



Abstract Book

SETAC Latin America 14th Biennial Meeting
Latin America, Diversity of Knowledge for a Sustainable Future

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Abstract Book

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This book comprises the abstracts of the presentations for the platform and poster sessions of the Society of Environmental Toxicology and Chemistry (SETAC) Latin America 14th Biennial Meeting, conducted virtually from 26–29 September 2021. 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. The author index cross-references the corresponding abstract numbers.

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appropriate developmental stage to be subjected to the tests. Individuals were exposed to different concentrations of Ant and OA-NP to establish toxicological parameters. Each concentration was tested by triplicate and each exposure was repeated at least three times. 72 h embryos and 10 days-old larvae were exposed for 96 h in modified Amphitox medium (containing a final concentration of 0,1% v/v of acetone) in static conditions, keeping a ratio of 10 individuals in 100 mL of medium. Mortality and malformations were assessed daily. A logistic model was adjusted to mortality data by non-linear regression and the toxicological parameters LC50, LC10 and LC1 were calculated. Anthracene was toxic for both embryos and larvae. For embryos, the toxicological parameters calculated were: LC50-96h: 4.65 ± 0.15 mg/L; LC1: 2.08 mg/L; LC10: 3.16 mg/L. Toxicological parameters for larvae were: LC50: 4.85 ± 0.13 mg/L; LC1: 2.85 mg/L; LC10: 3.76 mg/L. Individuals exposed to Ant showed malformations such as edema, caudal fin folds, blistering and lacerations. OA-NP were neither toxic nor teratogenic to embryos and larvae in concentrations up to 10 mg/L. Both embryos and larvae ingested the OA-NP, which were detected in feces. Anthracene toxicity was similar for both embryos and larvae of *R. arenarum*, while OA-NP displayed low apparent toxicity. Preliminary analyses on oxidative stress showed no significant effects. Experiments to evaluate the toxicity of the combination between Ant and OA-NP will be carried out, and sublethal exposures will be conducted to assess the impact of Ant, OA-NP and their combination at the biochemical and molecular levels in *R. arenarum* embryos and larvae.

06A.19 Effects of UV Filter Benzophenone-3 and Temperature on Hemocytes Condition of the Yellow Clam *Amarilladesma mactroides*

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Benzophenone-3 (BP3) is widely present in sunscreens used to protect human skin from UV radiation. This chemical is reaching coastal regions and have been detected in water, sediment and marine biota. Its low degradation rate and high lipophilicity contribute to BP3 bioaccumulation and toxicity. In addition to BP3 contamination, increasing in temperature, as a consequence of the global warming, is another factor that is impacting the ecosystems and may affect bioavailability of chemical compounds and their toxicity. In this sense, it is estimated that ocean temperature will increase by approximately 4.3 °C at 2100. This can affect biochemical reactions and physiology of organisms, including the ability detoxification. Thus, this study investigated if exposure to BP3 and high temperature affect viability and reactive oxygen species (ROS) levels in the hemocytes of the yellow clam *Amarilladesma mactroides*. Animals collected in Southern Brazil were exposed to BP3 at 1 µg/L, an environmental relevant concentration, for 96 h at the 20 °C and 24.3 °C. They were previously acclimated (15 days) to both experimental temperatures. Control groups, without BP3, were conducted for both temperatures. At the end of exposure time, hemolymph was punctured and the hemocytes were separated by centrifugation. Then, ROS was quantified, and cell viability was analyzed through the neutral red assay in microplate. Results showed an increase in ROS levels in the treatment with 1 µg/L of BP3 at 24.3 °C compared to the other experimental conditions. An increase in the viability of hemocytes was also observed for the same

treatment. These results may be related to an increase of immune response or may indicate cellular stress caused by BP3 and high temperature together. As the hemocytes play a fundamental role in the defense system of invertebrates, it is noteworthy that a change in their condition can influence the resilience of yellow clams in impacted environments.

