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Insecutor Inscitiae Menstruus

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DESCRIPTIONS OF NEW AMERICAN THYSANOPTERA

By J. DOUGLAS HOOD

One genus and twenty species of Thysanoptera are described in the following pages. Twelve of these are from the United States, three are from Panama, four from Peru, and one from Porto Rico. The finding of five new *Heterothrips* is worthy of comment as it nearly doubles the number of known species of the family. And the existence in eastern United States of three undescribed species of *Chirothrips* when only an equal number of species are recorded from that region is also a matter of interest.

The writer gratefully acknowledges his indebtedness to the many friends and correspondents mentioned in the description below for their painstaking collecting and their generous donation of type material.

Heterothrips borinquen, new species. (Pl. I, fig. 1.)

Female (macropterous).—Length about 1 mm. Color, dark blackish brown, with tarsi, distal ends of tibiæ, and third antennal segment pale grayish yellow; fore wings dark brownish gray except for a white transverse band just beyond scale.

Head about 1.7 times as wide as median dorsal length, distinctly shorter than prothorax, widest behind eyes, thence narrowing abruptly to eyes and tapering slightly to base; surface with a few minute spines, impressed and transversely rugose in front of anterior ocellus, smooth between ocelli, and with four or five anastomosing striæ on occiput; frontal costa with deep, U-shaped emargination; ocellar area delimited by

two dark, transverse, chitinous lines, the posterior one of which extends entirely across the head behind the eyes. Eyes setose, two-thirds as long as head, as wide as their dorsal interval. Ocelli of posterior pair twice the diameter of anterior ocellus, a little less than half as wide as their interval. Antennæ about three times as long as head; segment 3 very slender, subconical, about three times as long as greatest width, with deep incisions at basal sixth and basal two-fifths; 4 a little more than half as wide as long, roundly tapering to base; 5-8 more or less barrel-shaped, with sense cones, 5 with indications of a brief pedicel; 9 about three times as long as wide, nearly cylindrical; segments 1 and 2 nearly concolorous with head; 3 pale grayish yellow; 4 blackish brown, sometimes slightly paler apically; remainder of antenna blackish brown.

Prothorax about one and one-third times as long as head and about 1.8 times as wide as long, sides and posterior margin rounded, anterior margin straight or slightly concave; notum with a few short spines, its surface free from sculpture except for two or three anastomosing striæ at anterior margin. Wings of fore pair half as wide at middle as near base, the greatest subbasal width (exclusive of scale) about one-eighth the length of wing; costal margin, anterior vein, and posterior vein with about 26, 22, and 18 short, stout spines, respectively, these being closer together toward base of wing.

Abdomen stout; pubescence very sparse, as in *H. flavicornis* (Pl. I, fig. 3), disposed on prominent, almost reticular, lines; posterior margins of abdominal tergites 1-7 fringed at sides with contiguous, chitinous scales or plates, whose apical margins are very irregularly produced; segment 1 unarmed on middle portion of posterior margin; segments 2-5 with a few slender spines at middle of posterior margin; 6 and 7 with a regular fringe of similar spines between the lateral plates; sternites fringed posteriorly with regularly disposed plates whose apical margins are produced into about ten slender spines.

Measurements of holotype: Length 0.960 mm.; head, length 0.090 mm., width 0.154 mm.; prothorax, length 0.121 mm., width 0.221 mm.; pterothorax, width 0.254 mm.; fore wing,

length 0.612 mm., width at base 0.075 mm., at middle 0.036 mm.; abdomen, width 0.324 mm.

Antennal segments....	1	2	3	4	5	6	7	8	9
Length (μ).....	20	32	66	42	24	24	16	15	21
Width (μ).....	27	27	23	23	16	14	11	9	7

Total length of antenna, 0.257 mm.

Male (macropterous).—Length about 0.8 mm. Color and structure essentially as in female. Tergite of abdominal segment 9 with two pairs of long, strong bristles behind middle.

Measurements of allotype: Length 0.840 mm.; head, length 0.108 mm., width 0.163 mm.; prothorax, length 0.132 mm., width 0.233 mm.; pterothorax, width 0.252 mm.; fore wing, length 0.564 mm., width at base 0.072 mm., at middle 0.034 mm.; abdomen, width 0.240 mm.

Antennal segments....	1	2	3	4	5	6	7	8	9
Length (μ).....	20	33	70	40	23	24	17	15	19
Width (μ).....	29	25	23	22	15	14	12	10	7

Total length of antenna, 0.261 mm.

Described from 12 females and 21 males "taken in the blossoms of an undetermined plant," at Rio Piedras, Porto Rico, August 10, 1914, by Thomas H. Jones.

Allied to *decacornis* Crawford by the type of armature of the abdominal tergites and the antennal coloration, but differing from that species conspicuously in the much shorter pedicel of the third antennal segment. It is named after the Island of Porto Rico which, when Ponce de León landed on its western coast in 1508, was called by the Indians the Island of Borinquen.

Heterothrips flavicornis, new species. (Pl. I, figs. 2 and 3.)

Female (macropterous).—Length about 1.1 mm. Color dark blackish brown, with tarsi, proximal and distal ends of mid and hind tibiae, all of fore tibiae, tip of fore femora, and antennae except for extreme base and apex, lemon yellow.

Head about 1.6 times as wide as median dorsal length and 0.7 as long as prothorax, widest just behind eyes, thence narrowing abruptly to eyes and tapering concavely to base; surface with a few minute spines, impressed and transversely

rugose in front of anterior ocellus, smooth between ocelli, and with four or five anastomosing striæ on occiput; frontal costa with deep, U-shaped emargination; ocellar area delimited anteriorly and posteriorly by two dark, transverse, chitinous lines, the posterior one of which extends entirely across the head as a heavy chitinous line just behind the eyes. Eyes setose, about 0.7 as long as head, as wide as their dorsal interval. Ocelli of posterior pair twice the diameter of anterior ocellus, about half as wide as their interval. Antennæ about 2.7 times as long as head; segment 3 slender, subconical, about three times as long as greatest width, with deep incisions at basal sixth and third; 4 a little more than half as wide as long, roundly tapering to base; 5-8 more or less barrel-shaped, with sense cones, 5 with indications of a brief pedicel; 9 a little more than three times as long as wide, nearly cylindrical; segments 1 and 2 light yellowish brown, very much paler than head; 3-7 lemon yellow, or 5-7 slightly darkened with gray; 8 and 9 shaded with gray.

Prothorax about 1.4 times as long as head and about 1.7 times as wide as long, sides and posterior margin rounded, anterior margin straight; notum with a few short, inconspicuous spines, its surface nearly rugose, the anastomosing lines of sculpture almost forming polygons. Wings of fore pair slightly more than twice as wide at base as near middle, the greatest subbasal width (exclusive of scale) about one-eighth the length of wing; costal margin, anterior vein, and posterior vein with 32, 23 and 18 short, stout spines, respectively.

Abdomen stout; pubescence very sparse, disposed on prominent, almost reticulate, lines; posterior margins of abdominal tergites 1-7, fringed at sides with contiguous, chitinous scales or plates whose apical margins are very evenly produced in short slender spines (Pl. I, fig. 3); segment 1 unarmed on middle portion of posterior margin; segments 2-5 with a few slender spines at middle of posterior margin; 6 and 7 with a regular fringe of similar spines between the lateral plates; sternites fringed posteriorly with regularly disposed

plates whose apical margins are produced into many very fine, slender spines.

Measurements of holotype: Length 1.10 mm.; head, length 0.110 mm., width 0.174 mm.; prothorax, length 0.156 mm., width 0.262 mm.; pterothorax, width 0.300 mm.; fore wing, length 0.720 mm., width at base 0.091 mm., at middle 0.041 mm.; abdomen, width 0.360 mm.

Antennal segments....	1	2	3	4	5	6	7	8	9
Length (μ).....	28	39	73	46	30	28	17	17	19
Width (μ).....	31	28	24	24	19	15	11	10	7

Total length of antenna, 0.297 mm.

