Chapter - 1

Introduction
Fossils are remnants of past life and their preservational patterns and study have gained greater importance now a days. Man has been fascinated by the fossils from ancient time. Their preservational patterns (Impressions and Petrifications) were taken curiously and these types were nurtured by superstitious notions and believed that these fossils had some magical properties. Fossil plants assumed a very special significance and some were used as offerings in religious ceremonies. There is evidence to show that fossils were offered to departed soul and were buried along with mortal remains of human beings. Only by the end of 17th century his fantasies took a scientific turn. When he realised that fossils, both (plants and animals) are the remnants of once living organisms. Fossils are very important and fossil studies also give us idea about the past vegetation.

Palaeobotany is the systematic study of fossil plants. Plant fossils are main tools which help in reconstruction of past vegetation. It is the fusion of the Geological and Botanical sciences and needs to be pursued with a deep insight into the geological and biological forces at work. Prof. Birbal Sahni the architect of modern palaeobotanical researches in India, fully realised the inter-disciplinary nature of Palaeobotany when he remarked that “Fossil Plants represent the debt that Botany owes to Geology.

By late Paleozoic the world vegetation was distinguished mainly into four geobotanical provinces. The Gondwana super continent was the largest of these in Southern hemisphere comprising the present South America, South Africa, India, Australia, Madagascar and Antarctica. The Gondwana land was bounded on its Northern periphery by the girdling ocean, the Tethyas beyond which lay the three geobotanical provinces of the Northern hemisphere (a) Eurameria (covering Europe and North America), (b) Angara (covering Russia and Central Asia), (c) Cathasia (covering China, Indo-China, Korea, Japan and Indonesia).
‘Gondwana’ is an extensive system of land deposits ranging in age from Upper Carboniferous to Lower Cretaceous except for some local unconformities the sequence is conformable from bottom to the top. It is named after the ancient “Gond” kingdom of Central India. However the Gondwana deposits are distributed in Southern hemisphere countries such as South Africa, South America, Australia, Madagascar, Antarctica, Peninsular India which were once connected together to form a single land mass known as “Gondwana land”. The Gondwana Era began with a glacial climate and the deposits commenced with the boulder beds. The later deposits are fluviatile or lacustrine with abundance of plant remains and thick deposits of coal seams. The flora which flourished during this period is characterised by Glossopteris, Gangamopteris, Phyllotheca Schizoneura, Vertebraria and other associated genera which together form “GLOSSOPTERIS FLORA”. Plenty of fossil gymnospermous woods are found due to presence of large sized trees of Glossopteris plant with large amount of secondary wood. Climate was also favourable for plants growth with large amount of rainfall and sunlight. Among the fossil woods Genus: Araucarioxylon is dominant.

The Indian Gondwana rocks are found in a series of faulted troughs in long and narrow tracks from Godavari valley to Rajmahal hills and in the Mahanadi Sone, Narmada and Damodar valleys other groups of exposures are found in Assam, Kashmir, Nepal, Bhutan, foothills of Himalayas, along the east coast in Madhya Pradesh, Rewa, Kutch and Kathiawar. It is almost a triangular area containing major coal deposits of Lower Gondwana age. These Lower Gondwana basins presumably in Post Permian time sank along faults in the basement rocks and hence were preserved because of protection from overlying sedimentary deposits. The rocks of Lower Gondwana are lacustrine or fluviatile in nature which were deposited in lake or river basins.

The Palaeobotanical investigation of Lower Gondwana Strata of Chandrapur district Wardha valley of Maharashtra state was undertaken by

The present work deals with only an account of fossil plants collected from certain localities in Maharashtra state in the Peninsular region of India. The study helps in reconstructing past vegetation. Hence the above region of Chandrapur and Nagpur district was selected for thorough palaeobotanical exploration.

The primary objective of present investigation is to explore thoroughly fossil plant localities situated in the vicinity of coal bearing beds in Wardha valley of Chandrapur. Hence study of megafossils will give clear picture of past vegetation which existed in this region during the Lower Gondwana time. Apart from the work done by Agashe et. al., in our laboratory various other workers in India and other countries have made extensive palaeobotanical studies of Lower Gondwana Strata. But of all the countries, India is most prominent because of the wide occurrence of Gondwana outcrops rich in well preserved plant fossil contents and also because of the fact that Gondwana rocks were first discovered from India.

The pioneering Palaeobotanical work on the Gondwanas of India was done by various British Geologists serving in the Geological Survey of India. However it was Prof. Seward and his student Prof. Sahni who jointly initiated scientific research on systematic lines from purely palaeobotanical aspect and made original contribution to Indian Gondwana Palaeobotany.

Inspired by Prof. Sahni, many followers of Sahni took up further studies on Indian Gondwana Palaeobotany. Extensive Palaeobotanical expeditions have been
made from the Lower Gondwana Strata occurring in Assam, Bihar, Bengal and Madhya Pradesh. Since the Palaeobotanical investigation of Chandrapur district of Maharashtra state was not exhaustively conducted considering the richness of the Lower Gondwana outcrops of Chandrapur district, particularly of petrified woods, the present work was undertaken by us which is a continuation of work done by earlier workers in our laboratory.

The investigation on the present research problem was carried out with the following objectives.

1) To make detailed anatomical studies of the petrified woods collected from various Lower Gondwana localities of Chandrapur district like Lathi, Wejgaon, Rangenapalli, Sarandi, Kanhargaon, Camp IV, Lohara, Sironcha and other areas.

2) To describe the plant megafossils such as Impression fossils collected from Nagpur and Chandrapur district of Maharashtra state.

3) To reconstruct Palaeovegetation.

4) To interpret Palaeoclimatic conditions that existed during the deposition of Lower Gondwana sediments by means of palaeobotanical parameters.