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Interglacial Climatic Changes in Southern Iberia during MIS 1-6 and 11-12

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Marine isotopic stage 11 (the interval between 374 and 424 thousand years before present) has been argued to be the most recent astronomical analogue for the current interglacial period. This similarity is mainly a function of orbital scale climatic changes (eccentricity, precession). To gain a better insight into the Iberian Peninsula climate and its transitions during these periods, a marine sediment core from the Alboran Sea, Western Mediterranean, is used to reconstruct climate relevant variables related to surface ocean, atmospheric circulation and hydrology by applying a set of organic geochemical proxies (biomarkers). The location of the core, between the African continent and with major terrestrial flux from the Iberian Peninsula make it especially interesting for investigating regional and terrestrial climate changes and transitions.

Here we present millennial scale resolution data (2 ky) for the interval from 0 to 130 and 374-484 ky corresponding to MIS 1-6 and 11-12, respectively.

Terrestrial eolian inputs and vegetation changes are determined by the analysis of n-alkyl compounds (long chain n-alkanes, n-alkenols and n-alkanoic acids) which are major components of leaf waxes from terrestrial higher plants. Like mineral aerosols, these compounds are wind-transported from terrestrial vegetation sources to adjacent oceans where the particles settle and are preserved in ocean sediments with very little diagenetic alteration. To assess hydrology related shifts in Iberian Peninsula climate, the compound specific hydrogen isotope ratio in higher plant n-alkanes was used. These biomarkers offer a promising tool for reconstructing terrestrial vegetation and hydrology from marine sequences. To correlate these findings to changes in the adjacent ocean conditions, the reconstruction of sea surface temperatures was done by the analysis of alkenones (U^{K}_{37}'-index) and paleoproductivity was determined by chlorophyllic pigment concentration.

The results of this multi-biomarker analysis give new insights into past ocean climate conditions as well as into the processes that occurred onshore during this period.

This study will help to understand the link between past and future climate change in the Mediterranean, its transitions and possible effects on future human activity related to hydrological changes in this area.