Geophysical Research Abstracts, Vol. 8, 06184, 2006
SRef-ID: 1607-7962/gra/EGU06-A-06184
© European Geosciences Union 2006

Water column dynamics in the Aegean Sea during MIS5e

G. Marino (1), E.J. Rohling (2), S. Schouten (3), J.S. Sinninghe Damsté (3)

(1) Istituto per l'Ambiente Marino Costiero (IAMC) CNR, Naples, Italy, (2) School of Ocean and Earth Science, Southampton University, National Oceanography Centre, Southampton, United Kingdom, (3) Department of Marine Biogeochemistry and Toxicology, Royal Netherlands Institute for Sea Research (NIOZ), Texel, The Netherlands

(gianluca.marino@iamc.cnr.it / Fax: +39 081-5423888)

Eastern Mediterranean (EMED) hydrography responds dramatically to monsoon maxima, in turn triggered by precession cycle minima in the Northern Hemisphere. The main, widely-recognized features in such "episodes" are (a) reduction in excess evaporation over precipitation and run-off in the basin, (b) increased density stratification, (c) shoaling of the pycno- nutri-cline between intermediate and surface waters, (d) elevated primary productivity and (e) lack/reduction of ventilation of the bottom waters. This results in anoxic/dysoxic organic rich layers (sapropels) deposition. Studies of the most recent of these deposits (Holocene sapropel S1) suggest that poorly oxygenated conditions reached significantly shallower levels in the Aegean Sea than in other areas of the EMED, and that a centennial-scale climatic cooling caused newly formed deep-water to ventilate the sea-floor down to depths of 1500 m, interrupting S1 deposition and displacing nutrients upward.

S5 formed during the last interglacial climatic optimum (MIS5e) over a period of $\sim$5 kyr (124-119 ka BP). During its deposition both the severity of monsoon flooding and the magnitude of organic carbon accumulation were significantly greater than during S1. In spite of the large number of investigations performed on sediment cores recovered from several locations throughout the Ionian and the Levantine basin, issues such as depth limits of anoxia, nature of the $\sim$800 yr interruption in the monsoon maximum and the potential for deep-water formation in the basin still remain unresolved. A lack of highly resolved records from the marginal basins of the EMED (Adriatic and the Aegean Sea), where present-day deep-water formation takes place, prevents

these issues from being addressed.

Here we present the first high-resolution record of S5 for the Aegean Sea. It is derived from sediment core LC-21 from the south-eastern Aegean Sea at 1500 m depth, with a mean sedimentation rate of 40 yr cm^{-1}. To depict variations in the surface to intermediate water density gradient, and thereby water-column stability, oxygen isotope analyses were performed on the planktonic foraminifera *Globigerinoides ruber* (shallow-dwelling) and *Neogloboquadrina pachyderma* (right coiling) (intermediate-water dwelling). A complementary reconstruction of Sea Surface Temperature changes is provided based on both alkenones and the recently developed TEX86 index. Finally, we discuss the development of photic layer euxinia, as highlighted by isorenieratene concentrations, and its timing with respect to the freshwater flooding and organic carbon deposition.