



A high-resolution integrated stratigraphy of the last 9kyr in the eastern Tyrrhenian margin continental shelf marine sediment

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A multidisciplinary faunal and geochemical study was carried out on a gravity core collected in the Salerno Gulf (on the margin of the eastern Tyrrhenian continental shelf) which contains an expanded, undisturbed and well-preserved hemi-pelagic sedimentary sequence punctuated by a number of volcanoclastic layers.

Six tephra layers associated to the Vesuvius volcanic activity and an AMS¹⁴C calibrated age provide the stratigraphic framework for the last 9 kyr of the sedimentary core. The achieved age-depth profile indicates a mean sedimentation rate of about 1.3cm/10years for the first 2000 years BP and a mean value of 0.32cm/10 years for the lower 7000 years BP.

Significant changes in the quantitative distribution of calcareous plankton assemblages (planktonic foraminifera and calcareous nannofossils) allowed us to identify several bio-events useful to accurately define the boundaries of ecobiozones widely recognised in the Mediterranean sediment and used for large scale correlations. In particular, over the last 6 kyr BP, the sharp decreases in the abundance of planktonic foraminiferal species *Globorotalia truncatulinoides* left coiled, and a distinct acme interval of *Globigerinoides quadrilobatus* represent two valid bio-events already reported from different sectors of the Mediterranean basin.

In addition, the integration of planktonic foraminifera and calcareous nannofossils quantitative oscillations combined with measures of $\delta^{18}\text{O}$ values on the carbonate shells of *Globigerinoides ruber* and *Globorotalia inflata* allowed a reliable identi-

fication of geochemical and faunal signatures (without lithological evidence) of the climatic events associated to the deposition of sapropel S1 at the base of the studied sediments. Variations in the planktonic foraminiferal and calcareous nannofossil assemblages and in oxygen stable isotopic compositions well-mark the two short-term warm oscillations (S1a and S1b), separated by a cold phase in the middle.

The interruption of sapropel S1-equivalent, marked by a shift of $\delta^{18}\text{O}$ *G. ruber* values from about 0.20‰, during S1b phase, up to 1.46‰, during the phase of interruption, is well evidenced also by an important change in sediment grain-size from marl to marly-silty sand which is clearly related to a sea-level drop occurring at that time.

Finally, results from spectral and wavelet analysis performed on the $\delta^{18}\text{O}$ *G. ruber*, *G. ruber*, *Globigerina bulloides* and *G. inflata* records indicate that concentration of variance is spread over a relatively broad range of periodicities, and that a periodicity of ~ 800 -kyr is uniformly distributed throughout the different signals.