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Biostratigraphy and diversity of mid-Cretaceous benthic foraminifers of Adriatic Platform, South Croatia

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The Late Mesozoic Barremian to Cenomanian southern interior part of the Adriatic platform, Croatia, is characterized by exclusively shallow water carbonate facies that were deposited in shallow water, peritidal environments. The succession is characterized by a relatively rich association of shallow marine benthic organisms, primarily foraminifers and dasyclad algae. The analysis of the entire microfossil association has provided a detailed biostratigraphic zonation based on the stratigraphic distribution of either benthic foraminifera or calcareous algae. Both the fossil and the sedimentary record point to several episodes of change in relative sea level, paleoenvironments, and distribution of paleocommunities dominated by benthic foraminifers and dasyclad algae. The Barremian to Cenomanian benthic foraminiferal assemblages, including a total of 106 species and 57 genera, were analyzed to establish the principal diversity patterns at (sub)stage level of resolution. The diversity patterns of benthic foraminifers in the study area appear related to regional changes in relative sea level, coupled with related changes in habitats.

The observed diversity pattern of benthic foraminifers shows that after a relatively high diversification in the Barremian, the early Aptian marked the foraminiferal diversity maximum. Foraminifers diversified into a suite of euphotic habitats backed by a relative sea-level rise that coincided with oceanic anoxic event (OAE-1A). The regional regression in the late Aptian resulted in loss of "deeper" subtidal habitats and, consequently, foraminiferal diversity dropped. Transgression in the early Albian and probable associated decrease in platform waters fertility, resulted in the gradual increase of diversity throughout the Albian. Regional onset of regression in the latest Albian, again could have increased nutrient supplies to surface waters, and consequently, the subsequent early Cenomanian foraminiferal association reached its mid-Cretaceous diversity minimum. The middle Cenomanian relative sea-level rise led to a gradual recolonization of the platform interior and the renewal of the benthic foraminiferal association.

The present study, calibrated against the standard regional biostratigraphic zonation for the Eastern Adriatic mid-Cretaceous (Barremian to Cenomanian),

documents that several species of benthic foraminifers have exceptional age-diagnostic value for the Barremian to Cenomanian biostratigraphy, the most important being orbitolinids (*Campanellula capuensis*, *Palorbitolina lenticularis*, *Praeorbitolina cormyi*, *Orbitolina* (*M.*) *lotzei*, *O.* (*M.*) *parva*, *O.* (*M.*) *texana*, "*Valdanchella*" *dercourti*, *Neoiraqia insolita*, *N. convexa*), and alveolinids (*Archaealveolina reicheli*, *Ovalveolina crassa*, *O. maccagnoae*, *Sellialveolina viallii*, *Cisalveolina fraasi*), as well as ataxophragmiids (*Voloshinoides murgensis*) and chrysalinids (*Protochrysalidina elongata*, *Chrysalidina gradata*). These are generally abundant, have a widespread distribution and a restricted stratigraphic range. They evolved rapidly and became extinct suddenly.