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**ZOOPLANKTON AS BIO-INDICATORS OF
EUTROPHICATION AND POSSIBLE
EUTROPHICATION CONTROLLING MEASURES FOR
KANDY LAKE**

By

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Abstract

The traditional relationship between lakes and human kind is now been jeopardized by unbalanced development of our civilization due to misuse of surrounding lands. The degradation of water quality of the lakes due to excessive nutrients has become an important issue in Sri Lanka today. It has become an urgent need of the country to restore the friendly coexistence of lakes and humankind through appropriate management.

Kandy Lake is an ornamental fresh water body in Sri Lanka, which has become a victim of eutrophication recently, causing accelerated growth of *Microcystis aeruginosa* leading to formation of blooms. This has led to severe water quality problems in the lake. Bad catchment practices are responsible for the deteriorated water quality of the lake. It has been found that a large number of effluents canal draining in to the lake directly with a continuous flow, carrying sewage and domestic wastewater.

Present study is an effort to evaluate the trophic status of the lake in numeric values using zooplankton as bio indicators. Field studies were carried out for a six-month period, from September 2001 to February 2002 to determine the physico chemical & biological properties of the lake. Physico chemical properties were used in determining present trophic status of the lake. Analysis of zooplankton samples collected during the study period was conducted to determine the species composition of zooplankton, their spatial & temporal distribution and the diversity during the study period.

A series of laboratory experiments also were carried out with five dilutions of lake water with normal water; 1:4, 2:3, 3:2, 4:1 & with original lake water. One replicate experiment also was carried out for each month. Zooplankton densities & nutrient levels in each vessel were determined throughout the investigation period for six months to compare the species diversity of Lake Water under different nutrient levels. It was used to compare the changes in diversity indices with increasing nutrient levels of the lake water.

Simpson & Shannon wiener Diversity indices were calculated for each zooplankton sample collected & these values were used as bio indicators in determining water quality of the lake. These values were compared with the nutrient levels of the lakes to find out the correlation.

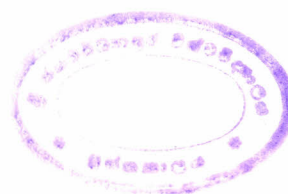
The zooplankton community of the Kandy Lake composed of three major taxonomic groups namely Copepods, Cladocerans and Rotifers. Throughout the investigation period only 10 zooplankton species were found. Highest species richness was found in Rotifers with 6 species namely; *Brachionus angularis*, *Brachionus falcatus*, *Brachionus forficula*, *Brachionus nilsoni*, *Keratella tropica*, & *Filinia longista*. Overall number of zooplankton species in the Kandy Lake water during this study period was very low indicating its deteriorating water quality.

The diversity index values calculated for the entire lake throughout the study period were well below 1.0 indicating highly polluted status, according to existing literature on bio

indicators. Even during different seasons, values have never increased indicating the permanent eutrophic status of the Kandy Lake.

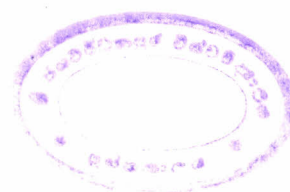
Therefore, implementation of remedial measures to improve the water quality of Kandy lake has become an urgent need of the country as this lake is very important due to its location particularly closer to a sacred place.

The recommendations made under this study would be useful in improving the water quality of the lake. A systematic monitoring programme for water quality assessment of the Kandy Lake should be implemented. Awareness building program for the public should be launched to educate the people living in the vicinity of the Kandy Lake & within the catchment, regarding waste disposal, causes and effects of eutrophication and water related health problems. It is recommended to encourage community participation to control the soil erosion by making awareness programmes for conservation techniques. It is highly advisable to install a common sewage treatment plant for the sewage generated from Hotels, Nursing homes, Schools and from the other institutions. Continuous monitoring of the water quality of the lake using bio indicator technique would be useful in assessing the lake condition in numerical values.



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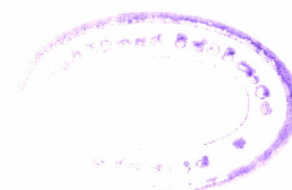
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