Styles of Magmatism and Crustal growth in the Dharwar craton

Manikyamba, C*, Tarun C. Khanna, Prachiti, P.K., Raju, K., Balaram, V., Keshav Krishna, A. National Geophysical Research Institute (CSIR), Hyderabad 500 606, India.

(*Coresponding author: cmaningri@yahoo.com)

The granite greenstone terranes of Dharwar craton range in age from 3.4 -2.6 Ga and depict varied styles of magmatic processes that have contributed to the growth of continental crust in this part of Peninsular India. The lithotectonic variations observed in the greenstone belts of the Dharwar craton range from mid ocean ridge basalts reflecting on MOR environment, komatiite-komatiitic basalts representing mantle plume processes, boninite-arc basalt-adakite association endorsing the subduction zone processes. Apart from these, the association of komatiite-high Mg basalt-adakite and komatiite-dacite-shoshonite reflect on plumearc interaction processes. All these processes have played a significant role in the development of different mineral deposits like iron, manganese, copper, gold etc. in these greenstone belts. The associated sedimentary rocks also exhibit petrological and geochemical signatures indicative of these processes. Though the Dharwar craton has been divided into eastern and western sectors by the emplacement of linear outcrop of Closepet granite, the available geological, geochemical and geochronological data indicate that the greenstone belts of western Dharwar craton are older and deposited through mantle plume activity that erupted through or at the margin of continental. The greenstone belts of eastern Dharwar craton are younger and intraoceanic type indicative of partial melting of mantle wedge, subducting slab and their interaction. Recent geochemical studies have indicated complex type of island arc processes that have resulted in hybrid type of magmatic rocks. The greenstone belts of Dharwar craton are composite terranes represented by suture zones/accretionary planes. The crustal growth in the Dharwar craton represents autochthonous and allochthonous accretion of multiple terranes of different lithotectonic associations across these suture zones as the subduction-accretion complex migrated eastern side. All these processes together contributed for the growth of continental crust in the Dharwar craton.