PETROLOGICAL STUDY AREA AROUND SAPPANAGUDDA OF HANNUR,KOLLEGAL TALUK, CHAMARAJANAGAR DISTRICT, KARNATAKA STATE INDIA

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Abstract

The paper concentrates on the Granulites of Kollegal area stated to have attained granulite facies metamorphism and the rocks themselves are called "Granulite materials required They are the result of high temperature and pressure acting on older rocks. Granulite is a coarse grained metamorphic rock formed at high temperatures and pressures The main lithological units that encompass the area are Granulites and they are strongly deformed and based on the field characters and petrography, it is inferred that these rocks are formed by metamorphism under granulite metamorphism followed by retrogression.

Keywords: *Granulites, Charnockites.*

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1. INTRODUCTION

In the extreme South Karnataka, Metamorphism has reached the highest grade, as a result of which rocks are coarsely crystalline and granular.They are the result of high temperature and pressure acting on older rocks. Granulite is a coarse grained metamorphic rock formed at high temperatures and pressures deep in the Earth's crust Its name derives from its even grained granular texture. Some mineral groups, such as amphiboles and micas cannot survive at the high metamorphic grade under which Granulites form and they are converted into Pyroxenes and Garnets by losing water.In India these rocks are widely distributed especially in Tamil Nadu and Kerala, Thomas Holland of the Geological Survey of India who made a detailed study of these rocks and designated them by a special name 'Charnockite' Rocks belonging to this group are particularly well exposed in the Coorg (Kodagu) region and in the mountainous belt forming the Biligirirangan and Malemahadeswara ranges in the south-eastern corner of the state.

A gradual transition from the low-grade facies rocks in the northern parts of Karnataka to the highest grade Granulites facies rocks at the southern tip can be traced. Nowhere else is such a continuous cross section is available for studying the processes operating over the full thickness of the continental crust. It is for this reason the Granulites grade rocks of Karnataka have attracted the attention of the international community.One of the most important contributions to the understanding of the Charnockites was by Pichamutu, who focussed the attention of the world to the process of transformation of the older gneisses to Charnockites, through metasomatic alteration. South Karnataka which shows a transition from an amphibolite facies terrain to granulite facies terrain then granulite facies terrain obviously holds the key for a final answer to the solution of this vexed question of the origin of charnockites.

In the South of 130 1atitude is a group of pyroxene bearing Granulites which have been named as 'Charnockites' These are believed to be formed as transformation of older gneisses due to the influx of CO2 rich fluids leading to the formation of orthopyroxenes.Charnockite formation and gold mineralization in auriferous schist belts are believed to be coeval with the major tectono-thermal event of emplacement of younger (closepet) granite.

