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# ABUNDANCE AND DIVERSITY OF PLANKTON IN MAMUNUGAMA TANK CASCADE SYSTEM

**D.A.N.M. Amarasinghe, B.D.I.M. Batugedara, H.M.K.D. Handapangoda and S.A.M.A.I.K. Senanayake***

*Department of Zoology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka*
**indunil@sci.sjp.ac.lk*

Plankton are critical biological indicators used to assess the water quality in aquatic ecosystems. The objectives of the study were to identify the phytoplankton and zooplankton and estimate their diversity and abundance in the Mamunugama Tank Cascade System (TCS), located in the Kurunegala District, Sri Lanka. This TCS consists of six interconnected tanks: Ulpath tank, Athaudagama tank, Ihala Thimbiriyawa tank, Mamunugama tank, Kandubodagama tank and Weera tank. Plankton samples were collected from August 2023 to February 2024, covering both wet and dry months. At each visit, three samples were collected from each tank using a 55 µm mesh size plankton net. Planktons were identified based on the morphological features using standard keys, and their abundance was estimated using a Sedgewick-Rafter counting cell. The Simpson and Shannon-Wiener diversity indices were calculated. A total of forty-five phytoplankton species from seven groups were identified, with chlorophytes accounting for 40%, making them the dominant group, while Chrysophyta represented the lowest abundance of 2.2%. Twenty-four species of zooplankton were recorded representing four groups, with Rotifera being the most abundant group, accounting for 45.5%, and Cladocera being the least abundant group, accounting only for 9.1%. Plankton abundance was higher during wet months compared to dry months. The Simpson index indicated a high degree of diversity (D = 0.81-0.99) in all tanks during both dry and wet months. The Shannon-Wiener index values ranged from H = 2-3 in the dry months and H = 3-4.5 during the wet months. The dominance of chlorophytes and rotifers suggests favourable conditions for these groups. Seasonal variations in plankton abundance and diversity highlight the seasonal dynamics in aquatic ecosystems.

**Keywords:** Plankton diversity, Shannon-Wiener index, Simpson index, Tank cascade systems