

## Article XII.—DESCRIPTIONS OF THREE NEW FREE-TAILED BATS.

By GERRIT S. MILLER, Jr.

The American Museum of Natural History contains specimens of three Free-tailed Bats that have not hitherto been described. All were collected by Mr. Frank M. Chapman; one in Cuba, the two others on the island of Trinidad. My thanks are due to Dr. J. A. Allen for the privilege of examining the collection of bats in his charge, and also for facilities for work in the museum.

### ***Nyctinomus minutus*, sp. nov.**

1892. *Nyctinomus brasiliensis* CHAPMAN, Bull. Am. Mus. Nat. Hist., IV, p. 316. December 29, 1892 (part).

*Type*, adult ♂ (in alcohol), No. 4915, American Museum of Natural History, collected at Trinidad, Cuba, March 8, 1892, by Frank M. Chapman. Original number, 359.

*General characters*.—Smallest known species of *Nyctinomus* (forearm about 30 mm, longest finger about 56 mm); ears separate, small, distinctly pointed, and very slightly keeled; anterior edge of ear without trace of horny excrescences; pad at base of thumb broad and conspicuous; skull with short, broad rostrum and conspicuous lachrymal processes; dental formula,

$$I \frac{1-1}{2-2}, C \frac{1-1}{1-1}, PM \frac{1-1}{2-2}, M \frac{3-3}{3-3} = 28.$$

*Muzzle and lips*.—Muzzle produced, bluntly triangular, the tip about 3 mm in front of upper incisors. Nostrils and nostril pad as in *N. cynocephalus* from Florida, but the pad more sharply outlined, and bordered by longer, sharper, horny projections, which continue uninterruptedly over well-defined median ridge to lower border of pad. The triangular smooth space back of the nostril pad is relatively longer and narrower than in *N. cynocephalus*, and is distinctly truncate posteriorly between the bases of the ears. Stiff hairs bordering this area about 1 mm in length. Lips ample but much smaller and less wrinkled than in *N. cynocephalus*, the upper not distinctly overhanging the lower when mouth is shut. Spoonhairs few, their tips not well developed. They are confined to definite areas: on the upper lip below nostril pad, on the glandular portion of cheek between eye and nostril, and on sides of chin. Those on upper lip are conspicuously smaller than the others.

*Ears*.—Ears small; laid forward they reach to within about 2 mm of tip of muzzle. The inner margins arise 2 mm apart on forehead, 5 mm behind tip of muzzle, and about 2 mm in front of inner canthus of eye. Anterior border

of conch nearly straight from base to rather narrowly rounded-off tip, immediately below which is a barely noticeable concavity. Posterior border strongly and evenly convex from tip to a small concavity at level of tip of tragus, below this convex again to abrupt notch at base of antitragus. No cross striation on inner surface of conch. Keel occupying the same position as in *N. cynocephalus*, but reduced to a mere thickened ridge too low to be measured. Antitragus higher than broad, irregularly trapeziform in outline, the tip and anterior border concave. It sends forward a low ridge to angle of mouth.

Tragus narrower and higher than in *N. cynocephalus*, the anterior border distinctly longer than the superior. Tip broadly and evenly rounded off. Posterior border faintly concave.

*Feet*.—Structure and proportions of feet, tibiæ, and toes as in *N. cynocephalus*. No trace of wart at heel.

Calcar short (scarcely exceeding tibia), closely bound to tibia to near middle, very weak, and terminating without lobe. Posterior border with a few hairs, but no keel. Calcar considerably shorter than free border of uropatagium.

*Tail*.—The tail is as in *N. cynocephalus*. Caudal vertebræ seven.

*Wings and membranes*.—Wings long, but relatively less narrow than in *N. cynocephalus*. Base of thumb with a well defined disc-shaped pad 2 mm or more in diameter.

