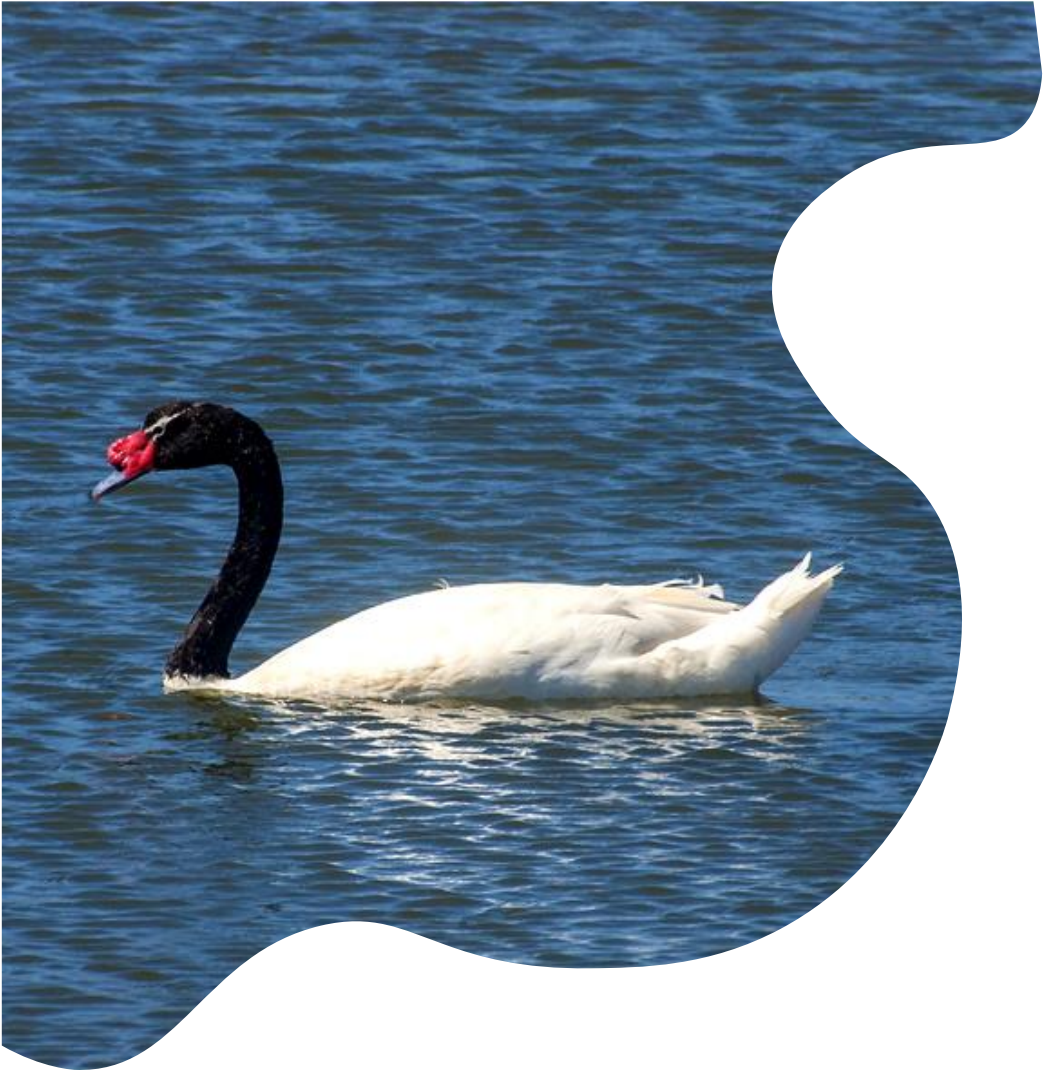

Abstract Book

SETAC Latin America 14th Biennial Meeting

Latin America, Diversity of Knowledge for a Sustainable Future

26–29 SEPTEMBER 2021 • VIRTUAL

Abstract Book

SETAC Latin America 14th Biennial Meeting

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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.

both analyzed tissues, higher activity of POD, lower levels of H2O2 but higher levels of MDA in summer than in spring were detected. These results show that the oxidative stress biomarkers in summer increased respect the spring, mainly the oxidative damage, according to the highest levels of CUPs detected in La Brava lake. More studies will be carried out to elucidate the direct relationship between the CUPs and the adverse effects in *B. laevis*.

