

PS 1694 Use of the Risk21 Framework to Determine Adequacy of Various Data Streams for Exposure Modeling in Risk Assessments

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Risk assessment of pesticide exposures to humans is characterized by a large body of mammalian toxicological data and estimated exposures. Exposures are estimated from a combination of scenarios in which a population could be exposed (dietary intake, drinking water intake, and/or residential handling). Dietary exposure via residues on food is usually the most prevalent exposure scenario; however, for certain pesticides, drinking water can be the major route of exposure. Drinking water monitoring is not only costly, but the question of sampling frequency is also important. For widely used pesticides like atrazine, extensive water monitoring including daily/near daily samples may be available; however, for most pesticides monitoring data are very limited. Various methods have been used to fill the non-sampled days (filling the gaps) to allow for better temporal resolution for risk assessments. Using the daily/near daily monitoring data of atrazine, we show the performance of various methods (linear interpolation, statistically based bias factor and kriging) by evaluating the uncertainties (deviation from the true) of various estimates of assessment endpoints with specified likelihood (i.e., to minimize false negatives). For the atrazine case study (using these data and the existing toxicological data for atrazine), the Risk21 analysis tool was used to show that daily/near daily monitoring is not necessary, and that the kriging-predicted daily exposures are robust and provide sufficient resolution for risk assessment. This case study shows that the Risk21 framework is a useful and important tool in determining whether a sufficiently robust dataset is available for risk assessment and regulatory decision making.

PS 1695 Soil Concentrations of Environmental Contaminants at Urban Agricultural Sites in New Orleans, Louisiana

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Urban agriculture produces numerous social and economic benefits to the cities where it is practiced. However, these cities may have soils with unsafe levels of contaminants that could be unhealthy for farmers and gardeners and impact the safety of the produce grown in these areas. We are evaluating soil levels of 22 different elements at urban farms and gardens in New Orleans, LA to determine whether unsafe levels are present. Elements were analyzed by ICP/MS (Hg CVAAS) and field-portable X-ray fluorescence spectrometry (XRF). Results were benchmarked using the Louisiana Department of Environmental Quality's (LDEQ) soil standards. Analysis of 27 sites found that the XRF regularly reported higher concentrations of contaminants across multiple elements and was poorly correlated with ICP/MS measurements. For lead, however, XRF and ICP/MS measurements were highly correlated (Spearman's R = 0.82). A health risk assessment for the urban agriculture community is currently being developed. Ultimately, our objective is to inform both policy and plan, from sampling to mitigation, for examining soils in highly urbanized areas where legacy pollution may create a health hazard. Comparing the XRF to the EPA standard ICP/MS analysis method is one step in evaluating screening tools for practitioners of urban agriculture.

PS 1696 Risks Assessment of Total Petroleum Hydrocarbon (TPH) in Four Important Seafood from Crude Oil Polluted Waters of Ogoniland, Rivers State, Nigeria

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This study was designed to evaluate the risk levels of Total Petroleum Hydrocarbon (TPH) in seafoods from crude oil polluted waters of Ogoniland, Rivers State, Nigeria. GC-FID was used for the quantification technique. The result showed significant differences ($p \leq 0.05$) between TPH levels in seafood from Kaa/B-Dere and Kaa/Bodo City for *Tilapia queneensis*, *Liza falcipinis* and *Callinectes pili*. *T. queneensis* recorded cumulative TPH levels of 124 ± 0.71 , $1,048 \pm 26.6$ and $1,549 \pm 2.01$ μgkg^{-1} wet wt. at Kaa, B-Dere and Bodo City respectively, while *L. falcipinis* recorded cu-

mulative TPH levels of 105 ± 0.03 , $1,100 \pm 6.10$ and $1,610 \pm 5.89$ μgkg^{-1} wet wt. at Kaa, B-Dere and Bodo City respectively. Also, *C. pili* recorded cumulative TPH levels of 72.8 ± 0.67 , 746 ± 9.57 and $1,201 \pm 16.7$ μgkg^{-1} wet wt. at Kaa, B-Dere and Bodo City respectively while *Penaeus notialis* recorded cumulative TPH levels of 50.8 ± 0.63 , 365 ± 10.3 and $1,031 \pm 12.5$ μgkg^{-1} wet wt. at Kaa, B-Dere and Bodo City respectively. Between the three sites and the seafood analyzed, *L. falcipinis* ($1,610 \pm 5.89$ μgkg^{-1} wet wt.) accumulated significantly higher levels ($p < 0.05$) of TPH at Bodo City. Accumulation of petroleum hydrocarbon may reduce the quality of this seafood tissues and cause tenting. Total petroleum hydrocarbon levels in most of the seafood tissue were at critical level (exceeding DPR set limits) and also suggest that these samples tissues may act as bioindicators of exposure owing to expressed contaminants uptake pattern. Possible health risk consequences of such high bioaccumulation of TPH on public health cannot be ignored.

