

**Paleo-temperature and C-isotopes records derived from bivalves shells across the OAE-2 in the shallow water carbonates of the Apennine Platform of Italy: Local or global signal?**

***Frijia, G.<sup>1</sup>, Forkner, R.<sup>2</sup>, Jekel, D.***

1) Sultan Qaabos University, Muscat, Oman, E-mail: [gfrijia@libero.it](mailto:gfrijia@libero.it)

2) Statoil, Austin, USA

Oceanic Anoxic Event 2 (OAE-2), spanning the Cenomanian-Turonian boundary, represents a major perturbation of the global carbon cycle with an extensive deposition of organic-carbon rich deposits (black shales) in ocean basins worldwide. A number of studies have suggested, as potential trigger mechanism of the OAE-2, enhanced volcanic activity at mid oceanic ridges and large igneous province (LIP) eruptions. These phenomena would have led to CO<sub>2</sub> degassing and a consequent dramatic increase in temperature. Several studies showed that Late Cenomanian-Early Turonian SSTs were the warmest in the Cretaceous Greenhouse period and much warmer than today. The onset of the OAE-2 was characterized by a rapid increase in the SST during very short time. However, in this general picture of warm regime during the OAE-2 a brief cooling episode has been reported, potentially related to atmospheric pCO<sub>2</sub> drawdown. Up to date the reconstructed paleotemperature records come from deep water deposits, mainly, from the proto-Atlantic Ocean. Furthermore, whilst the sedimentological, geochemical and paleontological aspects of deep water expressions of OAE-2 have been intensively studied in the last few decades, much less attention has been put on the coeval shallow water deposits.

The Campanian Apenninic Platform (Italy) preserves a record of shallow-water carbonates through the OAE-2, offering the unique opportunity of looking at a continuous archive of paleoenvironmental changes at tropical latitude, in the Tethys ocean, far from the influence of large continental blocks. Here we present the first continuous high-resolution record of temperature changes across the OAE-2, based on bivalves O-isotopes together with C-isotopes stratigraphy performed on the same shells. This latter were used to establish the time-framework corresponding to OAE-2 helping to precisely tie the onset of the event which was, otherwise, masked by diagenesis in the bulk-derived C-isotope curve.

The study is completed with a detailed facies analysis which allows to discuss the factors influencing facies changes and isotopic trends in the context of local Vs global processes associated to the OAE-2. We will show that Paleo-temperature trend in the platform carbonates of the Tethys is comparable, during the OAE-2, to that observed in the open proto-Atlantic Ocean sites thus opening new interesting possibilities to the understanding/modeling of oceanic circulation and heat transport during the event. Finally, we will demonstrate how the Campanian Platform, during the OAE-2, experienced dramatic facies/biotic changes which represented an ecological response of the system to temperature and others paleoenvironmental variations.