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ABSTRACT BOOK

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TALK

Revisiting and updating the biochronology and palaeoenvironmental interpretations of the Bozeș Formation deposits from the south-eastern part of the Apuseni Mountains (Romania)

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Upper Cretaceous deposits, belonging to the Bozeș Formation, are cropping out extensively in the south-eastern part of the Apuseni Mountains. Their lithology is typical for a turbidite environment, as they are characterised by a rhytmic alternation of marls and sandstones in centimetric-decimetric beds. These deposits were previously studied for their calcareous nannoplankton (Bălc & Chira, 2002; Suciu-Krausz et al., 2006; Bălc et al., 2007, 2012; Bălc & Zaharia, 2013; Vremir et al., 2014) and foraminifera (Marincaș & Mânecan, 1971; Marincaș, 1973) content, but a detailed biostratigraphic analysis as well as detailed palaeoenvironmental reconstructions are still lacking. Aiming to mitigate this shortcoming, our study focuses on the Upper Cretaceous turbidites of the Stăuini Valley where nine sections were investigated fortheir microfossil content, petrography, and sedimentology.

The microfossil content (calcareous nannoplankton, small foraminifera, palynomorphs) was investigated by sampling marly beds, and the obtained results were used to develop better age constraints and palaeoenvironmental condition reconstructions. The calcareous nannoplankton assemblages are more abundant in the sections from the upper part of the valley, whereas many samples from the sections situated in the lower part are barren. The most abundant species is *Watznaueria barnesiae*, followed by *Cribrosphaerella ehrenbergii*, *Eiffelithus eximius*, *Micula staurophora*, *Prediscosphaera cretacea*, *Retcapsa crenulata*, *Tranolithus orionatus* and *Zeugrhabdotus* spp. The composition of the calcareous nannoplankton assemblages either suggests that the assemblages were affected by dissolution processes or else points to warm surface waters and oligotrophic conditions. Index calcareous nannoplankton taxa were identified only in five sections, represented by *Broinsonia parca parca* (three sections), *Broinsonia parca constricta* (three sections), *Ceratolithoides aculeus* (two sections), and *Uniplanarius sissinghii* (one section). Thus, based on the presence of the above-mentioned species we establish an early to middle Late Campanian age (between UC14 and UC15c Zones) for the studied deposits, further supported by the conspicuous absence of *Uniplanarius trifidus*. The palynomorph assemblages consist mainly of terrestrial taxa, while marine phytoplankton has very rare occurrences. Preliminary palynological analyses show that the fern spores are represented mainly by *Polypodiaceoisporites*, *Deltoidospora* and *Ruffordiaspora*, previously identified in the Bozeș Formation (Țabără et al., 2022); the gymnosperm pollen becomes predominant in the sections located in the lower part of the valley, this group of palynomorphs being represented mainly by various species of *Ephedripites* that preferred well-drained sandy substrates in temperate and warm arid regions (Mishra et al., 2022). Terrestrial palynomorph taxa such as *Appendicisporites tricornitatus*, *Trilobosporites canadensis*, *Klukisporites pseudoreticulatus* and *Subtriporopollenites constans*, in association with taxa of marine origin (*Odontochitina* sp.), suggest that the age of the deposits is no younger than Campanian, allowing correlations with the *Pseudopapilopollis praesubhercynicus* Concurrent Range Zone (Lower Campanian–lowermost

Maastrichtian; Ion et al., 1998), even though the typical taxon of this biozone (i.e., *P. praesubhercynicus*) is missing in the samples from the Stăuini Valley. The foraminifera assemblages are represented mainly in the upper part of the valley and comprise agglutinated (species of *Bathysiphon*, *Saccammina*, *Ammodiscus*, *Rzehakina*, *Haplophragmoides*), calcareous benthic (species of *Dentalina*, *Lenticulina*, *Reussella*, *Quadrimorphina*, *Brotzenella*), and planktonic taxa (*Globotruncana* spp., *Planoheterohelix* sp.). The benthic foraminifera abundance and diversity display variations along the studied sections, caused by changes in the content of organic matter flux and degree of oxygenation at the sea bottom.

Petrographic analyses suggest a quartz arenite to arkosic arenite and lithic arenite character for the sandstones from the studied outcrops. The marls' composition is dominated by clay minerals along with quartz and calcite. The clay minerals assemblage consists of illite and smectite, with small amounts of kaolinite and chlorite. These mineral assemblages indicate that the sedimentary material originates from a relatively distant metamorphic source, complemented by a magmatic one. The source area could be represented by igneous and metamorphic rocks generated during the Hercynian orogeny. Additionally, preliminary U-Pb analyses of detrital zircon assemblages from the studied outcrops identify the Jurassic 'ophiolitic' belt, as well as Upper Cretaceous banatitic magmatic products, as further source areas.

The mapped sedimentary facies range from meter-thick, clast-supported, coarse grained, poorly-sorted conglomerates with erosional lower boundaries to mudstones or siltstones with rare massive or graded sandstone interbeds (i.e., several decimeter thick laminated to thinly bedded mudstone/siltstone packages with rare thin– less a centimeter thick– fine-grained sandstone beds), and suggest depositional processes ranging from high-concentration turbidity currents or debris flows with rapid final sedimentation, to low velocity and low density turbidity currents.

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