Evolutionary trends of selected coccolithophore species in the North Atlantic during the Pliocene to Pleistocene

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Selected keystone coccolith taxa, which are characterized by a global distribution and a continuous geological record, were quantified and morphologically analyzed. By means of Plio- to Holocene Atlantic time-serie,s the range of their morphological variability is assessed to elucidate their evolutionary development. Geologic investigations on species-level diversity allow tentative concepts on speciation to be tested, evaluated, and long-term patterns to be tracked, in order to identify periods of niche differentiation. Special attention is directed to interactions with biotic and abiotic factors.

Selected coccolithophorid species from three DSDP/ODP sites in the North Atlantic covering the last 5 Myr were biometrically characterized and the spatial distribution patterns of distinct morphotypes from the tropical to northern NE Atlantic Ocean were reconstructed. Moreover, speciation and species evolution were evaluated with respect to the decline and extinction events of other floral elements.

The chosen time-interval, encompassing the Pliocene to Quaternary, is characterised by significant geologic and climate-relevant events: changes in oceanic and atmospheric circulation linked to the closing of the Isthmus of Panama (4.6 Myr BP); the building up of the Northern Hemisphere ice shields 3.1 Myr ago; the onset of enhanced ice growth between 3.1 and 2.6 Myr BP, and finally the development of the Quaternary glacial-/interglacial-cyclicity. A total of five species complexes was quantitatively and morphologically analysed, including *Calcidiscus leptoporus*, *Florisphaera profunda*, *Syracosphaera pulchra*, *Umbilicosphaera sibogae* and *Coccolithus pelagicus*.