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Triassic/Jurassic boundary in peritidal carbonates from western Tethys



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A carbonate platform from the western margin of the Ionian Tethys has been investigated for biotic and geochemical variations across the Triassic/Jurassic boundary (TJB). The section of Mount Sparagio (north-western Sicily) exposes a peritidal succession of Rhaetian-Hettangian age with a thickness of about 400 m. The peritidal sediments are organized in metre-scale shallowing upward cycles formed by subtidal, intertidal and supratidal facies. Along the section, the subtidal facies vary from bioturbated mud/wackestones with rare mollusc shells, to Megalodont-rich wacke/packstones to, more rarely, coral bafflestones, most likely as response to variations of the accommodation space and water energy in the lagoon. The intertidal facies show planar stromatolites or loferites with fenestral fabric, while flat pebble conglomerates passing in turn to thick reddish or yellowish paleosols compose the supratidal facies.

The lower part of the section is attributed to the Rhaetian, on the base of the common presence of *Triasina hantkeni* (Majzon) in the subtidal units, not excluding a possible upper Norian age of the lowermost beds. The foraminifer *T. hantkeni* is associated to several benthic foraminifers, such as *Aulotortus sinuosus* (Weynschenk), *Aulotortus* sp. and *Auloconus permodiscoides* (Oberhauser). Megalodontids are particularly abundant and large in the lower part of the *T. hantkeni* biozone, while they became rare and small in the last 150 m of the biozone.

The Last Occurrence of *T. hantkeni*, along with the disappearance of the benthic foraminifer fauna and the bloom of the calcareous alga *Thaumatoporella parvovesiculifera* (Raineri) in the lagoonal facies is assumed as the Rhaetian-Hettangian boundary. Notably, all the benthic foraminifers in the subtidal facies disappear in a stratigraphic interval of about 10 m (of ca. 7 or 8 peritidal cycles). This turnover is followed by a gradual recovery of the Jurassic biota about 20 m upward the boundary zone, marked by the appearance of benthic foraminifers such as *Siphovalvulina* sp. The observed biostratigraphic signature in the studied section is well comparable to similar Tethyan sections described from Greece [1] and Turkey [2].

The boundary stratigraphic interval has been also analysed for isotopic investigations. Thirty-eight bulk rock samples were collected across the boundary interval. All the samples were mainly calcareous wackestones and packstones from the lagoonal facies. The preliminary $\delta^{13}\text{C}$ values range from -3.42‰ to 2.95‰. A negative C-isotope pulse about 60 m below the disappearance of the end-Triassic benthic faunal assemblage marks the established $\delta^{13}\text{C}$ curve. Two minor negative peaks follow this negative spike more close to the T/J boundary interval, followed in turn by a positive C-isotope excursion. The obtained values roughly match the widespread negative Carbon excursion recorded in many T/J boundary sections [3 and ref. therein], however a detailed global stratigraphic correlation of the observed trend needs further investigations.

References:

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