G-IV7

Cretaceous Unconformities in the Southeastern Mediterranean Basin

Yossi MART

National Institute of Oceanography, IOLR, Tel Shikmona, Haifa 31080 (Israel)

The Cretaceous period in the SE Mediterranean region was characterized by intensive sedimentation along the continental margin and the adjacent continental rise, and by significant tectonic phases during the Neocomian and the Senonian. There is ground to presume that the tectonic phase, that affected the continental slope and rise area in the Senonian, did not lead to subaerial exposure of the sedimentary sequence. Therefore stratigraphic unconformities in the late Cretaceous marine depositional sequence are attributed to changes in seafloor geomorphology and the sedimentary regime, with submarine erosion in places. The Cretaceous seismostratigraphic unconformities thus delineate the contemporaneous structural features with marginal masking of subsequent subaerial erosion.

The continental margin of the SE Mediterranean is located on top of the ancient margin of the southwestern Neo-Tethys. This superposition apparently suggested a tectonic effect of pre-existing Jurassic and early Cretaceous structures on the preceding late Cretaceous and Neogene phases. However, recent findings suggest that although superimposed, structures of the late Cretaceous tectonic phase that affected the SW margin of the Neo-Tethys show only marginal similarity to early Cretaceous structures in that region. The correlation between the structures of the two phases seems erratic, conformable in some places, contrasting in others, and a few structures show no correlation between the early and the late phases. It is suggested that the conspicuous tectonophysical constraints in the southeastern Mediterranean margin region that caused the general geographic recurrence of the folded belts in the region, as well as the stability of the land-sea transition zone during more than 200 Ma, are associated with variations in crustal composition. Therefore the significance of the superpositional structural constraints are secondary to the deformational stress tensor in setting the outlines of regional tectonic development.

G-IV8

Late Pleistocene Paleoclimates and Anoxic Events in the Eastern Mediterranean : The Deep-Sea Record

Yvonne HERMAN

Department of Geology, Washington State University, Pullman, WA 99164 (U.S.A.)

Faunal composition and oxygen isotopic analyses of foraminiferal and pteropodal shells were utilized to reconstruct the paleoclimatic and paleohydrologic history of the Eastern Mediterranean. The reconstruction was done by mapping the recent fauna in core "tops" deposited during the Holocene and their calibration against observed present-day temperatures and salinities in the water column. The broad data base, using published faunal distributions from the world ocean, covers a wider range of temperatures and salinities and a combination of these factors, than those which are thought to have existed during glacial periods in the Mediterranean. In the longest core with a nearly continuous record, spanning ~ 500 K years is contained in the ≈ 1000 cm long Lamont-Doherty Geological Observatory (LDGO) core RC9-181. Within this time interval represented by RC9-181 six major cold-warm cycles, correlatable to Emiliani's isotopic stages 1-12 occur. Calcareous

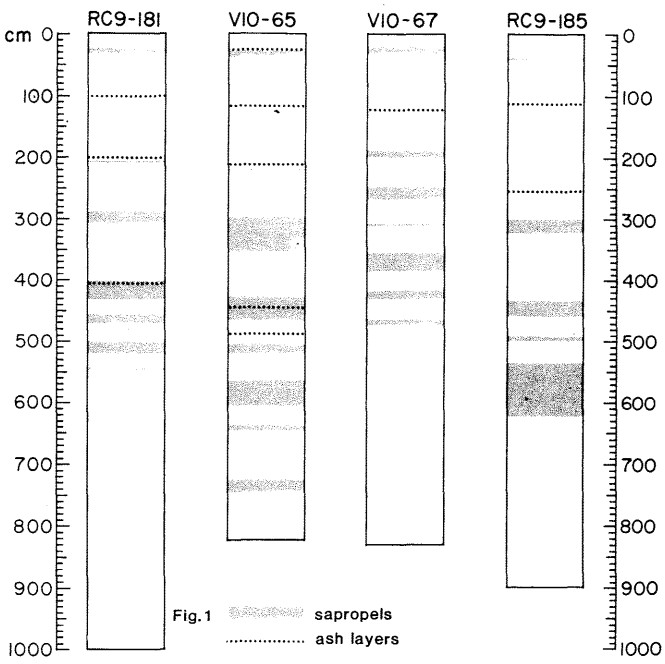

Fig. 1

nannoplankton biostratigraphic and biochronologic framework was utilized for determining the times various events occurred and for estimating rates of sedimentation. Two important datum levels were recorded: the extinction of *Pseudoemiliania lacunosa* between 899 and 938 cms (0.44-0.46 Ma ago), and the first appearance of *Emiliania huxleyi* 0.26-0.27 Ma ago, between 455 and 479 cm depth in core. During glacial temperature minima, surface water temperatures were ≈ 3°C lower in summer and 3-4°C lower in winter. Stadial and interstadial salinities were variable, reaching highest values during the last glacial temperature minimum when climates were more arid than today, sea level stood very low, the Nile discharge was greatly reduced and the connection between the Mediterranean and the Black Sea, which is a major supplier of low salinity water was severed. Following global warming and subsequent massive deglaciation, sea level rose. When the sea stand reached the Bosporus sill (≈36 m) the connection between the Mediterranean and the Black Sea was reestablished and the low salinity Black Sea water spilled over into the Mediterranean. A significant increase in precipitation and river runoff is also recorded during transitional climatic periods. These compounded effects produced a low density surface water layer which restricted thermohaline convection. The result was stagnation of the subsurface water and subsequent deposition of sapropels, some of which were laid down during intervals of pronounced density stratification. Surface water salinities dropped to low values during the deposition of sapropels as evidenced by oxygen isotope data. Twelve sapropels, characterized by distinct faunal associations, documenting different degrees of stagnation, occur in sediments representing the last 0.5 Ma.

TABLE 1 Location, deptn and length of cores

Core	Latitude (N)	Longitude (E)	Depth of water (m)	Length of core (cm)
V10-65	34°37.00'	23°25.00'	2586	960
V10-67	35°42.00'	20°43.00'	2890	830
RC9-181	33°25.00'	25°01.00'	2286	930
RC9-185	34°27.10'	20°07.00'	2858	902

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