Male (macropterous).—Length about 0.8 mm. Color and structure essentially as in female. Tergite of abdominal segment 9 with two pairs of long, strong bristles behind middle.

Measurements of allotype: Length 0.792 mm.; head, length 0.085 mm., width 0.160 mm.; prothorax, length 0.152 mm., width 0.240 mm.; pterothorax, width 0.252 mm.; fore wing, length 0.588 mm., width at base 0.079 mm., at middle 0.035 mm.; abdomen, width 0.192 mm.

Antennal segments....	1	2	3	4	5	6	7	8	9
Length (μ).....	24	33	64	45	28	27	18	17	20
Width (μ).....	30	26	22	22	17	15	11	8	6

Total length of antenna, 0.276 mm.

Described from 79 females and 36 males taken with *Heterothrips minor* sp. nov., in the flowers of a tree (*Byrsonima crassifolia?*), at Soná, Panama, April 22, 1914, by Mr. James Zetek.

Distinguished from all other known species of the genus by the antennal colorations.

Heterothrips pectinifer, new species. (Pl. I, fig. 7.)

Female (macropterous).—Length about 1.2 mm. Color dark blackish brown, with tarsi, distal ends of tibiae, and third antennal segment grayish yellow; fourth antennal segment distinctly paler than fifth and with a pale band at apex and another just basal to middle; fore wings dark brownish gray, except for a white transverse band just beyond scale.

Head about 1.3 times as wide as median dorsal length, dis-

tinctly shorter than prothorax, widest midway between eyes and base, cheeks gently rounded; surface with a few minute spines, impressed and transversely rugose in front of anterior ocellus, smooth between ocelli, and with four or five anastomosing striæ on occiput; frontal costa with deep, U-shaped emargination; ocellar area not at all delimited by chitinous lines. Eyes setose, about 0.63 as long as head, about as wide as their dorsal interval, not bounded behind by a chitinous line. Ocelli of posterior pair twice the diameter of anterior ocellus, a little less than half as wide as their interval. Antennæ about 2.5 times as long as head; segment 3 very slender, subconical, about three times as long as greatest width, with deep incisions at basal sixth and third; 4 about half as wide as long, roundly tapering to base; 5-8 more or less barrel-shaped, with sense cones; 9 about 2.5 times as long as wide, narrowed to apex; segments 1 and 2 nearly concolorous with head; 3 grayish yellow; 4 blackish brown, paler apically and just basal to middle; remainder of antenna blackish brown.

Prothorax about 1.2 times as long as head and about 1.6 times as wide as long, sides and posterior margin rounded, anterior margin straight; notum with numerous short, distinct spines, its entire surface with anastomosing lines which are heavier and more transverse toward anterior and posterior margins, particularly the latter. Wings of fore pair about half as wide at middle as near base, the greatest subbasal width (exclusive of scale), about one-ninth the length of wing; costal margin, anterior vein, and posterior vein with about 31, 27, and 23 short, stout spines, respectively, though this character is highly variable.

Abdomen stout; pubescence disposed on faint anastomosing lines, much more numerous than in *flavicornis*, which is shown in figure 3, Plate I; posterior margins of abdominal tergites 1-7 fringed at sides with contiguous, chitinous scales or plates, whose apical margins are evenly produced in long, slender spines, giving a comb-like appearance; segment 1 unarmed on middle portion of posterior margin; segments 2-5 with a few slender spines at middle of posterior margin; 6 and 7 with a regular fringe of similar spines between the lat-

eral plates; sternites fringed posteriorly, with long, slender spines, the lateral ones of which are sometimes fused at base in groups of 3 to 6.

Measurements of holotype: Length 1.20 mm.; head, length 0.132 mm., width 0.174 mm.; prothorax, length 0.156 mm., width 0.246 mm.; pterothorax, width 0.288 mm.; fore wing, length 0.840 mm., width at base 0.096 mm., at middle 0.051 mm.; abdomen, width 0.348 mm.

Antennal segments....	1	2	3	4	5	6	7	8	9
Length (μ).....	24	38	83	54	35	34	23	17	20
Width (μ).....	33	28	28	26	20	17	12	11	8

Total length of antenna, 0.328 mm.

Described from 11 females taken on "Indian Geranium," at Tempe, Arizona, April 25, 1913, by Mr. H. M. Russell.

Easily distinguished by the armature of the posterior margins of the abdominal tergites.

Heterothrips minor, new species. (Pl. I, fig. 6.)

Female (macropterous).—Length about 0.84 mm. Color dark blackish brown, with tibiæ, tarsi, apices of fore femora, and antennal segments 1, 3, and 4 paler; fore wings dark brownish gray except for a white transverse band just beyond scale.

Head about 1.4 times as wide as median dorsal length, slightly shorter than prothorax, widest about midway between eyes and base, cheeks slightly rounded; surface with a few minute spines, impressed and transversely rugose in front of anterior ocellus, smooth between ocelli, and with about five anastomosing striæ on occiput; frontal costa with deep U-shaped emargination; ocellar area not at all delimited by chitinous lines. Eyes setose, about 0.6 as long as head, about as wide as their dorsal interval, not bounded behind by a chitinous line. Ocelli of posterior pair twice the diameter of anterior ocellus, a little less than half as wide as their interval. Antennæ about 2.4 times as long as head; segment 3 stout, subconical, about two and one-fourth times as long as greatest width, with deep incision at basal sixth and third; 4 about 0.6 as wide as long, roundly narrowed to base; 5-8

more or less barrel-shaped, with sense cones; 9 about 2.5 times as long as wide, narrowed to apex; segment 1 slightly paler than head, 2 concolorous with head; 3 grayish yellow, distinctly clouded apically; 4 not abruptly darker than 3, more deeply infusate in apical half and narrowly so at extreme base; 5 slightly lighter than 6-9, which are blackish brown.

Prothorax about 1.1 times as long as head and a little less than twice as wide as long, sides and posterior margin rounded, anterior margin straight; notum with a few inconspicuous spines, its surface free from sculpture. Wings of fore pair nearly twice as wide near base as at middle, the greatest sub-basal width (exclusive of scale) about one-ninth the length of wing; costal margin, anterior vein, and posterior vein with about 25, 22, and 18 short, stout spines, respectively.

Abdomen stout; pubescence comparatively dense, disposed on close, anastomosing, transverse lines, almost as in *H. sericatus* Hood; posterior margins of abdominal tergites 1-5 fringed at sides with numerous slender spines which are not at all coalesced at base to form plates or scales; tergites 6-8 and sternites 2-6 with their entire posterior margins similarly produced.

Measurements of holotype: Length 0.840 mm.; head, length 0.096 mm., width 0.132 mm.; prothorax, length 0.106 mm., width 0.192 mm.; pterothorax, width 0.228 mm.; fore wing, length 0.588 mm., width at base 0.066 mm., at middle 0.036 mm.; abdomen, width 0.282 mm.

Antennal segments. . . .	1	2	3	4	5	6	7	8	9
Length (μ)	19	32	52	36	27	24	14	9	12
Width (μ)	26	23	23	22	18	12	10	8	5
Total length of antenna, 0.225 mm.									

Described from one female taken by Mr. James Zetek from the flower of a tree at Soná, Panama, April 22, 1914. The Spanish name of the plant, according to Mr. Zetek, is "Nance," which probably refers to *Byrsonima crassifolia* H. B. and K. With this unique female were associated numerous individuals of *Heterothrips flavicornis*, new species.

This is the only known species of the genus with a densely pubescent abdomen and a smooth pronotum.

Heterothrips analis, new species. (Pl. I, figs. 4 and 5.)

Female (macropterous).—Length about 1 mm. Color dark blackish brown, with tarsi, proximal and distal ends of mid and hind tibiæ, all of fore tibiæ, distal third of fore femora, and antennal segments 3–5, very pale grayish yellow.

