

# Gradual phyletic evolution of *Reticulofenestra oamaruensis* from *Reticulofenestra clatrata*: A rare example of calcareous nannoplankton microevolution preserved in the sedimentary record at IODP Site U1553 (southern Pacific Ocean)

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Persico et al. (2014) first proposed a possible gradual phyletic evolution of *Reticulofenestra oamaruensis* from *R. clatrata* during the study of Ocean Drilling Program (ODP) Sites 738, 748, 744 (Kerguelen Plateau), and 689 (Maud Rise). International Ocean Discovery Program (IODP) Expedition 378 Site U1553, drilled in the Southern Ocean (Campbell Plateau), recovered a continuously cored, multiple-hole (U1553A–U1553E) Paleogene sedimentary section (Röhl et al., 2022). The good preservation of calcareous nanofossils in these cores made possible a study of the origin of *R. oamaruensis* and its intraspecific variability, as well as its biostratigraphic distribution in the middle–late Eocene. The original description of this transition only considered samples with sizes of 13.8–17  $\mu\text{m}$ , but our biometric analyses and morphological investigations suggest including transitional morphotypes of *R. oamaruensis* (10–14  $\mu\text{m}$ ). Morphometric quantitative studies allowed us to recognize an intraspecific evolutionary trend that is characterized by a gradual increase in size of small specimens of *R. clatrata* (8–10  $\mu\text{m}$ ), which are present from the base of the stratigraphic sequence (263.81 m core composite depth below seafloor [CCSF]) (Raffi et al., submitted), to large specimens of *R. oamaruensis* (>14  $\mu\text{m}$ ). Intermediate specimens were placed into two size categories (10–12  $\mu\text{m}$  and 12–14  $\mu\text{m}$ ). All “morphotypes”, including species with sizes defined in the original descriptions, disappear simultaneously during the Eocene–Oligocene transition (Raffi et al., submitted). Intermediate morphotypes appear as distinct and stratigraphically identifiable events, suggesting a potential “lineage zone” that is useful in Southern Ocean biostratigraphy. The morphological homology, the continuity in the stratigraphic distribution, the same geographical distribution area, and the presence of a gradually increasing size trend from *R. clatrata* to *R. oamaruensis* represent a possible phyletic lineage that is endemic to high southern latitudes where *R. clatrata* represents the archetype.

## References:

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