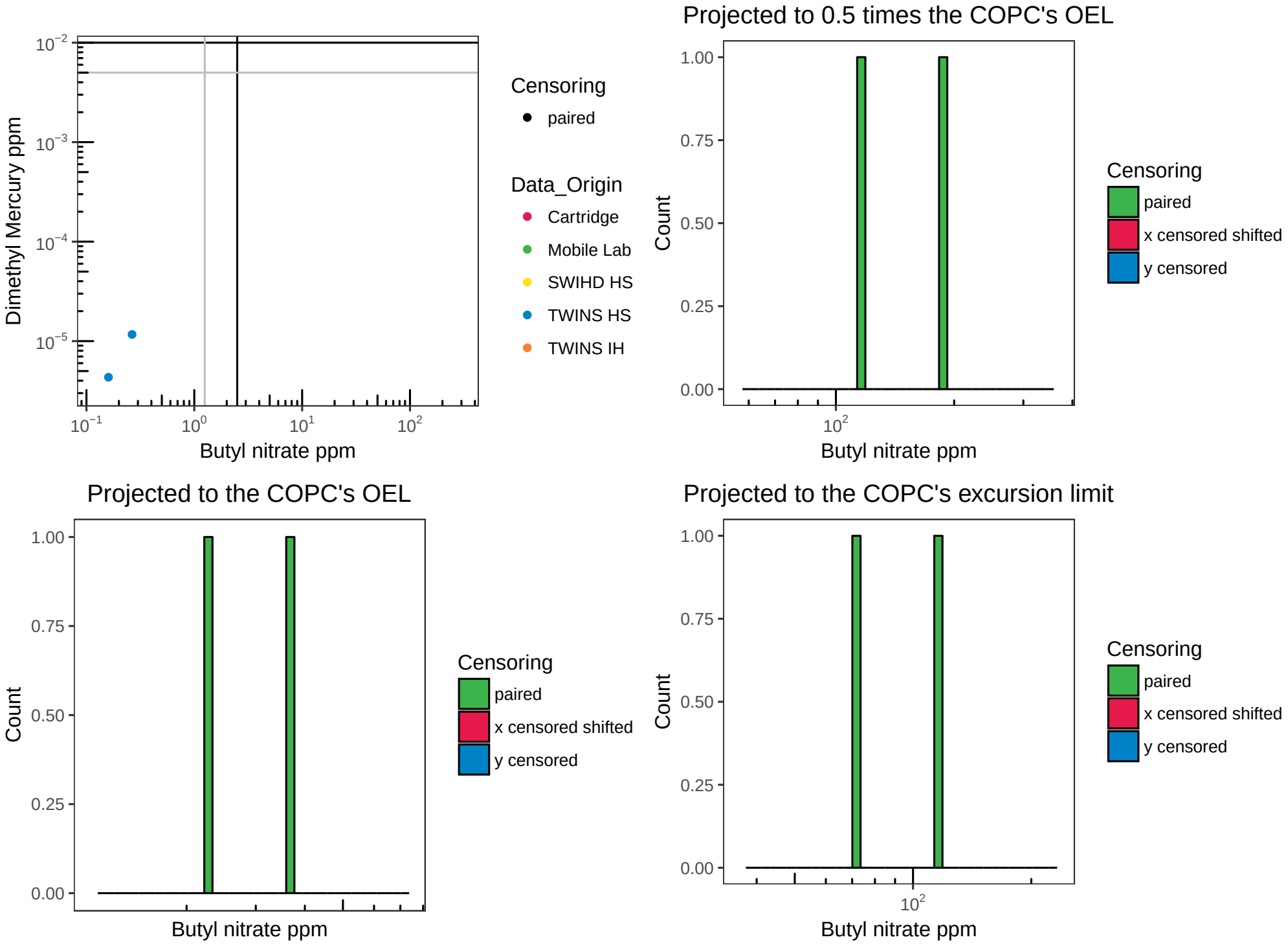


Figure C.2688: Dimethyl Mercury vs Butyl nitrate

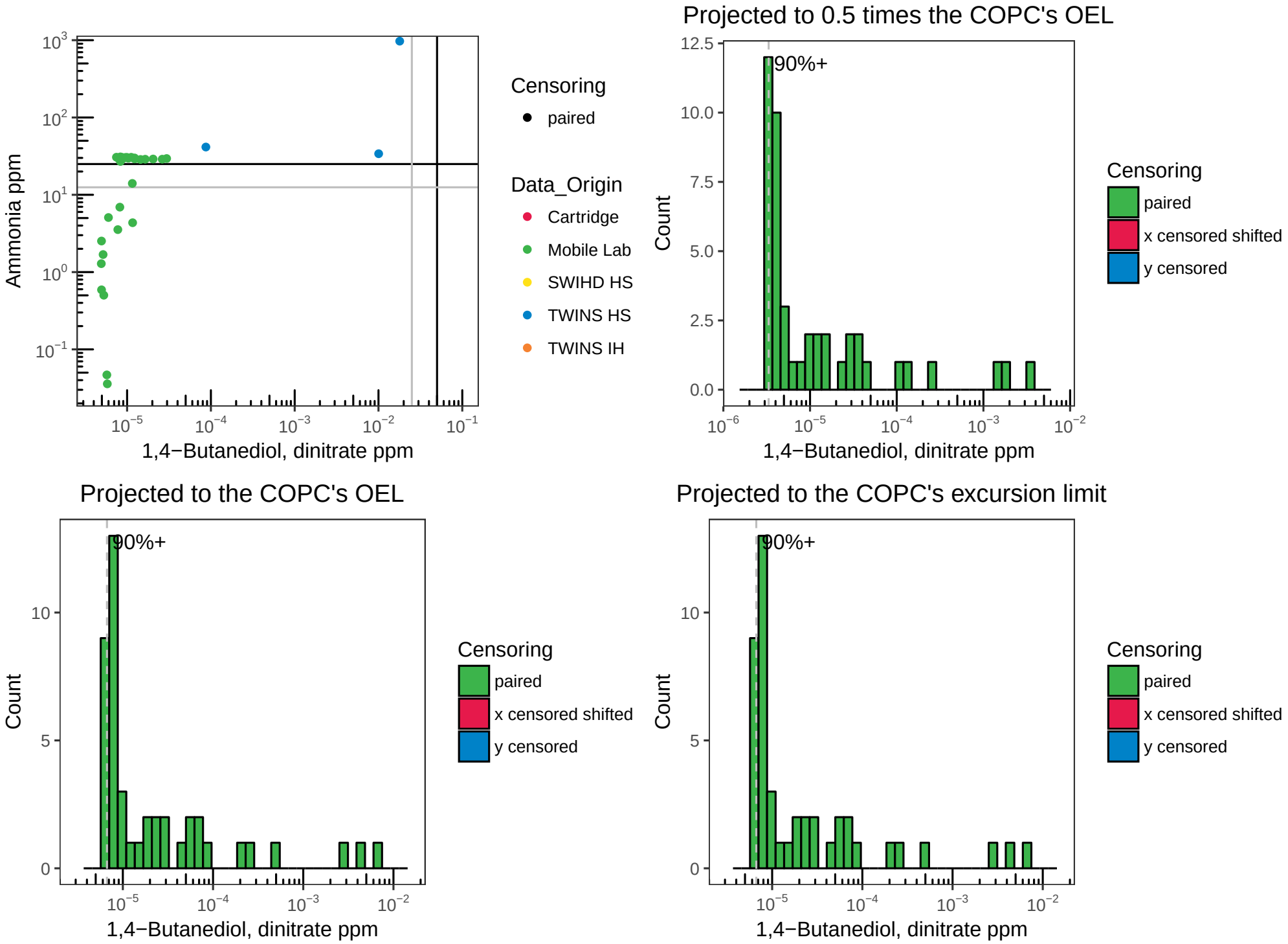


Figure C.2689: Ammonia vs 1,4-Butanediol, dinitrate

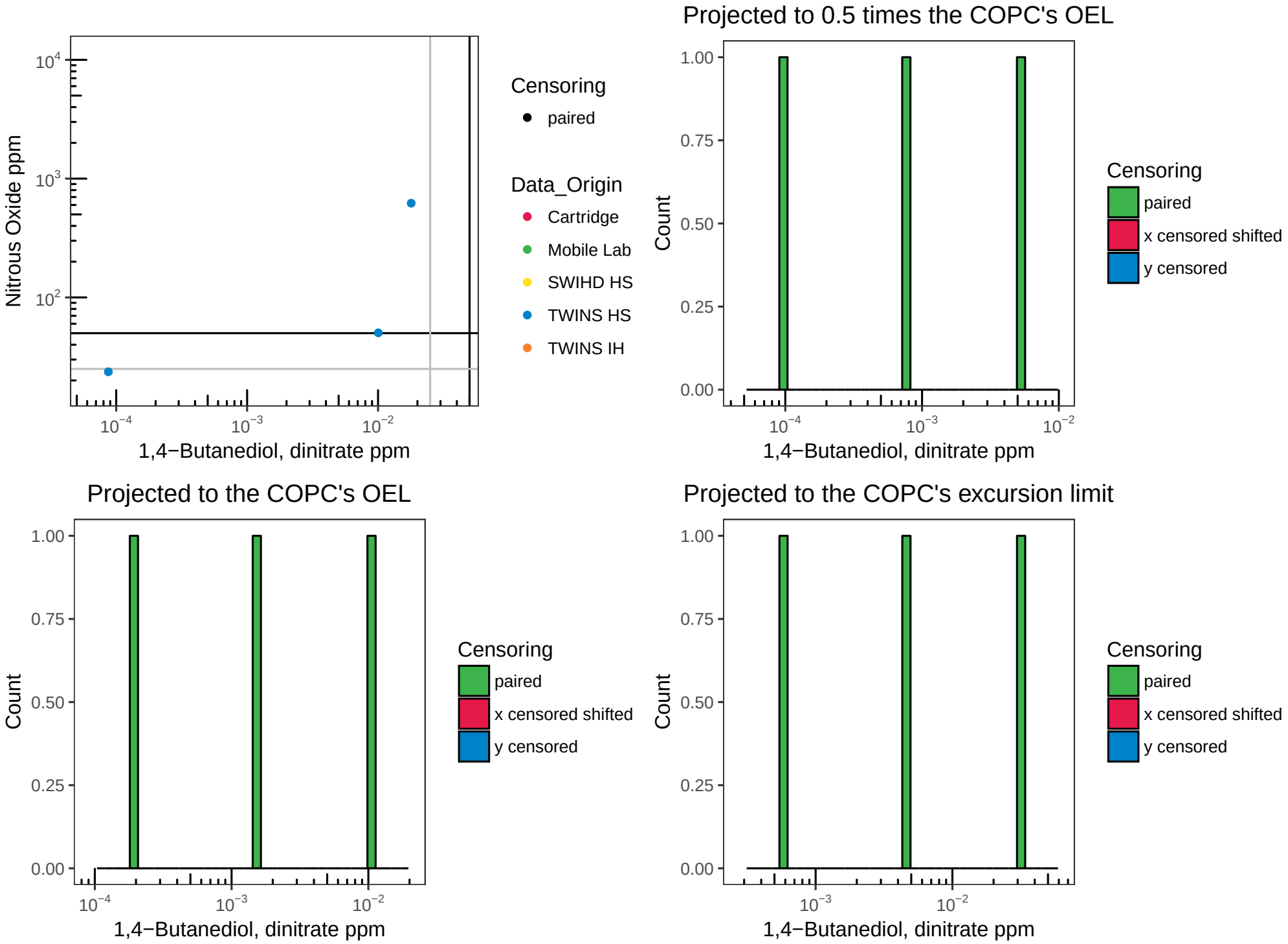


Figure C.2690: Nitrous Oxide vs 1,4-Butanediol, dinitrate

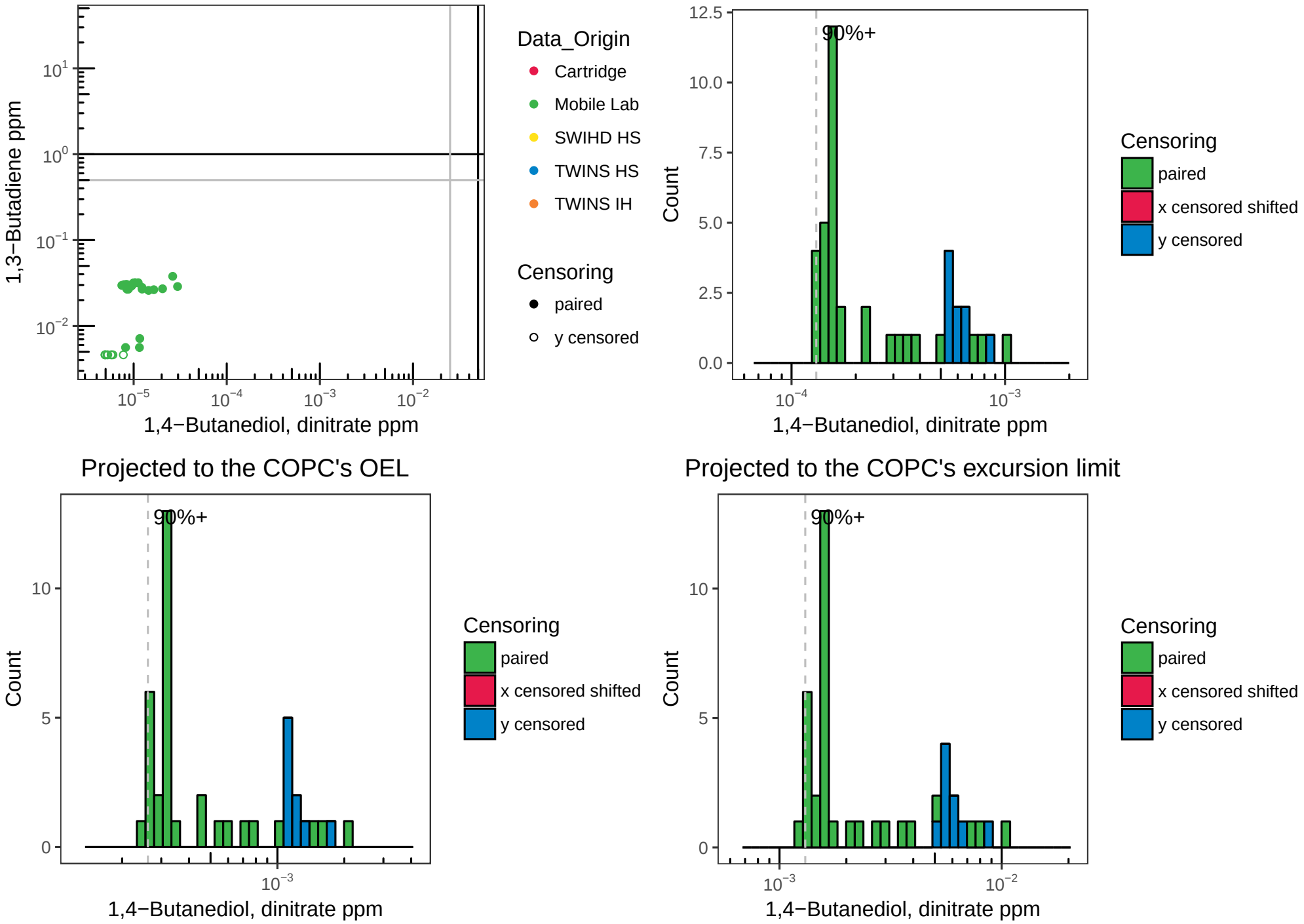


Figure C.2691: 1,3-Butadiene vs 1,4-Butanediol, dinitrate

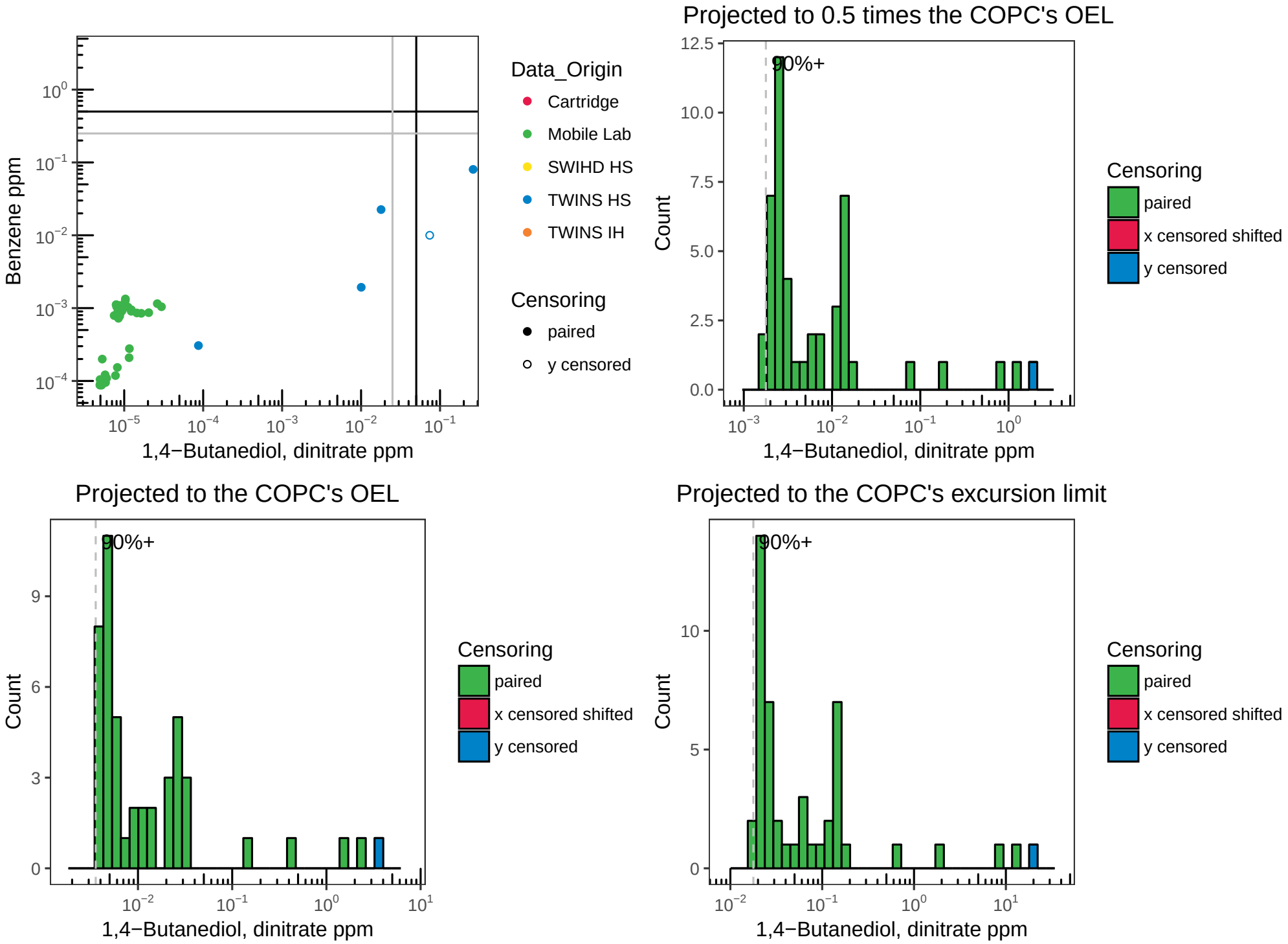


Figure C.2692: Benzene vs 1,4-Butanediol, dinitrate

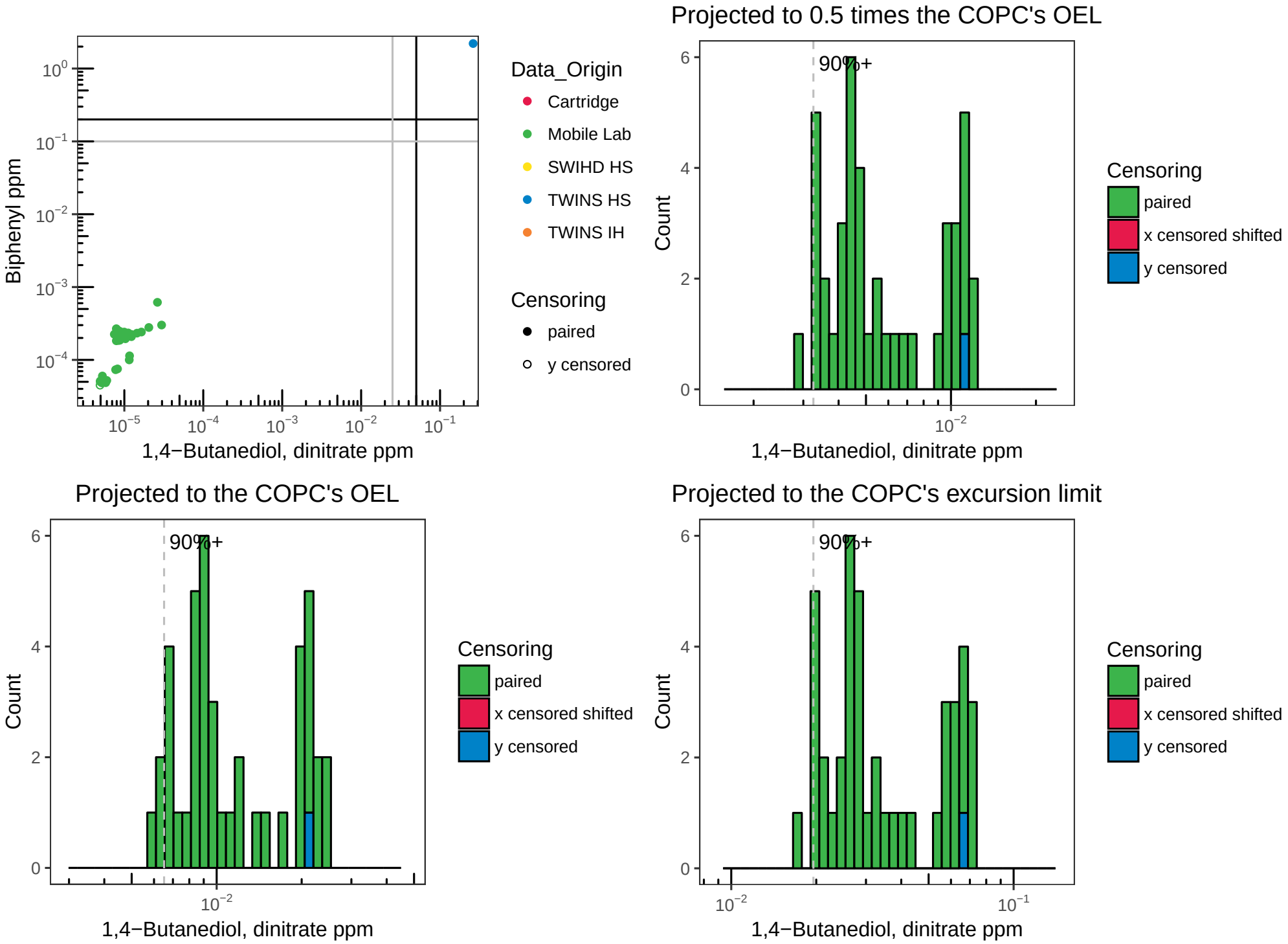


Figure C.2693: Biphenyl vs 1,4-Butanediol, dinitrate

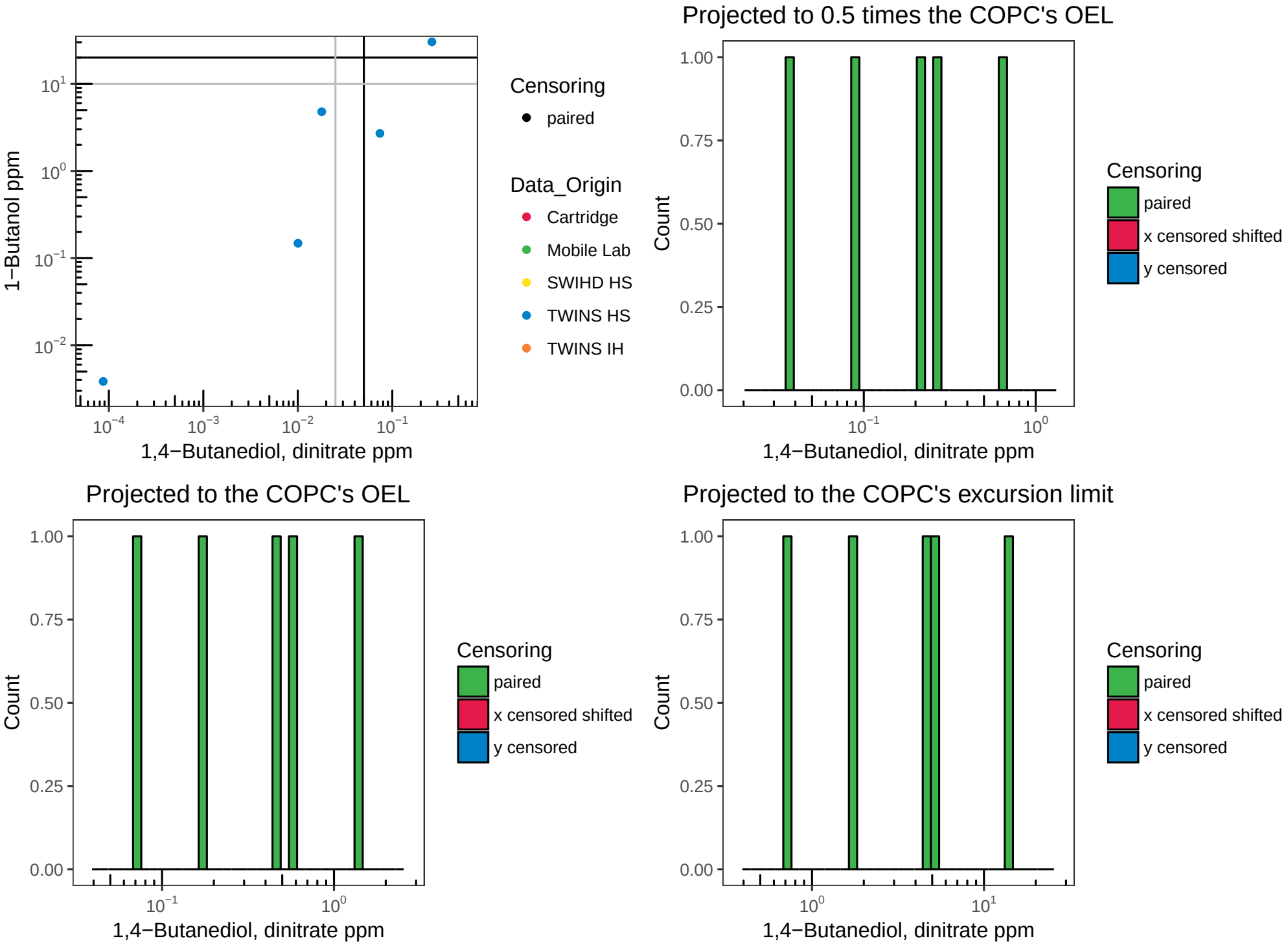


Figure C.2694: 1-Butanol vs 1,4-Butanediol, dinitrate

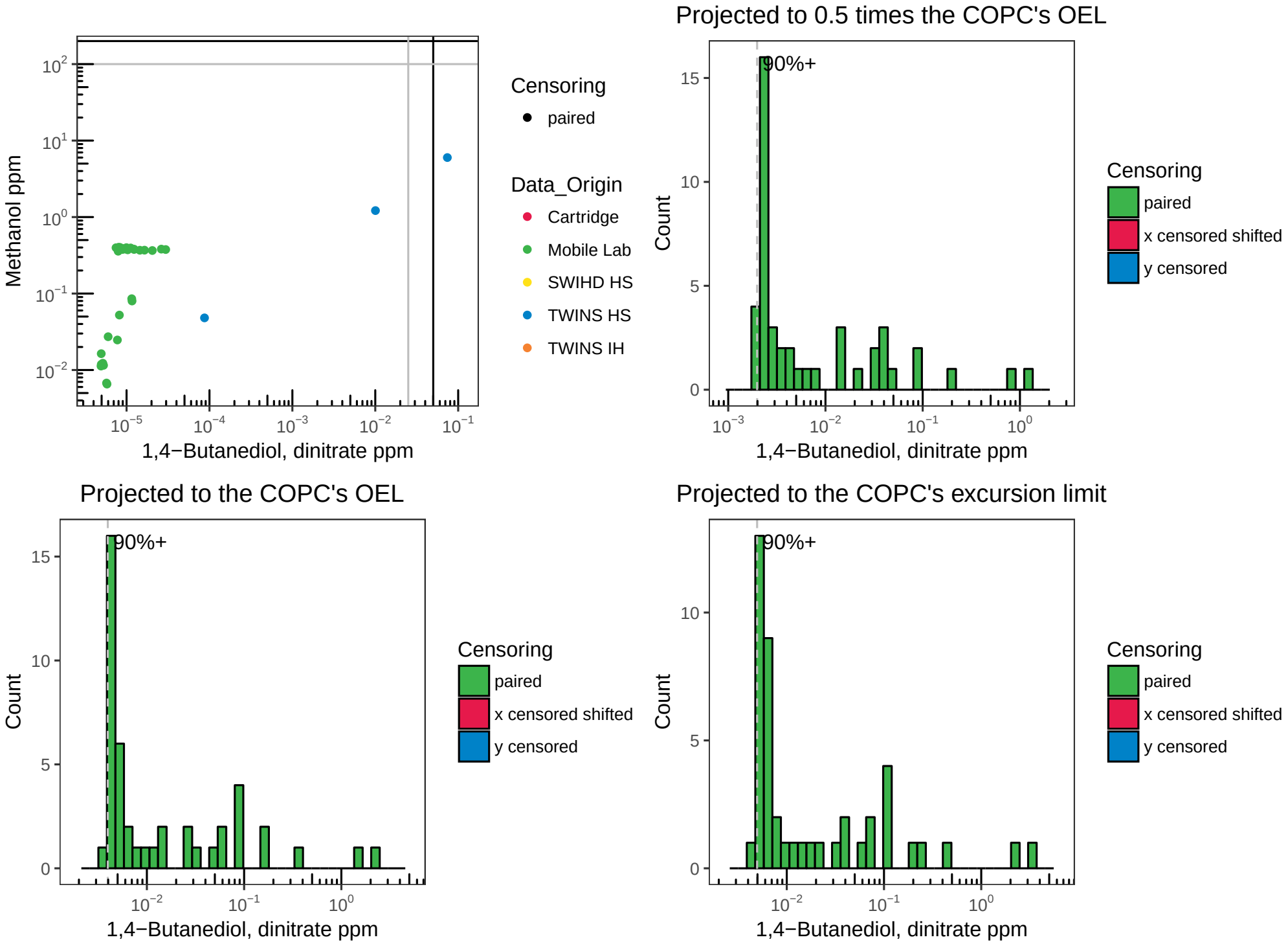


Figure C.2695: Methanol vs 1,4-Butanediol, dinitrate

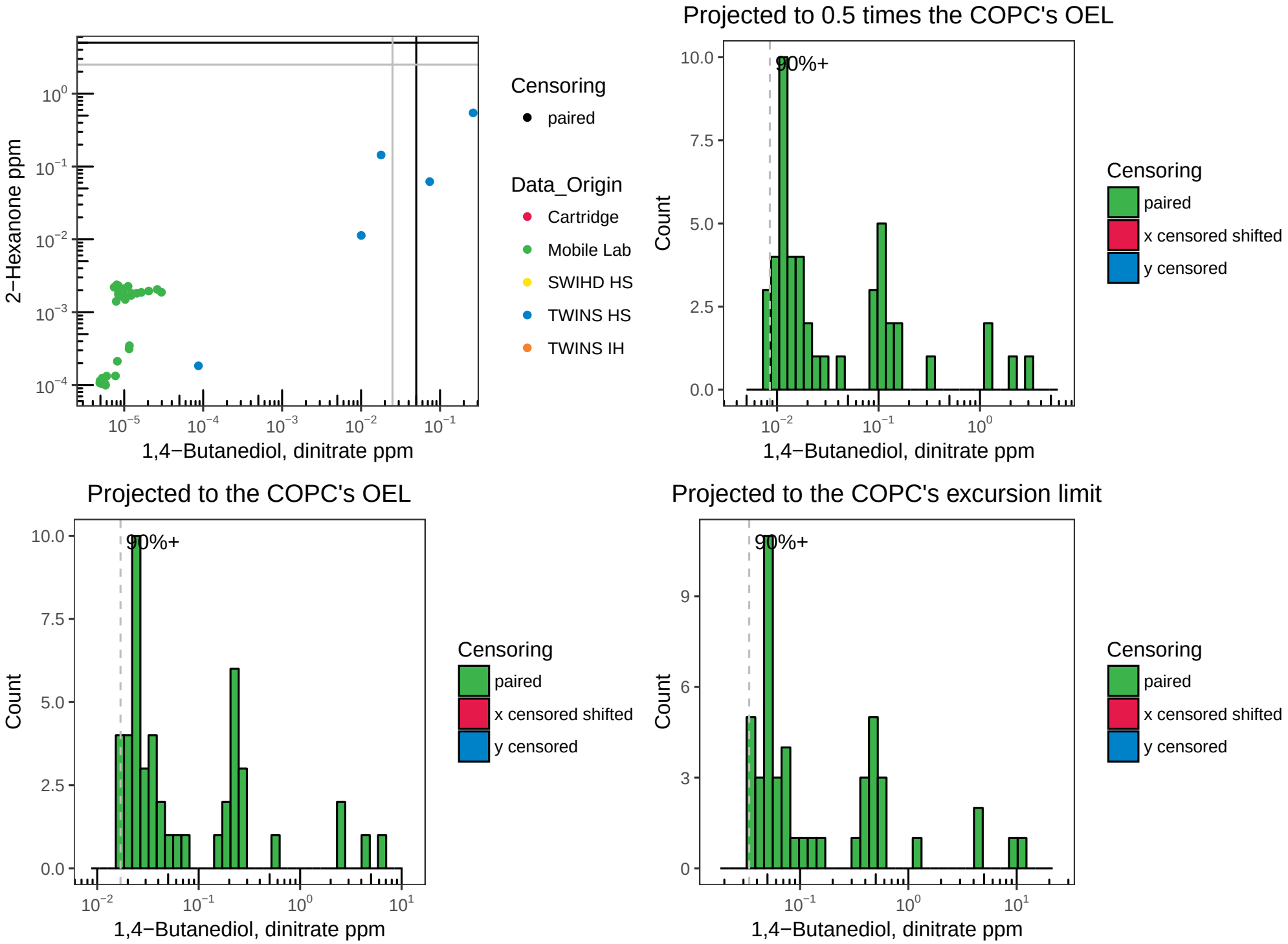


Figure C.2696: 2-Hexanone vs 1,4-Butanediol, dinitrate

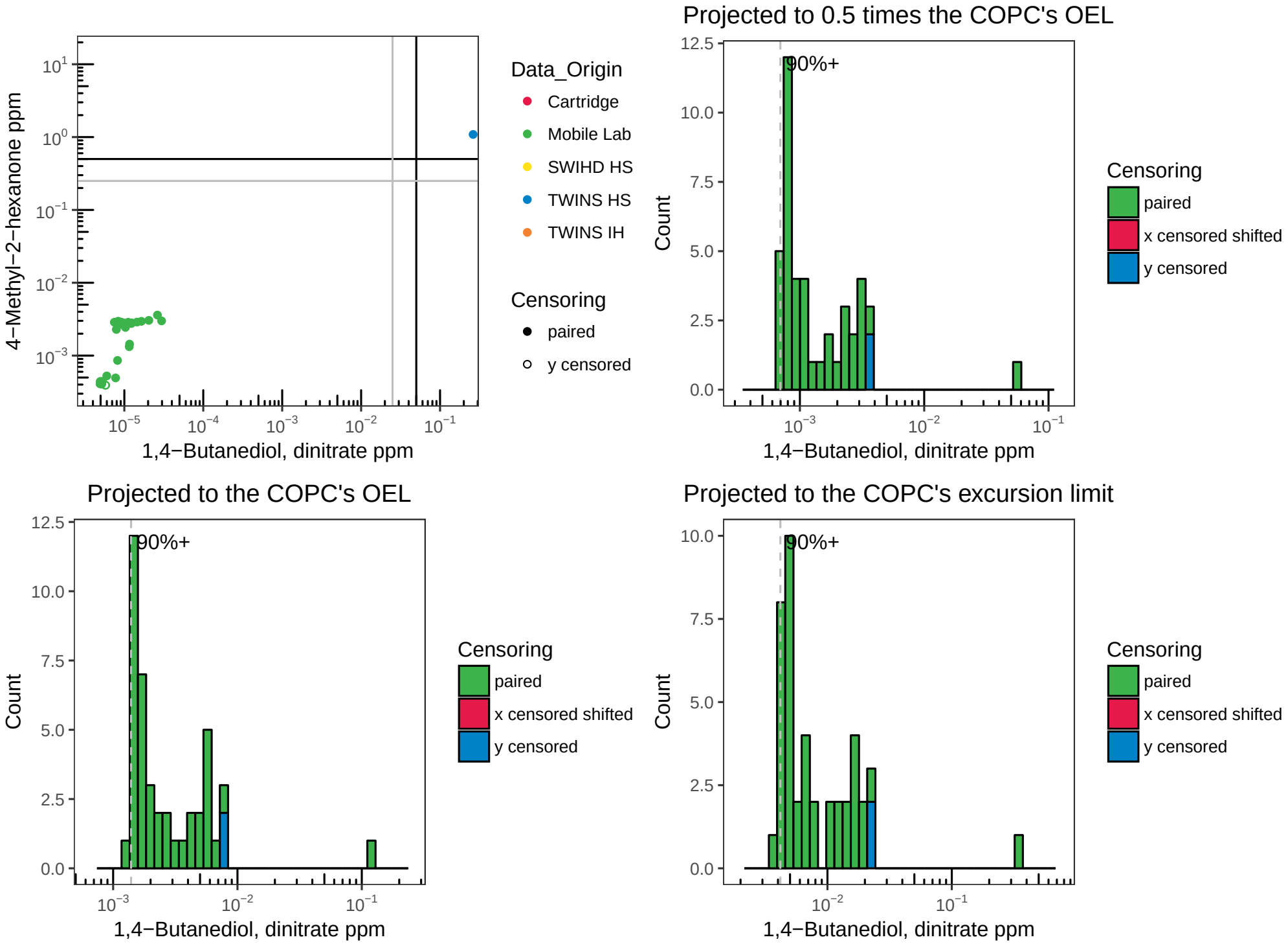


Figure C.2697: 4-Methyl-2-hexanone vs 1,4-Butanediol, dinitrate

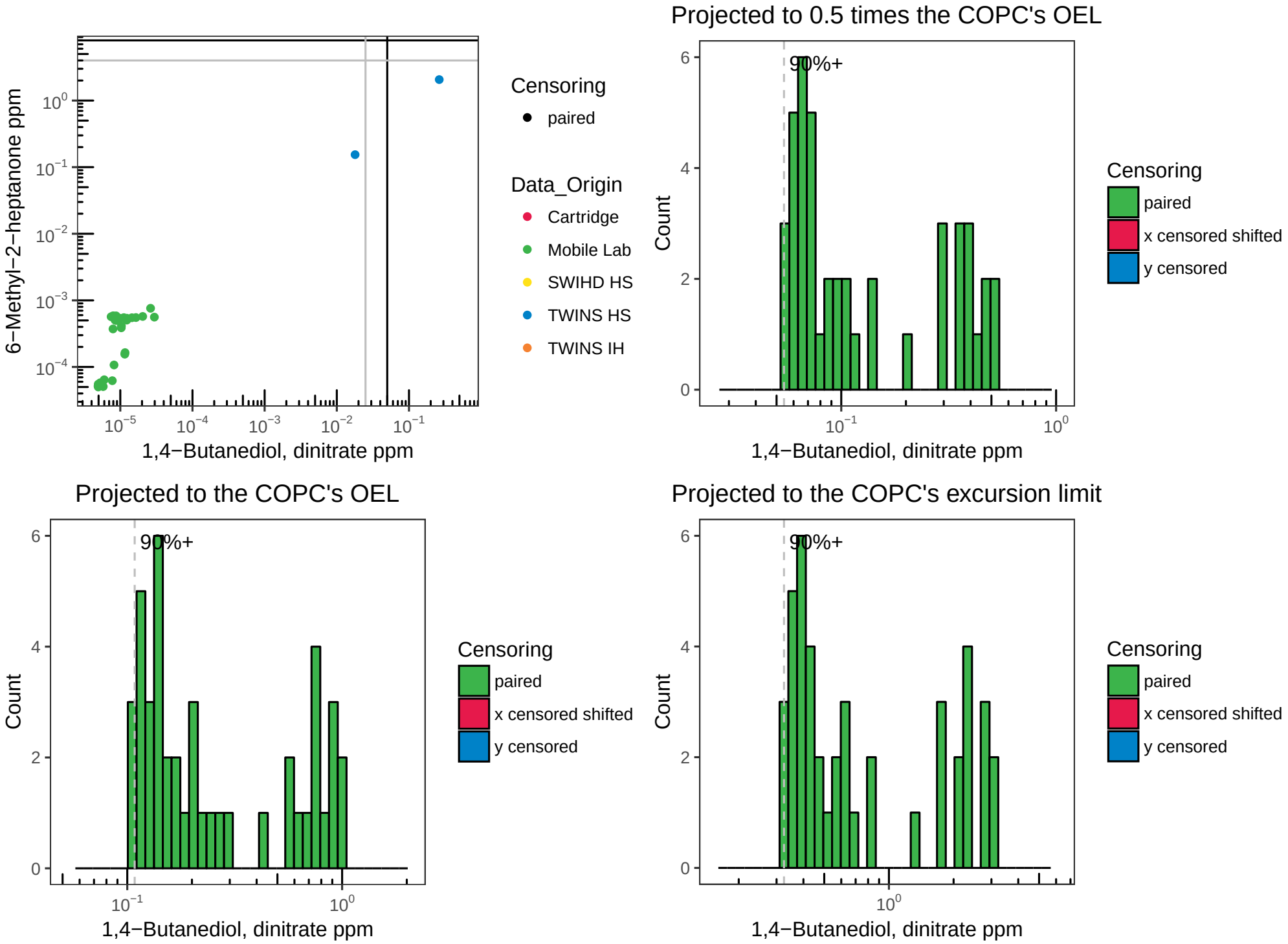


Figure C.2698: 6-Methyl-2-heptanone vs 1,4-Butanediol, dinitrate

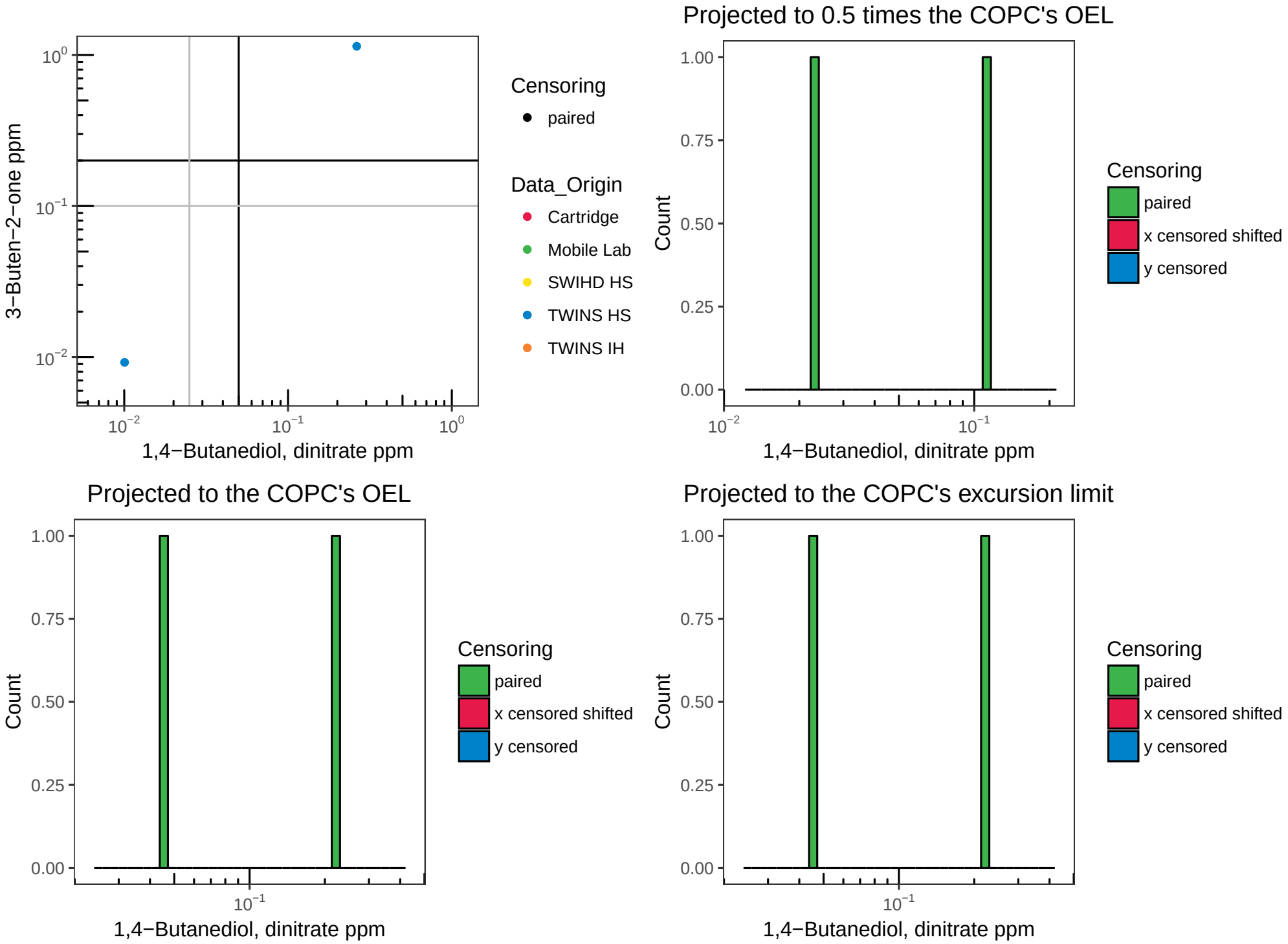


Figure C.2699: 3-Buten-2-one vs 1,4-Butanediol, dinitrate

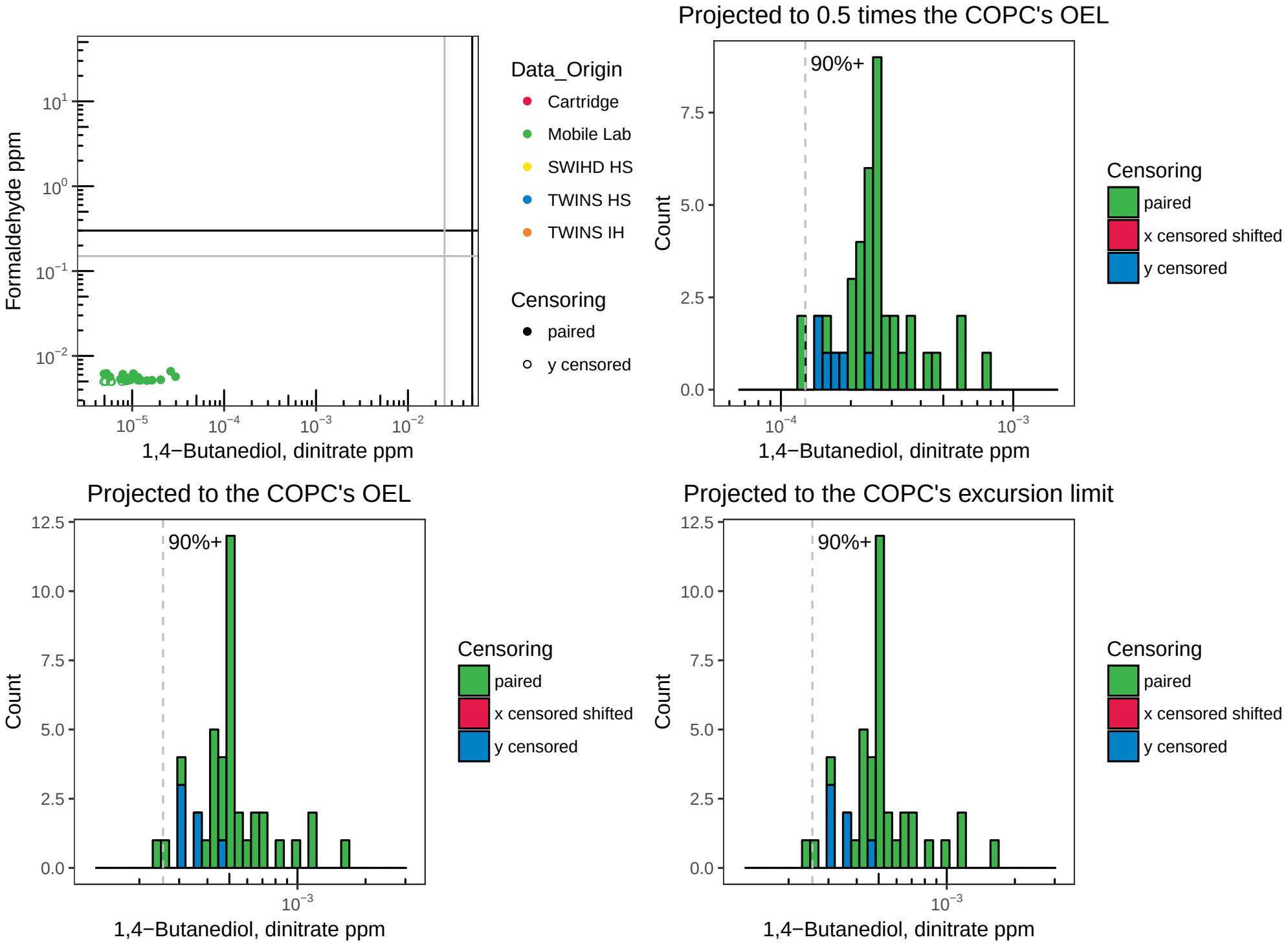


Figure C.2700: Formaldehyde vs 1,4-Butanediol, dinitrate

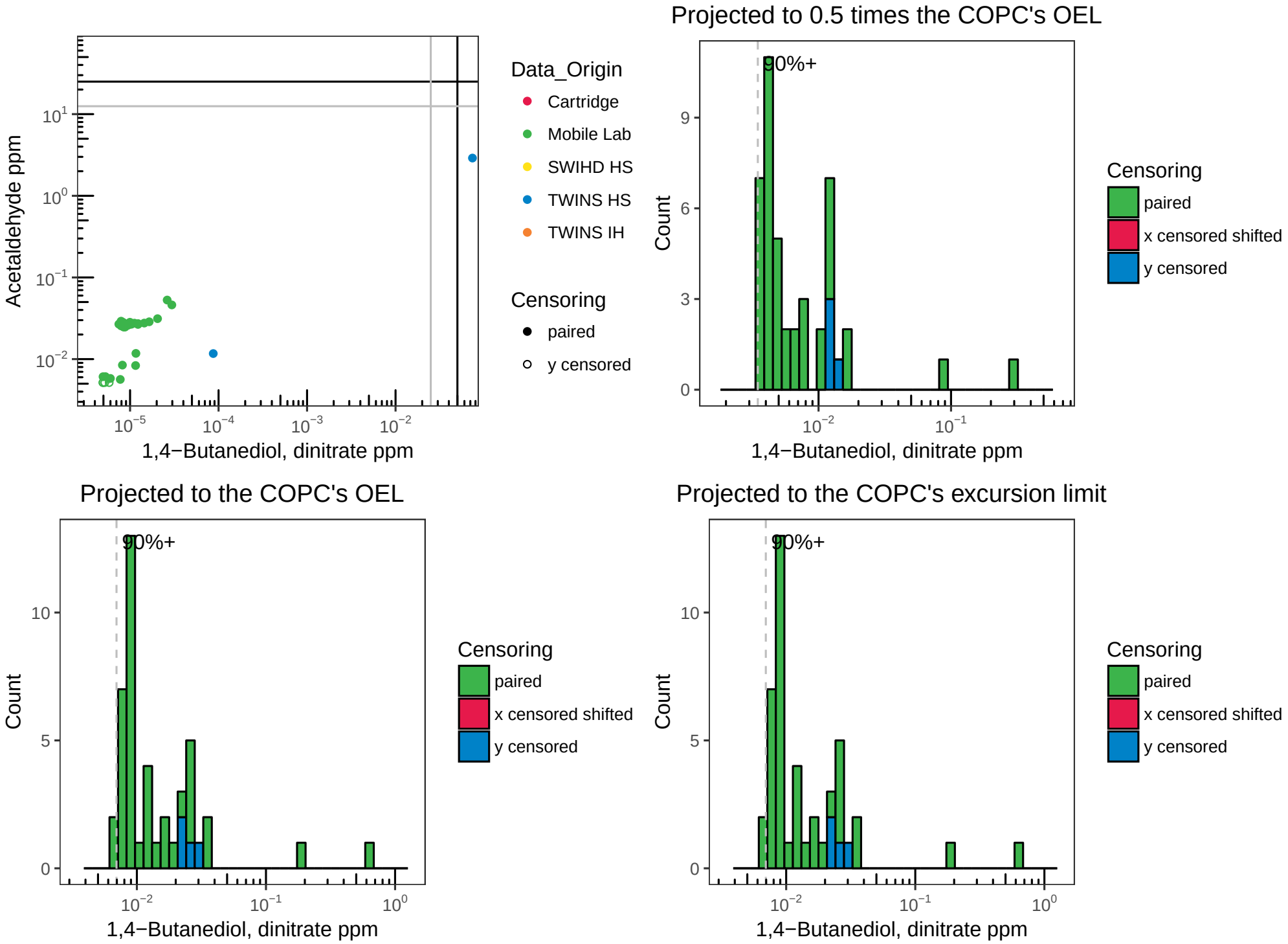


Figure C.2701: Acetaldehyde vs 1,4-Butanediol, dinitrate

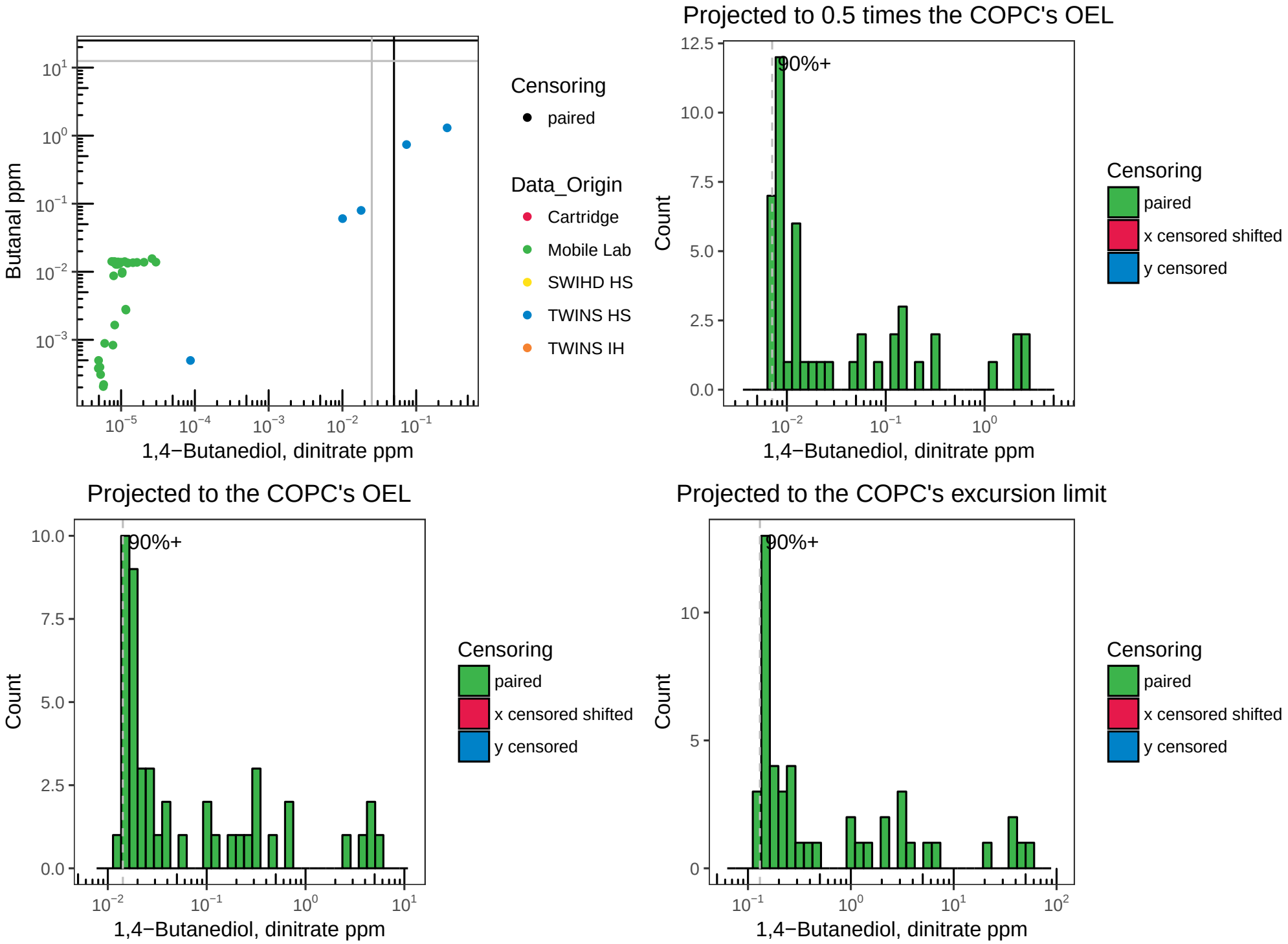


Figure C.2702: Butanal vs 1,4-Butanediol, dinitrate

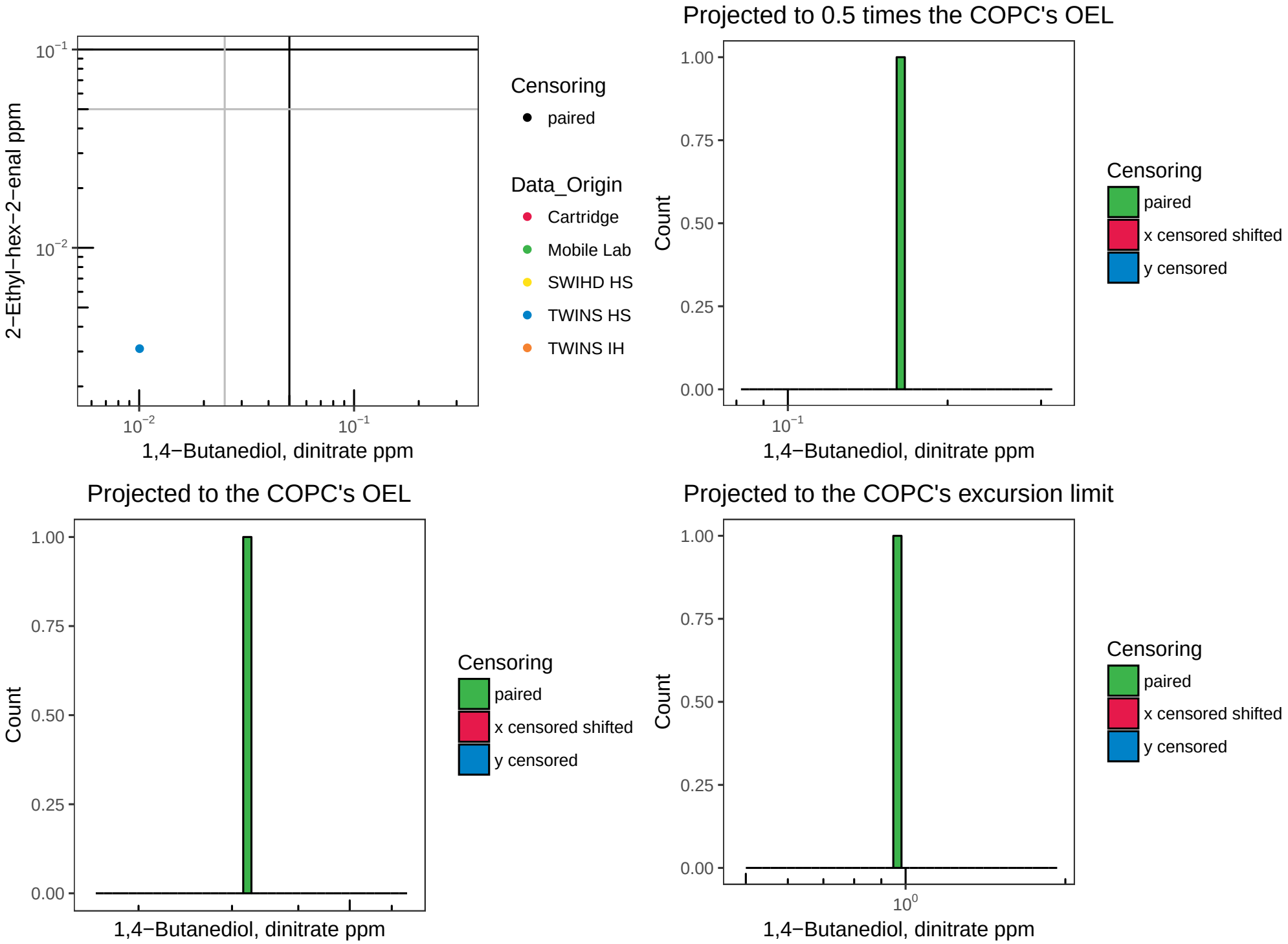


Figure C.2703: 2-Ethyl-hex-2-enal vs 1,4-Butanediol, dinitrate

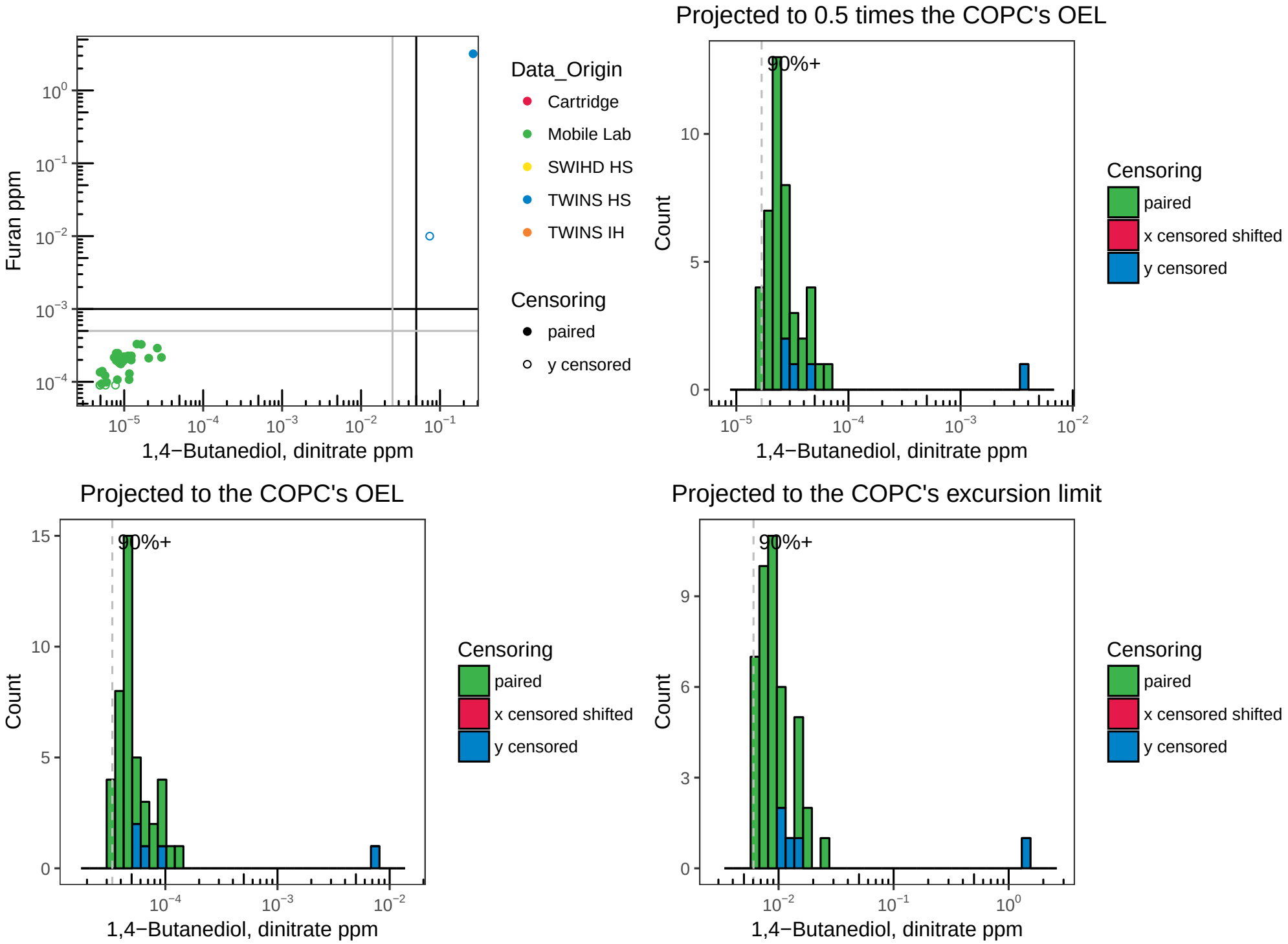


Figure C.2704: Furan vs 1,4-Butanediol, dinitrate

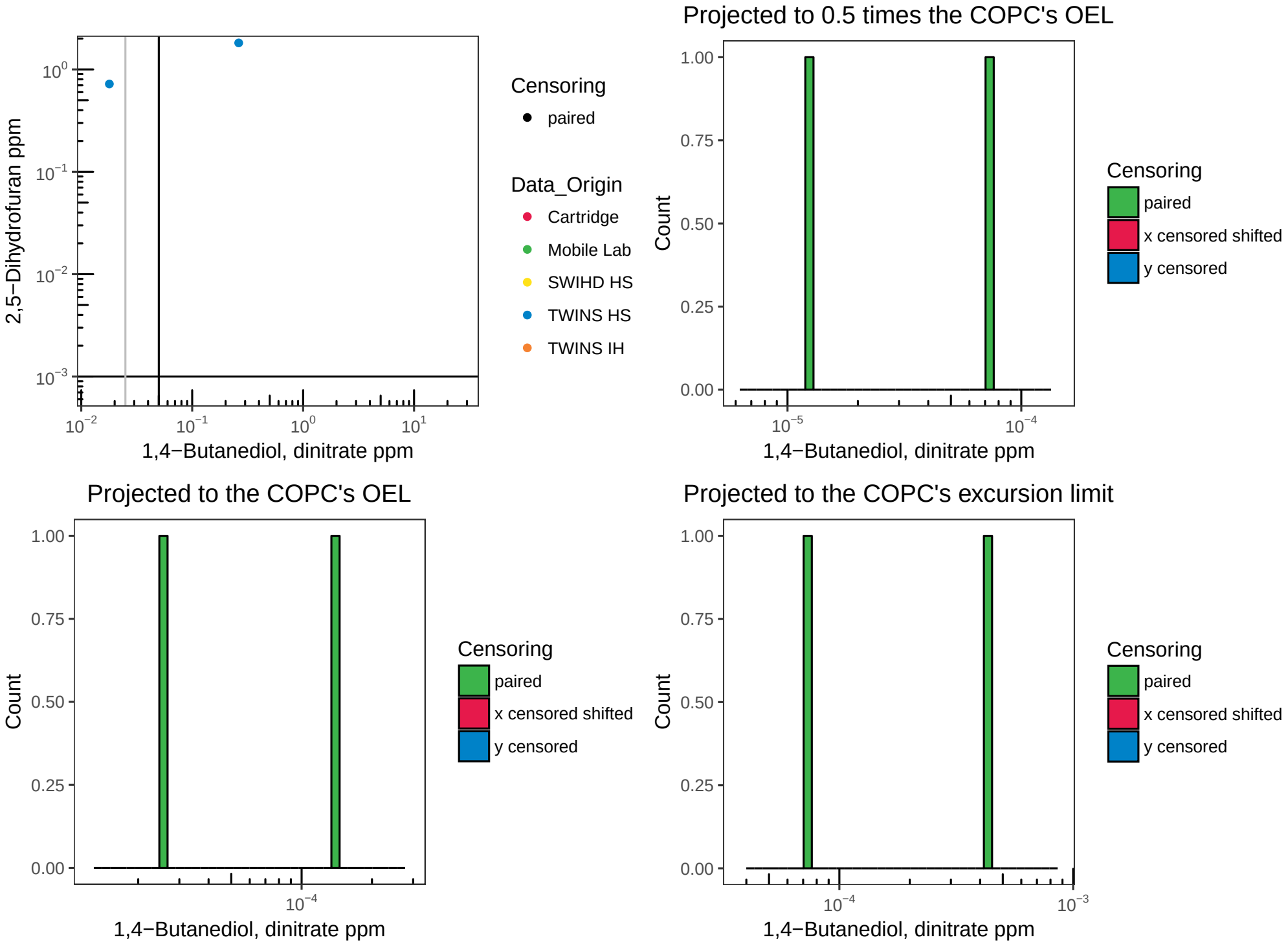


Figure C.2705: 2,5-Dihydrofuran vs 1,4-Butanediol, dinitrate

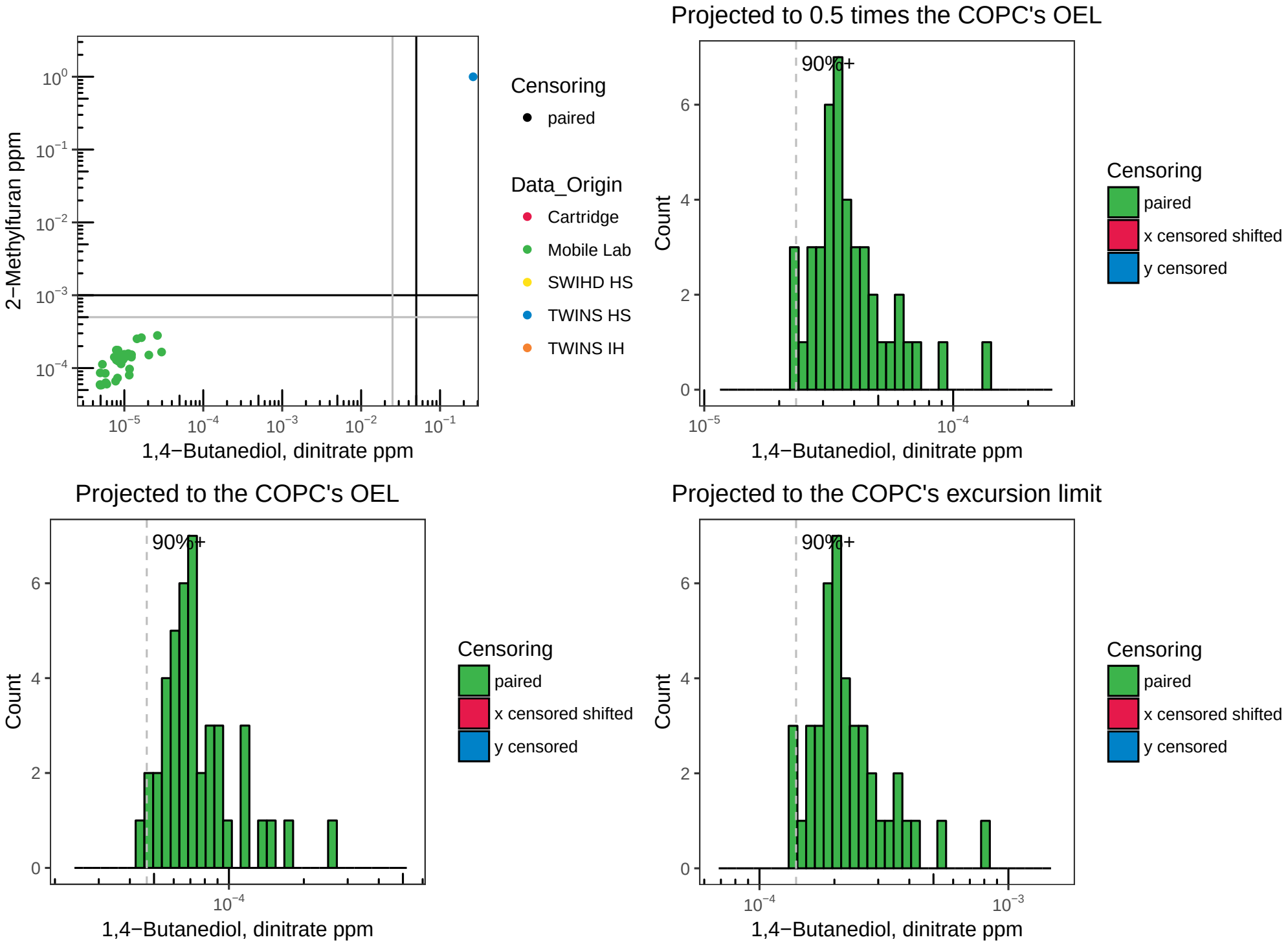


Figure C.2706: 2-Methylfuran vs 1,4-Butanediol, dinitrate

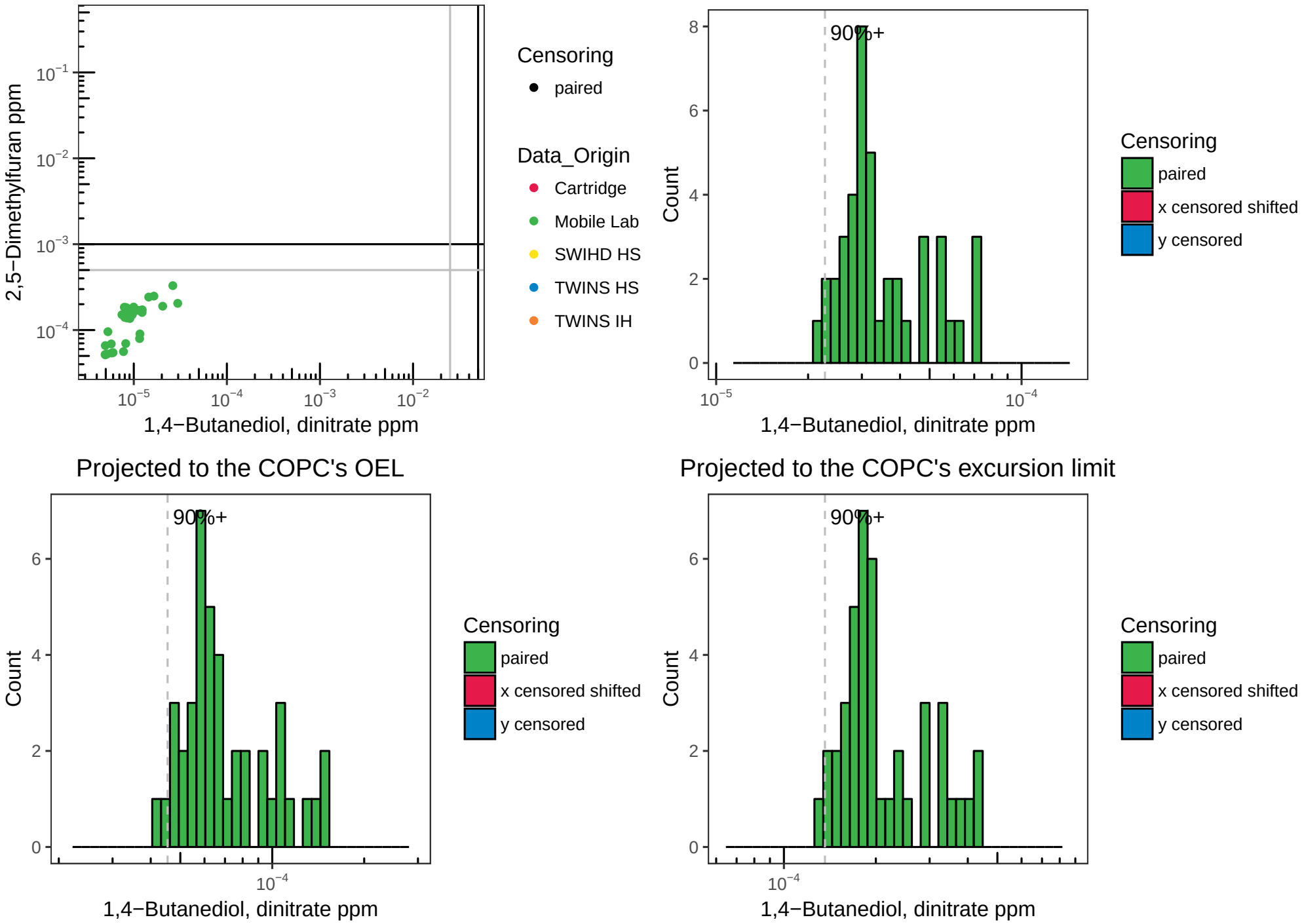


Figure C.2707: 2,5-Dimethylfuran vs 1,4-Butanediol, dinitrate

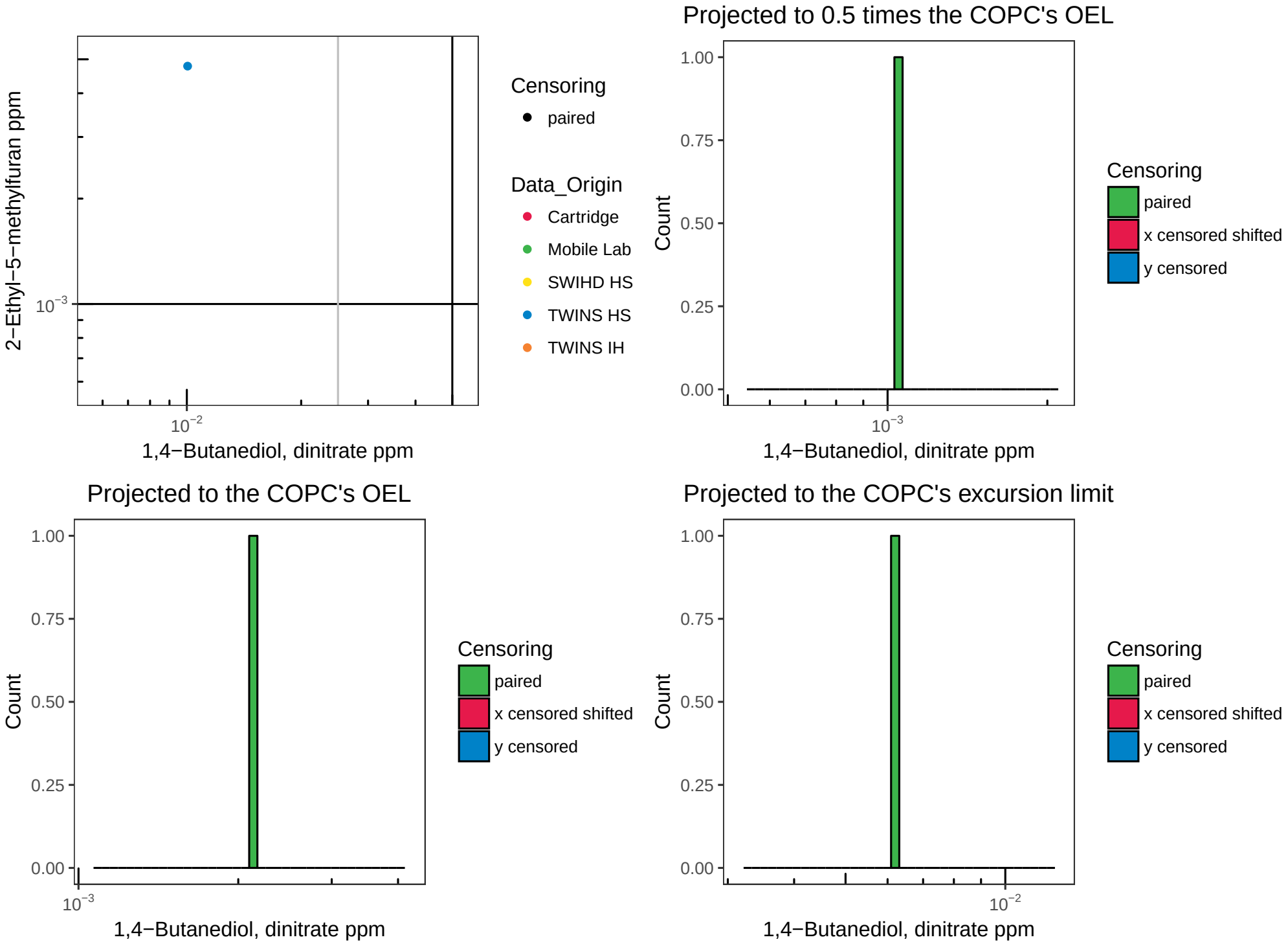


Figure C.2708: 2-Ethyl-5-methylfuran vs 1,4-Butanediol, dinitrate

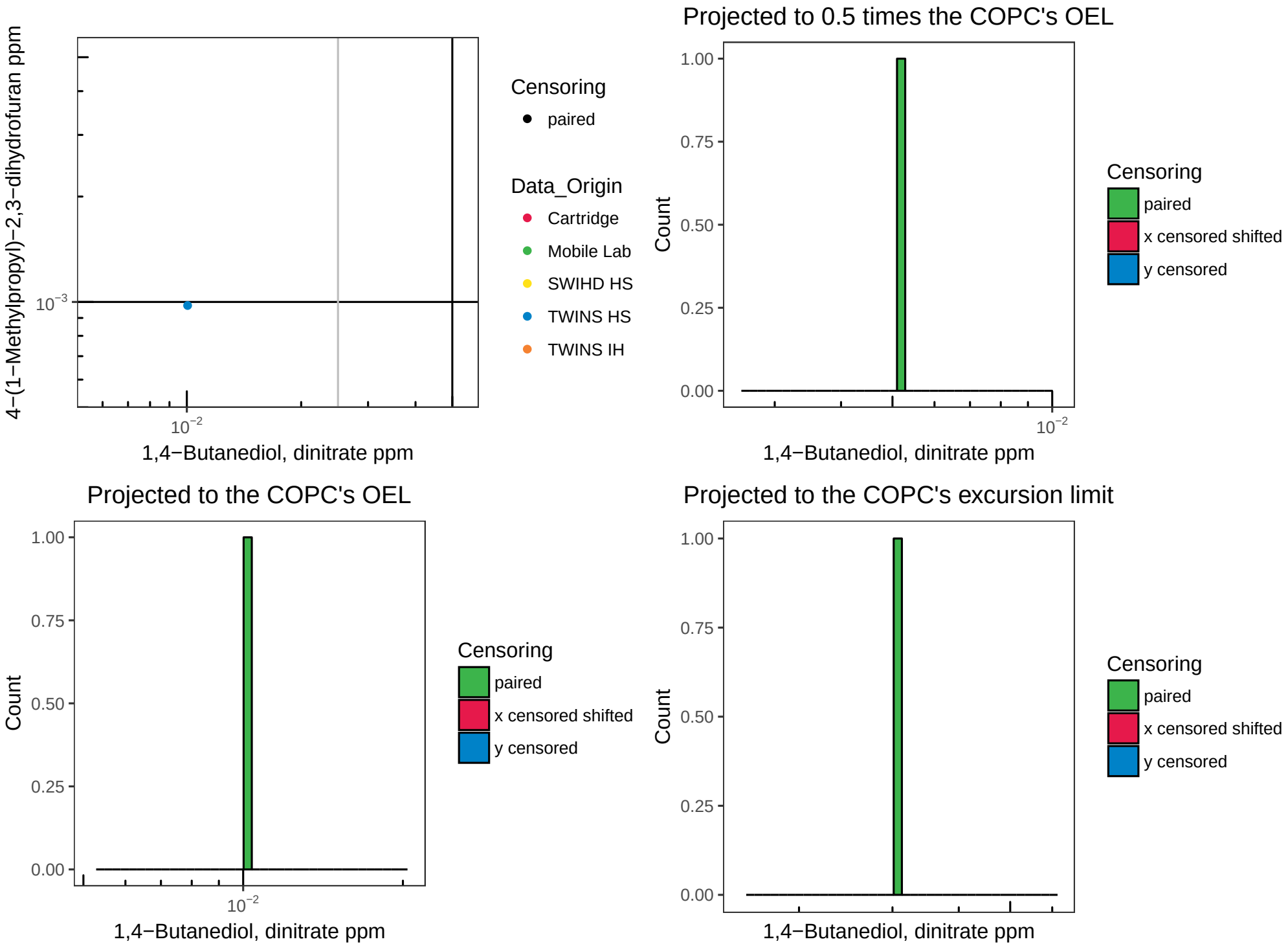


Figure C.2709: 4-(1-Methylpropyl)-2,3-dihydrofuran vs 1,4-Butanediol, dinitrate

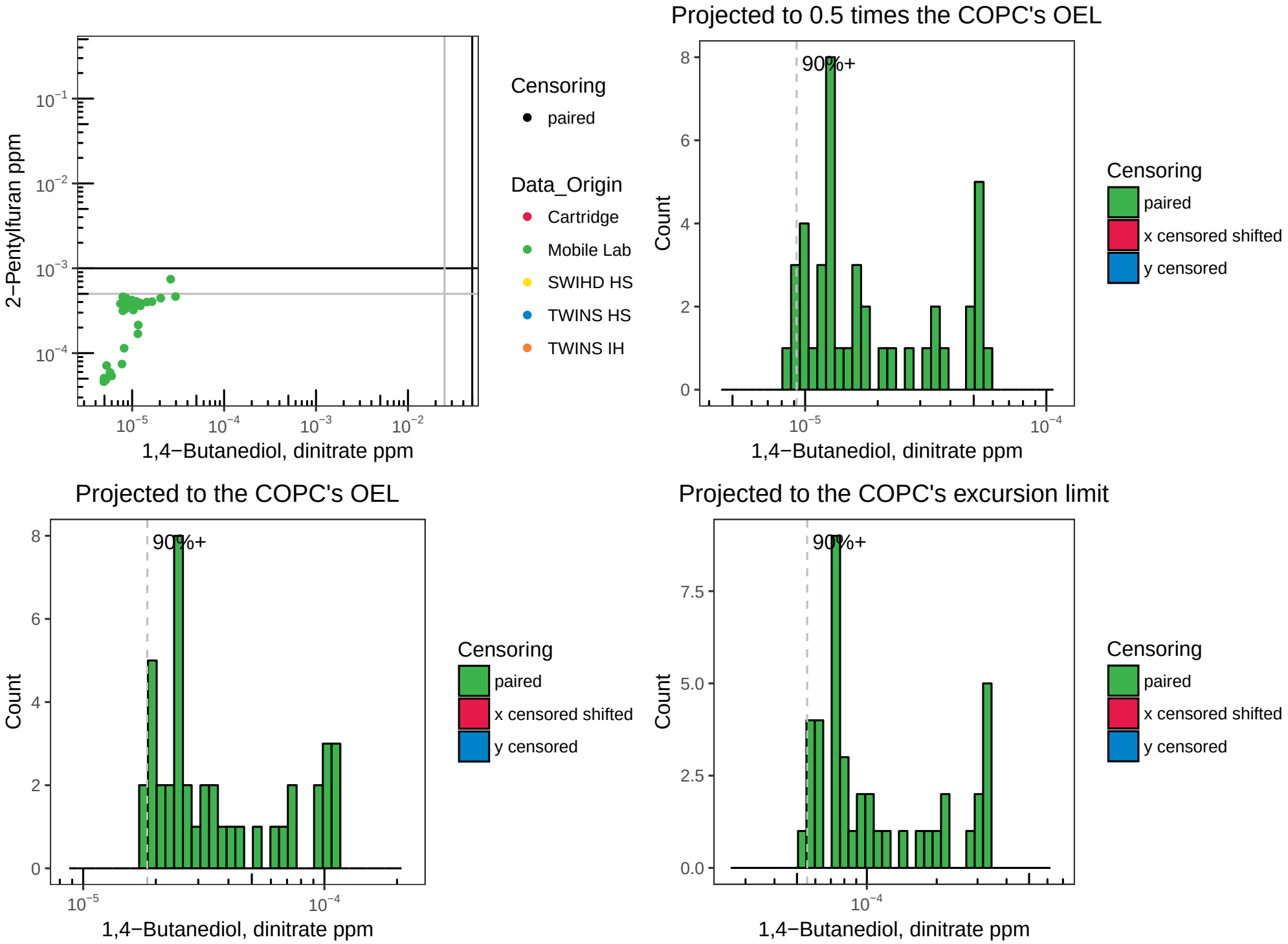


Figure C.2710: 2-Pentylfuran vs 1,4-Butanediol, dinitrate

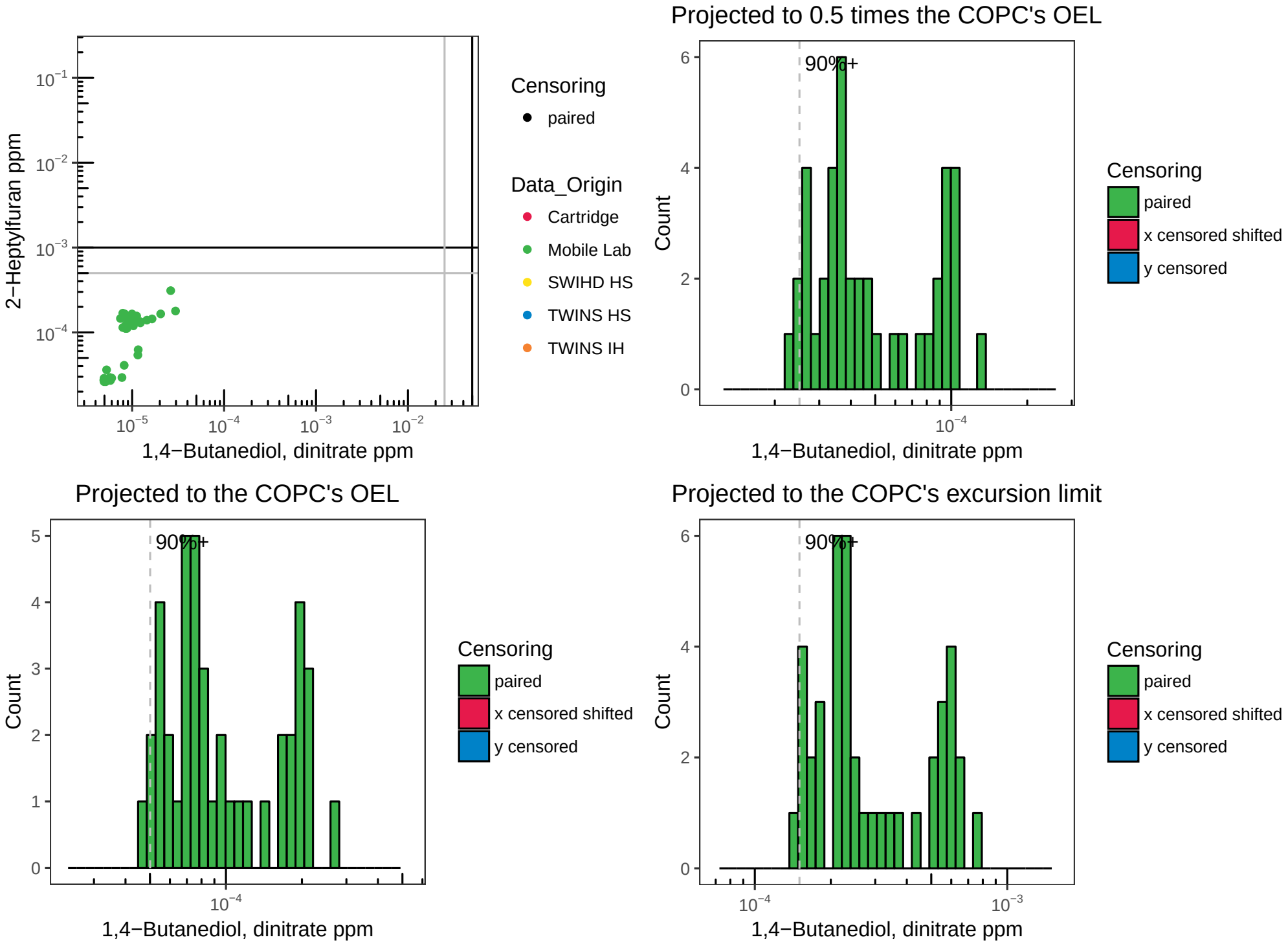


Figure C.2711: 2-Heptylfuran vs 1,4-Butanediol, dinitrate

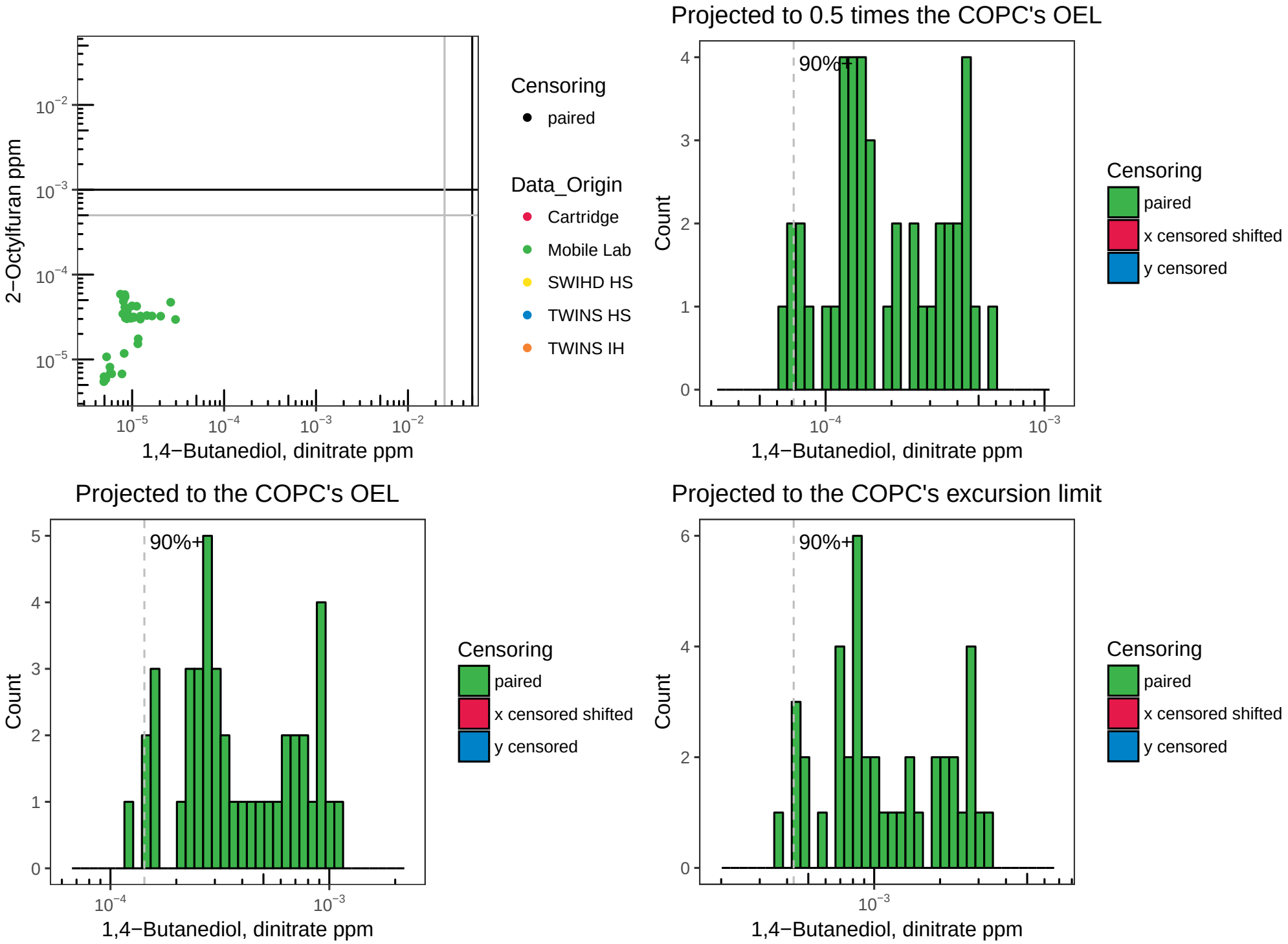


Figure C.2712: 2-Octylfuran vs 1,4-Butanediol, dinitrate

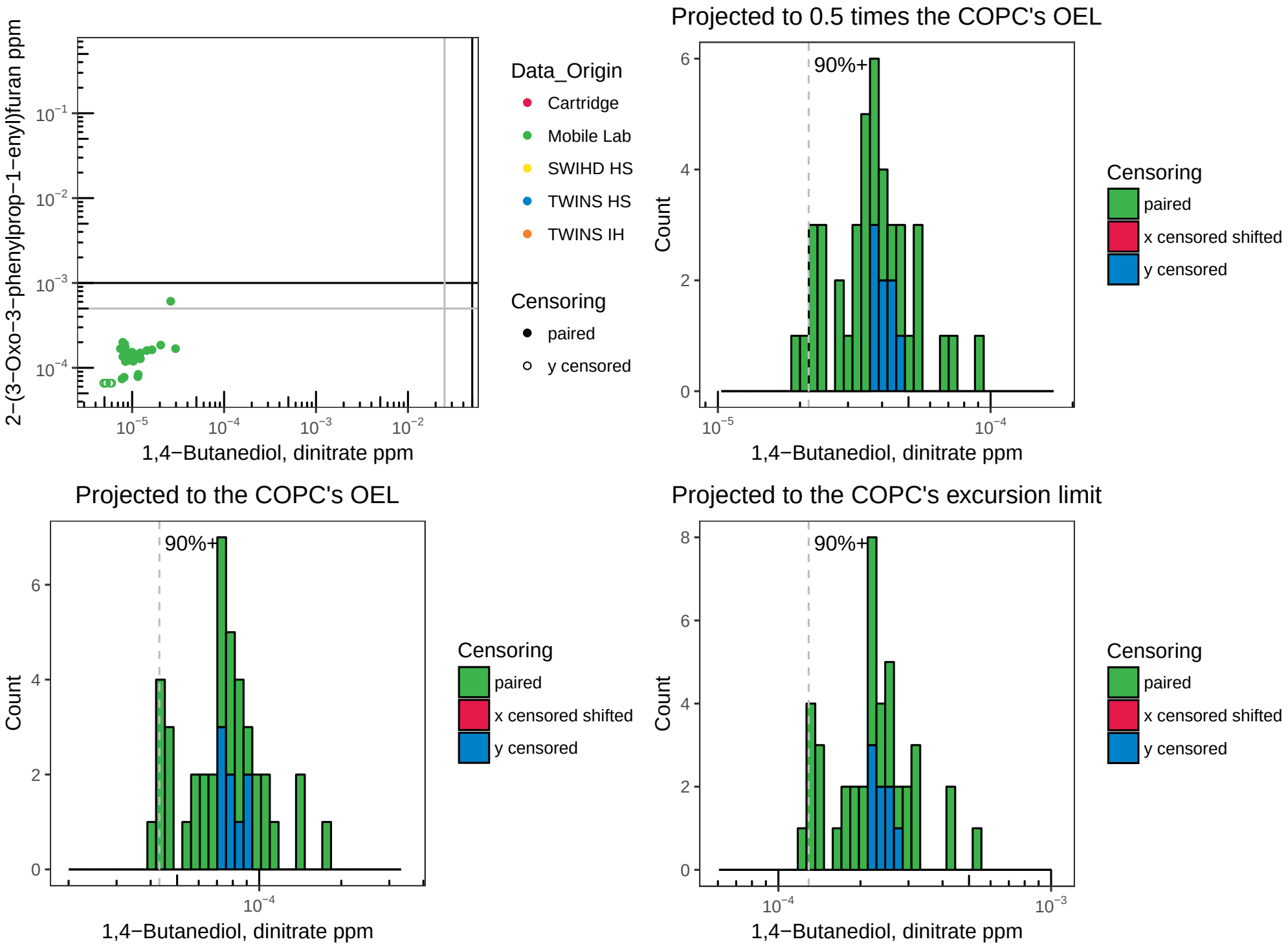


Figure C.2713: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 1,4-Butanediol, dinitrate

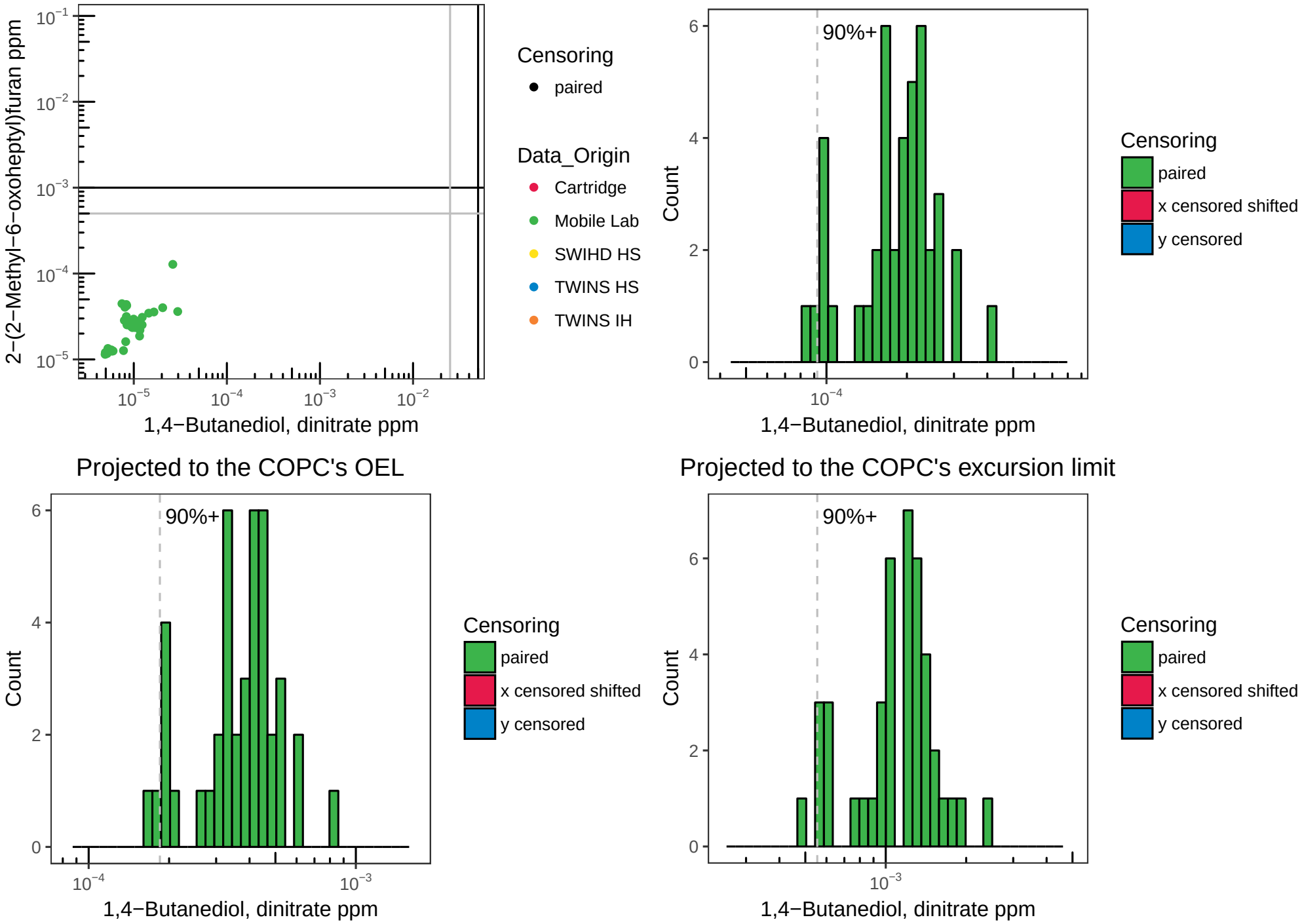


Figure C.2714: 2-(2-Methyl-6-oxoheptyl)furan vs 1,4-Butanediol, dinitrate

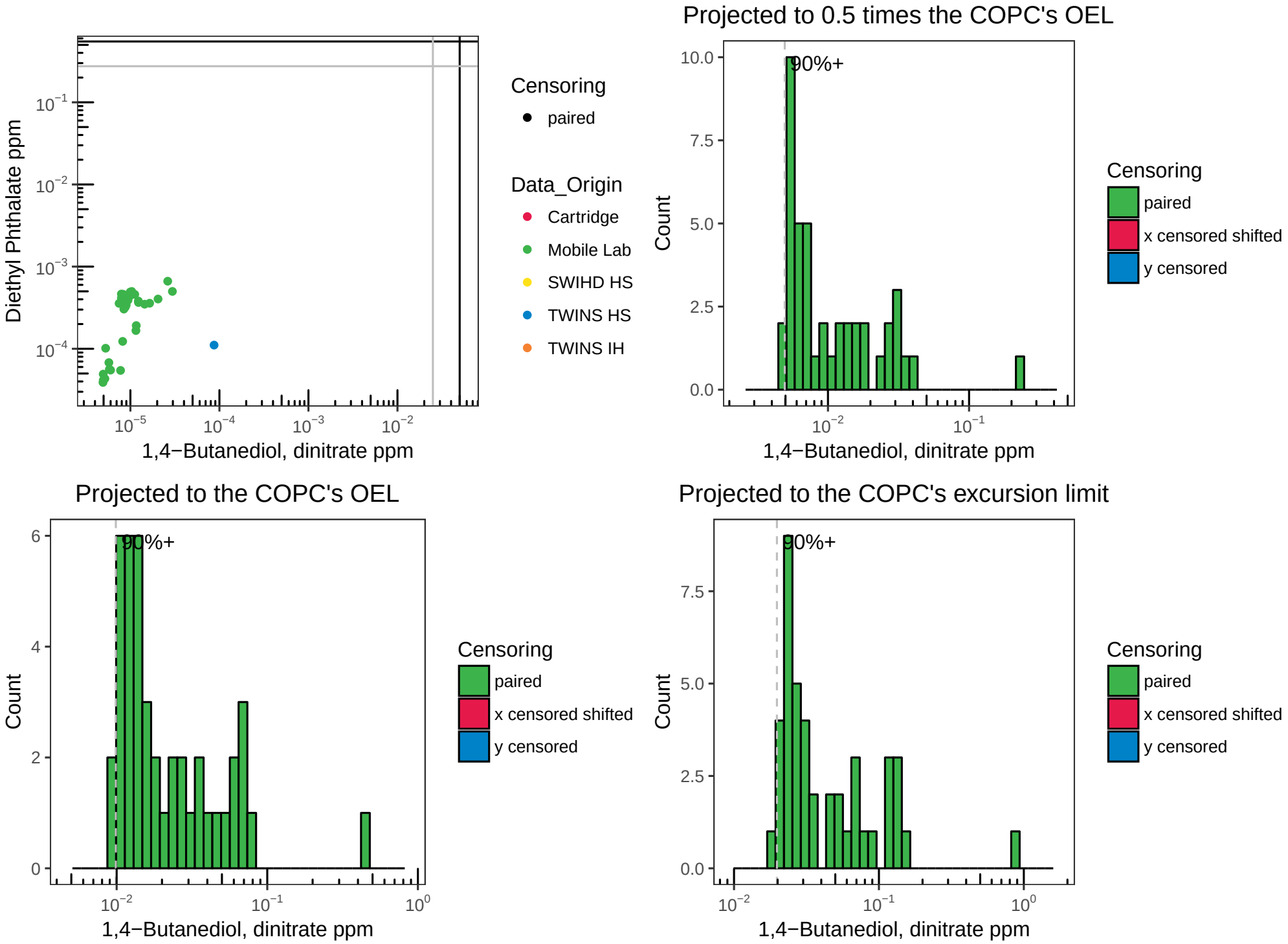


Figure C.2715: Diethyl Phthalate vs 1,4-Butanediol, dinitrate

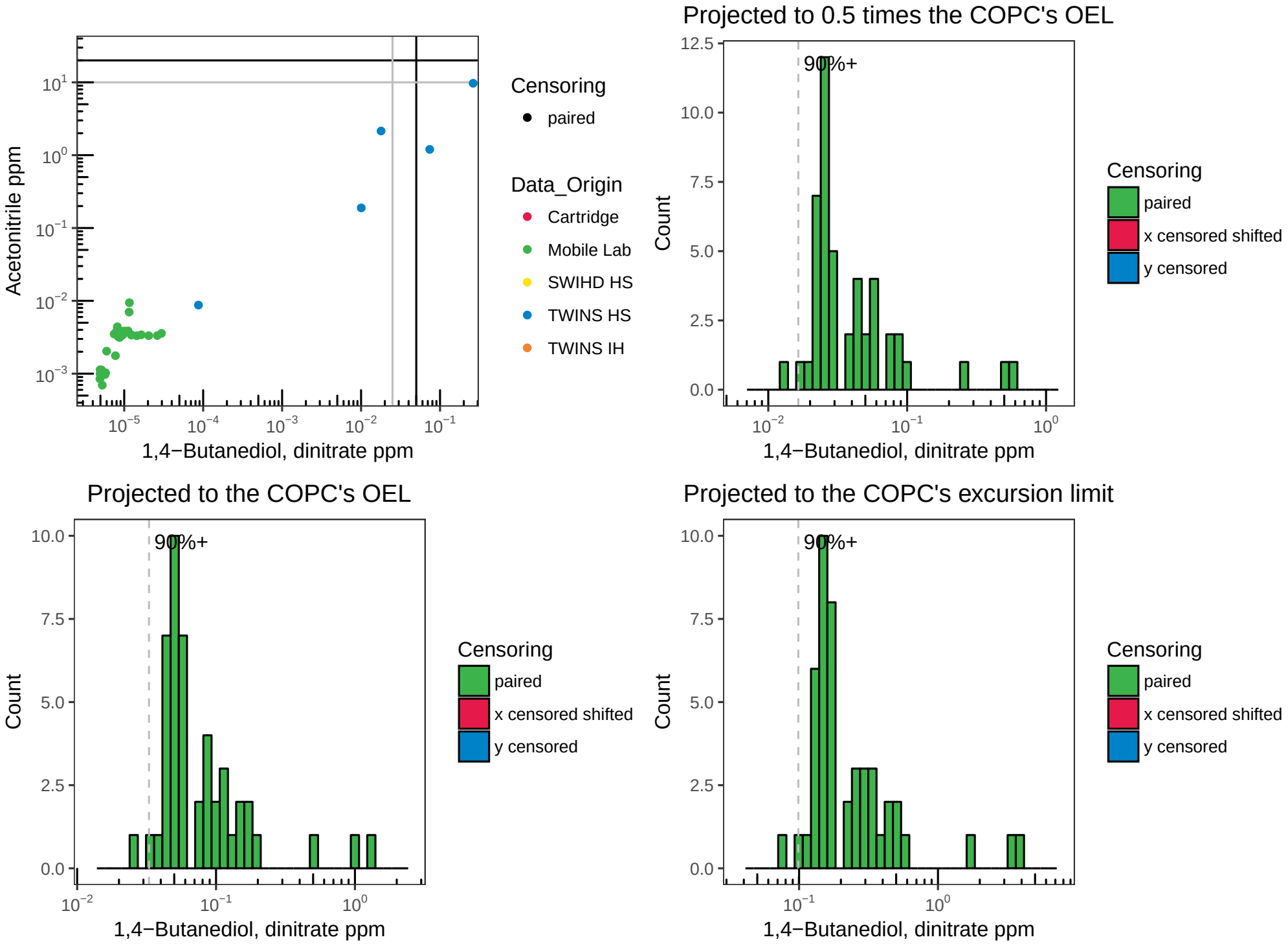


Figure C.2716: Acetonitrile vs 1,4-Butanediol, dinitrate

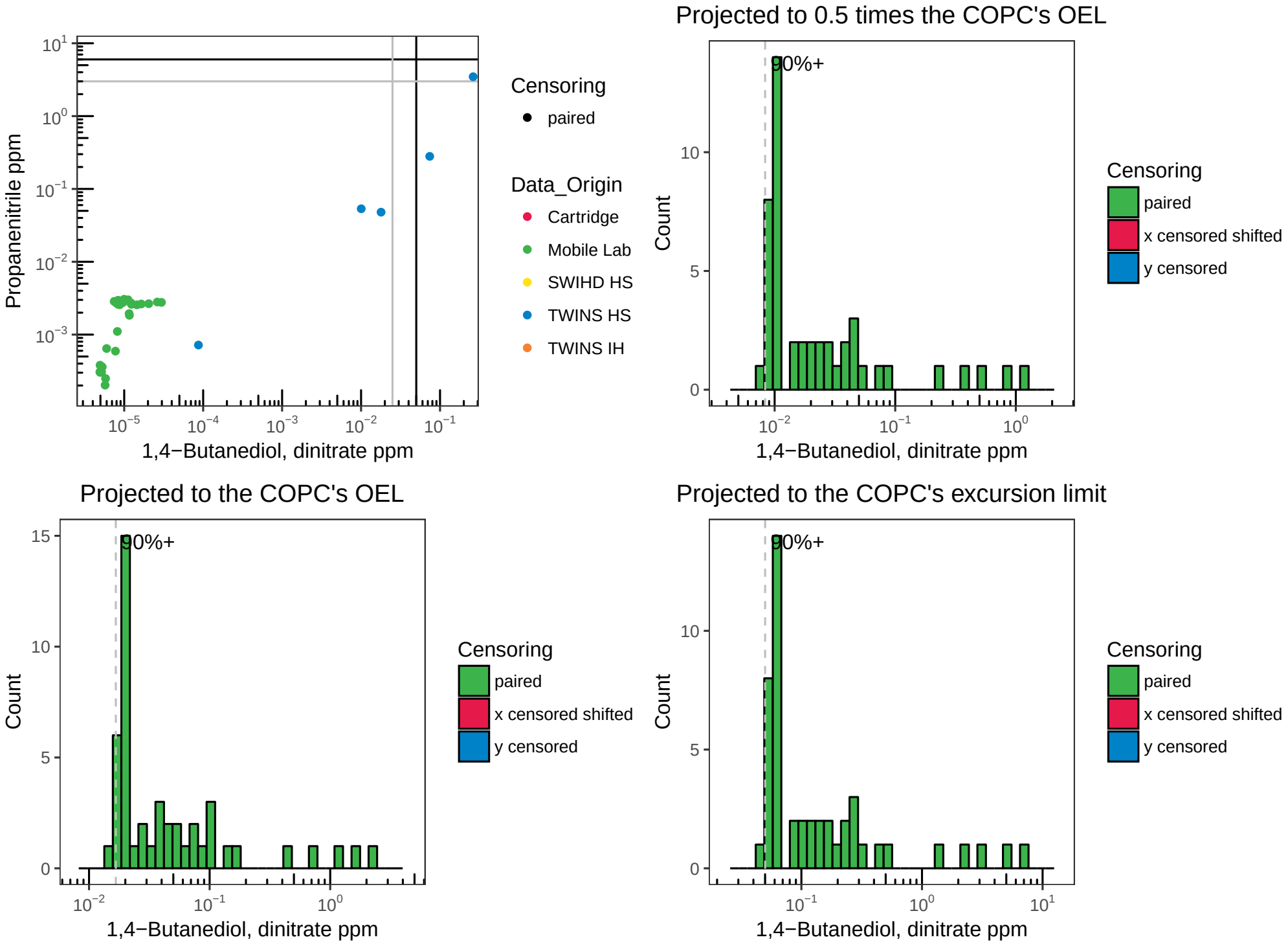


Figure C.2717: Propanenitrile vs 1,4-Butanediol, dinitrate

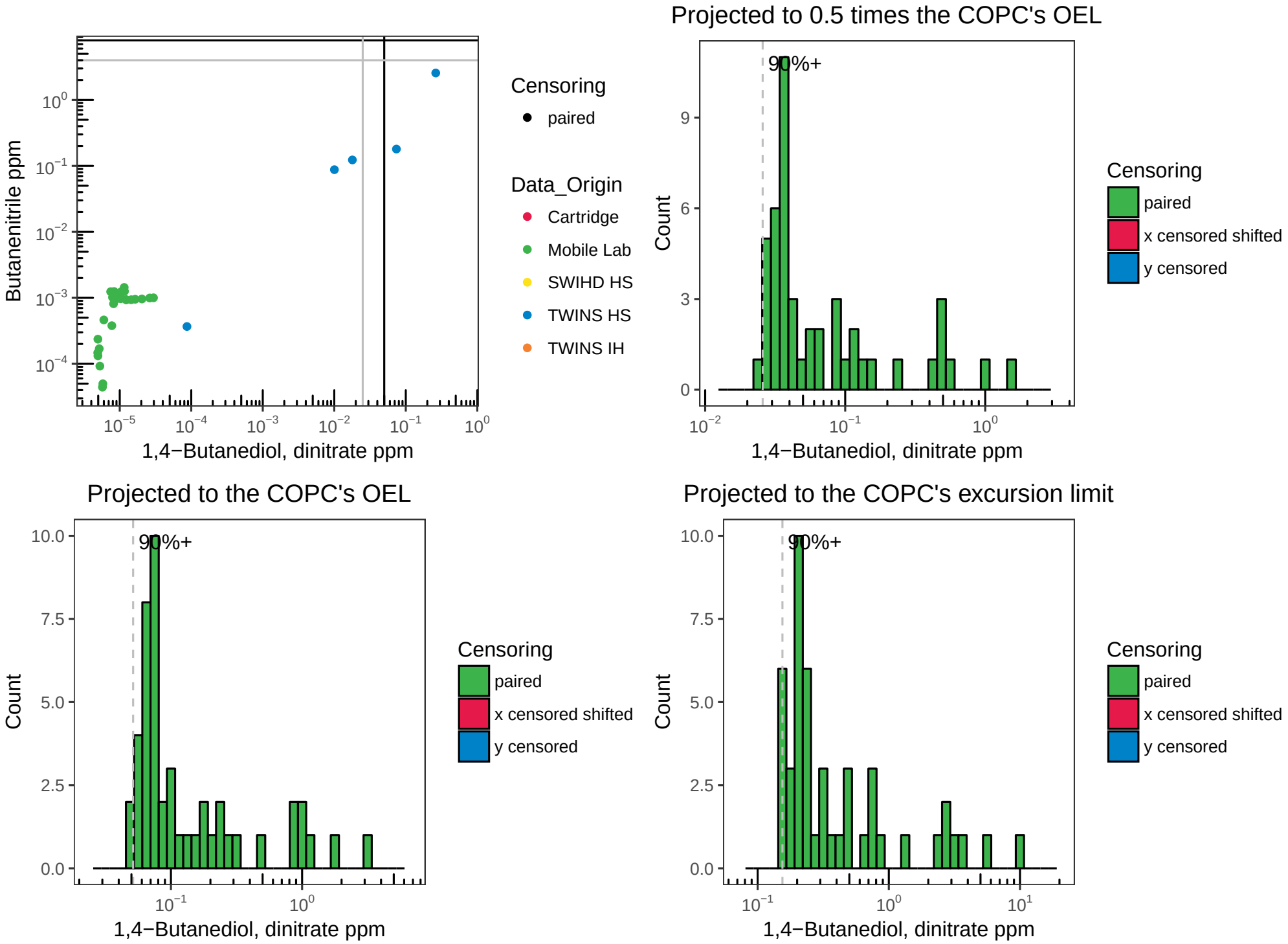


Figure C.2718: Butanenitrile vs 1,4-Butanediol, dinitrate

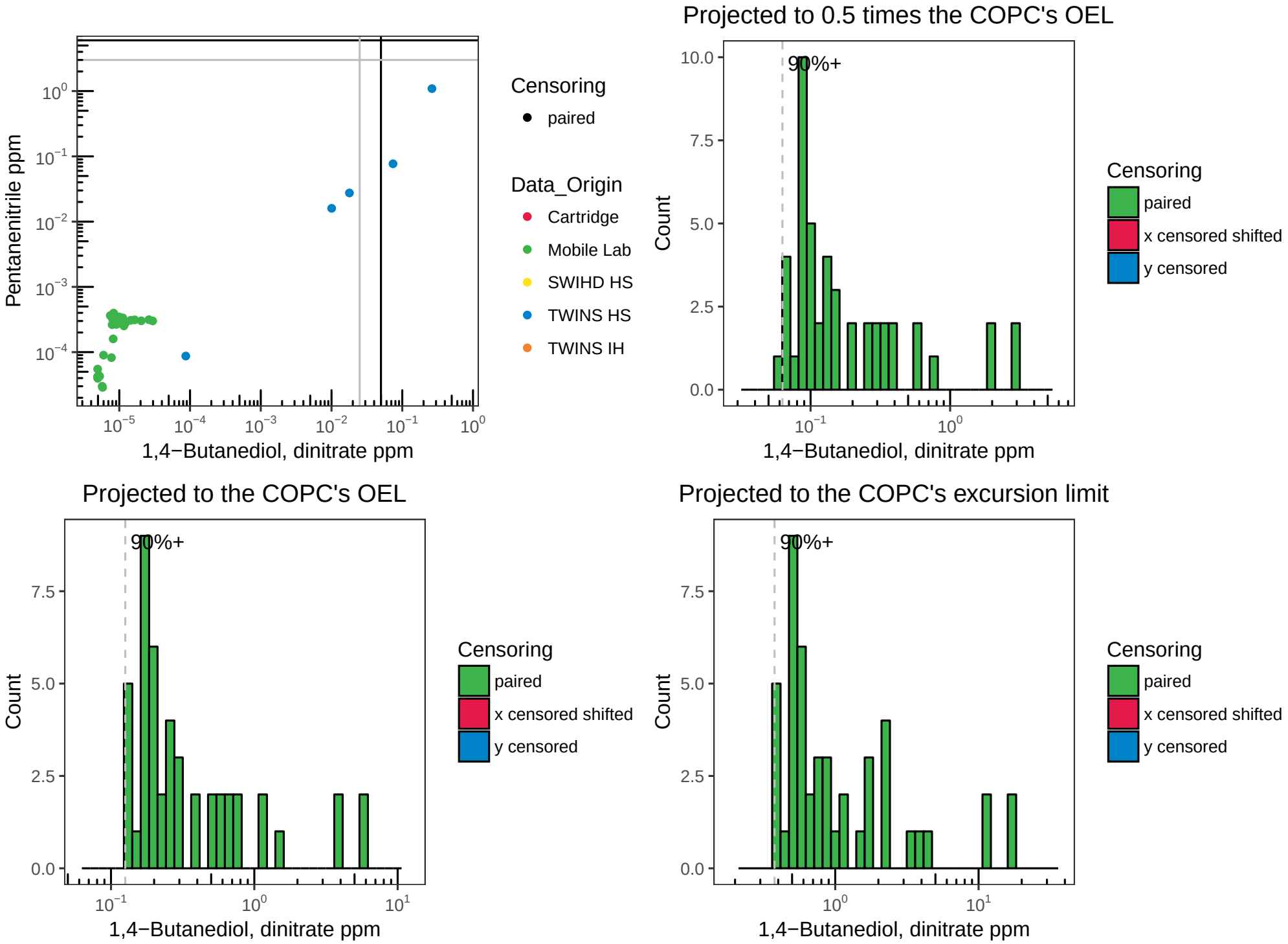


Figure C.2719: Pentanenitrile vs 1,4-Butanediol, dinitrate

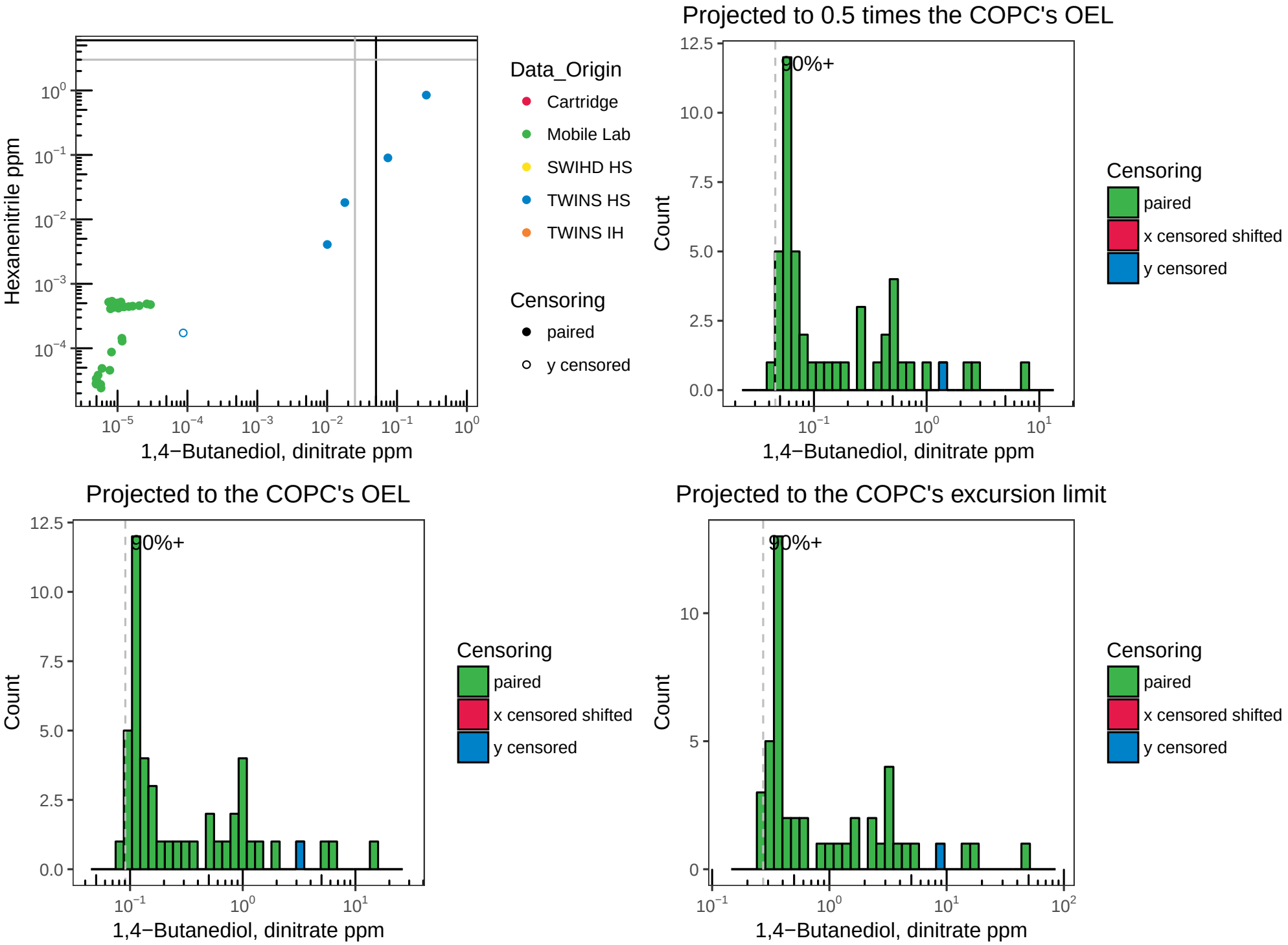


Figure C.2720: Hexanenitrile vs 1,4-Butanediol, dinitrate

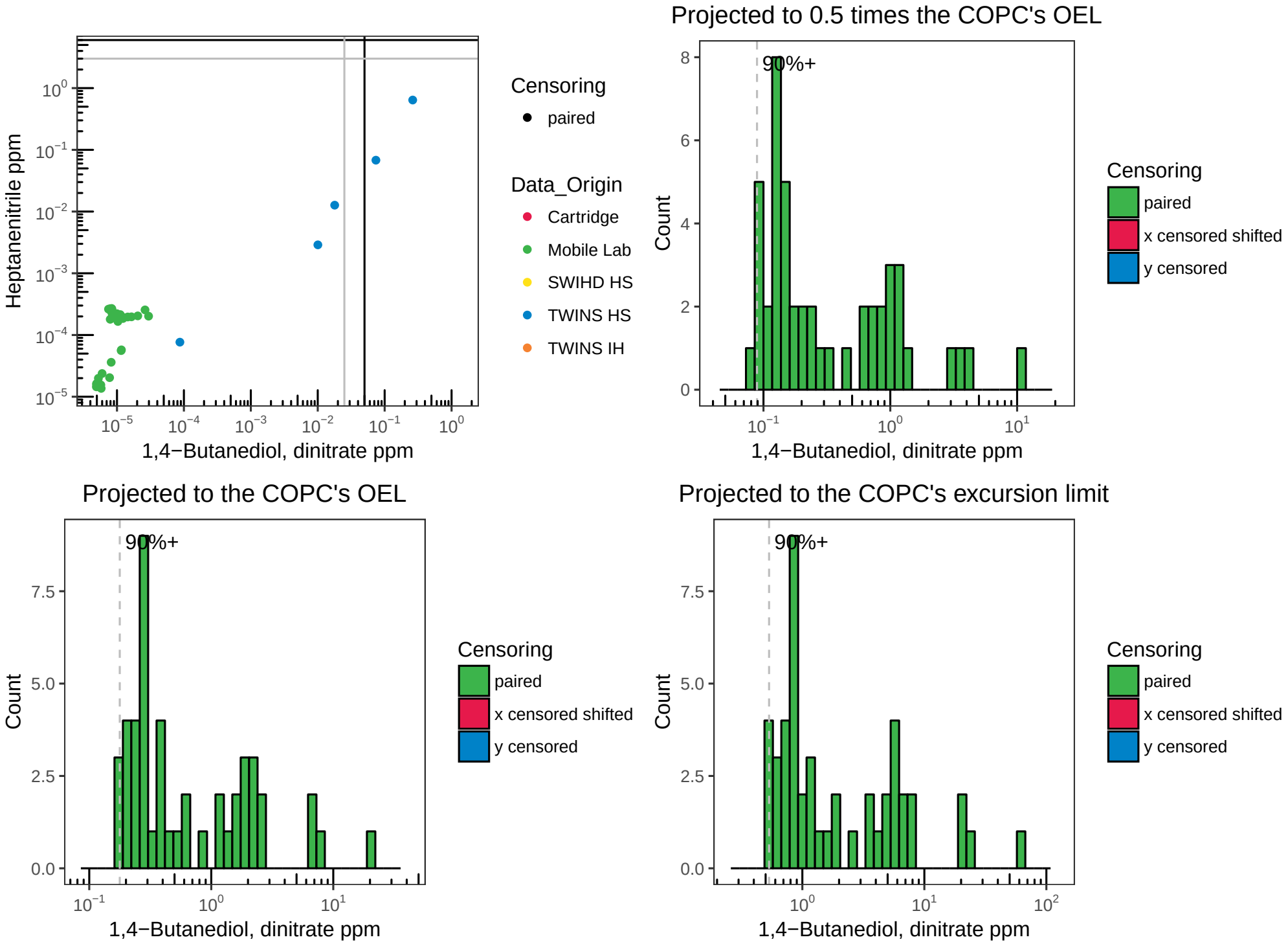


Figure C.2721: Heptanenitrile vs 1,4-Butanediol, dinitrate

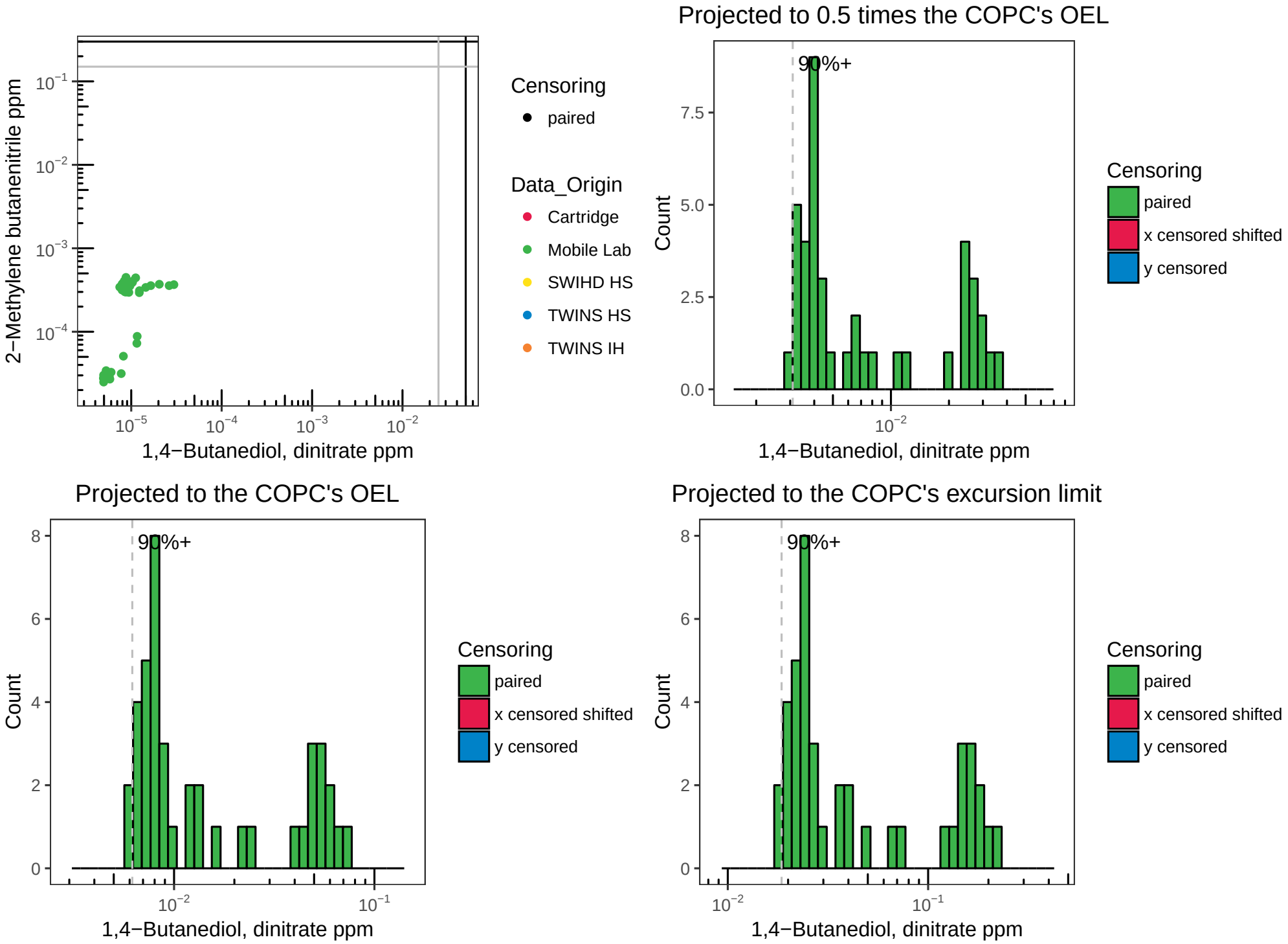


Figure C.2722: 2-Methylene butanenitrile vs 1,4-Butanediol, dinitrate

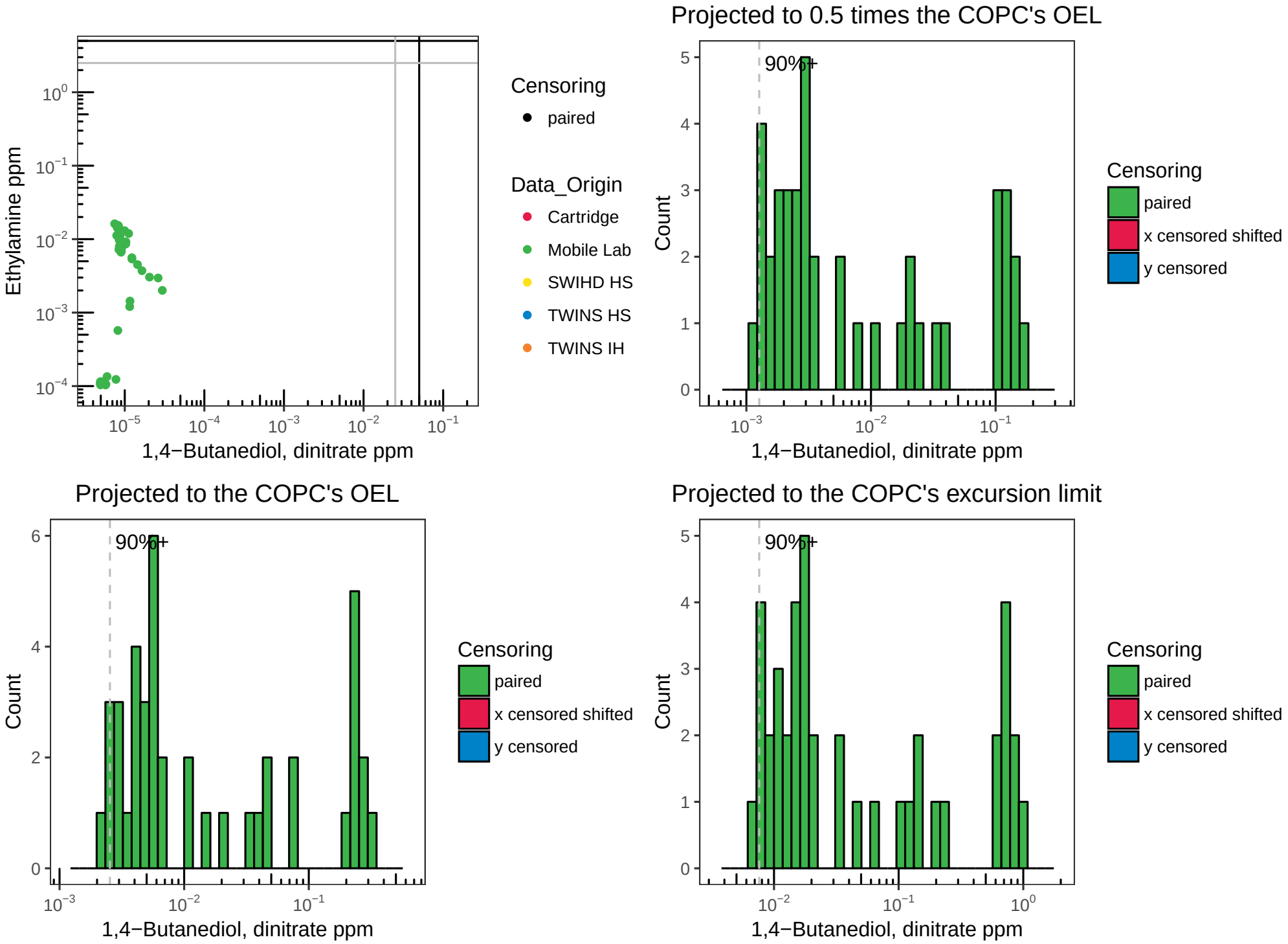


Figure C.2723: Ethylamine vs 1,4-Butanediol, dinitrate

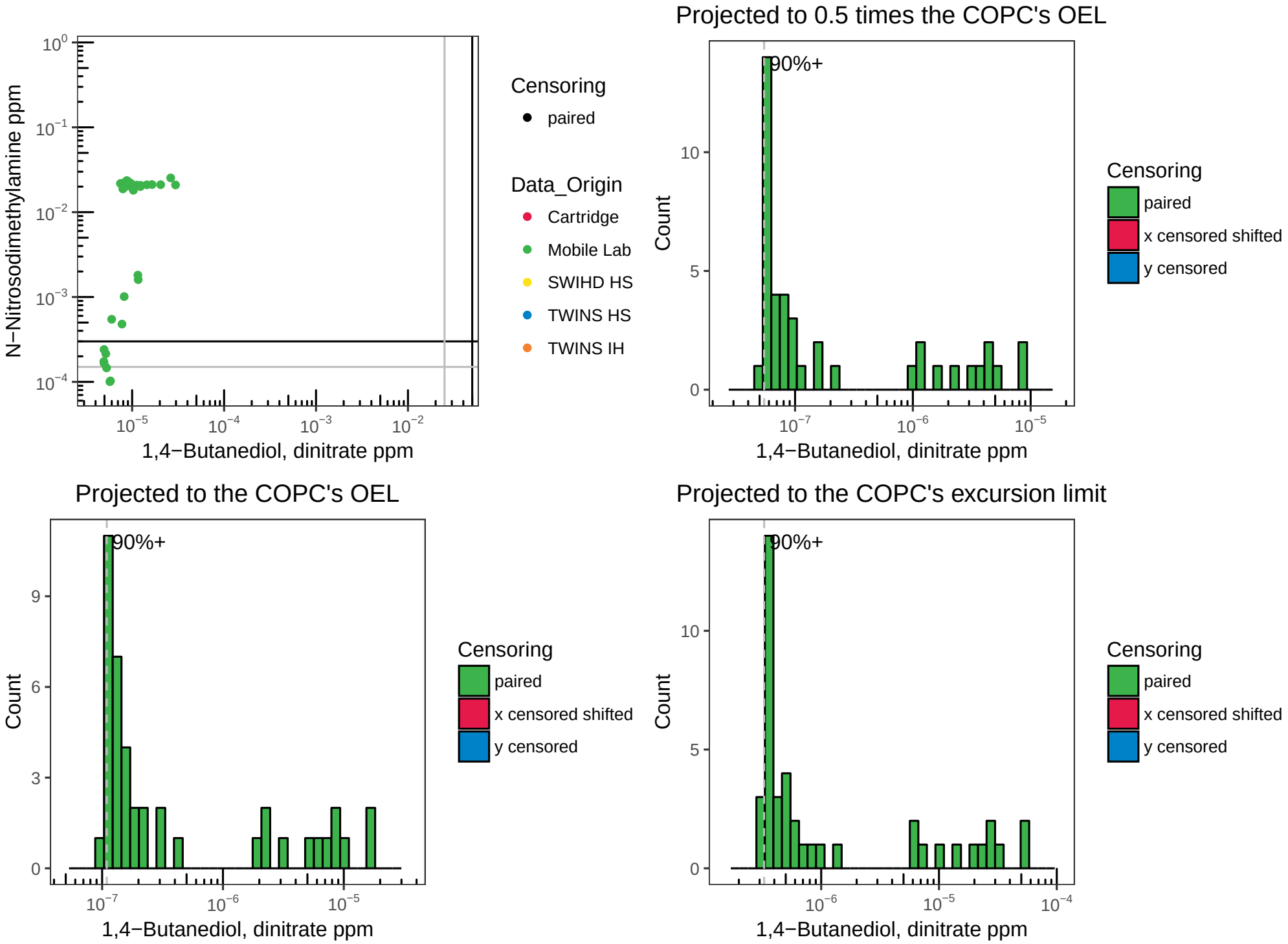


Figure C.2724: N-Nitrosodimethylamine vs 1,4-Butanediol, dinitrate

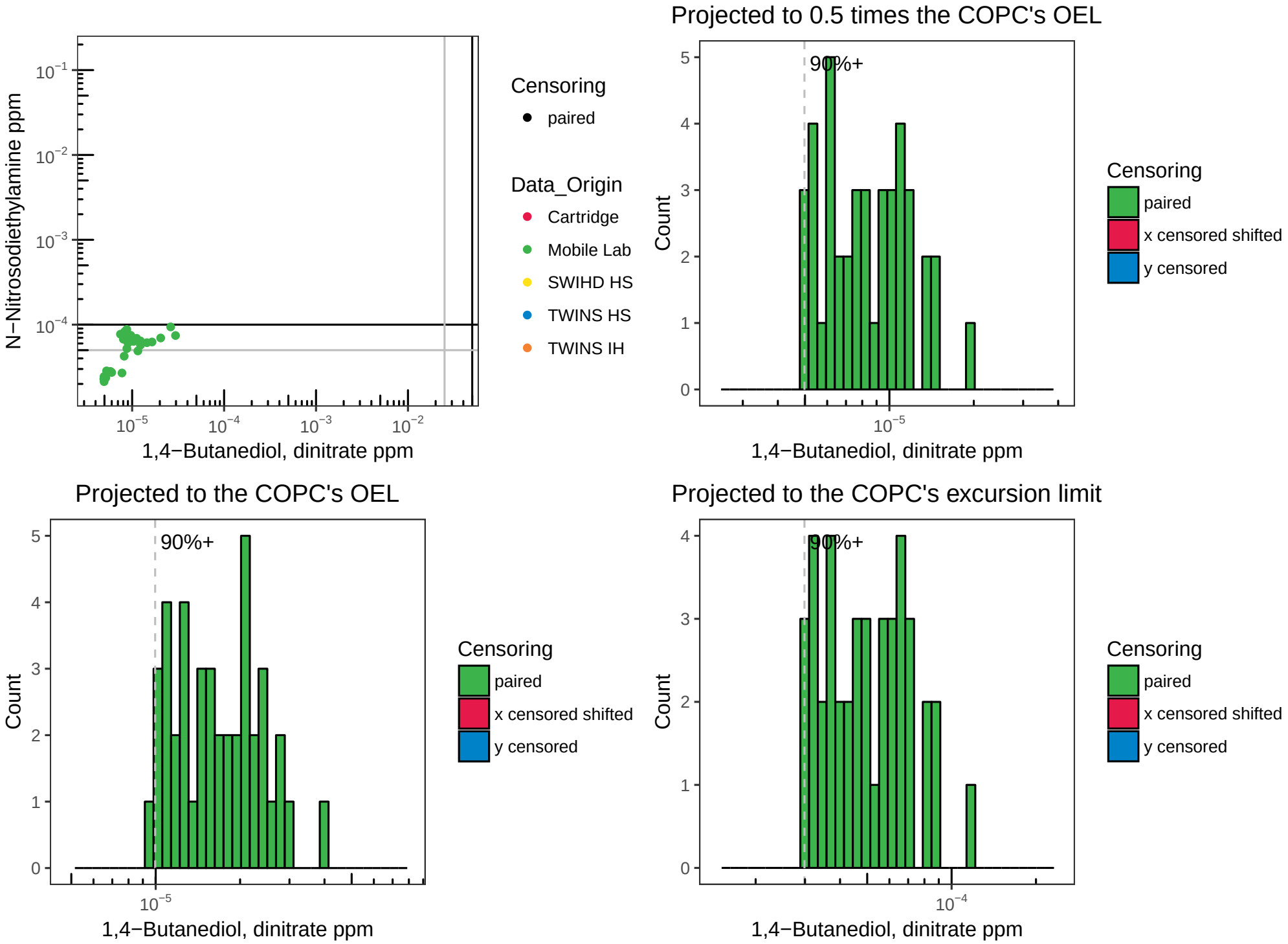


Figure C.2725: N-Nitrosodiethylamine vs 1,4-Butanediol, dinitrate

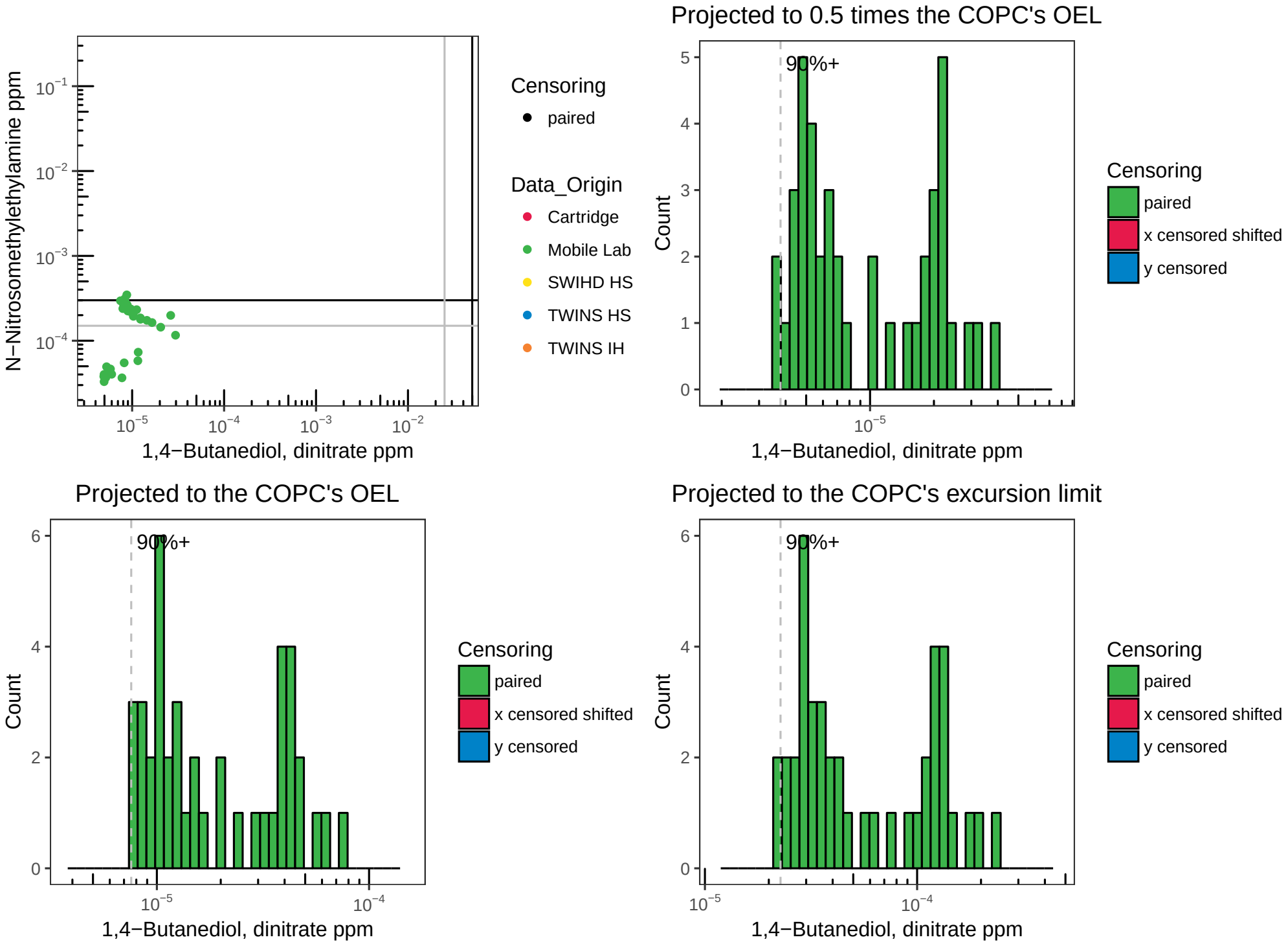


Figure C.2726: N-Nitrosomethylethylamine vs 1,4-Butanediol, dinitrate

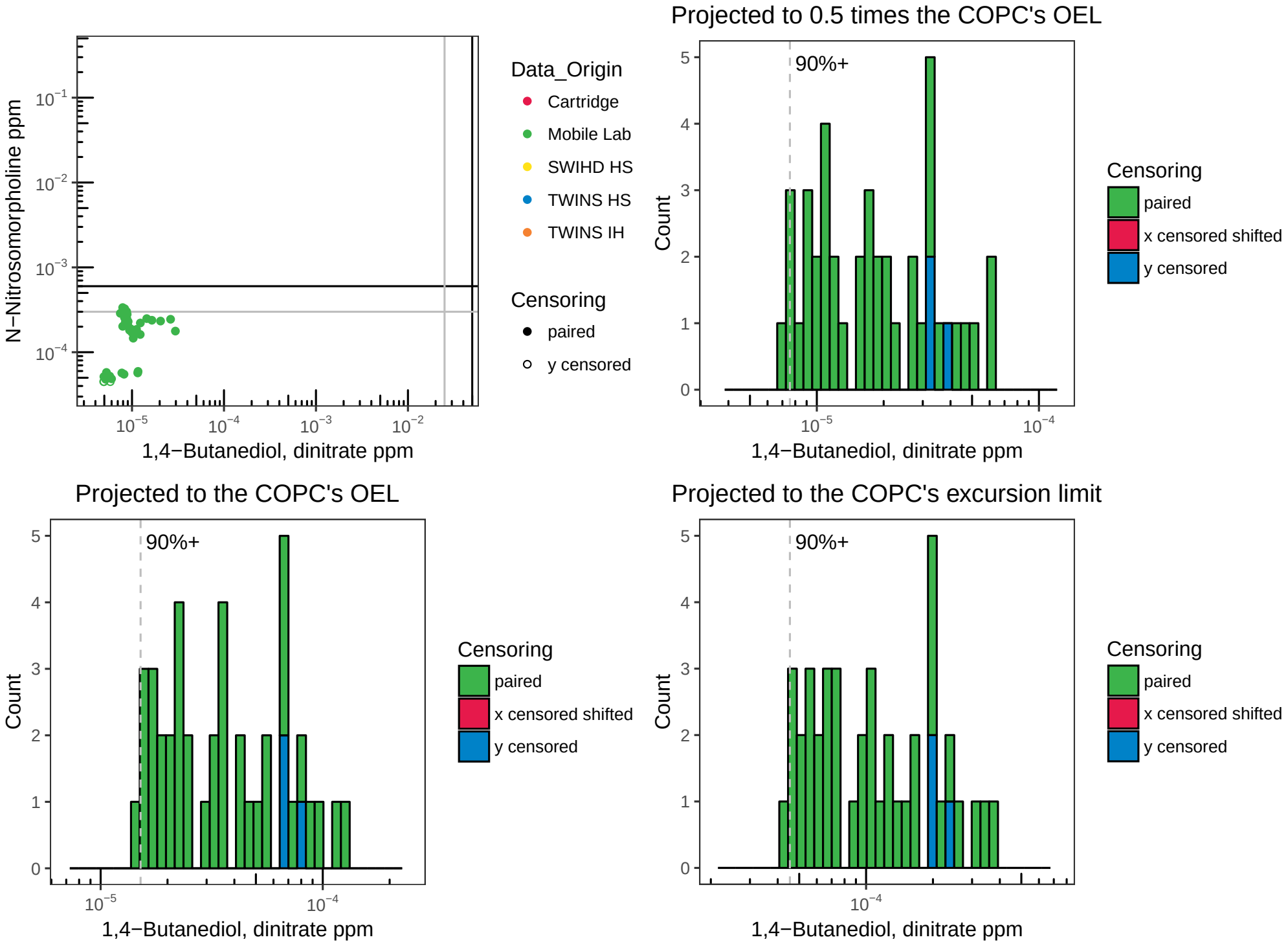


Figure C.2727: N-Nitrosomorpholine vs 1,4-Butanediol, dinitrate

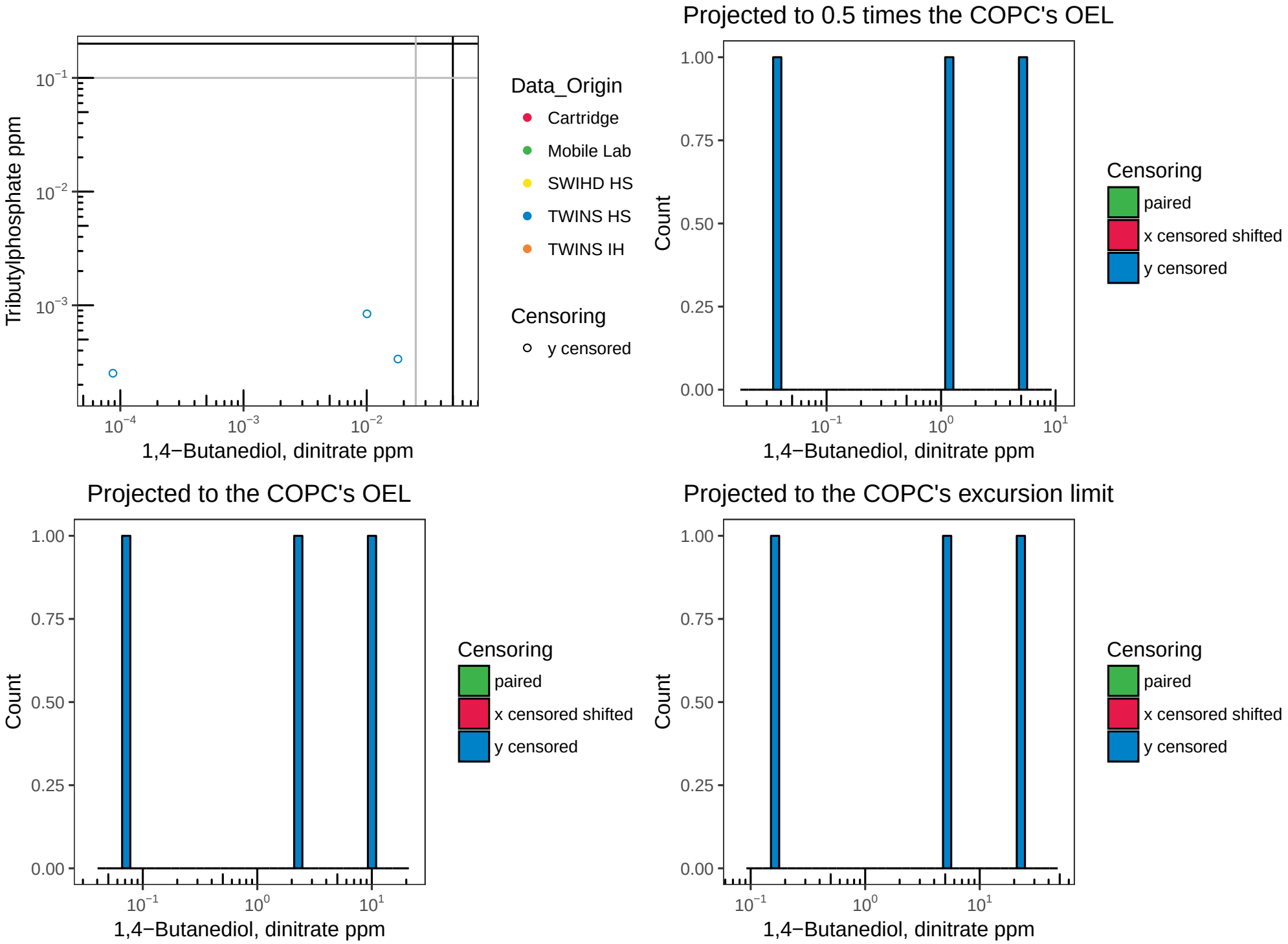


Figure C.2728: Tributylphosphate vs 1,4-Butanediol, dinitrate

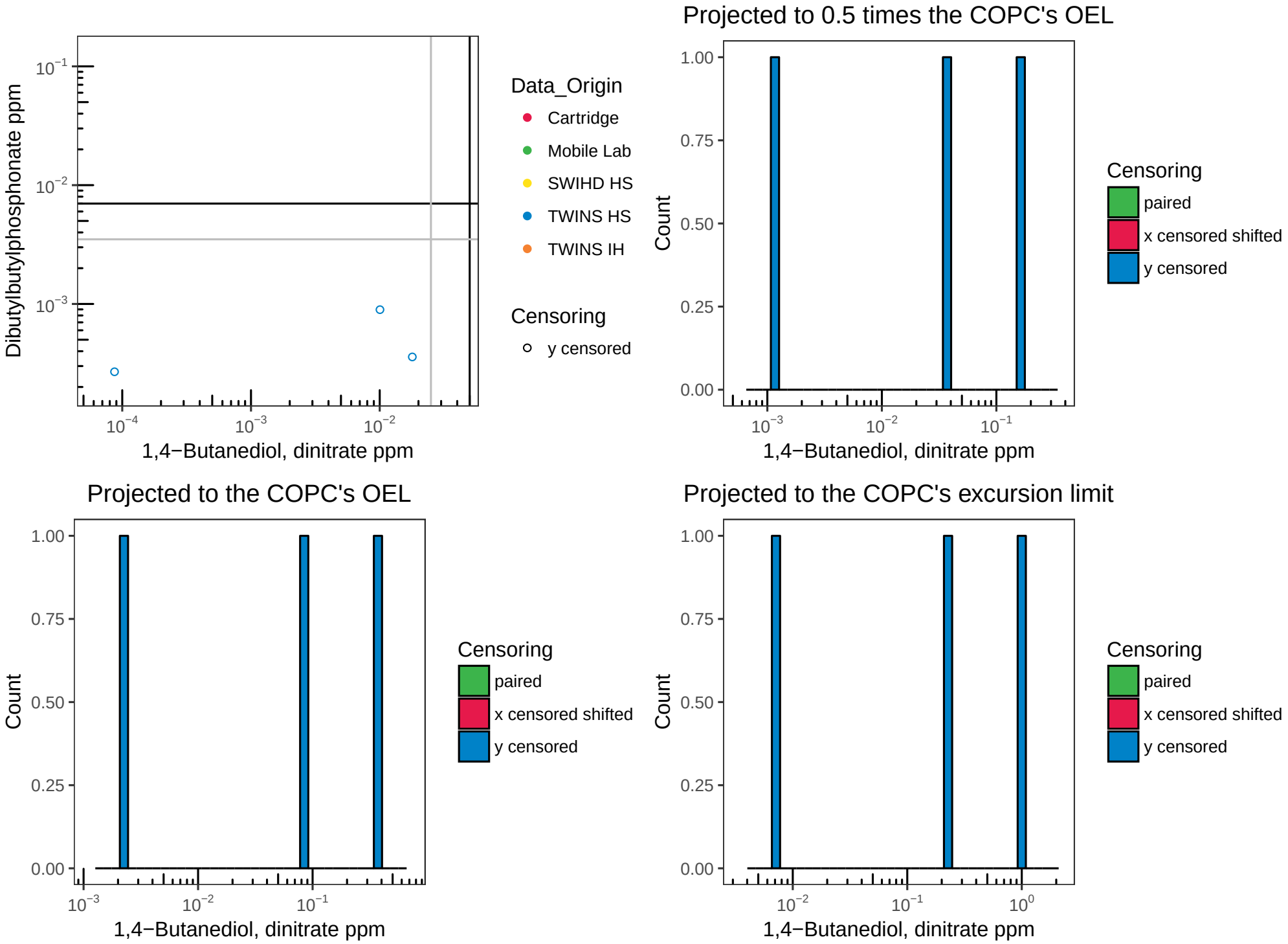


Figure C.2729: Dibutylbutylphosphonate vs 1,4-Butanediol, dinitrate

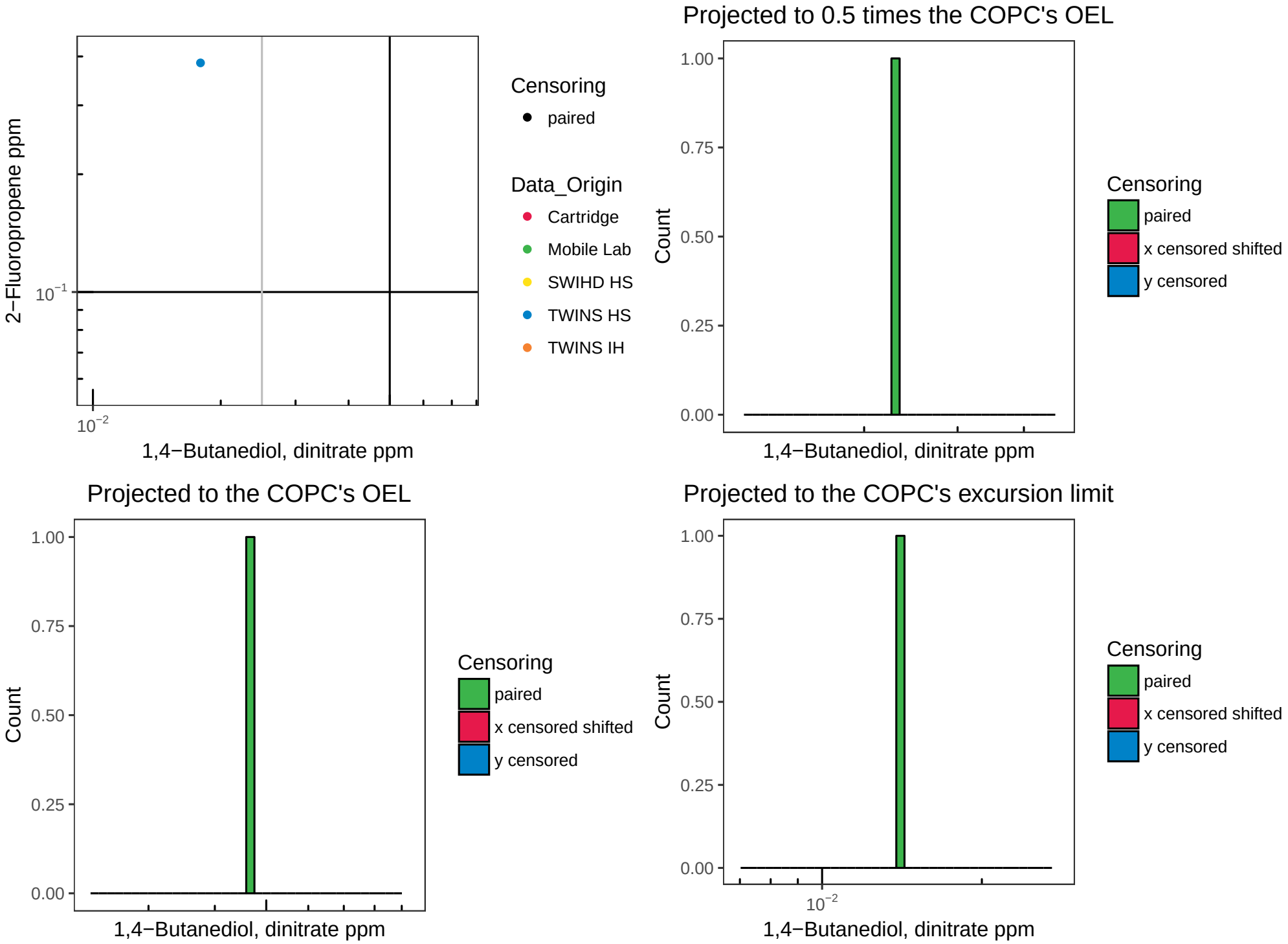


Figure C.2730: 2-Fluoropropene vs 1,4-Butanediol, dinitrate

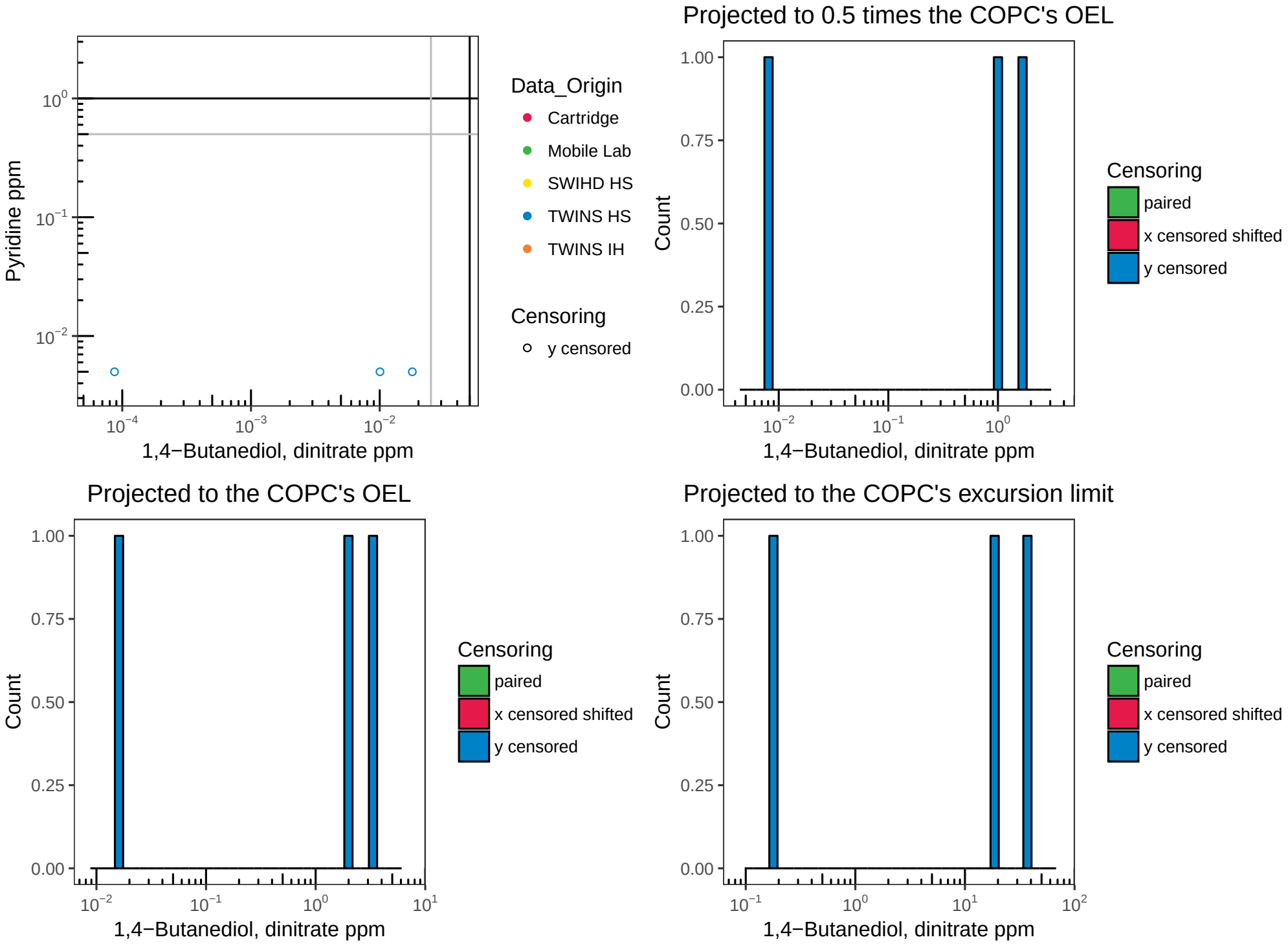


Figure C.2731: Pyridine vs 1,4-Butanediol, dinitrate

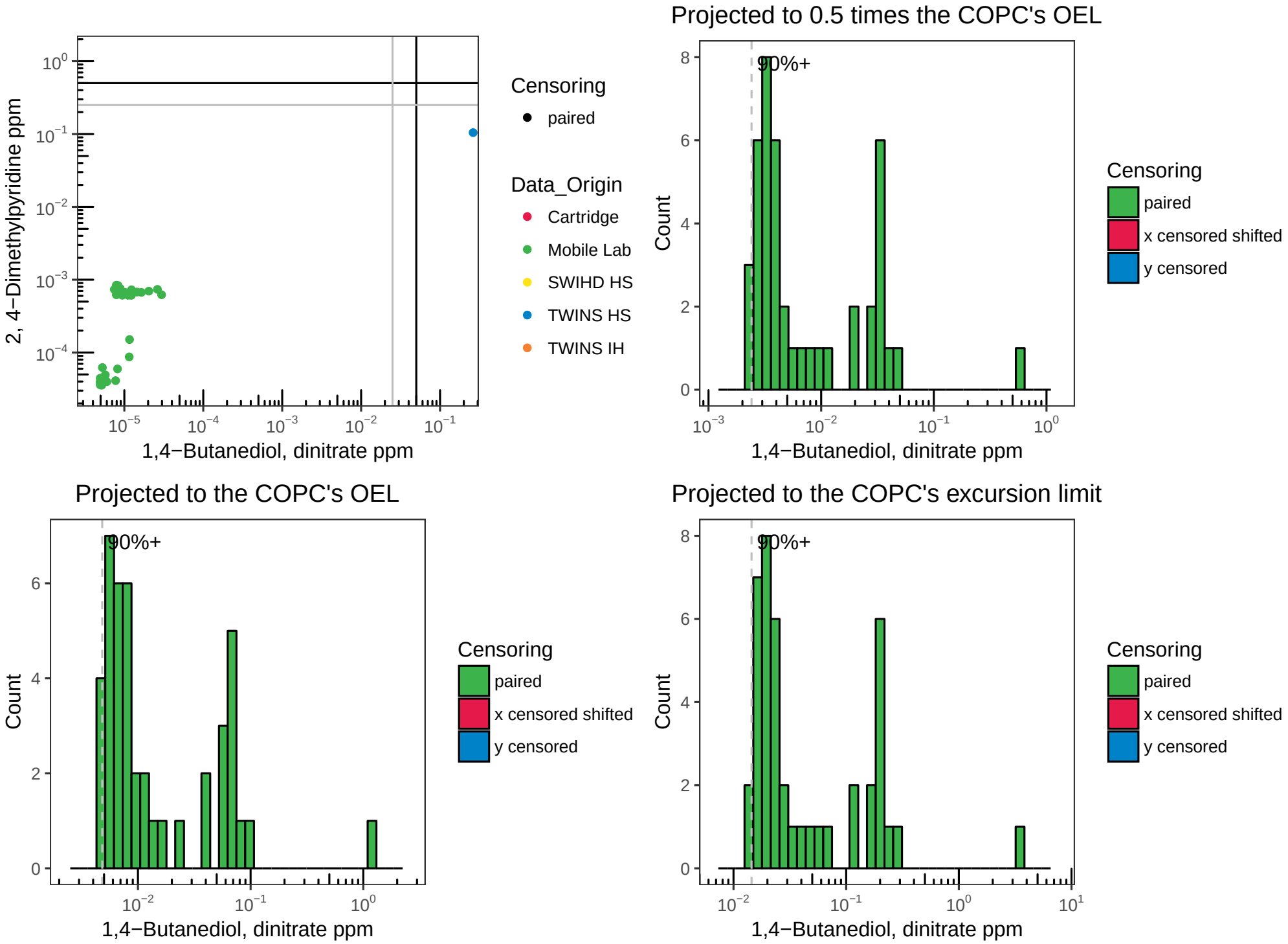


Figure C.2732: 2, 4-Dimethylpyridine vs 1,4-Butanediol, dinitrate

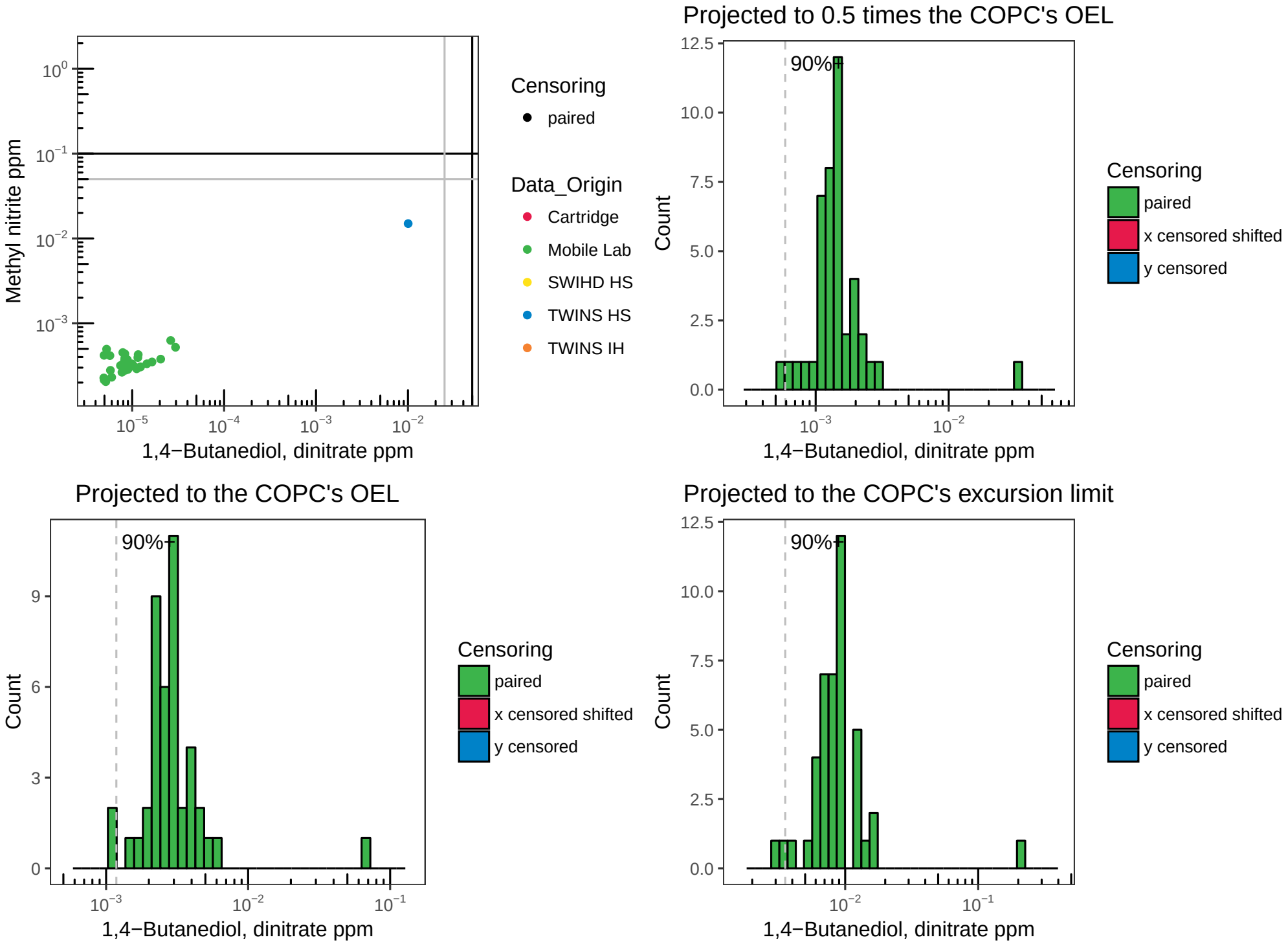


Figure C.2733: Methyl nitrite vs 1,4-Butanediol, dinitrate

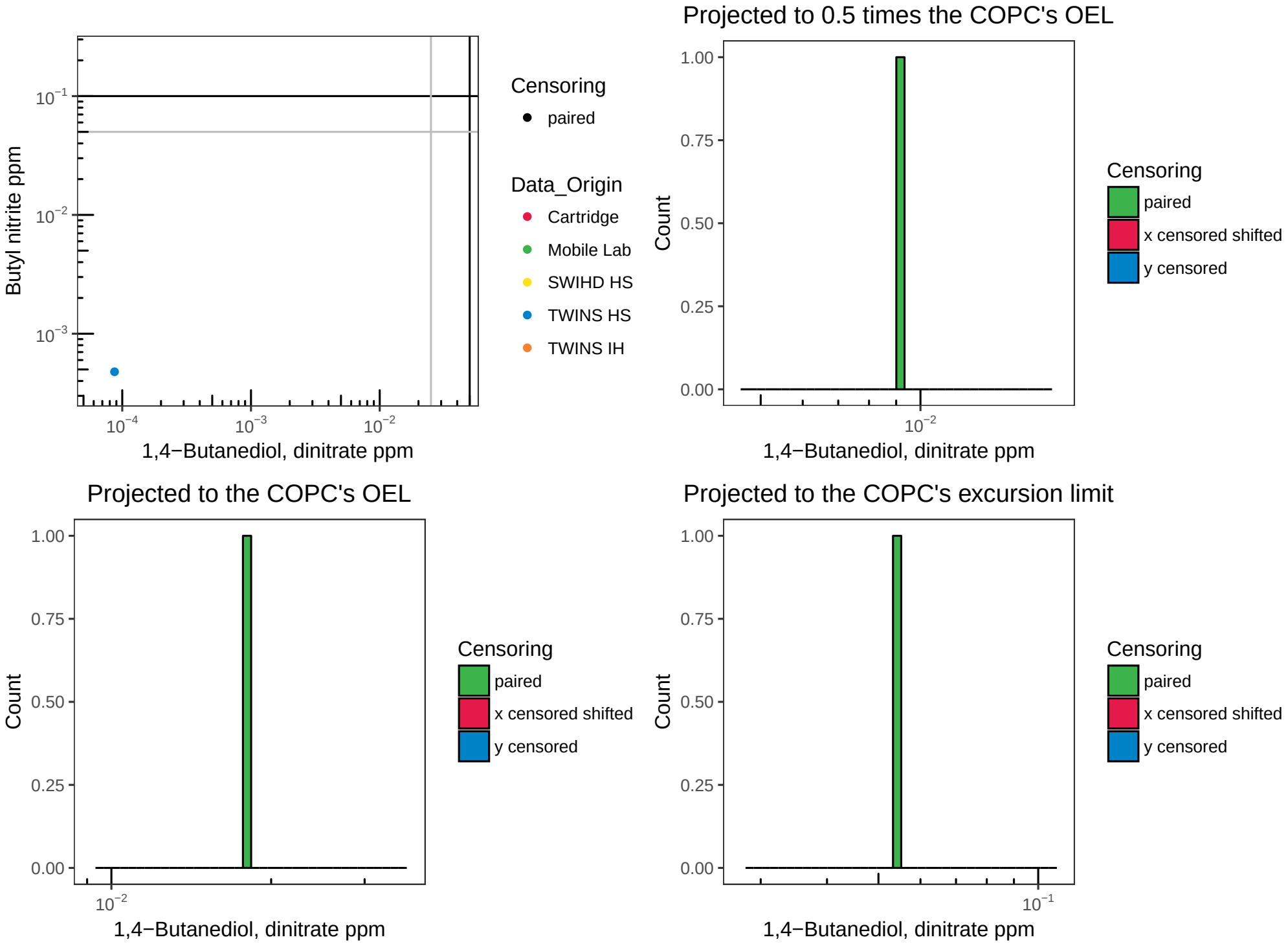


Figure C.2734: Butyl nitrite vs 1,4-Butanediol, dinitrate

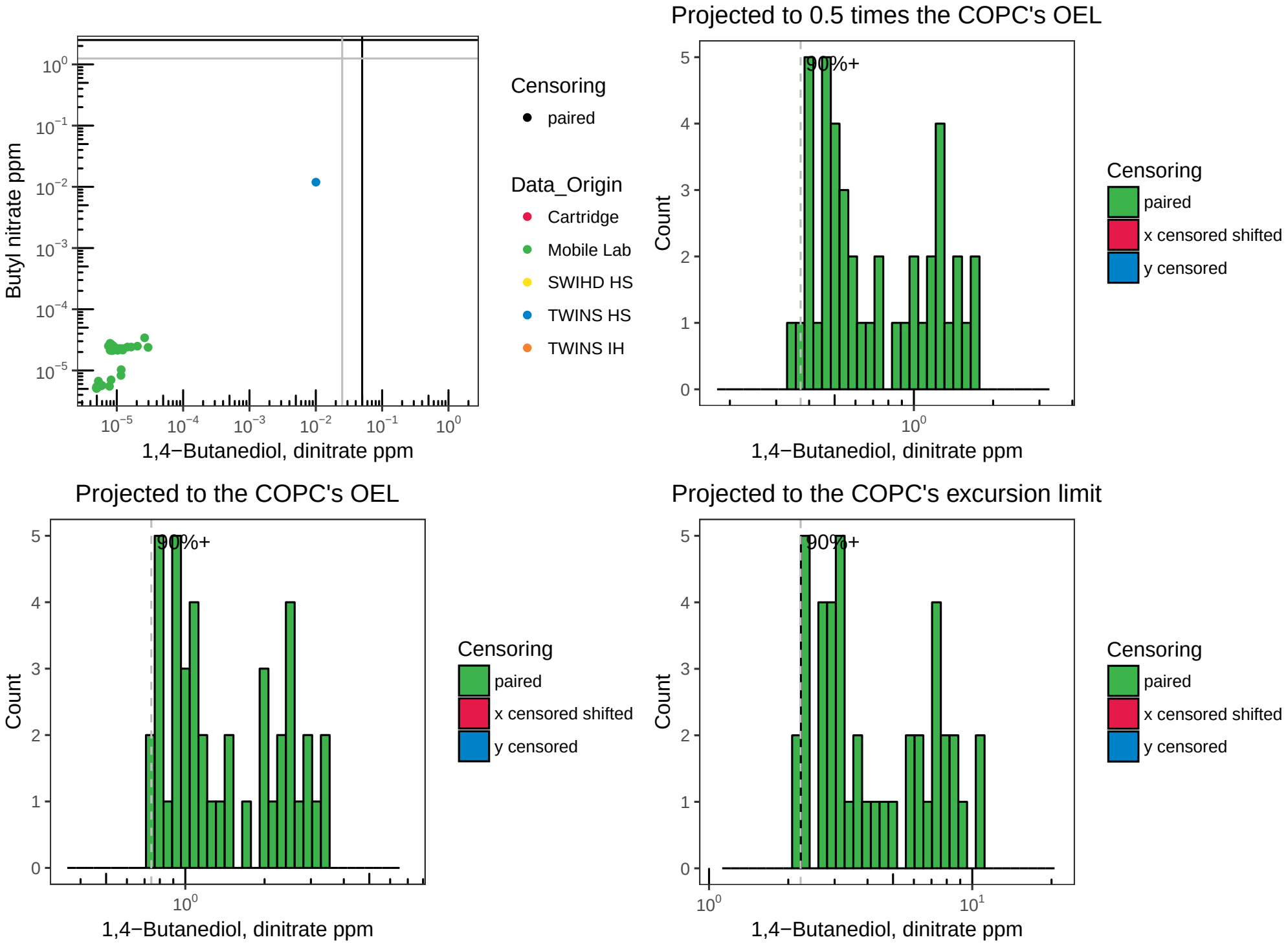


Figure C.2735: Butyl nitrate vs 1,4-Butanediol, dinitrate

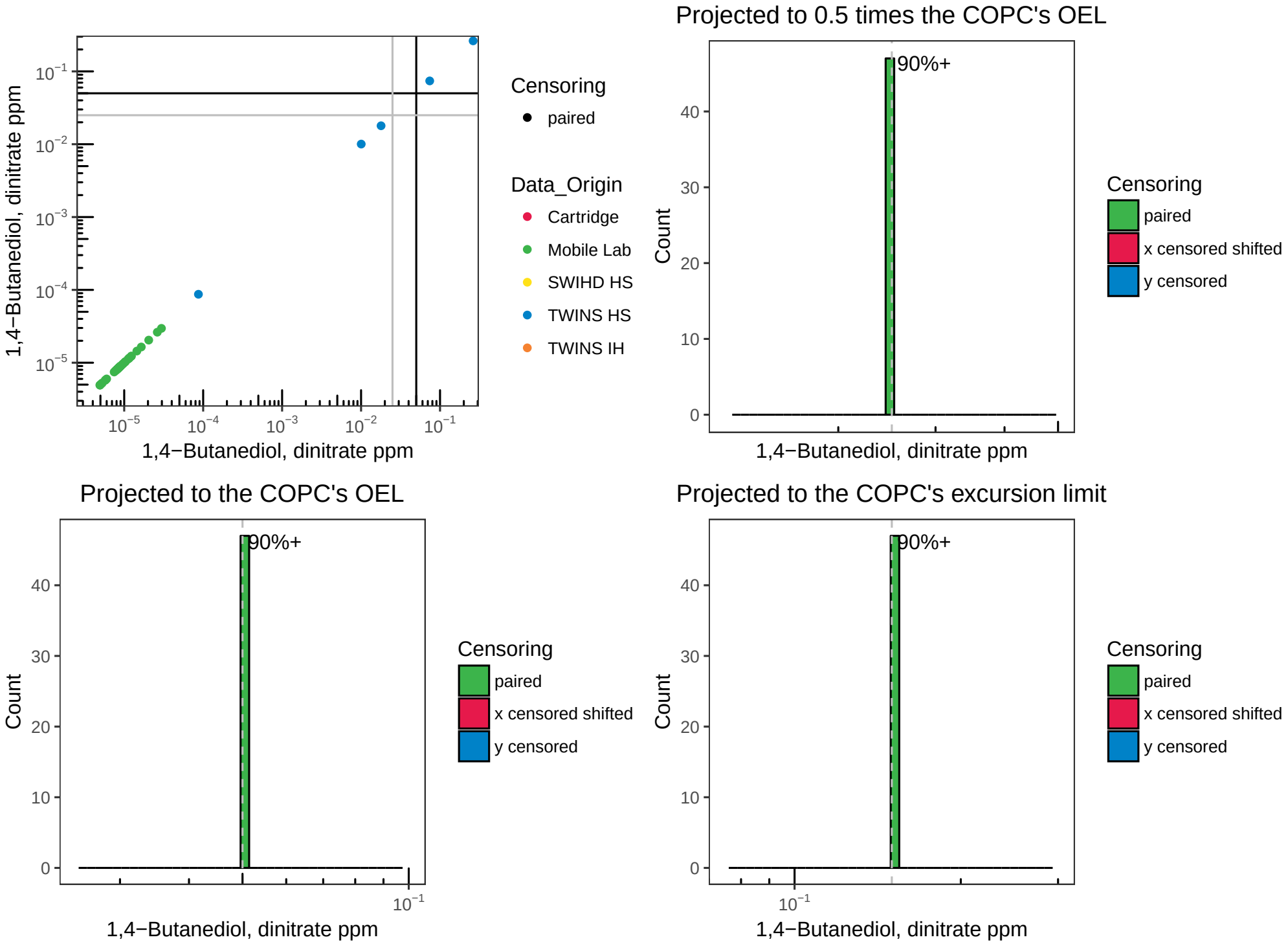


Figure C.2736: 1,4-Butanediol, dinitrate vs 1,4-Butanediol, dinitrate

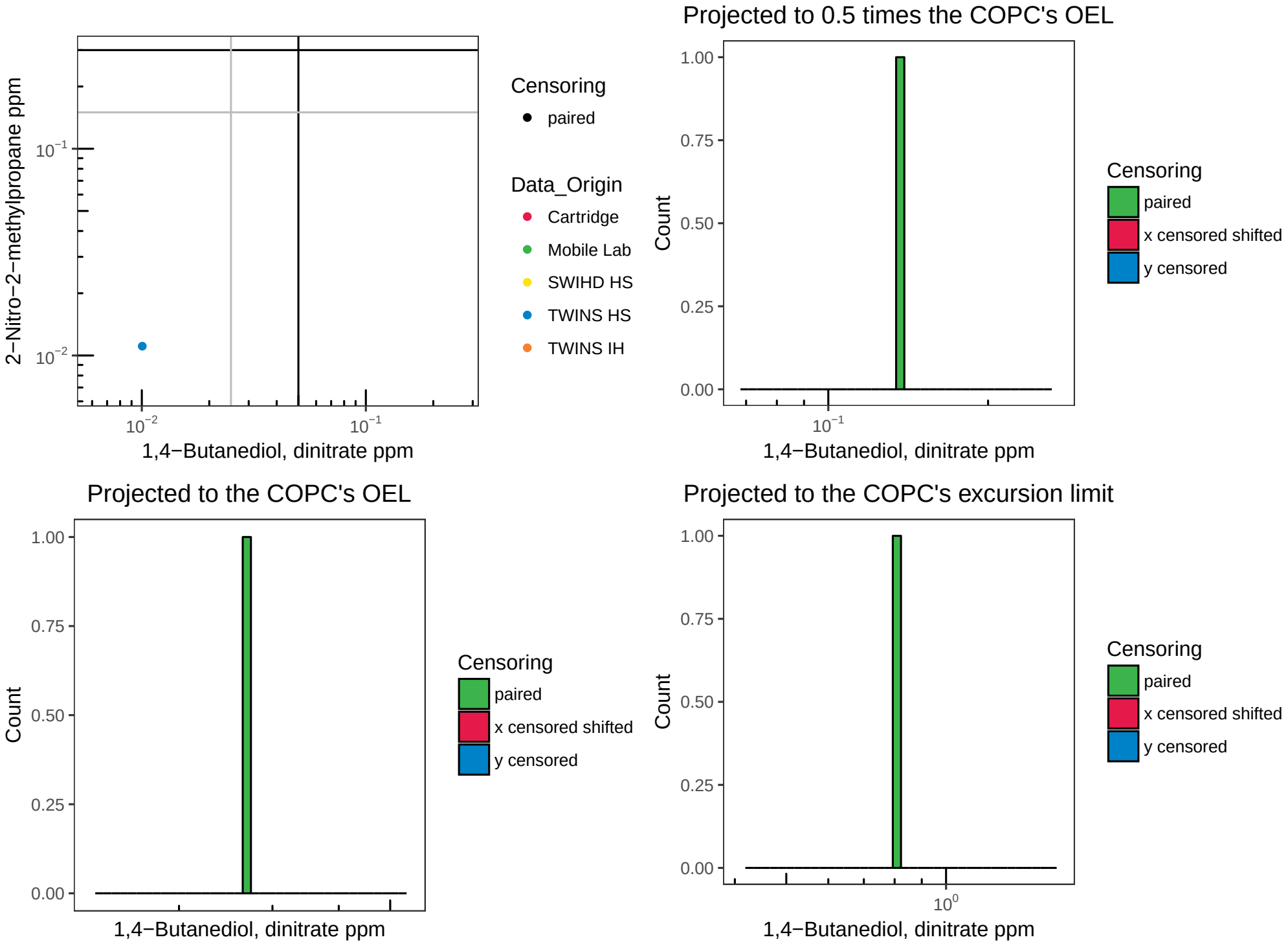


Figure C.2737: 2-Nitro-2-methylpropane vs 1,4-Butanediol, dinitrate

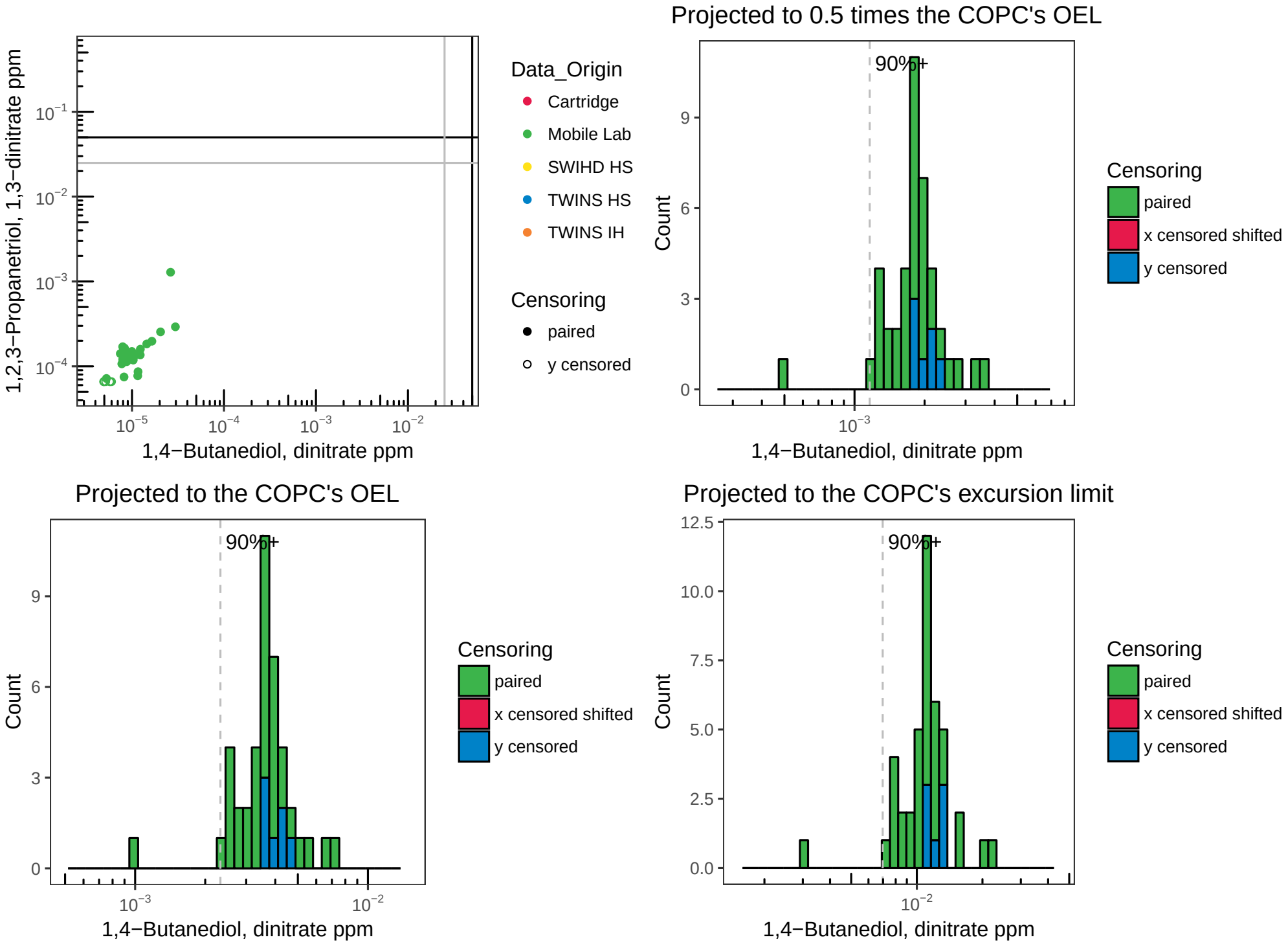


Figure C.2738: 1,2,3-Propanetriol, 1,3-dinitrate vs 1,4-Butanediol, dinitrate

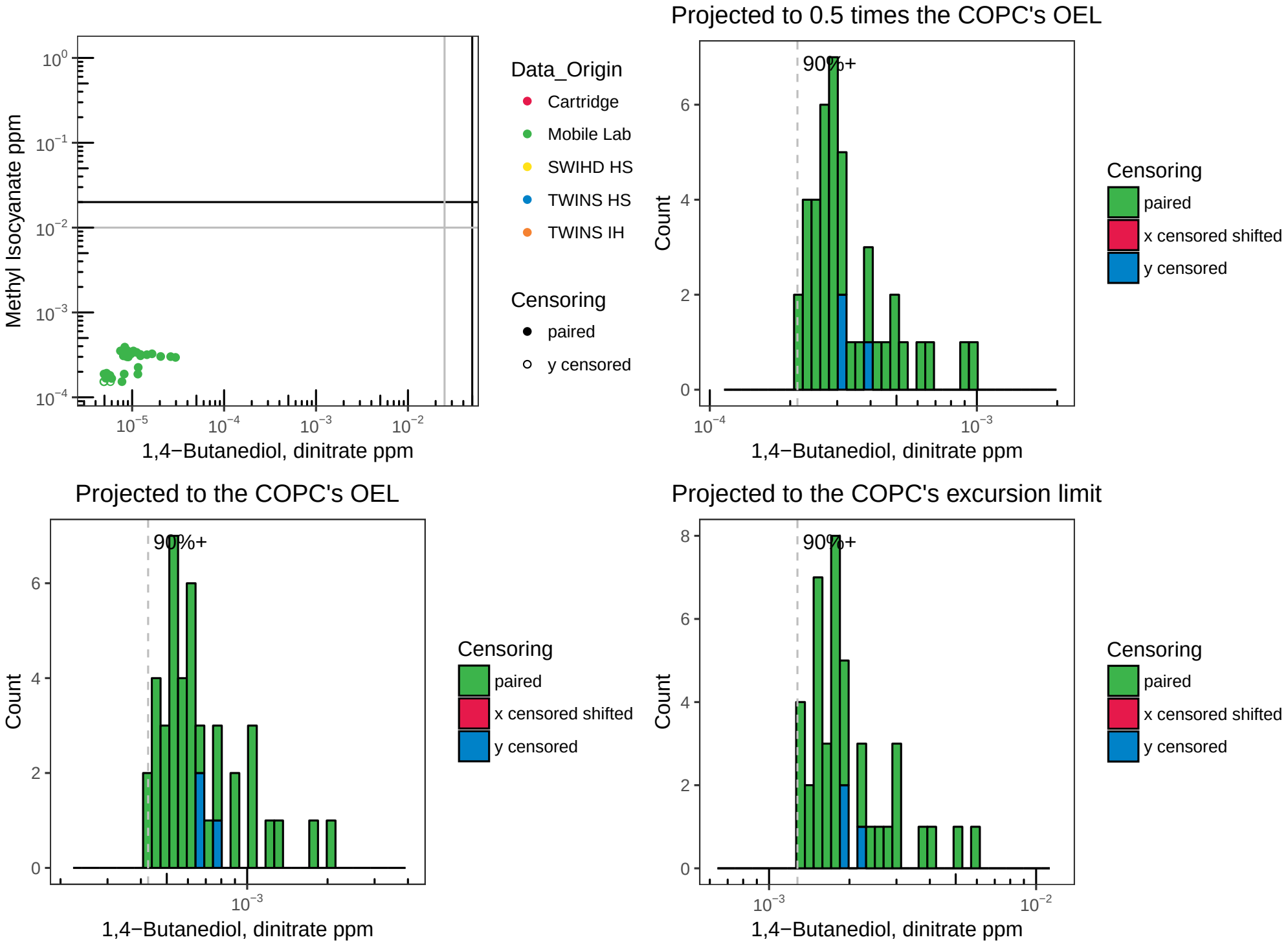


Figure C.2739: Methyl Isocyanate vs 1,4-Butanediol, dinitrate

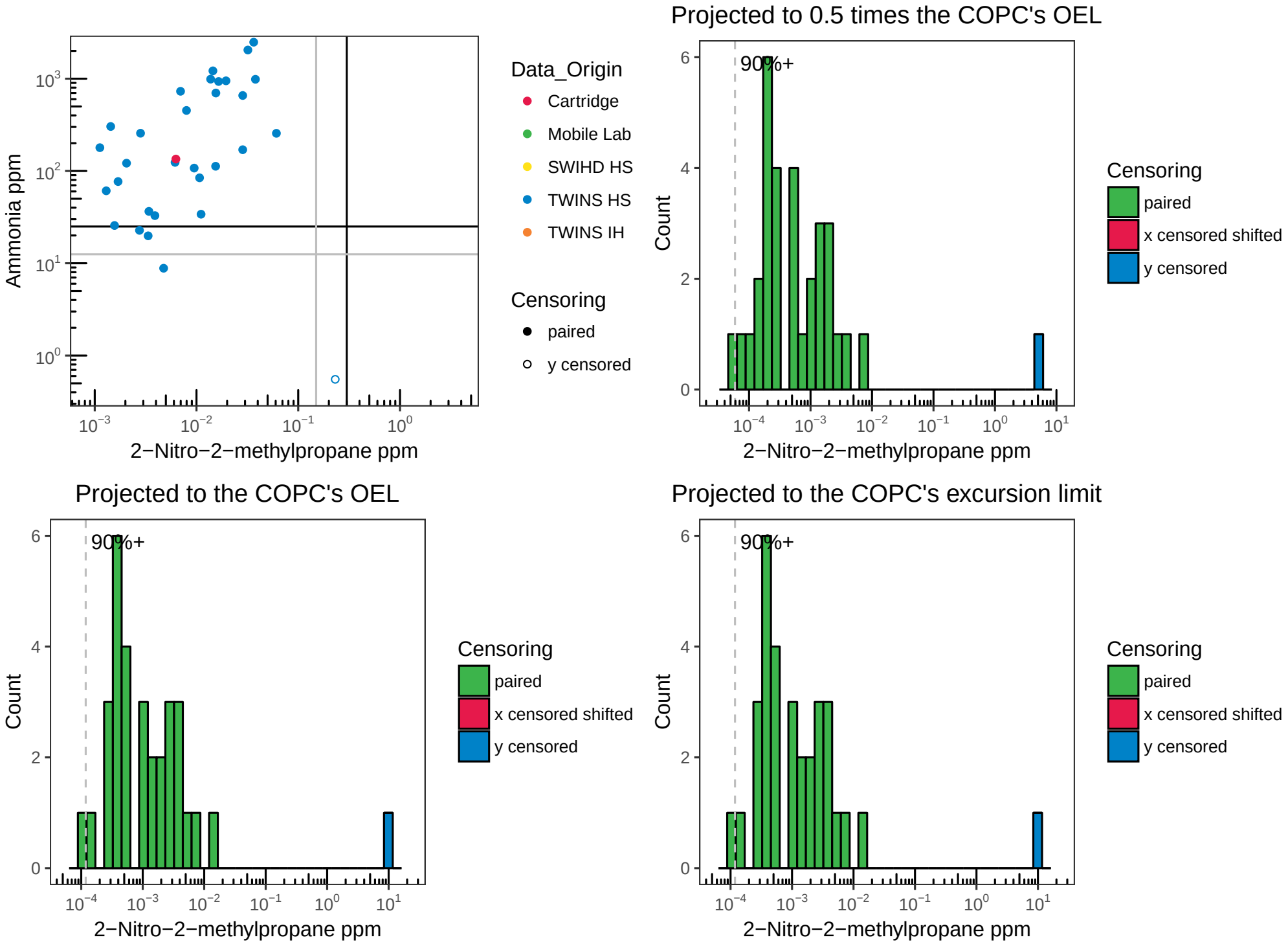


Figure C.2740: Ammonia vs 2-Nitro-2-methylpropane

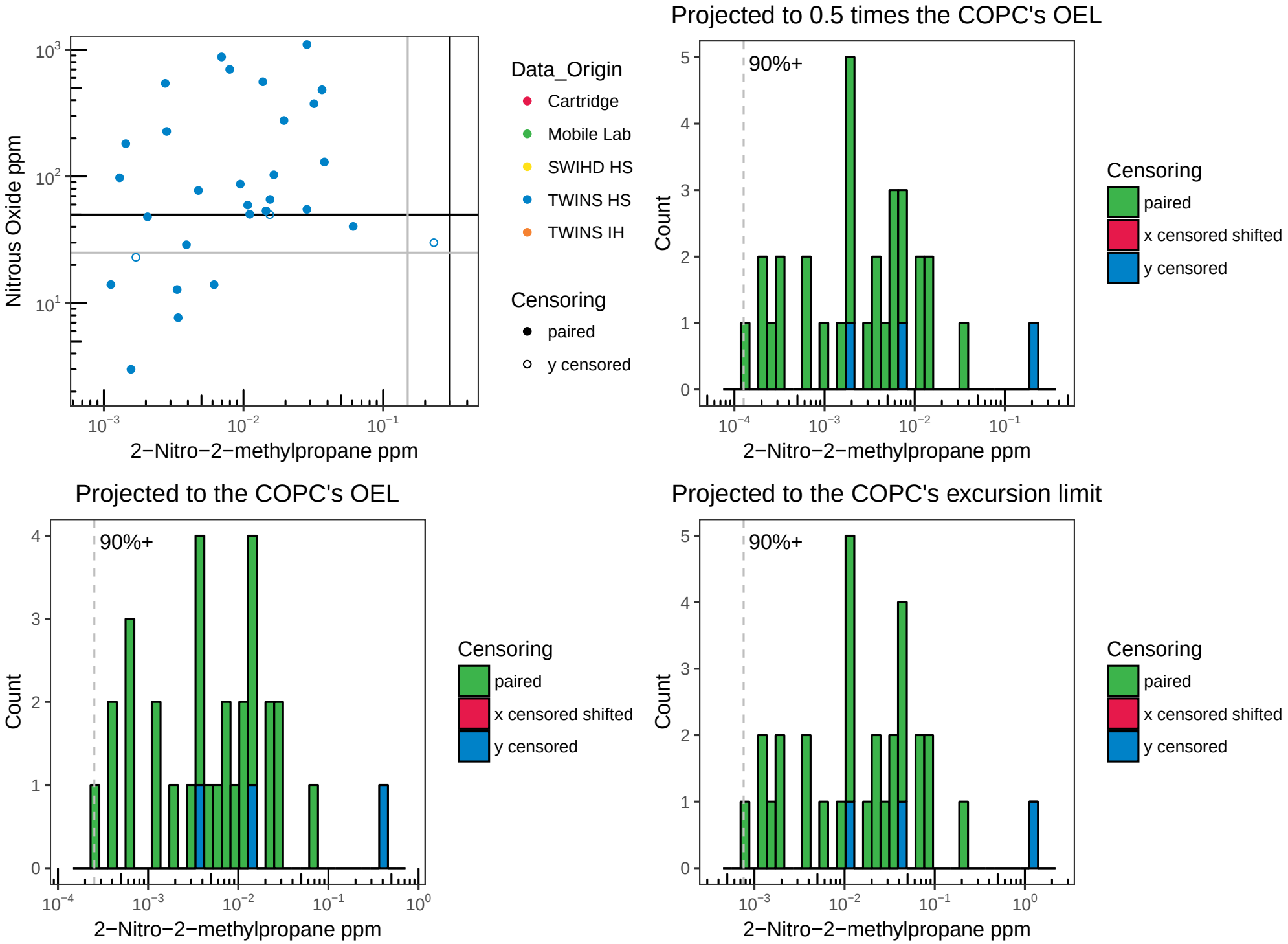


Figure C.2741: Nitrous Oxide vs 2-Nitro-2-methylpropane

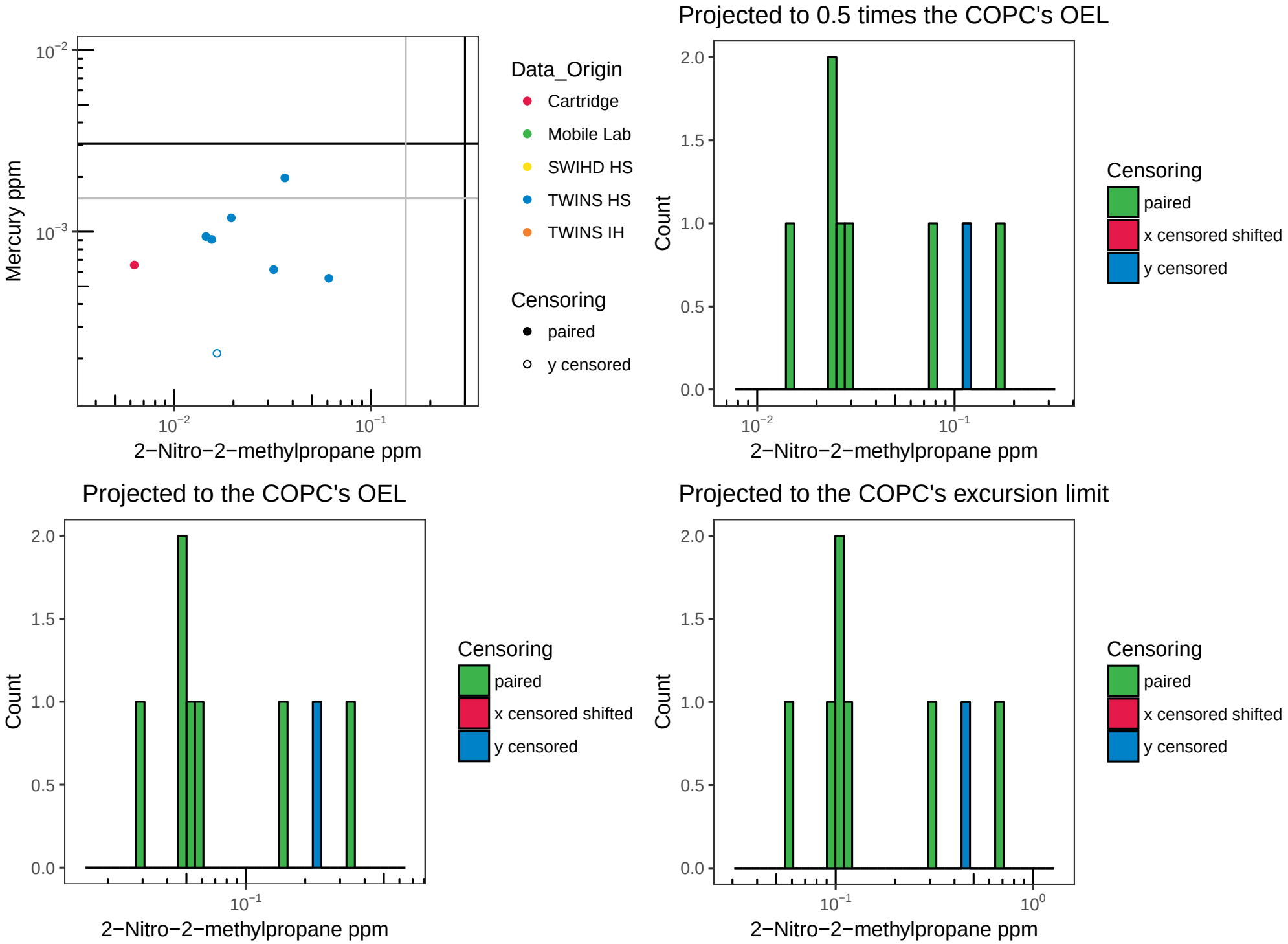


Figure C.2742: Mercury vs 2-Nitro-2-methylpropane

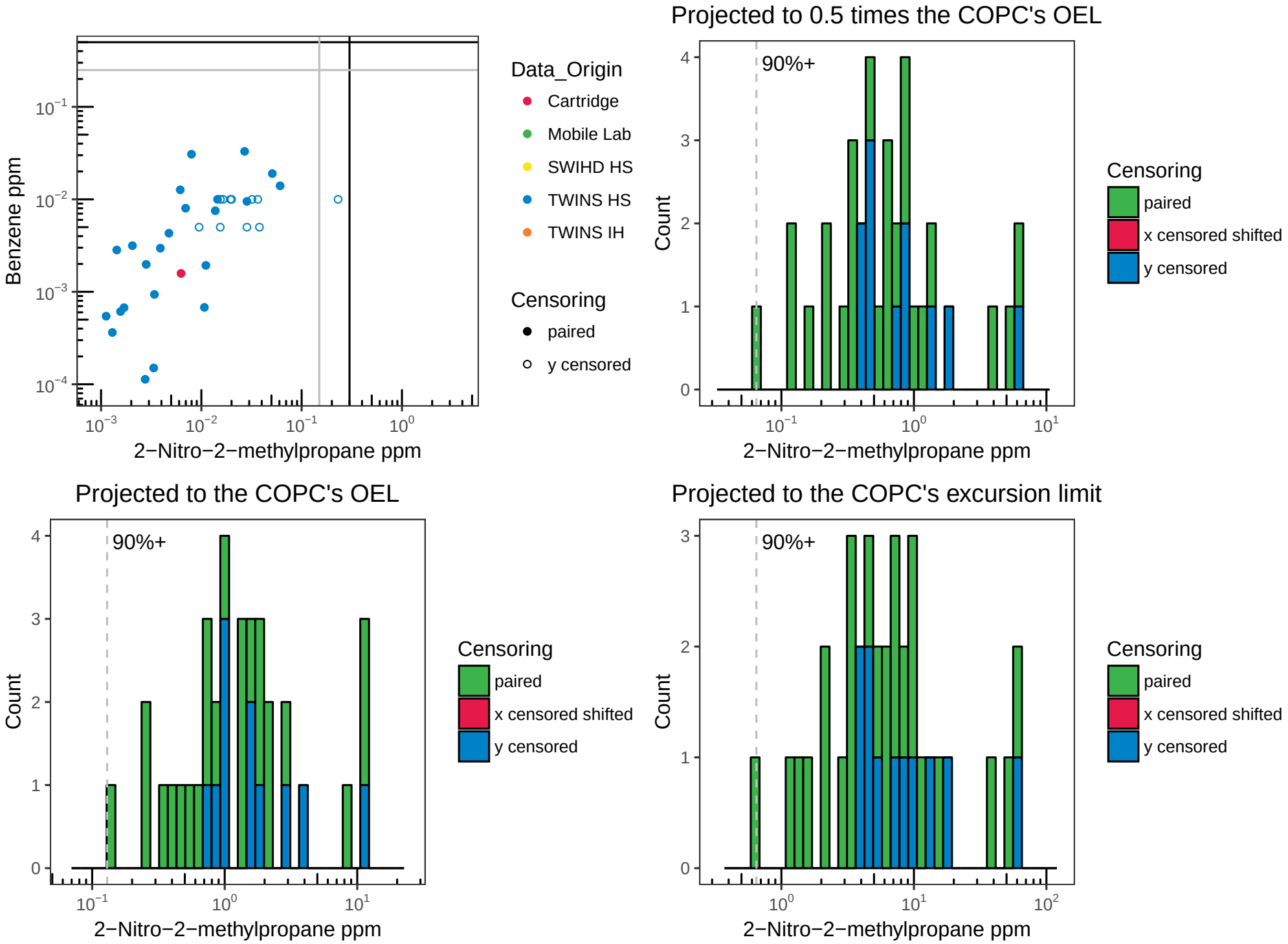


Figure C.2743: Benzene vs 2-Nitro-2-methylpropane

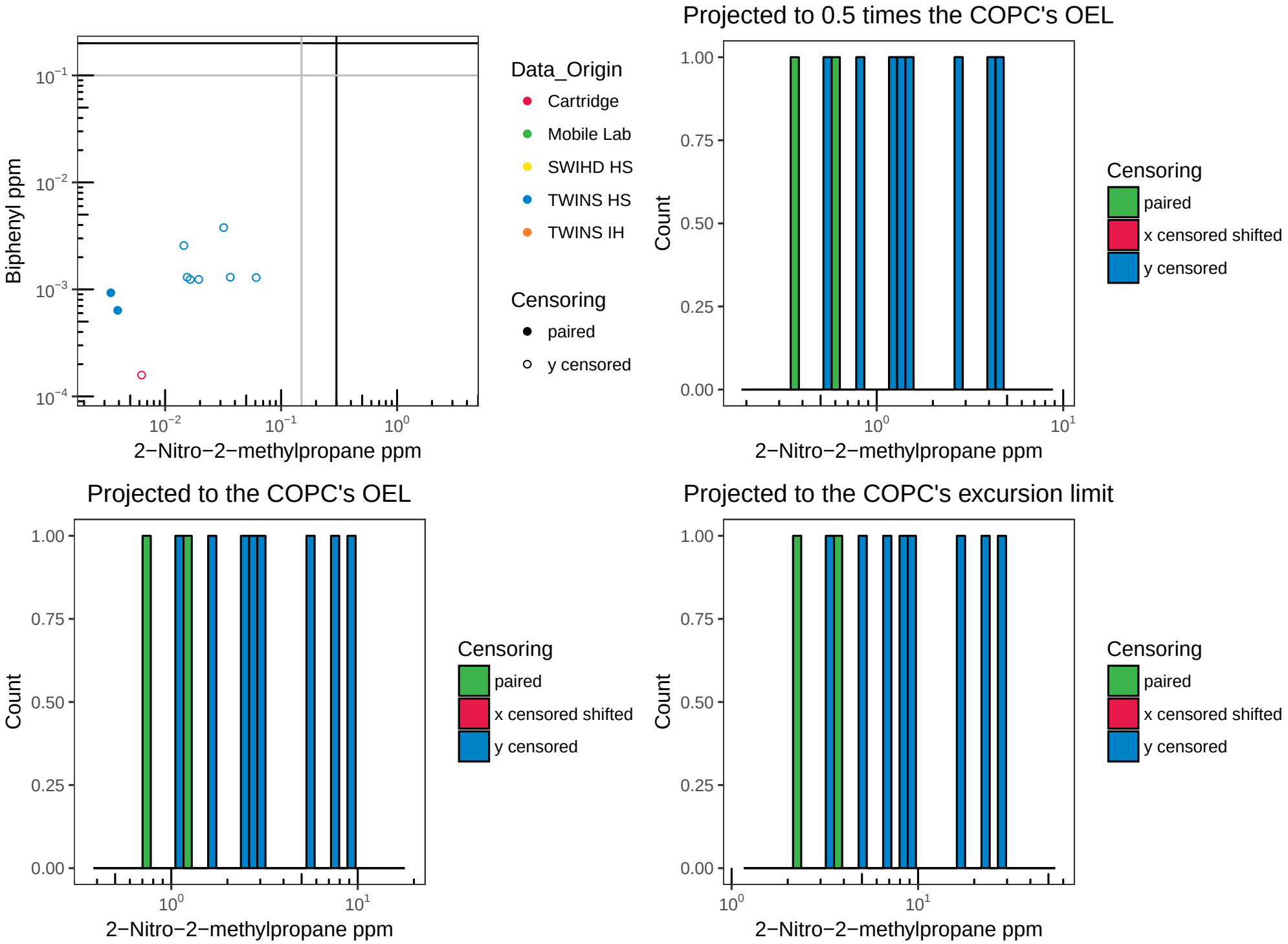


Figure C.2744: Biphenyl vs 2-Nitro-2-methylpropane

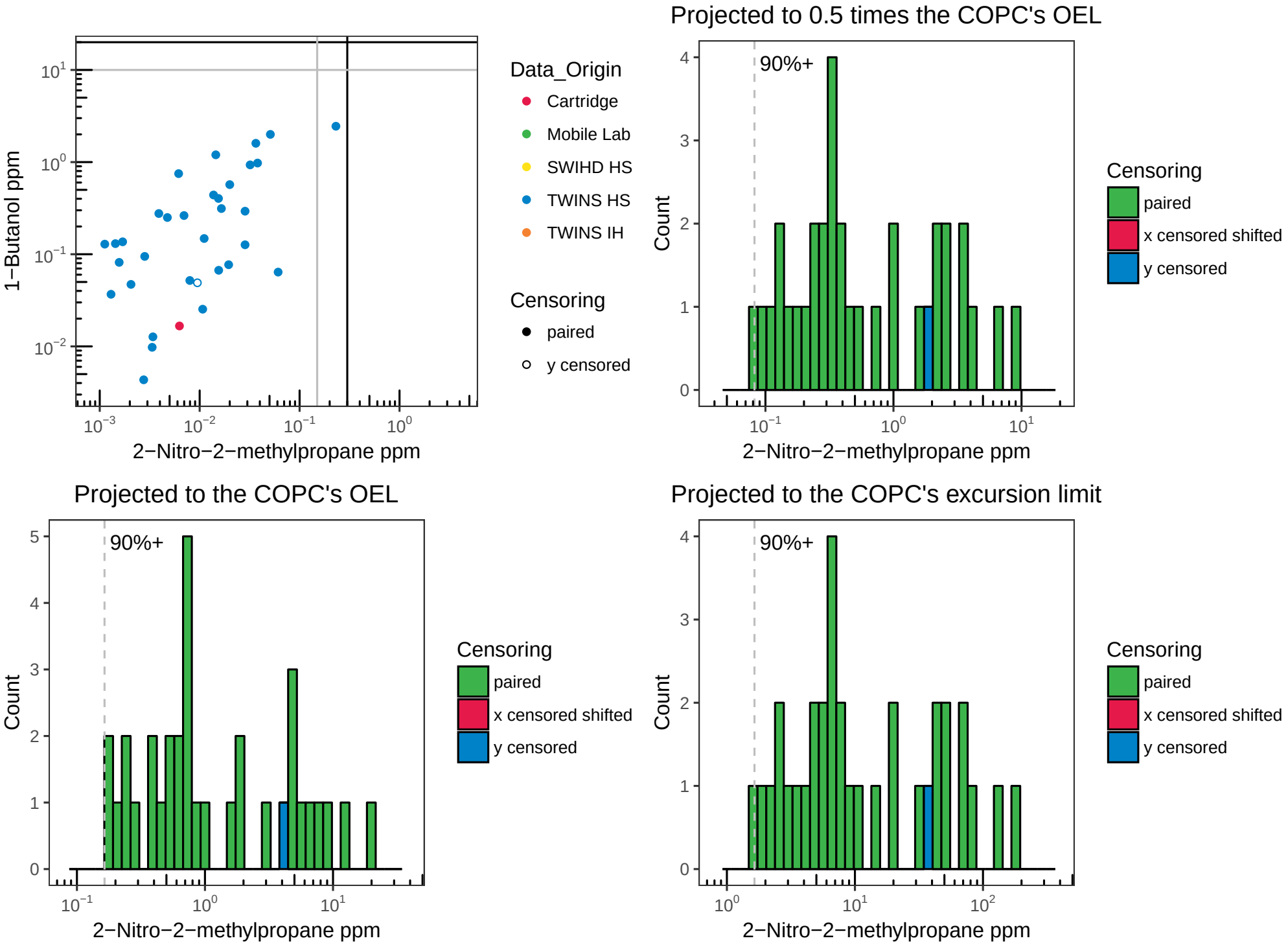


Figure C.2745: 1-Butanol vs 2-Nitro-2-methylpropane

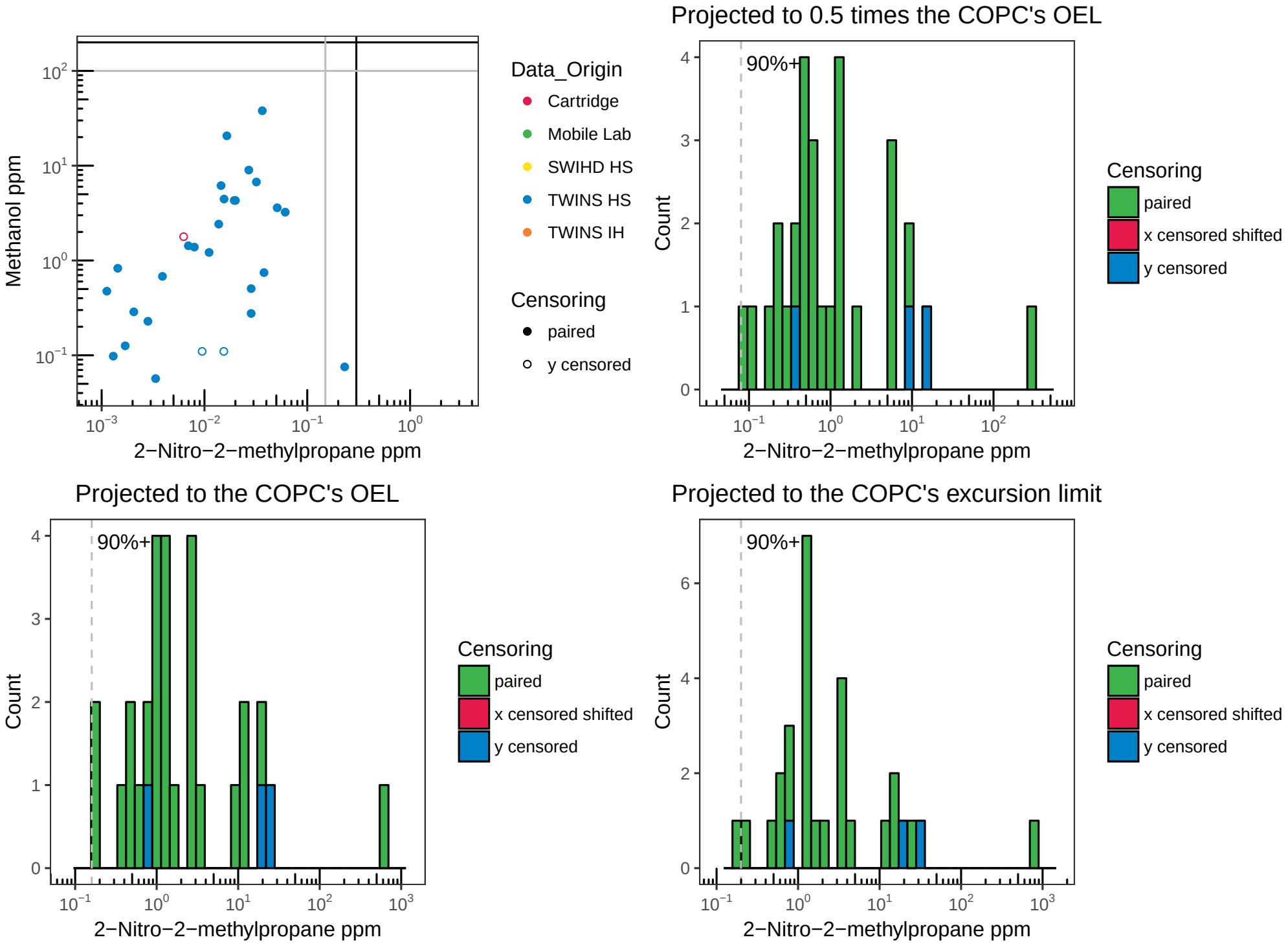


Figure C.2746: Methanol vs 2-Nitro-2-methylpropane

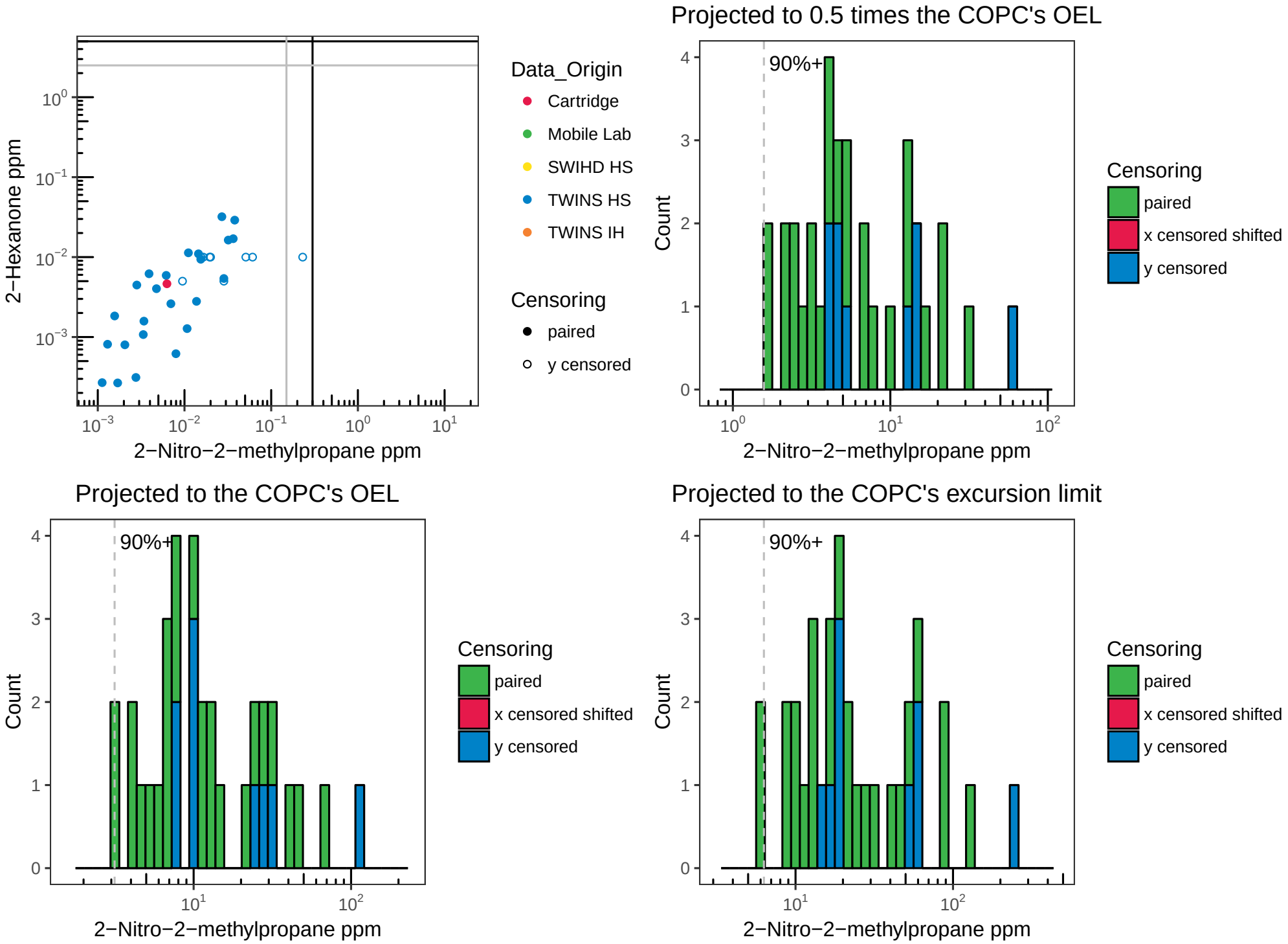


Figure C.2747: 2-Hexanone vs 2-Nitro-2-methylpropane

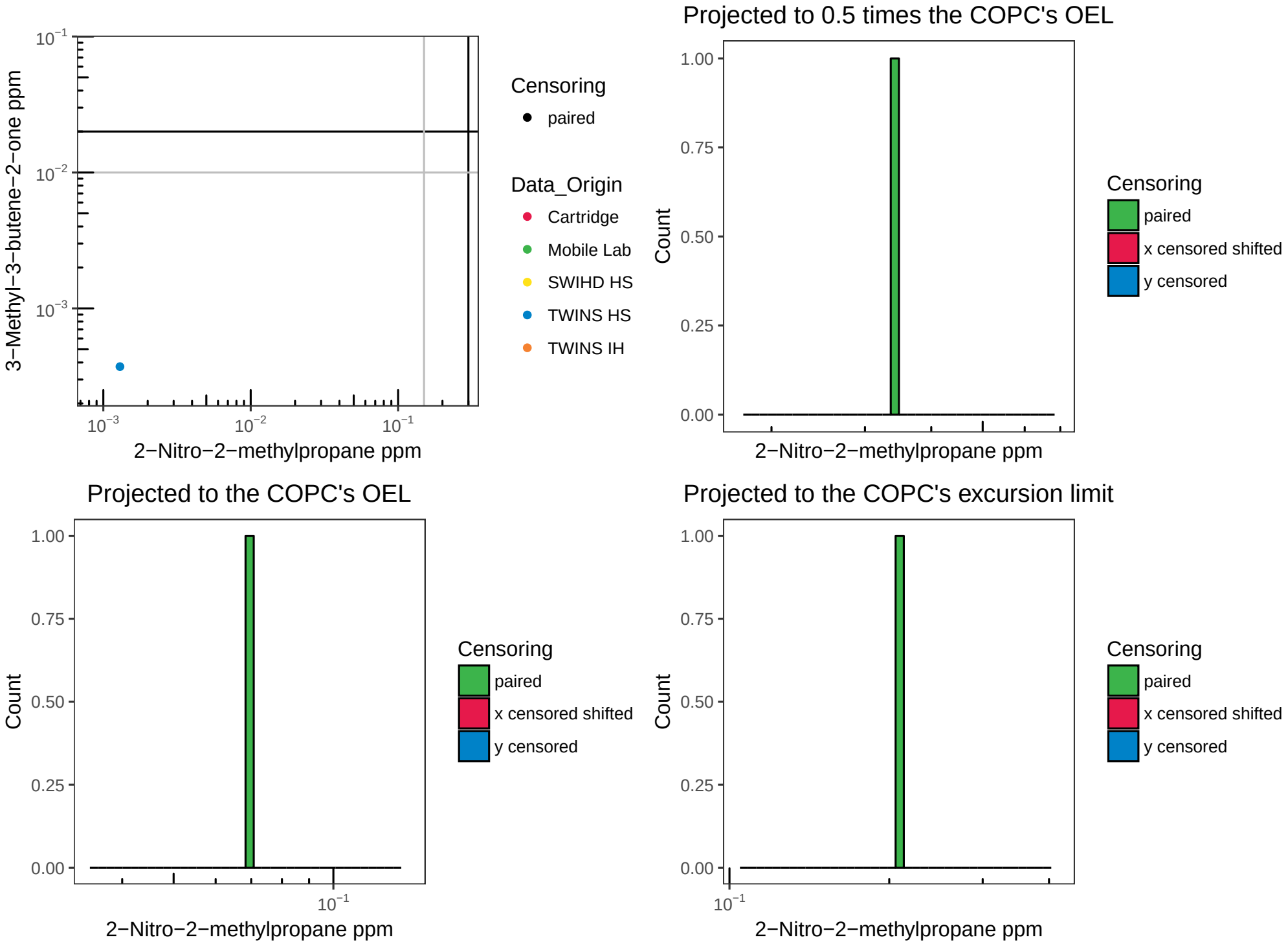


Figure C.2748: 3-Methyl-3-butene-2-one vs 2-Nitro-2-methylpropane

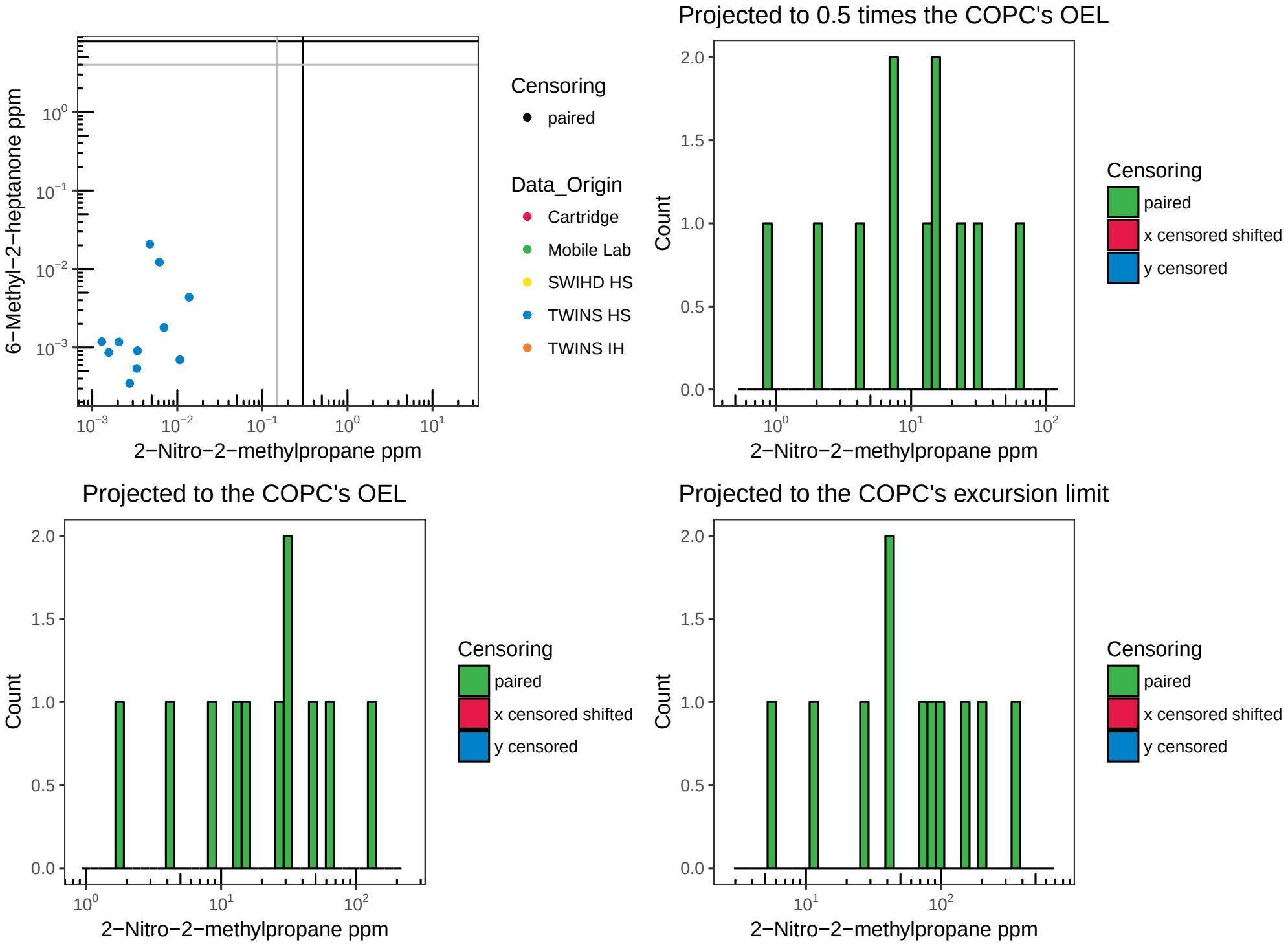


Figure C.2749: 6-Methyl-2-heptanone vs 2-Nitro-2-methylpropane

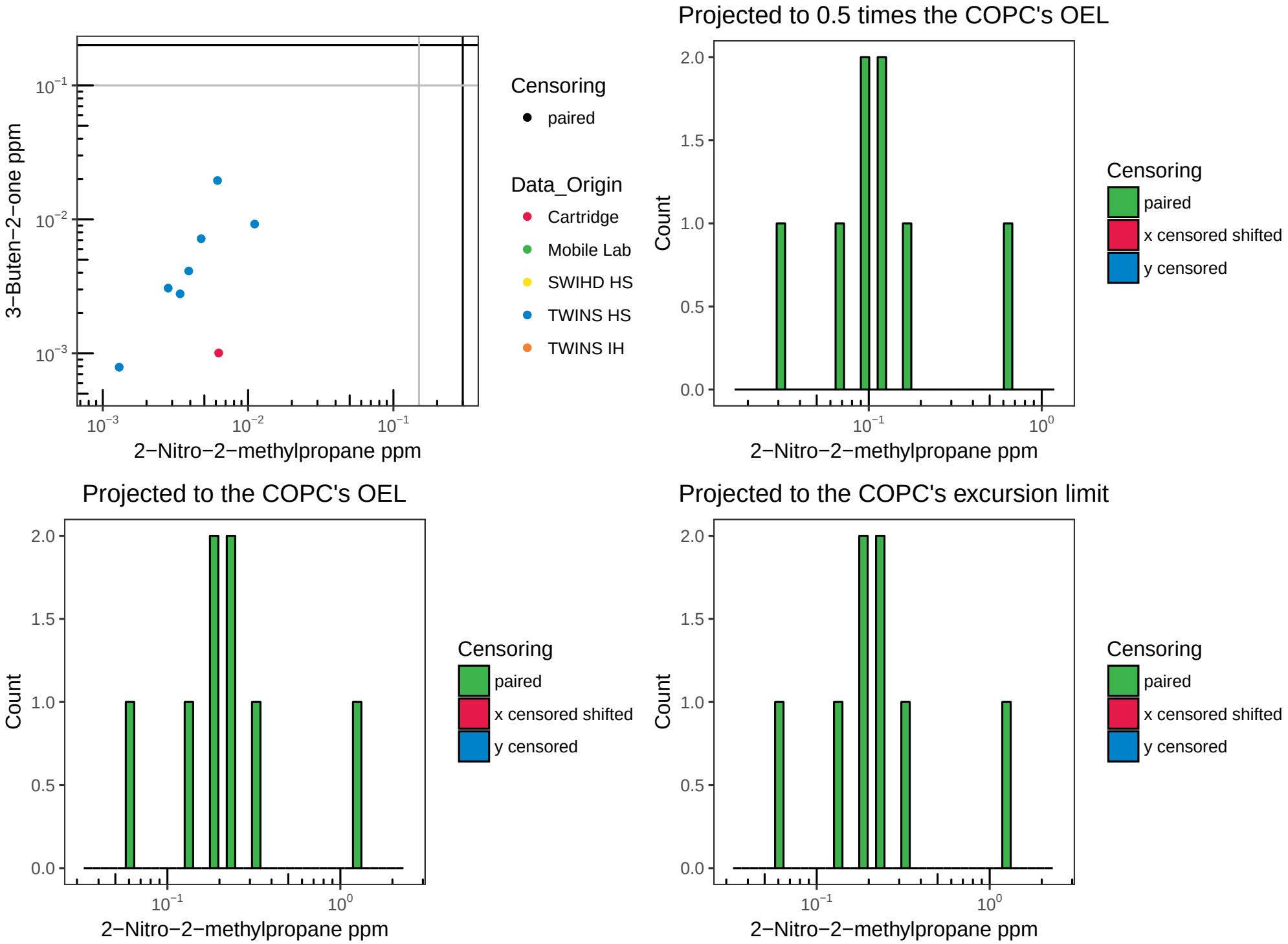


Figure C.2750: 3-Buten-2-one vs 2-Nitro-2-methylpropane

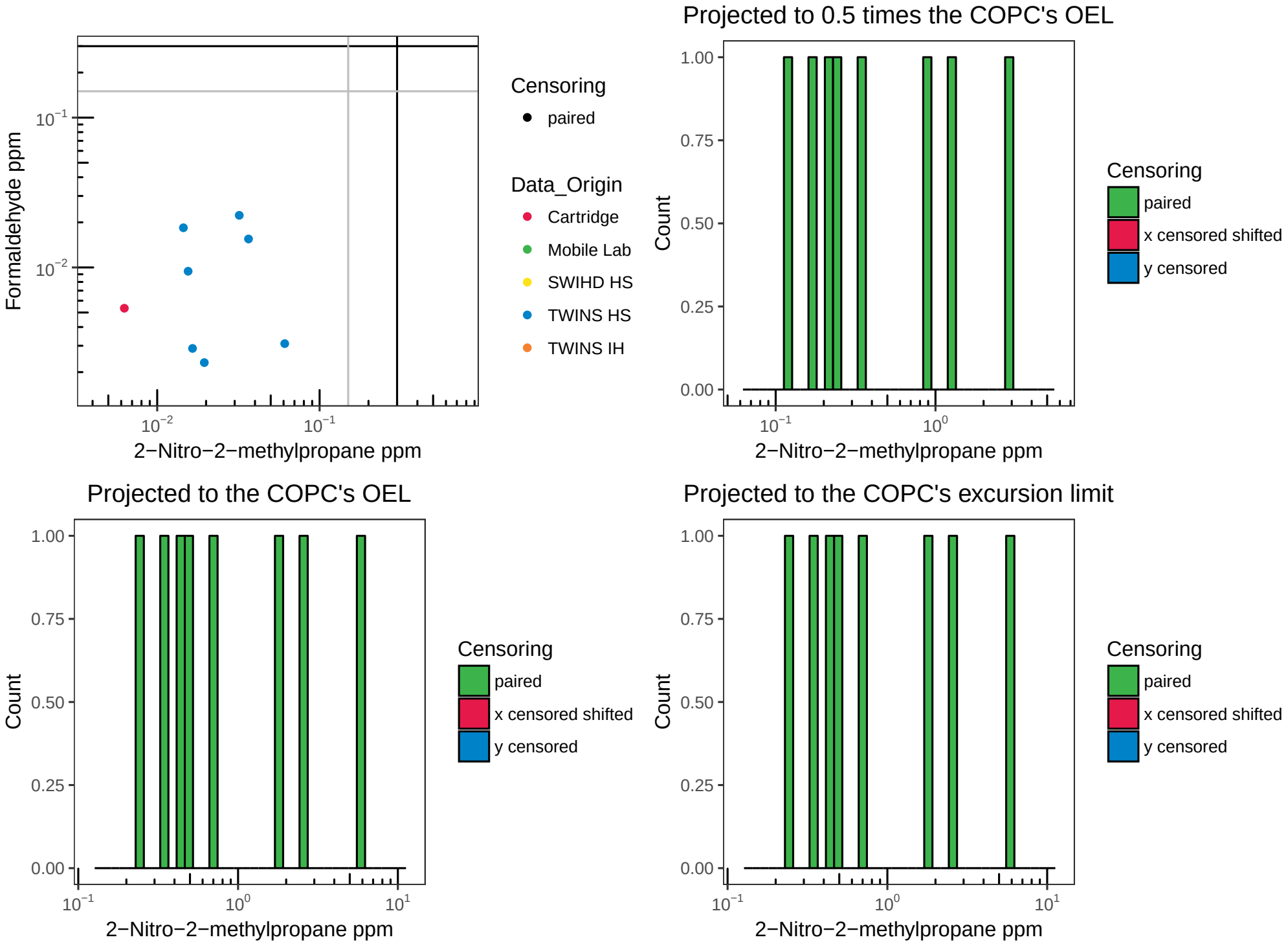


Figure C.2751: Formaldehyde vs 2-Nitro-2-methylpropane

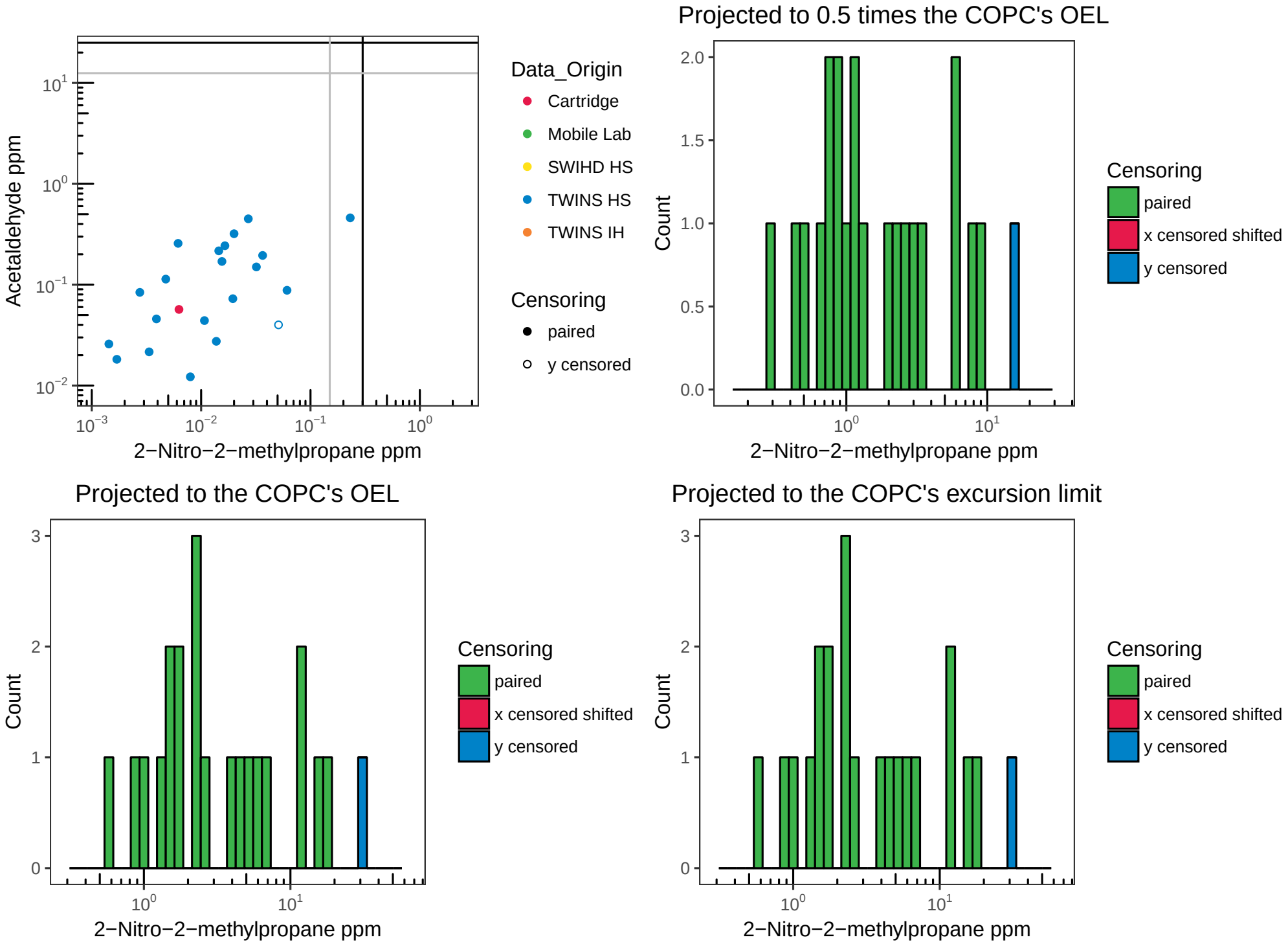


Figure C.2752: Acetaldehyde vs 2-Nitro-2-methylpropane

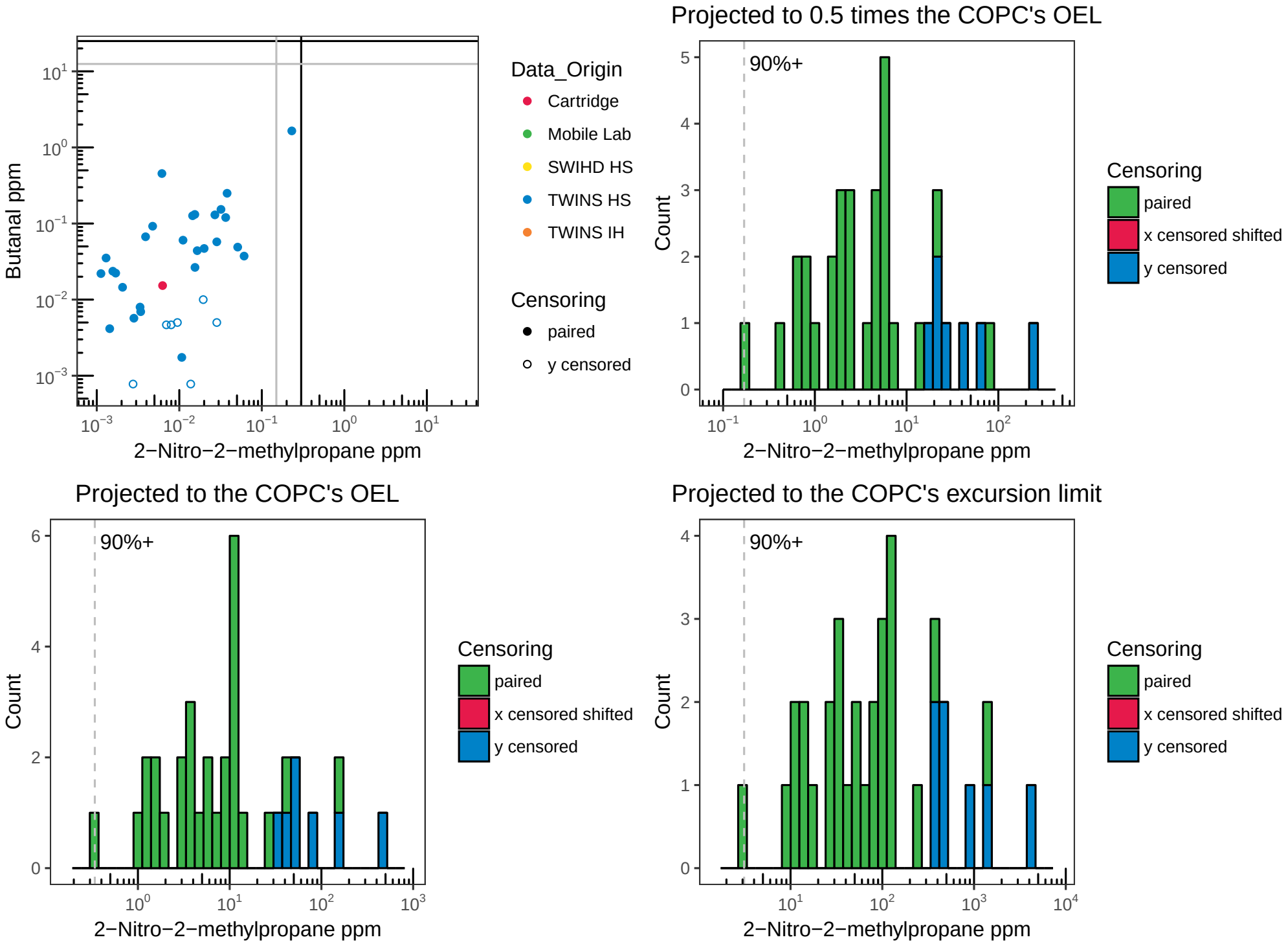


Figure C.2753: Butanal vs 2-Nitro-2-methylpropane

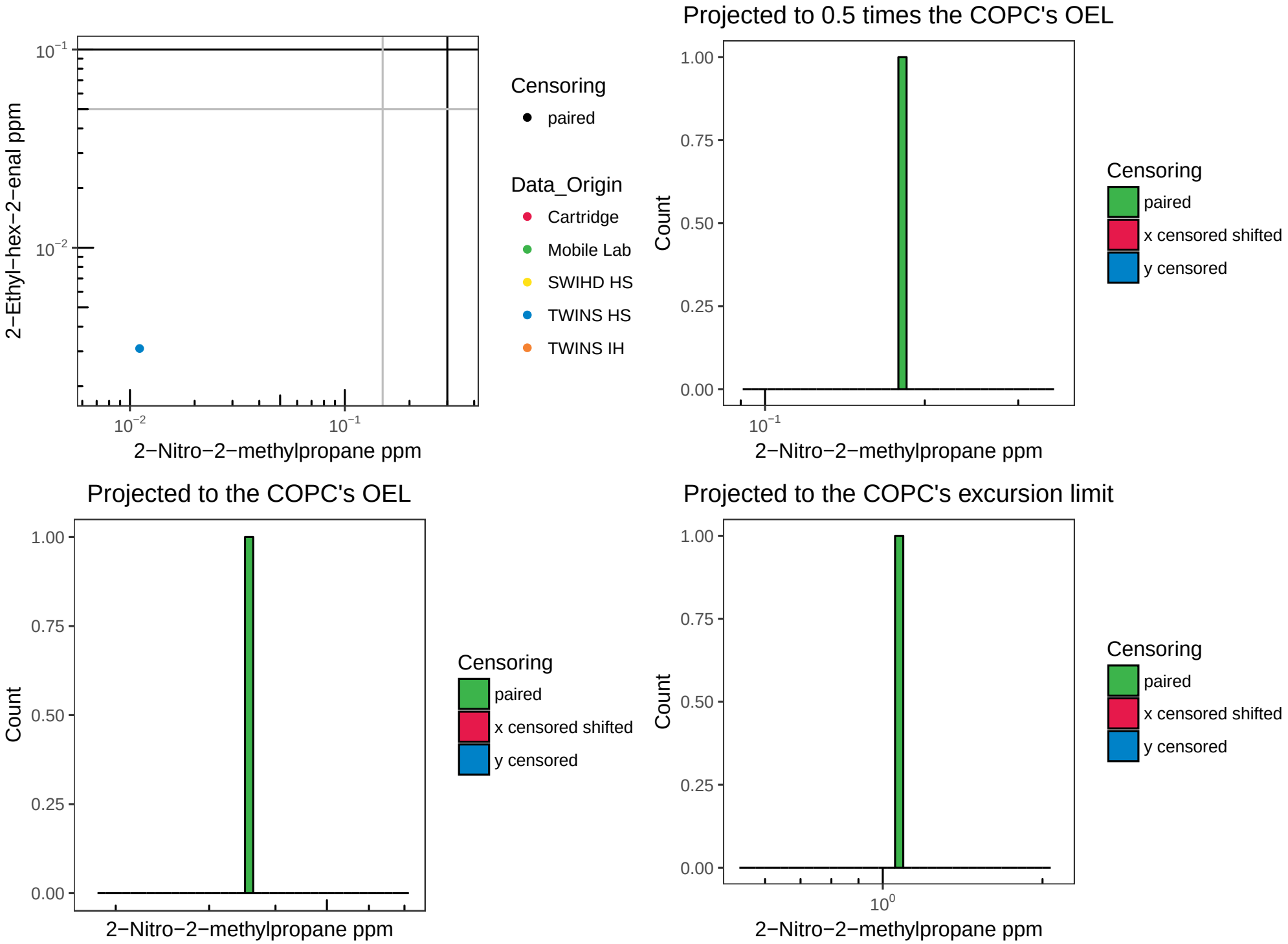


Figure C.2754: 2-Ethyl-hex-2-enal vs 2-Nitro-2-methylpropane

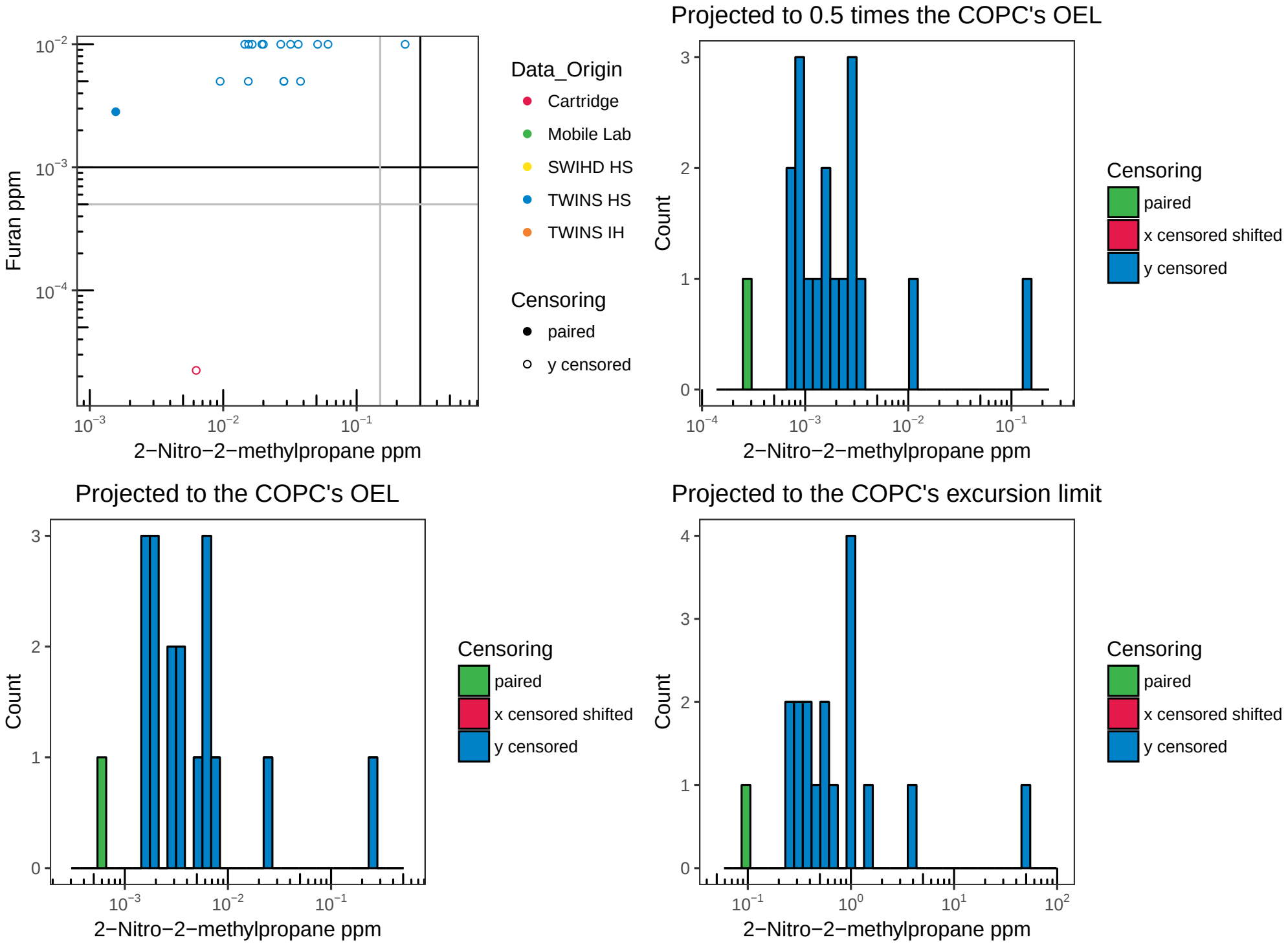


Figure C.2755: Furan vs 2-Nitro-2-methylpropane

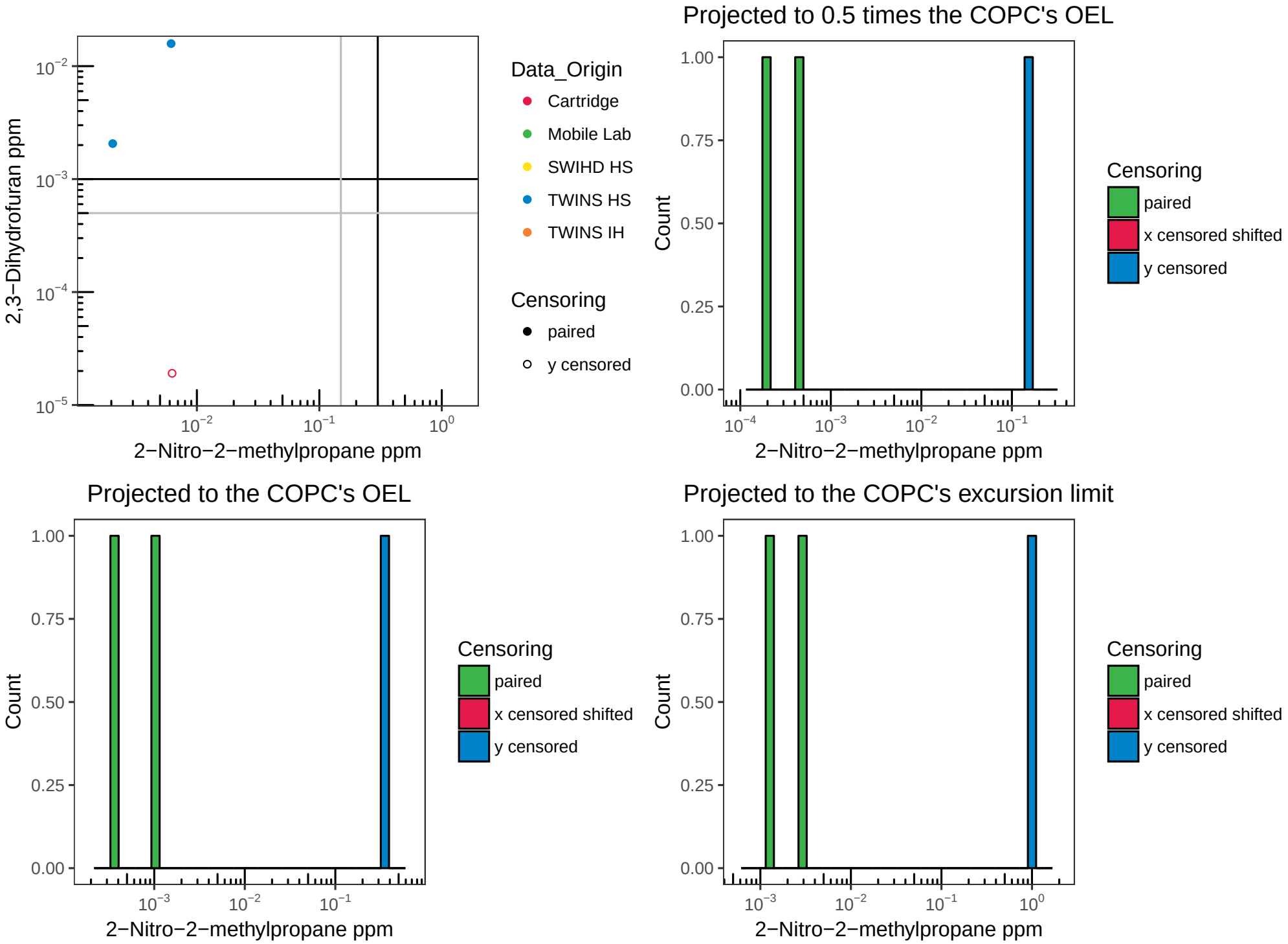


Figure C.2756: 2,3-Dihydrofuran vs 2-Nitro-2-methylpropane

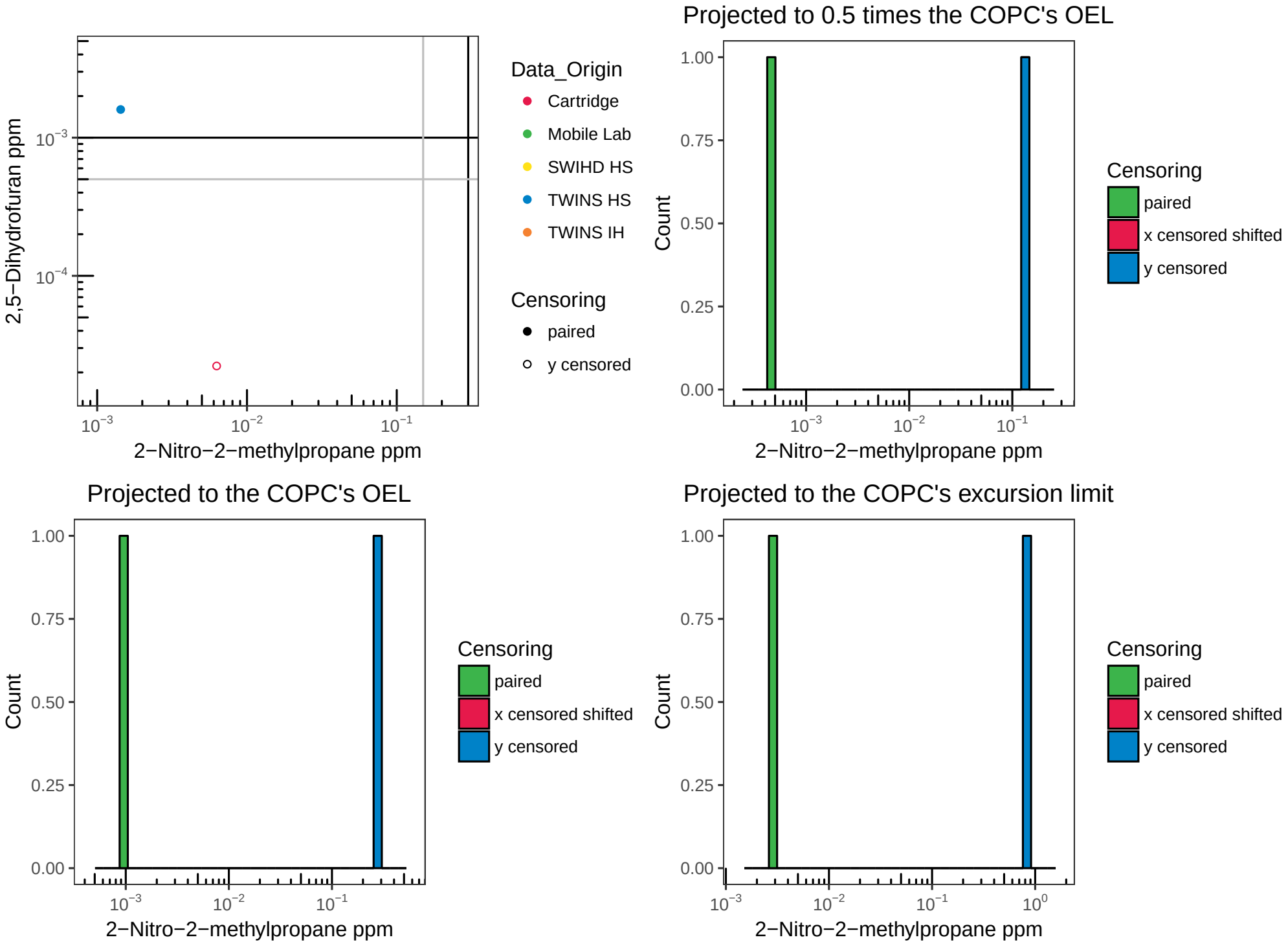


Figure C.2757: 2,5-Dihydrofuran vs 2-Nitro-2-methylpropane

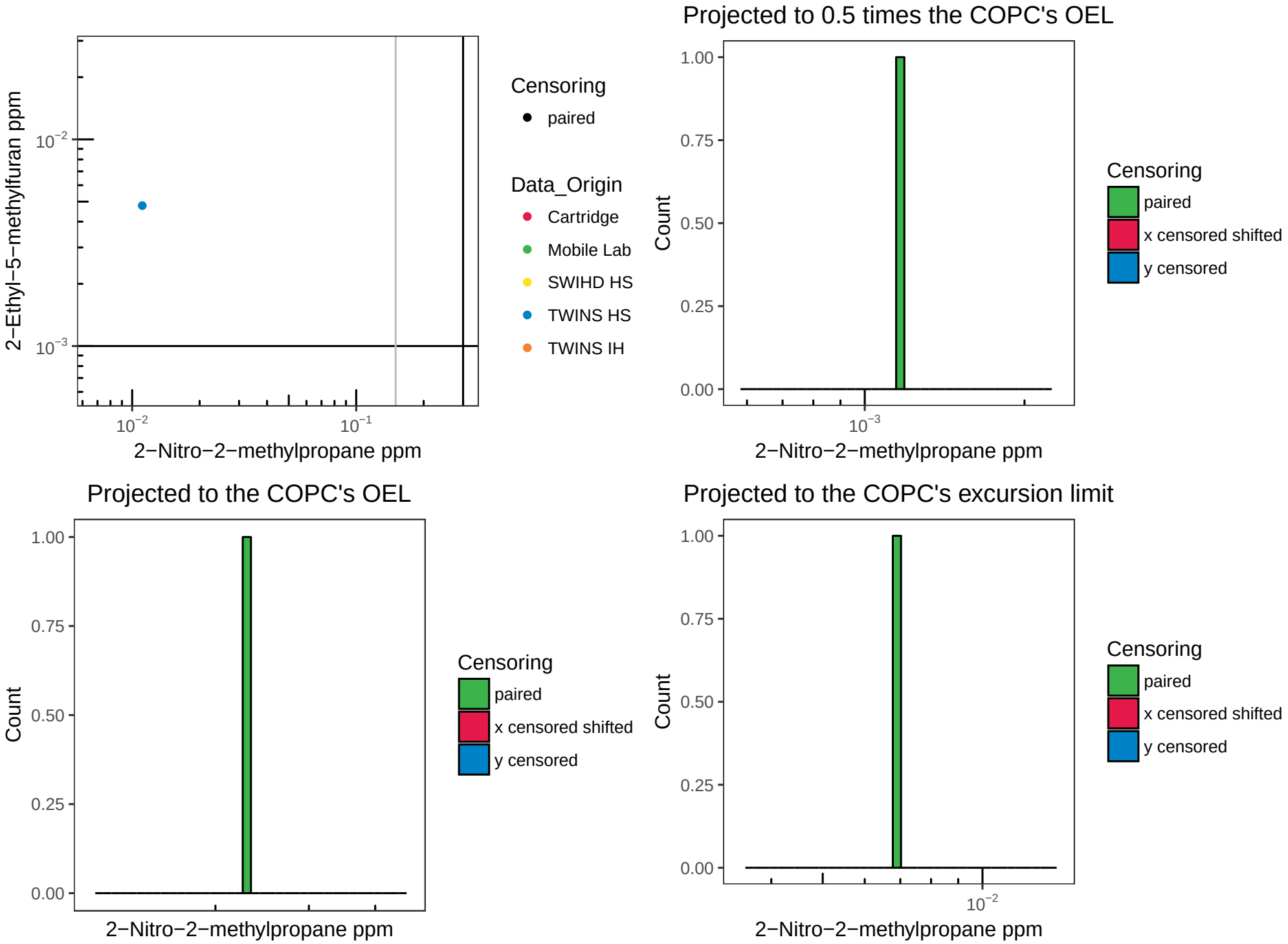


Figure C.2758: 2-Ethyl-5-methylfuran vs 2-Nitro-2-methylpropane

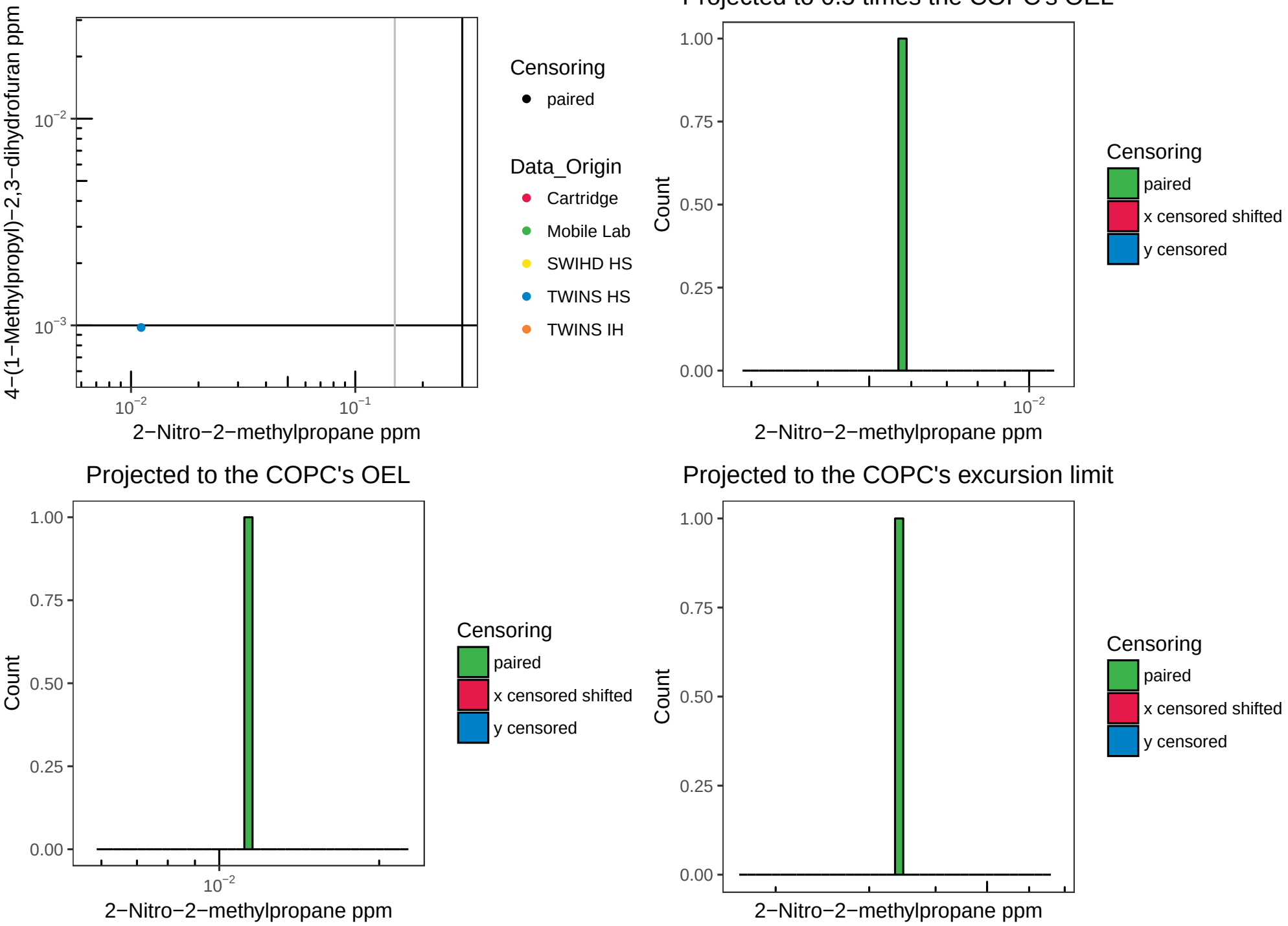


Figure C.2759: 4-(1-Methylpropyl)-2,3-dihydrofuran vs 2-Nitro-2-methylpropane

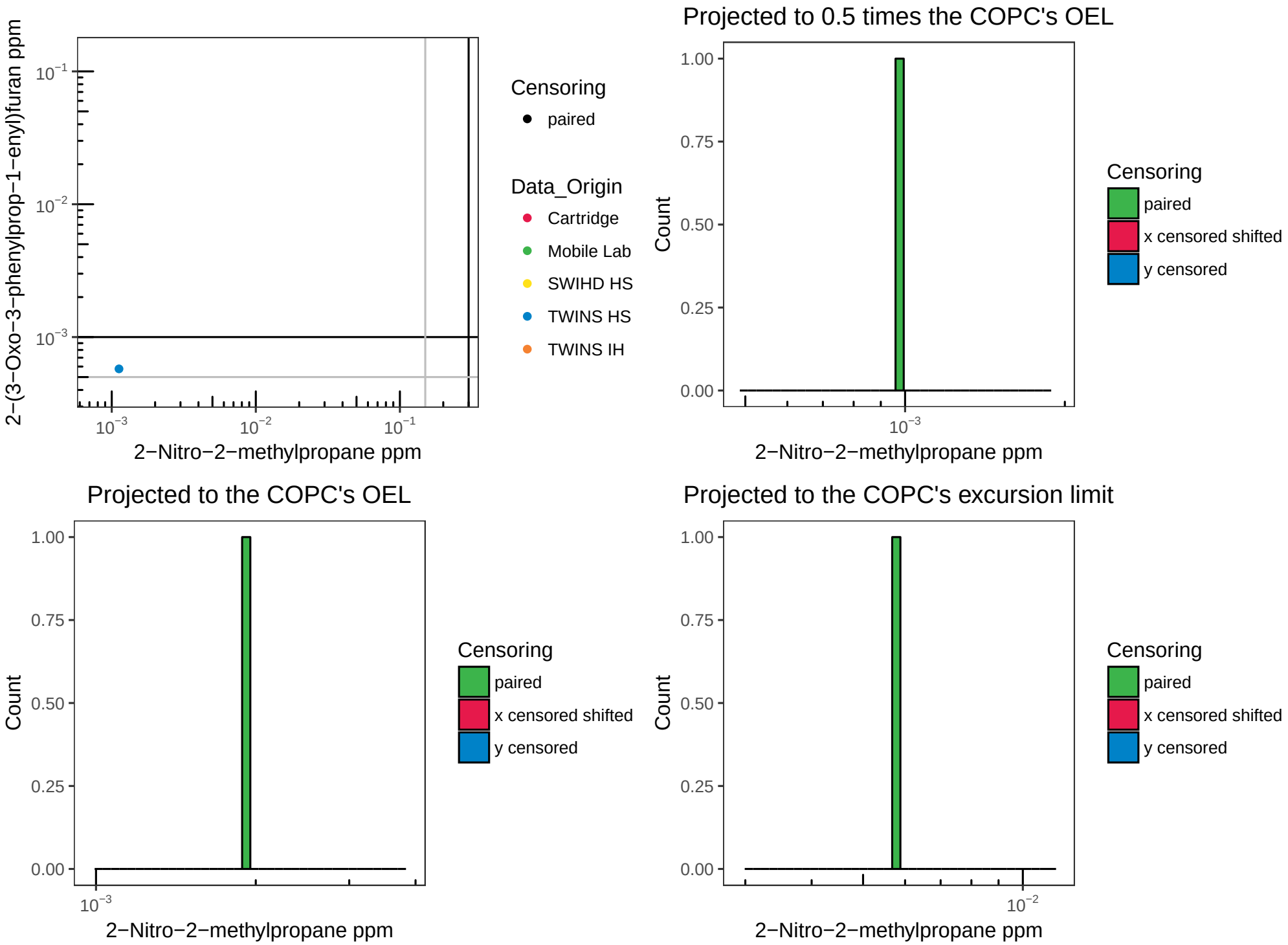


Figure C.2760: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 2-Nitro-2-methylpropane

