

Spatiotemporal records of Large Igneous Province in the Indian Shield: retrospect and prospect

RAJESH K. SRIVASTAVA, AMIYA K. SAMAL AND GULAB C. GAUTAM

Banaras Hindu University
 Presenting Author: rajeshgeolbhu@gmail.com

Spectacular spatiotemporal records of Large Igneous Provinces (LIPs) are documented in the Indian Shield. These LIPs are represented by volcanic flood basalts (mostly Phanerozoic) and plumbing system of komatiite-tholeiite occurrences, mafic/ultramafic dyke swarms and sill complexes, intermediate magmatic rocks, and alkaline-carbonatite complexes (see Fig. 1). Here we provide a comprehensive information on these LIPs. Total twenty LIPs are documented in the Indian Shield.

Most Precambrian LIPs are identified on the basis of their distribution, field-setting, emplacement ages, and trends of dyke swarms. These include three LIPs during Archean (ca. 3.35-3.34 Ga Sargur, ca. 2.80-2.75 Ga Ghatgaon, and ca. 2.7 Ga Sukma LIPs) and thirteen LIPs in Proterozoic (ca. 2.50-2.47 Ga Dantewara, ca. 2.37-2.236 Ga Bangalore, ca. 2.26-2.25 Ga Ippaguda, ca. 2.22 Ga Kandalamadugu, ca. 2.21-2.18 Ga Anantapur, ca. 2.08 Ga Devarabanda, ca. 1.98-1.97 Ga Jhansi, ca. 1.89-1.85 Ga Bastanar, ca. 1.79-1.77 Ga Pipilia, ca. 1.73 Ga Gwalior, ca. 1.46-1.42 Ga Lakha, ca. 1.12-1.05 Ga Mahoba and ca. 0.80-0.75 Ga Malani LIPs). Based on the identified Precambrian LIPs, a megacraton ‘DHABASI’ is discovered in the Indian Shield. Phanerozoic period witnessed four LIPs (ca. 290-270 Ma Panjal, ca. 132-100 Ma Greater Kerguelen, ca. 92-84 Ma Madagascar-India LIP, and 66.0-65.5 Ma Deccan LIPs). These LIP events suggest that the Indian Shield was an integral part of all the known supercontinents throughout the Earth history and could be targeted for different mineral systems.

Figure caption:

Figure 1: Spatiotemporal distribution of distinct magmatic units in the Indian Shield (see Samal et al. 2019; Srivastava et al. 2020 for a complete information).

Figure 2: The ‘DHABASI’ megacraton consisting of the Dharwar, Bastar and Singhbhum cratons (see Srivastava et al. 2022).

References

Samal, A.K. et al. (2019) In: Dyke Swarms of the World: A Modern Perspective, Springer Nature Singapore Pte Ltd 335–390.
 Srivastava, R.K. et al. (2020) Proceedings of the Indian National Science Academy, 86: 313-330.
 Srivastava, R.K. et al. (2022) Geological Society, London, Special Publication, 518, 175-198.

