Development of the Structure and Granite Emplacement along the Boundary between Vepor and Gemer Units (Western Carpathians)

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The boundary between the Vepor and Gemer crustal units of the Western Carpathians was investigated. The present work is essentially focused on the description of structures and tectonic relation of these two units, studied on four structural cross-sections.

The essential zoning of lithostratigraphic units remains identical in all profiles. From the north to the south and from the bottom to the top these are: 1) Variscan crystalline basement, mainly Grt-Bt schists and orthogneisses (Vepor basement), 2) Upper Carboniferous fine- to medium-grained metasandstones (Slatvina Formation) frequently intruded by leucocratic magma of granite-granodiorite composition (Rimavica granite), 3) Permian metamorphosed medium- to coarse-grained clastics (Rimava Formation), 4) Lower Carboniferous metamorphosed sandstones and phyllites (Ochtina Formation) and 5) Lower Paleozoic metasediments of the Gemer Unit. Mesozoic rocks of the Turna and Silica units occasionally occur in the most hangingwall position.

The dominant structure in all units is the variable dipping, SW–NE-striking foliation (S_2), overprinting metamorphic fabric S_1. S_2 foliation dips steeply SE, bearing stretching and mineral lineation plunging SW. The S_1 fabric is completely overprinted in high-strain domains and in soft lithologies but its relicts are well preserved in low-strain domains as well as in contact-metamorphosed quartz-rich schists of the Slatvina Formation. The S_1 foliation generally dips south and is associated with syn-schistose–isoclinal folding of S_0. The S_1 fabric is developed in greenschist-facies conditions; biotite schists occur in areas of contact metamorphism.

The Rimavica granite itself is almost undeformed in its internal parts, and the preserved magmatic fabric is often parallel to the strike of S_2 foliation. Magmatic fabric becomes dominant towards the footwall of the intrusion. Deformation in solid state and magmatic fabric systematically show sinistral sense of shear. The upper part of the intrusion contact aureole shows preserved crosscutting relations of S_1 fabric with complex finger-like intrusions of granite sills and dikes. The whole sequence is occasionally overprinted by late kink bands (S_3) of various intensities according to the lithological changes.

Based on these field observations, we presume that the emplacement of granite was synchronous with the formation of the S_2 fabric. The emplacement occurred in sinistral transpressive regime which is typical for the whole southern margin of the Vepor basement. As the S_2 is developed in the Mesozoic rocks as well, we put forward a hypothesis that the granite was emplaced during Cretaceous convergence.

Structural Evolution and Metamorphic Zoning of the Jeseník Amphibolite Massif

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The study area is situated at the northeastern margin of the Bohemian Massif, at the northern termination of the Desná Dome of the Silesicum. The Desná Dome consists of the crystalline pre-Variscan basement and its Devonian metasedimentary and metavolcanic envelope. All lithologies are strongly influenced by the Variscan orogenic event. The studied metabasites belong to the Devonian volcanites, which form a part of the Devonian envelope of the Desná crystalline basement. From the geochemical point of view, majority of the metabasites of the Jeseník amphibolite massif have a composition of ocean tholeiites (Souček 1981) related to the Devonian rifting of the eastern part of Brunia (Schulmann and Gayer 1999). The aim of this work is to investigate relationships between variations of micro- and macrostructural patterns and the degree of metamorphism across the Desná Dome.

The character of metabasites varies strongly from E to W, depending on the metamorphic degree. Five metamorphic zones are traditionally distinguished on thebasis of mineral assemblages in metapelites (Souček 1978): the chlorite zone in the SE, the biotite, garnet, and staurolite zones in the NE central parts of the dome, and the sillimanite zone in the NW, near the contact with the Žulová pluton. In the least metamorphosed areas, the volcanic rocks are represented by metatuffs, metabasalts, and metagabbros, scarcely with relict magmatic ophitic textures, or greenschists with well-developed metamorphic fabric. The metabasites become darker, well foliated and often layered with increasing metamorphic grade.

According to Schulmann and Gayer (1999), the Silesian domain was affected by two main Variscan deformation events, termed D_2 and D_3, while the pre-Variscan deformations were grouped in D_1. This classification was used when studying the area under consideration. Because of the Devonian age of the metabasites, only D_2 and D_3 deformations can be observed in metavolcanites. The D_2 deformation is related to the Early Carboniferous underthrusting. During this phase the NW- or SE-dipping S_2 foliation has developed, being associated with the