

### **3.3 Evaluation of the Potential of Selected Polycyclic Aromatic Hydrocarbons in Inducing Xenobiotic Biotransformation Enzymes in Nile Tilapia**

C. K. Hemachandra<sup>1</sup>, A. Pathiratne<sup>1</sup> and K. A. S. Pathiratne<sup>2</sup>

<sup>1</sup>Department of Zoology, University of Kelaniya, Kelaniya

<sup>2</sup>Department of Chemistry, University of Kelaniya, Kelaniya

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#### **ABSTRACT**

Polycyclic Aromatic Hydrocarbons (PAHs) are ubiquitous contaminants of much ecotoxicological concern in the aquatic ecosystems. They can be biotransformed in fish liver by the phase I CYP1A1 dependent activation enzymes such as 7-ethoxyresorufin-O-deethylase (EROD) and the phase II detoxification enzyme, Glutathione S-transferase (GST). The present study was carried out to evaluate the potential of selected PAHs in the natural environment in inducing hepatic xenobiotic biotransformation enzymes viz. EROD and GST in Nile tilapia, a widely distributed food fish in freshwater ecosystems. The fish (n = 5-6) were treated with naphthalene (20 µg/g) or phenanthrene (20 and 40 µg/g) or fluoranthene (1, 5, and 20 µg/g) or corn oil alone as the carrier (controls) and enzyme activities were determined at 1 day and 3 days after the treatment using standard methods. The results showed that the EROD activity of the fish was not affected significantly by the treatment of fish with 1 µg/g fluoranthene. However all the other PAH treatments significantly depressed the EROD activity of the fish in comparison to the controls. Hepatic GST activity of the fish was significantly increased (up to 2 folds) by the PAH treatments in a dose dependent manner. Liver somatic index of the fish was not affected by the PAH treatments. The results revealed that naphthalene, phenanthrene and fluoranthene lack the inducing ability of hepatic EROD which could produce damaging side effects through the formation of reactive intermediates that could bind covalently with cellular DNA, RNA and proteins.