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The record of the End Triassic Extinction in southern Tethyan carbonate platforms

Francesca Falzoni, Andrea Montanaro, Alessandro Iannace, and Mariano Parente

Dipartimento di Scienze della Terra, dell'Ambiente e delle Risorse, Università degli Studi di Napoli Federico II, Italy
(francesca.falzoni@unina.it)

The End Triassic Extinction (ETE), one of the “big five” of the Phanerozoic, caused a severe loss of biodiversity both in the continental and in the marine realm. The ETE has been linked with enhanced volcanism of the Central Atlantic Magmatic Province (CAMP), which injected a large amount of CO₂ in the ocean-atmosphere system, triggering major paleoenvironmental perturbations including climate change, ocean acidification and marine anoxia.

In the marine realm, shallow-water benthic biocalcifiers of subtropical carbonate platforms were severely affected, with reef-building scleractinian corals and calcisponges, large megalodontid bivalves, involutinid benthic foraminifers and dasycladalean algae being among the most famous victims. In the classical localities of the Northern Calcareous Alps and Transdanubian Range, the ETE coincides with the demise of the Dachstein-type carbonate platform, which is generally sharply overlain by relatively deep-water facies of outer ramp to basinal environment. This stratigraphy has been interpreted as recording subaerial exposure of the carbonate platform, associated to a sea-level drop in the late Rhaetian that generated a hiatus of variable and generally poorly constrained duration, followed by drowning during transgression in the Early Jurassic.

A different stratigraphic evolution is recorded in some areas of the southern Tethyan margin (i.e., the southern Apennines and Sicily in southern Italy, Greece, the United Arab Emirates and Oman) where carbonate platform facies persist across the Triassic/Jurassic boundary. Stratigraphic sections in these areas are particularly significant to document the evolution of biodiversity of shallow-water benthic biocalcifiers across the ETE interval.

In this study we present new data on the stratigraphic distribution and changes in abundance of benthic foraminifers in two latest Triassic–earliest Jurassic carbonate platform sections of the southern Apennines (Italy) and Pelagonian domain (Greece). We document a decline in diversity and abundance of involutinid benthic foraminifers predating the extinction of several genera in the latest Rhaetian. Carbon isotope profiles of the studied sections show a complicated pattern of repetitive high-frequency negative excursions, seemingly related to local paleoenvironmental and/or early diagenetic features. However, by integrating bio- and carbon isotope stratigraphy we are able to correlate the studied sections with other persistent carbonate platform sections and with reference sections of the Lombardy Basin and of the Northern Calcareous Alps.

