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Tanyops undans Marsh, 1894: A Junior Subjective Synonym of *Protapirus obliquidens* Wortman and Earle, 1893 (Mammalia, Perissodactyla)

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Abstract

Tanyops undans Marsh, 1894, a tapirid from upper Oligocene strata of South Dakota, has been almost totally ignored in the literature. Here the unique holotype specimen is redescribed and illustrated for the first time. *Tanyops undans* is virtually identical in morphology to, and thus a junior subjective synonym of, *Protapirus obliquidens* Wortman and Earle, 1893.

Key Words

Tanyops, Protapirus, Tapiroidea, Oligocene, fossil mammal.

Introduction

In 1893 Wortman and Earle described the first known North American representatives of the earliest tapirid genus, *Protapirus* Filhol, 1877; *Protapirus simplex* from the middle Oligocene of South Dakota and *Protapirus obliquidens* from the upper Oligocene of South Dakota. The following year Marsh (1894), without mentioning Wortman and Earle's recent work, described a new genus and species of tapiroids, *Tanyops undans,* in a 145-word, unreferenced and unillustrated paper. This taxon was based on "a pair of lower jaws in good condition recently found in the *Miohippus* beds of South Dakota." (This specimen probably comes from upper Oligocene strata; see below.) Hatcher (1896) subsequently reviewed early tapirid evolution in North America and described the new species *Protapirus validus* from the late Oligocene of South Dakota, but failed to mention *Tanyops.* In his review and discussion of Hatcher's paper, Earle (1896) also failed to mention *Tanyops,* as did Sinclair (1901) in describing the new species *Protapirus robustus* from the upper John Day Formation (upper Oligocene-lower Miocene) of Oregon. Scott (1941) also failed to mention *Tanyops undans* in his monograph on the perissodactyls of the White River Oligocene. Indeed, to my knowledge, since its description, *Tanyops* has only been mentioned twice in the literature. Schlaikjer (1937) based his brief discussion of *Tanyops* solely on Marsh's (1894) description without seeing the actual specimen, and tentatively retained it as a valid taxon. Simpson (1945, p. 140) stated without explanation that *Protapirus* included *Tanyops.* Here I illustrate, describe and discuss the holotype and only known specimen of *Tanyops undans,* Yale Peabody Museum (YPM) 12026, and conclude that

this taxon is based on a specimen referable to *Protapirus obliquidens*. From handwritten notes found with YPM 12026 it is evident that Leonard Radinsky came to essentially the same conclusion, although he failed to mention it in print (see Radinsky, 1969, and his earlier works on perissodactyls cited therein). Tooth nomenclature follows Radinsky (1969, fig. 1).

Systematic Paleontology

CLASS Mammalia Linnaeus, 1758
ORDER Perissodactyla Owen, 1848
SUBORDER Ceratomorpha Wood, 1937
SUPERFAMILY Tapiroidea Burnett, 1830 (Gill, 1872)
FAMILY Tapiridae Burnett, 1830
Protapirus Filhol, 1877

New Synonym

Tanyops Marsh, 1894 (type species= *Tanyops undans* Marsh, 1894).

Protapirus obliquidens Wortman and Earle, 1893
(Fig. 1, Table 1)

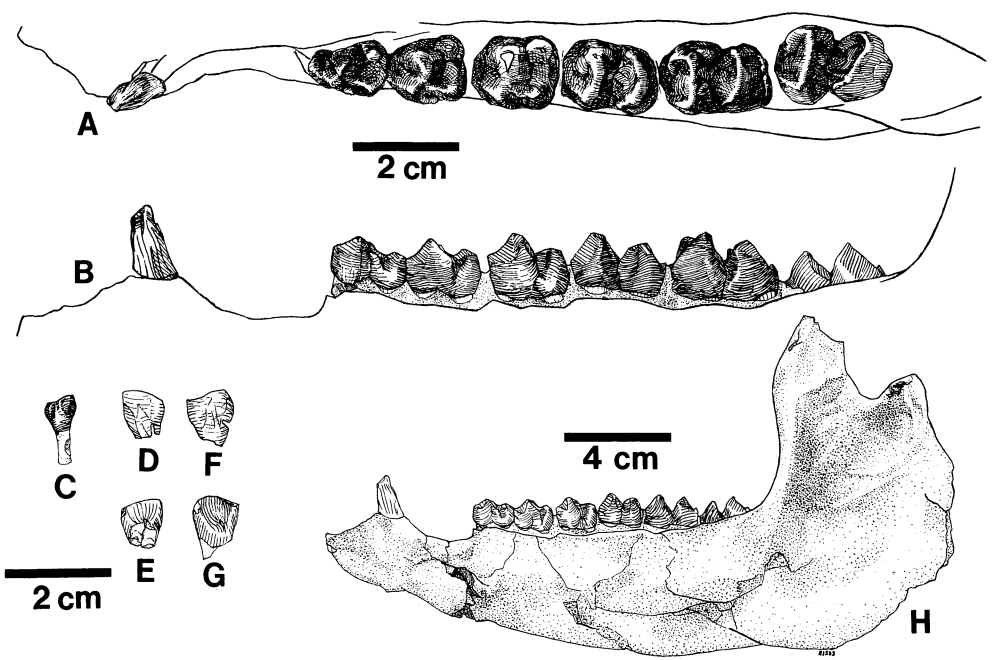
New Synonym

Tanyops undans Marsh, 1894.

