

# DISPLACED DINARIDIC—ALPINE CONNECTION IN THE BASEMENT OF THE PANNONIAN BASIN

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**Abstract:** Prior to the fundamental displacements, certain elements of the basement mosaic of the NW part of the Pannonian Basin belonged to the Dinaridic and the Alpine systems or even the junction zone between them. It is worth mentioning that the lithosphere elements of Dinaridic affinity can be found in a relatively narrow zone between the Mid-Hungarian (Zagreb—Zemplin) Lineament and Periadriatic—Balaton Lineament and its assumed NE-ward continuation in the Zagyva depression.

**Key words:** structural unit, structure evolution, Alps, Dinarides, Pannonian Basin

One of the fundamental questions of the connection of the Dinaridic and Alpine systems is the north-western termination the Dinaridic ophiolites and the nature of the contact between the Dinaridic and the Alpine units. In our opinion the original relationships between these realms cannot be reconstructed without taking into consideration those lithosphere fragments (terranes) that are located at present in the basement of the Pannonian Basin mostly hidden under thick Neogene cover. Comparative analyses led to conclusion that prior to the fundamental displacements, certain elements of the basement mosaic of the NW part of the Pannonian Basin belonged to the Dinaridic and the Alpine systems or even the junction zone between them. It is worth mentioning that the lithosphere elements of Dinaridic affinity can be found in a relatively narrow zone between the Mid-Hungarian (Zagreb—Zemplin) Lineament bounding the Tisza Megaunit of European origin and Periadriatic—Balaton Lineament and its assumed NE-ward continuation in the Zagyva depression (Fig. 1).

Two key-areas will be discussed: the Alpine–Dinaridic–Pannonian triple junction in SW Hungary and NW Croatia (Haas et al., 2000) and the displaced Dinaridic terranes in NE Hungary (Protić et al., 2000, Filipović et al., in press, Dimitrijević et al., in press). Between the Periadriatic–Balaton and Mid-Hungarian Lineaments, in the Sava Composite Unit, blocks of South Alpine and Internal Dinaridic origin are juxtaposed. The non-metamorphosed nappes of the South Alpine South Karawanken and Julian–Savinja Units are overthrust onto the Alpine metamorphic complex of the Medvednica and South Zala Units and the ophiolite melange of the Kalnik Unit (Fig. 2) that is considered the prolongation of the Vardar Zone (Pamić 1997). The Bükk Composite Unit (Bükk Paraautochthon, Szarvaskő and the Darno Ophiolite Complexes – Fig. 3) with its southerly-vergent structure and typical Dinaridic development represents a displaced fragment of the Dinarides. These ophiolite complexes do not belong to the “Meliatikum” tectonostratigraphic unit, which is involved into the northerly-vergent Austroalpine nappe system in Slovakia and Austria. 400–500 km dextral offset along a transpressional shear-zone at the southern boundary of the Pelso system that was formed as a result of opposite movements of the Pelso (ALCAPA) and Tisza Megaunits (Csontos & Nagymarosy, 1998) is well constrained. However, as a result of block movements, there is a sinistral facies offset of similar scale between the Pelso and the Tatrio-Veporic system (Haas et al., 1995), that should have preceded the Late Cretaceous nappe stacking.

## **Conclusions**

Abrupt NW termination of the Internal Dinaridic units is apparent. Sizable tectonic movements led to displacement of the transitional paleogeographic zones between the Dinaridic and the Alpine systems, i.e. the area surrounding the western termination of the one-time Vardar (Neotethys) branch. Sheared remnants of the ophiolite melange can be found along the major transpression zone, in the inside of the Pannonian Basin. These studies were supported by the National Research Fund (OTKA) projects No. T 029797 and T 037966 (J. Haas) and No. T 037595 (S. Kovács)

## Refereces









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**Fig. 1.** Major structural units of the basement of the Pannonian Basin and the surrounding region

