

Title

Coccolithophore diversity and morphology in different oceanic environments

Specialisation

Marine Biology, Phytoplankton, Taxonomy, Ecology

Description

Coccolithophores are marine unicellular phytoplankton featuring a calcite-biomineral shell comprised of individual platelets called coccoliths. These coccoliths have a species specific, highly elaborate morphology enabling identification to the sub-species level. Apart from being useful guides to taxonomy the coccoliths have a multiple significance. Coccoliths exported to the deep-sea form massive sediments such as the cretaceous White Cliffs of Dover. The impact of coccolith production and export on the global carbon cycle is even more wide-ranging because coccolith production influences the carbonate system of seawater in a way opposite to the effect of photosynthesis. Besides their biogeochemical relevance, coccolithophores are important for the marine food web, since they are major primary producers. Moreover, coccolithophore distribution and coccolith morphology can also be used to characterize water masses and changes in environmental conditions. Therefore, coccolithophore biogeography, depth distribution and morphology are central to several areas of coccolithophore research in the widest sense.

This project will analyse coccolithophore samples collected either in the North Pacific Ocean or the Southern Ocean. The Southern Ocean samples are focused on the **morphology of *E. huxleyi***, the most abundant species globally. The North Pacific samples would be analysed for community composition, i.e. **species-level identification**. In any case analyses will be performed by means of **scanning electron microscopy** which features a higher resolution than light microscopy and enables the analysis of fine scale features.

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