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A NEW SPECIES OF THE SCIURID RODENT *CEDROMUS* WILSON, 1949 (MAMMALIA) FROM THE WHITNEYAN (MIDDLE OLIGOCENE) OF SOUTH DAKOTA

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ABSTRACT

A new species of sciurid *Cedromus woodi* is named. It is the latest occurring species of this rare Oligocene genus. It is distinguished from other species of the genus by its larger size and dental morphology of the lower molars (incomplete hypolophid, enlarged metastylid, and separation of the posterior cingulid from the entoconid).

INTRODUCTION

Cedromus Wilson, 1949a, is a relatively rare sciurid that is limited to the early and middle Oligocene (Orellan and Whitneyan) of the central Great Plains. Except for the unique accumulation from "owl pocket" in Wyoming (Lucas et al., 2012) where five nearly complete crania of a single species are preserved (Korth and Emry, 1991), the remaining record of *Cedromus* is represented only by several lower jaws and a single cranium (Wilson, 1949a; Galbreath, 1953; Korth and Emry, 1991). The specimens described below represent a new species of the genus and are Whitneyan in age and extend the known record of *Cedromus* into South Dakota.

Dental terminology follows that of Wood and Wilson (1936). Lower molars are listed as lower-case letters (e.g. m1, m2). Abbreviations for institutions: SDSM, Museum of Geology, South Dakota School of Mines and Technology; UCM, University of Colorado Museum; UNSM, University of Nebraska State Museum.

SYSTEMATIC PALEONTOLOGY

Order Rodentia Bowdich, 1821
Family Sciuridae Gray, 1821
Subfamily Cedrouminae Korth and Emry, 1991
Cedromus Wilson, 1949a

Type Species—*Cedromus wardi* Wilson, 1949a

Referred Species—*C. wilsoni* Korth and Emry, 1991; *Cedromus* sp., Korth and Emry, 1991; *C. woodi* new species.

Range—Orellan (early Oligocene) of Colorado and Wyoming, Whitneyan (middle Oligocene) of South Dakota, Nebraska.

Cedromus woodi, new species

Type Specimen—SDSM 75302, left partial dentary with m1-m3 (Figure 1B, C).

Referred Specimen—SDSM 75294, right dentary with m1-m3 (Figure 1A).

Horizon and Locality—Early Whitneyan (middle Oligocene), Norbeck North locality (SDSM locality V2005-07), Poleslide Member, Brule Formation, South Dakota (see Janis et al., 1998:Appendix 1; Janis et al.,2008:Appendix 1; Evanoff et al., 2010).

Diagnosis—Largest species of the genus; mesostylids greatly enlarged on lower molars; hypolophids on lower molars weakly developed; posterolophid on m1-m2 separated at lingual end from entoconid.

Etymology—Patronym for A. E. Wood.

Description—The dentary is similar to that of all other species of *Cedromus*: it is thick (transversely) and deep; the masseteric scar forms a U-shape and ends anteriorly below the posterior root of m1; and a deep valley separates the ascending ramus from the tooth row (Figure 1C). The incisor is nearly triangular in cross-section and is longer than wide. The anterior enamel surface is gently convex and smooth.

The m1 is the smallest of the molars and nearly equal in width and length (Table 1). The talonid is slightly wider than the trigonid. The metaconid and protoconid are of equal size and compressed anteroposteriorly. They are connected to one another

