

Tectonic evolution of the Orava Basin in the light of geomorphological and geophysical studies tested by earthquake of 11 September 1995

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The intramontane Orava Basin situated on the boundary of Inner and Outer Carpathians is the tectonic depression formed due to subsidence and filled with the Upper Badenian through Pontian deposits up to 950 m thick. The erosional history was associated with general uplift initiated in Late Pliocene time. During Quaternary the western part of rombochasm of Orava Basin was uplifted and a system of 6 cut and fill terraces was formed, showing the western direction of outflow of Czarny Dunajec river from Tatra Mts to Orava and Vah (Black Sea drainage basin). The eastern part

of Orava Basin was controlled by Quaternary subsidence and infilled by fluvial and glacio-fluvial deposits of Czarny Dunajec, flowing from the Western Tatra to Dunajec and Vistula rivers (Baltic Sea). The opening of Wróblówka and Pieniążkowice troughs with 100 and 50 m thick Quaternary deposits resting directly on the Magura flysch seems to be formed by the same mechanism which determined opening of the Orava Basin during the Neogene. My hypothesis is that the Orava Basin was formed under extensional regime which existed between the Orava Block rotating by 40–42° toward NW and the NE migrating Tatra Block. The principal oblique-slip fault is the sinistral fault bordering from the south the Choč massif, from the west the Western Tatra Mts and continuing to NE as Krowiarki–Domański Wierch fault,

and along the Lepietnica Valley probably to the western margin of Mszana tectonic window. This tectonic line was presented also by Slovakian geologists and named Prosečno dislocation system.

The exceptional position of Orava Basin is documented by model of the top of crystalline basement where its the most lower position is manifested at a -18 km depth. On the geophysical map of Western Carpathians the course of axis of gravimetric minimum presents en-echelon pattern between Zázrivá sigmoid and Orava Basin (within rotated Orava Block).

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search — grant No 6PO4E 020 08, the seismic studies (refraction and reflection) and evaluation of earthquake of 11 September 1995 was carried out. The seismic study documents the complexity of Neogene structures near Czarny Dunajec and is in good agreement with the result of gravilineaments interpretation. Interesting results of spatial and temporal analysis of epicentres of earthquakes from 11–13. 09.1995 are elaborated. The epicentres with contraction effects calculated from seismograms are spatially related with the zone of Domański Wierch left-lateral strike-slip fault, while the epicentres with dilatation effects were limited to vast flat area of Czarny Dunajec fan, a subsiding area.