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*** START OF THE PROJECT GUTENBERG EBOOK *PIPISTRELLUS CINNAMOMEUS* MILLER 1902 REFERRED TO THE GENUS *MYOTIS* ***

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Referred to the Genus *Myotis***

BY

E. RAYMOND HALL and WALTER W. DALQUEST

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**Pipistrellus cinnamomeus Miller 1902
Referred to the Genus *Myotis***

[Pg 583]

By

E. RAYMOND HALL AND WALTER W. DALQUEST

Miller (Proc. Acad. Nat. Sci. Philadelphia, 1902, p. 390, September 3, 1902) based the name *Pipistrellus cinnamomeus* on a skin and skull of a vespertilionid bat obtained on May 4, 1900, at Montecristo, Tabasco, Mexico, by E. W. Nelson and E. A. Goldman. A single specimen was available to Miller when he proposed the name *P. cinnamomeus*. Dalquest and Hall (Jour. Mamm., 29:180, May 14, 1948) reported three additional specimens collected in 1946 by W. W. Dalquest on the Río Blanco, twenty kilometers west-northwest of Piedras Negras, Veracruz, Mexico. No other published information concerning this species is known to us, although the name has, of course, appeared in regional lists, for example in the "List of North American Recent Mammals, 1923" (Bull. U. S. National Museum, 128:75, April 29, 1924) by Gerrit S. Miller, Jr.

Additional specimens, nevertheless, are known. Two collected on April 18 and 20, 1903, at Papayo, Guerrero, by

Nelson and Goldman, are in the Biological Surveys Collection in the United States National Museum. A skin, probably of this species, for which the skull cannot now be found, was taken on October 27, 1904, at Esquinapa, Sinaloa, by J. H. Batty and is in the American Museum of Natural History. This is the skin referred by Miller and Allen (Bull. U. S. Nat. Mus., 144:100, May 25, 1928) to *Myotis occultus*. Three additional specimens, each a skin with skull, were collected twenty kilometers east-northeast of Jesús Carranza, at 200 feet elevation, Veracruz, by Walter W. Dalquest, two on April 13, 1949, and one on May 16 of the same year. These are in the Museum of Natural History of the University of Kansas, as also are the three previously reported by Dalquest and Hall (*loc. cit.*). A total of ten specimens, from five localities, all in Mexico, thus is accounted for.

On page 392 of the original description—which our study of the holotype shows to be accurate—Miller wrote: "This bat differs so widely from the other known American species of *Pipistrellus* as to need no special comparisons. Superficially it has much the appearance of an unusually red *Myotis lucifugus*, and only on examination of the teeth do the animal's true relationships become apparent." In referring to the teeth Miller almost certainly was thinking of the premolars of which there are only two on each side of the upper jaw and on each side of the lower jaw in *Pipistrellus*, including his *Pipistrellus cinnamomeus*, whereas *Myotis* at that time was thought always to have three premolars on each side of both the upper and lower jaw, except in rare instances where one premolar might be lacking on one side of one jaw or even more rarely on both sides of the upper jaw. In his original description of *P. cinnamomeus*, Miller mentioned also that it had the "Inner upper incisor distinctly smaller than the outer, not approximately equal to it as is the case in *P. subflavus*."

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At this point it is well to make clear that each of the genera *Pipistrellus* and *Myotis* contains a large number of species and that the differences between the two genera are few. Our examination of American specimens reveals only one differential character: In *Myotis* the outer upper incisor is distinctly larger than the inner, whereas the two incisors are of approximately equal size in *Pipistrellus*. It may be noted that the outer upper incisor of several, but not all, species of *Myotis* has a well-developed concave surface directed toward the canine whereas this surface is flat or convex in *Pipistrellus*. In both features, the type of *Pipistrellus cinnamomeus* Miller agrees with *Myotis* and differs from *Pipistrellus*.

Five years after naming and describing *Pipistrellus cinnamomeus*, Miller published his monumental work entitled "The families and genera of bats" (Bull. U. S. Nat. Mus., 57, June 29, 1907) wherein he points out the differences in the upper incisors between *Pipistrellus* and *Myotis* (by a *lapsus plumae* ascribes subequal incisors to *Myotis* and unequal incisors to *Pipistrellus*) but seemingly failed to reexamine *P. cinnamomeus* in the light of this better understanding of the two genera, or if he did examine *P. cinnamomeus* he possibly was misled still by the absence of the third premolar on each side of both the upper and lower jaw.