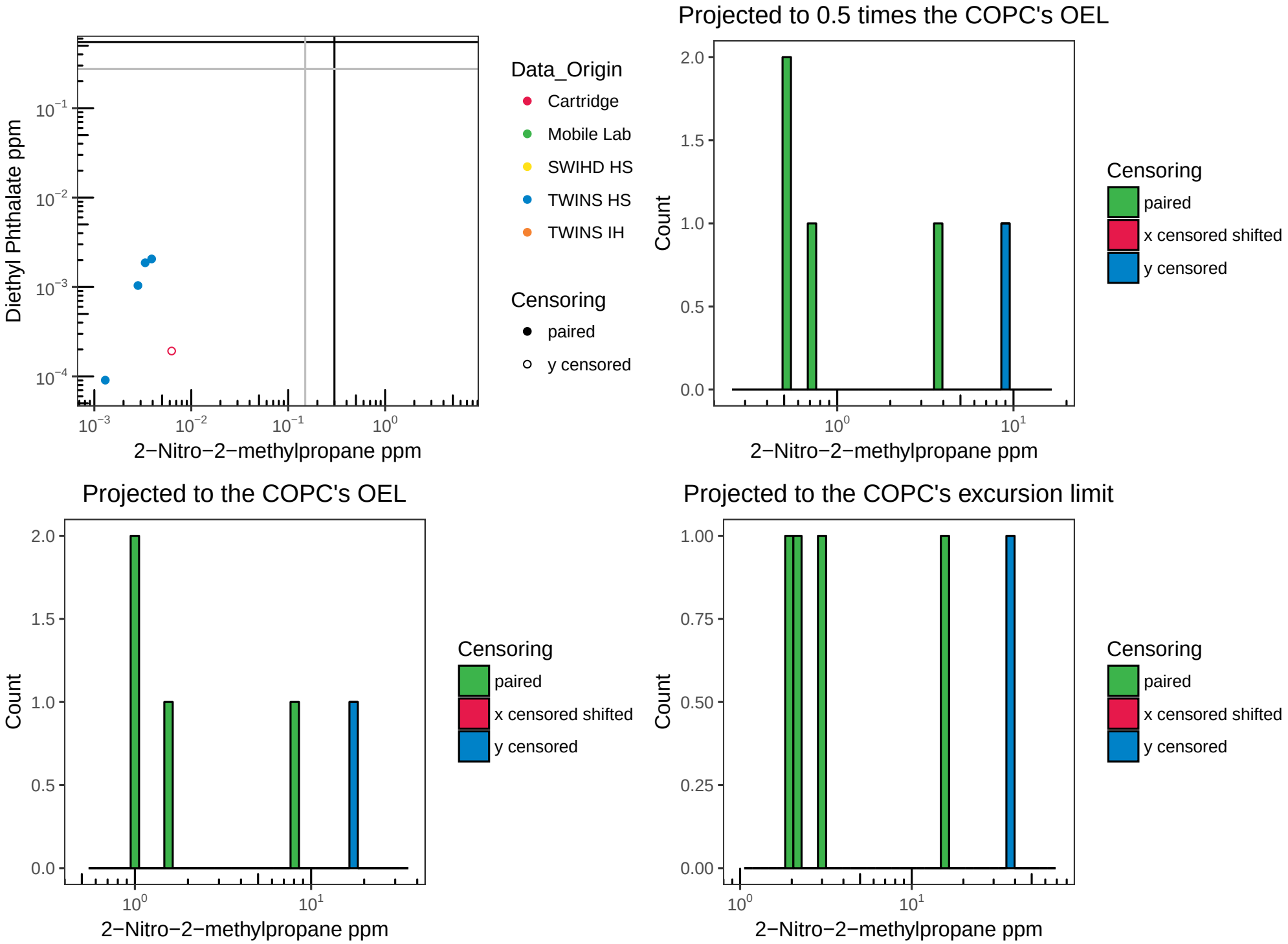


Figure C.2761: Diethyl Phthalate vs 2-Nitro-2-methylpropane

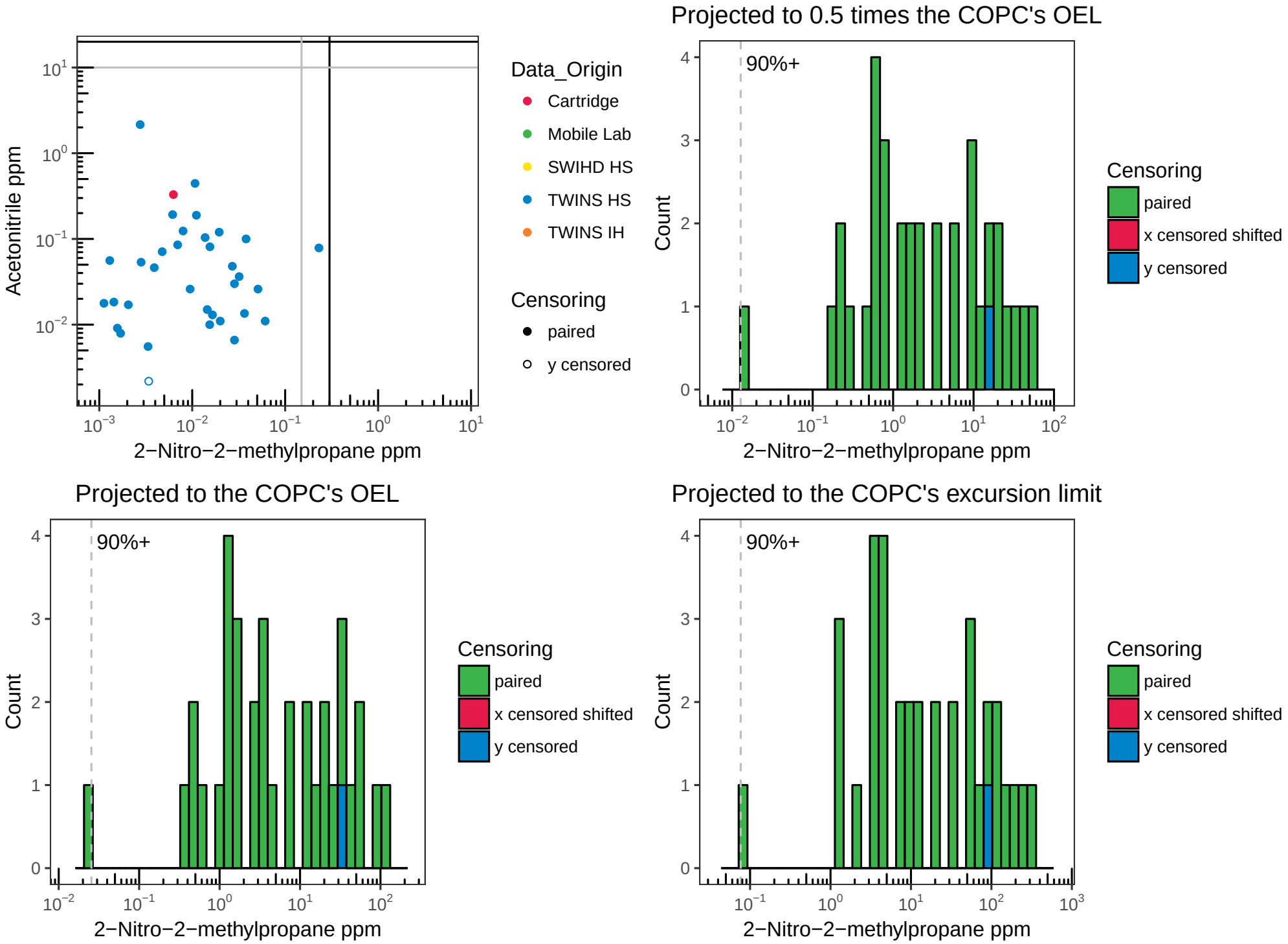


Figure C.2762: Acetonitrile vs 2-Nitro-2-methylpropane

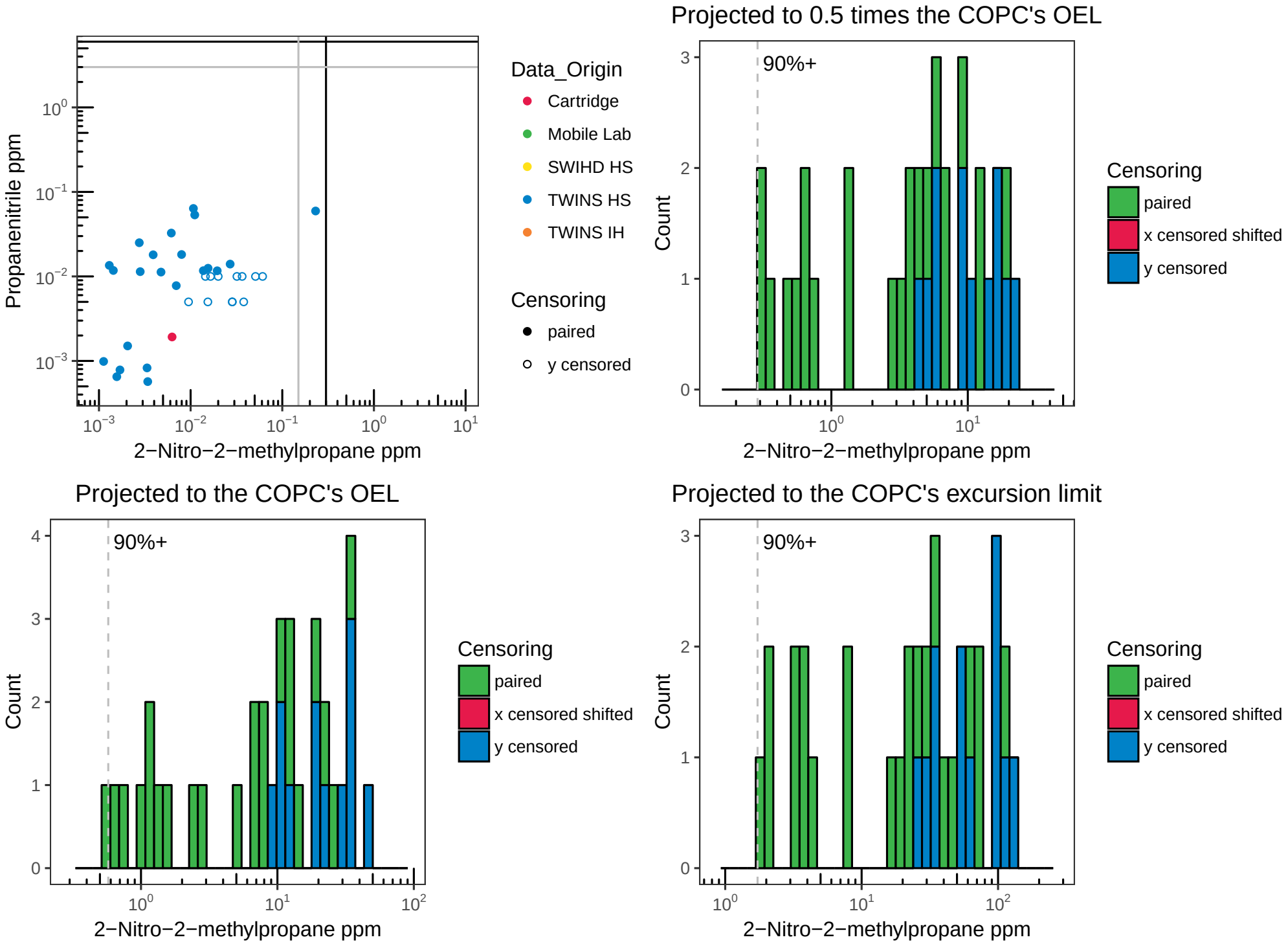


Figure C.2763: Propanenitrile vs 2-Nitro-2-methylpropane

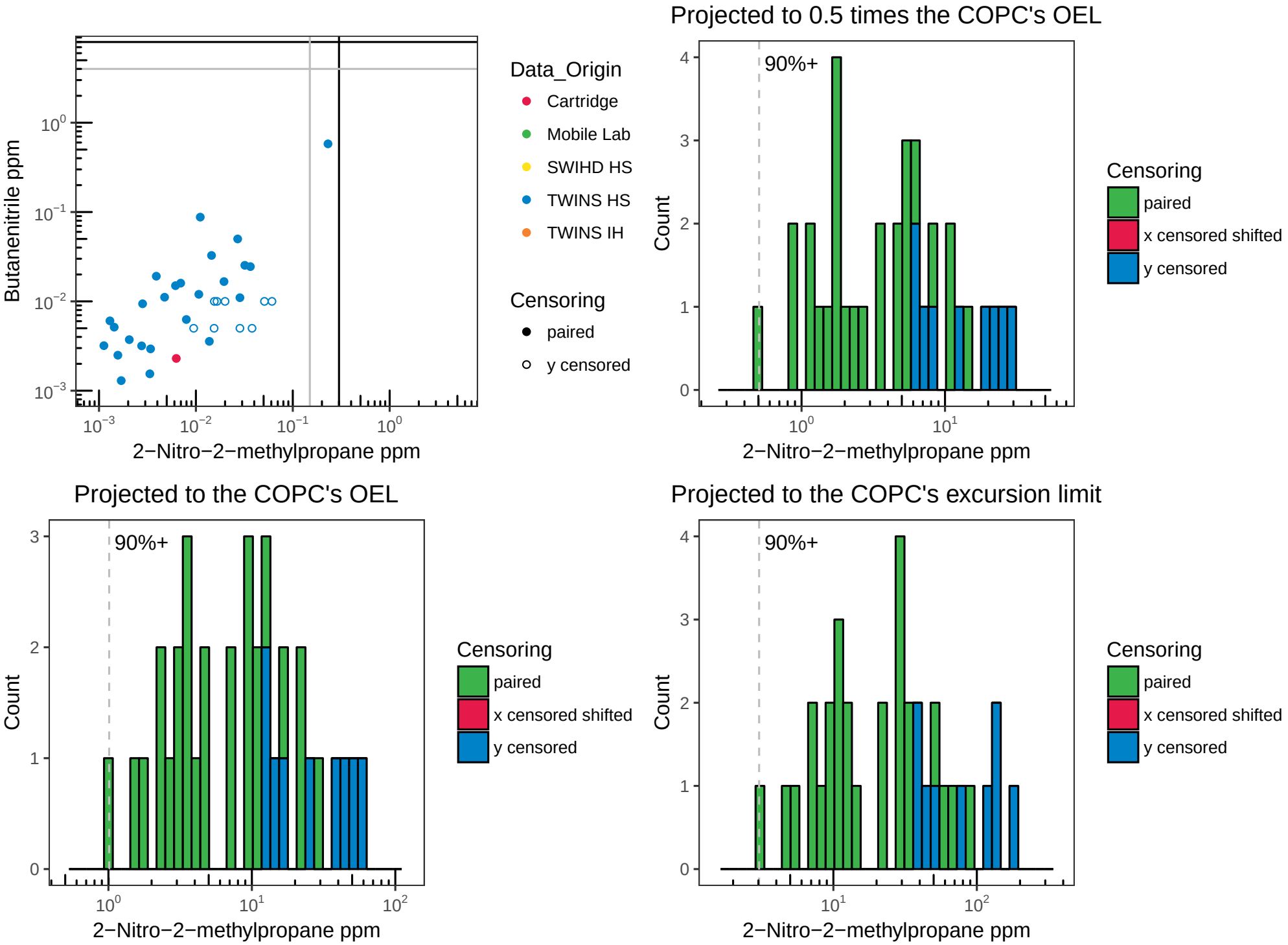


Figure C.2764: Butanenitrile vs 2-Nitro-2-methylpropane

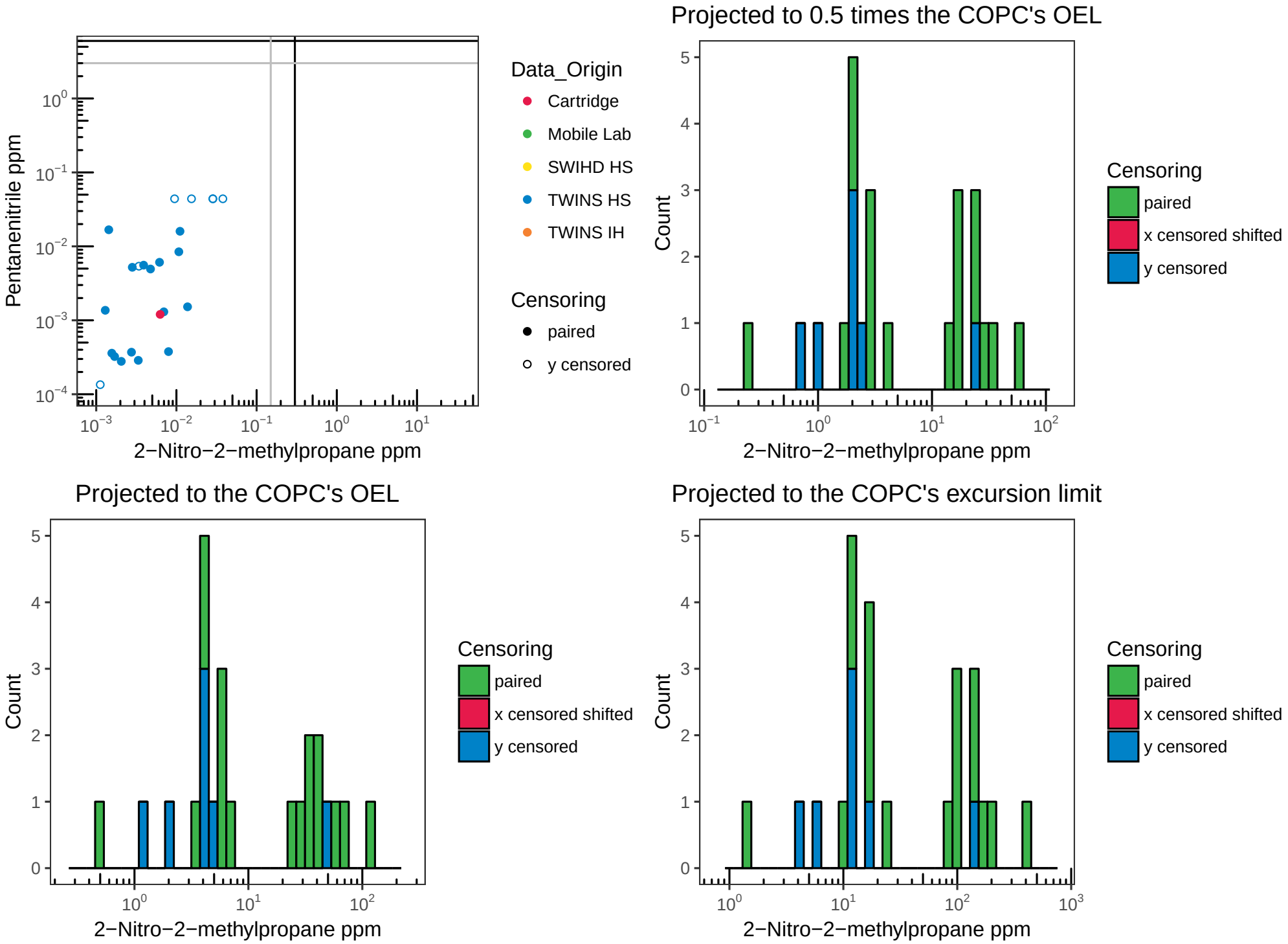


Figure C.2765: Pentanenitrile vs 2-Nitro-2-methylpropane

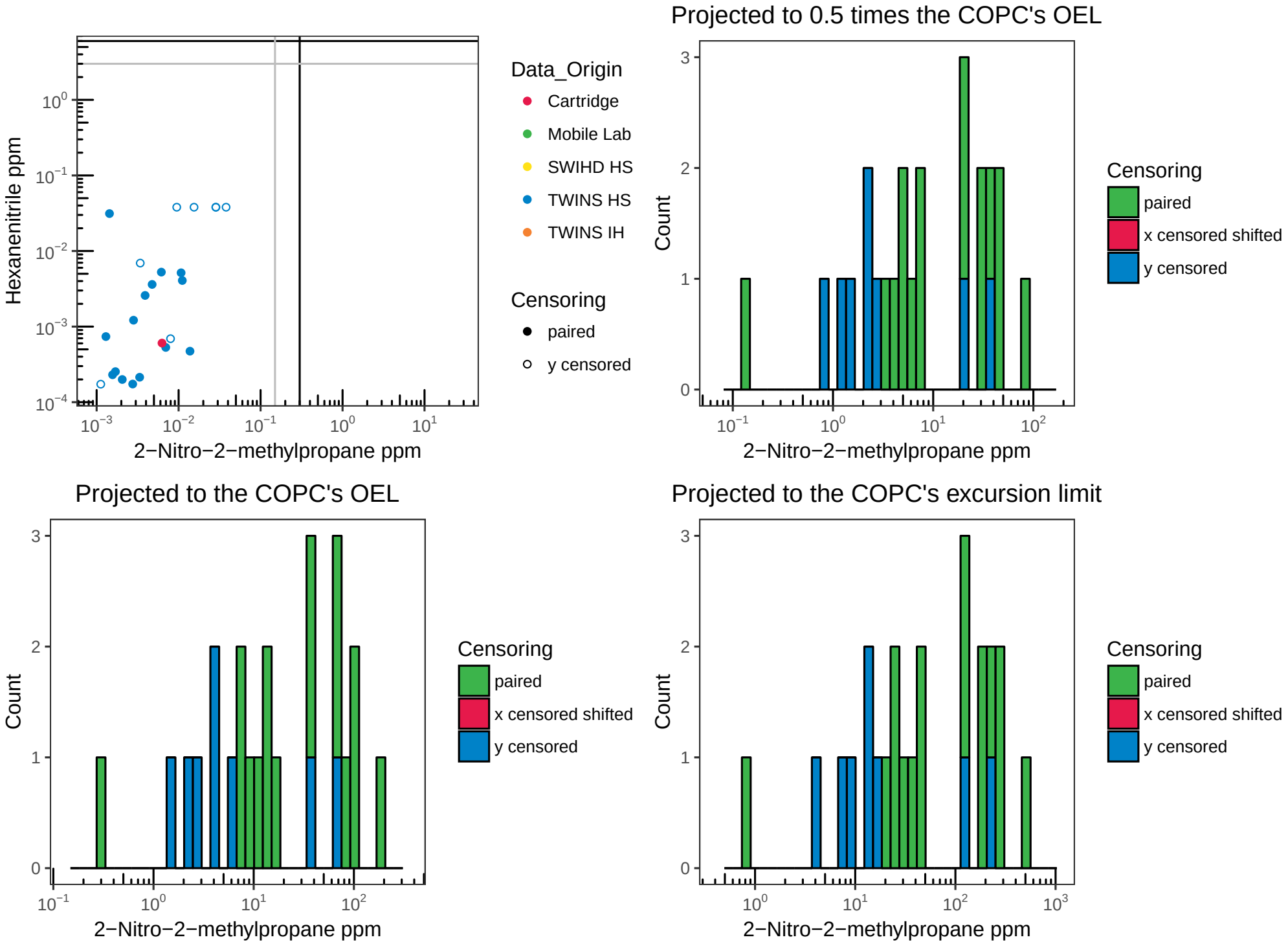


Figure C.2766: Hexanenitrile vs 2-Nitro-2-methylpropane

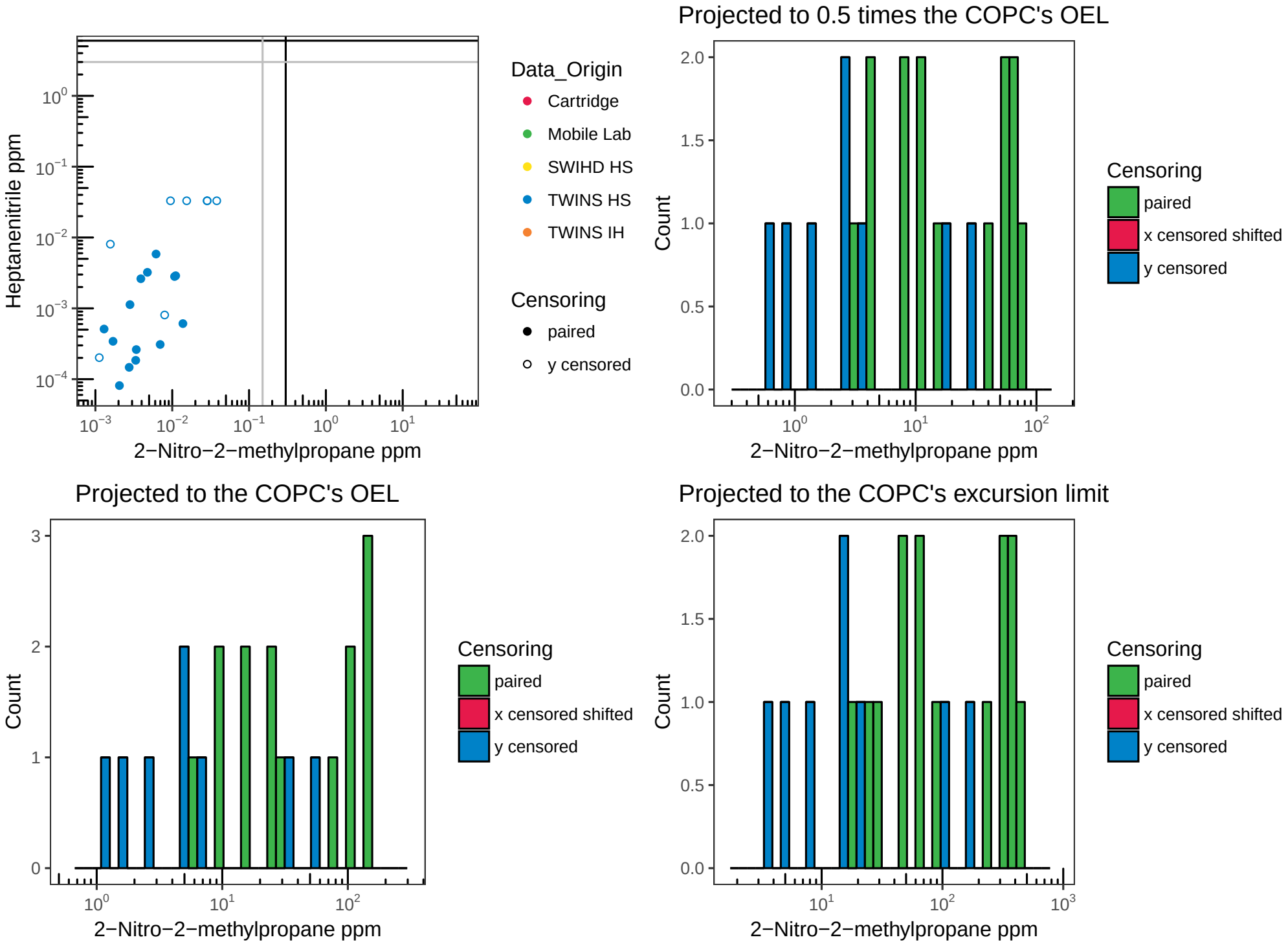


Figure C.2767: Heptanenitrile vs 2-Nitro-2-methylpropane

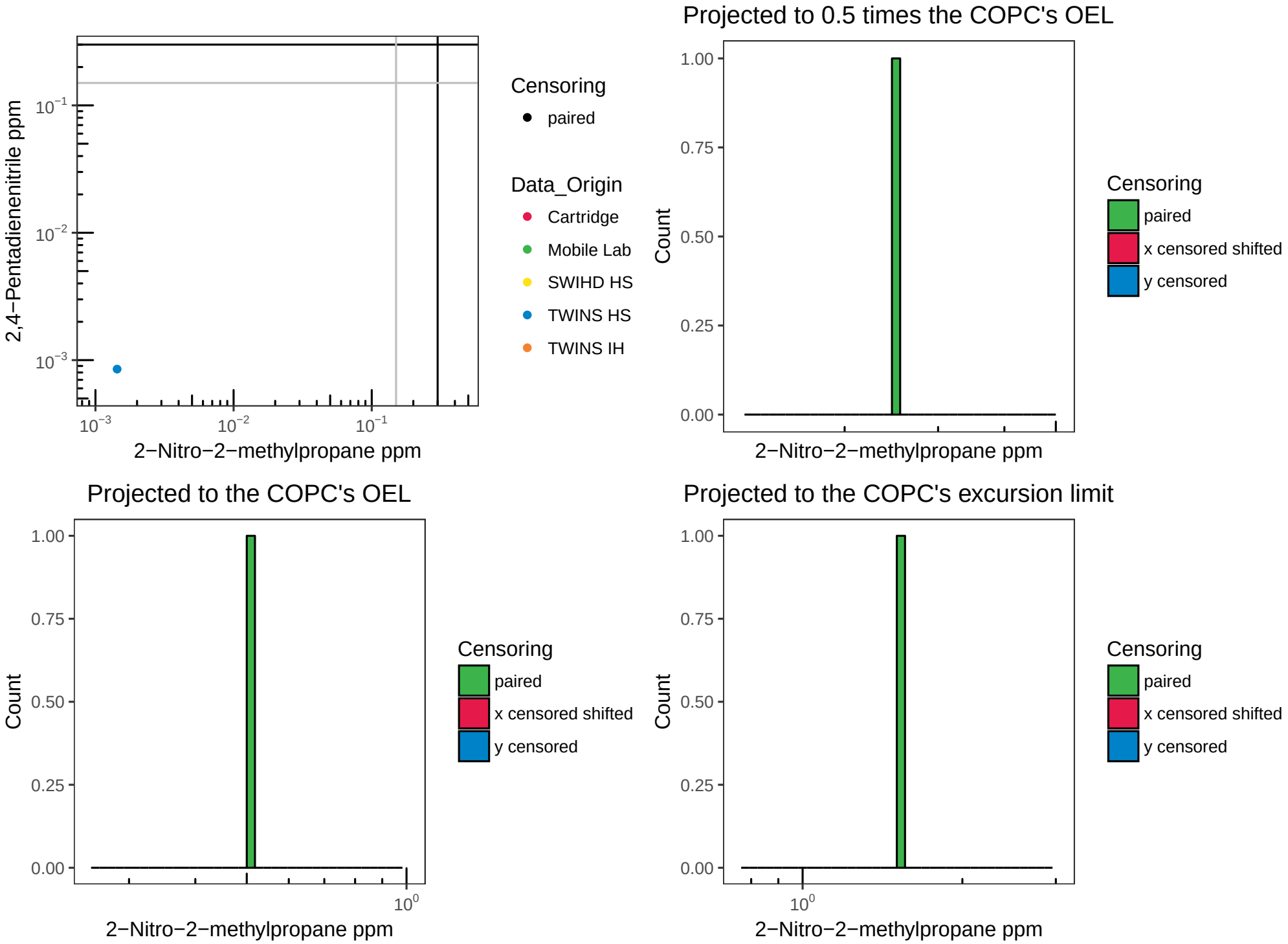


Figure C.2768: 2,4-Pentadienenitrile vs 2-Nitro-2-methylpropane

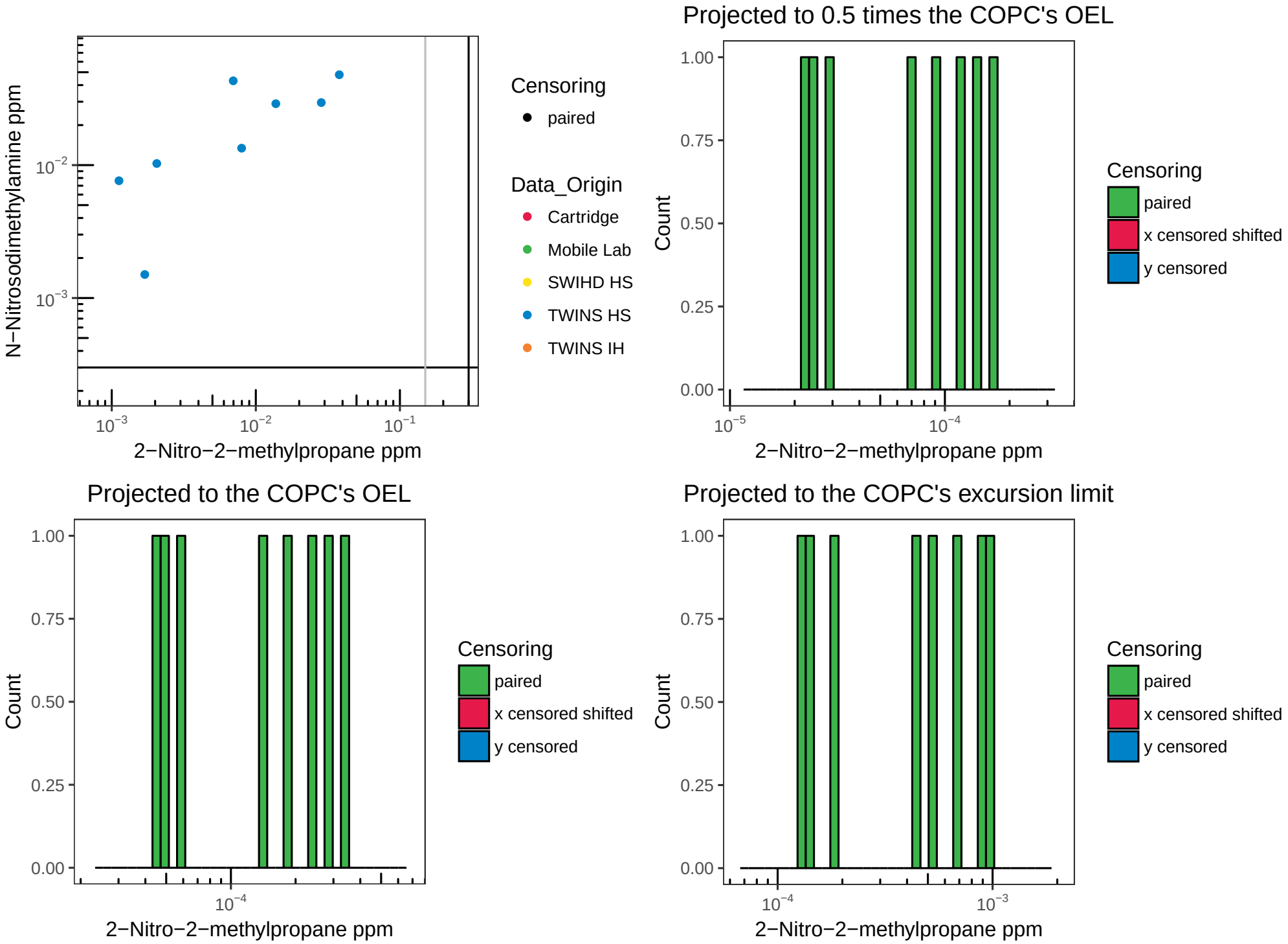


Figure C.2769: N-Nitrosodimethylamine vs 2-Nitro-2-methylpropane

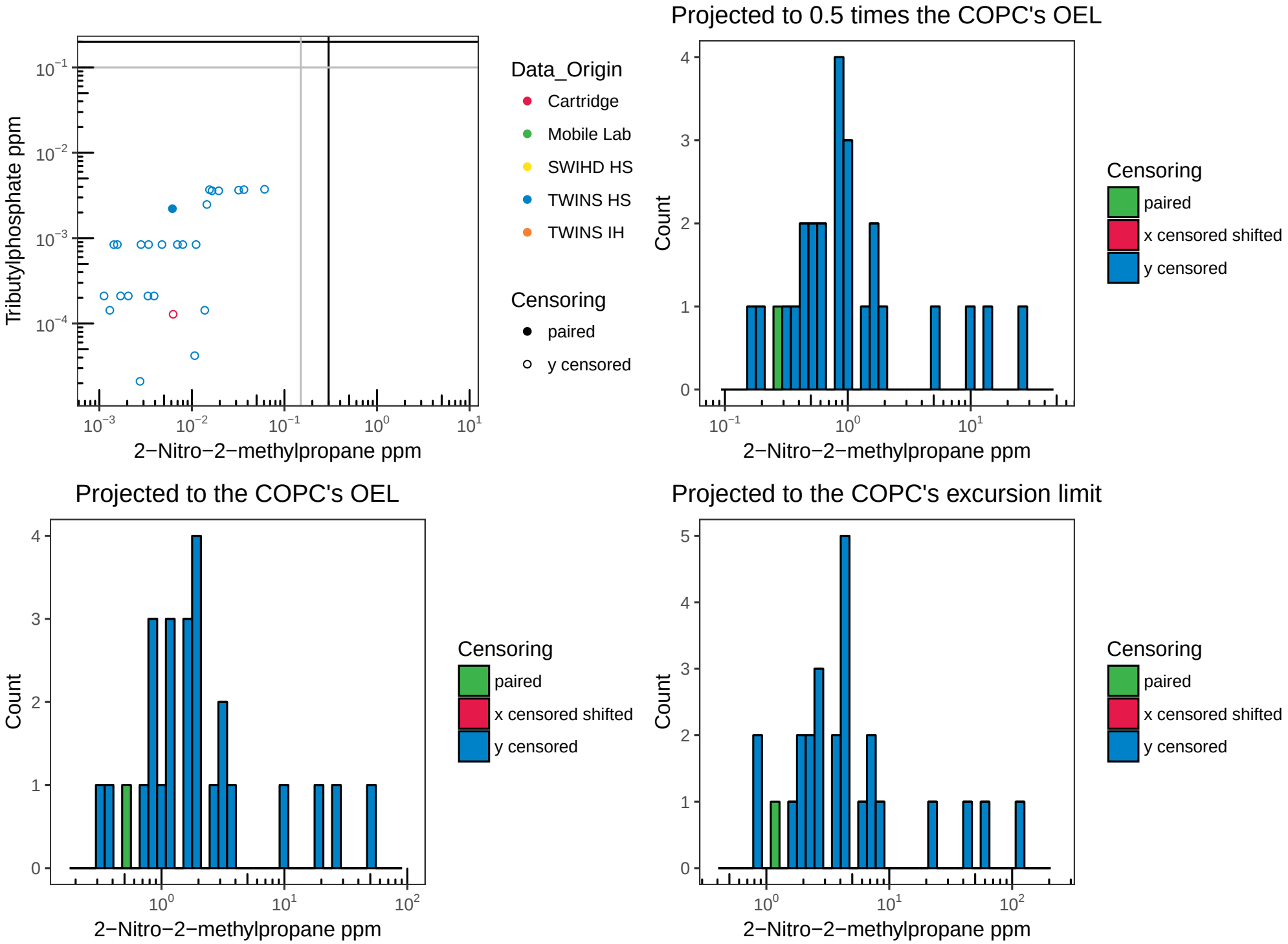


Figure C.2770: Tributylphosphate vs 2-Nitro-2-methylpropane

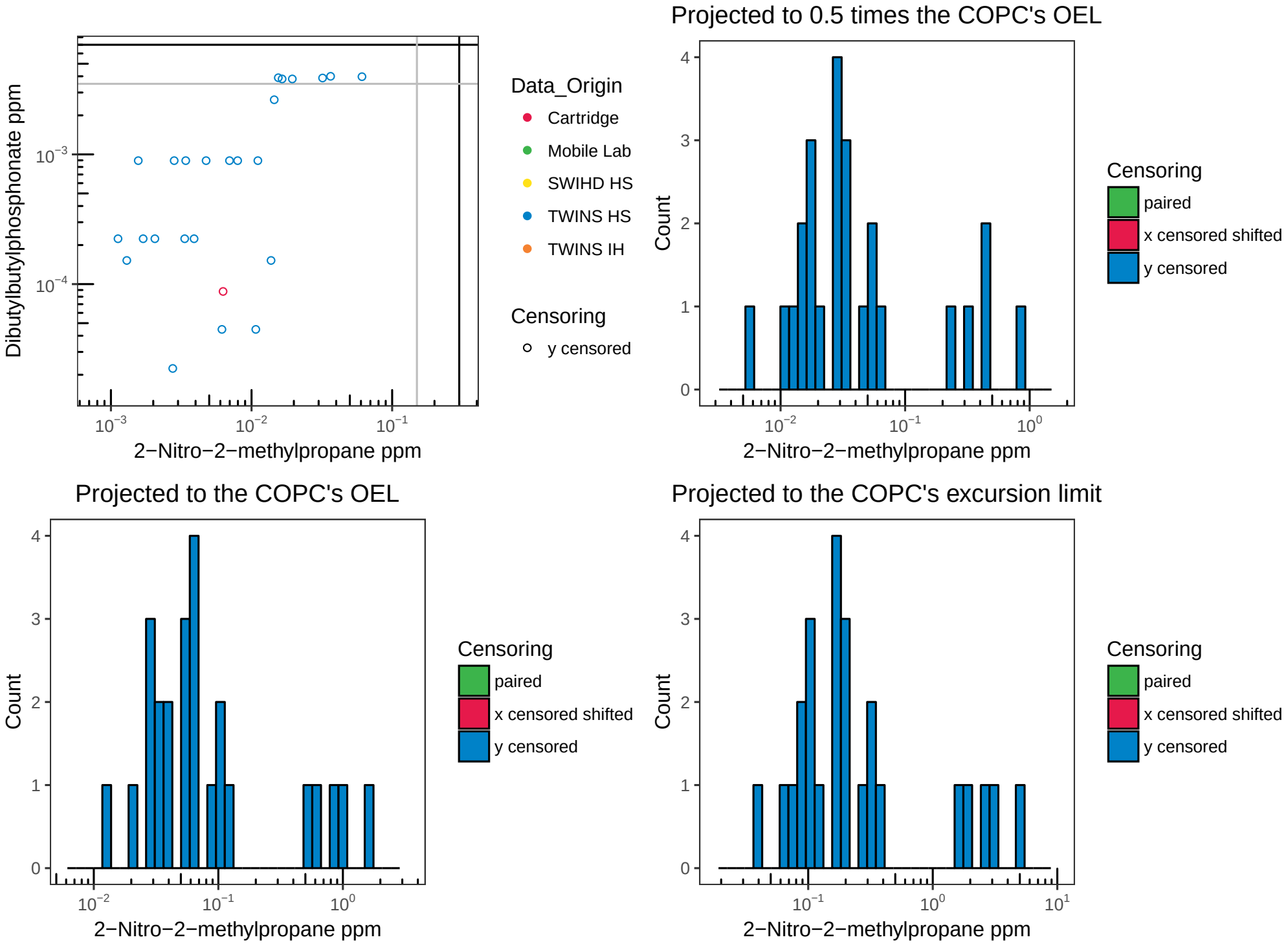


Figure C.2771: Dibutylbutylphosphonate vs 2-Nitro-2-methylpropane

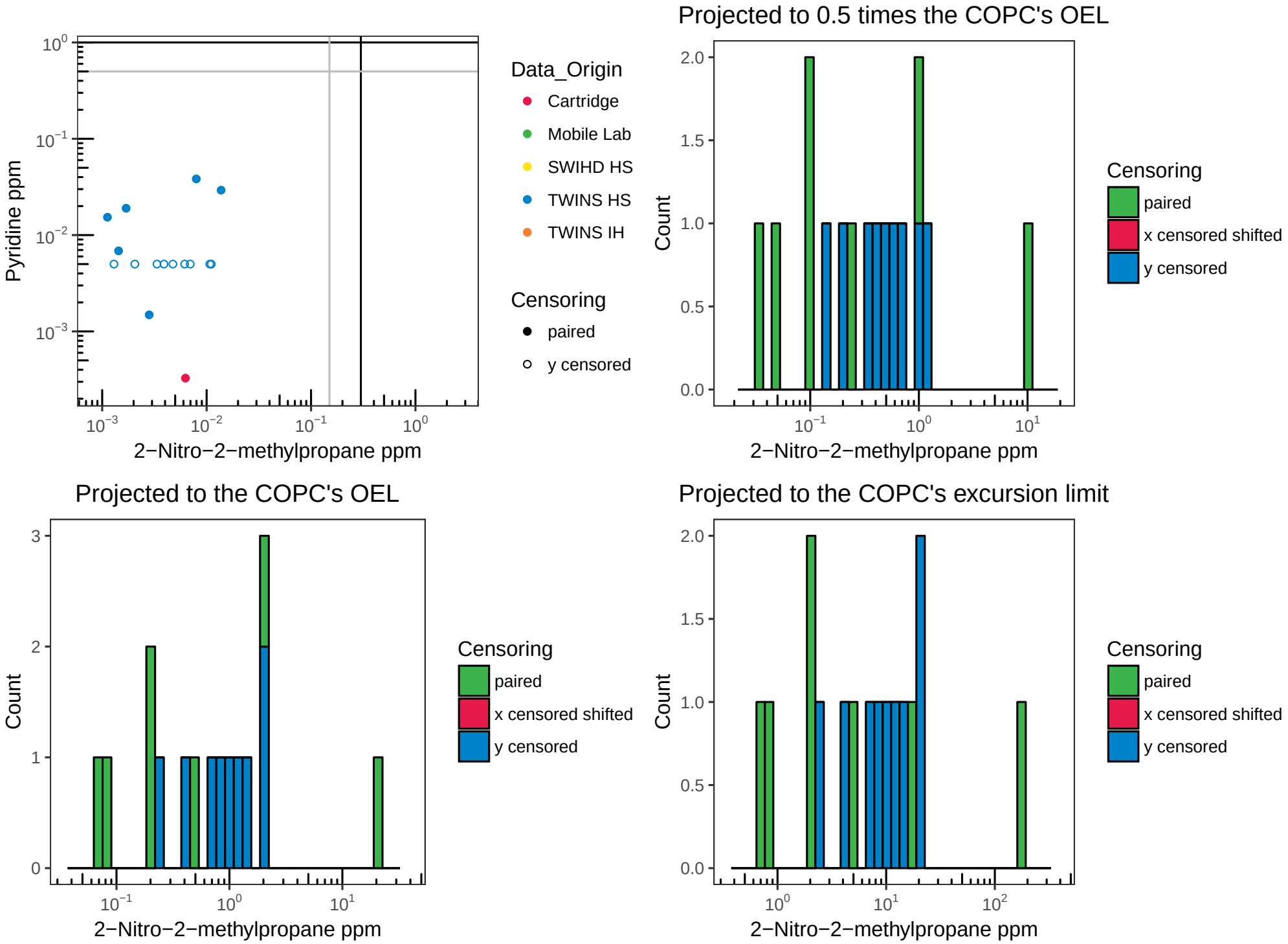


Figure C.2772: Pyridine vs 2-Nitro-2-methylpropane

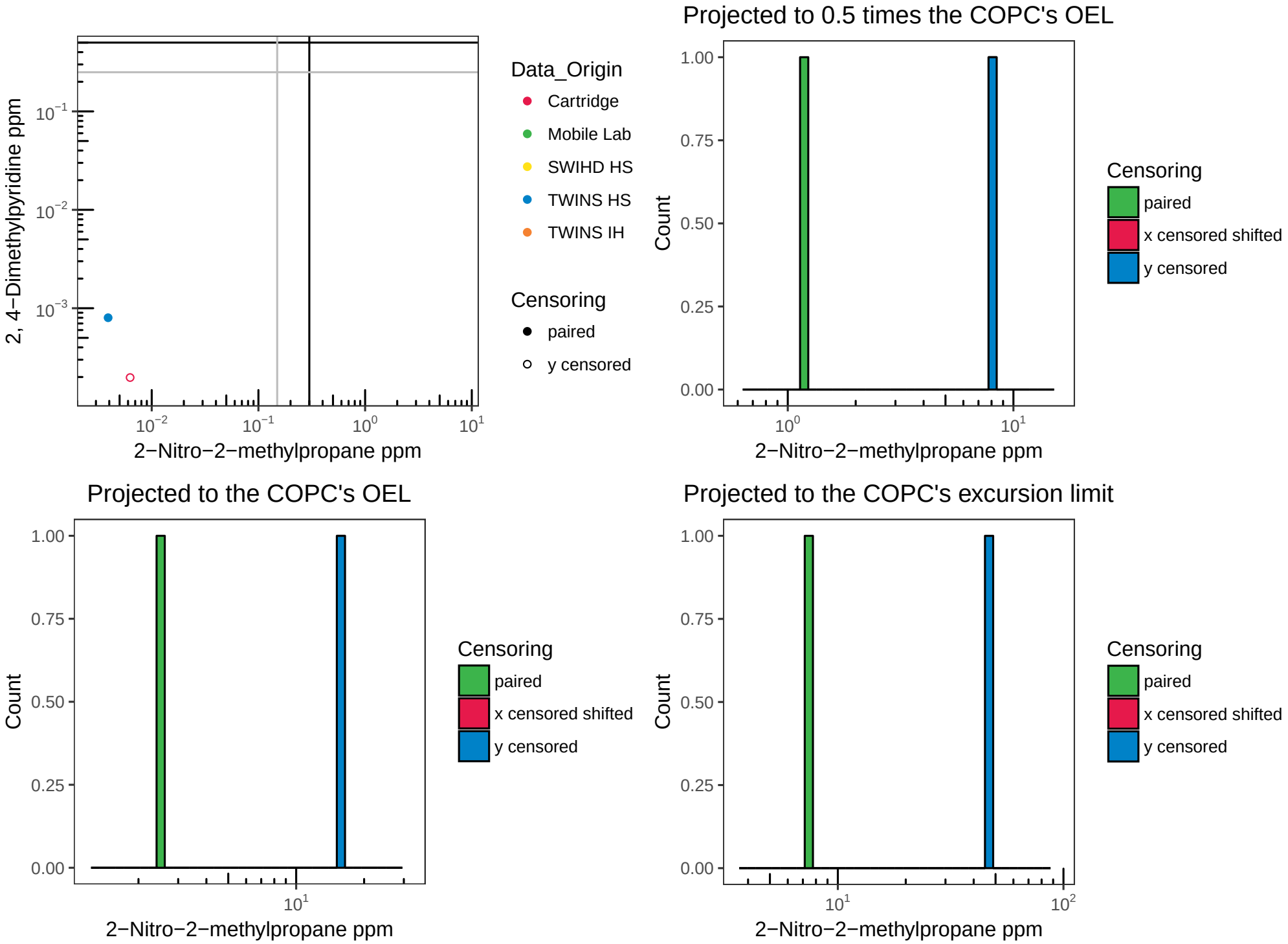


Figure C.2773: 2, 4-Dimethylpyridine vs 2-Nitro-2-methylpropane

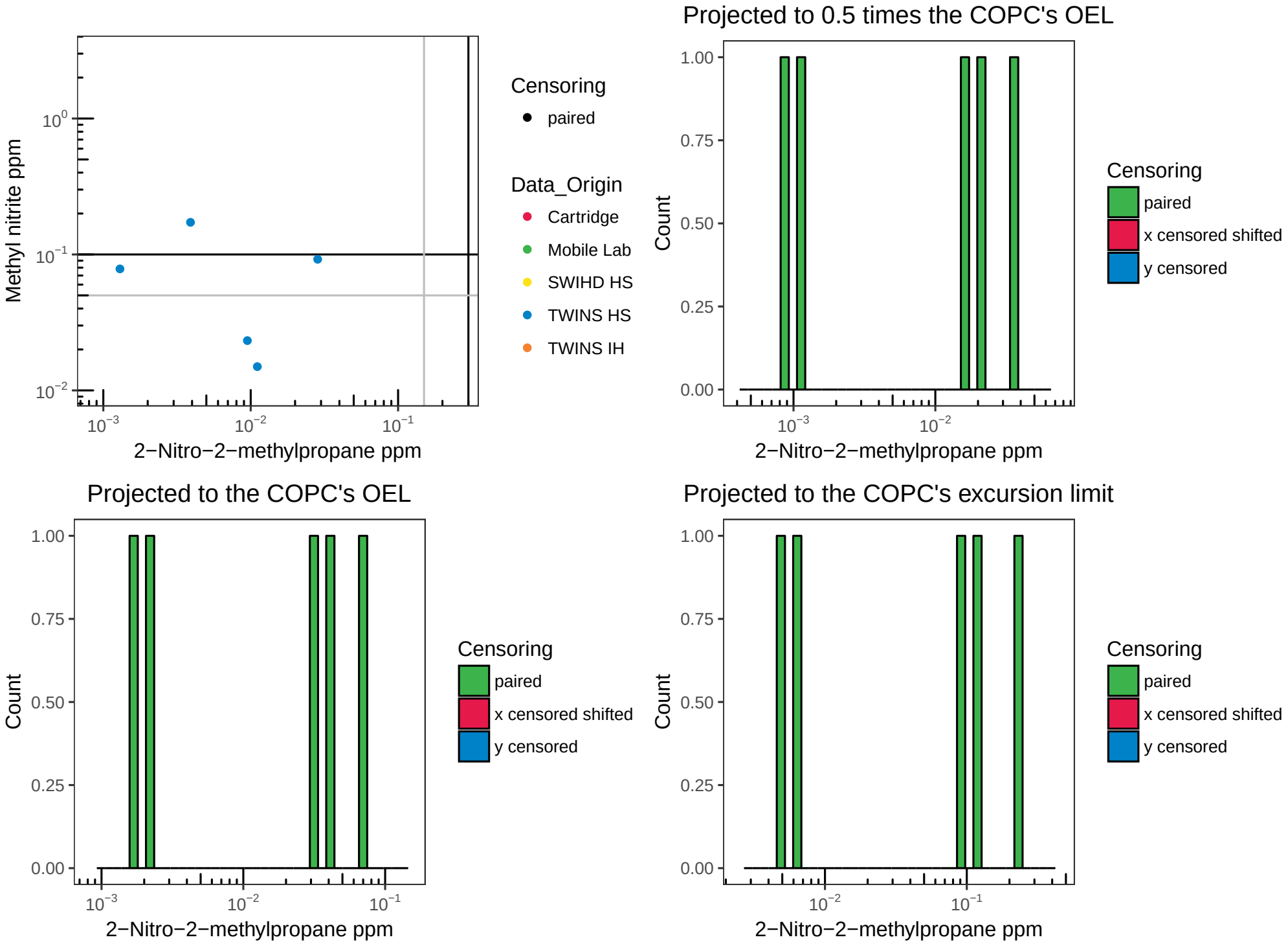


Figure C.2774: Methyl nitrite vs 2-Nitro-2-methylpropane

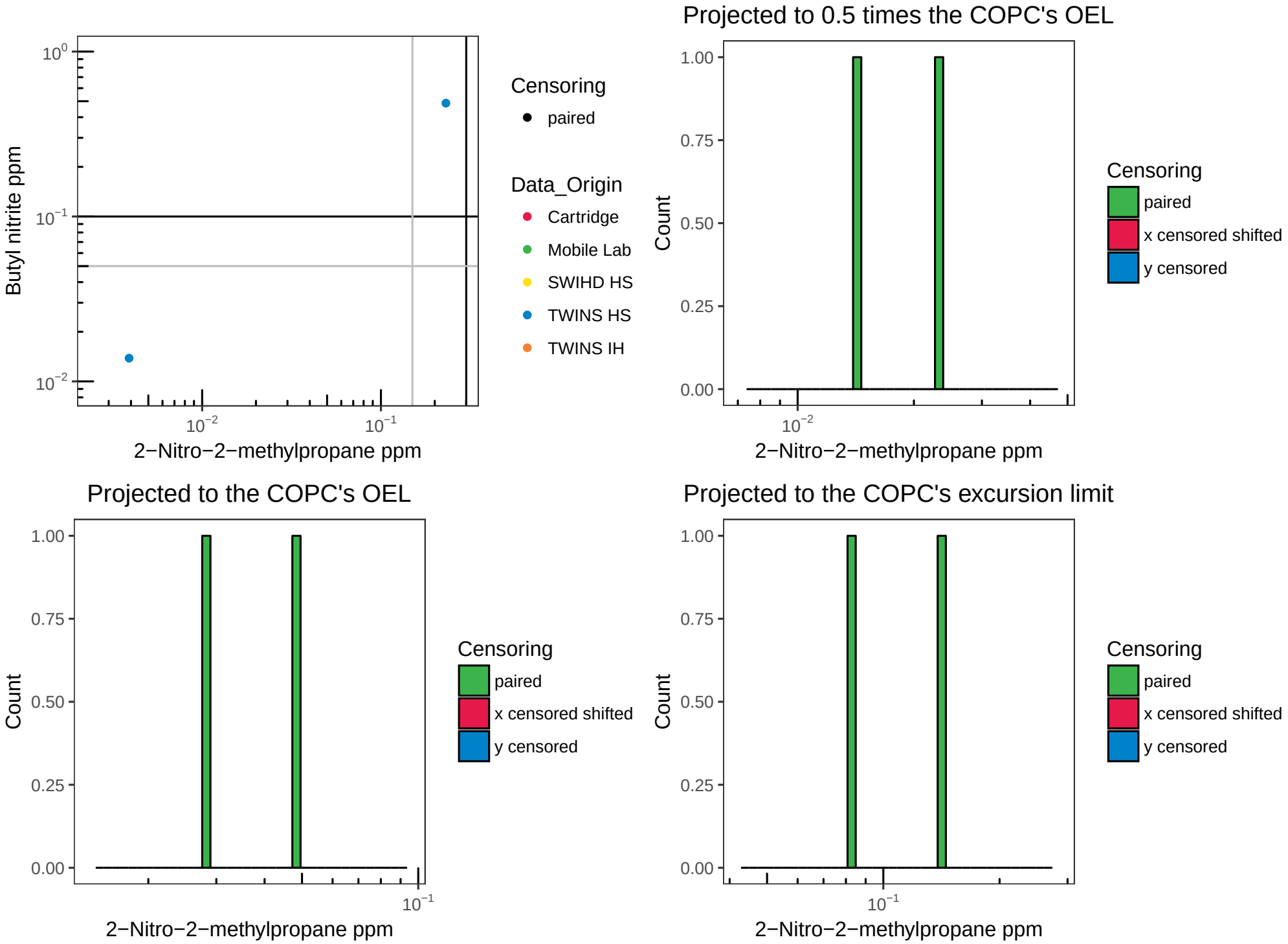


Figure C.2775: Butyl nitrite vs 2-Nitro-2-methylpropane

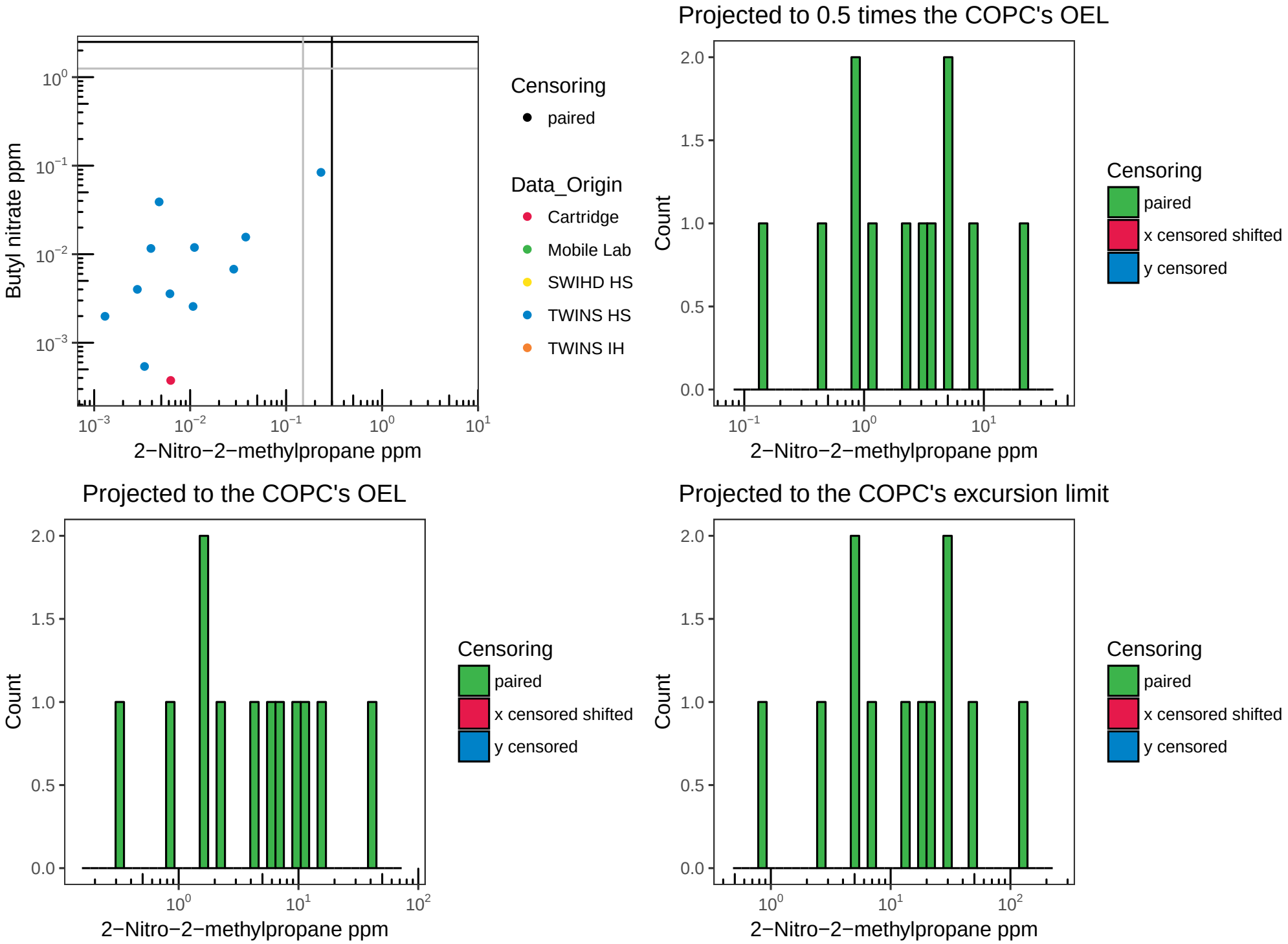


Figure C.2776: Butyl nitrate vs 2-Nitro-2-methylpropane

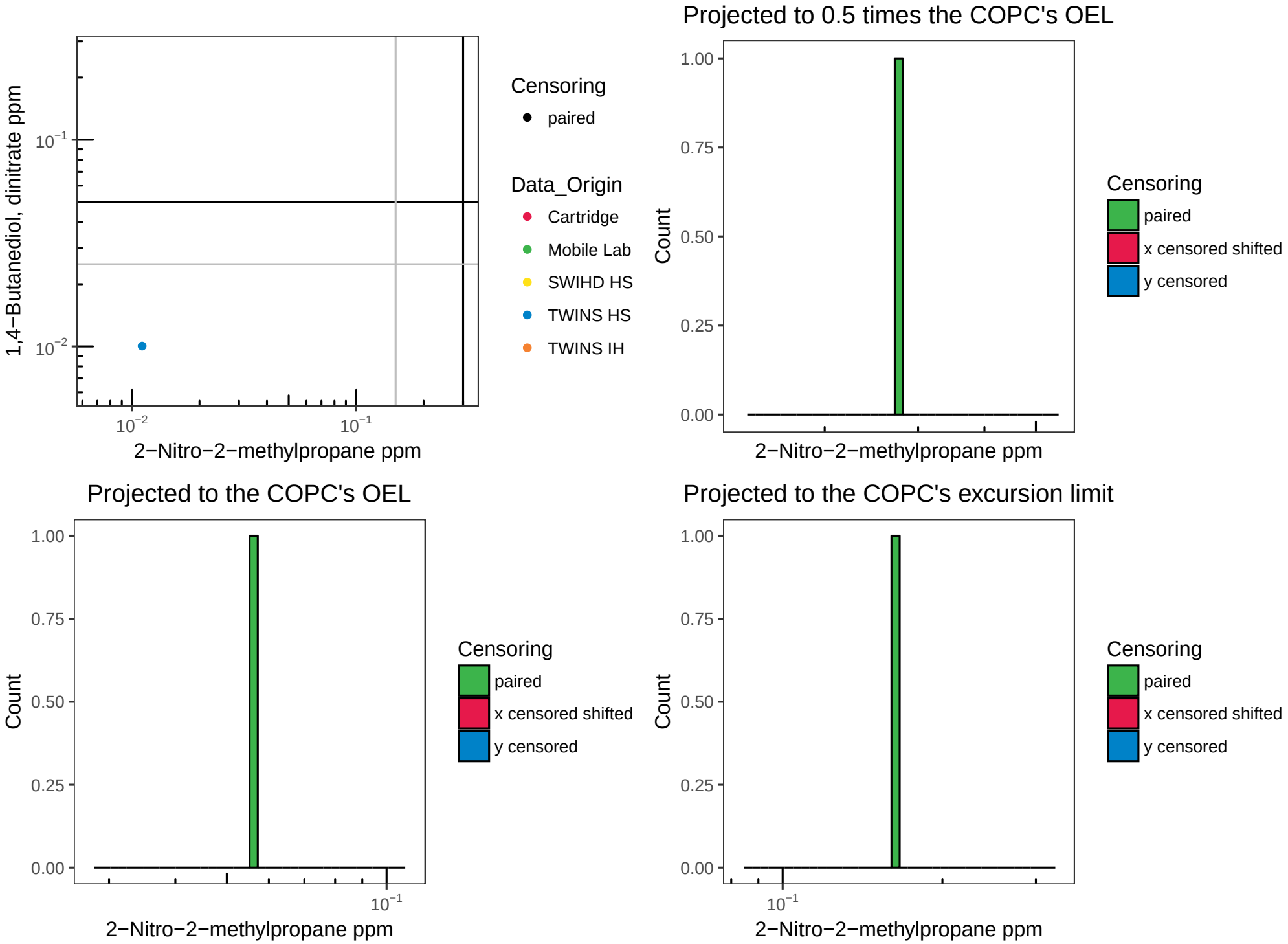


Figure C.2777: 1,4-Butanediol, dinitrate vs 2-Nitro-2-methylpropane

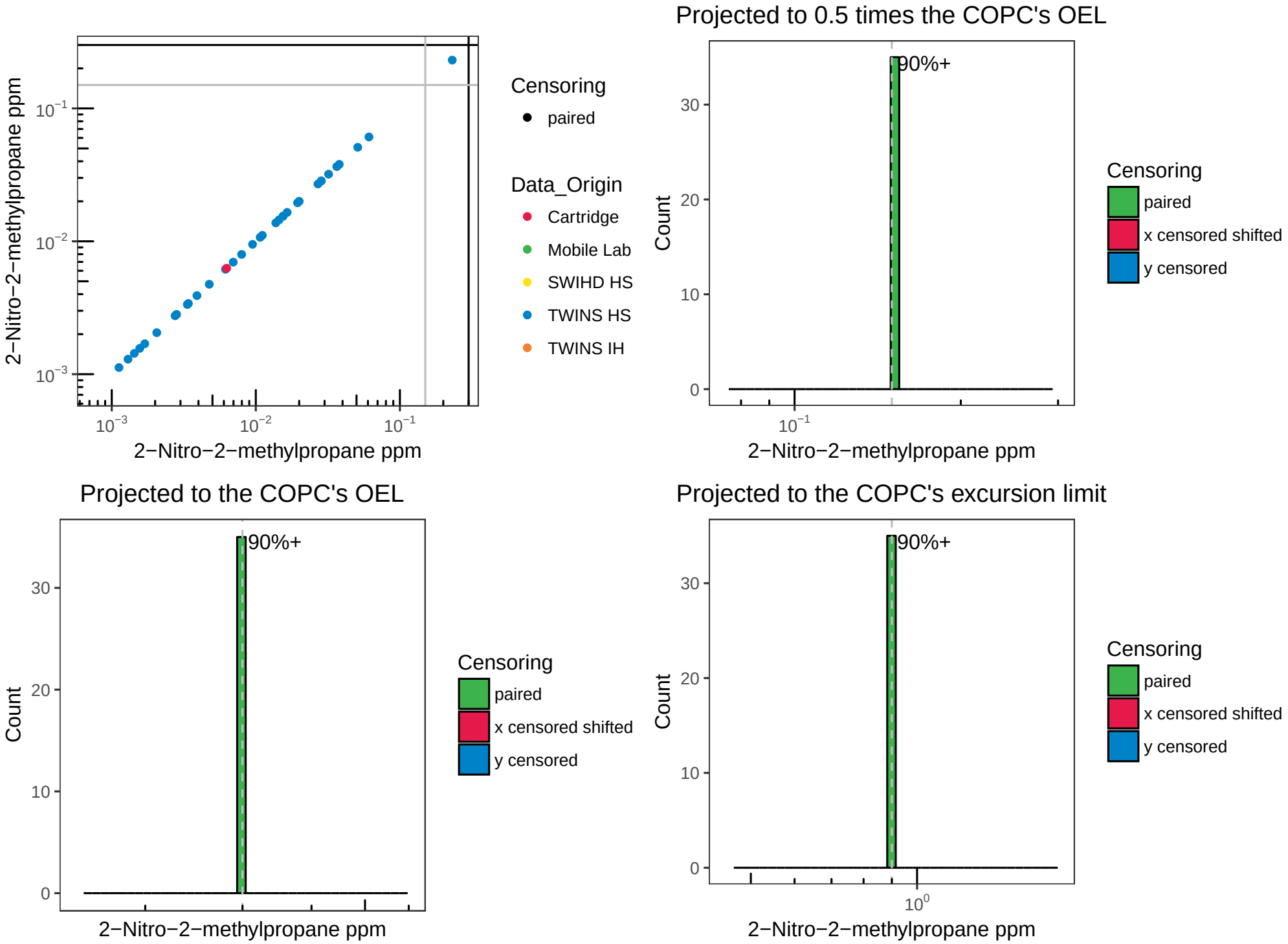


Figure C.2778: 2-Nitro-2-methylpropane vs 2-Nitro-2-methylpropane

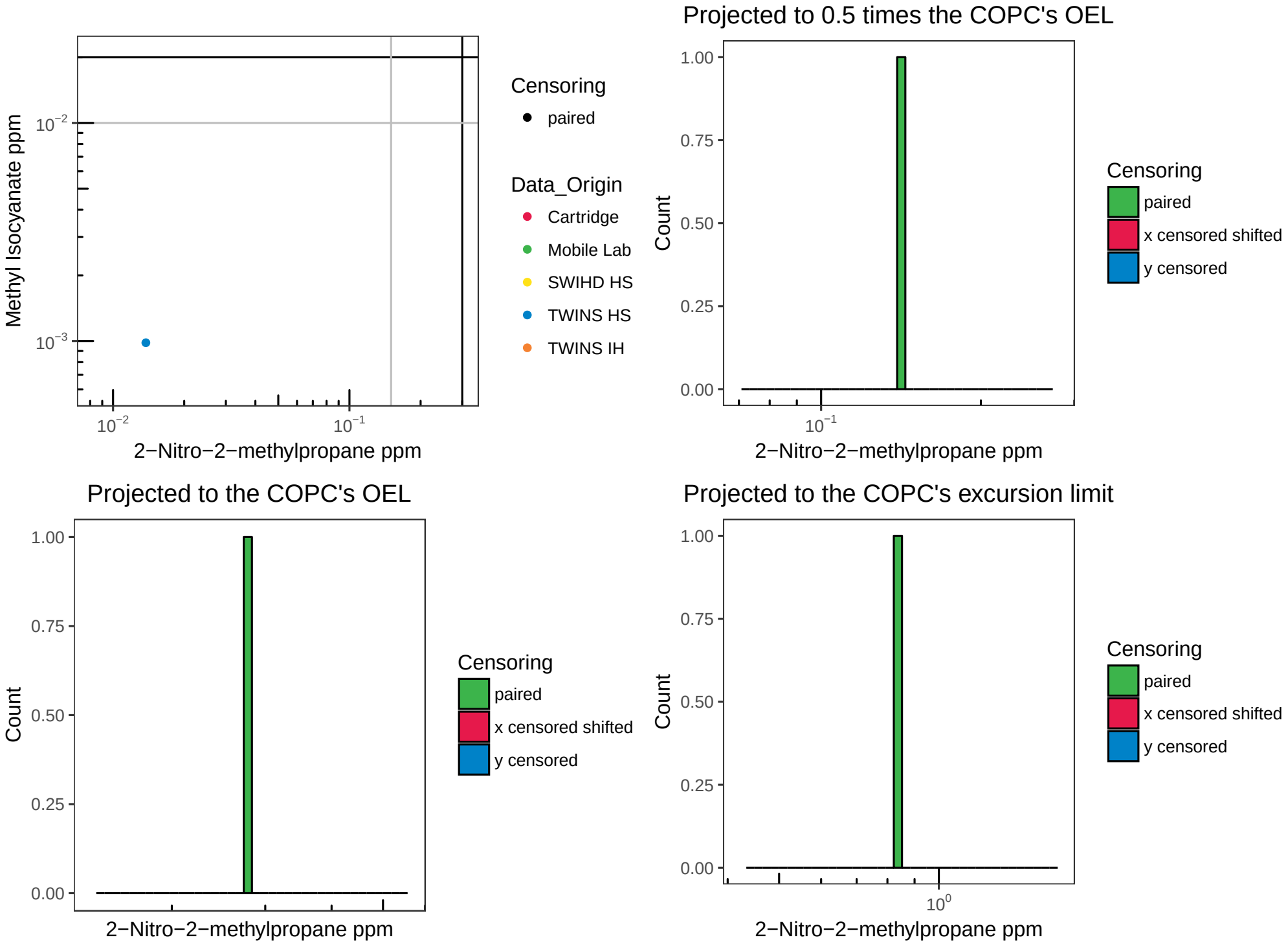


Figure C.2779: Methyl Isocyanate vs 2-Nitro-2-methylpropane

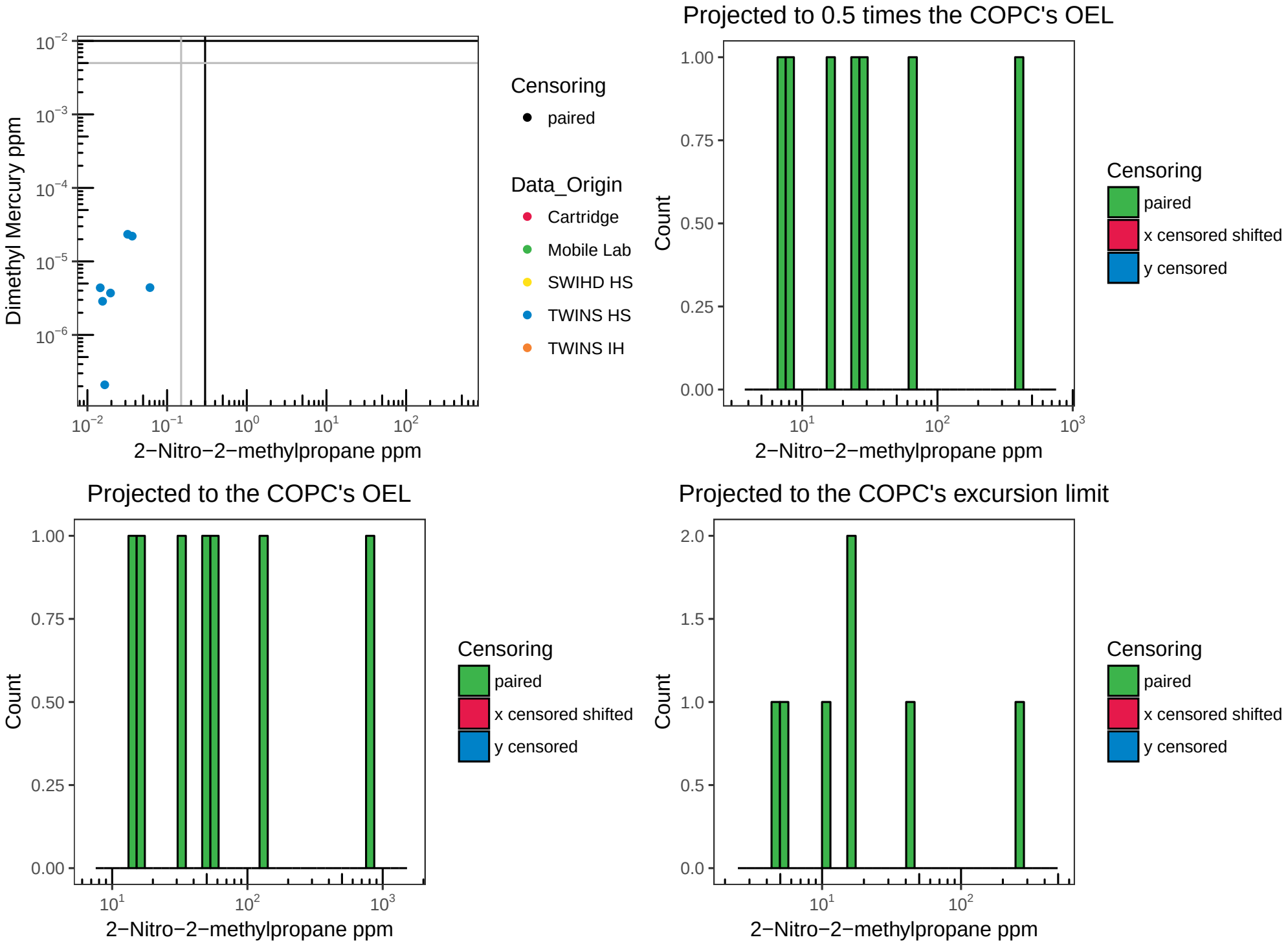


Figure C.2780: Dimethyl Mercury vs 2-Nitro-2-methylpropane

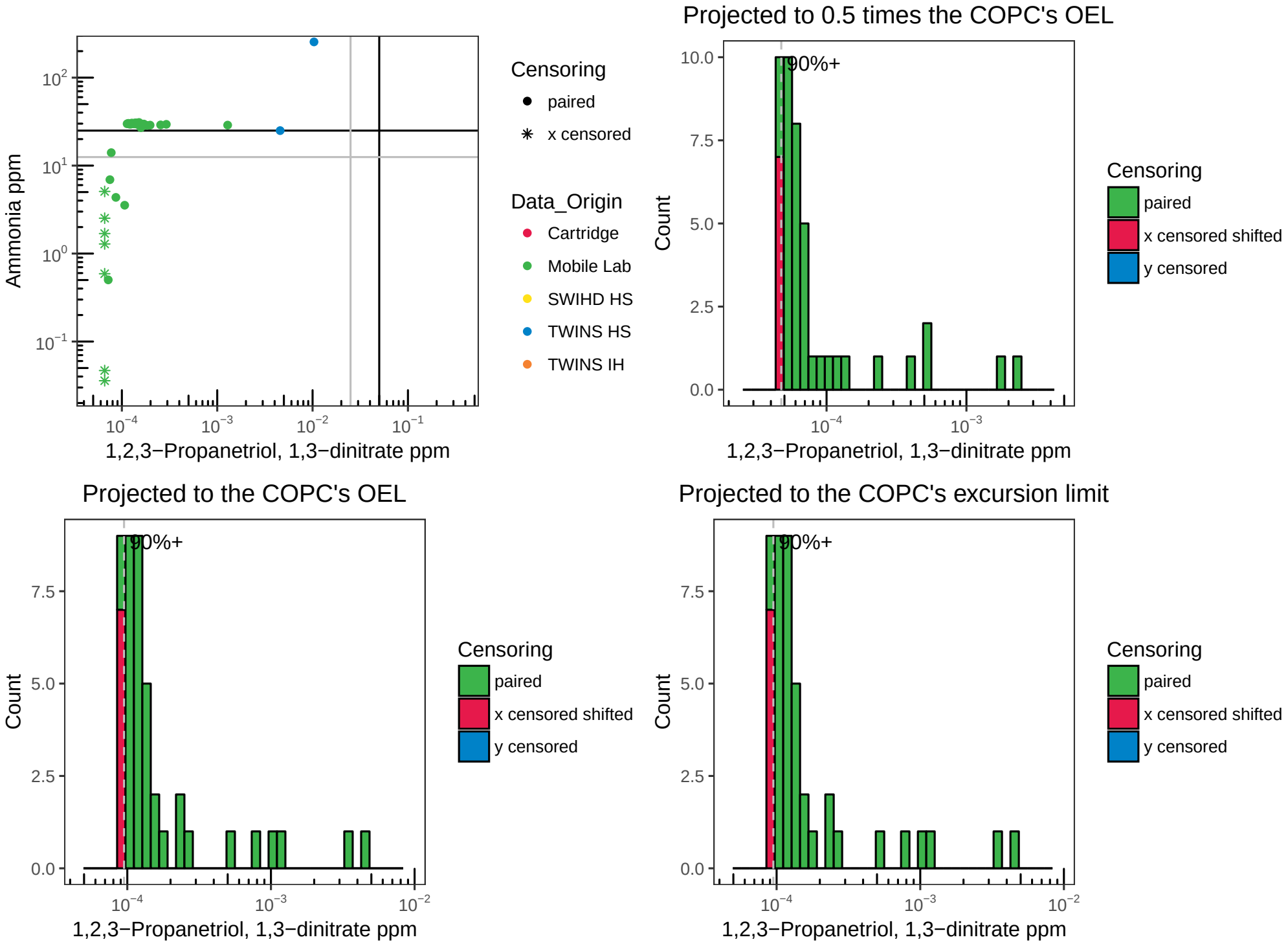


Figure C.2781: Ammonia vs 1,2,3-Propanetriol, 1,3-dinitrate

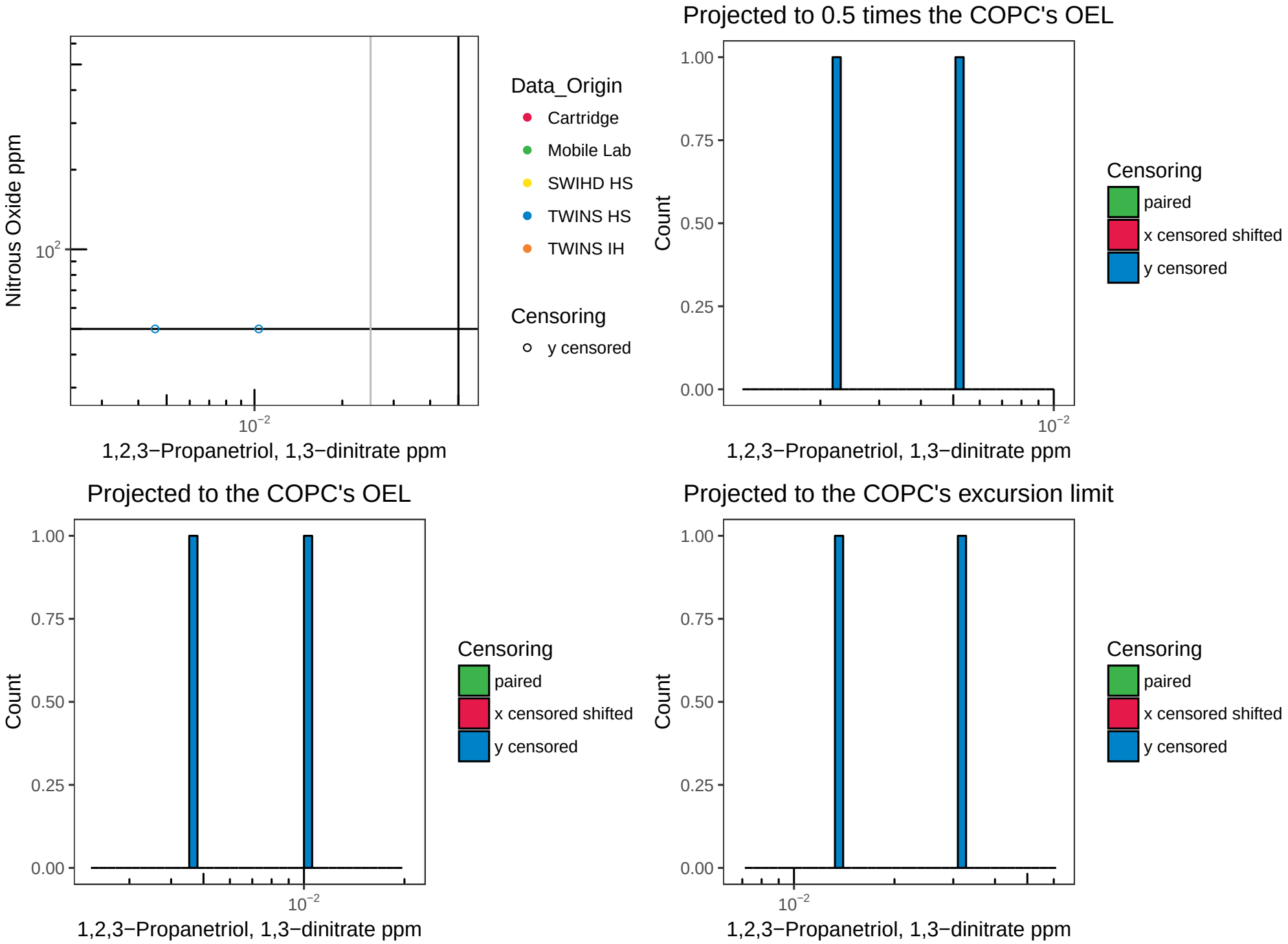


Figure C.2782: Nitrous Oxide vs 1,2,3-Propanetriol, 1,3-dinitrate

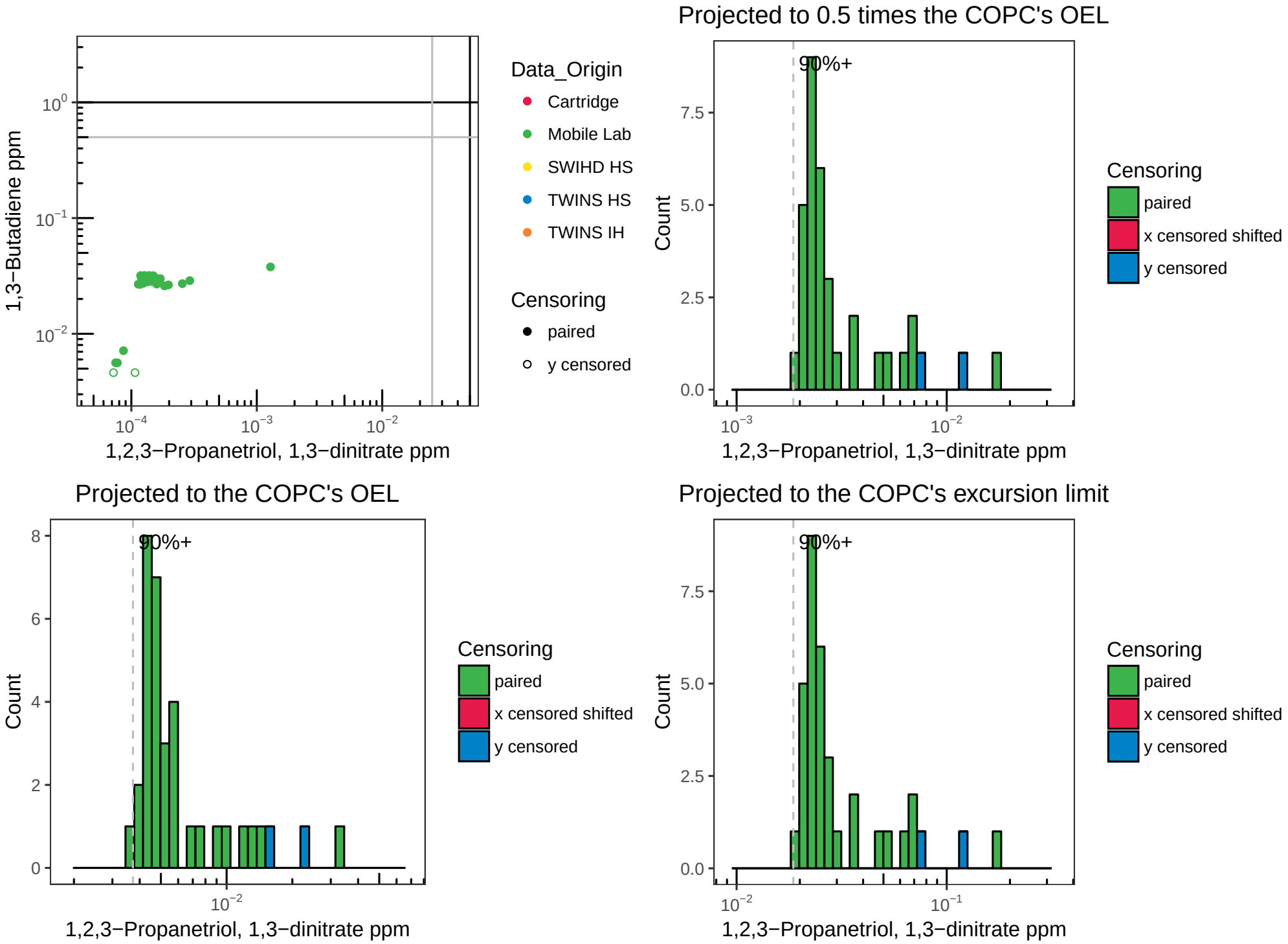


Figure C.2783: 1,3-Butadiene vs 1,2,3-Propanetriol, 1,3-dinitrate

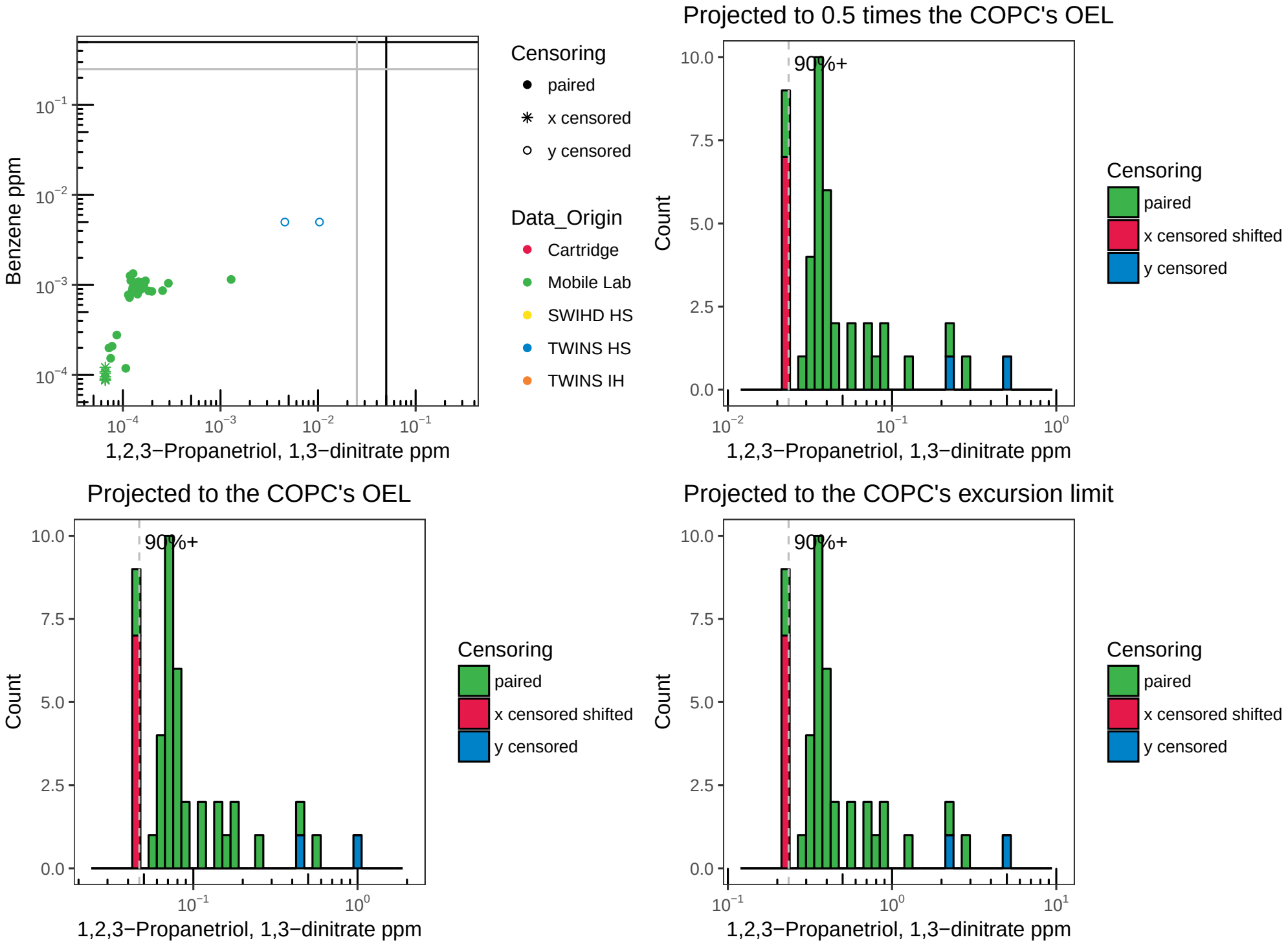


Figure C.2784: Benzene vs 1,2,3-Propanetriol, 1,3-dinitrate

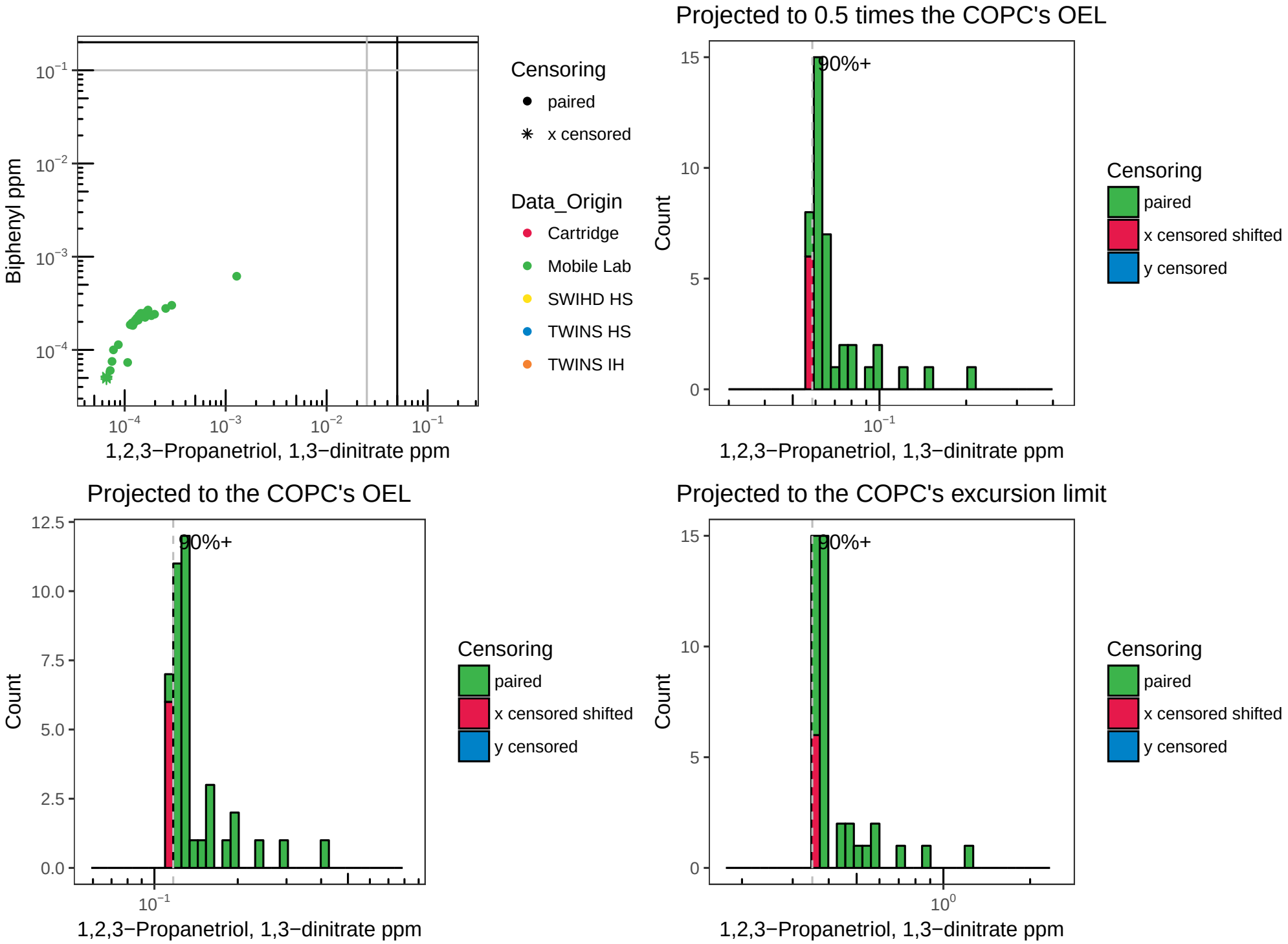


Figure C.2785: Biphenyl vs 1,2,3-Propanetriol, 1,3-dinitrate

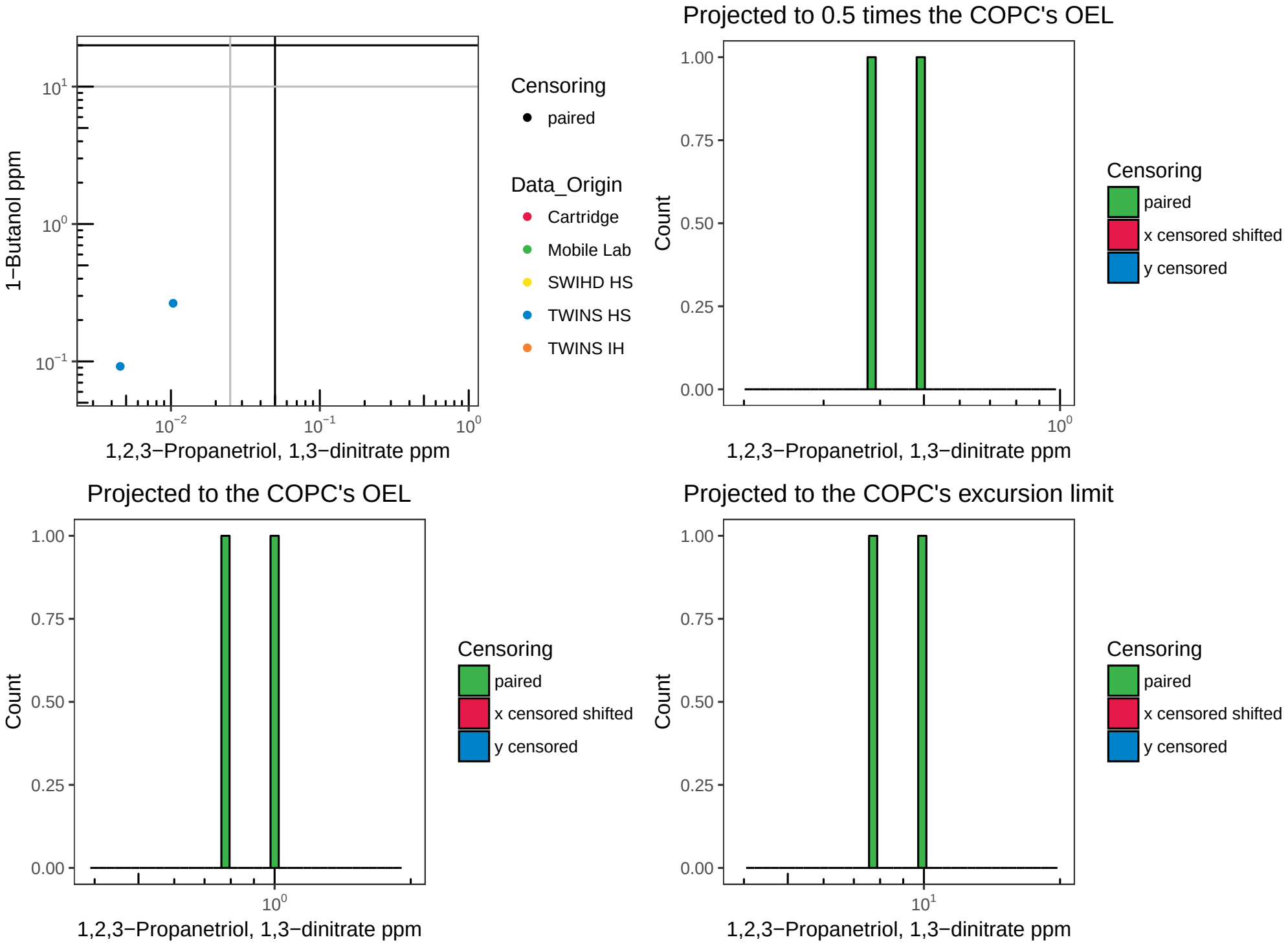


Figure C.2786: 1-Butanol vs 1,2,3-Propanetriol, 1,3-dinitrate

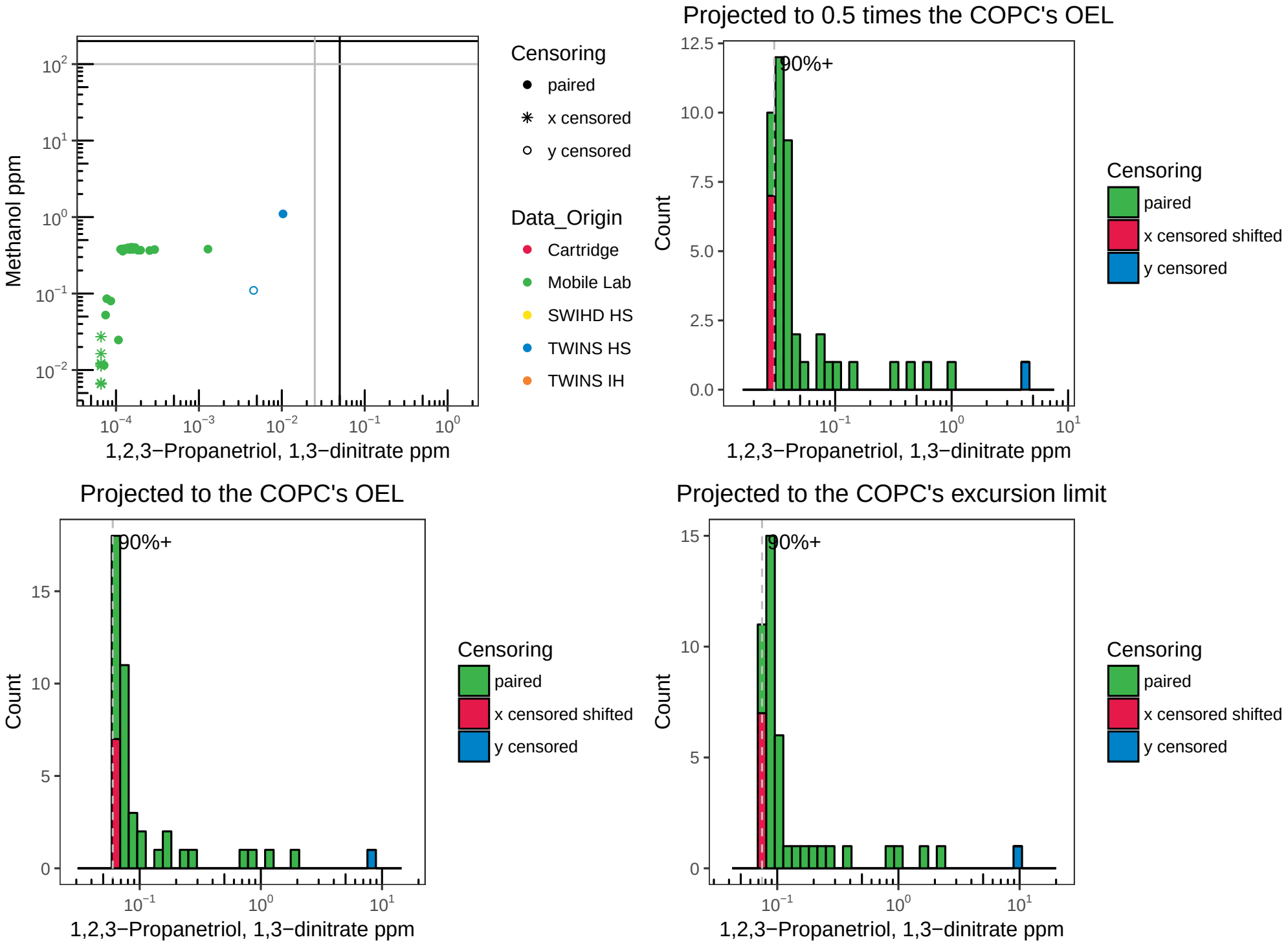


Figure C.2787: Methanol vs 1,2,3-Propanetriol, 1,3-dinitrate

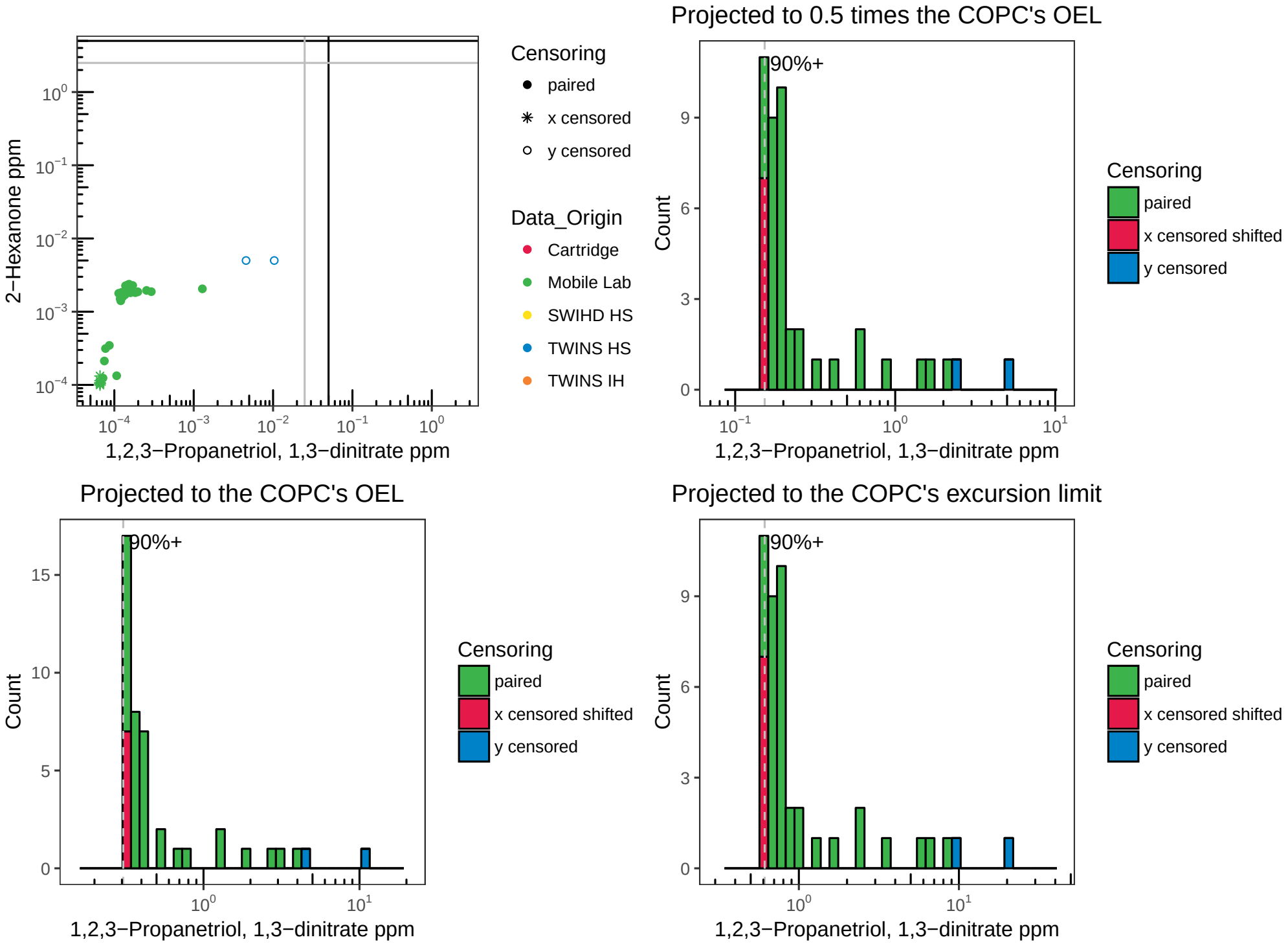


Figure C.2788: 2-Hexanone vs 1,2,3-Propanetriol, 1,3-dinitrate

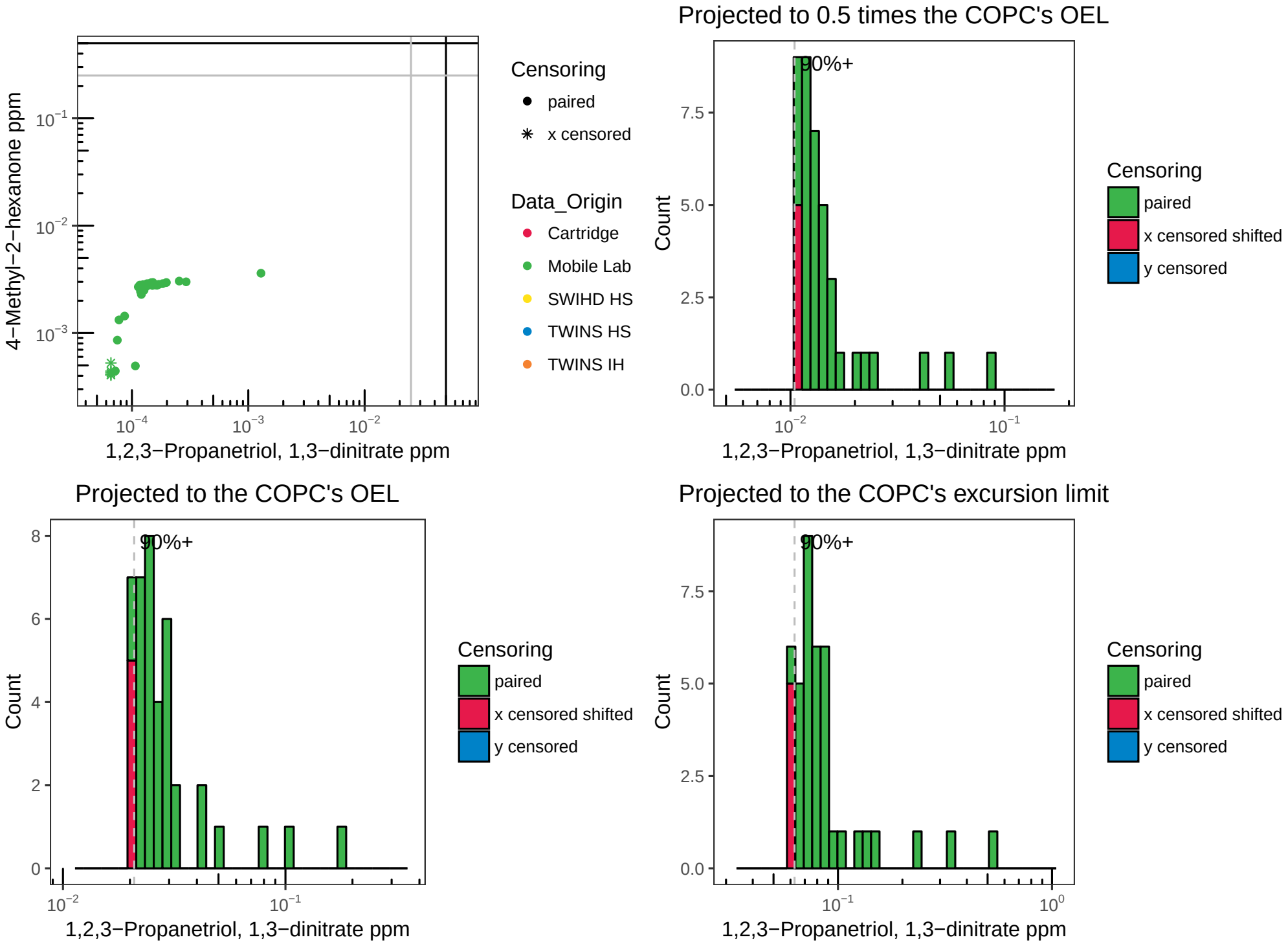


Figure C.2789: 4-Methyl-2-hexanone vs 1,2,3-Propanetriol, 1,3-dinitrate

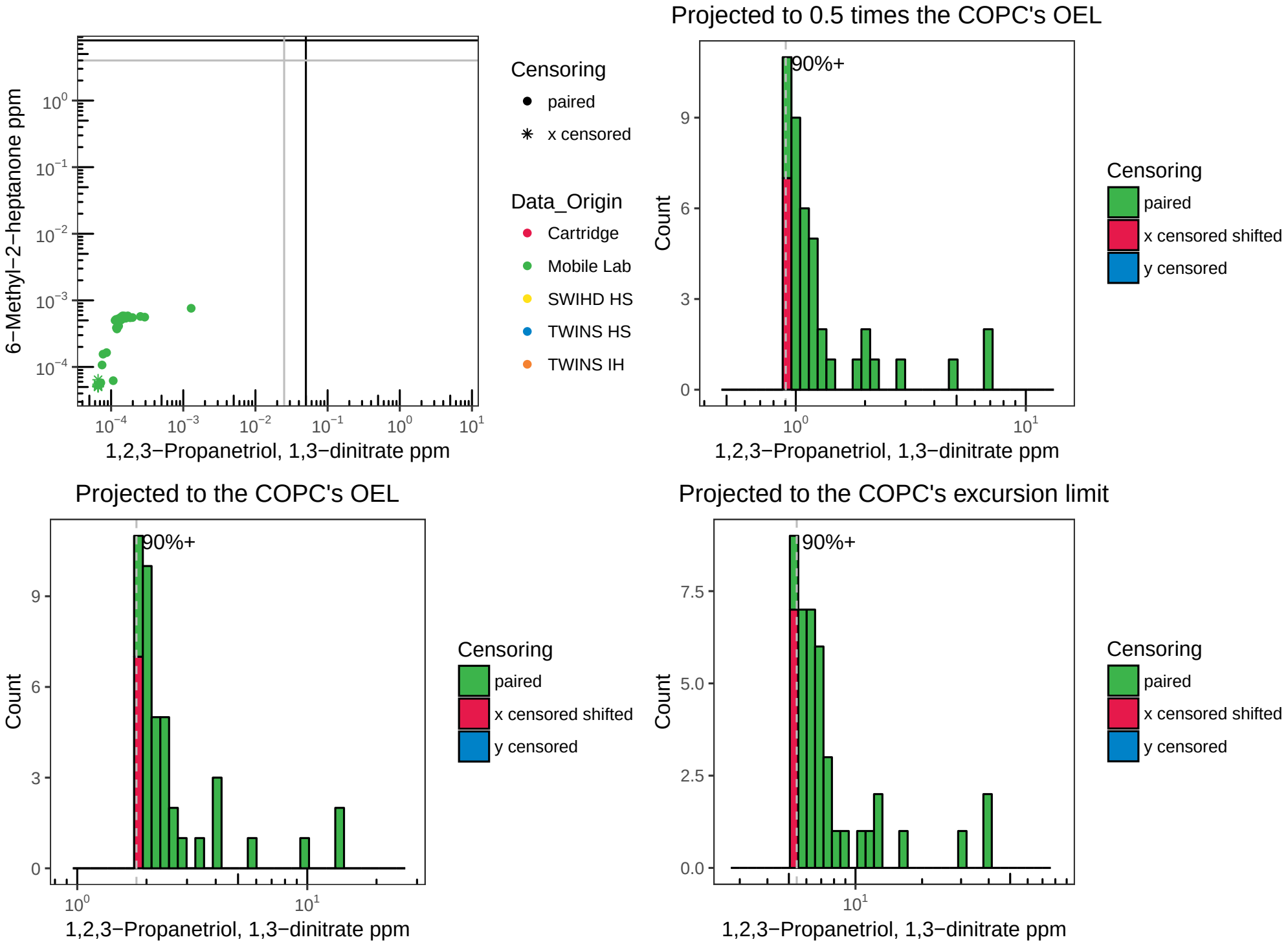


Figure C.2790: 6-Methyl-2-heptanone vs 1,2,3-Propanetriol, 1,3-dinitrate

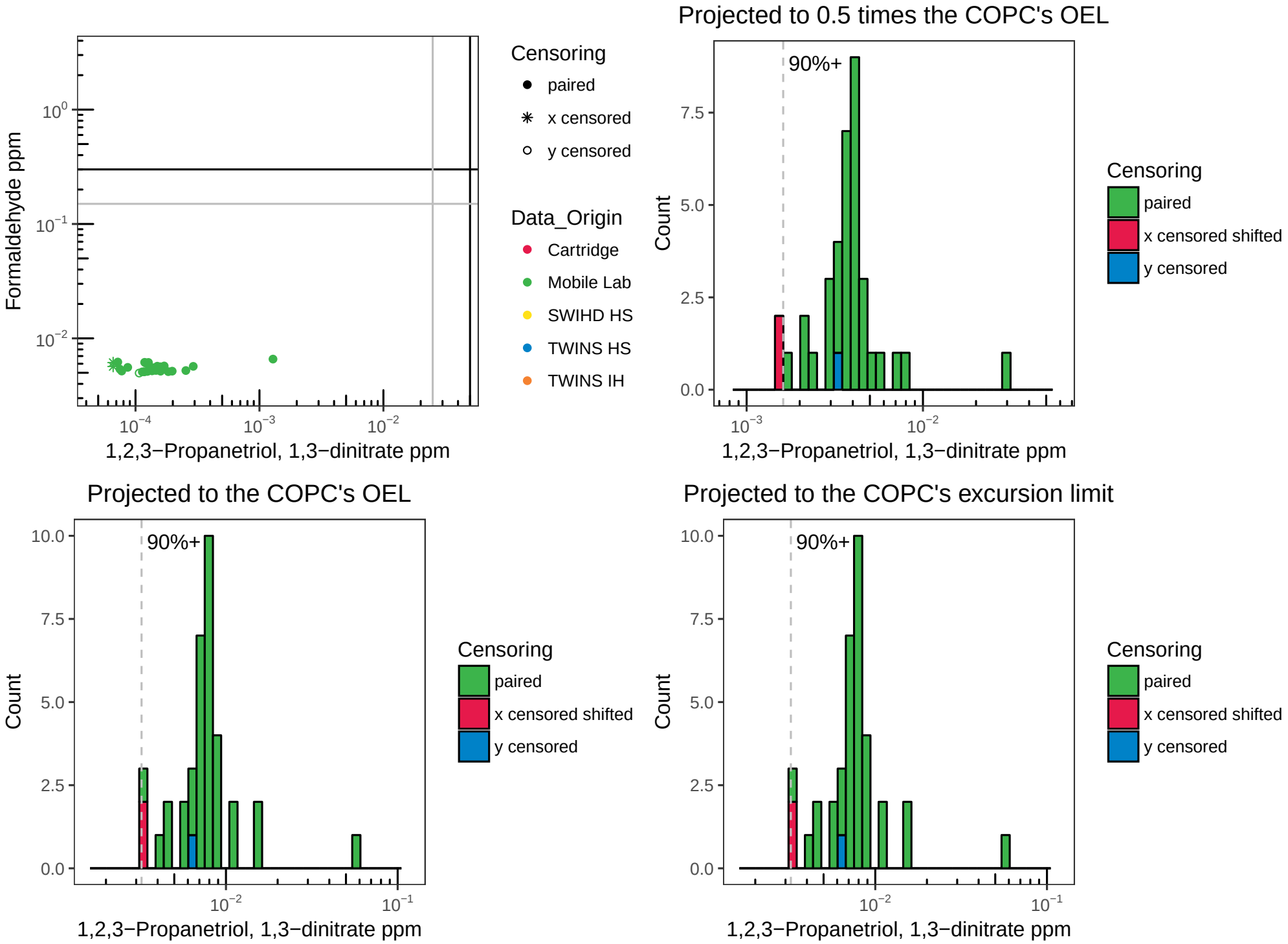


Figure C.2791: Formaldehyde vs 1,2,3-Propanetriol, 1,3-dinitrate

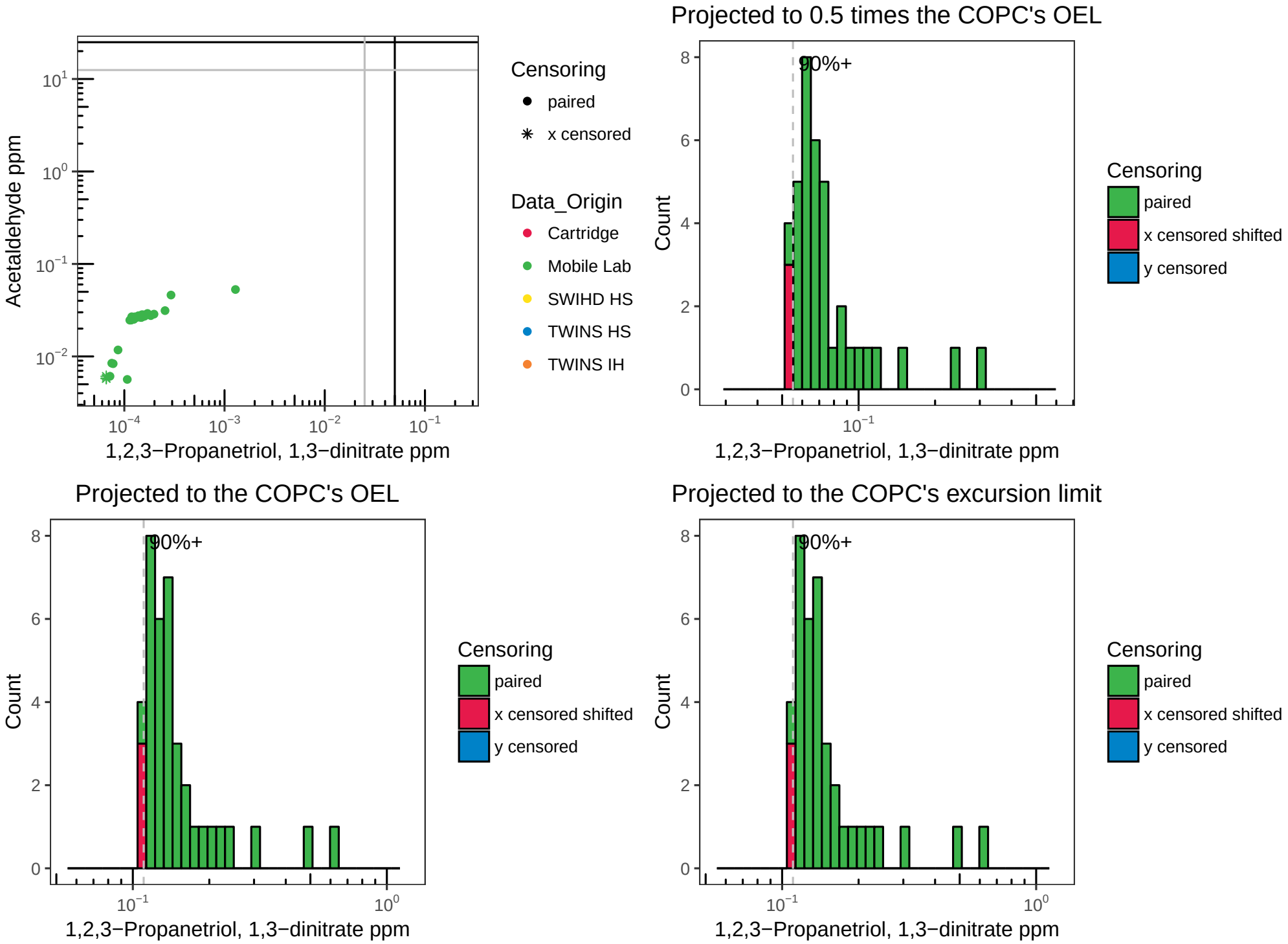


Figure C.2792: Acetaldehyde vs 1,2,3-Propanetriol, 1,3-dinitrate

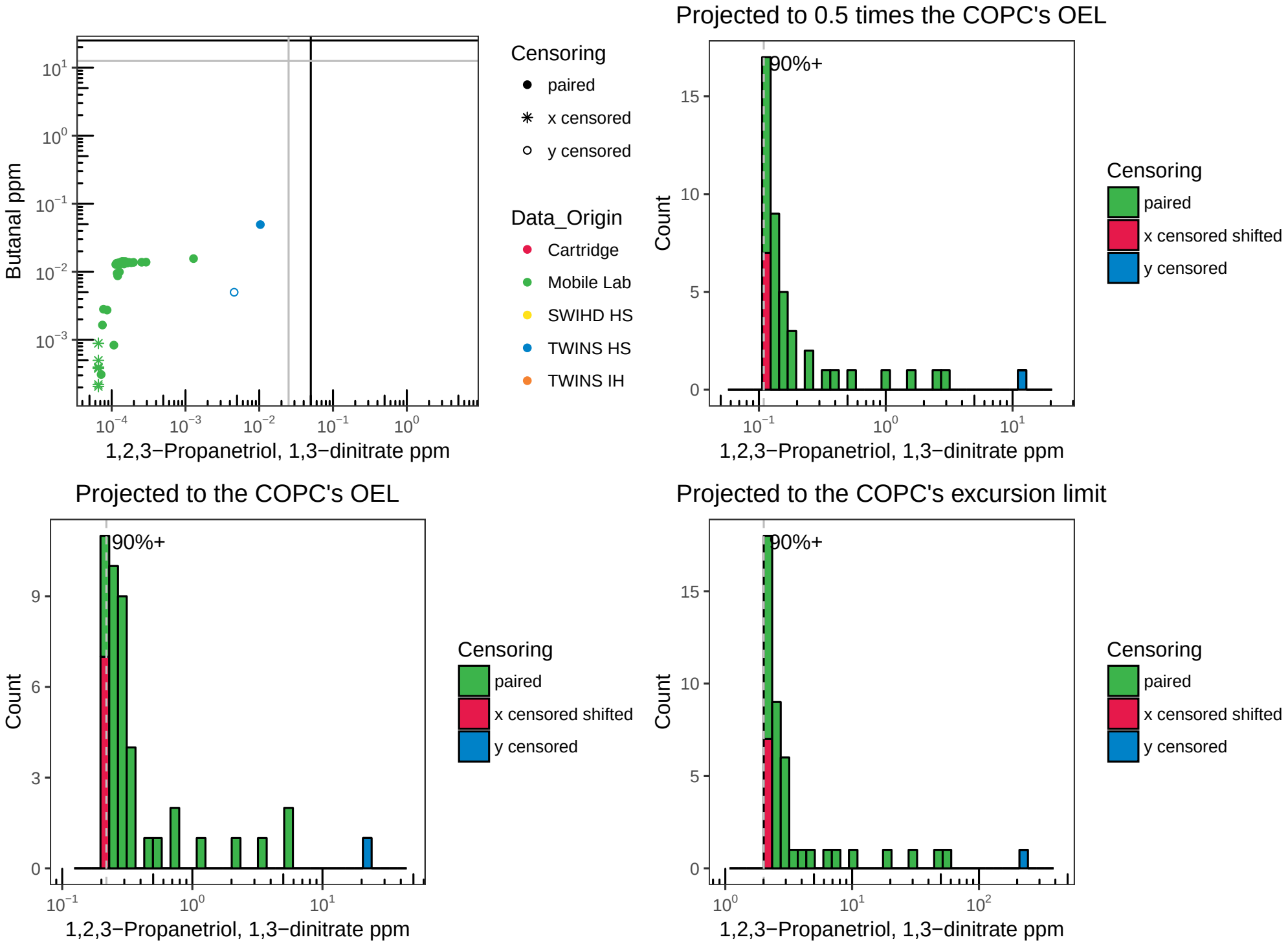


Figure C.2793: Butanal vs 1,2,3-Propanetriol, 1,3-dinitrate

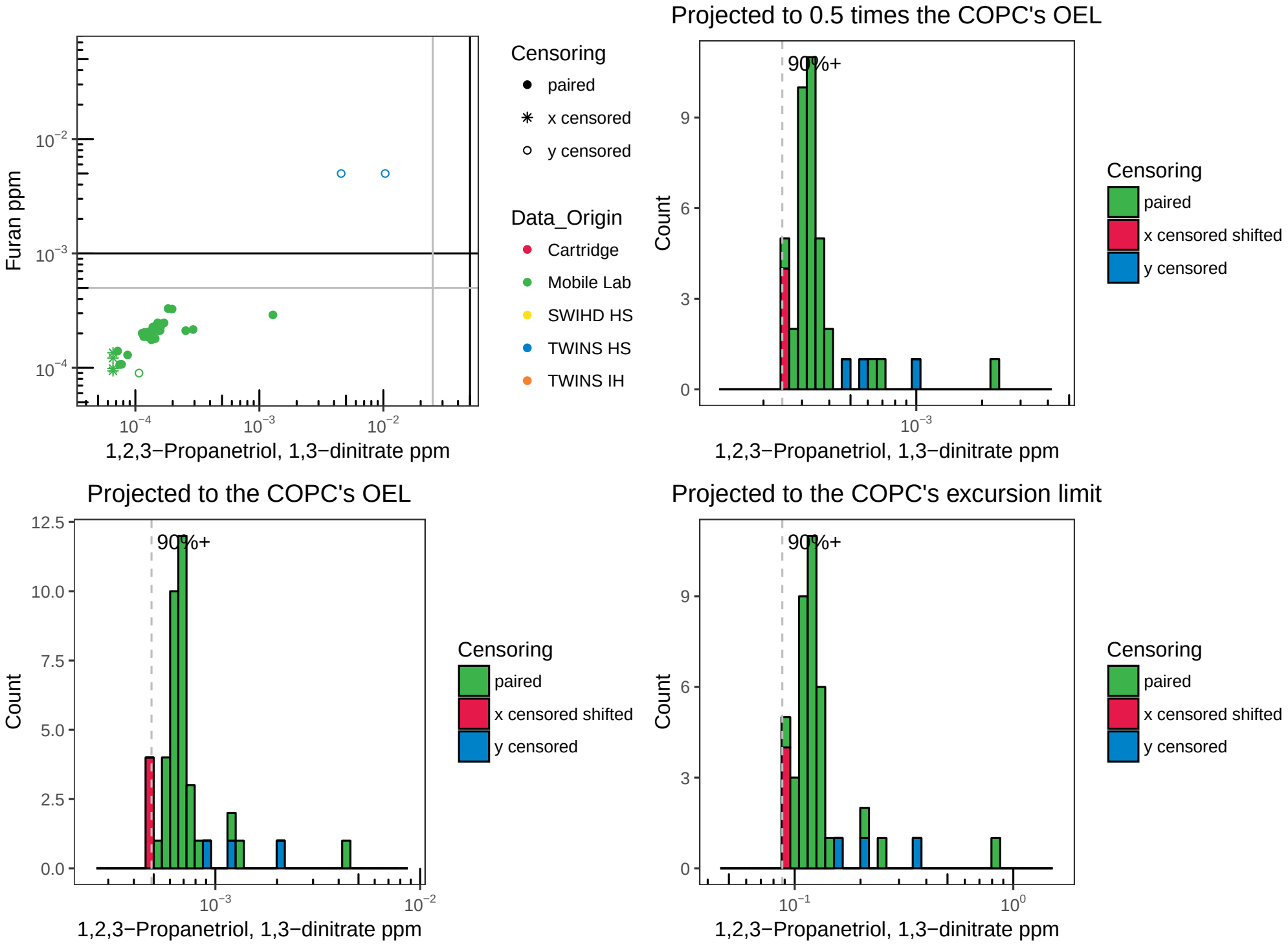


Figure C.2794: Furan vs 1,2,3-Propanetriol, 1,3-dinitrate

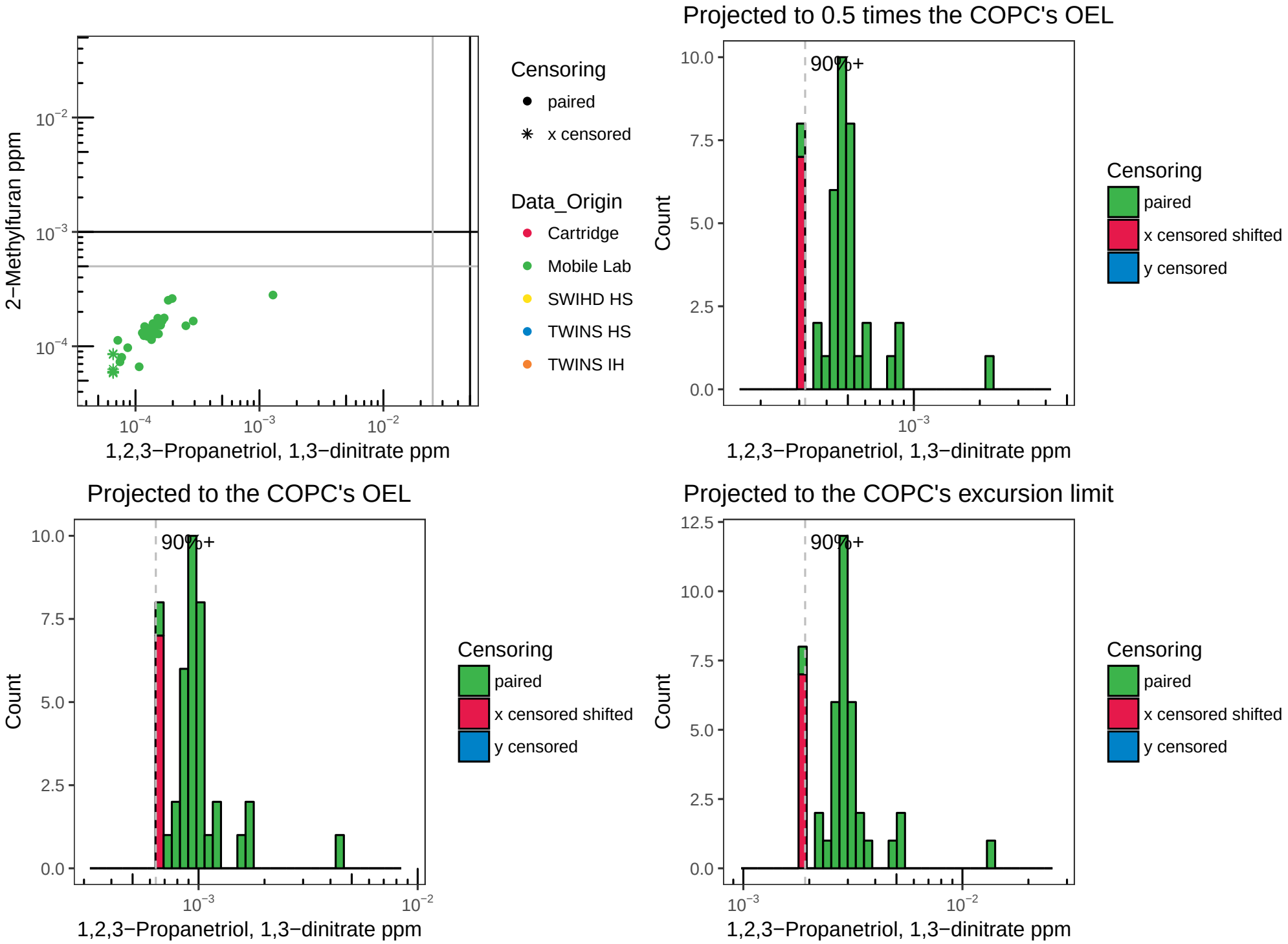


Figure C.2795: 2-Methylfuran vs 1,2,3-Propanetriol, 1,3-dinitrate

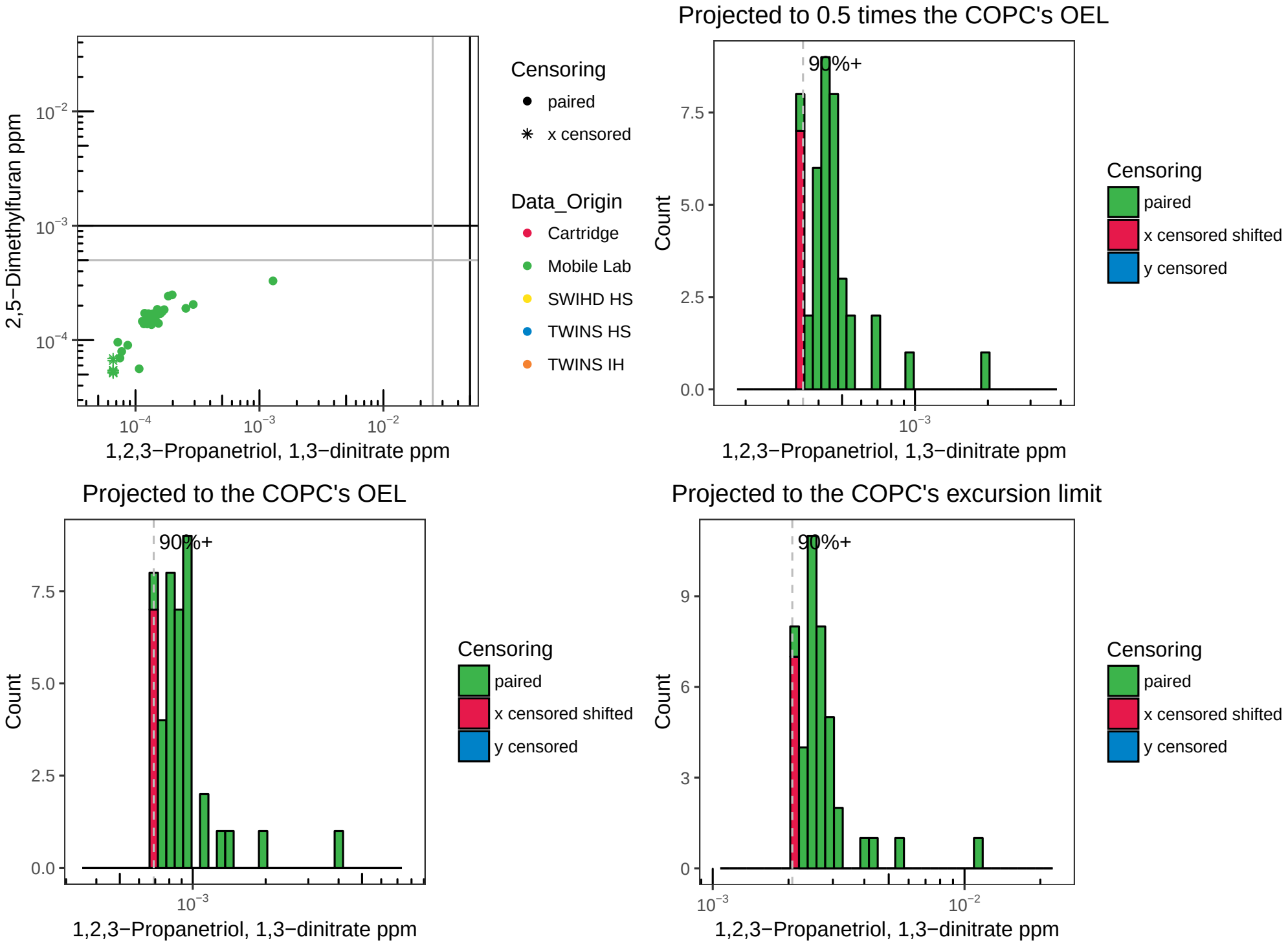


Figure C.2796: 2,5-Dimethylfuran vs 1,2,3-Propanetriol, 1,3-dinitrate

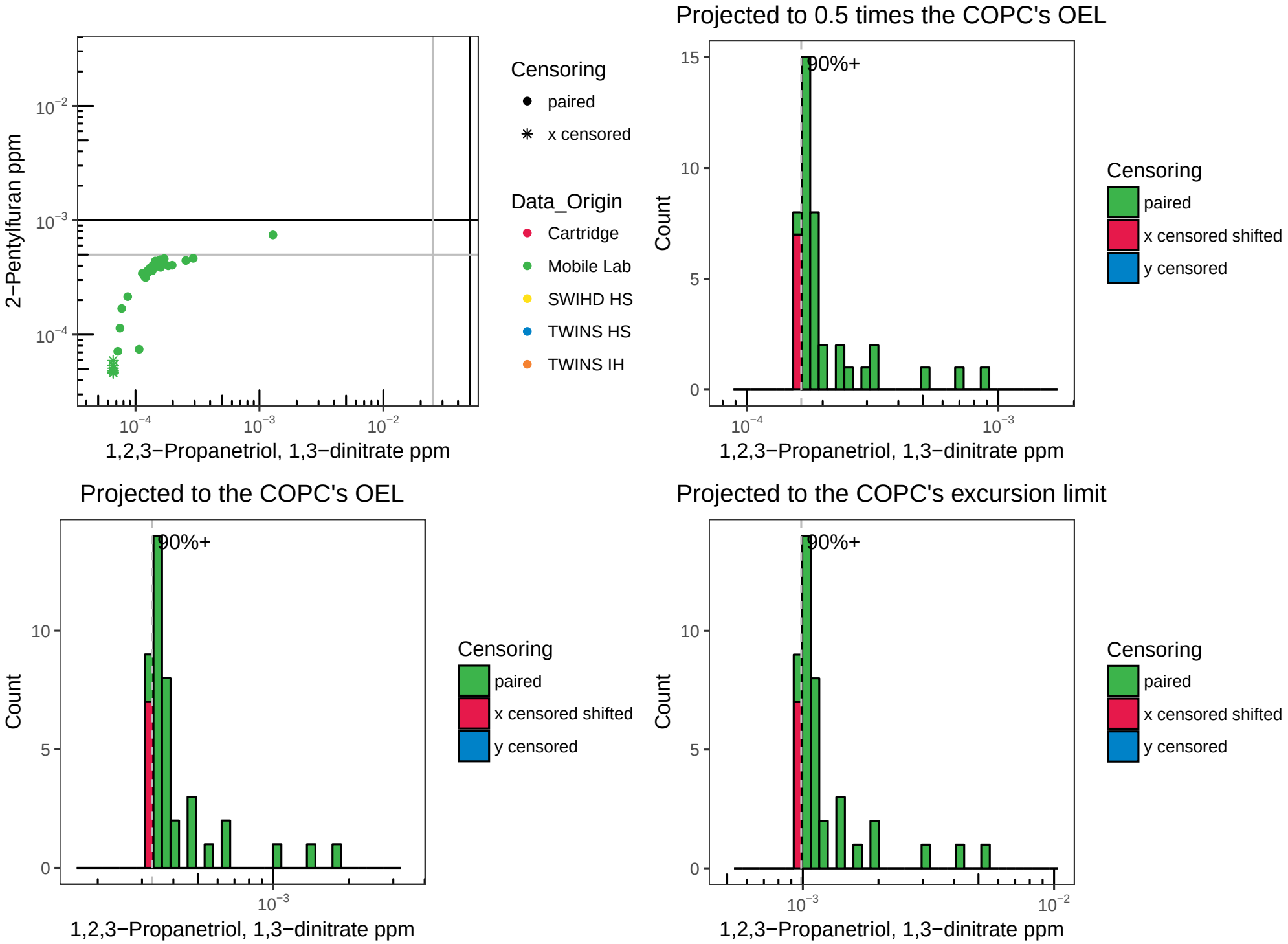


Figure C.2797: 2-Pentylfuran vs 1,2,3-Propanetriol, 1,3-dinitrate

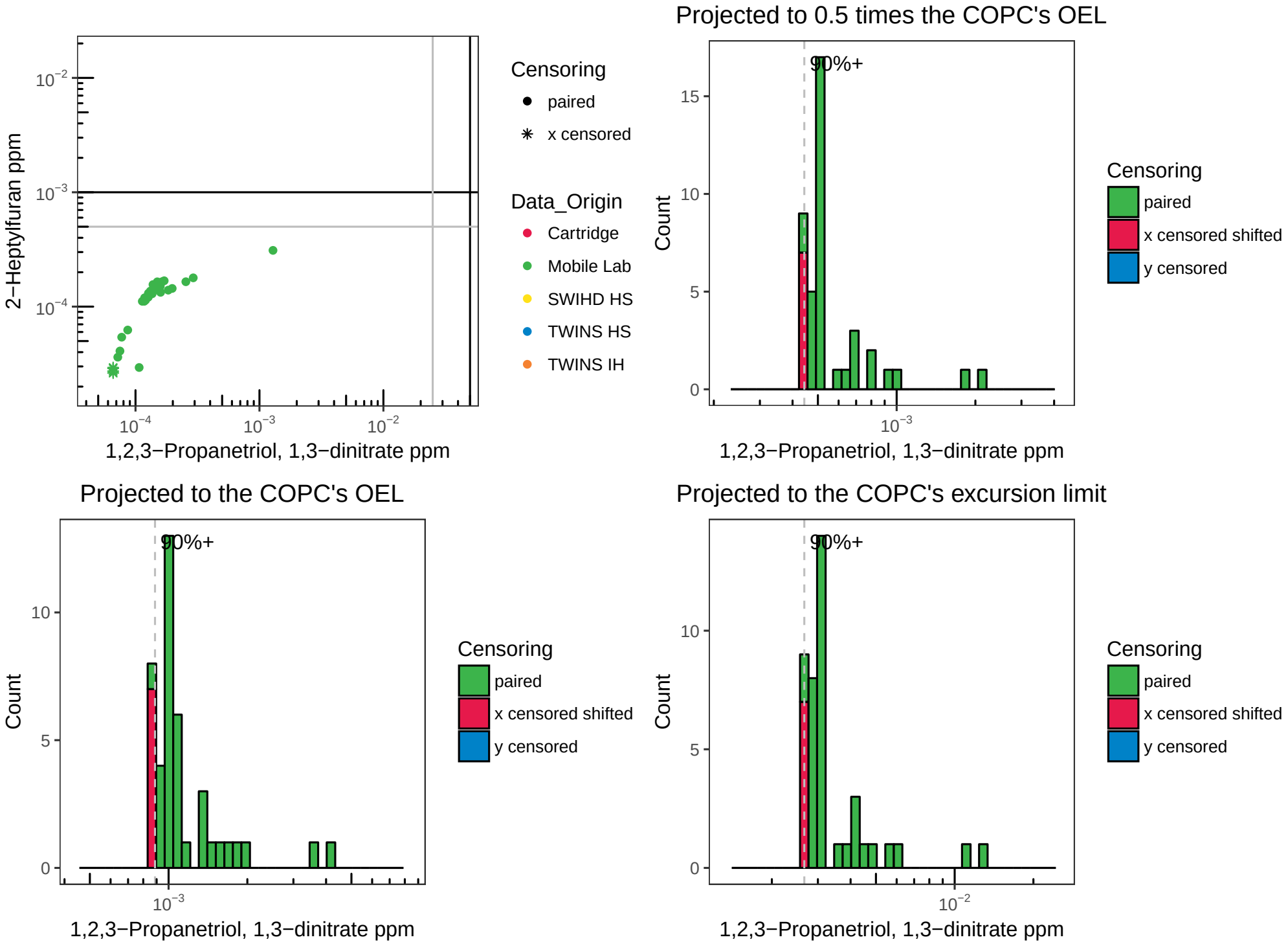


Figure C.2798: 2-Heptylfuran vs 1,2,3-Propanetriol, 1,3-dinitrate

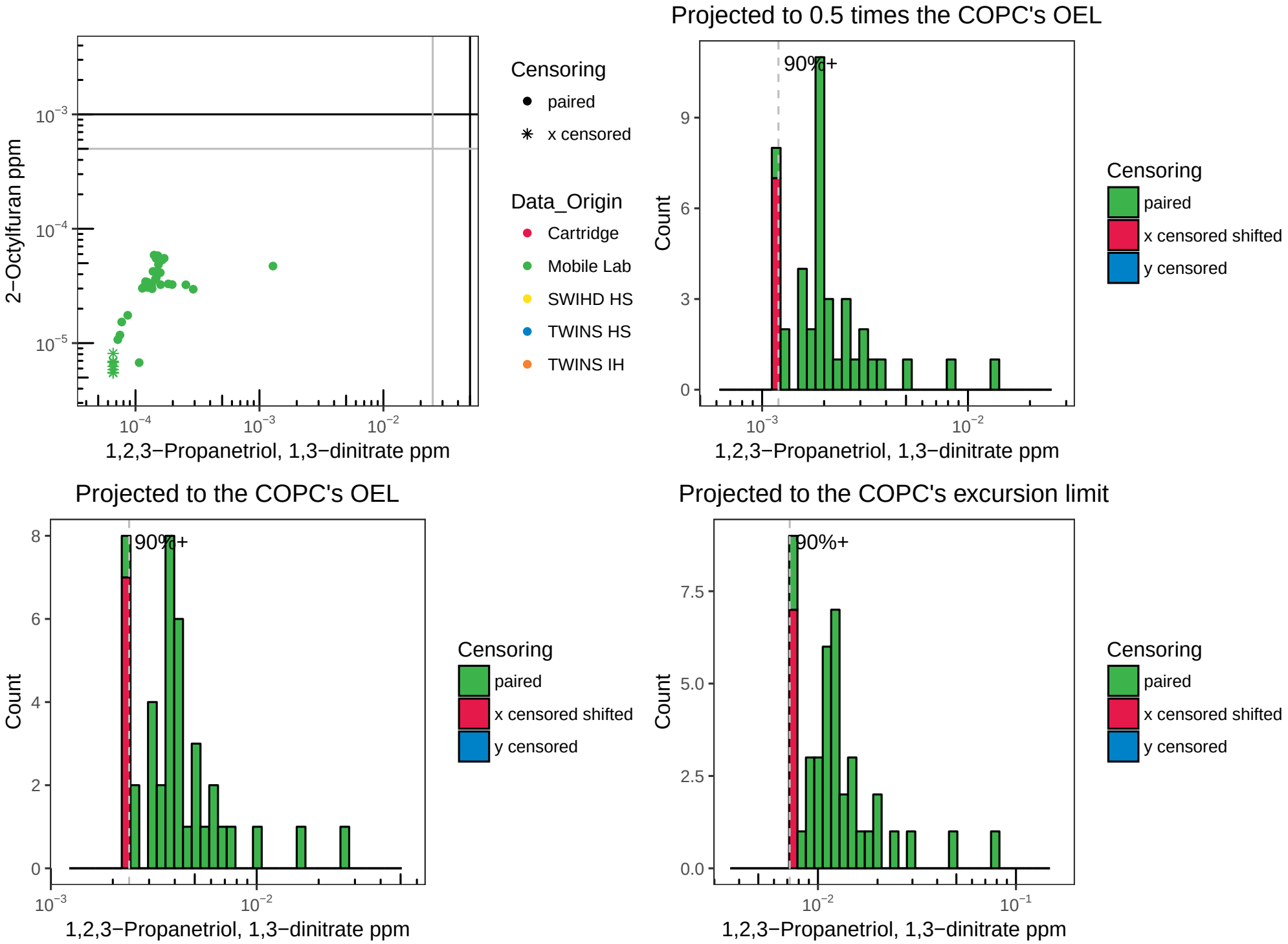


Figure C.2799: 2-Octylfuran vs 1,2,3-Propanetriol, 1,3-dinitrate

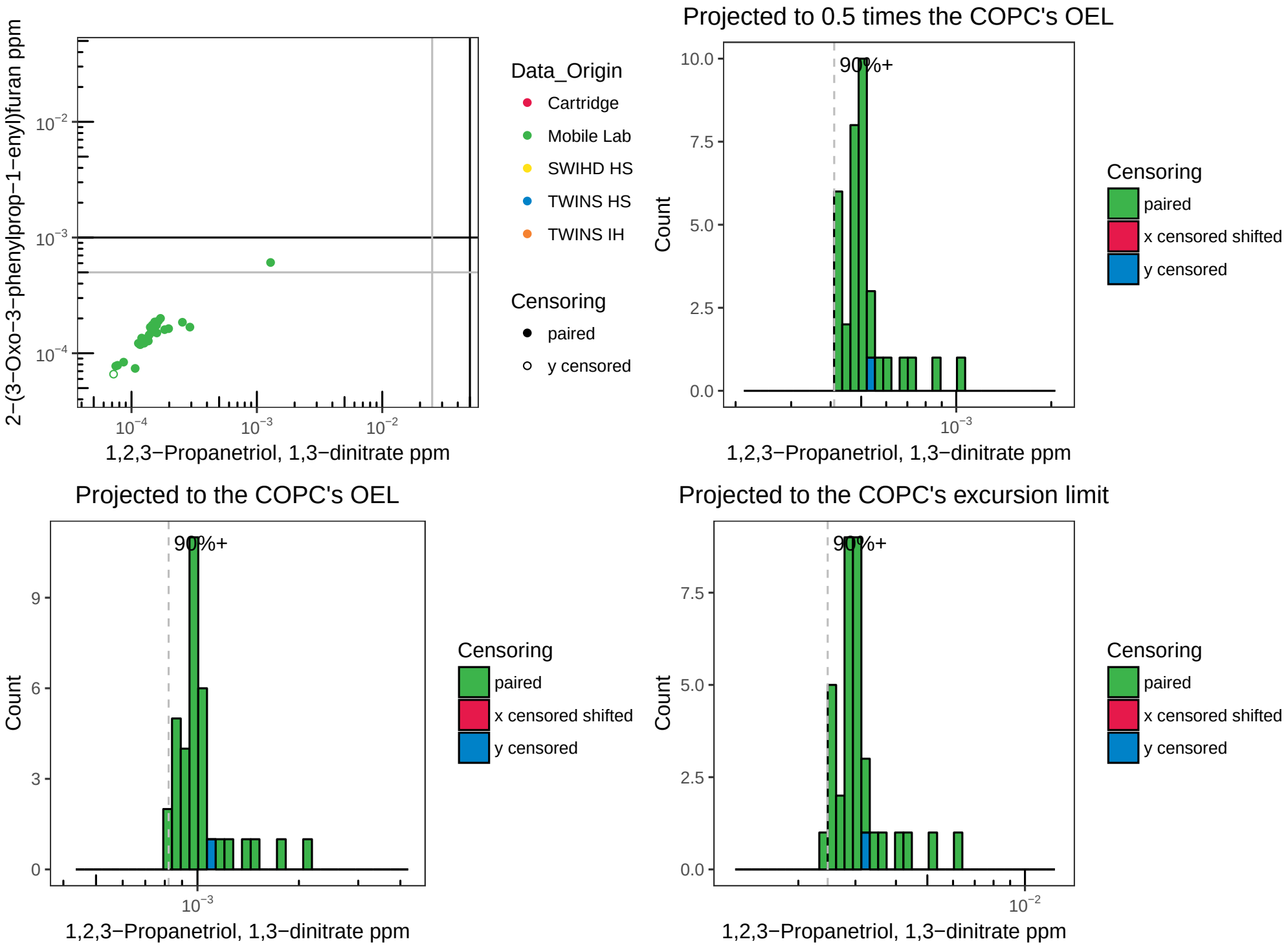


Figure C.2800: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs 1,2,3-Propanetriol, 1,3-dinitrate

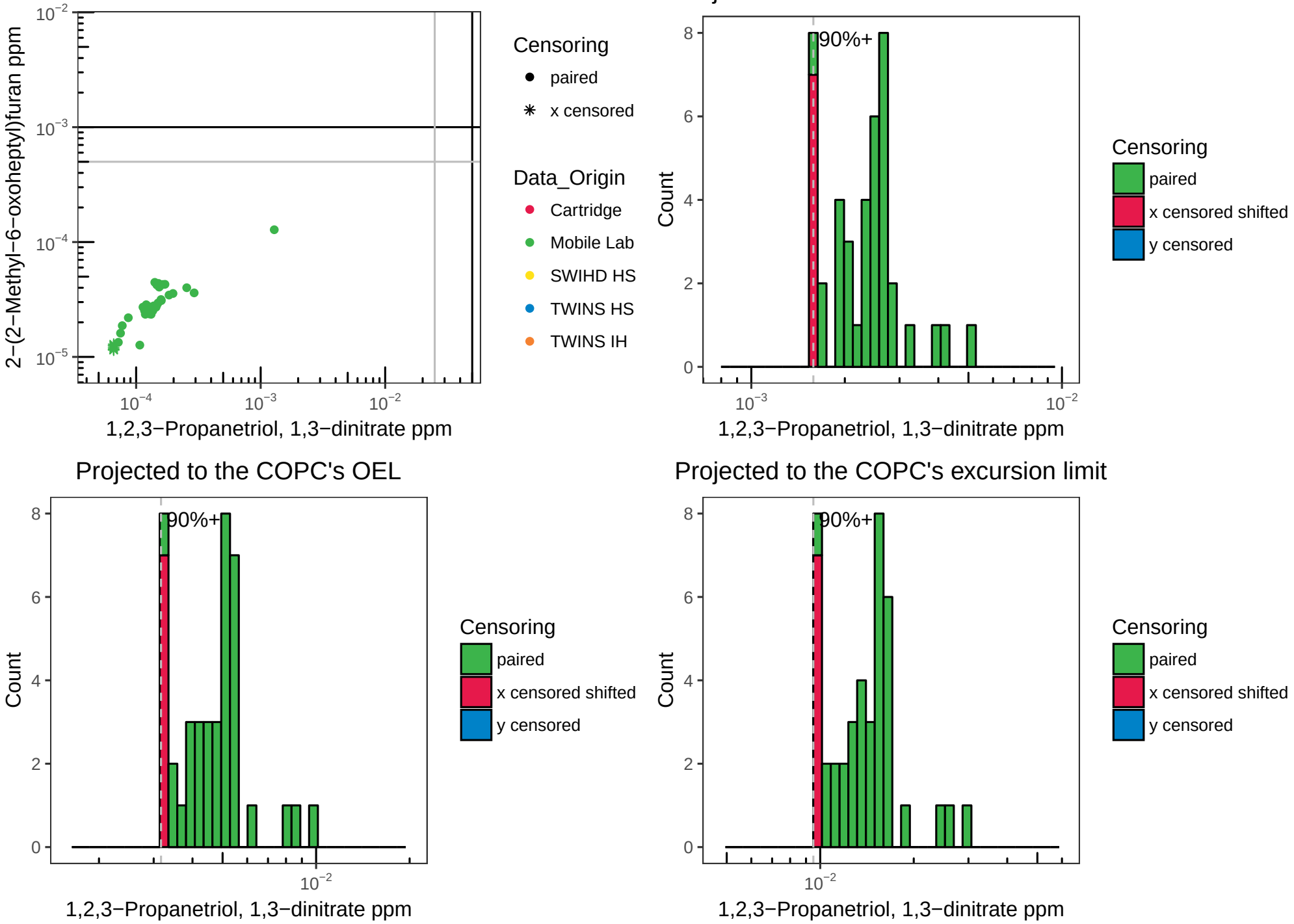


Figure C.2801: 2-(2-Methyl-6-oxoheptyl)furan vs 1,2,3-Propanetriol, 1,3-dinitrate

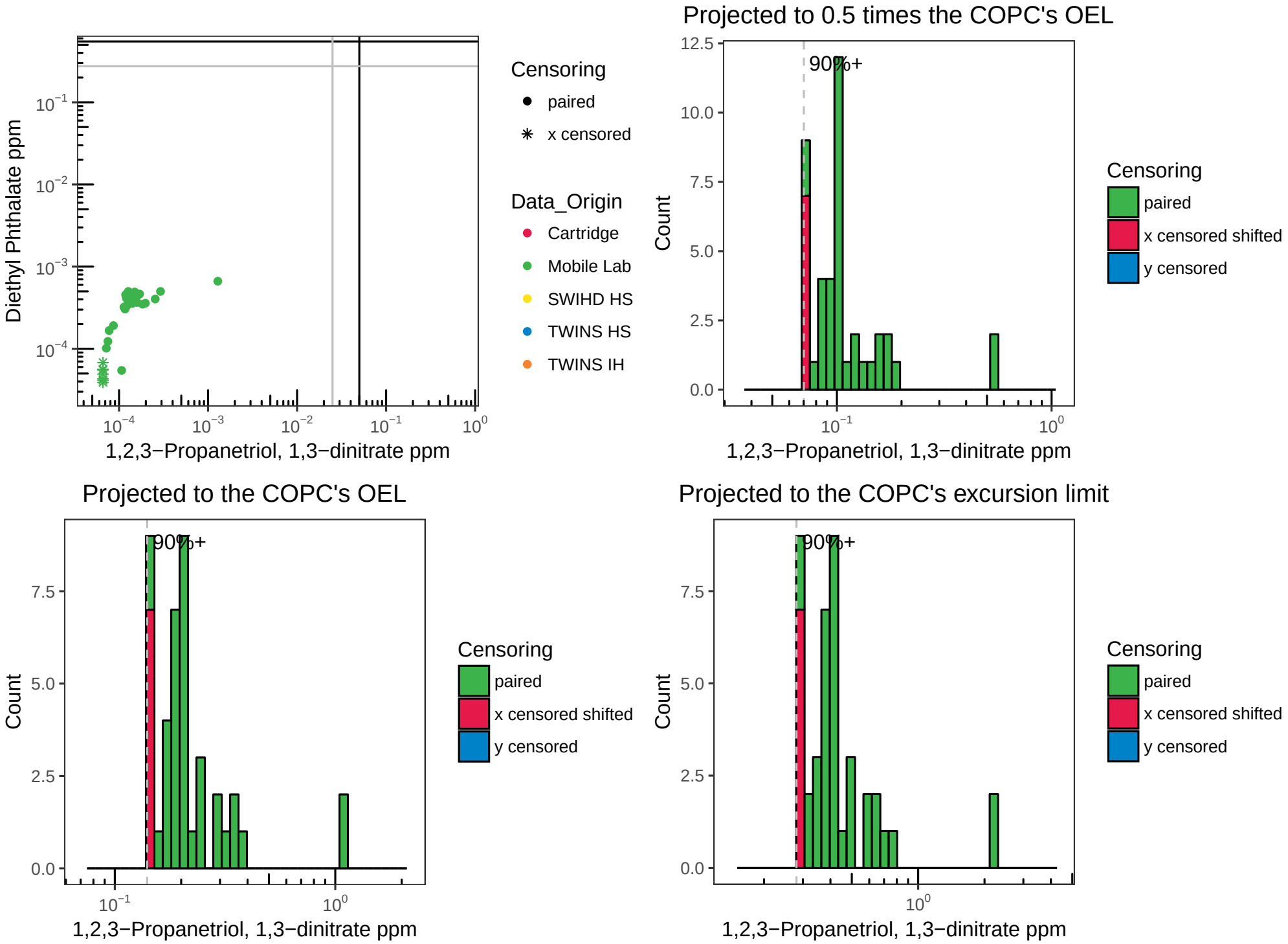


Figure C.2802: Diethyl Phthalate vs 1,2,3-Propanetriol, 1,3-dinitrate

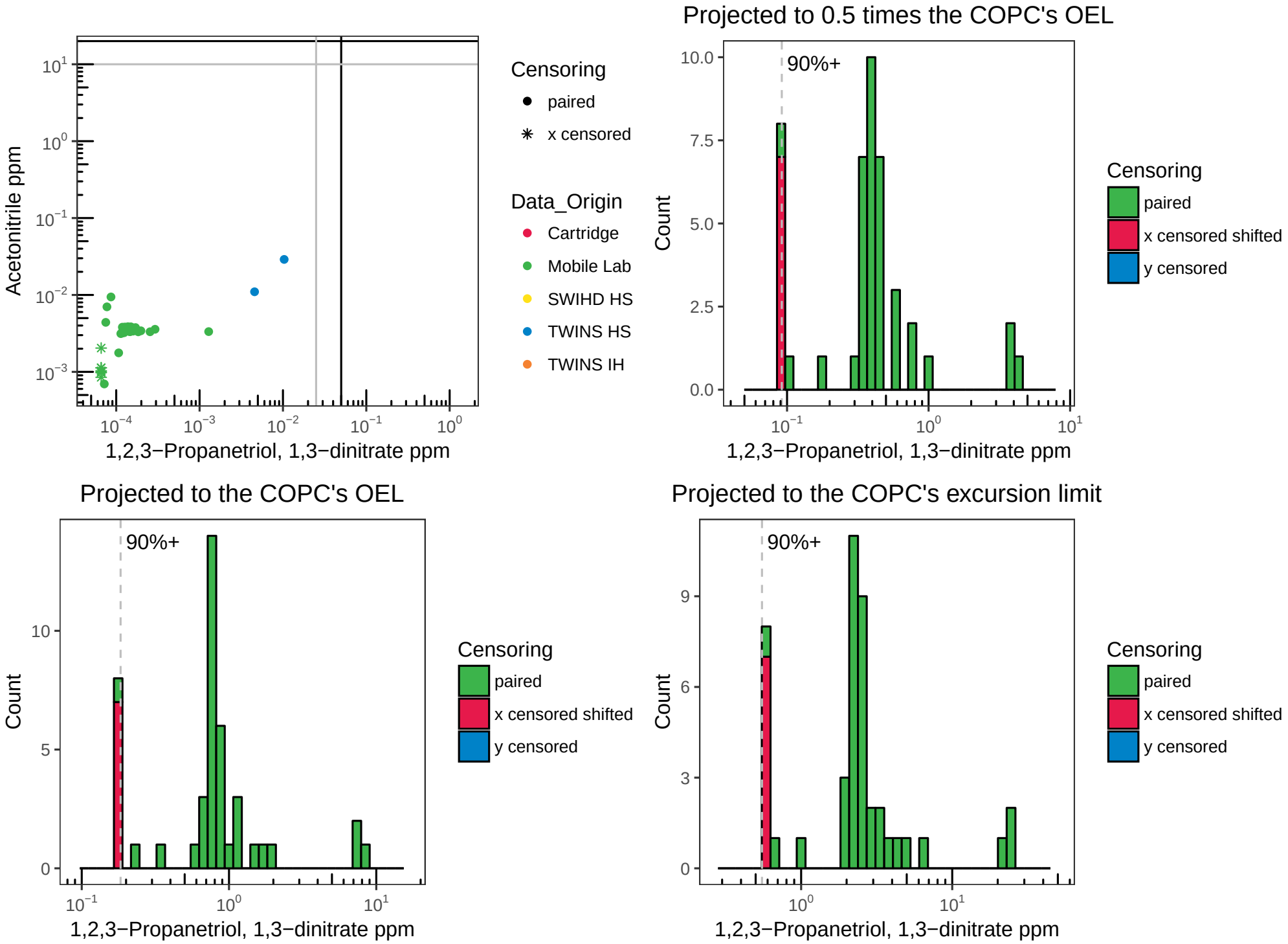


Figure C.2803: Acetonitrile vs 1,2,3-Propanetriol, 1,3-dinitrate

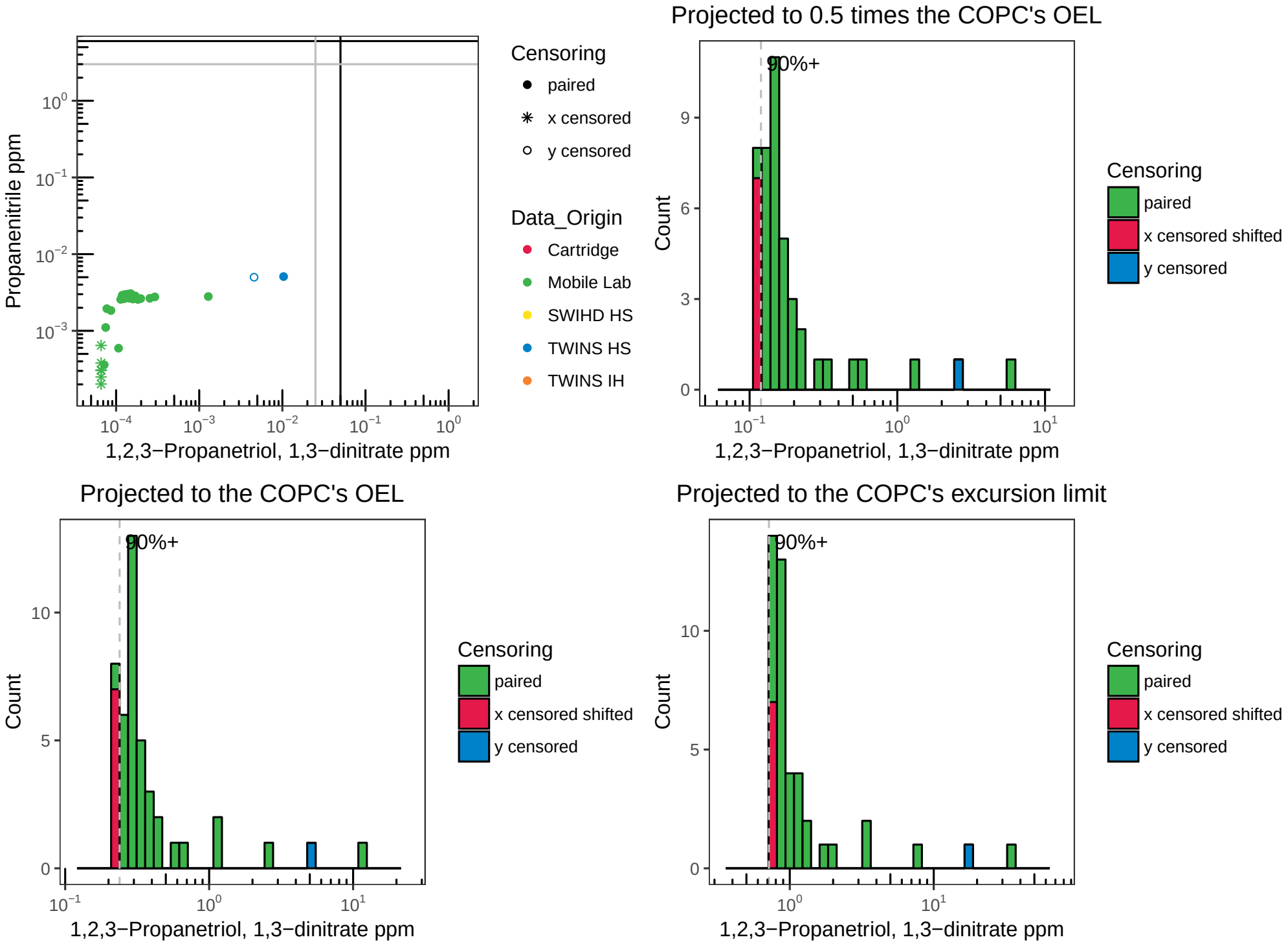


Figure C.2804: Propanenitrile vs 1,2,3-Propanetriol, 1,3-dinitrate

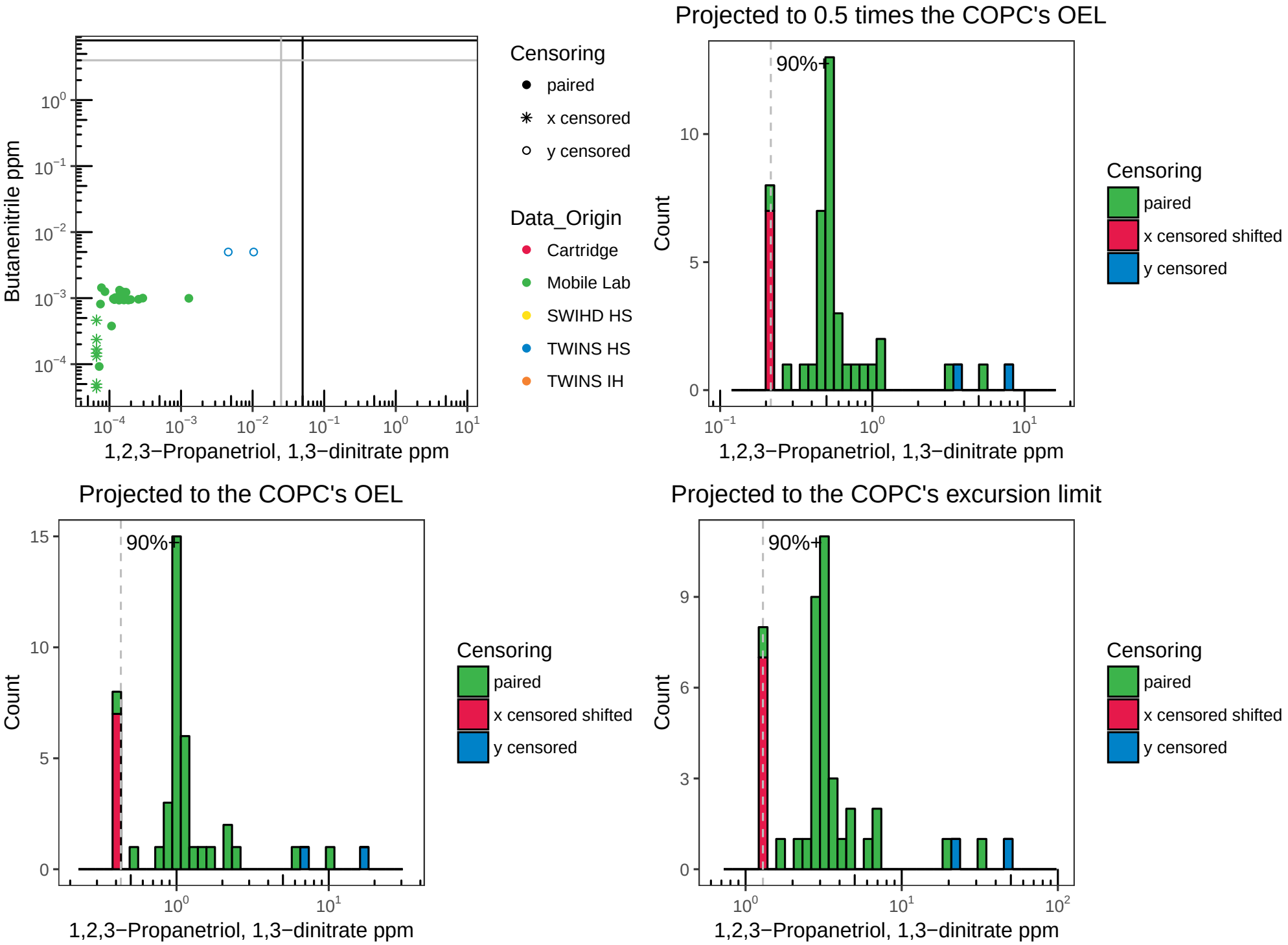


Figure C.2805: Butanenitrile vs 1,2,3-Propanetriol, 1,3-dinitrate

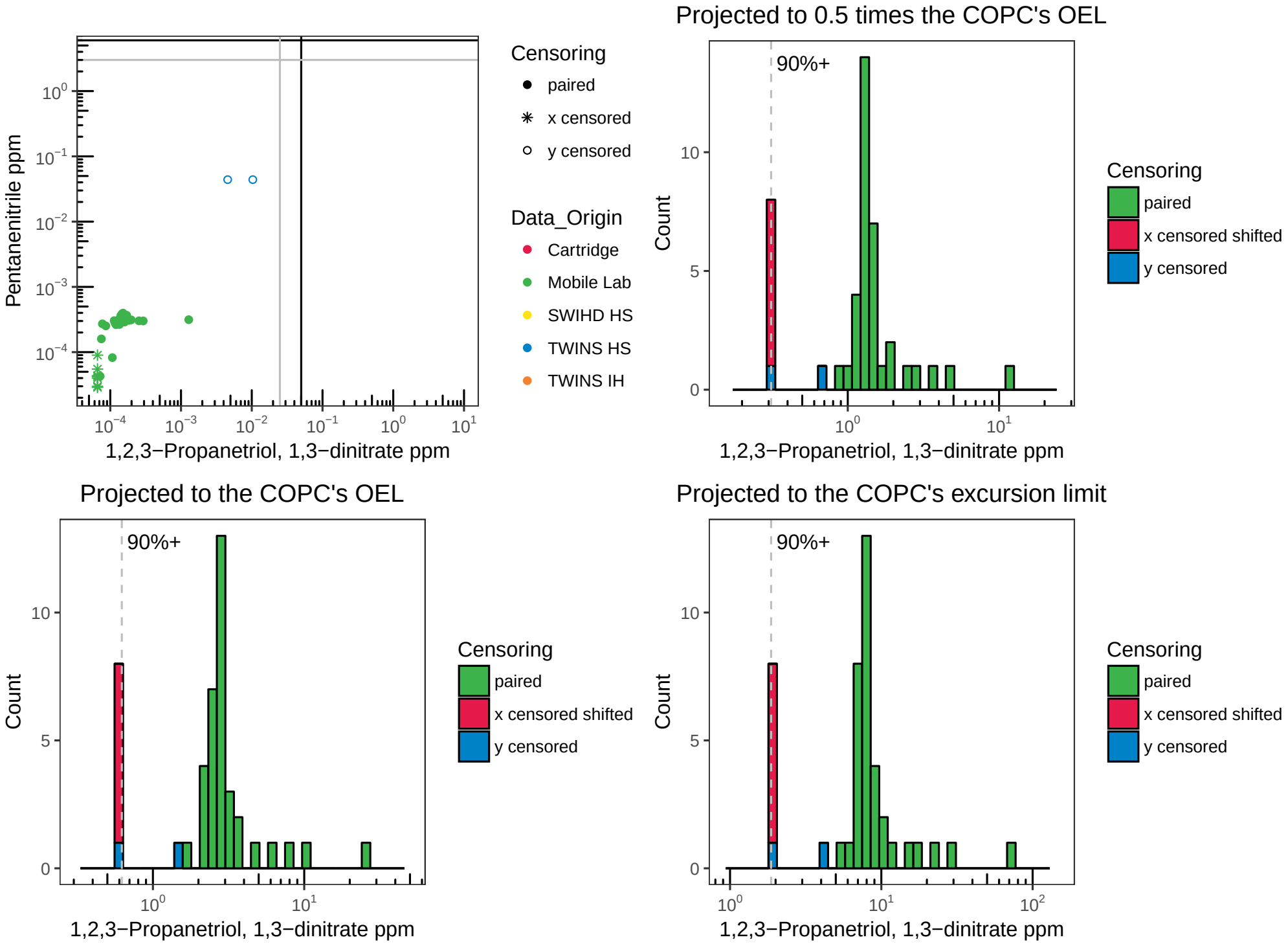


Figure C.2806: Pentanenitrile vs 1,2,3-Propanetriol, 1,3-dinitrate

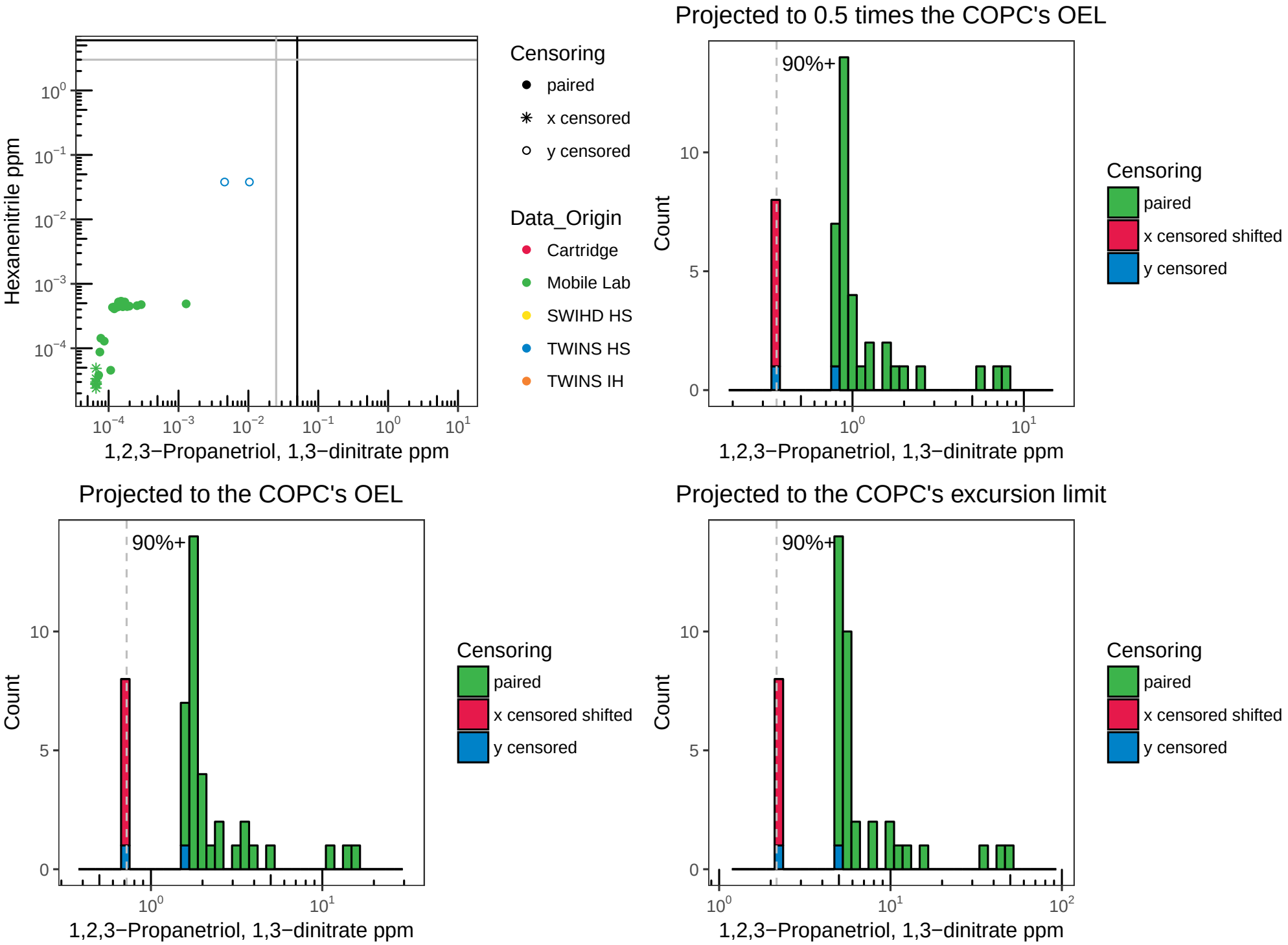


Figure C.2807: Hexanenitrile vs 1,2,3-Propanetriol, 1,3-dinitrate

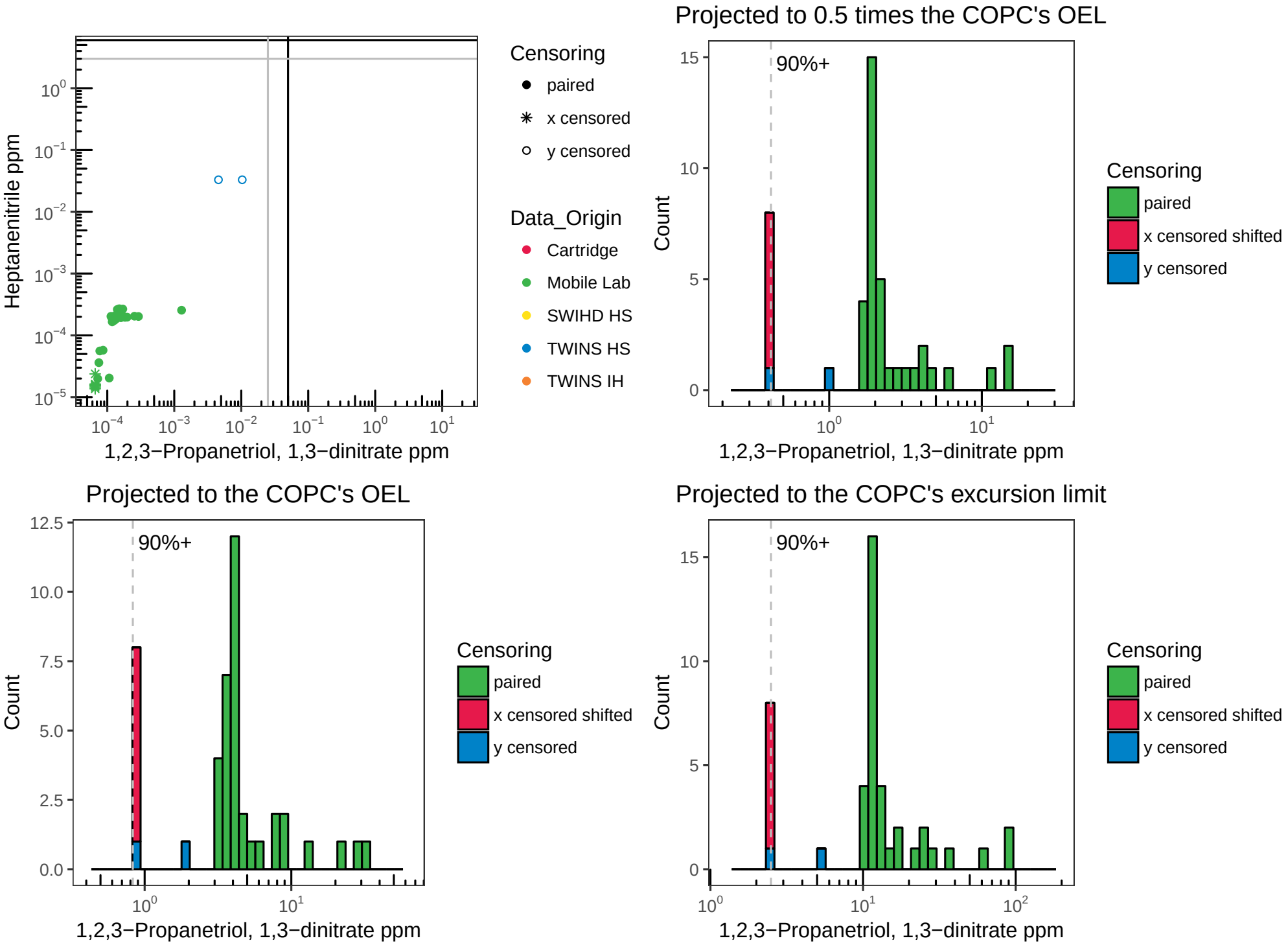


Figure C.2808: Heptanenitrile vs 1,2,3-Propanetriol, 1,3-dinitrate

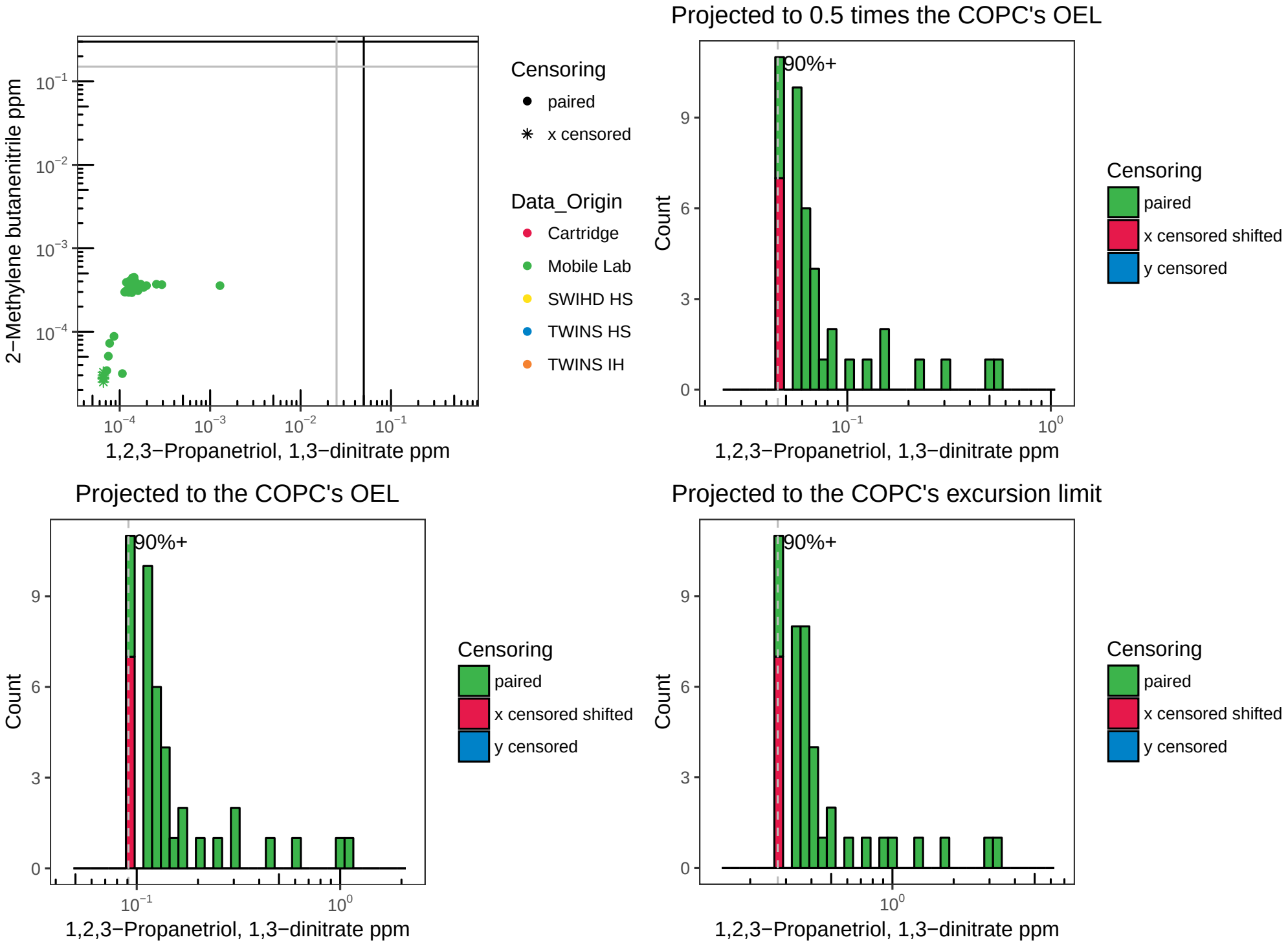


Figure C.2809: 2-Methylene butanenitrile vs 1,2,3-Propanetriol, 1,3-dinitrate

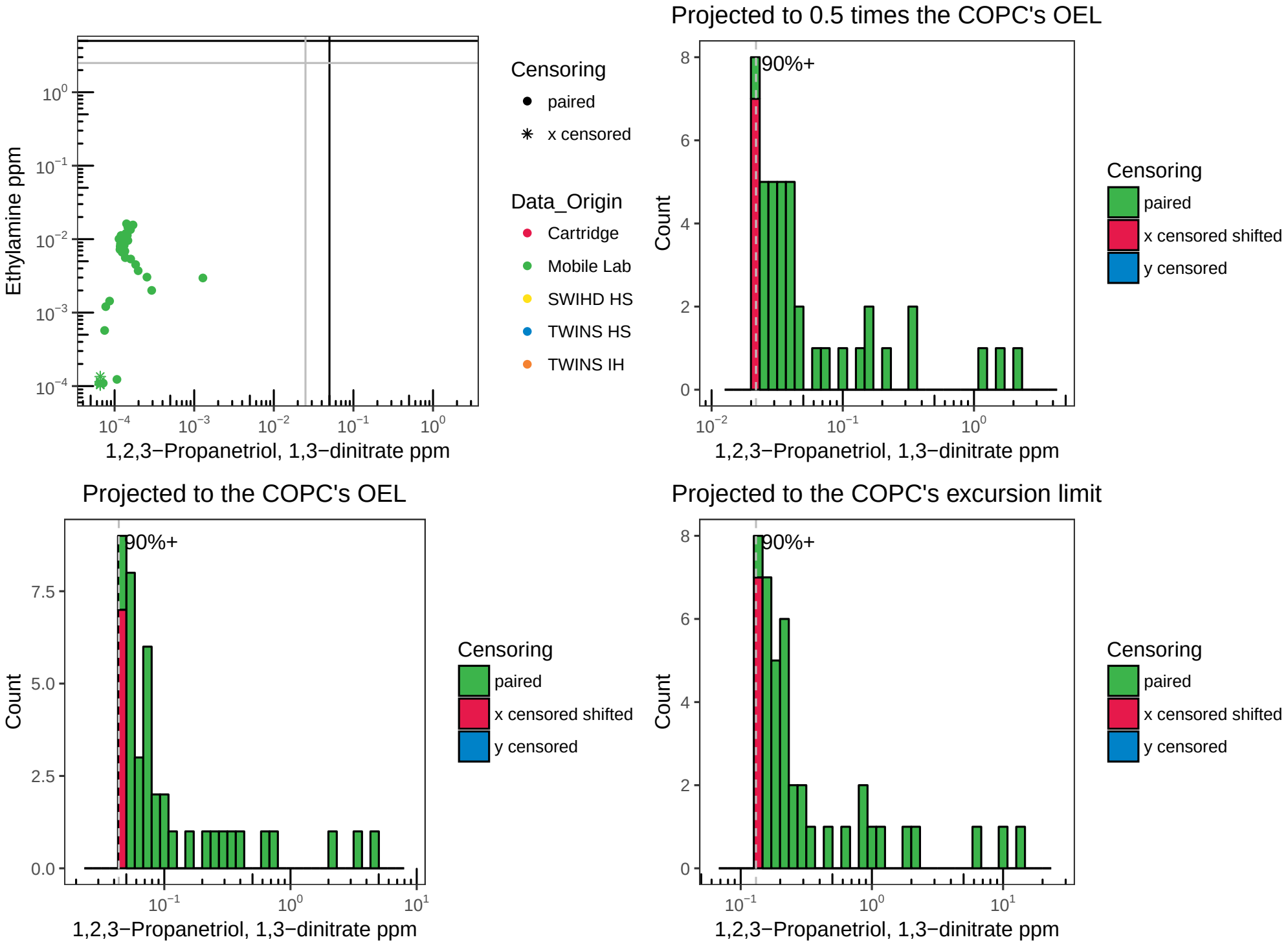


Figure C.2810: Ethylamine vs 1,2,3-Propanetriol, 1,3-dinitrate

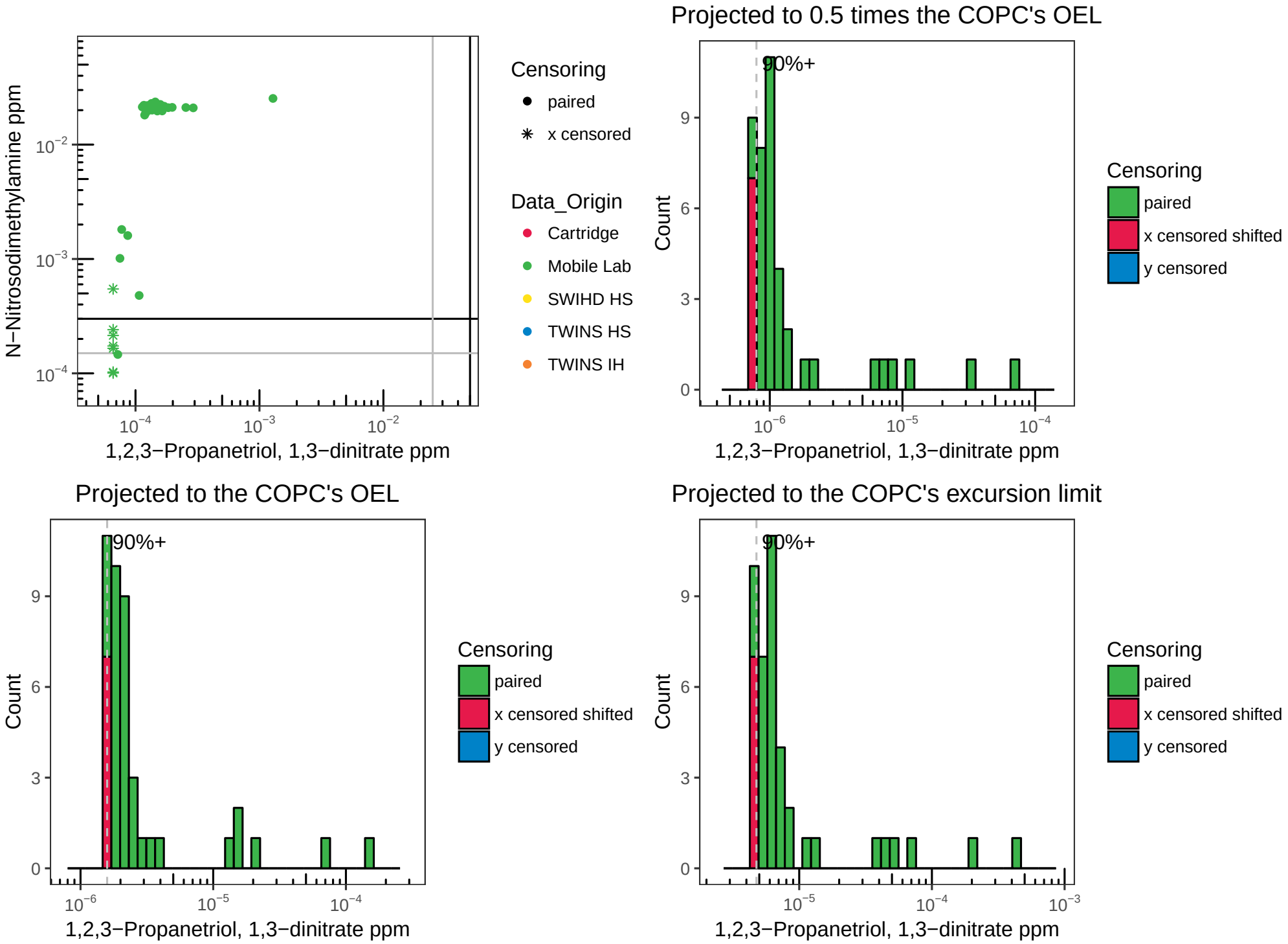


Figure C.2811: N-Nitrosodimethylamine vs 1,2,3-Propanetriol, 1,3-dinitrate

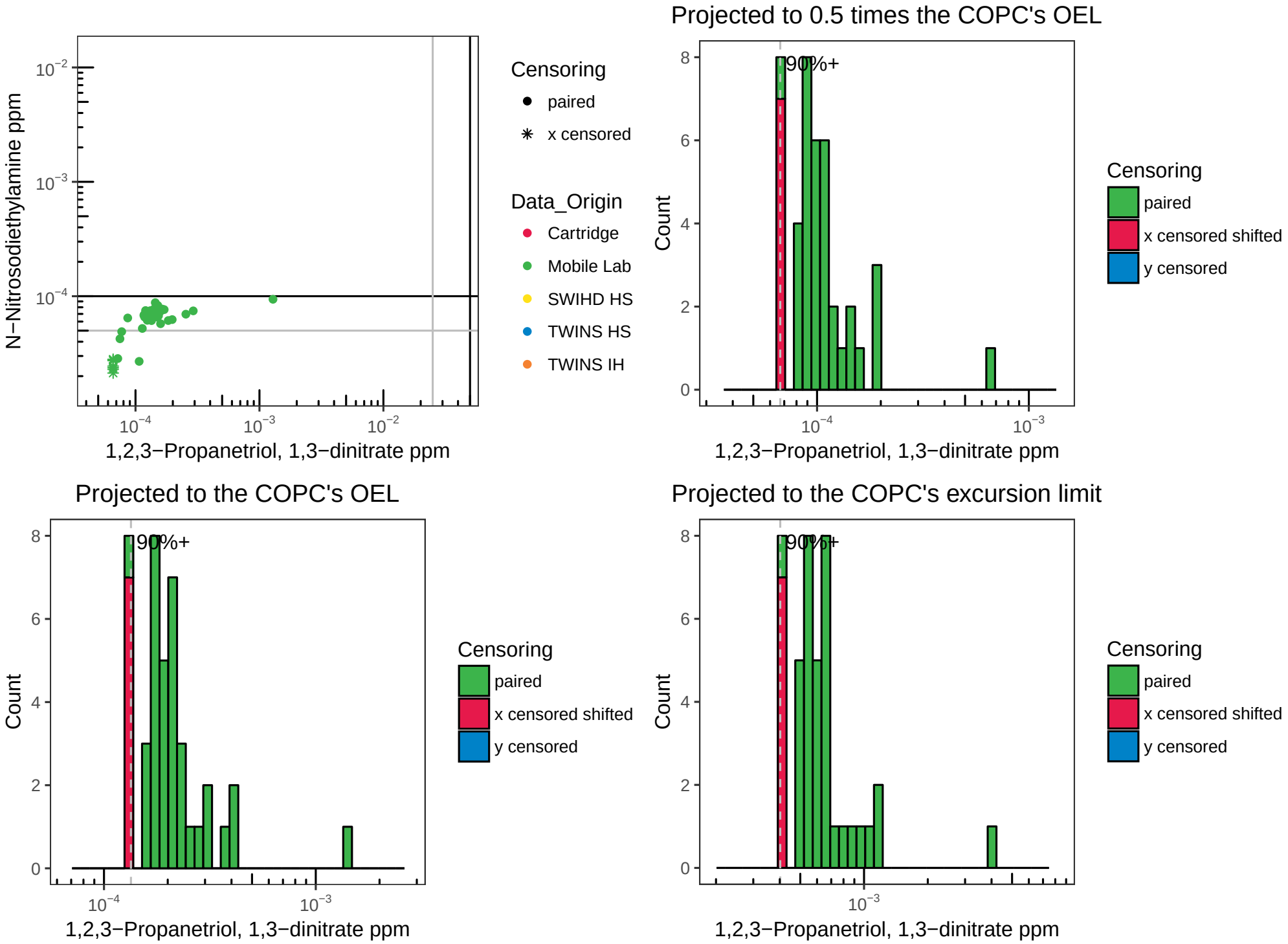


Figure C.2812: N-Nitrosodiethylamine vs 1,2,3-Propanetriol, 1,3-dinitrate

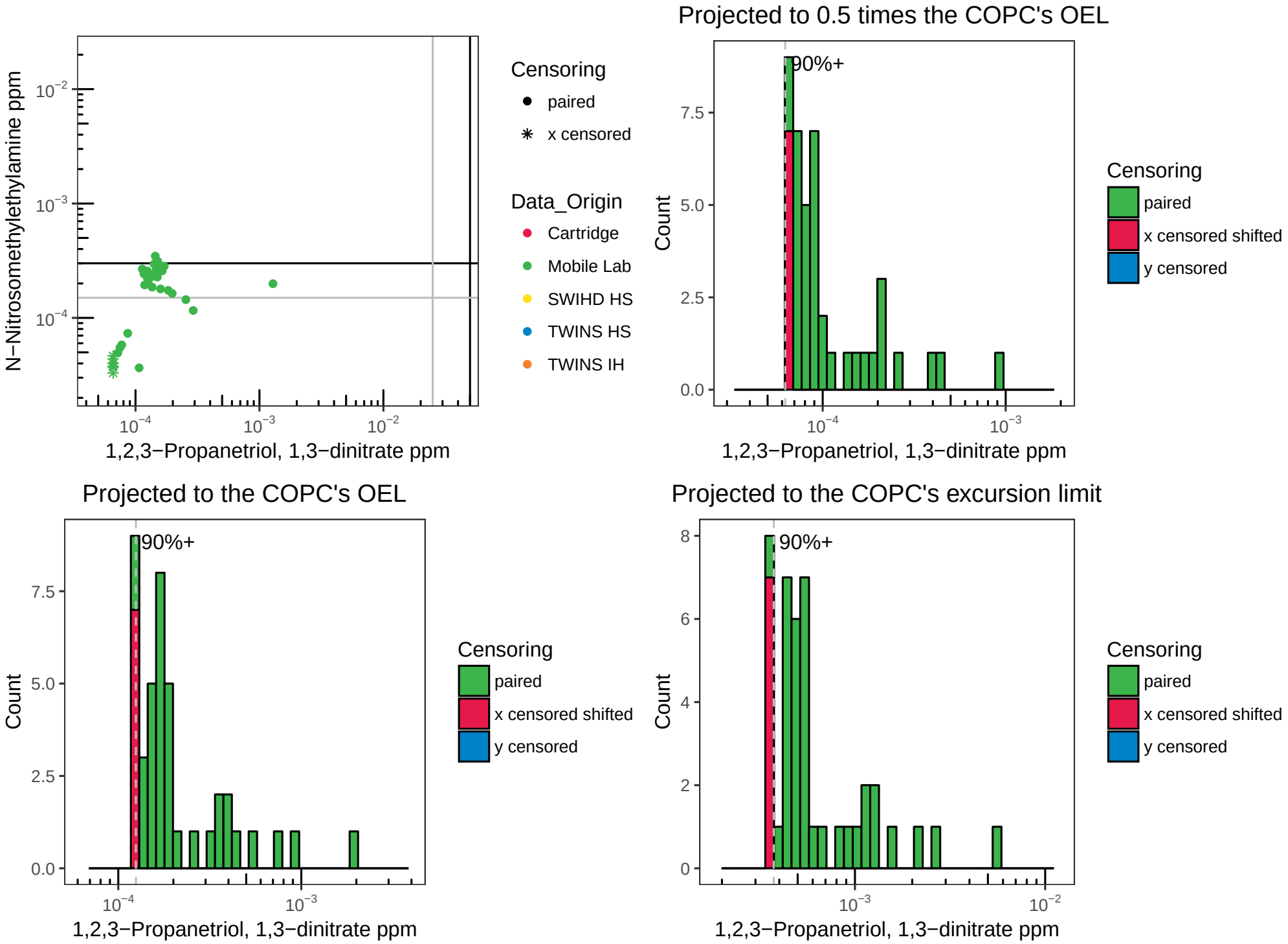


Figure C.2813: N-Nitrosomethylethylamine vs 1,2,3-Propanetriol, 1,3-dinitrate

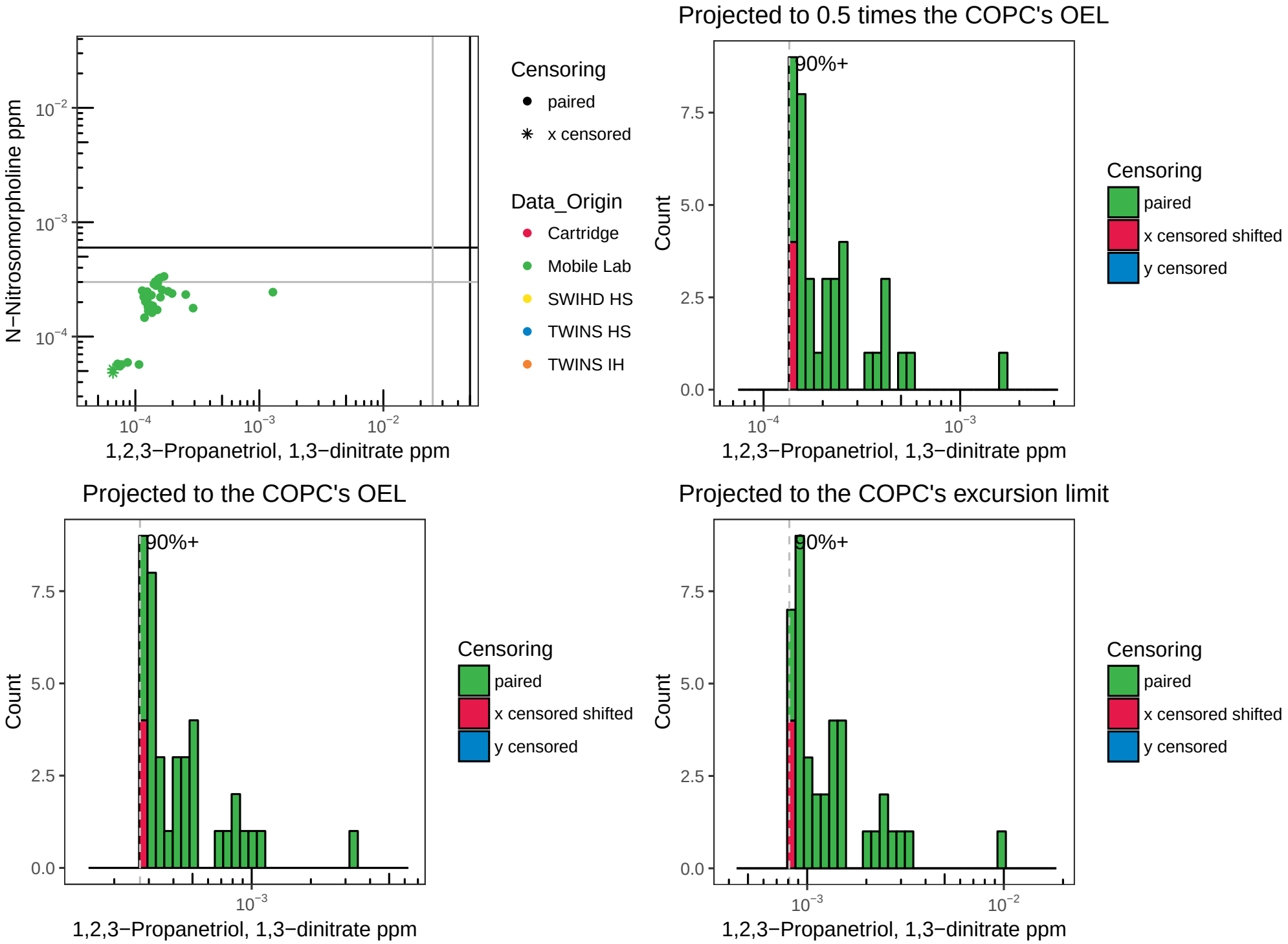


Figure C.2814: N-Nitrosomorpholine vs 1,2,3-Propanetriol, 1,3-dinitrate

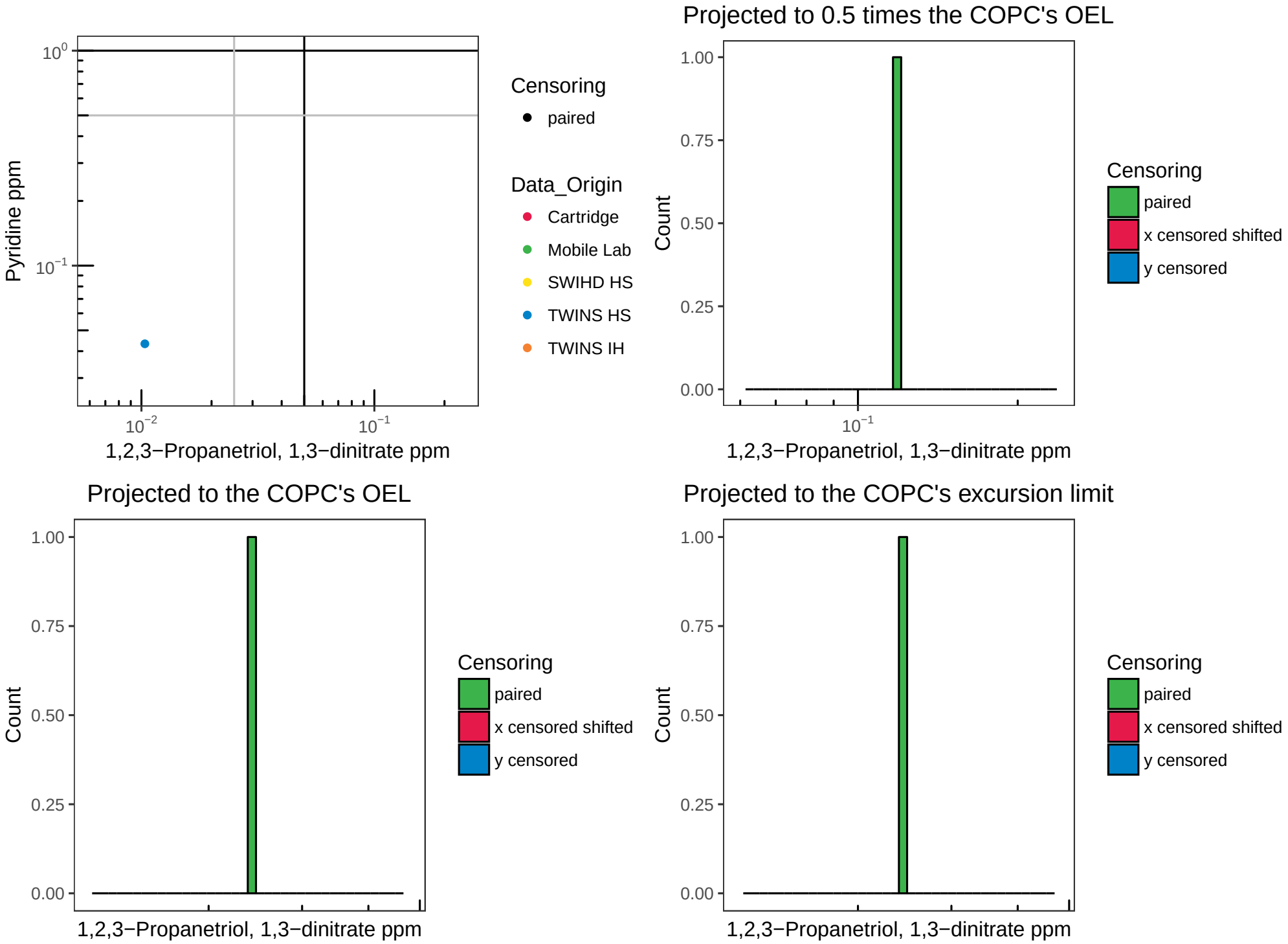


Figure C.2815: Pyridine vs 1,2,3-Propanetriol, 1,3-dinitrate

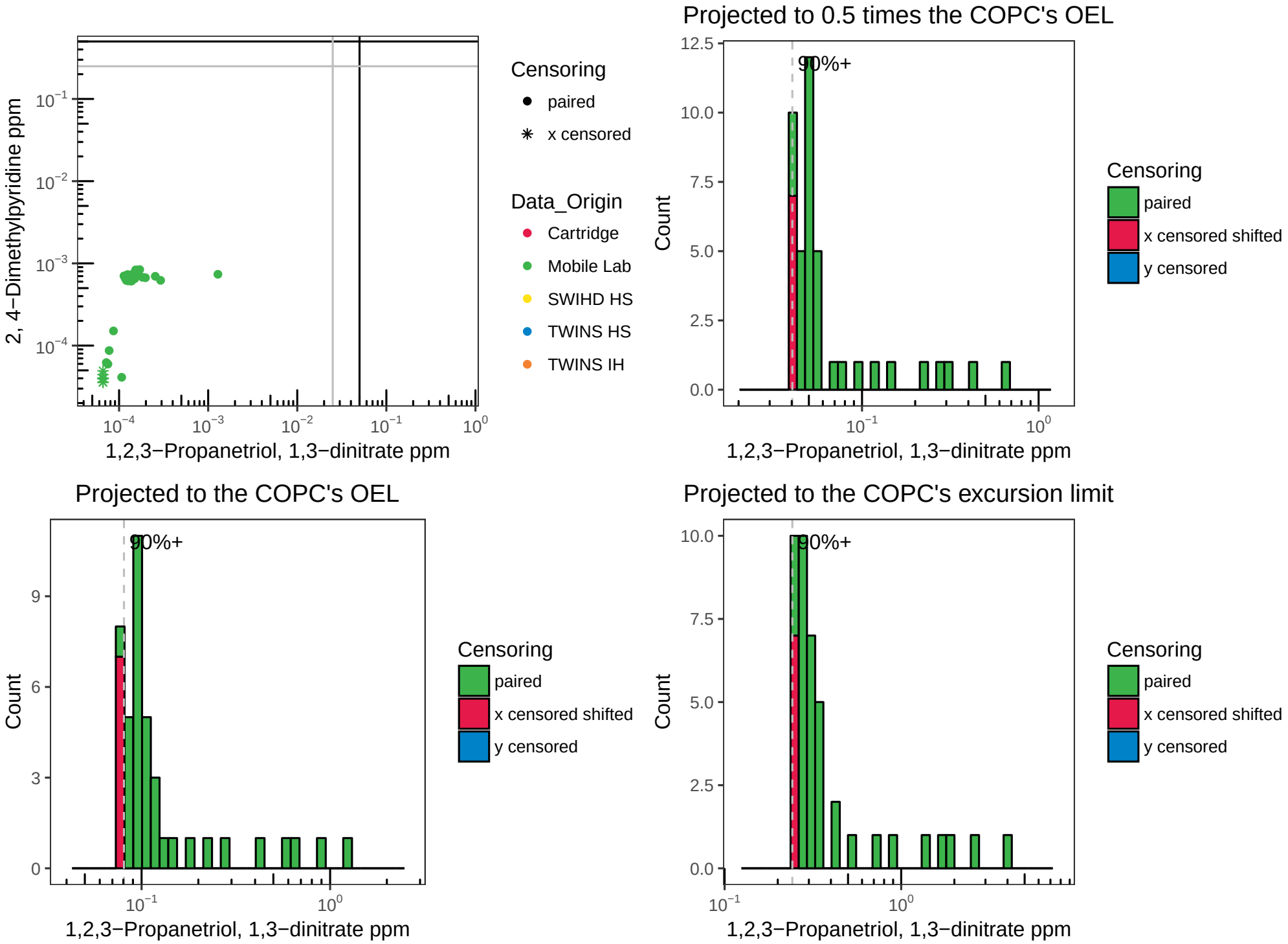


Figure C.2816: 2, 4-Dimethylpyridine vs 1,2,3-Propanetriol, 1,3-dinitrate

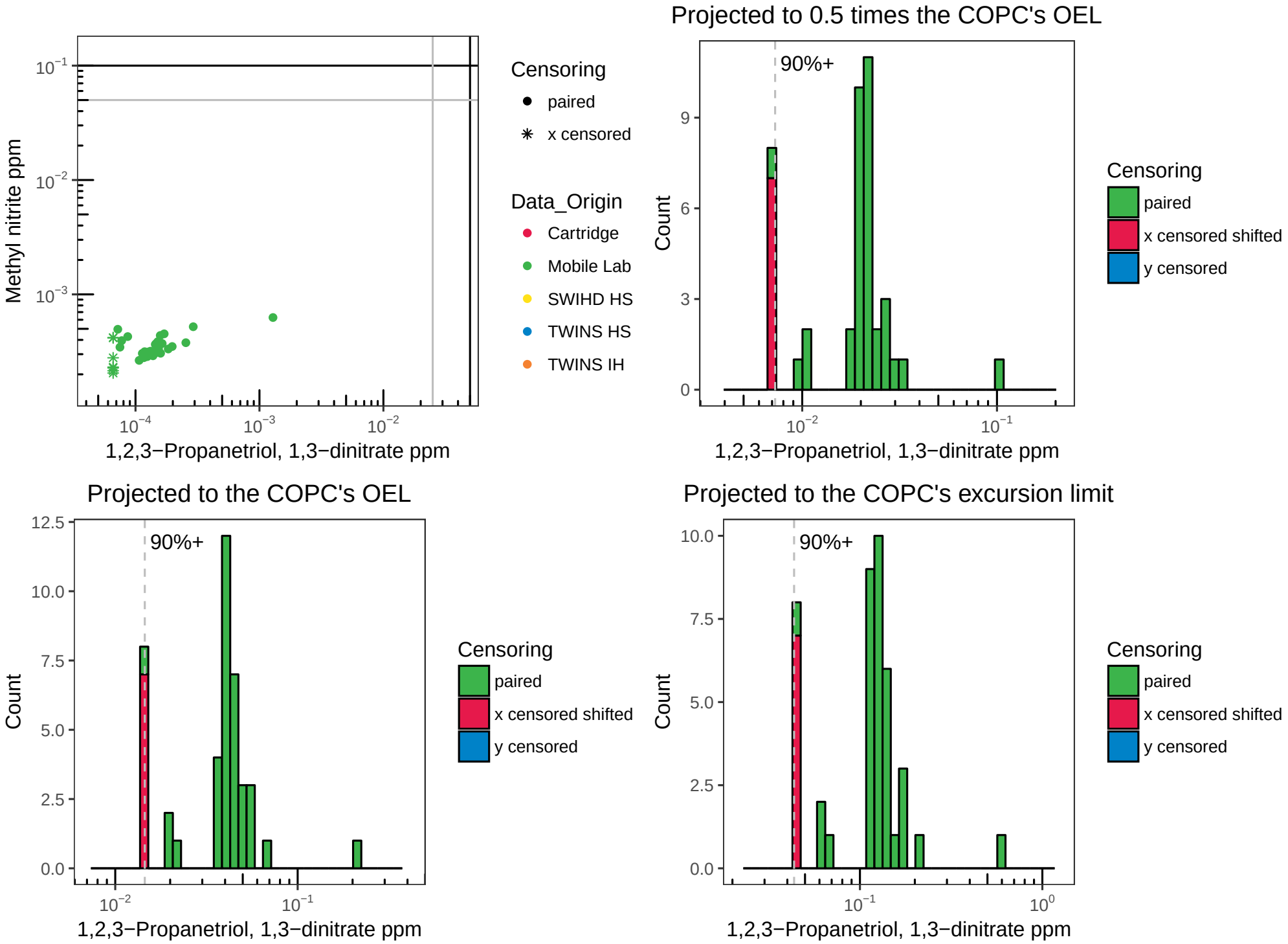


Figure C.2817: Methyl nitrite vs 1,2,3-Propanetriol, 1,3-dinitrate

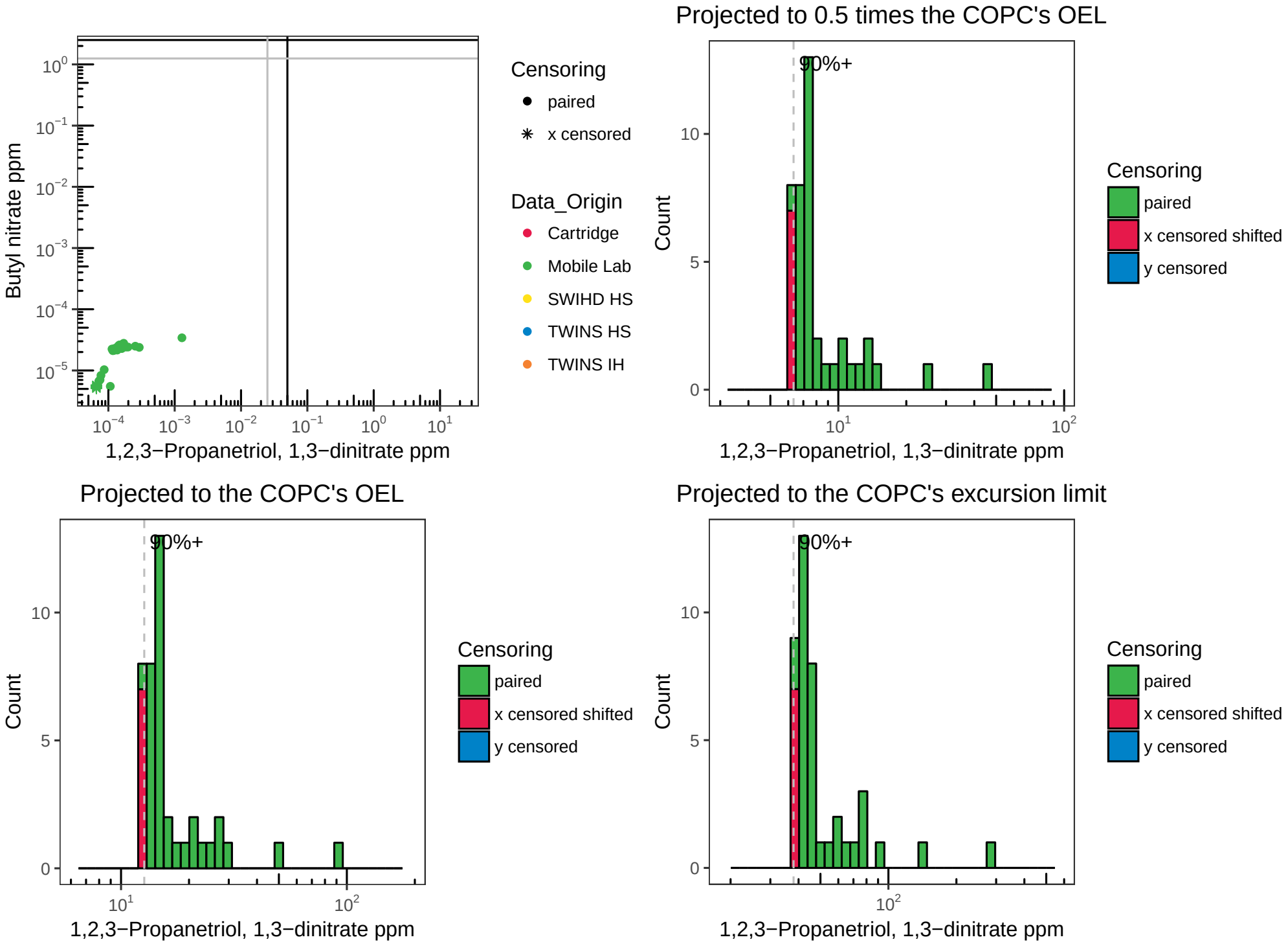


Figure C.2818: Butyl nitrate vs 1,2,3-Propanetriol, 1,3-dinitrate

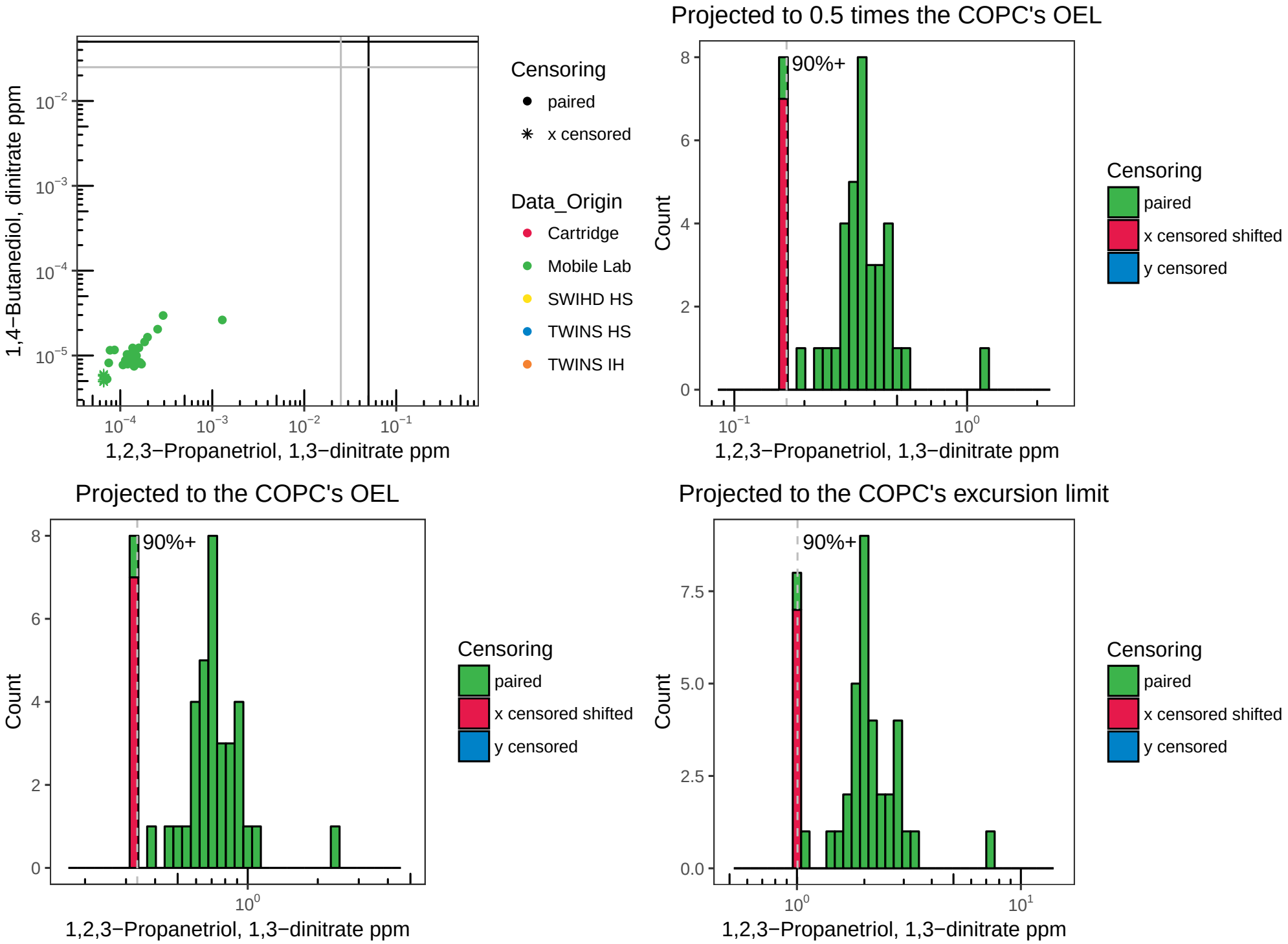


Figure C.2819: 1,4-Butanediol, dinitrate vs 1,2,3-Propanetriol, 1,3-dinitrate

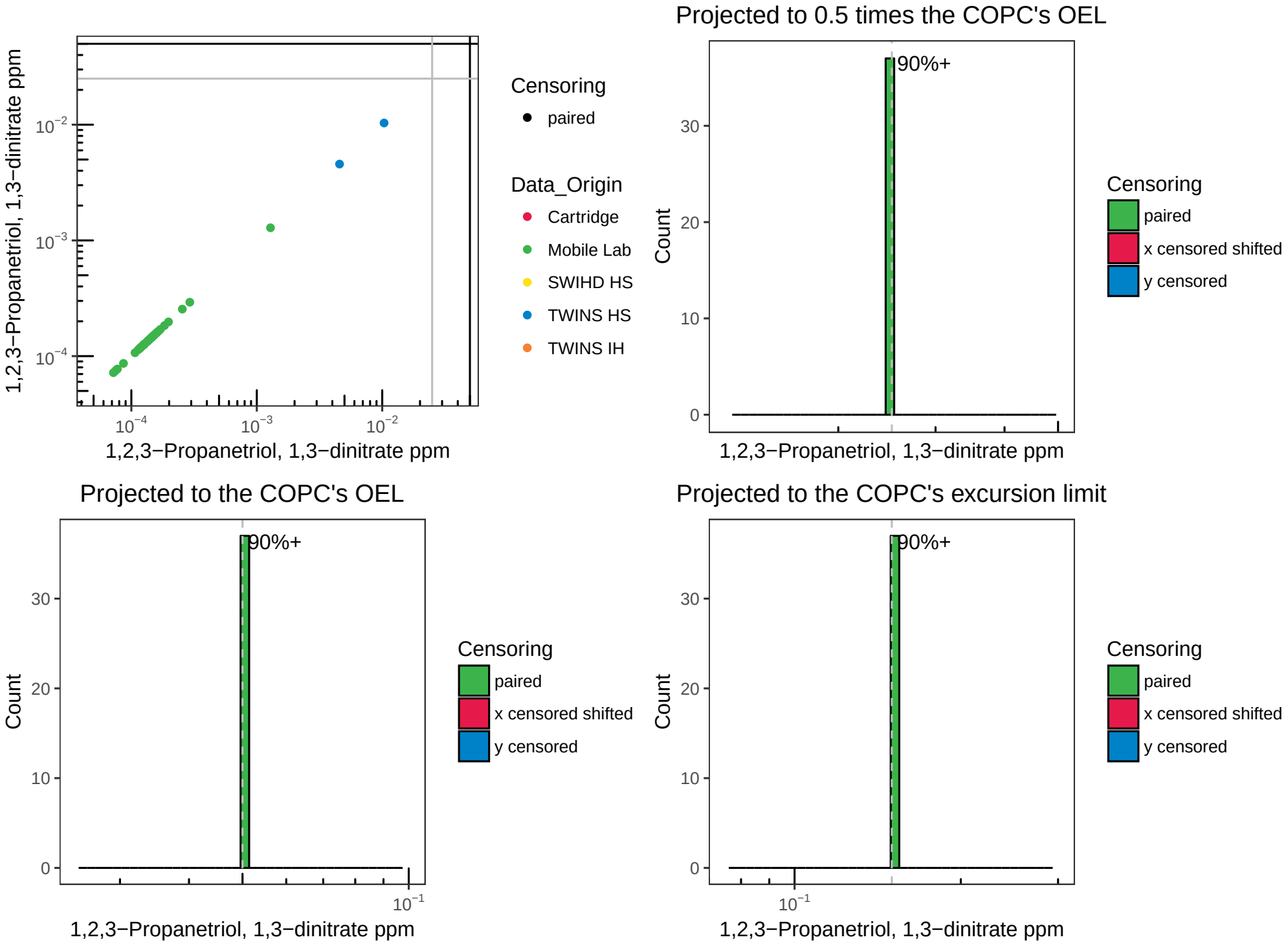


Figure C.2820: 1,2,3-Propanetriol, 1,3-dinitrate vs 1,2,3-Propanetriol, 1,3-dinitrate

