

The Cretaceous paleobiogeography of *Braarudosphaera bigelowii*

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Over the last 82 years, a massive amount of data concerning *Braarudosphaera bigelowii* has been collected. Thousands of nannofossil biostratigraphic accounts have reported the presence (or absence) of this species in the fossil record all over the world. Nonetheless, progress in understanding the paleoecology and paleogeography of *B. bigelowii* has been limited. The casuistic-based model of micropaleontological research has led, on one hand, to a useful accumulation of local and regional data but, on the other, to limited attempts at globally compiling and analyzing those disparate resources.

This study is based on the systematic data mining of international, regional, and local data sets and represents the first long-term reconstruction of the paleogeography of a coccolithophore species. The generated database includes 480 locations where *B. bigelowii* was found in Cretaceous strata. In addition, 501 locations where *B. bigelowii* was not found were considered for more precise determination of progression along expansion routes.

Results show that *B. bigelowii* evolved during the early Berriasian on the eastern margin of the Iberian plate.

Claims of a Jurassic origin were found to be unsubstantiated. The stage-by-stage expansion routes it took during the Cretaceous in the process of colonizing most of the world's continental shelves will be presented and detailed. By the late Maastrichtian, every continent and ocean except the Arctic had been reached.

Expansion occurred in pulses that closely followed the Cretaceous oceanic anoxic events (OAE). The expansion rate into new locations strongly correlates with the growth rate of strata with a high abundance of *B. bigelowii*, and both are consistently linked to biotic crises. Oceanic expansion is a circular, worldwide phenomenon that can be correlated with neritic expansion only during the Early Cretaceous.

Braarudosphaera bigelowii is shown to be, in general, a good proxy for shallow water and low salinity during the Cretaceous, with the exception of low biotic diversity ecosystems and during biotic crises.

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