Genetic diversity in two species of freshwater cyanobacteria, *Planktothrix (Oscillatoria) rubescens* and *P. agardhii*

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With 2 figures and 3 tables

**Abstract:** The genetic diversity of two freshwater cyanobacteria, *Planktothrix rubescens* and *P. agardhii*, was studied by sequencing a 519 bp fragment of the 16S rRNA gene, a 550 bp fragment of the psaAB locus, a 517 bp fragment of the rbcLX locus and a 550 bp fragment of the 16S-23S ITS. Most of the 19 isolates were obtained from five alpine lakes, except for four purchased from culture collections. There was no polymorphism between the *P. rubescens/agardhii* strains for the 16S rRNA gene (partial sequencing) and only a few polymorphic sites were found in the other sequences. These informative sites had a mosaic structure in the *Planktothrix* strains, suggesting the occurrence of recombination between them. In contrast, the population structure during a bloom appears to be clonal. The existence of recombinations between the strains of *P. rubescens* and *P. agardhii* and the 16S sequencing data suggest that they are conspecific.

**Key words:** Cyanobacteria, *Planktothrix rubescens*, *P. agardhii*, genetic diversity, taxonomy.

**Introduction**

*Planktothrix rubescens* and *P. agardhii* are filamentous non-heterocystous cyanobacteria that can produce hepatotoxin and neurotoxin, which are dangerous to animals and humans (Feuillade et al. 1996, Sivonen & Jones 1999). These species are very common in deep stratified sub-alpine lakes and are water bloom-forming cyanobacteria (Feuillade 1994, Micheletti et al. 1998). The identification of these two species is traditionally based on the color of the filaments, *P. rubescens* being red-colored when *P. agardhii* is green. But sev-

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