

**Abstract No: BO-63**

**Detection of microcystins (cyanotoxin) in selected drinking water wells in the Gampaha district, Sri Lanka**

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The prevalence of toxic cyanobacteria and various cyanotoxins, such as microcystins (MCs) in drinking water sources have gained considerable attention worldwide due to their potential health risk. Approximately 80% of the Sri Lankan rural population and 34% of the urban population rely on well water for their daily needs. Therefore, people could be exposed to cyanotoxins by consuming well water. This study investigated the presence of potentially toxic cyanobacteria and microcystin variants in the household well water samples collected from the 13 divisional secretariats in the Gampaha district, the second-most populated district in Sri Lanka. Twenty-six well water samples were collected, and physicochemical parameters such as temperature, salinity, pH, conductivity, and Total Dissolved Solids (TDS) were measured in triplicates, *in situ* using a multi-parameter. All samples met the Sri Lankan Standards (SLS) for drinking water in terms of pH, salinity, temperature and TDS. One well water sample collected from Wattala did not meet the SLS standards in terms of conductivity ( $829.00 \pm 2.05 \mu\text{S/cm}$ ), indicating the well's unsuitability for water consumption. Morphological identification of cultures originating from well water samples in cyano-specific BG11 medium indicated the presence of nine cyanobacterial genera, including *Gloeobacter*, *Myxosarcina*, *Dermocarpa*, *Xenococcus*, *Synechococcus*, *Pseudanabaena*, *Chroococcus*, *Lyngbya* and *Geitlerinema*. Among them, *Synechococcus* and *Pseudanabaena* are reported to be microcystin producers. The presence of extracellular MCs in water samples was detected by High-Performance Liquid Chromatography (HPLC). Extracellular MCs were extracted from water samples using 70% methanol. MC variants and their concentrations in each well water sample were determined using MC-RR-YR-LR standard mixture (Cat no. 33578; SIGMA ALDRICH) by comparing peak retention times and the area of the peaks. HPLC analysis revealed the presence of the microcystin variant MC-LR only in two water samples collected from wells located in the Divulapitiya and Katana areas with MC-LR concentrations of 195.1  $\mu\text{g/L}$  and 278.3  $\mu\text{g/L}$ , respectively. These values exceeded the standard guideline value of 1  $\mu\text{g/L}$  for MC-LR set by the World Health Organization for drinking water. This indicates the potential health risk for consumers of those wells because there is a potential for hepatotoxic MCs to cause acute and chronic illnesses in humans.

**Keywords:** Cyanobacteria, HPLC analysis, Microcystins, Morphology

**Acknowledgement**

This work was supported by the National Science Foundation of Sri Lanka under the research grant ICRP/NSF-NSFC/2019/BS/01