

**THE EAST SLOVAKIAN TRIPLE POINT JUNCTION AREA:
COLLISIONAL PUZZLE OF THE WEST CARPATHIAN – PANNONIAN
– EAST CARPATHIAN UNITS**

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Abstract: The paper deals with alternatives for correlation of the units, which occur in the West Carpathian – Pannonian – East Carpathian junction. The Zemplín Unit appear to be a prolongation of the Tatro-Veporic Zone, comprising of the Middle Cretaceous formations and *Calpionella*- and *Globochaete*-limestones in the Ptrukša Zone. The Iňačovce-Kričovo Unit is considered to be a metamorphic core complex, exhumed from below the Zemplín terrane during the back-arc extension. The Humenné-Užhorod Zone shows a strong slicing of the Centrocarrpathian nappes in strike-slip zone between the Močarany-Topľa and Peri-Pieniny faults. Some regional aspects of Transylvanides, Outer Dacides in Marmaroš and Szolnok Zone in Northern Alföld are briefly discussed.

Key words: Eastern Slovakia, Transcarpathian units, Zemplinicum, interregional correlations

The Western and Eastern Carpathian junction is considered to be a node area of units of various regional-tectonic appurtenance (Maheľ 1995). In this area, the Western Carpathian units fade out in “en echelon“ course and the Pannonian and Transcarpathian units appear. Changes in structural frame of the Western Carpathian units occur at the Hornád Fault. The boundary zone at the Hornád Fault is a system of normal faults (Grecula et al. 1977), syngenetic with marginal strike-slip faulting of the Western Carpathian segments along the Central Hungarian lineament (i.e. the Zagreb-Zemplín Line and/or Darnó Line). Nevertheless, the Veporic unit of the Čierna hora Mts. continues behind the Hornád Fault to the Prešov Depression (Kecerovské Pekľany-1 and Rozhanovce-1 boreholes), taking a connection with crystalline complex of Zemplinicum (Vozárová & Vozár 1997, Faryad & Vozárová 1997, Finger & Faryad 1999). Mesozoic formations of the Zemplinicum are known incompletely, preserved only as a Middle Triassic carbonates. The most complete data about a younger sediments of the Mesozoic formations have been obtained from the Ptrukša Zone. This Zemplinic subunit consists of dark pelitic formations (e.g. Ptrukša-55 borehole), which recently provide a foraminiferal evidences for the Middle Cretaceous age (*Whiteinella*-type associatian – Soták in prep.). Beside of these sediments, the Mesozoic rocks of the Ptrukša Zone

are also reworked in the marginal delta-fan conglomerates of the Neogene formations (e.g. Ptrukša-55 borehole), where the carbonate pebbles consist of dolomites, *Calpionella*-limestones and *Globochaete*-limestones. Considering that, the Mesozoic formations of the Ptrukša Zone (Zemplinicum) are not different from those in the Central Carpathian units. Nevertheless, the Zemplín Unit is considered to be a marginal segment of the Tisia block wedged in structures of the Western Carpathians along the Zagreb-Zemplín and Trebišov-Samoš Lines (Grecula et al. 1981).

Mesozoic units of the Central Western Carpathians beyond the Hornád Fault occur in the Humenské vrchy Mts. as well. They form an elevated area of the Humenné – Užhorod Zone. Structure of these units in the Humenské vrchy Mts. revealed a strong slicing of Krížna, Tatric and perhaps also Choč nappes (Mahel' 1995, Jacko & Schmidt 1994, Soták et al. 1997). The Humenné Unit joints with the basement units of the East Slovakian Basin (Iňačovce-Kričovo Unit) on the strike-slip system of the Močarany-Topľa Faults, indicating their possible tectonic juxtaposition. Eastward continuation of Mesozoic units along the inner side of the Klippen Belt is also traced by the Central Carpathian Paleogene sediments of the Kapušany-Humenné-Beňatina Zone, and than up to Transcarpathian area. The “Podhale Flysch” in the Transcarpathian area is developed as Šaflary Fm. and Zakopane Fm. (Sviridenko 1973), that like as in the Šambron Zone, contain extremely abundant spinels (Kruglov 1974).

