Variation of trophic determinants in Kandy lake

F F Sharaff and E I L Silva*
Institute of Fundamental Studies, Hantana Rd, Kandy

Kandy Lake, the only ornamental freshwater body in Sri Lanka is located in the heart of Kandy. Being located in the hill capital of Sri Lanka, it has become an important socioeconomic administrative attribute. This small water body attracts thousands of local pilgrims and foreign tourists. The lake became hypereutrophic with the emergence of a blue green algae *Microcystis aeruginosa* bloom with the onset of the southwest monsoonal winds in May 1999. Limnological characteristics (physicochemical, nutrient and phytoplankton) were examined bi-weekly from July 2001 to December 2002 using standard methods to determine the trophic trend of the lake following a cyanobacterial outbreak which is an important tool to be examined prior to implementation of restoration strategies.

There were no significant spatial differences in physicochemical parameters and nutrients but there was a prominent oxygen gradient from top to bottom in the deep basin as it was before the cyanobacterial outbreak. Underwater light climate (Secchi depth, Euphotic depth), nutrients (phosphorus, nitrogen, dissolved silica) showed a marked seasonal pattern bound to the rainfall. Correlation between chlorophyll-a (10 - 168 μg L^{-1}) and Secchi depth (55 – 151 cm) was highly significant than it was with suspended solids (1.5 to 14.5 mg L^{-1}) and Secchi depth indicating underwater light penetration is regulated primarily by phytoplankton densities. Although the curvilinear relationship between the Secchi depth and euphotic depth is highly significant ($p < 0.001$), percentage deviation of Secchi depth from euphotic depth was noticeably high when euphotic depth was less than 300 cm. The relationship between chlorophyll-a and total phosphorus (23 - 94 μg L^{-1}) in Kandy Lake clearly demonstrates an equilibrium within eutrophic boundary. Discontinuous fluctuations in trophic attributes (chlorophyll-a and nutrients) in Kandy Lake indicates an uncertainty in self-recovery.

Acknowledgements: Financial assistance by Institute of Fundamental Studies, Kandy.

*sil@ifs.ac.lk

Tel: 081 2232002