Oceanic biological productivity changes off Iberia during MIS 5 and its relation to the Atlantic Meridional Overturning Circulation

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Most of paleoproductivity studies focused on high-productivity areas such as upwelling areas (i.e. equatorial or coastal upwelling areas) even though those regions appraise only a small part of the ocean. Accordingly, the importance of productivity variations in oligotrophic areas, and its sensitivity to climate change should be better known, as it may also play an important role on the loss of photosynthetically generated carbon as a central mechanism in the global carbon cycle. Its understanding will help quantifying the parameters needed to run comprehensive climate models, and subsequently help to better predict climate change for the near future.

A high-resolution study of oceanic productivity, bottom water flow speed, surface and deep-water mass, bottom water ventilation, and terrestrial input changes during Marine Isotope Stage (MIS) 5, at an open ocean site approximately 300 km west off Portugal [IMAGES core MD01-2446: 39°03'N, 12°37'W, 3547 m water depth] was conducted within the AMOCINT project (ESF-EUROCORES programme, 06-EuroMARC-FP-008).

Even though productivity is low at the limb of the North Atlantic Subtropical Gyre, it shows a regular pattern with increased values during cold phases of MIS 5, and during the glacial stages 4 and 6 suggesting higher nutrient availability, during these periods. The opal record is fully supported by the organic carbon content, Ba (XRF counts) and to the estimated productivity using foraminifera based FA20 and SIMMAX.28 transfer functions for a near location [D11957P; 39º02.4'N; 12º35.3'W; 3585 m water depth; *Paleoceanography*, 1997, 12, 718-727].

Lighter $\delta^{13}C$ values, interpreted as higher proportion of Southern sourced Ocean Water over North Atlantic Deep Water, are coeval with periods of higher productivity. The variations on ARM/IRM and ARM/κ suggest stronger/faster bottom currents during cold phases, in agreement with a stronger component of the Southern sourced Deep Water at the Eastern Atlantic Margin. This would additionally account for a higher preservation of siliceous biogenic particles at the ocean floor sediment/water interface.

Our data strongly suggests that glacial interglacial productivity changes are likely related to increased nutrient availability associated to changes on the Atlantic Meridional Oceanic Circulation.