

# Simultaneous Cultivation of *Spirulina platensis* and the Toxigenic Cyanobacteria *Microcystis aeruginosa*

Jorge Alberto Vieira Costa\*, Michele Greque de Moraes, Francieli Dalcanton, Carolina da Cruz Reichert, and Andrei José Durante

Laboratório de Engenharia Bioquímica, Departamento de Química, Fundação Universidade Federal do Rio Grande, Caixa Postal 474, CEP 96201-900, Rio Grande, RS, Brazil.

Fax: +55-53-32338745. E-mail: dqmjorge@furg.br

\* Author for correspondence and reprint requests

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Mangueira Lagoon, located in the extreme south of Brazil, has water with physicochemical characteristics such as alkaline pH and carbonate levels propitious for the growth of the cyanobacterium *Spirulina platensis*. Previously published studies have shown that Mangueira Lagoon water supplemented with small quantities of carbon and nitrogen is suitable for *S. platensis* cultivation and can significantly reduce production costs. We studied mixed cultures of *Spirulina platensis* and the toxic cyanobacterium *Microcystis aeruginosa* using a  $2^3$  factorial design in which the three factors were the initial biomass concentration of *S. platensis* and *M. aeruginosa* and the type of culture medium (100% Zarrouk's medium or 80% Mangueira Lagoon water plus 20% Zarrouk's medium). The highest *S. platensis* maximum specific growth rate ( $\mu_{\max}$ ) occurred in the culture with the highest *M. aeruginosa* biomass concentration and when undiluted culture medium was used ( $\mu_{\max} = 0.283 \text{ d}^{-1}$ ). The highest *M. aeruginosa* specific death rate ( $k$ ) was obtained in the presence of *S. platensis* ( $k = 0.555 \text{ d}^{-1}$ ) and was independent of the initial *M. aeruginosa* biomass concentration and culture medium, demonstrating that *S. platensis* cultures are not susceptible to contamination by *M. aeruginosa*. The culture medium had no significant influence ( $p > 0.05$ ) on *S. platensis*  $\mu_{\max}$  values, indicating that production costs could be reduced by using a medium consisting of 80% Mangueira Lagoon water plus 20% Zarrouk's medium.

**Key words:** Cyanobacteria, *Microcystis aeruginosa*, *Spirulina platensis*