ABSTRACT

Dharwar Craton has a number of volcano-sedimentary sequences preserved in the form of linear belts ranging in age from early (3.0Ga) to late Archaean (2.7Ga to 2.5Ga); these belts are recognised as “Greenstone Belts” or “Schist Belts”. Based on the nature of distribution, order of superposition, tectonic setup and their relationship with the peninsular gneiss, these Greenstone Belts can be classified as Western and Eastern Greenstone Belts. There are seventeen Eastern Greenstone Belts, including the major and minor ones. Amongst the seventeen, the Peddavuru Greenstone Belt is of minor magnitude and is located on way to Nagarjuna Sagar from Hyderabad. It has all the lithological sequence, structural events, basement-cover relationship and younger intrusives similar to any major belt. In pursuance of this, the researcher has taken up this schist belt for her doctoral dissertation. This schist belt has liner disposition; it is in the form of hook shape and trending NW-SE extends over a strike length of 25Km from Jugudem in the north to Ethipotala in the south. The width of the belt varies from 0.5 to 2Km. The study area lies between North Latitude 16° 30' and 16° 49' and East Longitude 79° 05' and 79° 28' which occurs in the survey of India Toposheet Nos. 56 p/2, p/5, p/6 and p/10 was geologically mapped on 1: 25,000 scale. The dissertation is aimed to understand the stratigraphy, structure, lithology and evolution of schist belt. The thesis includes field studies, petrographic studies and geochemical studies.

The entire study has been divided in to three stages, Viz., (a). Pre-field stage (b). Filed stage ND (c). Post-field stage. During the pre-field stage, extensive literature concerned with greenstone belts has been collected and FCC of the area has been studied.

The representative samples of all the lithological units have been collected during the field stage and the geological map has been prepared using the spectral reflectance and spectral signatures of various lithological units. Thin sections of the representative litho-units are made for mineralogical and petrographic studies.
The chemical analysis has been done during the post field session. The rock samples have been analysed for the major, minor and trace elements. This data has been processed and used for classification and tectonic setting of litho-units.

The entire information is presented in six chapters, the details of which are documented below.

CHAPTER I - INTRODUCTION: This chapter deals with the general characters of the Dharwar Craton. The two styles of greenstone belts are detailed and the characters of the Eastern Greenstone Belts have been highlighted. In addition to the normal information on location, topography, communication, climate and geological setup etc., the methodology adopted was also explained vividly.

CHAPTER II - SCHIST BELT LITHO UNITS: The rocks of the schist belt include Metabasalt, Metarhyolite and Banded Iron Formation which have been documented with a special stress on their spectral signatures, field setup, structure, petrography and geo-chemistry. The classification of the volcanics, nature of the magma and tectonic setting are also discussed in detail in this chapter.

CHAPTER III- GRANITOIDS: The granitoids which occur on either side of the schist belt range from tonalite-granodiorite to granite have been studied in detail. These rocks are classified following the modern trends of the study of granites. The field setup, structure, petrography and geo-chemistry are described in this chapter. The geo-chemistry is used for classification and tectonic setting of the granitoids.

CHAPTER IV- DYKE ROCKS: The dyke rocks represent the last phase of igneous activity in the area are described in this chapter. In the study area dolerite dykes are more common. The structure, petrography and geochemistry of dolerite dykes are explained. The specialty of the Peddavuru schist belt has unique intrusive called as 'Foot ball Anorthosite'. The features of this unit are clearly explained and the possible origin is discussed.

CHAPTER V- STRATIGRAPHY OF THE SCHIST BELT: The importance of the stratigraphy and the various types of stratigraphic studies are explained in this chapter. The lithostratigraphy is the best suited for the study of schist belts. The lithostratigraphy of the Peddavuru schist belt has been established.

CHAPTER VI- SUMMARY AND CONCLUSIONS: All the information mentioned in the above chapters has been summarised and the conclusions drawn based on the field and laboratory data are presented in this chapter.