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## *Kennatherium shirensis* (Mammalia, Palaeoryctoidea), a New Didymoconid from the Eocene of Asia<sup>1</sup>

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### INTRODUCTION

Among a large collection of Eocene mammalian fossils obtained by the American Museum of Natural History Central Asiatic Expedition of 1928 was a small fragment of a lower jaw of a placental mammal that we consider distinct enough from any other known taxon to be made the type of a new genus. The discovery of this animal adds another form to the growing list of genera of Asiatic Didymoconidae. A comprehensive review of that family is now in preparation by one of us (MelleTT).

We thank Dr. Malcolm C. McKenna of the American Museum of Natural History for permitting the study of the extensive collection of fossil mammals from Mongolia under his care.

Figure 1 was prepared by Mr. Chester Tarka; figure 2 was drawn by Miss Biruta Ackerbergs. Figures 3 and 4 were prepared by us.

### ABBREVIATION

A.M.N.H., the American Museum of Natural History, Department of Vertebrate Paleontology

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<sup>1</sup> Publications of the Asiatic Expeditions of the American Museum of Natural History, Contribution No. 163.

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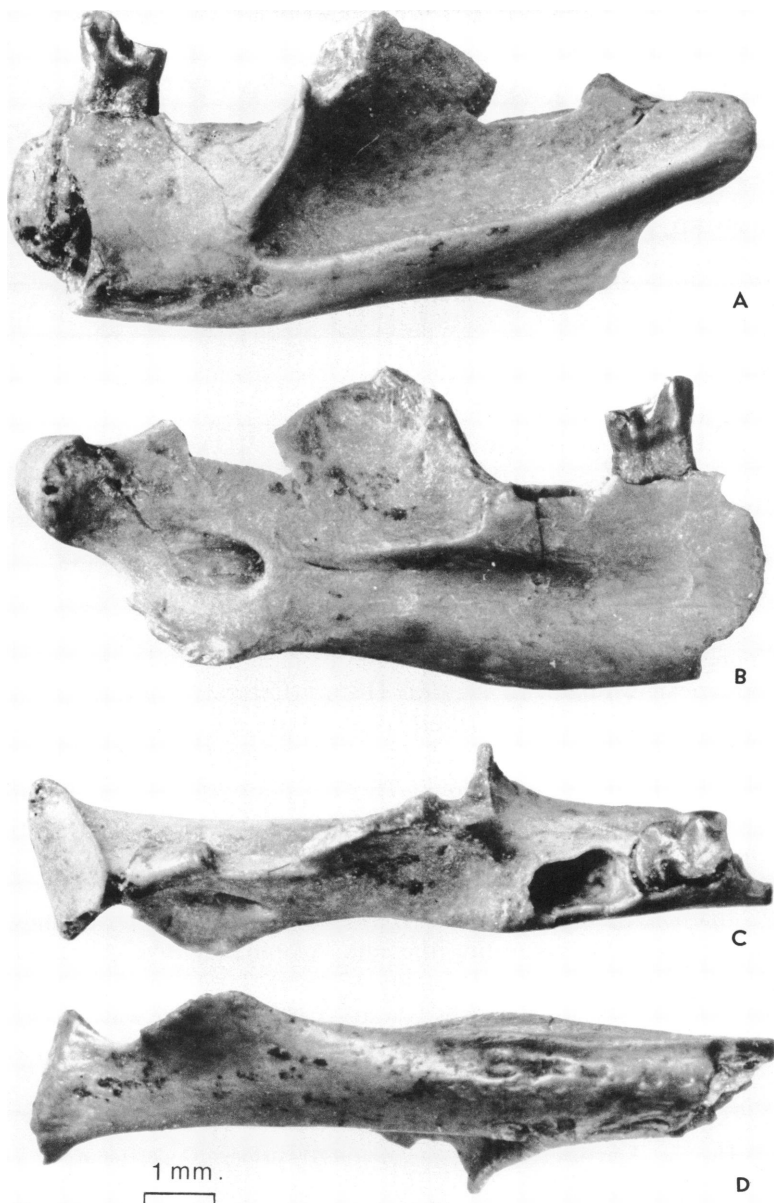


FIG. 1. *Kennatherium shirensis* Mellett and Szalay, new species, holotype, A.M.N.H. No. 26295. A. Lateral view. B. Medial view. C. Dorsal view. D. Ventral view.

