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A New Species of *Niptomomys* (Microsyopidae) from the Early Eocene of Wyoming

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Abstract. A new, relatively large species of *Niptomomys* is described from the late Wasatchian of the Bighorn Basin of Wyoming. The importance of a stratigraphic approach to problems of species-level phylogeny is stressed, and then applied to an investigation of the evolutionary history of *Niptomomys*. The new *Niptomomys* species may have evolved gradually from early Wasatchian *Niptomomys doreenae* in the Bighorn Basin and vicinity, or it may have evolved elsewhere and replaced the earlier form relatively rapidly. The available evidence is not yet sufficient to distinguish between these two alternatives.

Introduction

Microsyopidae are an important family of archaic North American and European Paleocene and Eocene primates of the suborder or infraorder Plesiadapiformes. Two subfamilies, Microsyopinae and Uintasoricinae, are generally recognized within this family. The subfamily Uintasoricinae contains four genera: *Niptomomys, Uintasorex, Berruvius* and *Navajovius*. Of these, *Niptomomys* and *Uintasorex* were the most successful in terms of their stratigraphic and geographic diversity. *Berruvius*, from the Paris Basin in France, is not well known and its affinities are uncertain [Russell, 1964; Szalay and Delson, 1979]. *Navajovius* is known from the late Paleocene locality of Mason Pocket in Colorado [Matthew and Granger, 1921], where it is represented by three specimens. *Navajovius* is also possibly represented

by a single specimen from Quarry 58 of the American Museum of Natural History in the San Jose Formation of New Mexico [Szalay, 1969a]. Alternatively, the latter specimen may represent a very small species of *Niptomomys* [see Bown, 1979].

Two species of *Uintasorex, U. parvulus* and *U. montezumicus,* have a fairly wide geographic distribution. *U. parvulus* is known from Bridgerian (middle Eocene) beds in the Bridger Basin of Wyoming [Matthew, 1909], from Powder Wash in the Green River Formation of Utah [Gazin, 1958], and from the Badwater Creek area of Wyoming [Robinson, 1968]. *U. montezumicus* is known from various localities in the Mission Valley and Friars Formations, Uintan (late Eocene) of California [Lillegraven, 1976]. These represent the latest North American uintasoricines, ranging from the early Bridgerian through the Uintan.

Niptomomys, the focus of the present paper, is the earliest relatively well-known representative of the subfamily. Only *Navajovius* from Colorado and *Berruvius* from France are older. *Niptomomys* is known from the earliest Eocene Clarkforkian of the Clark's Fork Basin, Wyoming [Rose, 1979] through most of the Wasatchian early Eocene of the central Bighorn Basin, Wyoming [Bown and Gingerich, 1972]. *Niptomomys* is also known from a relatively wide geographic area, stretching from the Four Mile area of northwestern Colorado [McKenna, 1960] to the central and northern parts of the Bighorn Basin in north-central Wyoming [Bown, 1979; Rose, 1979].

Niptomomys, like all uintasoricines, is quite small. It is characterized by having lanceolate lower incisors [Bown and Gingerich, 1972], lower fourth premolars that lack paraconids [Szalay, 1969b; Bown, 1979], and lower molars with large, deep talonid basins [McKenna, 1960]. Both upper and lower fourth premolars are rather robust, and upper molars have large trigon basins and buccally placed conules. Postprotocingula may be present on upper molars [Bown, 1979].

We recently restudied most of the known specimens of *Niptomomys,* making use of stratigraphic information where available. Our purpose was to investigate the evolutionary history of this early group of uintasoricine primates.

Abbreviations used in the text. AMNH = American Museum of Natural History (New York); PU = Princeton University (Princeton); UM = University of Michigan, Museum of Paleontology (Ann Arbor); YPM = Yale Peabody Museum (New Haven); L = length; W = width.

Systematic Paleontology

Order Primates
Infraorder Plesiadapiformes
Family Microsyopidae
Subfamily Uintasoricinae
Niptomomys thelmae, sp. nov.

