

PROCEEDINGS
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TWELVE NEW WOOD RATS OF THE GENUS *NEOTOMA*.

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The following descriptions are published in advance of a revision of the genus *Neotoma* now in course of preparation. For the opportunity to study the unparalleled series of wood rats of the Biological Survey I am indebted to Dr. C. Hart Merriam, who had already done much work on the genus, and under whose direction the collections have been brought together. My thanks are also due to Dr. J. A. Allen of the American Museum of Natural History and Mr. D. G. Elliot of the Field Columbian Museum, for the loan of types and topotypes, and to Mr. F. W. True, Executive Curator, and Mr. Walter L. Hahn, Aid, for the use of the National Museum Collection and other courtesies.

***Neotoma palatina* sp. nov.**

Type from Bolaños, Jalisco, Mexico (altitude, 2800 feet). Adult male, No. 90,959, U. S. National Museum, Biological Survey Collection. September 12, 1897. E. W. Nelson and E. A. Goldman. Original number 7104.

General characters.—Size large; ears small; pelage short and coarse; skull heavy; sphenopalatine vacuities closed; vomer peculiar.

Color.—Type (in worn pelage): Upperparts pale cinnamon, suffused with buffy along cheeks and sides, becoming much darker on dorsal region from abundant admixture of black hairs; underparts dull white, the basal color plumbeous except on throat, breast, and inguinal region; muzzle brownish gray; ears brownish; feet white; tail scantily haired, bicolor, blackish above, soiled whitish below.

Cranial characters.—Skull large and massive, rather smoothly rounded, well arched across anterior roots of zygomata; rostrum short and heavy; nasals wedge-shaped, reaching posteriorly to plane of orbits; braincase somewhat truncate posteriorly; interparietal large and rectangular without trace of a posterior angle; sphenopalatine vacuities completely closed by palatines; vomer prolonged posteriorly as a thin vertical plate along median line of presphenoid, partially dividing posterior nares, and ending in a point at suture between presphenoid and basisphenoid; bullæ small and heavy, somewhat pear-shaped, and pointed anteriorly.

Measurements.—Type: Length (head and body), 187; tail vertebræ (incomplete), 60; hind foot, 37.

***Neotoma martinensis* sp. nov.**

Type from San Martin Island, Lower California, Mexico. Adult female, No. 81,074, U. S. National Museum, Biological Survey Collection. July 17, 1896. A. W. Anthony. Original number 39.

General characters.—Size medium; tail moderately long, thinly covered with short hairs; outer sides of hind legs conspicuously blackish. In color closely resembling *N. anthonyi*, but tail more scantily haired, and cranial characters very different.

Color.—Upperparts grayish brown, evenly mixed dorsally with dusky hairs, becoming lighter and somewhat suffused with pale buff along sides; underparts creamy white, the fur everywhere deep plumbeous basally; ears dusky; upper sides of forearms dusky brown; outer sides of hind legs and inner sides of ankles conspicuously blackish; feet, including the sides of the soles to point well above heels on hind feet, pure white; tail bicolor, brownish black above, grayish below.

Cranial characters.—Skull of medium size, rather smoothly rounded, high and well arched across anterior roots of zygomata; temporal ridges faintly developed and widely separated; nasals very long, abruptly narrowing posteriorly, and reaching well beyond plane of lachrymals; frontal region narrowly constricted anteriorly, broadening posteriorly, the upper surface nearly flat and without well developed lateral ridges; bullæ rather small and somewhat pear-shaped, the meatus very large and widely open.

Measurements.—Type: Total length, 342; tail vertebræ, 167; hind foot (dry skin), 35.7.

***Neotoma nudicauda* sp. nov.**

Type from Carmen Island, Lower California, Mexico. Nearly adult female, No. 79,073, U. S. National Museum, Biological Survey Collection. October 14, 1895. J. E. McLellan. Original number 1517.

