CHAPTER-1

INTRODUCTION

I.A :GENERAL :

The Jharol area of Southern Rajasthan where the present work has been carried out is geologically a very important area. Geological data put forward by a number of previous workers on various aspects remain insufficient due to the lack of detailed studies. This area is still not fully and systematically mapped and no investigation regarding structures and metamorphism has been carried out. The availability of information pertaining to various aspects of geology remains scanty. The author in this thesis has tried to put forward a detailed work on stratigraphy, mesoscopic, macroscopic and microscopic structures and metamorphic characteristics of the rocks encountered.

I.B LOCATION AND COMMUNICATION :

The study area lies between the lattitudes 24°15' to 24°30' and longitudes 73°15' to 73°30'. The total area is estimated to be about 1800 sq.km. The three main villages which are found in the area are from North to South. Ogna in the North, Phalasia in the South and Jharol in East. Beside these villages, there are several smaller villages which are mostly distributed along the narrow zones of lowland area where various rivers and streams flow. The area falls in the

southern extremity of the Udaipur district of Rajasthan. All the main villages (Ogna, Phalasia, Bichhwara, Jharol, Bagpura, etc.) are connected by interdistrict highway and motorable roads in dry season. It is accessible throughout the year from Udaipur and from Kherwara towns (Figure-I.1).

I.C :PHYSIOGRAPHY :

Topographically the area is extremely rugged and hilly. The main river which flows through the area is Mansi Nadi which is the tributary of Wakal river. The average elevation of the ridges is about 741 metres. The highest peak is of 1005 metres height; named as Kamalnath Ka Pahar and made up of quartzite ridges. the tract that extends from Nenbara in the South to Kaliawa in the North exhibits beautiful trallise and rectangular types of drainage pattern which indicates erosional propagation after faulting, shearing and folding and has led to the formation of linear quartzite ridges as fault escarpment alternated with narrow lowlands comprising of soft and easily erodable schistose rocks.

I.D :DURATION AND TYPE OF WORK :

Geological mapping of the area was carried out on a scale of 1:50,000 using the toposheets number 45H/6, 45H/7, 45H/8, 45H/10 45H/11 and 45H/12. The survey was done by "Traverse method" for the purpose of studying the geology of the area. A number of close traverse were taken for detailed studies. More than 200 representative samples were collected

