Petrography and geochemistry of basalts from Ranikot and Bara Nala sections, Laki Range, Lower Indus Basin, Pakistan

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Volcanic rocks of basaltic composition are exposed in various sections of the Laki Range in the Lower Indus Basin which comprises of sedimentary rocks ranging from Upper Cretaceous to Recent (Fig. 1). The presence of thin horizons of volcanic rocks in at the Cretaceous-Tertiary boundary in the region is a peculiar and hence the focus of this study. In the Rani Kot area, the basaltic rocks are exposed in the core of an anticline, and are composed mainly of plagioclase, clinopyroxene, glass and ore mineral(s) as primary constituents. An orange brown secondary material, probably after olivine and amygdaloidal carbonate filling are the secondary phases. The basaltic rocks are generally fine-grained and porphyritic, with sub-ophitic to ophitic clinopyroxene, while the intersertal glass is charged with ore due possibly to devitrification. Different discrimination diagrams based on major element geochemistry indicate that these basalts are tholeiitic and belong to Continental Flood Basalt type.

In the Bara Nala section, where the oldest sedimentary rocks of the Lower Indus Basin are exposed, there are three volcanic flows. One of these occurs within the Pab Sandstone of Upper Cretaceous age, whilst two are within the Khadro Formation of Early Paleocene age. There is a strong similarity in the petrography of these flows, and those of the Ranikot and there is not much difference in their major element geochemistry either. However, the analyses from the Bara Nala range from tholeiitic to alkaline in composition. In view of the presence of Late Cretaceous volcanic rocks in Kutch and several places in Sindh (Kazmi and Jan, 1997), it is likely that the Late Cretaceous-Early Paleocene volcanic rocks of the Kirthar Range may be an extension of the Deccan volcanic province.

References

Kazmi, A. H. and Jan, M. Q., 1997. Geology and Tectonics of Pakistan. Graphic Publishers, Karachi.

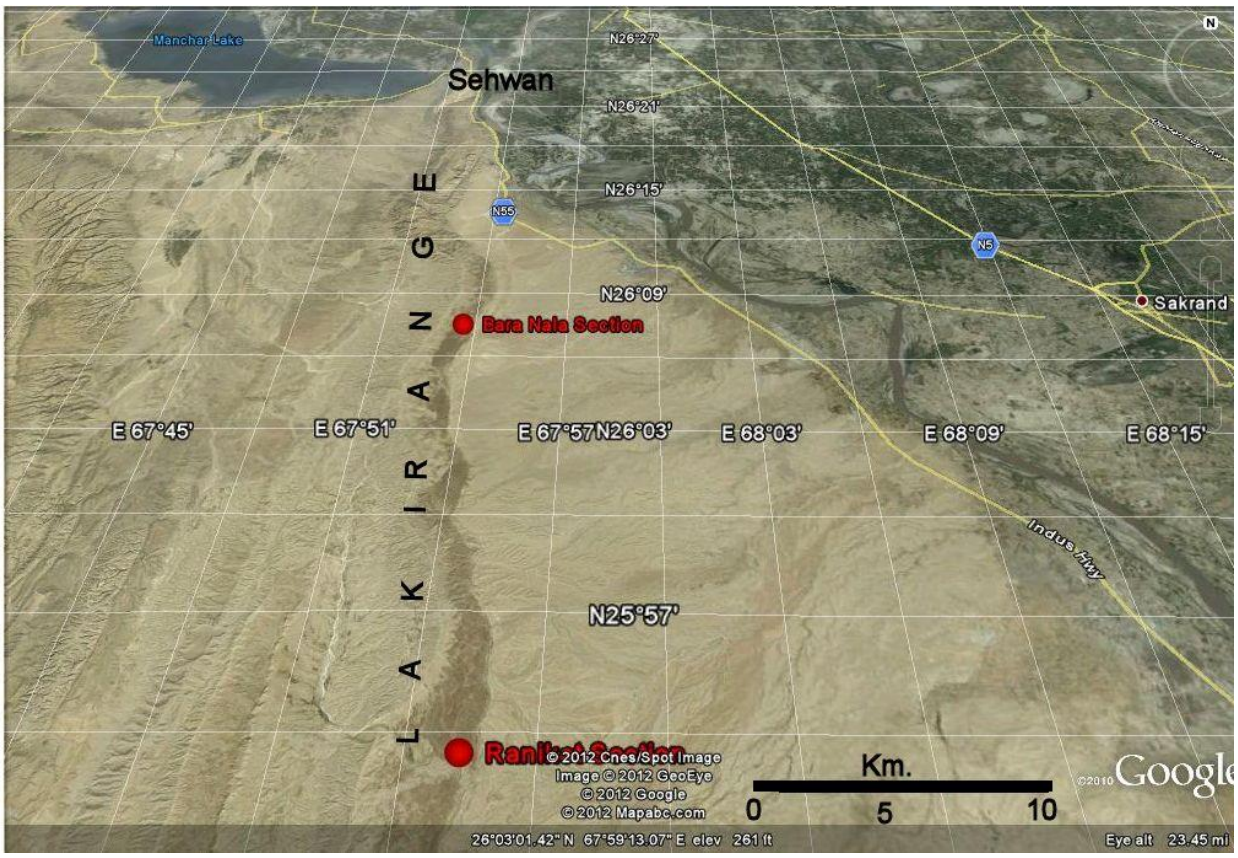

Fig. 1. Map showing the location of Basalts within the Laki Range.