STRUCTURAL CONTROLS OF FLUID MOBILIZATION PROCESSES CONNECTED TO THE VARISCAN AND ALPINE IGNEOUS ACTIVITY IN THE VELENCE MTS. (WESTERN HUNGARY) ON THE BASIS OF STUDIES OF FLUID INCLUSION PLANES

BENKÓ, Zs. & MOLNÁR, F.
Department of Mineralogy, Eötvös Loránd University, Pázmány Péter sétány 1/C, H-1117 Budapest, Hungary.
E-mail: molnar@abyss.elte.hu

The Velence Mts. is a part of a largely covered NE–SW oriented belt that consists of Variscan granitoid intrusions and Palaeogene andesitic-dioritic intrusive and volcanic complexes (among other sedimentary and metamorphic rocks) along the southern margin of a crustal unit that has been escaped from the Alpean collision zone due to north-east-oriented lateral movements of Neogene age. In the area of the Velence Mts., both Variscan and Alpine igneous rocks are strongly mineralized and there are field, mineralogical-geochemical, as well as fluid inclusion evidences of the interaction of the Palaeogene hydrothermal system with the granitoid intrusion that has already been mineralised during the Variscan post-magmatic activity. Fluid inclusion studies on granite-related pegmatite, quartz-molybdenite stockwork and base-metal bearing vein-filling mineralization as well as on the porphyry-copper and high-sulphidation type epithermal mineralization connected to the emplacement of intrusions and volcanic rocks of Palaeogene age revealed significant differences in chemical and phase compositions of fluids of these various hydrothermal systems (MOLNÁR *et al.*, 1995; MOLNÁR, 1996, 1997). In the eastern part of the Velence Mts., there are small intrusions and dikes of Palaeogene age that intrude into the old granite, and outcrops and quarries excellently expose their tectonised and hydrothermally altered zones. Fracturation of granitic rocks and type of fluids that circulated along fractures can be reconstructed on the basis of orientation (dip direction and dip angle) measurements and microthermometric analyses of secondary planes of fluid inclusion assemblages in rock-forming quartz together with the evaluation of field observations on joints and faults.

The tectonic regime at the time of the emplacement of the Variscan intrusion is characterized by the orientation aplite and granite-porphyry dikes which is NE–SW in the recent position of the granite. Analyses of field data and data of fluid inclusion planes revealed that the high temperature (400–600°C at 2 kbar pressure) and relatively dilute early magmatic fluids of the Variscan system circulated along fractures that have N–S strike-direction and were developed due to a N–S oriented compression. The late Variscan fluids with carbonic-aqueous composition (300–400 °C at 1.5–2.5 kbars pressure) were channelled by NW–SE oriented fractures.

The Palaeogene fluids circulated under low pressure conditions (20–300 bars) that resulted in their boiling. Two stages of Palaeogene hydrothermal fluid circulation that affected the Variscan granite have been recognised. The older Palaeogene fluid circulation event took place mostly along E-W oriented fractures and it was associated with intense illitic alteration of granite. These fluids are characterized by about 250°C temperature and low salinities. The second phase of Palaeogene fluid mobilization may be connected to a second generation of intermediate intrusions. This phase of fluid circulation was connected to a NW–SE oriented shear-zone and is characterised by the occurrence of high temperature (around 400°C) and low salinity, as well as low-temperature (around 250–300°C) and low and high salinity hydrothermal solutions.

The post-Palaeogene fracturation of granite is characterized by NE–SW orientation of joints and can be connected to the NE-oriented large scale lateral movements of Neogene age. A second generation of young open fractures is NW–SE oriented and they can be connected to the recent-subrecent stress field of the Pannonian Basin.

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