Geophysical Research Abstracts
Vol. 20, EGU2018-8548-1, 2018
EGU General Assembly 2018

Anoxic platform top water masses during OAE1a – the carbonate archive

Alexander Hueter (1), Adrian Immenhauser (1), Stefan Huck (2), and Stéphane Bodin (3)

(1) Ruhr-Universität Bochum, Institute for Geology, Mineralogy und Geophysics, Sediment and Isotope Geology, Germany (alexander.hueter@rub.de), (2) Leibniz Universität Hannover, Institute for Geology, (3) Aarhus University, Department of Geoscience

Evidence has been given for a fundamental biotic turnover in the prelude, during, and in the aftermath of the Lower Aptian Oceanic Anoxic Event (OAE) 1a in a series of Tethyan-wide (Oman, Croatia) and proto-Atlantic (Portugal) shallow-water carbonate platforms. The taxonomically problematic microencruster communities referred to as *Bacinella irregularis* and *Lithocodium aggregatum* temporarily replaced coral and rudist-dominated ecosystems. Little is known about the triggering factors that control the temporal dominance of the latter. Our working hypothesis is that in the context of the larger OAE1a, reduced dissolved seawater-oxygen levels of Lower Aptian shallow neritic water masses temporarily impaired oxygen-dependent coral-rudist communities as efficient neritic carbonate producers. Uranium isotope ($^{238}U/^{235}U$) analysis, redox sensitive trace elements as well as Rare Earth Element (REE) patterns, particularly Cerium anomalies, are used in this study as proxies for seawater redox conditions. In combination with detailed fieldwork and thin section analysis, these proxies represent a powerful tool to reconstruct the seawater-oxygen content prior and during the OAE 1a time interval. First $^{238}U/^{235}U$, trace element and REE results from the Kanfanar section in Croatia show a significant decrease in dissolved seawater-oxygen at the beginning of laminar and massive *Bacinella irregularis* and *Lithocodium aggregatum* growth, though to be occurring slightly after the onset of OAE 1a. These data may point towards a dichotomy of oceanic oxygenation levels between the deep and shallow marine area, although uncertainties in the stratigraphic attribution of the OAE 1a interval in the Kanfanar section need to be resolved. Given the coeval onset of massive microencruster growth and neritic oxygen level depletion in Kanfanar, the hypothesis of neritic (sub)anoxia as the main controlling factor for the palaeoecological turnover seems plausible. Further work will focus on: (i) the importance of regional factors, here particularly the formation of regionally limited, platform-top anoxic water masses, overprinting a global environmental trend that finally culminated in OAE 1a-related basinal black-shale deposits as well as (ii) a more precise stratigraphic attribution of the OAE 1a time interval in the Kanfanar section by Sr-isotope analysis.