In 1928 when Miller and Allen published their account of "The American bats of the Genera *Myotis* and *Pizonyx*" (Bull. U. S. Nat. Mus., 144, May 25, 1928) they examined specimens of *Myotis occultus* which they implied (*op. cit.*: 99-100) had only two instead of three premolars on each side of both the upper and lower jaws. In preparing this taxonomic account of bats of the genus *Myotis*, the specimens (type and two from Papayo) of *Pipistrellus cinnamomeus* seem not to have been examined. Indeed, it is almost certain that they were not examined for the species was renamed; the new name, *Myotis lucifugus fortidens* Miller and Allen (Bull. U. S. Nat. Mus., 144:54, May 25, 1928), was based on a skull with the corresponding body in alcohol. The characters of this specimen are almost exactly those of *Pipistrellus cinnamomeus*, named and described by Miller 26 years earlier. The type locality (Teapa) of *M. l. fortidens* is 80 miles westerly from the type locality of *P. cinnamomeus*; both are in the state of Tabasco, and in the same life-zone, at equivalent elevations (neither higher than 50 meters). Since there are no characters of taxonomic worth to distinguish the two named specimens, *Myotis lucifugus fortidens* Miller and Allen 1928 falls as a synonym of *Pipistrellus cinnamomeus* Miller 1902. But, according to Miller and Allen (Bull. U. S. Nat. Mus., 144:19, 197), *Vespertilio cinnamomeus* Wagner 1855 is a name based on *Myotis ruber* (E. Geoffroy, 1806) from Paraguay and hence *Myotis cinnamomeus* (Miller) 1902 is a homonym of *Myotis cinnamomeus* (Wagner) 1855 and is unavailable for the animal from Montecristo when it is transferred to the genus *Myotis*; the species of animal concerned will take the next available name, which seems to be *Myotis lucifugus fortidens* Miller and Allen 1928.

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It may reasonably be asked if *Myotis* and *Pipistrellus* should be retained as separate genera if the only constant difference between the two is subequal versus unequal upper incisors. In our opinion it would be worth-while for someone who had access to adequate material from both the Old World and the New World to investigate this question. We lack adequate material from the Old World.

When Miller and Allen named *M. l. fortidens* they had only two specimens, the holotype from Teapa, Tabasco, and a referred specimen from Fort Hancock, El Paso County, Texas, approximately 1,200 miles north-northwest of Teapa. We have examined this specimen from Texas (U. S. Nat. Mus., 21083/36121, skin and skull) and regard it as *Myotis lucifugus carissima* Thomas. Furthermore, we regard the holotype of *Myotis lucifugus fortidens* Miller and Allen 1928 as specifically distinct from *Myotis lucifugus* of Miller and Allen 1928. The Cinnamon *Myotis*, described below, therefore may stand as:

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***Myotis fortidens* Miller and Allen**

CINNAMON MYOTIS

Pipistrellus cinnamomeus Miller, Proc. Acad. Nat. Sci. Philadelphia, p. 390, September 3, 1902, type from Montecristo, Tabasco (preoccupied by *Vespertilio cinnamomeus* Wagner, Schreber's Säugethiere, suppl., 5:755, 1855, a renaming of *Vespertilio ruber* E. Geoffroy Saint-Hilaire).

Myotis lucifugus fortidens Miller and Allen, Bull. U. S. Nat. Mus., 144:54, May 25, 1928.

Type.—"Adult female (in alcohol) No. 88.8.8.18, British Museum (Natural History). Collected at Teapa, Tabasco, Mexico, by H. H. Smith, January 5, 1888. Presented by Messrs. Salvin and Godman [after Miller and Allen, Bull. U. S. Nat. Mus., 144:54, May 25, 1928]."

Range.—Known only from the lower part of the Tropical Life-zone of the region of the Isthmus of Tehuantepec and east and west coasts of Mexico.

