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Geochronology, geochemistry and geological significance of the Mesozoic-Cenozoic volcanic rocks in southern Lhasa block, Tibet

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A large volume of Mesozoic-Cenozoic volcanic and intrusive rocks were distributed in southern Lhasa block, Tibet, which plays an important role in understanding the evolution of the Neo-Tethy and tectonic setting of the Lhasa block. On the basis of field investigations, five suits of Mesozoic-Cenozoic volcanic and intrusive rocks related to the subduction of the Neo-Tethy in southern Lhasa block were selected for petrological, geochemical and geochronological analyses, aiming to reveal their magmatic sequence, petrogenesis and tectonic setting. These are further applied to provide constraints on the tectonic evolution of the southern Lhasa block during the Mesozoic to the Cenozoic.

Results show that the island arc-derived volcanic rocks of the Yeba and Bima formations were formed during the initial stage(195—152Ma)of the northward subduction of the Yarlung Zangbo oceanic crust. Subsequently, typical adakitic rocks of the Mamuxia Formation were formed during the rapid subduction stage (136—100Ma) due to higher subduction angle. During late stage of the subduction (100—80Ma), the roll-back of the Neo-Tethy's oceanic plate had caused magmatic flare-up, which was well preserved in the Danshiting Formation. At the continent-continent collision stage (60—40Ma), the oceanic crust of the Yarlung Zangbo Neo-Tethy eventually disappeared. The collision between India and Asia continents formed volcanic rocks of the Linzizong Group.

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