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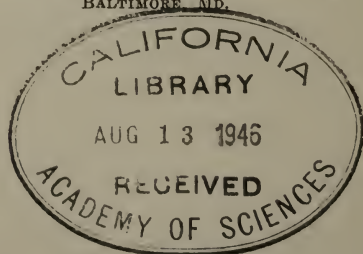
E. P. KILLIP

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PUBLICATION NOTE

By a change in the By-Laws of the Biological Society of Washington, effective March 27, 1926, the fiscal year now begins in May, and the officers will henceforth hold office from May to May. This, however, will make no change in the volumes of the Proceedings, which will continue to coincide with the calendar year. In order to furnish desired information, the title page of the current volume and the list of newly elected officers and committees will hereafter be published soon after the annual election in May.

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ERRATA

Plate XIII, page 75, should read Plate VIII.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS

The Society meets from October to May on the second Saturday of each month at 8 P. M. All meetings in 1946 were held in Room 43 of the U. S. National Museum.

January 12, 1946—955th Meeting

President Thone in the chair; 110 persons present.

New member elected: R. H. Baker.

Informal communications: F. Thone, Exhibition of new biological publications; F. R. Fosberg, Exhibition of some publications of *Chronica Botanica*.

Formal communication: William Vogt, A catastrophe year on the Peruvian coast.

February 9, 1946—956th Meeting

President Thone in the chair: 28 persons present.

New members elected: R. I. Cohen, K. L. Knight.

Informal communication: F. Thone, Exhibition of new biological publications.

Formal communication: A. F. Sievers and E. C. Stevenson, Illustrated account of some plants of specific and peculiar interest to man.

March 16, 1946—957th Meeting

President Thone in the chair; 51 persons present.

New member elected: R. M. Bohart.

Informal communications: F. Thone, Exhibition of new biological publications; H. B. Humphrey, Note on the scarcity of gray squirrels in the Cabin John region this winter; E. P. Walker, Note on a method of ascertaining whether natural food for squirrels is running low.

Formal communication: T. P. Dykstra, Some biological and agricultural facts gleaned out of Free China.

April 13, 1946—958th Meeting

President Thone in the chair; 51 persons present.

Informal communication: Malcolm Davis, Exhibition of a domestic pigeon which had starved to death due to displacement and locking of the mandibles.

Formal communications: Elmer Dorbin, Noises made by fishes and other marine life; F. G. Orsinger, Tongueless toads.

May 12, 1946—959th Meeting

SIXTY-SEVENTH ANNUAL MEETING

President Thone in the chair; 7 persons present.

New members elected: M. S. Briscoe, M. C. Gardner.

The death of T. S. Roberts was noted.

Reports were received from the Recording Secretary, Corresponding Secretary (informal), and Treasurer. The following officers and members of council were elected: President, Joe S. Wade; Vice Presidents, W. L. Schmitt, J. W. Aldrich, F. C. Lincoln, J. E. Benedict, Jr.; Recording Secretary, S. F. Blake; Corresponding Secretary, R. S. Bray; Treasurer, A. J. Duvall; Members of the Council, Malcolm Davis, J. A. Fowler, D. E. McHenry, H. J. Deason, W. Stickel. S. F. Blake and F. C. Lincoln were appointed Trustees of Permanent Funds to succeed J. S. Wade and M. B. Waite.

October 12, 1946—960th Meeting

President Wade in the chair; 38 persons present.

New members elected: R. M. Gilmore, C. O. Handley, Jr., W. V. King, R. T. Peterson, A. R. Phillips.

The death of E. A. Goldman was noted.

Informal communication: E. P. Walker, Note on experiments in making photographs of small mammals in motion.

Formal communications: J. F. G. Clarke, Informal discussion of the present status of European museums; R. A. F. Gohar, Marine biological research on the Red Sea.

November 9, 1946—961st Meeting

President Wade in the chair; 80 persons present.

New member elected: R. D. Van Pelt.

Informal communications: F. Thone, Exhibition of new biological publications; I. N. Hoffman, Note on a species of *Solanum* from Venezuela.

Formal communications: M. A. Elliott, Birds along the way; New York Zoological Society, The flight of the humming bird.

December 14, 1946—962d Meeting

President Wade in the chair; 74 persons present.

New members elected: E. J. Hambleton, H. I. Kleinpeter, III.

Informal communications: H. B. Humphrey, Note on scarcity of gray squirrels and rabbits; T. S. Palmer, Note on the Pinchot Collection of photographs and notes relating to persons connected with forestry, in the Library of Congress.

Formal communication: A. J. Duvall and C. O. Handley, Jr., Land of the Eskimo.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

FOUR NEW SPECIES OF DICTYNA.

BY SHERMAN C. BISHOP AND CLAIRE RUDERMAN.¹

The new species here described are from the Cornell University collection and were made available through the courtesy of Dr. Helen Blauvelt. The types will be deposited at Cornell.

These four species are from a series of thirteen described, but not published, several years ago. The remaining nine species of the series have either been described recently by other workers or are in the process of description by Dr. W. J. Gertsch, of the American Museum, who kindly checked our material with his to avoid possible duplication of effort.

Dictyna cornupeta new species.

(Figs. 1-2.)

Male. Length, 3 mm. Cephalothorax with the head relatively broad, light yellow-brown with the radiating lines on the thorax and four longitudinal lines on the head darker. Sternum yellow in some individuals with the margin narrowly black and with a dark median stripe which does not reach the margin either in front or behind. Labium slightly dusky. Endites yellow. Chelicerae light dusky orange, concave, strongly bowed apart in the middle leaving an ovate opening between them closed below by a pair of opposed teeth; lateral ridges at base of chelicerae short, not well developed, not tooth-like. Legs and palpi pale yellow, tarsus of latter dark. Abdomen above pale yellowish with a basal lanceolate dark stripe followed by a diamond-shaped median spot and this by a double row of irregular spots connected by narrow chevrons and to the dark on the sides by oblique lines; venter yellowish or whitish, with two dark spots in front of the epigastric furrow, a dark spot at each end of this furrow, a dusky median area back of it and a dark spot at each end of the spiracular furrow.

Posterior eyes in a gently recurved line, equidistant, separated by

¹ Department of Biology, The University of Rochester.



two-thirds the diameter. Anterior eyes in a straight line, separated by a little less than the diameter and from the lateral by less than the radius.

Femur of palpus short, thicker distally. Patella short and broad. Tibia moderately long, viewed from the side gently convex above, more strongly concave below; viewed from above, the mesal side convex and the lateral side concave, the distal margin obliquely truncate. Tibia armed dorsolaterally at base with a short, stout, erect process bearing at tip two black teeth set in sockets. The embolus arises at the base of the bulb from a moderately swollen base; it is black and is strengthened by three thickened ribs. The conductor lies free from the cymbium for a considerable distance; it ends basally in a black pointed process which is curved around a circular passageway for the tip of the embolus.

Holotype male, Arizona: Texas Pass, Dragoon Mts., Aug. 21, 1917; paratype, Wyoming: Yellowstone Lake, Yellowstone National Park, Aug. 29, 1927, 1 male.

Dictyna tridentata new species.

(Figs. 3-4.)

Male. Length, 2.8 mm. Cephalothorax dark mahogany brown, darker radiating lines on the thorax and longitudinal lines of fine white hairs on the head. Sternum dusky orange, very much darker on margin and posteriorly. Labium nearly black, lighter distally. Endites dark dusky orange. Chelicerae dusky with a tinge of orange showing through, strongly concave and strongly bowed apart in the middle, face of chelicerae flat transversely with mesal and lateral edges clean cut at a right angle, the lateral ridges at base well developed but without a tooth. Legs dull orange with faint, darker annulations on posterior femora and at the ends of the segments. Palpi dull orange. Abdomen reddish orange with distinct black markings; a basal median wedge-shaped mark constricted at posterior third, followed by a series of narrow chevrons connected laterally with a row of irregular spots; venter broadly dark medially, lighter on the sides.

Posterior eyes almost in a straight line, the median separated by more than the diameter and slightly farther from the lateral. Anterior eyes in a straight line, the median separated by nearly twice the diameter and from the lateral by two-thirds the diameter.

Femur of palpus rather stout, from above widened distally, gently curved downward. Patella short and broad. Tibia rather stout, viewed from the side concave below and convex above beyond the process; viewed from above, the mesal side gently convex, the lateral, concave, the distal margin gently concave, the lateral angle widened and produced forward; tibia armed dorsally near base with a stout, flattened, erect process gently curved forward and about three-fourths as long as width of segment, bearing at tip three black teeth in a row set in sockets. The embolus arises on the mesal side of the bulb from a distinctly swollen bulb-like base, passes along the edge of the cymbium to the tip of the bulb where it enters the groove of the conductor. The

conductor lies close to the cymbium throughout its length and ends basally in a narrow sharp-pointed process, finely denticulate at tip.

Holotype male, Wyoming: Summit of the Grand Teton Pass, July 4, 1933.

Dictyna peragrata new species.

(Figs. 5-8)

Male. Length, 2 mm. Cephalothorax chestnut brown with dark radiating lines on the thorax and fainter longitudinal lines on the head. Sternum dark gray over orange yellow, dark at margin and behind. Labium dark at base. Endites yellow suffused with dusky. Chelicerae chestnut brown, strongly concave and bowed apart in the middle, lateral margin convex, the lateral ridges at base well developed. Legs pale yellowish suffused with dusky and with dark annulations at the ends of tibiae and metatarsi. Abdomen light above with a basal dark wedge-shaped mark connected with a broader black spot, followed after an interval by a black chevron and other indistinct markings. Sides of abdomen dark.

Posterior eyes oval, in a straight line, equidistant, separated by a little more than the long diameter. Anterior eyes in a straight line, the median separated by a little more than the diameter and from the lateral by a little less.

Femur of palpus nearly straight and cylindrical. Patella short, as broad as femur. Tibia short, viewed from the side strongly concave below, straight above beyond the two teeth; viewed from above widened distally on the outer angle, the mesal side straight, the lateral, concave, armed near base dorsolaterally with two nearly sessile black teeth set in sockets. The embolus arises from a swollen bulb-like base on the ventral side near base. It is rather stout and jet black. Near the distal end of bulb it enters the groove of the conductor. The conductor lies free from the edge of the cymbium for some distance, basally it is moderately thickened and ends in a narrow, slender slightly curved process, serrated along the inner margin of the tip.

Female: Length 2 to 2.25 mm. Similar to the male in form but generally lighter in color, the cephalothorax dusky orange yellow, the abdomen mottled gray and yellow, the basal mark, when present, brown. Epigynum of adult (Fig. 7) with a triangular median lobe, the apex directed forward and with the margins continued laterally. The openings, in mature individuals, show as dark oval cavities on either side of the median lobe. Posteriorly, the receptacles show through as dark round or oval blotches. In juvenile females (Fig. 8), the openings are indistinct and the receptacles are faintly outlined beneath the surface.

Holotype male. Washington: Edmonds, August 16, 1927; allotype, California: Miranda, June 4, 1936; paratypes, Washington: Friday Harbor, June-July, 1928, 3 males, 3 females; California: Miranda, June 4, 1936, 1 male, 3 females.

Dictyna francisca new species.

(Figs. 9-11.)

Male. Length, 2-2.2 mm. Cephalothorax reddish orange with darker radiating lines to dark brown in preserved specimens, head high and narrow, clothed with five longitudinal rows of white hairs. Sternum dark grayish orange narrowly black at margin. Labium darker, endites a little lighter. Chelicerae dull orange brown, long, concave, bowed apart in the middle, the lateral ridges at base short, thin, forming a small but distinct tooth. Legs and palpi pale orange yellow. Abdomen yellowish white above, with darker reticulations and with a dark median basal mark which is strongly constricted and then enlarged to form a distinct median spot; farther back there is a double row of 3 or 4 dark spots, the last two pairs connected by transverse bars which are sometimes very heavy. Sides of abdomen grayish to blackish, venter broadly pale across the middle, dusky in front and behind. Abdomen clothed with long, white to light brown hairs.

Posterior eyes in a gently recurved line, equidistant, separated by the diameter. Anterior eyes in a gently procurved line, the median smaller than the lateral, separated by one and one-half times the diameter and from the lateral by a little less than the diameter.

Femur of palpus nearly straight and cylindrical. Patella short, strongly convex above. Tibia rather long, evenly convex above and more strongly concave below, viewed from above the mesal side nearly straight with the distal angle cut off, the lateral side concave; ventrolaterally the margin is thinned out and is somewhat widened distally. Tibia armed dorsolaterally at base with two black teeth borne on a very low tubercle. The black, rather stout embolus arises from a rather low quadrate bulb-like base on the mesal side of the bulb near the base. It enters the conductor near the apex of the bulb and divides into three branches which can be seen through its wall. The conductor lies close to the edge of the cymbium throughout its course; it is only moderately thickened basally and terminates in a rather long, nearly straight process which is thin, dorsally black, ventrally colorless and gently spirally twisted, the tip is very finely granulate, bluntly rounded with a point at one side.

Female. Length, 2.1-2.5 mm. Similar to the male in coloration, the pattern on the abdomen in some specimens more distinct. The epigastric plate orange, darker than rest of the venter, the median lobe of epigynum broad, notched posteriorly and limited on each side by a chitinated ridge which is continued laterally. The openings are beneath the anterior edge of the ridges.

Holotype male, allotype female. California: San Francisco, sand dunes, November 11, 1907; paratypes, 1 male, 1 female, same data. California: Christine, May 30, 1936, 1 male; Fort Ross, May 28, 1936, 1 male, 2 females; Gualala, May 29, 1936, 1 male, 13 females.

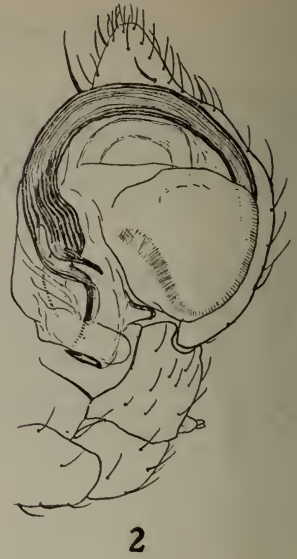
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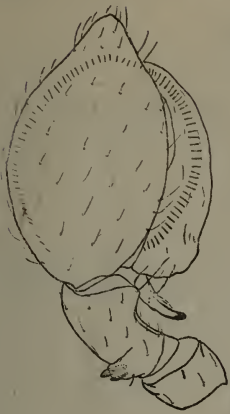
PLATE I.

- Fig. 1. *Dictyna cornupeta* n. sp. Right palpus, dorsal view.
- Fig. 2. *Dictyna cornupeta* n. sp. Right palpus, ventral view.
- Fig. 3. *Dictyna tridentata* n. sp. Right palpus, dorsal view.
- Fig. 4. *Dictyna tridentata* n. sp. Right palpus, ventral view.

PLATE II.

- Fig. 5. *Dictyna peragrata* n. sp. Right palpus, dorsal view.
- Fig. 6. *Dictyna peragrata* n. sp. Right palpus, ventral view.
- Fig. 7. *Dictyna peragrata* n. sp. Epigynum, adult.
- Fig. 8. *Dictyna peragrata* n. sp. Epigynum, immature.
- Fig. 9. *Dictyna francisca* n. sp. Epigynum.
- Fig. 10. *Dictyna francisca* n. sp. Right palpus, dorsal view.
- Fig. 11. *Dictyna francisca* n. sp. Right palpus, ventral view.





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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW SPECIES AND NEW GENERA OF AMERICAN
TINGIDAE (HEMIPTERA).

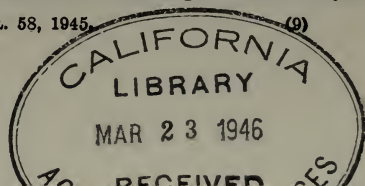
BY C. J. DRAKE AND E. J. HAMBLETON.

This paper is based upon lace bugs collected by E. J. Hambleton and some miscellaneous specimens from Central and South America. We are indebted to Mr. W. E. China of the British Museum for comparing the new species of *Leptopharsa* Stål (with transverse fasciae in costal areas) with the type of *L. constricta* Champion from Guatemala. Dr. R. I. Sailer has kindly loaned us the specimens of this group in the U. S. National Museum. The disposition of types is indicated beneath the descriptions of each new species.

Zelotingis, n. gen.

Head very short, the frontal pair of spines short, the others absent; bucculae short, broad, not meeting in front. Rostrum short, extending a little beyond mesosternum; mesosternum longitudinally furrowed so as to form rostral groove, without rostral laminae; metasternum slightly convex, the laminae low, widely separated, cordate, present on sides and behind. Eyes moderately large, transverse, exerted. Orifice distinct, rimmed. Antennae long, longly pilose, slender; segment I moderately long, stouter and more than twice as long as II; III longest, slenderest, slightly tapering apically, truncate at apex; IV extremely long, slightly thickened, about two-thirds the length of III. Antenniferous tubercles represented by broad laminae.

Pronotum moderately convex, pitted, tricarinate, the hind triangular process reticulate; hood moderately large, inflated, projecting over base of head; paranota, carinae, hood and outer margins of elytra beset with long fine hairs, the areolae large; carinae foliaceous, with large areolae, the lateral pair slightly convex within; paranota large, strongly reflexed. Elytra broad, much longer than abdomen, widely reticulate, divided into the usual area, the discoidal area not reaching middle of elytra.



Legs long, rather slender, beset with long hairs. Body beneath and bucculae moderately hairy.

Generotype, *Zelotising aspidospermae* (Drake and Hambleton) (= *Stenocysta aspidospermae*).

This genus may be separated from *Stenocysta* Champion by the long fourth antennal segment (attached at the centre of apex of third segment), large areolae, and much shorter discoidal area of elytra.

Zelotising aspidospermae is represented in our collection by specimens from Minas Gerais, Brasil (types) and Horqueta, Paraguay. It feeds on *Aspidosperma melanocalyx* Muell. Arg.

Vatiga, n. gen.

Elongate, slender, subparallel. Head short, usually with three spines, the front pair atrophied or wanting, sometimes with median wanting. Antennae long, slender, the fourth segment generally as long or longer than one and two conjoined, the first segment usually long. Bucculae contiguous in front. Rostrum extending on mesosternum. Rostral channel deeply, broadly constricted on mesosternum. Pronotum convex, pitted, tricarinate; collar distinct; calli present; paranota narrow, areolate, somewhat rectangular in outline; triangular process well developed, areolate. Orifice distinct. Elytra elongate, divided into usual areas, the discoidal area extending around middle of elytra. Hypocostal ridge present. Hood absent, sometimes the median carina slightly elevated on collar.

Generotype, *Vatiga vicosana*, n. sp.

The name *Vatiga* is an anagram of *Tigava*. The general shape of the insect and the deeply constricted rostral groove on the mesosternum separate this genus from *Tigava* Stål or *Leptopharsa* Stål. *Leptopharsa longula* Drake (1922), *L. manihotae* Drake (1934), *L. illudens* Drake (1922), *L. illudens variantis* Drake (1930), *Tigava cassiae* Drake and Hambleton (1934), *T. lonchocarpa* Drake and Hambleton (1944) and *T. sesoris* Drake and Hambleton (1942) are congeneric and belong to the new genus *Vatiga*. These species are similar in form and have the rostral channel deeply constricted.

Vatiga vicosana, n. sp.

Moderately large, elongate, brown, the carinae, paranota, costal area and cephalic spines testaceous. Head short, smooth; median spine porrect, moderately long; hind pair of spines long, slender, strongly recurved forward, the anterior ends nearly touching or touching surface of head. Antennae very long, indistinctly pilose; segment I rather long, three times as long and considerably stouter than II, the latter short; III very slender testaceous, straight, three times as long as IV; IV moderately thickened, hairy, mostly brownish black. Antenniferous tubercles broad. Rostrum yellowish brown, not quite reaching middle of mesosternum; rostral laminae testaceous, areolate, deeply constricted on mesosternum. Bucculae broad, areolate, margined with testaceous.

Front margin of pronotum testaceous. Body beneath brown, smooth, somewhat shiny.

Paranota moderately transversely convex, deeply pitted, tricarinate; carinae foliaceous, uniseriate, the areolae small; lateral pair slightly divaricating anteriorly, faintly convex within in front, median carina raised on collar; collar distinct, uniseriate; calli deep, dark; paranota testaceous, biseriata in front, narrower and uniseriate behind. Elytra elongate, narrow, slightly constricted behind middle; costal area biseriata, moderately wide, testaceous; discoidal area extending slightly beyond middle, widest near middle, there five areolae deep; sutural areas completely overlapping in repose, the areolae becoming a little larger apically.

Length, 3.00 mm.; width, 1.10 mm.

Type (male), allotype (female) and 5 paratypes, Vicosá, Minas Gerais, Brazil, April 29, 1934, E. J. Hambleton, in Drake Collection.

The lighter color, more foliaceous carinae and narrower paranota separate this species from *V. variana*, n. sp.

Vatiga variana, n. sp.

Head black, short, the hind pair of spines very short, adpressed, testaceous, the others wanting. Bucculae blackish, margined with testaceous. Eyes transverse, black. Rostrum short, brownish, extending on mesosternum. Antennae long, indistinctly pilose; segment I moderately long, black, nearly two and one-half times as long as II; II very short, black, much slenderer; III long, dark fuscous, pale at apex, three times as long as IV; IV hairy, black-fuscous. Body beneath black, rostral laminae testaceous, deeply constricted on mesosternum. Legs slender, brownish testaceous, the tibiae testaceous, the tarsi dark.

Pronotum moderately convex, tricarinate, strongly narrowed anteriorly; carinae distinct, mostly testaceous, dark on disc, low, indistinctly areolate; lateral carinae slightly concave within anteriorly; collar distinct, truncate in front, scarcely elevated at middle. Paranota narrow, narrower than in other species of the genus, uniseriate opposite calli, biseriata in front, the outer margins straight. Elytra moderately broad, with discoidal area moderately broad, biseriata (on one side with two extra areolae in widest part); subcostal area biseriata, narrow; discoidal area reaching middle of elytra, five areolae deep in widest part; sutural area becoming more widely areolate posteriorly.

Length, 3.85 mm.; width, 2.25 mm.

Type (female), Rio Grande do Sul, Brazil, in Drake Collection. Separated from its congeners by the narrower paranota, blackish color and short hind pair of spines. It is most closely related to *V. longula* (Drake) and separated from it by more lacy appearance, much shorter first antennal segment, shorter hind pair of spines and dark color.

Leptopharsa rumiana, n. sp.

Small, slender, whitish testaceous, the head and pronotum black, a transverse band in costal area near base of elytra, discoidal, sutural and

most of subcostal area fuscous to dark fuscous. Head short, often covered with whitish exudations, with five moderately long spines, the three anterior ones black (median longest), and the hind pair brownish. Antennae moderately long, indistinctly pilose, testaceous, the basal two and apical segments slightly darker, usually brown; segments I and II short, moderately thickened, the former longer and slightly thicker; segment III very slender, straight, about three times the length of IV, the latter slightly enlarged. Rostrum brownish, almost extending to end of sulcus; rostral laminae testaceous. Body beneath black; bucculae margined with testaceous.

Pronotum moderately convex, coarsely deeply pitted, the paranota, carinae, hood and most of triangular process testaceous; hood small, inflated; paranota narrow, slightly reflexed, biseriate, the areolae small; carinae foliaceous, uniseriate, the areolae small, the lateral pair distinctly constricted behind disc, the median with a small dark fuscous spot on disc; triangular process areolate. Elytra rather narrow, widest at transverse band, distinctly constricted behind middle; costal area almost entirely biseriate, uniseriate apically; subcostal area narrower, mostly biseriate; discoidal area short, not extending to middle of elytra, with a slightly raised, dark fuscous spot at apex, widest beyond middle, there three areolae deep. Legs very slender, whitish testaceous. Abdomen beneath black.

Length, 2.55 mm.; width, 1.00 mm.

Type (male), allotype (female) and 42 paratypes, taken on fiber plant, *Malvaviscus arboreus* at San Andres, El Salvador, July 21-26, 1944, E. J. Hambleton; 2 paratypes, Finca, Los Cerritos, Guatemala, July 6, 1944, E. J. Hambleton.

This species differs from *L. constricta* Champion in having a smaller, less inflated hood, and the antennae is longer with fourth segment yellowish or brownish instead of black. The elytra are also narrower and less concave along costal margins. Type in Drake Collection. Paratypes in U. S. National and British Museum.

***Leptopharsa machalana*, n. sp.**

Small, moderately elongate, the costal area with a prominent, dark-fuscous band near the base. Pronotum moderately convex, deeply pitted, black, the triangular process, hood, carinae and paranota whitish testaceous; hood small, moderately swollen; paranota biseriate, the areolae small; carinae uniseriate, the areolae very small, the lateral carinae constricted behind disc and slightly concave within on disc; paranota, hood, apical portion of triangular process and carinae whitish testaceous, the median with fuscous spot on disc. Antennae moderately long, indistinctly pilose; segment I short, dark fuscous, slightly stouter and longer than II, the latter testaceous; III testaceous, about three times as long as IV; IV yellowish to pale brown, slightly enlarged, shortly pilose.

Head black, with five moderately long spines, the hind pair brownish,

the others dark, the median longest; eyes reddish brown to dark; elytra very similar in color and markings to *L. rumiana* n. sp. Legs very slender, whitish testaceous. Rostrum extending to base of mesosternum. Body beneath black.

Length, 2.25 mm.; width, 0.85 mm.

Type (male), allotype (female) and 12 paratypes, Machala, Ecuador, September 27, 1944, taken on a species of *Desmodium* by E. J. Hambleton. Akin to *L. rumiana* n. sp. but smaller and with less inflated hood. Type in Drake Collection.

***Leptopharsa machalana vinnula*, n. var.**

Closely allied to *L. machalana* n. sp. from Ecuador in size, form and color, but differs from it in having the first two antennal segments and the apical half of fourth dark fuscous; the hood slightly more tectiform, the nervures infusate. Paranota narrowed anteriorly, the nervelets bordering humeri infusate. Sutural area with three large and two or three smaller areolae before apex hyaline. Rostrum extending to meso-metasternal suture. Legs very slender, testaceous. Antennae moderately long, indistinctly pilose; segment I short, longer and stouter than II, both dark fuscous; III, whitish testaceous, about three times as long as IV, the latter moderately swollen, hairy, the distal half dark fuscous. Other structures and color very similar to *L. machalana*.

Length, 2.20 mm.; width, 0.85 mm.

Type (male), allotype (female) and 32 paratypes, Fort Pierce, Florida, October 7, 1942, W. Mathis; taken on Beggars lice and Caesar's burr. Type in U. S. National Museum.

Distinctly narrower and with the hood much less swollen than in *L. clitoriae* (Heidemann) or *L. constricta* (Champion).

Since writing the above description, numerous specimens, taken on *Desmodium* (Leguminosae), Puerto Barrios, Guat., May 8, 1945, are almost indistinguishable from the Florida examples of *vinnula*, and indicates that *vinnula* is not more than a variety of *L. machalana*. It seems advisable to treat *vinnula* as a variety because of host plants, the wide range or distribution and slight color differences of antennae. More information is needed on the food habits of the *constricta* group of *Leptopharsa*.

***Leptopharsa siderea*, n. sp.**

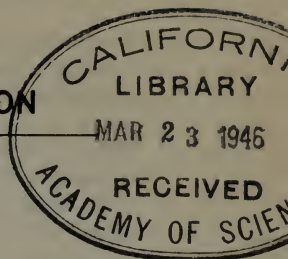
Very similar to *L. vinnula* n. sp. in size and general appearance, but easily separated from it and other members of the group by the absence of a transverse band in the costal area. Hood, paranota, carinae, apex of hind pronotal process and costal areas of elytra whitish testaceous. Pronotum moderately convex, black, finely pitted; carinae finely uniseriate, the lateral carinae slightly constricted behind. Elytra moderately constricted behind middle; costal area moderately wide, irregularly uniseriate in front, biseriate in widest part; subcostal area triseriate, the nervures brown to fuscous; discoidal area small, not reaching middle of

elytra, triseriate. The nervures also brown to fuscous and with centres whitish; sutural area brown, with three large areolae near the apex clear, the others brown. Antennae moderately long, indistinctly pilose, slender; segments I and II brownish, short, the latter slenderer and nearly one-half the length of the first; III very long, slender, testaceous, nearly two and one-half times the length of IV, the latter slightly thickened, the apical two-thirds dark brown or fuscous. Rostrum brownish, extending between intermediate coxae. Orifice with prominent, white, projecting margin. Legs slender, testaceous, the tarsi dark.

Length, 2.22 mm.; width, 85 mm.

Type (female) and allotype (male), taken on undetermined legume, Esquintla, Guat., June 27, 1945, E. J. Hambleton, in Drake Collection. The whitish testaceous costal area without transverse bands separates this species from *C. constricta* Champion and the new species described above.

PROCEEDINGS
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A SMALL HERPETOLOGICAL COLLECTION FROM
EASTERN PERU.

EMMETT REID DUNN, *Haverford College.*

Dr. Doris Cochran of the United States National Museum recently sent me for identification a Caecilian and twelve snakes from Peru. The material was sent in by Mr. J. G. Sanders in 1944, and bears the data "Fundo Sinchono, 4600-5000 feet, Prov. Loretta, Peru." This cinchona plantation is in the Province of Loreta, in the northeastern part of Peru. The nearest town is Tinga Maria in Huanuco Province over the Andean Divide, 72 Km. to the west.

Caecilia pachynema Gqntner. No. 119008. A specimen 1030 mm. long, with 146 primaries and no secondaries.

Tropidophis taczanowskyi (Steindachner). No. 119009. This seems to be the first South American *Tropidophis* to reach this country, and the seventh to be recorded. It is a female 268 mm. long, tail 33 mm. Dorsals 23-21, keeled save for the lower four rows; ventrals 152; anal single; caudals 27; upper labials 8, third and fourth in orbit on right side, third in orbit on left; lower labials 10, two in contact with geneials; suture between internasals very indistinct; two cross rows of plates between internasals and frontal, five in the anterior one (=two loreals and three anterior prefrontals), two in the posterior (=posterior prefrontals); one preocular; three postoculars, the lower almost a subocular; temporals 3-3; parietals entire; rich brown above, yellow below; black markings on temporals and as vague dots on adjacent scales of rows 2-3, 5-7, and vertebrales and paravertebrales (=three vague rows of spots on each side); large circular black blotches below, which may extend onto first scale row; maxillary teeth 18, subequal.

The specimen is unique in having separate loreals (they are fused with the anterior prefrontals in all other known *Tropidophis*). The count of maxillary teeth (18) is distinctly higher than that of Antillean *Tropidophis* (12-15), but agrees with the number (19) given for the only other South American specimen for which this count is recorded (type of *paucisquamis*).

Previous reports of *Tropidophis* from South America are as follows: *Ungalia taczanowskyi* Steindachner 1879, Sitz. Ak. Wien 79, p. 522. Two specimens from Tambillo, Peru. I cannot place the locality. A "tambo" was a stopping place on the old Inca road system, and there were many of them. Some of them persist, and some are on maps, some not. A "tambillo" would be an insignificant "tambo". There are at least eleven in Peru. Boulenger (1893, Cat. Snakes British Mus. Nat. Hist., ed. 2, vol. 1, p. 111) records a specimen from Guayaquil, Ecuador.

Ungalia paucisquamis Muller 1901 in Schenskel, Verh. Nat. Ges. Basel 13, pl. 154. A specimen from "South America." Amaral (1930, Mem. Inst. Butantan 4, 1, pl. 5) records a specimen from Santo Armero (near Serra de Paranapiacaba), Sao Paulo, Brazil.

Ungalia brasiliensis Anderson 1901, Bih. Svenska Vet. Ak. Handl. 27, p. 4, pl. 1, fig. 1. A specimen from "Brazil."

The scale counts indicate a division on the basis of ventrals and caudals, but not on a basis of dorsals.

T. taczanowskyi.

Guayaquil	ventr. 149	caud. 25	dors. 23 keeled	
Tambillo	150	25	23 "	Type
"	160	25	23 "	Type
Loreta	152	27	23 "	

T. paucisquamis.

"S. Amer."	178	40	21 smooth	
			Type <i>paucisquamis.</i>	
"Brazil	178	37	21 smooth	
			Type <i>brasiliensis.</i>	
Sao Paulo	175	32	23 keeled	

The closely allied and equally rare genus *Ungaliophis* (one specimen from each of the countries Colombia, Panamá, Costa Rica; several from Guatemala) seems to intervene between the rare *Tropidophis* of South America and the common *Tropidophis* of the Greater Antilles. Whereas in *Tropidophis* the loreal is fused (except in the present specimen) and the prefrontals are much subdivided, in *Ungaliophis* the loreal is retained (sometimes subdivided) and the prefrontals are fused into a single scale.

The single South American specimen of *Ungaliophis* was taken at Andes, Antioquia, Colombia (a town on the east slope of the western Andes at 1357 meters elevation). It had 19 smooth dorsals, 226 ventrals, and 41 caudals. It served as the type of *U. danieli* Prado (1940, Mem. Inst. Butantan 14, p. 35).

Atractus sp. (cf. *badius*). No. 119011. A male with long loreal, long upper second temporal, 7 upper labials, 17 dorsals, 2 postoculars, 4 sublabials in contact with geneals, 146 ventrals, and 32 caudals. The markings consist of two-scale light bars separating four-scale darker blotches, both of which fade gradually into the uniform drab of the sides and belly.

The scalation is close to that of typical *badius* (type ventr. 154, caud.

36), whose markings, however, are of equal light and dark crossbands, more prominent anteriorly. I rather suspect that this snake is what has been called "*badius*" from Peru; a very similar if not identical form has been called "*badius*" from the Oriente of Colombia.

Dipsas latifasciatus (Boulenger). No. 119013. A female with 182 ventrals, 90 caudals; nine upper labials, 4-6 entering eye; a small preocular above loreal; two postoculars; temporals 2-3; 14 lower labials, two pairs in contact, five in contact with the first of the two or three pairs of square genaeals.

Dipsas schunkii (Boulenger). No. 119014. A female with 189 ventrals; 93 caudals; eight upper labials, 4-5 entering eye; a small preocular above loreal; a tiny preocular below loreal on left side; two postoculars; temporals 1-2; twelve lower labials, one pair in contact, five in contact with the first of the three pairs of square genaeals.

Xenodon rabdocephalus (Wied). No. 119012. A male with 144+1 ventrals, 45 caudals; 19-15 dorsals; 8 upper labials.

Oxyrhopus petola ssp. No. 119018. A male with 199 ventrals, 104 caudals; 7 upper labials; 17-15 dorsals; 33 black body bars.

Clelia clelia ssp. No. 119015. A male with 209 ventrals, 91 caudals; 7 upper labials; 19-17 dorsals.

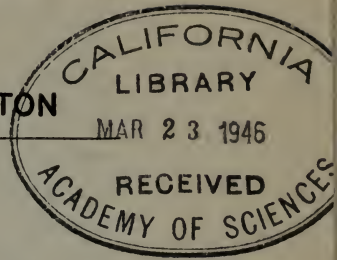
Chironius fuscus ssp. No. 119010. A female with 155+1 ventrals, 122 caudals; 10-10 dorsals; 9 upper labials; probably green in life.

Leptomicrurus narduccii (Jan.) No. 119019. A male with 271 ventrals, 19 caudals; temporals 1-1; 42 light spots on belly.

Micrurus langsdorffii (Wagler). No. 119016-17. The former, a male, has 204 ventrals, 40 caudals; 49 black body bars. The latter, a female, has 216 ventrals, 33 caudals; 61 black body bars. Neither have any light spots on the head. Both belong to the "*annellatus*" type of coloration, with the red rings turned black.

Bothrops oligolepis (Werner) = *chloromelas* Boulenger. No. 119020. A small female, 460 mm. long, has 188 ventrals, 44 caudals; 7 upper labials, the second in the pit; 23 dorsals. Four of the subcaudals are undivided. Werner's *oligolepis* from Bolivia has over ten years priority to Boulenger's *chloromelas* from Huancabamba near Oxypampa, Peru. This report records this species for the third time.

PROCEEDINGS
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TAXONOMIC NOTES ON AMERICAN CHIGGERS
(LARVAE OF THE MITE FAMILY TROMBICU-
LIDAE), INCLUDING THE REDESCRIPTION
OF A GENUS AND THE DESCRIPTIONS OF TWO
NEW SPECIES.

H. E. EWING.

In addition to the redescription of the genus *Euschöngastia* Ewing and the description of a new species of *Trombicula* Berlese and *Acomatacarus* Ewing notes are here presented on generic and subgeneric characters and the relationship of *Acariscus flui* (Van Thiel) and *Acariscus hominis* (Ewing).

Generic and Subgeneric Characters in the Family Trombiculidae.

More recent work on the taxonomy of the trombiculid mites, particularly the work done by means of the oil immersion lens and mounting media with better refractive indices than those formerly used has brought to light the fact that many of our generic and specific descriptions made in former years are seriously inadequate and inaccurate. For this reason the present writer is now reviewing the descriptions of all genotypes and many others, noting specific characters, previously neglected, overlooked or improperly described, and listing them for the evaluation of their possible subgeneric or generic value. In giving the description of a species or a genus, often it is of almost as much importance to state the absence of a structure, as it is to describe it fully if present.

The Genus *Euschöngastia* Ewing.

The genus *Euschöngastia* Ewing was established in 1938. The outstanding character of this genus is the peculiar palpal claw. This structure in the type species is strongly bent inward toward the tip and has several accessory prongs grouped together on the outer curve of the claw near its apex. The single included species was described from eight engorged specimens taken from a chipmunk, *Eutamias* sp. at Boise,

Idaho and three partly engorged specimens taken from a "mouse" at San Simeon, California.

Recently several well mounted, undetermined specimens belonging to this genus have come to hand. In studying them it was soon noticed that my former diagnosis needs revision, hence there is here given a formal description of the genus *Euschöngastia*.

1938. *Euschöngastia* Ewing, Jour. Wash. Acad. Sci., vol. 28, p. 293.

Chelicera stout; blade large, broad at base, sharp at apex, toothless or with a minute dorsal tooth, and extending beyond apex of basal segment. Galeal seta simple or branched. Palpus somewhat stout; palpal femur angulate laterally and with posterior margin broadly and deeply incurved; palpal claw with more than three prongs, the accessory prongs frequently being paired. No tracheae or spiracles. Dorsal plate with a large, crescentic ridge in front of each pseudostigma and a single median barbed or branched seta on or near its anterior margin. Antero lateral setae of dorsal plate large, barbed, similar to posterolateral setae; pseudostigmatic organs strongly clavate or capitate. Eyes poorly developed or absent. Abdomen without posterodorsal plates; dorsal setae numerous, humerals not situated in row II, rows II and III each with ten or more setae. Legs of median length; each coxa with a semi-plumose seta; tarsi three-clawed, middle claw being more slender than other two.

Type species.—*Euschöngastia americana* Ewing 1938.

Included species.—Besides the type species this genus includes *Euschöngastia sciuricola* (Ewing) (type host, red squirrel, *Sciurus hudsonicus richardsonii*, type locality, Florence, Montana) and possibly *Neoschöngastia blarinae* (Ewing) (type host, short-tailed shrew, *Blarina brevicauda*, type locality, Washington, D. C. Three partly engorged specimens taken from a "mouse" at San Simeon, California and regarded as being the same as *Euschöngastia americana* have been found to differ slightly from the specimens taken on the type host at the type locality of *Euschöngastia americana*.

Acariscus flui (Van Thiel 1930) and *Acariscus hominis* (Ewing 1933).

A recent study of additional material of *Acariscus hominis* (Ewing 1933) sent in by Lt. Charles D. Michener, Sn. C., shows that this species varies considerably in regard to the number and arrangement of the dorsal setae behind row IV and in the development of the second pair of eyes. In the type material of *hominis* the second eyes are very slightly smaller than the first while in some of the specimens sent in by Lt. Michener they are much smaller. The inner prong of the palpal claw also shows considerable variation being somewhat smaller than in the types.

Of particular interest among the material sent in by Lt. Michener are four specimens taken on grass at Santa Rosa, Colon Province, Panama. Except for an extra seta on one side in row III, the chaetotaxy of the dorsum of abdomen of all four specimens is exactly the same being 2, 8, 8, 8, 6, 4, 2, not counting the posterior marginals. In these specimens from grass the posterior eyes are much smaller than the anterior.

Possibly this material represents *Acariscus flui* (Van Thiel) but the anterior margin of the dorsal plate is incurved on each side of the middle as in *hominis* instead of being outwardly rounded or convex as in *A. flui*.

There is a tendency for the dorsal plate to be more heavily sclerotized in *A. hominis* specimens from the southeastern part of the United States. In some specimens taken from a quail at Savannah, Georgia, this increased sclerotization is so pronounced that an inverted crescentic or angulate line is formed behind the median seta delimiting a distinctive anterior area. Also this increased sclerotization in the specimens from Savannah has resulted in forming an irregular yet more or less distinct bar extending from one pseudostigma to the other.

The variations here noticed in *Acariscus hominis* indicate that there is a rather closely related *flui-hominis* complex which may consist of two closely related species, one of which has two varieties, or that the whole complex consists of three or possibly more varieties of the same species.

A NEW SPECIES OF TROMBICULA BERLESE.

The genus *Trombicula* Berlese (1905) is here considered in a restricted sense to include only those species in which the palpal claw is trifurcate and the abdominal setae usually over thirty.

Trombicula bakeri, new species.

(Fig. 1.)

Chelicera with large basal segment that is rounded laterally and ends dorsally in a stout, hooklike process; piercing apparatus of chelicera a curved blade with a single dorsal tooth and apparently no ventral tooth. Palpus stout; palpal femur somewhat angulate laterally; first seta bilaterally plumose, curved, and extending forward almost to the end of the palpal femur; second seta almost straight, with two lateral branches; palpal claw strongly curved, trifurcate, larger accessory prong almost straight, situated dorsally between the other two prongs and almost reaching tip of main prong, smaller accessory prong also almost straight, situated laterally next to larger prong. Galeal seta simple. Tracheae and spiracles absent. Dorsal plate minutely granular, with anterior margin about straight, the sides slightly diverging posteriorly, and posterior margin evenly rounded; anterolateral seta with lateral branches, when depressed backward reaching beyond base of posterolateral by almost one-third its length; submedian seta similar to antero-lateral and when depressed extending almost to posterior margin of dorsal plate, posterolateral seta similar to anterolateral but somewhat longer; pseudostigmata each situated in front of an oblique slit and on a level with posterolateral setae; pseudostigmatic organ flagelliform, and slightly longer than posterolateral seta, with only two or three short lateral branches. Eyes very large, the anterior and posterior being fused; ocular plate vestigial. Dorsal setae 2, 6, 6, 6, 4, 2, 2, 2 (counting latero-marginals). Ventral setae 2, 2, 8 (or 9), 2, 8, 2, 2, 2. All coxal setae bilaterally subplumose, there being one on each coxa. Tarsal armature as

usual. Length of dorsal plate 0.074 mm.; greatest width, 0.128 mm.
Length of unengorged larva, 0.315 mm.; width, 0.238 mm.

Type host.—Larva unattached.

Type locality.—Mount Popocatepetl (about 9,100 feet; west slope), Mexico.

Type slide (holotype).—U. S. National Museum No. 1517.

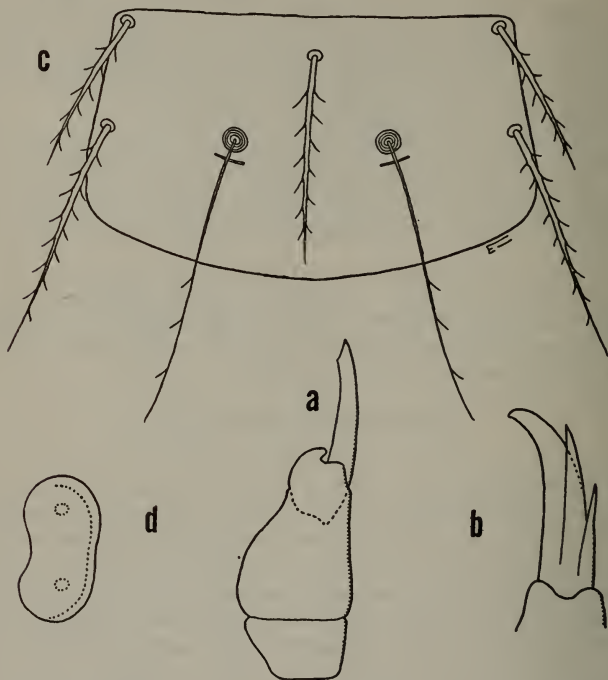


PLATE III—*Trombicula bakeri*, new species; a, dorsal view of left chelicera; b, dorsal view of right palpal claw; c, dorsal plate; d right eyes. All greatly but not equally enlarged.

Description based on a single specimen taken along with other mites in moss at type locality, December 29, 1942, by E. W. Baker, for whom the species is named. *T. bakeri* is an unusual species in two respects, in having the anterior and posterior eyes fused and in the arrangement of both dorsal and ventral setae into so many transverse rows. This latter condition is doubtless due to the migration of certain setae from the rows to which they belong phylogenetically. This new species is not closely related to any known species of *Trombicula*.

A NEW SPECIES OF ACOMATACARUS EWING.

The genus *Acomatacarus* Ewing (1942) is a derivative of the old genus *Leeuwenhoekia* Oudemans (1911). It is noted particularly for the presence of tracheae and a pair of spiracles which open laterally in front of the first pair of coxae.

Acomatacarus galli, new species.

(Fig. 2.)

Piercing apparatus of chelicera a broad sharply pointed blade with a single ventral tooth and three minute, appressed dorsal teeth. Palpus not swollen; femur broadly rounded along outer margin; first seta bilaterally semiplumose, curved, extending forward for about one-third its length beyond distal margin of palpal femur; second seta similar to first, situated near middle of patella and extending beyond distal margin of same by about two-thirds its length; palpal claw bifurcate, outer accessory prong conspicuous, curved, slender but falling far short of reaching the tip of primary prong. Galeal seta simple. Tracheae and spiracles present, the latter each with a conspicuous atrium. Dorsal plate large, sides slightly diverging posteriorly and posterior margin angulate; anterior process oval in front, total length of process less than distance from anterolateral seta to submedian seta; anterolateral seta subplumose, when depressed extending backward about to pseudostigma, situated considerably nearer submedian seta than posterolateral seta; submedian seta similar to anterolateral, when depressed extending to pseudostigma; posterolateral seta similar to anterolateral but slightly longer; pseudostigmata each cuplike and slightly in front of a level with posterolateral setae; pseudostigmatic organ fine, threadlike, simple, slightly longer than posterolateral seta. Eyes well developed, posterior smaller than anterior and situated about its diameter from the latter; ocular plate well developed. Dorsal setae very numerous, 80 to 90, few being arranged in rows; no row II or III. All coxal setae semiplumose there being two on coxa I, one on coxa II, and one on coxa III. Tarsal claws as usual.

