The Species of *Fahrenholzia* Kellogg and Ferris from Spiny Pocket Mice  
(*Anoplura: Hophalipaeidae*)

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ABSTRACT

The seven species of *Fahrenholzia* which occur on mice of the subfamily Heteromyinae (spiny pocket mice) are described and illustrated. Three new species are included: *rehboui*, from *Lontra curassavi* subspecies, *frenchii*, from *Lontra solzini* subspecies, *l. advenus*, and *Heteromyxus demerolletii*. The description of the genus *Fahrenholzia* is revised, based on characters found in the new species.

There are eight described species of *Fahrenholzia* Kellogg and Ferris, all occurring on members of the sciuromorph family Heteromyidae (spiny pocket mice). Four of the described forms are found on mice of the entirely North American subfamilies Dipodomyinae and Perognathinae. The hosts of the remaining four *Fahrenholzia* are all species of Heteromyinae (spiny pocket mice), a subfamily whose members occur in the southwestern United States, Mexico, Central America, and northern South America.

The review of *Fahrenholzia* species found in the United States by Stojanovich and Pratt (1961), has well-executed drawings of certain diagnostic structures of the four large species found on *Perognathus* and *Dipodmys*: *F. renata* Kellogg and Ferris, *F. robusta* Ferris, *tribusora* Ferris, and *amauroce* Ferris) plus a workable key, and this group is not considered in the present paper.

The four described species in the heteromyine-hosting group are *microcephala* Ferris, *ferrisi* Wen- neck, *advenus* Wenneck, and *tevanus* Stojanovich and Pratt. *F. ferrisi* was described by Wenneck from specimens included in the type series of *microcephala* and taken from *Heteromyxus gurneyi*. *F. tevanus*, from *Lontra curassavi* subspecies, is also represented in the *microcephala* type series, as is a new species described in this paper. Records and figures in Stojanovich and Pratt (1961), attributed to *microcephala*, are of the new species.

I have studied collections from the following sources: Panama and the Canal Zone (Malaria Control and Survey Branch, Fort Clayton, Canal Zone, directed by Major, Robert Atwood and Vernon Tyy...
IV lacking setae, narrowly rounded to acute apically. 

Avadouc (fig. 3) with basal plate truncate anteriorly, slightly expanded posteriorly, with posterioroedema margin much longer than half their length; posterioroedema extension narrowing apically, joined to basal plate. Pseudopenis a short, straight rod with well defined apices.

Female (fig. 1): Closely resembles male, but apparently smaller for genital segments (fig. 35). Genital plate almost twice as long as broad, with subterminal pair of lateral ova, forming the typical pair of lateral ova in a female. The segmentation of the segments of the seventh egg in segments of the eighth egg ("gonopods") (fig. 36).

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Type Data:—Selection of a lectotype male is necessary since neither of the males in the type series, nor the female, was ever photographed or illustrated. The holotype in the original description. I have selected a lectotype male for the female with a female, and have labeled the slide "Lectotype 2," male type, one male and three female paratypes from Heteromyidae sp. (USNM 16422). Abdi, Rana, and Varecoan, Mexico. These specimens were included in the type series of Microtus ferris.

Lectotypes and paratypes are in the collections of the Smithsonian National History Museum.

Specimens Examined.—The type plus five males and nine females from Heteromyidae sp. (USNM 16422). 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

Males and females from Heteromyidae sp. (USNM 16422). 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

Type Data:—Male holotype, female allotype, one male and four female paratypes. From Heteromyidae sp. (USNM 16422). 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

Description.—Male (fig. 12):—Body length, 96 mm; tail length, 26 mm; hind foot length, 16 mm; ear length, 9 mm.

Fur:—The fur is dense, short, and fine. The fur on the head and neck is dark brown, but the fur on the back and sides is lighter, ranging from light brown to golden brown. The fur on the abdomen is a mix of light brown and white.

Eyes:—The eyes are small and dark, located on the anterior part of the head.

Ears:—The ears are large and pointed, with a dark brown inner surface.

Nose:—The nose is small and round, located in the center of the face.

Sides:—The sides of the body are covered with short, dense fur that is slightly lighter than the fur on the back.

Arms:—The arms are short and muscular, with small, rounded shoulders.

Legs:—The legs are long and slender, with four toes on each foot. The toes are long and pointed, with slender claws.

Tails:—The tail is short and bushy, with a dark brown tip.

