(101)

Levels of Naphthalene and Phenanthrene Concentrations in Meandering Part of the Kelani River Basin, Sri Lanka

Adhikari, P.A.A.S.[1], Bandara, K.R.V.[1,2], Manage, P.M.[*1,2]

[1]Center for Water quality and Algae Research, Department of Zoology, University of Sri Jayawardenapura , Nugegoda, Sri Lanka
[2]Faculty of Graduate Studies, University of Sri Jayewardenepura, Nugegoda, Sri Lanka
**Pathmalal@sjp.ac.lk*

Abstract

Polycyclic Aromatic Hydrocarbons (PAHs) are diverse and ubiquitous organic pollutants which daily leach into the water bodies. Naphthalene (NAP) and Phenanthrene (PHE) are recognized as priority pollutants by the United States Environmental Protection Agency. The present study was carried out to evaluate the levels of NAP and PHE in water and biological samples collected from the meandering part of the Kelani River basin. Water fish samples were samples collected from 13 distinct locations (n=3 each) within two seasons, along the selected area underwent High-Performance Liquid Chromatography analysis, followed by rotary evaporation, organic solvent extraction and filtration. The results of the study provide valuable insights into the water quality of the studied area, indicating variations in NAP and PHE contamination. The concentrations of NAP in water ranging from 2.499-8.414 (mg/L) in wet season and 0.005-9.658 (mg/L) in dry season, where PHE concentrations vary from undetectable to 0.248 (mg/L) during the wet season and undetectable to 0.329 (mg/L) in dry season. The highest PHE concentration in water was recorded in Mattakkuliya in both seasons (wet-5.36±0.55(mg/L), dry 0.284±0.045 (mg/L). However, PHE was not detected in Talduwa, Kudagama, Kelaniya and Ambathale locations. Paliyagoda was heavily polluted, having the highest NAP concentrations in both seasons (wet-8.420±0.006 (mg/L), dry-9.648±0.010 (mg/L). The high concentrations of PAHs might be due to high oil and grease content caused by infrequent oil and sludge spills from nearby industries and tributary inflows. Since NAP has a higher solubility in water, the concentration of NAP in both water and fish samples was higher than that of PHE. This study provides valuable information for EIA programs and contributes to developing effective strategies to mitigate PAH pollution in the meandering part of the Kelani River.

Keywords: *Polycyclic Aromatic Hydrocarbons, Naphthalene, Phenanthrene, HPLC, Kelani River basin*