

Factors initiating algal life-form shift from sediment to water

Lars-Anders Hansson

Institute for Ecology/Limnology, P.O. Box 65, S-221 00 Lund, Sweden

Received: 10 October 1992 / Accepted: 28 January 1993

Abstract. In enclosure and whole-lake experiments, I tested whether life-form shift (recruitment) is a passive process induced by turbulence, a seasonal phenomenon, or a behavior that can be induced by alterations in environmental variables. The number of algal cells recruited from the sediment varied considerably during the experimental period. The most important migrating genera in this study were: *Cryptomonas*, *Dinobryon*, *Gonyostomum*, *Gymnodinium*, *Peridinium*, and *Synura*. An obvious conclusion is that it is not the same factor in each case that causes life-form shift, but that different triggering factors operate in different algal species. Turbulence and temperature were similar in all treatments and therefore did not cause the considerable fluctuations and trends in algal recruitment in the enclosures. This suggests that life-form shift is not a passive process driven by wind and temperature-induced currents. In the enclosure experiment, alterations in the light régime explained a major part (up to 53%) of the variation in recruitment for most genera. For *Gymnodinium* this was corroborated in the whole-lake experiment, where the depth of the euphotic zone explained 41% of the variation in recruitment. For *Cryptomonas*, however, 64% of the variation in recruitment was explained by the depth of the “oxycline”, whereas 52% of the variation in recruitment of *Synura* were explained by the depths of the euphotic zone and the oxyline. *Peridinium pusillum* and *P. wisconsinense* showed low recruitment at high zooplankton abundance and high recruitment at low zooplankton abundance in the lake experiment, as well as in the enclosure experiment. Thus, the hypothesis that the presence of grazers can induce shifts in behaviour of some algal groups cannot be rejected.

Key words: Phytoplankton – Migration – Life-form shift – Recruitment – Algae
