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THE COTTON MOUSE, *PEROMYSCUS GOSSYPINUS*.

BY OUTRAM BANGS.

The present revision of the subspecies of *Peromyscus gossypinus* is based on the study of several hundred specimens in the collection of E. A. and O. Bangs and the type and five topotypes of *Peromyscus gossypinus mississippiensis* kindly lent me by Mr. Samuel N. Rhoads.

LeConte, in 1853, bestowed the name *Hesperomys gossypinus* upon the large dark-colored, white-footed mouse of Georgia. Two years later the same author named what he supposed to be another species from the same general region, calling it *Hesperomys cognatus*. This last name has troubled subsequent mammalogists not a little, until Mr. Rhoads, in his 'Mammals of Tennessee,'* in 1896, relegated it to its proper place, and it became a synonym of *P. gossypinus*, based on the young in the pelage assumed after the plumbeous first coat has disappeared. There is, however, a name earlier than LeConte's *H. gossypinus* that must be considered. It is *Hesperomys polionotus* of Wagner, described in 1843.† This animal is said to have come

* Proc. Acad. Nat. Sci., Phila., 1896, p. 189.

† Archiv für Naturgeschichte von Wiegmann, 1843, 2ter. Bd., pp. 51-52. "Aus eben diesem Staate [Georgia] herrührend liess mir Prof. Schinz zwei Mäuse zur Ansicht zukommen, unter denen die eine mit M. Lecontii übereinstimmt. Der andern, die mir unbeschrieben scheint, habe ich den Namen *Mus polionotus* beigelegt: M. supra flavido-plumbeus subtus pedibusque albidus; auriculis mediocribus, dent. prim. integris, cauda pilosa abbreviata. Körper 2'' 4''' , Schwanz 1'' 2''' , Ohren 4''' , Hinterfuss 7''' . Wie schon erwähnt, werden beide nicht zu *Mus* gehören, doch ist mir ihr Gebiss unbekannt."

from Georgia. The measurements and description of the colors of Wagner's specimen show it to have been a very young individual, and now impossible to identify. Wagner gives no definite locality in the State of Georgia, and as *P. aureolus* is found generally distributed throughout that State and as *P. leucopus* undoubtedly occurs in the mountains, it would be unwise to assume that the specimen in question was certainly the young of *P. gossypinus*, and thus allow Wagner's name to stand for that species.

Two names have been given lately to subspecies of *gossypinus* by Mr. Samuel N. Rhoads. One of these, the so-called *Sitomys megacephalus*, from Woodville, Alabama,* becomes a synonym of *P. gossypinus*. I have not seen the type, which is in alcohol, but there are no characters attributed to it that can in any way separate it from true *gossypinus* of Georgia, an animal Mr. Rhoads was wholly unfamiliar with, he making his comparisons with the Florida form, which is subspecifically distinct. The cranial characters claimed for *megacephalus* are individual and in nowise diagnostic. The other is the *Peromyscus gossypinus mississippiensis* of the bottom lands of the Mississippi in Tennessee, and is a well-marked race. I now describe two more races, one from the peninsula of Florida, the other from the bayou region of Louisiana, thus dividing *P. gossypinus* into four subspecies.

Peromyscus gossypinus has been given by authors in recent years as a subspecies of *P. leucopus*, not because any intermediates were forthcoming, but on general principles, until Rhoads, in his 'Mammals of Tennessee,' in 1896, gave it full specific rank. Mr. Rhoads, in the summer of 1895, found *gossypinus* and *leucopus* in the Mississippi bottoms in Tennessee, where, he says, it was possible to catch both species in the same trap, and yet the two kept perfectly distinct. This undoubtedly will prove to be the case wherever the ranges of *P. leucopus* and *P. gossypinus* overlap.