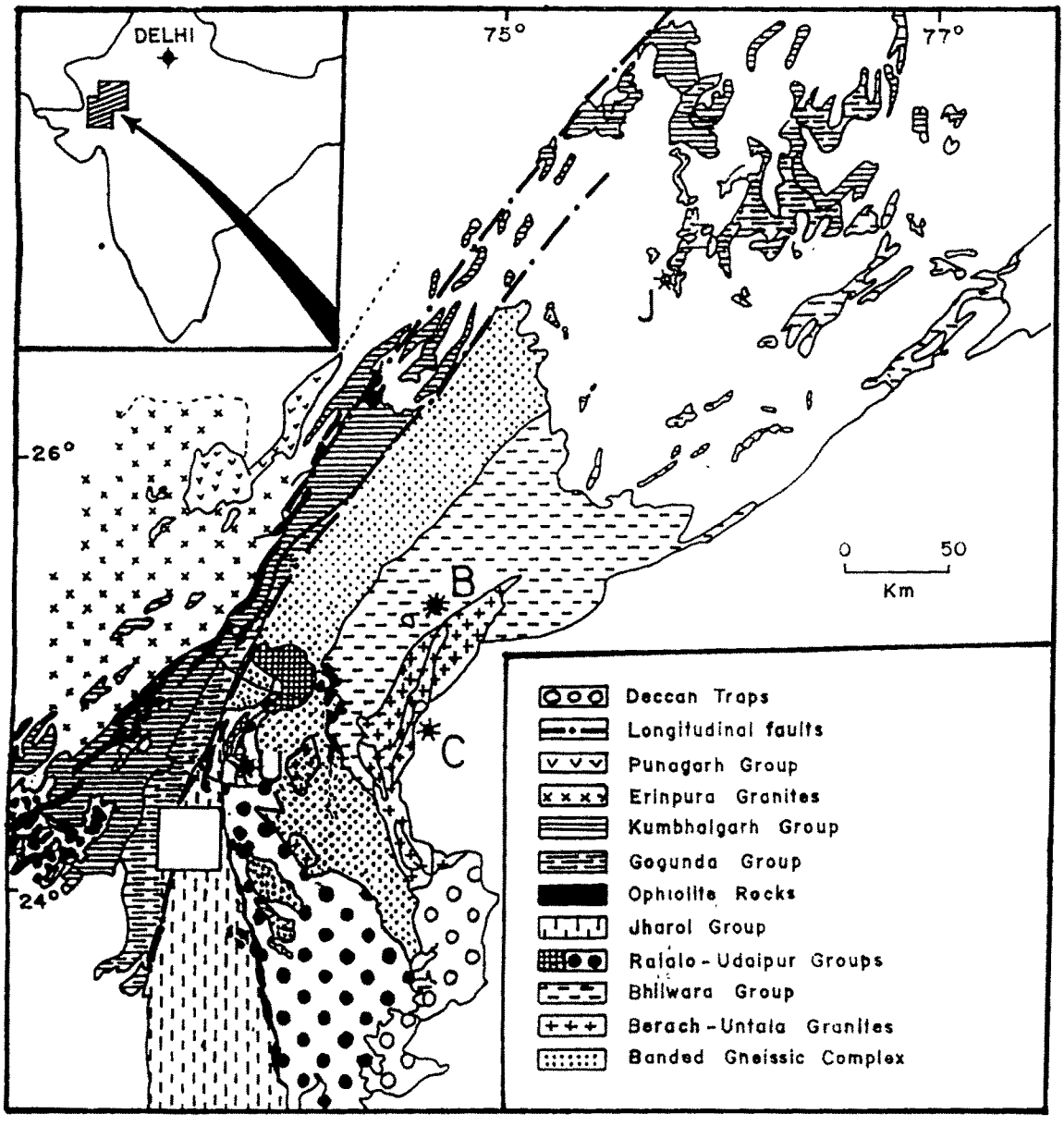

Figure - 1 : Generalised geological map of Rajasthan and North Gujarat, the inset open square represents the study area.

and studied in detail. Thin sections were prepared from different representative rocks and their optical properties were studied in detail and the strike and dip also recorded systematically. Some oriented samples were collected for the study of microstructures. Various structural features such as foliation, cleavage, lineation, minor folds etc., were measured for preparing the geological map of the area.

I.E :SCOPE OF STUDY :

The author has visited the study area in the field seasons of 1992, 1993 and 1994 and carried out a detailed mapping of the area, systematically collected samples of various rock types as well as oriented samples for structural analysis. After realizing that structurally the area is not as simple as the earlier workers have interpreted, the author had to go through a detailed structural and petrographical study of the specimens collected. During all the field seasons as described above almost all the outcrops were visited and structural and lithological data were collected. In order to construct the stratigraphical and structural models, the present author had to vist the adjoining areas also, like Kotra, Panarwa and Manpur, west of the study area, Bagrunda, in the North of study area, Dhikwas and Garanwas, in the south of the study area. These traverses allowed the author to revise the stratigraphy and solve the structural problem of the area. The plan of work has been proposed as follows :-

1) Stratigraphy - Stratigraphic investigation of the entire area and its neighbourhoods based on field data.

2) Mega structures - The study based on the Indian Remote Sensing (IRS) False Colour Composite (FCC) - data revealing mega structures.

3) Major structures - Major structures which are encountered in the field. The fold patterns recorded in the field during detailed field mapping.

4) Microstructures - Microstructural investigation has been carried out through thin section studies of oriented samples to obeserve the sense of shear movement, and internal microfabrics of the rocks.

5) Petrography and metamorphic history.

6) Basin Evolution and Deposition of the Jharol rocks.

7) Deformational model for the structural evolution of the Jharol group of rocks.