403/D

Use of biliary fluorescence metabolites in Nile tilapia (*Oreochromis niloticus*) as a biomarker for monitoring of polycyclic aromatic hydrocarbon contaminations in two selected water bodies in Sri Lanka

C.K.Hemachandra[1], A.Pathiratne[1*] and K. A.S.Pathiratne[2]
[1] *Department of Zoology, Faculty of Science, University of Kelaniya, Kelaniya*
[2] *Department of Chemistry, Faculty of Science, University of Kelaniya, Kelaniya*

Polycyclic aromatic hydrocarbons (PAHs) are a group of ubiquitous organic pollutants mainly derived from petrogenic and pyrogenic sources. They occur in aquatic ecosystems especially in water bodies near industrialized and densely populated areas. PAHs have recently received increased attention in pollution studies as some PAHs are highly carcinogenic and mutagenic to vertebrates including fish and humans. Measurement of biliary fluorescent metabolites in fish is a promising biomarker for assessment of recent exposure of fish to PAH. The objective of the present study was to assess the PAH contaminations in two selected water bodies in Sri Lanka *viz*. Bolgoda North Lake (an urban water body) and Bathalagoda reservoir (a non-urban water body) using biliary fluorescent metabolites in feral Nile tilapia (*Oreochromis niloticus*). Fish were sampled from water bodies during the period September 2007 to May 2009 and biliary fluorescence metabolites were measured using synchronous fluorescence spectroscopy and fixed wavelength fluorescence following standard procedures. The results showed temporal and site specific variations in the fluorescent metabolite pattern in the fish during the study period. Biliary fluorescence was significantly higher in fish inhabiting selected sampling sites in Bolgoda Lake compared to those in Bathalagoda reservoir with respect to naphthalene type (up to 5 fold), phenanthrene type (up to 38 fold), pyrene type (up to 17 fold) and benzo(a)pyrene type metabolites (up to 44 fold). Highest levels of PAH metabolites were detected in fish inhabiting Aththidiya area of the Bolgoda North Lake. Analysis of fluorescent metabolite patterns revealed that the fish from Aththidiya site of Bolgoda North Lake had been exposed to relatively high levels of petrogenic and pyrogenic PAHs compared to the fish collected from non-urban Bathalagoda reservoir. Hence, biliary fluorescent metabolite measurements in fish is a cost effective and simple technique for biomonitoring PAH pollution in aquatic ecosystems in Sri Lanka.

Acknowledgement: Financial assistance by National Research Council Research grant No 05-24 and National Science Foundation research grant No. RG/2006/EB/07.is acknowledged.

Keywords: PAHs, bile fluorescence, biomonitoring pollution, tilapia, biomarker