

# **MIOCENE DEVELOPMENT OF THE CARPATHIAN ARC AND PANNONIAN BASIN: SUBDUCTION DRIVEN INTERACTION OF THE ALPS, DINARIDES AND BALKAN LITHOSPHERIC BLOCKS**

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The Carpathian arc and the basement of the Pannonian basin present themselves as an exception in between Tertiary arcs of the Mediterranean area. Unlike these, the Carpathians are formed by two former – Mesozoic - orogens, the Alps and the Western Carpathians in the NW and the Vardar zone (with surrounding zones) and the East Carpathians in the SE. These subplates are called ALCAPA and Tisa-Dacia, respectively. In the SW the arc is bounded by the Dinarides. The interaction of these blocks and subplates during the Neogene oceanic subduction event is the subject of the present abstract and paper. Paleomagnetically confirmed rotations during the subduction event between 19 – 12 Ma brought the most important evidence of the model. Both plates rotated in non-rigid manner. The ALCAPA rotated in anticlockwise and the Tisa-Dacia in clockwise direction of some 80°. Surprisingly, only in few regions like the East Slovakian basin and the Ukrainian Transcarpathian depression the intensive orogen parallel extension with exhumation of middle crustal blocks took place. This exhumation occurred exactly in the volcanic arc zone. The other parts of the volcanic arc in Slovakia and Romania were extended only slightly.

Final docking of the ALCAPA and Tisa-Dacia was influenced importantly by the rheological character of the lower plate. This lower plate is represented by the Brunovistulic and Malopolska Massif blocks under the West Carpathians, and by the Moesian Platform under the Southeast and South Carpathians. These plate fragments are of the Panafrican orogeny age (ca. 700 – 550 Ma). Very different was the docking event under the Ukrainian and the North Romanian Carpathians as the lower plate there is represented by the Early Proterozoic Ukrainian Shield.

There was not much extension in the Pannonian basin during the subduction. Net income of masses mainly from the South (the Tisa-Dacia plate) was enormous and did not allow for the extension. Great majority of Neogene sediments of the Pannonian basin are of the post-subduction period origin. Later, in latest Miocene, Pliocene and Quaternary, the whole Pannonian basin has been strongly inverted during the compression event.

The Dinarides probably rotated together with the whole Adriatic plate during the Carpathian Neogene subduction. At the same time, they continued in collisional movement against the Adria. Part of the Dinarides in the North was also brought in the Pannonian basin extension and sedimentation.

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