General characters.—Size medium; ears large; tail moderately long, nearly naked. Similar in general to *N. arenacea*, but color paler and cranial characters different.

Color.—Type: Upperparts pale grayish buff, tinged with brownish along cheeks and sides, the back slightly darkened by black-tipped hairs; underparts white, the fur pale plumbeous basally along sides of belly; ears grayish brown; feet white; tail bicolor, brownish on upper third of circumference, dull whitish on lower two-thirds.

Cranial characters.—Skull similar to that of *N. arenacea*, but bullæ larger; interpterygoid fossa narrower; maxillary arm of zygoma heavier; ant-orbital foramina larger, the outer walls broader and projecting farther forward; nasals truncate posteriorly, reaching plane of orbits; jugal rather long; dentition of the *albigula* type, but rather light; supraorbital ridges well developed and sharp as in *N. arenacea*.

Measurements.—Type: Total length, 330; tail vertebræ, 155; hind foot, 40.

***Neotoma montezumæ* sp. nov.**

Type from Zimapan, Hidalgo, Mexico (altitude, 7500 feet). Adult male, No. 81,426, U. S. National Museum, Biological Survey Collection. October 17, 1896. E. W. Nelson and E. A. Goldman. Original number 10,275.

General characters.—Size medium; tail rather short, scantily haired, bicolored. Somewhat resembling *N. a. melanura*, but differing in darker color, and in marked cranial characters.

Color.—Upperparts dull ochraceous buff, palest on head and along sides, everywhere evenly and abundantly darkened by brownish or blackish hairs; underparts dull white, the under color of the fur plumbeous except on throat, chest and inguinal region where it is pure white; nose, upper sides of forearms and outer sides of hind legs, grayish brown; ears brownish; feet white; tail blackish above, whitish below.

Cranial characters.—Skull in general form similar to that of *N. a. melanura*, but larger and heavier; maxillary arm of zygoma decidedly heavier; nasals narrower posteriorly; dentition much heavier; first upper molar with antero-internal reëtrant angle deeper, but not so deep as in *N. mexicana*; bullæ small as in *N. a. melanura*, but more pointed anteriorly.

Measurements.—Type: Length (head and body), 181; tail vertebræ (incomplete), 91; hind foot, 39.

***Neotoma nelsoni* sp. nov.**

Type from Perote, Vera Cruz, Mexico (altitude, 7800 feet). Adult female, No. 54,320, U. S. National Museum, Biological Survey Collection. June 3, 1893. E. W. Nelson. Original number 4935.

General characters.—Size large; tail stout, well haired, rather short; coloration dark. Related to *N. leucodon*, but differing in darker color, and important cranial characters.

Color.—Type: Upperparts pale cinnamon, heavily overlaid with smoky brown or Prout's brown, this color predominating on top of head and along back, becoming grayish brown on cheeks and middle of face; under-

parts dull white, the deep plumbeous basal color showing through everywhere except on a small pectoral area where the fur is pure white; tail indistinctly bicolor (nearly concolor toward tip), smoky brown above, slightly paler and grayer below.

Cranial characters.—General outline of skull similar to that of *N. leucodon*; nasals more wedge-shaped, pointed posteriorly, with a narrow emargination between the ends; palate decidedly shorter than incisive foramina (in *leucodon* about equal), and with a short posterior median projection (absent in *leucodon*); ascending branches of premaxillæ very long, the ends reaching posteriorly beyond nasals in approaching parallel lines to interorbital constriction.

Measurements.—Type: Total length, 335; tail vertebræ, 145; hind foot, 37.

***Neotoma leucodon zacatecæ* subsp. nov.**

Type from Plateado, Zacatecas, Mexico (altitude, 7600 feet). Adult female No. 90,957, U. S. National Museum, Biological Survey Collection. September 4, 1897. E. W. Nelson and E. A. Goldman, Original number 11,641.

