

## **Sedimentological and Geochemical Characteristics of Aeolian Sediments and Their Implication for Sand Origin in the Yarlung Zangbo River Valley, Southern Qinghai-Tibetan Plateau**

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**Abstract :** The understanding of the dynamics of aeolian sand in the Yarlung Zangbo River Valley (YLZBV), southern Qinghai-Tibetan Plateau, including its origins, transportation, and deposition, remains preliminary. In this study, we investigated the extensive origin of aeolian sediments in the YLZBV by analyzing the distribution and composition of sediment's grain size and geochemical composition in dune sediments collected from the wide river terraces. The major purpose is to characterize the sedimentological and geochemical compositions of these aeolian sediments, trace back to their sources, and understand their influencing factors. As a result, the grain size and geochemistry variations, which showed a significant correlation between grain sizes distribution and element abundances, give a strong evidence that the important part of the aeolian sediments in the downstream areas was firstly derived from the upper reaches by intense fluvial processes. However, the sediments experienced significant mixing process with local inputs and reconstructed by regional wind transportation. The diverse compositions and tight associations in the major and trace element geochemistry between the up- and down-stream aeolian sediments and the local detrital rocks, which were collected from the surrounding mountains, suggest that the upstream aeolian sediments had originated from the various close-range rock types, and experienced intensive mixing processes via aeolian- fluvial dynamics. Sand mass transported by water and wind was roughly estimated to qualify the interplay between the aeolian and fluvial processes controlling the sediment transport, yield, and ultimately shaping the aeolian landforms in the mainstream of the YLZBV.

**Keywords :** grain size distribution, geochemistry, wind and water load, sand source, Yarlung Zangbo River Valley

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