

Calcareous nannofossil assemblages across the Paleocene-Eocene transition in the Kharouba section, northern Tunisia

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The Paleocene-Eocene transition is marked by a global warming event (PETM), a carbon isotope ($\delta^{13}\text{C}$) negative excursion, and several environmental and biotic perturbations, which have been well documented in various environmental settings. This work focuses on the biostratigraphy and the biotic response of calcareous nannofossils to this thermal event in Tunisia, an area in the Tethys that has not been well investigated.

Quantitative and qualitative sample analyses revealed a high diversity in the calcareous nannofossils, which allowed us to attribute the section to Zones NP9 and NP10 (late Paleocene to early Eocene). This section is biostratigraphically continuous, and the Zone NP9/NP10 boundary is placed at the first appearance of *Romboaster bramlettei*. The top of the section is attributed to the highest part of Zone NP10.

Toweius spp. and *Coccolithus pelagicus* are the most abundant species in the section. Across the PETM,

several calcareous nannofossil events and changes in the assemblage were recognized: the decrease in abundance of *Toweius* spp. and *Fasciculithus* spp., the presence of deformed *Discoaster* spp., as well as the abundance of *Discoaster araneus* and *Romboaster* spp., which are known to be excursion taxa. The increase in abundance of *Zygrhablithus bijugatus* and the gradual increase of *Toweius* spp. indicate the return to oligotrophic conditions above the PETM.

In conclusion, calcareous nannofossils in the Kharouba section show different responses and key shifts across the PETM than found in previously studied oceanic sites. There was a proliferation of relatively warm and oligotrophic taxa across the event, while above the PETM with a return to normal conditions, there was a proliferation of relatively cooler taxa. This section provides new information and documents events that are useful for correlation with other sites in the Tethyan Realm.