

Jacek PUZIEWICZ¹, Vladimír ŽÁČEK²

THE EASTERN PART OF THE ŽULOVÁ PLUTON (NE BOHEMIAN MASSIF): A REVIEW

The Žulová Pluton (Fig. 1) is located at the south-eastern part of the Fore-Sudetic Block (NE Bohemian Massif). It consists of granitoids varying in composition from the two-mica granites through the biotite granites and granodiorites to subordinate tonalites. The age of granites was determined at 305 Ma (Novák et al. in press). They are considered to be the ilmenite-allanite I-type granitoids (Zachovalová et al. 2002). Northern edge of the Pluton is located in Poland, whereas the main part belongs to the Czech Republic. Since the description of Scharff (1920) no complete study of the Pluton was presented. In this paper we show a short review of geological and petrological data on the Pluton and its eastern cover.

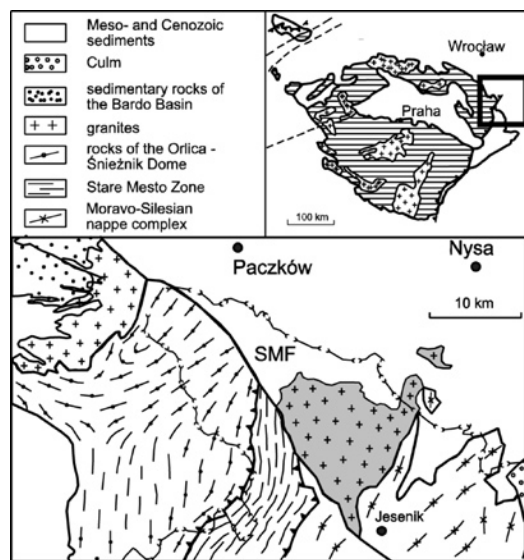


Fig. 1. Location of the Žulová Pluton at the eastern part of Fore-Sudetic Block. SMF = Sudetic marginal Fault

Granitoids (crosses) and metamorphic basement (lines) are marked at the inset.

The granitoids outcrop is relatively large, but northern and western parts the Pluton are covered by Tertiary and Quaternary sediments (Fig. 2). The granitoids and their cover rocks are exposed at the surface in a NNE-SSW trending zone forming the eastern part of the Pluton. Numerous roof pendants as well as contacts with the roof rocks demonstra-

te that apical parts of the pluton are exposed. The relationships among various granitoid varieties indicate that they were formed by multiple injections of magma of varying composition (Puziewicz 1999).

¹Institute of Geological Sciences, University of Wrocław, Cybulskiego 30, 50-205 Wrocław, Poland;

jpuz@ing.uni.wroc.pl

²Czech Geological Survey, Klarov 3, 118 21 Praha, Czech Republic; zacek@cgu.cz

Gneisses, amphibolites and quartzites of the cover occur in NNE-SSW trending zones (Fig. 2). They are considered to be Devonian sedimentary and volcanic rocks metamorphosed before the Pluton emplacement, and to be an equivalent of the Vrbno Series, which is situated to the south of the Sudetic Marginal Fault (Cháb and Žáček 1994). Large asymmetrical megasyncline with closure situated at Jeseník dominates the structure of the cover. The intrusion of granitoid magmas led to metamorphism and refoliation of adjoining rocks in the stability field of sillimanite and cordierite (Souček 1978, Cháb and Žáček 1994). Two belts of steep foliation paralleling the contour of the Žulová Pluton overprint the pre-plutonic foliations (Cháb and Žáček 1994).

The gneisses vary in structure, layered to stromatic migmatitic varieties are common close to the contact with the Pluton. They are accompanied by subordinate high-grade mica schists. Garnet-biotite-sillimanite paragneisses and garnet-sillimanite-cordierite-K-feldspar migmatites are most common.

Cháb and Žáček (1994) concluded that the feldspar quartzites adjoining the gneisses share the metamorphic grade of the latter. The quartzites are rich in feldspars (K-feldspar and smaller amounts of plagioclase) and their sedimentary fabric is usually obliterated. Detailed microscope and BSE microprobe study enabled to recognize the primary detrital grains and matrix containing metamorphic mineral assemblage: albitic plagioclase, pumpellyite, actinolite/ferroactinolite, chlorite, muscovite, clinozoisite, titanite and graphite (Puziewicz et al. 2003). This mineral assemblage is characteristic of pumpellyite-actinolite facies. In the opinion of Puziewicz et al. (2003) the quartzites contain no minerals characteristic of higher-grade metamorphism, and belong to the pumpellyite-actinolite facies. Thus, two different views on the metamorphic grade of the quartzites exist.

The amphibolites of the Žulová Pluton cover are a part of larger amphibolite mass, termed the Jeseník amphibolitic massif. The amphibolites occurring in the cover usually overly the quartzites (Jelínek and Souček 1981). Volcanic-sedimentary rocks with significant carbonate content were the protolith of the amphibolites. Typically the amphibolites occurring in the cover of the Žulová Pluton are layered and consist of amphibolite and calc-silicate layers. The amphibolite layers are composed of hornblende with subordinate plagioclase of highly variable composition (An₈₅ – An₃₁), quartz, chlorite and accessory titanite and ilmenite; locally clinozoisite-epidote and pumpellyite occur (Olejniczak 2002). The calc-silicate layers consist of diopside, plagioclase of highly variable composition (An₆₄ – An₉), acicular amphibole, chlorite, accessory ilmenite and locally prehnite and K-feldspar (Olejniczak 2002). The zoning patterns of amphibole and plagioclase vary from place to place (Olejniczak 2002). Mineral assemblages of amphibolites as well as zoning patterns were strongly dependent on local variations in water activity, analogically to the example shown by Puziewicz and Olejniczak (2001).

Numerous dikes of barren pegmatite of simple mineral composition (quartz, plagioclase, K-feldspar, biotite) with rare sillimanite, tourmaline and garnet occur in the cover of the Žulová Pluton. Isolated inhomogenous coarse-grained pegmatitic granite dikes and stocks contain abundant accessory garnet and locally muscovite. Lenses of

marble occur between Pisečná and Velké Kunětice. The small occurrences of calc-silicate rocks are known for their museum-class specimens of grossular garnet and vesuvianite.

THE FIELD TRIP

The intention of the field trip is to show a full cross section of the eastern cover of the Žulová Pluton. We will visit the apical parts of the pluton and their cover gneisses in the Kamienna Góra quarry first. This point will show the relationships of the granites to the gneisses as well as the characteristic features of the gneisses occurring at the contact with the granites. The quartzites follow the gneisses eastwards of the granites, and we will visit the quartzites at the Kamenny vrch, which contain well formed and complete mineral assemblage indicative of pumpellyite-actinolite facies. If time allows, we will visit another quartzite exposure in the Lubina stream valley, to demonstrate the calc-silicate diopside-bearing veins in the quartzites. Finally, we will visit the Bukovice quarry. Amphibolites, occurring next to the quartzites, are exposed here. This point will demonstrate the amphibolites typical of the Žulová Pluton cover.

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