Most of the closely related forms of white-footed mice look very different from each other when one is trapping and handling them in the flesh. This 'aspect difference,' as Professor Shaler aptly calls it, is subtle and hard to define, and may disappear almost entirely when the animals are made into the conventional museum skins or preserved in spirits, thus leaving the characters on which species and subspecies are based very

* Proc. Acad. Nat. Sci., Phila., 1894, p. 254.

slight in comparison with what they were in life. This is strikingly true of *P. gossypinus*, and I well remember, when I first trapped this beautiful mouse, being astonished to see a creature so wholly different from *P. leucopus*, of which I had previously supposed it merely a subspecies. Since the cranial characters presented by the members of the genus *Peromyscus* are so slight that it is often difficult to tell apart the skulls of very different species, they are naturally of little help in distinguishing closely related forms.

Peromyscus gossypinus has a wide range in the lower Austral Zone, extending north along the Atlantic coast to North Carolina, up the Mississippi Valley to Tennessee, and west along the Gulf coast to Louisiana; but it is not found on the higher land between the most northern, eastern, and western points of its range.* *Peromyscus gossypinus* inhabits a variety of situations, but my experience with the typical form in Georgia has been that it is rare. About St. Marys, Georgia, they lived in the hammocks and margins and around the edges of some of the cleared fields, but were not numerous anywhere. I could not find them in the pine woods at all, but their absence there may be due to the annual firing of these woods to make pasture. The Florida form is very abundant in many parts of peninsular Florida. At Oak Lodge, on the east peninsula opposite Micco, I trapped them by the hundred. Their favorite abodes there were the edges of the salt savannah, the piles of brush and rubbish around the cleared fields, and along the edge of the beach in the saw palmetto thickets. In these dense thickets and among the plants and grasses of the upper beach *Peromyscus gossypinus palmarius* and the exquisite little *Peromyscus niveiventris* occurred together in great numbers, feeding largely on the seeds of the sea oats, *Uniola paniculata*.

Peromyscus gossypinus meets or overlaps the ranges of at least four and probably five other white-footed mice. All along its northern limits it must come in contact with *Peromyscus leucopus*, and judging from Mr. Rhoads' experience in Tennessee the two species overlap, but keep distinct. *P. gossypinus* can always be told from *P. leucopus* by its much larger size, stouter build, bigger hind foot, shorter tail, browner and less fulvous coloration of the upper parts, and the gray (not white) under parts. Major LeConte states in his description of *P. gossypinus* that it has

* Reelfoot Lake, Tennessee, and Bertie County, North Carolina.

longer front legs than *leucopus*, and consequently a different gait, progressing in an even run, while *leucopus* goes by little leaps. I regret to say that while I had the opportunity I never studied the movements of *P. gossypinus* in life. Major LeConte undoubtedly did, and I see no reason to doubt his statement. The skull of *P. gossypinus* averages larger than that of *P. leucopus* when individuals of the same age are compared, but apart from this difference in size the two are indistinguishable.

Peromyscus aureolus overlaps the greater part of the range of *P. gossypinus*, but reaches farther north and probably not so far south, the southernmost examples, so far as I know, coming from Enterprise, Florida. It can always be told from *gossypinus* by the bright ochraceous of the upper parts, the under parts being also extensively washed with this color, and its smaller size about that of *P. leucopus*.

In Florida two white-footed mice, very different from each other and equally different from *gossypinus*, occur in many places associated with *gossypinus*. The commoner of these is the most beautiful of all white-footed mice, the little, ghost-like *Peromyscus niveiventris*. This species is about half the size of *gossypinus*, with pale gray and fawn-colored upper parts and snowy white under parts. The other is *Peromyscus floridanus*, an animal very unlike *P. gossypinus* and belonging to a different group of the genus. It is a large mouse, with big, nearly naked ears, short tail, and very large hind foot. The sides are a bright ochraceous buff and the under parts white. The fur is very soft and silky.

In the west *Peromyscus gossypinus* may meet the range of *P. mearnsi* of the lower Rio Grande and coast of Texas. *P. mearnsi* is about the size and proportions of *P. leucopus*, and is dark gray (purplish gray in fresh pelage) above, without a marked darker dorsal band, and white below.