Membranes thick and leathery, opaque. Their surface is for the most part smooth, but over an area bounded on the outer side by a line from elbow to knee the dorsal surface of the wing is studded with minute elevations, each of which bears a tuft of almost microscopic hairs. A narrow, ill-defined pale border along free edge of wing. Attachment of wing to tibia apparently as in *N. cynocephalus*. Free border of uropatagium much longer than calcar. Propatagium extended outward along under side of forearm as a narrow fold nearly or quite to base of thumb.

*Fur and color*.—Fur very short and dense, 3 mm to 4 mm in length. It extends on wing membranes, both above and below, in a band about 5 mm wide running along sides of body from humerus to femur. On dorsal surface the fur barely reaches extreme base of uropatagium, which, however, is rather profusely sprinkled with hairs on the lower surface, especially near tail. Propatagium with a thin coating of very short hairs above near elbow and along free edge of narrow fold bordering forearm. Fur of head extending on back of ears over basal third. On under side of head the fur becomes abruptly sparse at line joining corners of mouth. Face naked except for an irregular sprinkling of fine hairs.

Color of two specimens, after seven years' immersion in alcohol, dull reddish brown, slightly paler ventrally, the hairs everywhere very inconspicuously lighter at extreme base.

*Skull*.—The skull of *Nyctinomus minutus* (fig. 1) is small, broad, flat, and lightly built. Profile nearly straight from nares to the highest point of occiput. Interorbital region irregularly and broadly hourglass-shaped. Braincase broader than long, and in occipital region slightly more than half as deep as wide. Sagittal crest represented by a low ridge; lambdoid crest moderately

developed. Rostrum broad and short, with a distinct median groove, its width including lachrymal processes considerably greater than distance from front of premaxillary to proencephalon. Lachrymal processes strongly developed, peg-like, overhanging lachrymal foramen, and plainly visible when skull is viewed from below. Position of postorbital process marked by a distinct, though minute elevation, connected by a ridge with lachrymal process; this ridge forming anterior rim of orbit. Antorbital foramen relatively large, opening distinctly forward immediately in front of lachrymal process and directly above middle of premolar. It is very conspicuous when skull is viewed from directly in front. Basisphenoid pits shallow and indistinctly outlined, separated by a broad, low, median ridge. Hamulars slightly thickened and turned outward at tips. Bony palate moderately arched, extending a little behind plane of last molar, terminating posteriorly in a broadly angular median projection. Zygomata nearly parallel with each other and with longitudinal axis of skull, standing out to plane of tip of mastoid process, not expanded near middle.

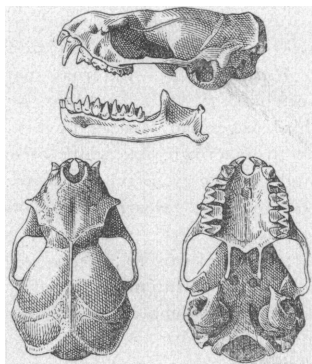


Fig. 1. Skull of *Nyctinomus minutus*.  
Type. ( $\times 2$ .)

Mandible heavily built relatively to its length, considerably deeper at base of canine than immediately behind last molar. Coronoid process high and narrow, strongly deflected outward, the distance from its tip to extremity of articular process equal to that from its tip directly downward to lower edge of ramus. Articular process small. Angular process longer than broad, directed strongly downward and backward and slightly outward, the tip a little thickened.

*Teeth.*—The teeth of *Nyctinomus minutus* are rather more heavily built relatively to the size of the skull than in the larger members of the genus. Except in the absence of the minute outer mandibular incisor and anterior upper premolar the dentition shows no very conspicuous peculiarities.

Upper incisors irregularly triangular-cylindrical in cross section, wide apart at base, strongly converging at tips, their bases separated from bases of canines by spaces about equal to diameter of incisor at middle. Canines triangular in cross-section at base, with strongly developed anterior-internal cutting edge, and a prominent cingulum which develops a small, low, posterior cusp. Premolar large, its tip in line with tip of canine and points of molars, its posterior border overhung by anterior border of first molar. It is separated from canine by a space slightly narrower than that between the latter and the incisor. First and second molar crowns broad and short, the first especially so. Posterior borders very slightly excavated. Third molar nearly as broad as narrowest part of second.