Holotype. YPM 27577, right mandibular fragment with I_1, P_{3-4}, M_1 (fig. 1).

Locality. Yale locality 175, Lower Eocene, Lysite beds, Willwood Formation, SW¼, NE¼, Sec. 1, T48N, R97W, Washakie County, Wyoming.

Hypodigm. The type specimen and AMNH 16829, a mandibular fragment preserving P_4 and M_1 and alveoli for M_{2-3}, found in 1913 by William Stein at the Head of Ten Mile Creek in Big Horn County, Wyoming (fig. 2).

Diagnosis. Differs from *N. doreenae* (fig. 3) in being significantly larger, with more robust P_4. M_1 more expanded bucco-lingually, with reduced or absent paraconid and anteroposteriorly expanded trigonid. Mandible more robust and deeper than in *N. doreenae.*

Etymology. Named for Mrs. Thelma Churchill, in recognition of the many contributions that she and her family have made to the promotion of paleontological field work in the Bighorn Basin of Wyoming.

Description. As was discussed in Bown and Gingerich [1972], the incisor of YPM 27577 is very similar in morphology to typical microsyopid lower incisors. It has been adequately described by previous authors, but we shall add a comment here concerning its microsyopid affinities. The wear shown on the *N. thelmae* incisor is similar to that seen in species of *Microsyops.* The medial-most surfaces of the incisors wear through their thin enamel covering relatively rapidly and assist in keeping a sharp cutting surface along the superior margin of the tooth. The wear appears heaviest along the superior border of the medial aspect of the incisor in both genera. The posterior lateral expansion of the lower incisor in *N. thelmae* is less well developed and suggests a less marked tapering towards the tip than is seen

