



Are Cambisols in Alpine Karst Soil Systems Autochthonous or Eolian in Origin (Northern Calcareous Alps, Germany) – Results of a two-year study

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Thirty soil profiles of Cambisols on karst paleosurfaces developed on Triassic and Cretaceous limestones are investigated. Dust samples collected periodically on snow cover provide influx rates and a seasonal dust record. Samples of soils, insoluble bedrock residue, and dust are characterized by pedological (e.g. grain size) and mineralogical (e.g. heavy minerals) data.

The data indicate a subdivision of limestone soil subtype profiles. Most of the Bo-horizons are autochthonous. The topsoils, however, show a substantial eolian addition (silt, fine sand, mica).

In winter, far-traveled red Saharan dust without organic material prevails, carried to the area by strong foehn winds. In early springtime, browner dust (organic rich) is observed which contains periglacial silicate-rich detritus from regional sources such as the Crystalline Austrian Alps.

The measured winter dust flux rates are 4.8cm per 10,000years (related to 210 winter days). This is more than twice the calculated thickness of Holocene residue accumulation out of limestone weathering (2.3cm per 10,000years, related to 210 winter days), which indicates that eolian dust is a major contributor to alpine karst soil development.