Single culture and co-culture of two *Synechococcus* phylotypes respond differently to nanoflagellate grazing

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Cyanobacteria belonging to the genus *Synechococcus* are found in lake waters typically as planktonic single cells and monospecific microcolonies. In oligotrophic lakes, single cells dominate in spring, while microcolonies are mostly found in late summer-autumn when the large colonial cyanobacteria increase in number. Since grazing activity is known as one of the major factors inducing microbial phenotypical changes, the formation of *Synechococcus* microcolonies was proposed as an efficient defence strategy against size-selective predators. To better understand this ecological interaction, we explored the effect of grazing by the mixotrophic nanoflagellate *Poteriochromonas* sp. on the aggregation of two freshwater *Synechococcus* strains belonging to different phylogenetic clades (phycoerythrin-rich cells, PE, Group A; phycocyanin-rich cells, PC, Group I). During four days of incubation, we followed the dynamics of single-cells, microcolonies, and flagellates in semi-continuous cultures under different treatments (single culture and co-culture, with and without predators) by flow cytometry, epifluorescence microscopy and PhytoPAM. In single culture with the addition of *Poteriochromonas*, we observed the formation of grazing-induced monoclonal PE microcolonies, conversely limited in PC. In co-culture, there was an interaction between PE and PC, with an active microcolony formation by both PE and PC, and an increase of PC photosynthetic fitness (Fv/Fm). In co-culture, the microenvironment, generated by the formation of PE microcolonies, PC cells, bacteria and *Poteriochromonas*, can be the site of a beneficial "communication signalling" among *Synechococcus* cells for attaining the best spatial distribution for the fitness of the group.