CHAPTER - I

INTRODUCTION

INTRODUCTION

The Gondwana system of India consist of sedimentary deposits of considerable interest. These rocks were discovered in 1872, when Medlicott used the term Gondwana for sedimentary deposits in the satpura basin of Madhya Pradesh. However this term did not appeared in published report before 1876. When Feistmantel reintroduced the term and brought it as a publication since then the term Gondwana is widely used for similar formation of other countries also. They are found in India, South Africa, Madagascar Island, Antartica and South Amarica. These rocks show characteristic flora, fauna and palaeoclimate. Hence a huge southern land mass represents the Gondwana land. The term Gondwana was derived from the Gond tribe whose kingdom was spreade in the Bastar province of Madhya Pradesh. The Gondwana system of India consists of a group of formations which are 6000 meters in thickness and were deposited during an era of 120 - 150 million years. For this purpose the term Gondwana era is used. It starts from the Upper Carboniferous and ends into the Lower Cretaceous. The group of rocks have been divided into various series and stages and the relative position of these stages have been accepted into different ways. About the classification of Gondwana system there are disputes among the geologiest and palaeocobotanists. According to Medlicott and Bland Ford

(1879), Oldham (1893), Cottar (1917) and Fox (1931), the Gondwana system is divided into two distinct parts namely

(1) Lower Gondwana (2) Upper Gondwana

This classification is called as the bipartite system or two fold classification. It is accepted by Geological survey of India. On the other hand the system is divided into three divisions by Feistmantel (1879), Vredenburg (1910) and Wadia (1953). This system is called as tripartite system or three fold division. According to this system the Gondwanas are divided into following divisions.

(1) Lower Gondwana

(2) Middle Gondwana

(3) Upper Gondwana.

According to Surange (1966) the Gondwana system and its division represents distinct floras. These are the Glossopteris flora; developed in Lower Gondwana period and the Ptilophyllum flora, which was developed in Upper Gondwana period. But it was discovered by several workers that a distinct flora was developed in the south Rewa Gondwana basin in Madhya Pradesh. Hughes (1884), Feistmantel (1882) studied the Fossil Flora of south Rewa distinct in Madhya Pradesh and found that the rocks show distinct lithological characters as well as floral assemblege. They collected plants like Glossopteris and Pterophyllum in these areas, which are represented by Lower Gondwana and Upper

Gondwana. Besides these typical elements the areas shows a presence of a dominant genus Dicroidium. Hence the flora shows mixture of two different floras in addition to its own elements. Therefore Feistmantel (1882) called a typical persora beds exposed in south Rewa District as 'Transitional beds'. Based on these observations a new sub division Middle Gondwana was proposed which represents the Dicroidium flora. In recent years the new hypothesis of Middle Gondwana is supported by Saksena (1952) who described plant fossils from pali and other localities in south Rewa District. Tremendous work was carried out by Lele (1955, 1962, 1964). On the basis of palaeobotanical data it was suggest that Indian Gondwana shows three district floras, representing three divisions namely Lower, Middle and Upper. Which are characterised by Glossopteris, Dicroidium and Ptilophyllum floras. Wadia (1957) accepted the three fold division in his classification of Gondwanas.

Thus lot of work on Gondwana floras of India was carried out by several workers like Surange (1966), Saksena (1974), Pant (1955) Bose (1966a, 1974, 1966b), Maheshwari (1965, 1966b, 1986), Prasad (1978) Prasad and Chandra (1978a, 1978b) Mahabale (1967), Biradar and Mahabale (1978). Recent discoveries based on Megafossil and microfossil studies have brought a new information to the knowledge of the Gondwana flora of India.

The Gondwana deposits which are lacustrine and fluviable in origin. In the peninsular India, they are mostly deposited in river basins like Wardha - Godavari basin, the Mahanadi basin, the Cauvery basin, the Krishna Godavari basin and Palar basin. Along the east coast the Gondwana deposits show a distinct characters of marine incrusion. The extra peninsular deposits are also found in India, they are Punjab salt range, Hazara, Shekh Budin hills, Kashmir and Assam. However they are found as isolated areas and quite apart from each other.

