

Abstract

In this study frame, the Himalayan zone between the SE Zaskar and the Upper Lahul region was investigated, where the High Himalayan Crystalline (HHC) is bounded to the South by the Cambro-Ordovician Kade orthogneiss and to the North by the Gumburanjun Tertiary leucogranite intrusion. Rocks of the studied region forming the HHC have been transformed into metasediments because of the intense tectonic and metamorphic events related to the subduction of the Phe Formation beneath the North Himalayan Nappes. Crustal thickening and the associated Barrovian metamorphism are the consequences of this event and characterize the rocks found the studied area. This compressional episode is followed by the exhumation of the High-Himalayan nappe towards the SW along major structures, the Zaskar Shear Zone and the Main Central Thrust. The rapid exhumation and the partial melting of high-grade rocks have provoked the formation of leucogranitic magma related the Gumburanjun intrusion complex outcropping to the North of the area. The highest-grade rocks corresponding to the Giambul dome are located further North of the studied area.

The succession of these two major tectonic phases are observable in the entire of the area marked by the refolded metasediments and the associated crenulation cleavages superimposed by extensional shear planes and high angle normal faults. The orientation of the main schistosity and the fold axial planes shows a general trend dipping towards South. The structural study of this region reveals the presence of a huge syncline observable in both Jankar-Kade valley and Shingo-La valley probably associated to the last folding phase. This fold is limited to the South by the Kade Orthogneiss rocks and to the North by the exhumation of the High Himalayan metamorphic rocks.

Metamorphism associated to the HHC formation is characterized by a low to medium Barrovian metamorphism from the chlorite to kyanite zone. The lower grade rocks are located close to the Shingo-La area in the eastern part whereas the highest-grade rocks are situated in the North of the area, close to the Gumburanjun intrusion. In the Jankar Kade valley eastwards, the close juxtaposition of the garnet and biotite isograds is related to a high angle normal fault. Above this biotite zone, a highest-grade rock zone of staurolite and kyanite occurs. This abrupt metamorphic transition between kyanite and biotite zones could be explained by the thrusting of highest-grade rocks above the weak metamorphosed rocks.

The chemical analyses realized on the garnet metapelites samples close to the Gumburanjun leucogranite show evidence of a contact metamorphism rather than a typical Barrovian metamorphism associated to the HHC rocks. This garnet seems to be related to Pre-Himalayan events, more precisely during the Pan-African events and the granitic intrusions at the Cambro-Ordovician age, referring to the actual Kade orthogneiss.