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

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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 ($\mu_{\text{max}}$) occurred in the culture with the highest *M. aeruginosa* biomass concentration and when undiluted culture medium was used ($\mu_{\text{max}} = 0.283 \text{ d}^{-1}$). 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* $\mu_{\text{max}}$ 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*