SCREENING OF SELECTED DRINKING WATER BODIES IN SRI LANKA FOR THE DETECTION OF THEIR POTENTIAL FOR PRODUCTION OF CYANOTOXIN, MICROCYSTIN USING PCR

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Contamination of freshwater bodies in Sri Lanka with hepatotoxic cyanotoxin, microcystin (MC) gained much attention of water treatment facilities recently. Most of the Islandwide water bodies were identified as potential sources of cyanobacterial contaminations and temporal contaminations of MCs. This group of toxins are synthesized by a large gene cluster (≃55 kb) consisting of non-ribosomal peptide synthetases and polyketide synthases in a variety of distantly related cyanobacterial genera. Twenty one reservoirs were selected for the present study belonging to Western, North Western, Southern, Sabaragamuwa, Eastern, North Central and Uva provinces which were considered as sources for the supply of drinking water. Total MC contamination levels were assessed with the Enzyme Linked Immuno Sorbent Assay (ELISA). Actual potential of the reservoirs for production of MCs was evaluated by the Polymerase Chain Reaction (PCR) using specific primers for three genes involved in MC biosynthesis namely, *mcy A*, *mcy B* and *mcy E*. All the reservoirs were having considerable levels of total MCs ranging from 0.025 (±0.001) to 434.5 (±1.16) ppb and Labugama, Kalatuwawa, Rathkinda and Minneriya reservoirs were not having detectable amounts of MCs. Eventhough, PCR confirmed the presence of MC producing genotypes in the reservoirs with detectable amounts of MCs. PCR also revealed that though there were no detectable MCs, Minneriya reservoir was having cyanobacterial genotypes with MCs biosynthesis capability. Absence of MCs in Labugama, Kalatuwawa and Rathkinda reservoirs was proven by the negative results for PCR. Molecular screening could reflect the actual ability of MC production even when the toxin is not in detectable levels at a given moment. PCR could engaged as a new pre-screening method for cyanotoxin biosynthesis in water bodies in Sri Lanka.

Keywords: Microcystin, contamination, biosynthesis, potential, screening, PCR