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Plankton Assemblage in Coastal Waters near to Kalu Ganga River Mouth, Sri Lanka

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Abstract

The plankton community plays a major role in the stability of coastal ecosystems. They serve as key players in marine food webs. The current study was conducted to investigate the plankton diversity in coastal waters near Kalu Ganga river mouth, Sri Lanka. Six sampling locations were selected based on the random sampling technique, including three locations (CR_1-CR_3) along the right-side coastline and three locations (CL_1-CL_3) along the left-side coastline from the river mouth. Zooplankton and phytoplankton at each location were sampled from September 2020 to February 2021 using a 55 µm plankton net in surface waters on a monthly basis. Zooplankton and phytoplankton were morphologically identified to the nearest possible taxonomic level by using standard keys and guides. Shannon-Weiner diversity index (H) was calculated to determine the plankton diversity. Number of phytoplankton species found in the wet months (September-October) and dry months (January-February) were 62 and 68 respectively, while a similar number of zooplankton species (43) were recorded in both periods. Altogether, 81 phytoplankton species and 53 zooplankton species were identified during the research period. Bacillariophyta (72%) and Copepods (68%) were identified as the dominant phytoplankton and zooplankton groups respectively. Dinoflagellates including, *Peridinium* sp., *Protoperidinium* sp., *Ceratium* sp., *Noctiluca* sp., *Gonyaulax* sp., *Alexandrium* sp., which are well-known to form harmful algal blooms (HABs) accounted for 17%. Chlorophyta and Cyanophyta were less dominated and found only during wet months at nearest sampling locations (CL_1 and CR_1) to river mouth. Among them *Closterium* sp. was the dominant. Rotifera (11%), foraminifera (9%), protozoa (10%) and ichthyoplanktons (<1%) were also reported. The H values for plankton were recorded between 2.7 to 3.1 and values were not significantly different (p>0.05) between wet months and dry months at each location. The highest H value (3.1) was reported at the nearest sampling locations (CL_1 and CR_1) to the river mouth from each side of the coastline. Nauplius and *Nitzchia* sp. were the most abundant zooplankton and phytoplankton respectively in the study area. Although the number of recorded plankton species was almost similar in both periods, a variation of species composition was observed between wet months and dry months. The plankton diversity as well as the number of reported freshwater phytoplankton were increased towards the river mouth along the coastline. Further research should be conducted to determine the temporal and spatial variation of plankton diversity in the studied area.

Keywords: Kalu Ganga river mouth, Coastal waters, Plankton diversity, Shannon-Wiener diversity index