



Variability in surface water properties of the southeastern South Atlantic Ocean related to the Miocene Cooling Events, evidence from calcareous dinoflagellate cysts.

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The middle- and upper Miocene represent major climatic shifts to colder global temperatures. These periods of cooling (Mi-Events) were characterized by oxygen isotopic shifts that have been related to size changes of the Antarctic and Arctic ice-sheets (e.g. Miller et al., 1991, St. John, 2008). The start and development of the Antarctic Circumpolar Current (ACC) during this time-interval is of major interest, as it changed the atmospheric and oceanic circulation pattern which led to the initiation of upwelling off the south western African coast (Paulsen et al., 2007). However, the complex interaction between the initiation and development of the upwelling in the western South Atlantic and its interaction with the evolution of the Antarctic Circumpolar Current as well as the built-up of the Antarctic ice-sheet is far from being fully understood. We want to improve the understanding of these processes by establishing a detailed palaeoceanographic reconstruction of the southeastern South Atlantic Ocean on the basis of calcareous dinoflagellate cyst associations.

Within this study 53 samples were taken from sediment core ODP 175 1085A off the coast of Namibia and investigated by defining the calcareous dinoflagellate cyst assemblage.

The general cooling trend during the middle- and upper Miocene is clearly reflected in the dinocyst record by the decrease of species adapted to warm water conditions (*Calciodinellum albatrosianum* and *Thoracosphaera heimii*) and the appearance and increase of *Caracomia arctica* after ~ 11.1 Ma. *C. arctica* is a cold water species which today is only present south of the polar front. The concentration of *C. arctica* varies with a cyclicity of about 200-400 kyrs which reflects an eccentricity signal. We assume that observed changes in association such as the appearance of *C. arctica* can either be related to the initiation of the upwelling activity in the region, which is suggested to occur at ~ 11.6 Ma (Paulsen & Bickert 2007), or might be the result of a northwards migration of the subantarctic front.

References

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