Head about 1.4 times as wide as median dorsal length and nearly 0.9 as long as prothorax, widest about midway between eyes and base, cheeks rounded; surface with a few minute spines, impressed and transversely rugose in front of anterior ocellus, smooth between ocelli, and with about eight anastomosing striæ behind ocelli; frontal costa with deep U-shaped emargination; ocellar area not delimited by chitinous lines. Eyes setose, about 0.6 as long as head, slightly wider than their dorsal interval, not bounded behind by a chitinous line. Ocelli of posterior pair twice the diameter of anterior ocellus, about half as wide as their interval. Antennæ about 2.7 times as long as head; segment 3 very slender, about 3.6 times as long as greatest width, with deep incisions at basal fifth and third; 4 about half as wide as long, roundly tapering to base; 5–8 more or less barrel-shaped, with sense cones, 5 with indications of a brief pedicel; 9 about three times as long as wide, obliquely truncate at base, its axis tipped outward from that of rest of antenna; segments 1 and 2 slightly lighter in color than head, 2 pale grayish yellow in apical half; 3–5 very pale grayish yellow, or 5 slightly infusate apically; 6 blackish brown, paler basally; 7–9 blackish brown.

Prothorax about 1.2 times as long as head and a little less than twice as wide as long, sides and posterior margin rounded, anterior margin nearly straight; notum with a few inconspicuous bristles, its surface closely transversely striate with anastomosing lines which are about half as numerous as in *H. sericatus* Hood. Wings of fore pair nearly half as wide at middle as near base, the greatest subbasal width (exclusive of scale), less than one-ninth the length of wing; costal margin, anterior vein, and posterior vein with about 34, 28, and 22 short, stout spines, respectively.

Abdomen stout; pubescence dense, disposed on close anasto-

mozing striæ, almost as in *H. sericatus*; posterior margins of abdominal tergites 1-5 fringed at sides with numerous slender spines which are not at all coalesced at base to form plates or scales; tergites 6-8 and sternites 2-6 with their entire posterior margins similarly produced.

Measurements of holotype: Length 1.020 mm.; head, length 0.113 mm., width 0.160 mm.; prothorax, length 0.132 mm., width 0.228 mm.; pterothorax, width 0.254 mm.; fore wing, length 0.792 mm., width at base 0.084 mm., at middle 0.046 mm.; abdomen, width 0.276 mm.

Antennal segments....	1	2	3	4	5	6	7	8	9
Length (μ).....	22	38	72	43	33	35	18	20	17
Width (μ).....	29	25	20	21	17	16	12	11	6

Total length of antenna, 0.298 mm.

Male (macropterous).—Length about 0.85 mm. Color and structure essentially as in female. Tergite of abdominal segment 9 with a pair of heavy, finger-like chitinous processes between the usual two pairs of long bristles behind middle (Pl. I, fig. 5).

Measurements of allotype: Length 0.852 mm.; head, length 0.098 mm., width 0.146 mm.; prothorax, length 0.121 mm., width 0.192 mm.; pterothorax, width 0.223 mm.; fore wing, length 0.660 mm., width at base 0.072 mm., at middle 0.040 mm.; abdomen, width 0.168 mm.

Antennal segments....	1	2	3	4	5	6	7	8	9
Length (μ).....	20	33	66	41	32	35	20	19	17
Width (μ).....	26	23	18	19	16	16	12	11	6

Total length of antenna, 0.283 mm.

Described from 5 females and 15 males taken by the writer at Plum Point, Maryland, June 21, 1914. The males of this species were swarming in numbers about a few females on the flowers of a wild rose in a low marshy area.

The female may easily be distinguished by having the abdomen closely pubescent, the thorax finely striate, and the middle and hind legs mostly blackish brown; while the male may be known by the armature of the ninth abdominal tergite.

Chirothrips insolitus, new species. (Pl. II, figs. 1 and 2.)

Female (macropterous).—Length about 1.1 mm. Color quite uniform dark blackish brown, with pterothorax tinged with orange, tarsi yellowish.

Head about 0.9 as long as wide and 0.6 as long as prothorax, broadest across eyes, occiput with about three anastomosing lines; cheeks straight and parallel, about one-sixth as long as head or about one-third as long as eyes; front produced beyond eyes, its sides slightly converging anteriorly, about two-thirds the length of cheek; three pairs of minute bristles near base of antennæ, in addition to a much longer pair near eyes in front of anterior ocellus; three additional pairs of minute bristles at posterior margin of eyes on dorsal surface. Eyes about 0.6 as long as head. Ocelli approximate, equal in size, the posterior pair slightly more widely separated. Antennæ nearly 1.9 times as long as head, nearly uniform blackish brown, apex of 2 and base of 3 yellowish; segment 2 about 0.8 as long as greatest width, trapezoidal, with sides very slightly convex, the outer surface meeting the apical in an acute angle which does not bear a terminal spine; 3 only 0.9 as long as greatest width, with slender pedicel; 4 and 5 slightly wider than long, very briefly pedicellate; 6 about twice as long as wide, broadest at about basal three-tenths, thence tapering evenly to apex; 7 and 8 equal in length, each fully two-fifths as long as 6, 8 nearly four times as long as wide.

Prothorax about one and two-thirds times as long as head and about 1.4 times as wide as long; pronotum sparsely spinose, with rather close, distinct, anastomosing striæ; the two pairs of bristles at posterior angles unusually long for the genus, fully one-third as long as pronotum. Pterothorax nearly 1.2 times as wide as prothorax; mesoscutum with close, anastomosing striæ in posterior half, the anterior half with the striæ broken up into chitinous arcs. Wings of fore pair about sixteen times as long as width at middle, slightly curved throughout, blackish brown, paler near base; costa, anterior vein, and posterior vein with 19, 9, and 7 bristles, respectively. Legs of fore pair with the femora deeply sinuate on outer surface at

apex, fully one and one-half times as long as wide; fore tarsi nearly three times as long as wide.

Abdomen broader than pterothorax, with transverse, anastomosing striæ; tergites with posterior margin deeply dentate; tergite 1 with about six transverse rows of chitinous arcs in basal three-fifths; chitinous line at basal sixth of tergite 2 interrupted in several places near median line; sternites 2 and 3 with the transverse striæ interrupted to form dark chitinous arcs; on sternites 4-7 these coalesce to form normal transverse striæ. Segment 10 slightly longer than basal width, angulate and pointed at apex, divided above.

Measurements of holotype: Length 1.13 mm.; head, length 0.109 mm., width 0.120 mm.; prothorax, length 0.180 mm., width 0.254 mm.; pterothorax, width 0.304 mm.; fore wing, length 0.756 mm., width at base 0.072 mm., at middle 0.048 mm.; abdomen, width 0.324 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	21	28	26	26	20	44	19	19
Width (μ).....	33	34	29	28	23	21	9	5

Total length of antenna, 0.203 mm.

Described from one female taken by sweeping at Four Mile Run, Virginia, May 3, 1914, by Mr. W. L. McAtee.

Remarkable for the form of the antennæ and the long prothoracic bristles.

Chirothrips spiniceps, new species. (Pl. I, fig. 8.)

Female (macropterous).—Length about 1.1 mm. Usually bicolored (brown and yellow); head and thorax yellowish to blackish brown, the head and sides of pterothorax darker and the latter often with reddish orange hypodermal pigment; abdomen usually lemon yellow, though sometimes heavily shaded with brown and nearly concolorous with head and thorax, apex of segment 10 always black; two or three basal segments of antennæ yellow; legs usually yellow, with basal half of fore femora and outer surface of middle and hind legs shaded more or less with gray, though sometimes nearly uniform brown with only the tarsi, fore tibiæ, and apex of fore femora yellow.

