



Detrital zircon age record of platformal and basinal Neoproterozoic sandstones from Varanger Peninsula, North Norway: a preliminary study

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Neoproterozoic to Cambrian sedimentary assemblages on Varanger Peninsula, northern Norway, are separated into platformal and basinal domains along the NW-SE-trending, Trollfjorden-Komagelva Fault Zone (TKFZ). Platformal successions southwest of the fault range from autochthonous to allochthonous (diagenesis to anchizone grade) and comprise the fluvial to shallow-marine Vadsø, Tanafjord and Vestertana groups. Northeast of the fault zone, basinal successions are allochthonous and of slightly higher metamorphic grade (epizone), and most have been involved in modest dextral strike-slip translation along the fault. They comprise the 9 km-thick Barents Sea Group, the unconformably overlying Løkvikfjellet Group, and the marginally higher-grade rocks of the Tanahorn Nappe.

In an ongoing detrital zircon provenance study of several formations from Varanger Peninsula and adjacent areas, we have carried out LA-ICP-MS, U-Pb analyses on five samples from four representative sandstone units. One formation, the Vendian, inter-tillite Nyborg Formation, is from south of the TKFZ, and two (Båsnæring and Sandfjord formations) from north of the fault. The fourth sandstone unit analysed is from the Berlevåg Formation in the Tanahorn Nappe. Preliminary results obtained from these formations show the following main features of the detrital zircon populations:

1. *Nyborg Formation*, Tanafjord Group (sample NY2): one group dominates the probability plot at 2.0-1.7 Ga with a minor spread of mostly discordant grains between 3.0 and 2.5 Ga.

2. *Båsnæring Formation, Barents Sea Group (BÅS1; two samples)*: a multimodal spread extends from c. 2.1 to 1.0 Ga with three peaks of concordant grains at around 1.80-1.65, 1.45-1.40 and 1.2-1.0 Ga, and subsidiary peaks at c. 2.0 and 2.9-2.6 Ga.
3. *Sandfjord Formation, Løkvikfjellet Group (SF2)*: two principal groups at 2.0-1.7 and 2.9-2.6 Ga with a subsidiary group ranging from 1.6 to c. 1.0 Ga.
4. *Berlevåg Formation, Tanahorn Nappe (BLV1)*: one major group at 1.9-1.7 Ga and a minor group at 2.9-2.6 Ga.

A feature common to all these analyses is the presence of a detrital population peak at c. 2.0-1.7 and a subsidiary peak at 2.9-2.6 Ga. From the known geological, stratigraphical and sedimentological picture, with palaeocurrent data indicating that detritus in both the pericratonic and basinal (submarine fan and deltaic) domains came largely from southerly source regions, this is consistent with derivation from the Fennoscandian Shield. Northern parts of this craton are dominated by Neoarchean complexes and, just to the south, also by terranes of Palaeoproterozoic age deformed during the 1.9-1.8 Ga Svecofennian orogeny. The fact that even the Berlevåg Formation (in a thrust sheet correlated with the Kalak Nappe Complex) shows these typically Baltican detrital populations is of special interest here.

An apparent anomaly in our data is seen in the subsidiary peaks ranging from c. 1.45 to c. 1.0 Ga in formations north of the TKFZ, in the dextrally translated, allochthonous basinal domain. Such Mesoproterozoic ages have hitherto not been reported from the exposed basement of this northern part of the Fennoscandian Shield, and could possibly be attributed to Laurentian sources. However, it is perfectly conceivable that rock complexes of Mesoproterozoic age (associated with Grenvillian magmatism) may be present in the **concealed** Baltican basement, i.e., beneath the Caledonian nappes and parts of the continental shelf, and thus provided some of the detritus in the fluvial to deltaic formations now forming the allochthon northeast of the TKFZ. An alternative interpretation would be that parts of the hidden pericraton beneath the nappes may belong to an exotic microcontinental block welded onto Baltica prior to the inception of Neoproterozoic basinal sedimentation.