EVOLUTION OF TERTIARY MAMMALS OF NORTH AMERICA

VOLUME I:
TERRESTRIAL CARNIVORES, UNGULATES, AND UNGULATELIKE MAMMALS

EDITED BY CHRISTINE M. JANIS, KATHLEEN M. SCOTT, AND LOUIS L. JACOBS

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INTRODUCTION

The Oromerycidae were a middle to late Eocene group of glypopods closely related to camels and proboscideans. They originated in North America in the early Uintan, during the great middle Eocene radiation of artiodactyls, and became extinct during the terminal Eocene extinction crisis at the end of the Chadronian. Of the six valid genera, four are known from the Uintan, three from the Duchesneaean, and only two genera occur in the Chadronian. Most were small deer-like animals, the size of musk deer or elk-dillos, but the late Eocene Eoeryops and Mammameryops reached the size of small antelopes (Figure 28.1). They had no cranial appendages or locomotory specializations. Indeed, they are so primitive in skull, dentition, and skeleton that they have long been confused with primitive camels and proboscideans. Although Oromeryx was described by Marsh in 1894, the family was not formally named until 1955 (Glaess). (Figure 28.1. Restoration of Protorhyacn, by Brian Regal.)

DEFINING FEATURES OF THE FAMILY OROMERYCIDAE

CRANIAL

As already noted, the oromerycids have remarkably few derived characters that distinguish them from primitive camels and proboscideans. The skull (Figure 28.2A) is like that of most primitive tylopods, with a short, broad rostrum, incomplete postorbital bar, and no frontal or lacrimal vacuities. Like other glypopods, the bulla is inflated and filled with cancellous bone.

DENTAL

The dentition (Figure 28.2B) is unusually low crowned and bunodont for a selenomerycid tylopod. All of the anterior teeth are present, and there are no diastemata. Eoeryops has slightly enlarged canines, but all other oromerycids have equal-sized canines and incisors (if they are known). The first two premolars are simple blades, and the last two premolars are blade-like with a lingual cusp. The molars are bunoselenodont with strong labial cusps and mesocones. Only two features help distinguish them from primitive tylopods. In the upper molars, the protocones are bifurcate posteriorly (Wilson, 1974; Prothero, 1986), which is found elsewhere only in the most primitive camels. All oromerycids retain this primitive feature. The only uniquely derived feature in the dentition is the deep lingual cleft between the entoconid and hypoconulid on m3.

POSTCRANIAL

Postcranially, oromerycids are known primarily from the nearly complete skeleton of Eoeryops (Matthew, 1900) and a partial skeleton of Mammameryops (Prothero, 1986). The vertebrae have the primitive condition of the vertebral artery passing through transverse processes, rather than through the pedicles of the neural arch, as in camels and proboscideans. The limb elements are elongate, like those of most cursorial artiodactyls, but not nearly as slender as those of camels. The only noticeable specialization is the fusion of the radius and ulna, which happened independently in a number of advanced ungulates. The manus has four fully-developed mesocuneiforms, although the central two are more robust. The fibula is

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reduced to a nodule. The lateral metatarsals have been so reduced that the foot is essentially didactyl.

SYSTEMATICS

SUPRAFAMILY

Although the teeth of Oromeryx were described by Marsh in 1894, and the complete skeleton of Ertolopus was described by Matthew in 1910, oromerycids remained poorly understood. Some taxa (e.g., Oromeryx) were considered primitive ruminants; others (e.g., Preyolopus, Ertolopus) were considered ancestral to the camels (Scott, 1899, 1940, 1945; Simpson, 1945). The oromerycids were recognized as distinct from camels by Matthew in 1910, but were not formally named until Garth did so in 1955. Subsequent authors (Wilson, 1975; Golz, 1976; Black, 1978; Prothero, 1986) have upheld the validity of the group, although Wilson (1974) placed them as a subfamily of the Camelidae.

INFRAFAMILY

Six valid genera of oromerycids are recognized (Fig. 28.3). Their temporal and geographic distribution is shown in Figures 28.4 and 22.5. Camelolophus amplusolopus (Granger, 1910) from the Beaver Dam locality in central Wyoming (CP3928) is based on a left mandible with such a worn dentition that there is no recognizable crown pattern. Its only unique feature is a diastema between p2 and p3, which does not place it with any group. The affinities of this taxon are indeterminate.

INCLUDED GENERA IN THE FAMILY OROMERYCIDAE

The locality numbers listed for each genus refer to the list of unified localities in Appendix I. The acronyms for museum collections are listed in Appendix III. The locality numbers may be found in a number of alternative ways. Parentages around the locality (e.g., [CP101]) mean the taxon in question is that locality is cited as an "after" or "before" theaxon in question. Parentages are usually used for individual species, thus implying the genus is firmly known from the locality, but the actual species identification may be questionable. Question marks in front of the locality (e.g., [CP101]) mean the taxon is questionably known from that locality, thus implying some doubt that the taxon was actually present at that locality, either at the genus or the species level.

_Merychippus_ Golz, 1976


_Type specimen:_ LACM 27551.

_Characteristics:_ Most primitive of the oromerycids, with teeth intermediate between the bunodont and selodont conditions. Differs from all other oromerycids in having lower-crowned upper molars with weaker crests, stronger cingula, and more squared occlusal outline.

