Geophysical Research Abstracts,
Vol. 10, EGU2008-A-07243, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-07243
EGU General Assembly 2008

Sedimentary facies analysis and palaeoecology of an early Tortonian turbidite-like sequence in Gavdos island, Greece.

H. Drinia

University of Athens, Faculty of Geology and Geoenvironment, Dept. of Hist. Geology and Paleontology, Athens, Greece

cntrinia@geol.uoa.gr

The studied early Tortonian succession in Gavdos Island is 115 m thick and is mainly composed of whitish to greyish bluish marls and sands of turbiditic origin. The studied section has been divided into four sedimentary facies, each one identified by lithology, physical and biological sedimentary structures and grain size.

Facies 1 dominates mainly the basal part of the studied section and comprises bluish, fossiliferous marls with occasional lenses or layers of fine to very fine grained sands.

Facies 2 consists of thin-bedded and very fine to fine-grained sands embedded in shelf mud. The thinly-interbedded sands-marls facies resemble distal storm sands deposited below storm wave base or alternatively fine-grained turbidites, interbedded with marls deposited under lower-energy conditions.

Facies 3 is characterized by fine to medium grained, poorly sorted sands, which are laterally persistent. Generally, the base and the top of each sandstone bed are sharp and smooth surfaces. These beds are intercalated with thin marly horizons or very thin alternations of mudstone and very fine-grained sandstones.

Facies 4. The uppermost levels of the studied section consist of medium-sized partially cemented sandstone with no visible stratification. Bivalves, bryozoans, echinoids (*Clypeaster*) and large benthic foraminifera (*Heterostegina*) dominate, with mi-

nor proportions of gastropods. The biogenic content of this facies implies a fully marine shelf setting. Biota is well preserved, indicating a rather calm depositional setting below wave abrasion depth (WAD). The presence of *Heterostegina* indicates a depositional environment in the lower part of the photic zone, characterized by warm-temperate surface temperatures.

Quantitative analysis of benthic foraminifera has been carried out in order to: 1) evaluate the immediate impact of turbidites on benthic assemblages and 2) monitor the recolonization and subsequent evolution of the foraminiferal fauna following the turbidite layers. Samples analyzed were collected from Facies 1 and from the marly intervals of Facies 2. Sands (Facies 3) above and below the marly intervals were not sampled or when sampled, yield poorly preserved microfossils.

Significant differences in diversity, community structure, feeding and habitat preferences are observed among benthic foraminiferal assemblages below and above turbidite layers. Prior to the deposition of the turbiditic sands, the benthic foraminiferal assemblage is indicative of a certain environmental stability as indicated by the relatively minor fluctuations in the measured faunal parameters. This stability was disrupted by the recurrent deposition of turbiditic sands. Some specialized endobenthic forms, such as *Valvulineria complanata* and *Nonion* spp. could keep pace with high sedimentation in this high-energy regime, taking advantage of the food supplied by the strong bottom currents.

A remarkable pattern that can be interpreted as evidence of faunal recovery characterized the sea-floor following the deposition of the turbiditic sands. A new assemblage of opportunistic taxa (*Bolivina spathulata* assemblage) starts the process of recolonization. This oligotypic fauna is replaced later by a more-diversified fauna which is capable to occupy a wider range of ecological niches.

This project is co-funded by the European Social Fund and National Resources – (EPEAEK II).