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Vegetation response to rapid climatic variability in the Alboran Sea region (W. Mediterranean) during the last 30 kyr

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Extensive multi-proxy investigations of the marine sediment core MD95-2043 (Alboran Sea, W. Mediterranean; 36˚8'6"N, 2˚37'3"W; 1841m water depth; total length 36m) have provided a detailed record of climatic variability in the Mediterranean-Atlantic linkage region during the last 50 kyr. The influence of northern hemisphere climate changes on sea-surface temperatures (SST) in the W. Mediterranean, in particular abrupt episodes of SST cooling during Heinrich events and the Younger Dryas, is well-documented in this high-sedimentation-rate core through the analysis of physical, geochemical and biological proxies (stable isotopes, alkenones, TOC, coarse fraction analysis, major and trace element content, planktonic and benthic foraminifera, pollen (MIS 3) and coccolithophores).

The impact of climatic variability on terrestrial ecosystems during the last 30 ka is explored through the first results of high-resolution pollen analysis for MIS 2 and 1 from core MD95-2043 (upper 10m). The presence of diverse and well-preserved pollen in the marine sediments provides a detailed, continuous and chronologically accurate record of vegetation history in the semi-arid regions of SE Spain and N Africa. Moreover, direct comparison of the pollen and marine records from the core (land-sea correlation) permits critical evaluation of the timing and character of vegetation response to rapid climate events as documented independently in the marine proxies. In particular, the pollen record of MD95-2043 provides information about dynamic changes between forest development and steppe expansion during the LGM, Heinrich events 2

and 1, and across the Late-glacial to Holocene transition. Finally, the regional setting of core MD95-2043 also permits comparison with both the long continental pollen sequence of Padul (Granada, SE Spain) and the marine pollen record of ODP Site 976 (Alboran Sea; 36˚12'N, 4˚18'W), contributing to a better regional understanding of the nature of vegetation response to climate variability.

This research forms a part of the EuroCLIMATE project RESOLuTION (Rapid climatic and environmental shifts during Oxygen Isotope Stages (OIS) 2 and 3 – linking high-resolution terrestrial, ice core and marine archives).