Landforms and structural expression of the Muráň fault in the Levočské vrchy Mts. (Western Carpathians)

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The Muráň fault (MUF) trace is clearly visible only in the middle segment of the fault, where it creates distinct tectonic contact between contrasting Mesozoic sequences and the Veporic crystalline basement unit. The fault trace in lithologically monotonous Paleogene flysch terrane of the Levočské vrchy Mts. is difficult to determine for the lack of geological criteria. In geological maps, it uses to be only intuitively drawn as a directional continuation of confirmed middle fault segment. Nevertheless, the MUF trace is evident at the surface morphology along its whole length, even in the Central Carpathian Paleogene Basin (CCPB), in the Levočské vrchy Mts. (Fig. 1). It represents one of the most spectacular photolineaments in the visible spectrum as well as in Radar (ERS-2) images. To evaluate the nature of the geomorphological MUF-related phenomena, derived DEM maps were compiled. In directional continuation of the MUF trace to the CCPB, there is a system of parallel morpholineations genetically related to joint sets or faults with moderate normal block separation. They allowed increased rate of selective erosion within the MUF zone and affected also drainage network. The most prominent

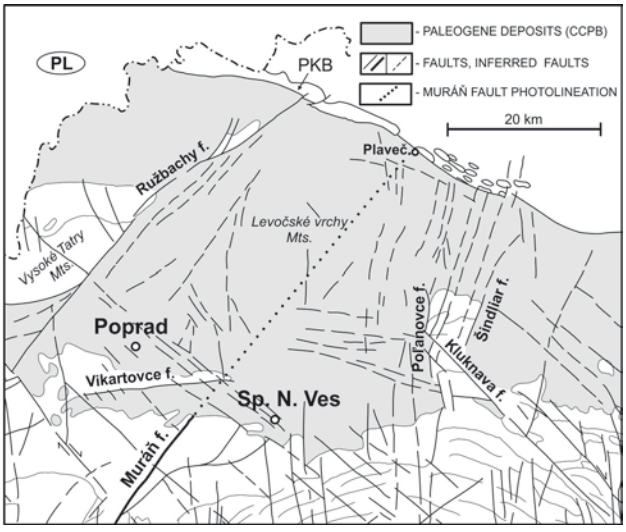

Fig. 1. Map-scale faults network of the area with indicated Muráň fault trace in the Central Carpathian Paleogene Basin.

NE–SW morpholineations following the MUF strike represent positive morphostructure, the main mountain ridge line, which is followed by the water springs. It suggests that this structure is related to discontinuities open for the groundwater migration. As the youngest structures seem to be arc-shaped morpholineations. The huge circular structure is located just at the northern tip of the MUF trace, with the centre in the Plaveč village. Other ones are situated at the eastern wall of the fault, interpreted as boundary dislocations rimming gravitationally slided blocks. They could be genetically related to dynamics of the MUF zone. Field research focussed to analysis of structural phenomena related to fault trace was carried out. Only two fault-slip related paleostress events were resolved, the WNW–ENE extension and the NNE–SSW extension in the study area. Both events are recorded by populations of meso-scale slickensides and tension gashes, which correspond well with the map-scale fault network of the area. To confirm occurrence of the fault damage zone at the surface geological architecture, two geophysical profiles with electric resistivity profiling method (ER) across the expected MUF trace were done as well. The ER profiles show ca. 100 m wide anomalous zone of strongly decreased resistivity just at the expected MUF line course. The character of resistivity curves is typical for the damage zone of dislocations. Finally, it can be concluded that the MUF influences landforms, what refers to its neotectonic reactivation. Field structural data show extensional character of the MUF zone affecting the surface of the CCPB in the Levočské vrchy Mts. and no strike-slip or reverse-slip records were observed. Present--day activity of the studied Muráň fault segment is not probable, because the cluster of earthquake epicentres do not follow Muráň fault trace, but the Ružbachy fault, as well as the longitudinal river valley profiles analysis does not show any Quaternary reactivation of faults in the vicinity of MUF trace, at the eastern wall of the fault.

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