

## **A-type magmatism associated with 2.44 Ga continental rifting: the Kynsijärvi granite, Koillismaa, eastern Finland**

<sup>1</sup>LANDÉN, L.S., <sup>2</sup>ILJINA, M., <sup>1</sup>RÄMÖ, O.T. and <sup>3</sup>MÄNTTÄRI, I.  
<sup>1</sup>Dept. of Geology, Univ. of Helsinki, Finland; Geol. Surv. of Finland, offices in <sup>2</sup>Rovaniemi and <sup>3</sup>Espoo

Kynsijärvi granite is a small (~5 km<sup>2</sup>) A-type granite pluton closely associated with the 2440 Ma Koillismaa Complex, one of the Paleoproterozoic mafic layered intrusion complexes of northern Finland associated with Paleoproterozoic rifting of the Fennoscandian Archean craton. In the Koillismaa area, these mafic and felsic intrusions were emplaced into Neoarchean (2900–2600 Ma) basement and stratigraphically underlie supra-crustal rocks of the Paleoproterozoic Kuusamo Schist Belt.

The Kynsijärvi granite is a medium-grained hypersolvus granite with mesoperthitic alkali feldspar, quartz, and amphibole as the major rock forming minerals. Biotite, magnetite, zircon, and fluorite are found in accessory amounts. The rock shows extensive subsolidus alteration.

Geochemically, the Kynsijärvi granite is A-type. It is characterized by high SiO<sub>2</sub> (70–72 wt%), total alkalis (~10 %), Ba (>700 ppm), Zr (>500 ppm), Ga (>30 ppm) and Nb (>40 ppm). Chondrite-normalized REE patterns are moderately enriched in LREE ([La/Yb]<sub>N</sub>=12.48) and show a negative Eu-anomaly (Eu/Eu\*=0.14). Rb/Sr is relatively low (<5), which indicates that the pluton crystallized from a relatively primitive silicic magma.

Four zircon fractions from the Kynsijärvi granite yield a U-Pb upper intercept age of 2442 ± 3 Ma. The initial ε<sub>Nd</sub> value for the pluton is -4.4 and T<sub>DM</sub> model age 2.93 Ga. This corresponds well to the evolution path of the surrounding Neoarchean crust but is distinct from the ~chondritic initial ratios of the associated mafic rocks. Accordingly, the Kynsijärvi granite was probably not comagmatic with the mafic intrusions.