Referred Specimen

YPM 12026, mandible with roots of right I_{1-3}, right and left C_1, P_2–M_2, left M_3 and alveolus for right M_3, isolated crowns of right I_{1-2} and right I_3 partially imbedded in matrix against its lingual face (holotype of *Tanyops undans* Marsh, 1894).

Fig. 1.
Holotype of *Tanyops undans* Marsh, 1894, YPM 12026. *A,* occlusal view of left C_1, P_2–M_3; *B,* labial view of left C_1, P_2–M_2; *C,* labial view of right I_3; *D,* labial view of right I_2; *E,* lingual view of right I_2; *F,* labial view of right I_1; *G,* lingual view of right I_1; *H,* lateral view of left dentary. Note separate scales for *A* and *B, C–G* and for *H.* Drawing by Ruth Santer.



Horizon and Locality

Collected by Henry F. Wells in the summer of 1894 from "the *Miohippus* beds of South Dakota" according to Marsh (1894), but from the *"Protoceras* beds" according to Wells (letter dated 11 Aug. 1894 from Wells to Marsh, Othniel Charles Marsh Papers, Manuscripts and Archives, Yale University Library). Thus this specimen probably comes from upper Oligocene strata (Wood et al., 1941).

Description

YPM 12026 is a well-preserved, nearly complete mandible (Fig. 1) that is virtually identical to a lower jaw of *Protapirus obliquidens* in the American Museum of Natural History, New York, described and illustrated by Wortman and Earle (1893, pp. 165–67, figs. 2, 3) and Scott (1941, p. 760). YPM 12026 differs from the American Museum specimen primarily in having a somewhat shorter mandible and diastema length (Table 1).

A summary of important morphological features of YPM 12026 follows. 1) The spatulate incisors decrease in size posteriorly. 2) The lower canine is placed directly posterior to I_3 and is relatively small. 3) There is a moderate diastema between C_1 and P_2, and P_1 is absent. 4) The remaining premolars are all double-rooted, increase in size posteriorly, and are submolariform. P_{2-4} bear distinct trigonids and talonids; however, the talonids are relatively short

Table 1

Comparative measurements (in mm) of *Tanyops undans* (YPM 12026) and *Protapirus obliquidens* (from Wortman and Earle, 1893, p. 167, fig. 2). Measurements of *P. obliquidens* are a composite of both right and left sides.

	Tanyops undans				***P. obliquidens***	
	Right Side		Left Side			
	Length	Width	Length	Width	Length	Width
I_1	6.4	8.0				
I_2	5.6+	7.1				
I_3	—	4.8				
C_1	6.8	6.3	7.0	6.2		
P_2	13.9	10.7	14.3	10.6	16.0	11.0
P_3	14.5	12.9	14.3	12.9	15.2	12.3
P_4	14.4	14.3	15.0	14.0	16.4	14.5
M_1	16.4	13.1	17.3	12.8		
M_2	19.2	13.4	19.2	14.0	20.8	14.2
M_3	—	—	20.6+	14.5	24.6	14.8
P_{2-4} length	44.6		42.4		47. ± 1	
M_{1-3} length	—		58.2		60. ± 1	
P_2–M_3 length	—		103.5		108. ± 1	
C_1–P_2 Diastema	30.0		28.0		38. ± 1	
Depth of ramus below M_2	43.1		42.8		40. ± 1	
Total length of jaw	235+				260. ± 1	

(anteroposteriorly), low and wide and bear distinct and separate entoconids and hypoconids. In none of the premolars are the entoconids and hypoconids connected to form high, transverse hypolophids as in the molars. 5) The molars bear trigonids and talonids that are subequal in length and width. The protolophids and hypolophids are tall, transverse crests (the protolophids are slightly higher than the hypolophids). The paralophids and metalophids are extremely reduced on M_{1-3}. 6) There is only the slightest trace of a hypoconulid lobe on M_3.

