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## Geochemistry and Petrogenesis of Mafic Dykes in Paleoproterozoic Cu( $\pm$ Mo $\pm$ Au) Hosting Granitoids at Malanjkhand Mine Area, Central India

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### Abstract

Mafic dykes of variable thickness intrude the Paleoproterozoic Cu ( $\pm$ Mo $\pm$ Au) hosting granitoids in and around the Malanjkhand mine locality, central India. These mafic dykes are fine to medium grained, subophitic to ophitic bearing cpx( $\pm$ hbl)-pl-mag-ap-zrn assemblage, which are collectively referred as Malanjkhand dolerite dykes (MDD). The MDD can be geochemically classified as basalt, basalt andesite and andesite of subalkaline, quartz tholeiite affinity. Based on major and trace elements, the MDD can be divided into three groups. Group-1 is marked by low SiO<sub>2</sub>, high MgO and low Fe<sub>2</sub>O<sub>3</sub><sup>T</sup>. Group-2 is characterized by relatively moderate SiO<sub>2</sub>, lower MgO and higher Fe<sub>2</sub>O<sub>3</sub><sup>T</sup> contents. Group-3 belongs to highest silica containing MDD, which are highly contaminated with crustal components and therefore do not possess systematic trace and rare earth element (REE) variations as commonly noted for least contaminated Group-1 and 2 MDD. The mafic to hybrid microgranular enclaves (ME) hosted in Malanjkhand granitoids have been geochemically compared with MDD, which strongly reveal that assimilation causes limited compositional changes of MDD whereas mixing between mafic and felsic melts producing different degrees of hybridized ME displays wide compositional spectrum. The observed Nb/La, Nb/Ce, Ce/Nd, Th/Yb, TiO<sub>2</sub>/Yb and chondrite to sub-chondrite REE patterns of least contaminated MDD (Group-1 and 2) depicted the involvement of primitive mantle-like source in the evolution of MDD rather than enriched or depleted mantle sources.

**Keywords:** Geochemistry, Mafic dykes, Enclaves, Malanjkhand, Central India.