## SYSTEMATICS

## CLASS MAMMALIA

ORDER DELTATHERIDIA VAN VALEN, 1965<sup>1</sup>

## SUPERFAMILY PALAEORYCTOIDEA WINGE, 1917

## FAMILY DIDYMOCONIDAE KRETZOI, 1943

***Kennatherium shirensis* Mellett and Szalay, new species**

TYPE SPECIES: *Kennatherium shirensis* Mellett and Szalay, new species.

HOLOTYPE: A.M.N.H. No. 26295, posterior part of mandible, including  $M_1$  and alveoli of  $M_2$ ; dorsal half of coronoid process lacking (fig. 1).

GEOLOGIC AND GEOGRAPHIC DISTRIBUTION: Chimney Butte ("Buck-shot's") Quarry, Ulan Shireh Formation (type beds), North Mesa, Shara Murun region, about 15 miles northeast of Ula Usu, Inner Mongolia, China; approximately Late Eocene in age (see Radinsky, 1964; Szalay and Gould, 1966).

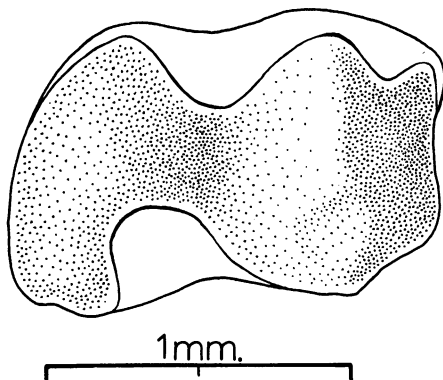


FIG. 2. *Kennatherium shirensis* Mellett and Szalay, new species, holotype, occlusal view of  $M_1$ . Anterior is to the right.

DIAGNOSIS: Distinguishable from other genera of the Didymoconidae (*Ardynictis*, *Didymoconus*, *Mongoloryctes*) by its much smaller size, strongly developed lateral and medial masseteric crests, and a distinct, inflected angular process on the mandible.

ETYMOLOGY: *Kennatherium*, for Malcolm C. McKenna, who discovered the specimen in the collection; *shirensis*, for the Ulan Shireh Formation, where the holotype was found.

<sup>1</sup> One of us (Szalay) believes that the Palaeoryctoidea should be classified with the Insectivora, not the Deltatheridia. The reasons for this belief will be explained in detail later.

DESCRIPTION: The most interesting features of the small jaw are on the ascending ramus. The masseteric fossa (fig. 1) is exceptionally deep and sharply excavated. The anteriormost extension of the masseteric fossa extends under the alveolus of the posterior root of  $M_1$ . The crista condyloidea (the crest that forms the lower limit of the masseteric

