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Plankton diversity in Bomburuella reservoir, Nuwara-Eliya: A preliminary survey

N. D. Hettige^{1*}, K. A. W. S. Weerasekara¹, E. G. D. N. Chandrasiri² and J. M. C. K. Jayawardene²

¹Environmental Studies Division, National Aquatic Resource Research and Development Agency (NARA), Crow Island, Colombo 15, Sri Lanka

²Department of Natural Resources, Faculty of Applied Science, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka

*nadeeshahettige7@gmail.com

Bomburuella is a perennial reservoir located in the Nuwara-Eliya district. This reservoir is mainly used for fisheries, agriculture and drinking purposes. Although, a number of studies have been carried out to assess the water quality of this reservoir, there is a dearth of information on the plankton diversity. Therefore, a study was carried out to determine the species composition of zooplankton and phytoplankton in the reservoir. Plankton were collected using 55 µm open type nylon plankton net from 10 sampling locations in the reservoir over a four-month period from February to May in 2014. Plankton were identified to highest possible taxonomic levels using standard plankton identification guides. Average species richness and diversity of the plankton were also estimated. Dissolved Oxygen (Orion 830A), pH (Orion 260A), turbidity (Hatch 2100P), water temperature, conductivity, total dissolved solids and salinity (Hanna multi range conductivity meter, HI 8733) were determined in *in situ* using portable meters. In addition, water samples were analyzed for ammoniacal-N, nitrate-N, nitrite-N and orthophosphate at the laboratory using standard methods. Two replicates were analyzed for both plankton and water samples. The correlation between plankton species and water quality parameters were assessed using Pearson correlation coefficient using MINITAB 14.0 statistical software. A total of 28 phytoplankton taxa belonging to the five major divisions namely Chlorophyta, Cyanophyta, Dinoflagellata, Bacillariophyta and Ochrophyta were identified. Coscinodiscophyceae is the most abundant phytoplankton (32.84%) group followed by *Melosira granulata* (16.23%) and *Rhizosolenia* sp. (11.82%). Toxin producing *Microcystis* sp. was also recorded (7.58%). In addition to the above phytoplankton, a total of 21 zooplankton species belonging to Arthropoda (73%) and Rotifera (27%) were identified. Of them, *Keratella cochlearis* (70.46%) and *Cyclops prasinus* (10.92%) were the most abundant zooplankton species. The mean of the Shannon-Wiener diversity index (<2) of phytoplankton and zooplankton recorded were 1.55 ± 0.61 and 1.02 ± 0.62 respectively indicating high water pollution status of the reservoir. Only the correlation between number of phytoplankton and zooplankton species with nitrate - nitrogen showed a moderate ($r=0.428$) and strong ($r=0.568$) positive correlation respectively at 5% level of significance. The findings of the study can be used as a baseline study to estimate the pollution status of the Bomburuella reservoir. Further studies are recommended to investigate the plankton diversity and status of water pollution in the reservoir with seasonal variations.

Keywords: Phytoplankton, Shannon-Wiener diversity index, zooplankton