Geophysical Research Abstracts
Vol. 14, EGU2012-9935-1, 2012
EGU General Assembly 2012

Palynomorph responses to sea-level change: preliminary results for Upper Cretaceous assemblages from East Bohemia (Czech Republic)

K. Olde (1), D. Uličný (2), I. Jarvis (1), and M. Pearce (3)

(1) Kingston University London, School of Geography, Geology and the Environment, London, United Kingdom, (k.olde@kingston.ac.uk), (2) Institute of Geophysics of the Academy of Sciences of the Czech Republic, Praha 4, Czech Republic, (3) Statoil Gulf Services, Houston, Texas, USA

Late Cenomanian to Early Coniacian times (95 – 88 Ma) were characterised by a eustatic sea-level maximum during the latest Cenomanian – early Turonian followed by a general long-term second order sea-level fall, and a global temperature maximum during the Turonian. Major short-term fluctuations in relative sea level were superimposed on the long-term falling trend, but the relative influence of eustatic change on sea-level records remains controversial. A new regional reference core (Bch-1) spanning the Turonian – Lower Coniacian was drilled in 2010 at Běchary in eastern Bohemia (Czech Republic). The 400 m core provides a basinal section, which can be correlated to shallow-marine and coastal facies at the basin margins. The latter have provided a basis for the development of a robust sequence stratigraphic framework for the region.

This study investigates how the basinal palynomorph record responded to transgression and regression. It aims to develop criteria that may be used to better constrain evidence of sea-level change from basinal successions, with a particular focus on the response of organic-walled dinoflagellate cyst (dinocyst) assemblages. Samples taken through the Bch-1 core at 2 m intervals have been analysed for palynological composition to complement ongoing macrofossil, microfossil, chemostratigraphic, cyclostratigraphic and sequence stratigraphic studies. All samples were spiked with *Lycopodium* spores to allow the calculation of absolute abundance variation (i.e. palynomorphs per gram). The major- and minor-element geochemistry of the dinocyst samples was determined to investigate relationships between assemblages and sediment composition and to enable the recalculation of palynomorph data on a carbonate-free basis.

Abundant and diverse assemblages have been recovered throughout the core. Lower Turonian dinocyst biostratigraphic datums include the first appearance datum levels (FADs) of *Oligosphaeridium pulcherrimum*, *Senoniasphaera rotundata alveolata* and *Raetiaedinium truncigerum* and the last common occurrence of *Cauveridinium membraniphorum*. The Middle Turonian is marked by a *Circulodinium distinctum* acme and the FAD of *Florentinia buspina*. The Lower Coniacian includes the last appearance (LAD) of *Pervosphaeridium truncatum*. Variations in dinocyst and terrestrial spores and pollen assemblages are considered to reflect major changes in sediment fluxes, nutrient supply, and water mass conditions. The lower Middle Turonian is characterised by an increase in terrestrial palynomorphs, as well as increased Al_2O_3 and P_2O_5, general clay mineral and nutrient proxies, and decreases in Si/Al and Ti/Al. This interval corresponds to the advance of a deltaic complex to the west of the core site. The Lower Coniacian reveals a maximum in abundance (palynomorphs per gram) of both dinocysts and terrestrial palynomorphs, and a maximum in the relative abundance of the cyst *Palaeohystrichophora infusorioides*, which is considered to be from a heterotrophic dinoflagellate, and is indicative of high primary productivity. Increased clay and accompanying nutrients is supported by the geochemical data. This interval corresponds to the development of the early Coniacian Gilbert delta complex to the NW of the core locality. The preliminary data confirm a strong signal in basinal palynomorph records that may be related to changes in sediment supply and sea level.

The core was obtained with financial support from the Czech Science Foundation (GAČR), grant No. P210/10/1991 to D. Uličný. IJ acknowledges funding by UK Natural Environment Research Council (NERC) grant NE/H021868/