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Grain-size characterization of reworked fine-grained aeolian deposits

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Abstract

After a previous review of the grain-size characteristics of in situ (primary) fine-grained aeolian deposits, reworked (secondary) aeolian deposits, as modified in lacustrine environments and by alluvial and pedogenic processes, are discussed in this paper. As a reference, the grain-size characteristics of primary loess deposits are shortly described. Commonly, pedogenesis and weathering of primary loess may lead to clay neof ormation and thus to an enrichment in grain diameters of 4-8 μm , a size which is comparable to the fine background loess. Remarkably, the modal grain-size values of primary loess are preserved after re-deposition in lakes and floodplains. But, secondary lacustrine settings show a very characteristic admixture with a clayey population of 1-2,5 μm diameter due to the process of settling in standing water. Similarly, alluvial settings show often an addition with coarse-grained sediment supplied by previously eroded sediment. However, floodplain settings show also often the presence of pools and other depressions which behave similarly to lacustrine environments. As a result, alluvial secondary loess sediments are characterized by the poorest grain-size sorting when compared with the other secondary loess and primary loess. Despite the characteristic texture of each of these deposits, grain-size characteristics of the described individual sediment categories are not always fully diagnostic and thus grain-size analysis should be complemented by other information, as sedimentary structures and fauna or flora, to reliably reconstruct the sedimentary processes and environments.

Keywords: grain size, aeolian, loess, reworked loess

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