Variations in surface-water conditions at the NW Iberian margin during the last ~50kyr, as revealed by coccoliths

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We present results from a Late Glacial and Holocene sediment sequence from the Northeast Atlantic. The studied gravity Core GeoB 11035-1 spanning 505 cm sediment recovery was taken at the north-western Iberian Margin off the Galician coast during the cruise P-342 in 2006. The site is located at 42˚10'N/9˚39'W in a water depth of 2045 m. The area is dominated by wind-driven upwelling during summer, downwelling in winter and, furthermore, terrestrial sediment input by rivers (Schmidt *et al*., 2002). Therewith the thickness of the surface water is subject to seasonality and shows strong variations between the winter and summer seasons (Fiúza *et al*., 1998).

The investigations cover the study of coccolith assemblages, as well as the analysis of fine-fraction (<20 μm) stable isotopes, assuming that the carbonate of the fine fraction is mainly build up by coccoliths.

In the lowermost 400 cm, probably spanning MIS 3 and MIS 2, the coccolith assemblage is dominated by the species *Emiliania huxleyi* and *Gephyrocapsa muellerae*. Coccolith numbers vary between *c*. 1000 and 3000 x10^6 coccoliths/g sediment. Few thermophilic species, such as *Syracosphaera* or *Helicosphaera*, seem to prevail in phases of the influence of warmer surface waters. This pattern changes with the onset of the Holocene, which is indicated by a sharp increase in total coccolith numbers to more than 16 000 x10^6 coccoliths/g sediment pointing to an enhanced productivity.

Fine-fraction $\delta^{18}O$ values vary between 1.5 and -2.5 during the Last Glacial, showing a slight trend towards lighter values. With the beginning of the Holocene, fine-fraction oxygen isotope values increase from -2.5 towards heavier values around 1.5. Studies of Dudley *et al*. (1986) have already shown that coccolith $\delta^{18}O$ shows a positive correlation of lighter values with increasing water temperatures, as it is also known and succesfully used in palaeoceanographic studies on planktic foraminifera. In our studies, we see, in contrast, an inverse trend to planktic foraminifera oxygen isotope values from this area.

In near future, we will look for an explanation on this problem and extend our study on this site by using other proxies for the reconstruction of surface water conditions.

References

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