CHAPTER - 7

SUMMARY AND CONCLUSION

The present investigation has been aimed on the biostratigraphy of the marine Neogene sediments of the East Coast of India. These sediments are exposed in the vicinity of Mayurbhanj region of Orissa. The present study has been restricted to the exposed sequence of the marine Neogene strata. In these strata have been described as 'Baripada Beds' and the same nomenclature has been retained herein this study.

The Baripada beds have been subjected to geological studies ever since they were first reported by Bose (1904) and a considerable amount of work on the stratigraphy and micropalaeontology is available, however, a controversy exists amongst workers regarding the age of the Baripada beds. The
precise fixation of the age is still to be made and realising this fact a biostratigraphic study has been undertaken. The results of the work carried out by the author are summarised herein this chapter.

Chapter - 1 - deals with the Introduction and provides necessary general informations regarding the location and physiographic features of the area under investigation which is located in the vicinity of Mayurbhanj district of Orissa. It is approachable throughout the year by bus or rail from Kharagpur, Tatanagar or Balasore. The methods followed in this study are outlined. The scope of the work has been enumerated.

Chapter - 2 - contains a concise account of the stratigraphic and palaeontologic studies carried out by earlier workers. The first geological report of the marine, fossiliferous Neogene horizon in Mayurbhanj region was made by Bose (1904) and these sediments have been named as 'Baripada Beds'. Since their discovery, these beds have been subjected to examination by several biostratigraphers. The salient features of all the contributions made on the stratigraphy and palaeontology of the Baripada beds have been accounted. The survey of literature reveals that a considerable work has been made on the microfaunal assemblage but the mega faunal assemblage of invertebrates has received a cursory treatment. The precise age of the Baripada beds has not been fixed so far.
Chapter - 3 - presents a detailed account of the stratigraphy of the Neogene sediments distribution along the east coast of India. The generalised stratigraphic sequence of these sediments have been incorporated. The stratigraphic set-up of the marine Neogene Baripada beds has been studied. The stratigraphic sections have been examined at Usurdihi, Satpautia and Mukurmatia villages situated along the Burhabalanga River, mainly towards south of Baripada town. The exposed sequence consists of three lithounits - (1) Dark green to greyish green shales, (2) yellow to yellowish-brown limestones and (3) Grey to greyish-green shales. These units are developed under a fairly thick cover of lateritic soil. The stratigraphic succession has been established on the basis of different measured sections.

Chapter - 4 - describes the petrographic features of different lithounits encountered in the study area. The megascopic and microscopic characteristics have been described. An attempt has been made to determine the detrital mineral composition of limestones and shales by using the modern techniques including the X-Ray Diffraction. A few selected samples of rock types were also chemically analysed to understand their nature of composition. The textual and compositional attributes of lithounits of the Baripada beds provide a supplementary evidence for the interpretation of depositional environment. The petrographic analysis of constituent lithounits of Baripada beds reveals that the deposition took place in a shallow water marine environment close
to the land area having fluctuating conditions and being affected by periodic sea storms or low tides.

Chapter 5 is devoted to systematic palaeontology of the Baripada beds of Orissa. A systematic palaeontologic examination of the exposed sequence of Baripada beds revealed the presence of a fairly rich assemblage of megafossils belonging to both invertebrate and vertebrate groups of organisms. The mega invertebrate fauna consists of 11 species of pelecypods and 2 species of gastropods while, the mega vertebrate assemblage comprises 8 species of elasmobranchs and 1 species of teleost fish. All the recorded species have been described and illustrated. The present forms have been compared with the allied species described from Miocene beds of different parts of the world.

Chapter 6 deals with the biostratigraphic analysis carried out in the present investigation. It provides a synthesis of the work conducted on the stratigraphy, petrography and palaeontology of the Baripada beds.

The mega fauna of the Baripada beds collected by the author contains 22 species referable to pelecypods (11 species), gastropods (2 species), elasmobranchs (8 species) and osteichthyes (1 species). The pelecypod fauna is dominated by 8 species of Ostrea. The occurrence of Ostrea latimarginata, Lucina orbicularis rotundelloides, and Cardita (Glans) quilonensis is recorded for the first time of Baripada area. The gastropod fauna consists only two
species represented by Conus sp, and Indoplanorbis aff. exustus. The later form is described from the study area for the first time.

The fish faunal assemblage is dominated by 8 species of elasmobranchs and 1 species of teleost. Amongst fish remains, Carcharhinus leucas is recorded for the first time from Baripada.

The present assemblage contains three new species of Ostrea namely Ostrea baripadaensis, Ostrea sahnii and Ostrea srinivasani. Some other forms may also represent new species but due to paucity of well preserved specimens such individuals are kept under open nomenclature.

The environment of deposition of the Baripada beds has been interpreted on the basis of faunal and petrographic evidence. The Baripada beds were deposited in a shallow warm water, rather protected, marine environment, having fluctuating conditions such as existing in a lagoon or back reef.

The age of the Baripada beds is discussed at length and all the available views have been accounted. The faunal assemblage contains a majority of species known to occur in the Miocene formations of different localities in the world. Ostrea latimarginata, Lucina orbicularis rotundelloides, Carcharodon megalodon and Carchariolamna heroni have been described from formation ranging in age from Lower to Middle Miocene and their occurrence in the present collection, provides a supplementary
evidence to favour the view of Middle Miocene age for the Baripada beds.

The Baripada beds on the east coast of India, can be correlated, on the basis of faunal assemblages, with the Miocene beds of Kutch, Piram Island, and Guilon on the west coast of India, on the one hand and with the Andaman Islands along east coast on the other hand. These beds are also correlated with the Miocene formations of Sumatra, Australia and New Zealand belonging to Indo-Pacific Zoogeographic province. On the basis of fish fauna, a free sea communication can be visualised between east and west coast of India, and also with Burma, during the Miocene period.