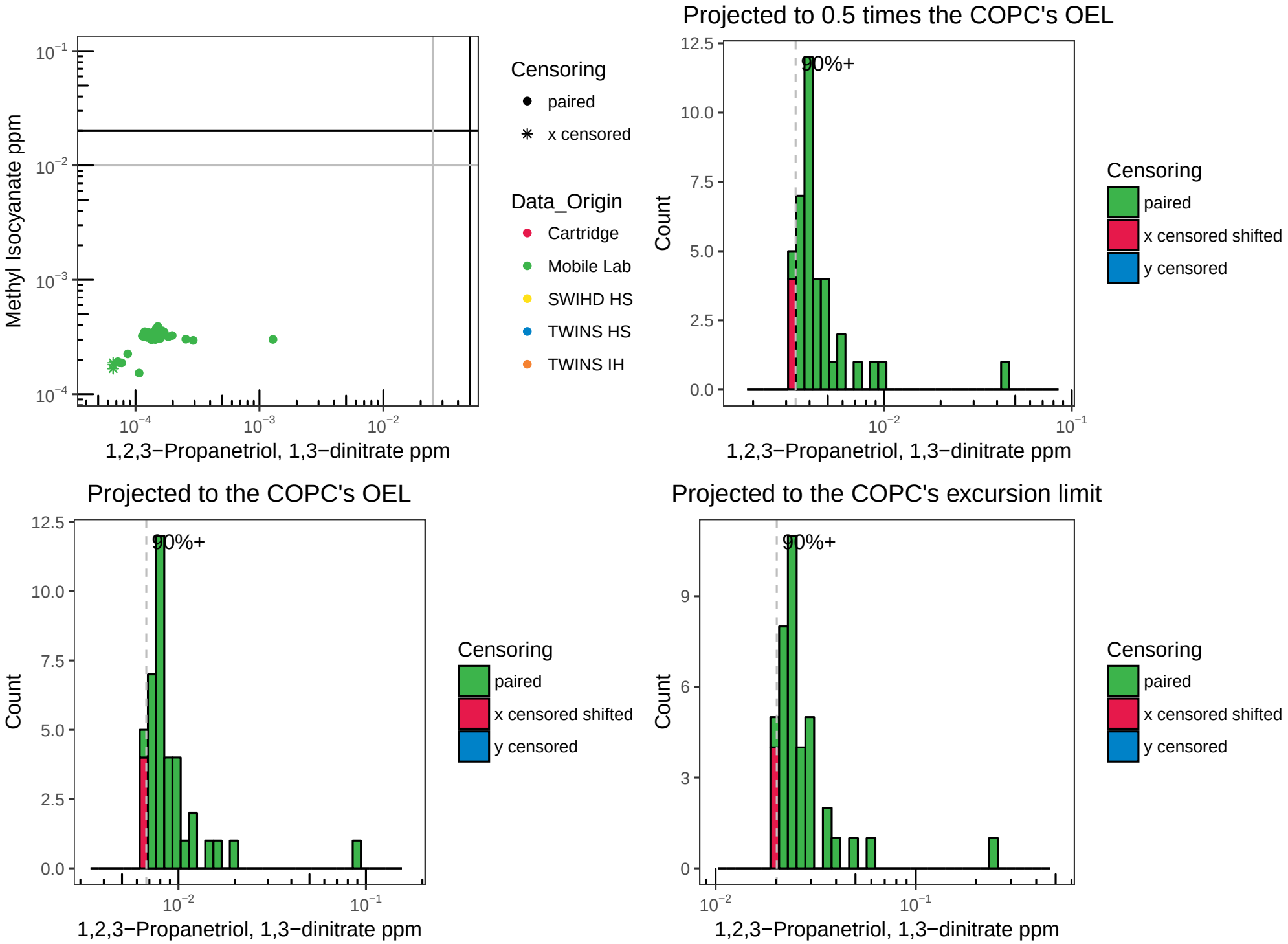


Figure C.2821: Methyl Isocyanate vs 1,2,3-Propanetriol, 1,3-dinitrate

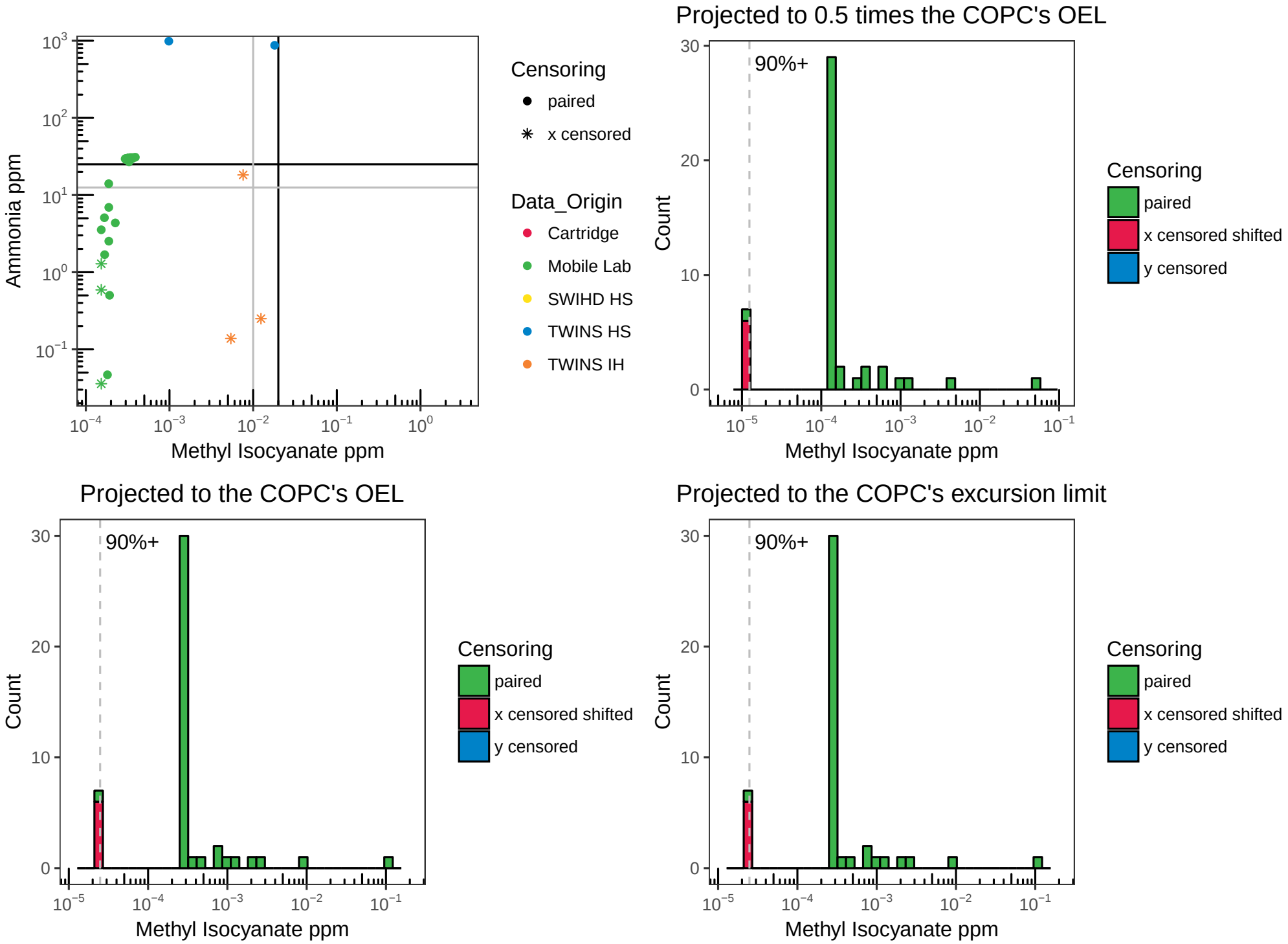


Figure C.2822: Ammonia vs Methyl Isocyanate

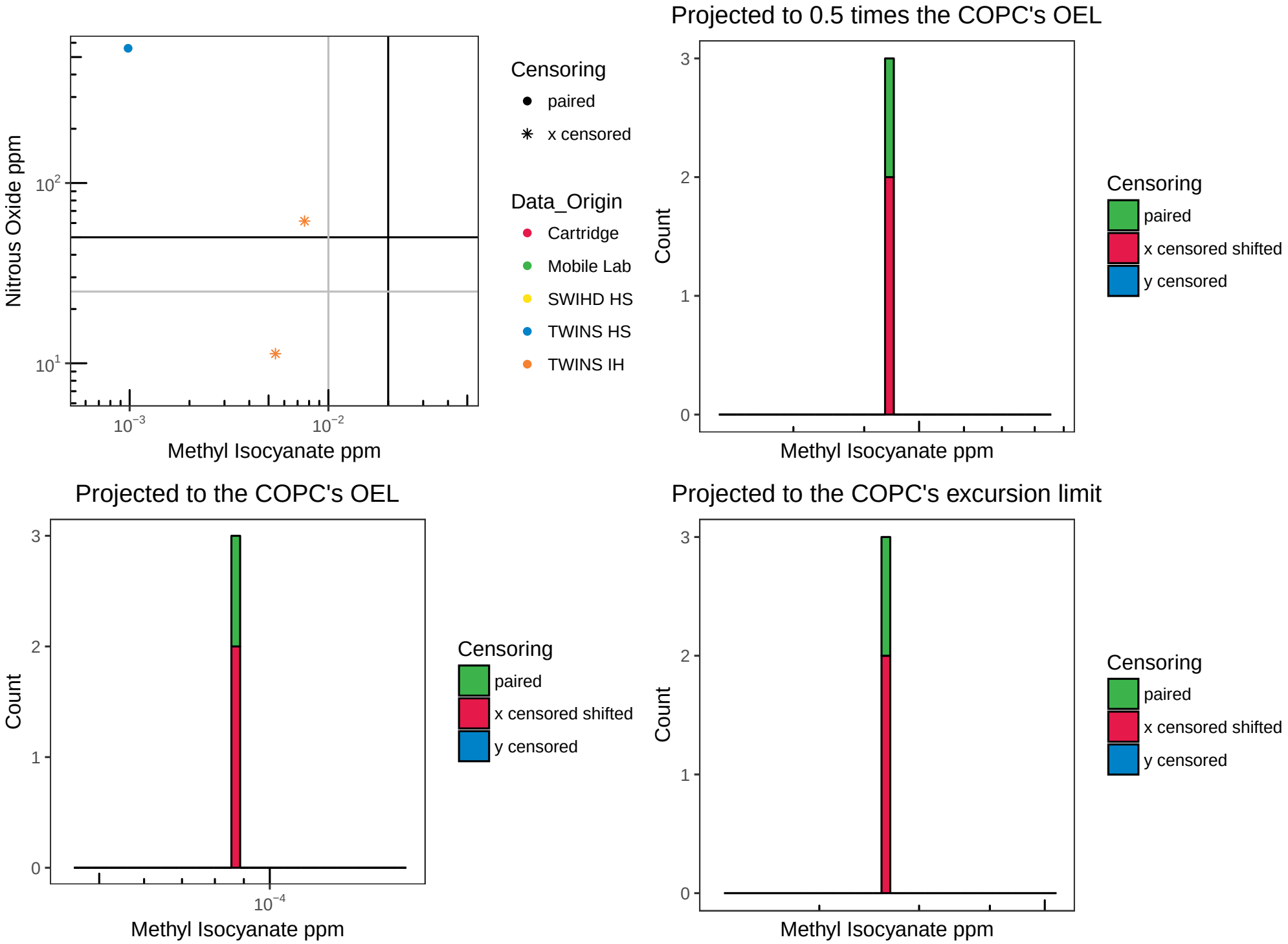


Figure C.2823: Nitrous Oxide vs Methyl Isocyanate

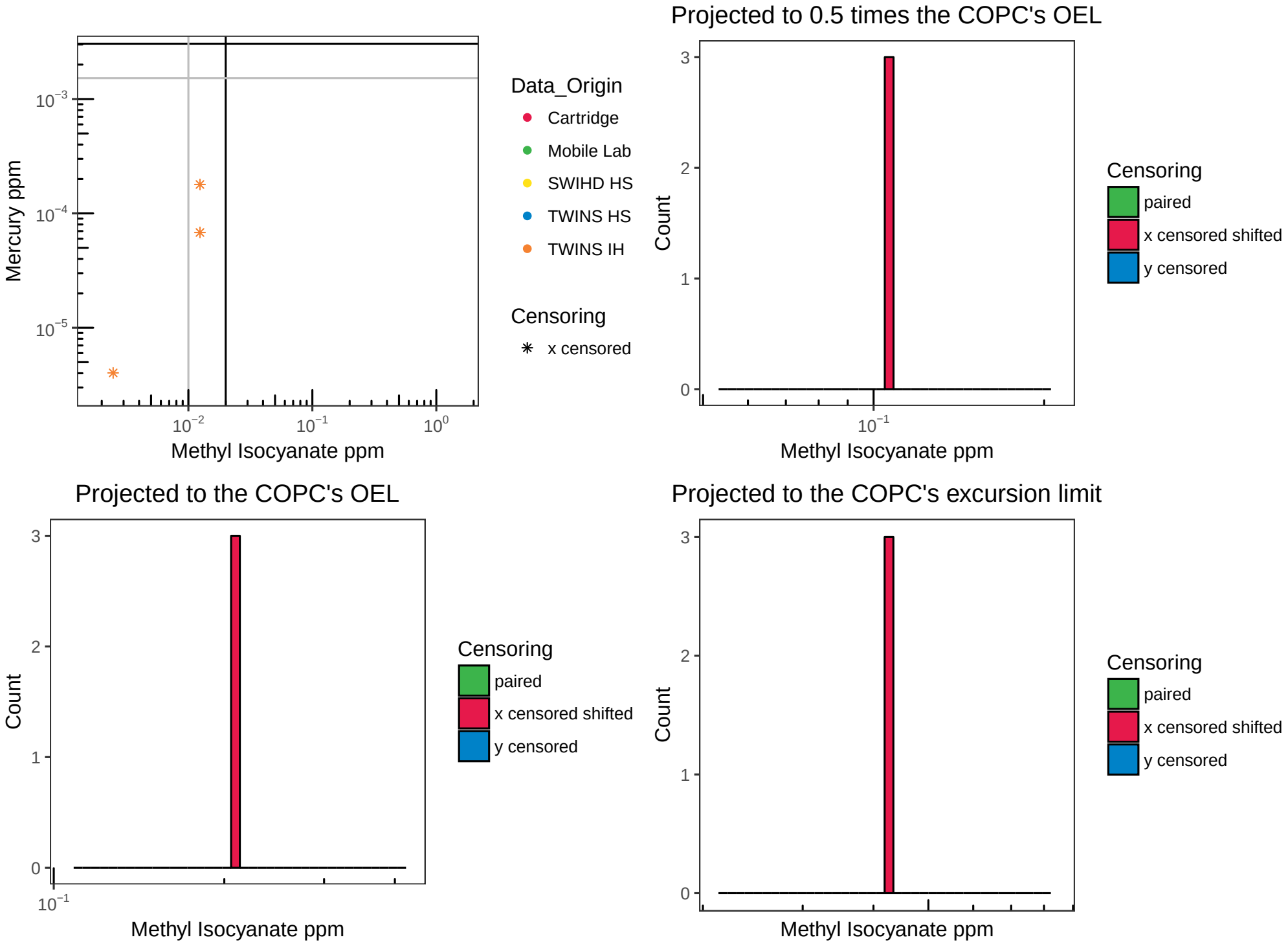


Figure C.2824: Mercury vs Methyl Isocyanate

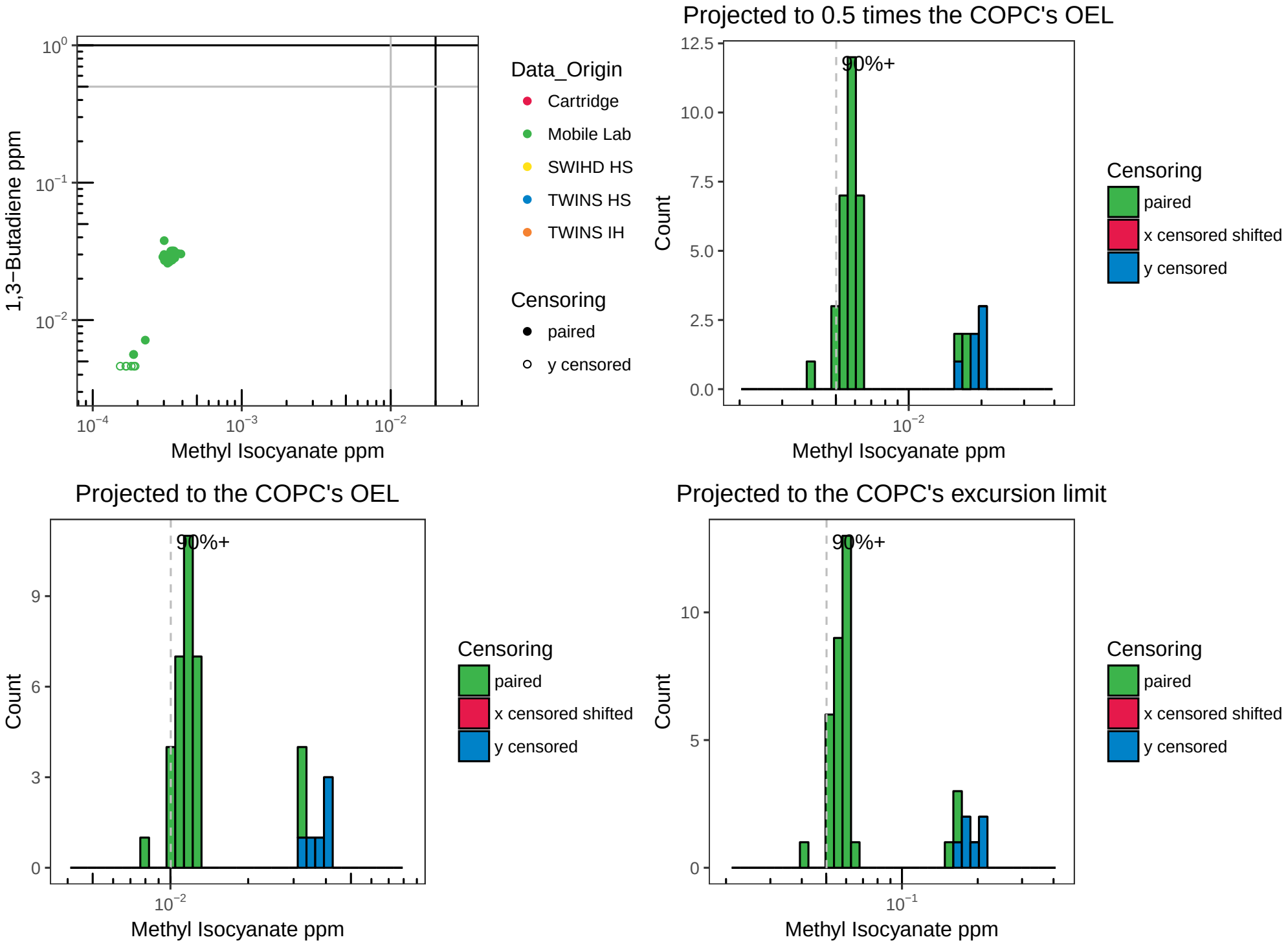


Figure C.2825: 1,3-Butadiene vs Methyl Isocyanate

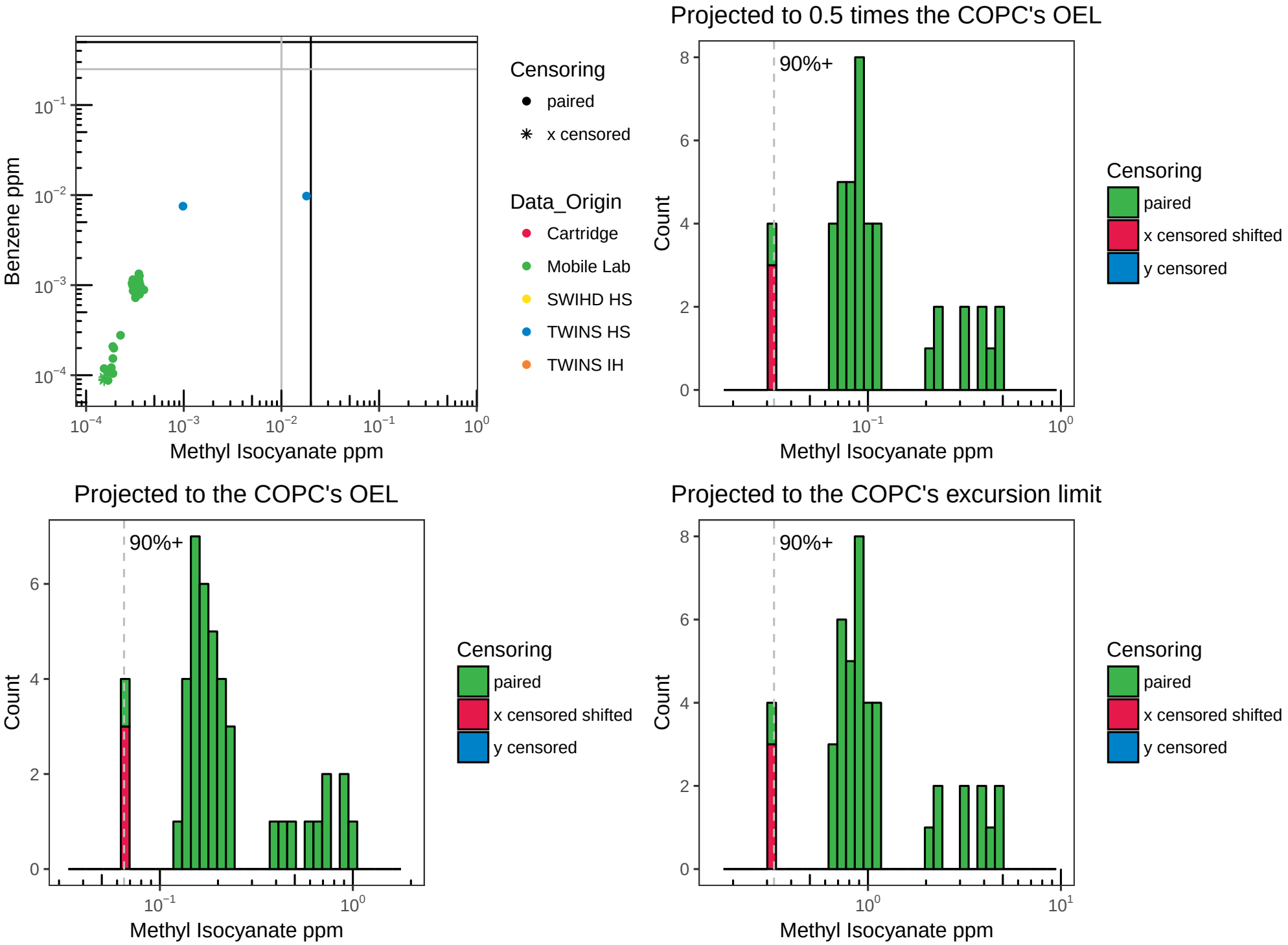


Figure C.2826: Benzene vs Methyl Isocyanate

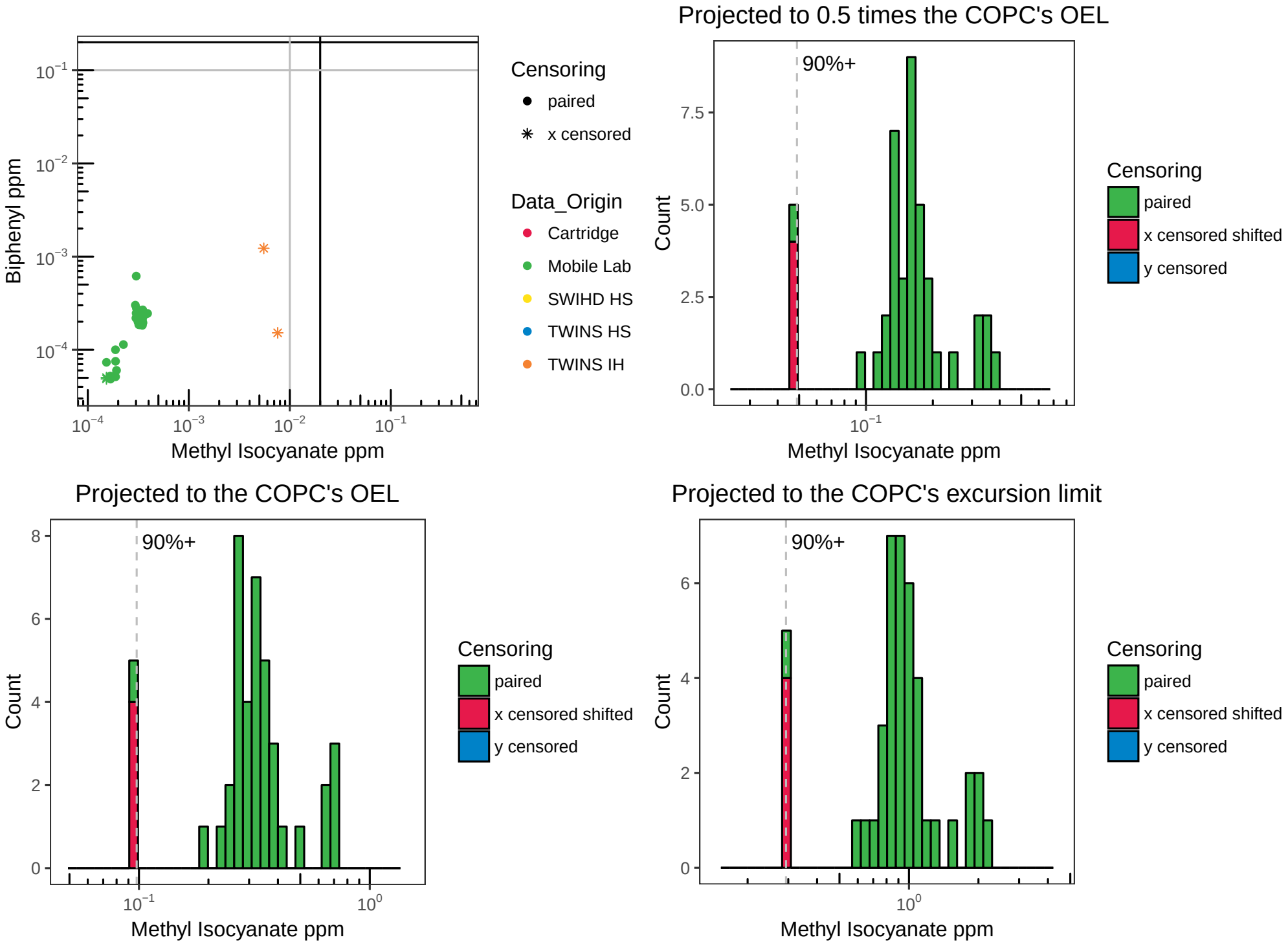


Figure C.2827: Biphenyl vs Methyl Isocyanate

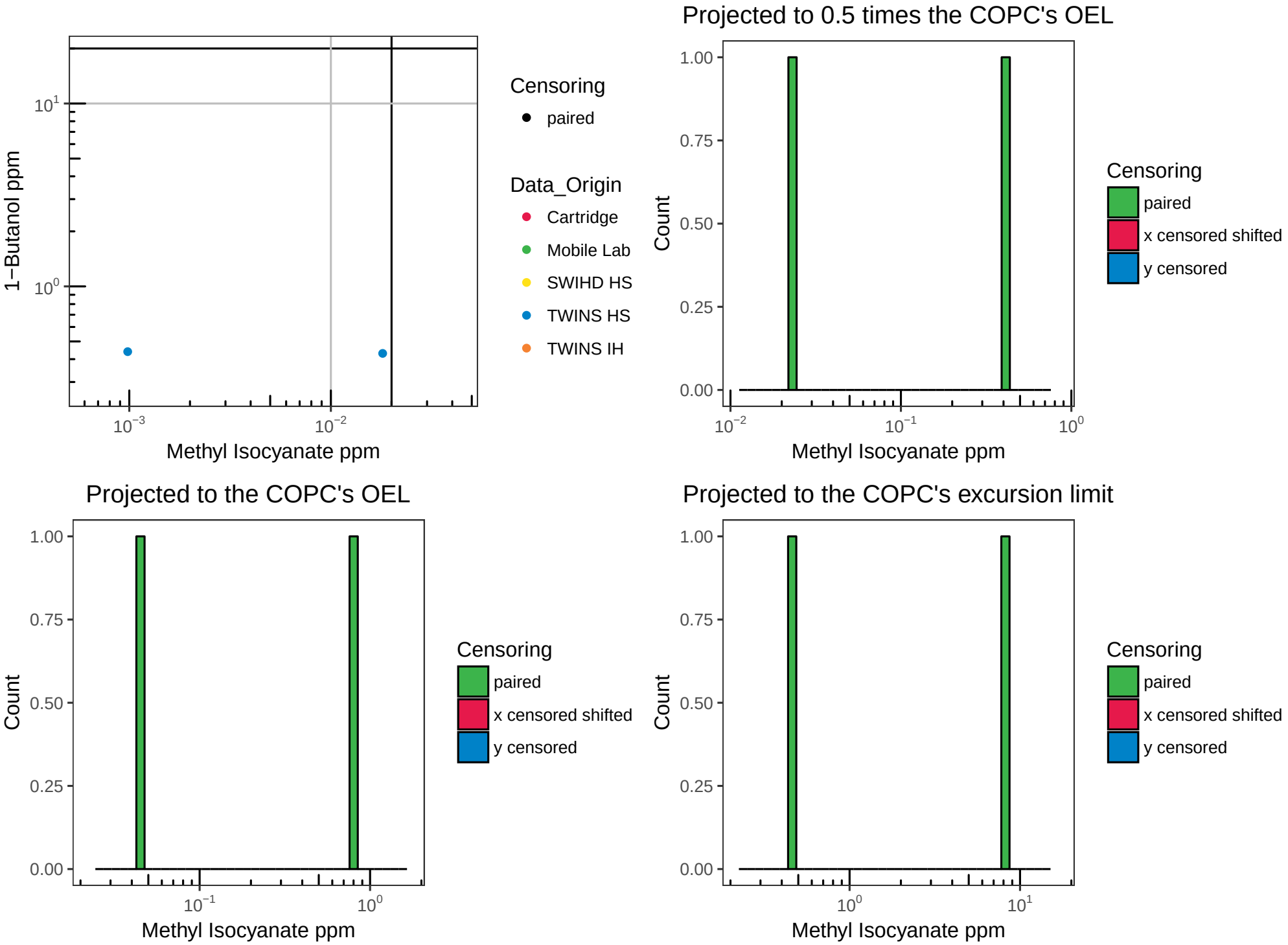


Figure C.2828: 1-Butanol vs Methyl Isocyanate

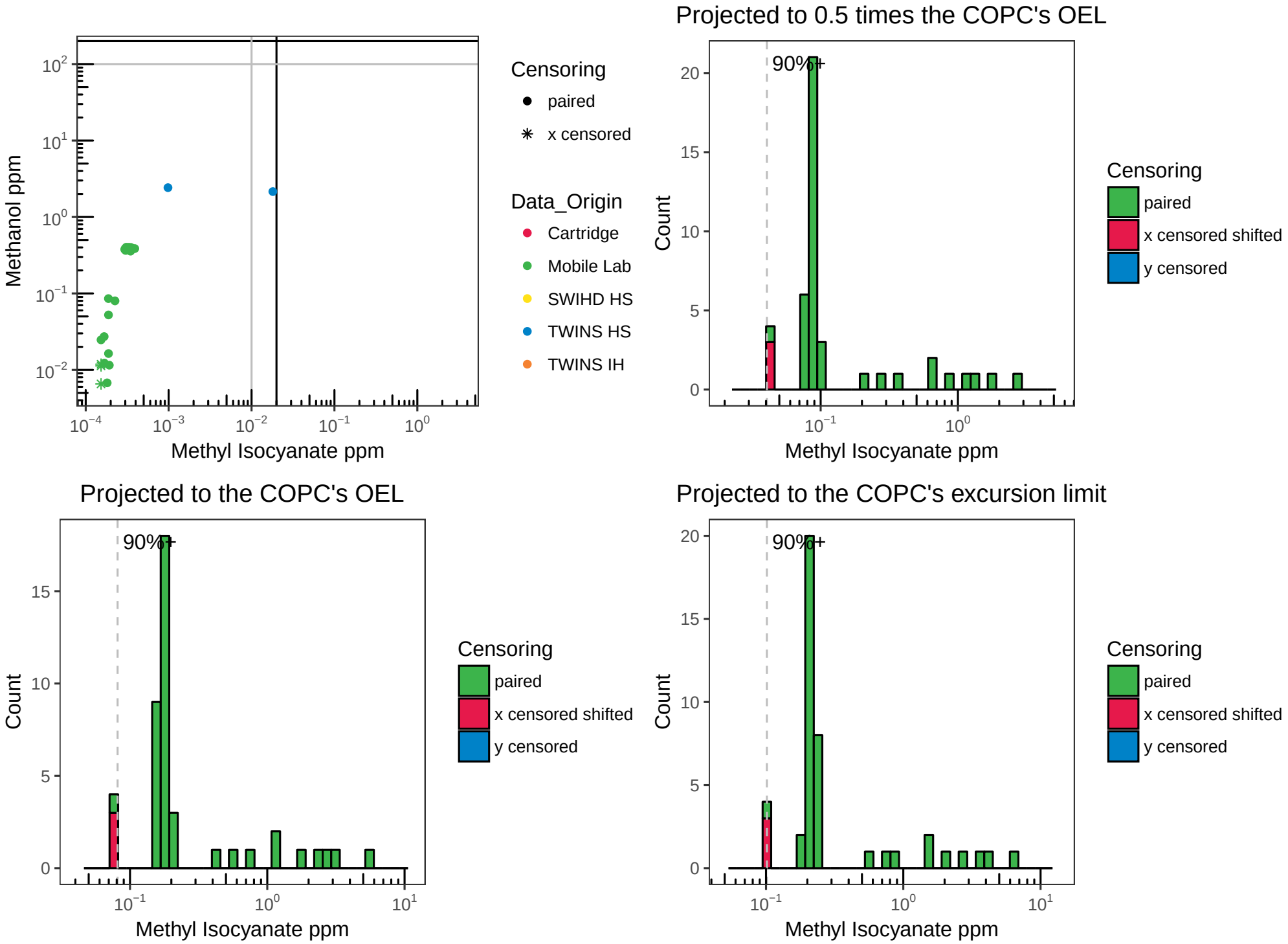


Figure C.2829: Methanol vs Methyl Isocyanate

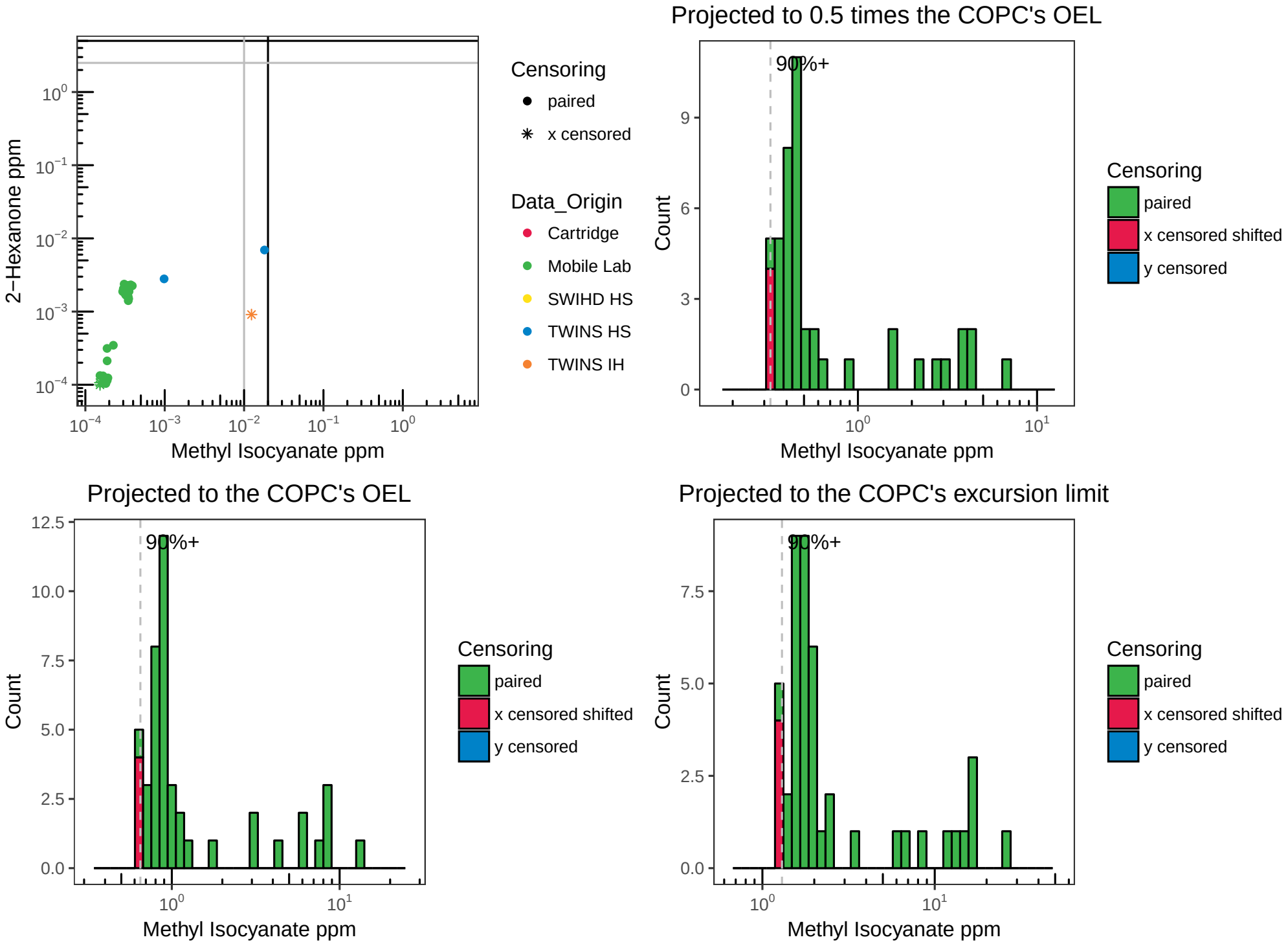


Figure C.2830: 2-Hexanone vs Methyl Isocyanate

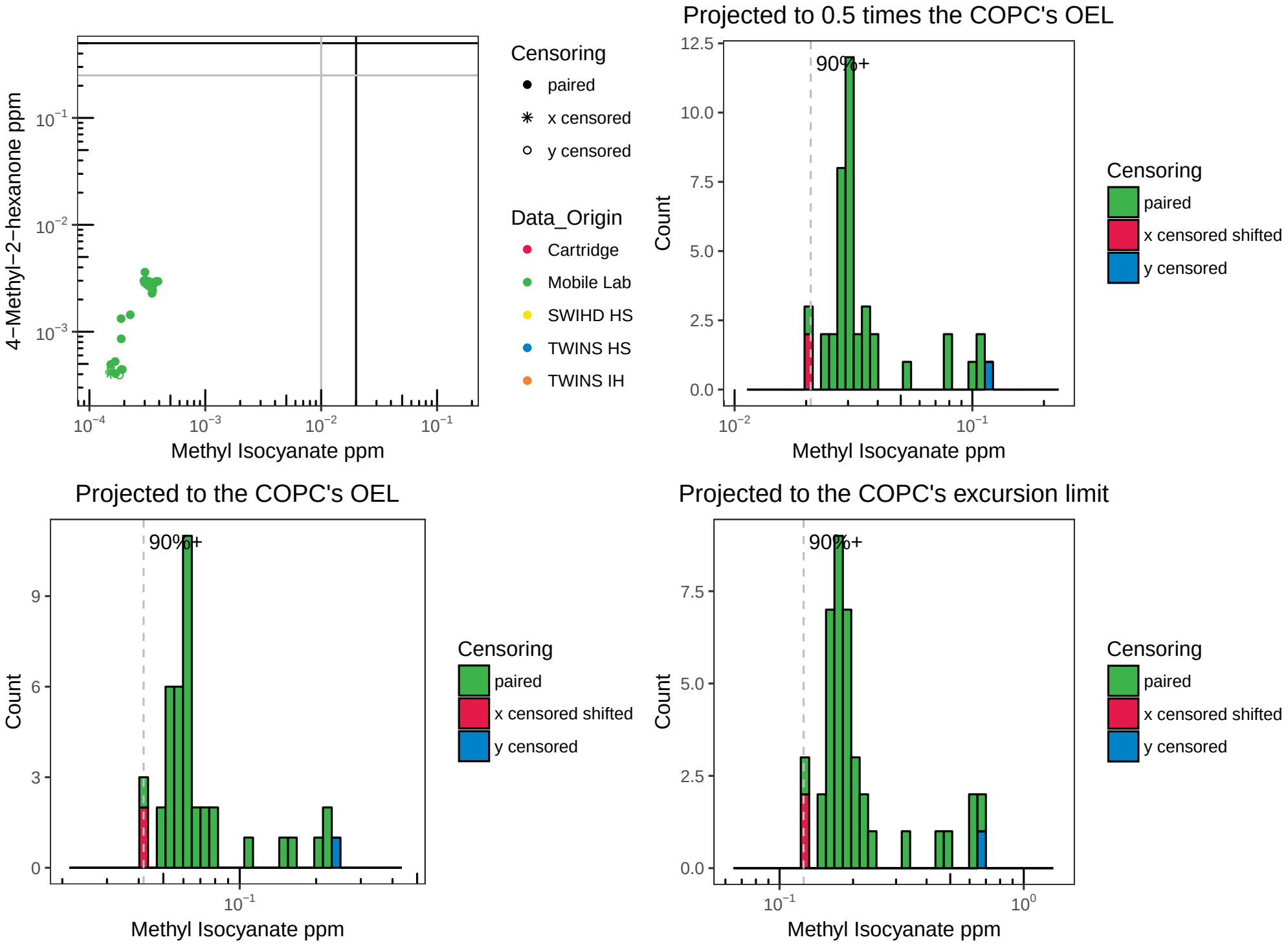


Figure C.2831: 4-Methyl-2-hexanone vs Methyl Isocyanate

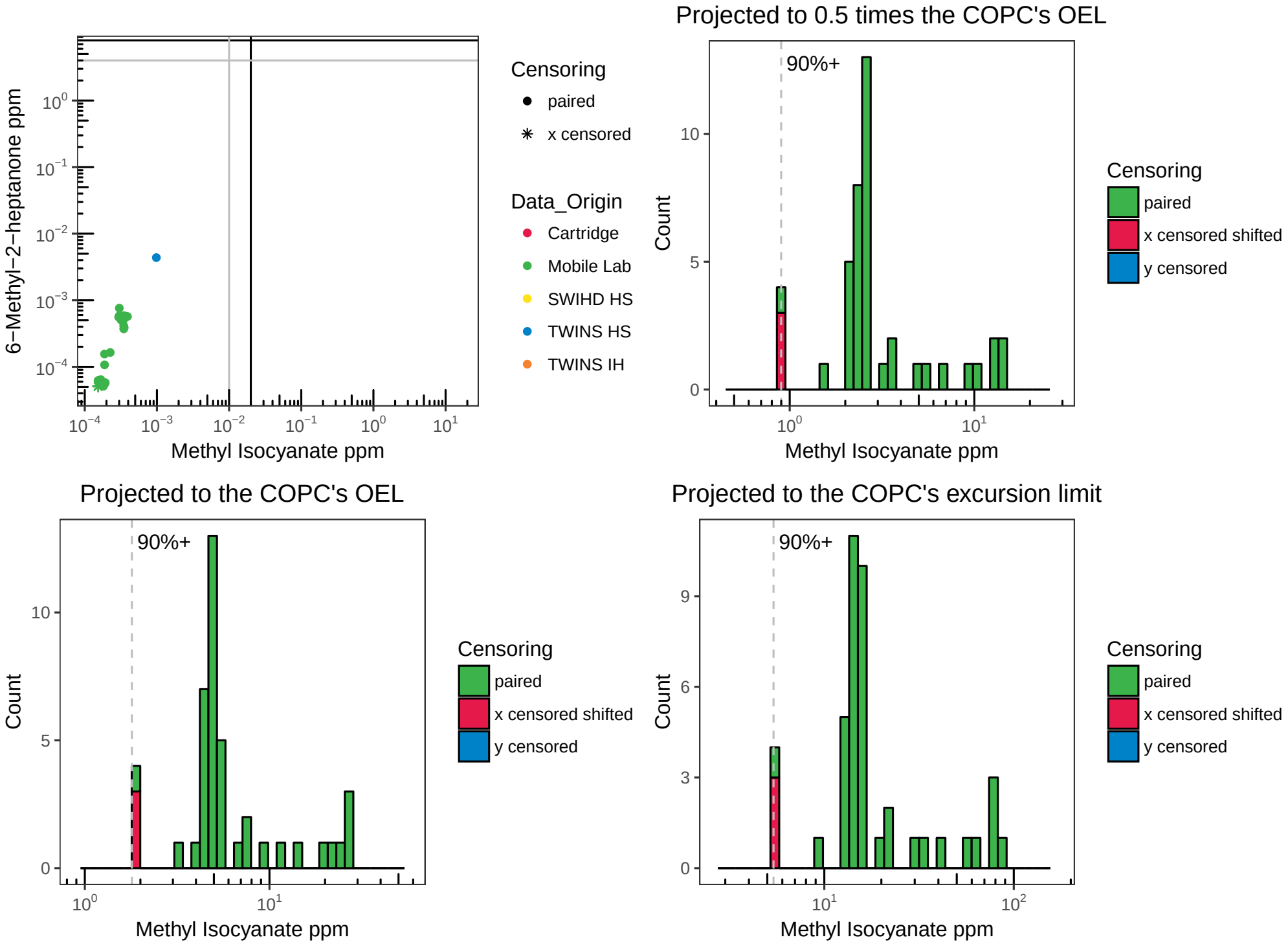


Figure C.2832: 6-Methyl-2-heptanone vs Methyl Isocyanate

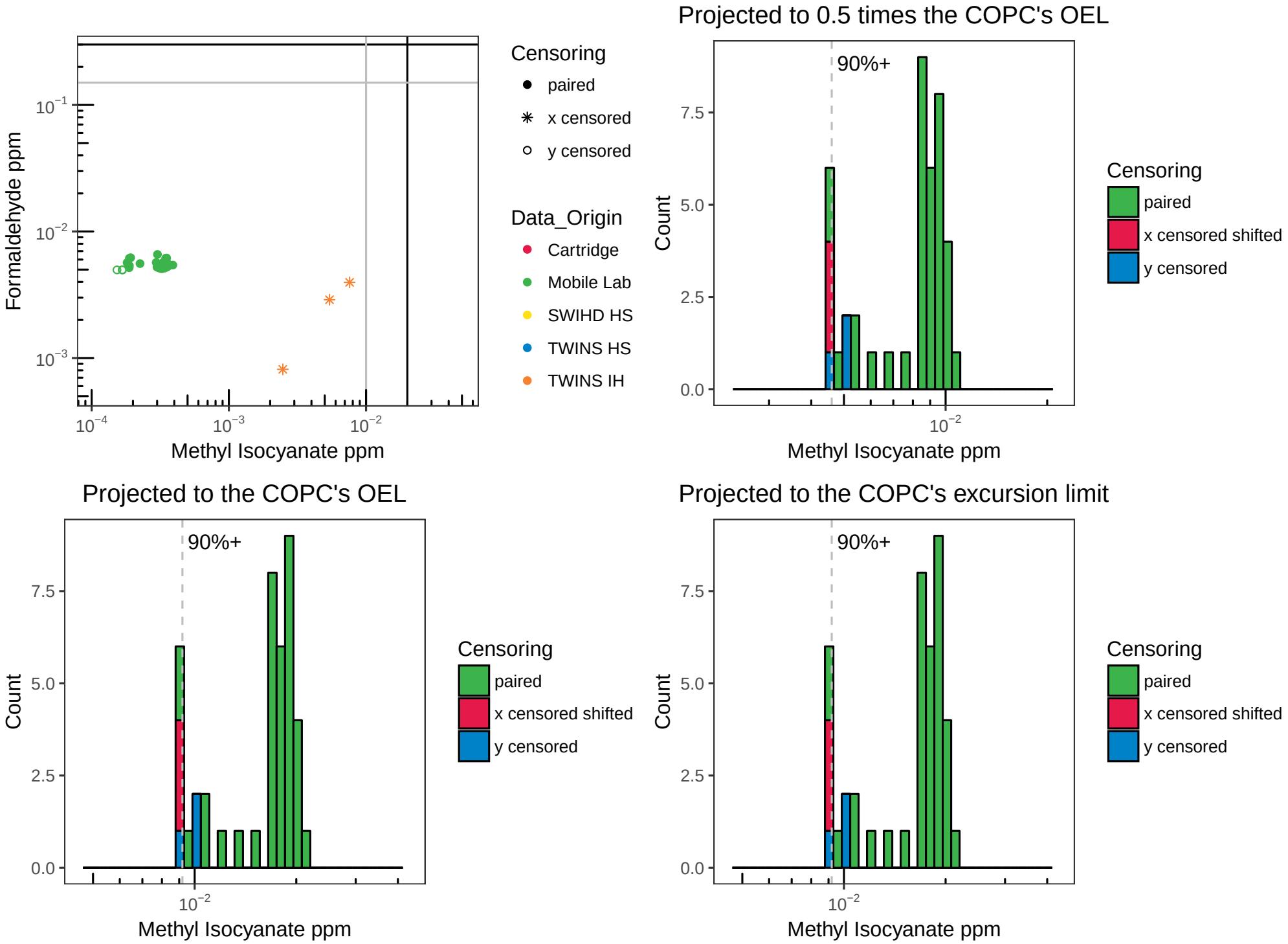


Figure C.2833: Formaldehyde vs Methyl Isocyanate

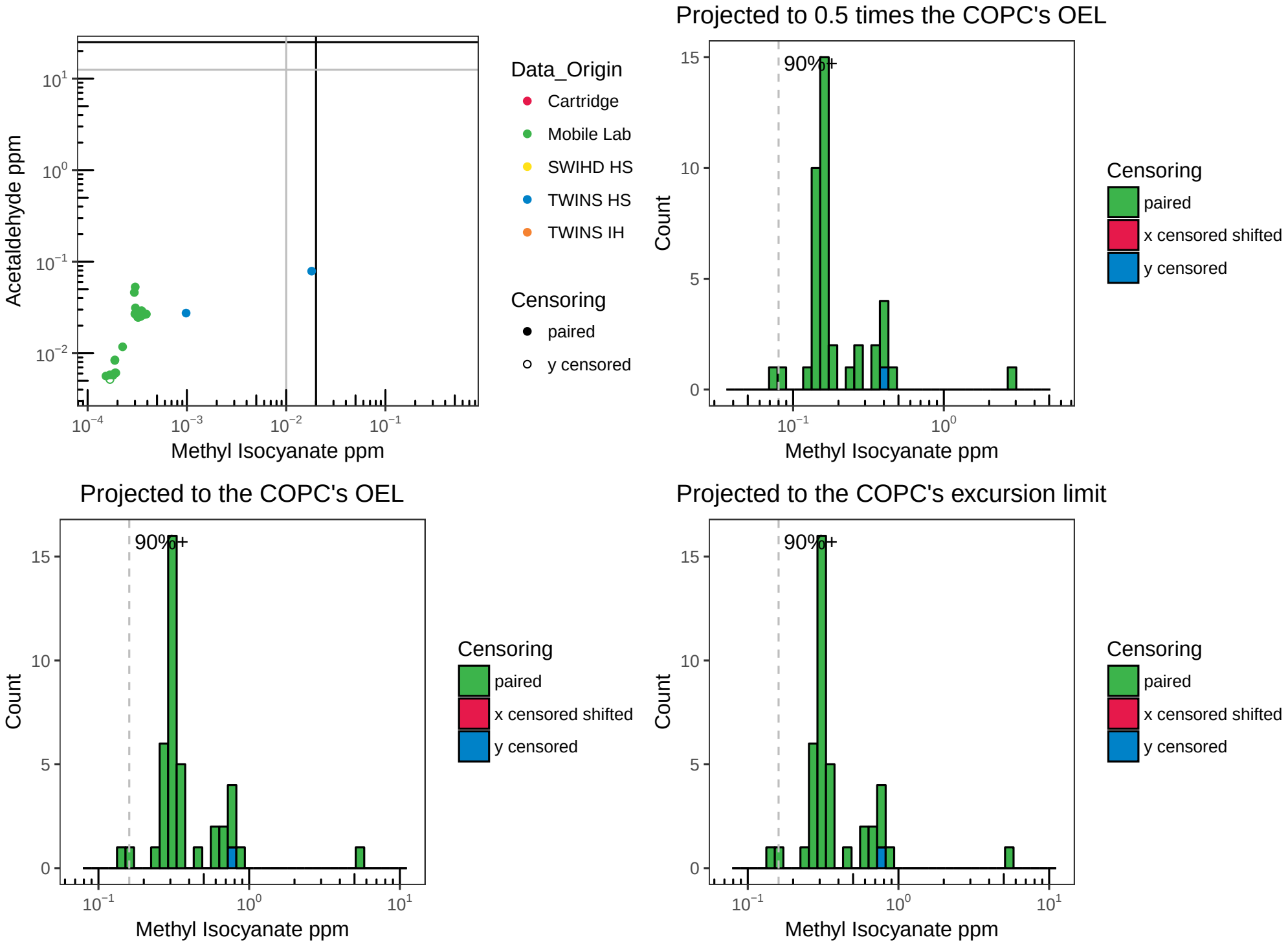


Figure C.2834: Acetaldehyde vs Methyl Isocyanate

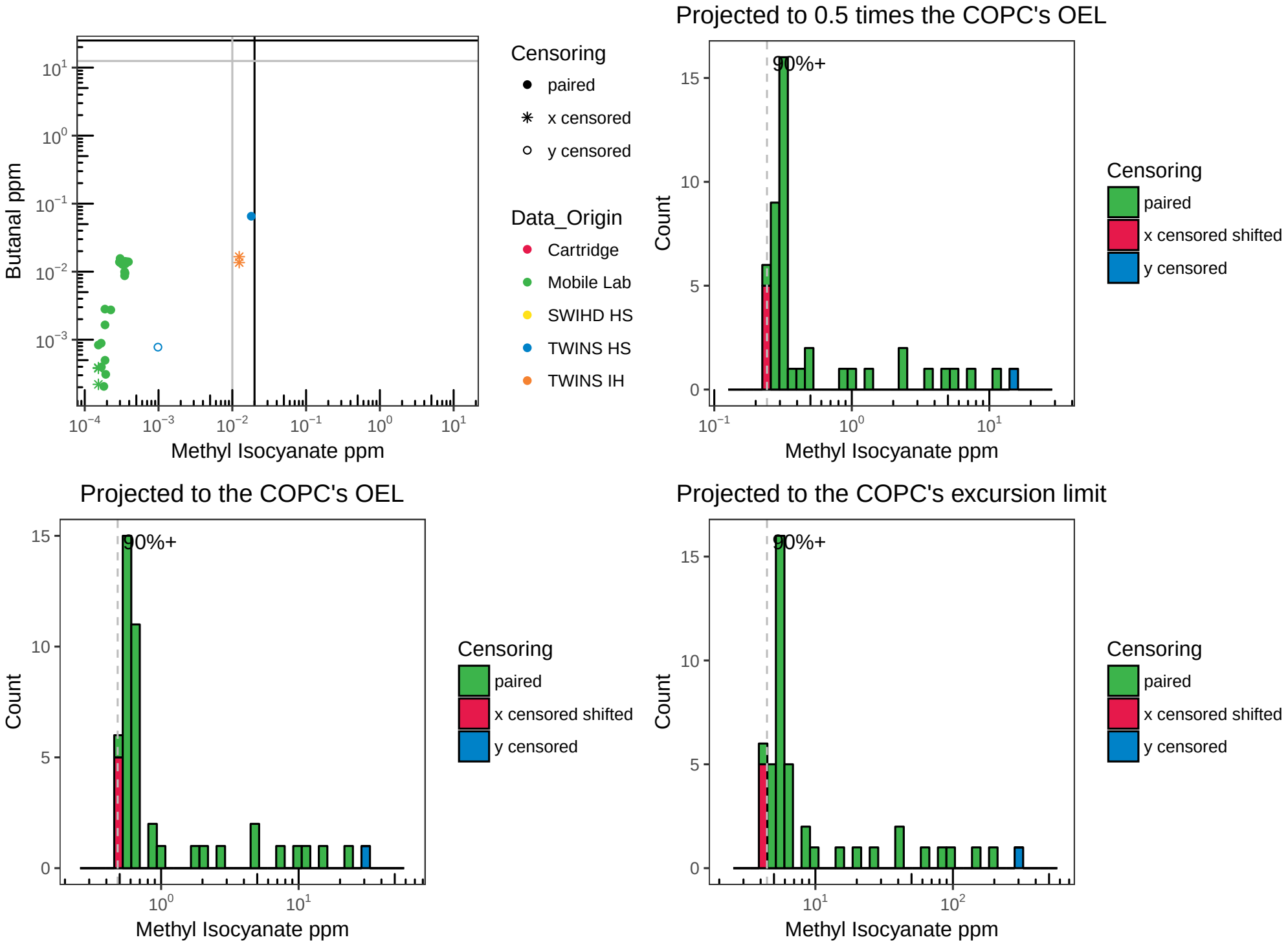


Figure C.2835: Butanal vs Methyl Isocyanate

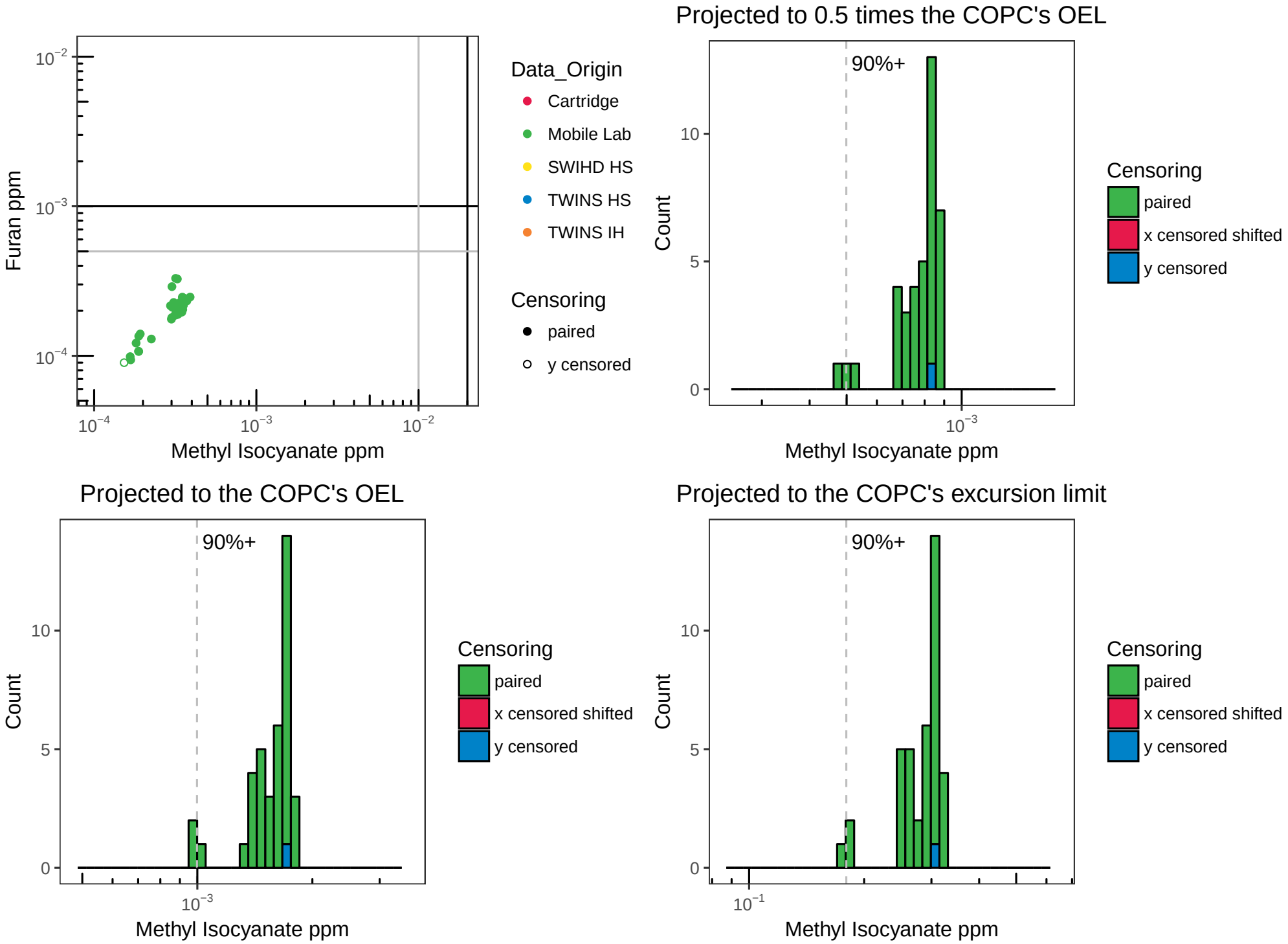


Figure C.2836: Furan vs Methyl Isocyanate

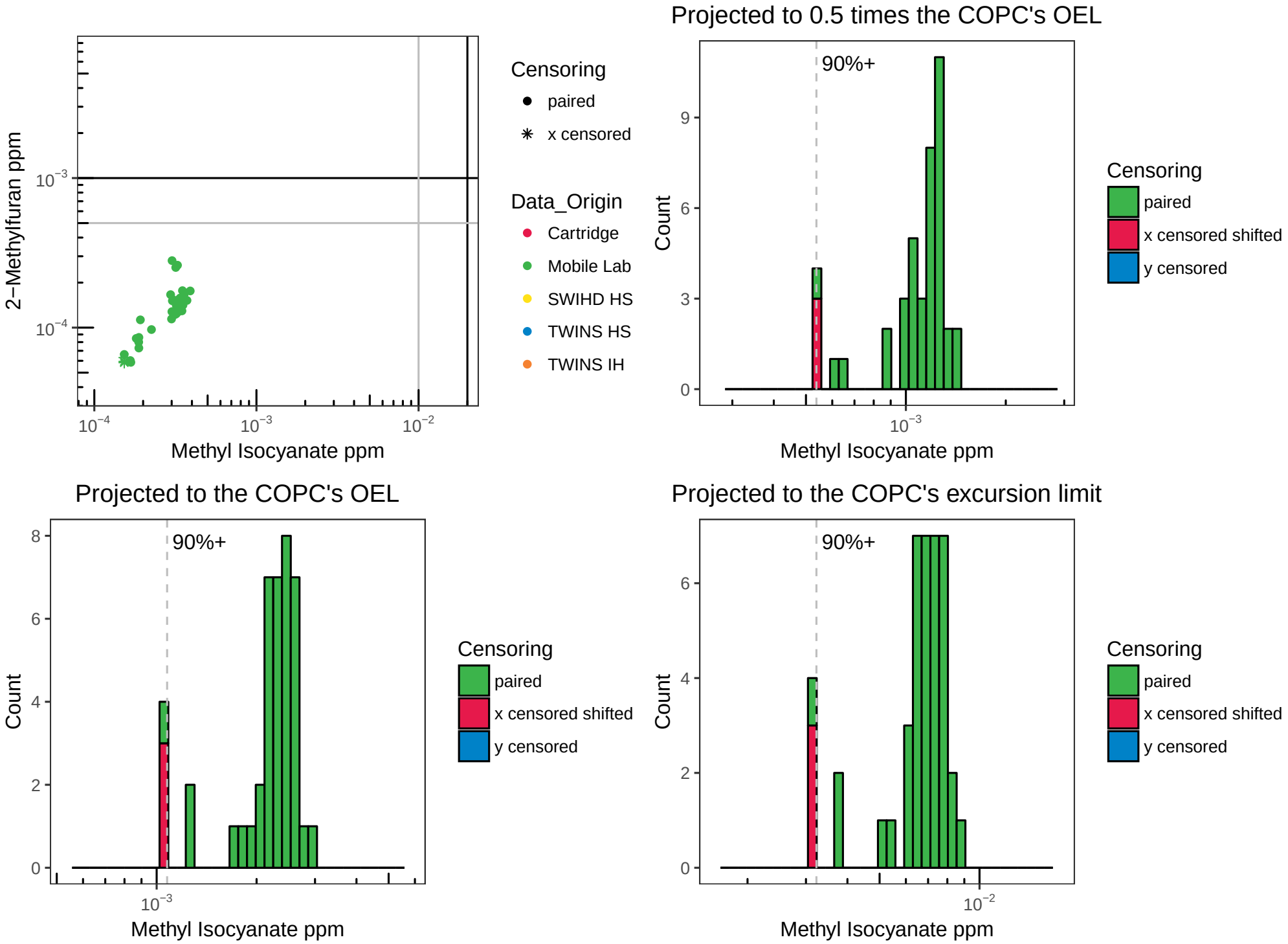


Figure C.2837: 2-Methylfuran vs Methyl Isocyanate

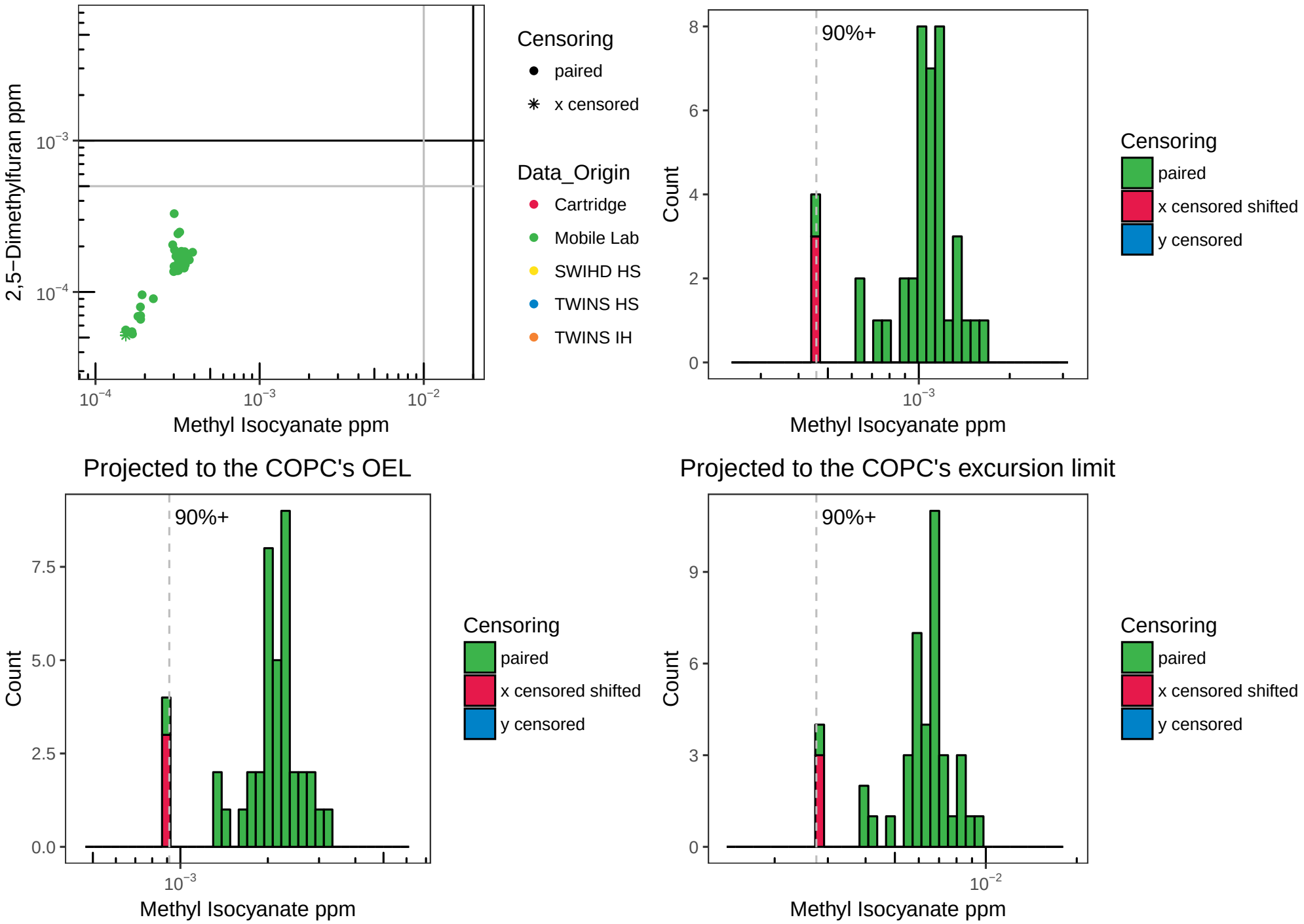


Figure C.2838: 2,5-Dimethylfuran vs Methyl Isocyanate

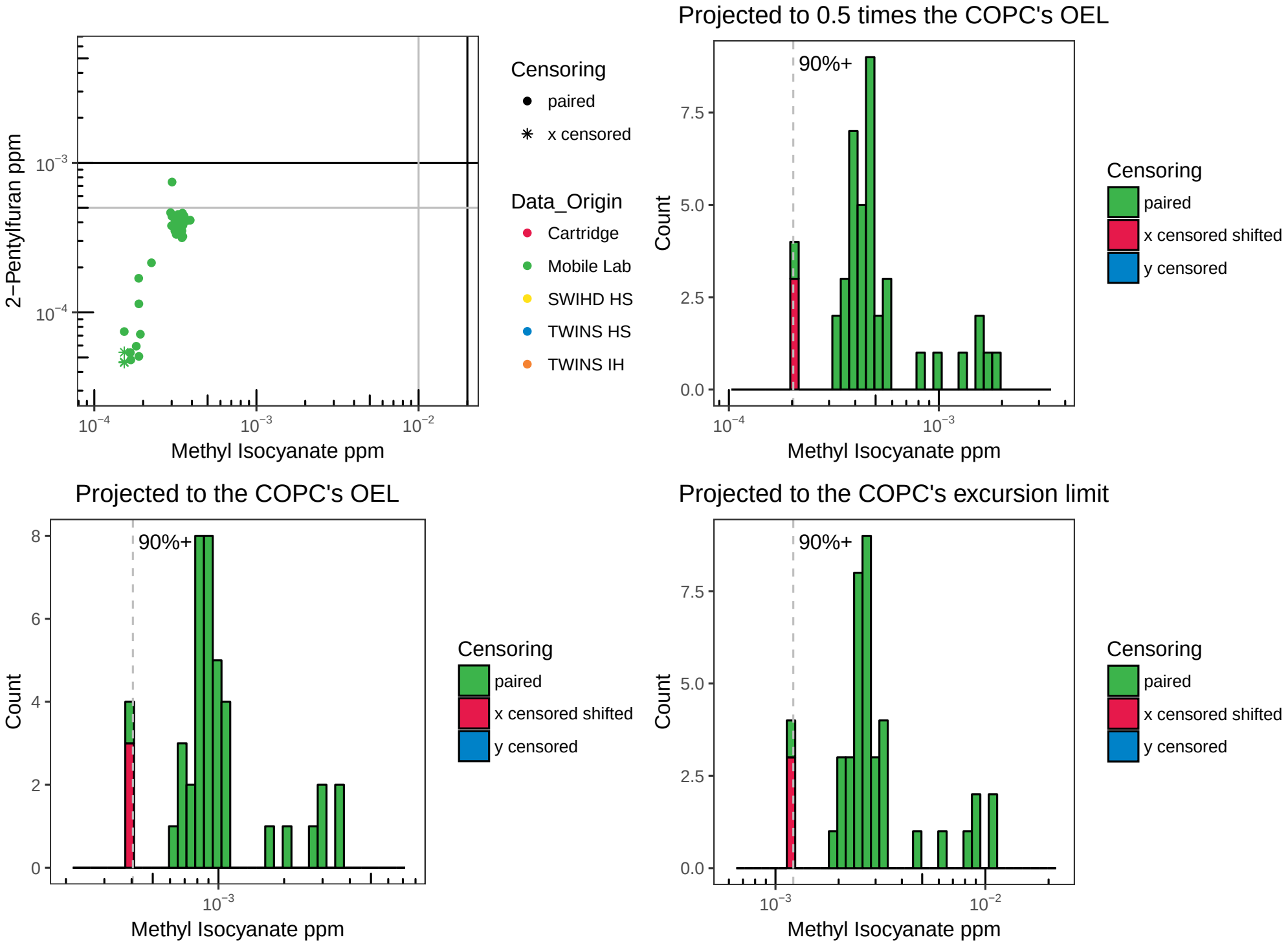


Figure C.2839: 2-Pentylfuran vs Methyl Isocyanate

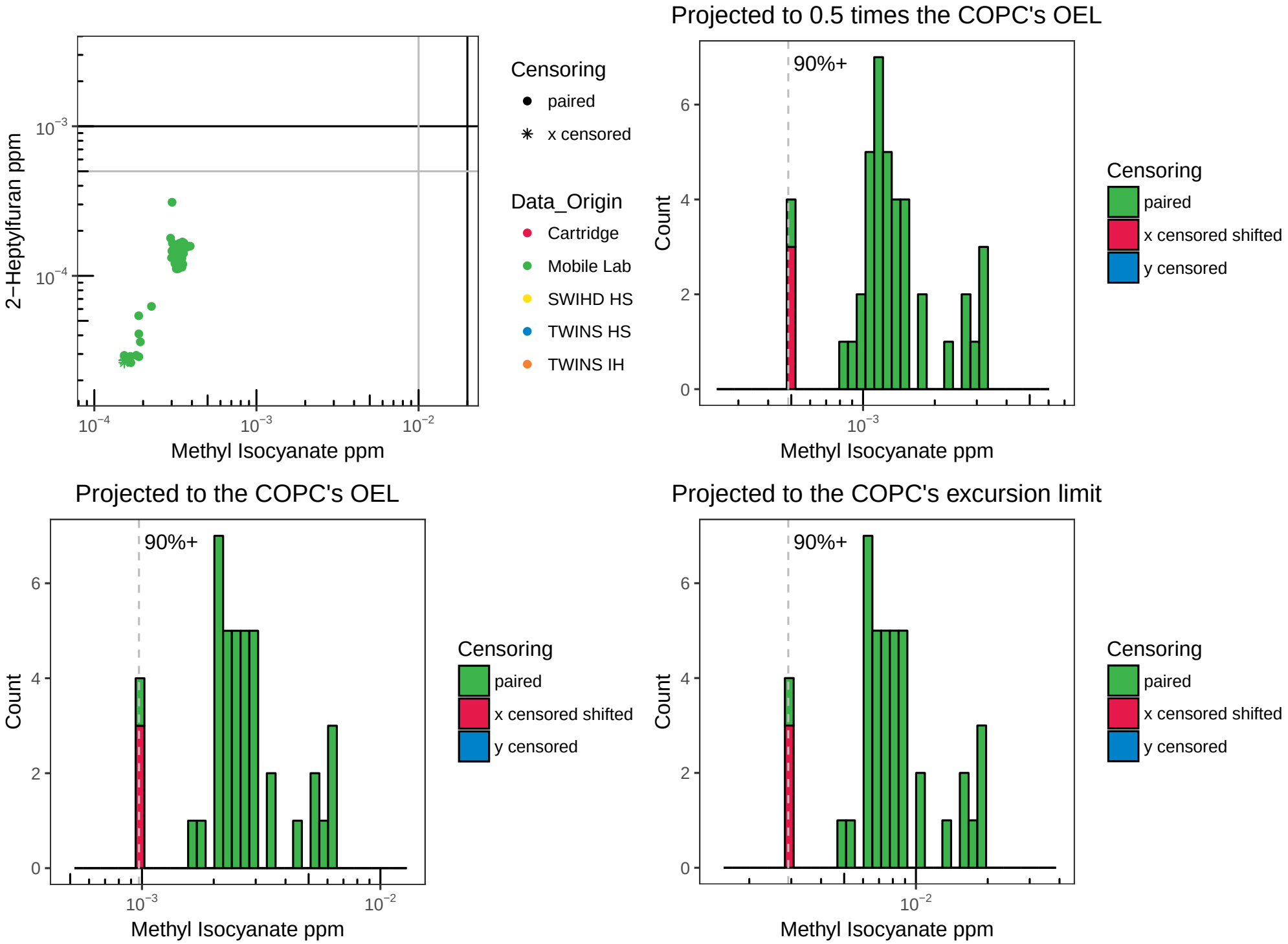


Figure C.2840: 2-Heptylfuran vs Methyl Isocyanate

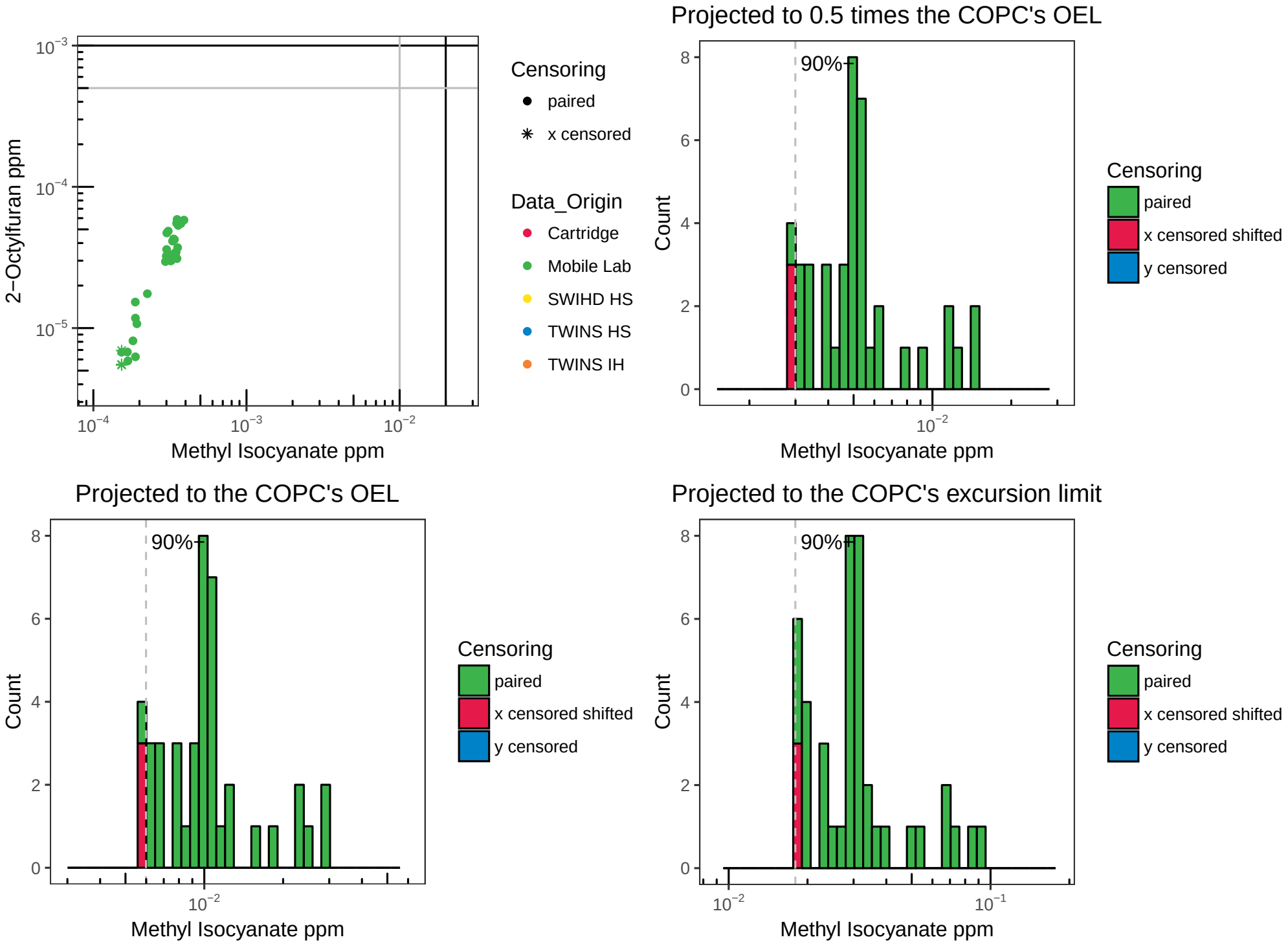


Figure C.2841: 2-Octylfuran vs Methyl Isocyanate

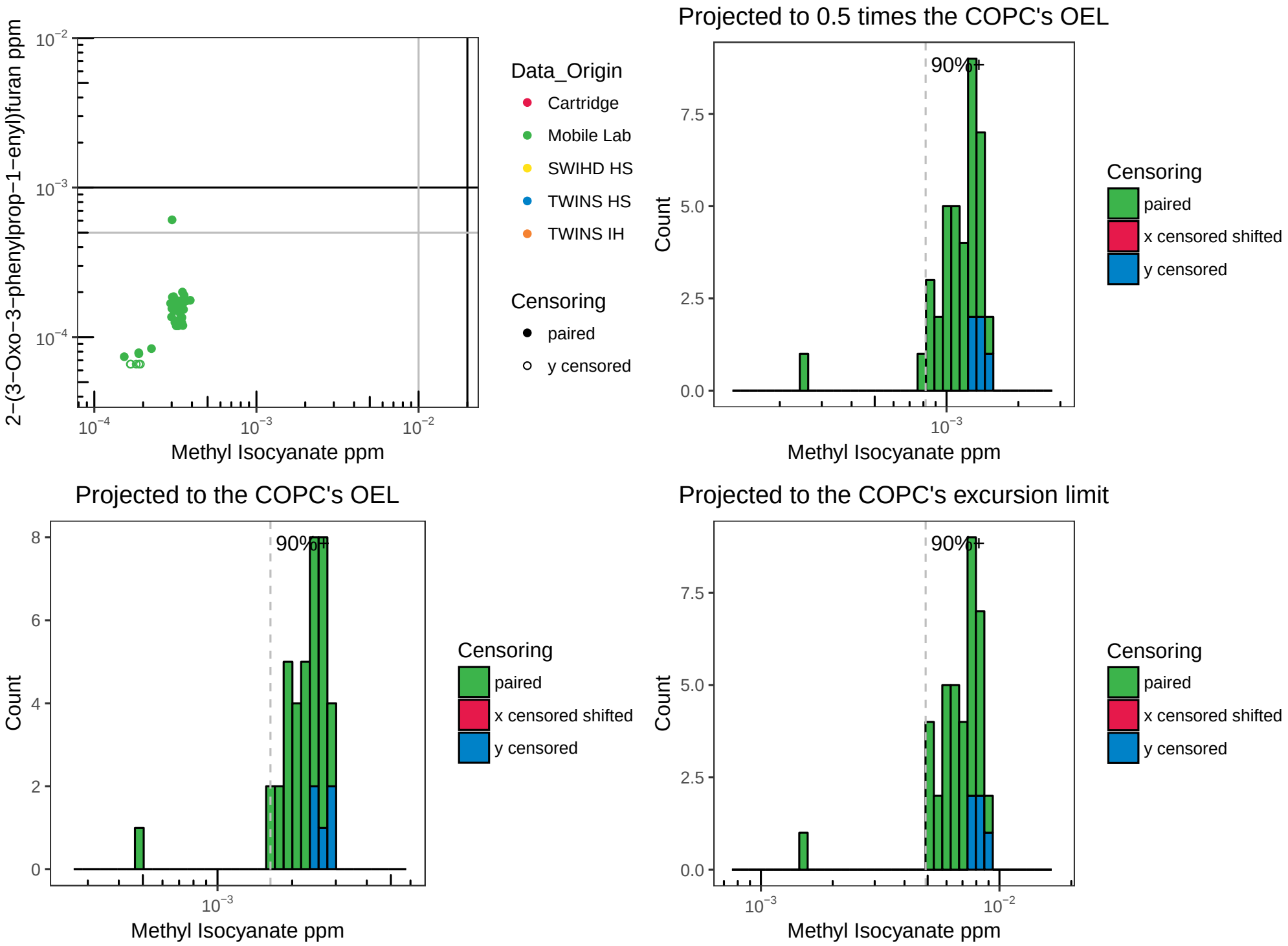


Figure C.2842: 2-(3-Oxo-3-phenylprop-1-enyl)furan vs Methyl Isocyanate

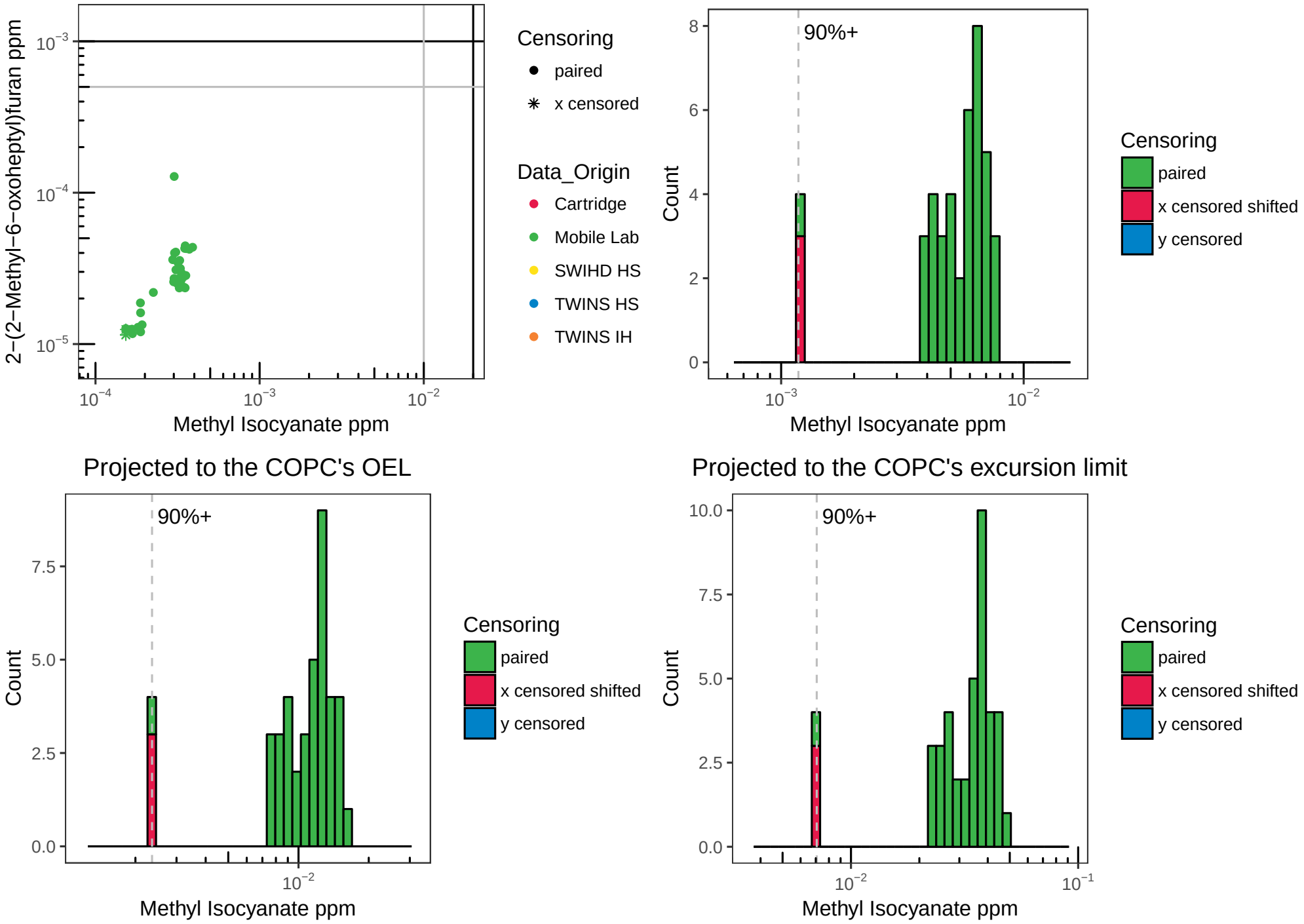


Figure C.2843: 2-(2-Methyl-6-oxoheptyl)furan vs Methyl Isocyanate

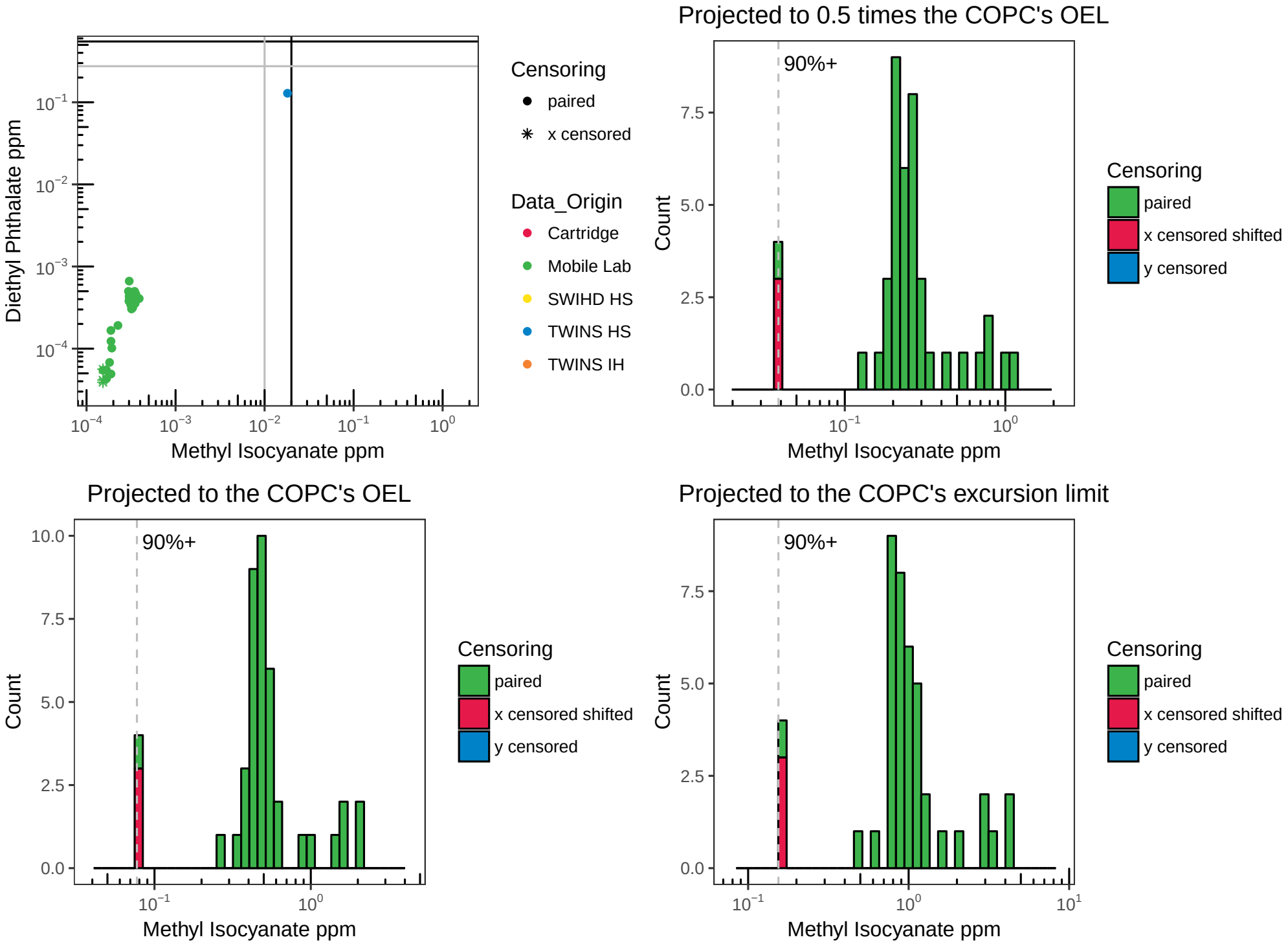


Figure C.2844: Diethyl Phthalate vs Methyl Isocyanate

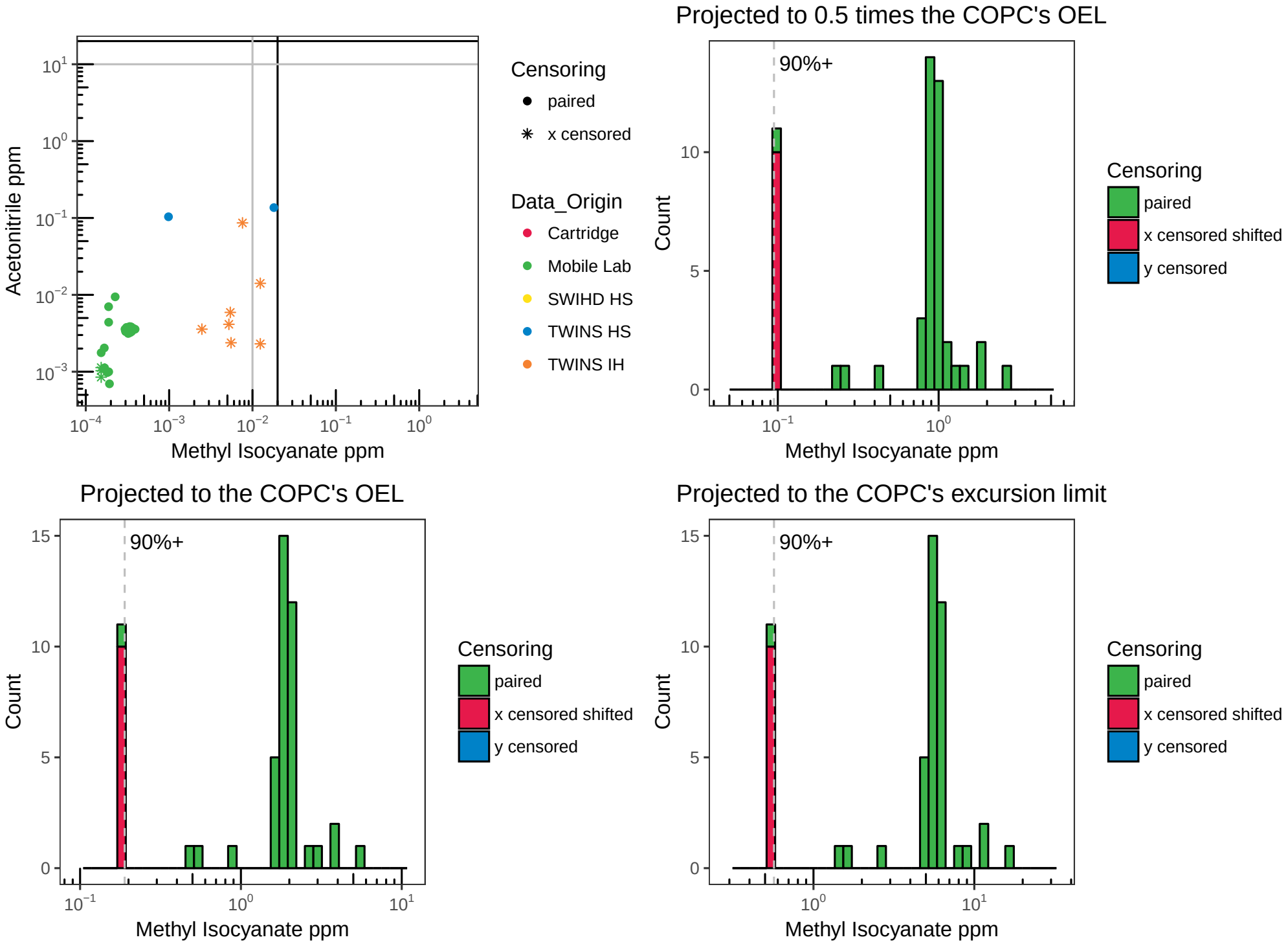


Figure C.2845: Acetonitrile vs Methyl Isocyanate

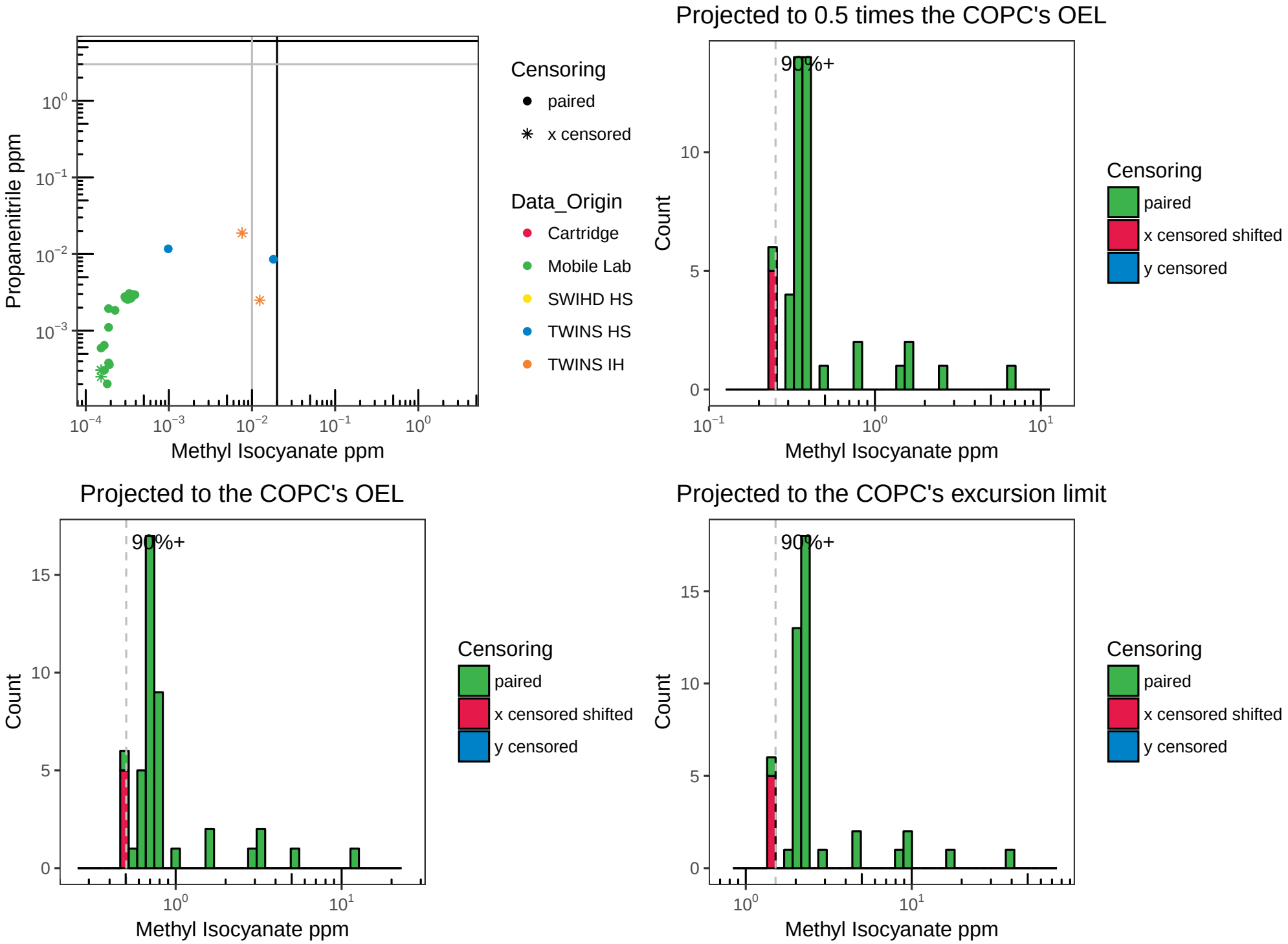


Figure C.2846: Propanenitrile vs Methyl Isocyanate

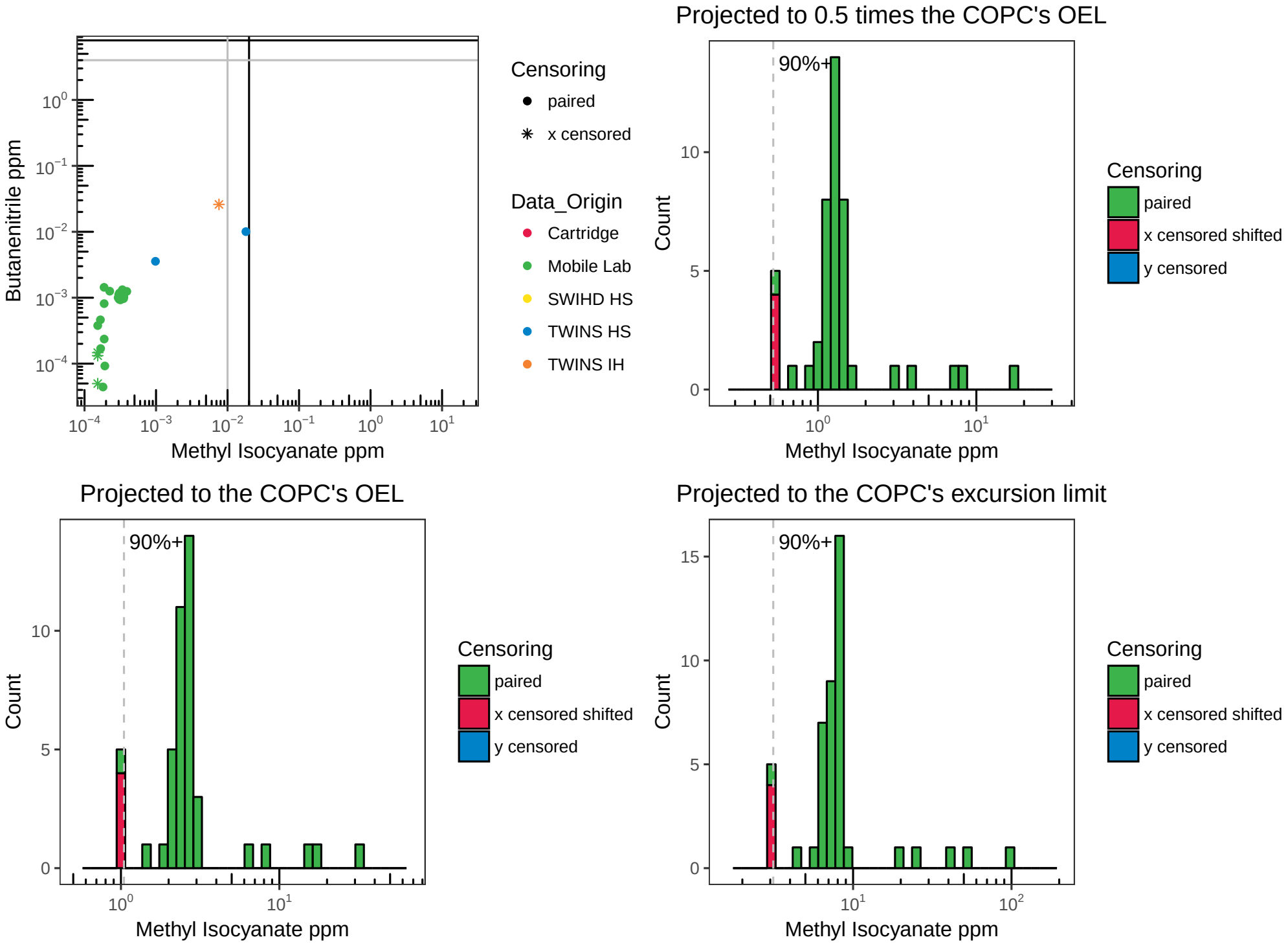


Figure C.2847: Butanenitrile vs Methyl Isocyanate

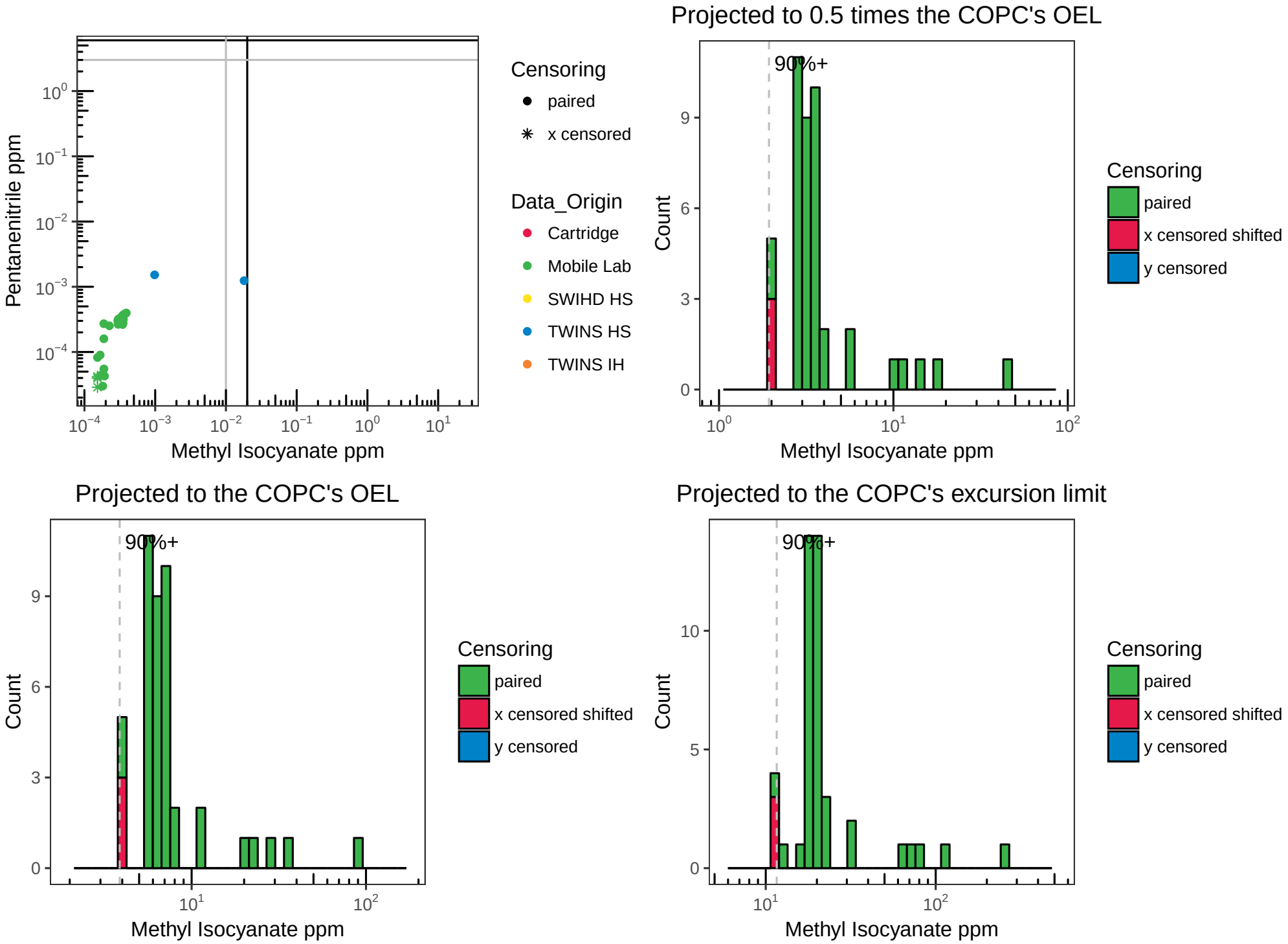


Figure C.2848: Pentanenitrile vs Methyl Isocyanate

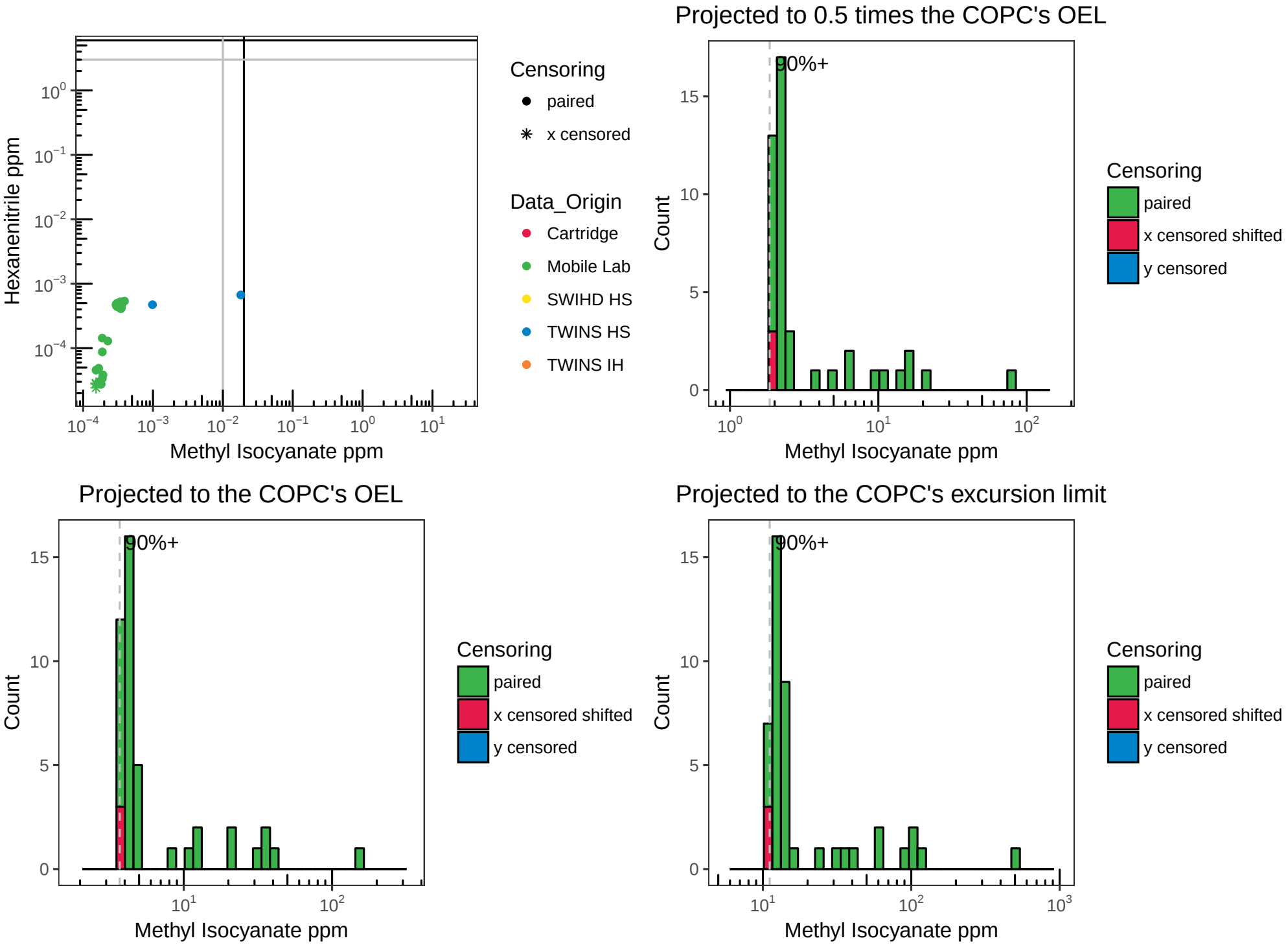


Figure C.2849: Hexanenitrile vs Methyl Isocyanate

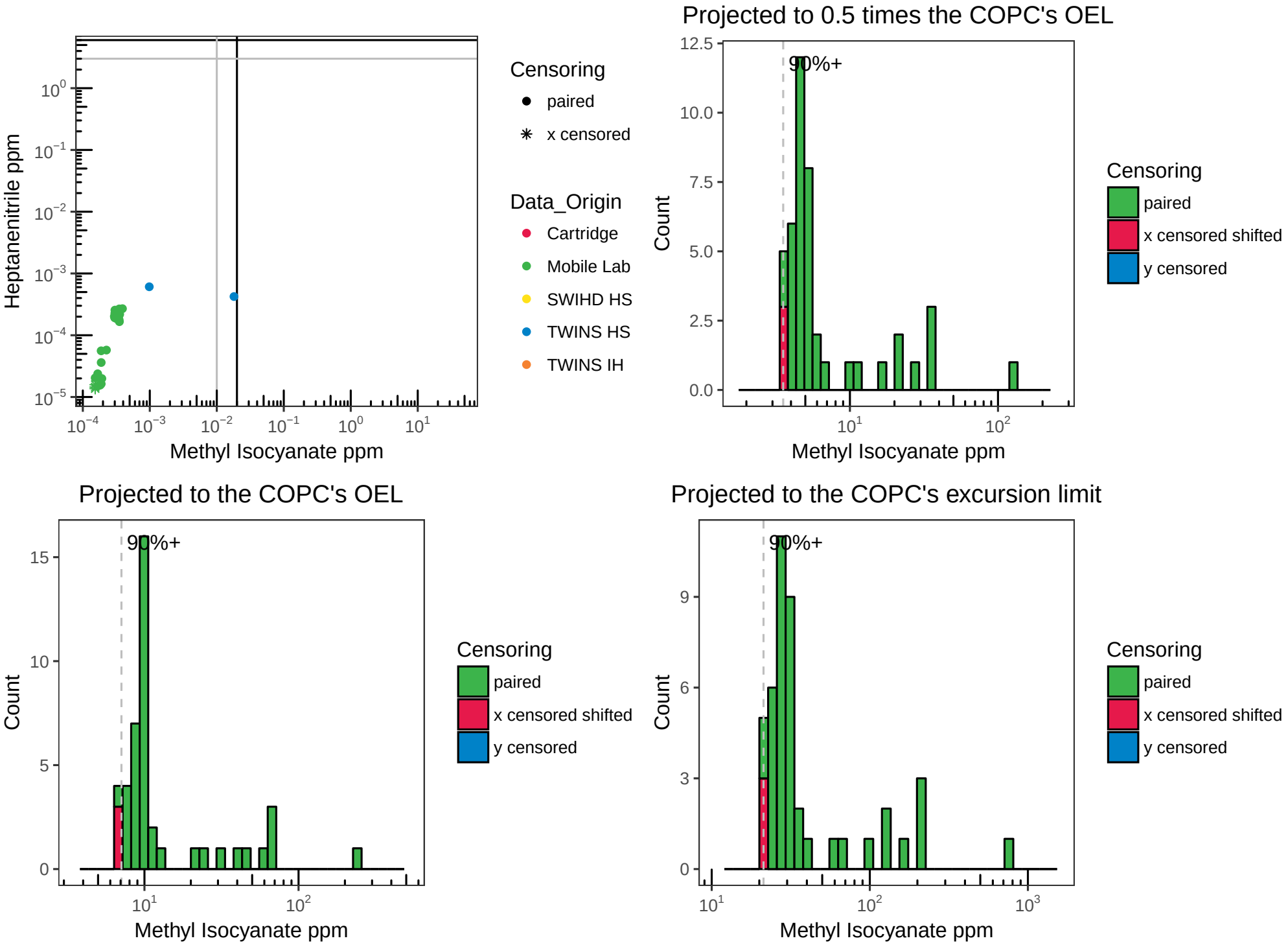


Figure C.2850: Heptanenitrile vs Methyl Isocyanate

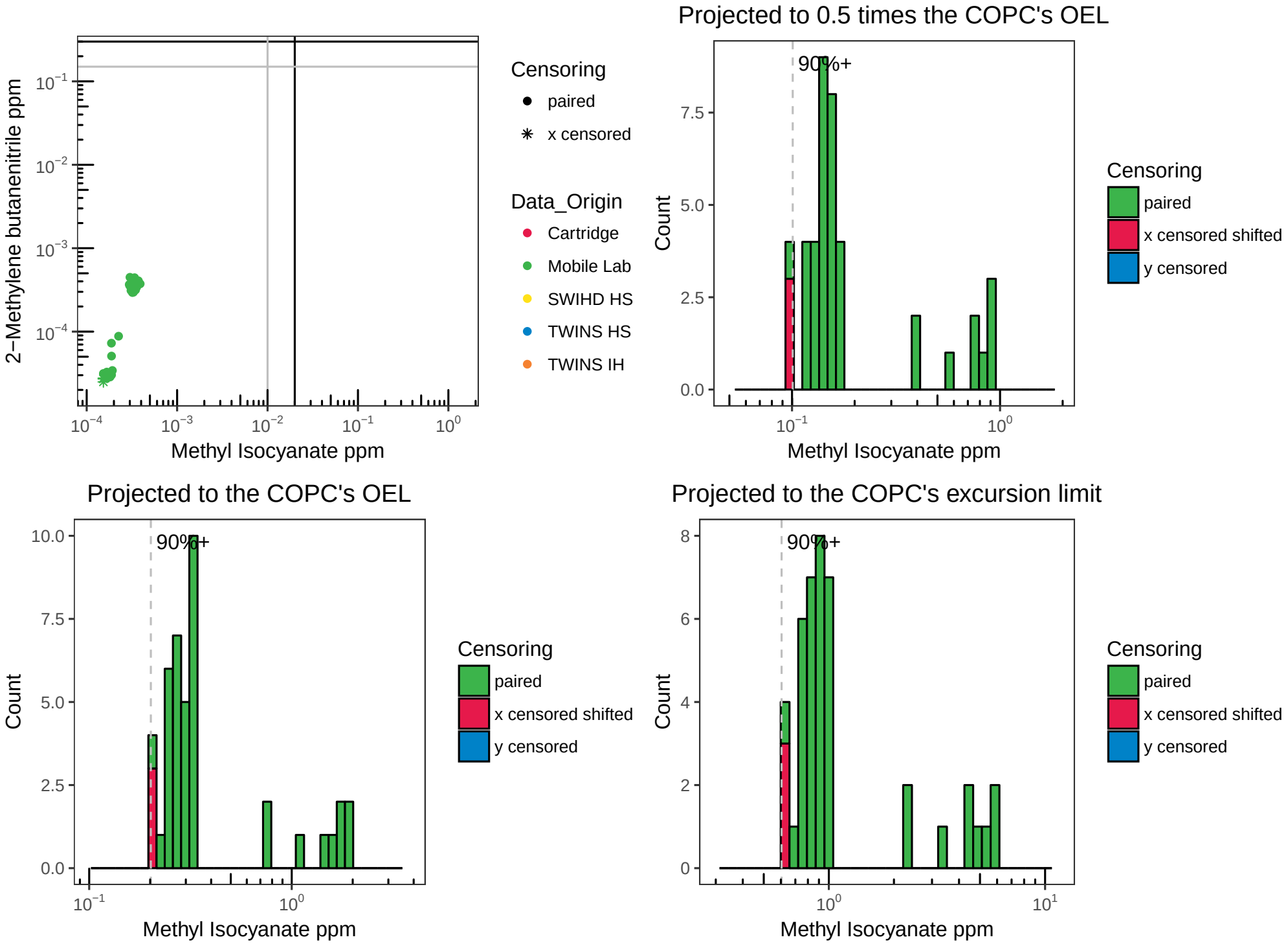


Figure C.2851: 2-Methylene butanenitrile vs Methyl Isocyanate

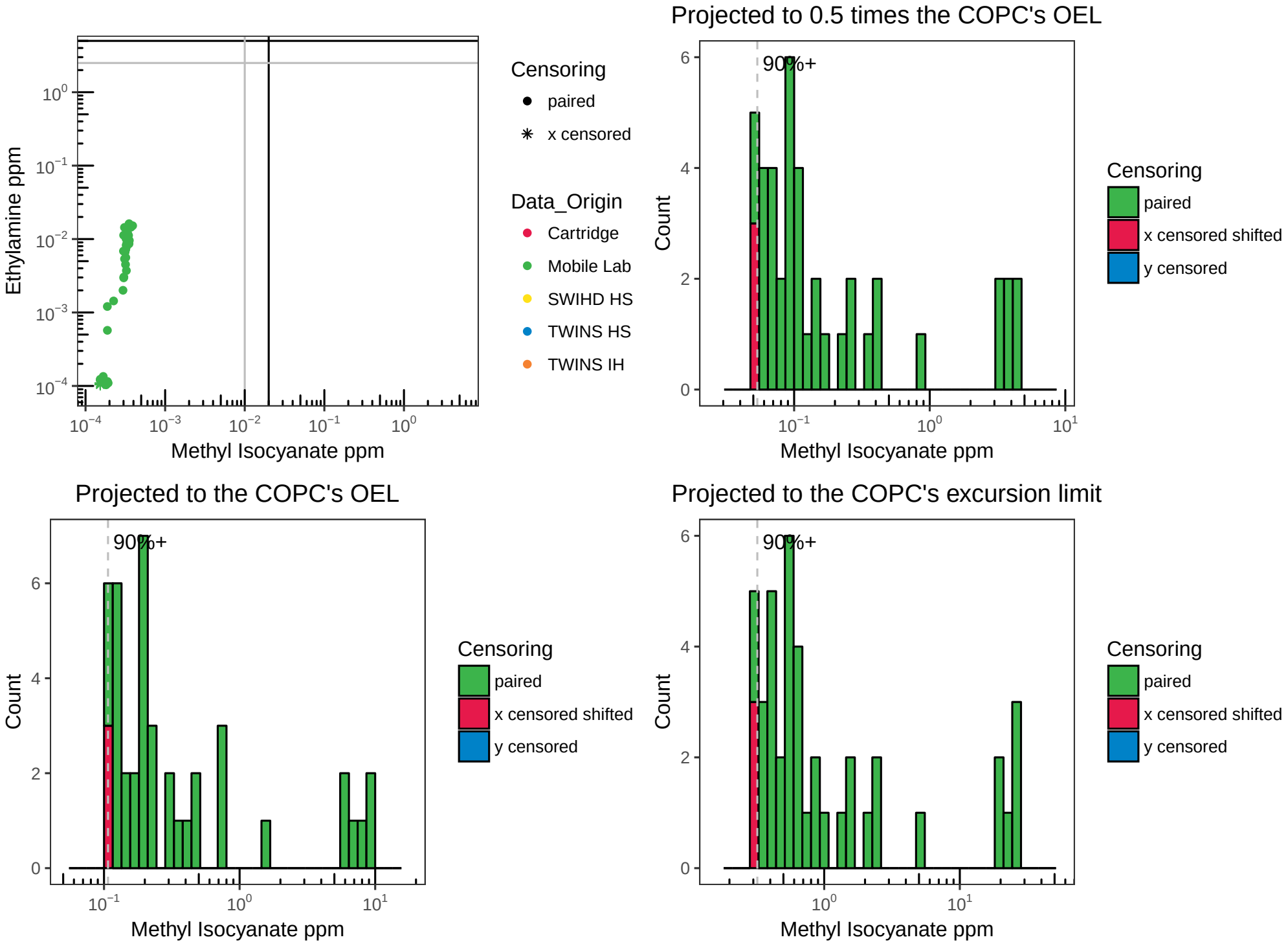


Figure C.2852: Ethylamine vs Methyl Isocyanate

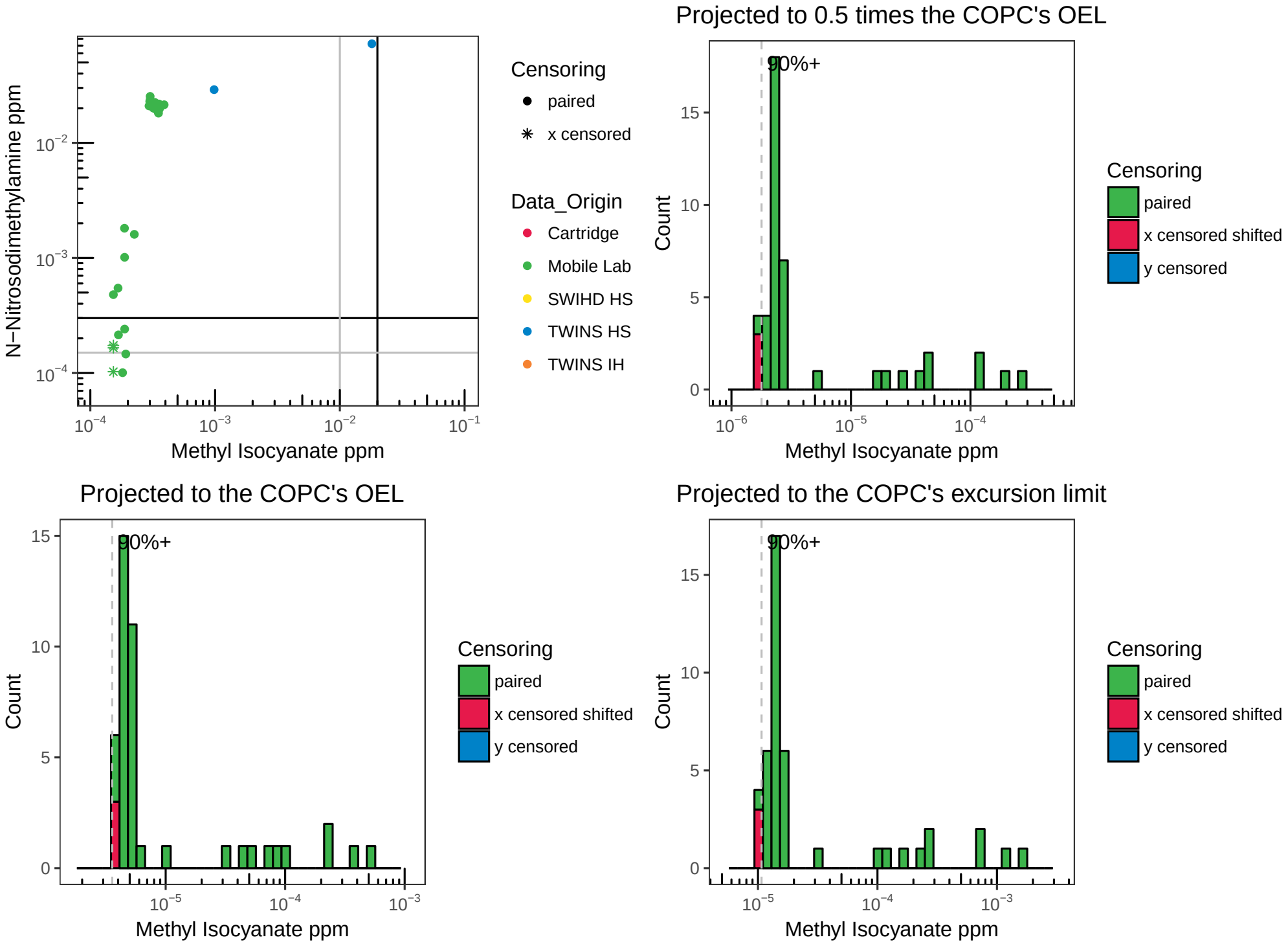


Figure C.2853: N-Nitrosodimethylamine vs Methyl Isocyanate

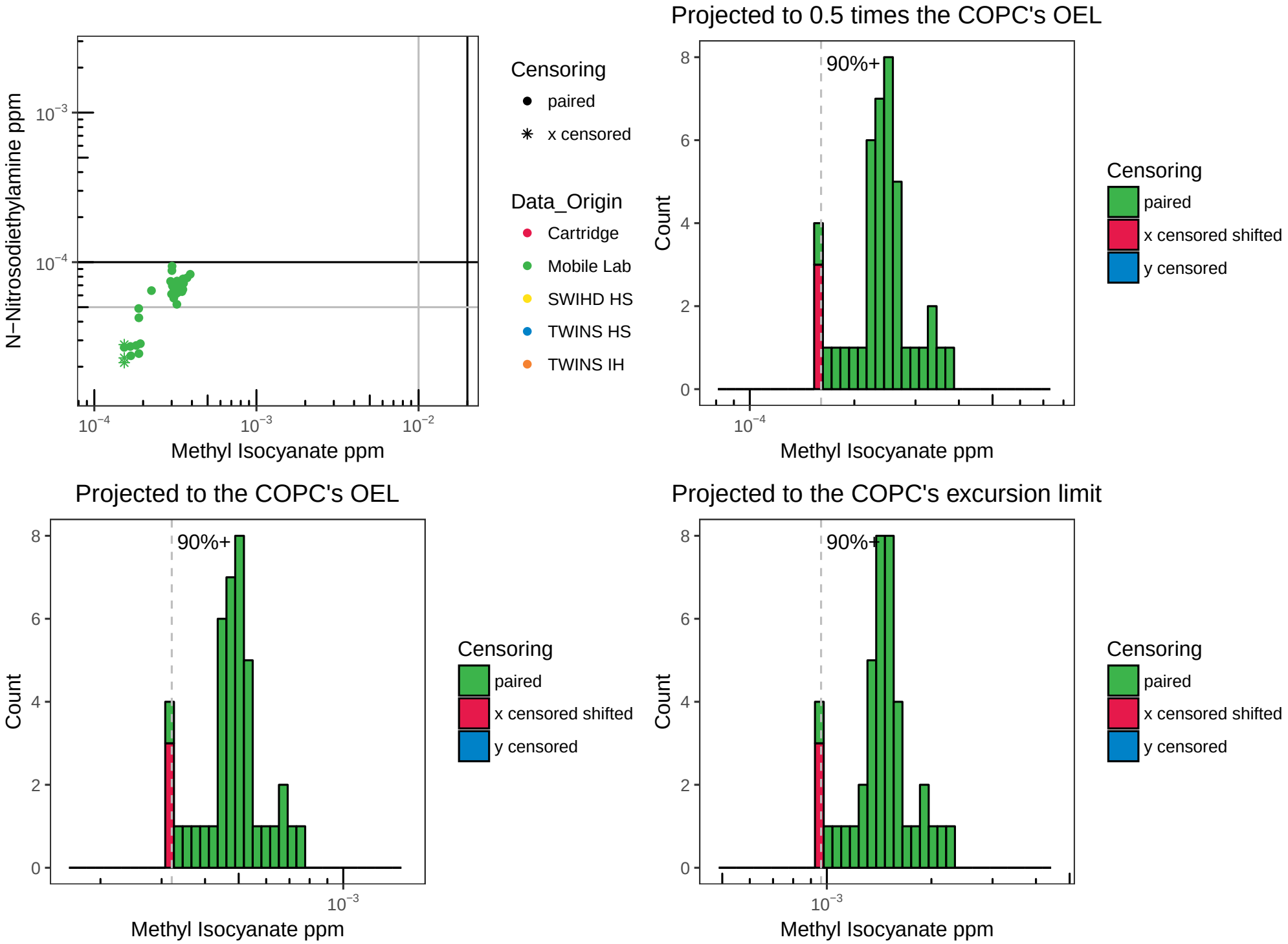


Figure C.2854: N-Nitrosodiethylamine vs Methyl Isocyanate

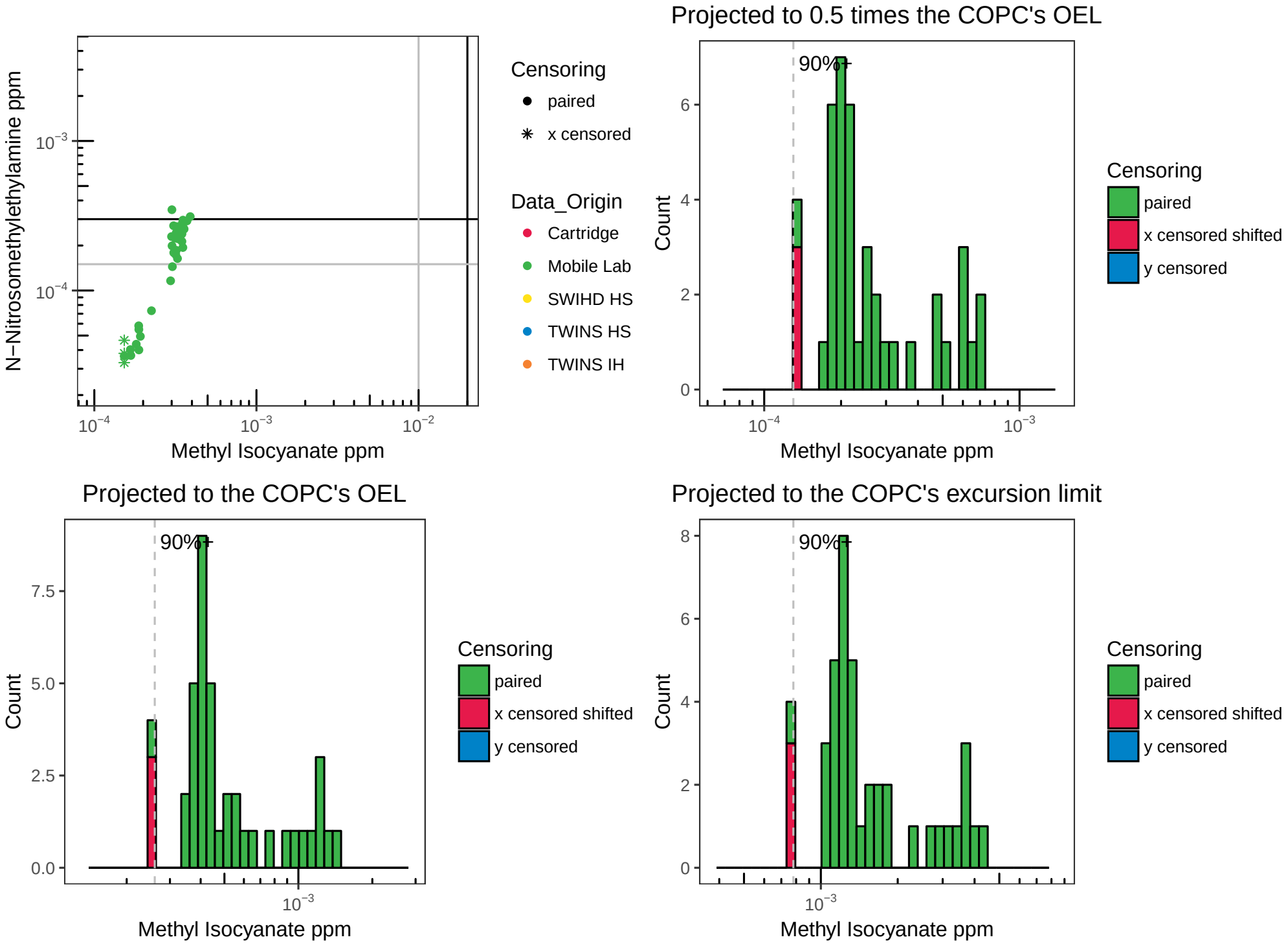


Figure C.2855: N-Nitrosomethylethylamine vs Methyl Isocyanate

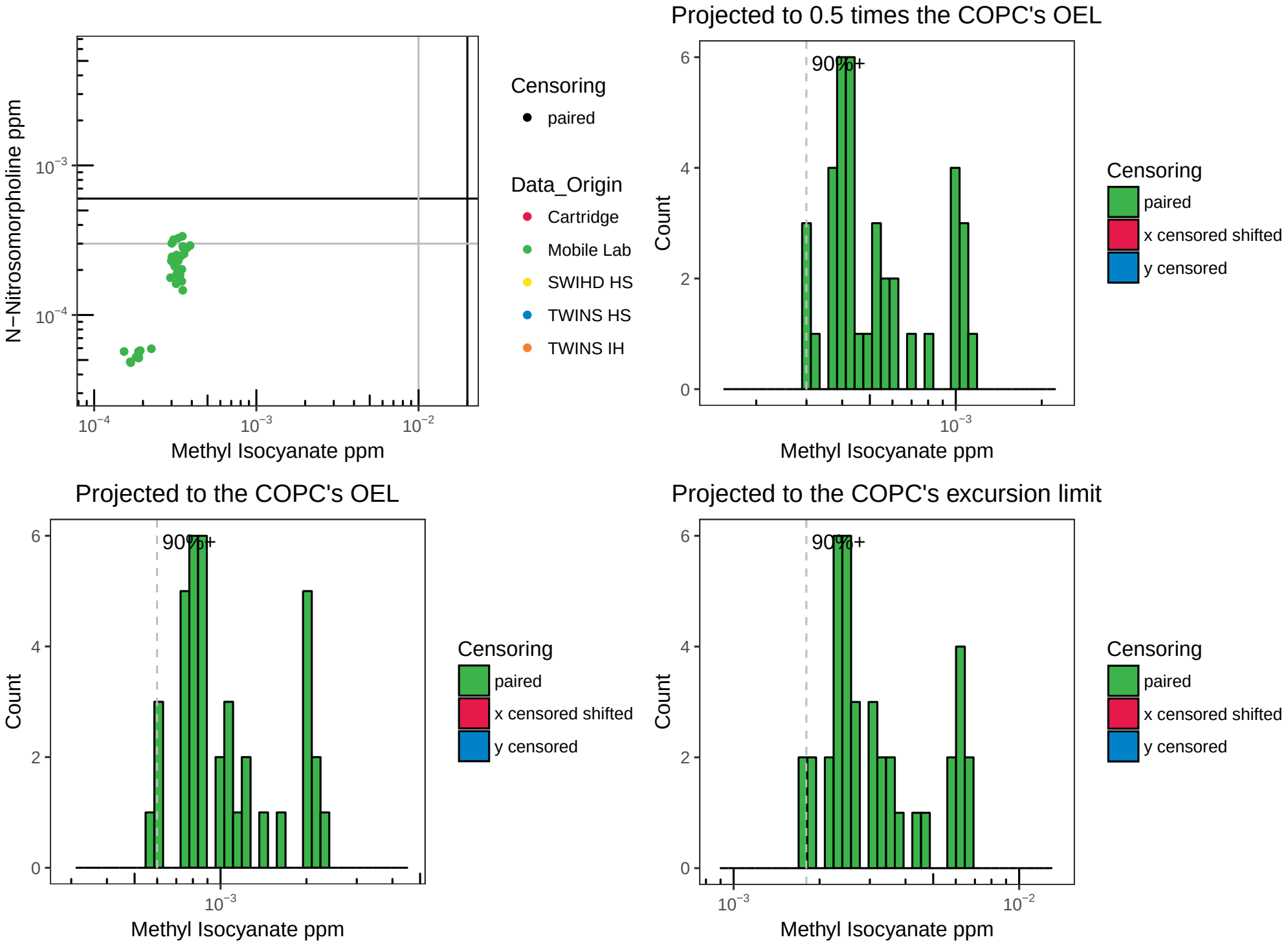


Figure C.2856: N-Nitrosomorpholine vs Methyl Isocyanate

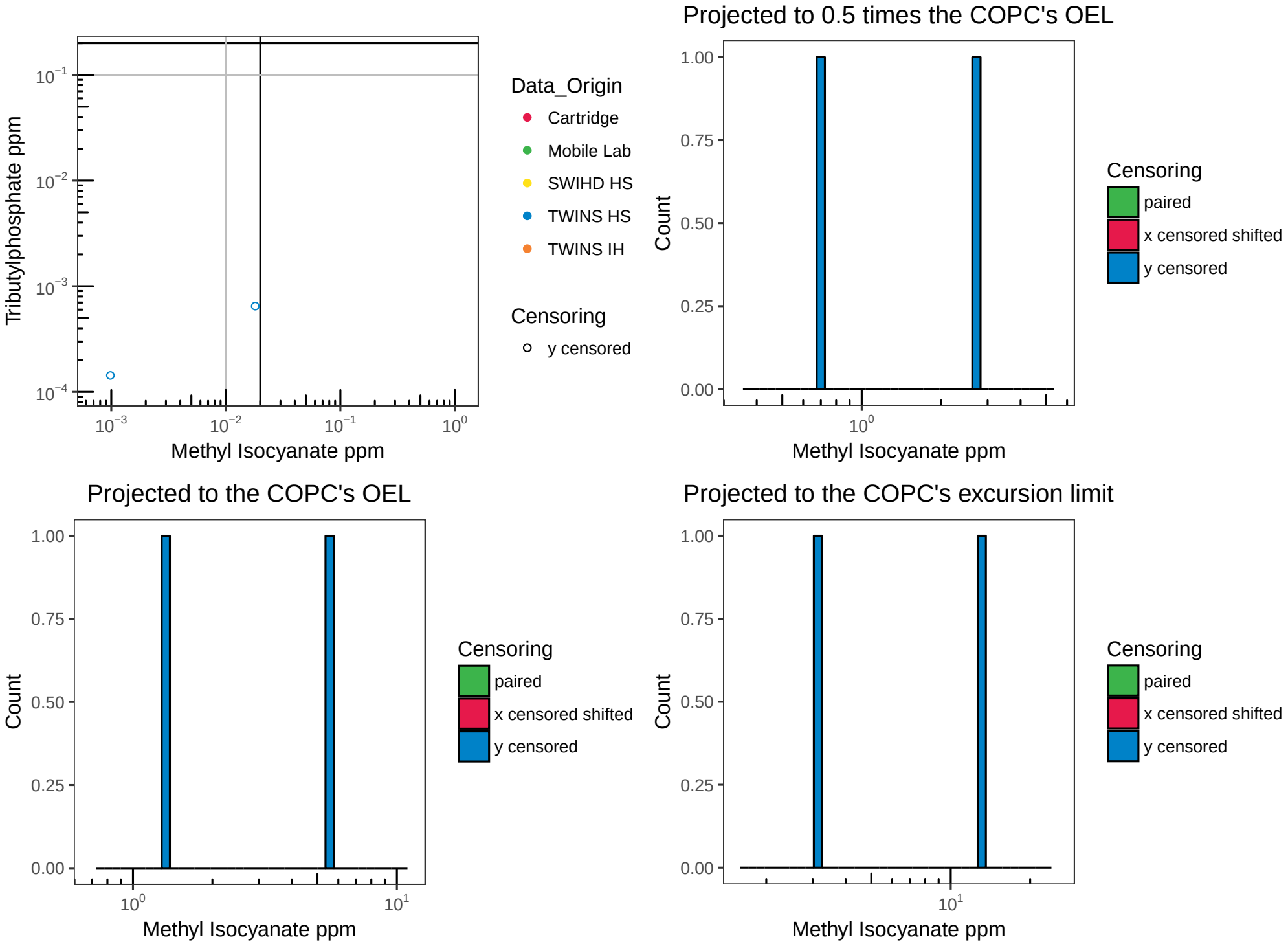


Figure C.2857: Tributylphosphate vs Methyl Isocyanate

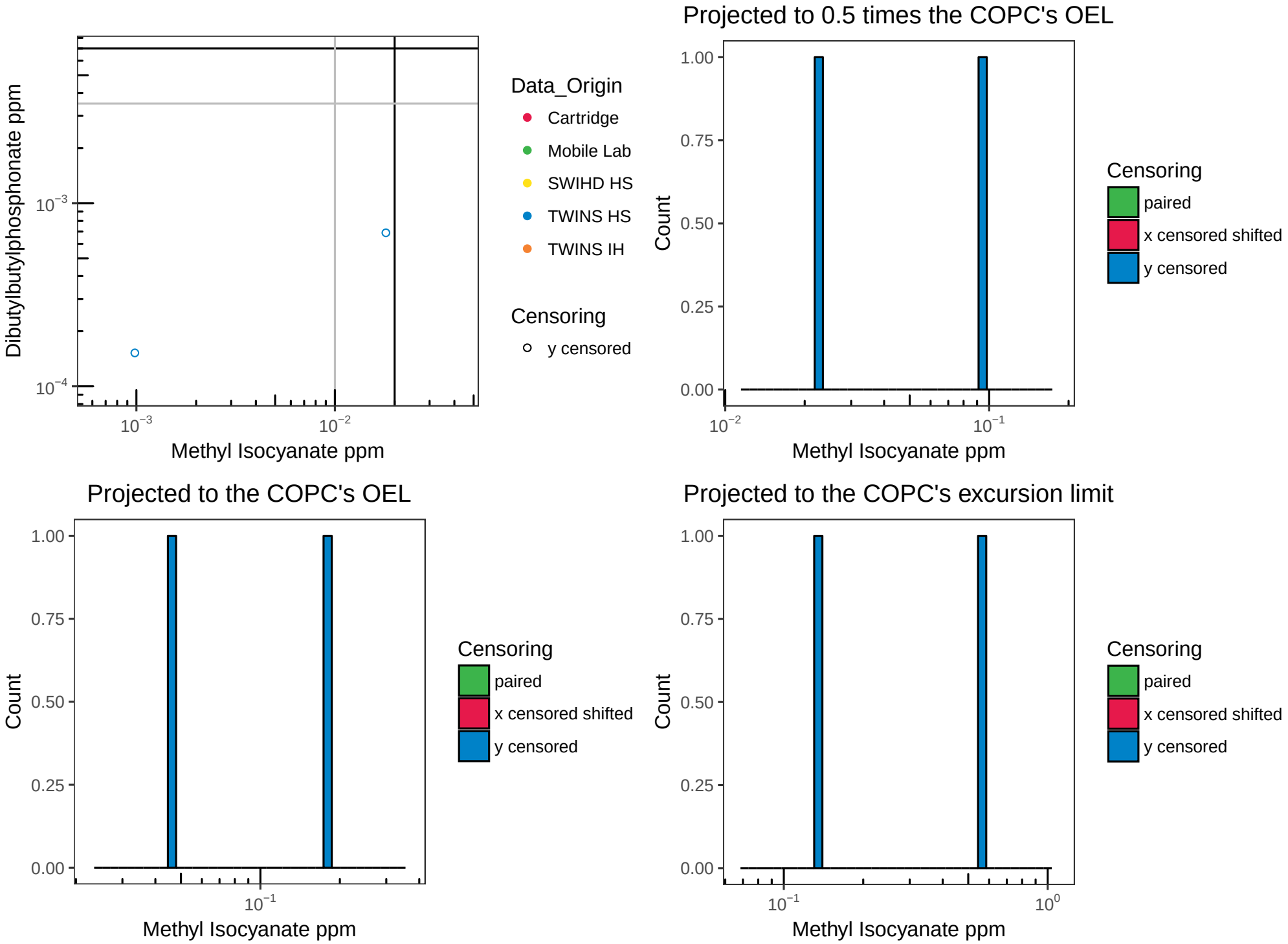


Figure C.2858: Dibutylbutylphosphonate vs Methyl Isocyanate

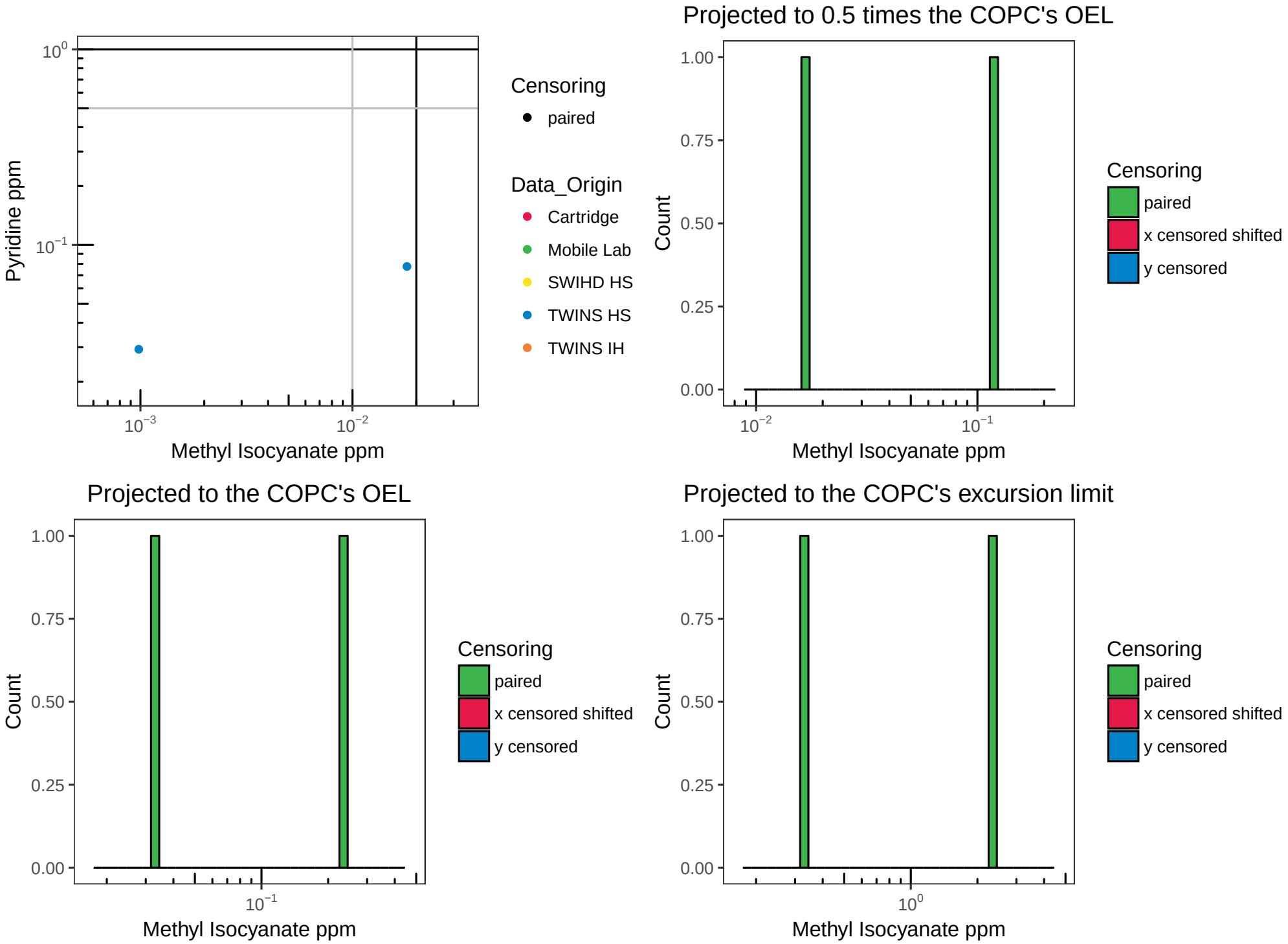


Figure C.2859: Pyridine vs Methyl Isocyanate

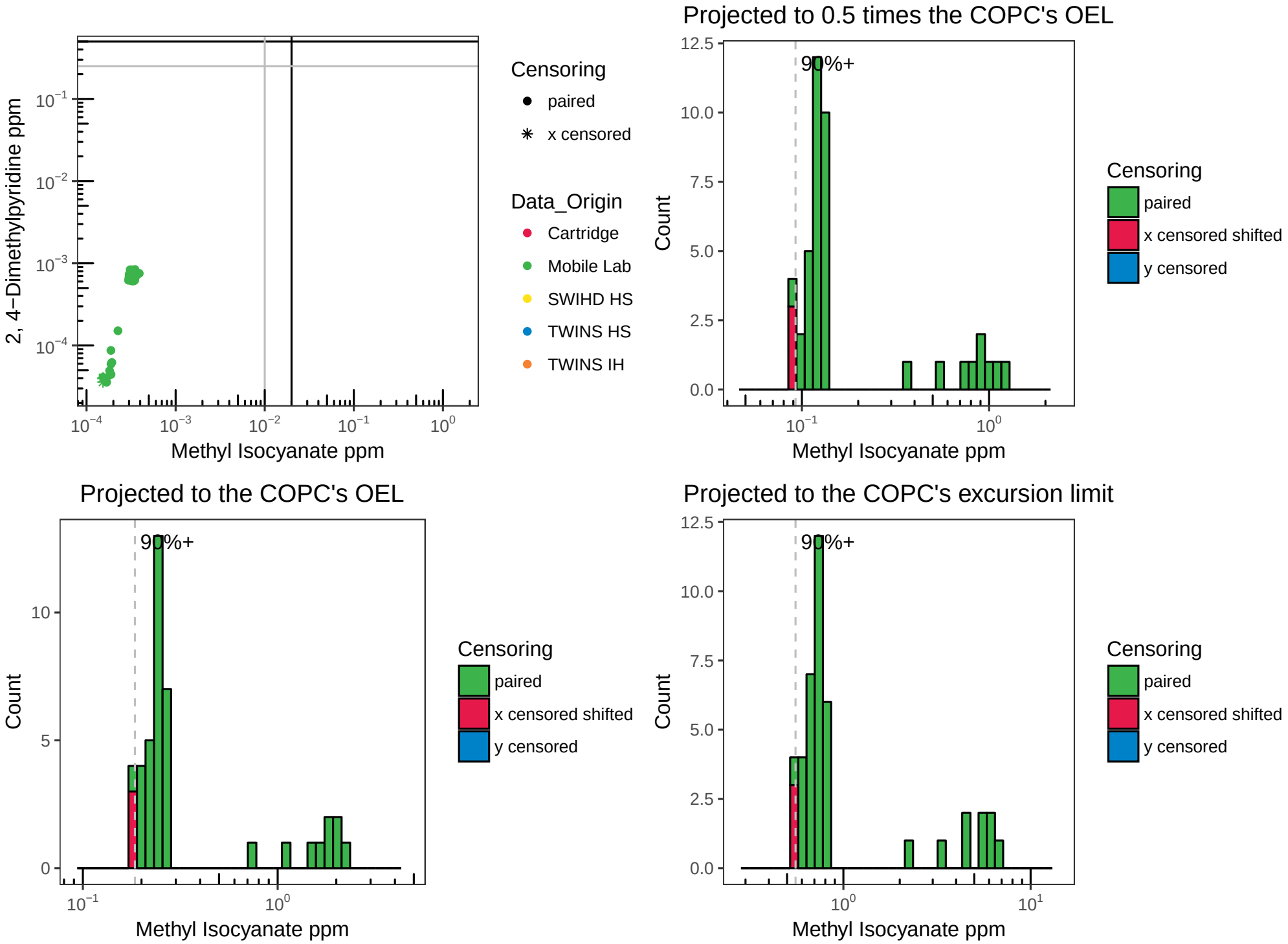


Figure C.2860: 2, 4-Dimethylpyridine vs Methyl Isocyanate

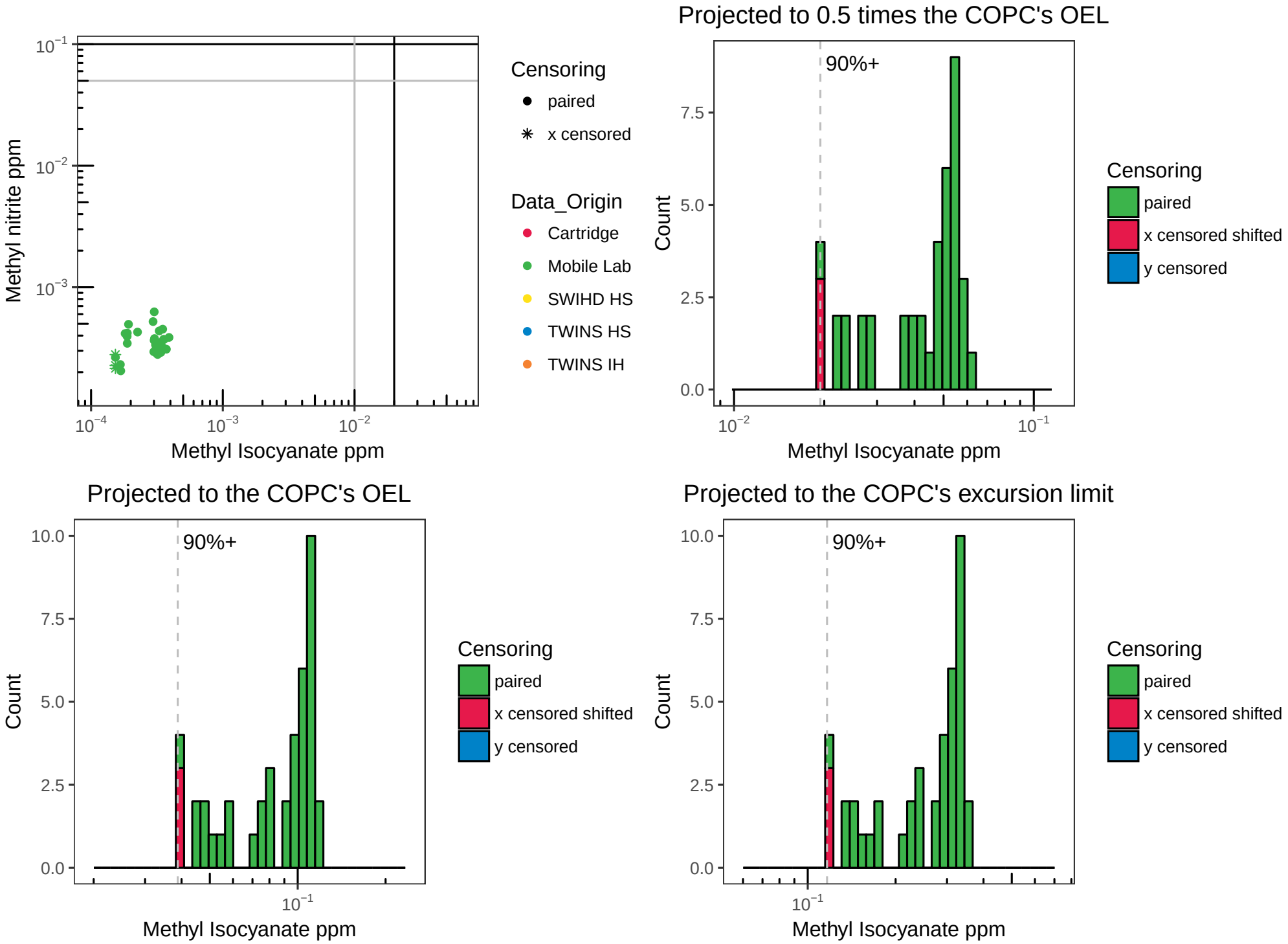


Figure C.2861: Methyl nitrite vs Methyl Isocyanate

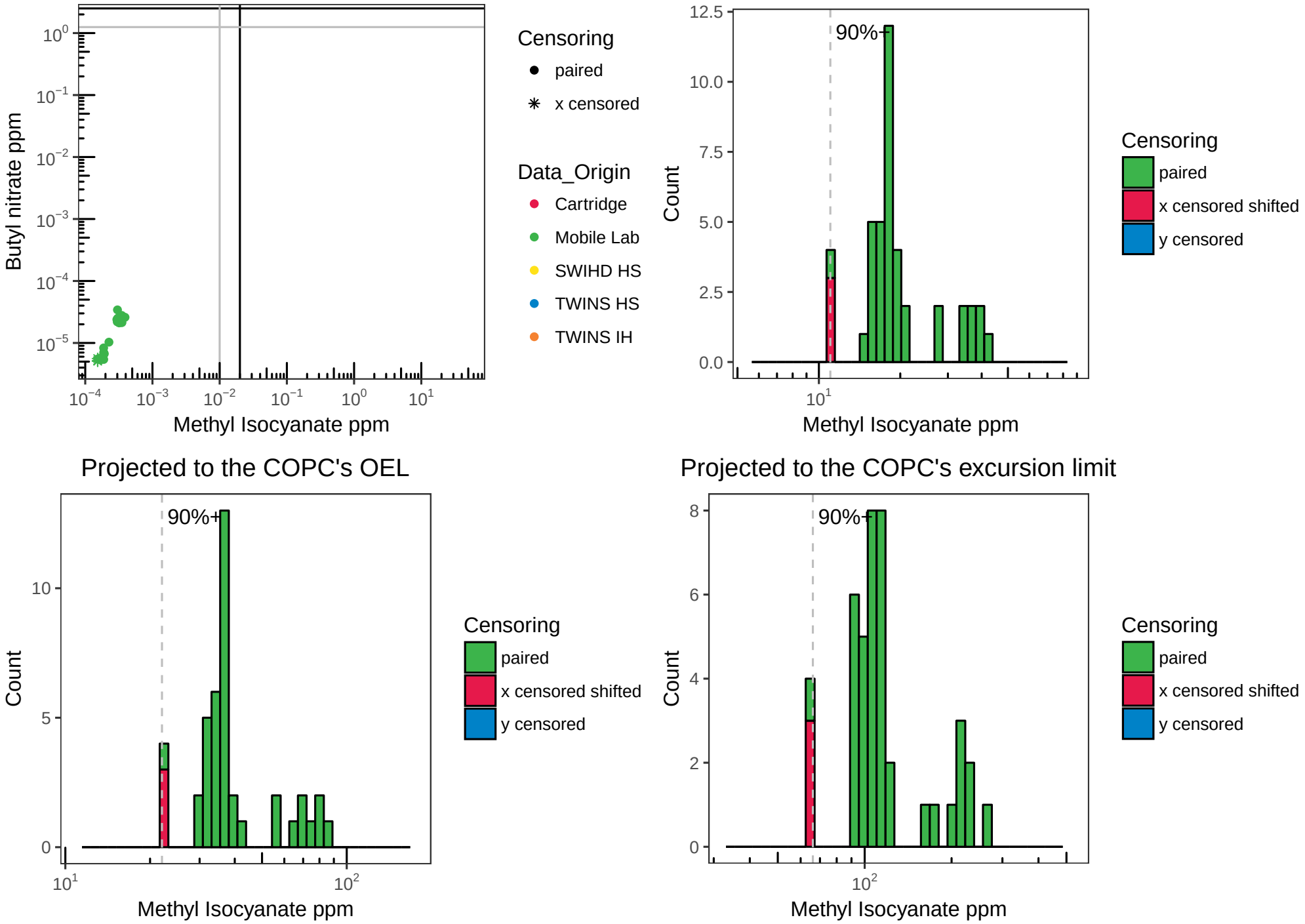


Figure C.2862: Butyl nitrate vs Methyl Isocyanate

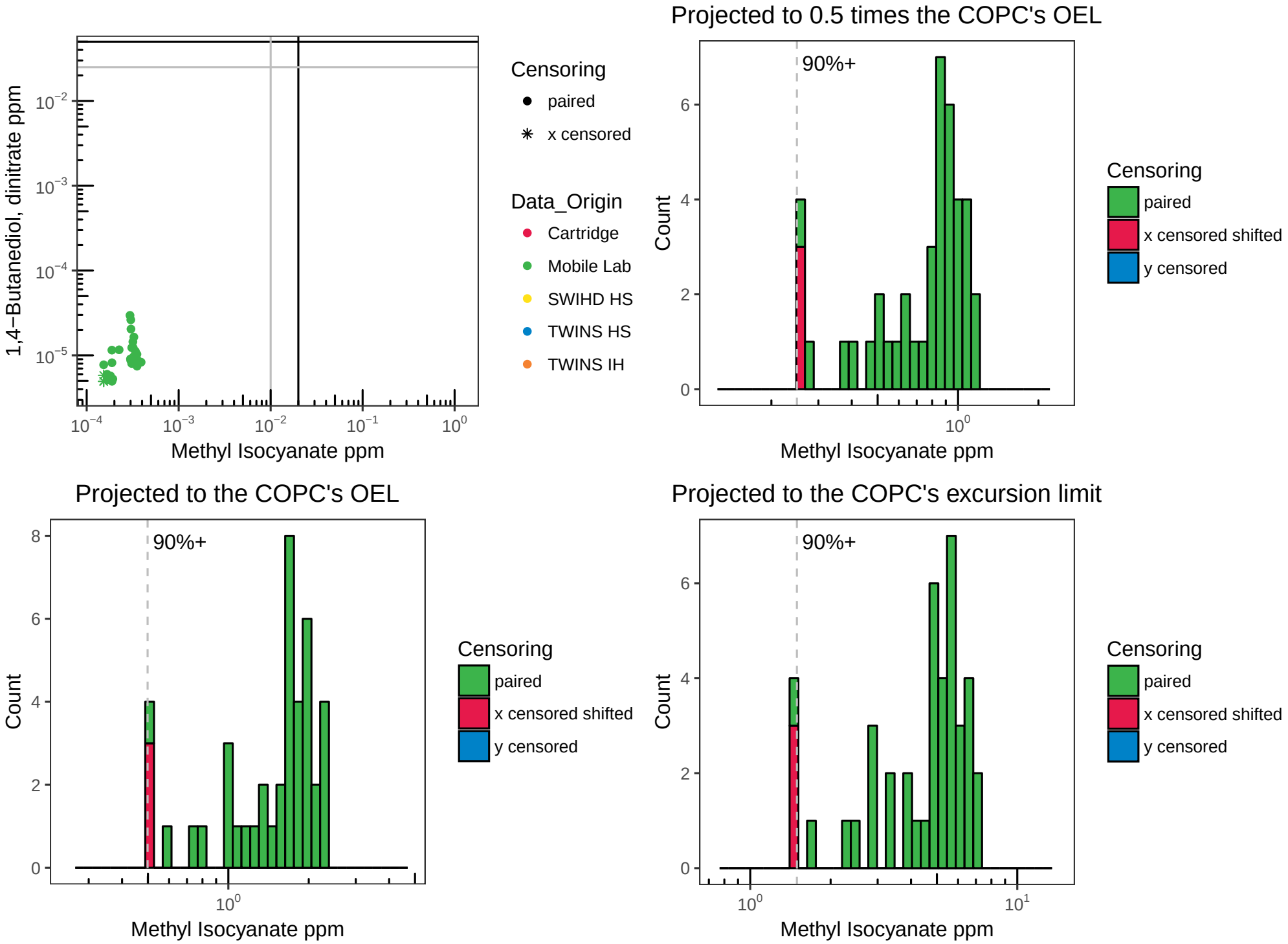


Figure C.2863: 1,4-Butanediol, dinitrate vs Methyl Isocyanate

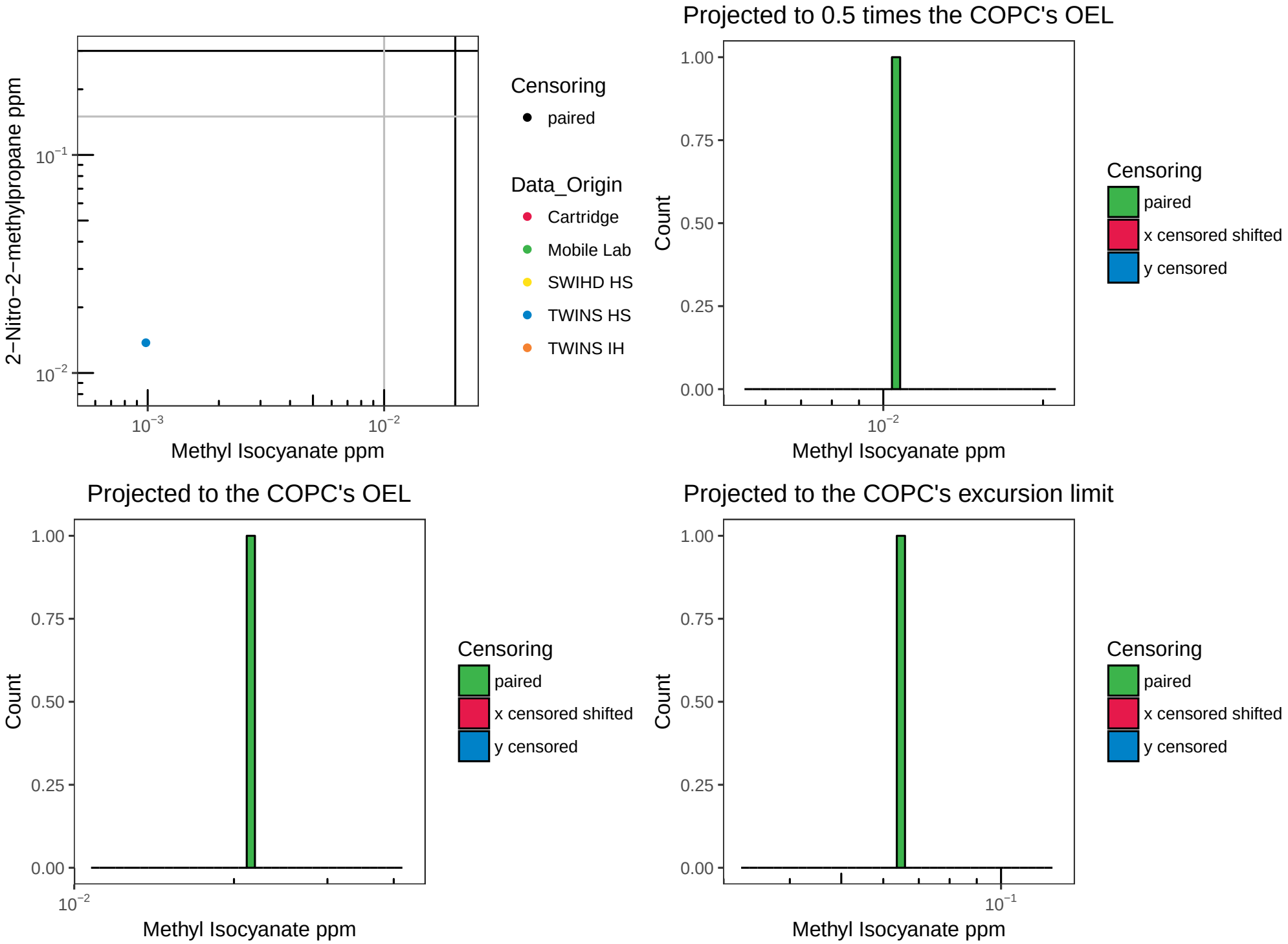


Figure C.2864: 2-Nitro-2-methylpropane vs Methyl Isocyanate

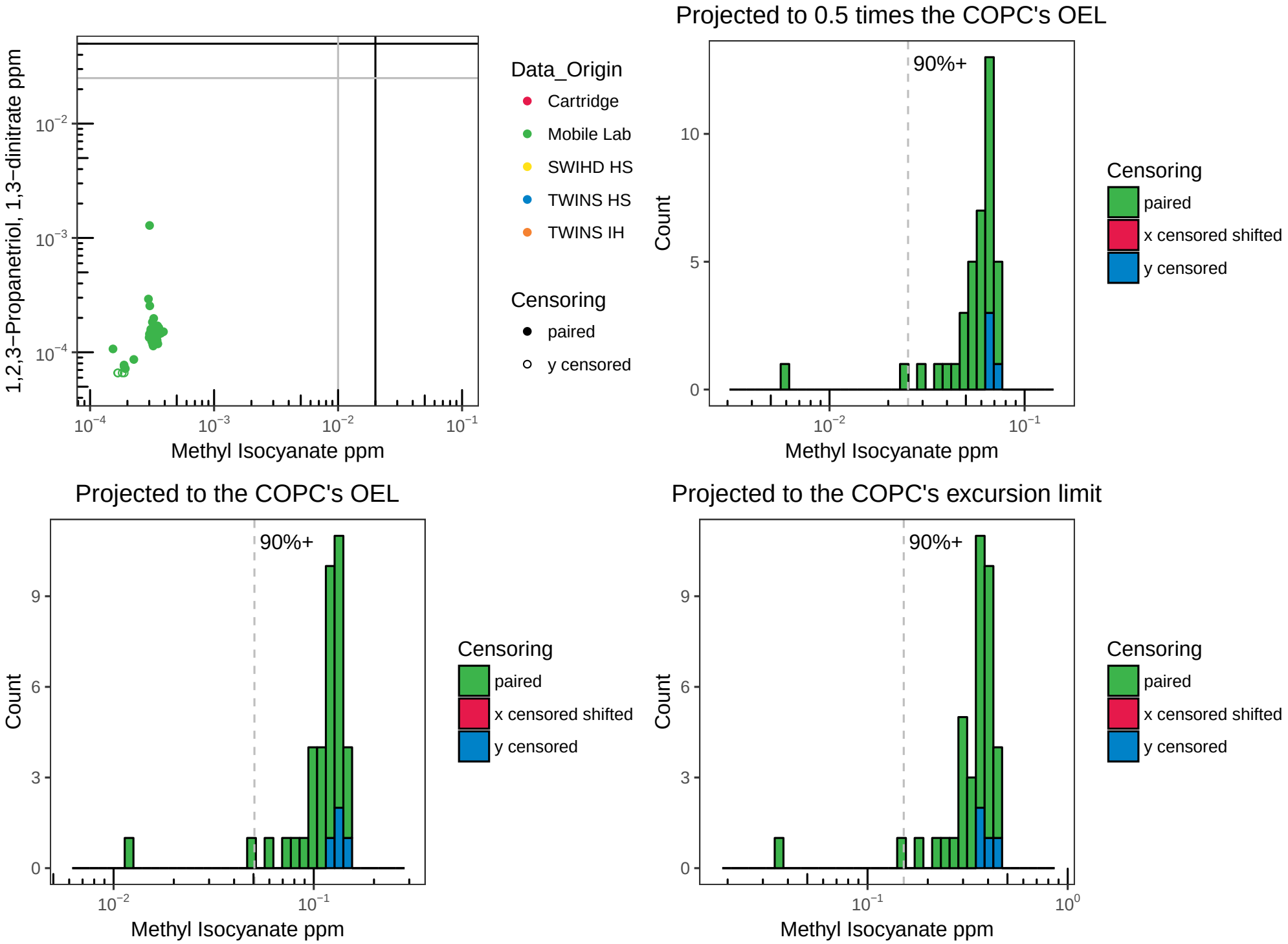


Figure C.2865: 1,2,3-Propanetriol, 1,3-dinitrate vs Methyl Isocyanate

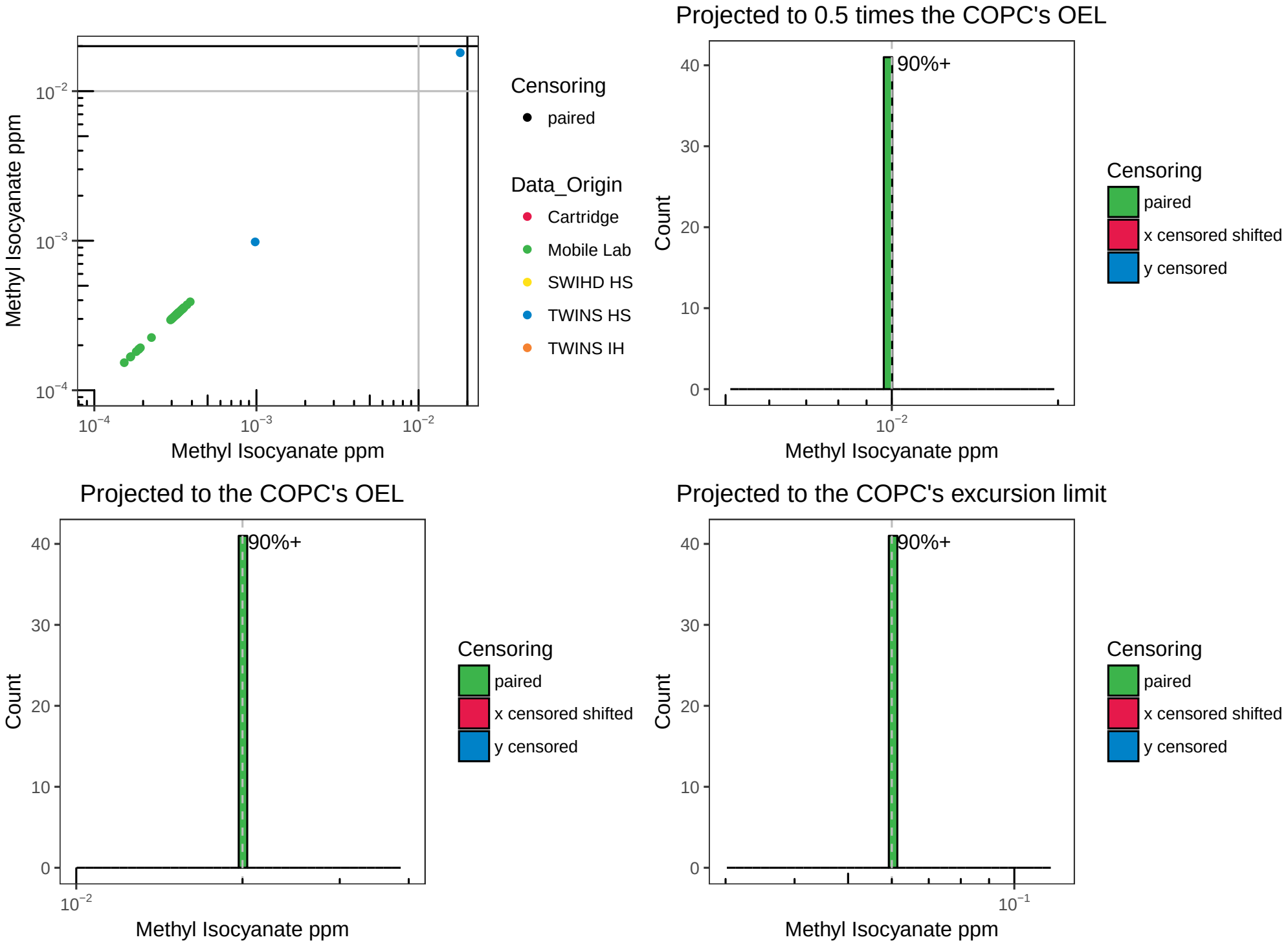


Figure C.2866: Methyl Isocyanate vs Methyl Isocyanate

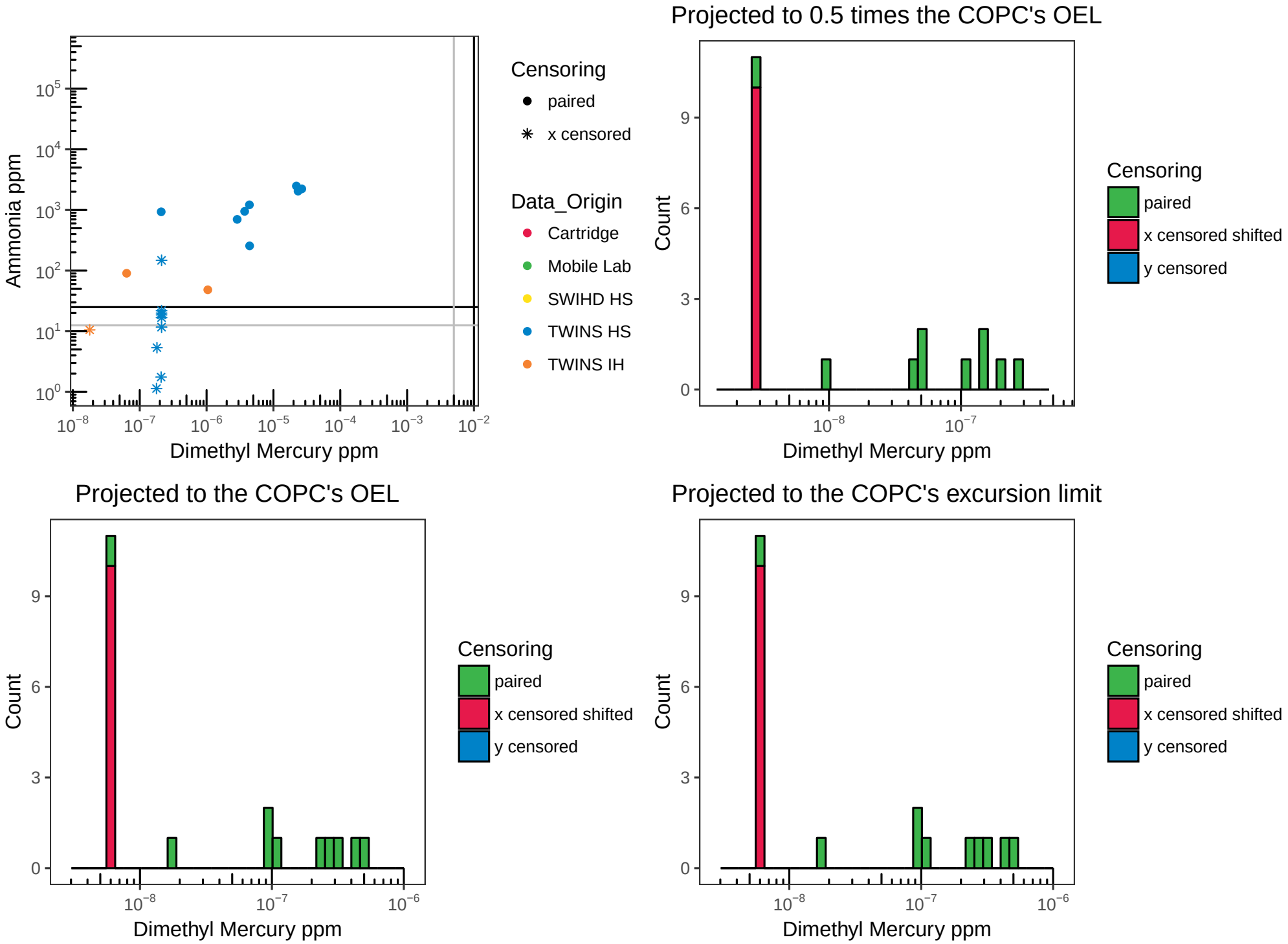


Figure C.2867: Ammonia vs Dimethyl Mercury

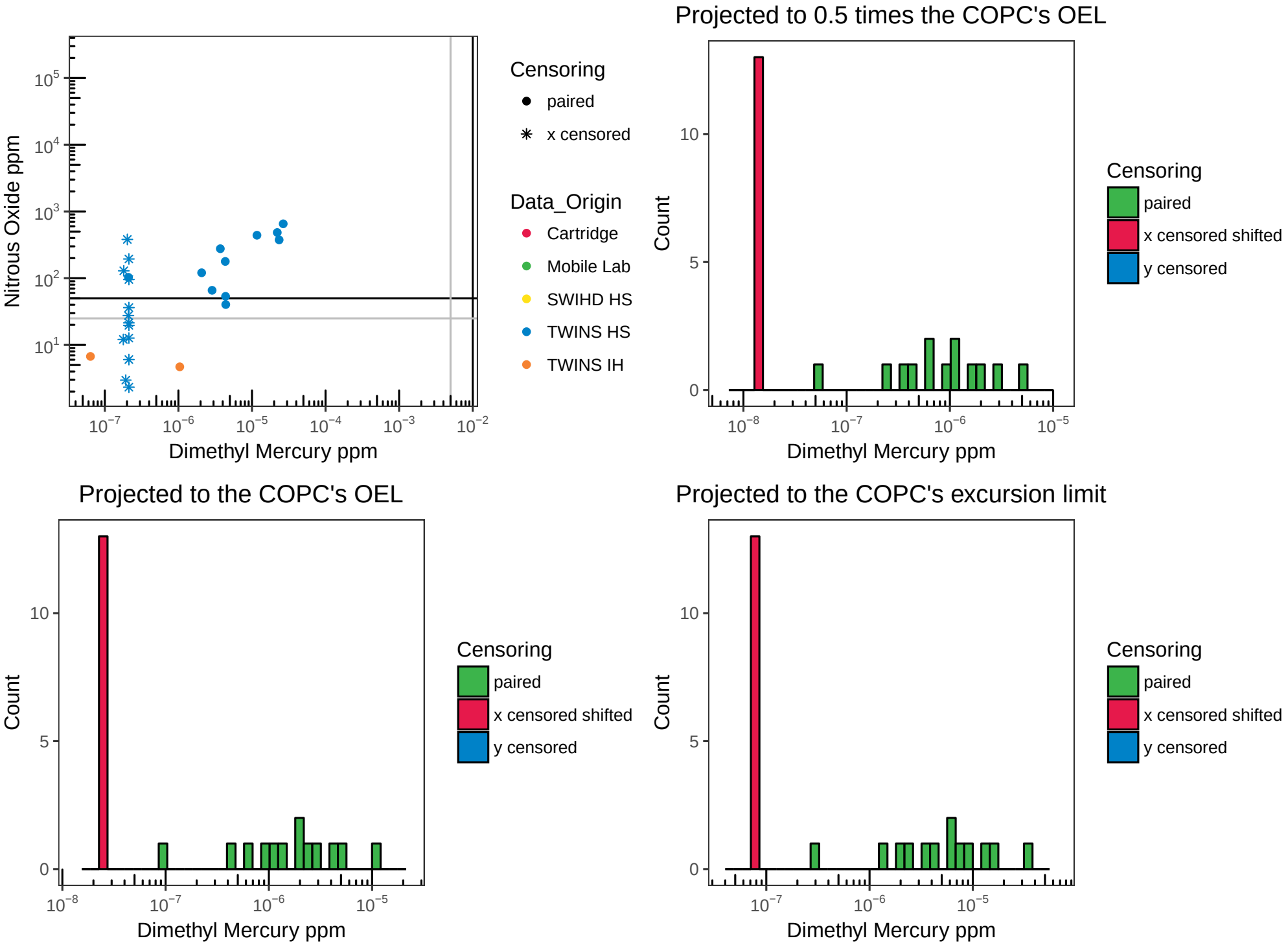


Figure C.2868: Nitrous Oxide vs Dimethyl Mercury

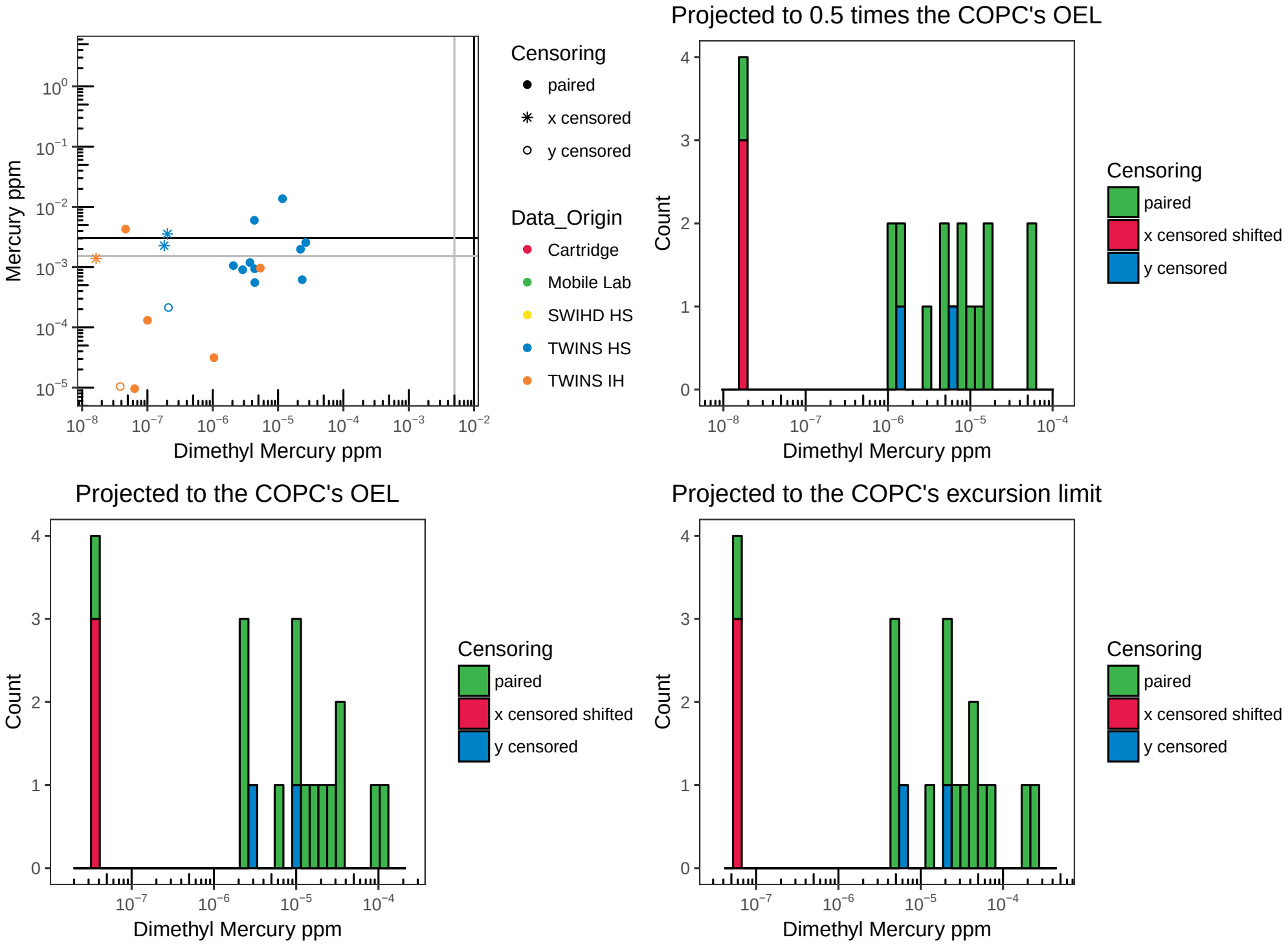


Figure C.2869: Mercury vs Dimethyl Mercury

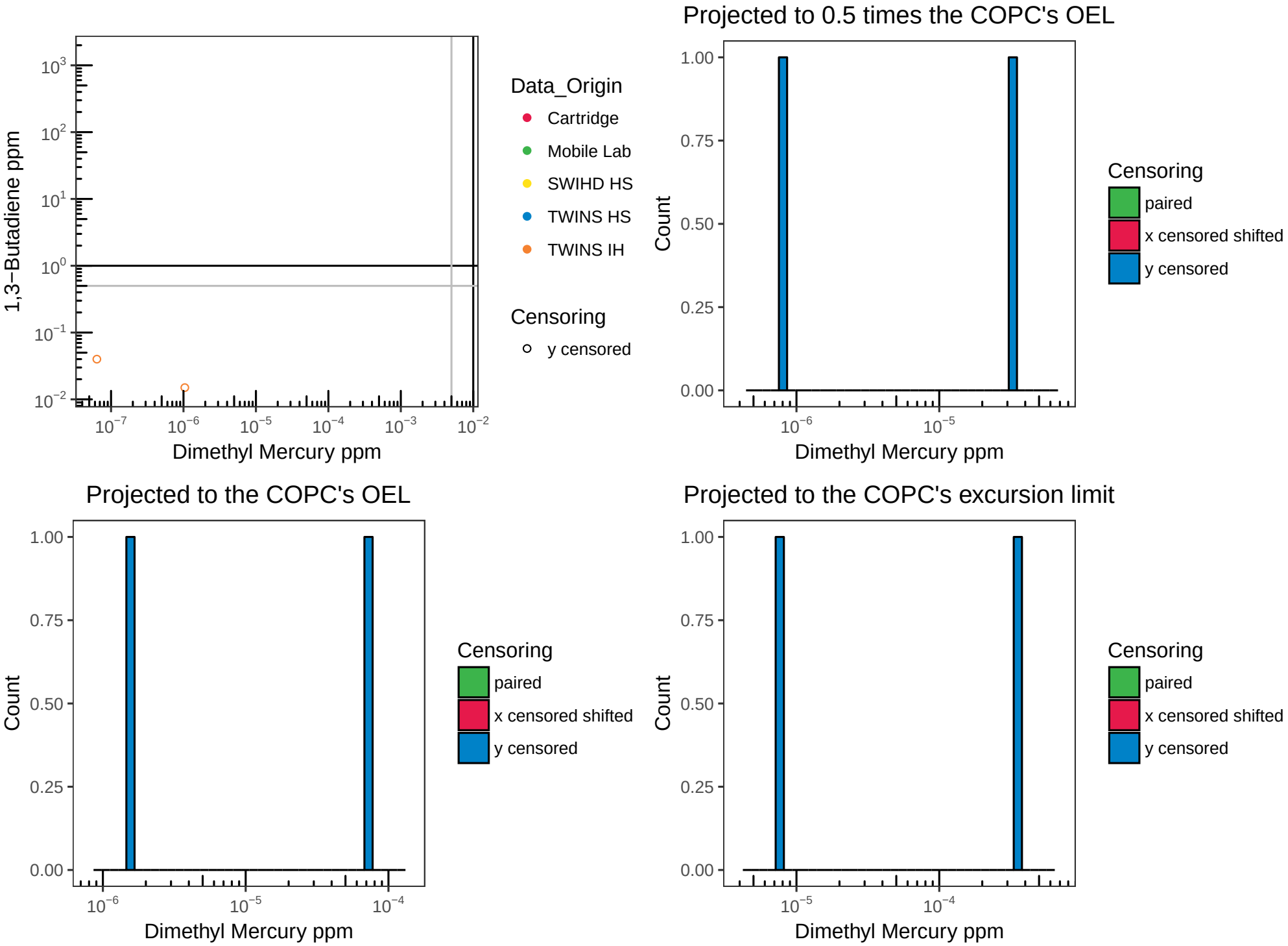


Figure C.2870: 1,3-Butadiene vs Dimethyl Mercury

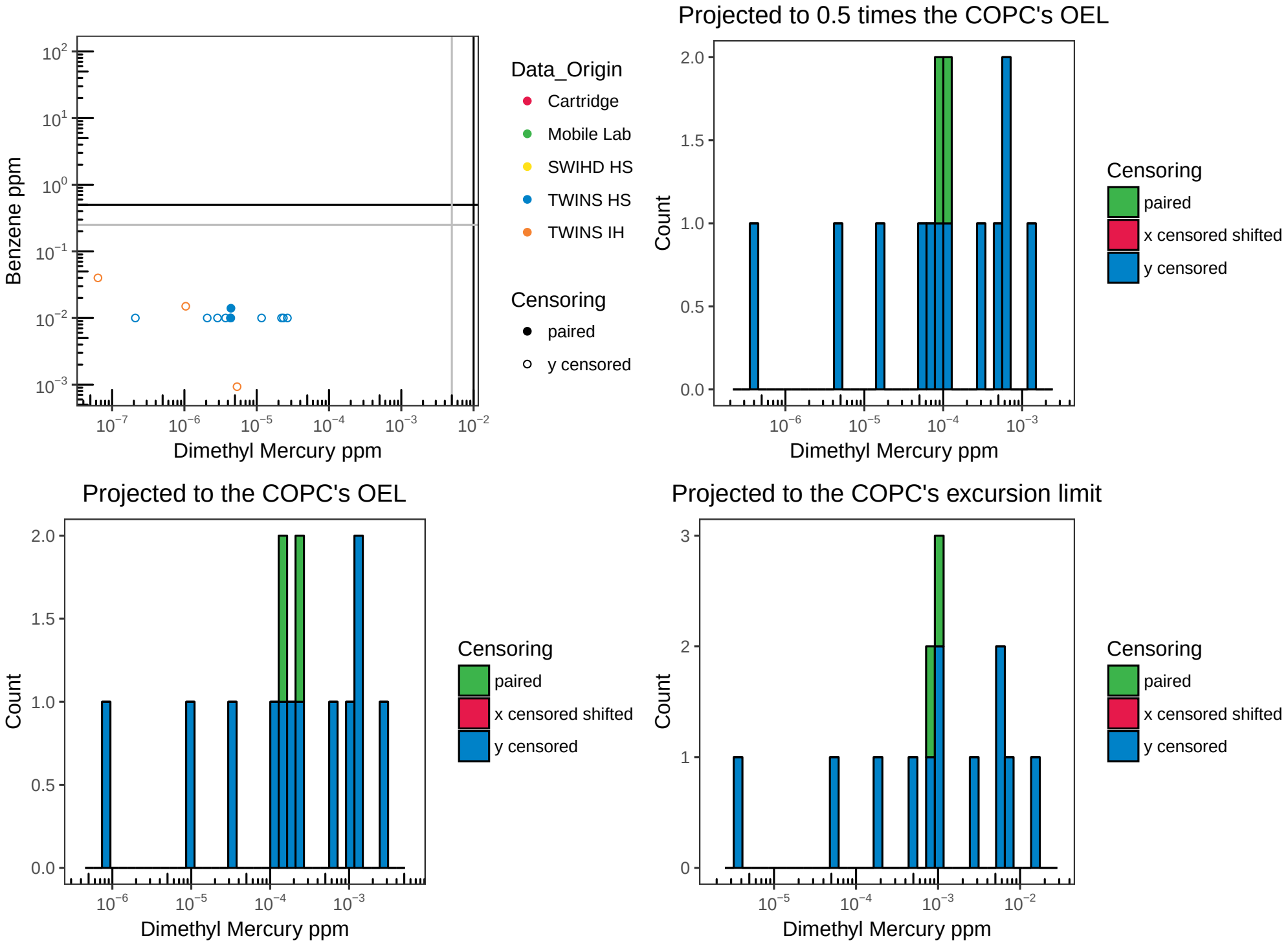


Figure C.2871: Benzene vs Dimethyl Mercury

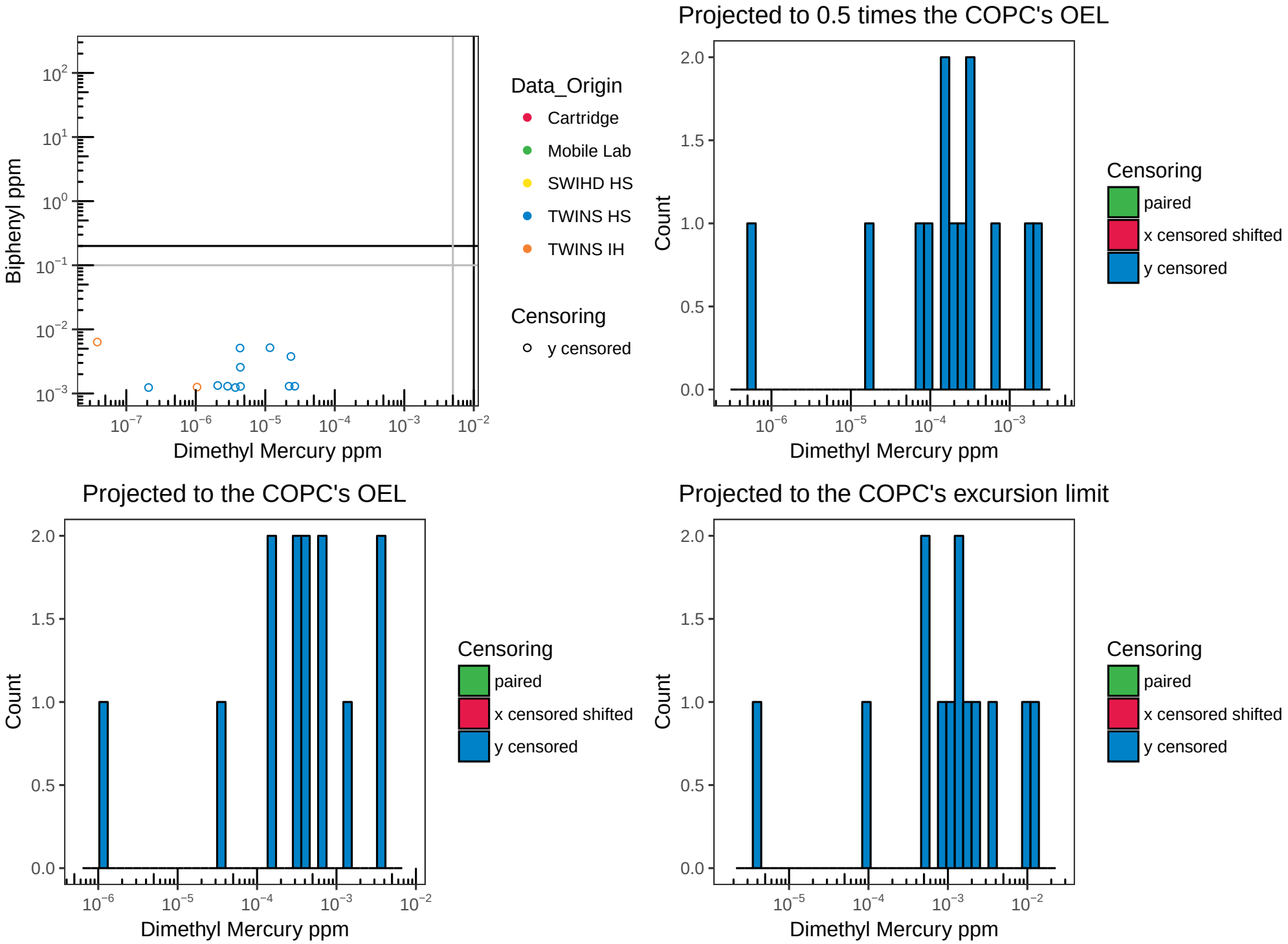


Figure C.2872: Biphenyl vs Dimethyl Mercury

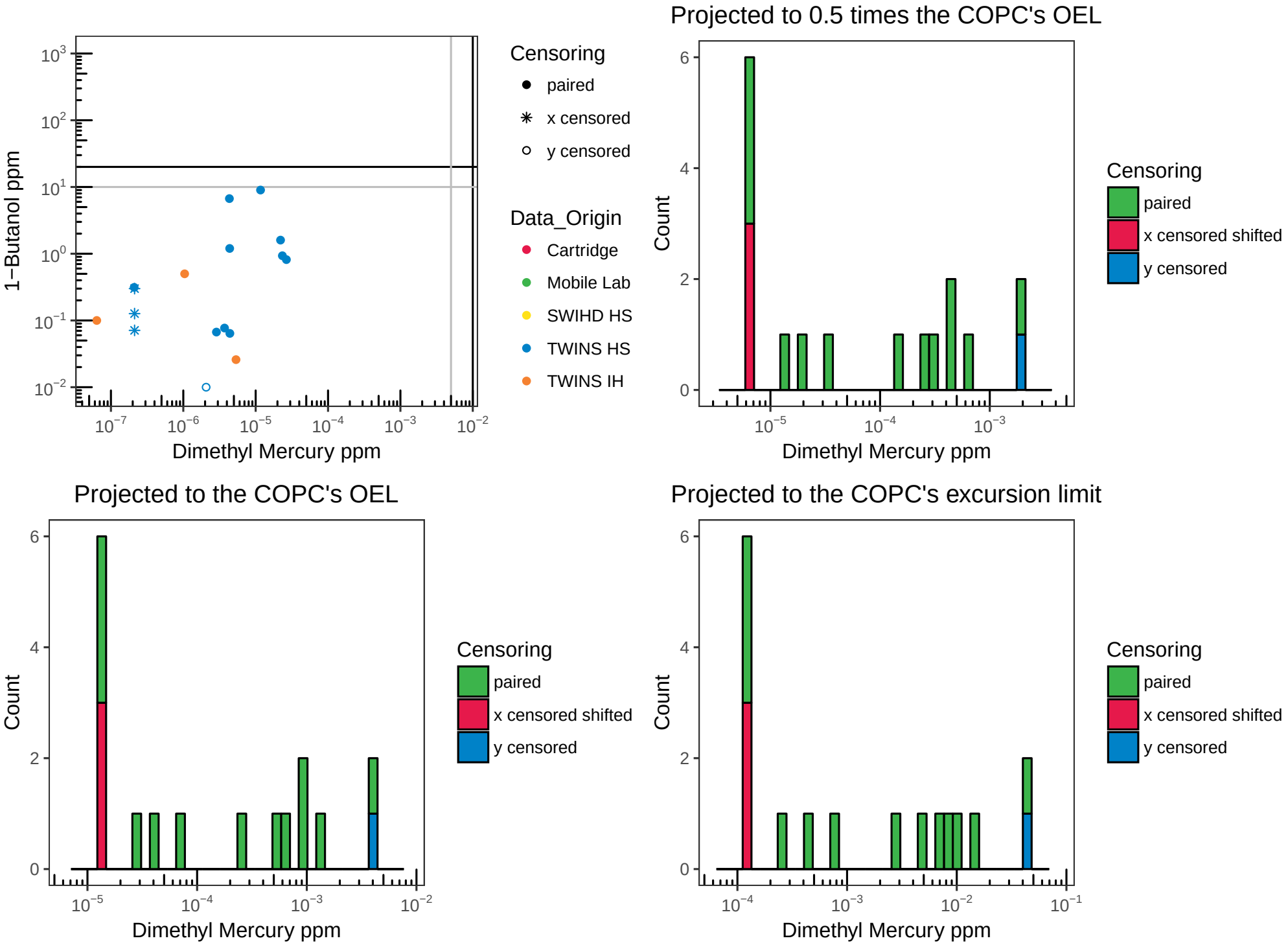


Figure C.2873: 1-Butanol vs Dimethyl Mercury

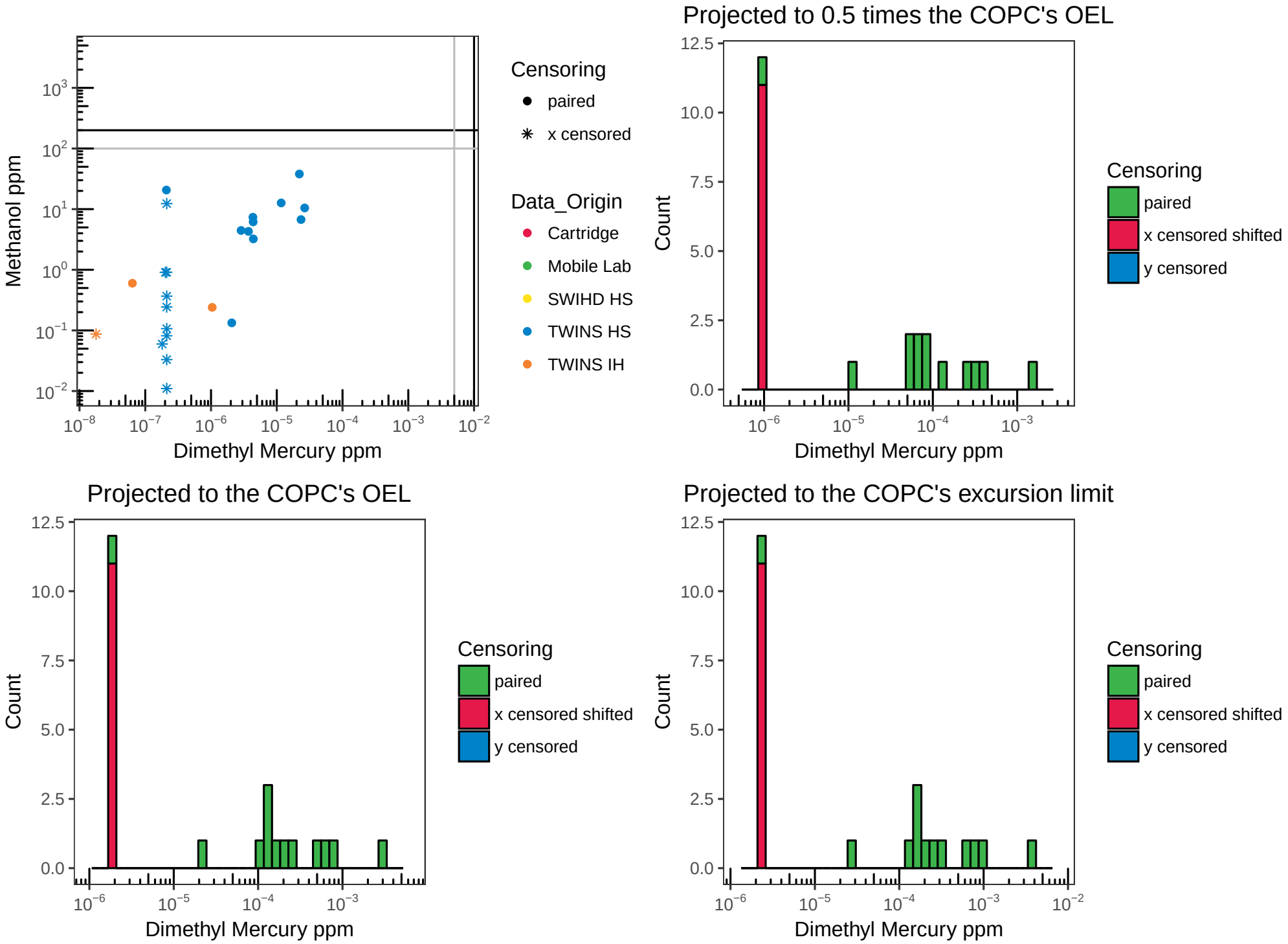


Figure C.2874: Methanol vs Dimethyl Mercury

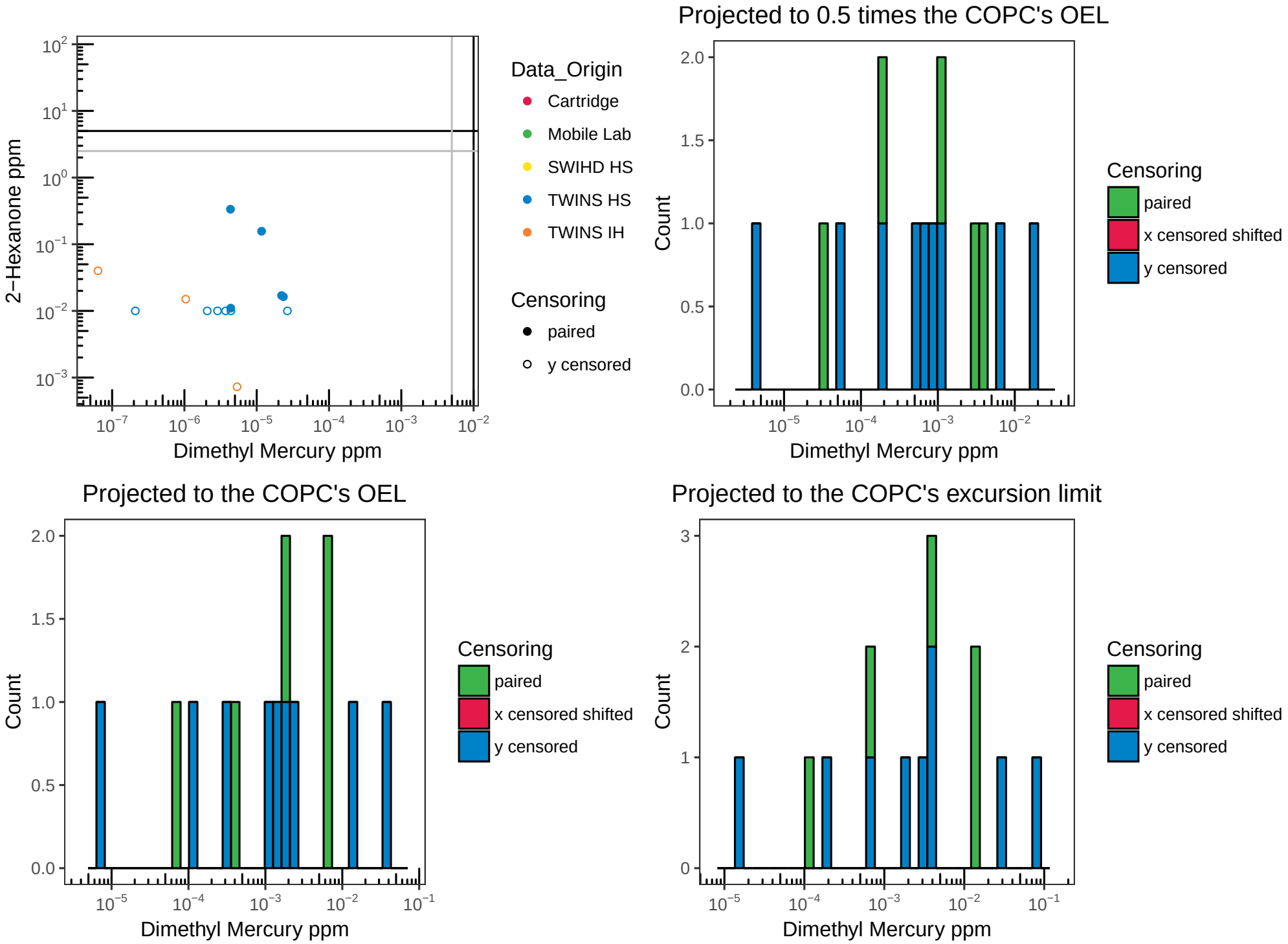


Figure C.2875: 2-Hexanone vs Dimethyl Mercury

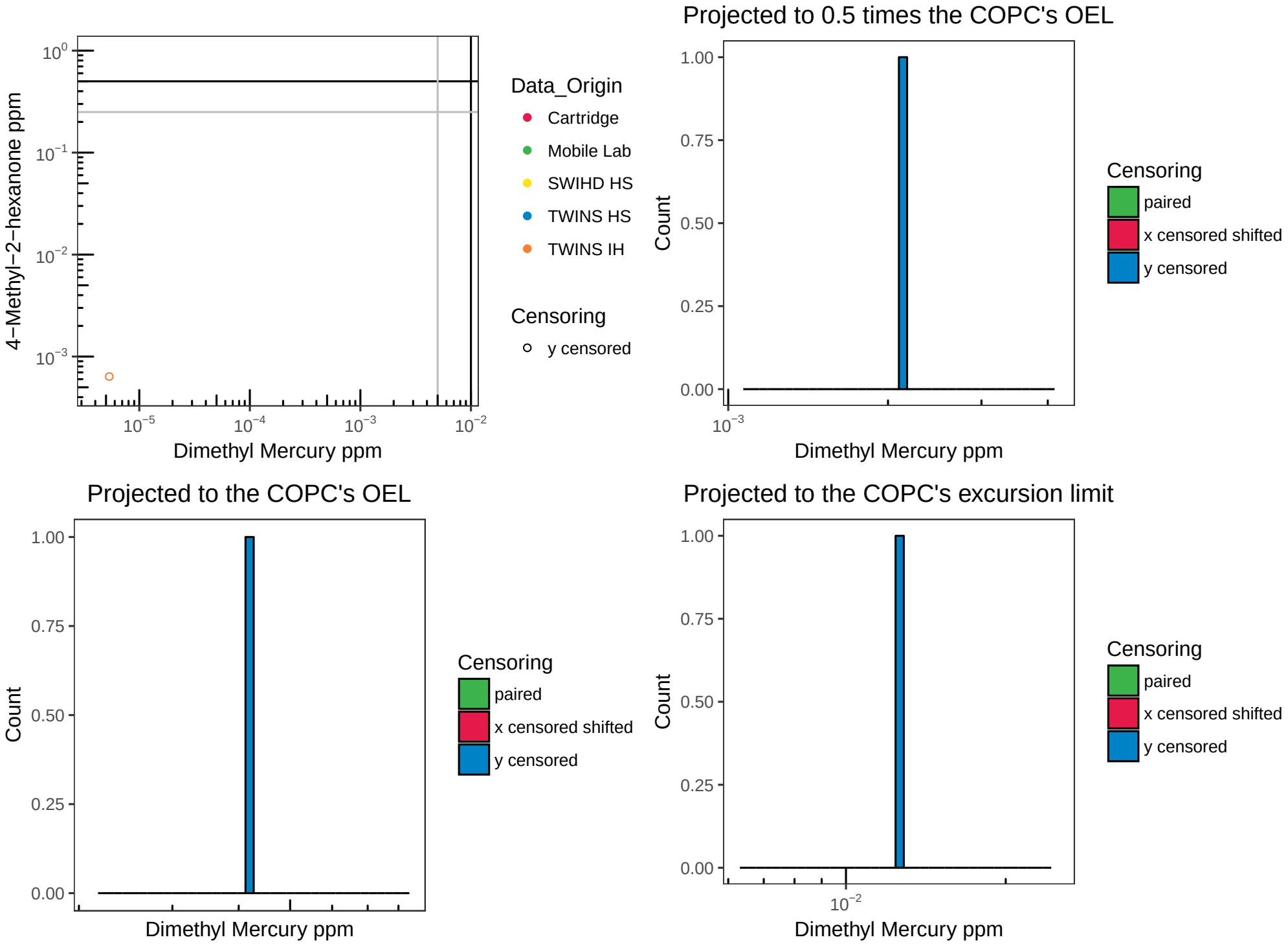


Figure C.2876: 4-Methyl-2-hexanone vs Dimethyl Mercury

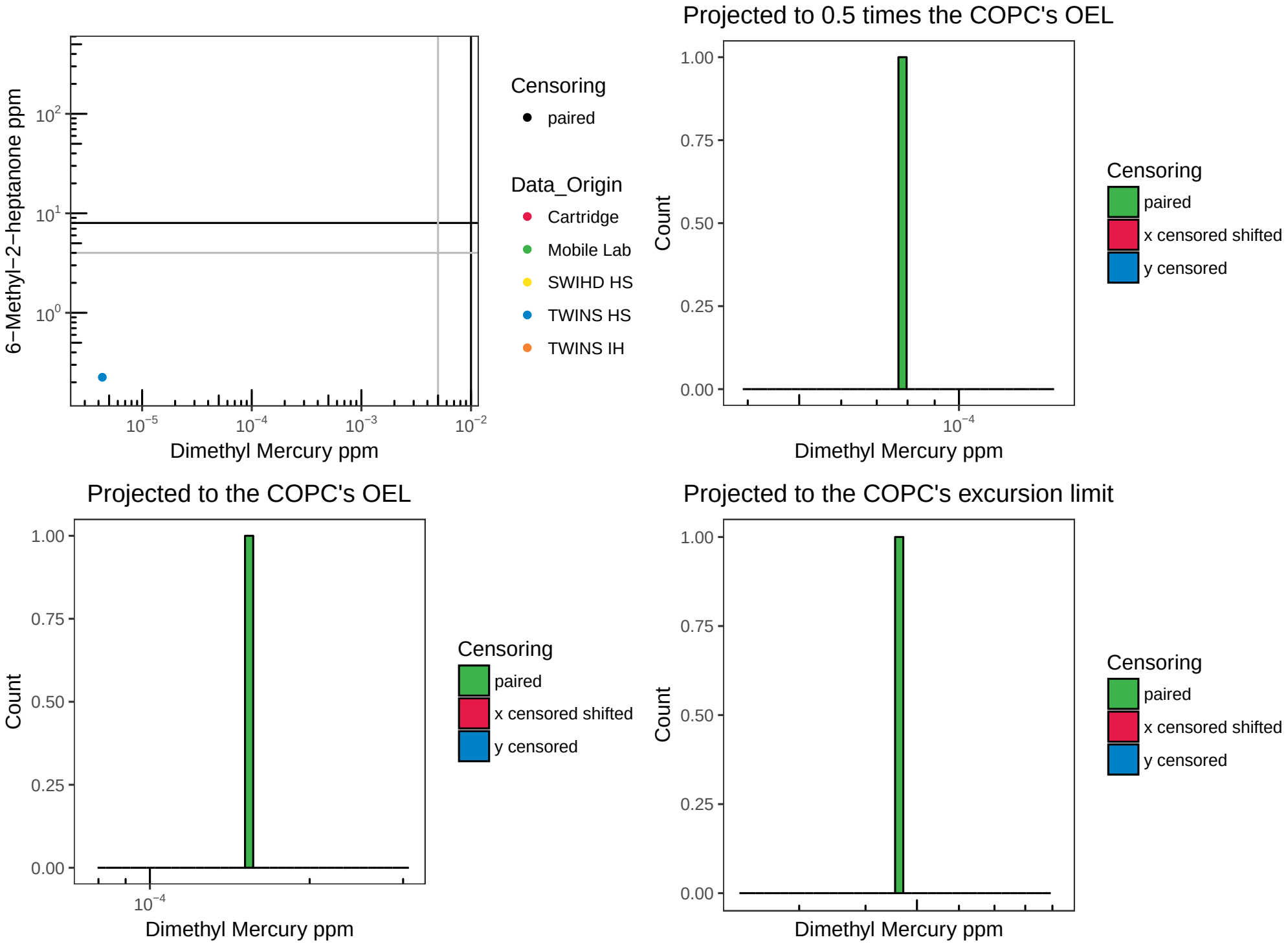


Figure C.2877: 6-Methyl-2-heptanone vs Dimethyl Mercury

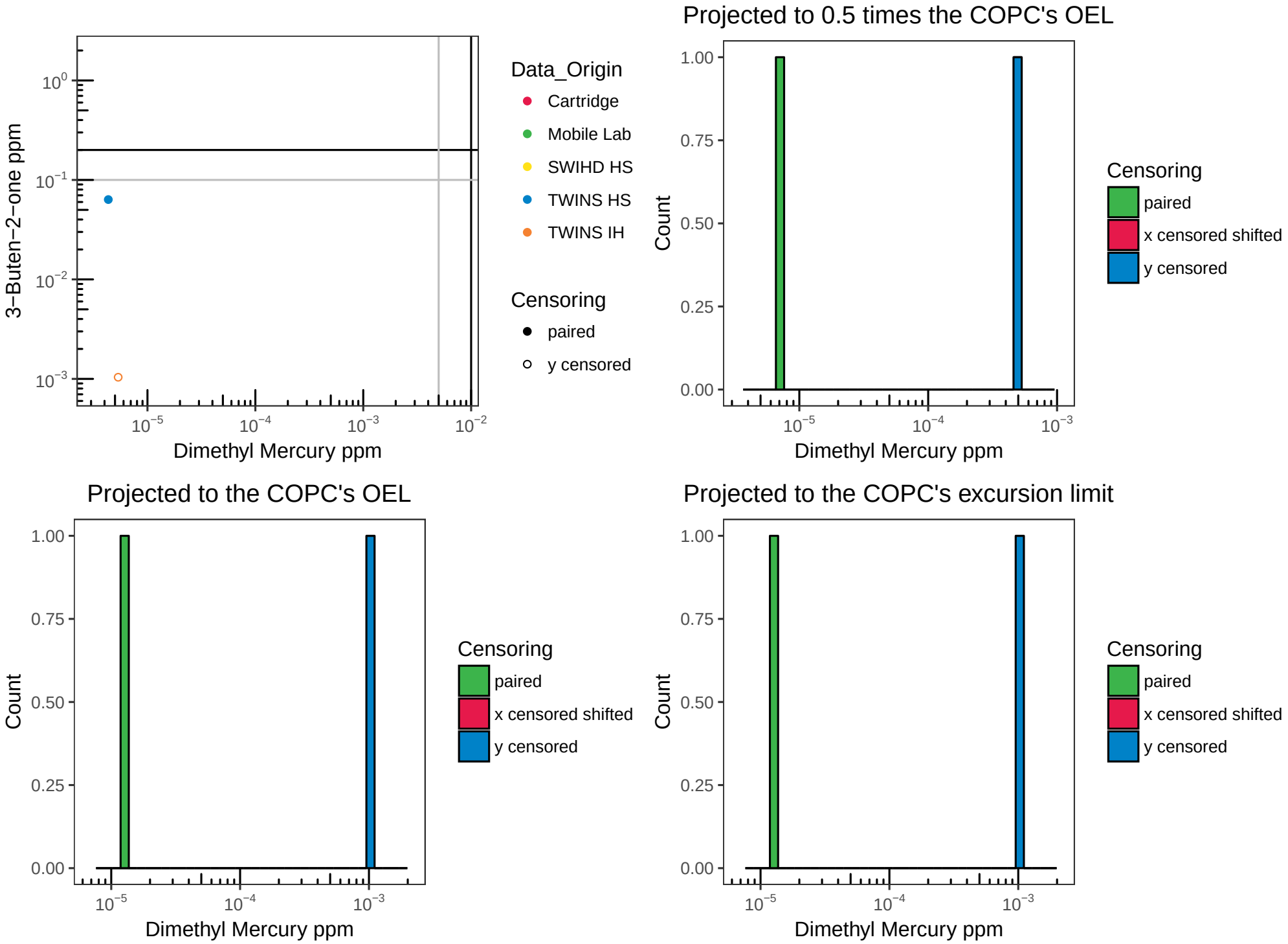


Figure C.2878: 3-Buten-2-one vs Dimethyl Mercury

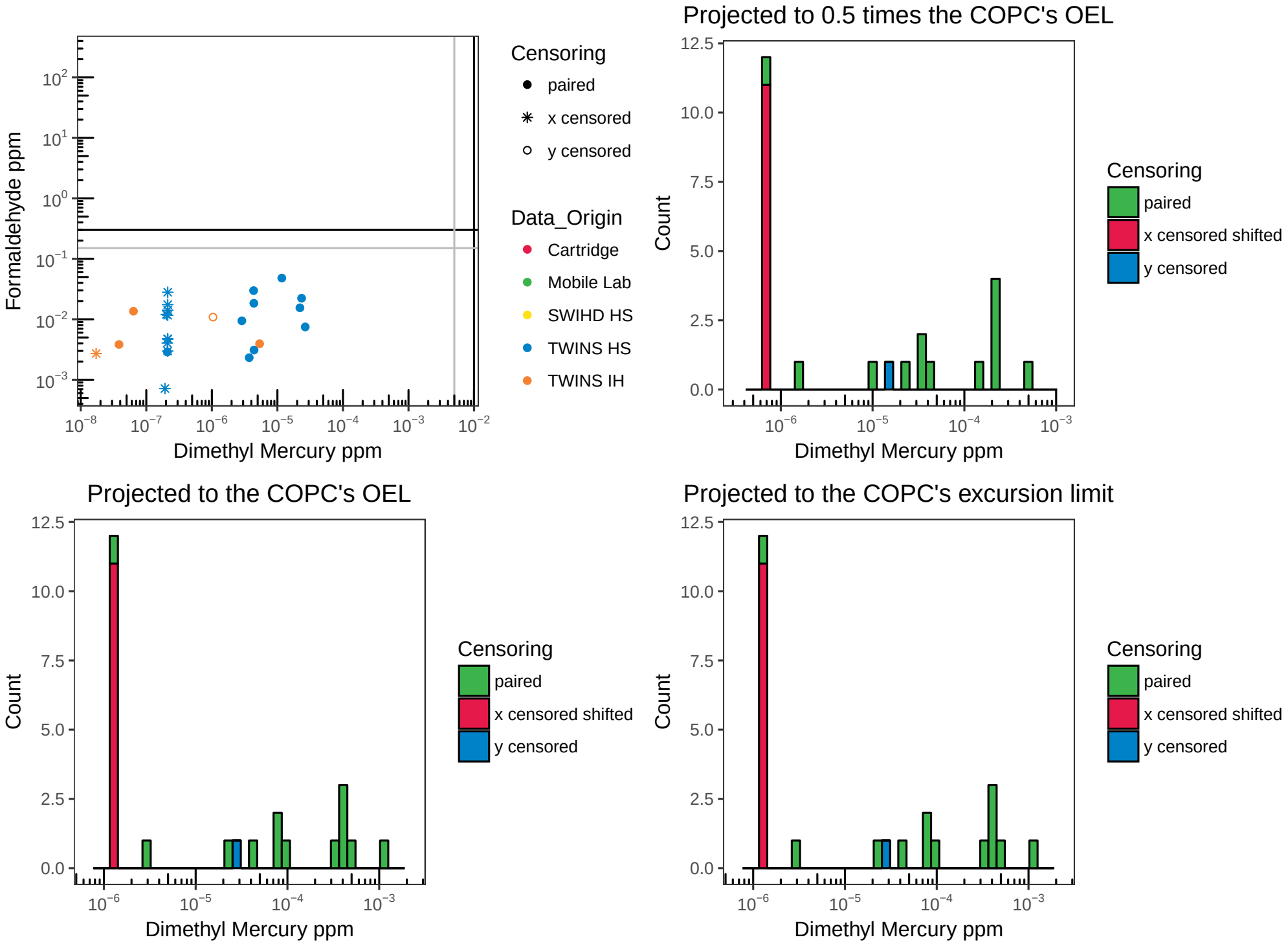


Figure C.2879: Formaldehyde vs Dimethyl Mercury

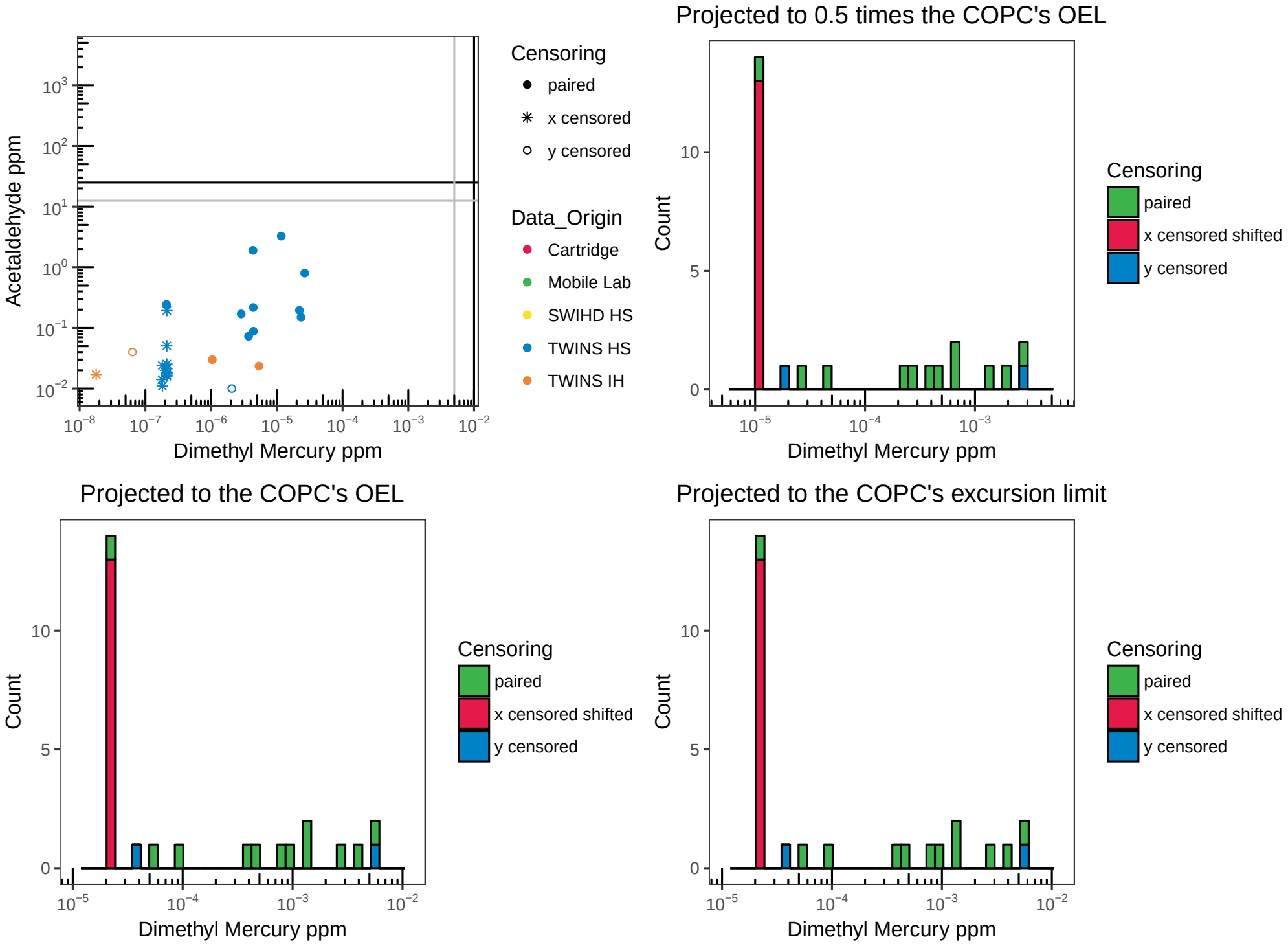


Figure C.2880: Acetaldehyde vs Dimethyl Mercury

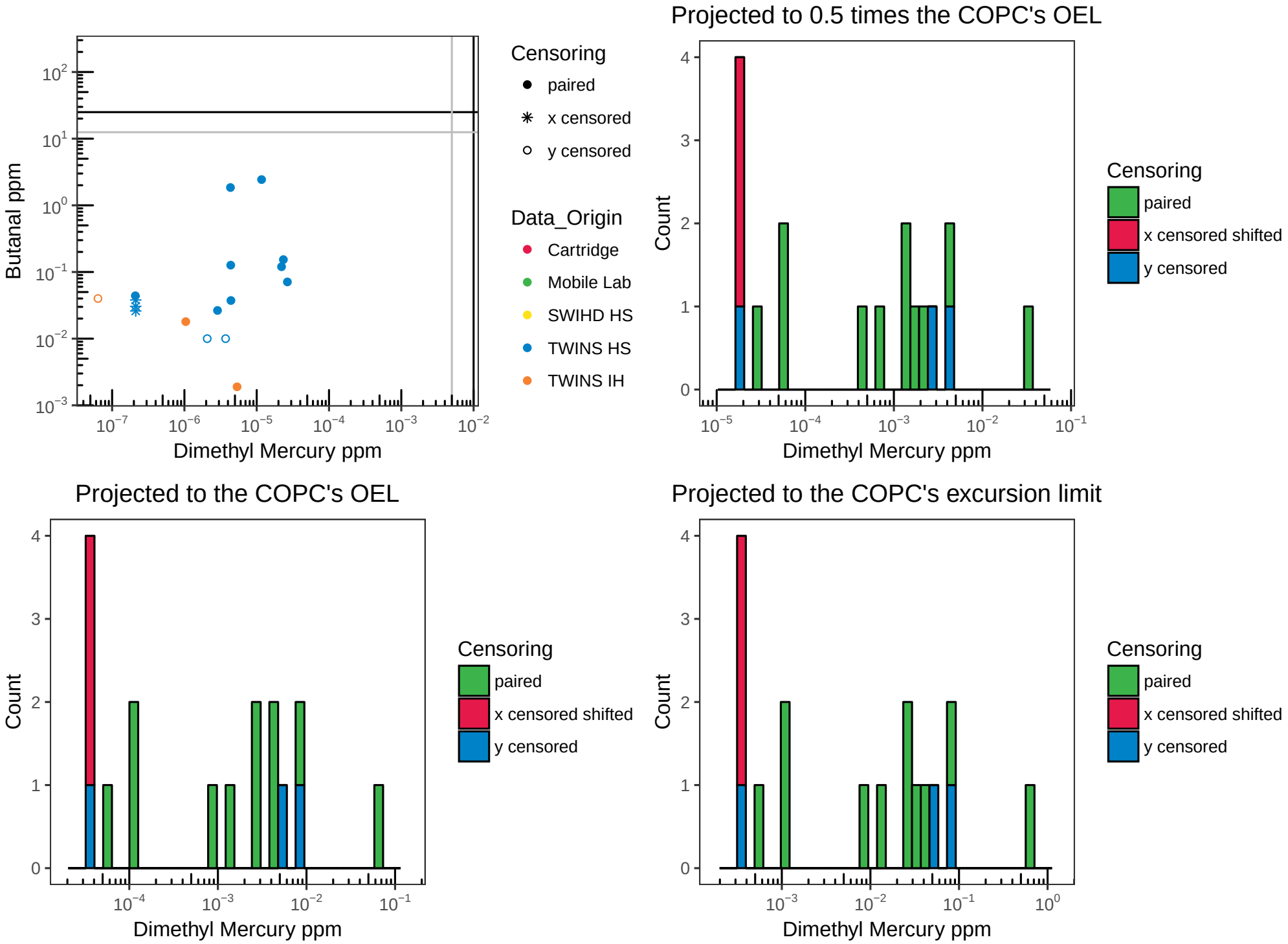


Figure C.2881: Butanal vs Dimethyl Mercury

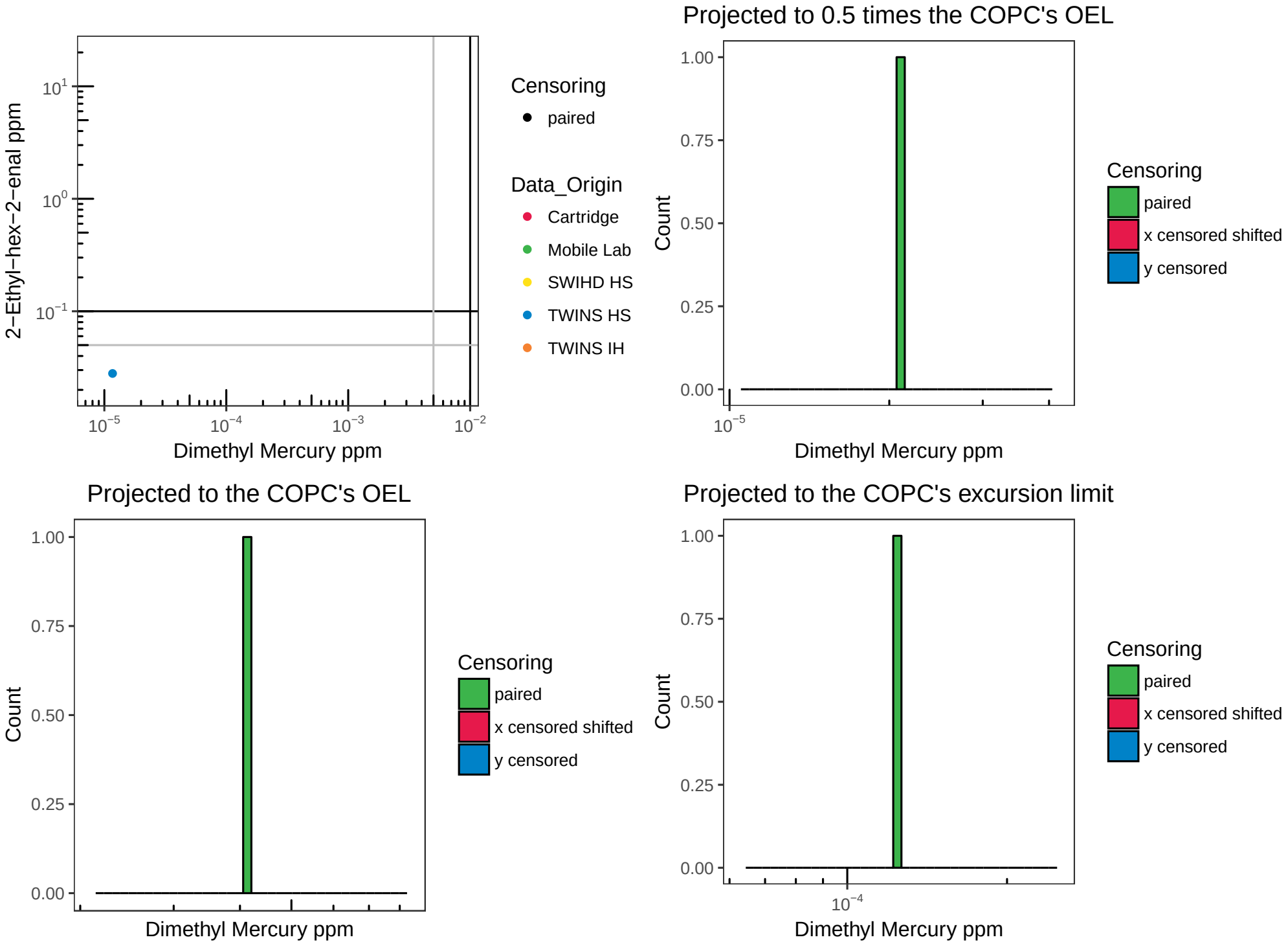


Figure C.2882: 2-Ethyl-hex-2-enal vs Dimethyl Mercury

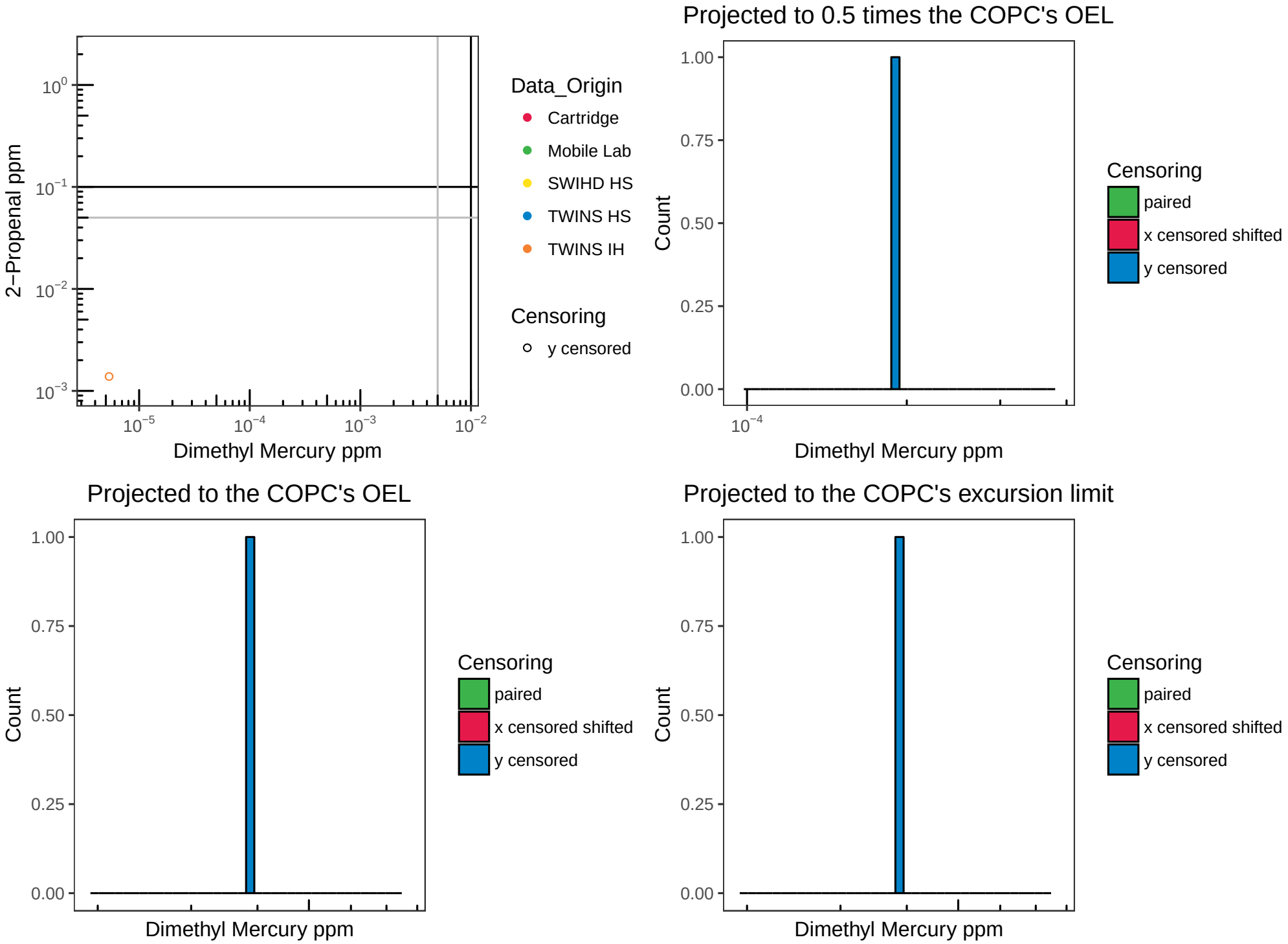


Figure C.2883: 2-Propenal vs Dimethyl Mercury

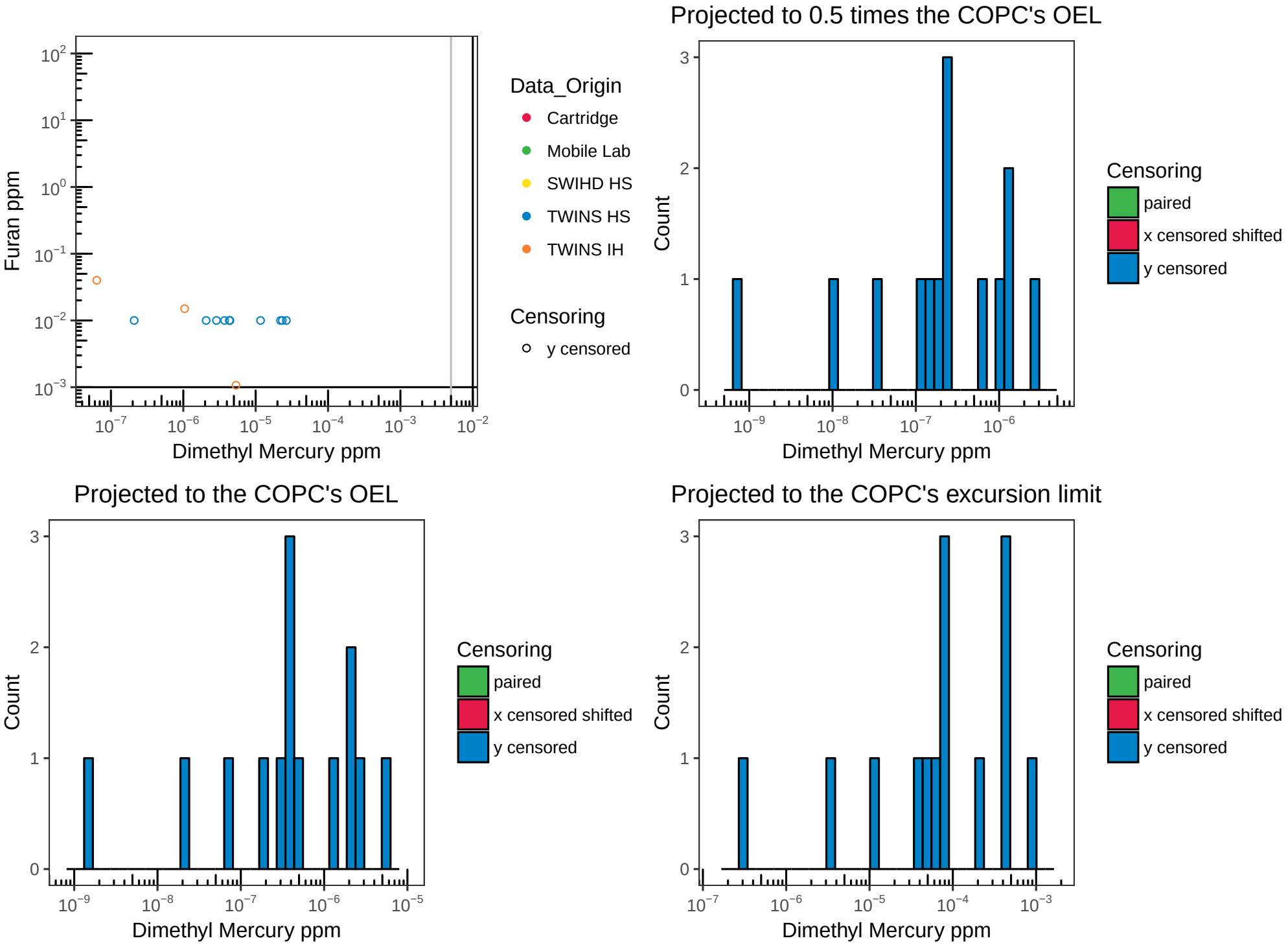


Figure C.2884: Furan vs Dimethyl Mercury

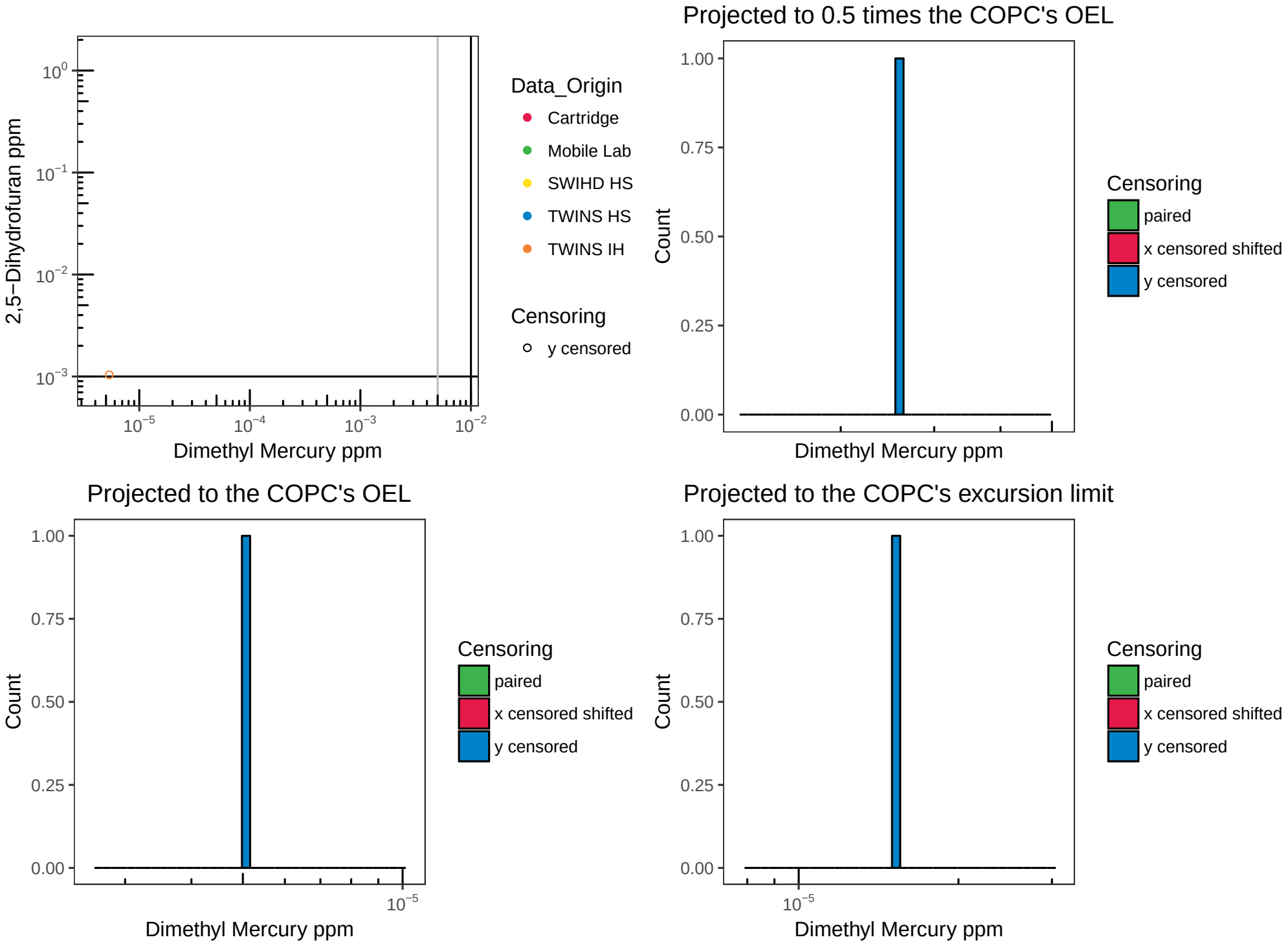


Figure C.2885: 2,5-Dihydrofuran vs Dimethyl Mercury

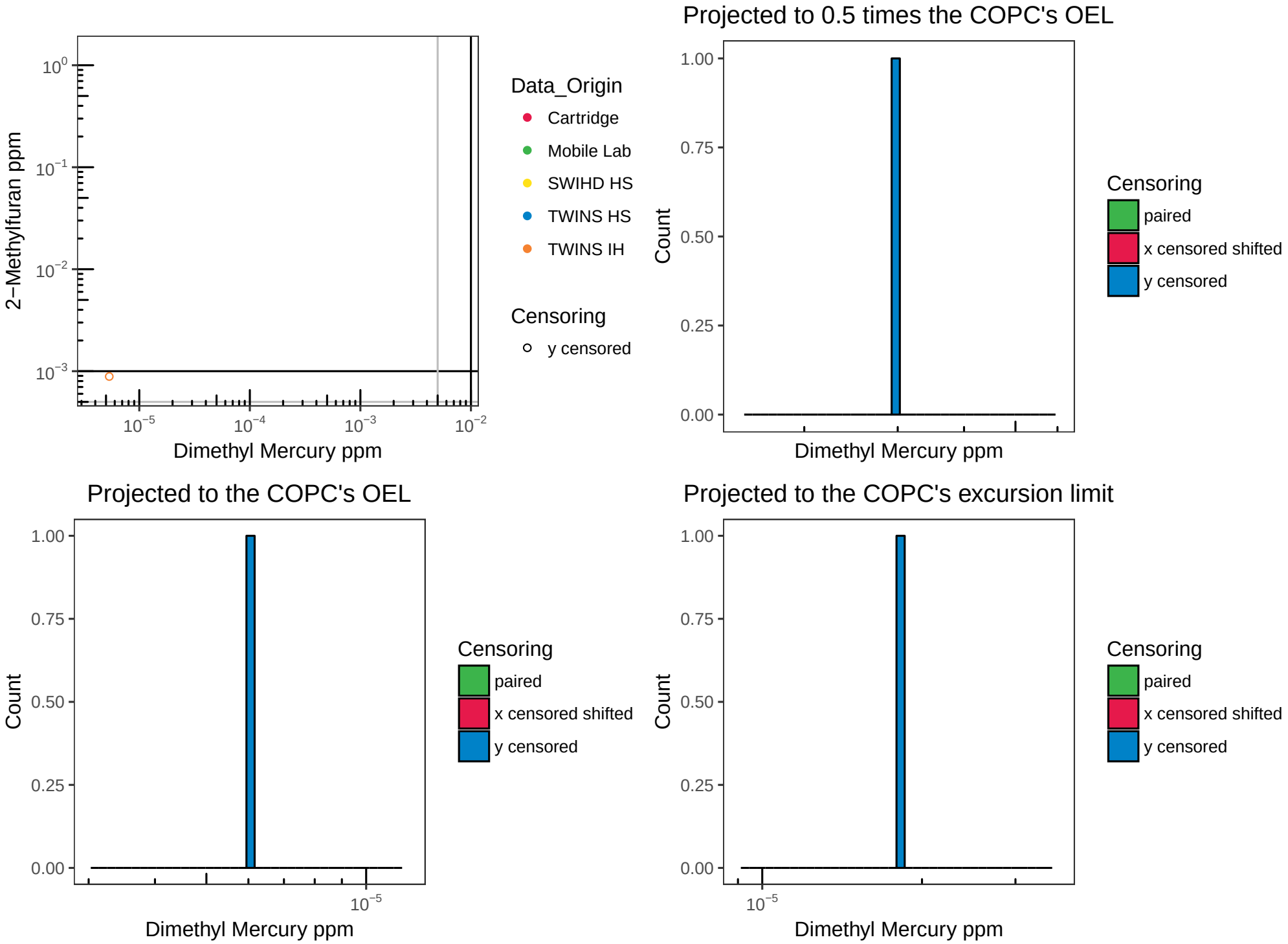


Figure C.2886: 2-Methylfuran vs Dimethyl Mercury

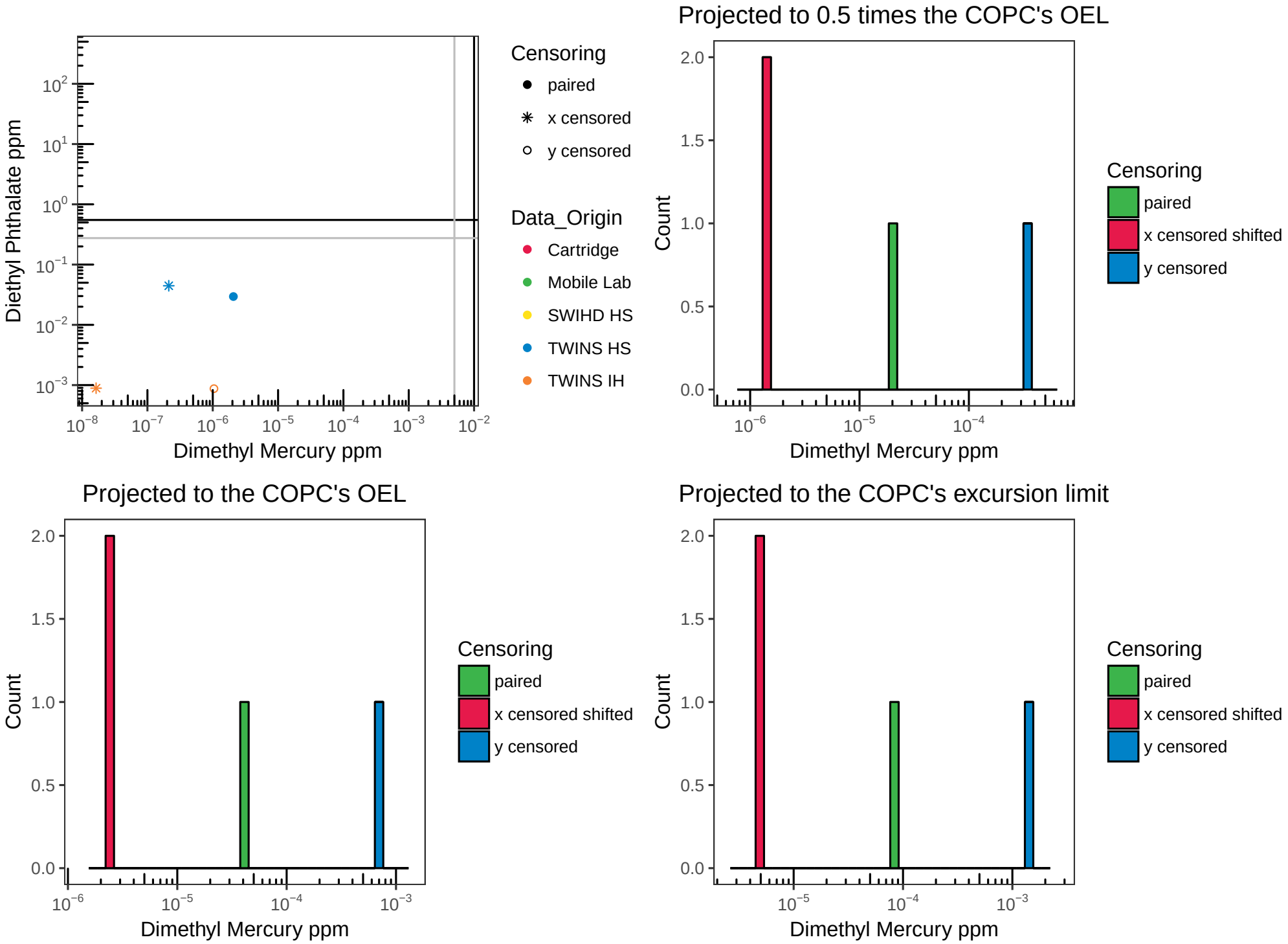


Figure C.2887: Diethyl Phthalate vs Dimethyl Mercury

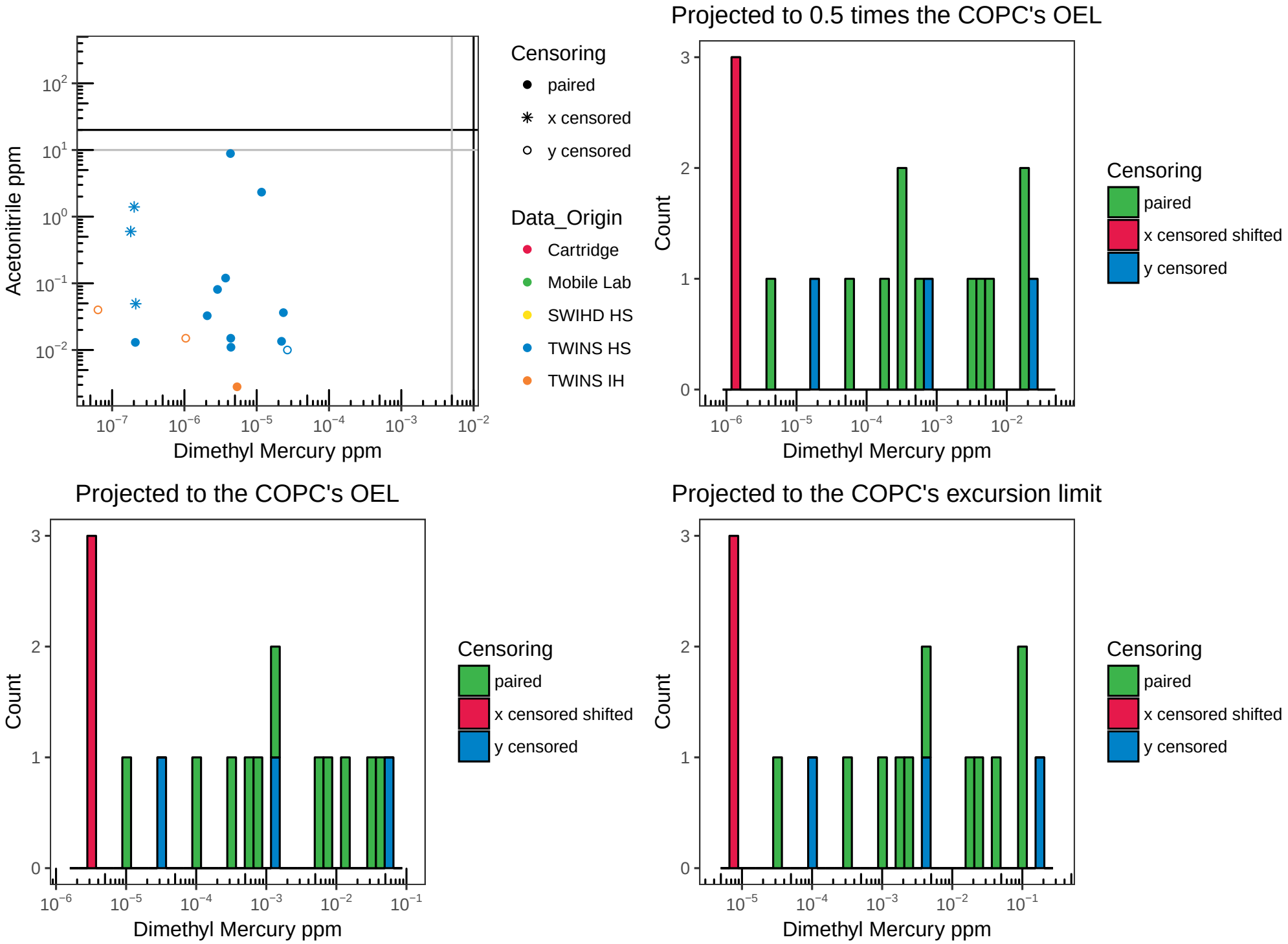


Figure C.2888: Acetonitrile vs Dimethyl Mercury

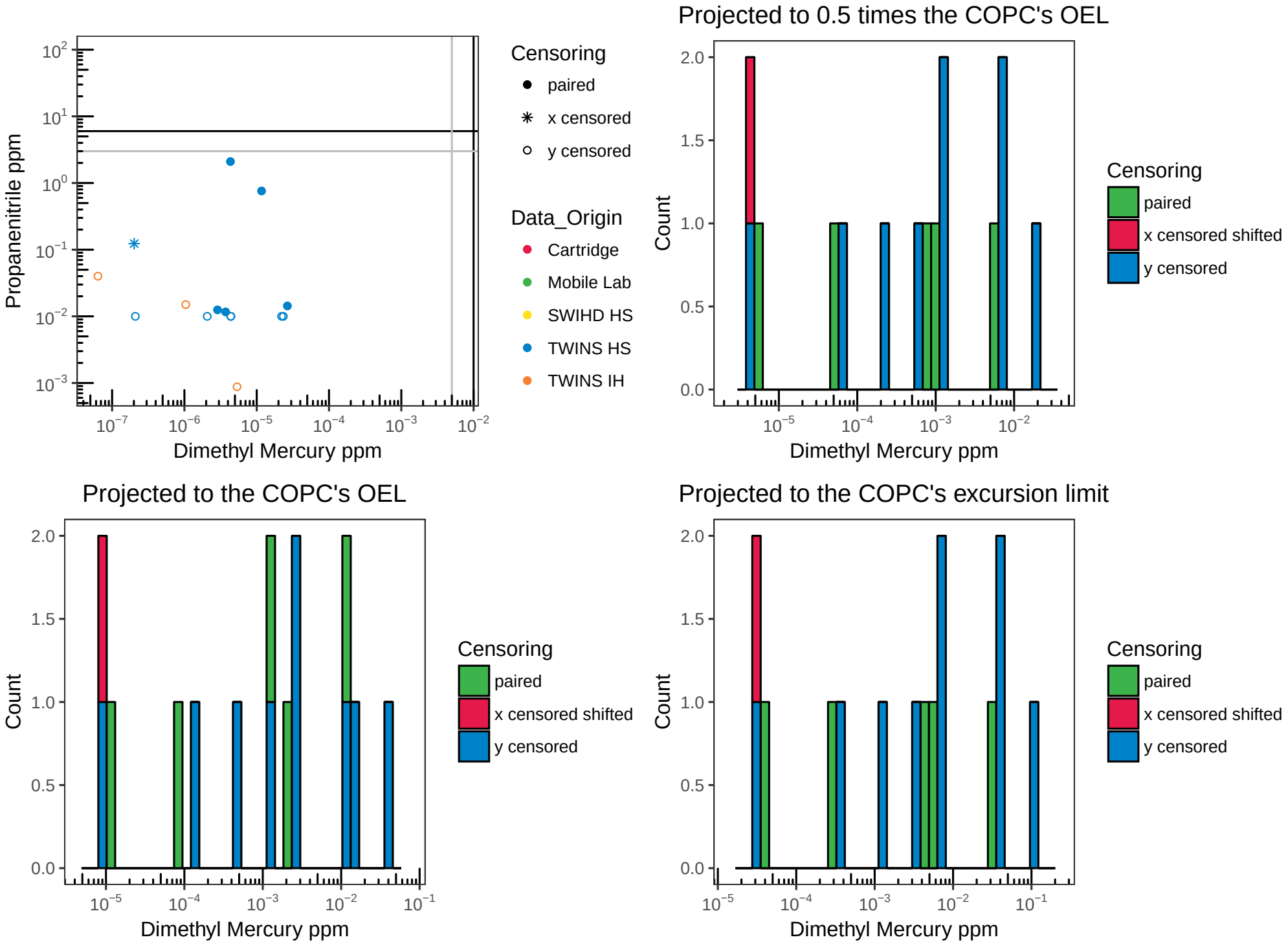


Figure C.2889: Propanenitrile vs Dimethyl Mercury

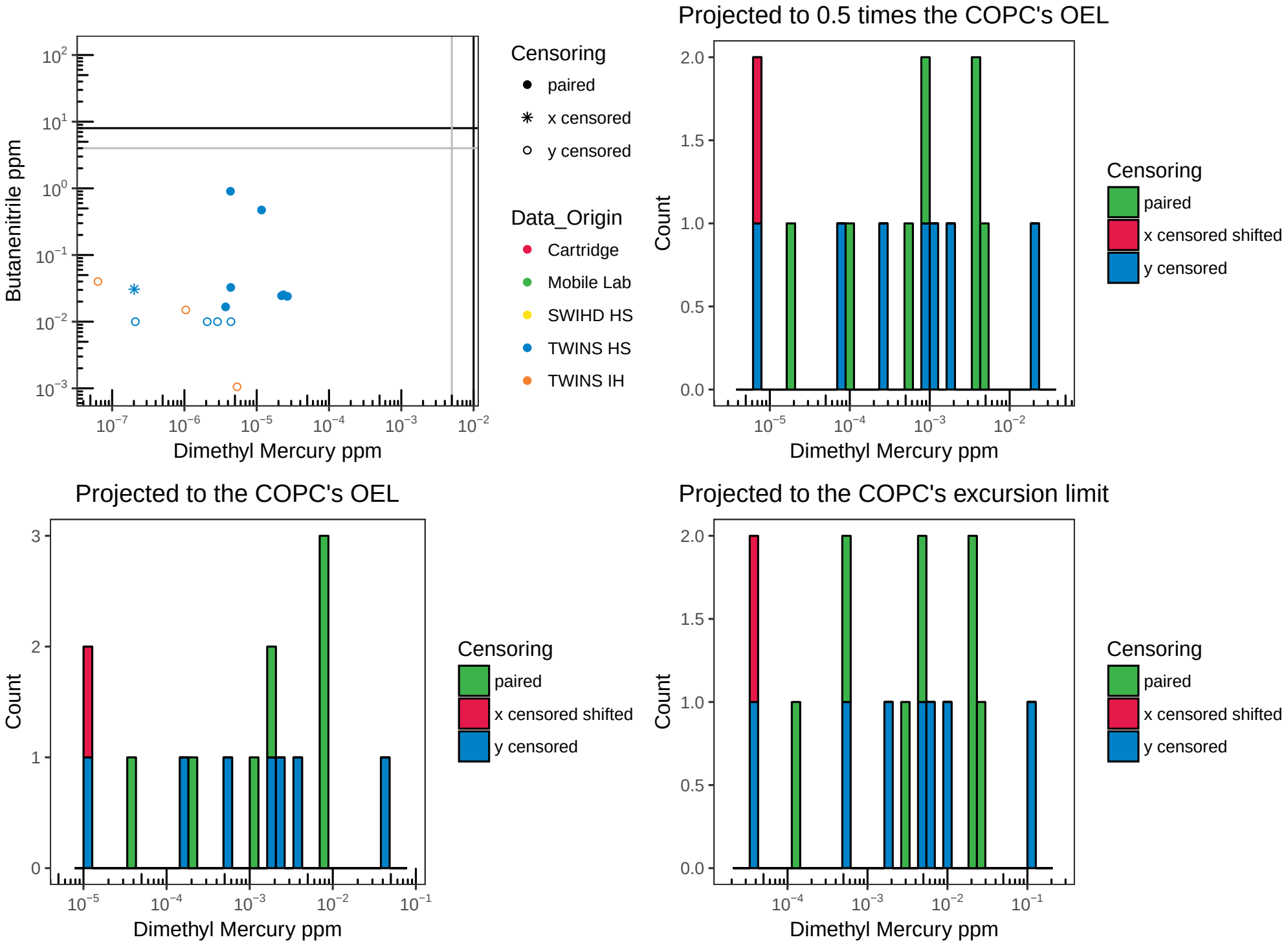


Figure C.2890: Butanenitrile vs Dimethyl Mercury

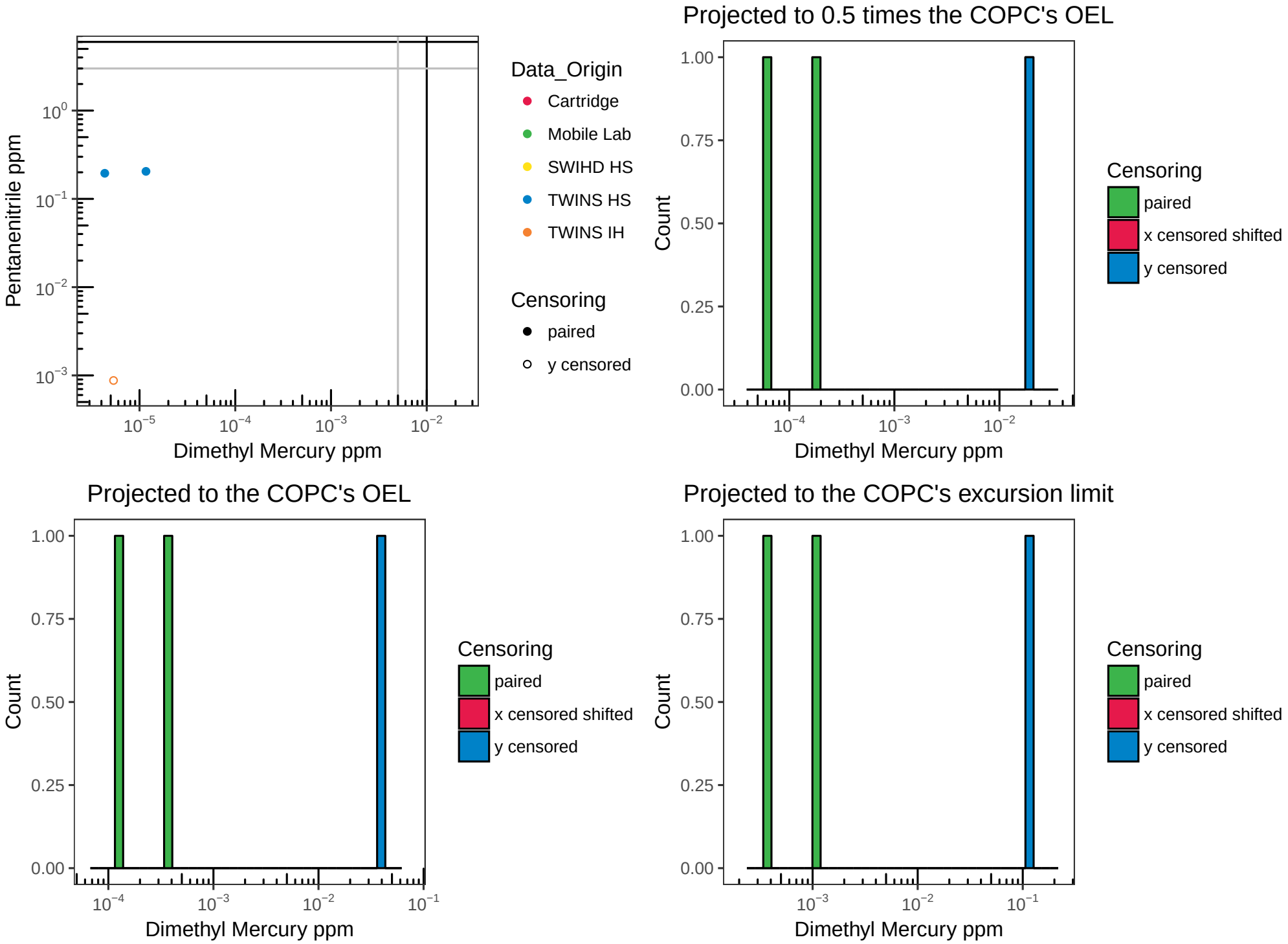


Figure C.2891: Pentanenitrile vs Dimethyl Mercury

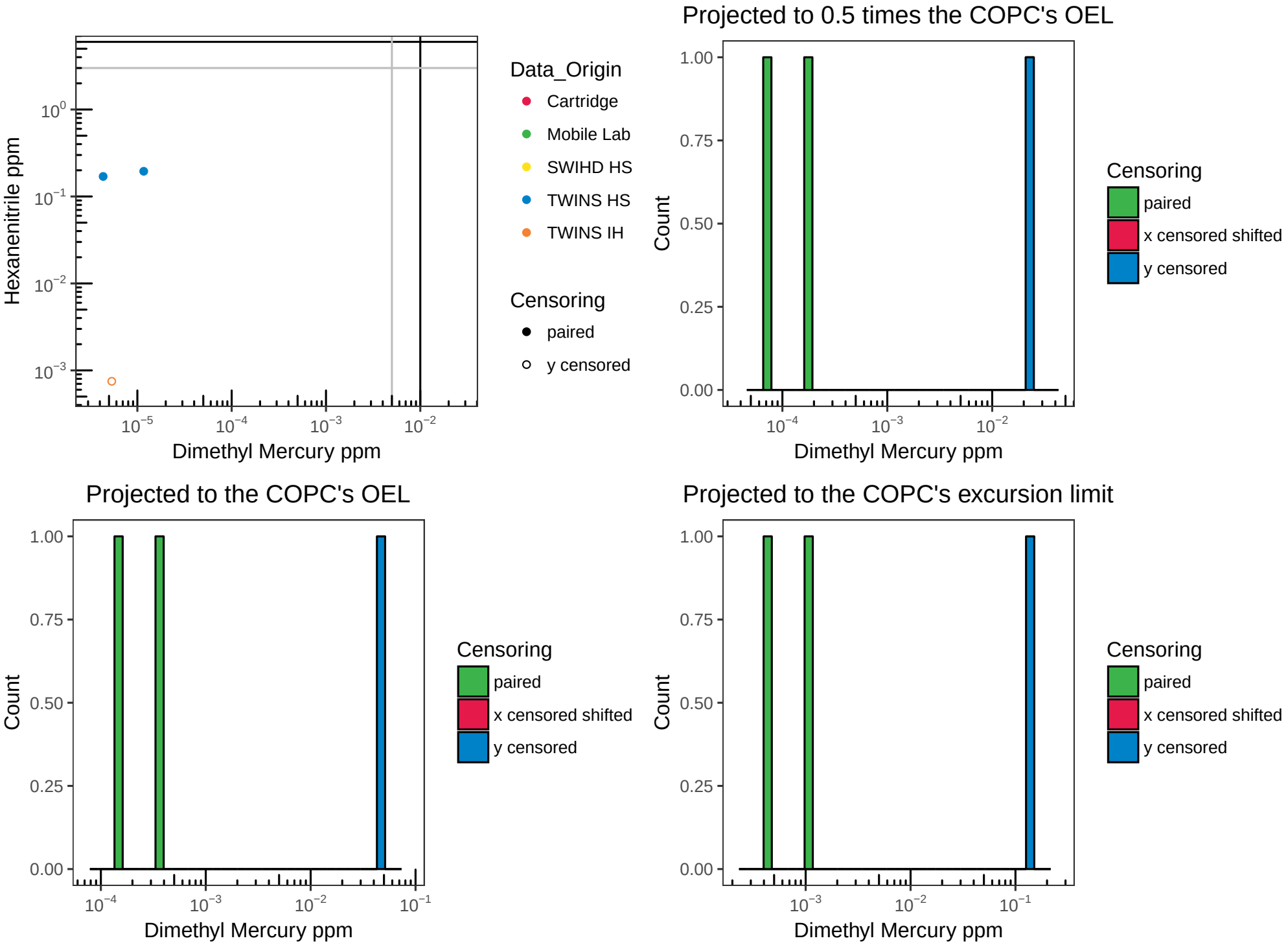


Figure C.2892: Hexanenitrile vs Dimethyl Mercury

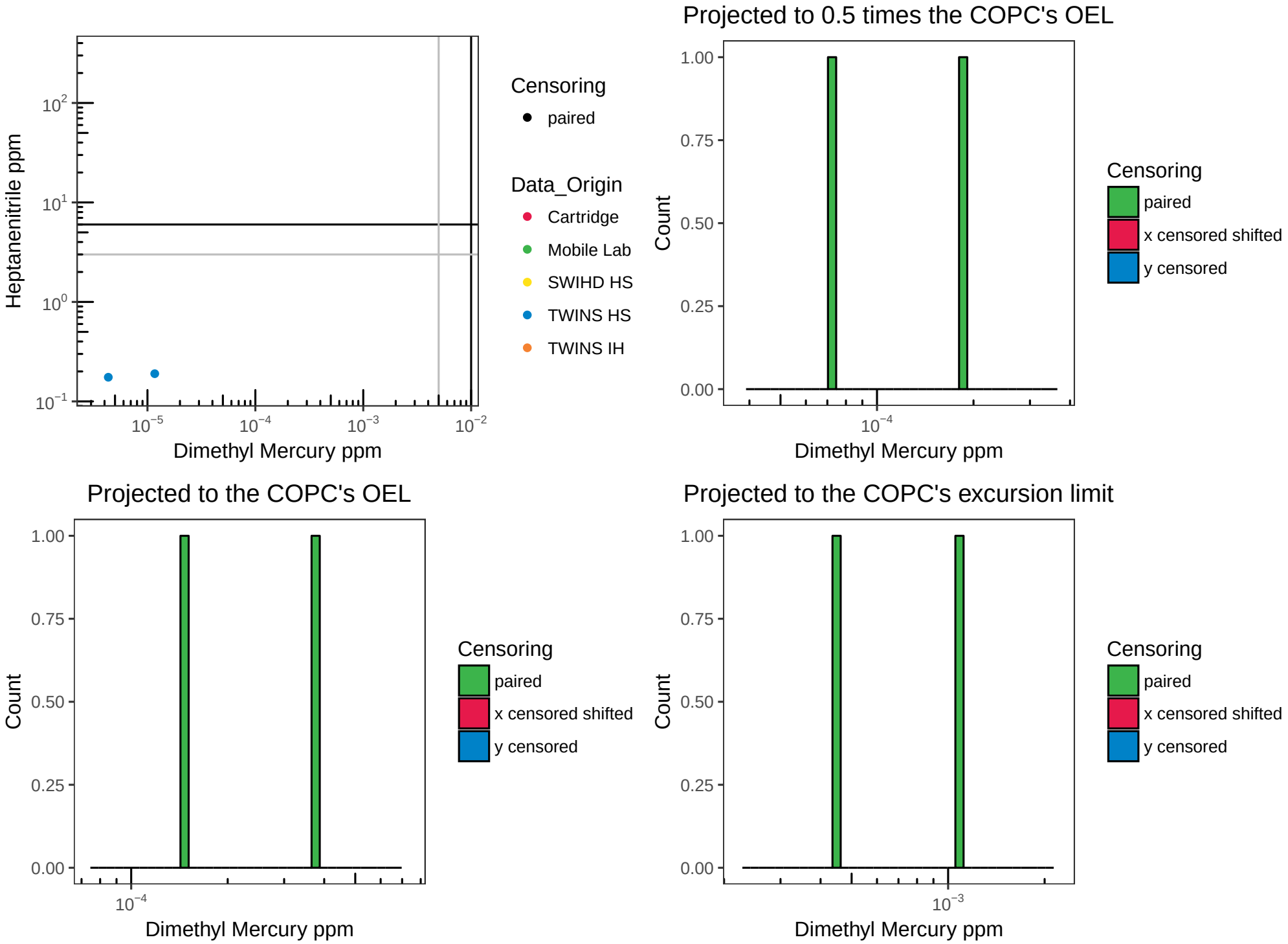


Figure C.2893: Heptanenitrile vs Dimethyl Mercury

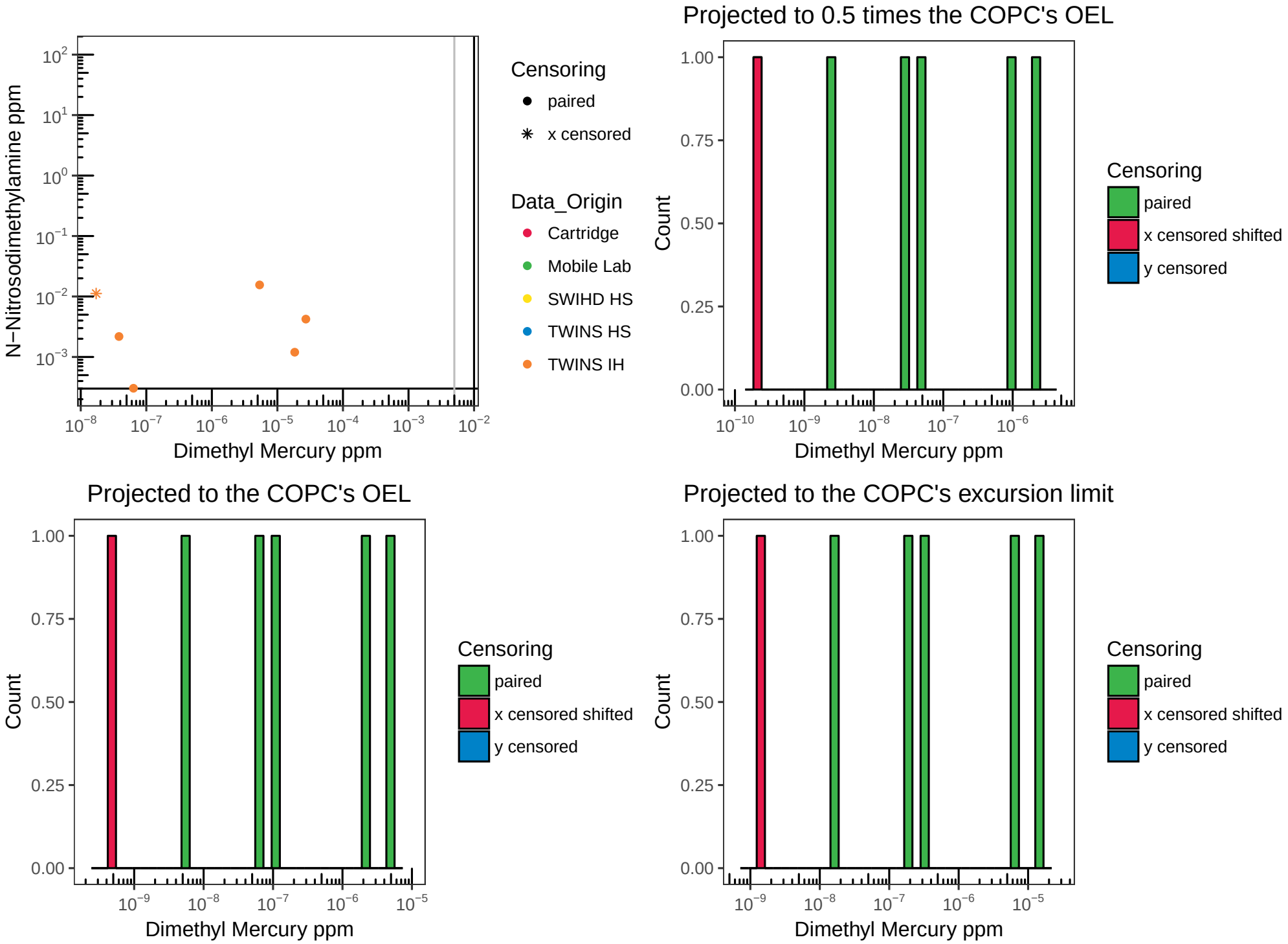


Figure C.2894: N-Nitrosodimethylamine vs Dimethyl Mercury

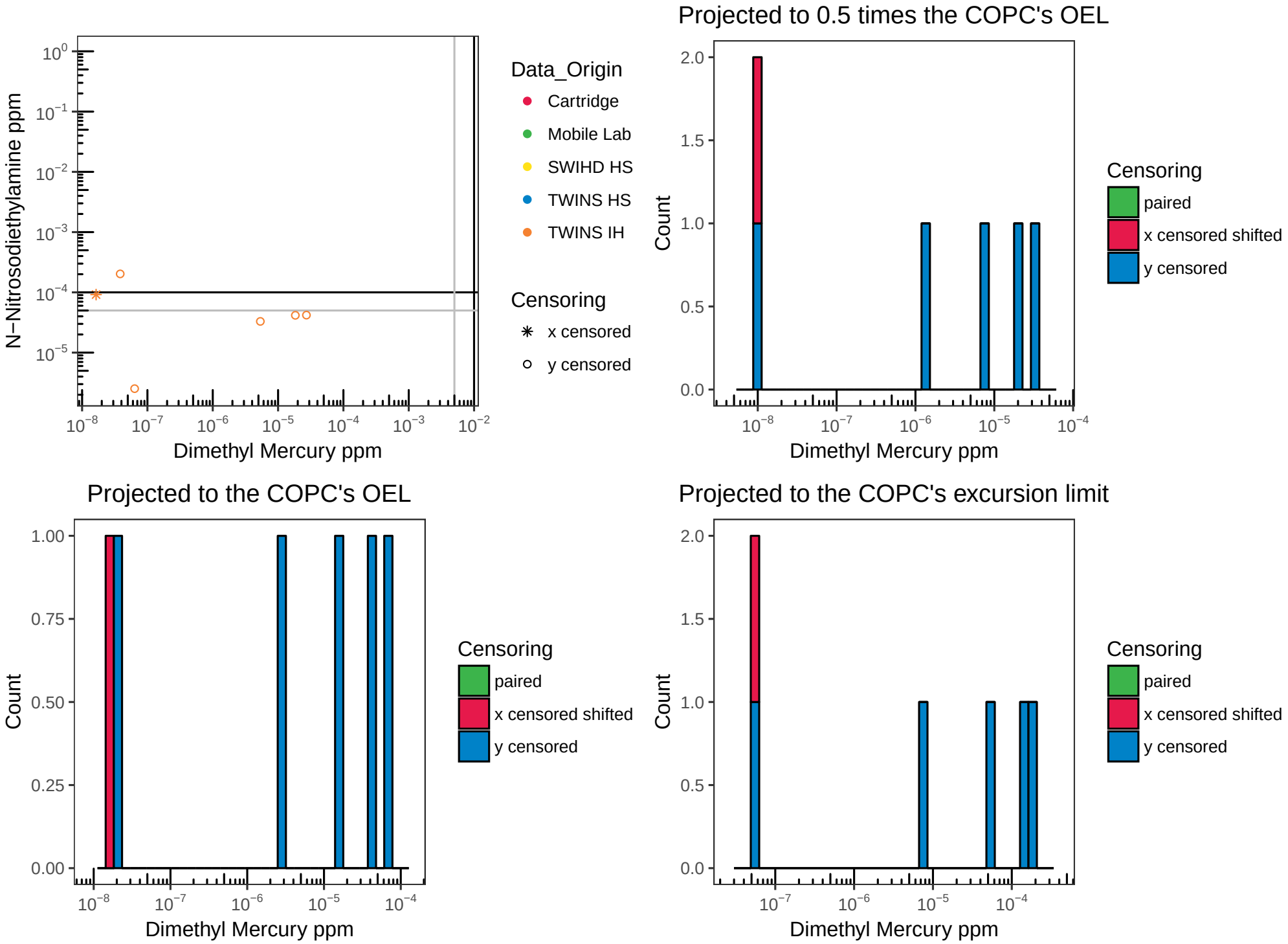


Figure C.2895: N-Nitrosodiethylamine vs Dimethyl Mercury

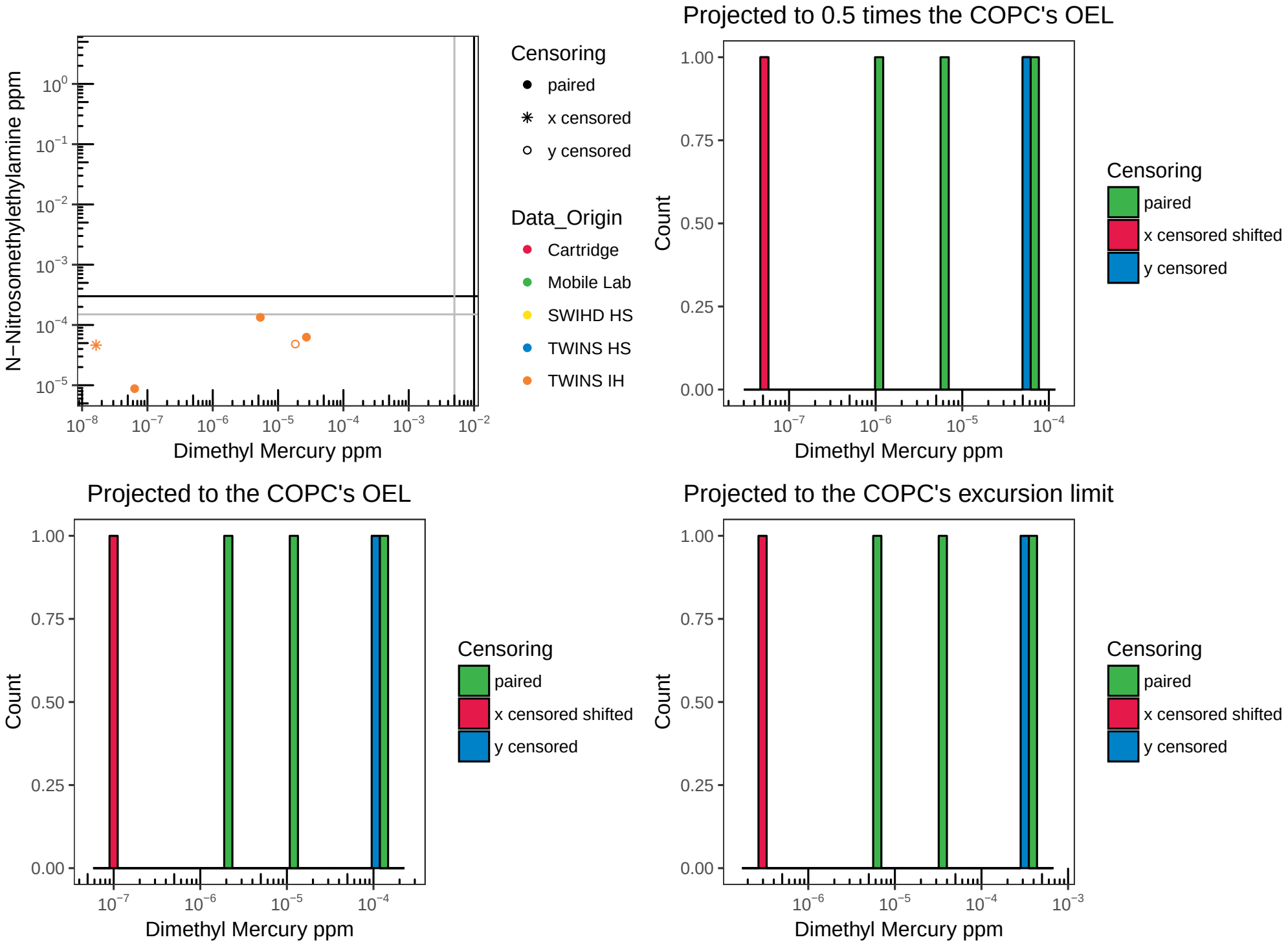


Figure C.2896: N-Nitrosomethylethylamine vs Dimethyl Mercury

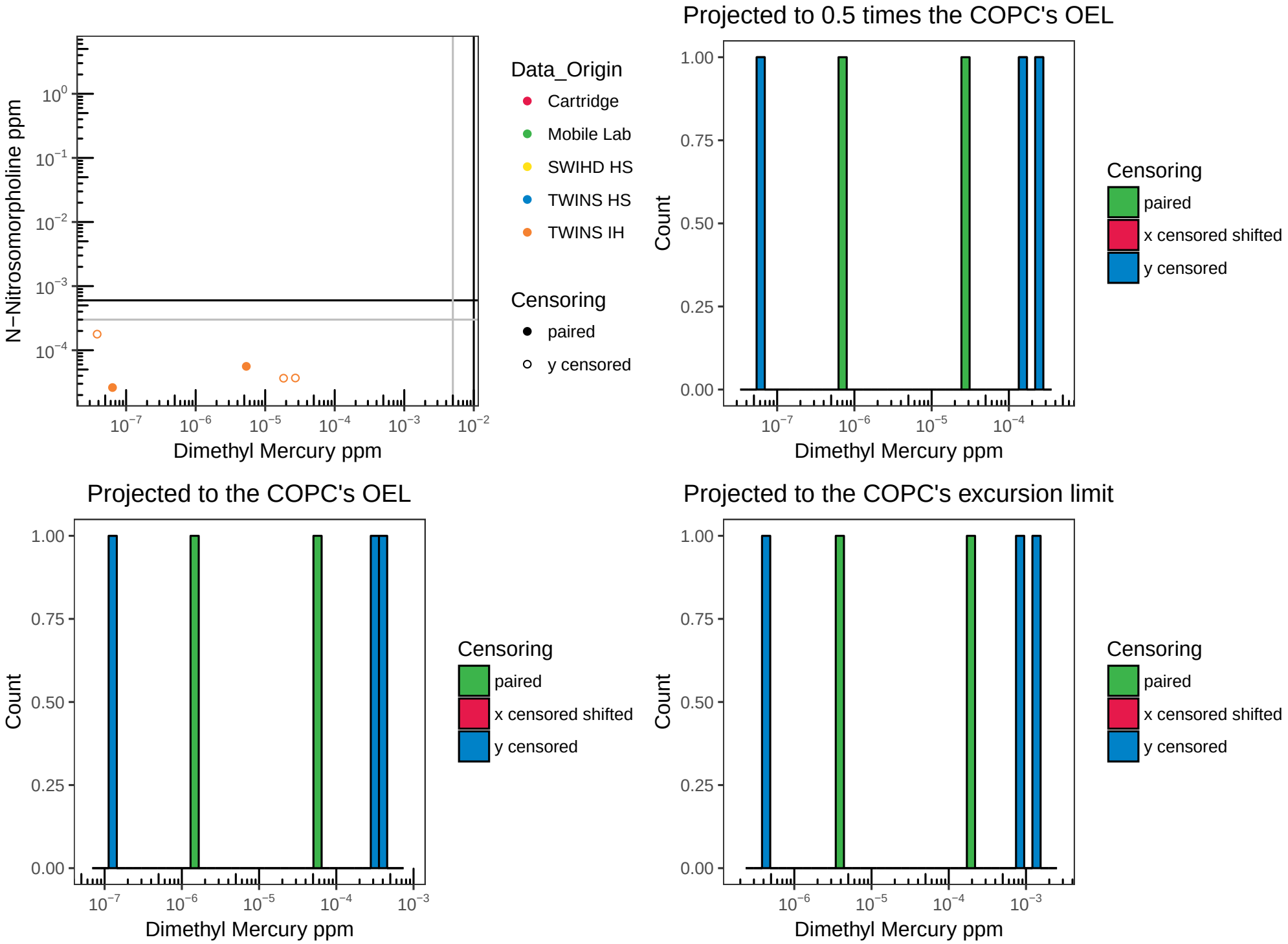


Figure C.2897: N-Nitrosomorpholine vs Dimethyl Mercury

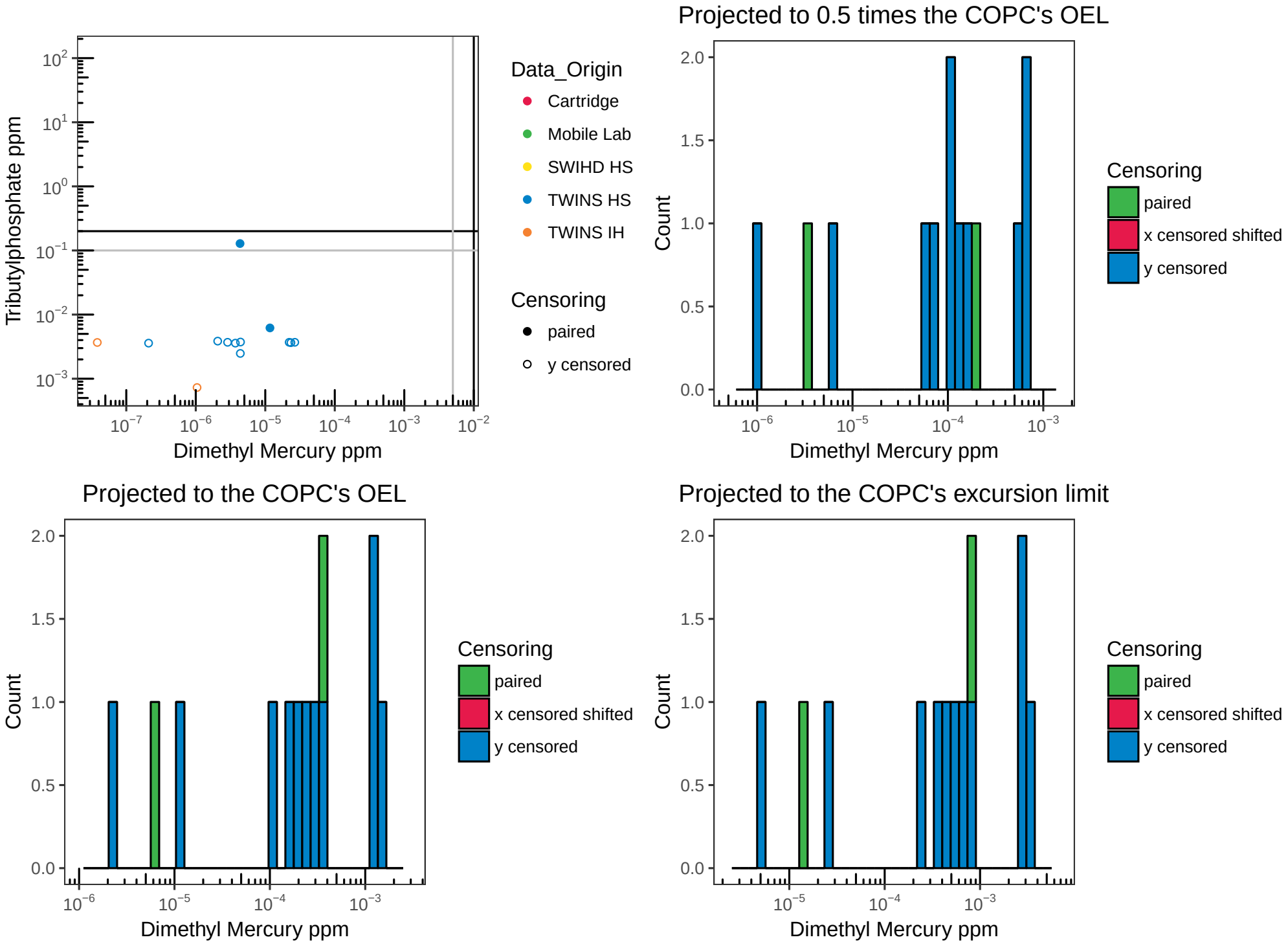


Figure C.2898: Tributylphosphate vs Dimethyl Mercury

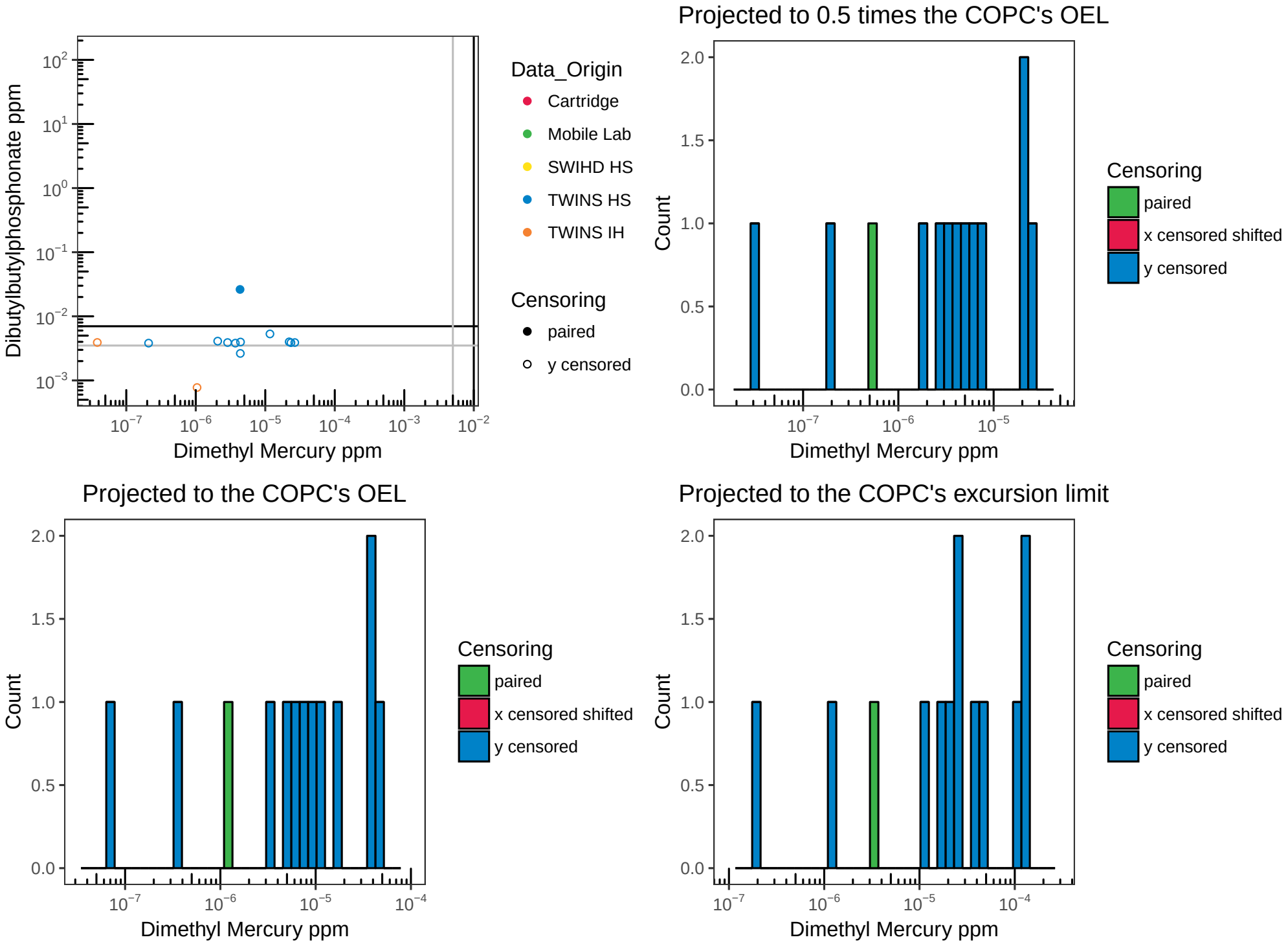


Figure C.2899: Dibutylbutylphosphonate vs Dimethyl Mercury

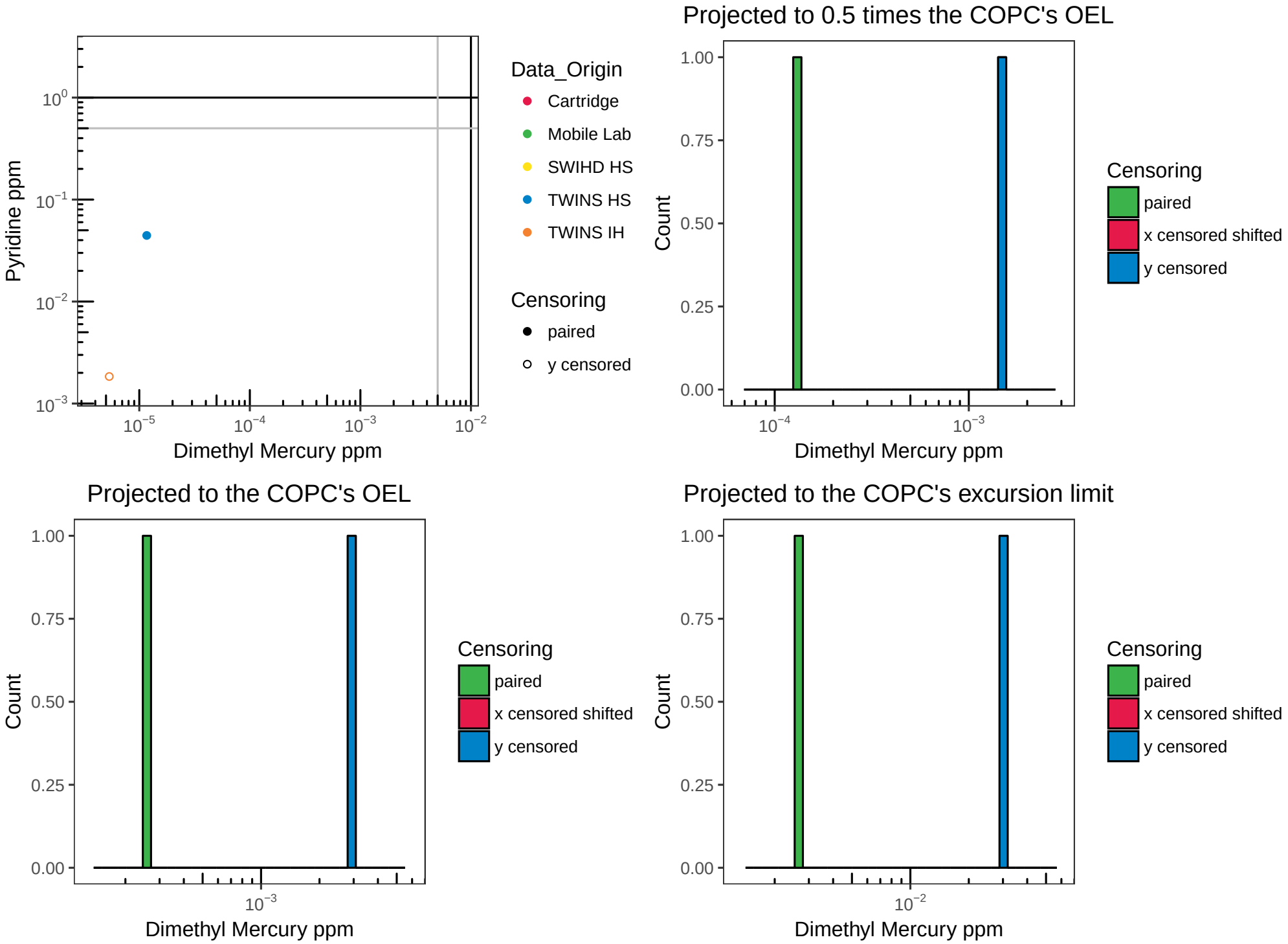


Figure C.2900: Pyridine vs Dimethyl Mercury

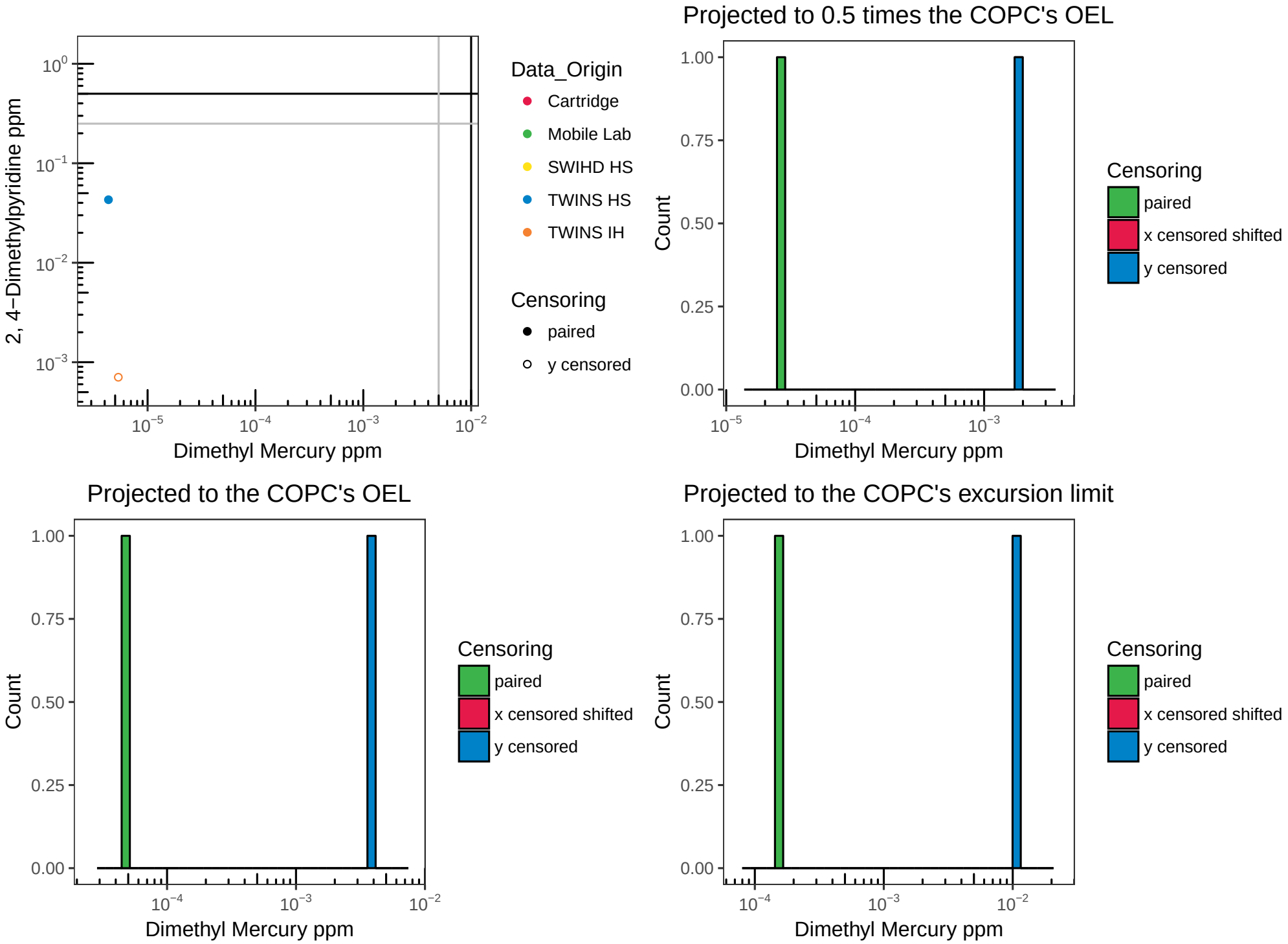


Figure C.2901: 2, 4-Dimethylpyridine vs Dimethyl Mercury

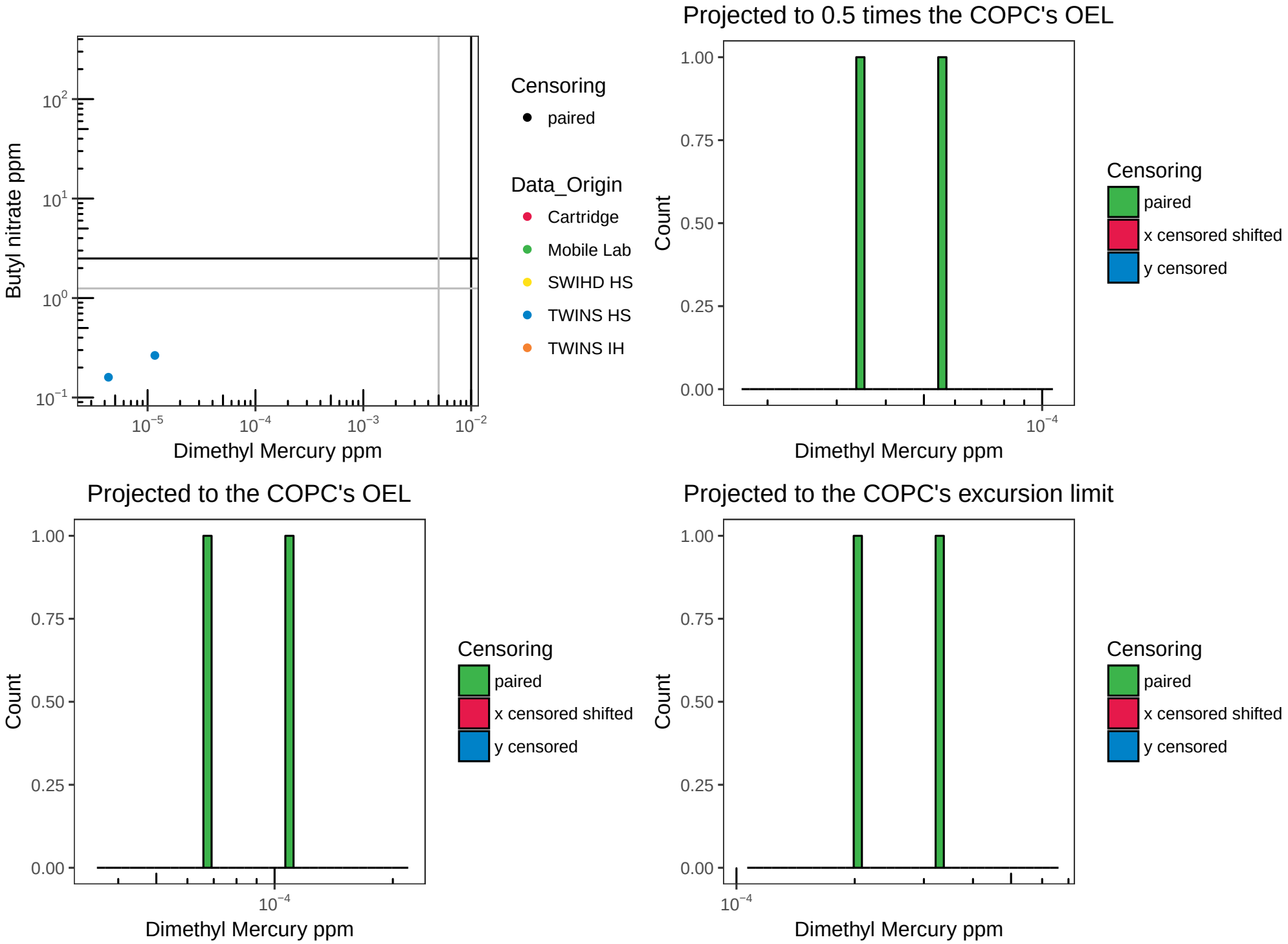


Figure C.2902: Butyl nitrate vs Dimethyl Mercury

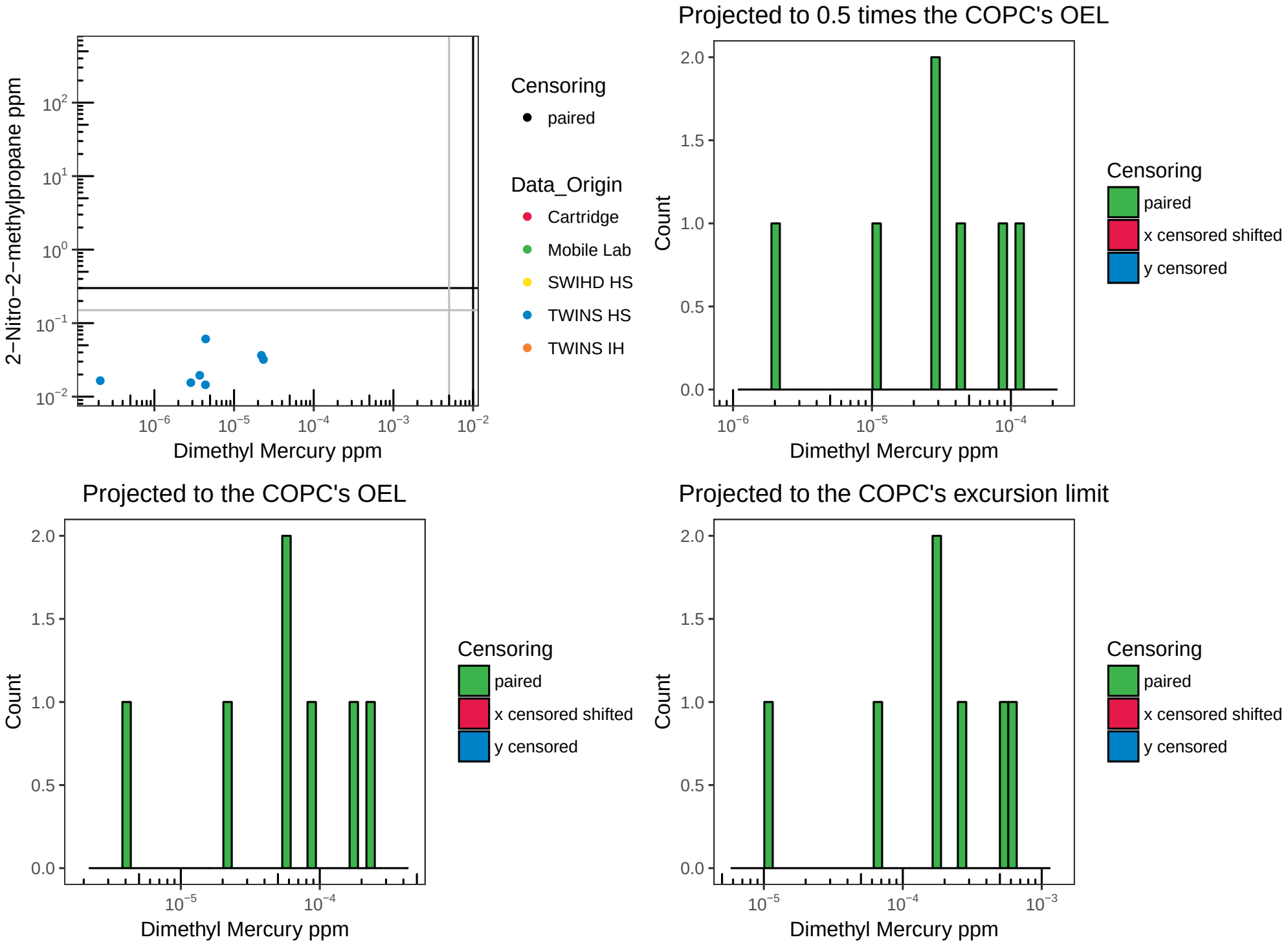


Figure C.2903: 2-Nitro-2-methylpropane vs Dimethyl Mercury

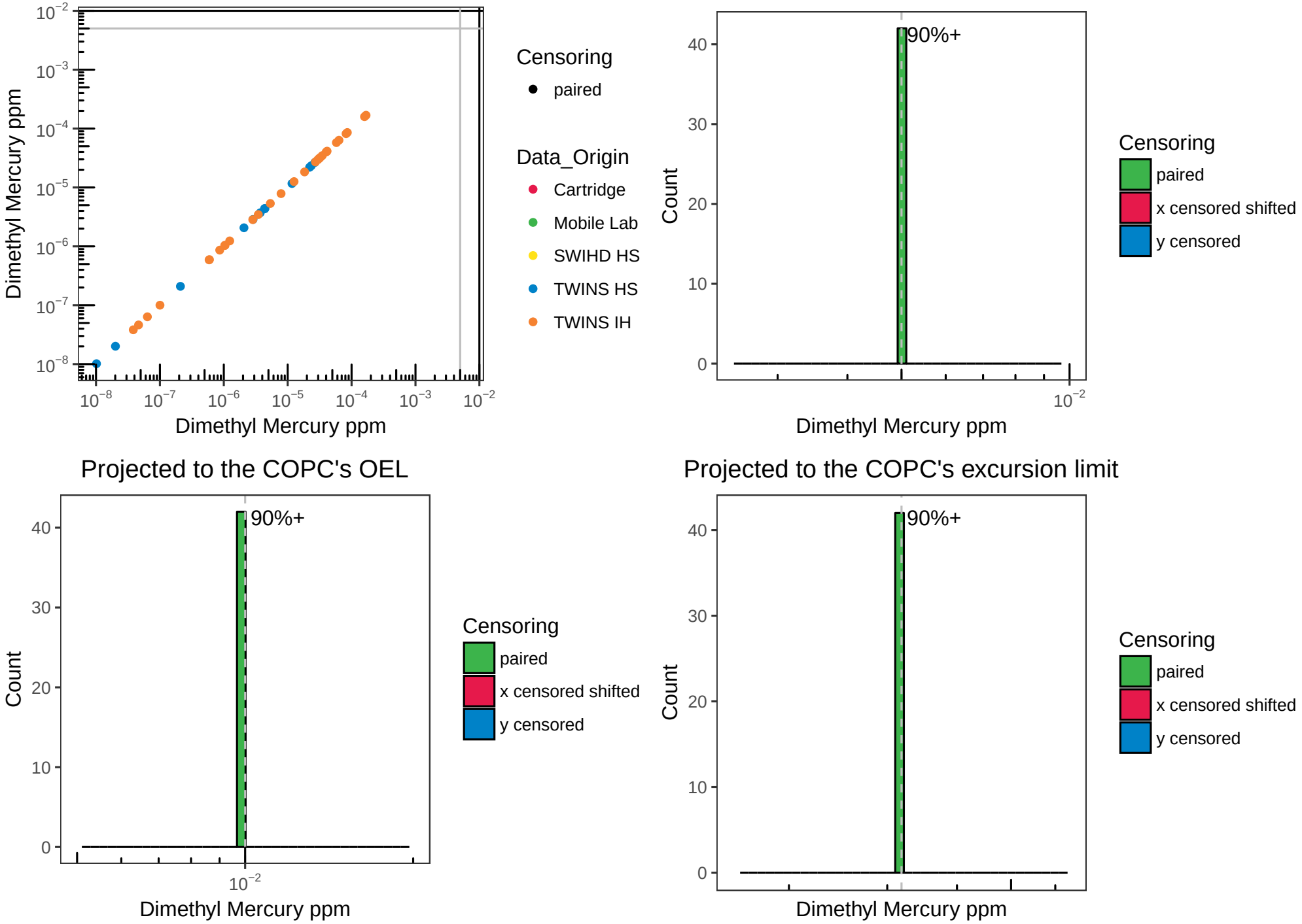


Figure C.2904: Dimethyl Mercury vs Dimethyl Mercury

Appendix D

Tolerance Limit Tables

Appendix D

Tolerance Limit Tables

This appendix contains tolerance limit tables for all candidate leading indicators evaluated. There is a separate column for 1/2 occupational exposure limit (OEL), OEL, and the excursion limit listed in Table 5.1 for both 90/90 and 95/95 tolerance limits. Tolerance limits that fell within the x-censored region of data are indicated by values in parentheses.

Table D.1: Ammonia: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Ammonia	Ammonia	12.5	12.5	25	25	25	25
Ammonia	Nitrous Oxide	0.133	(0.00681)	0.267	(0.0136)	0.8	(0.0408)
Ammonia	Mercury	2.99	(0.0696)	5.98	(0.139)	12	(0.279)
Ammonia	1,3-Butadiene	45.4	12.7	90.7	25.4	454	127
Ammonia	Benzene	114	23.2	228	46.4	1140	232
Ammonia	Biphenyl	203	NSD	406	NSD	1220	NSD
Ammonia	1-Butanol	58.2	(0.249)	116	(0.499)	1160	(4.99)
Ammonia	Methanol	368	16.6	736	33.2	920	41.5
Ammonia	2-Hexanone	1130	173	2260	347	4520	694
Ammonia	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	4-Methyl-2-hexanone	1860	322	3720	644	11100	1930
Ammonia	6-Methyl-2-heptanone	2820	(815)	5640	(1630)	16900	(4890)
Ammonia	3-Buten-2-one	33	3.96	66	7.93	66	7.93
Ammonia	Formaldehyde	(0.145)	(0.145)	(0.289)	(0.289)	(0.289)	(0.289)
Ammonia	Acetaldehyde	183	8.96	366	17.9	366	17.9
Ammonia	Butanal	2230	176	4460	351	41000	3230
Ammonia	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	Furan	0.154	0.0398	0.307	0.0796	55.3	14.3
Ammonia	2,3-Dihydrofuran	11.8	NSD	23.7	NSD	71	NSD
Ammonia	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	2-Methylfuran	0.273	NSD	0.546	NSD	1.64	NSD
Ammonia	2,5-Dimethylfuran	13.3	NSD	26.6	NSD	79.7	NSD
Ammonia	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	2-Pentylfuran	14.6	2.8	29.1	5.6	87.4	16.8
Ammonia	2-Heptylfuran	28.1	NSD	56.1	NSD	168	NSD
Ammonia	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	2-Octylfuran	2.88	NSD	5.76	NSD	17.3	NSD
Ammonia	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.355	NSD	0.709	NSD	2.13	NSD
Ammonia	2-(2-Methyl-6-oxoheptyl)furan	1.81	NSD	3.63	NSD	10.9	NSD
Ammonia	Diethyl Phthalate	610	15.5	1220	30.9	2440	61.9
Ammonia	Acetonitrile	(0.268)	(0.268)	(0.537)	(0.537)	(1.61)	(1.61)
Ammonia	Propanenitrile	934	288	1870	576	5610	1730
Ammonia	Butanenitrile	1070	82.6	2140	165	6420	496
Ammonia	Pentanenitrile	2220	491	4440	981	13300	2940
Ammonia	Hexanenitrile	2250	463	4500	927	13500	2780
Ammonia	Heptanenitrile	3490	1300	6990	2590	21000	7770
Ammonia	2-Methylene butanenitrile	246	NSD	491	NSD	1470	NSD
Ammonia	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	Ethylamine	92.3	21.8	185	43.5	554	131
Ammonia	N-Nitrosodimethylamine	0.195	(0.000569)	0.39	(0.00114)	1.17	(0.00341)
Ammonia	N-Nitrosodiethylamine	1.82	0.654	3.64	1.31	10.9	3.93
Ammonia	N-Nitrosomethylethylamine	4.47	0.728	8.94	1.46	26.8	4.37
Ammonia	N-Nitrosomorpholine	10.4	2.09	20.8	4.17	62.3	12.5
Ammonia	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	Pyridine	330	42.5	660	84.9	6600	849
Ammonia	2, 4-Dimethylpyridine	237	NSD	474	NSD	1420	NSD
Ammonia	Methyl nitrite	6.42	NSD	12.8	NSD	38.5	NSD
Ammonia	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Ammonia	Butyl nitrate	22	(8.22)	43.9	(16.4)	132	(49.3)
Ammonia	1,4-Butanediol, dinitrate	154	NSD	309	NSD	926	NSD
Ammonia	2-Nitro-2-methylpropane	(0.359)	NSD	(0.718)	NSD	(2.15)	NSD
Ammonia	1,2,3-Propanetriol, 1,3-dinitrate	17.7	NSD	35.5	NSD	106	NSD
Ammonia	Methyl Isocyanate	0.255	NSD	0.511	NSD	1.53	NSD
Ammonia	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.2: Nitrous Oxide: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Nitrous Oxide	Ammonia	(0.549)	(0.549)	(1.1)	(1.1)	(1.1)	(1.1)
Nitrous Oxide	Nitrous Oxide	25	25	50	50	150	150
Nitrous Oxide	Mercury	(0.59)	NSD	(1.18)	NSD	(2.36)	NSD
Nitrous Oxide	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Benzene	(0.5)	(0.5)	(1)	(1)	(5)	(5)
Nitrous Oxide	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	1-Butanol	(0.472)	(0.472)	(0.944)	(0.944)	(9.44)	(9.44)
Nitrous Oxide	Methanol	(0.95)	(0.95)	(1.9)	(1.9)	(2.38)	(2.38)
Nitrous Oxide	2-Hexanone	(6.54)	(6.54)	(13.1)	(13.1)	(26.2)	(26.2)
Nitrous Oxide	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	6-Methyl-2-heptanone	(2050)	NSD	(4100)	NSD	(12300)	NSD
Nitrous Oxide	3-Buten-2-one	(8.53)	NSD	(17.1)	NSD	(17.1)	NSD
Nitrous Oxide	Formaldehyde	(6.08)	NSD	(12.2)	NSD	(12.2)	NSD
Nitrous Oxide	Acetaldehyde	(0.386)	(0.386)	(0.773)	(0.773)	(0.773)	(0.773)
Nitrous Oxide	Butanal	(0.733)	(0.733)	(1.47)	(1.47)	(13.5)	(13.5)
Nitrous Oxide	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Furan	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Acetonitrile	(1.31)	(1.31)	(2.62)	(2.62)	(7.85)	(7.85)
Nitrous Oxide	Propanenitrile	(1.21)	(1.21)	(2.43)	(2.43)	(7.29)	(7.29)
Nitrous Oxide	Butanenitrile	(2.83)	(2.83)	(5.67)	(5.67)	(17)	(17)
Nitrous Oxide	Pentanenitrile	(10.7)	(10.7)	(21.5)	(21.5)	(64.4)	(64.4)
Nitrous Oxide	Hexanenitrile	(12)	(12)	(24)	(24)	(72)	(72)
Nitrous Oxide	Heptanenitrile	(16.7)	NSD	(33.4)	NSD	(100)	NSD
Nitrous Oxide	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	N-Nitrosodimethylamine	(0.0349)	NSD	(0.0699)	NSD	(0.21)	NSD
Nitrous Oxide	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Pyridine	(37.4)	NSD	(74.9)	NSD	(749)	NSD
Nitrous Oxide	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Butyl nitrate	(2.02)	NSD	(4.05)	NSD	(12.1)	NSD
Nitrous Oxide	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	2-Nitro-2-methylpropane	(19.5)	NSD	(39)	NSD	(117)	NSD
Nitrous Oxide	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
Nitrous Oxide	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.3: Mercury: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Mercury	Ammonia	(2.78e-07)	(2.78e-07)	(5.56e-07)	(5.56e-07)	(5.56e-07)	(5.56e-07)
Mercury	Nitrous Oxide	(5.38e-07)	NSD	(1.08e-06)	NSD	(3.23e-06)	NSD
Mercury	Mercury	0.00152	0.00152	0.00305	0.00305	0.0061	0.0061
Mercury	1,3-Butadiene	0.00105	NSD	0.0021	NSD	0.0105	NSD
Mercury	Benzene	(6.02e-05)	(6.02e-05)	(0.00012)	(0.00012)	(0.000602)	(0.000602)
Mercury	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	1-Butanol	(9.1e-05)	(9.1e-05)	(0.000182)	(0.000182)	(0.00182)	(0.00182)
Mercury	Methanol	(0.00104)	NSD	(0.00207)	NSD	(0.00259)	NSD
Mercury	2-Hexanone	(0.000602)	(0.000602)	(0.0012)	(0.0012)	(0.00241)	(0.00241)
Mercury	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	4-Methyl-2-hexanone	0.123	(0.0183)	0.246	(0.0366)	0.737	(0.11)
Mercury	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	3-Buten-2-one	(0.000107)	(0.000107)	(0.000214)	(0.000214)	(0.000214)	(0.000214)
Mercury	Formaldehyde	(1.32e-05)	(1.32e-05)	(2.64e-05)	(2.64e-05)	(2.64e-05)	(2.64e-05)
Mercury	Acetaldehyde	(0.00301)	(0.00301)	(0.00602)	(0.00602)	(0.00602)	(0.00602)
Mercury	Butanal	(0.000885)	(0.000885)	(0.00177)	(0.00177)	(0.0163)	(0.0163)
Mercury	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	Furan	1.05e-06	NSD	2.1e-06	NSD	0.000378	NSD
Mercury	2,3-Dihydrofuran	0.000914	NSD	0.00183	NSD	0.00548	NSD
Mercury	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-Pentylfuran	0.0018	NSD	0.0036	NSD	0.0108	NSD
Mercury	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	Diethyl Phthalate	0.00989	NSD	0.0198	NSD	0.0396	NSD
Mercury	Acetonitrile	(0.000153)	(0.000153)	(0.000307)	(0.000307)	(0.00092)	(0.00092)
Mercury	Propanenitrile	(0.000211)	(0.000211)	(0.000423)	(0.000423)	(0.00127)	(0.00127)
Mercury	Butanenitrile	(0.000204)	(0.000204)	(0.000407)	(0.000407)	(0.00122)	(0.00122)
Mercury	Pentanenitrile	0.0812	(0.00278)	0.162	(0.00556)	0.487	(0.0167)
Mercury	Hexanenitrile	0.0821	(0.00189)	0.164	(0.00378)	0.493	(0.0113)
Mercury	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	Ethylamine	0.00812	NSD	0.0162	NSD	0.0487	NSD
Mercury	N-Nitrosodimethylamine	(8.13e-08)	(8.13e-08)	(1.63e-07)	(1.63e-07)	(4.88e-07)	(4.88e-07)
Mercury	N-Nitrosodiethylamine	0.00013	(2.57e-05)	0.000259	(5.15e-05)	0.000778	(0.000154)
Mercury	N-Nitrosomethylethylamine	(6.41e-06)	(6.41e-06)	(1.28e-05)	(1.28e-05)	(3.85e-05)	(3.85e-05)
Mercury	N-Nitrosomorpholine	(1.55e-05)	(1.55e-05)	(3.1e-05)	(3.1e-05)	(9.31e-05)	(9.31e-05)
Mercury	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	Pyridine	0.0166	(0.00109)	0.0331	(0.00218)	0.331	(0.0218)
Mercury	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
Mercury	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.4: 1,3-Butadiene: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
1,3-Butadiene	Ammonia	(5.5e-05)	(5.5e-05)	(0.00011)	(0.00011)	(0.00011)	(0.00011)
1,3-Butadiene	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	Mercury	(0.00099)	NSD	(0.00198)	NSD	(0.00396)	NSD
1,3-Butadiene	1,3-Butadiene	0.5	0.5	1	1	5	5
1,3-Butadiene	Benzene	(0.0778)	(0.0778)	(0.156)	(0.156)	(0.778)	(0.778)
1,3-Butadiene	Biphenyl	(0.139)	NSD	(0.277)	NSD	(0.831)	NSD
1,3-Butadiene	1-Butanol	(0.00236)	NSD	(0.00473)	NSD	(0.0473)	NSD
1,3-Butadiene	Methanol	(0.0864)	NSD	(0.173)	NSD	(0.216)	NSD
1,3-Butadiene	2-Hexanone	(0.0878)	(0.0878)	(0.176)	(0.176)	(0.351)	(0.351)
1,3-Butadiene	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	4-Methyl-2-hexanone	(1.06)	NSD	(2.12)	NSD	(6.35)	NSD
1,3-Butadiene	6-Methyl-2-heptanone	(1.45)	NSD	(2.9)	NSD	(8.71)	NSD
1,3-Butadiene	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	Formaldehyde	(0.01)	(0.01)	(0.0201)	(0.0201)	(0.0201)	(0.0201)
1,3-Butadiene	Acetaldehyde	(0.269)	(0.269)	(0.537)	(0.537)	(0.537)	(0.537)
1,3-Butadiene	Butanal	(0.132)	(0.132)	(0.265)	(0.265)	(2.43)	(2.43)
1,3-Butadiene	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	Furan	(5.39e-05)	NSD	(0.000108)	NSD	(0.0194)	NSD
1,3-Butadiene	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	2-Methylfuran	(0.00844)	NSD	(0.0169)	NSD	(0.0506)	NSD
1,3-Butadiene	2,5-Dimethylfuran	(0.0241)	NSD	(0.0482)	NSD	(0.144)	NSD
1,3-Butadiene	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	2-Pentylfuran	(0.0166)	NSD	(0.0332)	NSD	(0.0996)	NSD
1,3-Butadiene	2-Heptylfuran	(0.0318)	NSD	(0.0636)	NSD	(0.191)	NSD
1,3-Butadiene	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	2-Octylfuran	(0.183)	NSD	(0.367)	NSD	(1.1)	NSD
1,3-Butadiene	2-(3-Oxo-3-phenylprop-1-enyl)furan	(0.0311)	NSD	(0.0622)	NSD	(0.187)	NSD
1,3-Butadiene	2-(2-Methyl-6-oxoheptyl)furan	(0.00209)	NSD	(0.00417)	NSD	(0.0125)	NSD
1,3-Butadiene	Diethyl Phthalate	(2.35)	NSD	(4.69)	NSD	(9.39)	NSD
1,3-Butadiene	Acetonitrile	(0.0106)	(0.0106)	(0.0212)	(0.0212)	(0.0635)	(0.0635)
1,3-Butadiene	Propanenitrile	(0.0236)	(0.0236)	(0.0473)	(0.0473)	(0.142)	(0.142)
1,3-Butadiene	Butanenitrile	(0.118)	(0.118)	(0.235)	(0.235)	(0.706)	(0.706)
1,3-Butadiene	Pentanenitrile	(0.0722)	NSD	(0.144)	NSD	(0.433)	NSD
1,3-Butadiene	Hexanenitrile	(0.0491)	NSD	(0.0981)	NSD	(0.294)	NSD
1,3-Butadiene	Heptanenitrile	(0.882)	NSD	(1.76)	NSD	(5.29)	NSD
1,3-Butadiene	2-Methylene butanenitrile	(10)	NSD	(20.1)	NSD	(60.3)	NSD
1,3-Butadiene	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	Ethylamine	(0.348)	NSD	(0.695)	NSD	(2.09)	NSD
1,3-Butadiene	N-Nitrosodimethylamine	(3.49e-06)	(3.49e-06)	(6.99e-06)	(6.99e-06)	(2.1e-05)	(2.1e-05)
1,3-Butadiene	N-Nitrosodiethylamine	(0.00223)	NSD	(0.00445)	NSD	(0.0134)	NSD
1,3-Butadiene	N-Nitrosomethylethylamine	(9.19e-05)	NSD	(0.000184)	NSD	(0.000551)	NSD
1,3-Butadiene	N-Nitrosomorpholine	(0.00115)	NSD	(0.0023)	NSD	(0.00691)	NSD
1,3-Butadiene	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	2, 4-Dimethylpyridine	(0.289)	NSD	(0.579)	NSD	(1.74)	NSD
1,3-Butadiene	Methyl nitrite	(0.00324)	NSD	(0.00648)	NSD	(0.0194)	NSD
1,3-Butadiene	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	Butyl nitrate	(0.0917)	NSD	(0.183)	NSD	(0.55)	NSD
1,3-Butadiene	1,4-Butanediol, dinitrate	(12.2)	NSD	(24.3)	NSD	(73)	NSD
1,3-Butadiene	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
1,3-Butadiene	1,2,3-Propanetriol, 1,3-dinitrate	(0.736)	NSD	(1.47)	NSD	(4.42)	NSD
1,3-Butadiene	Methyl Isocyanate	(0.24)	NSD	(0.48)	NSD	(1.44)	NSD
1,3-Butadiene	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.5: Benzene: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Benzene	Ammonia	(9.5e-06)	(9.5e-06)	(1.9e-05)	(1.9e-05)	(1.9e-05)	(1.9e-05)
Benzene	Nitrous Oxide	(5.21e-06)	(5.21e-06)	(1.04e-05)	(1.04e-05)	(3.13e-05)	(3.13e-05)
Benzene	Mercury	(2.25e-06)	(2.25e-06)	(4.49e-06)	(4.49e-06)	(8.99e-06)	(8.99e-06)
Benzene	1,3-Butadiene	0.00128	(0.000648)	0.00257	(0.0013)	0.0128	(0.00648)
Benzene	Benzene	0.25	0.25	0.5	0.5	2.5	2.5
Benzene	Biphenyl	0.0855	NSD	0.171	NSD	0.513	NSD
Benzene	1-Butanol	(0.00262)	(0.00262)	(0.00524)	(0.00524)	(0.0524)	(0.0524)
Benzene	Methanol	(0.0125)	(0.0125)	(0.025)	(0.025)	(0.0312)	(0.0312)
Benzene	2-Hexanone	(0.042)	(0.042)	(0.084)	(0.084)	(0.168)	(0.168)
Benzene	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	4-Methyl-2-hexanone	0.071	0.0519	0.142	0.104	0.426	0.311
Benzene	6-Methyl-2-heptanone	(0.154)	(0.154)	(0.309)	(0.309)	(0.926)	(0.926)
Benzene	3-Buten-2-one	(0.000872)	(0.000872)	(0.00174)	(0.00174)	(0.00174)	(0.00174)
Benzene	Formaldehyde	(0.000833)	(0.000833)	(0.00167)	(0.00167)	(0.00167)	(0.00167)
Benzene	Acetaldehyde	(0.0114)	(0.0114)	(0.0227)	(0.0227)	(0.0227)	(0.0227)
Benzene	Butanal	(0.0181)	(0.0181)	(0.0362)	(0.0362)	(0.333)	(0.333)
Benzene	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	Furan	(1.26e-05)	(1.26e-05)	(2.52e-05)	(2.52e-05)	(0.00453)	(0.00453)
Benzene	2,3-Dihydrofuran	0.000765	NSD	0.00153	NSD	0.00459	NSD
Benzene	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	2-Methylfuran	0.000832	NSD	0.00166	NSD	0.00499	NSD
Benzene	2,5-Dimethylfuran	0.00117	NSD	0.00235	NSD	0.00704	NSD
Benzene	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	2-Pentylfuran	0.00097	(0.000292)	0.00194	(0.000585)	0.00582	(0.00175)
Benzene	2-Heptylfuran	0.00187	NSD	0.00375	NSD	0.0112	NSD
Benzene	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	2-Octylfuran	0.00651	NSD	0.013	NSD	0.0391	NSD
Benzene	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000664	NSD	0.00133	NSD	0.00398	NSD
Benzene	2-(2-Methyl-6-oxoheptyl)furan	0.00374	NSD	0.00748	NSD	0.0224	NSD
Benzene	Diethyl Phthalate	(0.0208)	(0.0208)	(0.0417)	(0.0417)	(0.0834)	(0.0834)
Benzene	Acetonitrile	(0.000525)	(0.000525)	(0.00105)	(0.00105)	(0.00315)	(0.00315)
Benzene	Propanenitrile	(0.00566)	(0.00566)	(0.0113)	(0.0113)	(0.034)	(0.034)
Benzene	Butanenitrile	(0.019)	(0.019)	(0.038)	(0.038)	(0.114)	(0.114)
Benzene	Pentanenitrile	(0.0413)	(0.0413)	(0.0826)	(0.0826)	(0.248)	(0.248)
Benzene	Hexanenitrile	(0.04)	(0.04)	(0.08)	(0.08)	(0.24)	(0.24)
Benzene	Heptanenitrile	(0.103)	(0.103)	(0.207)	(0.207)	(0.62)	(0.62)
Benzene	2-Methylene butanenitrile	0.335	NSD	0.671	NSD	2.01	NSD
Benzene	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	Ethylamine	(0.0032)	(0.0032)	(0.0064)	(0.0064)	(0.0192)	(0.0192)
Benzene	N-Nitrosodimethylamine	(3.95e-07)	(3.95e-07)	(7.89e-07)	(7.89e-07)	(2.37e-06)	(2.37e-06)
Benzene	N-Nitrosodiethylamine	0.00016	(0.000124)	0.00032	(0.000247)	0.00096	(0.000741)
Benzene	N-Nitrosomethylethylamine	(8.89e-05)	(8.89e-05)	(0.000178)	(0.000178)	(0.000533)	(0.000533)
Benzene	N-Nitrosomorpholine	(0.00029)	(0.00029)	(0.000579)	(0.000579)	(0.00174)	(0.00174)
Benzene	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	Pyridine	(0.0117)	(0.0117)	(0.0235)	(0.0235)	(0.235)	(0.235)
Benzene	2, 4-Dimethylpyridine	0.123	NSD	0.247	NSD	0.74	NSD
Benzene	Methyl nitrite	(0.000232)	NSD	(0.000464)	NSD	(0.00139)	NSD
Benzene	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Benzene	Butyl nitrate	(0.0376)	(0.0376)	(0.0751)	(0.0751)	(0.225)	(0.225)
Benzene	1,4-Butanediol, dinitrate	0.00481	NSD	0.00962	NSD	0.0288	NSD
Benzene	2-Nitro-2-methylpropane	(0.00618)	NSD	(0.0124)	NSD	(0.0371)	NSD
Benzene	1,2,3-Propanetriol, 1,3-dinitrate	(0.0121)	NSD	(0.0242)	NSD	(0.0725)	NSD
Benzene	Methyl Isocyanate	0.0054	NSD	0.0108	NSD	0.0324	NSD
Benzene	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.6: Biphenyl: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Biphenyl	Ammonia	(2.82e-06)	NSD	(5.63e-06)	NSD	(5.63e-06)	NSD
Biphenyl	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	1,3-Butadiene	(4.58e-05)	NSD	(9.16e-05)	NSD	(0.000458)	NSD
Biphenyl	Benzene	(0.00429)	NSD	(0.00858)	NSD	(0.0429)	NSD
Biphenyl	Biphenyl	0.1	NSD	0.2	NSD	0.6	NSD
Biphenyl	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	Methanol	(0.00264)	NSD	(0.00529)	NSD	(0.00661)	NSD
Biphenyl	2-Hexanone	(0.00196)	NSD	(0.00392)	NSD	(0.00785)	NSD
Biphenyl	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	4-Methyl-2-hexanone	(0.0166)	NSD	(0.0332)	NSD	(0.0997)	NSD
Biphenyl	6-Methyl-2-heptanone	(0.091)	NSD	(0.182)	NSD	(0.546)	NSD
Biphenyl	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	Formaldehyde	(0.000172)	NSD	(0.000344)	NSD	(0.000344)	NSD
Biphenyl	Acetaldehyde	(0.0042)	NSD	(0.00839)	NSD	(0.00839)	NSD
Biphenyl	Butanal	(0.0091)	NSD	(0.0182)	NSD	(0.167)	NSD
Biphenyl	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	Furan	(1.04e-05)	NSD	(2.09e-05)	NSD	(0.00376)	NSD
Biphenyl	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	2-Methylfuran	(1.49e-05)	NSD	(2.99e-05)	NSD	(8.97e-05)	NSD
Biphenyl	2,5-Dimethylfuran	(0.000299)	NSD	(0.000597)	NSD	(0.00179)	NSD
Biphenyl	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	2-Pentylfuran	(0.000265)	NSD	(0.00053)	NSD	(0.00159)	NSD
Biphenyl	2-Heptylfuran	(0.000731)	NSD	(0.00146)	NSD	(0.00439)	NSD
Biphenyl	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	2-Octylfuran	(0.00191)	NSD	(0.00382)	NSD	(0.0115)	NSD
Biphenyl	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000369	NSD	0.000737	NSD	0.00221	NSD
Biphenyl	2-(2-Methyl-6-oxoheptyl)furan	(0.00195)	NSD	(0.0039)	NSD	(0.0117)	NSD
Biphenyl	Diethyl Phthalate	(0.00778)	NSD	(0.0156)	NSD	(0.0311)	NSD
Biphenyl	Acetonitrile	(0.00047)	NSD	(0.000939)	NSD	(0.00282)	NSD
Biphenyl	Propanenitrile	(0.00116)	NSD	(0.00231)	NSD	(0.00694)	NSD
Biphenyl	Butanenitrile	(0.00402)	NSD	(0.00805)	NSD	(0.0241)	NSD
Biphenyl	Pentanenitrile	(0.00311)	NSD	(0.00623)	NSD	(0.0187)	NSD
Biphenyl	Hexanenitrile	(0.00278)	NSD	(0.00556)	NSD	(0.0167)	NSD
Biphenyl	Heptanenitrile	(0.0818)	NSD	(0.164)	NSD	(0.491)	NSD
Biphenyl	2-Methylene butanenitrile	0.0749	NSD	0.15	NSD	0.45	NSD
Biphenyl	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	Ethylamine	(0.00129)	NSD	(0.00258)	NSD	(0.00775)	NSD
Biphenyl	N-Nitrosodimethylamine	(7.93e-08)	NSD	(1.59e-07)	NSD	(4.76e-07)	NSD
Biphenyl	N-Nitrosodiethylamine	(1.98e-05)	NSD	(3.96e-05)	NSD	(0.000119)	NSD
Biphenyl	N-Nitrosomethylethylamine	(3.33e-05)	NSD	(6.67e-05)	NSD	(2e-04)	NSD
Biphenyl	N-Nitrosomorpholine	(9.59e-05)	NSD	(0.000192)	NSD	(0.000576)	NSD
Biphenyl	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	2, 4-Dimethylpyridine	(6.46e-07)	NSD	(1.29e-06)	NSD	(3.88e-06)	NSD
Biphenyl	Methyl nitrite	(0.000185)	NSD	(0.00037)	NSD	(0.00111)	NSD
Biphenyl	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	Butyl nitrate	(0.0244)	NSD	(0.0489)	NSD	(0.147)	NSD
Biphenyl	1,4-Butanediol, dinitrate	(0.21)	NSD	(0.419)	NSD	(1.26)	NSD
Biphenyl	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Biphenyl	1,2,3-Propanetriol, 1,3-dinitrate	0.0171	NSD	0.0343	NSD	0.103	NSD
Biphenyl	Methyl Isocyanate	0.00222	NSD	0.00444	NSD	0.0133	NSD
Biphenyl	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.7: 1-Butanol: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
1-Butanol	Ammonia	(4.11e-05)	(4.11e-05)	(8.22e-05)	(8.22e-05)	(8.22e-05)	(8.22e-05)
1-Butanol	Nitrous Oxide	(4.5e-05)	(4.5e-05)	(9.01e-05)	(9.01e-05)	(0.00027)	(0.00027)
1-Butanol	Mercury	(2.37e-06)	(2.37e-06)	(4.73e-06)	(4.73e-06)	(9.47e-06)	(9.47e-06)
1-Butanol	1,3-Butadiene	0.068	NSD	0.136	NSD	0.68	NSD
1-Butanol	Benzene	0.625	0.288	1.25	0.575	6.25	2.88
1-Butanol	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	1-Butanol	10	10	20	20	200	200
1-Butanol	Methanol	(0.115)	(0.115)	(0.23)	(0.23)	(0.287)	(0.287)
1-Butanol	2-Hexanone	5.95	2.88	11.9	5.75	23.8	11.5
1-Butanol	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	4-Methyl-2-hexanone	1.56	0.833	3.12	1.67	9.38	5
1-Butanol	6-Methyl-2-heptanone	10.2	NSD	20.4	NSD	61.1	NSD
1-Butanol	3-Buten-2-one	0.221	0.124	0.441	0.247	0.441	0.247
1-Butanol	Formaldehyde	(0.0016)	(0.0016)	(0.00321)	(0.00321)	(0.00321)	(0.00321)
1-Butanol	Acetaldehyde	(0.158)	(0.158)	(0.315)	(0.315)	(0.315)	(0.315)
1-Butanol	Butanal	10.9	4.76	21.7	9.51	200	87.5
1-Butanol	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	Furan	0.00235	NSD	0.0047	NSD	0.846	NSD
1-Butanol	2,3-Dihydrofuran	0.0107	NSD	0.0213	NSD	0.0639	NSD
1-Butanol	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	Diethyl Phthalate	0.919	NSD	1.84	NSD	3.68	NSD
1-Butanol	Acetonitrile	(0.000313)	(0.000313)	(0.000626)	(0.000626)	(0.00188)	(0.00188)
1-Butanol	Propanenitrile	5.78	2.28	11.6	4.57	34.7	13.7
1-Butanol	Butanenitrile	8.43	2.75	16.9	5.5	50.6	16.5
1-Butanol	Pentanenitrile	7.8	3.78	15.6	7.57	46.8	22.7
1-Butanol	Hexanenitrile	8.63	5.09	17.3	10.2	51.8	30.6
1-Butanol	Heptanenitrile	4.14	NSD	8.27	NSD	24.8	NSD
1-Butanol	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	Ethylamine	0.726	NSD	1.45	NSD	4.36	NSD
1-Butanol	N-Nitrosodimethylamine	(4.16e-07)	(4.16e-07)	(8.32e-07)	(8.32e-07)	(2.5e-06)	(2.5e-06)
1-Butanol	N-Nitrosodiethylamine	0.00303	0.000633	0.00607	0.00127	0.0182	0.0038
1-Butanol	N-Nitrosomethylethylamine	0.00721	(0.000507)	0.0144	(0.00101)	0.0433	(0.00304)
1-Butanol	N-Nitrosomorpholine	0.0131	(0.000764)	0.0262	(0.00153)	0.0787	(0.00458)
1-Butanol	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	Pyridine	0.893	0.433	1.79	0.865	17.9	8.65
1-Butanol	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	Butyl nitrate	8.03	NSD	16.1	NSD	48.2	NSD
1-Butanol	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	2-Nitro-2-methylpropane	(0.157)	NSD	(0.315)	NSD	(0.944)	NSD
1-Butanol	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
1-Butanol	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.8: Methanol: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Methanol	Ammonia	(0.00638)	(0.00638)	(0.0128)	(0.0128)	(0.0128)	(0.0128)
Methanol	Nitrous Oxide	(0.00132)	(0.00132)	(0.00265)	(0.00265)	(0.00794)	(0.00794)
Methanol	Mercury	(0.0299)	NSD	(0.0598)	NSD	(0.12)	NSD
Methanol	1,3-Butadiene	(0.228)	NSD	(0.456)	NSD	(2.28)	NSD
Methanol	Benzene	(0.275)	(0.275)	(0.55)	(0.55)	(2.75)	(2.75)
Methanol	Biphenyl	6.58	NSD	13.2	NSD	39.5	NSD
Methanol	1-Butanol	(0.308)	(0.308)	(0.616)	(0.616)	(6.16)	(6.16)
Methanol	Methanol	100	100	200	200	250	250
Methanol	2-Hexanone	(2.75)	(2.75)	(5.5)	(5.5)	(11)	(11)
Methanol	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	4-Methyl-2-hexanone	(4.17)	NSD	(8.33)	NSD	(25)	NSD
Methanol	6-Methyl-2-heptanone	33.9	(6.41)	67.9	(12.8)	204	(38.4)
Methanol	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	Formaldehyde	(0.179)	(0.179)	(0.357)	(0.357)	(0.357)	(0.357)
Methanol	Acetaldehyde	(2.05)	(2.05)	(4.1)	(4.1)	(4.1)	(4.1)
Methanol	Butanal	(0.572)	(0.572)	(1.14)	(1.14)	(10.5)	(10.5)
Methanol	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	Furan	(0.00055)	NSD	(0.0011)	NSD	(0.198)	NSD
Methanol	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	2-Methylfuran	0.0519	NSD	0.104	NSD	0.312	NSD
Methanol	2,5-Dimethylfuran	0.0601	NSD	0.12	NSD	0.361	NSD
Methanol	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	2-Pentylfuran	(0.0214)	NSD	(0.0429)	NSD	(0.129)	NSD
Methanol	2-Heptylfuran	0.159	NSD	0.319	NSD	0.956	NSD
Methanol	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	2-Octylfuran	0.472	NSD	0.944	NSD	2.83	NSD
Methanol	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.0512	NSD	0.102	NSD	0.307	NSD
Methanol	2-(2-Methyl-6-oxoheptyl)furan	0.262	NSD	0.524	NSD	1.57	NSD
Methanol	Diethyl Phthalate	(0.068)	NSD	(0.136)	NSD	(0.272)	NSD
Methanol	Acetonitrile	(0.307)	(0.307)	(0.614)	(0.614)	(1.84)	(1.84)
Methanol	Propanenitrile	(2.67)	(2.67)	(5.34)	(5.34)	(16)	(16)
Methanol	Butanenitrile	(0.521)	(0.521)	(1.04)	(1.04)	(3.12)	(3.12)
Methanol	Pentanenitrile	(5.1)	(5.1)	(10.2)	(10.2)	(30.6)	(30.6)
Methanol	Hexanenitrile	(5.37)	(5.37)	(10.7)	(10.7)	(32.2)	(32.2)
Methanol	Heptanenitrile	34.1	(6.13)	68.2	(12.3)	205	(36.8)
Methanol	2-Methylene butanenitrile	36.3	NSD	72.6	NSD	218	NSD
Methanol	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	Ethylamine	(8.75)	NSD	(17.5)	NSD	(52.5)	NSD
Methanol	N-Nitrosodimethylamine	(0.000262)	(0.000262)	(0.000524)	(0.000524)	(0.00157)	(0.00157)
Methanol	N-Nitrosodiethylamine	(0.0117)	NSD	(0.0233)	NSD	(0.0699)	NSD
Methanol	N-Nitrosomethylethylamine	(0.0211)	NSD	(0.0423)	NSD	(0.127)	NSD
Methanol	N-Nitrosomorpholine	(0.021)	NSD	(0.0421)	NSD	(0.126)	NSD
Methanol	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	Pyridine	(1.55)	(1.55)	(3.1)	(3.1)	(31)	(31)
Methanol	2, 4-Dimethylpyridine	25.7	NSD	51.4	NSD	154	NSD
Methanol	Methyl nitrite	0.114	NSD	0.229	NSD	0.687	NSD
Methanol	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Methanol	Butyl nitrate	2.4	(0.827)	4.81	(1.65)	14.4	(4.96)
Methanol	1,4-Butanediol, dinitrate	3.03	NSD	6.05	NSD	18.2	NSD
Methanol	2-Nitro-2-methylpropane	(0.049)	NSD	(0.0981)	NSD	(0.294)	NSD
Methanol	1,2,3-Propanetriol, 1,3-dinitrate	2.48	NSD	4.96	NSD	14.9	NSD
Methanol	Methyl Isocyanate	0.428	NSD	0.856	NSD	2.57	NSD
Methanol	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.9: 2-Hexanone: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Hexanone	Ammonia	(3.22e-06)	(3.22e-06)	(6.43e-06)	(6.43e-06)	(6.43e-06)	(6.43e-06)
2-Hexanone	Nitrous Oxide	(1.07e-05)	(1.07e-05)	(2.13e-05)	(2.13e-05)	(6.39e-05)	(6.39e-05)
2-Hexanone	Mercury	(1.82e-06)	(1.82e-06)	(3.65e-06)	(3.65e-06)	(7.3e-06)	(7.3e-06)
2-Hexanone	1,3-Butadiene	0.00256	(0.000893)	0.00511	(0.00179)	0.0256	(0.00893)
2-Hexanone	Benzene	(0.00503)	(0.00503)	(0.0101)	(0.0101)	(0.0503)	(0.0503)
2-Hexanone	Biphenyl	0.0731	NSD	0.146	NSD	0.439	NSD
2-Hexanone	1-Butanol	(0.00458)	(0.00458)	(0.00915)	(0.00915)	(0.0915)	(0.0915)
2-Hexanone	Methanol	(0.00974)	(0.00974)	(0.0195)	(0.0195)	(0.0243)	(0.0243)
2-Hexanone	2-Hexanone	2.5	2.5	5	5	10	10
2-Hexanone	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	4-Methyl-2-hexanone	0.125	0.0617	0.251	0.123	0.752	0.37
2-Hexanone	6-Methyl-2-heptanone	1.05	(0.776)	2.11	(1.55)	6.33	(4.65)
2-Hexanone	3-Buten-2-one	(0.00126)	(0.00126)	(0.00251)	(0.00251)	(0.00251)	(0.00251)
2-Hexanone	Formaldehyde	(0.000669)	(0.000669)	(0.00134)	(0.00134)	(0.00134)	(0.00134)
2-Hexanone	Acetaldehyde	(0.00954)	(0.00954)	(0.0191)	(0.0191)	(0.0191)	(0.0191)
2-Hexanone	Butanal	(0.0146)	(0.0146)	(0.0291)	(0.0291)	(0.268)	(0.268)
2-Hexanone	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	Furan	(2.78e-05)	(2.78e-05)	(5.56e-05)	(5.56e-05)	(0.01)	(0.01)
2-Hexanone	2,3-Dihydrofuran	0.000361	NSD	0.000722	NSD	0.00216	NSD
2-Hexanone	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	2-Methylfuran	0.000739	NSD	0.00148	NSD	0.00443	NSD
2-Hexanone	2,5-Dimethylfuran	0.00187	NSD	0.00373	NSD	0.0112	NSD
2-Hexanone	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	2-Pentylfuran	0.000929	(0.000282)	0.00186	(0.000565)	0.00558	(0.00169)
2-Hexanone	2-Heptylfuran	0.00204	NSD	0.00408	NSD	0.0122	NSD
2-Hexanone	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	2-Octylfuran	0.00578	NSD	0.0116	NSD	0.0347	NSD
2-Hexanone	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000754	NSD	0.00151	NSD	0.00453	NSD
2-Hexanone	2-(2-Methyl-6-oxoheptyl)furan	0.00399	NSD	0.00798	NSD	0.0239	NSD
2-Hexanone	Diethyl Phthalate	(0.0148)	(0.0148)	(0.0296)	(0.0296)	(0.0593)	(0.0593)
2-Hexanone	Acetonitrile	(0.00125)	(0.00125)	(0.0025)	(0.0025)	(0.00749)	(0.00749)
2-Hexanone	Propanenitrile	(0.0345)	(0.0345)	(0.0689)	(0.0689)	(0.207)	(0.207)
2-Hexanone	Butanenitrile	(0.0637)	(0.0637)	(0.127)	(0.127)	(0.382)	(0.382)
2-Hexanone	Pentanenitrile	1.32	(0.133)	2.64	(0.267)	7.92	(0.8)
2-Hexanone	Hexanenitrile	1.98	0.743	3.96	1.49	11.9	4.46
2-Hexanone	Heptanenitrile	1.36	0.521	2.72	1.04	8.15	3.12
2-Hexanone	2-Methylene butanenitrile	0.544	NSD	1.09	NSD	3.27	NSD
2-Hexanone	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	Ethylamine	0.00221	(0.00143)	0.00441	(0.00285)	0.0132	(0.00855)
2-Hexanone	N-Nitrosodimethylamine	(3.08e-07)	(3.08e-07)	(6.15e-07)	(6.15e-07)	(1.85e-06)	(1.85e-06)
2-Hexanone	N-Nitrosodiethylamine	0.00012	(8.92e-05)	0.000241	(0.000178)	0.000723	(0.000535)
2-Hexanone	N-Nitrosomethylethylamine	(4.97e-05)	(4.97e-05)	(9.94e-05)	(9.94e-05)	(0.000298)	(0.000298)
2-Hexanone	N-Nitrosomorpholine	(0.000173)	(0.000173)	(0.000347)	(0.000347)	(0.00104)	(0.00104)
2-Hexanone	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	Pyridine	(0.00702)	(0.00702)	(0.014)	(0.014)	(0.14)	(0.14)
2-Hexanone	2, 4-Dimethylpyridine	0.162	0.0568	0.324	0.114	0.973	0.341
2-Hexanone	Methyl nitrite	0.0018	NSD	0.00359	NSD	0.0108	NSD
2-Hexanone	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Hexanone	Butyl nitrate	0.187	(0.129)	0.375	(0.258)	1.12	(0.774)
2-Hexanone	1,4-Butanediol, dinitrate	0.0282	NSD	0.0564	NSD	0.169	NSD
2-Hexanone	2-Nitro-2-methylpropane	(0.0065)	NSD	(0.013)	NSD	(0.039)	NSD
2-Hexanone	1,2,3-Propanetriol, 1,3-dinitrate	(0.0121)	NSD	(0.0242)	NSD	(0.0725)	NSD
2-Hexanone	Methyl Isocyanate	0.00384	NSD	0.00768	NSD	0.023	NSD
2-Hexanone	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.10: 3-Methyl-3-butene-2-one: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
3-Methyl-3-butene-2-one	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Furan	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
3-Methyl-3-butene-2-one	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.11: 4-Methyl-2-hexanone: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
4-Methyl-2-hexanone	Ammonia	(3.01e-06)	(3.01e-06)	(6.02e-06)	(6.02e-06)	(6.02e-06)	(6.02e-06)
4-Methyl-2-hexanone	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	Mercury	(1.11e-05)	(1.11e-05)	(2.23e-05)	(2.23e-05)	(4.46e-05)	(4.46e-05)
4-Methyl-2-hexanone	1,3-Butadiene	(0.000404)	NSD	(0.000807)	NSD	(0.00404)	NSD
4-Methyl-2-hexanone	Benzene	(0.00636)	(0.00636)	(0.0127)	(0.0127)	(0.0636)	(0.0636)
4-Methyl-2-hexanone	Biphenyl	0.104	NSD	0.207	NSD	0.621	NSD
4-Methyl-2-hexanone	1-Butanol	(0.005)	(0.005)	(0.01)	(0.01)	(0.1)	(0.1)
4-Methyl-2-hexanone	Methanol	(0.0019)	NSD	(0.00379)	NSD	(0.00474)	NSD
4-Methyl-2-hexanone	2-Hexanone	(0.0345)	(0.0345)	(0.0689)	(0.0689)	(0.138)	(0.138)
4-Methyl-2-hexanone	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	4-Methyl-2-hexanone	0.25	0.25	0.5	0.5	1.5	1.5
4-Methyl-2-hexanone	6-Methyl-2-heptanone	(0.582)	NSD	(1.16)	NSD	(3.49)	NSD
4-Methyl-2-hexanone	3-Buten-2-one	(0.00216)	(0.00216)	(0.00431)	(0.00431)	(0.00431)	(0.00431)
4-Methyl-2-hexanone	Formaldehyde	(0.000251)	(0.000251)	(0.000502)	(0.000502)	(0.000502)	(0.000502)
4-Methyl-2-hexanone	Acetaldehyde	(0.00881)	(0.00881)	(0.0176)	(0.0176)	(0.0176)	(0.0176)
4-Methyl-2-hexanone	Butanal	(0.015)	(0.015)	(0.03)	(0.03)	(0.276)	(0.276)
4-Methyl-2-hexanone	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	Furan	(1.74e-05)	NSD	(3.48e-05)	NSD	(0.00627)	NSD
4-Methyl-2-hexanone	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	2-Methylfuran	(4e-04)	NSD	(0.000801)	NSD	(0.0024)	NSD
4-Methyl-2-hexanone	2,5-Dimethylfuran	0.00148	NSD	0.00296	NSD	0.00887	NSD
4-Methyl-2-hexanone	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	2-Pentylfuran	(0.000579)	NSD	(0.00116)	NSD	(0.00348)	NSD
4-Methyl-2-hexanone	2-Heptylfuran	(0.0013)	NSD	(0.0026)	NSD	(0.00781)	NSD
4-Methyl-2-hexanone	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	2-Octylfuran	(0.0206)	NSD	(0.0413)	NSD	(0.124)	NSD
4-Methyl-2-hexanone	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.00307	NSD	0.00615	NSD	0.0184	NSD
4-Methyl-2-hexanone	2-(2-Methyl-6-oxoheptyl)furan	(0.0141)	NSD	(0.0282)	NSD	(0.0845)	NSD
4-Methyl-2-hexanone	Diethyl Phthalate	(0.0476)	NSD	(0.0951)	NSD	(0.19)	NSD
4-Methyl-2-hexanone	Acetonitrile	(0.000751)	(0.000751)	(0.0015)	(0.0015)	(0.00451)	(0.00451)
4-Methyl-2-hexanone	Propanenitrile	(0.0219)	(0.0219)	(0.0438)	(0.0438)	(0.131)	(0.131)
4-Methyl-2-hexanone	Butanenitrile	(0.0562)	(0.0562)	(0.112)	(0.112)	(0.337)	(0.337)
4-Methyl-2-hexanone	Pentanenitrile	(0.125)	(0.125)	(0.25)	(0.25)	(0.749)	(0.749)
4-Methyl-2-hexanone	Hexanenitrile	(0.0207)	(0.0207)	(0.0415)	(0.0415)	(0.124)	(0.124)
4-Methyl-2-hexanone	Heptanenitrile	(1.61)	NSD	(3.23)	NSD	(9.68)	NSD
4-Methyl-2-hexanone	2-Methylene butanenitrile	(0.932)	NSD	(1.86)	NSD	(5.59)	NSD
4-Methyl-2-hexanone	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	Ethylamine	(0.00132)	(0.00132)	(0.00265)	(0.00265)	(0.00794)	(0.00794)
4-Methyl-2-hexanone	N-Nitrosodimethylamine	(7.7e-07)	(7.7e-07)	(1.54e-06)	(1.54e-06)	(4.62e-06)	(4.62e-06)
4-Methyl-2-hexanone	N-Nitrosodiethylamine	(2.8e-05)	(2.8e-05)	(5.6e-05)	(5.6e-05)	(0.000168)	(0.000168)
4-Methyl-2-hexanone	N-Nitrosomethylethylamine	(3.59e-05)	(3.59e-05)	(7.18e-05)	(7.18e-05)	(0.000216)	(0.000216)
4-Methyl-2-hexanone	N-Nitrosomorpholine	(0.000107)	(0.000107)	(0.000215)	(0.000215)	(0.000644)	(0.000644)
4-Methyl-2-hexanone	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	Pyridine	(0.0126)	(0.0126)	(0.0252)	(0.0252)	(0.252)	(0.252)
4-Methyl-2-hexanone	2, 4-Dimethylpyridine	0.128	NSD	0.256	NSD	0.769	NSD
4-Methyl-2-hexanone	Methyl nitrite	(0.0447)	NSD	(0.0894)	NSD	(0.268)	NSD
4-Methyl-2-hexanone	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	Butyl nitrate	(0.286)	NSD	(0.571)	NSD	(1.71)	NSD
4-Methyl-2-hexanone	1,4-Butanediol, dinitrate	(0.104)	NSD	(0.207)	NSD	(0.621)	NSD
4-Methyl-2-hexanone	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
4-Methyl-2-hexanone	1,2,3-Propanetriol, 1,3-dinitrate	0.115	NSD	0.231	NSD	0.692	NSD
4-Methyl-2-hexanone	Methyl Isocyanate	0.023	NSD	0.0461	NSD	0.138	NSD
4-Methyl-2-hexanone	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.12: 6-Methyl-2-heptanone: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
6-Methyl-2-heptanone	Ammonia	0.000121	2.91e-05	0.000242	5.83e-05	0.000242	5.83e-05
6-Methyl-2-heptanone	Nitrous Oxide	1.61e-05	NSD	3.22e-05	NSD	9.65e-05	NSD
6-Methyl-2-heptanone	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	1,3-Butadiene	0.00551	NSD	0.011	NSD	0.0551	NSD
6-Methyl-2-heptanone	Benzene	0.0766	0.0447	0.153	0.0894	0.766	0.447
6-Methyl-2-heptanone	Biphenyl	0.0546	NSD	0.109	NSD	0.327	NSD
6-Methyl-2-heptanone	1-Butanol	0.0684	NSD	0.137	NSD	1.37	NSD
6-Methyl-2-heptanone	Methanol	0.109	0.104	0.219	0.208	0.273	0.259
6-Methyl-2-heptanone	2-Hexanone	0.621	0.184	1.24	0.369	2.49	0.738
6-Methyl-2-heptanone	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	4-Methyl-2-hexanone	0.0294	NSD	0.0587	NSD	0.176	NSD
6-Methyl-2-heptanone	6-Methyl-2-heptanone	4	4	8	8	24	24
6-Methyl-2-heptanone	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	Formaldehyde	0.00135	NSD	0.0027	NSD	0.0027	NSD
6-Methyl-2-heptanone	Acetaldehyde	0.113	0.0521	0.226	0.104	0.226	0.104
6-Methyl-2-heptanone	Butanal	0.458	0.0352	0.916	0.0703	8.42	0.647
6-Methyl-2-heptanone	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	Furan	0.000153	NSD	0.000306	NSD	0.055	NSD
6-Methyl-2-heptanone	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	2-Methylfuran	0.000257	NSD	0.000514	NSD	0.00154	NSD
6-Methyl-2-heptanone	2,5-Dimethylfuran	0.00037	NSD	0.00074	NSD	0.00222	NSD
6-Methyl-2-heptanone	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	2-Pentylfuran	0.000405	NSD	0.000811	NSD	0.00243	NSD
6-Methyl-2-heptanone	2-Heptylfuran	0.000869	NSD	0.00174	NSD	0.00521	NSD
6-Methyl-2-heptanone	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	2-Octylfuran	0.00314	NSD	0.00629	NSD	0.0189	NSD
6-Methyl-2-heptanone	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000385	NSD	0.00077	NSD	0.00231	NSD
6-Methyl-2-heptanone	2-(2-Methyl-6-oxoheptyl)furan	0.00204	NSD	0.00407	NSD	0.0122	NSD
6-Methyl-2-heptanone	Diethyl Phthalate	0.0799	NSD	0.16	NSD	0.32	NSD
6-Methyl-2-heptanone	Acetonitrile	0.173	0.00162	0.345	0.00324	1.04	0.00972
6-Methyl-2-heptanone	Propanenitrile	0.206	0.0329	0.413	0.0658	1.24	0.197
6-Methyl-2-heptanone	Butanenitrile	0.45	0.0163	0.9	0.0326	2.7	0.0977
6-Methyl-2-heptanone	Pentanenitrile	1.14	0.248	2.29	0.497	6.87	1.49
6-Methyl-2-heptanone	Hexanenitrile	1.33	0.394	2.65	0.788	7.95	2.36
6-Methyl-2-heptanone	Heptanenitrile	3.86	0.322	7.71	0.644	23.1	1.93
6-Methyl-2-heptanone	2-Methylene butanenitrile	0.153	NSD	0.307	NSD	0.92	NSD
6-Methyl-2-heptanone	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	Ethylamine	0.083	NSD	0.166	NSD	0.498	NSD
6-Methyl-2-heptanone	N-Nitrosodimethylamine	3.11e-06	NSD	6.22e-06	NSD	1.86e-05	NSD
6-Methyl-2-heptanone	N-Nitrosodiethylamine	9.05e-05	NSD	0.000181	NSD	0.000543	NSD
6-Methyl-2-heptanone	N-Nitrosomethylethylamine	0.000175	NSD	0.00035	NSD	0.00105	NSD
6-Methyl-2-heptanone	N-Nitrosomorpholine	0.000301	NSD	0.000601	NSD	0.0018	NSD
6-Methyl-2-heptanone	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	2, 4-Dimethylpyridine	0.0837	NSD	0.167	NSD	0.502	NSD
6-Methyl-2-heptanone	Methyl nitrite	0.00333	NSD	0.00667	NSD	0.02	NSD
6-Methyl-2-heptanone	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	Butyl nitrate	0.516	0.34	1.03	0.68	3.1	2.04
6-Methyl-2-heptanone	1,4-Butanediol, dinitrate	0.201	NSD	0.402	NSD	1.21	NSD
6-Methyl-2-heptanone	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
6-Methyl-2-heptanone	1,2,3-Propanetriol, 1,3-dinitrate	0.0148	NSD	0.0296	NSD	0.0887	NSD
6-Methyl-2-heptanone	Methyl Isocyanate	0.00293	NSD	0.00586	NSD	0.0176	NSD
6-Methyl-2-heptanone	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.13: 3-Buten-2-one: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
3-Buten-2-one	Ammonia	(4.61e-06)	(4.61e-06)	(9.23e-06)	(9.23e-06)	(9.23e-06)	(9.23e-06)
3-Buten-2-one	Nitrous Oxide	(7.29e-05)	NSD	(0.000146)	NSD	(0.000437)	NSD
3-Buten-2-one	Mercury	(2.44e-05)	(2.44e-05)	(4.88e-05)	(4.88e-05)	(9.77e-05)	(9.77e-05)
3-Buten-2-one	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Benzene	(0.00481)	(0.00481)	(0.00962)	(0.00962)	(0.0481)	(0.0481)
3-Buten-2-one	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	1-Butanol	(0.00608)	(0.00608)	(0.0122)	(0.0122)	(0.122)	(0.122)
3-Buten-2-one	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Hexanone	(0.0209)	(0.0209)	(0.0419)	(0.0419)	(0.0838)	(0.0838)
3-Buten-2-one	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	4-Methyl-2-hexanone	(0.0288)	(0.0288)	(0.0577)	(0.0577)	(0.173)	(0.173)
3-Buten-2-one	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	3-Buten-2-one	0.1	0.1	0.2	0.2	0.2	0.2
3-Buten-2-one	Formaldehyde	(0.000897)	(0.000897)	(0.00179)	(0.00179)	(0.00179)	(0.00179)
3-Buten-2-one	Acetaldehyde	(0.00687)	(0.00687)	(0.0137)	(0.0137)	(0.0137)	(0.0137)
3-Buten-2-one	Butanal	(0.0374)	(0.0374)	(0.0748)	(0.0748)	(0.688)	(0.688)
3-Buten-2-one	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Furan	(2.79e-05)	NSD	(5.57e-05)	NSD	(0.01)	NSD
3-Buten-2-one	2,3-Dihydrofuran	(0.000103)	NSD	(0.000206)	NSD	(0.000619)	NSD
3-Buten-2-one	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Acetonitrile	(0.000939)	(0.000939)	(0.00188)	(0.00188)	(0.00563)	(0.00563)
3-Buten-2-one	Propanenitrile	(0.025)	(0.025)	(0.0501)	(0.0501)	(0.15)	(0.15)
3-Buten-2-one	Butanenitrile	(0.0447)	(0.0447)	(0.0894)	(0.0894)	(0.268)	(0.268)
3-Buten-2-one	Pentanenitrile	(0.00955)	(0.00955)	(0.0191)	(0.0191)	(0.0573)	(0.0573)
3-Buten-2-one	Hexanenitrile	(0.0532)	(0.0532)	(0.106)	(0.106)	(0.319)	(0.319)
3-Buten-2-one	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Ethylamine	(0.00212)	NSD	(0.00423)	NSD	(0.0127)	NSD
3-Buten-2-one	N-Nitrosodimethylamine	(4.4e-07)	(4.4e-07)	(8.8e-07)	(8.8e-07)	(2.64e-06)	(2.64e-06)
3-Buten-2-one	N-Nitrosodiethylamine	(2.09e-05)	(2.09e-05)	(4.18e-05)	(4.18e-05)	(0.000125)	(0.000125)
3-Buten-2-one	N-Nitrosomethylethylamine	(4.86e-05)	(4.86e-05)	(9.72e-05)	(9.72e-05)	(0.000291)	(0.000291)
3-Buten-2-one	N-Nitrosomorpholine	(0.000124)	(0.000124)	(0.000248)	(0.000248)	(0.000743)	(0.000743)
3-Buten-2-one	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Pyridine	(0.0205)	(0.0205)	(0.041)	(0.041)	(0.41)	(0.41)
3-Buten-2-one	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
3-Buten-2-one	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.14: Formaldehyde: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Formaldehyde	Ammonia	(3.05e-05)	(3.05e-05)	(6.1e-05)	(6.1e-05)	(6.1e-05)	(6.1e-05)
Formaldehyde	Nitrous Oxide	(9.4e-05)	NSD	(0.000188)	NSD	(0.000564)	NSD
Formaldehyde	Mercury	(0.000118)	(0.000118)	(0.000236)	(0.000236)	(0.000472)	(0.000472)
Formaldehyde	1,3-Butadiene	0.0175	0.00369	0.035	0.00738	0.175	0.0369
Formaldehyde	Benzene	(0.0179)	(0.0179)	(0.0357)	(0.0357)	(0.179)	(0.179)
Formaldehyde	Biphenyl	0.46	NSD	0.92	NSD	2.76	NSD
Formaldehyde	1-Butanol	(0.0138)	(0.0138)	(0.0276)	(0.0276)	(0.276)	(0.276)
Formaldehyde	Methanol	(0.00909)	(0.00909)	(0.0182)	(0.0182)	(0.0227)	(0.0227)
Formaldehyde	2-Hexanone	(0.0955)	(0.0955)	(0.191)	(0.191)	(0.382)	(0.382)
Formaldehyde	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	4-Methyl-2-hexanone	0.437	(0.0856)	0.874	(0.171)	2.62	(0.513)
Formaldehyde	6-Methyl-2-heptanone	(0.199)	NSD	(0.398)	NSD	(1.19)	NSD
Formaldehyde	3-Buten-2-one	(0.0125)	(0.0125)	(0.0249)	(0.0249)	(0.0249)	(0.0249)
Formaldehyde	Formaldehyde	0.15	0.15	0.3	0.3	0.3	0.3
Formaldehyde	Acetaldehyde	(0.0169)	(0.0169)	(0.0338)	(0.0338)	(0.0338)	(0.0338)
Formaldehyde	Butanal	(0.187)	(0.187)	(0.374)	(0.374)	(3.44)	(3.44)
Formaldehyde	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	Furan	0.000273	(3.57e-05)	0.000546	(7.14e-05)	0.0982	(0.0129)
Formaldehyde	2,3-Dihydrofuran	0.00383	NSD	0.00766	NSD	0.023	NSD
Formaldehyde	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	2-Methylfuran	0.000823	NSD	0.00165	NSD	0.00494	NSD
Formaldehyde	2,5-Dimethylfuran	0.00843	NSD	0.0169	NSD	0.0506	NSD
Formaldehyde	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	2-Pentylfuran	0.0064	(0.00443)	0.0128	(0.00886)	0.0384	(0.0266)
Formaldehyde	2-Heptylfuran	0.0133	NSD	0.0266	NSD	0.0798	NSD
Formaldehyde	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	2-Octylfuran	(0.0454)	NSD	(0.0908)	NSD	(0.272)	NSD
Formaldehyde	2-(3-Oxo-3-phenylprop-1-enyl)furan	(0.00541)	NSD	(0.0108)	NSD	(0.0325)	NSD
Formaldehyde	2-(2-Methyl-6-oxoheptyl)furan	(0.0257)	NSD	(0.0515)	NSD	(0.154)	NSD
Formaldehyde	Diethyl Phthalate	1.11	(0.245)	2.22	(0.49)	4.45	(0.981)
Formaldehyde	Acetonitrile	(0.00376)	(0.00376)	(0.00751)	(0.00751)	(0.0225)	(0.0225)
Formaldehyde	Propanenitrile	(0.0381)	(0.0381)	(0.0763)	(0.0763)	(0.229)	(0.229)
Formaldehyde	Butanenitrile	(0.101)	(0.101)	(0.202)	(0.202)	(0.605)	(0.605)
Formaldehyde	Pentanenitrile	1.42	(0.459)	2.83	(0.918)	8.49	(2.75)
Formaldehyde	Hexanenitrile	2.8	(0.126)	5.61	(0.252)	16.8	(0.755)
Formaldehyde	Heptanenitrile	(0.511)	NSD	(1.02)	NSD	(3.07)	NSD
Formaldehyde	2-Methylene butanenitrile	(1.76)	NSD	(3.53)	NSD	(10.6)	NSD
Formaldehyde	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	Ethylamine	0.15	(0.0497)	0.3	(0.0995)	0.9	(0.298)
Formaldehyde	N-Nitrosodimethylamine	(4.11e-06)	(4.11e-06)	(8.22e-06)	(8.22e-06)	(2.47e-05)	(2.47e-05)
Formaldehyde	N-Nitrosodiethylamine	0.000958	(0.000199)	0.00192	(0.000398)	0.00575	(0.00119)
Formaldehyde	N-Nitrosomethylethylamine	(0.000257)	(0.000257)	(0.000514)	(0.000514)	(0.00154)	(0.00154)
Formaldehyde	N-Nitrosomorpholine	0.00128	(0.000396)	0.00256	(0.000791)	0.00768	(0.00237)
Formaldehyde	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	Pyridine	0.0601	(0.0309)	0.12	(0.0618)	1.2	(0.618)
Formaldehyde	2, 4-Dimethylpyridine	0.501	NSD	1	NSD	3.01	NSD
Formaldehyde	Methyl nitrite	(0.0548)	NSD	(0.11)	NSD	(0.329)	NSD
Formaldehyde	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	Butyl nitrate	(0.0978)	NSD	(0.196)	NSD	(0.587)	NSD
Formaldehyde	1,4-Butanediol, dinitrate	(4.8)	NSD	(9.6)	NSD	(28.8)	NSD
Formaldehyde	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Formaldehyde	1,2,3-Propanetriol, 1,3-dinitrate	(0.128)	NSD	(0.256)	NSD	(0.769)	NSD
Formaldehyde	Methyl Isocyanate	(0.00329)	NSD	(0.00659)	NSD	(0.0198)	NSD
Formaldehyde	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.15: Acetaldehyde: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Acetaldehyde	Ammonia	(0.000337)	(0.000337)	(0.000674)	(0.000674)	(0.000674)	(0.000674)
Acetaldehyde	Nitrous Oxide	(0.000436)	(0.000436)	(0.000871)	(0.000871)	(0.00261)	(0.00261)
Acetaldehyde	Mercury	(0.00218)	(0.00218)	(0.00436)	(0.00436)	(0.00872)	(0.00872)
Acetaldehyde	1,3-Butadiene	0.108	(0.0378)	0.216	(0.0757)	1.08	(0.378)
Acetaldehyde	Benzene	0.45	(0.0312)	0.9	(0.0625)	4.5	(0.312)
Acetaldehyde	Biphenyl	1.29	NSD	2.58	NSD	7.75	NSD
Acetaldehyde	1-Butanol	(0.125)	(0.125)	(0.25)	(0.25)	(2.5)	(2.5)
Acetaldehyde	Methanol	0.657	(0.364)	1.31	(0.727)	1.64	(0.909)
Acetaldehyde	2-Hexanone	3.5	(1.58)	7	(3.16)	14	(6.32)
Acetaldehyde	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	4-Methyl-2-hexanone	2.04	(0.25)	4.08	(0.5)	12.2	(1.5)
Acetaldehyde	6-Methyl-2-heptanone	(1.48)	(1.48)	(2.96)	(2.96)	(8.89)	(8.89)
Acetaldehyde	3-Buten-2-one	(0.0667)	(0.0667)	(0.133)	(0.133)	(0.133)	(0.133)
Acetaldehyde	Formaldehyde	(0.0429)	(0.0429)	(0.0857)	(0.0857)	(0.0857)	(0.0857)
Acetaldehyde	Acetaldehyde	12.5	12.5	25	25	25	25
Acetaldehyde	Butanal	(1.23)	(1.23)	(2.47)	(2.47)	(22.7)	(22.7)
Acetaldehyde	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	Furan	7e-04	(0.000244)	0.0014	(0.000487)	0.252	(0.0877)
Acetaldehyde	2,3-Dihydrofuran	0.0112	NSD	0.0224	NSD	0.0672	NSD
Acetaldehyde	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	2-Methylfuran	0.0175	NSD	0.0351	NSD	0.105	NSD
Acetaldehyde	2,5-Dimethylfuran	0.0205	NSD	0.0411	NSD	0.123	NSD
Acetaldehyde	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	2-Pentylfuran	0.0247	0.00456	0.0494	0.00913	0.148	0.0274
Acetaldehyde	2-Heptylfuran	0.0355	NSD	0.0709	NSD	0.213	NSD
Acetaldehyde	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	2-Octylfuran	(0.228)	NSD	(0.456)	NSD	(1.37)	NSD
Acetaldehyde	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.0435	NSD	0.0869	NSD	0.261	NSD
Acetaldehyde	2-(2-Methyl-6-oxoheptyl)furan	(0.207)	NSD	(0.413)	NSD	(1.24)	NSD
Acetaldehyde	Diethyl Phthalate	(0.0932)	NSD	(0.186)	NSD	(0.373)	NSD
Acetaldehyde	Acetonitrile	(0.0119)	(0.0119)	(0.0238)	(0.0238)	(0.0715)	(0.0715)
Acetaldehyde	Propanenitrile	3.3	(0.486)	6.6	(0.973)	19.8	(2.92)
Acetaldehyde	Butanenitrile	2.61	(1.18)	5.22	(2.35)	15.7	(7.06)
Acetaldehyde	Pentanenitrile	8	(2.65)	16	(5.3)	48	(15.9)
Acetaldehyde	Hexanenitrile	9	(1.66)	18	(3.32)	54	(9.97)
Acetaldehyde	Heptanenitrile	(3.53)	(3.53)	(7.07)	(7.07)	(21.2)	(21.2)
Acetaldehyde	2-Methylene butanenitrile	(9.09)	NSD	(18.2)	NSD	(54.5)	NSD
Acetaldehyde	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	Ethylamine	0.246	(0.244)	0.491	(0.489)	1.47	(1.47)
Acetaldehyde	N-Nitrosodimethylamine	(3.71e-05)	(3.71e-05)	(7.42e-05)	(7.42e-05)	(0.000223)	(0.000223)
Acetaldehyde	N-Nitrosodiethylamine	0.0037	(0.00122)	0.00741	(0.00244)	0.0222	(0.00732)
Acetaldehyde	N-Nitrosomethylethylamine	(0.00316)	(0.00316)	(0.00632)	(0.00632)	(0.0189)	(0.0189)
Acetaldehyde	N-Nitrosomorpholine	(0.00833)	(0.00833)	(0.0167)	(0.0167)	(0.05)	(0.05)
Acetaldehyde	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	Pyridine	0.423	(0.159)	0.845	(0.319)	8.45	(3.19)
Acetaldehyde	2, 4-Dimethylpyridine	2.65	NSD	5.3	NSD	15.9	NSD
Acetaldehyde	Methyl nitrite	(0.0133)	NSD	(0.0266)	NSD	(0.0797)	NSD
Acetaldehyde	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	Butyl nitrate	(0.927)	(0.927)	(1.85)	(1.85)	(5.56)	(5.56)
Acetaldehyde	1,4-Butanediol, dinitrate	(0.98)	NSD	(1.96)	NSD	(5.88)	NSD
Acetaldehyde	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Acetaldehyde	1,2,3-Propanetriol, 1,3-dinitrate	1.32	NSD	2.64	NSD	7.91	NSD
Acetaldehyde	Methyl Isocyanate	0.0436	NSD	0.0873	NSD	0.262	NSD
Acetaldehyde	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.16: Butanal: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Butanal	Ammonia	(9.83e-06)	(9.83e-06)	(1.97e-05)	(1.97e-05)	(1.97e-05)	(1.97e-05)
Butanal	Nitrous Oxide	(3.47e-05)	(3.47e-05)	(6.95e-05)	(6.95e-05)	(0.000208)	(0.000208)
Butanal	Mercury	(1.62e-05)	(1.62e-05)	(3.24e-05)	(3.24e-05)	(6.48e-05)	(6.48e-05)
Butanal	1,3-Butadiene	0.00993	0.00527	0.0199	0.0105	0.0993	0.0527
Butanal	Benzene	0.217	(0.025)	0.435	(0.0501)	2.17	(0.25)
Butanal	Biphenyl	0.34	NSD	0.679	NSD	2.04	NSD
Butanal	1-Butanol	(0.0177)	(0.0177)	(0.0353)	(0.0353)	(0.353)	(0.353)
Butanal	Methanol	(0.0135)	(0.0135)	(0.0271)	(0.0271)	(0.0338)	(0.0338)
Butanal	2-Hexanone	2.05	(0.0372)	4.1	(0.0744)	8.19	(0.149)
Butanal	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	4-Methyl-2-hexanone	0.475	0.175	0.95	0.349	2.85	1.05
Butanal	6-Methyl-2-heptanone	2.07	(0.711)	4.14	(1.42)	12.4	(4.27)
Butanal	3-Buten-2-one	0.0561	(0.0129)	0.112	(0.0257)	0.112	(0.0257)
Butanal	Formaldehyde	(0.00093)	(0.00093)	(0.00186)	(0.00186)	(0.00186)	(0.00186)
Butanal	Acetaldehyde	(0.0764)	(0.0764)	(0.153)	(0.153)	(0.153)	(0.153)
Butanal	Butanal	12.5	12.5	25	25	230	230
Butanal	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	Furan	0.000354	(2.79e-05)	0.000708	(5.57e-05)	0.127	(0.01)
Butanal	2,3-Dihydrofuran	0.00313	NSD	0.00625	NSD	0.0188	NSD
Butanal	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	2-Methylfuran	0.00198	NSD	0.00395	NSD	0.0119	NSD
Butanal	2,5-Dimethylfuran	0.00524	NSD	0.0105	NSD	0.0315	NSD
Butanal	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	2-Pentylfuran	0.0049	0.00204	0.00981	0.00408	0.0294	0.0122
Butanal	2-Heptylfuran	0.00792	NSD	0.0158	NSD	0.0475	NSD
Butanal	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	2-Octylfuran	0.0144	NSD	0.0288	NSD	0.0865	NSD
Butanal	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.00167	NSD	0.00334	NSD	0.01	NSD
Butanal	2-(2-Methyl-6-oxoheptyl)furan	0.00883	NSD	0.0177	NSD	0.053	NSD
Butanal	Diethyl Phthalate	(0.0753)	(0.0753)	(0.151)	(0.151)	(0.301)	(0.301)
Butanal	Acetonitrile	(0.00156)	(0.00156)	(0.00313)	(0.00313)	(0.00938)	(0.00938)
Butanal	Propanenitrile	1.11	(0.0819)	2.22	(0.164)	6.65	(0.491)
Butanal	Butanenitrile	1.63	(0.0808)	3.27	(0.162)	9.8	(0.485)
Butanal	Pentanenitrile	3.18	(0.0113)	6.36	(0.0227)	19.1	(0.0681)
Butanal	Hexanenitrile	3.21	0.808	6.43	1.62	19.3	4.85
Butanal	Heptanenitrile	1.85	(0.864)	3.7	(1.73)	11.1	(5.18)
Butanal	2-Methylene butanenitrile	1.22	NSD	2.44	NSD	7.33	NSD
Butanal	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	Ethylamine	0.145	(0.00347)	0.291	(0.00693)	0.872	(0.0208)
Butanal	N-Nitrosodimethylamine	(4.27e-07)	(4.27e-07)	(8.55e-07)	(8.55e-07)	(2.56e-06)	(2.56e-06)
Butanal	N-Nitrosodiethylamine	0.000442	(8.51e-05)	0.000884	(0.00017)	0.00265	(0.000511)
Butanal	N-Nitrosomethylethylamine	(9.19e-05)	(9.19e-05)	(0.000184)	(0.000184)	(0.000551)	(0.000551)
Butanal	N-Nitrosomorpholine	(0.000332)	(0.000332)	(0.000664)	(0.000664)	(0.00199)	(0.00199)
Butanal	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	Pyridine	0.179	(0.0133)	0.357	(0.0265)	3.57	(0.265)
Butanal	2, 4-Dimethylpyridine	0.411	0.188	0.822	0.377	2.47	1.13
Butanal	Methyl nitrite	0.0225	NSD	0.045	NSD	0.135	NSD
Butanal	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Butanal	Butyl nitrate	3.38	0.846	6.76	1.69	20.3	5.08
Butanal	1,4-Butanediol, dinitrate	0.124	NSD	0.248	NSD	0.744	NSD
Butanal	2-Nitro-2-methylpropane	(0.00847)	NSD	(0.0169)	NSD	(0.0508)	NSD
Butanal	1,2,3-Propanetriol, 1,3-dinitrate	0.078	NSD	0.156	NSD	0.468	NSD
Butanal	Methyl Isocyanate	0.011	NSD	0.0219	NSD	0.0658	NSD
Butanal	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.17: 2-Methyl-2-butenal: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Methyl-2-butenal	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methyl-2-butenal	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.18: 2-Ethyl-hex-2-enal: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Ethyl-hex-2-enal	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-hex-2-enal	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.19: 2-Propenal: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Propenal	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propenal	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.20: Furan: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Furan	Ammonia	(2.32e-07)	(2.32e-07)	(4.64e-07)	(4.64e-07)	(4.64e-07)	(4.64e-07)
Furan	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
Furan	Mercury	(2.68e-06)	NSD	(5.37e-06)	NSD	(1.07e-05)	NSD
Furan	1,3-Butadiene	(3.56e-06)	NSD	(7.13e-06)	NSD	(3.56e-05)	NSD
Furan	Benzene	(0.000533)	(0.000533)	(0.00107)	(0.00107)	(0.00533)	(0.00533)
Furan	Biphenyl	(0.0057)	NSD	(0.0114)	NSD	(0.0342)	NSD
Furan	1-Butanol	(0.00018)	NSD	(0.000361)	NSD	(0.00361)	NSD
Furan	Methanol	(0.000119)	NSD	(0.000238)	NSD	(0.000298)	NSD
Furan	2-Hexanone	(0.00119)	(0.00119)	(0.00238)	(0.00238)	(0.00477)	(0.00477)
Furan	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Furan	4-Methyl-2-hexanone	(0.00159)	NSD	(0.00319)	NSD	(0.00956)	NSD
Furan	6-Methyl-2-heptanone	(0.164)	NSD	(0.329)	NSD	(0.987)	NSD
Furan	3-Buten-2-one	(1.84e-05)	NSD	(3.67e-05)	NSD	(3.67e-05)	NSD
Furan	Formaldehyde	(5.1e-05)	(5.1e-05)	(0.000102)	(0.000102)	(0.000102)	(0.000102)
Furan	Acetaldehyde	(0.000391)	(0.000391)	(0.000782)	(0.000782)	(0.000782)	(0.000782)
Furan	Butanal	(0.00321)	(0.00321)	(0.00643)	(0.00643)	(0.0591)	(0.0591)
Furan	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Furan	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Furan	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Furan	Furan	5e-04	5e-04	0.001	0.001	0.18	0.18
Furan	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Furan	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Furan	2-Methylfuran	(3.62e-05)	NSD	(7.24e-05)	NSD	(0.000217)	NSD
Furan	2,5-Dimethylfuran	(4.59e-05)	NSD	(9.19e-05)	NSD	(0.000276)	NSD
Furan	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Furan	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Furan	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Furan	2-Pentylfuran	(0.000161)	NSD	(0.000322)	NSD	(0.000967)	NSD
Furan	2-Heptylfuran	0.000376	NSD	0.000751	NSD	0.00225	NSD
Furan	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Furan	2-Octylfuran	(0.00183)	NSD	(0.00367)	NSD	(0.011)	NSD
Furan	2-(3-Oxo-3-phenylprop-1-enyl)furan	(0.000238)	NSD	(0.000477)	NSD	(0.00143)	NSD
Furan	2-(2-Methyl-6-oxoheptyl)furan	(0.00113)	NSD	(0.00227)	NSD	(0.0068)	NSD
Furan	Diethyl Phthalate	(0.0129)	NSD	(0.0258)	NSD	(0.0516)	NSD
Furan	Acetonitrile	(0.000347)	(0.000347)	(0.000695)	(0.000695)	(0.00208)	(0.00208)
Furan	Propanenitrile	(0.00112)	(0.00112)	(0.00223)	(0.00223)	(0.0067)	(0.0067)
Furan	Butanenitrile	(0.00187)	(0.00187)	(0.00373)	(0.00373)	(0.0112)	(0.0112)
Furan	Pentanenitrile	(0.00229)	(0.00229)	(0.00457)	(0.00457)	(0.0137)	(0.0137)
Furan	Hexanenitrile	(0.00158)	NSD	(0.00315)	NSD	(0.00946)	NSD
Furan	Heptanenitrile	(0.158)	NSD	(0.316)	NSD	(0.947)	NSD
Furan	2-Methylene butanenitrile	(0.0349)	NSD	(0.0698)	NSD	(0.209)	NSD
Furan	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Furan	Ethylamine	(0.00012)	NSD	(0.000241)	NSD	(0.000722)	NSD
Furan	N-Nitrosodimethylamine	(4.7e-09)	(4.7e-09)	(9.4e-09)	(9.4e-09)	(2.82e-08)	(2.82e-08)
Furan	N-Nitrosodiethylamine	(2.72e-06)	NSD	(5.43e-06)	NSD	(1.63e-05)	NSD
Furan	N-Nitrosomethylethylamine	(8.49e-08)	(8.49e-08)	(1.7e-07)	(1.7e-07)	(5.09e-07)	(5.09e-07)
Furan	N-Nitrosomorpholine	(2.39e-05)	NSD	(4.77e-05)	NSD	(0.000143)	NSD
Furan	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Furan	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Furan	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Furan	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Furan	2, 4-Dimethylpyridine	(1.02e-05)	NSD	(2.03e-05)	NSD	(6.1e-05)	NSD
Furan	Methyl nitrite	(0.002)	NSD	(0.004)	NSD	(0.012)	NSD
Furan	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Furan	Butyl nitrate	(0.0347)	NSD	(0.0694)	NSD	(0.208)	NSD
Furan	1,4-Butanediol, dinitrate	(0.00338)	NSD	(0.00676)	NSD	(0.0203)	NSD
Furan	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Furan	1,2,3-Propanetriol, 1,3-dinitrate	(0.00564)	NSD	(0.0113)	NSD	(0.0339)	NSD
Furan	Methyl Isocyanate	(0.0056)	NSD	(0.0112)	NSD	(0.0336)	NSD
Furan	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.21: 2,3-Dihydrofuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2,3-Dihydrofuran	Ammonia	(4.83e-07)	NSD	(9.65e-07)	NSD	(9.65e-07)	NSD
2,3-Dihydrofuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Mercury	(4.5e-06)	NSD	(9e-06)	NSD	(1.8e-05)	NSD
2,3-Dihydrofuran	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Benzene	(0.000366)	NSD	(0.000731)	NSD	(0.00366)	NSD
2,3-Dihydrofuran	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	1-Butanol	(0.000169)	NSD	(0.000339)	NSD	(0.00339)	NSD
2,3-Dihydrofuran	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Hexanone	(0.00225)	NSD	(0.00451)	NSD	(0.00902)	NSD
2,3-Dihydrofuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	3-Buten-2-one	(3.57e-05)	NSD	(7.13e-05)	NSD	(7.13e-05)	NSD
2,3-Dihydrofuran	Formaldehyde	(0.000115)	NSD	(0.000229)	NSD	(0.000229)	NSD
2,3-Dihydrofuran	Acetaldehyde	(0.000768)	NSD	(0.00154)	NSD	(0.00154)	NSD
2,3-Dihydrofuran	Butanal	(0.00321)	NSD	(0.00641)	NSD	(0.059)	NSD
2,3-Dihydrofuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Furan	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2,3-Dihydrofuran	5e-04	NSD	0.001	NSD	0.003	NSD
2,3-Dihydrofuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Acetonitrile	(0.000447)	NSD	(0.000894)	NSD	(0.00268)	NSD
2,3-Dihydrofuran	Propanenitrile	(0.00217)	NSD	(0.00434)	NSD	(0.013)	NSD
2,3-Dihydrofuran	Butanenitrile	(0.00363)	NSD	(0.00725)	NSD	(0.0218)	NSD
2,3-Dihydrofuran	Pentanenitrile	(0.00444)	NSD	(0.00888)	NSD	(0.0266)	NSD
2,3-Dihydrofuran	Hexanenitrile	(0.00148)	NSD	(0.00296)	NSD	(0.00889)	NSD
2,3-Dihydrofuran	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	N-Nitrosodimethylamine	(4.04e-09)	NSD	(8.08e-09)	NSD	(2.43e-08)	NSD
2,3-Dihydrofuran	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	N-Nitrosomethylethylamine	(7.3e-08)	NSD	(1.46e-07)	NSD	(4.38e-07)	NSD
2,3-Dihydrofuran	N-Nitrosomorpholine	(3.18e-05)	NSD	(6.36e-05)	NSD	(0.000191)	NSD
2,3-Dihydrofuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Pyridine	(0.000613)	NSD	(0.00123)	NSD	(0.0123)	NSD
2,3-Dihydrofuran	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
2,3-Dihydrofuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.22: 2,5-Dihydrofuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2,5-Dihydrofuran	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Furan	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dihydrofuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.23: 2-Methylfuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Methylfuran	Ammonia	(4.48e-07)	NSD	(8.96e-07)	NSD	(8.96e-07)	NSD
2-Methylfuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	1,3-Butadiene	(3.31e-05)	NSD	(6.62e-05)	NSD	(0.000331)	NSD
2-Methylfuran	Benzene	(0.000624)	NSD	(0.00125)	NSD	(0.00624)	NSD
2-Methylfuran	Biphenyl	(0.00658)	NSD	(0.0132)	NSD	(0.0395)	NSD
2-Methylfuran	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	Methanol	(0.000123)	NSD	(0.000245)	NSD	(0.000307)	NSD
2-Methylfuran	2-Hexanone	(0.00247)	NSD	(0.00495)	NSD	(0.0099)	NSD
2-Methylfuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	4-Methyl-2-hexanone	(0.00991)	NSD	(0.0198)	NSD	(0.0595)	NSD
2-Methylfuran	6-Methyl-2-heptanone	(0.46)	NSD	(0.92)	NSD	(2.76)	NSD
2-Methylfuran	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	Formaldehyde	(9.79e-05)	NSD	(0.000196)	NSD	(0.000196)	NSD
2-Methylfuran	Acetaldehyde	(0.00164)	NSD	(0.00328)	NSD	(0.00328)	NSD
2-Methylfuran	Butanal	(0.0047)	NSD	(0.0094)	NSD	(0.0865)	NSD
2-Methylfuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	Furan	(7.29e-06)	NSD	(1.46e-05)	NSD	(0.00262)	NSD
2-Methylfuran	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	2-Methylfuran	5e-04	NSD	0.001	NSD	0.003	NSD
2-Methylfuran	2,5-Dimethylfuran	(6.04e-05)	NSD	(0.000121)	NSD	(0.000362)	NSD
2-Methylfuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	2-Pentylfuran	(0.000146)	NSD	(0.000291)	NSD	(0.000873)	NSD
2-Methylfuran	2-Heptylfuran	(0.000358)	NSD	(0.000717)	NSD	(0.00215)	NSD
2-Methylfuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	2-Octylfuran	0.00132	NSD	0.00264	NSD	0.00792	NSD
2-Methylfuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000344	NSD	0.000687	NSD	0.00206	NSD
2-Methylfuran	2-(2-Methyl-6-oxoheptyl)furan	0.00158	NSD	0.00317	NSD	0.0095	NSD
2-Methylfuran	Diethyl Phthalate	(0.0122)	NSD	(0.0245)	NSD	(0.049)	NSD
2-Methylfuran	Acetonitrile	(0.000288)	NSD	(0.000577)	NSD	(0.00173)	NSD
2-Methylfuran	Propanenitrile	(0.0115)	NSD	(0.0231)	NSD	(0.0693)	NSD
2-Methylfuran	Butanenitrile	(0.00468)	NSD	(0.00937)	NSD	(0.0281)	NSD
2-Methylfuran	Pentanenitrile	(0.0295)	NSD	(0.059)	NSD	(0.177)	NSD
2-Methylfuran	Hexanenitrile	(0.00126)	NSD	(0.00253)	NSD	(0.00759)	NSD
2-Methylfuran	Heptanenitrile	1.62	NSD	3.23	NSD	9.7	NSD
2-Methylfuran	2-Methylene butanenitrile	0.0484	NSD	0.0967	NSD	0.29	NSD
2-Methylfuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	Ethylamine	(0.000164)	NSD	(0.000328)	NSD	(0.000984)	NSD
2-Methylfuran	N-Nitrosodimethylamine	(3.34e-09)	NSD	(6.68e-09)	NSD	(2e-08)	NSD
2-Methylfuran	N-Nitrosodiethylamine	(2.8e-06)	NSD	(5.6e-06)	NSD	(1.68e-05)	NSD
2-Methylfuran	N-Nitrosomethylethylamine	(6.03e-08)	NSD	(1.21e-07)	NSD	(3.62e-07)	NSD
2-Methylfuran	N-Nitrosomorpholine	(1.27e-05)	NSD	(2.55e-05)	NSD	(7.64e-05)	NSD
2-Methylfuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	2, 4-Dimethylpyridine	(8.43e-06)	NSD	(1.69e-05)	NSD	(5.06e-05)	NSD
2-Methylfuran	Methyl nitrite	0.0102	NSD	0.0204	NSD	0.0611	NSD
2-Methylfuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	Butyl nitrate	6.41	NSD	12.8	NSD	38.4	NSD
2-Methylfuran	1,4-Butanediol, dinitrate	0.14	NSD	0.28	NSD	0.841	NSD
2-Methylfuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylfuran	1,2,3-Propanetriol, 1,3-dinitrate	0.0142	NSD	0.0284	NSD	0.0853	NSD
2-Methylfuran	Methyl Isocyanate	0.00361	NSD	0.00722	NSD	0.0217	NSD
2-Methylfuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.24: 2,5-Dimethylfuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2,5-Dimethylfuran	Ammonia	(3.82e-07)	NSD	(7.65e-07)	NSD	(7.65e-07)	NSD
2,5-Dimethylfuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	1,3-Butadiene	(1.01e-05)	NSD	(2.02e-05)	NSD	(0.000101)	NSD
2,5-Dimethylfuran	Benzene	(0.000869)	NSD	(0.00174)	NSD	(0.00869)	NSD
2,5-Dimethylfuran	Biphenyl	0.0534	NSD	0.107	NSD	0.32	NSD
2,5-Dimethylfuran	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	Methanol	(0.000171)	NSD	(0.000342)	NSD	(0.000427)	NSD
2,5-Dimethylfuran	2-Hexanone	(0.00218)	NSD	(0.00437)	NSD	(0.00874)	NSD
2,5-Dimethylfuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	4-Methyl-2-hexanone	(0.00539)	NSD	(0.0108)	NSD	(0.0323)	NSD
2,5-Dimethylfuran	6-Methyl-2-heptanone	0.593	NSD	1.19	NSD	3.56	NSD
2,5-Dimethylfuran	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	Formaldehyde	(8.36e-05)	NSD	(0.000167)	NSD	(0.000167)	NSD
2,5-Dimethylfuran	Acetaldehyde	(0.00132)	NSD	(0.00265)	NSD	(0.00265)	NSD
2,5-Dimethylfuran	Butanal	(0.00538)	NSD	(0.0108)	NSD	(0.0991)	NSD
2,5-Dimethylfuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	Furan	(6.23e-06)	NSD	(1.25e-05)	NSD	(0.00224)	NSD
2,5-Dimethylfuran	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	2-Methylfuran	(0.000122)	NSD	(0.000245)	NSD	(0.000735)	NSD
2,5-Dimethylfuran	2,5-Dimethylfuran	5e-04	NSD	0.001	NSD	0.003	NSD
2,5-Dimethylfuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	2-Pentylfuran	(0.000162)	NSD	(0.000324)	NSD	(0.000971)	NSD
2,5-Dimethylfuran	2-Heptylfuran	(0.00031)	NSD	(0.00062)	NSD	(0.00186)	NSD
2,5-Dimethylfuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	2-Octylfuran	0.00144	NSD	0.00288	NSD	0.00865	NSD
2,5-Dimethylfuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000375	NSD	0.000751	NSD	0.00225	NSD
2,5-Dimethylfuran	2-(2-Methyl-6-oxoheptyl)furan	0.00169	NSD	0.00339	NSD	0.0102	NSD
2,5-Dimethylfuran	Diethyl Phthalate	(0.0105)	NSD	(0.0209)	NSD	(0.0418)	NSD
2,5-Dimethylfuran	Acetonitrile	(0.000246)	NSD	(0.000492)	NSD	(0.00148)	NSD
2,5-Dimethylfuran	Propanenitrile	(0.00378)	NSD	(0.00755)	NSD	(0.0227)	NSD
2,5-Dimethylfuran	Butanenitrile	(0.00413)	NSD	(0.00827)	NSD	(0.0248)	NSD
2,5-Dimethylfuran	Pentanenitrile	(0.00773)	NSD	(0.0155)	NSD	(0.0464)	NSD
2,5-Dimethylfuran	Hexanenitrile	(0.00112)	NSD	(0.00223)	NSD	(0.0067)	NSD
2,5-Dimethylfuran	Heptanenitrile	1.73	NSD	3.45	NSD	10.4	NSD
2,5-Dimethylfuran	2-Methylene butanenitrile	0.0555	NSD	0.111	NSD	0.333	NSD
2,5-Dimethylfuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	Ethylamine	(0.000243)	NSD	(0.000485)	NSD	(0.00146)	NSD
2,5-Dimethylfuran	N-Nitrosodimethylamine	(3.14e-09)	NSD	(6.27e-09)	NSD	(1.88e-08)	NSD
2,5-Dimethylfuran	N-Nitrosodiethylamine	(3.9e-06)	NSD	(7.8e-06)	NSD	(2.34e-05)	NSD
2,5-Dimethylfuran	N-Nitrosomethylethylamine	(5.67e-08)	NSD	(1.13e-07)	NSD	(3.4e-07)	NSD
2,5-Dimethylfuran	N-Nitrosomorpholine	(1.88e-05)	NSD	(3.77e-05)	NSD	(0.000113)	NSD
2,5-Dimethylfuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	2, 4-Dimethylpyridine	(0.000582)	NSD	(0.00116)	NSD	(0.00349)	NSD
2,5-Dimethylfuran	Methyl nitrite	0.00829	NSD	0.0166	NSD	0.0498	NSD
2,5-Dimethylfuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	Butyl nitrate	7	NSD	14	NSD	42	NSD
2,5-Dimethylfuran	1,4-Butanediol, dinitrate	0.173	NSD	0.346	NSD	1.04	NSD
2,5-Dimethylfuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2,5-Dimethylfuran	1,2,3-Propanetriol, 1,3-dinitrate	0.0131	NSD	0.0262	NSD	0.0787	NSD
2,5-Dimethylfuran	Methyl Isocyanate	0.00328	NSD	0.00655	NSD	0.0197	NSD
2,5-Dimethylfuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.25: 2-Ethyl-5-methylfuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Ethyl-5-methylfuran	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
2-Ethyl-5-methylfuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.26: 4-(1-Methylpropyl)-2,3-dihydrofuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
4-(1-Methylpropyl)-2,3-dihydrofuran	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Furan	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
4-(1-Methylpropyl)-2,3-dihydrofuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.27: 3-(1,1-Dimethylethyl)-2,3-dihydrofuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Furan	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
3-(1,1-Dimethylethyl)-2,3-dihydrofuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.28: 2-Pentylfuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Pentylfuran	Ammonia	(2.66e-07)	(2.66e-07)	(5.32e-07)	(5.32e-07)	(5.32e-07)	(5.32e-07)
2-Pentylfuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	Mercury	(2.28e-06)	NSD	(4.56e-06)	NSD	(9.13e-06)	NSD
2-Pentylfuran	1,3-Butadiene	(7.95e-06)	NSD	(1.59e-05)	NSD	(7.95e-05)	NSD
2-Pentylfuran	Benzene	(0.000726)	(0.000726)	(0.00145)	(0.00145)	(0.00726)	(0.00726)
2-Pentylfuran	Biphenyl	0.0172	NSD	0.0344	NSD	0.103	NSD
2-Pentylfuran	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	Methanol	(0.000143)	NSD	(0.000285)	NSD	(0.000357)	NSD
2-Pentylfuran	2-Hexanone	(0.00157)	(0.00157)	(0.00314)	(0.00314)	(0.00627)	(0.00627)
2-Pentylfuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	4-Methyl-2-hexanone	(0.00305)	NSD	(0.00611)	NSD	(0.0183)	NSD
2-Pentylfuran	6-Methyl-2-heptanone	2.57	NSD	5.15	NSD	15.4	NSD
2-Pentylfuran	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	Formaldehyde	(5.81e-05)	(5.81e-05)	(0.000116)	(0.000116)	(0.000116)	(0.000116)
2-Pentylfuran	Acetaldehyde	(0.000728)	(0.000728)	(0.00146)	(0.00146)	(0.00146)	(0.00146)
2-Pentylfuran	Butanal	(0.00387)	(0.00387)	(0.00773)	(0.00773)	(0.0711)	(0.0711)
2-Pentylfuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	Furan	(4.33e-06)	NSD	(8.66e-06)	NSD	(0.00156)	NSD
2-Pentylfuran	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	2-Methylfuran	0.000295	NSD	0.000591	NSD	0.00177	NSD
2-Pentylfuran	2,5-Dimethylfuran	9.38e-05	NSD	0.000188	NSD	0.000563	NSD
2-Pentylfuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	2-Pentylfuran	5e-04	5e-04	0.001	0.001	0.003	0.003
2-Pentylfuran	2-Heptylfuran	(0.000396)	NSD	(0.000792)	NSD	(0.00238)	NSD
2-Pentylfuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	2-Octylfuran	0.00333	NSD	0.00666	NSD	0.02	NSD
2-Pentylfuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000353	NSD	0.000706	NSD	0.00212	NSD
2-Pentylfuran	2-(2-Methyl-6-oxoheptyl)furan	0.00202	NSD	0.00403	NSD	0.0121	NSD
2-Pentylfuran	Diethyl Phthalate	(0.00727)	NSD	(0.0145)	NSD	(0.0291)	NSD
2-Pentylfuran	Acetonitrile	(0.000171)	(0.000171)	(0.000342)	(0.000342)	(0.00103)	(0.00103)
2-Pentylfuran	Propanenitrile	(0.00265)	(0.00265)	(0.0053)	(0.0053)	(0.0159)	(0.0159)
2-Pentylfuran	Butanenitrile	(0.00297)	(0.00297)	(0.00594)	(0.00594)	(0.0178)	(0.0178)
2-Pentylfuran	Pentanenitrile	(0.0146)	(0.0146)	(0.0291)	(0.0291)	(0.0873)	(0.0873)
2-Pentylfuran	Hexanenitrile	(0.000801)	NSD	(0.0016)	NSD	(0.00481)	NSD
2-Pentylfuran	Heptanenitrile	4.6	NSD	9.21	NSD	27.6	NSD
2-Pentylfuran	2-Methylene butanenitrile	0.131	NSD	0.262	NSD	0.785	NSD
2-Pentylfuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	Ethylamine	(0.000188)	NSD	(0.000377)	NSD	(0.00113)	NSD
2-Pentylfuran	N-Nitrosodimethylamine	(1.92e-09)	(1.92e-09)	(3.83e-09)	(3.83e-09)	(1.15e-08)	(1.15e-08)
2-Pentylfuran	N-Nitrosodiethylamine	(3.25e-06)	NSD	(6.51e-06)	NSD	(1.95e-05)	NSD
2-Pentylfuran	N-Nitrosomethylethylamine	(3.46e-08)	NSD	(6.93e-08)	NSD	(2.08e-07)	NSD
2-Pentylfuran	N-Nitrosomorpholine	(1.46e-05)	NSD	(2.92e-05)	NSD	(8.77e-05)	NSD
2-Pentylfuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	2, 4-Dimethylpyridine	(0.000418)	NSD	(0.000836)	NSD	(0.00251)	NSD
2-Pentylfuran	Methyl nitrite	0.00714	NSD	0.0143	NSD	0.0428	NSD
2-Pentylfuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	Butyl nitrate	11.1	NSD	22.3	NSD	66.8	NSD
2-Pentylfuran	1,4-Butanediol, dinitrate	0.233	NSD	0.466	NSD	1.4	NSD
2-Pentylfuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Pentylfuran	1,2,3-Propanetriol, 1,3-dinitrate	0.0174	NSD	0.0348	NSD	0.104	NSD
2-Pentylfuran	Methyl Isocyanate	0.00287	NSD	0.00573	NSD	0.0172	NSD
2-Pentylfuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.29: 2-Heptylfuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Heptylfuran	Ammonia	(2.21e-07)	NSD	(4.42e-07)	NSD	(4.42e-07)	NSD
2-Heptylfuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	1,3-Butadiene	(9.13e-06)	NSD	(1.83e-05)	NSD	(9.13e-05)	NSD
2-Heptylfuran	Benzene	(0.000576)	NSD	(0.00115)	NSD	(0.00576)	NSD
2-Heptylfuran	Biphenyl	0.0095	NSD	0.019	NSD	0.057	NSD
2-Heptylfuran	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	Methanol	(0.000113)	NSD	(0.000227)	NSD	(0.000283)	NSD
2-Heptylfuran	2-Hexanone	(0.00126)	NSD	(0.00253)	NSD	(0.00505)	NSD
2-Heptylfuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	4-Methyl-2-hexanone	(0.00351)	NSD	(0.00702)	NSD	(0.0211)	NSD
2-Heptylfuran	6-Methyl-2-heptanone	0.745	NSD	1.49	NSD	4.47	NSD
2-Heptylfuran	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	Formaldehyde	(4.83e-05)	NSD	(9.67e-05)	NSD	(9.67e-05)	NSD
2-Heptylfuran	Acetaldehyde	(0.000836)	NSD	(0.00167)	NSD	(0.00167)	NSD
2-Heptylfuran	Butanal	(0.00311)	NSD	(0.00623)	NSD	(0.0573)	NSD
2-Heptylfuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	Furan	(3.6e-06)	NSD	(7.2e-06)	NSD	(0.0013)	NSD
2-Heptylfuran	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	2-Methylfuran	(8.93e-05)	NSD	(0.000179)	NSD	(0.000536)	NSD
2-Heptylfuran	2,5-Dimethylfuran	(4.59e-05)	NSD	(9.18e-05)	NSD	(0.000275)	NSD
2-Heptylfuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	2-Pentylfuran	(0.00014)	NSD	(0.00028)	NSD	(0.00084)	NSD
2-Heptylfuran	2-Heptylfuran	5e-04	NSD	0.001	NSD	0.003	NSD
2-Heptylfuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	2-Octylfuran	0.00136	NSD	0.00271	NSD	0.00814	NSD
2-Heptylfuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000199	NSD	0.000398	NSD	0.00119	NSD
2-Heptylfuran	2-(2-Methyl-6-oxoheptyl)furan	0.00112	NSD	0.00224	NSD	0.00673	NSD
2-Heptylfuran	Diethyl Phthalate	(0.00604)	NSD	(0.0121)	NSD	(0.0242)	NSD
2-Heptylfuran	Acetonitrile	(0.000142)	NSD	(0.000284)	NSD	(0.000851)	NSD
2-Heptylfuran	Propanenitrile	(0.00305)	NSD	(0.00609)	NSD	(0.0183)	NSD
2-Heptylfuran	Butanenitrile	(0.00239)	NSD	(0.00478)	NSD	(0.0143)	NSD
2-Heptylfuran	Pentanenitrile	(0.0167)	NSD	(0.0334)	NSD	(0.1)	NSD
2-Heptylfuran	Hexanenitrile	(0.000645)	NSD	(0.00129)	NSD	(0.00387)	NSD
2-Heptylfuran	Heptanenitrile	1.67	NSD	3.33	NSD	10	NSD
2-Heptylfuran	2-Methylene butanenitrile	0.0488	NSD	0.0975	NSD	0.293	NSD
2-Heptylfuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	Ethylamine	(0.000205)	NSD	(0.00041)	NSD	(0.00123)	NSD
2-Heptylfuran	N-Nitrosodimethylamine	(1.81e-09)	NSD	(3.63e-09)	NSD	(1.09e-08)	NSD
2-Heptylfuran	N-Nitrosodiethylamine	(2.58e-06)	NSD	(5.17e-06)	NSD	(1.55e-05)	NSD
2-Heptylfuran	N-Nitrosomethylethylamine	(3.28e-08)	NSD	(6.55e-08)	NSD	(1.97e-07)	NSD
2-Heptylfuran	N-Nitrosomorpholine	(1.59e-05)	NSD	(3.18e-05)	NSD	(9.55e-05)	NSD
2-Heptylfuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	2, 4-Dimethylpyridine	(0.000336)	NSD	(0.000673)	NSD	(0.00202)	NSD
2-Heptylfuran	Methyl nitrite	0.00353	NSD	0.00707	NSD	0.0212	NSD
2-Heptylfuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	Butyl nitrate	6.05	NSD	12.1	NSD	36.3	NSD
2-Heptylfuran	1,4-Butanediol, dinitrate	0.117	NSD	0.234	NSD	0.701	NSD
2-Heptylfuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Heptylfuran	1,2,3-Propanetriol, 1,3-dinitrate	0.00686	NSD	0.0137	NSD	0.0412	NSD
2-Heptylfuran	Methyl Isocyanate	0.00156	NSD	0.00313	NSD	0.00938	NSD
2-Heptylfuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.30: 2-Propylfuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Propylfuran	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
2-Propylfuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.31: 2-Octylfuran: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Octylfuran	Ammonia	1.26e-05	NSD	2.51e-05	NSD	2.51e-05	NSD
2-Octylfuran	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	1,3-Butadiene	0.000497	NSD	0.000994	NSD	0.00497	NSD
2-Octylfuran	Benzene	0.00614	NSD	0.0123	NSD	0.0614	NSD
2-Octylfuran	Biphenyl	0.00921	NSD	0.0184	NSD	0.0553	NSD
2-Octylfuran	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	Methanol	0.00787	NSD	0.0157	NSD	0.0197	NSD
2-Octylfuran	2-Hexanone	0.0415	NSD	0.0829	NSD	0.166	NSD
2-Octylfuran	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	4-Methyl-2-hexanone	0.00265	NSD	0.00531	NSD	0.0159	NSD
2-Octylfuran	6-Methyl-2-heptanone	0.226	NSD	0.451	NSD	1.35	NSD
2-Octylfuran	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	Formaldehyde	0.000165	NSD	0.00033	NSD	0.00033	NSD
2-Octylfuran	Acetaldehyde	0.0111	NSD	0.0223	NSD	0.0223	NSD
2-Octylfuran	Butanal	0.028	NSD	0.056	NSD	0.515	NSD
2-Octylfuran	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	Furan	2.31e-05	NSD	4.63e-05	NSD	0.00833	NSD
2-Octylfuran	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	2-Methylfuran	4.61e-05	NSD	9.21e-05	NSD	0.000276	NSD
2-Octylfuran	2,5-Dimethylfuran	5.27e-05	NSD	0.000105	NSD	0.000316	NSD
2-Octylfuran	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	2-Pentylfuran	3.18e-05	NSD	6.37e-05	NSD	0.000191	NSD
2-Octylfuran	2-Heptylfuran	8.28e-05	NSD	0.000166	NSD	0.000497	NSD
2-Octylfuran	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	2-Octylfuran	5e-04	NSD	0.001	NSD	0.003	NSD
2-Octylfuran	2-(3-Oxo-3-phenylprop-1-enyl)furan	4.15e-05	NSD	8.29e-05	NSD	0.000249	NSD
2-Octylfuran	2-(2-Methyl-6-oxoheptyl)furan	0.000239	NSD	0.000478	NSD	0.00143	NSD
2-Octylfuran	Diethyl Phthalate	0.0175	NSD	0.035	NSD	0.0701	NSD
2-Octylfuran	Acetonitrile	0.0218	NSD	0.0436	NSD	0.131	NSD
2-Octylfuran	Propanenitrile	0.0285	NSD	0.0571	NSD	0.171	NSD
2-Octylfuran	Butanenitrile	0.0558	NSD	0.112	NSD	0.335	NSD
2-Octylfuran	Pentanenitrile	0.208	NSD	0.416	NSD	1.25	NSD
2-Octylfuran	Hexanenitrile	0.201	NSD	0.402	NSD	1.21	NSD
2-Octylfuran	Heptanenitrile	0.445	NSD	0.89	NSD	2.67	NSD
2-Octylfuran	2-Methylene butanenitrile	0.0119	NSD	0.0239	NSD	0.0716	NSD
2-Octylfuran	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	Ethylamine	0.00766	NSD	0.0153	NSD	0.046	NSD
2-Octylfuran	N-Nitrosodimethylamine	2.09e-07	NSD	4.18e-07	NSD	1.26e-06	NSD
2-Octylfuran	N-Nitrosodiethylamine	1.23e-05	NSD	2.47e-05	NSD	7.4e-05	NSD
2-Octylfuran	N-Nitrosomethylethylamine	1.69e-05	NSD	3.39e-05	NSD	0.000102	NSD
2-Octylfuran	N-Nitrosomorpholine	3.59e-05	NSD	7.17e-05	NSD	0.000215	NSD
2-Octylfuran	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	2, 4-Dimethylpyridine	0.0112	NSD	0.0223	NSD	0.067	NSD
2-Octylfuran	Methyl nitrite	0.000977	NSD	0.00195	NSD	0.00586	NSD
2-Octylfuran	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	Butyl nitrate	1.37	NSD	2.73	NSD	8.19	NSD
2-Octylfuran	1,4-Butanediol, dinitrate	0.025	NSD	0.0499	NSD	0.15	NSD
2-Octylfuran	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Octylfuran	1,2,3-Propanetriol, 1,3-dinitrate	0.00158	NSD	0.00316	NSD	0.00947	NSD
2-Octylfuran	Methyl Isocyanate	0.000349	NSD	0.000698	NSD	0.00209	NSD
