

**A new U-Pb baddeleyite age for the Ottfjället dolerite dyke swarm in the Scandinavian Caledonides – a minimum age for late Neoproterozoic glaciation in Baltica**

R. A. KUMPULAINEN <sup>1\*</sup>, M. A. HAMILTON <sup>2</sup>, U. SÖDERLUND <sup>3</sup>, AND J. P. NYSTUEN <sup>4</sup>

<sup>1</sup>*Dept Geol Sci, Stockholm Univ, SE-106 91 Stockholm, Sweden,*

*(\*correspondence: risto.kumpulainen@geo.su.se),*

<sup>2</sup>*Jack Satterly Geochron Lab, Dept Earth Sci, Univ of Toronto, Toronto, Canada, M5S 3B1,*

<sup>3</sup>*Dept Geol, Lund Univ, Sölvegatan 12, SE-223 62, Sweden, and*

<sup>4</sup>*Dept Geosci, Univ Oslo, N-0316 Oslo, Norway*

Emplacement of the Ottfjället mafic dyke swarm in the Swedish Caledonides has been related to the break-up of Rodinia and opening of the Iapetus ocean. The swarm represents part of the Baltoscandian Large Igneous Province, which has provided radiometric ages in the range of 605 to 665 Ma, including an Ar-Ar age on the Ottfjället dykes themselves. In Härjedalen and Jämtland, the Ottfjället dykes intrude the Tossåsfjället Group of the Särvi Nappes, which host glacial deposits of Neoproterozoic age. No fossils are found from the under- and overlying clastic units for a reliable age estimate for these glacial deposits. In order to constrain a minimum age for Neoproterozoic glaciation in Baltica, a coarse-grained dyke of the Ottfjället swarm was sampled from Häckelåsen in Härjedalen for U-Pb dating. Fine-grained baddeleyite from this sample is mostly near-concordant and define an emplacement and igneous crystallization age at 596 Ma.

This age determination, together with U-Pb ages for the Egersund dykes (616 ± 3 Ma; Bingen et al. 2005), and Sarek dykes of the Seve Nappes (608 ± 1 Ma; Svenningsen, 1994) may reflect a protracted 15-25 m.y. interval of extension and Laurentia-Baltica breakup. The Ottfjället mafic dyke age directly overlaps that of the dominantly basaltic Tayvallich volcanic complex of Scotland (595 ± 4 Ma, U-Pb zircon; Halliday et al., 1989), which likely erupted at the adjacent, conjugate Laurentian margin. All events likely record evolving early stages of an opening Iapetus ocean. The Ottfjället dyke age represents the first robust isotopic minimum age for late Neoproterozoic glaciation in Baltica.