

Syntectonic Emplacement of Leucogranitic Magma during Oblique Transpression: the Boundary between the Vepor and Gemer Units (West Carpathians)

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This work is primarily focused on the interpretation of leucocratic granite emplaced along the boundary between the Vepor and Gemer crustal units, its internal fabric and timing of intrusion. The age and the role of this intrusion have been a matter of debate among Carpathian geologists for a long time. Andrusov et al. (1953), Klinec et al. (1962) suggested that it is an integral part of the Vepor crystalline basement build up mainly of Grt-Bt schists and leucocratic orthogneisses. However, Kantor (in Vozárová et al., 1979) proposed that the granitoids are Cretaceous in age and were emplaced parallel to the major tectonic boundary between the Vepor and Gemer units. This concept is based on the presence of a narrow contact metamorphic aureole developed in the Slatvina Formation (Late Carboniferous cover of the Vepor crystalline basement). The contact metamorphism affected greenschist facies rocks being marked by the occurrence of biotite schists, almandine-biotite and cordierite-andalusite hornfels. The PT estimates from contact mineral assemblages by Vozárová (1990) indicate the depth of intrusion at 2 kbars.

The greenschist facies metamorphic schistosity in the Slatvina Formation is generally dipping to the south and is overprinted by late lower greenschist S2 fabric. The S2 is a predominant structure, steeply dipping to the SE and bearing stretching and mineral lineation plunging to the SW. The whole sequence is overprinted by late compressional kink-bands indicating an E-W stress orientation. The leucogranite intrusion in footwall of the Slatvina Formation is almost undeformed showing only a weak magmatic fabric. The uppermost part of the intrusion is characterized by finger-like dikes and sills crosscutting the original metamorphic fabric. These dikes indicate coeval magma intrusion with development of S2 cleavage and also with contact metamorphism. The degree of leucogranite deformation increases towards the underlying Vepor basement gneisses. Here, the transition from magmatic to solid state deformation is manifested by narrow shear zones indicating sinistral sense of shear.

The preliminary AMS data show homogeneously developed subhorizontal magnetic lineation and mostly steep magnetic foliation. The intrusion shows very low degree of anisotropy and mostly oblate character of magnetic ellipsoid. Structural and AMS

analyses reveal that magmatic fabrics and sub-solidus shear zones are geometrically consistent with late D2 oblique transpression. Importantly, the structures and magnetic fabrics in the Vepor basement are discordant with respect to those developed in leucogranite and the Slatvina Formation.

The U-Pb zircon dating (laser ablation ICPMS) of the basement gneisses gave a concordia age of 551 ± 17 Ma (2 sigma), while the zircons from the leucogranite yield an age of 395 ± 8 Ma. We suggest that the latter event represents the age of the protolith, which the leucogranite was derived from. Alternatively, if the leucogranite originated by melting of sedimentary rocks, the early Devonian age would correspond to zircon crystallization in the source of the sediments. In either case, the U-Pb zircon age of 395 ± 8 Ma corresponds to the maximum age of the protolith that contributed to the leucogranite melt. However, the age of magmatic crystallization of the leucogranite still remains to be established.

Despite the fact that the age of granite was not determined to be Cretaceous using the U-Pb method, the structural discontinuity between the Vepor basement and the overlying granite and Carboniferous cover indicate also temporal difference in structural records. The coherency of leucogranite internal fabrics with D2 transpressional deformation affecting also Mesozoic rocks may still indicate its Cretaceous age of emplacement. We hope that the Ar-Ar dating currently in progress will help to clarify this problem.

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Successive Intrusion of Three Calc-Alkaline Granites during Oblique Transtension: Central Part of the Vosges (NE France)

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The studied area is situated in the central (Moldanubien) part of the Vosges (NE France). Successive intrusion of three calc-alkaline granites, (the Thannenkirch granite, the Brezouard gran-

ite and the Bilstein granite) separating medium-pressure rocks to the north from low-pressure anatectic crust to the south, was investigated. Based on AMS data and detailed structural analy-