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GT13	
GT14	
GT15	
GT16	

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SS1	
SS2	
SS3	
SS4	
SS5	
SS6	
SS7	
SS8	
SS9	
SS10	
SS11	

GT17	
GT18	

Middle Miocene (Badenian) calcareous nannofossil and geochemical fluctuations in the Romanian Carpathian Bend Zone

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During Middle Miocene times (within the Paratethyan stage Badenian), carbonates and evaporates were sedimented on large areas, from the Vienna Basin up to N Bulgaria. This type of deposition occurs also in the Eastern Carpathians, especially in their external thin-skinned nappes, namely Moldavides.

We have studied a succession placed in the Outer Moldavides (Tarcău Nappe), cropping out in the axial part of the Slănic syncline, N of the Slănic-Prahova locality. The Badenian exposed several formations (from old to young): (i) Slănic (= the Slănic Tuff), with interbedded volcanic tuffs and marlstones, enclosing levels rich in *Globigerina* foraminifer taxa, (ii) the Evaporates, with salt and gypsum, (iii) the 'Radiolarian Shale', composed of rich-radiolarian shales and (iv) the 'Spirialis Marls'. This work is focused on the 'Radiolarian Shale' unit, which contains volcanic ash layers, which the age is 13.32 ± 0.07 Ma, based on $^{40}Ar/^{39}Ar$ analysis (de Leeuw *et al*., 2018).

The qualitative and quantitative calcareous nannofossil analysis made on samples collected from the Radiolarian Shale Formation pointed out the presence of the NN6 biozone, based on the presence of significant biostratigraphic taxa, such as *Discoaster exilis*, *Discoaster musicus, Coronocyclus nitescens* and *Cyclicargolithus floridanus*. The most common taxa are *Helicosphaera* spp. (mainly *H. carteri*) that together with *Sphenolithus* spp., *Cyclicargolithus floridanus* and *Braarudosphaera bigelowii* made up to 50% of total assemblages.

An interval showing a consistent increase of *Braarudosphaera bigelowii* was observed towards the lower part of studied successions, along with the dominance of a 'rounded' morphotype of the aforementioned species, while the 'classical' one, with sharp corners and trapezoidal segments is almost absent. This nannofossil event was previously reported from Miocene successions of the Central Paratethys (Bartol *et al*., 2008; Melinte-Dobrinescu and Stoica, 2013; Peryt *et al*., 2021). The carbon and oxygen isotopic values show wide ranges, with a negative shift of isotope $\delta^{13}C$ towards the upper part of the studied successions, within the upper Badenian sediments.

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