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FROM  
WESTERN INDIA

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# LOWER TERTIARY VERTEBRATES FROM WESTERN INDIA

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**ABSTRACT.**—Palaeogene and Lower Miocene rocks of Kutch, Western India, have yielded a prolific vertebrate fauna from three separate horizons: Middle Eocene, Chattian (uppermost Oligocene) and Lower Miocene. The Middle Eocene fauna comprises of siluroid fishes, *Fajunia menoni* sp. nov., *Fajunia misrai* sp. nov., *Socnophaea horai* sp. nov. and *Arius kutchensis*; trionychid turtles; a new tomistomin, *Tomistoma tandoni* sp. nov. and crocodilian remains as well as the mammals represented by archaeocetes, odontocetes, a sirenian and a probable terrestrial mammal. Of the mammalian genera and species, the following taxa are new: *Protocetus harudiensis* sp. nov., *Indocetus ramani* gen. et sp. nov., *Andrewsiphius kutchensis* gen. et sp. nov., and *Andrewsiphius minor* sp. nov. *Indocetus ramani* gen. et sp. nov. suggests an intermediate stage between Mesonychidae and Archaeoceti. The Chattian mammalian fauna is marine with the predominance of the dugongid *Halitherium*. The Lower Miocene is a mixed facies fauna comprising of the sirenians, *Indosiren koenigswaldi* sp. nov., as well as definite terrestrial mammals represented by *Deinotherium* and the anthracotheriid *Brachyodus*.

The lower Tertiary vertebrate fauna from Kutch closely resembles corresponding faunas from Egypt and Nigeria.

## INTRODUCTION

Tertiary vertebrates from Kutch, western India, were first reported by Grant (1840). For well over a century until the present time, little attention was paid to the investigation of Kutch vertebrates except for a few reports (Wynne 1872, Rao 1956, Tewari 1959 and Tandon 1971). The main emphasis was directed to the study of foraminifers and ostracodes (Sykes 1840, Sowerby 1840, Vredenburg 1906, Nuttall 1926, Tewari and others 1956-1968, Tandon 1966, Singh 1967, Mohan and others 1968-1970, Srivastava 1970). There are several other reports on invertebrates (D'Archiac and Haime 1853, Duncan and Sladen 1883, Vredenburg 1925, 1928).

Systematic collection of Tertiary vertebrates of Kutch was undertaken by Lucknow University field parties during the years 1970-1973. During six months of field prospecting, a large and varied collection was made from a number of localities (Fig. 1), and from horizons ranging in age from the Lower Eocene to the Lower Miocene (Fig. 2).

The Tertiaries of south-western Kutch are essentially a shallow water, coastal sequence, exposed in numerous nala sections in the area (Fig. 2). The Palaeocene Madh Series overlying the Deccan plateau basalts, consists of red lateritic and tuffaceous, trap-wash material containing plant fossils and representing non-marine deposition. These beds are overlain by the Eocene Berwali Series attaining a maximum thickness of 95 meters in south-western Kutch. The series is divisible into two stages, the Kakdi Stage comprising Lower Eocene, and Babia Stage comprising the Middle Eocene beds, and has been separated mainly on the basis of ostracodal and foraminiferal assemblages (Biswas 1965, 1971a). The Oligocene Bermoti Series are deposits of arenaceous marls, and are overlapped in several areas by a thick sequence of Mio-Pliocene sandstones and carbonates (Khari and Kankawati Series) which suggest the transition of marine conditions in Lower Miocene to terrestrial conditions in the Pliocene. The Pleistocene is represented by a thin bed of Miliolitic Limestone. In south-western Kutch, Recent and sub-Recent alluvium as well as wind-blown sand extensively blanket the Tertiary and Mesozoic sequences.

The Eocene fauna includes fish, turtles, crocodiles, primitive cetaceans, sirenians and a doubtful moeritheriid. The fishes are dominated by large siluroids comprising of three genera and five species. Elasmobranchs are represented by five species of sharks and one species of rays. The turtles are mostly estuarine forms, comprising the genera *Asperidites* and *Trionyx*. The crocodilian fauna is diversified and consists of a new species of a large tomistomiid, and *Crocodylus*. The mammals consist of archaeocete cetaceans as well as doubtful odontocetes. The sirenians are represented by a single genus, *Protosiren*. The presence of land mammals during Middle Eocene times in Kutch is recorded by a sacrum presumably belonging to a moeritheriid.