



## **Late Pleistocene to early Holocene aeolian and flash-flood sedimentation and soil formation in a small hilly catchment in SW-Germany (Palatinate forest)**

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This paper focuses on the dynamics of sedimentation processes and soil development in a steep slope 0-order catchment in the sandy Lower Bunter of the south-western mid-range mountains in Germany during the transition period from the late Glacial to the early Holocene. It also discusses how late Palaeolithic gatherers and hunters may have influenced these processes by sedentary land occupation. The investigated dry valley covers an area of around 16.6 ha and is characterized by short and steep slopes of 30° to 60°. A significant amount of the sediments from the adjacent slopes had been captured along the wide and rather flat valley bottom and at the small outlet. Several exposures, pits, and percussion liner drillings revealed a weak to highly weathered reddish sandy material at the base and eight subsequent layers of incoherent sandy and charcoal (from pines) enriched sediments with different colours ranging from olive-brown to dull reddish brown. By stratigraphical means, the lowermost sediment can be ascribed to the early Lateglacial when the deposition of aeolian sands under cold conditions with scarce vegetation cover was a widespread phenomenon. The subsequent layer contains a higher amount of silt and dates into the Allerød as suggested by radiocarbon dating. This is corroborated by the occurrence of LST that indicate that these sediments have been near to the surface around 12,900 yr BP. It shows characteristics of a palaeosol with Bwb and BwAhb horizons (Brunic Arenosols dystric) and with greyish Ahb and Eb horizons (Albic Arenosols dystric) similar to the Usselo/Finow soils in north-eastern Germany. In the material above, many remnants of roots and organic particles and rounded bone fragments were revealed by micromorphological analyses. Then, an alternation of reddish brown coarse to fine sands and small, partly rounded stones with some small intercalate aggregations of humic material rich in charcoal which dates to around 10,000 yr BP were deposited. The layers are overlain by very clear visible wavy and frequently distributed clay-illuviation bands typical for a Luvisol. The upper meter looks duller and more homogenous which is typical for a Bv-horizon of a Cambisol. The embedded deposition shows structures in this sediment package that are typical for a flash-flood event. Records of soil erosion during this time period are sparse and it is generally assumed that sediments were fixed by forest vegetation. In contrast, these presented results indicate that the manipulation of forest vegetation by fire by sedentary Mesolithic hunter-gatherers created an open area and enabled soil erosion with a high geomorphological impact on a local scale. This geoarchive provides first time high resolution data on a natural (and anthropogenic) soil-sediment formation during the Late Pleistocene and Early Holocene in SW-Germany.