Kinematics of the Jinhe-Qinghe Thrust Belt: implication for the morphotectonic evolution of Southeast Tibet Plateau

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The study about southeast Tibet is significant to understand the evolution of Asian monsoons and the timing as well as the mechanism of growth of the Tibet Plateau. Understanding the development of key thrust fault in SE Tibet not only helpsis significant to reconstruct the geodynamic but alsoand the topography processes. Detailed field structure analysis along the nearly ~400 km long Jinhe-Qinghe thrust belt (JQTB) indicate thrust motion with minor left-lateral component. The cooling and exhumation history of the Baishagou granite based on apatite (U-Th)/He and fission fission-track thermochronology and thermal modeling (QTQT) suggest acceleratеda rapid increase in exhumation rate during 20-15 Ma at ~0.42 km/Myr. We interpret that fast exhumation as due to the activation of the Nibi thrust, a northern branch of the JQTB. The ~1.5-2.2 km magnitude of the exhumation is ~1.5-2.2 km, which corresponded to the present topographic difference across the thrust belt. In the early Miocene, the JQTB was a thrust system building significant relief along JQTB was generated by thrusting. When compared with previous studies it appears that Cenozoic exhumation and relief creation in SE Tibet does not follow a simple pattern that could not be explained by a single mechanism, and at least three stages of Cenozoic shortening and relief creation have toshould be invoked. The first phase is an Eocene NE-SW compression at least partly coeval with the Eocene sedimentation of the Eocene sediments. During late Oligocene to early Miocene the second thrusting phase occurred along the Yulong and Longmenshan thrust belts, and then migrated to the JQTB further to the southeast during 20-15 Ma. A third phase involved the activation of the left-lateral Xianshuihe fault and the re-activation of the Longmenshan thrust beltsBeichuan and Wulong faults in the LMS and the Muli thrust NW of the JQTB. The precise interaction between thrusting and fast river erosion triggered by climate change is not deciphered yet but the two Miocene to present thrusting along thrust belts the phases appears to explain most of the present-day relief in SE Tibet Yalong and LMS belts.

Mots-Clés : Southeast Tibet, low-temperature thermochronology, multistage history

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