D-17 Phytoplankton primary productivity of the Kandy Lake

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Kandy Lake, the only ornamental waterbody in Sri Lanka, has been identified as one of the most polluted. Since the lake has not been subjected to a sound water quality assessment, a series of intensive studies to determine the seasonality of primary productivity and species composition of phytoplankton was launched. Using standard techniques, the water temperature, Secchi disk transparency, total phosphorous, nitrate and chlorophyll-a content were determined. Phytoplankton samples were collected using a Wisconsin net. Monthly determination of net primary productivity was made by suspending light-dark bottles at different depths coupled with Winkler's oxygen determination during the peak photoperiod.

The maximum net primary production occurred at 0.5 m ranging between 0.073 $gO_2m^{-2}h^{-1}$ - 2.279 $gO_2m^{-2}h^{-1}$ and no net primary production took place below 4m. There is no significant relationship between net primary production and mean algal biomass, whereas the relationship between net primary production and depth of the euphotic zone was not statistically significant. Total phosphorous varied in the surface water from 10μgl^{-1} to 51μgl^{-1}. The mean total phosphorous concentration in the bottom water (115μgl^{-1} ± 115 SE) is higher than in the surface water (31μgl^{-1} ± 17 SE) while there were no significant differences in mean nitrate between the surface and the bottom water. Statistically, net primary productivity was not related significantly with nitrate and phosphate. The phytoplankton community of the lake was dominated by *Pediastrum simplex.*

Though aerial based net primary productivity is relatively high, an extremely high heterotrophic condition in the bottom strata, indicates marked organic pollution. This situation may lead to hypereutrophic conditions when nutrient requirements are favourable for blue green algae.