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## **Evaluation of the photosynthetic potential and its relationship with the production of microcystins in strains of *Microcystis aeruginosa***

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Lack of conclusive data about the role of microcystins and of control of their production does not allow the establishment of how and when a toxin can be produced by a species of cyanobacteria. Some hypotheses indicate that microcystins have a potential role in regulating photosynthesis. Our objective was to investigate in different growth phases variations in the production of microcystins and in the development and profile of pigments in two strains of *Microcystis aeruginosa*, a toxic one and a non-toxic one. Quantitative and qualitative analyses of microcystins were carried out in the exponential and stationary growth phases. Every three days, samples of chlorophyll and phycobiliproteins were collected for analysis. The t-test and ANOVA of one factor were performed. Exponential phase: the toxic strain had higher growth rate and chlorophyll production than the non-toxic one. However, both strains produced the same amount of C-phycoerythrin and allophycocyanin at this growth stage. C-phycoerythrin was not detected in either strain. Stationary phase: no significant difference in growth between toxic and non-toxic strains occurred. However, after 19 days of cultivation, the toxic strain continued growing and the non-toxic strain tended to senescence. Nevertheless, the latter produced higher amounts of phycoerythrin and allophycocyanin than the former. Microcystin production: higher concentration was detected in the exponential growth phase. Photosynthetic parameters: there was no statistical difference between the tested strains in terms of maximum photosynthesis, light saturation point and effective quantum yield (RQE). However, the non-toxic strain showed higher photosynthetic efficiency (alpha) and the toxic strain had no photoinhibition (Beta). Our results support the hypothesis that microcystins have an intracellular function related to oxidative stress. The fact that both strains keep the same RQE may be related to the greater ability of the toxic strain to avoid oxidative stress and of the non-toxic strain to produce more phycobiliproteins.

**Key words:** *Microcystis aeruginosa*, microcystins, photosynthesis.

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