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Geomorphological and palaeoecological investigations in the periglacial area of the Pleistocene Salzach glacier (Austria)

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Sedimentological, palaeopedological and palaeoecological investigations were carried out on the periglacial loess deposits of Duttendorf (Austria) in the forefield of the Pleistocene Salzach glacier. The deposit was firstly described in an earlier work including first detailed malacological analysis. In the re-investigations presented here, first analysis of pollen and macro remains content of the loess deposit is presented. It seems that alluvial processes have played a more important role in the sedimentation of the deposits than previously supposed; therefore the sediment is classified as alluvial loess. The recent investigations, combined with the malacological account, offers detailed insights into the past climate, topography and vegetation of this northern Alpine foreland region. The loess at Duttendorf is superimposed by pleniglacial gravel outwash ("Niederterrassen" sensu Penck & Brückner), which makes it possible to determine a minimum age. At the base, the loess is followed by a cryogenic layer and, below this, a fossil soil horizon on gravel from the penultimate glaciation ("Riss"). The loess itself can be subdivided into an upper, fossiliferous section with high carbonate contents, and a lower, fossil-free and more loamy section. The upper loess section was positioned into the Last Glacial Maximum (OIS 2) by an earlier radiocarbon date of mollusc shells, which is confirmed by a recent OSL-date. The pollen content of eight selected samples throughout the whole profile (including the fossil soil) shows the picture of an open grassland, especially in the upper loess section, with several herbal taxa and a strikingly low percentage of grass pollen. The presence of hygrophilous species points to more humid high glacial conditions than previously supposed and

the (at least) temporal presence of open water bodies. The sedimentological account and especially the malacofauna underpin this picture. The lower loess section seems to originate from early and middle pleniglacial times, although absolute chronological information is missing at the moment. The pollen samples show a generally open landscape with changing plant diversity and tree presence. The sample from the fossil soil contains pollen from a dense forest vegetation dominated by coniferous trees, but also (thermophilous) deciduous tree species are present. This, together with the sedimentological account, makes an Eemian age of this fossil soil horizon, as postulated before, very unlikely. From the modern point of view, the fossil soil represents a pleniglacial interstadial of unknown age.