***Peromyscus gossypinus* (LeConte).**

- 1831. *Hyp[udæus] gossipinus* LeConte, M'Murtrie's Cuvier's Animal Kingdom, I, 1831, app., p. 434 (nomen nudum).
- 1853. *Hesperomys gossypinus* LeConte, Proc. Acad. Nat. Sci. Phila., 1853, p. 411.
- 1855. *Hesperomys cognatus* LeConte, Proc. Acad. Nat. Sci. Phila., 1855, p. 442.
- 1874. *Hesperomys* (*Vesperimus*) *leucopus gossypinus* Coues, Proc. Acad. Nat. Sci. Phila., 1874, p. 179.
- 1877. *Hesperomys leucopus gossypinus* Coues, Monog. N. American Muridæ, p. 76.

1894. *Sitomys megacephalus* Rhoads, Proc. Acad. Nat. Sci. Phila., 1894, p. 254.
 1896. *Peromyscus gossypinus* Rhoads, Proc. Acad. Nat. Sci. Phila., 1896, p. 189.

Type locality.—The LeConte plantation a few miles above Riceboro, Liberty County, Georgia.

Geographic distribution.—From northern Florida north along the coast at least to Bertie County, N. C.; west through the non-mountainous parts of Georgia to Alabama and perhaps Mississippi.

Subspecific characters.—A large heavily built mouse; hind foot large; tail shorter than head and body, bicolored; ears dusky, nearly naked, of moderate size; general color of upper parts dark brown, with broad darker dorsal band; under parts gray; feet and hands grayish white.

Color.—*Adult*: Upper parts dark brown, varying from Prouts brown to sepia, darkening along middle of back into a broad dorsal band, which ranges from clove brown to black; a black orbital ring. Under parts smoke gray, the hairs plumbeous at base; feet grayish white; ears dusky; tail bicolored, dusky above, grayish white below. *Nursing young*: Blackish slate above, slate gray below; tail and feet as in adult. *Young in second pelage*: General color of upper parts duller, more hair brown, often with a sooty cast; otherwise like adult, dorsal stripe well marked.*

Size.—Average measurements of twelve adult specimens from St. Marys, Ga.: total length, 177.66; tail vertebræ, 70.25; hind foot, 22.35. Maximum size (of largest old adult in above average): total length, 197; tail vertebræ, 82.5; hind foot, 22.

Specimens examined, 37, from the following localities:

Georgia: St. Marys, 35.

North Carolina: Bertie County, 2.

***Peromyscus gossypinus mississippiensis* Rhoads.**

1896. *Peromyscus gossypinus mississippiensis* Rhoads, Proc. Acad. Nat. Sci. Phila., 1896, p. 189.

Type locality.—Samburg, Reelfoot Lake, Tennessee.

Geographic distribution.—The Mississippi bottoms in Tennessee; limits of range unknown.

Subspecific characters.—Size about that of typical *gossypinus*; tail a little longer; hind foot larger; colors paler and more yellowish; dorsal band less well defined, without black orbital ring.

Color.—*Adult*: Upper parts varying from cinnamon brown to russet, darkening on middle of back into an ill-defined dorsal band about mummy brown; no dark orbital ring; under parts grayish white, the hairs plumbeous at base; ears dusky; tail bicolored, dusky above, white below; feet grayish white.

* The young in this pelage are much smaller than the adults, but as they frequently breed they have the appearance of full-grown animals, and gave rise to LeConte's species *Hesperomys cognatus*.

Size.—Average measurements of six adult specimens from type locality: total length, 183; tail vertebræ, 79.5; hind foot, 24.45. Maximum size (of largest old adult in above average): total length, 196; tail vertebræ, 84; hind foot, 25.

Specimens examined, 6, all from the type locality.

