Newly discovered record of garnet-facies peridotites in the Seve Nappe Complex – post-garnet kelyphite structures from Lejarfjället, Scandinavian Caledonides, Sweden

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Garnet-bearing ultramafic rocks of the Seve Nappe Complex of Jämtland have been known only from the two iconic localities, namely Frinigen and Stor Jougdan. Additionally, van Roermund *et al.* (2017) mentioned an occurrence of a retrogressed garnet peridotite ~10 km NE from Friningen. Here we report on newly discovered voluminous retrogressed garnet peridotites from Lejarfjället located NW of Friningen.

The studied peridotite is a foliated orthopyroxene-bearing dunite with post-garnet kelyphite structures up to 0.7 cm in diameter. Some of the garnet pseudomorphs preserve brittle deformation of the original garnet (Fig. 1B). Pressure shadows (at different stages of development) surround each post-garnet structure.

Kelyphites consist dominantly of amphibole (hornblende/pargasite), chlorite and a variety of Al-rich spinels. Within pseudomorphs, larger spinel grains (>20 μm) are usually zoned: in cores the Al_2O_3 content is ~30 wt%, increasing up to 60 wt% in the rim. In smaller grains (<20 μm) Al_2O_3 content typically exceeds 50 wt%. Pressure shadows around kelyphite consist of amphibole (hornblende/pargasite) or fine enstatite, often with Al-spinel grains and vary between single structures.

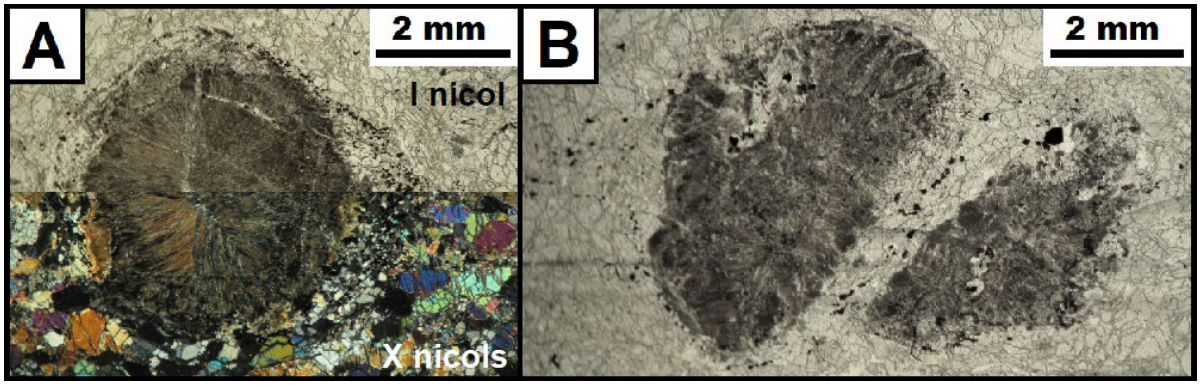

Figure 1 – Examples of post-garnet kelyphite microtextures.

Similar microtextures were reported from *e.g.* Beni-Bousera peridotite (Afiri *et al.,* 2011) and are interpreted as an early effect of decompression of garnet facies mantle domains through exhumation in lithospheric scale extensional shear zones. We conclude that Lejarfjället retrogressed garnet peridotites record similar process, however the original setting and timing remain an object of discussion.

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van Roermund, H.L.M., Majka, J., Janák, M., Klonowska, I., 2017. *Orogenic (spinel and garnet) peridotites and high and ultrahigh pressure rocks of the Seve Nappe Complex*. 12th International Eclogite Conference, Pre-conference excursion guide.

Afiri, A., Gueydan, F., Pitra, P., Essaifi, A., Précigout, J., 2011. Oligo-Miocene exhumation of the Beni-Bousera peridotite through a lithosphere-scale extensional shear zone. *Geodinamica Acta*, 24:1, p. 49-60, DOI: 10.3166/ga.24.49-60