06A.30 Liver Morphological Alterations Induced by Glyphosate-Based Herbicide Exposure in Zebrafish (Danio rerio)

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The increasing use of pesticides in agricultural practices around the world is alarming. In this context, Brazil is one of the largest agricultural producers in the world, using large amounts of pesticides, among them, glyphosate-based herbicides (GBH) are the most used. GBH can reach and contaminate aquatic ecosystems, causing a reduction of the environmental quality and being able to affect non-target organisms. Zebrafish is considered a vertebrate model organism widely used in different areas of research such as genetics, developmental biology and toxicology. The liver plays an important role in biotransformation and excretion of contaminants, as well as in energy reserve and metabolism, biosynthesis of proteins, carbohydrates and in the accumulation of lipids. Therefore, the hypothesis of this study is that the liver is an important target organ of toxicity of GBH. The aims of this research were to characterize the cellular toxicity of the herbicide Roundup WG® on morphology and histochemistry of adult zebrafish (*Danio rerio*) liver. Females and males were exposed to two concentrations of GBH (0.065 and 6.5 mg/L) for 15 days (n = 5 fish/sex/group). The concentration of 0.065 mg/L was based on the maximum permissible concentration of glyphosate in Brazilian waters for human drinking by CONAMA (Resolution No. 357/2005). Non-exposed fish were used as controls (n = 5 fish/sex). The procedures were approved by the UFSC Animal Use Ethics Commission (No. 5466040416/2016). Fish were euthanized and livers were removed for morphological and histochemical analyzes by light microscopy. The organ index (I_{org}) was determined based on the importance factor of each observed alteration and its frequency, which indicates the extent of damage caused by the exposure. For histochemical analyzes, liver samples were stained with Coomassie Bright Blue (proteins) and Periodic Acid-Schiff (polysaccharides) and the integrated density with IMAGE J software was calculated. Result showed for both males and females, vasodilation and vacuolization in animals exposed to the two concentration. I_{org} values of exposed males and females were higher than control group. Polysaccharides and total proteins decreased significantly after GBH exposure compared to those of the control group. These results corroborated our hypothesis that GBH can promote hepatic morphological changes, being able to affect the biotransformation and detoxification function of liver.

06A.31 Mercury in Small Characids in the Brazilian Amazon

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Mercury is a global contaminant that mainly affects aquatic organisms. Analyzes of mercury contamination in small fish are generally neglected, as they are not used in the human diet. However, they are fundamental links for understanding the dynamics of mercury biomagnification. Characids Knodus heteresthes (Eigenmann, 1908) and Moenkhausia lepidura (Kner, 1858) were sampled in September and October 2016 in the Teles Pires and Juruena rivers in the Tapajós hydrographic basin, southern Amazonia. Stomach contents were analyzed for composition of the diet. Detection of THg in the samples with the aid of an atomic absorption spectrometer (240FS AAS, Agilent) with steam generation accessory (VGA 77 AA, Agilent) at the Ecotoxicology and Limnology Laboratory of the Center Research in Limnology, Biodiversity and Ethnobiology of the Pantanal (CELBE). In the Teles Pires river, both species were classified as omnivorous with an insectivorous tendency and average mercury concentration of 0.215 µg.g-1, in the Juruena river the insectivorous behavior occurs, with a mercury concentration of 0.131 µg.g-1, with significant differences when comparing both rivers ($t = -2.385$, $p = 0.023$). The concentrations were lower than those established by the World Health Organization for fish used for human consumption, but were considered high, because they are no larger than 5.5 cm, used in the diet of piscivorous birds and potentially piscivorous / carnivorous fish. The higher concentration of mercury in the fish of the Teles Pires River probably occurs due to a history of mining, deforestation and burning in the last decades in the region, and recently the implantation of hydroelectric dams in cascade.

