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Dinoflagellate resting cysts as factors in phytoplankton ecology of the North Sea

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Abstract The occurrence and distribution of dinoflagellate resting cysts were investigated at 11 locations in the south-eastern part of the North Sea. Twenty-six known cyst species and 7 unknown cyst types, which may act as seed population for planktonic dinoflagellate blooms, have been recorded for the first time in the area. The most common cysts in recent sediments were those of *Scrippsiella trochoidea, Zygabikodinium lenticulatum, Peridinium dalei, Scrippsiella lachrymosa, Protoceratium reticulatum, Protoperidinium denticulatum*, and *P. conicum*. At all stations, *S. trochoidea* dominated the cyst assemblages with a maximal abundance of 1303 living cysts/cm^3 in the uppermost half centimetre. Cysts of the potentially toxic dinoflagellates *Alexandrium* cf. *excavatum* and *A.* cf. *tamarense* were scarce. In the upper 2-cm layer of sediment, dinoflagellate cysts were found in concentrations of 1.8 up to 682 living cysts/cm^3. Empty cysts constituted 22-56% of total cyst abundance. The comparative distribution of the cysts showed a general increase in abundance from inshore sites to the offshore area, whereby sandy stations exhibited the lowest cyst abundance and diversity. The wide distribution of living and empty cysts of *Scrippsiella lachrymosa* suggests that its motile form, which has not been officially recorded in the area until now, is a common plankton organism in German coastal waters. The relatively high abundance of cysts in recent sediments demonstrates the potential importance of benthic resting stages for the initiation of dinoflagellate blooms in the study area.