In the present investigation the subject selected is the investigation of some areas from the Upper Gondwana floras of India. Regarding the Upper Gondwana classification there are some different views, regarding the sequence of stages present in the Upper Gondwana.

According to Feistmantel (1876). Upper Gondwanas are divided into following five stages.

Kachh

Jabalpur

Rajmahal

Golapilli

Sriperamatur

Later on Blandford and Medlicott (1879) divided the Upper Gondwana into following four formations.

Cutch and

Jabalpur

Rajmahal

and Mahadeva

Oldham (1893) proposed some what similar sequence which is as follows.

Umia and

Jabalpur

Rajmahal

and Mahadeva

Vredenburg (1910) presented the following sequence

Tripetty

Chikiala

Vemaverum

Jabalpur

Kota

Rajmahal

and Mahadeva

Further Cotter (1917) suggested the following sequence of Upper Gondwana formations.

Umia

Jabalpur

Kota

Rajmahal

Fox (1931) gave the following system of the sequence of the Upper Gondwanas

Umia

Jabalpur

Chaugan

Kota

Rajmahal

Recently Wadia (1961) putforth the following sequence of the Upper Gondwanas

Umia

Jabalpur

Rajmahal

Kota

Recently Shah (1966) has given a statigraphical note on the standard sequence of Upper Gondwana of India. According to him the correlative chart of Upper Gondwana formations in India can be arranged in the following manner. This chart shows the probabal relation to the standard scale of the Geological Time Scale.

Correlative Chart Of Upper Formation Based On Earlier Work

Standard Scale	I PRANHITA GODAVARI	II SATPURA	III SON	IV RAJMAHAL HILL'S BIHAR	V WEST COAST
Umia	-	-	-	-	Umia (Bhuj)
Jabalpur	Chikiala	Jabalpur	Jabalpur	-	-
Kota	Kota	-	-	-	-
Rajmahal	-	-	-	Rajmahal	-
Parsora	-	-	Parsora	Dubrajpur	-
Maleri	Maleri	Bagra-Denwa	Tiki	-	-
Pachmarhi	Upper Kamthis	Panchmarhi	-	-	-

Each Gondwana Flora shows distinct composition of floral elements. For example the Lower Gondwana flora is more or less uniform, having elements like Glossopteris, Vertibraria, Phyllothica etc. On the other hand the Upper Gondwana flora shows a rich assemblege of various plant groups and is more heterogenous in nature. It mainly developed in Bengal and Bihar state under warm, humid climate. Hence these areas show more Pteridophytes and Pteridosperms and few Conifers than other Jurassic floras. Even though Cycadophytes are dominating, they are equally associated with number of Pteridophytes and Pteridosperms. Conifers naturally are representing in lesser prepotion. Similarly

the Upper Gondwana flora of Jabalpur and Cutch have distinct combination and they show different characteristic than Rajmahal flora.

The Upper Gondwana flora of East Coast represent a series of detached out crops along the coastal lines of Orissa, Andhra Pradesh and Tamil Nadu. They are considered as an extension of the Northern, Upper Gondwana flora. Among these floras the flora developed in Krishna - Godavari basin and Pranhita Godavari basin represents a distinct combination which represents a typical formation called as Kota stage. The Kota stage is represented at different places along the east coast, such as Vemaverum beds in Krishna Godavari basin located in Prakasum district. Similarly the Raghavapuram shales of West Godavari district and Raghudevapuram of east Godavari district also represent the Kota stage. In Tamil Nadu a typical Kota stage is represented by Sripermatur beds in Palar basin as well as Sivaganga formation in Cauvery basin. Several workers have made contributions on the fossil flora of Kota stage exposed at various places. The contributions include Seward and Sahni (1920); Sahni (1928, 1931) Bose and Zeba-bano (1978), Bose and Maheshwari (1974), Bose and Jain (1967) Bose and Banerji (1981), Jeyasingh and Sudhersen (1989), Bakshi (1968), Mahabale and Satyanarayana (1979), Biradar (1978), Rajanikanth and Sukh-Dev (1989). For present investigation the Kota stage exposed in the interior part

of the peninsular India is selected. The typical area of Kota is exposed in Pranhita Godavari basin which covers the parts of Maharashtra and Andhra Pradesh.

