

ABSTRACT

Morphological and molecular characterization of cyanobacteria in Maha Oya hot springs in Sri Lanka

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Cyanobacteria are morphologically, physiologically and genetically diverse group of organisms inhabiting almost all the environments from aquatic to terrestrial habitats and some of them are potential toxins producers. In Sri Lanka few studies have been conducted for identifying thermophilic cyanobacteria based on morphology and 16S rDNA sequences. But research on comprehensive molecular characterization of thermophilic cyanobacteria and identification of potential toxin producers in Maha Oya hot springs are still inadequate. The present study was conducted to isolate and identify thermophilic cyanobacteria in Maha Oya hot springs based on morphology and 16S rDNA gene and to identify the presence of potential microcystin producers by microcystin synthetase (*mcy*) gene amplification. Water and mat samples were collected from the seven wells of Maha Oya hot springs which showed water temperatures ranging from 42 to 59.8 °C and pH ranging from 6.89-7.63. Water and mat samples were inoculated into cyano specific BG11 and BG11₀ media. Morphological identification of both uncultured and cultured cyanobacteria revealed the presence of eight different cyanobacterial genera. The most abundant genus was *Oscillatoria*. Additionally *Calothrix*, *Synechococcus*, *Gloeocapsa*, *Gloeotheca*, *Cylindrospermopsis*, *Lyngbya* and *Pseudanabaena* were observed. Amplification of cyanobacterial 16S rDNA (~450 bp) and segments of *mcyA* (~230 bp) and *mcyE* (~300 bp and ~400 bp) genes by PCR indicate the presence of cyanobacteria and potential toxin producers in mats. Findings of the present study confirmed the presence of rich cyanobacterial diversity and potential microcystin producers in Maha Oya hot springs. The isolation of these cyanobacterial strains will be useful for future research on thermostable enzymes and other heat stable bioactive compounds.