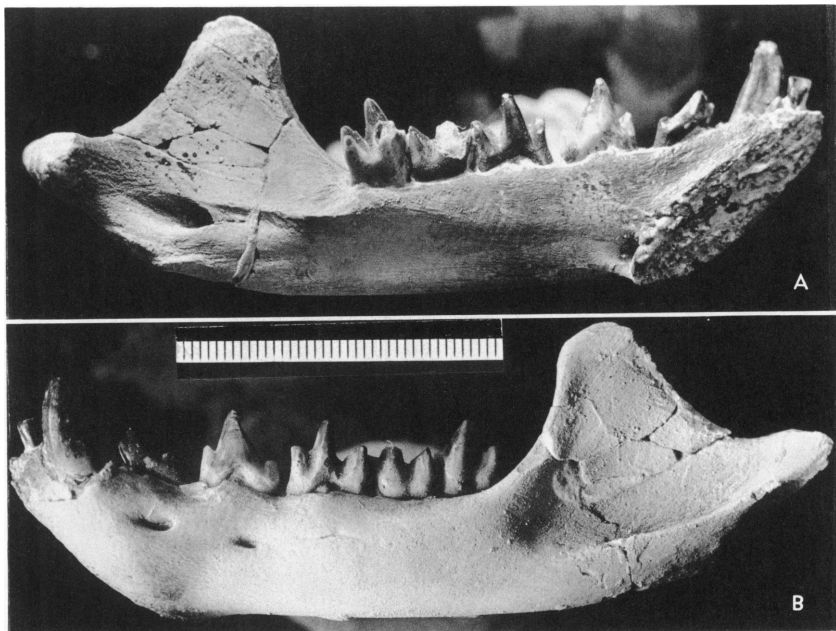


FIG. 3. *Didymoconus colgatei*, A.M.N.H. No. 21651. A. Lateral view of mandible. B. Medial view of mandible. Each subdivision on scale equals 0.5 mm.

fossa) extends far posteriorly to the lateral side of the mandibular condyle. The condyle is robust, and the articular surface covers an arc of approximately 180 degrees. The neck of the condyle is tilted slightly dorsad; thus a greater part of the articular surface faces posterodorsally rather than posteroventrally. The articular condyle itself is transversely broad, and its transverse axis is oriented very slightly anteromedially and posterolaterally. The most dorsal surface of the articular condyle is on the same level as the base of the crown of the molars in a mature individual, such as the holotype of *Kennatherium*.

On the medial surface of the mandible (fig. 1B), there is an enormous triangular muscle scar immediately posterior to the alveoli for  $M_2$ .

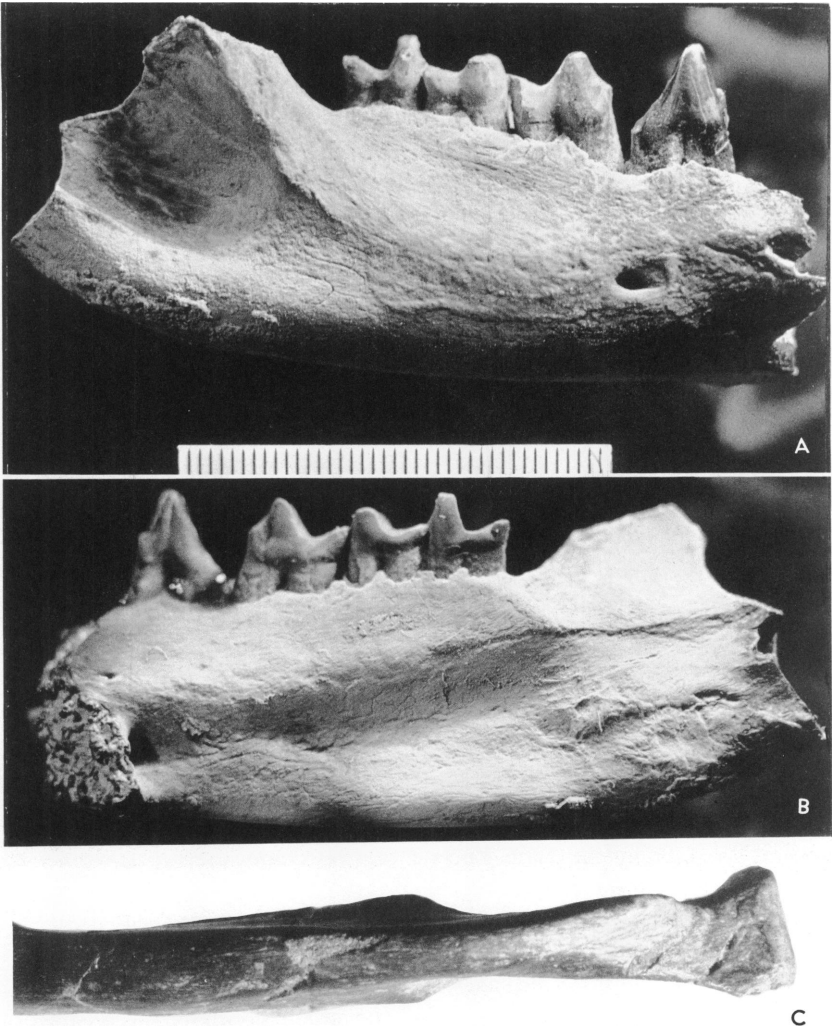


FIG. 4. *Didymoconus colgatei*. A. A.M.N.H. No. 21671, lateral view of mandible. B. A.M.N.H. No. 21671, medial view of mandible. C. A.M.N.H. No. 21651, ventral view of mandible. Each subdivision on scale equals 0.5 mm.

