

The spatial distribution of the intrusions in the Gutâi Mts. suggests a possible connection with the major transcrustal fault/ tectonic system Bogdan Vodă-Drăgoș Vodă, developed in the southern part of the volcanic area, as well as with some tectonic alignments showing the same orientation as most of the hydrothermal veins. The inception of the intrusive phases can be related to the change of the regional tectonic regime from transpressional to transtensional at 12 Ma, as it was recently invoked in the case of the “Subvolcanic Zone” of the Eastern Carpathians. It ended at 9.2 Ma, except for the late mafic/basaltic phase from Gutâi Mts. (8.1-7.0 Ma) ceasing the magmatism. In Oaș Mts. the intrusions were emplaced exclusively in Pannonian (10.8-9.6 Ma), while in Gutâi Mts. the intrusive magmatism started in Sarmatian (11.9-11.4 Ma) postdating the Sarmatian volcanism (13.4-12.1 Ma). Along with the emplacement of the Pannonian volcanics, intrusive rocks with different K-Ar ages (11.7-9.2 Ma) were also emplaced, being attributed to different volcanic phases. The main intrusive magmatism occurred contemporaneously with the paroxysm of the OG volcanism. The time intervals of the intrusion emplacement in OG and Poiana Botizei and Țibles from the “Subvolcanic Zone”, respectively are similar except for the mafic intrusive phase from OG.

Important veins are hosted by the intrusions from OG. Comparing the age intervals of the mineralisations with those of the intrusions, seems that the radiometric data achieved on adularia and illite from the epithermal ore deposits are consistent with those of the intrusions identified all over the metallogenic fields: e.g. the Ilba-Nistru base metal metallogenic field from the south-western part of Gutai Mts. shows 11.9-11.4 Ma interval of K-Ar ages for the intrusive rocks, 11.6-10.7 Ma interval for the K-Ar ages of adularia and illite and 10.6 Ma Ar-Ar age for adularia, exclusively. Except for the basaltic intrusive complex, the intrusions from OG are older than the epithermal mineralisations from all the ore deposits.

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## **Tectonostratigraphic terranes in the Circum-Pannonian region (pre-Neogene basement of the Pannonian Basin and its Alpine-Carpathian-Dinaridic frame): a school example of exotic terranes**

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Tectonostratigraphic terrane maps of the Circum-Pannonian region showing paleoenvironments from the Devonian to Jurassic were published by the Hungarian Geological Institute in 2004 on the occasion of the Geological Word Congress held in Florence. The explanatory book of these maps in form of a monography is going to be published by the Geological Institute of the Slovak Academy of Science on the occasion of the present congress of the Carpatho-Balkan Geological Association. We shortly present the essential principles of the maps and related monography chapters, and implications for the terranology of the area concerned.

Obducted remnants and suture zone(s) of the NW part of the Mesozoic Neotethys Ocean can be found in the internal zones of the Hellenides–Dinarides and then as small, dispersed blocks in the Circum-Pannonian region more to the North. The European (Carpatho-Balkanide) margin of this ocean was formed upon the Variscan Moldanubian Zone and Mediterranean Crystalline Zone, respectively. On the other hand, its Adriatic margin was formed upon the eastern part of the Variscan Carnic–Dinaridic microplate. Its rifting began in the early part of the Middle Triassic, whereas in the Hellenides already in the late Early Triassic. Moreover, the Main Vardar Zone is supposed to have existed already in the Paleozoic, thus representing an inherited Paleotethyan domain. This pattern of deformed continental margin zones and remnants of one/or two oceanic zone(s) inbetween them is preserved until the southern margin of the Pannonian Basin, until the Bosnian–Serbian sector.

Further to N, in the basement of the Pannonian Basin this pattern is completely changed due to intervening of the large Tisia Megaterrane. Small displaced Neotethyan remnants can be followed from the NW Dinarides (Medvednica, Kalnik Mts. in NW Croatia) through the Mid-Hungarian Zone up to the Bükk-Darnó area in NE Hungary and Jaklovce Subunit of Meliaticum in SE Slovakia (Zagorje-Bükk-Gemer Composite Terrane). Another branch of these remnants can be followed E of the Tisia Megaterrane to the Transylvanides of Romania.

On the other hand, the northern part (Mecsek Zone) of the Tisia Megaterrane was formed on the Variscan Moldanubian Zone, whereas its southern part on more southern Variscan crystalline—granitoid complexes comparable with those of the Eastern Alps and West Carpathians (Mediterranean Crystalline Zone). It was part of Europe until early Middle Jurassic and became separated from there in the Bathonian due to the beginning of Penninic rifting.

The present terrane pattern of the Pannonian basement was then formed later due to late Mesozoic and early Tertiary rotational and strike slip movements. As a result of them, units/terrane of opposite origin became juxtaposed in the central part of the Pannonian basement, thus this area can be considered as a school example of exotic terranes. On the other hand, small Neotethyan remnants (Meliatic, Transylvanide), which became separated from the main Neotethyan trunk already in the Late Jurassic to Early Cretaceous times and became involved in Middle to Late Cretaceous nappe stackings of the Carpathians, represent typical disrupted terranes.

## **Metaophiolite association in the Rhodope Massif as a stratigraphical and structural marker**

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The paper is a brief survey of the geological setting and metamorphism of the Metaophiolite Association within the metamorphic basement of the Rhodope Massif on Bulgarian territory. It emphasizes the stable stratigraphic level of metaophiolites in the lower layers of the Variegated Formation of the Rhodopian Supergroup. Usually, they crop out in deep tight synclinal folds between anticlinal structures. On the basis of new geological arguments and lithological analysis that take into consideration the syn-metamorphic deformation and metamorphic changes, an attempt is made to reconstruct the primary lithostratigraphy of the metamorphic complex. In addition, some corrections of the current stratigraphic column and geological map of the Rhodope Massif are also made. The view that fold structures dominate instead of thrusts is affirmed. Geological relationships assume that the most likely way for the integration of serpentinites into the Variegated Formation of the Rhodopian Supergroup was obduction of fragments of serpentinitized oceanic crust onto an ancient continent consisting of gneisses of the Prarhodopian Supergroup. The ophiolites have undergone various metamorphic changes: hydrothermal ocean and regional metamorphism in the amphibolite facies, culminating in migmatization. It is suggested that eclogitization occurred in local shear zones within the crust, and not along thrust surfaces or within subduction zones to mantle depth. The Metaophiolite Association is an important marker for the stratigraphic correlation of the metamorphic terranes as well as for the structural and metamorphic evolution of the Rhodope massif basement.