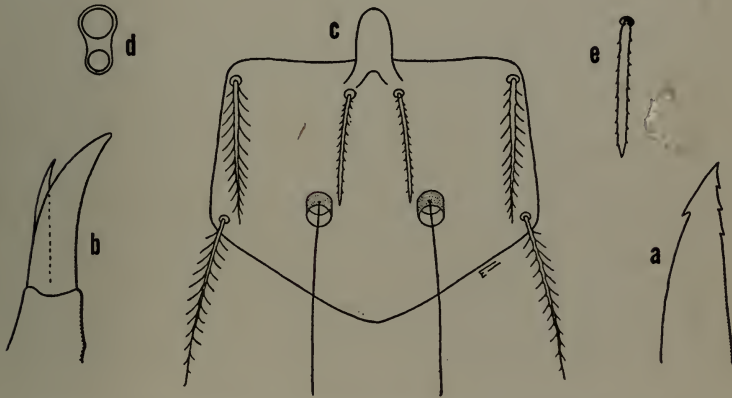


PLATE IV.—*Acomatacarus galli*, new species; a, dorsal oblique view of blade of chelicera; b, dorsal view of left palpal claw; c, dorsal plate; d, eyes; e, seta from posterior part of dorsum of abdomen. All greatly but not equally enlarged.

Length of dorsal plate (from tip of anterior process to tip of posterior angle), 0.076 mm.; greatest width of dorsal plate, 0.081 mm.; length of partly engorged individual, 0.37 mm.; width, 0.24 mm.

Type host.—"Chicken."

Type locality.—Uvalde, Texas.

Type slide (cotypes).—U. S. National Museum No. 1516.

Described from four cotypes mounted on the same slide with two specimens of *Eutrombicula alfreddugèsi* (Oudemans). They were taken from type host at type locality by E. Lester, January 13, 1943.

Only two species of *Acomatacarus* are known from the New World. They are separated by means of the following key:

Dorsal plate with posterior margin broadly rounded; a slightly curved ridge in front of each pseudostigma; first and second palpal setae simple. *A. arizonensis* Ewing 1942

Dorsal plate angulate posteriorly; no ridge in front of each pseudostigma; first and second palpal setae unilaterally semiplumose. . . .

A. galli, new species

PROCEEDINGS
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THE NAME OF THE ROYAL PALM.

FRANCIS HARPER.

A Bartramian name, whose validity has hitherto curiously escaped the notice of both Dr. Merrill (*Bartonia* 23, 1945) and myself, is *Palma elata*. It occurs at three places in the text of William Bartram's *Travels* (1791: 90, 94, 141), in each case without a validating description, and without a reference to the description on pages 115-116, which reads:

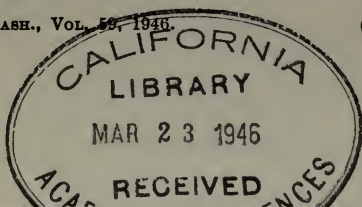
'The Palm trees here seem to be of a different species from the Cabbage tree; their strait trunks are sixty, eighty or ninety feet high, with a beautiful taper of a bright ash colour, until within six or seven feet of the top, where it is a fine green colour, crowned with an orb of rich green plumed leaves: I have measured the stem of these plumes fifteen feet in length, besides the plume, which is nearly of the same length.'

Since this description does not include any technical name, it did not seem possible to connect it definitely with the *Palma elata* referred to above. However, there is one other occurrence of the technical name in an easily overlooked place—page iv of the Contents (part II, chapter V): 'description of the Palma Elate'¹ (misprint, corrected to 'Palma Elata' in the London edition (1794: iv) and perhaps other editions). This unmistakable reference to the description on pages 115-116 validates the name.

This belated resurrection of Bartram's name apparently throws into synonymy *Oreodoxa regia* H. B. K. (*Nov. Gen. et Spec. Plantarum* 1: 305, (1815) 1816), later transferred to *Roystonea* as *R. regia* (H. B. K.) O.F. Cook (*Science* 12 (300): 479, 1900). Subsequently the last-mentioned author (*Bull. Torrey Bot. Club* 28 (10): 554, 1901) distinguished the Florida tree under the name of *Roystonea floridana*, leaving the name *regia* for the Cuban tree; but this distinction has not been recognized by such recent authorities as Small and Bailey.

The name of the royal palm now becomes *Roystonea elata* (Bartr.),

¹ The Linnaean genus *Elate* (1753), based upon an Indian palm, evidently requires no consideration in the present connection.



comb. nov. The original reference is: *Palma Elate* (misprint for *elata*) Bartram, *Travels*: iv, 115-116, 1791. The type locality is the St. John's River between Astor and Lake Dexter, Lake and Volusia Counties, Florida. The species has long since disappeared from this part of Florida.

Swarthmore, Pa.

PROCEEDINGS
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TWO NEW SPECIES OF THE MILLIPED GENERA
CHONAPHE AND *ANIULUS*.

BY RALPH V. CHAMBERLIN.

Of the two new species here described, *Chonaphe michigana* is the second species of its genus to be described. The generotype, *C. armata*, occurring in the Pacific Northwest, was described by Harger in 1872 under the genus *Polydesmus*. The new species of *Aniulus* belongs in a group of species including the common *A. venustus* (Wood) and *A. impressus* (Say). The specimens of *C. michigana* were included in a small collection made by Mr. R. R. Dreisbach in Michigan, and those of *A. orthodox* in one made in Illinois, Indiana, and Tennessee by Mr. W. F. Rapp, Jr. The types are retained by the author.

Chonaphe michigana, new species.

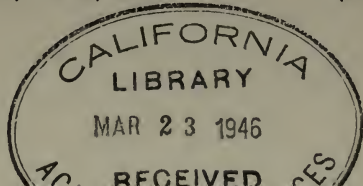
Dorsum black, with the carinae and a narrow band across the posterior border of each tergite yellow. Legs yellow. Antennae light brown, excepting last two articles which are darker, nearly black.

Legs long, without tarsal pads. A transverse series of four widely separated setae across clypeus with an extra seta below and close to the outermost one of these at each end of series. Also two long setae between the antennae and two toward vertex.

Dorsum strongly arched, with the carinae at middle of sides; the carinae of anterior segments nearly continuing the slant of the dorsum, but posteriorly less depressed. The collum a little narrower than the second tergite. Anal tergite with cauda narrow, distally blunt or shallowly notched, curving moderately downward. Dorsum smooth.

Sides smooth except for the pleral keels found on first seven segments.

Characterized by details of the male gonopods, such as the straight spine arising from the mesal corner of the laminate process at middle of the large lobe arising from femur. Gonopodal cavity large, with gono-



Pods widely separated at base. Details of gonopods as shown in figs. 1, and 2.

Width: 5.5 mm.

Length: About 31 mm.

Locality: Michigan: Midland County, in Midland Cemetery.

One male, the holotype, taken May 7, 1943, and one male, not in full color, taken in the county May 25, 1942, by R. R. Dreisbach.

This is a larger form than *C. armata* (Harger), the generotype, and is readily distinguishable in the details of the male gonopods.

***Aniulus orthodoxus*, new species.**

A species of medium size, color pattern typical. A median dorsal black line distinct, a series of black spots with adjacent light maculae along each side over the repugnatorial glands and a series of less dense dark spots along lower part of each side. Dorsum between spots in some much lighter than sides.

Last tergite with caudal angle acute, produced well beyond the anal valves, the produced portion straight, not at all decurved.

In the male the stipes of the mandible with distocaudal corner produced conspicuously as shown in the figure. The collum of the male is elongate, the lower margin straight with above it a single deep sulcus. (See further, fig. 3.)

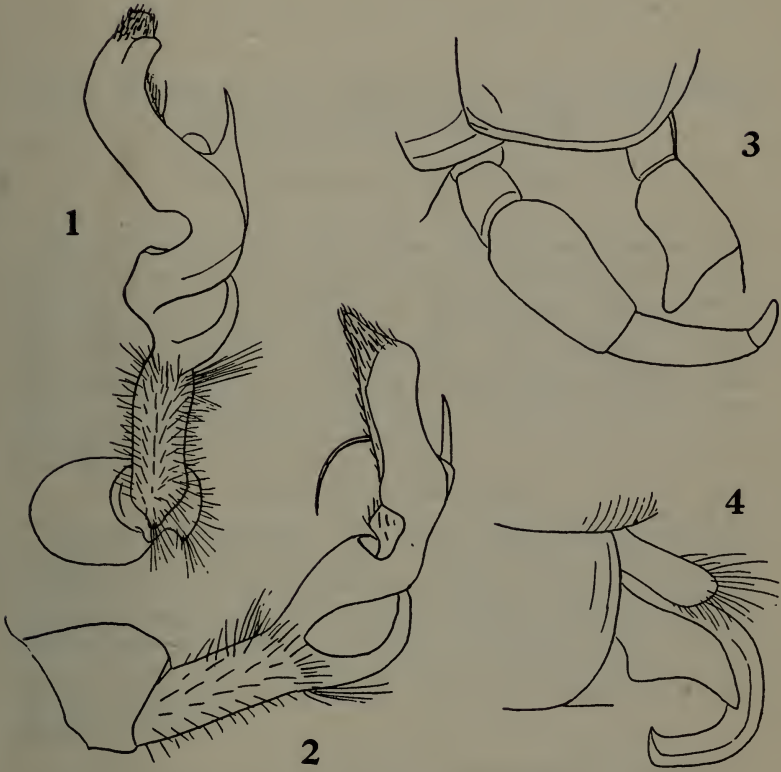
In the male the sternal plate of the eighth segment is but slightly bowed forward at middle, there touching but not overlapping the bases of the posterior gonopods. The form of the divisions of the anterior gonopods (coleopods) as shown in figure 4. Each posterior gonopod above base bent abruptly mesad to meet its mate at the mesal line, next curving caudad in contact with it and then outward and downward, the blade relatively broad. See further, fig. 4.

Length: About 27 mm.

Width: 2.2 mm.

Locality: Tennessee: Reelfoot Lake. One male and three females taken April 12, 1945, by J. and W. Rapp.

Distinct form *A. venustus* in the much broader blade of the posterior gonopods and from *A. impressus* in the form of the coxal lamina of the anterior gonopods as well as in the form and relations of the posterior pair.



New Millipeds of Genera *Chonaphe* and *Aniulus*.

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A NEW AMERICAN GENUS IN THE CHILOPOD
FAMILY HIMANTARIIDAE.

BY RALPH V. CHAMBERLIN.

The Himantariid genus here established embraces at present three known species,—the generotype, *Stenophilus coloradanus*, described below, *S. californicus*, (Chamberlin), originally described (1930) under the European genus *Meinertophilus*, and *S. audacior* (Chamberlin), placed originally (1909) under *Haplophilus*. The type of the new species is in the author's collection.

STENOPHILUS, new genus.

A genus of Himantariidae. The labrum deeply incised, the incision reaching nearly to the anterior edge. Mandible with teeth up to ten in number and with about six pectinate lamellae. Second maxillae with coxae completely fused, typically with an anterior median notch; claw of palpi straight or nearly so, smooth. Prehensors lacking chitinous lines. Tergites only obscurely bisulcate. No suprascutella or paratergites. No ventral pores present. Coxal pores numerous and uniformly distributed.

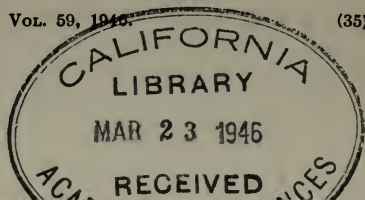
GENEROTYPE—STENOPHILUS COLORADANUS, new species.

Differing from the European *Meinertophilus* in lacking ventral pores on the sternites and in lacking chitinous lines on the prosternum of the prehensors.

Stenophilus coloradanus, new species.

Body gradually attenuated forward, more abruptly toward posterior end. Pale yellow in color, the head and antennae not darker. Prehensors also pale excepting the claws, which are light chestnut.

Head of form shown in fig. 1, the frontal plate not discrete. Antennae cylindrical, the articles mostly obviously shorter than in *S. californicus*, with the last article a little surpassing the three preceding taken together. (Fig. 2.)



Labrum with middle embayment large, armed in type with 13 close-set, large teeth as shown in fig. 3.

The second maxillae with coxae completely fused at middle line, without trace of suture; anterior margin of coxosternum notched as shown in the figure; palpi relatively stout, with claw smooth. (See fig. 4.)

Mandibles with six pectinate lamellae; dentate lamella with six teeth (fig. 5).

Basal plate very short, as wide as the head; overlapped by cephalic plate at middle, anterior border concavely excavated on each side as shown in the figure. (Fig. 1.) Prehensors nearly covered from above; claws smooth, when closed not attaining anterior margin of head; prosternum relatively broad, without chitinous lines, the anterior margin smooth. (See fig. 6.)

Second dorsal plate wide anteriorly and narrowed caudad, the succeeding plates of usual form.

Tergites bisulcate in middle region but absent or obscure in anterior and posterior regions.

Ventral plates smooth, without depressions, no pores detected.

Last ventral plate trapeziform, narrowed caudad. Coxal pores small and very small, numerous but not crowded, present over entire surface.

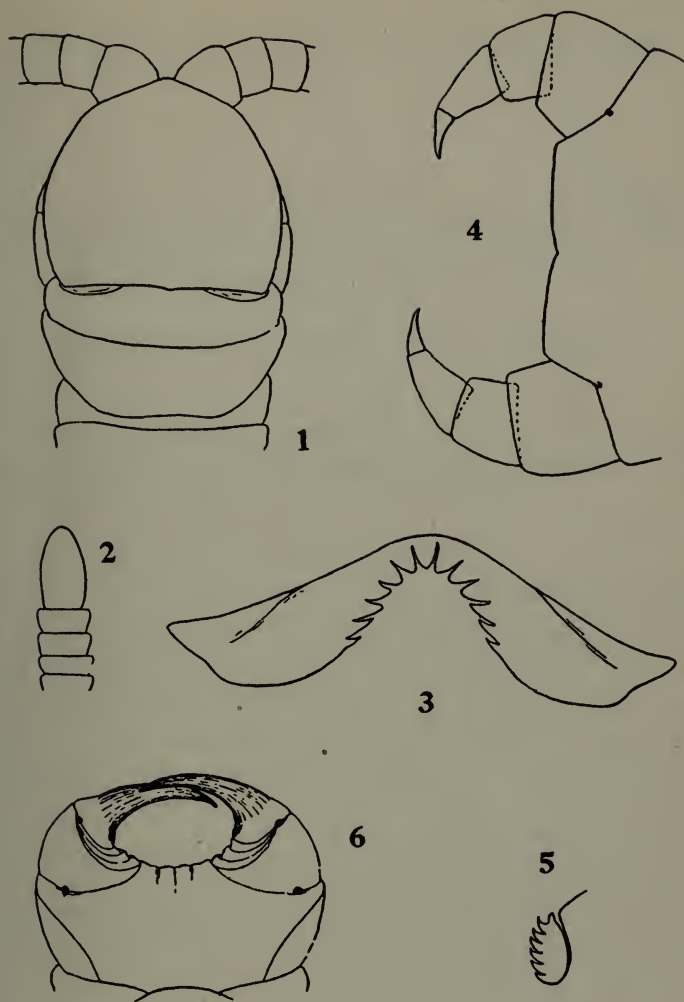
No suprascutella or paratergites. All spiracles circular. Spiraculiferous plates all free from tergites.

Pairs of legs in female holotype, 77.

Length, about 38 mm.

Locality:—Colorado: Mesa Verde. One female taken June 29, 1944, by Professor V. E. Shelford.

A smaller form than *S. californicus* (Chamberlin), with 77 pairs of legs as against 97, and conspicuously different in the form of the labrum and in its larger and more numerous teeth.



Stenophilus coloradanus, new species.

Fig. 1. Anterior end, dorsal view.

Fig. 3. Labrum.

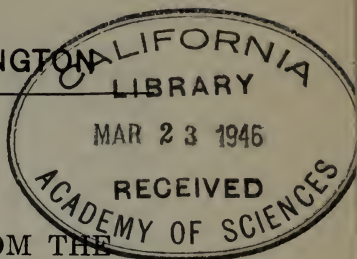
Fig. 5. Dentate plate of mandible.

Fig. 2. Distal end.

Fig. 4. Second maxillae.

Fig. 6. Prehensors.

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NEW SPECIES OF MOSQUITOES FROM THE
MARIANAS AND OKINAWA (DIPTERA,
CULICIDAE).¹

BY RICHARD M. BOHART, LT., H(S), USNR.²

Four new species are described in this paper so that they can be included in a forthcoming general treatise on mosquitoes of the Marianas Islands and Okinawa.

Aedes (*Finlaya*) *okinawanus*, n. sp.

Male.—Length of body 4.0 mm., wing 3.0 mm. Median area of vertex with pale lemon yellow, narrow curved and upright forked scales, flanked by a large spot of black broad appressed scales and a lateral spot of broad appressed creamy ones; eyes bordered with yellow narrow curved scales along inner half; palpus and proboscis black, palpus about two-thirds as long as proboscis, last segment about as long as its apical bristles. Scutum with distinct lines of pale lemon yellow consisting of a median line forking posteriorly, a submedian line on anterior half of scutum, a line around anterior margin of scutum which bows inward along fossal area and continues to posterior margin as a sublateral line, a few pale scales over wing base; scutellum with black broad appressed scales on mid lobe and with black and yellow narrow curved scales on all lobes; anterior pronotal lobe with whitish broad appressed scales; proepimeron with whitish broadly crescent-shaped scales; pleuron dark brown with several large patches of whitish broad appressed scales. Fore and mid femora with a broad pale line on hind surface, hind femur dark along whole length dorsally but with basal two-thirds pale in front and basal one-half pale on hind surface, a restricted knee spot present on hind femur, very indistinct on other femora; tibiae dark except for a few scales at base beneath and scattered along hind surface; fore tarsus dark, mid and hind tarsi with pale mark at base of first segment, hind tarsus also with pale joint marks over first 3 joints. Wing scales dark, halter

¹ I wish to thank Dr. Alan Stone, Division of Insect Identification, U. S. Department of Agriculture for his suggestions and assistance.

² Research Division, Bureau of Medicine and Surgery, Navy Department.

knob with dark and dull pale scales. Abdominal tergites I-VII with lateral basal silvery spots, sternites with broad pale basal bands. Genitalia as in figures 1-3; basal lobe attached to claspette and with about 7 leaf-like blades, more basally with setiform bristles which extend up harpaginal fold, gradually becoming thicker and flatter; inner margin of basistyle with a group of twisted bristles toward base; basistyle ventrally with a tight clump of about 13 long and rather pale bristles near apex.

Female.—About as in male except for hind tarsi. Palpus all dark and about one-fifth as long as proboscis. Lateral pale spot on vertex enclosing a small dark spot. Scutal lines slightly deeper in color than in male, approaching pale golden. Five-fifths of hind femur pale on posterior surface; tarsal marks more distinct than in male, first fore tarsal sometimes with a few basal pale scales; last hind tarsal with dull white scaling above.

Larva.—About 7 mm. long. Antenna (fig. 5) very slender, about one-half as long as head, a single hair inserted before middle and reaching to apex of shaft, shaft sparsely spiculate; clypeal spines very slender, brown; median hairs of mouth brush with small teeth; head hair A with 8 to 10 plumose branches; B single and very long, one and one-half times as long as head; C slightly posterior and close to B, with 4 or 5 plumose branches which are about half as long as B; d on a line with B, small and with 5 to 7 branches; mentum (fig. 4) subtriangular with about 19 sharp teeth. Shoulder hairs well developed; hair 0 short and bushy, about 25-branched; hairs 1 to 3 moderate in length, hair 1 with 2 or 3 branches, 2 single, 3 with 4 or 5 branches; hair 4 with 3 or 4 moderately long branches; hairs 5 and 7 very long, plumose and triple; hair 6 long and single. Lateral abdominal bristles double on I and II, single and long on III to VII. Comb of about 60 apically fringed teeth in a patch; lateral hair of segment VIII with 3 to 5 plumose branches. Siphon (fig. 6) about 3.5 times its basal diameter, gradually tapering toward apex, acus small, pecten of 22 to 26 teeth of which last 10 are about equal in size, pecten occupying basal half of tube; tuft at apical two-fifths, with 5 to 7 plumose branches, about as long as basal diameter of tube. Anal segment (fig. 6) with a two-thirds complete sclerotized ring which is spiculate along posterior margin, lateral single hair shorter than ring and divided into 3 or more branches at about middle; gills unequal and pointed, longer pair about as long as ring, shorter pair half as long; fan of 10 hair brushes, all in barred area; outer apical bristle (osc) single, inner apical bristle (isc) triple.

Type.—Male (U. S. National Museum No. 57758), Okuma, Okinawa, September, 1945, reared from a treehole (C. L. Harnage).

Paratypes.—Four males and 3 females, same data as type; 1 male and 32 females, Chizuka,³ Okinawa, August to September, 1945, taken

³ Also known as Chijuka and Kizyoka.

biting, resting on vegetation, and reared from treeholes; 1 male, Nago, Okinawa, May 14, 1945, reared from an earthenware jug; 8 larval paratypes on slides, Okuma, Okinawa, from treehole (C. L. Harnage). Other

specimens were collected at Kochiya, Shana Wan, Hentona and Euka. The females bite readily in deep shade during the day.

This species is closely related to *aureostriatus* (Doleschall) of which I have examined New Guinea specimens in the U. S. National Museum. Points of difference are the presence in *okinawanus* of all yellow upright vertex scales and the dark last hind tarsal in the male. The male genitalia have a row of setae on the harpaginal fold which are stouter than in *aureostriatus*, there is a group of twisted bristles at the base of the inner basistyle margin and there is a tight clump of about 13 long bristles near the apex of the basistyle ventrally. The larvae have a somewhat shorter siphon than those of *aureostriatus* but otherwise appear identical.

***Culex (Culiciomyia) ryukyensis*, n. sp.**

Male.—Length of body 3.0 mm., wing 2.5 mm. Vertex with broad median area covered with yellowish white narrow curved scales and brown upright forked ones, vertex laterally with a spot of dull whitish, broad appressed scales continued inward along eye margin; mouthparts dark-scaled, palpus longer than proboscis by one-fourth to one-third of last segment, last two segments sparsely haired (as compared with *pallidothorax* Theobald), first long segment with 3 or 4 short translucent scales projecting downwards. Scutum brown-scaled; pleuron without scales, pale green or pale brown, with a faint dark stripe from anterior pronotal lobe to upper part of mesepimeron, a small dark spot at anterior corner of sternopleuron; 1 lower mesepimeral bristle; legs dark-scaled except for undersurfaces of femora; plume scales of veins 2.1 and 2.2 about 6 times their greatest width. Abdomen with dull pale straight-margined basal bands on tergites II to VII; venter mainly pale-scaled. Genitalia (figs. 7-9) with the 2 black rods of subapical lobe plainly visible in dried specimen (also in all paratypes); lateral arm of paraproct elongate but not enlarged.

Female.—About as in male. Palpus about 3 times as long as clypeus and one-fifth proboscis length. Plume scales of veins 2.1 and 2.2 from 6 to 10 times as long as broad; fork cells one and one-half to twice as long as their stems.

Larva.—About 8.0 mm. long. Antenna (fig. 10) about five-sixths as long as head, tufted at middle, tuft not quite reaching to apex, shaft sparsely spiculate, not much darkened apically, insertions of apical and subapical bristles well separated; clypeal spines very slender and curved; head hair A about 7-branched, B and C with 3 branches reaching a short distance beyond clypeus, d simple; mentum (fig. 11) subpyramidal with about 20 small teeth and 7 larger ones. Shoulder hairs moderate reaching about to middle of head; hairs 1 to 3 on a sclerotized plate, 1 double, 2 single, 3 single or double, 4, 7 and 8 double, 5 and 6 single. Lateral abdominal bristles double on I and II, single or rarely double on III to VI. Comb of about 55 slender and apically fringed teeth without a distinct apical spine, lateral hair of segment VIII with about 7 plumose branches. Siphon (fig. 12) about 6 times its basal diameter, tapering

gradually to a narrow and somewhat upturned apex, with 3 pairs of small sublateral double hairs along apical two-fifths, pecten of 14 to 20 teeth along basal one-fourth of tube. Anal segment (fig. 12) with a complete sclerotized ring which is strongly spiculate along its posterior edge, lateral single hair about as long as ring; gills unequal, shorter pair twice as long as anal ring, fan of 8-hair brushes, all in barred area; outer and inner apical bristles (osc and isc) single.

Type.—Male (U. S. National Museum No. 57759), Chizuka, Okinawa, September, 1945, collected resting on a damp rock (R. Bohart and R. Ingram).

Paratypes.—30 males and 15 females, Chizuka; Okinawa, August and September 1945, collected from damp rocks and reared from rock holes; 9 males, 6 females and 4 larvae (on slides), Kochiya, Okinawa, June 15, 1945, from an earthenware crock in the woods; 1 male, Hedo, Okinawa, September 23, 1945; 6 larvae (on slides), Yaba, Motabu Peninsula, Okinawa, May 1945, from an earthenware crock by the roadside. All paratypes collected by R. Bohart and R. Ingram. Females of *ryukyensis* were not observed to bite.

This species appears to be most closely related to the Indian *bailyi* Barraud which also has an uncrested male basistyle, and reduced pleural markings. It differs from *bailyi*, however, in having the male palpi, extending beyond the proboscis by less than half of the length of the last segment (the whole last segment in *bailyi*), in the darkened anterior corner of the sternopleuron, and in details of the male genitalia (figs. 7-9). The larva (figs. 10-12) checks closely with the description of *viridiventer* Giles given by Barraud (Barraud, P. J., 1934, Fauna, British India, Diptera, vol. 5, Culicidae, p. 379) but differs in having the siphon tufts almost invariably double, in having only 3 or 4 denticles on the pecten teeth instead of 5 to 7, and in the pointed anal gills.

Culex (*Lophoceraomyia*) *tuberis*, n. sp.

Male.—Length of body 3 mm., wing 2.5 mm. Vertex covered with pale narrow curved and dark upright forked scales in broad median area, laterally with a large spot of pale broad appressed scales continued inward along eye margin; torus with a pronounced knob at upper inner angle; flagellum with specialized setae on segments VI to X (torus considered as first segment); VI with 7 or 8 yellowish setae of varying lengths, the longest about like those on X; VII to IX with matted and twisted tufts, shortest on VIII; X with 6 slender setae; mouthparts dark, palpus longer than proboscis by about length of last segment, last 2 segments not very hairy, no row of stiff hairs at base of palpus. Scutal integument pale brown with indistinct submedian dark lines and with hair-like brown scales; pleuron almost uniformly pale brown with a few scattered scales, most evident along lower hind margin of sternopleuron, no lower mesepimeral bristle; femora with a line of pale scales beneath, tibiae and tarsi dark. Abdominal tergites dark-scaled, venter with some paler scales. Genitalia (figs. 13-16) with distal division of subapical lobe of basistyle

greatly elongated and hairy, bearing at its base a long blade and at its apex 2 short curved setae and a short blade of distinctive shape; inner margin of basistyle with a row of 6 (7 in one paratype) long curved bristles.

Larva.—A single specimen which is probably this species was found in a seepage pool at Ginka, Okinawa (R. Ingram) in company with *C. (Neoculex) hayashii* Yamada. It appears to be very similar to that of *mammilifer* Leicester according to the characters given by P. J. Barraud (1934, Fauna British India, Diptera vol. V, Culicidae). It has the following salient characters: Antenna tufted at apical two-thirds, only slightly darkened at base and beyond tuft; head hairs B and C fairly long and double; comb about 50 scales in a patch; siphon distinctly but gently curved upwards, about 10 times its basal diameter, with 4 pairs of double hairs which are about as long as diameter of tube subapically, 17 pecten teeth, each with about 7 denticles; anal gills pointed and subequal, longer pair a little longer than anal ring.

Type.—Male (U. S. National Museum No. 57760), Chizuka, Okinawa, September, 1945, reared from larvae collected in a rockhole along a stream (R. Bohart and R. Ingram).

Paratypes.—Two males, same data as holotype.

This species is related to *minor* Leicester, *mammilifer* Leicester, *uniformis* Theobald, *plantaginis* Barraud, *mindinaoensis* Baisas and *nolledoi* Baisas, all of which in the male have a knob on the torus, specialized setae on antennal segments VI to IX or X and an unbanded abdomen. It differs from all of these by the elongate hairy distal division of the subapical lobe of the basistyle. In addition to the length of the distal division, the terminal processes are distinctive (fig. 13). Except in this last character it closely resembles *nolledoi*, of which I have seen paratypes. The scutal integument of *tuberis* is pale brown instead of dark brown as in *nolledoi*, however.

Culex (Culex) litoralis, n. sp.

Male.—Length of body 3.5 mm., wing 2.9 mm. Vertex with median area covered with pale yellowish narrow curved and upright forked scales, a few submedian dark upright scales, vertex laterally with a large spot of dull white, broad appressed scales. Palpus longer than proboscis by the last segment; first long segment (actual II and III) as seen laterally with five bands of about equal length, those of base, middle and apex black, the other two pale yellow; subterminal segment with a narrow basal pale band; terminal segment with narrow basal and apical pale bands; first long segment with a row of short ventral hairs on apical one-half and a lateral row of long hairs on apical one-fourth. Proboscis with a pale ring just beyond middle, taking up one-fifth of proboscis. Scales of anterior pronotal lobe, proepimeron, scutum and scutellum narrow curved and pale yellowish; scutum also with dark curved scales forming a spot in fossal area and a fringe around antescutellar area; scutal scales mostly scimitar-like and imparting a shaggy appearance; pleuron with 3 small spots of pale broad appressed scales, integument

mottled, darkest in postspiracular area and on sternopleuron except in scaled portions. Wing dark-scaled; halter knob entirely pale. Posterior surface of femora mostly pale, anterior surface of fore and mid femora dark and unspeckled, that of hind femur pale on most of basal two-thirds; tibiae dark-scaled; tarsi with narrow pale joint bands. Dorsum of abdomen with broad whitish yellow basal bands on II-VII, the bands occupying one-half or more of each segment, all more or less produced backwards at mid line of body, segment VIII with a lateral spot; venter of abdomen mostly pale-scaled. Genitalia (figs. 17-19) with basal arm of paraproct very small.

Female.—About as in male. Palpus about one-fourth proboscis length, pale at tip; pale ring of proboscis one-fourth to nearly one-third proboscis length; dark scutal areas more distinct than in male. Costa with a line of basal pale scales on its posterior margin above. Pale tergal bands most often produced on II to V, rarely occupying less than half of segment.

Larva.—Head broad; antenna (fig. 20) relatively short and slightly bowed, constricted and tufted at apical third, tuft surpassing antennal apex, basal two-thirds of shaft spiculate; apical third smooth but darkened, apical and subapical bristles arising close together and about equal in length; clypeal spines (fig. 22) very stout and spatulate, light brown in color; head hair A 6-branched, B double, C triple, d simple, e triple, hairs B and C hardly reaching past middle of antenna; mentum (fig. 21) subtriangular with about 15 teeth. Pronotal hairs fine and moderate in length, shoulder hairs (from left to right): 8 small and single, 7 double, 6 to 4 single, 3 to 1 single on a sclerotized plate. Lateral abdominal bristles triple on I and II, double on III to VI. Comb of about 30 apically fringed teeth without a distinct apical spine, lateral hair of segment VIII of about 10 plumose branches, siphon (fig. 23) tapering gradually toward apex, about 3.5 times as long as broad at base, with 8 to 11 long multiple hair tufts arranged in an irregular ventral row along apical three-fourths of tube, 2 pairs of short sublateral posterior tufts, acus well developed, pecten of 12-16 often irregularly placed stout teeth with 2 or 3 large denticles along anterior edge, pecten extending along entire basal third of tube. Anal segment (fig. 23) with a partial sclerotized ring which is apically spiculate, lateral single hair inserted just outside sclerotized area; gills short, rounded bud-like, slightly unequal; fan of 12 hair brushes, all in barred area; outer apical bristle (osc) single, inner apical bristle (isc) double or triple.

Type.—Male, Rota Island (north shore), Marianas Islands, October 26, 1945, reared from brackish coral rockhole (R. Bohart and R. Ingram).

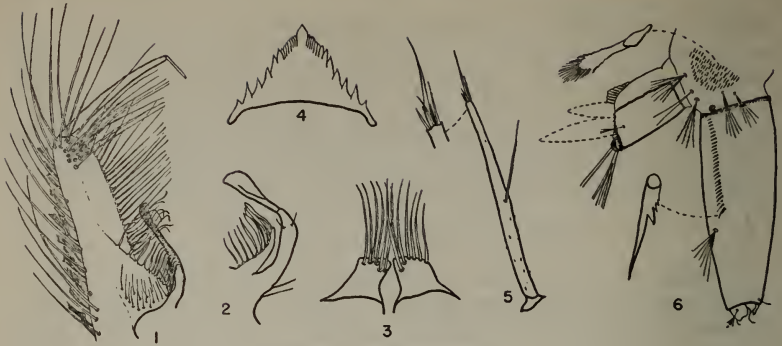
Paratypes.—21 males, 25 females, 10 larvae and 1 pupa (larvae and pupa on slides), same data as type. I have also studied specimens from the islands of Tinian and Guam.

This species was first collected by Dr. S. F. Bailey in the fall of 1945 during the invasion of the island of Tinian. It has since been found on Guam and Rota. It is abundant during rainy spells following periods of unusually high tides, the larvae breeding in brackish water of coral

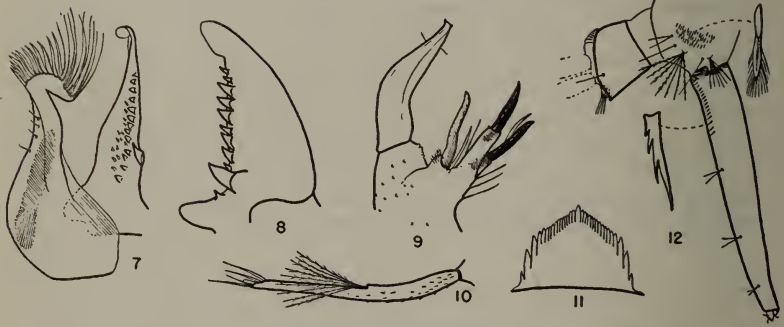
rockholes and artificial containers along the shore. The species is related to *jepsoni* Theobald and *annulirostris* Skuse. From the former it differs by its much paler vertex and scutum, its unspckled mid femora, and the broader and often produced abdominal bands. From *annulirostris* it differs particularly by the much broader abdominal bands. The larva (figs. 20-23) has bud-like gills as in *jepsoni*, but the pecten teeth are much stouter and with fewer denticles, and the anal ring is incomplete.

EXPLANATION OF PLATE VII.

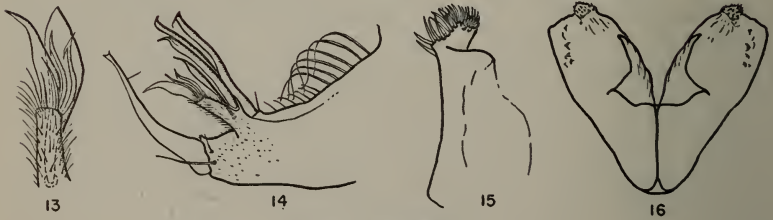
Figures 1-6, *Aedes okinawanus*: 1, basistyle and dististyle (ventral); 2, claspette and basal lobe (lateral); 3, lobes of ninth male tergite; 4, larval mentum; 5, larval antenna; 6, caudal segments of larva. Figs. 7-12, *Culex ryukyensis*: 7, mesosome lobe and paraproct (left, ventral); 8, mesosome lobe (left, inner, lateral); 9, subapical lobe of basistyle and dististyle (inner, lateral); 10, larval antenna; 11, larval mentum; 12, caudal segments of larva. Figs. 13-16, *Culex tuberis*: 13, subapical lobe of basistyle; 14, basistyle and dististyle, showing subapical lobe in slightly different view (inner lateral); 15, paraproct (left, ventral); 16, mesosome (dorsal), Figs. 17-23, *Culex litoralis*: 17, subapical lobe of basistyle; 18, mesosome lobe and part of paraproct (left, ventral); 19, mesosome lobe (left, inner, lateral); 20, larval antenna; 21, larval mentum; 22, larval clypeus; 23, caudal segments of larva.



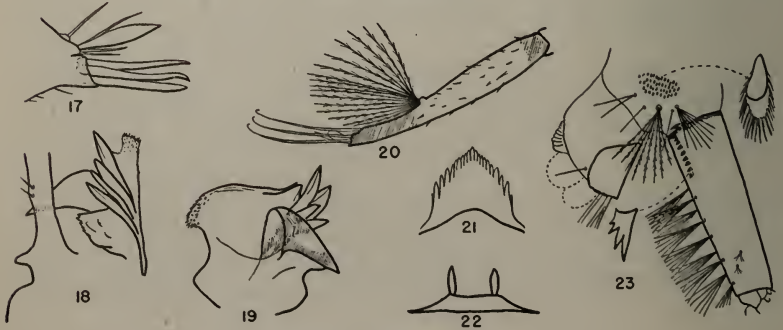
AEDES OKINAWANUS



CULEX RYUKYENSIS

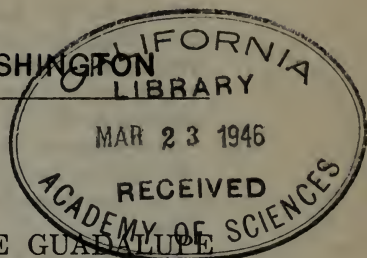


CULEX TUBERIS



CULEX LITORALIS

PROCEEDINGS
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A NEW *CHAETOPAPPA* FROM THE GUADALUPE
MOUNTAINS OF NEW MEXICO AND TEXAS.

BY S. F. BLAKE.

The following new species of *Chaetopappa* (Asteraceae, tribe Asteroideae) is published here in order that the name may be available for use in a revision of this genus in preparation by Dr. L. H. Shinnors.

Chaetopappa hersheyi Blake, sp. nov.

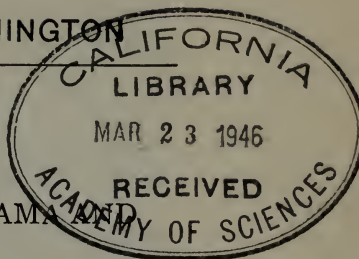
Perennis caespitosa uncialis; caules paucifoliati monocephali simplices hirsutuli pilis erectis vel erectiusculis; folia inferiora anguste spathulata obtusa setoso-apiculata in basem petioliformem angustata integra subcoriacea laete viridia 1-nervia sparse hispidula vel glabra 3.5-6 mm. longa, 0.7-1 mm. lata, caulina linearia vel inferiora lineari-spathulata acuta setoso-apiculata sessilia 1-nervia sparse hispidula 5-8 mm. longa 0.3-0.5 mm. lata, supremis paullum reductis; pedunculus 1-5 mm. longus; capitulum ca. 12 mm. latum; discus (madefactus) 6 mm. altus 2.5 mm. diam.; flores fem. 10, hermaph. 6; involucri oblongo-cylindrici 4-4.5 mm. alti ca. 4-seriati non conspicue gradati phyllaria ca. 12 lineari-lanceolata acuminata laxe setoso-apiculata subsicca purpurascens linea centrali viridescens margine angusto albo scarioso supra plusminusve lacerato-ciliato 1-nervia glabra v. dorso sparsissime hispidula; receptaculum nudum planiusculum; corollae flor. fem. "bluish, fading to white with age," sicco pulchre purpurascens, tubo glabro ca. 2.5 mm. longo, lamina elliptica 3-dentata 4-nervia 5 mm. longa 2 mm. lata; corollae disci flavae glabrae 4-4.3 mm. longae (tubo 0.5-0.7 mm., fauce anguste obconica 2.8-3 mm., dentibus 5 oblongo-ovatis apice papillosis 0.7 mm. longis); achenia radii submatura lineari-oblonga 3-nervia erecto-hirsuta pilis 1-ocularibus 1.3 mm. longa, ea disci cylindrico-oblonga 0.8-1 mm. longa 5-nervia erecto-hirsuta; pappus e setis 4-5 (6) hispidulis persistentibus 3.8-4.2 mm. longis et squamellis totidem minutis truncatis denticulatis ca. 0.1 mm. longis compositus; flores disci verosim. infertiles, ramis styli 0.8 mm. longis, lineis stigmaticis non valde distinctis 0.3 mm. longis appendicibus triangularibus acuminatis hispidulis 0.5 mm. longis.

NEW MEXICO: Local on barren rocky ledges in canyons, Guadalupe Mts., Eddy Co., altitude about 1525 m., 23 May 1944, *A. L. Hershey* 3532 (type no. 166267, Herb. Nat. Arb.). TEXAS: Shaded bank, McKittrick Canyon, Guadalupe Mts., Culberson Co, 15-17 Aug. 1924, *P. C. Standley* 40551 (U. S. Nat. Herb.).

This species of the Guadalupe Mountains in Texas and New Mexico is well distinguished by habit and pappus. Standley's late-season specimen from Texas bears only a few empty heads with most of the involucre fallen.

One of the rays in the head dissected was bilabiate, and was in fact intermediate between the normal rays and the hermaphrodite flowers. The upper part of the tube was somewhat enlarged. The outer lip was 3-toothed and 4-nerved, essentially as in the normal ray. The inner lip consisted of 2 teeth about 0.5 mm. long, papillose on margin above in the manner of the teeth of the normal disk corolla. The style branches were decidedly unequal, the shorter one essentially glabrous, the larger one hispidulous above somewhat as in the hermaphrodite flowers. There were 3 imperfect stamens, one with free filament, the two others with filaments adnate to the style.

PROCEEDINGS
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NEW FORMS OF BIRDS FROM PANAMA AND
COLOMBIA.

BY ALEXANDER WETMORE.

The following races have been distinguished during study of collections made during two recent field trips, the first in Colombia in company with M. A. Carriker, Jr., and the second in the Pearl Islands of Panamá where J. P. E. Morrison of the U. S. National Museum was my companion.

Family ARDEIDAE.

Nyctanassa violacea caliginis subsp. nov.

Characters.—Similar to *Nyctanassa violacea violacea*¹ but with thicker, heavier bill; adult decidedly darker gray. Similar to *Nyctanassa violacea bancrofti*² in size of bill but decidedly darker in color.

Description.—Type, U. S. National Museum No. 376,007, ♂ adult, from Isla San José, Archipiélago de las Perlas, Panamá, February 20, 1944, collected by A. Wetmore and J. P. E. Morrison, original No. 11,998. Throat, head, except as noted beyond, and upper hindneck black; a broad streak from beneath eye back across auricular region pure white; central part of crown broadly white, the tips of the feathers washed with pinkish buff; long nuchal plumes white, edged with black at base; underparts neutral gray, a little paler on under tail-coverts; under wing-coverts deep neutral gray; hindneck and sides of neck deep neutral gray; feathers of back, and scapulars dusky neutral gray centrally, margined broadly with neutral gray; wing-coverts dusky neutral gray, margined widely with light neutral gray; longer inner greater coverts and inner secondaries with an indistinct wash of dark ivy green on the outer webs towards the tips; primaries slate color; edge of wing pinkish buff along alula and distally, and broadly white between these points; rump deep neutral gray; rectrices dark neutral gray, the central pair with a faint wash of olivaceous black. Bill dull black, horn color at tip and on base of mandibular rami;

¹ *Ardea violacea* Linnaeus, Syst. Nat., ed. 10, vol. 1, 1758, p. 143 (South Carolina).

² *Nyctanassa violacea bancrofti* Huey, Condor, vol. 29, May 15, 1927, p. 167 (Scammon Lagoon, Baja California).

front of tarsus and top of toes and nails blackish, the feet elsewhere dull buffy brown (from dried skin).

Measurements.—Males (12 specimens), wing 282–299 (290.1), tail 101.7–116.9 (108.7), culmen from base 67.6–81.3 (73.8), tarsus 87.7–101.3 (92.1), depth of bill at nostril 22.2–25.1 (23.4) mm.

Females (2 specimens), wing 288–291 (289.5), tail 101.1–109.0 (105.0), culmen from base 73.7–74.7 (74.2), tarsus 96.5–97.4 (97.0), depth of bill at nostril 22.2–23.5 (22.9) mm.

Type, male, wing 284, tail 109.4, culmen from base 73.3, tarsus 94.7, depth of bill at nostril 23.4 mm.

Range.—Panamá (Balboa, Taboga Island, Obaldía) including the Pearl Islands (San José, El Rey, Saboga) to the Pacific coast of Colombia (Bahía de Cueva) and Ecuador (Isla de Jambelí and Vaquería).

Remarks.—Preliminary comparisons of our specimens taken on San José indicated that they were darker in color, but I was uncertain as to the stability of this character until I had examined the series in the Museum of Comparative Zoölogy from Isla El Rey (San Miguel) and Saboga, and found that they were likewise darker. It is interesting to observe that this tendency toward darker color is in the direction of the very dark *N. v. pauper* of the Galápagos Islands. Birds from the Pacific side of Panamá likewise belong with the new race which extends to the mainland of the Pacific coast from Panamá to Colombia and Ecuador. For the privilege of examining specimens from the two latter countries I am indebted to Robert Cushman Murphy.

Family RALLIDAE.

Aramides cajanea morrisoni subsp. nov.

Characters.—Similar to *Aramides cajanea latens* Bangs and Penard³ but with gray of hindneck darker, and also grayer, less brownish; back, wing-coverts and scapulars darker, more olivaceous green.

Description.—Type, U. S. Nat. Mus. no. 376,059, ♂, San José Island, Archipiélago de las Perlas, May 21, 1944, collected by J. P. E. Morrison (orig. no. 160). Forehead and forepart of crown deep mouse gray; posterior half of crown and nape indistinctly olive brown; hindneck and adjacent area of upper back slightly darker than neutral gray; rest of back, scapulars and tertials brownish olive; rump, upper tail-coverts, tail, flanks, abdomen and under tail-coverts dull black, with a wash of olive-brown on rump; primaries and secondaries dull russet, tipped with sepia; outer wing-coverts russet, inner ones brownish olive; sides of head light mouse gray, with an indistinct streak of mouse gray covering lower eyelid and extending to upper edge of gape; chin and throat whitish; foreneck and sides of neck between neutral gray and light neutral gray; breast and sides sayal brown; tibia fuscous black; under wing-coverts sayal brown, barred heavily with dusky neutral gray. Anterior half of bill varying from mignonette green to Krönberg's green, basal part

³ *Aramides cajanea latens* Bangs and Penard, Bull. Mus. Comp. Zoöl., vol. 62, April, 1918, p. 41 (San Miguel = Isla El Rey, Archipiélago de las Perlas, Panamá).

orange cinnamon on culmen, elsewhere honey-yellow; legs varying from vinaceous-rufous to hazel, claws fuscous (from dried skin).

