



Centennial- to millennial-scale climate oscillations in the Central-Eastern Mediterranean between 20,000 and 70,000 years ago: evidence from a high-resolution geochemical and micropaleontological record

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Here we present a high-resolution faunal, floral and stable isotope record, from the sediments of ODP Site 963A (central Mediterranean basin), that evidence striking centennial/millennial-scale resemblance to the high-northern latitudes rapid temperature fluctuations documented in the Greenland ice cores.

Oxygen and carbon isotopes, planktonic foraminifers and calcareous nannofossil distributions suggest that Dansgaard–Oeschger (D/O) and Heinrich events (HE) are distinctly expressed in the Mediterranean climate record. Moreover, recurrent although subdued oscillations not resolved before in the Late Glacial Mediterranean sediments among the well-known D/O events, document a relevant centennial-scale climate variability of the basin, higher than that generally thought.

Alternations between climate regimes dominated by polar outbreaks during D/O stadials and seasonal northward displacement of the Intertropical Convergence Zone (ITCZ) during the D/O interstadials, with associated intensification of continental runoff and relevant changes in the evaporation/precipitation budgets of the Eastern Mediterranean basin, are well expressed in the ODP Site 963A and confirm the role of the Mediterranean basin as reliable recorder of the interplay between high-latitude and tropical climate control on the intermediate latitudes. The D/O interstadials warmer/humid phases induced short-term stratification of the water column, with associated relative declining of surface productivity. Though the relative short duration of the 3D stratification events never reached the threshold of complete oxygen consumption along the water column, evident effects of sluggish 3D circulation in the basin are clearly testified by negative excursions in the $[U+F064]^{13}C$ values measured on selected species of planktonic and benthic foraminifers

HEs are constantly associated to lighter $[U+F064]^{18}O$ in planktonic foraminifera, suggesting an impact of the fresher Atlantic waters on the isotopic composition of Mediterranean intermediate Waters. In two cases, HE2 and HE5, fresher Atlantic waters may have affected even the deeper layers of intermediate waters.

The result for the ODP Site 963A will be contrasted with time series from other ocean basins to constrain the role of the Mediterranean dynamics in shaping the local response to the atmospheric forcing variations.