



Nanofiltration membranes applied to the removal of saxitoxin and congeners

Lucila Adriani Coral^{a,*}, Luis Antonio de Oliveira Proença^b, Fatima de Jesus Bassetti^c,
Flávio Rubens Lapolli^a

^aDepartment of Sanitary and Environmental Engineering, Water Reuse Laboratory, Universidade Federal de Santa Catarina - UFSC, Technological Center. Campus Trindade, PO Box 476, 88040-970, Florianópolis, Santa Catarina, Brazil
Tel. +55 48 9963-1403, +55 48 3721-7750; email: lucila_coral@yahoo.com.br

^bCenter of Technological Sciences of Land and Sea, Laboratory of Harmful Algae, Universidade do Vale do Itajaí, Univali. Rua Uruguai, 458, Bloco 19, PO Box 360, Zipcode: 88302-202, Itajaí, Santa Catarina, Brazil

^cDepartment of Chemistry and Biology, Universidade Tecnológica Federal do Paraná – UTFPR. Avenida Sete de Setembro, 3165, 80230-901, Curitiba, Paraná, Brazil

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ABSTRACT

Cyanobacterial toxins pose a potential threat to human health and wildlife. Effective treatment processes are essential for the removal of these constituents in drinking water. The efficiency of two nanofiltration membranes (NF-270 and NF-90) in the removal of cyanotoxins of the saxitoxin group from water was investigated. In this work, these toxins were extracted from a laboratory culture of *C. raciborskii* and added to surface water. A working pressure of 8 bar was applied. A filtration time of 180 min was used for each experiment. Total removal (100%) of the identified toxins was obtained with the NF-90 membrane throughout the filtration period. A lower degree of toxin removal was observed with the NF-270 membrane, decreasing with filtration time. Different rejection mechanisms can be considered in the process: size exclusion, electrostatic interactions and hydrophilic interactions, as well as the mechanism of concentration polarization. A larger influence of fouling phenomena was considered for the NF-270 membrane, with a larger drop in the permeate flux. A more stable permeate flux was observed for the NF-90 membrane. These results indicate that the use of nanofiltration technology is effective in the removal of dissolved cyanotoxins in water intended for human consumption.

Keywords: Water supply source; Nanofiltration; Cyanobacteria; Saxitoxin and congeners

*Corresponding author.