Abstract Book

SETAC North America 28th Annual Meeting

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This book is comprised of the abstracts of the presentations for the platform, interactive platform, and poster sessions of the 28th Annual Meeting in North America of the Society of Environmental Toxicology and Chemistry (SETAC), held at the Midwest Airlines Center, Milwaukee, Wisconsin, 11–15 November 2007. The abstracts are reproduced as accepted by the Scientific Program Committee and appear in numerical order. In each abstract, the Presenting Author's name is underlined.

This book contains an Author Index that cross-references the corresponding abstract numbers. A Session Index to all the presentations is also included.

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SETAC

A Professional Society for Environmental Scientists and Engineers and Related Disciplines Concerned with Environmental Quality

The Society of Environmental Toxicology and Chemistry (SETAC), with offices currently in North America and Europe, is a nonprofit, professional society established to provide a forum for individuals and institutions engaged in the study of environmental problems, management and regulation of natural resources, education, research and development, and manufacturing and distribution.

Specific goals of the society are:

- Promote research, education, and training in the environmental sciences.
- Promote the systematic application of all relevant scientific disciplines to the evaluation of chemical hazards.
- Participate in the scientific interpretation of issues concerned with hazard assessment and risk analysis.
- Support the development of ecologically acceptable practices and principles.
- Provide a forum (meetings and publications) for communication among professionals in government, business, academia, and other segments of society involved in the use, protection, and management of our environment.

These goals are pursued through the conduct of numerous activities, which include:

- Hold annual meetings with study and workshop sessions, platform and poster papers, and achievement and merit awards.
- Sponsor a monthly scientific journal, a newsletter, and special technical publications.
- Provide funds for education and training through the SETAC Scholarship/Fellowship Program.
- Organize and sponsor chapters to provide a forum for the presentation of scientific data and for the interchange and study of information about local concerns.
- Provide advice and counsel to technical and nontechnical persons through a number of standing and ad hoc committees.

SETAC membership currently is composed of more than 5000 individuals from government, academia, business, and public-interest groups with technical backgrounds in chemistry, toxicology, biology, ecology, atmospheric sciences, health sciences, earth sciences, and engineering.

If you have training in these or related disciplines and are engaged in the study, use, or management of environmental resources, SETAC can fulfill your professional affiliation needs.

All members receive a newsletter highlighting environmental topics and SETAC activities, and reduced fees for the Annual Meeting and SETAC special publications.

All members except Students and Senior Active Members receive monthly issues of *Environmental Toxicology and Chemistry* (*ET&C*) and *Integrated Environmental Assessment and Management* (*IEAM*), peer-reviewed journals of the Society. Student and Senior Active Members may subscribe to the journal. Members may hold office and, with the Emeritus Members, constitute the voting membership.

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exceeded at Site 4 during all three field bouts, some fish and other aquatic life appeared to breed at that site. We conclude that discharge permits and testing requirements for CBNG produced water should be evaluated to consider the pH drift in laboratory toxicity tests and how ammonia criteria should be applied in ephemeral drainages. Key words: ammonia, CO2, fathead minnow, NaHCO3, toxicity.

WP65 Toxicity of a Representative HMG-CoA Reducatse Inhibitor, Pravastatin, to Aquatic Organisms. D. Huggett, W.T. Waller, B.J. Venables, G.C. Nallani, University of North Texas, Denton, TX. A variety of pharmaceutical classes are being detected in the aquatic systems, though few toxicological data are available to reliably determine the risk of these drugs classes in the aquatic environment. HMG-CoA reductase (HMG-CoAR) inhibitors are a class of drugs designed to inhibit the rate limiting step of cholesterol synthesis in humans. HMG-CoAR appears to be very well conserved across species, performing a similar function in fish and other aquatic vertebrates. In arthropods, this enzyme is involved in the biosynthesis of juvenile hormone. In order to better understand the potential impacts of these compounds in aquatic environments, aquatic organisms were exposed to the hydrophilic HMG-CoAR inhibitor pravastatin. Aqueous 48hr LC50 values for fathead minnow and Japanese medaka were > 1mg/L. Ceriodaphnia dubia 48hr EC50 was 0.308 mg/L. A 14d six brood chronic study with C. dubia revealed a reproductive no observable effect concentration (NOEC) of 0.125 mg/L. Additional long term chronic data will be provided for the fathead minnow and C. dubia.

