Paleoclimate significance of organic-carbon-rich sapropels of the Mediterranean Sea

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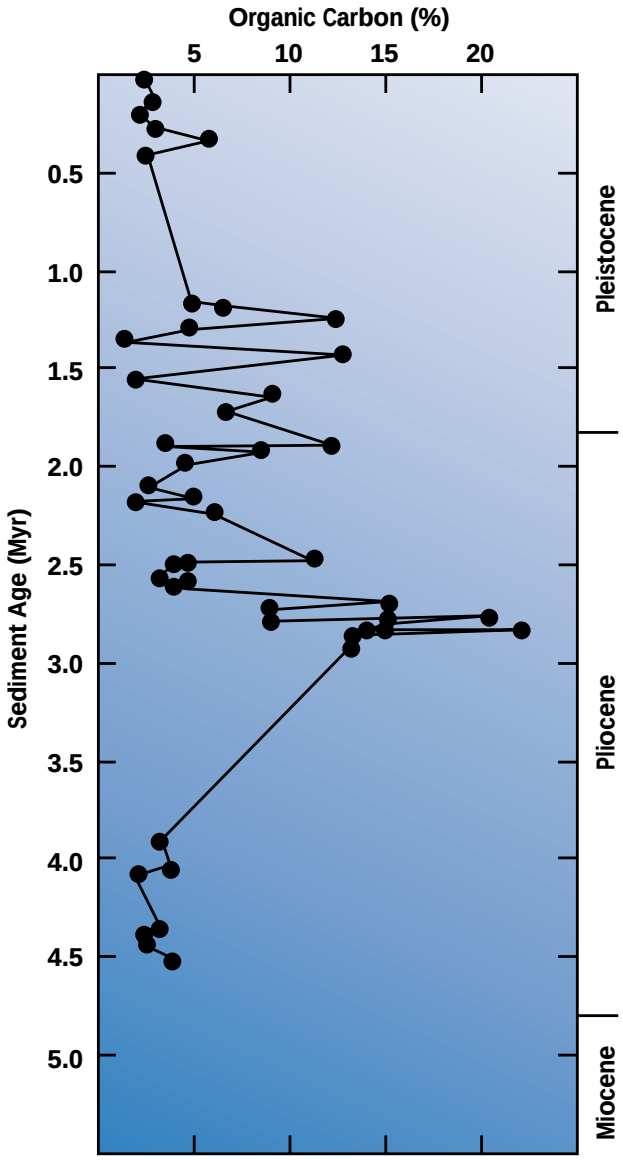

Organic-carbon-rich layers, ODP Site 969 (Crete).

Deep-sea sediments typically contain little organic carbon. The multiple layers of organic-carbon-rich sediments, or sapropels, that occur in the Mediterranean Sea are therefore noteworthy. ODP Legs 160 and 161 proved that sapropel occurrences extend across the Mediterranean, from the Levantine Basin to the Alboran Sea [*Rullkötter et al.,* 1995]. Sapropels containing as much as 25% organic carbon were recovered at locations in the Ionian Sea and south of Crete. Organic carbon reaches 6% and 3% in Pleistocene sapropels from the Tyrrhenian Sea and the Balearic Sea, respectively. Several sites in the Alboran Sea yielded sapropel-like sediments having 2% organic carbon. The sapropels contain predominantly marine organic matter that is partially oxidized, indicating that the water column contained dissolved oxygen The sapropels record times when marine biological production was enhanced over modern levels. Precessional (19 to 23 Ky) climate changes that increased river flows, freshened the usually salty surface waters of the Mediterranean, and delivered land-derived nutrients to marine algae are the probable cause of these anomalous sediments. Oceanic sub-basins and adjacent seas, like the Mediterranean Sea, are often more responsive to environmental changes than the global oceans because of their smaller size and partial isolation. Periods of wetter climate that modified the hydrologic balance evidently were magnified in the sedimentary records of this semi-isolated sea, and these climate cycles are likely to have occurred throughout temperate latitudes. Study of the amplified paleoclimate record of the Mediterranean can therefore be used to understand the types of changes that have happened to worldwide temperate-zone climates in the past and to predict possible future changes in global climate.

References:

Rullkötter, J., I. Bouloubassi, P.A. Meyers, H. Doose, and Leg 160 and Leg 161 Scientific Parties, Sources and preservation of organic matter in Pliocene-Pleistocene sapropels of the Mediterranean Sea. *EOS, Transactions American Geophysical Union*, 76, F624 (abstract), 1995.