

Response of coccolithophores to atmospheric and oceanographic changes during the Holocene African Humid Period in the East Atlantic, NW Africa

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Core MD03-2705 -DUST was recovered on a seamount at 18°05'N and 21°09'W at a water depth of 3085 m off Mauritania-Senegal (NW Africa) during the R/V *Marion Dufresne II* Cruise (PICABIA, summer/fall 2003). The continuous sediment sequence consists of foraminifer and nannofossil oozes. The age-model is based on the correlation of $\delta^{18}\text{O}$ record of the benthic foraminifer *Cibicides wuellerstorfi* to the SPECMAP and ODP Hole 658C records (Martinson *et al.*, 1987; deMenocal *et al.*, 2000). Additionally, these results were compared to ^{14}C analyses. Qualitative analyses, carried out on coccolithophores together with wind-transported microfossils (phytoliths and fresh-water diatoms) from continental NW African areas, allow us to interpret variations in the direction and intensity of winds and their relationship with superficial oceanographic dynamics during 14.5-5.5 ka cal. BP, associated with the African Humid Period (Sarnthein *et al.*, 1982; deMenocal *et al.*, 2000). The terrigenous record exhibits a well-defined period of low influx associated with the African Humid Period (AHP), when the Sahara was nearly completely covered by vegetation and supporting perennial lakes. This period has been attributed to a strengthening of the African monsoon, due to gradual orbital increases in summer insolation. Variations in the surface-water productivity of coccolithophores (variations in the nutricline/thermocline position) were monitored using the N ratio between Noelaerhabdaceae (inhabitants of the upper photic zone) versus *Florisphaera profunda* (a lower photic zone inhabitant). High values in the N ratio imply a relatively high nutricline/thermocline position. During the AHP, the high productivity conditions are related with high values in the N ratio with abundant specimens of Noelaerhabdaceae. The transition between the Younger Dryas and the Holocene is interpreted as a rapid shift to arid conditions. The end of this period is coincident with high abundance in fresh-water diatoms and phytoliths, and with a progressing positive pulse in the Ti/Al ratio, suggesting intensification in the wind regime. At this time, the coccolithophore assemblage shows a dramatic decrease in the cool-water species *Gephyrocapsa muelleriae*, interpreted as a return to warmer conditions.

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