Setting up a polymerase chain reaction assay for the detection of toxic cyanobacteria

D.N. Magana-Arachchi*, R.P. Wanigatunge and P. Jeyanandarajah
Institute of Fundamental Studies, Hantana Road, Kandy.

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Abstract: Cyanobacteria are aquatic and photosynthetic prokaryotes which form harmful algal blooms under certain conditions. Water blooms of cyanobacteria from the genus *Microcystis* are of increasing concern due to their production of microcystin, a cyclic heptapeptide which is formed nonribosomally by peptide and polyketide synthetases. A number of studies have targeted the PCR amplification of microcystin synthetase gene cluster foı the identification of toxic cyanobacteria, both in cultivated strains and environmental samples. In this study, water samples collected from seven sites and the cultures originated from the cyanobacterial bloom of the Lake Beira were analyzed by polymerase chain reaction (PCR) using the cyanobacterial specific oligonucleotide primers for the 16S rRNA gene and genus specific oligonucleotide primers for the *mcy*E gene. All DNA samples submitted to PCR reactions yielded the unique fragments of about 450 bp for the 16S rRNA gene and 250bp for the *mcy*E gene. The results of the BLAST EF051239 showed 98% of the nucleotide homology to the *Microcystis aeruginosa* gene of 16S ribosomal RNA and EF051238, 95% homology to the *mcy* E gene of *M. aeruginosa* (PCC 7941).These results confirm the presence of microcystin producing *M. aeruginosa* in the Beira Lake and the need for rapid identification of toxin producing cyanobacteria from environmental samples.

Keywords; Cyanobacteria, *mcy* gene, microcystin, *Microcystis aeruginosa*