

Pelagic carbonate production across the Cretaceous-Paleogene boundary

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The Cretaceous-Paleogene (K/Pg) boundary is one of the most important mass extinction events during the Phanerozoic. Caused by the volcanism of Deccan Traps and/or the impact of a meteorite, this mass extinction had a disastrous impact on calcareous nannofossil diversity and led to the most important turnover in their evolutionary history. The K/Pg mass extinction also led to an important change in pelagic carbonate production and accumulation, which deeply perturbed the carbonate system. The aim of this study was to quantify nannofossil carbonate accumulation rates before and after the K/Pg boundary in order to understand (1) the impact of the volcanism on calcareous nannofossil size and carbonate production, (2) the impact of the mass extinction event on the pelagic carbonate accumulation rate, and (3) the timing of recovery to stable and efficient pelagic carbonate production and accumulation after the crisis. Ultimately, the aim was to estimate the impact of the K/Pg mass extinction on carbonate and carbon cycles.

Three deep-sea sites were studied: ODP Site 762C from the eastern Indian Ocean, IODP Site 1209 from the north-western Pacific Ocean, and IODP Site 1267 from the south-eastern Atlantic Ocean. These sites have been precisely dated by cyclostratigraphy and biostratigraphy (Husson *et al.*, 2011; Westerhold *et al.*, 2011; Dinarès-Turell *et al.*, 2014)

and present continuous sedimentation in the studied interval. We studied approximately 100 samples per site that covered about 3Myr before and 3Myr after the K/Pg boundary. For each sample, the total carbonate content was measured, and its accumulation rate was estimated. We performed biometry on the nannofossils (size and mass) in order to trace the morphometric variability of nannofossils and species specific carbonate accumulation rates through the K/Pg boundary.

References

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