8.5 IDENTIFICATION ,EXTRACTION AND ANALYSIS OF CYANOBACTERIAL TOXINS IN KALAWEWA AND NACHCHADUWA FRESH WATER TANKS OF SRI LANKA

411/D

Identification, extraction and analysis of cyanobacterial toxins in Kalawewa and Nachchaduwa fresh water tanks of Sri Lanka

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Mass growths of cyanobacteria (blue–green algae), leading to the production of blooms, scums, and mats can occur in nutrient-enriched water bodies throughout the world. The cyanobacterial species which dominate these growths typically belong to the genus *Microcystis* which produce the hepatotoxic microcystin. Poisonings of vertebrate and invertebrate animals following ingestion of cyanobacterial bloom/scum material have been widely reported for many years and number of human deaths have been reported through exposure to cyanobacterial toxins through renal dialysis and also implicated in drinking-water. Hence, the study was focused to recognize the presence of cyanobacterial toxins and their toxicity in Kalawewa and Nachchaduwa water tanks in the island.

Cyanotoxins were extracted from the environmental samples and from the standard samples [*Microcystis aeruginosa* PCC 7941 and *Microcystis aeruginosa* BL1 (EF051239)]. Fourier transform infrared (FTIR) Spectroscopy was used for the identification of functional groups of the extracted cyanotoxins and a comparison was done with the chemical structures of the standard microcystins. A bioassay was performed for the detection of toxicity of these toxins based on its lethal effect on the brine shrimp, *Artemia salina*. This study showed that considerable amounts of cyanobacterial cells were present in both Kalawewa and Nachchaduwa tanks and there is a considerable risk with cyanotoxins. The toxic compounds extracted from certain sites of the Kalawewa and Nachchaduwa were recognized as microcystin variants with FTIR. The results of bio assays indicated that Kalawewa samples contained toxins which were lethal to *Artemia salina;* but for most of the samples toxicity values were not significant. The cyanobacterial extracts from Nachchaduwa had a significant impact on *Artemia salina*. According to this preliminary investigation, we suggest that Kalawewa and Nachchaduwa water bodies of Sri Lanka are at a risk of contamination with hepatotoxic microcystins and other cyanotoxins. Therefore further investigations are necessary to determine the level of toxicity in these water bodies as they are being used for human consumption.

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