Measurements.—Males (six specimens), wing 165–179 (174.3), tail 54.1–64.2 (58.3), culmen from base 46.8–58.7 (52.5), tarsus 64.2–71.0 (67.6) mm.

Females (six specimens), wing 161–173 (166.5), tail 54.5–56.8 (54.9), culmen from base 48.0–51.9 (49.8), tarsus 62.7–70.0 (66.5) mm.

Type, male, wing 176, tail 54.1, culmen from base 56.0, tarsus 70.8 mm.

Range.—San José and Pedro González Islands, Archipiélago des las Perlas, Panamá.

Remarks.—The series of birds from the two outermost islands, the basis of the present description, has been compared directly with the original specimens of *latens* in the Museum of Comparative Zoölogy. The differences while not extensive are definite, and carry through all of the specimens. The characters marking the subspecies *latens* and *morrisoni* from *Aramides cajanea cajanea*, while warranting the separation, are not great. In size the two former average smaller but with a definite overlap among the larger individuals. The brown on the pileum is slightly duller and grayer, and the greenish olive brown on the back slightly duller. Below most specimens are slightly duller reddish brown, with the foreneck and sides of neck, duller gray, though some individuals may not be distinguished on these characters.

Aramides c. latens is recorded definitely on the island of El Rey, the type locality, and *morrisoni* on San José and Pedro González.

These rails are recorded also from Viveros where, according to Rendahl, Bovallius secured a specimen. It seems probable that this record belongs with *latens* as the island is adjacent to El Rey.

The form is named for Dr. J. P. E. Morrison of the U. S. National Museum in recognition of his work with birds during the investigations.

Family TYRANNIDAE.

Elaenia flavogaster silvicultrix subsp. nov.

Characters.—Similar to *Elaenia flavogaster pallididorsalis* Aldrich⁴ but clearer, brighter yellow on lower breast and abdomen; clearer, less brownish gray on upper breast and foreneck.

Description.—Type, U. S. National Museum no. 376,315, ♂, from Isla San José, Archipiélago de las Perlas, Panamá, collected February 18, 1944, by A. Wetmore and J. P. E. Morrison (original no. 11,980). Crown feathers dark grayish olive centrally, margined with deep grayish olive, the latter color predominating on forehead; a concealed central crown patch of white; hindneck grayish olive; back and scapulars somewhat grayer than citrine-drab; rump and upper tail-coverts citrine drab; lesser wing-coverts citrine-drab with chaetura drab centers; middle and

⁴ *Elaenia flavogaster pallididorsalis* Aldrich, Scient. Publ. Cleveland Mus. Nat. Hist., vol. 7, August 31, 1937, p. 106 (Paracoté, Montijo Bay, one mile south of mouth of Río Angulo, Veraguas, Panamá).

greater coverts chaetura drab, tipped broadly with pale olive-buff forming two wing bars, primaries and secondaries chaetura drab, the inner primaries and outer secondaries edged externally with dark olive-buff, and the inner secondaries broadly with dull white; rectrices dull hair brown, edged externally with deep olive-buff; throat whitish; sides of head deep olive-gray; foreneck and upper breast smoke gray becoming grayish olive on sides; lower breast and abdomen primrose yellow becoming dark olive-buff on the sides and flanks; under wing-coverts primrose yellow, the outer ones marked with chaetura drab centrally; bend of wing primrose yellow. Bill dusky neutral gray, becoming grayish olive on base of mandible; tarsus and toes blackish brown (from dried skin).

Measurements.—Males (19 specimens), wing 76.5–84.8 (80.2), tail 65.7–78.1 (72.5), culmen from base 12.8–14.7 (13.6), tarsus 18.0–20.8 (19.9) mm.

Females (16 specimens), wing 72.5–82.2 (77.8), tail 65.7–74.0 (70.5), culmen from base 12.5–13.6 (13.1), tarsus 17.5–20.3 (19.2) mm.

Type, male, wing 80.6, tail 72.5, culmen from base 13.6, tarsus 19.9 mm.

Range.—Archipiélago de las Perlas, Panamá (specimens examined from El Rey, Saboga, Pedro González and San José).

Remarks.—The differences that mark this race are easily evident when the island birds are compared with those of the mainland. The brighter colors of the new form stand out as clearly in the specimens collected 40 years ago by W. W. Brown as they do in our fresh material.

Family MNIOTILTIDAE.

Dendroica petechia chrysendeta subsp. nov.

Characters.—Male, similar to *Dendroica petechia erithachorides* Baird⁵ but brown of head and forepart of body decidedly darker, and extended farther down the foreneck; the breast streakings averaging heavier and darker, merging with the brown of the head area; the yellow below averaging deeper and brighter; and the edgings on the middle and greater wing coverts wider and brighter yellow. Similar also to *D. p. paraguanae*⁶ but brown on the foreneck heavier, extending farther down the foreneck, with less tendency toward streaking; chin and throat darker; yellow on middle and greater wing-coverts more extensive.

Description.—Type, U. S. Nat. Mus. no. 369,925, ♂ adult, Laguna de Tucacas, Puerto López, Guajira, Colombia, April 23, 1941, A. Wetmore and M. A. Carriker, Jr. (orig. no. 11561). Entire crown and upper part of hindneck very dark chestnut; throat and foreneck chestnut, shading over on the sides of the head into the much darker color of the crown; feathers of head lemon chrome basally, but this color completely concealed except where it shows indistinctly along the center of the throat;

⁵ *Dendroica erithachorides* (typographical error for *erithachorides*, as indicated on same page and in index) Baird, Rep. Pac. R. R. Surv., vol. 9, 1858, p. 283 (Cartagena, Colombia).

⁶ *Dendroica petechia paraguanae* Phelps and Gilliard, Amer. Mus. Nov., no. 1153, November 26, 1941, p. 10 (La Boca, Adicora, Paraguaná Peninsula, Estado Falcón, Venezuela).

feathers of ear-coverts edged narrowly and indistinctly with sulphine yellow, with faint indication of this same color in nasal tufts and below the rictus; brown of head forming an extensive and sharply delimited hood, covering the entire head, and on the lower surface extending down over most of the foreneck; upper surface between sulphine yellow and citrine, with the rump brighter, nearer sulphine yellow than the back; remiges blackish brown, the primaries and secondaries externally edged with citrine, this changing distally on the secondaries to strontian yellow; tertials with a wide edging of yellowish citrine; lesser wing-coverts yellowish citrine; middle and greater coverts widely edged with strontian yellow; rectrices blackish brown, with external margins above edged with yellowish citrine, inner webs on 5 outermost strontian yellow, except at extreme tip on 3 outermost, and except for the extreme tip and a narrow line along the shaft in the fourth and fifth, the sixth (central) having a very narrow edging only of strontian yellow; sides of neck, adjacent to the brown of head, wax yellow; under surface clear brilliant yellow between lemon chrome and light cadmium, streaked heavily on breast, sides and flanks with chestnut, the streakings heaviest on chest where they expand anteriorly to merge in the chestnut of the foreneck; edge of wing light cadmium; under wing-coverts lemon chrome; inner webs of primaries and secondaries extensively strontian yellow. Bill brownish black, tarsus and toes brown (from dried skin).

Measurements.—Males (11 specimens) wing 65.7–71.7 (68.9), tail 50.2–55.3 (52.2), culmen from base 13.7–14.7 (13.9), tarsus 20.8–22.1 (21.6) mm.

Females (5 specimens), wing 62.5–67.1 (64.5), tail 46.2–53.5 (50.8), culmen from base 12.7–13.6 (13.2), tarsus 20.0–22.0 (20.9) mm.

Type, male, wing 70.7, tail 55.3, culmen from base 14.7, tarsus 22.1 mm.

Range.—The Guajira Peninsula, northeastern Colombia and northwestern Venezuela (Bahía Portete, Puerto López, Castilletes, Paraguiipa).

Remarks.—The present bird, beautiful in the contrast of its rich yellow and deep chestnut markings, represents the maximum in pigmentation among the chestnut-capped group of golden warblers. The deepened color reaches its greatest extent in specimens in the region from Puerto López to Paraguiipa. At Bahía Portete the color lightens toward the condition characteristic of *erithachorides* so that birds from this point must be considered intermediate. There seem to be no records at present for birds of this group between Punto Caimán on Isla Salamanca on the northern edge of the Ciénaga Grande and Bahía Portete, La Guajira. Colonies may exist in this considerable area, but the birds seem to be rare. We searched for it at the mouth of the Río Ranchería at Ríoacha without success.

While the brown-hooded forms of the golden warbler group stand out conspicuously from those with the head and throat yellow, so that for a long period they have been accepted as specifically distinct, in recent years material has come to hand indicating that the two groups merge. The brown-headed subspecies range along both coasts of México, Central America, and northwestern South America, with one outlying population

on the island of Martinique in the Lesser Antilles. This distribution cuts off *Dendroica petechia aureola*, of Cocos Island and the Galápagos, and *D. d. peruana* of southern Colombia, Ecuador and Perú, from the other subspecies to which they appear most similar. In *peruana* we find, however, one approach to the brown-hooded state, as in highly colored males there is often a decided wash of chestnut brown across the cheeks and throat. Proceeding eastward in northwestern Venezuela, males of *D. p. paraguanae* of the Paraguaná Peninsula have the sides of the head yellowish, so that here again there is an intermediate stage. These two separate approaches are so significant as to justify treatment of all of the races under one specific name. Between them it is interesting to note that all male birds are completely hooded, and that in the Guajira Peninsula the brown head attains the deepest, richest color known.

PROCEEDINGS
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A NEW PITTA FROM THE MALAY PENINSULA.

BY H. G. DEIGNAN.¹

The differences between *Pitta irena* of Sumatra and the population of the same species resident in the Malay Peninsula are so striking and consistent that it is believed no good purpose would be served by further delay in naming the mainland form. I therefore propose

Pitta irena ripleyi, subsp. nov.

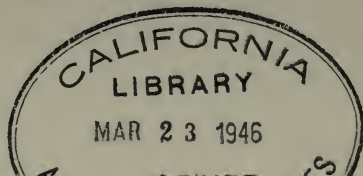
Type.—Adult male, U. S. National Museum 333828, collected on Khao Soi Dao (lat. 7° 20' N, long. 99° 50' E), Trang Province, Peninsular Siam, January 1, 1934, by Hugh M. Smith (original number 6826).

The new race is similar to *P. i. irena* (northern Sumatra), but may be distinguished therefrom, in either sex, by having the flame-scarlet not restricted to the nape, but strongly invading the golden yellow of the supercilia (usually as far forward as the supraocular region); by having the mantle of a paler, less rich, chestnut-brown; and, in the male, also by having the center of the breast and the abdomen of a paler, less rich, purplish blue.

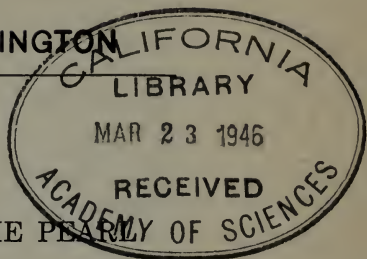
Fourteen males and nine females of *P. i. ripleyi* have been compared with two males and two females of *P. i. irena* from northern Sumatra. No exceptional examples are found in either series. The range of *ripleyi* is the Malay Peninsula from the Isthmus of Kra south to Malacca and Pahang.

The new subspecies is named in honor of S. Dillon Ripley, my friend and colleague at the U. S. National Museum.

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PROCEEDINGS
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THREE NEW MAMMALS FROM THE PEARL ISLANDS, PANAMA.

BY REMINGTON KELLOGG.¹

During the year 1944, Dr. A. Wetmore, Secretary of the Smithsonian Institution, and J. P. E. Morrison of the Division of Mollusks procured a large number of zoological specimens for the collections of the United States National Museum on San José Island. Ten kinds of mammals were represented in their collections and among these are three apparently undescribed forms.

Mazama permira, sp. nov.

Type locality.—Isla San José, Archipiélago de las Perlas, Golfo de Panama, Panama.

Type specimen.—Male adult, skin and skull; No. 277144, U. S. National Museum; collected September 24, 1944, by C. F. Jones, W. N. Collins and Robert Carder; original number 50.

Distribution.—Known only from the type locality.

General characters.—Ground color of upperparts mixed natal brown and cinnamon, with bone brown streak from shoulders to base of tail; underparts whitish in contrast to reddish or fawn colored chest and anterior part of abdomen of *Mazama sartorii reperticia*. Incisive foramina shorter and wider, lachrymal vacuities much smaller and narrower, nasals more noticeably widened laterally above lachrymal vacuities, and skull as a whole smaller and narrower than in *reperticia*.

Color (terms after Ridgway, Color Standards and Color Nomenclature, 1912).—Upperparts in general a mixture of natal brown and cinnamon, with broad median bone brown streak from shoulders to base of tail, and grading into wood brown on lower sides; individual hairs light drab at base grading gradually into natal brown, with cinnamon subapical band and blackish tip; broad cinnamon buff streak below eye and wider supraorbital streak of same color extending more than half way to

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ear, and forming lateral border to crown patch; hair on forehead and crown noticeably longer and darker than on sides of head and neck, near bone brown in color, but with hairs on hinder borders of crown broadly tipped with cinnamon or cinnamon buff; upper lip whitish near nasal pad; muzzle covered with short whitish tipped hairs, with small rounded cinnamon buff patch on side adjacent to nasal pad, but becoming darker (near prout's brown) on snout behind nasal pad as well as in front of eyes; sides of face and neck near drab color, the individual hairs having narrow buffy subapical bands; ears dull dark brownish; exposed surfaces of forelimbs similar in color to neck, becoming more mixed with cinnamon buff hairs on lower portions of limbs and with inner surface lighter to base of hoof; exposed surfaces of hind limbs similar in color to forelimbs, the white of underparts extending downward along inner surface of hind limb as a narrow stripe, gradually disappearing below middle of metatarsal; tufts on tarsal glands mixed natal brown and cinnamon, with cluster of shorter white hairs in center; chin whitish grading into light avellaneous on throat; under surface of neck similar in color to sides of face; drab colored bases of the white and cinnamon buff tipped hairs showing through on brisket in front of forelimbs; rest of underparts whitish; upper surface of tail rusty, near hazel in color, above, white below, with white tip.

Skull.—Smaller and narrower than that of *Mazama sartorii reperticia*. Anterior frontal region convex and somewhat elevated; nasals noticeably widened laterally above lachrymal vacuities and but slightly encroached on by these vacuities; lachrymal vacuities small and narrow; incisive foramina short and wide; premaxillary portion of rostrum noticeably attenuated anteriorly; ventral surface of bulla somewhat pyramidal in outline. Width across jugal portion of orbit noticeably less and maxillary tooth row shorter than in *reperticia*.

Measurements.—*Type*: Total length, 1060 mm.; tail, 85; hind foot, 245; height at shoulder, 570; height at hip, 590. A female topotype: Total length, 1000; tail, 80; hind foot, 250.

Skull (type): Greatest length, 178; condylobasal length, 171; width across orbit at fronto-lachrymal suture, 43; maximum width across jugal portion of orbit, 76.8; zygomatic width, 74.7; length of nasals, 53.5; maximum width of nasals posteriorly, 23.2; maximum width of nasals anteriorly, 14.5; maxillary tooth row, 51; maximum distance across maxillary tooth rows (outside measurement), 57; length of mandible, 142.5; lower cheek tooth series, 54.5. One male and one female topotype, respectively: Greatest length, —, 163.3; condylobasal length, —, 157.3; width across orbit at fronto-lachrymal suture, 38, 38.8; maximum width across jugal portion of orbit, 71, 69; zygomatic width, 68.5, 68.5; length of nasals, 43.5, 42.5; maximum width of nasals posteriorly, 22.3, 20; maximum width of nasals anteriorly, 11.5, 11.5; maxillary tooth row, 52.2, 54; maximum distance across maxillary tooth rows (outside measurement), 54.5, 53.5; length of mandible, 129, 128; lower cheek tooth series, 54.7, 56.5.

Remarks.—The specimen selected for the type is an old male, which

apparently suffered severe injuries at one time in fighting with an opponent. Consequently, the skull is not complete. The left antler and its osseous base were broken off, resulting in the destruction of the posterior upper border of the orbit and the adjacent upper portion of the postorbital bar. The wound, however, healed over, leaving a roughened irregular surface on the left side of the skull. The right antler is quite slender and short, not more than 50 mm. in length. The slightly worn permanent dentition is in place and the left upper canine is present. The hinder upper surfaces of the skulls of both adult males are irregularly pitted, which may indicate rickets, resulting from overcrowding or inadequate diet on this small island. The skull of the second male, which likewise has the permanent dentition, lacks both premaxillaries and is incomplete in other respects. The skull of the female may not be fully adult, although the permanent dentition is in place. It will be noted from the measurements that the maxillary tooth row of this female is actually longer than that of either of the males. The coloration of this brocket is quite different from that of *Mazama sartorii* and *M. s. reperticia*, the ground color of the upperparts being natal brown in contrast to these reddish forms. Furthermore, the underparts of *permira* are whitish in contrast to the reddish or fawn colored chest and anterior abdomen of *reperticia* and *sartorii*.

Specimens examined.—Total number, 5 (including 2 fawns), from the type locality.

Dasyprocta punctata bellula, subsp. nov.

Type locality.—Isla San José, Archipiélago de las Perlas, Golfo de Panama, Panama.

Type specimen.—Male adult, skin and skull; No. 277152, U. S. National Museum; collected May 11, 1944, by J. P. E. Morrison; original number 29.

Distribution.—Known only from the type locality.

General characters.—Closely allied to *Dasyprocta punctata callida* of Isla del Rey [San Miguel Island], but darker and not so yellowish above (the subapical band on hairs of back and sides varying from mustard yellow to ocher in *callida*) and the hairs on the underparts have grayish white instead of buffy tips. Differs from *Dasyprocta punctata dariensis* on the mainland in smaller size, especially the smaller foot, and the notably duller coloration of the upperparts. Skull and bullae much smaller than in *dariensis* although the transverse diameter of the anterior-most upper cheek tooth is approximately the same in both forms.

Color (terms after Ridgway, Color Standards and Color Nomenclature, 1912).—Hairs on snout and top of head dusky drab basally with subapical warm buff band and black tip; crown of head distinctly darker than snout because of elongation of black tips; hairs on top and sides of neck and shoulders light vinaceous drab basally becoming darker near subapical warm buff band and tipped with black; hairs on mid-back and corresponding area on sides dark vinaceous drab basally with subapical

band varying from pale orange yellow to light orange yellow, and with black tips; hairs on rump near dull purplish black except for the rather long grayish white tips; hairs on upper arms and legs to ankles dark at base with subapical band varying from grayish white to buff. Digits on fore and hind feet blackish; remainder of fore and hind feet grizzled above, the hairs dark basally with short subapical grayish white or buffy bands. Hairs of underside from throat to vent light vinaceous drab basally with grayish white tips. Hairs on chin whitish. Ears sparsely covered with short unicolor hairs externally, but on inside the hairs have short buffy subapical bands.

Pelage.—Stiff and harsh on back and sides. Hairs on rump long, up to 85 mm. in length; hairs on back and shoulders shorter, about 25–30 mm. in length; hairs on underparts 12–14 mm. in length; hairs on hands and feet short. Tail almost bare. Ears sparsely covered with short hairs internally and externally and about 25 mm. in length from notch (dried).

Skull.—Similar to *Dasyprocta punctata dariensis*, but smaller. Bullae somewhat smaller than in *dariensis* and apparently slightly smaller than in *callida*. Nasals variable in width and length, but averaging broader than in *callida*.

Measurements.—*Type*: Total length, 500 mm.; tail, 10; hind foot, 102. Four male topotypes, respectively: Total length, 495, 480, 470, and 460; tail, 10, 10, 33 (tail vertebrae), and 10; hind foot, 100, 102, 102, and 105. Four female topotypes, respectively: Total length, 500, 480, 430, and 430; tail, 10, 10, 12, and 8; hind foot, 99, 102, 100, and 98.

Skull (type): Greatest length, 103.6; condylobasal length, 96.9; zygomatic width, 47.1; least interorbital width, 29.3; length of nasals, 41.2; palatilar length, 38.6; length of bulla, 15.3; crown length of upper molar row, 18.1; length of mandible, 59.9. Four male topotypes, respectively: Greatest length, 101.7, 97.1, 98, and 96.2; condylobasal length, 95.9, 89.3, 92.6, and 90.4; zygomatic width, 47, 44.2, 44.8, and —; least interorbital width, 30.3, 27.5, 28, and 28.8; length of nasals, 38.5, 35.5, 34.5, and 35.8; palatilar length, 39.4, 36.8, 36.7, and 37.4; length of bulla, 16.5, 15, 14.3, and 15.1; crown length of upper molar row, 17.7, 16.8, 18.2, and 17.6; length of mandible, 58.3, 55.3, 55.5, and 55.5. Four female topotypes, respectively: Greatest length, 98.7, 100.6, 90.4, and 89.2; condylobasal length, 91.8, 93.9, 81.5, and 82.3; zygomatic width, 46.2, 46.1, 40.5, and 41.8; least interorbital width, 29, 28, 25.6, and 26.7; length of nasals, 35.1, 38.3, 32.6, and 31.7; palatilar length, 36.8, 38.4, 33.6, and 32.8; length of bulla, 13.8, 14.7, 13.7, and 12.8; crown length of upper molar row, 17.3, 18.3, 18, and 17; length of mandible, 56.7, 58.8, 51.2, and 51.

Remarks.—This series of skins from San José Island are rather uniform in general coloration and are readily distinguishable from related forms by the different coloring of the upperparts and underparts. They have been compared with one topotype of *callida* from the series described by Bangs as well as with specimens representing the races from the adjacent mainland. Both of the two races of agouti which occur on adjacent islands in the Pearl Island group have somewhat smaller skulls and external dimensions than the mainland race *dariensis*. Like *dariensis*,

however, both have white tipped rump hairs but lack the rich orange buffy coloration of the upperparts.

Specimens examined.—Total number, 9 (2, skulls only), from the type locality.

***Proechimys semispinosus ignotus*, subsp. nov.**

Type locality.—Isla San José, Archipelago de las Perlas, Golfo de Panama, Panama.

Type specimen.—Male adult, skin and skull; No. 277160, U. S. National Museum; collected May 8, 1944, 1945, by J. P. E. Morrison; original number 28.

Distribution.—Known only from the type locality.

General characters.—Like *Proechimys semispinosus burrus*, *P. s. panamensis*, and *P. s. chiriquinus*, but general coloration darker, less reddish and with more pronounced blackish suffusion in color of upperparts. Hind foot apparently larger than in *burrus*. Skull differing from *panamensis* in wider incisive foramina, narrower third upper cheek tooth, and nasals terminating normally anterior to level of front edge of orbit.

Color (terms after Ridgway, Color Standards and Color Nomenclature, 1912).—General color of upperparts much darker than in either *Proechimys semispinosus burrus* or *P. s. panamensis*, and more black lined and less reddish, the black tipped hairs and channeled spines predominating over the cinnamon to tawny subapical bands on the hairs. Hairs on back light drab basally, with subapical cinnamon (rarely tawny) band about 2.5 mm. in width and a black tip. Channeled spines pale ecru drab basally with black tips. Rump coarsely haired, similar in color to rest of back, but with longer black tips on the hairs. Forehead, cheeks and sides of neck as dark as in some specimens of *panamensis*. Outer surfaces of fore and hind limbs similar to sides, but the cinnamon or tawny subapical bands on the hairs are shorter. Upper surface of hands and feet much lighter than upperparts, near cinnamon drab on the darker portions although the hairs have light tips and with whitish hairs projecting from base of the nails. Underparts pure white except for the cinnamon wash on some of the hairs in front of forelimbs. Inner surfaces of fore and hind limbs bare or sparsely covered with white hairs. Tail dark above, lighter below.

Pelage.—Stiff and harsh on back, sides less so; rump and outer surface of limbs without spines. Noticeable admixture of flattened channeled spines on back and sides, each about 20–22 mm. in length. Hairs on upperparts up to 20 mm. in length; hairs on underparts rather soft; hairs on hands and feet short, 3–4 mm. in length and cinnamon drab colored with light tips. Tail moderately haired, the majority of the bristle hairs on basal half of tail being as long as the length of 5–6 scales. Tail moderately scaled, 9–10 rows per 10 mm. Ears normal, sparsely covered with short hairs internally and externally, about 20 mm. in length from notch (dried).

Skull.—Crown length of molar series as well as skull apparently aver-

aging larger than in *burrus*. Skull large and robust; nasals long, slightly widened near middle, not markedly attenuated posteriorly, and extending to level of front edge of orbit on only one (type) of nine skulls; supraorbital edges broadly ridged, continuous posteriorly with the somewhat narrower ridges that extend obliquely forward from outer edges of interparietal; incisive foramina wider medially than in *panamensis*; hamular processes of pterygoids broad and spatulate; third upper cheek tooth averaging narrower than in *panamensis*; zygomatic arches and bullae similar to *panamensis*.

Measurements.—*Type*: Total length, 477 mm.; tail, 182; hind foot, 62. Three male topotypes, respectively: Total length, 463, 444, and 420; tail, 182, 180, and 165; hind foot, 62, 61, and 57. Two female topotypes, respectively: Total length, 437, 432; tail, 172, 170; hind foot, 58, 55.

Skull (type): Greatest length, 67.2; condylobasal length, 59.1; zygomatic width, 31; least interorbital width, 13.9; length of nasals, 26.7; palatilar length, 24.2; anterior palatine foramina, 5.8; length of bulla, 11.4; crown length of molar row, 10.6; length of mandible, 35.2. Three male topotypes, respectively: Greatest length, 63.8, 63.1, and 60.1; condylobasal length, 57.2, 56.9, and 54.1; zygomatic width, 29.8, 30, and 29.8; least interorbital width, 13.7, 13.9, and 14.3; length of nasals, 24.4, 25.4, and 23.1; palatilar length, 23.2, 22.2, and 20.8; anterior palatine foramina, 5.5, 5.7, and 5.4; length of bulla, 10.6, 10.1, and 10.2; crown length of upper molar row, 10.2, 10.1, and 9.8; length of mandible, 34.3, 33.9, and 32.3. Two female topotypes, respectively: Greatest length, 61.4, 64.2; condylobasal length, 55.5, 56.8; zygomatic width, 30.1, 30.6; least interorbital width, 14.3, 14.7; length of nasals, 23.7, 24.7; palatilar length, 22.2, 23.2; anterior palatine foramina, 5.3, 5.8; length of bulla, 10.3, 10.7; crown length of upper molar row, 10, 10.1; length of mandible, 33.8, 35.5.

Remarks.—This spiny rat is closely allied to *Proechimys semispinosus burrus*, *P. s. panamensis*, and *P. s. chiriquinus*, but is distinguished by its darker coloration. In color at least, the San José island spiny rat is more noticeably differentiated from the mainland forms than *burrus* on the adjacent Isla del Rey [San Miguel]. Only one of the specimens (No. 271455) taken on San José Island exhibited an approach to the reddish coloration of the above mentioned races. Bangs in describing *burrus* published the measurements of 10 of the 51 specimens captured on Isla del Rey. These 10 selected specimens have an average head and body length of 279.3 mm. (260–305). Since the series from San José Island have a head and body length ranging from 240 to 295, it is quite likely that an equivalent series from this island would closely approximate the average head and body length of *burrus*.

Specimens examined.—Total number, 10 (2, skulls only), from the type locality.

PROCEEDINGS
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TWO NEW WOOD-HEWERS OF THE GENUS *DENDROPLEX* FROM VENEZUELA AND COLOMBIA.

BY ALEXANDER WETMORE AND W. H. PHELPS.

Detailed examination of extensive series of Dendrocolaptids of the genus *Dendroplex* that have been obtained recently for the Phelps collection from Venezuela, and for the U. S. National Museum from Colombia, indicate two unrecognized forms related to *picrostris*. Their recognition has come during a study of all of the more northern forms of the genus, by which the specific unity of *picrostris* and *picus* has been definitely established through specimens that show graduated stages in intergradation along the lower Río Orinoco between Caicara, Bolívar and Barrancas, Monagas.¹ All forms of these two groups, therefor, are placed under *picus* as the older of the two names.

Descriptions of the two additional subspecies here recognized follow:

Dendroplex picus choica subsp. nov. ♀

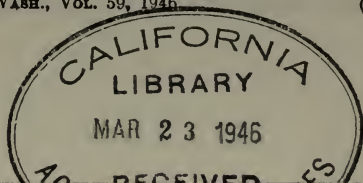
Characters.—Similar to *Dendroplex picus picrostris*² but extent of light (Colombia).

color of foreneck restricted distally so that it barely reaches the upper breast; dark markings on sides of head behind the eye averaging heavier, more extensive; light markings on crown and hindneck smaller; light superciliary narrower; slightly smaller.

Description.—Type, Phelps Collection No. 29,106, male adult, in breeding condition, from Borburata, Puerto Cabello, Estado Carabobo, Venezuela, collected May 6, 1945, by W. H. Phelps, Jr. Crown and hindneck sepia, the anterior feathers spotted with pinkish buff, the light spots edged with fuscous black; forehead mainly pinkish buff with little of the darker color; on the posterior part of the crown the spots smaller,

¹ See also Zimmer, Amer. Mus. Nov., no. 753, November 10, 1934, pp. 16-17.

² *Dendroplex picrostris* Lafresnaye, Rev. Zool., vol. 10, March, 1847, p. 76 (Ríoachaca,



more elongated with little of the dark margin, becoming larger but still elongate on hindneck, and also becoming lighter, cartridge buff, and extending as elongated light streaks, bordered narrowly with fuscous black, on to upper back; rest of upper surface, including wings and tail, russet, slightly lighter on back and rump; sides of head, including superciliary, lighter than cartridge buff; an indistinct line of sepia behind eye; lores pinkish buff to cartridge buff; sides of neck cartridge buff to white, margined with fuscous black; throat and foreneck cartridge buff to white, this color extending to upper breast, where it is margined with fuscous black in distinct squamations, which become indistinct anteriorly, and are very faintly indicated to middle of foreneck; breast tawny-olive lined with light cartridge-buff, margined faintly with fuscous, the light streaks becoming narrower and disappearing toward the lower breast; sides, flanks, and abdomen sayal brown; under tail-coverts snuff brown with somewhat brighter, narrow shaft streaks; under wing-coverts tawny, with the bend of the wing cinnamon; tips of outer primaries clove brown. Bill hair brown, with gonyes, mandibular rami, and sides of maxillae near center pale olive-buff; tarsus and toes chaetura black (from dried skin).

Measurements.—Males (9 specimens), wing 92.0–98.5 (95.7), tail 69.8–81.7 (76.4), culmen from base 27.5–32.6 (29.1), tarsus 21.0–23.0 (21.8) mm.

Females (8 specimens), wing 87.1–98.4 (93.1), tail 70.3–79.5 (76.7), culmen from base 26.9–31.5 (29.3)³, tarsus 21.0–22.3 (21.7) mm.

Type, male, wing 96.8, tail 80.1, culmen from base 29.0, tarsus 21.0 mm.

Range.—Northern Venezuela, from extreme eastern Falcón (Tucacas) eastward, north of the Cordillera de la Costa, through Carabobo (Urama, Puerto Cabello) Distrito Federal (Los Caracas, Río San Julián) and Miranda (Carenero).

Remarks.—This form is quite distinct from typical *picrostris* in the restriction of the light markings on the upper breast, and in the increase in the darker markings on the side of the head and neck. The smaller size is an average character that is evident in series. The increase in dark markings on the side of the head is a slight resemblance to the *picus* group of subspecies from which, however, *choica* is completely separated by the broad range of *phalara*.

Dendroplex picus dugandi subsp. nov.

Characters.—Similar to *Dendroplex picus picrostris* but with feathers of upper breast, lower foreneck, and sides of neck edged with fuscous black, so that the light color is definitely restricted; light superciliary narrower and not extending so far behind the eye; light markings on upper back less extensive; light spotting on crown less extensive, especially on the forehead.

Description.—Type, U. S. National Museum No. 373,327, male adult, from Puerto Sagoc, La Gloria, Magdalena, Colombia, collected May 24,

1943, by M. A. Carriker, Jr. (original number 3981). Crown slightly darker than clove brown; forehead cream-buff with the feathers tipped with clove brown, the cream-buff decreasing on forecrown until the marks become elongated spots near the tips of the clove brown feathers; feathers on hindneck dull cartridge buff, bordered by clove brown; lores pale cartridge buff; superciliary cartridge buff anteriorly, becoming dull white posteriorly, this color continuing over the side of the head to become cartridge buff again on the side of the neck; feathers of posterior part of superciliary, behind eye, tipped very narrowly with clove brown, these tipplings becoming wider over side of neck; an indistinct line of clove brown behind eye; upper two-thirds of back, and lesser and middle wing-coverts, Mars brown; lower back, rump, upper tail-coverts, greater wing-coverts, wings and tail russet; alula and tips of primaries clove brown; chin white; throat, foreneck and extreme upper breast whitish cartridge buff, with very narrow edgings of clove brown beginning at center of foreneck and becoming more pronounced laterally and posteriorly; an indistinct, fine line of clove brown below auricular region, and another below posterior half of malar area; middle and lower breast buffy brown, with a few narrow light streaks bordered with clove brown; abdomen brighter than Saccardo's umber; sides and flanks dull snuff brown; under tail coverts Verona brown, with indistinct shaft lines of pinkish buff; bend of wing pinkish buff; under wing coverts Sayal brown. Bill olive-buff, browner along the culmen and at the base; tarsus and toes blackish slate (from dried skin).

Measurements.—males (12 specimens), wing 92.8–102.5 (98.6), tail 73.2–79.8 (76.9), culmen from base 27.3–29.5 (28.6), tarsus 21.2–23.2 (22.2) mm.

Females (10 specimens), wing 93.0–102.5 (97.9) tail 65.5–82.7 (76.4), culmen from base 27.7–31.7 (29.4), tarsus 21.5–23.7 (22.7) mm.

Type, male, wing 98.1, tail 77.0, culmen from base 27.3, tarsus 22.2 mm.

Range.—Northern Colombia, from the western and southern base of the Sierra Nevada de Santa Marta, and the valley of the Río César in northern Magdalena (Gaira, Punto Caimán on Isla Salamanca, Fundación, Codazzi, Casacará) west and south through Atlántico (La Plata, Aguada de Pablo), Bolívar (Puerto Zapote, Calamar, Turbaco, Cartagena), the lower Río Atrato in northern Chocó (Sautatá), and southern Magdalena (La Gloria, Puerto Sagoc, Gamarra), Antioquia (Malena) to Tolima (Honda, Chicoral on the Río Coello).

Remarks.—This form extends through the drainage system of the Río Magdalena. In restriction of the light color on the upper breast, and in the markings on the sides of the head, it shows definite approach to the more heavily marked subspecies of the *picus* group, from which, however, it is separated by high mountains. It suggests somewhat *D. p. choica*, here described, from the coastal plain of north central Venezuela, but differs in much more extensive dark markings on the side of the head, darker upper back, darker lower surface, and in more extensive light markings on the lower hindneck and upper back. One bird from Isla Salamanca at the mouth of Ciénaga Grande is placed here tentatively

as it appears to be intermediate toward *picrostris*. A bird from Gaira, southwest of Santa Marta, is definitely *dugandi*. A specimen in the Carnegie Museum taken by Carriker on the lower course of the Río Atrato at Sautatá is assigned here also, as is one in the American Museum of Natural History labelled "Atrato River" taken December 20, 1909, by Mrs. E. L. Kerr. These are a little lighter than average on the upper back but agree otherwise with birds from farther east.

This new race is named in honor of Dr. Armando Dugand, Director of the Instituto de Ciencias Naturales of Bogotá, in recognition of his contributions to the knowledge of the ornithology of his country.

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A NEW NAME FOR THE DESERT RACE OF THE BAT,
MYOTIS CALIFORNICUS.

BY WALTER W. DALQUEST.

Museum of Vertebrate Zoology, University of California, Berkeley.

Tate (1941, Amer. Mus. Nat. Hist. Bull., vol. 78, p. 547) reduced the genus *Chrysopteron* Jentink to a subgenus of *Myotis*, bringing *Kerivoula pallida* Blyth into the genus *Myotis*. Dobson (1876, Monogr. Asiatic Chiroptera) considered *K. pallida* a synonym of *Vespertilio formosa* (*Myotis formosus*) Hodgson. Tate (ibid.) has restored it as a full species, *Myotis pallidus*. *Myotis pallidus* (Blyth), named from central India in 1863, antedates *Myotis californicus pallidus* Stephens by 37 years. No name seems to be available for the desert race of *Myotis californicus*, currently known as *pallidus*. Therefore this race may be known as:

Myotis californicus stephensi new name

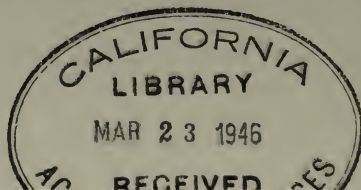
Myotis californicus pallidus Stephens, Proc. Biol. Soc. Wash., vol. 13, p. 153, June 13, 1900 (preoccupied).

Type.—Adult female, skin and skull number 16657, Mus. Vert. Zool., obtained by Frank Stephens at Vallecito, San Diego County, California, on March 29, 1912; original number 3493.

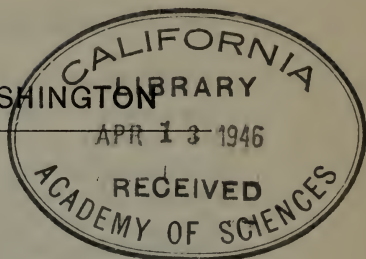
Diagnosis.—Total length 75-85 mm.; ear short, reaching slightly past nose when laid forward; tragus slim, straight; foot small, about 6 mm.; calcar keeled; forehead abruptly rising.

Comparisons.—Paler and less reddish than *Myotis californicus californicus* and *Myotis californicus caurinus*. Upper parts buffy, yellowish, or whitish. The small foot, keeled calcar, and straight tragus separate it from all bats that occur within its range, save *Myotis subulatus*. From the latter it may be separated by the abruptly rising forehead.

Range.—The interior desert area of the southwestern United States.



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NOTES ON THE TAXONOMY OF THREE GENERA
OF TROMBICULID MITES (CHIGGER MITES),
TOGETHER WITH THE DESCRIPTION OF A
NEW GENUS

BY H. E. EWING

In this paper some notes are recorded on the taxonomy of the genera *Trombiculoides* Jacot, *Paraschöngastia* Womersley, and *Neoschöngastia* Ewing of the family Trombiculidae. Also a new genus is described to include a part of *Neoschöngastia* Ewing as originally proposed.

Status of *Trombiculoides* Jacot

Jacot (1938) established the genus *Trombiculoides* on what he regarded as Say's *Trombidium scabrum*. However, he identified as representing *scabrum* a species taken "from under the bark of a large prone oak," near Savannah, Georgia, which clearly is a trombiculid mite. That this identification was correctly made there is reason to doubt, since following Say's original description (Say, 1821) Say stated that his *scabrum* was found: "In forests, on trees, etc.; not uncommon." He made no mention of its occurrence in Georgia or East Florida. This is very significant since this description of *Trombidium scabrum* was given in a paper that had the title, "An account of the Arachnides of the United States." Several species mentioned in this paper evidently were not taken along the Southeastern coast,—for example *Oribata concentrica* Say. Say's statement in regard to this species is merely that it: "Inhabits Pennsylvania."

Three statements in Say's original paper are of special significance, one in his generic description of *Trombidium* that the eyes are pedunculated, and two in the specific description of *scabrum*,—that the hairs are "hardly perceptible" and the eyes are "white". These statements, I believe, definitely eliminate all the trombiculid mites from consideration in connection with his *scabrum*. In the trombiculid mites the eyes are either absent, or there is a poorly developed pair easily overlooked, unless the specimen is cleared and mounted, and the hairs or setae are long and conspicuous.

The present writer believes that Say's description of *scabrum* does fit the species to which the name has been applied by various workers and especially by Howard (1918). Howard reared the larvae and gave a plate of drawings of the species that he regarded as Say's *scabrum*, putting it in the genus *Sericothrombium* Berlese. If Jacot's identification of *scabrum* is incorrect, *Trombiculoides*, according to the rules of nomenclature, probably should be considered a synonym of *Sericothrombium* Berlese.

Paraschöngastia Womersley 1939 = *Neoschöngastia* Ewing 1929

The genus *Paraschöngastia* Womersley 1939 was erected for four New Guinea species described by Gunther in *Neoschöngastia*. Although zoologically this genus is based on good generic characters, unfortunately its type, *Neoschöngastia yeomansi* Gunther, is very closely related to the type of *Neoschöngastia*, *Schöngastia americana* Hirst. In fact *Neoschöngastia americana* (Hirst) is a typical *Paraschöngastia*, as can be seen from a drawing (Fig. 1) here given of the dorsal plate.

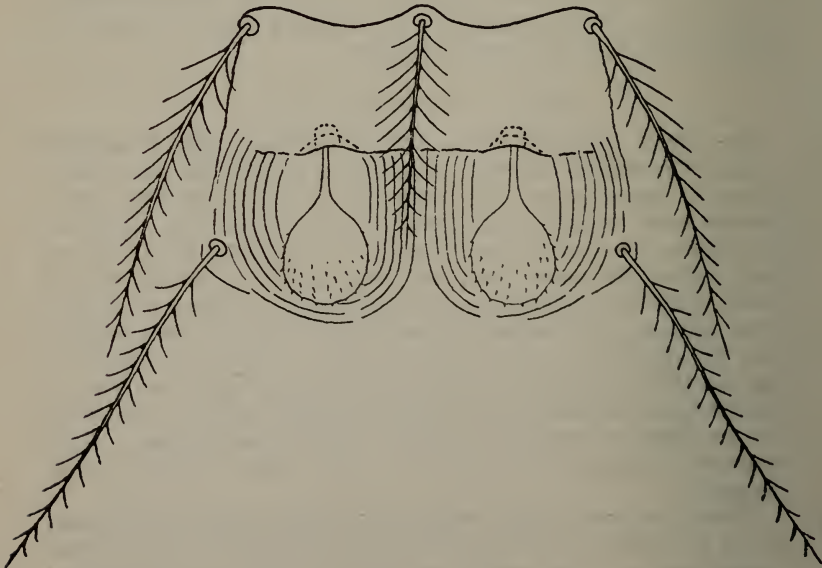


Fig. 1. Dorsal plate of *Neoschöngastia americana* (Hirst), the type species of *Neoschöngastia*.

If this synonymy is accepted, the name *Neoschöngastia* should be restricted to the species that have been placed in *Paraschöngastia*, and the species formerly going in *Neoschöngastia* should be given a new name.

For them the name *Ascoschöngastia* is proposed. It is described as follows:

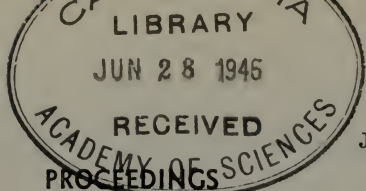
***Ascoschöngastia*, new genus**

Chelicera stout, bladelike, with a single tooth above and usually one below, and extending beyond apex of basal segment. Palpus rather stout; femur angulate laterally or rounded; palpal claw bifurcate or trifurcate. Tracheae and spiracles absent. Dorsal plate without a raised crest in front of pseudostigmata and posterior half without circular striations. Abdomen without posterodorsal plates; dorsal setae sometimes numerous, humerals not situated in row II. Legs of medium length; coxae III with one or more barbed or branched setae; tarsi three-clawed, middle claw being more slender than the other two.

Type species: Neoschöngastia malayensis Gater 1932.

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OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW WORM-LIZARD (*ANCYLOCRANIUM BARKERI*)
FROM TANGANYIKA TERRITORY.

By ARTHUR LOVERIDGE

Among some reptiles recently presented to the Museum of Comparative Zoölogy by Mr. R. de la B. Barker, is an extraordinary amphisbaenid of a genus hitherto unknown from south of the equator. Not only is it the first member of the peculiar genus to be found in Tanganyika Territory, but its nearest relative occurs nearly a thousand miles to the north at Caitoi in Somalia. The new species was taken by Mr. Barker near the Mbemkuru River (*circa* 9°30' S., 39°40' E.) which empties into Mzungu Bay between the headlands of Ras Mbemkuru and Ras Mawedi on the coast between Kilwa and Lindi, though rather nearer to the latter.

Except for the absence of a well-marked circular fold separating head and body, this new species is referable to the Genus *Baikia* as recently (1941, Bull. Mus. Comp. Zoöl., 87, p. 368) redefined. Two species were referred to Gray's *Baikia* until Parker (1942, Bull. Mus. Comp. Zoöl., 91, p. 57, fig. 7a) proposed *Ancylocranium* for *somalica* (Scortecchi, 1930). The East African lizard was separated from the western *africana* Gray on account of its possessing a bony crest formed by the compressed anterior elements of the skull, and because the extra-columella showed an anterior dilation. Parker's figure of the crested *somalicum* was based on a cleaned skull; that of *africana* on an x-ray of the holotype, as no second specimen has been taken since the discovery of *africana* sixty-five years ago.

That I might ascertain to which of the two genera the new species *barkeri* should be assigned, half-a-dozen x-ray photographs of it were taken through the courtesy of Dr. M. C. Sosman of the Peter Bent Brigham Hospital of Boston. In none of these photographs is the extra-columella sufficient distinct for me to say definitely that it is, or is not, dilated anteriorly. In the matter of the anterior crest, however, three of the photographs undoubtedly conform to Parker's figure of *Ancylocranium*. The other three resemble Parker's figure of *Baikia* in lacking a crest. As all six x-rays are of the same lizard the apparent difference must be due to some slight variation in position at the time the photographs were taken. As it seemed possible that the same might have oc-

curred with Parker's x-ray of *Baikia*, I wrote Parker who (18. ii. 46) assures me that he verified the absence of the crest in *Baikia* by dissection. As the Tanganyika reptile has at least one of the characters of *Ancylocranium*, it is referred to that genus.

