P R E L A U E

The present research programme was undertaken to study the palaeontology and palaeohistology of Subathu (Eocene) vertebrates. Emphasis was given to the biostratigraphic significance of the fossil vertebrate assemblages, dispersal corridors in the context of plate tectonic models and basinal palaeoenvironments. On the basis of field work undertaken between September 1979 and March 1982, several ossiferous sections were measured both in the Rajauri District of Jammu and Kashmir and in the Type Section of Subathu, Himachal Pradesh. The collection was made from multiple horizons starting from the base of the Subathus up to the topmost red-bed sequence.

Subathu vertebrates comprise fishes, chelonians, crocodilians, sirenians, perissodactyls, artiodactyls, cetaceans and rodents. The present dissertation describes a number of specimens collected by the author representing the oldest Tertiary mammal (Lower Eocene) from the Indian Subcontinent.

The fishes comprise selachians, batoids, holosteans and the teleosts which are divisible into 17 genera and 23 species.
Chelonians and crocodilians are represented by 2 and 3 taxa respectively. Most of the taxa are common to those from Himachal Pradesh and Jammu and Kashmir.

Mammals comprise 11 genera and 12 species belonging to the orders Sirenia, Perissodactyla, Artiodactyla, Cetacea and Rodentia. Artiodactyla constitute the most abundant group.

Some taxa are generically indistinguishable from those known from the Kuldana Formation (Lower Chharat Series), Pakistan. Prominent among these are the racellids Rhaqueina, Khirtharia and Pilgrimella, the cetacean Ichthyolestes and rodent genera Birbalomyx and Raisurisya.

The geological setting and basinal extensions have been reconstructed on the basis of the vertebrates collected. The affinities of the fauna, their palaeoecology and bearing on palaeogeographical models have also been discussed.

Besides this, a detailed study of micro and ultrastructure of calcified tissues of Subathu vertebrates has also been made.

The dissertation has been divided into eight chapters:

CHAPTER I - INTRODUCTION: This chapter introduces the area and the topic of research. The major objectives of the work have been listed. Other topics include
location and communication, background and perspective, techniques of fossil collection, micropalaeontological biostratigraphy and a locality index.

CHAPTER II - HISTORICAL REVIEW: In this chapter, the results of previous studies made on the Eocene sediments particularly those on the Palaeogene vertebrates have been given in chronological order.

CHAPTER III - GEOLOGY AND STRATIGRAPHY: This chapter incorporates the geology of measured stratigraphic sections in J&K and H.P. Lithology showing the position of ossiferous horizons have been prepared for promising vertebrate-yielding localities. Geological maps and composite stratigraphic sections of both areas have also been given.

CHAPTER IV - SYSTEMATIC PALAEONTOLOGY: This section starts with a complete list of taxa described in the present dissertation. This is followed by a detailed taxonomic description of each taxa.

CHAPTER V - PALAEOHISTOLOGY OF CALCIFIED TISSUES OF SUBATHU VERTEBRATES: This chapter deals with the systematic description of the micro and ultrastructure of enamel, dentine and bone of Subathu vertebrates. This section also incorporates the previous work
carried out on this topic and gives the current status and potential of palaeohistological studies.

CHAPTER VI - DISCUSSION: An analysis has been made of the various criteria, sedimentary and faunal, which help to delineate the extension of the Subathu Basin. Boundary problems including both upper and lower boundaries have been discussed in the light of vertebrate assemblages collected during the present work. An attempt has been made to reconstruct the structure of the vertebrate palaeocommunity on the basis of taxonomic diversity, palaeoecology and palaeogeography.

CHAPTER VII - SUMMARY AND CONCLUSIONS: This chapter includes a summary of the whole work and the conclusions to which the author has arrived after this study.

CHAPTER VIII - REFERENCES: A list of references which have been quoted in the text is given in alphabetical order.

Text Figures: 1-27
Photographic Plates: 1-26