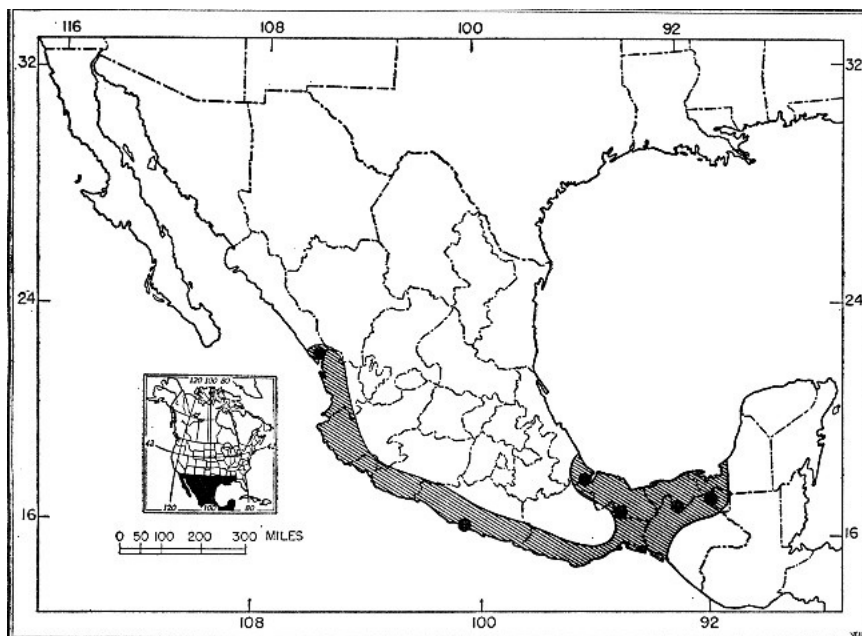
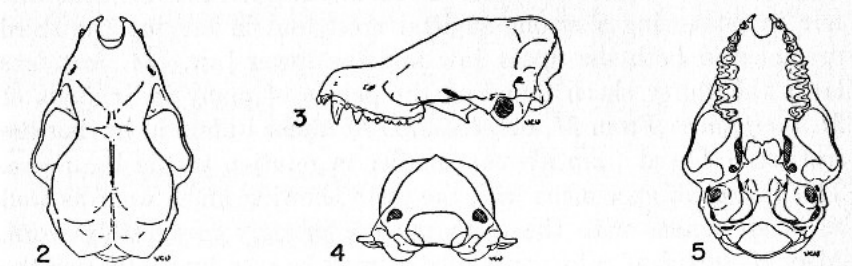


Fig. 1. Map showing localities from which *Myotis fortidens* has been recorded.

Diagnosis.—Among American species of the genus, over-all size medium (total length 94 mm); body long (54); tail short (39); forearm of medium length (37); tibia short (14.5); foot long (58 per cent of length of tibia); wing membrane arising from side of foot at distal end of metatarsal; calcar simple (not keeled) and 7 mm long; ears 15 to 16 mm long measured in the flesh from the notch (posteroventral border of the meatus); tragus, measured from same place, 7 to 8 mm high with posterobasal lobe; third metacarpal longest and second metacarpal shortest; fifth shorter than fourth; ears brownish; membranes of wing and tail blackish; uropatagium almost hairless, the few hairs that are present being almost invisible; pelage of back 5 mm long with some overhairs 8 to 9 mm long; basal 3 mm of fur black, remainder Cinnamon-Brown (capitalized color terms, after Ridgway, Color Standards and Color Nomenclature, Washington, D. C., 1912); outline of skull viewed dorsally similar to that of *Myotis lucifugus*; sagittal crest well developed; distance across upper canines equal to or slightly exceeding interorbital constriction; braincase low; two premolars on each side in upper jaw and also in lower jaw, the one remaining small premolar in contact with both the canine and the fourth premolar.

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Figs. 2-5. Four views of the skull of *Myotis fortidens*. No. 32112, University of Kansas Museum of Natural History, ♂, obtained 20 kilometers east-northeast Jesús Carranza, 200 feet elevation, Veracruz, Mexico, on May 16, 1949, by Walter W. Dalquest; original no. 12869. ×2.