Glands:—The glands on the male's neck are visible as small, dark, round bumps.

Color:—The color of the male is a dark brown, with lighter brown on the sides and a lighter brown on the abdomen.

Female (fig. 13):—Body length, 90 mm; tail length, 22 mm; hind foot length, 16 mm; ear length, 8 mm.

Fur:—The fur is dense, short, and fine. The fur on the head and neck is dark brown, but the fur on the back and sides is lighter, ranging from light brown to golden brown. The fur on the abdomen is a mix of light brown and white.

Eyes:—The eyes are small and dark, located on the anterior part of the head.

Ears:—The ears are large and pointed, with a dark brown inner surface.

Nose:—The nose is small and round, located in the center of the face.

Sides:—The sides of the body are covered with short, dense fur that is slightly lighter than the fur on the back.

Arms:—The arms are short and muscular, with small, rounded shoulders.

Legs:—The legs are long and slender, with four toes on each foot. The toes are long and pointed, with slender claws.

Tails:—The tail is short and bushy, with a dark brown tip.

Glands:—The glands on the female's neck are visible as small, dark, round bumps.

Color:—The color of the female is a dark brown, with lighter brown on the sides and a lighter brown on the abdomen.

References:—See also descriptions of other species of Heteromyidae sp. (USNM 16422). 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

Additional species include:—Heteromyidae sp. (USNM 16422). 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

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lobed, each lobe narrowly rounded or acute, bearing two apical setae, one of these very long, other minute. Plate IV posteriorly narrowly rounded or truncate, often with apex notched. Segments of abdomen as shown in figures. Adenogastris (fig. 29). Basal plate rounded anteriorly, gradually broadening to short lateral posterior arms which enclose only tips of paramere bases; with paddle-shaped median process which has a narrow neck joining basal plate and rounded, expanded apex. Parameres narrow, curved, posteriorly excised to form a broad rounded-truncate lobe and hook-shaped lateral lobe. Pseudopenis with narrowed waist, posteriorly nearly rounded, apex somewhat trilobed in appearance.

FEMALE (fig. 18): As male except for genital segments (fig. 30). Genital plate subquadrate, not fringed posteriorly, with small circular subapical setae near posterior apex. Lateral setigerous lobes of eighth segment extending posterior to genital plate, oval, bearing two transverse-striated setae on median margin near posterior apex. Often, below setigerous lobes, with two horizontally elongate plates which bear one seta each on posterior margin, but these plates not always developed.

LACERTA—Male holotype, 14.4 mm.; paratype, 14.13 mm.; female allotype, 14 mm.; paratypes, 1.95—1.94 mm.

This species is named in honor of my colleague, Dr. G. B. Fairchild of Gorgas Memorial Laboratory, Panama.

Fahrenholzia heringi, new species (Figs. 22, 23, 34, 40)

Type: Male.—Female holotype and six female

Plate 1

Fahrenholzia heringi, new species

Fig. 1, female. Fig. 2, thoracic sternal plate. Female. Fig. 3, adenogastris. Fig. 4, male.

Plate 2

Fahrenholzia heringi, new species

Fig. 5, female allotype. Fig. 6, sternal plate. Female allotype. Fig. 7, male type. Female allotype. Fig. 8, male holotype. Fig. 9, female, paratype from T. ovata. Matamoros, Mex. not to same scale as fig. 7.
a straggler. There was no chance of mechanical contamination in this case, since Major Alman has informed me that for 2 weeks prior to and after the date of collection, no *Heteromyia* or *Loxoconymus* had been collected in Camp Piña.

Description.—Immediately separable from other members of the *microcephala* group in that the antennae have segments 3-5 completely coalesced and are no longer than the head (fig. 34). Further separable in that the thorax is no broader than the head, and has its sternum plate divided into a large posterior part and a small detached anterior part (fig. 23).

