



PICTORIAL CATALOGUE OF SIWALIK VERTEBRATE FOSSILS FROM NORTHWEST HIMALAYA.

B.C. Verma, V.P. Mishra and S.S. Gupta, Geological Survey of India, Northern Region, Lucknow. G.S.I. Catalogue Series No. 5, 378 pages including 145 plates, 2002. M/S Army Printing Press, 33, Nehru Road, Sadar Cantt., Lucknow-226 002, India. Published by the Director General, Geological Survey of India, 27, Jawaharlal Nehru Road, Kolkata-700 016. hardbound, Rs. 375/- (\$18.25).

In the nineteenth century, the pioneer workers like H. Falconer, P.T. Cautley, and R. Lydekker made extensive collection of vertebrate fossils from the Siwaliks and other Neogene-Quaternary sequences exposed in Narmada valley. Their work has been the basis of the later workers such as Colbert who Published a detailed account of the Siwalik mammalian fauna in 1935. Up to now the vertebrate record published by these workers had been used for taxonomic identification of Siwalik fauna. There had been no attempt to extend the work of these pioneer workers by providing information and data on the material which was collected by later workers and had been lying unattended in the field museum of Siwalik Fossil Park, Saketi and in the museum of GSI, Northern Region, Lucknow. The pictorial catalogue published by the authors fulfills the need of time, especially for those working on Neogene-Quaternary vertebrates of the Siwaliks. The authors have taken up the difficult task of studying and classifying the unattended vertebrate fossils for the convenience of future palaeontologists. Earlier, the catalogue numbers given on these fossils were highly confusing as it was not possible to distinguish between the museum catalogue numbers and the numbers given to the fossils in the field. The authors have taken each and every specimen's number and recatalogued them in the repository of GSI, Kolkata by giving them a separate GSI type number. This systematic cataloguing has made it easy for the future workers to quickly refer to them for their own purposes. A considerable review work on the Siwalik vertebrates is in progress which would utilize the

information on some, so far undocumented, vertebrate fossils illustrated in this catalogue. The catalogue describes 335 specimens referable to as many as 86 genera and 131 species belonging to fish, reptiles, avian and mammals. A major part of the catalogue comprises mammalian fossils housed in Siwalik Fossil Park, Saketi and GSI Museum, Northern Region, Lucknow. All the specimens are documented by good quality photographs, some of which are supported by line diagrams. The equal measurement of the bar scales given with each photographs (unless stated otherwise) makes the illustrations more comparable.

The first chapter deals with the introduction of the lithostratigraphy, chronostratigraphy and biostratigraphy of the Siwalik rocks exposed in Jammu & Kashmir, Himachal Pradesh and Haryana. A substantial body of data has been provided in the chapter, which could be useful for the scientists working on various aspects of geology of the Siwaliks. The correlation charts and stratigraphic successions can be used as keynotes for more work in the Siwalik localities. The systematic description starts with the teleost fossil fishes distinguishable into two families. The cast of the most of the reptilian fauna illustrated here had been prepared by German and Indian workers. Their review work on the Siwalik reptiles includes these new, undescribed fossils (the manuscript is presently in press). Although preliminary observation of the authors is excellent and provides the first comprehensive record of these fossils useful in establishing palaeoecology in the area, a specimen illustrated in Plate 3 as *Lissemys* is neither a *Lissemys* nor a testudinid but belongs to a new genus of the family Bataguridae (= Emydidae). Three avian bone pieces are not referable to any of the families and therefore the option for their identification has been left open for future workers. The mammalian fossils of the Siwaliks start with the illustration and description of insectivores referable to the family Soricidae and primates referable to the family Hominidae. Most of the mammalian species reported from the Siwaliks are present in the collection of Siwalik Fossil Park,

Saketi and GSI Museum, Lucknow and they have been illustrated in the catalogue. Though some recent work on the Siwalik rodents and lagomorphs could not be used in the present work, the data presented has adequately provided information on these smallest mammalian groups. Enormous data on the Siwalik artiodactyls, perissodactyls, rhinocerotids and proboscideans have been collected during the last one and a half century. The authors have successfully and very precisely classified these mammalian remains by observing their diagnostic characters and illustrating the underscribed dental and skeletal remains in the present work. Two coprolites of unidentified mammals have also been recorded and illustrated and are available to the palaeontologists for future work.

The authors have tabulated the stratigraphic distribution of the illustrated taxa which suggests the abundance of larger mammals in the Tatrot and Pinjor formations (from approximately 3.3 to 1.0 Ma). Apart from two reptilian genera (*Kachuga* and *Rhamphosuchus*), almost all the reptiles illustrated in this catalogue have been recorded from the Saketi Formation (approximately 3.3-1.6 Ma). This tabulated distribution may prove to be useful in broadly reconstructing the palaeoecologic and palaeoclimatic setting during the Upper Siwalik times. A comprehensive list of the references contains almost all the major work on the Siwalik fauna, especially the mammalian taxa. Few recent works could not be added to the list, probably due

to their late arrival. The field photographs of the Siwaliks given at the end of the catalogue give the readers an idea about the ecologic and panoramic view of the area exposed in districts Sirmaur and Jammu.

The catalogue is an excellent work on the Siwalik fauna and adds new information to the catalogues of Lydekker which was published during the last decades of the nineteenth century. The short descriptions of the specimens are supported by remarks giving justification for their given taxonomic status. The justification in most of the cases is correct but in some cases it can be argued and leaves scope for revision. The authors have taken maximum care while providing the stratigraphic and age details of the fossils on the basis of which it is possible to precisely pinpoint the location from where the specimens have been collected. In some cases, the data are inadequate, but still they are datable and can be useful for phylogenetic work. The general stratigraphic distribution and diversification of the fossil vertebrate families has been given in the beginning of the description of each group.

The book is well illustrated and supplemented with all the information about the fossil vertebrate specimens. I am of the opinion that the authors have successfully updated the Siwalik vertebrate data to a large extent. I believe that the publication would be popular among the future scientists interested in working on or reviewing Siwalik palaeontology and biostratigraphy.

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