On geographical grounds there appears no reason for separating *Ancylocranium* from *Baikia* for other amphisbaenid genera like *Amphisbaena*, *Monopeltis*, and *Dalophia*, have a trans-African distribution.

***Ancylocranium barkeri* sp. nov.**

Type.—Museum of Comparative Zoölogy, No. 48,950, a ♂, from Mbemkuru River, Lindi Province, Tanganyika Territory. Collected by Mr. R. de la B. Barker in 1941.

Diagnosis.—In some ways nearer to *B. africana*, but distinguished from its geographically nearest relative as follows:

A single pair of shields (parietals) on occiput behind rostral; 31 (20 + 11) segments in a midbody annulus; median ventrals in a single transversely dilated series; 222 annuli on body, 5 on tail, but posterior half of tail without annuli; range: Tanganyika Territory*barkeri*
 Two pairs of shields (postfrontals and parietals) on occiput behind rostral; 49-55 (27-32 + 21-24) segments in a midbody annulus; median ventrals in a double series; 186-199 annuli on body, 6-8 on tail extending to the tip; range: Somalia and British Somaliland*somalicum*

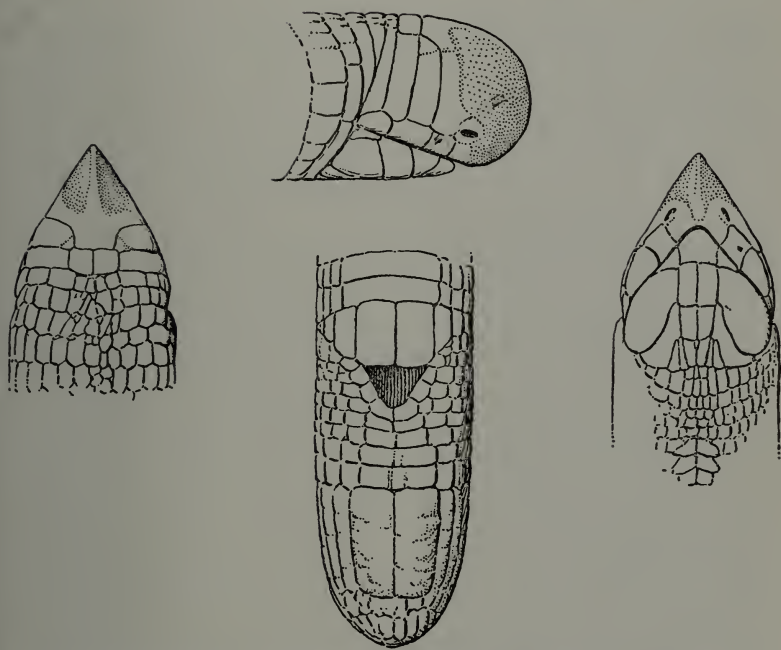
Description.—Rostral enormous, compressed, arched, with sharp cutting edge, nostril pierced in the rostral, slightly above and anterior to the groove separating rostral from first upper labial; neither nasal nor nasal suture; no prefrontal; no frontal; no postfrontals; a single pair of shields (parietals) on occiput behind rostral and immediately above a narrow, vertically-elongate ocular that is preceded by a slightly broader preocular and followed by a similarly vertically-elongate postocular; eye hidden; no temporals; upper labials 3, second largest and immediately below the preocular, the ocular resting in an angle between the second and third labials; two pairs of elongate sublinguals of which the anterior pair (postmentals) are the longer; the posterior pair in contact with the median pair of a row of 6 scales that separate a pair of large, wedge-shaped sublabials; lower labials 3, the second enormous, the third scarcely noticeable.

Body annuli 222 between the 6 scales mentioned above and the 6 enlarged anals, 5 caudal annuli apart from the elongate dome-shaped terminal segment that occupies more than half the length of tail; 31 (20 + 11) segments in a midbody annulus, dorsal segments longer than broad; the median ventral segment resembling the ventral shield of a snake being broader than all the other 10 ventral segments together; 6 anals; no preanal pores.

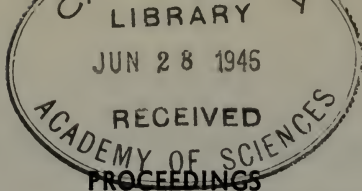
Color.—In alcohol. Tip of snout horn colored, rest of head and body dirty white (? flesh-pink in life), tip of tail purplish brown.

Size.—Total length of holotype ♂, 193 (185 + 8) mm.

Diet.—Undigested jaws of soldier termites in intestines.



♂ Holotype of *Ancylocranium barkeri* (M.C.Z. 48950). 4.6 x Nat. size.



OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW RACE OF *RHIPIDURA RUFIFRONS* FROM
ROTA ISLAND, MARIANA ISLANDS.

By ROLLIN H. BAKER, *Lieut. H(S), USNR*¹

A party from the Laboratory of Mammalogy, U. S. Naval Medical Research Unit No. 2, collected vertebrates at Rota Island, Mariana Islands, during the period from October 17 to November 2, 1945. Study of the birds reveals two specimens of a hitherto unrecognized race of *Rhipidura rufifrons*. This new form may be known as

Rhipidura rufifrons mariae subsp. nov.

Type.—No. 384935, U. S. National Museum; adult male; Mariiru Point, Rota Island, Mariana Islands; October 22, 1945; prepared by Odis A. Muennink, collected by David H. Johnson.

Superspecific characters.—Similar to *R. r. saipanensis* Hartert of Saipan and Tinian, but with a richer brown coloring on the breast and belly and darker above, especially the rufous coloring of the rump, basal half of the tail and forehead.

Description of type.—Forehead and anterior crown light "orange rufous" (feathers with black bases); lores and auriculars black; eye ring black; chin, forward part of throat and malar region white (feathers with black bases); a few feathers on the posterior edge of the malar region tipped with "citrine drab"; throat and upper breast black with feathers on the posterior margin edged with white; lower breast, belly, side, flank, tibia, vent and lower tail coverts near "ochraceous-tawny" becoming lighter on the breast, especially in the mid-portion, and slightly grayer on the flanks (feathers with black bases); sides of neck, shoulder and back near "Dresden brown" becoming grayer on the neck and crown where feathers have darker shafts (feathers with black bases); rump and upper tail coverts near "Sanford's brown" (feathers with black bases); basal half of tail near "amber brown" with coloring extending distally on edges of feathers; rest of tail black with ends tipped with white; wings and secondaries dark, edged with coloring similar to back; underwing grayish with axillaries tipped with buffy white; tarsus of dried specimen dark brown with darker toes; bill dark brown with mid-portion basally whitish; eye color not recorded.

Distribution.—Rota Island, Mariana Islands.

Remarks.—The two specimens from Rota have been compared with six topotypes from Saipan and seven birds from Tinian of *R. r. saipanensis* and 20 specimens from Guam of *R. r. uraniae* Oustalet. The Rota birds

¹Research Division, Bureau of Medicine and Surgery, Navy Department.

have distinctly richer breast and belly coloring than either of these two races. Of specimens from Tinian, two have this coloring quite similar to the Rota birds while the five others are paler. Being situated between the islands of Saipan and Rota, Tinian birds might conceivably show some intergradation between the two races. There is some difference in the extent of white on the chin and throat of birds of these races; however, it is difficult to state with accuracy the differences since the preparation of the skins alters this feature considerably. Specimens of *R. r. saipanensis* have white feathers on the chin and much of the throat to form practically a solid band of white and with a heavy line of white in the malar region. The two birds from Rota have white feathers on the chin and only a small amount on the upper throat and with a somewhat lighter line of white in the malar region. Specimens of *R. r. uraniae* from Guam have a small amount of white on the chin and with a very thin line extending in the malar region. Weights of the two Rota birds are 9.0 (type) and 8.5 grams (No. 384936, U. S. N. M.).

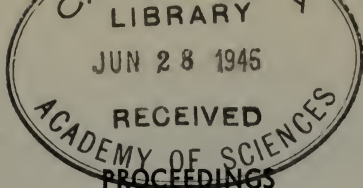
Measurements of adult male birds from the four islands indicate that size differences are not sufficient to distinguish the three races. The measurements of 11 males from Guam overlap the measurements of birds from the other islands with the exception of bill length, the Rota birds having a slightly shorter one. Wing length of the Rota specimens is slightly smaller than that of the birds from Saipan and Tinian and more similar to the length of those from Guam.

	Wing	Tail	Culmen	Tarsus
<i>R. r. saipanensis</i>				
3 males—Saipan	68.0	80.6	13.3	16.8
	(67.8-68.2)	(80.2-81.1)	(13.1-13.5)	(16.2-17.2)
4 males—Tinian	68.8	81.6	13.1	17.7
	(68.2-69.4)	(80.1-83.4)	(13.0-13.3)	(17.2-18.4)
<i>R. r. mariae</i>				
2 males—Rota	66.0	82.3	12.2	17.1
	(65.4-66.7)	(82.2-82.4)	(12.1-12.4)	(17.1-17.2)
<i>R. r. uraniae</i>				
11 males—Guam	66.2	78.5	13.5	16.6
	(64.2-69.2)	(75.3-82.3)	(13.1-14.5)	(15.6-17.2)

The locality for the name, *Rhipidura atrigularis* Reichenow (Journ. f. Ornith., 1885, p. 110), was listed as the Palau Islands, but according to Hartert (Nov. Zool., 1898, vol. V, p. 53) this is probably erroneous and that the correct locality may be Guam or the Mariana Islands. As published the description might fit any of the three races discussed here. Since the type of *R. atrigularis* is not available for comparison and since Hartert found his Guam material to compare favorably with Reichenow's type, this name is apparently a synonym of *R. r. uraniae* and not pertinent to the race from Rota.

The writer is indebted to Dr. Herbert Friedmann of the U. S. National Museum for his helpful suggestions and to Dr. Ernst Mayr of the American Museum of Natural History for the loan of comparative material from Saipan and Tinian. Colors in quotation marks pertain to ones in Ridgway's "Color Standards and Nomenclature," 1912.

Rhipidura rufifrons mariae is named in honor of my wife.



OF THE
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NECESSARY CHANGES OF NAMES IN THE
COLEOPTEROUS FAMILY SCARABAEIDAE*

By EDWARD A. CHAPIN
Curator, Division of Insects, U. S. National Museum

The following nomenclatorial changes appear to be necessary under the International Rules of Zoological Nomenclature.

Ateuchus Weber

Ateuchus Weber, 1801, *Observ. entomologicae*, p. 10, 37.

Ateuchus Fabricius, 1801, *Syst. Eleuth.*, Vol. 1, p. 54.

Choeridium Serville, 1825, *Encycl. métho.*, Vol. 10, p. 356.

The generic name *Ateuchus* was first proposed by Weber in 1801 for a new species, *A. histeroides*, from North America. At almost the same time Fabricius proposed the same name as new, for a group of 58 species, 44 from the Old World and 14 from the New World. Since both papers are dated 1801, internal evidence of prior publication for one or the other was sought. The following facts were noted: Weber's introduction is dated Aug. 1, 1800 (Calendis Augusti MDCCC), that in Fabricius is dated April 10, 1801. Both works were published by the same printing house. This would indicate prior publication for Weber and that prior publication is established by a citation to Weber by page and species number on page 47 of Fabricius' work. Therefore, *Ateuchus* Weber returns to the American list and replaces *Choeridium* Serville 1825.

Kolbeus hornii (Rivers)

Bradycinetus hornii Rivers, 1886. *Bull. Calif. Acad. Science*, Vol. II, p. 61.

Kolbeus minor (Linell)

Bradycinetus minor Linell, 1896, *Proc. U. S. Nat. Mus.*, Vol. 18 (1895), p. 723.

These two species are closely related to *Kolbeus arcuatus* (Bts.). The genus *Kolbeus* was set up by Boucomont, 1911, *Ann. Soc. ent. France*, Vol. 79 (1910), p. 335, for the two species *Bolboceras arcuatus* Bates and *Bolboceras coreanus* Kolbe. As no type was designated, the writer selects *B. arcuatus* Bts., the first of the two, as type of *Kolbeus* Bouc.

Hoplia callipyge Leconte

Hoplia callipyge Lec., 1856, *Journ. Acad. Nat. Sci. Philadelphia*, Ser. 2, Vol. 3, p. 285.

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Hoplia pubicollis Lec., 1856, loc. cit., p. 285. Not *Hoplia pubicollis* Küster 1849.)

Hoplia oregona Lec., 1856, loc. cit., p. 284.

Hoplia convexula Lec., 1856, loc. cit., p. 285.

Hoplia irrorata Lec., 1857, Rept. Explor. Survey, IX, no. 1, p. 40. (Not *Hoplia irrorata* Blanch. 1850.)

Hoplia mutata Gemminger and Harold, 1869, Catalogus Coleopterorum, Vol. 4, p. 1113. (New name for *irrorata* Lec.).

Hoplia lecontei Dalla Torre, 1913, Coleopt. Catalogus (Junk), Pars 50, p. 376 (new name for *pubicollis* Lec.).

The acceptance of *Hoplia oregona* Lec. as the correct name for this species (Boyer, 1940, Microentomology, Vol. 5, Part 1, p. 16) appears to be incorrect under the International Code, in that it disregards the right of a previous reviser. When two or more names are published simultaneously and prove later to be synonyms, the first reviser may select any one of them to stand and, providing the name selected is valid, his decision is final (Article 28). The use of the method of "page priority" in selecting the proper name is not obligatory; it appears in the code as Recommendation "t" under Article 30 "All other things being equal, page precedence should obtain in selecting a type."

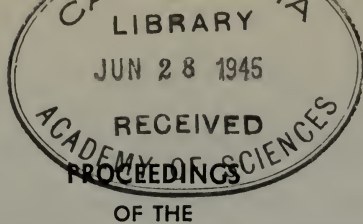
Leconte in 1856 proposed four names, *oregona*, *callipyge*, *convexula* and *pubicollis* for what are now considered as four color phases or forms of a single species. In 1880, the same author recognized part of this synonymy and suppressed *oregona* and *convexula* under *pubicollis*. However, as *pubicollis* Leconte 1856 is a homonym of *pubicollis* Küster 1849, his right as first reviser is void and a new selection was necessary. This was done by Dalla Torre in 1913 (Coleopt. Catalogus, Junk, Pars 50, p. 372) who selected *convexula* Lec. for the species with *oregona*, *pubicollis* and others as synonyms. Therefore, in 1940 when Boyer extended the synonymy to include *callipyge*, he had the choice of either *callipyge* or *convexula* as the correct name of the species since *oregona* had already been synonymized. As between those names, the writer selects *Hoplia callipyge* Lec.

Cotinis palliata (Gory-Percheron)

Gymnetis palliata Gory-Percheron, 1833, Monog. Cétoines, p. 336, Pl. 67, fig. 2.

Cotinis arizonica Casey, 1915, Mem. Coleopt., Vol. 6, p. 287.

Gory and Percheron described the species *Gymnetis palliata* as from California. In 1869, Gemminger and Harold referred it to the genus *Cotinis* and suppressed the name as synonym of *Cotinis sobrina* (G.-P.). Further to confuse the issue, the locality record of California is changed to Mexico. Dalla Torre, in Coleopt. Catalogus (Junk) Pars 72, p. 85, 1921, places both *sobrina* and *palliata* as aberrations of *C. mutabilis* G.-P. and continues to use the false citation of locality. The name is omitted from the Henshaw and Leng check-lists. Casey's *arizonica* appears certainly to be the same as Gory-Percheron's *palliata*.



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A NEW BADGER FROM SOUTH DAKOTA

By VIOLA S. SCHANTZ

In studying the badgers of South Dakota I discovered an unrecognized form in the Badlands area which is described as follows:

Taxidea taxus dacotensis, subsp. nov.

Type.—No. 223233, U. S. National Museum, Biological Surveys collection; male adult (coronal sutures fused), skull only; collected at Folsom, Custer County, South Dakota, September 9, 1916, by T. C. Beach. Original no. 26; Biological Surveys misc. no. 17782X.

Distribution.—Badlands region of western South Dakota. Transition, Upper, and Sonoran life zones. In the Saskatchewan biotic province (Dice).

Diagnostic characters.—A light-colored subspecies, and smaller than *Taxidea taxus taxus*.

Color.—Topotype No. 225838, U. S. National Museum, Biological Surveys collection (skin only) winter pelage: Facial area, including forehead (except median line), around the eyes, and patches on sides of head in front of ears, brownish-black, less accentuated than in *taxus*, irregular white markings of cheeks confluent with white throat; underfur of general dorsal area and sides pale ivory-yellow, though at base a buffy brown; the guard hair basal color also buffy brown, fading into ivory-yellow, and becoming black subterminally and white at the tip; this black band is narrower than in *taxus*, giving *dacotensis* a more yellowish grizzled appearance; general abdominal area uniform ivory-yellow; the white median line extends from the middle of the face to near the shoulders; chin slightly brownish; ears blackish edged with white; limbs brownish black; upper side of tail grizzled cinnamon buff, under side of tail cinnamon buff.

On several pelages taken late in summer the facial area including the forehead (exclusive of median line), around the eyes and patches on side of head in front of ears are mummy brown (Ridgway); dorsal area hairs are a warm buff becoming dark brown subterminally, tipped with buff, giving them a grizzled brown appearance, while the abdominal area is a warm buff color.

Skull.—The skull is similar to that of *taxus* excepting that it is smaller; however, the teeth P⁴ and M¹ average proportionately as large or larger. In *dacotensis* the condylobasal length of five females measured

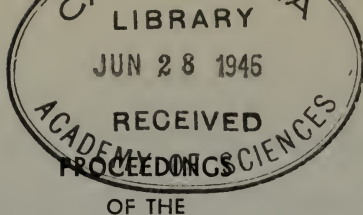
from 116 to 123.4 mm., or an average of 119.5; and four males measured from 120.6 to 125.3 or an average of 122.7.

Measurements.—Type: Skull condylobasal length, 120.6; zygomatic breadth, 79.1; breadth of brain case across mastoid processes, 75.2; interorbital breadth, 27.3; least postorbital constriction, 26.5; palatal length, 58.4; palatal constriction, 13; maxillary tooth row (alveoli), 41.5; crown length (outer side) of upper carnassial, 11.9; crown width of upper carnassial, 10.

Remarks.—*Taxidea taxus dacotensis* appears closely allied to the more northern *T. t. taxus* with which it undoubtedly intergrades. In comparison the condylobasal length of four adult male specimens of *T. t. taxus* from North Dakota measured from 128.6 to 132 mm., whereas four adult males of *T. t. dacotensis* from South Dakota measured from 120.6 to 125.3 mm.

Specimens examined.—Total 16 from South Dakota: Badlands, 1 (skull only); Dewey, Custer County, 2 (skulls only); Eagle Butte, Dewey County, 2 (skins and skulls); Faith, Meade County, 2 (1 skull only and 1 skin only); Folsom, Custer County, 8 (1 young skin and skull, 6 skulls only and 1 skin only); White River Valley, 1 (skull only).

Biological Surveys, U. S. Fish and Wildlife Service, Washington, D. C.



OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE AEDES (STEGOMYIA) ALBOLINEATUS GROUP¹
(DIPTERA, CULICIDAE)

By KENNETH L. KNIGHT, *Lt. Comdr. H(S), USNR*², and LLOYD
E. ROZEBOOM, *Lt., H(S), USNR*²

Recent collections made by the authors in the Philippine Islands have disclosed 5 new species of the subgenus *Stegomyia* which in general appearance resemble *Aedes* (*Stegomyia*) *albolineatus* (Theobald). These, along with *pseudalbolineatus* Brug form a section of *Stegomyia* that is distinct enough to be considered a group of that subgenus.

Edwards³ considered *albolineatus* as a member of the *scutellaris* group. In this group he also included *albopictus* (Skuse) and its related species.

The *albolineatus* group, as based on the species known at present, is characterized by: a diamond-shaped anterior area of narrow white scales on the median portion of the vertex; a single broad longitudinal pleural band of white scales that begins on the propleuron and extends posteriorly across the upper portion of the sternopleuron and the upper mesepimeron; having only the first three tarsal segments of the hind legs marked with basal white areas (a few white scales may occasionally occur on segment IV); the scutum being marked with a conspicuous longitudinal median white stripe; and the dististyle having its appendage well removed from the apex.

Key to Adults of the Albolineatus Group

- | | |
|---|-----------------------------------|
| 1. All three lobes of scutellum largely covered with broad white scales | 2 |
| Only mid scutellar lobe with broad white scales, lateral lobes covered with broad black scales | 5 |
| 2. Median stripe of scutum extending posteriorly to the scutellum (female unknown) | <i>bambusicolus</i> , new species |
| Median stripe of scutum extending only to level of wing bases | 3 |
| 3. An area of broad white scales on the lateral margin of the scutum just before level of wing base | <i>laffooni</i> , new species |
| No area of broad white scales on lateral scutal margin | 4 |

¹The collections reported on here were made under the auspices of U. S. Naval Medical Research Unit No. 2. The material was worked up in space furnished by the Division of Insects, U. S. National Museum and by Johns Hopkins University (School of Public Health and Hygiene).

²Division of Research, Bureau of Medicine and Surgery, U. S. Navy Department.

³Edwards, F. W., 1932. *Genera Insectorum. Culicidae. Fasc. 173, p. 161. F.* Wytzman, Brussels.

4. Only about basal two-fifths of third hind tarsal segment marked with white (female only, male cannot be separated).
arboricolus, new species
 Most, or all, of third hind tarsal segment marked with white
pseudalbolineatus Brug⁴
5. Scales of *apn* and *ppn* all dark.....*albolineatus* (Theobald)
 At least some of the scales of *ppn* pale, usually some pale scales on
apn also 6
6. Median scutal stripe extending posteriorly to scutellum; *ppn* with narrow curved creamy scales only.....*hoogstraali*, new species
 Median scutal stripe extending posteriorly only to level of wing bases; *ppn* with narrow dark scales dorsally and broad white scales below*boharti*, new species

Key to the *Albolineatus* Group Based on Male Genitalia

1. Lateral plate of mesosome with less than 10 teeth..... 2
 Lateral plate of mesosome with more than 10 teeth..... 3
2. Basistyle with 2 distinct prominences and with 4 bladelike specialized setae near the more basal of these lobes; dististyle appendage at basal one-seventh (Fig. 8).....*bambusicolus*, new species
 Basistyle with one prominence (bears 3-4 very stout short spines) and without bladelike specialized setate; dististyle appendage inserted just beyond middle (Fig. 21).....*albolineatus* (Theobald)
3. Lateral teeth of mesosome narrow and slender (Fig. 10); dististyle appendage very long and slender (Fig. 20)
hoogstraali, new species
 Lateral teeth of mesosome broad, tapered, blade-like (Fig. 13); dististyle appendage broader and shorter (Fig. 22)..... 4
- 4.⁵ Tips of strongest basal lobe spines reaching level of apex of basistyle; hairs of inner dorsal (before rotation) margin of basistyle with hairs as long as those on basal lobe (Fig. 23)
arboricolus, new species
laffooni, new species
 Tips of strongest basal lobe spines falling well short of level of basistyle apex; hairs of inner dorsal margin of basistyle short, usually conspicuously shorter than those of basal lobe (Fig. 22)*boharti*, new species

Aedes (*Stegomyia*) *albolineatus* (Theobald). 1904.

Entom. 37: 77 (female) (*Scutomyia*). TYPE-LOC.: Kuala Lumpur, Malay Peninsula (Leicester). TYPE: Female in British Museum.

MALE (Philippine specimens). Wing about 2½ mm. *Head*:—Proboscis and palpi black. Palpus approximately one-half to two-thirds (observed range 0.48-0.65) the length of the proboscis, latter about four-fifths the length of the abdomen. Antenna dusky, torus densely clothed on inner aspect with broad white scales. Vertex with a median longitudinal band of broad white scales, widening anteriorly, a broad somewhat diamond-shaped area of narrow white scales wedged deeply into the anterior margin of this band and extending anteriorly between the eyes, laterally these narrow scales extend far enough along the eye margins

⁴We have not seen specimens of this species.

⁵From Brug's description, *pseudalbolineatus* would key here. However, it is not possible to separate it from *arboricolus* and *boharti* on the basis of his description.

so as to cut off the broad white scales and the first of the broad black scales from the eye margins; remainder of vertex covered with broad black scales, except for a line of broad white scales on a level with the lower portion of *apn* (this may be reduced to a few scales or even absent) and a patch of similar scales in the lateral corner; a narrow area of black forked scales on the nape. *Thorax*:—Scutum dark, covered with black narrow scales, a median longitudinal stripe of white narrow scales that widens slightly from the anterior margin to a level with the post-spiracular area and then tapers rather abruptly to an end just before the level of the wing bases; a line of short golden bristles over the wing base. Scutellum with mid lobe clothed with broad white scales, frequently a few apical broad dark scales, lateral lobes clothed entirely with broad black scales. *Apn* with sparse narrow black scales, *ppn* with sparse narrow black scales dorsally. Pleuron with a large triangular area of broad white scales on the ventro-posterior portion of the sternopleuron in addition to the dorsal band. Coxae covered with broad white scales. Fore femur dark scaled, a small basal pale area ventrally on the anterior surface, a median longitudinal white stripe on the posterior surface, sometimes a small kneespot present; mid femur dark, a narrow white anterior kneespot, ventral margin marked with white that extends slightly onto the anterior and posterior surfaces; hind femur white scaled, the dorsal aspect black from apex nearly to base, the dark scaling extending subapically onto the anterior surface for a slight distance, the apical half of the posterior surface black, this black extending onto the ventral aspect subapically and occasionally just encroaching on the anterior surface. Tibiae dark, ventro-posterior scales and hairs paler. Fore and mid tarsi dark; hind tarsus with first 2 segments basally banded with white, the bands being about one-fourth the length of the segment and incomplete mesally, occasionally a few white scales basally on III. Halter pale with dark-scaled knob. *Abdomen*:—Tergites black-scaled with large lateral white patches on I-VII (basal on II-VII), becoming subbasal dorsally on II-VII, usually produced on dorsum to form narrow subbasal bands on VI and VII and occasionally on V and even IV. *Genitalia* (Figs. 17 and 21):—Basistyle conical, about 1 by $2\frac{1}{2}$, dorsal surface with several rows of long stout hairs that possess recurved tips; basal lobe with 3-4 stout spines and several slender hairlike setae at apex. Dististyle about half the length of the basistyle, tapering to a curved tip; appendage inserted just beyond middle and extending almost to the tip of the dististyle. Lateral plate of mesosome with a dorsal row of 5-7 apical stout teeth. Tenth sternite armed apically with a short, stout single or double process. Ninth tergite with an irregular row of 3-6 setae on each side.

FEMALE (Philippine specimens). Wing about $2\frac{1}{2}$ to 3 mm. Differs from the male chiefly as follows: Palpus about one-seventh to one-eighth the length of the proboscis. Median scutal stripe slightly broader than in the male. Fore femur occasionally with a few anterior apical white scales; mid tarsus frequently with a few white scales basally on the first 2 segments; hind tarsus with first 3 segments with broad basal white areas, that on II forming a complete band, occasionally a few pale scales basally on IV.

A certain amount of variation occurs in the adults of this species. Specimens were seen from Guadalcanal and New Georgia that differed

from the above description in having some or all of the median upright forked scales on the nape dusky to yellowish in color; in having the scutal stripe of the female wider (about width of median white area on the vertex) and that of the male somewhat narrower; in having a complete subapical black band on the hind femur (occasionally narrowly broken ventrally on anterior aspect); and in having complete or nearly complete bands on abdominal tergites II to VII (occasionally even a few pale scales on I). Specimens from New Guinea also possessed a more or less complete subapical band on the hind femur but otherwise did not appear to differ from Philippine material.

LARVA. The larva of *albolineatus* presents a striking range of variation; in fact, so much variation occurs as to make it almost inconceivable that only one species is present. However, a series of 116 larval skins from Guadalcanal, New Guinea, Morotai and the Philippines have been examined, and in no case was it found possible to detect more than one species in the associated adults. It is not inconceivable, of course, when progeny rearing is done from single egg batches, that it may be found possible to separate *albolineatus* into 2 or more species on the basis of the larva.

For descriptive purposes, the larva of this species has been divided into types. The common type of the Philippines has been described in some detail and is used as a basis for describing the others. On all characters except the number of branches of head hair 6, there seems to be a small amount of intergradation between the types. Two or more of these types may occur in the same breeding spot.

Type A (Series of 10 associated Philippine specimens from Samar and Luzon). *Head* (Fig. 1):—Antenna with a few very fine spicules scattered over basal one-half; length about $7\frac{1}{2}$ -8 times the width; hair tuft inserted slightly beyond middle, 3 branched (range 2-5). Median mouth brush hairs with fine comb-like tips.⁶ Preclypeal spine, pale, elongate and slender. Head hair 4⁷ with 12-20 branches; 5 with 10-20; 6 single, rarely double; 7 with 10-25; 8 single; 9 with 2-4; 12 many-branched; 13 single; 15 with 2-4; 17 with 2-7; 18 with 3-10; 20 with 2-4; hairs 4 and 6 anterior to 7, 5 behind and slightly mesad to 6, position of 4 in relation to 6 apparently variable. Mentum with first 2-3 teeth short and widely spaced, the remainder closely and evenly ranked, 9-12 lateral teeth. *Thorax*:—Integument with minute scattered spicules. Some of the hairs produced into stout stellate tufts, 8-19 branched. Meso- and metapleural hair tufts with a stout basal spine. *Abdomen* (Fig. 4):—Integument with minute scattered spicules. Some of the dorsal and ventral hairs developed into stout stellate tufts, 6-19 branched. Dorsolateral hair of segment I is 3-9 branched, lateral hair single, both hairs on or at the margin of opposite ends of a bar-like plate. Comb scales strongly developed, thorn-like, quite variable in length, a fine fringe present on basal portion of spine, scales arranged in a straight line, 9-12

⁶Unless the mouth brush hairs are completely extruded, this point is difficult to determine. Larval skins seldom have these brushes completely expanded, only about one in ten being so in the authors' collection. Comblike tips were seen on types A and B but not on C and D. However, not enough specimens of the latter were seen to be sure of the validity of this.

⁷In order to have a nomenclature for the ventral head hairs, Marshall is followed in naming the hairs of the head. Marshall, J. F., 1938. The British Mosquitoes. p. 45. British Museum, London.

in number. Siphon smooth, index about 2.4-2.8; detached acus present (rarely a very narrow attachment to the siphon); single subventral hair tuft, attached approximately at middle, 3-5 branched; pecten teeth 3-6 in number, posterior margin fringed, frequently both margins of posterior teeth fringed. Anal plate incomplete ventrally, posterior margin with a fringe of spines; lateral hair stout, single, occasionally 2-3 branched; *isc* 5-8 branched; *osc* single; ventral brush with 10 tufts, of which all but the most anterior two arise from a connected barred area, each tuft with about 5-6 branches; anal gills finger-like, rarely somewhat broadly lanceolate, upper pair slightly longer than the lower pair and about twice the length of the anal plate (observed range 1.6-2.2 times length of plate).

Type A was collected only in the Philippines. However, there is a variant of it that occurs in Guadalcanal, New Guinea and Morotai. In this, the body integument and siphon are covered with fine pile (visible under low power, 160x); the spines on the anal segment are more strongly produced; and the ventral head hairs tend to have more and stronger branches (thus approaching Type B).

Type B (Series of 10 specimens from New Guinea, Morotai and Luzon). Similar to Type A except as follows: Head hair 5 with 5-11 branches; 9 with 3-4; 15 with 2-8; 17 with 6-12; 18 with 8-16. Body integument and siphon densely covered with stout pile, that on the body being branched. Lateral hair of anal plate 2-4 branched, rarely single; posterior spines strongly produced. Material seen from New Guinea, Morotai, Samar, Balabac and Luzon.

Type C (Series of 10 specimens from Guadalcanal, New Guinea, Morotai, Samar and Luzon). Similar to Type A except as follows: Antenna longer, length about ten times the width, spicules scattered over whole length. Head hair 6 with 6-11 branches; 9 with 2-4 (one had 7). Body integument with fine pile, sometimes nearly invisible at 160x. Siphon with fine spicules or bare. Lateral hair of anal plate 1-4 branched.

Type D (Series of 5 specimens from Morotai, Samar and Luzon). Similar to Type A except as follows: Antenna longer, length about ten times width. Head hair 6 with 7-11 branches; 9 with 3-5; 15 with 3-5; 17 with 8-11; 18 with 8-12; 20 with 3-5. Body integument with prominent branched pile; siphon pilose. Lateral hair of anal plate 2-3 branched; spines on posterior margin of anal plate strongly produced.

Brug (1939)⁸ discusses the variability of the *albolineatus* larva and illustrates the differences of antennal length, of the branching of the dorsal head hairs and of the length of the posterior spines on the anal plate.

This species breeds commonly in tree holes, coconut shells and bamboo stumps, and more rarely in artificial containers and fallen leaves. Bonne-Wepster and Brug (1932)⁹ also report it as breeding in leaf axils of sago palms and *Colocasia*; and in a rockhole, lagoon and jungle pool.

PUPA. Figures 11, 12 and 18 illustrate the pupa arising from the Type A larva. Although some variation occurs in number of branches and of position of setae in a series of *albolineatus* pupae arising from

⁸Brug, S. L., 1939. Tijdschr. v. Ent., 82: 102-104.

⁹Bonne-Wepster, J., and Brug, S. L., 1932. Geneesk. Tijdschr. v. Nederland.-Indie 72 (Bijblad 2): 63.

the different types of larvae, there appears to be no significant difference between them.

TAXONOMIC DISCUSSION. From Theobald's original description of *albolineatus*, it cannot be told if his type is that species as understood here, or *boharti*. However, a female specimen in the U. S. National Museum collected in the type locality of *albolineatus* possesses only narrow curved black scales on *apn* and *ppn*, and thus agrees not only with the material in the authors' collections, but also with Barraud's (1934)¹⁰ conception of *albolineatus* (Assam). The only published figure of the mesosome of *albolineatus* is that by Brug (1939),⁸ and is presumably of a Ceram specimen. It agrees well with all the material studied.

There are specimens of *albolineatus* in the authors' collection from Guadalcanal, Solomon Islands; Hollandia, New Guinea; Morotai, Moluccas; and Mindanao, Balabac, Samar, and Luzon in the Philippines. Material was examined in the U. S. National Museum from the additional areas of Rendova and Munda Point, (W. G. Downs), Florida (K. L. Knight), Treasury Islands (J. H. Paullus) and Bougainville (A. B. Gurney, C. R. Bruck) in the Solomon Islands; Milne Bay (W. V. King, T. K. Ruebush, W. S. Ferguson, H. R. Roberts, G. H. Bick), Sidor (W. S. Ferguson), Kiriwinia (W. S. Ferguson), Dobodura (B. E. Rees), Finschafen (E. S. Ross) and Toem, east of Sarmi (E. S. Ross), all in New Guinea; Tarakan, Borneo (A. G. Humes); and Kuala Lumpur, Malay Peninsula (A. T. Stanton). This species has also been recorded from New Britain, New Ireland, Riouw, Sangir Islands, Ceram, Saparoea, Krakatoa Group, Indochina, and Assam.

Aedes (Stegomyia) pseudalbolineatus Brug, 1939

Tijdschr. v. Ent. 82: 103 (male and female). TYPE LOC.: Undesignated. Type series from Celebes and Sangir Islands. TYPE: Male in British Museum.

According to Brug the male can be distinguished externally from that of *albolineatus* only by the all white scutellum.¹¹ The genitalia differs in that the hairs on the basal lobe are stout and almost as thick as the 4 spines, and in that the lateral mesosomal plate possesses 14-16 dorsal teeth. The female has the additional character that the third hind tarsal segment is largely white on three sides, leaving only the fore side, and sometimes a narrow apical band, black. The type series was reared from a broken bottle, bamboo stumps and tree holes. Brug states that the larva falls within the range of variability found for *albolineatus*, the only difference he could find being that the outer occipital hair (hair 9) has 6-10 branches as against 2-3 (once 4 and once 5) in *albolineatus*. This number for *albolineatus* also holds for the rather considerable number of specimens (60 examples of hair 9, range in number of branches 2-5) examined by the authors.

Aedes (Stegomyia) arboricolus, new species

MALE. Wing about 2½ mm. Undistinguishable from the type description of the male of *pseudalbolineatus* Brug. Distinct from *albolineatus* on scaling of scutellum and the prothoracic lobes, and on male geni-

¹⁰Barraud, P. J. The Fauna of British India. 5:243. Taylor and Francis, London.

¹¹In a recent communication, Dr. John Smart, British Museum, states that the specimens of *pseudalbolineatus* in their collection have all the scales of *apn* and *ppn* broad white.

talic characters. Palpus approximately three-fifths (observed range 0.54 to 0.66, holotype 0.66) the length of the proboscis. A few narrow curved cream-colored scales on lateral margin of scutum between level of mesothoracic spiracle and of wing base. All three scutellar lobes clothed with broad white scales, the apex of the mid lobe with a few broad black scales, also a few similar apical scales on the lateral lobes. *Apn* with both broad and narrow white scales; *ppn* with sparse narrow black scales dorsally, broad white scales below. Fore and mid tarsi dark; hind tarsus with first three segments basally marked with white, the marking on I incomplete on mesal aspect, that on II about one-half the length of the band on I and narrowly complete mesally, that on III consisting of only a few lateral scales. Abdominal tergites with narrow subbasal white bands on VI and VII. Genitalia (Figs. 14, 19 and 23) with basistyle conical, about $1 \times 2\frac{1}{2}$; inner dorsal surface with several irregular rows of rather long hairs, a number of long stout setae on ventral and outer surface; basal lobe with 3-4 elongate spines (tips reach level of basistyle apex) and several long stout setae with slender curved tips. Dististyle about one-half length of sidepiece, tapering to a blunt point at tip; appendage insertion ranging from just before middle to just beyond, apex of appendage not reaching the tip of the dististyle. Lateral plate of mesosome with row of 13-16 dorsal teeth. Tenth sternite armed apically with a 1-3 lobed process. Ninth tergite with 4-10 hairs on each side.

FEMALE. Wing about 3 mm. Resembles the male in most respects. Similar to type description of *pseudalbolineatus* except for marking of the third hind tarsal segment. Palpus about one-eighth the length of the proboscis. Hind tarsus with first three segments with basal white bands, that on I about one-fourth the length of the segment and incomplete mesally, that on II about two-fifths the length of the segment and complete although narrowed mesally, that on III about two-fifths the length of the segment and incomplete mesally, occasionally a very few basal pale scales present on IV. Abdominal tergites with partially complete subbasal bands on IV and V, complete on VI and VII.

LARVA (Series of 12 associated skins and 2 larvae, all from one collection) (Figs. 2 and 3). Generally similar to Type B. *albolineatus* larva except for the shape of the anal gills: Head hair 5 with 8-13 branches; 9 with 4-8 (once 3); 15 with 3-6; 17 with 11-19; 18 with 12-17; relative position of anterior dorsal head hairs variable. Comb scales strongly developed, thorn-like, smooth, the spine about twice the length of the base, tightly arranged in an even single line, about 12 in number (range 11-16). Siphon index 2.4 to 3.1; 3-5 pecten teeth. Anal plate with posterior fringe of strong spines, the longest at least half the length of the anal plate in length. Anal gills tapered from base, occasionally somewhat lanceolate, dorsal pair just slightly longer than the anal plate (1.05-1.15), ventral pair somewhat shorter than the dorsal pair.

PUPA. Generally similar to that of *albolineatus*. A significant difference appears to occur in the greater number of branches of hair 1 of the seventh abdominal segment (*arboricolus*: 24 examples, range 4-8, average 6.1 branches; *albolineatus*: 155 examples, range 1-3, average 1.8).

TYPES. *Holotype*:—Male, with larval and pupal skins and genitalia (U. S. National Museum Cat. No. 57769). Shohoton Springs, inland on the Basey River, Samar, May 8, 1945 (K. L. Knight), reared from a large

open tree hole. *Paratypes*:—4 males, 7 females, with associated larval and pupal skins, 3 males and 2 larvae without associations, same data as for type. Paratypes deposited in U. S. N. M., Johns Hopkins University and California Academy of Sciences.

TAXONOMIC DISCUSSION. From *pseudalbolineatus* (type description, since no specimens were available for comparison), *arboricolus* is distinct in the female in having only about the basal two-fifths of the third hind tarsal segment marked with white. Brug (1939)⁸ describes *pseudalbolineatus* as having most of the third hind tarsal white on three sides, leaving only the fore side, and sometimes a narrow apical band, black. Apparently neither the male nor the larva are distinct from those of *pseudalbolineatus*. Brug states that the male of *pseudalbolineatus* differs from *albolineatus* only in scutellar and genitalic differences. This would imply that *apn* and *ppn* possess dark scales only, which would furnish a further differentiation point between *arboricolus* and *pseudalbolineatus*.¹¹ In the larva, this species is generally distinct from *albolineatus* on the shape of the anal gills and on the number of branches of head hair 9. However in some cases sufficient variation occurs so as to make identification difficult.

***Aedes (Stegomyia) boharti*, new species**

Aedes (Stegomyia) albolineatus (Theobald), Bonne-Wepster and Brug, 1932, *Geneesk. Tijdschr. v. Nederland.-Indie* 72 (Bijblad 2): 60 (Fig. 14, male genitalia; description of male in part).

MALE. Wing about 2 mm. Closely similar to *albolineatus*, but readily distinguished by the scaling of *apn* and *ppn*, and by the structure of the mesosome. Palpus approximately three-fifths (observed range 0.5-0.7, holotype 0.7) the length of the proboscis. *Apn* usually with narrow black scales and with a variable amount of narrow and broad white scales; *ppn* with narrow dark scales dorsally and broad white scales below, a few narrow white scales generally present along the margin of the white broad scales. Lateral scutellar lobes clothed with broad black scales, median lobe with broad white scales only. Genitalia (Figs. 9, 13 and 22) with basistyle conical, $1 \times 2\frac{1}{2}$, some long stout setae on ventral and outer surface, hairs on inner dorsal surface usually quite short, sometimes nearly as long as in *arboricolus*, basal lobe with three stout spines (tips fall well short of basistyle apex) and a number of shorter setae, those on the upper part of the lobe stout and resembling spines. Dististyle tapering to tip; appendage inserted at, or beyond, middle and extending about to apex of dististyle. Lateral plate of mesosome with a row of 11-16 teeth on dorsal margin. Tenth sternite ending in a blunt, 1-3 lobed process. Ninth tergite with 3-5 hairs on each side.

FEMALE. Wing about $2\frac{1}{2}$ - $3\frac{1}{2}$ mm. Similar to the female of *albolineatus* except for the scaling of *apn* and *ppn* as described for the male.

LARVA. Two main types of larvae give rise to *boharti* adults. These are separable, as with *albolineatus*, on whether head hair 6 is single or multiple.

Type D (Holotype and 7 paratypes, all associated skins, Samar and Luzon):—Apparently not distinguishable from Type D of *albolineatus*, except on shape of anal gills. Inner mouth brush hairs with comblike tips. Antenna 9- $11\frac{1}{2}$ times longer than wide; hair tuft 2-5 branched. Head hair 5 with 12-19 branches; 6 with 4-8; 7 with 10-16; 9 with 2-8;

12 with 11-17; 15 with 1-7; 17 with 10-18; 18 with 10-20. Mentum with 9-14 lateral teeth. Comb scales 8-12 in number, the spines at least as long as the bases; some or all of the teeth may be joined basally. Siphon index approximately 3; 3-6 pecten teeth; hair tuft 2-4 branched. Lateral hair of anal plate 2-4 branched. Anal gills tapered from base, dorsal pair only slightly longer than ventral and about $1\frac{1}{2}$ times longer than anal plate (3 specimens all measured 1.4). A series of unassociated larvae from Luzon have the anal gills broadly lanceolate and subequal to the anal plate in length. An associated specimen each of *albolineatus* and *boharti* was reared from this collection. The gills of the *boharti* specimen are somewhat lanceolate and are slightly longer than the anal plate. This would indicate that the unassociated specimens are possibly *boharti*. However, that gill type was never seen in any of the other associated *boharti* material.

Type B (10 associated skins from Culion, Palawan, Samar and Luzon):—Apparently not distinguishable from Type B of *albolineatus*, except on shape of anal gills. Inner mouth brush hairs with comblike tips. Antenna $7\frac{1}{2}$ -10 times longer than wide; hair tuft 1-4 branched. Head hair 5 with 5-15 branches; 6 single, rarely 2-branched; 9 with 2-6; 15 with 2-6; 17 with 12-19; 18 with 10-17; 20 with 2-5. Mentum with 9-13 lateral teeth. Comb scales 9-16 in number, the spines at least equal to the bases in length, occasionally nearly twice the length of the base, some or all the teeth may occasionally be joined basally. Siphon index approximately 2.5-3.0. Lateral hair of anal plate 2-4 branched; posterior spines about half the length of the anal plate. Dorsal anal gills approximately $1\frac{3}{4}$ times length of anal plate (observed range 1.3-2.2), gills tapered from base, rarely lanceolate.

The larva of *boharti* is apparently not separable from that *arboricolus*.

PUPA. No significant pupal differences can be correlated with the above 2 larval types. Nor can the pupa of this species be separated with certainty from that of *albolineatus*. It is true, however, that in *boharti* hair 1 of the seventh abdominal tergite on the average possesses more branches (33 examples, average 3.5, range 2-6) than that hair in *albolineatus* (155 examples, average 1.8, range 1-3). Similarly, *boharti* differs from *arboricolus* on the number of branches of hair 10 of the second abdominal segment (*boharti*: 25 examples, range 1-5, average 2.8; *arboricolus*: 21 examples, range 3-10, average 5.4).

TYPE. *Holotype*:—Male, with larval and pupal skins, and genitalia (U. S. National Museum Cat. No. 57770), Osmena, Samar, May 15, 1945 (A. E. McMillan and M. J. MacMillan), reared from coconut shell halves in the vicinity of a native habitation. *Paratypes* (34 males, 52 females, all with associated larval and pupal skins, year 1945):—1 male and 2 females, same data as for holotype; 4 females, Osmena, Samar, June and August; 4 males and 5 females, Balinsasayao, Leyte, June; 2 females, 1,000 ft. elevation, slopes of Mt. Lobi, Leyte, August; 1 male and 1 female, Irahuan River, Palawan, June; 1 female, Bacungan, Palawan, June; 1 male and 1 female, Culion Island, June; 2 males, Cape Melville, Balabac Island, June; 13 males and 15 females, Subic Bay, Luzon, June, July and August; 10 males and 14 females, San Ramon, Mindanao, September; 2 males and 7 females, Zamboanga, Mindanao, September. The paratype series was collected by D. R. Johnson, Jean Laffoon, A. E. McMillan, L. E. Rozeboom, K. L. Knight, E. Bogusz, E. S. Zolick, F. E.

