Geophysical Research Abstracts,
Vol. 10, EGU2008-A-06345, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-06345
EGU General Assembly 2008

Response of benthic foraminiferal assemblages to the Neogene tectono-sedimentary evolution of the Pre-Apulian zone (Levkas Island, western Greece).

H. Drinia (1), A. Antonarakou (1), F. Lirer (2), M. Sprovieri (2), G. Kontakiotis (1), N. Tsaparas (1), G. Goumas (1), D. Galanakis (3), P. Paschos (3)

(1) University of Athens, Faculty of Geology and Geoenvironment, Dept. of Hist. Geology and Paleontology, Athens, Greece, (2) Instituto per l' Ambiente Marino Costiero (IAMc)-CNR-Napoli, Italy, (3) Institute of Geology and Mineral Exploration,. 70 Mesogion Str, 115 27, Athens, Greece

In an attempt to discriminate the main factors which affected the sedimentation of a tectonically active setting, the palaeoenvironmental evolution during the early Tortonian of Levkas Island, W Greece, is reconstructed through benthic foraminiferal assemblages. The studied section (25 m thick), located in the northern part of the Pre-Apulian Foreland Basin, close to the emergent areas of the Ionian zone, is composed of hemipelagic silty clays and turbidite sandstones, reflecting sedimentation as a result of thrust activity.The tectonostratigraphic setting of the studied section indicates that sedimentation occurred in a wide, deep and well-ventilated foreland basin (e.g. Drinia et al., 2007). Deposition occurred on a steep, unstable slope adjacent to a narrow shelf. Periodic downslope transport of shallow-water sediments into deeper water occurred throughout this interval, perhaps related to intense tectonic activity.

Reconstruction of palaeoenvironmental changes of the early Tortonian succession was performed using qualitative and quantitative estimates from benthic foraminiferal biofacies analysis and quantitative constraints from oxygen and carbon isotope data.

Benthic foraminiferal biofacies are characterized by a distinct set of foraminiferal indices (planktonic / benthic ratio, alpha-diversity index, absolute abundance etc.) and by a specific assemblage of individual taxa providing information about the deposi-

tional environment of the fossil setting.

The lower part of the succession is characterized by relatively high abundances of outer neritic to bathyal taxa (e.g. *Siphonina reticulata, Cibicidoides kullenbergi, C. italicus, Mellonis barleeanum, Uvigerina semiornata rutila, Lenticulina* spp., *Globocassidulina subglobosa*), whereas the upper part is dominated by transported inner neritic marine taxa.

Stable C and O isotope compositions of benthic (*C. kullenbergi*)and planktonic (*G. obliquus*) foraminifera from the studied section mimic the general world climatic tendency for the early Tortonian (relatively stable climatic conditions characterized by an increase in local deep ocean temperatures), yet they present certain differentiations that are owed to local factors.

Two climate systems have been recognized: A warm, wet, climate with a stratified water column which consists of low surface water δ^{18}O, high surface δ^{13}C, and high deep water δ^{18}O and δ^{13}C, and a warm, wet climate with some ocean mixing. This climate contains low surface δ^{18}O and δ^{13}C values, and low deep water δ^{18}O and δ^{13}C values due to mixing of the water column.

There seems to be no obvious relationship between SST trends and the increased fluxes of transported material, taken as indicative of sea-level fall, excluding thus an underlying glacio-eustatic mechanism as the cause for sea-level lowering and increased transportation of marginal marine elements. The effect of intense tectonic activity seems to be accountable for the observed changes in the faunal pattern (i.e. approach of the Ionian thrust front, compressional tectonics).

The trends and fluctuations in benthic foraminiferal biofacies and oxygen and carbon stable isotopes mirror the interference of tectonically induced sea level fluctuations rather than climatically-controlled sea level changes.

Drinia, H., Antonarakou, A., Kontakiotis, G., Tsaparas, N., Segou, M. & Karakitsios, V., 2007. Paleobathymetric Evolution of the Early Late Miocene Deposits of the Pre-Apulian Zone, Levkas Island, Ionian Sea. *Bulletin Geol. Soc. Greece*, 40/1, 39-52.

This work is part of Italy-Greece Joint Research and Technology Programmes (2005-2007) and is co-funded by the European Social Fund and National Resources (EPEAEK II) PYTHAGORAS II (70/3/8020).