



Sedimentological Aspects of Palnad Basin, Kurnool Group, Andhra Pradesh

* P.Madesh. ** P.Lokesh Bharani ***S.Baby Shwetha

*** Department of Earth Science, Manasagotri, University of Mysore – 570 006

ABSTRACT

Sandstones, quartzites and shales ascribed to the Kurnool Group occur as major outcrops in the area around palnad basin, Guntur district. Studies have been carried out on the rocks of the above areas to understand their sedimentological characteristics. The statistical parameters and moment measures have been calculated from size frequency distribution, based on sieve analysis data on sandstones. Mineralogy of sandstone have been determined. From field characteristics and laboratory data, the sedimentological and environmental conditions have been interpreted.

Keywords :

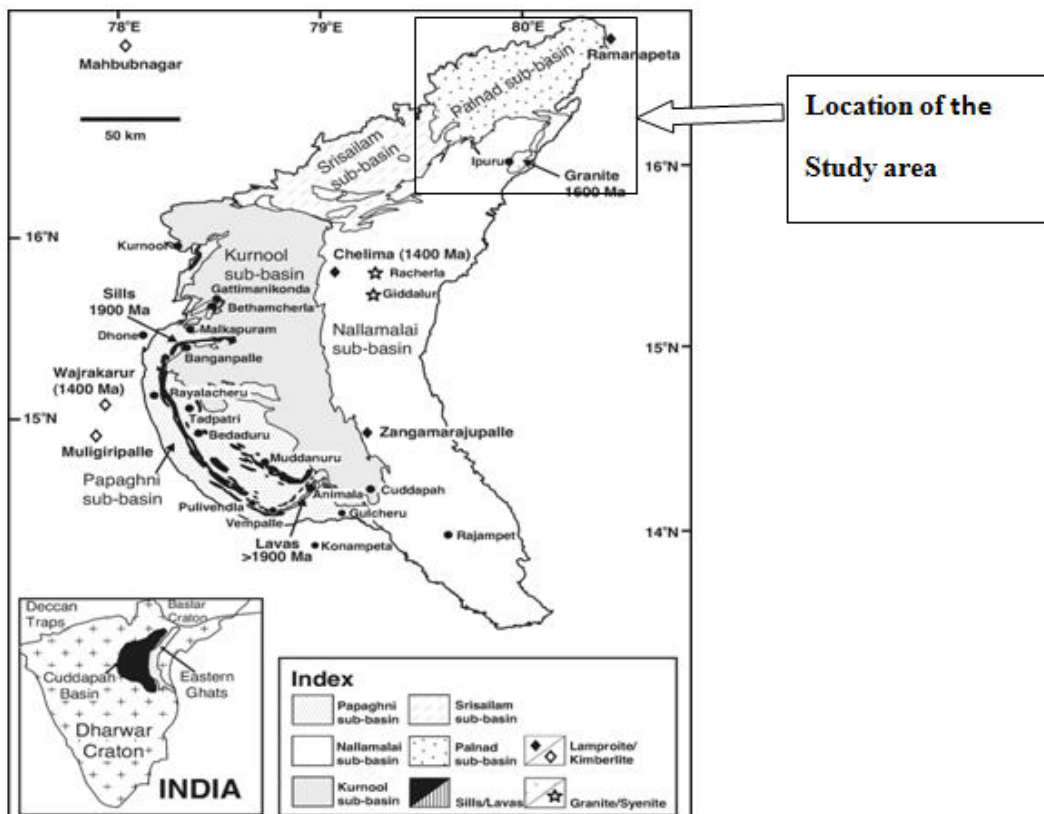
INTRODUCTION

The sedimentary deposits consisting of quartzites, sandstones and shales ascribed to the Kurnool Group. The late Proterozoic Kurnool group of rocks are very well exposed in Kurnool as well as in Palnad basin and are developed mainly as half graben due to reactivation of related fractures (Nagaraja Rao et.al,1987) and rocks belonging to Kurnool group are exposed in two basins; one is Kundair basin and the other in Palnad basin. Principally mineralogical and textural features of these rocks have been examined and a brief account is given of the characteristics of the rocks in the study area. Studies have enabled a better understanding of the sedimentolog-

ical nature and environmental conditions of the deposition of these ancient sediments.

LOCATION OF THE STUDY AREA

The area taken up for the present study occupies about 760 sq. km in the Palnad basin to the south of Nagarjunasagar Dam. It is located between 16°15' – 16°35'N latitudes and 79°15'-79°36'E longitudes on Survey on India topo sheets 56 P/8 & 7. The stratigraphy of the various formations in the Palnad Basin, particularly that of the quartzite horizon has been correlated with the Banganpalli and Krishna Groups of rocks of the type area in the western part of the Cuddapah Basin.