06A.20 Aproximación Ecotoxicológica en Peces Nativos de una Cuenca Andina: Río Garagoa (Boyacá, Colombia)

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Los peces son organismos vertebrados muy importantes para la seguridad alimentaria, desempeñan un papel fundamental en los procesos de transferencia de materia y energía entre los sistemas terrestres y acuáticos hacia otros grupos faunísticos, como eslabón en las redes tróficas. Los riachuelos (cuerpos de agua de baja magnitud, orden 1 a 3) presentan ictiofauna de pequeño porte, utilizados como carnada y también para consumo. Estas especies podrían ser más sensibles al efecto de los tóxicos, por lo cual cualquier incidencia negativa, además de alterar la dinámica y función del ecosistema acuático, podría repercutir en la productividad pesquera de ríos de orden mayor, no sólo porque se modificarían los eslabones de la red trófica en el continuo del río, sino también por la biomagnificación de contaminantes. En el departamento de Boyacá (Colombia), existen diferentes actividades conflictivas que afectan negativamente la biota acuática, sin embargo, aún no se tienen datos de línea base sobre contaminación por sustancias tóxicas en subcuencas afectadas por actividad minera, agropecuaria y asentamientos urbanos. Este proyecto indaga en particular sobre los niveles de mercurio y arsénico, en el agua y en la ictiofauna de la cuenca del río Garagoa, afectada por actividad minera de carbón y esmeraldas, además se analizarán cambios histológicos en peces por la contaminación acuática. El Hg y As son considerados desreguladores endocrinos que alteran la producción, liberación, transporte, metabolismo, unión o eliminación de las hormonas responsables de la homeostasis e interfieren en la regulación de los procesos de desarrollo embrionario de la fauna acuática. Así mismo, pueden alterar procesos fisiológicos esenciales que inciden en el crecimiento, la respuesta al estrés y la reproducción. Se incluirá además la participación de los ciudadanos del área de estudio en el reconocimiento de esta riqueza íctica poco conocida, sus usos, los riesgos químicos y en la construcción de la co-gestión comunitaria para restaurar y conservar los ecosistemas acuáticos. Este trabajo es pionero en la ecotoxicología de peces de ambientes acuáticos de los Andes Nororientales, importante centro de endemismos neotropical, y busca resaltar la necesidad de proponer medidas de conservación acordes con su importancia biogeográfica.

06A.21 Evaluation of the Toxicity of Sediments From a Feedlot Influenced Area Located in Northeastern Buenos Aires (Argentina) by Bioassays With *Hyaella curvispina*

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Intensive animal production of the feedlot type has spread in the Pampas region of Argentina. These activities can act as point sources of contamination if they are not properly designed and managed. The generation of large amounts of manure and its decomposition, releases, among other elements, nutrients that can infiltrate, or be transported by runoff and reach water courses where they can be captured by bottom sediments. A useful bioanalytical tool for diagnosing ecosystems is sediment toxicity bioassays. The aim of the study was to evaluate the toxicity of sediment samples from water courses in an area with present feedlot activity using *Hyallela curvispina*, a representative species of aquatic ecosystems of the neotropics. The study area is in a sub-basin of the El Pescado stream, northeast of the province of Buenos Aires, where a feedlot has been active since 2014. Four sediment samples were collected: 1) directly from a waterway that rounds the feeding lot, 2) from a waterbody located at the perimeter of the establishment, 3) from a permanent course of the sub-basin under study located 1 km downhill, and 4) from a reference site located 30 km from the feedlot. A bioassay (10 days) was performed following standardized protocols of the American Society for Testing Materials with minor modifications, placing 100 mL of sediment samples and 175 mL of water in 500 mL glass containers. Eight replicates per sample were used with 10 juveniles of *H. curvispina*. Mortality was determined by direct observation, and growth inhibition was assessed by measuring body length after digital photograph with the ImageJ program. In addition, physicochemical measurements (hardness, alkalinity, nutrients, among others) were made, and surface runoff and land use classification through the joint analysis of digital elevation models were evaluated using geographic information system tools. Sediments from the feedlot and the perimetral area showed significantly higher toxicity ($p < 0.05$) than the other ones, which showed less than 10% mortality. The results obtained allow us to conclude that the feedlot establishment is a locally pollution source, and toxicity bioassays are an efficient tool for the evaluation of environmental pollution. Future studies will focus on taking more samples from those sites where modeling and analysis of physicochemical parameters indicate whether pollutants are reaching the sites through runoff, and determining the pollution plume.

