

# Aptian–Albian calcareous nannofossils from the South Atlantic Ocean: Implications for paleoclimate and paleogeography

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<https://doi.org/10.58998/jnr3212>

Calcareous nannofossil assemblages indicate marked changes in surface-water temperature and fertility across the Aptian–Albian transition. However, most records are from the northern hemisphere, and less is known about the response of calcareous nannoplankton in the southern hemisphere. Here, we focus on two locations in the South Atlantic Ocean, namely Deep Sea Drilling Project (DSDP) Site 364 (Kwanza Basin) and DSDP Site 511 (Falkland Plateau), to analyze the paleoceanographic and paleoclimatic changes in the Southern Ocean during the Aptian–Albian transition interval.

Calcareous nannofossils were investigated to refine the biostratigraphy, obtain relative abundances, and document size variations of *Watznaueria barnesiae* and *Biscutum constans*. A comparison with the Tethyan record (Cismon and Piobbico cores) allowed for the differentiation between local and global factors such as paleotemperature and paleofertility. Notably, some similarities in the temperature trends were observed, but there was evidence of cooler conditions at DSDP Site 511, possibly indicative of latitudinal gradients that were established during the Aptian–Albian transition. A moderate change occurred in the calcareous nannofossil assemblage composition with the appearance of abundant cold-water species such as *Repagulum parvidentatum* and more abundant surface-water fertility taxa such as *B. constans* and *Zeugrhabdotus erectus* in the early late Albian at DSDP Site 511. Paleofertility exhibited more localized changes except during the Aptian/Albian boundary interval, which is marked by a temperature rise and increased fertility, aligning with observations in the western Tethyan Ocean. This serves as evidence of the global nature of the warming phase associated with this interval, likely triggered by volcanism from the Kerguelen Plateau Large Igneous Province.

Morphometric analyses of *W. barnesiae* and *B. constans* revealed similar responses and trends to those identified in the Tethys but with larger average coccolith length and width values in the South Atlantic. *Watznaueria barnesiae* is confirmed to display a much less pronounced size change compared to *B. constans*, which is now confirmed to be more sensitive to paleoenvironmental changes.