Zedeck and M. J. MacMillan. The paratypes are deposited in U. S. N. M., Johns Hopkins University and the California Academy of Sciences.

The paratypes were all reared from coconut halves, bamboo stumps, tree holes, banana stumps, palm stump hole and from a water bucket in the woods. Other specimens were captured as adults when aroused from resting places in deep woods. On at least one occasion, 2 specimens were captured biting man in the woods. This species apparently is more abundant in the Philippines than *albolineatus* (see distribution).

No definite locality was given for the male specimen that Bonne-Wepster and Brug mentioned, but apparently it was from somewhere in the Dutch East Indies.

This species is dedicated to Dr. Richard M. Bohart.

Aedes (*Stegomyia*) *hoogstraali*, new species

MALE. Wing about 2½ mm. Similar to *albolineatus*, but differing markedly in scutal and genitalic characters. Palpus approximately five-sixths the length of the proboscis. Proboscis slightly shorter than the abdomen. Head with median area as in *albolineatus*, laterad to this is an area of broad black scales that is approximately the same width as the median white area, frequently a band of white scales present in this dark-scaled portion, lateral corner of head with pale broad scales, a narrow area of small black forked scales on the nape. Scutum (Fig. 6) dark, densely clothed with hairlike black scales, marked with a complete median longitudinal line of hairlike white scales, the line increasing slightly in width to the level of the postspiracular area, then tapering gradually to the prescutellar space, the portion that extends through the prescutellar space widening slightly to the same width as the midscutellar lobe and with parallel sides, scales at posterior margin of prescutellar portion of the line broad and undistinguished from mid lobe scutellar scales; lateral scutal margin from level of posterior edge of *ppn* to level of wing base with creamy-white narrow-curved scales. Mid lobe of scutellum with broad white scales, lateral lobes with broad black scales. *Apn* and *ppn* with narrow-curved creamy-white scales only. Hind femur white, a black subapical band that is ventrally incomplete on both surfaces. Fore tarsus with a small basal white patch on I; mid tarsus with a white basal patch on I and a few basal white scales on II; hind tarsus with prominent white basal bands on the first three segments, that on III incomplete ventrally. Abdomen with complete subbasal bands on tergites V to VII. Genitalia (Figs. 10 and 20) with basistyle cylindrical, about 1 x 3, several irregular rows of short curved-tipped hairs dorsally, basal lobe with 3 stout spines, 2-3 stout setae and 2-3 slenderer setae apically. Dististyle half the length of the basistyle, tapering to a blunt apical point; appendage inserted at basal third and extending almost to apex of dististyle, long, slender, acutely tapered. Lateral plate of mesosome with a dorsal row of 13-15 rather thin teeth. Tenth sternite ending in a 1-2 lobed blunt process. Ninth tergite with 4-5 hairs on each side.

FEMALE. Wing about 3 mm. Palpus only about one-sixth the length of the proboscis. Legs marked as in male except that the fore femur possesses an anterior kneespot; the mid tibia is entirely dark. Remainder as in male.

LARVA. Apparently two slightly different larval types occur in this species, although not sufficient larval material is available to be com-

pletely sure. The two types are separable on the branching of head hair 6 and on the length of the antenna. The larva of *hoogstraali* is distinct from the other species described in this paper on the absence of prominent thoracic and abdominal stellate tufts and on the form of the comb and pecten teeth.

Type A (Series of 3 associated larval skins). *Head*:—Antenna with a few very fine spicules scattered basally; $8\frac{1}{2}$ - $9\frac{1}{2}$ times longer than wide, hair tuft inserted just beyond middle, single. Median mouth brush hairs with comblike tips. Preclypeal spine pale, elongate and slender. Head hair 4 many branched; 5 with 8-11 branches; 6 single; 7 with 10-14; 9 double; 15 with 4-5; 17 with 2-4; 18 with 2-6; 20 with 3-4; hairs 4 and 6 anterior to 7, 5 behind and slightly mesad to 6. Mentum with first 2-3 teeth separated, acute, the remainder rounded and evenly ranked, 10-11 lateral teeth. *Thorax*:—Mesothoracic pleural hair tuft with stout basal spine which may be split into several points; metathoracic pleural hair tuft with similar but smaller spine. *Abdomen* (Fig. 5):—Dorso-lateral hair of segment I is 4 branched, lateral hair single, the hairs located at opposite ends of a small barlike plate; the lateral hairs of II-VI double, rarely one or more single. Comb scales with broad oval bases, the spines narrow thornlike, equal to or somewhat less in length than the basal portion, very fine fringe on basal portion and extending onto base of short spines; lateral hair double; *isc* 4-5 branched; *osc* single; ventral brush with 10 tufts, each tuft 2-4 branched, the most anterior 2 not attached to a lateral bar. Anal gills broad fingerlike, dorsal pair slightly longer than ventral pair and 1.3-1.9 times longer than the anal plate.

Type B (Two associated larval skins). Similar to Type A except as follows: Antenna ten times longer than wide, hair tuft 1-2 branched. Head hair 5 with 14-20 branches; 6 with 3; 15 with 4-5; 17 with 1-2; 18 double. Dorso-lateral hair of abdominal segment I is 6-8 branched. Dorsal pair of anal gills 2.8 times length of anal plate.

PUPA. Similar to *albolineatus* except as follows: Vertical plate differently shaped (Fig. 15). Trumpet shorter and broader (Fig. 16). Hairs 4 and 6 of the cephalothorax not appreciably different in length from hair 5. Hair 6 of abdominal segments IV-V (usually III also) is mesad of a longitudinal line through 10. Hair 1 of VII lies mesad of a longitudinal line through 2 and is nearer the posterior margin of the segment than the lateral margin.

TYPES. Holotypes:—Male, with larval and pupal skins and dissected genitalia (U. S. National Museum Cat. No. 57771), Subic Bay, Luzon, June 27, 1945 (E. S. Zolick and F. E. Zedeck), reared from bamboo stump. *Paratypes* (6 males, 8 females):—1 female, with larval and pupal skins, same data as for type; 3 males and 5 females, with larval and pupal skins, 2 males and 2 females, Subic Bay, Luzon, July 1945 (M. J. MacMillan, L. E. Rozeboom, F. E. Zedeck), reared from bamboo stumps; 1 male, Subic Bay, Luzon, July 1945 (M. J. MacMillan), reared from a tin can.

The paratypes are deposited in U. S. N. M., Johns Hopkins University and California Academy of Sciences.

This species is dedicated to Mr. Harry Hoogstraal.

***Aedes (Stegomyia) bambusicolus*, new species**

MALE. Wing about 2½ mm. Externally, somewhat intermediate between *hoogstraali* and *pseudalbolineatus*, but differing markedly on genitalia from any of the *albolineatus* group. The following points of difference from *albolineatus* occur: Palpus nearly as long as the proboscis (0.97 of the proboscis length). Scutum (Fig. 7) dark, covered with hairlike black scales, a median longitudinal stripe of hairlike white scales, tapered to level of the wing bases from where it continues onto the bare prescutellar space as a narrow line, a few broad white scales medially on posterior margin of scutum, a few broad black scales laterally, a band of broad white scales extending from level of mesothoracic spiracle to level of wing base on extreme lateral margin of scutum, a small patch of narrow curved ochreous scales above wing base. Scutellum clothed with broad white scales. *Apn* densely covered with broad white scales, *ppn* with narrow white scales dorsally and broad white scales below. Fore femur black with a narrow white kneespot and a few basal pale scales anteriorly, posteriorly broadly white on basal half, reduced to a line on apical portion; mid femur with a white kneespot, a ventral pale line anteriorly, posterior surface all white basally, the white extending narrowly along ventral margin to near middle, a white ventral line at apex. Hind femur white, a broad complete subapical dark band. Fore tarsus dark with white basal patch on I; mid tarsus dark with pale basal patch on I, a few basal white scales on II; hind tarsus with broad basal white bands on first three segments, that on I about one-third of the segment, that on II about one-half and that on III about two-thirds. Abdominal tergites with complete subbasal bands on IV to VII. Genitalia (Fig. 8) with basistyle conical, 1 x 2, dorsally with several rows of very long stout bristles; a lobe-like prominence on inner dorsal surface near the base, a number of long stout setae with slender curved tips arising from this prominence, 4 large curved blade-like specialized setae inserted just dorsally to this prominence; basal lobe with a dense covering of long stout setae but without distinctly enlarged spines. Dististyle slender, almost as long as basistyle, sharply angled before apex, the tip truncate, appendage short, tapered, rodlike and located at basal one-seventh. Lateral plate of mesosome with 7-8 dorso-apical teeth. Tenth sternite ending in a long slender blunt process. Ninth tergite with 5 hairs on each side.

FEMALE, LARVA and PUPA. Unknown.

TYPES. *Holotype*:—Male, with mounted genitalia (U. S. National Museum Cat. No. 57772), Culion Island, June 20, 1945 (D. R. Johnson and Jean Laffoon), reared from bamboo stump. *Paratype*:—1 male, same data as for holotype. Paratype deposited in U. S. N. M.

***Aedes (Stegomyia) laffooni*, new species**

MALE. Wing about 2 mm. Similar to *albolineatus*, but differing markedly in scutal, scutellar and genitalic characters (for separation from the other species, see key). The following points of difference from *albolineatus* occur: Scutal stripe widest at midpoint of length; an area of broad white scales extending forward from level of wing base to

level of postspiracular area on lateral margin of scutum. Scutellum clothed with broad white scales, some broad dark scales apically on each lobe. *Apn* and *ppn* clothed with broad white scales, a few narrow dark scales dorsally on *ppn*. Mid tarsus with a few white basal scales on I; hind tarsus with first 3 segments basally banded with white, those on I and III being incomplete medially, the band on I being about one-fourth the length of the segment and those on II and III about one-third. *Genitalia*:—Apparently not distinct from that of *arboricolus*.

FEMALE. Wing about 3 mm. Similar to the male except as follows: Fore femur with a few anterior apical white scales; subapical dark area of hind femur only slightly extended basally on dorsal aspect (not reaching middle); mid tarsus with lateral basal white scales on first 2 segments; hind tarsus with basal white bands on first 4 segments, incomplete medially on all except II, the band on I about one-fourth to one-third the length of the segment, on II-IV one-third to nearly one-half.

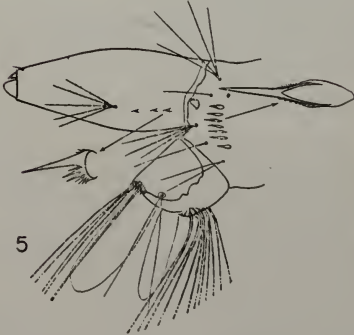
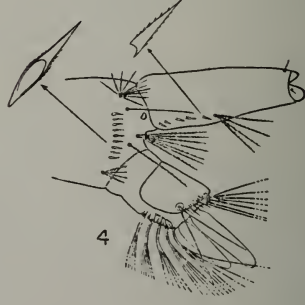
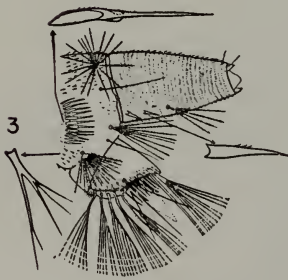
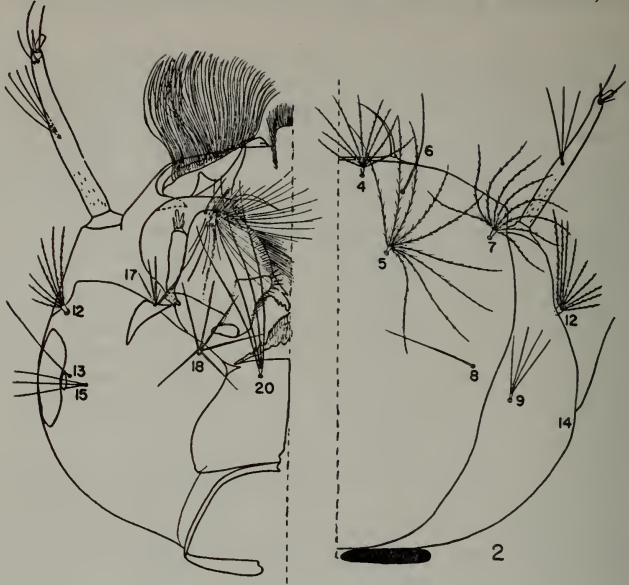
LARVA and PUPA. Unknown.

TYPES. *Holotype*:—Male, with mounted genitalia (U. S. National Museum Cat. No. 57876), 2 miles inland from San Ramon, Mindanao, about 500' elevation, September 17, 1945 (Jean Laffoon), reared from tree hole in dense jungle. *Paratypes*:—2 females, same data as for holotype; 1 female, Maasin Village, Zamboanga Province, Mindanao, September 25, 1945 (Jean Laffoon), collected as an adult in a nipa palm swamp. Paratypes deposited in U. S. N. M.

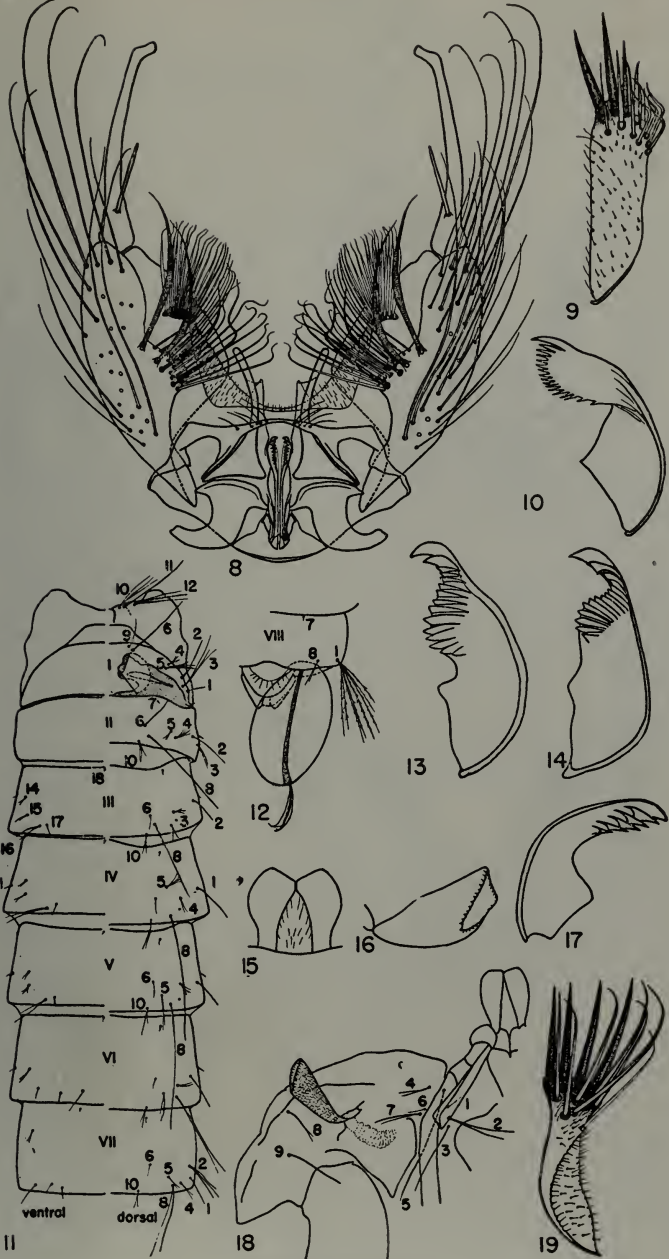
This species is dedicated to the collector.

EXPLANATION OF PLATES

- Figure 1. *A. albolineatus*. Ventral aspect of larval head.
 Figure 2. *A. arboricolus*. Dorsal aspect of larval head.
 Figure 3. *A. arboricolus*. Lateral aspect of larval terminal segments.
 Figure 4. *A. albolineatus*. Lateral aspect of larval terminal segments.
 Figure 5. *A. hoogstraali*. Lateral aspect of larval terminal segments.
 Figure 6. *A. hoogstraali*. Dorsal aspect of anterior prothoracic lobes, scutum and scutellum.
 Figure 7. *A. bambusicolus*. Dorsal aspect of anterior prothoracic lobes, scutum and scutellum.
 Figure 8. *A. bambusicolus*. Male genitalia.
 Figure 9. *A. boharti*. Basal lobe of male genitalia.
 Figure 10. *A. hoogstraali*. Lateral aspect of lateral mesosome plate.
 Figure 11. *A. albolineatus*. Metanotum and abdominal segments I-VII of pupa.
 Figure 12. *A. albolineatus*. Segment VIII and paddle of pupa, dorsal aspect.
 Figure 13. *A. boharti*. Lateral aspect of lateral mesosome plate.
 Figure 14. *A. arboricolus*. Lateral aspect of lateral mesosome plate.
 Figure 15. *A. hoogstraali*. Vertical plate of pupal cephalothorax.
 Figure 16. *A. hoogstraali*. Pupal trumpet.
 Figure 17. *A. albolineatus*. Lateral aspect of lateral mesosome plate.
 Figure 18. *A. albolineatus*. Cephalothorax of pupa.
 Figure 19. *A. arboricolus*. Basal lobe of male genitalia.
 Figure 20. *A. hoogstraali*. Male genitalia.
 Figure 21. *A. albolineatus*. Male genitalia.
 Figure 22. *A. boharti*. Male genitalia.
 Figure 23. *A. arboricolus*. Male genitalia.



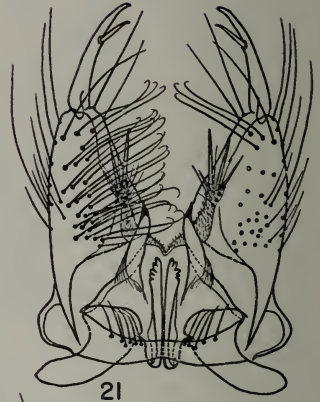
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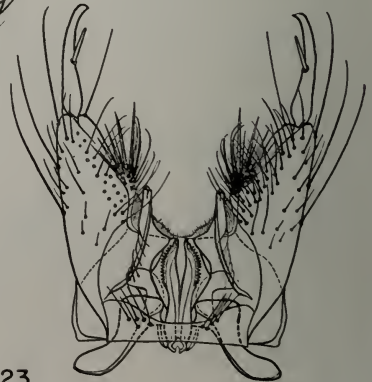
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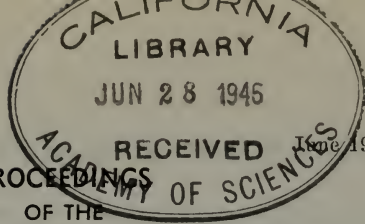


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Details of Aedes



BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW WARBLERS FROM MEXICO

By ROBERT T. MOORE

The following warblers, apparently new to science, have been added to the Moore Collection in the last few years and are herewith described:

*Geothlypis nelsoni karlenae*¹ subsp. nov.

Karlene's Warbler

Type.—Male adult; number 38391, collection of Robert T. Moore; Totontepec, Mt. Zempoaltepec, Oaxaca, Mexico; altitude about 6,560 feet, according to the collector; April 21, 1942; collected by Mario del Toro Aviles.

Subspecific characters.—Males differ from *Geothlypis nelsoni nelsoni* Richmond in having upper parts grayer (less greenish); gray band behind the black mask wider, more conspicuous and carried laterally to the post-ocular and post-auricular areas; averages slightly larger in wing and tail. The female has the lower throat brighter yellow (more orange); under tail coverts more bronzy yellow.

Range.—Although the topotypical series, all adults, of five males and one female were all taken on Mt. Zempoaltepec in eastern Oaxaca, this form ranges north through Puebla (Chalchicomula) to Careaga in the District Federal.

Measurements.—

	Males	Wing	Tail	Exposed Culmen
Aver. 7 ad. <i>karlenae</i>		56.2(53.2-58.2)	60.7(57.2-63.2)	11.3(11.1-11.7)
Aver. 5 ad. <i>nelsoni</i>		53.7(51.-56.6)	57.1(55.2-59.)	11.2(10.0-12.)

Specimens examined.—Moore Collection—*karlenae*—Oaxaca: Totontepec 3 ♂ 1 ♀ (Apr. 12-May 11), Moctum 1 ♂ (Dec. 5); District Federal: Careaga 1 ♂ (Mar. 15). *nelsoni*—Veracruz: 5 mi. N. of Jalapa 3 ♂ 1 ♀ (Mar. 15-25); San Luis Potosi: 6 mi. E. Ciudad del Maiz 1 ♀ (Oct. 2). Collections U. S. Nat'l Mus. and Biol. Sur.—*karlenae*—Puebla: Chalchicomula 2 ♂ (Mar. 17-April 18). *nelsoni*—Veracruz: Las Vegas 1 ♂ (Apr. 4), Jico 2 ♂ (June 30); Hidalgo: Real del Monte 1 ♂ (Mar. 12, Type of *microrhyncha*).

Remarks.—No comparison was made between *karlenae* and *microrhyncha* Ridgway, because the latter is deemed a synonym of *G. nelsoni nelsoni*. I have examined two of the three males of the topotypical series (Biol. Sur. Coll.) of *microrhyncha*, taken at Real del Monte, Hidalgo in

¹Named in honor of the author's daughter, Karlene Pim, who accompanied him and helped him on his last expedition in Ecuador.

March 1891. It is true that the gray of the crown is much reduced in these specimens, but the same is equally true of my three specimens from Jalapa, Veracruz, which are practically topotypical and were secured in the same month of March, they showing barely a trace of gray. The type and the only other specimen in good condition from Real del Monte, No. 143334, were collected on March 13th and 12th, whereas the three specimens from Jalapa were secured between March 15th and March 22nd. All are in exactly the same condition of wear. The type of *Geothlypis cucullata* Salvin and Godman was collected at the Cofre de Perote only a few miles from Jalapa and as the name was preoccupied, Richmond re-named this bird *nelsoni* to replace *cucullata*. Furthermore, there is another male in the Biological Survey Collection, No. 365932, taken by Burleigh at Las Vigas on April 4th, 1939, also only a short distance from Jalapa and this bird, too, resembles my specimens. The only individual of *nelsoni*, which has an appreciable amount of gray behind the black mask, is a male from Jico, Veracruz, a June 30th bird, which possesses the minimum amount shown by any *karlanae*. If the type of *cucullata* has a more conspicuous gray crown band, the wider band is abnormal or probably due to its being in fresh plumage and a series of *microrhyncha* in similar plumage would probably show the same wide band. The only other character alleged to differentiate *microrhyncha*, small bill, is certainly very unimportant. Even Ridgway shows the difference as only about 1 mm smaller! In the females, too, this difference is slight. The female from Ciudad del Maiz, San Luis Potosi has an exposed culmen of 10.3 mm, compared with 10.5 for the Jalapa female. Dr. Herbert Friedmann examined all of these birds with me in April 1944 and agrees with me that *Geothlypis nelsoni microrhyncha* Ridgway is a synonym of *Geothlypis nelsoni nelsoni* Richmond.

Great care should be taken to compare birds of the same period of the year and of amount of wear, because the feathers of the pileum in March and April are generally somewhat worn. Fortunately, all of the critical birds from Real del Monte, Jalapa, Las Vigas, Careaga and Mt. Zempoaltepec were collected in the same two months of March and April.

Basileuterus belli bateli, subsp. nov.
Batel Chestnut-eared Warbler

Type.—Male breeding adult in nearly fresh plumage; number 20647, collection of Robert T. Moore; Rancho Batel, 6 mi. north of Santa Lucia, Sinaloa, Mexico; altitude about 6,800 feet; May 28, 1938; sex organs fully enlarged; collected by Chester C. Lamb.

Subspecific characters.—Differs in breeding and winter plumage from *Basileuterus belli clarus* Ridgway in having auriculars darker chestnut; underparts darker yellow, rather than paler; upperparts darker golden green; olive on flanks more extensive. Differs from *Basileuterus belli belli* (Giraud) in having chestnut area around the eyes and auriculars paler chestnut; upperparts more golden (less olive) green; rectrices not only longer as in *clarus*, but also much broader.

Range.—Occurs in Temperate and Upper Transition Zones on the sierras of southeastern Sinaloa (Rancho Batel breeding) through Jalisco (San Sebastian) and Michoacan to at least the Sierra Ozumatlan (9,500 ft.) and (in somewhat intermediate form) to the mountains surrounding the Valley of Mexico.

Measurements in mm of males	Wing	Tail
Aver. 12 <i>bateli</i>	60.3	59.2
Aver. 6 <i>clarus</i>	62.0	60.2
Aver. 6 <i>belli</i> from eastern Mexico.....	60.0	53.4
Aver. 10 <i>belli</i> from Oaxaca.....	60.4	55.2
Aver. 8 <i>scitulus</i> from Chiapas.....	61.4	57.3
Aver. 8 <i>subobscurus</i> from Honduras.....	61.2	56.7

Specimens examined.—Moore Coll. of Orcutt Trust—*bateli*—Sinaloa: Rancho Batel 1 ♂ (May 28 Type, breed.); Michoacan: Sierra Ozumatlan 1 ♂ 1 im. ♀ (Nov. 3-4); Boundary range between Michoacan and Mexico: Puerta Lengua de Vaca 7 ♂ 1 im. ♂ 2 ♀ 1 im. ♀ (Oct. 12-31); District Federal: Desierto de Leones 1 ♂ 2 ♀ (July 15-Aug. 7). *Bateli* × *belli*—Puebla: El Venerable, 4 mi. E. Agua Frio, 1 im. ♂ 1 ♀ (Apr. 2, July 30). In other collections—*bateli*—N. W. Jalisco: San Sebastian 1 ♀ (Mar. 17); Michoacan: Mt. Tancítaro 2 ♂ 4 ♀ (Feb. 24, June 28-July 31). In Orcutt Trust Coll.—*belli*—Veracruz: La Puerta, top of Aculzingo Grade, 4 ♂ (breed.) 2 juv. ♂ 1 ♀ 1 im. ♀ (July 20-26); 5 mi. N. of Jalapa 2 ♂ 1 ♀ (Mar. 16-23); San Luis Potosí: 16 mi. E. Ciudad del Maiz, 2 im. ♂ (Oct. 5-8); Oaxaca: Totontepac 6 ♂ 2 juv. ♂ 4 ♀ 4 juv. ♀ (Apr. 1-May 31); Moctum 4 ♂ 10 ♀ (Sept. 19-Dec. 25). Intergrades *belli* × *clarus*—Morelos: Coajomulco 2 ♂ 1 ♀ (June 22 breed.); Mexico: Temascaltepec 1 ♀ (June 27). Other collections—*belli*—Veracruz: Orizaba 1 Type (no data), 1 ♀ (Mar. 7), Jico 1 (?) 1 ♀; Oaxaca: Mt. Zempoaltepec 2 ♂ 1 ♀ (July 10-13), Reyes 1 ♀ (Oct. 20); Tamaulipas: Montelunga 2 ♂, Galindo 1 ♀, Carrictos 2 ♂; District Federal: Ajusco 1 ♂, Mt. Orizaba 2 (not sexed). *Belli* × *clarus*—Morelos: Huitzilac 1 ♂ (June 12). Orcutt Trust Coll.—*clarus*—Guerrero: Cuapongo 2 ♂ (Dec. 20-30). Other collections—Guerrero: Chilpancingo 2 ♂ (includ. type) 1 ♀, Omilteme 1 ♂ 1 ♀ 1 ♀. Moore Coll.—*scitulus*—Chiapas: Volcan de Tacaná 8 ♂ 1 ♀ (Apr. 11-May 13); *subobscurus*—Honduras: 35 specs. altogether.

Remarks.—Wetmore (Proc. U. S. Nat'l. Mus., 89, No. 3105, 1941, pp. 552-573) gives an excellent review of the species *belli*, in which he recognizes *Basileuterus belli clarus* Ridgway of Guerrero, an opinion with which I agree. None of the races of *belli* are sharply differentiated and characters overlap somewhat from one race to another. The Orcutt series of nine April-May birds from Volcan de Tacaná, Chiapas, includes a fall male that can be matched by a *clarus* and a dark female that is as dark and dull as a female *obscurus* from Cantoral, Honduras. Wetmore stated he had not seen specimens "from near Mexico City." At that time he was also not aware of an important two hundred mile extension of the range of the species northwest to Sinaloa and the filling of important gaps in our knowledge of its distribution in the Transverse Volcanic Province. 30 of the 112 specimens of the species in the Moore Collection of the Orcutt Trust come from this area and give us our first real glimpse of the performance of this northwestern group of the species. It is now fairly certain that *clarus* in its clearest manifestation does not extend north of Guerrero beyond the Rio Balsas, the birds of Mt. Tancítaro, Michoacan, just north of the Balsas, being nearer *bateli*, while those of Morelos and the southwestern portion of the state of Mexico are almost exact intergrades between *clarus* and true *belli*. We still do not have a clear picture of the distribution of *bateli* and an ade-

quate series must be obtained in the practically unknown northwestern prong of its habitat to complete it. We can be reasonably positive it breeds near the top of the Sierra Madre range above Rancho Batel, around the 7,000 foot level, for the author in early June of 1938 observed several individuals obviously under the spell of the mating season, but their secretive actions made collecting in the thick undergrowth difficult. The type had the sex organs greatly enlarged, which the author checked with Mr. Lamb. The next nearest specimen, geographically, was taken two hundred miles to the southeast at San Sebastian by Nelson and Goldman and this female, though not so clearly marked, is nearer to *bateli* than to *clarus*, and the same is true of the birds of southwestern Michoacan. But the true range of the race probably turns east through *northern*, instead of southern, Michoacan, since we find the birds of the Sierra Ozumatlan in northeastern Michoacan and of the Puerta Lengua de Vaca range in the northwestern portion of the State of Mexico—five hundred miles from the Type locality—slightly nearer to *bateli* than those of Mt. Tancítaro. Even the individuals from the mountains surrounding the Valley of Mexico are nearer to *bateli*, the real change towards *belli* coming in a group of specimens from the "Top of the Acuzingo Grade," Veracruz, southwest of Mt. Orizaba. The range of *bateli*, therefore, appears to be a long belt of some 600 miles, running southeast from Sinaloa to the District Federal.

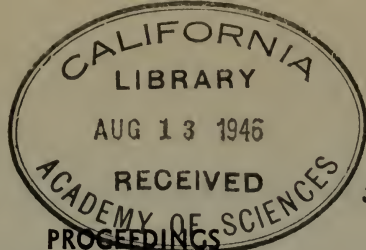
On the contrary, the range of *Basileuterus belli belli* is a north-south one along the mountain boundary of eastern Mexico, beginning in southwestern Tamaulipas and extending south through San Luis Potosí to the great Mount Orizaba massif, thence southeast through Oaxaca to Mount Zempoaltepec in the eastern part of that state. The series of 10 adult males of the 30 winter and breeding birds from this last locality have slightly longer tails than *belli* of Veracruz, a slight approach in this one character only to *clarus*.

Since Todd (Revision of the Wood Warbler Genus *Basileuterus* and Its Allies, Proc. U. S. Nat'l. Mus., Vol. 74, Art VII, No. 2752, P. 84) has suggested a type locality for *Basileuterus belli belli* (Giraud) in terms of a large region including many zones: "Mount Orizaba, Vera Cruz," thus restricting it only to that portion of the mighty massif, which is not in Puebla, it would be desirable to restrict it more definitely to that portion of the northeastern slope of the Mount Orizaba massif near Jalapa, Veracruz. For the sake of clarity, I thus designate and restrict the type locality.

I wish to thank Messrs. Emmett R. Blake, Harold C. Hanson and Mrs. Ellen T. Smith for the loan of five specimens from Mount Tancítaro, Michoacan; Dr. Alexander Wetmore and Dr. John Aldrich for the privilege of inspecting specimens in the United States National Museum and Biological Survey collections and especially to Dr. Herbert Friedmann for checking up with me the characters of *bateli*.

The type of *bateli* has less black on the margins of the pileum than in true *belli* or *clarus*.

There is a remarkable difference in the tails of both *bateli* and *clarus* when compared with those of *belli*. They are not only longer, but noticeably broader and sturdier, these differences being very obvious when one is measuring them. The tails of these two races are almost as long as their wings, whereas in the case of the eastern bird (*belli*), the tails are much shorter than the wings, while *scitulus* and *subobscurus* lie in between. The wings of all are about the same length.



OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW WOODPECKER FROM MEXICO

By ROBERT T. MOORE¹

Ascents by the author in 1942 of three of the highest mountains of Mexico (Popocatepetl, Ixtaccihuatl, Toluca) and several crossings of the great range, which forms part of the boundary between the states of Michoacan and Mexico, the road itself reaching an altitude of nearly 10,000 feet, have made possible the collecting of eighteen specimens of the species, *Dendrocopos stricklandi*. This bird is a frequenter of very high altitudes. It was a common bird about our base camp on Mt. Popocatepetl at 13,000 feet near the upper limit of tree line. Sutton and Burleigh (Auk, 1942, 419) found a breeding pair on March 31st at Rio Frio on the eastern side of Mt. Ixtaccihuatl at an altitude of about 11,000 feet. That it occurs occasionally at lower stations is proved by the taking of our series of five specimens from Puerta Lengua de Vaca at approximately 9400 feet among a dense stand of firs with scattered oaks and by a female taken by Loetscher on April 4th on the mountains south of Las Vigas, Veracruz. I believe that the record given in the Catalogue of the Birds of the British Museum (Vol. 18, p. 244), of the taking of an adult female in January at Xochimilco on the floor of the Valley of Mexico is either an error or represents an individual driven down from the high mountains by an unusually cold winter, for snow sometimes falls even at the low altitude of Mexico City, 7415 feet. Neither Chester Lamb nor I have obtained it at lower localities in the strictly Transition Zone, which in Michoacan is the chief habitat of *stricklandi*'s nearest relative, *Dendrocopos arizonae fraterculus*.

Heretofore, the nominate form, *Dendrocopos stricklandi*, has been shown to range from Cofre de Perote, Veraacruz, only to the mountains

¹Contribution from the California Institute of Technology, Pasadena, California.

on the western side of the Valley of Mexico. We are dealing with two distinct forms and true *stricklandi* is confined to the eastern section of its range, namely to the Orizaba-Zempoaltepec District of the great Transverse Volcanic Biotic Province.

The birds which are found on the mountains surrounding the Valley of Mexico and thence west to the great mountain range between the states of Mexico and Michoacan, an area recently denominated the "Aztec Faunal District" of the above-mentioned Province (Trans. San Diego Soc. Nat. Hist., X, No. 12, p. 219, Map), apparently represent a new form and it is herewith described:

***Dendrocopos stricklandi aztecus* subsp. nov.**

Aztec Woodpecker

Type.—Male adult in winter plumage; number 30697, collection of Robert T. Moore; Puerta Lengua de Vaca, on the boundary line between the states of Michoacan and Mexico, 15 miles east of Zitácuaro, Michoacan, altitude about 9350 feet; Oct. 17, 1941; collected by Chester C. Lamb.

Subspecific characters.—Differs in both sexes from *Dendrocopos stricklandi stricklandi* (Malherbe) in having white portions of posterior underparts immaculate or streaked chiefly on flanks instead of densely barred on flanks and entire abdomen; streaks on lower throat narrower; dark portions of upper parts blacker (less brownish); white of anterior portion of back more extensive toward nape.

Range.—Upper Transition and Temperate Zones of the great range in the western portion of the state of Mexico; thence in somewhat intergrading form east to Mt. Ixtaccihuatl.

Measurements.—About the same as those in the nominate race.

Specimens examined.—Moore Col.—*D. s. aztecus*—Boundary between states of Michoacan and Mexico: Puerta Lengua de Vaca 2 ♂ 3 ♀ (Oct. 17-28); District Federal: Mount Popocatepetl (13,000 ft.) 3 ♂ 2 im. ♂, 3 ♀ 1 im. ♀ (May 17-27); Mt. Toluca (11,000 ft.) 2 ♂ 2 ♀ (June 10-15). *D. s. stricklandi*—Biol. Sur. Col.—2 ♂ 1 ♀ (Apr. 22, Dec. 31, Jan. 1).

Remarks.—Malherbe did not give the type locality, but it is a strong probability that the type was secured in the mountains of Veracruz and specimens have been taken on the vast Mt. Orizaba massif of that area. Therefore, the author herewith restricts the type locality of *P[icus] (Leuconotopicus) stricklandi* Malherbe to the Mt. Orizaba massif.

Since the now known habitat of its nearest congener, *Dendrocopos arizonae fraterculus*, has been extended by our collections southeast and east to Tzitzio, Michoacan (shown on Rand McNally's Map as Sitzio), only 50 miles west of the type locality of *aztecus*, it is alluring to think of the two forms as possibly conspecific. However, these most eastern specimens show no approach whatever to *stricklandi* and the well-marked differences in pattern negative such an amalgamation.

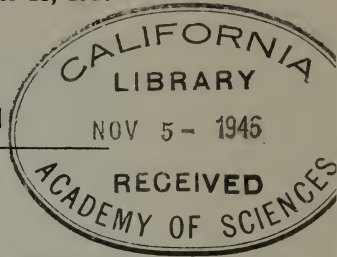
Aztecus expresses itself in its truest form in the mountains of the western portion of the state of Mexico and the series of five specimens

from these mountains have one character much more pronounced than any of the specimens from farther east, namely: the extension of white on the anterior back much more prominent and in addition a second character, not previously mentioned, the nasal tufts, point of chin and anterior forehead conspicuously Tawny-Olive.

There may be an additional important character, which appears in all specimens of the topotypical series from Puerta Lengua de Vaca, namely, the apical quarter of the three outer pair of rectrices is Apricot-Orange instead of merely buffy brown as in some specimens of true *stricklandi*, as well as in some intergrades from the mountains surrounding the Valley of Mexico. This is not believed to be stain, because all the feathers of the Puerta Lengua de Vaca birds are freshly molted.

Although true *stricklandi* generally seems to be found as a breeding bird in pure stands of evergreens, chiefly pines, the Puerta Lengua de Vaca series of *aztecus* was taken at a somewhat lower altitude around 9400 feet, where oaks occur occasionally among the firs and some of the individuals were actually collected as they foraged on oak trees.

PROCEEDINGS
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NOTES ON THE DISTRIBUTION OF THE CHIPMUNKS
(*EUTAMIAS*) IN SOUTHERN BRITISH COLUMBIA
AND THE ROCKY MOUNTAIN REGION OF SOUTHERN
ALBERTA WITH DESCRIPTIONS OF TWO NEW
RACES

BY I. MCT. COWAN

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A critical examination of the specimens of chipmunks in the collection of the Museum of Zoology at the University of British Columbia, and the B. C. Provincial Museum, makes it evident that the existing concepts of the distribution of certain species and races of *Eutamias* in southern British Columbia and western Alberta require revision.

In the course of the present study many specimens have been loaned to me from the National Museum of Canada through the kindness of Dr. R. M. Anderson; others have been borrowed from the U. S. Fish and Wildlife Service collection, through Dr. H. H. T. Jackson; from the Kenneth Racey collection, Vancouver; and from E. S. Booth of Walla Walla, Washington. Grateful acknowledgment is made of this assistance.

The genus *Eutamias* is represented in western Canada by four species: *Eutamias amoenus*, *Eutamias minimus*, *Eutamias ruficaudus*, and *Eutamias townsendii*. Certain phases of the distribution of the first three of these have been studied in connection with this paper.

Eutamias townsendii (Bachman) is represented by two races in extreme southwestern British Columbia, a region not dealt with in the present study. *Eutamias amoenus felix* (Rhoads) occupies a slightly wider range in the same general region, while *Eutamias minimus caniceps* (Osgood) occurs in extreme northwestern British Columbia. Both races occupy ranges outside the region dealt with in this paper.

Eutamias amoenus:—The species *Eutamias amoenus* ranges over practically the entire southern half of British Columbia from the Rocky Mountains to the beaches of the Pacific Coast and north to the region between the 54th and 55th parallels of north latitude. It occurs also in parts of the Rocky Mountains of western Alberta but its distribution there makes it plain that the species had its origin west of the Rockies and has pene-

trated onto the east slope to a very limited degree by way of the low passes. As will be discussed further later in this paper the two geographic races inhabiting the Rocky Mountains of Alberta do not occupy contiguous territory but are separated by 100 miles or more of mountains in which no chipmunks of the *amoenus* group are known to occur.

Eutamias amoenus luteiventris (Allen)

This race occupies a very wide range in southeastern and south-central British Columbia and southwestern Alberta. Over much of this region it is the only chipmunk present but at various places it occupies the same general terrain as one or more other species of chipmunks. Where this occurs there is frequently an ecological separation that for the most part prevents interspecific competition.

In the Waterton Lakes region of southwestern Alberta this race is in co-occupancy with *Eutamias ruficaudus* and *Eutamias minimus oreocetes* and here the ecological separation is most apparent. *Luteiventris* inhabits the aspen parkland type of environment to the exclusion of the other two species. It is thus the only chipmunk seen at lake level at 4,000 feet elevation. Where, as on the east slope of Sofa Mountain, there is continuous parkland environment from the prairie edge to timberline *luteiventris* is found up to timberline and in close proximity to *minimus*.

Farther north on the east slope of the Rockies, at the level of Banff, Alberta, *luteiventris* is more local in its distribution. It is found in fair numbers at the base of Mt. Rundle, along the lower reaches of Brewster Creek and Redearth Creek, and on Mt. Inglesmaldie, all but the last, localities on the south side of the Bow Valley and at elevations between 4,500 and 5,000 feet. It has not been seen at or near timberline, nor anywhere north of the Bow Valley, though it seems probable that it does occur at lower levels along the lower reaches of some of the streams tributary to the Bow from the north.

None was seen on the Panther, Red Deer, Clearwater or Saskatchewan rivers in the northern part of Banff Park. The race is, however, widely distributed on the western slope of the Rockies. In Kootenay and Yoho Parks, B.C., it was the only chipmunk taken, but *minimus* certainly occurs at and near timberline where these two parks have a common boundary with Banff Park, as the latter species has been seen and taken just on the Alberta side of the Interprovincial Boundary. It was found abundantly at Mt. Assiniboine on the British Columbia side of the Rockies just south of Kootenay Park (Crowe, 1943: 399).

The northernmost locality record for *luteiventris* on the west slope of the Rockies is Kinbasket Lake, B. C.

From this Rocky Mountain area of distribution the race extends westward through the mountains of southern British Columbia to the North Thompson River near Kamloops and to the Monashee Range on the east side of the Okanagan Valley. In the latter region intergradation with *Eutamias amoenus affinis* takes place.

Material from southern British Columbia is inadequate to give a clear

picture of the nature of the distribution of *luteiventris* and of *affinis* where these two meet. In certain places there is an indication of altitudinal separation with *luteiventris* occupying the higher zones and *affinis* the valley bottoms. In other places all levels seem to be occupied by a population of intergrades.

In a few localities large rivers seem to serve as barriers to chipmunk distribution. In the vicinity of Kamloops the South Thompson River, flowing in an east-west direction, is joined from the north by the North Thompson River. In the northeast angle of this junction the chipmunk population is intermediate between *affinis* and *luteiventris* but closer to the latter, while west of the North Thompson and south of the South Thompson the chipmunks are typical of *affinis*.

At Newgate, B.C. the Kootenay River appears to have some barrier effect. Here in 1930 there was a readily discernible difference in the populations on either side of the river. Chipmunks collected on the east side are referable to *luteiventris* and differ most obviously from those across the river in having buff bellies, upper sides of the feet ochraceous and the tail edged with buff, as compared with the white bellies, pale yellowish feet and white-margined tails of the chipmunks from the west side of the river. This west-side population is apparently intermediate between *luteiventris* and *canicaudus*. The results of such intermediacy are closely similar to the characters of *affinis*, and Cranbrook specimens, which appear to me to fall into the same category, were so identified by Howell (1929:73). However the tails of these intermediates are even paler ventrally and more obviously margined with white than the mean of *affinis*. *Canicaudus* is a larger, longer-tailed race than *luteiventris* but the Newgate specimens are not intermediate as regards dimensions. In this respect they are not significantly different from the condition in the smaller race.

At Newgate there were no discernible differences in the environments offered by the opposing sides of the river.

At another point in southwestern British Columbia a river apparently separates chipmunk populations. Dr. R. M. Anderson writes me that a National Museum of Canada field party collecting on the west side of the Kootenay River took *E. amoenus luteiventris* and *E. ruficaudus simulans*, while Maillard (1932:289) took only *E. a. affinis* (cited by him as *E. r. simulans*) (Anderson 1934) on the east side of the river.

Specimens of *luteiventris* examined 53: Alberta: Waterton Lake 6, Brewster Creek 5, Healy Creek 6, Mount Inglesmaldie 1, Mount Rundle 2, 15 miles up Spray River 1, Marvel Lake 1. British Columbia: Vermilion Crossing 1; Kootenay Crossing 1, Radium Hot Springs 1, Sherbrooke Lake near Field 2, Crow's Nest Pass 2, 19 miles w. of Invermere 1, Kinbasket Lake 1, Newgate 5, Phoenix 1, Revelstoke 10, Monashee Pass 4, Rayleigh 2.

Specimens of *affinis* examined, 47 all from British Columbia: Midway 1, Anarchist Mountain 10, Hedley 6, Ashnola Creek 4, Fairview-Keremeos summit 4, Salmon Arm 2, Kamloops 10, Black Pines 2, Wentworth Lake 2, Princeton 1, Clinton 1, Lytton 2, Pavilion 2.

Eutamias amoenus ludibundus (Hollister)

As mentioned earlier, there exists, between the northernmost known locality of *luteiventris* on the Alberta side of the Rocky Mountains and the southernmost locality inhabited by *ludibundus* in that province, a hundred-mile stretch of terrain in which *amoenus* chipmunks are not known to occur. Many chipmunks have been examined closely in the field in this region and some collected, but all have been *minus*.

The Jasper population of *ludibundus* is at the eastern end of Yellowhead Pass; the Bow Valley *luteiventris* at the eastern entrance to Kickhorse Pass. There are no low passes between the two.

E. a. *ludibundus* in the Athabasca valley near Jasper, Alberta, inhabits rockslides and rock cliffs close to the valley floor (3,500 ft.) and altitudinally above the main range of *minus* at that latitude. Both, however, have been taken in the same rockslides on a few occasions. *Ludibundus* ranges to timberline but does so rarely in the Jasper region.

