

Zooplankton assemblages in Nilwala River and Madu River estuaries in Southern Sri Lanka as indicators of ecosystem health

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This research delved into the correlation between water quality parameters and the relative abundance and diversity of zooplankton within two specific locales: the Nilwala River (5°57'N, 80°32'E) and the Madu River estuaries (06°16'25"N, 80°02'05"E) situated in Southern Sri Lanka. Triplicate samples of zooplankton were procured from each river estuary, encompassing the lower river estuarine stretch (L1) and two other locations about 2 km (L2) and 20 km (L3) upstream from L1, during the period from March 2021 to February 2022. Standard analytical methods were employed to measure Dissolved Oxygen (DO), Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), pH, nitrate, orthophosphate, ammonium, turbidity, total dissolved solids (TDS), conductivity, and temperature. Zooplankton were collected using a plankton net (aperture size: 300 µm) filtering approx. 1000 L of water. The species diversity and richness of the zooplankton communities were estimated using Shannon Weiner's Diversity Index (H) and Pielou's evenness index (J), respectively. Twenty-two zooplankton species were identified in both locations, comprising 14 species of copepods, 5 species of rotifers, and 3 species of cladocerans, and the rest included nauplii stages and ichthyoplankton. The highest zooplankton density (53 ind./L), species diversity (1.44), and evenness (0.58) were recorded from the Madu River. The presence of species like *Brachionus* sp. and *Thermocyclops* sp. in the Madu River's lower stretch indicated eutrophic conditions, while elevated *Keratella* sp. density in the Nilwala River estuary suggested high turbidity due to suspended sediments. This is further confirmed by CCA results. CCME water quality index values confirmed that the lower stretches of the Nilwala and Madu rivers are more polluted than their middle and upper stretches.

Keywords: CCME water quality index, Shannon-Weiner index, species richness, Canonical analysis

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