



Supplement of

Coccolithophore signatures across the termination of the late Miocene to early Pliocene biogenic bloom in the Atlantic and Indian oceans

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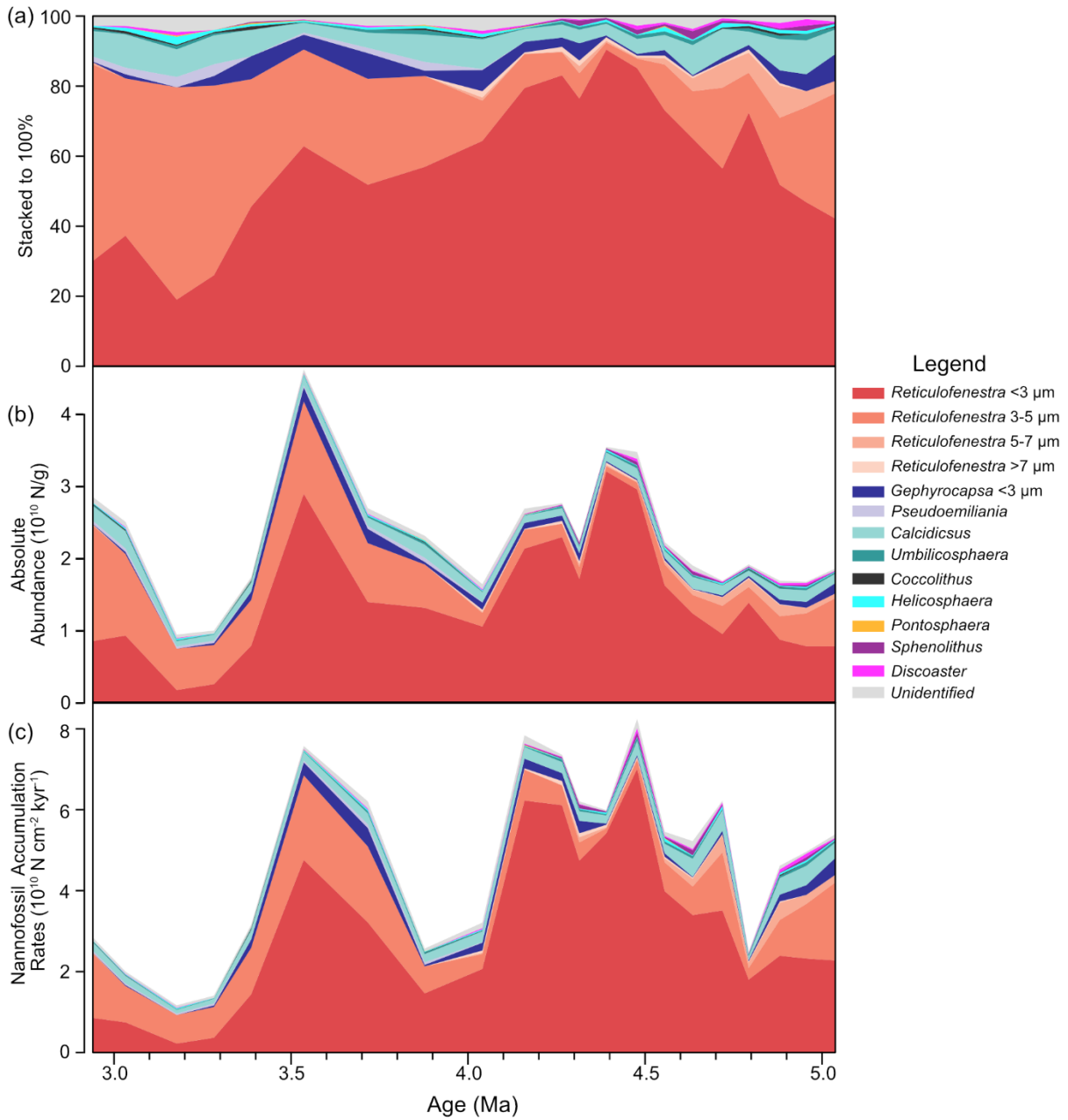
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Supplementary Figures S1-S5

