

Upper quaternary organic rich sequences
in the outer periphery of the South Aegean Island Arc :
new developments

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During the Tyro 87/2 mission a total of 24 piston and gravity cores (Fig. 1) were recovered from the outer periphery of the South Aegean island Arc. Knowledge gained in previous missions suggested that a more condensed and complete stratigraphic record is normally encountered on topographic highs (Anastasakis and Stanley, 1984). It is well established that only cores recovered from regions dominated by hemipelagic sedimentation, that is deposition of sediment by settling through the water column are likely to bear evidence for the complete range of oceanographic conditions affecting the hydrography of the basin (Anastasakis and Stanley, 1986). The Tyro 87/2 coring sites have been selected on a basis of a dense high resolution seismic reflection survey.

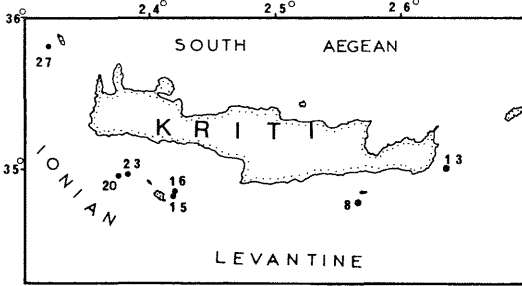


Fig. 1. Tyro 87/2 station locations of the cores illustrated in Fig. 2. Representative core logs from the four regions of the South Aegean island Arc studied in detail are given in Fig. 2. These cores recovered several sapropel-lic sequences displaying a well preserved development and bearing no evidence of reworked organic rich lithofacies. Individual sapropel and/or sapropelic layers are correlated in terms of their compositional, faunistic and isotopic characteristics. New developments in our knowledge of these organic rich Eastern Mediterranean sediments based on the study of these cores suggest: a) A new uppermost limit of S₁ deposition in water depths of less than 230m in the NW Levantine and Ionian Seas. This is based on the recovery of S₁ in cores retrieved from the Gavdos Rise (cores 15 and 16 in Fig. 2). b) The recovery for the first time, of a complete succession of the five uppermost sapropel-lic sequences.

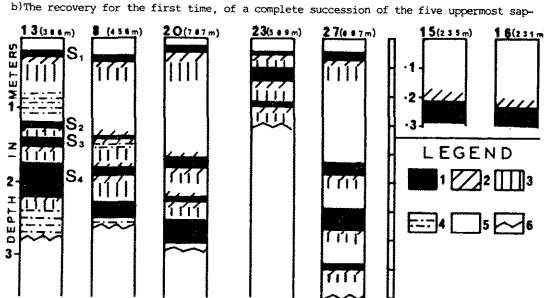


Fig. 2. Representative core logs of the Tyro 87/2 mission. The lithofacies associations in the legend are: 1) sapropel-lic 2) organic ooze 3) grey mud 4) sandy silt. ropels in minimal water depths of 300m (Four of them are contained in core 13, see Fig. 2) c) The relevance of similar compositional attributes in the sapropelic sequences S₁, S₂, S₃ which however are displaying different isotopic signals suggesting that different paleoceanographic scenarios can result in similar sapropel-lic sequence development. d) The identification of marked differences in the development of the S₄ sequence, including a significant increase in the organic carbon contents reaching values up to 11% with a concomitant decrease in the carbonate contents and an increase in the siliceous test contents upwards.

TABLE 1:

Core No and sample depth in cms	Organic C% N	Carbonates %	Core No and sample depth in cms	Organic C% N	Carbonates %
TYR-13: 0 - 3.5	0.34	60	TYR-13: 213 - 215	9.5	2.1
13 - 15.5	0.99	58	216.5 - 220	6.1	1.95
16.5 - 21	1.1	56.5	222 - 225	1.75	1.5
26 - 29.5	0.29	69.3	234 - 236	0.49	0.8
113.5-116	0.31	65.0	271 - 273	0.49	0.7
118.5-120.5	1	65.5	TYR-15: 3 - 5	0.28	0.13
124.5-126.5	0.36	65.5	17.5 - 20	0.35	0.2
137 - 139.5	0.27	64	25.5 - 28	0.89	0.85
142 - 144	1.1	61	TYR-16: 3 - 4	0.27	0.14
145.5-148	1.8	65	10 - 12	0.29	0.2
152 - 154	0.36	65	20.5 - 22.5	0.28	0.24
165 - 167	0.48	55	23 - 24.5	0.86	0.84
170.5-172.5	1.85	37	27 - 29	0.92	0.59
191 - 193	10.95	49			

It is becoming apparent that each individual sapropel or sapropelic horizon has its own distinctive history, including areal extent, time needed for its deposition and complex interplay of factors that triggered its deposition. Different paleoceanographic scenarios, as evidenced by isotopic signals, can result in a similar stratigraphic and subsequent stagnation of the water column. Moreover some of the Eastern Mediterranean sapropels can result from stratification and subsequent stagnation of the water column accompanied also at some point by an enhanced productivity of the surface waters. These sapropel lithofacies are associated with the highest organic carbon values, normally exceeding 5%.

References

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The Dolomitic Breccias of Malinalon Mt.
(Central Peloponnesus).
Origin and diagenesis

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ABSTRACT

The Tripolitza zone is tectonically underlain by the Manis metamorphic zone and overlain by the Pindic Arcadic cover and represents a continual platform carbonate sequence, from Triassic to Eocene.

The present study is focussed on the origin of the dolomitic breccias that are distributed along the Jurassic-Cretaceous dolomitic beds of the Tripolitza zone in the Malinalon Mt. and the surrounding areas.

This brecciation is not due to tectonic activity as it is limited to certain stratigraphic horizons and seems to have a local character with no continual lateral extension. On the contrary sedimentological studies revealed that these dolomitic breccias correspond to an evaporite solution-collapse breccia formation.

The breccia clasts are consisted of cloudy xenotopic, microcrystalline, slightly calcian and non-ferroan dolomite, resulting by penecontemporaneous dolomitization of a precursor calcium carbonate sediment, under Sabkha conditions. Dolomitization and following recrystallization has obliterated the primary textural characteristics of the sediments. Only in places crystallogal laminites have been preserved.

The dolomitic clasts either float in a matrix of crushed dolomite or are cemented by isopachous dolomite fringes composed of clear coarse blocky dolomite crystals. The dolospar cement is considered a relative late diagenetic event because it has precipitated on cavities and/or cracks surfaces that developed after dolomitization, lithification and dissolution of evaporites by freshwater influx.

A late-stage syntaxial sparry calcite cement coats the remaining dolospar lined voids precipitated from meteoric fluids. Doubly-terminated megacrystalline crystals frequently occlude the remaining voids. Due to the well-developed cementation, porosity of the rocks has been strongly reduced.

Evidence for vanished evaporites consist pseudomorphs after evaporite crystals and/or nodules, as well as the euhedral quartz crystals.

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