



Active Features of Guguan-Guizhen Fault at the Northeast Margin of Qinghai-Tibet Block since Late Quaternary

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Guguan-Guizhen fault is located at the northeast margin of Qinghai-Tibet Block and northwest margin of Ordos Block; it is the boundary of the two blocks, and one of the multiple faults of northwest Haiyuan-Liupanshan-Baoji fault zone. Guguan-Guizhen fault starts from Putuo Village, Huating County, Gansu Province, and goes through Badu Town, Long County in Shaanxi Province ends in Guozhen Town in Baoji City, Shaanxi Province. The fault has a full length of about 130km with the strike of $310-330^\circ$, the dip of SW and the rake of $50-60^\circ$, which is a sinistral slip reverse fault in the north part, and a sinistral slip normal fault in the southeast part.

Guguan-Guizhen fault has a clear liner structure in satellite images and significant landform elevation difference with a maximum difference of 80m, and is higher in the east lower in the west. The northwest side of Guguan-Guizhen fault is composed of purplish-red Lower Cretaceous sandstones and river terrace; the northeast side is composed of Ordovician Limestone. Shigou, Piliang, Songjiashan, Tianjiagou and Chenjiagou fault profiles are found to the south of Badu Village. After $14C$ and optically stimulated luminescence dating, the fault does not dislocate the stratum since late Pleistocene ($90.5 \pm 4.4ka$) in Shigou, Piliang and Songjiashan fault profiles, and does not dislocate the cobble layer of Holocene first terrace and recent sliderock ($3180 \pm 30 BP$). But the fault dislocated the stratum of middle Pleistocene in some of the fault profiles. All the evidences above indicate that the fault is active in middle Pleistocene, and being silence since late Pleistocene. It might be active in Holocene to the north of Badu Village due to collapses are found in a certain area. The cause of these collapses is Qinlong M6-7 earthquake in 600 A.D., and might be relevant with Guguan-Guizhen fault after analysis of the scale, feature and age determination of the collapse. If any seismic surface rupture and ancient earthquake traces exist is still in researching. This study has a significant meaning of major earthquake risk analysis at the northeast margin of Qinghai-Tibet Block.