

Stratigraphic variation and significance of long-chain alkenones during the Late Cretaceous Cenomanian

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Late Cretaceous Cenomanian through Turonian is known to be a warmest interval of the Phanerozoic. Within this interval, paleoclimatic event associated with global perturbation of carbon cycling was recorded as Oceanic Anoxic Event 2. Previous studies of late Cenomanian are known from low latitudes and only few studies from higher latitudes. As it is more sensitive to global warming/cooling, higher latitude should provide unique opportunity for paleoclimatic studies. Biomarker analyses is one of the tool for paleoclimatic reconstruction. Biomarker molecules from haptophytes, which is known as alkenones, are especially important for paleoceanography. Alkenones with 37 carbons are often employed for paleothermometry for Quaternary ($U^{K'}_{37}$). From Cretaceous sediments, however, we cannot use this technique because of absence of tri-unsaturated C37 alkenone. Recently we have found tri-unsaturated alkenone with 40 carbons. Following after $U^{K'}_{37}$, we calculated $U^{K'}_{40}$ values to discuss paleotemperature from middle Cenomanian through late Cenomanian. The $U^{K'}_{40}$ values showed gradual increase through this interval suggesting gradual warming toward OAE2. Comparison of the values of $U^{K'}_{40}$ and oxygen isotopes from planktonic foraminifers (Petrizzo et al., 2022, Paleoceanography and Paleoclimatology) suggests that $U^{K'}_{40}$ indicates temperature trend of lower part of the surface water.

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