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India-Asia collision near the western syntaxis: paleomagnetic constraints from Late Cretaceous volcanic rocks at the westernmost Lhasa Terrane

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We report the first combined geochronologic and paleomagnetic study of volcanic rocks from the Shiquanhe and Yare basins at the westernmost Lhasa Terrane, which aims to provide further constraint on the shape and paleoposition of the southern margin of Asia prior to the India-Asia collision. Characteristic remanent magnetizations (ChRMs) have been successfully isolated from 38 sites which pass positive fold and/or reversal, conglomerate tests and are hence interpreted as primary in origin. The two paleopoles obtained from Yare and Shiquanhe yield consistent paleolatitudes at $\sim 14^\circ\text{N}$ indicating that the southern margin of Asia near the western syntaxis was located far south during the Late Cretaceous time. A reconstruction of the Lhasa Terrane in the frame of Eurasia with paleomagnetic data obtained from its western and eastern parts indicates that the southern margin of Eurasia probably had a quasi-linear orientation prior to the collision formerly trending approximately 310°E . This is compatible with the shape of the Neo-Tethys slab observed from seismic tomographic studies (e.g. Van der Voo *et al.*, 1999). In addition, on the basis of compilation of the available paleomagnetic data obtained from the area near the western syntaxis, the paleopositions of the terranes has been achieved. The paleopositions of the subducted oceanic slabs and paleo-suture zone are evaluated which are in accordance with the global seismic tomography studies and numerical modeling. On the basis of the above information, the positions of continent-arc and continent-continent collisions are defined. Together with the motion images of continent India since ~ 100 Ma, the timing of initial contacts between India and Kohistan-Ladakh arc and Asia are evaluated on the assumption of different sizes of Greater India. Our findings provide a solid basis for evaluating Cenozoic crustal shortening in the Asian interior and the size of Greater India near the western syntaxis.

Key words: India-Asia collision ; Paleogeography reconstruction ; Paleomagnetism; Lhasa Terrane.

References

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