06A.33 Effects of Acute Insecticide Exposures on Pomacea canaliculata

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The fresh water snail, *Pomacea canaliculata*, has particularities that makes it a potential good bioindicator. This species is affected by agrochemicals that can induce physiological and histopathological changes that have the potential to be characterized and could be used as biomarkers of freshwater contamination. In this study we a) identify the LC50 and $NOEC_L$ at 48 hours of exposure to the insecticides Deltamethrin (Decis forte® 10.5%), Chlorfenapir (Onfire® 24%) and Lambdacialothrin (Rafter® 5%); b) evaluate changes in the activity of antioxidant enzymes in the digestive gland after an acute exposure to $NOEC_L$ of these compounds, c) characterize whether exposure to these insecticides induces histological alterations in the digestive gland or in the presence of a symbiotic cyanobacterium that lives there. Adult animals (4 and 5 months) of both sexes cultured under laboratory conditions were used. Exposures of 48 hours to $NOEC_L$ doses were carried out in four experimental groups from which tissues samples were taken for protein extraction, evaluation of superoxide dismutase (SOD) and catalase (CAT) activities and for histological processing and subsequent morphometric analysis (Image ProPlus®), respectively. LC50 (48h) and $NOEC_L$ (48h) for Deltamethrin were 0.88 and 1.22 µg/mL, for Chlorfenapir were 2.85 and 1.00 µg/mL and for Lambdacialothrin 0.74 and 0.67 µg/mL. Acute exposure to insecticides produced a significant increase in SOD activity and also a significant decrease in CAT activity in Deltamethrin exposed animals (ANOVA I, Tukey post test). Likewise, the occupation of the glandular acini by symbiotic cyanobacteria was significantly decreased also in animals exposed to Deltamethrin (ANOVA I, Tukey post test). These results open the possibility of using *P. canaliculata* anatomical-physiological parameters as biomarkers of water contamination by insecticidal

agrochemicals like Deltamethrin, and future studies evaluating the activity of other antioxidant enzymes and morphological alterations in other tissues will complete their characterization.

06A.34 Mortality, Immobility and Biochemical Acute Effects of Thiacloprid on Two Populations of Hyalella Curvispina Amphipods From North Patagonia Argentina

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Thiacloprid (TCP) is a neonicotinoid insecticide widely used in the Valley of Río Negro River as pest control for fruit production. The aim of this study was to evaluate TCP acute effects in two different populations of the amphipod *Hyallela curvispina*, from a pristine site (LB) and an agricultural one (FO) located in North Patagonia Argentina. Both populations have shown differences in susceptibility to anticholinesterasic insecticides in previous studies. Amphipods from LB and FO were exposed to increasing concentrations (0-100 mg/L) of TCP (Calypso ®, Bayer), lethality and immobility were measured every 24 h for four days and 96 h LC50 and EC50 values were determined. In addition, amphipods were exposed to sublethal and lethal concentrations of TCP (LB: 0.02-2, FO: 0.02-100 mg/L), and enzymatic activity of glutathione-S-transferase (GST) and carboxylesterase (CE), and reduced glutathione content (GSH) were measured spectrophotometrically in surviving individuals at 48 and 96 h. TCP 96h-LC50 for LB was 0.42 (0.21-0.78) mg/L, while for FO it was 44.2 (15.6-134.8) mg/L, two orders of magnitude higher. Immobility 96h-EC50 value for LB was 0.14 (0.07-0.23) mg/L, and for FO, 0.14 (0.06-0.26) mg/L. GST activity in LB was not significantly affected by TCP. In FO it showed a tendency to increase at 2 mg/L and a significant increase with 20 and 100 mg/L (50 and 60% vs. control), and after 96 h with 0.2 and 2 mg/L (42 and 35%). There were no significant differences in CE activity in LB after 48 h, while all tested concentrations decreased after 96 h (48, 53 and 51%, respectively). CE activity increased in FO after 48 h exposure to 0.2; 2 and 100 mg/L TCP (28, 93 and 57 %, respectively) while no significant differences with controls were observed after 96 h. No significant differences were found in GSH content between exposed and control amphipods from both populations. Higher LC50 levels in FO compared to LB could be a sign of tolerance to TCP due to a history of use in this agricultural frame. However, both populations showed the same immobility response, which would most likely hinder the chances of survival in the wild. This highlights the importance of immobility as a biomarker of effect. The increase in GST and CE activities, even at sublethal concentrations, could be linked to a protective response in FO amphipods. The results obtained in this study constitute further evidence of the impact from continued neonicotinoid applications on autochthonous species.