Discussion

In his original description Marsh (1894) distinguished *Tanyops* as a form with "essentially the same dentition as *Tapirus,* but the last premolar only is like the molars." Schlaikjer (1937, p. 248) interpreted Marsh's description as indicating that *Tanyops* had a relatively molariform P_4 with a complete and high hypolophid ("posterior cross crest" of Schlaikjer). Otherwise, Schlaikjer could not distinguish *Tanyops undans* from *Protapirus obliquidens.* In *Protapirus* P_{2-4} are all submolariform and lack complete, high, well-developed hypolophids (Wortman and Earle, 1893), whereas in the Miocene genus *Miotapirus* and in later tapirs such as *Tapiravus* and *Tapirus* the hypolophids are complete, high and well developed on P_{3-4} or P_{2-4} (Hatcher, 1896; Schlaikjer, 1937; Olsen, 1960). Thus on the basis of Marsh's (1894) description, Schlaikjer (1937) provisionally retained *Tanyops undans* as a valid genus and species morphologically intermediate between *Protapirus obliquidens* and *Miotapirus harrisonensis.* However, Schlaikjer (1937, p. 248) also stated that "it may prove to be a more advanced species of *Protapirus."*

As is evident from the description and illustrations (Fig. 1) of YPM 12026 that I have presented above, Marsh's (1894) original description of the holotype of *Tanyops undans* is misleading. In YPM 12026 the P_4 bears a distinct and separate hypoconid and entoconid. These conids are as in the referred specimens of *P. obliquidens* (Wortman and Earle, 1893; Scott, 1941: the holotype of *P. obliquidens* includes only an upper dentition) and are not connected by a well-developed hypolophid as in *Miotapirus.* P_{2-4} are all submolariform in *Tanyops undans* as in *Protapirus.*

If *Tanyops undans* is compared to *Protapirus obliquidens,* YPM 12026 is only very slightly smaller than the lower jaw originally referred to *P. obliquidens* by Wortman and Earle (1893, fig. 2). This is primarily seen in the somewhat shorter mandible and diastema of *Tanyops undans* (Table 1); however, the cheek teeth of the two specimens are of nearly the same size (Table 1). Differences seen in the sizes of the cheek teeth in the two specimens are of the same order of magnitude as differences seen in some cases between the right and left teeth of YPM 12026 (Table 1). I believe that this indicates that YPM 12026 represents a slightly smaller individual (perhaps a female?) than the American Museum specimen (perhaps a male?), not that they necessarily represent different taxa. Furthermore, *Protapirus* may be closely related to *Colodon occidentalis,* an early to middle Oligocene helaletid tapiroid known from a moderately large number of specimens (Radinsky, 1963). *Colodon occidentalis* is slightly smaller than *Protapirus obliquidens* and *Tanyops undans;* yet individuals referable to this species show as great a range in cheek tooth size as is seen between *Tanyops undans* and *Protapirus obliquidens.* (Compare Table 1 with Radinsky's, 1963, p. 64, table 10, "Statistical data on teeth of *Colodon occidentalis.")* Thus, except for individual variation, YPM 12026 is identical both in size and morphology to specimens of *Protapirus obliquidens* and therefore is referable to Wortman and Earle's earlier named taxon. On this basis I consider *Tanyops undans* Marsh, 1894, to be a junior subjective synonym of *Protapirus obliquidens* Wortman and Earle, 1893.

Historical Context

The sequence of events relating to the discovery and description of *Tanyops undans* is as follows. YPM 12026 was collected by H. F. Wells in the summer of 1894 (letter dated 11 Aug. 1894 from Wells to Marsh, Othniel Charles Marsh Papers), it was shipped by freight from Hermosa, South Dakota and received at Yale on 7 September 1894 as part of Accession Number 2248. The box was unpacked on 20 September (Accession records for Number 2248, Archives of the Division of Vertebrate Paleontology, Peabody Museum of Natural History), Marsh wrote his description of *Tanyops,* submitted it to the *American Journal of Science* on 22 September (Marsh, 1894) and it was published in October, 1894. Originally the collector, H. F. Wells, asked Marsh for $10.00 for YPM 12026 (letter dated 11 Oct. 1894 from Wells to Marsh, Othniel Charles Marsh Papers). After much haggling, Marsh paid Wells $500.00 for approximately three dozen specimens from South Dakota including the "tapir jaws." This sum was not paid in full until 18 May 1895 (letter dated 18 May 1895 from Wells to Marsh, Othniel Charles Marsh Papers), long after Marsh had initially described *Tanyops.*

In 1893 several papers on early tapirids were published (Earle, 1893a, 1893b; Wortman and Earle, 1893). All of these found their way into the Peabody Museum Library; however, I cannot positively state that Marsh saw any of them before his publication of *Tanyops.* Yet Marsh was not unfamiliar with tapirs (e.g., Marsh, 1877, 1890) and he owned a copy of Filhol (1877) in which *Protapirus* is described. Still, Marsh published only a hastily written description of *Tanyops,* failing to compare it to any genera other than *Colodon* and *Tapirus,* and never referred to *Tanyops* again in his later papers.

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