



Magma-poor and magma-rich segments along the hyperextended, pre-Caledonian passive margin of Baltica

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The Scandinavian Caledonides constitute a more than 1850 km long ‘Himalayan-type’ orogen, formed by collision between Baltica-Avalonia and Laurentia. Subduction-related magmatism in the Iapetus ended at ~430 Ma and continental convergence continued for ~30 Myr until ~400 Ma. The collision produced a thick orogenic wedge comprising the stacked remnants of the rifted to hyperextended passive Baltican margin (Andersen et al. 2012), as well as suspect, composite and outboard terranes, which were successively emplaced as large-scale nappe complexes onto Baltica during the Scandian collision (see Corfu et al. 2014 for a recent review). Large parts (~800 km) of the mountain-belt in central Scandinavia, particularly in the Särvi and Seve Nappes and their counterparts in Troms, are characterised by spectacular dyke complexes emplaced into continental sediments (e.g. Svenningsen 2001, Hollocher et al. 2007). These constitute a magma-rich segment formed along the margin of Baltica or within hyperextended continental slivers outboard of Baltica. The intensity of the pre-Caledonian magmatism is comparable to that of the present NE-Atlantic and other volcanic passive margins. The volumes and available U-Pb ages of 610-597 Ma (Baird et al. 2014 and refs therein) suggest that the magmatism was short lived, intense and therefore compatible with a large igneous province (LIP). By analogy with present-day margins this LIP may have been associated with continental break-up and onset of sea-floor spreading. The remnants of the passive margin both north and south of the magma-rich segment have different architectures, and are almost devoid of rift/drift related magmatic rocks. Instead, these magma-poor segments are dominated by heterogeneous sediment-filled basins characterised by the abundant presence of solitary bodies of variably altered mantle peridotites, also commonly present as detrital serpentinites. These basins are interpreted to have formed by hyperextension. We suggest that the pre-Caledonian margin of Baltica underwent hyperextension until break-up, which was associated with emplacement of a LIP at ~600 Ma in the central segment.

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