

Microtextural and heavy mineral constraints on the oscillations of the late Pleistocene Scandinavian Ice Sheet

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Microtextural and heavy mineral characteristics of the upper sediments of the Rautuvaara terrestrial succession in NW Finland is studied to better understand the Scandinavian Ice Sheet (SIS) dynamics during the late Pleistocene. Investigation of the SIS evolution has become particularly relevant since the recent research concluded that the Rautuvaara sediments are much younger than previously assumed; the entire succession deposited during the Weichselian Stage in at least three glacial ice advance-retreat cycles and glaciolacustrine conditions existed between the cycles. In this framework we analyse quartz grain surface microtextural and heavy mineral contents of the Rautuvaara sediments to interpret their origin and processes of sediment transport. Focus is on the upper 7 m of the section where two uppermost tills and the interbedded sediments are exposed.

Preliminary microtextural analyses show that the sediments have been subjected to subglacial, fluvial and chemical processes during transportation and sedimentation. A strong subglacial signal exist at lower till bed accompanied by upwards intensifying fluvial signal. Subsequently, fluvial signal become dominant in the following ripple- and horizontally bedded sand and massive fine sand/silt beds. In the lower part of massive fine sand/silt bed, there is, however, a considerable increase in subglacial and reduce in chemical signal as compared to the sand beneath. These findings may indicate change in sediment source and geochemical environment. Observations of dropstones support sedimentation by iceberg rainout. Heavy mineral analyses will provide further detailed information of mineralogical source characteristics of tills and interbedded sediments.

References:

Lunkka, J.P., Sarala, P. and Gibbard, P.L., 2015. The Rautuvaara section, western Finnish Lapland, revisited – new age constraints indicate a complex Scandinavian Ice Sheet history in northern Fennoscandia during the Weichselian Stage. *Boreas* 44, 68-80.