

# LILLE RAIPAS COPPER-BEARING BRECCIAS: STRUCTURE AND ORIGIN (ALTA-KVAENANGEN TECTONIC WINDOW, NORTHERN NORWAY)

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Some new actual data on copper-bearing breccias on Lille Raipas have been obtained during the geological mapping fieldtrips of SPbSU's students in 2016-2017. The autochthonous rocks of Raipas Gr. compose the steep-dip to southwest limb of a asymmetric anticline. High-order folds with slowly dipping to the northeast axial planes complicate the anticline limb. The cleavage planes and low-amplitudes thrusts are observed along these axial planes. The rocks of Storviknes Fm. lie with disconformity on volcano-sedimentary sequences of Kvenvik Fm. that have relics of weathering crust at the top. In turn, shale-sandstone sequences of Skoadduvarry Fm. superpose the stepped paleo-relief composed by Storviknes dolomite with stromatolite replaced by silica. The copper-bearing breccias are widespread only within shale-dolomite sequences of the Storviknes Fm. Generally, breccia bodies orient across the Storviknes dolomite bedding (60-70°), and have a length of 250-380 m. The breccia bodies have wedge-like or irregular tree-branch shapes, at the bottom, they have slump folds. Their thickness increases up to 60 m to the top (123 m with sub-layer apophyses). In horizontal plane, the breccia bodies are observed with spaces of 260 and 420 m. The breccias consist of large (1-4, rarely 10-80 m) angular or sub-rounded fragments of Storviknes dolomite and small sharp-edged fragments of mudstones, cherts and chalcedony. The composition of breccia matrix is inhomogeneous: generally shaly and siliceous, sometimes consisted of hematite, copper sulfides and barite. Faults with accompanying copper mineralization can be traced through the Storviknes into the underlying Kvenvik Fm. The northeast-strike faults and high-order folds with ones trends observed in overlying Skoadduvarry and Bossekop Gr. They faults derived from initial Palaeoproterozoic faults with breccias. The origin of these high-order folds corresponds to the Caledonian thrusting and nappes moving. Thus, the copper-bearing breccias are the result of submarine fissures of hydrothermal vents along northeast Palaeoproterozoic faults. Formation of these breccias took place before the Skoadduvarry clay sequences sedimentation. The part of cupriferous ore bodies had been separated along slowly-dip thrusts during the Svekofennian folding, that had limited and displaced ore bodies at depth, as it is observed at the Raipas mine [Vokes, 1955] and on the Lille Raipas ridge surface [Vik, 1985]. The copper-bearing breccias and faults characterize a large tectonic stage; and, likely, expand further of the Lille Raipas area: similarly sequences breccias are traced in 14 km to the west from Lille Raipas, where they are observed on the Kåfjord orefield's southwest flank [Thomas, 1845].

## References

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