

A Review of Toxic and Non-Toxic Cyanobacteria Species Occurrence in Water Supplies Destined for Maize Meal Production Process: A Case Study of Vhembe District

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Abstract : Cyanobacteria or blue green algae have been part of the human diet for thousands of years. Cyanobacteria can multiply quickly in surface waters and form blooms when favorable conditions prevail, such as high temperature, intense light, high pH, and increased availability of nutrients, especially phosphorous and nitrogen, artificially released by anthropogenic activities. Consumption of edible cyanotoxins such as Spirulina may reduce risks of cataracts and age related macular degeneration. Sulfate polysaccharides exhibit antitumor, anticoagulant, anti-mutagenic, anti-inflammatory, antimicrobial, and even antiviral activity against HIV, herpes, and hepatitis. In humans, exposure to cyanotoxins can occur in various ways; however, the oral route is the most important. This is mainly through drinking water, or by eating contaminated foods; it may even involve ingesting water during recreational activities. This paper seeks to present a review on cyanobacteria/cyanotoxin contamination of water and food and implications for human health. In particular, examining the water quality used during maize seed that passes through mill grinding processes. In order to fulfil the objective, this paper starts with the theoretical framework on cyanobacteria contamination of food that will guide review of the present paper. A number of methods for decontaminating cyanotoxins in food is currently available. Therefore, physical, chemical, and biological methods for treating cyanotoxins are reviewed and compared. Furthermore, methods that are utilized for detecting and identifying cyanobacteria present in water and food were also informed in this review. This review has indicated various routes through which humans can be exposed to cyanotoxins. Accumulation of cyanotoxins, mainly microcystins, in food has raised an awareness of the importance of food as microcystins exposure route to human body. Therefore, this review demonstrates the importance of expanding research on cyanobacteria/cyanotoxin contamination of water and food for water treatment and water supply management, with focus on examining water for domestic use. This will help providing information regarding the prevention or minimization of contamination of water and food, and also reduction or removal of contamination through treatment processes and prevention of recontamination in the distribution system.

Keywords : biofilm, cyanobacteria, cyanotoxin, food contamination

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