The scar probably represents the area of insertion of a substantial component of the temporalis muscle. The dental foramen is large and occupies the posterior half of the ascending ramus, anteroventral to the articular condyle.

$M_1$ , the only preserved tooth, is heavily worn (figs. 1C, 2). The crown of the tooth is extended well out of its alveoli, exposing as much root above the mandible as the height of the worn trigonid. The configuration of the trigonid suggests the presence of twinned protoconid and metaconid and a small, centrally placed paraconid. The talonid is worn almost completely flat, although a substantial portion of the talonid basin buccal to the talonid notch bears no trace of wear (see figs. 1C, 2). We suppose that the position of the hypoconid was at the most buccal part of the talonid. The cristid obliqua joined the trigonid at about the middle of the protocristid. Part of the strong precingulid-paraconid is clearly visible in buccal and occlusal views of  $M_1$ . The trigonid has been worn down, and the anterior face of the "loph" had developed as a result of postvallum-prevallid shear between  $P^4$  and  $M_1$ ; the posterior half is the result of postvallid-prevallum shear between  $M_1$  and  $M^1$ .

MEASUREMENTS OF HOLOTYPE (A.M.N.H. No. 26295): Length of  $M_1$ , 1.35 mm.; posterior width of  $M_1$ , 0.92 mm.; anterior width of  $M_1$ , 0.96 mm.; length of the two alveoli for  $M_2$ , 1.40 mm.; width of the first alveolus of  $M_2$ , 0.65 mm.; width of the second alveolus for  $M_2$ , 0.71 mm.; distance from posterior border of  $M_1$  to posterior border of articular condyle, 8.90 mm.; depth of mandible at level of  $M_2$ , 3.15 mm.; thickness of articular condyle, 1.60 mm.

DISCUSSION: The strongly inflected angle and the wear pattern of the single preserved tooth of *Kennatherium* suggested to us that the animal may represent the first known Asiatic marsupial. These morphological characters, however, also occur in the Didymoconidae, a group that was present in Asia in the Late Eocene to mid-Oligocene and possibly as long ago as the Cretaceous.

Both *Ardynictis* from the Ardyn Obo beds and *Didymoconus* from the Hsanda Gol beds have inflected angles, although the degree of inflection is not so pronounced as it is in *Kennatherium*. In well-preserved specimens of *Didymoconus* (figs. 3, 4) the crista condyloidea is sharply delineated and runs onto the neck of the condyle, as in *Kennatherium*. The total configuration of the dentary condyle is similar in both *Didymoconus* and *Kennatherium*. These two genera and *Ardynictis* possess a strongly developed medial shelf on the mandible, just below the anterior part of the coronoid process. We believe that this shelf (probably for the insertion of part of the temporalis muscle) is an important feature in primitive eutherians; it is not so well developed in any marsupials known to us.

The wear pattern on  $M_1$  of *Kennatherium* is basically similar to that

on  $M_1$  of older individuals of *Didymoconus*; all possess a lophodont trigonid and a flattened talonid (figs. 1B, 4). Finally, the position of the dental foramen is basically the same in *Kennatherium*, *Ardynictis*, and *Didymoconus*.

*Kennatherium* is the smallest recognized member of the family Didymoconidae. It is difficult to speculate on its ecology because so little is preserved of the animal. The related *Ardynictis* and *Didymoconus* were probably insectivorous (Matthew and Granger, 1924, 1925), and it seems likely that *Kennatherium* was also insectivorous.

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