

Phytoplankton Diversity in Six Major Reservoirs of Badulla District, Uva Province, Sri Lanka

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Phytoplanktons are major primary producers and act as a bioindicator in inland waters. The present study investigated the phytoplankton species composition of six reservoirs (Ulhitiya, Rathkinda, Mapakada, Nagadeepa, Dambarawa, and Sorabora) with highest inland fish production in Badulla district. Samples were collected using a plankton net (60 μm mesh size) from five sampling points of each reservoir during November 2019-January 2020. The taxonomical status of collected samples was identified using previous literature records, standard pictorial guides (The Genera of the Freshwater Algae of Sri Lanka). Biodiversity indices were calculated to identify the variations of phytoplankton diversity among sampling points and reservoirs. Total of 41 phytoplankton species belonging nine major taxonomic classes; Bacillariophyceae (10), Chlorophyceae (10), Cyanophyceae (08), Zygnemaphyceae (06), Euglenophyceae (02), Fragilariophyceae (02), Chrytophyceae (01), Xanthophyceae (01), Dinophyceae (01) were recorded. Diatoms (Bascillariophyceae) recorded the highest relative abundance (61.57%) from selected reservoirs. Sampling points of each reservoir had no significant effect ($p>0.05$) on the phytoplankton diversity while it showed a significant effect ($p>0.05$) on phytoplankton diversity among reservoirs. The highest Shannon-Wiener index (1.61 ± 0.06), Simpson's Index (0.71 ± 0.01), evenness (0.52 ± 0.024) and richness (21 ± 1.62) were reported from Dambarawa, while lowest Shannon-wiener index (1.25 ± 0.19), Simpson's index (0.59 ± 0.08), evenness (0.42 ± 0.19) and richness (19 ± 0.89) resulted for Ulhitiya Reservoir. The current study reveals that *Aulacoseira* sp, *Microcystis* sp, *Pediastrum* sp, *Staurostrum* sp, *Arthrospira* sp shows the highest abundance in all six reservoirs. Dominant species play a vital role as primary producers, bioindicators (*Aulacoseira* sp, *Microcystis* sp), and feed (*Staurostrum* sp, *Arthrospira* sp) for fish. Due to the high abundance of *Microsystis* sp. (51.58%) in the Ulhitiya reservoir, the potential to generate toxic algal blooms was identified by the current study. In conclusion, this study identified the dynamic phytoplankton community and dominant species which act as the major autotrophs in studied reservoirs. Further, data collected could be used as the baseline information for the aquatic ecological studies and inland fishery enhancement programs

Keywords: Shannon-Wiener index, Simpson's index, Biodiversity, Inland fishery, Primary producers/autotrophs