2-Octylfuran	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.32: 2-(3-Oxo-3-phenylprop-1-enyl)furan: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-(3-Oxo-3-phenylprop-1-enyl)furan	Ammonia	(4.03e-05)	NSD	(8.06e-05)	NSD	(8.06e-05)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	1,3-Butadiene	0.00188	NSD	0.00376	NSD	0.0188	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Benzene	(0.0233)	NSD	(0.0466)	NSD	(0.233)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Biphenyl	(0.0559)	NSD	(0.112)	NSD	(0.335)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Methanol	(0.0311)	NSD	(0.0622)	NSD	(0.0777)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Hexanone	(0.159)	NSD	(0.319)	NSD	(0.638)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	4-Methyl-2-hexanone	(0.0106)	NSD	(0.0213)	NSD	(0.0639)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	6-Methyl-2-heptanone	(0.921)	NSD	(1.84)	NSD	(5.53)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Formaldehyde	(0.00159)	NSD	(0.00319)	NSD	(0.00319)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Acetaldehyde	(0.0456)	NSD	(0.0912)	NSD	(0.0912)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Butanal	(0.111)	NSD	(0.223)	NSD	(2.05)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Furan	(0.000236)	NSD	(0.000471)	NSD	(0.0848)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Methylfuran	(0.000293)	NSD	(0.000585)	NSD	(0.00176)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2,5-Dimethylfuran	(0.000328)	NSD	(0.000656)	NSD	(0.00197)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Pentylfuran	(0.000165)	NSD	(0.00033)	NSD	(0.000991)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Heptylfuran	(0.000463)	NSD	(0.000925)	NSD	(0.00278)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Octylfuran	(0.00143)	NSD	(0.00286)	NSD	(0.00857)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-(3-Oxo-3-phenylprop-1-enyl)furan	5e-04	NSD	0.001	NSD	0.003	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-(2-Methyl-6-oxoheptyl)furan	(0.00188)	NSD	(0.00377)	NSD	(0.0113)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Diethyl Phthalate	(0.0687)	NSD	(0.137)	NSD	(0.275)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Acetonitrile	(0.0889)	NSD	(0.178)	NSD	(0.534)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Propanenitrile	(0.121)	NSD	(0.243)	NSD	(0.728)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Butanenitrile	(0.219)	NSD	(0.438)	NSD	(1.31)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Pentanenitrile	(0.869)	NSD	(1.74)	NSD	(5.21)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Hexanenitrile	(0.826)	NSD	(1.65)	NSD	(4.96)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Heptanenitrile	(1.8)	NSD	(3.6)	NSD	(10.8)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Methylene butanenitrile	(0.046)	NSD	(0.0919)	NSD	(0.276)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Ethylamine	(0.0259)	NSD	(0.0519)	NSD	(0.156)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	N-Nitrosodimethylamine	(8.09e-07)	NSD	(1.62e-06)	NSD	(4.85e-06)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	N-Nitrosodiethylamine	(6.49e-05)	NSD	(0.00013)	NSD	(0.00039)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	N-Nitrosomethylethylamine	(6.72e-05)	NSD	(0.000134)	NSD	(0.000403)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	N-Nitrosomorpholine	(0.000145)	NSD	(0.000291)	NSD	(0.000872)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2, 4-Dimethylpyridine	(0.0426)	NSD	(0.0852)	NSD	(0.256)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Methyl nitrite	(0.00666)	NSD	(0.0133)	NSD	(0.04)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Butyl nitrate	(6.71)	NSD	(13.4)	NSD	(40.3)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	1,4-Butanediol, dinitrate	(0.142)	NSD	(0.284)	NSD	(0.852)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	1,2,3-Propanetriol, 1,3-dinitrate	(0.0118)	NSD	(0.0237)	NSD	(0.071)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Methyl Isocyanate	(0.0034)	NSD	(0.0068)	NSD	(0.0204)	NSD
2-(3-Oxo-3-phenylprop-1-enyl)furan	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.33: 2-(2-Methyl-6-oxoheptyl)furan: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-(2-Methyl-6-oxoheptyl)furan	Ammonia	9.85e-06	NSD	1.97e-05	NSD	1.97e-05	NSD
2-(2-Methyl-6-oxoheptyl)furan	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	1,3-Butadiene	0.000371	NSD	0.000743	NSD	0.00371	NSD
2-(2-Methyl-6-oxoheptyl)furan	Benzene	0.00465	NSD	0.0093	NSD	0.0465	NSD
2-(2-Methyl-6-oxoheptyl)furan	Biphenyl	0.011	NSD	0.0219	NSD	0.0658	NSD
2-(2-Methyl-6-oxoheptyl)furan	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	Methanol	0.0063	NSD	0.0126	NSD	0.0157	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Hexanone	0.0329	NSD	0.0658	NSD	0.132	NSD
2-(2-Methyl-6-oxoheptyl)furan	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	4-Methyl-2-hexanone	0.00222	NSD	0.00444	NSD	0.0133	NSD
2-(2-Methyl-6-oxoheptyl)furan	6-Methyl-2-heptanone	0.185	NSD	0.37	NSD	1.11	NSD
2-(2-Methyl-6-oxoheptyl)furan	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	Formaldehyde	0.000324	NSD	0.000648	NSD	0.000648	NSD
2-(2-Methyl-6-oxoheptyl)furan	Acetaldehyde	0.0109	NSD	0.0219	NSD	0.0219	NSD
2-(2-Methyl-6-oxoheptyl)furan	Butanal	0.0231	NSD	0.0461	NSD	0.425	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	Furan	4.79e-05	NSD	9.57e-05	NSD	0.0172	NSD
2-(2-Methyl-6-oxoheptyl)furan	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Methylfuran	6.82e-05	NSD	0.000136	NSD	0.000409	NSD
2-(2-Methyl-6-oxoheptyl)furan	2,5-Dimethylfuran	6.96e-05	NSD	0.000139	NSD	0.000418	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Pentylfuran	3.08e-05	NSD	6.16e-05	NSD	0.000185	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Heptylfuran	8.92e-05	NSD	0.000178	NSD	0.000535	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Octylfuran	0.000345	NSD	0.000689	NSD	0.00207	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-(3-Oxo-3-phenylprop-1-enyl)furan	8.68e-05	NSD	0.000174	NSD	0.000521	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-(2-Methyl-6-oxoheptyl)furan	5e-04	NSD	0.001	NSD	0.003	NSD
2-(2-Methyl-6-oxoheptyl)furan	Diethyl Phthalate	0.0142	NSD	0.0284	NSD	0.0569	NSD
2-(2-Methyl-6-oxoheptyl)furan	Acetonitrile	0.0267	NSD	0.0534	NSD	0.16	NSD
2-(2-Methyl-6-oxoheptyl)furan	Propanenitrile	0.0242	NSD	0.0485	NSD	0.145	NSD
2-(2-Methyl-6-oxoheptyl)furan	Butanenitrile	0.0698	NSD	0.14	NSD	0.419	NSD
2-(2-Methyl-6-oxoheptyl)furan	Pentanenitrile	0.242	NSD	0.485	NSD	1.45	NSD
2-(2-Methyl-6-oxoheptyl)furan	Hexanenitrile	0.16	NSD	0.319	NSD	0.958	NSD
2-(2-Methyl-6-oxoheptyl)furan	Heptanenitrile	0.358	NSD	0.715	NSD	2.15	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Methylene butanenitrile	0.00903	NSD	0.0181	NSD	0.0542	NSD
2-(2-Methyl-6-oxoheptyl)furan	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	Ethylamine	0.00582	NSD	0.0116	NSD	0.0349	NSD
2-(2-Methyl-6-oxoheptyl)furan	N-Nitrosodimethylamine	1.69e-07	NSD	3.38e-07	NSD	1.01e-06	NSD
2-(2-Methyl-6-oxoheptyl)furan	N-Nitrosodiethylamine	1.57e-05	NSD	3.14e-05	NSD	9.42e-05	NSD
2-(2-Methyl-6-oxoheptyl)furan	N-Nitrosomethylethylamine	1.49e-05	NSD	2.98e-05	NSD	8.93e-05	NSD
2-(2-Methyl-6-oxoheptyl)furan	N-Nitrosomorpholine	2.91e-05	NSD	5.82e-05	NSD	0.000174	NSD
2-(2-Methyl-6-oxoheptyl)furan	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	2, 4-Dimethylpyridine	0.00909	NSD	0.0182	NSD	0.0546	NSD
2-(2-Methyl-6-oxoheptyl)furan	Methyl nitrite	0.00144	NSD	0.00287	NSD	0.00862	NSD
2-(2-Methyl-6-oxoheptyl)furan	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	Butyl nitrate	1.3	NSD	2.6	NSD	7.79	NSD
2-(2-Methyl-6-oxoheptyl)furan	1,4-Butanediol, dinitrate	0.0405	NSD	0.0811	NSD	0.243	NSD
2-(2-Methyl-6-oxoheptyl)furan	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-(2-Methyl-6-oxoheptyl)furan	1,2,3-Propanetriol, 1,3-dinitrate	0.00296	NSD	0.00592	NSD	0.0178	NSD
2-(2-Methyl-6-oxoheptyl)furan	Methyl Isocyanate	0.000669	NSD	0.00134	NSD	0.00401	NSD
2-(2-Methyl-6-oxoheptyl)furan	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.34: Diethyl Phthalate: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Diethyl Phthalate	Ammonia	(1.7e-06)	(1.7e-06)	(3.41e-06)	(3.41e-06)	(3.41e-06)	(3.41e-06)
Diethyl Phthalate	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	Mercury	(7.24e-08)	NSD	(1.45e-07)	NSD	(2.9e-07)	NSD
Diethyl Phthalate	1,3-Butadiene	(4.45e-05)	NSD	(8.9e-05)	NSD	(0.000445)	NSD
Diethyl Phthalate	Benzene	(0.00424)	(0.00424)	(0.00848)	(0.00848)	(0.0424)	(0.0424)
Diethyl Phthalate	Biphenyl	0.0424	NSD	0.0849	NSD	0.255	NSD
Diethyl Phthalate	1-Butanol	(0.000201)	NSD	(0.000402)	NSD	(0.00402)	NSD
Diethyl Phthalate	Methanol	(0.0108)	NSD	(0.0216)	NSD	(0.0271)	NSD
Diethyl Phthalate	2-Hexanone	(0.000681)	(0.000681)	(0.00136)	(0.00136)	(0.00272)	(0.00272)
Diethyl Phthalate	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	4-Methyl-2-hexanone	(0.0165)	NSD	(0.033)	NSD	(0.0991)	NSD
Diethyl Phthalate	6-Methyl-2-heptanone	(0.305)	NSD	(0.611)	NSD	(1.83)	NSD
Diethyl Phthalate	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	Formaldehyde	(0.000175)	(0.000175)	(0.00035)	(0.00035)	(0.00035)	(0.00035)
Diethyl Phthalate	Acetaldehyde	(0.00303)	NSD	(0.00606)	NSD	(0.00606)	NSD
Diethyl Phthalate	Butanal	(0.00316)	(0.00316)	(0.00632)	(0.00632)	(0.0581)	(0.0581)
Diethyl Phthalate	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	Furan	(7.66e-06)	NSD	(1.53e-05)	NSD	(0.00276)	NSD
Diethyl Phthalate	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	2-Methylfuran	(1.76e-05)	NSD	(3.52e-05)	NSD	(0.000106)	NSD
Diethyl Phthalate	2,5-Dimethylfuran	0.000375	NSD	0.00075	NSD	0.00225	NSD
Diethyl Phthalate	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	2-Pentylfuran	(0.000101)	NSD	(0.000203)	NSD	(0.000609)	NSD
Diethyl Phthalate	2-Heptylfuran	(0.000573)	NSD	(0.00115)	NSD	(0.00344)	NSD
Diethyl Phthalate	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	2-Octylfuran	0.00303	NSD	0.00607	NSD	0.0182	NSD
Diethyl Phthalate	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000313	NSD	0.000626	NSD	0.00188	NSD
Diethyl Phthalate	2-(2-Methyl-6-oxoheptyl)furan	0.00179	NSD	0.00358	NSD	0.0107	NSD
Diethyl Phthalate	Diethyl Phthalate	0.275	0.275	0.55	0.55	1.1	1.1
Diethyl Phthalate	Acetonitrile	(0.00031)	(0.00031)	(0.00062)	(0.00062)	(0.00186)	(0.00186)
Diethyl Phthalate	Propanenitrile	(0.000401)	NSD	(0.000803)	NSD	(0.00241)	NSD
Diethyl Phthalate	Butanenitrile	(0.0014)	NSD	(0.00279)	NSD	(0.00838)	NSD
Diethyl Phthalate	Pentanenitrile	(0.00108)	NSD	(0.00216)	NSD	(0.00649)	NSD
Diethyl Phthalate	Hexanenitrile	(0.000964)	NSD	(0.00193)	NSD	(0.00579)	NSD
Diethyl Phthalate	Heptanenitrile	(0.533)	NSD	(1.07)	NSD	(3.2)	NSD
Diethyl Phthalate	2-Methylene butanenitrile	0.149	NSD	0.299	NSD	0.896	NSD
Diethyl Phthalate	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	Ethylamine	(0.00125)	NSD	(0.00251)	NSD	(0.00753)	NSD
Diethyl Phthalate	N-Nitrosodimethylamine	(4.24e-07)	(4.24e-07)	(8.48e-07)	(8.48e-07)	(2.54e-06)	(2.54e-06)
Diethyl Phthalate	N-Nitrosodiethylamine	(1.82e-05)	NSD	(3.64e-05)	NSD	(0.000109)	NSD
Diethyl Phthalate	N-Nitrosomethylethylamine	(3.45e-05)	NSD	(6.91e-05)	NSD	(0.000207)	NSD
Diethyl Phthalate	N-Nitrosomorpholine	(0.000107)	NSD	(0.000213)	NSD	(0.00064)	NSD
Diethyl Phthalate	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	2, 4-Dimethylpyridine	(2.74e-07)	NSD	(5.48e-07)	NSD	(1.65e-06)	NSD
Diethyl Phthalate	Methyl nitrite	0.000597	NSD	0.00119	NSD	0.00358	NSD
Diethyl Phthalate	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	Butyl nitrate	(0.0571)	NSD	(0.114)	NSD	(0.342)	NSD
Diethyl Phthalate	1,4-Butanediol, dinitrate	0.176	NSD	0.352	NSD	1.06	NSD
Diethyl Phthalate	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Diethyl Phthalate	1,2,3-Propanetriol, 1,3-dinitrate	0.0129	NSD	0.0258	NSD	0.0775	NSD
Diethyl Phthalate	Methyl Isocyanate	0.00257	NSD	0.00515	NSD	0.0154	NSD
Diethyl Phthalate	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.35: Acetonitrile: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Acetonitrile	Ammonia	(3.73e-05)	(3.73e-05)	(7.46e-05)	(7.46e-05)	(7.46e-05)	(7.46e-05)
Acetonitrile	Nitrous Oxide	(7.87e-05)	(7.87e-05)	(0.000157)	(0.000157)	(0.000472)	(0.000472)
Acetonitrile	Mercury	(5.87e-06)	(5.87e-06)	(1.17e-05)	(1.17e-05)	(2.35e-05)	(2.35e-05)
Acetonitrile	1,3-Butadiene	0.0604	0.0461	0.121	0.0923	0.604	0.461
Acetonitrile	Benzene	0.48	0.221	0.961	0.442	4.8	2.21
Acetonitrile	Biphenyl	1.28	NSD	2.55	NSD	7.65	NSD
Acetonitrile	1-Butanol	(0.0137)	(0.0137)	(0.0274)	(0.0274)	(0.274)	(0.274)
Acetonitrile	Methanol	(0.0355)	(0.0355)	(0.0711)	(0.0711)	(0.0888)	(0.0888)
Acetonitrile	2-Hexanone	4.13	2.39	8.26	4.79	16.5	9.57
Acetonitrile	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	4-Methyl-2-hexanone	0.31	0.292	0.621	0.584	1.86	1.75
Acetonitrile	6-Methyl-2-heptanone	9.15	(1.19)	18.3	(2.38)	54.9	(7.15)
Acetonitrile	3-Buten-2-one	0.22	0.0413	0.441	0.0826	0.441	0.0826
Acetonitrile	Formaldehyde	(0.00112)	(0.00112)	(0.00223)	(0.00223)	(0.00223)	(0.00223)
Acetonitrile	Acetaldehyde	(0.0558)	(0.0558)	(0.112)	(0.112)	(0.112)	(0.112)
Acetonitrile	Butanal	1.29	(0.245)	2.58	(0.489)	23.7	(4.5)
Acetonitrile	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	Furan	0.00119	0.00075	0.00238	0.0015	0.428	0.27
Acetonitrile	2,3-Dihydrofuran	0.014	NSD	0.0281	NSD	0.0842	NSD
Acetonitrile	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	2-Methylfuran	0.00263	NSD	0.00527	NSD	0.0158	NSD
Acetonitrile	2,5-Dimethylfuran	0.0107	NSD	0.0213	NSD	0.0639	NSD
Acetonitrile	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	2-Pentylfuran	0.00462	0.00408	0.00924	0.00817	0.0277	0.0245
Acetonitrile	2-Heptylfuran	0.0126	NSD	0.0252	NSD	0.0757	NSD
Acetonitrile	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	2-Octylfuran	0.0307	NSD	0.0614	NSD	0.184	NSD
Acetonitrile	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.00527	NSD	0.0105	NSD	0.0316	NSD
Acetonitrile	2-(2-Methyl-6-oxoheptyl)furan	0.0247	NSD	0.0494	NSD	0.148	NSD
Acetonitrile	Diethyl Phthalate	2.2	0.305	4.39	0.609	8.79	1.22
Acetonitrile	Acetonitrile	10	10	20	20	60	60
Acetonitrile	Propanenitrile	3.96	3.67	7.92	7.34	23.7	22
Acetonitrile	Butanenitrile	7.54	2.4	15.1	4.8	45.2	14.4
Acetonitrile	Pentanenitrile	10.4	2.05	20.9	4.09	62.6	12.3
Acetonitrile	Hexanenitrile	10.9	2.29	21.8	4.58	65.5	13.7
Acetonitrile	Heptanenitrile	1	0.6	2	1.2	6	3.6
Acetonitrile	2-Methylene butanenitrile	1.31	NSD	2.62	NSD	7.85	NSD
Acetonitrile	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	Ethylamine	0.779	0.262	1.56	0.523	4.67	1.57
Acetonitrile	N-Nitrosodimethylamine	(3.49e-06)	(3.49e-06)	(6.99e-06)	(6.99e-06)	(2.1e-05)	(2.1e-05)
Acetonitrile	N-Nitrosodiethylamine	0.00238	0.00183	0.00475	0.00367	0.0143	0.011
Acetonitrile	N-Nitrosomethylethylamine	0.00189	(0.000106)	0.00377	(0.000212)	0.0113	(0.000637)
Acetonitrile	N-Nitrosomorpholine	0.00418	(0.00028)	0.00837	(0.000559)	0.0251	(0.00168)
Acetonitrile	Tributylphosphate	1.33	NSD	2.67	NSD	6.13	NSD
Acetonitrile	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	Pyridine	1.14	0.443	2.28	0.885	22.8	8.85
Acetonitrile	2, 4-Dimethylpyridine	1.14	NSD	2.28	NSD	6.83	NSD
Acetonitrile	Methyl nitrite	0.0134	NSD	0.0268	NSD	0.0804	NSD
Acetonitrile	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Acetonitrile	Butyl nitrate	1.72	(0.471)	3.43	(0.942)	10.3	(2.83)
Acetonitrile	1,4-Butanediol, dinitrate	0.47	NSD	0.94	NSD	2.82	NSD
Acetonitrile	2-Nitro-2-methylpropane	(0.027)	NSD	(0.0541)	NSD	(0.162)	NSD
Acetonitrile	1,2,3-Propanetriol, 1,3-dinitrate	0.0649	NSD	0.13	NSD	0.39	NSD
Acetonitrile	Methyl Isocyanate	0.00431	NSD	0.00861	NSD	0.0258	NSD
Acetonitrile	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.36: Propanenitrile: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Propanenitrile	Ammonia	(1.45e-05)	(1.45e-05)	(2.9e-05)	(2.9e-05)	(2.9e-05)	(2.9e-05)
Propanenitrile	Nitrous Oxide	(5.91e-05)	(5.91e-05)	(0.000118)	(0.000118)	(0.000355)	(0.000355)
Propanenitrile	Mercury	(2.29e-06)	(2.29e-06)	(4.58e-06)	(4.58e-06)	(9.16e-06)	(9.16e-06)
Propanenitrile	1,3-Butadiene	0.00568	(0.000609)	0.0114	(0.00122)	0.0568	(0.00609)
Propanenitrile	Benzene	(0.0058)	(0.0058)	(0.0116)	(0.0116)	(0.058)	(0.058)
Propanenitrile	Biphenyl	0.146	NSD	0.292	NSD	0.876	NSD
Propanenitrile	1-Butanol	(0.00491)	(0.00491)	(0.00982)	(0.00982)	(0.0982)	(0.0982)
Propanenitrile	Methanol	(0.00111)	(0.00111)	(0.00221)	(0.00221)	(0.00276)	(0.00276)
Propanenitrile	2-Hexanone	(0.0464)	(0.0464)	(0.0929)	(0.0929)	(0.186)	(0.186)
Propanenitrile	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	4-Methyl-2-hexanone	0.189	(0.0712)	0.378	(0.142)	1.13	(0.427)
Propanenitrile	6-Methyl-2-heptanone	1.01	(0.784)	2.01	(1.57)	6.03	(4.7)
Propanenitrile	3-Buten-2-one	(0.00135)	(0.00135)	(0.0027)	(0.0027)	(0.0027)	(0.0027)
Propanenitrile	Formaldehyde	(0.000553)	(0.000553)	(0.00111)	(0.00111)	(0.00111)	(0.00111)
Propanenitrile	Acetaldehyde	(0.0182)	(0.0182)	(0.0365)	(0.0365)	(0.0365)	(0.0365)
Propanenitrile	Butanal	(0.0156)	(0.0156)	(0.0312)	(0.0312)	(0.287)	(0.287)
Propanenitrile	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	Furan	(2.78e-05)	(2.78e-05)	(5.56e-05)	(5.56e-05)	(0.01)	(0.01)
Propanenitrile	2,3-Dihydrofuran	0.000361	NSD	0.000722	NSD	0.00216	NSD
Propanenitrile	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	2-Methylfuran	0.00187	NSD	0.00374	NSD	0.0112	NSD
Propanenitrile	2,5-Dimethylfuran	0.00327	NSD	0.00654	NSD	0.0196	NSD
Propanenitrile	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	2-Pentylfuran	0.00289	(0.000444)	0.00578	(0.000888)	0.0173	(0.00266)
Propanenitrile	2-Heptylfuran	0.00498	NSD	0.00996	NSD	0.0299	NSD
Propanenitrile	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	2-Octylfuran	0.0124	NSD	0.0249	NSD	0.0747	NSD
Propanenitrile	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.00153	NSD	0.00307	NSD	0.0092	NSD
Propanenitrile	2-(2-Methyl-6-oxoheptyl)furan	0.00784	NSD	0.0157	NSD	0.047	NSD
Propanenitrile	Diethyl Phthalate	(0.0182)	NSD	(0.0365)	NSD	(0.073)	NSD
Propanenitrile	Acetonitrile	(0.00187)	(0.00187)	(0.00374)	(0.00374)	(0.0112)	(0.0112)
Propanenitrile	Propanenitrile	3	3	6	6	18	18
Propanenitrile	Butanenitrile	(0.0633)	(0.0633)	(0.127)	(0.127)	(0.38)	(0.38)
Propanenitrile	Pentanenitrile	2.76	(0.0142)	5.52	(0.0283)	16.6	(0.085)
Propanenitrile	Hexanenitrile	3.01	(0.0468)	6.01	(0.0937)	18	(0.281)
Propanenitrile	Heptanenitrile	2.98	0.423	5.96	0.845	17.9	2.54
Propanenitrile	2-Methylene butanenitrile	1.02	NSD	2.04	NSD	6.11	NSD
Propanenitrile	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	Ethylamine	(0.00432)	(0.00432)	(0.00864)	(0.00864)	(0.0259)	(0.0259)
Propanenitrile	N-Nitrosodimethylamine	(3.71e-07)	(3.71e-07)	(7.43e-07)	(7.43e-07)	(2.23e-06)	(2.23e-06)
Propanenitrile	N-Nitrosodiethylamine	(2.61e-05)	(2.61e-05)	(5.22e-05)	(5.22e-05)	(0.000157)	(0.000157)
Propanenitrile	N-Nitrosomethylethylamine	(7.12e-05)	(7.12e-05)	(0.000142)	(0.000142)	(0.000427)	(0.000427)
Propanenitrile	N-Nitrosomorpholine	(0.000141)	(0.000141)	(0.000283)	(0.000283)	(0.000848)	(0.000848)
Propanenitrile	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	Pyridine	(0.0173)	(0.0173)	(0.0347)	(0.0347)	(0.347)	(0.347)
Propanenitrile	2, 4-Dimethylpyridine	0.161	NSD	0.322	NSD	0.967	NSD
Propanenitrile	Methyl nitrite	0.0036	NSD	0.00721	NSD	0.0216	NSD
Propanenitrile	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Propanenitrile	Butyl nitrate	0.361	(0.281)	0.722	(0.562)	2.16	(1.69)
Propanenitrile	1,4-Butanediol, dinitrate	0.0946	NSD	0.189	NSD	0.568	NSD
Propanenitrile	2-Nitro-2-methylpropane	(0.0198)	NSD	(0.0395)	NSD	(0.119)	NSD
Propanenitrile	1,2,3-Propanetriol, 1,3-dinitrate	(0.0123)	NSD	(0.0246)	NSD	(0.0739)	NSD
Propanenitrile	Methyl Isocyanate	0.00473	NSD	0.00946	NSD	0.0284	NSD
Propanenitrile	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.37: Butanenitrile: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Butanenitrile	Ammonia	(9.21e-06)	(9.21e-06)	(1.84e-05)	(1.84e-05)	(1.84e-05)	(1.84e-05)
Butanenitrile	Nitrous Oxide	(1.8e-05)	(1.8e-05)	(3.6e-05)	(3.6e-05)	(0.000108)	(0.000108)
Butanenitrile	Mercury	(2.75e-06)	(2.75e-06)	(5.51e-06)	(5.51e-06)	(1.1e-05)	(1.1e-05)
Butanenitrile	1,3-Butadiene	0.00352	(0.000733)	0.00704	(0.00147)	0.0352	(0.00733)
Butanenitrile	Benzene	(0.00388)	(0.00388)	(0.00776)	(0.00776)	(0.0388)	(0.0388)
Butanenitrile	Biphenyl	0.0971	NSD	0.194	NSD	0.582	NSD
Butanenitrile	1-Butanol	(0.000464)	(0.000464)	(0.000928)	(0.000928)	(0.00928)	(0.00928)
Butanenitrile	Methanol	(0.00881)	(0.00881)	(0.0176)	(0.0176)	(0.022)	(0.022)
Butanenitrile	2-Hexanone	(0.0122)	(0.0122)	(0.0245)	(0.0245)	(0.049)	(0.049)
Butanenitrile	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	4-Methyl-2-hexanone	0.0856	(0.0282)	0.171	(0.0563)	0.514	(0.169)
Butanenitrile	6-Methyl-2-heptanone	1.13	(0.423)	2.26	(0.847)	6.77	(2.54)
Butanenitrile	3-Buten-2-one	(0.000743)	(0.000743)	(0.00149)	(0.00149)	(0.00149)	(0.00149)
Butanenitrile	Formaldehyde	(5e-04)	(5e-04)	(0.001)	(0.001)	(0.001)	(0.001)
Butanenitrile	Acetaldehyde	(0.022)	(0.022)	(0.044)	(0.044)	(0.044)	(0.044)
Butanenitrile	Butanal	(0.00861)	(0.00861)	(0.0172)	(0.0172)	(0.158)	(0.158)
Butanenitrile	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	Furan	(2.78e-05)	(2.78e-05)	(5.56e-05)	(5.56e-05)	(0.01)	(0.01)
Butanenitrile	2,3-Dihydrofuran	0.00108	NSD	0.00216	NSD	0.00649	NSD
Butanenitrile	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	2-Methylfuran	0.00177	NSD	0.00355	NSD	0.0106	NSD
Butanenitrile	2,5-Dimethylfuran	0.00161	NSD	0.00321	NSD	0.00964	NSD
Butanenitrile	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	2-Pentylfuran	0.0012	(0.000333)	0.0024	(0.000665)	0.00721	(0.002)
Butanenitrile	2-Heptylfuran	0.00261	NSD	0.00523	NSD	0.0157	NSD
Butanenitrile	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	2-Octylfuran	0.00272	NSD	0.00545	NSD	0.0163	NSD
Butanenitrile	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000377	NSD	0.000755	NSD	0.00226	NSD
Butanenitrile	2-(2-Methyl-6-oxoheptyl)furan	0.00199	NSD	0.00399	NSD	0.012	NSD
Butanenitrile	Diethyl Phthalate	(0.0215)	NSD	(0.0429)	NSD	(0.0859)	NSD
Butanenitrile	Acetonitrile	(0.000939)	(0.000939)	(0.00188)	(0.00188)	(0.00563)	(0.00563)
Butanenitrile	Propanenitrile	(0.0775)	(0.0775)	(0.155)	(0.155)	(0.465)	(0.465)
Butanenitrile	Butanenitrile	4	4	8	8	24	24
Butanenitrile	Pentanenitrile	1.94	(0.0106)	3.88	(0.0211)	11.6	(0.0634)
Butanenitrile	Hexanenitrile	1.72	(0.126)	3.44	(0.253)	10.3	(0.758)
Butanenitrile	Heptanenitrile	3.89	(0.708)	7.79	(1.42)	23.4	(4.25)
Butanenitrile	2-Methylene butanenitrile	0.276	NSD	0.552	NSD	1.66	NSD
Butanenitrile	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	Ethylamine	0.00395	(0.00207)	0.00789	(0.00413)	0.0237	(0.0124)
Butanenitrile	N-Nitrosodimethylamine	(4.47e-07)	(4.47e-07)	(8.93e-07)	(8.93e-07)	(2.68e-06)	(2.68e-06)
Butanenitrile	N-Nitrosodiethylamine	8.87e-05	(7.98e-05)	0.000177	(0.00016)	0.000532	(0.000479)
Butanenitrile	N-Nitrosomethylethylamine	(5.37e-05)	(5.37e-05)	(0.000107)	(0.000107)	(0.000322)	(0.000322)
Butanenitrile	N-Nitrosomorpholine	(0.000137)	(0.000137)	(0.000274)	(0.000274)	(0.000822)	(0.000822)
Butanenitrile	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	Pyridine	(0.0113)	(0.0113)	(0.0227)	(0.0227)	(0.227)	(0.227)
Butanenitrile	2, 4-Dimethylpyridine	0.176	NSD	0.352	NSD	1.06	NSD
Butanenitrile	Methyl nitrite	(0.00288)	NSD	(0.00575)	NSD	(0.0173)	NSD
Butanenitrile	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Butanenitrile	Butyl nitrate	0.516	(0.357)	1.03	(0.714)	3.1	(2.14)
Butanenitrile	1,4-Butanediol, dinitrate	0.105	NSD	0.211	NSD	0.633	NSD
Butanenitrile	2-Nitro-2-methylpropane	(0.0198)	NSD	(0.0395)	NSD	(0.119)	NSD
Butanenitrile	1,2,3-Propanetriol, 1,3-dinitrate	(0.0121)	NSD	(0.0242)	NSD	(0.0725)	NSD
Butanenitrile	Methyl Isocyanate	0.00326	NSD	0.00651	NSD	0.0195	NSD
Butanenitrile	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.38: Pentanenitrile: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Pentanenitrile	Ammonia	(1.35e-06)	(1.35e-06)	(2.7e-06)	(2.7e-06)	(2.7e-06)	(2.7e-06)
Pentanenitrile	Nitrous Oxide	(6.29e-06)	(6.29e-06)	(1.26e-05)	(1.26e-05)	(3.77e-05)	(3.77e-05)
Pentanenitrile	Mercury	(2.2e-06)	(2.2e-06)	(4.4e-06)	(4.4e-06)	(8.8e-06)	(8.8e-06)
Pentanenitrile	1,3-Butadiene	(0.000194)	NSD	(0.000388)	NSD	(0.00194)	NSD
Pentanenitrile	Benzene	(0.00273)	(0.00273)	(0.00547)	(0.00547)	(0.0273)	(0.0273)
Pentanenitrile	Biphenyl	0.0306	NSD	0.0613	NSD	0.184	NSD
Pentanenitrile	1-Butanol	(0.00188)	(0.00188)	(0.00376)	(0.00376)	(0.0376)	(0.0376)
Pentanenitrile	Methanol	(0.00167)	(0.00167)	(0.00334)	(0.00334)	(0.00417)	(0.00417)
Pentanenitrile	2-Hexanone	(0.0156)	(0.0156)	(0.0312)	(0.0312)	(0.0625)	(0.0625)
Pentanenitrile	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	4-Methyl-2-hexanone	(0.0184)	(0.0184)	(0.0367)	(0.0367)	(0.11)	(0.11)
Pentanenitrile	6-Methyl-2-heptanone	(0.331)	(0.331)	(0.662)	(0.662)	(1.98)	(1.98)
Pentanenitrile	3-Buten-2-one	(0.000954)	(0.000954)	(0.00191)	(0.00191)	(0.00191)	(0.00191)
Pentanenitrile	Formaldehyde	(0.000449)	(0.000449)	(0.000897)	(0.000897)	(0.000897)	(0.000897)
Pentanenitrile	Acetaldehyde	(0.00728)	(0.00728)	(0.0146)	(0.0146)	(0.0146)	(0.0146)
Pentanenitrile	Butanal	(0.0111)	(0.0111)	(0.0221)	(0.0221)	(0.203)	(0.203)
Pentanenitrile	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	Furan	(1.81e-05)	(1.81e-05)	(3.62e-05)	(3.62e-05)	(0.00651)	(0.00651)
Pentanenitrile	2,3-Dihydrofuran	(3.14e-05)	NSD	(6.28e-05)	NSD	(0.000188)	NSD
Pentanenitrile	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	2-Methylfuran	0.000341	NSD	0.000683	NSD	0.00205	NSD
Pentanenitrile	2,5-Dimethylfuran	0.000542	NSD	0.00108	NSD	0.00325	NSD
Pentanenitrile	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	2-Pentylfuran	(9.93e-05)	(9.93e-05)	(0.000199)	(0.000199)	(0.000596)	(0.000596)
Pentanenitrile	2-Heptylfuran	0.000758	NSD	0.00152	NSD	0.00455	NSD
Pentanenitrile	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	2-Octylfuran	0.00185	NSD	0.00369	NSD	0.0111	NSD
Pentanenitrile	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000219	NSD	0.000438	NSD	0.00131	NSD
Pentanenitrile	2-(2-Methyl-6-oxoheptyl)furan	0.00116	NSD	0.00233	NSD	0.00698	NSD
Pentanenitrile	Diethyl Phthalate	(0.00265)	NSD	(0.0053)	NSD	(0.0106)	NSD
Pentanenitrile	Acetonitrile	(0.00125)	(0.00125)	(0.0025)	(0.0025)	(0.00749)	(0.00749)
Pentanenitrile	Propanenitrile	(0.0415)	(0.0415)	(0.083)	(0.083)	(0.249)	(0.249)
Pentanenitrile	Butanenitrile	(0.0444)	(0.0444)	(0.0888)	(0.0888)	(0.266)	(0.266)
Pentanenitrile	Pentanenitrile	3	3	6	6	18	18
Pentanenitrile	Hexanenitrile	(0.0468)	(0.0468)	(0.0936)	(0.0936)	(0.281)	(0.281)
Pentanenitrile	Heptanenitrile	1.4	(0.134)	2.81	(0.267)	8.43	(0.802)
Pentanenitrile	2-Methylene butanenitrile	0.106	NSD	0.213	NSD	0.638	NSD
Pentanenitrile	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	Ethylamine	(0.00224)	(0.00224)	(0.00448)	(0.00448)	(0.0134)	(0.0134)
Pentanenitrile	N-Nitrosodimethylamine	(1.8e-07)	(1.8e-07)	(3.6e-07)	(3.6e-07)	(1.08e-06)	(1.08e-06)
Pentanenitrile	N-Nitrosodiethylamine	(2.11e-05)	(2.11e-05)	(4.23e-05)	(4.23e-05)	(0.000127)	(0.000127)
Pentanenitrile	N-Nitrosomethylethylamine	(6.63e-06)	(6.63e-06)	(1.33e-05)	(1.33e-05)	(3.98e-05)	(3.98e-05)
Pentanenitrile	N-Nitrosomorpholine	(1.69e-05)	(1.69e-05)	(3.38e-05)	(3.38e-05)	(0.000101)	(0.000101)
Pentanenitrile	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	Pyridine	(0.0044)	(0.0044)	(0.00879)	(0.00879)	(0.0879)	(0.0879)
Pentanenitrile	2, 4-Dimethylpyridine	0.0301	NSD	0.0603	NSD	0.181	NSD
Pentanenitrile	Methyl nitrite	(0.000209)	NSD	(0.000419)	NSD	(0.00126)	NSD
Pentanenitrile	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	Butyl nitrate	(0.0432)	(0.0432)	(0.0863)	(0.0863)	(0.259)	(0.259)
Pentanenitrile	1,4-Butanediol, dinitrate	0.026	NSD	0.052	NSD	0.156	NSD
Pentanenitrile	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Pentanenitrile	1,2,3-Propanetriol, 1,3-dinitrate	(0.00611)	NSD	(0.0122)	NSD	(0.0367)	NSD
Pentanenitrile	Methyl Isocyanate	0.00165	NSD	0.00331	NSD	0.00993	NSD
Pentanenitrile	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.39: Hexanenitrile: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Hexanenitrile	Ammonia	(5.08e-06)	(5.08e-06)	(1.02e-05)	(1.02e-05)	(1.02e-05)	(1.02e-05)
Hexanenitrile	Nitrous Oxide	(7.99e-06)	(7.99e-06)	(1.6e-05)	(1.6e-05)	(4.79e-05)	(4.79e-05)
Hexanenitrile	Mercury	(1.95e-06)	(1.95e-06)	(3.91e-06)	(3.91e-06)	(7.82e-06)	(7.82e-06)
Hexanenitrile	1,3-Butadiene	(0.00052)	NSD	(0.00104)	NSD	(0.0052)	NSD
Hexanenitrile	Benzene	(0.00368)	(0.00368)	(0.00737)	(0.00737)	(0.0368)	(0.0368)
Hexanenitrile	Biphenyl	0.0245	NSD	0.049	NSD	0.147	NSD
Hexanenitrile	1-Butanol	(0.00121)	(0.00121)	(0.00242)	(0.00242)	(0.0242)	(0.0242)
Hexanenitrile	Methanol	(0.000905)	(0.000905)	(0.00181)	(0.00181)	(0.00226)	(0.00226)
Hexanenitrile	2-Hexanone	(0.0134)	(0.0134)	(0.0269)	(0.0269)	(0.0538)	(0.0538)
Hexanenitrile	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	4-Methyl-2-hexanone	(0.0154)	(0.0154)	(0.0308)	(0.0308)	(0.0923)	(0.0923)
Hexanenitrile	6-Methyl-2-heptanone	0.417	(0.363)	0.833	(0.726)	2.5	(2.18)
Hexanenitrile	3-Buten-2-one	(0.000815)	(0.000815)	(0.00163)	(0.00163)	(0.00163)	(0.00163)
Hexanenitrile	Formaldehyde	(0.000418)	(0.000418)	(0.000837)	(0.000837)	(0.000837)	(0.000837)
Hexanenitrile	Acetaldehyde	(0.0112)	(0.0112)	(0.0224)	(0.0224)	(0.0224)	(0.0224)
Hexanenitrile	Butanal	(0.00945)	(0.00945)	(0.0189)	(0.0189)	(0.174)	(0.174)
Hexanenitrile	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	Furan	(1.71e-05)	NSD	(3.41e-05)	NSD	(0.00614)	NSD
Hexanenitrile	2,3-Dihydrofuran	(2.3e-05)	NSD	(4.6e-05)	NSD	(0.000138)	NSD
Hexanenitrile	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	2-Methylfuran	0.000186	NSD	0.000372	NSD	0.00112	NSD
Hexanenitrile	2,5-Dimethylfuran	0.000407	NSD	0.000813	NSD	0.00244	NSD
Hexanenitrile	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	2-Pentylfuran	(9.86e-05)	NSD	(0.000197)	NSD	(0.000591)	NSD
Hexanenitrile	2-Heptylfuran	0.000446	NSD	0.000891	NSD	0.00267	NSD
Hexanenitrile	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	2-Octylfuran	0.00169	NSD	0.00339	NSD	0.0102	NSD
Hexanenitrile	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000183	NSD	0.000367	NSD	0.0011	NSD
Hexanenitrile	2-(2-Methyl-6-oxoheptyl)furan	0.00107	NSD	0.00213	NSD	0.0064	NSD
Hexanenitrile	Diethyl Phthalate	(0.00143)	NSD	(0.00286)	NSD	(0.00572)	NSD
Hexanenitrile	Acetonitrile	(0.000805)	(0.000805)	(0.00161)	(0.00161)	(0.00483)	(0.00483)
Hexanenitrile	Propanenitrile	(0.0208)	(0.0208)	(0.0416)	(0.0416)	(0.125)	(0.125)
Hexanenitrile	Butanenitrile	(0.0311)	(0.0311)	(0.0621)	(0.0621)	(0.186)	(0.186)
Hexanenitrile	Pentanenitrile	(0.112)	(0.112)	(0.225)	(0.225)	(0.674)	(0.674)
Hexanenitrile	Hexanenitrile	3	3	6	6	18	18
Hexanenitrile	Heptanenitrile	0.978	(0.0858)	1.96	(0.172)	5.87	(0.515)
Hexanenitrile	2-Methylene butanenitrile	0.145	NSD	0.289	NSD	0.868	NSD
Hexanenitrile	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	Ethylamine	(0.0018)	NSD	(0.00359)	NSD	(0.0108)	NSD
Hexanenitrile	N-Nitrosodimethylamine	(3.17e-07)	(3.17e-07)	(6.34e-07)	(6.34e-07)	(1.9e-06)	(1.9e-06)
Hexanenitrile	N-Nitrosodiethylamine	(2.06e-05)	(2.06e-05)	(4.12e-05)	(4.12e-05)	(0.000124)	(0.000124)
Hexanenitrile	N-Nitrosomethylethylamine	(2.73e-05)	(2.73e-05)	(5.46e-05)	(5.46e-05)	(0.000164)	(0.000164)
Hexanenitrile	N-Nitrosomorpholine	(6.96e-05)	(6.96e-05)	(0.000139)	(0.000139)	(0.000418)	(0.000418)
Hexanenitrile	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	Pyridine	(0.00431)	(0.00431)	(0.00862)	(0.00862)	(0.0862)	(0.0862)
Hexanenitrile	2, 4-Dimethylpyridine	0.0601	NSD	0.12	NSD	0.361	NSD
Hexanenitrile	Methyl nitrite	(0.000295)	NSD	(0.00059)	NSD	(0.00177)	NSD
Hexanenitrile	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	Butyl nitrate	0.109	(0.0386)	0.218	(0.0771)	0.654	(0.231)
Hexanenitrile	1,4-Butanediol, dinitrate	(0.0101)	NSD	(0.0203)	NSD	(0.0608)	NSD
Hexanenitrile	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Hexanenitrile	1,2,3-Propanetriol, 1,3-dinitrate	(0.00916)	NSD	(0.0183)	NSD	(0.055)	NSD
Hexanenitrile	Methyl Isocyanate	0.00152	NSD	0.00304	NSD	0.00911	NSD
Hexanenitrile	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.40: Heptanenitrile: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Heptanenitrile	Ammonia	(5.29e-06)	(5.29e-06)	(1.06e-05)	(1.06e-05)	(1.06e-05)	(1.06e-05)
Heptanenitrile	Nitrous Oxide	(6.77e-06)	NSD	(1.35e-05)	NSD	(4.06e-05)	NSD
Heptanenitrile	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	1,3-Butadiene	(0.00148)	NSD	(0.00296)	NSD	(0.0148)	NSD
Heptanenitrile	Benzene	(0.00351)	(0.00351)	(0.00702)	(0.00702)	(0.0351)	(0.0351)
Heptanenitrile	Biphenyl	0.0278	NSD	0.0556	NSD	0.167	NSD
Heptanenitrile	1-Butanol	(0.00398)	NSD	(0.00797)	NSD	(0.0797)	NSD
Heptanenitrile	Methanol	(0.0114)	(0.0114)	(0.0228)	(0.0228)	(0.0285)	(0.0285)
Heptanenitrile	2-Hexanone	(0.0563)	(0.0563)	(0.113)	(0.113)	(0.225)	(0.225)
Heptanenitrile	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	4-Methyl-2-hexanone	(0.00869)	NSD	(0.0174)	NSD	(0.0522)	NSD
Heptanenitrile	6-Methyl-2-heptanone	(0.218)	(0.218)	(0.437)	(0.437)	(1.31)	(1.31)
Heptanenitrile	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	Formaldehyde	(0.000399)	NSD	(0.000797)	NSD	(0.000797)	NSD
Heptanenitrile	Acetaldehyde	(0.0219)	(0.0219)	(0.0438)	(0.0438)	(0.0438)	(0.0438)
Heptanenitrile	Butanal	(0.0417)	(0.0417)	(0.0834)	(0.0834)	(0.767)	(0.767)
Heptanenitrile	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	Furan	(9.57e-06)	NSD	(1.91e-05)	NSD	(0.00344)	NSD
Heptanenitrile	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	2-Methylfuran	9.19e-05	NSD	0.000184	NSD	0.000551	NSD
Heptanenitrile	2,5-Dimethylfuran	0.000113	NSD	0.000226	NSD	0.000677	NSD
Heptanenitrile	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	2-Pentylfuran	(0.000126)	NSD	(0.000253)	NSD	(0.000758)	NSD
Heptanenitrile	2-Heptylfuran	(0.000252)	NSD	(0.000503)	NSD	(0.00151)	NSD
Heptanenitrile	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	2-Octylfuran	0.000928	NSD	0.00186	NSD	0.00557	NSD
Heptanenitrile	2-(3-Oxo-3-phenylprop-1-enyl)furan	(0.000104)	NSD	(0.000207)	NSD	(0.000621)	NSD
Heptanenitrile	2-(2-Methyl-6-oxoheptyl)furan	0.000603	NSD	0.00121	NSD	0.00362	NSD
Heptanenitrile	Diethyl Phthalate	(0.000904)	NSD	(0.00181)	NSD	(0.00362)	NSD
Heptanenitrile	Acetonitrile	(0.000682)	(0.000682)	(0.00136)	(0.00136)	(0.00409)	(0.00409)
Heptanenitrile	Propanenitrile	(0.0176)	(0.0176)	(0.0352)	(0.0352)	(0.106)	(0.106)
Heptanenitrile	Butanenitrile	(0.0281)	(0.0281)	(0.0561)	(0.0561)	(0.168)	(0.168)
Heptanenitrile	Pentanenitrile	(0.146)	(0.146)	(0.292)	(0.292)	(0.875)	(0.875)
Heptanenitrile	Hexanenitrile	1.17	(0.114)	2.35	(0.227)	7.04	(0.682)
Heptanenitrile	Heptanenitrile	3	3	6	6	18	18
Heptanenitrile	2-Methylene butanenitrile	0.0649	NSD	0.13	NSD	0.39	NSD
Heptanenitrile	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	Ethylamine	0.0401	NSD	0.0802	NSD	0.241	NSD
Heptanenitrile	N-Nitrosodimethylamine	(8.74e-07)	NSD	(1.75e-06)	NSD	(5.25e-06)	NSD
Heptanenitrile	N-Nitrosodiethylamine	2.81e-05	NSD	5.61e-05	NSD	0.000168	NSD
Heptanenitrile	N-Nitrosomethylethylamine	5.33e-05	NSD	0.000107	NSD	0.00032	NSD
Heptanenitrile	N-Nitrosomorpholine	9.11e-05	NSD	0.000182	NSD	0.000547	NSD
Heptanenitrile	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	2, 4-Dimethylpyridine	(0.0147)	NSD	(0.0295)	NSD	(0.0884)	NSD
Heptanenitrile	Methyl nitrite	(0.000162)	NSD	(0.000323)	NSD	(0.000969)	NSD
Heptanenitrile	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	Butyl nitrate	0.103	(0.0745)	0.207	(0.149)	0.62	(0.447)
Heptanenitrile	1,4-Butanediol, dinitrate	0.0177	NSD	0.0354	NSD	0.106	NSD
Heptanenitrile	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Heptanenitrile	1,2,3-Propanetriol, 1,3-dinitrate	(0.00477)	NSD	(0.00953)	NSD	(0.0286)	NSD
Heptanenitrile	Methyl Isocyanate	0.000858	NSD	0.00172	NSD	0.00515	NSD
Heptanenitrile	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.41: 2-Methylene butanenitrile: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Methylene butanenitrile	Ammonia	8.05e-05	NSD	0.000161	NSD	0.000161	NSD
2-Methylene butanenitrile	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	1,3-Butadiene	0.00293	NSD	0.00586	NSD	0.0293	NSD
2-Methylene butanenitrile	Benzene	0.0588	NSD	0.118	NSD	0.588	NSD
2-Methylene butanenitrile	Biphenyl	0.0496	NSD	0.0993	NSD	0.298	NSD
2-Methylene butanenitrile	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	Methanol	0.0775	NSD	0.155	NSD	0.194	NSD
2-Methylene butanenitrile	2-Hexanone	0.395	NSD	0.789	NSD	1.58	NSD
2-Methylene butanenitrile	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	4-Methyl-2-hexanone	0.0147	NSD	0.0293	NSD	0.088	NSD
2-Methylene butanenitrile	6-Methyl-2-heptanone	1.88	NSD	3.75	NSD	11.3	NSD
2-Methylene butanenitrile	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	Formaldehyde	0.000752	NSD	0.0015	NSD	0.0015	NSD
2-Methylene butanenitrile	Acetaldehyde	0.0604	NSD	0.121	NSD	0.121	NSD
2-Methylene butanenitrile	Butanal	0.275	NSD	0.551	NSD	5.07	NSD
2-Methylene butanenitrile	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	Furan	0.000117	NSD	0.000235	NSD	0.0422	NSD
2-Methylene butanenitrile	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	2-Methylfuran	0.000169	NSD	0.000337	NSD	0.00101	NSD
2-Methylene butanenitrile	2,5-Dimethylfuran	0.000207	NSD	0.000414	NSD	0.00124	NSD
2-Methylene butanenitrile	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	2-Pentylfuran	0.000212	NSD	0.000423	NSD	0.00127	NSD
2-Methylene butanenitrile	2-Heptylfuran	0.000475	NSD	0.00095	NSD	0.00285	NSD
2-Methylene butanenitrile	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	2-Octylfuran	0.00176	NSD	0.00351	NSD	0.0105	NSD
2-Methylene butanenitrile	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000205	NSD	0.00041	NSD	0.00123	NSD
2-Methylene butanenitrile	2-(2-Methyl-6-oxoheptyl)furan	0.00108	NSD	0.00217	NSD	0.0065	NSD
2-Methylene butanenitrile	Diethyl Phthalate	0.114	NSD	0.228	NSD	0.456	NSD
2-Methylene butanenitrile	Acetonitrile	0.104	NSD	0.207	NSD	0.622	NSD
2-Methylene butanenitrile	Propanenitrile	0.117	NSD	0.235	NSD	0.704	NSD
2-Methylene butanenitrile	Butanenitrile	0.226	NSD	0.453	NSD	1.36	NSD
2-Methylene butanenitrile	Pentanenitrile	0.956	NSD	1.91	NSD	5.74	NSD
2-Methylene butanenitrile	Hexanenitrile	1.75	NSD	3.49	NSD	10.5	NSD
2-Methylene butanenitrile	Heptanenitrile	3.92	NSD	7.83	NSD	23.5	NSD
2-Methylene butanenitrile	2-Methylene butanenitrile	0.15	NSD	0.3	NSD	0.9	NSD
2-Methylene butanenitrile	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	Ethylamine	0.0558	NSD	0.112	NSD	0.335	NSD
2-Methylene butanenitrile	N-Nitrosodimethylamine	2.08e-06	NSD	4.15e-06	NSD	1.25e-05	NSD
2-Methylene butanenitrile	N-Nitrosodiethylamine	5.15e-05	NSD	0.000103	NSD	0.000309	NSD
2-Methylene butanenitrile	N-Nitrosomethylethylamine	9.79e-05	NSD	0.000196	NSD	0.000587	NSD
2-Methylene butanenitrile	N-Nitrosomorpholine	0.000166	NSD	0.000332	NSD	0.000995	NSD
2-Methylene butanenitrile	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	2, 4-Dimethylpyridine	0.106	NSD	0.212	NSD	0.637	NSD
2-Methylene butanenitrile	Methyl nitrite	0.00345	NSD	0.0069	NSD	0.0207	NSD
2-Methylene butanenitrile	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	Butyl nitrate	6.03	NSD	12.1	NSD	36.2	NSD
2-Methylene butanenitrile	1,4-Butanediol, dinitrate	0.117	NSD	0.233	NSD	0.699	NSD
2-Methylene butanenitrile	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Methylene butanenitrile	1,2,3-Propanetriol, 1,3-dinitrate	0.00736	NSD	0.0147	NSD	0.0442	NSD
2-Methylene butanenitrile	Methyl Isocyanate	0.0016	NSD	0.00321	NSD	0.00963	NSD
2-Methylene butanenitrile	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.42 : 2,4-Pentadienenitrile: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2,4-Pentadienenitrile	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Furan	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
2,4-Pentadienenitrile	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.43: Ethylamine: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Ethylamine	Ammonia	(7.15e-05)	(7.15e-05)	(0.000143)	(0.000143)	(0.000143)	(0.000143)
Ethylamine	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	Mercury	(0.000371)	NSD	(0.000742)	NSD	(0.00148)	NSD
Ethylamine	1,3-Butadiene	(0.000814)	NSD	(0.00163)	NSD	(0.00814)	NSD
Ethylamine	Benzene	(0.0375)	(0.0375)	(0.075)	(0.075)	(0.375)	(0.375)
Ethylamine	Biphenyl	0.182	NSD	0.365	NSD	1.09	NSD
Ethylamine	1-Butanol	(0.01)	NSD	(0.02)	NSD	(0.2)	NSD
Ethylamine	Methanol	(0.0238)	NSD	(0.0477)	NSD	(0.0596)	NSD
Ethylamine	2-Hexanone	(0.25)	(0.25)	(0.5)	(0.5)	(1)	(1)
Ethylamine	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	4-Methyl-2-hexanone	(0.061)	(0.061)	(0.122)	(0.122)	(0.366)	(0.366)
Ethylamine	6-Methyl-2-heptanone	(7.57)	NSD	(15.1)	NSD	(45.4)	NSD
Ethylamine	3-Buten-2-one	(0.0225)	NSD	(0.045)	NSD	(0.045)	NSD
Ethylamine	Formaldehyde	(0.00265)	(0.00265)	(0.00529)	(0.00529)	(0.00529)	(0.00529)
Ethylamine	Acetaldehyde	(0.051)	(0.051)	(0.102)	(0.102)	(0.102)	(0.102)
Ethylamine	Butanal	(0.0806)	(0.0806)	(0.161)	(0.161)	(1.48)	(1.48)
Ethylamine	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	Furan	(0.000143)	NSD	(0.000285)	NSD	(0.0513)	NSD
Ethylamine	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	2-Methylfuran	0.000611	NSD	0.00122	NSD	0.00367	NSD
Ethylamine	2,5-Dimethylfuran	0.000871	NSD	0.00174	NSD	0.00523	NSD
Ethylamine	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	2-Pentylfuran	(0.000767)	NSD	(0.00153)	NSD	(0.0046)	NSD
Ethylamine	2-Heptylfuran	(0.00151)	NSD	(0.00303)	NSD	(0.00909)	NSD
Ethylamine	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	2-Octylfuran	0.00637	NSD	0.0127	NSD	0.0382	NSD
Ethylamine	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000786	NSD	0.00157	NSD	0.00472	NSD
Ethylamine	2-(2-Methyl-6-oxoheptyl)furan	0.00409	NSD	0.00817	NSD	0.0245	NSD
Ethylamine	Diethyl Phthalate	(0.173)	NSD	(0.346)	NSD	(0.692)	NSD
Ethylamine	Acetonitrile	(0.0025)	(0.0025)	(0.00501)	(0.00501)	(0.015)	(0.015)
Ethylamine	Propanenitrile	(0.134)	(0.134)	(0.267)	(0.267)	(0.802)	(0.802)
Ethylamine	Butanenitrile	(0.258)	(0.258)	(0.516)	(0.516)	(1.55)	(1.55)
Ethylamine	Pentanenitrile	(1.13)	(1.13)	(2.26)	(2.26)	(6.78)	(6.78)
Ethylamine	Hexanenitrile	(0.407)	NSD	(0.813)	NSD	(2.44)	NSD
Ethylamine	Heptanenitrile	(16.5)	NSD	(33)	NSD	(99.1)	NSD
Ethylamine	2-Methylene butanenitrile	0.481	NSD	0.962	NSD	2.89	NSD
Ethylamine	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	Ethylamine	2.5	2.5	5	5	15	15
Ethylamine	N-Nitrosodimethylamine	(4.32e-06)	(4.32e-06)	(8.64e-06)	(8.64e-06)	(2.59e-05)	(2.59e-05)
Ethylamine	N-Nitrosodiethylamine	(0.000187)	(0.000187)	(0.000373)	(0.000373)	(0.00112)	(0.00112)
Ethylamine	N-Nitrosomethylethylamine	(0.000333)	(0.000333)	(0.000666)	(0.000666)	(0.002)	(0.002)
Ethylamine	N-Nitrosomorpholine	(0.000569)	(0.000569)	(0.00114)	(0.00114)	(0.00341)	(0.00341)
Ethylamine	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	Pyridine	(0.168)	NSD	(0.337)	NSD	(3.37)	NSD
Ethylamine	2, 4-Dimethylpyridine	(0.212)	NSD	(0.424)	NSD	(1.27)	NSD
Ethylamine	Methyl nitrite	0.0111	NSD	0.0221	NSD	0.0663	NSD
Ethylamine	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	Butyl nitrate	(0.255)	NSD	(0.51)	NSD	(1.53)	NSD
Ethylamine	1,4-Butanediol, dinitrate	0.452	NSD	0.903	NSD	2.71	NSD
Ethylamine	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Ethylamine	1,2,3-Propanetriol, 1,3-dinitrate	0.0381	NSD	0.0762	NSD	0.228	NSD
Ethylamine	Methyl Isocyanate	0.00571	NSD	0.0114	NSD	0.0343	NSD
Ethylamine	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.44: N-Nitrosodimethylamine: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
N-Nitrosodimethylamine	Ammonia	(3.05e-07)	(3.05e-07)	(6.09e-07)	(6.09e-07)	(6.09e-07)	(6.09e-07)
N-Nitrosodimethylamine	Nitrous Oxide	(2.8e-06)	NSD	(5.59e-06)	NSD	(1.68e-05)	NSD
N-Nitrosodimethylamine	Mercury	(1.02e-06)	(1.02e-06)	(2.03e-06)	(2.03e-06)	(4.06e-06)	(4.06e-06)
N-Nitrosodimethylamine	1,3-Butadiene	0.00241	0.000148	0.00483	0.000296	0.0241	0.00148
N-Nitrosodimethylamine	Benzene	0.0064	(0.000121)	0.0128	(0.000242)	0.064	(0.00121)
N-Nitrosodimethylamine	Biphenyl	0.0402	NSD	0.0804	NSD	0.241	NSD
N-Nitrosodimethylamine	1-Butanol	(2.51e-05)	(2.51e-05)	(5.01e-05)	(5.01e-05)	(0.000501)	(0.000501)
N-Nitrosodimethylamine	Methanol	0.0194	0.00259	0.0389	0.00519	0.0486	0.00649
N-Nitrosodimethylamine	2-Hexanone	0.0711	0.00638	0.142	0.0128	0.284	0.0255
N-Nitrosodimethylamine	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	4-Methyl-2-hexanone	0.112	0.0162	0.224	0.0325	0.67	0.0974
N-Nitrosodimethylamine	6-Methyl-2-heptanone	7.88	NSD	15.8	NSD	47.3	NSD
N-Nitrosodimethylamine	3-Buten-2-one	0.00279	(0.000165)	0.00558	(0.00033)	0.00558	(0.00033)
N-Nitrosodimethylamine	Formaldehyde	(7.23e-05)	(7.23e-05)	(0.000145)	(0.000145)	(0.000145)	(0.000145)
N-Nitrosodimethylamine	Acetaldehyde	0.00791	(0.000471)	0.0158	(0.000941)	0.0158	(0.000941)
N-Nitrosodimethylamine	Butanal	0.0694	(0.000392)	0.139	(0.000783)	1.28	(0.0072)
N-Nitrosodimethylamine	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	Furan	2.75e-05	(2.45e-06)	5.5e-05	(4.9e-06)	0.0099	(0.000882)
N-Nitrosodimethylamine	2,3-Dihydrofuran	0.00061	NSD	0.00122	NSD	0.00366	NSD
N-Nitrosodimethylamine	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	2-Methylfuran	9.12e-05	NSD	0.000182	NSD	0.000547	NSD
N-Nitrosodimethylamine	2,5-Dimethylfuran	0.0011	NSD	0.0022	NSD	0.00661	NSD
N-Nitrosodimethylamine	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	2-Pentylfuran	0.00129	0.00026	0.00257	0.00052	0.00771	0.00156
N-Nitrosodimethylamine	2-Heptylfuran	0.00189	NSD	0.00378	NSD	0.0113	NSD
N-Nitrosodimethylamine	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	2-Octylfuran	0.00681	NSD	0.0136	NSD	0.0409	NSD
N-Nitrosodimethylamine	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000777	NSD	0.00155	NSD	0.00466	NSD
N-Nitrosodimethylamine	2-(2-Methyl-6-oxoheptyl)furan	0.00411	NSD	0.00822	NSD	0.0247	NSD
N-Nitrosodimethylamine	Diethyl Phthalate	0.0429	(0.000588)	0.0857	(0.00118)	0.172	(0.00235)
N-Nitrosodimethylamine	Acetonitrile	(5.13e-05)	(5.13e-05)	(0.000103)	(0.000103)	(0.000308)	(0.000308)
N-Nitrosodimethylamine	Propanenitrile	0.0949	0.0114	0.19	0.0227	0.57	0.0682
N-Nitrosodimethylamine	Butanenitrile	0.0502	(0.000211)	0.1	(0.000423)	0.301	(0.00127)
N-Nitrosodimethylamine	Pentanenitrile	0.229	0.0335	0.457	0.067	1.37	0.201
N-Nitrosodimethylamine	Hexanenitrile	0.245	0.0342	0.49	0.0685	1.47	0.205
N-Nitrosodimethylamine	Heptanenitrile	2.69	NSD	5.37	NSD	16.1	NSD
N-Nitrosodimethylamine	2-Methylene butanenitrile	0.569	NSD	1.14	NSD	3.41	NSD
N-Nitrosodimethylamine	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	Ethylamine	0.0335	0.0082	0.067	0.0164	0.201	0.0492
N-Nitrosodimethylamine	N-Nitrosodimethylamine	0.00015	0.00015	3e-04	3e-04	9e-04	9e-04
N-Nitrosodimethylamine	N-Nitrosodiethylamine	0.000217	0.00011	0.000434	0.000221	0.0013	0.000662
N-Nitrosodimethylamine	N-Nitrosomethylethylamine	0.00046	0.000276	0.00092	0.000551	0.00276	0.00165
N-Nitrosodimethylamine	N-Nitrosomorpholine	0.00116	0.000684	0.00233	0.00137	0.00699	0.0041
N-Nitrosodimethylamine	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	Pyridine	0.0223	0.00377	0.0446	0.00753	0.446	0.0753
N-Nitrosodimethylamine	2, 4-Dimethylpyridine	0.0247	NSD	0.0493	NSD	0.148	NSD
N-Nitrosodimethylamine	Methyl nitrite	0.0148	NSD	0.0295	NSD	0.0885	NSD
N-Nitrosodimethylamine	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	Butyl nitrate	21.7	NSD	43.4	NSD	130	NSD
N-Nitrosodimethylamine	1,4-Butanediol, dinitrate	0.442	NSD	0.884	NSD	2.65	NSD
N-Nitrosodimethylamine	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodimethylamine	1,2,3-Propanetriol, 1,3-dinitrate	0.0389	NSD	0.0777	NSD	0.233	NSD
N-Nitrosodimethylamine	Methyl Isocyanate	0.00671	NSD	0.0134	NSD	0.0402	NSD
N-Nitrosodimethylamine	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.45: N-Nitrosodiethylamine: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
N-Nitrosodiethylamine	Ammonia	(1.54e-07)	(1.54e-07)	(3.07e-07)	(3.07e-07)	(3.07e-07)	(3.07e-07)
N-Nitrosodiethylamine	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	Mercury	(2.83e-07)	(2.83e-07)	(5.67e-07)	(5.67e-07)	(1.13e-06)	(1.13e-06)
N-Nitrosodiethylamine	1,3-Butadiene	(7.57e-06)	NSD	(1.51e-05)	NSD	(7.57e-05)	NSD
N-Nitrosodiethylamine	Benzene	(8.68e-05)	(8.68e-05)	(0.000174)	(0.000174)	(0.000868)	(0.000868)
N-Nitrosodiethylamine	Biphenyl	0.00368	NSD	0.00735	NSD	0.0221	NSD
N-Nitrosodiethylamine	1-Butanol	(9.09e-06)	(9.09e-06)	(1.82e-05)	(1.82e-05)	(0.000182)	(0.000182)
N-Nitrosodiethylamine	Methanol	(0.000421)	NSD	(0.000842)	NSD	(0.00105)	NSD
N-Nitrosodiethylamine	2-Hexanone	(0.000338)	(0.000338)	(0.000676)	(0.000676)	(0.00135)	(0.00135)
N-Nitrosodiethylamine	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	4-Methyl-2-hexanone	(0.00195)	(0.00195)	(0.0039)	(0.0039)	(0.0117)	(0.0117)
N-Nitrosodiethylamine	6-Methyl-2-heptanone	0.418	NSD	0.835	NSD	2.51	NSD
N-Nitrosodiethylamine	3-Buten-2-one	(4.97e-05)	(4.97e-05)	(9.95e-05)	(9.95e-05)	(9.95e-05)	(9.95e-05)
N-Nitrosodiethylamine	Formaldehyde	(1.02e-05)	(1.02e-05)	(2.03e-05)	(2.03e-05)	(2.03e-05)	(2.03e-05)
N-Nitrosodiethylamine	Acetaldehyde	(0.000282)	(0.000282)	(0.000565)	(0.000565)	(0.000565)	(0.000565)
N-Nitrosodiethylamine	Butanal	(0.000284)	(0.000284)	(0.000568)	(0.000568)	(0.00523)	(0.00523)
N-Nitrosodiethylamine	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	Furan	(7.86e-07)	NSD	(1.57e-06)	NSD	(0.000283)	NSD
N-Nitrosodiethylamine	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	2-Methylfuran	2.05e-05	NSD	4.11e-05	NSD	0.000123	NSD
N-Nitrosodiethylamine	2,5-Dimethylfuran	0.000126	NSD	0.000253	NSD	0.000758	NSD
N-Nitrosodiethylamine	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	2-Pentylfuran	(6.32e-05)	NSD	(0.000126)	NSD	(0.000379)	NSD
N-Nitrosodiethylamine	2-Heptylfuran	0.000163	NSD	0.000326	NSD	0.000977	NSD
N-Nitrosodiethylamine	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	2-Octylfuran	0.000692	NSD	0.00138	NSD	0.00415	NSD
N-Nitrosodiethylamine	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000161	NSD	0.000323	NSD	0.000968	NSD
N-Nitrosodiethylamine	2-(2-Methyl-6-oxoheptyl)furan	0.000831	NSD	0.00166	NSD	0.00499	NSD
N-Nitrosodiethylamine	Diethyl Phthalate	(0.000426)	NSD	(0.000852)	NSD	(0.00171)	NSD
N-Nitrosodiethylamine	Acetonitrile	(3.38e-05)	(3.38e-05)	(6.76e-05)	(6.76e-05)	(0.000203)	(0.000203)
N-Nitrosodiethylamine	Propanenitrile	(9.09e-05)	(9.09e-05)	(0.000182)	(0.000182)	(0.000545)	(0.000545)
N-Nitrosodiethylamine	Butanenitrile	(0.000153)	(0.000153)	(0.000307)	(0.000307)	(0.00092)	(0.00092)
N-Nitrosodiethylamine	Pentanenitrile	(0.000278)	(0.000278)	(0.000556)	(0.000556)	(0.00167)	(0.00167)
N-Nitrosodiethylamine	Hexanenitrile	(0.000189)	(0.000189)	(0.000377)	(0.000377)	(0.00113)	(0.00113)
N-Nitrosodiethylamine	Heptanenitrile	0.806	NSD	1.61	NSD	4.84	NSD
N-Nitrosodiethylamine	2-Methylene butanenitrile	0.0237	NSD	0.0473	NSD	0.142	NSD
N-Nitrosodiethylamine	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	Ethylamine	(0.000365)	(0.000365)	(0.000731)	(0.000731)	(0.00219)	(0.00219)
N-Nitrosodiethylamine	N-Nitrosodimethylamine	(4.6e-09)	(4.6e-09)	(9.21e-09)	(9.21e-09)	(2.76e-08)	(2.76e-08)
N-Nitrosodiethylamine	N-Nitrosodiethylamine	5e-05	5e-05	1e-04	1e-04	3e-04	3e-04
N-Nitrosodiethylamine	N-Nitrosomethylethylamine	(9.85e-08)	(9.85e-08)	(1.97e-07)	(1.97e-07)	(5.91e-07)	(5.91e-07)
N-Nitrosodiethylamine	N-Nitrosomorpholine	(2.85e-06)	(2.85e-06)	(5.7e-06)	(5.7e-06)	(1.71e-05)	(1.71e-05)
N-Nitrosodiethylamine	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	Pyridine	(0.000119)	(0.000119)	(0.000237)	(0.000237)	(0.00237)	(0.00237)
N-Nitrosodiethylamine	2, 4-Dimethylpyridine	(2.71e-05)	NSD	(5.42e-05)	NSD	(0.000163)	NSD
N-Nitrosodiethylamine	Methyl nitrite	0.00292	NSD	0.00584	NSD	0.0175	NSD
N-Nitrosodiethylamine	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	Butyl nitrate	2.92	NSD	5.83	NSD	17.5	NSD
N-Nitrosodiethylamine	1,4-Butanediol, dinitrate	0.0852	NSD	0.17	NSD	0.511	NSD
N-Nitrosodiethylamine	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosodiethylamine	1,2,3-Propanetriol, 1,3-dinitrate	0.00629	NSD	0.0126	NSD	0.0378	NSD
N-Nitrosodiethylamine	Methyl Isocyanate	0.00139	NSD	0.00278	NSD	0.00835	NSD
N-Nitrosodiethylamine	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.46: N-Nitrosomethylethylamine: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
N-Nitrosomethylethylamine	Ammonia	(1.78e-07)	(1.78e-07)	(3.56e-07)	(3.56e-07)	(3.56e-07)	(3.56e-07)
N-Nitrosomethylethylamine	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	Mercury	(6.23e-07)	(6.23e-07)	(1.25e-06)	(1.25e-06)	(2.49e-06)	(2.49e-06)
N-Nitrosomethylethylamine	1,3-Butadiene	(8.93e-06)	NSD	(1.79e-05)	NSD	(8.93e-05)	NSD
N-Nitrosomethylethylamine	Benzene	(5.49e-05)	(5.49e-05)	(0.00011)	(0.00011)	(0.000549)	(0.000549)
N-Nitrosomethylethylamine	Biphenyl	0.00954	NSD	0.0191	NSD	0.0573	NSD
N-Nitrosomethylethylamine	1-Butanol	(1.05e-05)	(1.05e-05)	(2.11e-05)	(2.11e-05)	(0.000211)	(0.000211)
N-Nitrosomethylethylamine	Methanol	(0.000342)	NSD	(0.000683)	NSD	(0.000854)	NSD
N-Nitrosomethylethylamine	2-Hexanone	(0.000392)	(0.000392)	(0.000783)	(0.000783)	(0.00157)	(0.00157)
N-Nitrosomethylethylamine	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	4-Methyl-2-hexanone	0.011	(0.0023)	0.0219	(0.0046)	0.0658	(0.0138)
N-Nitrosomethylethylamine	6-Methyl-2-heptanone	0.582	NSD	1.16	NSD	3.49	NSD
N-Nitrosomethylethylamine	3-Buten-2-one	(1.94e-05)	(1.94e-05)	(3.89e-05)	(3.89e-05)	(3.89e-05)	(3.89e-05)
N-Nitrosomethylethylamine	Formaldehyde	(2.9e-05)	(2.9e-05)	(5.8e-05)	(5.8e-05)	(5.8e-05)	(5.8e-05)
N-Nitrosomethylethylamine	Acetaldehyde	(0.000332)	(0.000332)	(0.000664)	(0.000664)	(0.000664)	(0.000664)
N-Nitrosomethylethylamine	Butanal	(0.000329)	(0.000329)	(0.000658)	(0.000658)	(0.00606)	(0.00606)
N-Nitrosomethylethylamine	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	Furan	(1.1e-07)	(1.1e-07)	(2.2e-07)	(2.2e-07)	(3.95e-05)	(3.95e-05)
N-Nitrosomethylethylamine	2,3-Dihydrofuran	(7.45e-06)	NSD	(1.49e-05)	NSD	(4.47e-05)	NSD
N-Nitrosomethylethylamine	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	2-Methylfuran	6.55e-05	NSD	0.000131	NSD	0.000393	NSD
N-Nitrosomethylethylamine	2,5-Dimethylfuran	0.000149	NSD	0.000298	NSD	0.000894	NSD
N-Nitrosomethylethylamine	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	2-Pentylfuran	0.000116	NSD	0.000233	NSD	0.000698	NSD
N-Nitrosomethylethylamine	2-Heptylfuran	0.000173	NSD	0.000346	NSD	0.00104	NSD
N-Nitrosomethylethylamine	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	2-Octylfuran	0.00196	NSD	0.00393	NSD	0.0118	NSD
N-Nitrosomethylethylamine	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000247	NSD	0.000494	NSD	0.00148	NSD
N-Nitrosomethylethylamine	2-(2-Methyl-6-oxoheptyl)furan	0.00143	NSD	0.00285	NSD	0.00855	NSD
N-Nitrosomethylethylamine	Diethyl Phthalate	(0.000519)	NSD	(0.00104)	NSD	(0.00208)	NSD
N-Nitrosomethylethylamine	Acetonitrile	(4.13e-05)	(4.13e-05)	(8.26e-05)	(8.26e-05)	(0.000248)	(0.000248)
N-Nitrosomethylethylamine	Propanenitrile	(0.000105)	(0.000105)	(0.000211)	(0.000211)	(0.000632)	(0.000632)
N-Nitrosomethylethylamine	Butanenitrile	(0.000178)	(0.000178)	(0.000355)	(0.000355)	(0.00107)	(0.00107)
N-Nitrosomethylethylamine	Pentanenitrile	(0.000322)	(0.000322)	(0.000644)	(0.000644)	(0.00193)	(0.00193)
N-Nitrosomethylethylamine	Hexanenitrile	(0.000219)	(0.000219)	(0.000437)	(0.000437)	(0.00131)	(0.00131)
N-Nitrosomethylethylamine	Heptanenitrile	2.12	NSD	4.24	NSD	12.7	NSD
N-Nitrosomethylethylamine	2-Methylene butanenitrile	0.0584	NSD	0.117	NSD	0.35	NSD
N-Nitrosomethylethylamine	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	Ethylamine	0.0043	(0.000684)	0.00861	(0.00137)	0.0258	(0.00411)
N-Nitrosomethylethylamine	N-Nitrosodimethylamine	(5.71e-08)	(5.71e-08)	(1.14e-07)	(1.14e-07)	(3.43e-07)	(3.43e-07)
N-Nitrosomethylethylamine	N-Nitrosodiethylamine	1.23e-05	(9.44e-06)	2.47e-05	(1.89e-05)	7.4e-05	(5.66e-05)
N-Nitrosomethylethylamine	N-Nitrosomethylethylamine	0.00015	0.00015	3e-04	3e-04	9e-04	9e-04
N-Nitrosomethylethylamine	N-Nitrosomorpholine	0.000145	(3.39e-06)	0.00029	(6.79e-06)	0.00087	(2.04e-05)
N-Nitrosomethylethylamine	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	Pyridine	(0.000138)	(0.000138)	(0.000275)	(0.000275)	(0.00275)	(0.00275)
N-Nitrosomethylethylamine	2, 4-Dimethylpyridine	0.00658	NSD	0.0132	NSD	0.0395	NSD
N-Nitrosomethylethylamine	Methyl nitrite	0.00498	NSD	0.00996	NSD	0.0299	NSD
N-Nitrosomethylethylamine	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	Butyl nitrate	6.09	NSD	12.2	NSD	36.5	NSD
N-Nitrosomethylethylamine	1,4-Butanediol, dinitrate	0.118	NSD	0.236	NSD	0.707	NSD
N-Nitrosomethylethylamine	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomethylethylamine	1,2,3-Propanetriol, 1,3-dinitrate	0.00854	NSD	0.0171	NSD	0.0512	NSD
N-Nitrosomethylethylamine	Methyl Isocyanate	0.00215	NSD	0.00431	NSD	0.0129	NSD
N-Nitrosomethylethylamine	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.47: N-Nitrosomorpholine: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
N-Nitrosomorpholine	Ammonia	(1.35e-07)	(1.35e-07)	(2.7e-07)	(2.7e-07)	(2.7e-07)	(2.7e-07)
N-Nitrosomorpholine	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	Mercury	(4.52e-07)	(4.52e-07)	(9.04e-07)	(9.04e-07)	(1.81e-06)	(1.81e-06)
N-Nitrosomorpholine	1,3-Butadiene	(6.8e-06)	NSD	(1.36e-05)	NSD	(6.8e-05)	NSD
N-Nitrosomorpholine	Benzene	(7.41e-05)	(7.41e-05)	(0.000148)	(0.000148)	(0.000741)	(0.000741)
N-Nitrosomorpholine	Biphenyl	0.00567	NSD	0.0113	NSD	0.034	NSD
N-Nitrosomorpholine	1-Butanol	(8e-06)	(8e-06)	(1.6e-05)	(1.6e-05)	(0.00016)	(0.00016)
N-Nitrosomorpholine	Methanol	(4.71e-05)	NSD	(9.43e-05)	NSD	(0.000118)	NSD
N-Nitrosomorpholine	2-Hexanone	(0.000297)	(0.000297)	(0.000594)	(0.000594)	(0.00119)	(0.00119)
N-Nitrosomorpholine	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	4-Methyl-2-hexanone	(0.00175)	(0.00175)	(0.0035)	(0.0035)	(0.0105)	(0.0105)
N-Nitrosomorpholine	6-Methyl-2-heptanone	(0.0981)	NSD	(0.196)	NSD	(0.589)	NSD
N-Nitrosomorpholine	3-Buten-2-one	(4.38e-05)	(4.38e-05)	(8.75e-05)	(8.75e-05)	(8.75e-05)	(8.75e-05)
N-Nitrosomorpholine	Formaldehyde	(9.41e-06)	(9.41e-06)	(1.88e-05)	(1.88e-05)	(1.88e-05)	(1.88e-05)
N-Nitrosomorpholine	Acetaldehyde	(0.000241)	(0.000241)	(0.000482)	(0.000482)	(0.000482)	(0.000482)
N-Nitrosomorpholine	Butanal	(0.00025)	(0.00025)	(5e-04)	(5e-04)	(0.0046)	(0.0046)
N-Nitrosomorpholine	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	Furan	(3.28e-07)	NSD	(6.55e-07)	NSD	(0.000118)	NSD
N-Nitrosomorpholine	2,3-Dihydrofuran	(5.67e-06)	NSD	(1.13e-05)	NSD	(3.4e-05)	NSD
N-Nitrosomorpholine	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	2-Methylfuran	1.72e-05	NSD	3.43e-05	NSD	0.000103	NSD
N-Nitrosomorpholine	2,5-Dimethylfuran	0.000123	NSD	0.000245	NSD	0.000736	NSD
N-Nitrosomorpholine	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	2-Pentylfuran	(4.38e-05)	NSD	(8.76e-05)	NSD	(0.000263)	NSD
N-Nitrosomorpholine	2-Heptylfuran	8.28e-05	NSD	0.000166	NSD	0.000497	NSD
N-Nitrosomorpholine	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	2-Octylfuran	(0.0017)	NSD	(0.00339)	NSD	(0.0102)	NSD
N-Nitrosomorpholine	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000355	NSD	0.000709	NSD	0.00213	NSD
N-Nitrosomorpholine	2-(2-Methyl-6-oxoheptyl)furan	(0.000956)	NSD	(0.00191)	NSD	(0.00574)	NSD
N-Nitrosomorpholine	Diethyl Phthalate	(0.000375)	NSD	(0.00075)	NSD	(0.0015)	NSD
N-Nitrosomorpholine	Acetonitrile	(3.19e-05)	(3.19e-05)	(6.39e-05)	(6.39e-05)	(0.000192)	(0.000192)
N-Nitrosomorpholine	Propanenitrile	(8e-05)	(8e-05)	(0.00016)	(0.00016)	(0.00048)	(0.00048)
N-Nitrosomorpholine	Butanenitrile	(0.000135)	(0.000135)	(0.00027)	(0.00027)	(0.000809)	(0.000809)
N-Nitrosomorpholine	Pentanenitrile	(0.000244)	(0.000244)	(0.000489)	(0.000489)	(0.00147)	(0.00147)
N-Nitrosomorpholine	Hexanenitrile	(0.000166)	(0.000166)	(0.000332)	(0.000332)	(0.000996)	(0.000996)
N-Nitrosomorpholine	Heptanenitrile	(2.32)	NSD	(4.64)	NSD	(13.9)	NSD
N-Nitrosomorpholine	2-Methylene butanenitrile	(0.0562)	NSD	(0.112)	NSD	(0.337)	NSD
N-Nitrosomorpholine	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	Ethylamine	(0.000536)	(0.000536)	(0.00107)	(0.00107)	(0.00322)	(0.00322)
N-Nitrosomorpholine	N-Nitrosodimethylamine	(4.65e-09)	(4.65e-09)	(9.31e-09)	(9.31e-09)	(2.79e-08)	(2.79e-08)
N-Nitrosomorpholine	N-Nitrosodiethylamine	(1.11e-06)	(1.11e-06)	(2.23e-06)	(2.23e-06)	(6.68e-06)	(6.68e-06)
N-Nitrosomorpholine	N-Nitrosomethylethylamine	(8.41e-08)	(8.41e-08)	(1.68e-07)	(1.68e-07)	(5.04e-07)	(5.04e-07)
N-Nitrosomorpholine	N-Nitrosomorpholine	3e-04	3e-04	6e-04	6e-04	0.0018	0.0018
N-Nitrosomorpholine	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	Pyridine	(0.000104)	(0.000104)	(0.000209)	(0.000209)	(0.00209)	(0.00209)
N-Nitrosomorpholine	2, 4-Dimethylpyridine	0.000586	NSD	0.00117	NSD	0.00352	NSD
N-Nitrosomorpholine	Methyl nitrite	(0.00583)	NSD	(0.0117)	NSD	(0.035)	NSD
N-Nitrosomorpholine	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	Butyl nitrate	(7.21)	NSD	(14.4)	NSD	(43.3)	NSD
N-Nitrosomorpholine	1,4-Butanediol, dinitrate	(0.124)	NSD	(0.247)	NSD	(0.741)	NSD
N-Nitrosomorpholine	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
N-Nitrosomorpholine	1,2,3-Propanetriol, 1,3-dinitrate	0.0133	NSD	0.0266	NSD	0.0799	NSD
N-Nitrosomorpholine	Methyl Isocyanate	0.00274	NSD	0.00548	NSD	0.0164	NSD
N-Nitrosomorpholine	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.48: Tributylphosphate: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Tributylphosphate	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Furan	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Acetonitrile	(9.75e-05)	NSD	(0.000195)	NSD	(0.000585)	NSD
Tributylphosphate	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Tributylphosphate	0.1	NSD	0.2	NSD	0.46	NSD
Tributylphosphate	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
Tributylphosphate	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.49: Dibutylbutylphosphonate: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Dibutylbutylphosphonate	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Furan	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
Dibutylbutylphosphonate	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.50: 2-Fluoropropene: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Fluoropropene	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
2-Fluoropropene	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.51: Pyridine: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Pyridine	Ammonia	(5.16e-06)	(5.16e-06)	(1.03e-05)	(1.03e-05)	(1.03e-05)	(1.03e-05)
Pyridine	Nitrous Oxide	(0.000142)	NSD	(0.000285)	NSD	(0.000854)	NSD
Pyridine	Mercury	(2.4e-06)	(2.4e-06)	(4.8e-06)	(4.8e-06)	(9.61e-06)	(9.61e-06)
Pyridine	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Benzene	(0.0075)	(0.0075)	(0.015)	(0.015)	(0.075)	(0.075)
Pyridine	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	1-Butanol	(0.005)	(0.005)	(0.01)	(0.01)	(0.1)	(0.1)
Pyridine	Methanol	(0.00642)	(0.00642)	(0.0128)	(0.0128)	(0.016)	(0.016)
Pyridine	2-Hexanone	(0.0215)	(0.0215)	(0.043)	(0.043)	(0.0859)	(0.0859)
Pyridine	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	4-Methyl-2-hexanone	(0.0571)	(0.0571)	(0.114)	(0.114)	(0.343)	(0.343)
Pyridine	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	3-Buten-2-one	(0.00233)	(0.00233)	(0.00466)	(0.00466)	(0.00466)	(0.00466)
Pyridine	Formaldehyde	(0.000581)	(0.000581)	(0.00116)	(0.00116)	(0.00116)	(0.00116)
Pyridine	Acetaldehyde	(0.00697)	(0.00697)	(0.0139)	(0.0139)	(0.0139)	(0.0139)
Pyridine	Butanal	(0.0251)	(0.0251)	(0.0502)	(0.0502)	(0.462)	(0.462)
Pyridine	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Furan	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2,3-Dihydrofuran	(0.000158)	NSD	(0.000316)	NSD	(0.000948)	NSD
Pyridine	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Acetonitrile	(0.000939)	(0.000939)	(0.00188)	(0.00188)	(0.00563)	(0.00563)
Pyridine	Propanenitrile	(0.043)	(0.043)	(0.086)	(0.086)	(0.258)	(0.258)
Pyridine	Butanenitrile	(0.0543)	(0.0543)	(0.109)	(0.109)	(0.326)	(0.326)
Pyridine	Pentanenitrile	(0.118)	(0.118)	(0.236)	(0.236)	(0.708)	(0.708)
Pyridine	Hexanenitrile	(0.114)	(0.114)	(0.228)	(0.228)	(0.685)	(0.685)
Pyridine	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Ethylamine	(0.00572)	NSD	(0.0114)	NSD	(0.0343)	NSD
Pyridine	N-Nitrosodimethylamine	(3.9e-07)	(3.9e-07)	(7.79e-07)	(7.79e-07)	(2.34e-06)	(2.34e-06)
Pyridine	N-Nitrosodiethylamine	(2.07e-05)	(2.07e-05)	(4.14e-05)	(4.14e-05)	(0.000124)	(0.000124)
Pyridine	N-Nitrosomethylethylamine	(0.000105)	(0.000105)	(0.00021)	(0.00021)	(0.00063)	(0.00063)
Pyridine	N-Nitrosomorpholine	(0.000121)	(0.000121)	(0.000242)	(0.000242)	(0.000727)	(0.000727)
Pyridine	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Pyridine	0.5	0.5	1	1	10	10
Pyridine	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
Pyridine	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.52: 2, 4-Dimethylpyridine: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2, 4-Dimethylpyridine	Ammonia	(7.21e-06)	NSD	(1.44e-05)	NSD	(1.44e-05)	NSD
2, 4-Dimethylpyridine	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	1,3-Butadiene	(0.000175)	NSD	(0.00035)	NSD	(0.00175)	NSD
2, 4-Dimethylpyridine	Benzene	(0.00679)	NSD	(0.0136)	NSD	(0.0679)	NSD
2, 4-Dimethylpyridine	Biphenyl	(0.00474)	NSD	(0.00948)	NSD	(0.0284)	NSD
2, 4-Dimethylpyridine	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	Methanol	(0.00129)	NSD	(0.00259)	NSD	(0.00324)	NSD
2, 4-Dimethylpyridine	2-Hexanone	(0.0263)	(0.0263)	(0.0526)	(0.0526)	(0.105)	(0.105)
2, 4-Dimethylpyridine	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	4-Methyl-2-hexanone	(0.0164)	NSD	(0.0329)	NSD	(0.0986)	NSD
2, 4-Dimethylpyridine	6-Methyl-2-heptanone	(0.202)	NSD	(0.405)	NSD	(1.21)	NSD
2, 4-Dimethylpyridine	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	Formaldehyde	(0.000445)	NSD	(0.000891)	NSD	(0.000891)	NSD
2, 4-Dimethylpyridine	Acetaldehyde	(0.00535)	NSD	(0.0107)	NSD	(0.0107)	NSD
2, 4-Dimethylpyridine	Butanal	(0.0311)	(0.0311)	(0.0622)	(0.0622)	(0.572)	(0.572)
2, 4-Dimethylpyridine	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	Furan	(1.64e-05)	NSD	(3.28e-05)	NSD	(0.0059)	NSD
2, 4-Dimethylpyridine	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	2-Methylfuran	5.23e-05	NSD	0.000105	NSD	0.000314	NSD
2, 4-Dimethylpyridine	2,5-Dimethylfuran	(0.000325)	NSD	(0.000649)	NSD	(0.00195)	NSD
2, 4-Dimethylpyridine	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	2-Pentylfuran	(0.000258)	NSD	(0.000515)	NSD	(0.00155)	NSD
2, 4-Dimethylpyridine	2-Heptylfuran	(0.000679)	NSD	(0.00136)	NSD	(0.00407)	NSD
2, 4-Dimethylpyridine	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	2-Octylfuran	0.00285	NSD	0.00569	NSD	0.0171	NSD
2, 4-Dimethylpyridine	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000272	NSD	0.000544	NSD	0.00163	NSD
2, 4-Dimethylpyridine	2-(2-Methyl-6-oxoheptyl)furan	0.00155	NSD	0.00311	NSD	0.00933	NSD
2, 4-Dimethylpyridine	Diethyl Phthalate	(0.0265)	NSD	(0.053)	NSD	(0.106)	NSD
2, 4-Dimethylpyridine	Acetonitrile	(0.000845)	NSD	(0.00169)	NSD	(0.00507)	NSD
2, 4-Dimethylpyridine	Propanenitrile	(0.0592)	NSD	(0.118)	NSD	(0.355)	NSD
2, 4-Dimethylpyridine	Butanenitrile	(0.0911)	NSD	(0.182)	NSD	(0.546)	NSD
2, 4-Dimethylpyridine	Pentanenitrile	(0.193)	NSD	(0.386)	NSD	(1.16)	NSD
2, 4-Dimethylpyridine	Hexanenitrile	(0.0561)	NSD	(0.112)	NSD	(0.337)	NSD
2, 4-Dimethylpyridine	Heptanenitrile	(0.489)	NSD	(0.979)	NSD	(2.94)	NSD
2, 4-Dimethylpyridine	2-Methylene butanenitrile	0.18	NSD	0.359	NSD	1.08	NSD
2, 4-Dimethylpyridine	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	Ethylamine	(0.00358)	NSD	(0.00716)	NSD	(0.0215)	NSD
2, 4-Dimethylpyridine	N-Nitrosodimethylamine	(2.99e-07)	NSD	(5.98e-07)	NSD	(1.79e-06)	NSD
2, 4-Dimethylpyridine	N-Nitrosodiethylamine	(2.56e-05)	NSD	(5.13e-05)	NSD	(0.000154)	NSD
2, 4-Dimethylpyridine	N-Nitrosomethylethylamine	(9.23e-05)	NSD	(0.000185)	NSD	(0.000554)	NSD
2, 4-Dimethylpyridine	N-Nitrosomorpholine	(0.000121)	NSD	(0.000242)	NSD	(0.000727)	NSD
2, 4-Dimethylpyridine	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	2, 4-Dimethylpyridine	0.25	0.25	0.5	0.5	1.5	1.5
2, 4-Dimethylpyridine	Methyl nitrite	0.0053	NSD	0.0106	NSD	0.0318	NSD
2, 4-Dimethylpyridine	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	Butyl nitrate	0.0862	NSD	0.172	NSD	0.517	NSD
2, 4-Dimethylpyridine	1,4-Butanediol, dinitrate	0.133	NSD	0.266	NSD	0.797	NSD
2, 4-Dimethylpyridine	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
2, 4-Dimethylpyridine	1,2,3-Propanetriol, 1,3-dinitrate	0.0135	NSD	0.027	NSD	0.0811	NSD
2, 4-Dimethylpyridine	Methyl Isocyanate	0.00235	NSD	0.0047	NSD	0.0141	NSD
2, 4-Dimethylpyridine	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.53: Methyl nitrite: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Methyl nitrite	Ammonia	0.000119	NSD	0.000239	NSD	0.000239	NSD
Methyl nitrite	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	1,3-Butadiene	0.00492	NSD	0.00983	NSD	0.0492	NSD
Methyl nitrite	Benzene	0.0679	NSD	0.136	NSD	0.679	NSD
Methyl nitrite	Biphenyl	0.124	NSD	0.248	NSD	0.744	NSD
Methyl nitrite	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	Methanol	0.0747	NSD	0.149	NSD	0.187	NSD
Methyl nitrite	2-Hexanone	0.354	NSD	0.708	NSD	1.42	NSD
Methyl nitrite	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	4-Methyl-2-hexanone	0.0253	NSD	0.0506	NSD	0.152	NSD
Methyl nitrite	6-Methyl-2-heptanone	2.11	NSD	4.22	NSD	12.7	NSD
Methyl nitrite	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	Formaldehyde	0.00648	NSD	0.013	NSD	0.013	NSD
Methyl nitrite	Acetaldehyde	0.137	NSD	0.274	NSD	0.274	NSD
Methyl nitrite	Butanal	0.263	NSD	0.526	NSD	4.84	NSD
Methyl nitrite	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	Furan	0.000536	NSD	0.00107	NSD	0.193	NSD
Methyl nitrite	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	2-Methylfuran	0.000669	NSD	0.00134	NSD	0.00402	NSD
Methyl nitrite	2,5-Dimethylfuran	0.000704	NSD	0.00141	NSD	0.00422	NSD
Methyl nitrite	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	2-Pentylfuran	0.000376	NSD	0.000751	NSD	0.00225	NSD
Methyl nitrite	2-Heptylfuran	0.000994	NSD	0.00199	NSD	0.00596	NSD
Methyl nitrite	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	2-Octylfuran	0.00281	NSD	0.00562	NSD	0.0169	NSD
Methyl nitrite	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000881	NSD	0.00176	NSD	0.00528	NSD
Methyl nitrite	2-(2-Methyl-6-oxoheptyl)furan	0.00356	NSD	0.00713	NSD	0.0214	NSD
Methyl nitrite	Diethyl Phthalate	0.174	NSD	0.348	NSD	0.697	NSD
Methyl nitrite	Acetonitrile	0.54	NSD	1.08	NSD	3.24	NSD
Methyl nitrite	Propanenitrile	0.313	NSD	0.627	NSD	1.88	NSD
Methyl nitrite	Butanenitrile	0.879	NSD	1.76	NSD	5.28	NSD
Methyl nitrite	Pentanenitrile	2.4	NSD	4.8	NSD	14.4	NSD
Methyl nitrite	Hexanenitrile	1.83	NSD	3.65	NSD	11	NSD
Methyl nitrite	Heptanenitrile	3.52	NSD	7.04	NSD	21.1	NSD
Methyl nitrite	2-Methylene butanenitrile	0.114	NSD	0.228	NSD	0.683	NSD
Methyl nitrite	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	Ethylamine	0.0532	NSD	0.106	NSD	0.319	NSD
Methyl nitrite	N-Nitrosodimethylamine	1.93e-06	NSD	3.86e-06	NSD	1.16e-05	NSD
Methyl nitrite	N-Nitrosodiethylamine	0.000202	NSD	0.000405	NSD	0.00121	NSD
Methyl nitrite	N-Nitrosomethylethylamine	0.000159	NSD	0.000317	NSD	0.000952	NSD
Methyl nitrite	N-Nitrosomorpholine	0.000331	NSD	0.000662	NSD	0.00199	NSD
Methyl nitrite	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	2, 4-Dimethylpyridine	0.105	NSD	0.21	NSD	0.63	NSD
Methyl nitrite	Methyl nitrite	0.05	NSD	0.1	NSD	0.3	NSD
Methyl nitrite	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	Butyl nitrate	1.3	NSD	2.6	NSD	7.81	NSD
Methyl nitrite	1,4-Butanediol, dinitrate	0.44	NSD	0.88	NSD	2.64	NSD
Methyl nitrite	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Methyl nitrite	1,2,3-Propanetriol, 1,3-dinitrate	0.0371	NSD	0.0742	NSD	0.223	NSD
Methyl nitrite	Methyl Isocyanate	0.00859	NSD	0.0172	NSD	0.0515	NSD
Methyl nitrite	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.54: Butyl nitrite: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Butyl nitrite	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Furan	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrite	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.55: Butyl nitrate: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Butyl nitrate	Ammonia	8.95e-06	(7.41e-06)	1.79e-05	(1.48e-05)	1.79e-05	(1.48e-05)
Butyl nitrate	Nitrous Oxide	0.000442	NSD	0.000884	NSD	0.00265	NSD
Butyl nitrate	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	1,3-Butadiene	0.000349	NSD	0.000698	NSD	0.00349	NSD
Butyl nitrate	Benzene	0.00538	0.00416	0.0108	0.00833	0.0538	0.0416
Butyl nitrate	Biphenyl	0.00752	NSD	0.015	NSD	0.0451	NSD
Butyl nitrate	1-Butanol	(0.0133)	NSD	(0.0266)	NSD	(0.266)	NSD
Butyl nitrate	Methanol	0.00567	0.00553	0.0113	0.0111	0.0142	0.0138
Butyl nitrate	2-Hexanone	0.0282	0.0253	0.0564	0.0506	0.113	0.101
Butyl nitrate	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	4-Methyl-2-hexanone	0.00179	NSD	0.00358	NSD	0.0107	NSD
Butyl nitrate	6-Methyl-2-heptanone	0.163	(0.159)	0.326	(0.318)	0.979	(0.953)
Butyl nitrate	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	Formaldehyde	0.000153	NSD	0.000306	NSD	0.000306	NSD
Butyl nitrate	Acetaldehyde	0.00996	0.00646	0.0199	0.0129	0.0199	0.0129
Butyl nitrate	Butanal	0.0198	(0.0197)	0.0396	(0.0393)	0.365	(0.362)
Butyl nitrate	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	Furan	2.39e-05	NSD	4.79e-05	NSD	0.00861	NSD
Butyl nitrate	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	2-Methylfuran	3.15e-05	NSD	6.31e-05	NSD	0.000189	NSD
Butyl nitrate	2,5-Dimethylfuran	4.11e-05	NSD	8.21e-05	NSD	0.000246	NSD
Butyl nitrate	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	2-Pentylfuran	2.4e-05	NSD	4.8e-05	NSD	0.000144	NSD
Butyl nitrate	2-Heptylfuran	6.68e-05	NSD	0.000134	NSD	0.000401	NSD
Butyl nitrate	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	2-Octylfuran	0.000223	NSD	0.000446	NSD	0.00134	NSD
Butyl nitrate	2-(3-Oxo-3-phenylprop-1-enyl)furan	3.72e-05	NSD	7.45e-05	NSD	0.000223	NSD
Butyl nitrate	2-(2-Methyl-6-oxoheptyl)furan	0.000217	NSD	0.000435	NSD	0.0013	NSD
Butyl nitrate	Diethyl Phthalate	0.0129	NSD	0.0258	NSD	0.0517	NSD
Butyl nitrate	Acetonitrile	0.016	(0.0109)	0.0319	(0.0219)	0.0957	(0.0656)
Butyl nitrate	Propanenitrile	0.022	(0.0128)	0.044	(0.0257)	0.132	(0.077)
Butyl nitrate	Butanenitrile	0.0494	(0.0195)	0.0988	(0.0389)	0.296	(0.117)
Butyl nitrate	Pentanenitrile	0.19	0.0919	0.381	0.184	1.14	0.551
Butyl nitrate	Hexanenitrile	0.145	0.131	0.29	0.263	0.87	0.788
Butyl nitrate	Heptanenitrile	0.299	0.287	0.599	0.574	1.8	1.72
Butyl nitrate	2-Methylene butanenitrile	0.00803	NSD	0.0161	NSD	0.0482	NSD
Butyl nitrate	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	Ethylamine	0.00426	NSD	0.00853	NSD	0.0256	NSD
Butyl nitrate	N-Nitrosodimethylamine	1.44e-07	NSD	2.87e-07	NSD	8.62e-07	NSD
Butyl nitrate	N-Nitrosodiethylamine	8.27e-06	NSD	1.65e-05	NSD	4.96e-05	NSD
Butyl nitrate	N-Nitrosomethylethylamine	1.25e-05	NSD	2.49e-05	NSD	7.48e-05	NSD
Butyl nitrate	N-Nitrosomorpholine	2.39e-05	NSD	4.78e-05	NSD	0.000143	NSD
Butyl nitrate	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	2, 4-Dimethylpyridine	0.00782	NSD	0.0156	NSD	0.0469	NSD
Butyl nitrate	Methyl nitrite	0.000697	NSD	0.00139	NSD	0.00418	NSD
Butyl nitrate	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	Butyl nitrate	1.25	1.25	2.5	2.5	7.5	7.5
Butyl nitrate	1,4-Butanediol, dinitrate	0.018	NSD	0.036	NSD	0.108	NSD
Butyl nitrate	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Butyl nitrate	1,2,3-Propanetriol, 1,3-dinitrate	0.00129	NSD	0.00258	NSD	0.00773	NSD
Butyl nitrate	Methyl Isocyanate	0.000317	NSD	0.000634	NSD	0.0019	NSD
Butyl nitrate	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.56: 1,4-Butanediol, dinitrate: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
1,4-Butanediol, dinitrate	Ammonia	3.33e-06	NSD	6.67e-06	NSD	6.67e-06	NSD
1,4-Butanediol, dinitrate	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	1,3-Butadiene	0.000131	NSD	0.000261	NSD	0.00131	NSD
1,4-Butanediol, dinitrate	Benzene	0.00178	NSD	0.00356	NSD	0.0178	NSD
1,4-Butanediol, dinitrate	Biphenyl	0.00326	NSD	0.00651	NSD	0.0195	NSD
1,4-Butanediol, dinitrate	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	Methanol	0.00198	NSD	0.00396	NSD	0.00496	NSD
1,4-Butanediol, dinitrate	2-Hexanone	0.00848	NSD	0.017	NSD	0.0339	NSD
1,4-Butanediol, dinitrate	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	4-Methyl-2-hexanone	0.000697	NSD	0.00139	NSD	0.00418	NSD
1,4-Butanediol, dinitrate	6-Methyl-2-heptanone	0.0541	NSD	0.108	NSD	0.325	NSD
1,4-Butanediol, dinitrate	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	Formaldehyde	0.000127	NSD	0.000255	NSD	0.000255	NSD
1,4-Butanediol, dinitrate	Acetaldehyde	0.00348	NSD	0.00696	NSD	0.00696	NSD
1,4-Butanediol, dinitrate	Butanal	0.0071	NSD	0.0142	NSD	0.131	NSD
1,4-Butanediol, dinitrate	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	Furan	1.68e-05	NSD	3.36e-05	NSD	0.00605	NSD
1,4-Butanediol, dinitrate	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	2-Methylfuran	2.34e-05	NSD	4.68e-05	NSD	0.00014	NSD
1,4-Butanediol, dinitrate	2,5-Dimethylfuran	2.27e-05	NSD	4.54e-05	NSD	0.000136	NSD
1,4-Butanediol, dinitrate	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	2-Pentylfuran	9.22e-06	NSD	1.84e-05	NSD	5.53e-05	NSD
1,4-Butanediol, dinitrate	2-Heptylfuran	2.5e-05	NSD	5.01e-05	NSD	0.00015	NSD
1,4-Butanediol, dinitrate	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	2-Octylfuran	7.14e-05	NSD	0.000143	NSD	0.000429	NSD
1,4-Butanediol, dinitrate	2-(3-Oxo-3-phenylprop-1-enyl)furan	2.15e-05	NSD	4.3e-05	NSD	0.000129	NSD
1,4-Butanediol, dinitrate	2-(2-Methyl-6-oxoheptyl)furan	9.24e-05	NSD	0.000185	NSD	0.000554	NSD
1,4-Butanediol, dinitrate	Diethyl Phthalate	0.00494	NSD	0.00988	NSD	0.0198	NSD
1,4-Butanediol, dinitrate	Acetonitrile	0.0165	NSD	0.0329	NSD	0.0988	NSD
1,4-Butanediol, dinitrate	Propanenitrile	0.00834	NSD	0.0167	NSD	0.05	NSD
1,4-Butanediol, dinitrate	Butanenitrile	0.0257	NSD	0.0515	NSD	0.154	NSD
1,4-Butanediol, dinitrate	Pentanenitrile	0.0629	NSD	0.126	NSD	0.377	NSD
1,4-Butanediol, dinitrate	Hexanenitrile	0.0454	NSD	0.0908	NSD	0.272	NSD
1,4-Butanediol, dinitrate	Heptanenitrile	0.0889	NSD	0.178	NSD	0.534	NSD
1,4-Butanediol, dinitrate	2-Methylene butanenitrile	0.00309	NSD	0.00619	NSD	0.0186	NSD
1,4-Butanediol, dinitrate	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	Ethylamine	0.00127	NSD	0.00254	NSD	0.00761	NSD
1,4-Butanediol, dinitrate	N-Nitrosodimethylamine	5.46e-08	NSD	1.09e-07	NSD	3.28e-07	NSD
1,4-Butanediol, dinitrate	N-Nitrosodiethylamine	4.98e-06	NSD	9.95e-06	NSD	2.99e-05	NSD
1,4-Butanediol, dinitrate	N-Nitrosomethylethylamine	3.79e-06	NSD	7.57e-06	NSD	2.27e-05	NSD
1,4-Butanediol, dinitrate	N-Nitrosomorpholine	7.56e-06	NSD	1.51e-05	NSD	4.54e-05	NSD
1,4-Butanediol, dinitrate	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	2, 4-Dimethylpyridine	0.00241	NSD	0.00482	NSD	0.0145	NSD
1,4-Butanediol, dinitrate	Methyl nitrite	0.00059	NSD	0.00118	NSD	0.00354	NSD
1,4-Butanediol, dinitrate	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	Butyl nitrate	0.371	NSD	0.743	NSD	2.23	NSD
1,4-Butanediol, dinitrate	1,4-Butanediol, dinitrate	0.025	NSD	0.05	NSD	0.15	NSD
1,4-Butanediol, dinitrate	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
1,4-Butanediol, dinitrate	1,2,3-Propanetriol, 1,3-dinitrate	0.00116	NSD	0.00232	NSD	0.00697	NSD
1,4-Butanediol, dinitrate	Methyl Isocyanate	0.000213	NSD	0.000426	NSD	0.00128	NSD
1,4-Butanediol, dinitrate	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.57: 2-Nitro-2-methylpropane: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
2-Nitro-2-methylpropane	Ammonia	5.91e-05	NSD	0.000118	NSD	0.000118	NSD
2-Nitro-2-methylpropane	Nitrous Oxide	0.000127	NSD	0.000253	NSD	0.00076	NSD
2-Nitro-2-methylpropane	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Benzene	0.0648	NSD	0.13	NSD	0.648	NSD
2-Nitro-2-methylpropane	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	1-Butanol	0.0821	NSD	0.164	NSD	1.64	NSD
2-Nitro-2-methylpropane	Methanol	0.0798	NSD	0.16	NSD	0.2	NSD
2-Nitro-2-methylpropane	2-Hexanone	1.57	NSD	3.15	NSD	6.3	NSD
2-Nitro-2-methylpropane	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Butanal	0.169	NSD	0.339	NSD	3.12	NSD
2-Nitro-2-methylpropane	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Acetonitrile	0.0128	NSD	0.0255	NSD	0.0765	NSD
2-Nitro-2-methylpropane	Propanenitrile	0.288	NSD	0.576	NSD	1.73	NSD
2-Nitro-2-methylpropane	Butanenitrile	0.506	NSD	1.01	NSD	3.04	NSD
2-Nitro-2-methylpropane	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	2-Nitro-2-methylpropane	0.15	NSD	0.3	NSD	0.9	NSD
2-Nitro-2-methylpropane	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
2-Nitro-2-methylpropane	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.58: 1,2,3-Propanetriol, 1,3-dinitrate: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
1,2,3-Propanetriol, 1,3-dinitrate	Ammonia	(4.75e-05)	NSD	(9.49e-05)	NSD	(9.49e-05)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	1,3-Butadiene	0.00186	NSD	0.00373	NSD	0.0186	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Benzene	(0.0234)	NSD	(0.0469)	NSD	(0.234)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Biphenyl	(0.0585)	NSD	(0.117)	NSD	(0.351)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Methanol	(0.03)	NSD	(0.06)	NSD	(0.0749)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Hexanone	(0.153)	NSD	(0.306)	NSD	(0.612)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	4-Methyl-2-hexanone	(0.0104)	NSD	(0.0209)	NSD	(0.0627)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	6-Methyl-2-heptanone	(0.904)	NSD	(1.81)	NSD	(5.43)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Formaldehyde	(0.00161)	NSD	(0.00322)	NSD	(0.00322)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Acetaldehyde	(0.0552)	NSD	(0.11)	NSD	(0.11)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Butanal	(0.109)	NSD	(0.218)	NSD	(2.01)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Furan	(0.000244)	NSD	(0.000488)	NSD	(0.0878)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Methylfuran	(0.000319)	NSD	(0.000638)	NSD	(0.00191)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2,5-Dimethylfuran	(0.000345)	NSD	(0.00069)	NSD	(0.00207)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Pentylfuran	(0.000164)	NSD	(0.000329)	NSD	(0.000986)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Heptylfuran	(0.000444)	NSD	(0.000887)	NSD	(0.00266)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Octylfuran	(0.0012)	NSD	(0.0024)	NSD	(0.0072)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000411	NSD	0.000821	NSD	0.00246	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-(2-Methyl-6-oxoheptyl)furan	(0.00158)	NSD	(0.00317)	NSD	(0.0095)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Diethyl Phthalate	(0.0701)	NSD	(0.14)	NSD	(0.281)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Acetonitrile	(0.0918)	NSD	(0.184)	NSD	(0.551)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Propanenitrile	(0.119)	NSD	(0.239)	NSD	(0.716)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Butanenitrile	(0.215)	NSD	(0.431)	NSD	(1.29)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Pentanenitrile	(0.311)	NSD	(0.623)	NSD	(1.87)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Hexanenitrile	(0.361)	NSD	(0.721)	NSD	(2.16)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Heptanenitrile	(0.415)	NSD	(0.831)	NSD	(2.49)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Methylene butanenitrile	(0.0455)	NSD	(0.0911)	NSD	(0.273)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Ethylamine	(0.0218)	NSD	(0.0436)	NSD	(0.131)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	N-Nitrosodimethylamine	(7.94e-07)	NSD	(1.59e-06)	NSD	(4.76e-06)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	N-Nitrosodiethylamine	(6.7e-05)	NSD	(0.000134)	NSD	(0.000402)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	N-Nitrosomethylethylamine	(6.24e-05)	NSD	(0.000125)	NSD	(0.000374)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	N-Nitrosomorpholine	(0.000135)	NSD	(0.00027)	NSD	(0.000811)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2, 4-Dimethylpyridine	(0.0403)	NSD	(0.0806)	NSD	(0.242)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Methyl nitrite	(0.00726)	NSD	(0.0145)	NSD	(0.0436)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Butyl nitrate	(6.34)	NSD	(12.7)	NSD	(38)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	1,4-Butanediol, dinitrate	(0.168)	NSD	(0.335)	NSD	(1.01)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
1,2,3-Propanetriol, 1,3-dinitrate	1,2,3-Propanetriol, 1,3-dinitrate	0.025	NSD	0.05	NSD	0.15	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Methyl Isocyanate	(0.00337)	NSD	(0.00674)	NSD	(0.0202)	NSD
1,2,3-Propanetriol, 1,3-dinitrate	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.59: Methyl Isocyanate: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Methyl Isocyanate	Ammonia	(1.24e-05)	NSD	(2.48e-05)	NSD	(2.48e-05)	NSD
Methyl Isocyanate	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	1,3-Butadiene	0.00502	NSD	0.01	NSD	0.0502	NSD
Methyl Isocyanate	Benzene	(0.0326)	NSD	(0.0652)	NSD	(0.326)	NSD
Methyl Isocyanate	Biphenyl	(0.0489)	NSD	(0.0978)	NSD	(0.293)	NSD
Methyl Isocyanate	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	Methanol	(0.0406)	NSD	(0.0812)	NSD	(0.101)	NSD
Methyl Isocyanate	2-Hexanone	(0.325)	NSD	(0.65)	NSD	(1.3)	NSD
Methyl Isocyanate	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	4-Methyl-2-hexanone	(0.0209)	NSD	(0.0418)	NSD	(0.125)	NSD
Methyl Isocyanate	6-Methyl-2-heptanone	(0.899)	NSD	(1.8)	NSD	(5.39)	NSD
Methyl Isocyanate	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	Formaldehyde	(0.0046)	NSD	(0.0092)	NSD	(0.0092)	NSD
Methyl Isocyanate	Acetaldehyde	0.0801	NSD	0.16	NSD	0.16	NSD
Methyl Isocyanate	Butanal	(0.242)	NSD	(0.483)	NSD	(4.45)	NSD
Methyl Isocyanate	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	Furan	0.000499	NSD	0.000998	NSD	0.18	NSD
Methyl Isocyanate	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	2-Methylfuran	(0.000538)	NSD	(0.00108)	NSD	(0.00323)	NSD
Methyl Isocyanate	2,5-Dimethylfuran	(0.000458)	NSD	(0.000916)	NSD	(0.00275)	NSD
Methyl Isocyanate	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	2-Pentylfuran	(0.000203)	NSD	(0.000405)	NSD	(0.00122)	NSD
Methyl Isocyanate	2-Heptylfuran	(0.000486)	NSD	(0.000971)	NSD	(0.00291)	NSD
Methyl Isocyanate	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	2-Octylfuran	(0.00299)	NSD	(0.00599)	NSD	(0.018)	NSD
Methyl Isocyanate	2-(3-Oxo-3-phenylprop-1-enyl)furan	0.000817	NSD	0.00163	NSD	0.0049	NSD
Methyl Isocyanate	2-(2-Methyl-6-oxoheptyl)furan	(0.00118)	NSD	(0.00236)	NSD	(0.00707)	NSD
Methyl Isocyanate	Diethyl Phthalate	(0.0386)	NSD	(0.0772)	NSD	(0.154)	NSD
Methyl Isocyanate	Acetonitrile	(0.0947)	NSD	(0.189)	NSD	(0.568)	NSD
Methyl Isocyanate	Propanenitrile	(0.252)	NSD	(0.504)	NSD	(1.51)	NSD
Methyl Isocyanate	Butanenitrile	(0.522)	NSD	(1.04)	NSD	(3.13)	NSD
Methyl Isocyanate	Pentanenitrile	(1.93)	NSD	(3.87)	NSD	(11.6)	NSD
Methyl Isocyanate	Hexanenitrile	(1.85)	NSD	(3.7)	NSD	(11.1)	NSD
Methyl Isocyanate	Heptanenitrile	(3.54)	NSD	(7.09)	NSD	(21.3)	NSD
Methyl Isocyanate	2-Methylene butanenitrile	(0.101)	NSD	(0.202)	NSD	(0.605)	NSD
Methyl Isocyanate	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	Ethylamine	(0.0535)	NSD	(0.107)	NSD	(0.321)	NSD
Methyl Isocyanate	N-Nitrosodimethylamine	(1.79e-06)	NSD	(3.57e-06)	NSD	(1.07e-05)	NSD
Methyl Isocyanate	N-Nitrosodiethylamine	(0.00016)	NSD	(0.000321)	NSD	(0.000963)	NSD
Methyl Isocyanate	N-Nitrosomethylethylamine	(0.00013)	NSD	(0.00026)	NSD	(0.00078)	NSD
Methyl Isocyanate	N-Nitrosomorpholine	3e-04	NSD	0.000599	NSD	0.0018	NSD
Methyl Isocyanate	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	2, 4-Dimethylpyridine	(0.0925)	NSD	(0.185)	NSD	(0.555)	NSD
Methyl Isocyanate	Methyl nitrite	(0.0194)	NSD	(0.0388)	NSD	(0.116)	NSD
Methyl Isocyanate	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	Butyl nitrate	(11)	NSD	(22)	NSD	(66.1)	NSD
Methyl Isocyanate	1,4-Butanediol, dinitrate	(0.249)	NSD	(0.498)	NSD	(1.5)	NSD
Methyl Isocyanate	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Methyl Isocyanate	1,2,3-Propanetriol, 1,3-dinitrate	0.0253	NSD	0.0505	NSD	0.152	NSD
Methyl Isocyanate	Methyl Isocyanate	0.01	NSD	0.02	NSD	0.06	NSD
Methyl Isocyanate	Dimethyl Mercury	NSD	NSD	NSD	NSD	NSD	NSD