General characters.—Similar to *N. leucodon*, but color decidedly darker; upper lip dusky instead of grayish or whitish; skull more arched and otherwise peculiar.

Color.—Upperparts pale cinnamon, lightest on cheeks and along sides, becoming redder on rump, well darkened along median dorsal area by black-tipped hairs; chest and inguinal region pure white; belly dull creamy white; upper lip dusky; feet white; tail well haired, sharply bicolor, brownish black above, white below.

Cranial characters.—Skull similar to that of *N. leucodon*, but more arched across anterior roots of zygomata; rostrum more decurved; frontals longer; maxillary arm of zygoma heavier; upper incisors smaller.

Measurements.—Type: Total length, 358; tail vertebræ, 162; hind foot, 37.

***Neotoma ferruginea ochracea* subsp. nov.**

Type from Atemajac, near Guadalajara, Jalisco, Mexico (altitude, 4000 feet). Nearly adult male, No. $\frac{34142}{46219}$, U. S. National Museum, Biological Survey Collection. May 21, 1892. E. W. Nelson. Original number 2653.

General characters.—Size smaller than *N. ferruginea*; coloration pale; feet pure white; tail sharply bicolor; skull small, light and elongated.

Color.—Entire upperparts light ochraceous buff, purest and brightest along cheeks and sides, darkened over dorsal region, especially on posterior half, by black-tipped hairs; underparts dingy white, washed with buffy, becoming clear, strong, ochraceous buff on pectoral region; nose and upper lip grayish white; feet pure white; tail brownish above, whitish below.

Cranial characters.—Skull similar in general to that of *N. ferruginea*, but smaller and more arched; nasals more slender, reaching posteriorly to plane of lachrymals, the ends more pointed; ascending branches of pre-

maxillæ relatively longer, reaching posteriorly nearly to interorbital constriction; frontals longer and narrower, the sides slightly upturned.

Measurements.—Type: Total length, 348; tail vertebræ, 161; hind foot, 38.

***Neotoma ferruginea solitaria* subsp. nov.**

Type from Nenton, Guatemala (altitude, 3500 feet). Adult male, No. 76,908, U. S. National Museum, Biological Survey Collection. December 17, 1895. E. W. Nelson and E. A. Goldman. Original number 8813.

General characters.—Similar in general to *N. ferruginea*, but smaller; fur shorter; color brighter; outer sides of forearms and hind legs not dusky as in *N. ferruginea*.

Color.—Upperparts tawny ochraceous, brightest along sides, becoming ochraceous buff on head, outer sides of forearms and hind legs, well mixed with brownish black on top of head and along back; underparts dull white owing to plumbeous basal color of fur, except a small area on chin and throat which is pure white; nose dusky; fore feet white; hind feet irregularly clouded with dusky to toes, the toes white; tail faintly bicolor, brownish black above, dull gray below, becoming brownish toward tip.

Cranial characters.—Skull similar to that of *N. ferruginea* but smaller and lighter, relatively longer and narrower; rostrum more slender; nasals narrower and more attenuate posteriorly; dentition as in *N. ferruginea* but lighter.

Measurements.—Type: Total length, 338; tail vertebræ, 156; hind foot, 35.

***Neotoma mexicana madreensis* subsp. nov.**

Type from Sierra Madre, near Guadalupe y Calvo, Chihuahua, Mexico (altitude, 7000 feet). Adult female, No. 95,244, U. S. National Museum, Biological Survey Collection. August 26, 1898. E. W. Nelson and E. A. Goldman. Original number 12,918.

General characters.—Size smaller than *N. mexicana*; color very different; tail long, slender and thinly haired; ears rather large.

Color.—Type: Above pale cinnamon, purest along sides, strongly darkened dorsally by black-tipped hairs; underparts dull white, the hairs everywhere plumbeous basally; axillæ ochraceous buff; fore and hind feet white; tail distinctly bicolor, brownish above, whitish or grayish below.

