Geophysical Research Abstracts
Vol. 12, EGU2010-5021-2, 2010
EGU General Assembly 2010

The sedimentary expression of the Aptian/Albian OAE 1b in the North Atlantic: a comparative study

João Trabucho Alexandre (1), Roeland van Gilst (1), Juan Pedro Rodríguez-López (2), and Poppe L. de Boer (1)

(1) Sedimentology Group, Department of Earth Sciences, Utrecht University, Budapestlaan 4, 3584 CD Utrecht, The Netherlands (jp.trabucho@geo.uu.nl), (2) Grupo de Análisis de Cuencas Sedimentarias (UCM-CAM), Departamento de Estratigrafía, Facultad de Ciencias Geológicas, Instituto de Geología Económica (UCM-CSIC), Ciudad Universitaria, 28040 Madrid, Spain

In the Mesozoic, the combination of particular basin physiographies with a greenhouse climate and enhanced tectono-volcanic activity resulted in palaeoceanographic conditions which were favourable for the production, export and preservation of organic matter in the marine realm. Oceanic anoxic events (OAEs) are stratigraphic intervals in the Mesozoic which are defined by excursions in the carbon isotope record resulting from perturbations in the global carbon cycle. The local lithologic expression of an OAE, i.e. whether marine sediments are organic-rich or not at a particular location and in what sediment type the OAE has been recorded, depends on palaeogeographic and depositional setting as well as on local climate.

The Aptian/Albian OAE 1b is composed of one Aptian event and two Albian events with a latest Aptian eustatic sea level fall separating them. The second sub-event (Early Albian, *Hedbergella planispira* Zone), known as Paquier Level, is defined by a negative excursion in the carbon isotope record and has an organic-rich sedimentary record in the Western Tethys (Mediterranean), the North Atlantic and in Mexico. The isotopic signal is remarkably similar between North Atlantic sites and allows their stratigraphic correlation. Furthermore, the good agreement between the North Atlantic carbon isotope record and that of the open ocean Resolution Guyot (Pacific) suggests that the negative excursion associated with this event is indeed a primary global signal. The other two sub-events are apparently absent in the North Atlantic, although at least their chemostratigraphic signature is expected to be present.

For the present study, a total of 124 samples from Deep Sea Drilling Program (DSDP) Site 545 (Mazagan Plateau) and Ocean Drilling Program (ODP) sites 1049 (Blake Nose) and 1276 (Newfoundland Basin) were collected and analysed. The grain size distribution of the siliciclastic fraction of all samples was determined and the grains examined using a scanning electron microscope (SEM). Stable carbon isotopes of organic matter, total organic carbon (TOC) content and Rock-Eval parameters were determined. Sediment geochemistry was studied using inductively coupled plasma optical emission spectrometry (ICP-OES).

Based on our results, we show that, despite sharing a common set of global forcing mechanisms, organic-rich sediments deposited during OAEs are the result of different combinations of equifinal processes acting on a local scale.