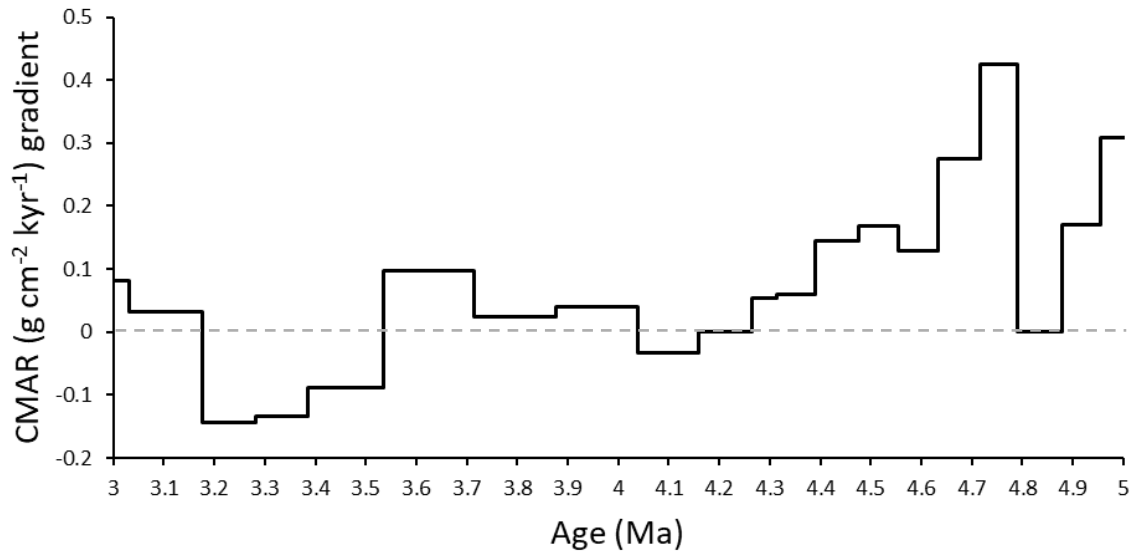
Supplementary Tables S1 and S2

Summary

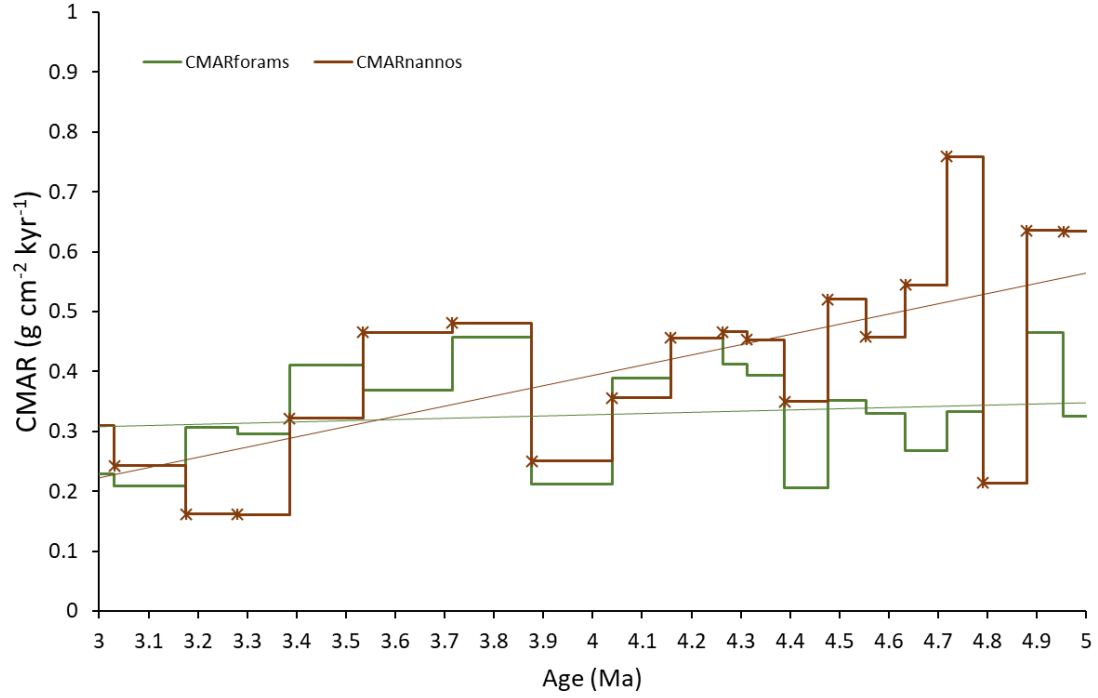
This supplement contains figures and tables in support of the main text of the article. The supplementary figures provide additional information regarding the estimated CaCO_3 accumulation rates, as well as the ocean circulation patterns in the study region. The data tables for this study can be found at ZENODO under DOI: [10.5281/zenodo.19854421](https://doi.org/10.5281/zenodo.19854421)



