

## Heavy metal pollution in water and their effect on *Mugil cephalus* fish tissues at Negombo Estuary

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Heavy metal pollution in aquatic environment has become major concern as a result of their non-biodegradable nature, long biological half-life and their potential to accumulate in different body parts of organism. The objective of this study was to determine the levels of selected five heavy metals viz, lead (Pb), cadmium (Cd), mercury (Hg), copper (Cu) and zinc (Zn) in water and fish tissues. The *Mugil cephalus* fish samples and water samples (n=60) were collected from Negombo Estuary at five sampling sites namely, Pitipana, Thaladuwa, Munnakkaraya, Katunayake, and Dandugam oya during the period from January to December 2016. The heavy metal concentrations in fish tissues and water were analyzed employing standard methods. The concentration of the metals in water were fluctuated within a range Pb,  $12.1 \pm 0.23$  to  $70.4 \pm 13.0$ ; Cd,  $4.5 \pm 0.28$  to  $13.2 \pm 0.04$ ; Hg,  $2.0 \pm 0.01$  to  $5.0 \pm 0.29$ ; Cu,  $13.3 \pm 0.5$  to  $22.6 \pm 0.8$  and Zn  $360.2 \pm 98.3$  to  $460.1 \pm 132.0$   $\mu\text{g L}^{-1}$ . The results revealed that the concentration of metals ( $\text{mg kg}^{-1}$ ) Pb, Cd, Hg, Cu and Zn in fish tissues were  $0.045 \pm 0.003$  to  $0.071 \pm 0.002$ ;  $0.035 \pm 0.001$  to  $0.04 \pm 0.004$ ;  $0.24 \pm 0.02$  to  $0.41 \pm 0.06$ ;  $0.35 \pm 0.05$  to  $0.378 \pm 0.06$  and  $3.32 \pm 0.32$  to  $5.82 \pm 0.54$ . It was observed that the concentrations of Pb, Cd, Hg, Cu and Zn in water were below the proposed tolerance limits for the discharges of industrial wastewater quality standards of Central Environmental Authority of Sri Lanka. Further, the concentration of Pb and Hg levels in fish tissues were exceeded the maximum recommended levels in food for human consumption specified by European Union standards limits. Hence, the Pb and Hg in *Mugil cephalus* fish tissue were comparatively high in Thaladuwa and Munnakkaraya sites and *Mugil cephalus* not suitable for safe human consumption.

Keywords: Heavy metals, *Mugil cephalus*, Negombo Estuary

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