The OAE2 and Late Cretaceous cooling across the Cenomanian–Campanian succession in the Kopet-Dagh Basin, NE of Iran (Eastern Tethyan Region)

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The shallow water Upper Cretaceous succession (Cenomanian–Campanian) in Kopet-Dagh basin, Northeast of Iran, considered as eastern part of the Tethys, has been investigated to evaluate Oceanic Anoxic Event (OAE2), mid-Cretaceous peak warming and late Cretaceous cooling trends. The succession is characterized by silty shales and shales of upper Aitamir Formation and marls and limestones of the Abderaz Formation. Age control has been based on calcareous nannofossils. In this carbonate shelf environment, the OAE2 $\delta^{13}C$ excursion appears comparable to that of open marine environments. Although TOC content is low across the succession, it shows a gradual increasing trend across OAE2. It seems that organic carbon sedimentation was dilution due to the high rate of carbonate sedimentation. $\delta^{18}O$ data imply relatively high paleotemperatures at the Cenomanian-Turonian boundary up to 34°C. This is comparable with other studies from the same palaeolatitude (20 to 30° N) e.g. ODP site 1276. In the late Santonian-early Campanian, the paleotemperature shows a decrease which is accompanied by an increase in relative abundance of cool water nannofossil taxa such as *Ahmuellerella octoradiata*, *Gartnerago segmentatum* and *Kamptnerius magnificus*. This can be interpreted by the movement of Kopet-Dagh basin from 20–25° N to 25-30° N paleolatitude position, besides the effect of Late Cretaceous cooling.

Spectral analyses performed separately on data from the Aitamir and Abderaz Formations show evidence for harmonic frequencies preserved in the carbonate contetnt record. Distinct signals that could indicate orbitally driven cycles can be interpreted from the limestone – marl rhythmites of the Abderaz formation, while data from shales provide faint hints towards Milankovitch cycles. However, the harmonic frequencies could be interpreted as evidence for an eccentricity cycles (405ka and 100ka).

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