

with six replicates of the control (C) as well. The microcosm experiment lasted 7 weeks after the copper addition. Abundance of plankton and benthic meiofauna were used as structural indicators. Photosynthesis activity measured as Chl *a* and changes in size spectra evaluated with flow cytometry were used as functional indicators. Both structural and, especially, functional indicators showed an effect of copper pulse on wetland communities. The H treatment caused the most dramatic effect, preventing recover capacity. During the experimental period, a recovery in phytoplankton was detected in both treatments, but in the L ones the recovery was faster. This study works towards a deeper understanding of the agrochemicals effects and recovery capacity of wetlands communities. Such knowledge is useful to ensure adequate regulation limits for achieving a balance between development and conservation.

T1-P89 Recente colapso das escombrelas das minas do Portelo (NE Portugal) e impactos potenciais nos ecossistemas aquáticos

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Em Janeiro de 2010 uma grande parte dos materiais armazenados nas escombrelas da mina do Portelo foi arrastada para a ribeira do Portelo. O objectivo do presente estudo foi avaliar o processo de recuperação da ribeira afectada por este acontecimento. Amostras de água e de macroinvertebrados foram recolhidas mensalmente entre Janeiro e Julho de 2010 em 4 locais de amostragem: um local não influenciado pela entrada de inertes (controlo) e os outros 3 localizados a 250 m, a 5 e a 15 km da mina. Foram determinados diversos parâmetros físico-químicos, tais como o pH, a condutividade, o oxigénio dissolvido, a matéria particulada em suspensão e diversos metais por ICP-MS e amostradas as comunidades de macroinvertebrados. As águas recolhidas nos 2 pontos mais próximos da mina apresentavam valores de pH baixos (= 4) e toxicidade potencial devido às elevadas concentrações de Cu. Nestes locais os macroinvertebrados estavam ausentes. No ponto mais afastado da mina não foram detectados sinais de perturbação. Uma vez que não foram implementadas medidas de mitigação é possível que continuem a ocorrer entradas de água da mina e de sedimentos na ribeira do Portelo de forma contínua, podendo acentuar-se nos períodos em que ocorram fortes chuvadas. O presente trabalho pretende alertar para o facto deste tipo de contaminação poder ter impactos não só nos sistemas aquáticos do Parque Natural de Montesinho, mas também noutros ecossistemas com elevado valor ambiental e económico.

T1-P128 Enzymatic analysis of *Chironomus sancticaroli* (Diptera: Chironomidae) exposed to organophosphate

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Organophosphate compounds are used by humans in agro-systems and programs to control vectors of pathogens. Because they are consistently applied, these compounds can reach water bodies affecting aquatic biota. The aim of this study was to evaluate the effects of acute and chronic exposure of the species *Chironomus sancticaroli* to the organophosphate insecticide malathion through the use of three biochemical biomarkers: the activities of acetylcholinesterase (AChE);

alpha esterase (EST- α) and beta esterase (EST- β). The organisms were from a colony of the Laboratory of Medical and Veterinary Entomology, Federal University of Paraná (UFPR). They were maintained at room temperature ($25 \pm 2^\circ\text{C}$), controlled photoperiod (12h light/12h dark) and humidity ($80 \pm 10\%$). Five acute bioassays (96 h) were conducted with 5 insecticide concentrations (0.1, 0.251, 1.37, 1.96 and $2.51 \mu\text{g L}^{-1}$) and 2 chronic bioassays (6 days) with 2 concentrations (0.1 and $0.251 \mu\text{g L}^{-1}$). Solvent controls with alcohol were maintained for each test. We analyzed 50 larvae per concentration for each measured enzyme, totaling 1,350 larvae. The activities of AChE, EST- α and EST- β decreased by both acute and chronic exposure at all concentrations. In acute exposure AChE, EST- α and EST- β were significantly reduced by respectively 66, 40 and 37% in the concentration of $0.251 \mu\text{g L}^{-1}$ and more than 80% in the concentrations of 1.37, 1.96 and $2.51 \mu\text{g L}^{-1}$. In chronic exposure AChE and EST- α activities were significantly reduced by respectively 28 and 15% in the concentration of $0.251 \mu\text{g L}^{-1}$. Our findings show that low concentrations of malathion can change the metabolism of individual larvae, indicating high toxicity and environmental risk of this compound for the species.

T1-P135 Deleterious effects in liver and gills of *Oncorhynchus mykiss* after acetaminophen chronic exposure

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The growing presence of pharmaceutical drugs in nature can cause oxidative stress in several non-target species, which could be used as a proxy of adverse effects in contaminated aquatic ecosystems. Acetaminophen is widely used in human medicine as an analgesic and antipyretic drug and it is one of the most sold non-prescription drugs. In some European countries, values up to $6 \mu\text{g L}^{-1}$ of acetaminophen can be found in water from sewage treatment plants. Such high values cause concern due to the adverse effects on non-target species and potential ecological consequences in aquatic ecosystems. This study aims to test the effect of acetaminophen (N-acetyl-p-aminophenol) in *Oncorhynchus mykiss*. Thus, individuals of rainbow trout were chronically exposed (28 days) to the drug in order to evaluate enzymatic and histological damages. The experiment was carried out under laboratory-controlled conditions, and involved one control (unexposed) group, and 3 different acetaminophen concentrations (12.5, 25 and $50 \mu\text{g L}^{-1}$). A total of 15 animals were used in each concentration, with 5 animals in 3 replicates per concentration. After the exposure period, the animals were ice-cold sacrificed and a portion of liver and gills were removed for histological and enzymatic analysis. A qualitative and semi-qualitative evaluation of the liver and gills architecture were performed. Gills morphometry was also quantified. The enzymatic biomarkers quantified were: lipoperoxidation (TBARS), glutathione S-transferases (GSTs), glutathione reductase (GRed), glutathione peroxidase (GPx) and Catalase (Cat). Data show increasing levels of oxidative stress and histological changes in organs, gills and livers of *O. mykiss*, suggesting a dose-dependent relationship with the acetaminophen content in water.