



The depositional environment during Homeric in the Baltic Silurian Basin

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The late Wenlock (Silurian) period is characterised by biogeochemical perturbations expressed through two global regressive-transgressive eustatic cycles. These cycles are associated with a double-peaked positive carbon isotope excursion linked to the Mulde Event, also known as the “Big Crisis” (Radzevičius *et al.*, 2014). While these features are widely recognised, the processes that explain the heterogeneity of geochemical and sedimentary responses on a basin scale remain poorly understood. Here, we present an integrated geochemical and sedimentary facies study of Homeric successions from the shelf zone of the Baltic Silurian Basin in Gotland, Sweden. For this study, we collected a total of 64 rock samples from outcrops on Gotland Island. The studied interval included the Slite, Fröjel, and Halla formations. We performed stable carbon isotope, trace element, and X-ray diffraction (XRD) analyses. Preliminary data revealed positive shifts in $\delta^{13}\text{C}$ at the onset of the Mulde Event, demonstrating that these variations are systematically linked to changes in depositional facies, mineralogical composition and redox conditions. Ratios of trace elements such as U, Th, V, Cr, and Ce were used to determine the bottom-water oxygenation status. X-ray diffraction analysis was used to detect the presence of the dolomite mineral, which may indicate secondary alteration of the sediments. Results suggest that depositional environment might reflect the interaction of eustatic sea-level change, basin restriction, and water-column redox stratification rather than representing a simple, synchronous global signal. The newly obtained results can be used to gain a more detailed understanding of the mechanisms that explain Silurian climate-ocean coupling and highlight the importance of local depositional controls in modulating global biogeochemical signals.

Radzevičius, S., Spiridonov, A. & Brazauskas, A. 2014: Application of Wavelets to the Cyclostratigraphy of the Upper Homeric (Silurian) Géluva Regional Stage in the Viduklė-61 Deep Well (Western Lithuania). In: Rocha, R., Pais, J., Kullberg, J., Finney, S. (eds): STRATI 2013. Springer Geology. https://doi.org/10.1007/978-3-319-04364-7_84