

# **Geochemical and Sm–Nd isotopic constraints on the petrogenesis and tectonic significance of magmatism in Mahakoshal belt, central India**

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The Mahakoshal Belt (MB) is characterized by both acidic and basic rocks. Present study is carried out on acidic (granite & gneiss) and basic (basalt & dolerite) rocks to put constraints on their genesis and possible tectonic setting. Geochemical data of these rocks show calc-alkaline and tholeiitic affinity, respectively. Major elements show negative correlation with SiO<sub>2</sub> except for Na<sub>2</sub>O, suggests primary magmatic characteristics. The REEs patterns are characterized as LREEs enriched and HREEs are almost flat excluding granite, enrichment may be due to the low degree of partial melting. Basaltic rocks show highly fractionated patterns (La/Sm)<sub>N</sub>=1.74 to 4.30 and (Gd/Yb)<sub>N</sub>=1.37 to 2.38. However, dolerite show moderate (La/Sm)<sub>N</sub>=0.94 to 2.20 and (Gd/Yb)<sub>N</sub>=1.20 to 2.40 with negative Eu anomaly in basaltic rocks suggesting plagioclase fractionation. Spider-diagrams show moderate fractionation with Nb and Ti negative anomalies indicates crustal contamination. Sm-Nd model ages (T<sub>DM</sub>) of gneiss and granite rocks obtained are 1.55-1.89Ga and 1.07-1.18Ga with values of εNd (-23 to -28) and (-18 to -20), respectively. However, dolerite and basalt show 1.07-1.18Ga and 1.98 with εNd (-17 to -18) and (-8.66), respectively. These evidences suggest that MB has evolved through multi-stages event (longer crustal residence) with mixed origin magma generation in continental rift/within plate tectonic settings.