

The effect of mid Cretaceous paleoenvironmental changes on *Biscutum constans* size changes

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In the last decades, many studies have focused on specific intervals of the geological record in order to identify size variations of selected species of nanofossils. Fluctuations in the mean size of *Biscutum constans* were identified in the early Aptian oceanic anoxic event (OAE) 1a and latest Cenomanian OAE 2, when *B. constans* reached its smallest mean size under “extreme” conditions in terms of greenhouse climate, excess CO₂, and accelerated nutrient recycling, as well as trace metals peaks. *Biscutum constans* is considered to be a mesotrophic species, and different hypotheses have been formulated to interpret its size changes, including ocean acidification, variation in light, and anomalies in trace metal concentrations. In order to understand better which factor/s may have influenced the size of *B. constans*, we decided to investigate a continuous record through the Aptian–Cenomanian. Very little is known about size variations in *B. constans* over longer periods of time (thousand/millions of years), and it is not clear if

there were any changes in size during interludes of “stable” paleoenvironmental conditions. The chosen time interval was selected because it includes periods of stability and episodes of global environmental perturbation, such as OAE 1a, OAE 1b, OAE 1d, the Mid-Cenomanian Event, and OAE 2. We focused on the Umbria–Marche Basin (central Italy) and investigated the Piobbico core and the Monte Petrano section, which are stratigraphically well constrained and for which a complete characterization of paleotemperatures and paleofertility is available. Morphometrics revealed changes in the mean size of *B. constans*. After OAE 1a, which is characterized by dwarf specimens, *B. constans* showed a recovery, although the largest mean values were reached in the middle Albian. A relative decrease in size was detected just prior to OAE 1d. The next main shift coincided with OAE 2 and was marked by dwarf specimens. Statistical analyses are planned to detect any possible dependence upon temperature and nutrient variations.