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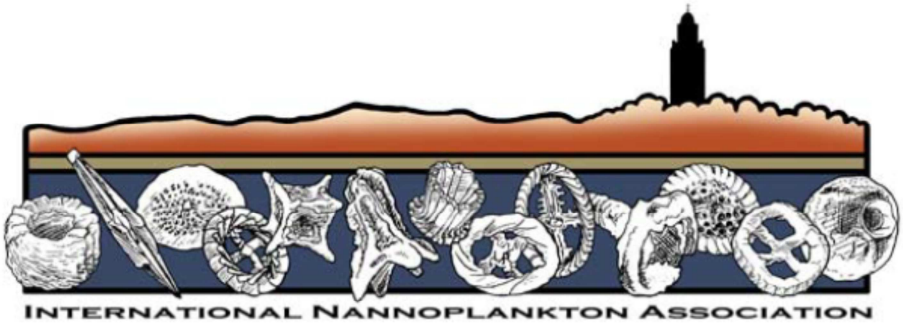

PROGRAM WITH ABSTRACTS

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Pelagic Carbonate Production by Nannoplankton across the Early Toarcian Anoxic Event

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The Early Toarcian anoxic event (ETAE; Jenkyns, 1988) was characterized by a major biologic crisis of marine ecosystems (Harries & Little, 1999) and a perturbation of the carbon cycle testified by an important negative excursion of the carbon stable isotopes, recorded in the carbonates of bulk rock, in the organic matter, organic biomarkers, and fossil wood. The organic matter-rich deposits that were formed during the ETAE have been interpreted as the result of an enhanced primary production, issued either from an intensification of upwelling (Jenkyns, 1988), or from increased continental weathering and runoff under greenhouse conditions (Cohen et al., 2004). Both these mechanisms might have produced nutrification of surface waters. However, enhanced primary production during the ETAE is questionable, because the photosynthetic incorporation of light carbon in biomass production likely produces a depletion of ^{12}C in surface waters, which should result in a positive $\delta^{13}C$ excursion (Arthur et al., 1990), very negative values are observed during the ETAE instead, when organic matter accumulation and preservation was important. Furthermore, a quantification of the abundance of primary producers of that period (dinoflagellates and coccolithophorids) indicates a significant decrease in primary production, until a temporary disappearance of phytoplankton during the crisis acme (Bucefalo Palliani et al., 2002; Mattioli et al., 2004). Primary productivity was probably solely sustained by phototrophic bacteria (Chlorobiaceae; van de Schootbrugge et al., 2005) or by green algae (*Tasmanites*, Bucefalo Palliani et al., 2002; Mattioli et al., 2004).

The quantification of spatial distribution of coccolithophorid productivity in the Tethys Ocean during the different phases of the ETAE is therefore crucial for the understanding of the role of primary production in the mechanisms of carbon sequestration from surface waters and its eventual export to the sedimentary reservoirs. Furthermore, Toarcian coccolithophorids being in a phase of diversification (Bown et al., 2004) did not experience the mass extinction that affected most of benthic and nekto-benthic organisms during the ETAE.

Coccolith and *Schizosphaerella* absolute abundance were quantified in five sections and boreholes located within the Jurassic western Tethys. Nannofossil abundance was then corrected by the accumulation rate calculated for each studied site. The size of *Schizosphaerella*, the major carbonate producer in the study interval, was measured in two sections. The results of this work show that nannofossil abundance and size significantly decrease during the ETAE. Absolute abundance of nannofossils significantly varies from a site to another suggesting a variable nannoplankton production in different areas within the western Tethys. *Schizosphaerella* size stays, however, in the same range in the two studied sites. The highest absolute abundance measured in this study corresponds to the low productivity areas in modern Oceans (Baumann et al., 1999). This is consistent with the fact that nannoplankton was in the early stage of its evolution during the Early Jurassic; abundance seems to increase exponentially though Mesozoic (Mattioli & Pittet, 2002).

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