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Birth of Interior Drainages of the Northwestern Tibet Plateau

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Emerging and developing of drainages accompany with formation and evolution of their geomorphological system (Burbank & Anderson, 2011). Therefore birth of a drainage suggest forming of the geomorphological system that the drainage belongs to. In this presentation we provide systematic evidence to demonstrate birth of the interior drainages of the Northwestern Tibet Plateau took place around the beginning of Pliocene, that is, ca. 6 Ma, which suggest that the West Kunlun Mountains and the Tibet Plateau forming as young as that age.

Tracing back to the Miocene northern Tarim Basin we can reconstruct the easternmost part of Paratethys during that time (Rögl, 1999; Guo et al., 2002; Harzhauser et al., 2007). Marine and lagoon deposits with Miocene Ammonia Fauna as well as lacustrine and fluvial deposits were recognized in drilling wells of all three Miocene formations of the northern Tarim Basin from the western Wuqia, via Kashi, Kuqa, to east of Korla, more than thousand of kilometers (Guo et al., 2002).

The Miocene Wuqia Group of the northwestern Tibet Plateau and the southwestern Tarim Basin is mainly dominated by fine-grained delta to plain fluvial clastics, which is overlying the Paleocene-Oligocene Kashi Group whose sediments contain shallow marine to lagoon layers with shark teeth. Over two thousands paleocurrent data measured from the Wuqia Group of the region demonstrate approximately east to west drainage, coincided to Tethys-Paratethys Paleogeography remained. Its fine-grained sediments and plan fluvial facies show a distal provenance and low gradient slope, which means that the topographical features then was higher in east than in south. We can't find any shadow of the Tibet Plateau and Pamirs then except some, not all, paleocurrent data measured from the southwestern corner illustrate southwest to northeast paleocurrents, suggesting a rudiment Pamir being.

The dramatic change occurred around the end of Miocene to the beginning of Pliocene when deposition of the Artux Formation started with disconformable overlaying on the Wuqia Group. The upheaval of depositional environment and topographical features in the beginning of the Wuqia age occurred with paleocurrents shifted from southwest or south-west-west to northeast or north-east-east based upon 1195 paleocurrent measured and usual appearance of fan facies gravels, whose

components are dominated by limestone and sandstone and siliceous rock, showing uplifting and unroofing of the sedimentary cover of the provenance, the western Kunlun Mountains. The depositional environment of the Artux formation is of fluvial to fan margin facies. Growth strata during deposition of the Artux Formation are common in the Tarim Basin (Sun et al., 2008, 2009; Li et al., 2010) and marine or lagoon environment vanished completely, which suggest that crustal shortening between the Pamir and Tian Shan began and the sea way between the Pamir and Tian Shan was finally closed. During deposition of the Xiyu formation, the Xiyu conglomerate, which is ca. 3-1 Ma in age and is alluvial-diluvial deposition of upper fan to middle fan facies, paleocurrents was identical to those of the Wuqia Formation based upon over two thousands data measured. Metamorphic and granitic gravels as well as coarse debris flow deposits of alluvial fan occur in the Xiyu conglomerate, which suggests very rapid exhumation and erosion of source rocks in the steep slope of the western Kunlun Mountains and rising of the Tibet Plateau. It is just the age of intense deformation happened during the late Xiyu phase (Zheng et al., 2000; Sun et al., 2008; Li et al., 2010). The interior drainages of the northwestern Tibet Plateau presently observed is inherited from the Xiyu age.

Birth of interior drainages of the Northwestern Tibet Plateau occurred around the end of Miocene to the beginning of Pliocene, ca. 6 Ma. The drainage and geomorphological system reorganized accompanying intensely regional deformation, closing the sea way between the Pamir and Tian Shan due to crustal shortening between them and emerging of the western Kunlun Mountains, northwestern Tibet Plateau.

Key words: birth of drainage, northwestern Tibet Plateau, the end of Miocene to the beginning of Pliocene, the Artux Formation, paleocurrents

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