

of head at occiput 2.5; 0.46; depth of body at two head lengths behind tip of snout 1.7; 0.32 (1.3; 0.22); length of longest pectoral fin ray about 0.8; 0.15 (0.75; 0.16); tip of snout to origin of anal fin 7.0; 1.3 (8.0; 1.67); anal fin origin to anus 0.6; 0.11 (4.5; 0.94); tip of snout to bony structure back of head 6.3; 1.17 (5.1; 1.06); width of premaxillary toothless space 0.4; 0.07 (0.05; 0.14); height of base of pectoral fin 0.9; 0.17 (1.0; 0.13); width of iris 0.4; 0.07 (0.4; 0.08).

The pectoral fins have 17 and 18 rays (20 or 21 on left side of *fluviatilis*). By staining the specimen in alizarin it was possible to count with great difficulty about 165 vertebrae.

There are four mucous pores on the preorbital; 7 or 8 black pigment cells on each side of the midline on the upper surface of the snout just above the anterior nostril; about 1+2 or 3 pointed, rather short gill rakers on first gill arch; along midline of belly, a fleshy kiel extends from in front of anus to anterior end of isthmus (also present in *D. fluviatilis*).

The color before staining with alizarin was plain light gray in alcohol.

Although this genus is referred to the eels, it does possess characters which might place it somewhere among the elongate jugular fishes. However, until its skeleton is carefully studied, I believe it should be referred to the apodal fishes.

Only the holotype known.

Named in honor of Dr. A. W. T. Herre who discovered this remarkable family of fishes.

ZOOLOGY.—*List of the gray foxes of Mexico.*¹ E. A. GOLDMAN,
Bureau of Biological Survey.

Gray foxes occur throughout Mexico wherever local conditions are suitable. They favor rocky, partially wooded areas, where crevices or cavities afford suitable natural shelter, and are generally absent on broad expanses of open, level plain; but they also invade heavily forested regions in the eastern part of the republic. Gray foxes everywhere climb trees to some extent, especially to escape when hard pressed by enemies, but in the "cloud forests" along the eastern flank of the Mexican tableland and in the nearly unbroken lowland forests of the Yucatan peninsula the arboreal habit is more strongly developed. In these regions the claws are more recurved and sharper than in territory where the foxes are more terrestrial. In the gray foxes individual variation in size and color and in cranial and dental details covers a wide range, but combinations of characters distinguish closely allied geographic races.

The gray foxes in a broad belt extending nearly across the northern end of the Mexican mainland are referred to *Urocyon cinereoargenteus scottii*, which extends into the region from Arizona and Texas. The

¹ Received September 17, 1938.

name *Urocyon cinereoargenteus texensis* for the fox described from the junction of the Devils River with the Rio Grande, Texas, appears to belong in the synonymy of *scottii*, as regarded by Bailey (North Amer. Fauna, 25: 180, Oct. 24. 1905). Near the Isthmus of Tehuantepec larger foxes give way to decidedly smaller, more southern races, but specimens from the Isthmian region present evidence that intergradation is complete. *Urocyon parvidens* from Merida, Yucatan, proves to be identical with the earlier named animal, *Urocyon cinereoargenteus fraterculus*, from San Felipe, Yucatan. The range of *Urocyon cinereoargenteus californicus* extends from southern California into northern Lower California, but passes farther south into that of *Urocyon cinereoargenteus peninsularis*. Two subspecies are here described as new.

*List of Mexican subspecies of Urocyon cinereoargenteus, with
type localities*

Urocyon cinereoargenteus californicus Mearns. San Jacinto Mountains, Riverside County, California (altitude 8,000 feet).

Urocyon cinereoargenteus peninsularis Huey. San Ignacio, southern Lower California, Mexico.

Urocyon cinereoargenteus scottii Mearns. Pinal County (probably near Oracle), Arizona.

Synonym—*Urocyon cinereoargenteus texensis* Mearns. Junction of Devils River and Rio Grande, Texas.

Urocyon cinereoargenteus colimensis subsp. nov. City of Colima (three miles west), Colima, Mexico (altitude 1,700 feet).

Urocyon cinereoargenteus orinomus subsp. nov. Orizaba, Vera Cruz, Mexico (altitude 4,000 feet).

Urocyon cinereoargenteus fraterculus Elliot. San Felipe, Yucatan, Mexico.

Synonym—*Urocyon parvidens* Miller. Merida, Yucatan, Mexico.

Urocyon cinereoargenteus guatemalae Miller. Nenton, Huehuetenango, Guatemala (altitude 3,000 feet).

Descriptions of new subspecies

***Urocyon cinereoargenteus colimensis*, subsp. nov.**

Colima Gray Fox

Type.—From three miles west of City of Colima, Colima, Mexico (altitude 1,700 feet). No. 33519/45564, ♂ adult, skin and skull, U. S. National Museum (Biological Survey collection); collected by Nelson and Goldman, April 1, 1892. Original number 2378.

