SRI LANKAN SOCIETY FOR MICROBIOLOGY (SSM)

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ABSTRACT AND DELEGATE INFORMATION 2019

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Hot springs are unique natural environments for thermophilic microorganisms that thrive at relatively higher temperatures of more than 45 °C. Sri Lanka has many hot springs and their microbial diversity can vary depending on physicochemical parameters such as temperature, chemical composition, pH, etc. The present study was conducted to isolate and identify thermophilic bacteria and cyanobacteria in Mahapellessa hot spring.

Temperature, pH, total dissolved solids (TDS), dissolved oxygen (DO) and salinity were measured in well water *in situ* using a multiparameter. Water and microbial mat samples were collected from the surface and the bottom of the Mahapellessa hot water spring. Thermophilic bacteria were isolated by inoculating 50 µL of water samples into nutrient agar, tryptone soya agar, MacConkey agar, xylose lysine decarboxylase agar and M17 agar media and incubated at 45.5°C for 48 hours. Water and microbial mat samples were inoculated into cyano-specific BG11 liquid and solid media and incubated at 45.5 °C and 12:12 hours dark:light cycle to isolate thermophilic cyanobacteria. Pure cultures were obtained after 1-2 consecutive sub-culturing on to fresh media plates by streaking. Bacterial and cyanobacterial 16S rRNA genes were amplified using specific primers.

Temperature, pH, total dissolved solids (TDS), dissolved oxygen (DO%) and salinity were recorded as 44.5 °C, 8.14, 7.60 ppt, 7.1%, and 8.94 ppt, respectively. Twenty four bacterial pure cultures were isolated and based on colony morphology, Gram stain and standard identification methods, the bacterial isolates were identified as *Bacillus* (10 isolates), *Escherichia* (8 isolates), *Pseudomonas* (4 isolates) and *Klebsiella* (2 isolates) species which have been previously reported in hot springs in other countries. These bacteria are facultative aerobes and their presence could be correlated with the percentage of dissolved oxygen in the well (7.1%). Morphological identification of cultured cyanobacteria revealed the presence of three different cyanobacterial genera: *Oscillatoria*, *Gloeocapsa*, and *Leptolyngbya*. Among them, *Oscillatoria* species are reported as potential toxin producers. Amplified bacterial and cyanobacterial for their isolates into the bacterial and cyanobacterial diversity in Mahapellessa hot spring, which could utilize for biotechnological and industrial applications.

Keywords: Thermophiles, bacteria, cyanobacteria, hot spring.