



Genetic linkage between the Yellow River and the Chinese Loess Plateau

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The Chinese Loess Plateau contains one of the most valuable Cenozoic climate archives on land. However, the origin of these sediments is highly controversial. Previous models suggest that the sediment was sourced from the regional deserts to the north and the west of the Loess Plateau. In contrast, a more recent proposal is that the sediment was transported from the Qaidam basin and the northern part of the Tibetan Plateau, at least during glacial periods. Until this issue is resolved the climate records preserved in these loess sequences cannot be fully exploited.

This project uses single-grains of zircon for U-Pb and fission-track dating alongside heavy mineral analysis to test the role of proximal deserts and the potential influence of major rivers. Initial results suggest that the samples from the eastern Mu Us desert and the Tengger desert can be explained by local sources and recycling of the underlying Cretaceous aeolianite. However, the western Mu Us desert samples show different zircon U-Pb age spectra and heavy mineral distributions, indicative of a strong influence from Tibet. Further, a sample from the Yellow River is close to identical to these western Mu Us samples and to the samples from the Loess Plateau. This and the differences between samples from the Tengger desert, the Loess Plateau, the western Mu Us and the eastern Mu Us suggests that the Tibetan sediments are unlikely to have been transported directly by wind, but rather have been delivered by the Yellow River. This provides the first evidence of a genetic link between the Yellow River and the Loess Plateau.