

Correlation of the lithostratigraphic profiles in the Paleogene basins in the Republic of Macedonia

Violeta Stojanova, Goše Petrov

Faculty of Natural and Technical Sciences, University "Goce Delcev", Štip, R. Macedonia; E-mail: violeta.stojanova@ugd.edu.mk, gose.petrov@ugd.edu.mk

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Introduction

During the Upper Cretaceous - Paleocene, after closure of the Vardar Ocean and collision processes (Laramie orogeny phase), on the territory of the Vardar zone and Serbian - Macedonian massif, in conditions of extension, were formed continental trenches where Paleogene molassa sediments are deposited. Lithostratigraphical structure of Paleogene sediments in the basins can be analysed on numerous open cross sections. Deep drilling was performed in the Tikves and Ovce Pole basin (to 2703 m). Paleogene sediments have been identified as Upper Eocene - Priabonian and Lower Oligocene (Maksimović et al., 1954; Džuranov et al., 1999; Stojanova, 2008), with a maximum thickness of 3000 - 4000 m.

Lithostratigraphy of Paleogene basins in the Republic of Macedonia

Paleogene in the Republic of Macedonia is present in 4 larger basins: Tikveš, Ovče Pole, Skopje - Kumanovo and Delčevo basin and a few isolated masses: Deve Bair, Valandovo - Gevgelija and Strumica, mostly located along the shells and covers with an orientation NW - SE (Fig. 1). With lithostratigraphical studies of the Paleogene sediments in the basins of R. Macedonia, 5 superpositionally disposed lithostratigraphical units (lithozones) have been determined: basal lithozone, lower flysch lithozone, lithozone of yellow sandstones, upper flysch lithozone and carbonate-sandy lithozone (Fig. 2).

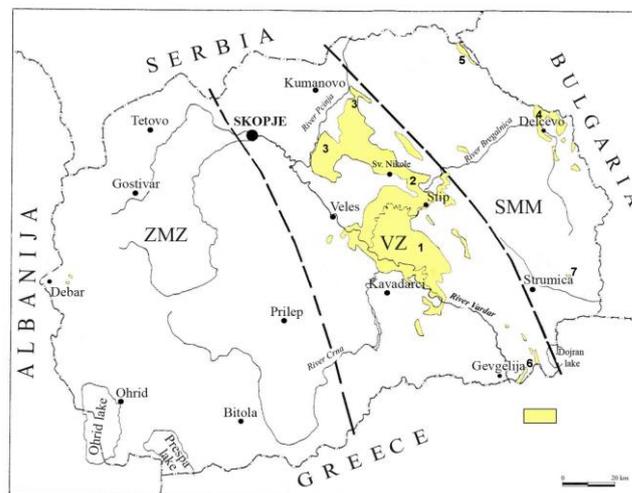


Fig. 1. Distribution of Paleogene sediments in Macedonia

Basins: 1, Tikveš; 2, Ovče Pole; 3, Skopje-Kumanovo; 4, Delčevo; 5, Deve Bair; 6, Valandovo-Gevgelija; 7, Strumica

Results and discussion

Analyzing the horizontal distribution of Upper Eocene and Lower Oligocene sediments, as well as analysis of the thickness of lithozones, correlation is made between the lithostratigraphic profiles of the Paleogene basins on the territory of the Republic of Macedonia. It is concluded that:

Basal lithozone (1E_3) starts with basal conglomerates and sandstones, clay stone and kalkarenits (all in red and purple color) lay above. This lithozone is presented in all Paleogene basins on the territory of the Republic