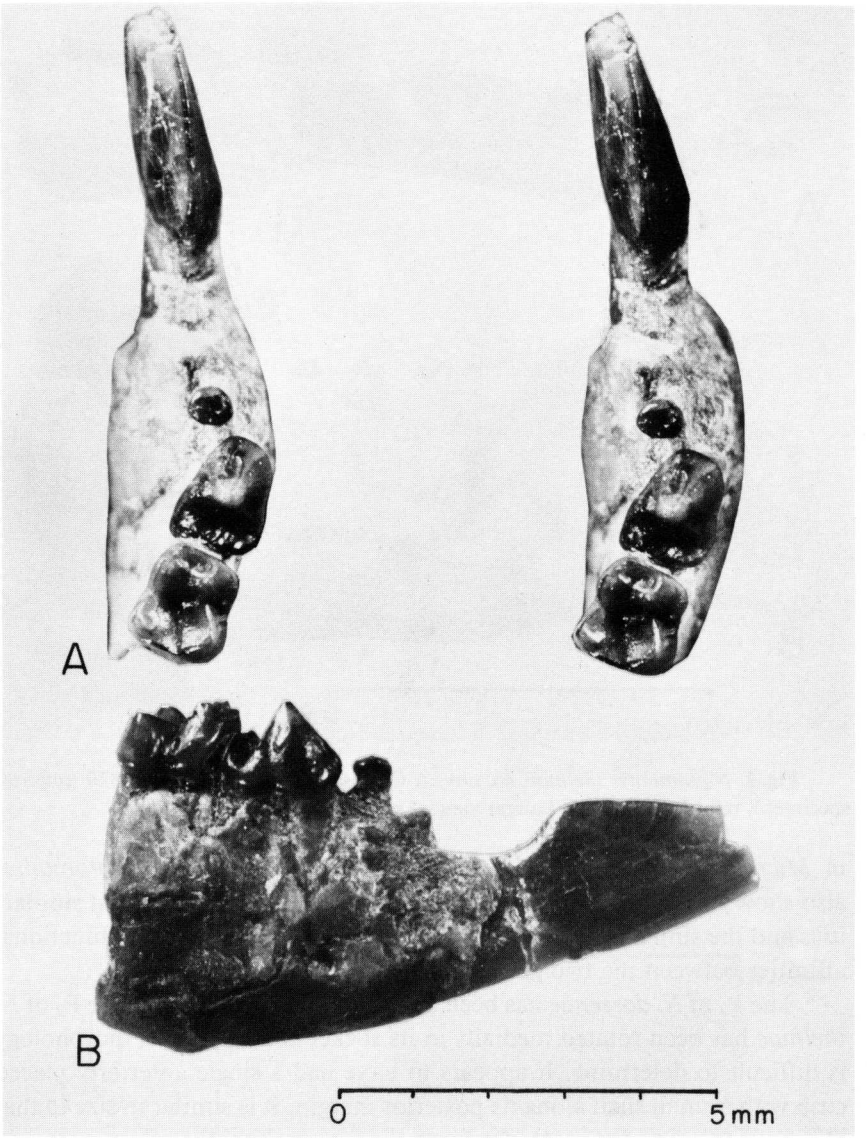

Fig. 1. *Niptomomys thelmae,* sp. nov. **A** Occlusal aspect of YPM 27577 (holotype), right I_1, P_{3-4}, M_1, stereophotograph. **B** Lateral view of same specimen.

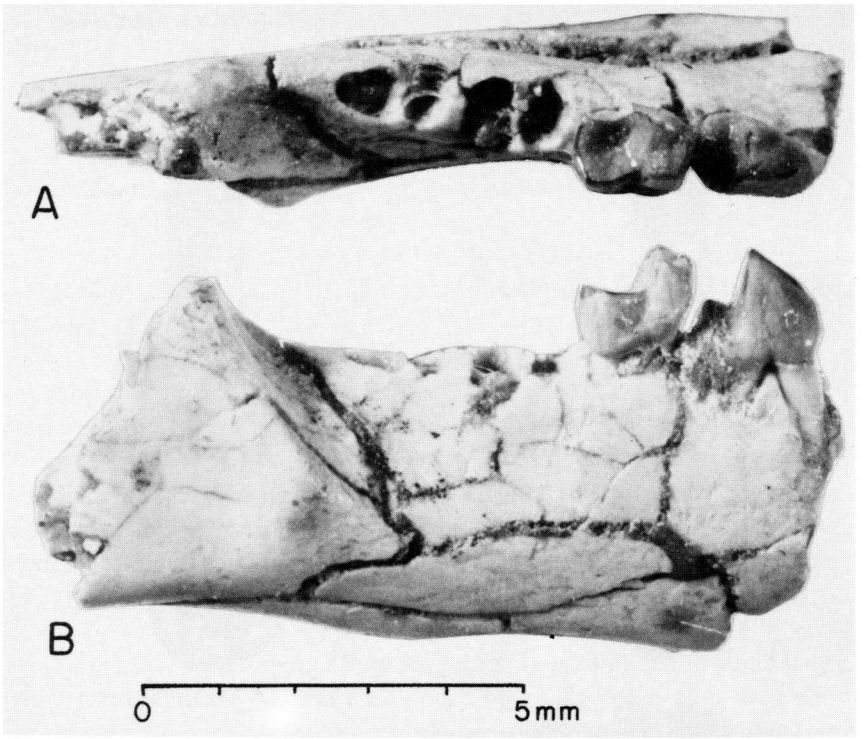

Fig. 2. *Niptomomys thelmae,* sp. nov. **A** Occlusal aspect of AMNH 16829 (referred specimen), right P_4 and M_1. **B** Lateral view of same specimen.

in *Microsyops.* Other lower incisors tentatively assigned to *Niptomomys* also show this characteristic. However, the over-all morphological similarities and the similar wear patterns suggest close phylogenetic and functional affinities between the two genera.