Lower incisors very small and simple, their tips without distinct trace of lobation. A very narrow space between inner incisor and canine. First lower premolar much shorter than second, but discrepancy in area of base much less than that in height. Both teeth are crowded into space between canine and first molar; and the crown of each is roughly triangular in outline, with its longest diameter directed forward and outward. The lower molars show no characters of importance. They slightly decrease in size from first to third.

*Measurements*.—External measurements of type: Total length, 74; tail vertebræ, 28; tibia, 9; foot, 6; forearm, 29; thumb, 6; second finger, 25; third finger, 56; fourth finger, 47; fifth finger, 33; ear from meatus, 12.4; ear from crown, 10; width of ear, 12; tragus, 4. External measurements of adult female from type locality: Total length, 75; tail vertebræ, 27; tibia, 10; foot, 5; forearm, 30; thumb, 7; second finger, 27; third finger, 56; fourth finger, 45; fifth finger, 33; ear from meatus, 12.4; ear from crown, 10; width of ear, 12; tragus, 4.

Cranial measurements of adult female from type locality: Greatest length, 13.4; basal length, 12.6; basilar length, 10.4; zygomatic breadth, 8.6; mastoid breadth, 8.4; breadth across lachrymal processes, 6.4; width of brain case above root of zygomata, 7; interorbital constriction, 3.4; palatal length, 5; palatal width between posterior molars, 3.4; palatal depth (at middle of molar series), 2; occipital depth, 4.6; upper toothrow (exclusive of incisors), 5; mandible, 9.6; lower toothrow (exclusive of incisors), 6.

*Specimens examined*.—Two, both from the type locality.

*Remarks*.—*Nyctinomus minutus* needs no close comparison with the common Cuban member of the genus (a species closely related to *N. cynocephalus*), from which its dental formula, small size, and pointed ears at once distinguish it. Its only near relative is *Nyctinomus kalinowskii* Thomas,<sup>1</sup> an inhabitant of central Peru. This species, however, is larger (total length, 84; forearm, 34.5), the inner margins of the ears arise from the same point on forehead, and, so far as can be judged from the original description, it lacks the conspicuous pad at base of thumb.

### ***Saccopteryx perspicillifer*, sp. nov.**

1893. *Saccopteryx bilineata* THOMAS, Journ. Trinidad Field Naturalists' Club, I, p. 161. April, 1893 (not of Temminck, 1839).

1893. *Saccopteryx bilineata* ALLEN & CHAPMAN, Bull. Am. Mus. Nat. Hist., V, p. 205. September 21, 1893.

1897. *Saccopteryx bilineata* ALLEN & CHAPMAN, Bull. Am. Mus. Nat. Hist., IX, p. 14. February 26, 1897.

*Type*, adult ♂ (in alcohol), No. 7508, American Museum of Natural History, collected at Caura, Trinidad, April 21, 1894, by Frank M. Chapman. Original number 929.

<sup>1</sup> Proc. Zool. Soc., London, 1893, p. 334.

*General characters.*—Like *Saccopteryx bilineata* (Temminck), but larger (fore-arm about 48 mm, greatest length of skull about 17.5); skull heavily built, the supraorbital processes relatively broader than in *S. bilineata* and *S. leptura*; tragus strongly bent forward, and earconch marked with conspicuous cross ridges; color apparently as in *S. leptura* (only alcoholic specimens examined).

*Muzzle and lips.*—The muzzle and lips are as in *S. bilineata*, though the lips appear to be more conspicuously glandular-swollen.

