

Tectonic setting of Nalgonda area Granitoids Part of EDC India

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Abstract:

The archean granite-greenstone terrain exposed around Nalgonda area in Nalgonda district of Telangana is comprised of granitoids of Peninsular Gneissic Complex (PGC). Petrographically the granitoids exhibit hypidiomorphic texture and are essentially composed of K-feldspar, quartz, plagioclase, biotite \pm hornblende, while zircon, epidote, apatite and opaques are noticed as accessory minerals. Mafic rich microgranitoid enclaves widely noticed indicating magma mingling phenomenon. These granitic rocks are peraluminous and metaluminous in nature and exhibit calc-alkaline trend. Major oxide geochemistry indicates high SiO₂ and high Na₂O + K₂O content. Positive correlation between SiO₂ vs alkalis (Na₂O, K₂O) and alumina (Al₂O₃) indicate normal differentiation trend characteristic of calc-alkaline plutonic felsic magmatism. Chondrite normalised REE plot of these granitoids conspicuous LREE enrichment, negative Eu anomaly and depleted HREE patterns indicating enrichment crustal source. The mafic dykes are occurring in the form of amphibolites and dolerites. The amphibolites show excellent foliation and abundant in gneissic grey granitoids. The dolerite dyke are cross cutting relation with granitoids and showing varying width and kilometers in length. REE data seems that the granitoids could be fractional crystallization products of felsic melt that was generated by melting of lower crust (or) hydrous basalt (amphibolitic) through magmatic upper mantle underplating beneath thickened crust and this is confirmed by field, petrographic and trace element characteristics. From our data we conclude that all the rocks have been derived from the continental crust/slab melting that has been taken place through a cycle of Island arc magmatic activity at the time of amalgamation of Dharwar craton.

Key words: Peninsular Gneissic Complex, Dharwar craton, igneous intrusions, amphibolites, granitoids and amalgamation.