STUDY ON PRESENCE OF CYANOBACTERIA IN UNNICHCHAI RESERVOIR-BATTICALOA

By

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Abstract

The increased population, insufficient sanitation infrastructure facilities and prolong drought condition in the Batticaloa district, Eastern part of Sri Lanka enhance ground water pollution (contaminated with faecal coliform) and drying out drinking water sources such as dug wells and surface water sources in the mid part (dry season) of every year. The Government of Sri Lanka has proposed and been implementing a new greater water supply scheme, which is going to be used to get raw water form Unnichchai reservoir, to fulfil safe drinking water requirement. Unnichchai tank is the only source of water supply proposed for the Greater Batticaloa Water Supply Scheme and in addition it has been used for agriculture, bathing activities, and for commercial fishing to a certain extent. Unnichchai reservoir is eutrophic water body and frequently affected by occurrence of algae blooms. This phenomenon raises the possibility of contamination of the raw water with toxic cynobacteria, which is hazard for human health while expose via reticulated town water supply and engaged to start investigation of cyanobacteria in the reservoir.

Grab sample of scum collection has been done in the Unnichchai reservoir while a composite sample mixed from samples taken at different depths was collected to determine the mean density of cynaobacterial population from July to September (dry period) 2009 by using deep water sampler. For preservation of samples, Lugol's iodine solution was added. Quantification of *Microcysystis* and *Cylindrospermopsis* species were counted for samples taken near the intake structure and middle of the reservoir by using Haemocytometer. Physico –chemical parameters such as pH, temperature, total alkalinity, salinity NO_3^- , and PO_4^{2-}, were recorded and Secci disc measurements were taken for light attenuation.

Stimulated water surveillance of toxic cyanobacteria and chemical and physical parameters proved that the presence of toxic *Cylindropermopsis raciborskii* (138464 Nos /ml) and *Microcystis arugunosa sp* (5163Nos/ml) during July to September. The pH was increased up to 9.0, NO_3^- decreased from 50 mg/l to 24.2 mg/l and PO_4^- decreased from 1.8 mg/l to 1.34 mg/l during the dry period observation. Temperature was around 30^0C degrees at surface, however in 1 m deep water it was around 29^0C. The highest population of *C. raciborskii* has recorded as 23.8×10^4 cells ml^{-1} in September from surface scum near the intake structure of the Unnichchai Tank.

This study recorded the higher cell numbers than the guidance values and therefore it is needed to consider, as this water resource use for public water supply. Special attention should be drawn when taking algae control action as cell lyses may cause toxin emission. Further it is very important to continue the research study of cyanobacteria during wet as well as dry season.