*Ears.*—The ears are slender above, broad below, and moderately long; laid forward they extend about to extremity of muzzle. Anterior borders arising wide apart on forehead, each immediately behind the base of its corresponding supraorbital process. Anterior border straight from base nearly to tip, immediately below which it is slightly convex, the edge slightly thickened. Tip narrowly rounded off and slightly recurved, owing to convexity of anterior border and concavity of posterior border. Below the terminal concavity the posterior border is straight to about middle, where it bends abruptly outward to form the broad, convex basal lobe. This lobe, the margin of which is slightly thickened, extends practically without interruption to extreme outer base of ear, about 4 mm behind angle of mouth, though a faint concavity below meatus marks the posterior limit of the obsolete antitragus. Inner surface of conch crossed by about sixteen conspicuous cross ridges near posterior border. On the outer surface of the conch these ridges appear as minute though plainly visible grooves.

Tragus blunt and distinctly curved forward. Anterior margin evenly concave from base to tip. Upper margin strongly crenulate, so cut away posteriorly that it merges insensibly into posterior margin without distinct upper posterior angle. Posterior margin faintly concave, then abruptly convex at level of deepest part of anterior concavity. Below this it is nearly straight to base, and parallel with lower half of anterior border.

*Membranes.*—Membranes as in *S. bilineata*, but wingsac apparently larger.

*Feet, tail, and distribution of fur* as in *Saccopteryx leptura* and *S. bilineata*.

*Color.*—A specimen after five years' immersion in alcohol is seal-brown above, wood-brown below, ears and membranes blackish. Dorsal stripes grayish-white, irregular in outline, and showing a tendency to break up into spots.

*Skull and teeth.*—The skull is noticeably larger than that of *S. bilineata*, and  
[October, 1899.]

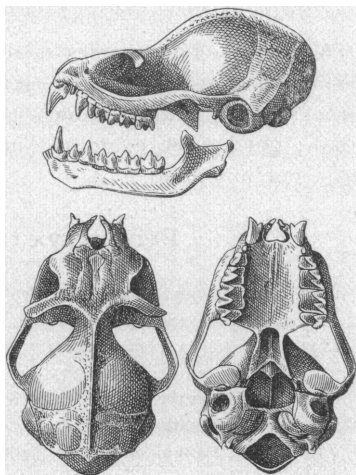


Fig. 2. Skull of *Saccopteryx perspicillifer*.  
( $\times 2$ ).

the rostrum is perhaps relatively more heavily built, though the braincase appears more slender. The lachrymal region shows a little more distinct inflation. Supraoccipital processes relatively as well as actually larger and more conspicuous than in any other species of the genus. Sagittal crest high and well developed. Teeth larger than in *S. bilineata*, but not different in form.

*Measurements.*—External measurements of type: Total length, 70; tail vertebrae, 18; tibia, 22; foot, 9.4; calcar, 18; forearm, 47.5; thumb, 8; second finger, 41; third finger, 82; fourth finger, 59; fifth finger, 58; ear from meatus, 18; ear from crown, 15; width of ear, 12; tragus, 5.4. Average of six specimens (2 ♂ ♂, 4 ♀ ♀): Total length, 72.6 (70–78); tail vertebrae, 18.7 (17–22); tibia, 21.2 (20–22.4); foot, 10.1 (9.4–11); calcar, 18 (17–19); forearm, 47.8 (45–50); thumb, 7.7 (7–8); second finger, 42 (40–45); third finger, 87 (82–90); fourth finger, 60 (58–63); fifth finger, 56 (52–60); ear from meatus, 15.7 (15–18); ear from crown, 13.7 (13–15); width of ear, 11 (10–12); tragus, 4.8 (4–5.4).

Cranial measurements of type: Greatest length, 17.8; basal length, 15.6; basilar length, 13; greatest breadth of rostrum in front of orbits, 6.2; least breadth immediately in front of supraorbital processes, 4.6; least width immediately behind supraorbital processes, 2.6; tip to tip of supraorbital processes, 9.6; zygomatic breadth, 11; mastoid breadth, 9; greatest breadth of braincase, 8; median length of bony palate, 5.6; width of bony palate between posterior molars, 4; occipital depth (exclusive of sagittal crest), 6; depth of rostrum at posterior premolar, 3.4; upper tooththrow (exclusive of incisors), 7.4; mandible, 13; lower tooththrow (exclusive of incisors), 7.8.

