Seasonal Variation of Selected Heavy Metals in Water and Tissues of the Grey Mullet (*Mugil cephalus)* Species from the Negombo Estuary.

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Abstract

Heavy metal pollution is of particular concern as they have deleterious effects on biota through mobilization and accumulation in various tropic levels. Industrial pollution and domestic solid waste dumping are considered as the major pollution sources of the Negombo estuary. Based on the pollution inputs into the estuary, it is considered that different localities within the estuary are polluted at different rates. The objectives of this study were to assess the seasonal variations (rainy and non rainy periods) and levels of water and fish tissues in selected sites. Four sampling sites were selected along the estuary. Sampling sites during the one year study period from January to December 2014. The levels of Hg metals were analyzed by cold vapor atomic absorption spectrophotometer whereas the other metals were analyzed by flame furnace atomic absorption spectrophotometer.

The results revealed that the average concentration of metals Pb, Cd and Hg in water were 0.01 to 0.005 ppm, 0.0 to 0.01 ppm and 0 to 0.013 ppm respectively. The detected average concentration of mercury in water was above the maximum permissible limits of the proposed tolerance limits for the discharge of industrial wastewater quality standards for Central Environmental Authority, 2001 in Sri Lanka. This study revealed that the concentrations (mg/kg) of metals in the fish tissues were Pb,0 to 0.3, Cd, 0.35 to 1.104, and Hg, 0.0005 to 0.05 mg/kg respectively. According to the mean concentration of Pb and Hg metal levels in fish were much below these international standard limits. Significant differences ($P<0.05$) were observed for of Pb and Hg depend on fish tissues. Significant seasonal differences ($P<0.05$) were observed for all metals in water. North region of the estuary, the levels of heavy metals in water and fish tissue levels were higher due to the discharge of industrial effluents and domestic solid waste into the estuary.The seasonality in the heavy metal levels of water and fish tissue were observed with a peak periods from May and June to October and November, which apparently coincided with the South West monsoon and the onset of second inter monsoon of the island respectively.

Keywords: Heavy metals, Seasonal variations, Water, Fish tissues