The Gemicum seems to not continue beyond the Hornád Fault, where it sharply turns in N-S direction (Grecula et al. 1981). Nevertheless, there are also opinions, that the Gemic-like complexes occur in the nappe structure of the Marmarosh massif. The Early Paleozoic formations of the Marmaroš massif are dated by the Ordovician graptolites and conodonts (Drygant & Bojchevskaja 1984). The Marmaroš massif shows a similarity to the Central Western Carpathians, which differ only in magnitude of horizontal displacement (Slavin et al. 1975). Another interpretations refuse this correlation, emphasizing the principal role of the Pieniny boundary fault (Vjalov 1975, Sviridenko 1976). However, the Marmaroš elements occur in the basement of the Transcarpathian Depression in Solotvino area as well (Petraškevič 1968). This part of the Transcarpathian Depression is flooded by the epicontinental Paleogene sediments (Bajlovo Fm.), which correspond to variegated facies of the Paleogene sediments in the Marmaroš massif (Petraškevič l.c.).

At the junction of the Inner Carpathians with the Zemplín block probably disappear also units of the Silicicum - and Bükk-Meliata domain. Toward the east, the Meliata?-type sequence with radiolarites?, diabases and tuffites is constrained from boreholes near Beregovo and in Rusko-Komarov and Begač Zones (Sviridenko 1976, Petraškevič & Lozyniak 1988). Based on these

indications, Rakús et al. (1998) proposed a prolongation of Transylvanides to the basement structure of the Transcarpathian Depression.

The substratum of the Transcarpathian Depression is formed by the Iňačovce- Kričovo Unit, which consists of Late Paleozoic?, Mesozoic and Paleogene formations. Their stratigraphic classification is based on the occurrences of Jurassic and Lower Cretaceous fauna in the Kričovo Zone (*Posidonia* sp., *Vermicerae* sp. *Deshayesites borowae* UHLIG, calpionellids – Burrov et al. 1975). In the basement of the East Slovakian Basin, the Iňačovce-Kričovo Unit consists of metasedimentary formations. This unit is supposed to be a subduction complex (Soták et al. 1993, 1994, Vozár et al. 1993), based on the metamorphic lithology, MP to HP/LT metamorphism, Lower Miocene cooling age (≈ 20 Ma) and subductional-accretionary deformation. Metasedimentary formations of the Iňačovce-Kričovo Unit are also completed by bodies of ultrabasics, recovered in deep boreholes and presumed in the area of large magnetic anomalies near Nacinná Ves and Sečovce (Mořkovský & Čverčko 1987, Gnojek et al. 1991). In the Eastern Carpathians, the Jurassic and Cretaceous sediments with oceanic lithologies occur in the Ceahlau – Severin Zone, which westwardly links with the Porkurec Unit of the Ukraine Carpathians. The Porkurec Unit disappears in the system of Latorica faults, close to the Slovak-Ukraine border. According to some authors (e.g. Kovács 1982, Chain et al. 1980), the oceanic-type units in the East Carpathian – Pannonian area are divided into two zones – Outer Dacide Zone (“Black Flysch” and Ceahlau Units) and Szolnok Zone. Iňačovce-Kričovo Unit seems to be in direct connection with the Szolnok Zone. This zone is formed by the Senonian and Paleogene sediments, which were detached from the Mecsek-type units (Balla 1987). Pelagic marly facies of the Szolnok Zone (Púchov Marls) and the Mesozoic formations of the Mecsek Unit are not present in the Iňačovce-Kričovo Unit. Considering that, the Mesozoic formations of the Szolnok Zone likely correlate with those in the Pieniny Klippen Belt (Szentgyörgyi 1989, Soták et al. 1995, Potfaj 1998).

The units of the Western and Eastern Carpathian junction are covered by Neogene sediments of the Eastern Slovakian Basin, which in the deepest part attain thickness of up to 6-7 km (the so called Trebišov Depression *sensu* Rudinec 1980). The subsidence of the basin during the Lower Miocene was taking place in depocentres formed by pull-apart mechanism (Vass et al. 1988), which also documents its foundation in the transtensional shear zone. During the Middle Miocene, the structural development of the basin tend to back-arc extension (Kováč et al. 1995). Back-arc extension, mainly initiated by roll-back effect of the subducted plate, consequently forced the mantle upheaval and intensive calc-alkaline volcanism. Andesite eruptive centres were mainly activated at crossing of significant tectonic lines in the system of volcanic apparatuses of the Slanské vrchy and Vihorlat – Gutin Mts. (Kaličiak and Pospíšil 1990).