Head usually very slightly wider than long, broadest behind eyes, about 0.6 as long as prothorax, frontal costa narrow, occiput with three or four very faint striæ, eyes bordered with a chitinous line behind; cheeks slightly arched, usually about one-sixth as long as head; front produced, its sides about two-thirds as long as cheeks; about eight pairs of short, stout spines near base of antennæ in addition to a slightly longer pair opposite anterior fifth of eyes; three additional pairs of minute bristles at posterior margin of eyes on dorsal surface. Eyes about half as long as head. Ocelli of posterior pair widely separated, equal in size to anterior ocellus. Antennæ fully 1.7 times as long as head; segments 1-3 yellow or yellowish, 1 usually infusate throughout, 3 infusate apically, 4-8 brown or with 4 paler; segment 1 rounded, swollen, on ventral surface about two-thirds as long as wide; segment 2 inverted foot-shaped, its axis about two-thirds as long as width along line parallel to apical margin; 3 pyriform, with rather long, slender pedicel, and three-fourths as wide as long; 4 and 5 suboval, slightly longer than wide; 6 nearly twice as long as wide, broadest at basal two-fifths, roundly tapering to apex; 7 and 8 about equal in length, each about one-third as long as 6, 8 about three times as long as wide.

Prothorax about one and two-thirds times as long as head and nearly one and one-half times as wide as long; pronotum sparsely spinose and with anastomosing striæ; hind angles with only one moderately long bristle, directed posteriorly. Pterothorax unusually broad, about one and one-fourth times as wide as prothorax and slightly wider than abdomen; mesoscutum with the striæ broken up into chitinous arcs. Wings of fore pair about fourteen times as long as width at middle, slightly sinuate in form, rather strongly curved in apical third, shaded with gray, especially at base and apex and on scale, distinctly paler subbasally; anterior vein with about 8 bristles and posterior vein with 3 to 5. Legs of fore pair with the femora not at all sinuate on outer surface at apex, the tibiæ nearly as wide as long, and the tarsi about 0.6 as wide near base as long.

Abdomen slightly narrower than pterothorax, almost per-

fectly smooth, without patches of accessory spines. Segment 10 slightly longer than basal width, acutely rounded at apex, divided above.

Measurements of holotype: Length 1.09 mm.; head, length 0.120 mm., width 0.128 mm.; prothorax, length 0.212 mm., width 0.292 mm.; pterothorax, width 0.366 mm.; fore wing, length 0.732 mm., width at base 0.075 mm., at middle 0.051 mm.; abdomen, width 0.360 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	32	31	32	32	24	35	13	12
Width (μ).....	50	45	24	27	21	18	7	4
Total length of antenna, 0.211 mm.								

Described from 210 females, as follows: Glendale and Phoenix, Arizona, October 4 and 6, 1913, H. M. Russell, 200 females on sugar cane; Brownsville, Texas, December 8, 1910, C. A. Hart, 1 female in sweepings; Mission, Texas, June 26 and 30, 1914, J. W. Bailey, 3 females; Dallas, Texas, August 26, 1905, and August 8, 1906, W. A. Hooker, 2 females in laboratory; New Orleans, Louisiana, December 1, 1914, C. B. Williams, 4 females from privet and bamboo.

Type locality.—Region of Glendale and Phoenix, Arizona.

This, one of the dominant species of *Chirothrips* in southern United States, is commonly labeled *C. obesus* Hinds in collections, so close is the superficial resemblance of the two. It may be separated without difficulty from that species, however, by the greater number of spines on the vertex, the longer prothorax, and the much larger size.

The following is from Mr. Russell's notes: "I found this species first in the fall of 1913, feeding on sweet corn, Johnson grass, and sugar cane. On the first two food plants it occurred in small numbers, while on the sugar cane it was very abundant, those collected representing only about twenty minutes' work. Undoubtedly the 10 acres of cane were infested with millions. Each unfolded growing leaf-bud contained numbers of these minute creatures. At that time the growing season of the cane was about over, so that the species had had the entire season to increase in. They were feeding on the tender, moist leaves. When exposed to the light, they rapidly crawled

to shelter, still deeper into the buds. If this insect should attack the young cane in large numbers in the spring, it seems quite possible that considerable damage would result. We have in this insect what I should call a potential economic species. It seems, next to *Frankliniella tritici*, to be the most abundant thrips in this part of Arizona."

Chirothrips vestis, new species. (Pl. I, fig. 9.)

Female (macropterous).—Length about 1.1 mm. Color yellow ocher, with head and antennal segments 4–8 blackish brown, and thorax, outer surface of legs, and sides and tip of abdomen lightly shaded with gray.

Head about 0.86 as long as wide and a little more than half as long as prothorax, frontal costa wide, concave, occiput smooth, eyes bordered with a chitinous line behind; cheeks nearly straight and parallel, about one-fifth as long as head, outline almost continuous with that of eyes; front slightly produced, its sides parallel and less than half as long as cheeks; about seventeen pairs of short, stout spines near base of antennæ, in addition to a similar interocellar pair; three additional pairs of minute bristles at posterior margin of eyes on dorsal surface. Eyes about half as long as head. Ocelli of posterior pair widely separated, much larger than anterior ocellus. Antennæ about 1.8 times as long as head; segments 1 and 2 clear lemon yellow; 3 yellow, clouded with gray, more deeply toward apex; 4–8 blackish brown; segment 1 on ventral surface about 0.6 as long as wide; segment 2 inverted foot-shaped, its axis about 0.6 as long as width along line parallel to apical margin; 3 pyriform, with brief pedicel, four-fifths as wide as long; 4 and 5 suboval, about as long as wide; 6 about 1.7 times as long as wide, broadest at basal third, roundly tapering to apex; 7 and 8 about equal in length, each about one-third as long as 6, 8 about twice as long as wide.

Prothorax about 1.9 times as long as head and only about 1.2 times as wide as long; pronotum without sculpture, closely and prominently set with short, stout spines along median fourth and in a pair of midlateral patches, the two usual bristles at posterior angles only slightly longer. Pterothorax

nearly 1.2 times as wide as prothorax; mesoscutum without sculpture but closely set with about 60 short, stout spines; metascutum smooth, with about 26 similar spines. Wings of fore pair yellowish gray, about 23 times as long as median width, very slightly curved, nearly straight in apical half; other characters obscured in the unique specimen. Legs of fore pair with the femora not at all deeply sinuate on outer surface at apex; width of tibiæ at middle about 1.5 times their length, the fore tarsi about three-fifths as wide as long.

Abdomen broader than pterothorax, without sculpture; four or five of the basal tergites with transverse patches of about 15 spines similar to those on head and thorax. Segment 10 about as long as basal width, broadly rounded at apex, divided above.

Measurements of holotype: Length 1.08 mm.; head, length 0.100 mm., width 0.115 mm.; prothorax, length 0.188 mm., width 0.220 mm.; pterothorax, width 0.272 mm.; fore wing, length 0.756 mm., width at middle 0.033 mm.; abdomen, width 0.296 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	27	26	30	27	22	32	11	10
Width (μ).....	46	42	24	25	21	19	7	5
Total length of antenna, 0.185 mm.								

Described from one female taken by sweeping at Vienna, Virginia, September 4, 1913, by Mr. R. A. Cushman and the writer.

This is a very aberrant species, distinguishable by the pale coloration and the closely spinose head, thorax, and basal abdominal segments.

Frankliniella annulipes, new species. (Pl. II, fig. 3.)

Female (macropterous).—Length about 1.7 mm. Color dark blackish brown, nearly black, with tarsi, fore tibiæ, apex of fore femora, and bases of middle and hind femora and tibiæ clear pale yellow; intermediate antennal segments yellowish; fore wings clear in basal third, blackish brown beyond.

Head 1.3 times as wide as long, conspicuously narrowed

posteriorly; occiput with two heavy, uninterrupted, transverse chitinous ridges behind and numerous faint anastomosing lines in front of them; all cephalic bristles long, stout, dark, the prominent interocellar pair nearly as long as eye, a large postocular pair two-thirds as long. Eyes about half as long as head and two-thirds as wide as their interval. Ocelli of posterior pair widely separated, distinctly behind middle of eyes, equal in size to anterior ocellus. Antennæ about two and one-half times as long as head; segments 1 and 2 dark blackish brown, 2 slightly paler at apex; 3 clear lemon yellow; 4 lemon yellow, infusate in apical half; 5-8 blackish brown, 5 yellow at base; segment 1 about as long as wide; 2 twice as long as wide; 3 and 4 nearly fusiform, each a little more than three times as long as wide, 3 slightly longer and wider than 4; 5 slightly narrower and much shorter than 4 and 6, nearly three times as long as wide, slender in basal half; 6 a little more than three times as long as wide, only slightly more than 0.8 as long as segment 4, not at all abruptly constricted at apex; 7 and 8 small, cylindrical, 8 slightly longer and narrower than 7.

