

Nannofossil assemblages from the Paleogene Nemanjici section, Republic of Macedonia

Нанофосилни асоциации в палеогенския профил Неманици, Република Македония

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Introduction

Nemanjici section belongs to the Ovče Pole Paleogene Basin, the Republic of Macedonia. This basin is a large Paleogene sedimentary mass with NW-SE trend that is superimposed on varied rocks from the eastern part of the Vardar Zone in the territory of the Republic of Macedonia (Fig. 1).

According to the current knowledge, the Paleogene sediments of the Ovče Pole basin are nearly 3.5 km thick. Four lithostratigraphical units (basal unit, lower flysch unit, unit of yellow sandstones, upper flysch unit) have been recognized, as their lithology, thickness and spatial relationships were discussed in several works (Maksimovič et al., 1954; Stojanova, 2008; Stojanova et al., 2011, 2012; Stojanova, Petrov, 2014,

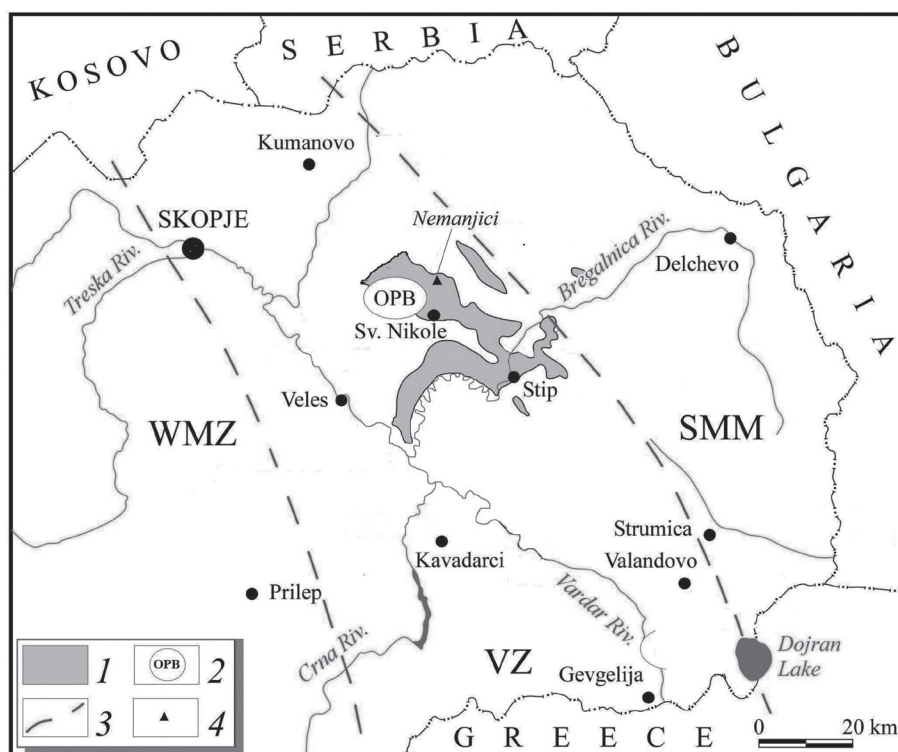


Fig. 1. Distribution of Paleogene sediments in the Ovče Pole basin, Republic of Macedonia: 1, Paleogene sediments; 2, Ovče Pole basin; 3, tectonic boundary; SMM, Serbian-Macedonian Massif; VZ, Vardar Zone; WMZ, Western Macedonian Zone; 4, Paleogene cross-section

2016). In the Nemanjici section benthic and planktonic foraminifers have been recently found (Stojanova, 2008; Stojanova et al., 2013; Valchev et al., 2013). Based on benthic foraminifera *Bolivina antegressa* Subzone of the *Planulina costata* Zone was divided (Stojanova, 2008), and later on Early Oligocene age for the Nemanjici section was determined on the base of planktonic foraminifers (Juranov in: Stojanova et al., 2013).

Nemanjici section is located 6.5 km NE of the town of Sveti Nikole, and it comprises 90–100 m of the upper flysch unit, represented by greenish calcareous clay alternating with thin sandstone beds. 18 samples (N1 to N18) were taken from the section, and the sampling was performed in marly-clay layers at a distance of 2–3 m between the samples. The overall procedure for allocating nannofossils was performed with standard processing methods, which include making microscopic preparations with Canada balsam. Paleontological determination were made under JENAPOL-d light microscope with magnification x 2000.

Results and discussion

Nannofossil research revealed that the samples contain well preserved specimens of 15 species including: *Blackites spinosus* (Deflandre & Fert), *Braardosphaera bigelowii* (Gran & Braarud), *Chiasmolithus grandis* (Bramlette & Riedel), *Coccolithus formosus* (Kamptner), *Coccolithus pelagicus* (Wallich), *Cyclicargolithus floridanus* (Roth & Hay), *Helicosphaera compacta* Bramlette & Wilcoxon, *Lanthernites minutus* Stradner, *Pontosphaera multipora* (Deflandre & Fert), *Pontosphaera plana* (Bramlette & Sullivan), *Reticulofenestra bisecta* (Hay, Mohler and Wade), *Reticulofenestra reticulata* (Gartner & Smith), *Reticulofenestra stavensis* (Levin & Joerger), *Zygrhablithus bijugatus* (Deflandre and Fert). By analyzing the stratigraphic range of individual species, composing the nannofossil association, Nemanjici

section is referred to NP 18 nannofossil biozone (Martini, 1971), and thus the sediments belong to the Upper Eocene (Priabonian). In samples 13, 16 and 17 *Watznaueria barnesiae* (Black & Barnes) from the Upper Cretaceous was found. Most probably it was re-sedimented from the surrounding Cretaceous cliffs, during the processes of their erosion and the deposition of the Paleogene sediments.

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