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Detection of potential microcystin-producing cyanobacteria of order Oscillatoriales, from Mahapelessa hot springs in Hambantota, Sri Lanka

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Toxic cyanobacteria are well reported in rivers, lakes and even marine environments, but the toxin production of cyanobacteria in hot springs is largely unexplored. The aim of the present study was to conduct a preliminary screening for microcystin producing ability of three cyanobacterial species from hot water springs of Mahapelessa, Sri Lanka. In this study PCR based assay on *mcyA* gene was used to detect the presence of potential microcystin generating ability in three cyanobacterial strains belonging to order Oscillatoriales H1, H2, H10 (accession numbers EU276384, EU276385, EU276386) isolated from sediment soil (103 °C), surface water (44 °C), stream water (27 ^{0}C) respectively. *Microcystis aeruginosa* (EF051239) was the standard strain. Cyanobacterial cultures were maintained in BG11 medium at 28 °C with 16:8 light dark cycling. Extraction and purification of DNA from cultured organisms were carried out by Boom's method using silica particles and guanidium isothiocyanate. DNA amplification was performed for the *mcyA* gene using self-designed forward primer McyAF87 (5'-ATACCTGAGACTGTGCGAACGG-3') and the reverse primer McyAR99 (5'-TTATCGGGTCATTTTCTGCCAC-3') in the microcystin synthesis pathway to detect potential microcystin generating ability. Two cyanobacterial strains namely, Oscillatoriales cyanobacterium H2 and Oscillatoriales cyanobacterium H10 yielded the unique fragment of about 600 bp, though PCR-amplification products of *mcy* A were not found in Oscillatoriales cyanobacterium H1. The presence of the gene *mcy* A in the isolates H2 and H10 indicates that the strains have the genetic potential to produce microcystins. Though all three molecularly identified cyanobacterial species belong to the same order Oscillatoriales, microcystin-producing ability of Oscillatoriales cyanobacterium H1 may have become lost due to evolutionary phenomena. This preliminary study shows that further work for detection of microcystin in hot springs is important to protect public health where surface water is used for recreational activities.

Keywords: toxic cyanobacteria, *mcyA*, Oscillatoriales, microcystin