Geophysical Research Abstracts,
Vol. 10, EGU2008-A-01679, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-01679
EGU General Assembly 2008

Latest Cretaceous Tethyan carbonate platforms in the central-eastern Mediterranean and Middle East: patterns of demise compared to the evolution of depositional environments

M. Schlueter (1), T. Steuber (2), M. Parente (3), J. Mutterlose (1)

(1) Institut für Geologie, Mineralogie und Geophysik Ruhr-Universität Bochum,

Universitätsstr. 150, 44801 Bochum, Germany (malte.schlueter@rub.de)

(2) Petroleum Institute Abu Dhabi,

PO Box 2533, Abu Dhabi, United Arab Emirates (tsteuber@pi.ac.ae)

(3) Dipartimento di Scienza della Terra Università “Federico II” Napoli,

Largo San Marcellino 10, 80138 Napoli – Italy (maparent@unina.it)

The evolution of the Late Cretaceous (Maastrichtian) rudist-bearing carbonate platforms and the detailed chronology of their demise are rather imprecisely constrained, due to the low-resolution biostratigraphy generally based on long-ranging taxa of benthic foraminifera.

We used strontium-isotope stratigraphy to derive numerical ages for key localities of latest Cretaceous carbonate platforms in the central-eastern Mediterranean (Apulia, Salento, Ionian Islands; south-eastern Turkey) and Middle East (United Arab Emirates and north-eastern Oman). The preferred sample material for Sr-isotope analysis was low-Mg calcite from the outer shell layer of rudist bivalves. The chemical composition (Sr, Mn, Fe, and Mg concentrations), and stable isotopes ($^{18}O/^{16}O$ and $^{13}C/^{12}C$) were analyzed to assess the preservation of the original seawater Sr-isotope ratio of the sampled material. These data are used to constrain the stratigraphical ranges of characteristic rudist species, and to calibrate the ranges of benthic foraminifera and

calcareous algae with chronostratigraphy.

Our results show that rudist associations range stratigraphically into the latest Maastrichtian on all carbonate platforms studied here. The data of the Apulian platform are confirmed by similar deposits of the same age exposed on the Ionian Islands (Greece). In Oman the abrupt demise of the characteristic rudist association is obvious in a continuous Cretaceous/Paleogene sequence of platform carbonates. There, benthic foraminifera and calcareous algae delimit the position of the K/P boundary interval to less than five meters. While the typical late Maastrichtian biota became extinct, open marine shallow-water carbonate facies persisted across the boundary interval.

At all sites, the species-richness of rudist associations is correlated to the depositional environment, with species-rich associations in high-energy platform margin deposits (Ciolo, Salento) and a lower diversity in low-energy open marine environments (UAE, Oman). This suggests a catastrophic extinction of the characteristic Late Cretaceous carbonate producers, but the causal factors of this selective extinction remains obscure.