

INTEGRATED $\delta^{13}\text{C}$ ISOTOPE AND GRAPTOLITE STRATIGRAPHY OF UPPER WENLOCK AND LOWER LUDLOW OF THE VILKAVIŠKIS-134 CORE, LITHUANIA

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The Vilkaiviškis-134 well is located in the central Lithuania in the transitional facial zone of the Silurian Baltic basin, between deep facies in the west and shallow facies belt in the east. So, it is located in the crucial location which is perfect for correlation of sedimentary sequences between variable environments. In this study we researched the core material for the presence of graptolites, and also subdivided it stratigraphically based on the stable carbon isotopic examination.

In the investigated interval in several samples we found rare remains of graptolites. They were located in the lower part of the section. Zonal species *Pristiograptus* ex. gr. *dubius* (Suess) was found at the depth of 748.9 m. This species is not important for detailed biostratigraphy, because it is long ranging. There are four findings of *Gothograptus nassa* (Holm) in the 736.8–714.3 m interval. This species is common in *parvus*–*praedeubeli* biozones which points that this part of the section belongs to the lower part of the Gėluva Regional Stage.

The samples for stable carbon isotope analyses were collected from the 780–630.4 m interval. The stable carbon isotopic analysis of the samples was performed in the Department of Geology of the University of Tartu.

The chemostratigraphic study has shown that in the lower part of the section (780–744.3 m interval) the $\delta^{13}\text{C}$ values were centered near zero and experienced some minor fluctuations, the values varied from -0.01‰ to $+0.72\text{‰}$. Subsequently, they rose rapidly to $+3.67\text{‰}$, reaching climax at the depth of 741.3 m, which is the maximum value in the whole studied portion of the section. We interpret this transition as signifying the beginning of the Mulde excursion during the Gėluva time. Passing this point the $\delta^{13}\text{C}$ values stabilize to $+1.94\text{‰}$ at 732.3 m depth and fall again to -0.04‰ at 717.3 m depth. We interpret this swing as signifying the first Homerian excursion. Though the trend is generally smooth, there is one exclusive value of $\delta^{13}\text{C}$ (-1.13‰) at 727.8 m. After that, the $\delta^{13}\text{C}$ values rise rapidly with minor fluctuations (and one more outlier (-1.39‰) at 702.3 m depth) to the maximal values of $+2.47\text{‰}$ at 696.3 m, and fall rapidly in the 727.8–670.2 m interval (from $+2.47\text{‰}$ up to 0.31‰), ending the second Mulde excursion episode. The values above decrease very rapidly to -2.81‰ at 654.7 m depth and rise again to 0.55‰ at the depth of 647.8 m, and finally drop to -1.32‰ at 639.6 m depth. In the uppermost part of the section at 639.6–630.4 m depth, the $\delta^{13}\text{C}$ values are stably negative and vary from -2.25‰ up to -1.1‰ .

As mentioned, the highest $\delta^{13}\text{C}$ values in the 742.8–663.7 m interval could be interpreted as the Middle Homerian double positive carbon isotope excursion episode and the

uppermost positive episode documented in this section could be one of the Lower Ludlow positive excursions. However, to confirm this proposition we need more detailed biostratigraphic data. The determination of conodont distributions promises interesting additions, and more rigorous constraints to the pattern found in the Vilkaviškis-134 well.

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ABSTRACTS