Table D.60: Dimethyl Mercury: rounded tolerance limits in ppm after projection to the COPC's half OEL, OEL, and excursion limit. Tolerance limits for 90% confidence that 90% of the distribution lies above and for 95% confidence that 95% of the distribution lies above. Numbers in parentheses are not robust estimates because they rely heavily on the treatment of censored data points.

LI Name	COPC Name	Half OEL 90	Half OEL 95	OEL 90	OEL 95	Excursion 90	Excursion 95
Dimethyl Mercury	Ammonia	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Nitrous Oxide	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Mercury	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	1,3-Butadiene	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Benzene	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Biphenyl	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	1-Butanol	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Methanol	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Hexanone	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	3-Methyl-3-butene-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	4-Methyl-2-hexanone	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	6-Methyl-2-heptanone	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	3-Buten-2-one	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Formaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Acetaldehyde	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Butanal	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Methyl-2-butenal	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Ethyl-hex-2-enal	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Propenal	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Furan	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2,3-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2,5-Dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2,5-Dimethylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Ethyl-5-methylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	4-(1-Methylpropyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Pentylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Heptylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Propylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Octylfuran	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-(3-Oxo-3-phenylprop-1-enyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-(2-Methyl-6-oxoheptyl)furan	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Diethyl Phthalate	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Acetonitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Propanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Pentanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Hexanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Heptanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Methylene butanenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2,4-Pentadienenitrile	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Ethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	N-Nitrosodimethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	N-Nitrosodiethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	N-Nitrosomethylethylamine	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	N-Nitrosomorpholine	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Tributylphosphate	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Dibutylbutylphosphonate	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Fluoropropene	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Pyridine	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2, 4-Dimethylpyridine	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Methyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Butyl nitrite	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Butyl nitrate	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	1,4-Butanediol, dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	2-Nitro-2-methylpropane	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	1,2,3-Propanetriol, 1,3-dinitrate	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Methyl Isocyanate	NSD	NSD	NSD	NSD	NSD	NSD
Dimethyl Mercury	Dimethyl Mercury	0.005	NSD	0.01	NSD	0.00318	NSD

Appendix E

Number Lines

Appendix E

Number Lines

This appendix contains number lines for all candidate leading indicators evaluated. There is a separate number line for dilution projections to 1/2 occupational exposure limit (OEL), OEL, and the excursion limit listed in Table 5.1 for both 90/90 and 95/95 tolerance limits. The 1/2 OEL and OEL of the candidate leading indicator are identified by dashed grey and black lines, respectively. Chemicals of potential concern (COPCs) have been segregated into groups based on relative importance. The big 9 identified by red circles include ammonia, nitrous oxide, mercury, 1,3-butadiene, acetonitrile, formaldehyde, furan, nitrosodimethylamine (NDMA), and nitrosomethylethylamine. The COPCs listed on the A farm and AP farm Tank Vapor Information Sheet (TVIS) lists, but not included in the big 9, are shown as blue triangles. These are 2,3-dihydrofuran, 2,5-dihydrofuran, 2-heptylfuran, 2-pentylfuran, ethylamine, nitrosodiethylamine, and nitrosomorpholine. The TVIS group, burgundy squares, includes all COPCs on the other 15 TVIS lists not already covered. All remaining COPCs not already listed are represented by crosses. Symbols are solid when the tolerance limit falls within the x-censored data (red column) on the histogram to identify increased uncertainty with the value.

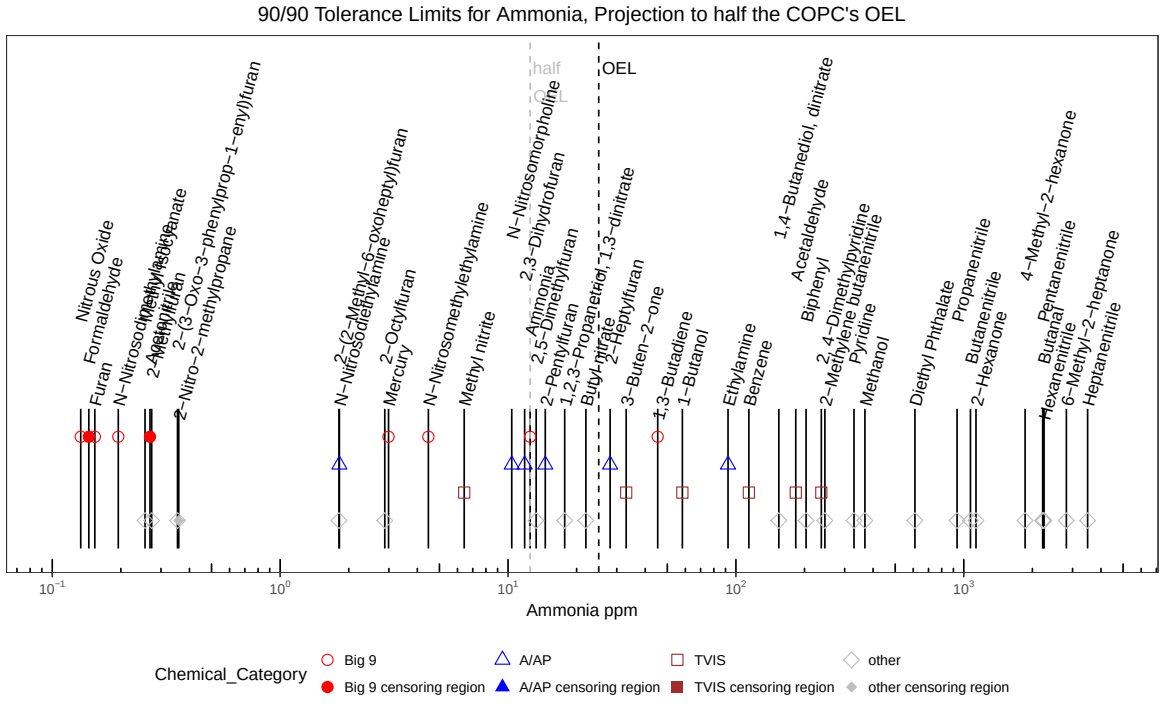


Figure E.1: Tolerance limits for Ammonia as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

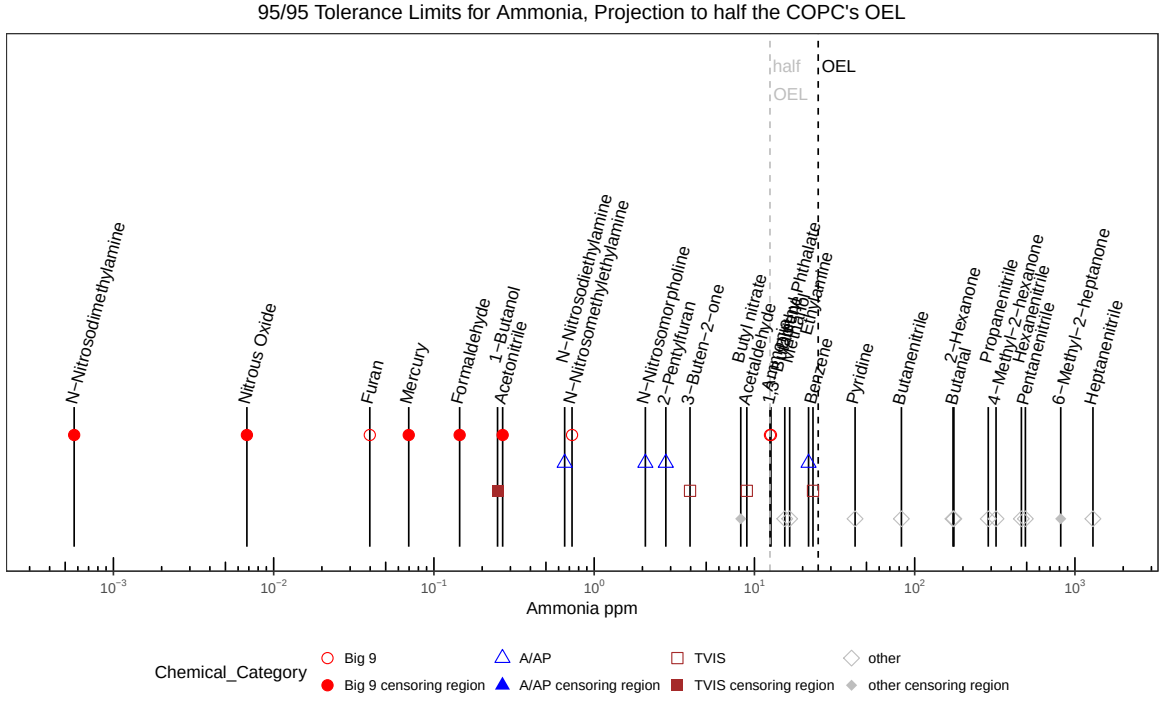


Figure E.2: Tolerance limits for Ammonia as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

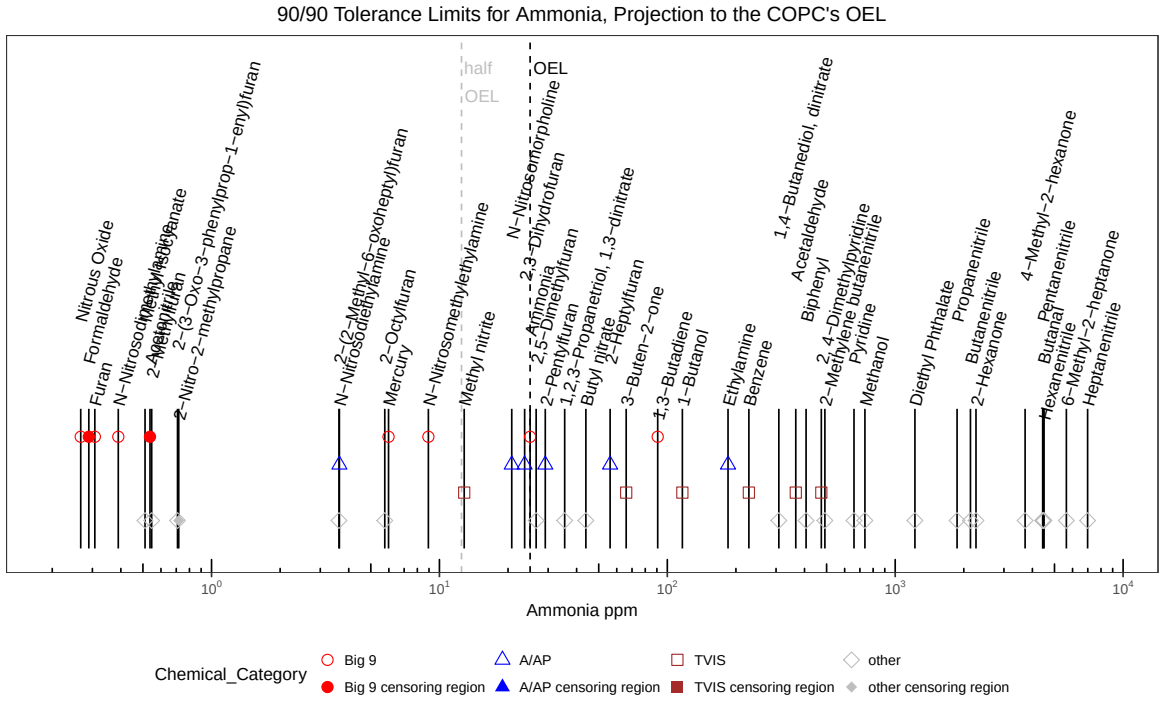


Figure E.3: Tolerance limits for Ammonia as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

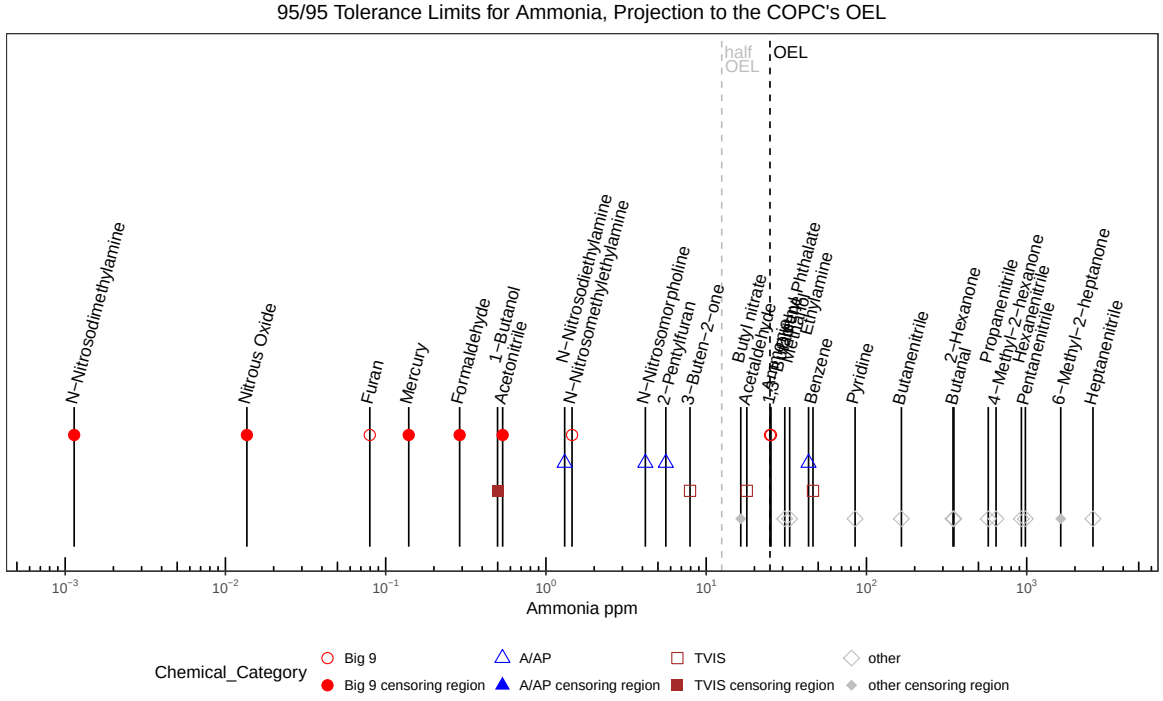


Figure E.4: Tolerance limits for Ammonia as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

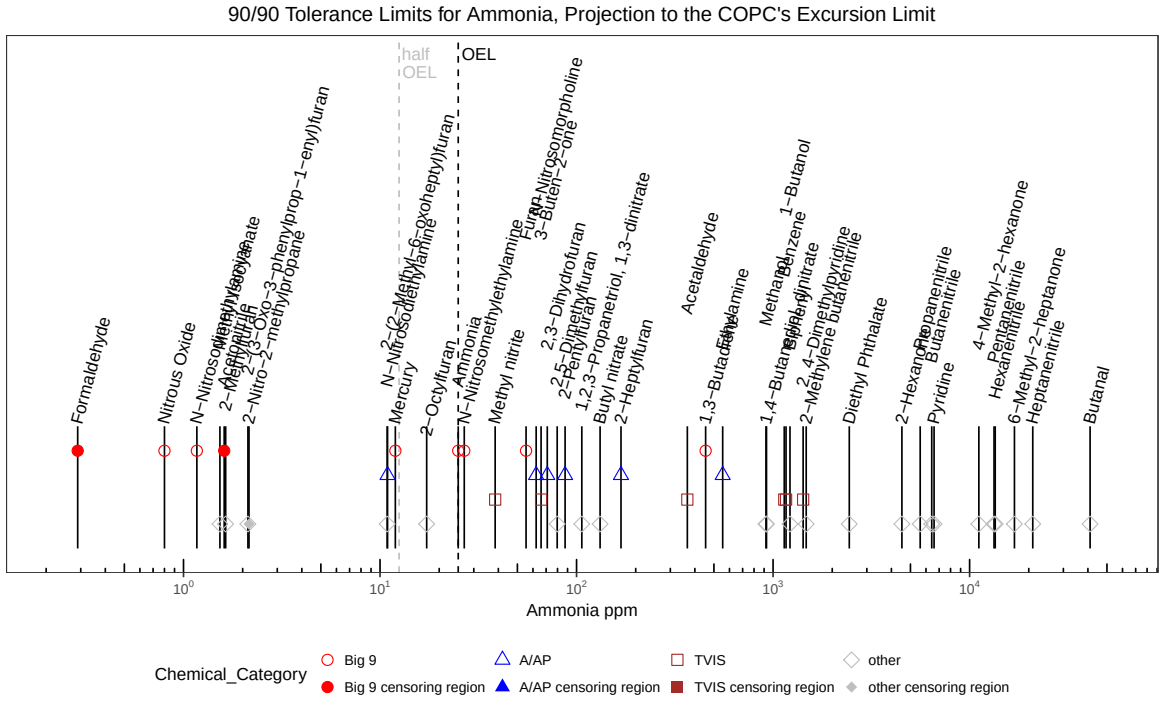


Figure E.5: Tolerance limits for Ammonia as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

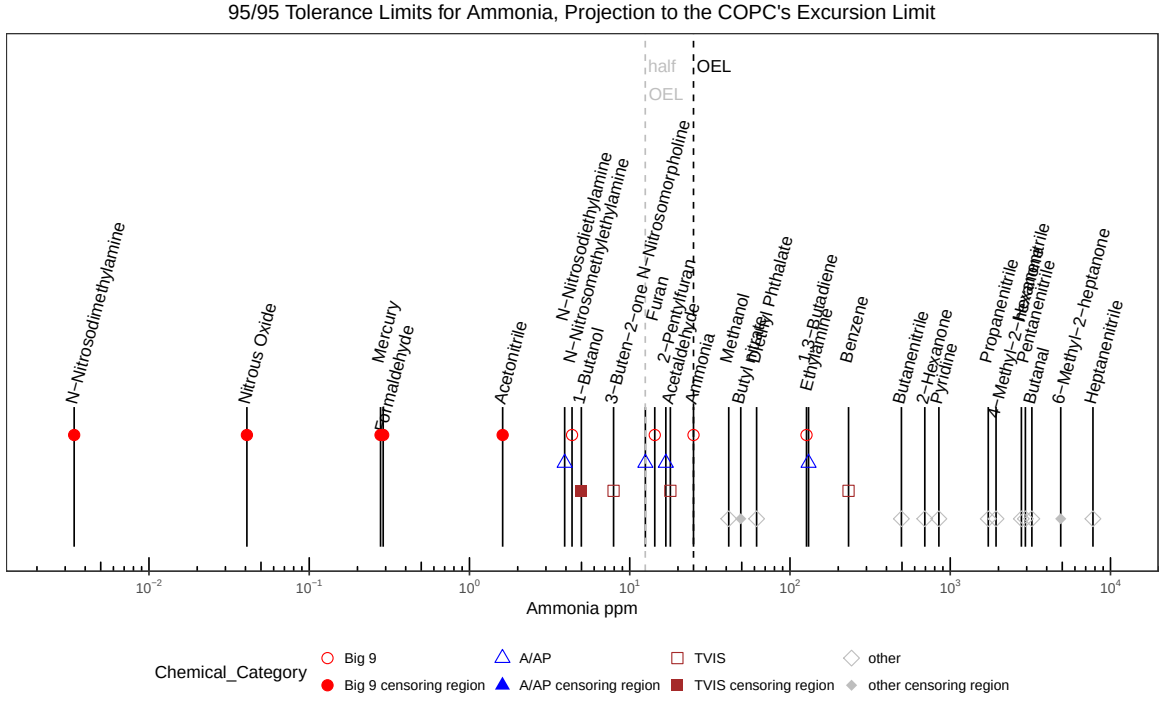


Figure E.6: Tolerance limits for Ammonia as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

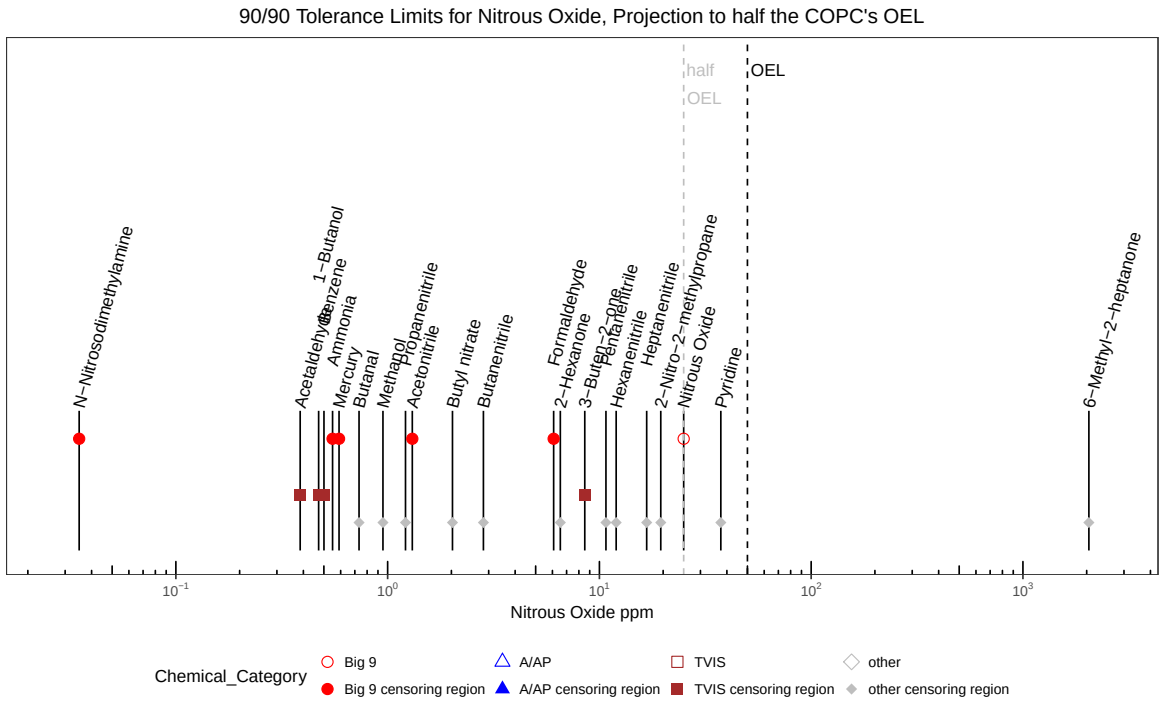


Figure E.7: Tolerance limits for Nitrous Oxide as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

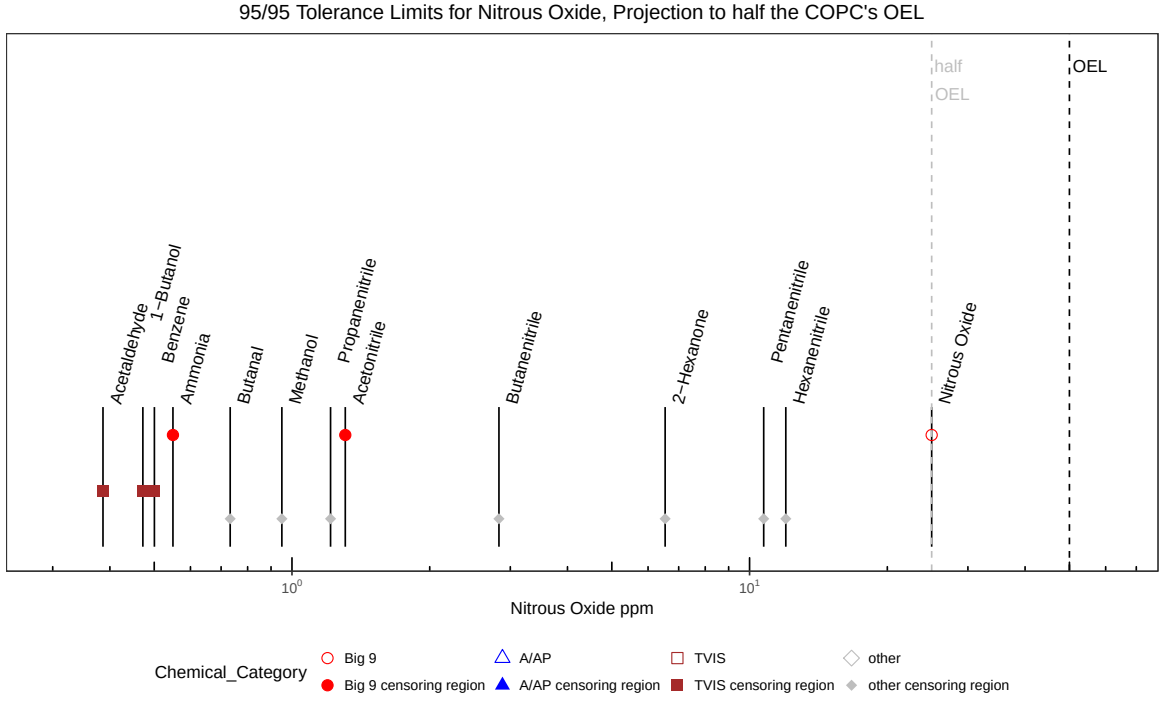


Figure E.8: Tolerance limits for Nitrous Oxide as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

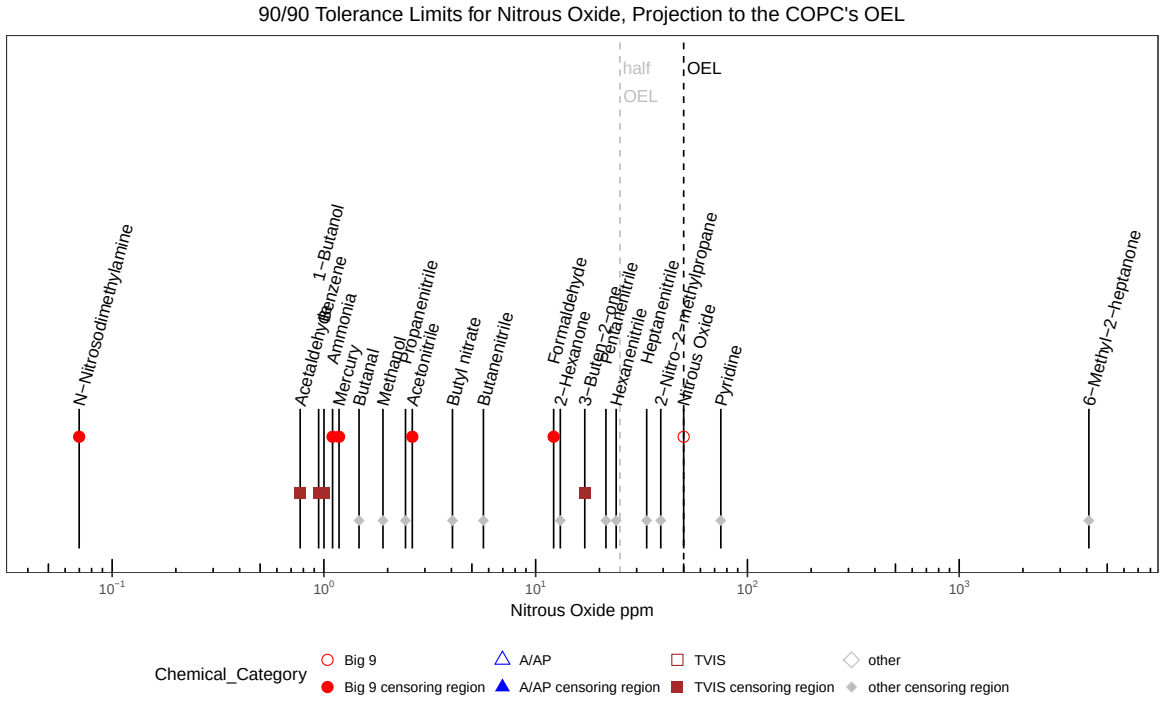


Figure E.9: Tolerance limits for Nitrous Oxide as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

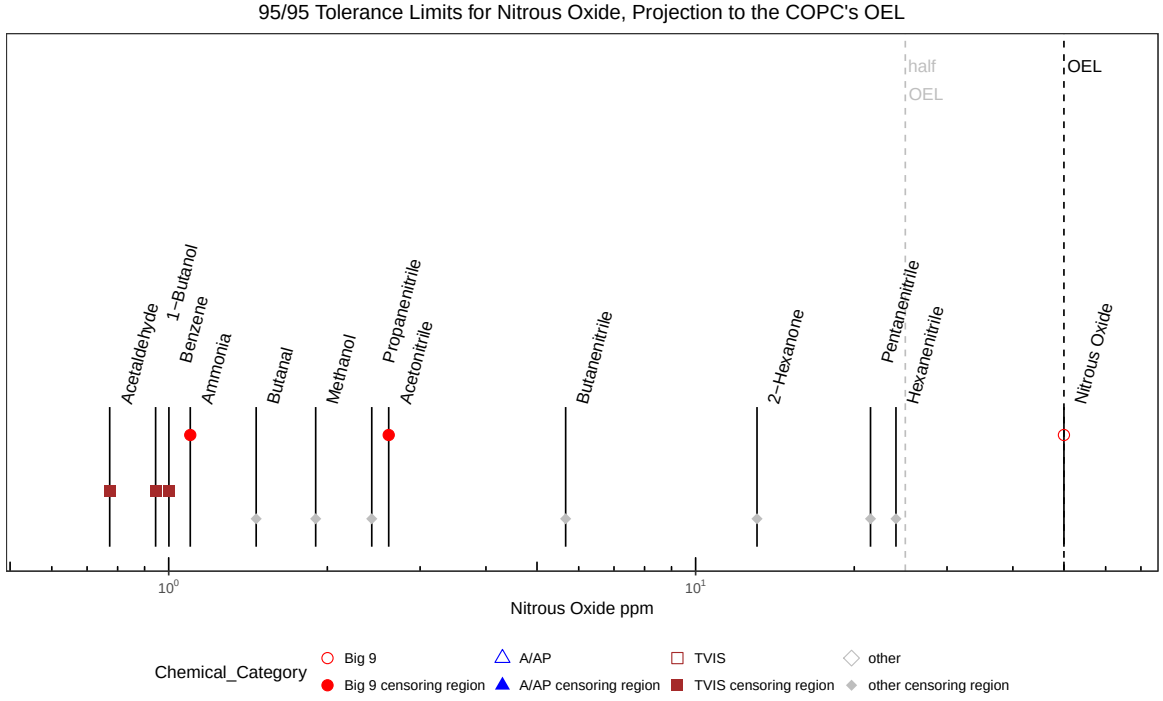


Figure E.10: Tolerance limits for Nitrous Oxide as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

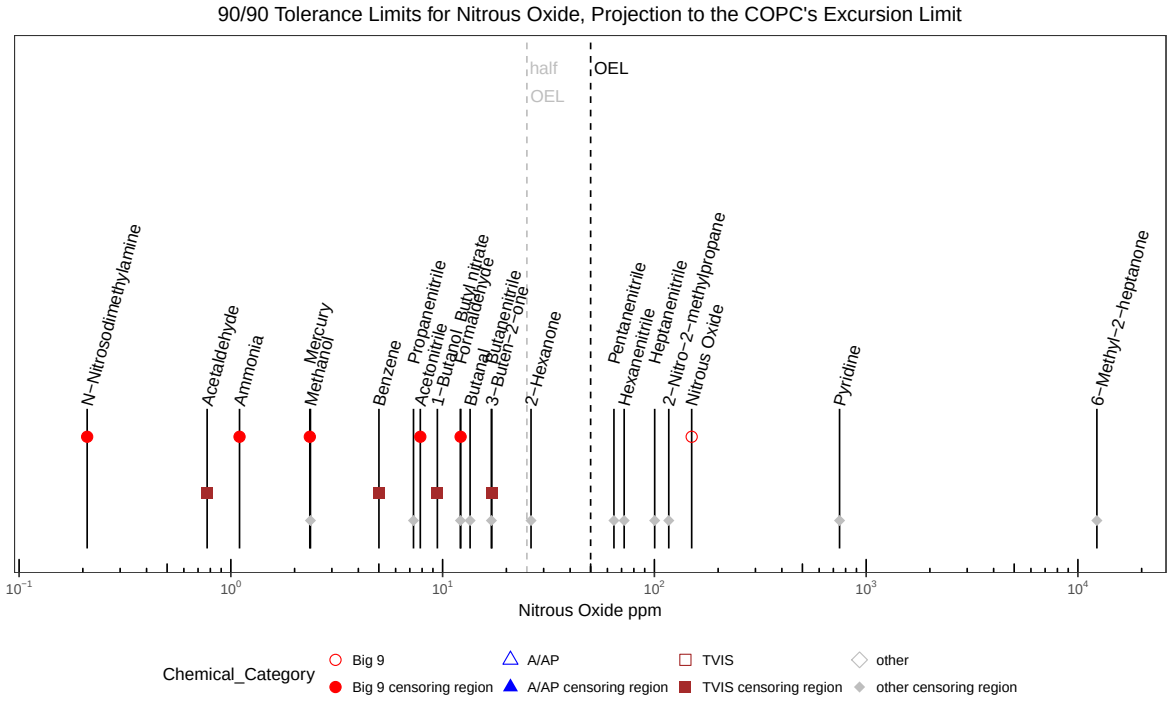


Figure E.11: Tolerance limits for Nitrous Oxide as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

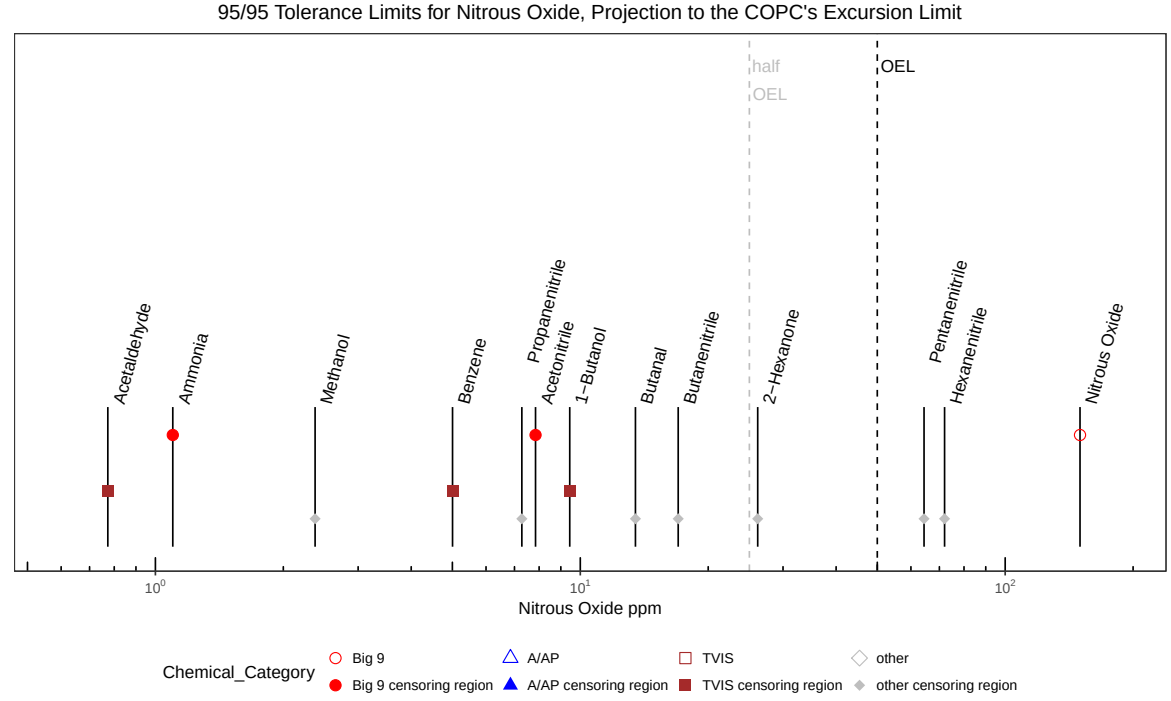


Figure E.12: Tolerance limits for Nitrous Oxide as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

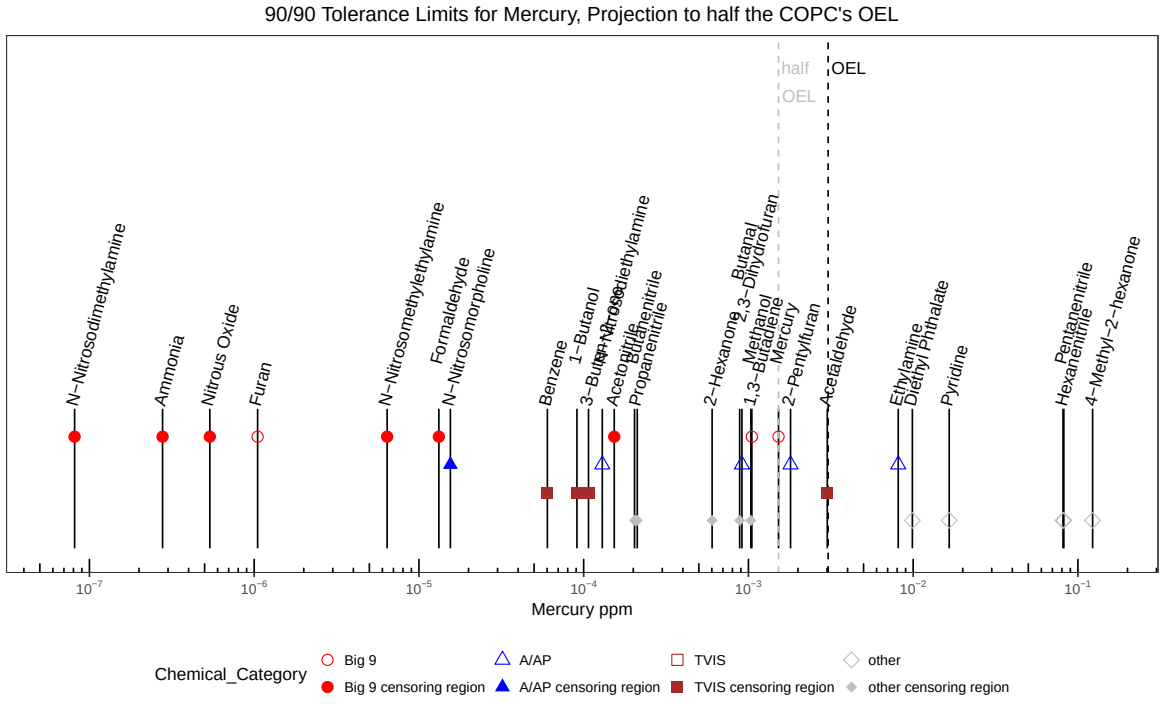


Figure E.13: Tolerance limits for Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

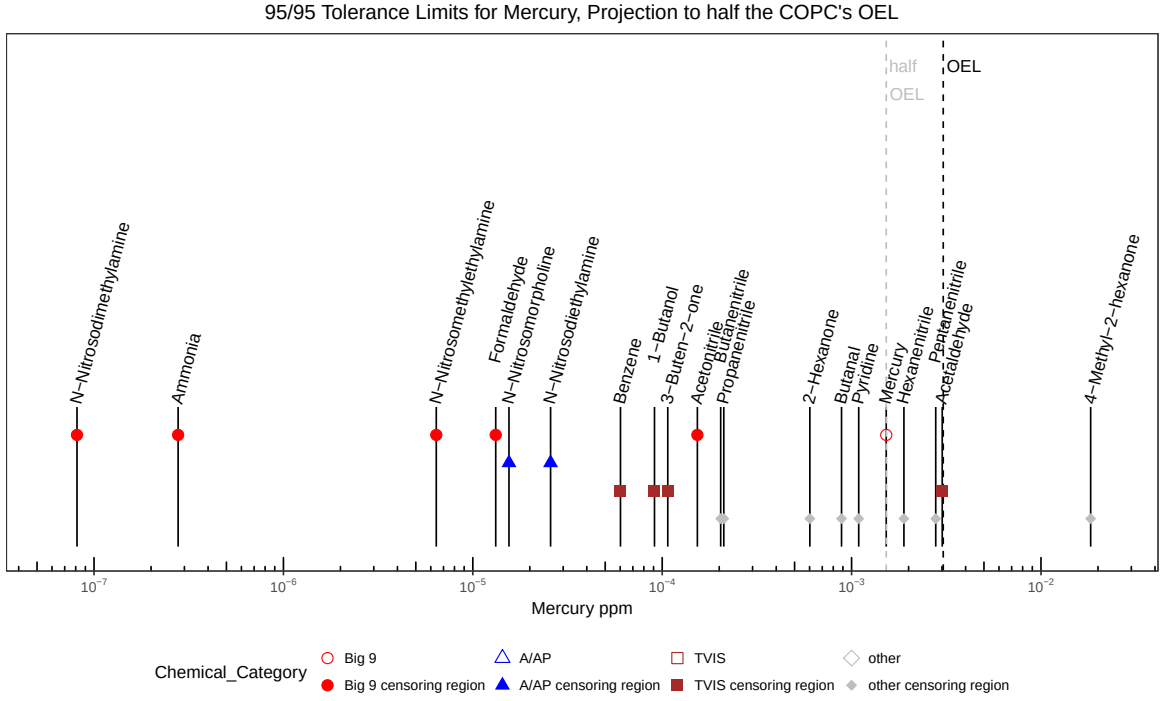


Figure E.14: Tolerance limits for Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

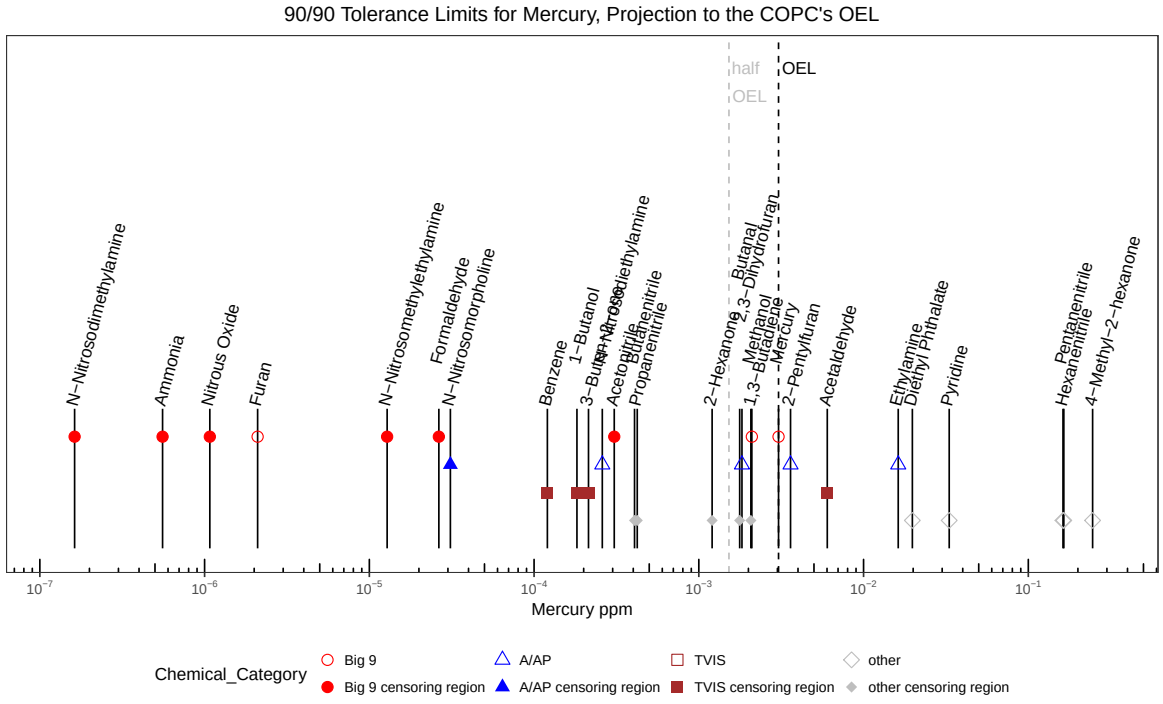


Figure E.15: Tolerance limits for Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

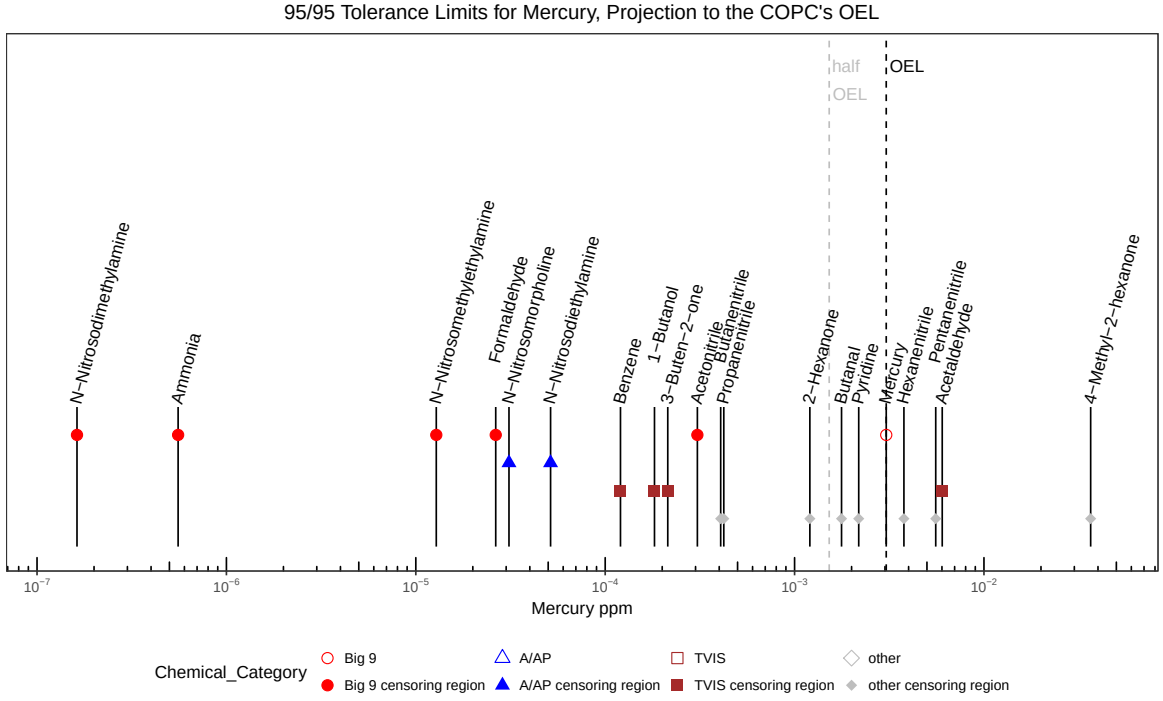


Figure E.16: Tolerance limits for Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

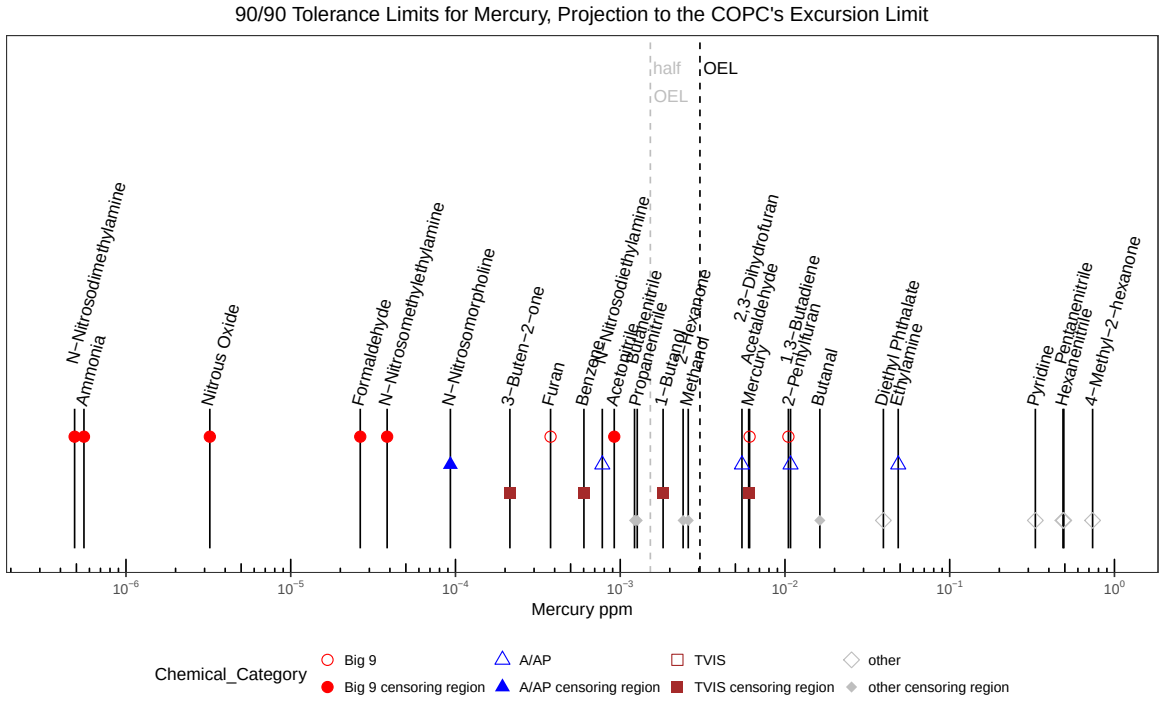


Figure E.17: Tolerance limits for Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

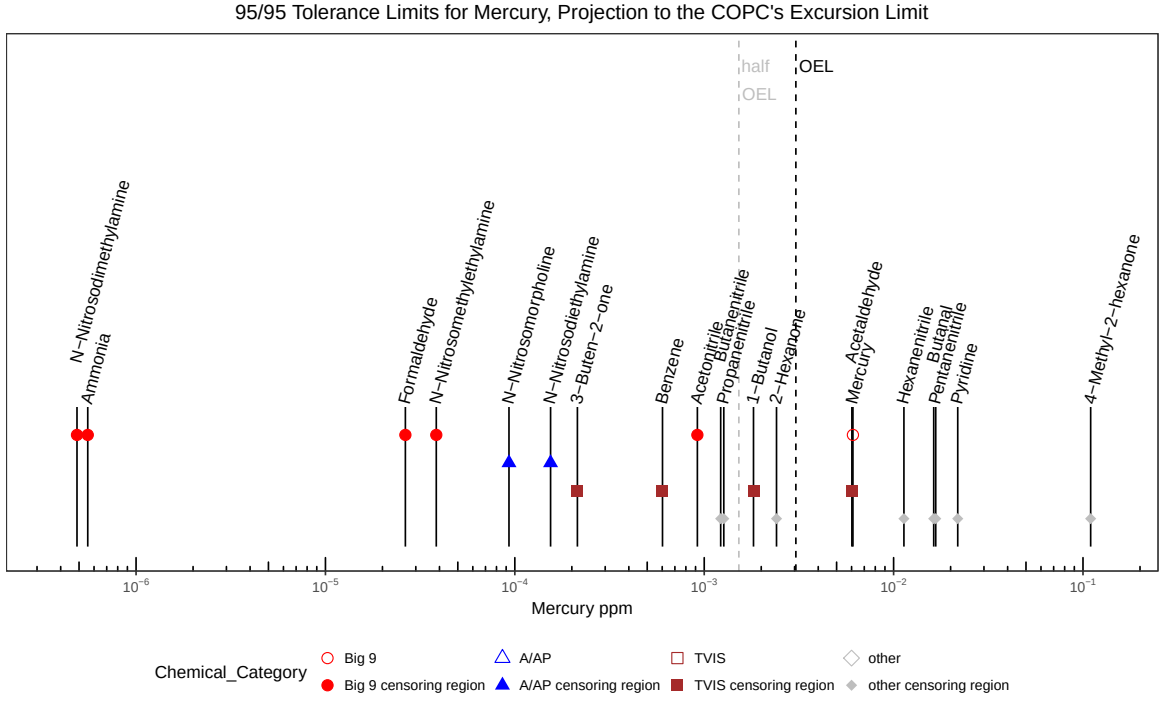


Figure E.18: Tolerance limits for Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

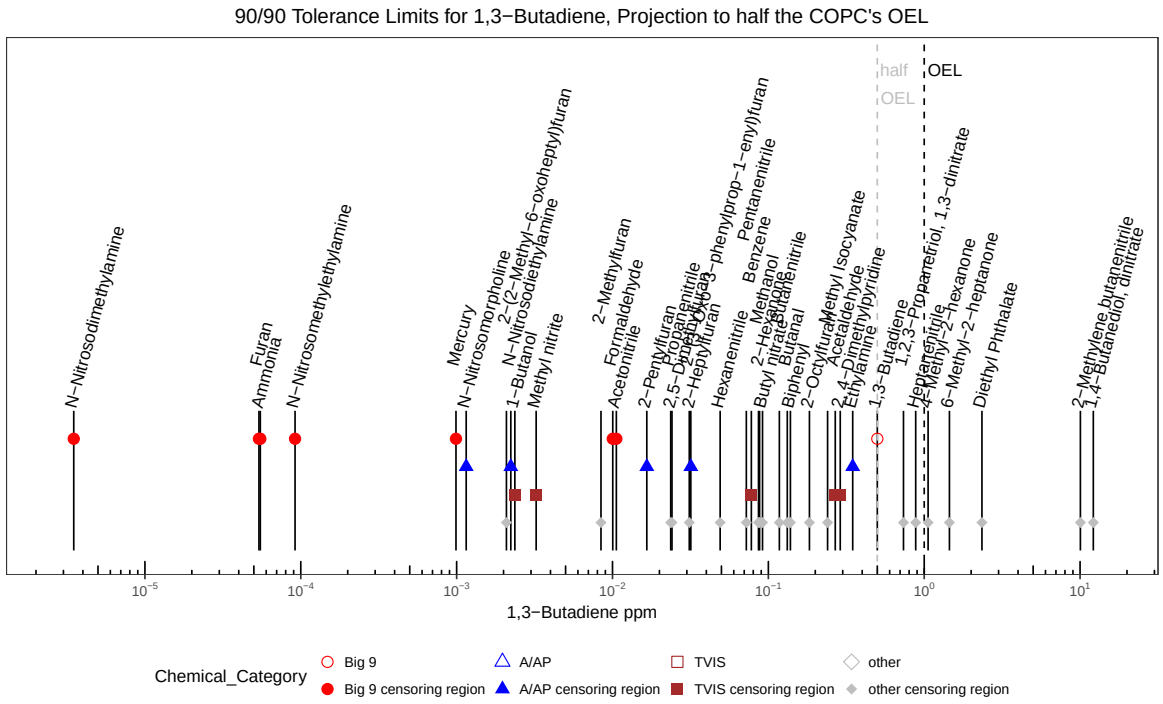


Figure E.19: Tolerance limits for 1,3-Butadiene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

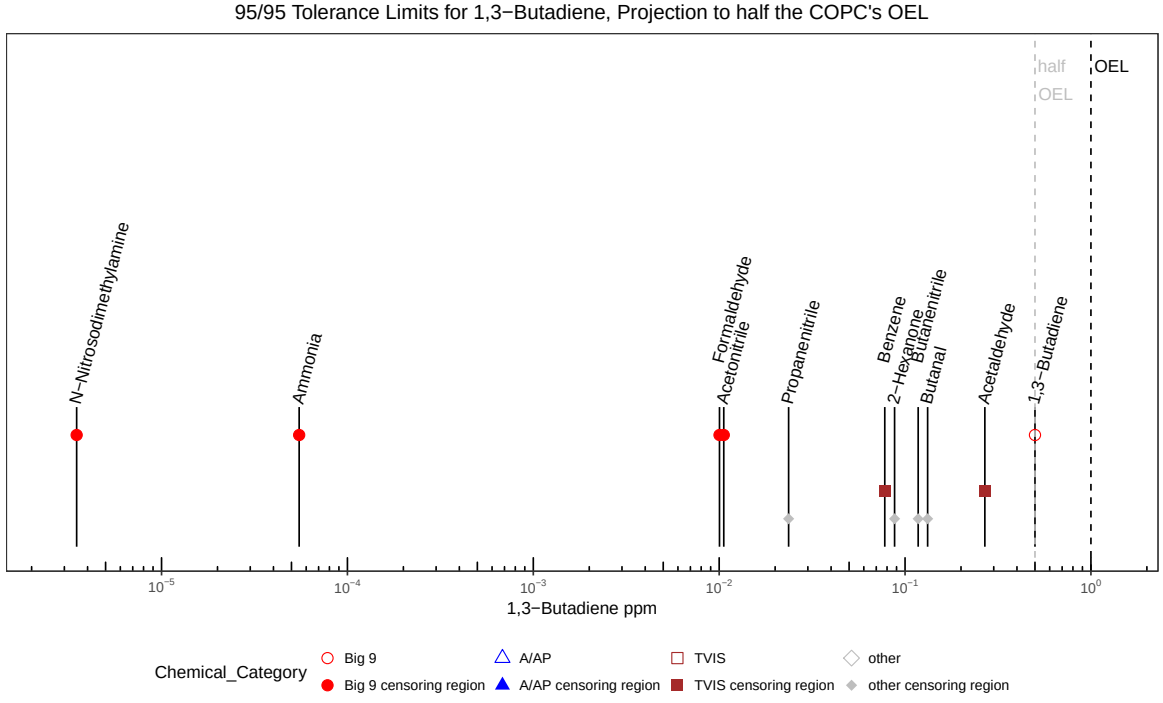


Figure E.20: Tolerance limits for 1,3-Butadiene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

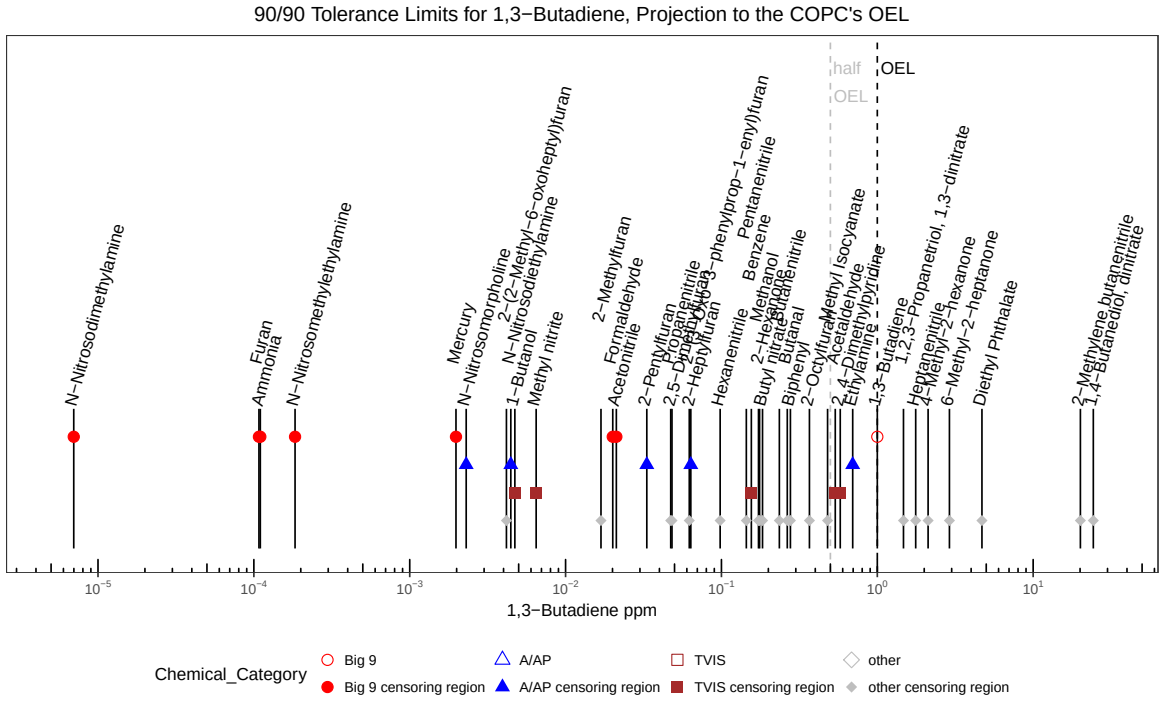


Figure E.21: Tolerance limits for 1,3-Butadiene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

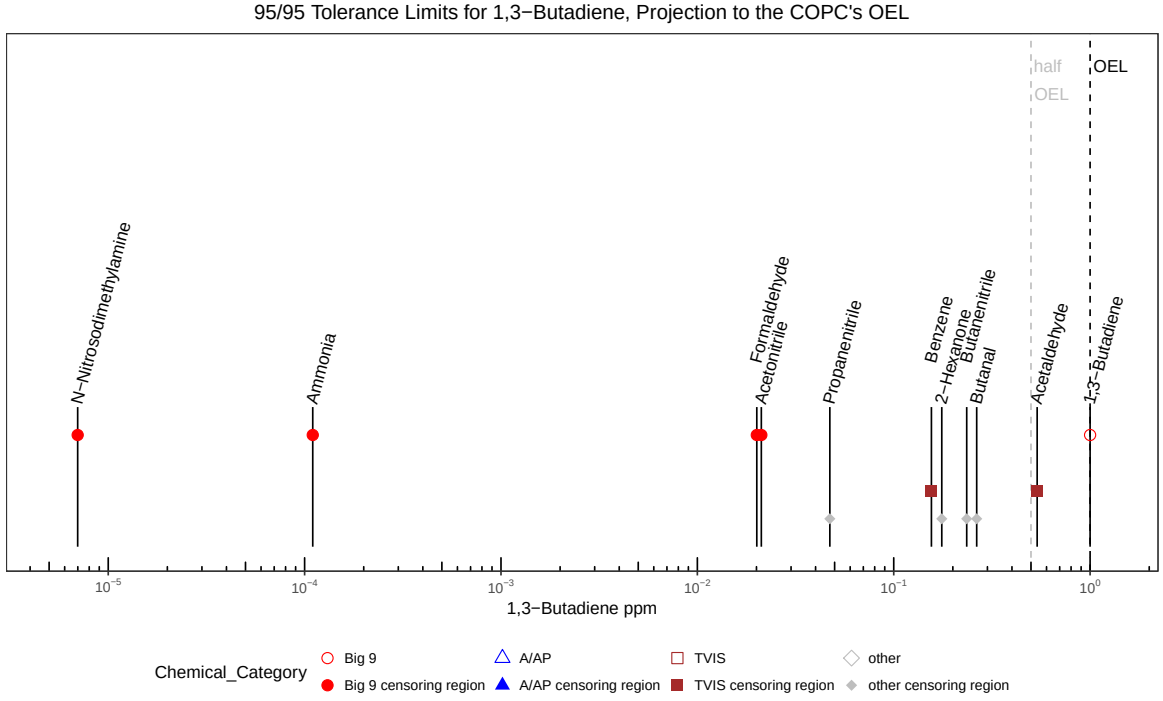


Figure E.22: Tolerance limits for 1,3-Butadiene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

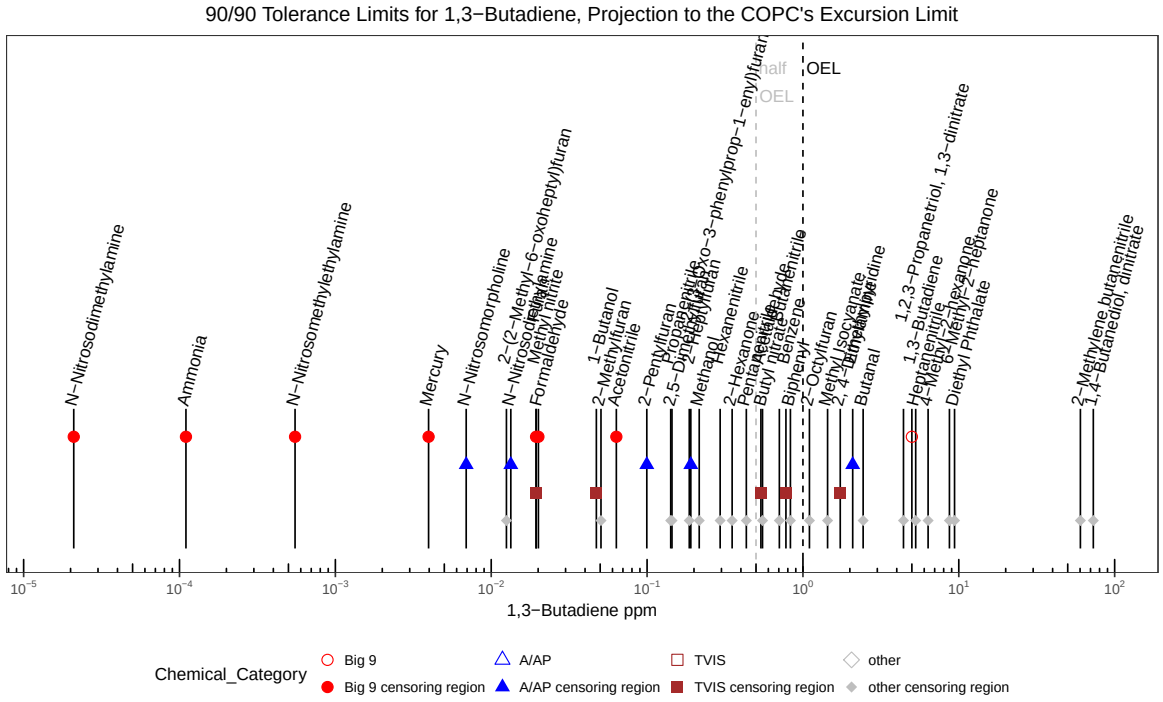


Figure E.23: Tolerance limits for 1,3-Butadiene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

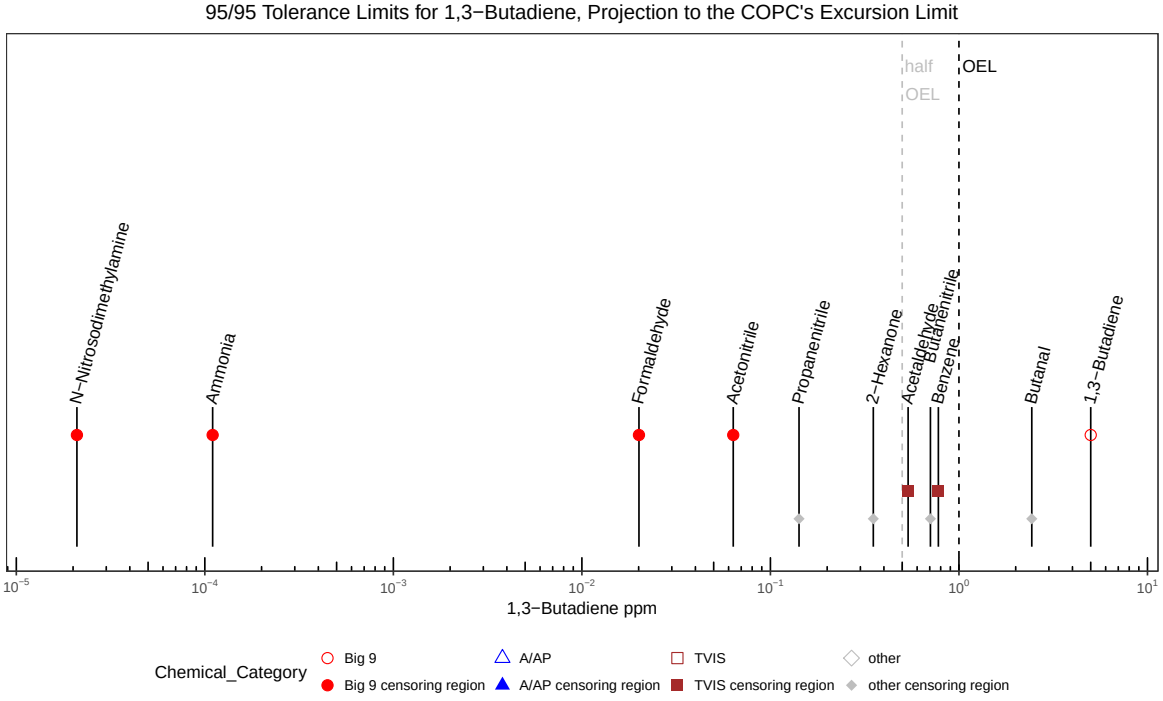


Figure E.24: Tolerance limits for 1,3-Butadiene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

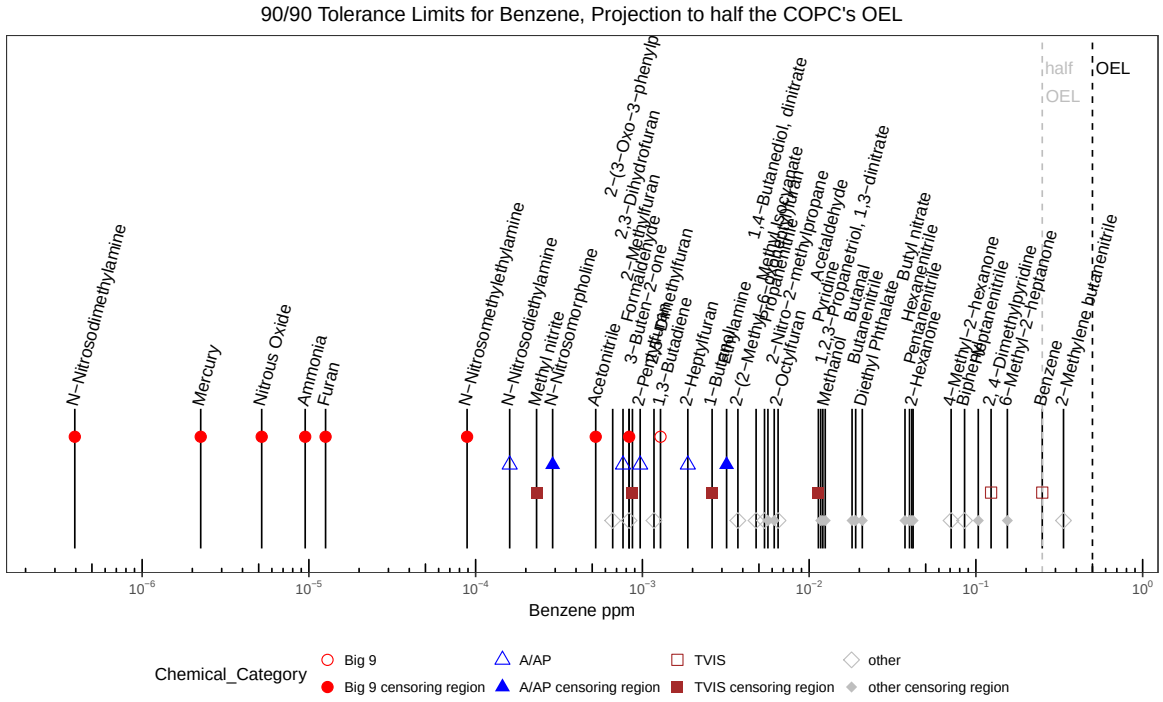


Figure E.25: Tolerance limits for Benzene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

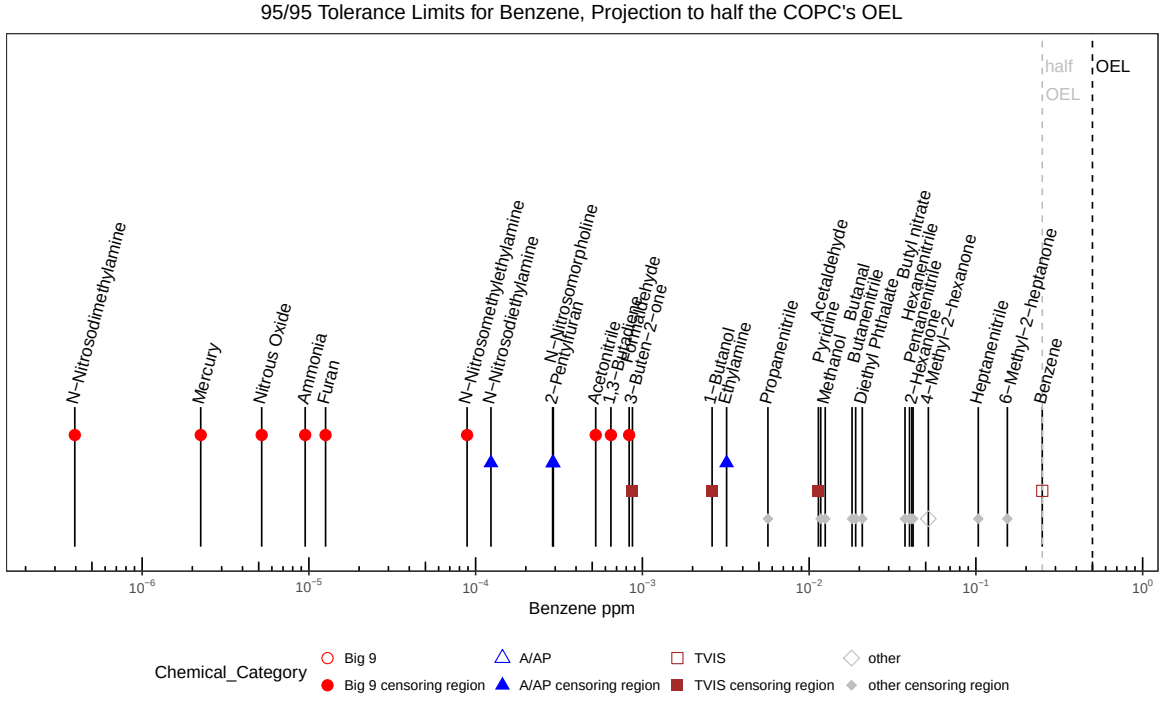


Figure E.26: Tolerance limits for Benzene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

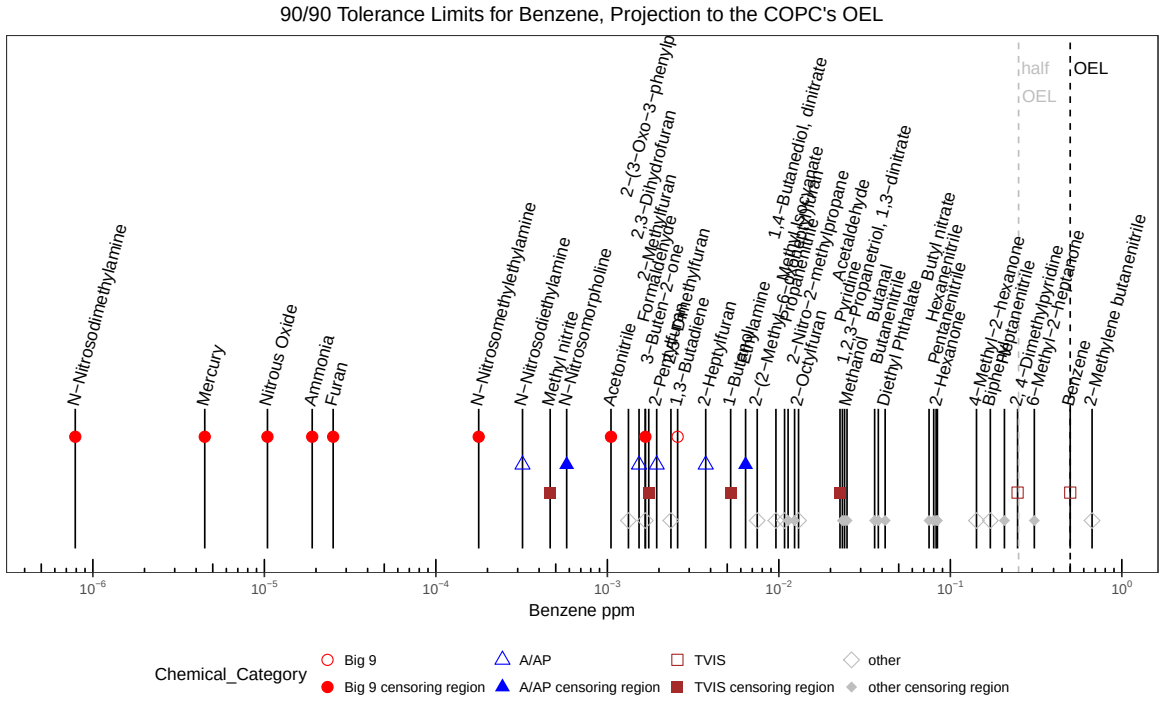


Figure E.27: Tolerance limits for Benzene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

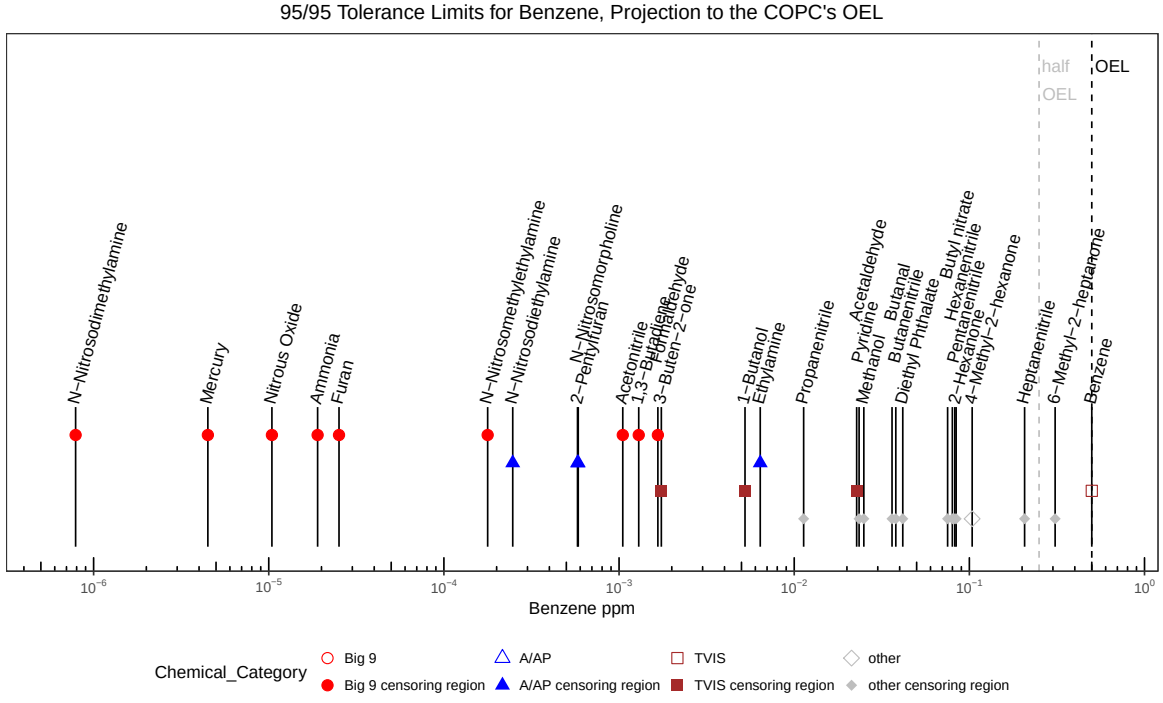


Figure E.28: Tolerance limits for Benzene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

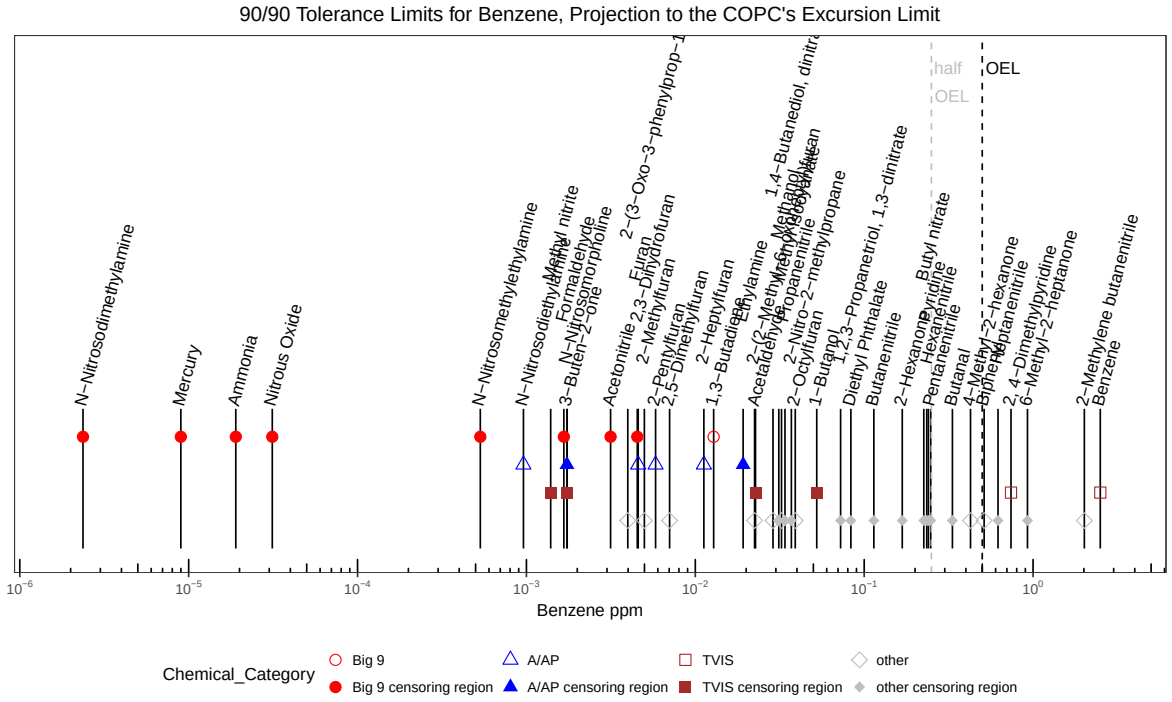


Figure E.29: Tolerance limits for Benzene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

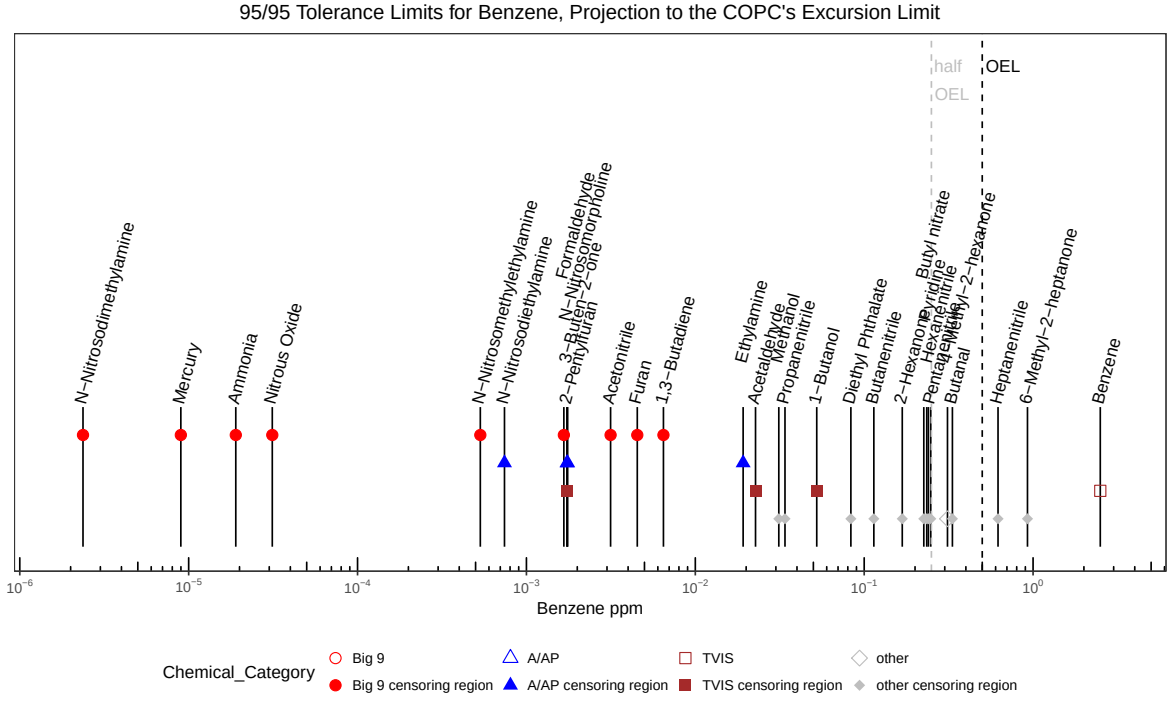


Figure E.30: Tolerance limits for Benzene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

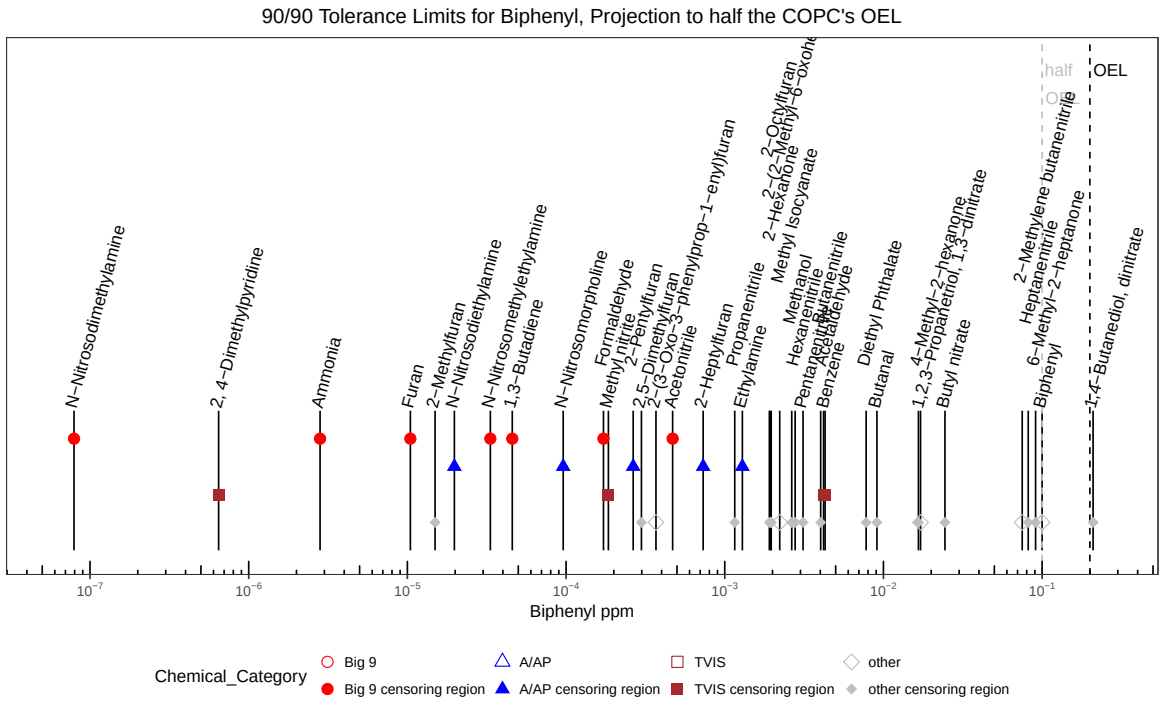


Figure E.31: Tolerance limits for Biphenyl as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

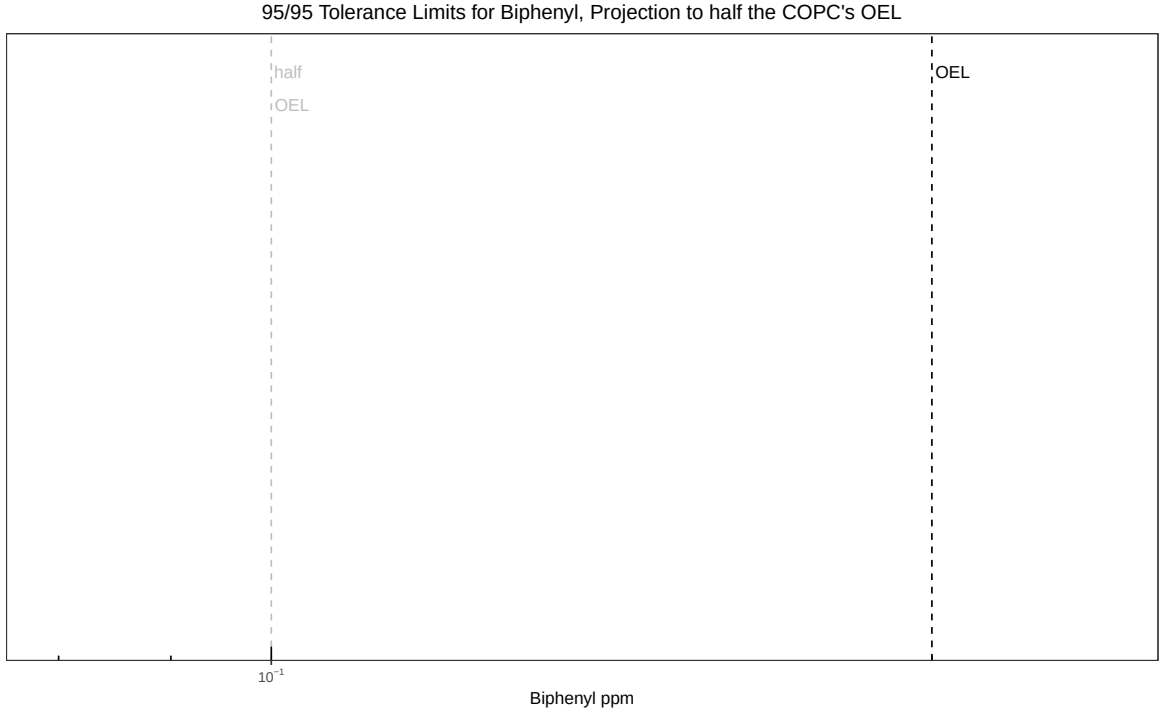


Figure E.32: Tolerance limits for Biphenyl as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

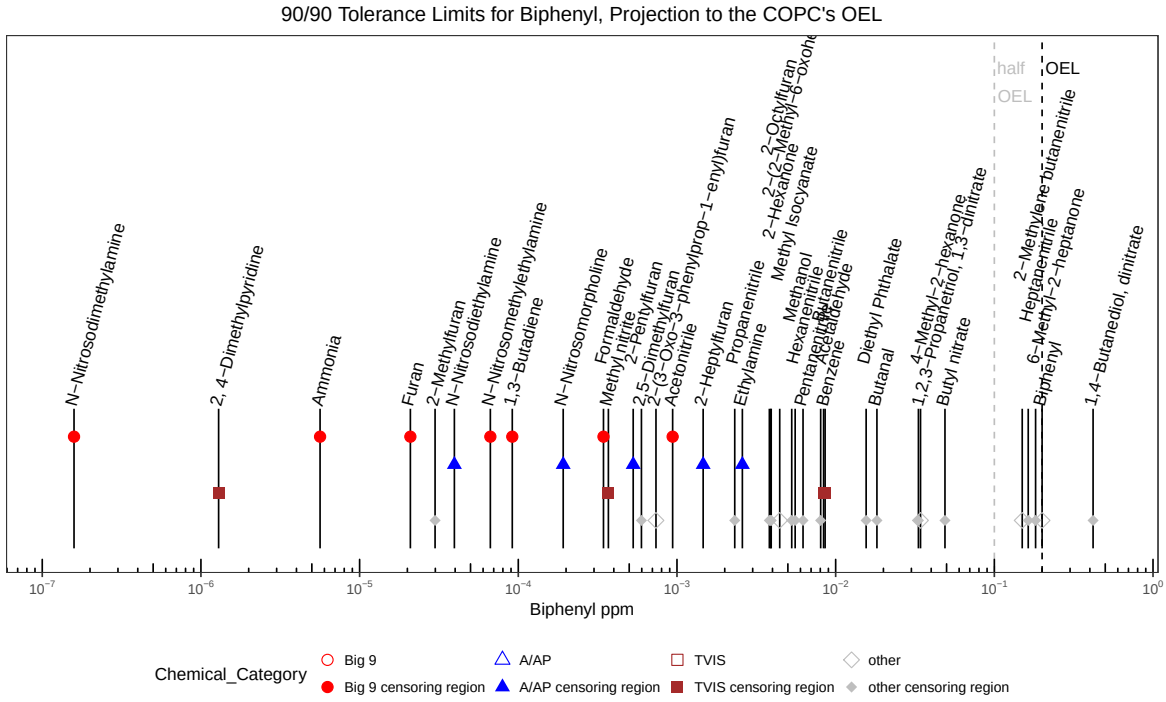


Figure E.33: Tolerance limits for Biphenyl as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

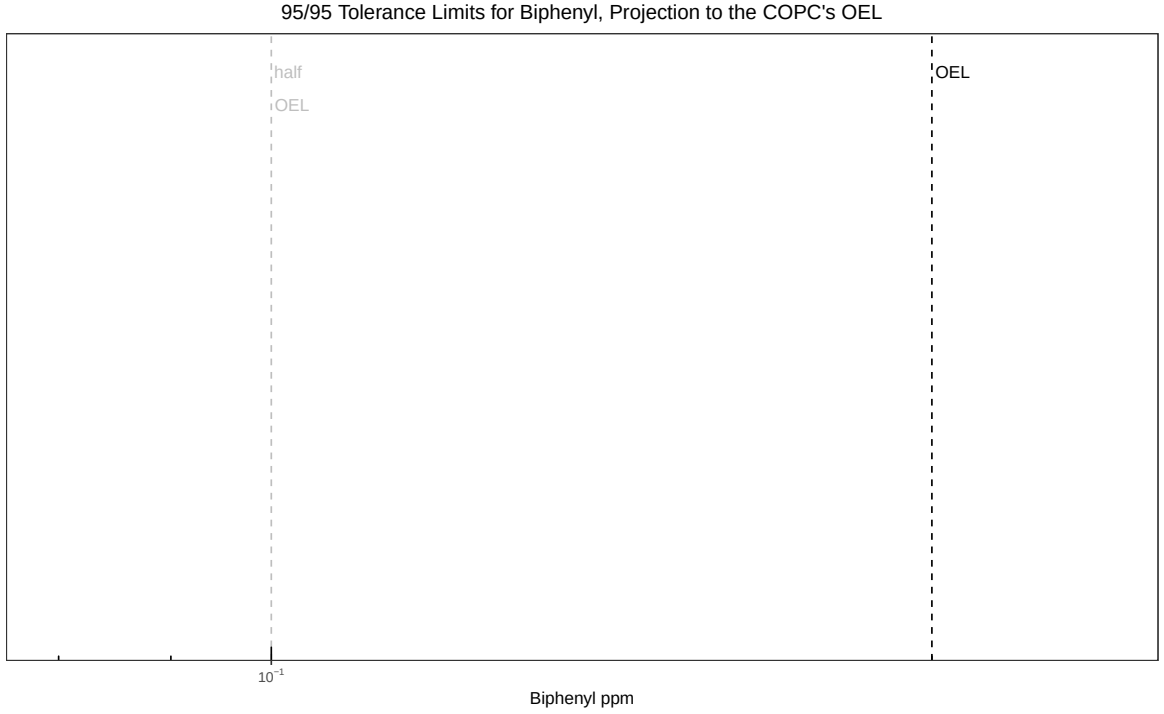


Figure E.34: Tolerance limits for Biphenyl as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

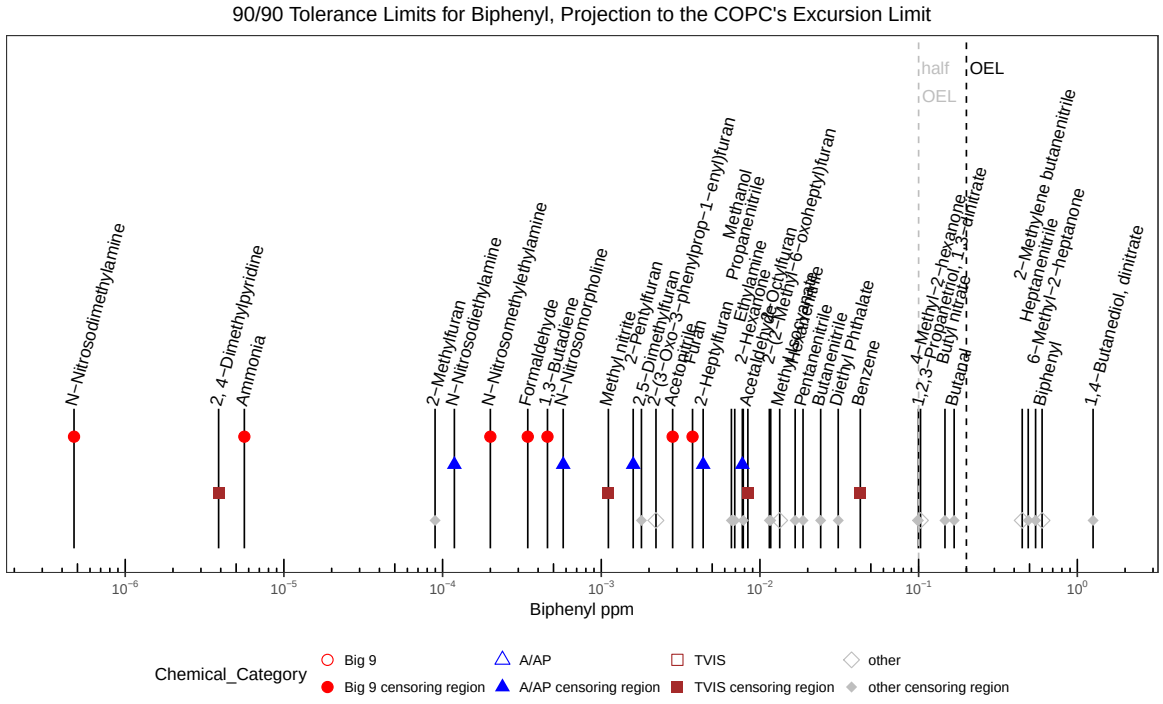


Figure E.35: Tolerance limits for Biphenyl as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

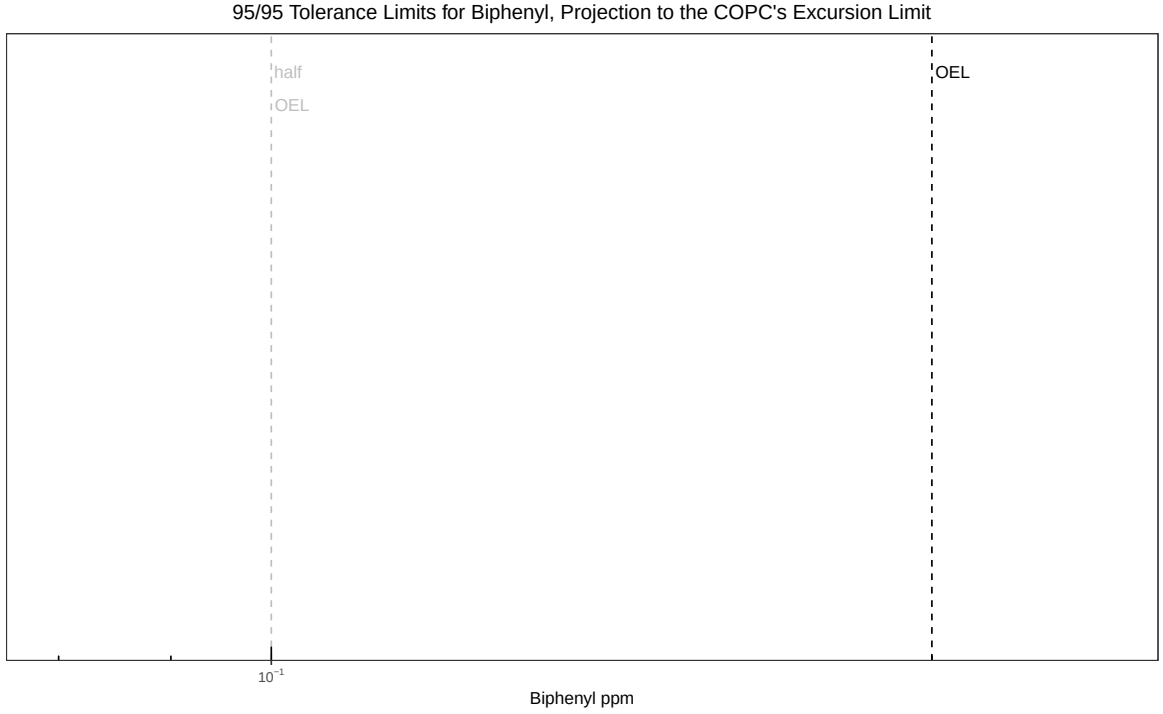


Figure E.36: Tolerance limits for Biphenyl as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

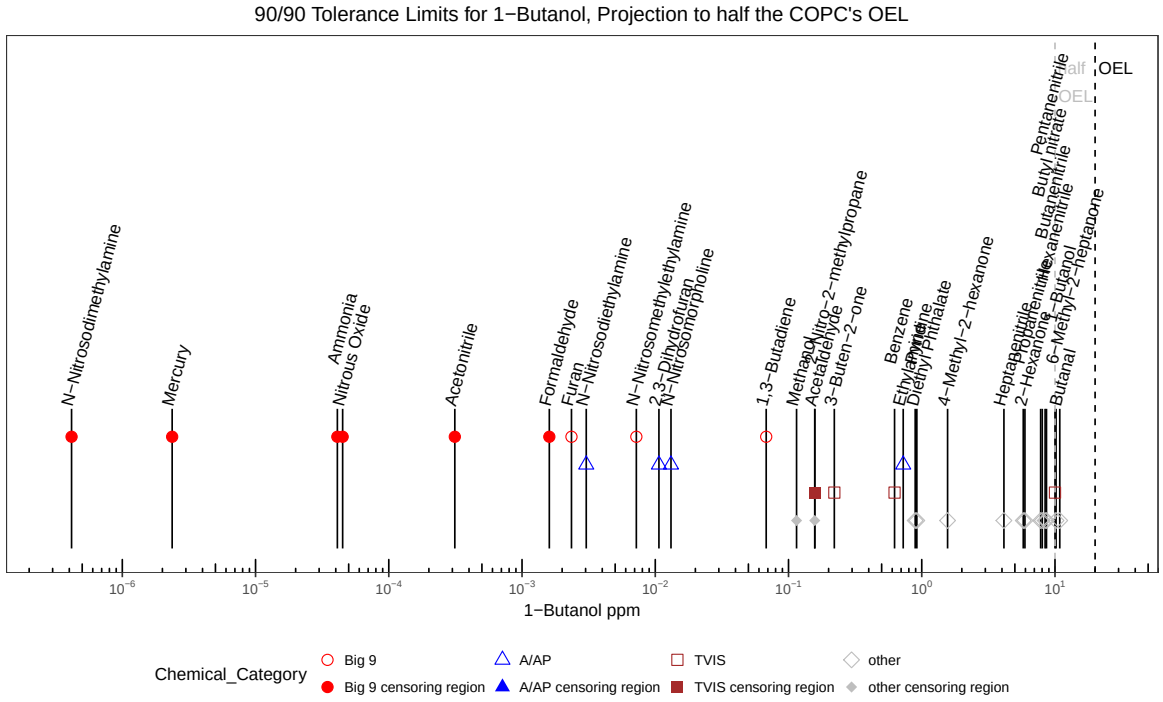


Figure E.37: Tolerance limits for 1-Butanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

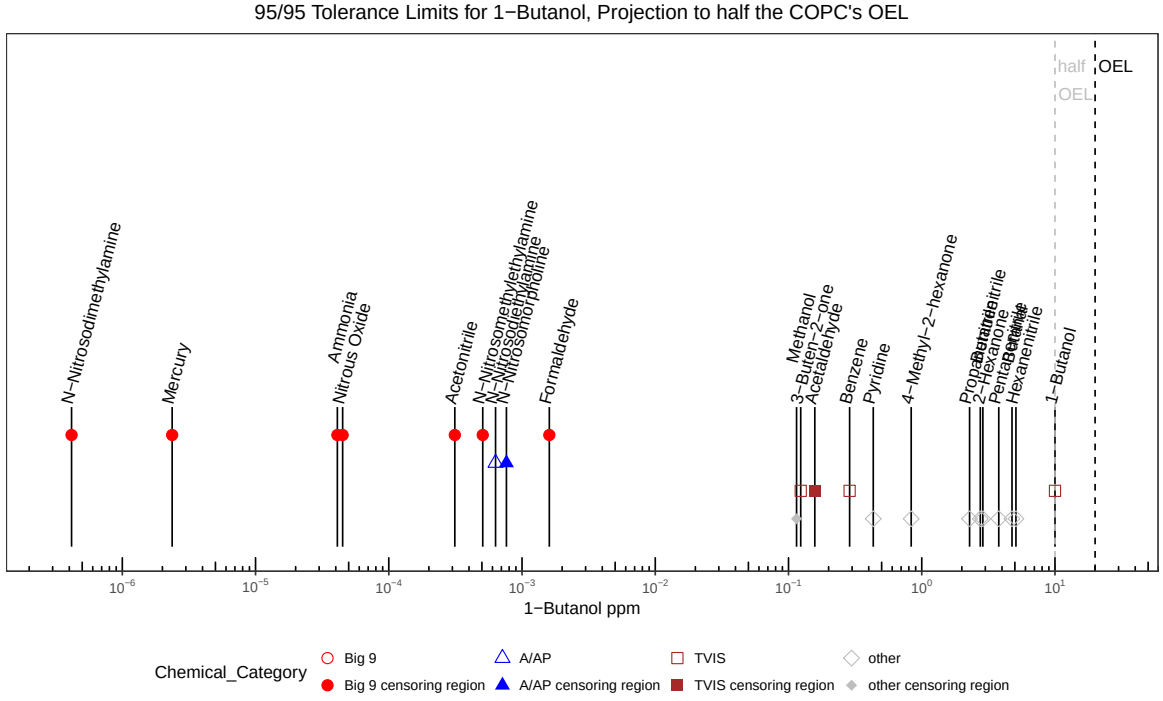


Figure E.38: Tolerance limits for 1-Butanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

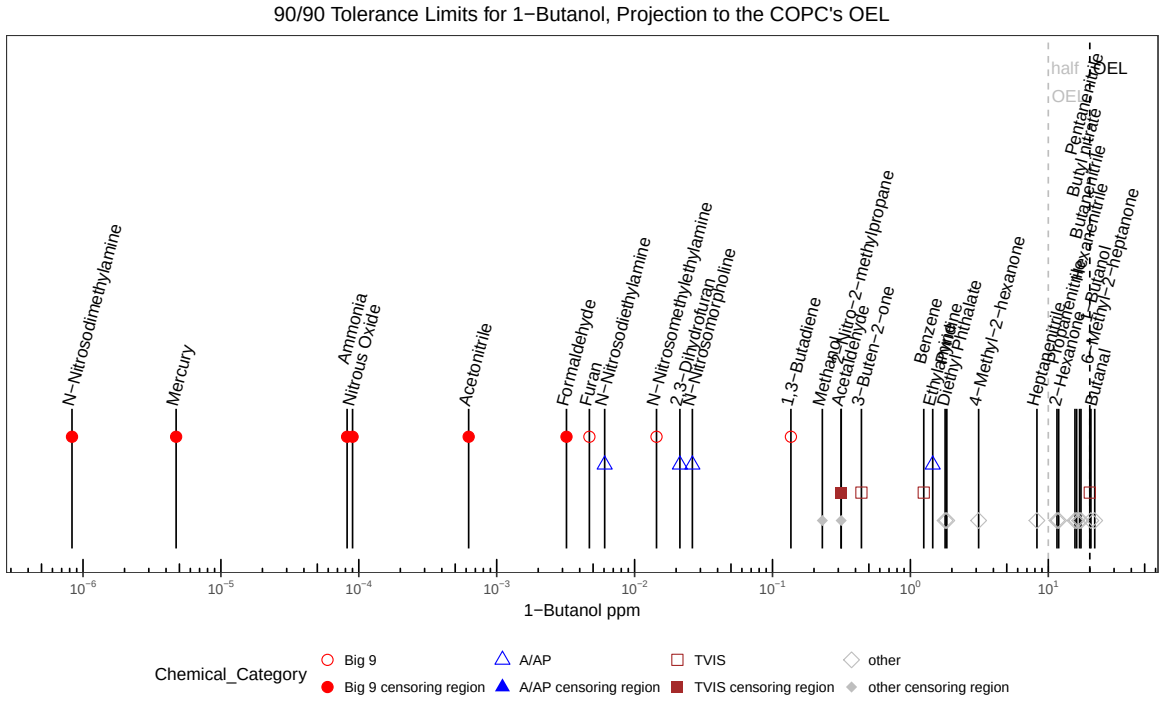


Figure E.39: Tolerance limits for 1-Butanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

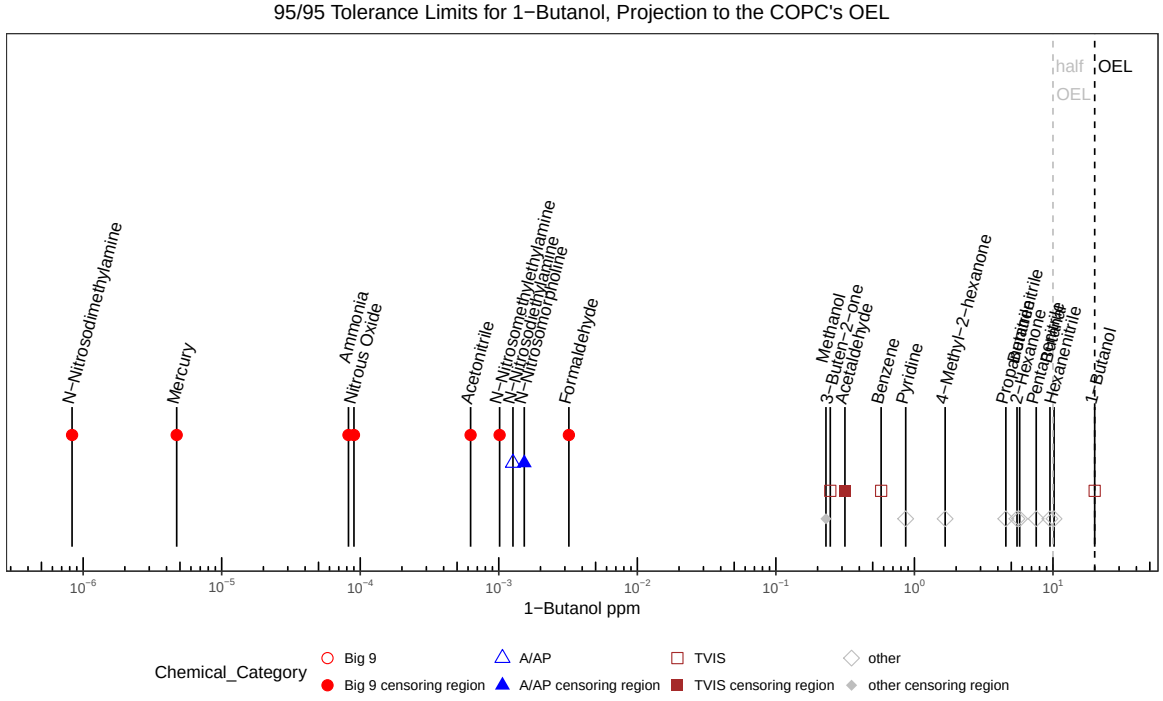


Figure E.40: Tolerance limits for 1-Butanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

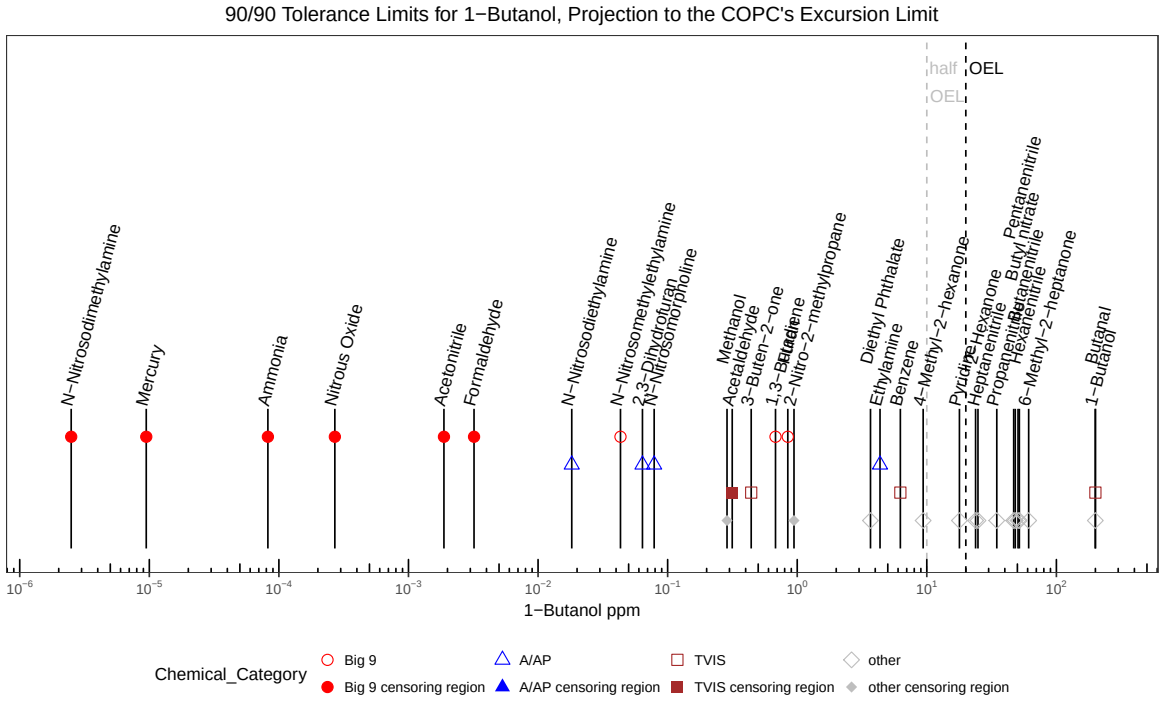


Figure E.41: Tolerance limits for 1-Butanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

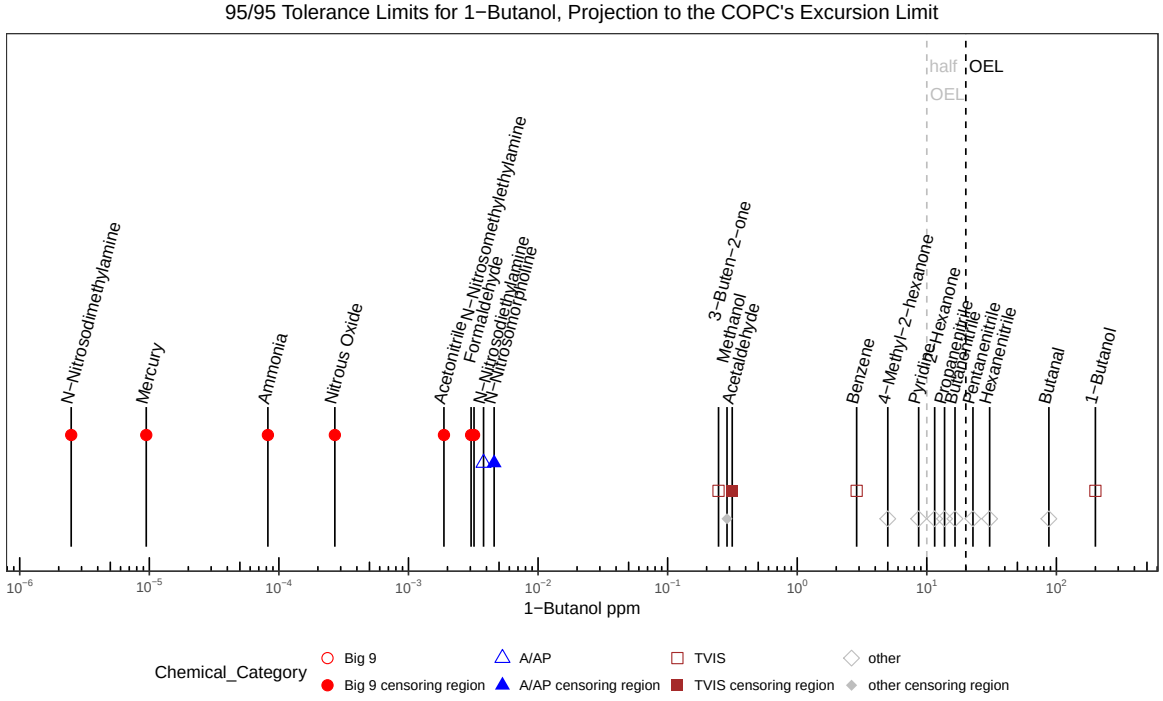


Figure E.42: Tolerance limits for 1-Butanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

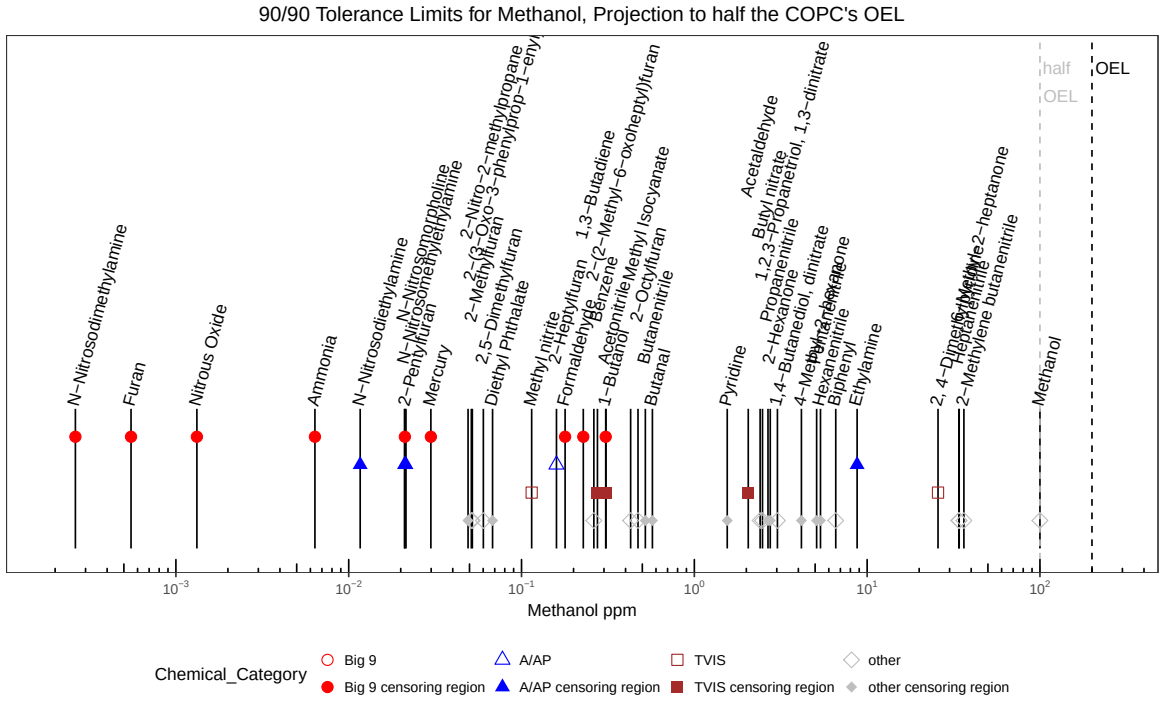


Figure E.43: Tolerance limits for Methanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

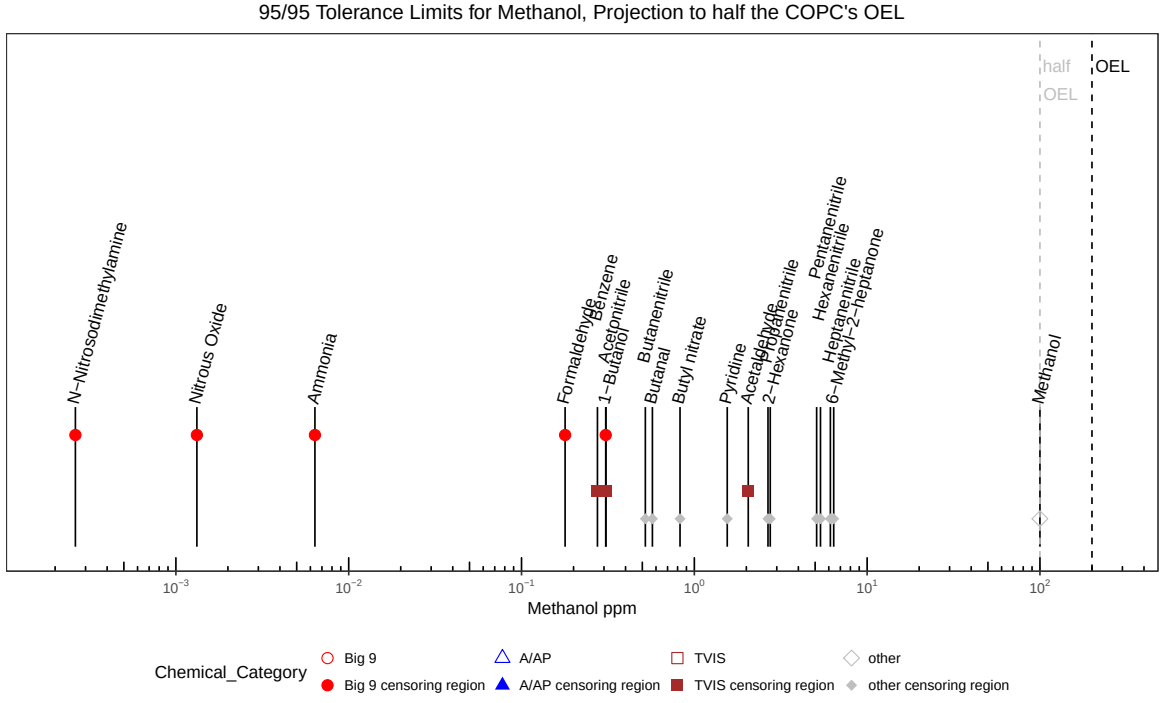


Figure E.44: Tolerance limits for Methanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

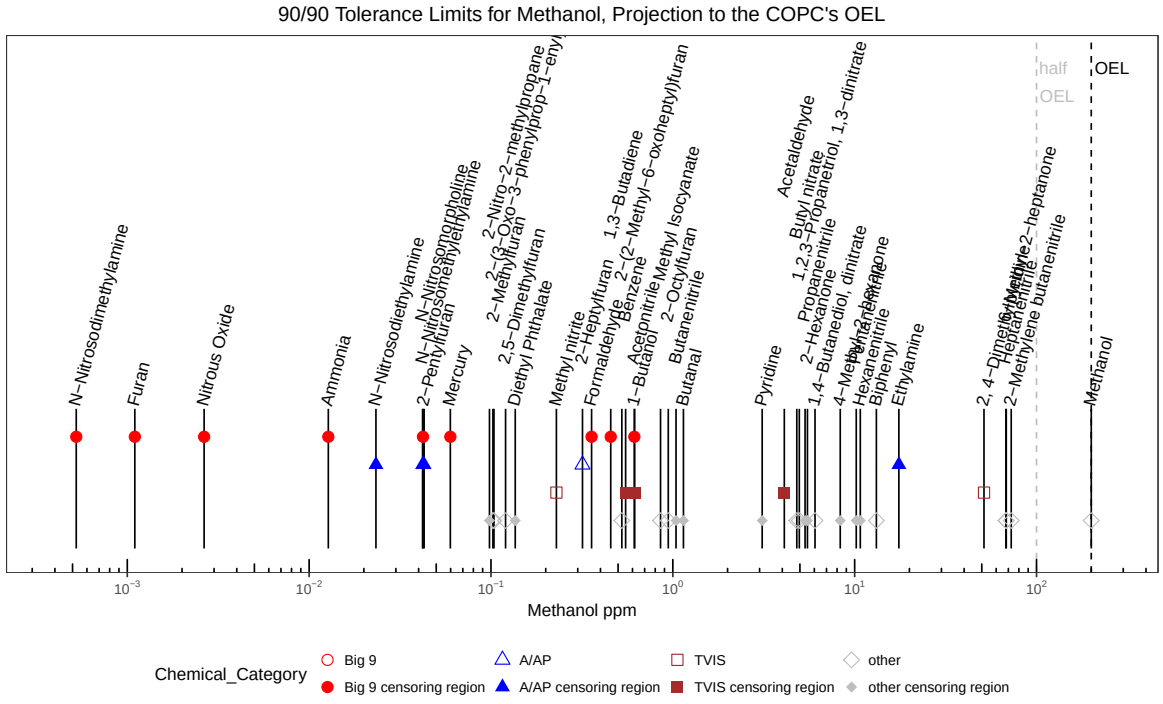


Figure E.45: Tolerance limits for Methanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

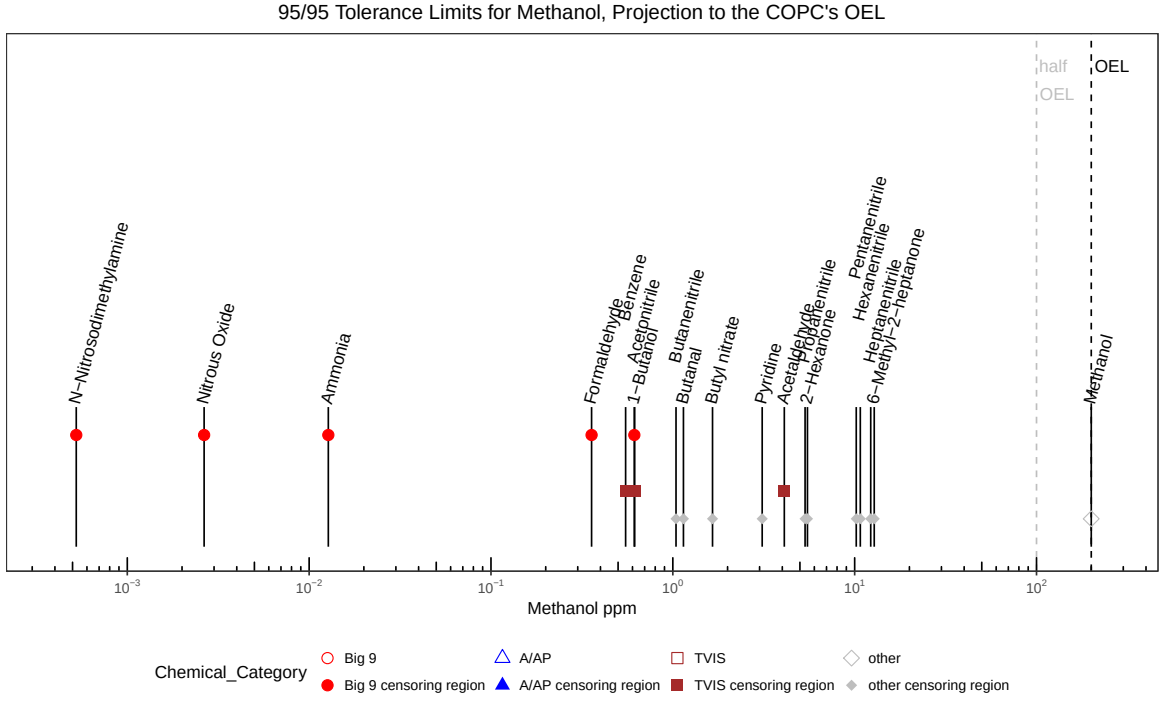


Figure E.46: Tolerance limits for Methanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

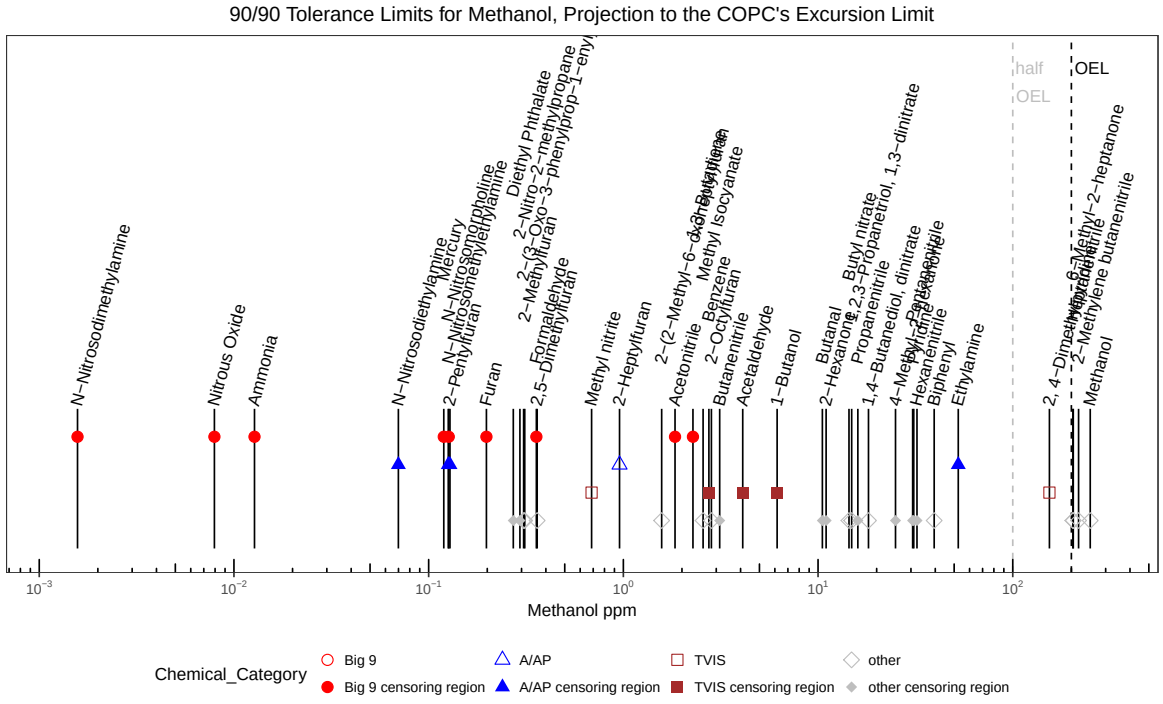


Figure E.47: Tolerance limits for Methanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

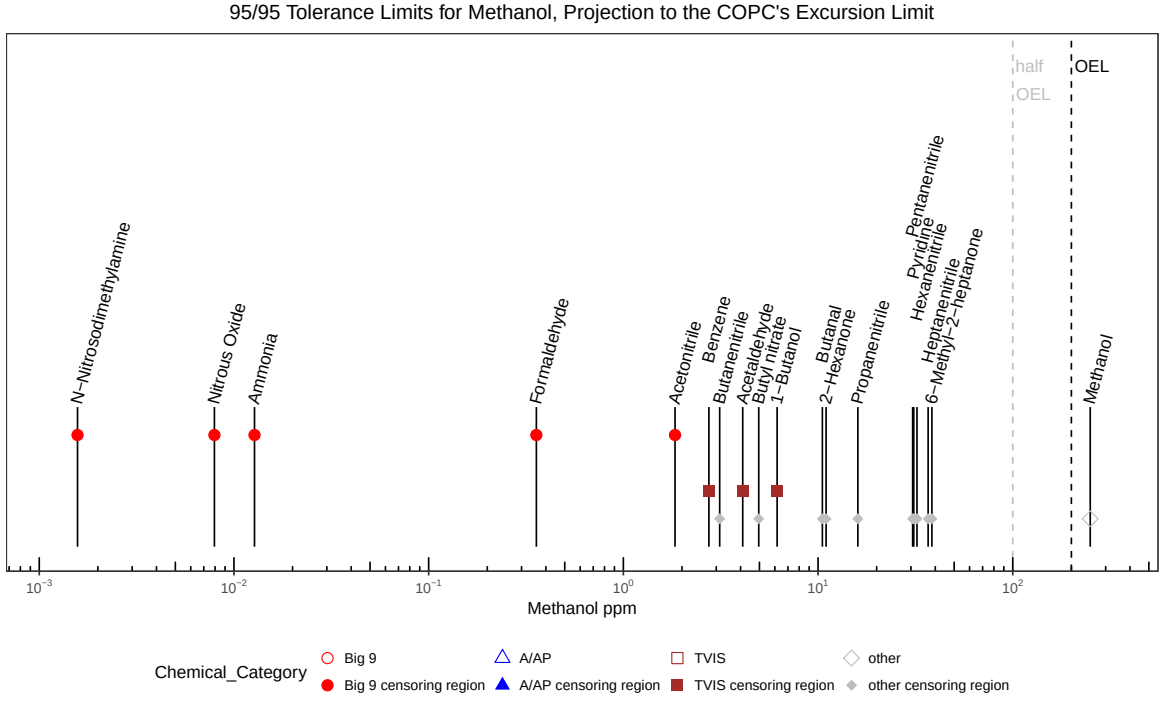


Figure E.48: Tolerance limits for Methanol as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

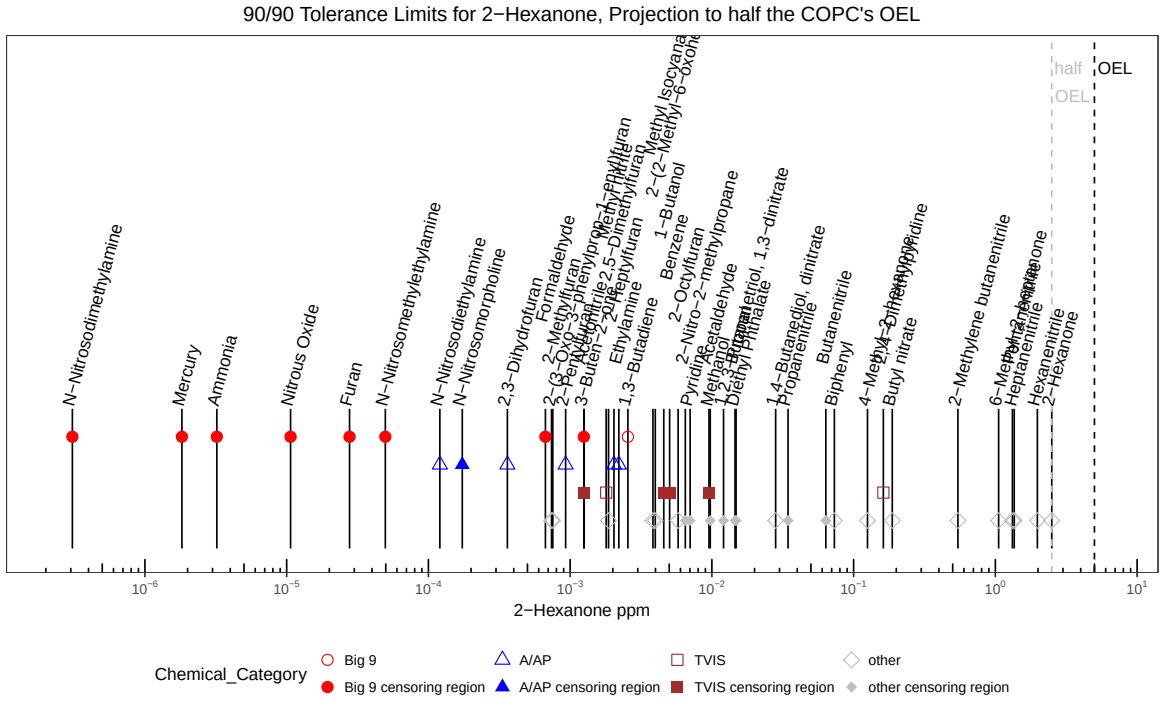


Figure E.49: Tolerance limits for 2-Hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

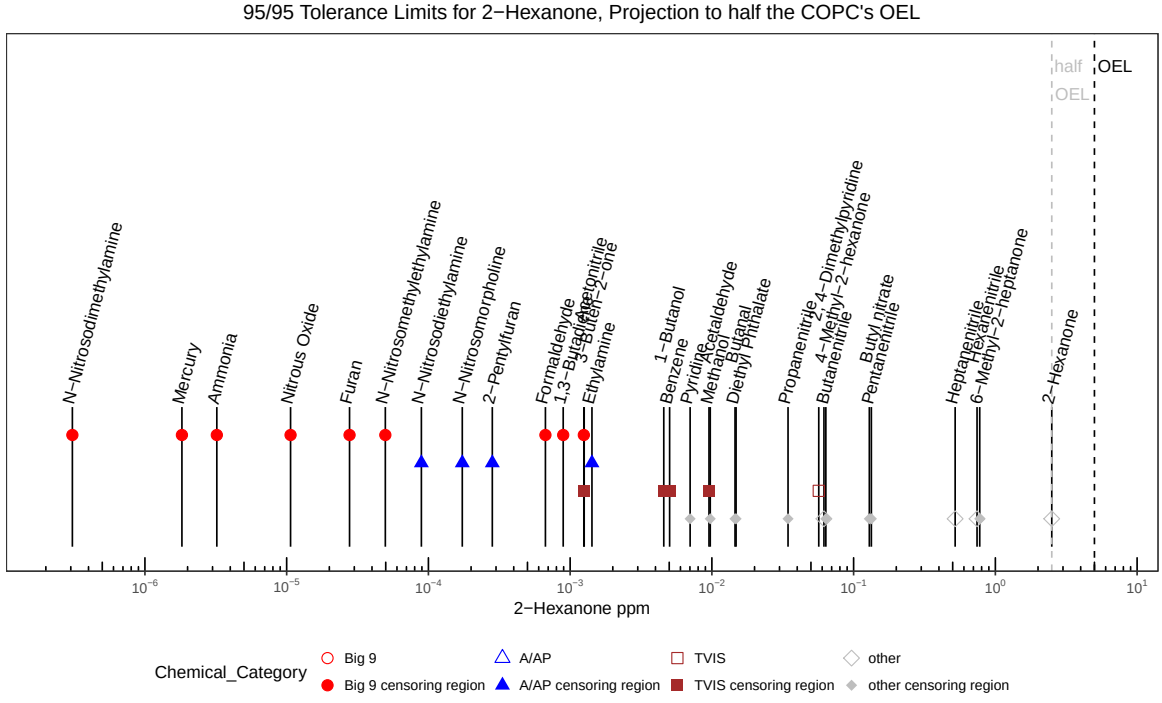


Figure E.50: Tolerance limits for 2-Hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

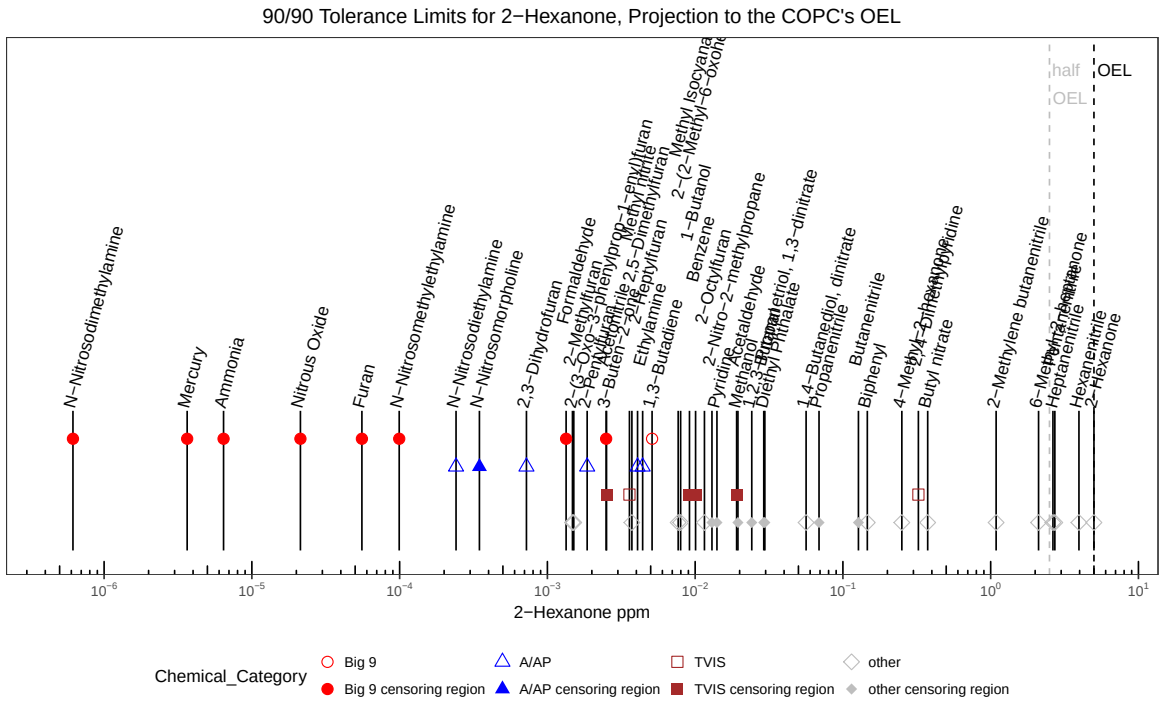


Figure E.51: Tolerance limits for 2-Hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

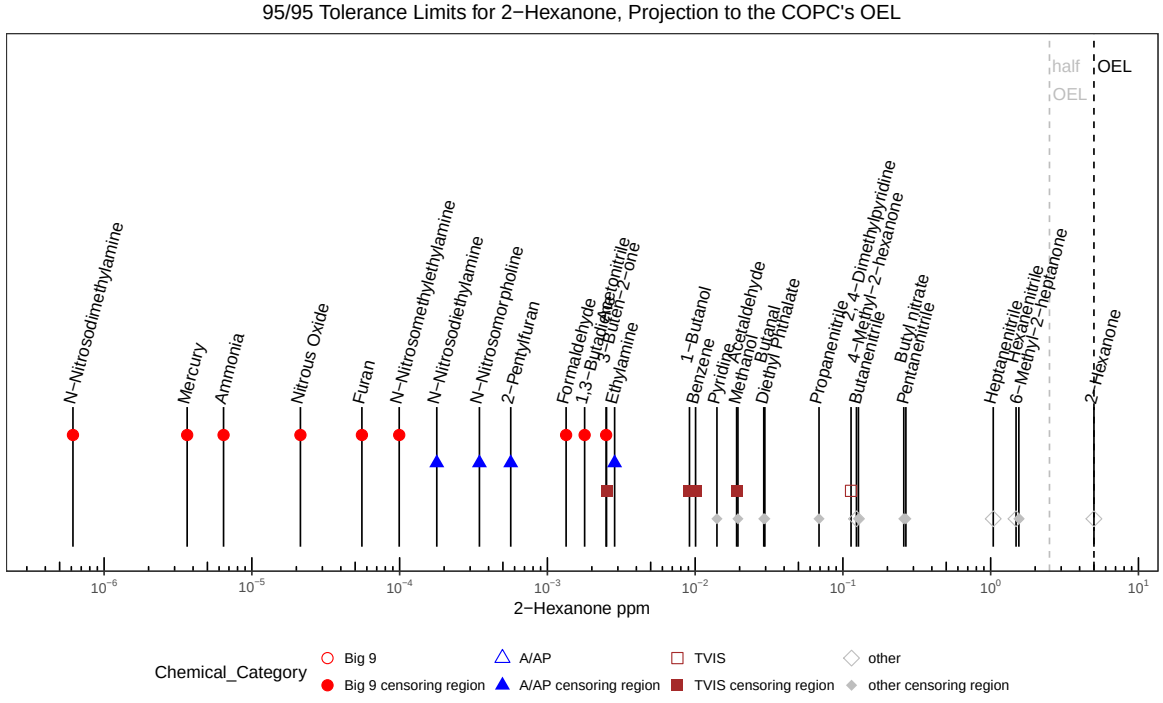


Figure E.52: Tolerance limits for 2-Hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

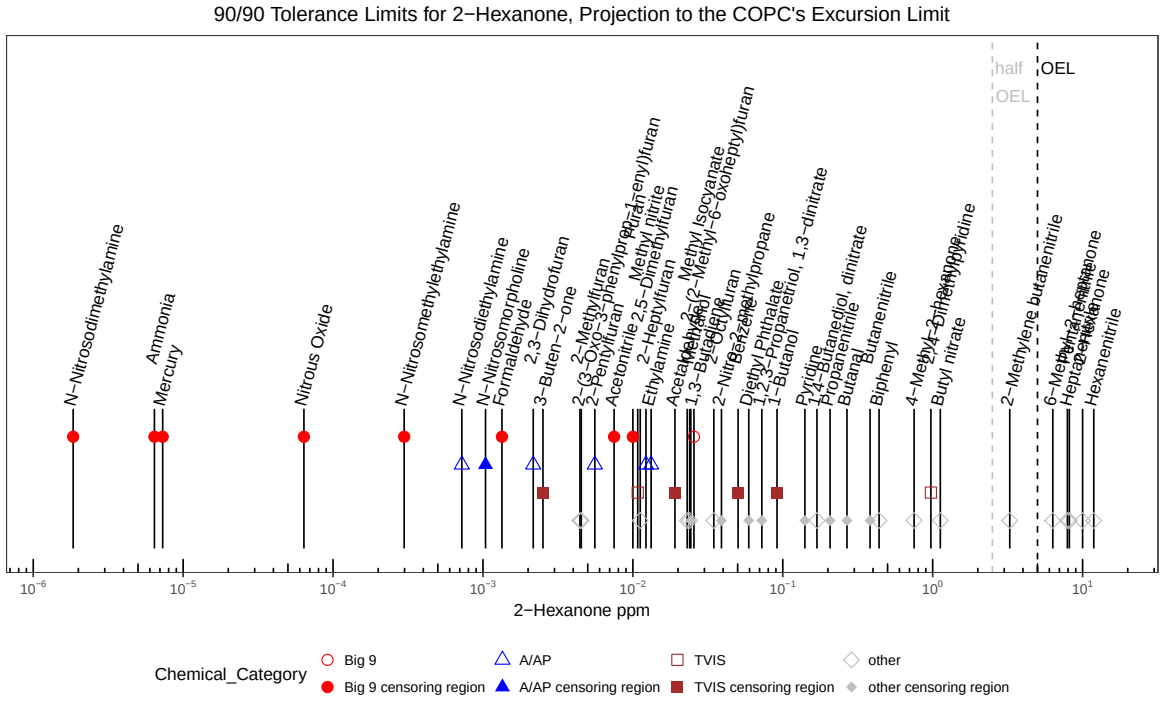


Figure E.53: Tolerance limits for 2-Hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

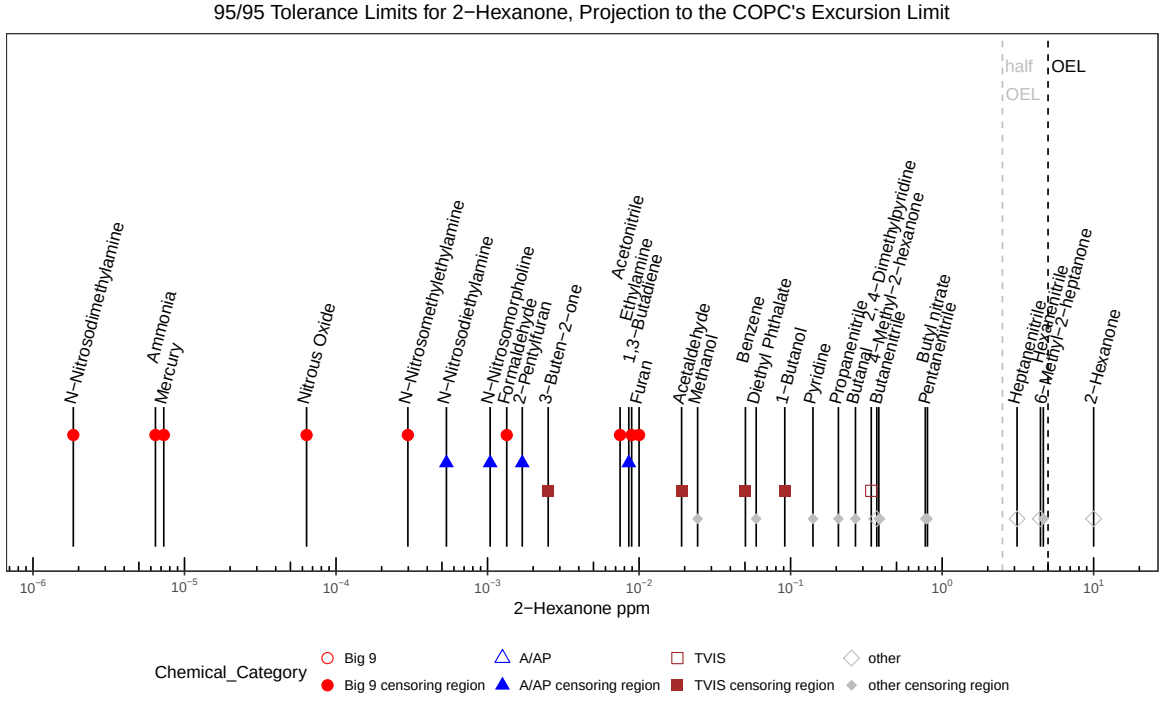


Figure E.54: Tolerance limits for 2-Hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

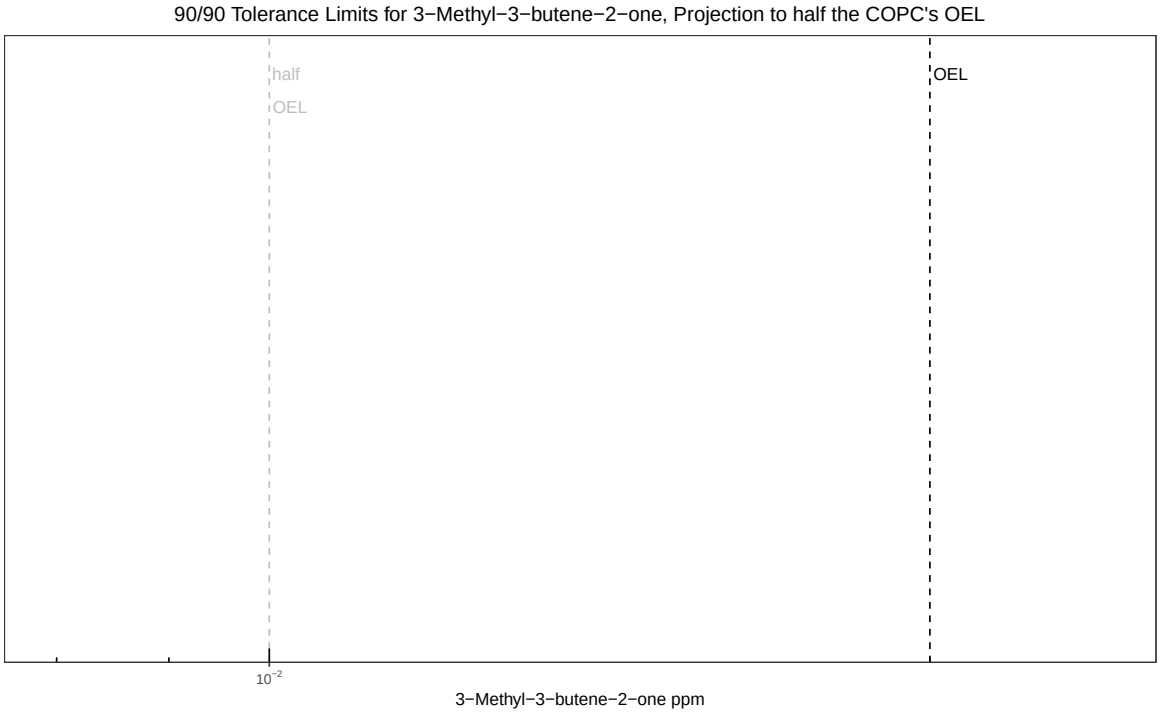


Figure E.55: Tolerance limits for 3-Methyl-3-butene-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

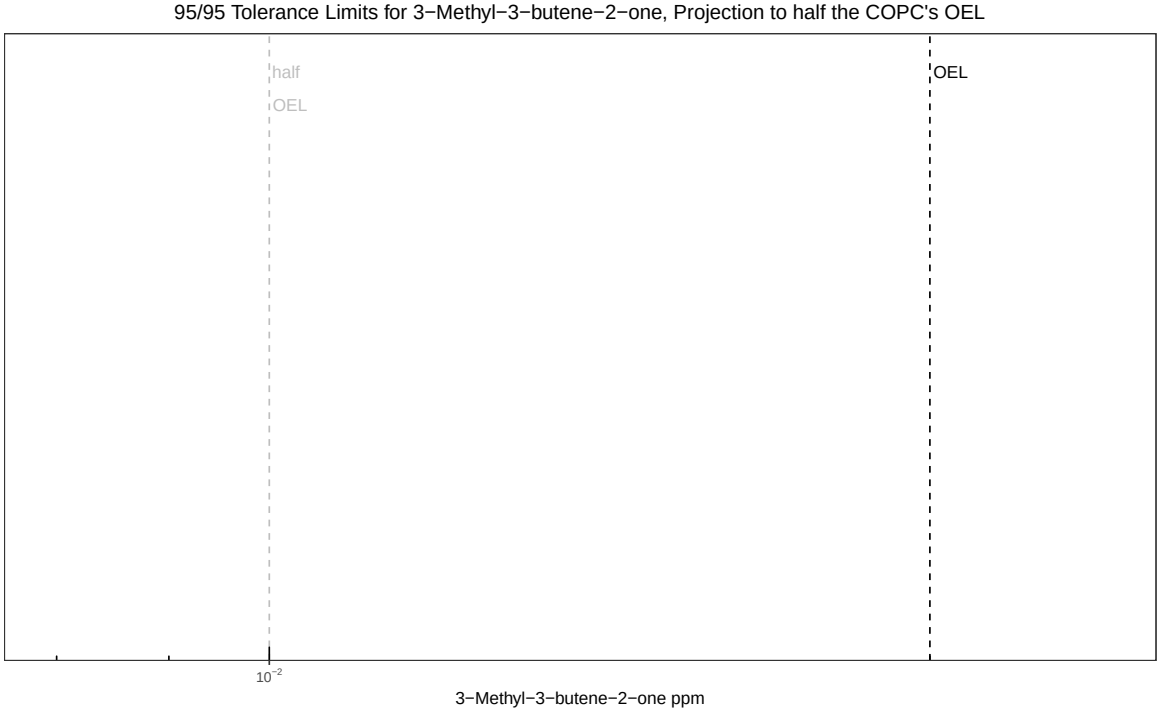


Figure E.56: Tolerance limits for 3-Methyl-3-butene-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

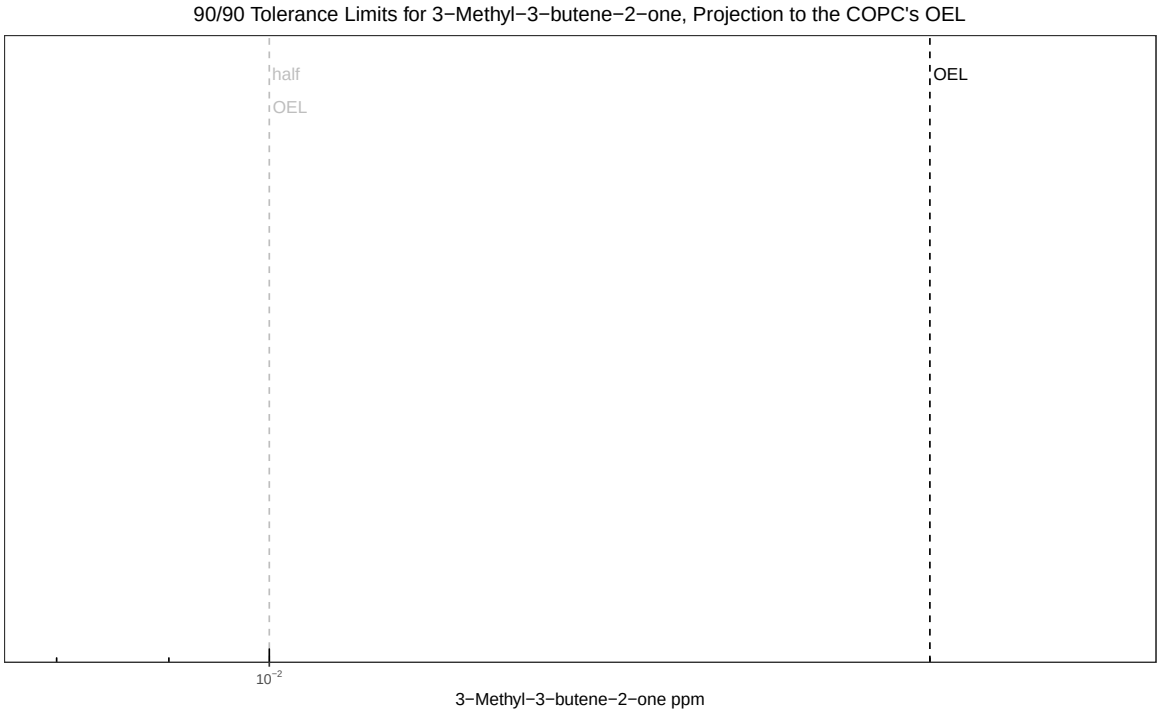


Figure E.57: Tolerance limits for 3-Methyl-3-butene-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

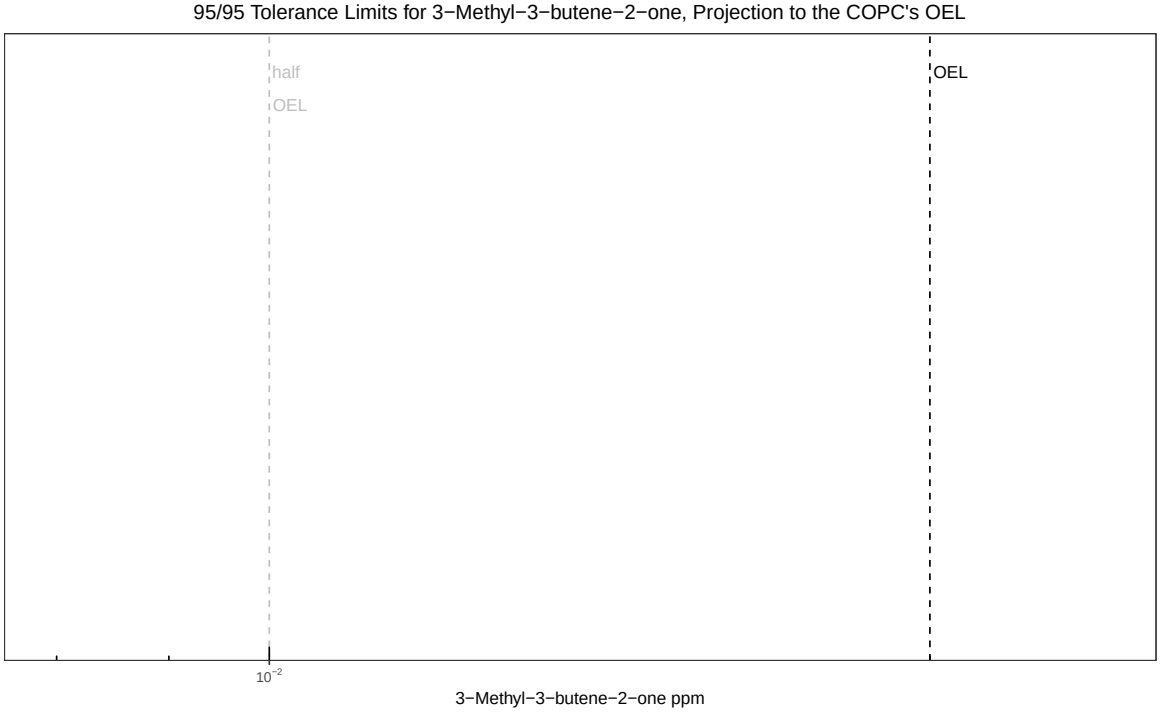


Figure E.58: Tolerance limits for 3-Methyl-3-butene-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

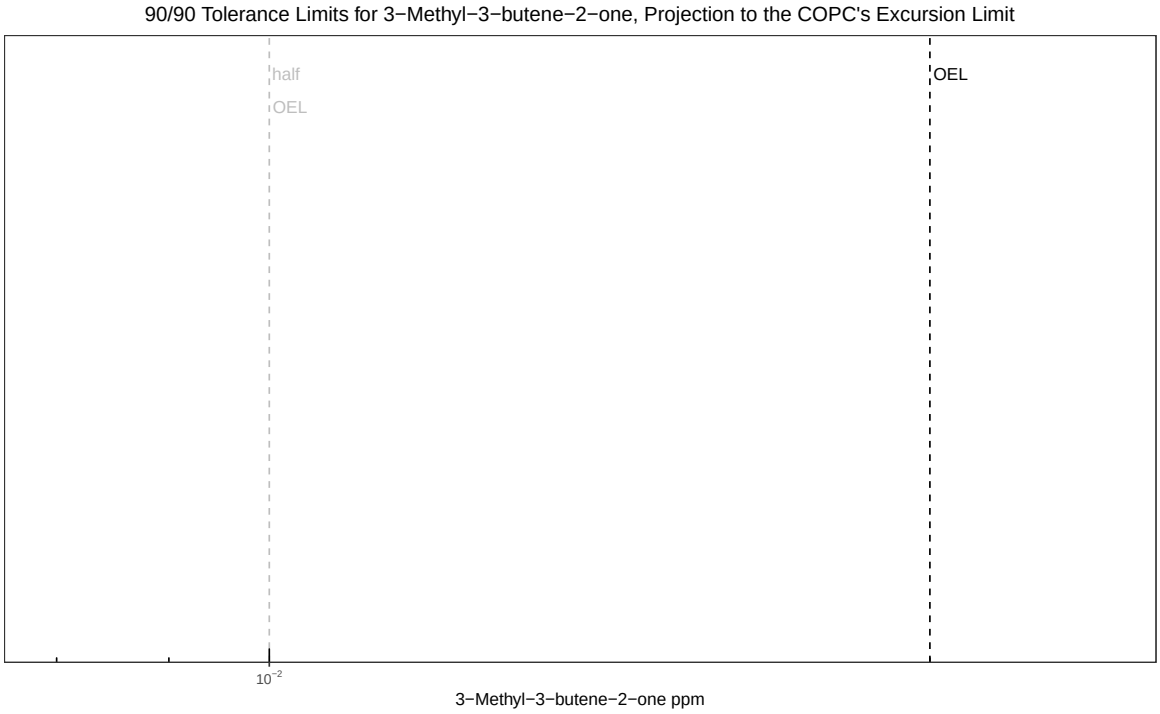


Figure E.59: Tolerance limits for 3-Methyl-3-butene-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

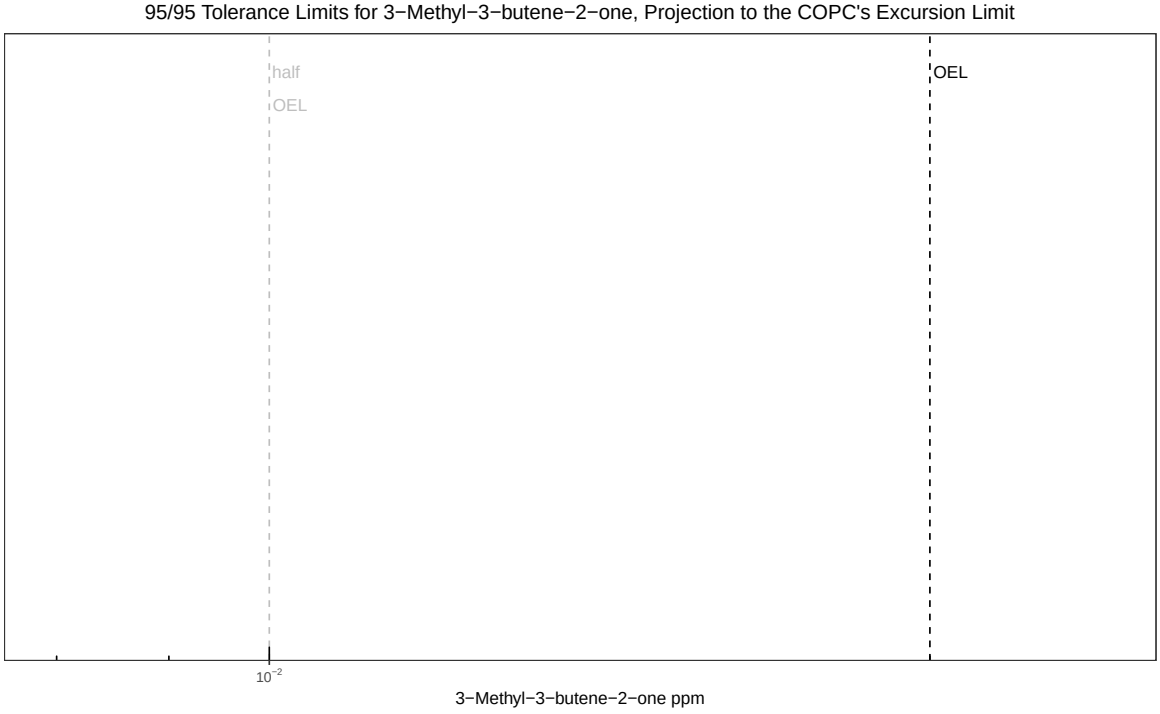


Figure E.60: Tolerance limits for 3-Methyl-3-butene-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

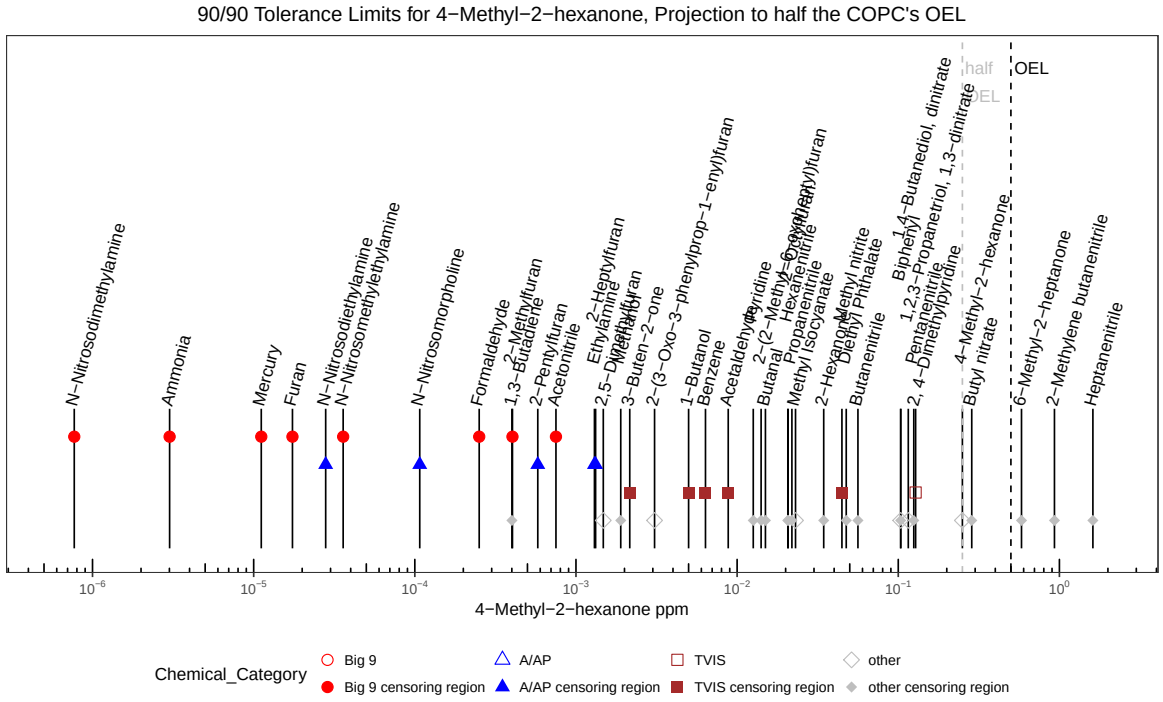


Figure E.61: Tolerance limits for 4-Methyl-2-hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

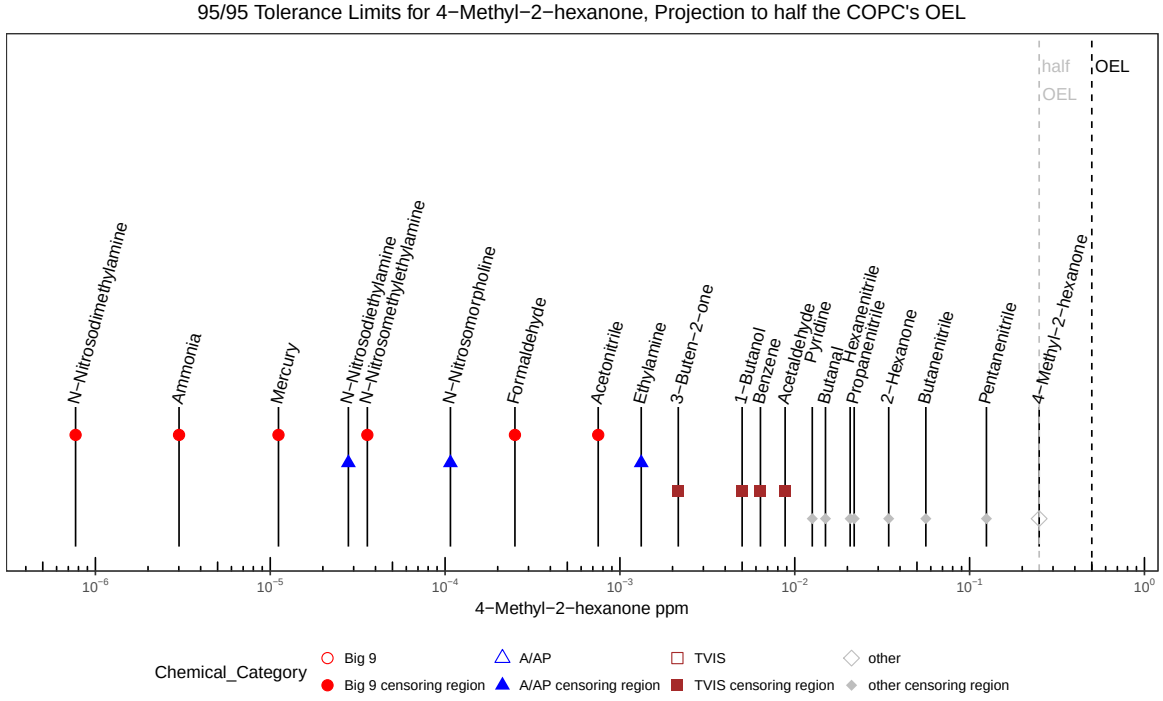


Figure E.62: Tolerance limits for 4-Methyl-2-hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

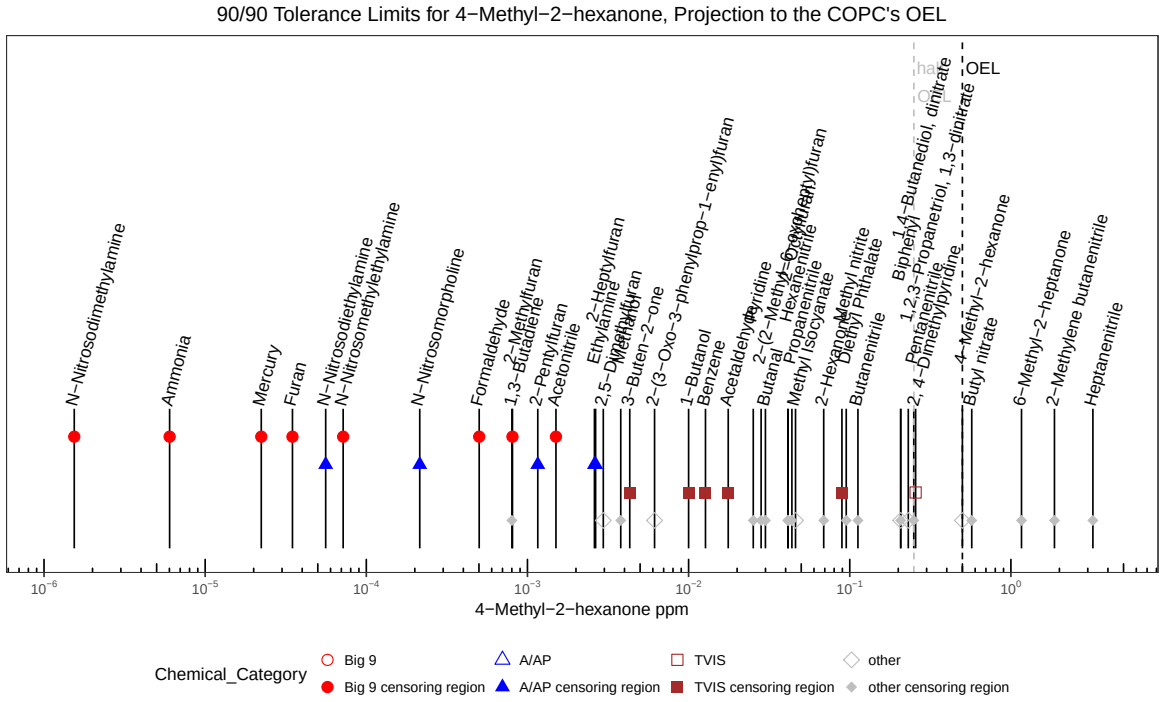


Figure E.63: Tolerance limits for 4-Methyl-2-hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

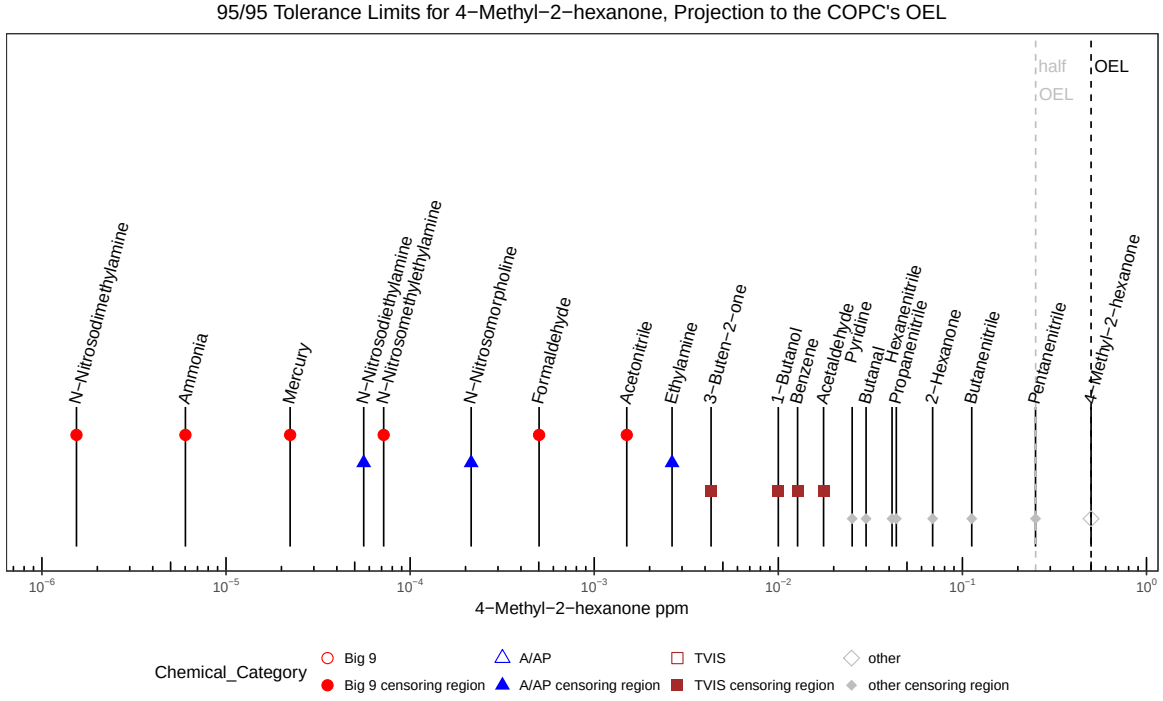


Figure E.64: Tolerance limits for 4-Methyl-2-hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

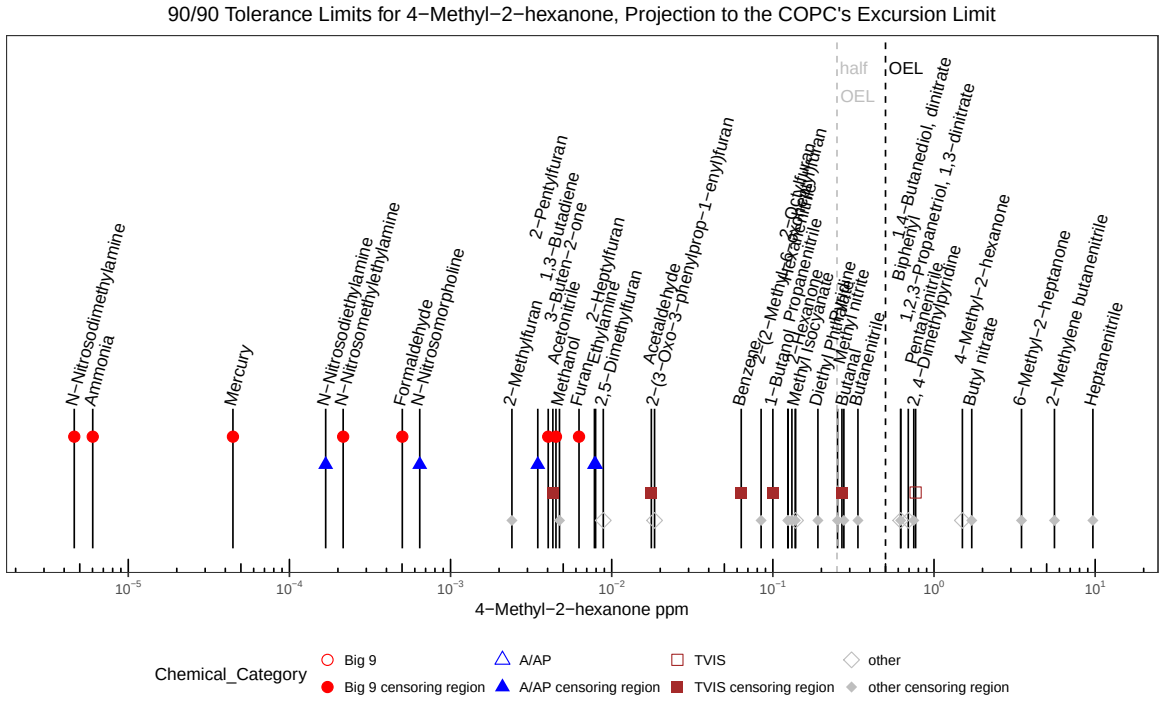


Figure E.65: Tolerance limits for 4-Methyl-2-hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

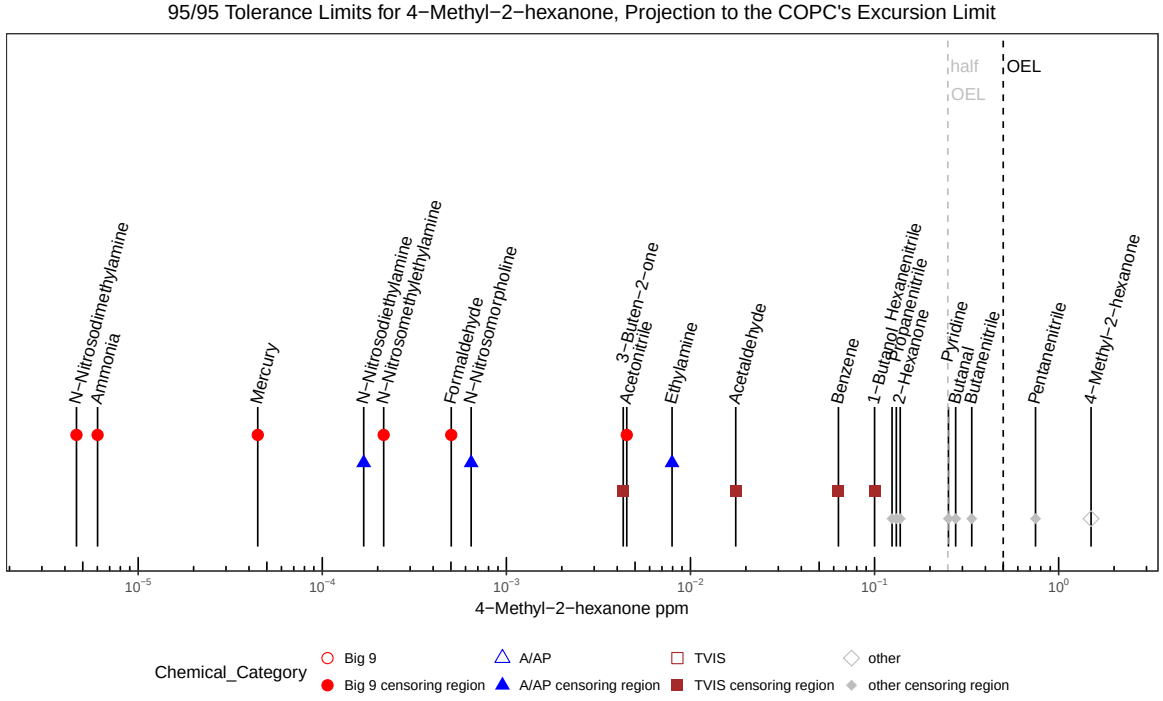


Figure E.66: Tolerance limits for 4-Methyl-2-hexanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

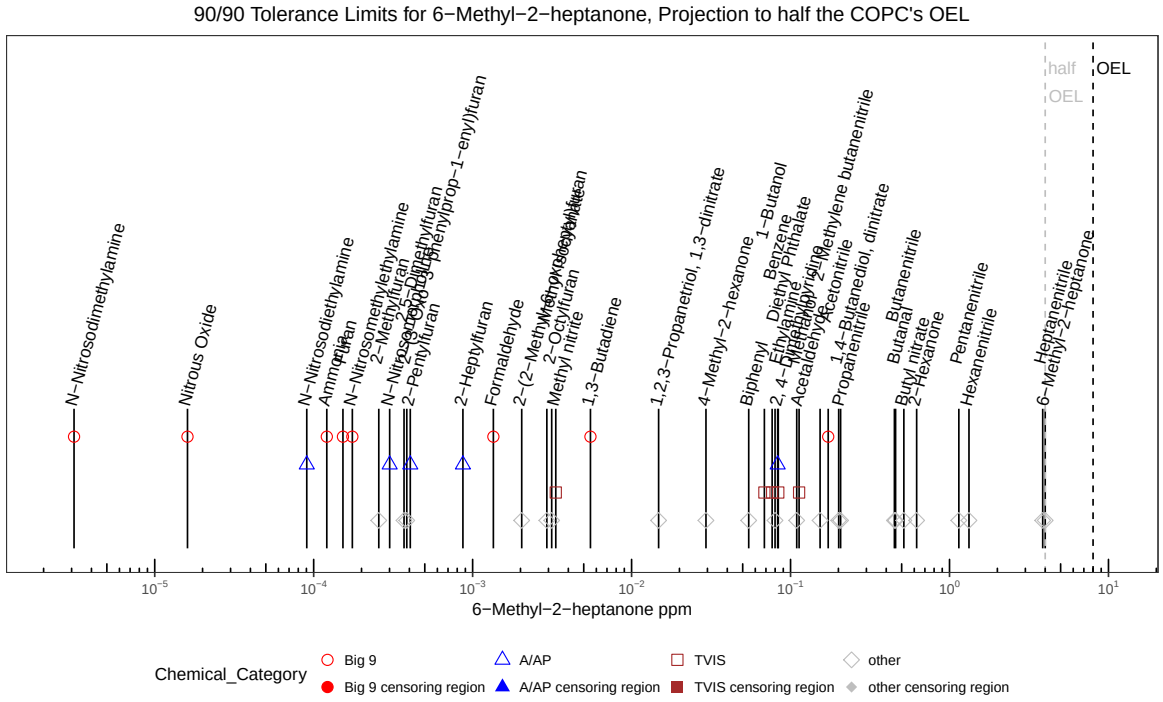


Figure E.67: Tolerance limits for 6-Methyl-2-heptanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

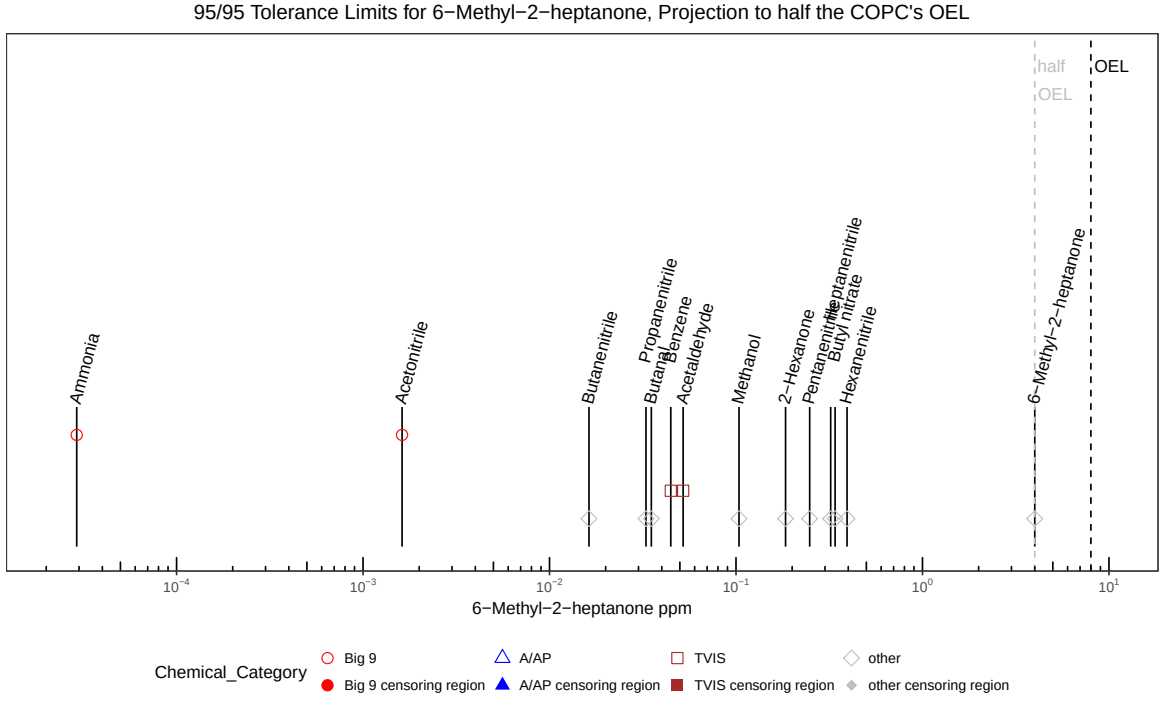


Figure E.68: Tolerance limits for 6-Methyl-2-heptanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

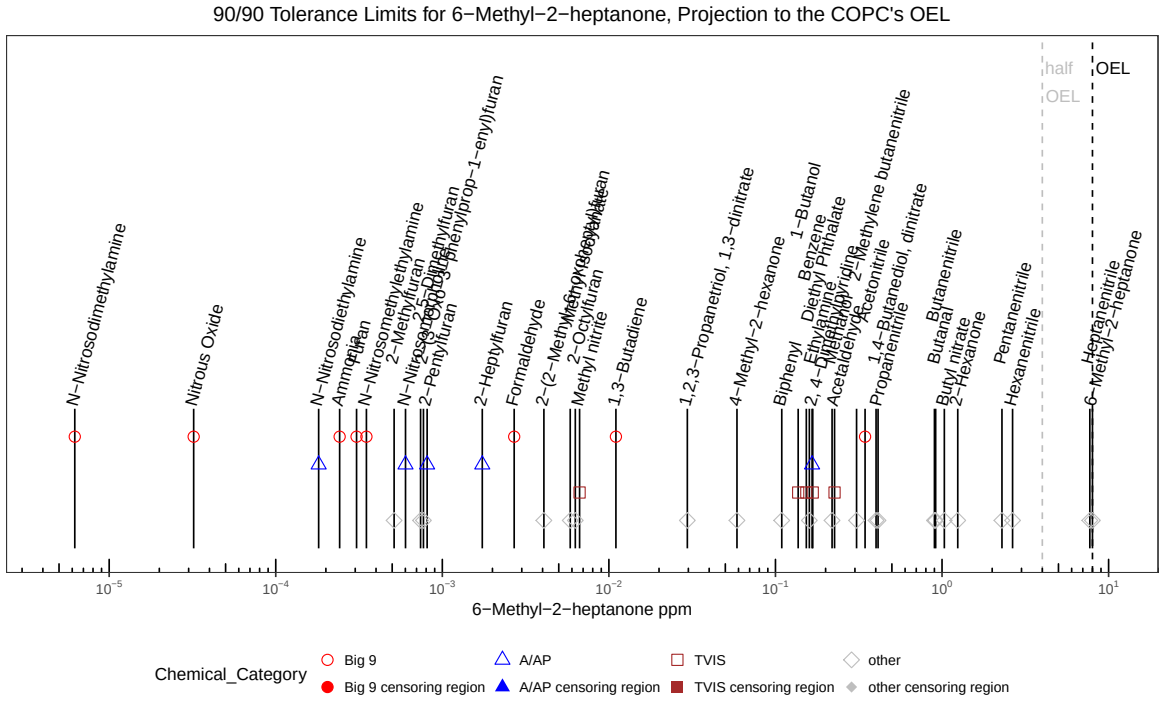


Figure E.69: Tolerance limits for 6-Methyl-2-heptanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

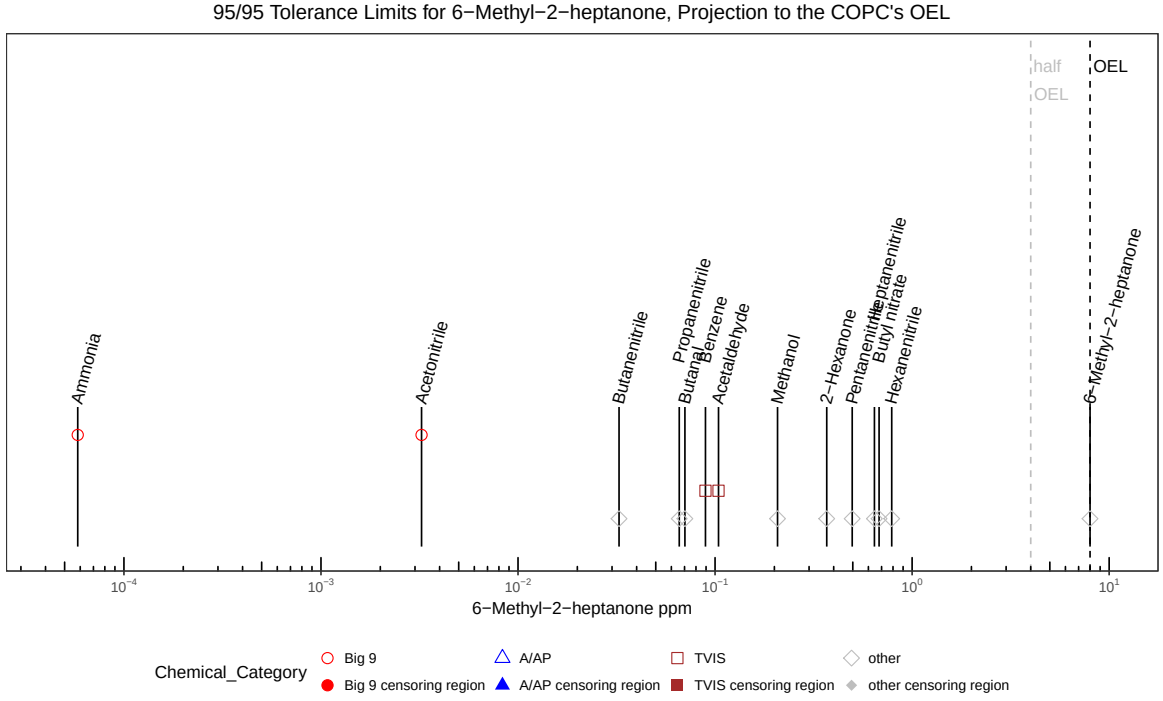


Figure E.70: Tolerance limits for 6-Methyl-2-heptanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

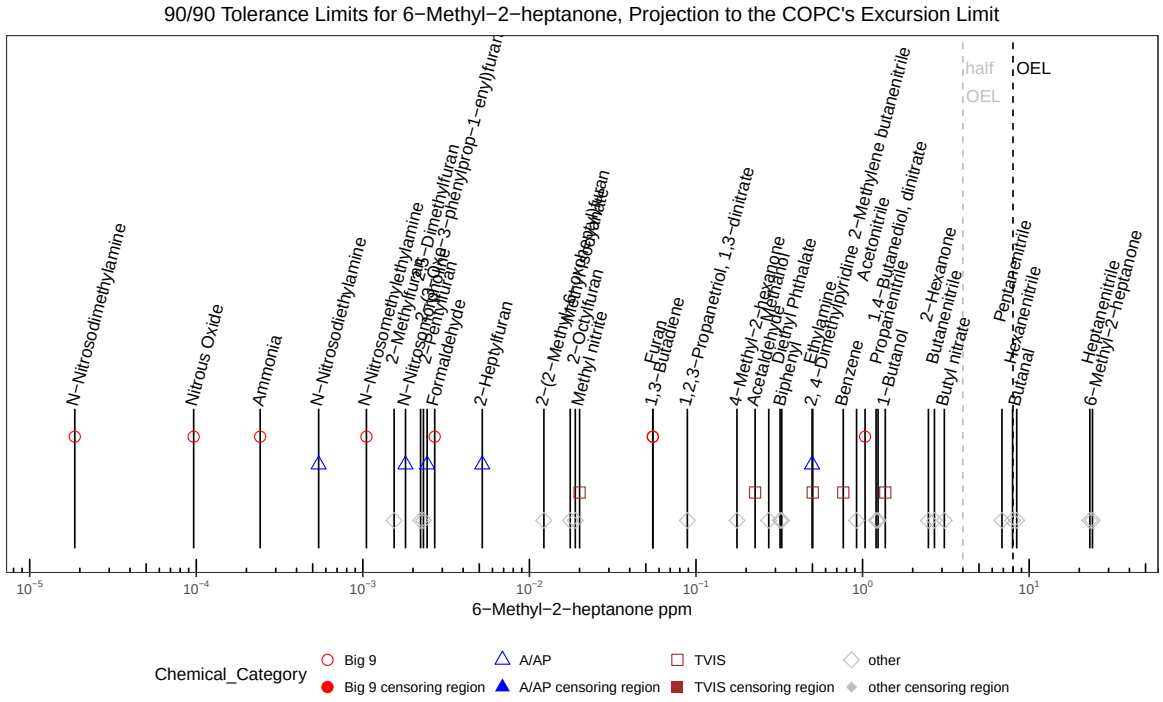


Figure E.71: Tolerance limits for 6-Methyl-2-heptanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

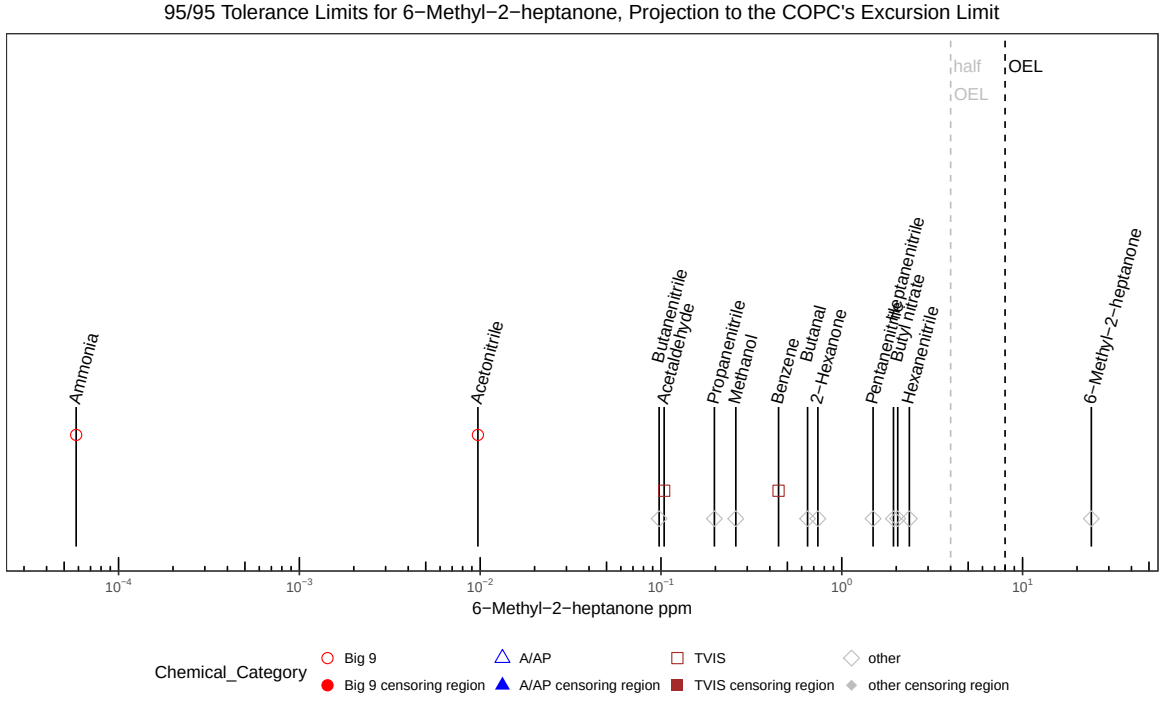


Figure E.72: Tolerance limits for 6-Methyl-2-heptanone as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

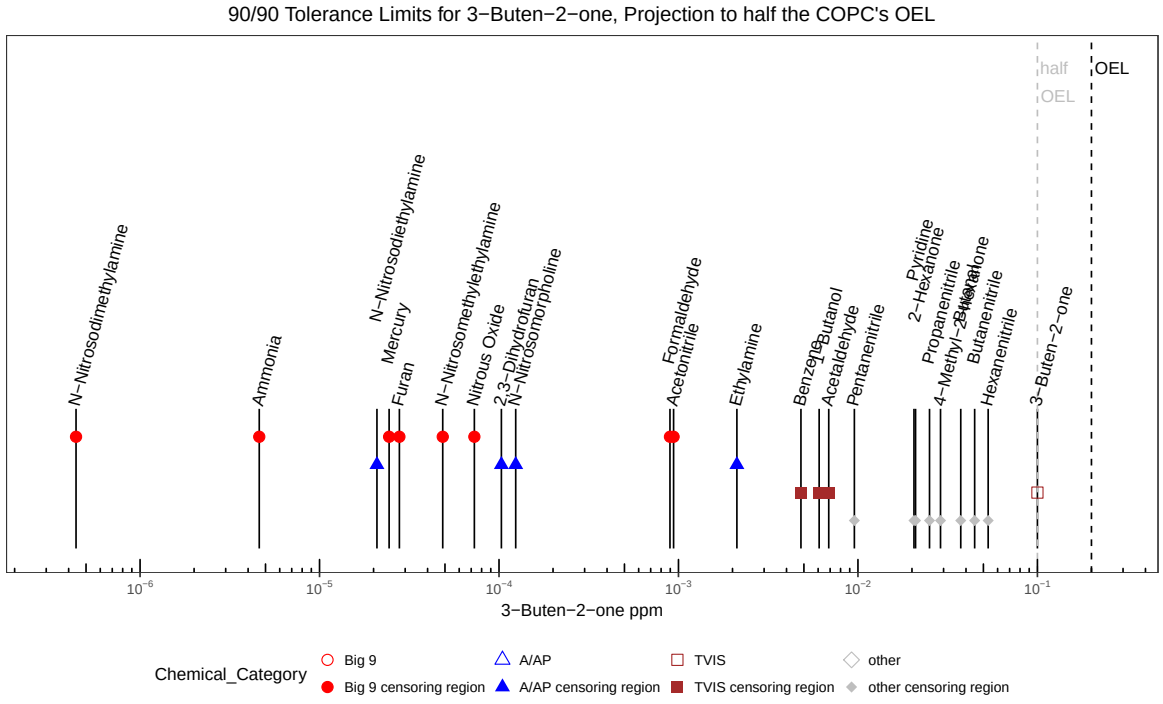


Figure E.73: Tolerance limits for 3-Buten-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

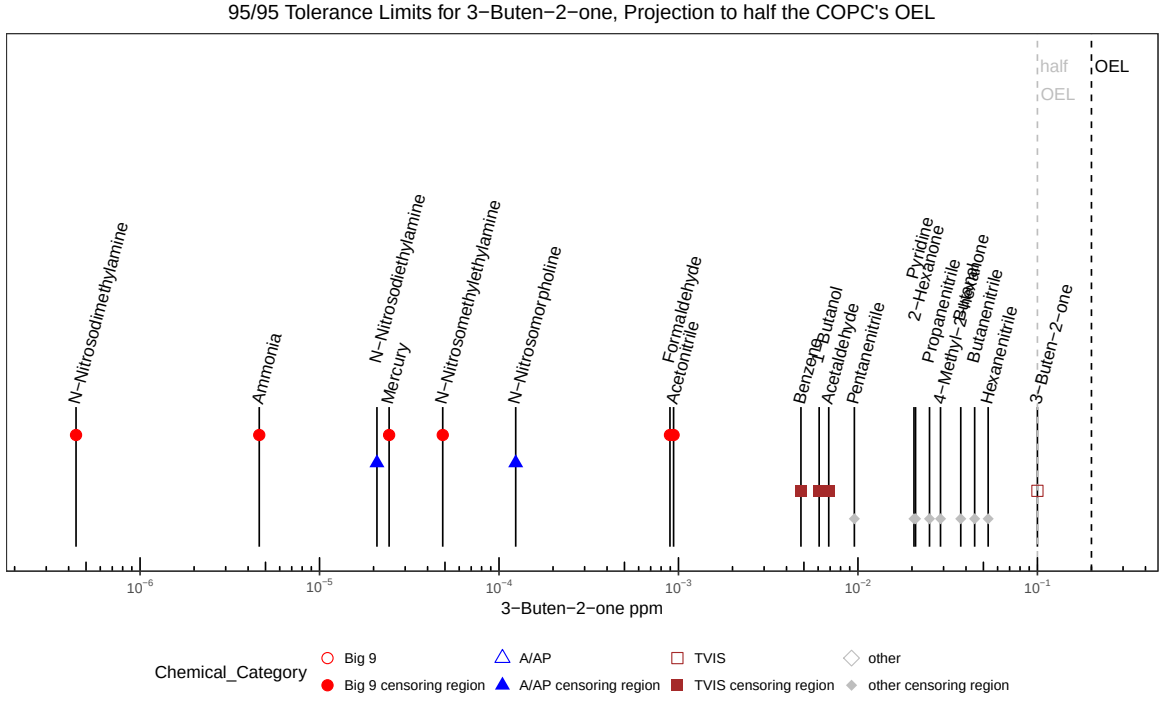


Figure E.74: Tolerance limits for 3-Buten-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

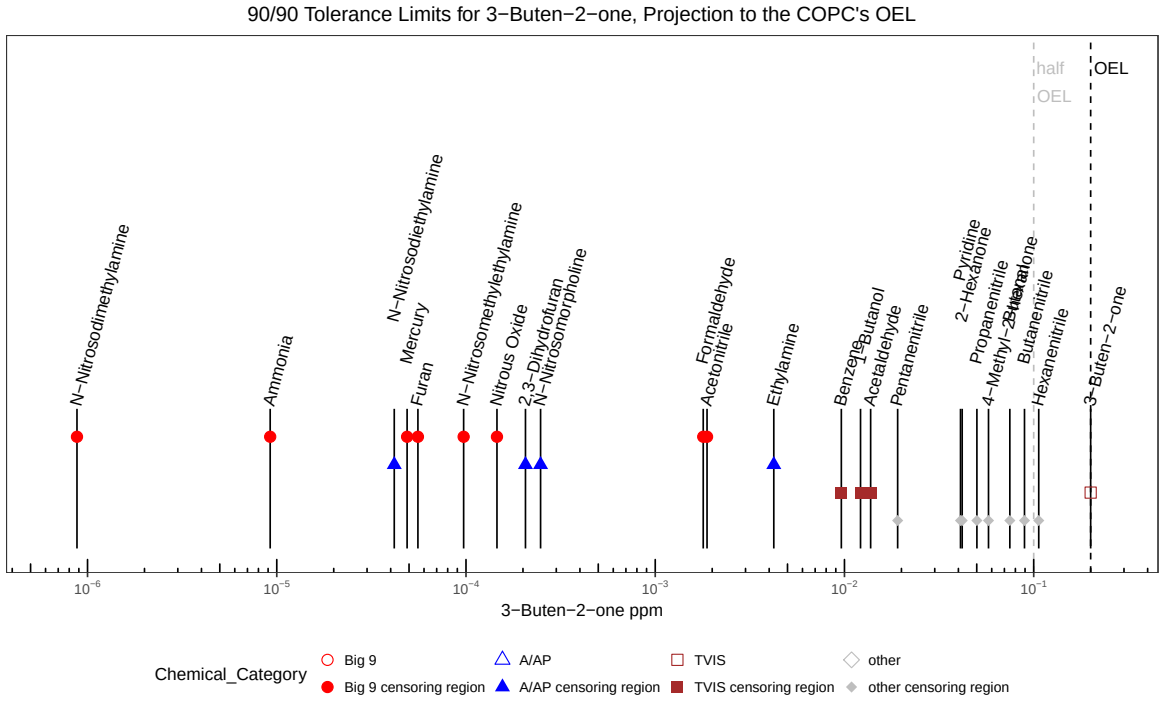


Figure E.75: Tolerance limits for 3-Buten-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

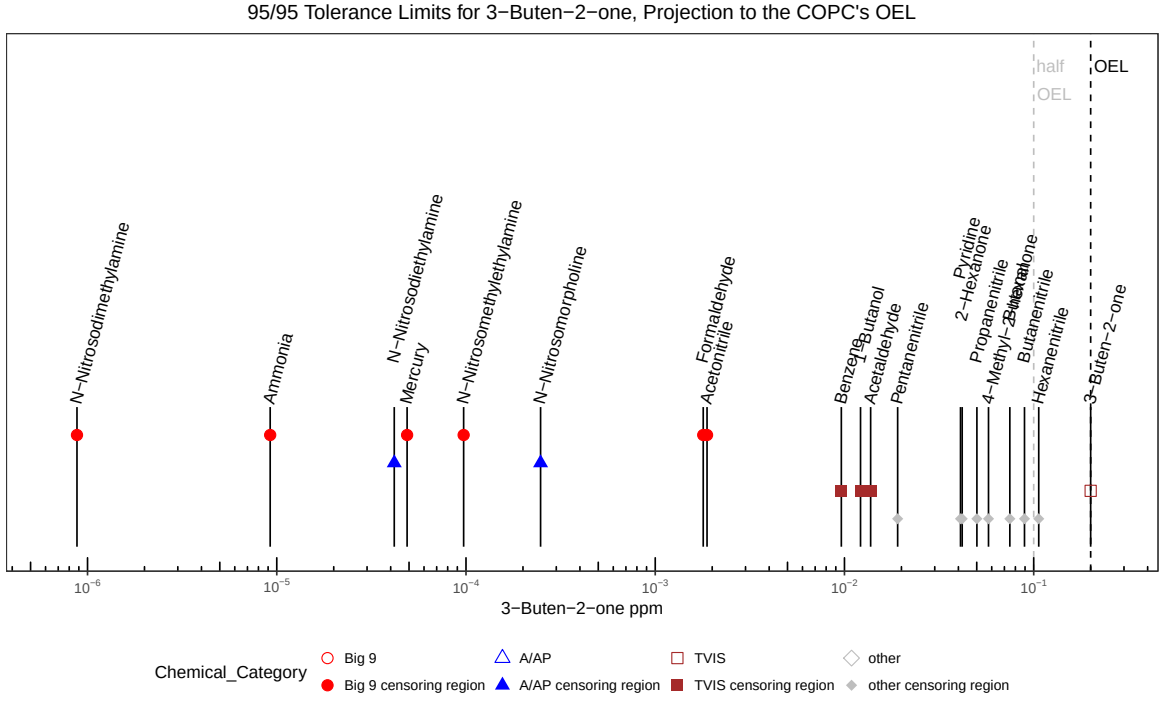


Figure E.76: Tolerance limits for 3-Buten-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

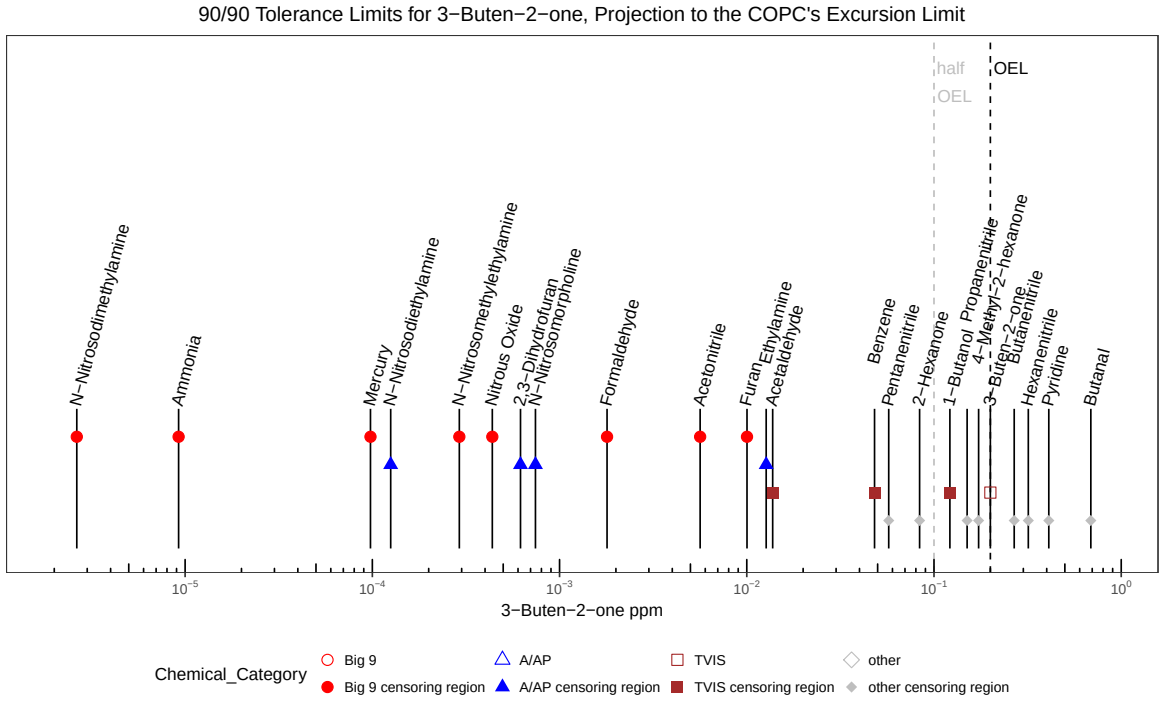


Figure E.77: Tolerance limits for 3-Buten-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

