
CHAPTER – IV

GEOLOGY AND TOPOGRAPHY

The Upper Gondwana deposits are found at several places in India. The major deposits represents Rajmahal hills in Bihar, Jabalpur rocks in Madhya Pradesh and Cutch deposits in Western India. In the peninsular India the Upper Gondwana deposits represents an interesting sequence on the East-Coast. These deposits are Jurassic to Cretaceous in age and represents marine beds which were considered as marine intercalations. The deposits are paralic, lagoonal in nature. They are present as a series of detached outcrops parallel to the shoreline. The East Coast Gondwanas are interesting due to their distinct nature from other Gondwana deposits. In Orissa they are found in the Cuttack district, in Andhra Pradesh they are found in the Krishna-Godavari, Nellore, Guntur, and Prakasam district, in Tamil Nadu they are found in Chinglepet, Trichinopoly and Ramnathpuram district. some of these deposits contain plant fossils associated with marine animals. The plant fossils are found as impressions as well as petrifications. The impressions rarely shows the presence of phytollemma.

Recently Venkatachala and Rajanikanth ¹⁹⁸⁷ have given stratigraphic implications of Upper Gondwana flora in the east-coast. They have suggested that the east coast Gondwana deposits are found in distinct basins which are compared to those of West

Coast of Australia. Accordingly the East-Coast Gondwanas are distributed in following river basins -

- (1) Cauvery Basin - In Tamil Nadu.
- (2) Palar Basin - In Tamil Nadu.
- (3) Krishna-Godavari Basin - In Andhra Pradesh
- (4) Mahanadi Basin - In Orissa.

The present work deals with the Upper Gondwana localities found in Cauvery basin, here the deposits occur in Trichinopoly district near Uttatur, Terani, Naicolam, Karai, Rayani and Sivaganga areas. In the Trichinapoly district the Uppere Gondwana beds are represented by Uttatur plant beds which directly rest upon the Archaean rocks. These rocks occur in 5 small isolated patches covering an area of 20 Kms. This area is overlane by marine beds of upper Cretaceous age. Shah & Singh (1972) named the beds of 'Terani Beads'.

Acharyya, Singh & Ghosh (1977) include the Uttatur plant beds and Terani beds in the Sivaganga beds. It consist of white and ash-grey coloured clay and sand stones. Foote (1878) first reported the plant fossils from Uttatur plant beds of the Trichinapoly district. Later on Feistmantel (1879) described several plant fossils from 6 different localities.

Gopal, Jacob & Jacob (1957) listed the plant fossils from Uttatur in Trichinopoly district. Mamgain, Sastry & Subba-

raman (1973) noted that the animal fossils are associated with plant fossils at several places in the clay and sand stone deposits.

Banerji (1983) described the Geology of Cauvery Basin and showed that it covers the area of 25,000 square Kms. between Pondicherry in the north and Ramanathapuram in the South. It is limited to the igneous and metamorphic rocks of the Archeon.

The sediments in age range from Upper Jurassic to Lower Cretaceous and in some cases upto Pleistocene near the Western marginal parts of the basin. The rocks show gently southeastern dips with minor undulations. In Ariyalur area the general strike of the beds near the western margin is towards NE-SW direction.

The area is covered by alluvium, which show the sequence representing the entire time span from Jurassic to Cretaceous. There are following important depressions present in the Cauvery Basin. (1) Ariyalur-Pondicherry Depression: it is present on the northern side on the Cauvery Basin and covers the largest area, (2) Thanjavur Depression : it consists of 2 important Mesozoic outcrops, a small area near Thanjavur and area around Sivaganga to the southwest side. This depression shows sand stones with conglomerate having a thickness of 150 meters, (3) Tranquebar Depression : it is present on the eastern

side and is offshore extension of the Thanjavur Depression, (4) Tirutturaipundi Depression : it represents a major part of the Cauvery Basin present on the eastern side. On its northern side Karaikal area is present and eastern side Tirupundivadarniyam ridge is present. The karaikal shows a stratigraphy having an Archaean basement 1500 meters in thickness. It covers thick grey, greenish grey, micaceous sand stone sequence of Early Cretaceous age. The uppermost part represents Neocomian age.

The present work represents Ariyalur region of the Cauvery Basin and shows the following sequence of rock deposits. The Cretaceous system of the Trichinopoly district consist of the following stages :

- (1) Niniyur
- (2) Ariyalur
- (3) Trichinopoly
- (4) Uttatur

The beds exposed around the Trichinopoly stage represent important fossiliferous localities. The report of petrified woods was first made by Blanford (1865) and later on by Feistmantel (1887) from Trichinopoly district. Krishnan (1949) mentioned of huge tree trunks lying near Sattanur and Garuda-mangalam but did not give detailed accounts.

Aiyengar and Jacob described a cycad from

Varangur in Trichinopoly district. However, accounts of coniferous woods were quite rare. Sahní (1931) described woods from Uttatur in Trichinopoly district. Recently Verma (1954) described two coniferous woods belonging to genus: Mesembri oxylon from Cretaceous rocks of Trichinopoly district.

The present work adds further information to the knowledge of coniferous woods collected from Garudmangalam and Uttatur. Impressions were collected from different places like Uttatur and Terani they also add more information to the floristic of this area.

The Upper Gondwanas of Trichinopoly district occur as narrow outcrops along the Western edge of the Upper Cretaceous beds. These beds are separated from the gneissic rocks. The Gondwanas rest upon gneissic rocks and are several meters in thickness. The inclination of the beds is generally low but the dip in places rises to 20°. These Upper Gondwana beds are called as Uttatur Plant Beds. They are located in 5 to 6 separate patches covering the distance of 20 Kms. They are covered by Upper Cretaceous marine deposits. The most important outcrops is present near Uttatur popularly called as Uttatur Plant Beds. It consist of soft sandy clay and micaceous shales. They are associated with sand stone and a conglomerate of rounded pebbles at the base. The base is 5 or 6 feet in thickness. The sand stones are current-bedded and characterised by Calcareous

deposits. Near Maruvattur the animal and plant fossils are found. They suggest the marine intercalation. At Kailakkudi these Uttatur bed is covered by fine shales, grey sand and intercalated grit bands. The Uttatur plant beds are rich in plant impression as well as petrifications.