

## Review of calcareous nannofossil biostratigraphy and biochronology for the upper Miocene-Pliocene at ODP Site 999 (Caribbean Sea)

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Ocean Drilling Program (ODP) Site 999A was drilled by the R/V *Joides Resolution* during Leg 165 in the Caribbean Sea. This site is located in the Colombian Basin (12°44.639'N, 78°44.360'W), on a promontory named Kogi Rise, or Chibchas Rise, at a water depth of 2827.9 m (Sigurdsson *et al.*, 1997). The calcareous nannofossil biostratigraphy at Site 999A was previously studied by Kameo & Bralower (1997), using bioevent data for the upper Pliocene and Pleistocene (Raffi & Flores, 1995; Takayama *et al.*, 1995) and zonal schemes for the Neogene and the Quaternary (Martini, 1971; Bukry, 1973, 1975; Okada & Bukry, 1980). This study provided a low-resolution biostratigraphic scheme. Due to this, the main aim of this work is to achieve a high-resolution biostratigraphic and biochronologic record over the Upper Miocene to Pliocene.

We have prepared 298 samples, with an average spacing of between 3 cm to 24 cm. The slides were prepared following a decantation technique (Flores & Sierro, 1997) and they were analysed using a polarized microscope at a magnification of 1000x. Calcareous nannofossils show good to moderate preservation throughout the studied stratigraphic interval. Evidence of reworking is recorded by the finding of specimens like *Lithostromation perdurum*, with an age range from Late Paleocene to Early Eocene. The identification of some calcareous nannofossil markers allowed the recognition of the biozones proposed by Martini (1971) and Okada & Bukry (1980). The Upper Miocene (Biozone NN10; Okada & Bukry, 1980) is defined in this study by the first occurrence (FO) datum of *Reticulofenestra rotaria*, which appears approximately at 239.1 mbsf with an average age of 8.76 Ma. Additionally, the FO datums of *Discoaster berggrenii* at ~229.65 mbsf, *Amaurolithus primus* and *Catinaster mexicanus* (both at 229.5 mbsf) were used to locate the boundary between Biozones CN8/CN9 (Okada & Bukry, 1980) and NN10/NN11 (Martini, 1971). Magnetostratigraphic and oxygen and carbon stable isotope records measured in Site 999 will further improve the biochronology of this site.

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