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8 – 15 OCTOBER 2005

UNESCO – IGCP – IUGC
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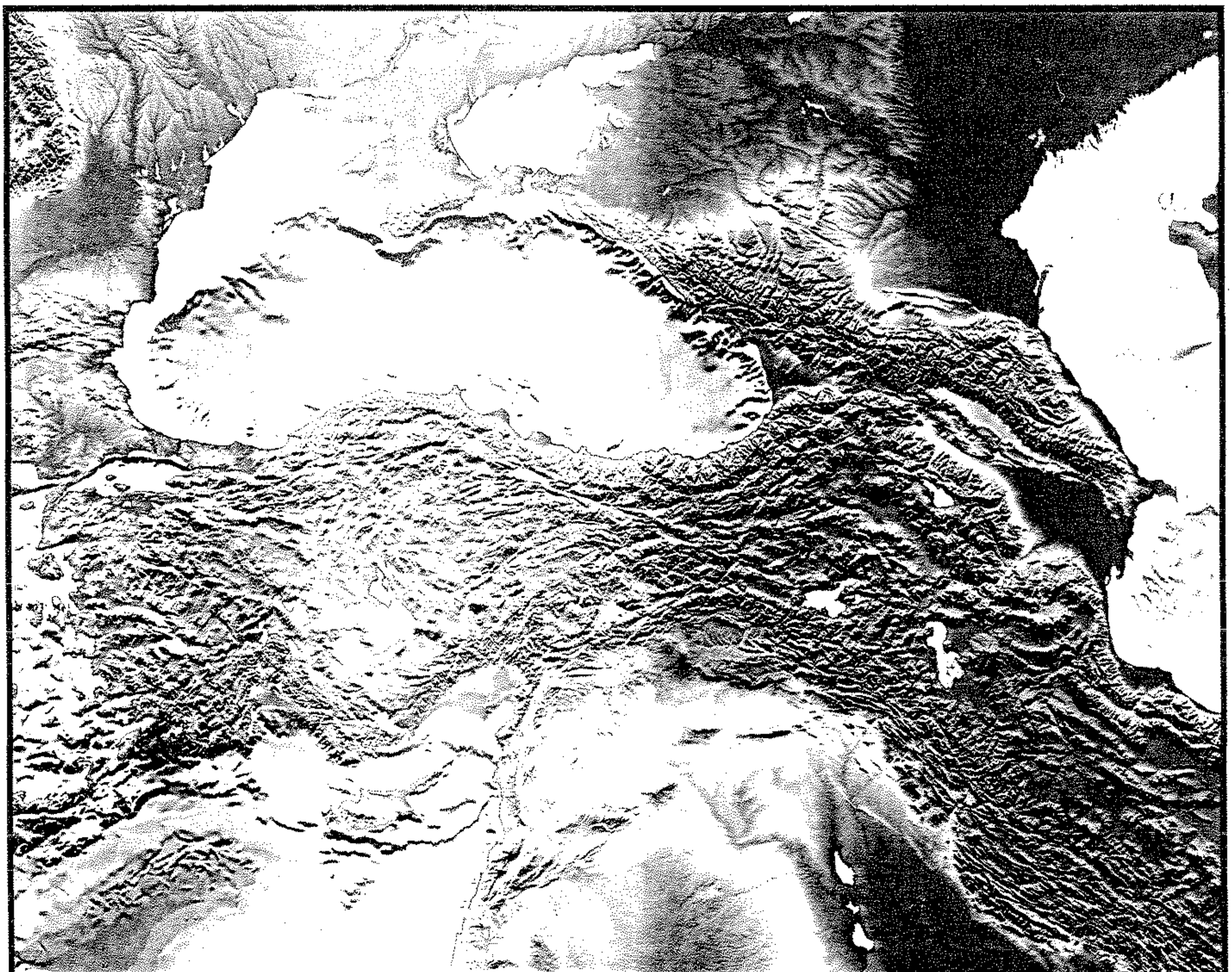

EXTENDED ABSTRACTS

1st PLENARY MEETING AND FIELD TRIP OF PROJECT IGCP – 521
BLACK SEA-MEDITERRANEAN CORRIDOR DURING THE LAST 30 KY:
SEA LEVEL CHANGE AND HUMAN ADAPTATION (2005 – 2009)

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Late Quaternary Benthic Foraminifera assemblages in the North Evoikos Basin, Aegean Sea

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Keywords: Holocene, faunal record, paleoenvironmental changes,