2. METHODOLOGY

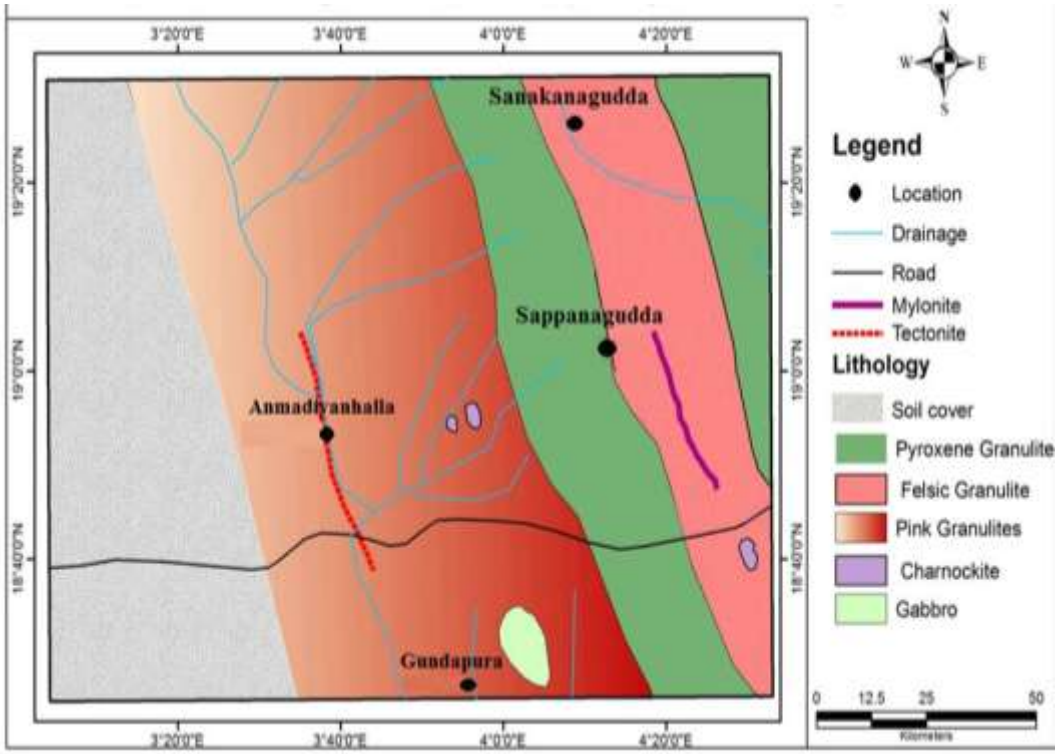
2.1 Study Area

The study area is located on the south in and around the hanur the area mapped falls in the Kollegal Taluk of Chamarajanagar District, Karnataka and is bounded by Latitudes $12^{o}0'00''$ and Longitude $77^{o}15'00''$area under study forms parts of toposheets No 57H/4 and 57H/8 of Survey of India. The state highway no 86 connects Bangalore with Kollegal good asphalt road pass through Hannur Ramapura and Kaudalli connecting MM hills

Fig 1: Study Area of Sappanagudda, Hannur village Kollegal taluk

2.2Geological Setting

Feld work in the area of Sappanagudda of the Hanur part of Toposheet 57H/8, Hanur village Kollegal Taluk, Chamarajanagar District, covering an area of about 2km has been carried out.The area is constituted by black soil, the fresh rocks are seen in the valley of river course, and study is focused on the different rocks based on their physical properties. The rocks arePyroxene granulite, Felsic granulite, Pink granulite, Charnockite,shear zone



Map1: Geological map of Sappanagudda Hannur village Kollegal taluk

3. PETROGRAPHY

3.1 Pyroxene Granulite

Megascopic characters This rock shows a dark grey in colour with coarse grained minerals. It is a hard and compact rock. Hypersthene occurs as the rocks are greyish green in colour. They are medium grained to fine grained rocks; the rocks are greyish in colourThey show different degrees of amphibolitization. Minor amount of opaque mineral are also present and hypersthene and plagioclase show a tendency towards gneissosity

