

**RESPONSES FOR PALEOCENE-EOCENE THERMAL MAXIMUM:
EVIDENCED BY CALCAREOUS NANNOFOSSIL ASSEMBLAGES OF
THE MANNAR BASIN, OFFSHORE SRI LANKA**

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The Paleocene-Eocene transition, spanning about ~170 to ~217 kyr, records a significant and extreme global warming event known as Paleocene-Eocene Thermal Maximum (PETM). PETM is marked by temperature elevations across ocean water columns and lateral temperature increments in the tropics to high latitude regions. The effects of these climatic events have been discussed by many researchers as a bloom of many biotic assemblages. In this research segment, we focused on identifying the paleoclimatic changes associated with the Mannar Basin during the period of PETM by using calcareous nannofossil assemblage. The samples were deep-marine carbonate-rich sediments selected within the depth of 2,400 – 2,605 m at 25 m intervals from the Dorado-North Hydrocarbon Exploration well drilled in the Mannar Basin, Sri Lanka. Simple smear slides were prepared and observed under the polarized microscope with an oil-immersion objective lens (magnification 1000x). Based on the calcareous nannofossil stratigraphy, the age determined for the section is Late Paleocene to Early Eocene (P/E), which traverses from biozone NP8 to zone NP10 and the subzones of NP9; NP9a and NP9b were identified. Calcareous nannofossils discovered at the P/E boundary are distinguished by a considerable rise in warm water taxa (e.g., *Sphenolithus*, *Discoaster*, *Ericsonia*, *Fasiculithus*). The pre-PETM and post-PETM periods were characterized by the presence of cold-water taxa (*Coccolithus*, *Toweius* and *Chiasmolithus*). The study samples showed evidence for an increasing temperature of the ocean surface, with an increase in the relative abundance of dissolution-resistant forms (*D. multiradiatus* and *F. tympaniformis*) and the decrease in the relative abundance of cold-water taxa (*C. pelagicus* and *T. pertusus*) during the PETM, while ceasing of the event could be inferred by the increasing of cold-water species (e.g., *Coccolithus*, *Toweius* and *Chiasmolithus*) upon reaching the Early Eocene.

Financial assistance from the Postgraduate Institute of Science (Grant No: PGIS/2020/03) is acknowledged.

Keywords: Biozones, Calcareous Nannofossil, Global warming, Mannar Basin, PETM