06A.35 Global Warming and Cyanotoxins Effects in Neotropical Female Catfish: A Proteomic Approach

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Water has become one of the resources most affected by anthropic activities. The aquatic environment's eutrophication, together with the temperature rise due to the greenhouse gases, make potentially toxic cyanobacterial blooms more frequent and intensely. *Raphidiopsis raciborskii* is a cyanobacterium, whose strains in the Southern hemisphere produce neurotoxins called saxitoxins. This study aimed to evaluate how female Neotropical catfish respond to temperature rise and exposure to cyanotoxins produced by *R. raciborskii* (T3 strain), using a proteomic approach. *Rhamdia quelen* juvenile females were exposed to four treatments, based on literature: control at 25 °C (C25), control at 30 °C (C30), crude extract equivalent to 100000 cells/ml of *R. raciborskii* at 25 °C (STX25) and crude extract equivalent to 100000 cells/ml at 30 °C (STX30). After 96 hours, the animals were anesthetized and, after euthanasia, the liver, an important metabolism tissue, was collected for proteomic analysis. The proteins were extracted and the samples were analyzed at LC/MC. Three comparisons were conducted, using online software and databases (e.g. MetaboAnalyst, Gene Ontology and KEGG): C25 x STX25, to evaluate the cyanobacterial bloom in the current scenario; C30 x STX30, to evaluate cyanobacteria bloom in a global warming scenario; and STX25 x STX30 to assess the difference between temperatures. At 25°C, cyanotoxin was able to decrease the abundance of 53 proteins and increase of 6, which belong to 79 biological different pathways. At 30°C, cyanotoxin was able to decrease the abundance of 14 proteins and increase of 25, which belong to 48 pathways. The STX25 x STX30 comparison results in a decrease of 22 proteins and an increase of 58, which belong to 74 pathways. It was observed that saxitoxin can alter proteins related to reproduction, carbon metabolism, amino acids biosynthesis, apoptosis and necroptosis, regardless of temperature. However, the temperature rises to 30 °C can alter proteins related to different pathways, such as: arginine biosynthesis, phenylanine metabolism, phagosome and RNA degradation. These data demonstrate the effects range that saxitoxins can cause in non-target tissue and how the temperature rise can increase or decrease different proteins abundance in female fish exposed to saxitoxins, resulting in different effects on fish.

06A.36 Hepatic Transcriptomic Response in Aequidens Metae to Polycyclic Aromatic Hydrocarbons (PAH)

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Aquatic systems receive Polycyclic aromatic hydrocarbons (PAH) through atmospheric deposition and direct runoff release, being fish one of the targets with a particular interest because they occupy key positions in aquatic and terrestrial food webs. In fact, exposure to different PAH can generate specific responses in gene expression profiles associated with biotransformation that could be used as biomarkers of exposure to these hydrocarbons. In this regard, RNA sequencing (RNA-seq) has provided insight into response mechanisms in gene expression studies by integrating data on biological effects in response to sublethal PAH exposure in non-model organisms without available genomic information. However, there are no transcriptomic profiling studies in fish in Colombia. Therefore, the objective of the present study was to characterize the hepatic transcriptional response in the non-model fish *Aequidens metae* exposed to polycyclic aromatic hydrocarbons under acute exposure.Liver samples were taken from adult