

# WOSC

World Ocean Science Congress 2024

Sustainable Utilization of  
Oceans in Blue Economy

## ABSTRACT VOLUME

27-29 February, 2024 at IIT Madras Research Park, Taramani, Chennai-113



Decade Collaborative Centre  
Indian Ocean Region

*Heavy metal accumulation in plankton in 24 hour tidal cycle, Ganges estuary*

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The heavy metal accumulation in the lower food web of Indian estuaries received attention in literature owing to the rapid industrialisation and urbanization of coastal regions. A study of the variability of heavy metal accumulation (e.g., Zinc, Chromium, Lead and Arsenic) among plankton in 24 hours tidal cycle is globally rare. Such a study was conducted on a macro-tidal connecting creek of the Muriganga, Ganges estuary (18 and 19th June 2023 from 11.00 hrs to next day 11.00hrs). Hourly in-situ data of the water-depth, salinity, water-temperature, pH, dissolved oxygen (DO) were recorded. The plankton were collected separately for quantitative and metal analysis. The plankton and water samples were analyzed for heavy metal using Atomic Absorption Spectrophotometer. The water- depth ranged 1.5 and 5.3 m, salinity 12.54 to 17.55 psu, water-temperature 31.2 to 31.7



C and DO 4.92 – 5.92 mg/L during the 24 hours tidal cycle. The phytoplankton biodiversity is significant made of diatoms followed by dinoflagellates and the zooplankton were mostly dominated by the calanoid followed by the cyclopoid copepods. The heavy metal concentrations in the water, phytoplankton and zooplankton followed a similar trend i.e.,  $Cr > Zn > Pb > As$ . The metal concentrations ( $\mu\text{g/L}$ ) in the surface water were Cr (9.30 – 32.08), Zn (7.25 – 59.78), Pb (0.76 – 19.76) and As (Not Detectable – 0.05). The metal concentrations ( $\mu\text{g/g}$ ) of the phytoplankton and zooplankton ranged Cr (2.12–20.3), Zn (13.7–56.7), Pb (3.52–11.72) As (Not Detectable – 0.009) and Cr (21.7–194.3), Zn (225.7–1670.9), Pb (10.6–97.5), As (0.003 – 0.010), respectively. The bioaccumulation factor was formulated which revealed significant variation within the hours. This study suggested that 24 hours tidal cycle brings variability in heavy-metal accumulation process in an estuary so shall not be overlooked while conceptualizing management plan of an estuary.