In the heavily wooded mountainous terrain, extending from the west slope of the Rockies in the vicinity of Robson to the valley of the Fraser River near Quesnel and south through the eastern Cariboo district to Canim Lake, *ludibundus* is the only chipmunk.

Specimens of *ludibundus* examined, 59: Alberta: Jasper and vicinity (Astoria Creek and Portal Creek) 19, Tonquin Valley 1. British Columbia: Moose Lake 5, Indianpoint Lake near Barkerville 8, Quesnel 1, Canim Lake 3, Lac La Hache 5, and Horse Lake 17.

The great plateau area constituting the western Cariboo and Chilcotin districts, together with the western mountain ranges, is apparently inhabited by a clearly differential race of *Eutamias amoenus* for which there is no name available. This newly recognized geographic race is named and described below.

Eutamias amoenus septentrionalis subsp. nov.

Type: Female adult, number 1648 British Columbia Provincial Museum, taken July 24, 1938 at Ootsa Lake P.O., on the north shore of Ootsa Lake, B.C., by I. McT. Cowan. Original number 839.

Distribution: West-central British Columbia west of the Fraser River, north at least to Babine Lake, south at least to Chezacut Lake and west to the sea coast at the heads of certain inlets.

Diagnosis: A large bodied, relatively short-tailed race of *Eutamias amoenus*.

In summer pelage all dark stripes black, with a reddish brown wash over their anterior ends to a slight degree on the middle stripe, and a progressively greater degree on the lateral stripes; inner light stripes reddish brown anteriorly, paler on lower back; outer light stripes white with faint reddish brown wash; sides between Cinnamon and Tawny (capitalized color terms are from Ridgway "Color Standards and Nomenclature"); a wash of the same color over shoulders and part way down back as mentioned above; rump between Drab and Grayish Olive; under side of tail between Pinkish Cinnamon and Cinnamon Buff; underparts white.

In worn winter pelage all dark stripes broad and black without tipping; inner light stripes brownish gray, outer white; rump between Light Grayish Olive and Drab; under side of tail between Pinkish Buff and Cinnamon Buff; sides of body pale, nearest Cinnamon Buff.

Comparisons: Most nearly like *E.a. affinis*, from which it differs as follows: In worn winter pelage darker throughout with all 5 stripes black instead of outermost stripes with pronounced brownish wash. Inner light stripes brownish gray, rather than clear gray. Rump brownish rather than grayish; shoulders and flanks more brightly coloured.

Mid-summer juvenals of *septentrionalis* as compared with those of *affinis* are duller in general body color with a dull brownish wash across the shoulders, darker median light stripes, darker sides and with color of sides extending farther onto thighs; rump with an ochraceous tinge rather than clear gray.

From *ludibundus*, the only other race with contiguous range, *septentrionalis* is readily separable on the basis of color of undersurface of tail. This is usually rich tawny in *ludibundus*, almost as it is in *ruficaudus*, while in *septentrionalis* it is paler, as described above. In winter pelage *septentrionalis* differs from *ludibundus* in having the dark stripes broader and darker, the sides paler, and the upper surface and rump more grayish. *Septentrionalis* also differs from *ludibundus* in having a longer body while tail length remains the same. Mean and extreme measurements in a series of 18 specimens, 9 ♂♂ and 9 ♀♀, from Jasper Park, Alberta, are: body length 117 ± 1.30 , (109-127); tail 95 ± 1.90 , (86-104); while corresponding measurements for 15 *septentrionalis*, 10 ♂♂ and 5 ♀♀, are: 123 ± 1.20 , (114-130); tail 95 ± 1.84 , (89-100). The difference in body length has been subjected to statistical test for probability and has a value of $P =$ less than .01 and can therefore be regarded as significant.

Skull: Not differing in general dimensions from those of *affinis* and *ludibundus* but usually separable from the latter on the basis of dorsal outline of cranium. In *ludibundus* the anterior part of the cranium is swollen to produce, between the supra-orbital processes, a prominent bulge on the dorsal outline, or an angle on the even contour of this line. In *septentrionalis* the high point on the dorsal surface is farther back, at the fronto-parietal suture. The condition in *affinis* is approximately intermediate.

Specimens examined 31: Ootsa Lake 6, Western end of Eutsuk Lake, 1; Chezacut Lake, 10; Itcha Mountains, 1; Babine Lake, 1; Puntchesakut Lake, 3; Nulki Lake, 6; Rocher Deboule, 1; and Lonesome Lake, 2. The National Museum of Canada specimens from Kimsquit, Stuie, Caribou Mts., and Rainbow Mts. were examined in February, 1944, and identified as belonging to the race here described but were not re-examined during the preparation of the description of this race.

Remarks: Specimens now referred to this race have been examined by other students of mammalian systematics and identified variously. For instance Howell examined the Chezacut specimens and their labels bear his determination of them as *affinis*. Later Anderson and Rand reported upon the Kimsquit and other specimens from the coastal

region (op. cit.) and while noting the paler ventral surface of the tail, regarded them as representing the race *ludibundus*. Further study has revealed other characters serving to identify this population of *amoenus* chipmunks from the great central plateau region of British Columbia and from the western mountains as distinct from the other described forms. No specimens have been seen from the area in which *septentrionalis* would be expected to intergrade with *ludibundus* but it seems certain that intergradation does take place. The Chezacut specimens show a slight approach toward *affinis*, particularly in the restriction of the reddish dorsal wash on the shoulders and dorsum so characteristic of *septentrionalis*.

Eutamias minimus.—*Eutamias minimus* is known to inhabit the greater part of British Columbia north of the 55th parallel of latitude as well as the length of the Rocky Mountain Range of Alberta south to the International Boundary. *Eutamias minimus caniceps* (Osgood) is the race occupying the extreme northwesterly part of British Columbia east of the Coast Range and south as far as Telegraph Creek. *Eutamias minimus oreocetes* Howell is found at high altitudes in the extreme southern end of the Canadian Rockies. As yet no specimens have been taken in British Columbia in the Waterton Lakes Park area but the author has seen chipmunks of this species within two miles of the Alberta-B.C. boundary and there is no ecological barrier to prevent them ranging across. This they undoubtedly do. The intervening area, between the ranges of the two races mentioned above, is inhabited by *E. m. borealis* Allen.

There is a noteworthy change in the ecological distribution of the *minimus* chipmunks in the Rocky Mountains between the 49th and 54th parallels of latitude. In the Waterton Lakes area of southwestern Alberta *oreocetes* is a very scarce mammal and is confined exclusively to the most intensely insulated mountain slopes above timberline where fairly coarse broken rock is strewn on slopes that support sparse stands of weeds and grasses.

At the latitude of Banff, Alberta (approx. 51°) *E. minimus* is distributed from alplands to valley floor—that is, at elevations from 7,800 ft. to 4,500 ft. Preference, however, seems to be for the partially wooded or brush-covered areas, and for burns in early stages of forest regeneration at intermediate elevations.

In the vicinity of Jasper, Alberta, (latitude 53°) *Eutamias minimus* is an inhabitant of the lower elevations in the more easterly areas of the Rockies. It extends west to Jasper but not beyond, and it is not found at timberline on the mountains of the main divide at least.

In the Peace River district of British Columbia at latitude 56° it was found to be an inhabitant of the aspen parkland floral type at an altitude of 1,500 feet.

Comparisons of series of specimens from various points on the latitudinal distribution of *E. m. borealis* reveals that there is a cline in total length and tail length measurements (table I) with the more northerly populations having greater body size and longer tail than the southern populations. For this reason external measurements do

not serve as reliable criteria for delimiting the ranges of *borealis* and *oreocetes* in the area where these two races meet.

Specimens examined from the Rocky Mountain region as far south as the Bow Valley at Banff have the color characteristics of *borealis*. This was mentioned by Anderson and Rand (op. cit.) who found themselves in disagreement with Crowe's (op. cit.) assignment of Banff specimens to *oreocetes*. I have not seen Crowe's series, which was preponderantly from the timberline region and it may be that the timberline populations from the ranges south of the Bow Valley have the color characteristics of *oreocetes*, but the change would be an unexpectedly abrupt one if this were the case.

In 1944 Carl and Hardy (1945: c 33) discovered *Eutamias minimus* in the Selkirk Mountain range 19 miles west of Invermere. Here the species was occupying a timberline habitat and was not found below such elevations. Fairly intensive studies of the mammals of the Selkirk Range in the vicinity of Revelstoke (Cowan and Munro 1945) and of Glacier (Munro mss.) failed to discover this chipmunk there. It can be assumed then that the population of the southeastern Selkirks is an isolated one, separated from the timberline populations of the Rockies by the full width of the Rocky Mountain trench and without more northern connection with the main range of the species.

The original collections made by Carl included but two specimens of *E. minimus* both juveniles, but in August 1945 the author took three additional specimens, an adult pair and a juvenile. These five specimens reveal that the Selkirk population possesses characteristics distinguishing it from both *borealis* and *oreocetes* and it is here named and described as—

***Eutamias minimus selkirki* ssp. nov.**

Type: Adult female, skin and skull, Museum of Zoology, University of British Columbia number 1551, taken August 28, 1945, at Paradise Mine near Toby Creek, 19 miles west of Invermere, B. C. by I. McT. Cowan.

Diagnosis: A small pale race of *minimus* resembling *oreocetes* in external dimensions and in size and proportions of skull. In August pelage median dark stripe black; second dark stripes brown on anterior half black on posterior half; outer dark stripes brown. Inner light stripes heavily overlaid with gray and brown; outer light stripes white washed with gray on rump. Dark facial stripes extending to nostrils. Ear black anteriorly, white posteriorly; post-auricular patch grayish white. Crown hair Brown (capitalized color terms are from Ridgway, "Color Standards and Nomenclature"); sides nearest Cinnamon Buff; rump between Mouse Gray and Deep Mouse Gray; under-surface of tail between Pinkish Cinnamon and Cinnamon Buff; tail edged with Pinkish Buff; upper surface of front feet whitish, of hind feet gray.

Comparisons: *E. m. selkirki* is most like *E.M. oreocetes* but differs from that race in darker body color; rump and hind legs in August specimens gray rather than grayish with a yellowish brown wash; dorsal surface of shoulders and back with duller brown hair-tipping; dorsal

surface of tail darker in comparable specimens; facial stripes darker and more extensive; crown darker and more grayish rather than brownish in tone.

Measurements: Measurements of the adult male and female are respectively: total length 189 mm., 204 mm.; tail 85, 91; hind foot 32, 34; greatest length of cranium 31.6, 31.7; basilar length of Hensel 23.8, 24.2; zygomatic width 17.4, 18.2; least interorbital width 7.7, 7.7; width of brain case 15.7, 15.8; length of upper molar row 5.3, 5.5; length of nasals 9.0, 9.5.

Distribution: Known only from the vicinity of the type locality.

Remarks: *E. m. selkirki* in the sum of its characteristics approaches closer to *oreocetes* than it does to *borealis*. From the latter race it differs in having a shorter tail; upper surfaces of feet whitish, rather than distinctly brownish; median dark stripe narrower; and general body color brighter and less brownish.

Specimens examined: 5, all from the type locality.

Eutamias ruficaudus:—This species is represented in the region under discussion by the races *E. r. simulans* Howell, recorded from Nelson by Anderson and Rand (1943) and from Invermere, B.C. by Crowe (1943) and *E. r. ruficaudus* Howell. The latter race is a fairly abundant inhabitant of the upper rim of the spruce forests in the vicinity of Waterton Lakes Park, Alberta, and Akamina Pass, B.C. Anderson and Rand (1943:135) record a specimen from Portal Creek, Jasper Park, Alta., as referable to this race, thus extending the known range of the race north from 49°50 to 53° north latitude. No other specimens of *ruficaudus* have been taken in the region between Waterton Lake and Jasper despite a considerable amount of careful biological work extending over many years.

Dr. Anderson has very kindly loaned me the specimen in question, male, number 16033, National Museum of Canada. In body color it resembles summer specimens of *ruficaudus* closely, but in summation of characters is clearly referable to *Eutamias amoenus ludibundus*. The brilliant under-tail color of this race closely resembles that of *ruficaudus* and in the specimen in question is perfectly matched by certain topotypes of *ludibundus* collected by Hollister (1911) and used as a basis for the original description of this race. The external measurements 211, 92, 31, while considerably less than the minimum measurements of topotypical *ruficaudus* given by Howell (1929:96) are within the limits of variation for that species as it occurs in Waterton Lakes Park except as regards length of hind foot. All *ruficaudus* measurements available indicate a hind foot in excess of 32 mm. long, and averaging in excess of 34 mm. As regards cranial dimensions the Jasper specimen is below the minimum for *ruficaudus* in almost every respect and below the mean of *ludibundus* in all measured features. (See table II.)

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TABLE I
External measurements of *Eutamias minimus* populations from northern British Columbia to northern Montana.

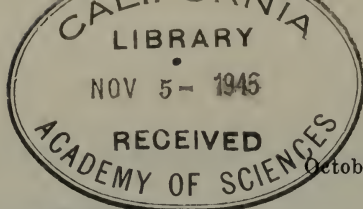
	N.	—Total Length—		—Tail—		—Hind Foot—	
		Mean	Extremes	Mean	Extremes	Mean	Extremes
Peace River, B.C.	7	217	209-227	100	93-108	32.5	31-34
Jasper, Alta.	9	210	198-218	95	90-100	32	30-33.5
Banff, Alta.	17	198	193-211	88	81-94	32	29-34
Waterton-Glacier	4	195	185-201	85	82-90	32	31-34

TABLE II
Comparison of cranial measurements of *E. r. ruficaudus* and *E. a. ludibundus*.

	N	Greatest Length	Zygomatic Width	Cranial Width	Interorbital Width	Length of Nasals
<i>Eutamias r. ruficaudus</i> *	20	35.2 (34.0-36.2)	19.5 (19.0-20.3)	15.3 (14.5-15.8)	8.0 (7.5-8.8)	11.2 (9.6-11.9)
<i>Eutamias a. ludibundus</i>	12	33.9 (33-34.4)	19.0 (18.4-19.5)	15.0 (14.3-15.6)	7.6 (7.4-7.8)	10.9 (10.1-11.4)
N.M.C. spec. No. 16033		33.9	18.6	14.7	7.3	10.7

*In part from Howell, 1929.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW BUTTERFLIES FROM THE ADMIRALTY ISLANDS¹

BY AUSTIN H. CLARK

Messrs. Warren H. Wagner, Jr., and David F. Grether in the course of a number of visits to the Admiralty Islands in 1944 and 1945 made extensive collections of the local butterflies on Manus, Los Negros, and Lou Islands. There are no published records of any species from either Los Negros or Lou.

Among the rather numerous additions to the known butterfly fauna of the Admiralty Islands are the two interesting local races the descriptions of which follow. Both will be figured in the report on the butterflies of the Admiralties soon to be published by Messrs. Wagner and Grether.

***Hypolimnas antilope wagneri*, subsp. nov.**

Description: This subspecies resembles *H. a. antilope*, but the fore wings have a broad light brownish patch 4-6 mm. wide contrasting with the darker brown general ground color which extends from just beyond the middle of the costal border to the middle of the outer border; the hind wings have a broad light border shading into the darker base; fore wings 31-36 mm. long.

Type: No. 57958 U. S. National Museum, male, from Los Negros, Admiralty Islands, collected by W. H. Wagner, Jr., and D. F. Grether on November 16, 1944. In addition to the holotype there are two male cotypes, one from Los Negros, November 11, 1945, and one from the Drangot River, Manus, November 14, 1945.

***Hypolimnas pithoea gretheri*, subsp. nov.**

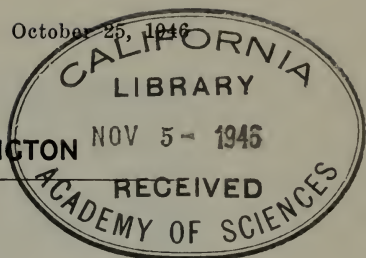
Description: This subspecies resembles *H. p. unicolor* from the Solomon Islands but is much darker—blackish; there is a submarginal row of white dots on both wings, one in each interspace, the dots on the fore wings being slightly larger than those on the hind wings, the most anterior the largest; fore wings 41-42 mm. long.

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Type: No. 57959 U. S. National Museum, male, from Lou Island, Admiralty Islands, collected by W. H. Wagner, Jr., and D. F. Grether on November 16, 1945. In addition to the holotype there is a male cotype taken at the same place on the same date.

Note: For comparison with this new subspecies there is available in the National Museum a long series of *H. p. unicolor* from Lunga, Guadalcanal, collected and presented by James Paul Burke, and a single specimen from Kukum Ridge, Guadalcanal, collected by W. H. Wagner, Jr., and J. W. Perry on June 8, 1945.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



NEW GENERA OF ELEOTRIDAE AND GOBIIDAE
AND ONE NEW SPECIES FROM WEST AFRICA

BY ALBERT W. C. T. HERRE

The fishes of West Africa are but little known. Any material from there is particularly welcome for the light it throws on geographical distribution, and for the help it affords in the better elucidation of the genera and species occurring in that region.

The Rev. A. I. Good, stationed in Cameroon, has earned the thanks of all who are interested in the study of fishes. From the considerable collection of marine and fresh-water fishes obtained by the Rev. Good, the eleotrids and gobies have been turned over to me for study.

Boulenger placed all eleotrids in the genus *Eleotris*, and nearly all gobies in the genus *Gobius*. This is an easy and simple method of disposing of troublesome fishes, but it results finally in having a hodgepodge of divergent and unrelated species spilled into a catch-all genus. In the present paper several genera are proposed and defined, in order to free the genera *Eleotris* and *Gobius* from species that cannot fit into them.

ELEOTRIDAE

Batanga Herre, new genus

Head and body laterally compressed, strongly so posteriorly. Scales ctenoid, except part of those on head; under a compound microscope the opercular scales and part of those before the dorsal are ctenoid; the preopercular scales and those on top of the head are cycloid. Head much deeper than broad. Mouth moderate, teeth in both jaws in villiform bands; the teeth in the outer row in both the upper and lower jaws are longer, very slender, and movable, becoming conspicuous in large old specimens. No canines, no palatal teeth, and no preopercular spine. The free tip of the tongue is truncate to emarginate.

Scales in longitudinal series 28 to 32, extending before the first dorsal through the interorbital space. Dorsals close together, VII—VIII—I—8 or 9; anal I—9. The second dorsal and anal both high, longer than the head, and extending on the caudal when depressed. The rounded caudal is also longer than the head.

Anal papilla large, flat, elliptical or somewhat pointed; a few large

old specimens (males?) have it very broad and relatively short, the wide free end fimbriate.

Batanga is distinguished by its shape, scalation, dentition, and vertical fins.

Type, *Batanga lebretoni* (Steindachner). Only known on the west coast of Africa.

Bataanga lebretoni (Steindachner)

Dorsal VII—VIII—I—8 or 9; anal I—9; scales in longitudinal series 28-32, plus 4 small ones on the caudal base; transverse series 10 or 9; predorsal scales 18-22.

Depth 3.9 to 4.3 in the length; the head and rounded caudal are equal or nearly so, 3.2 to 3.4 in the length; the eye is lateral, 4 to 4.33 in the head. The mouth is moderate, the lower jaw slightly or not at all projecting, the maxillary not reaching the eye. The first dorsal extends upon the second dorsal when depressed; the three posterior second dorsal rays are much elongated, extending to or upon the caudal base; the ultimate and penultimate anal rays are elongate, reaching or nearly reaching the caudal.

The color is brown, with a longitudinal band of black vertical bars along the side; some specimens have one, two, or three rows of black spots above this; behind and above the upper angle of the gill opening, and extending downward on the pectoral base, is a large black spot; four dusky stripes radiate backward from the eye; a series of blackish bands across the back, often much obscured; dorsals and caudal with numerous transverse rows of dark brown spots, the anal uniform brown; ventral more or less brown with the central rays more or less black; pectoral colorless. Juvenile specimens have the anal nearly colorless, with 3 brown longitudinal streaks; the ventral and pectorals colorless.

10 specimens, 37-44 mm. in length, from the Nkao, a very small brackish stream flowing into the sea at Batanga.

15 specimens, 36-62 mm. in length, from a small stream flowing into the ocean at Kribi.

A specimen, 37 mm. long, from a small stream at Moode.

Eleotris monteiri O'Shaughnessy

2 specimens, 74 and 83 mm. in length, from a small brackish stream, Mbode, on coast 10 miles south of Batanga.

3 specimens, 36-44 mm. in length, from the Nkao, a very small brackish stream emptying into the sea at Batanga.

1 specimen, 62 mm. in length, from a small stream emptying into the sea north of Kribi.

Eleotris vittata Dumeril

3 specimens, 40-115 in length, from the Nkao, a very small brackish stream emptying into the sea at Batanga.

2 specimens, 39 and 42 mm. in length, Dihane, on the Edea-Kribi road, 20 miles from Kribi, and 15 miles from the sea.

1 specimen, 43 mm. long, from Ebunga, on the coast 6 miles south of Batanga.

6 specimens, 65-93 mm. in length, from a small stream at Kribi.

4 specimens, 57 to 87 mm. in length, from the Bivusé, a small stream flowing into the sea, between Kribi and Lobé rivers.

Hanno Herre, new genus

The stout, somewhat elongate body is little compressed, low, the dorsal profile horizontal, the head broad with depressed snout, the caudal peduncle strongly compressed.

Dorsals—VI—I—9, close together; anal I—8; vertical fins low; caudal rounded, shorter than the head. Scales cycloid, small, becoming very small anteriorly, 75-90 in longitudinal series and 33-35 in a transverse series; predorsal scales 52-55, extending to snout; scales on opercle and preopercle, and extending well out on caudal and pectoral fins. Mouth large, maxillary extending beneath middle of the eye or beyond; lips thick, with double row of fimbriate papillae concealing the outer teeth; upper jaw with 5, the lower with 4 rows of teeth, those of the outer and inner rows in both jaws slightly enlarged; no palatal teeth, no canines, and no preopercular spine. Under the lower jaw is a groove containing a series of groups of papillae, a feature not observed in any other eleotrid or gobioid fishes. Numerous transverse and longitudinal rows of sensory papillae on the preopercle and opercle. Ventrals rather narrow, well separated, shorter than the broad, rounded pectorals. A black ocellus above on the basal part of the caudal fin.

The type is *Hanno africanus* (Steindachner). This fish, described as an *Eleotris* and listed as such by various authors following Steindachner, is manifestly not a member of the genus *Eleotris*.

Hanno, in honor of the great Carthaginian who circumnavigated Africa more than 2,500 years ago.

Hanno africanus (Steindachner)

2 specimens, 68 and 84 mm. in length, from a small stream flowing into the sea at Kribi.

1 specimen 132 mm. long, from Londji.

Kribia Herre, new genus

Body cylindrical to slightly compressed, the head broad, with projecting lower jaw. The maxillary extends beneath the anterior part or middle of eye, the large mouth strongly oblique; bands of very small teeth in both jaws; no canines and no palatal teeth. The free tip of the tongue is broad and rounded. No preopercular spine.

32 to 35 ctenoid scales in longitudinal, 12 in transverse series; predorsal scales cycloid. The opercles covered with very small cycloid scales, the rest of the head naked. Ridges of sensory papillae on the cheeks and top of the head.

Dorsals VI—I—8 (9), close together; anal I—7, opposite second dorsal; vertical fins of moderate height; caudal rounded, shorter than head. Ventrals narrow, wide apart. The thin flat anal papillae has the tip broadly rounded. The gill opening is moderate, extending forward beneath the posterior part of the preopercle.

The type of the genus is *Kribia kribensis* (Boulenger), first collected from the Kribi River. Only known from Cameroon.

Kribia kribensis (Boulanger)

Dorsal VI—I—8; anal I—7; 32-35 ctenoid scales in longitudinal, 12 in transverse series; 10-14 cycloid predorsal scales, extending to a point above the opercles.

The dorsal and ventral profiles are very slightly curved, the depth 4.7 to 5, the broad head 3. to 3.2, the rounded caudal about 4 times in the length. The broad rounded snout equals the eye; the interorbital is noticeably wider than the eye. The breadth of the head is two-thirds of its length. The second dorsal and anal do not reach the caudal when depressed. The broad pectoral $\frac{3}{4}$ to $\frac{5}{6}$ of the length of the head, or 3.65 to 3.73 times in the length, and longer than the narrow, widely separated ventrals.

The color in alcohol is dusky brown; some specimens with narrow transverse pale lines which separate 5 or 6 poorly defined dark crossbands; a black crossband on the caudal base. Vertical fins black or blackish, and more or less white-edged. Caudal dark brown, with traces of pale crossbands. Pectorals and ventrals more or less suffused with pale brown and specked with darker.

Described from 4 male specimens, 33 to 37 mm. in length, from the Lobé river, Mabenanga, Batanga. A juvenile specimen, 27 mm. long, was taken from the Mvas river, a tributary of the Ntem river, Campo.

GOBIIDAE

Ebomegobius Herre, new genus

Body naked, moderately plump, compressed posteriorly. The head moderate, the oblique mouth large with projecting lower jaw, the maxillary extending to beneath the middle of the eye, or below its hind margin; teeth small, uniform, in bands in both jaws. Eyes small, very close together, dorso-lateral, equal to the rather broad snout. Tongue narrow, its free tip more or less emarginate or bilobed. Gill openings very wide, extending forward to beneath the hind margin of the eye.

Dorsal VI—I—11-14; anal I—11-14. Pectorals broad, rather short; ventrals long, with delicate and easily torn frenum; the round pointed caudal much shorter than the head.

Type *Ebomegobius goodi* Herre, new species. Name derived from a small stream, the Ebomé, where the specimen was caught.

Ebomegobius goodi Herre, new species

Dorsal VI—I—1-12; anal I—13. Body with protuberant belly, the posterior half of the body laterally compressed. The depth equals the caudal, 4.37, the head 3.18 times in the length. The eyes are high up, their inner margins touching, equal to the snout in length, 7.33 times in the head. The mouth is large, oblique, the prominent maxillary extending beneath the hind margin of the eye, 2.29 times in the head. The upper jaw has 4 rows, the lower jaw 3 rows of small uniform teeth. The vertical fins are low and do not touch the caudal base when depressed, nor does the first dorsal extend to the second dorsal. The first dorsal and anal are about equal in height, 3.14 times, the second dorsal 2.75 times in the head. Pectorals rather short, 5.8, the large ventrals 4.1 times in the length. The anal papilla is tongue-like in shape.

The color in alcohol is uniform reddish brown, sprinkled with minute black dots, which are coarsest on top of the head and about the dorsal fins; all the fins are clear brown, more or less lightly sprinkled with blackish dots; on the first dorsal is a black vertical band between the fourth and fifth spines.

Here described from the type and only specimen, 35 mm. long. It was taken by A. I. Good from the Ebomé, a small brackish stream at Kribi. Type in Natural History Museum of Stanford University.

Named for A. I. Good, missionary and ardent collector of West African fishes.

Bathygobius fuscus (Rüppell)

22 specimens, 29-65 mm. in length, from the Ebunja river in brackish water, at Ebunja, on the coast 6 miles south of Batanga.

2 specimens, 45-48 mm. in length, from the mouth of the Kribi river, Kribi.

8 specimens, 40-75 mm. in length, from the Ebomé, near Kribi.

3 specimens, 39-55 mm. in length, from brackish water, Bwanjo river, Bwanjo.

Chonophorus guineensis (Peters)

11 specimens, 55-75 mm. in length, from the Nkao, a very small brackish stream at Batanga.

7 specimens, 45-116 mm., from the Mbode, 10 miles south of Batanga.

One specimen, 110 mm. long, from the Bilobi, 40 miles from the ocean, Njabilobi (Efulan).

5 specimens, 80-138 mm. in length, Kribi, Kribi river system.

2 specimens, 90 to 110 mm. in length, Kribi, from a small brackish stream, the Ebome, the Kribi river system.

3 specimens, 55 to 96 mm. in length, from brackish water, Ebunja river, Ebunja.

1 specimen, 77 mm. long, Mvase river, a tributary of Campo river, Campo.

A specimen, 19 mm. long from a small brackish stream 10 miles south of Batanga, on the coast at Mbode.

Coronogobius schlegeli (Günther)

Dorsal VI—I—8; anal I—9; scales in longitudinal series 28, plus 3 more on the caudal base; transverse series 8. The body is laterally compressed, the dorsal profile very little curved, the ventral outline gently arched; the depth is 4.95 times in the length; the caudal and pectoral are both pointed, of equal length, 2.85 times in the length. The head is pointed, with prominent chin, 3.17 in the length, the cheeks more or less tumid; the eyes are very high up, 4.25 times in the head, the inter-orbital 3 in the eye; the snout equals the eye; the mouth is oblique, the angle of the maxillary beneath the front margin of the eye; the teeth are typical of the genus, with a well developed posterior canine. A row of sensory pores descends from the posterior nostril to the middle of the maxillary, where it gives off two branches which cross the preopercle to its hind margin; behind the angle of the mouth it turns and crosses the cheek parallel to the lines across the middle of the preopercle; above

it is a much smaller parallel line. Another line of pores runs around the margin of the preopercle and along the lower margin of the jaw to the symphysis. Several small lines of pores cross the opercle transversely and diagonally two small lines of pores extend backward from the eye a short distance; two others are on the snout. The vertical fins are of moderate height, the second spine of the first dorsal 5 times in the length; the longest second dorsal spine is 7.7, the longest anal spine 6.75 times in the length. The ventral is broad and long, with a strong frenum, 4.5 times in the length. The least depth of the caudal peduncle is 1.8 times in its own length.

The color in alcohol is brown, with 8 or 9 faint darker stripes over the back, 8 black transverse lines on the lower third of the trunk, and another one three scales behind; the fins are concolorous; a black spot at the base of the first three rays of the second dorsal, and a black spot on the upper part of the pectoral base; some longitudinal rows of black spots are on the lower part of the caudal fin.

Here described from the following specimens:

1 specimen, 54 mm. long, collected from a small brackish stream, called Nkao, at Batanga, Cameroon, Africa.

3 specimens, 38-50 mm. in length, from a brackish water stream at Eburnja, on the coast 6 miles south of Batanga.

4 specimens, 39-56 mm. in length, from brackish water at the mouth of the Kribi river, Kribi.

4 specimens, 51-60 mm. in length, from the Ebomé, a small brackish stream at Kribi.

2 specimens, 41-46 mm. in length, from brackish water, the Eburnja river, Eburnja.

3 specimens, 34-40 mm. in length, Bwanjo River, in brackish water, Bwanjo.

Ctenogobius bequaerti (Fowler)

2 specimens, 31-36 mm., from a small stream emptying into the sea at Kribi.

Ctenogobius thomasi (Boulanger)

6 specimens, 26-34 mm. in length, from the Nkao, a very small brackish stream flowing into the sea at Batanga.

Nematogobius ansori Boulanger

1 specimen, 37 mm. long, from the Nkao, Batanga.

Oxyurichthys occidentalis (Boulanger)

2 specimens, 46 and 51 mm. long, from the Nkao, Batanga.

Sicydium brevifile Grant

9 specimens, 33-51 mm. in length, from the Lokunje river, Sepindi.

Periophthalmidae

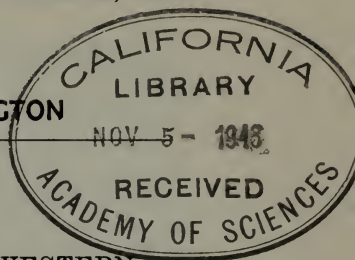
Periophthalmus papilio Bloch and Schn.

13 specimens, 67-126 mm. in length, Londji.

2 specimens, 88-95 mm., from the Nkao, a small brackish stream at Batanga.

1 specimen, 48 mm. long, from the brackish Bwanjo river, at Bwanjo.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



NEW SUBSPECIES OF BIRDS FROM WESTERN
NORTH AMERICA

BY JOHN W. ALDRICH

During the past few years the writer's studies have dealt largely with collections of birds from the State of Washington. In attempting satisfactorily to identify these specimens it has been thought desirable to recognize additional races of some of the species. Some of these have already been described in previous papers. The purpose of the present paper is to describe formally the remainder in advance of the publication of the complete report on the birds of Washington State.

Centrocercus urophasianus phalos, new subspecies
Western Sage Grouse

Type.—Adult ♂, 259861, U. S. National Museum (Fish and Wildlife Service collection); Fremont, Oregon; August 21, 1914; L. J. Goldman, original number, 106.

Subspecific characters.—Similar to *Centrocercus u. urophasianus* of the Great Plains and eastern Great Basin, but darker. White markings reduced in area and grays darker and more brownish. The resultant impression is a more dusky appearance above, on flanks and tarsal feathering.

Geographic distribution.—Permanent resident north to central-southern British Columbia; west to central Washington, central Oregon, and northeastern California; south to northeastern California; east to southeast-central and northeastern Oregon (possibly central-western Idaho) and central-eastern Washington.

Specimens examined.—*Washington*: Yakima River [♀], Sept. 16, 1853; [♂], Sept. 14, 1853; Spokane Plain [♂, 1853], head only. *Oregon*: Fremont, ♂, Aug. 21, 1914; Blitzen Valley, Harney County, ♂, Oct. 11, 1934; Huntington, ♀, May 22, 1916; Juntura, 2 [im.], July 9, 1916; Mt. Warner, 2 [♂], Sept. 23, 1914. *California*: Ravendale, ♂, Jan. 25, 1915.

Certhia familiaris caurina, new subspecies
Northwestern Brown Creeper

Type.—Adult ♂, No. 367378, U. S. National Museum (Fish and Wildlife Service collection); Gotchen Creek Ranger Station, Mt. Adams, Yakima County, Washington; May 16, 1942; Stanley G. Jewett, original number, 1395.

Subspecific characters.—Similar to *Certhia familiaris montana* from Arizona north to eastern Washington, but more brownish and buffy, less grayish and whitish. Similar also to *Certhia familiaris occidentalis*, of the Pacific coastal region from the islands of southeastern Alaska, south to California, but more grayish, less rufescent above and less buffy below. From *Certhia familiaris zelotes* of the Sierra Nevada and southern Cascade Mountains it differs in being paler, with brown areas lighter and black areas less extensive above.

Measurements.—Adult ♂ (16 specimens): wing, 58-66 (Av. 63.4) mm.; tail, 56-65.5 (60.7); exposed culmen, 13-16 (15.2); tarsus, 14-16.8 (15.7); middle toe without claw, 11-12.3 (11.5). Adult ♀ (4 specimens): wing, 58-63 (60.6); tail (59.5-63); exposed culmen, 12-14 (13.4); tarsus, 14.5-16 (15.4); middle toe without claw, 11-11.5 (11.3).

Geographic distribution.—Breeds on the east slopes of the Cascade Mountains from northern Oregon northward to the mainland of Alaska. Apparently partially permanent resident throughout its range, but at least some of the birds migrate southward to California.

Remarks.—The above described population of brown creepers might be considered merely as intergrades between the extremely grayish and whitish race *montana*, and the extremely rufescent and relatively uniformly colored *occidentalis*. However, the large range occupied by this variant with a relatively uniform appearance throughout necessitates recognition as a separate subspecies.

Specimens examined.—*Alaska*: Head of Toklat River, —, Oct, 1907; Susitma, ♂, Feb. 4, 1922; Cook Inlet, ♀, Aug. 31, 1900, ♂, Apr. 8, 1892; Yakutat, ♂ im., ♀ im., July 18, 1895, ♂, ♂ im., July 19, 1895; Juneau, ♂, Apr. 7, 1920. *Washington*: Whatcom County, Noosak River at Swamp Creek, ♂, July 23, 1920; Whatcom Pass (between Chilliwack Creek and the pass), ♂, July 30, 1920; Glacier, ♂, July 15, 1920; Okanogan County, Hidden Lakes, ♂, Sept. 2, 1920; Bauerman Ridge, ♀, Sept. 11, 1920; Monument 83, U. S. Boundary, im., July 26, 1942, ♀ im., Aug. 3, 1942; Aeneas, 2♂, Feb. 18, 1942; Ferry County, Swan Lake, ♀, ♂, June 17, 1942, ♂, June 12, 1942; Ferry Lake, ♂, June 16, 1942, ♂, June 21, 1942; Snohomish County, Suittale River, Chiwawa Mt. Fork, ♀, Aug. 4, 1918; Chelan County, Wenatchee Lake, ♂ im., Aug. 19, 1918; Keechelus Lake, ♂, Aug. 15, 1897; Pierce County, Mt. Rainier, Owyhigh Lakes, juv., Aug. 12, 1919 ♀ im., Sept. 1, 1919; Yakima County, Bumping Lake, ♂ im., Aug. 28, 1917; Mt. Adams, Bird Lake, ♂, May 12, 1942, ♂ May 16, 1942, ♂, July 17, 1942, ♂ im., July 27, 1942; Yakima Indian Reservation, Signal Peak, ♂, July 26, 1917; Skamania County, Trout Lake, ♂, Oct. 5, 1941. *Oregon*: Portland, ♂, Feb. 27, 1882; Warm Springs, ♀, May 5, 1915; Anchor, ♀, Aug. 8, 1916; Fort Klamath, ♂, Dec. 15, 1882, ♂, Dec. 29, 1882, ♂, April 14, 1883, ♂, Oct. 25, 1882. *California*: Freestone, ♂, Nov. 20, 1904; Quincy, ♂, Nov. 4, 1897.

***Talmatodytes palustris pulverius*, new subspecies**

Northwestern Long-billed Marsh Wren

Type.—Adult ♂, No. 262472, U. S. National Museum (Fish and Wildlife Service collection); Sprague, Lincoln County, Washington; June 11, 1918; George G. Cantwell, original number, 175.

Subspecific characters.—Similar to *Telmatodytes palustris plesius* from the Rocky Mountain and eastern Great Basin regions, but duller, less rufescent brown above and on flanks.

Measurements.—Adult ♂ (14 specimens): wing, 50-57.5 (53.9); tail, 42.5-50 (45.6); exposed culmen, 12-13.8 (13.0); tarsus, 18.5-20.5 (19.8); middle toe without claw, 12-14 (13). Adult ♀ (8 specimens): wing, 49-54.5 (51.1); tail, 42-46 (44.4); exposed culmen, 12-13.5 (12.6); tarsus, 18.5-20 (19.4); middle toe without claw, 11.5-13 (12.4).

Geographic distribution.—The northwestern portion of the Great Basin region from northeastern California and northwestern Nevada, north to east-central Washington (Lincoln County).

Remarks.—*Telmatodytes palustris pulverius* is the duller colored of all the interior forms of the long-billed marsh wren. It is relatively pale and rufescence is at a minimum. The contrast with the deeply colored *paludicola* west of the Cascade Mountains is very pronounced. *T. p. plesius*, which breeds somewhat farther east than *pulverius* in the eastern Great Basin and Rocky Mountain region, is somewhat paler and distinctly more rufescent. Two immature specimens from Lovelock in northwest central Nevada are intermediate. The breeding marsh wren of the Great Plains region north to Lake Athabaska (= *laingi*) is very light and bright colored, being more rufescent than *plesius*. The type specimen of *Telmatodytes palustris iliacus* Ridgway, which was apparently a migrant specimen from Wheatland, Indiana, matches these birds perfectly and *laingi* should be considered a synonym of *iliacus*.

Specimens examined.—*Washington*: Sprague, 2 ♂, June 11, ♂, June 13, 1918; Marshall, —, Oct. 5, 1890; Odessa, Sylvan Lake, 2 ♂ im., ♀ im., June 20, 1918; Sulphur Lake, Franklin County, —, Nov. 4, 1941; Lake Washtucna, ♂, Nov. 4, 1941. *Oregon*: Burns, ♂, July 7, 1896; Harney County, ♀, Dec. 10, 1914; Klamath Falls, ♀ im., Aug. 28, 1916. *California*: Tule Lake, ♂ im., ♀ im., July 6, 1899; Marysville, —, 1877; Sunset Beach, Orange Co., ♀, Dec. 27, 1916, ♀, Jan. 24, 1917, —, Jan. 28, 1921, ♀, Feb. 7, 1916, ♂, Feb. 27, 1917.

Catherpes mexicanus griseus, new subspecies

Northern Canyon Wren

Type.—Adult ♂, Br.; No. 367804, U. S. National Museum (Fish and Wildlife Service collection); Logy Creek, Yakima Indian Reservation, Yakima County, Washington; April 20, 1943; Stanley G. Jewett, original number 1603.

Subspecific characters.—Similar to *Catherpes mexicanus conspersus* of the Great Basin region, but more grayish, less rufescent both above and below. Similar also to *C. m. punctulatus* of California west of the Sierra Nevadas, but paler and more grayish.

Measurements.—Adult ♂ (14 specimens): wing, 57-62 (60.2); tail, 47.5-54 (51.1); exposed culmen, 18-21 (19.9); tarsus, 17.5-19 (18.4); middle toe without claw, 13-15 (13.8).

Geographic distribution.—Permanent resident in eastern Washington and eastern Oregon.

Remarks.—From the material available to me *Catherpes mexicanus punctulatus* seems like a very distinct race and I cannot concur with Grinnell and Behle (Condor, 37: 247, 1935) in lumping it with *conspersus*.

sus. Specimens in the U. S. National Museum from California west of the Sierra Nevadas (*punctulatus*) are markedly and consistently darker and more brownish, less rufescent, than a series from the Great Basin east of the Sierra Nevadas. *Catherpes mexicanus griseus* is a pale form and is more grayish than either *conspersus* or *punctulatus*. The differences in these three races are equally obvious in fresh autumn, worn breeding, and immature plumage.

Specimens examined.—Oregon: Mt. Vernon, ♂, July 1, 1915; Crane, ♂, July 28, 1916; Homestead, ♂, June 17, 1916; Malheur Cave, ♂, Oct. 6, 1916. Washington: Yakima County, Logy Creek, 2♂, April 20, 1943; Yakima, ♀, April 15, 1928; Wenatches, ♂, June 28, 1934; Almoda, ♂, April 17, 1904, ♂ im., Aug. 21, 1895, ♂ im., Aug. 22, 1895, ♂ im., July 24, 1903; ♂ im., Sept. 4, 1920; Wishram, ♂, Nov. 10, 1941; Rogersburg, ♀, May 31, 1918.

Dumetella carolinensis ruficrissa, new subspecies

Western Catbird

Type.—Adult ♂, No. 262173, U. S. National Museum (Fish and Wildlife Service collection), Colville Lake, Sprague, Washington; June 10, 1918; Walter P. Taylor, original number, 294.

Subspecific characters.—Similar to *Dumetella carolinensis carolinensis* of Virginia and other eastern states, but lighter colored below. This is particularly noticeable on the abdomen, which shows more whitish in contrast to the chest, and on the crissum, which is Russet instead of Bay. There is no significant difference in size.

Measurements.—Adult ♂ (23 breeding specimens from west of the Great Plains): wing, 86.5-97 (91.1); tail, 91-104 (96.2); exposed culmen, 15-17 (16). Adult ♀ (13 breeding specimens from west of the Great Plains): wing, 83.5-93.5 (8.4); tail, 88.5-97.5 (93.5); exposed culmen, 15.5-17 (16.1).

Geographic distribution.—Breeds north to southwestern British Columbia and Montana; east to northeast-central North Dakota (Devils Lake) and central-northern New Mexico (Rinconada); south to central-eastern Arizona (Springerville); west to north-central Utah (Provo), northeast central Oregon (Mt. Vernon), and central-southern Washington (Trout Lake). Migrates south through Mexico and to the West Indies.

Remarks.—A disconcerting fact that was soon evident in the course of studying catbird specimens is that in old specimens the brown color of the under tail coverts of eastern birds tends to fade and approach those of western specimens. Specimens collected prior to 1900 are quite unreliable in this respect, some retaining the deeper tones while others are very rufescent exactly like western specimens.

Specimens examined.—British Columbia: Chilliwack, ♂, June 3, 1889. Washington: Odessa, ♀, June 19, 1918; Trout Lake, ♂, Aug. 17, 1918, ♀, Aug. 28, 1918; Stehekin, ♀, July 20, 1918; Sprague, ♂, June 10, 1918; Spokane Bridge, ♀ im., Aug. 13, 1895; Anatone, ♀, June 26, 1919. Oregon: Mt. Vernon, ♂, June 30, 1915. Utah: Provo, ♀, July 30, 1872; Ogden, ♂, June 18, 1872; Salt Lake, Strawberry Island, ♀, June 12, 1869; mouth of Bear River, —, May 28, 1915. Idaho: Shelley, ♂, July 28, 1911; Idaho City, ♂, June 17, 1910; Blackfoot, —, July 7, 1890, ♂, July 10, 1890; American Falls, ♂, June 1, 1911. Montana:

Lismas, ♀, June 25, 1919; Geysler, —, Aug. 14, 1919; Livingston, ♂, July 5, ♂, July 6, 1917; Glasgow, ♂, June 21, 1910, June 7, 1919; Big Timber, ♂, June 25, 1917, ♀, June 6, 1918; Terry, ♀, June 12, ♀, July 2, ♂, ♀, July 3, 1916; Reese Creek, Gallatin County, ♂, Aug. 14, 1888; Hilger, ♀, July 31, 1919; Fort Logan, ♀, Aug. 25, 2 ♂, 2 ♀, Aug. 30, 1919; Dillon, 2 ♂, Aug. 10, 1917. *Wyoming*: Laramie, 2 ♂, summer, 1875; Moran, ♀, Sept. 13, 1910; Fort Bridger, ♂, May 21, 1858; Valley, ♀, July 11, 1910; Greybull, ♂, June 8, ♂, June 11, ♀, June 13, 1910; Fort Steele, ♂, May 24, 1911; Fort Fetterman, ♂, June 4, 1878. *Colorado*: Colorado Springs, ♂, June 9, 1883. *Arizona*: Springerville, ♂, June 7, 1915; Tunitcha Mountains, ♀, June 25, 1927. *New Mexico*: Rinconada, ♂, ♀, June 4, 1904. *North Dakota*: Oakdale, ♂, July 1, 1913; Turtle Mountains, ♂, July 23, 1873; Devils Lake, Graham Island, ♂, Sept. 21, 1903. *Texas*: Point Bolivar, ♀, April 22, 1907. *Vera Cruz*: Papanita, ♀, March 6, 1898; Tres Zapotes, ♀, Jan. 17, 1940. *Mexico*: Metlaltoyuca, ♂, Feb. 22, ♀, Feb. 23, 1898. *Tabasco*: Frontera, ♀, March 5, 1900. *Yucatan*: (G. F. Gaumer specimen). *Louisiana*: Jefferson Parish, Southport, ♀, Jan. 13, 1900. *Cuba*: Port Tanamo, ♀, March 2, 1930.

