A | R | T
APPLIED RESEARCH IN TOXICOLOGY

ISSN: 2359-4721
Volume 2 / Suppl. 1 / 2017

ISTA18-902661 - BLYES AND FET: A PRELIMINARY UNDERSTANDING BETWEEN EFFECTS AND TOTAL ESTROGENIC ACTIVITY ON SURFACE WATERS

G A MARTINI[1], W VIVEIROS[2], G QUINAGLIA[2], M L FERREIRA[3], S O ROGERO[1], J R ROGERO[1]

[1]Instituto de Pesquisas Energéticas e Nucleares, Centro de Química e Meio Ambiente, Universidade de São Paulo – USP, Brasil # [2]Companhia Ambiental do Estado de São Paulo – CETESB, São Paulo, Brasil # [3]Instituto Butantan, Laboratório de Toxinologia Aplicada – LETA, São Paulo, Brasil

Endocrine disrupting chemicals (EDCs) are included in a range of substances and are present in practically all environmental matrices, generally at low concentrations. For the occurrence evaluation of these substances, several in vitro tests are employed, among of them Bioluminescent Yeast Estrogen Screening (BLYES), which measures the total estrogenic activity in EEQ. However, this assay is not able to provide information about adverse effects to aquatic organisms. In order to observe aquatic communities effects, organic extracts of surface water samples from rivers and reservoirs of São Paulo state with results above the detection limit in BLYES (> 0.1 EEQ) were performed with embryonic assays with Danio rerio. The methodology was conducted according OECD 236, to verify acute effects such as: absence of heart beats, absence of somites, no tail detachment and coagulated embryo. Embryonic malformations were evaluated, such as: reduction of organism size, cardiac and vitelline edema, spine curvature and reduction of heart beating, which are characteristics of chronic effects. Among the 21 tested samples, 24% showed acute effects for Danio rerio and 14%, chronic effects. The effects observed probably would be associated with EDCs and/or other contaminants that may bind to the receptor in BLYES assay. The information obtained by embryonic assay with Danio rerio was suitable to show the effects of these groups of contaminants of the organic extracts and would complement the BLYES response. Accomplishing tests to evaluate effects on embryo reproductive system to establish a correlation between estrogenic activity and acute and chronic effects observed on FET is necessary.

ISTA18-923494 - CASE STUDY: APPLICATION OF THE TIE (TOXICITY IDENTIFICATION EVALUATIONS) METHODOLOGY IN THE ENVIRONMENTAL DIAGNOSIS OF GROUNDWATER CONTAMINATED BY PESTICIDES

A L CANALE, A YOSHINARI, F B Q GIMENES, N BRANDSCH

Geoklock Consultoria e Engenharia Ambiental Ltda. (andre.canale@geoklock.com.br, andreia.yoshinari@geoklock.com.br, filipe.gimenes@geoklock.com.br, norbert.brandsch@geoklock.com.br)

The TIE methodology (USEPA 1991, 1993), developed for liquid effluents, can be applied to other types of aqueous samples. In this study it was used to assist in the environmental diagnosis of a former industrial area contaminated by a mixture of compounds, mainly pesticides, in order to identify the chemical substances that cause toxicity to the groundwater and to give direction to the analytical scope of the next steps. The study was conducted according to the procedures defined in Phases I and II of TIE. In Phase I, groundwater samples were submitted to acute toxicity tests for Ceriodaphnia dubia, with an exposure of 5 organisms per concentration and duration of 48 hours. New tests were conducted in the toxic samples, preceded by treatments aiming the fractionation and removal of non-polar organic substances, metals, ammonia, etc. In Phase II, the treatments with better results to reduce toxicity were repeated and the extracts were analyzed with gas and liquid chromatography. From a total of 30 samples submitted to Phase I, 11 presented some degree of toxicity and were selected for toxicity reduction treatments. The solid phase extraction by the C18 column showed the best results. Repeating this Phase II treatment, with methanol and water, allowed the distinction of metals from non-polar organic compounds. The chemical analyses of the methanolic extracts revealed the presence of pesticides associated to the processes of the former industrial unit. The application of this methodology was efficient, since it allowed to delineate the main zones of contamination and to guide the direct investigations and analytical scope.