In-vitro Study on Geosmin and 2-Methylisoborneol Producing Four Species of Native Cyanobacteria

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The production of odiferous metabolites, such as Geosmin and 2-methlyisoborneol (2-MIB) cause muddy and moldy taste and odor in water is a major limitation in safe and adequate provision of potable waters in worldwide. The biological functions of these odorants have not known, and cyanobacteria are the major producers of Geosmin and 2-MIB in natural waters as a result of their secondary metabolites. Objective of the current study was to investigate four laboratory cultured cyanobacteria's ability to produce Geosmin and 2- MIB. Production of Geosmin and 2- MIB was studied using native cyanobacteria isolated from Unnichchi tank in Baticolloa district, Jayanthi tank in Ampara district and Padawiya tank in Anuradhapura district where taste and odour issues are prevailing. Isolation of cyanobacteria was carried out using dilution and spread plate method by maintaining cultures in BG 11 medium with antibiotics. The cultures were identified as *Oscillatoria* sp., *Psudoanabena* sp., *Lyngbya* sp., and *Nostoc* sp. using the 16s rRNA sequencing. 10 ml aliquots of two months old axenic cultures were subjected to Solid Phase Micro Extraction (SPME) and Gas Chromatography Mass Spectrometry (GC/MS) analysis with BG 11 culture medium as control. The concentration of Geosmin produced from the cyanobacteria were ranged between 10.8 ng/L to 162.6 ng/L whereas 2- MIB levels ranged from 50.8 ng/L to 532.5 ng/L. Axenic cultures of *Nostoc* sp. recorded the highest Geosmin level (162.6 ng/L) and highest 2- MIB level was detected from *Psudoanabena* sp. (532.5 ng/L). Further *Nostoc* sp. recorded a significant high level of 2- MIB level (379.6 ng/L) compared to *Oscillatoria* sp. and *Lynbya* sp. ($p < 0.05$). It can be concluded that above species are commonly available cyanobacteria species in Sri Lankan water bodies and popular Geosmin and 2- MIB producers.

Keywords: Geosmin, 2-Methylisoborneol, Cyanobacteria, Solid phase micro extraction, Gas chromatography mass spectrometry