

Calcareous nannofossils from the Miocene of the Andaman and Nicobar Islands, India: biostratigraphic and paleoecological perspectives

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Neogene sediments from the Andaman and Nicobar Islands, specifically from lower to upper Miocene sequences, were analyzed for calcareous nannofossil content and found to contain well preserved and diverse fossil assemblages. The majority of the samples contained stratigraphic marker taxa that allowed us to identify successions within the lower to middle Miocene (Zone NN4) on Havelock Island (*Sphenolithus heteromorphus* and *Helicosphaera ampliaperta*), and upper Tortonian (late Miocene, Zone NN11A) on Neil Island (*Discoaster bergrennii/quinquerramus* and the absence of *Amaurolithus primus*). Rock surface observations with the SEM revealed the dominance of sphenoliths, reticulofenestrads,

and the genus *Umbilicosphaera*. The presence of relatively unusual assemblage compositions, especially the presence of abundant sphenoliths and small reticulofenestrads, and rare discoasters, along with common diatoms, indicated high productivity surface waters and probable upwelling paleoenvironmental conditions. In the late Miocene, a low abundance of discoasters and a high abundance of small reticulofenestrads (<3 μ m) indicate eutrophic conditions. This may be due to the influence of intensified monsoonal activity because the onset of these high productivity surface water environments can be linked to an intensification of the Indian Summer Monsoon around 8 million years ago.