

## Thin loess in southwest Sweden

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A thin (20-80 cm), patchy layer of silt-rich sediment occurs at the surface throughout Svartedalen, a nature reserve in southwest Sweden 30 km north of Gothenburg. This surface silt, known locally and colloquially as *rödfemman*, mantles a bedrock-dominated, fracture-valley landscape. Through grain-size analysis, OSL dating and detrital-zircon U-Pb dating we argue that the silt is loess and that it was deposited following deglaciation from glacial sediment that was derived from local bedrock sources. The silt has a grain-size distribution typical of loess, especially similar to thin deposits of loess overlying coarser material. The Svartedalen silt contains more fine and medium sand than far-traveled loess in other regions of the world, and we interpret this is due to local sources and post-depositional mixing by bioturbation and slope processes. OSL ages on five samples range from 1 to 8 ka, although analysis of equivalent dose distributions of one may suggest an age as old as 11 ka. We argue two explanations for these dates. The dates can represent true depositional ages and indicate several periods of deposition and or reworking during the Holocene. However, we also consider that the loess was deposited during or slightly after deglaciation, and quartz-grain signals have been partially reset during bioturbation; we consider this latter explanation more likely. U-Pb ages on 273 zircon grains from the loess show prominent peaks at 1.6 and 1.8 Ga, as well as smaller numbers of grains from 1.0 to 1.6 Ga. These ages strongly match dates from the Idefjord Terrane, formed during the Gothian and Sveconorwegian orogenies, and which comprises the bedrock of the study area. As such, we argue that during ice-margin retreat, the glacier sediment load was dominated by locally derived debris. This glacial sediment was left in thin patches on the Svartedalen uplands during retreat and particularly in larger accumulations in ice-marginal deltas. These deposits provided the proximal source for the loess. The extensive presence of thin loess in Svartedalen suggests loess to be a common component of surface soils of southwest Sweden, particularly above the marine limit. The loess deposits can provide more information on past eolian activity, as well as understanding the character of regional surface soils.