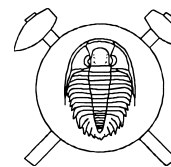


## Proterozoic and Palaeozoic crustal components across the East/Central Sudetes boundary at the eastern margin of the Bohemian Massif: new U/Pb and Pb/Pb single zircon ages from the eastern Fore-Sudetic block (SW Poland)

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The boundary between the eastern and central Sudetes lies within a Variscan collision zone at the eastern margin of the Bohemian Massif that separates the Brunovistulian domain to the east from the units consisting of the Moldanubian and the West and Central Sudetic (Lugian) domains to the west (Matte *et al.* 1990; Schulmann – Gayer 2000). Early Carboniferous collision followed on westward subduction of the Brunovistulian passive margin below the Moldanubian and Central Sudetic domains. This collision resulted in large-scale eastward thrusting of the latter domains over nappe complexes of the Brunovistulian lower plate (e.g. Suess 1912; Matte *et al.* 1990; Schulmann – Gayer 2000). The East Sudetic nappes consist of medium-grade Neoproterozoic crust, partly reworked during the Variscan event, and folded together with its metamorphic Devonian and early Carboniferous cover. These rocks were overridden from the west by the mostly ca. 500 Ma old Orlica-Snieznik and Staré Město metaigneous complexes.

The terrane boundary between the East and Central Sudetes, which probably separates the Armorican units from the Brunovistulian terrane, is supposed to continue to the north into the Fore-Sudetic block. The latter comprises isolated outcrops of crystalline basement, often of uncertain affinity and emerging from beneath the Cenozoic sedimentary cover. The largest basement outcrop in the eastern part of the Fore-Sudetic block is the Strzelin crystalline massif. It shows an overall similarity to the basement of the Desná Dome in Czech Republic, in containing both quartzites of imprecisely constrained Devonian age and Neoproterozoic orthogneisses dated at 600–570 Ma (Oberc-Dziedzic *et al.* 2001). The Neoproterozoic rocks are interlayered with minor early Palaeozoic orthogneisses dated at 504 ± 3 Ma (Oliver *et al.* 1993).

In order to explain the still ambiguous relationships between the Proterozoic and Palaeozoic crustal domains in the eastern Fore-Sudetic block, we undertook reconnaissance zircon dating, using the single grain evaporation method, on rocks along a roughly W-E profile, i.e. perpendicular to the presumed East/Central Sudetes boundary. Our preliminary results come from four orthogneiss localities, representing from west to east: (1) the Doboszowice augen-gneiss; (2) the Gościęcice augen gneiss; (3) the Skalice migmatitic gneiss and (4) the Maciejowice granite-gneiss.

The Doboszowice granitic gneiss forms a small outcrop accompanied in the east by minor paragneisses and amphibolites. Its western position, relative to the other studied gneiss bodies, suggests an affinity with the Central Sudetic domain. However, the emplacement age of 380 ± 1 Ma seems to be unique at the scale of the entire Sudetes. This is even more interesting in the context of the syn-collisional geochemical signature of this rock (Hanzl *et al.* 1998). We therefore suggest that the Doboszowice intrusion resulted from late Devonian collision, the products of which have so far not been recognized in the Central Sudetes. A geodynamic framework of this collision still remains unclear. A zircon xenocryst dated at 592 Ma may suggest extraction of the magmatic precursor to the Doboszowice gneiss from a Neoproterozoic basement.

Both the Gościęcice and Skalice orthogneisses are fragments of the Strzelin crystalline massif. The Gościęcice gneiss yielded the age of 513 ± 1 Ma, analogous to that previously obtained by Oliver *et al.* (1993) for the same rock type. The minimum ages of several zircon xenocrysts range between 1096 and 1301 Ma. A distinct age was obtained for the Skalice migmatitic gneiss. Six zircons derived from this rock yielded a mean age of 1020 ± 1 Ma, and abundant xenocrysts vary in age between 1135 and 1767 Ma.

The Maciejowice granite-gneiss represents a small outcrop intruded by a Variscan granite and surrounded by Cenozoic sediments. Its position is far east from the other studied gneisses and the gneiss has therefore consistently been correlated in the past with the East Sudetic domain. Surprisingly, the Maciejowice gneiss yielded an age of 501 ± 1 Ma (xenocryst age of 1694 Ma), identical to that of the Orlica-Snieznik orthogneisses in the Central Sudetes (Lugian domain).

The age of the Skalice migmatitic gneiss demonstrates that Proterozoic basement underlies an extensive area in the eastern Fore-Sudetic Block. Its presence is in accord with the SHRIMP data of Oberc-Dziedzic *et al.* (2001), though no similar Grenvillian ages were reported by these authors from another gneiss variety. Surprisingly, the distribution of the early Palaeozoic (ca. 500 Ma), apparently minor orthogneiss bodies in the eastern Fore-Sudetic block does not support a clear division between early Palaeozoic gneisses of the West and Central Sudetes and the Proterozoic gneissic basement in the East Sudetes.

Thus, the diversity of protolith ages determined for the gneisses adjacent to the supposed East/Central Sudetes boundary in the Fore-Sudetic block does not help to delineate this boundary. The new situation may be explained in two alternative ways:

(1) The tectonic contact between the East and Central Sudetes across the Fore-Sudetic block is more complicated than previously expected or

(2) Early Palaeozoic (c. 500 Ma) granitoid magmatism was also active along the western margin of the Brunovistulian terrane and, consequently, caution must be used when developing tectonic models referring to protolith ages at the eastern margin of the Bohemian Massif.

Apart from the emplacement ages summarized above, abundant zircon xenocrysts in all dated rocks, except for the Doboszowice orthogneiss, clearly indicate derivation of the gneiss protoliths from Mesoproterozoic sources, comparable to those found within the Brunovistulian and Avalonian terranes.

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