

Drinking water treatment using upflow slow sand filtration systems in high density *Cylindrospermopsis raciborskii* cyanobacteria water

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ABSTRACT

Cyanobacterium *Cylindrospermopsis raciborskii* may cause problems in drinking water treatment plants if specific attention is not focused on removing the cyanobacteria. Slow sand filtration possesses a good capacity for cyanobacteria removal and is a simple alternative to more expensive treatments. However, high cyanobacteria concentrations can correspond to an operational problem for slow sand filters by reducing the filter running time, and therefore rough filtration is necessary. In this study, two similar upflow slow sand filters were used to evaluate *C. raciborskii* removal. Water with 9.1×10^5 cells/mL was used and an average of 99% of cells were removed. Nevertheless, average concentrations of 1.4×10^4 and 2.1×10^4 cells/mL were observed after filtration, and this could continue to act as a problem for water treatment. The system also indicated good results in terms of removing total coliforms, colour and turbidity. The average turbidity was below 1.0 NTU, which is the maximum value permitted by Brazilian regulations and WHO recommendations. The major advantage of the upflow slow sand filter involved the high removal of *C. raciborskii* without compromising the running time of the filter with the filters operating for almost 80 days without the use of rough filters. However, it is necessary to use a complementary treatment process to achieve better water quality results.

Keywords: Cyanobacteria; Slow sand filtration; Upflow filtration; Water quality; Filter running time

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