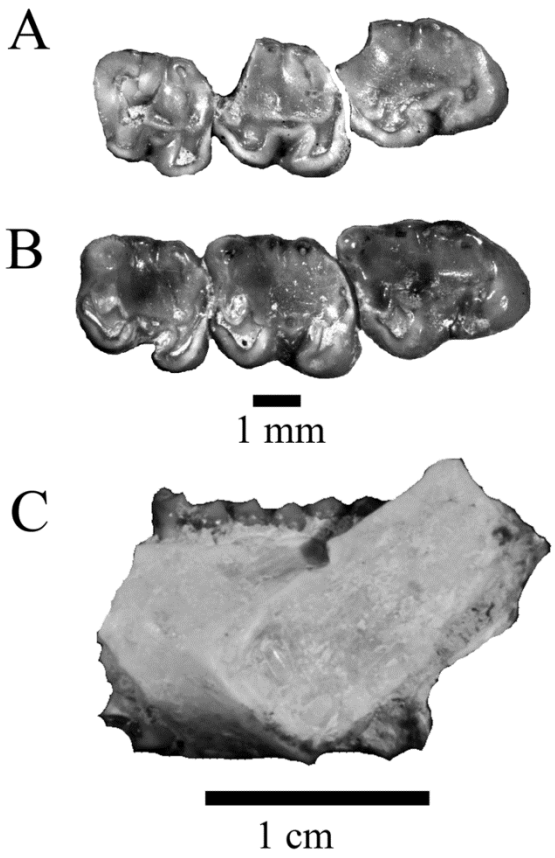

FIGURE 1. Dentary and dentition of *Cedromus woodi*. A, SDSM 75294, right m1-m3 (reversed). B, C, SDSM 75302 (holotype). B, left m1-m3. C, lateral view of dentary.

anteriorly by the anterior cingulid and posteriorly by the metalophulid, enclosing a small, circular trigonid basin. At the anterobuccal corner of the anterior cingulid is a small swelling (=anterostylid). Posterior to the metaconid, at the center of the lingual edge of the tooth is a large metastylid. It is conical in shape and separated from the surrounding cusps. On the buccal side of the tooth, the protoconid and hypoconid are connected weakly by the ectolophid that has a circular mesoconid at its center. The entoconid is anteroposteriorly compressed, and a weak hypolophid extends buccally from it that disappears into the talonid basin crossing less than one-fourth the width of the tooth. The hypoconid is obliquely compressed (anterolingual to posterobuccal). Posteriorly, the posterior cingulid runs along the posterior edge of the tooth, ending just before reaching the entoconid, and separated from it by a very narrow valley.

The m2 is larger than m1 and is slightly longer than wide, giving it a more rectangular occlusal outline. Morphologically, it is very similar to m1, but the anterior and posterior widths are equal. The only major differences are that the metastylid is larger and slopes buccally into the talonid basin and the valley separating the entoconid from the lingual end of the posterior cingulid is deeper.

The m3 is the largest of the molars and is elongated relative to the anterior molars. It differs from m1 and m2 in that there is no indication of an anterostylid and the trigonid basin is anteroposteriorly compressed and open posteriorly. The morphology of the hypolophid and endolophid are as in the anterior molars. However, the posterior cingulid is continuous with the entoconid.

Discussion—*Cedromus woodi* is the largest and latest occurring species of the genus (Figure 2). It most closely approaches the Orellan *C. wardi* in morphology because of the weakly developed hypolophids on the lower molars. However, it is distinct from *C. wardi* in having much larger mesostylids and a posterior cingulid that is not continuous with the entoconid. *C. woodi* differs from *C. wilsoni* in being larger and having much less well developed hypolophids on the molars but larger mesostylids, and the posterior cingulid not continuous with the entoconid. It differs from *Cedromus* sp. from the Whitneyan of Nebraska in being larger in size and having enlarged mesostylids (minute to absent in *Cedromus* sp.).

TABLE 1. Dental measurements of *Cedromus woodi*. Abbreviations: L, maximum anteroposterior length; W, maximum transverse width. Measurements in mm.

