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Paleogene calcareous nannofossil biostratigraphic updates from equatorial Indian Ocean

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ODP Sites 709 and 711 are located on the Madingley Rise, a local topographic high between the Mascarene Plateau and the Carlsberg Ridge in the Equatorial Indian Ocean, and drilled in the eighties, recovering sediments spanning the middle Eocene –Pleistocene time interval. The Paleogene nannofossil biostratigraphy was carried out by Okada (1980), and later Site 711 was further investigated by means of nannofossils for a paleoecologic and paleoceanographic study (Wei, Villa and Wise, 1992).
In the last two decades high resolution sampling from different oceanic and on land settings led to a detailed nannofossil biostratigraphy (e.g. Agnini et al., 2014) based on taxonomic updates. The recognition of several new nannofossil species is offering the opportunity to improve the biostratigraphic resolution and to achieve a detailed middle Eocene-early Oligocene biochronology.
On this basis, we present a new magnetostratigraphy, quantitative calcareous nannofossil analyses on a high resolution sample set, in order to reassess the middle Eocene to lower Oligocene biostratigraphy of both sites 711 and 709. Here we discuss 30 bioevents, spanning an interval of about 13 Myr (Chron C20 to Chron C12), and compare our results with previous data related to the Indian Ocean, and the recent biozonations established for low and middle latitudes.
The detailed time frame obtained is fundamental to place the paleoceanographic events, crucial in this time interval encompassing the Middle Eocene Climatic Optimum (MECO) and the long cooling trend that leads to the Oligocene glacial state. Nannofossil response to the paleoclimatic changes highlights a turnover in the assemblage showing an increase in eutrophic taxa and a decrease in oligotrophic and warm species just before the inception of the EOT (Eocene-Oligocene boundary), indicating a shift toward increased nutrient availability at the surface waters of the equatorial Indian Ocean.

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