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Assessment of water quality and pollution state using selected physicochemical parameters and bioindicators in “Modi canal” Galle

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This study was carried out to assess the water quality and pollution status using selected physicochemical and biological parameters in “Modi Canal” at Galle. Water samples were collected from five different sites for assessing selected physicochemical parameters. Sediment samples by Ekman grab and filtered water samples by plankton nets were also collected to assess water quality using macroinvertebrates, zooplanktons, and phytoplanktons. Shannon Wiener Diversity Index (SWDI) and Pollution Tolerant Index (PTI) were calculated for macroinvertebrates, zooplanktons and phytoplanktons according to the standard manual published by the United States Environmental Protection Agency (USEPA). During the study period, range of mean values of physicochemical parameters in the five sampling sites were temperature: 27.5-28.9°C, pH: 6.97-7.29, conductivity: 0.14 - 4.92 mS, salinity: 0.05-1.94 ppt, dissolved oxygen: 1.39-5.98 mg/L, biological oxygen demand: 0.34-1.14 mg/L, chemical oxygen demand 4.89-29.20 mg/L, alkalinity: 0.001- 0.004 mg/L, nitrate: 0.595-1.48 mg/L, phosphate: 0.437-2.867 mg/L. All the selected physicochemical parameters in selected five sites were significantly different from each other ($p < 0.05$: One-way ANOVA) during the study period. Considering the biological parameters, most of the macroinvertebrates identified within the canal were pollution-tolerant species such as chironomid larvae and aquatic worms. The calculated SWDI value for macroinvertebrates ranged from 1.30 to 1.87 and the PTI value ranged from 10.7 to 9.2. The SWDI values for zooplanktons ranged from 0.79 to 1.13 among the sites. Group Cladocera was recorded prominently in most sites. Among phytoplanktons, *Spirogyra* sp. and *Cylindrospermum* sp. were recorded as mostly found species and the SWDI value for phytoplanktons ranged from 0.83 to 1.31 among the sites. No significant differences of abundance values were observed among sites for macroinvertebrates, zooplanktons, and phytoplanktons. The present study concludes the “Modi Canal” at Galle as heavily polluted.

Keywords: Physicochemical parameters, Ekman grab, Macroinvertebrates