Geologic evolution of the Gyala Peri Massif, southeastern Tibet


Abstract

This chapter describes the geologic evolution of the Gyala Peri Massif, a metamorphic massif that occupies a large part of southeastern Tibet. The geology of this section is quite similar to that of the Nanga Parbat massif and, like it, represents progressive displacement and inheritance in the form of discordant ~100 Ma ages. The young ages found within the core of the Namche Barwa antiform are consistent with suggestions that this structure, like Nanga Parbat in the Himalaya, is a metamorphic nappe. We have reconnaissance Ar-Ar stepheating data from two feldspar samples, taken from the Namche Barwa-Gyala Peri structure, and 40 Ar/39 Ar whole rock dating from a high-temperature granite near the Jiali Fault Zone across the Gyala Peri massif. The ages ranging between ~20 to 25 Ma are quite unexpected from rocks that had previously been assumed to be a late Cretaceous or younger. In April 2000 we deployed 8 stations, 4 intermediate, and 4 short period, in the De’u Gungbu Valley (see map of fig 3 for locations). V=H scale. We report provisional zircon U-Pb ages from southeastern Tibet which provide a evolutionary context for the Gyala Peri massif, as well as new Ar-Ar K-feldspar dates which bear on the exhumation history of the Namche Barwa-Gyala Peri structure. SHRIMP U-Pb Results, Gyala Peri Transect

Geology and structure

A. The western boundary of the Namche Barwa-Gyala Peri (NB-GP) structure has been mapped (Fig. 3) north of the river course of the Tsangpo Gorge (Fig. 1), delineated by porphyroclasts and anorthosite gneisses along the west (proximal) part of the massif, and a current basement and metamorphic rock sequence zone (see section of Fig. 2) and in Fig. 4 interpreted to the the modified remnant of the Indo-China suture and Tethyan sediments in the Namche Barwa area. The sediments have been dated at 26-28 Ma (us-J of near Dongjiu, E over W) and 25 Ma (us-J of near Tongphu). The other is a leucocratic pegmatite. Zircons from the NB-GP structure is just west of the NB-GP structure zone, which, in turn, suggests an ~500 km-wide shear zone. The second exception in a metamorphic orthogneiss exposed in the Namche Barwa-Gyala Peri region, which contains xenoliths of gneiss. The very young ages found within the core of the Namche Barwa antiform are consistent with suggestions that this structure, like Nanga Parbat in the Himalaya, is a metamorphic nappe. The two feldspar samples taken from the Namche Barwa-Gyala Peri structure, and 40 Ar/39 Ar whole rock dating from a high-temperature granite near the Jiali Fault Zone across the Gyala Peri massif. The ages ranging between ~20 to 25 Ma are quite unexpected from rocks that had previously been assumed to be a late Cretaceous or younger. In April 2000 we deployed 8 stations, 4 intermediate, and 4 short period, in the De’u Gungbu Valley (see map of fig 3 for locations). V=H scale. We report provisional zircon U-Pb ages from southeastern Tibet which provide a evolutionary context for the Gyala Peri massif, as well as new Ar-Ar K-feldspar dates which bear on the exhumation history of the Namche Barwa-Gyala Peri structure. SHRIMP U-Pb Results, Gyala Peri Transect

Geochronology

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Fig. 2. Cross-section of the western margin of the Gyala Peri massif at the Dha Gungbu Valley (see map of Fig 3 for location). V=H scale.