

Geodynamic classification of the Lower and Middle Miocene coarse-grained sediments in Vienna Basin and Blatné depression (Danube Basin)

TAMÁS CSIBRI¹ – MICHAL KOVÁČ¹ – JOZEF HÓK¹

¹ *Comenius University in Bratislava, Faculty of Natural Sciences, Department of geology and paleontology, Ilkovičova 6, 842 15 Bratislava, Slovak Republic; tamas.csibri@gmail.com*

Geological boundaries, or the contact between Eastern Alps and Western Carpathians, are situated under the Neogene sediments of the Vienna. The Vienna Basin is an SSW–NNE oriented Neogene basin of about 200 km length and 55 km width. The Neogene sedimentary succession, reaching up to 5500 m of thickness in the central part of the basin, is documented by numerous wells and relatively dense network of seismic profiles. The Blatné Depression located in the NW part of the Danube Basin represents the northernmost sub-basins of the Pannonian Basin System. Its subsidence is associated with oblique collision of the Central Western Carpathians with the European platform, followed by the back-arc basin rifting stage in the Pannonian domain.

By combination of sedimentological and biostratigraphic analyses, interpretation of well-log curves and their mutual correlation, as well as by interpretation of seismic profiles using seismic stratigraphy methods, a complex image of paleoenvironment, transport mechanism and distribution of sedimentary facies in time and space has been achieved.

During the Lower and Middle Miocene, several significant tectonic activities took place, during which the coarse-grained sediments were deposited. These sediments include clasts of rock sequences after exhumation and denudation of Alpine and Carpathian units. The chronostratigraphic division reflects only the position in the sedimentary fill. The suggested division takes into account geodynamic processes, which results the sedimentation of conglomerates. There are also separate groups, which help understand the distribution of conglomerates and their transport from different parts of exhumed units.

Geodynamical classification of coarse-grained sediments of Low./Mid. Miocene					
Age/stage		NN zones	Conglomerates	Geod. Classification	Paleoenvironment
Badenian	Late	NN 6	Devínska N. Ves (Vienna Basin) and Doľany cong. (Blatné depres.)	marginal cong. connected by exhumation of Malé Karpaty Mts.	Alluvial fan
	Early	NN 5			
Karpatian		NN 4	Jablonica Group (Vienna Basin) and Cífer cong. (Blatné depres.)	conglomerates sedimented near active transtensional and normal faults	Delta to fan delta
Ottangian	NN 3				
Eggenburgian	NN 2		Planinka Fm. and Záhorie Group (Vienna Basin)	conglomerates of "piggy back" basins	Littoral zone

Fig. 1. Suggested geodynamic classification of the Lower and Middle Miocene coarse-grained sediments.

For the period of the Lower – Middle Miocene, three possible geodynamic environment can be considered (Fig. 1): (i) conglomerates of the „piggy-back“ basins of Eggenburgian to Ottangian age (Zohor Group, which includes Eggenburgian Chropov, Wintenberg, Podbranč and Dobrá Voda conglomerates; Ottangian is represented by conglomerates of Planinka Fm.) (ii) conglomerates sedimented near active transtensional and normal faults of upper Ottangian/Karpatian to Lower Badenian age (Jablonica Group, which is limited for Vienna Basin, includes Jablonica conglomerates (Lakšáre Fm.) and Zohor conglomerates (Lanzhot Fm.), while in the Blatné depression the Cífer conglomerates are present) and (iii) marginal conglomerates connected by uplift of the Malé Karpaty Mts. of the Upper Badenian age (Vienna Basin – conglomerates of the Devínska Nová Ves Fm.; Blatné Depression – Doľany conglomerates).

Acknowledgments

Our appreciation goes to Nafta a.s. — Oil and Gas Company management for allowing access to their well core repositories. This work was supported by APVV agency under the contract No. APVV-16-0121, APVV SK-AT-2017-0010, UK Grant 9/2018 and project VEGA 1/0115/18.