

Study of the paleoclimatic transition from Greenhouse to Icehouse conditions by means of calcareous nannofossils in the Southern, Atlantic, Pacific, and Indian Oceans

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The Eocene–Oligocene transition (EOT) occurred at approximately 34 Ma, lasted approximately 790 kyr, and includes the Eocene/Oligocene boundary (EOB). It marks the transition from a world without permanent ice sheets (Greenhouse conditions) to one with an Antarctic Ice Sheet (Icehouse conditions) (Hutchinson et al., 2021). The EOT was also a time of major extinctions and ecological reorganization in several biotic groups (Saraswati, 2021) that was probably due to several factors. This critical time interval is highlighted by multiple proxies and their correlations (Villa et al., 2014). The response of calcareous phytoplankton to global changes across the EOB is less well understood than other critical intervals such as the Paleocene/Eocene boundary (Dunkley Jones et al., 2008).

We undertook a high-resolution (5–10 cm), quantitative to qualitative analysis to improve the biostratigraphy of this interval and carried out a detailed paleoecological interpretation. In this study, 10 sites at low, medium, and high latitudes were considered with emphasis on understanding paleolatitude and paleobathymetry. Specifically, the objectives of this research work are to (1) reconstruct paleoclimatic and paleoceanographic conditions, (2) improve the framework of the changes that have occurred at different latitudes, (3) improve the knowledge of the effects recorded by calcareous nannofossils, and (4) improve paleoclimatic and paleoceanographic documentation by highlighting species distribution models.

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