Gemericum (Inner W. Carpathians): Variscan and Alpine tectonic overprint expressed in a new geological map of the Spiš-Gemer Ore Mts. at a scale 1 : 50 000

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The recently issued regional geological map of the Spiš-Gemer Ore Mts. area distinctly demonstrates a strong Alpine shearing of the territory by the distinguished 10 regional shear zones of the trends NW-SE (dextral) and NE-SW (sinistral shearing). As confirmed by the field observations and structural research, the shear zones modify the course of lithological units and the former Variscan tectonic setting as well. Earlier tectonic studies (e.g. Grecula et al., 1990; Németh, 2002) classified the origin of shear zones as a product of the deformation phase AD_3 (Tertiary – recent). In the presented map, the role of shearing is shown e.g. by the distinctly NW-SE trending lithological strips in the eastern part of the area along the Košice-Margecany shear zone, but further to NW in the area of the town Gelnica these strips are bended by the Transgemeric shear zone to W-E and WSW-ENE directions.

In both, western and eastern contact zones of Gemericum with Veporicum the manifestations of Alpine thrusting and subsequent unroofing were found in the mesoscale (the secondary foliation moderately dipping to E and SE in the western contact zone and to SW in the eastern contact zone). The lower temperature brittle to brittle-ductile overthrusting (Lower Cretaceous; AD_1) was followed by the ductile normal faulting (Upper Cretaceous, AD_2), being demonstrated by the microtectonics. As confirmed by the field structural research, AD_1-AD_2 structures are evidently overprinted by the AD_3 shear zones and therefore are older. Available geochronological data (e.g. Dallmeyer et al., 2005) are preferably demonstrating the higher temperature deformation stage AD_2, indicating the beginning of unroofing in the interval 115-101 Ma and the intensive unroofing kinematics in the interval 88-82 Ma.

Concerning the Variscan tectonic setting, based on correlation of microtectonic data with the geochronological data, the Variscan deformation stage VD is divided on part VD_1 of Variscan collision (323-262 Ma; the prograde metamorphic path M1) and part VD_2 (262-216 Ma) with a south-vergent Variscan postcollisional unroofing (Németh in Radvanec et al., 2007). The microstructural research has demonstrated that the interval 275-262 Ma represents the termination of VD_1 stage in the Bt zone with local anatectic melting (micrographic overgrowths of K feldspar and quartz, origin of K feldspar-albite micropertite). Therefore in the interval 275-262 Ma there originated a major part of granites and accompanied volcanic products, as well as the majority of ore veins in Gemericum. The continuity of VD_1 and VD_2 stages is confirmed by the P-T-t metamorphic path of Variscan orogeny (M1; Radvanec et al., 2007) and both stages are interpreted as Variscan. Learning the kinematics of extensional unroofing VD_2 has brought the missing structural evidences about the extension and opening of elongated basin south of Gemeric domain in the Permo-Triassic period.

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