## ABSTRACT

The Kandy Lake, a man-made ornamental freshwater body in Sri Lanka is located in the heart of Kandy. Being located in the hill capital of Sri Lanka and adjoining to the world famous Buddhist temple Dhalada Maligawa, it has become an important socioeconomic administrative attribute. The Lake became hypereutrophic with the emergence of a blue green algae *Microcystis aeruginosa* bloom with the onset of the southwest monsoon winds in May 1999. Limnological characteristics (physicochemical, nutrient and plankton) of this water body has been analyzed since mid 1990's but the lake has not been subjected to a detailed study with respect to microbiological analysis.

A study based on bacteriology was carried out from July 2001- 2002 July with an objective to understand the role of heterotrophic bacteria in eutrophication and pollution. The samples were collected from four different sites at different depths in the deep and shallow basins. Physicochemical and nutrient analyses of the samples were also carried out to determine the relationship between the distribution pattern of bacteria and nutrients such as Nitrogen and Phosphorus. Heterotrophic bacteria belonging to the Genus *Bacillus*, *Pseudomonas*, *Actinomycetes*, members of family Enterobacteriaceae, Nitrifying bacteria have been isolated, enumerated and identified up to their generic and species level using the conventional microbiological techniques such as morphological and biochemical methods.

The heterotrophic plate counts were in the range of $10^6$ cfu/ml and the planktonic bacteria were mainly Gram negative (75%) and the plate counts were high dry weather

condition than the rainy season. There was no significant ($p>0.05$) intersite differences with respect to bacterial counts except the fluorescent pseudomonad counts and physicochemical characteristics, which is due to the homogenous nature resulting from horizontal mixing of this small water body. However, there was a prominent gradient in the plate counts from top to bottom in the deep basin due to oxygen depletion in the hypolimnion. The high coliform counts (1200+/100ml) and faecal coliform counts (550/100ml) indicating faecal contamination, which is common for any surface water body receiving water draining due to unplanned human settlements. The results of this study show that the bacterial consortia in Kandy Lake did not show a spatial variation but it showed a temporal variation (not statistically significant) with a marked diversity and pathogenic species and their role in eutrophication may through cycling of nutrients such as Nitrogen and Phosphorus.