The m2 is unknown. M2 length = 8.1 mm.

_Included species: M. littoralis_ only, known from locality CC4 only._
Malacusifera Gaudin, 1955
Type species: Malacusifera turvulost Gaudin, 1955.
Type specimen: UNSM 20568.
Characteristics: Malacusifera also has very low crowned teeth, with square/upper molars and small protocristids on M1-M3. It is distinguished from most other onychoerycids in having highly wrinkled enamel and lacking lingual upper molar cingula.
Average length of m2: 9.8-11 mm.
Included species: M. intusulatus only (known from localities SBv3A, SBv3B, CPv3C).

Protopsylops Wormworth, 1908
Type species: Protopsylops Petersburg Wormworth, 1908.
Type specimen: AMNH 2759.
Characteristics: Protopsylops is slightly more advanced than *Merychippus* and *Malacusifera* in having higher crowned, more rectangular molars with stronger selenes. Unlike more advanced onychoerycids, the molars do not narrow posteriorly. As used by Golz (1976, Figure 15), *Protopsylops* is essentially a wastebasket genus for all onychoerycids that have reached a certain grade of evolution. Not all of the species are referable to this genus on the basis of shared derived characters.
Average length of m2: 7.9-10.6 mm.
Included species: *P. petersoni (= P. minor, P. parvus) (known from localities CCv7C, CCv9A, CPv5A, CPv6A, CPv6B, CPv3B; P. pearsoni (localities CCv7B, CCv9B, P. scotti (localities CCv7C, CCv9B, P. robustus (localities CCv7C, CCv9A); P. stoutii (CPv6B).
*Protopsylops* sp. is also known from localities CCv7B, CCv9A, CPv6B.

Oromerys Marsh, 1984
Type species: Oromerys placitus Marsh, 1984.
Type specimen: YPM 15751.
Characteristics: Oromerys is slightly larger than most *Protopsylops* and has posteriorly tapered upper molar. It is considerably smaller and less hypodont than *Eurylops* or *Montanotylosaurus*.
Average length of m2: 7.9 mm.
Included species: *O. placitus (known from localities SBv3A, SBv3B, CPv6A, CPv6B).

Eurylops Matthew, 1910
Type species: Eurylops radiatus Matthew, 1910.
Type specimen: UW 216.
Characteristics: *Eurylops* has slightly higher crowned teeth than other onychoerycids except *Montanotylosaurus*; and lacks the enamel plications seen in most other onychoerycids. It is also larger than any other onychoerycid except *Montanotylosaurus*. It differs from *Montanotylosaurus* in being smaller and much less hypodont.

Average length of m2: 9.8-11 mm.

Montanotylosaurus Prothero, 1986
Type species: Montanotylosaurus matthewi Prothero, 1986.
Type specimen: CPv6A.
Characteristics: *Montanotylosaurus* is readily distinguished from all other onychoerycids in its much larger size and its very hypodont teeth. Indeed, it is hypodont that it was long misidentified as a camel. However, it clearly shows the bifurcate protocristids and the entocristid-hypocristid groove that are diagnostic for onychoerycids.
Average length of m2: 10.5 mm.
Included species: *M. matthewi (known from localities SBv3B, CPv3A, NPF3C).

Indeterminate onychoerycids
Fragmentary remains ascribed to onychoerycids have been reported from localities CPv6B, NPF, NPv9A.

**Biology and Evolutionary Patterns**

Onychoerycids were very unexceptional in their skeletons and dentitions, so it is likely they were among the many small, primitive browsing artiodactyls that preceded the forests of the middle and late Eocene. In this regard, they must have shared this niche with primitive protoconodonts, orodontid, trituberculodont, leptophycodont, and mesonychosaurids. By the Oligocene, they had become considerably larger and more cursorial. *Eurylops* and *Montanotylosaurus* show signs of greater cursoriality in having a fused radius-ulna, reduced hands, and a less robust to claw digits. However, no onychoerycid is as gracile as Oligocene camels, protoconodonts, leptophycodonts, or hypocrycodonts, which were truly cursorial. *Montanotylosaurus* did converge considerably on camels in its much larger body size and high-crowned semidentine teeth.

Onychoerycids were always rare, so their distribution is largely an artifact of the small sample size. However, there are some distinct geographic trends. *Protopsylops* was relatively abundant in the middle Eocene of California, but rare elsewhere. *Malacusifera* was more common in Wyoming and Texas at the same time. *Oromerys* was always rare. *Eurylops* first appeared in the Duchesnan and lasts until very end of the Chadronian. It is by far the most long-lived and widespread of onychoerycids, ranging from New Mexico and Texas to Mexico and Wyoming. *Eurylops* is also some surprising **sensu** in its distribution. It is well known from the Chadronian of Wyoming, Colorado, and Texas, but some far not been reported from the large Chadronian samples of the South Dakota Badlands. *Montanotylosaurus* has an unusual distribution: McCurry's **sensu** in the Chadronian of Wyoming (Prothero, 1986), the Kaibab Peak Information
Figure 28.4. Temporal ranges of oromerycid genera.
REFERENCES