Prothorax about 1.3 times as long as head and about 1.4 times as wide as long, suborbicular in form with anterior margin straight; pronotum smooth; all bristles unusually long, stout, and prominent, black in color, nearly as long as head (Pl. II, fig. 3). Wings of fore pair almost clear in basal third, blackish brown beyond, about thirteen times as long as width at middle, set with unusually long, heavy, black, nearly equidistant bristles, of which there are about 30 on the costa, 22 on the anterior vein, and 17 on the posterior vein.

Abdomen broader than pterothorax; tergite of segment 1 with oblique anastomosing striæ at base and sides, other segments nearly smooth above; segment 10 divided above; abdominal bristles long, stout, black.

Measurements of holotype: Length 1.680 mm.; head, length 0.168 mm., width 0.218 mm.; prothorax, length 0.216 mm., width 0.308 mm.; pterothorax, width 0.378 mm.; fore wing, length 1.272 mm., width at base 0.126 mm., at middle 0.096 mm.; abdomen, width 0.492 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	39	60	88	80	57	66	14	17
Width (μ).....	42	31	28	25	20	21	9	7
Total length of antenna, 0.421 mm.								

Described from one female collected by Mr. James Zetek at Bouquete, Panama, in February, 1914, from the "flowers of a common shrub, with large white flowers resembling those of trumpet creeper."

Closely allied to *Frankliniella insularis* and *F. auripes*, but separable by the larger size, the enormous bristles, and the coloration of the legs.

Frankliniella auripes, new species.

Female (macropterous).—Length about 1.4 mm. Color dark blackish brown, nearly black, with all tibiæ and tarsi and inner surface of fore femora, clear lemon yellow; segment 3 of antennæ, most of 4 and base of 5, yellowish; fore wings clear in basal third, brownish gray beyond, becoming paler toward apex.

Head about 1.2 times as wide as long, much narrowed behind; occiput with about three quite distinct, transverse, chitinous, anastomosing lines and several fainter ones in front of them; interocellar bristles moderately large, two-thirds as long as eye, a large postocular pair 0.8 as long. Eyes about 0.6 as long as head, about three-fourths as wide as their interval. Ocelli of posterior pair widely separated, distinctly behind middle of eyes, equal in size to anterior ocellus. Antennæ about two and one-fourth times as long as head; segments 1 and 2 dark blackish brown, 2 slightly paler at apex; 3 yellow, sometimes slightly infusate apically; 4 and 5 grayish yellow in basal two-thirds and half, respectively, remainder of antenna brownish gray; segment 1 about as long as wide; 2 three-fifths as wide as long; 3 narrowed in apical fourth, three times as long as wide; 4 slightly shorter, nearly three times as long as wide; 5 three-fourths as long, and about 2.5 times as long as wide, truncate and slightly narrowed at apex, where it is about as wide as 4; 6 slightly shorter than 3 and 4, less than three

times as long as wide; 7 and 8 small, cylindrical, 8 slightly longer and narrower than 7.

Prothorax about equal in length to head and about 1.6 times as wide as long (this greater width may be due in part to the pressure of the cover glass), sides and posterior margin rounded, anterior margin straight; pronotum with a few anastomosing lines along anterior margin and with the extreme posterior portion slightly rugose; bristles long, nearly black, of the same number and arrangement as in *F. annulipes* (Pl. II, fig. 3), but more slender and shorter, the anterior marginal pair noticeably shorter and more slender than the anterior angular. Wings of fore pair almost clear in basal third, brownish gray beyond, becoming paler toward apex, nearly thirteen times as long as width at middle, set with long, heavy, nearly equidistant, black bristles, of which there are about 27 on the costa, 20 on the anterior vein, and 16 on the posterior vein.

Abdomen broader than pterothorax; tergite of segment 1 with oblique, anastomosing striæ, other segments with indistinct striæ at sides; segment 10 at least partially divided above; abdominal bristles long, stout, black.

Measurements: Length 1.36 mm.; head, length 0.148 mm., width 0.180 mm.; prothorax, length 0.144 mm., width 0.228 mm.; pterothorax, width 0.348 mm.; fore wing, length 0.856 mm., width at base 0.097 mm., at middle 0.069 mm.; abdomen, width 0.288 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	31	45	69	60	47	56	12	17
Width (μ).....	34	28	22	21	19	20	8	6
Total length of antenna, 0.337 mm.								

Described from three females taken by Mr. E. W. Rust at Lima, Peru, January 13, 1913, from "Jerusalem cherry."

Allied to *F. insularis* and *F. annulipes*, but easily distinguished by the color of the legs.

Frankliniella williamsi, new species. (Pl. II, figs. 4 and 5.)

Female (macropterous).—Length about 1.1 mm. Color nearly uniform pale yellow, with thorax, outer surface of legs,

and apex of tenth abdominal segment darkened with orange; antennal segments 6-8 largely blackish brown, remainder light yellowish, 2, 4, and occasionally 5 slightly infusate apically; fore wings uniform light yellowish.

Head only about one and one-fourth times as wide as long, sides almost straight and parallel, usually broadest across eyes; occiput with a few faint anastomosing lines; interocellar and one pair of postocular bristles alone prominent, slender, yellowish, the former longer; other bristles slender, pale, inconspicuous. Eyes somewhat less than half as long as head, about three-fifths as wide as their interval. Ocelli of posterior pair distinctly behind middle of eyes, rather widely separated, equal in size to anterior ocellus; ocellar pigment orange red. Antennæ 2.3 times as long as head, form and structure as in figure (Pl. II, fig. 5); segment 3 nearly as long as 6 and about 2.7 times as long as wide; 4 slightly shorter, nearly three times as long as wide; 5 still shorter, about 2.6 times as long as wide; 6 a little longer than 3, slightly more than three times as long as wide, abruptly constricted at base; 7 and 8 small, cylindrical, 8 slightly longer and narrower than 7; segment 1 colorless, transparent; 2-5 yellowish, with 2, 4, and occasionally 5, slightly infusate apically; 6 yellowish in basal third, blackish brown beyond; 7 and 8 blackish brown.

Prothorax about one and one-fourth times as long as head and nearly 1.3 times as wide as long, quadrangular with the angles rounded; pronotum smooth; bristles moderately long, pale in color (Pl. II, fig. 4). Wings of fore pair uniform light yellowish gray, about fourteen times as long as width at middle; spines brownish yellow, equidistant, about 23 on costa, 19 on anterior vein, and 16 on posterior vein.

Abdomen of normal form; tergite of segment 1 with very faint lines of sculpture, other segments smooth above; segment 10 divided above; abdominal bristles strong, yellowish brown.

Measurements of holotype: Length 1.14 mm.; head, length 0.124 mm., width 0.156 mm.; prothorax, length 0.152 mm., width 0.196 mm.; pterothorax, width 0.264 mm.; fore wing,

length 0.780 mm., width at base 0.072 mm., at middle 0.057 mm., abdomen, width 0.288 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	26	39	51	48	42	55	10	14
Width (μ).....	30	25	19	17	16	18	7	5

Total length of antenna, 0.285 mm.

Male (macropterous).—Length about 0.9 mm. Color and structure essentially as in female. Posterior margin of eighth abdominal tergite with a sparse, comb-like fringe; ninth tergite with two pairs of short, stout, approximate spines arising from cup-like tubercles and disposed on an arcuate line.

Measurements of allotype: Length 0.892 mm.; head, length 0.108 mm., width 0.142 mm.; prothorax, length 0.126 mm., width 0.169 mm.; pterothorax, width 0.226 mm.; fore wing, length 0.600 mm., width at base 0.060 mm., at middle 0.049 mm.; abdomen, width 0.204 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	24	34	49	41	36	50	10	14
Width (μ).....	26	22	18	17	16	16	6	5

Total length of antenna, 0.258 mm.

