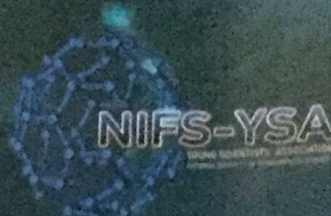




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PCR Amplification of Microcystin Synthetase Genes from Cyanobacterial Mats Collected from Maha Oya Hot Springs

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Cyanobacteria are oxygenic, photosynthetic, Gram-negative bacteria some of which produce toxins. Cyanotoxins such as microcystins, nodularins, cylindrospermopsins, anatoxins and saxitoxins have been well documented for hepatotoxicity, cytotoxicity, neurotoxicity and carcinogenicity. This study was performed to detect the presence of potential microcystin producing cyanobacteria in Maha Oya hot springs by amplification of genes A and E from microcystin synthetase (*mcy*) gene cluster. The *mcyE* gene was chosen from the *mcy* cluster because it is important in incorporating the toxicity determining moiety into the microcystin structure and it has been reported as a reliable biomarker for the detection of microcystin-producing cyanobacteria. Cyanobacterial mat samples were collected from Maha Oya hot springs which showed temperatures ranging from 42 to 59.8 °C and pH ranging from 6.89-7.63. DNA was extracted from cyanobacterial mats using modified cetyltrimethylammonium bromide (CTAB) protocol. The *mcyA* and *mcyE* genes of microcystin synthetase operon were amplified from cyanobacterial DNA by Polymerase Chain Reaction (PCR) using McyA-Cd1F & McyA-Cd1R and HEPF & HEPR primers respectively. *mcyA* gene (230 bp) and a 300 bp fragment of *mcyE* gene were amplified from cyanobacterial mats containing *Calothrix* sp., *Synechococcus* sp., *Oscillatoria* sp., *Gleocapsa* sp., *Gleotheca* sp. and *Cylindrospermopsis* sp. Further, a 472 bp fragment of *mcyE* was amplified from cyanobacterial mats with *Oscillatoria* sp. and *Cylindrospermopsis* sp. Among those cyanobacterial genera, *Oscillatoria* sp. and *Synechococcus* sp. have been reported to be microcystin producers. Hence, amplification of *mcyA* and *mcyE* genes indicates the possibility of the presence of potential microcystin producing cyanobacteria in Maha Oya hot springs. However future research is required to confirm the presence of cyanotoxins and their variants in Maha Oya hot springs.

Keywords: cyanobacteria, hot springs, microcystin, *mcy* genes, PCR