

# AMERICAN MUSEUM NOVITATES

Number 105      Published by  
THE AMERICAN MUSEUM OF NATURAL HISTORY      Jan. 18, 1924  
New York City

56.9 (118:51.7)

## NEW INSECTIVORES AND RUMINANTS FROM THE TERTIARY OF MONGOLIA, WITH REMARKS ON THE CORRELATION<sup>1</sup>

BY W. D. MATTHEW AND WALTER GRANGER

### **Tupaiodon morrisoni**, new genus and species

TYPE.—No. 19134, upper jaw and part of skull, parts of lower jaw with  $m_2$ - $a$ .

HORIZON AND LOCALITY.—Hsanda Gol formation, Red beds, Loh.

DIAGNOSIS.—Upper molars and premolars somewhat resembling those of *Ptilocercus*, but with larger and more separate hypocones on  $m^{1-2}$ . Incisors unknown. Canine and  $p^{1-2}$  small, two-rooted, with short stout cusp and rudimentary heel.  $P^{3-4}$  much larger with strong internal cusps,  $p^4$  with strong metastyle blade and rudimentary tetartocone.  $M^{1-2}$  sub-quadrate with high, rather angular cusps, metastyle distinct, hypocone more developed and separated than in *Ptilocercus*,  $m^3$  triangular with no metastyle or hypocone, proportioned about as in *Ptilocercus*. Lower

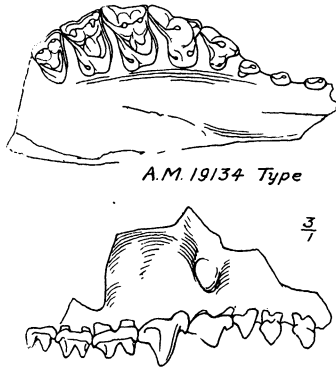


Fig. 1. *Tupaiodon morrisoni*, right upper jaw,  $c$ - $m^3$ , palatal and external views. Type specimen, No. 19134, Hsanda Gol formation, Mongolia. Three times natural size.

molars with rather short wide trigonid of three angular cusps,  $pr^d$  slightly highest, talonid as wide as trigonid, deeply basined with cusps at posterior angles, not as high as trigonid cusps. Infraorbital foramen above  $p^3$ ; root of zygoma above  $m^2$ .

Size about that of the European mole or the short-tailed shrews.  $C$ - $m^3$  = 13 mm.

While provisionally referred to the Tupaiidæ, the true affinities of this genus are uncertain. It is excluded from Leptictidæ by the single

<sup>1</sup>Publications of the Asiatic Expeditions of The American Museum of Natural History. Contribution No. 22.

outer cusp of  $p^4$ , prominence of paraconids and other characters, from the Soricoida by the comparatively large and complex  $p^{3-4}$ .

? **Tupaiodon minutus**, new species

TYPE.—No. 19135, lower jaw fragment,  $p_3$ - $m_1$  right side.

HORIZON AND LOCALITY.—Same as preceding species.

DIAGNOSIS. Somewhat smaller than *T. morrissi*, the molars of nearly the same size, but narrower, with distinct external cingulum; anterior part of lower jaw much more slender and weak;  $p_3$  two-rooted, simple, with single acute uncompressed cusp, minute anterior basal cusp and well-developed posterior basal cingulum;  $p_4$  sub-molariform but smaller than molars, having two well-separated central cusps, a lower anterior cusp, and a broad low cingulum encircling posterior end of tooth. Length  $p_3$ - $m_2$  = 9 mm.

**Palaeosaptor acridens**, new genus and species

TYPE.—No. 19138, a lower jaw with  $p_4$ - $m_3$ , associated with two others.

HORIZON AND LOCALITY.—Hsanda Gol formation, Red beds, 15 miles east of Loh, Mongolia.