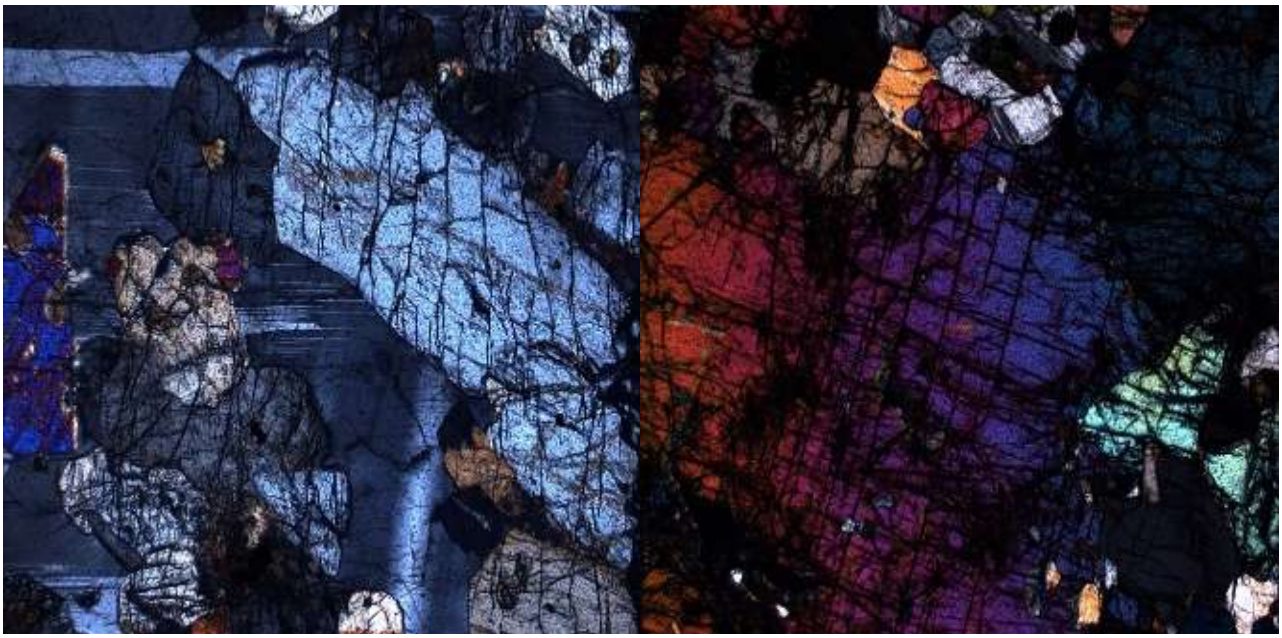


Fig 2: Plane polarized light **Fig:3** under crossed nicolTrack

3.2 Felsic Granulite

Megascopic characters: The rock shows red colour with felsic minerals and show the effect of mylonotisation, the minerals and the enclosed rock show a stretched appearance

Microscopic characters: In thin section it shows granoblastic texture, quartz, plagioclase, perthite, biotite and hypersthene constitute, the minerals are coarse grained and Quartz is colourless, anhedral and show undulose extinction. Hypersthene is shown all signs of retrogression to biotite mica and opaque minerals are present in felsic granulite.

