



CONTAMINATION STATUS OF GEOSMIN AND 2- MIB IN DRINKING WATER SOURCES IN NORTH CENTRAL AND EASTERN PROVINCES IN SRI LANKA IN DRY SEASON

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ABSTRACT

Geosmin (*trans*-1, 10-dimethyl-*trans*-9-decalol) and 2- MIB (2- Methyl isoborneol) are key compounds, which are known to cause off flavors in water. Despite no recorded health hazards, water consumers reject the drinking water contaminated with geosmin and 2- MIB due to their unpleasant earthy and musty taste and odour. The aim of the present study was to quantify geosmin and 2- MIB contamination in some selected drinking water sources in North Central (Pollonnaruwa) and Eastern provinces (Ampara, Batticaloe and Trincomalee) in Sri Lanka. Sampling was carried out in dry season during September and October 2017. Triplicate water samples were collected from each location and solid-phase micro extraction (SPME) was employed to extract geosmin and 2- MIB. Quantification was done by using Gas Chromatography–Mass Spectrometry (GC-MS). In addition, some taste and odour producing cyanobacteria and algae were identified and enumerated in the same water bodies. The results showed that the level of geosmin in water bodies was ranging from 7.8 to 34.6 ng/L whereas level of 2- MIB was ranging from 7.6 to 96.3 ng/L. Among the selected water bodies; the highest level of geosmin was recorded in Sagama tank (34.6 ng/L) while the lowest was detected in Parakrama Samudraya reservoir (7.8 ng/L). Kawdulla wewa recorded the highest 2- MIB level (96.3 ng/L) and Minneriya wewa recorded the lowest (7.6 ng/L) 2- MIB levels. Different concentrations of geosmin and 2- MIB were recorded in Jayanthi wewa (20 ng/L geosmin, 73.8 ng/L 2- MIB), Sagama tank (34.6 ng/L geosmin, 2- MIB not detected) and Kondawatuwana tank (12.4 ng/L geosmin, 14 ng/L 2- MIB) respectively. Unnichchi tank recorded 8.3 ng/L geosmin and 2- MIB was not detected at the sampling time. In Kantale tank 80.5 ng/L 2- MIB was recorded where geosmin was not detected during the sampling time. Furthermore different concentrations of geosmin and 2- MIB were recorded in Parakrama Samudraya (7.8 ng/L geosmin, 10.5 ng/L 2- MIB), Kawdulla wewa (geosmin not detected, 96.3 ng/L 2- MIB) and Minneriya wewa (23.6 ng/L geosmin, 7.6 ng/L 2- MIB) respectively. Odour and taste forming cyanobacteria and other algae were recorded as *Oscillatoria* sp., *Anabaena* sp., *Cylindrospermopsis* sp., *Microcystis* sp., *Scenedesmus* sp. and *Melosira* sp. According to Water Research Foundation, a range of 5 to 10 ng/L is considered to be the general public's odour threshold concentration (OTC) of geosmin and 2- MIB in room temperature. The results of the present study showed that 75% of the sampling locations covering 4 districts (Pollonnaruwa district, Ampara district, Batticaloe district and Trincomalee district) exceeded the threshold level for both geosmin and 2- MIB. Therefore, the current findings highlight the importance of removing geosmin and 2- MIB from drinking water to maintain the desirable taste and odour for consumption.

Keywords: Geosmin, 2- MIB, off flavors in water, cyanobacteria, algae