WP66 Assessing the sensitivity of freshwater mussels to coal effluents and coal slurries. N. Wang, J. Kunz, C. Ingersoll, USGS, Columbia, MO; C. Kane, USFWS, Gloucester, VA; S. Alexander, USFWS, Cookeville, TN; R. Neves, D. Hua, USGS, Blacksburg, VA; B. Evans, USFWS, Abingdon, VA; C. Walker, OSM, Pittsburgh, PA; J. Jones, USFWS, Blacksburg, VA. Coal mining-related discharges and runoff containing metals, hydrocarbons, surfactants and other pollutants enter streams in the upper Tennessee and Cumberland River basins, where 30 freshwater mussel species are federally listed endangered. The objective of this study is to assess acute and chronic toxicity of coal effluents and slurries to mussels and standard bioassay organisms. Grab samples of surface water, collected in Mud Lick Creek about 0.5 and 1.0 km downstream of a coal company discharge at Roda, VA, were used to conduct acute tests with 3-month-old rainbow mussels (Villosa iris; 96-h exposure), cladocerans (Ceriodaphnia dubia; 48-h exposure), and amphipods (Hyalella azteca; 48-h exposure). Fine coal refuse, pressed from coal slurry by a coal plant at Smoky Junction in Scott County, TN, was used to conduct 28-d chronic tests starting with 3-month-old rainbow mussels exposed to water (100% coal refuse) or sediment (25 and 50% coal refuse mixed with control sediment). Acute EC50s for amphipods exposed to 6.25_100% receiving water contaminated with coal effluent were 72 and 77% receiving water, whereas no mortality was observed with cladocerans or mussels exposed to 100% receiving water. By the end of 28-d slurry tests, 100% of mussels survived in all treatments. Preliminary results indicate that (1) the coal effluent was toxic to amphipods, (2) cladocerans and 3-month-old mussels were not acutely sensitive to the effluent, and (3) the coal slurry did not affect survival of juvenile mussels. The effect of slurry on mussel growth will be determined after measuring shell lengths of surviving mussels. Additional tests are planned with various sources of coal effluents or slurries using more test organisms, including newly transformed juvenile mussels, which are generally more sensitive to metals than older mussels.

WP68 Toxicity of three veterinary pharmaceuticals, tylosin, erythromycin and sulfamethazine, alone and in mixture to *Ceriodaphnia dubia*, *Daphnia magna* and *Chironomus tentans*. N.L. Cooper, J.R. Bidwell, C.R. Seery, Oklahoma State University, Stillwater, OK. Acute and chronic bioassays are being conducted to determine the effects of single, binary and tertiary mixtures of sulfamethazine, tylosin and erythromycin on two species of cladocerans, Daphnia magna and Ceriodaphnia dubia, and on the chironomid, Chironomus tentans. Acute bioassays (48-h) with single chemicals with both cladoceran species in moderately hard laboratory water have produced LC50 values for tylosin, erthryomycin and sulfamethazine of 565mgL, 98 mg/L and 87 mg/L, respectively for D. magna and 444mg/L, 100mg/L and 77 mg/L for C.dubia, respectively. In addition, acute bioassays have been conducted using binary and tertiary mixtures with the effects concentrations for both species being significantly lower than with each chemical alone. Based on the toxic units approach, these mixture effects (tertiary and binary) have been less than additive for both species. Preliminary studies have also begun to look at the effects of each chemical on 10-d survival and reproduction of Daphnia magna, with effects levels falling significantly below that found in the acute bioassays. Continued work will be carried out assessing further impacts of these 3 chemicals in the water column on both survival and reproduction in both cladoceran species, in addition to effects on the chironomid.

