What next for Palaeogene marine diatoms? - lessons from the western North Atlantic

Jakub Witkowski

Institute of Marine and Environmental Sciences, University of Szczecin, ul. Mickiewicza 18, 70-383 Szczecin, Poland

jakub.witkowski@usz.edu.pl

Recent years witnessed a renewed interested in the geological history of marine siliceous phytoplankton - diatoms in particular. Numerous important papers brought new insights on diatom biostratigraphy, palaeobiogeography, and temporal variations in taxonomic richness, cell size, biosilicification, silicon cycling, etc. One outstanding issue, however, that still needs to be addressed by future studies, is a quantification of diatom involvement in carbon cycling through times of profound global change, such as the Paleogene period.

The western North Atlantic is exceptionally rich in early Paleogene biosiliceous sediments. Recent work shows that these mostly occur along continental margins, indicating that marginal rather than pelagic settings were the key loci of biogenic opal burial since the early Cenozoic. Geographically extensive occurrences of Paleocene and Eocene diatomite and diatom clay hosting exceptionally diverse diatom assemblages also indicate that large quantities of biogenic opal were buried on continental shelves in the early Paleogene greenhouse. The broad picture of diatom production and carbon export through the Paleogene, however, is often blurred by diagenetic alteration, as evidenced by the ubiquitous Eocene chert and porcellanite, and common pyritization, e.g., in the North Sea Basin. Yet, a full understanding of the diatom impact on early Paleogene carbon cycling requires that diatom occurrences in these various settings and lithologies be incorporated in paleoceanographic models in addition to data from deep-sea sites.