Mafic Magmatism of the Singhbhum Craton, Eastern India: Implications for Mantle processes

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The Singhbhum Craton has a history of mafic magmatism spanning from early Archaean to Proterozoic (~0.1 Ga: represented by Newer Dolerites). The mafic magmatism is very significant for understanding the crustal growth processes. The available literatures indicate that the mafic members of the enclaves (amphibolites) found in older Metamorphic Group (OMG) of Singhbhum craton have signatures of enriched to depleted magma types. The volcanics of the volcano-sedimentary sequences present along the periphery of the Singhbhum nucleus exhibit picrite, komatiite and boninitic characters. The enclaves (within OMG) reveal compositional spectrum of silicious high-Mg basalts (SHMB) to andesites. Recurrence of depleted magma types are observed during the whole span of magmatic activity that has been vaguely related to mantle- heterogeneity. An alternative model of sequential mantlemelting is also proposed. The Singhbhum craton has been intruded by Proterozoic Newer Dolerite dyke swarms.

Detailed knowledge of geochemistry and isotope- systematics on individual mafic magmatic rocks is very important to understand geodynamic setting and the crustal growth processes in Singhbhum craton.

Keywords: Singhbhum Craton, Mafic magmatism, Older Metamorphic Group, Siliceous High Mg Basalt, Mantle-heterogeneity, Newer Dolerite dyke swarms.