PART I
TEXT-FIG. I - SHOWING LOCATION OF THE AREAS VISITED.
CHAPTER 1

INTRODUCTION

The rocks of the Gondwana system have attracted a great deal of attention since they were first described by Feistmantel in 1876. This is mainly because of the vast reserves of coal and the prolific fossil flora and fauna preserved in this thick pile of sediments - mostly freshwater but occasionally terrestrial and marine - and ranging in age from the Upper Carboniferous to the Lower Cretaceous. The system is interesting and of great scientific value because of its regional appeal in relation to the theory of continental drift.

In India, although a lot of paleobotanical work has been done on the Gondwana system, no significant study of its fossil micro-fauna has yet been made. Bhatia and Saxena (1957) were the first to describe the Foraminifera from the Umaria marine beds in Central India. These beds are found interstratified with the freshwater Lower Gondwanas. Subsequent works are by Tiwari (1958), and Bhatia and Singh (1959) on the Uralian Foraminifera from Manendragarh; Bhatia (1959) on the Ostracoda and other microfossils from the Umaria beds; Sastri, Chandra, and Pant (1961) on the Foraminifera from the Raghavapuram shales near Tirupati; and Murthy and Sastri (1960, 1962) on the Foraminifera from the Sriperumbudur beds.

Of the various marine exposures of the Peninsular Gondwanas, those found on the east coast of India are by far
the best developed and most interesting, and are commonly designated as the 'East Coast Gondwanas'. The rocks are interesting because, occasionally, the marine fauna and the land flora, are found preserved in a single bed - sometimes even "...together in the single hand specimens" - to quote Pascoe (1959, p. 1004).

A good deal of controversy centres round the upper age limit of the East Coast Gondwanas. Feistmantel (1939), on the basis of the plant fossils, considered them to be of Jurassic age. Cotter (1917), on the evidence of the flora and marine fauna suggested a Lower Oolite age for the Raghavapuram shales - a middle division of the Upper Gondwanas of the east coast. Spath (1933), on the basis of the contained ammonites suggested an Upper Neocomian (Barremian) age for these beds. On the basis of the evidence furnished by plant fossils, R. Sahni (1937), assigned an Upper Jurassic age to these formations. M.R. Sahni (1939), discussed the discrepancies between the chronological testimony of fossil plants and animals, and reported for the first time the occurrence of the Cenomanian genus Rectithyris from the East Coast Gondwanas. This report of the genus Rectithyris is of significant value in dating the Gondwanas of the east coast. As discussed elsewhere, the present detailed work on the Foraminifera from the Raghavapuram shales of the type area also suggests a Lower Cretaceous age for these beds.

Similarly, the nature of the Cretaceous-Eocene sequence has been one of the most controversial problems of Geology and, therefore, it is not surprising that it has engaged the attention
of the geologists almost all over the world. In India, the Cretaceous - Eocene rocks are widely distributed and are found in association at a number of places. An interesting patch of Cretaceous - Eocene succession is found in the vicinity of Rajahmundry, Andhra Pradesh. In this locality, outcrops of the Upper Gondwanas, the Infra-trappeans, as well as the Inter-trappeans are found in a small circumscribed area and their association with the Deccan Traps make them even more interesting because a detailed study of these rocks serves a three-fold purpose:

a) it helps in fixing the upper age limit of the East Coast Gondwanas;

b) it reveals the nature of the Cretaceous - Eocene sequence of this region; and

c) it throws considerable light on the age of the Deccan Traps - at least of this part of the country.

The marine Infra-trappean beds of the Rajahmundry area occupy an important place in the Indian stratigraphy. Their age has been a subject of great controversy since they were first scientifically described by King in 1880.
Although, some megafossils from these beds have been described, their identifications need revision. The micro-fossils from these beds have been recorded by Rao and Rao (1935a) but the present work for the first time deals with these in detail.

The Inter-trappean beds of the Rajahmundry area have been studied in greater detail than the Infra-trappeans. Both, the mega- and the micro-fossils from this formation have been studied. Hislop et al. (1930) described the megafossil fauna from these beds, but these too need revision. Rao and Rao (1935b), reported Acicularia from these sediments. Pia et al. (1937) studied chara from these formations and suggested a Tertiary age for them. Rao and Rao (1939) have described several forms of fossils chara (Gyrogonites) from these beds. As discussed in detail in the sequel, except for a few casual reports of Foraminifera (Rao and Rao, 1937a; Sastri, 1961) and Ostracoda (Sastri in Rao, 1953; Sastri, 1961) from these beds, the identifications of which in the majority of cases are only up to the generic level and without description, no detailed work on these important groups of microfossils has yet been done. The present work reveals the presence of a rich and interesting microfossil assemblage consisting of eighteen species of Foraminifera, sixteen species of Ostracoda besides abundant ophiuroid ossicles and a few chara fruits. Only the Foraminifera are here dealt with in detail. Owing to limitation of time, the systematic description of ostracoda and ophiuroid ossicles could not be incorporated in the present work.
Nearly all the type localities of the marine beds of the East Coast Gondwanas, except those of the Sriperumbudur area, were visited (text.-fig. 1) and bed-by-bed samples were collected from each locality. The Sriperumbudur area was omitted from the present study because Murthy and Sastri (1962) had already described the foraminiferal fauna of these beds. Out of the various localities of the Upper Gondwanas that were visited, the microfossils were found only at Raghavapuram and hence it is this area which has been dealt with in some detail in the present work.

Likewise, detailed sampling was done at different localities of the Infra- and the Inter-trappean beds, exposed on the right bank of the river Godavari.