Introduction

The North Evoikos Gulf is a landlocked, semi-enclosed, elongate embayment with a total surface area of about 400 km^2, located in the central-west Aegean Sea. The maximum depth of the gulf locally exceeds 420 m, and to the north it is connected through the Oreos Channel, with a sill depth of less than 45 m, to the West Aegean Sea, while to the south it is connected with the South Evoikos Gulf by the Euripus Channel. The composition of the North Evoikos Gulf sediments is predominantly calcareous in the shallower shelf areas (Anastasakis and Filippas, 1988) whereas the deep basin contains mostly sediments of terrigenous nature. The sedimentation rates in the basinal settings are much higher (almost double) than those in the shallower regions, because most of the sediments bypass the shallower sites and are deposited in the basin by gravity flows.

Benthic foraminifera were studied from three gravity cores (EYB1, EYB6 and EYB10) retrieved by a trawler vessel from the southern North Evoikos shelf, with the following objectives: 1) description of the benthic foraminiferal associations and 2) analysis of correlations between populations and environmental parameters.

Methods

EYB1 and EYB10 cores were recovered from water depths around 80 m, while EYB6 core from a water depth of 185 m. The sedimentology and depositional history of these core locations are described by Anastasakis and Filippas (1988). Significant is the presence of a stratigraphical hiatus in the basal part of the sections of the cores EYB1 and EYB10 whereas core EYB6 is continuous. Foraminiferal analyses were carried out on samples which were collected at 10 cm interval. An average of 150 specimens were randomly picked from each sample examined from the fraction >63 microns. A total of 75 species of benthic foraminifera were identified. Species identification is based on Bandy (1961), Cimerman and Langer (1991) and Sgarrella and Moncharmont-Zei (1993). In order to define foraminiferal biofacies and establish the relations between co-occurring (dependent) foraminiferal species, R-mode cluster analysis was conducted using SPSS 13 (SPSS Inc.) statistical software package by applying Average Linkage Method with Pearson correlation distances as a similarity index (Pielou, 1984; Parker and Arnold, 1999).

Results and Discussion

Benthic foraminiferal assemblages in the studied cores reflect an Upper Quaternary history of increasing paleowater depth through time, as the area became increasingly marine. Initially, the proximal part of the shelf (lowermost sections of cores EYB1 and EYB10) was dominated by chemical precipitation (mostly carbonate evaporites). By about 32.400±600 BP the foraminifera display low diversity and are completely dominated by an agglutinated assemblage. Moreover, fragments of molluscs, echinoderms and ostracode shells preserved as calcium carbonate are abundant. Thus, it is apparent that the lowermost parts of the cores, below the erosional suface-stratigraphic hiatus have not been significantly decalcified either by pre-diagenetic, diagenetic or weathering processes. Consequently, the agglutinant-dominated assemblage corresponds in composition to the original faunas. This impoverished assemblage in combination with the high abundance of peloids which are interpreted as in situ precipitates rather than infilling sediment, reflect a low-energy restricted lagoon.

Upcore, the diversity of benthic foraminifera increases and the first occurrence of *Bulimina marginata* is observed. Its coexistence with Haynesina depressula could be associated with normal marine conditions, but always with periodic brackish water influence (Cearreta 1989). In any case, this change coincides with an upward finer textural trend, and reflects increasing water depths. The high abundance of *B. aculeata – Cassidulina carinata* assemblage in the uppermost part of the cores EYB1 and EYB10 indicates that marine conditions were influenced by freshwater influx.

Around 8.160±90 yrs BP and in the distal part of the shelf (EYB6), the sedimentary environment is typically characterized by species that tolerate high levels of nutrients and less well oxygenated sea floors. In this environment, *Hyalinea balthica, Bolivina spathulata* and *B. marginata* have the highest concentration implying fine, organic matter rich sediments in a circalittoral environment (Sgarrella and Moncharmont Zei, 1993). The high abundance (up to 80%) of *B. spathulata* in the middle part of the core implies a phase of poor oxygenation. On the contrary, the presence of *H. balthica* upcore, with non-negligible abundance seems to be influenced by the conditions of the sea floor (grain size, oxygenation and nutrient concentrations), caused mainly by currents that distribute the sediments. At 7.610 BP, the significant occurrence of *C. carinata* can be related to the lower degree of organic matter enrichment in the sediments. The role of food availability seems to be confirmed by the presence of *Cibicidoides pachyderma* that is also dependent on high food availability.

The near absence of surface dwelling planktonic foraminifera (mainly *G. quinqueloba*) is a puzzle.

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