DIAGNOSIS.—Dentition probably  $\overline{2.1.3.3}$ . First incisor (?  $i_2$ ) enlarged, a long slender, simple procumbent tooth, enamelled, without heel or serrations; second incisor not preserved, the alveolus quite small, round oval; the canine small, root semi-double, crown premolariform and extended forward, followed by a similar but some-

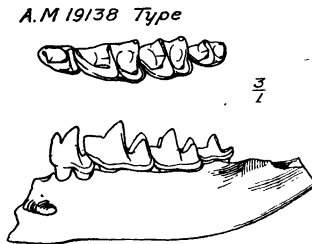


Fig. 2. *Palaeosaptor acridens*, lower jaw, left ramus, external view and crown view of lower teeth,  $p_4$ - $m_3$ . Type specimen, No. 19138. Three times natural size.

what smaller and less forwardly extended tooth with semi-double root; the last premolar two-rooted, small, sub-molariform, with trigonid-like main cusp and small transversely-crested heel;  $m_1$  much larger, with trigonid longer than wide, of three sharply angulate cusps, and deeply basined heel with acute cusps at posterior angles.  $M_2$  considerably smaller than  $m_1$ , similar trigonid relatively lower and shorter;  $m_3$  much reduced, with low single-cusped heel. The heel cusp is of considerable size on the type, but in other specimens it is vestigial; there is also a considerable range in size in the twenty or more fragmentary jaws that represent the genus; but we are unable to fix associated constant distinctions to divide the material into species.

**Palæoscaptor rectus**, new species

TYPE.—No. 19146, lower jaw with  $m_{2-3}$ .

HORIZON AND LOCALITY.—Oligocene, Hsanda Gol formation, Loh, Mongolia.

DIAGNOSIS.—Teeth, so far as shown, similar to those of *P. acridens*, except for considerably larger size and greater reduction of  $m_3$ , which has no heel. Lower jaw angle long, flat, projecting backwards in a rather slender process upturned towards tip.

Only one specimen of this species has been discovered.

AFFINITIES OF *Palæoscaptor*.—This genus is provisionally placed with the Soricidæ, but it is decidedly more generalized than any of the existing genera or of the better known extinct genera. The reduction of  $m_3$  is greater than in any of the modern genera, either of moles or shrews; the primitive brachyodont trituberculy also distinguishes it from most modern Soricoidea, likewise from *Proscalops*; and the reduction of the anterior teeth is greater than in the moles, less than in the shrews, while the enlarged incisor shows no trace of the heel or serrated edge developed in the typical Soricidæ. It is possible that some of the imperfectly known Oligocene Soricoidea may approach it; none of the Bridger soricoids come very near to it. On the whole, it might very well represent an ancestral type from which the soricid genera could be derived.

**Eumeryx culminis**, new genus and species

TYPE.—No. 19147, fragments of upper and lower jaws and foot bones, probably of several individuals found together.

HORIZON AND LOCALITY.—Hsanda Gol, 10 miles west of Loh, "Grand Canon," probably below lava.

DIAGNOSIS.—General characters of the primitive Cervidæ. Upper canine, a large compressed, slender tusk. Molars brachyodont, the upper molars with prominent styles and anterior rib but no trace of posterior rib, the lower molars with slight traces of a "palæomeryx-fold." Four lower premolars in series,  $p_1$  small, one-rooted and simple,  $p_{2-4}$  compressed, two-rooted, with inner crests nearly as in *Blastomeryx*, more developed than in *Prodremotherium*. Navicular and cuboid united, inner cuneiform separate. Median metacarpals and metatarsals united into cannon-bones, but the distal keels not extended over the dorsal surface. Fifth metacarpal and metatarsal coössified proximally, second separate.

Size about that of *Blastomeryx advena*; but there are a few specimens of considerably larger size that may prove to be a distinct species.

