

## PB–PB AND U–PB ZIRCON AGES FOR ORTHOGNEISSES FROM EASTERN BOHEMIA: FURTHER EVIDENCE FOR A MAJOR CAMBRO–ORDOVICIAN MAGMATIC EVENT

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Granitoid gneisses make up a major part of the Jizerské Hory, Krkonoše, Orlické Hory and Jeseníky Mts. in the eastern Czech Republic and extend in a broad zone between the Elbe lineament and the Intra–Sudetic fault from Lusatia in the NW to the Moravo–Silesian in the SE. We have dated a variety of gneisses from this region, using the single grain zircon evaporation method and the vapour digestion technique. Previous authors (1,2) reported Rb–Sr whole rock and U–Pb zircon ages between ~460 Ma and ~505 Ma for similar orthogneisses from southern Poland and ascribed these to a major Caledonian event.

The zircon populations of virtually all samples analyzed by us are isotopically unusually heterogeneous, in spite of similar morphologies, and contain a large number of inherited xenocrysts, attesting to the S–type character of most of the gneisses. The Jizera Gneiss was sampled in the area around Frýdlant, N of Liberec, and a coarse, strongly foliated variety yielded a reproducible <sup>207</sup>Pb/<sup>206</sup>Pb age of 515±8 Ma which we interpret as the time of original granite emplacement. Xenocrysts range in age from 546 to 1105 Ma. A porphyritic variety of the gneiss (augengneiss) yielded a <sup>207</sup>Pb/<sup>206</sup>Pb age of 504±10 Ma with xenocrysts ranging from 846 to 1707 Ma. These ages compare well with an (assumed) age of 505 Ma reported by Oliver et al.. We interpret the Rb–Sr age of 462±15 Ma (1) on mylonitized Jizera gneiss as reflecting a major pre–Variscan tectono–metamorphic event.

Granitoid gneisses of the Krkonoše Mts. collected at Bedřichov, Vrchlabí and Horní Maršov are compositionally similar to the Jizera Gneiss and yielded comparable emplacement ages between ~490 and 509 Ma. These rocks also contain xenocrysts as old as 2070 Ma. The age of the strongly foliated Kowary gneiss exposed on the Polish side has been estimated to be between 481 and 492 Ma (2), virtually identical to our results.

The two–mica granitoid gneisses in the Orlické hory Mts. consist of fine grained and coarse grained (augengneiss) varieties and are exposed in the core of what appears to be a major antiform. A sample of the fine–grained variety yielded a reproducible <sup>207</sup>Pb/<sup>206</sup>Pb age of 507±10 Ma, while the porphyritic (augengneiss) variety has an apparent emplacement age of 503±4 Ma. Both rock types also have xenocrysts as old as 1184±7 Ma. Zircons from a strongly foliated augengneiss from E of Králíky yielded a Concordia intercept age of 499±15 Ma.

Zircons from a wellfoliated granitoid gneiss with plagioclase porphyroblasts collected in the Desná Dome of the Jeseníky Mts. yielded an array of <sup>207</sup>Pb/<sup>206</sup>Pb ages between 507±11 and 1019±16 Ma of which we interpret the youngest to reflect the time of granitoid emplacement.

We conclude from our zircon data that the granitoids exposed from the Jizerské hory Mts. to the Jeseníky Mts. constitute a major Cambro–Ordovician magmatic province which also includes the Sniežnik and Strzelin gneisses in southern Poland, dated at ~504 Ma (2). This province is distinct from the Lusatian granitoid terrain where emplacement ages are between ~550 and 580 Ma (3), and seems to have experienced its main deformation and metamorphism during a Caledonian event, possibly during closure of the Tornquist Ocean.

### References

1. Borkowska, M. – Hameurt, J. – Vidal, P. (1980): Origin and age of Ižera gneisses and Rumburk Granites in W. Sudetes. *Acta Geol. Polonica*, 30, 121–146.
2. Oliver, G.J.H. – Corfu, F. – Krogh, T.E. (1993): U–Pb ages from SW Poland: evidence for a Caledonian suture zone between Baltica and Gondwana. *J. geol. Soc. Lond.*, 150, 355–369.
3. Kröner, A. – Hegner, E. – Hammer, J. – Haase, G. – Bielicki, K.–H. – Krauß, M. – Eidam, J. (1994): Geochronology and Nd–Sr systematics of Lusatian granitoids: Significance for the evolution of the Variscan orogen in east–central Europe. *Geol. Rundschau*, in press.