

Morphometric changes in two Late Cretaceous calcareous nannofossil lineages support diversification fueled by long-term cooling

Mohammad J. Razmjooei

Department of Geosciences and Natural Resource Management, University of Copenhagen, Øster Voldgade 10, DK-1350, Copenhagen C., Denmark.

Department of Geological Sciences, Stockholm University, 106 91 Stockholm, Sweden. mj.razmjooei@gmail.com

Nicolas Thibault

Department of Geosciences and Natural Resource Management, University of Copenhagen, Øster Voldgade 10, DK-1350, Copenhagen C., Denmark

Morphometric changes in two calcareous nannofossil species, *Cribrosphaerella ehrenbergii* and *Microrhabdulus undosus* were investigated across the Campanian to Maastrichtian. Results reveal a common episode of size increase at c. 76 Ma, with a sudden shift in the size of *C. ehrenbergii* toward larger specimens and with the emergence of the newly defined, larger species *Microrhabdulus sp. nov.1*. An even larger species emerges at c. 69 Ma within the *Microrhabdulus* lineage, *Microrhabdulus sp. nov.2*. The timing of these size changes and origination events matches global changes in nannoplankton diversity and/or in diversity of other planktonic organisms and cephalopods. Comparison with long-term global climate change supports that these new biometric and evolutionary events represent an excellent illustration of the Late Cretaceous global rise in nannoplankton diversity and size, being associated with climatic cooling and/or climatic instability.