Described from 110 females and 24 males, as follows: Vienna, Virginia, October 31, 1914, C. B. Williams, 3 females and 1 male; Georgetown, D. C., November 1, 1914, C. B. W. and J. D. H., 16 females and 8 males; Washington, D. C., November 3, 1914, J. D. H., 91 females and 15 males.

Type locality.—Washington, D. C.

The species was found abundantly between the husks of standing and freshly cut Indian corn. It is close to but entirely distinct from *F. tritici* and *F. gossypii*, as shown by the coloration and the form of the head, thorax, and antennæ. The male differs from that of the two species just mentioned more particularly in the armature of the ninth tergite of the abdomen. Named after its discoverer, one of the most able students of the Thysanoptera.

Frankliniella tympanona, new species.

Female (macropterous).—Length about 1.1 mm. Color dark blackish brown, with orange red hypodermal pigmentation in

thorax; tarsi, apical two-thirds of fore tibiæ, and third antennal segment brownish yellow; fore wings dark grayish brown, with a small clear area at basal fifth; ocellar pigment red.

Head nearly 0.9 as long as wide, sides almost straight and parallel, usually very slightly broadest across eyes; occiput with about three strong, anastomosing lines and several weaker ones; interocellar bristles small, only a little longer than diameter of posterior ocelli, situated well within the ocellar triangle; one pair of postocular bristles nearly as long as interocellars, all other cephalic bristles minute. Eyes four-sevenths as long as head and three-fourths as wide as their interval. Ocelli forming very nearly an equilateral triangle, posterior pair opposite posterior third of eyes and equal in size to anterior ocellus; ocellar pigment red. Antennæ about 2.2 times as long as head; segment 1 nearly as long as wide; 2 about three-fourths as wide as long; 3 a little more than twice as long as wide, sides evenly rounded, not constricted at apex; 4 nearly as long as 3 and about equal in width to it, slightly more narrowed at apex, twice as long as wide; 5 about 0.8 as long as 4, nearly twice as long as wide, and wider at apex than 4; 6 a little longer than 3, about two and one-half times as long as wide; 7 distinctly shorter and broader than 8; segments 1 and 2 nearly concolorous with head, 2 a little darker; 3 nearly uniform brownish yellow; 4-8 blackish brown, basal portion of 4 paler.

Prothorax about 1.1 times as long as head and about 1.5 times as wide as long, suborbicular in form, with sides flattened and anterior margin straight; pronotum slightly rugose along posterior margin and with a few indistinct, pale, anastomosing lines; the two pairs of bristles on posterior angles subequal, longest, about one-third the length of prothorax; one pair at anterior angles slightly shorter; one anterior marginal and one posterior marginal pair subequal, a little more than half as long as posterior angulars; a pair near posterior third of lateral margin slightly longer and stronger than about 36 other minute, usually paired bristles. Wings of fore pair fully fourteen times as long as width at middle, dark grayish brown, with veins darker and a small clear area at basal fifth; bris-

tles rather short and inconspicuous, costa with about 29, anterior vein with 21, posterior vein with 16.

Abdomen slightly broader than pterothorax; tergites of segments 1-8 at sides with a few oblique, anastomosing, dark lines, and a few short, rounded, chitinous teeth on posterior margin; segment 8 fringed posteriorly with acuminate chitinous projections; segment 9 about half as long as 10; sternite of segment 3 with a transversely elliptical pale area just before the middle, slightly smaller than first antennal segment; abdominal bristles rather short and weak.

Measurements of holotype: Length 1.08 mm.; head, length 0.108 mm., width 0.127 mm.; prothorax, length 0.120 mm., width 0.186 mm.; pterothorax, width 0.264 mm.; fore wing, length 0.798 mm., width at base 0.069 mm., at middle 0.054 mm.; abdomen, width 0.264 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	21	32	45	39	32	46	8	14
Width (μ).....	23	24	21	20	17	18	7	5
Total length of antenna, 0.237 mm.								

Male (macropterous).—Length about 0.8 mm. Color and structure differing but slightly from that of female. Abdominal segments 3-7 beneath with a nearly circular pale area basal to middle; tergite of segment 9 at middle with a transverse row of four nearly equidistant bristles three-fourths as long as the segment, between the outer ones of which, and nearly on a line with their bases, are a pair of circular pits and directly distal to these a pair of minute spines.

Measurements of allotype: Length 0.840 mm.; head, length 0.108 mm., width 0.129 mm.; prothorax, length 0.108 mm., width 0.158 mm.; pterothorax, width 0.204 mm.; fore wing, length 0.648 mm., width at base 0.058 mm., at middle 0.045 mm.; abdomen, width 0.180 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	18	31	41	37	30	44	10	15
Width (μ).....	23	23	18	18	16	17	9	5
Total length of antenna, 0.226 mm.								

Described from 95 females and 9 males taken on a compo-

site in Chosica Cañon, Peru, April 17, 1913, by Mr. E. W. Rust (No. A 3159).

This species superficially resembles *Frankliniella minuta* (Moulton) very closely, but is easily distinguished by the ventral tympanum on the third abdominal segment of the female.

Physothrips funestus, new species. (Pl. II, figs. 6 and 7.)

Female (macropterous).—Length about 1.1 mm. Color dark blackish brown, nearly black, with tarsi, middle apical portion of fore tibiæ, apical fourth of antennal segments 3 and 4, and extreme bases of segments 3–5, distinctly paler; fore wings nearly uniform dark gray-brown, with a minute, median, paler spot at basal fifth.

Head 0.9 as long as wide, slightly broadest behind eyes, sides slightly arcuate, nearly parallel; occiput with two or three anastomosing lines; interocellar bristles very long, about one-third the length of head, situated well within the ocellar triangle, though not always as posterior as shown in figure (Pl. II, fig. 6); a pair of approximate minute bristles in front of anterior ocellus and a slightly larger pair near inner margin of eyes; postocular bristles minute, subequal. Eyes about 0.6 as long as head and about equal in width to their interval. Ocelli equidistant, subequal in size, posterior pair opposite posterior half of eyes. Antennæ about 2.4 times as long as head, form and structure as in figure (Pl. II, fig. 7), unusual in that the fourth segment is noticeably longer than the third and the eighth segment nearly half as long as third; entire antenna nearly concolorous with body, except apical fourth of segments 3 and 4 and extreme bases of 3–5, which are paler.

Prothorax very slightly longer than head and about 1.5 times as wide as long; pronotum smooth; two strong dark bristles at posterior angles and a prominent smaller pair on posterior margin; all other bristles small. Wings of fore pair about fourteen times as long as width at middle, nearly uniform dark gray-brown, with a minute median paler spot at basal fifth; costa with about 26 bristles; anterior vein with three similar bristles in a basal group, followed immediately by another group of six, and then by two more in apical sixth;

posterior vein with about fourteen similar, equidistant bristles.

Abdomen of normal form, without sculpture; segment 8 with a comb of unusually small, acuminate spines, wanting in median third; segment 10 not divided above; abdominal bristles long, strong, brown.

Measurements of holotype: Length 1.06 mm.; head, length 0.124 mm., width 0.139 mm.; prothorax, length 0.132 mm., width 0.196 mm.; pterothorax, width 0.240 mm.; fore wing, length 0.708 mm., width at base 0.069 mm., at middle 0.051 mm.; abdomen, width 0.312 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	32	37	47	54	39	53	11	21
Width (μ).....	26	24	18	18	16	18	7	5
Total length of antenna, 0.294 mm.								

Described from six females collected by Mr. J. W. Bailey at Brownsville, Texas, June 25, 1914, from an unidentified plant.

Differs from both *Ph. ehrhornii* and *Ph. longirostrum*—the only other dark colored species of the genus known from North America—by the elongate fourth segment of the antennæ.

Thrips impar, new species.

