Metamorphic Evolution of Karimnagar Granulite Terrane, Eastern Dharwar Craton, South India

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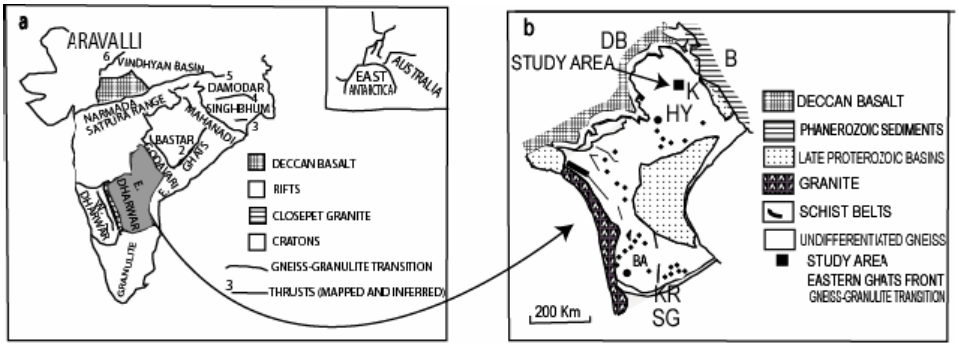
The Karimnagar granulite terrane is an integral part of the Eastern Dharwar Craton (EDC), India, having received much interest because of the only reported granulite facies rocks in the EDC. It shows a large variety of rock types with a wide range of mineral parageneses and chemical compositions, i.e. charnockites, gneisses, mafic granulites, quartz free granulites, granites, altered ultramafic rocks, metadolerites, banded magnetite quartzites and quartzites[1,2,3]. Andalusite and chlorite bearing assemblages presumably suggest retrograde origin[4]. These granulites are devoid of sillimanite and contain corundum instead. Reaction textures in the gneisses include breakdown of garnet to form corona and symplectites of orthopyroxene + cordierite, formation of cordierite from garnet + sillimanite + quartz and late retrograde biotite and biotite + quartz symplectites. In the mafic granulites inclusions of quartz and hornblende within orthopyroxene are interpreted as being a part of the prograde assemblage. At a later stage orthopyroxene is also rimmed by hornblende.The quartz free granulites display a variety of spectacular coronas, e.g. successive rims on corundum consisting of spinel + sapphirine + cordierite ± orthopyroxene, rare skeletal symplectitic intergrowth of sapphirine + cordierite + potash feldspar, and late retrograde formation of chlorite, corundum, spinel and andalusite from apphirine ± cordierite. Based on chemographic relationships and petrogenetic grids, a sequence of prograde, isothermal decompressive and retrograde reactions have been inferred. Quartz-free sapphirine granulites and mafic granulites record the highest P-T conditions (_ 7 Kbar, 850 ºC), whereas the gneisses were formed at lower P-T conditions (_ 5 Kbar, 800 ºC). Besides the presence of andalusite-bearing rocks suggest a pressure of around 2.5 Kbar. This change in pressure from 7 Kbar to around 2.5 Kbar suggests a decompressive path for the evolution of granulites in the study area, which indicates an uplift for the granulite facies rocks from lower crustal conditions[5].



a.Extension and boundaries of Eastern Dharwar Craton along with major thrusts of Peninsular India.
b. Lithologic patterns for the Precambrian rocks of the Eastern Dharwar Craton along with craton boundaries.

References

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