

Abstract FM 03

MICROCYSTIN-LR CONTAMINATION STATUS AND SOME PHYSICOCHEMICAL WATER QUALITY PARAMETERS OF TWO SELECTED URBAN LAKES IN SRI LANKA

NS Samaraweera, IUD Silva and PM Manage*

Centre for Water Quality and Algae Research, Department of Zoology, University of Sri Jayewardenepura, Nugegoda, Sri Lanka.

Cyanotoxin-producing cyanobacterial blooms have been increasingly observed in the ancient irrigation tanks and aesthetic, urban lakes in Sri Lanka. Microcystin-LR (MC-LR) was identified as the most frequent cyanotoxin. The International Agency for Research on Cancer has characterized MC-LR as a potent carcinogen on humans and animals. The present study focused on identification and quantification of MC-LR in two aesthetic lakes in Sri Lanka namely Beira and Boralesgamuwa. Surface water samples were collected, and temperature, pH, electrical conductivity (EC), dissolved oxygen (DO), total inorganic nitrogen (TIN) ($\text{N-NO}_2^- + \text{N-NO}_3^- + \text{N-NH}_3$), total phosphorous (T-P), chemical oxygen demand (COD) and chlorophyll-*a* concentration were determined using standard methods. Plankton samples were fixed at the site with acidified Lugol's solution at a final concentration of 1% for enumeration and identification of cyanobacteria. Methanol (80%) was used to extract the cell-bound MC-LR and dissolved MC-LR by solid phase extraction (SPE), and the resulting extracts were rotary evaporated. MC-LR was identified and quantified by high performance liquid chromatography at 238 nm with a photodiode-array detector. The lake water temperature varied between 29.0 - 32.0 °C and pII between 8.10 - 8.20. Correspondingly, DO and EC fluctuated from 9.00 - 9.30 mg L⁻¹ and 268 - 280 μS cm⁻¹, respectively. The TIN ranged between 4.40 - 8.20 mg L⁻¹, while T-P was recorded between 0.09 - 0.80 mg L⁻¹. Chlorophyll-*a* concentration and COD ranged between 56 - 275 μg L⁻¹ and 130 - 156 mg L⁻¹, respectively. The mean cyanobacterial cell densities were 12,950-50,147 cells mL⁻¹. The MC-LR concentration in Beira Lake (41 - 46 μg mL⁻¹) was higher than that of Boralesgamuwa Lake (20 - 25 μg mL⁻¹) which profoundly exceeded the WHO alert level of 4 μg L⁻¹ for MC-LR in recreational waters. Though the two lakes are not intended for drinking or fishing, public is highly vulnerable for the exposure to cyanotoxin through boating and canoeing, and consequently recreationists of these lakes need to be made aware of this alarming situation.

Keywords: Cyanobacteria, cyanotoxins, MC-LR, HPLC

* pathmalal@sjp.ac.lk