



Internal crustal deformation in the northern part of Shan-Thai Block: new evidence from paleomagnetic results of Cretaceous and Paleogene redbeds

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In order to describe the internal deformation of the northeast part of the Shan-Thai Block resulting from the penetration of the Indian plate into Asia, a paleomagnetic study was carried out on the Cretaceous and Paleogene strata in three separate areas of the southern part of the Simao Terrane. High-temperature magnetic components with unblocking temperatures around 680 centigrade were isolated and positive fold test shows its primary nature of magnetization. The tilt corrected site-mean directions of the Lower Cretaceous and Upper Cretaceous from the Menglun area are $D_s = 46.2^\circ$, $I_s = 45.9^\circ$, $k = 11.0$, $\alpha_{95} = 10.6^\circ$ and $D_s = 33.2^\circ$, $I_s = 30.9^\circ$, $k = 68.4$, $\alpha_{95} = 8.2^\circ$, respectively. The site-mean directions of the Upper Cretaceous and Paleocene for the Mengban area are $D_s = 50.5^\circ$, $I_s = 31.0^\circ$, $k = 207.6$, $\alpha_{95} = 6.4^\circ$ and $D_s = 43.5^\circ$, $I_s = 23.0^\circ$, $k = 26.1$, $\alpha_{95} = 13.4^\circ$, respectively. The results of the Paleocene and Lower Cretaceous from the Mengla area are $D_s = 41.8^\circ$, $I_s = 23.8^\circ$, $k = 38.9^\circ$, $\alpha_{95} = 5.8^\circ$ and $D_s = 46.9^\circ$, $I_s = 42.2^\circ$, $k = 27.3$, $\alpha_{95} = 7.7^\circ$, respectively. In comparison with previous paleomagnetic data in the Simao Terrane, the internal rotational deformation can be divided into three deformation stages. First, the large-scale fold system was developed on the Cretaceous and Paleocene/Eocene sediments in the northwestern and central part of the Simao Terrane in the post-Eocene period due to the India/Eurasia collision, while the folding took place in the southeast part of Tibetan plateau. Second, the penetration of India into Eurasia during the later Eocene to Oligocene resulted in the extrusion of mosaic blocks in southern Eurasia, including the Lhasa, the Shan-Thai and the Indochina Blocks. The movement included about a 35° clockwise rotation of the Simao Terrane relative to the South China Block. At the same time, the northwestern part of Simao Terrane and Baoshan Terrane experienced further deformation due to northward penetration of the East Himalayan syntaxis, which caused further clockwise rotation of the northwestern part of the Simao Terrane. On the other hand, the southeastern part of the Simao Terrane was extruded by the Baoshan Terrane, which resulted in the fold systems developed on the Cretaceous and Eocene/Oligocene strata in the Mengla area. Finally, the activity of strike-slip fault systems around the eastern Himalayan syntaxis caused further regional rotations in the Simao Terrane since the later Miocene. Three deformation stages overlapped and created a complex internal deformation pattern of the Simao Terrane.