Description.—*Pamulca* (fig. 22): Head (fig. 54) longer than broad, extending before antennae far about one-fourth of its total length; ventrally narrowed at juncture to thorax, postantennal margin convex. Antennae not longer than length of head, segments 3-5 coalesced. Thorax no wider than head, longer than broad, thoracic sternum plate divided into a large posterior part and a small detached anterior part (fig. 23). Legs. Second and third pairs...
harking toothlike projection at outer basal angle of tarsi. Claw of first leg not apically bifurcate. Abdomen narrow and elongate, with a narrow longitudinal dorsal plate on segment 2 which is not expanded posteriorly; anterior to third segment abdomen rugose both dorsally and ventrally. Paratergal plates present on segments 2-4. Paratergal plate III with dorsal detached portion having long, narrow, apical process; with two apical setae, one about as long as plate, other much shorter; ventral part of plate lacking setae, apically bifid. Two rather small setae laterally on segment 7, between part of paratergal plate. Plate IV with posterior apex divided by deep concavity into two equal acutely rounded lobes and with a pair of apical setae. One seta longer than plate, other shorter. Plate IV lacking setae, narrowly rounded.
posteroventrally, at times apex notched. Setation of abdomen as in figure. Genitalia (Fig. 49) with genital plate broadest medially; below plate, surface (lip of vulva?) is patterned. Lateral setigerous lobes of eighth segment narrowest anteriorly, posteriorly rounded, bearing three small setae on mesal margin of apex. Two small plates, more or less well-defined, below setigerous lobes.

**Length:** Holotype, 1.5 mm, paratypes, 1.55-1.55 mm.

This species is named for my colleague, Dr. Marshall Hertig of Gorgas Memorial Laboratory, Panama.

**Fahrencholzia texana** Stoianovich and Pratt


**Type Data:** Female holotype, male allotype, three female paratypes from *Lemur triqueter* texana, Gorgas Wildlife Refuge, Cameron County, Texas.
SPECIMENS EXAMINED.-One male from Liurge (laurence' rex) (USNM 30343), Brownsville, Texas (included in the microcephalus type series).

DESCRIPTION.-F. texana differs from all the microcephalus-like species in having the close of the first leg bidentate apically (fig. 25). Further separable from all the microcephalus group except fusciflava, n. sp., and lori, n. sp., in that the outer basal angle of each tarsus two and three lacks a toothlike process, and parietal plate III (of the third abdominal segment) bears the ventral apical angle acute (fig. 25). P. texana differs from lori in that antennal segments 3-5 are not completely coarsened (fig. 33); the antennae is longer than the head is broad, and the thoracic sternum plate lacks an inner detached portion. Distinct from fusciflava in that parietal plate II is longer than plate III, and the class of the second and third legs are no longer than the width of the head. Male texana is distinguished from fusciflava by having toothlike projections posteriorly on the pygum, and the posterior median extension of the basal plate is detached (fig. 25). In the female, texana differs from lori in having the lateral segments of the eighth segment horizontally elongate, not oval, and the genital plate lacks a circular sclerization near the posterior apex.

DIAGNOSIS.-Male (fig. 21). Head (fig. 33) about as wide as long, lateral posterior median margin with heavy medially sclerotization which is carried on to dorsal head surface as short, pale, horizontal band. Antennae segment 3 to 5 not coarsened, first segment lacking toothlike dorsal projection. Thoracic sternum plate as in fig. 26. Legs. Close of median and posterior legs not as long as head width. Lacking toothlike projection at outer basal angle of tarsus medially and posterior leg. Abdomen. Dorsal longitudinal plate of segment 2 variably developed, not expanded posteriorly, one or two of setae in horizontal row may be inserted on posterior apex of this plate. Parietal plate present on segments 2-4. Dorsal detached portion of plate II with two apical setae, one of them sharper than plate bearing it; two or three medium-sized setae on lateral margin of segment between parts of plate II, ventral portion of plate II with short, acutely rounded, apical base. Plate III shorter than plate II, with two acutely rounded apical bases, with two apical setae, both longer than plate, one much longer than other. Plate IV small, narrow, acute apically. Section of abdomen as in figure. Antennae (fig. 25). Basal plate roundly truncate anteriorly, not much widened posteriorly, posteroventral arms enclosing pygum not much their length; posteroventral extension detached from basal plate, irregularly spindle-shaped. Pygum variables lateral margins straight, abruptly angled so that posterior margin forms right angle to lateral margin, blunt toothlike projection at this angle, another such projection medially. Genitalia truncate anteriorly and posteriorly, with curved ventrally fixed upon itself in figure.

FEMALE. As male except for genitalic segments, central plate with intercospolac angle acutely rounded, posteriorly convex, this part spinulated. Lateral segments of eighth segment lying to either side of genital plate not below middle, horizontally elongate, with convex anterior, and concave posterior margin. Genitalia margin bearing three setae.

LENGTH.-Male, 1.2 mm.; female, 1.5 mm.

REFERENCES CITED

