

Paleomagnetic results of the Upper Jurassic redbeds from Xichang, China: tectonic implication of the southwestern part of the Yangtze craton

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Upper Jurassic red sandstones and red siltstones were collected at four sites in the Guangou Formation around Xichang city (27.8N, 102.3E) and at three sites in the Niugundang Formation at about 50km northeast of Xichang city. Xichang is located on the southwestern part of the Yangtze craton, which is discriminated from the northern part of the Yangtze craton by the Xianshuihe-Xiaojiang fault. Thermal demagnetization isolated a high temperature magnetic component with the maximum unblocking temperature of about 690C. The characteristic direction of the high temperature magnetic component is observed from four sites of the Guangou Formation. We recognized that this high temperature magnetic component is primary origin, because in-situ site mean direction of this component is different from the present field direction at Xichang. The tilt-corrected mean direction of the four sites is $D=0.2$, $I=51.0$ with $a95=9.2$, corresponding to a Late Jurassic paleomagnetic pole at 85.9N / 102.7E with $A95=10.8$.

This pole position is different from the other pole for the southwestern part of the Yangtze craton and the characteristic pole for the northern part of the Yangtze craton. The characteristic pole for the northern part of the Yangtze craton is calculated from the three poles for the Sichuan basin (Bazhong, Jiangyang and Wanchang), and the other pole for the southwestern part of the Yangtze craton is derived from Huili area. Comparison between these poles indicate that Xichang area is rotated 19.9 ± 16.3 counterclockwise and moves southward of 21.3 ± 12.7 with respect to the northern part of the Yangtze craton.

This counterclockwise rotation was observed from the previous Late Cretaceous paleomagnetic data of Xichang area. After removing this rotation, the pole for Xichang overlapped with the pole for Huili. We conclude that the

southwestern part of the Yangtze craton was deformed in two stages since Late Jurassic, with respect to the northern part of the Yangtze craton. In a first stage, the area, which includes Xichang and Huili areas, displaced southward along the Xianshuihe-Xiaojiang fault.

In a second stage, Xichang area was rotated counterclockwise since Late Cretaceous.