

The occurrence and significance of volcanic-sediment association in the Ladakh Granitic Complex, North of Ladakh range

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Introduction

During the course of mapping of the Ladakh Granitic Complex in the area between the Indus River and the Pangong mountains (Fig. 1) the authors came across an association of volcanics and sediments within the granitic complex. The present note discusses the geological set-up and significance of this association.

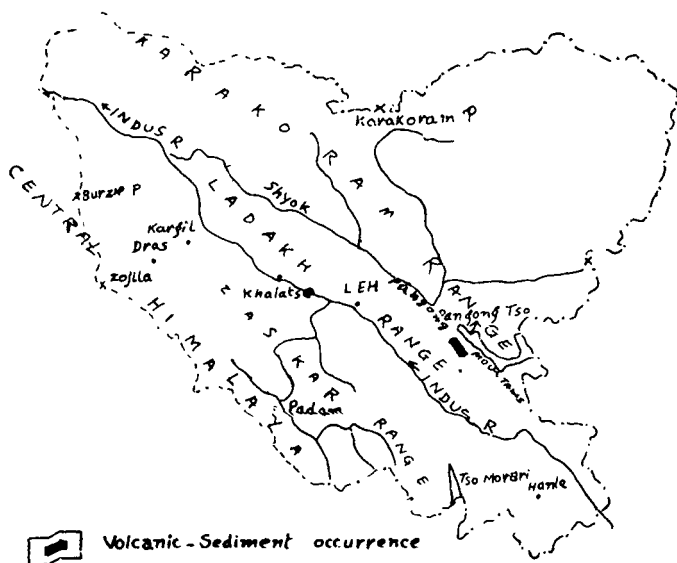


Figure 1. Locality Map.

Geological set-up

In the area north of the Ladakh Range, and within the Ladakh Granitic Complex, there is seen an association of basic volcanics with associated sedimentaries, exposed in the Balmiki Nala and Lalung Tokpo sections. The succession observed in the Balmiki Nala from north to south is as follows:

Lithology	Approximate thickness in metre
Purple and greenish conglomerates with occasional layers of sandstone	-
Vesicular greenish basalt with pillow structures	200
Pale greyish to greenish cherts and volcanic breccia with fragments of chert, and fossiliferous limestone	200
Greenish basalt/andesite, greyish chert and agglomerate/breccia with limestone bands	350
Basement not exposed, probably granitic	

Lithological Association

Volcanic-chert unit: Volcanic rocks are represented by greenish, fine grained, vesicular basalt and andesite. These are interbedded with agglomerates, bedded cherts and buff coloured limestone bands. Pillow structures are seen in the basic rocks. Individual pillows range in size from less than a metre to 2 metres and indicate right side up nature of the beds.

Cherts are pale grey to pale green in colour and thinly laminated. The agglomerates have fragments of cherts and pale buff limestone. Limestone fragments show recrystallised impressions of fossils like corals, crinoids, bivalves, gastropods, and algae.

Limestone unit: Buff coloured limestones occur as bands and lenses interbedded with the volcanic rocks. These have yielded fossil remains of corals, crinoids, bivalves, gastropods, and algae. The limestones as well as the fossils are recrystallized.

Diamictite unit: This is represented by purple and greenish conglomerate with interbeds of sandstone. The purple conglomerate overlying the volcanic rocks is made up of boulders, cobbles and pebbles of purple and green coloured volcanics, vesicular and amygdular basalt, quartzites, and cherts. It is devoid of any granitic clasts. The clasts are sub-rounded and are embedded in a gritty matrix. The matrix-clast ratio is about 40 : 60. The size of the clasts ranges from a few mm to 20 cm in diameter. The diamictite indicates a shallow basinal condition in the area surveyed. There is a close intercalation of sandstone, siltstone and grit.

Tectonic significance

The volcanic sediment belt occurs as a long linear zone trending NW-SE from near Chushul in the east to Shyok in the west. This belt appears to be bounded by a fault.

This zone occurs in the extension of the Shyok lineament within the Ladakh Granitic Complex and may together constitute a major lineament zone parallel to the Indus Tectonic Zone (Gansser, 1977; Srikantia and Bhargava, 1978). It is of significance to note that there is a complete absence of ophiolite rocks in the area, an aspect in which it is distinguished from the Indus Tectonic Zone.

This zone may represent a tensional zone which became a site of volcanic activity and sediment deposition.

References

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