Distribution.—Western Mexico, mainly in and along the Sierra Madre and the more elevated parts of the plateau region, from northern Sinaloa south to near the Isthmus of Tehuantepec. Altitudinal range: From sea level along Pacific coast to at least 8,500 feet on mountains bordering the Valley of Mexico.

General characters.—Closely allied to *Urocyon cinereoargenteus scottii* of Pinal County, Arizona, but usually smaller; pelage shorter; color normally darker, the outer sides of feet more mixed with brown or black; cranial details distinctive. Similar in general to *Urocyon cinereoargenteus fraterculus* of Yucatan, and *Urocyon cinereoargenteus guatemalae* of southeastern Mexico and Guatemala, but decidedly larger than either, and skull characters different.

Color.—*Type* (pelage somewhat worn): Upper parts in general a coarsely grizzled mixture of gray and black, the gray predominating, and the black most strongly in evidence on tips of longer guard hairs along median line of back; outer sides of forearms and thighs grayish buff; under parts in general whitish, becoming pinkish buffy on sides of neck and along sides of abdomen; chin blackish; muzzle grayish brown, darkest at base of vibrissae; ears clothed with buffy hairs, becoming rusty reddish or tawny at posterior base; sides of neck ochraceous tawny; lower part of cheeks white in continuation with white of throat; upper and outer sides of feet light buff, finely mixed with brown, the inner sides pale buff; tail with a narrow, black crest, as usual in the group, giving way abruptly to grayish buff along sides and pinkish buff below, becoming black all around at tip. In some specimens the postauricular areas are paler, less tawny, and the buff on sides of neck and abdomen lighter in tone.

Skull.—Closely resembling that of *scottii*, but somewhat smaller; braincase narrower; rostrum broader; nasals shorter; jugal narrower at insertion in maxilla, as viewed from side; interpterygoid fossa shorter; mandible deeper and heavier, more convex in lower outline near symphysis; auditory bullae usually smaller, narrower, less fully inflated; upper carnassial and first upper molar variable but usually smaller. Similar to *guatemalae*, but decidedly larger, with relatively smaller auditory bullae. Compared with that of *fraterculus* the skull is much larger, with more strongly developed temporal ridges, and relatively smaller, less inflated auditory bullae.

Measurements.—*Type*: Total length, 960 mm; tail vertebrae, 410; hind foot, 138. Average of three adult female topotypes: 927 (880–965); 385 (360–400); 130 (120–146). *Skull* (type [♂] and an adult female topotype, respectively): Greatest length, 117, 114; condylobasal length, 116, 114; zygomatic breadth, 65.6, 64.9; breadth of braincase, 44.2, 44.1; interorbital constriction, 24, 23.7; width of rostrum (just behind exposed canines), 19.2, 19.4; length of nasals, 37.3, 39.5; maxillary toothrow (front of canine to back of last molar), 50.4, 47.8; length of upper carnassial (inner side), 10.3, 10.3.

Remarks.—Specimens from various localities indicate the intergradation of *colimensis* with the closely allied race *scottii* toward the northern end, and along the eastern side of the Sierra Madre. Those from near the Isthmus of Tehuantepec exhibit an approach to *guatemalae*.

Specimens examined.—Total number, 35, as follows:
 COLIMA: Colima, 5; Hacienda Magdalena (20 miles southwest of Colima), 1.
 DURANGO: Chacala, 2.
 GUERRERO: Tlapa, 1.
 HIDALGO: El Chico, 1; Tula, 1.
 JALISCO: Ameca, 1; Atemajac, 1; Barranca Ibarra (Canyon de Oblatos), 2;
 San Sebastian, 1.

MEXICO: Huitzilac, 1.

MICHOACAN: La Huacana, 1; La Salada, 2; Los Reyes, 1; Mount Tancitaro, 1; Patzcuaro, 2.

MORELOS: Cuernavaca, 1; Tetela del Volcan, 1.

NAYARIT: Acaponeta, 2; Tepic, 1.

OAXACA: Juquila, 1; Llano Grande, 2.

PUEBLA: Piaxtla, 1.

SINALOA: Sierra de Choix, 1.

ZACATECAS: Hacienda San Juan Capistrano (about 25 miles northwest of Valparaiso), 1.

***Urocyon cinereoargenteus orinomus*, subsp. nov.**

Vera Cruz Gray Fox

Type.—From Orizaba, Vera Cruz, Mexico (altitude 4,000 feet). No. 58411, ♀ adult, skin and skull, U. S. National Museum (Biological Survey collection); collected by Nelson and Goldman, January 18, 1894. Original number 5679.

Distribution.—Eastern Mexico, from southern San Luis Potosi south to central Oaxaca. Altitudinal range: From 2,000 feet at Jalpan, Queretaro to 10,000 feet on Cerro San Felipe, Oaxaca, mainly in the Humid Tropical Zone.