PS 1697 Polybrominated Diphenyl Ethers (PBDE) and Their Hydroxylated and Methoxylated Derivatives in Seafood and Dust Collected From the Puget Sound, Washington Region

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The most important routes of human exposure to PBDEs are from contaminated food and contact with dust found in households and workplaces. Structurally related derivatives of PBDEs are the hydroxylated (OH-PBDEs) and methoxylated forms (MeO-PBDEs). Humans can metabolize some PBDEs into the hydroxylated forms, which is a concern due to greater health risks associated with OH-PBDEs. However, certain OH-PBDEs and MeO-PBDEs are also marine natural products and it is unclear although likely, that marine fish and shellfish, which bioaccumulate these compounds serve as a vector for human exposures. In this study, we measured approximately 30 different PBDE, OH-PBDEs and MeO-PBDEs in edible shellfish and finfish collected or purchased from seafood markets and restaurants located in the Puget Sound region of Washington State. We also measured 12 common PBDE congeners including PBDE-209 in dust samples collected from electronic waste (E-waste) recycling businesses, non-E-waste businesses and private homes. The focus on E-waste recycling was due to concerns that it's an occupation that may expose workers to dust with enriched levels of PBDEs. Results from the dust analysis indicated the predominant PBDE congeners measured were: PBDE-209 > PBDE-153 >> PBDE-183 > PBDE-47 > PBDE-99 > PBDE-100 > PBDE-154, 138. PBDE-17, 28, 66, 71 were very low or undetectable. PBDE-209 was detected in all dust samples and exceeded 300 $\mu\text{g/g}$ at one E-waste site. The most notable differences in the PBDE profiles from E-waste vs. non-E-waste dust was associated with PBDE-209 and PBDE-153, which were 15 - 1000 times higher at E-waste sites. Supported by NIOSH Grant 1R21OH010259-01A1

PS 1698 Internal Exposure to PAHs Using the INTEGRA Integrated Exposure Modelling Paradigm

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This study demonstrates the use of the INTEGRA platform (coupling multi-source multi-route external exposure modeling with a generic PBTK for internal exposure modeling) for estimating exposure to PAHs under a variety of scenarios of key relevance to REACH and the petroleum industry. Internal exposure to PAHs (i.e. arising from all sources a consumer is exposed to: environment, food, consumer products) and the relative contribution from different routes (oral-diet; oral-dust, inhalation, dermal) were calculated. Soil and dust ingestion are the dominant exposure pathways for children (uptake rate of $8.5\text{E-}03$ ng/kg bw/day , followed by diet (uptake rate for both adults and children at $6\text{-}7\text{E-}04$ ng/kg bw/day) and inhalation (uptake rate at $5.7\text{-}9.6\text{E-}07$ ng/kg bw/day). Oral is the dominant route of exposure (uptake rate at $3.2\text{E-}03$ - $15.2\text{E-}03$ ng/kg bw/day) followed by inhalation (uptake rate at $1\text{E-}06$ - $9\text{E-}08$ ng/kg bw/day) and dermal exposure (uptake rate at $9\text{E-}08$ ng/kg bw/day). Internal exposure to PAHs arising from specific use(s)/source(s) was calculated and split up according to uses and sources. More specifically: 1. The contribution of smoking fish to the total PAH content in fish, and consequently the contribution of the consumption of smoked fish to integrated PAH exposure (for fish consumers) is 1.4 ng/kg bw/day whereas the corresponding intake rate from soil or dust ingestion are $0.8\text{-}2.1\text{E-}03$ ng/kg bw/day and from inhalation $4\text{E-}07$ ng/kg bw/day . 2. The contribution of petroleum products (e.g. RAE - Residual Aromatic Extracts/OLBO - other lubricants based oils) to integrated PAH exposure

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Preface

This issue is devoted to the abstracts of the presentations for the Continuing Education courses and scientific sessions of the 55th Annual Meeting of the Society of Toxicology, held at the New Orleans Ernest N. Morial Convention Center, March 13–17, 2016.

An alphabetical Author Index, cross referencing the corresponding abstract number(s), begins on page 603.

The issue also contains a Keyword Index (by subject or chemical) of all the presentations, beginning on page 629.

The abstracts are reproduced as accepted by the Scientific Program Committee of the Society of Toxicology and appear in numerical sequence. Author names which are underlined in the author block indicate the author is a member of the Society of Toxicology. For example, J. Smith.

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