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Discovery of laterally extensive drape of siliciclastic silt in the Northern Calcareous Alps, Austria: Late-glacial to ?early Holocene aeolian deposition.

Charlotte Gild (1), Clemens Geitner (1), Jean Nicolas Haas (2), and Diethard Sanders (3)

(1) Institute of Geography, (2) Institute of Botany, (3) Institute of Geology, University of Innsbruck, Austria/EU. (Charlotte.Gild@gmail.com)

Field surveys in the Northern Calcareous Alps (NCA, a nappe stack of Triassic carbonate rocks) revealed a drape, or drapes, typically 20-40 cm in thickness of siliciclastic silt over extensive landscape areas, from valley floors to LGM (Last Glacial Maximum) nunataks. The drape veneers substrates ranging from country rocks to diverse post-LGM deposits – the latter with depositional and/or erosional topographies.
The drape mostly is overlain by vegetated organic material and, in turn, tops inactive/abandoned post-LGM successions of fluvial (including kame terrace), alluvial fan, scree slope, LGM basal till, and rock-avalanche origin. The drape extends over kilometers at least (limit of field investigation in specific areas), up to LGM nunatak plateaus. Deposystems (e.g., scree slopes, alluvial fans) on carbonate-rocky terrain that remained active until the Holocene are not topped by the drape; a level of siliciclastic silt, however, was spotted within a few of these successions. The possibility that several levels of silt are intercalated within or top post-glacial deposits cannot be excluded at present; the large lateral extent and the stratigraphic position, however, suggest that at least most locations pertain to a single widespread level (with that reservation, we prefer to speak in singular of the drape). Over the inspected area ($\sim$ 90 x 20 km), the drape consists mainly of silt-sized grains of quartz, feldspars, micas, and amphiboles; at a few sites, calci- or dolosilt are admixed. Most of the grains are angular to subrounded, some grains show features of corrosion. Preliminary palynological analyses of this silt – seven locations from LGM nunataks to kame terrace and alluvial fans – suggest vegetation types that, together, may be assigned to palaeoclimates ranging from the late-glacial (Younger Dryas?) to the middle Holocene. A few of the pollen spectra appear to record sparse vegetation cover allowing for enhanced aeolian deposition, but other spectra (e.g., with Tilia and Abies) reflect a forested landscape.

We interpret the drape as an intramontane loess sourced from glacier forefields and, perhaps, braided-stream systems on metamorphic rock terrains to the South. The Younger Dryas cold spell eventually had provided an environmental regime (dry–cool with scarce vegetation, windy) suited for effective aeolian transport and deposition. Because the drape is mostly overlain by vegetated soils, mixing of original with younger pollen spectra, respectively, seems probable; more detailed (horizonted) palynological analyses may help to resolve this.
Previously, the drape was only very rarely and cursorily mentioned, but never systematically tracked; our investigations first reveal its large lateral and altitudinal extent. Post-LGM sedimentary successions of the Eastern Alps are poor in deposits suited for numerical dating (e.g., soils, fine-grained feldspatho-quartzose sediments). The drape thus has the potential to provide a unique chronostratigraphic marker level. Yet even if not deposited during a single palaeoclimatic phase, because they are widespread, the identification of such drapes for the first time provides a hitherto unexploited potential to constrain the age of Late- and Post-glacial deposits. Our future investigations will establish numerical ages for the silt drape based on a combination of dating methods.