

Cooling history of the Brunovistulian Microcontinent (BVM; Central Europe): Insights from the $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology

SIMONA KRMÍČKOVÁ^{1,2}, MARTIN JAN TIMMERMAN³,
 LUKÁŠ KRMÍČEK^{1,2,4} AND MASAFUMI SUDO³

¹Czech Academy of Sciences

²Faculty of Science, Masaryk University

³Faculty of Science, University of Potsdam

⁴Brno University of Technology, Faculty of Civil Engineering

The crystalline basement of the BVM in the eastern part of the Variscan orogen is predominantly exposed as the Brno Batholith, but extends covered by sediments from the Weinviertel area (Austria) to the Odra–Kraków–Lubliniec Fault Zone (Poland). It is subdivided into the Ediacaran age Thaya, Slavkov (SD) and Upper Silesia (USD) domains, and the Tonian Metavolcanic and Cryogenian Metadiorite zones.

In order to determine the cooling history of the BVM, $^{40}\text{Ar}/^{39}\text{Ar}$ step heating dating was carried out on amphiboles and micas from igneous rocks of the Brno Batholith and micas from metapelites and orthogneisses from drill cores of the SD, USD and the Weinviertel area. Micas from the Weinviertel area yielded Variscan 325–314 Ma ages that agree with published ~325 Ma monazite ages [1], showing that the BVM ends at the NE-trending Diendorf–Boskovice fault. The strongly reworked part to its S may be a part of the Moravo-Silesian collision zone that was offset ~60 km to the NE in the Permo-Carboniferous [2].

Slavkov Domain undeformed arc granitoids have overlapping ~600 Ma cooling and published U–Pb zircon ages reflecting magma intrusion and crystallization during buoyancy induced uplift and cooling triggered by slab failure in the mid-Ediacaran.

Micas from amphibolite-facies accretionary wedge metasediments of the SD and the USD yielded much younger ages of ~550 (locally 535–520) Ma overlapping published 555–540 Ma protolith deposition ages. Hence, sedimentation in a fore-arc setting, accretion, amphibolite-facies metamorphism, uplift and cooling occurred within a short time, reflecting a very dynamic setting at the Ediacaran-Cambrian boundary. Furthermore, Early Cambrian sandstones overlying the USD contain ~540–565 Ma detrital white micas [3] that must have been derived from this part of the BVM. Moreover, ~535–545 Ma detrital white micas in the Holy Cross Mts. of the Małopolska Block [3], if BVM-derived, may date docking of the BVM to Baltica.

[1] Büttner & Finger (1999), *Arbeitstagung Geologische Bundesanstalt 1999*, 17–22.

[2] Finger, Hanžl, Pin, Von Quadt & Steyrer (2000), *Geological Society, London, Special Publications* 179, 103–112.

[3] Belka, Ahrendt, Franke & Wemmer (2000), *Geological Society, London, Special Publications* 179, 87–102.