PALNAD REGION

The sandstones are nearly having a thickness of about 4m. Sandstone is highly compact and shows various shades of brown and grey colour. They are medium grained and the sand grains are held together by the silica matrix. Sandstones are succeeded by quartzites having a thickness of about 15 meter.

The petrographic study of sandstones have enabled their grouping into three major types (a) sandstones with ferruginous cementing material, often reddish, (b) sandstones with siliceous material often gray to white, (c) hard, compact, grayish white to red orthoquartzite, practically devoid of feldspars.

Grain Size Parameters of the Sandstone (Banaganapalle Formation) of Palnad Area

Sand %	Silt %	Clay %	Mean Phi	Median Phi	Standard Deviation	Skewness	Kurtosis
84.10	12.86	03.04	2.21	1.88	0.48	+0.51	0.98
85.30	13.67	01.02	2.11	1.90	0.41	+0.26	0.98
82.41	15.78	01.80	2.01	1.79	0.50	+0.57	0.76
89.30	09.50	01.18	2.69	2.51	0.53	+0.38	0.91
78.14	18.48	03.36	2.25	2.32	0.38	-0.04	0.94

Modal Analysis of the Sandstone of Palnad Area

Minerals/Samples	MA/1	ET/1	AL/1
Quartz	82.78	72.00	73.72
Feldspar	2.72	4.43	3.58
Rock Fragments	2.63	2.17	6.33
others	1.87	1.50	5.37
Matrix	10.00	20.00	11.00

Grain Size Parameters of the Quartzite (Banaganapalle Formation) of Palnad Area

Sand %	Silt %	Clay %	Mean Phi	Median Phi	Standard Deviation	Skewness	Kurtosis
86.18	12.73	01.12	2.14	1.86	0.54	+0.48	1.19
81.41	15.17	03.41	2.15	1.94	0.46	+0.34	0.82
78.72	16.93	04.34	1.91	1.80	0.37	+0.24	1.03
77.44	17.60	04.95	1.80	1.67	0.32	+0.24	0.97
88.62	09.38	01.01	2.04	1.88	0.40	+0.25	1.12

Modal Analysis of the Quartzite of Palnad Area

Minerals/Samples	RA/1	UP/1	SU/1
Quartz	96.70	98.28	95.92
Feldspar	02.18	00.95	03.23
Rock Fragments	00.77	00.30	00.45
others	00.22	00.50	00.40
Matrix	-	-	-

CONCLUSION

In brief, it may be mentioned that quartzites, sandstones and intercalated shales in these areas have low northerly dips. Sandstones are medium grained, moderate to well sorted, meso to leptokurtic and are unimodal. Sand grains are sub-rounded to rounded and show high sphericity. Mineralogical studies on sandstones and shales indicate respectively the reworked nature of the sediments and shallow water marine conditions of deposition. Field and laboratory studies on conglomerates suggest that these belong to arenite facies.

The application of modern technique in the study of sediments and the grain size distribution data and statistical parameter derived, along with other field and laboratory data have been found to be significant in understanding the sedimentology of the part of the Kurnool Group of rocks around Palnad basin.

REFERENCES

Boruah, P.K and Dutta, S.K., (2000) Framework mineralogy and texture of the upper palaeocene sandstones from Laitrengrew-cherrapunji area of east Khasi Hills, Meghalaya. *J.Geol.Soc.India*. 56: 53-65. | Chaudhri, A.R., (1993) Textural parameters of the Nagthat sediments of the Chakrata hills, Kumaon Himalaya. *Ind.J.Ear.Sci.* 20: 119-125. | Dapples, E.C., and Rominger, J.F., (1945) Orientation analysis of fine grain elastic sediments: *Jour.Geol.* Vol.53, pp. 246-261. | Dapples, E.C., (1947) Sandstone types and their associated depositional environments: *J.Sed.Pet.* 17: 91-100. | Folk, R.L., (1966) A review of grain size parameters. *Sedimentology*, Vol.6, pp. 73-93. | Picard, (1968) Classification of fine grained sedimentary rocks: *Jour.Sed.Pet.* Vol.38, pp. 804-816. | Powers, M.C., (1953) A new roundness scale for sedimentary particles: *Jour.Sed.Petrology*, Vol.23, pp. 117-119. | Reddy, P.H. and Vijayam, B.E., (1976) Tectonic framework of sedimentation in the western part of the Palnad basin, Andhra Pradesh. *Ind.Mineral.*, Vol.17, No.4, pp. 439-448. | Sahu, B.K., (1983) Multigroup discrimination of depositional environments using size distribution statistics. *J.Ind. Ear.Sci.* 10(1): 20-29. | Visher, G.S., (1969) Grain size distribution and depositional processes. *Jour.Sed.Petrol.*, Vol.39(3), pp. 1074-1106.