Geophysical Research Abstracts, Vol. 8, 08639, 2006
SRef-ID: 1607-7962/gra/EGU06-A-08639

The initiation and the end of a major Mesozoic crisis of carbonate productivity as recorded by organic geochemical proxies. Relations with oceanic anoxic events and paleoclimatic changes.

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During the Jurassic and Cretaceous times, the tropical climate, high CO_2 content of the atmosphere and the low bathymetry were favorable to the carbonate productivity in the epieric seas of Western Europe. Thus, thick and vast carbonate platforms formed in sedimentary basins located northerly of the Proto-Atlantic/Tethys axis. However, this carbonate sedimentation was periodically interrupted by episods of argillaceous sedimentation. One of the most severe crisis of carbonate productivity is dated from the Callovo-Oxfordian (≈164-154 Ma). Several origins have been proposed to explain this major perturbation of the sedimentary record (eustatism, volcanism, meteoritic impact, *etc*.) and are still debated.

In this work, we study the stratigraphic evolution of molecular biomarkers during periods of major transitions between claystone and carbonate platform deposition events of Callovo-Oxfordian age in Western Europe (Paris basin, North Sea basin, Proto-Atlantic). We evidence two major events.

The first one is an oceanic anoxic event (OAE) which had variable intensity and duration in space. It is highlighted by relatively high TOC values as well as the presence of photic zone and/or sediment anoxia biomarkers. It is dated from the beginning of the Middle Callovian and is recorded by argillaceous sediments deposited just above the Dogger carbonate platform. This major perturbation of the marine water chemistry

could explain : 1) the rapid decrease of the carbonate productivity, 2) a cooling during the Upper Callovian by inverse greenhouse effect which inhibits the resumption of the carbonate productivity just after the end of the anoxic event.

The second event is a paleoflora change occurring at the end of the lower Oxfordian. It is expressed by the increase of the *Pinaceae* abundance as indicated by a major change of the vascular plant biomarkers distribution. This paleofloral evolution reflects a paleoclimatic change interpreted as an increase of aridity. This paleoclimatic change signs the return of favorable conditions for carbonate sedimentation which starts during the Middle Oxfordian and leads to the development of major carbonate platforms during the Upper Oxfordian.