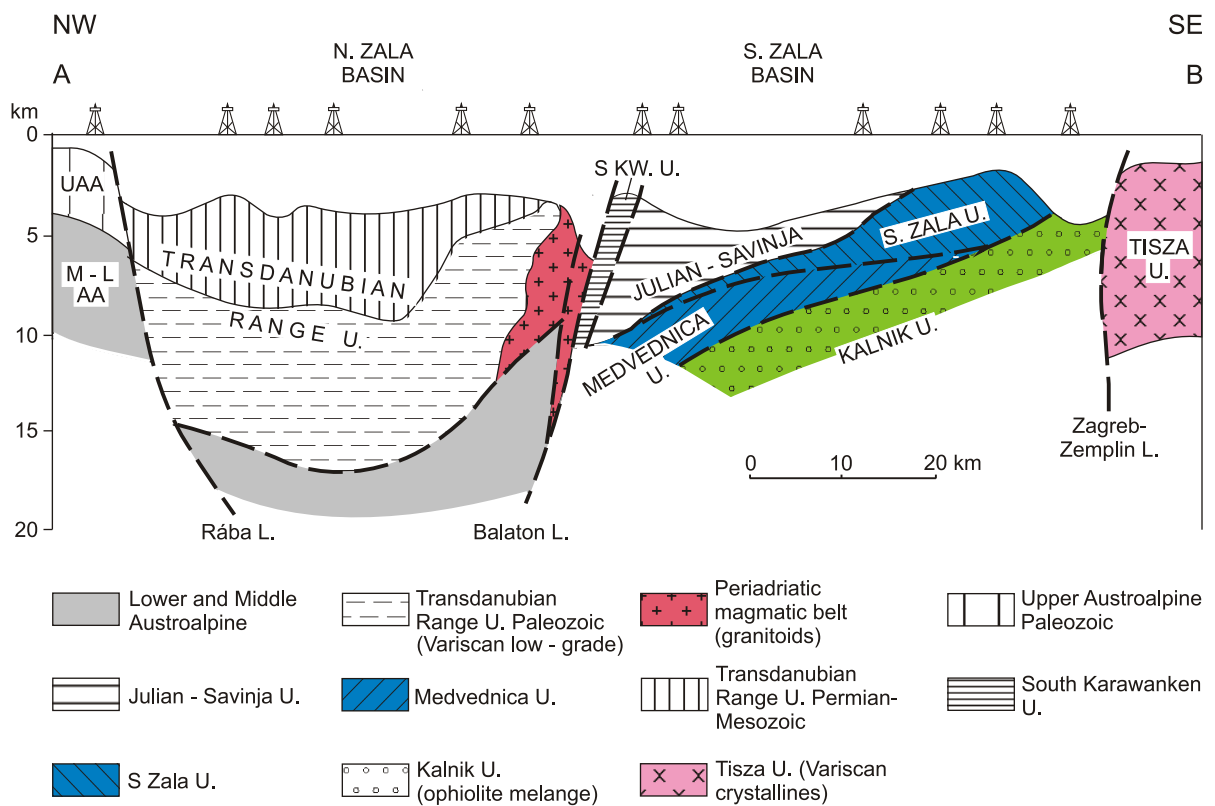
**Fig. 2.** Conceptual cross section of the Zala Basin showing position of the structural units in the basement.

**Fig. 3.** Structural scheme of the Bükk Mts.

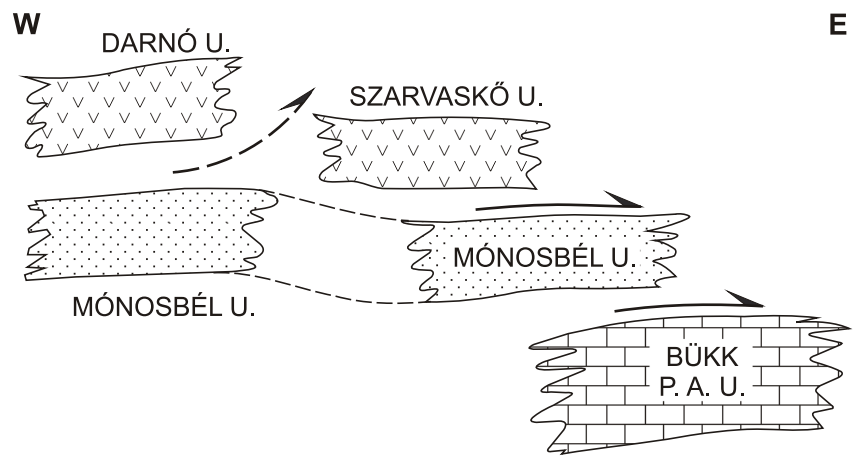


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| <ul style="list-style-type: none"> <li> Units related to the Variscan Moldanubian and Median zones and to the "northern" (European) Tethys margin in the Mesozoic</li> <li> Neotethyan ophiolite complexes (Vardar, Dinaridic Ophiolite Belt, Bükkian, "Meliatic") (outcrops are marked in black)</li> <li> Penninic–Outer Dacidic ophiolite complexes</li> <li> Pieniny Klippen Belt</li> </ul> | <ul style="list-style-type: none"> <li> Alpine flysch zones</li> <li> Units related to the southern (Adriatic–Apulian) Tethys margin</li> <li><b>Units related to the Variscan Betic–Serbian zone:</b></li> <li> having probably intraoceanic setting in the Mesozoic (Drina–Ivanjica unit)</li> <li> related either to the "northern" Tethys margin or having intraoceanic setting in the Mesozoic (Gemér–Silica–Aggtelek)</li> </ul> |
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Haas–Kovács Fig 1.



Haas-Kovács Fig 2.



Haas-Kovács Fig3.