The above diagnosis is based upon a large number of fragments of jaws and bones of the skeleton of many individuals. There can be little doubt, however, that they belong all to one genus and mostly to one species, which is the only artiodactyl present. It is an interesting type, as representing a stage of ruminant evolution intermediate between

*Leptomeryx* and *Blastomeryx* in the structure of teeth and feet, somewhat more progressive in premolar construction than *Amphitragulus* and *Prodremotherium* of the Phosphorites but of smaller size and differing too much to refer it to any of the described genera. In the Phosphorites genera, according to Schlosser, the metacarpals are not united into a cannon-bone and the distal keels are less developed than in *Eumeryx*.

In the Lower Miocene species of *Blastomeryx* the teeth are very like those of the new genus except for loss of  $p_1$ , and the median metacarpals

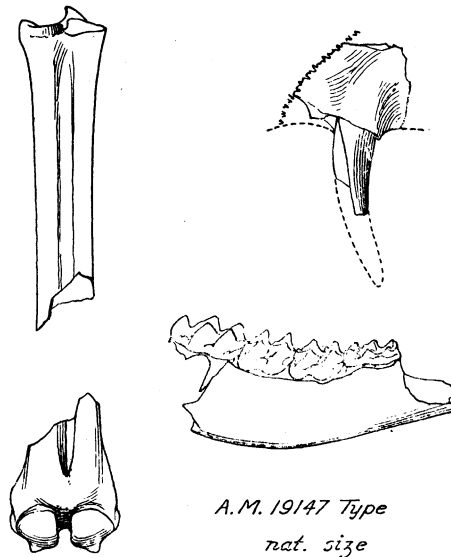


Fig. 3. *Eumeryx culminis*, fragment of upper jaw with canine tusk, lower jaw with  $dp_4$ - $ms$ , proximal and distal ends of metatarsus. Type specimen, No. 19147, Hsanda Gol formation, Mongolia. All natural size.

and metatarsals are similarly united into cannon-bones,  $mc\ ii$  remaining separate and complete; but the distal keels of the cannon-bones are extended over the front of the bone and the form and proportions of the cannon-bones have assumed more the type of the fully developed Cervidæ.

The new genus is of interest as fulfilling more nearly than any hitherto described the required characters for an early Oligocene direct ancestor of the Cervidæ.

## LIST OF THE HSANDA GOL FAUNA

## Carnivora

- Hyænodon pervagus*, new species  
*Didymoconus colgatei*, new genus and species of Oxyænidaë  
*Didymoconus berkei*, new species  
*Amphicticeps shackelfordi*, new genus and species  
*Bunælorus ulysses*, new species  
*Bunælorus parvulus*, new species  
*Palæoprionodon gracilis*, new species  
 ?*Cynodictis elegans*, new species  
 ?*Cynodon (Pachycynodon) teilhardi*, new species  
 ?*Viverravus constans*, new species

## Glires

- Tsaganomys altaicus*, new genus and species of Bathyergidaë  
*Cyclomytus lohensis*, new genus of Bathyergidaë  
*Cricetops dormitor*, new genus and species of Cricetopidaë  
*Selenomys mimicus*, new genus and species of Cricetopidaë  
*Tataromys plicidens*, new genus and species of ?Eomyidaë  
*Tataromys sigmodon*, new species of ?Eomyidaë  
*Karakoromys decessus*, new genus and species of ?Eomyidaë  
 ?*Prosciurus lohicululus*, new species of Paramyidaë  
*Eumys asiaticus*, new species of Cricetidaë  
*Desmatolagus gobiensis*, new genus and species of Leporidaë  
*Desmatolagus robustus*, new species of Leporidaë

## Insectivora

- Tupaïodon morrissi*, new species of tupaïoid Insectivora  
 ?*Tupaïodon minutus*, new species  
*Palæoscaptor acridens*, new genus and species of Soricoidea  
*Palæoscaptor rectus*, new species of Soricoidea

