

ASSESSMENT OF ZOOPLANKTON ABUNDANCE IN RELATION TO WATER QUALITY PARAMETERS: A CASE STUDY IN MAGALLA RESERVOIR IN THE NORTHWESTERN PROVINCE OF SRI LANKA

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The study was conducted in the freshwater reservoir Magalla in Nikaweratiya, Sri Lanka. The aim of the study was to assess the abundance of zooplankton in relation to selected water quality parameters. Four sampling sites were chosen; site 1 - wastes were added by nearby residences, site 2 - a bathing area, site 3 - receiving urban wastes, and site 4 - minimally disturbed (Reference site). Sampling was carried out once a month from May to December 2023. Standard methods were used for in situ analysis of water quality parameters, including water temperature (°C), dissolved oxygen concentration (mg/L), pH, total dissolved solids (mg/L), electrical conductivity (µS/cm), salinity (%) and transparency (cm). Zooplankton was collected using a 300 µm plankton net, preserved in 5% formalin and observed using a Sedgewick-rafter counting slide under a light microscope. Data were analysed using Minitab software (Version 19). According to Principal Component Analysis, water transparency, total dissolved solids and temperature were highest in sites 1 and 2, conductivity and salinity were highest in site 3 and dissolved oxygen concentration, and pH were highest in the reference site. Nineteen zooplankton species belonging to five main groups, namely, protozoa, ostracodes, cladocerans, rotifers, and copepods, were identified. Zooplankton abundance peaked in July and August, with the highest values observed at the reference site, while sites impacted by waste had significantly lower abundance. Zooplankton abundance plummeted in October and November, with the lowest values observed at site 3, which was contaminated by waste. The abundance of zooplankton at sites 1, 2, and 3 differed significantly ($p < 0.05$) from the reference site, and there was no significant difference among the three sampling sites according to the Kruskal Wallis test and Mann-Whitney U Test. This study revealed the effect of water quality parameters on the abundance and diversity of zooplankton in the Magalla reservoir, highlighting the importance of maintaining optimal water conditions to support a diverse and healthy zooplankton community.

Keywords: Abundance, Freshwater, Reservoir, Water quality, Zooplankton