



Grain size characteristics of surface aeolian sands in the downwind margin of modern Mu Us Sandland

Zhongyuan Wang and Yongqiu Wu

Beijing Normal University, Faculty of Geographical Science, China (201731480006@mail.bnu.edu.cn)

Desert (sandland) margin is the transition region from inner aeolian landforms to other landforms outside, while it remains as an ambiguous conception in previous researches. Accurately delineating its boundary line and realizing the characteristics of the particle size distribution of surface aeolian sands in margin area can help us understand the formation of modern boundary of desert (sandland). In this research, the criteria of identification of the boundary were proposed and the boundary line was extracted quantitative. Then systematic analyses of grain size of aeolian sand in margin were conducted. Together with the morphologic type, activity and the geomorphological location of collected dunes, the factors controlled the particle-size distributions had also been analyzed. The results reveal the following: (1) There is notable difference in grain size characteristics of aeolian sand between inside and outside of Mu Us sandland. The outside samples are finer than inside. Additionally, the aeolian sand covering on loess is always more poorly sorted and with different grain size fraction composition. (2) The controlling factors on particle size distribution are different in different downwind margins. In southwest margin, the grain size characteristics of aeolian sand are influenced by time and degree of stabilization of sampled dune and locally topographic relief; From the estuary of Lu River to Yuxi River, sediment transport by wind is affected by topographic obstacles including both valley and loess gully. Meanwhile, the small dunefields in Loess Plateau outside of Mu Us sandland may originate from a local alluvial source; In northeast downwind margin, the grain size characteristics of aeolian sand covering on loess are determined by regional gully erosion after its deposition.