



Synchronous basin-wide Mediterranean Sapropel S1 formation; Preservation versus Productivity

Gert J. De Lange (1), Caroline Slomp (1), Cesare Corselli (2), Elisabetta Erba (3), John Thomson (4), and Anja Reitz (5)

(1) Utrecht University, Geosciences, Utrecht, Netherlands (gdelange@geo.uu.nl), (2) University Milano Bicocca, Milano, Italy, (3) University Milano, Milano, Italy, (4) Southampton, United Kingdom, (5) Geomar, Kiel, Germany

The timing of deposition of all distinct organic-rich units (sapropels) in eastern Mediterranean sediments is precession-related and is associated with humid climate conditions. The last of such 'humid periods' occurred from 11 - 5 kyr 14C ago, simultaneous with a sustained circum-Mediterranean wet period including a vegetated Sahara. The end of this period coincides with a high manganese-oxide peak in all 30 studied cores and concurs with an abrupt re-ventilation event at 5.7 kyr for the deep-water.

We demonstrate that the most recent sapropel (S1) formed synchronously between 9.8 and 5.7 14C ky BP at all water depths greater than a few hundred metres. As a consequence of increased fresh water (monsoon) input, surface waters had a reduced salinity and concomitantly the deep (> 1.8 km) eastern Mediterranean Sea was devoid of oxygen during 4,000 years of S1 formation (De Lange *et al.*, 2008). This has resulted in a differential basin-wide preservation of S1 determined by water depth, as a result of different ventilation/climate-related redox conditions above and below 1.8 km. Climate-induced stratification of the ocean may thus contribute to enhanced preservation of organic matter, i.e. formation of sapropels (and potentially black shales).

Reference

De Lange G.J., Thomson J., Reitz A., Slomp C.P., Principato M.S., Erba E., and Corselli C. (2008) Synchronous basin-wide formation and redox-controlled preservation of a Mediterranean sapropel. *Nature Geo* 1, 606-610.