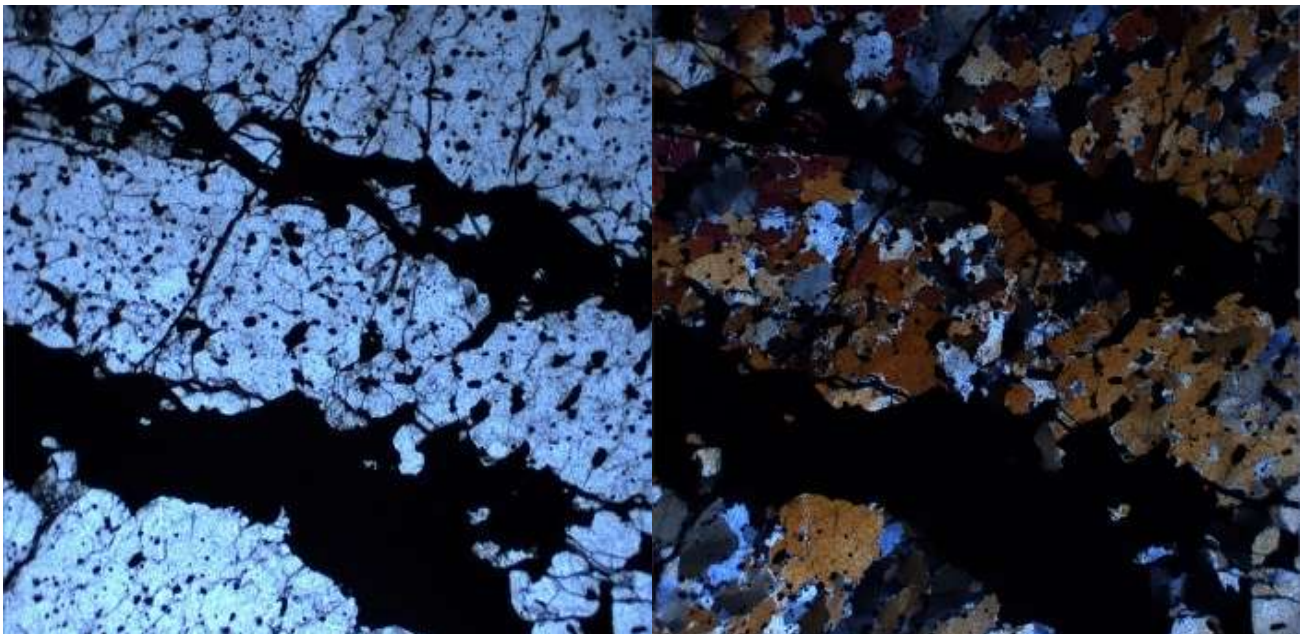


Fig 4: Plane polarized light **Fig 5:** under crossed nicol

3.3 Charnockite

Megascopic characters: Charnockite is similar to granulite and has a granoblastic texture it has an overall greasy appearance, and it is dark coloured. It does not contain amphiboles as these have been converted to pyroxenes under high grade metamorphism. Quartz, k-feldspar plagioclase and opx are the minerals.

Microscopic characters: Essential minerals are hypersthene, Plagioclase, Quartz, K-feldspar, Perthite (enstatite) and Garnet, Accessories minerals are biotite and opaque. The rock exhibit granoblastic texture garnet is formed after orthopyroxene biotite mica is also formed after hypersthene. Hypersthene is colour less show medium order interference colour and straight extinction.

