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Indication of Copper and Uranium Mineralization in PGC (Peninsular Gneissic Complex) around Utnur Area, Adilabad District Telangana

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ABSTRACT

During the field study, malachite stains were observed in granite which was intruded into biotite gneiss lithounit of the Peninsular gneissic group, mylonite and augen gneiss at places in the study area are the manifestation of Ductile deformation and ore fluid conduit. Formation of Chalcopyrite and uraninite in the granite indicate two different sets of redox stages so this also throws light on the different stages of paleo-environment condition in the basin when the minerals were crystallized out from the ore fluids

Keywords: Mylonite, Chalcopyrite, Uraninite, Ductile Deformation, Paleoenvironment

Geology of the Study Area

The area under consideration comprises the lithounits of PGC-ll of Archaean to Palaeoproterozoic age and Penganga Group of Upper Proterozoic age, which are unconformably overlain by basaltic flows of Deccan Traps of upper Cretaceous to Palaeogene age. Infra trappean beds are exposed at the contact of Penganga beds with Deccan Trap lavas. The basalt is lateralised at top. The PGC-II comprises grey biotite granite and is exposed in the southwest and belongs to Archaean to Palaeoproterozoic age. It is a massive and leucocratic rock. It is composed of K-feldspar, quartz, plagioclase and biotite. Basalts of the Poladpur Formation overlie the PGC-II . Deccan Basalt is a major rock type and is exposed in southeastern, central, and northern parts. It is of tholeiitic in a composition comprising andesine, labradorite, clinopyroxene, glassy matter and amorphous iron silicates.

The general stratigraphic sequence in the study area is given below (modified after Kameswara Rao, 1989)

Sahyadri group	
Penganga Group	
Acid Intrusives (quartz vein , Pegmatite)	Peninsular Gneissic Complex
Basic Intrusives (dolerite dyke, Pyroxenite)	
Grey granite /Tonalite	
Biotite gneiss	

Amphibolite	High grade
Banded Iron Formation , quartzite	Supracrustals

Polyphase deformation has produced complex structural features within the supracrustals, indicating major ductile deformation surrounding the emplacement of granitic rocks (Sarvothaman, 1984). The granite/granite gneiss displays two major fracture trends viz. NW-SE and NE-SW. Several NE-SW trending quartz and quartzo-feldspathic veins (of pegmatitic affinity), along with several epidote veins, occur as acidic intrusive bodies along with their basic counterparts of dolerite and pyroxenite within the granite.

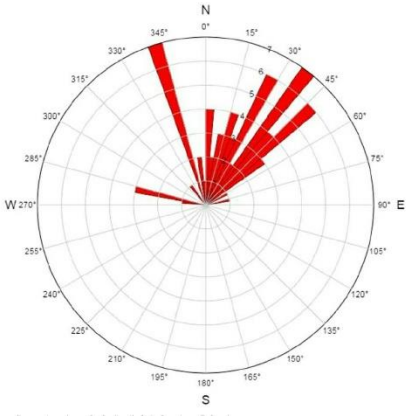

Figure 1: Rose diagram showing trends of joints, fracture, and veins in the study area, TS 56I/15

