SR-ISOTOPE CHEMOSTRATIGRAPHY AND DEPOSITIONAL ENVIRONMENTS OF LATEST CRETACEOUS CARBONATE PLATFORMS IN THE CENTRAL-EASTERN MEDITERRANEAN AND MIDDLE EAST

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A precise history of the demise of the characteristic Late Cretaceous rudist formations in the central-eastern Mediterranean and Middle East has not yet been established, because their evolution is rather imprecisely constrained by biostratigraphy of typical carbonate-platform biota such as benthic foraminiferas and calcareous algae, particularly in restricted inner-platform environments. We use Sr-isotope stratigraphy to derive numerical ages for species-rich rudist associations at several localities of the Apulian platform (SE Italy), the Arabian Peninsula (Oman), and SE Turkey to constrain the stratigraphical ranges of characteristic rudist species, and to calibrate the ranges of benthic foraminifera and calcareous algae with chronostratigraphy.

The preferred sample material for Sr-isotope analysis is low-Mg calcite from the outer shell layer of rudists. This material has a been shown previously to have a high potential to have retained the original Cretaceous seawater composition. Concentrations of Sr, Mn, Fe, and Mg and and stable isotope ratios ($^{18}O/^{16}O$ and $^{13}C/^{12}C$) are analyzed to assess a possible diagenetic overprint of the original seawater Sr-isotope ratio of the sampled material.

Our results show that species-rich rudist associations of the Apulian carbonate platform (Salento, SE Italy) range into the latest Maastrichtian (< 66.8 Ma). The same age has been obtained for similar deposits exposed on the Ionian Islands (Greece). Both localities represent high-energy outer margin depositional environments.

In Oman (Qalhat, Sur region), a continuous Cretaceous /Palaeogene sequence of platform carbonates has been studied that represents a small, isolated carbonate platform with normal marine conditions. The Sr-isotope values of rudist shells indicate the latest Maastrichtian, and benthic foraminifera and calcareous algae delimit the position of the K/P boundary a few meters above the last occurrence of moderately species-rich rudist associations. Ongoing studies are aiming at the detailed assessment of environmental change during the K/P transition. This is challenged by dolomitization of the critical boundary interval.

Considering additional published data on latest Maastrichtian rudist associations, a stepwise extinction or reduced diversity is not evident. The few localities representing open marine platform margin environments have highly diverse rudist associations, while species-poor formations are generally from restricted inner-platform environments.