# Occurrence of toxigenic cyanobacterial blooms in freshwaters of Sri Lanka

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## Abstract

A previous pioneering study of freshwater bodies in Sri Lanka revealed the presence of toxic cyanobacteria in three out of four water bodies tested. It was therefore important to perform a more detailed investigation into the presence of cyanobacteria and their toxins throughout Sri Lanka. The country has a long history of well-planned water management with the agricultural economy and drinking water supply still dependent on thousands of man-made tanks. Seventeen reservoirs from different user categories and different climatic zones were selected to study variations in phytoplankton communities with relation to major nutrients, with particular emphasis on cyanobacteria. The study was carried out during a two-year period and heavy growths or blooms of cyanobacteria observed during the study period were tested for microcystins. The results clearly categorised the 17 reservoirs into four groups parallel to the classification based on the user categories of water bodies. Biomass of total phytoplankton, the abundance of cyanobacteria, the dominance of *Microcystis* spp. and concentration of nitrate (N) and total phosphorous (P) were the lowest in drinking water bodies and the highest in aesthetic water bodies. Irrigation water bodies showed the second lowest values for phytoplankton biomass, and concentration of N and P, while hydropower reservoirs showed the second highest values for the same parameters. The fraction of cyanobacteria in irrigation waters was higher than that in hydropower reservoirs, but surprisingly the dominance of *Microcystis* spp. was reversed. Possible reasons for these variations are discussed. More than half of the bloom material tested contained microcystins up to 81 $\mu g l^{-1}$. Our findings indicate the potential for high-risk situations due to toxigenic cyanobacterial blooms in susceptible freshwaters of Sri Lanka.


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