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U-Pb Dating of Zircons From Metamorphic Rocks of Gaoligongshan Group in Western Yunnan, China and its Geological Significance

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The Gaoligongshan Group, famous metamorphic rocks, is situated at the western Yunnan, China. It is the northern continuation of the Mogoke metamorphic belt of Myanmar. It is bounded on the east by the Gaoligong shear zone and on the west by the Sagaing fault. It has long been interpreted as a Precambrian basement for its high-amphibolite to granulite-facies metamorphism, but without credible geochronologic evidences. Zircon U-Pb geochronologic dating were carried out in order to constrain the age of the Gaoligongshan Group. The data from orthogneisses (Pm10-7, Pm10-8), granitic mylonite (D2095) and leptynite (PM15-5) of the Gaoligongshan Group yield weighted mean $^{207}\text{Pb}/^{238}\text{U}$ ages of 497.8 Ma, 83.5 Ma, 41.9 Ma, 38.4 Ma and 55.2 Ma, respectively. These ages indicate that the Gaoligongshan Group have undergone multistage magmatism and metamorphism. Based on this geochronologic data, combined with detrital zircon ages obtained from adjacent area, it is concluded that the

sedimentary strata of the Gaoligongshan Group formed during Neoproterozoic-Early Cambrian and then intruded by Cambrian granites (497.8–500 Ma) formed during the circum-Gondwana orogeny and then submitted consequent metamorphism (457 Ma). The Gaoligongshan Group experienced an Andean-type orogenesis through the northward subduction of the Neo-Tethys oceanic lithosphere during Late Mesozoic time (83.46 Ma) and then the collision between the Indian Plate and Eurasia continent in the Cenozoic (55.2 Ma). The metamorphic age of granitic mylonite indicates that time of Gaoligong shear belt initial motion began from ca. 38.4 Ma during the south-eastward extrusion of the Indochina continent. This work demonstrates that the Gaoligongshan Group was metamorphosed at Paleozoic, Mesozoic and Cenozoic, not Precambrian metamorphic basement as previously considered.

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