*Specimens examined.*—Six, all from the island of Trinidad.

*Remarks.*—This species is readily distinguished from *Saccoteryx bilineata* by its large skull and conspicuous supraorbital processes. So far as known it is confined to the island of Trinidad; but I have examined no material from the immediately adjacent mainland.

### ***Peropteryx trinitatis*, sp. nov.**

1893. *Saccoteryx canina* THOMAS, Journ. Trinidad Field Naturalists' Club, I, p. 161. April, 1893 (not of Wied, 1826).

1893. *Saccoteryx canina* ALLEN & CHAPMAN, Bull. Am. Mus. Nat. Hist., V, p. 205. September 21, 1893.

1897. *Saccoteryx canina*, ALLEN & CHAPMAN, Bull. Am. Mus. Nat. Hist., IX, p. 14. February 26, 1897.

*Type*, adult, ♀ (in alcohol), No. 7496 American Museum of Natural History, collected at Port of Spain, Trinidad, April 27, 1894, by Frank M. Chapman. Original number, 956.

*General characters.*—Like *Peropteryx canina* (Wied) but much smaller (forearm, 40, greatest length of skull, 13).

*Muzzle and lips.*—Muzzle broadly conical; distance from incisor to nostril, 3 mm. Nostrils at extremity of muzzle opening forward, downward, and very slightly outward, the distance between their outer borders about 2 mm. They are separated by a deep groove which is especially conspicuous when the muzzle is viewed from above and behind. Lips broad and ample, both upper and lower noticeably glandular-swollen. Middle of upper lip with a large wart, deeply cleft from behind. When mouth is closed this wart fits between the swollen margins of the well developed groove at extremity of lower lip. Inner surface of both upper and lower lips marked with fine transverse wrinkles.

*Ears.*—The ears are large and broad, only slightly narrowed toward tip. Their anterior bases are about 2 mm apart, and about 3 mm above eye. Anterior border straight from base to middle, where there is a faint convexity; then straight to narrowly rounded off tip. Posterior border straight from tip to middle, then moderately convex to shallow notch opposite posterior base of tragus. Below this notch is the short, narrow, evenly convex antitragus, which terminates 3 mm behind angle of mouth. Inner surface of conch without cross striations.

Tragus straight, the tip rounded; width at base a little less than half height. Anterior border straight except for a very slight concavity immediately above base. Posterior border slightly concave to broadest point, opposite anterior base, this point marked by a slight projection; then straight to posterior base. The outline of the tragus is entire throughout.

*Feet.*—The foot is slender and weak, less than half as long as tibia. Toes scarcely longer than metatarsus, wholly destitute of basal membrane. First and fifth digits equal and slightly shorter than the others. Calcar slender, slightly shorter than tibia, terminating rather indistinctly.

*Tail.*—Tail short, about as long as femur, the terminal fifth free from membrane. Caudal vertebrae five.

*Membranes.*—Membranes thin, broad and ample. Wing attached at extremity of tibia. Uropatagium about as long as outstretched leg without foot, its free border shorter than calcar. Propatagium large, continued outward along forearm as a narrow fold including metacarpal of thumb.

*Wingsacs.*—The wingsacs when fully formed are about 5 mm in length. The inner surface of the sac is for the most part smooth, but it is crossed by a conspicuous longitudinal fold near side toward body.

*Fur and color.*—The fur is soft and loose in texture, that on middle of back about 8 mm in length. It extends on both surfaces of wings to line joining middle of humerus with middle of femur. This band is continued forward across base of propatagium. Uropatagium thinly haired throughout, the hairs most numerous near tail on dorsal surface and along veins on lower surface. The fur of the head covers lower half of outer surface of ears. The face in front of and below ears, and the lower jaws, chin, etc., are naked except for a sparse sprinkling of fine hairs.

Color of a specimen, preserved in alcohol for five years, dull sepia throughout, the hairs paler at base. Ears and membranes dark brown.