The P_3 of *N. doreenae* has been described by Bown [1979]. The P_3 of *N. thelmae* has been rotated medially in its socket and the crown morphology is difficult to determine. It appears to have had a single anteriorly placed cusp with a small shelf along its posterior margin. It is similar in size to that in specimens assigned to *N. doreenae.*

P_4 is a very robust tooth in both the type and the referred specimen, with dimensions larger than those seen in *N. doreenae.* It has a prominent protoconid, with a metaconid placed high on the medial slope of the protoconid. The protoconid is inflated bucco-lingually along its anterior margin to a much greater extent than is exhibited in *N. doreenae.* The metaconid is

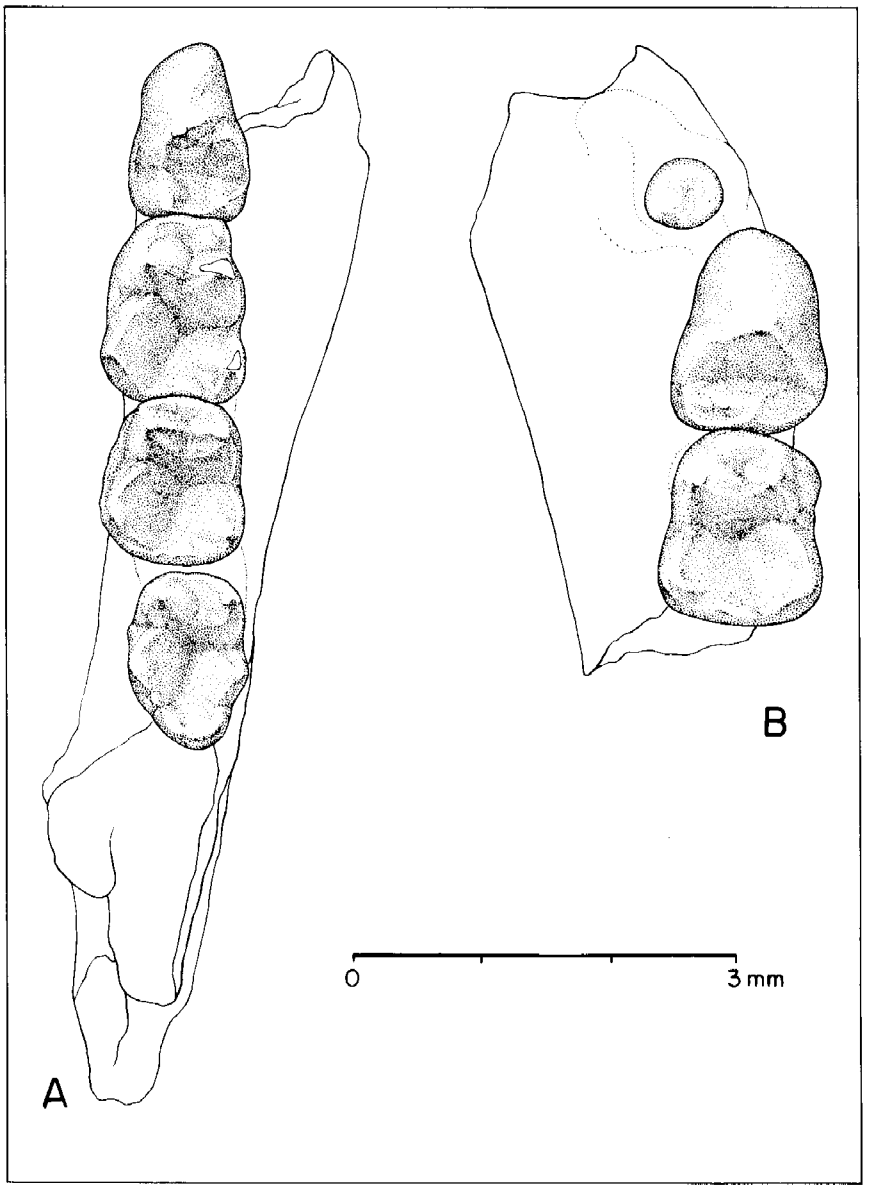

Fig. 3. Comparison of lower dentition of *Niptomomys doreenae* with *N. thelmae*. **A** *N. doreenae*, PU 17833, left P_4M_{1-3}, compared with **(B)** right P_{3-4}, M_1 of holotype of *N. thelmae*, YPM 27577. Both drawn to same scale. Note size difference, more inflated P_4, and reduced paraconid on M_1 in *N. thelmae*.