443/D

Microbial control of *Microcystis aeruginosa* bloom in a hypereutrophic lake

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Microcystis (Cyanophyceae) is well known all over the world as one of the most common bloom-forming cyanobacteria which have harmful effects on animals and potentially on human beings. The mortality of *Microcystis* due to microbial processes has been highlighted as an important factor in the termination of the bloom. Thus, the present study was carried to ascertain the potential impact of algicidal agents on *M. aeruginosa*. The surface phytoplankton samples were fixed with acidified Lugol's solution and counting was carried out using a haemocytometer. Algicidal bacteria and protozoa were enumerated by modified plaque count method and the grazing effect of the flagellate *Polytomella* sp. on *M. aeruginosa* was studied by fixed concentrated samples. The grazing effect was confirmed by adding cycloheximide (200 mg l^{-1}), a specific inhibitor of protein synthesis in eukaryotes.

Dominant phytoplankton species during the study period were the *M. aeruginosa, M. wesenbergi, Spirulina* sp., *Merismopedia* sp., *Koliella* sp. and *Melosira* sp.. *M. aeruginosa* and *M .wesenbergii* quantitatively dominated in most sampling dates and constituted >75% of the phytoplankton community when the bloom reached its peaks on 6 October 2005 and 14 October 2006 respectively. Densities of algicidal bacteria were relatively high with large fluctuations from June to August 2005, from December to January 2006 and from August to November 2006. From September to November 2005 and from April to July 2006 algicidal bacteria were undetectable. Algicidal protozoa (*Penardochlamys* sp.) had appeared in August and increased until it reached to the maximum (6.0×10^2 $PFUml^{-1}$) on 20 October. Protozoa and bacteria cell density tended to increase, following the increase of the cell density of *M aeruginosa* and a sudden decline of *M. aeruginosa* was detected when the cell density of algicidal agents were increased. The cell density of *M. aeruginosa* was suppressed and not exceed when the cell density of *Polytomella* sp. was greatest *in situ* and it was confirmed *in vitro* grazing experiment. In the laboratory, the degradation of *M. aeruginosa* was detected when the isolated bacteria and the amoebae *Penardochlamys* sp. were added to the algal lawn but not when only the culture filtrate was added, showing that the bacterium and amoebae killed the alga by direct contact. The conclusion of the present study is that algicidal bacteria and protozoa are important agents for the decomposition of *M. aeruginosa* bloom.

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