*Skull.*—The skull of *Peropteryx trinitatis* is small and lightly built—slightly

smaller than that of *Saccopteryx leptura*. Rostrum slightly broader than long, the dorsal surface rounding from all sides toward the middle except at interorbital constriction where it is slightly hollowed. Broadest part of rostrum immediately back of external nares, whence the straight sides slope inward and

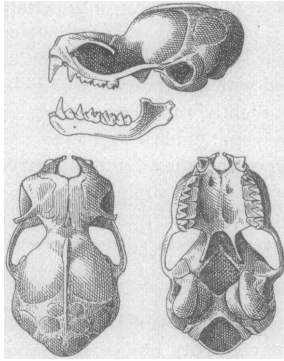


Fig. 3. Skull of *Peropteryx trinitatis*.  
Type. (X 2.)

backward to interorbital constriction, the three sides forming an isosceles triangle, broken only by the slight anterior projection of the maxillaries, which forms the walls of the anterior nares and supports the canines—upper surface horizontal from external nares to proencephalon. Supraorbital processes straight, horizontal or bent downward, short, and weak. They form the roof of from one third to two thirds of the upper-posterior rim of orbit. Lower orbital rim noticeably flaring, and lachrymal region and maxillary in front of orbit distinctly inflated. Antorbital foramen very minute, opening forward and outward over anterior root of large premolar; much smaller than lachrymal foramen, which opens upward

and outward above and slightly behind it. Interorbital region broadly hour-glass-shaped, very narrow in the middle, its narrowness exaggerated by the abrupt contrast with the braincase and rostrum. Braincase short egg-shaped in outline when viewed from above. Sagittal crest rudimentary. Zygomata narrow and weak, widest apart opposite glenoid surface, where they stand out slightly beyond braincase and mastoid region. Pterygoids short, very strongly divergent posteriorly. Basisphenoid pits perfectly confluent and without trace of median septum.

*Teeth.*—The teeth of *Peropteryx trinitatis* are large relatively to the size of the skull. Upper incisors minute, scarcely larger than inner cusp of canine. First upper premolar even smaller than incisor, closely crowded against posterior base of canine, but separated from large second premolar by a distinct space.

*Measurements.*—External measurements of type: Total length, 60; tail vertebræ, 14.4; tibia, 18; foot, 6.4; calcar, 17; forearm, 41; thumb, 7; second finger, 34; third finger, 72; fourth finger, 49; fifth finger, 47; ear from meatus, 15; ear from crown, 12; width of ear, 11; tragus, 5. Average measurements of five specimens (2 ♂♂, 3 ♀♀) from the type locality: Total length, 59 (57–60); tail vertebræ, 13.4 (13–14.4); tibia, 16.7 (16–18); foot, 6.3 (6–7); calcar, 15.4 (14–17); forearm, 40 (39–41); thumb, 6.5 (6–7); second finger, 32.6 (31–34); third finger, 69 (68–72); fourth finger, 48 (47–49); fifth finger, 46 (45–47); ear from meatus, 14 (13–15); ear from crown, 12.2 (12–13); width of ear, 11; tragus, 4.9 (4–5.4).

Cranial measurements of type: Greatest length, 13.8; basal length, 12;



basilar length, 10; greatest breadth of rostrum in front of orbits, 6; least breadth immediately in front of supraorbital processes, 4.8; least breadth immediately behind supraorbital processes, 2.6; tip to tip of supraorbital processes, 7; zygomatic breadth, 8; mastoid breadth, 7.4; greatest breadth of braincase, 6.4; median length of bony palate, 4; width of bony palate between posterior molars, 3.2; occipital depth, 5; depth of rostrum at base of second premolar, 1.8; upper toothrow (exclusive of incisors), 5.4; mandible, 9.4; mandibular toothrow (exclusive of incisors), 5.6.

*Specimens examined.*—Six, all from the type locality.

*Remarks.*—*Peropteryx trinitatis* is readily distinguishable from *P. canina* and *P. kappleri* by its small size (forearm 40 instead of 45 and 50 respectively) and short tibia.

