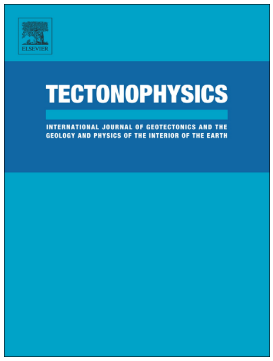

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Carpathian Shear Corridor – a strike-slip boundary of an extruded crustal segment

František Marko[1*], Paul A. M. Andriessen[2], Čestmír Tomek[3], Vladimír Bezák[3], Lucia Fojtíková[3,4], Marián Bošanský[5], †Milan Piovarči[6] and Peter Reichwalder[7]

[1] Comenius University in Bratislava, Department of Geology and Paleontology, Faculty of Natural Sciences, Ilkovičova 6, 84215 Bratislava, Slovakia, marko@fns.uniba.sk
[2] Vrije Universiteit, Faculty of Earth and Life Sciences, Isotope Geochemistry group, De Boelelaan 1085, 1081 HV Amsterdam, The Netherlands
[3] Earth Science Institute, Slovak Academy of Sciences, Dúbravská cesta 9, 84528 Bratislava, Slovakia
[4] Institute of Rock Structure and Mechanics, AS CR, v.v.i., v Holešovičkách 41, 18209 Praha, Czech Republic
[5] Comenius University in Bratislava, Faculty of Natural Sciences, Department of Applied and Environmental Geophysics, Ilkovičova 6, 842 15 Bratislava, Slovakia
[6] Data Image Ltd., Suchá 39, 83101 Bratislava, Slovakia
[7] Púpavova 20, 84107 Bratislava, Slovakia
[*] corresponding author

Abstract

The Carpathian Shear Corridor (CSC), a morphostructurally distinctive ENE-WSW brittle shear zone, is a prominent dynamic interface of crustal fragments shifted during an oblique collision process combined with lateral extrusions in the Late stages of the Western Carpathians tectonic evolution. This tectonics was due to convection in the upper mantle, driven mainly by slab-pull forces related to a subductional process in front of prograding Carpathians. The CSC separates the marginal segment of the Western Carpathians, already firmly attached to the European plate, from the southern still eastwardly moving block. This process led to structural transpositions, anomalous rotation of small blocks and tilting and uplift/subsidence events, resulting in a tectonic style of horst and intramountaine basin alternations within the corridor. Preliminary paleomagnetic data indicate anomalous CCW block rotations within this corridor, and AFT ages indicate Early and Late Miocene (ca 24-22 Ma and ca 10-7 Ma) fault controlled exhumation events triggered by increased shear zone activity. Deep seismic sections, magnetotelluric and gravity data show that CSC follows a frontal ramp of the Western Carpathians thrust over the foreland. The CSC remains an active strike-slip shear zone, and therefore the most important earthquake risk-zone in the Slovakian portion of the Western Carpathians. It presents a lateral ramp transform boundary of eastwardly extruding crustal segment during the Miocene and up to the recent time.