

## EFFECTS OF DISSOLVED ORGANIC MATTER AND IRON AVAILABILITY ON GROWTH OF CYANOBACTERIA IN A EUTROPHIC LAKE

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Dissolved organic matter (DOM) in lake water has a harmful effect on algal growth through either direct toxicity or iron limitation induced by its complexation with iron. We developed algal growth potential test to separately assess the direct toxic effect and the effect of iron complexation. We used the test to assess the effect of DOM in Lake Kasumigaura (Japan) using two species of cyanobacteria, *Microcystis aeruginosa* and *Planktothrix agardhii*. Although we observed no direct toxic effect of DOM, iron complexation had a marked effect. We also determined which nutrient limited the algal growth in the lake water. Iron was a limiting nutrient for the two species, as were nitrogen and phosphorus. We calculated the iron availability from the degree of the effect of DOM through iron complexation, and they differed greatly with sampling time and species. Furthermore, we analyzed iron speciation in Lake Kasumigaura by cathodic stripping voltammetry, and more than 99.9% of the dissolved iron presented as organic species in all samples. Our results suggest that some of organically complexed iron in natural waters was utilized by cyanobacteria.