New faunal data from Messinian outcrops on Cephalonia (Greece) and their geodynamic implications

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The Cape Liakas — section on Cephalonia comprises 230 m of Messinian sediments (Globorotalia plesiotumida — zone) without any gaps [BRAUNE, FABRICIUS & HEIMANN 1973] : marls with calcarenitic intercalations, conglomerates and thick evaporitic beds in the section's upper third, conformably overlain by Trubilimestones, marls and calcarenites of Early Pliocene age (Sphaeroidinellopsis - zone).

Several samples of the soft sediments below, in between and on top of the gypsum series, containing faunal components, have been investigated. At the first view the content of foraminifera indicates " pelagic " conditions, but in most of these samples 50 to 80 % of the pelagic foraminifera consist of worn resedimented specimen with reddish tets, useless for a true bathymetric interpretation. The well preserved part of these pelagic foraminifera however, 20 to 50 %, as well as most of the benthos, is thought to be autochthonous.

Some of the benthonic assemblages are of special interest : All samples show a relatively high percentage of well-preserved *Elphidium* (mostly *E. crispum*), partly associated with *Ammonia* beccarii tepida. Apparently high is the content of Bolivina (up to 37 % of the whole assemblage), often, but in changing concentrations occur species Bulimina, Uvigerina, Cassidulina, Nonion, Cibicides, Gyroidinoides, Discorbis. Very rare as Miliolids and Agglutinated Forams. Approaching the base of the thick-bedded gypsum the faunal assemblages show the well-known facts of impoverishment and dwarfening of forms, while the content of sponge-spicules, diatoms (up to 16 %) and radiolarians (up to 24 %) increases.

Putting the Elphidium/Globigerinidae ratio of these samples into a pattern versus water depth got from recent shelf-sediments off the coast of Cephalonia [BRAUNE 1973], we arrive at a maximum water depth of 160-180 meters. If we substract the percentage of the above mentioned allochthonous older specimen from the Globigerinidae-total — as we should do to come to exact bathymetric results — we arrive at a maximum water-depth of less than 100 meters.

The accompagning benthonic microfaunas in the Messinian, as well as in the recent samples, confirm this experimentally reconstructed water-depth.

Those results, indicating a littoral and shelf-facies for the deposition of the soft sediments below, in between, and on top of the gypsum series, are backed by field — and laboratory sedimentological data, e.g. :

— conglomerates, sometimes containing sandy linses or partially rounded blocks up to more than cubic meter size;
— parts of the section are represented by marls, intensively interbedded with calcarenitic layers;
— sometimes ripple marks and cross-bedding in and on top of the arenites;
— a fossil landslip onto the shore and into the flat coastal waters;
— small reef-like structures growing in the sediment, containing Lithothamnium, Lithoporella, Melobesoides, and corals, requiring a certain amount of penetrating sunlight, boring molluscs and Serpulae;

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— lumachellic beds in the lower part of the section, containing very well-preserved fragile shells of neritic molluscs and gastropods, excluding long transportation;
— rests of fossil seagrass and of terrestrial plants (see also HEIMANN, JUNG & BRAUNE 1975);
— faunas with Cardium, Ostreae and Pecten in the Early Pliocene calcarenites, conformably overlying the Trubi-limestone.

For the deep-basin model, especially the hypothesis of marginal " mesas ", drying out completely — when the brine retired to the centers of the 3000 — meters-depressions- no indications in the Cape Liakas sedimentological record have been found.

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Discussion

Biju-Duval : Avez-vous vu des faciès transgressifs du Miocène supérieur ou des faciès récifaux?
Réponse : Non.

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