

Abstract

The Central West Carpathians represents a crustal-scale thrust sheet stack formed by three major basement units, the Gemer, Vepor and Tatra. The basement of structurally middle Vepor Unit is dominated by Carboniferous granitoids while the upper Gemer Unit consists mainly of Lower Palaeozoic volcano-sedimentary complexes. Both units are overlain by Late Palaeozoic to Mesozoic cover sequences. During the Alpine orogenic event of Cretaceous age, the Vepor Unit was first buried during the northward overthrusting of the Gemer Unit and later exhumed during the eastward lateral escape of the Gemer. Alpine metamorphic conditions reached generally amphibolite facies conditions in the Vepor and greenschist facies conditions in the Gemer. In this work we concentrate on tectono-metamorphic record within the rock complexes incorporated into the imbricated structure of the Vepor-Gemer Contact Zone.

The Vepor basement schists were affected by Variscan and Alpine regional metamorphism of medium grade. The age of metamorphism was confirmed by the Sm/Nd garnet dating (355 ± 41 Ma – Variscan, 115 ± 24 Ma – Alpine). The Variscan metamorphic assemblage of garnet-biotite-plagioclase is mainly preserved closer to the contact with leucogranite which crosscuts Variscan metamorphic fabric. The schists and leucogranite are overprinted by the Alpine metamorphic assemblage of grossular rich garnet, biotite, albite, epidote and white mica. The Alpine deformation-metamorphic overprint is indicative of low strains in the vicinity of leucogranite while towards the south the Variscan schistosity is obliterated by the Alpine cleavage. The degree of metamorphism in the schists generally decreases towards SE where, however, the higher grade garnet bearing first Alpine fabric is overprinted by a lower grade muscovite-chlorite bearing second Alpine cleavage. The Permian cover metaarcoses and metaconglomerates are characterized by the presence of two Alpine deformation fabrics of different metamorphic grade that is mainly manifested by distinct quartz deformation microstructures. The presumably Carboniferous phyllites of the Ochtiná group show polydeformation record characterized by relics of higher grade fabric being nearly obliterated by the low grade muscovite-chlorite bearing cleavage. The two main metamorphic fabrics are subsequently folded and overprinted by steep discrete cleavage of very low grade developed mainly in the Ochtiná group.

Additional study of amphibolite and chloritoid schists from the Ochtiná group confirmed polymetamorphic record. The PT estimates in amphibolite indicate $\sim 500\text{--}580^\circ\text{C}$ and 3-8kbar. In the chloritoid schists the PT estimates indicate $\sim 420\text{--}460^\circ\text{C}$ and 6-10 kbar. The PT conditions obtained from chloritoid schists and amphibolites probably reflect two different metamorphic events. We interpret the chloritoid schists to be the part of metasedimentary complex of the Ochtiná group and their metamorphic record to be in association with development of first Alpine cleavage, whereas the amphibolites represent a part of the Gemer basement and their PT estimates reflect the Variscan regional metamorphism.

The medium grade first Alpine cleavage within the studied lithological complexes of the Vepor-Gemer Contact Zone is interpreted to result from overthrusting of the Gemer Unit and burial of the Vepor (Jeřábek et al. 2008). The low grade second Alpine cleavage is associated with exhumation of the Vepor Unit along a detachment zone located at the Vepor-Gemer boundary (Janák et al. 2001). The last deformation is associated with sinistral transpressional deformation manifested mainly by formation of the Trans Gemer Shear Zone (Lexa et al. 2003).