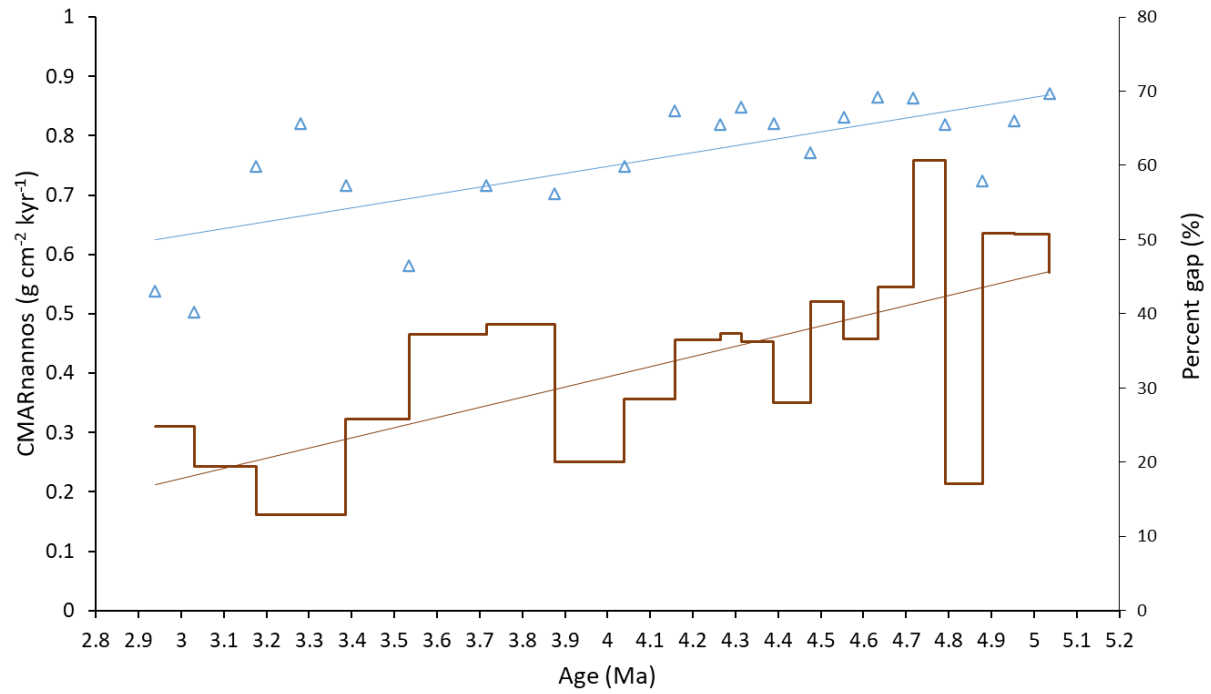
Supplementary Figure S1: (a) Relative (%) and (b) absolute abundances (N/g), as well as (c) nannofossil accumulation rates ($\text{N cm}^{-2} \text{kyr}^{-1}$) of all identified calcareous nannofossil taxa at ODP Site 1264.



Supplementary Figure S2: Evolution of the CaCO₃ accumulation rate (CMAR) gradient between CMAR_{nanos} and CMAR_{forams}. Values >0 indicate higher CMAR_{nanos} than CMAR_{forams}.



