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The main steps in the evolution of rudist bearing carbonates in the Campania Apennines (southern Italy): a refined time-framework using chemostratigraphy.

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Rudist-bearing carbonate platforms were extremely widespread in the Late Cretaceous. In recent papers (Simone et al., 2003 and references therein) they have been interpreted as open-shelves, characterised by foramol-type assemblages, and it has been shown how different facies and rudist assemblages developed in high-energy *vs* low-energy settings. Both local and global factors were certainly effective in shaping the evolution of this complex sedimentary system. However the most severe limitations in trying to relate this evolution to sea-level and to global climatic and paleoceanographic events is the low stratigraphic resolution attained by classical biostratigraphic methods. We use chemostratigraphy (carbon-isotope and strontium-isotope stratigraphy) to increase stratigraphic resolution and to establish precise correlations with the bio-chronological schemes of deep-water successions. This method allows establishing a refined time-framework for the main steps in the evolution of the rudist bearing sedimentary system of the Campania Apennines. All the successions exposed in the study area are characterised by more or less restricted low-energy facies. After the Cenomanian-Turonian boundary events rudist communities experienced a prolonged crisis. Lower-middle Turonian facies are in fact characterised by a very impoverished biota: larger foraminifers are nearly absent and rudists are represented by low-diversity assemblages. The rudist contribution to the sedimentary system is subordinate. Begin-

ning from the uppermost Turonian rudist shells and debris become a significant component. Our chemostratigraphic data suggest a correlation with the upper part of the neptuni zone. In the study area rudist-bearing beds become thicker and more closely spaced in the lower-middle Coniacian (petrocoriensis to margae zones of the Tethyan ammonite scale). Upper Coniacian-middle Santonian levels record a reduction in the contribution of rudist debris to the sedimentary system. A new phase of prolific production is witnessed by the occurrence in the upper Santonian-Lower Campanian of thick beds rich in displaced rudist shells and fragments (*Hydraulic Shell Concentrations*) in the more internal areas (M.Coccovello) and of complex rudist accumulations in the relatively more open areas (Trentinara). In these latter areas, a network of small channel-like depressions has been recognised. Along the margin of the channels the beneficial effect of active currents favoured the colonization and the survival of diverse rudist assemblages (*Primary Biogenic Accumulations*). The central zones of the depressions, instead, were blanketed by shells only weakly displaced (*Condensed Shell Accumulations*) (Ruberti et al., 2006). Carbon- and strontium-isotope stratigraphy allows correlating this episode with the interval going from the paraplanum to the top of the bidorsatum zone. The rudist-bearing limestones of the Campania Apennines are truncated by an erosional unconformity underlying the Eocene Trentinara Fm. The uppermost part, dated to the middle Campanian by Sr-isotope stratigraphy, is characterised in the study area by thin rudist-bearing levels with an impoverished fauna consisting only of small individuals. Ongoing research aims to interpret the evolution outlined above in terms of sea-level changes and oceanographic/ climatic fluctuations. Moreover we are using chemostratigraphy to relate trends and events recorded by the low-energy successions of the Campania Apennines to those recorded in high–energy sectors of the central-southern Apennines.

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