(73)

Studies on Identification of Algal Population, Detection and Removal of Algal Toxin in the Peraru Water Reservoir in Vavuniya

Puthumailolan K.[1], Pathmanathan S.[1*], Saravanan S.[2], Christie T.A.[1]

[1]Department of Botany, University of Jaffna, Sri Lanka
[2]National Water Supply and Drainage Board, Vavuniya, Sri Lanka
**sevvel@univ.jfn.ac.lk*

Abstract

A continuing worldwide problem for drinking water is the presence of microorganisms particularly algae in water sources. This algal population density is varying with seasonal changes and the quality of water is significantly reduced by algae especially Cyanobacteria which has the capability of producing toxins. In this study, the analysed water samples were collected from Peraru water reservoir located in Vavuniya. The impact of the seasonal changes on the algal population, detection of algal toxin and the different toxic removal approaches were also investigated. This study was conducted during the period of October 2019 to February 2020. A total of seventeen algal taxa were identified from the selected areas and 11 taxa belonged to green algae, 6 taxa belonged to blue green algae (Cyanobacteria) and diatoms. Among them, *Microcystis* sp. was found to be 17%. It was also found in the study that, the total population density of algae increased in summer and decreased in rainy season. Aerated water of the water treatment plant from the water reservoir contains 0.2 ng mL^{-1} concentration of microcystin toxin. In the water treatment plant, initially the concentration of the microcystin toxin was reduced from 0.2 ng mL^{-1} to 0.14 ng mL^{-1} by coagulation/flocculation. After that, the toxin concentration reduced from 0.14 ng mL^{-1} to 0.116 ng mL^{-1} by Granular Activated Carbon (GAC) treatment. So that, the water treatment plant removes 42% of total toxin from the initial concentration. According to the WHO guidelines, 1 µg L^{-1} microcystin toxin is safe for the person who drinks 2 liters of water per day. Therefore this water treatment plant achieves this guideline efficiently.

Keywords: Algae, *Microcystis* sp, Microcystin toxin, Algal population density, Granular activated carbon