



Dune Development on the Swiss Plateau – Landscape Evolution since the Late Pleistocene Constrained by Luminescence and Radiocarbon Dating

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Dunes are known from different areas in the river plains of the NW Alpine foreland: Rhine Valley, Swiss Plateau, Lower Wallis Valley and south of Lake Geneva. Following the last deglaciation 17'500 a BP (IVY-OCHS et al., 2004) opportunities for dune development have been assumed during the Oldest Dryas, 17'050 a BP, prior to reforestation in the Bolling, 14'500 a BP, and again during the Younger Dryas, 12'500 a BP (e.g. MEYER-WOHLFAHRT, 1986; VAN DER MEER, 1982). Due to the lack of numerical dating and before the advent of OSL, different ages and models to explain the dune genesis have been discussed.

New investigations, including soil mapping, geochemistry, sedimentology as well as luminescence dating of the dune sands and radiocarbon dating of underlying and intercalating organic material have been carried out on the Swiss Plateau dune field in an area called Großes Moos. This dune field consists of four main sandy dune-ridges divided by flat plains mainly covered by peat, River Aare deposits and lake sediments. Based on soil studies, the best developed soils (luvisols) occur on the outermost dune (Islerendüne) while less developed cambisols and arenosols are widespread. Following the assumption that the luvisols mark the oldest, undisturbed part of the dune, the sedimentation ages of the underlying dune sand have been obtained using luminescence dating. The results suggest dune activity during the Younger Dryas up to the Boreal; consequently the overlying luvisol is of Holocene age. The next three dunes, placed closer to the present edge of Lake Neuchâtel, reveal a higher stage of anthropogenic

degradation but also give an insight to the start of the dune formation. Both luminescence and radiocarbon ages suggest the formation of the Nusschhof Dune from the Middle Atlantikum (8'000 a BP) up to the Subboreal (5'500 a BP). The next younger, Witzwiler Dune I, was active during the Older Subatlantikum (2'100 a BP), the underlying peat-containing colluvium has been dated to the end of the Subboreal (4'300 a BP). The youngest dune ridge, Witzwiler Dune II, located close to the Lake Neuchâtel, developed during the Medieval Warm Period (900–500 a BP).

The dune-ridges become successively younger from the outermost Islerendüne-Ridge towards the present edge of the Lake Neuchâtel. As their shape along the NE edge and the diminishing age suggest, the lake level changes since the end of the Pleistocene have had an important influence on the development of the dune landscape on the Swiss Plateau.

References

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Manuskript bei der Schriftleitung eingelangt am 18. Juni 2008

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