WP69 Structural effects in the digestive gland of marine limpets living close to superficial hydrothermanl vents. A. Rodrigues, L. Cunha, G. Martins, F. Wallenstein, R. Couto, A. Neto, A. Amaral, CIRN, DB, University of the Azores, Ponta Delgada, Portugal. The present study aimed at determining the extent to which the presence of superficial hydrothermal vents provokes measurable effects on the structure of the digestive gland of limpets as well as to relate the extent of these effects to the concentrations of several metals. For this purpose, the digestive glands of marine limpets (Patella candei gomesii) sampled from four sites in the coast of São Miguel Island (Azores, Portugal), two with and two without hydrothermal vents, were submitted to: (i) chemical analyses, in order to quantify several metals; and (ii) histological staining, in order to quantify the relative abundance of digestive cells, basophilic cells, and connective tissue cells. Mean epithelial thickness (MET), mean luminal radius (MLR), and mean diverticular radius (MDR) were recorded as measures of sublethal effects of metals, and the levels of apoptosis were also quantified. In general, the structure of the digestive gland was found to be most affected in the individuals from the two sites exposed to the superficial hydrothermalism. These results are compared to others and discussed according to the concentrations and ratios of several metals.

WP71 Effects of Polychlorinated Dibenzofurans (PCDFs) on P450 Enzymes, Jaw Histology and Tissue Morphology of Mink (*Mustela vison*). J.N. Moore, M. Hecker, Z.J. Matthew, E.B. Higley, J.P. Giesy, Food Safety and Toxicology Center and Center for Integrative Toxicology, Michigan State University, East Lansing, MI; J.N. Moore, M. Hecker, Z.J. Matthew, E.B. Higley, Zoology, Michigan State University, East Lansing, MI; S.J. Bursian, Animal Science, Michigan State University, East Lansing, MI; S.D. Fitzgerald, Diagnostic Center for Population and Animal Health, Michigan State University, East Lansing, MI; J. Khim, J.P. Giesy, Biomedical Sciences and Toxicology Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada; J.L. Newsted, Entrix, Inc., Okemos, MI. Mink (Mustela vison) are often utilized as a sentinel species for ecological risk assessment of dioxins and dioxin-like compounds. This investigation determined the potential dose- and time-dependent effects of environmentally-relevant concentrations of 2,3,4,7,8–pentachlorodibenzofuran (PeCDF) and 2,3,7,8–tetrachlorodibenzofuran (TCDF), and their mixture on adult mink under controlled laboratory conditions. Three doses of each TCDF and PeCDF bracketing estimated environmentally-relevant dietary exposure levels and one mixture dose were administered in feed to mink for 180 d. Concentrations of TCDF and PeCDF in adipose and hepatic tissues were measured at 0, 90, and 180 d. Ethoxyresorufin O-deethylase (EROD) and methoxyresorufin O-deethylase (MROD) activities were also measured in liver after 0, 90, and 180 d as indicators of the biologically available fraction of a delivered dose. Mink were also examined histologically. There was a statistically significant and dose-dependent increase in the both EROD and MROD enzyme activities for all treatments, which confirmed the utility of these enzymes as a functional measure of exposure mink to dibenzofurans. However, none of these exposures resulted in any significant, treatment-related morphological or histological effects. These results indicate that while mink were relatively sensitive regarding the induction of hepatic detoxification enzymes the environmentally relevant concentrations of dibenzofurans tested in this study were not sufficient to induce pathological effects in adults.

WP72 Disruption of steroid biosynthesis in rainbow trout (*Oncorhynchus mykiss*) exposed to municipal waste water effluent. J.S. Ings, K.D. Oakes, M.R. Servos, M.M. Vijayan, Biology, University of Waterloo, Waterloo, Ontario, Canada. Municipal waste water effluent (MWWE) is the largest point source of contaminant discharge in Canada. There is evidence that compounds present in MWWEs can potentially disrupt endocrine homeostasis in fish living downstream of effluent outfalls. The objective of this study was to assess the use of short-term in situ caging studies to evaluate the impact of exposure to MWWEs on aspects of steroid biosynthesis in fish. In the fall of 2006, juvenile rainbow trout (Oncorhynchus mykiss) were caged in 100 and 10% effluent dilutions downstream of a MWWE outfall, as well