(147)

Determination of Heavy Metals in *Etroplus suratensis* from Koggala Lagoon in Southern, Sri Lanka

Abeysooriya A.P.S.W.[1]*, Wijesinghe R.D.N.[1], Bandara E.G.K.Y.C.[1], Sanjaya H.L.K.[2]

[1]Department of Fisheries and Aquaculture, University of Ruhuna, Matara, Sri Lanka
[2]Department of Limnology, University of Ruhuna, Matara, Sri Lanka
**sajiniabeysooriya@gmail.com*

Abstract

Fish is one of the best organisms in many scientific studies to evaluate heavy metal pollution and human health hazards as they are well-understood organisms in the aquatic environment. The present study was carried out to examine the level of heavy metals in different tissues of *Etroplus suratensis* (Green chromide) in Koggala lagoon, Sri Lanka. Atomic absorption spectrophotometer (AAS) was used to determine the levels of copper (Cu^{2+}), cadmium (Cd^{+3}), lead (Pb^{+2}), and chromium (Cr^{+3}) ions in the different tissues (skin, liver, gill, and flesh) of fish belonging to three different sizes; small (7.8–10.2) cm, medium (14.1–16.6) cm, and large (19.8–25.2) cm. The number of thirty-six fish were collected from the lagoon randomly. According to available sizes, 12 fish for each size class were used for the analysis. Furthermore, the histological analysis was carried out to identify the changes at the tissue level in the gill and liver of fish in three different size classes. Heavy metal concentrations in fish samples were compared with the standard levels of heavy metals. Heavy metal concentrations in body tissues of three different body sizes of fish were found to be mainly in the order of Cu>Pb>Cr> Cd. The highest concentrations ($P<0.05$) of heavy metals were found in the fish flesh and skin, while the lowest concentrations were found in the gills. The range of heavy metal concentrations (μg g^{-1} dry weight) in body tissue of small size, *E. suratensis* fish were, Cu: 0.0443-0.6210, Cd: 0.0110–0.0214, Pb: Below Detection Level (BDL)-0.46 and Cr: BDL-39.633, Medium size fish were, Cu: 0.0713–0.6210, Cd: 0.0134-0.0170, Pb: BDL-40.906, Cr: 0.0014–0.0500 and large fish were, Cu: 0.0553–0.345, Cd: 0.0110–0.0256, Pb: 0.0204–0.2103 and Cr: 0.0194–0.0773. However, Cd, Cr and Pb concentrations of flesh tissues were under the standard recommended limits referred by the FAO. Through the Cu concentration in flesh, tissues exceeded the standard limits of FAO. It is not considered as a toxic heavy metal. Histological analysis revealed that the deviation of shape of hepatic cells in the liver may due to the exposure to heavy metals in the lagoon. According to the overall result, the bioaccumulation and biomagnification nature of heavy metals, and the consumption of *E. suratensis* in the Koggala lagoon may create health hazards to consumers.

Keywords: Green chromide, Koggala Lagoon, Heavy metals, Histology