EEDEN PROGRAMM

Environment and Ecosystems Dynamics of the Eurasian Neogene

„THE MIDDLE MIOCENE CRISIS“

16. INTERNATIONALE SENCKENBERG KONFERENZ DES FORSCHUNGSINSTITUTES UND NATURMUSEUMS SENCKENBERG
FRANKFURT AM MAIN (GERMANY)
NOVEMBER 13TH TO NOVEMBER 16TH 2002

Foraminiferal Sequence Biostratigraphy of the Middle Miocene Potamos Section from Gavdos Island, Greece.

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Potamos section is located in the northeastern part of Gavdos island, along the Potamos bay. It is mainly composed of alternations of whitish to grayish-bluish alternations of marls and sands. Upwards these beds change into shale and sand alternations with significant presence of *Chlamys latissima* and *Gryphaea (Crassostrea)gryphoides crassissima* exposed in a distinct bed. In the uppermost levels of the Potamos section the deposits are topped by *Heterostegina* sands followed by red soils.

Calcareous nannoplankton and planktonic foraminifera obtained from the basal part of the Potamos section suggest a late Serravallian age, while faunal assemblages in the uppermost part of the section a late Serravallian to early Tortonian age (Anastasakis et al., 1995).This preliminary work aims to study foraminiferal biofacies and biofacies shifts related to environmental changes, especially fluctuations in sea level through the Middle Miocene.

56 samples were processed with standard techniques and about 300-500 foraminiferal individuals were systematically picked from each sample and identified.

Planktonic foraminifera have been used for the biostratigraphic determination of the Potamos section. In order to provide an accurate time spanning of the studied sediments and to determine and calibrate the bioevents recognized, we proceeded in a detailed qualitative and semiquantitative analysis of the planktonic foraminifera.

As far as benthonic foraminifera are concerned, richness of the species was measured by applying the α index of Fischer et al. (1943). To get a more detailed picture of the structure of the assemblages, the unequal distribution of individuals among the species had to be determined. The index of heterogeneity H(S) is calculated using the Shannon-Weaver formulation. In order to evaluate the preferred microhabitat, species of total assemblages were divided in two groups – epifauna and infauna – (Corliss, 1985; Corliss & Chen, 1988; Corliss, 1991; Jorissen et al., 1992; Murray, 1991; Barmawidjaja et al., 1992).

The planktonic to benthic (P/B) ratio shows planktonic foraminiferal abundances from 3 to >70%, averaging 20-40%

Paleobathymetry was calculated for each sample by introducing P/B ratios, in the equation of van der Zwaan et al., (1990). The depositional depth of the section varies from around 36 to 588 m indicating a rather shallow environment in the middle neritic to upper bathyal zone.One of the most prominent characteristics is that infaunal forms are abundant, varying between 20->40%. The enrichment of the infaunal foraminifera reflects an oxygen-poor, nutrient-rich environment (Brasier, 1995; Murray, 1995; Jorissen et al., 1995).

Oxygen-poor, nutrient-rich conditions are more typical of colder or deeper waters and may occur in shallower sites with upwelling influence. However, upwelling was highly unlikely because the locality was far from the open ocean combined with the maximum diversity in foraminifera and bryozoa. Faunas associated with upwelling waters are usually less diverse but abundant in individuals (e.g. Li & McGowran, 1994). Another mechanism which may produce a similar effect include large-scale runoff that produces a brackish water lid and ultimately a high nutrient level (Tyson & Pearson, 1991). Such low oxygen, high nutrient conditions encourage dysaerobic assemblages characterized by numerous infaunal species (Brasier, 1995; Jorissen et al. 1995; Murray, 1995). However, data at present are inadequate to distinguish which environmental factors played a primary role.

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