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Plankton Assemblage and Potential Indicator Species for Water Quality Assessment in Selected Wetlands in Ramsar Wetland City, Colombo

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Abstract

Wetlands are considered as one of most productive ecosystems in the Earth. Plankton is an essential part of wetland biodiversity and plays a vital role in wetland functioning. For assessing water quality and environmental status of wetlands, plankton are considered as ideal bioindicators. The study was carried out to determine plankton assemblage and potential indicator species for water quality assessment in selected wetlands in Colombo Ramsar wetland city including Nawala Wetland Park, Diyatha uyana, Diayasaru Park and Beddagana. Water samples and plankton samples were collected and analysed for four months (October 2022 to February 2023). Both zooplankton and phytoplankton were studied. During the study period, a total 39 phytoplankton species and 24 zooplankton were identified. The identified phytoplankton species were categories in to main three families namely: *Bacillariophyceae*, *Chlorophyceae* and *Cyanophyceae*. *Asterionella sp.*, *Attheya sp.*, *Cymbella sp.*, *Melosira spp.*, *Navicula sp.*, *Nitzschia sp.*, *Synedra sp.*, *Actinastrum sp.*, *Chlorella sp.*, *Coelastrum sp.*, *Monactinus spp.*, *Pediastrum spp.*, *Scenedesmus spp.*, *Staurastrum spp.*, *Tetraselmis sp.*, *Tetraedron sp.*, *Anabena sp.*, *Lyngbya sp.*, *Microcystis spp.*, *Ocillatoria sp.*, *Nostoc spp.*, *Spirulina sp.*, *Euglena sp.*, *Phacus spp.*, *Pandorina sp.* and *Gonium sp.* were recorded during the study period. Genus *Melosira* was recorded as highest number of individuals in all wetlands (more than 50% of total). Identified zooplankton species were categories in to main three groups namely: rotifers, copepods and ichthyoplankton. Rotifers were the dominant zooplankton group and *Keratella spp.*, *Brachionus spp.* were dominant in all wetlands. *Pediastrum spp.*, *Chlorella sp.*, *Closterium sp.*, *Phacus sp.*, *Euglena sp.*, *Melosira sp.*, *Microcystis sp.*, *Navicula sp.*, *Oscillatoria sp.*, *Scenedesmus sp.*, and *Synedra sp.*, *Keratella sp.*, *Brachionus sp.*, and *Lecane sp.* were identified as potential bioindicators for pollution. According to Shannon-Wiener diversity index phytoplankton species diversity is higher than zooplankton species diversity. A total of fourteen indicator species were observed, exhibiting varying levels of abundance. More than 75% of total were indicators of pollution. Hence, it may be inferred that the population density of these species was relatively high, and the degree of contamination in the wetland was also found to be high.

Keywords: Plankton, Bioindicators, Wetlands, Water quality, Plankton abundance