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Analysis of Heavy Metal in Macrophytes from Neg0mbo Lagoon, Sri Lanka

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Abstract

Heavy metal contamination poses a serious threat to coastal ecosystems. The comprehension of these metals' effects and how they bioaccumulate via food webs is still insufficient. This research aimed to examine the concentrations of heavy metals (Cu, Zn, Cr, Fe, Cd, and Mn) in four coastal macrophytes (*Halodule pinifolia*, *Chaetomorpha* sp., *Ulva intestinalis*, and *Gracilaria* sp.) collected from the Negombo lagoon, Sri Lanka. A random sampling approach was utilized by using a quadrat (50×50 cm) to collect macrophyte samples from each species across the study area. The samples were collected from January 2023 to June 2023, and twenty samples (n=20) from each species were analyzed. The heavy metals were extracted from macrophyte samples by acid digestion (conc. HNO3 and H2O2) and analyzed by the atomic absorption spectrometer (AAS). The heavy metal concentrations were varied among macrophytes, but their abundance was in the order of Fe>Cu>Zn>Mn. Cd and Cr were not at detectable levels. *Gracilaria* sp. exhibited higher concentrations of Cu, Zn, Fe, and Mn compared to other species (3.05±0.11 mg/L, 5.92±0.51 mg/L, 215.85±6.75 mg/L, and 0.86±0.95 mg/L, respectively). *Chaetomorpha* sp. consisted of Fe; 89.98±47.73 mg/L; Cu; 2.86±0.05 mg/L; Zn; 0.61±0.45 mg/L; and Mn; 0.20±0.21 mg/L. The abundance of metals in *Ulva intestinalis* is 2.80±0.21 mg/L, Zn is 0.18±0.26 mg/L, Fe is 11.01±4.64 mg/L, and Mn is 0.16±0.17 mg/L. The concentrations of metals in *Halodule pinifolia* are Cu (2.78±0.33 mg/L), Zn (0.44±0.08 mg/L), Fe (29.241±12.40 mg/L), and Mn (0.69±0.56 mg/L). This study reveals that bioaccumulation of heavy metals within marine food webs can occur, and further studies are required to evaluate the bioaccumulation of these metals in marine food webs resulting from macrophyte consumption.

***Keywords**:* AAS, Heavy metals, Macrophytes, Negombo lagoon

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