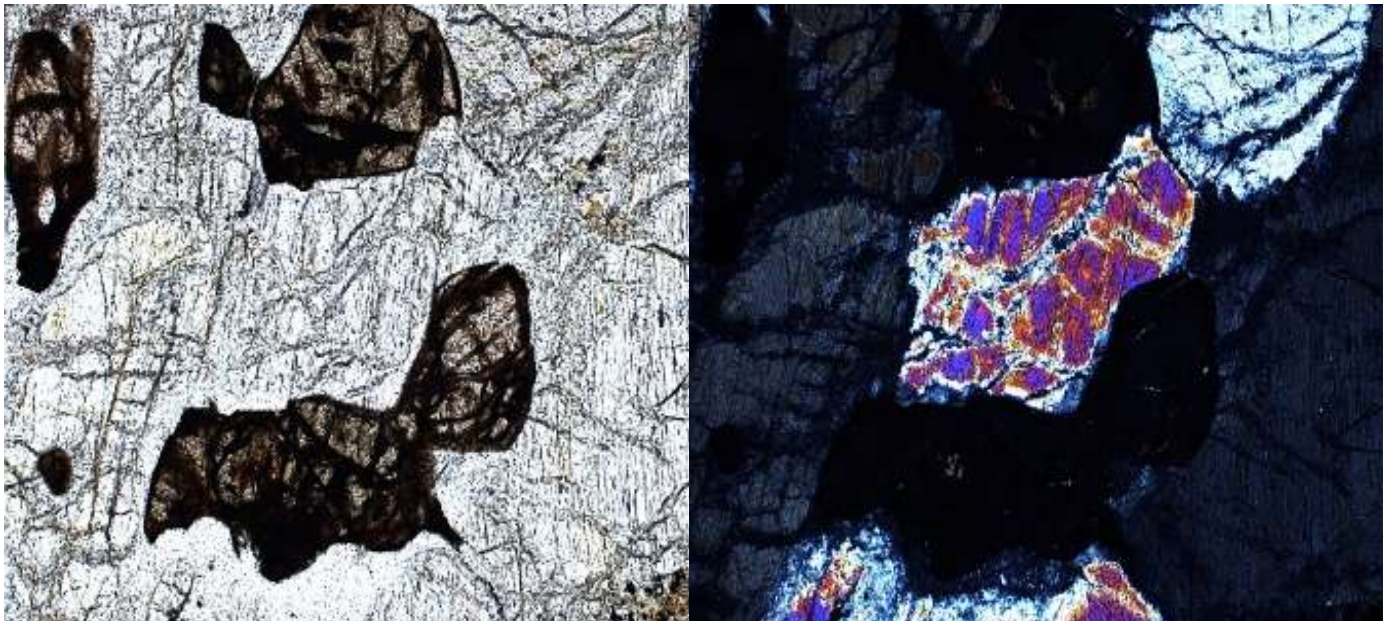


Fig 6: Plane polarized light **Fig7:** under crossed nicol

3.4 Tectonite

Megascopic characters: The rock is fine grained with alternate black and white bands the rock show all the effects of mylonitization. Microscopic characters: In thin section it shows fine grained texture with mylonite fabrics individual mineral are difficult to identify due to mylonitization process and later hydration

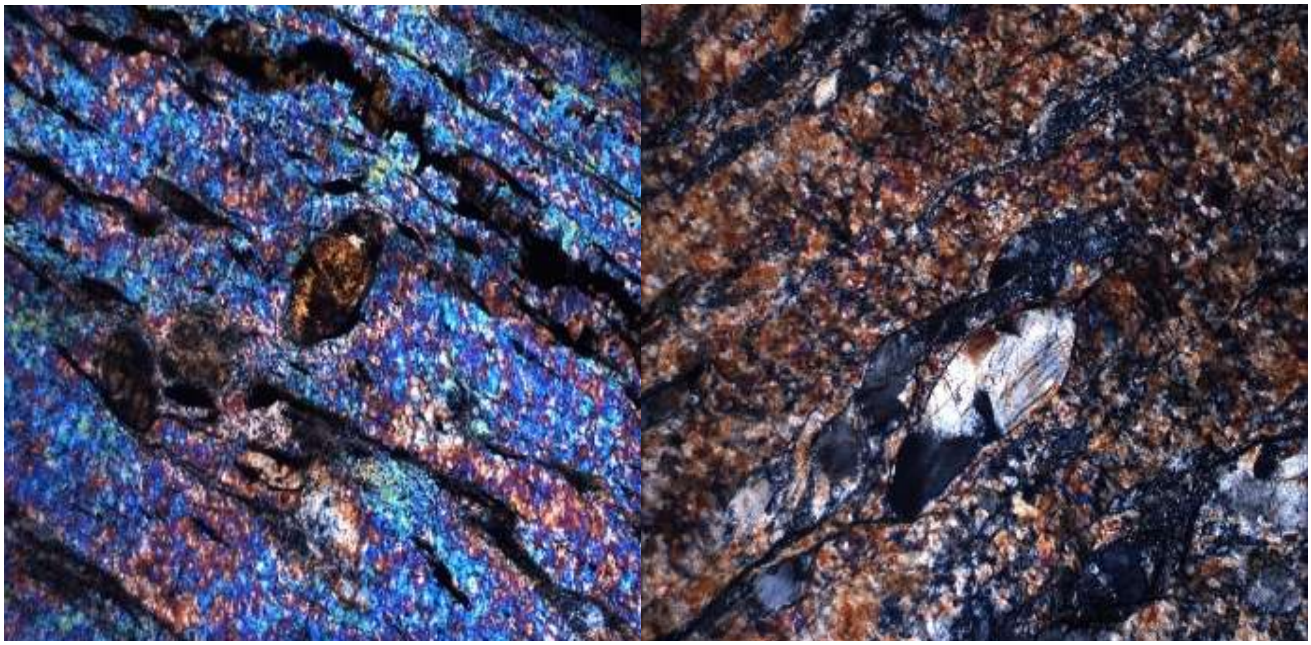


Fig 8: Plane polarized light **Fig 9:** under crossed nicol

4. CONCLUSION

Sappana gudda area of Hannur $12^0$0'00" and Longitude 77^o15'00" longitude is a village situated 6 kms from Hanur town. The study area forms a part of the high grade metamorphic terrain of Karnataka Craton. The main lithological units that encompass the area are Granulites and they are strongly deformed and based on the field characters and petrography, it is inferred that these rocks are formed by metamorphism under granulite metamorphism followed by retrogression

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