of Macedonia. Thickness of this lithozone varies from 350-700 m. Lower flysch lithozone (2E_3) is about 1100 m thick. It is developed in Tikveš, Ovče Pole and Deve Bair basin with rhythmic replacement of red and gray conglomerates, sandstones, claystones and marlstone and siltstones. In Deve Bair basin, in the rhythms of the zone volcanogenetic sediments appear. Lithozone of yellow sandstones (3E_3) is from 600 to 1000 m thick. This lithozone is not continuous in all Paleogene basins. It is present in Tikveš and Ovče Pole basin, where vertical and lateral passes in the top flysch lithozone, while in Skopje - Kumanovo basin sediments that belong to this lithozone were moved out into the sediments with Oligocene age. In the Delčevo, Gevgelija-Valandovo and Strumica basins this lithozone is not present. Upper flysch lithozone (4E_3) is from 1000 - 2000 m thick. The greatest thickness (about 2000 m) is established in Tikveš basin (based on drilling data). In this lithozone gray sandstone, marls and claystones are present with limestones on the top. It is absent in Skopje-Kumanovo and Deve-Bair basin. Carbonate-sandy lithozone (Ol_1) is presented in Ovče Pole basin (in the vicinity of Kočani) and in Skopje - Kumanovo basin, with thickness of 200-300 m. This lithozone begins with ridge gray limestones, with typical marine fauna, sandstones and claystones on the top.

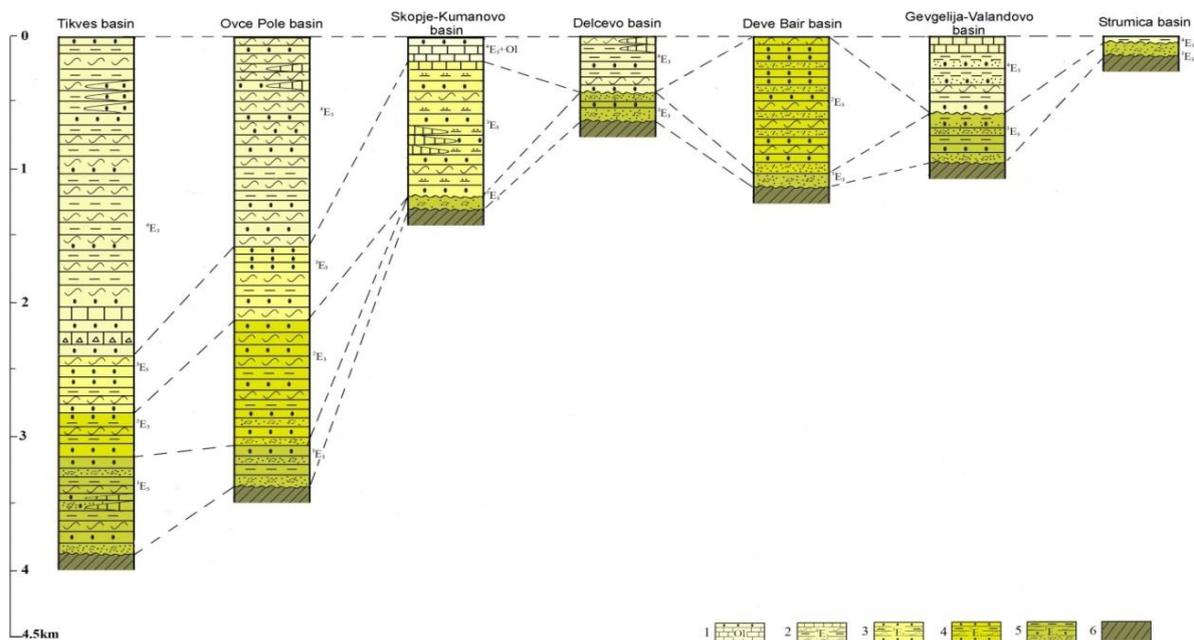


Fig. 2. Correlation of Paleogene basins in the Republic of Macedonia

- 1, carbonate-sandy lithozone; 2, upper flysch lithozone; 3, lithozone of yellow sandstones; 4, lower flysch lithozone; 5, basal lithozone; 6, paleorelief

Conclusion

The differences in lithostratigraphic profiles, related to presence in the lithozones and their thickness, on Upper Eocene and Lower Oligocene in Paleogene basins on the territory of the Republic of Macedonia are evident. Probably, they are result of differential vertical tectonic movements in Vardar zone and Serbian - Macedonian massif during the Pyrenean - Savian orogeny phase.

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