
Carbonate U-Pb dating on the syn-tectonic deposits along the Altyn Tagh fault reveals Paleocene initial deformation in the northern Tibetan Plateau

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Résumé

The timing of initial deformation at the North Tibet is of great significance for understanding the growth of the Tibetan Plateau, particularly the onset of the Cenozoic deformation along the Altyn Tagh fault (ATF), which defines the northern boundary of the plateau. However, previous studies have yielded conflicting results regarding the initiation of strike-slip motion of the ATF, with variations in timing and spatial aspects. The divergent interpretations primarily arise from methodological limitations and the ongoing debate on the chronology of the Qaidam Basin. Here we conducted the field geological research in the East Xorkol Basin within the Altyn Tagh Range, and applied U-Pb dating of the syn-tectonic carbonate within the Lulehe Formation. We suggest that the strike-slip motion along the ATF triggered the opening of the North Xorkol Basin (including East Xorkol Basin). Therefore, the obtained age of 58.9 Ma indicates that strike-slip motion commenced no later than the late Paleocene, shortly after the India-Eurasia collision. This age estimate is also indicative of the depositional age of the Lulehe Formation, adding valuable insights to the ongoing debate surrounding the age model of the Qaidam Basin. These findings yield crucial constraints for refining the deformation model of the Tibetan Plateau, contributing to a better understanding of its tectonic evolution.

Mots-Clés: Tibetan Plateau, North Tibet, Altyn Tagh fault, carbonate dating, strike, slip motion

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