Nature, tectonic setting and likely origin of the Paleoproterozoic (~2.1 Ga) Světlík orthogneisses (southern Bohemia)

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The growing database of *in situ* zircon data from the core of the Variscan orogen in the Bohemian Massif indicates a major role for recycling of a component c. 2.1 Ga old, corresponding to a magmatic event widespread in the northern part of Gondwana and related terranes (e.g., Eburnean basement of the West African Craton or Icartian Gneiss of the North Armorican Massif, France).

This component appears as inheritance in metaigneous rocks of the Moldanubian Zone, including the HP felsic granulites (e.g. Friedl et al., 2004), as well as in some Variscan plutonites, e.g., in the Central Bohemian Plutonic Complex (Janoušek et al., 2010). Eburnean ages form also a common part of the zircon age spectra in metasediments of the Moldanubian (Kröner et al., 1988) as well as Teplá–Barrandian zones (Drost et al., 2004; Strnad and Mihaljevič, 2005).

However, the outcrops of the Eburnean basement are extremely rare, being confined to allochthonous tectonic slices at the base of the Varied Group. The only region where they have been found and dated, is the surrounding of Muckov and Rájov in southern Bohemia (Wendt et al., 1993). The aim of the current work is to document the petrology and geochemical variability of these Paleoproterozoic orthogneisses known collectively as "Světlík orthogneiss". Granite members of the suite are studied for the first time.

The new SHRIMP dating of a Bt–Amp quartz dioritic gneiss from Rájov yielded an average $^{207}Pb/^{206}Pb$ age of 2 088.6 ± 4.3 Ma, which is in good agreement with previous zircon datings by Kröner et al. (1988) and Wendt et al. (1993): 2 048 ± 12 (conventional U–Pb age, U. I.), 2 060 ± 12 Ma, 2 104 ± 1 Ma and 2 061 ± 6 Ma (Pb–Pb evaporation). Any inherited components are lacking.

The petrological and geochemical studies have shown that the protoliths to amphibolite-grade orthogneisses were rather sodic, meta- to subaluminous quartz diorites–granites (SiO_2 ~ 60–74 wt.%). The NMORB-normalized spiderplots are characterized by a strong enrichment of LILE over HFSE, and conspicuous Nb–Ti anomalies, typical of magmas derived at active continental margins. Alternatively, such signatures may originate during continental collision, by anatexis of the older (arc-derived) crust. The chondrite-normalized REE patterns are steep, showing strong LREE/ HREE enrichments (LaN/YbN = 2.3–57) and variable magnitude of Eu anomaly (Eu/Eu* = 0.3–1.7).

The two-stage depleted mantle Nd model ages range from 1.8 to 3.4 Ga and show a crude positive correlation with differentiation indexes, such as SiO_2. This provides a strong evidence for two magmatic sources, one with composition close to the Paleoproterozoic depleted mantle, and the other mature crustal, most likely Archaean, as indicated by Nd model ages near 3 Ga.

This study was supported by the Internal Grant of Czech Geological Survey 329000.

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