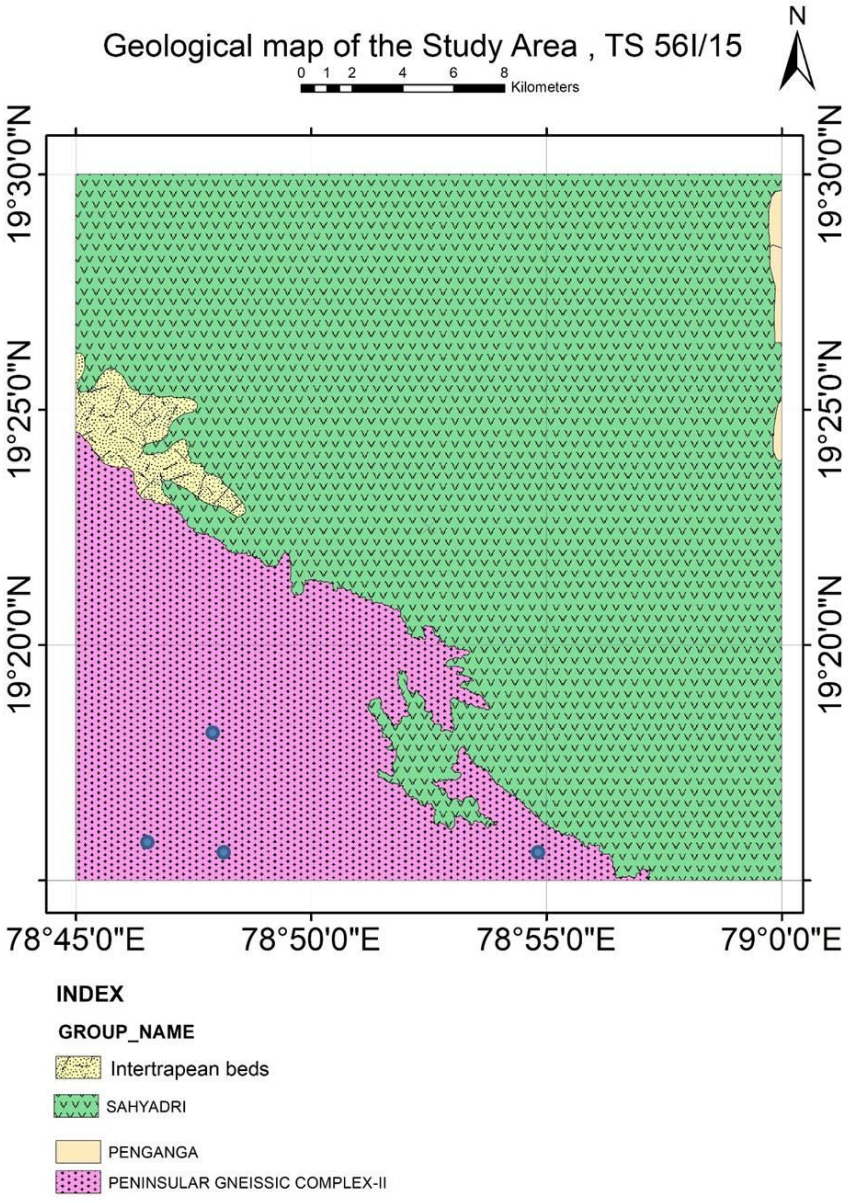

Figure 2: Geological Map of the Study area , toposheet no 56I/15

Ore petrography:

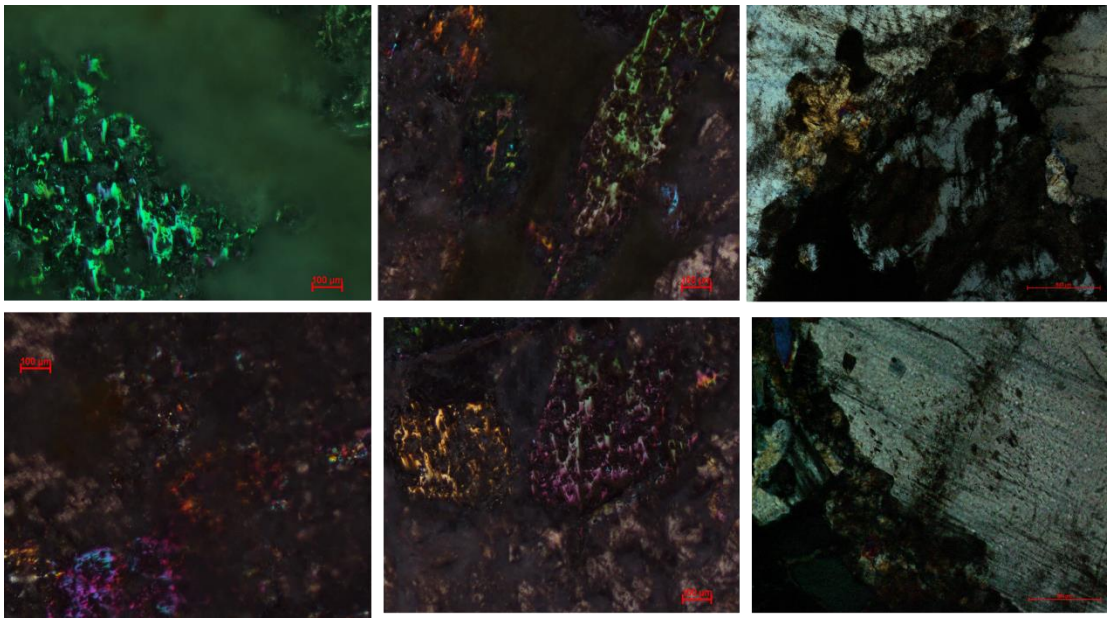

Figure 3: photomicrograph of Copper ores such as chalcopyrite, bornite,and malachite along with some pyrite

From ore petrography, it's quite clear that the first mineral to be crystallized from the ore fluid is chalcopyrite. oxidation and carbonation of ore converted chalcopyrite into bornite and malachite.

petrographic and field studies shows that uraninite might be epigenetic in origin (hydrothermal possibly ??) like copper but uraninite crystallization might be part of the oxidation stage of the basin when bornite and malachite were formed

Conclusion:

Mineralization in the study area is epigenetic in nature and the area might have the potential for uraninite and copper minerals. through study and exploration methods exact potential or reserve should be assessed

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