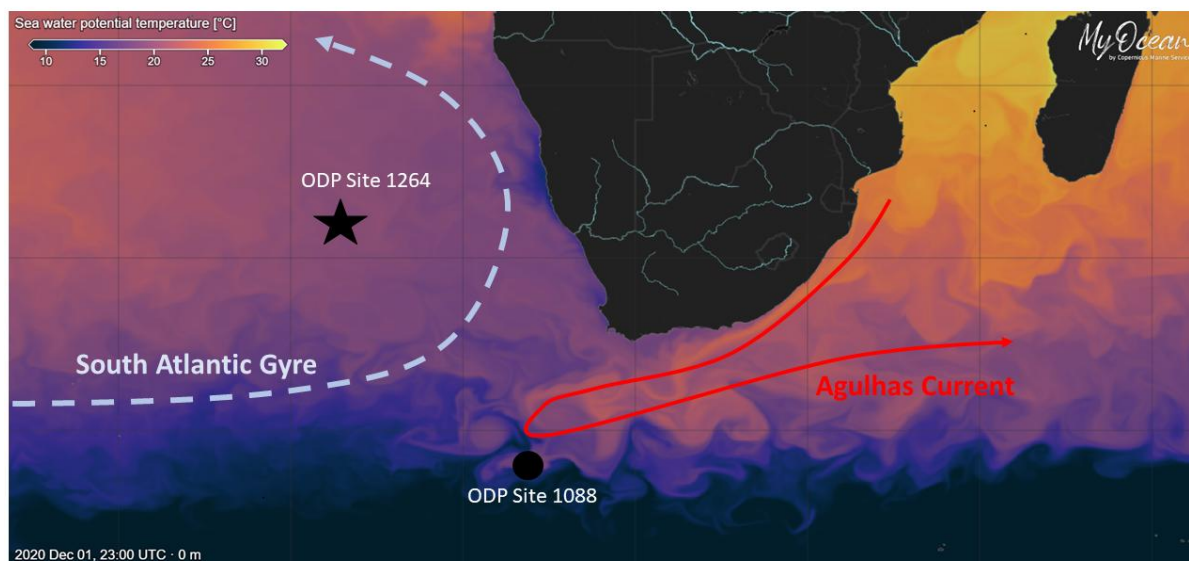
Supplementary Figure S3: CaCO₃ accumulation rates derived from nannofossils (CMAR_{nannos}; brown line) and foraminifera (CMAR_{forams}; green line). Superimposed trending lines demonstrate the long-term evolution of each record.



Supplementary Figure S4: CaCO₃ accumulation rates derived from nannofossils (CMAR_{nannos}; brown line) and the proportion CMAR unaccounted for (% gap; blue triangles). Superimposed trending lines demonstrate the long-term evolution of each record.

The unaccounted CMAR percent is calculated between the total CaCO₃ accumulation rates (CMAR) and the sum of CaCO₃ accumulation rates from nannofossils and foraminifera (CMAR_{bio}) following the equation:

$$CMAR_{gap} = \frac{(CMAR - CMAR_{bio})}{CMAR} \times 100$$



Supplementary Figure S5: Present day ocean circulation maps indicating sea surface temperature of the southwestern Indian Ocean and southeastern Atlantic area for the 1st of December 2020 (austral summer). Also shown are ODP Site 1088 (black circle) and ODP Site 1264 (black star), as well as the main oceanographic features in the area, namely the Agulhas current (red line) and the South Atlantic Gyre (approximate path; dashed blue line). Map was generated using the ocean data visualization tools of E.U. Copernicus Marine Service Information (CMEMS; MYOCEAN PRO) and dataset layer GLOBAL_ANALYSIS_FORECAST_PHY_001_024 (<https://doi.org/10.48670/moi-00016>)

Supplement Table S1: Mean masses (MM) of nannofossil taxa (in pg). The values are mostly from Sucheras-Marx and Henderiks 2014 and were used for the calculation of nannofossil CaCO₃ mass contributions (NCmass; see Methods).

Species	Mean Mass (pg)
<i>Reticulofenestra</i> <3μm	2.11
<i>Reticulofenestra</i> 3-5μm	8.64
<i>Reticulofenestra</i> 5-7μm	29.16
<i>Reticulofenestra</i> >7μm OCA	82.91
<i>Reticulofenestra</i> >7μm CCA	82.91
<i>Gephyrocapsa</i> <3μm	3.65
<i>Sphenolithus</i> spp.	8.01
<i>Pseudoemiliana lacunosa</i> spp.	6.91
<i>Calcidiscus</i> spp.	59.32
<i>Umbilicosphaera</i> spp.	17.55
<i>Helicosphaera</i> spp.	90.65
<i>Pontosphaera</i> spp.	69.12
<i>Discoaster</i> spp.	50.72
<i>Coccolithus</i> spp.	46.96
Unidentified	5.37

Supplement Table S2: Average estimates of mean masses for nannofossil taxa with multiple species.

Species (Late Miocene Pliocene)	Mean mass (pg)	Comment
<i>Coccolithus</i> spp.	46.96	
<i>Umbilicosphaera</i> spp.	17.55	
<i>Helicosphaera</i> spp.	90.65	
<i>Pontosphaera</i> spp.	69.12	
<i>Discoaster</i> spp.	50.72	Not late Miocene-Pliocene species
Unidentified	5.37	Small and 3-5μm <i>Reticulofenestra</i> values used