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Abstracts

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Distribution of Benthic and Planktonic Foraminifera in the surface exposures of Ierapetra Basin Early Pliocene (E. Crete, Greece)

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The Late Cenozoic evolution of Crete has been controlled by the final northward subduction of the African plate and incipient continental collision with the Anatolian-Aegean microplates (Makris & Vees 1977; Le Pichon & Angelier 1979). Although parts of Crete have been subaerially exposed since Mid-Miocene time, extensional faulting combined with eustacy resulted in local nonmarine and marine basins. Shallow marine sequences along the north and south coasts of Crete suggest an overall emergence and northward tilting of the island starting in late Early Pliocene time (4.4 Ma;; Meulenkamp & Hilgen 1986; Meulenkamp et al. 1994).
The Ierapetra Basin (eastern Crete) is known since long ago for its richness in marine Miocene and Pliocene deposits of various facies. According to Fortuin (1977), the oldest Pliocene sediments are the marl breccias of the Pakhiammos Formation which suggest submarine mass transport. The overlying marls, deposited in an open and quiet marine environment, indicate an abrupt deepening of the region. The studied section (15 m thick) covers the lower part of the Pliocene Pakhiammos Formation. Its marine sediments are characterized by beige-white coloured diatomaceous marls with intercalated finely bedded limestone marls. The diatomaceous marls occur at the base of the outcrop. They appear white and weather to small blocky fine-grained fragments, which have the appearance of white diatomite with little obvious bedding at the macroscale. The age of this sedimentary succession, based upon analysis of planktonic foraminifera, is attributed to the Early Pliocene. Benthic foraminifera are abundant in these sediments, and their assemblages provide a highly sensitive record of environmental changes associated with basin ventilation switches. The relatively diverse benthic foraminiferal assemblage characterizes a mesotrophic upper bathyal environment. It is mainly characterized by the presence of *Cibicidoides kullenbergi, C. pseudoungerianous,* and *Cibicidoides* spp. In addition, *G. subglobosa, Lenticulina* spp., and *Pullenia* spp. also occur within this assemblage suggesting a well-oxygenated environment. Marked variations in composition (particularly in the proportions of *Bolivina, Bulimina, Globobulimina,* and *Uvigerina*) may relate to changes in productivity or circulation. The high abundance of *B. exilis* in the upper part of the succession indicates conditions of pulse-like accumulating organic matter of high nutritive quality. The statistical relationship of these defined assemblages to various aspects of the marine environment (depth, temperature, salinity, percent gravel, sand and mud) are investigated through multiple regression techniques.

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