Female.—Length about 1.2 mm. General color brown; head maize yellow,¹ darkened with brown at sides and base, ocellar pigment carmine; prothorax buffy brown, concolorous with darker parts of head, with orange hypodermal pigmentation; pterothorax slightly paler than prothorax, with orange hypodermal pigmentation; abdomen concolorous with or slightly darker than prothorax, the last three segments paler; antennæ mouse gray, second segments much the darkest and with decided orange tinge; fore wings nearly uniform light mouse gray; legs yellow, the femora often shaded with brown or gray.

Head about 1.4 (1.33–1.5) times as wide as median dorsal length, about four-fifths as long as prothorax, broadest between eyes and base, and with distinct anastomosing lines of

¹Ridgway. Color Standards and Color Nomenclature. Washington, 1912.

sculpture; frontal costa notched at about 60° ; cheeks rather strongly arched. Eyes about half as long as head and 0.7 as wide as their interval, prominent, protruding, pilose. Ocelli normal, opposite about middle of eyes. Antennæ slender, about 2.7 times as long as head, of normal structure; segment 1 about concolorous with paler portions of head; 2 nearly cinnamon brown; 3 and 4 mouse gray, paler at extreme base; 5-7 darker mouse gray, 5 usually pale at base. Maxillary palpi three-segmented.

Prothorax 1.5-1.6 times as wide as long, without evident sculpture, sides gently rounded; two pairs of long, slender bristles at posterior angles; three additional pairs of smaller bristles, at anterior angles, at posterior third of lateral margins, and on posterior margin, respectively. Wings of fore pair about 15 times as long as wide, nearly uniform light mouse gray, appearing slightly darker in apical three-fourths because of the slightly darker veins; costal margin with about 23 bristles; anterior vein with 10 bristles, of which 7 are in the basal third, the remaining three at 9-15, 12-15, and 14-15 beyond base of wing, respectively; posterior vein with about 11 bristles, the first of which is usually opposite the last bristle in the basal series of the anterior vein, and the last of which is opposite a point nearly midway between the last two on the anterior vein.

Abdomen of normal form, with tenth segment longitudinally sulcate above in distal half or two-thirds; bristles on segments 9 and 10 long, brown.

Measurements of holotype: Length 1.2 mm.; head, length 0.114 mm., width 0.152 mm.; prothorax, length 0.130 mm., width 0.210 mm.; pterothorax, width 0.276 mm.; abdomen, width 0.324 mm. Antennal segments: 1, 30μ ; 2, 40μ ; 3, 60μ ; 4, 53μ ; 5, 44μ ; 6, 61μ ; 7, 21μ ; total length of antenna, 0.309 mm.; width at segment 4, 0.018 mm.

Male.—Length about 0.8 mm. Color nearly uniform deep chrome, prothorax and abdomen sometimes lightly shaded with gray; segment 1 of antenna cream color; 2 clay color, darkest in entire antenna; 3-7 light mouse gray, 3-5 pale at base. Head proportionately longer than in female, about 1.2 times as wide as long.

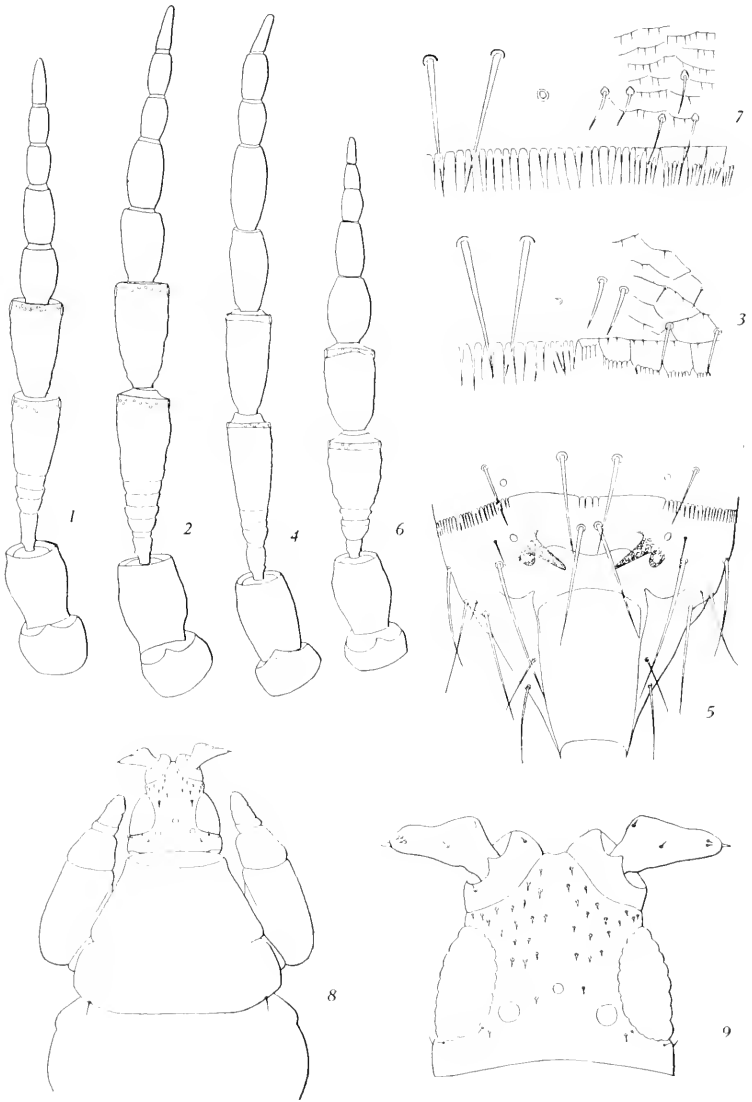
EXPLANATION OF PLATES

PLATE I

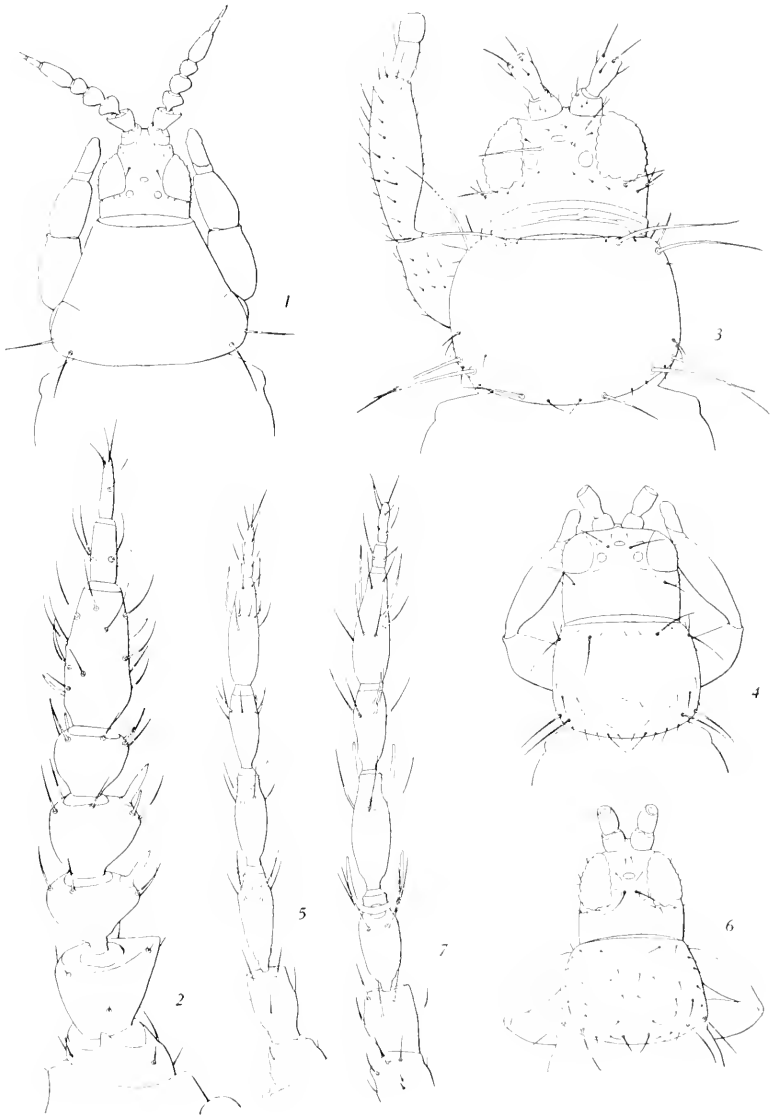
- FIG. 1.—*Heterothrips borinquen*, new species, right antenna of female, paratype.
- FIG. 2.—*Heterothrips flavicornis*, new species, right antenna of female, holotype.
- FIG. 3.—*Heterothrips flavicornis*, posterior margin of sixth abdominal tergite at right of median line, female, holotype.
- FIG. 4.—*Heterothrips analis*, new species, right antenna of female, paratype.
- FIG. 5.—*Heterothrips analis*, tip of abdomen of male (segment 10 incomplete), allotype.
- FIG. 6.—*Heterothrips minor*, new species, right antenna of female, holotype.
- FIG. 7.—*Heterothrips pectinifer*, new species, posterior margin of sixth abdominal tergite at right of median line, female, paratype.
- FIG. 8.—*Chirothrips spiniceps*, new species, head and prothorax of female, paratype.
- FIG. 9.—*Chirothrips testis*, new species, head of female, holotype.

