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Phytoplankton assemblage in Puttalam lagoon, Sri Lanka

N.D. Hettige*, M.D.S.R. Maddumage and W.D.N. Wickramaarachchi

Environmental Studies Division, National Aquatic Resources Research and Development, Agency (NARA), Crow Island, Colombo 15, Sri Lanka.

Abstract

Puttalam Lagoon, the second largest (32,700 ha.) lagoon in Sri Lanka is located in the Puttalam District of the Northwestern Province. The lagoon is fed by two rivers namely, Kala Oya and Mee Oya. Phytoplankton is sensitive to the changes in water quality thus is effective indicators of environmental conditions. The objective of this study was to determine the diversity and composition of the phytoplankton in Puttalam lagoon. Plankton sampling was done once in July 2017 from fifteen sampling locations. Samples (N = 36 samples/lagoon) were drawn by filtering 50 L of water collected at a depth of one meter from the surface using a 20 µm nylon plankton net. The filtrate was concentrated to 100 mL for each station. Three drops of Lugol's solution were added to each sample to preserve the phytoplankton and allowed the organisms to settle. Then quantitative analysis was carried out through sub sampling technique using a Sedgwick rafter cell under a compound microscope. Species were identified to the nearest taxonomic level following the standards guides. Shannon diversity index of phytoplankton was calculated. A total of 39 phytoplankton taxa belonging to two phylum (Ochrophyta and Dinoflagellata), and three classes (Bacillariophyceae, Coscinodiscophyceae and Dinophyceae) were identified. Bacillariophyceae (diatom) is the most abundant class which included 22 species. This was followed by Coscinodiscophyceae which included three species. Also, thirteen species were included in class of Dinophyceae. The dominant toxic phytoplankton species were identified as *Prorocentrum* sp, *Photoperidinium* sp, *Ceratium furca*, and *Noctiluca scintillians*. The highest abundance (27250 total individuals/ml) of phytoplankton was observed at sampling location, KL 12 (Northern part of the lagoon) and would be due to the less human disturbance. The lowest abundance (2467 total individuals/ml) of phytoplankton was recorded at sampling location, KL 1 (Southern part of the lagoon near the Puttalam town). This might be due to the high loads of pollutants discharge into the lagoon from Puttalam town area. The Shannon diversity index of 1.52 indicates lower species diversity in the lagoon.

Keywords: Diatom, Phytoplankton, Puttalam Lagoon, Shannon diversity index

***Corresponding Author:** nadeeshahettige7@nara.ac.lk