

Algal recruitment from lake sediments in relation to grazing, sinking, and dominance patterns in the phytoplankton community

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Abstract

I assessed the importance of algal recruitment from the sediment surface to the water relative to other population variables such as grazing, growth, and sinking. In four low-productivity lake basins, which were stratified throughout the study, 32% of the identified algal taxonomic groups exhibited recruitment, whereas the other 68% spent their entire lives in the pelagic habitat. For most species, recruitment from sediment to water occurred primarily at shallow depths (<8 m) and often increased total phytoplankton abundance by 10–50% per day. Grazing was the main loss process, reducing algal abundance by usually between 10 and 50% per day; sinking rates were usually one order of magnitude lower. Recruitment was highest in shallow water (<10 m deep); when maximum recruitment occurred below the thermocline, no relation was found between recruitment and abundance in the euphotic zone, suggesting that the thermocline functioned as a physical barrier for algal vertical migration. In three of the lakebasins, recruiting algae dominated more often than expected by chance ($P < 0.05$), suggesting a competitive advantage with the adaptation to perform recruitment. Successful recruitment may have a considerable impact on dominance patterns in the phytoplankton community.