Spinus pinus vagans, new subspecies

Western Pine Siskin

Type.—Adult ♂, No. 228860, U. S. National Museum (Fish and Wildlife Service collection); Edna, Idaho; June 21, 1910; Stanley G. Jewett, original number, 109.

Subspecific characters.—Similar to *Spinus p. pinus*, but lighter in coloration. Less heavily streaked with black above and below, and ground color of dorsal region lighter and more buffy, less brownish. Similar also to *Spinus pinus macropterus*, but smaller in wing and tail measurements. More heavily streaked with black above and below, and ground color of dorsal region lighter and more buffy, less brownish.

Measurements.—Adult ♂ (18 breeding specimens): wing, 68-75 (71.6); tail, 42-47 (44.9); exposed culmen, 9.3-11.5 (10.3); tarsus, 14-15 (14.6); middle toe without claw, 10-12 (11.1). Adult ♀ (7 breeding specimens): wing, 67.5-73 (69.9); tail, 41-46 (43.9); exposed culmen, 9.8-11 (10.4); tarsus, 14-15 (14.7) middle toe without claw, 10.5-11.3 (10.8).

Geographic distribution.—Breeds in coniferous forests of western North America from the Pacific coast region north to southern Alaska, and south to northern Baja California, eastward normally to the Rocky Mountains from Canada to northern Mexico. Apparently breeds farther east during years of excessive wandering to Ontario, Wisconsin, Michigan, and Ohio.

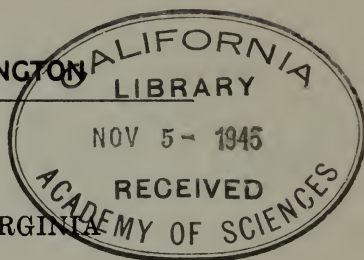
Remarks.—The vagrant habits of this species makes the separation of races difficult. It is more than ever necessary to have definitely breeding material for comparison. I was fortunate in having a good series of breeding specimens from various parts of the west, as well as from the east (Newfoundland south to the Great Smoky Mountains). In these series the differences were uniform and striking. In large series of specimens in fresh autumn plumage from east and west the differences were equally well marked, although not as constant. The western pine

siskin evidently invades the eastern States in large numbers in certain years, evidenced by the specimens of this form from New York, Maryland, Virginia, and the District of Columbia, particularly in the winters of 1882-83 and 1887-88. The eastern race wanders into the range of *Spinus pinus vagans*, even to western Washington, and is represented by three December specimens from South Park and Ravenna, Washington, in the U. S. National Museum. *Spinus pinus macropterus* wanders up from Mexico after the breeding season as far as New Mexico, judging from 2 specimens from that State (Bosque Del Apache, near Socorro, Aug. 17, 1942, and Questa, Aug. 15, 1904), in the U. S. National Museum collection.

Specimens examined.—*Alaska*: Cook Inlet, Tyoonok, 2, Sept. 22, 1900; St. Paul Island, Sept. 24, 1917; Keku Pass, Nov. 19, 1919; Kodiak, June 4, 1894, July 4, July 3 (5), July 20, and July 1, 1899; Juneau, April 5, 1920; Douglas Island, near Juneau, Jan. 9, 1920; off Pribilof Islands, Aug. 19, 1893; Sitka, Aug. 5, 1895; Lake Iliamna, Iliamna Village, July 13, 1902. *British Columbia*: Goldstream, May 15, May 14, 1895; North Fork, Moose River, July 21, 1911. *Washington*: Vancouver, April 13, 1892; Trout Lake, Skamania County, 2, Oct. 2, 1941; South Park, King County, 8, Dec. 1, 1894, 2, Dec. 12, 1894; Shoalwater Bay, Oct. 12, 1854, 1, no date; Ridgefield, April 3, 1941; Yakima Indian Reservation, Signal Peak, July 27, 1917; Mt. Vernon, 4, Dec. 18, 1895; Mt. Adams, southeast slope, Aug. 29, 1943; Semiahmoo Bay, Oct. 10, —. *California*: Eureka, 2, March 27, 1899, March 25, 1902; Haywards, 2, April 8, March 30, 1902; Mt. Shasta, Aug. 26, 1902; Marysville, no date; Walker's Basin, Nov. 5, 1875; South Yollo Bolly Mountain, July 26, 1905; Fort Crook, March 19, April 10, 1860; Pescadero, Feb. 19, 1894; Nevada, Oct. 1872; Humboldt Bay, 2, Dec. 4, 1885, June 12, 1899; St. Helens, 2, Dec. 23, 1897, Jan. 5, 1898; Beryessa, Feb. 26, 1890, Dec. 23, 1889; Smith River, Del Norte County, Oct. 9, 1905; Placerita Canon, 3, April 23, 1921; Big Trees, Aug. 10, 1878; Fort Tejon, no date; Ed River, near South Yolla Bolly Mountains, Aug. 6, 1905; Temescal Mountains, Feb. 23, 1889. *Oregon*: Seaside, Sept. 8, 1905; Philomath, 3, March 8, 1919; Fort Klamath, 3, Oct. 4, 1882, 2, Oct. 3, 1882; Corvallis, June 1, 1920. *New Mexico*: Cinequilla, March 31, 1904; Fort Wingate, March 6, 1885; Manzano Mountains, 2, Oct. 8, 1903; Zuni Mountains (Mt. Sedgwick), June 23, 1909; Capitan Mountains, Aug. 20, 1903; Arroyo Seco, 3, Jan. 28, 1904; Cantonment Burgwin, March 27, 1860; Big Hachita Mountains, Grant County, May 22, 1892. *Wyoming*: Sierra Madre Mountains, June 20, 1911; Fort Steele, May 27, 1911; Pahaska Tepee, Grinnell Creek, July 29, 1910; Jackey's Creek, 3 miles south of Dubois, May 13, 1910; Laramie, no date; Bull Lake, Aug. 21, 1893; Fort Bridger, 2, June 16, 1858. *Texas*: Frijole, June 14, 1939; Presidio County, May 24, 1890. *Montana*: Highwood Mountains, 2, Aug. 27, 1910; Poison Creek, 10 mi. S. E. Livingston, July 1, 1917; West of Boulder Creek, 18 mi. S. E. Livingston, June 27, 1917; Pass Creek, Gallatin County, Aug. 26, 1888. *Idaho*: Bannock Mountains, Swan Lake, July 8, 1911; Edna, June 21, 1910; Resort, July 30, 1913; Little Blackfoot River, Aug. 21, 1860. *Utah*: Promontory Point, Oct. 14, 1914; Pine Valley Mountains, Oct. 13, 1909. *Nevada*: East Humboldt Mountains, Sept. 5 and 8, 1863. *Arizona*: Mt. Thomas,

White Mountains, July 30, 1915; Fort Verde, 6, Jan. 25, 1888; Williams, May 26, 1927; Mount Graham, Sept. 21, 1874; Graham Mountains, Ash Creek, May 11, 1914, April 23, 1914; Pine Springs, Nov. 15, 1884; Fort Huachuca, May 16, 1892; Alpine, Apache County, Sept. 19, 1914; San Francisco Mountains, Aug. 31, 1889. *Colorado*: Fort Garland, May 29, 1873; Pueblo, Dec. 1, 1890; Park of the Peaks, west of Denver, July, 1867; Colorado Springs, May 26, 1883. *Chihuahua*: Colonia Garcia, 15 mi. W., Feb. 29, 1904. *Coahuila*: Sierra Guadalupe, April 23, 1902; *Nuevo Leon*: Mesa del Chipinque, Feb. 14, 1938, March 20, 1939. *Lower California*: La Paz, March 3, 1882; Hansen Laguna, 3, June 8, 1905; Sierra Guadalupe, 2, April 23, 1902; Vallecitos, July 14 and 17, 1905. *District of Columbia*: Washington, 4, Jan. 29, 1888, Feb. 12, 1888, 4, Jan. 22, 1888. *Maryland*: Laurel, Feb. 25, 1879. *Virginia*: Rosslyn, May 19, 1888; Ballston, Nov. 8, 1887; Arlington, Oct. 24, 1889. *Georgia*: Liberty County, no date. *New York*: West Point, Oct. 30, 1899, Feb. 11 and March 3, 1900; Highland Falls, March 9, 1883; Fort Montgomery, Feb. 6, 1878. *Wisconsin*: Outer Island, Sept. 10 and 11, 1919; Mamie Lake, Vilas County, June 12 and 18, 1918. *North Dakota*: Dawson, Sept. 11, 1922. *Illinois*: Milton Township, DuPage County, Sept. 26, 1896; Mount Carmel, April 21, 1869. *Michigan*: Escanaba, June 8, 1883. *Manitoba*: Western Manitoba, no date. *Massachusetts*: Belmont, 2, Oct. 17, 1880. *Ohio*: Rockport, July, 1849. *West Virginia*: White Sulphur Springs, Nov. 6, 1936. *Maine*: Westbrook, 2, Dec. 21, 1891. *Ontario*: Elmsdale, May 24, 1897. Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C., May 20, 1946.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



A NEW COTTON RAT FROM VIRGINIA

BY MARSHALL C. GARDNER

During the course of a revision of the North American cotton rats (Genus *Sigmodon*) a hitherto unrecognized subspecies was discovered. It is described as follows:

Sigmodon hispidus virginianus, subsp. nov.

Virginia Cotton Rat

Type specimen.—Adult ♀, skin and skull, No. 273535, U. S. National Museum (Biological Surveys collection); collected January 30, 1943, by John B. Lewis; original number, 705; Biological Surveys Miscellaneous No. 31384X.

Type locality.—Triplet, altitude 160 feet, Brunswick County, Virginia.

Geographic range.—As yet undetermined, but probably includes the southern portions of Mecklenburg and Brunswick counties in Virginia. Carolinian province (Dice) and Carolinian life zone.

Diagnostic characters.—A smaller, more blackish-gray subspecies, most closely allied to *Sigmodon hispidus hispidus*, but less brown. Hind feet average grayer. Skull about as in *S. h. hispidus* but smaller.

Color.—Upper parts raw umber brown mixed with black; sides buffy brown; hind feet averaging neutral gray; tail blackish above, grayish below; under parts neutral gray to whitish gray.

Skull.—Similar to that of *S. h. hispidus* but smaller.

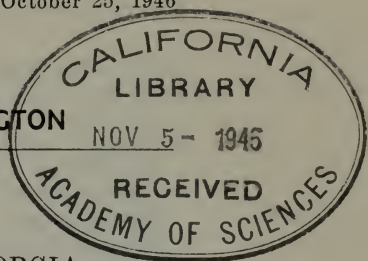
Measurements.—*Type*: Total length, 239; tail vertebrae, 93; hind foot, 31. *Skull* (type): Condylbasal length, 31.1; length of anterior palatine foramina, 7.2; palatal bridge, 6.1; nasals, 12.8; zygomatic breadth, 19.1; least interorbital breadth, 4.9; cranial breadth, 13.4; maxillary tooth row, 6.3.

Remarks.—When compared with *Sigmodon hispidus hispidus* from North Carolina this new subspecies averages smaller and more blackish gray.

Specimens examined.—Six, from the following localities in Virginia: Triplet (type locality), 5; Clarksville, 1.

Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C., June 13, 1946.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



ON FOUR MILLIPEDS FROM GEORGIA
AND MISSISSIPPI

BY RALPH V. CHAMBERLIN

In two small collections of diplopods recently sent me for identification the four new species here described were found represented.

The first of these collection was made by P. W. Fattig in Georgia and contains the types of the two new species of the Xystodesmid genus *Epeloria*. Other species represented are *Spirostrephon lactarium* (Say), *Euryurus erythrogygus* (Brandt), and *Dixidesmus humilidens* Chamberlin.

The second collection was made at Pass Christian, Mississippi, by J. and W. Rapp and in Illinois and Tennessee by Wm. F. Rapp, Jr., and was transmitted by the last named collector. It contains the types of the new species of the Xystodesmid genus *Eurymerodesmus* and of the Polydesmid genus *Dixidesmus*. Additional forms represented are *Pseudopolydesmus serratus* (Say) and *Nopoiulus minutus* (Brandt) from Urbana, Ill.; *Euryurus ergthrogygus* (Brandt) from Shawnee National Forest, Ill.; and *Pseudopolydesmus serratus* (Say) and *P. euthetus* Chamberlin from Reelfoot Lake, Tenn.

The types of the new species are retained in the author's collection at the University of Utah.

Epeloria dela, new species

A smaller form than *E. talapoosa*, the generotype, from which it differs in the details of the male gonopods. In the telopodite of these the apical branches are obviously unequal in size with the larger one somewhat lamellate, and of the form shown in the accompanying figure. Another readily detected difference is in the presence of a lateral tooth or spine on the basal process which is lacking in *E. talapoosa*. (Figs. 1 and 2.)

None of the sternites spined.

The dorsum is brown with the borders of the keels yellow, some showing within the yellow border a somewhat reddish area.

Width of the male holotype, 7 mm.

Locality—Georgia: Morgan, at Cordrays Pond. The male holotype and female allotype were taken April 4, 1946, by P. W. Fattig.

Epeloria leiacantha, new species

A somewhat smaller form than *E. dela* to which it is closest in form of the gonopods of the male. It differs, however, in lacking the lateral

tooth on the basal spine and in the more robust form of the telopodite as shown in the accompanying figure. (Fig. 3.)

Sternites not spined. No coxal spines, but those of femora well developed as usual.

The dorsum is brown, with borders of keels and covered portion of prozonites yellow. Legs and lower parts of segments yellow.

Width, 6.2 mm.

Locality—Georgia: Decatur Co., Spring Creek.

One male taken April 3, 1946.

Eurymerodesmus christianus, new species

This species seems to be set off very clearly from others so far known by the length of the apical beak or prolongation of the telopodite of the male gonopods, the beak in its form being otherwise nearest that of *E. louisianae* Chamberlin. It is further distinct in the number and arrangement of the setae on the telopodite as shown in the accompanying figure. (Fig. 4.)

The male lacks sternal processes on the sixth somite.

The venter, sides, keels and background of the dorsum yellow, the tergites incompletely covered with a network of brown which is denser across posterior part of prozonites and anterior border of metazonites. In the types the legs and antennae are also yellow.

Width, about 2.5 mm.

Locality—Mississippi: Pass Christian. Four specimens taken Feb. 16, 1946, by J. and W. Rapp.

Dixidesmus christianus, new species

Dorsum dark brown or in part somewhat chestnut with the keels light. Legs brown and antennae dark brown.

A typical tergite with the usual rounded swelling at base of each keel. The 6 tubercles of the posterior row distinct, those of adjacent row less well defined, while those in front of the sulcus are absent or obscure. Serrations of keels fine but distinct.

Sternal processes at bases of anterior legs of the sixth segment cylindrical and well developed, those of the eighth segment but little developed.

Distinguished by the details of the gonopods of the male as represented in the accompanying figure. (Fig. 5.)

Length of male holotype, 19.5 mm; width 3.2 mm.

Locality—Mississippi; Pass Christian. One male (holotype), three females and several immature specimens taken Feb. 15, 1946, by J. and W. Rapp.

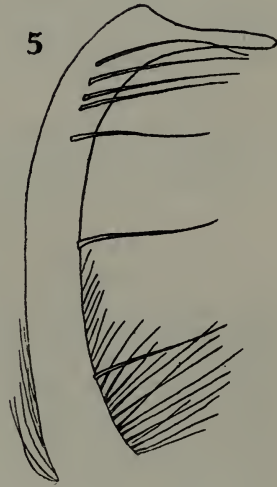
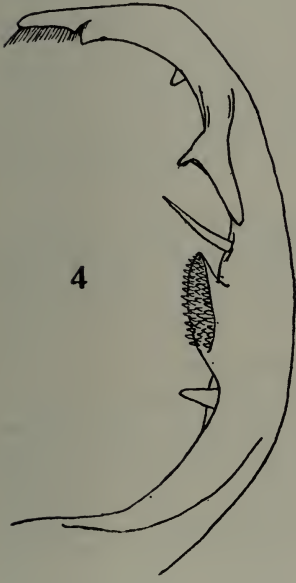
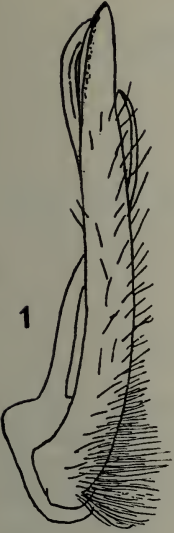
EXPLANATION OF FIGURES ON PLATE XII

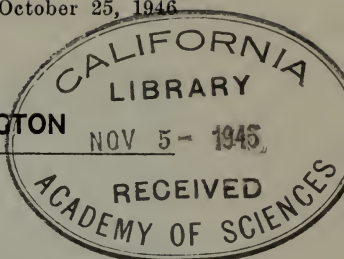
Epeloria dela, n. sp. Fig. 1. Right gonopod of male, a little ectad of ventral view. Fig. 2. Basal spine of left gonopod, lateral view.

Epeloria leiacantha, n. sp. Fig. 3. Right gonopod of male, aspect a little ectad of ventral.

Dixidesmus christianus, n. sp. Fig. 4. Ectal aspect of telopodite of male gonopod.

Eurymerodesmus christianus, n. sp. Fig. 5. Mesal aspect of telopodite of male gonopod.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONTHE NEW GUINEA SPECIES OF CULEX (CULICIO-
MYIA), WITH DESCRIPTIONS OF TWO NEW
SPECIES*BY WILLARD V. KING, *Colonel*
and HARRY HOOGSTRAAL, *Captain, Sn.C., AUS*

The members of this subgenus have unicolorous scaling of the tarsi, proboscis and scutum, and a lower mesepimeral bristle is present. They are usually of about medium size. The main characteristic of the subgenus is the presence of a row of long, translucent, modified scales extending ventrolaterally from the apical portion of the long segment of the male palpus. Usually also there are some broad flat scales on the head vertex, no scales on the pleurites, and a spiny crest on the male style. One species, *C. pullus*, a ground-pool breeder, is one of the most commonly encountered species of *Culex* in New Guinea, and both this species and *C. fragilis* are widely distributed. Neither is of any importance as pests so far as known.

Only five species are definitely known at present from New Guinea. An Indian species, *C. pallidothorax*, was listed from New Guinea by Bonne-Webster (1938) but without any description of specimens and the records are possibly attributable to *C. pullus*.

***Culex (Culiciomyia) nalloni* new species**

MALE.—*Head*: Proboscis slightly longer than fore femur, dark scaled. Palpus longer than proboscis by length of apical segment, dark scaled, with long bristles on apical two segments; a row of at least five long, curved, pale, modified scales arising from ventrolateral surface toward apex of long segment. Antenna with dense long hair whorls. Vertex with a small median triangular area of narrow pale brown scales not reaching eyes; remainder of vertex, border of eyes and lateral surface of head with broad pale scales; a patch of brownish upright forked scales posteriorly. *Thorax*: Scutum clothed with fine brownish scales; two narrow bare submedian lines extending almost to antescutellar space.

*From the 19th Medical General Laboratory, U. S. Army. Contribution No. 10 from the Entomology-Mammology Department.

Scutellum with narrow brownish scales on each lobe. Posterior pronotum with fine, hairlike scales on upper third. Pleurites pale yellowish without scales or dark markings; mesepimeron with a single long, median, lower bristle. Wings with the lateral scales of veins 2 to 4 long, linear, those at the tips of the forked cells slightly broadened; first forked cell about 1.5 times length of its stem, arising slightly closer to base of wing than second; posterior cross vein closer to base of wing than mid by a little more than its own length. Length of wing 2 mm. Inner surface of the femora with a narrow line of pale scales, the legs otherwise uniformly dark; fore and mid tarsal claws subequal, the larger ones toothed. *Abdomen*: Tergites uniformly clothed with dark scales. *Hypopygium* (fig. 1): Coxite about twice as long as mid width, unscaled; inner border with a row of closely set strong setae. Subapical lobe (SA) prominent, apically with a heavy rod and five flattened pointed spines; at base a stout rod on ventral side and a slender flattened spine on dorsal side. Apicoventral lobe (AV) slender, clothed with small hairs, the apex with an enlongate somewhat flattened rod. Style (S) a little more than half as long as coxite, strongly curved, slightly swollen basally and constricted medially, tapered to a pointed reflex tip; crest not spinose; a small patch of fine hairs on inner margin subbasally, outer margin and crest with several short hairs; appendage subapical, blunt. Paraproct moderately sclerotized apically, without the usual tuft of hairs and row of blunt spines on crest, having instead five or six long, closely appressed, pointed spines, at the base of which on the inner margin is a slender, weak extension bearing a few minute hairs; lateral arm short, slightly curved. Phallosome long and slender; lateral plate elongate, rounded at tip, simple except for a small sub-basal ventral tooth; basal process narrow, curved, pointed, nearly half as long as lateral plate. Ninth tergite with shoulders slightly rounded, well separated, each bearing a few weak setae.

FEMALE.—Similar to male except as follows: Antenna slightly longer than proboscis, with five or six short bristles arising from the base of each flagellar segment, pale hairs over entire surface; palpi not quite one-fourth length of proboscis; first fork cell a little more than twice the length of its stem; lateral scales toward tips of veins 2 to 4 distinctly broadened.

LARVA (fig. 6)—*Head*: Broader than long, very lightly pigmented. Antenna about three-fifths as long as head, with numerous heavy spines on basal three-fourths; a narrow darkly pigmented ring basally; tuft about two-thirds from base; subapical bristles arising well before apex. Preclypeal spines slender, about a third the length of antenna. Head hairs arising posterior to base of antenna, plumose, A with 6 to 8 branches, B and C double; *d* fine, single, anterior and internal of B; *e* bifid, *f* three-branched. *Abdomen*: Segment I with the upper lateral hair 3-branched, the lower single; lateral hair of II 3-branched, III single or with 2 or 3 branches, IV double, V 2-3 branched, VI and VII single (the hairs on I and II much stouter and darker than on other segments). Comb of segment VIII a triangular patch of 27 to 37 long, narrow scales, apically rounded and fringed; pentad hair 1 with five or six plumose branches, 2 and 4 single, 3 with five plumose branches, 5 with three or four plumose branches. Siphon rather long and narrow,

the apex about half as wide as base, index about 5:1, the surface covered with rows of fine spicules; a prominent acus present; pecten with 18 to 25 teeth on basal two-fifths, each tooth with a few stout denticles on one side; four or five pairs of branched hairs on apical half of siphon, the first three pairs longer than the diameter of the siphon at the point where they arise. Anal segment encircled by saddle; surface of saddle covered with rows of small spicules, the posterior border with short spines; lateral hair single or double; dorsal subcaudal hair single or double, ventral one single; anal gills equal, slender, pointed, about one and a half times as long as saddle.

Holotype.—Male (459), reared from larva taken from crab hole in rain forest, elevation 250 feet, Hollandia, Netherlands New Guinea, 22 December 1944 (W. T. Nailon, Collector). *Allotype*.—Female (459), same data. *Paratypes*.—Six males, 13 females, 12 larvae, and 3 larval exuviae (459), same data as above. Holotype, allotype, and paratypes deposited in the United States National Museum; other paratypes to be deposited in the Museum of the Division of Economic Entomology, Council for Scientific and Industrial Research, Canberra, A.C.T., Australia.

On external characters, this species is separable from other *Culiciomyia* of New Guinea by its small size combined with a lack of pleural and abdominal markings. The peculiar development of the paraproct (which is reminiscent of some species of *Lophoceraomyia*) appears to be unique in the subgenus, while the absence of a spiny crest on the style is unusual. *C. bailyi* Barraud, of India, which is similar in the latter respect, differs in having a banded abdomen, a dark stripe across the upper part of the pleura and in several genitalic characters.

Only one collection of this species was made at Hollandia, though it is probably more elusive than rare. *Aedes* (*Pseudoskusea*) *lunulatus* King and Hoogstraal and *Aedes* (*Aedes*) sp. were taken from the same crab hole at the same time. The species is named for Sergeant William T. Nailon, the collector.

Culex (*Culiciomyia*) *fuscicinctus* new species

MALE.—Similar in size and general appearance to *C. nailoni* except as follows: narrow scales of head yellowish, covering almost all of vertex; flat scales reduced, limited to a short line laterally on eye margin; no scales on posterior pronotum (three bristles on posterior border); pleurites pale with two brownish stripes, one beginning on the posterior pronotum and continuing across the upper part of the sternopleuron and mesepimeron, the other beginning on propleuron and extending across onto the lower portion of the mesepimeron; propleuron with about six bristles; femora largely pale beneath for entire length; lateral scales of veins 2 to 4 linear, slightly broadened towards tips of 2.1 and 2.2; first fork cell about one and a third times as long as its stem, its base about level with that of the second; abdominal tergites with small basal lateral spots of pale scales. Wing length 2 mm. *Hypopygium* (fig. 2): Coxite about a third longer than its midwidth; apicoventral lobe prominent, with a closely set pair of stout rods, one heavily sclerotized, arising from its apex, a group of about 15 flattened setae below these; subapical lobe inapparent but in its usual position a stout blunt rod, a lanceolate leaflet and a flattened

spine, a patch of uniform setae external to these. Style slightly more than half as long as coxite, the base greatly enlarged and finely pilose, the apical portion tapered to an upturned pointed tip; crest with six or seven retrorse spiny platelets; two papillated hairs on apical third; appendage slightly subapical, long, bluntly rounded. Paraproct sclerotized, the crown with a row of blunt spines and a tuft of hairs; lateral arm short and blunt. Phallosome (damaged in mount) apparently simple in structure without teeth. Ninth tergite with slightly rounded lobes bearing several small setae.

HOLOTYPE.—Male, collected by the writers in a light trap operated in the laboratory clearing, elevation 250 feet, Hollandia, Netherlands New Guinea, 4 April 1945. Female and larva unknown. The holotype is deposited in the United States National Museum.

On the combination of genitalic characters (enlarged base of style, two apical spines and patch of flattened setae on coxite, and short lateral arm of the paraproct) this species is very distinct among the described species. It is separable otherwise from other New Guinea species by the small amount of flat scales on the eye margins, presence of basal lateral spots on the abdominal tergites, two brownish stripes across pleurites, and, except for *C. nailoni*, by its small size.

Culex (Culiciomyia) papuensis (Taylor)

Melanoconion papuensis Taylor, 1914. Trans. Ent. Soc. London, p. 201.
(Type female, Papua, Lakekamu Gold Field.)

Culex (Culiciomyia) papuensis Taylor. Edwards, 1924, Bull. Ent. Res. 14:397 (in part).

This species has been confused with *C. fragilis* as the females of the two forms are similar in appearance. The male genitalia and the larvae of the two, however, are found to be very distinct. An examination by the senior author in 1944 of the type female in the University of Sydney (through the kindness of Mr. F. W. Taylor) showed it to be the same as females reared by ourselves and others from larvae having an inflated airtube. An illustration of the male genitalia of *C. papuensis* by Brug (Bull. Ent. Res., 17:82, 1926) is not recognizable either as this species or *C. fragilis* (only four spines are shown on the subapical lobe and the paraproct lacks a lateral arm).

The following description of the male hypopygium and larva, not previously described, is based on reared material from Hollandia, Netherlands New Guinea, and Dobodura, Papua.

Hypopygium (fig. 3): Coxite about twice as long as mid width; apico-ventral lobe (AV) large, bearing a cluster of about a dozen curved modified bristles; subapical lobe (SA) prominent, with two groups of structures, the first consisting of a stout spine and two longer, apically curved and flattened rods, the second group a pair of stout spines one of which is flattened leaflike; a dense patch of long fine hairs at side of lobe near base of style. Style (S) about three fourths as long as coxite, curved and upturned at tip, the crest with a row of from four to seven erect spines of varying sizes; a pair of fine hairs on each side near crest; appendage small, blunt, subapical. Paraproct heavily sclero-

tized, the crown basally bearing a row of about eight apically curved, broadened spines and an overlying row of shorter pointed spines; apically with a dense tuft of hairs; lateral arm (LA) long, slender and curved. Lateral plate of phallosome slender apically, widened basally, with from 4 to 7 small teeth on one side and a much larger tooth sub-basally. Ninth tergite with shoulders slightly rounded, separated, each bearing about 7 setae.

LARVA (fig. 7).—*Head*: Pale, two-thirds as long as wide. Antenna about two-thirds as long as head, with slender spinules on basal two-thirds; tuft arising near middle, with about 12 plumose branches not reaching apex of shaft; shaft narrower beyond tuft, without subapical bristles. Preclypeal spines one-sixth length of antenna, moderately stout, usually with one to four small lateral spinules; a slender clypeal hair arising near base of spines. Head hair A arising just posterior to base of antenna, with six to nine plumose branches; B and C both long, arising behind and interior of A, both usually 3-branched, one or the other sometimes 2-branched, plumose; *d* arising about level with A and interior of C, single, lightly plumose; *e* and *f* with two or three branches non-plumose. *Abdomen*: Lateral hairs on segment I double or triple, on segment II usually double or single, on III to V usually single, sometimes double. Segment VIII with lateral comb a triangular patch of from 35 to 45 elongate, apically rounded scales, each fringed from base to apex; pentad hair 1 with five or six plumose branches; hairs 2 and 4 single, non-plumose; hair 3 with seven or eight plumose branches; hair 5 double, lightly plumose. Siphon index 4:1, bulbous sub-basally, the distal half narrowed to apex, which is one-third width of base; acus present; 3 to 5 pecten teeth on basal two-fifths, each with elongate denticles along basal half of one side; four pairs of latero-ventral hair tufts, 4 to 6 branched, beyond pecten. Anal segment completely encircled by saddle, short spinose rows posteriorly on saddle; saddle hair single to triple; subcaudal hair tufts single; ventral brush of four or five pairs of tufts arising from a grid; anal gills slightly swollen basally, the apical half tapered to a blunt tip; dorsal pair about three times length of saddle (sometimes shorter), ventral pair about five-sixths as long as dorsal pair.

On external characters, the adults of this species are most apt to be confused with *C. fragilis* among the New Guinea fauna. They are somewhat larger (wing about 4.0 mm. compared with 3.5 mm.) and darker in color, there is no trace of apical lateral pale spots on the abdominal tergites, the wing scales on veins 2 to 4 are distinctly narrower, and there are fewer flat scales on head vertex. The swollen airtube of the larva is unusual, although in this respect it resembles somewhat *C. pallidothorax* Theobald of India and runs to this species in D. J. Lee's "Atlas of the Mosquito Larvae of the Australasian Region. Tribes-Megarhinini and Culicini" (Aust. Mil. Forces, 1944, North Melbourne). The adults of *pallidothorax* differ in having a banded abdomen and in several characters of the male genitalia.

This species was much less common at Hollandia than *Culex fragilis*, although the larvae were sometimes very numerous in certain collections of water. Twice they were taken in large numbers from the putrid water in hollowed sago trunks used by natives for preparing their sago dough; in these instances no other species was found with them.

Other collections were from wooden kegs, tin food containers, tree-holes, and drums, with *Aedes* (*Finlaya*) *notoscriptus* (Skuse), *Culex* (*Lutzia*) *halifaxi* (Theob.), *C. (Neoculex) brevipalpis* (Giles), *C. (Culex) pullus* Theob., and *Uranotaenia argyrotarsis* variety. The breeding places were shaded or semi-shaded, and the water was either clear or filled with leaves. In two collections at Dobodura, eastern New Guinea, (one collection in a steel drum filled with rocks and water, the other in pools in sagging canvas) numerous larvae were taken, associated with *C. fragilis*, *Aedes* (*Stegomyia*) *scutellaris* (Walk.), *A. (F.) notoscriptus*, *A. (F.) novalbitarsis* K. & H., *Tripteroides bimaculipes* (Theob.), and *Uranotaenia* sp. At Hollandia, adult specimens were taken in the light trap at the edge of rain forest only five times between January and June, and no females were taken attempting to bite.

Culex (Culiciomyia) fragilis Ludlow, 1903

Culex fragilis Ludlow, 1903. J1. N. Y. Ent. Soc. 11:142. (Type male and female, Oras, Samar, Philippine Is.)

Culex (Culiciomyia) papuensis of Lee, 1944 (nee Taylor), Atlas of Mosq. Larv. of Aust. Region, Aust. Mil. Forces, p. 96. (Illustration of larval characters).

A recent comparison by the writers of adult and larval material of *C. fragilis* from the Philippines has indicated that New Guinea specimens are the same species. The larva (fig. 8) is distinguishable from related species by the long tubular gills, multiple branching of head hairs B and C, and three pairs of hair tufts on a rather short siphon. The adults have a wide line of flat scales along the eye margin, the wing scales on the forked veins are distinctly broadened and the abdominal tergites have faint yellowish spots on the apical corners. In the male (fig. 4) the styde has a long crest of blunt spines, subapical lobe of coxite with a leaflet and about seven rods and spines, paraproct with a basal arm shorter and stouter than in *C. pullus*, the crown with a row of about seven long blunt spines followed by an equal number of sharp ones; lateral plate of phallosome with four to six medial teeth and a larger one sub-basally. Differences between this species and *C. papuensis* are mentioned under the latter.

This was one of the most common *Culex* breeding at Hollandia. Of 62 larval collection records about half are from temporary and semi-permanent ground pools, especially with stagnant, more or less foul or algae-filled water, in all degrees of shade, and the others are from larger tree and log holes and artificial containers, especially with rotting vegetation and usually shaded. Associated larvae from ground pools were *Culex (Lutzia) halifaxi*, *C. (Culicio.) pullus*, and *Uranotaenia argyrotarsis* var; from tree and log holes, coconut husks and artificial containers were *Aedes (Finlaya) notoscriptus* and *aureostriatus*, *A. (Stegomyia) scutellaris*, *Armigeres (Armigeres) breinli*, *Tripteriodes* spp. *Uranotaenia nigerrima*, *Culex (Lutzia) halifaxi*, *C. (Mochto.) brevipalpis*, and *Megarhinus splendens*. Three collections were from putrid water in the tips of fallen betel nut palms in a rain forest, associated with larvae of *Armigeres (A.) breinli* and *milnensis*. Adult fe-

males were taken from tents and from buttresses of large rain forest trees. None were taken hovering about persons or attempting to bite. Males and females in about equal proportions were attracted in large numbers to light traps operated between January and June.

Culex (Culiciomyia) pullus. Theobald

Culex pullus Theobald, 1905. Ann. Mus. Nat. Hung., 3:87. (Type female, Muina New Guinea.)

Culex (Culiciomyia) muticus Edwards, 1923. Bull. Ent. Res. 14:6. (Type male and female, Rabaul, New Britain; synonymized by Edwards, 1926, Bull. Ent. Res. 17:121.)

Culex (Culiciomyia) muticus Edw. Hill, 1925, Proc. Roy. Soc. Vict., 37:74. (Partial illustration of larva and pupa.)

Culex (Culiciomyia) muticus Edw. Brug., 1934, Bull. Ent. Res., 25:517. (Description and illustration of male genitalia and notes on the larval siphon.)

Culex (Culiciomyia) pullus Theob. Lee, 1944, Aust. Mil. Forces, p. 94. (Illustration of larva.)

?*Culex (Culiciomyia) pallidothorax* of Bonne-Webster (nec Theobald), 1938. Meded. Dienst Volksgezond, Ned.-Ind., 27, 206-212. (Listed from New Guinea.)

The larva of this species is easily recognized by the very long and slender airtube which has a lightly sclerotized section beyond the middle, giving the tube a broken appearance. The lateral and submedian hairs of abdominal segments 4 to 6 are each long and single. The characteristics of the adults are as given in the key. Parts of the male hypopygium are shown in Fig. 5.

Aside from *Aedes (Stegomyia) scutellaris*, this was the most commonly encountered mosquito at Hollandia. About 150 larval collections of *pullus* were recorded, and many individuals were frequently present. Sixteen records were from log holes or artificial containers, the others from shaded and sunlit collections of ground water of all types, except permanent ponds and brackish water. The list of associated species from these pools includes almost all the ground pool breeders taken at Hollandia. The collections other than ground pools were from large holes in logs, usually shaded, and from large cans, cisterns, oil drums, and beached canoes, in association with *Aedes (S.) scutellaris*, *A. (S.) albolineatus*, *A. (F.) notoscriptus*, *Culex (Lutzia) halifaxi*, *C. (Mochtwo.) brevipalpis*, *C. (Culicio.) fragilis*, *C. (Culicio.) papuensis*, *Megarhinus splendens* and *Tripteriodes* spp. Adults of both sexes were taken in tents and from buttresses of large rain forest trees on several occasions. Females were taken hovering about persons in the rain forest and sago swamp, but never biting. In light trap collections at the edge of a rain forest, adults of both sexes (about one-fourth males) were taken at an average of from four to ten per night during different months from January to May, 1945.

Besides New Guinea, the species has been reported from New Britain, the Solomons, Amboina and Queensland, Australia.

DESCRIPTIVE KEY TO ADULTS

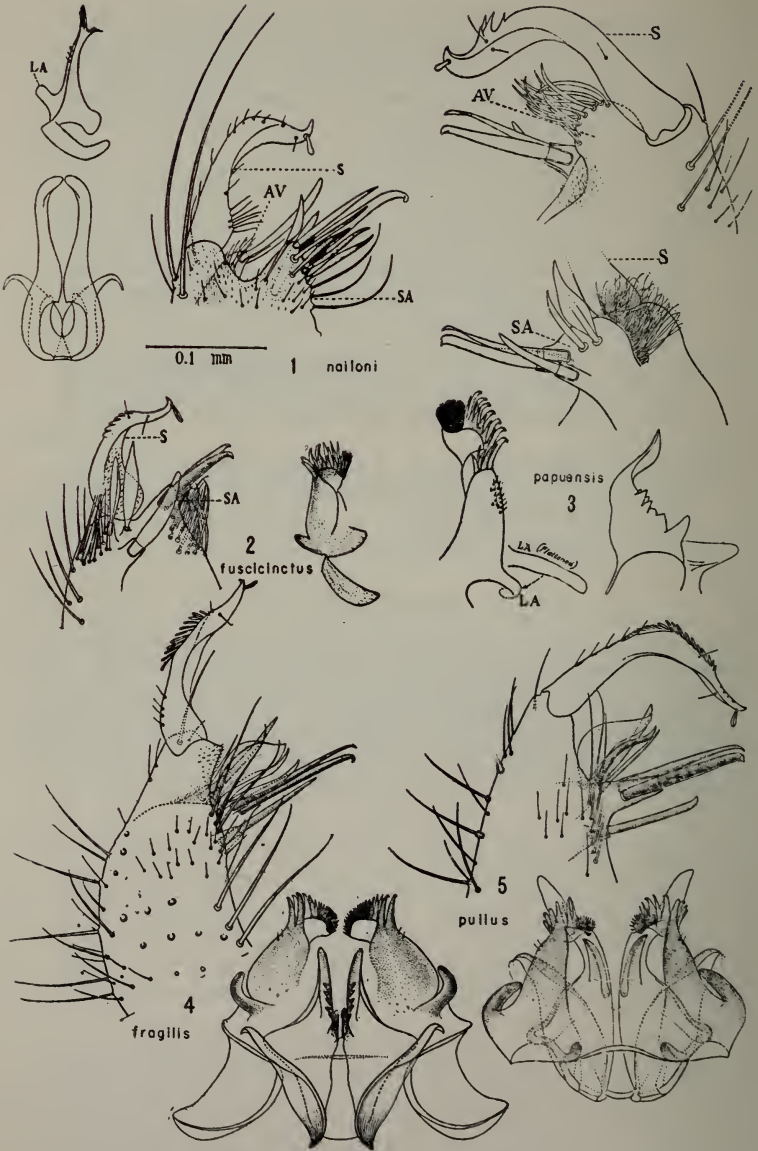
1. Abdominal tergites with wide basal white bands (frequently having a rounded posterior border on some segments). Upper parts of pleurites dark or with dark spots on sternopleuron and mesepimeron; subapical lobe of coxite with a large leaflet; apical half of style with a long row of flattened platelets on crest; lateral plate of phallosome elongate, rounded at tip, simple, basal arm elongate, pointed; basal arm of paraproct long and curved *pullus*
- Abdominal tergites unbanded 2
2. Abdominal tergites with small basal lateral spots of white scales; pleurites with two dark longitudinal stripes; only a few broad flat scales laterally on eye margin, not extending nearly to mid line. Style enlarged at base, the crest with a short row of spines; apicoventral lobe of coxite with two stout rods from tip; subapical lobe with a narrow leaflet; lateral arm of paraproct short; lateral plate of phallosome untoothed medially
fuscicinctus n. sp.
- Abdominal tergites without basal lateral white spots; pleurites unicolorous or with only indistinct dark markings; head vertex with 1-3 rows of flat scales along eye margin reaching median line, or nearly so; male style not greatly enlarged at base..... 3
3. Abdominal tergites entirely dark..... 4
- Abdominal tergites with indistinct apical lateral pale spots. Lateral wing scales distinctly broadened; head with a wide line of flat pale scales around eye margin, narrowly interrupted at mid line; a single lower mesepimeral bristle; crest of style with a long row of rounded spines; subapical lobe of coxite with a moderately broad leaflet; lateral arm of paraproct moderately long, stout; lateral plate of phallosome with 4-6 median teeth and a larger basal tooth..... *fragilis*
4. A small species, rather pale in color; head with a wide line of flat scales along eye margin, usually uninterrupted in middle. Lateral wing scales slightly broadened on apical half of the forks of vein 2; male style without a spiny crest; apicoventral lobe of coxite with an elongate rod; subapical lobe without a leaflet; lateral plate of phallosome simple; paraproct with a short lateral arm and only a few pointed spines on crest
nailoni n. sp.
- A rather large species, darker in color; head with the lines of flat scales well separated by narrow scales in middle. Lateral wing scales linear; two or three lower mesepimeral bristles frequently present; male style with a few spines on crest; apicoventral lobe of coxite with a cluster of modified bristles; subapical lobe with a narrow leaflet; lateral plate of phallosome toothed; paraproct with a long curved lateral arm, the crest with the usual dense tuft of hairs and a row of flattened, rounded spines *papuensis*

KEY TO LARVAE (Fourth instar)

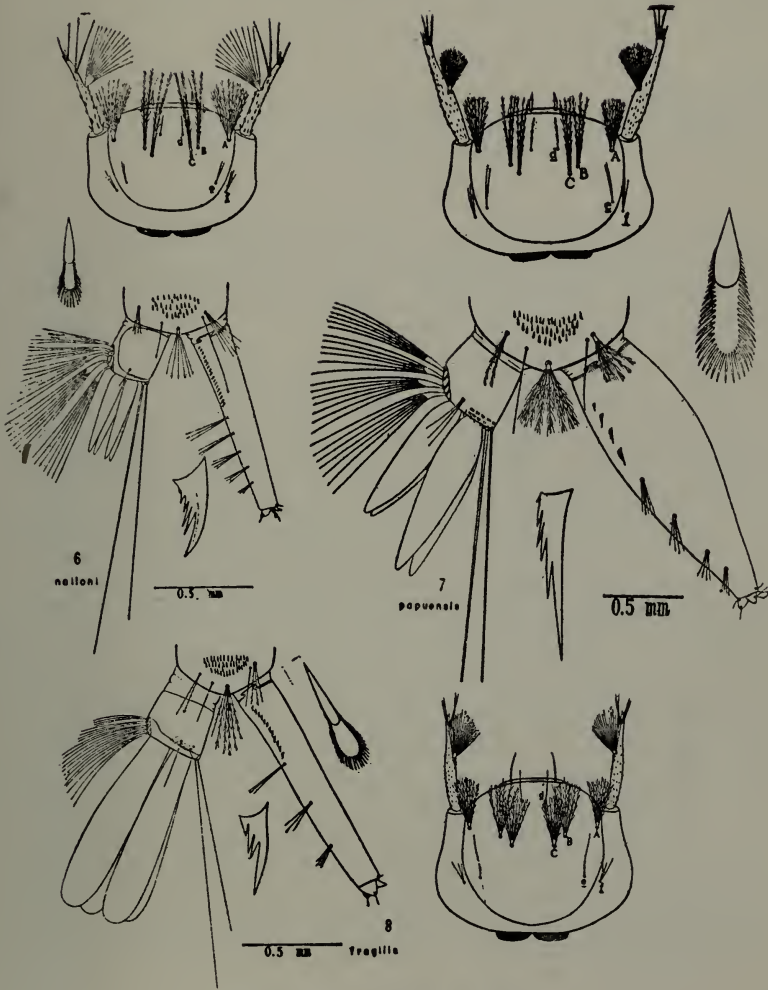
1. Airtube elongate, the sides straight and nearly parallel; pecten normal; anal gills usually equal..... 2
 Airtube enlarged, distinctly inflated before middle and tapered to tip; pecten of only 3-5 teeth; anal gills unequal, the dorsal pair twice as long as saddle, or longer, rather large but tapered to a bluntly pointed tip.....*papuensis*
2. Airtube moderately long, index about 5:1, normally sclerotized.... 3
 Airtube very long and slender, index 8-10:1, a weakly sclerotized band at apical third which gives the tube a fractured appearance; two or three pairs of ventrolateral hairs, single or bifid, very small; anal gills slender, about as long as saddle; head hairs B and C usually triple.....*pullus*
3. Anal gills large, 3-4 times as long as saddle, broadly rounded at tip; siphon with three pairs of hair tufts, each about as long as diameter of tube; head hairs B and C with 6-8 branches
fragilis
 Anal gills slender, less than twice as long as saddle; siphon with five pairs of hair tufts of decreasing lengths apically; head hairs B and C usually bifid.....*nailoni*
 (Larva of *fuscicinctus* unknown.)

ILLUSTRATIONS

Male genitalia: Fig. 1, *Culex nailoni*, paraproct, phallosome and tip of coxite (outer aspect); Fig. 2, *C. fuscicinctus*, tip of coxite (inner aspect) and paraproct; Fig. 3, *C. papuensis*, coxite (outer and inner aspects), paraproct and lateral plate of phallosome; Fig. 4, *C. fragilis*, coxite, paraproct and phallosome; Fig. 5, same of *C. pullus*. Head and terminal segments of larvae: Fig. 6, *Culex nailoni*; Fig. 7, *C. papuensis*; Fig. 8, *C. fragilis* (New Guinea).

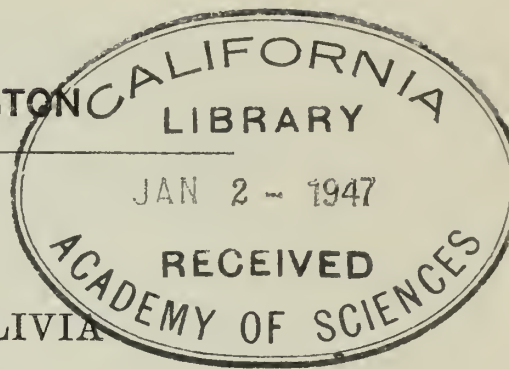


New Guinea Species of *Culex*.



