

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

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## Abstract

The *Mugil cephalus* fish samples and water samples were collected from Negombo estuary at five selected sampling sites namely, Pitipana, Thaladuwa, Munnakkaraya, Katunayake, and Dandugam oya sampling sites during the one year study period from January to December 2016. 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 the heavy metal content in the fish tissues. The concentrations of levels in fish tissues and water, heavy metals were analyzed employing standard methods. The concentration ( $\mu\text{gL}^{-1}$ ) of the metals in water 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  $460.1 \pm 132.0 \mu\text{L}^{-1}$ . The results revealed that the concentration of metals ( $\text{mgkg}^{-1}$ ) 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  $5.82 \pm 0.54$  respectively. It was observed that the concentrations of Pb, Cd, Hg, Cu and Zn in water were below the proposed tolerance limits for the discharge of industrial wastewater quality standards of Central Environmental Authority of Sri Lanka. Results revealed that 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 Thaladuwa and Munnakkaraya sites were showed highest values indicated that discharge of sewage and dumping of solid waste from households and other anthropogenic activities and accelerating sedimentation as well as accumulation. The results indicated that the levels of toxic heavy metals, Pb and Hg in fish tissue were comparatively high in Thaladuwa and Munnakkaraya sites samples and were not safe for human consumption.

**Key words; Negombo estuary, *Mugil cephalus*, Heavy metals, Anthropogenic activities**