***Peromyscus gossypinus palmarius* subsp. nov.**

Type from Oak Lodge, on east peninsula opposite Micco, Brevard County, Florida. No. 3224, ♀ old adult, collection of E. A. and O. Bangs. Collected by O. Bangs February 23, 1895. Total length, 183; tail vertebræ, 74; hind foot, 21.

Geographic distribution.—Peninsular Florida, north at least to Brevard County on the east and Citrus County on the west.

Subspecific characters.—About the size of typical *P. gossypinus*; hind foot shorter; colors much paler and more yellowish; no decided darker dorsal band; a black orbital ring.

Color.—*Adult*: Upper parts varying, according to freshness of pelage, from bright russet to wood brown, usually a few darker hairs scattered along middle of back, but not enough to form a dorsal band; a black orbital ring; under parts grayish white, the hairs plumbeous at base; ears dusky; tail bicolored, dusky above, white below; feet grayish white.

Size.—Average measurements of twenty adult specimens from type locality: total length, 181; tail vertebræ, 71.88; hind foot, 21.55. Maximum size (of largest old adult in above average): total length, 206; tail vertebræ, 83; hind foot, 22.

Remarks.—*Peromyscus gossypinus palmarius* often shows a pectoral spot of yellowish brown, sometimes of large size.

It is often difficult to tell the young in the second pelage of *palmarius* from the young of typical *gossypinus*, but as a rule they are lighter in color, more grayish, less sooty, and have the dorsal stripe much less well defined.

Specimens examined, 166, from the following localities in Florida: Oak Lodge, east peninsula opposite Micco, Brevard County, 111; Micco, 3; Flamingo, 19; Miami, 2; Jupiter Inlet, 3; Crystal River, 4; Citronelle, 3; Blitches Ferry, Citrus County, 21.

***Peromyscus gossypinus nigriculus* subsp. nov.**

Type from Burbridge, Plaquemines Parish, Louisiana. No. 2731, ♀ adult, collection of E. A. and O. Bangs. Collected by F. L. Small January 30, 1895. Total length, 174; tail vertebræ, 79; hind foot, 24.

Geographic distribution.—Bayou region of the coast of Louisiana.

Subspecific characters.—Size smallest of the *gossypinus* series; hind foot about as in typical *gossypinus*; tail proportionally longer; colors very dark; a broad dorsal band nearly black; ears and upper surface of tail black; a black orbital ring.

Color.—*Adult*: upper parts varying from vandyke brown to sepia, often with a sooty cast; darkening along middle of back into a broad dorsal

band of nearly black; a black orbital ring; under parts grayish white; the hairs plumbeous at base; ears black; tail bicolored, black above, grayish white below; feet and hands grayish white.

Size.—Average measurements of three adult specimens from the type locality: total length, 168.33; tail vertebræ, 76.66; hind foot, 23.66. Average measurements of twenty adult specimens from Gibson, Terre Bonne Parish, Louisiana: total length, 169.85; tail vertebræ, 77.85; hind foot, 22. Maximum size (of largest old adult in above average): total length, 184; tail vertebræ, 86; hind foot, 22.

Remarks.—The young of *Peromyscus gossypinus nigriculus* are very dark colored, both in the nursing and the second pelage, and can usually be separated, both by their dark color and their smaller size, from the young of corresponding age of *gossypinus* or of *palmarius*.

This form appears to be confined to the heavy swamps of the bayou region, and probably does not occur farther from the coast than the limits of these swamps. Although Mr. Small trapped persistently in several localities in the prairie and pine regions of central Louisiana, he failed to get a single specimen of any *Peromyscus* in such places and concluded that none occur north of the bayous.

Specimens examined, 89, from the following localities in Louisiana: Burbridge, Plaquemines Parish, 5; Gibson, Terre Bonne Parish, 56; Powhatan Plantation (near Gibson), 28.



Bangs, Outram. 1896. "The cotton mouse, *Peromyscus gossypinus*."
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