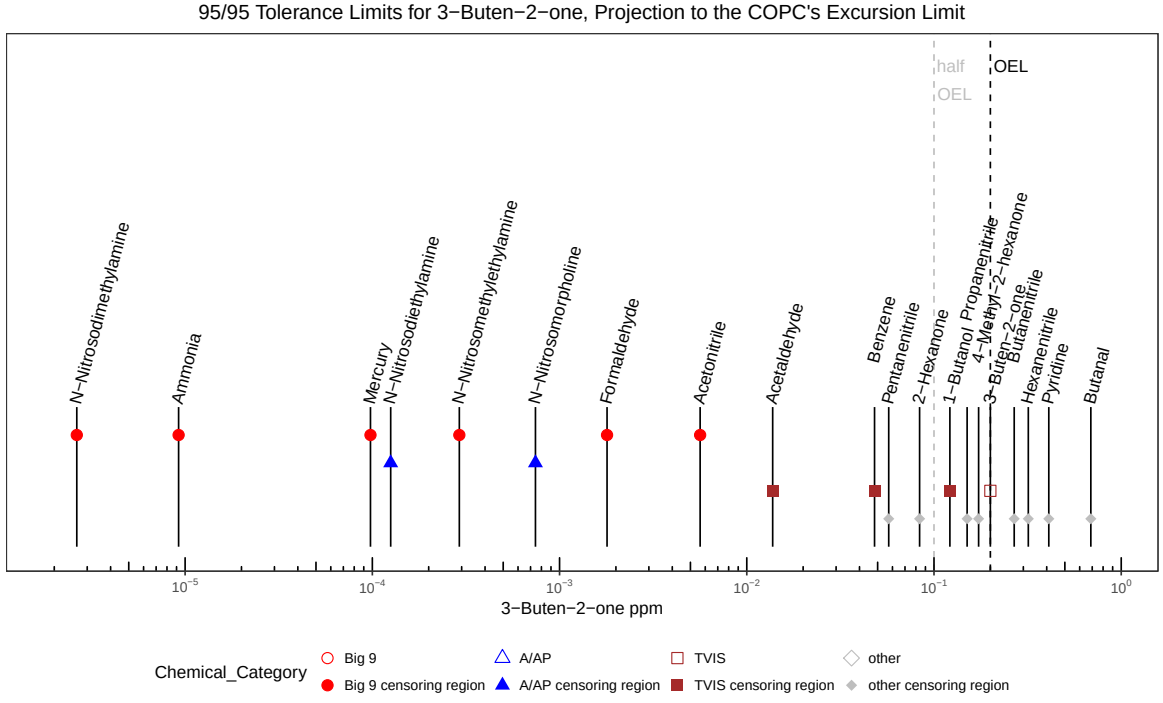


Figure E.78: Tolerance limits for 3-Buten-2-one as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

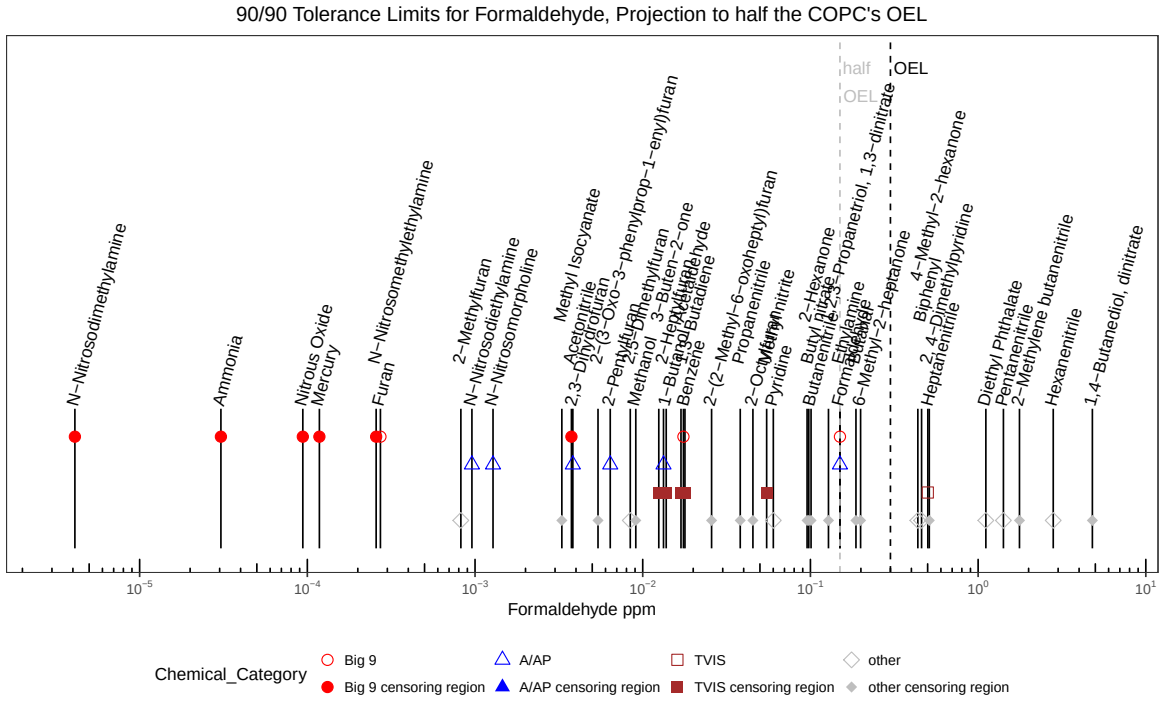


Figure E.79: Tolerance limits for Formaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

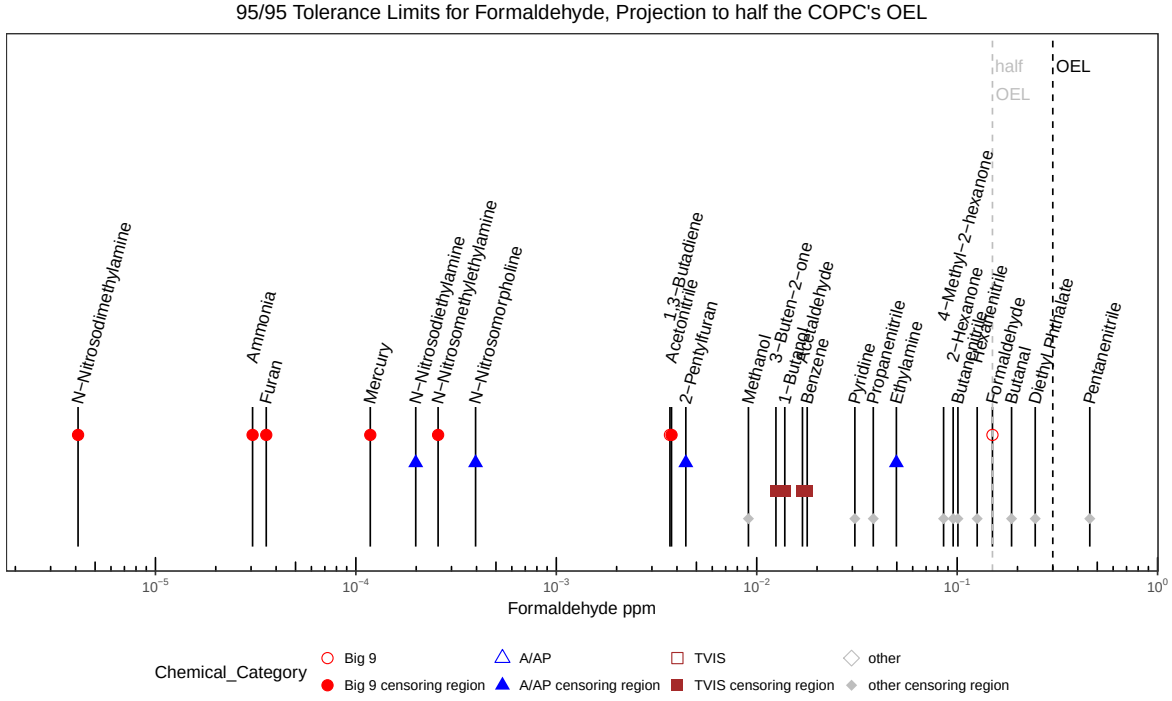


Figure E.80: Tolerance limits for Formaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

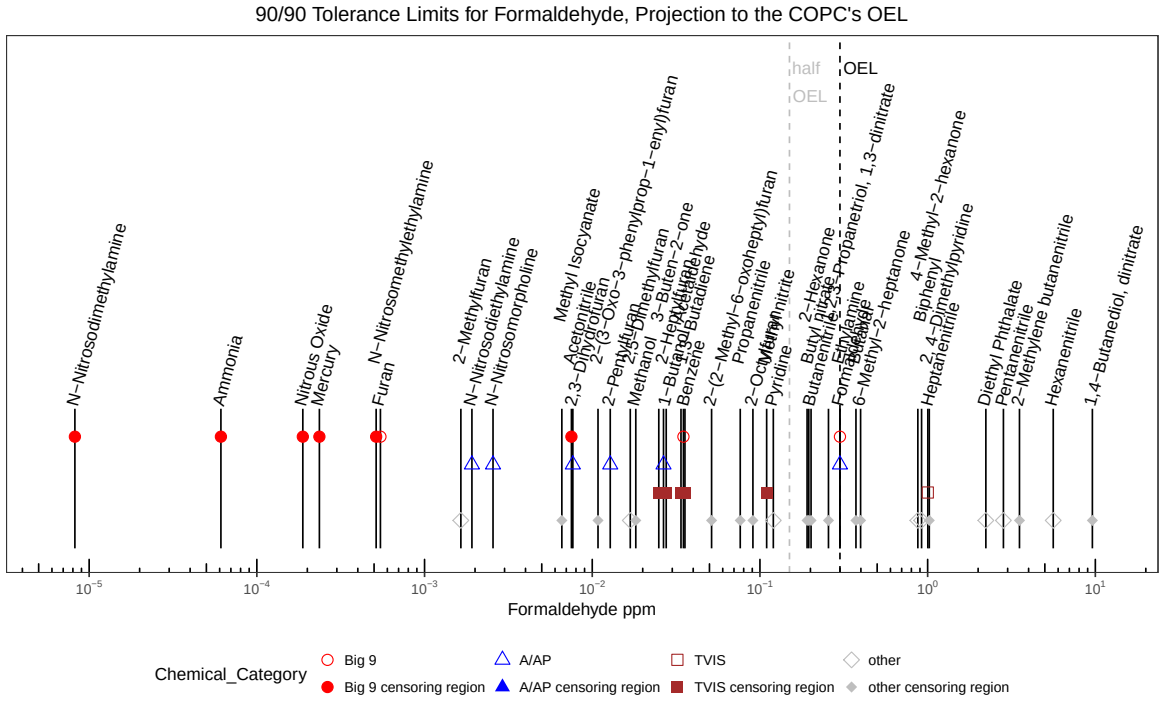


Figure E.81: Tolerance limits for Formaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

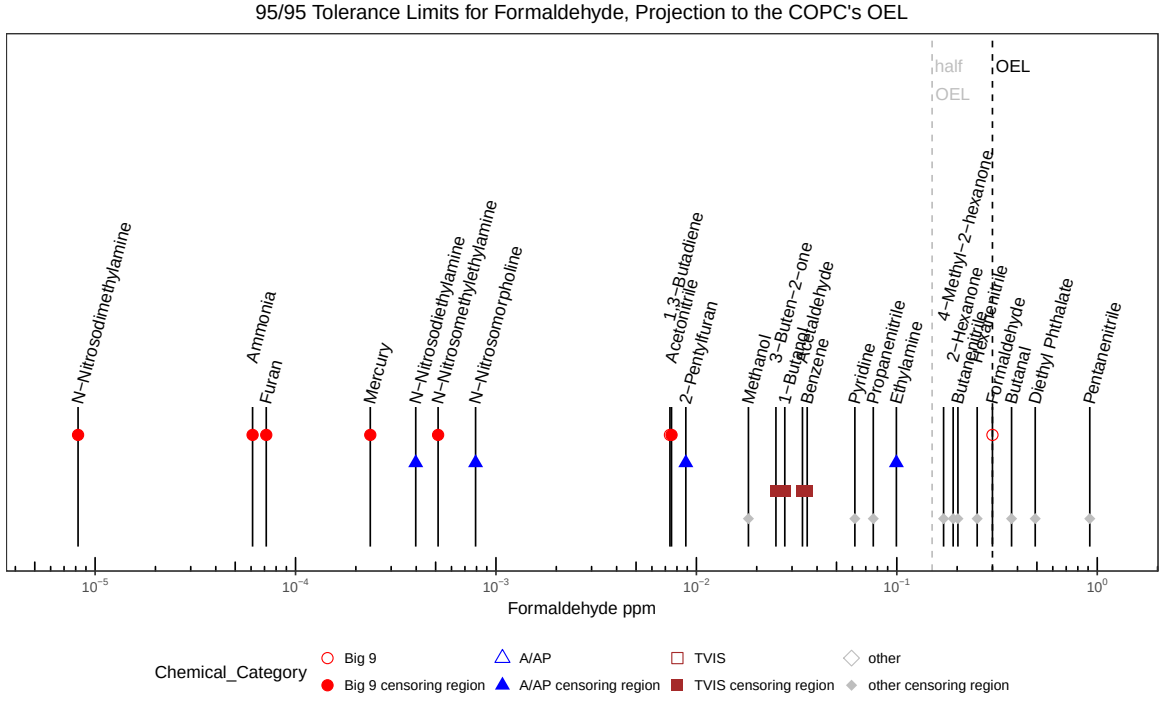


Figure E.82: Tolerance limits for Formaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

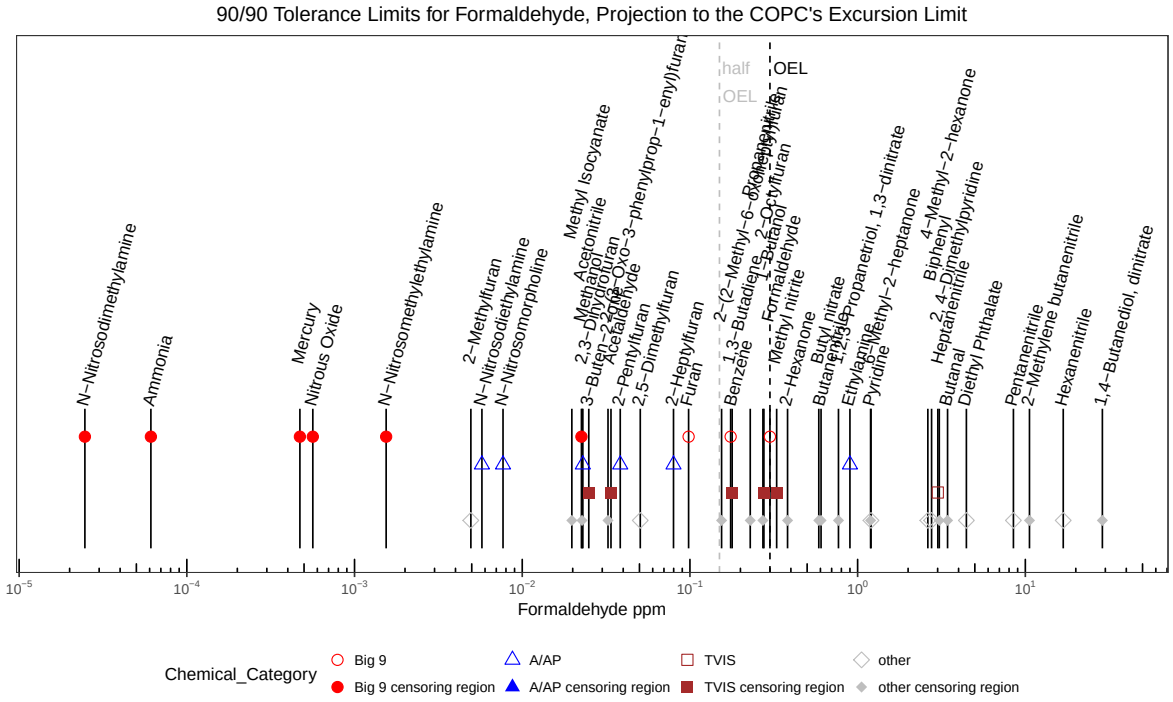


Figure E.83: Tolerance limits for Formaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

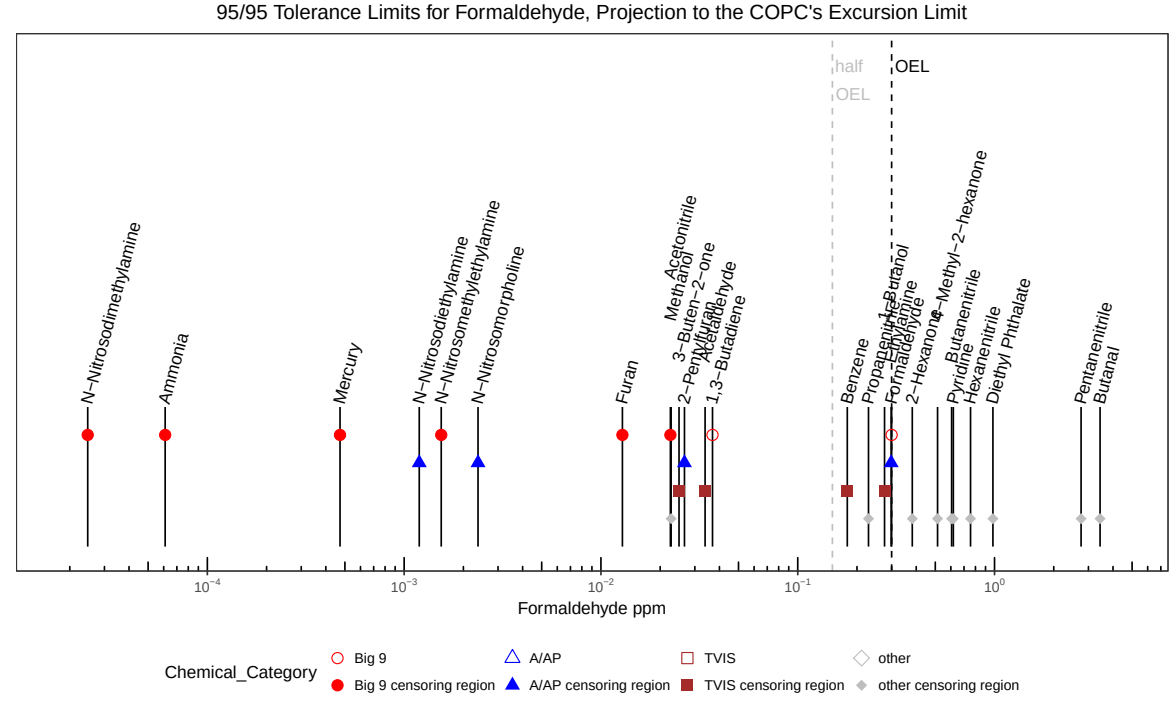


Figure E.84: Tolerance limits for Formaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

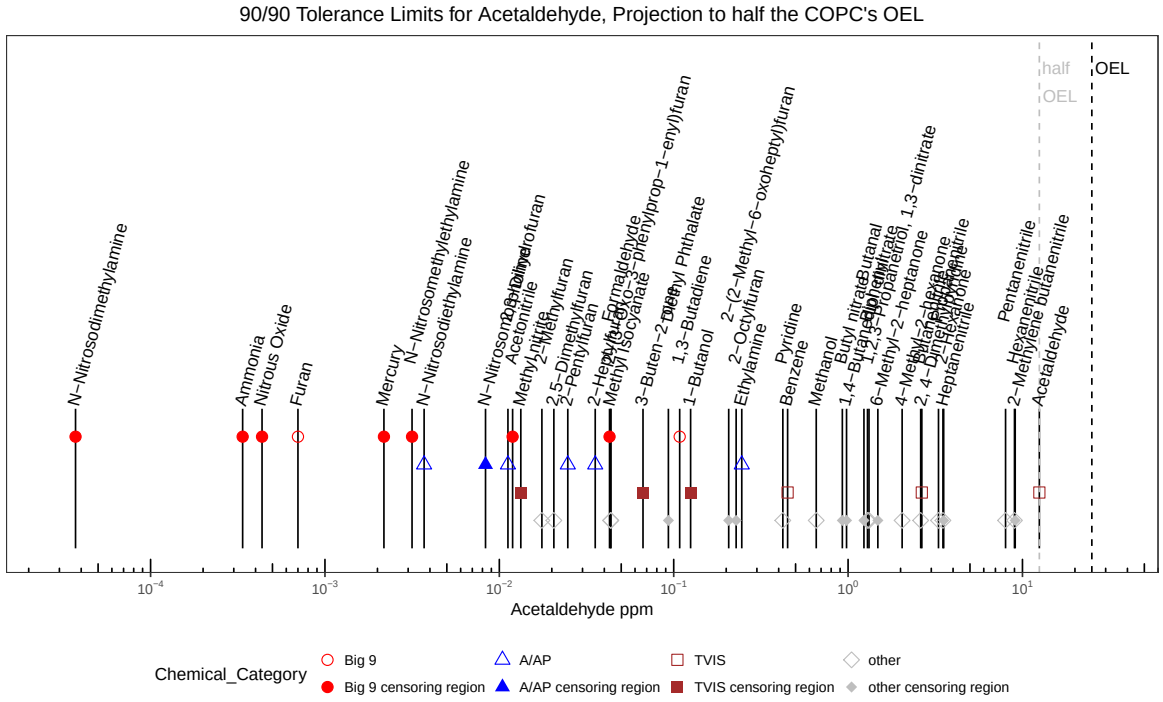


Figure E.85: Tolerance limits for Acetaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

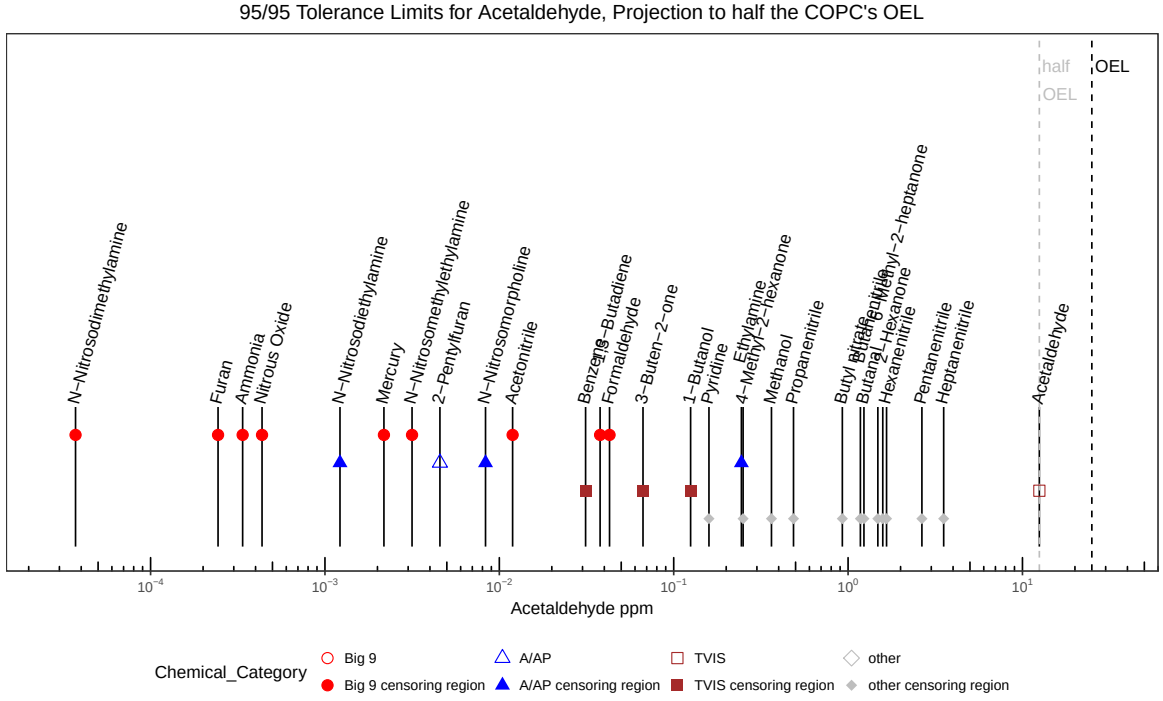


Figure E.86: Tolerance limits for Acetaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

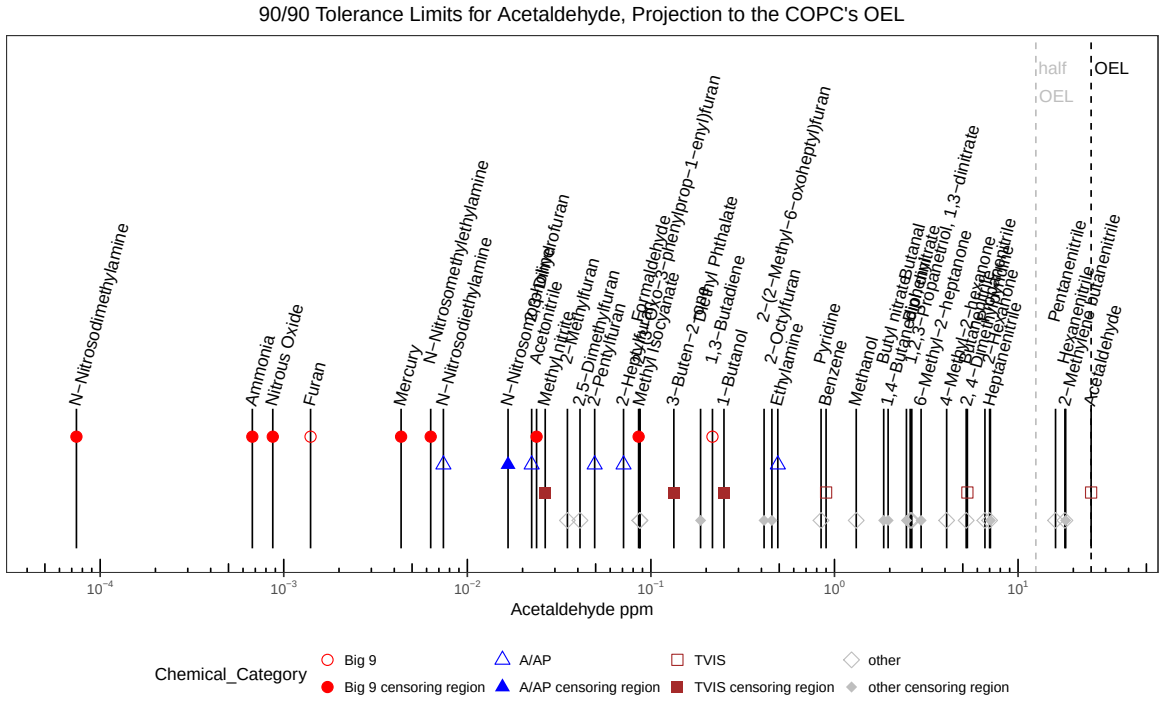


Figure E.87: Tolerance limits for Acetaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

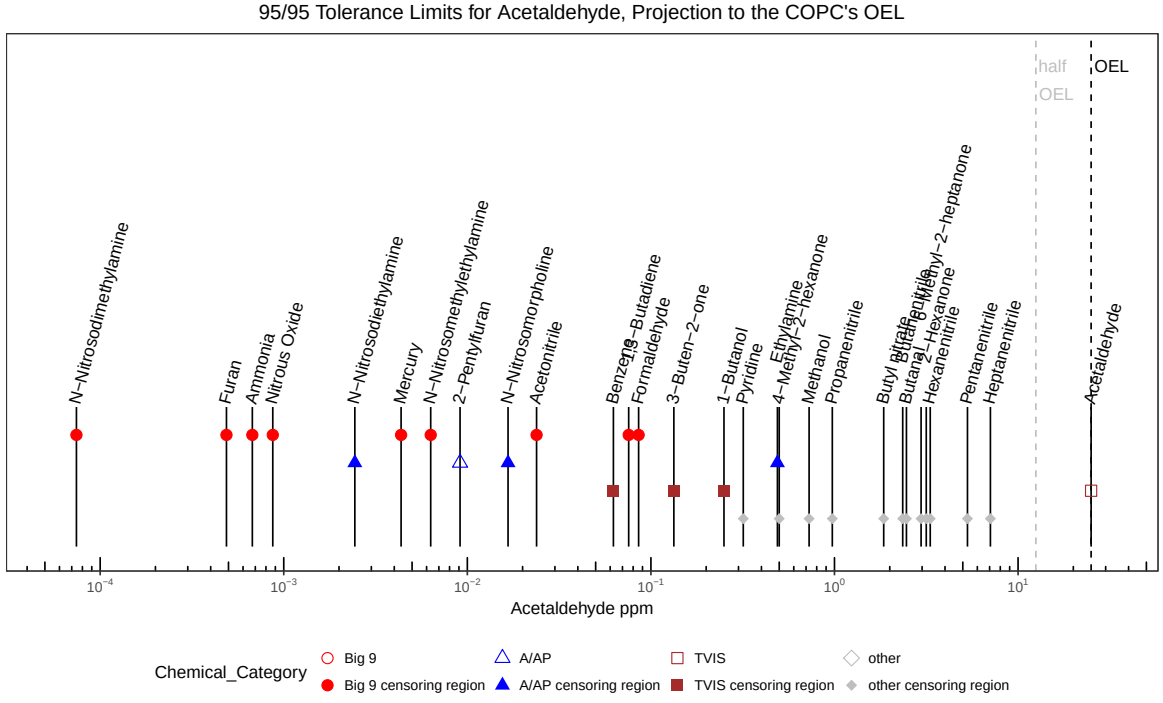


Figure E.88: Tolerance limits for Acetaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

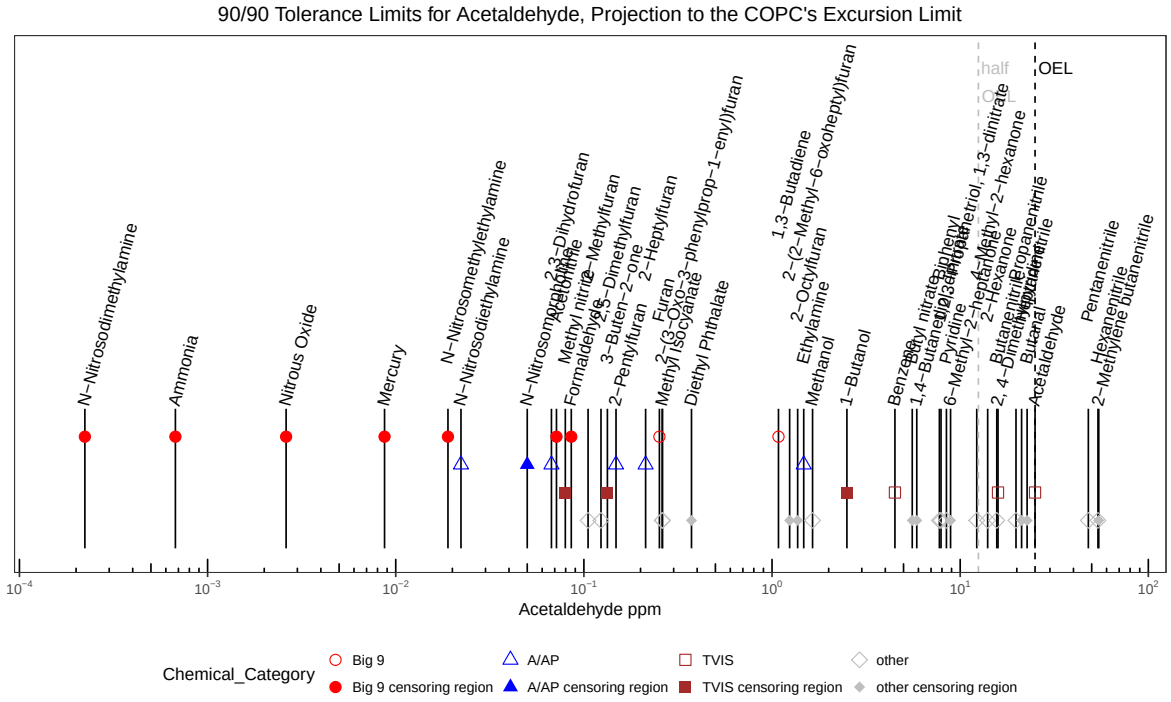


Figure E.89: Tolerance limits for Acetaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

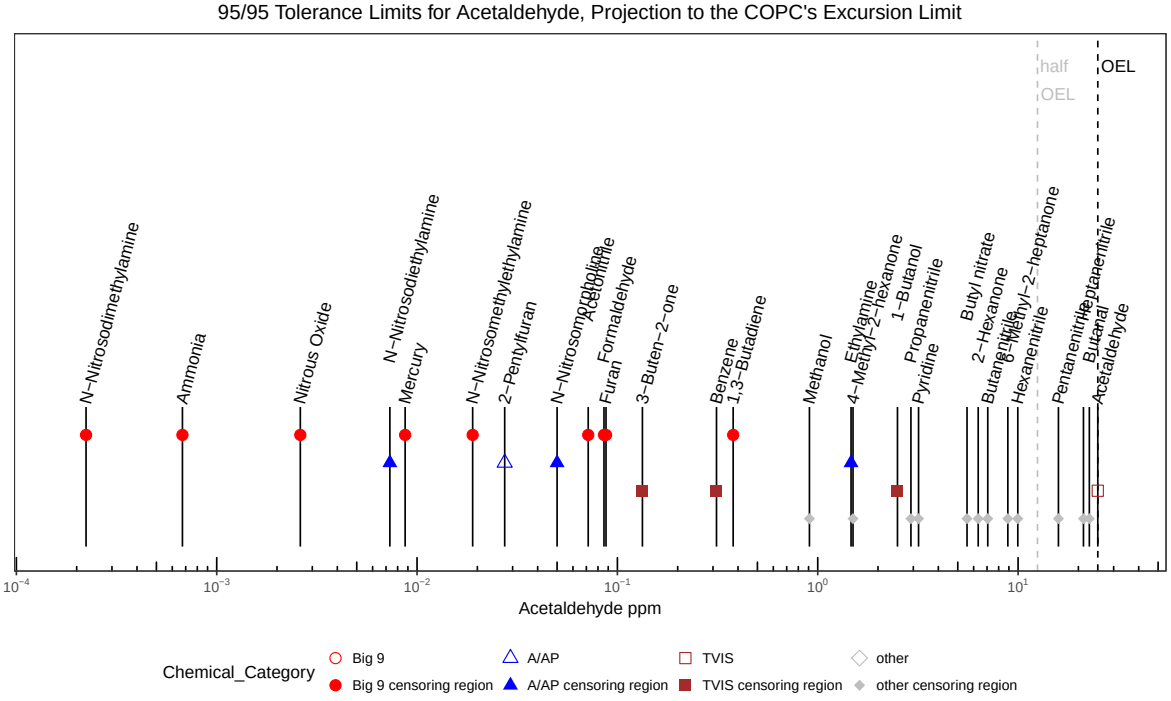


Figure E.90: Tolerance limits for Acetaldehyde as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

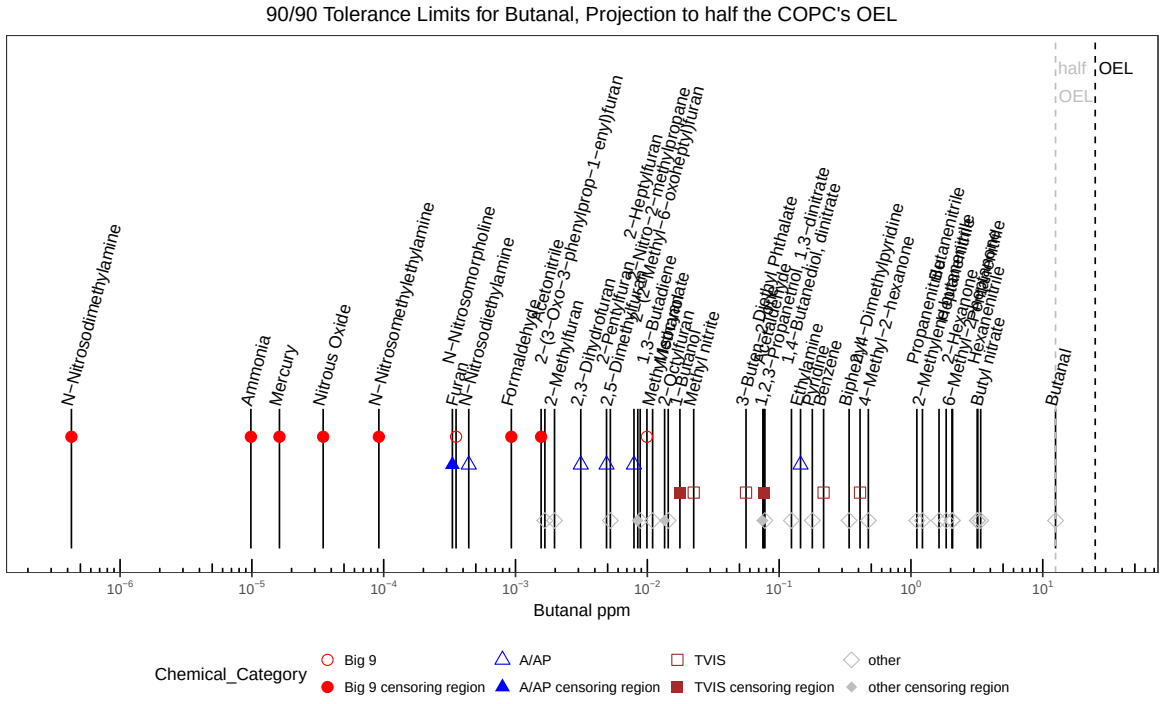


Figure E.91: Tolerance limits for Butanal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

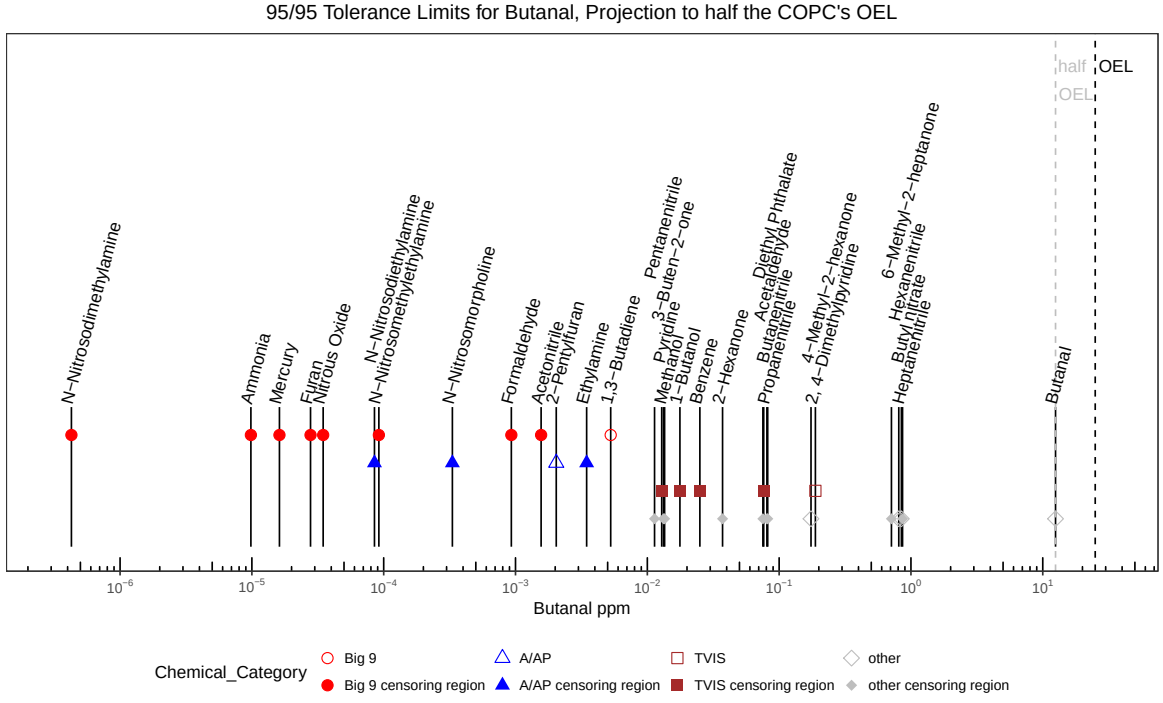


Figure E.92: Tolerance limits for Butanal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

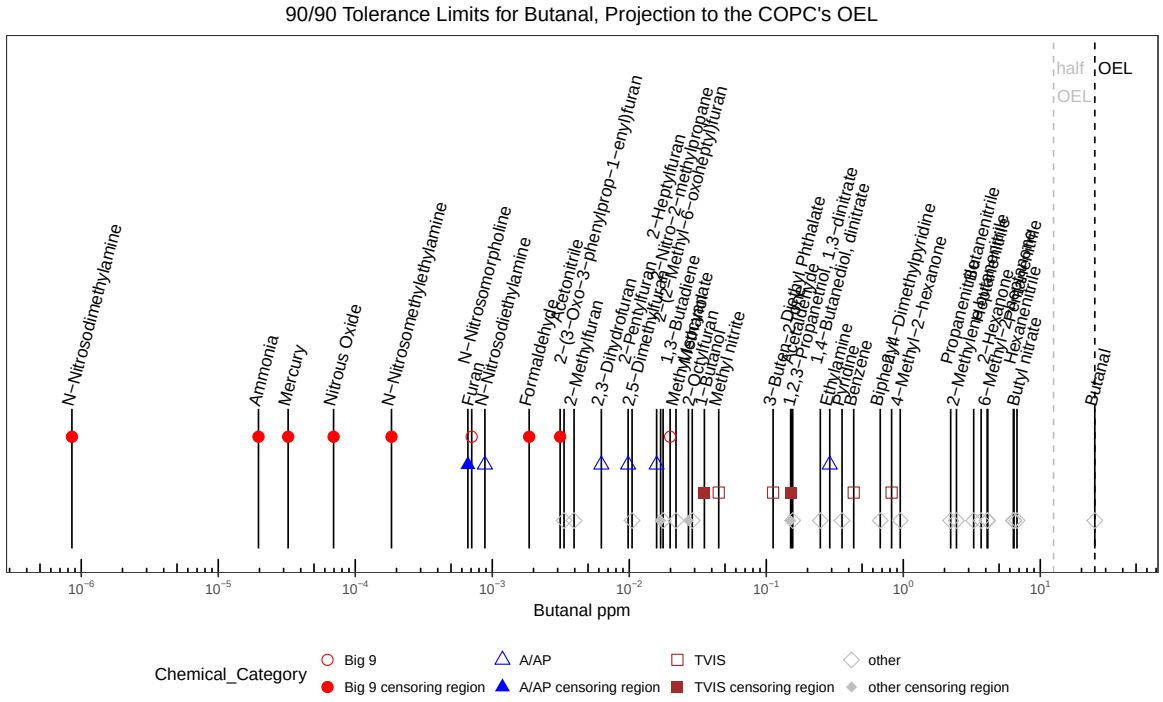


Figure E.93: Tolerance limits for Butanal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

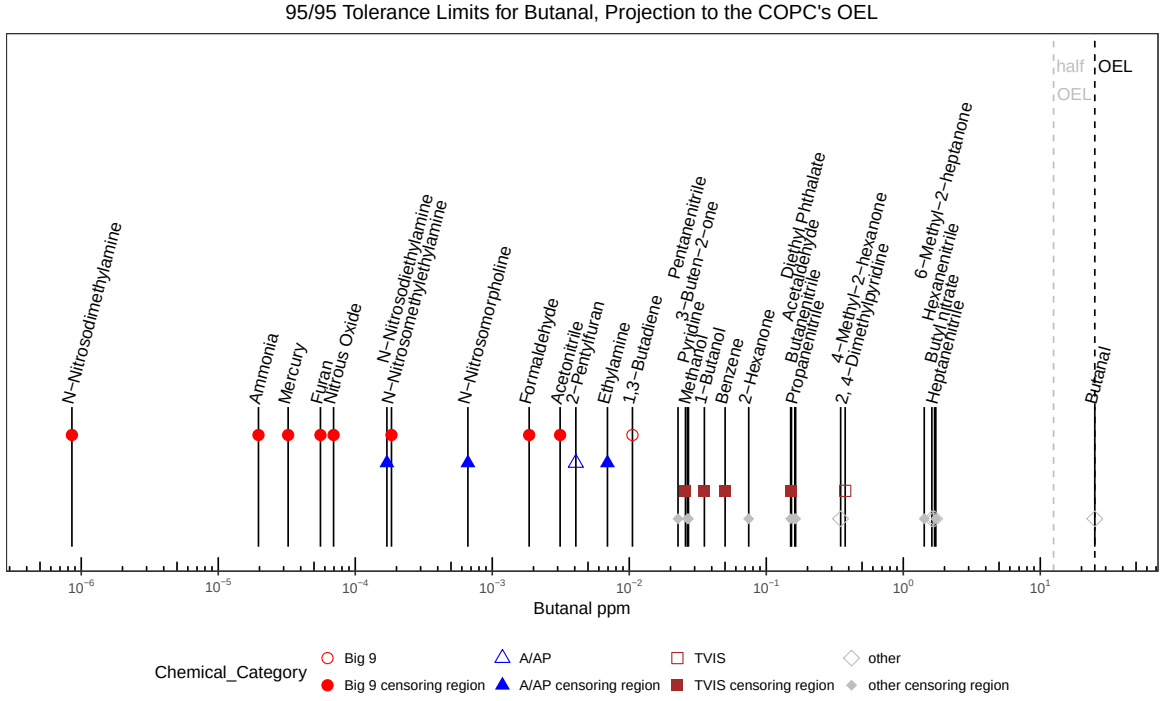


Figure E.94: Tolerance limits for Butanal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

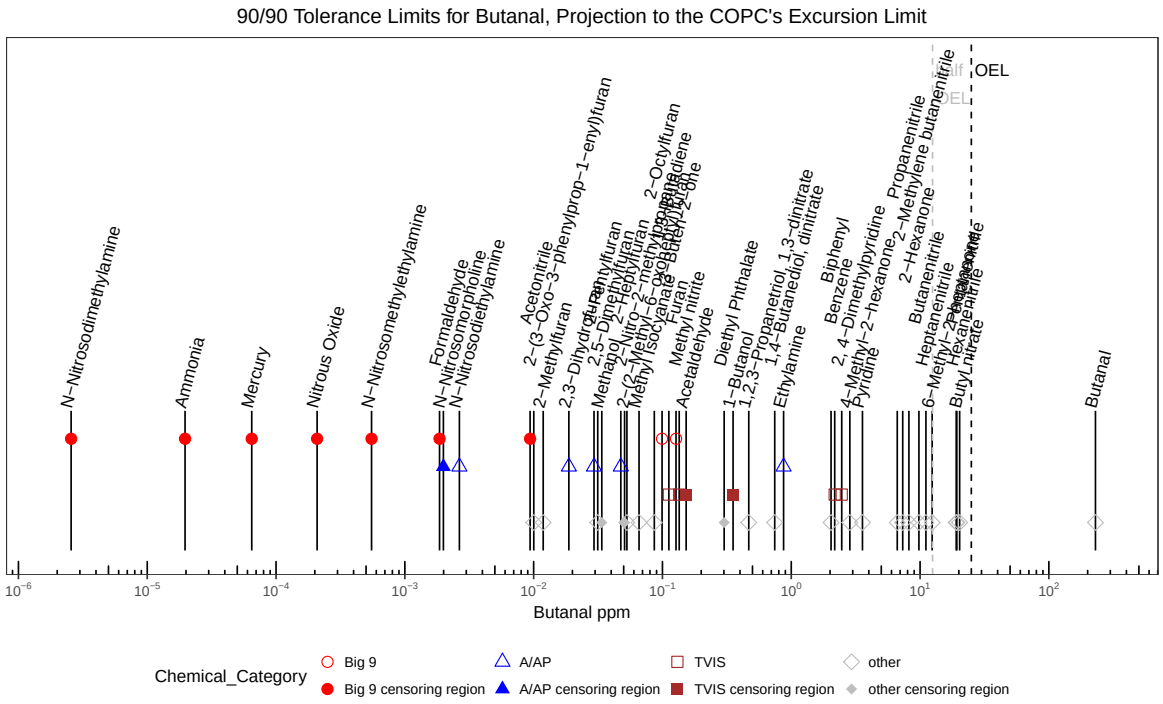


Figure E.95: Tolerance limits for Butanal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

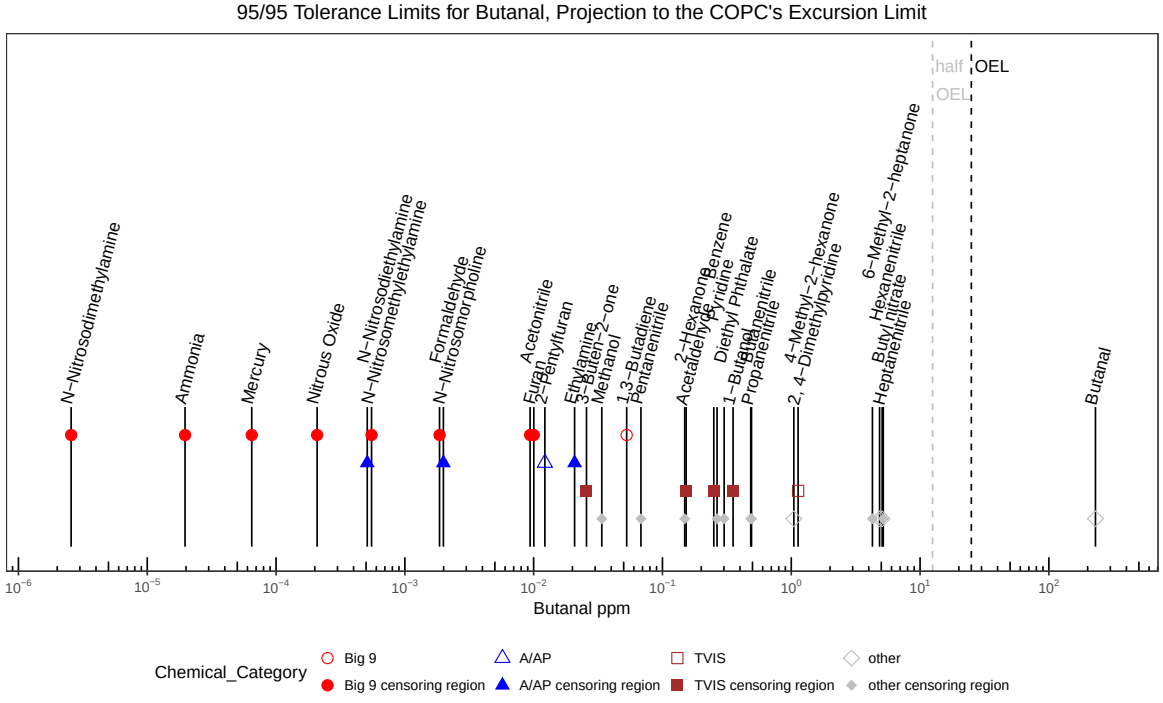


Figure E.96: Tolerance limits for Butanal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

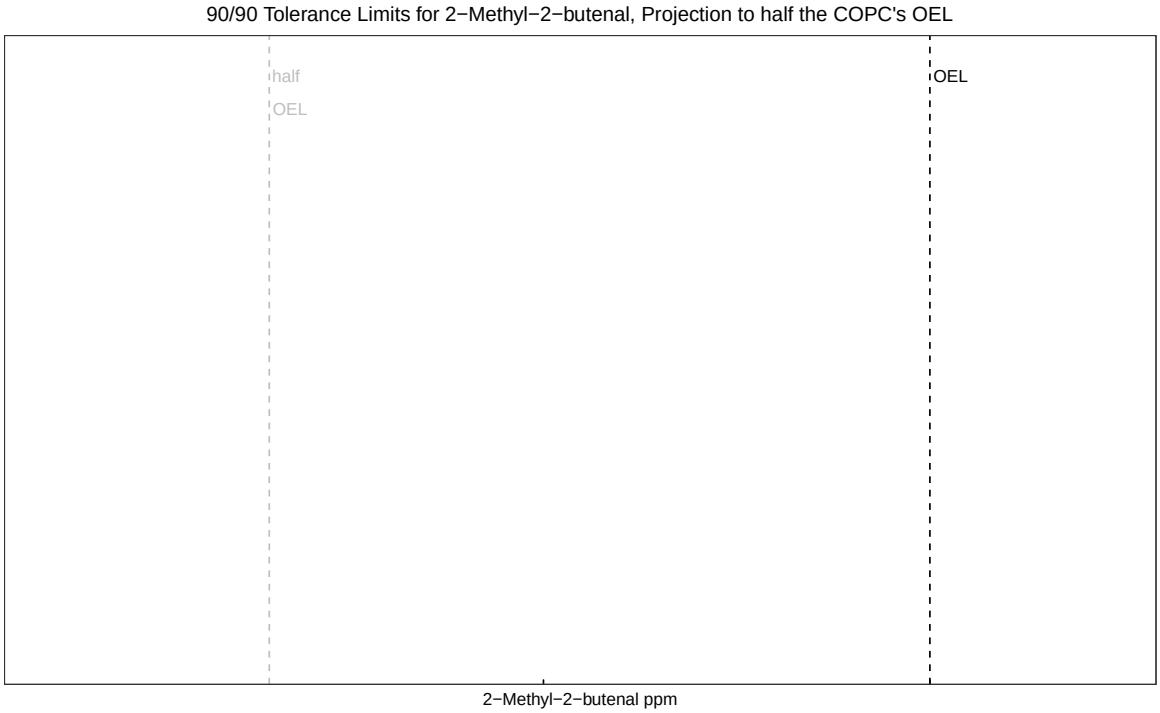


Figure E.97: Tolerance limits for 2-Methyl-2-butenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

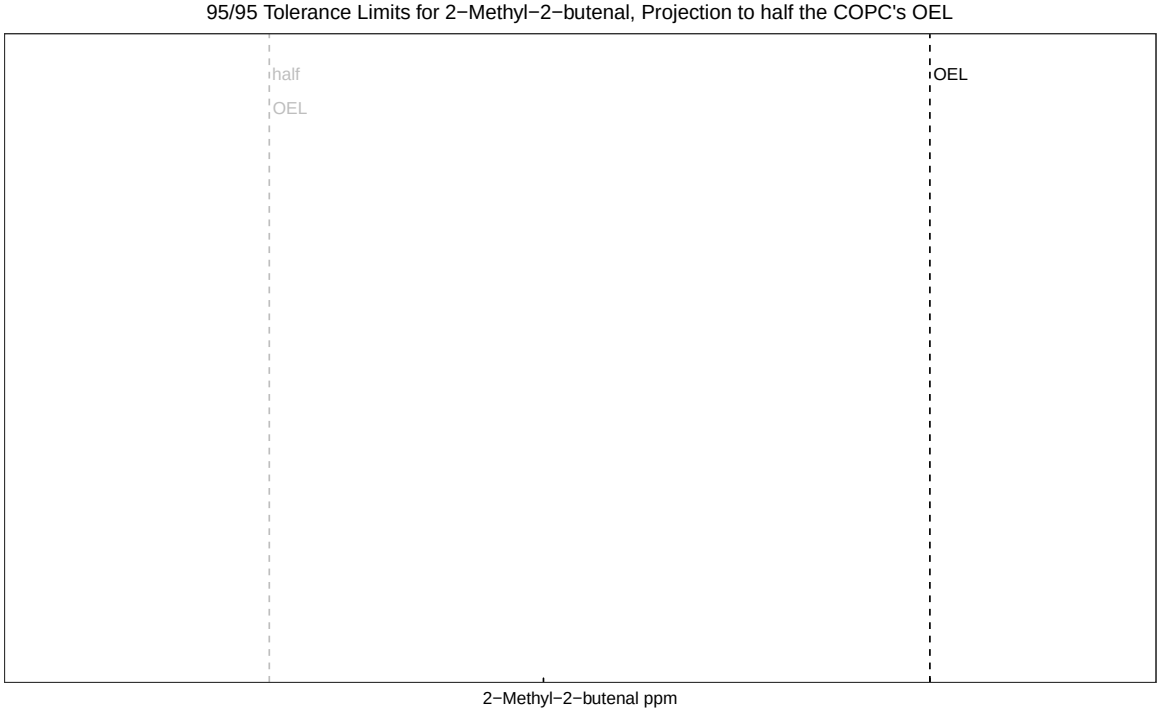


Figure E.98: Tolerance limits for 2-Methyl-2-butenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

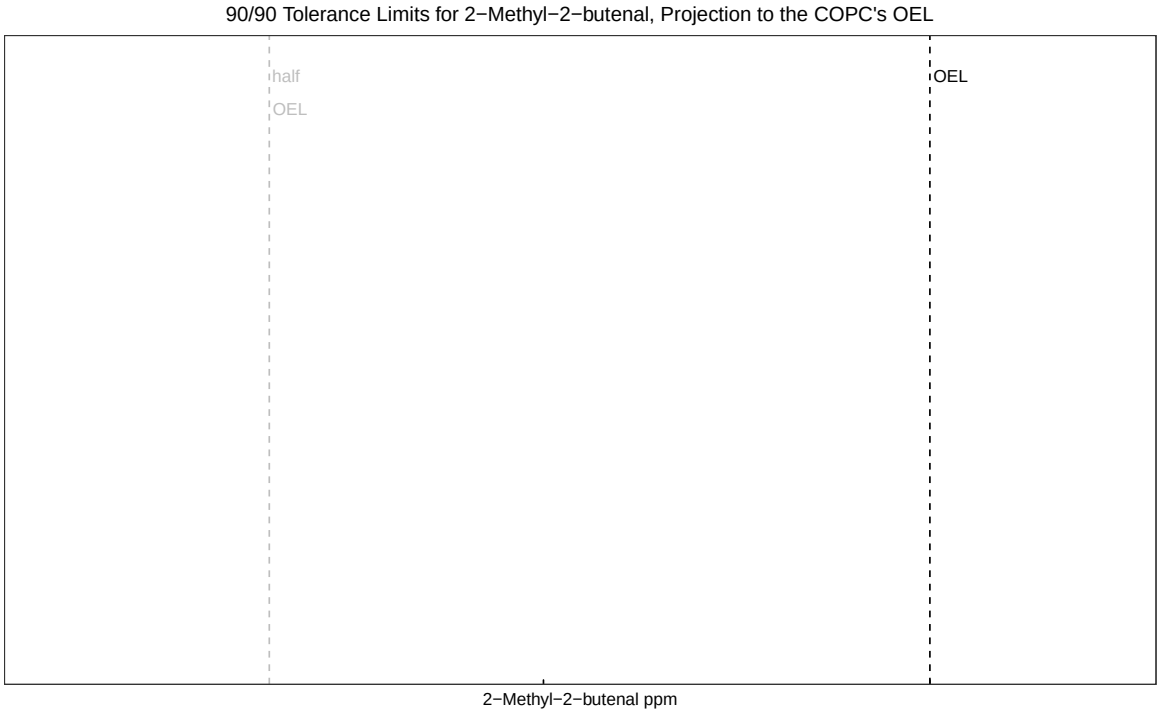


Figure E.99: Tolerance limits for 2-Methyl-2-butenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

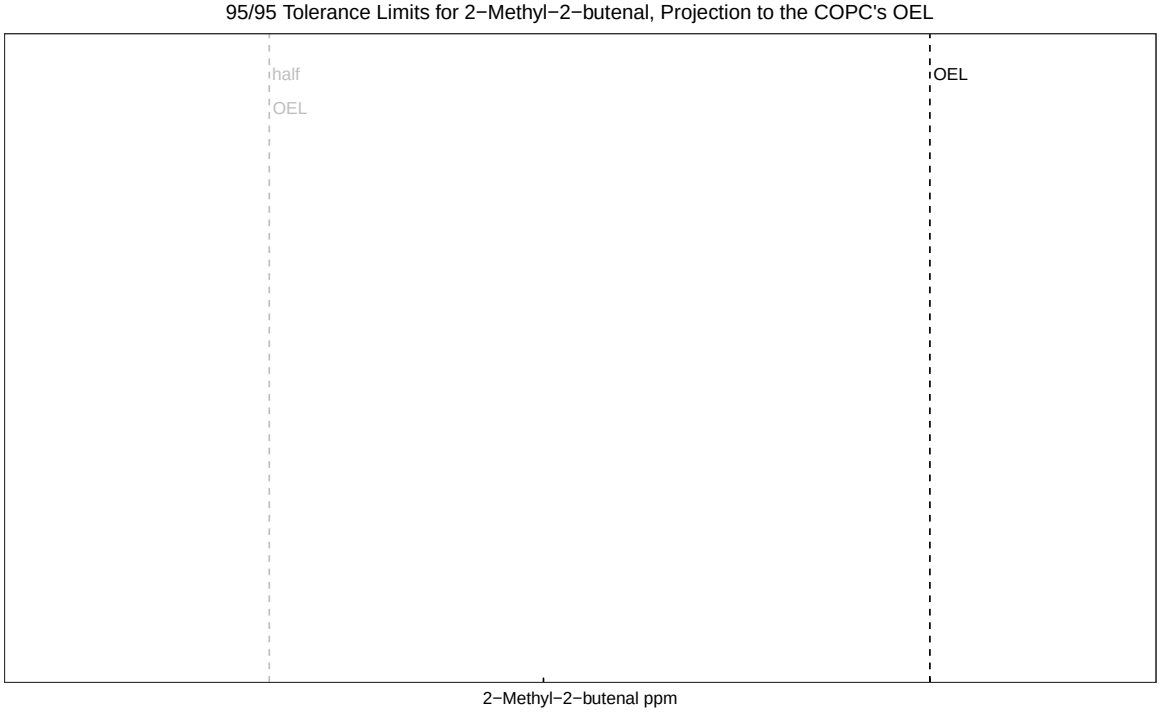


Figure E.100: Tolerance limits for 2-Methyl-2-butenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

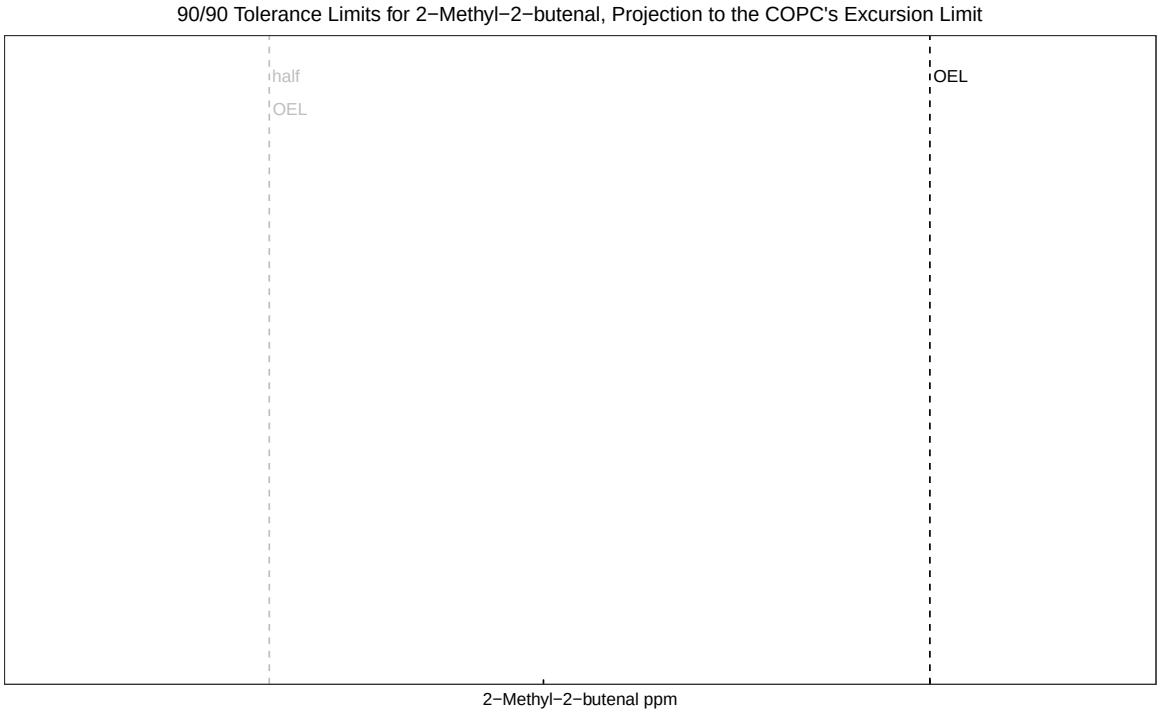


Figure E.101: Tolerance limits for 2-Methyl-2-butenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

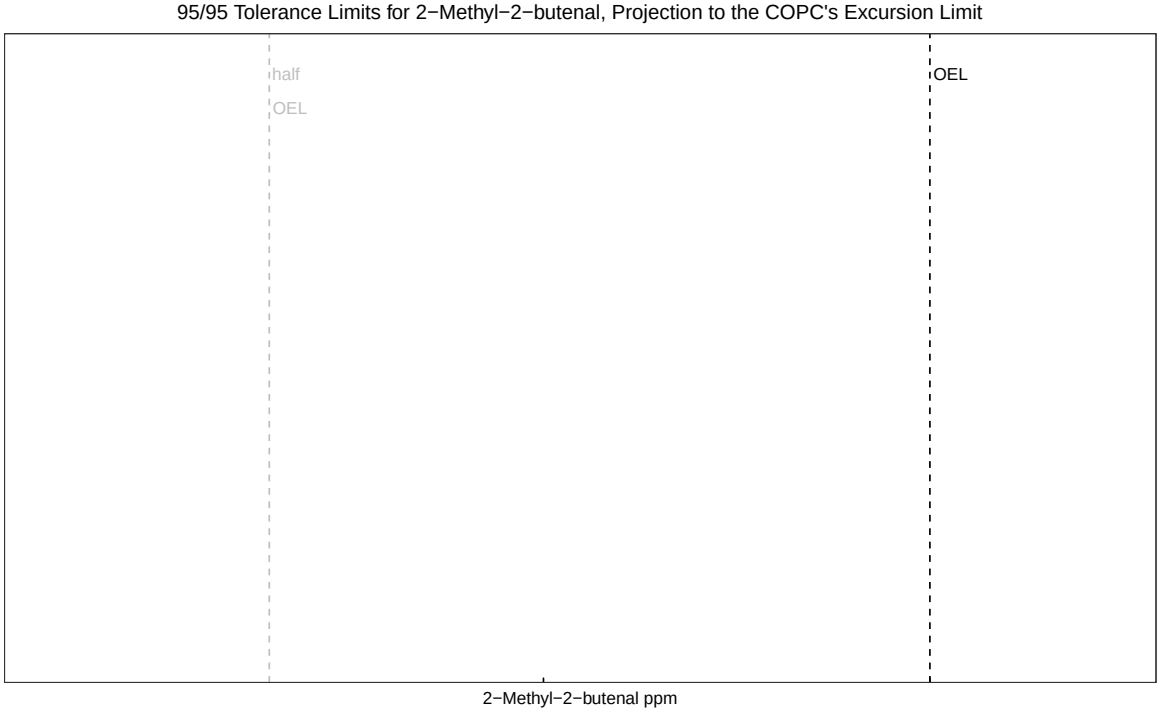


Figure E.102: Tolerance limits for 2-Methyl-2-butenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

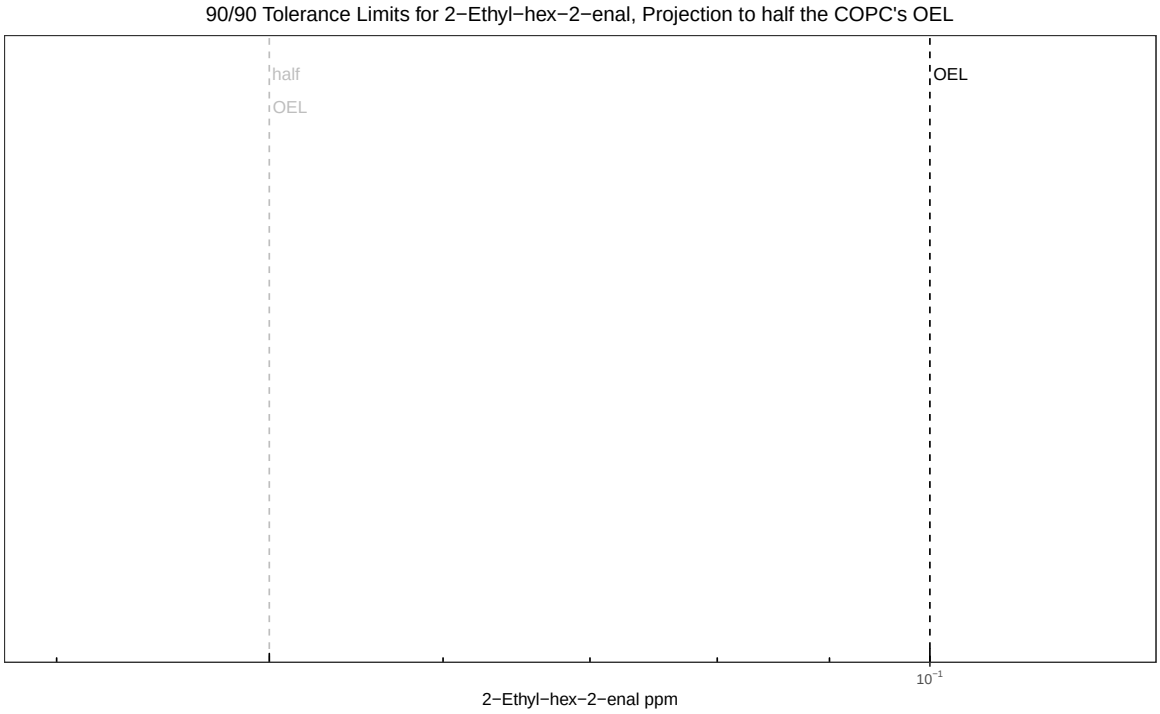


Figure E.103: Tolerance limits for 2-Ethyl-hex-2-enal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

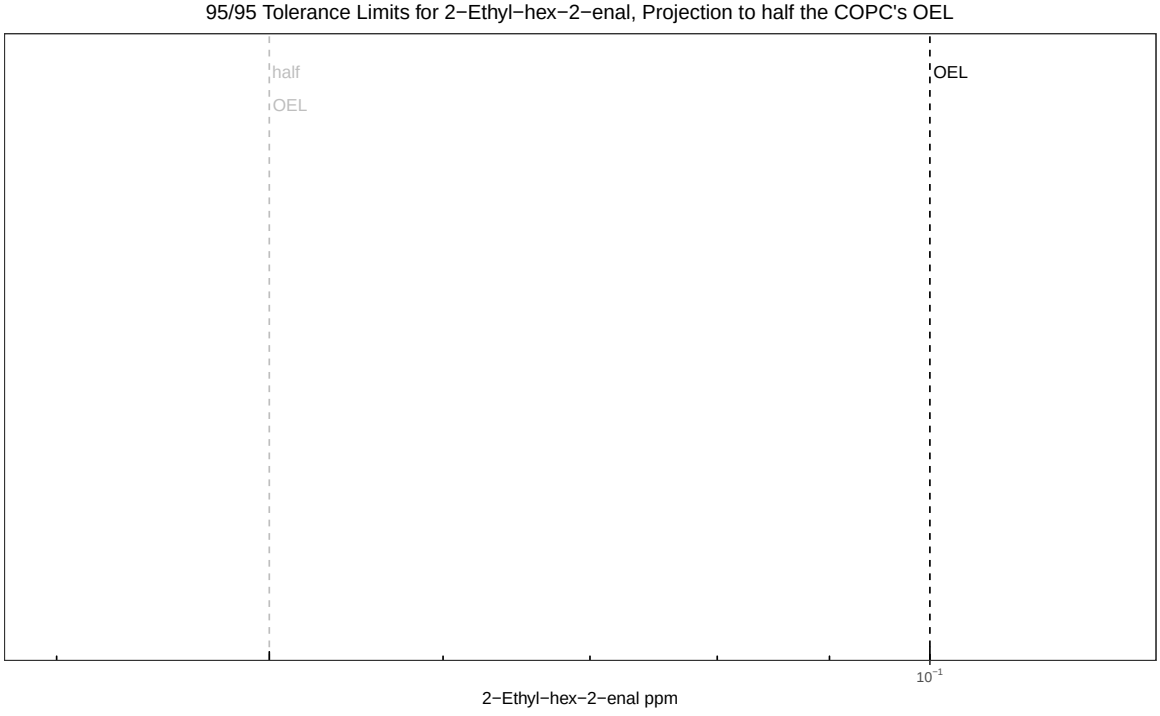


Figure E.104: Tolerance limits for 2-Ethyl-hex-2-enal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

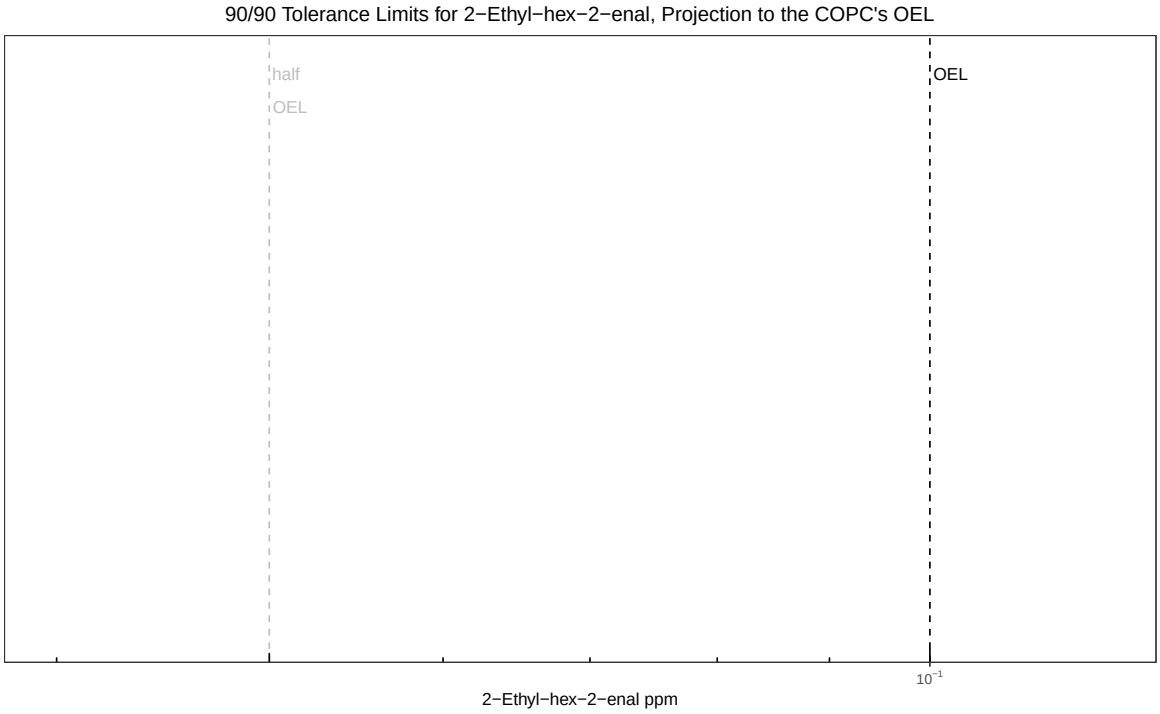


Figure E.105: Tolerance limits for 2-Ethyl-hex-2-enal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

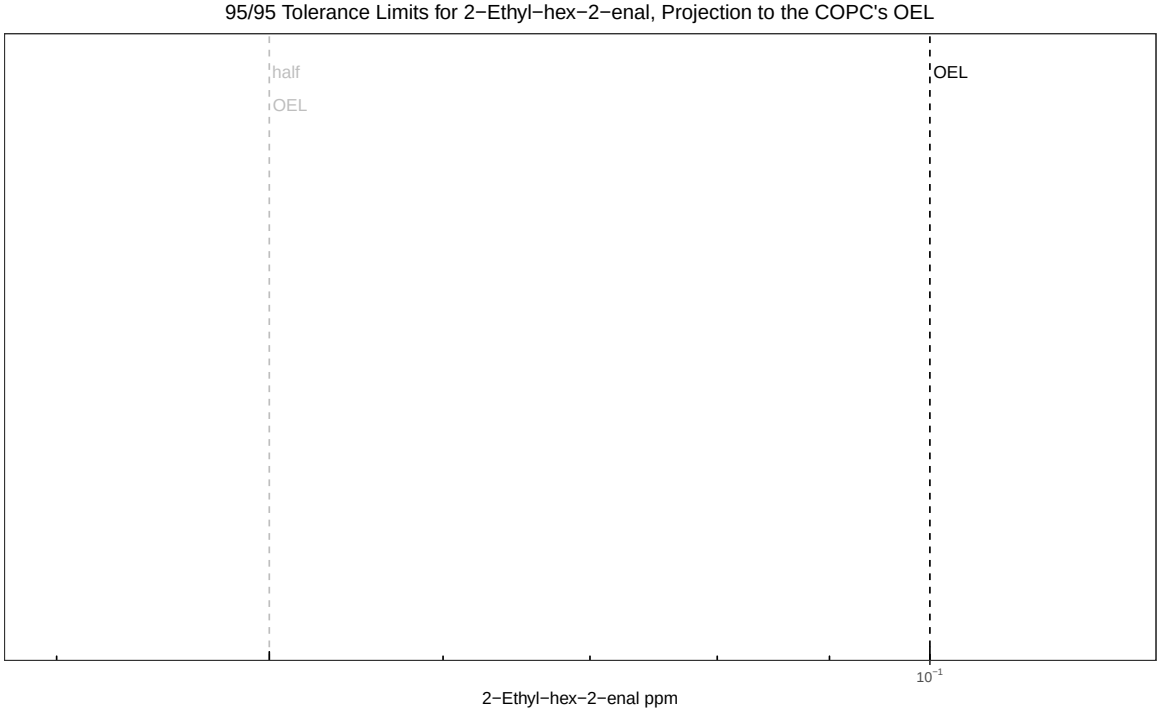


Figure E.106: Tolerance limits for 2-Ethyl-hex-2-enal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

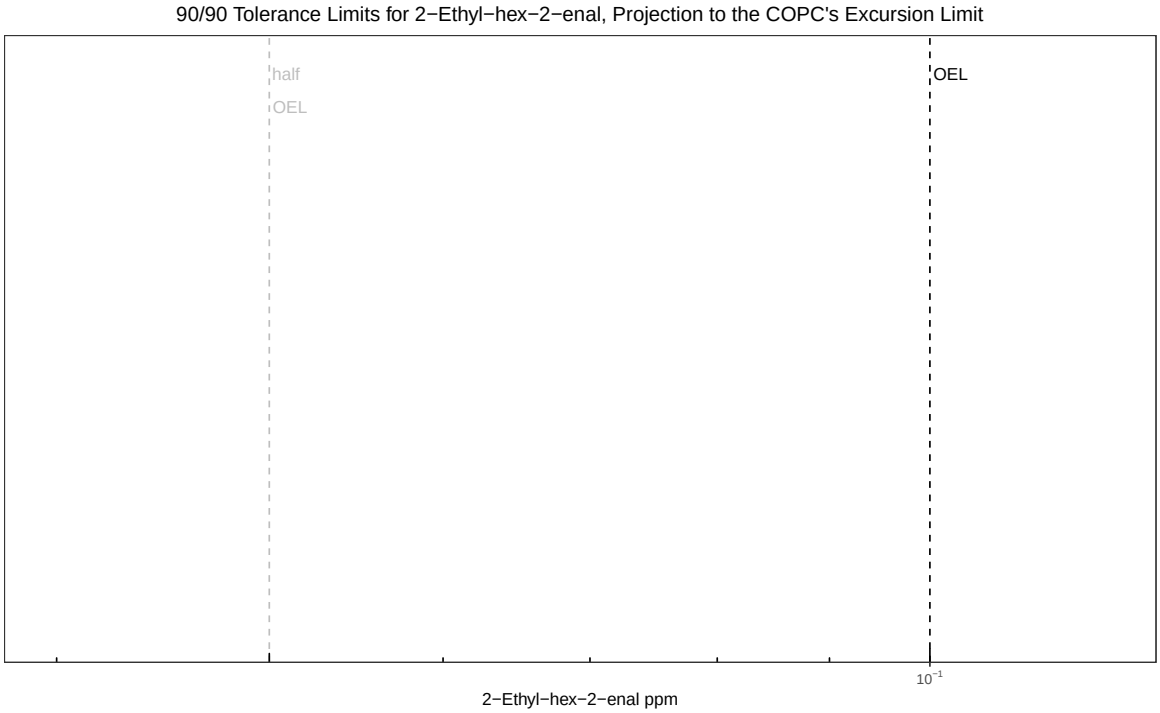


Figure E.107: Tolerance limits for 2-Ethyl-hex-2-enal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

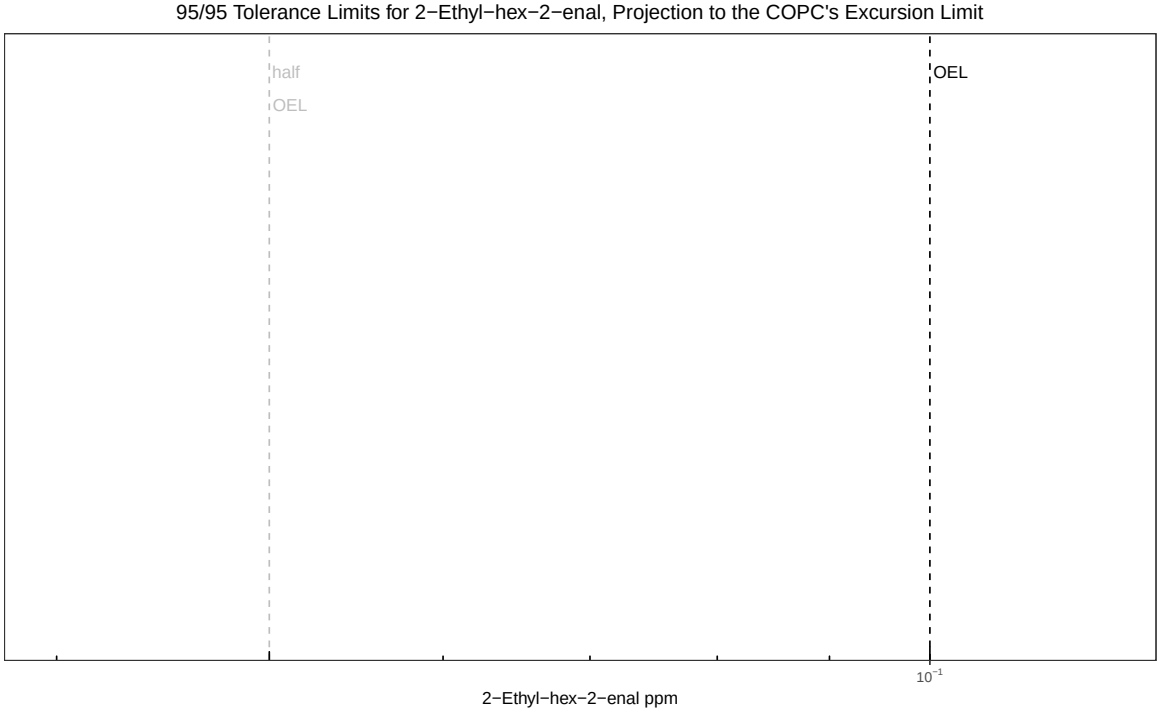


Figure E.108: Tolerance limits for 2-Ethyl-hex-2-enal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

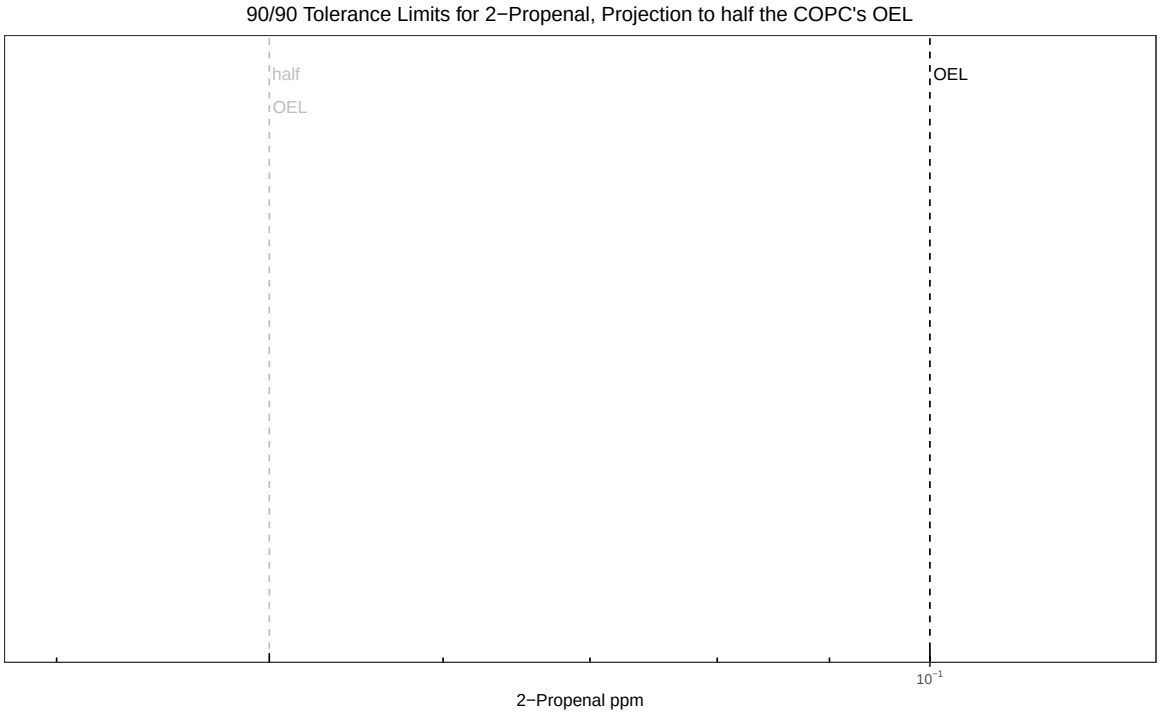


Figure E.109: Tolerance limits for 2-Propenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

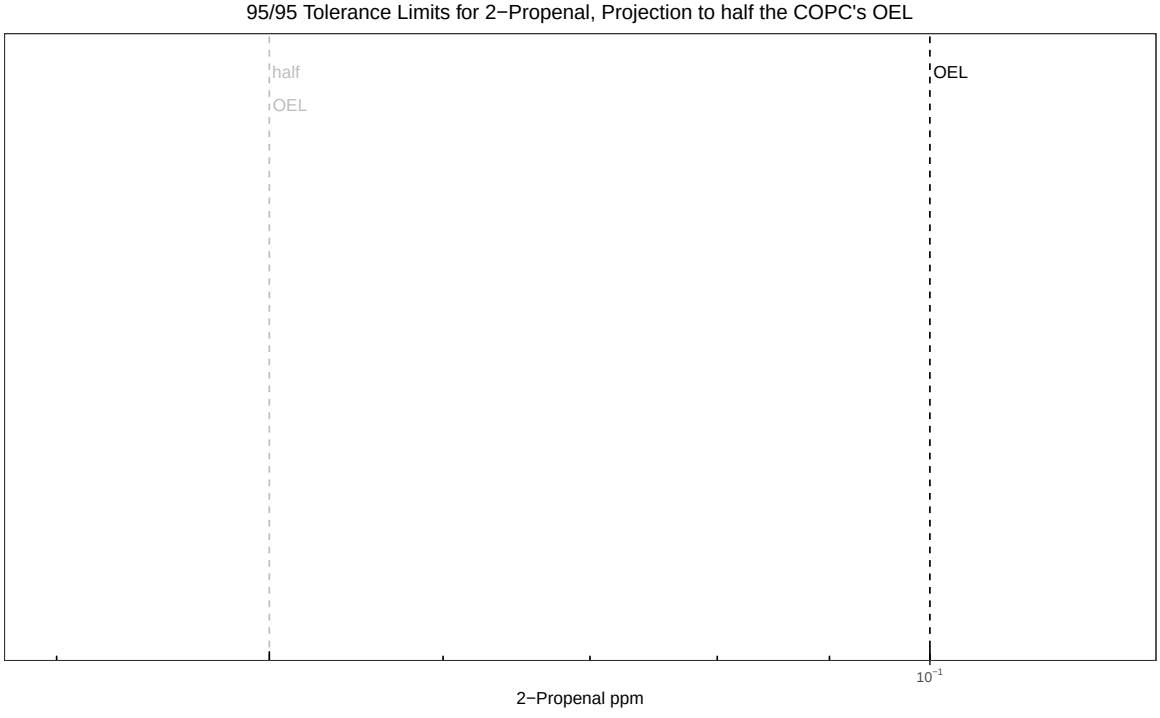


Figure E.110: Tolerance limits for 2-Propenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

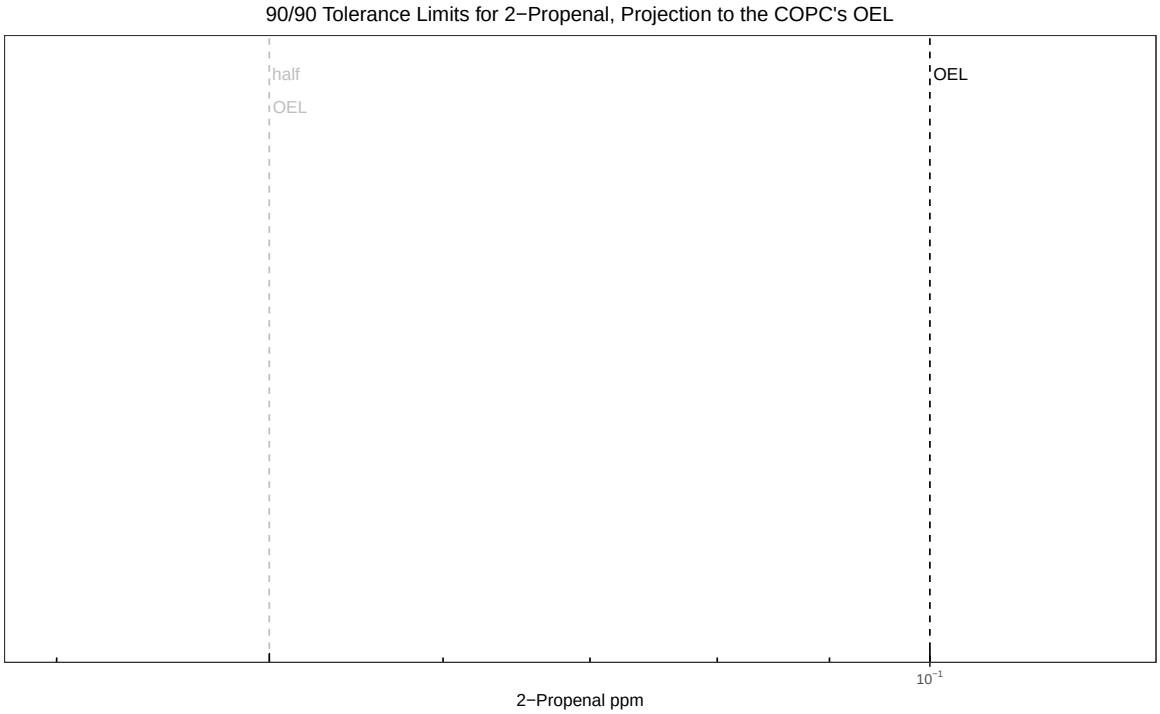


Figure E.111: Tolerance limits for 2-Propenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

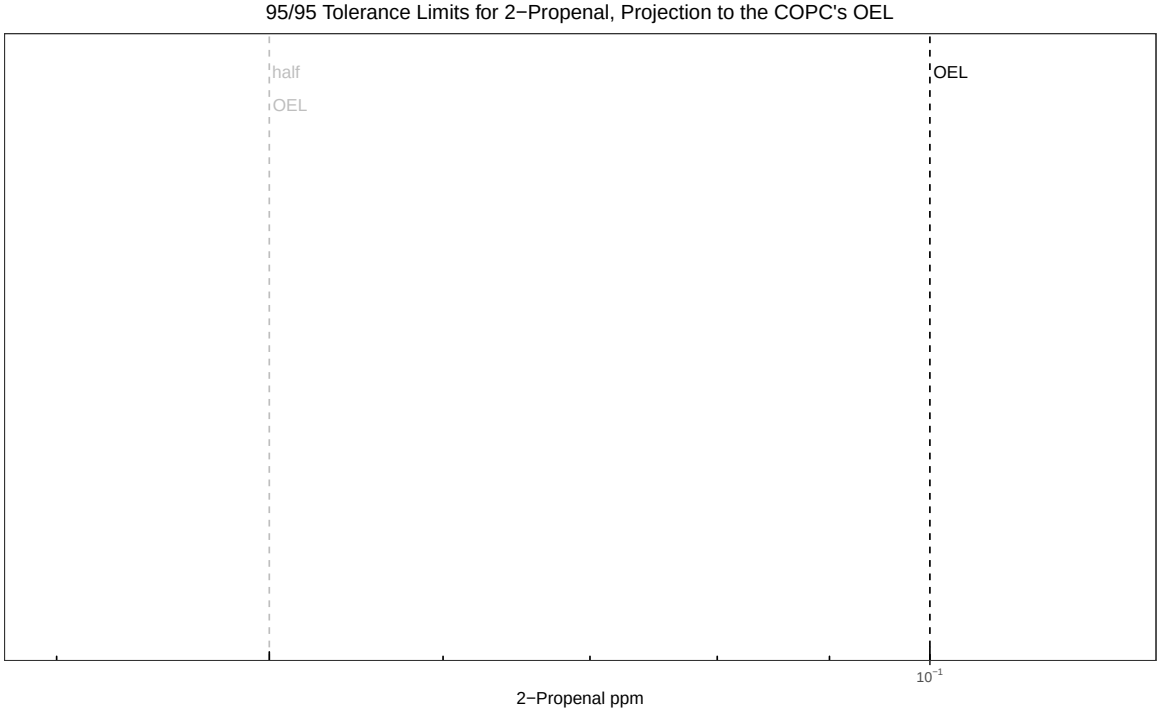


Figure E.112: Tolerance limits for 2-Propenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

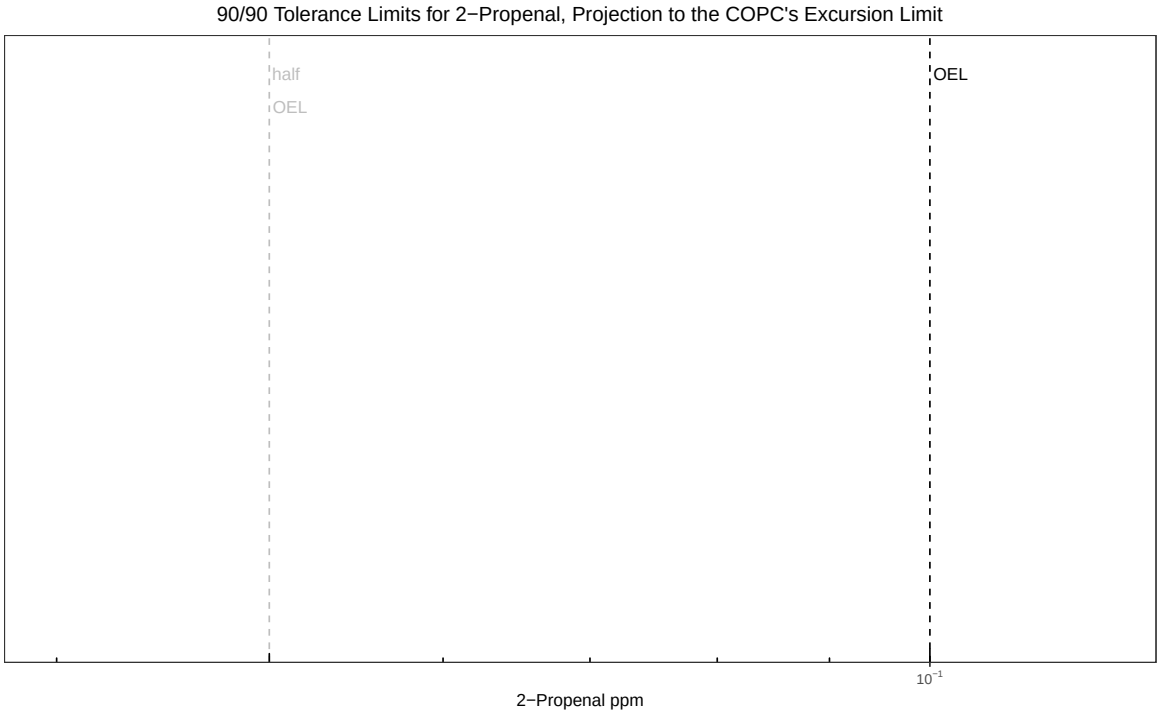


Figure E.113: Tolerance limits for 2-Propenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

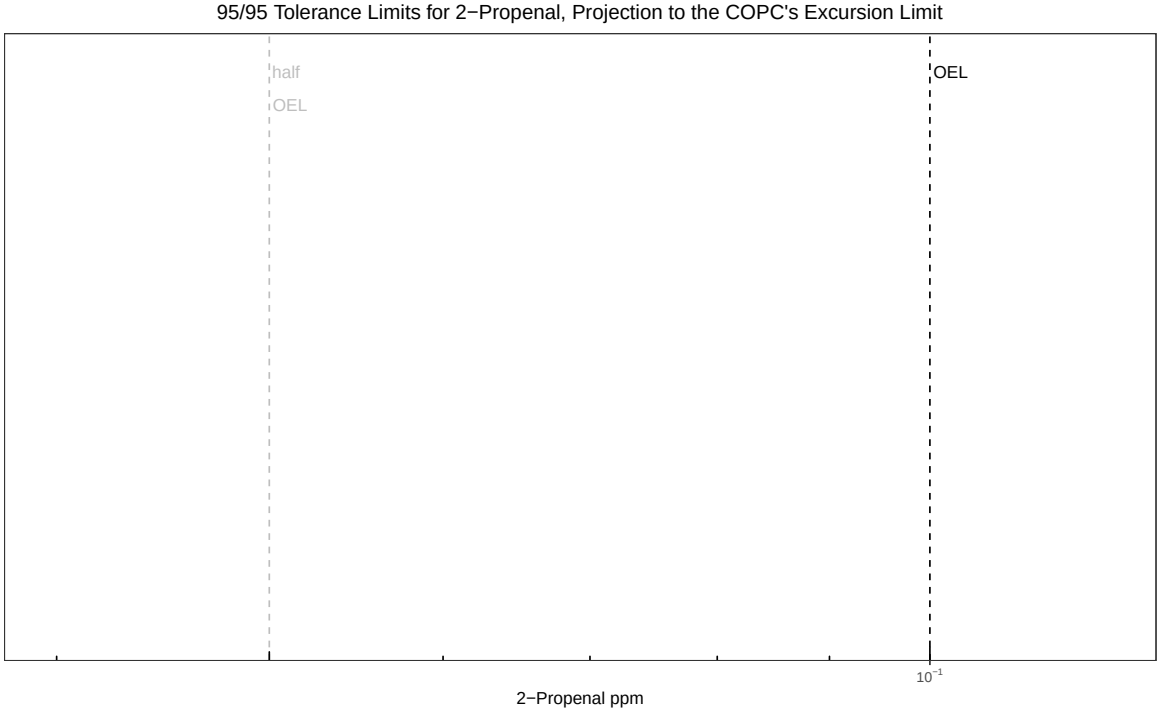


Figure E.114: Tolerance limits for 2-Propenal as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

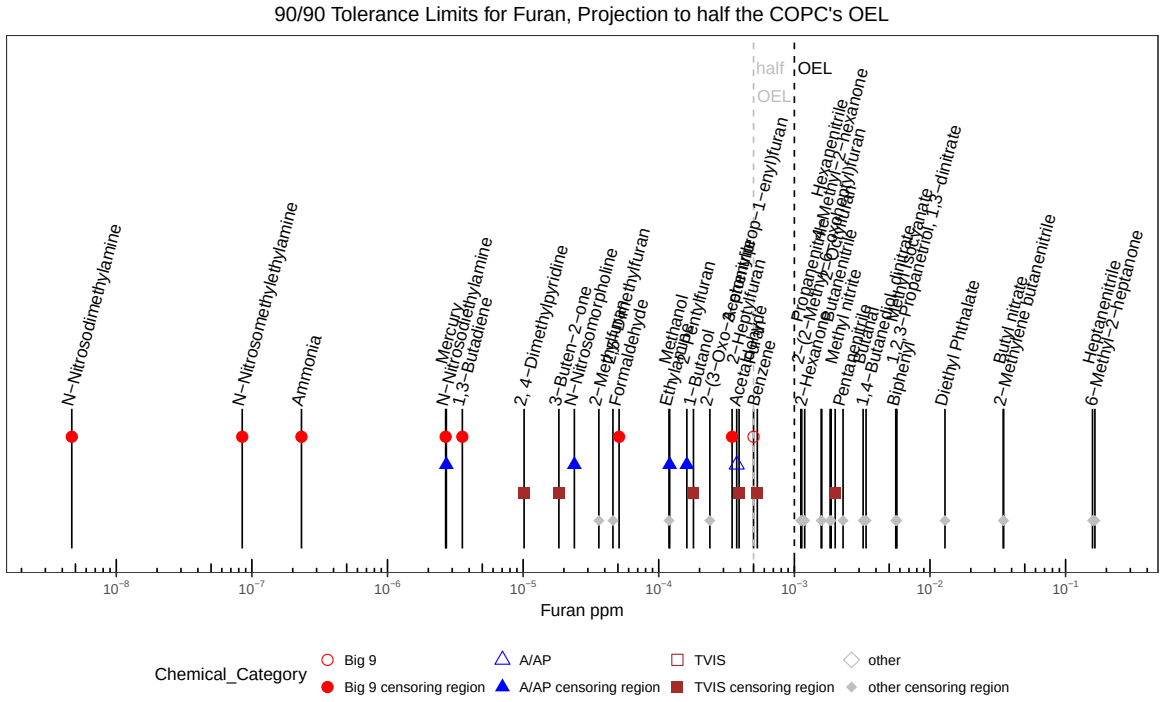


Figure E.115: Tolerance limits for Furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

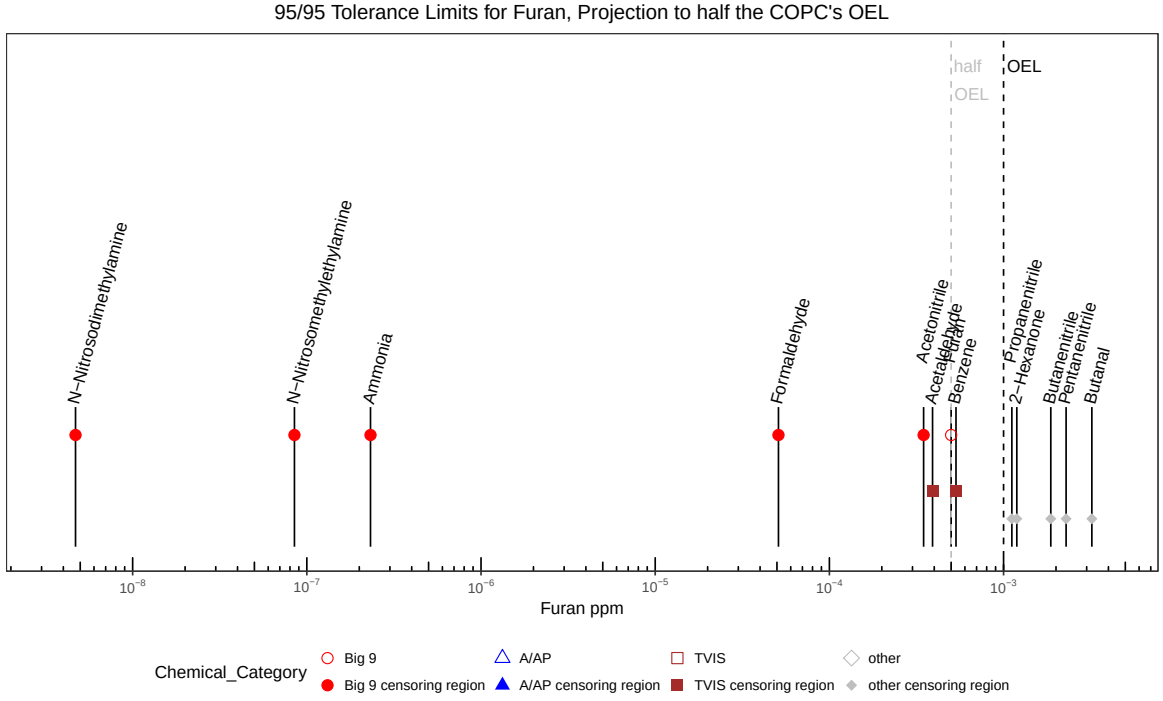


Figure E.116: Tolerance limits for Furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

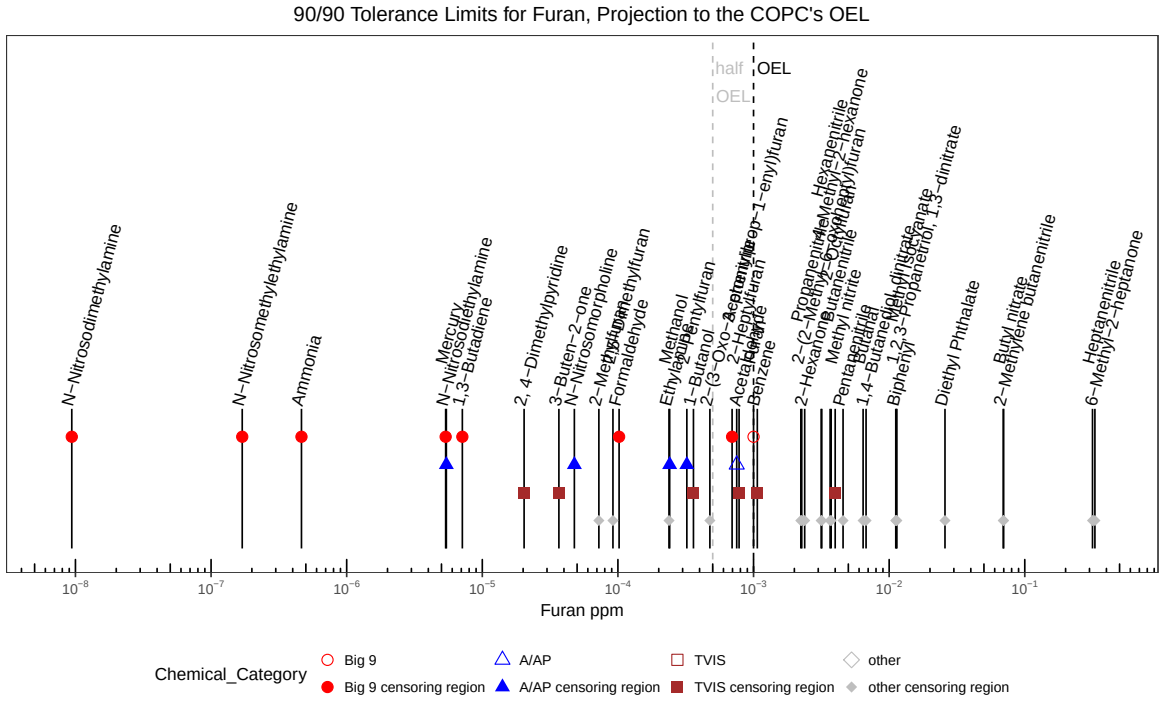


Figure E.117: Tolerance limits for Furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

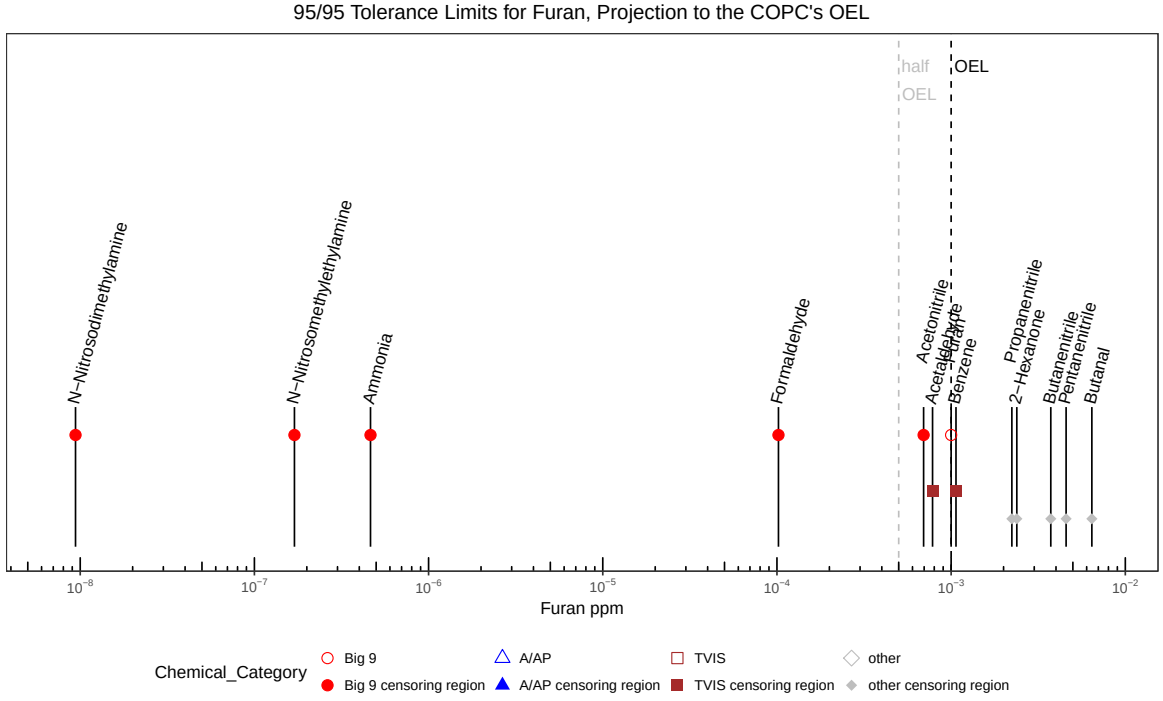


Figure E.118: Tolerance limits for Furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

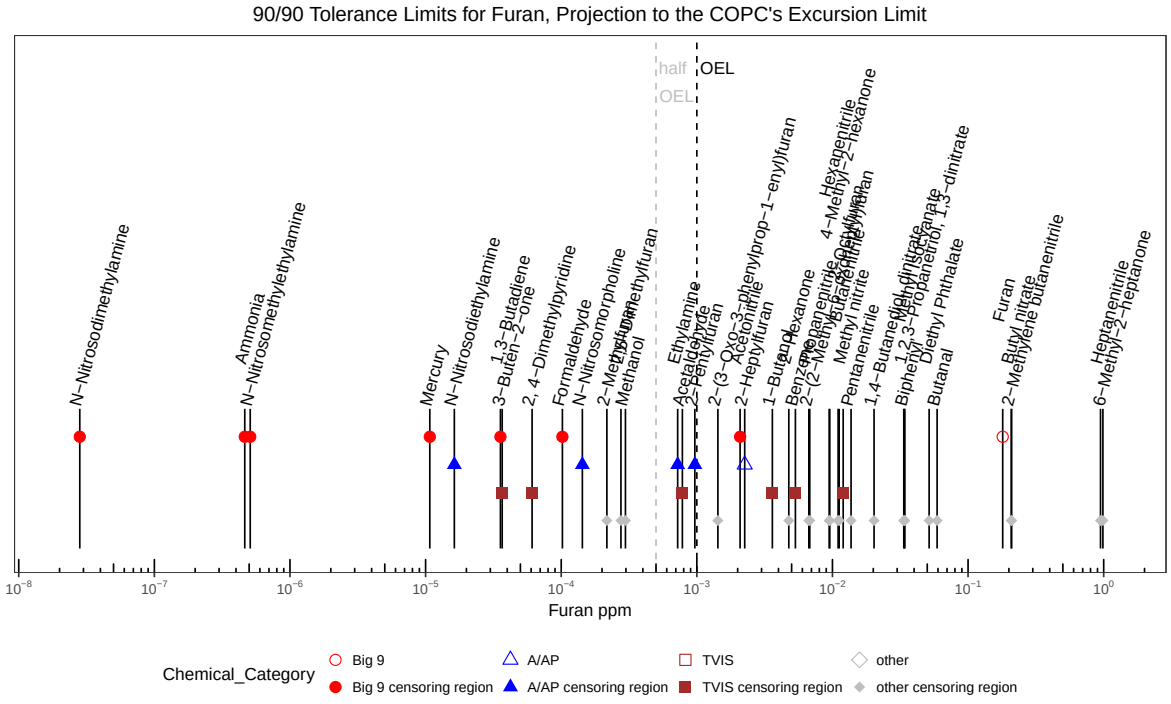


Figure E.119: Tolerance limits for Furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

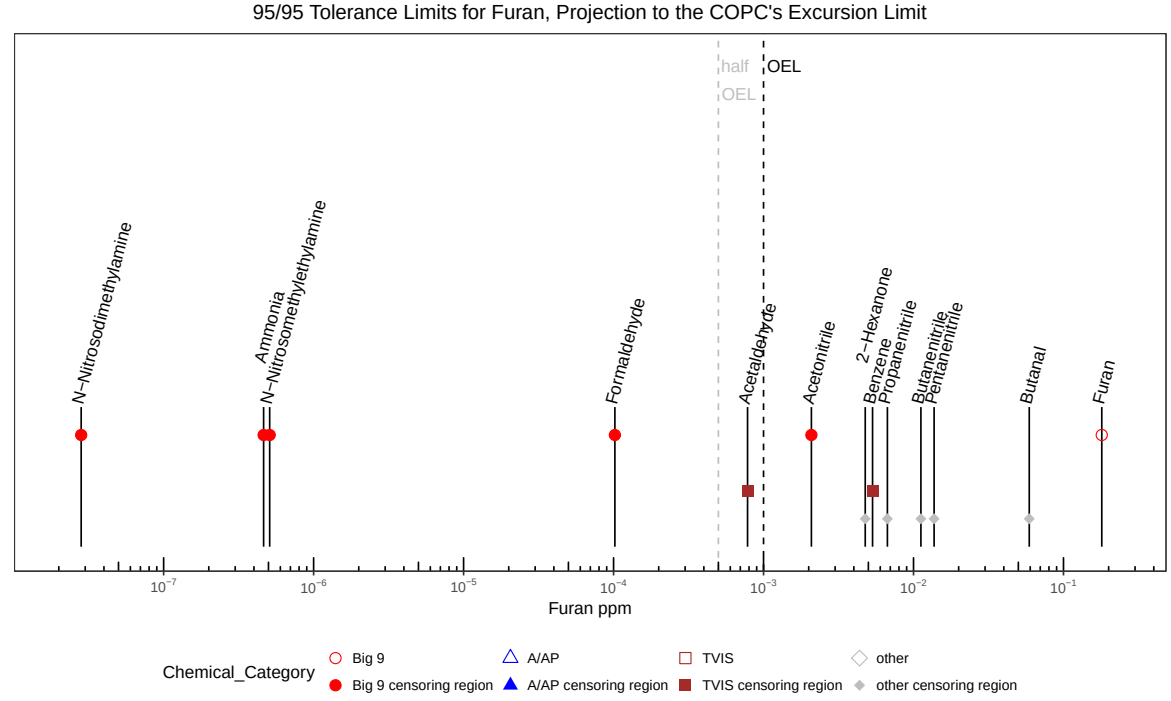


Figure E.120: Tolerance limits for Furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

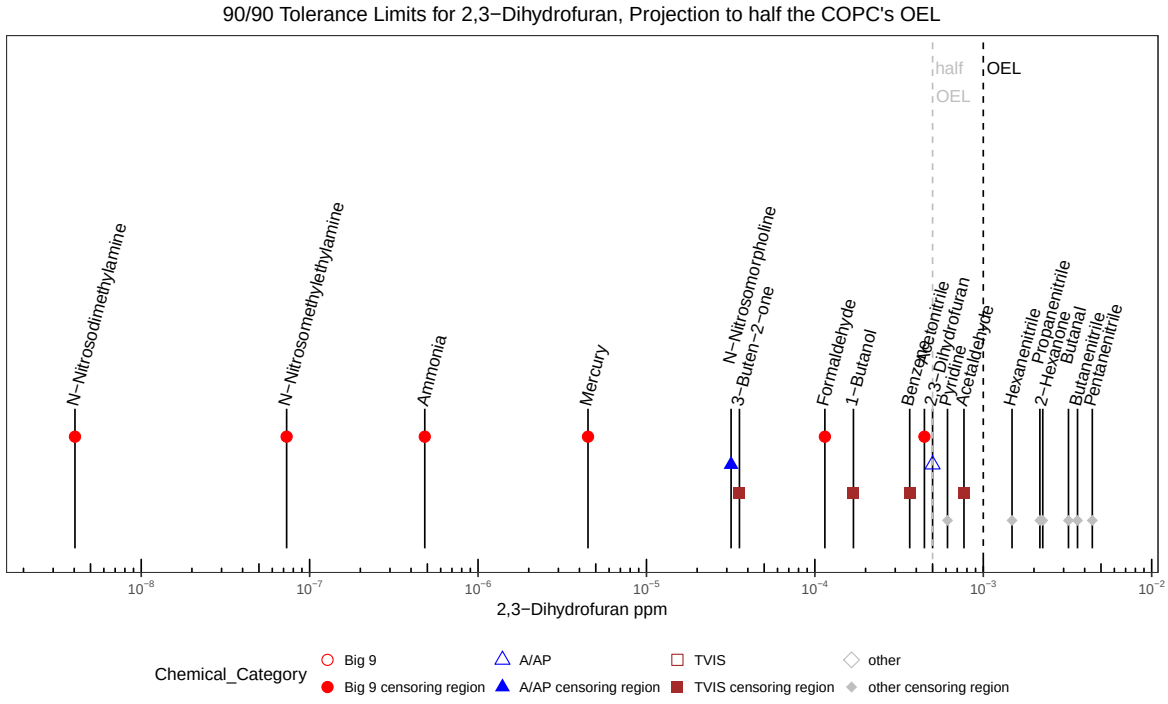


Figure E.121: Tolerance limits for 2,3-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

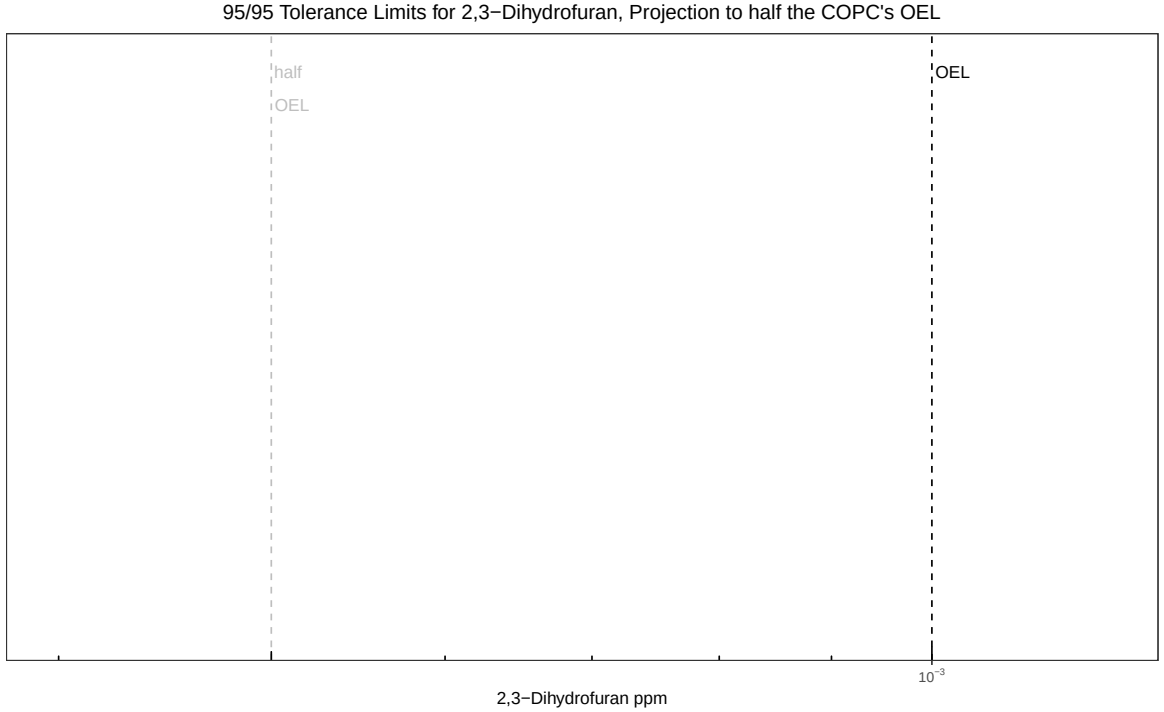


Figure E.122: Tolerance limits for 2,3-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

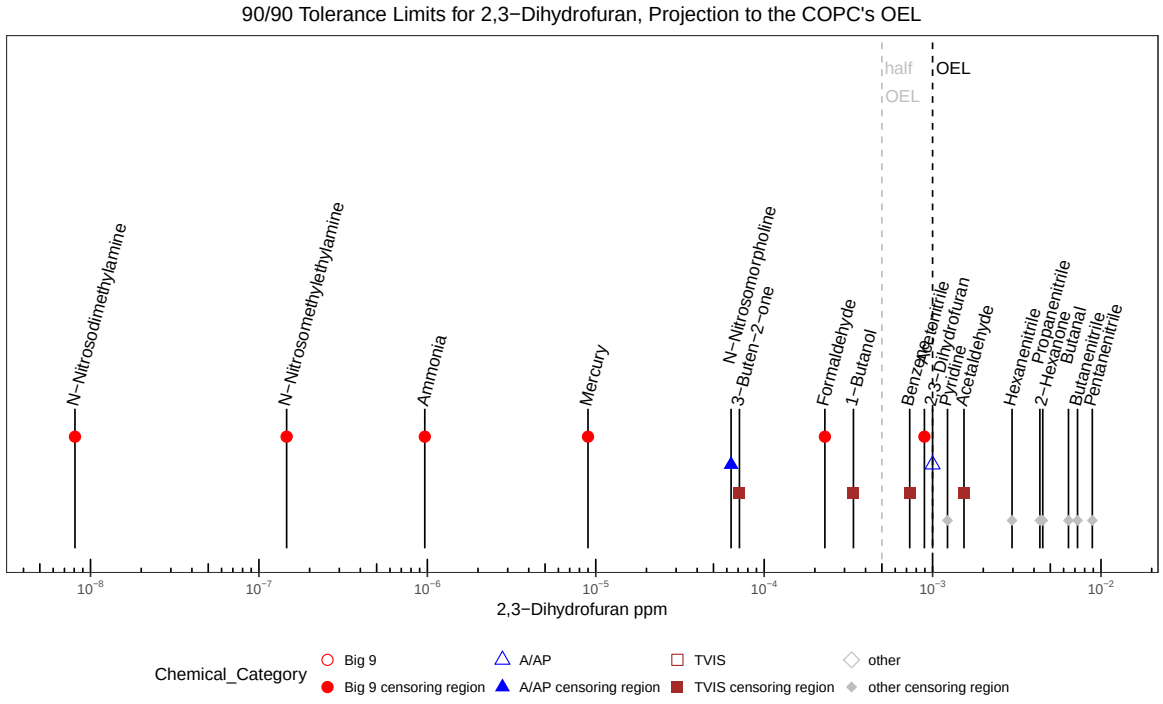


Figure E.123: Tolerance limits for 2,3-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

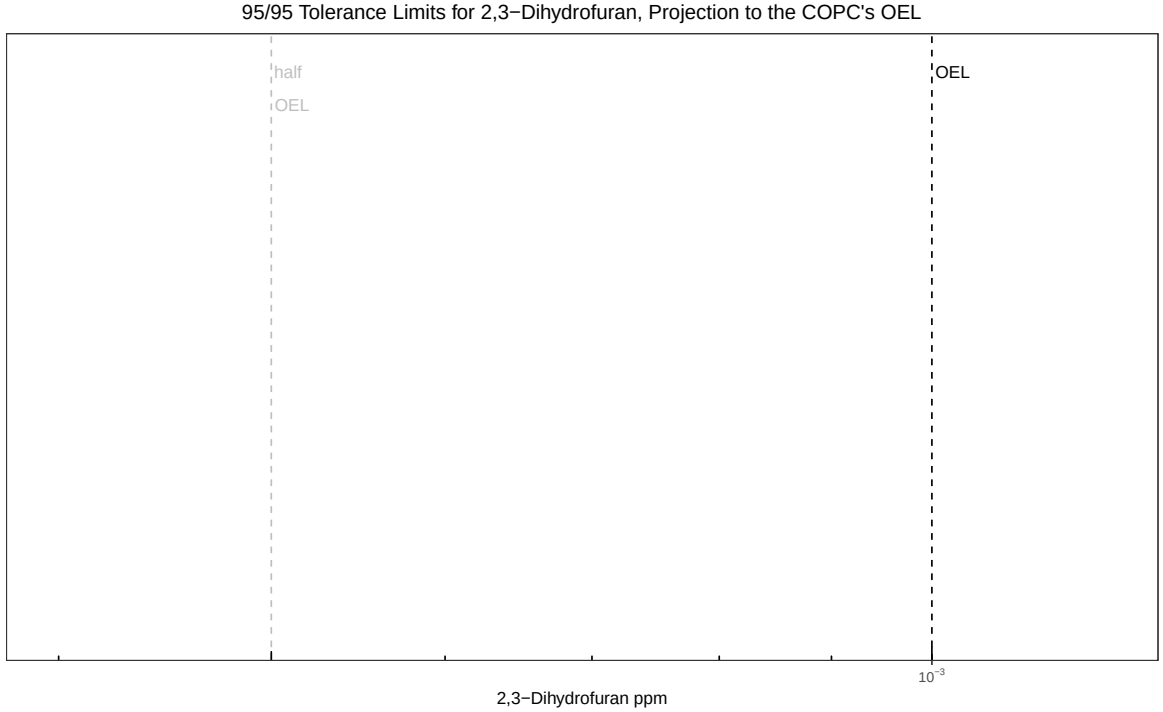


Figure E.124: Tolerance limits for 2,3-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

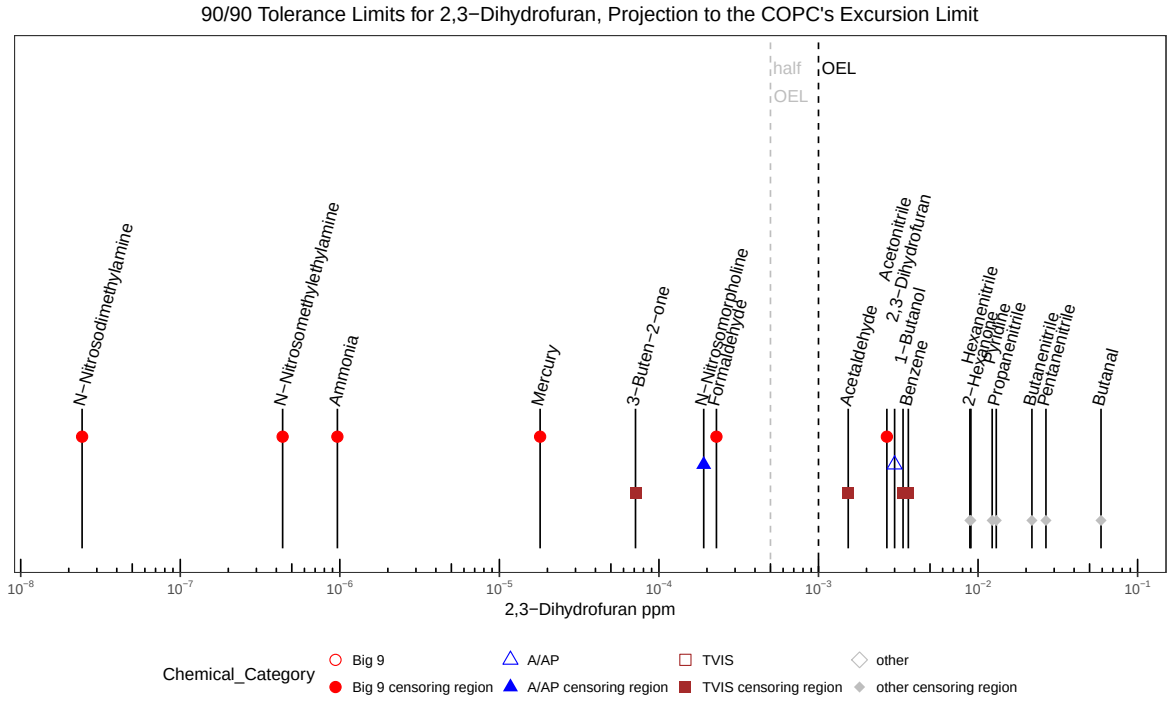


Figure E.125: Tolerance limits for 2,3-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

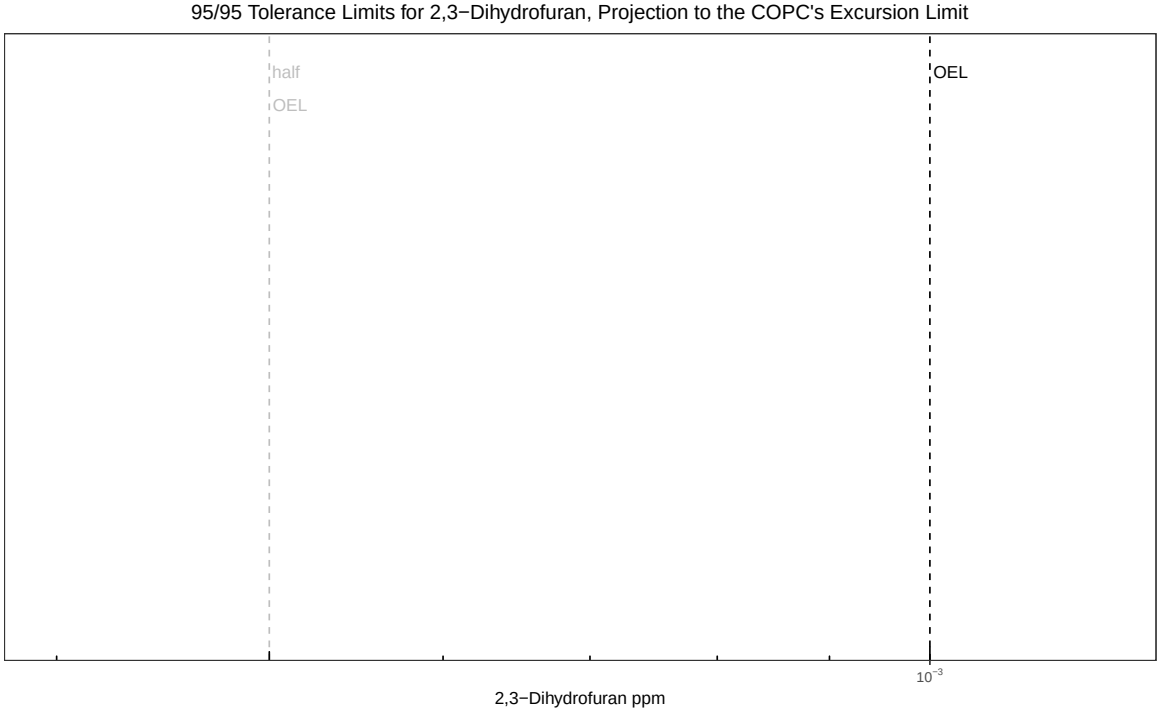


Figure E.126: Tolerance limits for 2,3-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

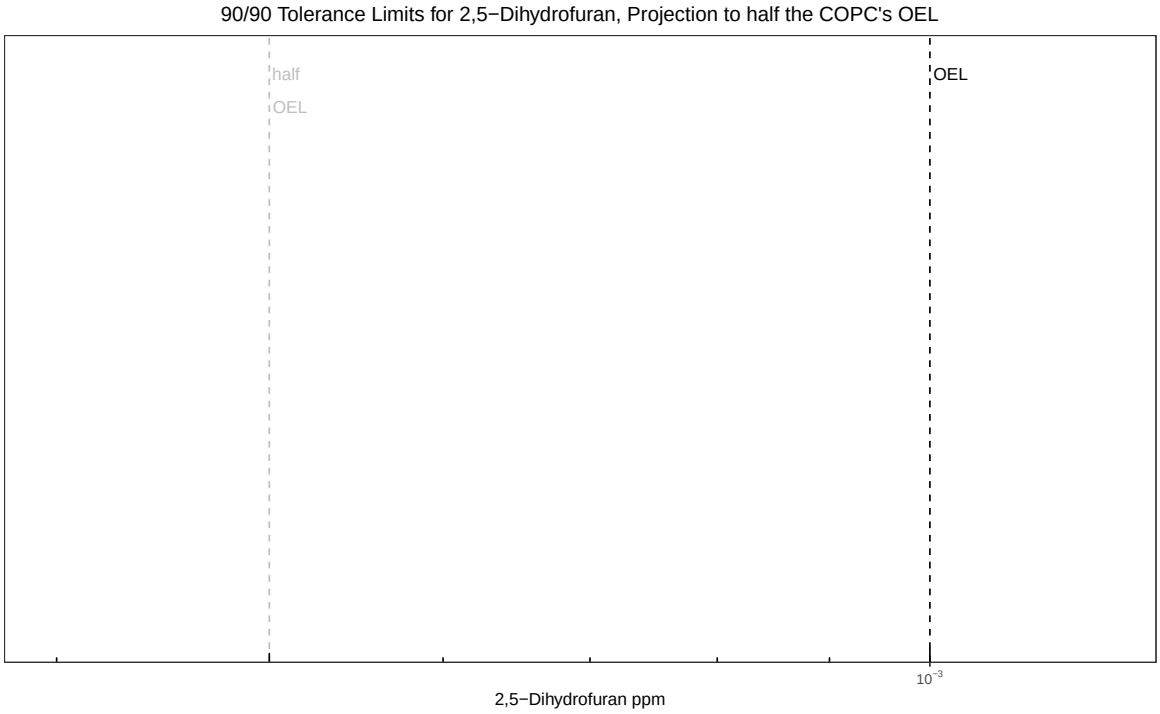


Figure E.127: Tolerance limits for 2,5-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

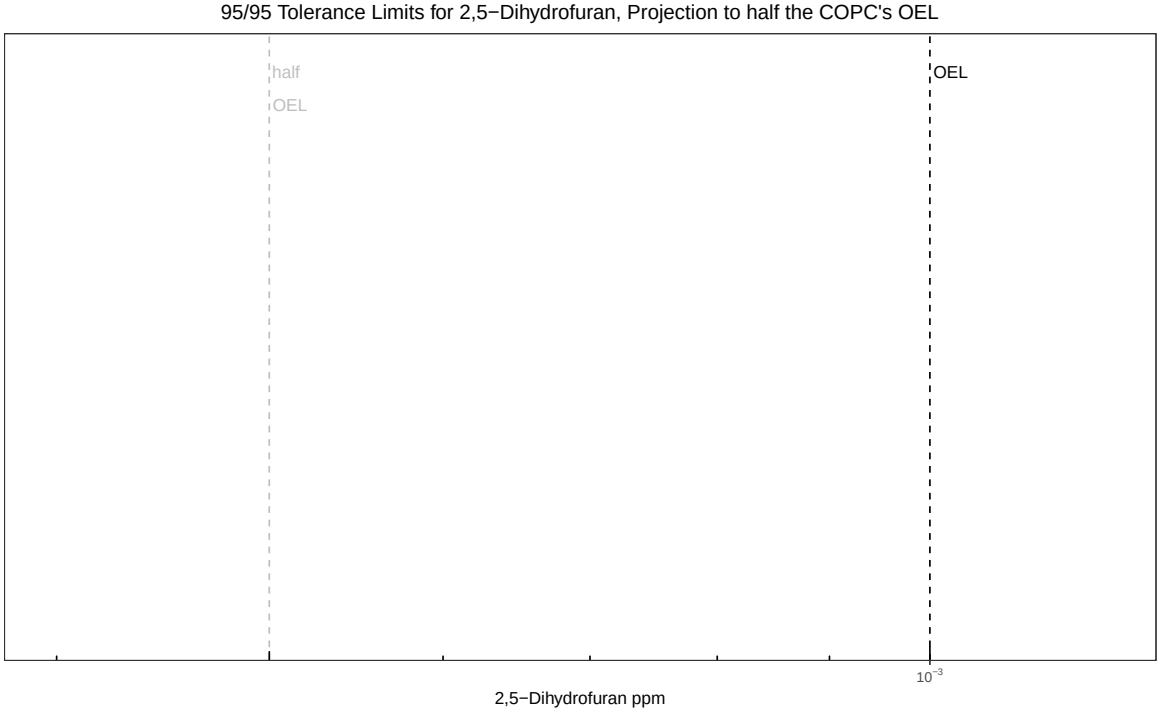


Figure E.128: Tolerance limits for 2,5-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

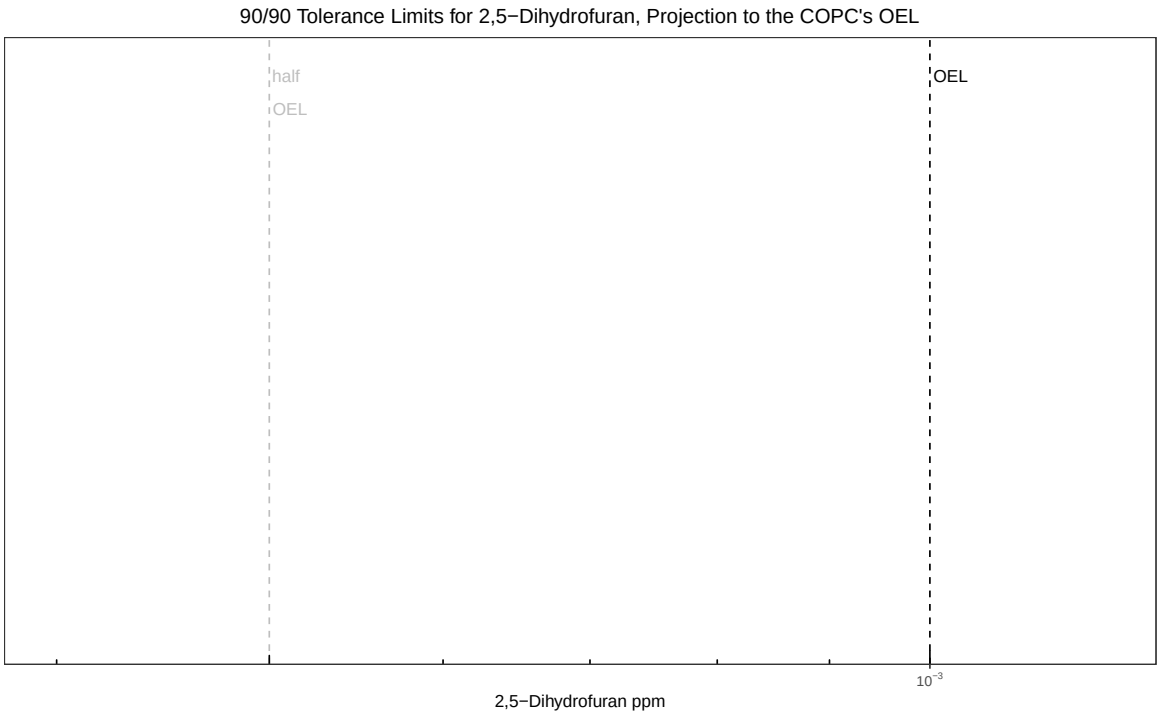


Figure E.129: Tolerance limits for 2,5-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

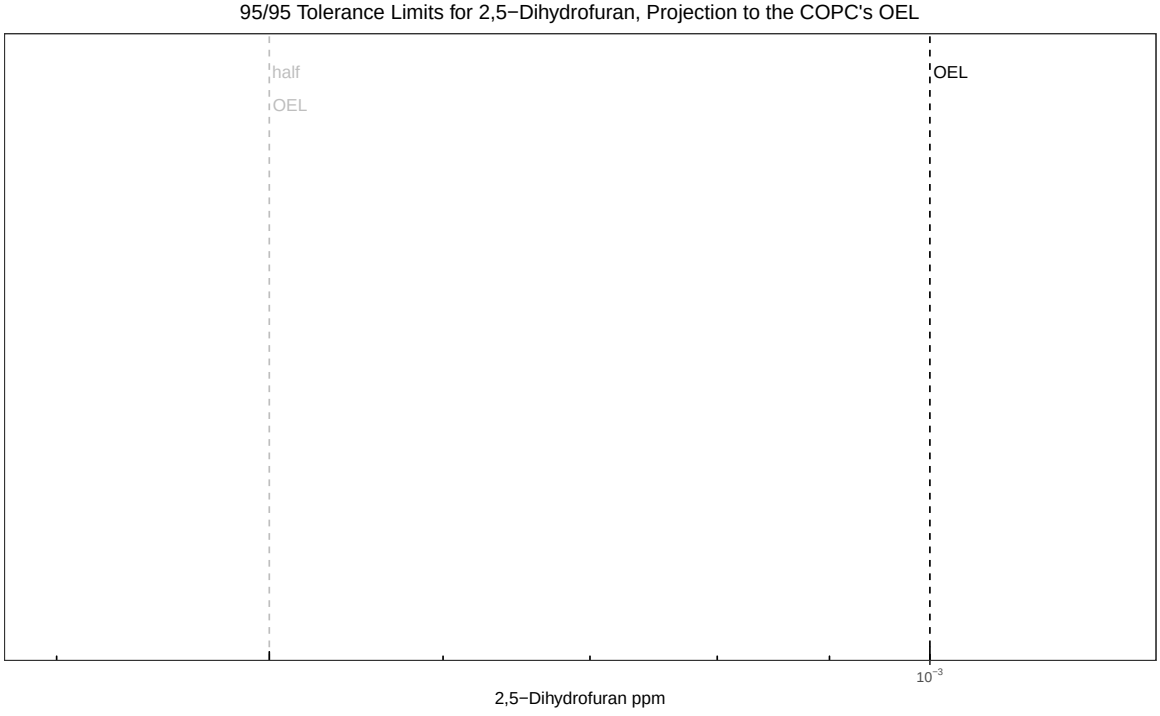


Figure E.130: Tolerance limits for 2,5-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

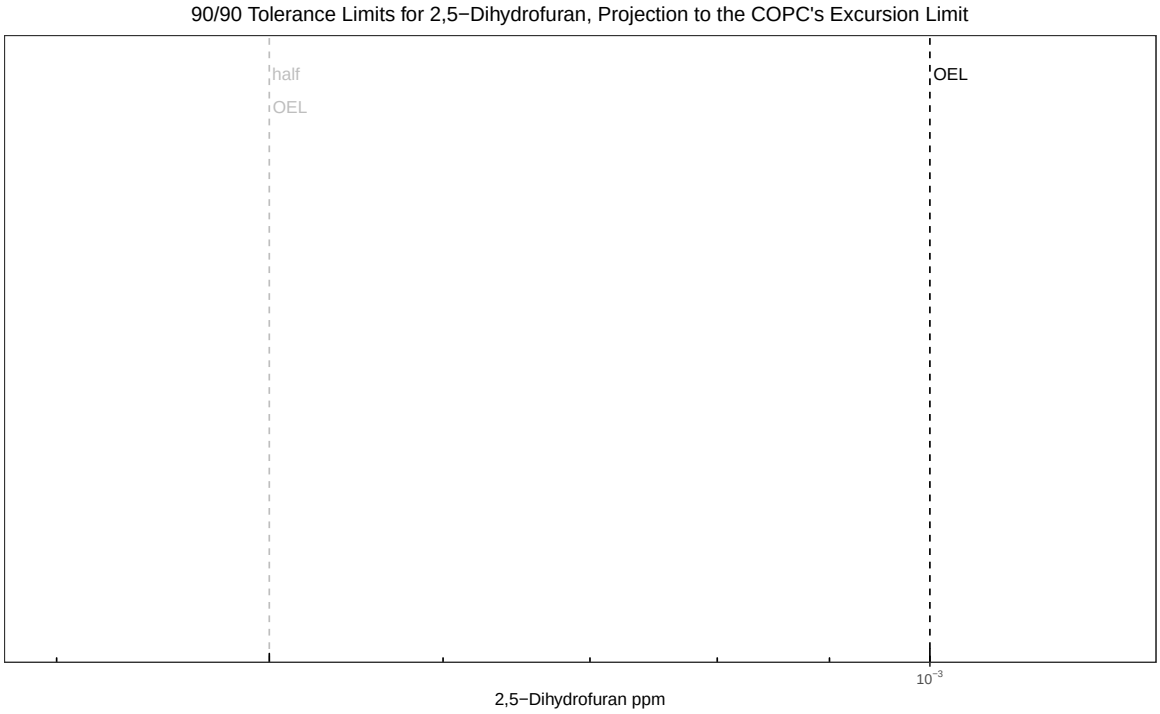


Figure E.131: Tolerance limits for 2,5-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

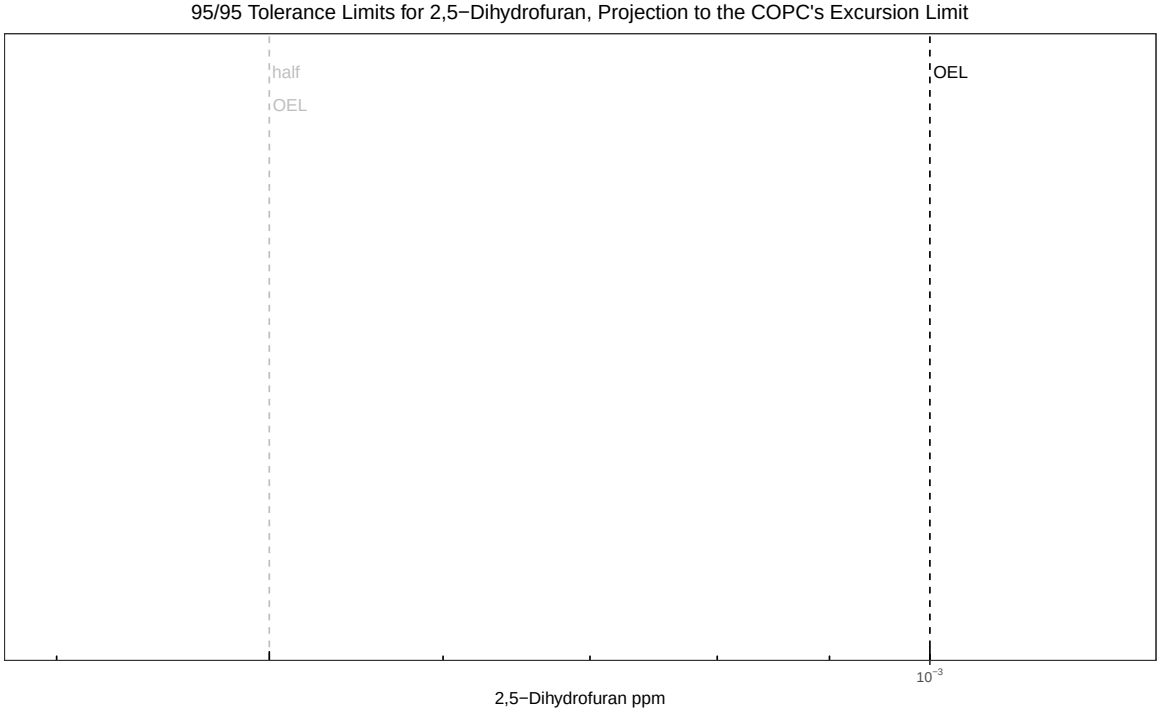


Figure E.132: Tolerance limits for 2,5-Dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

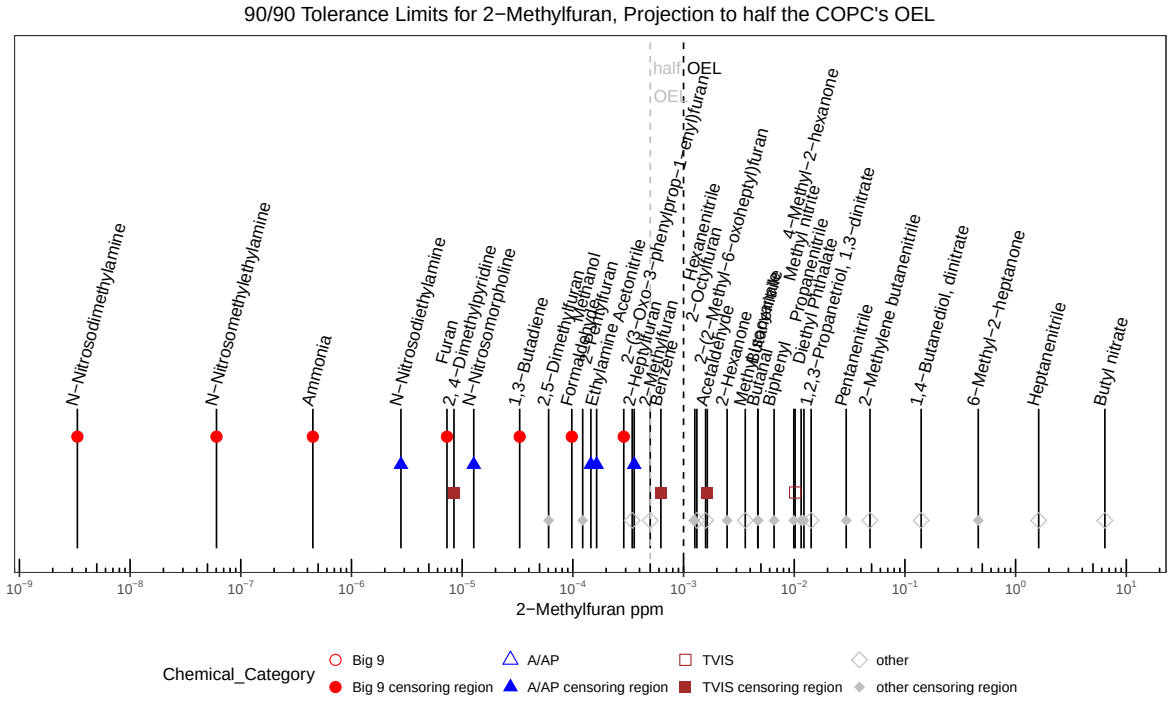


Figure E.133: Tolerance limits for 2-Methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

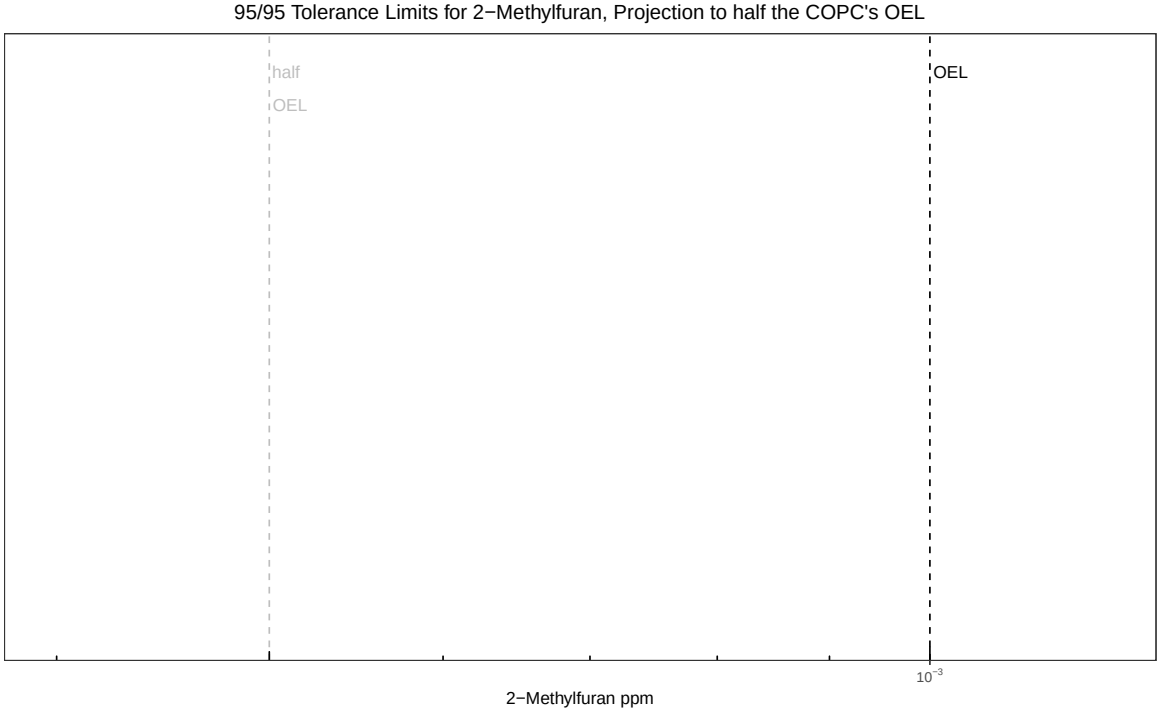


Figure E.134: Tolerance limits for 2-Methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

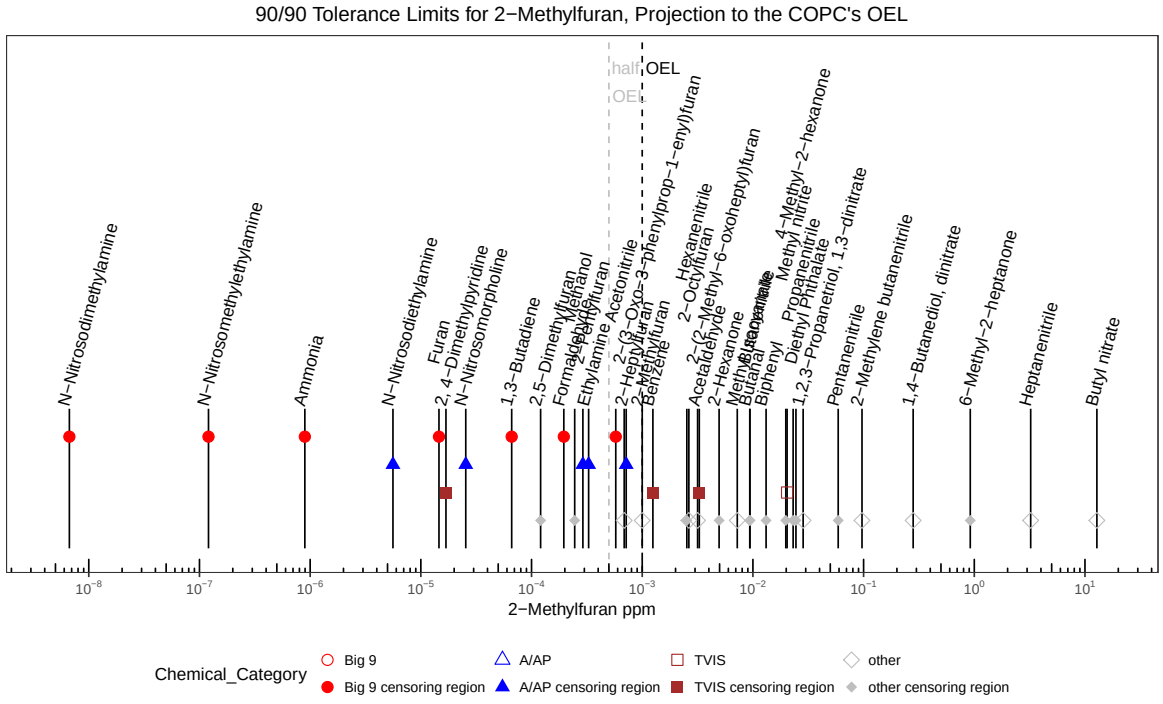


Figure E.135: Tolerance limits for 2-Methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

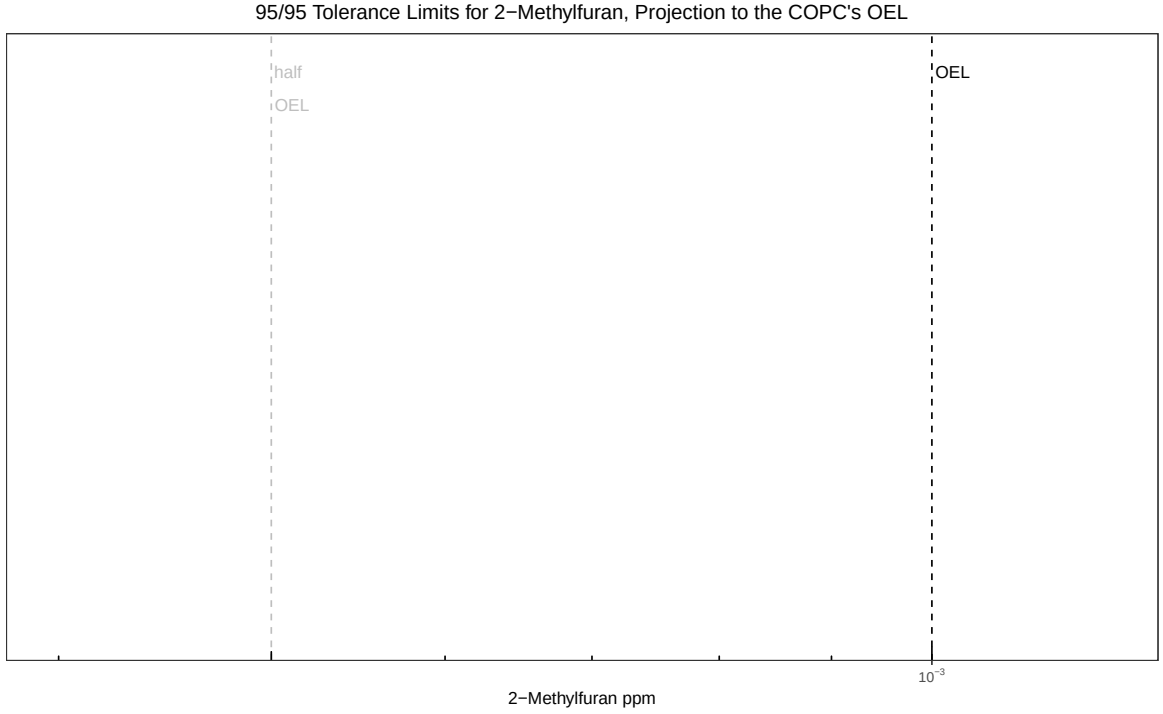


Figure E.136: Tolerance limits for 2-Methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

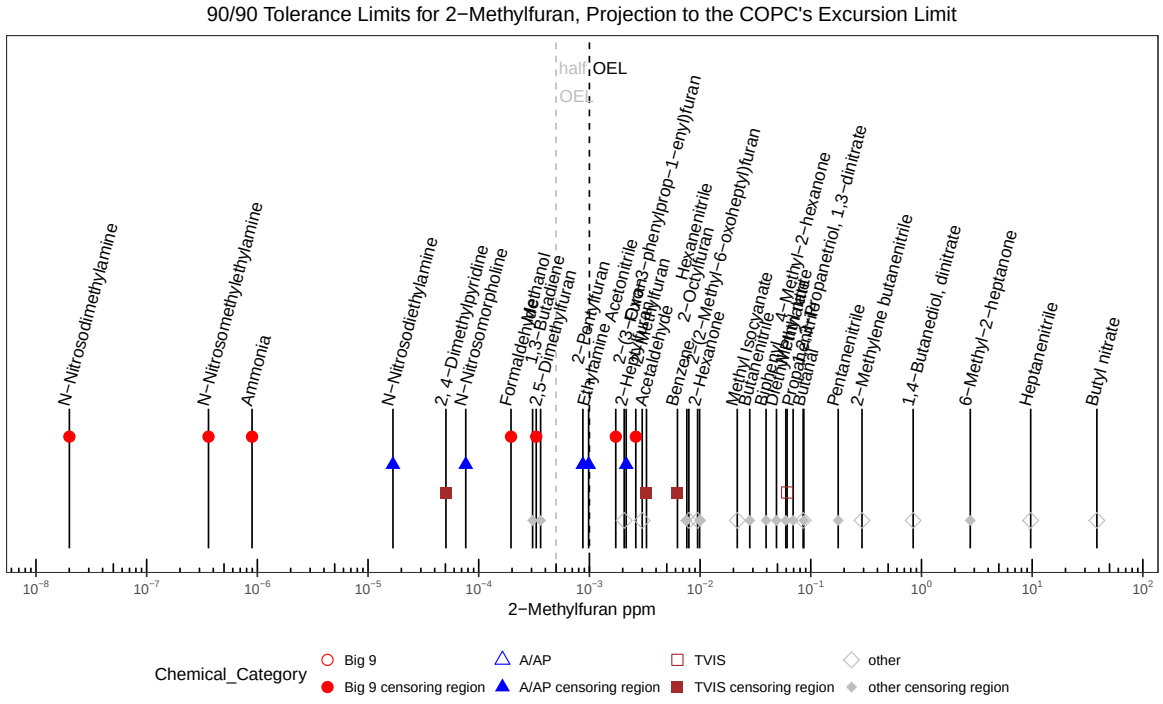


Figure E.137: Tolerance limits for 2-Methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

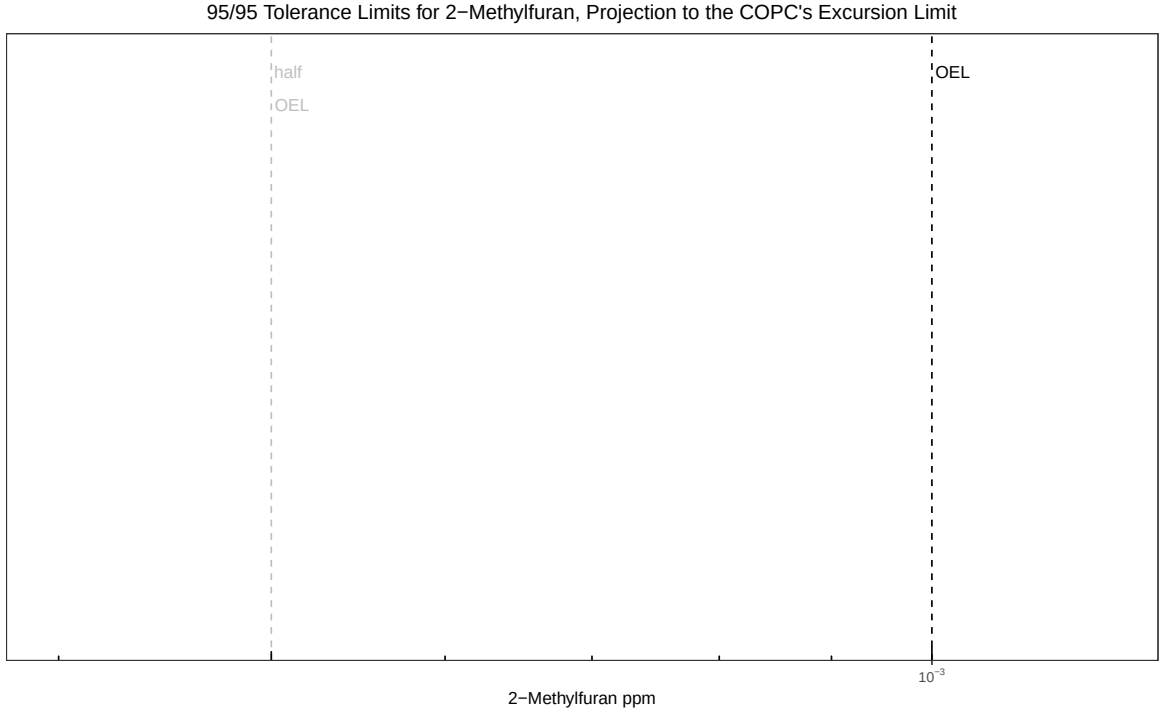


Figure E.138: Tolerance limits for 2-Methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

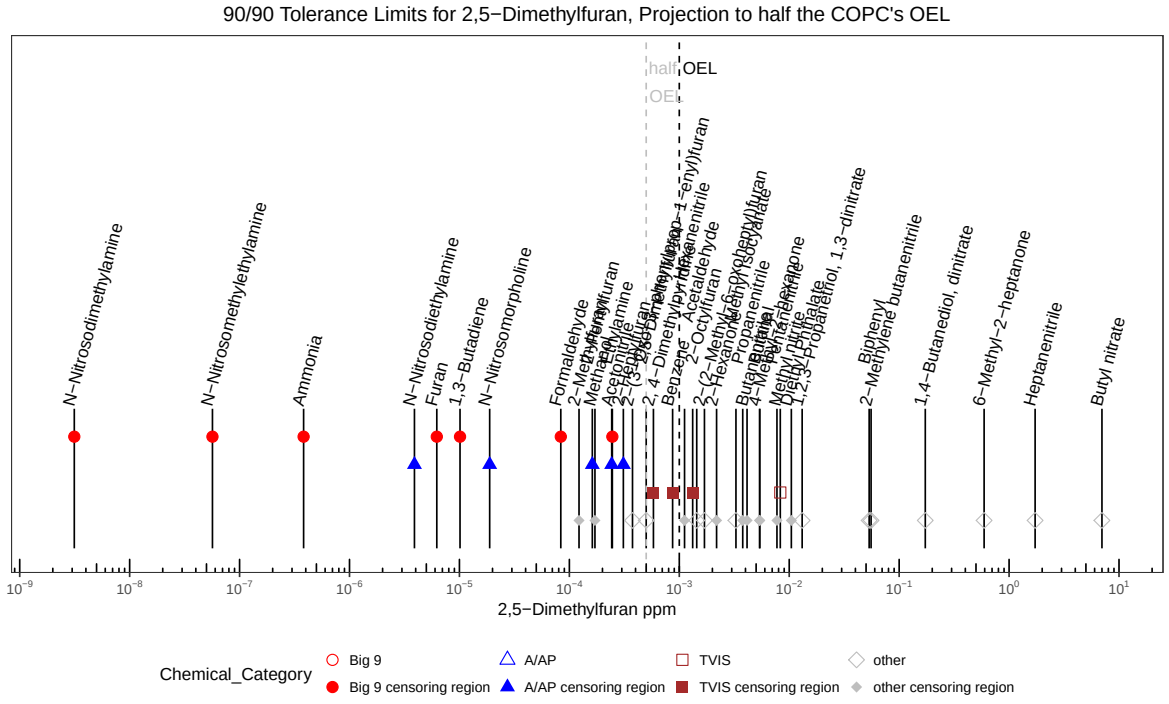


Figure E.139: Tolerance limits for 2,5-Dimethylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

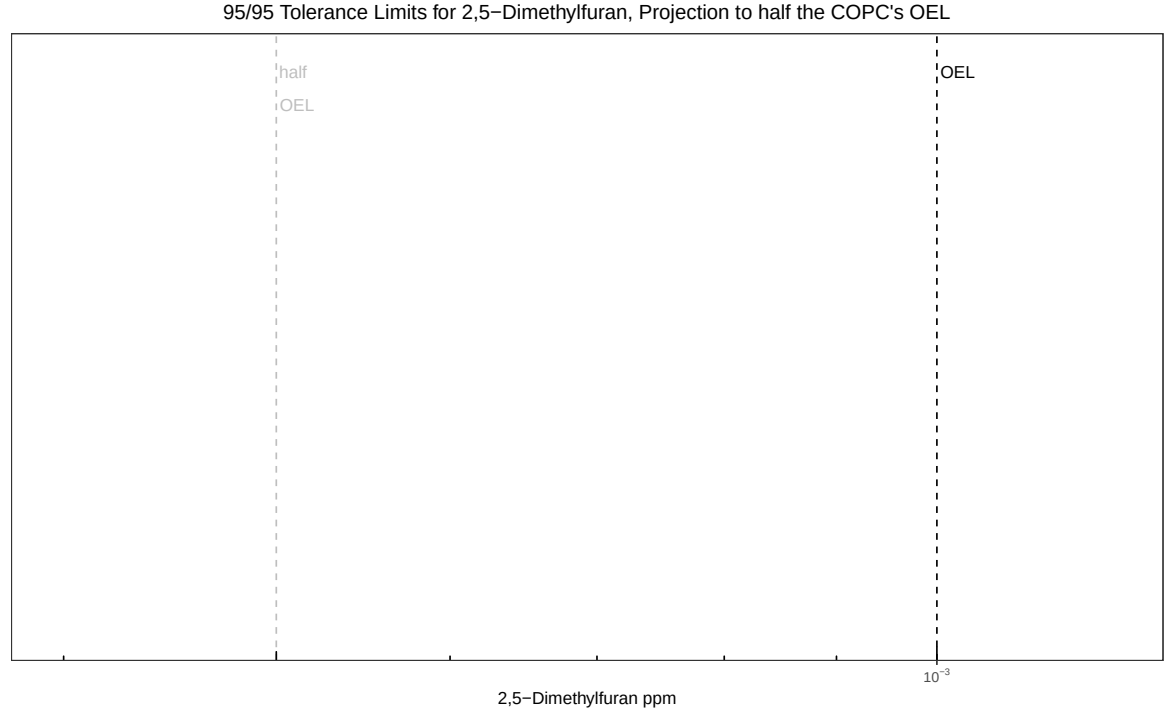


Figure E.140: Tolerance limits for 2,5-Dimethylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

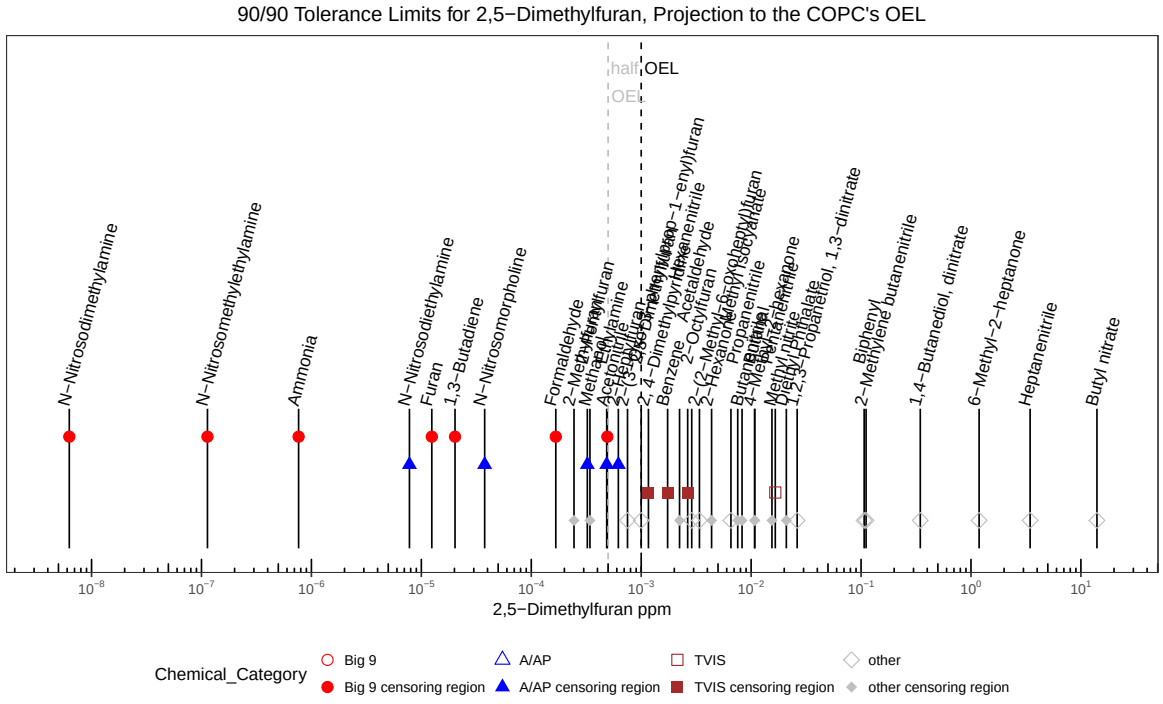


Figure E.141: Tolerance limits for 2,5-Dimethylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

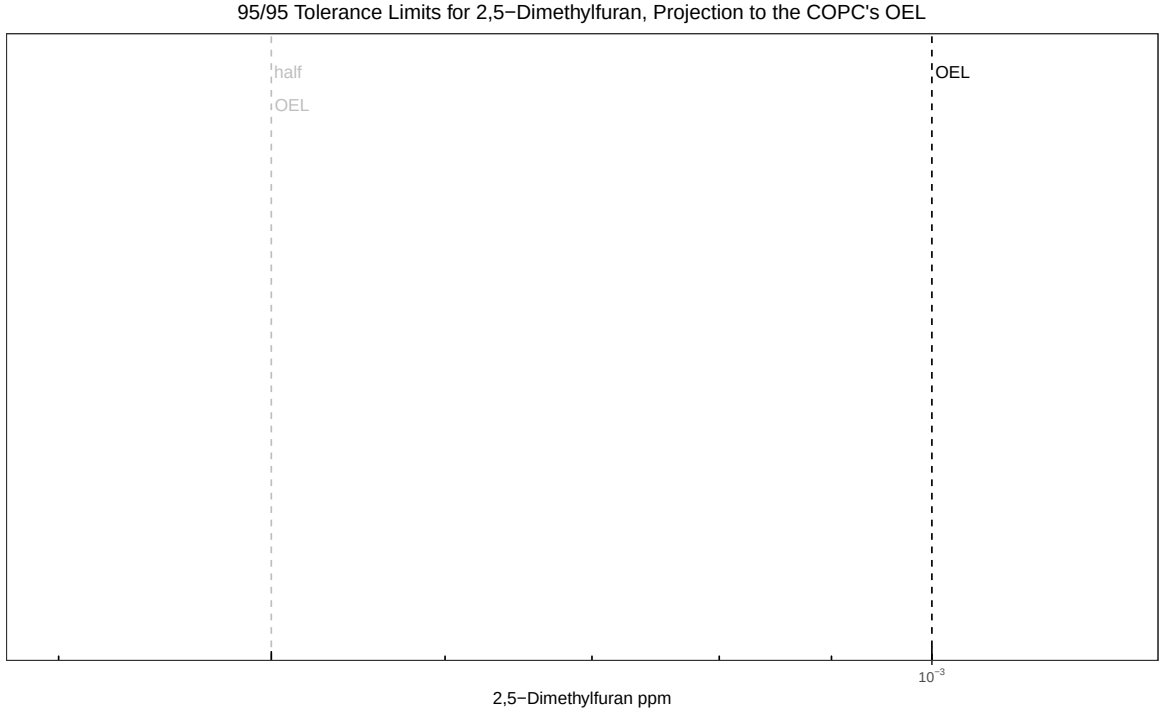


Figure E.142: Tolerance limits for 2,5-Dimethylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

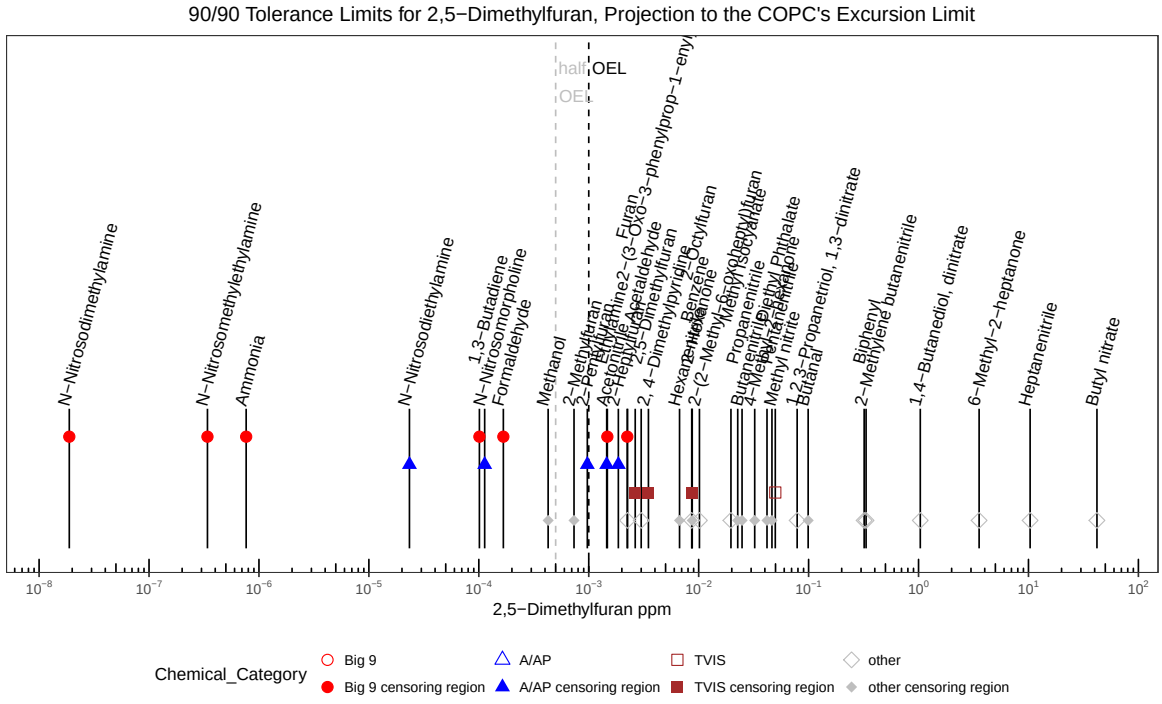


Figure E.143: Tolerance limits for 2,5-Dimethylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

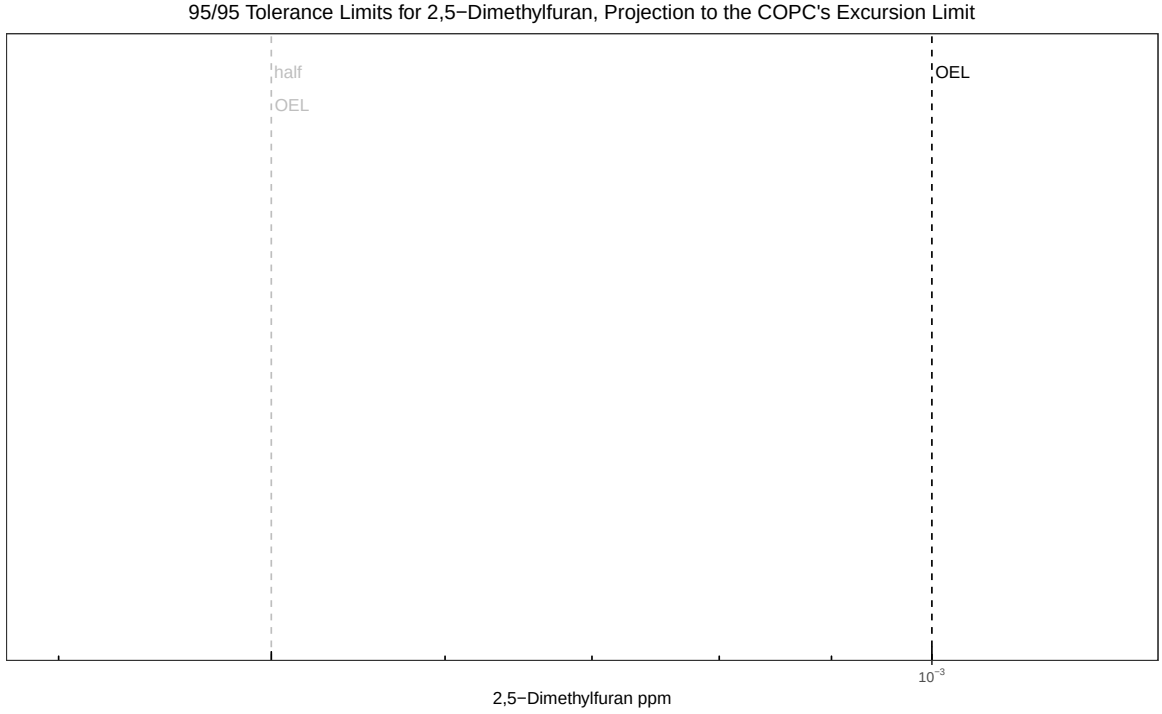


Figure E.144: Tolerance limits for 2,5-Dimethylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

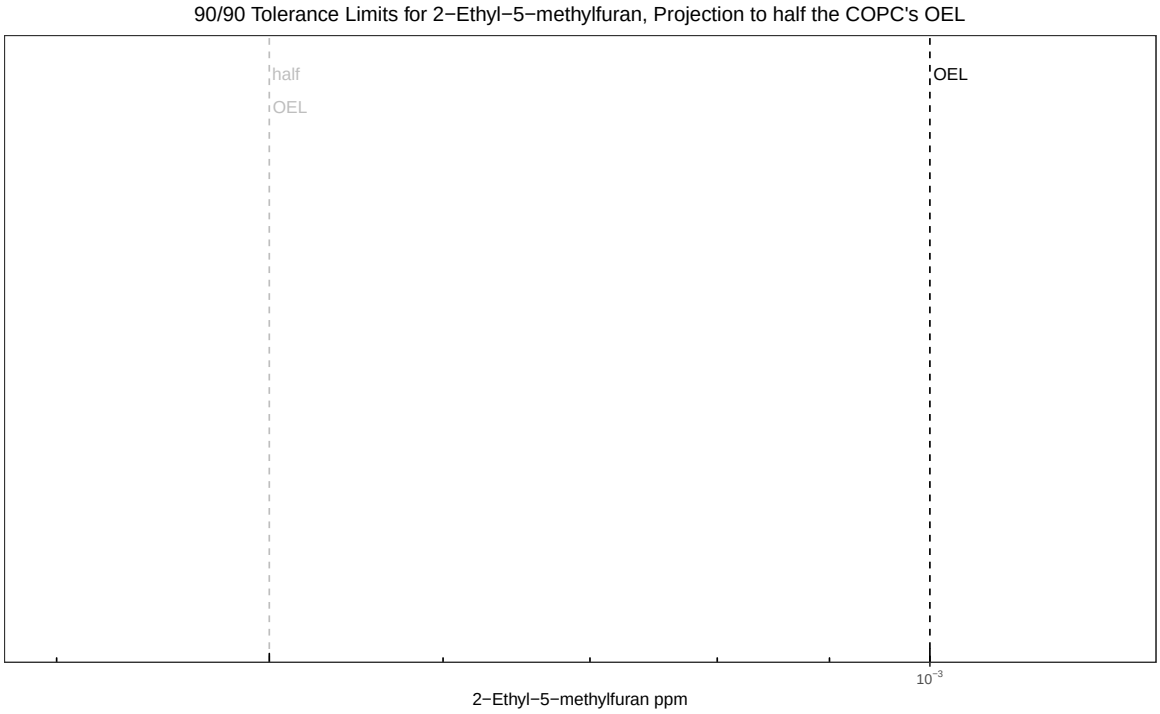


Figure E.145: Tolerance limits for 2-Ethyl-5-methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

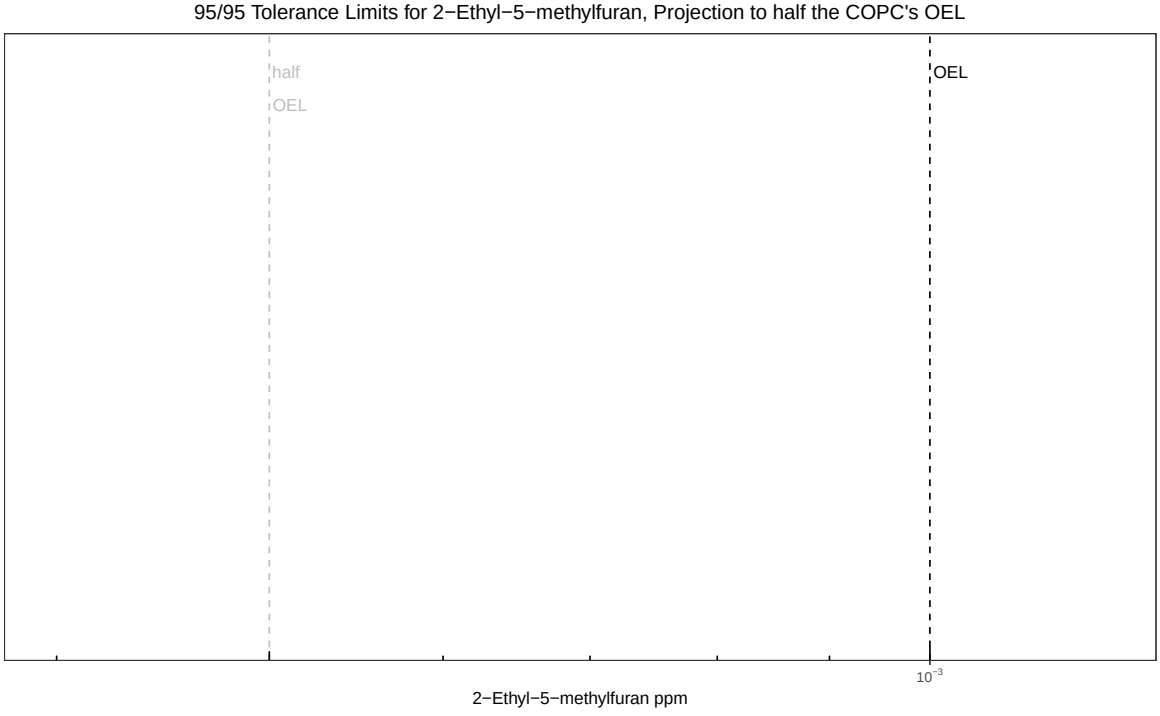


Figure E.146: Tolerance limits for 2-Ethyl-5-methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

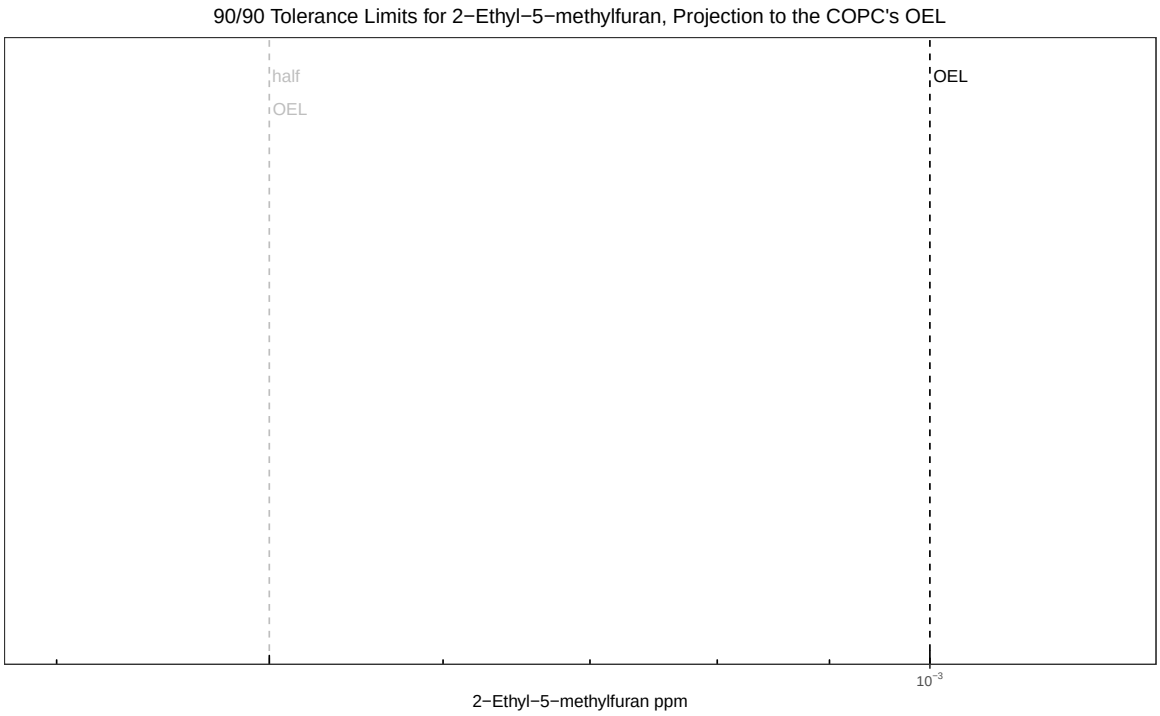


Figure E.147: Tolerance limits for 2-Ethyl-5-methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

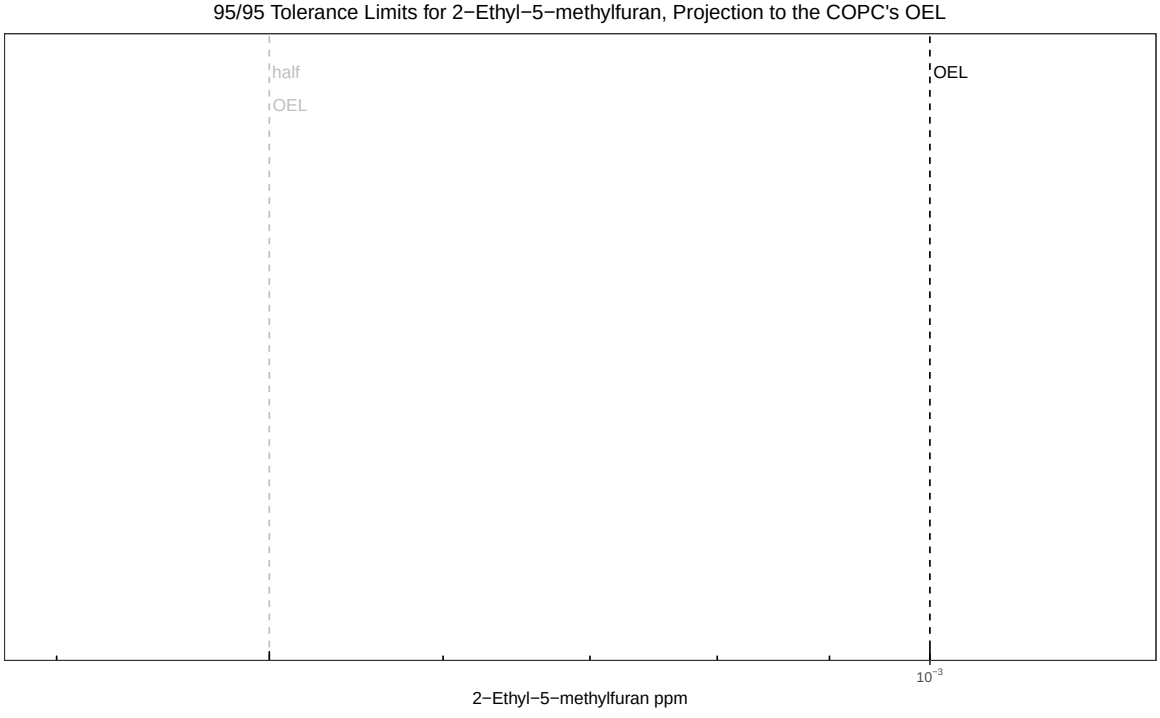


Figure E.148: Tolerance limits for 2-Ethyl-5-methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

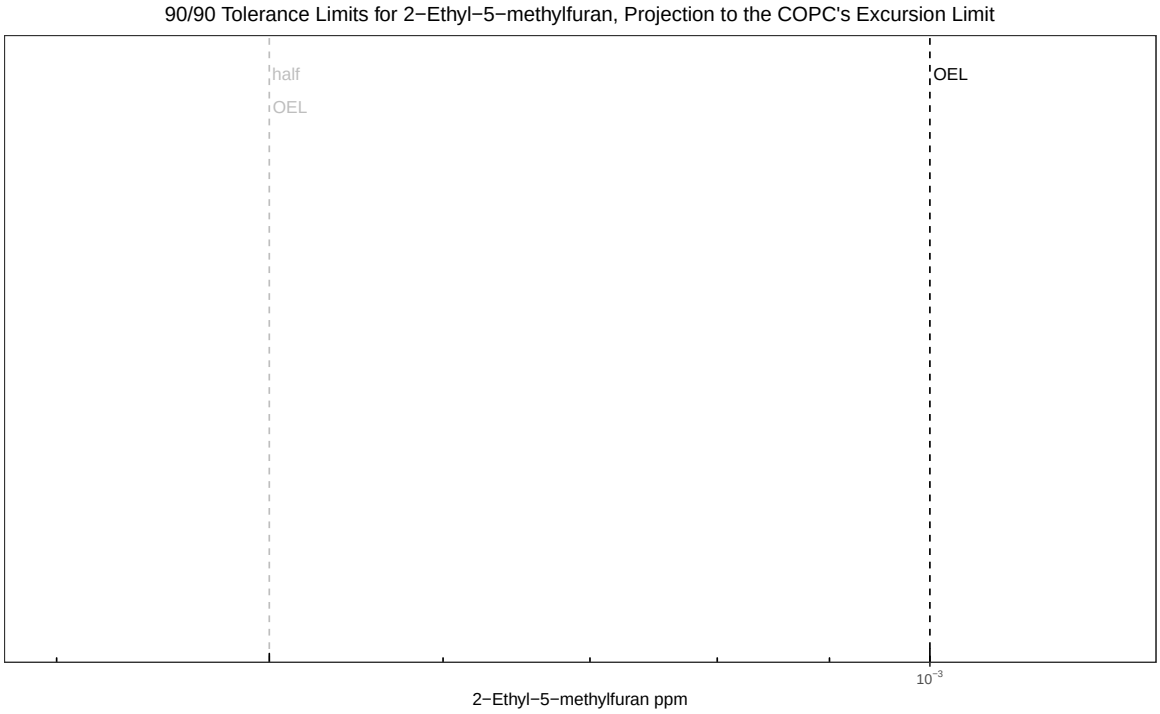


Figure E.149: Tolerance limits for 2-Ethyl-5-methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

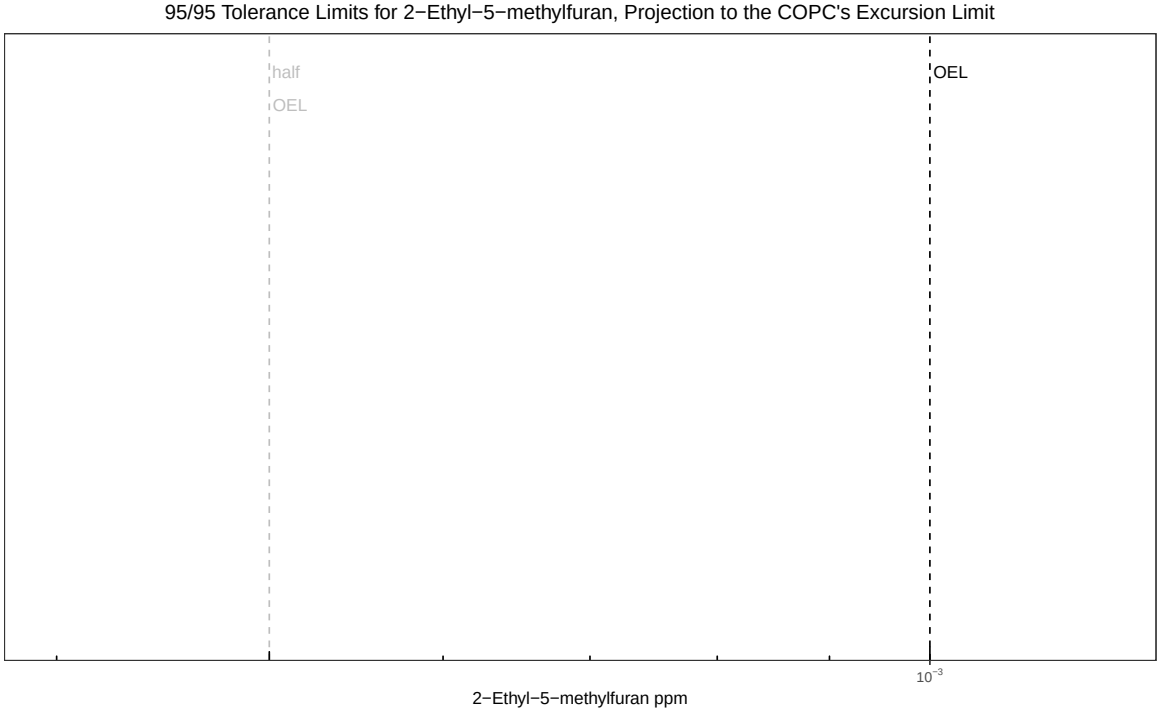


Figure E.150: Tolerance limits for 2-Ethyl-5-methylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

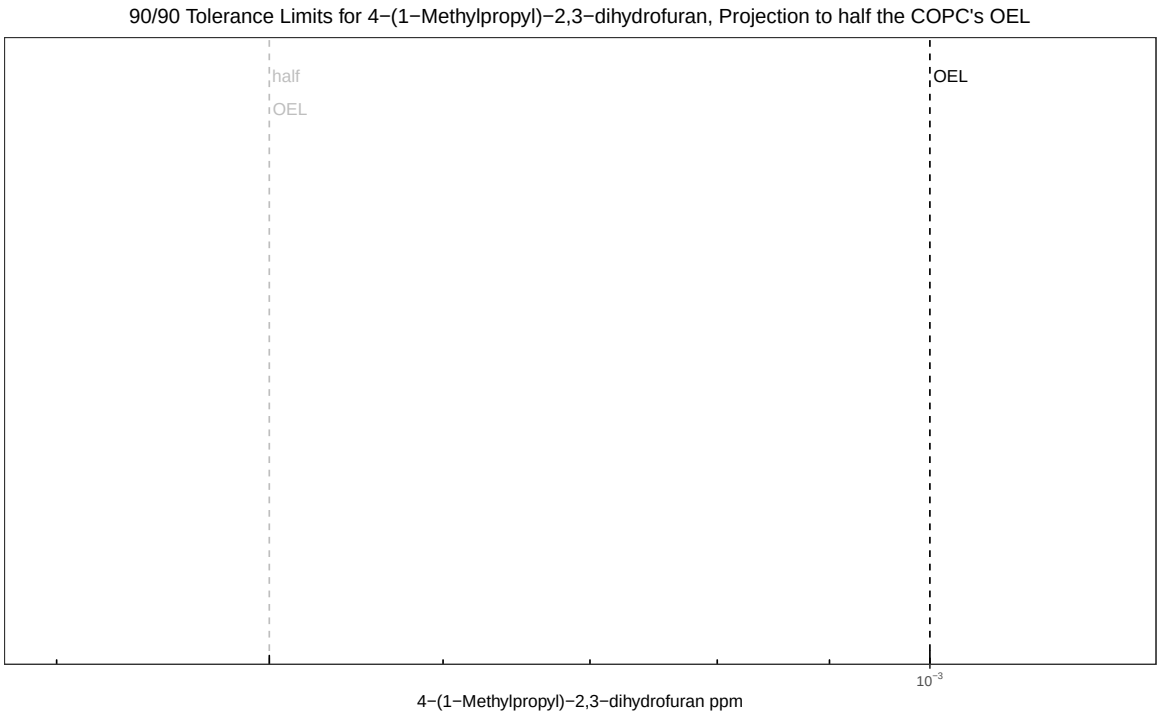


Figure E.151: Tolerance limits for 4-(1-Methylpropyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

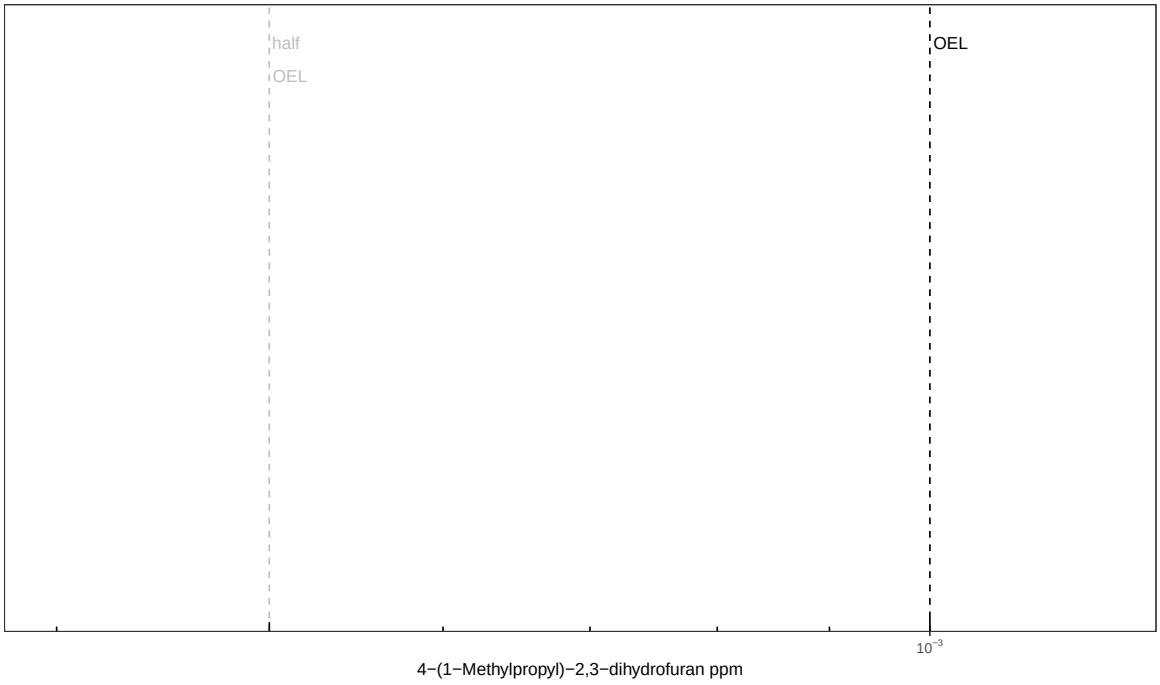


Figure E.152: Tolerance limits for 4-(1-Methylpropyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

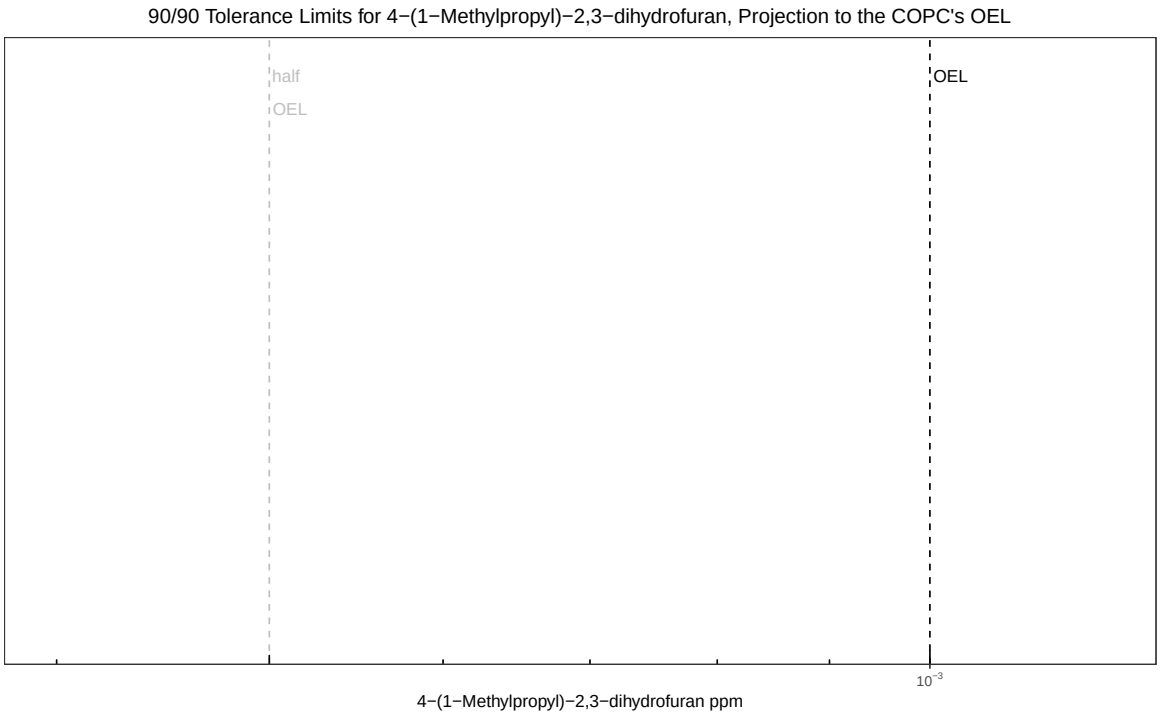


Figure E.153: Tolerance limits for 4-(1-Methylpropyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

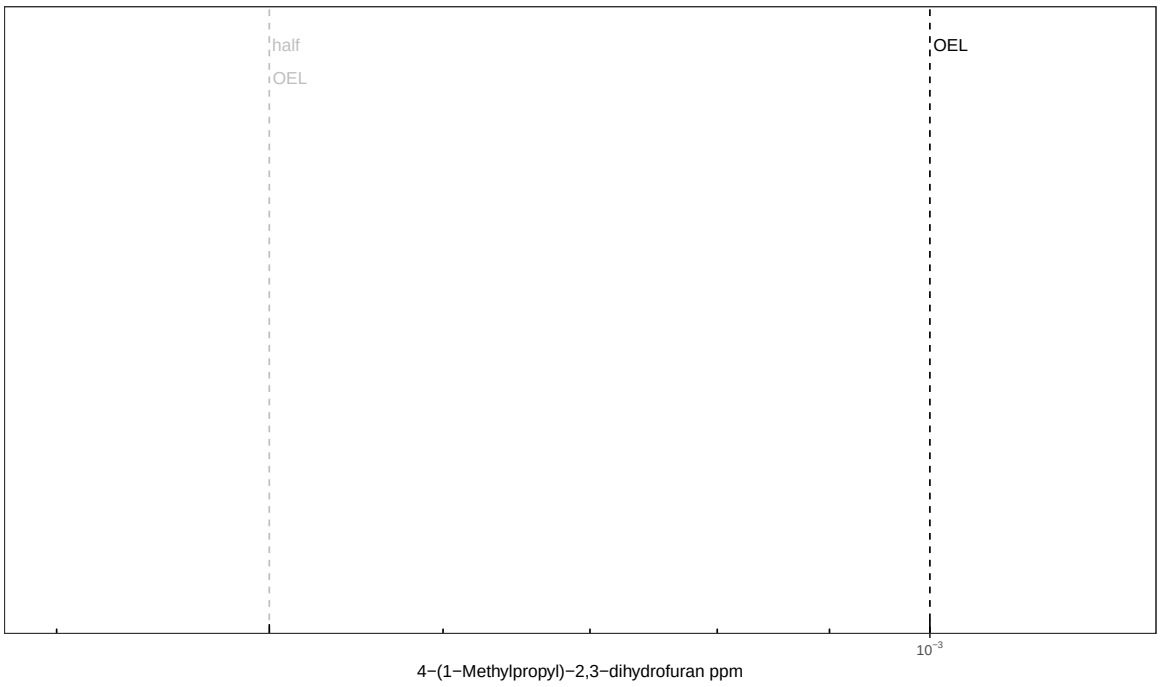


Figure E.154: Tolerance limits for 4-(1-Methylpropyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

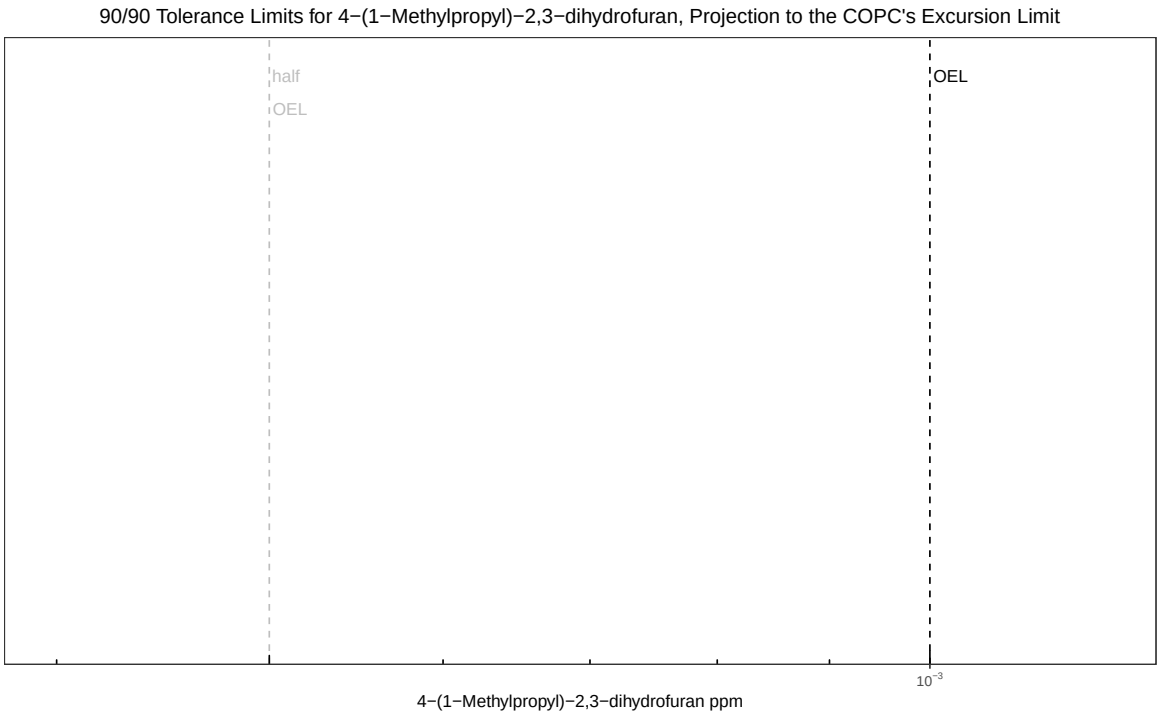


Figure E.155: Tolerance limits for 4-(1-Methylpropyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

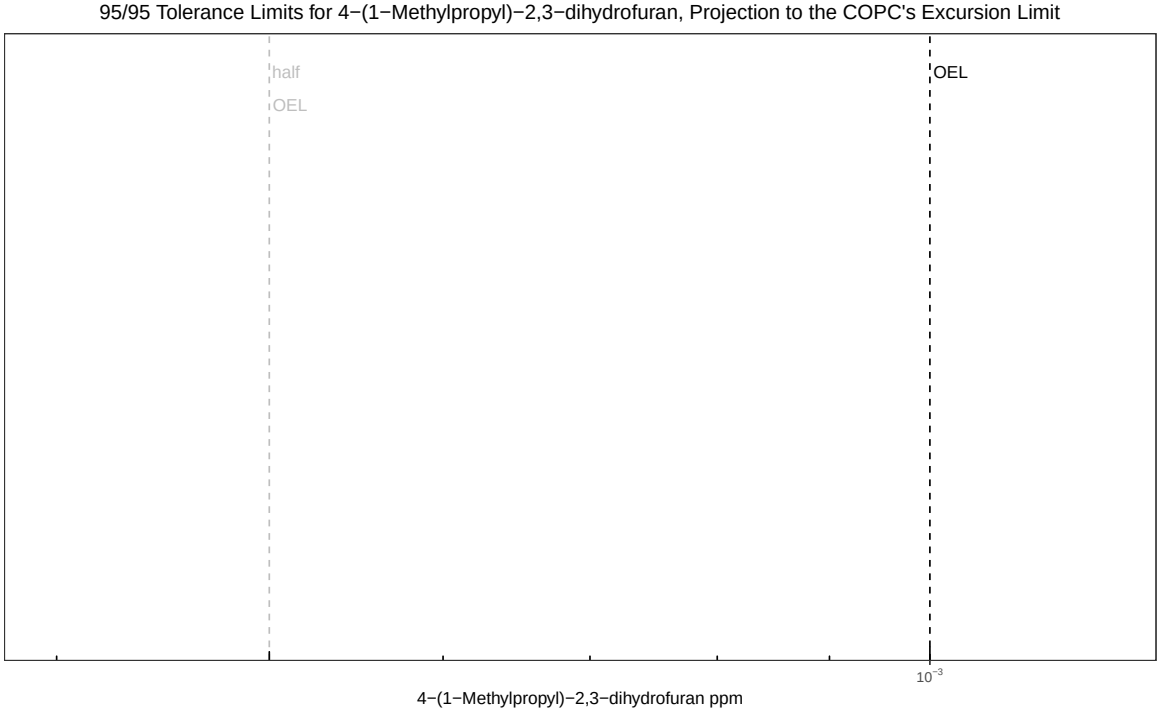


Figure E.156: Tolerance limits for 4-(1-Methylpropyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

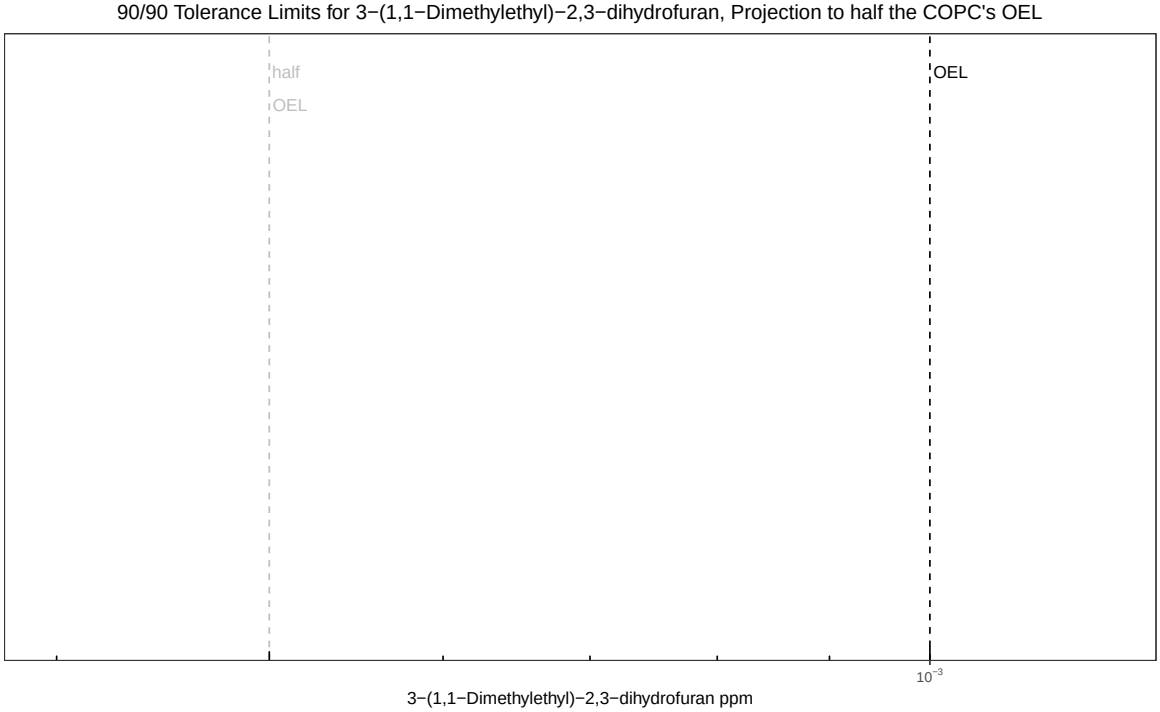


Figure E.157: Tolerance limits for 3-(1,1-Dimethylethyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

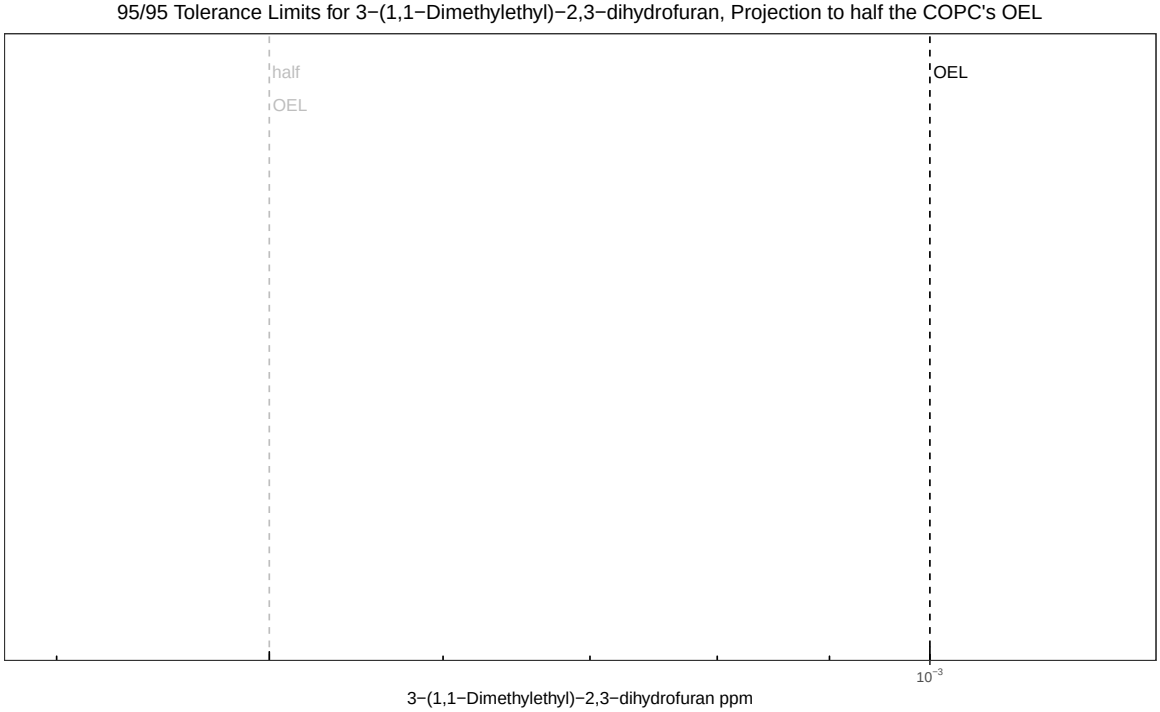


Figure E.158: Tolerance limits for 3-(1,1-Dimethylethyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

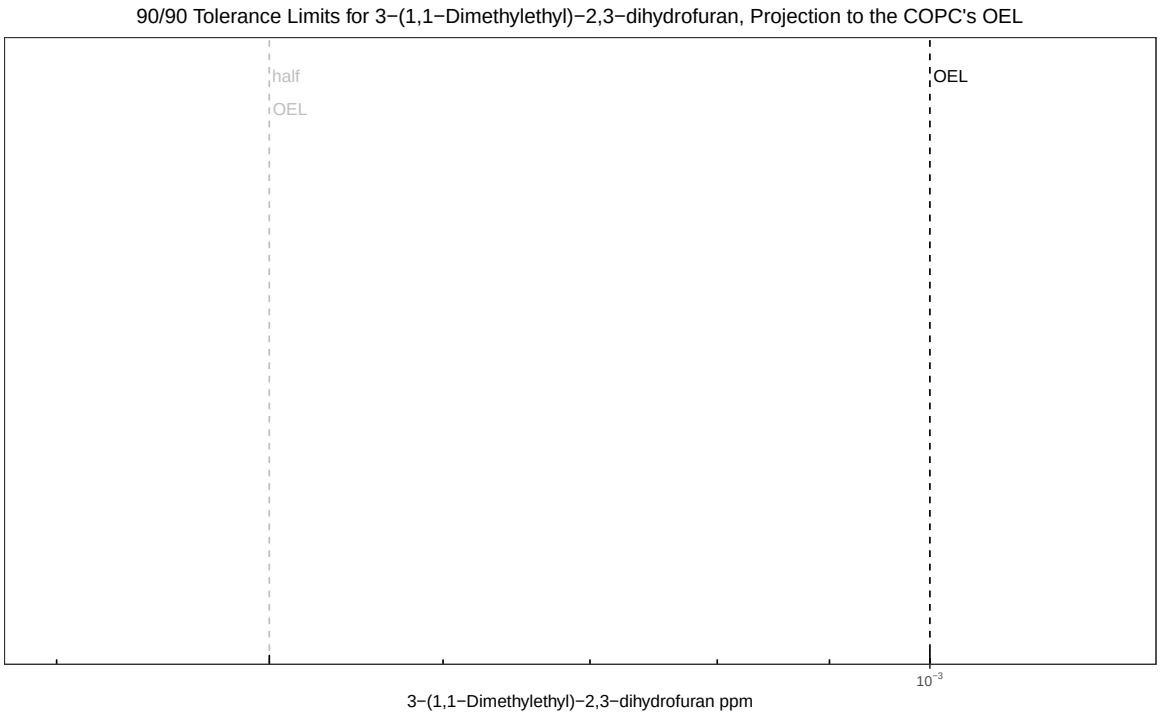


Figure E.159: Tolerance limits for 3-(1,1-Dimethylethyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

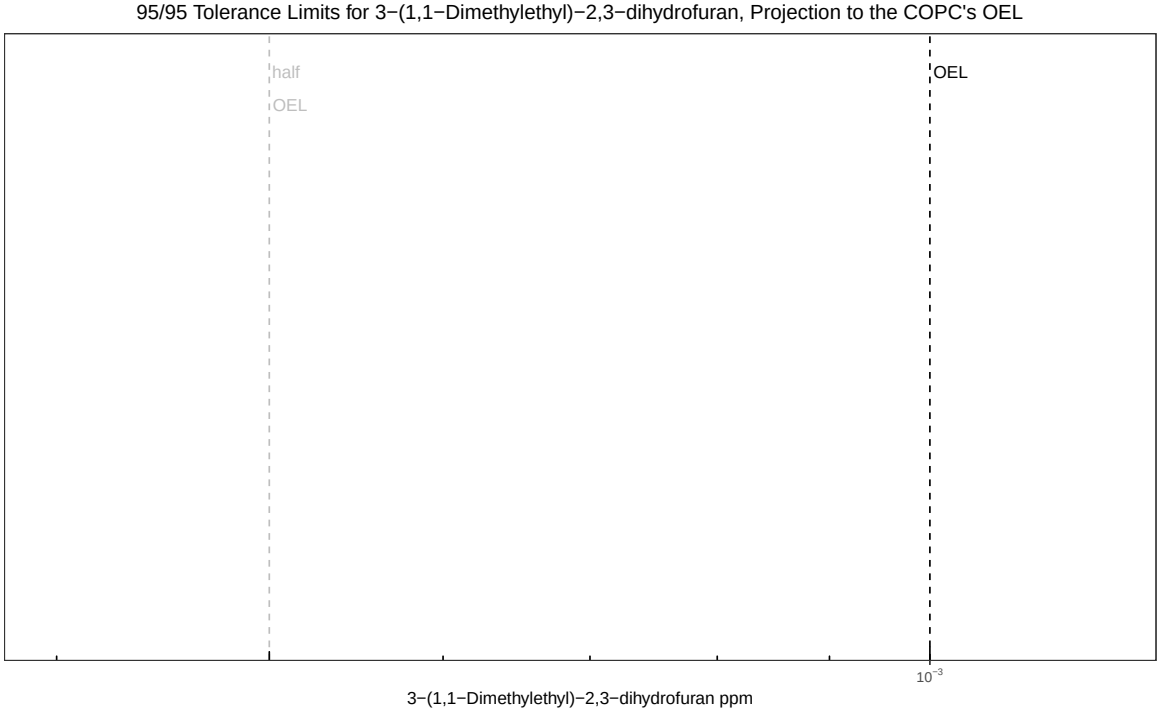


Figure E.160: Tolerance limits for 3-(1,1-Dimethylethyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

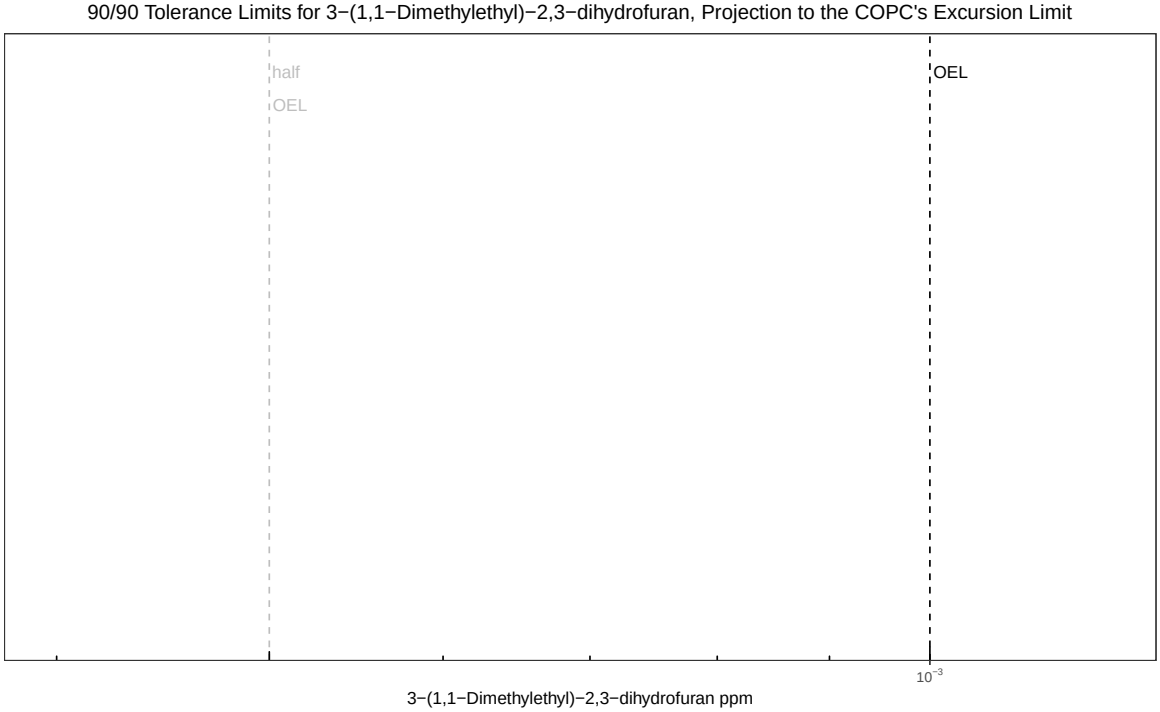


Figure E.161: Tolerance limits for 3-(1,1-Dimethylethyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

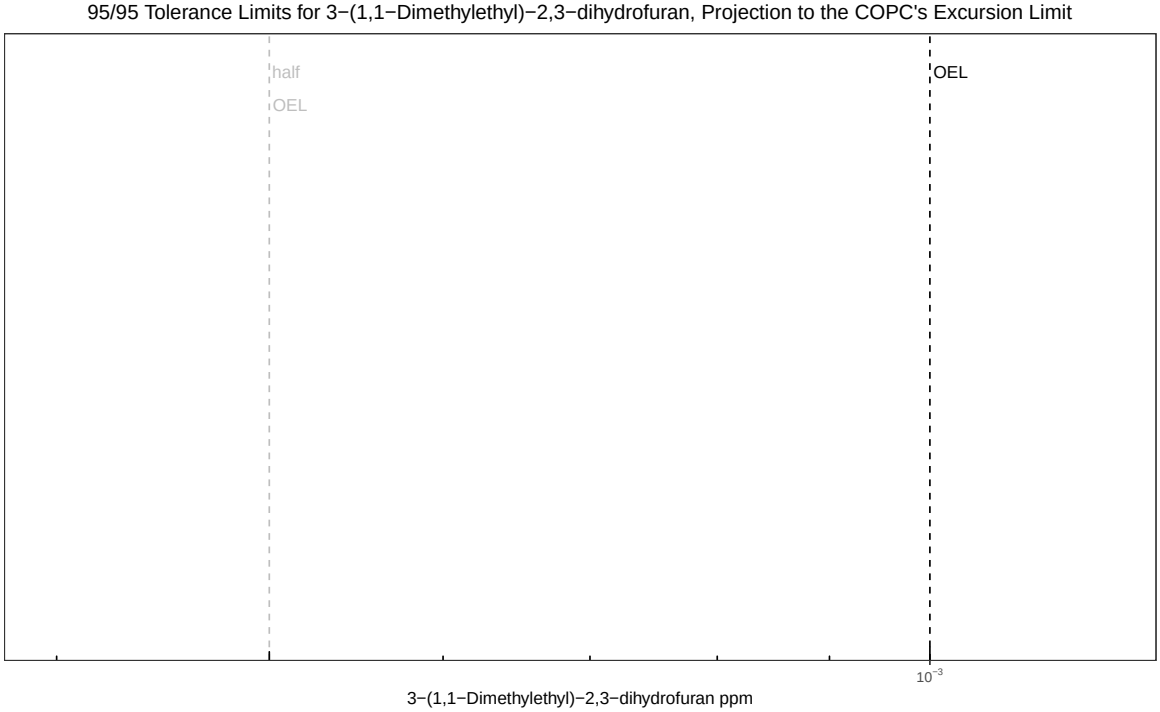


Figure E.162: Tolerance limits for 3-(1,1-Dimethylethyl)-2,3-dihydrofuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

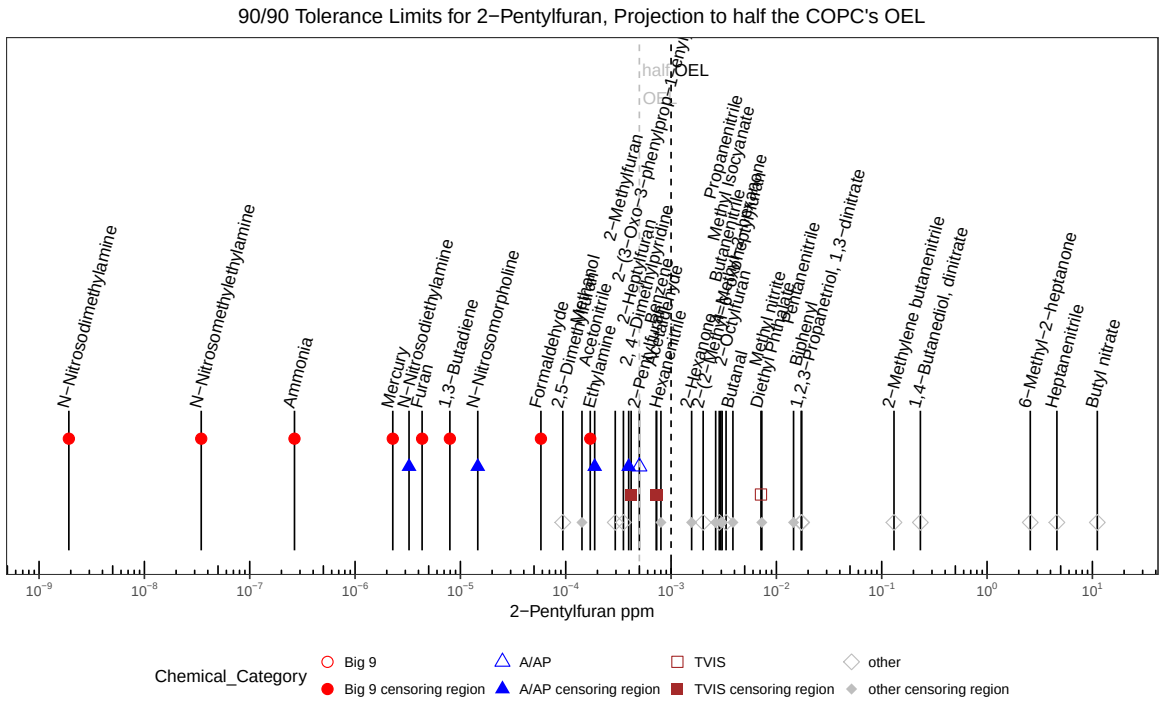


Figure E.163: Tolerance limits for 2-Pentylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

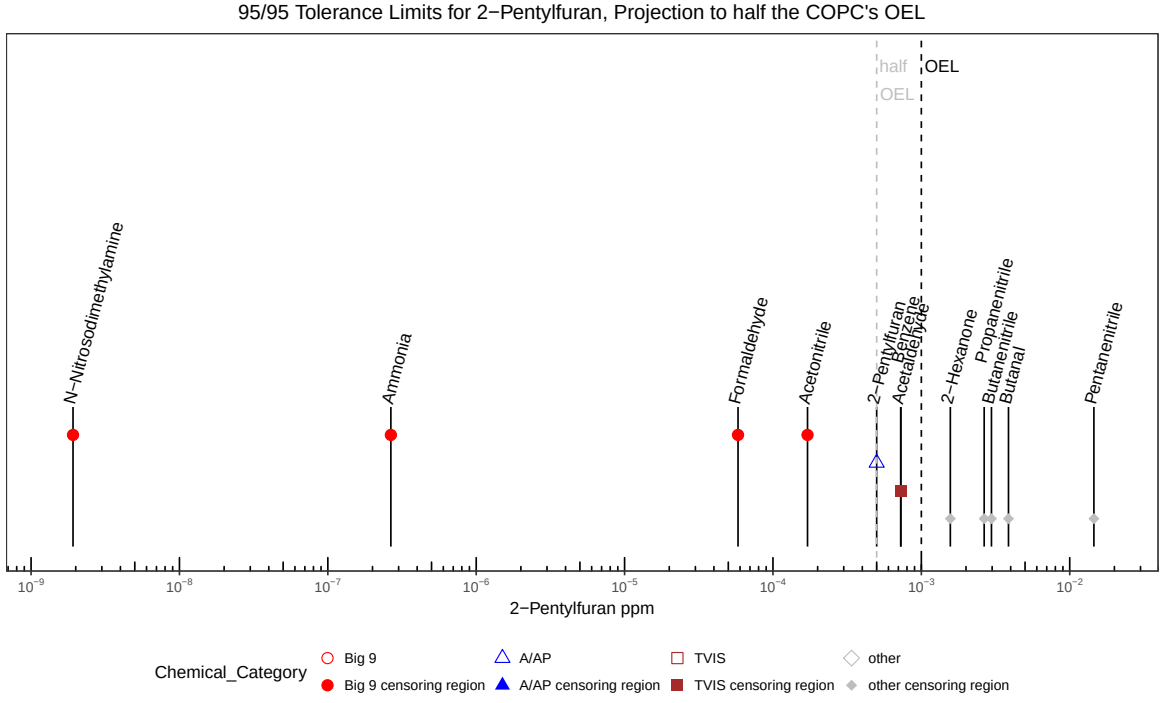


Figure E.164: Tolerance limits for 2-Pentylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

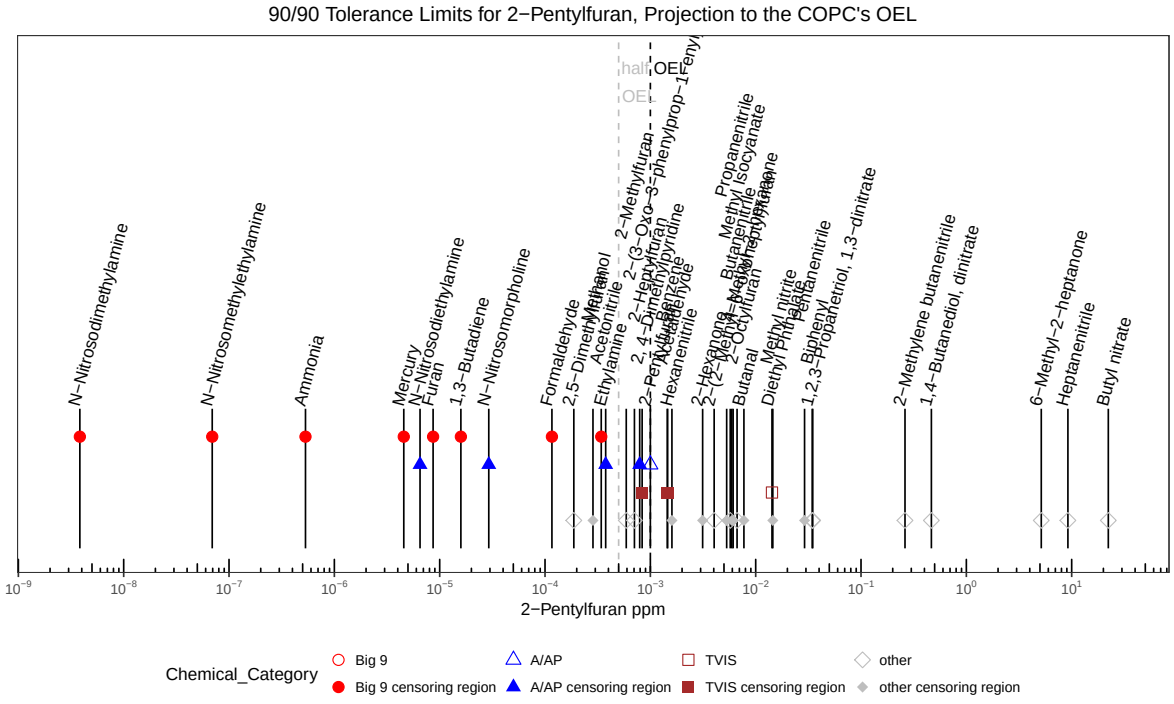


Figure E.165: Tolerance limits for 2-Pentylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

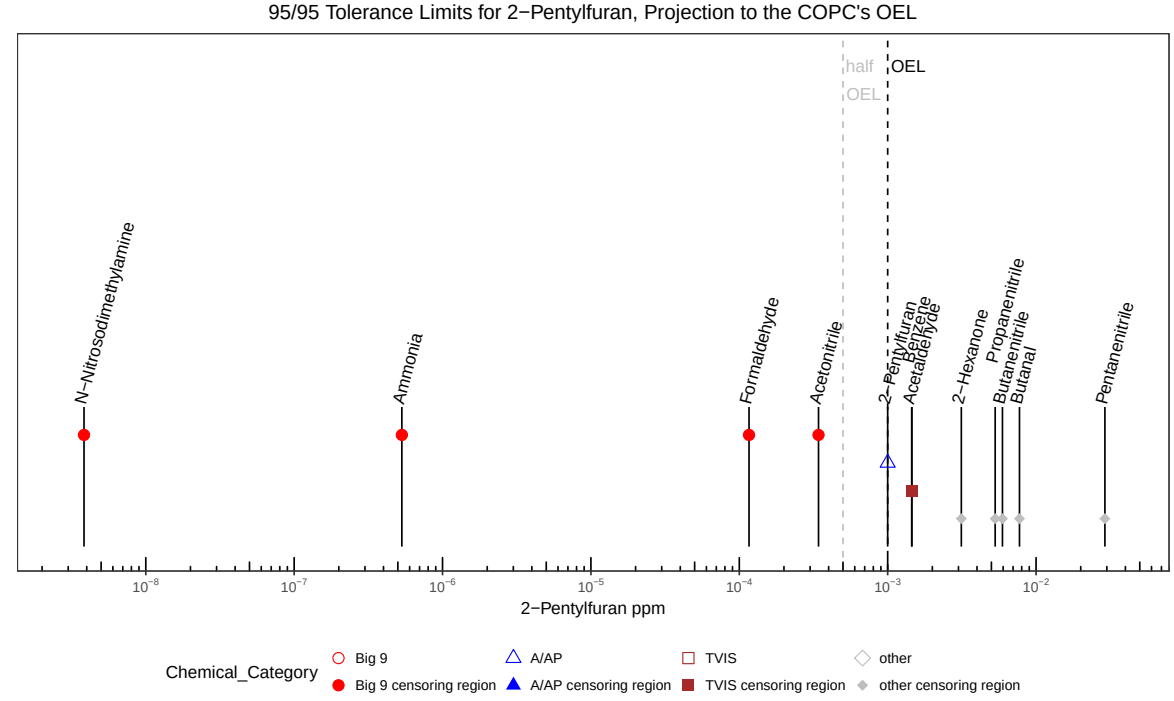


Figure E.166: Tolerance limits for 2-Pentylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

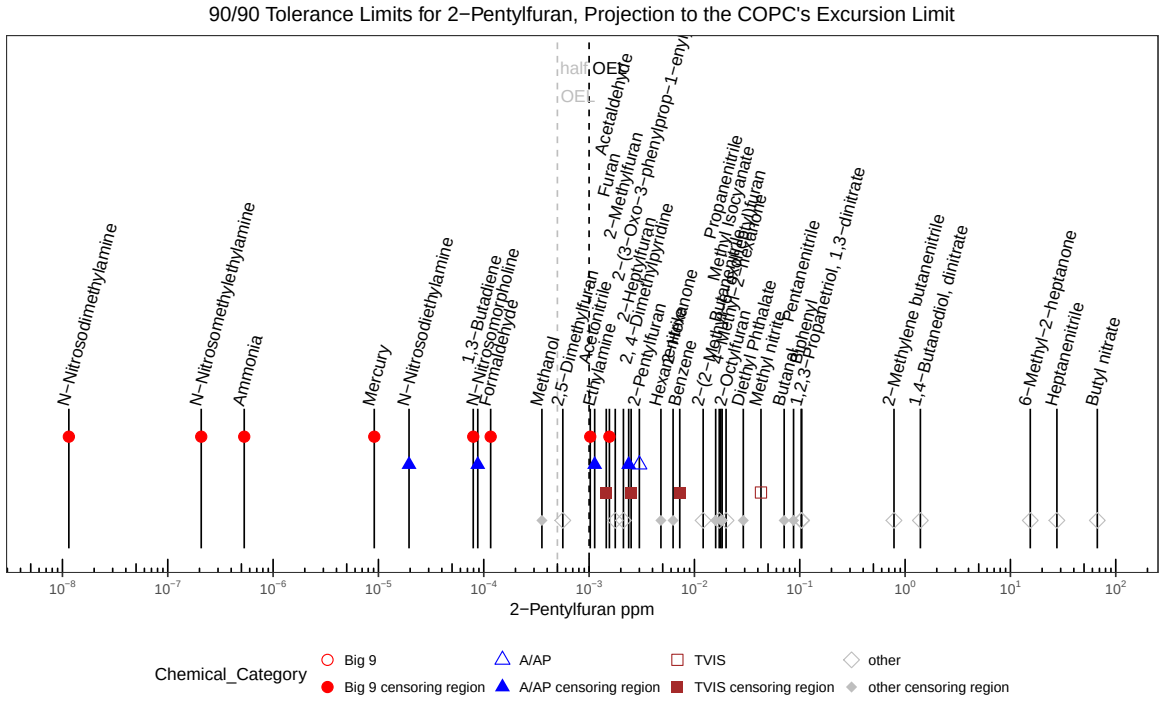


Figure E.167: Tolerance limits for 2-Pentylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

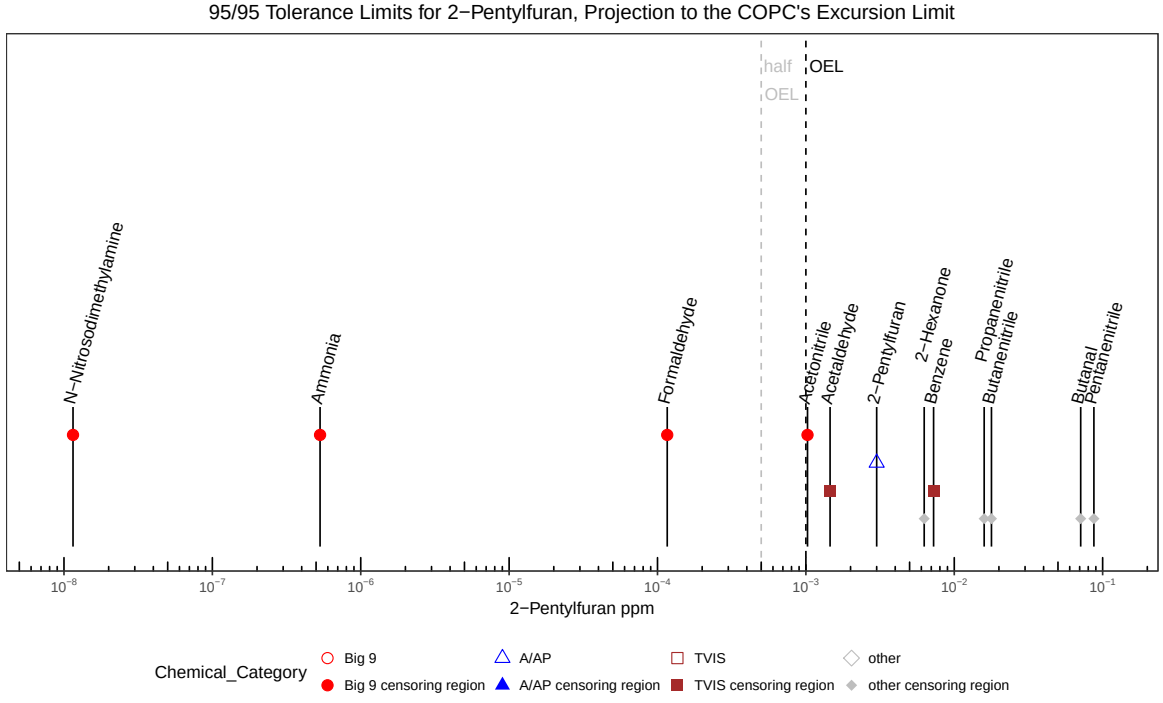


Figure E.168: Tolerance limits for 2-Pentylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

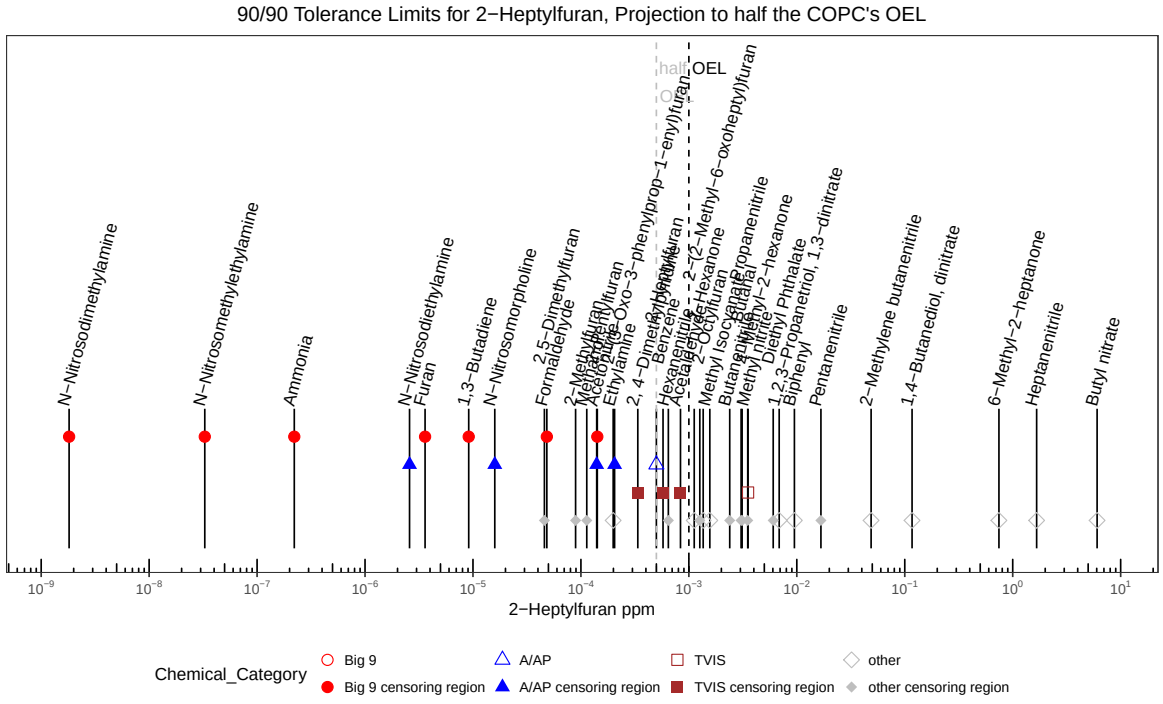


Figure E.169: Tolerance limits for 2-Heptylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

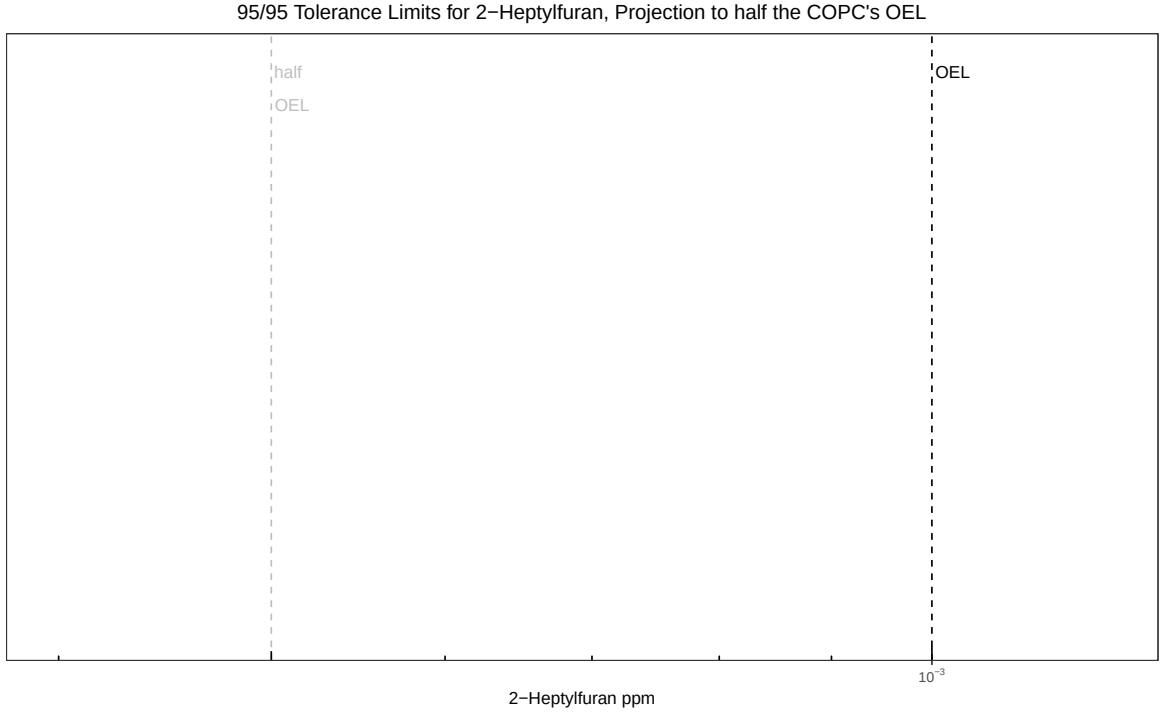


Figure E.170: Tolerance limits for 2-Heptylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

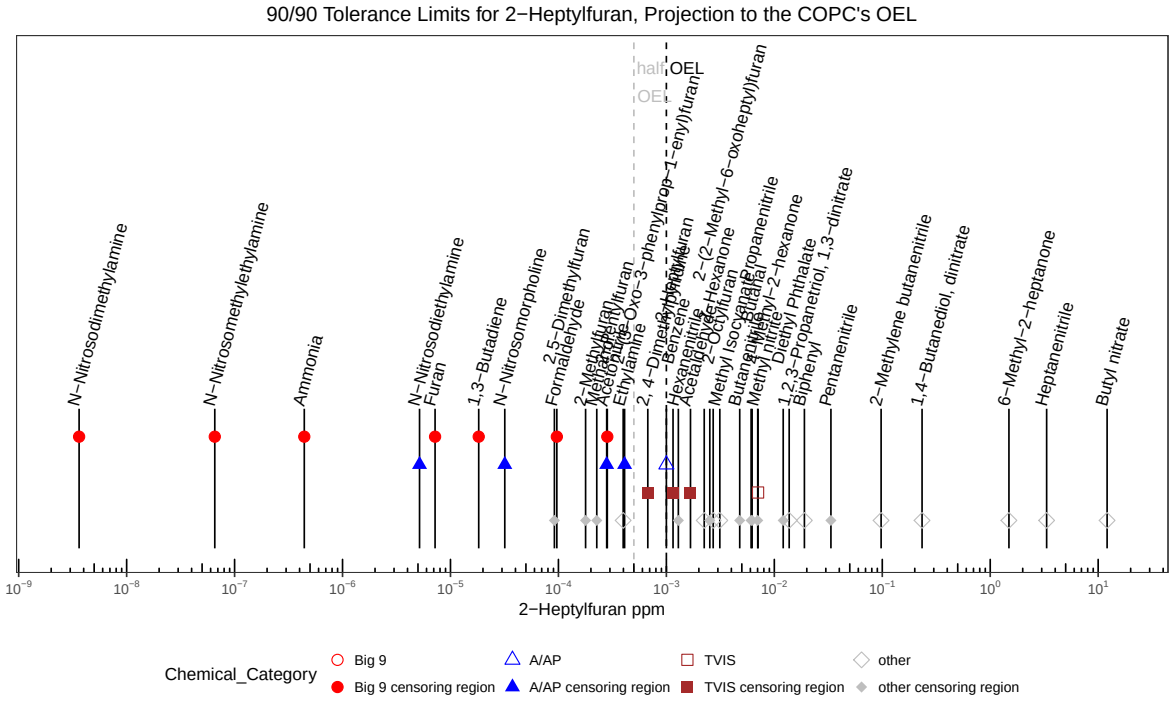


Figure E.171: Tolerance limits for 2-Heptylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

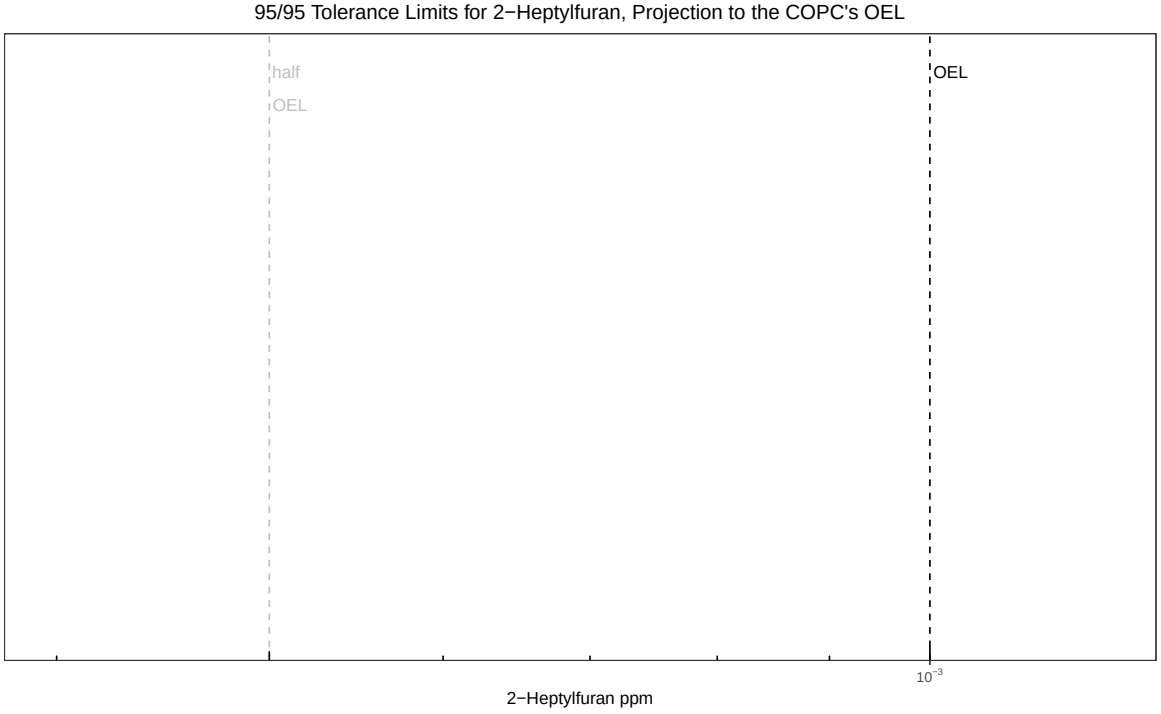


Figure E.172: Tolerance limits for 2-Heptylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

