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Radiolitid rudists: an underestimated palaeoclimatic archive?

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During the Cretaceous, rudist bivalves dominated shallow marine, low latitude carbonate platform settings in the Tethyan Ocean. After their first appearance in the Oxfordian (Late Jurassic) they evolved to the most important carbonate-producing biota of the Late Cretaceous. Like modern bivalves rudists show a rhythmic growth pattern (dark and light lamellae). This secretive process was affected by paleoclimatic (seasonal temperature variations), paleochemical (salinity changes) and paleobiological (growth rate and carbonate production) parameters. In contrast to uniformly compact outer (low-Mg calcite) shell layer (OSL) of requieniid, polyconitid and hippuritid rudist, the OSL microstructure of radiolitid shells exhibits a characteristic cellular network composed of horizontal laminae interrupted by vertical pillars that isolate each single cell. The resulting intraskeletal pore space was probably originally filled with organic material. The latter was decomposed and filled with diagenetic calcite, which hampers detailed sclerochronological geochemical approaches. We here present elemental and isotope data measured at ultra-high resolution along the left and right valves of Early Albian radiolitid shells, which were collected from an Apennine carbonate platform section in southern Italy (Monte La Costa, Matese Mountains). The combination of XRF element scanning and stable isotope analysis allows distinguishing between primary and diagenetic geochemical signals in the considered radiolitid shells.