

Persson, Agneta 2001. On the ecology of cyst-producing dinoflagellates on the Swedish west coast.

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Abstract

Dinoflagellates are important primary producers in the oceans and some species are well known for causing harmful algal blooms. Many dinoflagellate species have a dormant resting stage (cyst) in their life cycle. A survey of cyst-producing dinoflagellates in recent sediments from the northern Swedish west coast describes the abundance and diversity of cyst-producing dinoflagellates. The most common species were those of *Lingulodinium polyedrum*, *Protoceratium reticulatum*, *Scrippsiella trochoidea*, *Pentaparsodinium dalei* and *Gonyaulax* cf. *spinifera*. Nine of the species found have not previously been reported from Sweden.

A slurry culture method to study samples from natural sediments and ships' ballast tanks is described. Incubation of untreated sediment samples from the Swedish west coast resulted in a conspicuous proliferation of various protists. At least 47 different dinoflagellate taxa were found as vegetative stages. Small and naked dinoflagellates, normally not encountered in cyst analyses, were common in the slurry cultures. More than 46 different ciliate taxa and at least 128 diatom taxa were present together with many other groups. Potentially toxic dinoflagellate species present in the sediments were *Alexandrium minutum*, *A.* cf. *ostenfeldii* and *A. tamarense*. Multivariate analyses including different environmental data were applied to search for patterns of composition and abundance of taxa.

A theoretical model of dinoflagellate ecology is presented, including losses to the cyst seed bank due to grazing or microbial degradation. The effect of grazing on marine dinoflagellate cysts was studied by adding a concentrated cyst assembly to sediment with different deposit feeders. The deposit feeders used were *Abra nitida*, *Amphiura filiformis*, *Melinna cristata* and *Nereis diversicolor*. The results showed that grazing significantly changed the species composition of dinoflagellate cysts in sediments. A significant relative decrease of unfossilizable cyst species was seen, whereas the common fossilizable species *Lingulodinium polyedrum* constituted a significantly larger part of the cyst assemblage after grazing.

Keywords: *Alexandrium*, ciliates, cysts, deposit feeders, diatoms, dinoflagellates, germination, grazing, hatching, Kattegat, *Lingulodinium polyedrum*, marine, model, protists, resting stages, seed bank, seed bed, Skagerrak, spores.

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