

## **PROVENANCE AND WEATHERING HISTORY OF THE PALEOPROTEROZOIC METASEDIMENTARY ROCKS FROM THE BOMDILA GROUP, ARUNACHAL PRADESH, NE LESSER HIMALAYA**

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### **Abstract**

Geochemistry of the Paleoproterozoic metasedimentary rocks (quartzites, phyllites and schists) of Bomdila Group was carried out to decipher their provenance, tectonic setting and weathering conditions. In general, the metasedimentary rocks show high SiO<sub>2</sub> (up to 89%), Al<sub>2</sub>O<sub>3</sub> (8-27%), K<sub>2</sub>O (up to 6%) contents and depleted MgO (0.03-2.5%), TiO<sub>2</sub> (0.08-0.68%), Fe<sub>2</sub>O<sub>3</sub> (as low as 0.89%) and CaO (0.02-0.66%) concentrations. The CIA (chemical index of alteration) values ranging from 72-90 indicate intense chemical weathering of the source rocks which is also evident from the A-CN-K diagram in which all the samples follow granitic to granodioritic weathering trend. This inference is also supported by Al<sub>2</sub>O<sub>3</sub>/TiO<sub>2</sub> ratios which suggest predominance of a felsic (granitic) nature of the source of the Bomdila Group of sedimentary rocks. However, the slightly high MgO content in these rocks indicates a minor contribution by mafic rocks. Discrimination diagrams based on major elements suggest a felsic igneous and quartzose sedimentary (quartz-arenite) provenance and a passive continental margin tectonic setting for these sediments of Bomdila Group. Various studies from different parts of the Lesser Himalayan rocks indicate that Proterozoic granites occurring in Peninsular India (for e.g. Bundelkhand Massif, Aravalli Craton) may have supplied detritus to the Lesser Himalayan sedimentary basins. It is therefore inferred that the Bomdila Group of sedimentary rocks may have been derived from Proterozoic granites of Peninsular India.

Keywords: Geochemistry, Weathering, Provenance, Tectonic setting, Bomdila Group.