An integrated bio-chemostratigraphic framework for Lower Cretaceous (Barremian-Cenomanian) shallow-water carbonates of the Central Apennines (Italy)

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Shallow-water carbonate platform sections are valuable archives for the reconstruction of deep-time environmental and climatic conditions, but the biostratigraphic resolution is often rather low. Moreover, chemostratigraphic correlation with well-dated pelagic sections by means of bulk carbonate carbon-isotope stratigraphy is notoriously difficult and afflicted with large uncertainties, as shallow-water sections are particularly prone to the impact of diagenesis.

In the current study, an integrated biostratigraphic-chemostratigraphic approach is applied to southern Tethyan Lower Cretaceous carbonate platform deposits (Santa Lucia, Monte La Costa sections) situated in the Central Apennines in Italy. The 500 m thick Santa Lucia section, representing an open lagoonal inner carbonate platform setting, provides a characteristic carbon- and oxygen-isotope pattern that allows for correlation with pelagic composite reference curves (Vocontian and Umbria Marche basins). Calibrated by means of foraminiferal biostratigraphy and rudist bivalve strontium-isotope stratigraphy, the section serves as local chemostratigraphic shallow-water reference for the Barremian to Cenomanian. The 250 m thick Monte La Costa section comprises predominantly coarse grained (biostromal) and often strongly cemented shelf margin deposits. Although benthic foraminifera are scarce and the carbonates evidently suffered strong diagenetic alteration, high-resolution (rudist shell) strontium-isotope stratigraphy in combination with superimposed carbon-isotope trends and biological-lithological changes (e.g., mass occurrences of *Bacinella irregularis* s.l) enables correlation with the Early Albian to Cenomanian portion of the Santa Lucia reference section. At both localities, chemostratigraphy indicates a major gap covering large parts of the Lower and middle Cenomanian.

After having considerably improved the stratigraphic resolution of the studied sections, selected best-preserved rudist shells are going to be used for sclerochronological investigations. This will allow reconstructing the impact of long-term (Myr) and short-term (seasonal) paleoclimatic and paleoenvironmental changes on Cretaceous shallow seas.