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# Carbon cycle perturbations in a Tethyan carbonate peritidal succession across the Triassic-Jurassic boundary

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Evidences of carbon cycle perturbations were observed in a Triassic-Jurassic peritidal carbonate succession from western Sicily.
The studied succession consists of shallowing upward peritidal cycles characterized by subtidal, intertidal microbial and supratidal facies. The subtidal members contain a fossil content referable to a Rhaetian age with the common occurrence of rare corals (Retiophyllia sp.), megalodonts, calcareous algae and benthic foraminifera as Triasina hantkeni, Aulotuortus sinuosus, Auloconus permodiscoides.
The $\delta$13C curve obtained along 224 m of succession show two main negative excursion (CIEs) in the Rhaetian horizons. The two negative CIEs correspond to the Initial CIE and Main CIE described in literature from several Triassic Jurassic successions.
The two negative shift correspond to the extinctions of biomineralized organisms such as corals, mollusks and benthic foraminifera that occur in the subtidal members of the studied section. In detail, to the initial CIE corresponds a change of size and shell thickness of megalodotids that became smaller and thinner in the overlying stratigraphic levels. To the Main CIE correspond the total extinction of the Rhaetian fossil community followed by a barren interval characterized by an oolitic level at the base and by the exclusive presence of small calcispherae.
After the second negative excursion, the carbon curve shows a positive trend (ca. +1‰. It corresponds to the occurrence of olygotipic facies with Thaumatoporella parvovesiculifera and Aeolisaccus sp. referable to the recovery of carbonate productivity during Hettangian age.
The end of the Main CIE is assumed as a proxy of the Triassic-Jurassic boundary (TJB).
The data collected allow to demonstrate an evident perturbation of carbonate productivity in shallow water carbonate platform at the end of Triassic. This perturbation, testified by the negative trends of the carbon curve, is also highlighted by the extinction of carbonate depending organisms. The negative excursions of the resulting $\delta$13C curve are the result of the high amount of $CO_2$ released by CAMP volcanism at the end of Triassic.