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Terrigenous biomarker record off Morocco over the last five glacial cycles

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We present a record of terrigenous biomarkers - long chain n-alkanes - supplied to Moroccan coastal sediments over the past 500 kyr representing the last five glacial-interglacial cycles (MD08-3178, 31°17.09'N/11°29.20'W, 2184 m water depth). The eolian n-alkane supply along the eastern margin off the coast of NW Africa originates mainly from the Atlas Mountain region and the Moroccan coastal plain and partly from the northern Sahara. The new geochemical profiles record changes in vegetation cover, wind strength and fluvial transport from the Atlas Mountains.

Marine biological productivity proxies and n-alkane concentrations increase during glacial periods suggesting that stronger winds induce upwelling in the ocean and transport hydrocarbons from the continent. Chain-length distribution of n-alkanes points to variations in the relative input of terrestrial C3 and C4 plants. These variations are clearly paced by glacial cycles due to orbital variations as illustrated by their correlation with the alkenone sea surface temperature record measured on the same core (see companion poster by Nave et al.). The relative abundance of C3 plants is seen to be higher during glacial periods whereas the abundance of C4 plants is higher during warmer interglacial periods.

Our results suggest that important vegetation changes have occurred in this part of NW Africa during the last 500 kyr. These changes could be due to latitudinal migrations of vegetation belts, with plants adapted to a more humid Mediterranean climate in the north contrasting with arid Saharan vegetation in the south. In addition, the observed changes may also be related to relative changes of source regions of n-alkanes due to wind strength variations.