Geophysical Research Abstracts
Vol. 13, EGU2011-11936-2, 2011
EGU General Assembly 2011


# Environmental and climatic change during the Valanginian event: Case study of the Wawal section, Polish Basin

Chloé Morales (1), Ariane Kujau (2), Ulrich Heimhofer (2), Joerg Mutterlose (2), Jorge E. Spangenberg (3), Thierry Adatte (1), Stephane Westermann (4), Izabela Ploch (5), and Karl B. Foellmi (1)

(1) Institute of Geology and Palaeontology, Lausanne, Switzerland (chloe.morales@unil.ch), (2) Institute of Geology, Mineralogy, and Geophysics, Ruhr-University Bochum, Germany, (3) Institute of Mineralogy and Geochemistry, University of Lausanne, Switzerland, (4) Department of Earth Sciences, University of Bristol, UK, (5) Polish Geological Institute, Warsaw, Poland

The Valanginian positive $\delta$13C excursion, also known as the Weissert event, records the first major perturbation of the carbon cycle in the Cretaceous period. A general hypothesis to explain this anomaly is that an intensification in continental biogeochemical weathering occurred, which led to an increase in marine primary productivity and preservation. A recent study has shown, however, that organic-matter trapped in the Tethyan Ocean is of both marine and continental origin, and that there is no evidence for widespread anoxia during the Valanginian (Westermann et al., 2010). This implies that the resulting marine Corg burial rates may not be sufficient to explain the shift in $\delta$13C values. As controlling factors leading to the Valanginian event, Westermann et al. (2010) suggest therefore a combination of a decrease in shallow-marine carbonate production and the storage of organic-matter on the continent. Enhanced nutrient input into the ocean led indeed to an increase in marine primary productivity, which did, however, not materialize in enhanced organic-matter preservation, at least not in the Tethys.

We studied the section and drill cores of Wąwał, located in the Polish basin. This section is of particular interest because of its paleogeographic location within the Polish basin, which represents a narrow straight connecting the Boreal and Tethyan oceans, and because of its exceptional degree of organic-matter preservation. The section covers the Early and early Late Valanginian, its $\delta$13Corg and $\delta$13Ccarb records display the onset of the positive excursion and P contents indicate two intervals of phosphogenesis. Its clay-mineral composition shows a strong diminution in kaolinite contents during the positive $\delta$13C shift. These trends are comparable to trends in Tethyan sections and confirm the importance of environmental change prior and during the onset of the positive $\delta$13C excursion. However the study of this section should be continued to gather more information about this specific paleoenvironment.

References:

Westermann, S., Föllmi, K.B., Adatte, T., Matera, V., Schnyder, J., Fleitmann, D., Fiet, N., Ploch, I. and Duchamp-Alphonse, S. (2010). "The Valanginian $\delta$13C excursion may not be an expression of a global oceanic anoxic event." Earth and Planetary Science Letters