Calcareous nannofossil extinction, survivorship and speciation during the OAE2 in the Tethys Realm

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The Oceanic Anoxic Event 2 (OAE2) is discussed, taking into account the calcareous nannofossil data gathered from several sections around the Tethyan Realm, i.e., N Spain, Romanian Carpathians, China (Tibet) and Mexico, spanning the Cenomanian-Turonian boundary. In all the investigated successions, $\delta^{13}C$ and $\delta^{18}O$ isotope analyses have been performed; hence the calcareous nannofossil events are correlated with the chemostratigraphic ones.

During the onset of OAE2, few nannofossils vanished, the rate of extinction being in general very low, up to 4 % of total assemblages. Near the maximum of $\delta^{13}C$ fluctuation, speciation in terms of calcareous nannoplankton taxa occurs, but also showing a low rate, up to 5-6 % of assemblages. Initial phase of the OAE2 is coeval with significant increase in abundance of high fertility taxa, such as *Biscutum constans, Zeugrhabdotus erectus* and *Cyclagelosphaera margerelii*. Productivity seems to have increased through a short period preceding the critical turnover episode, but the ecosystem quickly became starved as the aforementioned species almost disappear from the record. The maximum of $\delta^{13}C$ values is coincident in some Tethyan studied sections, such as N Spain, by blooms of the calcareous dinoflagellate *Thoracosphaera* in the UC5a-b subzones, event that probably mirrored unstable ecosystem during critical phase of this oceanic event. In other Tethyan regions, such as Tibet, discrete peaks of *Braarudosphaera bigelowii* have been recorded. These bioevents are followed by a significant increase of *Watznaueria barnesiae*, over 40–50 %, along with poorly diversified nannofossil assemblages. As this bioevent was identified in various settings, such as open-marine and shelf, it may reflect global paleoenvironmental deterioration. Even in these stressful conditions, speciation took place, as new *Eprolithus* taxa and *Quadrum intermedium* successively occur. In the $\delta^{13}C$ post-excursion interval, high fertility taxa *Biscutum constans* and *Zeugrhabdotus erectus* occur again, showing a high abundance. During the main OAE2 interval, the correlation pattern between the most common nannofossils, such as *Watznaueria barnesiae*, *Eprolithus floralis*, *Biscutum constans*, *Zeugrhabdotus erectus*, *Thoracosphaera* spp., *Cyclagelosphaera margerelii*, *Prediscosphaera* spp. and *Eiffellithus turriseiffelii*, presents several inconsistencies, according to their proposed trophic behavior, linked to the establishment of anoxic conditions.