The flora is not much worked out and hence offers some scope for the new observation.

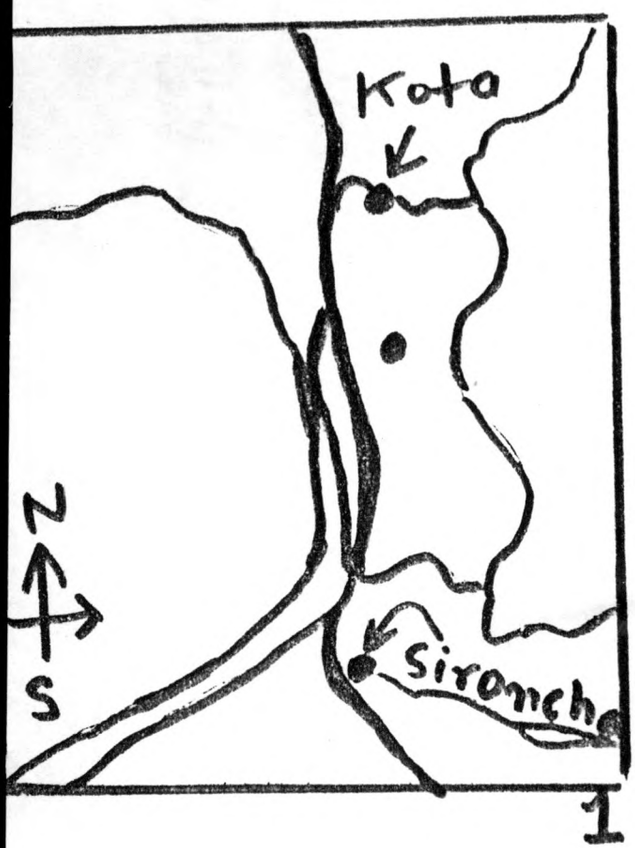
Present investigation includes the material collected from the localities situated from the east bank of the Pranhita river in Chandrapur distinct. A rich plant fossil assemblage was collected from following fossil localities

1) Kota
2) Chittur
3) Sironcha

Earlier the plant remains of these areas were studied by Rao and Shah (1963), Mahabale (1967) and Shah (1972), Biradar (1978), Yadagiri et. al. (1980), Jain (1983). The flora includes petrified woods as well as plant impression belonging to Cycadophytes, Conifers, Pteridophytes and Pteridosperms.

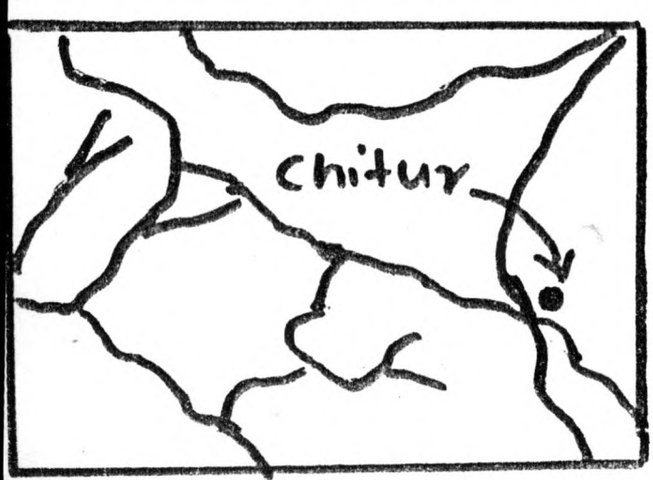
Our work includes investigation of some selected coniferous woods and few impressions representing different groups. On the basis of morphological and anatomical studies an attempt is made to correlate the present flora with other. The floral composition can be used to ascertain the age of the flora.

MAPS 1 & 2



1

Showing Plant fossil Localities in Chanchrapur District of Maharastra



2