

niveles de concentración que van desde 17.5 a 232 µg/g de peso lipídico (lw). Se observó la presencia de 4 OPFRs, TEP, TPP, DCP y 2IPDPDP, siendo el TEP el compuesto con mayor frecuencia de detección, y el 2IPDPDP el que presenta mayores niveles de contaminación.

WP060 Chronic exposure to manganese and neurotoxicity in welder informal workers population in Colombia

N. Cepeda Ortega, Universidad de Cartagena / bolivar; F. Vergara Murillo, Cartagena University / Exact and natural sciences School; B. Johnson-Restrepo, University of Cartagena / School of Exact and Natural Sciences

Introduction. Manganese is used in the steel industry, manufacture of dry batteries, ferromanganese alloys as well as an additive to gasoline to boost octane engines. Additionally it can be found in pesticides and fungicides. Currently, exposure to manganese occurs primarily through occupational sites in the steel industry and welding activities. These exposures are often chronic and vary occurring reduction on healthy workforce. Manganese is neurotoxic for chronic exposure that causes damage specifically at the level of the basal ganglia in humans, the phenotype associated with neurotoxicity first described in two workers occupationally exposed to Mn. The aim of this study is to establish the association between levels of Mn and development of neurological symptoms in a population of informal welders highly exposed to welding fumes on the Colombian Caribbean. **Method.** One of the most important biomarkers to establish manganese exposure is to measure manganese in blood (MnB). In this study the MnB was determined using atomic absorption spectrophotometry (AAS) couple to Zeeman correction graphite furnace (GF-AAS), Thermo Scientific iCE 3500. The sample was taken in 89 randomly informal welders using an informed consent from applied by Environmental Chemistry Research Group of University of Cartagena. It was reading to the workers, and later filled out and signed prior to collect the blood samples. After this was continued to perform the analysis of the sample in the laboratory, initially a protocol for determining manganese in whole blood which were used for samples, reagents magnesium nitrate $Mg(NO_3)_2$ as a matrix modifier, Triton and 10% HNO_3 2% and 100 µL of blood. The Certificated standards used were the CRM 12 and 12 14, and 15 which were produced by Wadsworth Center, New York State Department of Health, Trace Elements Laboratory. **Results and Discussion.** In the sample of 89 patients, 12% of the population was found with elevated concentrations of manganese (>14 µg/L, the maximum limit in human). In addition, these population have high triglyceride levels (28%), high cholesterol (18%), and a considerable hyperglycemia (9%). **Conclusions.** Workers that were exposure to welder fumes with high concentrations of MnB were found with neurotoxic symptoms which including often headache, muscular stiffness, and nervousness.

WP061 Mercury in Swamp fish impacted by gold mining in Atrato River, Choco-Colombia

Y. Murillo, Institute of Environmental Investigations of the Pacific / Ecosystem component; Y. Palacios-Torres, Technological University of Chocó / Environmental Toxicology and Natural Recourses Group. School of Natural Sciences; M. Celis, Amazonas University / School Basic Sciences; J. Olivero-Verbel, University of Cartagena / Environmental and Computational Chemistry Group. School of Pharmaceutical Sciences.; C. Lasso, School of Natural Sciences, Nacional University
The Anthropogenic activities are the main sources of mercury

contamination (Hg). The exposure of ichthyofauna to Hg represents a risk to health. The objective of this research was to assess the patterns of mercury accumulation in impacted swamps ecosystems by gold mining. Four species from different trophic guilds were evaluated Hg level by cold vapor Atom Absorption Spectrometry using a Buck Scientific 410 Mercury Analyzer. High Hg averages were revealed in carnivorous species and decreased to detritivores ones. The average overall concentration of Hg was 0.31 ± 0.02 µg/g with ranges (0.02-1.5 µg/g). The highest Hg contents were exhibited in *Hoplias malabaricus* (0.53 ± 0.38 µg/g, ranges 0.11-1.50 µg/g) and the lowest in *Prochilodus magdalenae* (0.05 ± 0.01 µg/g, ranges 0.02-0.08 µg/g). Differences between species were found according to weight - guild ($p < 0.0001$), and sites - guild ($p < 0.0001$). 26% of the samples were below than the permissible limit according to the World Health Organization (WHO) (0.5 µg/g). In particular, the pollution rates in swamps in the middle and down basin of the Atrato river are attributed to the distance with respect to the operations of the mining processes.

WP062 TOXICITY ASSESSMENT OF CAFFEINE, FLUOXETINE AND THEIR MIXTURE ON *Daphnia similis*: ACUTE AND CRONIC EFFECTS

N. Fonseca Boiani, IPEN-CNEN/SP / CTR; T.T. Silva, IPEN Instituto de Pesquisas Energéticas e Nucleares / Centro de Tecnologia das Radiações; S.I. Borrelly, Instituto de Pesquisas Energéticas e Nucleares / Centro de Tecnologia das Radiações
Emerging pollutants have already become a global problem, and they have been detected in dozens of countries, including Brazil. Even at very low concentrations, most of the emerging compounds are able to induce changes into biochemical system of aquatic organisms and they have also been reported as negative products to human health. Pharmaceuticals are considered as emerging contaminants detected in estuarine environment, in wastewater treatment facilities, lakes and rivers and even in sea waters. Generally the pharmaceuticals are detected among many other compounds into the ecosystem. The interaction of mixtures of contaminants is an important issue to be considered in monitoring programs as well as the negative effect to aquatic biota. The aim of the present paper was the assessment of toxic effects of pharmaceuticals exposed to *Daphnia similis* crustacean, individual and combined mixture of caffeine and fluoxetine. Caffeine (CAF) is a stimulant with cardiac, cerebral, diuretic and respiratory effects while Fluoxetine (FLX) is a selective serotonin re-uptake inhibitor, widely prescribed as antidepressant, (also known as Prozac®). The juveniles of *D. similis* were exposed separately to both caffeine (100mg/L) and to fluoxetine (20mg/L), and to a mixture of both (50mg/L caffeine and 20mg/L fluoxetine). Several experimental trials of acute immobilization test were performed. EC50 values ranged from 29,7 to 31 mg/L⁻¹ for caffeine, and from 1.0 to 1.4 mg/L⁻¹ for fluoxetine. Antagonistic effects of binary mixtures (EC50 = 15.2%) were observed. A chronic reproduction test was performed for the mixture of pharmaceuticals. We observed effects on *D. similis* survival, after 5 days. The mixture led to decrease of 72% in the reproduction, in maximum concentration (2.5% of the mixture – CAF 50ppm + FLX 20ppm). Concerning the importance of assessing toxicity the elected pharmaceuticals concentration were higher than those detected in the environment. These results may be incorporated into risk assessments analysis in order to protect sensitive aquatic ecosystems more effectively.

WP063 ¿Existen oportunidades para el desarrollo de la química