General characters.—A dark-colored, humid tropical forest-inhabiting geographic race, closely allied to *colimensis* of western Mexico, but darker, the upper parts more heavily overlaid with black; postauricular areas deeper tawny; feet usually more clouded with dusky; claws more recurved, laterally compressed and sharper pointed; skull differing in detail, especially the relatively high, narrow braincase. Similar in general to *scottii* of Arizona, but usually smaller; pelage shorter; color darker, the gray element less predominant, the upper parts more heavily overlaid with black; postauricular areas deeper tawny; feet more clouded with dusky; skull smaller, with distinctly narrower braincase. About like *guatemalae* of southeastern Mexico and *fraterculus* of Yucatan in color, but much larger than either, and cranial features different.

Color.—*Type* (fresh pelage): Upper parts a coarsely grizzled mixture of gray and black, the black most strongly revealed on the tips of the longer guard hairs on the neck, back and rump; outer sides of forearms and thighs finely grizzled black and gray, suffused with "ochraceous tawny" (Ridgway, 1912); lower part of cheeks, throat, chest, inguinal region and a line along inner side of hind leg white; under side of neck crossed by a band of "cinnamon-buff," abdominal area irregularly invaded by "pinkish buff," muzzle chin, and lips blackish; ears grayish brown, becoming rich "orange-cinnamon" at posterior base, fading to "cinnamon" on sides of neck; upper sides of feet a mixture of black and gray suffused with buff, the hind feet varying to between "cinnamon" and "orange-cinnamon" along outer sides; tail with a narrow, conspicuous black crest, giving way to buffy gray along sides, and between "pinkish buff" and "cinnamon-buff" below, becoming black all around at tip.

Skull.—Not very unlike that of *colimensis*, but somewhat lighter in structure; braincase still narrower, the vault rising more steeply to median line between parietals; rostrum narrower; dentition similar. Similar in general to that of *scottii*, but somewhat smaller; brain case narrower; nasals shorter;

jugal narrower at insertion in maxilla, as viewed from side; interpterygoid fossa shorter; auditory bullae smaller; dentition variable, much as in *scottii*. Similar to *guatemalae*, but decidedly larger, with relatively smaller auditory bullae. Compared with *fraterculus* the skull is much larger, with more prominent temporal ridges; auditory bullae relatively smaller, less inflated; dentition heavier.

Measurements.—*Type*: Total length, 935 mm; tail vertebrae, 358; hind foot, 128. An adult male topotype: 948; 376; 125. *Skull* (type [♀] and an adult male topotype, respectively): Greatest length, 111.6, 112.6; condylobasal length, 109.3, 110.7; zygomatic breadth, 65.1, 67.5; breadth of braincase, 42.3, 43.5; interorbital constriction, 22, 23.1; width of rostrum (just behind exposed canines), 18.6, 17.8; length of nasals, 35.9, 36; maxillary toothrow (front of canine to back of last molar), 48.8, 49; length of upper carnassial (inner side), 12.5, 10.7.

Remarks.—The dark coloration of this geographic race seems to be associated with its humid tropical forest habitat. General comparisons indicate intergradation on the north with *scottii*, on the west and south with *colimensis*, and toward the east with *fraterculus* and *guatemalae*.

Specimens examined.—Total number, 10, as follows:

OAXACA: Cerro San Felipe (10 miles north of City of Oaxaca), 1; Totontepec (20 miles northeast of Mount Zempoaltepec), 1.

QUERETARO: Jalpan, 1.

SAN LUIS POTOSI: Rio Verde, 1.

VERA CRUZ: Jalapa, 1; Las Vigas, 1; Orizaba, 4.

ZOOLOGY.—A new woodrat of the genus *Hodomys*.¹ E. A. GOLDMAN, Bureau of Biological Survey.

The genus *Hodomys* includes large, peculiar, tawny-backed woodrats known to range from Rosario, southern Sinaloa, southward at low elevations near the Pacific coast to Acapulco, central Guerrero, southwestern Mexico. One less vividly colored species (*Hodomys vetulus*) inhabits interior valleys as far east as southeastern Puebla, in the Atlantic drainage two-thirds of the distance across the continent. The largest individuals of *Hodomys alleni* present the maximum size attained by any of the many species of North American round-tailed woodrats (type of *alleni*: total length, 472; tail vertebrae, 225; hind foot, 46 millimeters). A new geographic race of lesser dimensions may be known by the following description.

***Hodomys alleni guerrierensis*, subsp. nov.**

Acapulco Woodrat

Type.—From Acapulco, Guerrero, Mexico (sea level). No. 70574, ♂ adult, skin and skull, U. S. National Museum (Biological Survey collection), collected by Nelson and Goldman, January 6, 1895. Original number 7321.

¹ Received September 17, 1938.



Goldman, Edward Alphonso. 1938. "List of the gray foxes of Mexico." *Journal of the Washington Academy of Sciences* 28, 494–498.

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