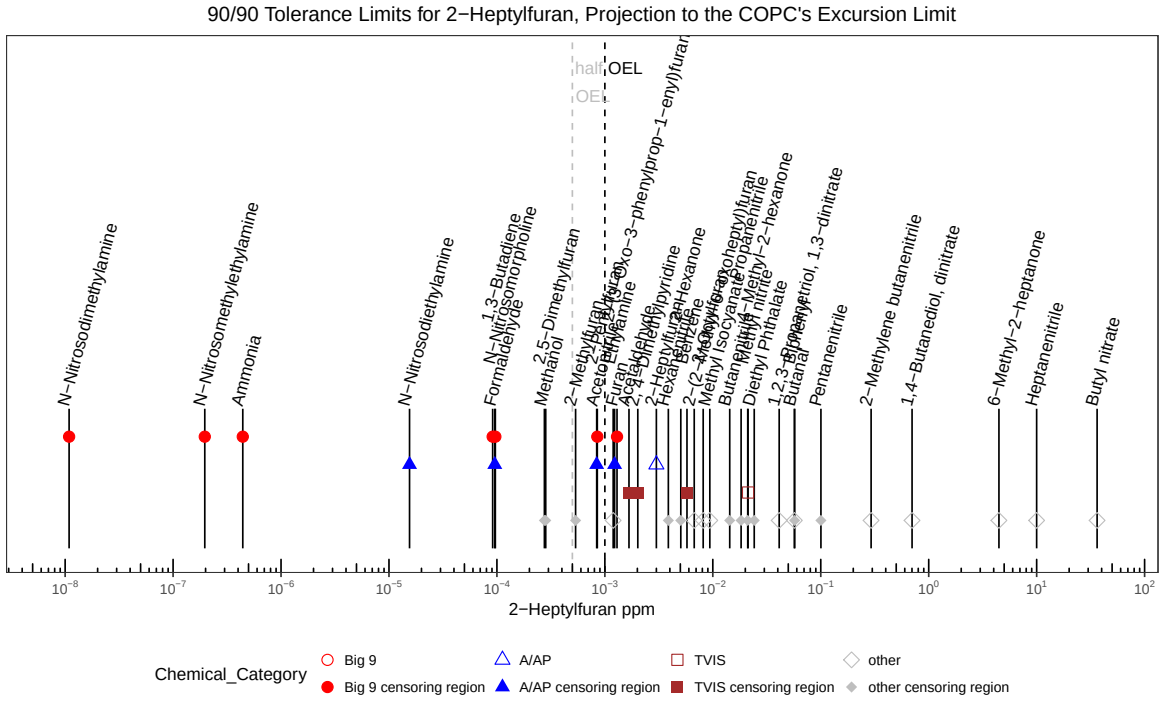


Figure E.173: Tolerance limits for 2-Heptylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

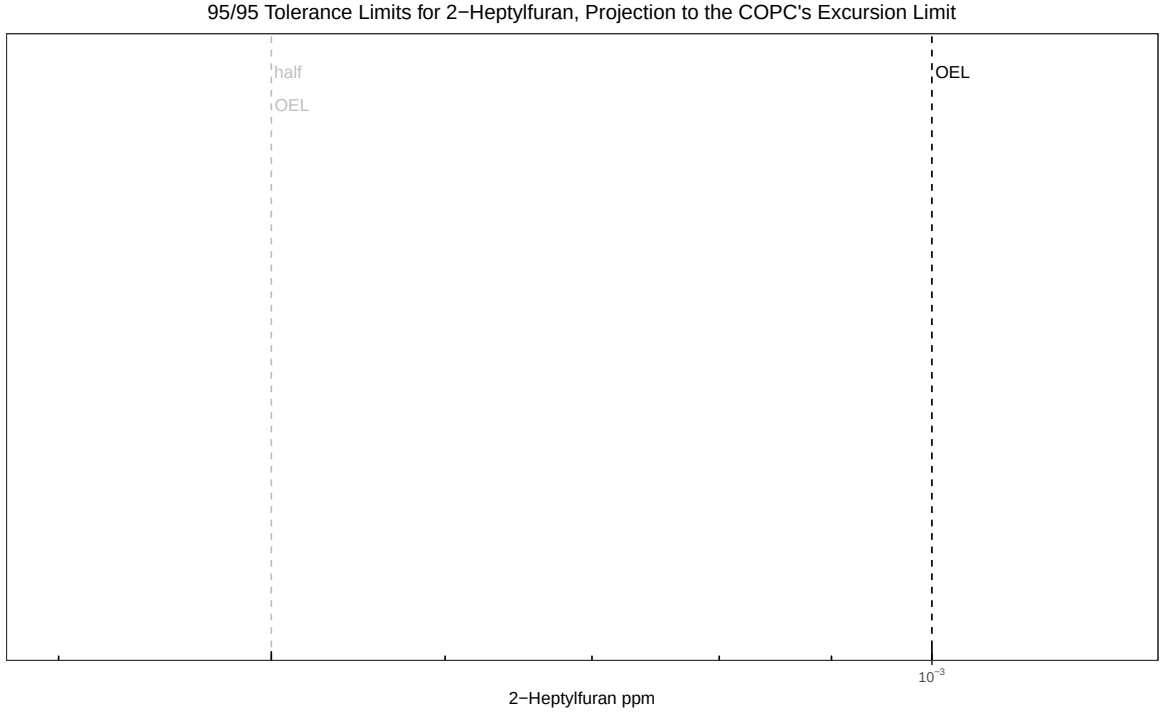


Figure E.174: Tolerance limits for 2-Heptylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

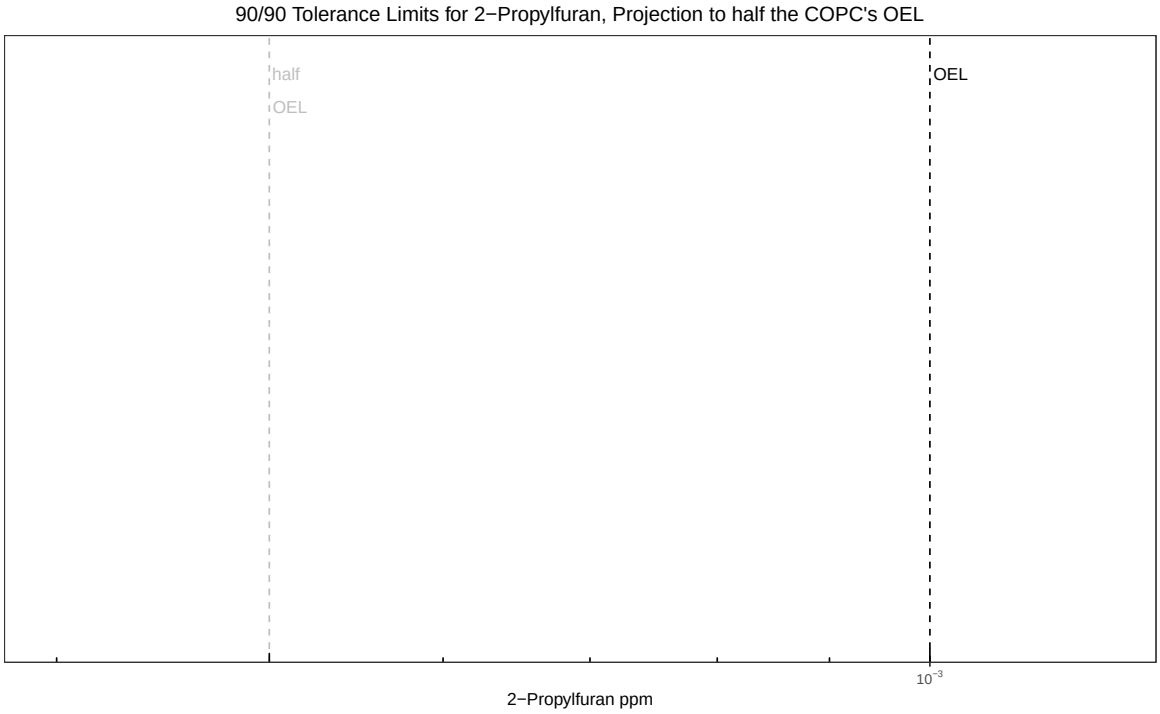


Figure E.175: Tolerance limits for 2-Propylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

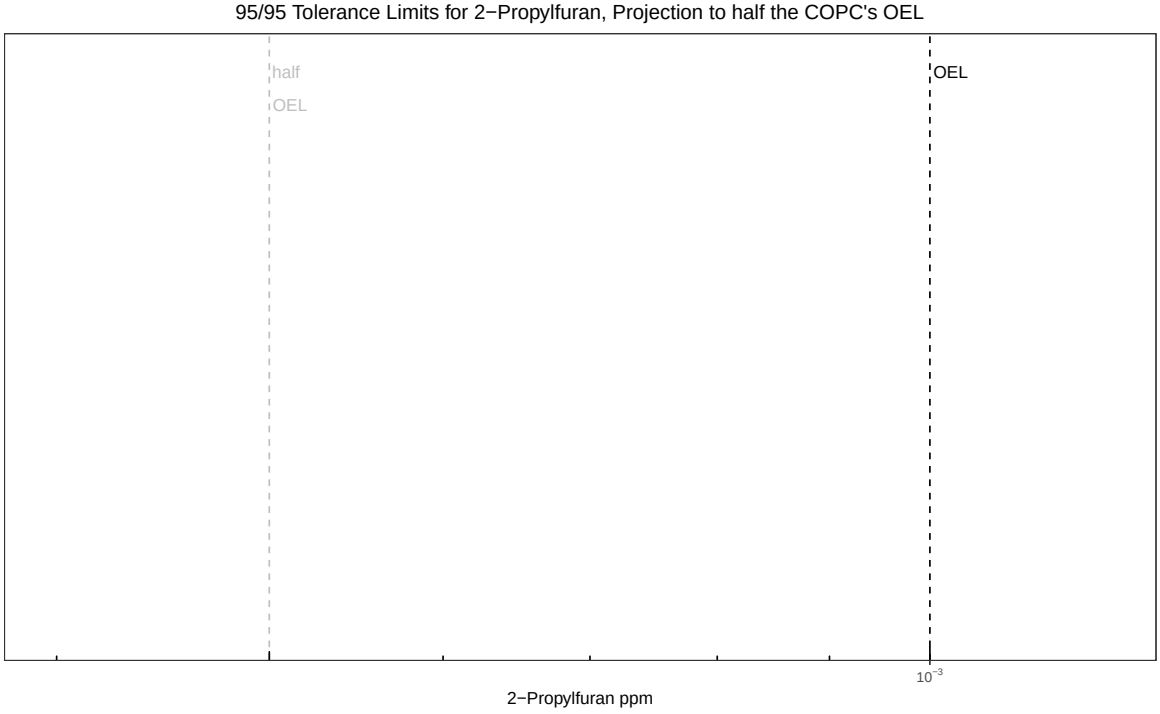


Figure E.176: Tolerance limits for 2-Propylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

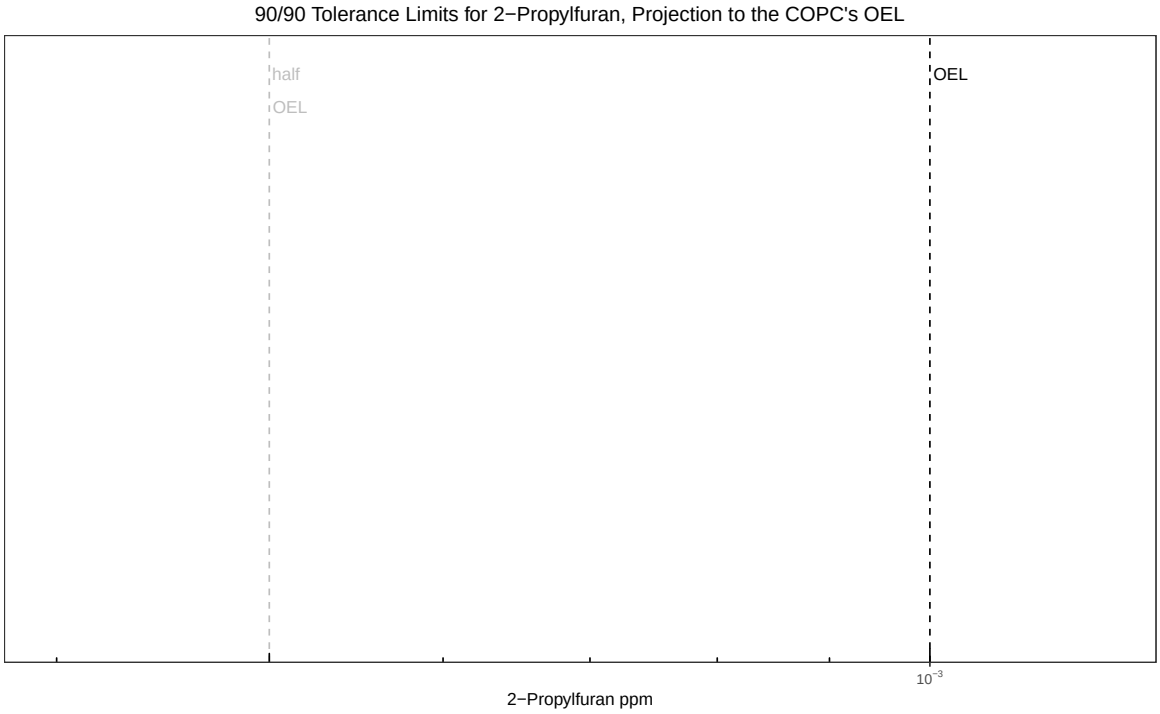


Figure E.177: Tolerance limits for 2-Propylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

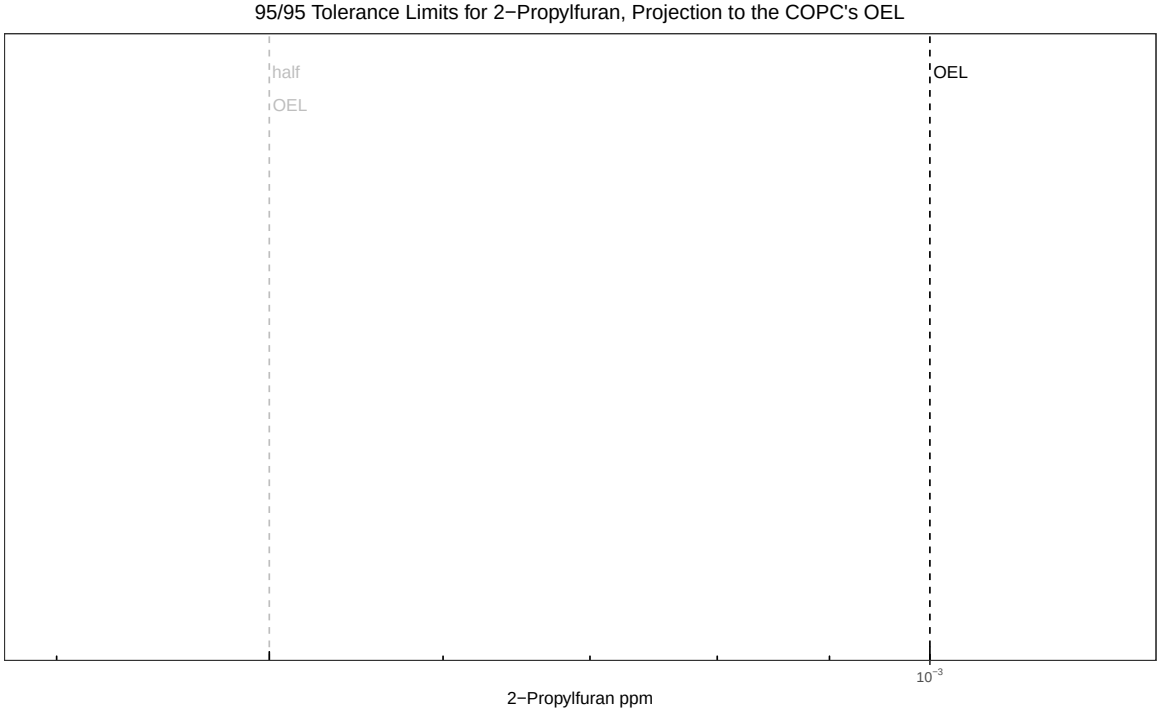


Figure E.178: Tolerance limits for 2-Propylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

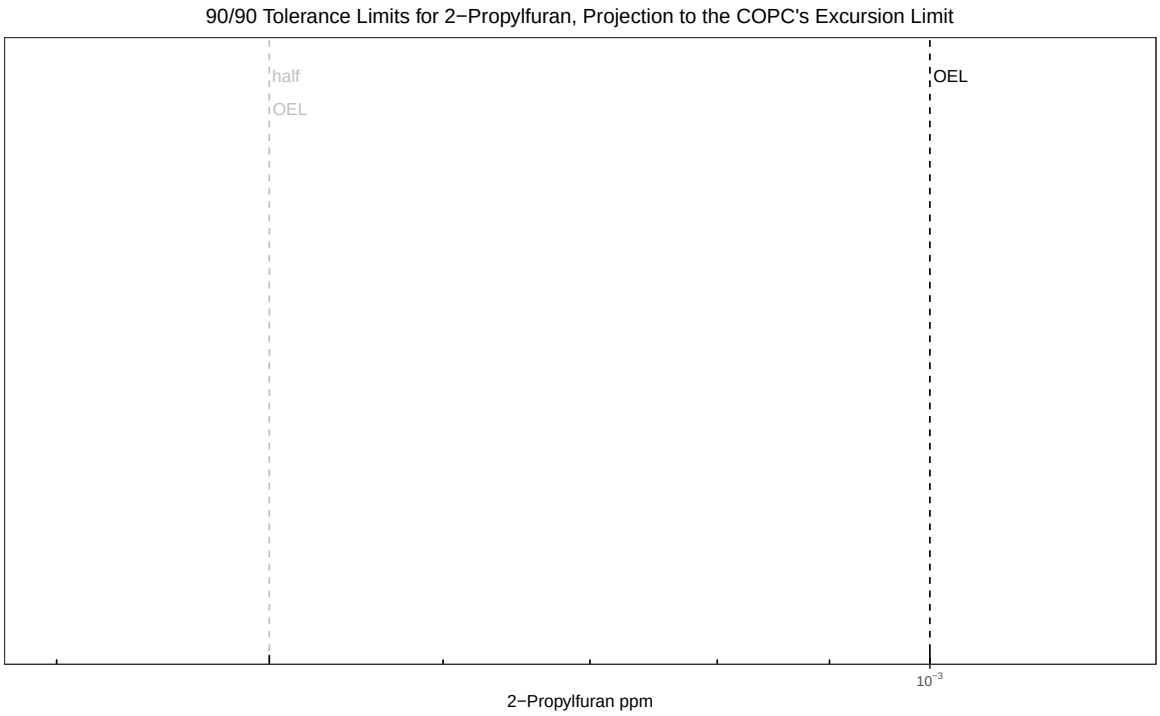


Figure E.179: Tolerance limits for 2-Propylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

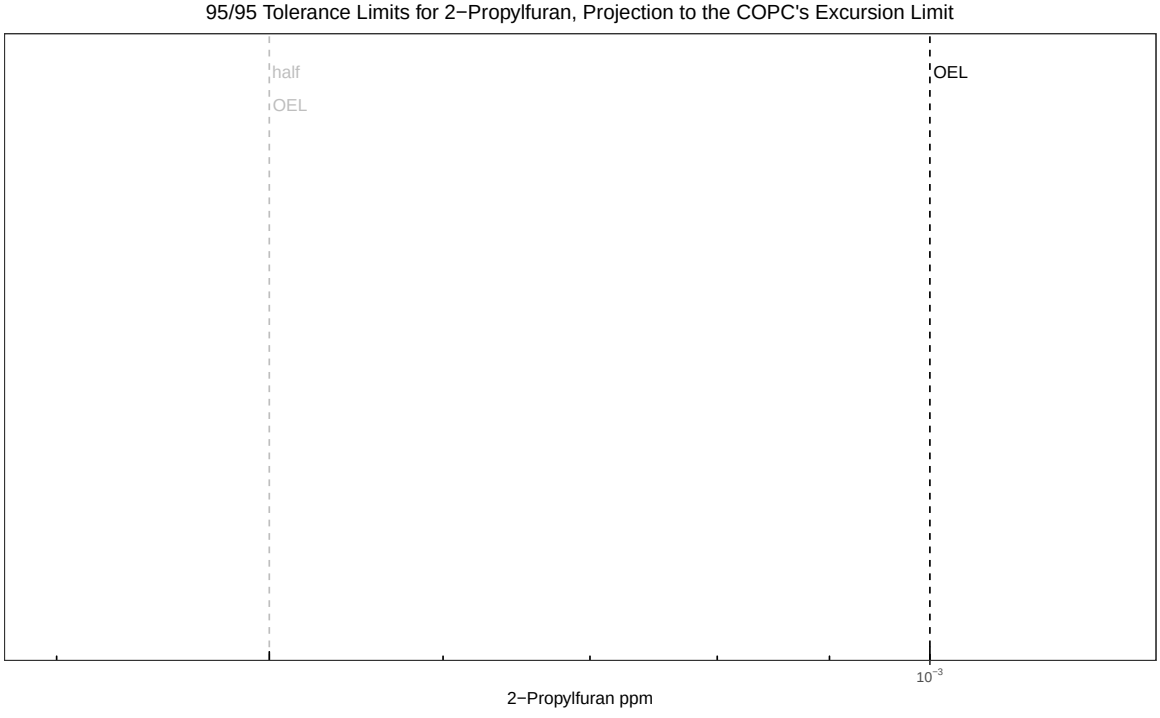


Figure E.180: Tolerance limits for 2-Propylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

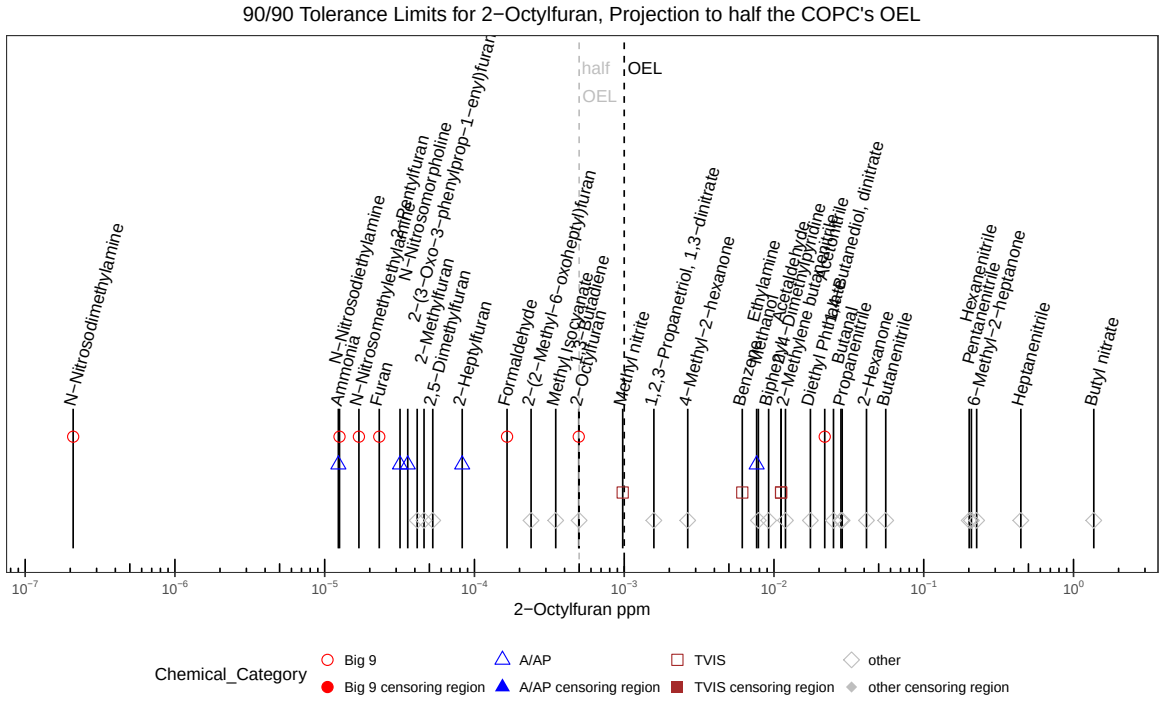


Figure E.181: Tolerance limits for 2-Octylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

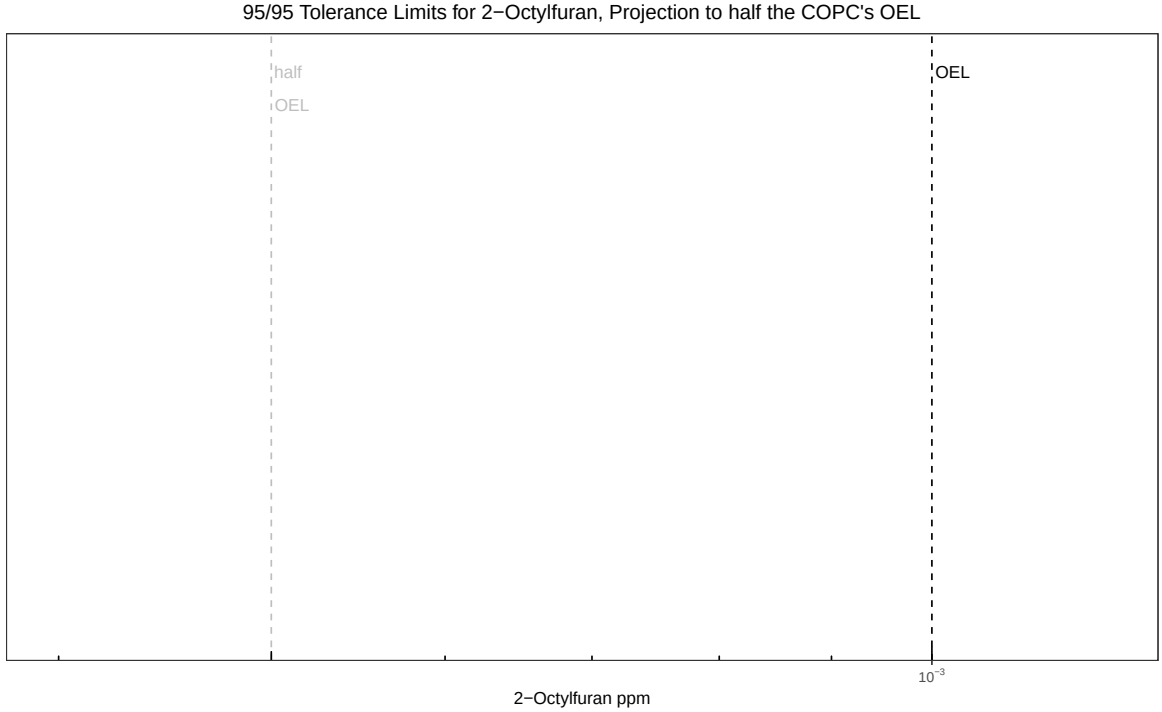


Figure E.182: Tolerance limits for 2-Octylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

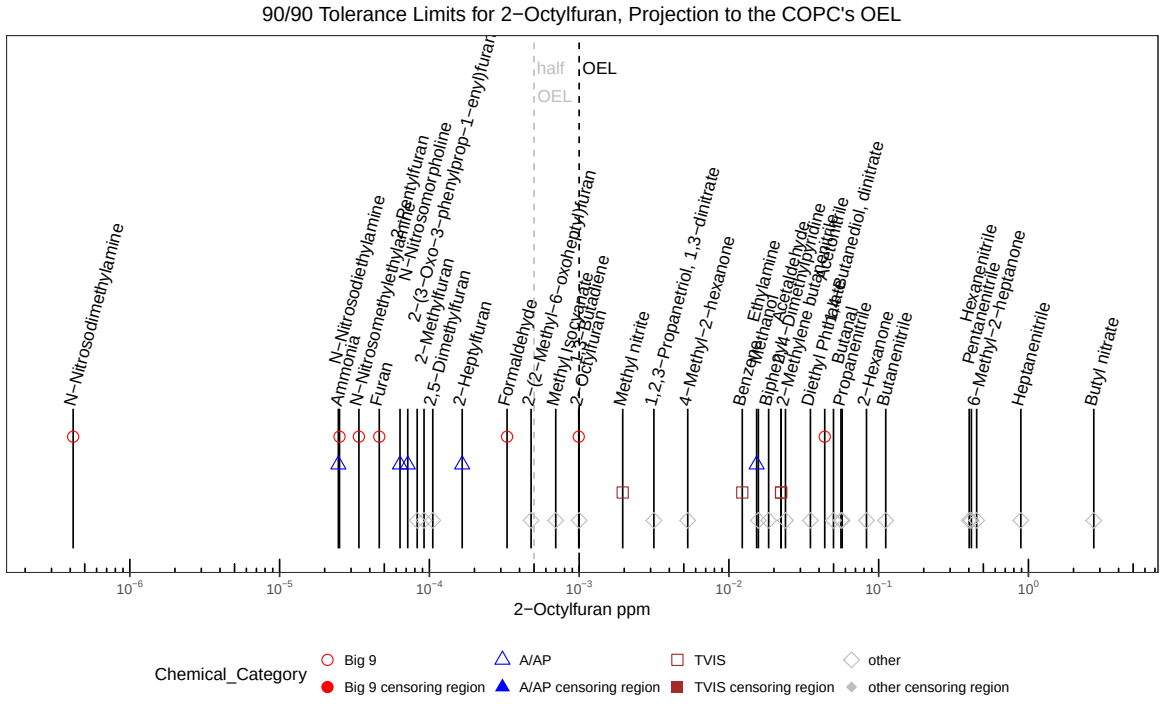


Figure E.183: Tolerance limits for 2-Octylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

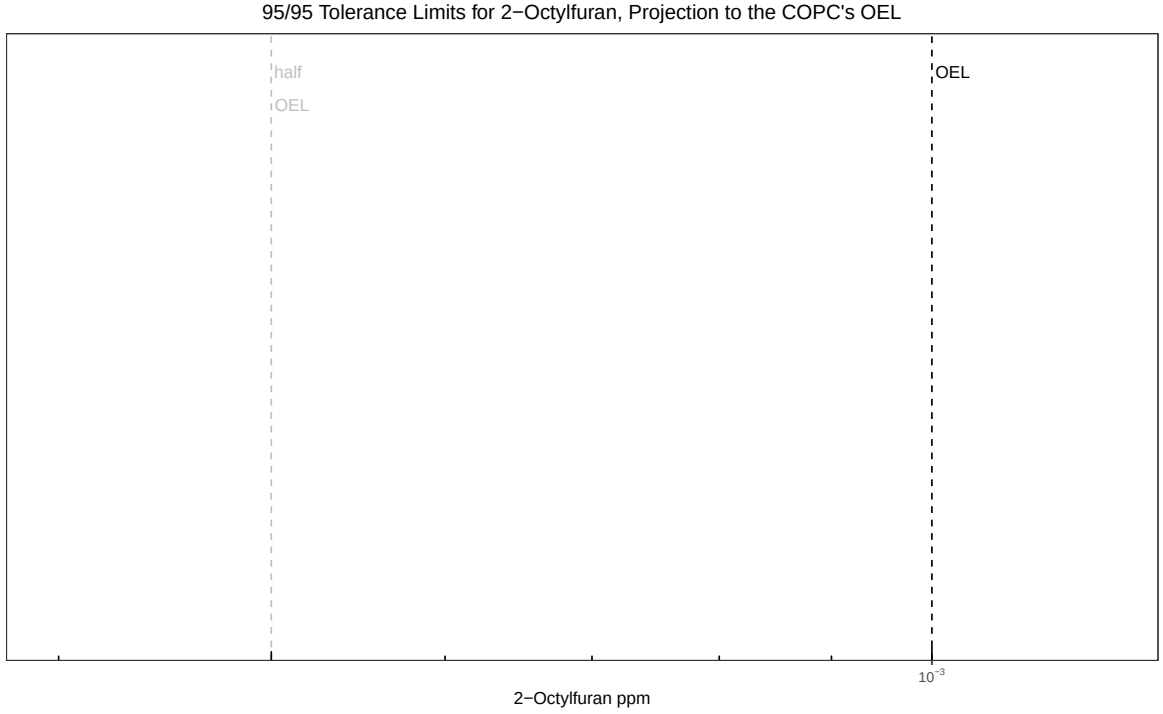


Figure E.184: Tolerance limits for 2-Octylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

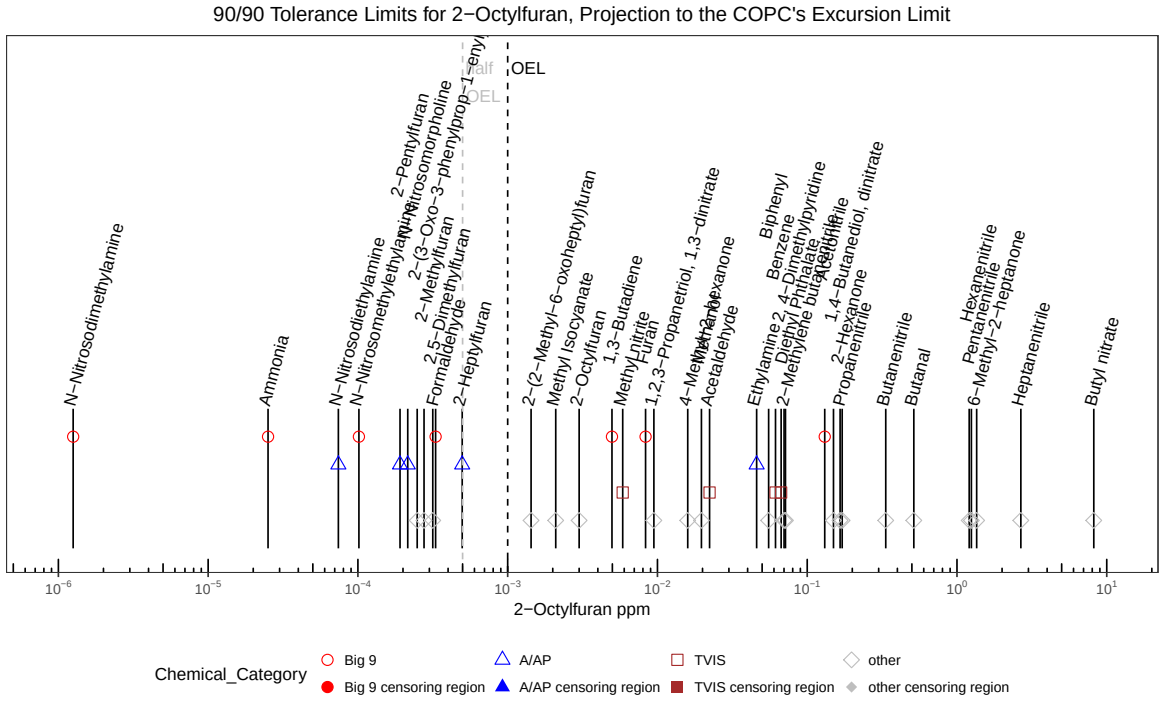


Figure E.185: Tolerance limits for 2-Octylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

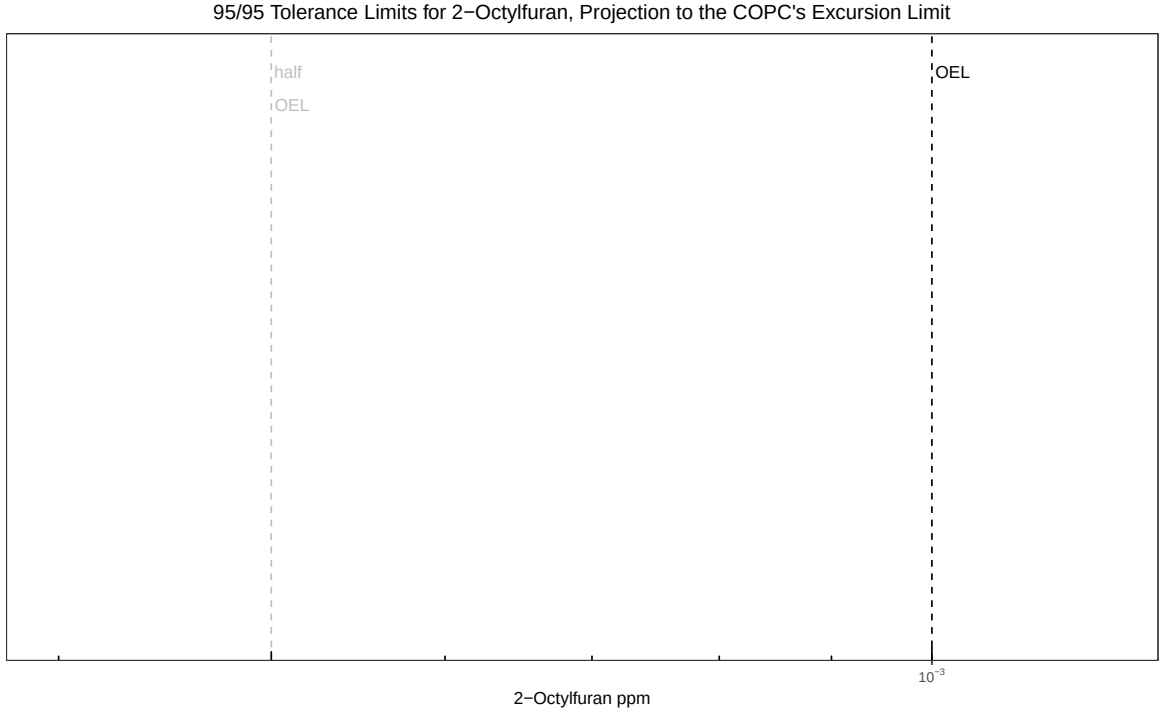


Figure E.186: Tolerance limits for 2-Octylfuran as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

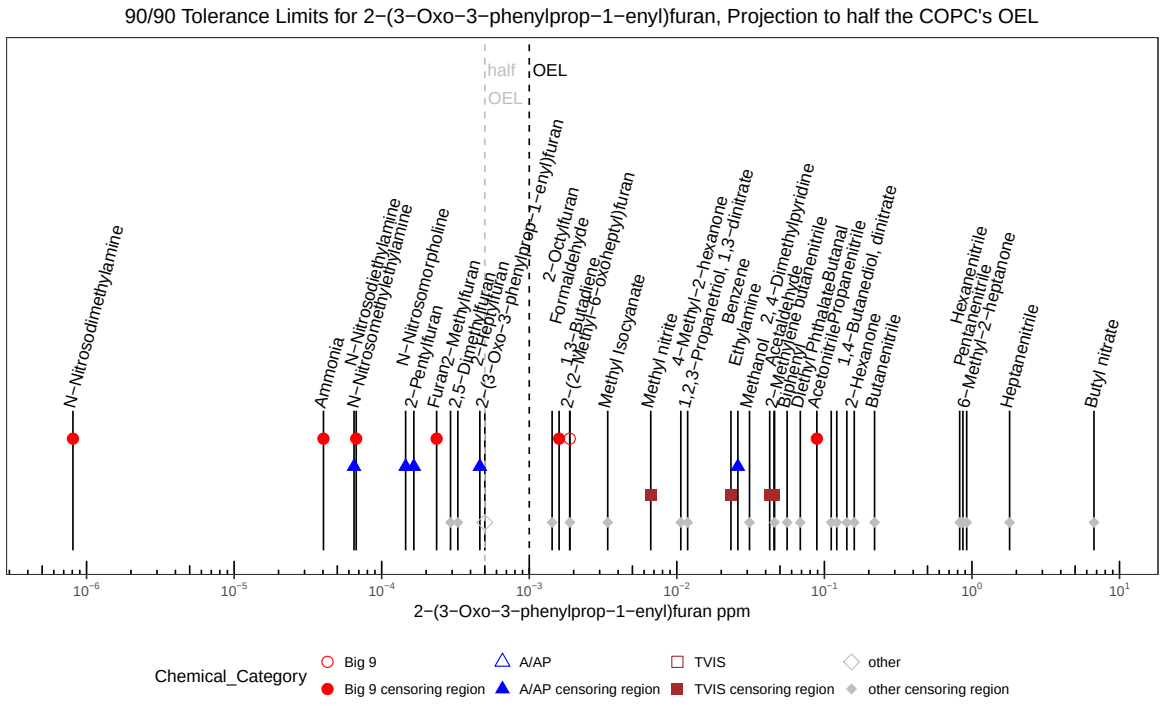


Figure E.187: Tolerance limits for 2-(3-Oxo-3-phenylprop-1-enyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

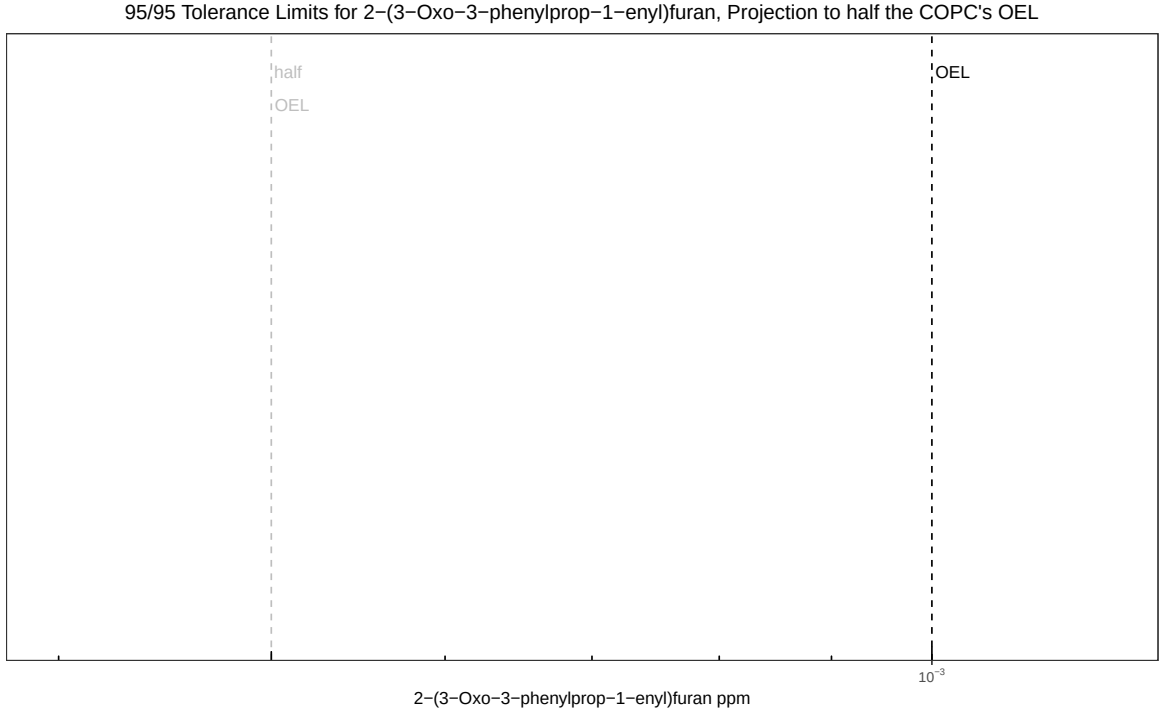


Figure E.188: Tolerance limits for 2-(3-Oxo-3-phenylprop-1-enyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

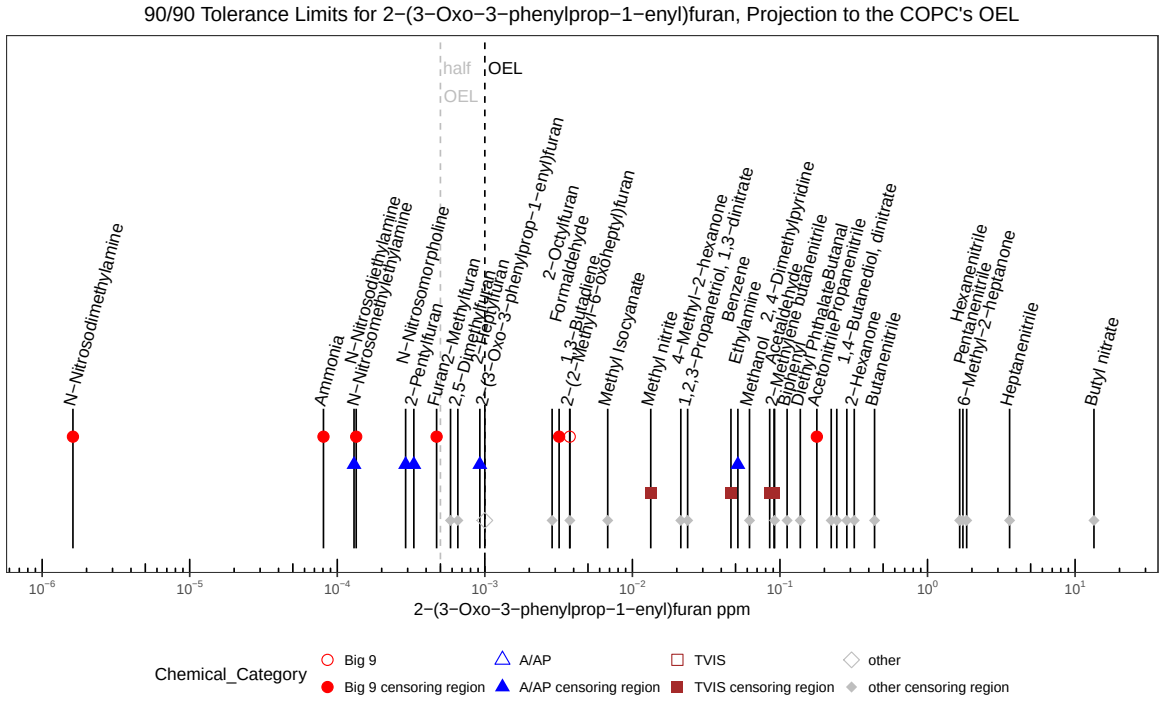


Figure E.189: Tolerance limits for 2-(3-Oxo-3-phenylprop-1-enyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

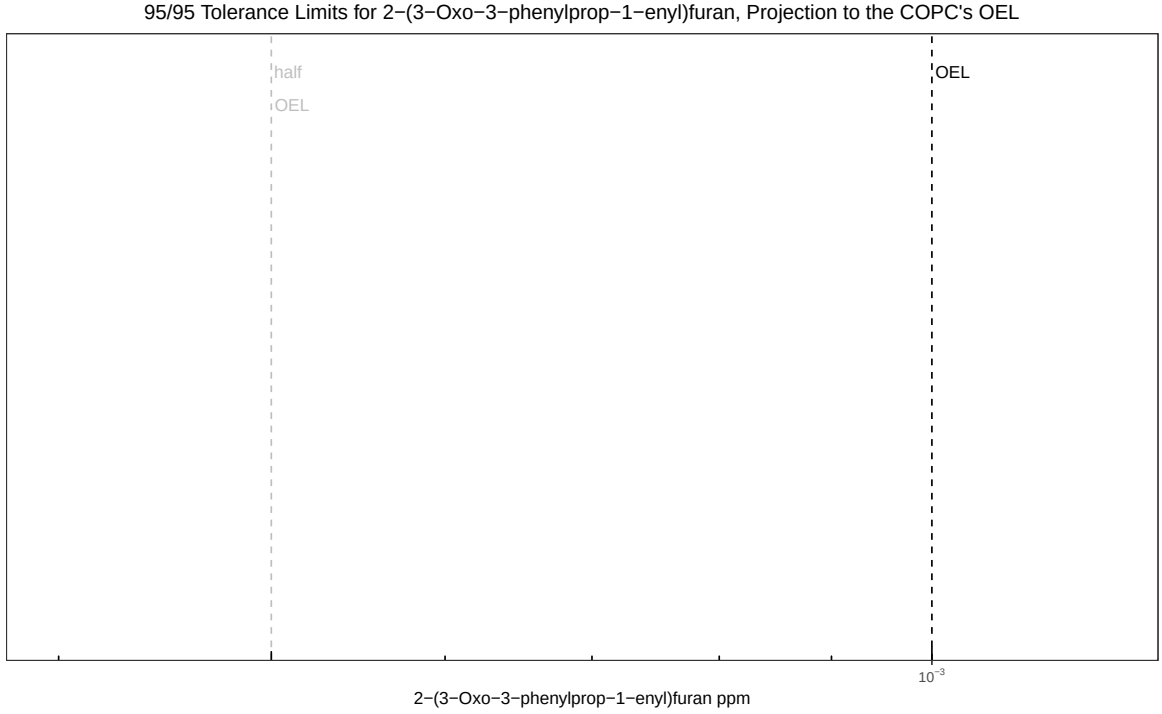


Figure E.190: Tolerance limits for 2-(3-Oxo-3-phenylprop-1-enyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

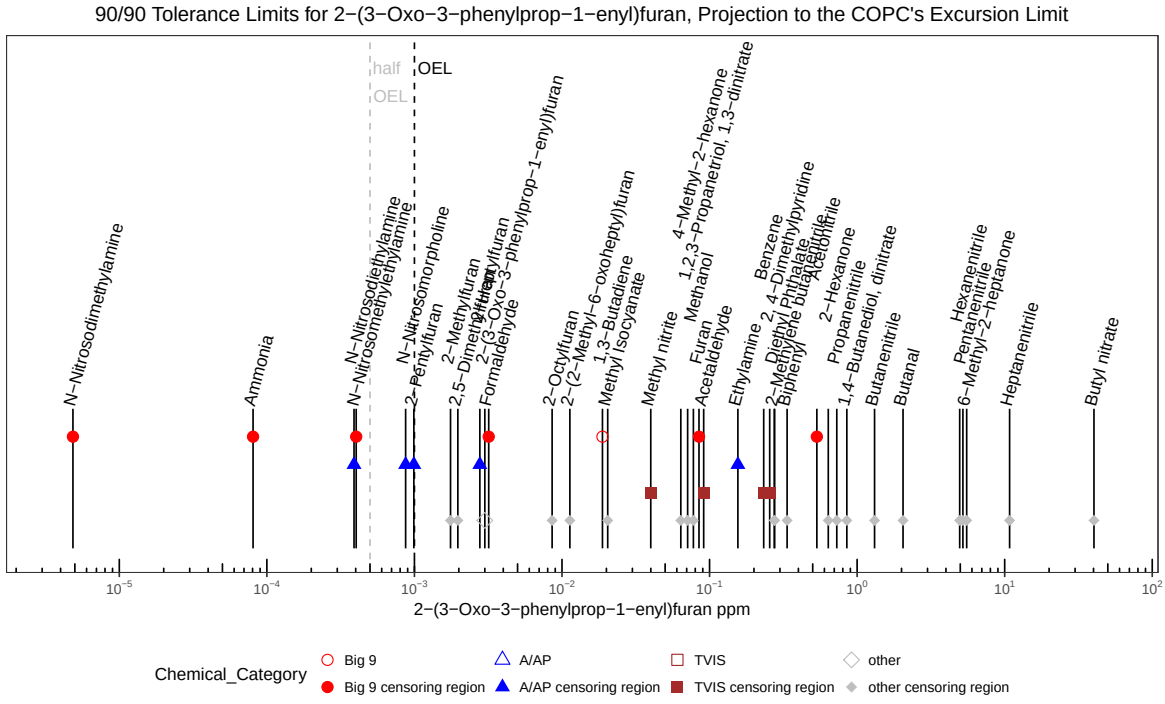


Figure E.191: Tolerance limits for 2-(3-Oxo-3-phenylprop-1-enyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

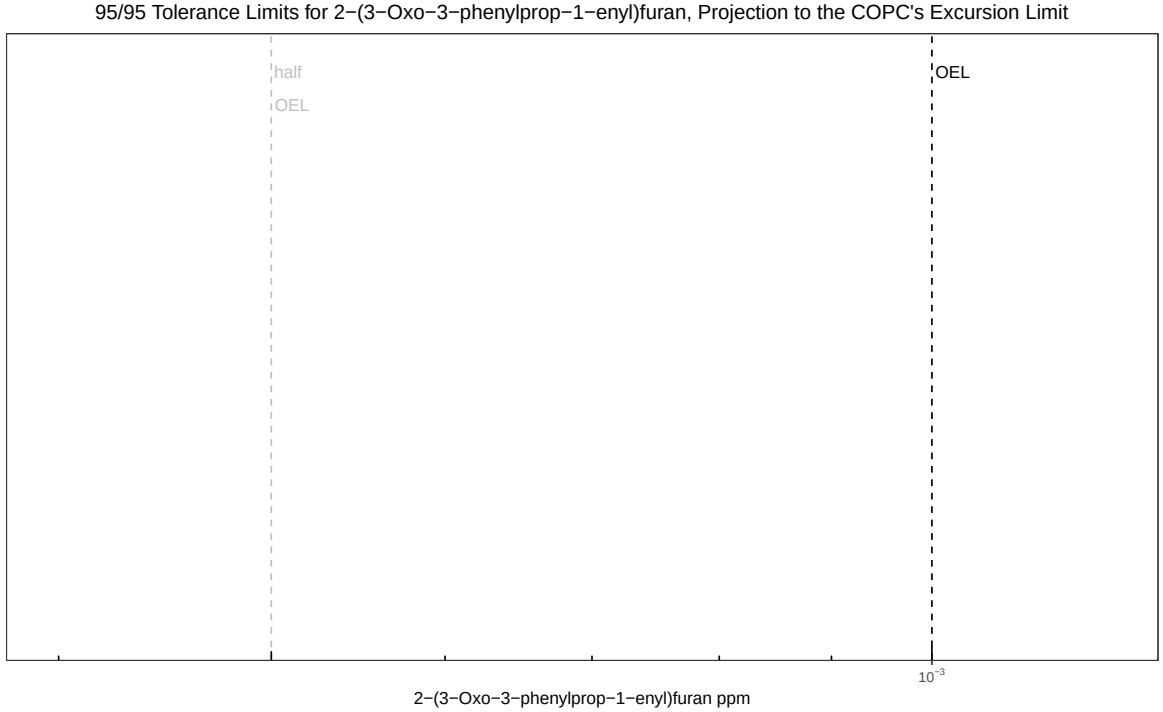


Figure E.192: Tolerance limits for 2-(3-Oxo-3-phenylprop-1-enyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

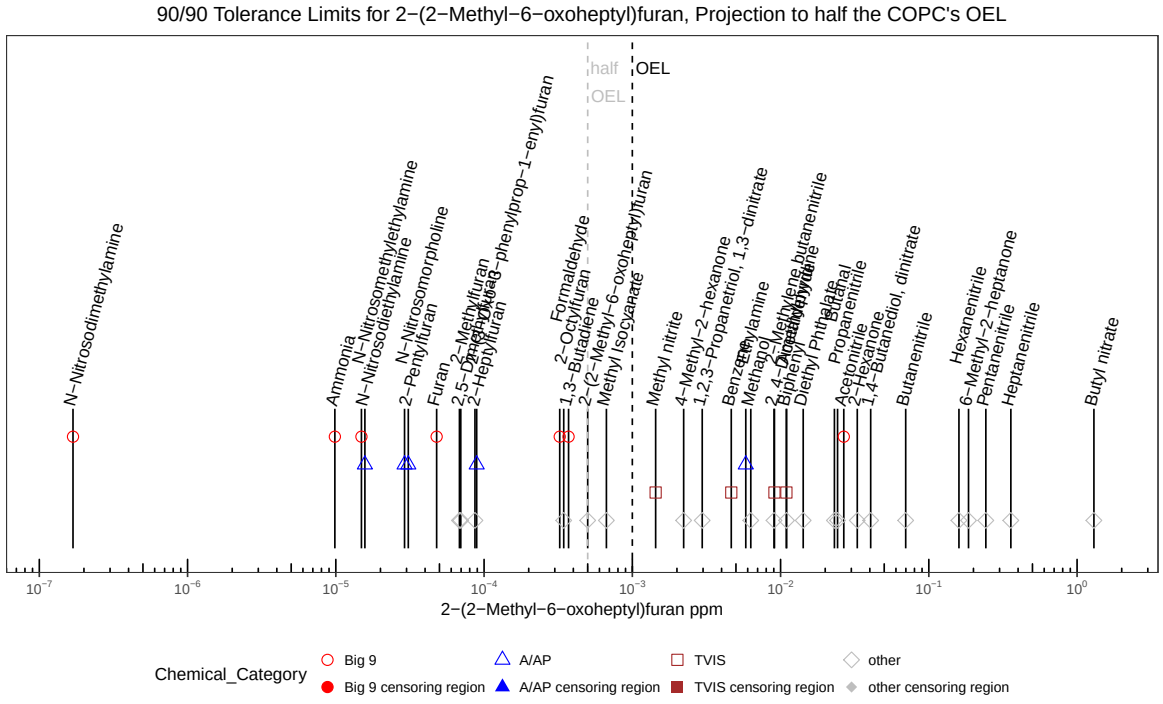


Figure E.193: Tolerance limits for 2-(2-Methyl-6-oxoheptyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

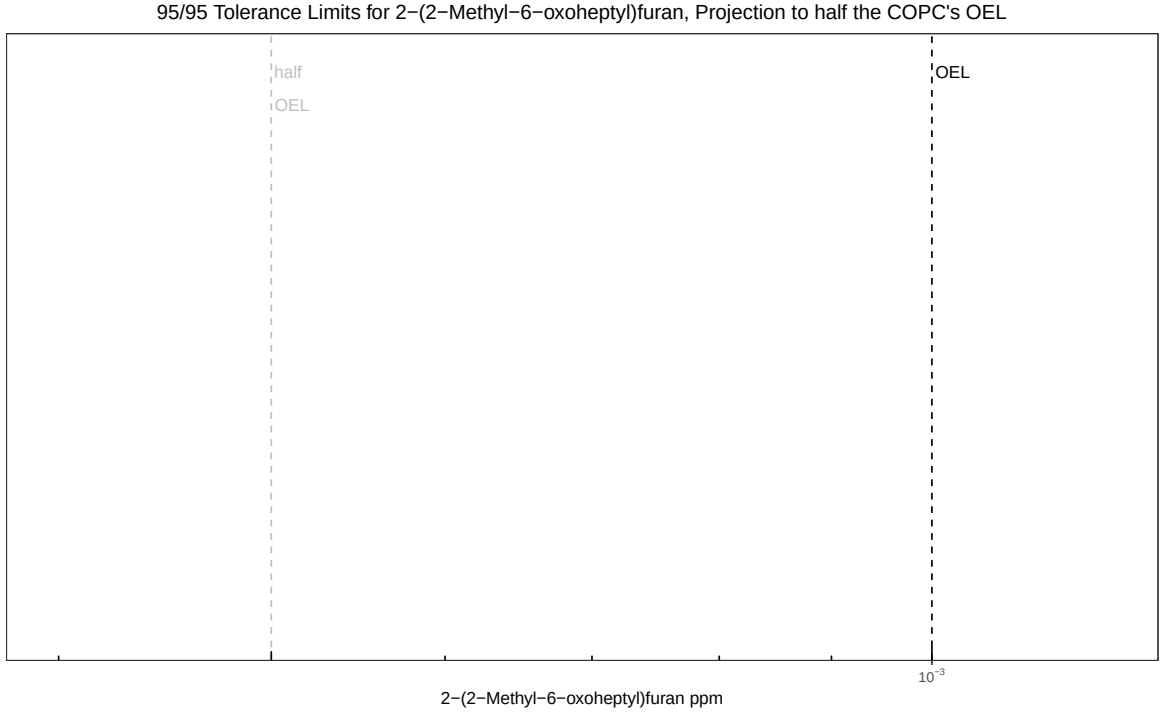


Figure E.194: Tolerance limits for 2-(2-Methyl-6-oxoheptyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

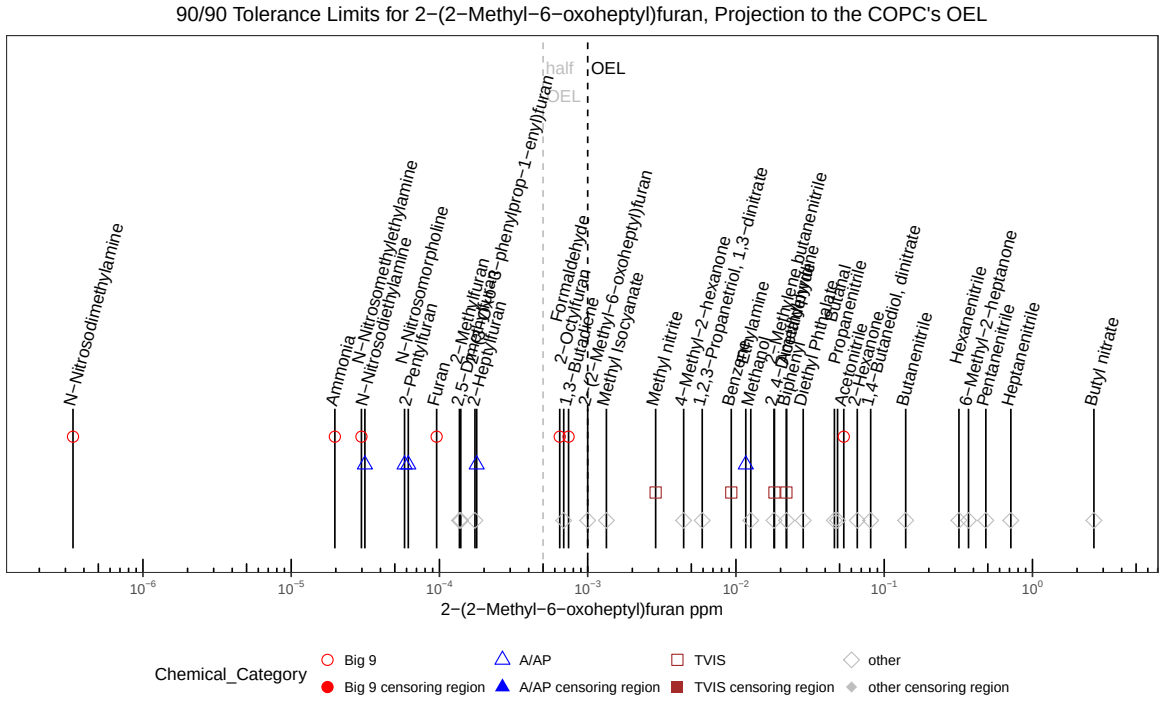


Figure E.195: Tolerance limits for 2-(2-Methyl-6-oxoheptyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

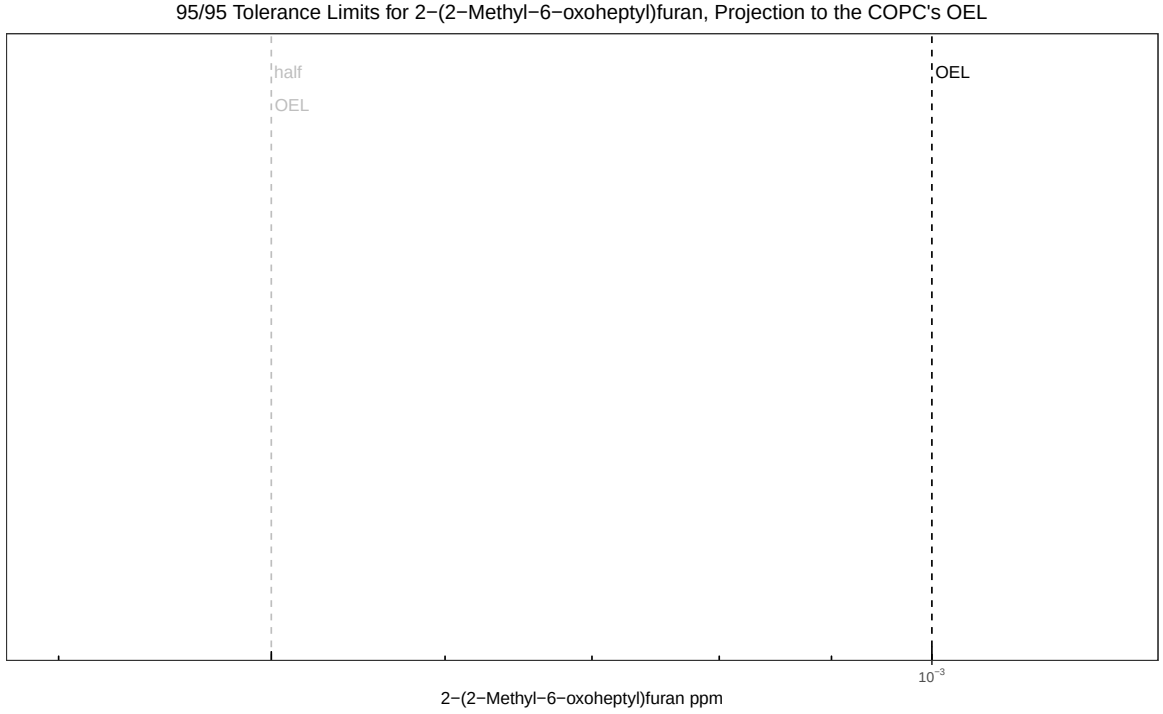


Figure E.196: Tolerance limits for 2-(2-Methyl-6-oxoheptyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

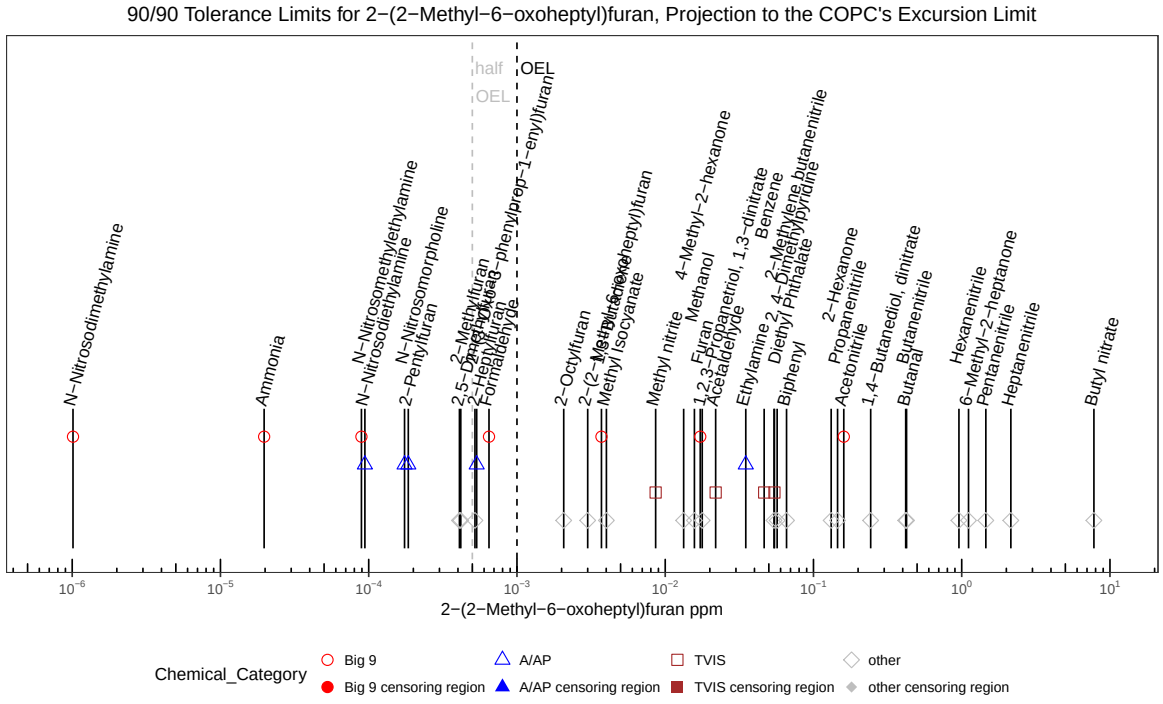


Figure E.197: Tolerance limits for 2-(2-Methyl-6-oxoheptyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

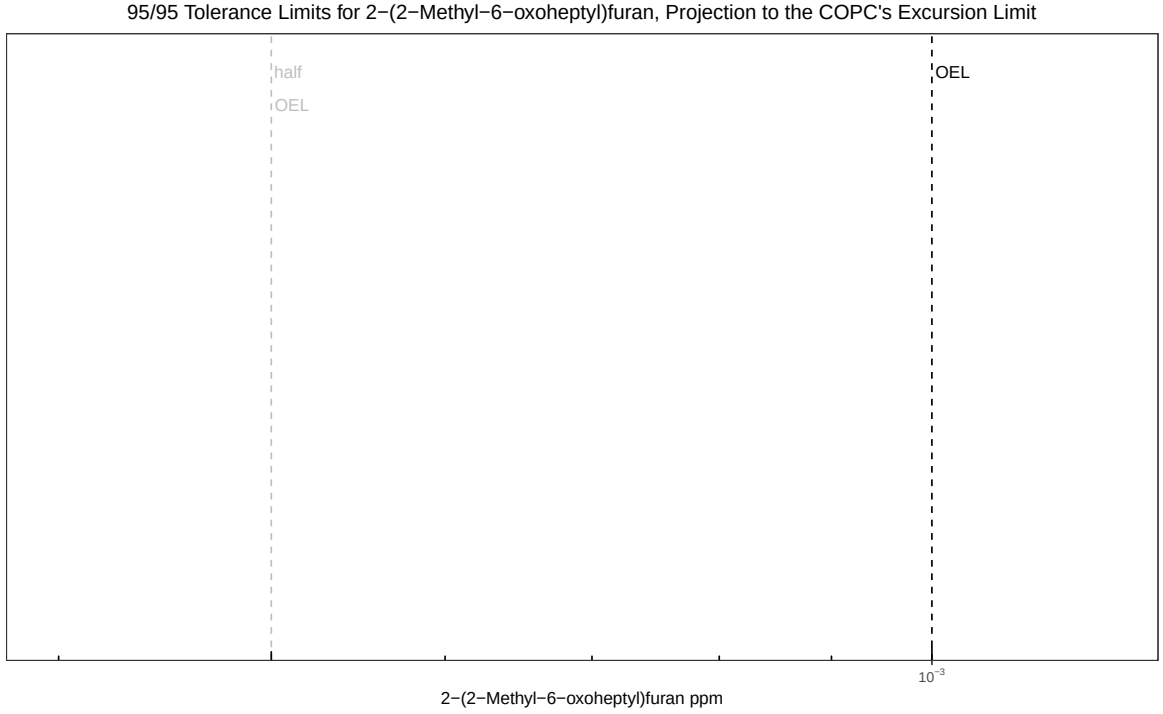


Figure E.198: Tolerance limits for 2-(2-Methyl-6-oxoheptyl)furan as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

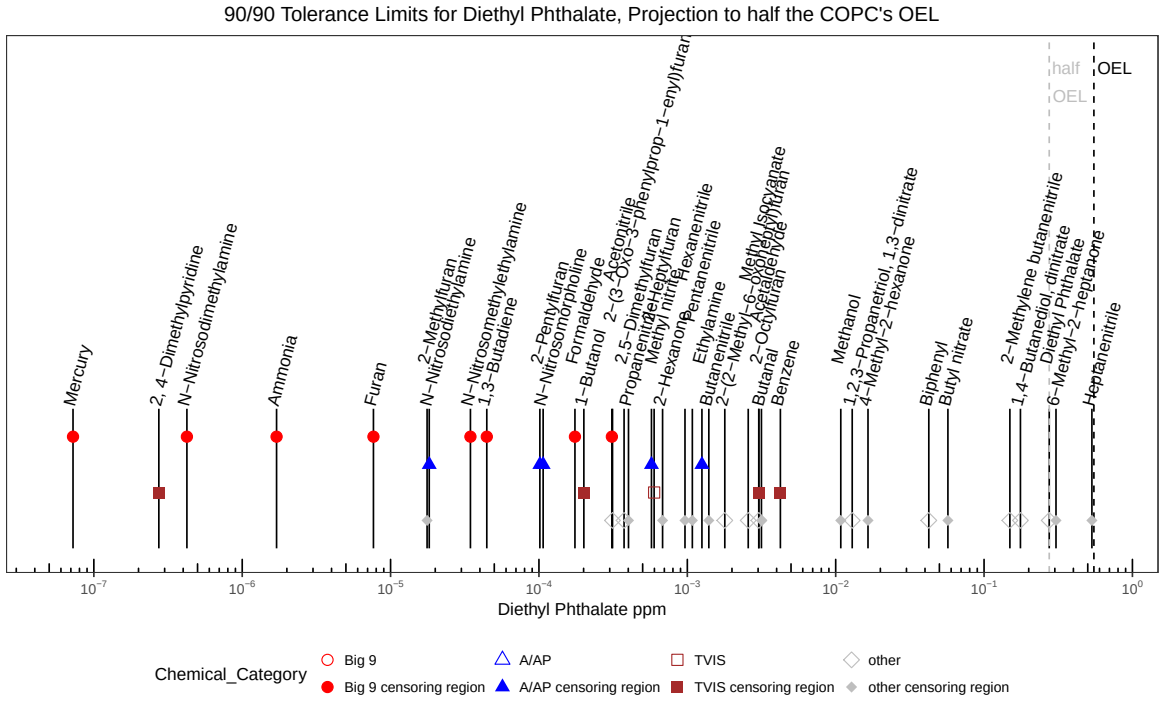


Figure E.199: Tolerance limits for Diethyl Phthalate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

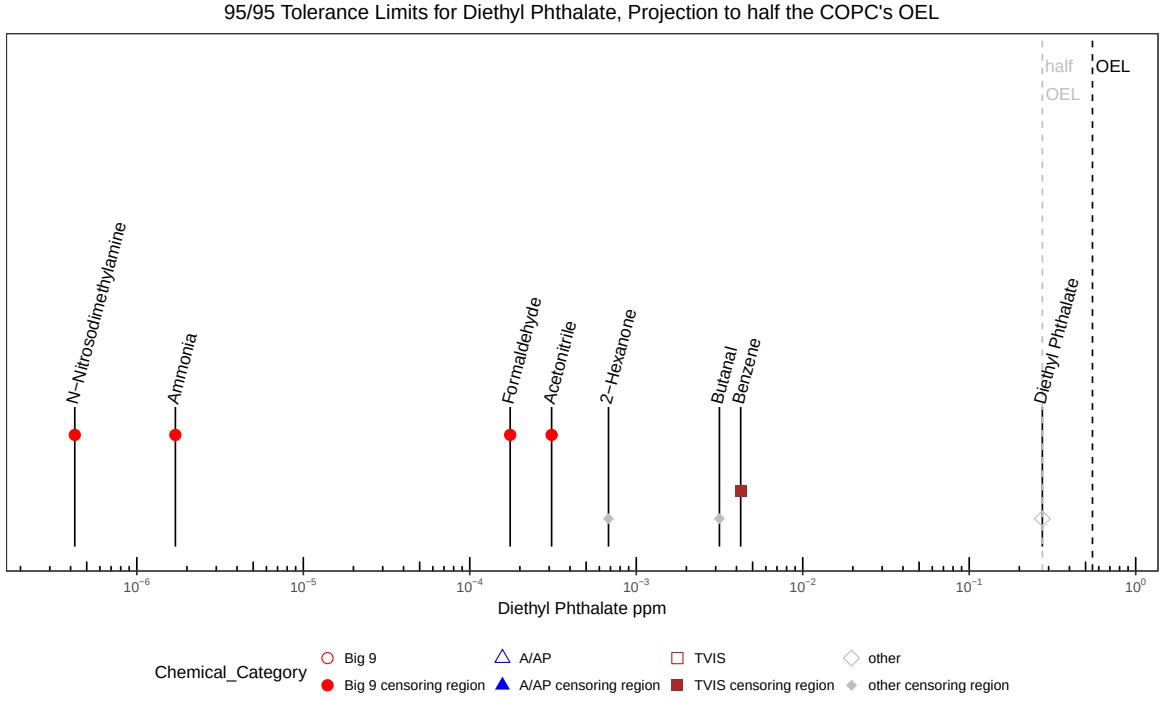


Figure E.200: Tolerance limits for Diethyl Phthalate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

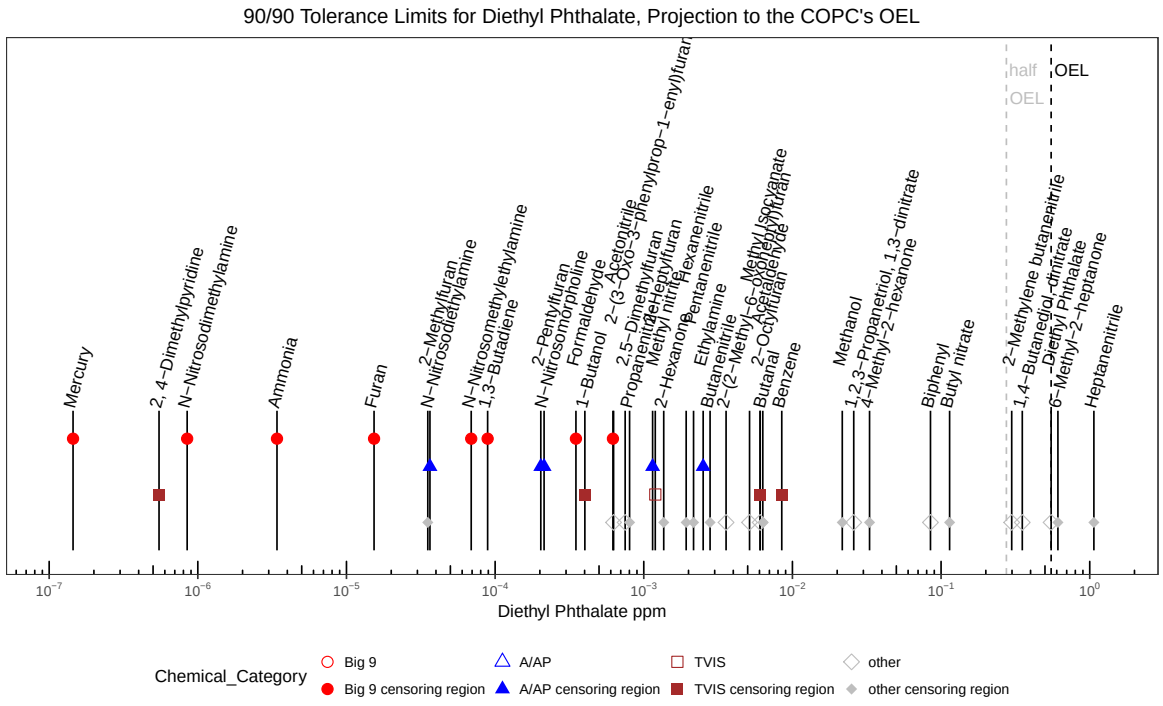


Figure E.201: Tolerance limits for Diethyl Phthalate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

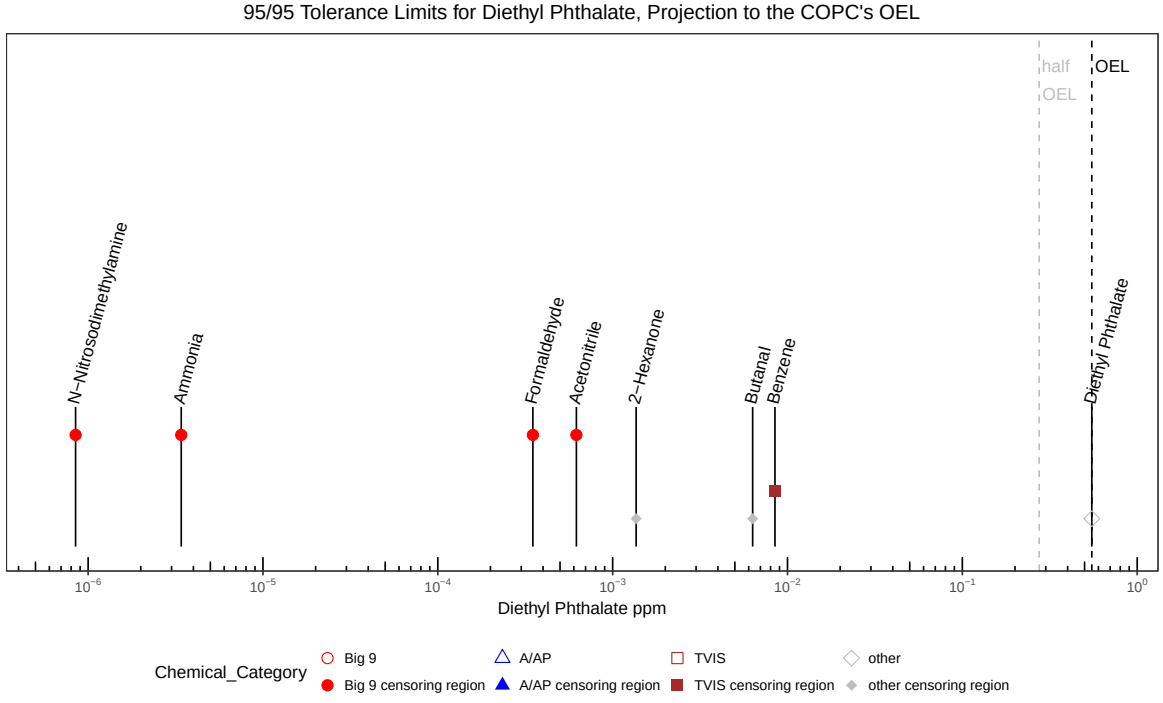


Figure E.202: Tolerance limits for Diethyl Phthalate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

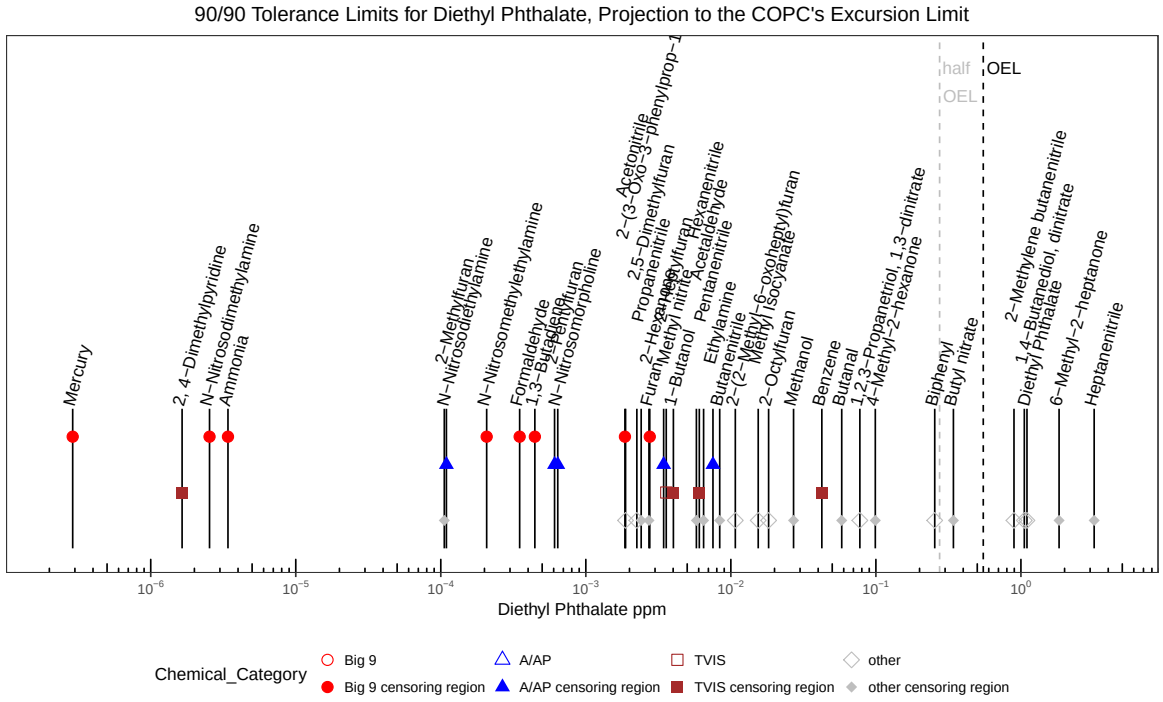


Figure E.203: Tolerance limits for Diethyl Phthalate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

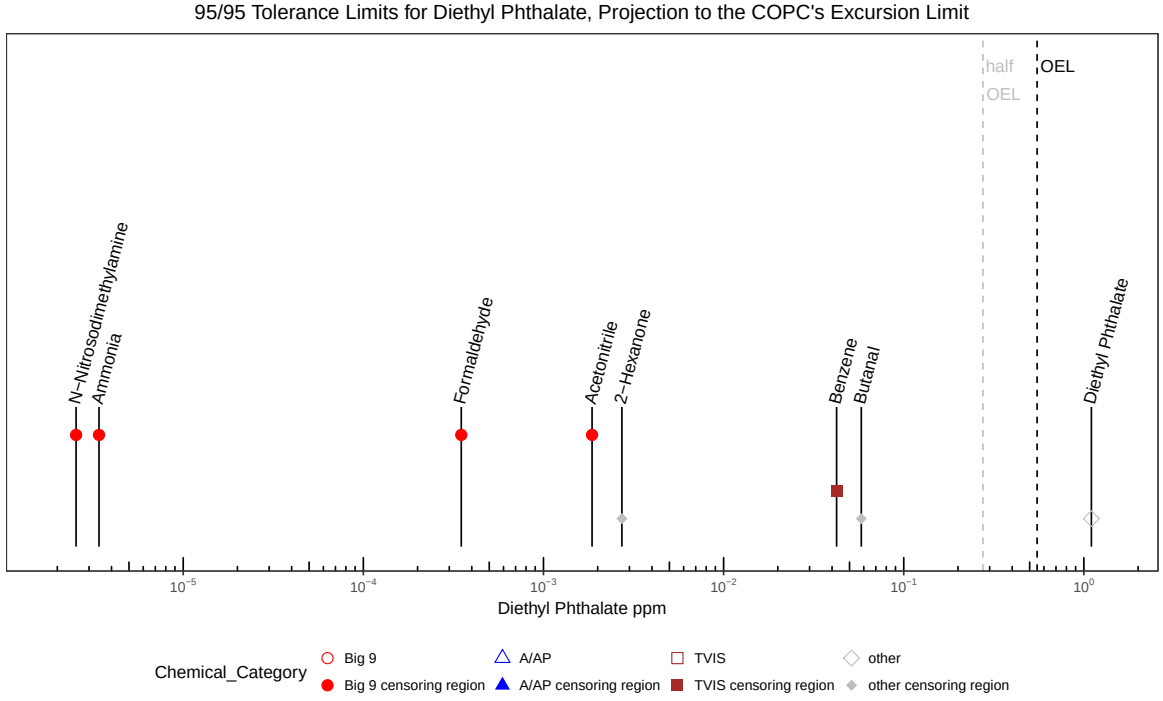


Figure E.204: Tolerance limits for Diethyl Phthalate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

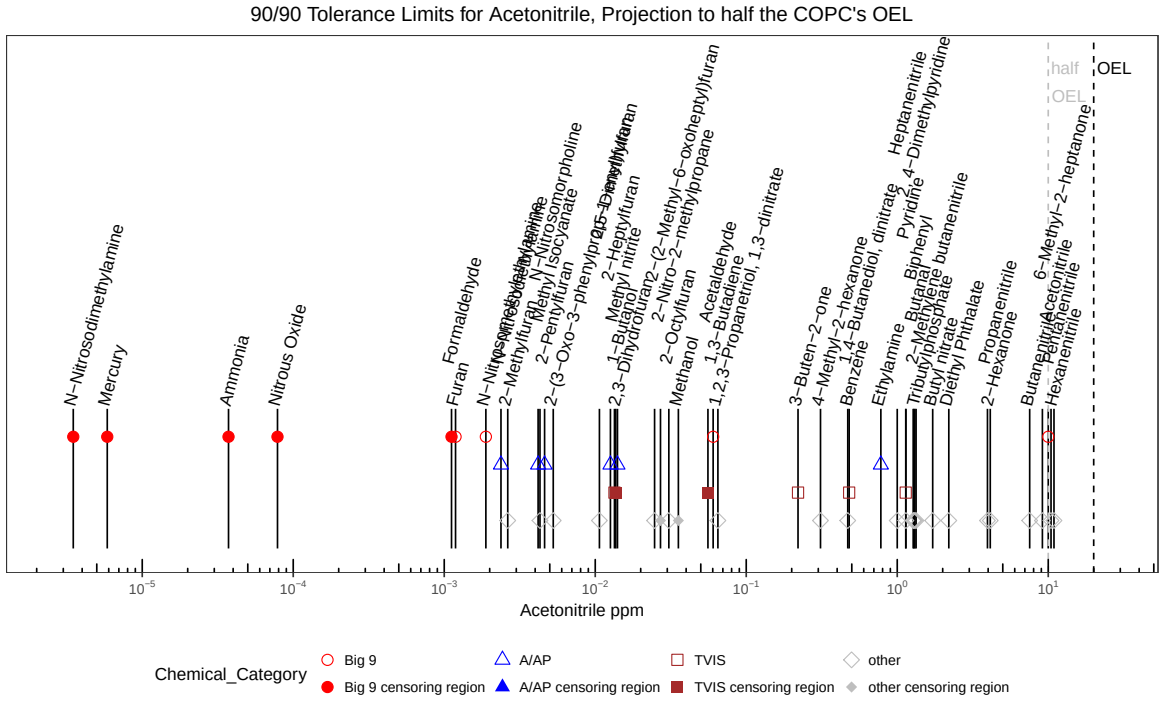


Figure E.205: Tolerance limits for Acetonitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

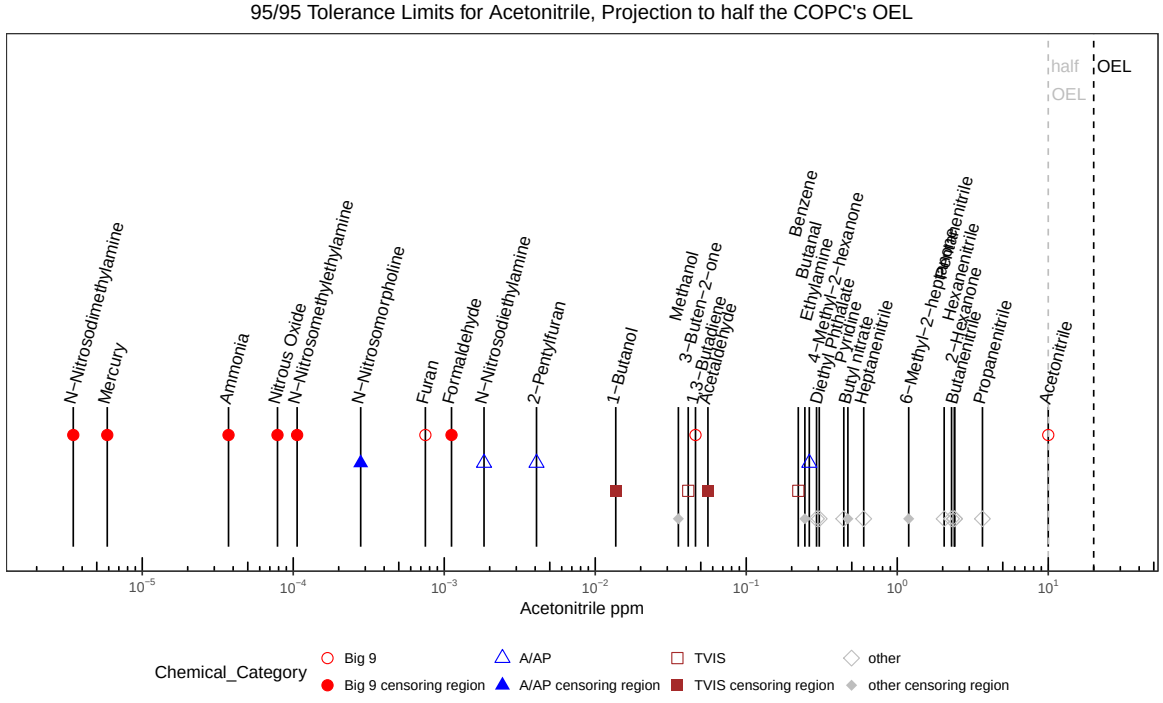


Figure E.206: Tolerance limits for Acetonitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

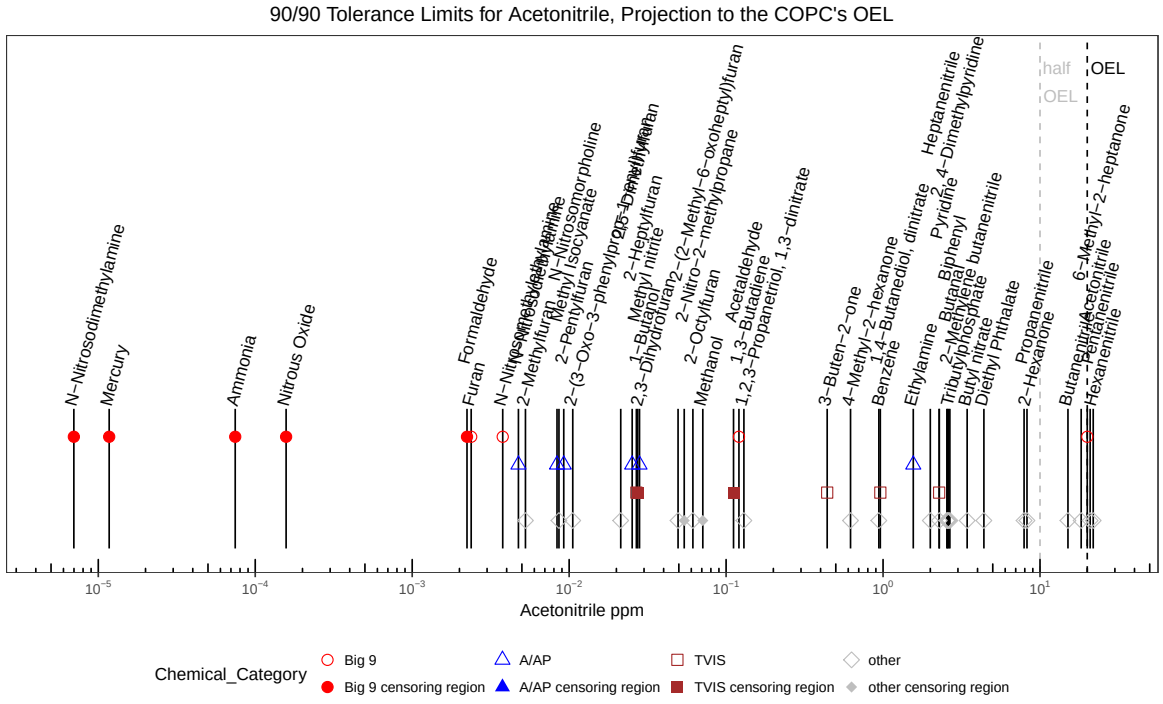


Figure E.207: Tolerance limits for Acetonitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

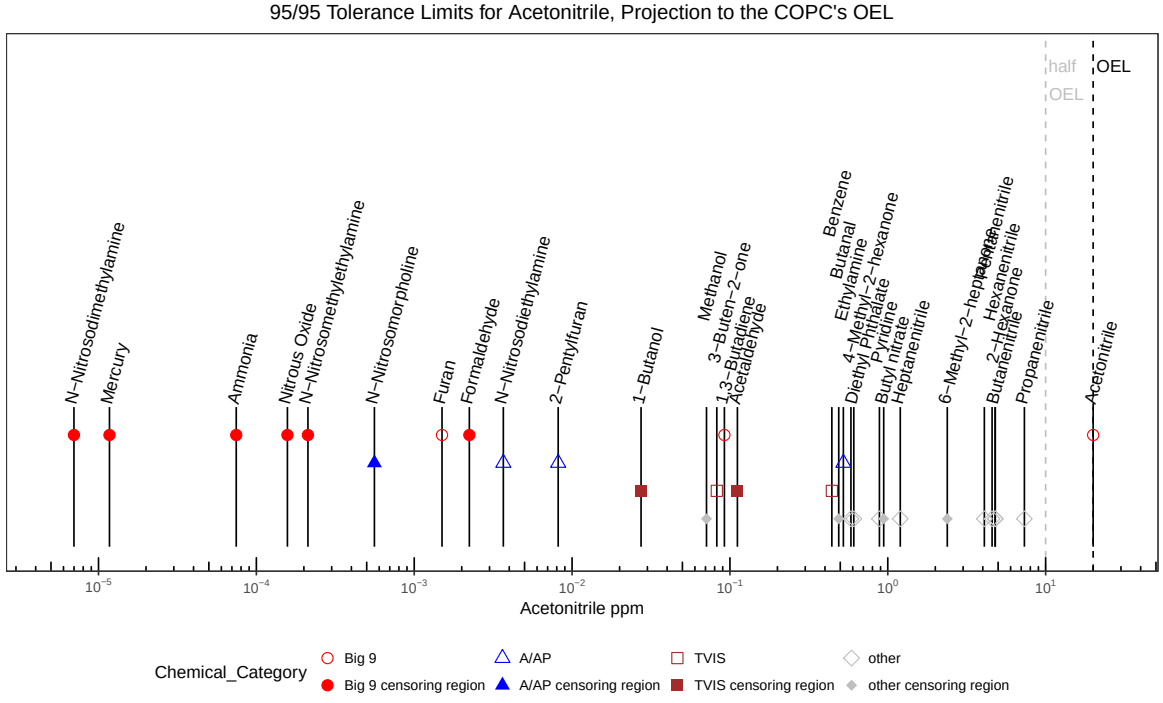


Figure E.208: Tolerance limits for Acetonitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

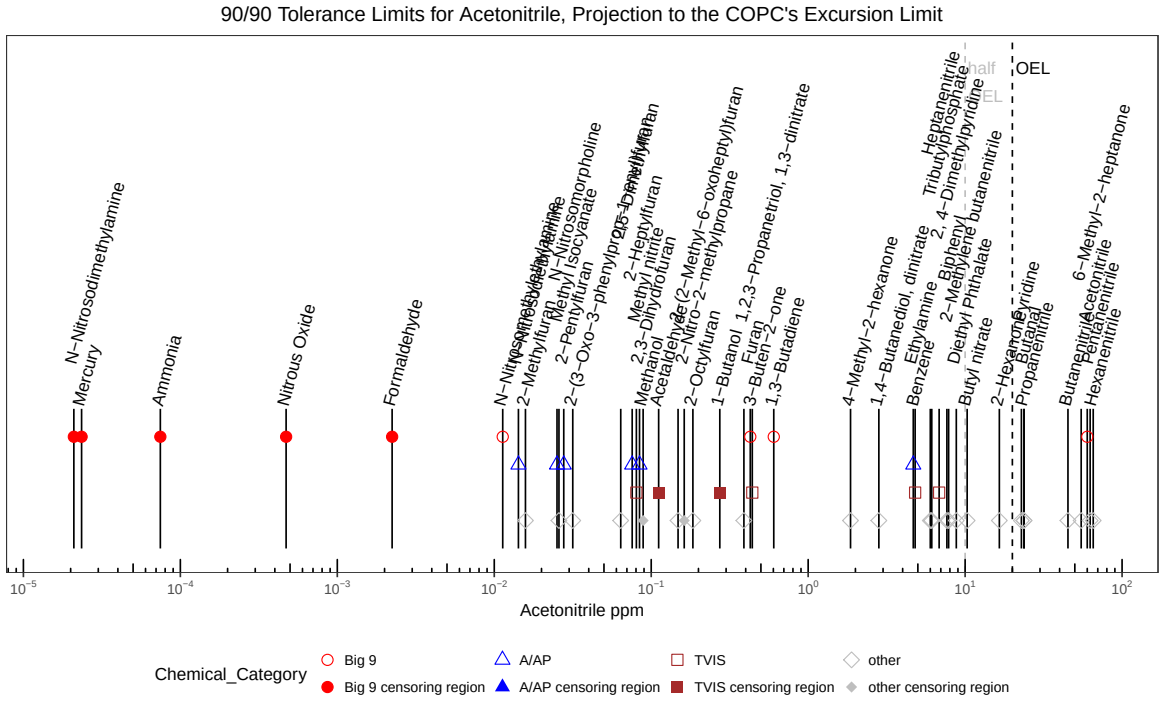


Figure E.209: Tolerance limits for Acetonitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

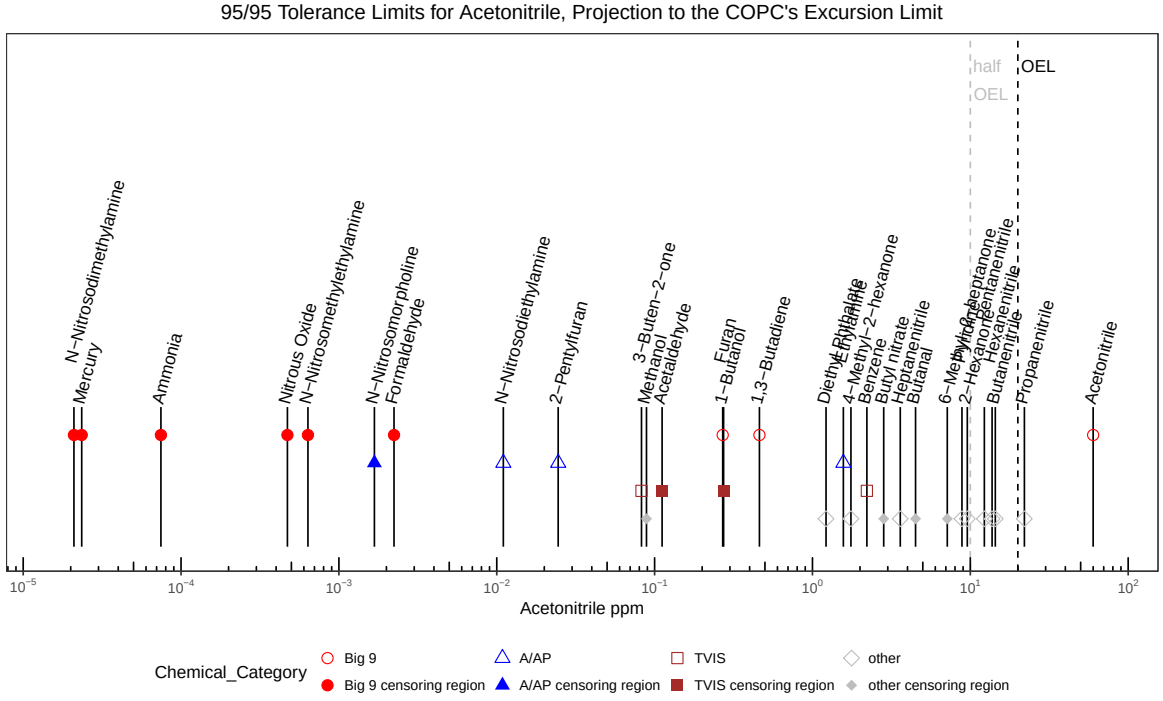


Figure E.210: Tolerance limits for Acetonitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

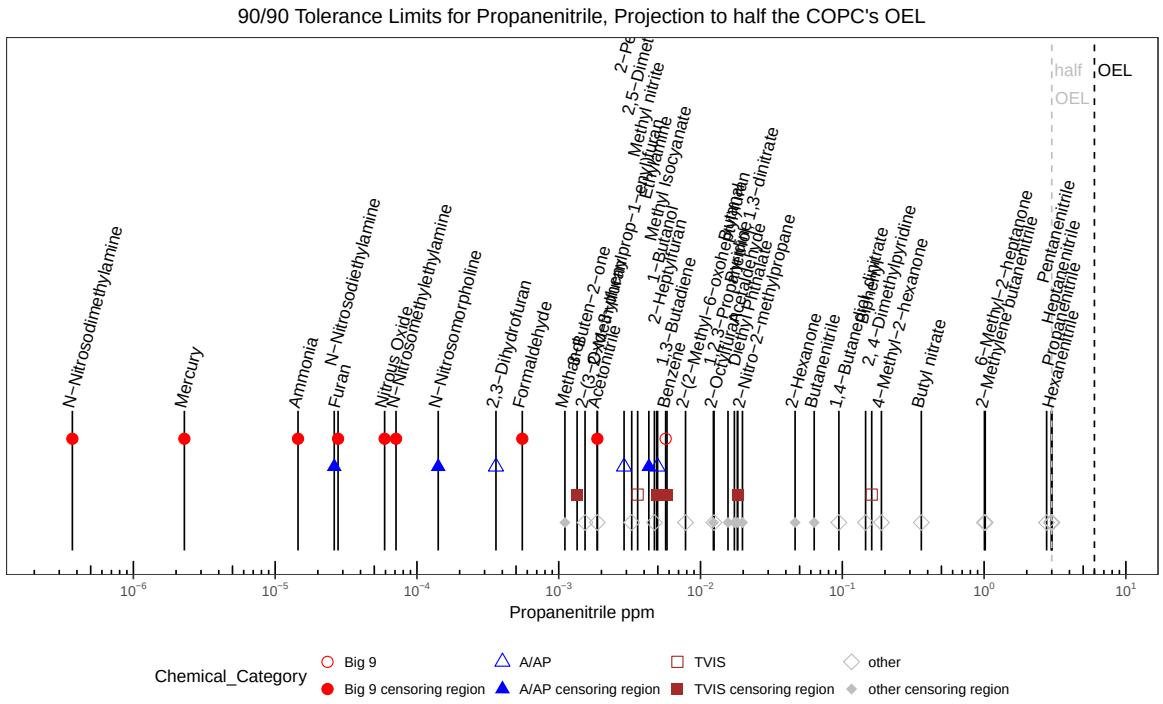


Figure E.211: Tolerance limits for Propanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

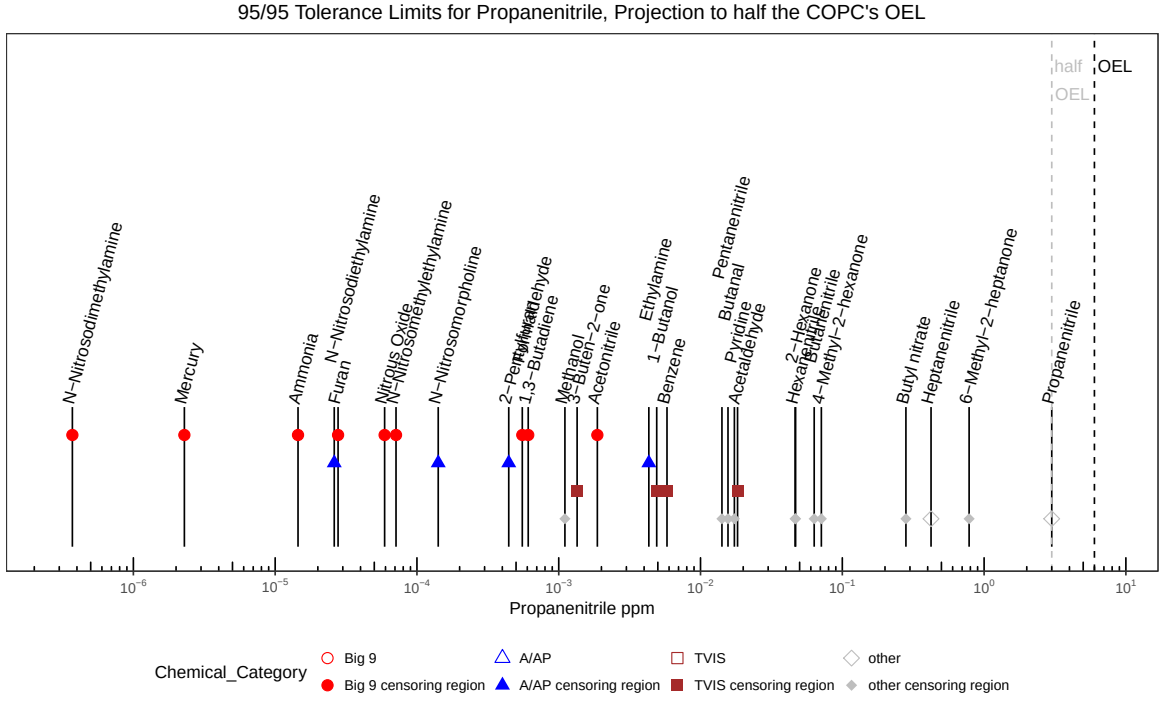


Figure E.212: Tolerance limits for Propanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

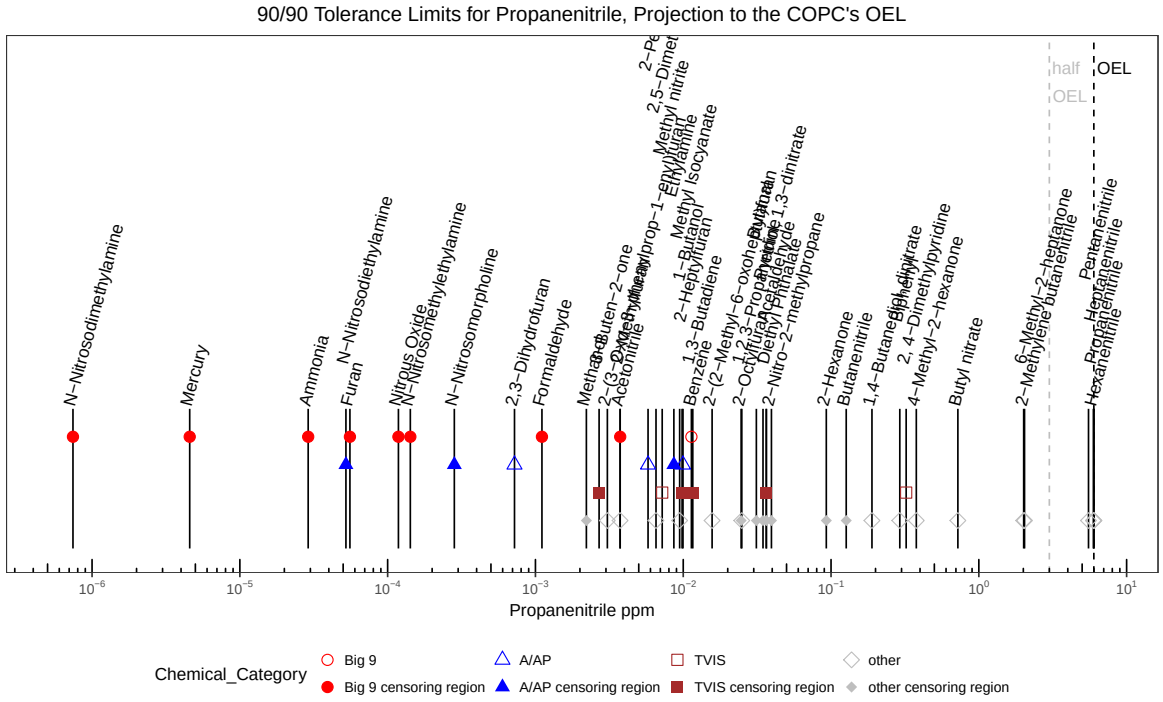


Figure E.213: Tolerance limits for Propanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

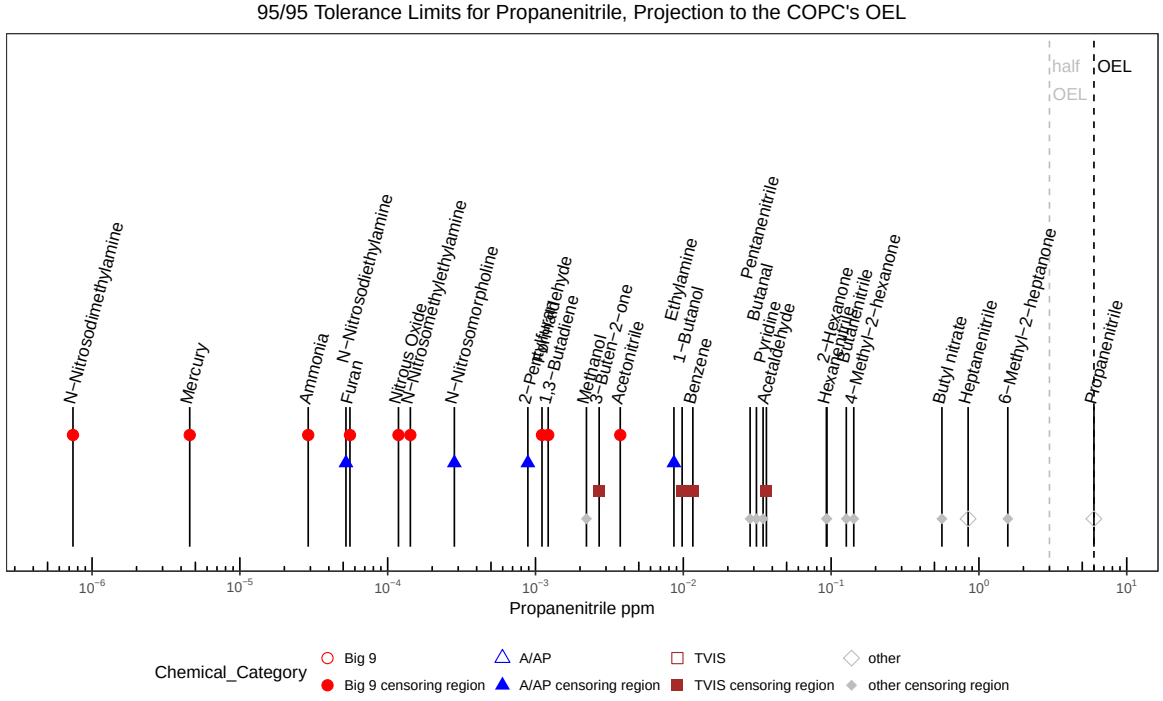


Figure E.214: Tolerance limits for Propanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

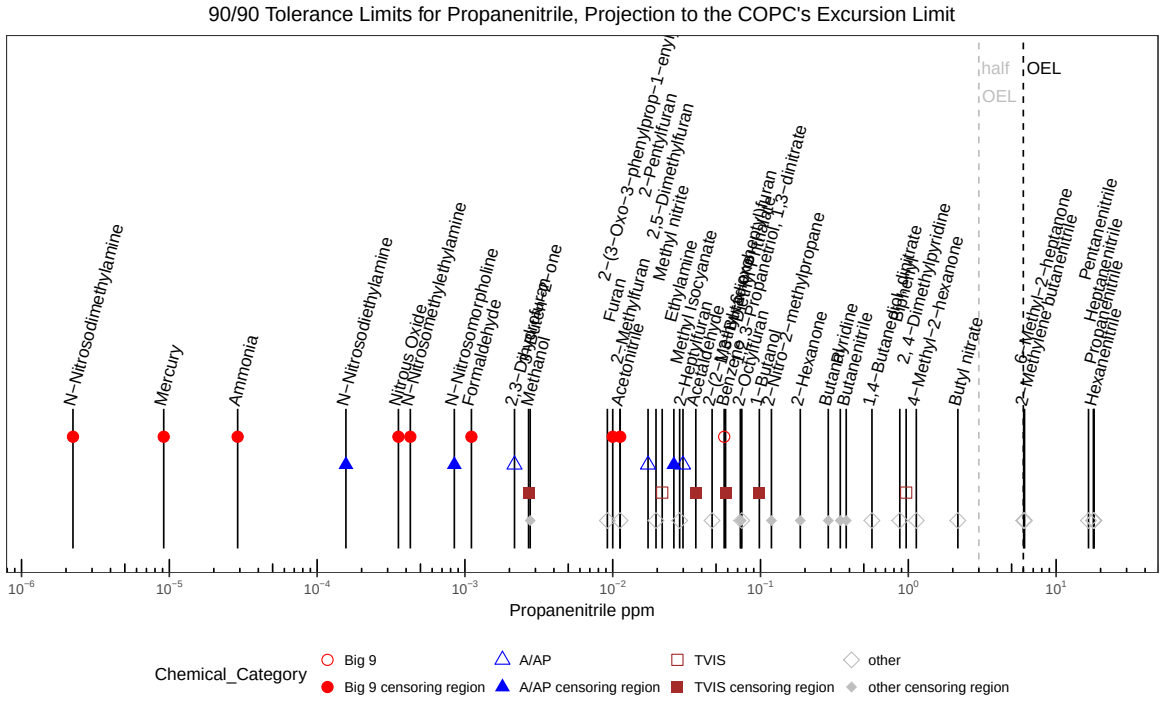


Figure E.215: Tolerance limits for Propanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

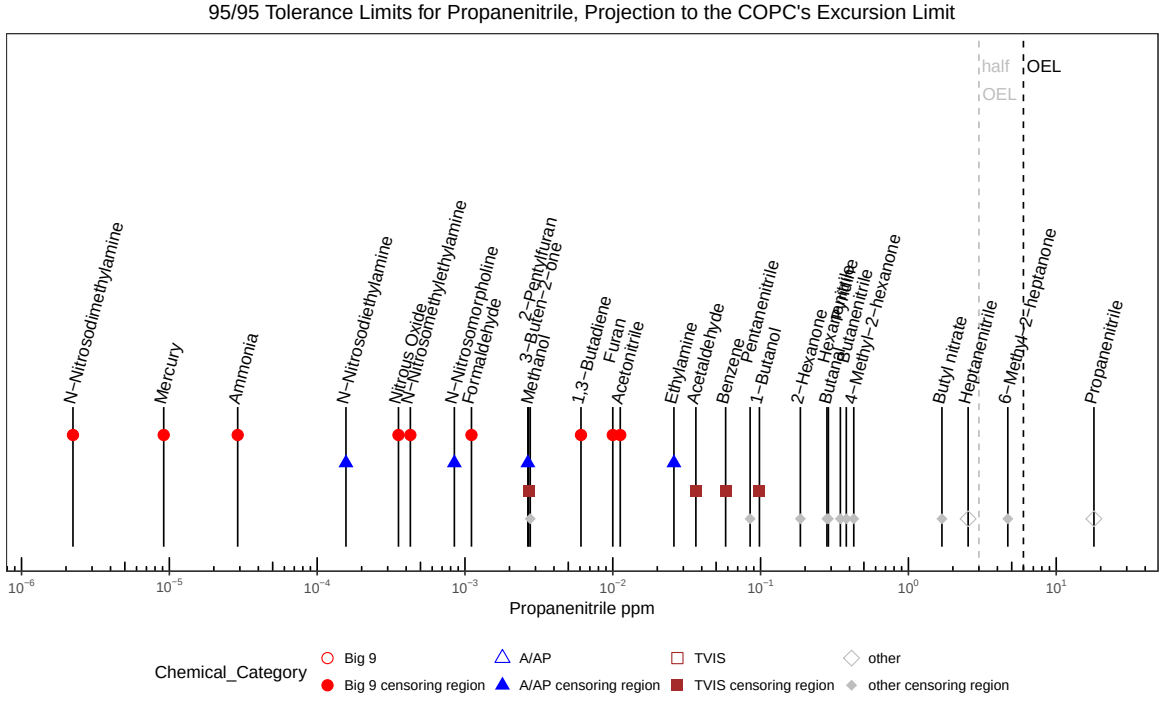


Figure E.216: Tolerance limits for Propanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

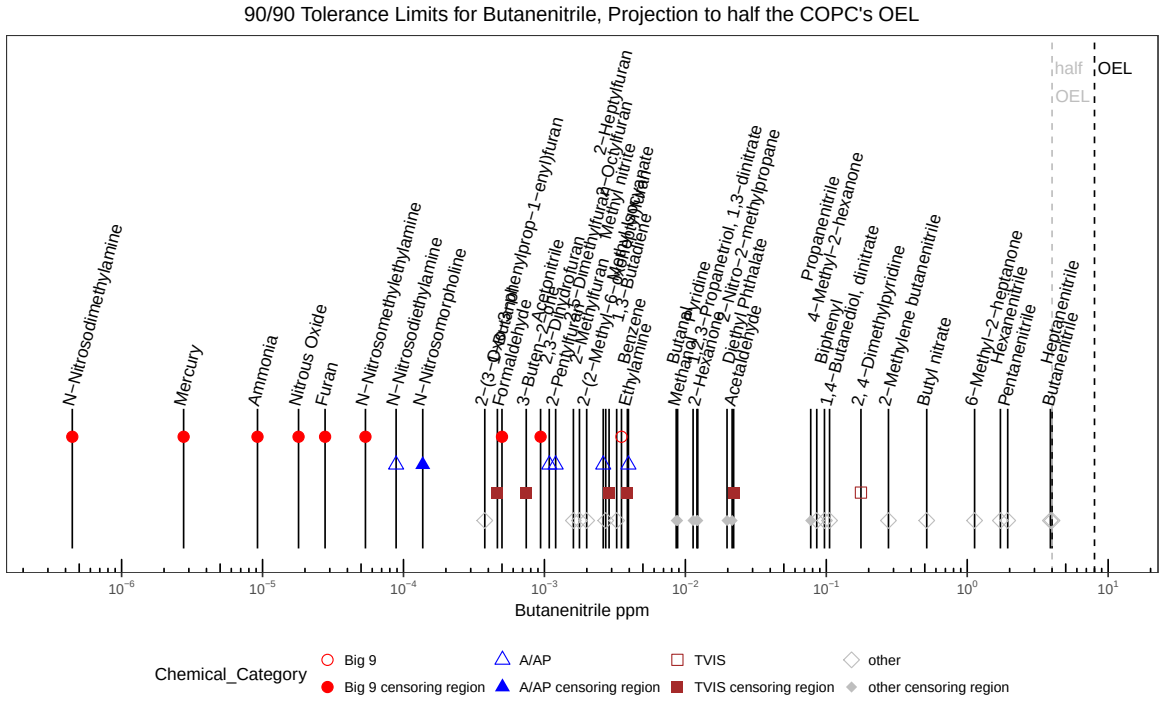


Figure E.217: Tolerance limits for Butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

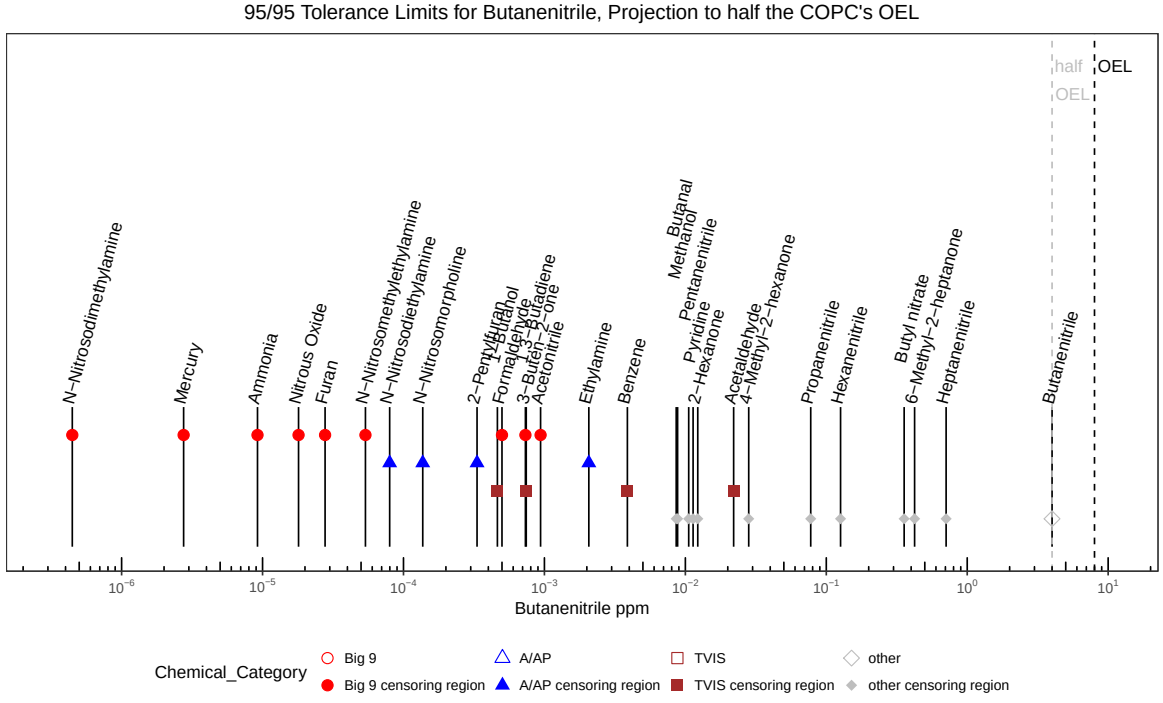


Figure E.218: Tolerance limits for Butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

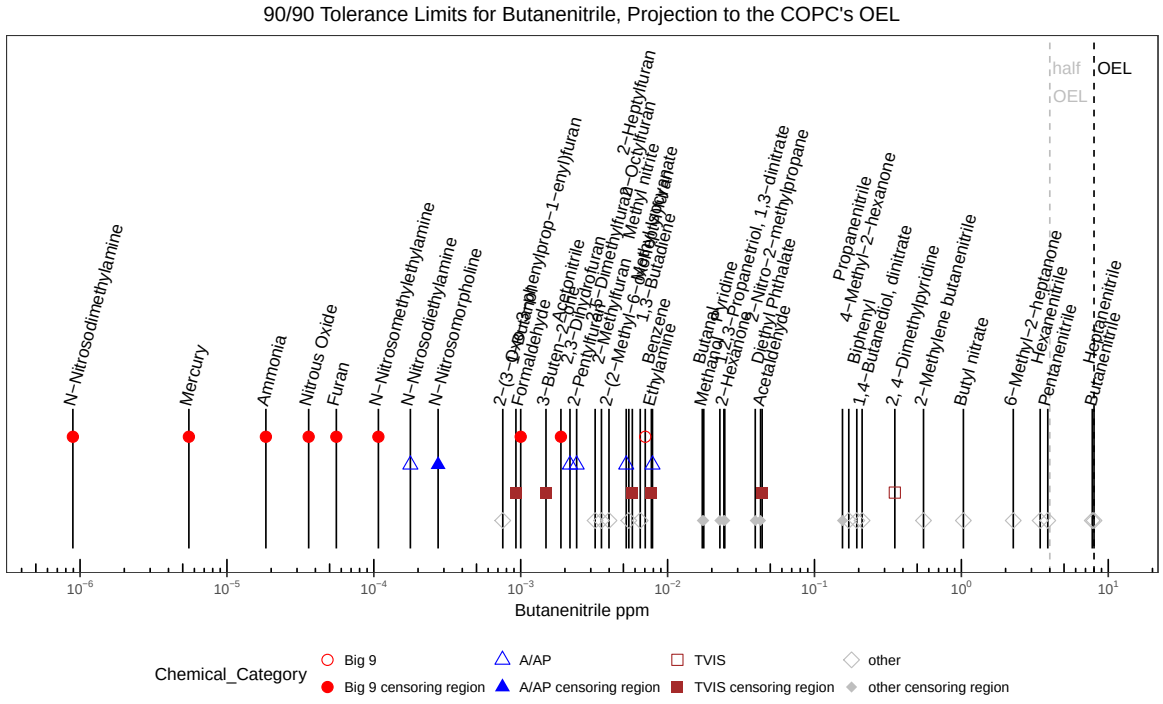


Figure E.219: Tolerance limits for Butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

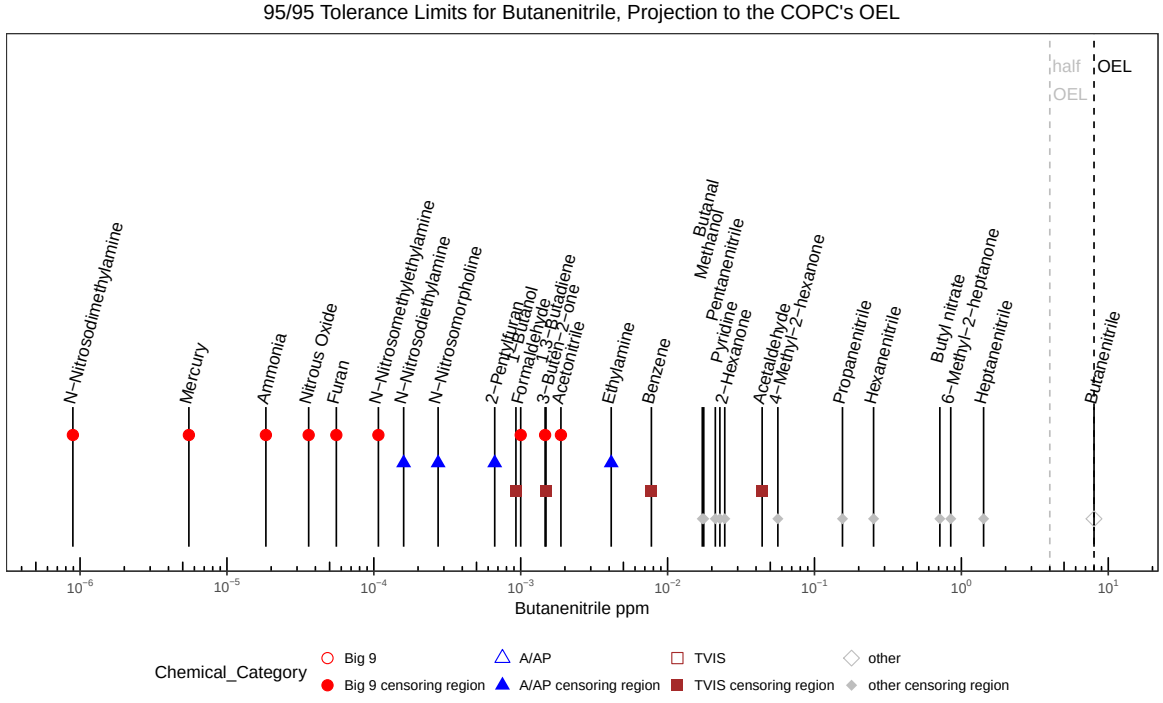


Figure E.220: Tolerance limits for Butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

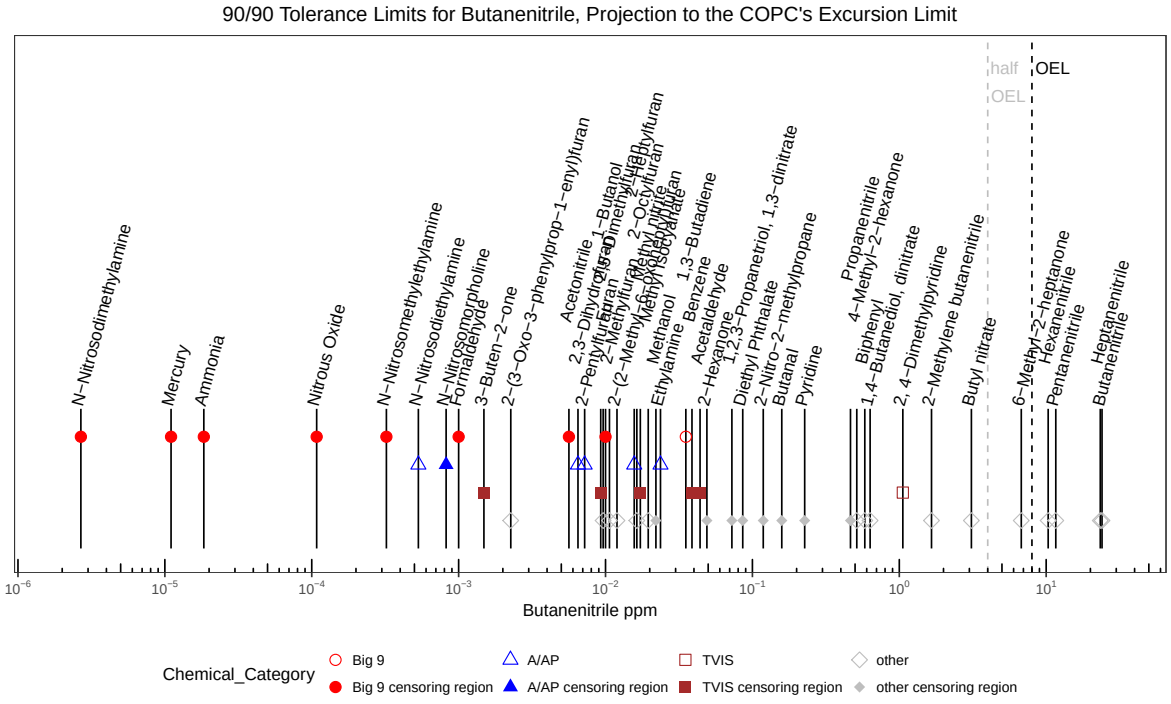


Figure E.221: Tolerance limits for Butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

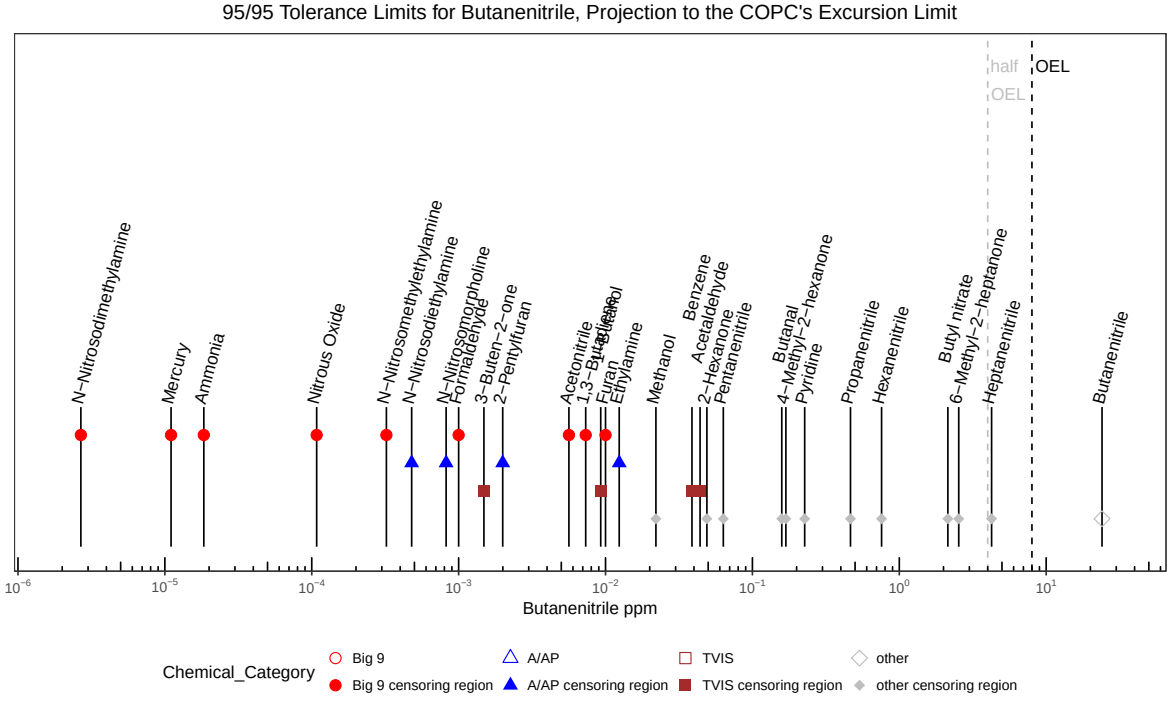


Figure E.222: Tolerance limits for Butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

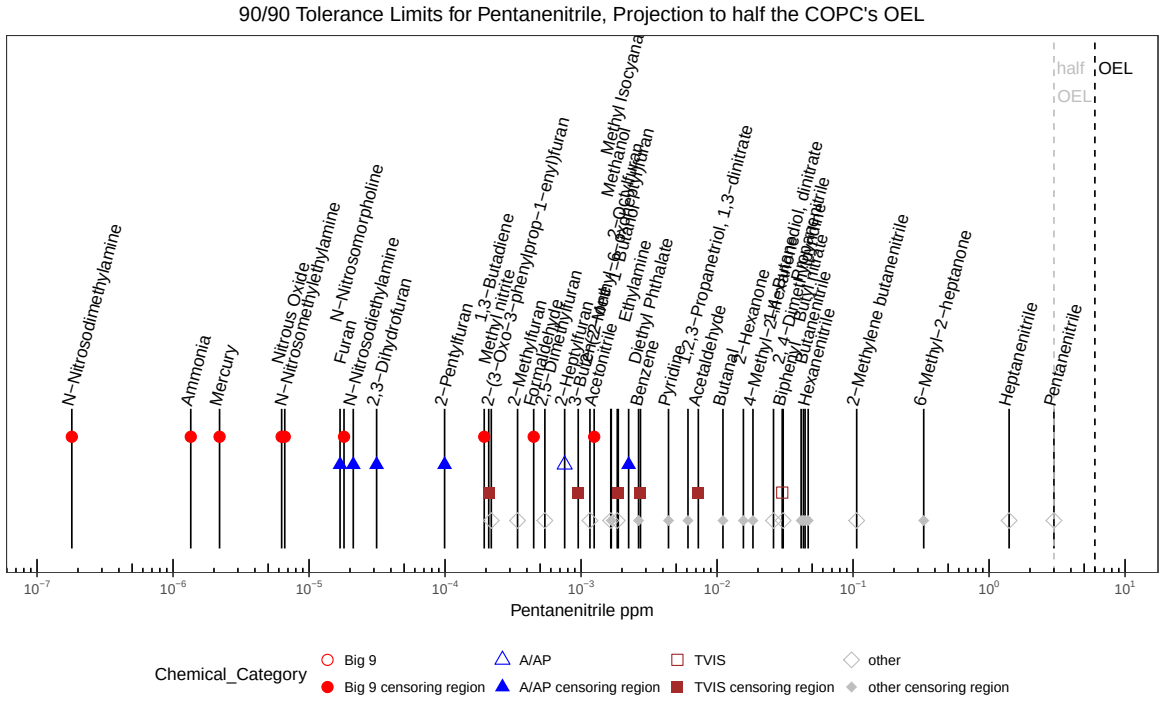


Figure E.223: Tolerance limits for Pentanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

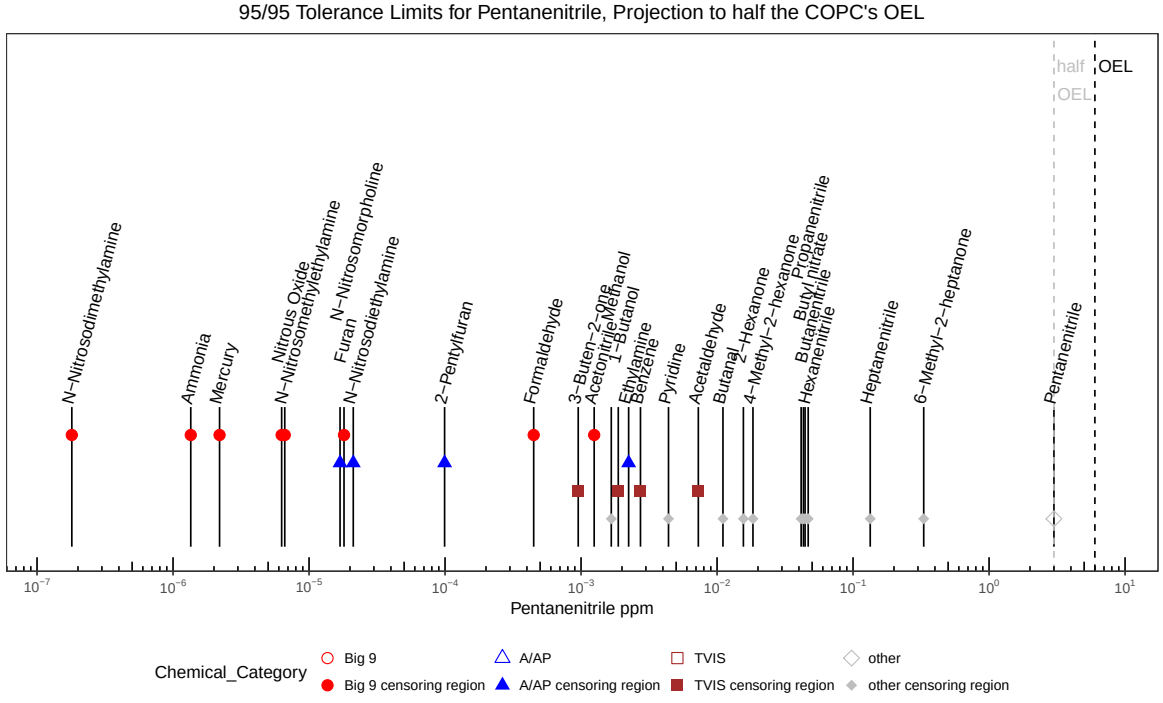


Figure E.224: Tolerance limits for Pentanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

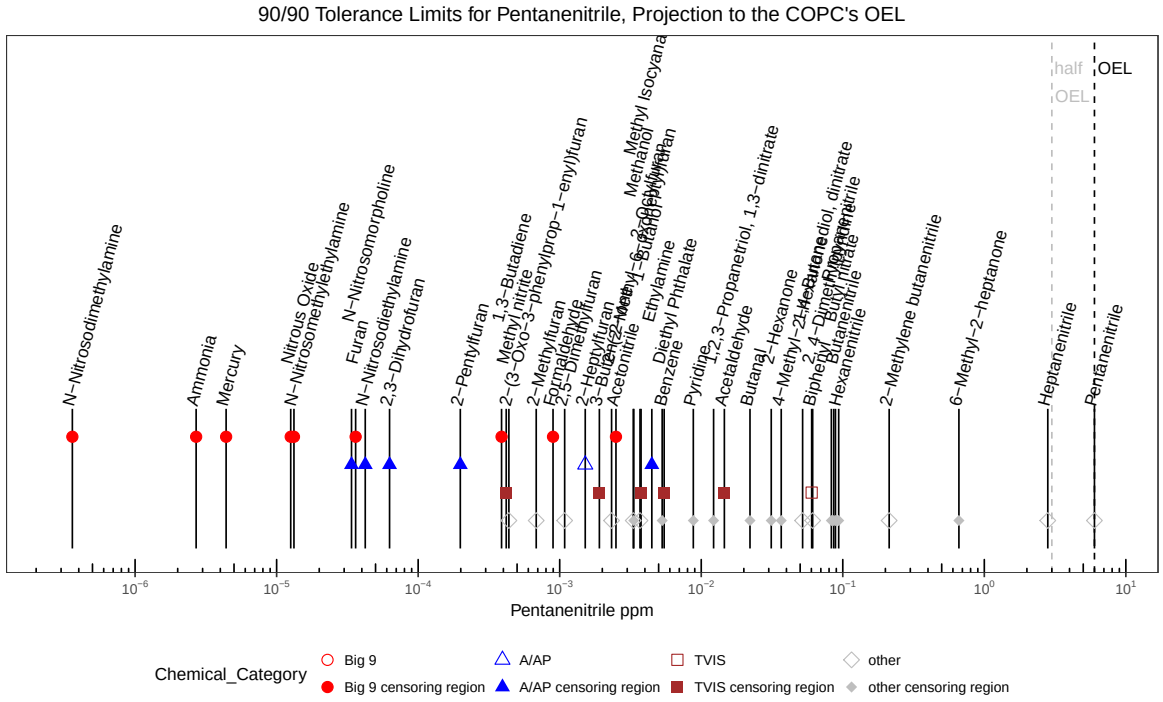


Figure E.225: Tolerance limits for Pentanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

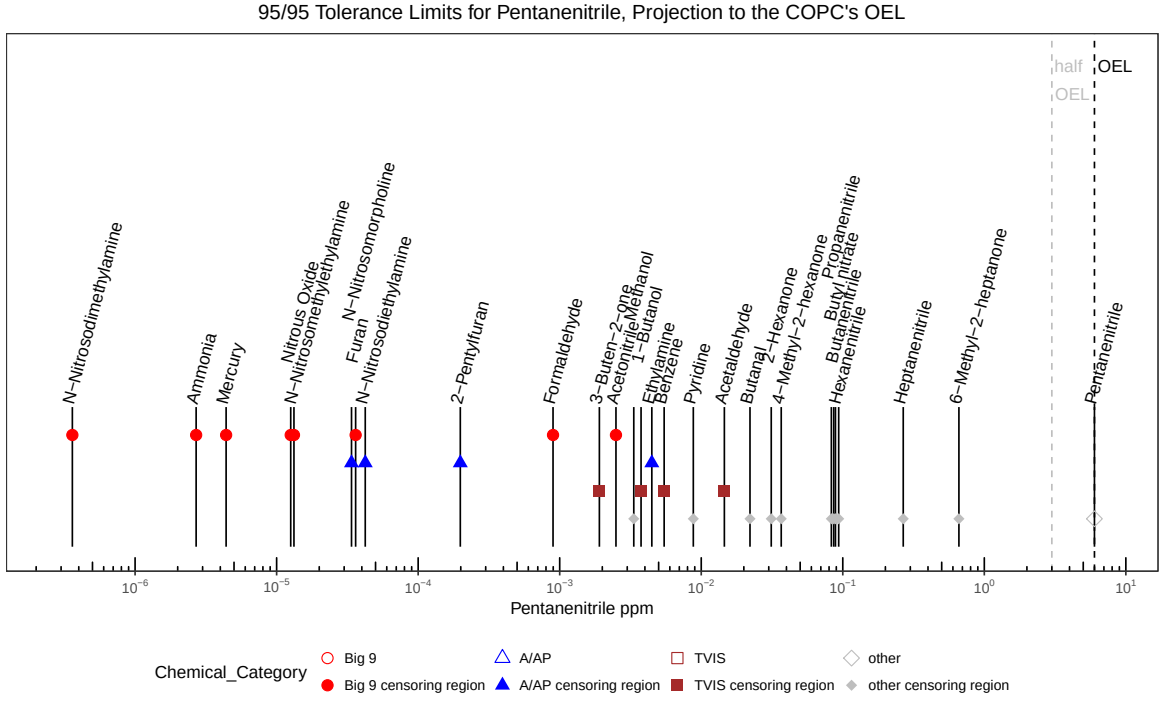


Figure E.226: Tolerance limits for Pentanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

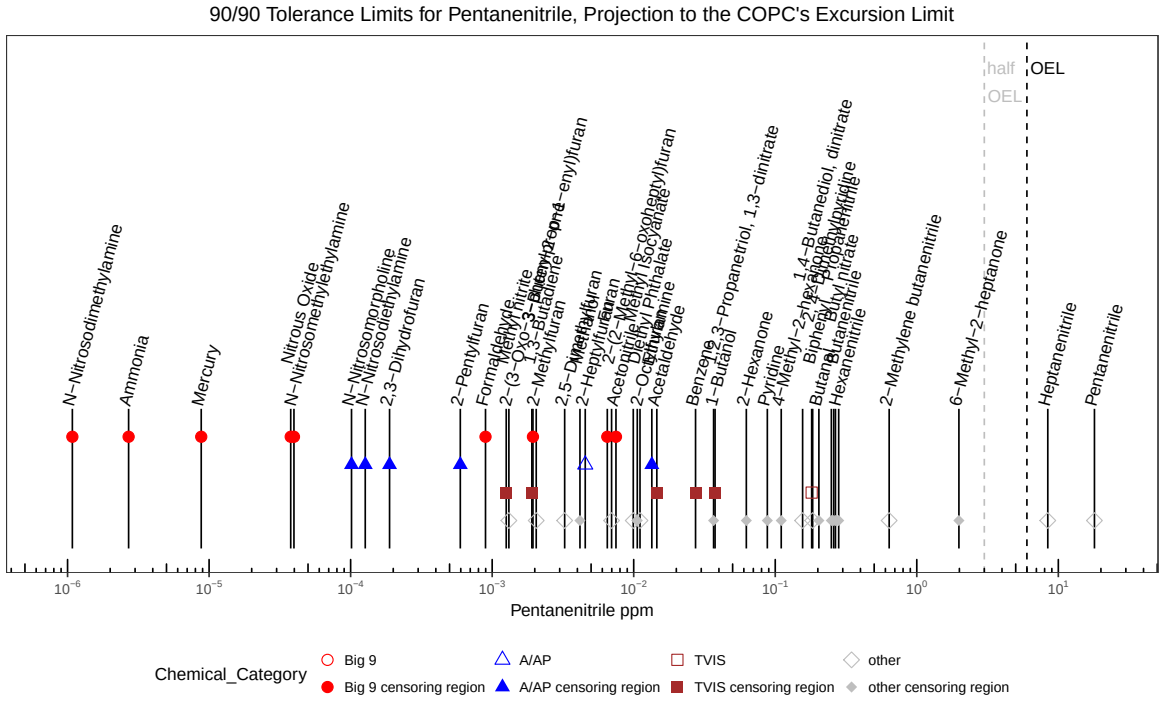


Figure E.227: Tolerance limits for Pentanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

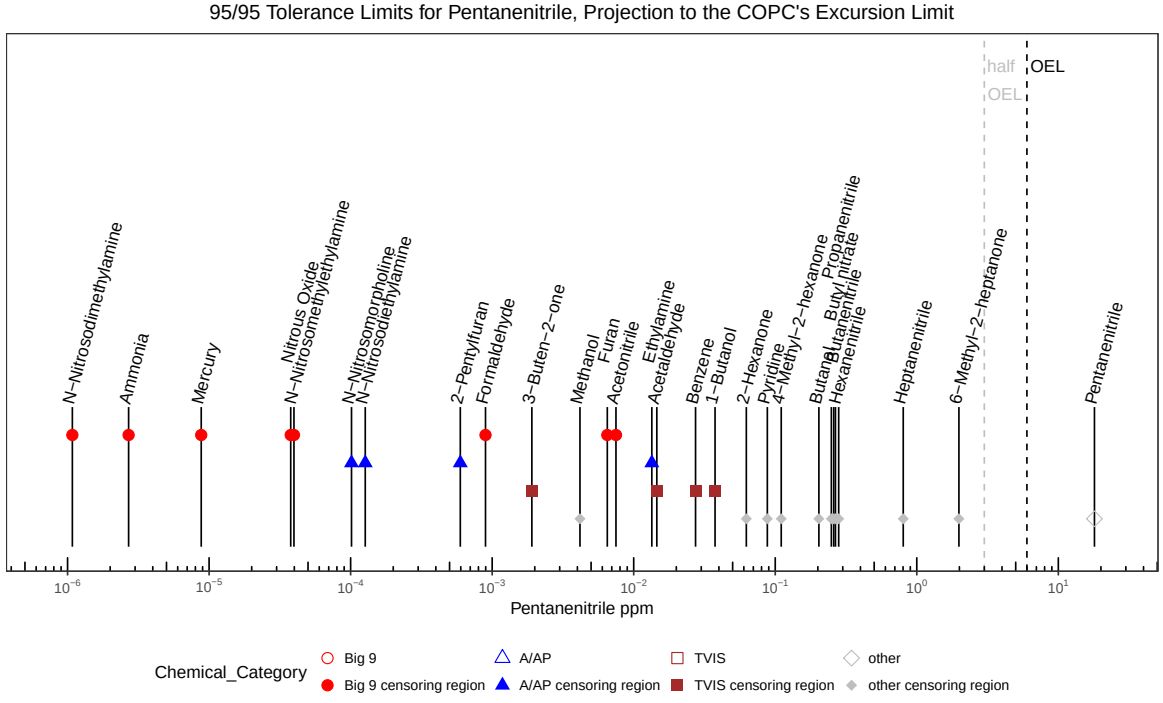


Figure E.228: Tolerance limits for Pentanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

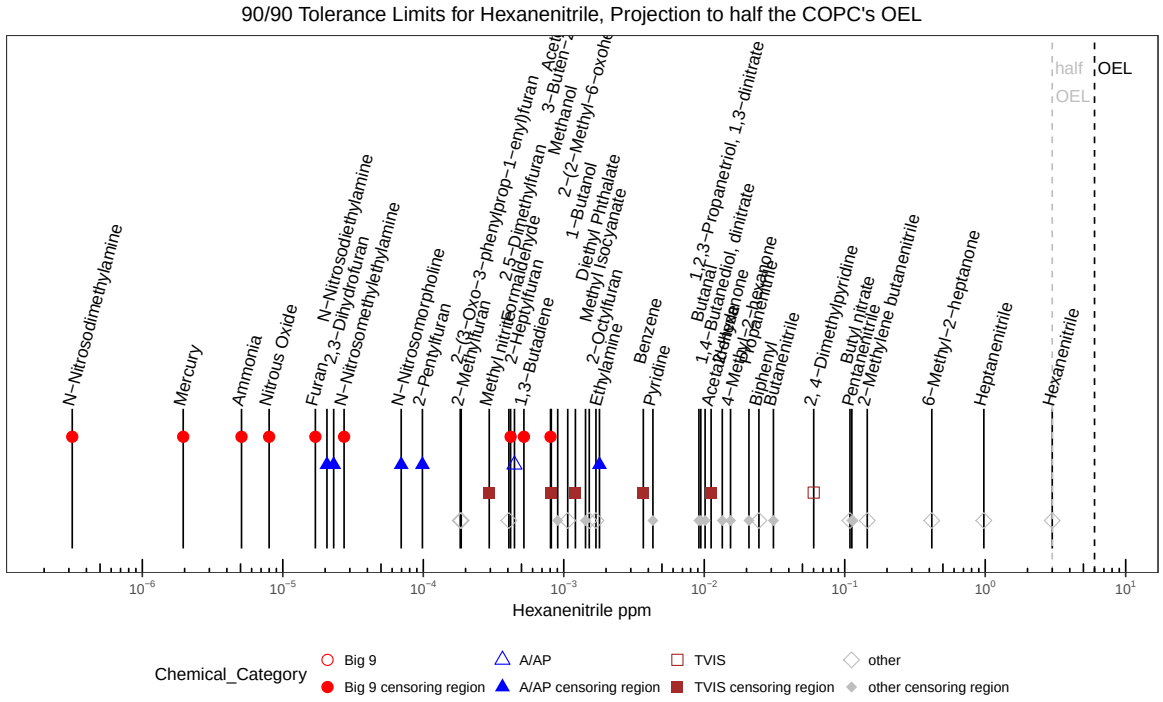


Figure E.229: Tolerance limits for Hexanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

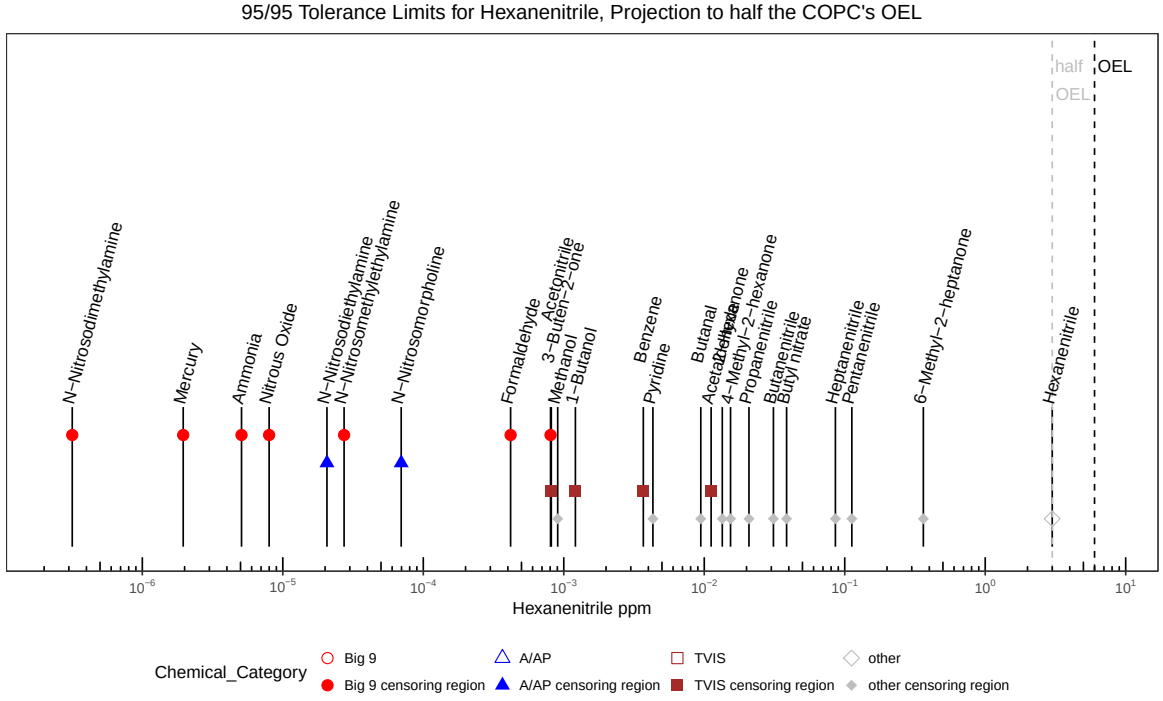


Figure E.230: Tolerance limits for Hexanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

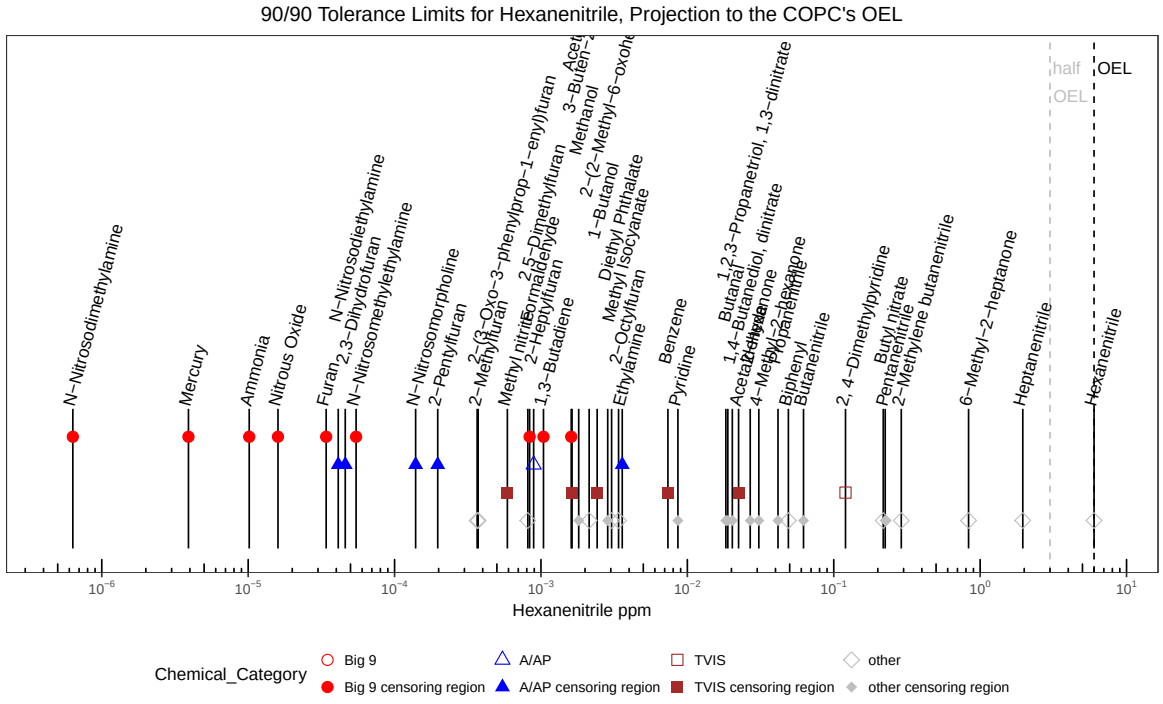


Figure E.231: Tolerance limits for Hexanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

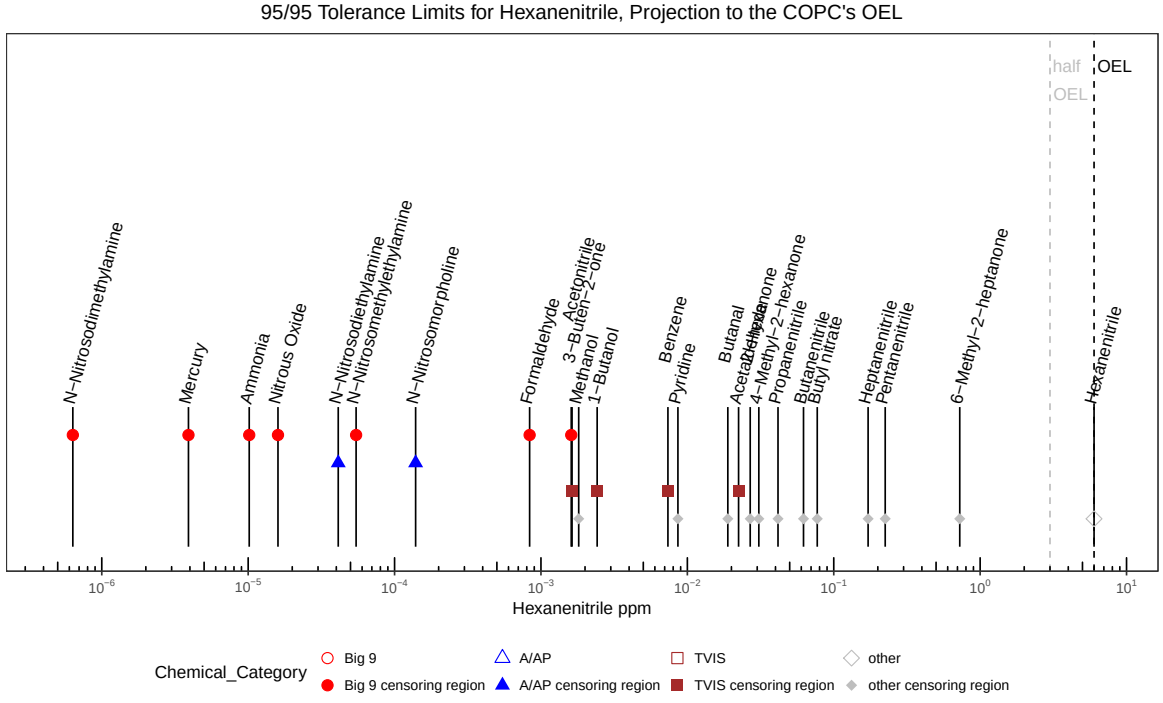


Figure E.232: Tolerance limits for Hexanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

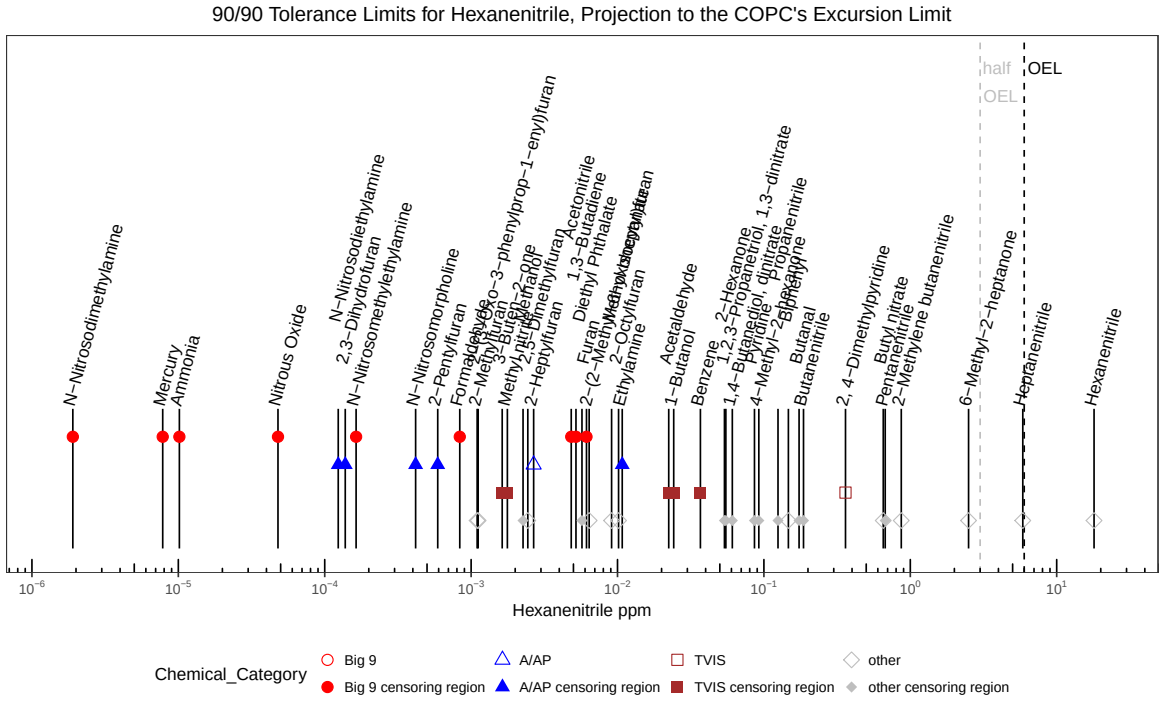


Figure E.233: Tolerance limits for Hexanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

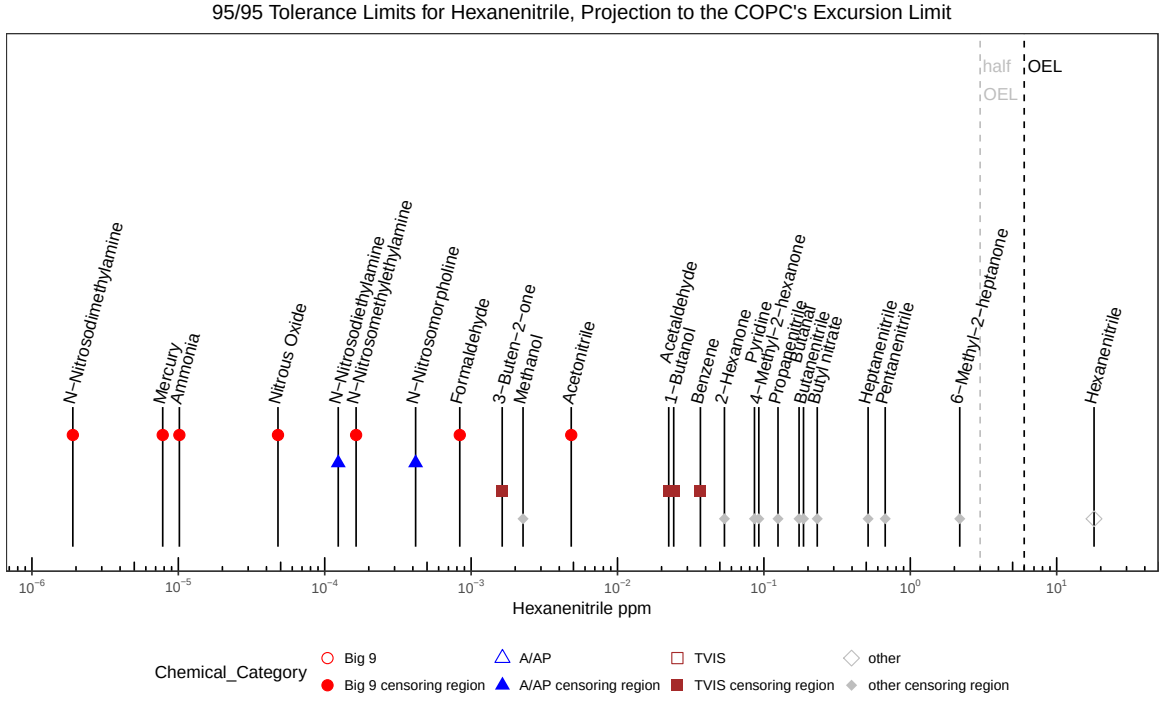


Figure E.234: Tolerance limits for Hexanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

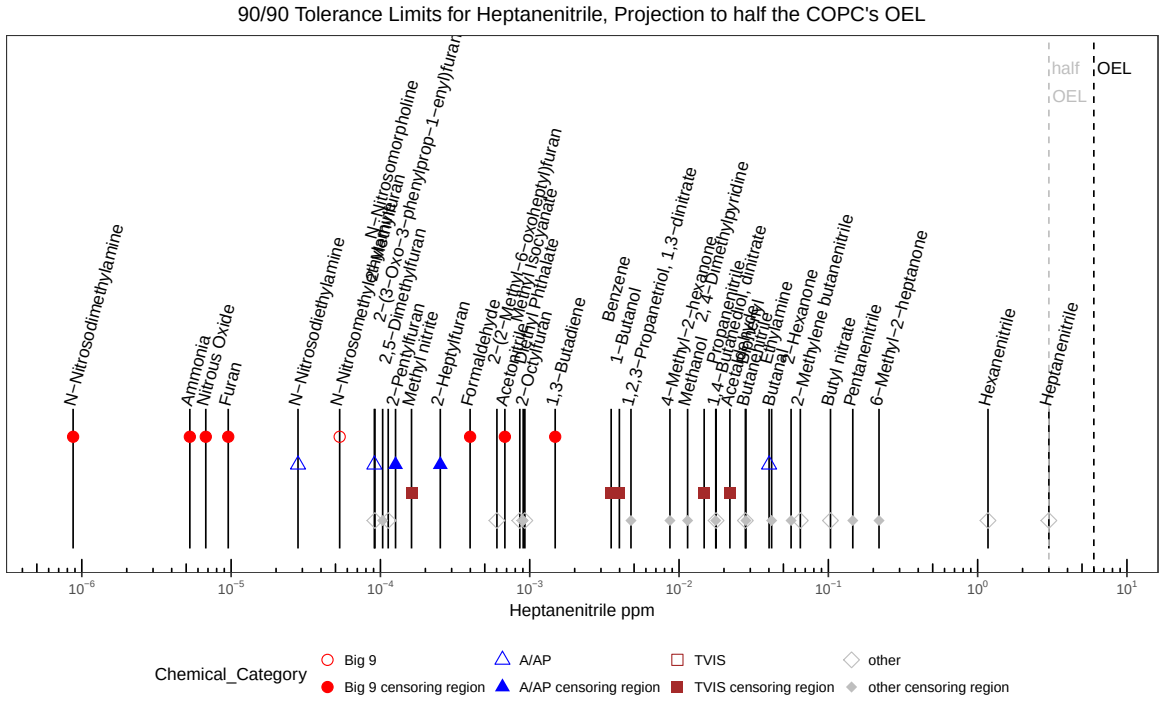


Figure E.235: Tolerance limits for Heptanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

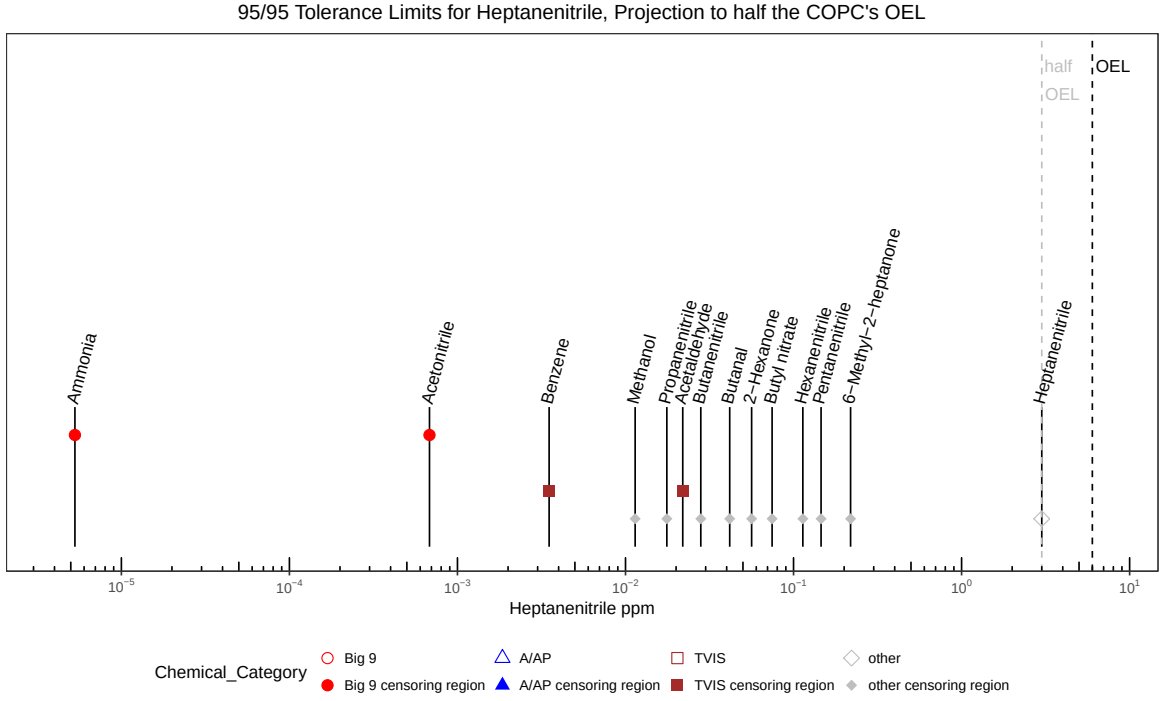


Figure E.236: Tolerance limits for Heptanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

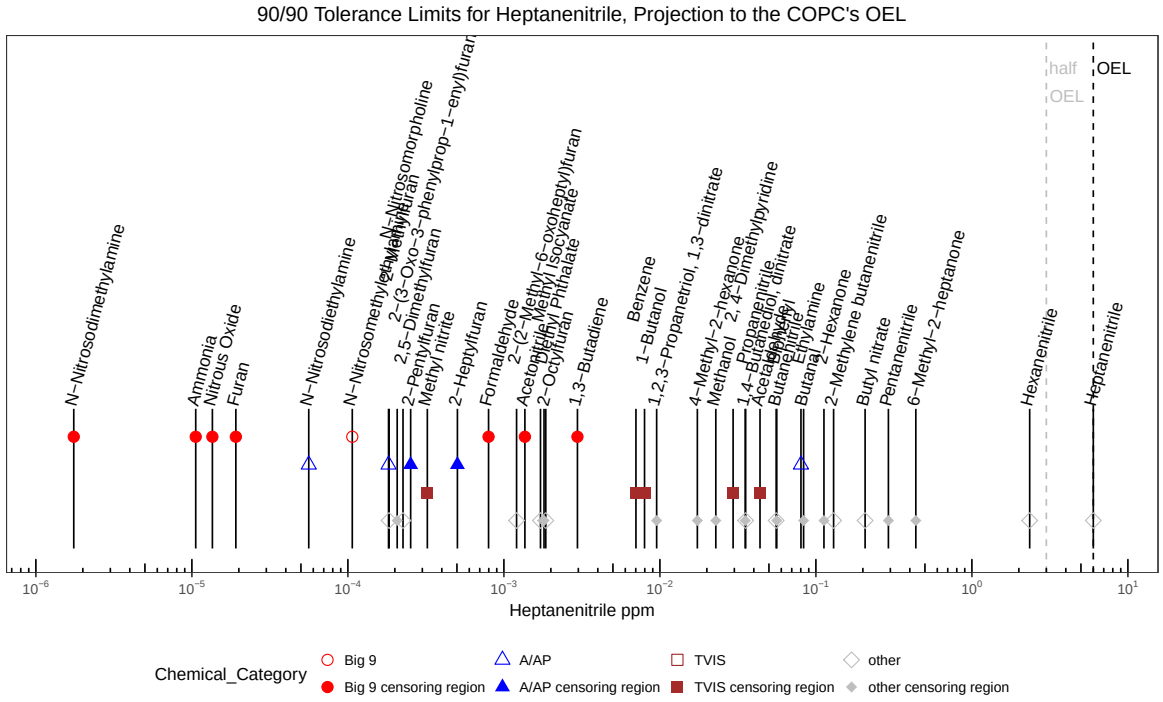


Figure E.237: Tolerance limits for Heptanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

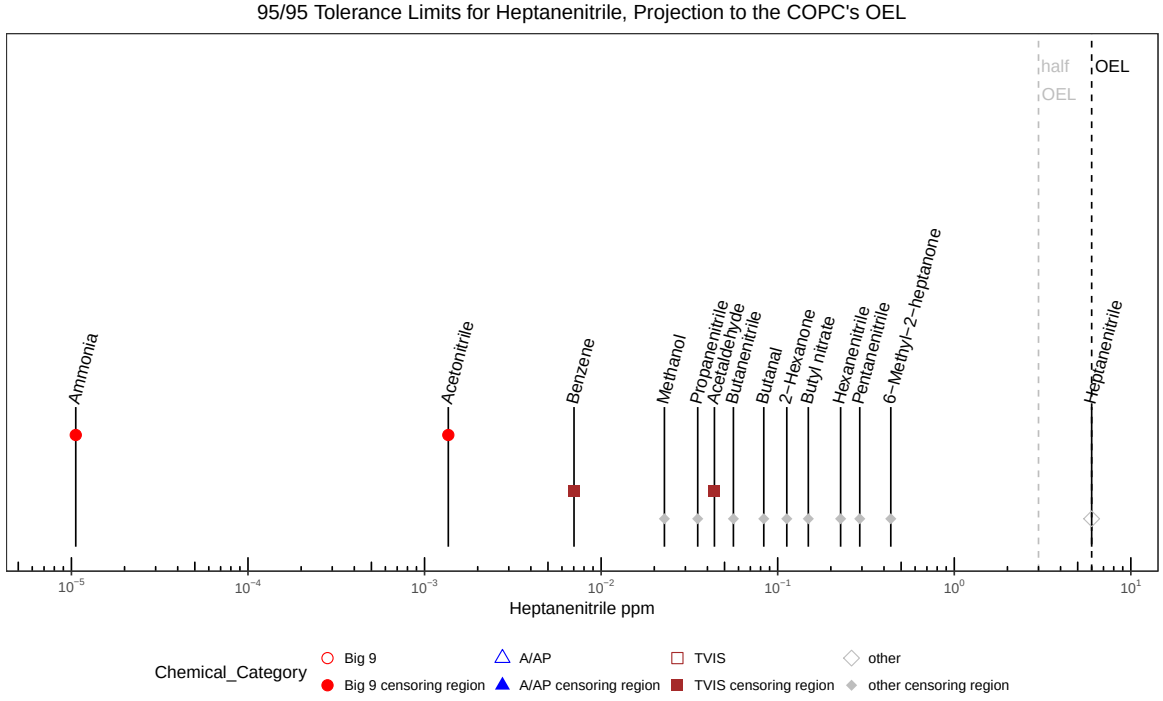


Figure E.238: Tolerance limits for Heptanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

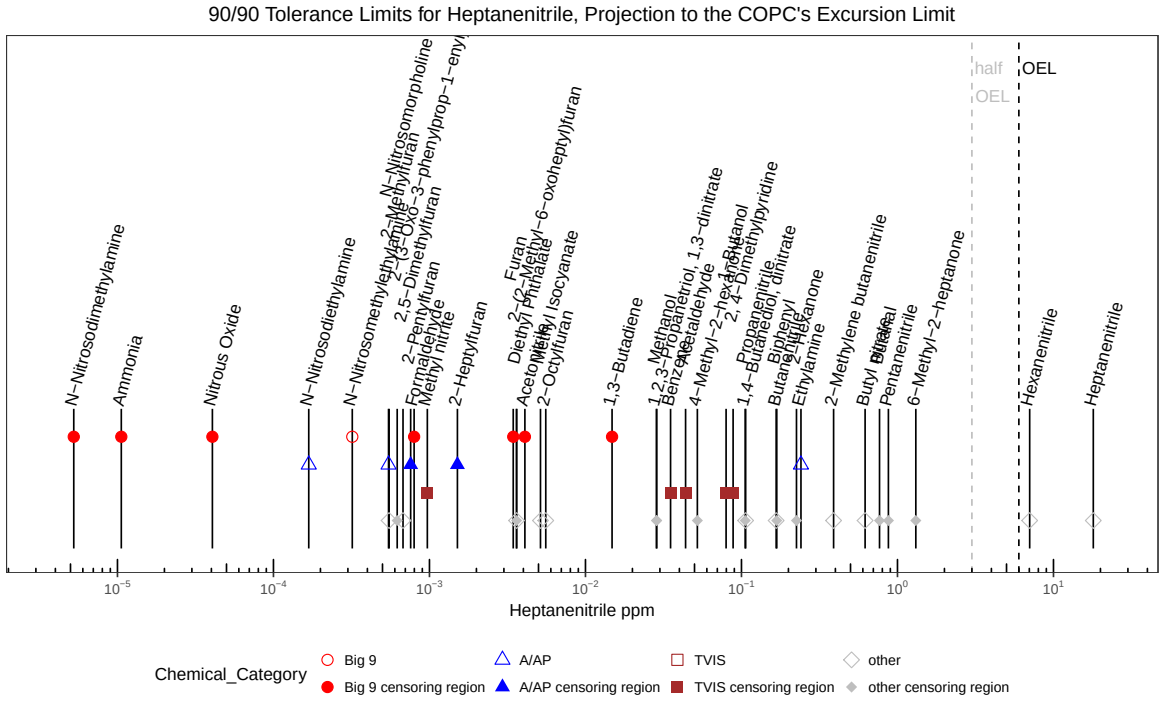


Figure E.239: Tolerance limits for Heptanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

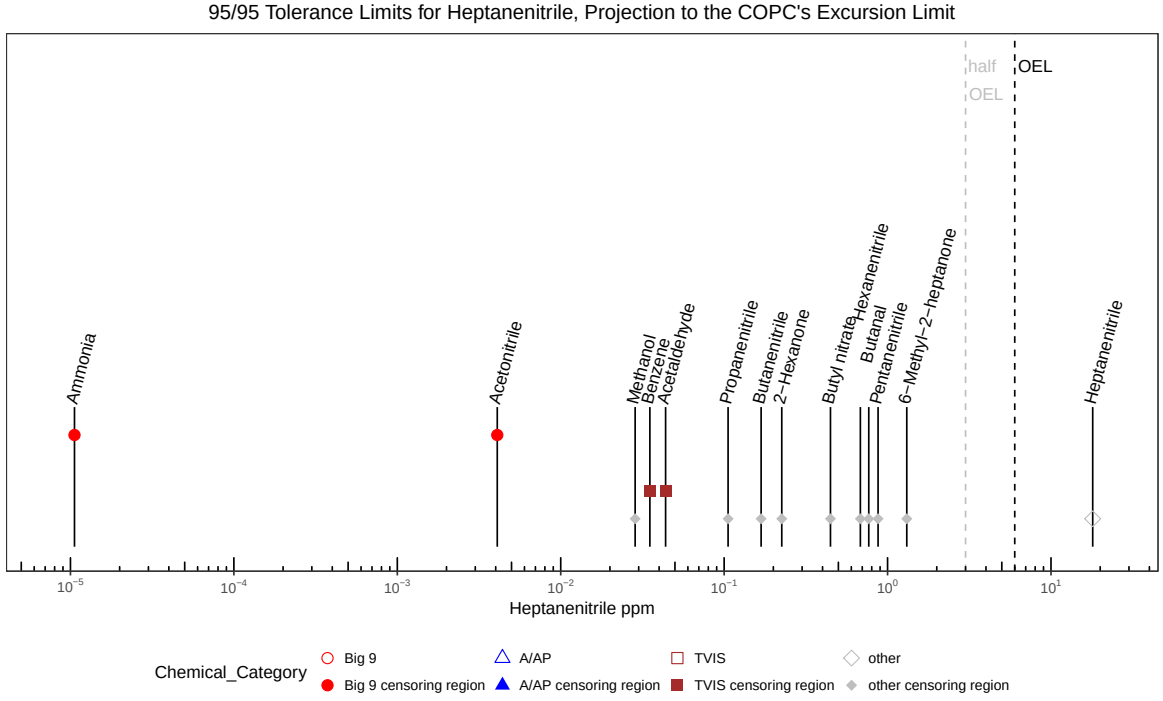


Figure E.240: Tolerance limits for Heptanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

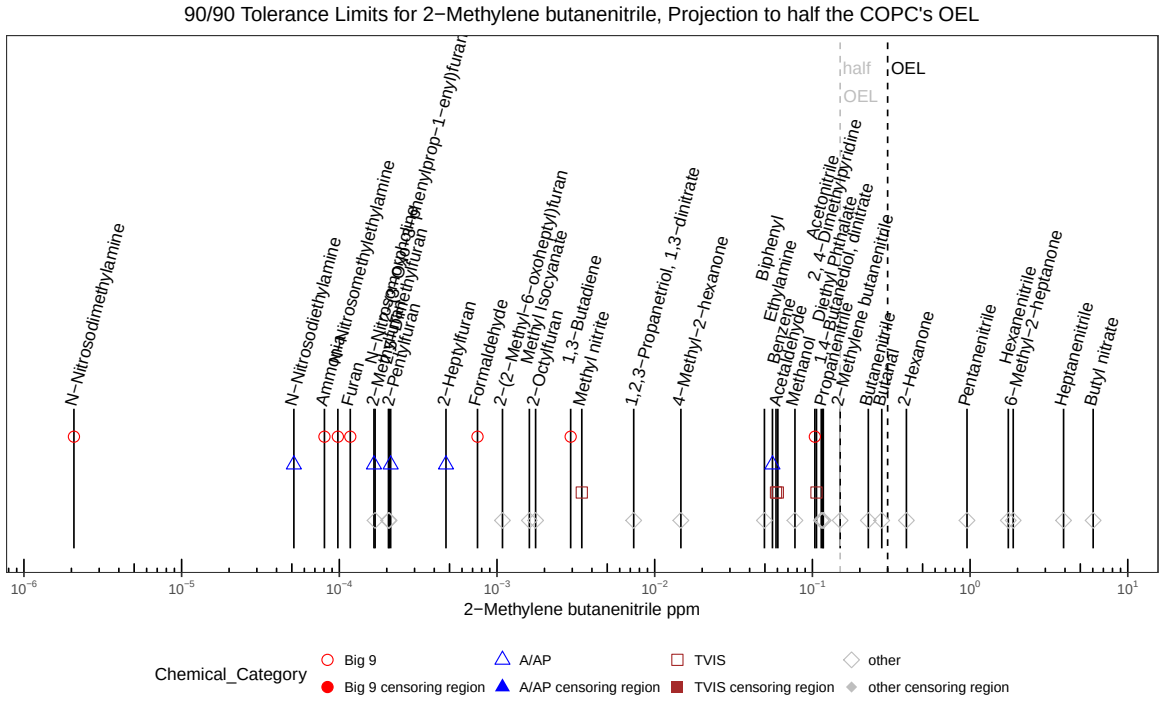


Figure E.241: Tolerance limits for 2-Methylene butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

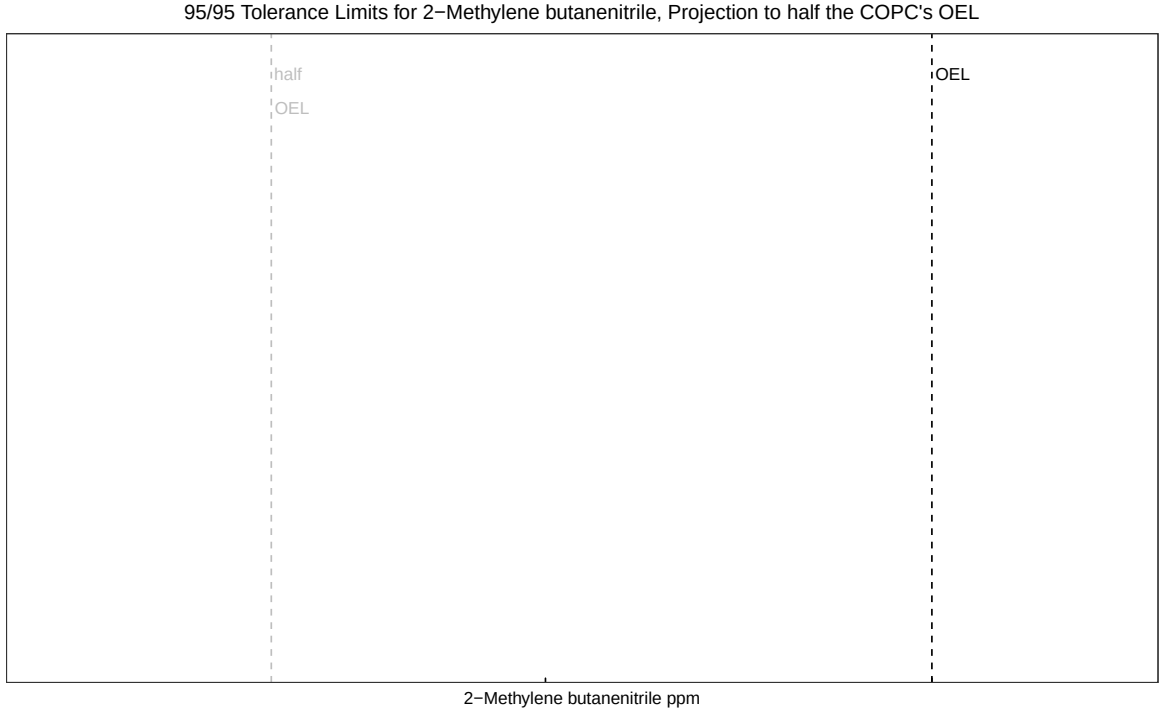


Figure E.242: Tolerance limits for 2-Methylene butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

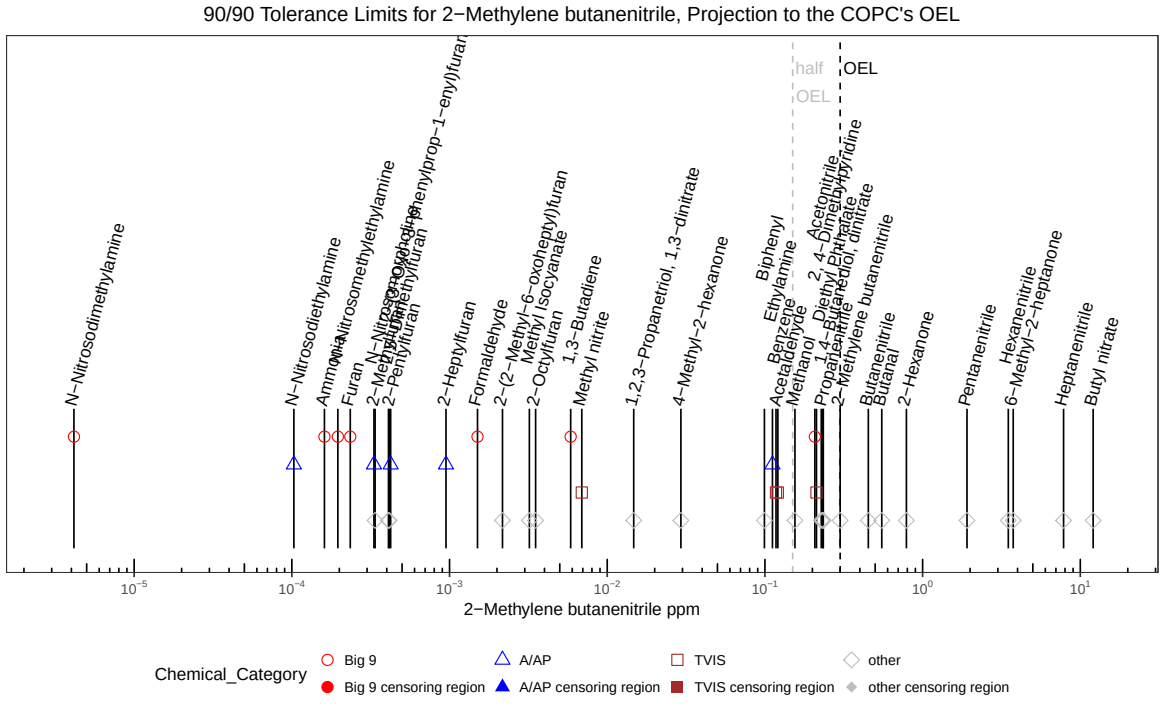


Figure E.243: Tolerance limits for 2-Methylene butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

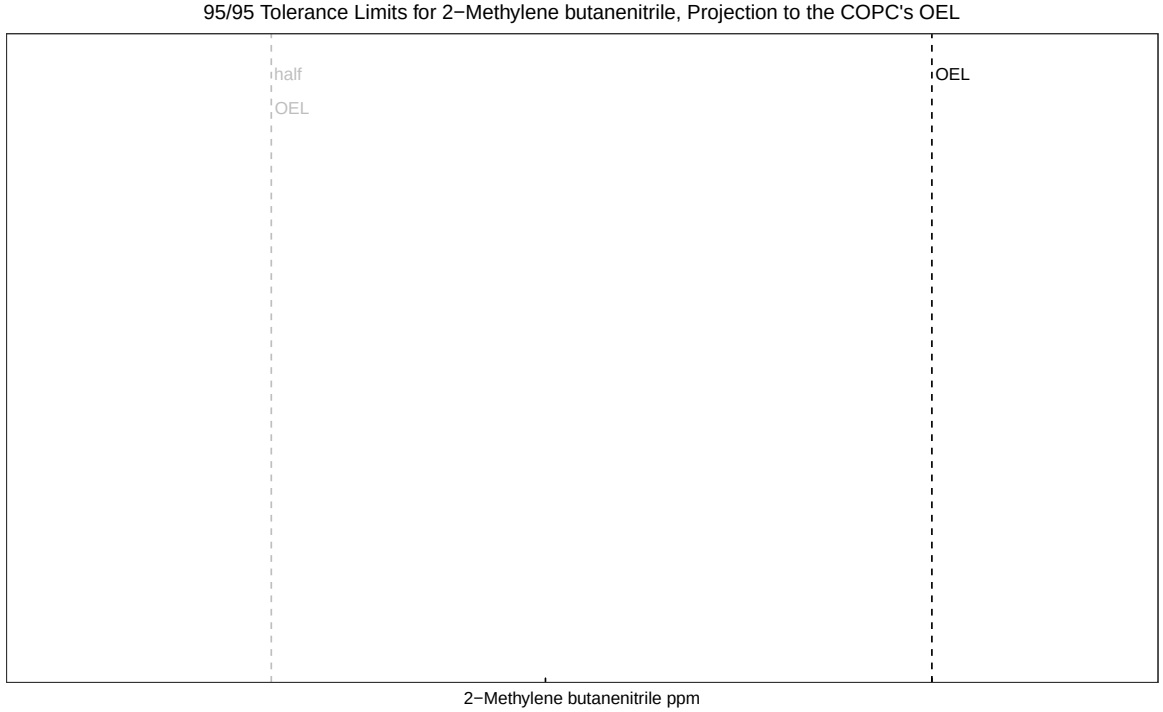


Figure E.244: Tolerance limits for 2-Methylene butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

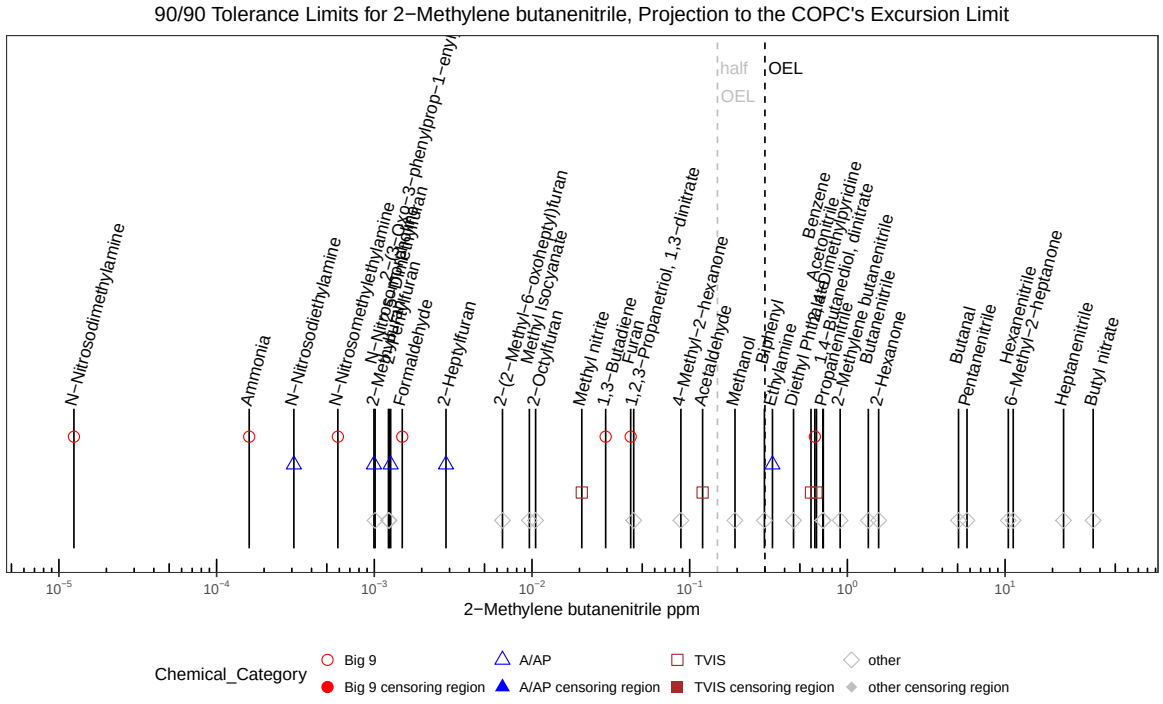


Figure E.245: Tolerance limits for 2-Methylene butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

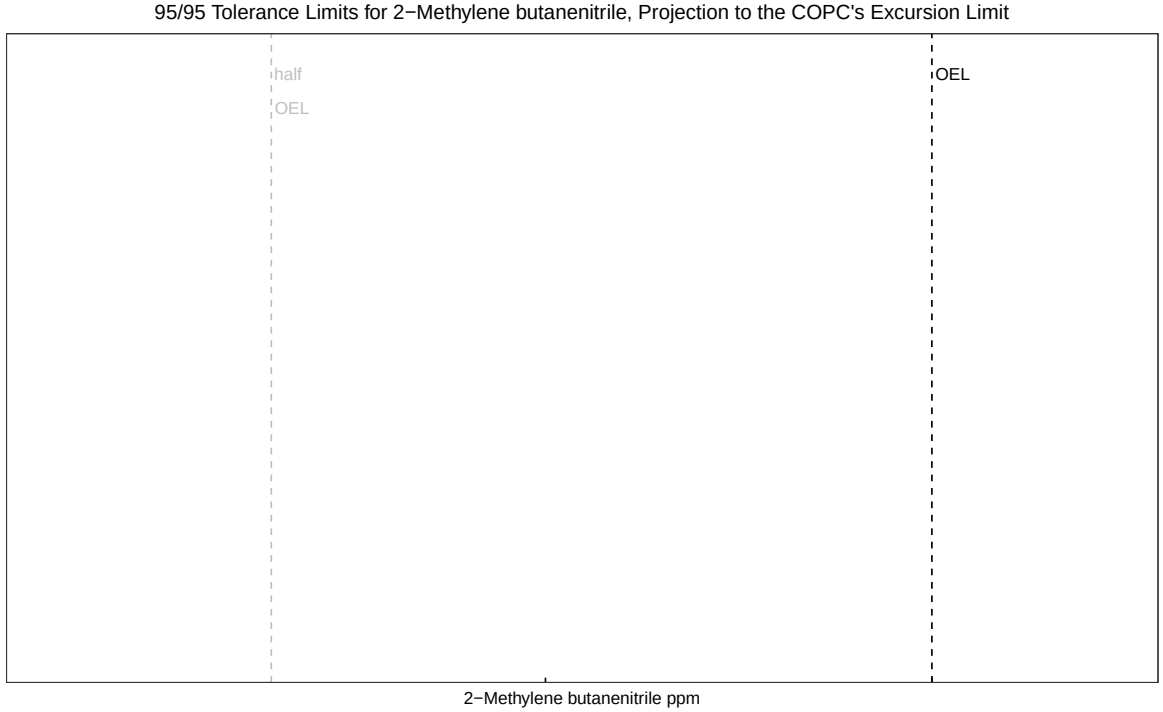


Figure E.246: Tolerance limits for 2-Methylene butanenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

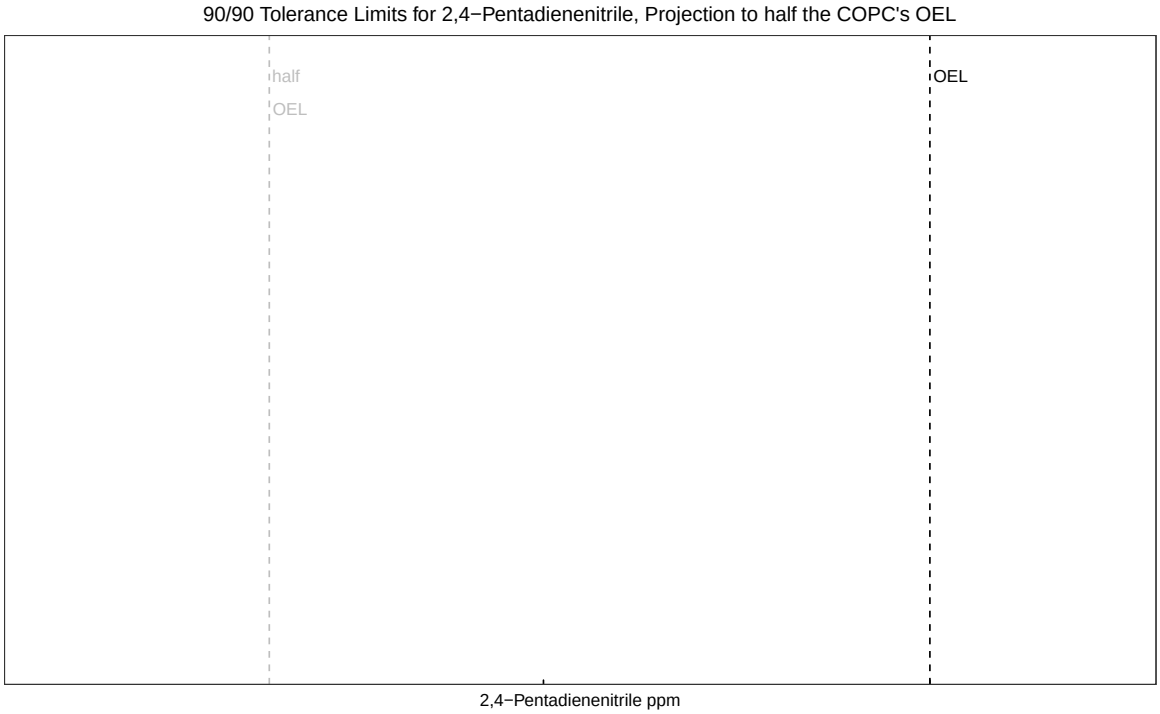


Figure E.247: Tolerance limits for 2,4-Pentadienenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

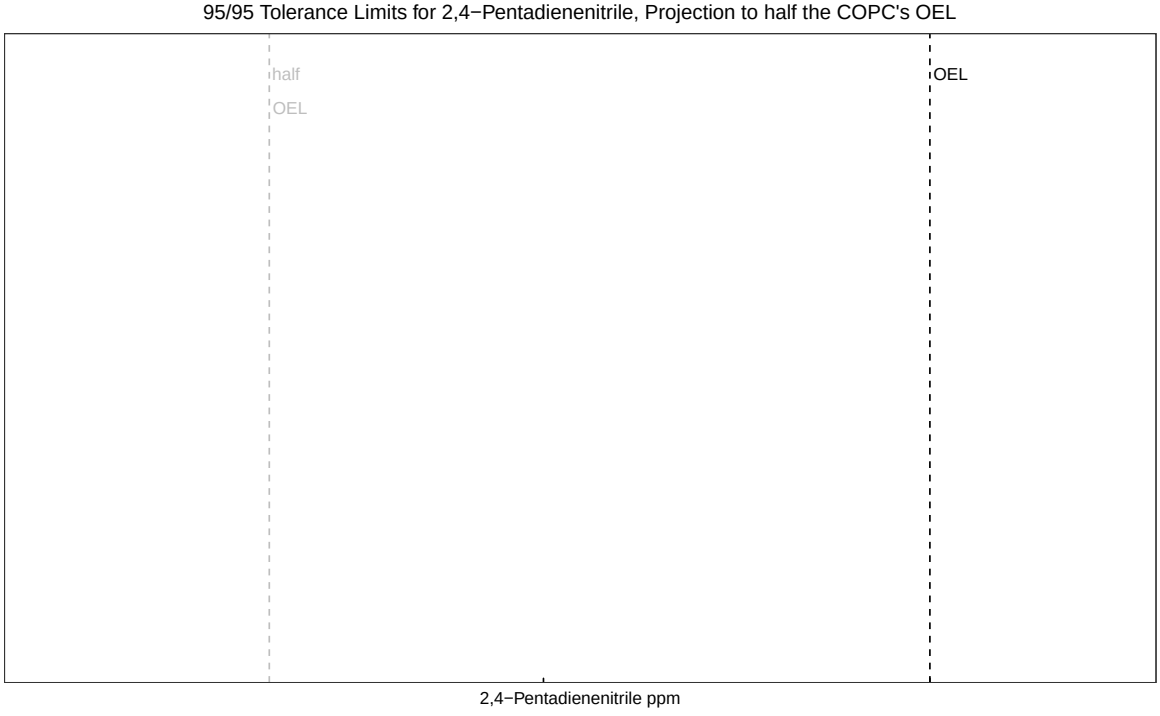


Figure E.248: Tolerance limits for 2,4-Pentadienenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

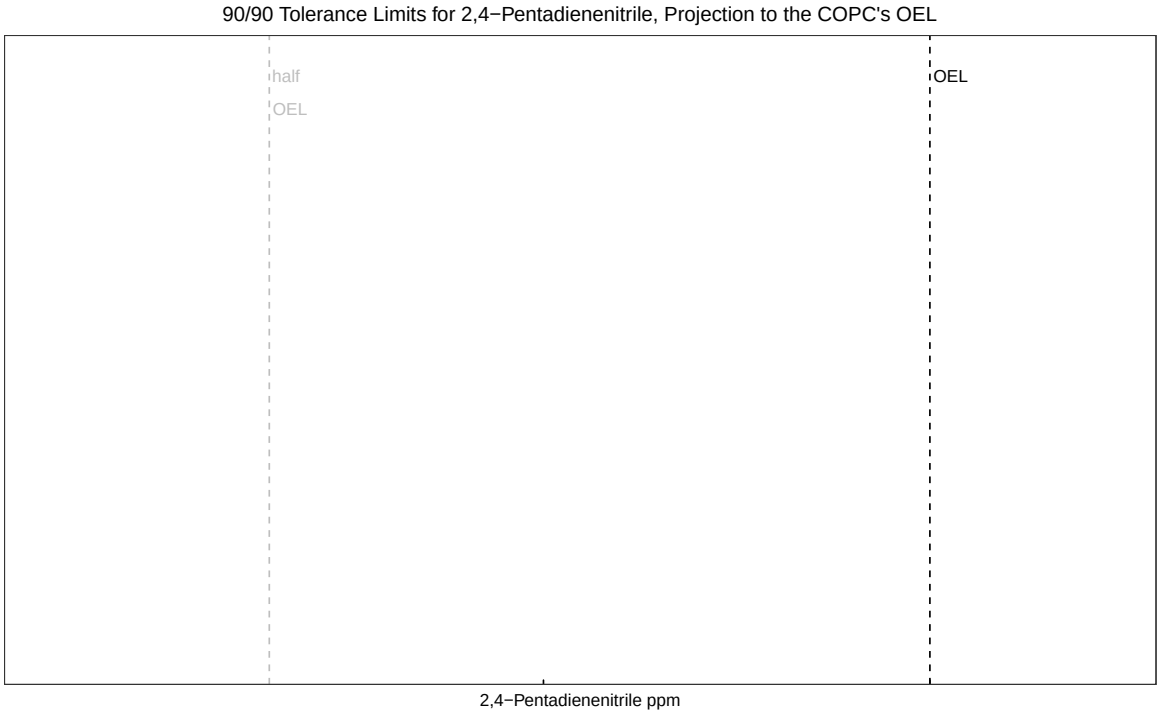


Figure E.249: Tolerance limits for 2,4-Pentadienenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

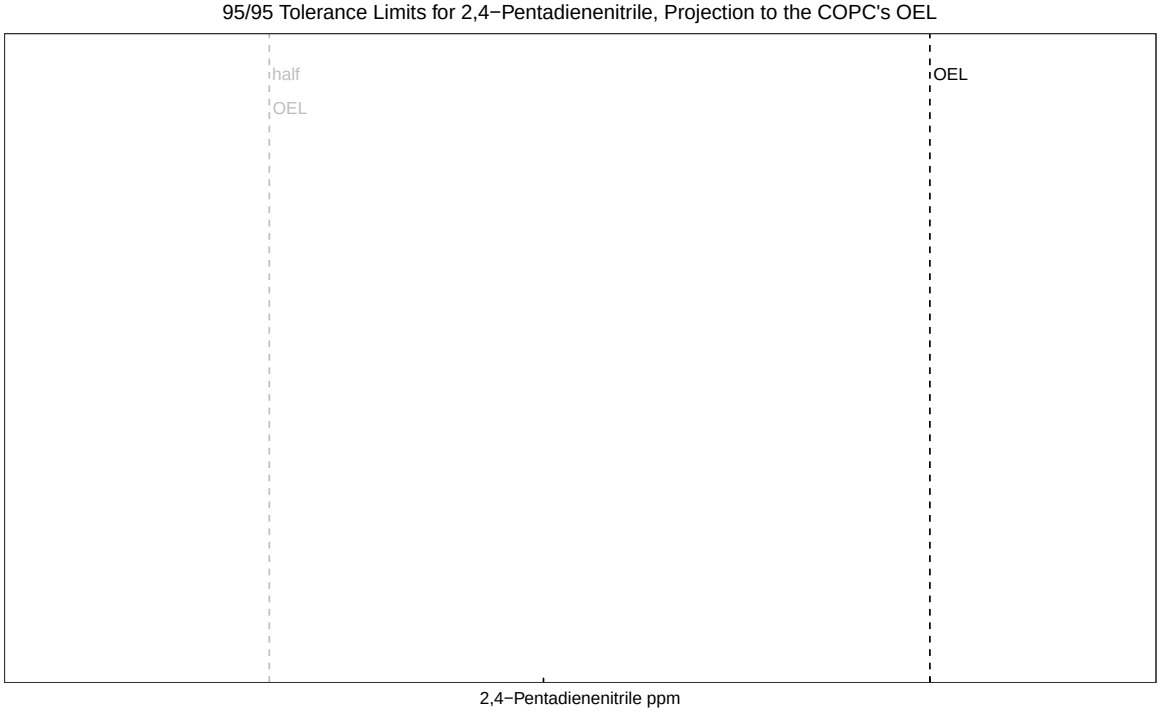


Figure E.250: Tolerance limits for 2,4-Pentadienenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

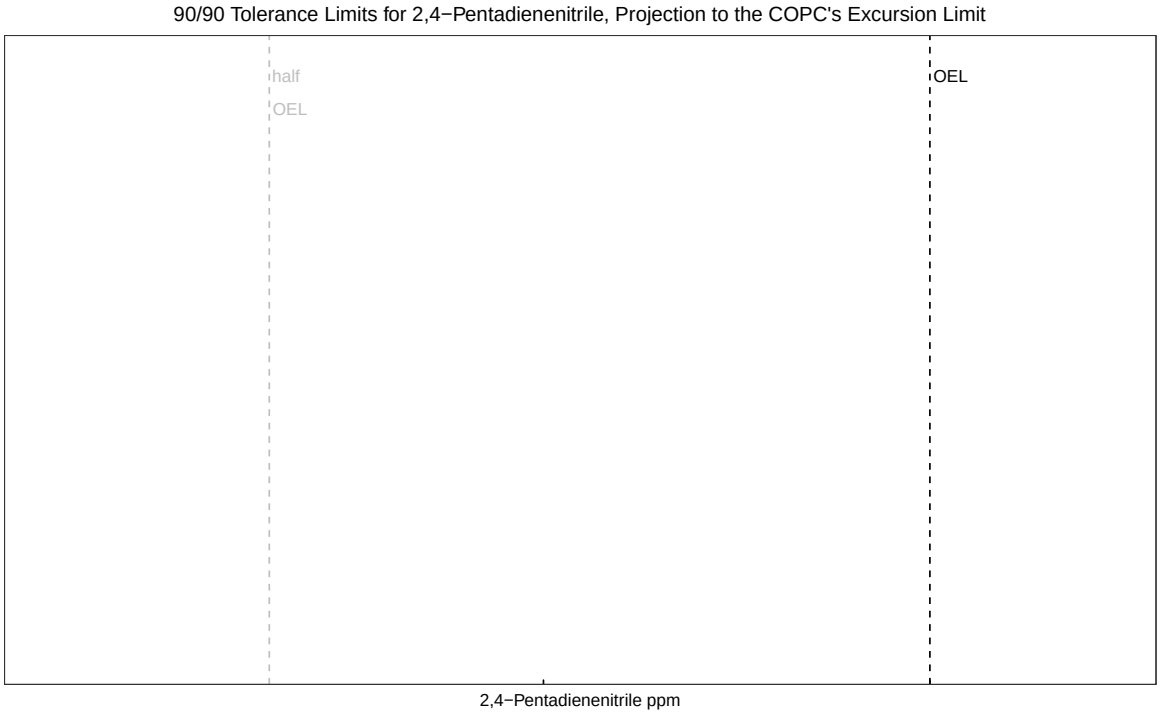


Figure E.251: Tolerance limits for 2,4-Pentadienenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

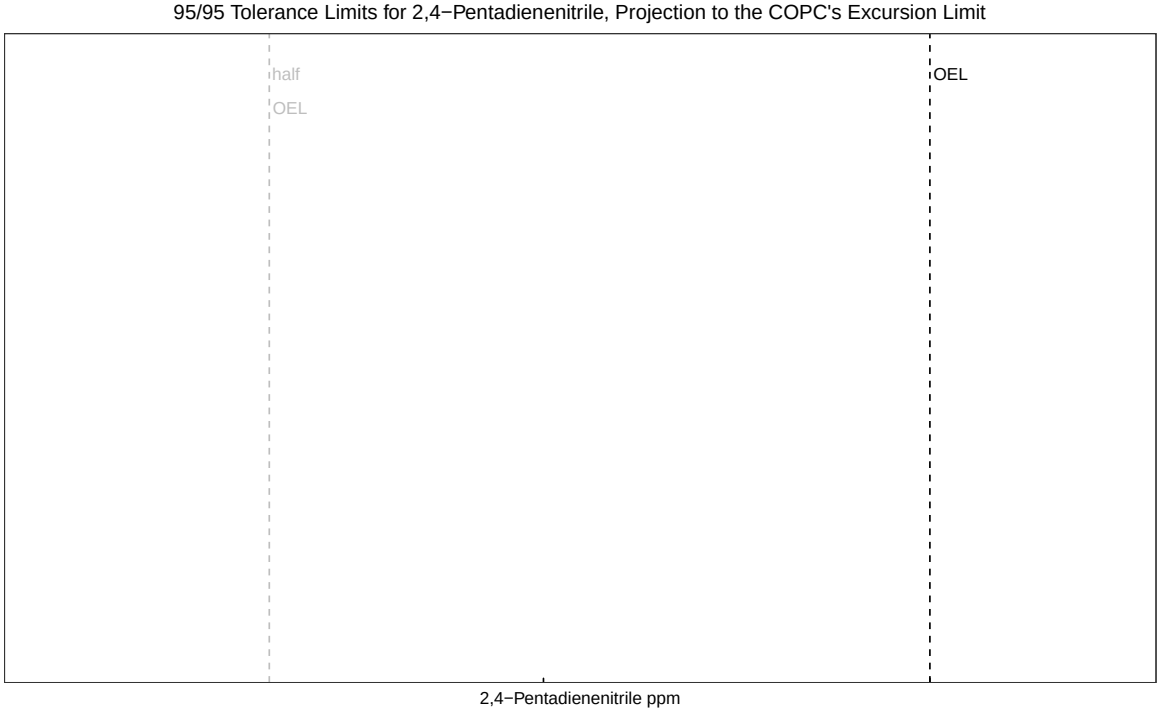


Figure E.252: Tolerance limits for 2,4-Pentadienenitrile as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

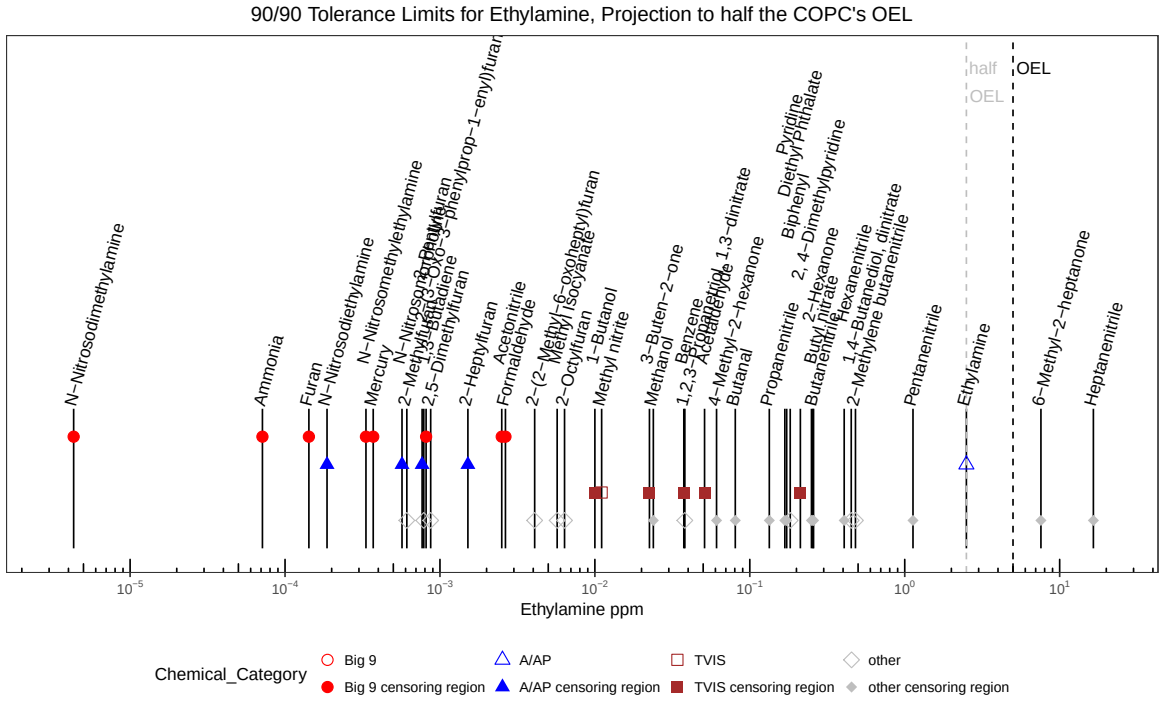


Figure E.253: Tolerance limits for Ethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

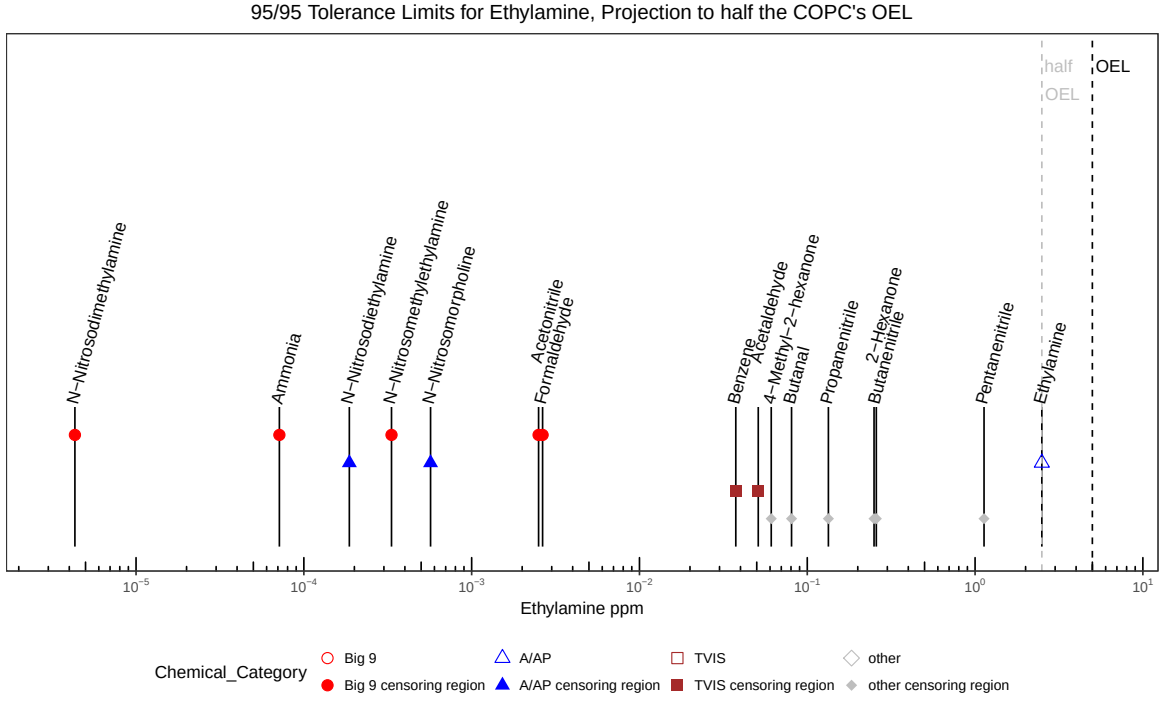


Figure E.254: Tolerance limits for Ethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

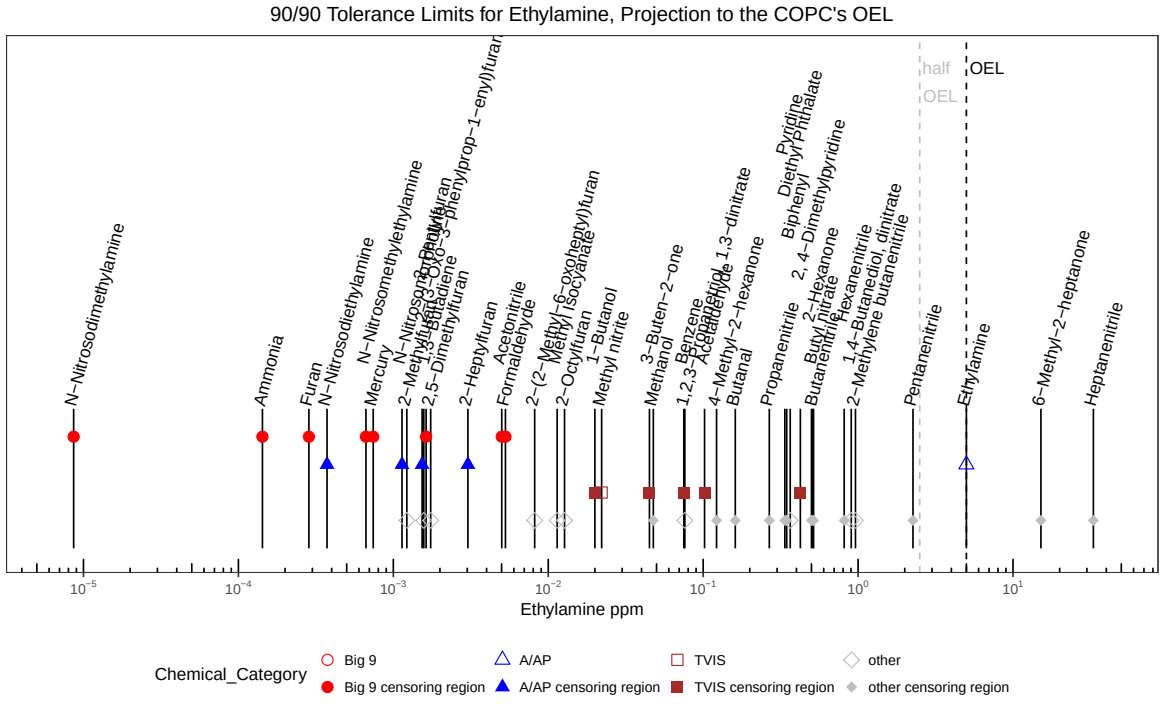


Figure E.255: Tolerance limits for Ethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

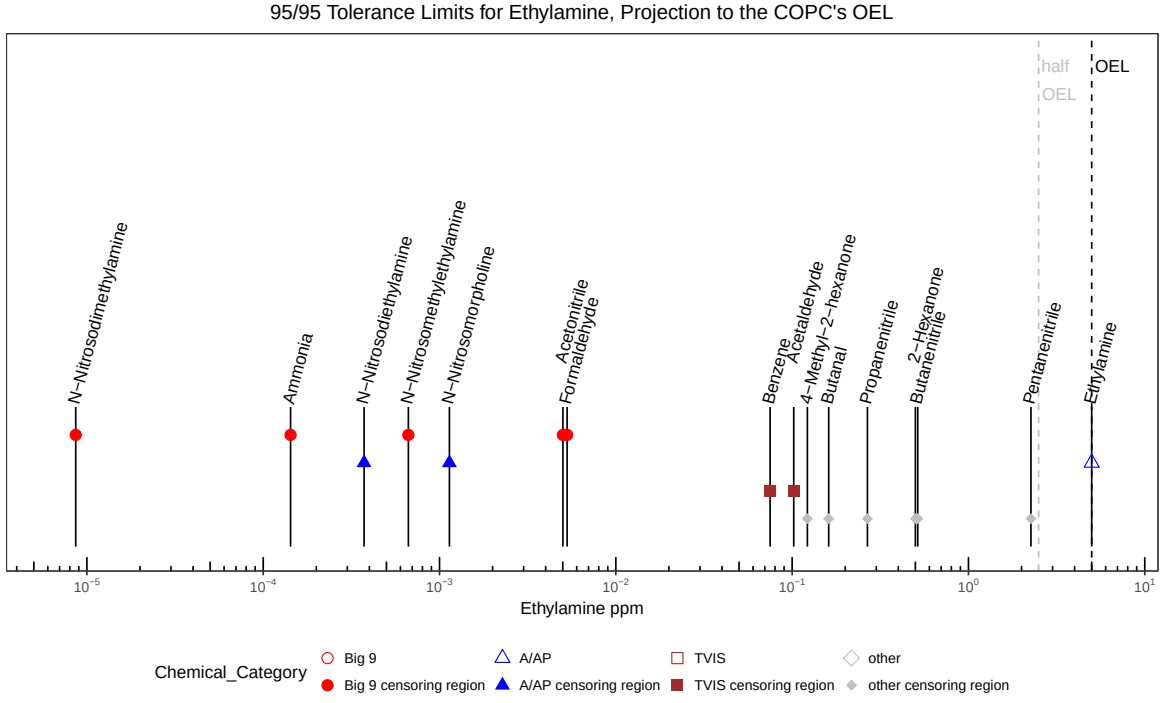


Figure E.256: Tolerance limits for Ethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

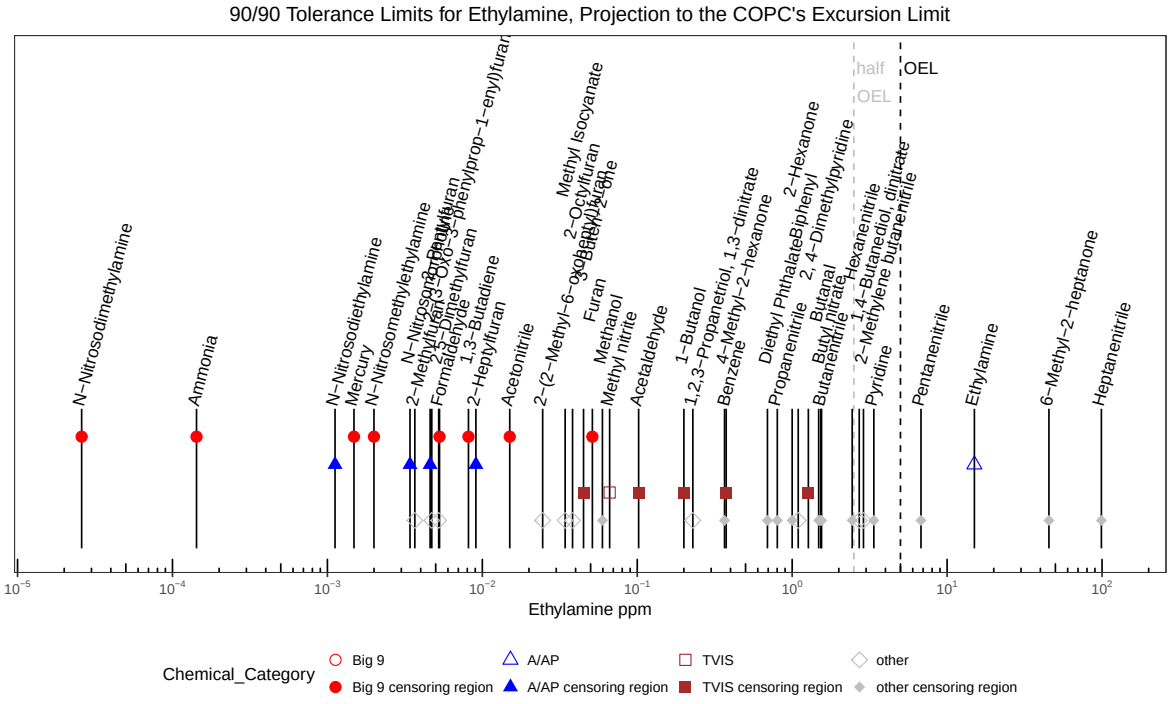


Figure E.257: Tolerance limits for Ethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

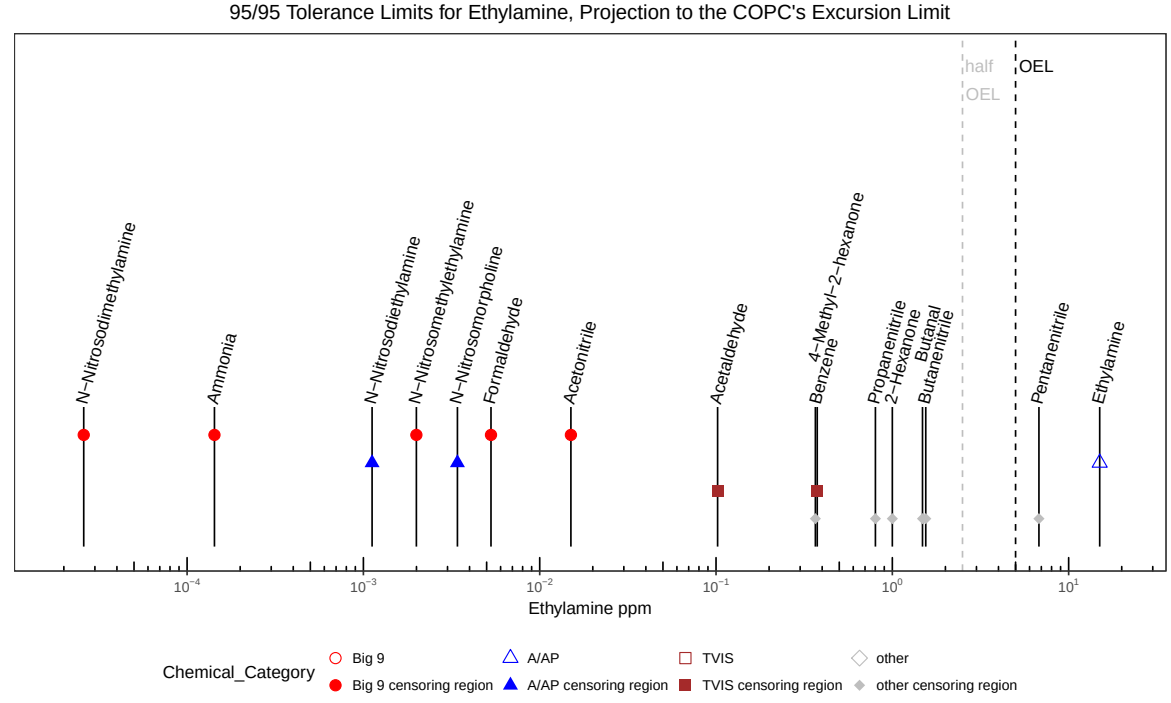


Figure E.258: Tolerance limits for Ethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

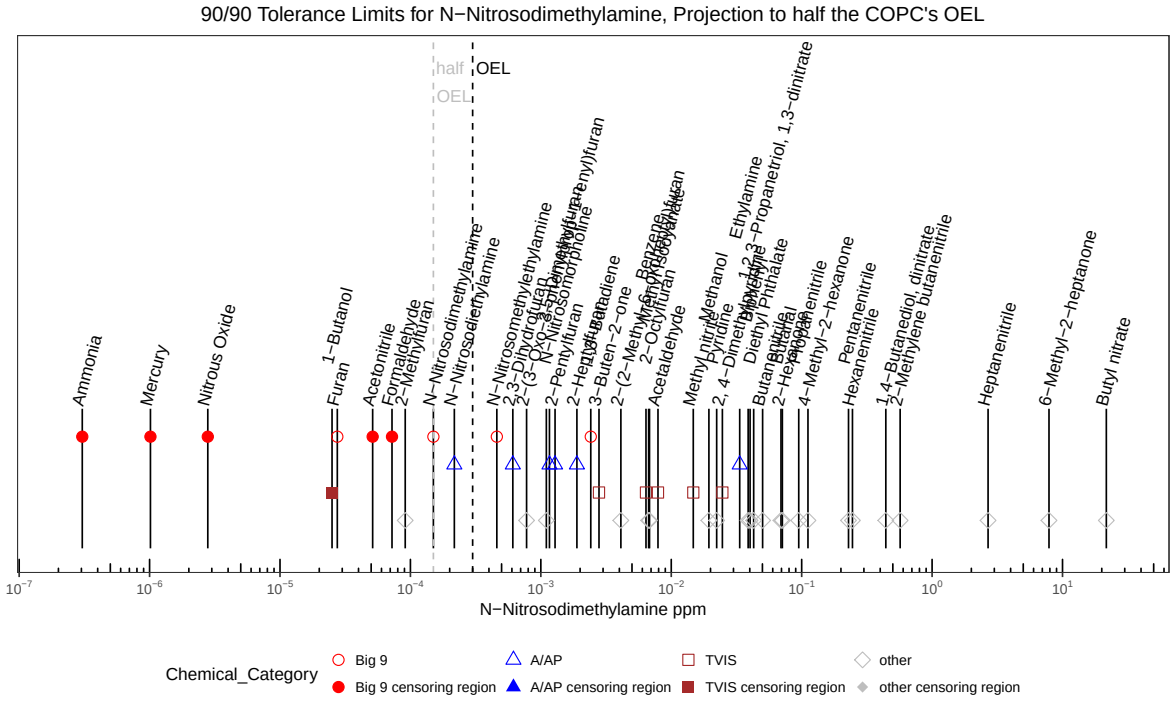


Figure E.259: Tolerance limits for N-Nitrosodimethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

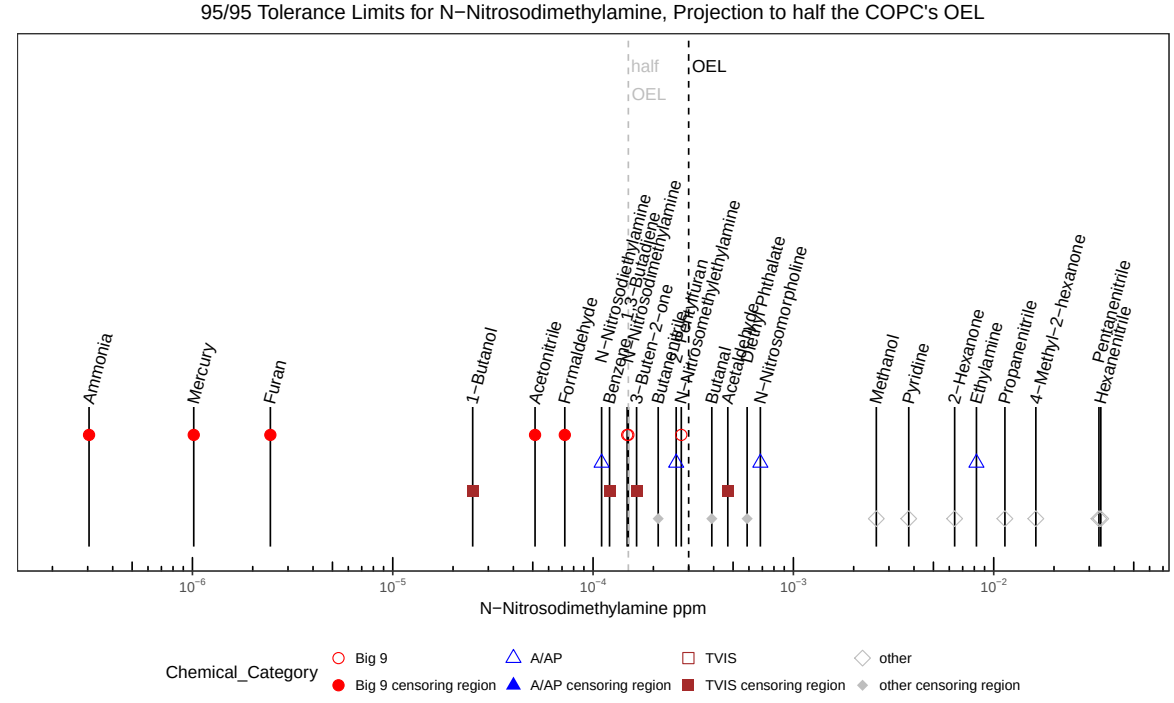


Figure E.260: Tolerance limits for N-Nitrosodimethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

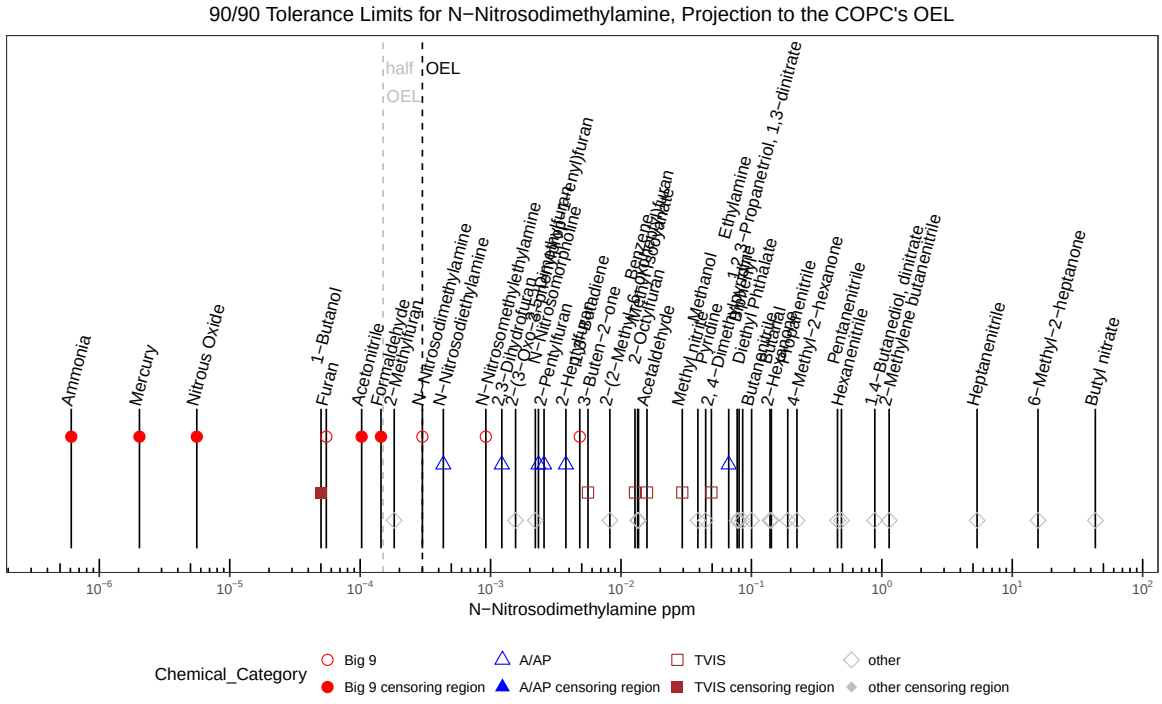


Figure E.261: Tolerance limits for N-Nitrosodimethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

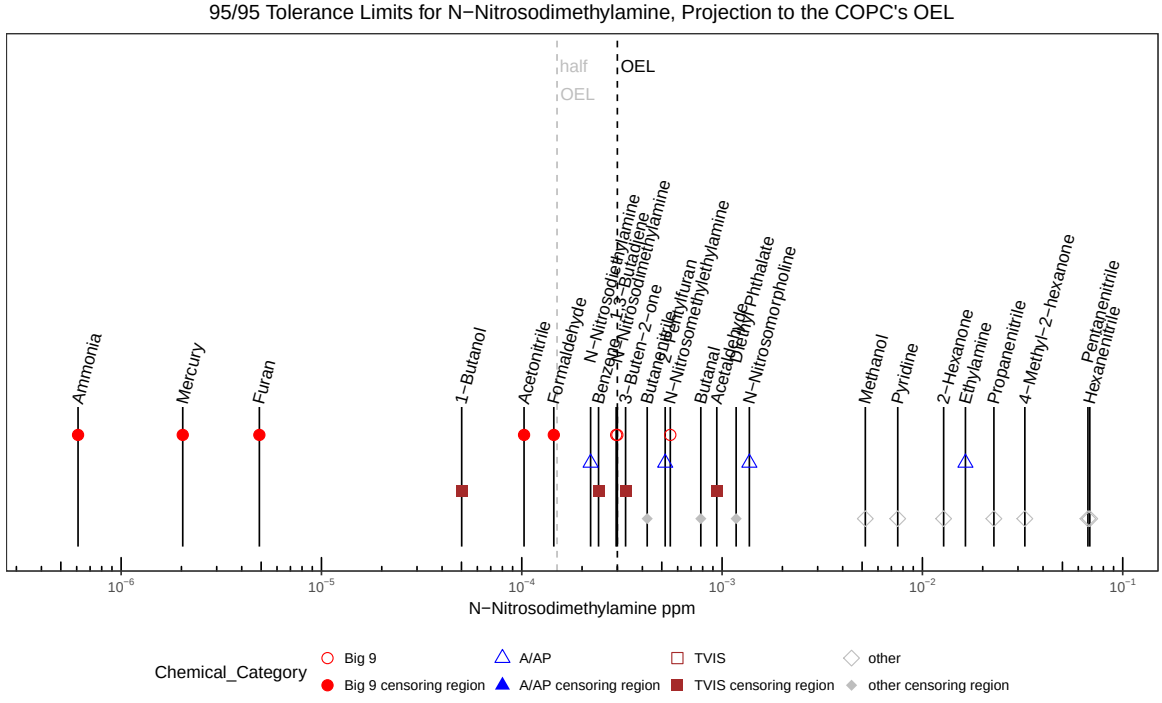


Figure E.262: Tolerance limits for N-Nitrosodimethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

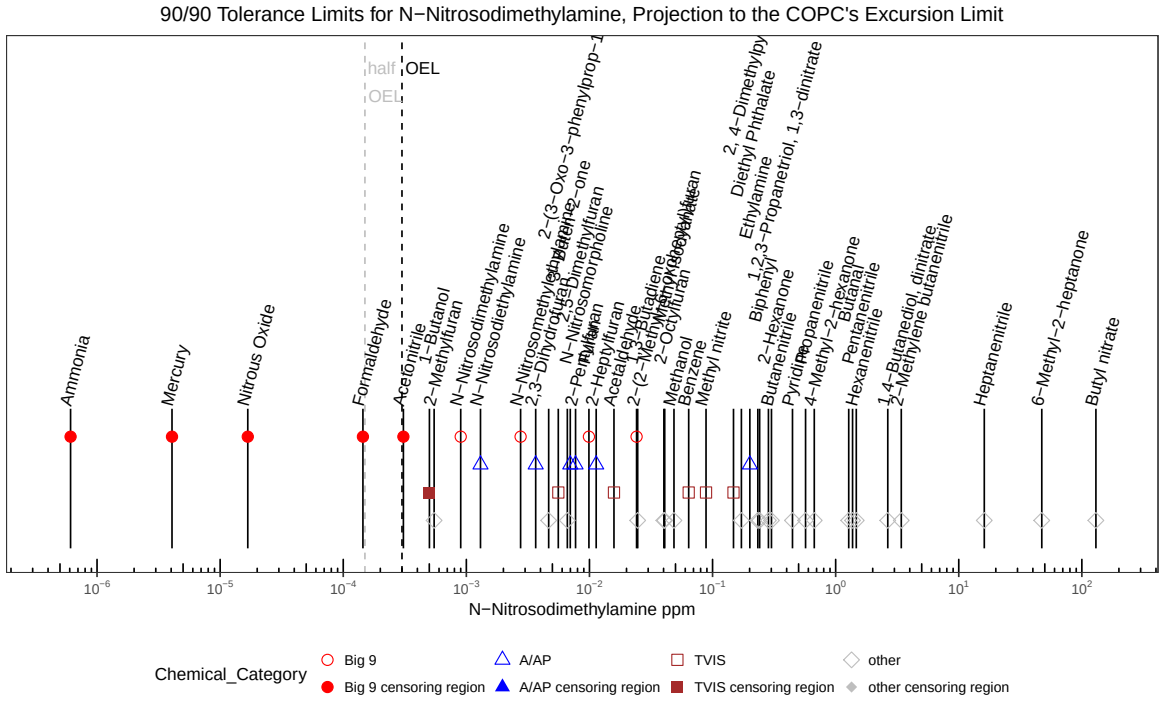


Figure E.263: Tolerance limits for N-Nitrosodimethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

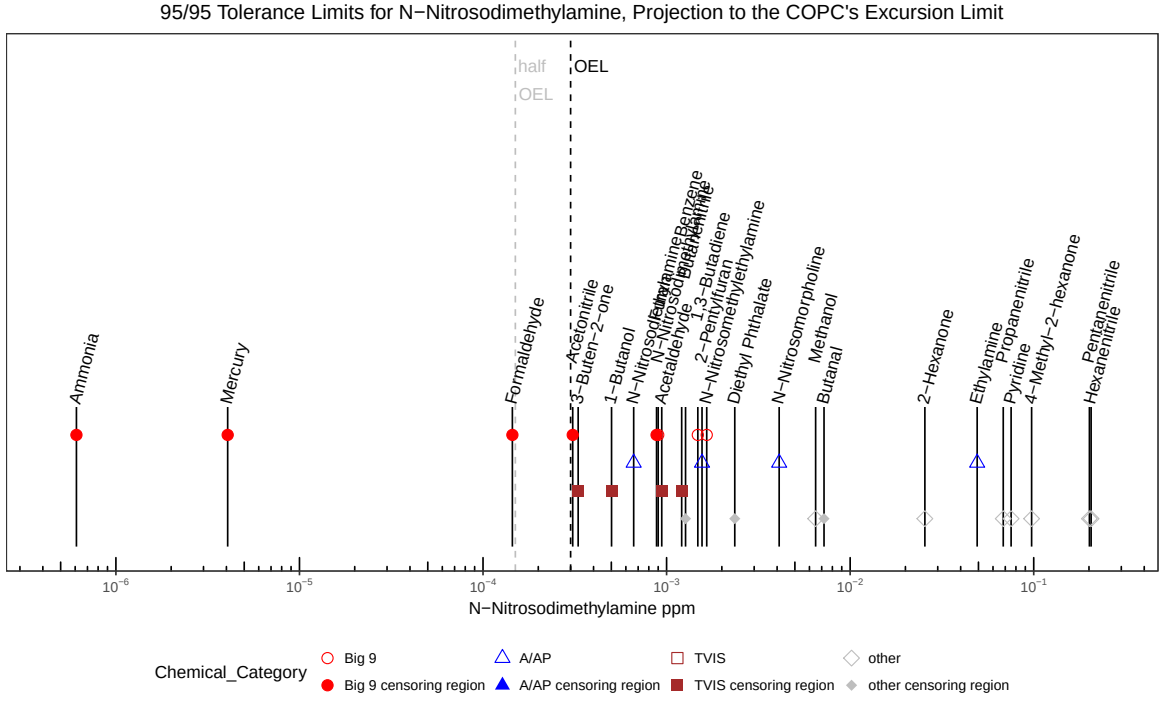


Figure E.264: Tolerance limits for N-Nitrosodimethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

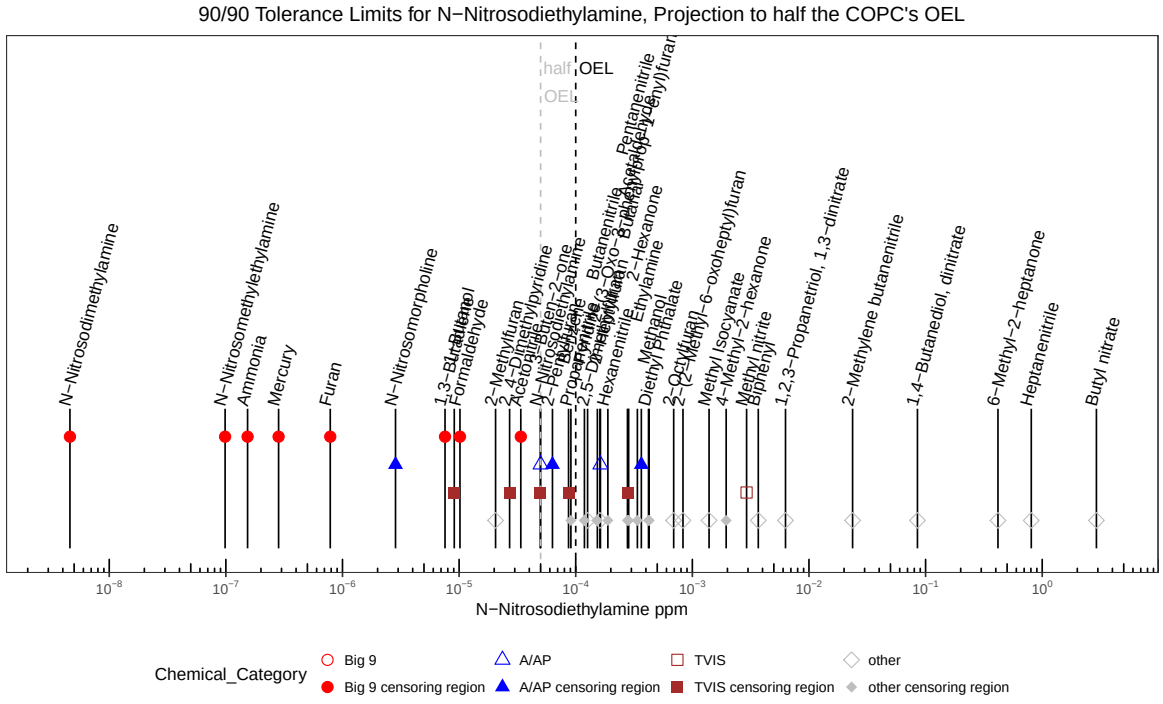


Figure E.265: Tolerance limits for N-Nitrosodiethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

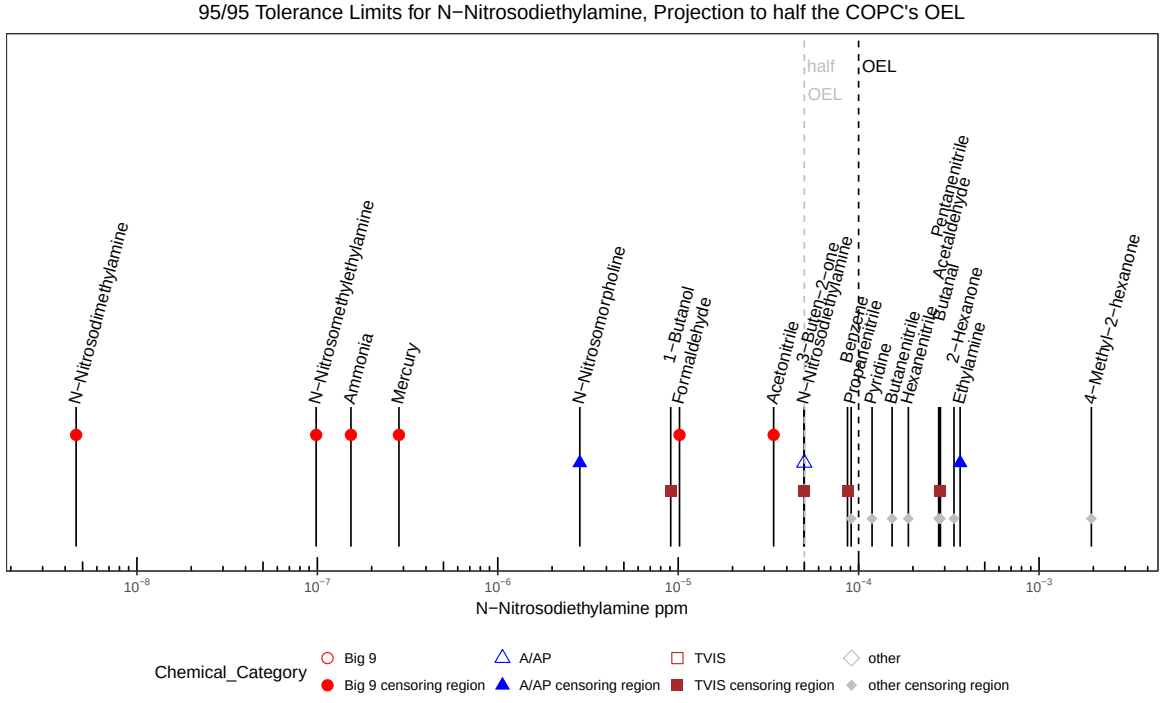


Figure E.266: Tolerance limits for N-Nitrosodiethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

