

## Abstract

Planktons are a vital component of coastal lagoon food webs and their structure and functions are affected considerably by physicochemical parameters of the water body. The current study was aimed to evaluate the present composition and spatial distribution of planktons of Mundel lagoon in relation to its water quality. Study also investigates the possibility of using planktons as bio indicators for Mundel lagoon.

The study was carried out from 23<sup>rd</sup> March to 7<sup>th</sup> of September covering six sampling sites of Mundel lagoon under varying anthropogenic and natural stressors. Hydrological physicochemical parameters were analysed in situ and ex situ and collected zooplankton and phytoplankton samples were identified and enumerated using a binocular microscope mounting on a Sedgwick-Rafter counting chamber. Pearson's coefficient analysis was performed to evaluate the relationship between water quality parameters and plankton density.

Elevated levels of salinity, total suspended solids, turbidity, ammonium and phosphate from and high frequency of exceeding the defined ranges for general estuarine fauna were observed at all sampling sites. Lagoon exhibited predominantly hypersaline conditions. Water quality parameters showed statistically significant variation in spatial distribution.

Thirty five phytoplankton taxa were identified, in which Bacillariophyceae was the dominant were contributing a 98.05% of total mean phytoplankton density. *Nitzschiasp.*, *Synedrasp.*, *Mastogloia* sp. and species belonging to *Order Naviculales* were the dominant species phytoplankton species identified. Phylum arthropoda was the most diverse group while molluscan veliger eggs and larvae was the most dominant. None of the major plankton groups showed statistically significant spatial distribution. *Pinnularia* sp. could be utilized as a bio indicator of TSS, turbidity, nitrite and phosphate. Class hydrozoans showed positive correlation with pH values and could be utilized as a bio indicator of pH.

Turbidity and pH were two abiotic factors that affected the distribution of phytoplankton and zooplankton respectively. The lagoon water quality was spatially heterogenous and showed deterioration, possible blooming forming conditions. Dominant plankton species did not show significant relationship with water quality indicating high resilience.