Petrology, Geochemistry and Palaeotectonic Setting of Metavolcanic Rocks at the Teplá–Barrandian—Moldanubian Boundary: Evidence from the NE Part of the Islet Zone, Central Bohemian Pluton

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The Islet Zone (IZ) is a belt, several km wide and *c.* 85 km long, of Late Proterozoic-Early Palaeozoic volcanosedimentary rocks preserved as roof pendants of the Variscan Central Bohemian Pluton (CBP). It occurs at the boundary between two contrasting crustal segments (terranes) — Moldanubicum s.s. and Teplá-Barrandian — that is obscured by the intrusion of the CBP. Hence their relationship has been a matter of a long-lasting debate (Zelenka 1929, Kettner 1930, Suk 1973, Chlupáč 1988, Kachlík 1992). Recent investigations in the NE part of the IZ suggest that, in spite of several differences, close correlation between the IZ and the Teplá-Barrandian terrane is possible on the basis of the facies development and geochemistry of Proterozoic-Early Palaeozoic sedimentary sequences (see Chlupáč 1988, Kachlík 1992 for details). However, additional important information on pre-Variscan development comes from study of metavolcanic rocks.

The metavolcanic rocks occur most frequently in two stratigraphic levels: (a) in the lower part of the Late Proterozoic Svrchnice Formation (Chlupáč 1981) in the Sedlčany-Krásná Hora (SK) islet and its equivalents in the Netvořice-Neveklov (NN), Čerčany and S part of the Ondřejov islets; (b) in the supposed Cambrian in the W part of the NN islet (Kachlík 1992). In addition, scarce (subvolcanic?) basaltic dykes, acid metarhyolites and volcaniclastic rocks occuring near the base of the Ordovician in the SK and Tehov islets document subordinate volcanic activity recorded elsewhere in the IZ at various stratigraphic levels.

The basaltic dykes cut palaeontologically confirmed Ordovician sediments of the Tehov islet and some of them were subjected to contact metamorphism by the CBP. The age of metarhyolites is difficult to constrain without radiometric dating.

The Proterozoic volcanism is represented by bimodal volcanic suite, in which basaltic members prevail. Metabasalts to basaltic andesites were predominantly massive lavas. Tuffs, tuffites and mixed volcano-sedimentary rocks occur near the transition of metavolcanic rocks to metasedimentary member of the Svrchnice Formation; acid metavolcanites crop out mainly in the E part of the NN islet and, to a lesser extent, in the SK islet.

Originally very fine-grained to glassy lavas with pyroxene phenocrysts up to 1 cm across represent geochemically primitive Mg-rich boninitic to picritic magmas derived from depleted mantle source. They show characteristic features of high-Ca bonititic suites: low SiO_2 (48–50 %), $Na_2O + K_2O$ <1 %, CaO/Al_2O_3 >0.7 and U-shaped REE patterns (cf. Rogers et al. 1989). They grade into tholeiitic low-Ti basalts or basaltic andesites. Major- and trace-element chemistry is locally strongly influenced by high element mobility during Variscan shearing. Associated Na-rich rhyodacites and rhyolites represent more evolved lavas typical of island arc setting. Indeed, both the geochemical character of the whole suite and its spatial association with flysch sediments point to an arc-type setting, likewise in the Jílové belt (Waldhausrová 1984, Fediuk 1992).

Supposed Cambrian volcanics (they occur in the hangingwall of the Štěchovice Group at the W margin of the NN islet) differ from the Late Proterozoic volcanics in several aspects: (a) they are associated with shallow-water sediments (sandstones, conglomeratic sandstones), (b) amygdaloidal lavas suggest very shallow-water to ?subaerial environment, (c) acid members (rhyolites, rhyodacites and Na-trachytes) prevail strongly over basaltic andesites. Geochemically, acid rocks represent more evolved magmas enriched in alkalies, LREE and incompatible elements. They may reflect transition from convergent to extensional setting.

Basaltic dykes of unknown (? Ordovician–Devonian) age differ from Proterozoic basaltic rocks by lower SiO_2 (45–51 %) and higher TiO_2. The contents of alkalies are very low; flat REE patterns are comparable to the recent MORB basalts. Also the metarhyolites of unknown age represent a separate group in which - in contrast to the Proterozoic and Cambrian acid volcanics - potassium prevails over sodium.

Geochemistry of metavolcanic rocks from the NE part of the Islet Zone suggests a change from convergent arc to extensional geotectonic setting in Precambrian to Cambrian times. The acid volcanism waned out at the beginning of the Ordovician. The younger (? Ordovician–Devonian) tholeiitic basaltic volcanism reflects probably - in contrast to the Prague Basin - only a minor crustal extension and this is in line with the assumed contemporaneous slow subsidence in the Islet Zone.

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