

EXECUTE SUMMARY**THE TIME OF SENDING THE FINAL REPORT OF THE WORK DONE ON THE PROJECT**

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UGC approval no. and Date : F. N. 47-1025/14 (General/58/WRO)
XII Plan, dated July 28, 2017.

Date of Implementation : 17th August, 2017

Tenure of the Project : Two Years

Total Grant Allocated : 3, 80,000

Total Grant Received : 3, 15,000/-

Final Expenditure : 3, 93,426/-

Title of the Project : "Geological Studies of Ultramafic Rocks
Gondpipri Area, Chandrapur District,
Western Bastar Craton, Central India"

Objectives of the Project : Copy attached (Annexure)

Whether objectives were achieved : Copy attached (Annexure)

Achievements from the Project
Summary of the finding : Copy attached (Annexure)

Contribution to the Society : Copy attached (Annexure)

Whether any Ph.D. enrolled/ : Yes 01

Number of publications out of the project : Copy attached 02 publications (Annexure)


(Principal Investigator)




(Principal)

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INTRODUCTION: Dyke formation is an integral feature of crustal evolution, closely interlinked with magmatic and deformational events, which have occurred since Archaean times. The phases of mafic magmatism, which periodically punctuate the geological record on every continent, represent major thermal events, resulting in extensive mantle melting.

Ultramafic-mafic magmatism is important throughout Earth history and such occurrences are restricted to specific periods of time and to specific tectonic settings (Crawford, 1989; De Wit and Ashwal, 1997). e.g. (1) Komatiitic suit of rocks are reported from the Archaean greenstone belts; (2) Norites and their extrusive volcanic equivalent siliceous high-Mg basalts (SHMB) are mainly of Neoarchaeal to Paleoproterozoic age and were emplaced mostly in intracratonic rift (Hall and Hughes 1990a, 1993); and (3) Boninite/ boninite-like rocks are mostly reported from the Phanerozoic and are confined to convergent margin settings (Crawford 1989; Srivastav et al., 2010).

Understanding of the crustal evolution of Peninsular India in totality would be incomplete without a proper understanding of the characteristics of the dyke rocks. The emplacement of the dykes usually postdates major magmatic and tectonic cycles. There may also be cases where they antedate or even be contemporaneous (Devaraju, 1995).

METHODOLOGY

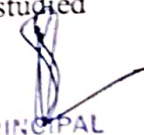
1. SAMPLING

Literature survey of ultra-mafic rocks of Gondpipri area of Chandrapur district. During First year field work investigation is exclusively concentrated on the study of the ultra-mafic rocks that are scattered in a vast granitic terrain of Gondpipri area of Chandrapur district, western Bastar craton. In the present work, District Resources Map (DRM) published by Geological Survey of India (GSI, 2001) having scale of 1:300,000 were first taken. It was then enlarged and superimposed on the respective toposheets and preliminary base map was prepared using DRM. The toposheets used for the present study are 55M/03, M/13, M/14 having 1:50,000 scale for the sampling purposed.

2. PETROGRAPHIC TECHNIQUES

In the present work, total 15 samples are collected in the field out of which 10 samples are selected for petrological studies. To describe detailed petrographic characters, both megascopic and microscopic examinations of all the collected mafic rocks have been studied and a brief methodology is discussed below:




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The petrological study of the samples on the megascopic level was carried out in the field itself with naked eye and with a hand lens, wherever necessary. Megascopic features are further studied in laboratory for other details such as textures, mineral compositions, specific gravity and any other specific observation. From the megascopic studies, one can have a firsthand assessment of the rock type but study of their microscopic characters is essential to describe its petrographic nature.

The petrographic study of 10 thin sections was carried out in the Post graduate Department of Geology, M. G. College Armori. Detailed petro-mineralogical studies including micro-structure and textures, constituent mineralogy,

AIM AND OBJECTIVES:

The main aim of the work is to understand the evolution of Precambrian lithosphere of western part of Bastar craton in general and study area in particular.

- To achieve this objective and for complete picture of the status of ultra-mafic rocks exposed in the study area of western Bastar craton and their role in the evolution of sub-continental lithosphere of central India, it is proposed to carry out following studies-
- To investigate whether there is any relationship exists between the dykes and associated ultra-mafic they are derived independently from a similar mantle source.
- To understand the processes involved in the development and evolution of the dykes and associated ultra-mafic rocks. This may provide significant information on the nature/ growth and development of the sub-continental lithosphere.

BRIEF OBJECTIVES OF MINOR RESEARCH PROJECT:

The various mafic-ultramafic rocks studied in detail includes granulites from Sukma Group namely charnockite, pyroxenites and gabbro/metagabbro; mafic volcanic enclaves (metabasalts / amphibolites) from Amgaon Gneissic Complex (AGC), older mafic intrusive represented by metagabbro and metadolerite and younger mafic intrusive represented by gabbro and dolerite.

Ultra-mafic rocks are an important feature of the crustal evolution in the stabilized Archean cratons all over the world. Ultra-mafic dykes constitute a common expression of crustal extension in both oceanic and continental environments, and represent major avenues by which basaltic magma is transferred from mantle to upper crust. Detailed studied of dykes in space and time could therefore, provide valuable information on the growth and development of the sub-continental lithosphere throughout the Palaeoproterozoic period. From the dyke



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chemistry dykes of different ages can be distinguished. Study of secular changes in the composition of basalts are important to study the mantle and crustal evolution.

The geological, petrological and geochemical details of mafic dykes as well as mafic volcanics and ultra mafics of Gondpipri area of western Bastar craton have been presented in previous sections. This presented information suggests different petrological types of mafic dykes and mafic volcanics which might have different petrogenetic histories. In the previous chapters, collected data is presented in such a way that the data reflects a better understanding of petrological and geochemical characteristics of the studied mafic rocks. The discussion about the same is presented in this chapter to understand the petrogenetic processes involved during the emplacement of western Bastar mafic rocks.

CONCLUSION: weather it is beneficial to society students and researchers- YES

1. Ultra-mafic dykes are an important feature of the crustal evolution in the stabilized Archaean cratons all over the world. They constitute a common expression of crustal extension in both oceanic and continental environments, and represent major avenues by which basaltic magma is transferred from mantle to upper crust.
2. In the study area, rocks of Bailadila Group with banded iron formation overlie the gneissic rocks. They are intruded by older mafic intrusives. The Mul Granite pluton represents the major phase of acid igneous activity intruding the older supracrustals. The rocks of the area are intruded by younger mafic intrusives, pegmatites and quartz veins. Older supracrustals are overlain by rocks of Pakhal, Penganga and Gondwana groups.
3. The pyroxenite occurs as low to moderately elevated NE trending linear ridges showing lobate outcrop boundaries and occur as floating elongated lenses lying within the DQDT and Charnockite-Pyroxene diorite suites. They are the continuation of Bhopalpatnam and Karimnagar granulites (2450 to 2500 Ma).
4. Copper mineralization is also observed in the study area along fault at Dubarpeth and Thanewasana. It is associated with Barite and minor amount of gold.
5. If We start copper mines at Thanewasana, It will be helpful to the society for their socio-economic development




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