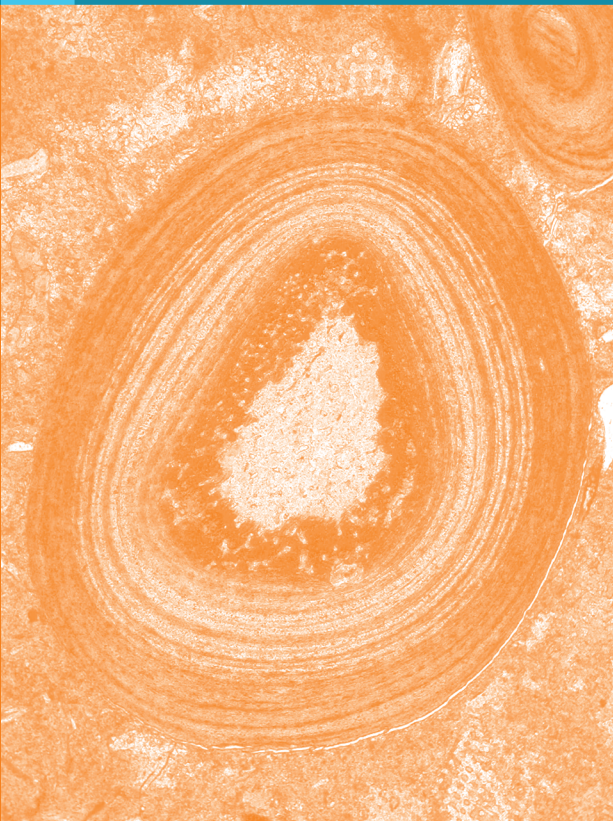


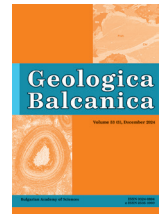
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Integrated bio- and chemostratigraphy of the Silurian in Kleczanów PIG – 1 borehole (Holy Cross Mountains, Poland): preliminary report

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A distinctive biotic crisis and carbon perturbation referred to as the Ireviken, Mulde, Lau events have been recognized worldwide in the Wenlock and Ludlow of the Silurian. It has a conspicuous stable carbon isotope signature referred to the sea level rise, glaciation, and climate aridity.

A new material has been obtained from the Silurian shales of the Prągowiec Beds in the Kleczanów PIG – 1 borehole. The borehole is located in the southern Holy Cross Mountains (Poland). Samples for graptolites and $\delta^{13}\text{C}_{\text{org}}$ analyses were collected approximately every 1 m. They were ground and dissolved using 5 N of HCl acid to remove carbonate material, and then washed with distilled water and dried. The stable carbon isotope values from organic material were measured using a Thermo Gasbench II coupled with a Thermo Delta V isotope ratio mass spectrometer.

The stratigraphy of the studied section was established on graptolite fauna, which indicates the presence of the interval from the *riccartonensis* to the *nilssoni* biozones (Wenlock, lower Ludlow). No graptolites were present in the upper part of the investigated interval.

There are three $\delta^{13}\text{C}_{\text{org}}$ positive excursions in the investigated interval of the Kleczanów PIG – 1 borehole. The first one is indicated in the lower part of the section. The max value of $\delta^{13}\text{C}_{\text{org}}$ is -24.53‰ and falls in the *riccartonensis* Biozone. This part of the section could be correlated with the $\delta^{13}\text{C}_{\text{org}}$ fall values interval of the Ireviken Carbon Isotope Excursion (lower Sheinwoodian). The second is indicated in the middle part of the geological section in Kleczanów PIG – 1 and is linked to the *parvus–ludensis* interval. Here, the $\delta^{13}\text{C}_{\text{org}}$ curve has two peaks that are indicative of the Mulde Carbon Isotope Excursion (upper Homerian). The last one is determined in the uppermost part of the Prągowiec Beds. The max $\delta^{13}\text{C}_{\text{org}}$ value is -28.48‰ . There are no graptolite finds in this interval. So, this part of the section could be correlated with the rise in $\delta^{13}\text{C}_{\text{org}}$ of the Lau Carbon Isotope Excursion (Ludfordian).

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Figures

Front cover:

Chlorite, albite, prehnite and quartz of the matrix of garnet–clinopyroxene–K-feldspar granulite from the Central Rhodopes, South Bulgaria (upper right); Semicircular chamosite ooid with a core of recrystallized bioclast, ferriferous on the periphery, from the Toarcian of the Ozirovo Formation near Beledie Han Village, Western Balkan Mts (lower left). The width of the areas photographed is ~ 2 mm.

Back cover:

a) General view of the cephalopod slab from Western Sahara – taken from Ferretti *et al.* (Fig. 1c).
 b) *Oktavites spiralis* (Geinitz), eponymous graptolite biozone, from the Tseretsel site, Bulgaria (specimen and photo of Juan Carlos Gutiérrez-Marco) – taken from Sachanski and Zareva (Fig. 7g).
 c) *Rectoclymenia tecta* Nikolaeva and Bogoslovsky; Zhalair section, Bed 14, Uppermost Famennian, Central Kazakhstan (scale bar = 10 mm) – taken from Kabanov *et al.* (Fig. 5b).