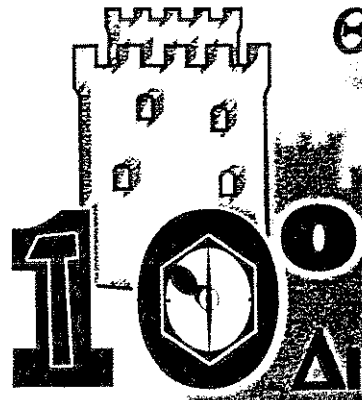


**ΕΚΤΕΤΑΜΕΝΕΣ  
ΠΕΡΙΛΗΨΕΙΣ**



**EXTENDED  
ABSTRACTS**



**ΘΕΣΣΑΛΟΝΙΚΗ 2004**

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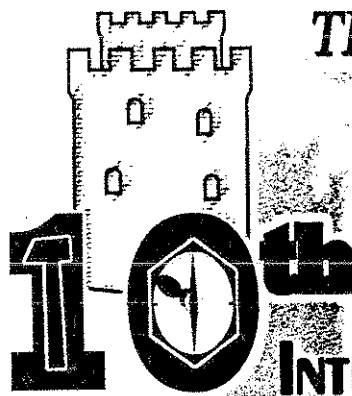
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## DIVERSITY AND ABUNDANCE TRENDS OF PLANKTONIC AND BENTIC FORAMINIFERA FROM THE SOUTHERN PART OF THE IRAKLION BASIN, CENTRAL CRETE

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### ABSTRACT

Foraminiferal fossil assemblages of the Roufas Section, southern Iraklion Basin, central Crete, were analyzed for the first time. Taxonomic and quantitative analyses were made in order to obtain paleoenvironmental (physical as well biological) information.

All the identified stratigraphic beds were sampled despite of their geometry and internal structure. The samples were processed in the laboratory according to the most classical micropaleontological procedure. Taxonomic identification at the generic level follows the systematic proposed by Loeblich & Tappan (1964).

Quantitative analysis was also made. Methodological procedure is the classical method applied in micropaleontological studies (c.f. Murray, 1991). As part of a sediment census of the >125 micrometer size fraction, planktonic and benthic biogenic diversity and abundance trends were examined. We have calculated: a) the specimen abundance or density (number of individuals registered in 250 gr of non-processed sample); b) the species richness (number of taxa collected per sample); the diversity index of Shannon-Wiener (Hs) (e.g. Buzas & Gibson, 1969); d) the a-Index of Fischer (Fischer et al., 1943), obtained by plotting the number of individuals per sample. In addition, ratios between planktic (P) and benthic (B) foraminifera were calculated applying the formula  $P/P+B$ .

Planktonic foraminifera assemblages were used for the biostratigraphic determination of the section. Qualitative and quantitative analysis of the species identified was carried out to construct the abundance pattern curve. Biostratigraphic analysis was based on the frequency peaks, the occurrences and disappearances of several species.

Planktonic foraminifera were grouped in cold eutrophic and warm oligotrophic indices and their relative abundance was used to estimate the paleoclimatic conditions.

Benthic foraminiferal fauna were compared with Recent equivalents from similar environments. The bathymetric preferences of the different benthic foraminiferal taxa were assessed by evaluating their distribution pattern in modern oceans.

Foraminifera were found throughout the section. The total fossil assemblage is clearly dominated by *Rotalina* (up to 75% of the total fossil assemblage) whereas the *Textulariina* are almost absent.

The specimen abundance shows fluctuating values. Benthic foraminifera are generally less abundant than the planktonic forms, but more diverse. Preliminary data of the benthic groups occurring at this section include *Bulimina aculeata*, *Cassidulina* spp., *Elphidium* spp., *Eponides* spp., *Melonis* spp. and *Pullenia bulloides*. The occurrence of shallow water *Elphidium* spp. at deepwater deposits indicates redeposition of shelf sediments into the basin.

Partly, the benthic ecosystem is mostly inhabited by low-diversity faunas that are rich in individuals adapted to high organic matter fluxes and low oxygen conditions in the pore and bottom water. Characteristic genera of these environments include *Uvigerina*, *Bulimina*, *Globobulimina*, *Briazalina* and *Bolivina* which frequently occur in eutrophic at oxygen-limited ecosystems such as oxygen-minimum zones at intermediate water depths (Sen Gupta & Machain-Castillo, 1993; Bernhard & Sen Gupta, 1999).

Therefore, for this part of the section, benthic foraminifera abundance and species content are found to be dependent on variation of paleoproductivity.

We suppose that low oxygen concentration at the sediment-water interface leads to low benthic foraminifera abundance. In its turn, the low oxygenation is associated with such processes as high surface productivity and organic matter flux.

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