

SEASONAL VARIATIONS AND DISTRIBUTION OF TRACE METALS IN THE SURFACE SEDIMENTS OF GORAI CREEK, WESTERN COASTLINE, MUMBAI, INDIA

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Abstract

The study was conducted to learn the congregation and distribution of selected trace metals in the surface sediments of the Gorai creek from January 2019 to January 2020 to understand the anthropogenic involvement and estimate the effects of seasons on geochemical processes in an estuarine ecosystem. Sediments from the estuary instantiate that the concentrations of manganese, cobalt, iron, copper, zinc, and lead vary from 3.1 to 49.7%; Detection Limit (DL)–1.51%; 2.9–32.3 $\mu\text{g g}^{-1}$; 13.5–77.8 $\mu\text{g g}^{-1}$; 11.9–79.5 $\mu\text{g g}^{-1}$; and 2.5–36.5 $\mu\text{g g}^{-1}$, respectively. The lowest amounts of metals were traced during the monsoon season due to the influx of rainwater. Metal levels in the sediments from different areas of the estuary imply that minimal anthropogenic disturbances are affecting the ecosystem. I_{geo} values calculated for Fe (2.5) and Mn (3.4) showed higher values in the pre-monsoon period in the downstream region of the estuary than in the post-monsoon and monsoon seasons. Cu and Zn quantities in the estuarine mouth could be associated with high organic carbon contents which indicate the influence of small quantities of organic wastes released into the waterbody. The intermetallic relationship revealed there could be an identical transport of metals in the estuarine environment. This study acts as a base for further monitoring initiatives that could record any degrading of the creek environment in recent times.

Keywords: Gorai; Geochemical processes; Sediments; Metal; I_{geo} values