New Guinea Species of *Culex*.

PROCEEDINGS
OF THE
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A NEW GNATCATCHER FROM BOLIVIA

By W. E. CLYDE TODD

A recently completed study of the Gnatcatchers (*Poliop-tila*) in the collection of the Carnegie Museum has revealed one form which is apparently undescribed, and which may be called

Polioptila dumicola saturata, subsp. nov.

Type, No. 80,776, Collection Carnegie Museum, adult male; Samaipata, Bolivia, November 17, 1919; José Steinbach.

Subspecific characters.—Similar to *Polioptila dumicola dumicola* (Vieillot) of Paraguay, eastern Bolivia, etc., but general coloration decidedly darker; pileum and upperparts slate color, and underparts slate gray, only slightly paler posteriorly; tail averaging longer.

Range.—Highlands of Bolivia.

Remarks.—The characters of this new race have already been indicated by Hellmayr (Field Mus. Zool. Ser., 13, pt. 7, 1934, 490, note). It varies away from *dumicola* of the lower elevations in a direction precisely opposite to *berlepschi* (a pale race). Hellmayr synonymizes the *Culicivora boliviana* of Selater (1853) with *dumicola*. It was described from "Bolivia" (exact locality unspecified), and since Hellmayr examined Selater's type, and comments as well on Samaipata specimens, his identification may be accepted. Our four males come from Samaipata and Chilon; they measure as follows: wing, 54, 55, 60, 55 mm.; tail, 63, 60, 64, 63. Thirteen males of *dumicola* from Bolivia and northern Argentina average: wing, 53.8; tail, 57.5.

Count Nils Gyldenstolpe (K. Svenska Vet. Hand., 23, No. 1, 1945, 246-7) has also commented on the peculiarities of the specimens he handled. Very significantly, he states that "the type of *C. boliviana*, as well as another male from Santa Cruz de la Sierra, is somewhat paler above and beneath than toptypical *P. d. dumicola* of Paraguay."

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THE OCCURRENCE OF WEHRLE'S SALAMANDER,
PLETHODON WEHRLEI FOWLER AND DUNN, IN
VIRGINIA

By M. GRAHAM NETTING, *Carnegie Museum*

and

N. BAYARD GREEN, *Marshall College*

and

NEIL D. RICHMOND, *Laneza, Virginia*

The eastern boundary of the range of *Plethodon wehrlei* Fowler and Dunn, as mapped by both Bishop¹ and Grobman,² lies slightly west of the border of Virginia. It appears desirable, therefore, to call attention to certain specimens which demonstrate the occurrence of this salamander in Virginia. This new state record, although of interest as an addition to the already large herpetofauna of Virginia, does not merit extended treatment as such. Nor do we attach any great significance to the fact that these appear to be the first examples of *wehrlei* obtained in the Atlantic Drainage, since the ultimate destination of local run-off can scarcely affect purely terrestrial salamanders living along a divide. The new locality records do indicate, however, that *Plethodon wehrlei* is not so strictly limited physiographically as was formerly believed. This should stimulate more careful search for the species in suitable habitats elsewhere in the folded Appalachians, and even in the Blue Ridge!

On May 30, 1940, we visited the portion of Allegheny Mountain known as Tamarack Ridge. The collecting site was about eight and a half miles (airline) southeast of Durbin, West Virginia, at the point where U. S. highway 250 crosses the ridge. The West Virginia-Virginia state line, in this area, follows the crest of Tamarack Ridge, Pocahontas County, West Virginia, lying to the west, and Highland County, Virginia, to the east. We searched along the ditches and roadcuts of the main highway, along the low banks of an intersecting dirt road, and in the woods adjacent to each, at elevations between 4,350 and 4,400 feet on both slopes.

¹Bishop, Sherman C., *Handbook of Salamanders*: 282, 1943.

²Grobman, Arnold B., *Ann. N. Y. Acad. Sci.*, 45: 286, 1944.



The ridge is largely covered with mixed second-growth forest, but occasional pastures with scattered trees border the highway. Small red spruce (*Picea rubra*), yellow birch (*Betula lutea*), striped maple (*Acer pennsylvanicum*), red berried elder (*Sambucus pubens*), and brambles (*Rubus canadensis*) are well represented. Numerous decaying logs of chestnut, birch, and spruce lie scattered on the forest floor.

Within forty-five minutes, during a hard afternoon rain, we obtained twelve specimens of *Plethodon wehrlei* (three of them, CM 19,597-99, being taken in Virginia), nine *P. cinereus cinereus* (both states represented), and two *P. glutinosus glutinosus* (West Virginia only). Of the dozen *wehrlei* found, most were in or under spruce logs, a few were under rocks, and one was in a chestnut log that also contained a specimen of *glutinosus*. The other *glutinosus* was found under a large rock, and the nine *cinereus* were in or under spruce logs. Our examination of birch logs here confirmed previous experiences, for, although many were torn apart, none contained salamanders. Birch decays as a soggy mass within its bark shell, and is usually either too wet or too spongy to be attractive to Plethodons.

We returned to the same spot in the evening and collected from 9:30 to 10:30 P.M. The air temperature was 43° F. and intermittent rain was falling. In one hour we obtained thirteen *wehrlei* (ten, CM 19,600, from the Virginia side) and four *glutinosus* (five additional specimens were observed). A careful search was made for *cinereus*, but no specimens were found, probably because the temperature was too low for nocturnal activity on the part of this species, which certainly appears to be less cold-resistant than *glutinosus*, although it is *reputed* to be more tolerant of low humidity. (In high-altitude collecting in West Virginia we have found that temperatures below 45° F. largely inhibit the nocturnal activities of many terrestrial plethodontids, but, on rainy evenings, *wehrlei*, *glutinosus*, and *nettingi* are sometimes active at somewhat lower temperatures.) Most of the specimens of *P. wehrlei* were found walking along the leaf-filled drainage ditches, but one was in a rock crevice, and one was on top of a log. One specimen of *wehrlei* regurgitated a centipede. Although several *glutinosus* were walking on the bare soil of the roadcut, the majority observed were resting in their burrows in the bank, their bright eyes sometimes glowing pink when caught by the beam of a headlamp.

Two additional specimens of *wehrlei* (CM 19,801-02) were obtained on June 2, along U. S. 250, at a point somewhat farther down the east slope of Tamarack Ridge, about one-half mile beyond the first locality.

Through the courtesy of Prof. H. W. Jackson, Virginia Polytechnic Institute, we are privileged to record *P. wehrlei* at a second area in Virginia; namely, the vicinity of Blacksburg, Montgomery County. The senior author has examined one specimen (VPI No. C19) collected in the twilight zone of Nellie's Cave, two miles southeast of Blacksburg, at an elevation of 2,100 feet, on February 9, 1943, and two specimens (VPI Nos. A3-4) collected under a log in a gully two miles east of Blacksburg, at an estimated elevation of 1,700 feet, on March 30, 1943. Professor Jackson stated (letter of Nov. 18, 1943):

It might interest you to know that this species is not at all un-

common and could be recorded as generally distributed. Although this species is frequently observed near the entrance of caves, it is not at all confined to caves and may be collected under stones or logs on moist wooded hillsides; for example, Trillium Vale, a valley one mile east of Blacksburg, and at an average elevation of 2,100 ft., is a very reliable source which we use for class demonstrations.

Still more recently (letter of Sept. 17, 1945), Professor Jackson reported:

You might be interested to know that we also have collected this species from Dixie Caverns which are located near the west border of Roanoke county on Route 11 about 300 yards north of the Roanoke River.

Dixie Caverns are about six miles west-southwest of Salem, approximately fourteen miles east of the Blacksburg stations, and only about eleven miles northwest of the crest of the Blue Ridge. Collectors in Virginia should make an especial attempt to locate *wehrlei* on Poor Mountain just south of the Roanoke River, and should also search for it at Slings Gap and Mason Knob in the adjacent Blue Ridge. The eastern slope of Tamarack Ridge is drained by northeast-flowing Laurel Fork, which combines with Straight Fork (in Pendleton County, West Virginia) to form the North Branch of the Potomac River. Blacksburg is actually in the New River drainage, but the three specific *wehrlei* localities are drained by short tributaries of the North Fork of the Roanoke River. Dixie Caverns are close to the Roanoke itself.

The occurrence of *P. wehrlei* in three counties in Virginia, as listed above, also establishes for the first time the presence of this species in two Atlantic drainage systems, apparent indication that the species can spread readily across environmentally suitable divides. Whether or not large rivers are a barrier to the dispersal of *wehrlei* remains to be established. It is beyond the scope of this paper to consider Grobman's discussion of the Ohio River as a modern barrier, but we do wish to point out in this connection that this author's statement, "It may be that the New-Kanawha Rivers restrict the southwestern spread of *wehrlei*," is contraverted by his own distribution map, which includes dots representing stations in Mercer and Raleigh counties, West Virginia, southwest of the New-Kanawha. (The specimens supporting these records are: CM 7,483 from Brush Creek Falls, near Athens, Mercer County; CM 15,874-76 from one mile south of Daniels, Raleigh County; and CM 15,873 from two miles west of Eccles, Raleigh County.) Although we are disinclined to regard water itself as a barrier to *wehrlei*, we cannot deny the possibility that a broad, hot flood-plain bordering a river might prove a very effective barrier indeed.

Plethodon wehrlei is widespread and locally numerous in suitable habitats in the middle eastern portion of the Appalachian Plateaus Province. Except for the localities discussed above, the forty-seven stations represented by the 391 specimens of *wehrlei* in the Carnegie Museum collection are all within this Province. In eastern West Virginia the Plateaus Province boundary, recently delimited by Fenneman,³ leaves the Allegheny Front just south of the thirty-ninth parallel and curves

³Fenneman, Nevin M., *Physiography of Eastern United States*: 250, 1938.

westward to Back Allegheny Mountain. From a strictly physiographic point of view it is correct, therefore, to consider that the specimens reported here constitute the first stations for *wehrlei* in the Valley and Ridge Province. Such treatment, however, implies a discontinuity in habitat that does not in fact occur. Allegheny Mountain, on which the Tamarack Ridge specimens were taken, is actually a continuation of the Allegheny Front, environmentally if not physiographically. Similarly, the Blacksburg stations, although well within the Valley and Ridge Province, are situated in an area where the Great Valley is completely blocked by a maze of short, high ridges and hills which are well interconnected with the dissected plateau to the west. To the best of our knowledge, *P. wehrlei* has not yet been collected at Mountain Lake, Giles County. In 1938, however, Prof. Maurice Brooks saw a large *Plethodon* in a hemlock log there. The specimen eluded capture, but he noted at the time that it was "not *glutinosus*."

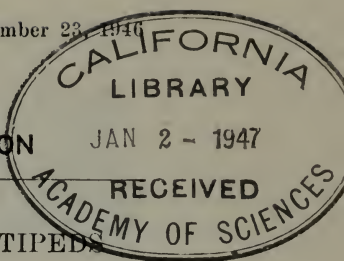
We believe that virgin spruce forest provides the optimum conditions of moisture, food, and shelter for *P. wehrlei*, at least in the southern half of its range. Caves, although probably a secondary habitat, appear to provide nearly optimum conditions, also, but access to their twilight zones must be by external routes through vegetative cover that is, or has been, suitable. The caves of the Shenandoah Valley offer apparently satisfactory habitats for *wehrlei*, yet much exploration by speleologists has not resulted in the finding of the species there. Its absence probably reflects the lack of present or former high-humidity migration lanes across the floor of the Great Valley.

On the basis of the records discussed here, we believe that it is safe to conclude that the folded ridges of the western portion of the Valley and Ridge Province—the Allegheny Ridges of some physiographers—may be expected to harbor *wehrlei* wherever spurs interconnect the ridges and plateau. Further search for *wehrlei* at Mountain Lake is indicated, for the absence of the species at this locality is difficult to understand in the light of the Blacksburg records. Extensive collecting between Blacksburg and the Blue Ridge should be productive of additional stations and should indicate whether or not the species has actually reached the Blue Ridge.

In conclusion, we believe that it is desirable to regard *Plethodon wehrlei* as essentially an Appalachian Plateaus endemic,⁴ which enters the Valley and Ridge Province in places where there is, or has recently been, continuity of habitat, and which may possibly have gained access to the Blue Ridge via the jumbled ridges which block the southern portion of the Great Valley.

⁴Mayr has recently (Wilson Bull., 58: 11, 1946) differentiated between endemic, "restricted to a given region," and autochthonous, "having originated in a given region; now sometimes found beyond the borders of that region." Using this terminology, *P. wehrlei* is an autochthonous rather than an endemic Appalachian Plateaus species.

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A NEW MILLIPED AND TWO NEW CENTIPEDES
FROM GUAM

By RALPH V. CHAMBERLIN

The specimens from Guam Id. upon which the present descriptions are based were among arthropods found "associated with the freeliving stages of a trombiculid mite that was investigated in connection with a study of the vectors of scrub-typhus by members of U. S. Naval Medical Research Unit No. 2," a study being made by Lieut. George W. Whar-ton, Jr.

The specimens sent to me for identification by Mr. C. F. Muesebeck of the U. S. Bureau of Entomology and Plant Quarantine prove to represent one species of spirobolid milliped typifying a new genus, and two species of chilopods, one a hemicopid and one a geophilid.

Genus **GUAMOBOLUS**, new genus

Distinguished among other genera of the Spirobolidae in wholly lacking a sternite to the anterior gonopods. These gonopods undivided, distally prolonged into processes which in the genotype meet mesally; their bases with lamellate extensions meeting at the middle line. Posterior gonopods widely separated, undivided, expanded distally in a somewhat canoe-shaped lamella. Supralabial setigerous feveolae 5+5 or 5+4. Repugnatorial pores on the metazonites. Anal valves protruding in the usual manner, neither depressed nor compressed at middle.

Genotype.—*Guamobolus delus*, new species.

Guamobolus delus, new species

A small dark brown form with paler annuli, these not always sharply defined. Legs also brown.

Eyes very widely separated. Ocelli in 5 transverse series, e.g., 6, 6, 6, 5, 4.

Collum strongly narrowed down the sides, with the lower ends rounded as shown in the figure (Fig. 3); without impressed sulci. Second tergite not descending below level of collum.

The ordinary segments moderately constricted, with course puncta and some horse-shoe shaped impressions especially in and in front of the furrow. The posterior segmental sulcus not sharply impressed, the pore touching the light line representing it.

In the male the coxae of the fifth legs with conspicuous, somewhat lamellate, processes which are distally bent forward. (Figs. 4 and 5.)

The gonopods of the male are as figured. (Figs. 1 and 2.)

Number of segments in the male holotype, 37 or 38.

Width, 1.6 mm.

Locality.—Guam Id: Oca Point. Male holotype taken Aug. 10, 1945 by Carver; one adult male, one immature male and three females taken Aug. 17, 1945 by Fritts, and a very young specimen by the latter on Aug. 24, 1945.

Mecistocephalus ocanus, new species

Head about once and a half as long as wide, its form as figured. (Fig. 6.)

Anterior margin of prosternum with two pale but distinct teeth; coxoid with a rounded tooth and femuroid with a similar one; two next joints also with distinct rounded teeth but claw not dentate at base.

Anterior areolabed area of the clypeus decidedly longer antero-caudal than the anterior non-areolated band.

Coxae of first maxillae with a well marked ectal shoulder the antero-ectal angle of which is produced moderately distad. (Fig. 7.) Palpi of second maxillae long, curving distally beyond the first maxillae; distal end with an abortive claw and with setae moderate in number as shown in the figure. (Fig. 8.)

First lamella of mandible with 5 long teeth, the corner beneath it produced as shown in the figure. (Fig. 9.)

Coxal pores small, moderate in number.

Pairs of legs, 49.

Length, about 15 mm.

Locality.—Guam: Oca Point. One specimen collected by Fritts, on Aug. 24, 1945.

Lamyctes guamus, new species

A smaller species than the widespread *L. fulvicornis* from which it differs in having the prosternal teeth 2+2 instead of 3+3, these teeth small, well spaced, with the median interval wide, obtusely angular at bottom. Antennae with articles short, moniliform, 23-25 in number. Ocellus present, large, pale, with no pigmented area about it.

Coxal pores 1, 1, 1, 1, small and circular, as against 2, 2, 2, 2, to 4, 4, 4, 3 in the other species known from the Pacific area.

Gonopods of male beyond the stout basal article straight and distally bristle like.

Length, 4.5 mm.

Locality.—Guam: Bile Bay. Five males taken by Carver, Aug. 31, 1945.

The occurrence exclusively of males in this lot is very interesting in view of their usual rarity.

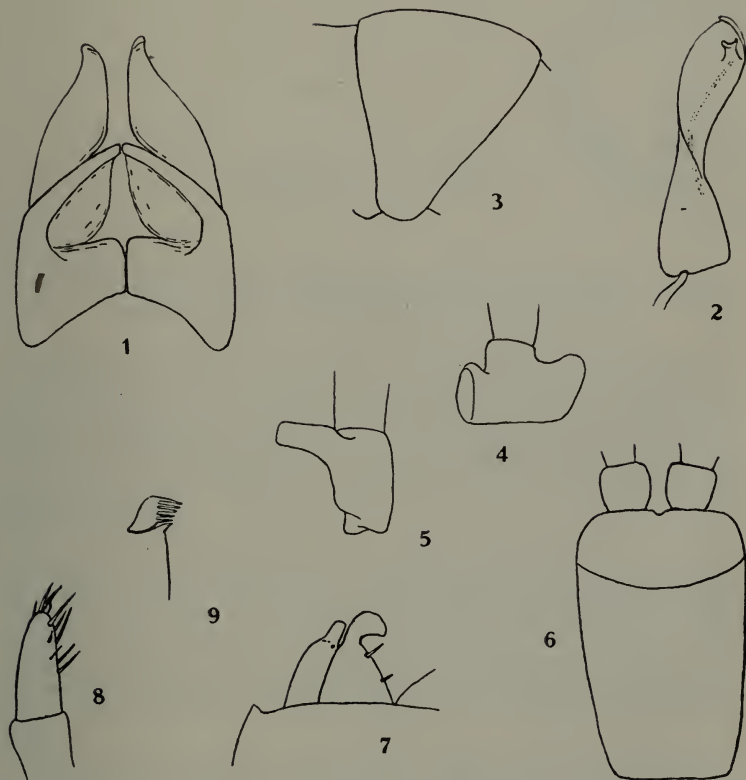
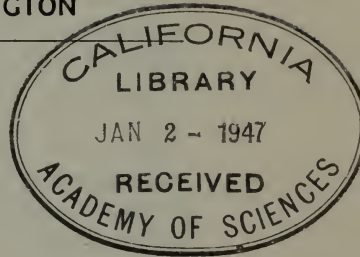


PLATE XV

Guamobolus delus, n. sp. Fig. 1. Gonopods of male, anterior view. Fig. 2. Posterior gonopod of male, subcaudal view. Fig. 3. Collum, viewed from right side. Fig. 4. Coxa of fifth left leg of male, anterior aspect. Fig. 5. The same, mesal aspect, showing process.

Mecistocephalus ocanus, n. sp. Fig. 6. Cephalic plate in outline. Fig. 7. First maxillae, right half. Fig. 8. End of palpus of second maxilla. Fig. 9. First lamella of mandible.

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GENERAL NOTES

A NEW LOCALITY RECORD FOR *EUMECES LATICEPS* (SCHNEIDER) IN MARYLAND

McCauley (1945, *The Reptiles of Maryland and the District of Columbia*, p. 51) indicates that the distribution of *Eumeces laticeps* in Maryland is limited to a few localities on the Coastal Plain. He also points out the possibility of its occurrence on the Piedmont Plateau and even as far west as the Allegheny Ridges.

On June 18, 1946, while collecting about 2½ miles above Seneca, Montgomery County, Maryland, a large specimen of this species was secured. The locality from which this specimen was taken is on the Piedmont Plateau in that portion known as the Triassic Lowland. This lowland is characterized by sandstones and shales of the Newark formation. Above Seneca these rocks form a line of bluffs about 200 feet high running parallel to the Potomac River for a distance of several miles.

The specimen was taken from beneath a large slab of shale poised on the edge of the bluffs at a point below which there is a broad floodplain of the river. When first noted its head and a part of its body were protruding from a burrow-like hole near one corner of the rock. Detecting the observers, it withdrew into this hole but reappeared a few minutes later. It was finally caught by sliding away this rock beneath which it was hiding. A nest, presumably of some rodent, was also found under the rock.

The lizard was an adult male with a snout to vent length of 123 mm. The largest Maryland specimen mentioned by McCauley (*loc. cit.*) had a snout to vent length of 120 mm. The maximum size attained by this species is 130 mm. (Smith, 1946, *Handbook of Lizards*, p. 353.) Other reptiles and amphibians collected at this same locality included *Agkistrodon m. mokeson*, *Triturus v. viridescens* (eft), *Ambystoma maculatum*, *Bufo woodhousii fowleri*, and *Hyla c. crucifer*.

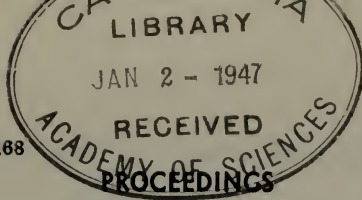
J. A. FOWLER

PARTIAL NEOTENY IN A COMMON NEWT

Noble (1929, Amer. Mus. Novitates, No. 348, pp. 1-22) in connection with observations on the life history of the newt, *Triturus v. viridescens*, reported a typical larva which contained fully formed spermatozoa. This was the first report of true neoteny in this species. In addition, many newts were partially neotenic in that they failed to complete metamorphosis and retained open gill-clefts, a more or less larval branchial apparatus, and gills partly or fully developed. Noble's investigations were conducted at Woods Hole on the Coastal Plain in Massachusetts but neotenic individuals of this newt have also been reported from other parts of the Coastal Plain as far south as New Jersey (Bishop, 1943, Handbook of Salamanders, p. 12).

In Maryland, judging from the number of normally transformed adults encountered in all parts of the state, neotenic newts are apparently the exception. It is therefore of interest to record a partially neotenic individual collected on Bear Island near Great Falls, Montgomery County. This locality is on the Piedmont Plateau about 10 miles west of its junction with the Coastal Plain. The specimen was taken from a small body of water occupying a river pot-hole. It had vestiges of gills and open gill-clefts and measured 72 mm. in total length. The average length of this species at transformation is about 36 mm. (Bishop, loc. cit., p. 103.) This is the only neotenic newt that has been noted among a number of individuals of this species collected from various ponds on the island where the immature, terrestrial red "eft" stage has also been found.

J. A. FOWLER



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A NEW MOUSE OF THE *PEROMYSCUS BOYLI*
GROUP FROM UTAH

By STEPHEN D. DURRANT

In the course of preparing the accounts of the Utah mammals an hitherto undescribed race of *Peromyscus boylii* has been recognized. The description and name of the new form are as follows:

Peromyscus boylii utahensis, new subspecies

Type.—Female, adult, skin and skull, No. 4400, Museum of Zoology, University of Utah; 5 mi. above lower power station, Millcreek Canyon, 5,800 ft., Salt Lake County, Utah; November 15, 1941; collected by Henry W. Setzer, original number, 297.

Range.—In that part of the state bounded on the east by the Colorado and Green rivers and on the west by the area formerly occupied by Pleistocene Lake Bonneville; limits unknown outside of Utah.

Diagnosis.—Size large; tail long; ears and hind feet short (see measurements). Color: Upper parts a mixture of Fuscous, Light Ochraceous-Buff and gray giving a ground color of Hair Brown; ears dusky, faintly margined with white; nose and post orbital regions grayish; eye ring black; markings at base of vibrissae black; hind legs dusky to tarsal joints; dorsal surface of tail like mid-dorsal region; lower sides, flanks, cheeks and outer surface of front legs Light Ochraceous-Buff: front feet, hind feet, ventral surface of tail and entire underparts white (Capitalized color terms according to Ridgway, Color Standards and Color Nomenclature, Washington, D. C., 1912). Skull: Large; nasals long; depression at proximal end of nasals present; interparietal actually as well as relatively narrow; braincase wide and moderately inflated; diastema long; tympanic bullae well inflated ventrally.

Measurements.—The average and extreme measurements of five adult females from the type locality and near vicinity are as follows: Total length, 194 mm. (200-188); length of tail, 104 (109-95); ratio of length of tail to head and body length, 118 per cent (133-100); length of hind foot, 19.6 (22.0-17.0); length of ear, 18 (19-16); greatest length of skull, 27.9 (28.3-27.6); zygomatic breadth, 13.9 (14.0-13.7); greatest breadth of braincase, 13.3 (13.4-13.2); interorbital breadth, 4.5 (4.5-4.4); length of nasals, 11.1 (11.2-10.8); length of palate, 4.4 (4.5-4.2); length of incisive foramina, 5.2 (5.4-5.1); length of diastema, 7.0 (7.1-6.8); post palatal length, 9.5 (9.7-9.1); interparietal, 9.1 × 2.9 (9.4 × 3.0-8.8 × 2.6); depth of braincase, 8.25 (8.4-8.2); alveolar length of upper molar series, 4.05 (4.1-4.0). No topotypical males were available for measurements.

Comparisons.—Among named races of *Peromyscus boylii*, *utahensis* most closely resembles *Peromyscus boylii rowleyi* from southeastern

Utah. Topotypical specimens of *utahensis* can be recognized from topotypes and near topotypes of *rowleyi* as follows: Size smaller; hind foot and ear shorter; tail relatively longer, averaging 118 per cent of the length of head and body as opposed to 106 per cent in *rowleyi*. Color: Markedly darker on upper parts (much more black and gray and less ochraceous); tail markedly darker. Skull: Larger in eleven of thirteen measurements; interorbital breadth narrower; alveolar length of upper molar series shorter; interparietal longer and narrower, extending nearly to the temporal suture in *rowleyi* (9.1×2.9 mm. as opposed to 9.6×2.8 in *rowleyi*); infraorbital foramina slightly narrower dorsally.

Remarks.—From the time of Osgood's revision of the genus *Peromyscus* (North American Fauna, No. 28, April 17, 1909) to the present, all Utah representatives of the species *Peromyscus boylii* have been referred to the subspecies *rowleyi*. At the time of his revision, Osgood (*op. cit.*: 147) only had specimens from extreme southeastern Utah, extreme southwestern Utah and from Ogden in northern Utah. He referred them all to *rowleyi*, the type locality of which is Noland's Ranch, N side San Juan River, $1\frac{1}{2}$ mi. above present "Four Corners" (Hall, Univ. California Publ. Zool., 37:2, April 10, 1931) in extreme southeastern Utah, east of the Colorado River. Thus there existed a peculiar discontinuity in the known distribution of this species within the state, as no specimens were known from the central part. Even though many more specimens are now available, they are all from the same general regions that Osgood reported and the large gap in the distribution still persists. Evidently these mice are not common, but further intensive collecting may yet bridge the gaps in this discontinuous distribution.

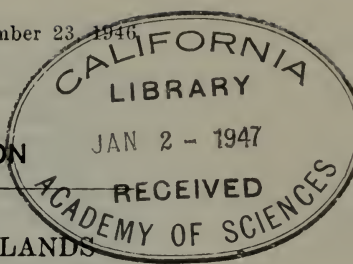
From the material available for this study it is apparent that the race *rowleyi* formerly considered to include all Utah animals of this species is limited to that part of the state east of the Colorado and Green rivers which appear to act as a barrier. All specimens studied from elsewhere in the state are referable to the subspecies *utahensis*.

Specimens from Zion National Park are intergrades between *utahensis* and *rowleyi*. They are intermediate in color but have the darker cast and the dark tail typical of *utahensis*. Moreover, they resemble *utahensis* in the proportion of tail length to head and body length. The majority of the cranial characters are like *utahensis* to which they are here referred. One specimen from 8 mi. N Escalante, Garfield County is also an intergrade, but referable to *utahensis*. Two specimens reported from the eastern end of the Uinta Mountains, west of Green River (Svihla, Journ. Mamm., 12:263, August 24, 1931) were unobtainable and have apparently been lost. They represented the most northern and eastern records of this species, and are provisionally placed under this new subspecies on distributional basis only. *Peromyscus boylii* is a southern species that in Utah reaches the northernmost limits of its range within the Great Basin. This new form here described is the northernmost one known from this region.

Specimens examined.—31, distributed as follows: *Salt Lake County*: 1 mi. above Forks, City Creek Canyon, 4,800 ft., 4; 2 mi. above mouth Millcreek Canyon, 4,800 ft., 2; 5 mi. above lower power station, Millcreek Canyon, 5,800 ft. (type locality), 3. *Garfield County*: 8 mi. N Escalante, 6,500 ft., 1. *Washington County*: Zion National Park, 21.

Contribution from the Department of Biology, University of Utah, Salt Lake City, Utah.

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THE SPINY RATS OF THE RIU KIU ISLANDS

By DAVID H. JOHNSON*

The name *Rattus jerdoni osimensis* was proposed by Abe in 1933 for a remarkable new rodent from Amami-Osima, Riu Kiu Islands. In 1941 Tokuda showed that this form was quite distinct from the Indian *Rattus jerdoni* and proposed for it the generic name *Acanthomys*. As the latter name has been used previously, a new name is required for the genus. Heretofore these rats have been recorded only from Amami-Osima. In the course of epidemiological surveys made in September, 1945, by U. S. Naval Medical Research Unit No. 2, specimens representing a new subspecies were trapped in the northern part of Okinawa Island. The taxonomy of this group is rearranged to stand as follows:

Genus *Tokudamys* (new name)

Rattus (part), Abe, Shokobutsu oyobi Dobutsu (Botany and Zoology), vol. 1, p. 942, July 1, 1933; Jour. Sci. Hiroshima Univ., ser. B, div. 1, vol. 3, p. 107, December, 1934 (*nec* G. Fischer, Das Nationalmuseum der Naturgeschichte zu Paris, vol. 2, p. 128, 1803).

Acanthomys Tokuda, Biogeographica (Trans. Biogeog. Soc. Japan), vol. 4, p. 93, December, 1941 (genotype, *Rattus jerdoni osimensis* Abe). Preoccupied by *Acanthomys* Lesson, Nouveau Tableau du Regne Animal, p. 135, 1842 (genotype not designated, applied to five species of murine rodents).

Genotype.—*Rattus jerdoni osimensis* Abe.

Remarks.—To the generic characters given by Tokuda (*loc. cit.*) for "*Acanthomys*," I would add, from observation of Okinawan specimens, that the mammary formula is $0 - 2 = 4$, that the posteroexternal cusp and a posteroexternal heel are present in M^1 and M^2 , and that M^2 lacks an anteroexternal cusp.

Tokudamys osimensis osimensis Abe

Rattus jerdoni osimensis Abe, Shokobutsu oyobi Dobutsu (Botany and Zoology), vol. 1, p. 942, July 1, 1933 (in Japanese); Abe, Jour. Sci. Hiroshima Univ., ser. B, div. 1, vol. 3, p. 107, December, 1934 (in English); Kuroda, List of the Japanese mammals, p. 67, June, 1938; Kuroda, Monograph of the Japanese mammals, p. 137, 1940 (in Japanese).

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Rattus fulvescens osimensis, Ellerman, Families and genera of living rodents, vol. 2, p. 193, March 21, 1941.

Acanthomys osimensis, Tokuda, Biogeographica (Trans. Biogeog. Soc. Japan), vol. 4, p. 95, December, 1941.

Type specimen.—Not designated. Abe's description was based on "several specimens" (10 are itemized in a table of measurements) collected by S. Ueki between April and June 15, 1933.

Type locality.—Village of Sumiyo, Anami-Osima, Riu Kiu Islands. Apparently no further locality records have been published.

Specimens examined.—None.

***Tokudamys osimensis muenninki*, new subspecies**

Type specimen.—U. S. National Museum, No. 278757, adult female, skin and skull; collected September 24, 1945, by David H. Johnson and Odis A. Muennink, original No. 479 (D. H. J.).

Type locality.—Hentona, western coast of northern Okinawa Island, Riu Kiu Islands.

Diagnosis.—Similar to *T. o. osimensis* but larger (length of head and body of adult male near 150 rather than 125 mm.; greatest length of skull near 40 rather than 36 mm.); tail relatively shorter (equal to about 73 rather than 87 per cent of head-and-body length); feet lacking dark extensions of body color on metapodial areas.

Description.—General external appearance like that of a large vole; body appearing short and thick (this impression enhanced by unusually thick pelage). Pelage composed of fine hairs mixed with coarse, flattened, grooved spines, the latter present and predominating everywhere except on tail, feet, ears, and area about mouth; spines on midback about 21 mm. long, those on belly about 11 mm. Color of upper parts a mixture of black and Ochraceous-Tawny (capitalized terms are from Ridgway, Color standards and color nomenclature, 1912); underparts grayish white, very faintly washed with ochraceous; individual hairs on back and sides gray with Ochraceous-Tawny tips; spines gray at base with distal parts either black or Ochraceous-Tawny with a minute black tip; black spines predominating at midback, ochraceous predominating on sides of body; spines on belly grayish white. Backs of fore and hind feet near Pinkish-Buff, metapodial areas lacking any indication of darker body color. Tail averaging about 73 per cent as long as head and body; bicolored, scales and hairs blackish above and grayish white below; scales in approximately 115 annular rows, averaging 8 rows per centimeter near base of tail; each scale subtending three hairs about 2.5 mm. long. Toes slender and distinct; forefoot with first toe apparently functional (its claw resembling a miniature hoof), and with claw of fifth toe extending to base of second phalanx of fourth toe; hind foot with sole bare to heel, claw of first toe reaching base of second phalanx of second toe, claw of fifth toe reaching middle of second phalanx of fourth toe. Ears subovate, moderately hairy inside and out. Vibrissae long, reaching well back to shoulder area; mostly black, those originating on cheeks whitish. Mammary formula: 0 — 2 = 4.

Skull angular and lightly built as compared with most species of *Rattus*. Rostrum prolonged, nasals extending about 3 mm. beyond in-

TABLE I

External and cranial measurements in millimeters of specimens of *Tokudamys osimensis muenninki*

U. S. Nat. Mus. cata. log No.	Sex	Length of head and body	Length of tail	Length of hind foot (with claw)	Length of ear (from notch)	Greatest length of skull	Condylabasal length of skull	Zygomatic breadth	Length of nasals	Diastema	Length of incisive foramina	Length of upper molar series
278758	♀	175	.....	36	25	42.4	38.3	19.5	18.3	11.3	7.9	6.2
279039	♀	145	116	37	24	.....	.....	.....	.....	.....	.....	.....
278760	♀	144	114	34	24	41.4	37.0	18.1	17.0	10.6	8.6	6.4
278756	♀	158	114	37	22	40.8	36.6	17.0	17.7	10.3	7.8	6.4
278759	♀	149	104	36	23	39.7	35.7	17.6	17.1	10.6	7.6	6.1
278755	♂	151	119	36	.....	39.6	35.2	16.9	16.0	10.4	7.6	6.1
278757	♂	166	108	35	24	41.2	36.6	19.0	17.3	10.2	8.6	6.1
279040	♂	165	117	38	24	.....	.....	.....	.....	.....	.....	.....
278761	♂	149	107	35	23	38.9	35.6	17.4	16.6	10.4	7.9	5.9
278763	♂	153	108	35	.....	40.1	35.5	17.2	17.1	10.6	7.6	6.1
278762	♂	141	99	34	.....	39.5	35.5	17.3	16.5	9.9	8.4	6.4
278752	♀
278754	♀	19.2	16.0	10.0	7.6	6.0
									17.0	11.2	8.7	

isors. Premaxillaries rising above level of nasals to form shallow trough near base of rostrum. Temporal ridges extended dorsolaterally on flange-like frontal processes, being thus raised above general frontal level in interorbital region, overhanging temporal fossae, and (in dorsal view) following almost straight divergent lines from premaxillary to occipital sutures. Maxillary part of zygomatic arch angular and prominent, squamosal part weak and adpressed to braincase. Incisive foramina broad, terminating opposite anterior root of M^1 . Palate narrow, terminating slightly posterior to M^3 , its posterior margin smoothly concave. Bullae small, recessed, little inflated. Mandible with weak coronoid process; articular process extending posteriorly beyond plane of angular process.

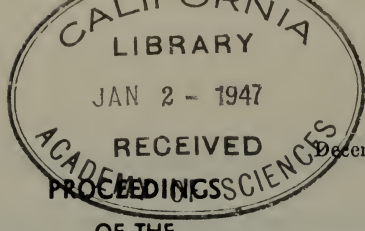
Upper incisors sharply recurved. Molars relatively high-crowned. M^1 with four roots (differing from *Rattus* in lacking external root beneath second lamina) and with anteroexternal cusp reduced; M^2 with this cusp absent. M^1 and M^2 each with a posterointernal cusp and an accessory posteroexternal cusp or heel. M_1 and M_2 each with two external accessory cusps.

Measurements.—See Table I.

Specimens examined.—A total of 13 (10 skins with skulls, 1 skull only, 2 in alcohol) including the type, all from the type locality, collected September 19-25, 1945.

Remarks.—The rats were all trapped along a three-mile stretch of trail that follows the crest of a ridge running westward from the main divide to the coast a half-mile north of Hentona. Here, as in most other parts of northern Okinawa, the terrain is mountainous and is covered with a dense forest, which on the exposed ridge-tops is reduced to a chaparral-like growth about ten feet high. Mixed with the shrubs in these places is a flourishing growth of coarse grass used by the Okinawans for thatching roofs. In some places the ground is covered with a knee-high mat of brake fern. Well beaten footpaths traverse the ridge-tops, and a network of temporary lateral trails has been made by thatch cutters. The most satisfactory bait was found to be a cube of raw sweet potato. The presence of the rats was first detected when a piece of spine-covered skin was found in a trail where it had apparently been discarded by some predator. This species was not found in the cultivated strip of rice fields and terraced sweet potato patches immediately adjacent to the coast.

The Okinawan subspecies is named for Odis A. Muennink of Hondo, Texas, who during the recent war collected more than a thousand specimens of animals for Naval Medical Research Unit No. 2 in various parts of the Pacific area.



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THREE NEW MITES FROM RATS IN PUERTO RICO

By IRVING FOX

*Department of Medical Zoology, School of Tropical Medicine,
San Juan, Puerto Rico*

The following new species of mites were found in the course of an ectoparasite survey of the rats of San Juan, Puerto Rico. At present, it is not possible to say whether they are parasitic on rats or simply associated with them. Types of these new species are in the entomological collection of the Department of Medical Zoology, School of Tropical Medicine, San Juan, Puerto Rico.

Family Laelaptidae

Androlaelaps setosus, new species

Female. Body oval in shape, longer than broad, well provided with setae: Total length, not including capitulum, .69 mm., width, .41 mm. Chelicerae prominent, toothed, fixed arm with a process. Sternal plate (Fig. 1) sculptured, broadest between coxae II and III with the corners acuminate. First pair of sternal setae on the anterior border of the sternal plate, second pair more or less level with the middle of coxa II, third pair of setae and the sternal pores placed as usual. Metasternal plates not heavily sclerotized, their setae level with the posterior borders of coxae III. Genito-ventral plate long and broad, more or less rounded posteriorly, almost reaching to the anal plate. Only one pair of setae—the genital pair—is present. Flanking the genito-ventral plate are three pairs of setae, the middle pair being in a very slight concavity of the plate. Approximately 15 setae are situated on each side laterad to the genito-ventral plate. A small narrow, more or less boat-shaped plate is present on each side posterior to coxa IV; below this is a much smaller, circular one. Anal plate broadly triangular, bearing the usual three setae. Peritremes extending posteriorly to beyond the middle of coxae IV, extending anteriorly to beyond coxae I. Stigmal pore level with the posterior border of coxa III, distant from the lateral edge of the body. Legs well provided with normal setae. Leg II broad, characteristic of the genus, femur with a long, stout spur, genu with a smaller one, tibia with a long sharp one, and tarsus with several pairs of setae. Dorsal plate covering most of the dorsal surface, provided with many long and stout, curved setae.

Type material. Female holotype and female paratype from *Rattus norvegicus* at San Juan (Santurce), Puerto Rico, collected September 18, 1946.

This new species resembles *A. oudemansi* Radford from which it differs in that the genito-ventral plate almost reaches to the anal plate, as well as in other respects.

Family Macrochelidae

Macrocheles alatus, new species

Female. Body oval, sparsely provided with setae; total length not including capitulum, .53 mm., width .32 mm., chelicerae robust, with prominent uneven teeth. Sternal plate (Fig. 2) expanded laterally, with three pairs of setae and two pairs of pores, the latter removed from the insertions of the setae. Metasternal setae not conspicuous, situated on small, weakly sclerotized plates. Genito-ventral plate weakly sclerotized, truncate posteriorly, bearing a single pair of setae; anteriorly with superimposed wing-like plates. Anal plate large and conspicuous, shield-shaped, provided with six setae in addition to the anal ones. Anal pore small, lyre-shaped, situated near the posterior border of the anal plate, its setae all of about the same size. Approximately seven setae are present on each side of the anal plate. Peritremes closely appressed to the lateral borders of the body, not extending posteriorly to the stigmal pore, reaching anteriorly to or beyond the anterior border of coxae I. Dorsal plate not occupying the entire dorsum, provided with setae and sculptured. Legs, characteristic of the genus, I long and slender without claws, II, III and IV broad with prominent claws and stout setae.

Type material. Female holotype from *Rattus norvegicus* at San Juan (Santurce), Puerto Rico, collected February 9, 1946.

This new species is readily differentiated from the other members of its genus by the shape of the anal plate.

Family Ascaidae

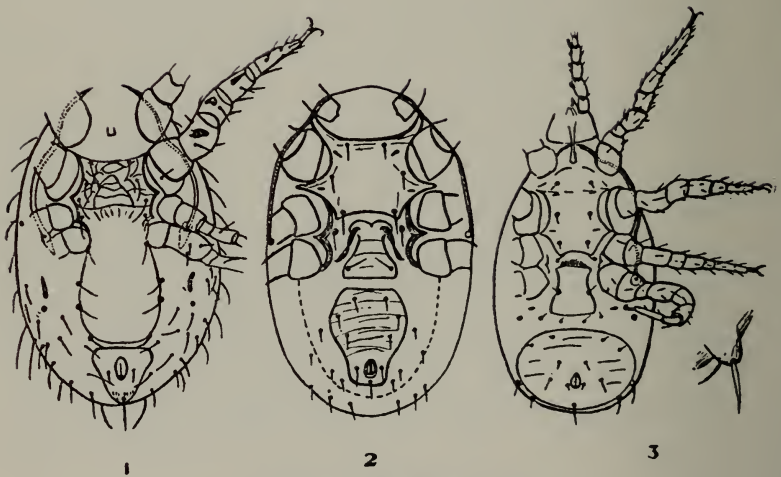
Asca duosetososa, new species

Female. Body oval, longer than broad, well provided with setae. Total length, not including capitulum, .40 mm., width, .24 mm. Chelicerae toothed. Palpus (Fig. 3) with a prominent spur on the inner surface of the second and third joints. Sternal plate with the structure not clear, apparently weakly sclerotized anteriorly, extending from behind coxae I to the middle of coxae III. First pair of sternal setae in the anterior weakly sclerotized portion of the plate with the first pair of pores just below them; other two pairs of sternal setae and the second pair of sternal pores placed as usual. Metasternal setae inconspicuous, situated on small lightly sclerotized circular plates. Genital plate weakly sclerotized with a single pair of setae, of the shape shown in Figure 3. Between the genital plate and the ventro-anal plate are four setae. Ventro-anal plate sculptured, more or less oval in shape, bearing eight setae in addition to the anal ones. Stigmal pore on a level with the middle of coxae IV, peritremes extending anteriorly to beyond the anterior borders of coxae I. Legs as usual for the genus, provided with many

small setae. Dorsal plate divided in two, the conspicuous line of division on a level with the middle of coxae IV, sculptured and provided with many stout scimitar-like setae. The posterior lateral border of the notogaster bears on each side the tubercle characteristic of the genus, and the tubercle is armed with two large prominent setae (Figure 3).

Type material. Female holotype and female paratype from *Rattus norvegicus* at San Juan (Santurce), Puerto Rico, collected September 17, 1946.

This new species is similar to *A. quinquesetosa* Wharton differing from the latter in having two setae on the posterior dorsal tubercle instead of five.



Explanation of Plate XVI

- Fig. 1. *Androlaelaps setosus* n. sp. Ventral plates and leg II.
 Fig. 2. *Macrocheles slatus* n. sp. Ventral plates.
 Fig. 3. *Asca duosetosa* n. sp. Ventral view and dorsal tubercle.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW NAME FOR A MEALYBUG

By EDSON J. HAMBLETON

Office of Foreign Agricultural Relations, U. S. Dept. of Agriculture

The genus *Morrisonella* was recently erected by the writer (Rev. de Ent. 17 (1-2): p. 16, Aug. 1946) to accommodate a number of described and undescribed species of hypogeic mealybugs. This name is preoccupied by *Morrisonella* Bartsch, The Nautilus, 50: p. 23, July 1945; therefore a new name, *Coccidella*, is here proposed.



**PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON**

**A NEW SUBSPECIES OF HELICOSTYLA FLORIDA
FROM MINDORO, PHILIPPINE ISLANDS**

By PAUL BARTSCH

*Associate, Division of Mollusks, United States National Museum**

Since the publication of my paper on "The tree Snails of the Genus *Cochlostyla* of Mindoro Province, Philippine Islands,"† there has come to hand from various sources a dark colored race of *Helicostyla florida* from the southern part of the Island of Mindoro, which merits recognition with a trinomial name, which is here furnished. Incidentally, it is well to state here that additional research has shown that the genus must be called *Helicostyla* not *Cochlostyla* used for it in my 1938 paper.

***Helicostyla florida saturata*, new subspecies**

The shell, as far as shape is concerned, agrees with the typical race. It differs from all the other described subspecies in having the outer lip chocolate brown; in the other subspecies this is white excepting in *Helicostyla florida fuscolabiata* Mollendorff, Kobelt and Winter, in which the outer lip has a brownish wash. The main coloration of this, however, is bright brown not green as in the present form.

The type, U.S.N.M. No. 543504, has 5.5 whorls and measures: Length, 40 mm.; greater diameter, 28 mm. It was collected by Pedro de Mesa at Bulalacao, southeastern Mindoro.

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†1938. Bull. 100, vol. 6, pt. 9, U. S. National Museum.





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