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An Appraisal of Precambrian Geology of Coastal Maharashtra, India

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Two contrasting sequences are mappable here, an older supracrustal and the relatively undeformed sedimentary cover. Foote¹ considered them as equivalent of Dharwar and Kaladgi Series respectively. Ghodke, 1983² compared the older sequence with the Upper Metagreywacke of Chitradurga Schist Belt. Beside this and available published geological map of GSI³ (1:250,000), no published literature is available to give integrated background of Precambrian Geology of the area under study. Jadhav and Kshirsagar, 2001⁴ have given a broad framework of the area.

The supracrustal rocks of diversified origin in the study area are reassessed on the basis of their depositional conditions, deformation and metamorphism along with field relationships. Our observations suggests that the biotite gneiss forms basement for the supracrustals comprising of mixed volcanoclastic sediments metamorphosed from lower green schist to Staurolite-kyanite grades (graphite) of metamorphism with consistent presence of almandine garnet originated in multiple phases particularly in the southern part. Quartz Mica Schist (QMS, Metagreywacke) and metabasalts/amphibolite are the most consistent units seen in most part of the area. Generally three phases of deformational structures are preserved in the southern and central parts while the western and northern parts have preserved two phases of secondary structures with a uniform mylonitic fabric as the youngest phase. The syntectonic granite gneiss conspicuous in the central part has presence of second generation of structures as earliest deformation structures. Interfingering of these with QMS and metabasalts/amphibolites have often given rise to migmatites in the southern part and higher grades of metamorphism in the absence of migmatization. Unfoliated/ weakly foliated potash rich granite is the youngest intrusive activity mapped. Granitization is completely absent in the northern part of the area. Metabasic and ultrabasic intrusives are seen in most of the area with presence of two phases of deformation in the southern part and one phase of deformation in the northern part. In general, the multiphase deformation has given rise to map scale interference patterns particularly in the southern and central part. A careful macro-meso-microstructural studies have revealed two phases of metamorphism corresponding with the first two phases. Presence of mappable conglomerate-quartzite association at three different places have helped understand relationship between different supracrustal sequences. Based on field evidence and laboratory analysis, it can be said that the supracrustal sequence is equivalent of Chitradurga Schist belt, particularly the southern part which continues in the further north-eastern part. They are really a continuation of supracrustals of Goa. However the western and northernmost exposures look different compared to these and has preserved a relatively simpler deformation geometry with presence of conglomerate horizon bordering the coast.

The supracrustal sequence are overlain by the relatively undeformed sedimentary cover with dominance of clastic component. Kshirsagar and Jadhav, 1999⁴, while comparing them equivalent of younger Kaladgi sequence, recognised them under Phonda Group. A distinct unconformable relationship exists between them.

An attempt is made here to take an overview of the Precambrian of the coastal Maharashtra and give a broad stratigraphic framework. The area becomes very important in the context of its close similarity

with the sequence of Madagascar Group, particularly in the presence of graphite schist in the central part.

References

- [1] Foote R B (1876), Mem Geol. Surv India Vol 12 (1) 268p.
- [2] Ghodke S S (1983), In Prof. Kelkar memorial volume, Indian Society of Earth Scientists.
- [3] GSI (1995) Geological Map of Goa and Maharashtra (48E) Scale Geol. Surv India.
- [4] Jadhav P B and Kshirsagar L K (2001) Project report, DST India, 141 pp
- [5] Kshirsagar L K and Jadhav P B (1999) Field workshop, Geol. Soc. India, 8-10 pp.

