

Occurrence of Polycyclic Aromatic Hydrocarbons (Pahs) in Beached Plastic Pellets from Mumbai Coast, India**Jayasiri H.B.^{1*}, Purushothaman C.S.² and Vennila A.²**¹*National Aquatic Resources, Research and Development Agency, Mattakkuliya, Sri Lanka*²*Central Institute of Fisheries Education, India*^{*}*hjayasiri@yahoo.com***Abstract**

PAHs are a class of ubiquitous pollutants that are found in polluted marine areas which consist of two or more fused benzene rings in various arrangements. There are over 100 different PAH compounds. A number of PAH compounds are known carcinogens and bioaccumulate and biomagnify. These compounds originate naturally as well as anthropogenically through oil spills, incineration of waste and combustion of fossil fuels and wood. Plastic pellets (small granules 1-5 mm in diameter) are the raw material used for the production of many different plastic products. The environmental consequence of these organic polymers is the sorption organic pollutants on their surface from the sea surface microlayer (SML) where the hydrophobic contaminants are known to be enriched. The plastic pellets were collected along the recent high tide line from four beaches of Mumbai coast bimonthly during May 2011 - March 2012. A total of 72 pools of plastic pellets were extracted, fractionated and analysed by Gas Chromatograph coupled to a mass spectrometer to evaluate the extent and sources of 16 polycyclic aromatic hydrocarbons (PAHs) of the priority list of the U.S. Environmental Protection Agency (EPA) The mean Σ PAH concentration in pellets was 9202.30 ± 114.89 ng g⁻¹ with a wide range (35.4-46191.58 ng g⁻¹). The concentration of fluorene was found to be the highest (1606.30 ± 251.54 ng g⁻¹) followed by anthracene, chrysene and phenanthrene. The Σ PAH concentration was significantly varied among months and there was no significant difference among sites at $p=0.05$. The 2-3 aromatic ring compounds accounted for 60% of the total PAHs in pellets of Mumbai coast while 4 rings and 5-6 rings compounds accounted for 26 and 14%, respectively. The ratio of low and high molecular weight PAHs indicated that the contamination by petrogenic sources was predominant over the pyrogenic ones in plastic pellets suggesting oil pollution in coastal area of Mumbai.

Keywords: Plastic pellets, PAHs, Mumbai