Assessment of water quality in Kattakaduwa reservoir in Southern Sri Lanka

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The land use types and water uses are very important factors to understand the variation of water quality and ecological status of a reservoir. The aim of this study was to assess the water quality in Kattakaduwa reservoir. Water samples were analyzed for pH, temperature, dissolved Oxygen, conductivity, salinity, total dissolved solids, Secchi depth, Nitrate, Phosphate, Chlorophyll-a concentration and phytoplankton from August 2017 to October 2017. Significant temporal variation ($p<0.05$) was observed for pH, conductivity, Nitrate and Euphotic zone depth among the three sites where the Site 1 was selected at an area surrounding the agricultural land, Site 2 was selected close to an aquaculture site and Site 3 was selected close to the water pumping house. The highest levels of pH (8.47 ± 0.03), Nitrate (1.85 ± 0.10 mg/L) and Euphotic Zone Depth (1.67 ± 0.25 m) were observed in August and the highest level of conductivity (0.84 ± 0.01 mS) was observed in September. Thirty two algal genera were identified and the most abundant phytoplankton genera were *Melosira*, *Navicula*, *Nitzschia, Oscillatoria* and *Pediastrum*. The pollution tolerant genera were recorded which were considered as bio-indicators according to Palmer pollution index. The values of Water Quality Index (WQI) indicated bad water quality throughout the study period. The Palmer index showed high organic pollution in August (26.00 ± 1.00), moderate organic pollution in September (14.00 ± 2.65) and probable high organic pollution in October (18.00 ± 1.00). Therefore, Carlson Trophic State Index (CTSI) varied significantly among the sites where the site 1 and 2 were strongly eutrophic and the site 3 was hyper eutrophic. The water quality explained that the reservoir needs proper management for its utilization.

Keywords: Pollution, water quality, WQI, CTSI.

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