Remarks.—*Myotis fortidens* is known only from the Tropical Life-zone. The skin, without a skull, from Esquinapa, Sinaloa, agrees in color with the undoubted specimens of *M. fortidens* from Papayo, Guerrero, but can be matched also by selected skins of *Myotis occultus* from Blythe, Riverside County, California. Without the skull the reference of this specimen to *M. fortidens* is provisional. Reason for referring it to *fortidens* rather than to *M. occultus* is provided, however, by a series of eleven specimens of *M. occultus* from Álamos, Sonora. These are Saccardo's Umber rather than Cinnamon-Brown and they are geographically intermediate between the reddish *M. occultus* of California and the reddish *M. fortidens* of Mexico. Furthermore, these specimens from Álamos have large skulls of slightly different proportions than those of *M. fortidens* or than those of *M. occultus* from California; possibly the animals from Álamos are representative of the larger, duller-colored variation for which Hollister proposed the name *Myotis baileyi* (Proc. Biol. Soc. Washington, 22:44, March 10, 1909). This duller-colored type of animal intervenes between the geographic ranges of undoubted *M. occultus* and undoubted *M. fortidens*. The specimen from Esquinapa, in the geographic sense, is on the *fortidens* side rather than on the *occultus* side of the *baileyi* population. This geographic position is the basis on which the specimen from Esquinapa is referred to *M. fortidens*. The third premolar is lacking from each side of both the upper and the lower jaws of each individual of this series from Álamos.

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The specimens of *M. fortidens* are all distinguishable by their color from other kinds of *Myotis* found in the same area. Occasional individuals of *Myotis velifer*, as for example three from Las Vigas, Veracruz, also are reddish but they are of brighter tone. In addition, the larger size and cranial features of these specimens of *M. velifer* permit ready differentiation of them from specimens of *M. fortidens*. One specimen (No. 32113) of *M. fortidens* from twenty kilometers east-northeast of Jesús Carranza is lighter than the others, being near (j) Cinnamon-Brown above and is lighter on the under-parts than on the upper parts. Another individual (No. 32112) is duller colored than the others, being Snuff Brown both above and below. Otherwise the specimens of *M. fortidens* agree in color.

Among named kinds of *Myotis*, *M. fortidens* resembles *Myotis lucifugus* and *Myotis occultus*. From the former, *M. fortidens* differs in possessing a strong sagittal crest and in lacking the third premolar in both the upper jaw and the lower jaw. *M. fortidens* lacks the glossy sheen found on the pelage of many individuals of *M. lucifugus*. From *M. occultus*, *M. fortidens* differs in having the rostrum (viewed from above) smaller in relation to the

braincase. This is true of specimens with the teeth showing much wear as well as in specimens with the teeth unworn or only moderately worn. Also, *M. fortidens* is longer bodied as may be seen by comparing the measurements given here with those recorded for *M. occultus* by Miller and Allen (Bull. U. S. Nat. Mus., 144:100, May 25, 1928). We are agreed that *M. fortidens* is as closely related to *M. occultus* as to any other named kind of *Myotis*, and that it is more closely related to it than to most other species of the genus, but one of us (Dalquest) thinks that *M. fortidens* is specifically distinct from *M. occultus*, whereas the other author (Hall) inclines to the view that additional specimens from localities intermediate between the known geographic ranges of *M. occultus* and *M. fortidens* will reveal intergradation between the two kinds. However that may be, there is no proof at present of such intergradation and the binomial is therefore used for the Cinnamon Myotis.

Specimens examined.—Total number, 10, all from Mexico, each a skin with skull except the skin-only from Sinaloa. *Sinaloa*: Esquinapa, 1 (Amer. Mus. Nat. Hist.). *Guerrero*: Papayo, 2 (U. S. Biological Surveys Collection). *Veracruz*: 20 km. WNW Piedras Negras, 3 (Mus. Nat. Hist., Univ. Kansas); 20 km. ENE Jesús Carranza, 200 ft. elevation, 3 (Mus. Nat. Hist., Univ. Kansas). *Tabasco*: Montecristo, 1 (U. S. Biological Surveys Collection).

Additional record.—Tabasco: Teapa, the holotype of *Myotis lucifugus fortidens* Miller and Allen 1928.

University of Kansas Museum of Natural History, Lawrence, Kansas. Transmitted October 31, 1949.

