

RELICS OF A LATE DEVONIAN MAGMATIC ARC IN THE MOLDANUBIAN ZONE

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Calc-alkaline intrusions of Late Devonian–Early Carboniferous age occur in the Moldanubian Zone of the Bohemian Massif, and in particular at its contact with the Teplá-Barrandian Zone. They are mainly of tonalitic composition; mafic microgranular enclaves, as well as larger, variously hybrid, mafic bodies are abundant. While the most typical representants are from the Sázava suite in the Central Bohemian Pluton (354.1 ± 3.5 Ma: JANOUSEK et al., 2004) and slightly older orthogneisses in the roof of the pluton (373 ± 5 Ma, 365 ± 5 Ma: KOSLER et al., 1993) tonalitic rocks in the S part of the Nasavrky Pluton probably also belong to this association (HROUDA et al., 1999; no reliable dating available). Moreover, geochemically similar and nearly contemporaneous calc-alkaline intrusions can be traced to the west, with the occurrences spanning much of the European Variscan belt (Schwarzwald, Odenwald, Voges and Limousin in the French Massif Central; see FINGER, et al., 1997 for a review). All these rocks show a chemical signature compatible with an origin in a magmatic arc setting.

A newly identified member of this calc-alkaline association are mafic granulites from the Lisov Massif (N of České Budějovice, S Bohemia), which show some important differences to the other Moldanubian granulites; most importantly they do not show evidence of HP–HT metamorphism only yielding 800–900 °C, 5–6 kbar. According to LA–ICP–MS U–Pb dating of abundant zircons with well-preserved magmatic zoning (CL), the protolith of the mafic (quartz dioritic–tonalitic) granulites crystallized at 361.3 ± 2.4 Ma (2σ). Metamorphically modified zircon grains with blurred primary zones, convoluted zoning, or rare metamorphic overgrowths, gave an age of 337.0 ± 2.8 Ma. The latter is in accordance with the well-established timing of high-grade metamorphism in other Moldanubian granulite massifs (O'BRIEN & RÖTZLER, 2001).

The mafic Lisov granulites are thought to have originated by a Visean metamorphic overprint of metaluminous, medium–K calc–alkaline plutonic rocks that formed in the mid-crustal root of a Late Devonian magmatic arc. A similar configuration has been described from a Cretaceous magmatic arc in the Sierra Nevada (SALEEBY, et al. 2003 and references therein).

References

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