SDSM#	75302	75294
m1L	2.87	2.80
m1W	2.89	2.72
m2L	3.10	2.95
m2W	2.84	2.92
m3L	3.72	--
m3W	2.96	2.84
m1-m3	9.69	8.90

CONCLUSIONS

Cedromus wardi was originally named and referred to the Paramyinae (family Ischyromyidae) by Wilson (1949a) based on a single denary with m1-m3 (UCM 19808) from Colorado. However, he (Wilson, 1949a, 1949b) noted the similarity between the dentition of *Cedromus* and primitive sciurids and aplodontids (Prosciurinae). Shortly afterward, Galbreath (1953) referred *Cedromus* to the Sciuridae based on the description of a possible referred cranium

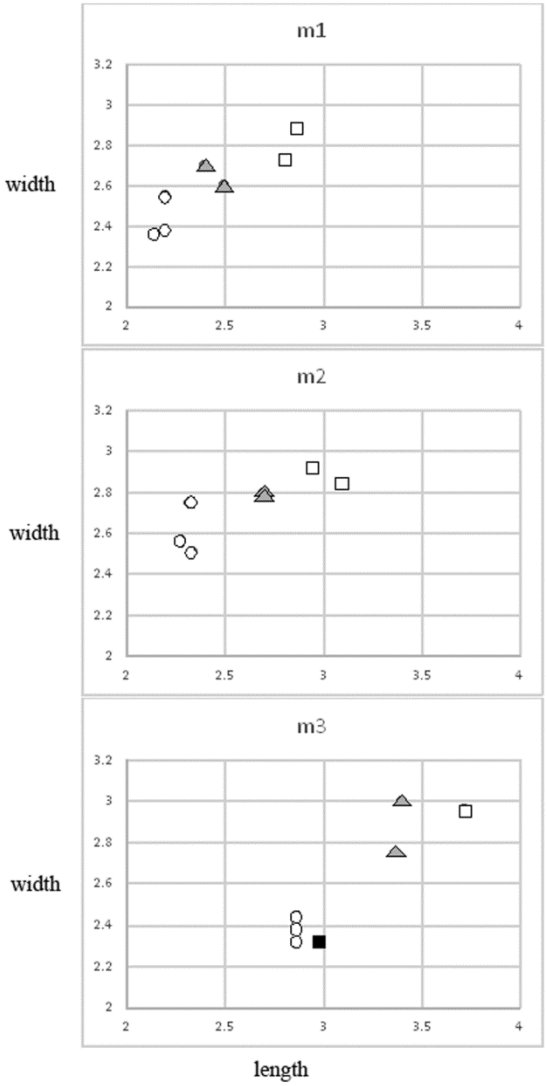

FIGURE 2. Comparative size of molars of species of *Cedromus*. White squares = *C. woodi*; gray triangles = *C. wardi*; white circles = *C. wilsoni*; black square = *Cedromus* sp. Scales in mm. Measurements from Wilson (1949a:32), Korth and Emry (1991:tables 1, 2) and Table 1, this paper.

(UCM 19852) from the same horizon as the holotype. Wood (1962) included *Cedromus* in the subfamily Prosciurinae within the family Paramyidae and included the Chadronian *Sciurus jeffersoni* Douglass, 1901, in the genus. Wood (1962) also acknowledged the similarity of *Cedromus* with sciruids. Later, several authors classified *Cedromus* as a prosciurine in the Aplodontidae mainly due to the protrogomorphous zygomasseteric structure of the skull (Russell, 1972; Rensberger, 1975; Wood, 1980). Korth and Emry (1991) described complete crania with associated dentaries of a new species of *Cedromus*, *C. wilsoni*, and demonstrated that it was definitely a sciurid rather than aplodontid. They erected a new subfamily Cedromurinae for *Cedromus* and another genus *Oligospermophilus* Korth, 1987. Since that time, the genus has been retained in the Sciuridae (Korth, 1994; McKenna and Bell, 1997; Goodwin, 2008). Emry and Korth (1996, 2001) named a new genus *Douglassciurus* for "*Sciurus" jeffersoni*, removing it from *Cedromus*.

Cedromus wardi and *C. wilsoni* are limited to the Orellan (Wilson, 1949a; Galbreath, 1953; Korth and Emry, 1991; Goodwin, 2008). The only specimen of *Cedromus* that was previously reported as Whitneyan in age was a single partial dentary from Nebraska with m2 and m3 (UNSM 80133) identified as *Cedromus* sp. (Korth and Emry, 1991). With the recognition of *C. woodi*, there are now two species from the Orellan and two from the Whitneyan.

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