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CRANIAL MEASUREMENTS OF *Myotis fortidens*

No.	Sex Age	Locality	Greatest length	Condylobasal length	Zygomatic breadth	Interorbital constriction	Breadth of braincase	Mandible	Maxillary tooth-row	Maxillary breadth at M3	Mandibular tooth-row	Wear of teeth
25030	♂	Esquinapa	....	....	...	...	...	....	...	...	...	?
126650	♀	Papayo	15.0	14.2	9.7	3.9	7.1	11.5	5.5	5.6	6.0	0
126651	♀	Do.	15.1	13.8	9.4	3.8	6.8	10.6	5.6	5.9	6.0	0
17834	♂	P. Negras[1]	....	....	....	4.1	....	10.6	5.6	5.7	6.0	0
17835	♀	Do.	15.5	14.9	9.6	4.2	7.2	11.0	5.7	6.0	6.1	2
17836	♀	Do.	15.5	14.5	9.7	4.2	7.3	10.9	5.4	5.9	5.7	3
32112	♂	J. Carranza[2]	15.3	14.4	9.7	4.1	7.3	11.5	5.7	5.9	6.3	1
32113	♂	Do.	15.0	14.0	9.5	4.2	7.2	10.9	5.5	5.9	5.9	1
32114	♂	Do.	15.0	13.9	9.7	4.1	7.2	10.8	5.4	6.0	5.9	1
88.8.8.18	♀[3]	Teapa	15.0	13.8	9.6	3.8	7.4	....	5.4	5.8	5.8	1
100231	♀[4]	Montecristo	15.0	14.1	9.0	4.0	7.2	11.4	5.8	...	6.0	0
Average			15.2	14.2	9.5	4.0	7.2	11.0	5.6	5.9	6.0	

[Note 1: 20 km. WNW Piedras Negras.]

[Note 2: 20 km. ENE Jesús Carranza, 200 ft.]

[Note 3: Type of *Myotis lucifugus fortidens*; measurements after Miller and Allen, Bull. U. S. Nat. Mus., 144:100, 101, May 25, 1928.]

[Note 4: Type of *Pipistrellus cinnamomeus* Miller 1902.]

EXTERNAL MEASUREMENTS OF *Myotis fortidens*

No.	Sex Age	Locality	Total length	Head and body	Tail	Tibia	Foot	Forearm	Thumb	Third metacarpal	Fifth metacarpal	Ear from notch
25030	♂	Esquinapa	..	..	..	14.2	8.1[5]	35.6	5.5	33.3	30.8	..
126650	♀	Papayo	..	..	..	14.7	8.2[5]	38.3	5.4	35.1	32.4	..
126651	♀	Do.	..	..	..	14.8	7.9[5]	35.6	5.7	32.7	31.1	..
17834	♂	P. Negras[6]	95	55	40	14.7	9.0[5]	37.0	5.7	33.8	32.0	15
17835	♀	Do.	93	55	38	15.6	9.4[5]	37.5	6.0	35.4	32.2	15
17836	♀	Do.	94	55	39	14.3	8.4[5]	37.6	6.0	34.5	32.7	15
32112	♂	J. Carranza[7]	94	53	41	14.5	8.9[5]	38.2	5.0	35.1	33.8	16
32113	♂	Do.	94	57	37	14.2	8.0[5]	36.5	5.3	34.9	32.7	16
32114	♂	Do.	90	53	37	....	...	37.0	5.1	34.2	33.0	16
88.8.8.18	♀[8]	Teapa	..	46	39	15.6	8.0	38.6	6.2	34.8	33.0	..
100231	♀[9]	Montecristo	99	56	44	15.4	9.6	37.0	6.0	....	....	..
Average			94	53.8	39.4	14.8	8.6	37.2	5.6	34.4	32.4	15.5

[Note 5: Measured on the dried skin.]

[Note 6: 20 km. WNW Piedras Negras.]

[Note 7: 20 km. ENE Jesús Carranza.]

[Note 8: Type of *Myotis lucifugus fortidens*; measurements after Miller and Allen, Bull. U. S. Nat. Mus., 144:100, 101, May 25, 1928.]

[Note 9: Type of *Pipistrellus cinnamomeus* Miller 1902.]

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