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Fig. 1 Tectonic sketch of the basement units in the West Carpathian – Pannonian – East Carpathian junction.

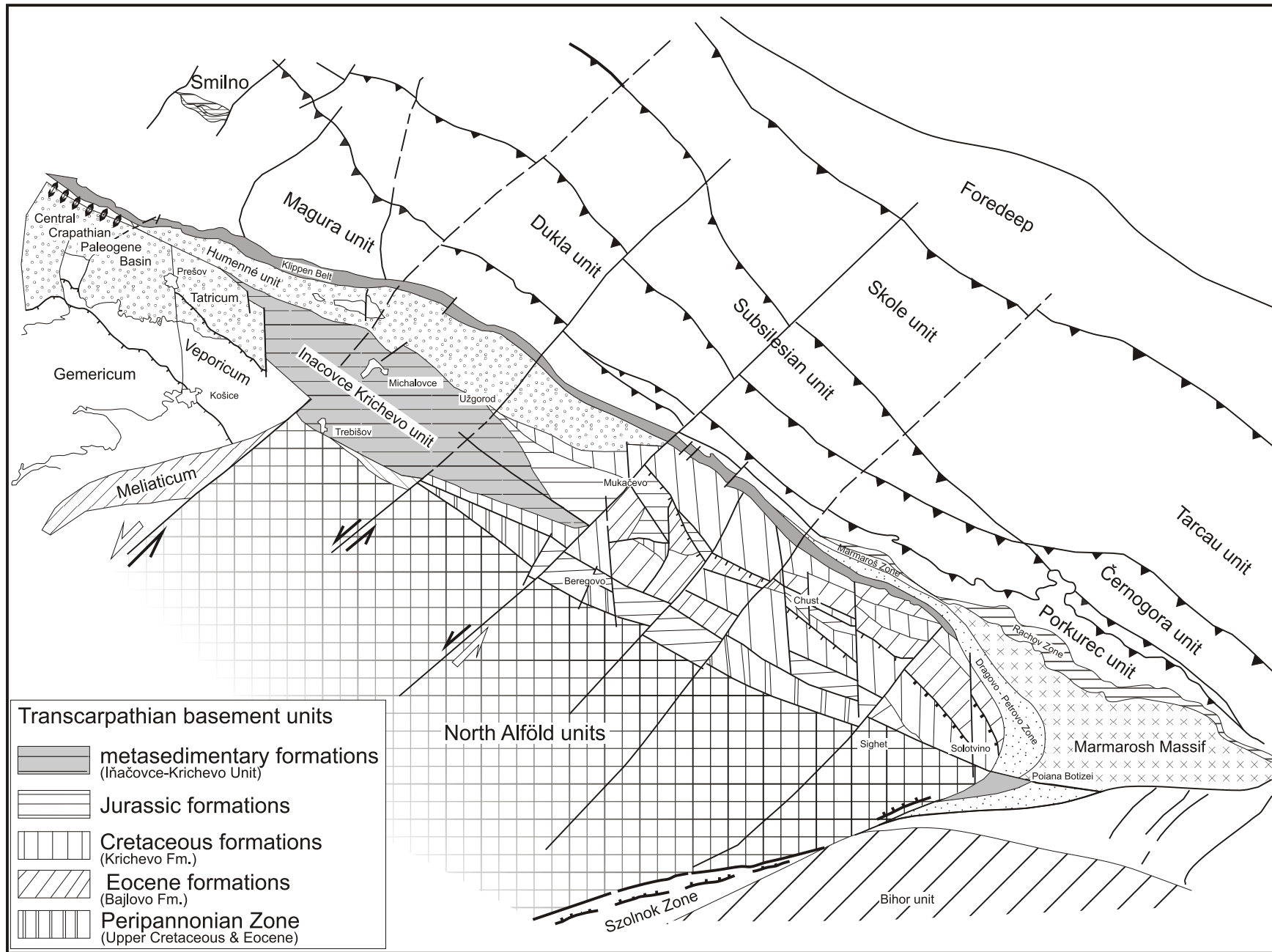


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