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Environment
and **Identity**
in the **Mediterranean**

The
Messinian
Salinity
Crisis
Revisited

Abstracts

Corte, July 19-25, 2004



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***ENVIRONMENT AND
IDENTITY IN THE
MEDITERRANEAN***

Università di Corsica Pasquale Paoli
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THE MESSINIAN SALINITY CRISIS REVISITED

ABSTRACTS

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E. MEDITERRANEAN SMALLER MAMMALS AT THE L. MIOCENE-E. PLIOCENE TRANSITION

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The late Turolian coincides with the Messinian Salinity Crisis in the marine sequences in the Mediterranean (de Bruijn, 1973).

The changes in composition of land mammals in the E. Mediterranean during this time interval (MN13) are the scope of this study.

Four Late Turolian rodent localities from Greece and Turkey are compared: the locality of Tomea Eksi in the Ptolemais basin, Maramena (Greece) and Suleimanli 2, and Kangal 2 (Turkey).

Of all the above localities, only Ptolemais basin (localities Komanos 1, 5.25 Ma and Tomea Eksi 5.34 Ma) has been calibrated by combining paleomagnetism, cyclostratigraphy and radiometric dating. Due to this, we have achieved an unprecedented high resolution time control for our rodent assemblages. We assume, based on the observed stage of evolution, that all four localities are coeval.

The rodent assemblages from the Late Turolian localities show an unusual patchiness, the presence of exotic fauna elements from different origins (*Calomyscus delicatus*, *Arvicanthis* n. sp. *Pseudomeriones* sp.) and differences in species content (Tbl. 1).

The composition of the Late Turolian assemblages does not suggest a dry environment. It is then safe to assume that during the Messinian the terrestrial environments in E. Mediterranean were not dry.

The great differences in diversity as well as in content are thought to be of local importance only due to local ecological factors around the localities.

Around the Mio/Pliocene boundary there is a change in rodent assemblages. They become more similar than before and lose their "exotic" elements. This is the time when arvicoline enter. The rodent assemblage from Komanos 1, in the Ptolemais basin over the Mio/Pliocene boundary has lost the "exotic" elements: *Arvicanthis* and *Pseudomeriones*, but includes the arvicoline *Promimomys*.

PALEOECOLOGICAL ASPECTS PRECEDING THE MESSINIAN SALINITY CRISIS: A CASE STUDY FROM GAVDOS ISLAND.

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The Messinian pre-evaporitic sedimentary succession of Gavdos island (Metochia section) is a nearly uninterrupted succession of marine sediments, dominated by finely laminated diatomaceous sediments, which are cyclically alternating with marlstone and white limestone beds. The purpose of this study is to analyze in detail the benthic and planktonic foraminiferal microfauna as well as the ichthyofauna preserved in the sediments of this section.

The qualitative and quantitative analysis of the planktonic foraminifera fauna allowed the recognition of six bioevents, which have been astronomically dated for the Mediterranean. The base of the diatomitic succession in Gavdos Island is dated at 6.696 Myr. The section ends at 6.0 Myr.

A species proportion matrix from benthic foraminifera was prepared from raw assemblage counts and a Principal Component Factor Analysis was implemented, yielding three principle axes which explain 83,031% of the variability contained in the matrix. The first axis which explains 57,221% of the variance is loaded negatively by *Bulimina aculeata* group indicating great tolerance for high salinities, oxygen deficiency and nutrient abundance (v.d. Zwaan, 1982; Kouwenhoven et al., 1999). The second axis which explains 13,341% of the variance is loaded negatively by *Bolivina plicatela*, which is a species highly tolerant to raised salinities and to oxygen deficiency, with probably an epiphytic mode of life (v.d. Zwaan, 1982.). The third axis which explains 12,47% of the total variance has a bipolar character indicating two assemblages. Species loading this axis positively is *Asterigerinata planorbis*, which is considered to have an epiphytic mode of life, pointing to a tolerance to increased salinities. Species loading the axis negatively *Bolivina spathulata* group which is known to survive in oxygen deficient environments and is often dominant in the oxygen-minimum zone or in the upwelling zones. The vertical distribution of the revealed scores indicate that throughout the deposition of the diatomaceous sequence of Metochia section extremely stagnant bottom water conditions interrupted by small scale stable marine conditions, prevailed. An assemblage containing Myctophidae and Syngnathidae has been observed throughout the studied section. Such an association of fish having ways of life apparently incompatible can be explained only by the action of marine currents (Gaudant 2002). In particular, Myctophidae attest the existence of deep zones of at least several hundred meters deep, located along the margins of the circalittoral zone.

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