Calcareous nannofossils across the Eocene–Oligocene transition at ODP Site 756 (Ninetyeast Ridge, Indian Ocean): Implications for biostratigraphy and palaeoceanographic clues

Allyson Viganò, Claudia Agnini

University of Padova, Department of Geosciences, 35131 Padova, Italy; allyson.vigano@phd.unipd.it, claudia.agnini@unipd.it

The Eocene–Oligocene transition (EOT; ca. 34–33.5 Ma) represents a key point in Cenozoic climatic evolution, marking the onset of a semipermanent ice sheet on Antarctica and a major step from a greenhouse to icehouse climate state (e.g. Coxall & Pearson, 2007). The timing and modalities of the nannoplankton response to this climatic phase are still poorly understood, and only a few nannofossil biohorizons are considered to be globally synchronous and reliable.

In this study, the calcareous nannofossil response to the EOT was investigated in ODP Hole 756C (27°21.25'S, 87°35.89'E) that was drilled on the Ninetyeast Ridge (eastern Indian Ocean) during Leg 121 (Peirce et al., 1989). Quantitative and semiquantitative analyses were carried out on 102 samples and showed no evidence for dramatic extinctions in the calcareous nannofossil assemblages at the Eocene–Oligocene boundary (EOB, 33.89 Ma). However, significant bioevents occurred short distances below this boundary, such as the successive disappearance of the rosette-shaped *Discoaster barbadiensis* and *D. saipanensis* and, a short distance above, there is an acme of *Clausiococcus subdistichus*. Based on the abundance patterns of the standard and additional marker species, the study section extends from nannofossil Zones NP19–NP20 to NP23 (Martini, 1971), which is equivalent to the CNE20–CNO4 interval of Agnini et al. (2014), and has an estimated duration of ca. 5.6 Myr.

High-resolution analyses allowed us to monitor new, potentially useful and reliable calcareous nannofossil biohorizons, and changes affecting the calcareous nannofossil communities across the EOT. In particular, our data suggest that during the EOT, trophic conditions were likely more important than temperature in controlling the variations observed in the relative abundances of the taxa. Of notable interest were the acme intervals of *C. subdistichus* and the holococcolith *Lanternithus minutus,* both of which are possibly related to episodic increased food supply during the earliest Oligocene.

References

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