

Oroclinal origin of the Simao Arc in the Shan-Thai Block inferred from the Cretaceous palaeomagnetic data

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An active oroclinal bending is discovered in the Shan-Thai block to the south of the eastern Himalayan syntaxis. To investigate the evolution of the Simao Arc using paleomagnetic techniques, Middle Cretaceous red beds of the Nanxin Formation were sampled at the Zhengwan (22.8N, 100.9E) and Dadugang (22.4N, 101.0E) localities in the southern Simao Basin. Most of the studied samples revealed the presence of characteristic remanent magnetization with unblocking temperatures around 680C. A primary nature for this magnetization is interpreted based on a positive fold and reversal test. Tilt-corrected mean directions calculated for Zhengwan and Dadugang localities are characterized by large easterly deflected declination; Dec= 51.8, Inc = 47.9, ks= 45.0, α_{95} = 6.9, N=11 and Dec= 64.1, Inc = 48.1, ks = 36.0, α_{95} = 7.3, N=12, respectively. Steep inclination values at both these localities with respect to the expected one are in the range previously reported from the Shan-Thai Block, confirming their southward displacement as part of the Shan-Thai Block. Combination of the present data (2 localities) with those previously reported from Simao basin (7 localities) reveals a positive paleomagnetic oroclinal test, indicating that the arc-like present-day geometry of the Simao basin was formed by oroclinal bending. Comparison with recent GPS and structural data suggest that formation of the Simao curvature started after the early Pliocene (after 4 Ma) and continuing until the present. Origin of the Simao Arc is ascribed to southwestward movement of the crustal material across the Ailaoshan Red River Fault (around the eastern Himalaya syntaxis), which was accomplished by westward movement of the decollement with progressive eastward deepening of the Lanping-Simao basin. Decoupling between the upper and the middle-lower crusts associated with decollement formation is requisite condition for the arc formation on continents.

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