Cranial characters.—Skull essentially as in *N. mexicana*, but smaller; bullæ relatively smaller; first upper molar with antero-internal reëntrant angle deep as in *N. mexicana*.

Measurements.—Type: Total length, 320; tail vertebræ, 150; hind foot, 33.

***Neotoma micropus littoralis* subsp. nov.**

Type from Alta Mira, Tamaulipas, Mexico (altitude, 100 feet). Adult male, No. 92,952, U. S. National Museum, Biological Survey Collection. April 10, 1898. E. A. Goldman. Original number 12,281.

General characters.—Similar to *N. micropus*, but differing in somewhat smaller size, decidedly brownish color, and slight cranial characters.

Color—Type: Upperparts nearly uniform grayish brown, moderately darkened on middle of face, top of head and along back by blackish hairs; underparts white; the fur plumbeous basally except on throat, pectoral and inguinal regions, where the hairs are pure white to roots; nose dusky; ears thinly clothed with comparatively long, brownish hairs; feet white; tail sharply bicolor, blackish above, whitish below.

Cranial characters.—In general form the skull agrees with that of *N. micropus*, but averages smaller; dentition usually less heavy; interpterygoid fossa narrower, encroached upon anteriorly by a short but more or less spinous projection from palate as in *N. micropus*.

Measurements.—Type: Total length, 366; tail vertebræ, 166; hind foot, 39.

***Neotoma micropus planiceps* subsp. nov.**

Type from Rio Verde, San Luis Potosi, Mexico (altitude, 3000 feet). Adult male, No. 82,105, U. S. National Museum, Biological Survey Collection. January 16, 1897. E. W. Nelson and E. A. Goldman. Original number 10,461.

General characters.—Size slightly smaller than *N. micropus*; color more buffy instead of drab gray; skull flatter and less angular.

Color.—Upperparts pale buffy gray, somewhat obscured by dusky hairs which are most abundant along the median line of the back; underparts white, the fur pale plumbeous basally along sides of belly and inner surface of hind legs; nose, eyelids and ankles dusky; feet white; tail thinly haired, bicolor, brownish black above, grayish below.

Cranial characters.—Skull similar in general to that of *N. micropus*, but smaller and less arched; frontals flatter above, the sides not upturned nor projecting as supraorbital shelves; braincase more smoothly rounded, bulging posteriorly below lambdoid crest; nasals attenuate posteriorly, the ends pointed and deeply emarginate; interpterygoid fossa very broad as in *N. micropus*.

Measurements.—Type: Total length, 351; tail vertebræ, 167; hind foot, 38.

***Neotoma stephensi* sp. nov.**

Type from Hualpai Mountains, Arizona (altitude, 6300 feet). Adult female, No. 117,466, U. S. National Museum, Biological Survey Collection. July 1, 1902. F. Stephens. Original number 4192.

General characters.—Size small, fur long, soft and silky; tail slightly bushy, nearly concolor; belly pinkish buff. Similar in general to *N. lepida*, but hind foot larger, differing also in color and cranial characters.

Color.—Type: Upperparts grayish buff, palest on head, becoming pinkish buff along cheeks and sides, well mixed on dorsal region with brownish hairs; underparts strongly washed with pinkish buff, this color spreading

over entire belly and more or less irregularly invading other parts; small areas on pectoral and inguinal regions, sometimes including throat, pure white; ears thinly covered with grayish brown hairs; ankles dusky; feet white; tail grayish brown above, slightly paler below.

Cranial characters.—Skull small, short and relatively broad; braincase large and smoothly rounded; frontal region broad and flat; bullæ large; first upper molar with antero-internal sulcus obsolete. Compared with *N. lepida* the skull averages larger, with decidedly longer toothrow, larger interparietal and smaller bullæ.

Measurements.—Type: Total length, 310; tail vertebræ, 139; hind foot, 31.



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