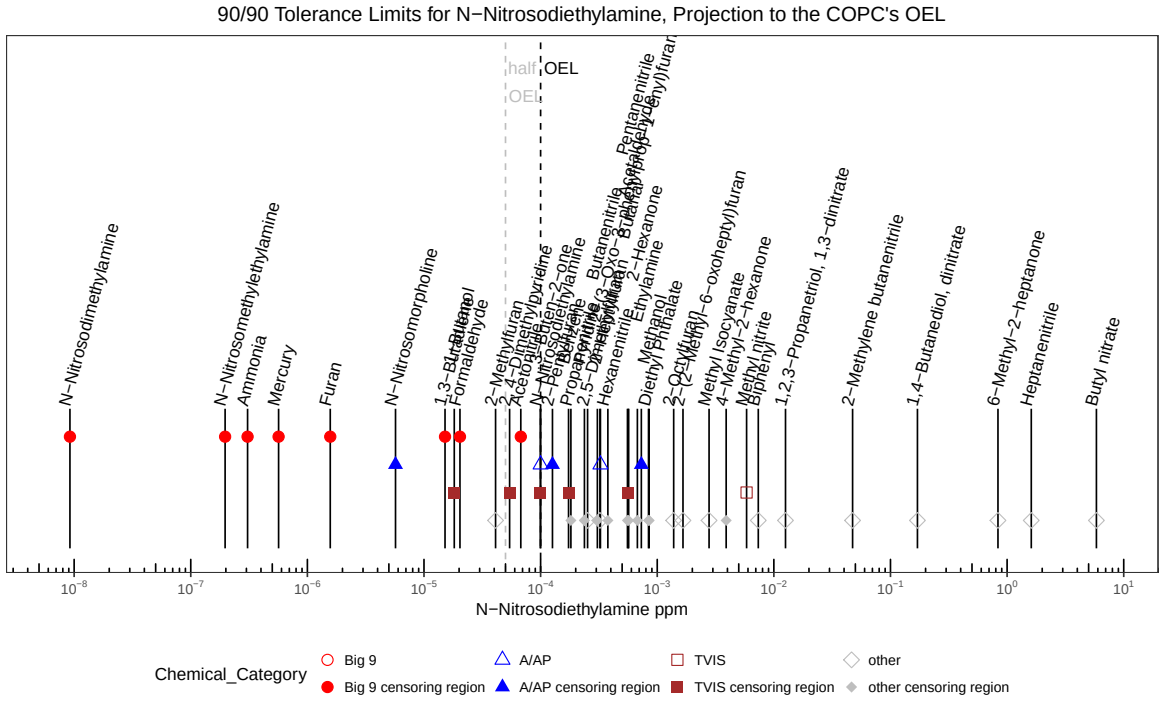


Figure E.267: Tolerance limits for N-Nitrosodiethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

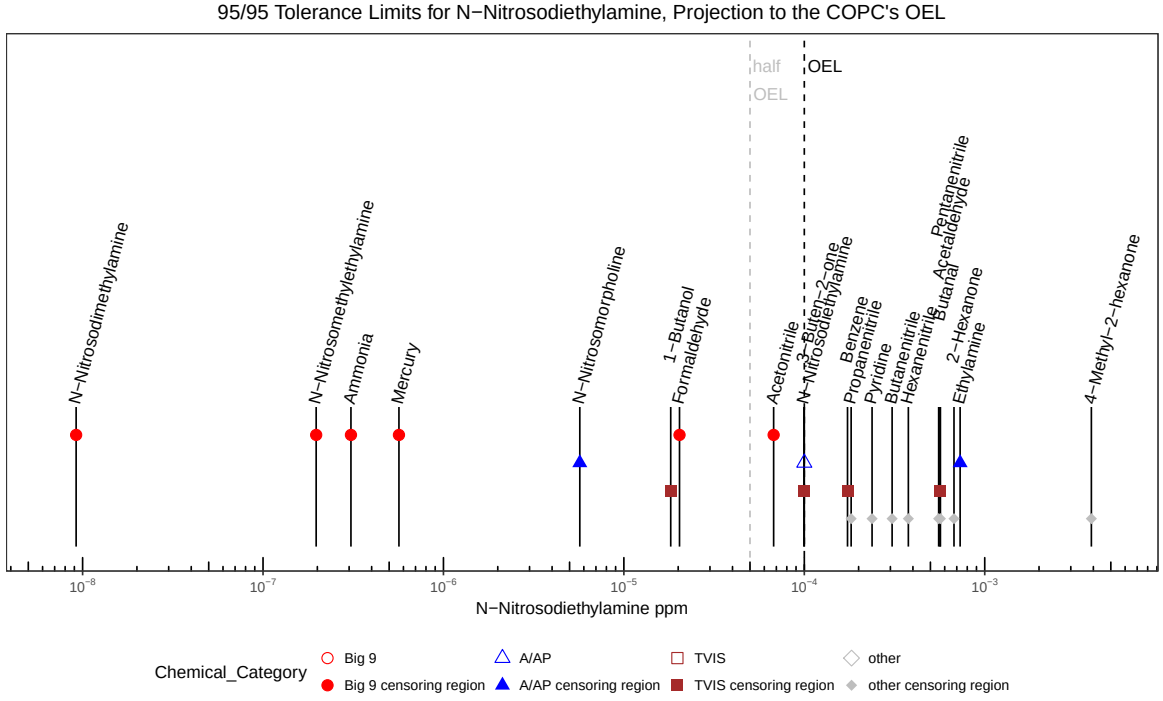


Figure E.268: Tolerance limits for N-Nitrosodiethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

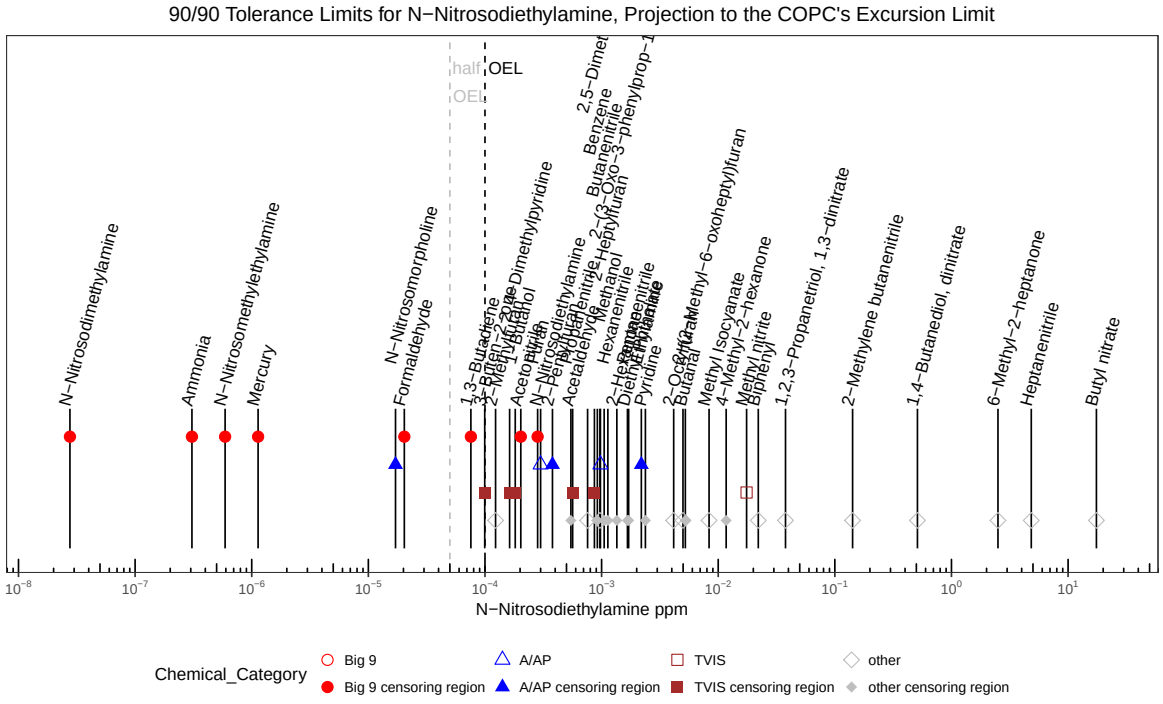


Figure E.269: Tolerance limits for N-Nitrosodiethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

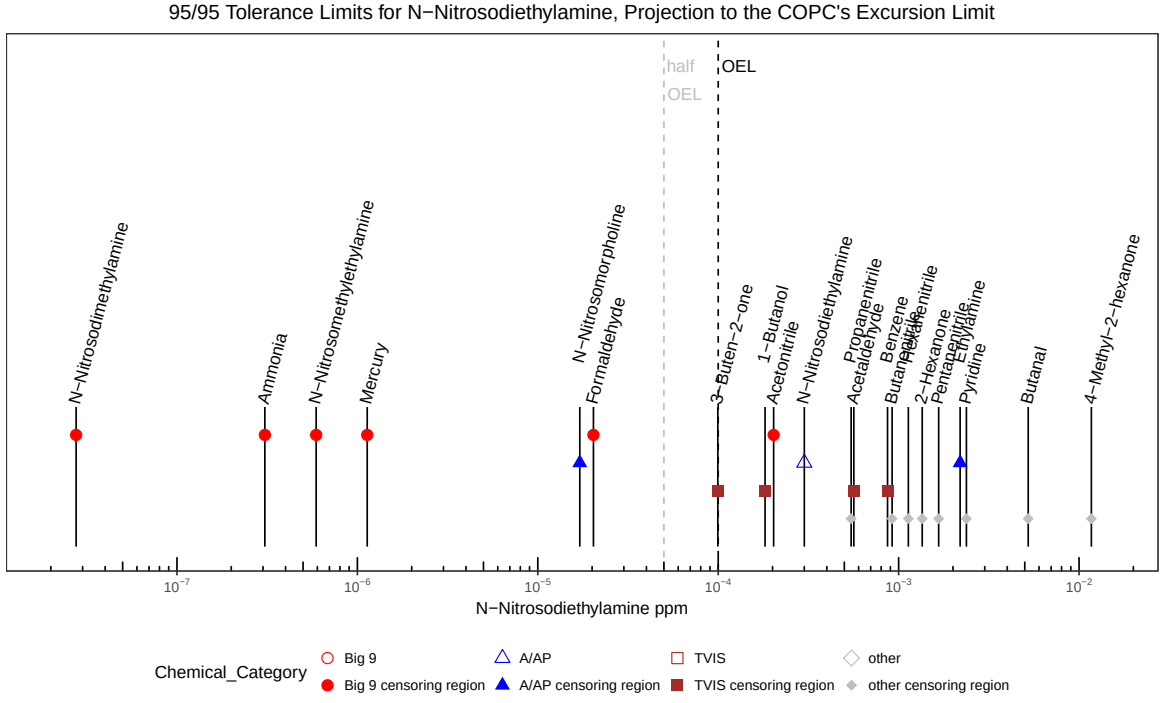


Figure E.270: Tolerance limits for N-Nitrosodiethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

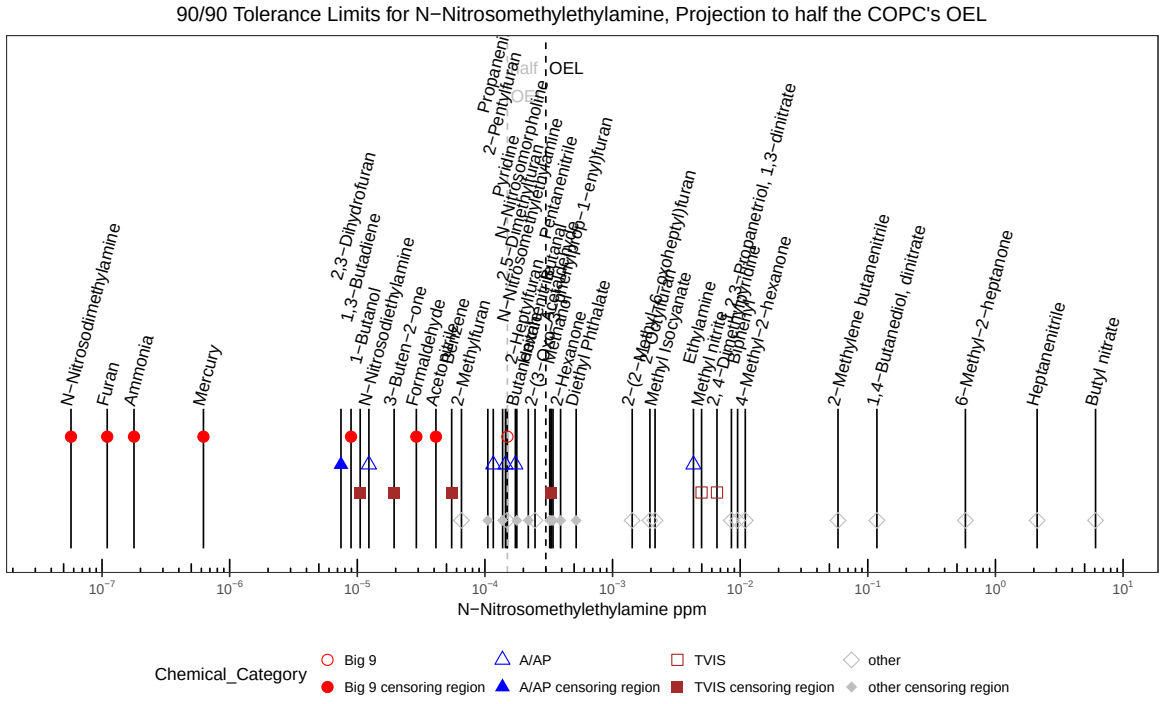


Figure E.271: Tolerance limits for N-Nitrosomethylethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

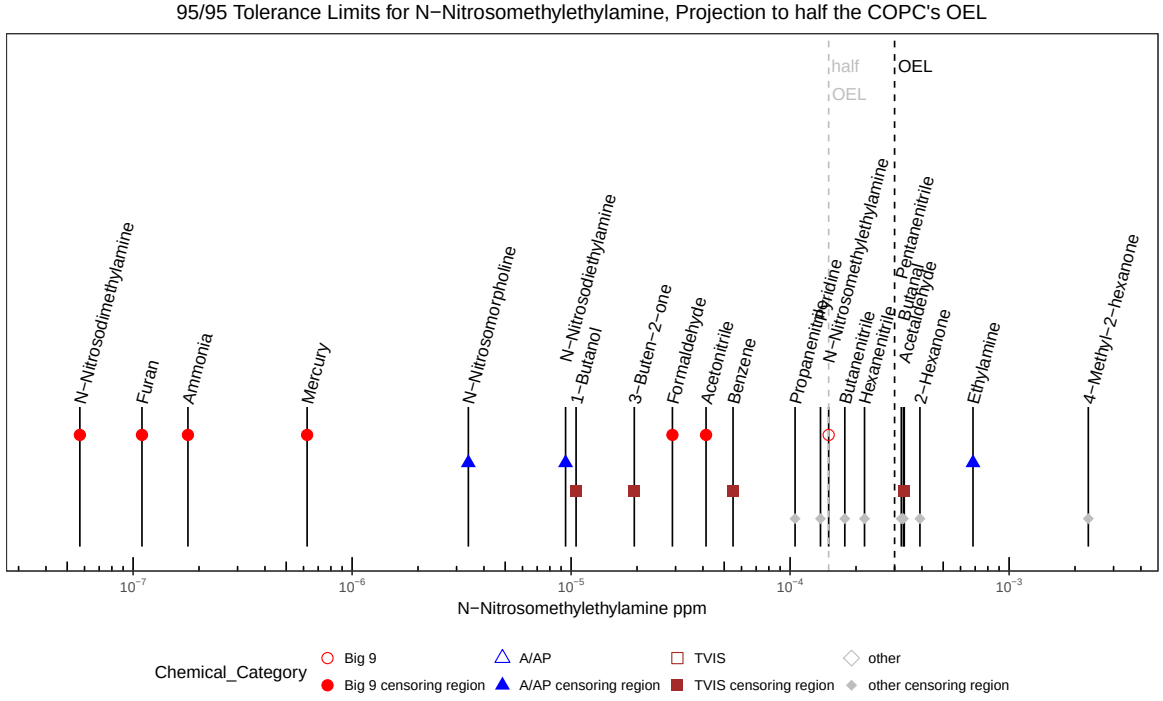


Figure E.272: Tolerance limits for N-Nitrosomethylethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

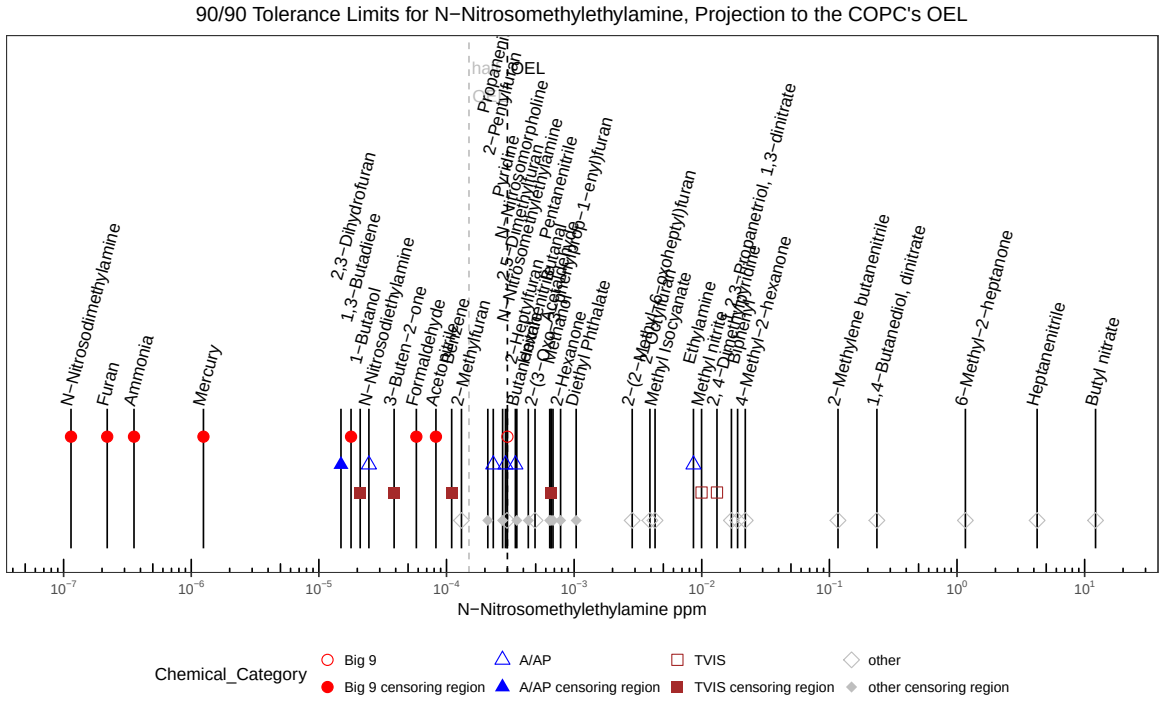


Figure E.273: Tolerance limits for N-Nitrosomethylethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

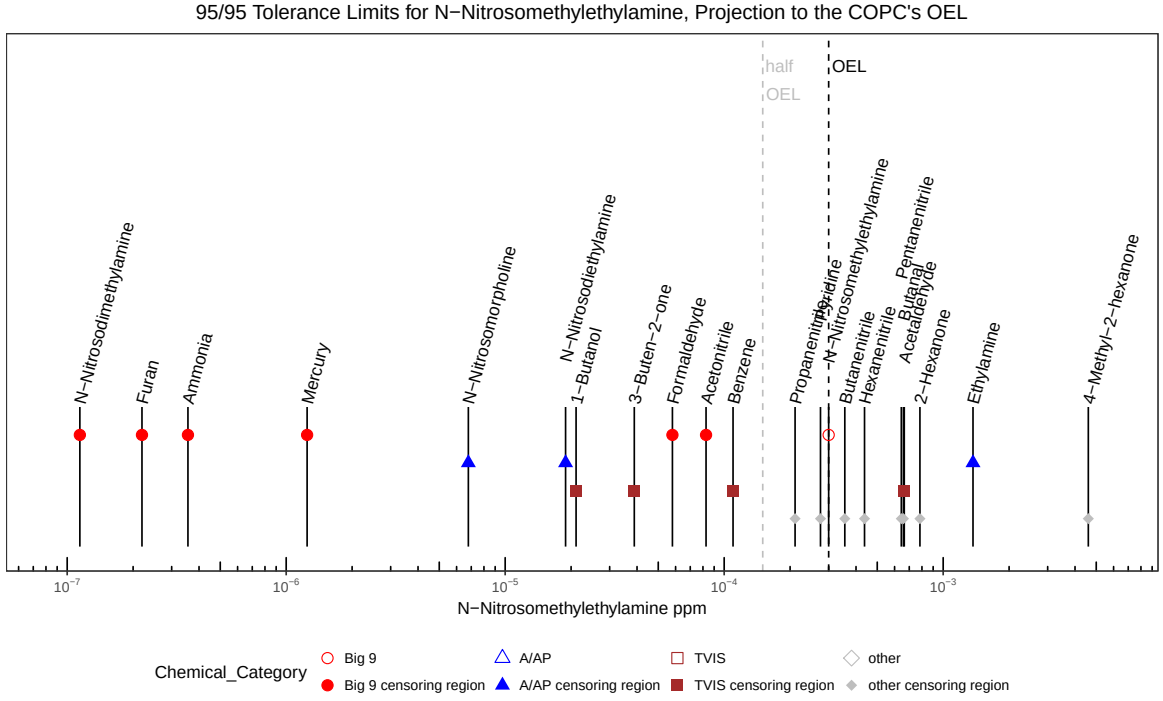


Figure E.274: Tolerance limits for N-Nitrosomethylethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

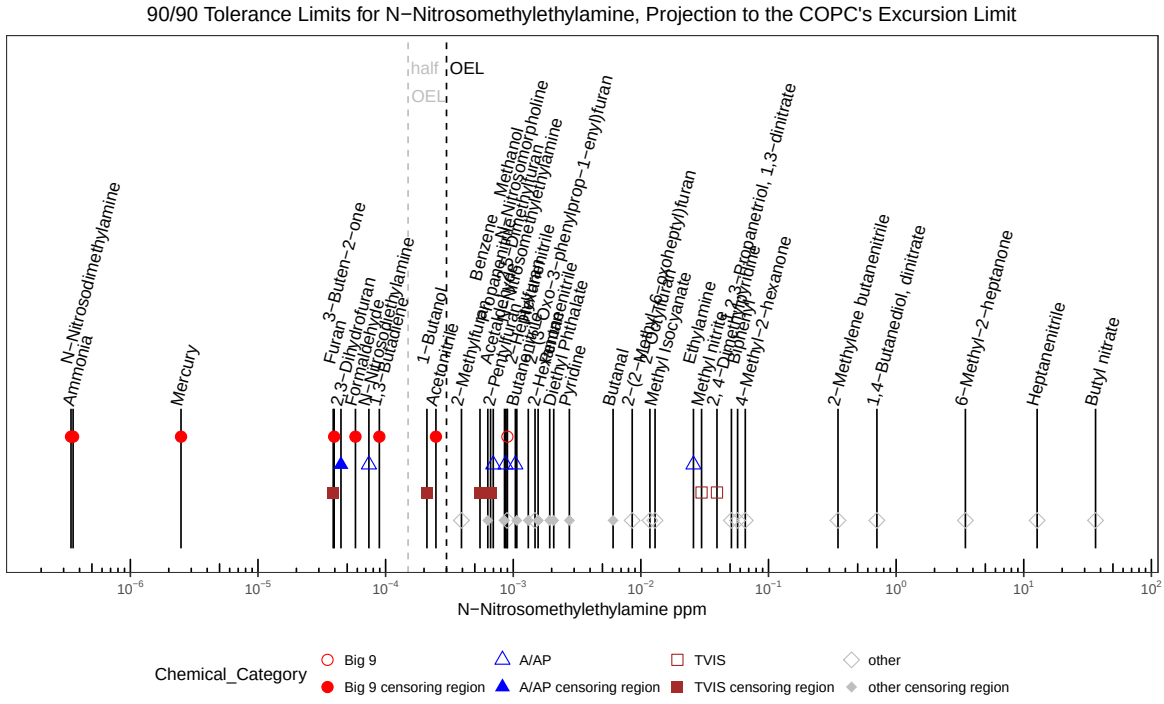


Figure E.275: Tolerance limits for N-Nitrosomethylethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

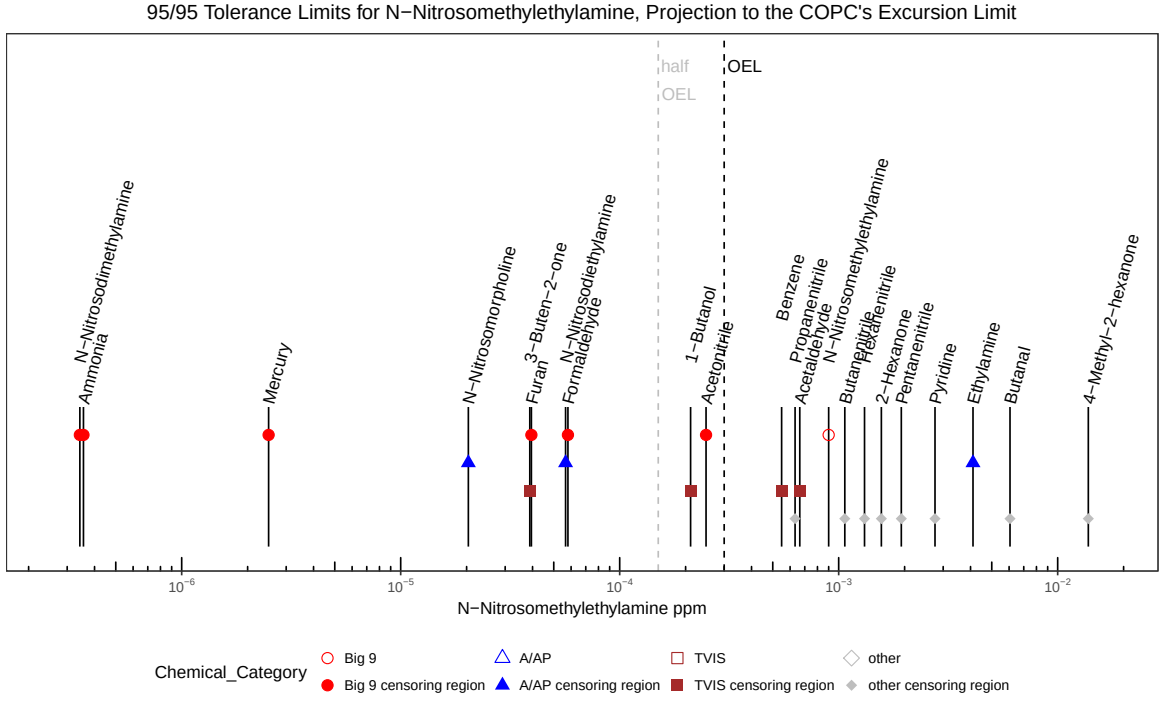


Figure E.276: Tolerance limits for N-Nitrosomethylethylamine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

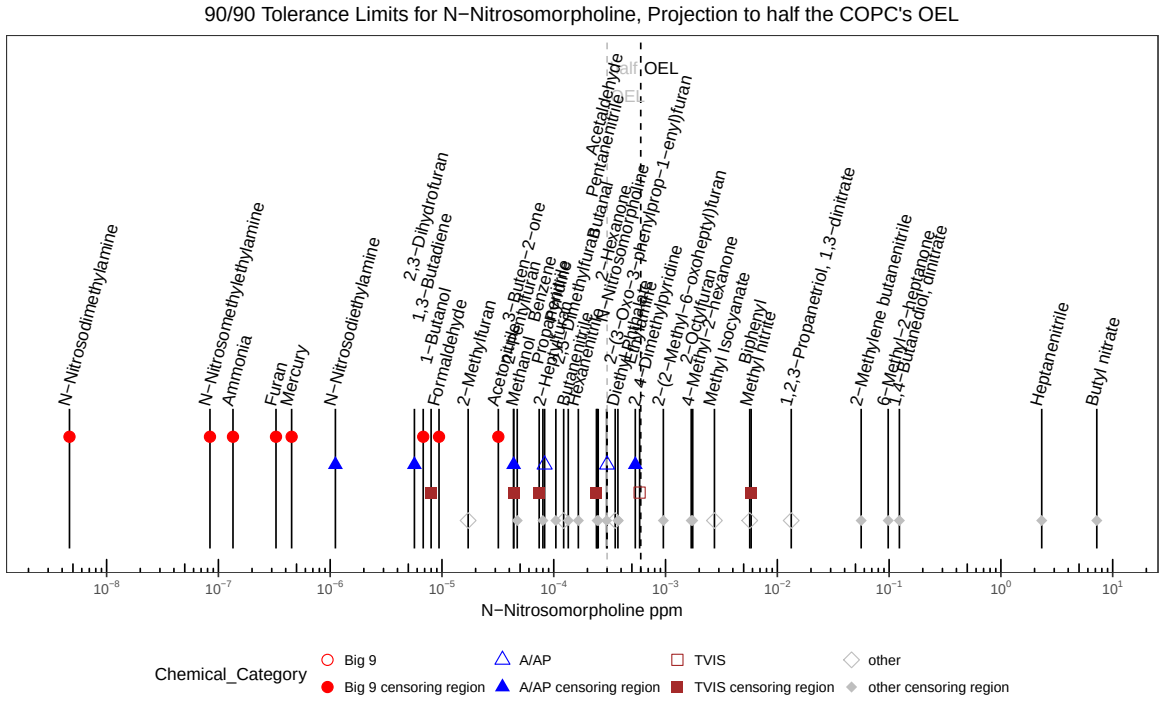


Figure E.277: Tolerance limits for N-Nitrosomorpholine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

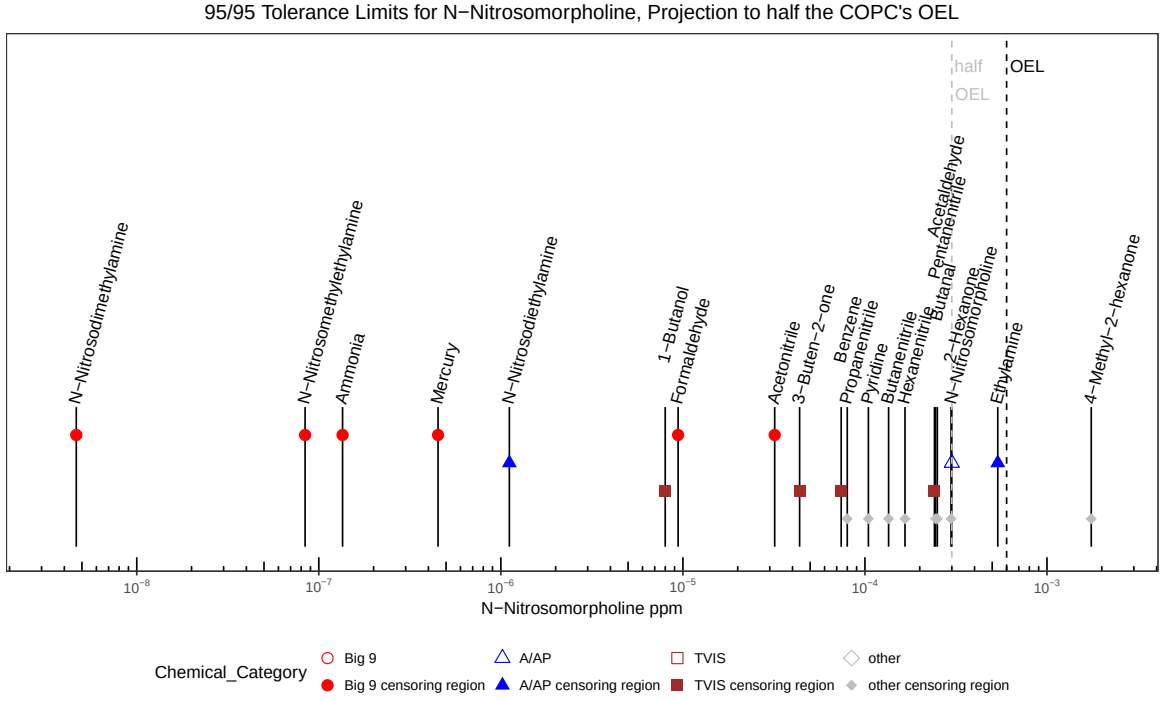


Figure E.278: Tolerance limits for N-Nitrosomorpholine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

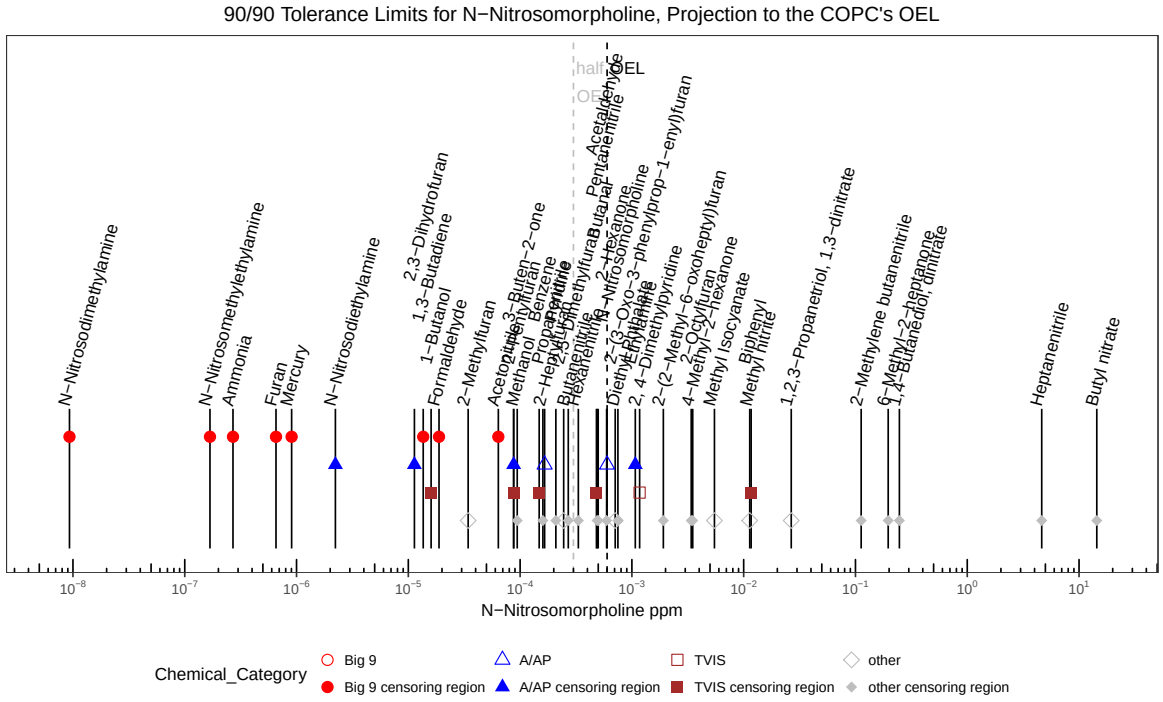


Figure E.279: Tolerance limits for N-Nitrosomorpholine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

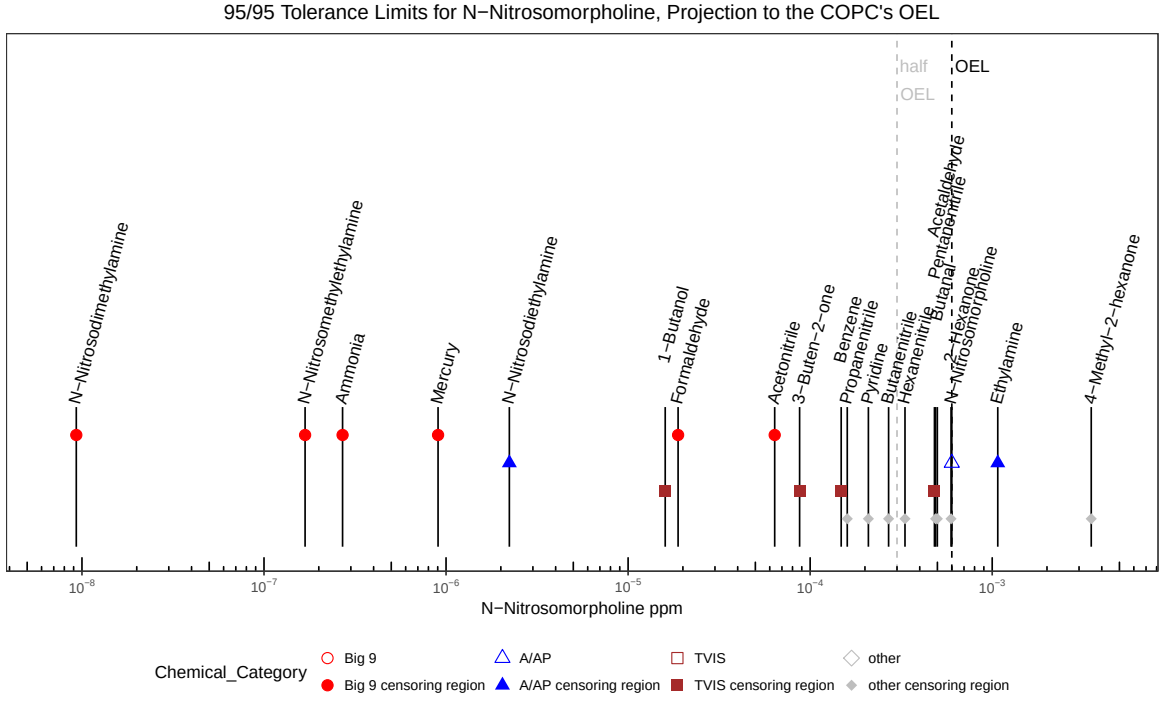


Figure E.280: Tolerance limits for N-Nitrosomorpholine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

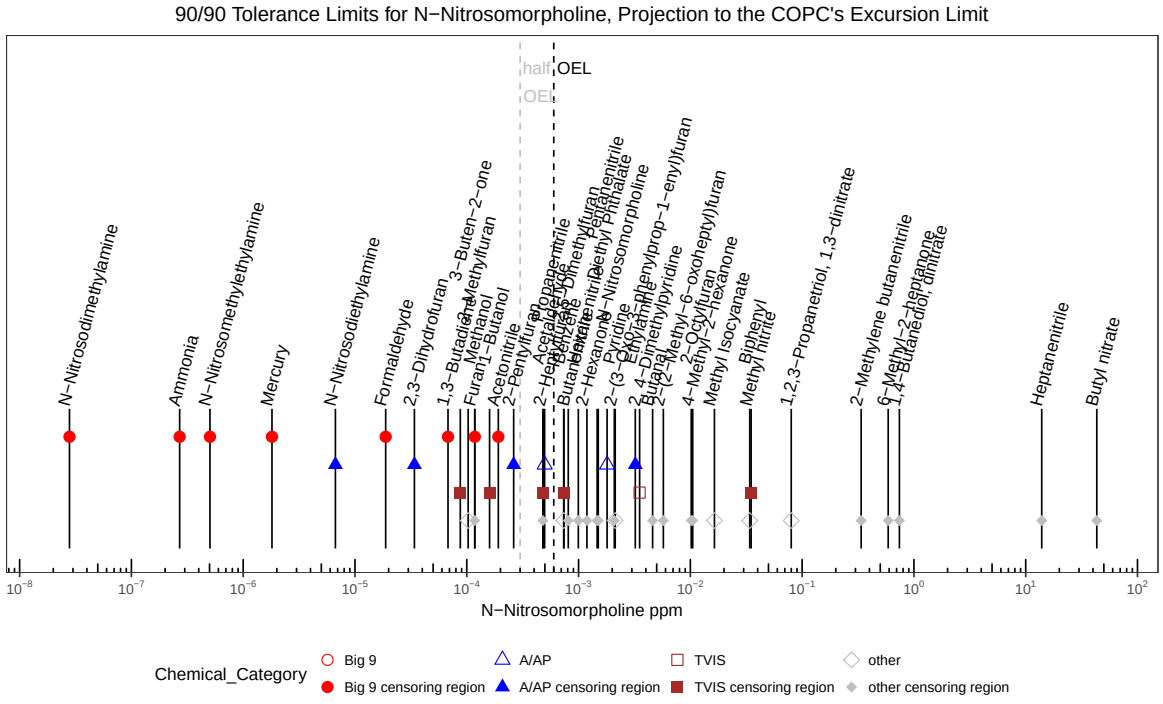


Figure E.281: Tolerance limits for N-Nitrosomorpholine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

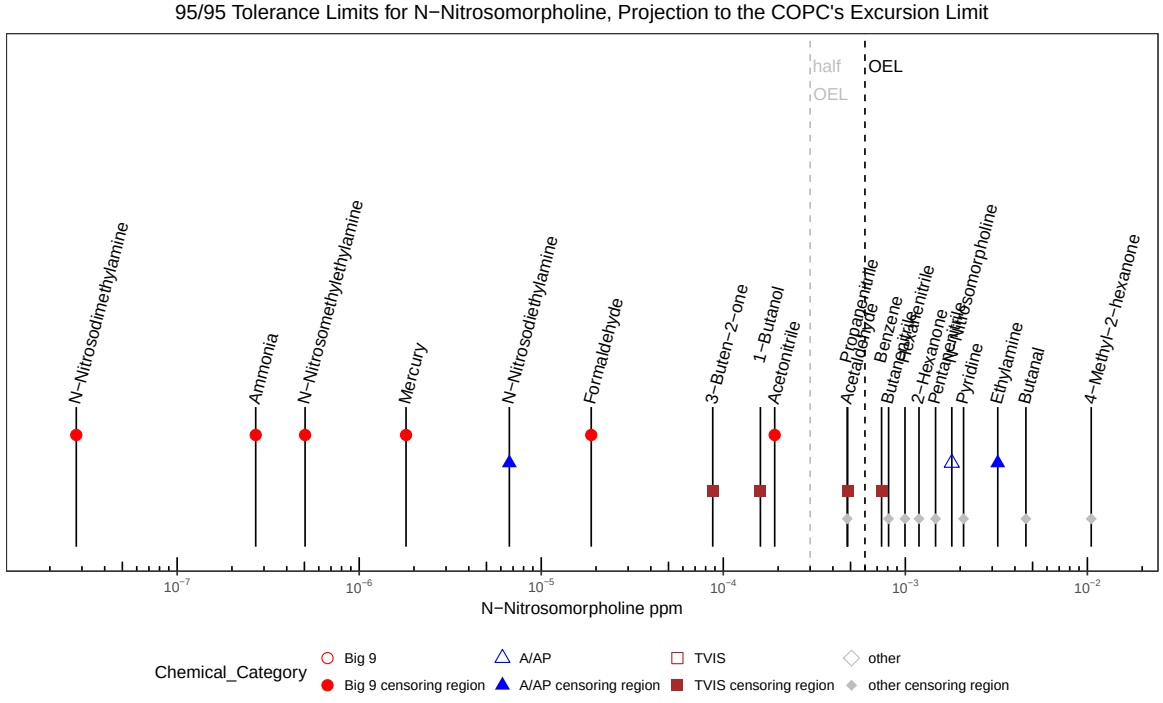


Figure E.282: Tolerance limits for N-Nitrosomorpholine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

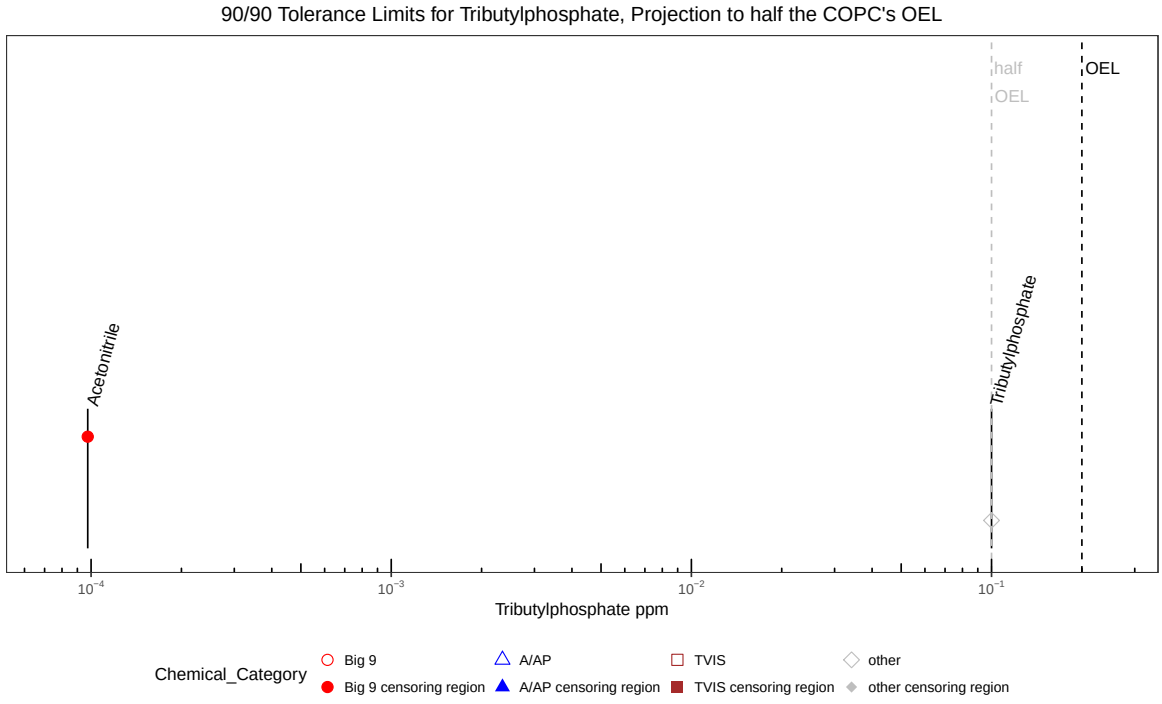


Figure E.283: Tolerance limits for Tributylphosphate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

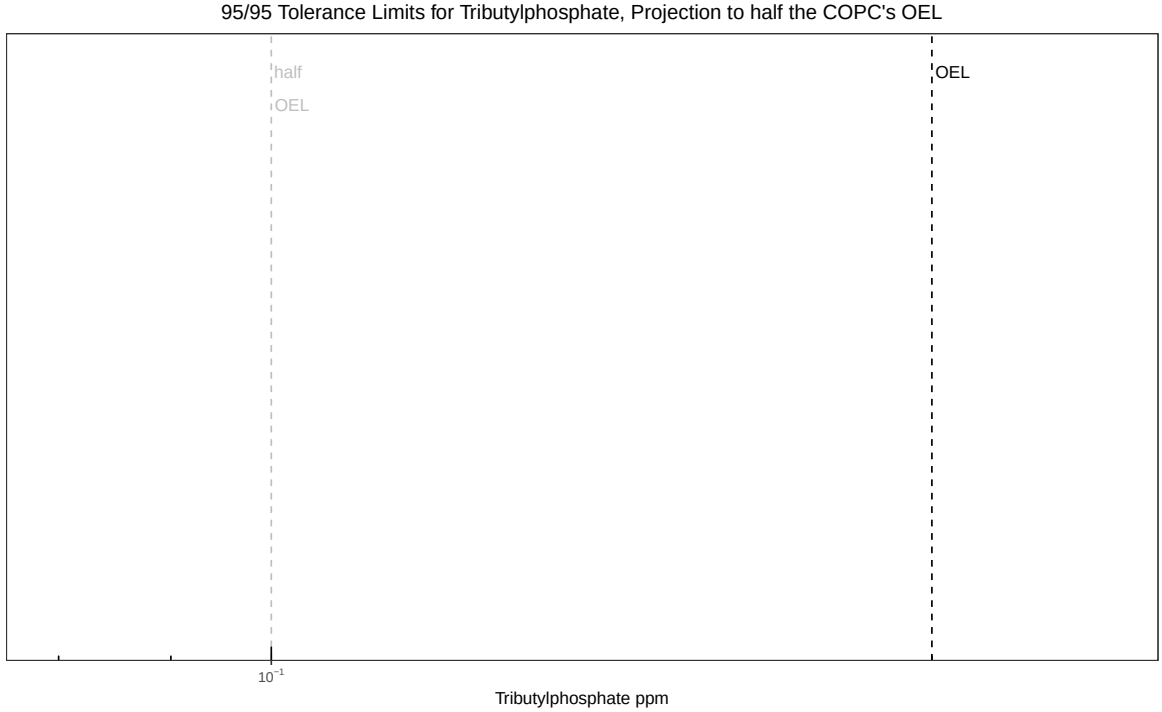


Figure E.284: Tolerance limits for Tributylphosphate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

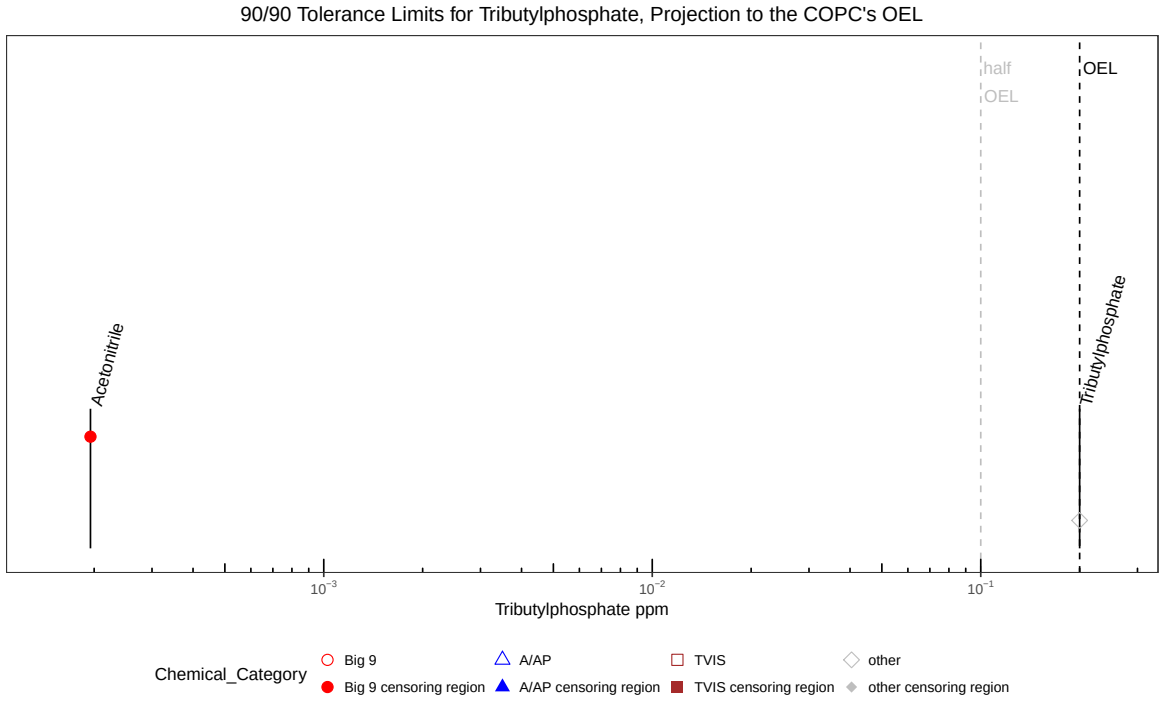


Figure E.285: Tolerance limits for Tributylphosphate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

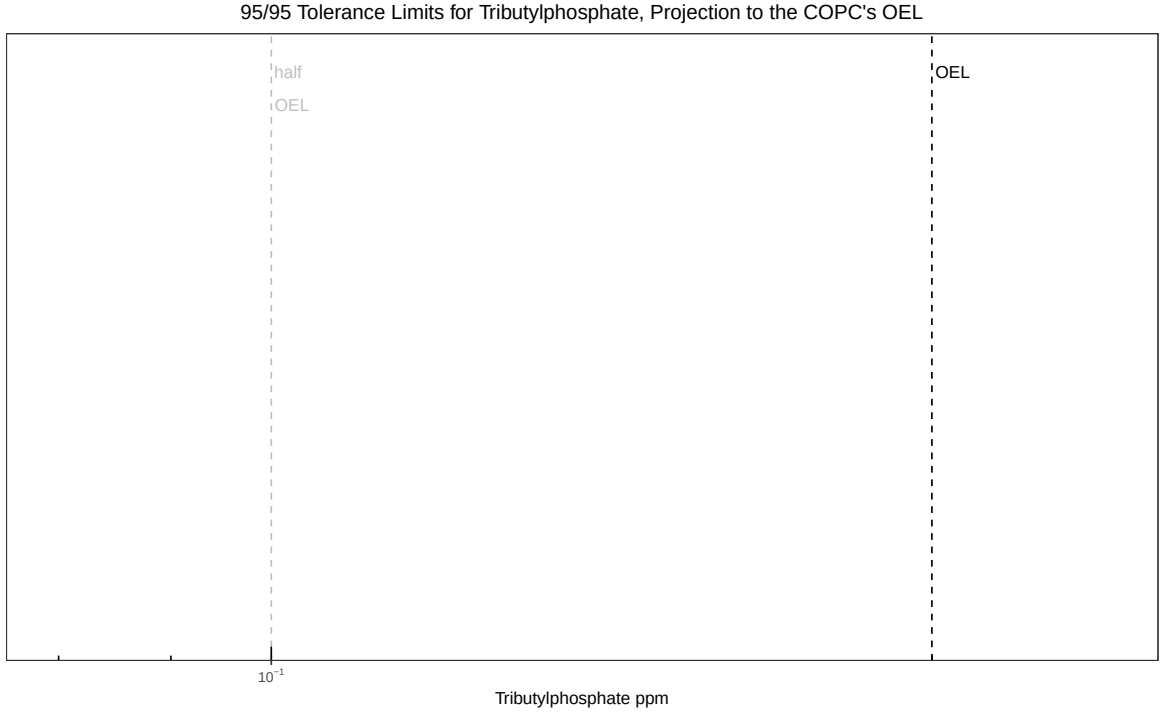


Figure E.286: Tolerance limits for Tributylphosphate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

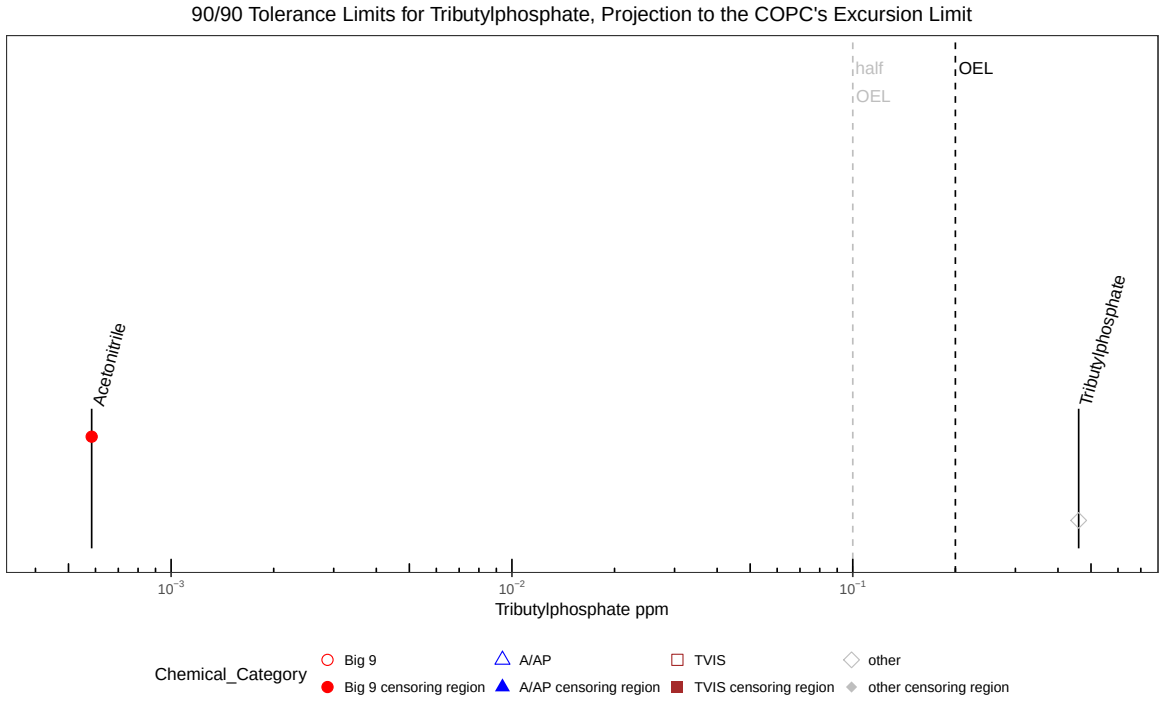


Figure E.287: Tolerance limits for Tributylphosphate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

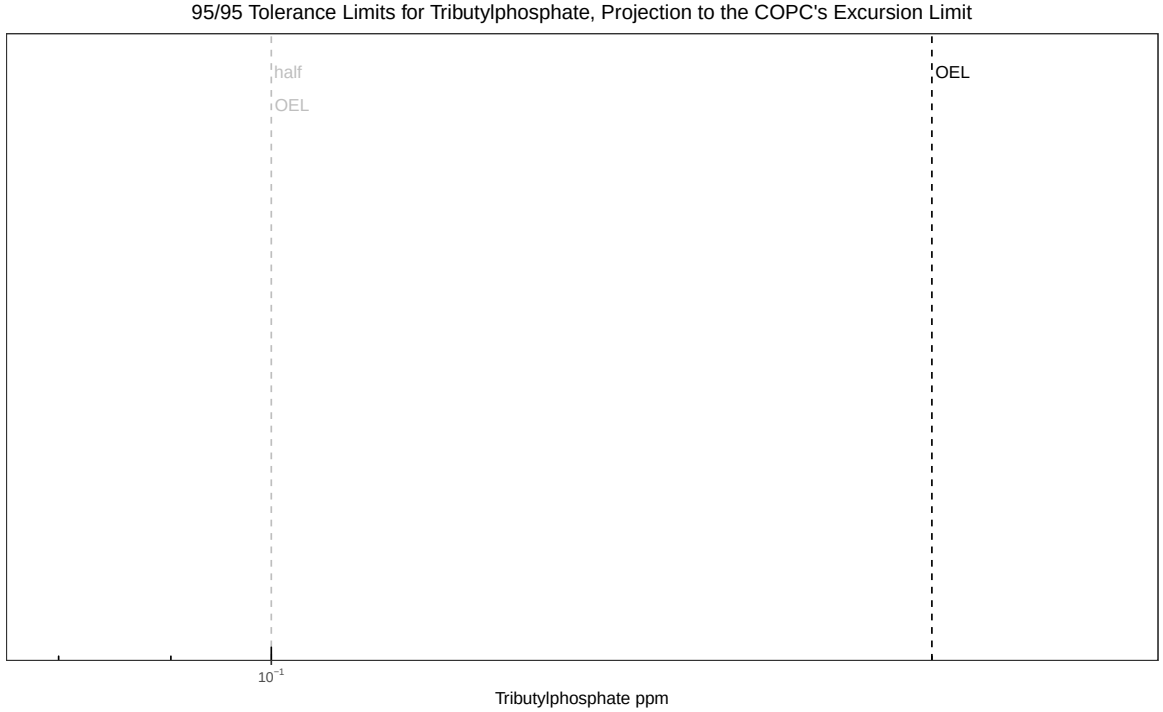


Figure E.288: Tolerance limits for Tributylphosphate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

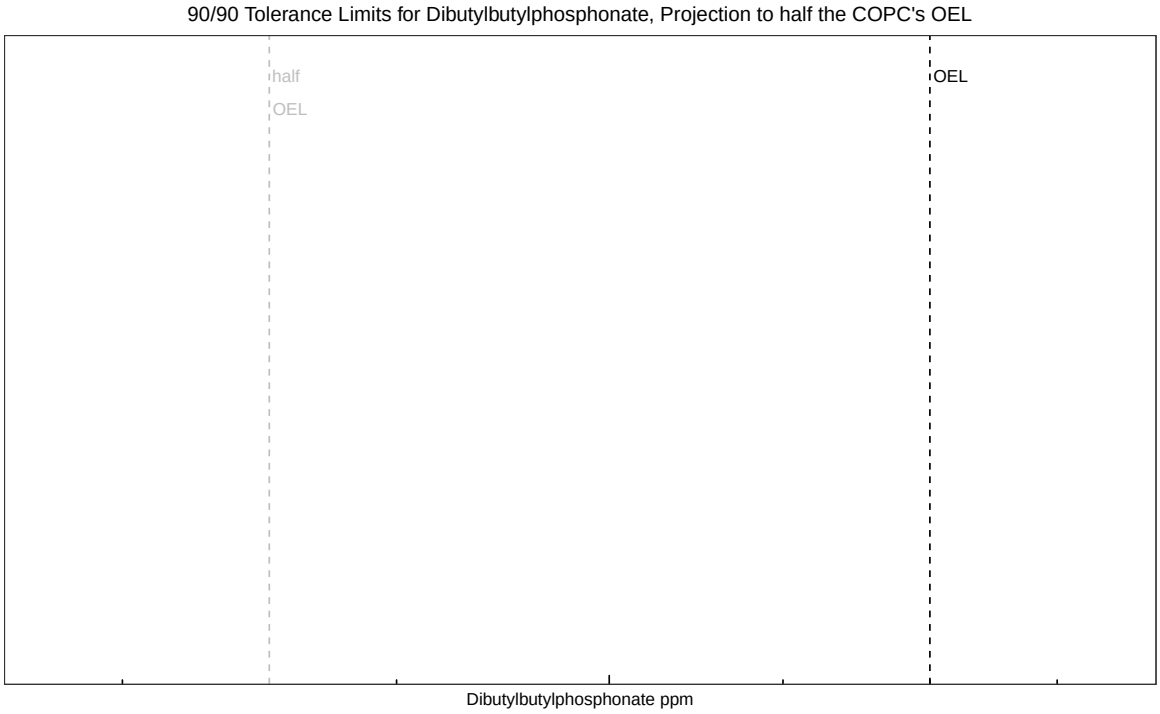


Figure E.289: Tolerance limits for Dibutylbutylphosphonate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

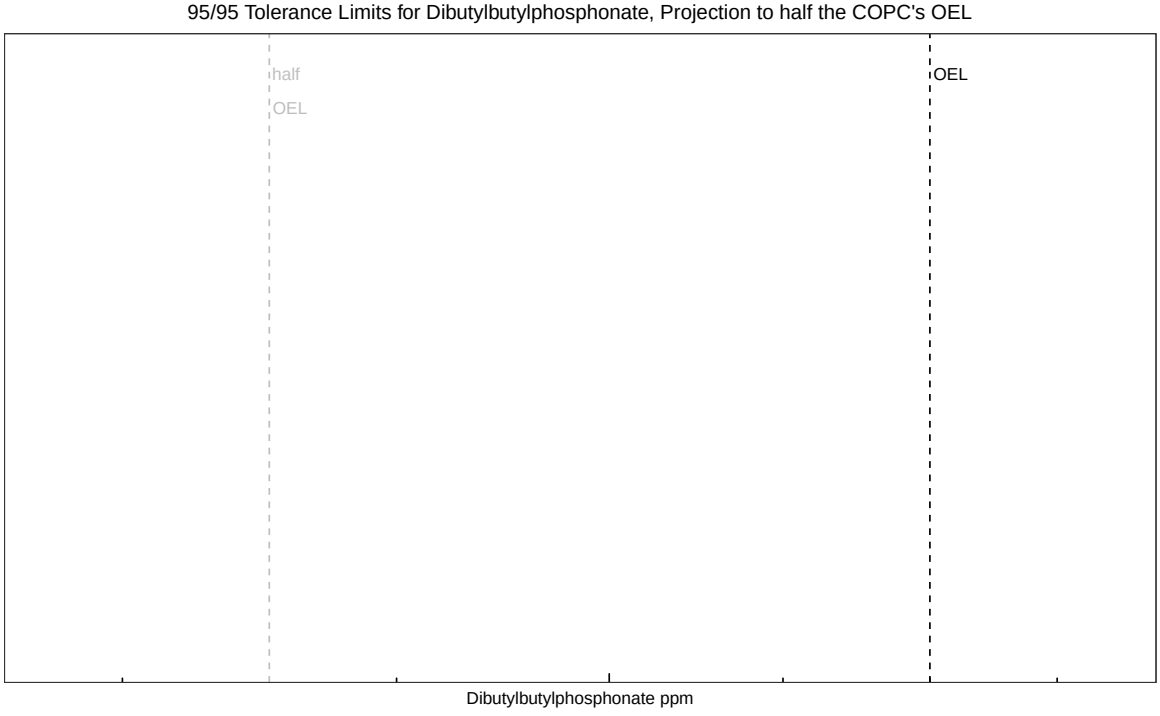


Figure E.290: Tolerance limits for Dibutylbutylphosphonate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

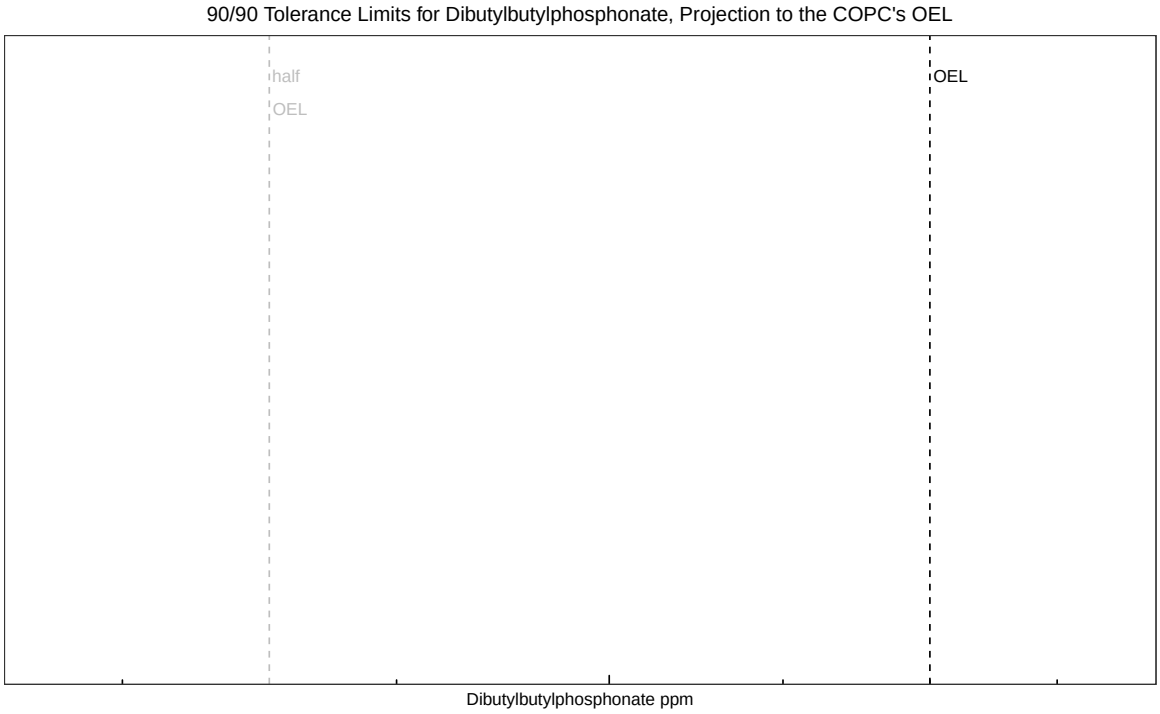


Figure E.291: Tolerance limits for Dibutylbutylphosphonate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

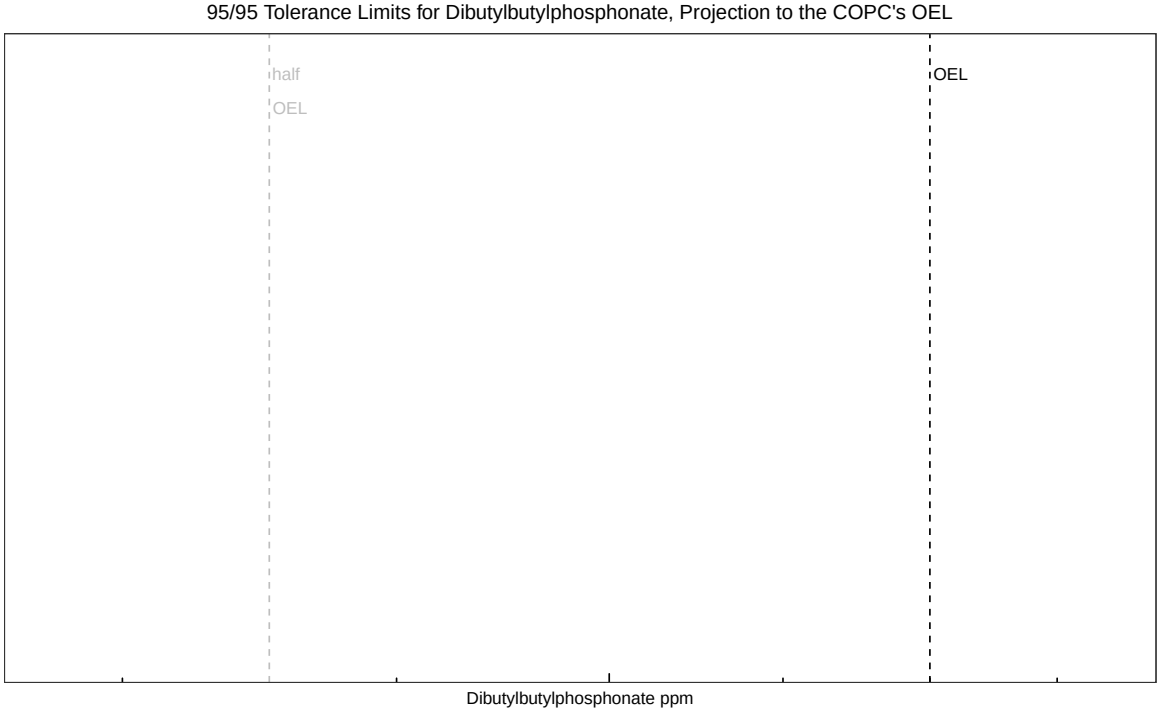


Figure E.292: Tolerance limits for Dibutylbutylphosphonate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

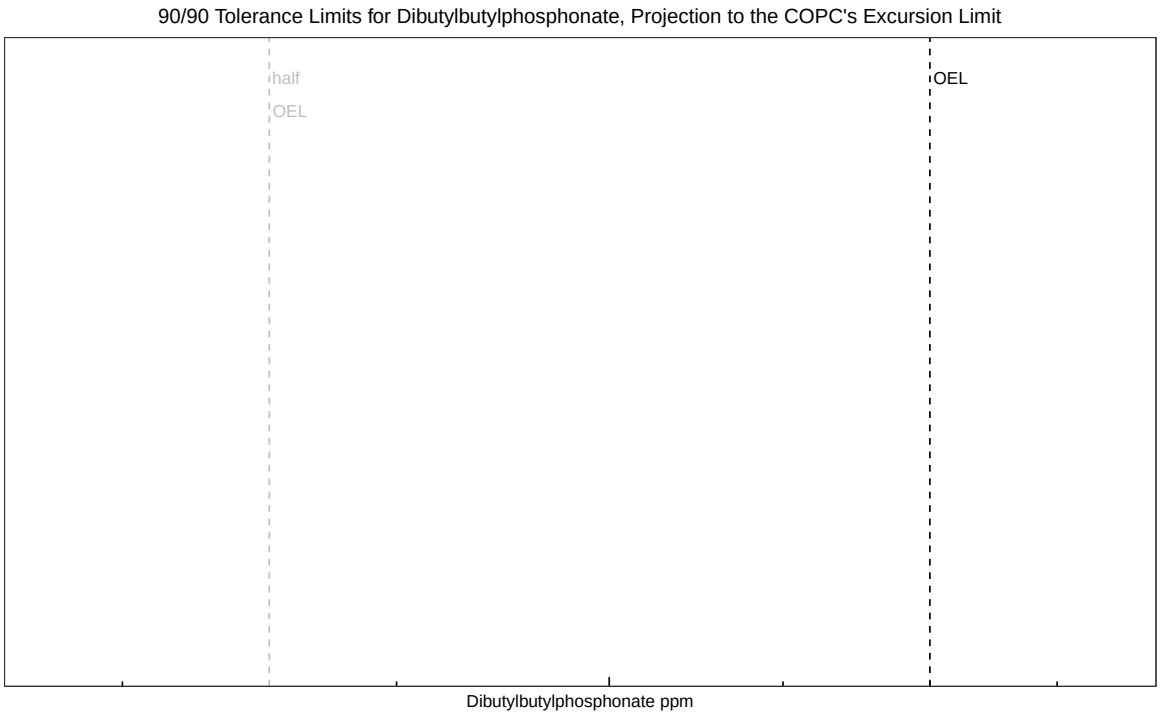


Figure E.293: Tolerance limits for Dibutylbutylphosphonate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

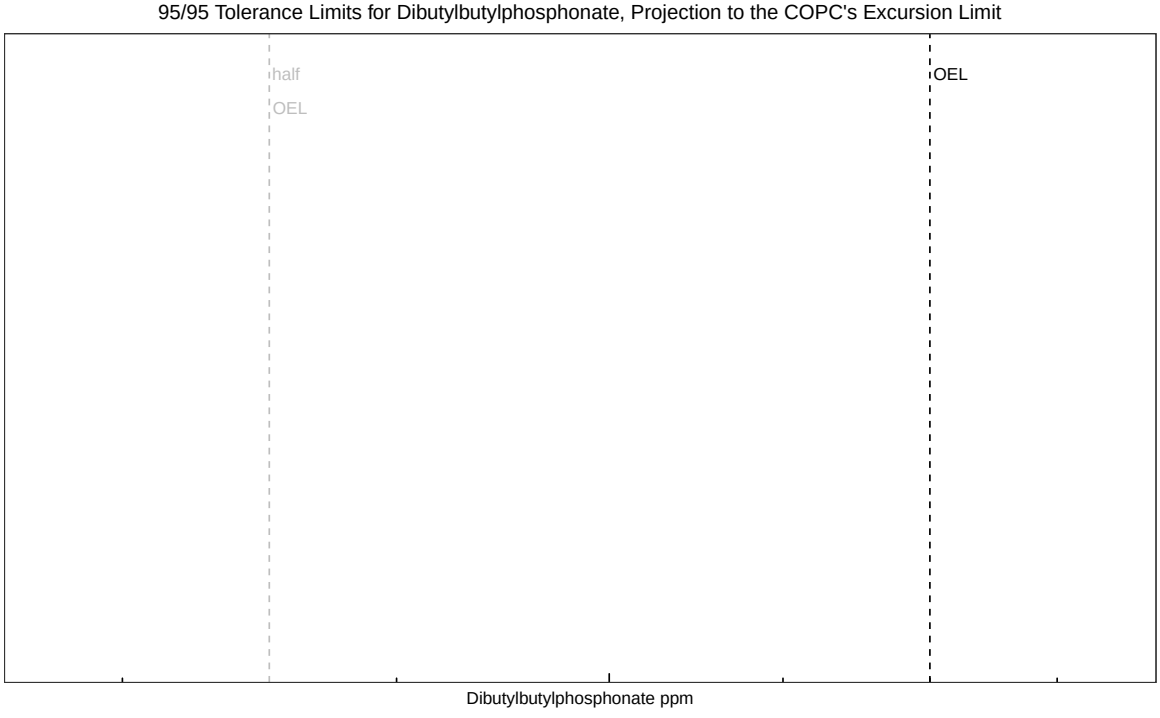


Figure E.294: Tolerance limits for Dibutylbutylphosphonate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

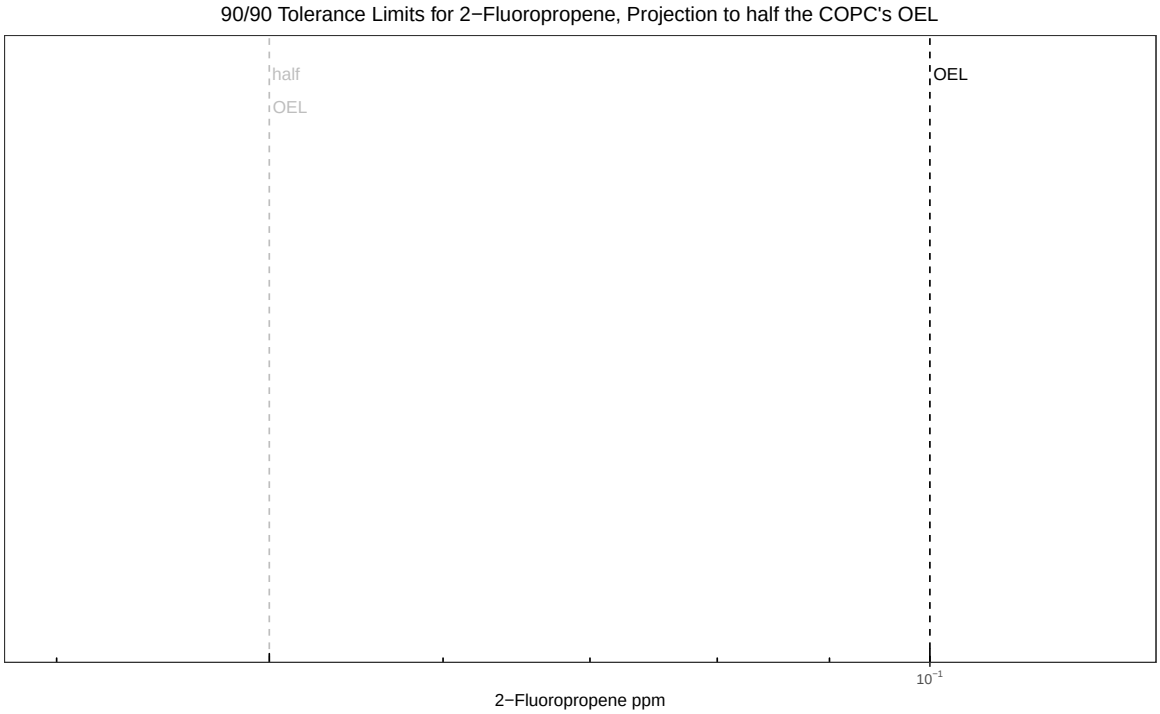


Figure E.295: Tolerance limits for 2-Fluoropropene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

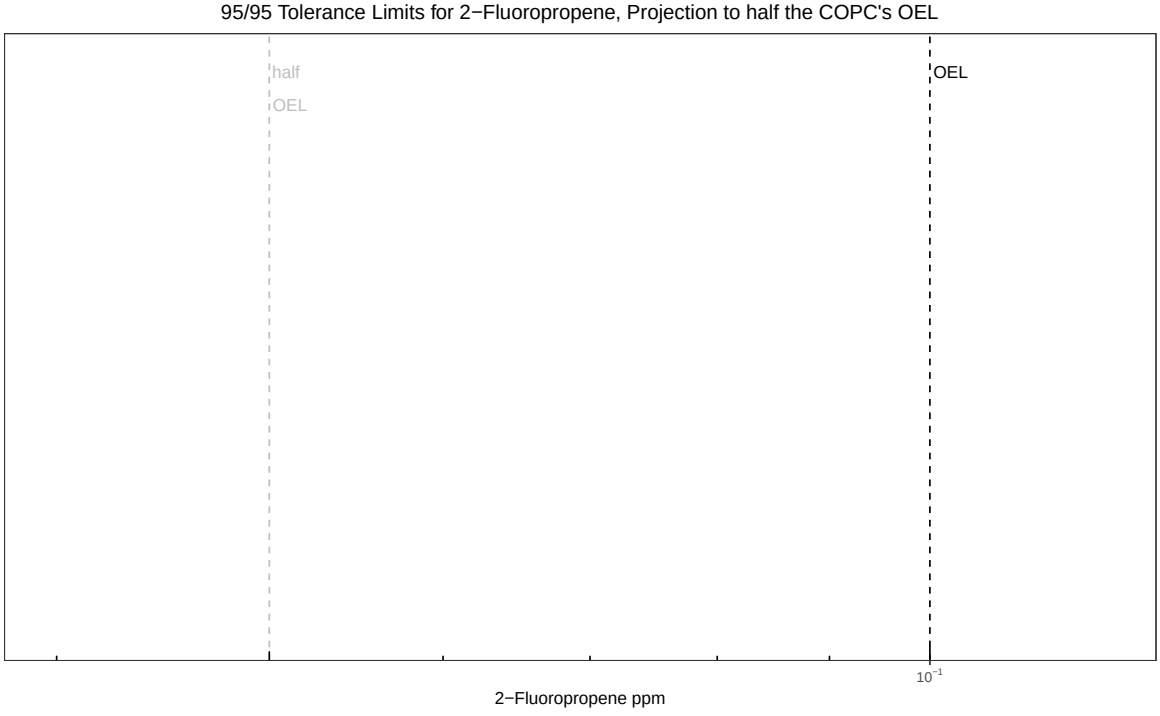


Figure E.296: Tolerance limits for 2-Fluoropropene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

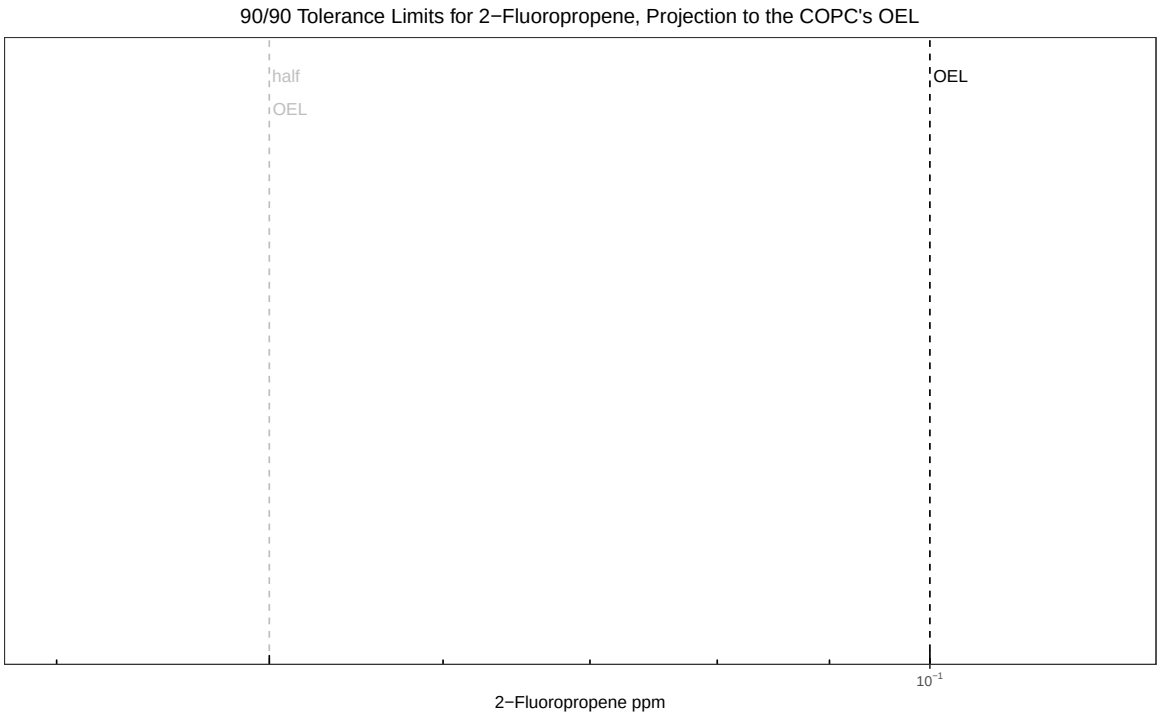


Figure E.297: Tolerance limits for 2-Fluoropropene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

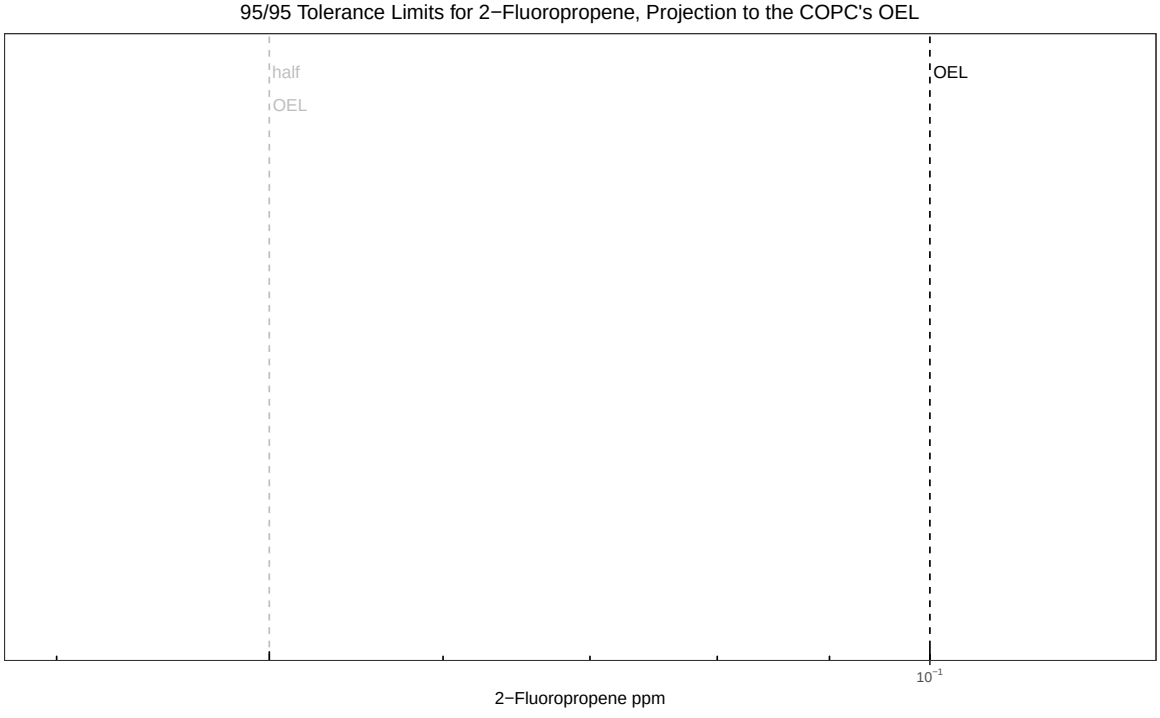


Figure E.298: Tolerance limits for 2-Fluoropropene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

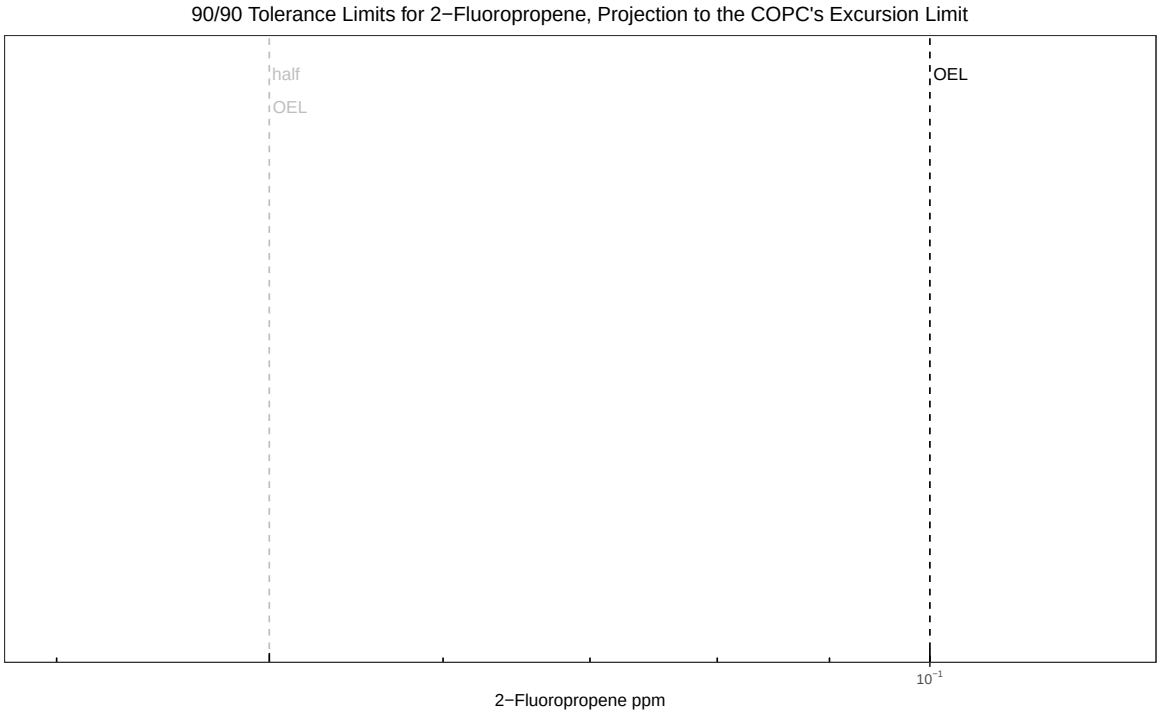


Figure E.299: Tolerance limits for 2-Fluoropropene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

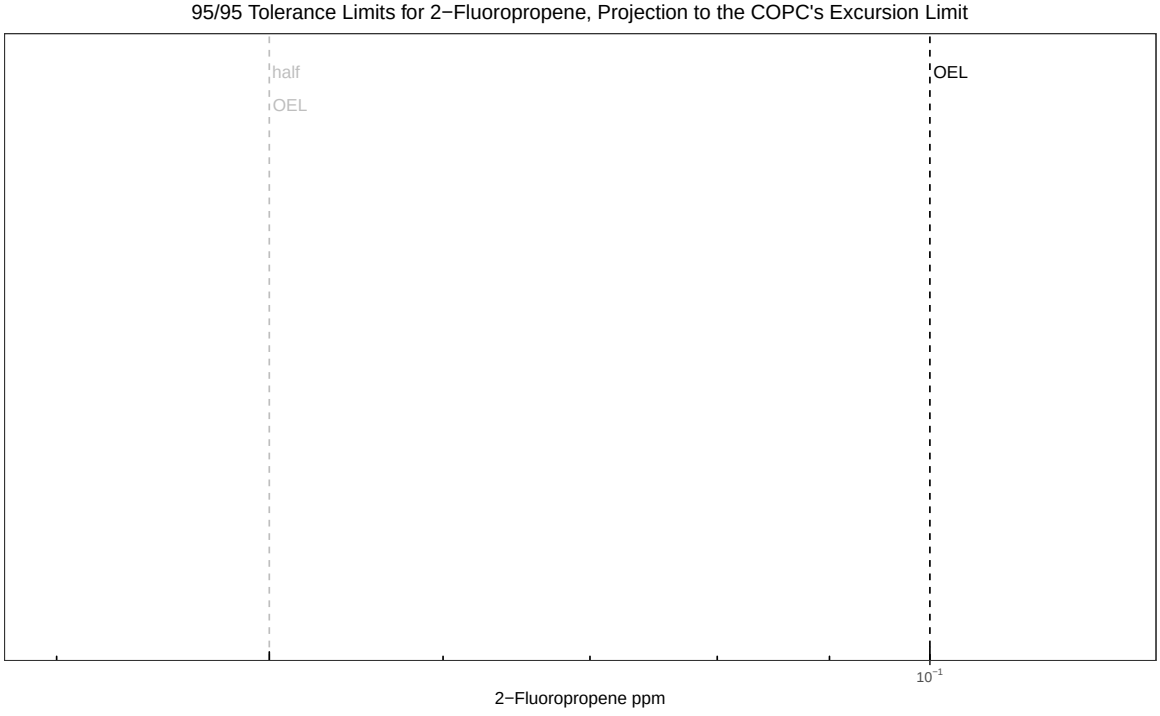


Figure E.300: Tolerance limits for 2-Fluoropropene as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

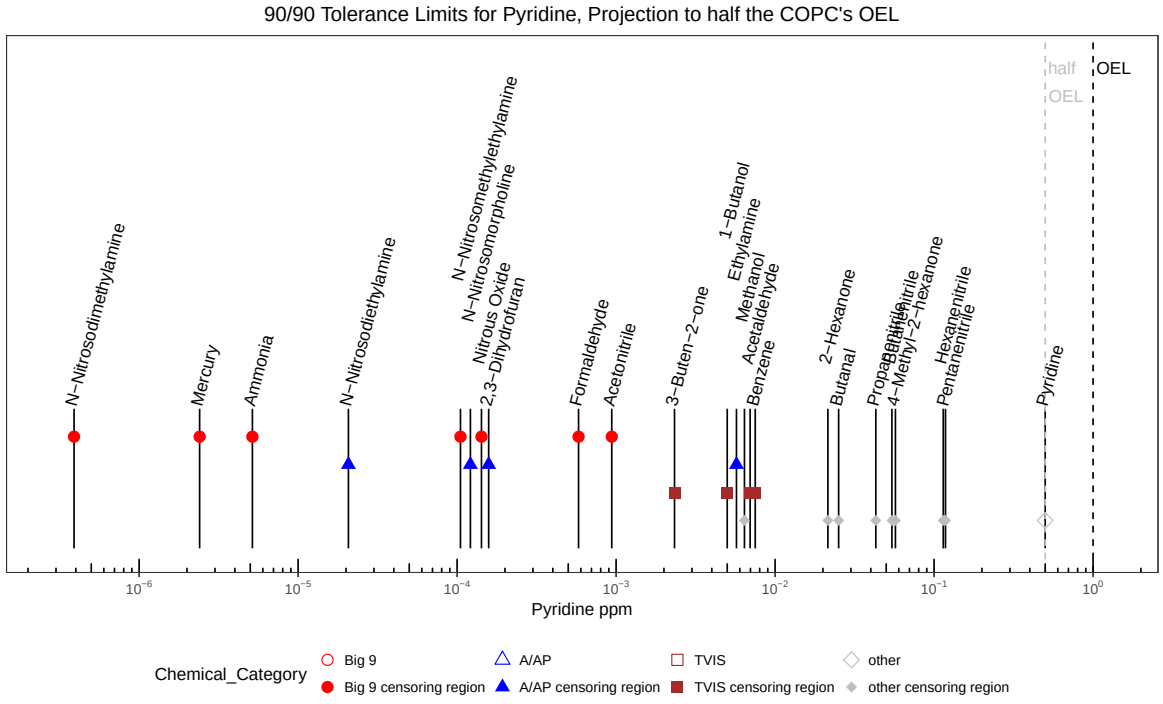


Figure E.301: Tolerance limits for Pyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

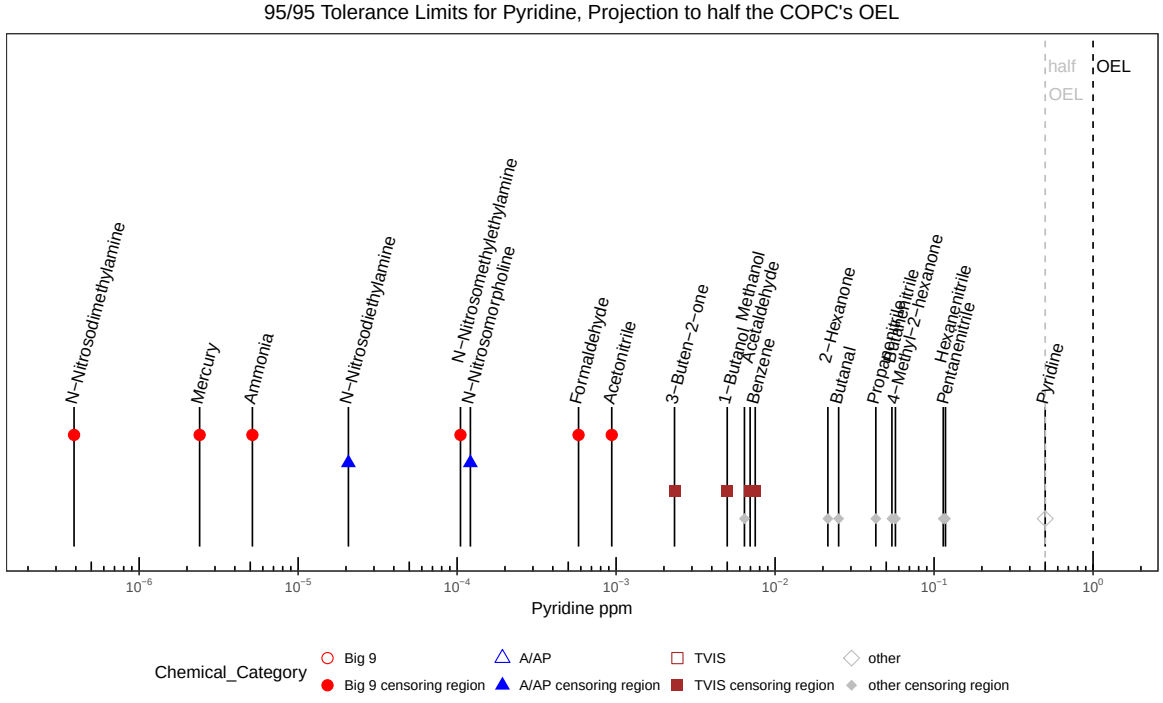


Figure E.302: Tolerance limits for Pyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

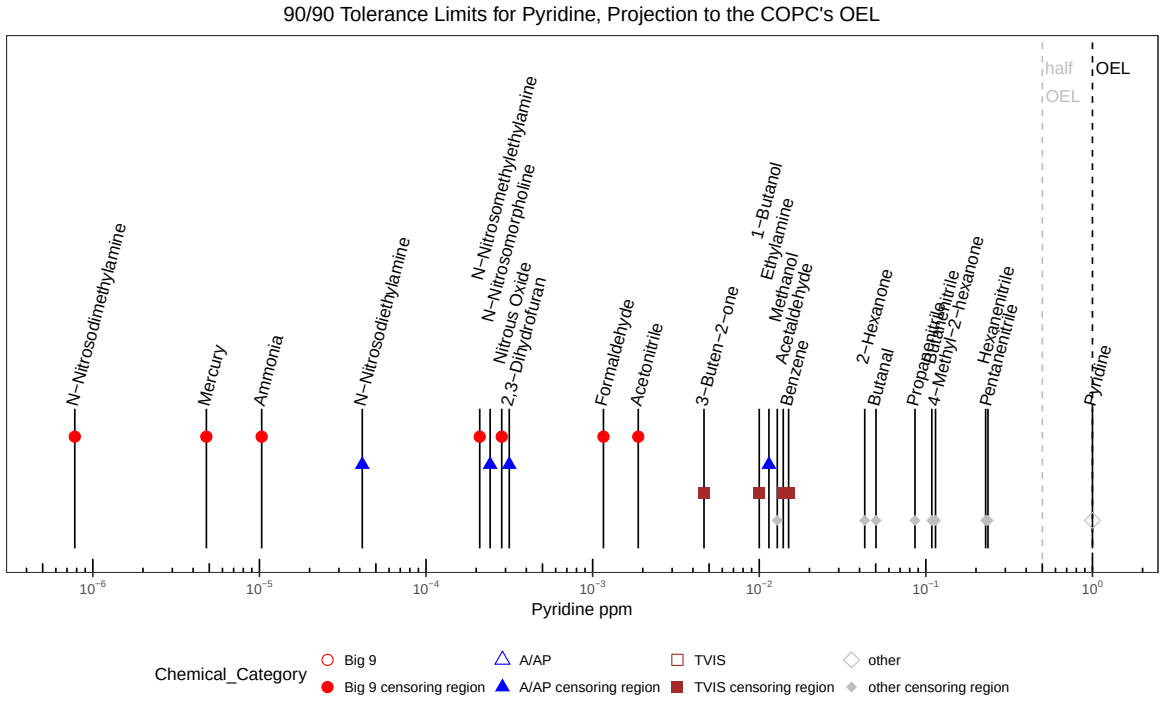


Figure E.303: Tolerance limits for Pyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

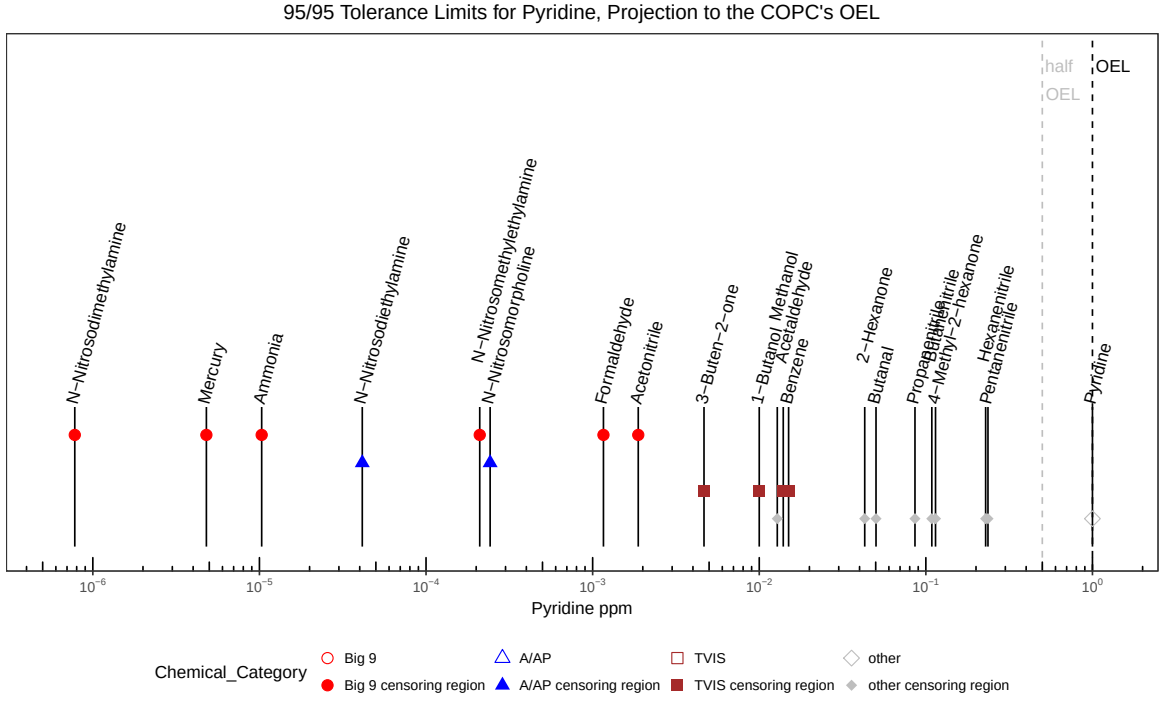


Figure E.304: Tolerance limits for Pyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

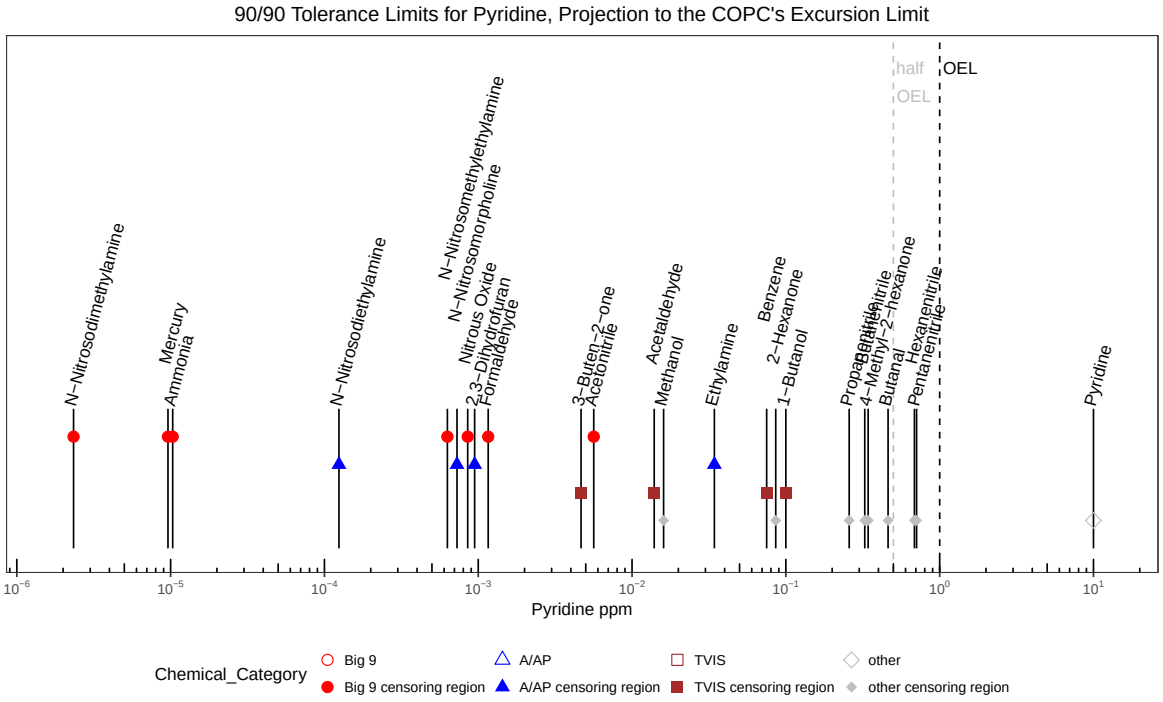


Figure E.305: Tolerance limits for Pyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

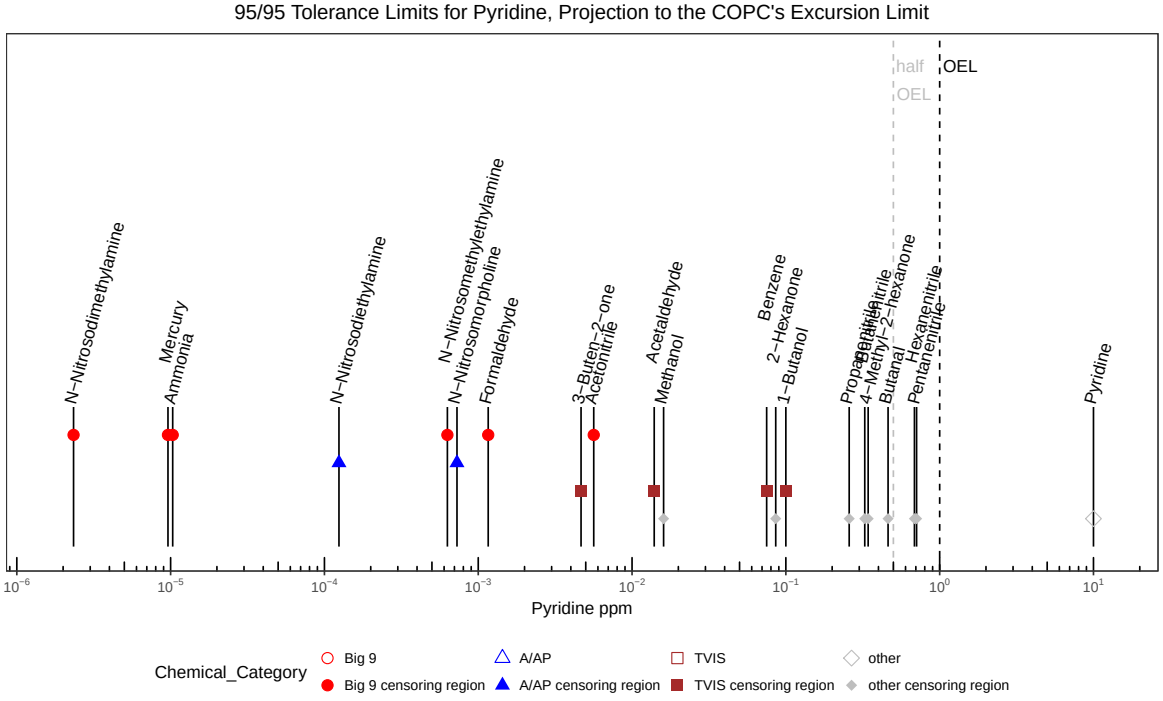


Figure E.306: Tolerance limits for Pyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

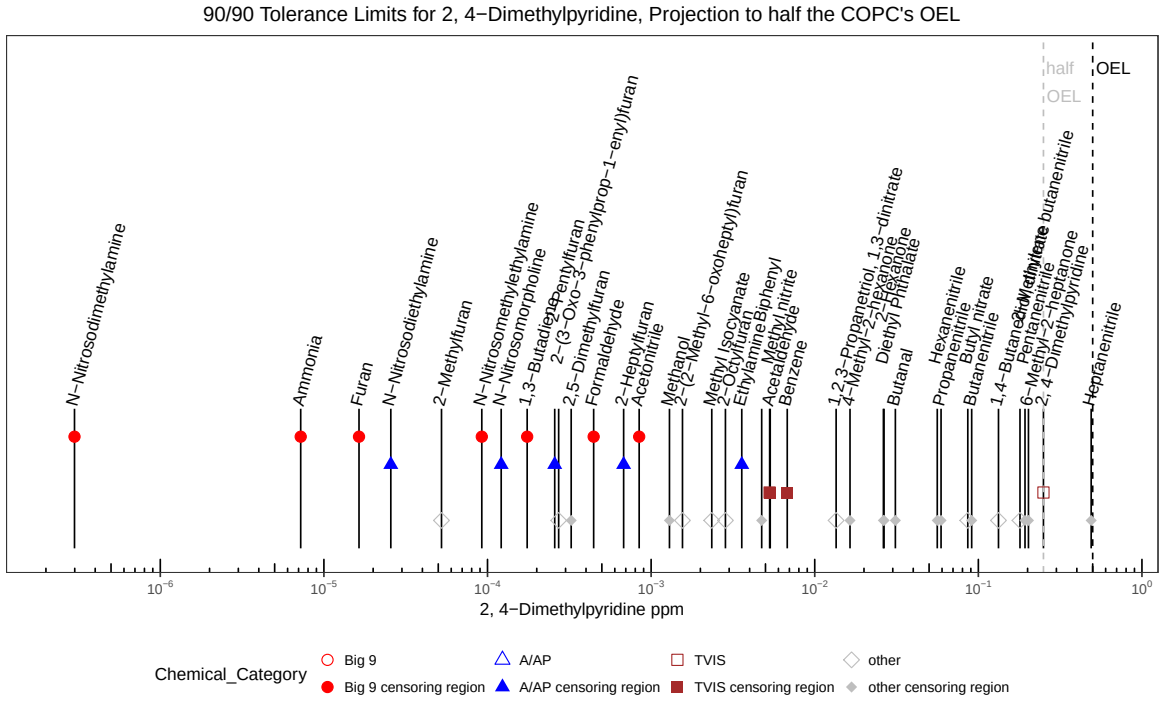


Figure E.307: Tolerance limits for 2, 4-Dimethylpyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

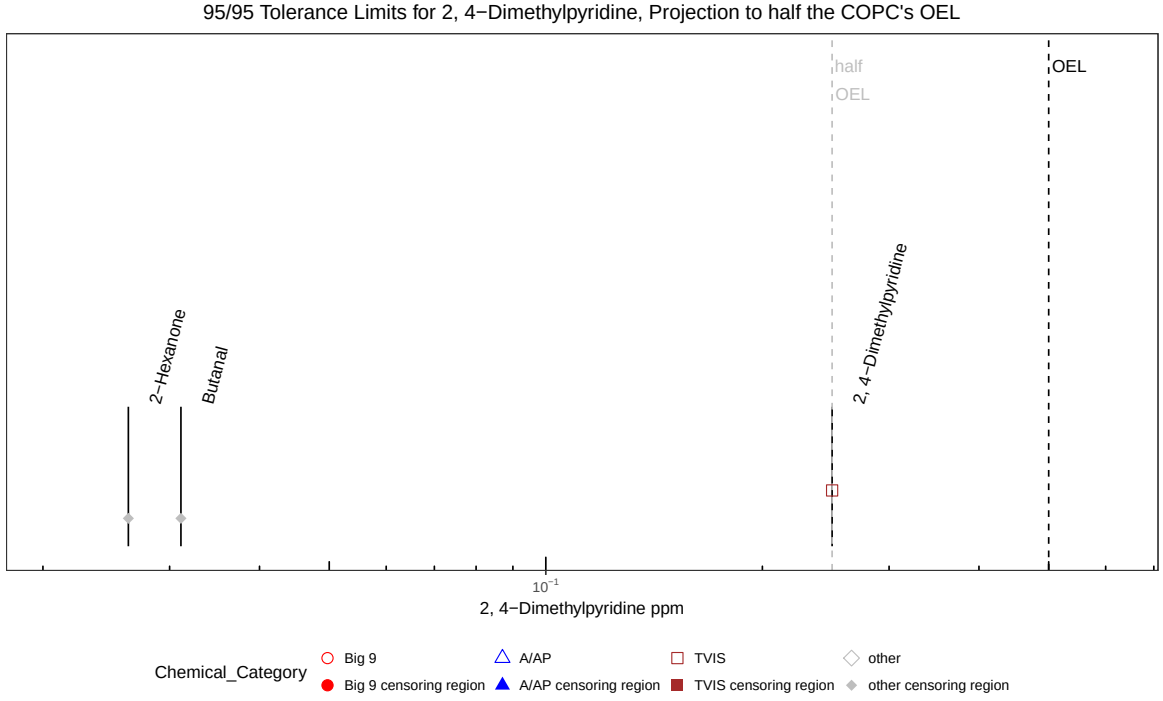


Figure E.308: Tolerance limits for 2, 4-Dimethylpyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

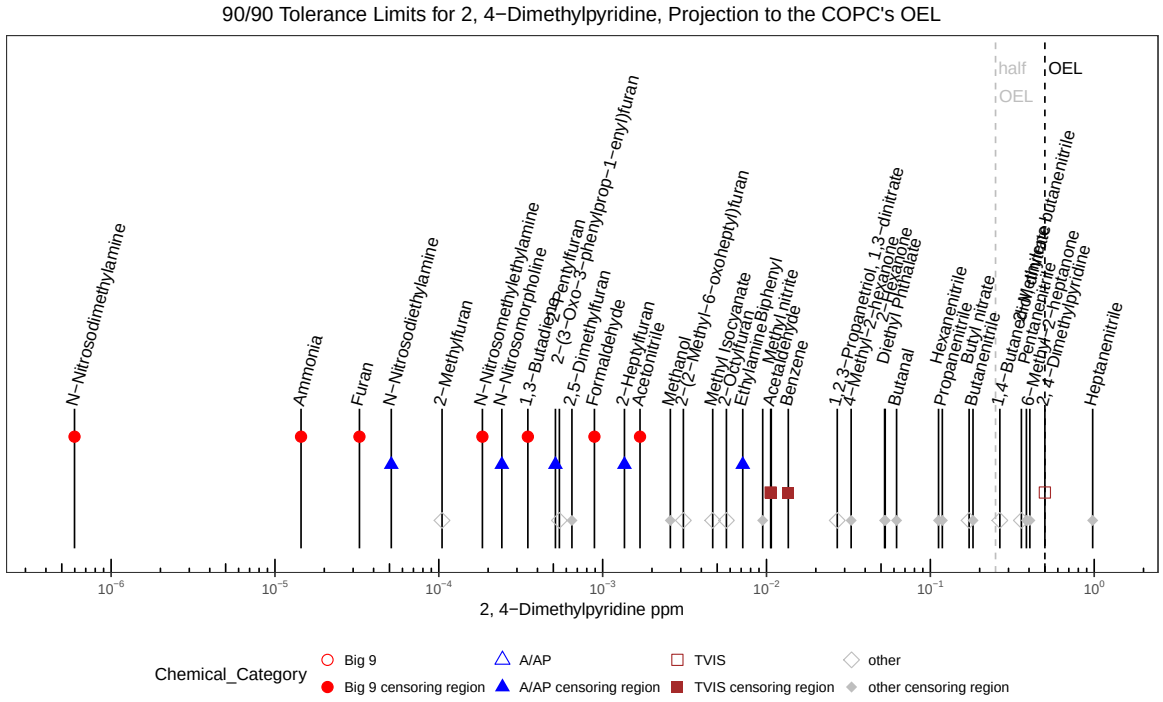


Figure E.309: Tolerance limits for 2, 4-Dimethylpyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

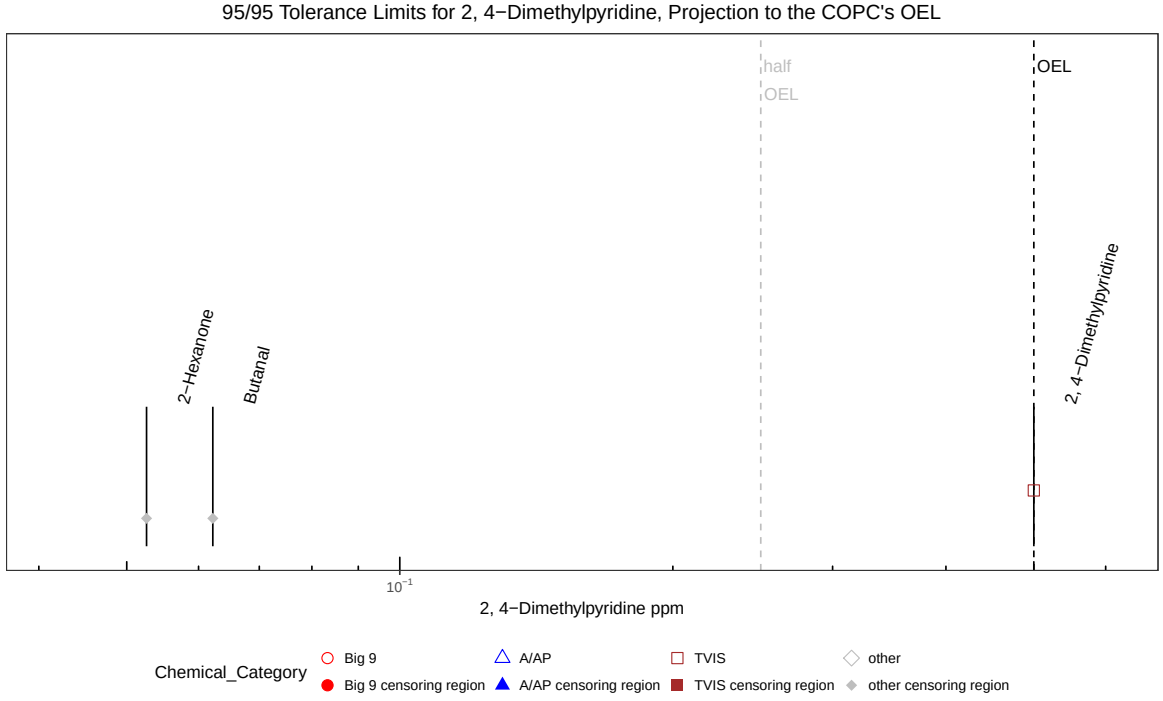


Figure E.310: Tolerance limits for 2, 4-Dimethylpyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

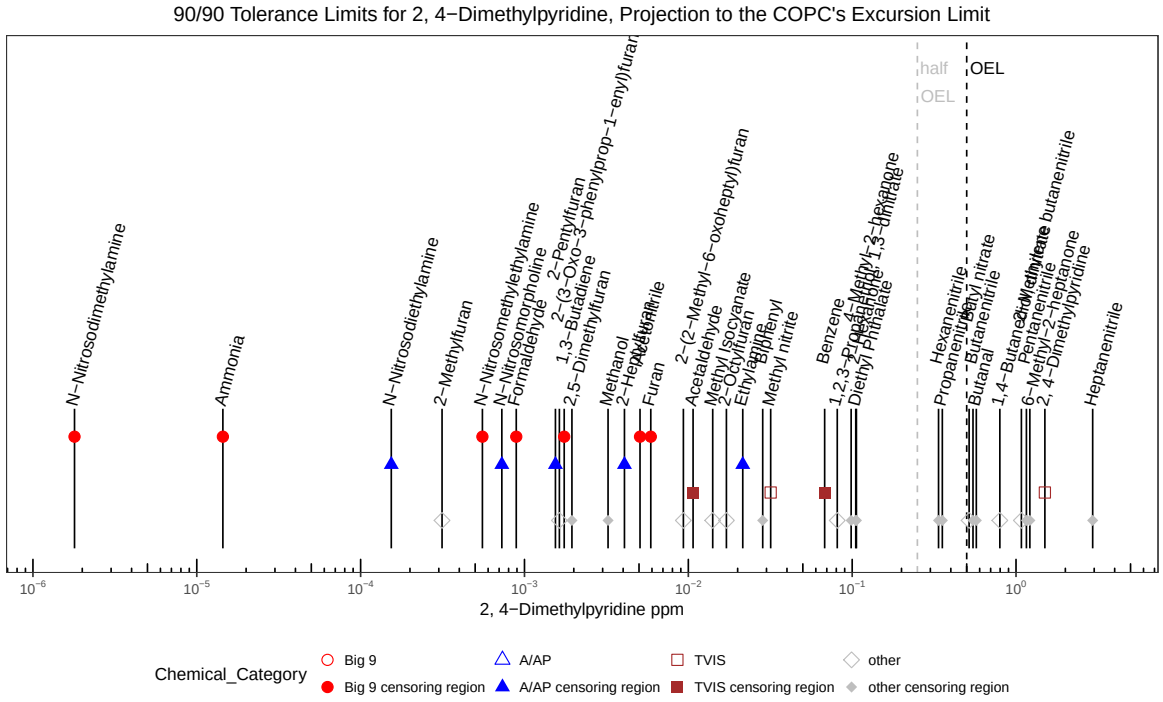


Figure E.311: Tolerance limits for 2, 4-Dimethylpyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

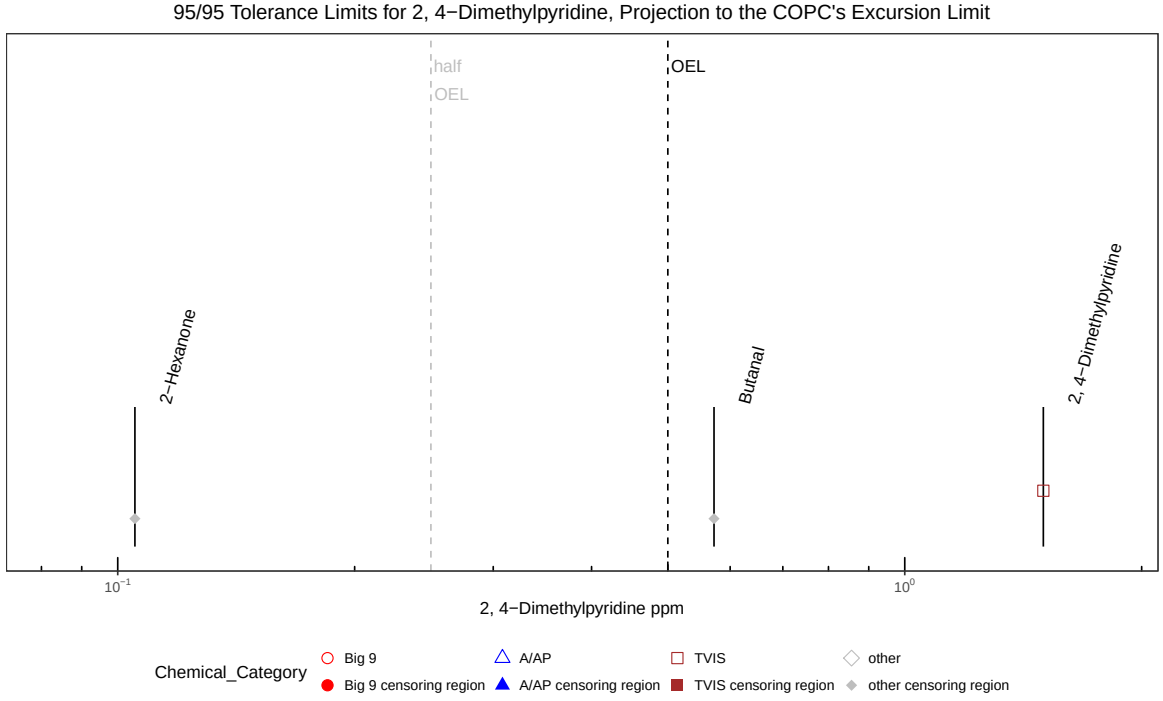


Figure E.312: Tolerance limits for 2, 4-Dimethylpyridine as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

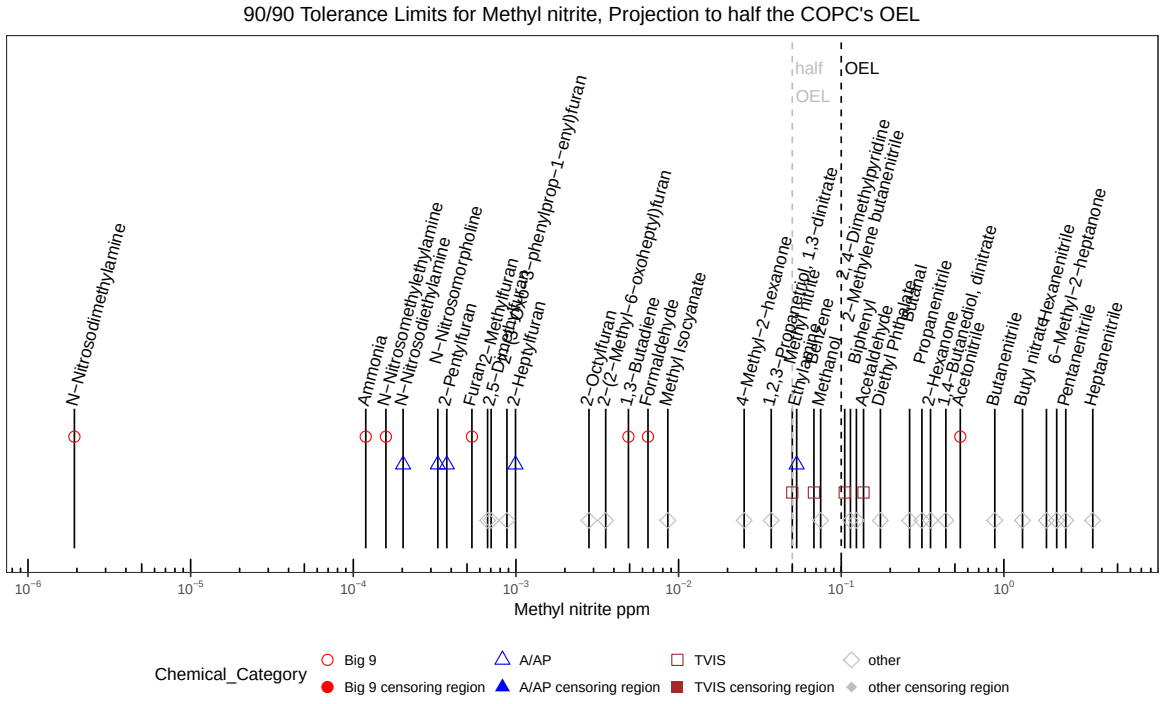


Figure E.313: Tolerance limits for Methyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

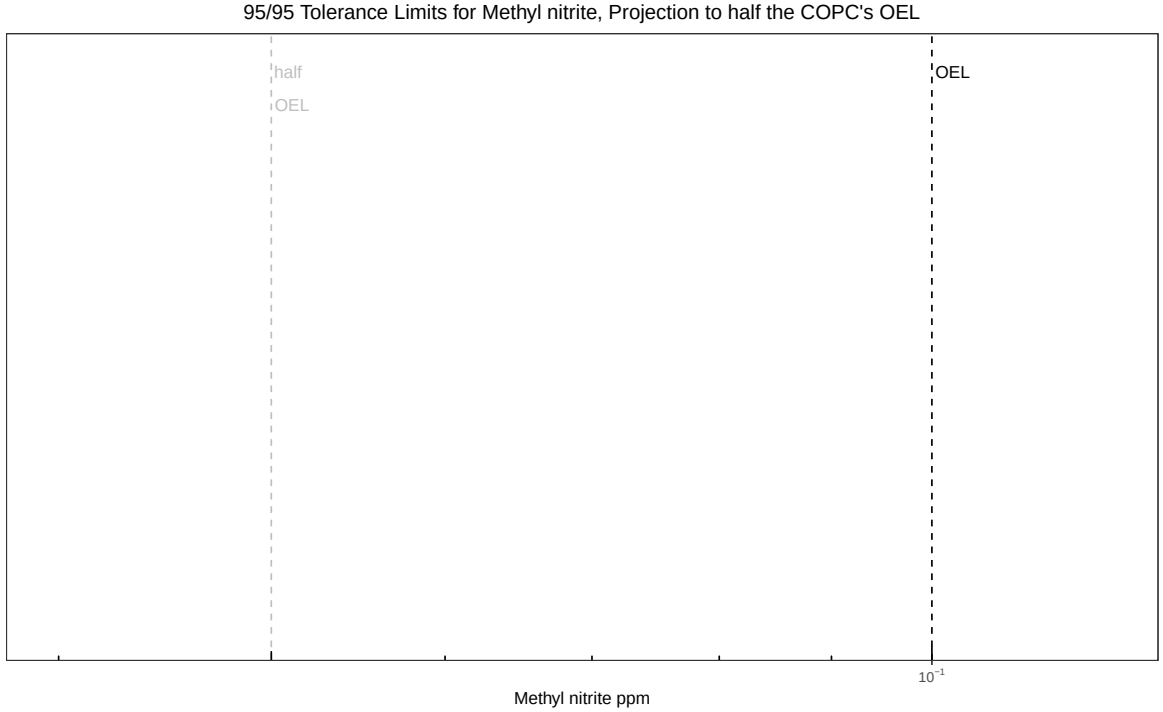


Figure E.314: Tolerance limits for Methyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

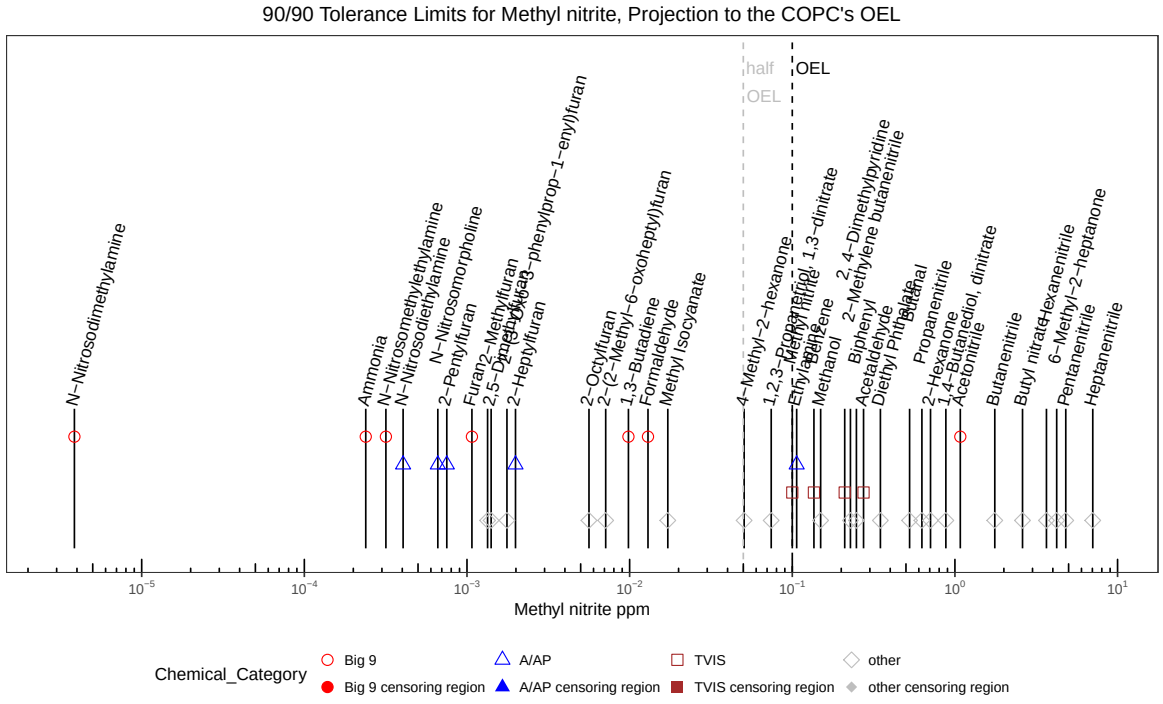


Figure E.315: Tolerance limits for Methyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

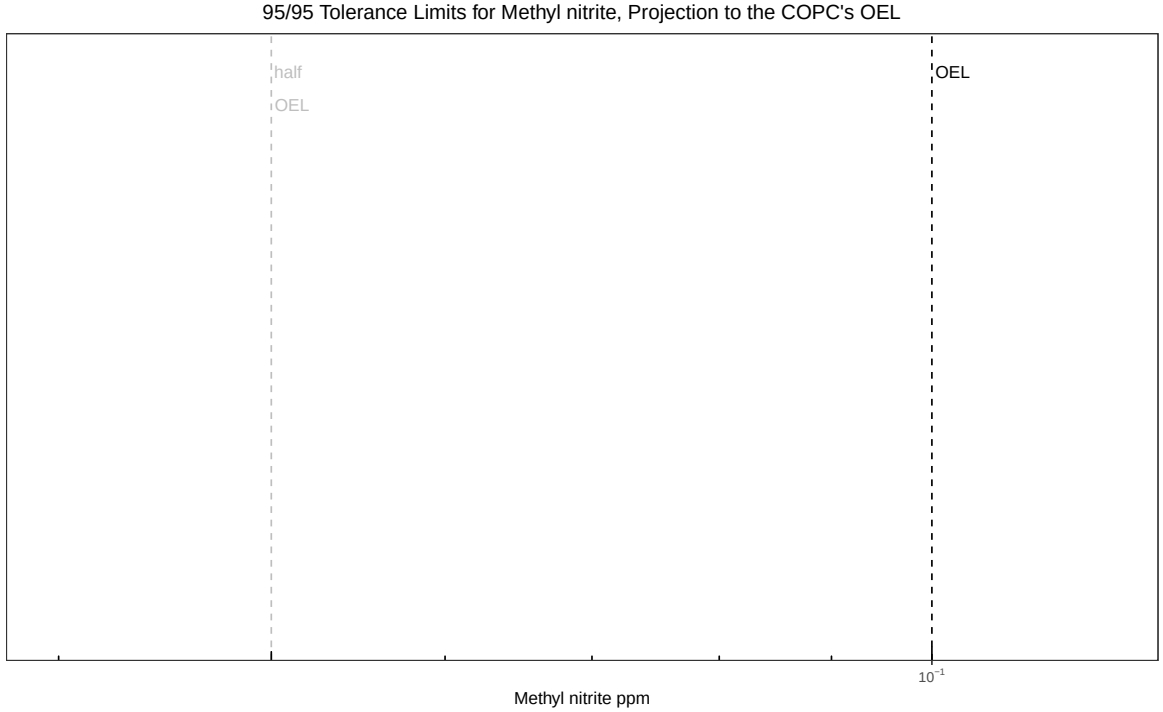


Figure E.316: Tolerance limits for Methyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

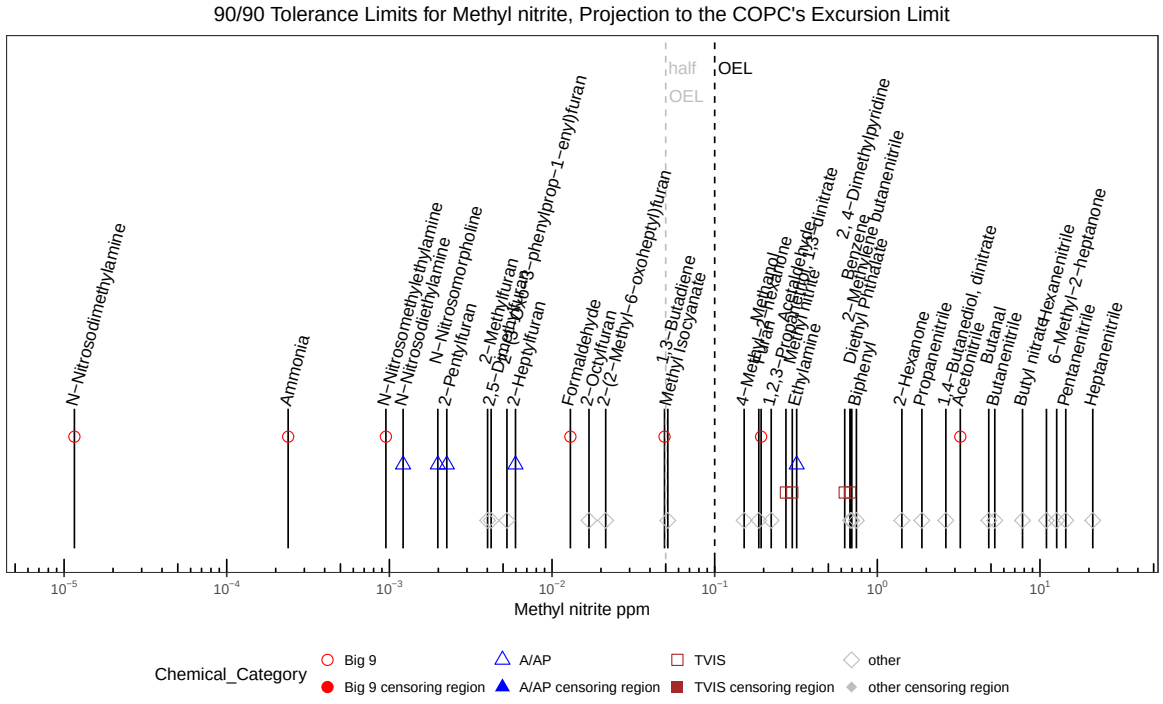


Figure E.317: Tolerance limits for Methyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

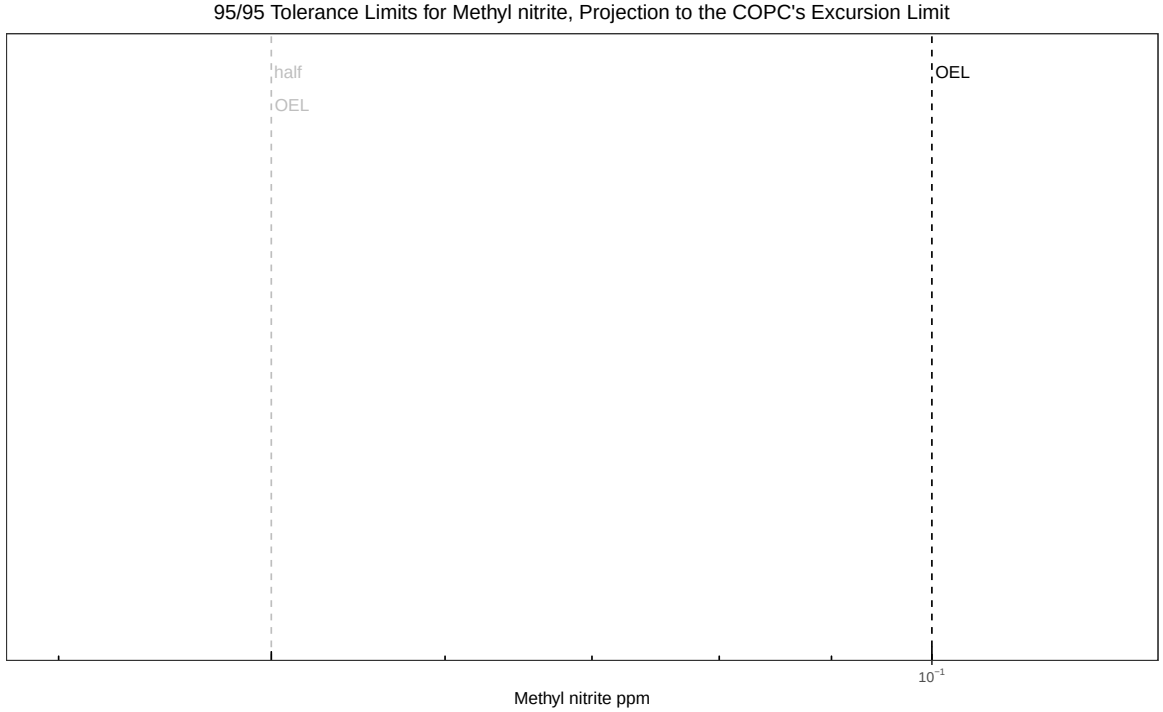


Figure E.318: Tolerance limits for Methyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

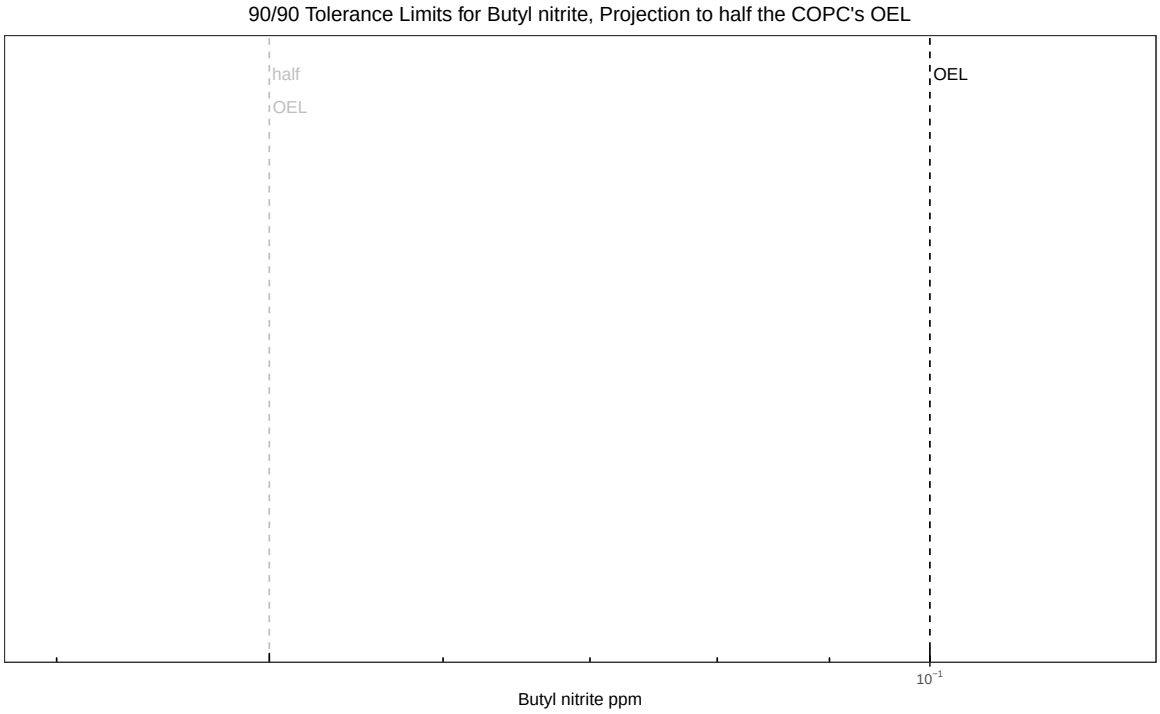


Figure E.319: Tolerance limits for Butyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

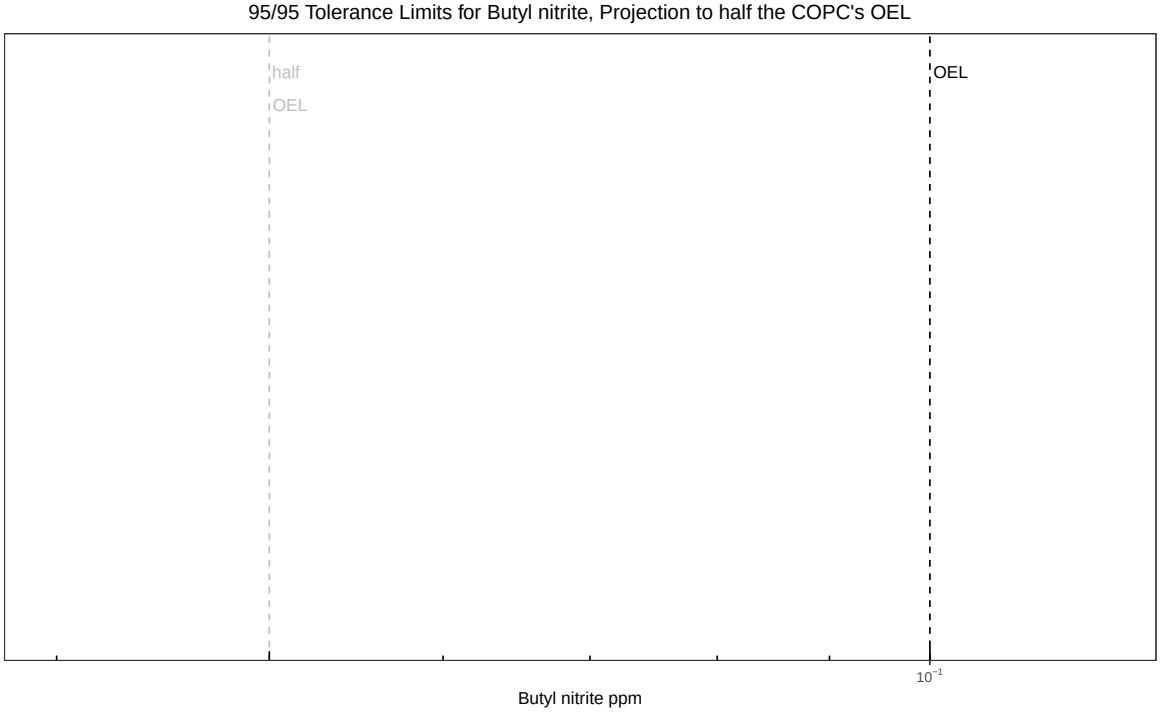


Figure E.320: Tolerance limits for Butyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

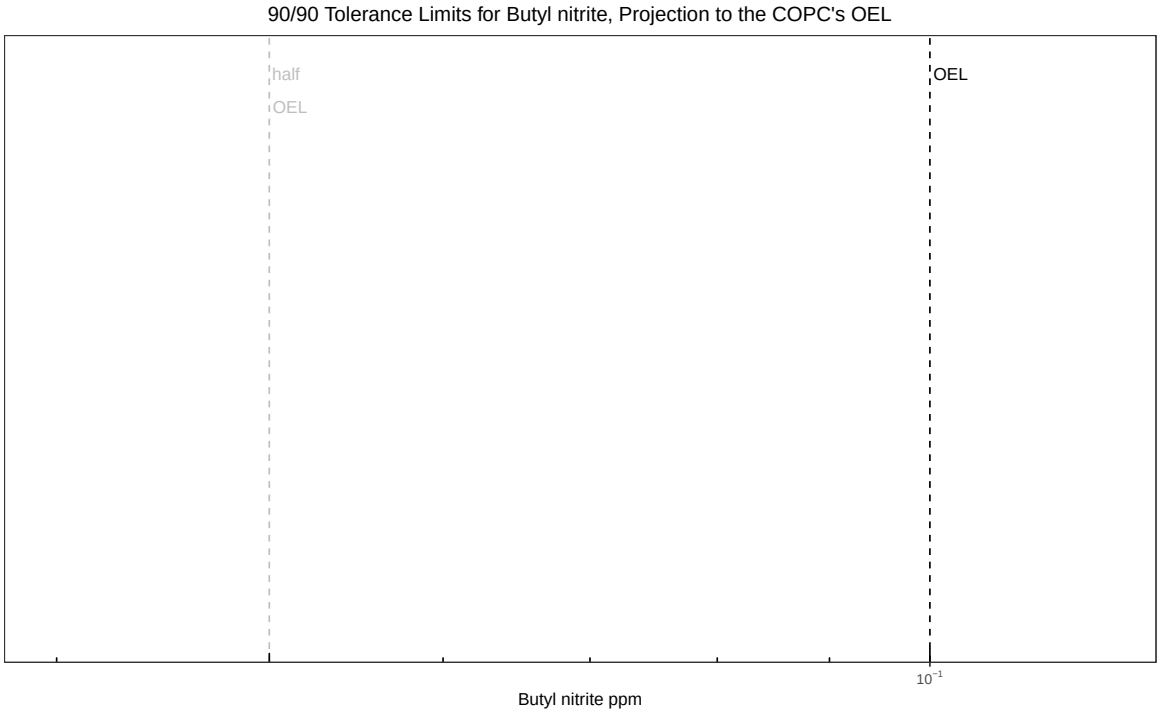


Figure E.321: Tolerance limits for Butyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

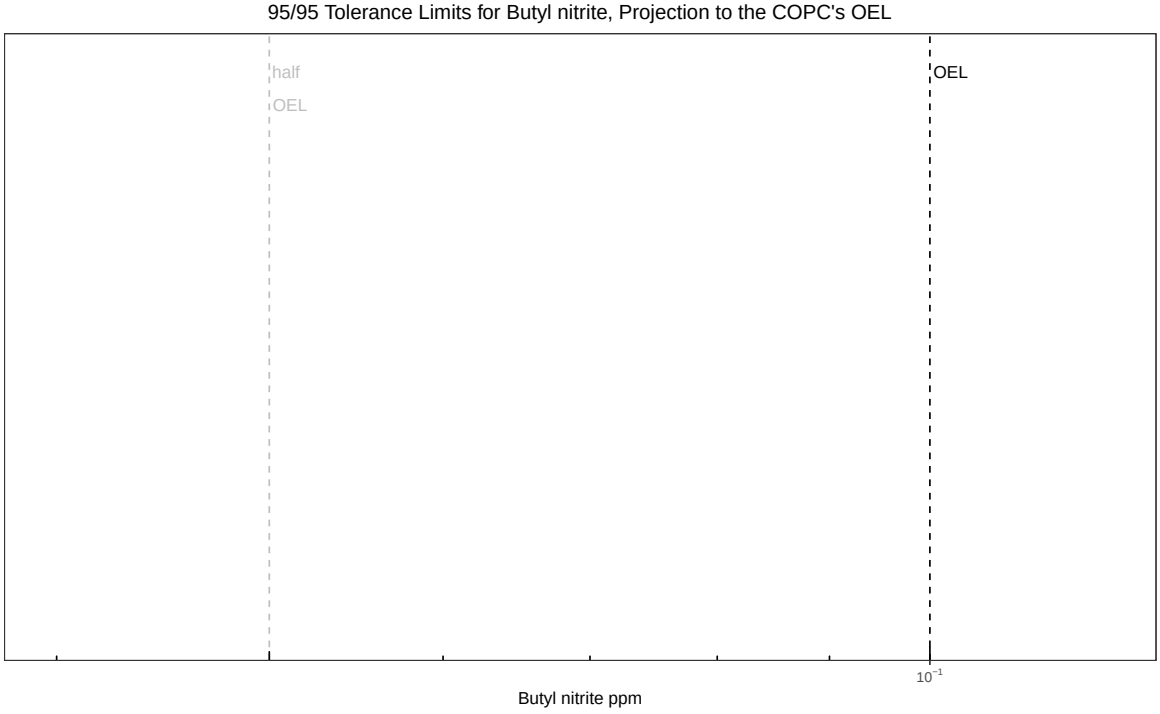


Figure E.322: Tolerance limits for Butyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

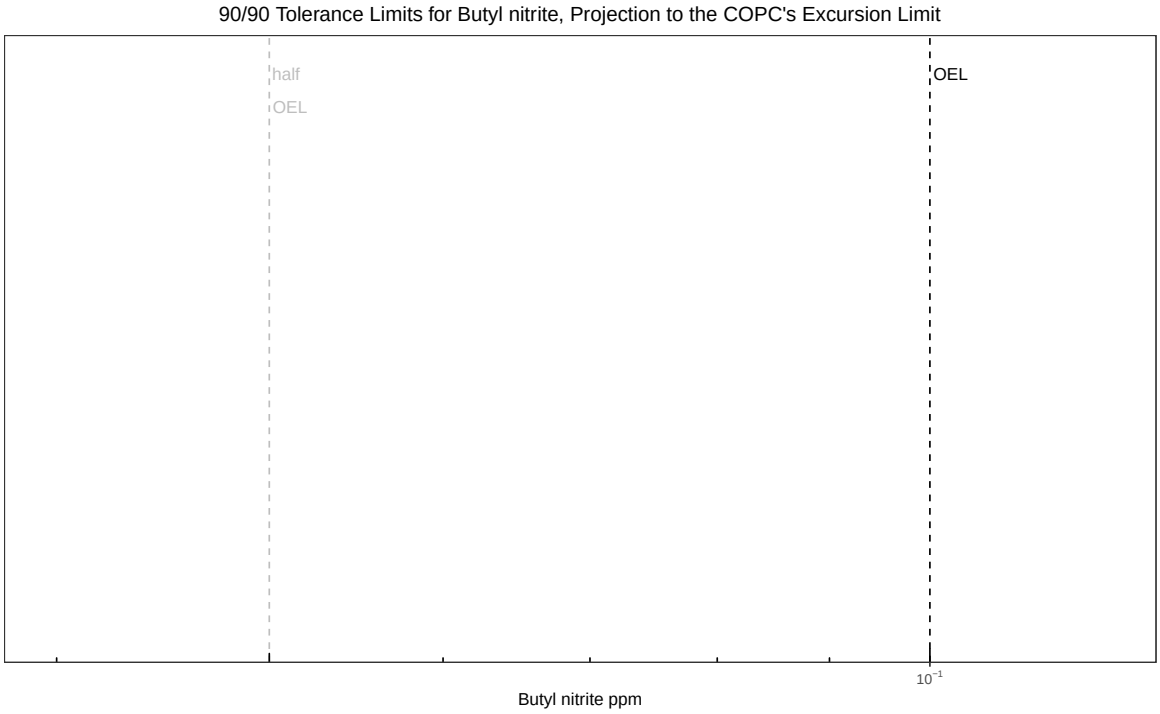


Figure E.323: Tolerance limits for Butyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

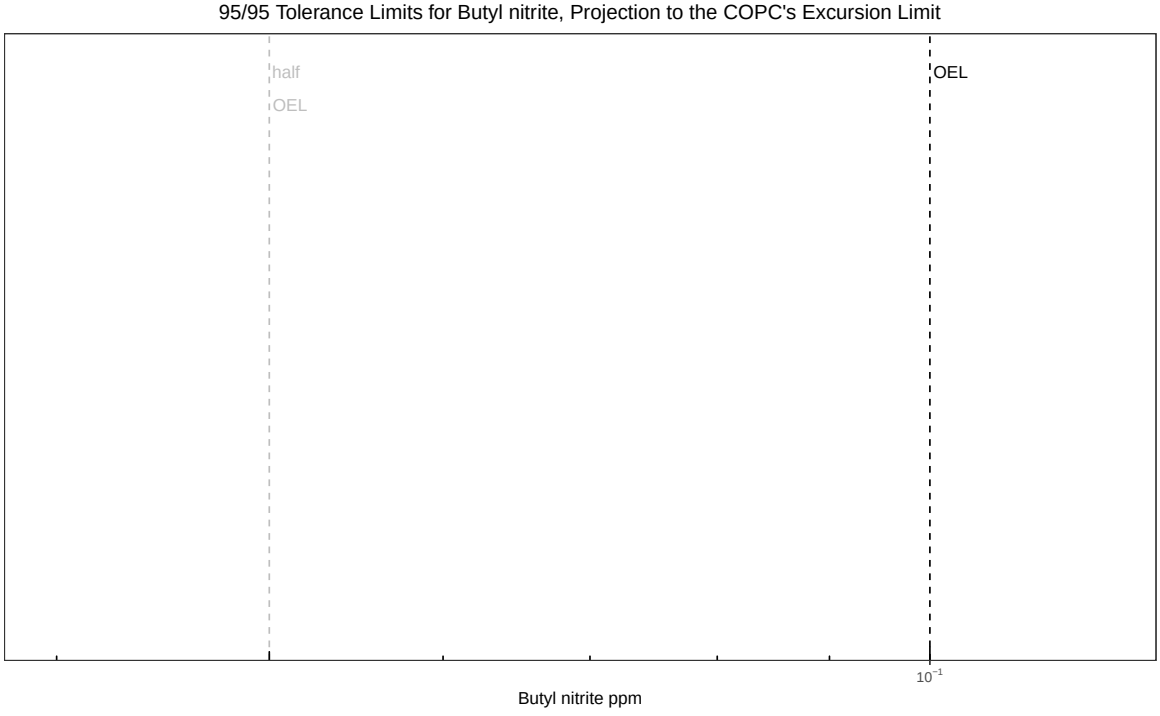


Figure E.324: Tolerance limits for Butyl nitrite as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

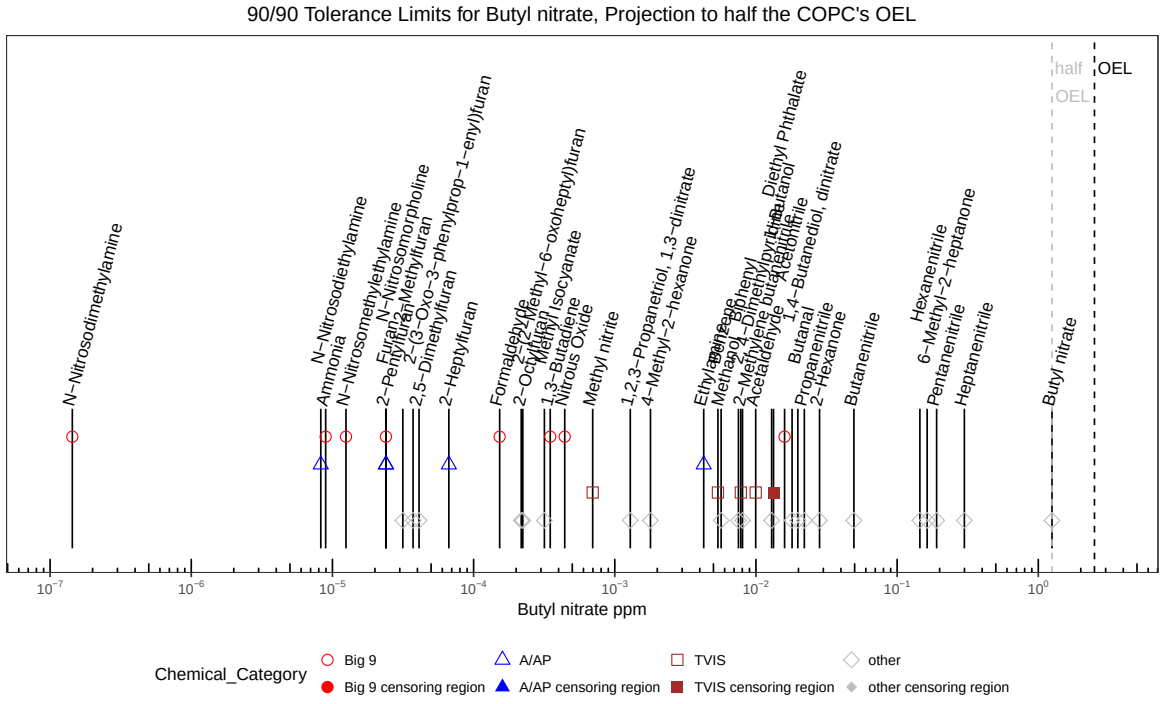


Figure E.325: Tolerance limits for Butyl nitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

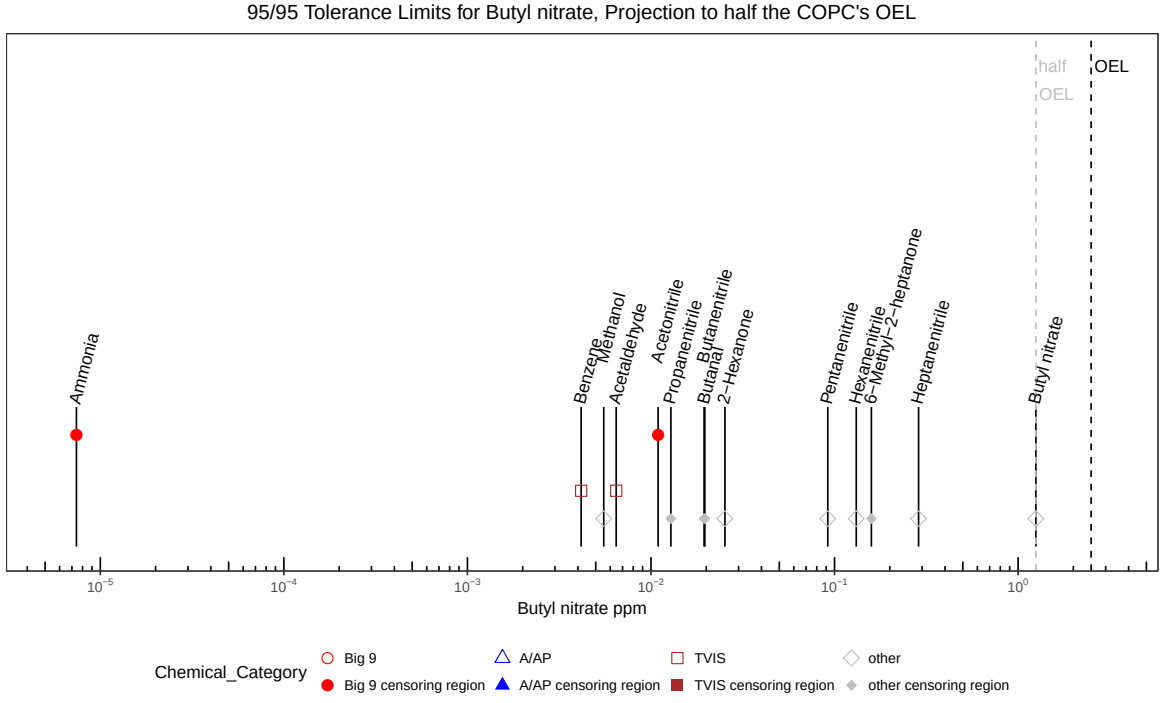


Figure E.326: Tolerance limits for Butyl nitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

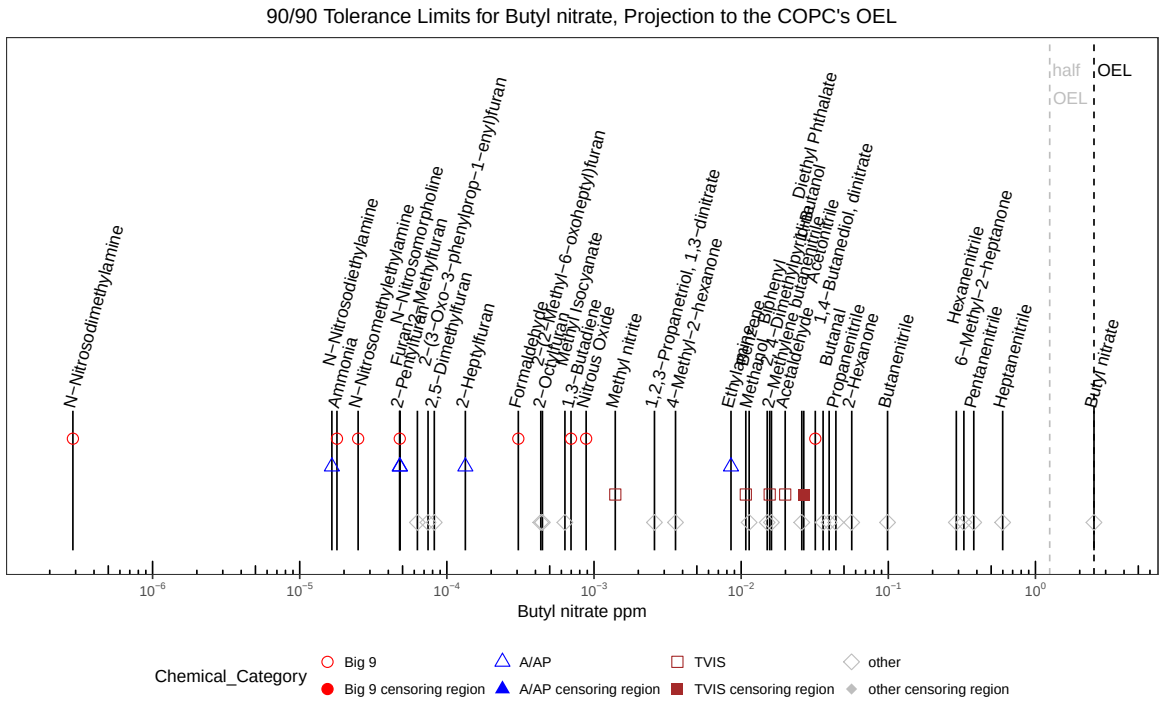


Figure E.327: Tolerance limits for Butyl nitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

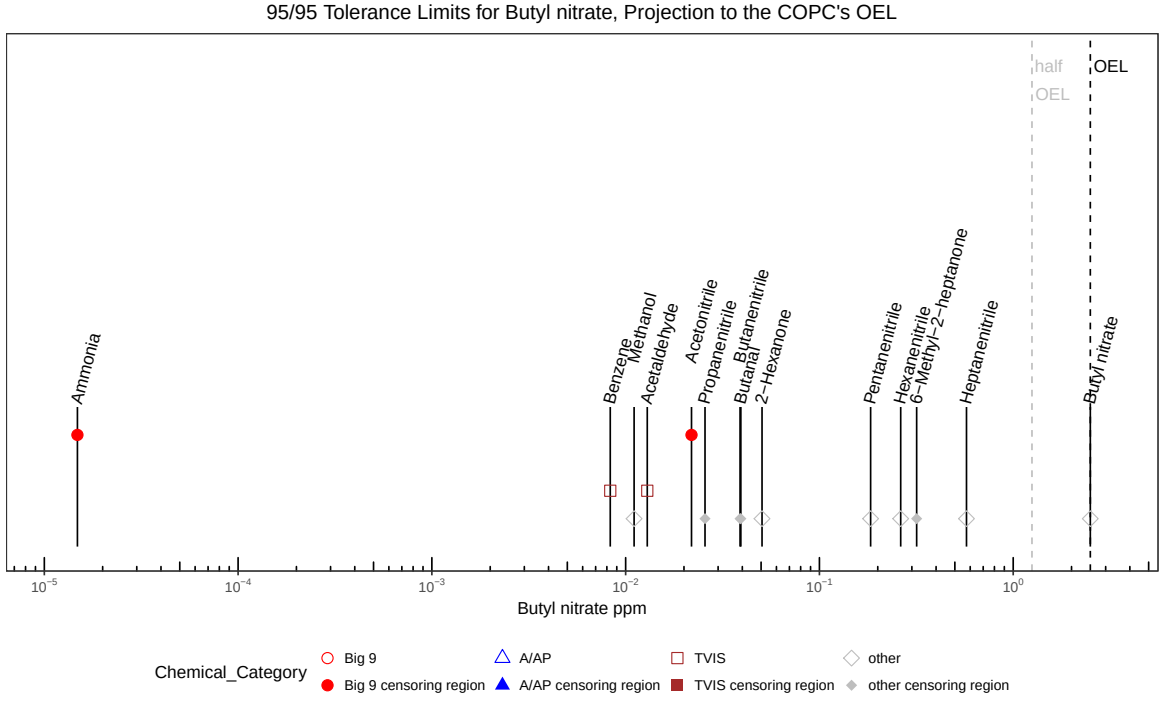


Figure E.328: Tolerance limits for Butyl nitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

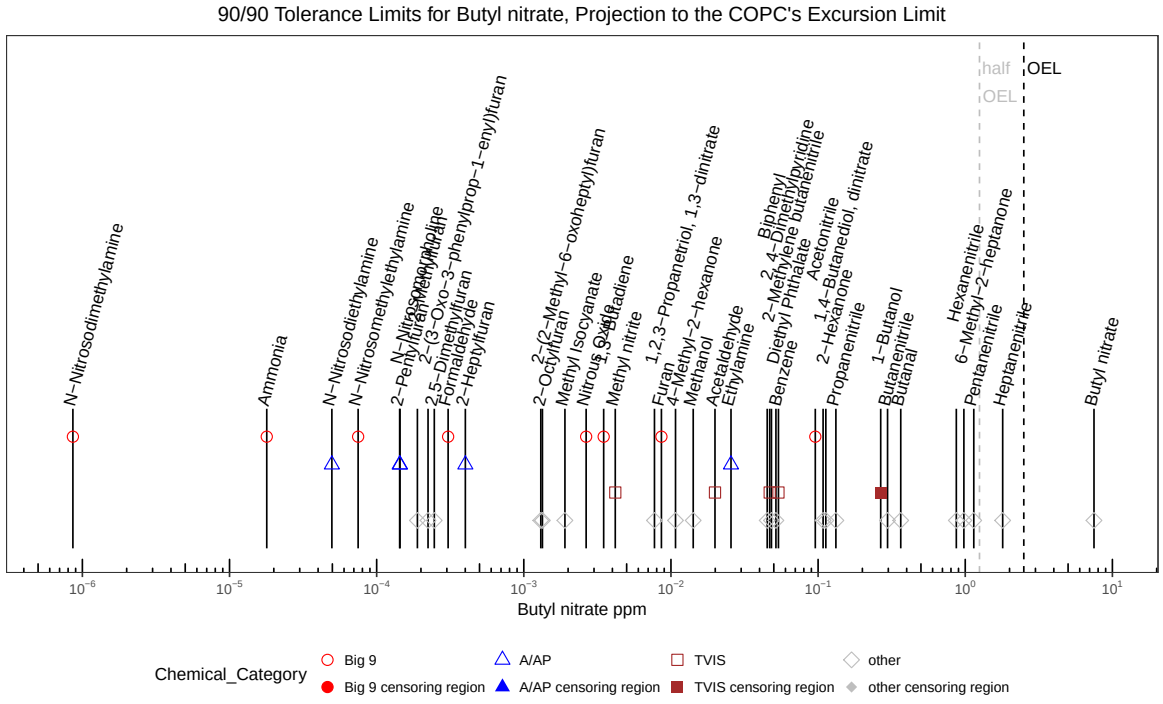


Figure E.329: Tolerance limits for Butyl nitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

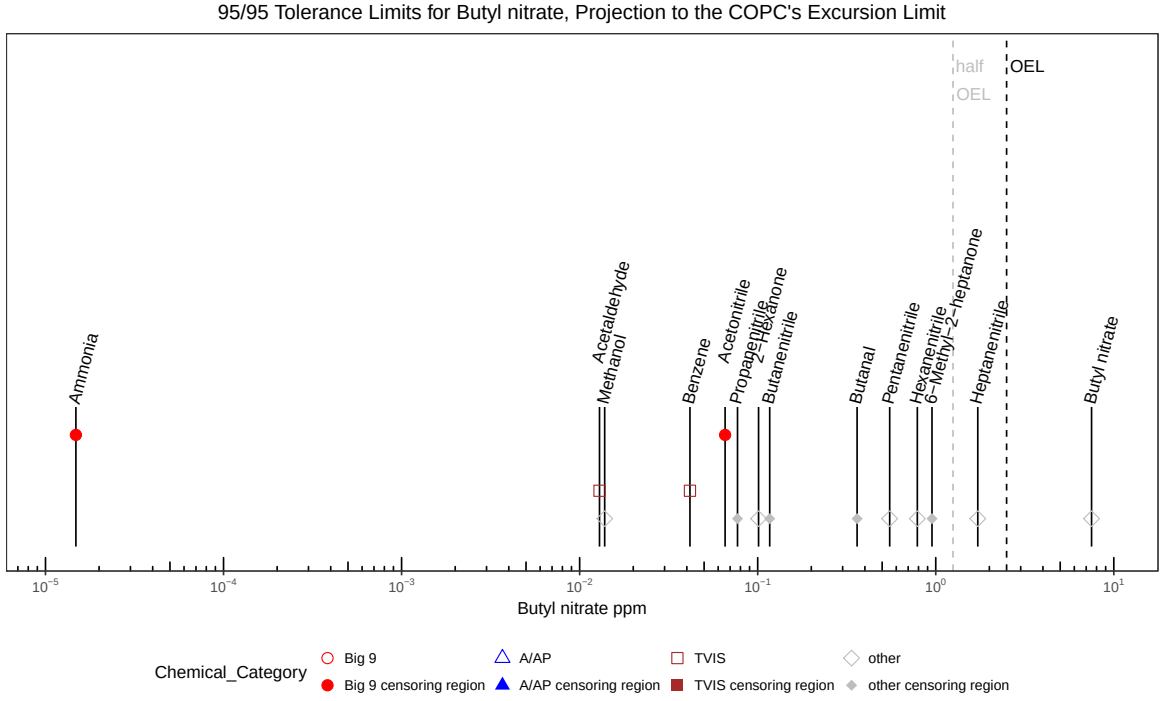


Figure E.330: Tolerance limits for Butyl nitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

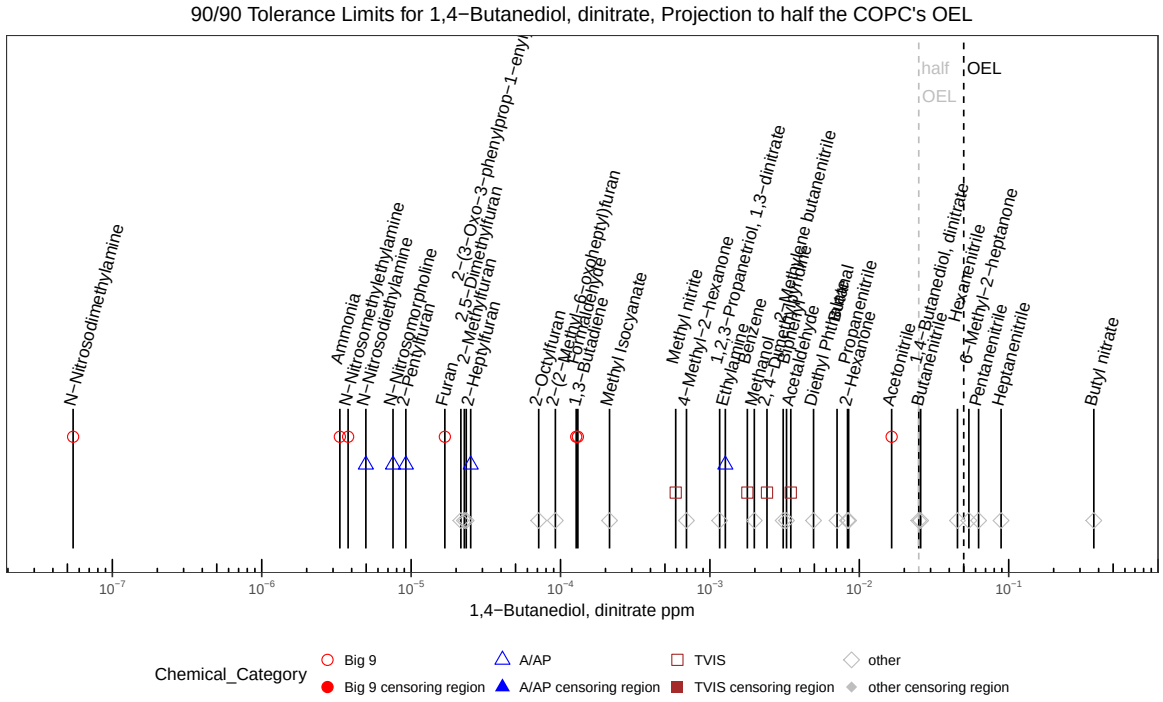


Figure E.331: Tolerance limits for 1,4-Butanediol, dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

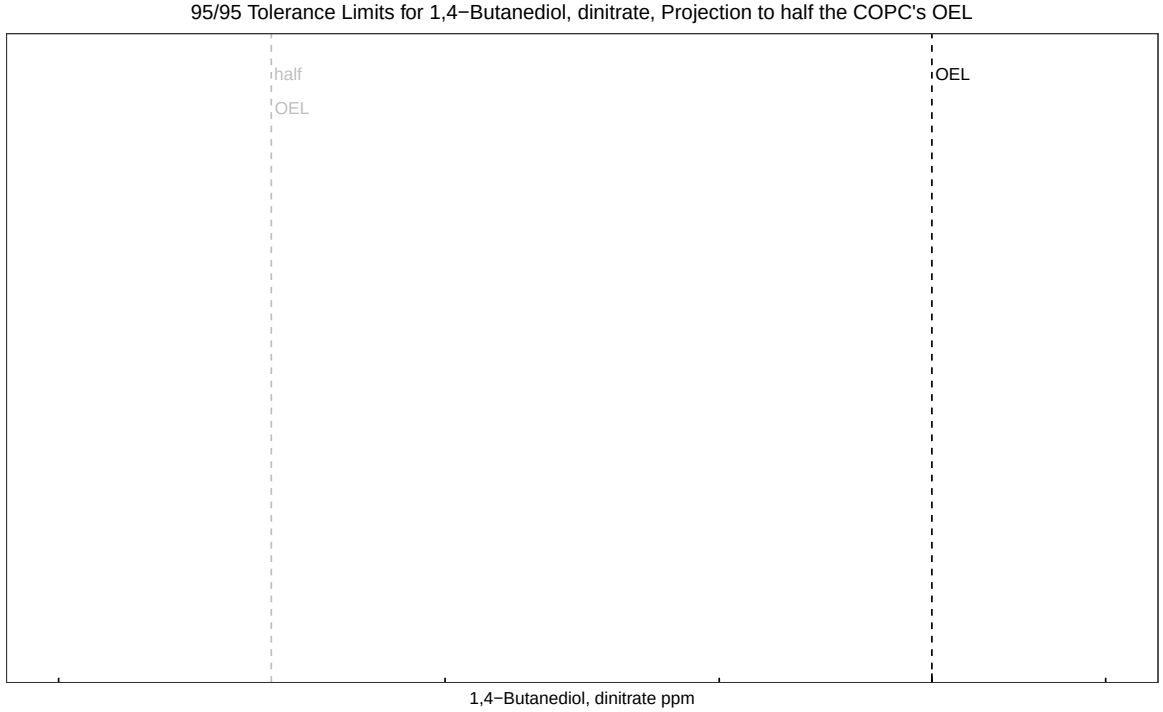


Figure E.332: Tolerance limits for 1,4-Butanediol, dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

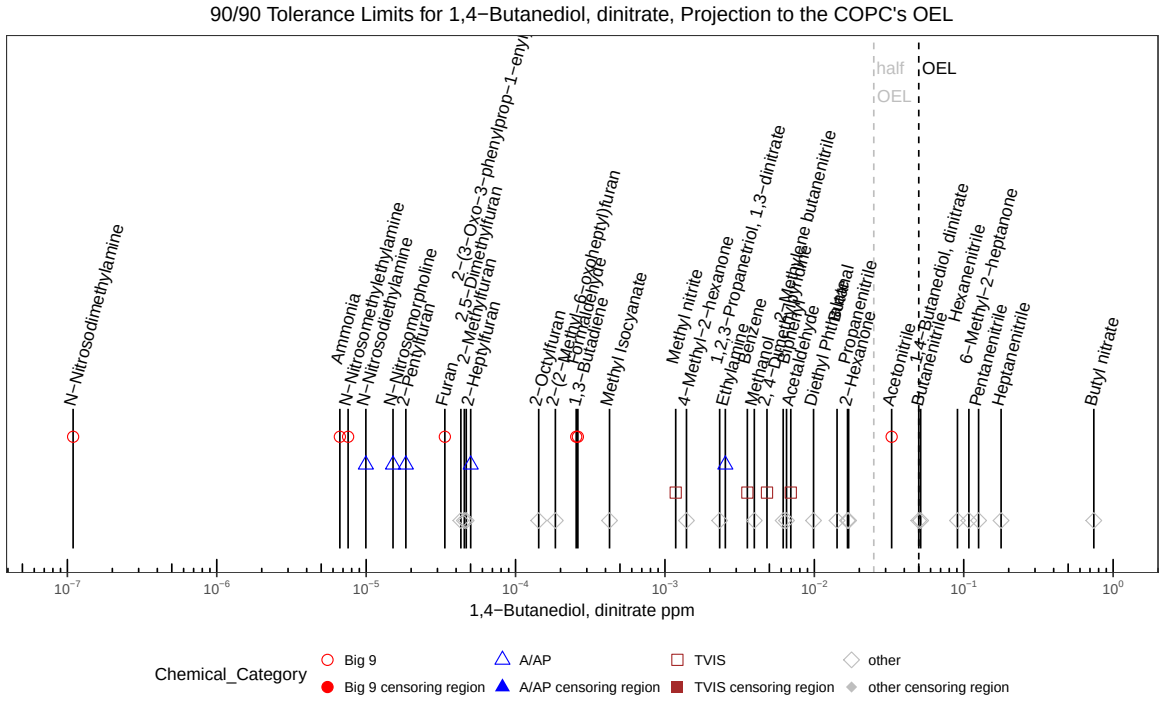


Figure E.333: Tolerance limits for 1,4-Butanediol, dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

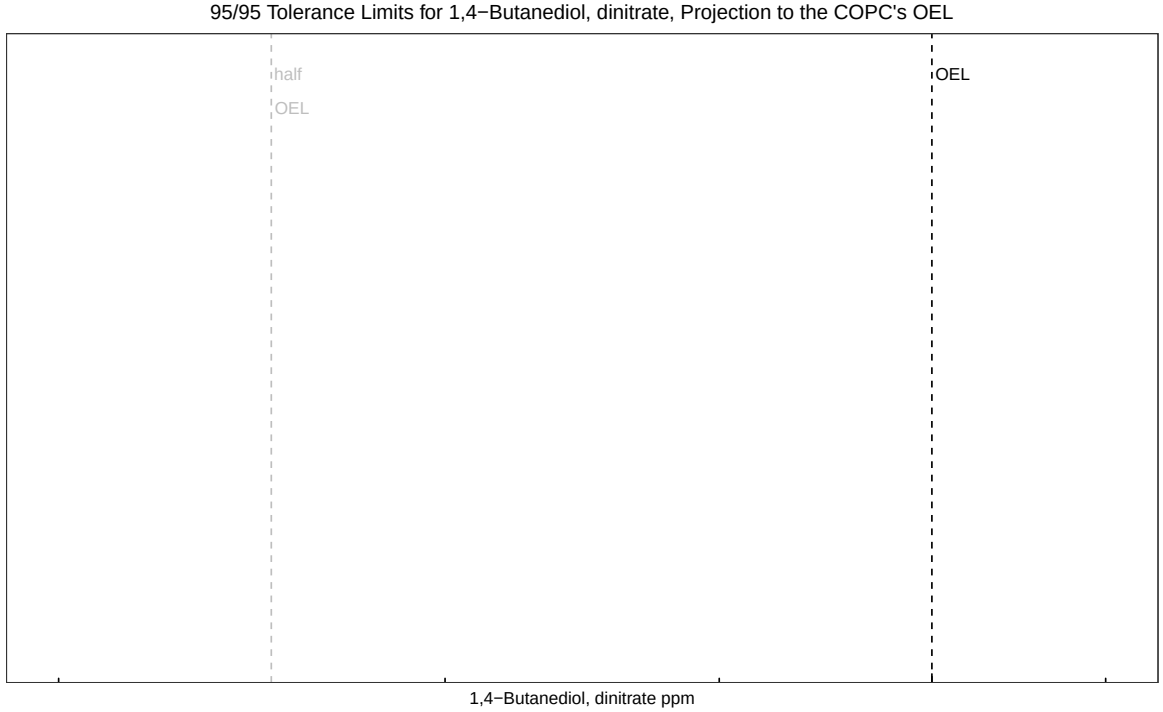


Figure E.334: Tolerance limits for 1,4-Butanediol, dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

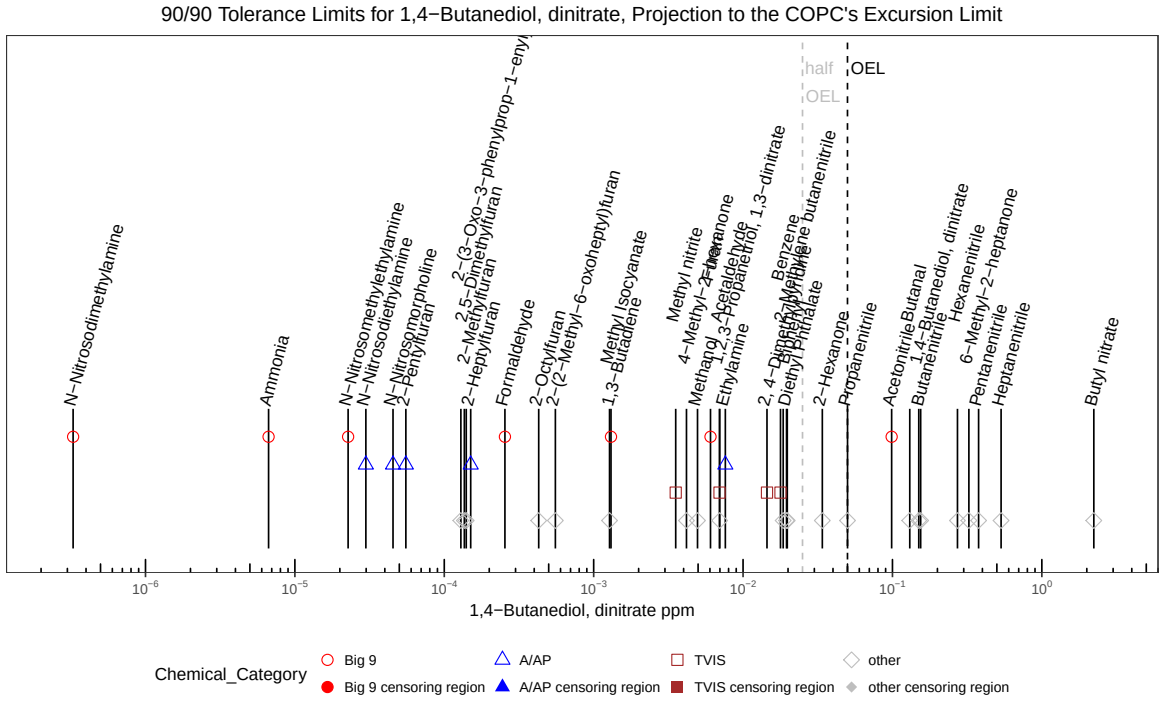


Figure E.335: Tolerance limits for 1,4-Butanediol, dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

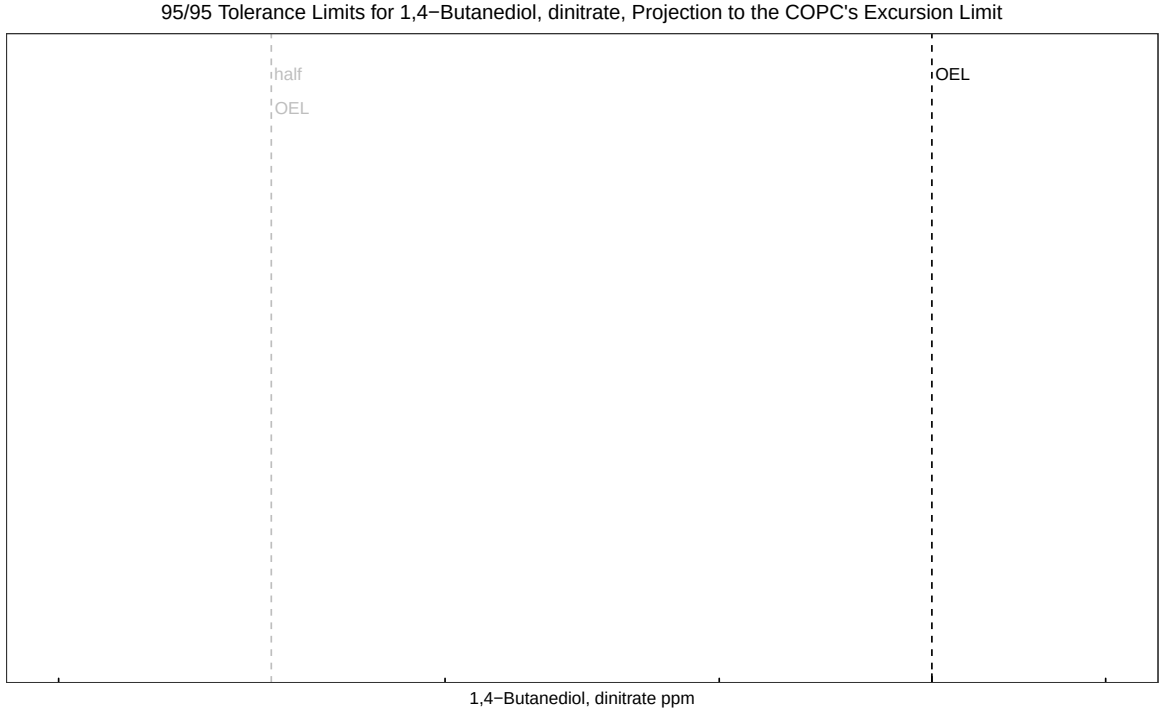


Figure E.336: Tolerance limits for 1,4-Butanediol, dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

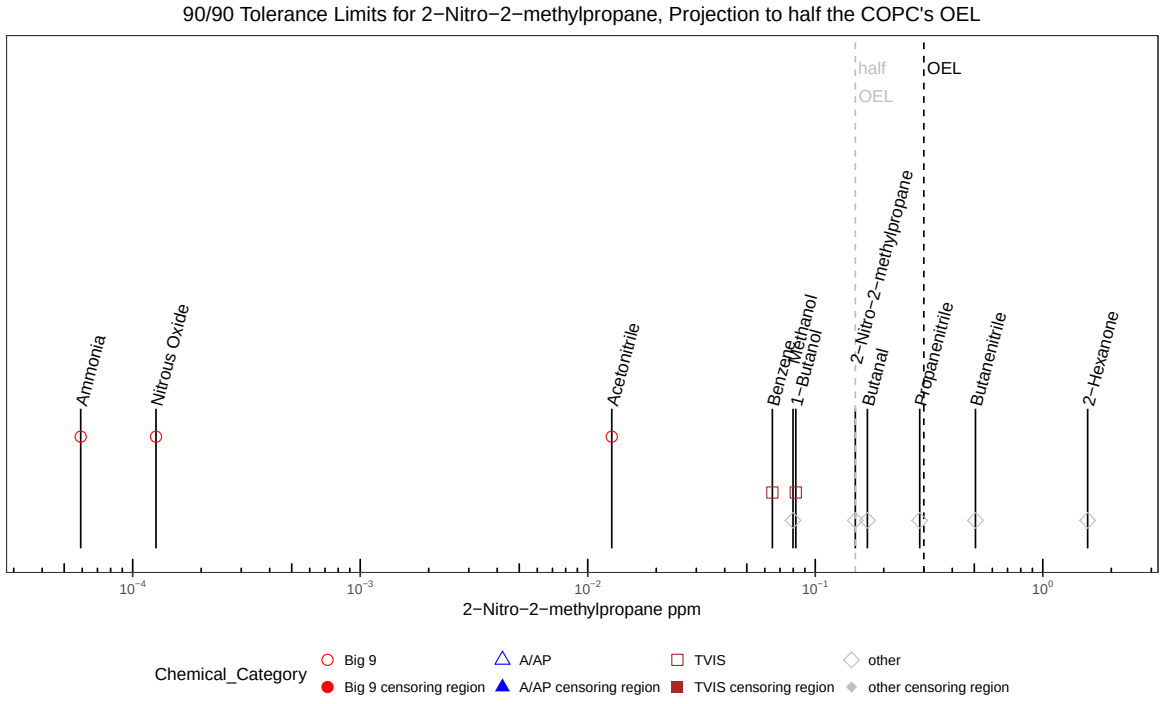


Figure E.337: Tolerance limits for 2-Nitro-2-methylpropane as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

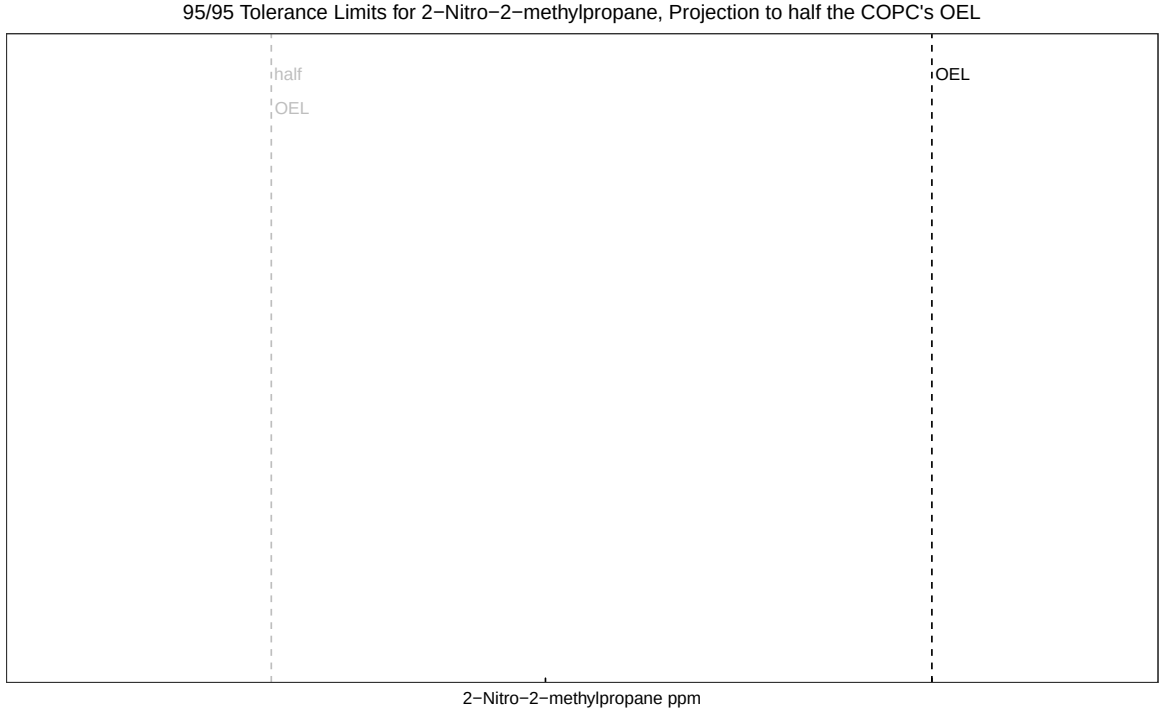


Figure E.338: Tolerance limits for 2-Nitro-2-methylpropane as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

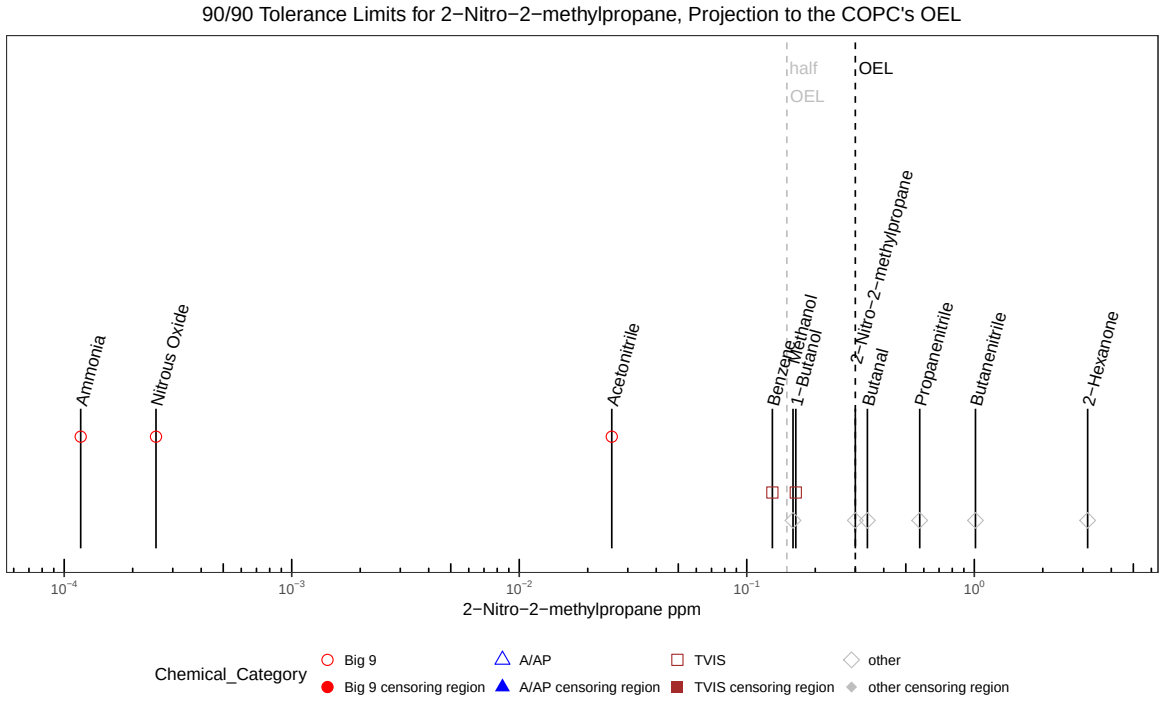


Figure E.339: Tolerance limits for 2-Nitro-2-methylpropane as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

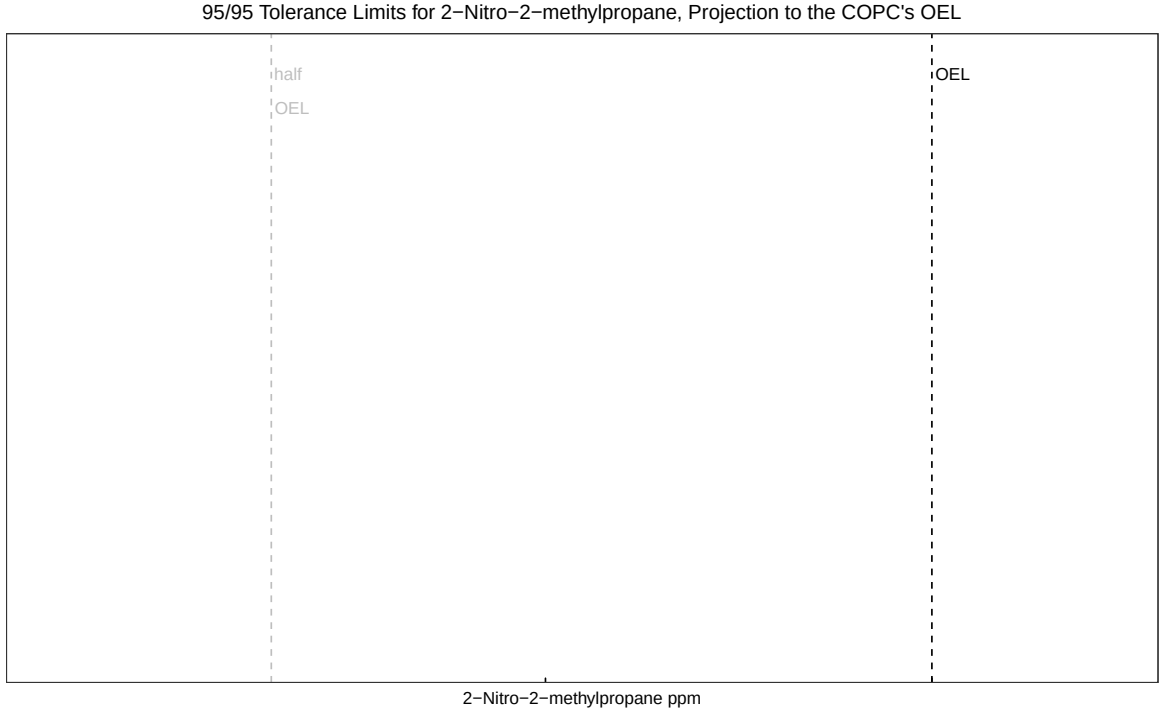


Figure E.340: Tolerance limits for 2-Nitro-2-methylpropane as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

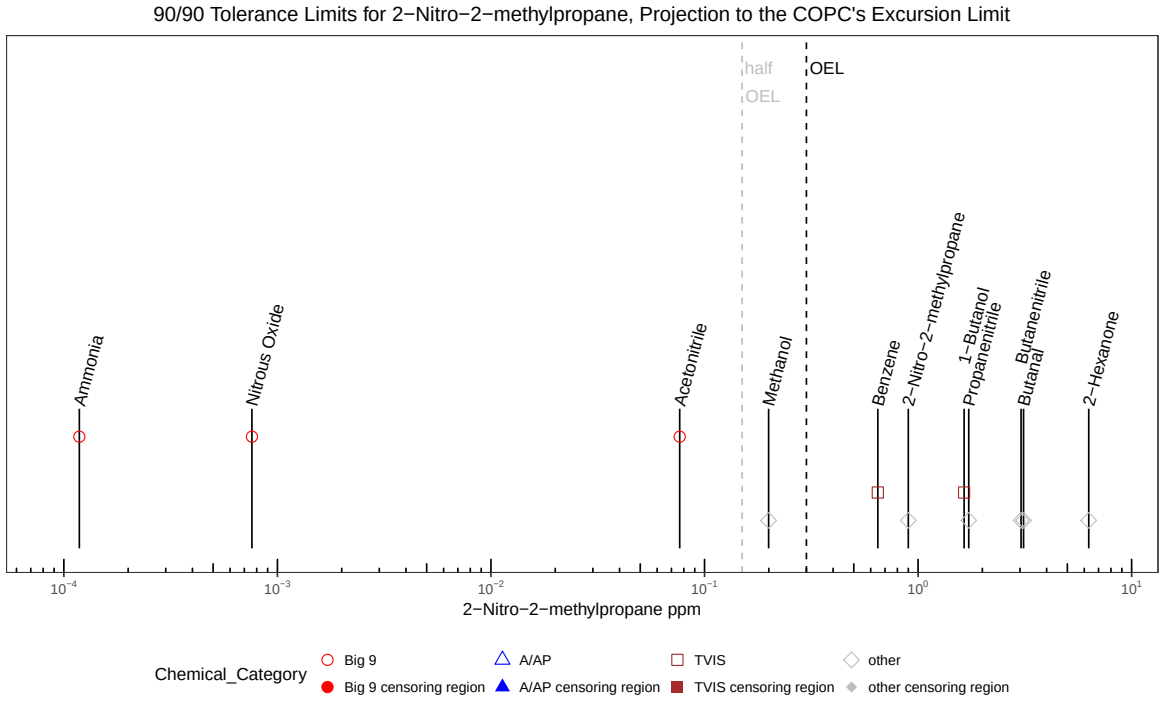


Figure E.341: Tolerance limits for 2-Nitro-2-methylpropane as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

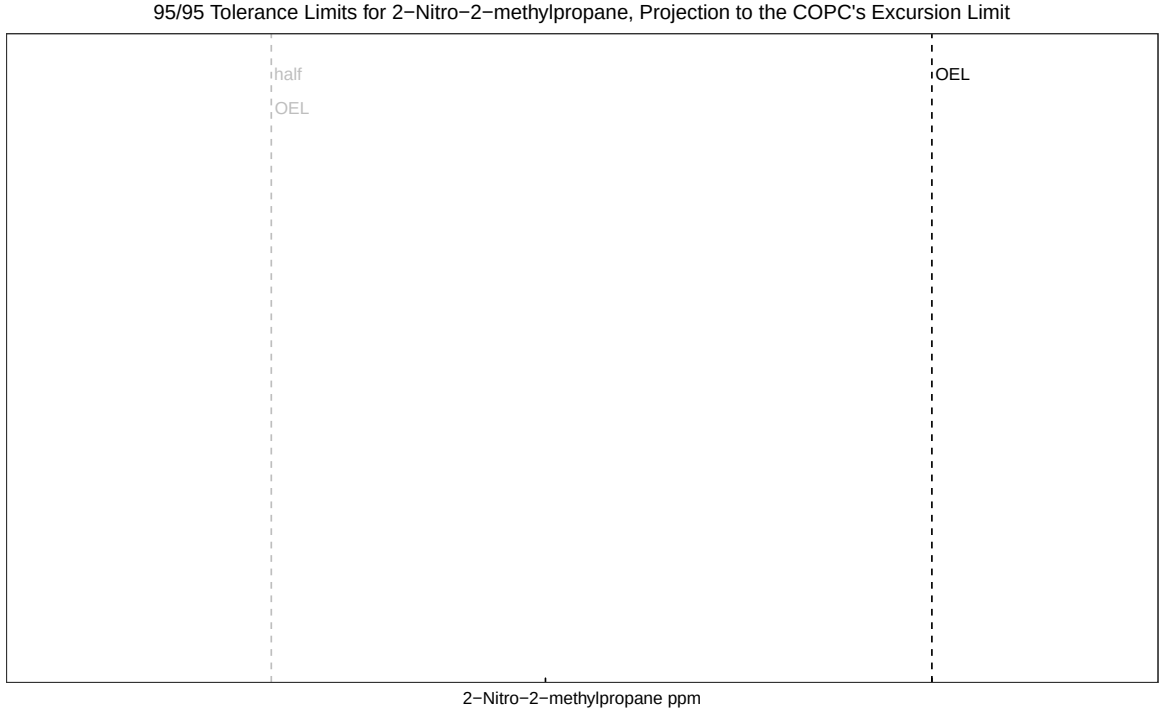


Figure E.342: Tolerance limits for 2-Nitro-2-methylpropane as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

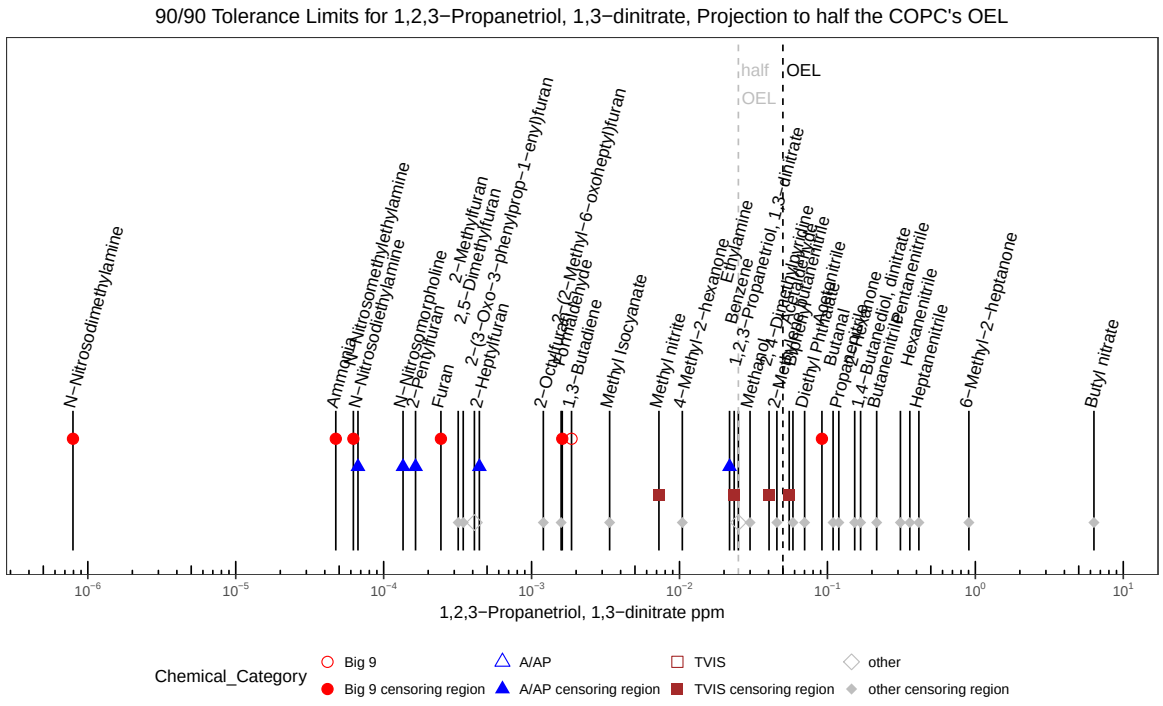


Figure E.343: Tolerance limits for 1,2,3-Propanetriol, 1,3-dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

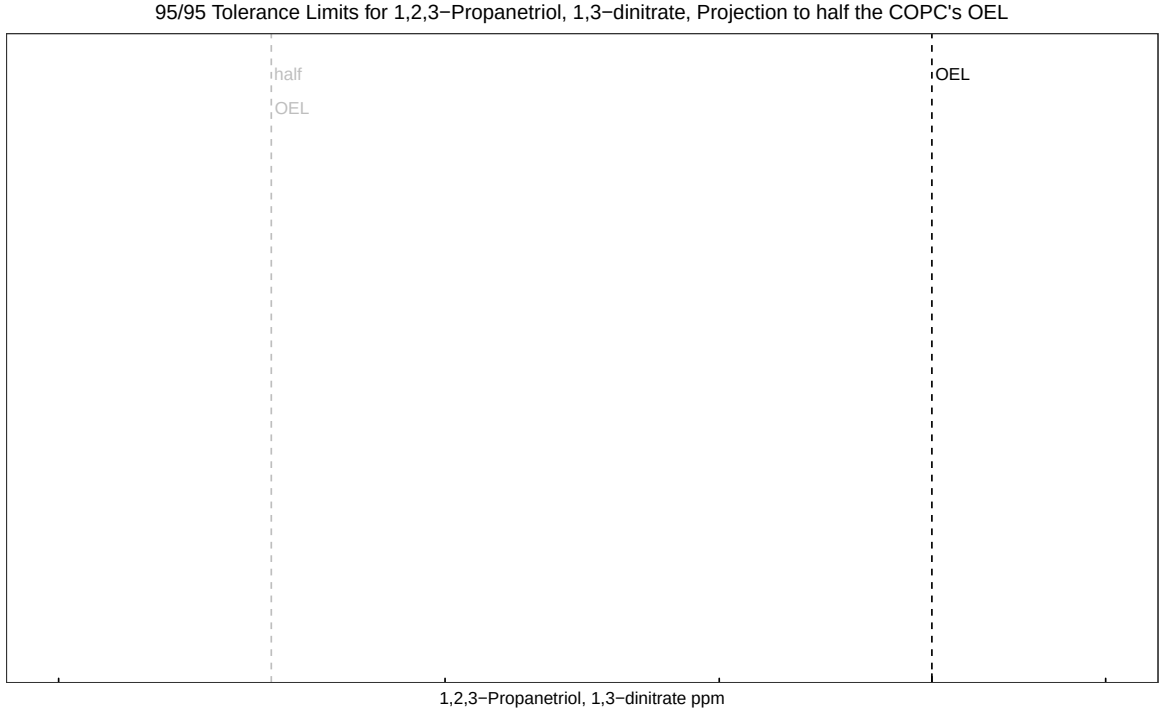


Figure E.344: Tolerance limits for 1,2,3-Propanetriol, 1,3-dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

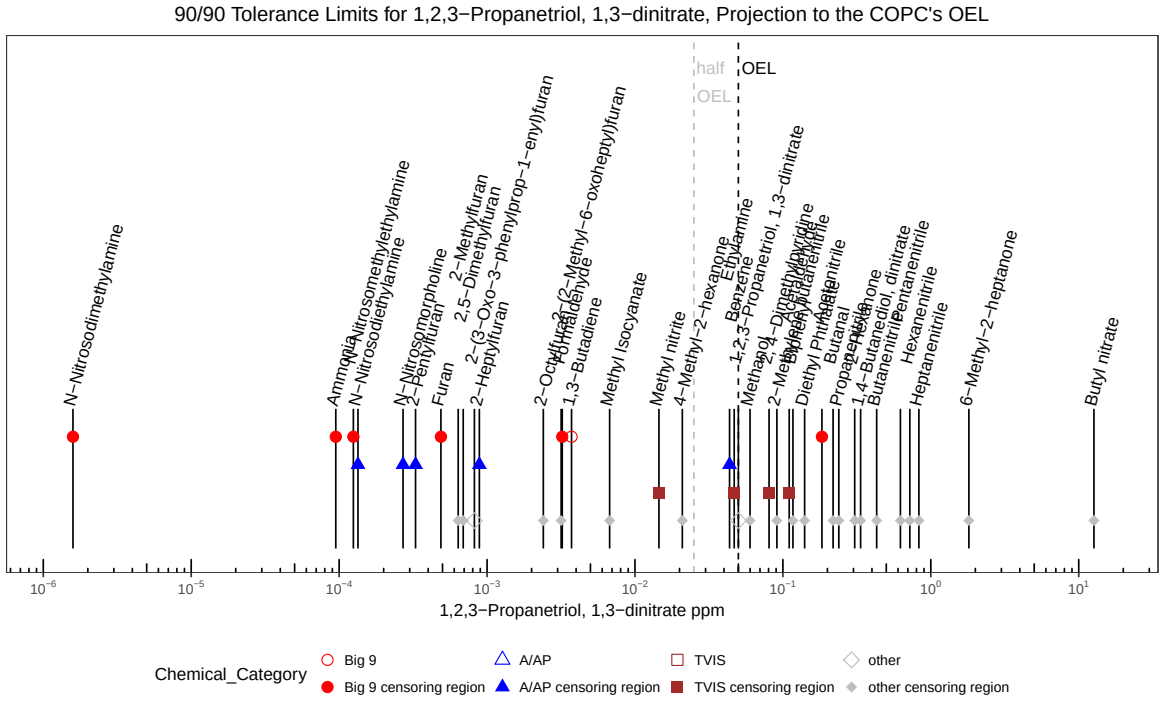


Figure E.345: Tolerance limits for 1,2,3-Propanetriol, 1,3-dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

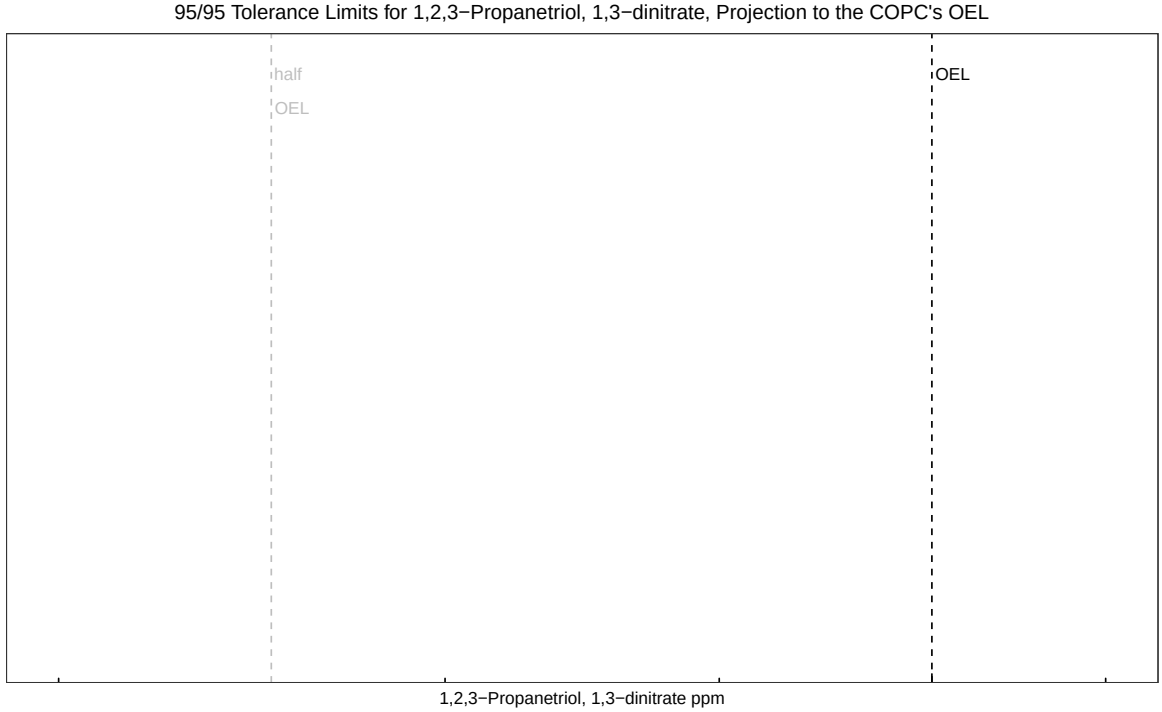


Figure E.346: Tolerance limits for 1,2,3-Propanetriol, 1,3-dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

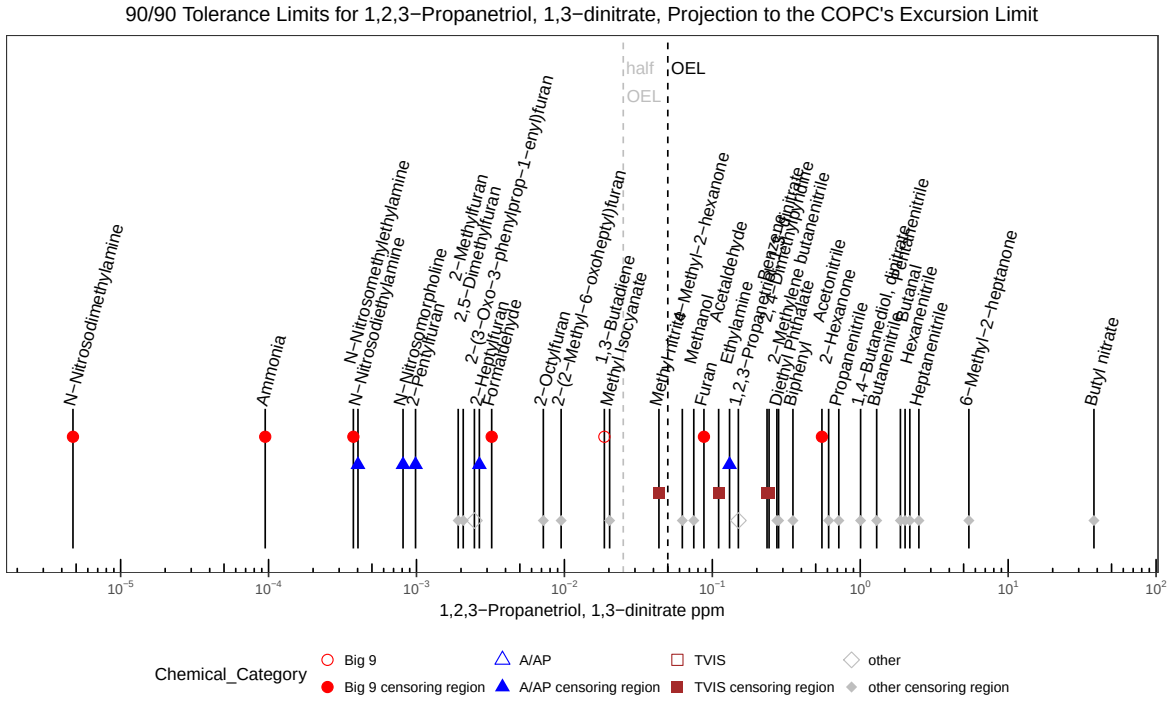


Figure E.347: Tolerance limits for 1,2,3-Propanetriol, 1,3-dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

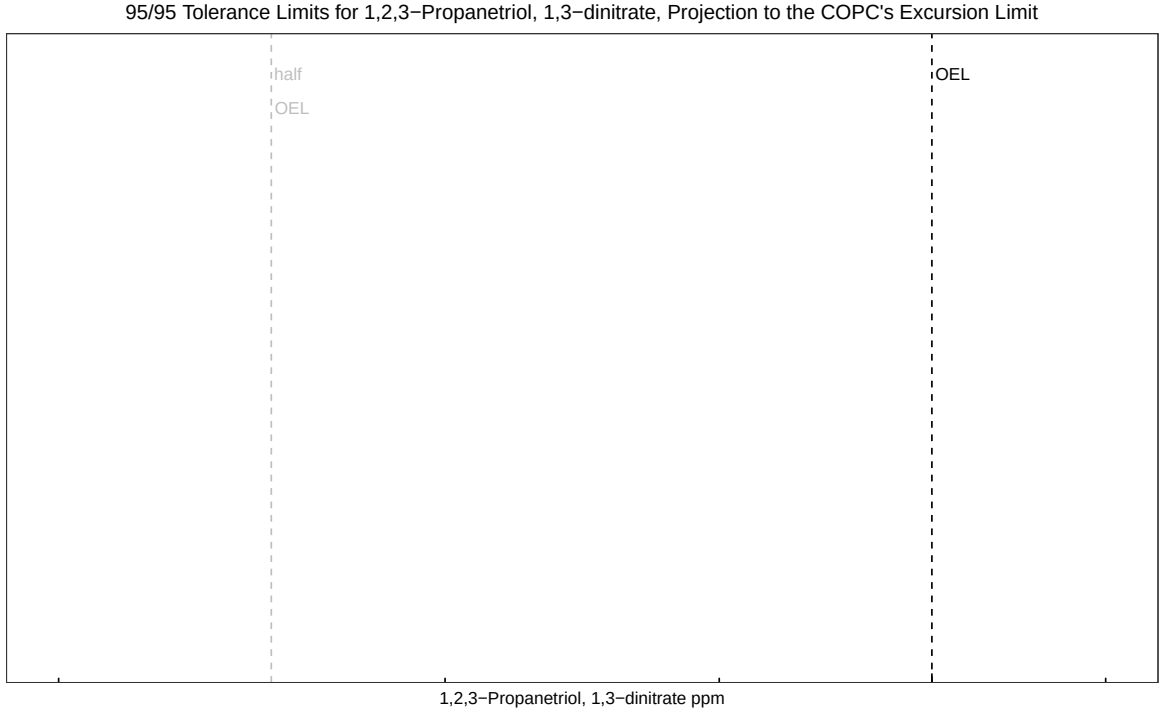


Figure E.348: Tolerance limits for 1,2,3-Propanetriol, 1,3-dinitrate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

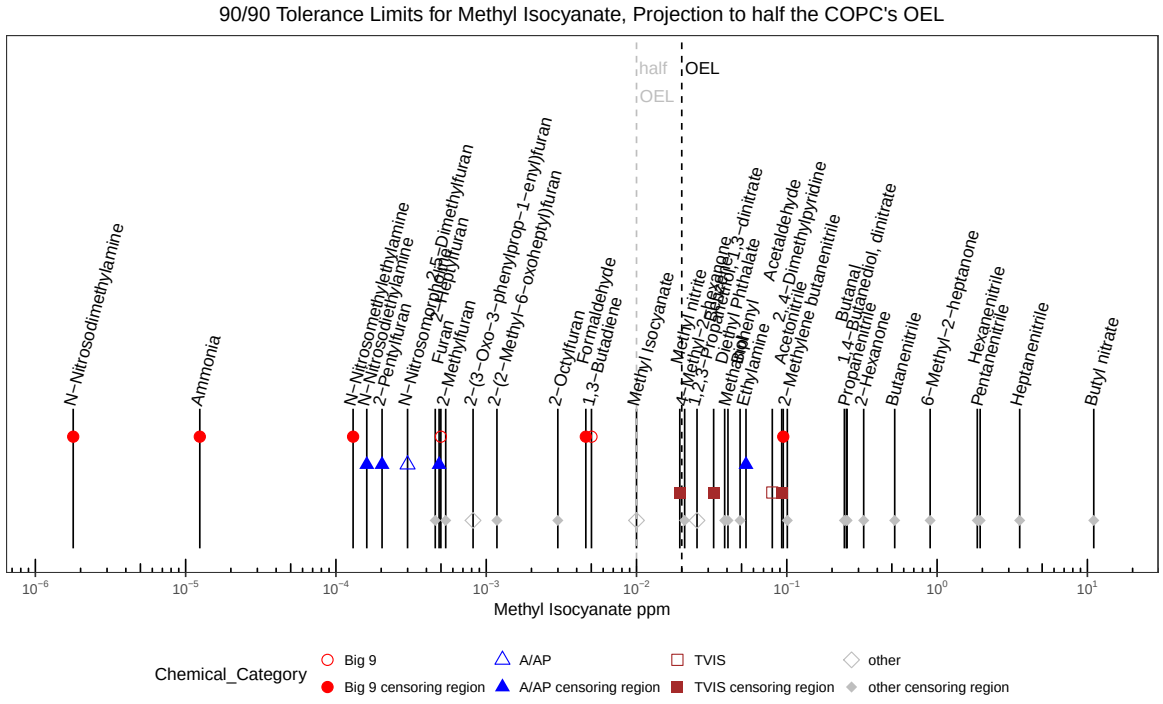


Figure E.349: Tolerance limits for Methyl Isocyanate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

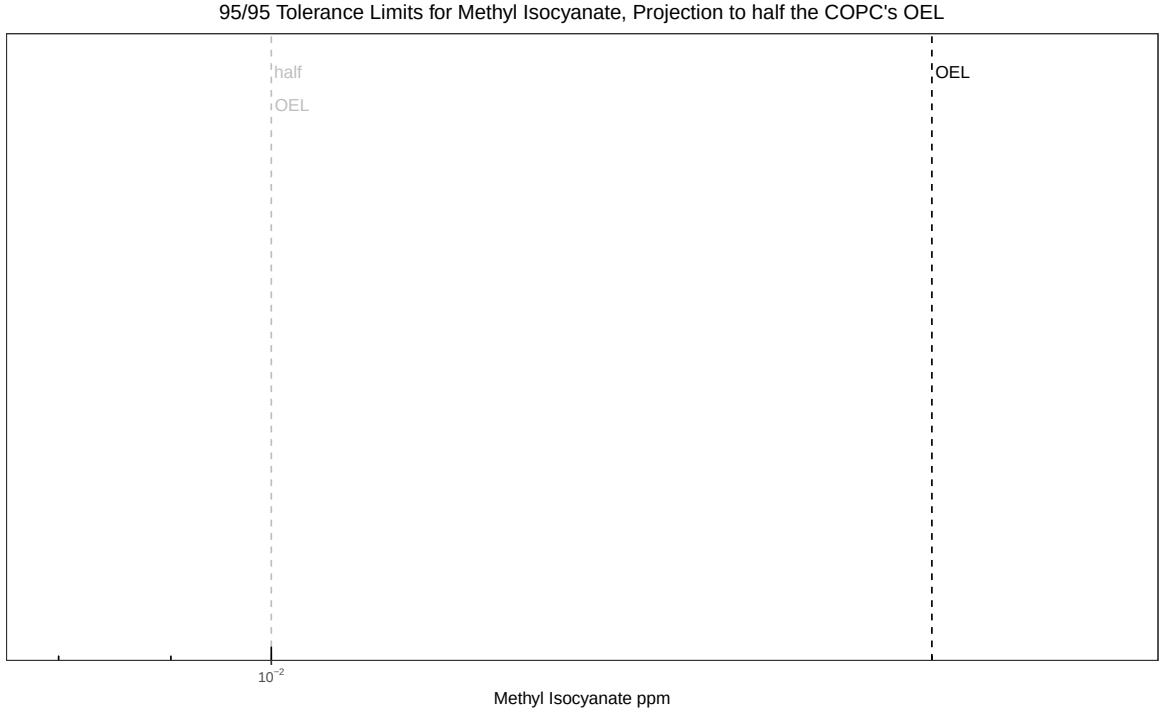


Figure E.350: Tolerance limits for Methyl Isocyanate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

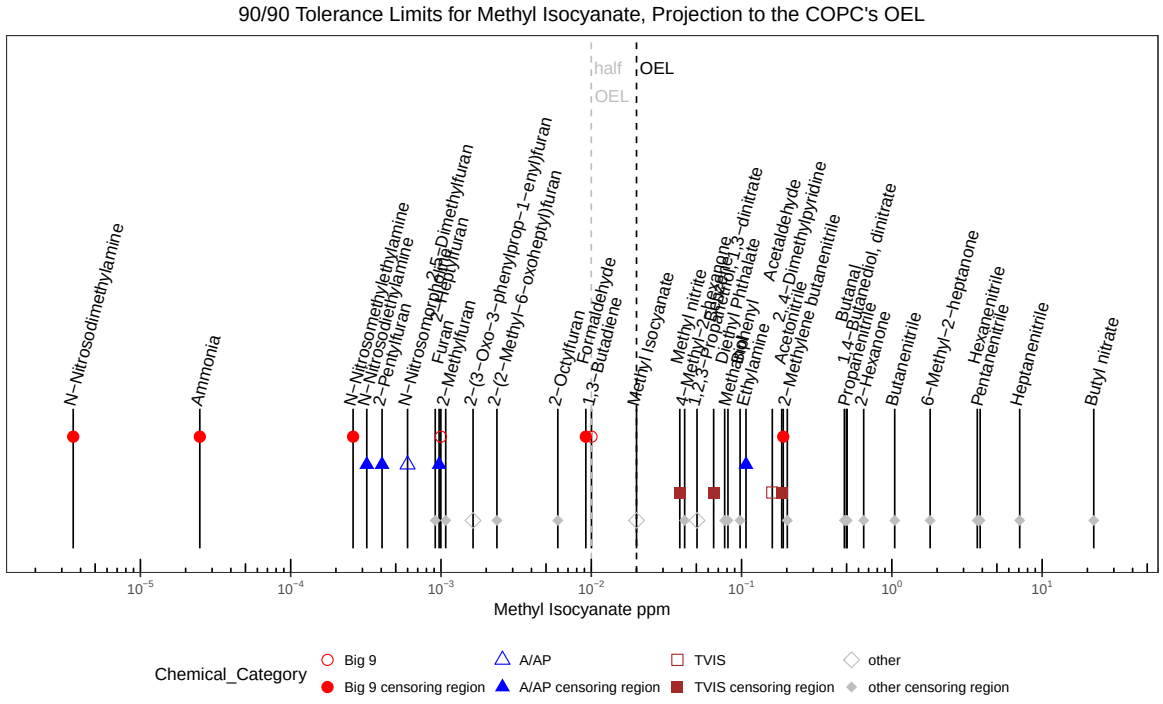


Figure E.351: Tolerance limits for Methyl Isocyanate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

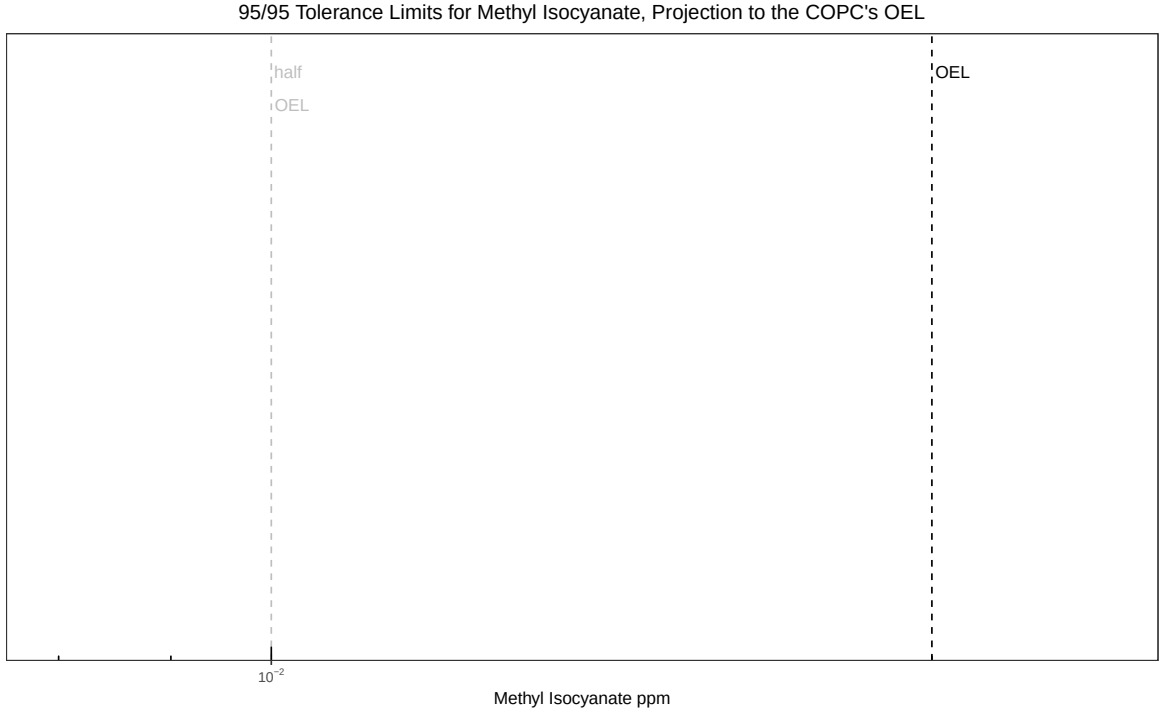


Figure E.352: Tolerance limits for Methyl Isocyanate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

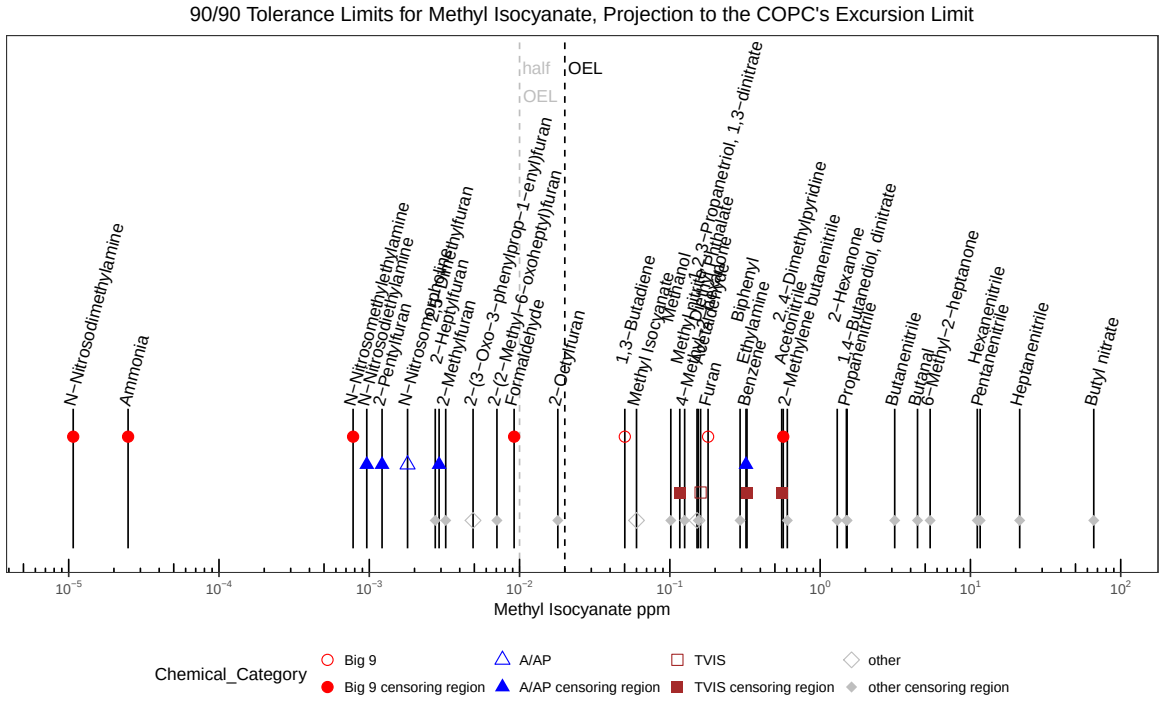


Figure E.353: Tolerance limits for Methyl Isocyanate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

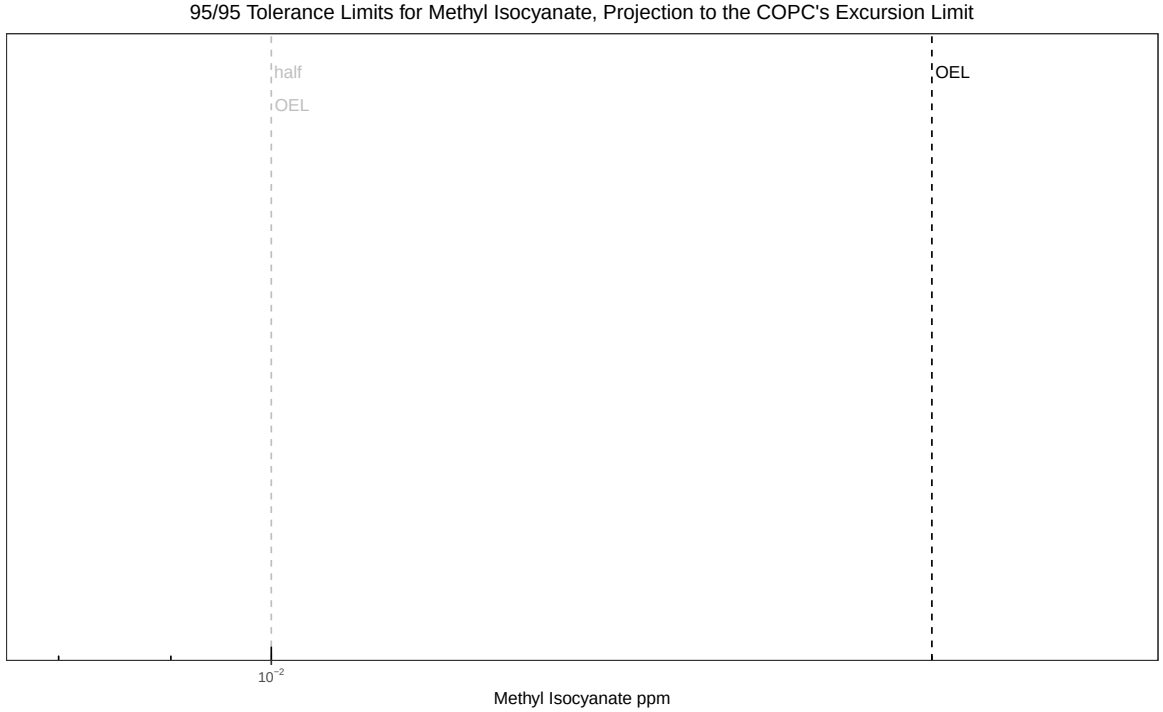


Figure E.354: Tolerance limits for Methyl Isocyanate as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

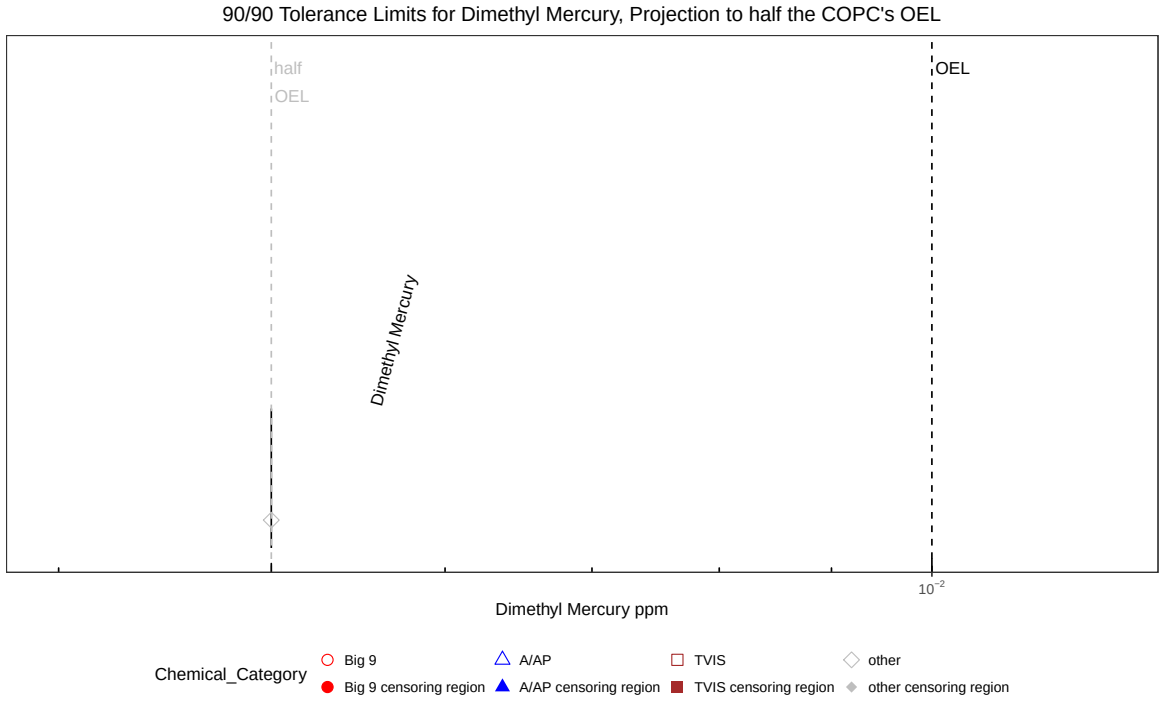


Figure E.355: Tolerance limits for Dimethyl Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

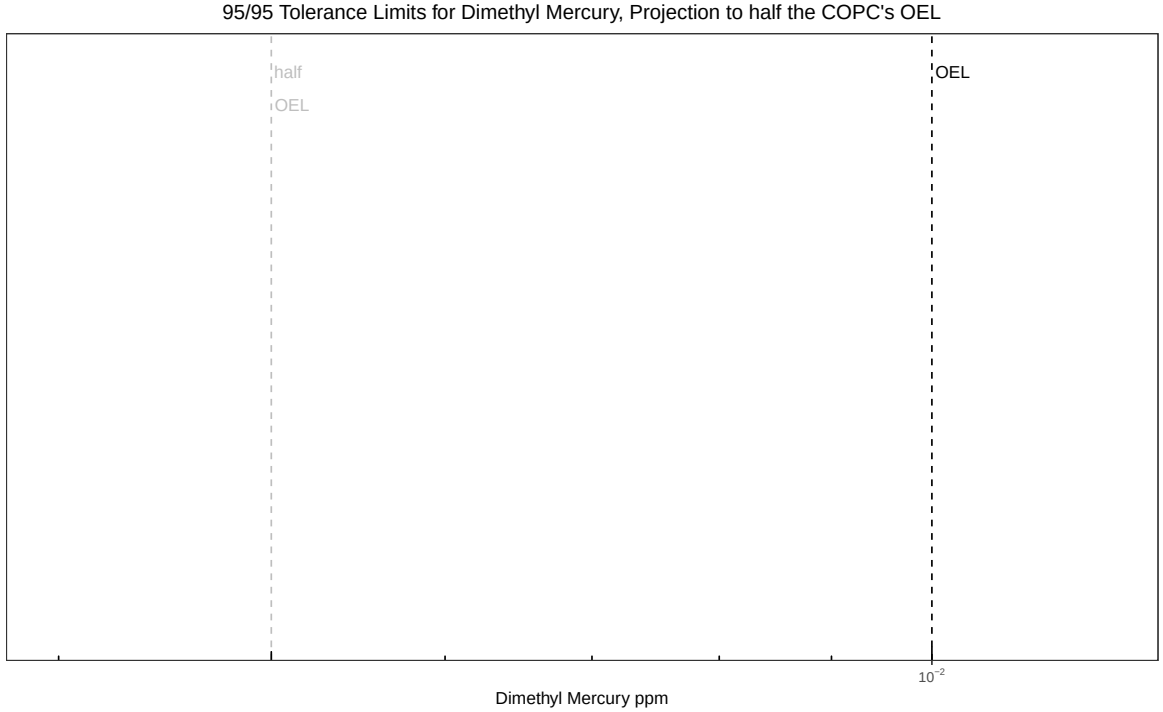


Figure E.356: Tolerance limits for Dimethyl Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at half the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

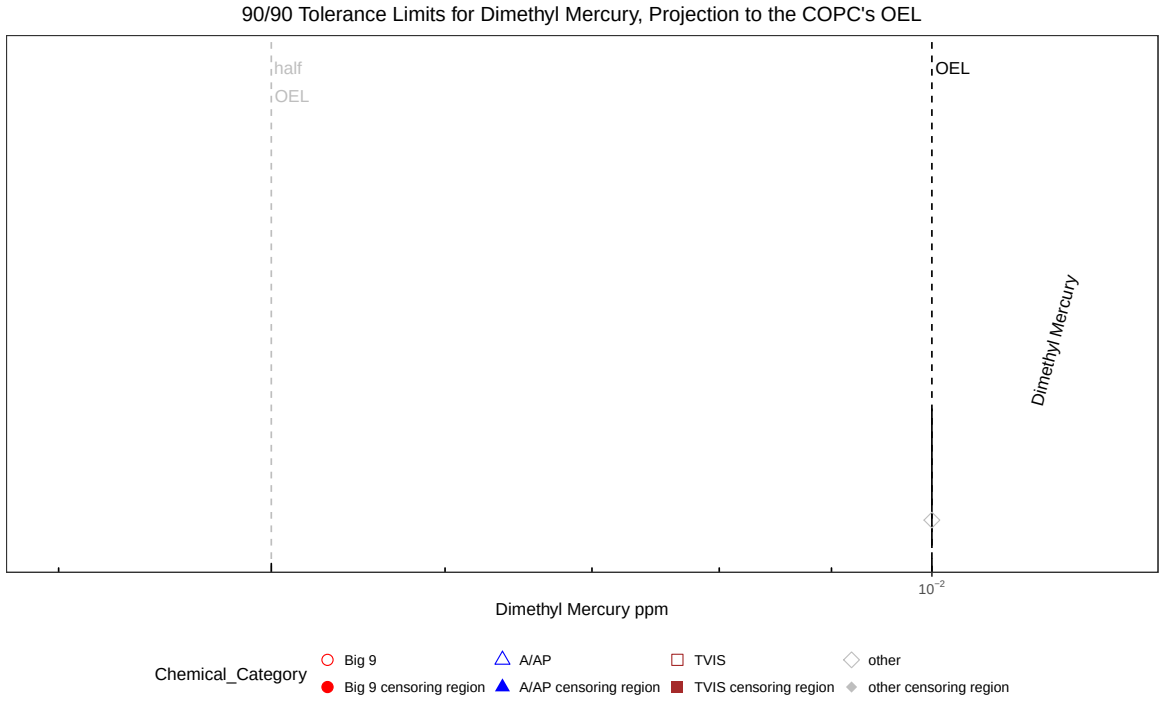


Figure E.357: Tolerance limits for Dimethyl Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

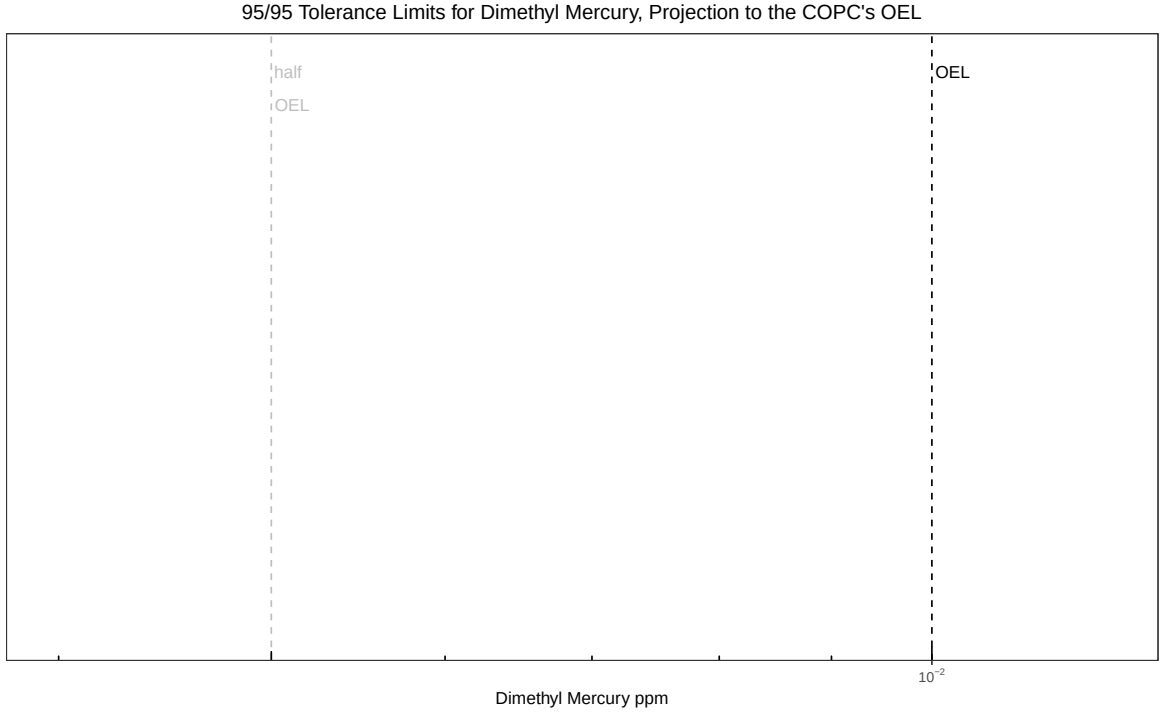


Figure E.358: Tolerance limits for Dimethyl Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's OEL. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.

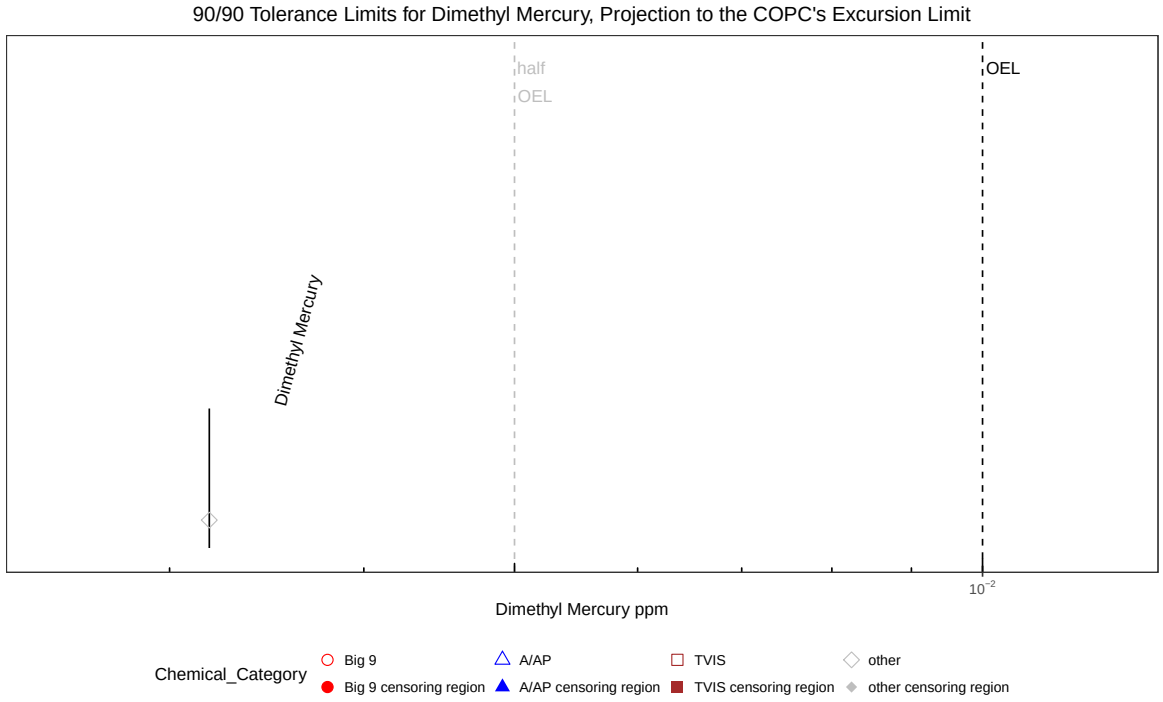


Figure E.359: Tolerance limits for Dimethyl Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 90% confidence that 90% of the distribution lies to the right of the position indicated on the number line.

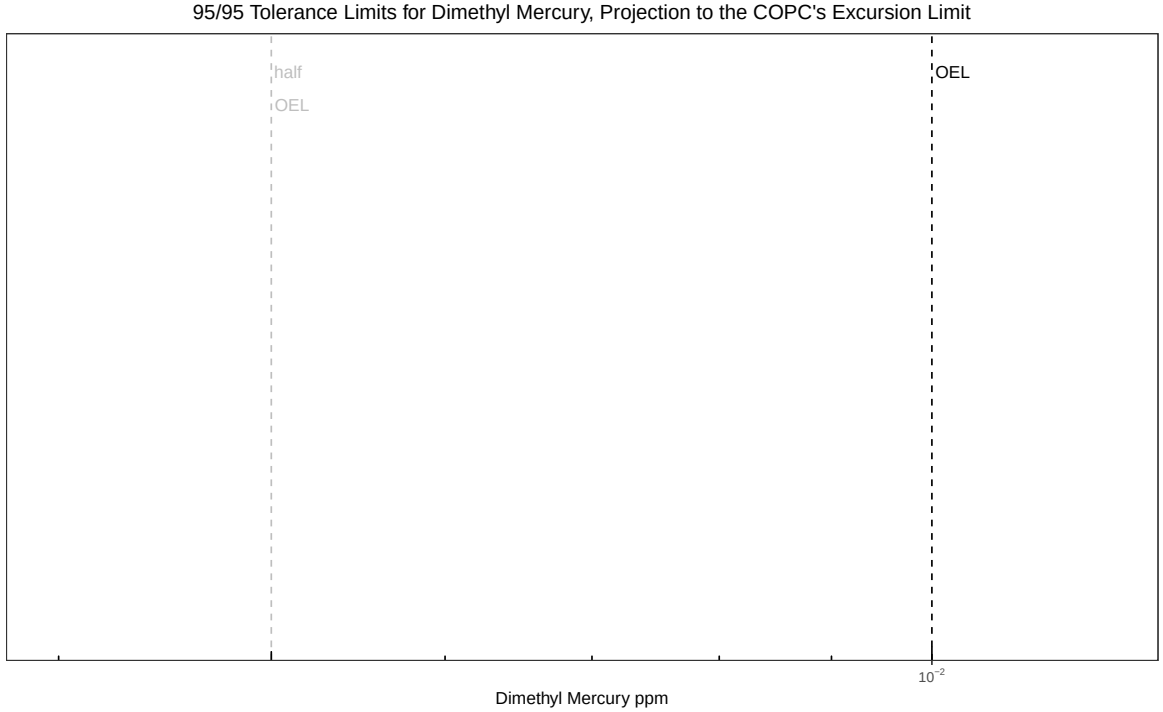


Figure E.360: Tolerance limits for Dimethyl Mercury as an LI. A one dimensional distribution was created by projecting paired COPC and LI concentrations via a 1-1 dilution to a horizontal line located at the COPC's excursion limit. Each line represents a threshold for which there is 95% confidence that 95% of the distribution lies to the right of the position indicated on the number line.



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by **Battelle** *Since 1965*

U.S. DEPARTMENT OF
ENERGY

902 Battelle Boulevard
P.O. Box 999
Richland, WA 99352
1-888-375-PNNL (7665)

www.pnnl.gov