06A.22 Comparative Analysis of the Toxicity of the Fungicide Mancozeb in Early Developmental Stages of a South American Amphibian After 24 Hours-Pulse Exposure

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After application, pesticides can reach aquatic environments causing harmful effects on non-target species such as amphibians, which are particularly threatened due to their high susceptibility to chemical contamination and insufficient conservation programs. We studied the lethal and sublethal effects (i.e malformations and behavioral changes) of 24h-pulse-exposures to a commercial formulation of the fungicide mancozeb (MCZ) 80% of active ingredient in 4 embryonic developmental stages of the South American amphibian *Rhinella arenarum*. Concentrations evaluated were 0.1, 0.5, 1, 5 and 10 mg/L MCZ. For bioassays, 10 individuals (x3) were exposed in glass Petri

dishes of 10 cm Ø with 40 mL of test solution for 24h, at blastula (S.4), neural plate (S.13), muscular response (S.18), and complete operculum (S.25). As dilution medium and negative control, it was used AMPHITOX saline solution (AS). After 24h, individuals were thoroughly washed and kept in AS for up to 504h. Mortality and, morphological and behavioral alterations were recorded every day, and LC50s for 48-504h post-exposure times were estimated for each developmental stage evaluated. Results of clearance experiments showed that after 24h-pulse of MCZ its toxic effects continued after stopping pesticide exposure. After 96h, S.4 was the most sensitive stage (96h-LC50= 2.25 (1.771-2.975) mg/L) while MCZ caused similar effects for individuals exposed at S.13 and S.18 (96h-LC50= 6.63 (5.708-7.729) mg/L and 5.93 (5.081-6.919) mg/L, respectively, $p > 0.05$). Otherwise, S.25 showed higher sensitivity than S.13 and S.18 (96h-LC50 = 4.72 (3.789-4.745) mg/L) but lower than S.4. As time progressed, a gradual increase in toxicity was observed for all stages. At 504h LC50 values for S.4, S.18 and S.25 did not differ significantly from each other (504h-LC50 = 1.46 (1.043-2.950) mg/L, 2.45 (1.737-3.366) mg/L and 3.23 (2.572-4.165) mg/L, respectively, $p > 0.05$). S.13 showed the greatest resistance since its LC50 was higher (504h-LC50= 5.59 (4.550-6.812) mg/L. MCZ also caused morphological and behavioral alterations such as edema, reduced tail length, tail flexures, and erratic swimming after 168h of purging with a high incidence in embryos exposed at S.4, S.13, and S.18. For S.25, only a low percentage exhibited tail flexures as the main sublethal effect. In conclusion, short exposures to MCZ, such as during spill events, cause persistent detrimental effects in exposed amphibian populations near agricultural fields.

06A.23 Pesticides Present in Feces of 3 Penguin Species From Kapaotic Island and the Antarctic Peninsula

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The Antarctica was for a long time considered as one of the last pristine environments, due to lack of industrial and agricultural operations. However, contamination is a global phenomenon and transport of pollutants to remote areas, due to their dispersal capacity, moving from warmer to colder regions of the planet is sadly a fact. Over the last decades, many organochlorine pesticides (OCP) have been continuously analyzed in almost all regions of the planet due to their toxicity to fauna, persistence in the environment and its potential to bioaccumulate and biomagnify. Pesticides were first found in fat tissues of polar bears in the Arctic and Antarctic penguins in the late 1960s. These facts pushed researchers to study environmental contamination in Antarctica over the last years, assessing the fate and distribution of many pollutants in different biotic and abiotic matrices. Seabirds are sensitive to environmental changes and are part of the highest levels of the trophic chain, they are considered among the most reliable indicators for environmental changes caused by pesticides. Penguins represent the highest bird biomass in the Southern Ocean, being a reliable indicator of