## Perissodaetyla

- Baluchitherium*  
 ?*Epiaceratherium*

## Artiodaetyla

- Eumeryx culminis*, new genus and species, primitive Cervidaë

This fauna is about half made up of new genera; the remainder are referred, positively or provisionally, to known genera on the present evidence. *Hyænodon* ranges through the Upper Eocene, Lower and Middle Oligocene of Europe; in North America it is limited to Middle and Lower Oligocene; in North Africa it occurs in the Lower Oligocene. The Oxyænidaë range through the Eocene of North America and have one representative, *Thereutherium*, in the Phosphorites.<sup>1</sup> The remaining carnivora all belong to that primitive group of Fissipedia best represented in the Phosphorite fauna of France and very difficult to place in the accepted fam-

<sup>1</sup>*Oxyæna* is also recorded from the Phosphorites but upon quite insufficient evidence.

ilies of Fissipedia, as they are essentially transitional between the Miacidæ of the Eocene and the Mustelidæ, Viverridæ, and Canidæ of the later Tertiary and Recent. *Palæoprionodon*, *Palæogale*, *Cynodictis*, *Viverravus* and *Cynodon* are characteristic of the Phosphorites; *Bunælorus* of the Middle Oligocene of North America is almost identical with *Palæogale* of the Phosphorites, and *Viverravus*, although occurring in the Phosphorites, is typical of the Lower and Middle Eocene of North America. *Amphicticeps* is comparable with the cynodont and stenoplesictid groups of the Phosphorites. All of these carnivora are clearly in an Oligocene stage of evolution and appear to be rather early Oligocene.

The rodents are mostly new. One species is comparable with the Oligocene species of *Cricetodon* in Europe and with *Eumys* of the Middle Oligocene of North America; another with *Prosciurus* of the Lower (and ?Middle) Oligocene of North America. The remainder represent an Oligocene stage of evolution in the writers' view, but their true relations to the later Tertiary and existing rodents require further study.

The two insectivore genera are not closely comparable but would be, in our judgment, in an Oligocene stage of evolution. *Eumeryx* compares with *Prodremotherium* and *Amphitragulus* of the French Oligocene, and is decidedly more primitive than *Blastomeryx* of the Lower Miocene, but more modernized than any of the American Oligocene White River or John Day ruminants.

The character of the *Baluchitherium* fauna is peculiar as compared with most Tertiary mammal faunas, in the great abundance and variety of rodents and small carnivora, and scarcity of ungulates, especially artiodactyla. It represents probably a somewhat different facies from the badland faunas of Western America, or the fissure and quarry faunas of Western Europe. It may perhaps be a desert basin fauna. The association of true though primitive Cervidæ with a fauna rather closely correlated with the older Oligocene of Europe and America is of importance as indicating the Asiatic origin of this group, if the principles of evolution and dispersal be adopted which were outlined by Matthew in 'Climate and Evolution.' Hasty conclusions, however, are to be deprecated, as the evidence is still scanty and imperfectly studied and there is excellent prospect of obtaining more of it in the near future.

The Irдин Manha beds contain the following fauna:

Carnivora

*Paracynohyænodon morrisoni*, new species of Hyænodontidæ

Mesonychid, undescribed

Insectivora

?*Pantolestes* of Pantolestidæ

## Perissodactyla

*Desmatotherium mongoliense* Osborn

*Protitanotherium mongolicum* Osborn

## Artiodactyla

Undetermined genus, Anthracotheriidae

The age of the formation appears to be fixed as Upper Eocene by the occurrence of *Protitanotherium*. *Desmatotherium*, a Bridger Middle Eocene genus, might suggest somewhat earlier age, but the Mongolian species which Osborn has referred to this genus appears to be considerably more hypsodont and otherwise more advanced than its American relative. The absence of ancestral types for the Oligocene invasion of Europe and America is unexpected. The Irdin Manha may be correlated with the Pondaung fauna of Burma, which underlies a marine Upper Eocene formation. This would suggest that both may be Middle rather than Upper Eocene, and the same would probably hold for the Uinta of Utah.

