



## **Hyperextension in the northern Caledonides: the Gargia nappe in Finnmark**

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Hyperextension stretches the lithosphere to the breaking point leading to the exhumation of serpentinitized upper mantle peridotites, and the development of sedimentary basins and tectonic melange. The products of such processes are well documented along recent passive margins and in the Alps. Melange defines also a prominent nappe units extending along the southern Scandinavian Caledonides, where it is interpreted as the product of extension during formation of Iapetus (Andersen et al. 2012). In western Finnmark, northern Norway, a melange-type assemblage with km-size serpentinite bodies embedded in various metasedimentary rocks, schists and mylonitic units occurs in the Gargia nappe. The nappe overlies an autochthonous basement suite of Early Paleoproterozoic basalts and associated sedimentary rocks and its Neoproterozoic sedimentary cover, including a tillite horizon. The Gargia nappe is itself overlain by the Kalak Nappe Complex, which in this region is composed mainly of psammites, likely deposited around 1000 Ma. The Kalak Nappe Complex contains the record of a multistage tectonic evolution with several episodes of magmatism and metamorphism between 900 and 550 Ma that paleogeographically do not fit the Archean to Paleoproterozoic evolution of the underlying autochthon of the Baltic Shield. Because of this recent new information, the postulation, in past decades, of an origin of the Kalak Nappe Complex from the Baltic margin has been problematic. The presence of exhumed mantle serpentinite bodies in the underlying Gargia Nappe, however, provides evidence for a truly allochthonous nature of the overlying nappes. The serpentinite mega-boudins of the Gargia Nappe are embedded in mica schists, hornblende schists, rare marbles, and mylonitic gneisses. Preliminary U-Pb geochronology indicates that the protoliths of the mylonitic gneisses are about 2830 Ma and probably were derived from the deformed basement gneisses, likely of Archean age, in the nappe. The time of extension is still uncertain and is presently under investigation.

Andersen T.B., Corfu F., Labrousse L. and Osmundsen P.T. 2012 Evidence for hyperextension along the pre-Caledonian margin of Baltica. *Journal of the Geological Society, London* 169: 601-612