

Contrasting collision processes between northwest and central Himalaya: examination from the "Lesser Himalayan granites" in Pakistan

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The Himalayan orogenic belt was formed by the Cenozoic collision of Indian and Eurasian plates. In the eastern and central part of the Himalaya, four main tectonostratigraphic zones have been recognized, such as from south to north, Sub-Himalaya, Lesser Himalaya, Greater Himalaya and Tethys Himalaya. However, the northwest Himalaya in Pakistan and northwest India shows some distinct features differ from the main part of the Himalaya, i.e., (1) Presence of the Cretaceous island arc blocks between the Indian and the Eurasian blocks: (2) Boundary between the Lesser Himalaya and Greater Himalaya is not well defined: (3) Presence of UHP eclogites: (4) Extensive exposure of "Lesser Himalayan granites" represented by the Mansehra granite in Pakistan. As granite and granitic gneiss are major components of the Himalayan orogenic belt, we have examined geochemical and isotopic characteristics of the Mansehra granite and compared those with "Lesser Himalaya granites" and granite gneisses of the Greater Himalaya in the central part of the Himalaya. Before the collision of the India to the Eurasian, granites similar to the Mansehra granite were present along the northern margin of the India continent. The collision of India continent with the Tibet of the Eurasia plate formed two separate zones of granites, the "Lesser Himalayan granites" and extensively deformed granite gneiss in the Greater Himalaya. In the collision of India to the Cretaceous island arc blocks in northwest Himalaya did not disturbed distribution of the granite, resulting large exposure of the Mansehra granite. The southern extension of the Karakoram Fault which is a dextral strike-slip fault separating the Tibet and the Karakoram/Pamir block, approximates a boundary between the northwest Himalaya and the eastern and central Himalaya.

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