Diversity and ecology of small coccoid green algae from Lake Itasca, Minnesota, USA, including *Meyerella planktonica*, gen. et sp. nov. (Trebouxiophyceae, Chlorophyta)

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We characterized 81 isolates of picoplankton and other small planktonic coccoid green algae from Lake Itasca, Itasca State Park, Minnesota, USA. Sequence analysis and examination by light microscopy revealed three common algae: *Pseudodictyosphaerium/Korshpalmella* spp. (Chlorophyceae), *Choricystis* spp. (Trebouxiophyceae) and a previously undescribed autosporic coccoid. *Pseudodictyosphaerium* spp. and *Korshpalmella* spp. that were evaluated all possessed identical 18S rDNA and *rbc*L sequences, but this 18S rDNA sequence differed from the published 18S rDNA sequence for *P. jurisii* isolated from Europe. These chlorophycean algae were isolated from samples collected from Lake Itasca during all seasons. The 18S rDNA sequence of some of the Itasca isolates of *Choricystis* was nearly identical to the published sequence for *Choricystis minor*; however, 6 different *rbc*L sequences were detected among the *Choricystis* isolates and none of these *rbc*L sequences matched published sequences for isolates from several lakes in Europe. The different *rbc*L sequence types of *Choricystis* had distinct seasonal distributions in Lake Itasca. These results extend our knowledge of the distribution of *Pseudodictyosphaerium* and *Choricystis* and suggest that *Choricystis* is even more diverse than previously thought. In addition, the distinct sequences of marker genes for Lake Itasca isolates indicate that these organisms have diverged from the European isolates. The previously undescribed alga isolated from Lake Itasca is a sister taxon to the trebouxiophyte lineage that includes *Chlorella vulgaris*, but differs from true *Chlorella* species in that it lacks a pyrenoid. Based upon this difference and molecular analyses, these isolates are described as *Meyerella planktonica*, gen. et sp. nov. (Trebouxiophyceae, Chlorophyta). All *M. planktonica* isolates examined possessed identical 18S rDNA, *rbc*L and ribosomal ITS sequences. *Meyerella planktonica* was isolated almost exclusively from winter and spring samples.

In Press, *Phycologia*