



Microcystin-LR Contamination Status along with Some Physico-Chemical Water Quality Parameters of Five Selected Recreational Water Bodies in Sri Lanka

Pooma C. Piyathilaka^{a,b} and Pathmalal M. Manage^{a,b}

^a Department of Zoology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka

^b Centre for Water Quality and Algae Research, Department of Zoology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka

Abstract

Microcystin-LR (MC-LR) is the most toxic and commonly encountered cyanotoxin variant in aquatic systems. MC-LR is a hepatotoxin, but evidences suggest that it might also induce kidney injury. There is an increasing trend in mortality due to chronic kidney disease (CKD) in Sri Lanka where underlying cause of CKD remains complicated. Cyanobacterial toxins is considered as one of the possible reasons implicated in the aetiology of CKDu in Sri Lanka. A significant source of cyanobacterial toxin exposure is recreational use of contaminated freshwater bodies. Therefore, it was a timely need to assess MC-LR contamination status. Thus, in the present study Beira, Boralessgamuwa, Kandy, Kurunegala and Hot water springs in Kinniya were sampled. Triplicate surface water samples were collected from each water body. Surface water temperature, pH, conductivity and dissolved oxygen (DO) were measured at the site itself and chemical analysis of nitrate, total phosphate and chlorophyll-a were assessed. Analysis of MC-LR contamination was done by Enzyme Link Immuno Sorbent Assay (ELISA). The cyanotoxin MC-LR was not recorded from Boralessgamuwa whereas all the other water bodies showed MC-LR contamination. The highest concentration of MC-LR was recorded in Beira lake (2198 ppb) followed by moderately high concentration in Kandy Lake (103 ppb) and Kurunagala Lake (75.6 ppb) and the Hot water springs 0.34 ppb respectively. Results of the present study revealed that, pH, nitrate, total phosphate and chlorophyll-a contents were having significant positive correlation with the MC-LR concentration of each water body ($p < 0.05$) while surface water temperature, DO and conductivity did not show significant correlation to MC-LR contamination.

Keywords: Recreational, Cyanotoxin, Exposure, Microcystin, ELISA, Water quality