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## Deciphering the Vássačorru Igneous Complex within the Seve Nappe Complex, Scandinavian Caledonides

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The Seve Nappe Complex (SNC) of the Scandinavian Caledonides comprises Neoproterozoic sedimentary and igneous rocks that experienced high-pressure metamorphism and deformation during subduction and exhumation. Fieldwork was conducted in the Kebnekaise region in northern Sweden, focusing on the Aurek metagabbro and the Vistas metaigneous rocks within the Vássačorru Igneous Complex (VIC), hosted within SNC metasediments. Field observations show that the Aurek metagabbro is locally sheared with well-defined foliation and lineation. In contrast, the Vistas metaigneous rocks, consisting of both granite and gabbro bodies, are only locally foliated. Furthermore, the granite is intruded by ENE-WSW striking dolerite and rhyolite dykes that parallel the local foliation, and are weakly deformed, whereas a NNE-SSW striking syenite dyke is observed in a portion of undeformed gabbro.

The Aurek metagabbro mineral assemblages consist of garnet, amphibole, plagioclase, biotite, chlorite, and pyroxene. The Vistas gabbro and dolerite dyke both consist of plagioclase, pyroxene, and amphibole. The Vistas granites and rhyolite dyke include quartz, feldspar, biotite, muscovite, ± garnet, and the syenite dyke contains feldspar, plagioclase, pyroxene, amphibole, quartz, and biotite. The Vistas metaigneous rocks generally show primary igneous assemblages.

Bulk rock chemistry shows that the Aurek and Vistas gabbros, and the Vistas dolerite dyke, are classified as tholeiites. For the Aurek gabbros, Th/Yb of 0.06-1.86 and Nb/Yb of 0.11-5.14 indicate that they have N-MORB to E-MORB compositions, with possible crustal input. The Vistas gabbro (Th/Yb of 0.09 and Nb/Yb of 1.15) and the dolerite dyke (Th/Yb of 0.12 and Nb/Yb of 0.66) also suggest such trend. The Vistas granites, rhyolite, and syenite dyke all have calc-alkaline composition. Trace elements confirm volcanic arc affinity for the granites and the syenite dyke (Nb: 3.1-5.9 ppm, Rb: 116.5-177.5 ppm, Y: 12.9-18.0 ppm, Ta: 0.3-0.4 ppm, Yb: 2.04-3.19 ppm), whereas the rhyolite dyke (Nb: 38.2 ppm, Rb: 247.8 ppm, Y: 72.6 ppm, Ta: 2.8 ppm and Yb: 12.62 ppm) reflects a within plate setting.

Combining the field relationship with geochemistry of the studied metaigneous rocks, we tentatively propose that the VIC is composed of three pulses of magmatism: (1) mafic MORB magmatism represented by the gabbros, emplaced in an extensional regime; (2) felsic calc-alkaline magmatism represented by granites and syenite, emplaced in an active continental margin

environment; and (3) bimodal within-plate magmatism or crustal assimilation in a volcanic arc represented by dolerite and rhyolite dykes. However, the only existing age is from U-Pb zircon dating of the Vistas granite, which yielded  $845 \pm 14$  Ma (Paulsson & Andreasson, 2002). Further zircon U-Pb geochronology will be conducted to obtain ages of the various lithologies of the VIC to better understand temporal relationships and to link the VIC with tectonic events in the Scandinavian Caledonides.

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#### References

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