PLATE II

- FIG. 1.—*Chirothrips insolitus*, new species, head and prothorax of female, holotype.
- FIG. 2.—*Chirothrips insolitus*, right antenna of female, holotype.
- FIG. 3.—*Frankliniella annulipes*, new species, head and prothorax of female, holotype.
- FIG. 4.—*Frankliniella williamsi*, new species, head and prothorax of female, holotype.
- FIG. 5.—*Frankliniella williamsi*, right antenna of female, paratype.
- FIG. 6.—*Physothrips funestus*, new species, head and prothorax of female, holotype.
- FIG. 7.—*Physothrips funestus*, right antenna of female.



NEW THYSANOPTERA



NEW THYSANOPTERA

Measurements of allotype: Length 0.83 mm.; head, length 0.114 mm., width 0.137 mm.; prothorax, length 0.100 mm., width 0.161 mm.; pterothorax, width 0.211 mm.; abdomen, width 0.168 mm. Antennal segments: 1, 27 μ ; 2, 35 μ ; 3, 52 μ ; 4, 48 μ ; 5, 37 μ ; 6, 66 μ ; 7, 17 μ ; total length of antenna, 0.282 mm.; width at segment 4, 0.017 mm.

Described from 25 females and 22 males, taken by the writer on Plummer's Island, Maryland, September 14, 1913, and August 16, 1914, in flowers of *Impatiens* sp.; and from one female taken by Dr. H. E. Ewing, at Arcola, Illinois, December 30, 1907, hibernating in moss.

Readily known by its sexually dimorphic coloration.

Thrips aureus, new species.

Female (forma brachyptera).—Length about 1 mm. General color yellow ocher,¹ with head and middle of abdomen slightly paler, and prothorax, sides of pterothorax, and tip of abdomen darker; segment 1 of antenna cream color; 2–7 nearly uniform light mouse gray, 3–5 usually slightly paler, especially at extreme base; ocellar pigment carmine.

Head about 1.6 times as wide as median dorsal length, two-thirds as long as prothorax, broadest slightly in front of base; cheeks gently arcuate to eyes and base of head; frontal costa shallowly notched at about 120°; cephalic bristles small and inconspicuous. Eyes about half as long as head, not protruding, pilose. Ocelli small, about opposite middle of eyes. Antennæ three times as long as dorsum of head. Maxillary palpi three-segmented.

Prothorax about 1.36 times as wide as long, without evident sculpture, sides somewhat flattened; two pairs of brown bristles at posterior angles; three additional pairs of smaller bristles, at anterior angles, at posterior third of lateral margins, and on posterior margin, respectively. Wings short, grayish, about attaining first abdominal segment, distinctly rounded at apex; fore pair set with about 12 long, stout, brown bristles, dis-

¹ Ridgway. Color Standards and Color Nomenclature. Washington, 1912.

posed as follows: Five along costa, the basal one smallest; three on median vein, all in distal half; three along anterior margin of scale, the distal one much the longest; and one near apex of wing, on anal margin. Legs straw yellow, darker at sides of femora and tibiæ.

Abdomen rather short and broad; tenth segment not sulcate above; bristles dark brown, stout and conspicuous; segments 2-6 each with three pairs of prominent dark brown bristles disposed in a transverse row across middle of notum; 7 and 8 with two pairs of similar bristles.

Measurements of holotype: Length 0.97 mm.; head, length along median dorsal line 0.096 mm., width 0.154 mm.; prothorax, length 0.144 mm., width 0.196 mm., pterothorax, width 0.222 mm.; abdomen, width 0.306 mm. Antennal segments: 1, 24 μ ; 2, 38 μ ; 3, 55 μ ; 4, 46 μ ; 5, 41 μ ; 6, 52 μ ; 7, 24 μ ; total length of antenna, 0.280 mm.; width at segment 4, 0.018 mm.

Male (forma brachyptera).—Length about 0.66 mm. Color paler than in female. Head proportionately longer than in female, about 1.4 times as long as wide, and about 0.8 as long as prothorax.

Measurements of allotype: Length, 0.66 mm.; head, length along median dorsal line 0.096 mm., width 0.132 mm.; prothorax, length 0.108 mm., width 0.168 mm.; pterothorax, width 0.186 mm.; abdomen, width 0.234 mm. Antennal segments: 1, 24 μ ; 2, 30 μ ; 3, 42 μ ; 4, 37 μ ; 5, 35 μ ; 6, 45 μ ; 7, 19 μ ; total length of antenna, 0.32 mm.; width at segment 4, 0.015 mm.

Described from 49 females and 2 males, taken by Mr. J. R. Malloch and the writer near Alexandria, Virginia, May 12, 1913, on the leaves of young plants of *Anthemis cotula* L.

The short wings, broad head, long prothorax, and the color make this species easily separable from its North American allies, though it is to some extent suggestive of *Thrips lactucæ* Beach. It is perhaps more closely related to the European *nigropilosus*, but differs from that species in the form and armature of the fore wings and in the coloration of the antennæ.

Haplothrips halophilus, new species.

Female (macropterous).—Length about 1.8 mm. Color dark blackish brown, nearly black, with bright crimson hypodermal pigmentation; fore tarsi and middle of apical half of fore tibiæ, lemon yellow; middle and hind tarsi blackish brown; antennæ nearly concolorous with body, segment 3 yellowish brown, pale at base.

Head about 1.2 times as long as wide, sides evenly arcuate, about as wide at posterior margin of eyes as at base; vertex distinctly produced, the anterior ocellus overhanging, attaining frontal costa; dorsal and lateral surfaces with close anastomosing striæ (very faint along median line) and a few minute spines; postocular bristles short, a little more than half as long as eyes, pointed. Eyes nearly two-fifths as long as head and about 0.8 as wide as their interval, nearly continuous in outline with cheeks. Ocelli anterior in position, the posterior pair opposite anterior third of eyes. Antennæ about 1.6 times as long as head; segment 1 a little longer than wide; 2 about 1.6 times as long as wide; 3 about 1.7 times as long as wide, sides gently rounded throughout, narrowed evenly in basal half, the pedicel not at all abrupt but bent slightly outward; 4 swollen, longest and widest in entire antenna, about 1.7 times as long as wide; 5 nearly twice as long as wide; 6 about 1.8 times as long as wide, broadest a little before apex, pedicel only about half as wide as that of segment 7; 7 about twice as long as wide, sides almost straight and parallel in apical three-fourths, pedicel with an abrupt, shoulder-like widening at extreme base, at this place about 0.8 as wide as apex or equal in width to base of segment 8; 8 about two-thirds as long as 7 and a little more than twice as long as wide; sense cones: 3, 0-1; 4, 2-2; 5, 1-1⁺; 6, 1⁺; 7 with one on dorsum near apex; segments 1 and 2 nearly black, about concolorous with head, 2 paler at middle of apex; 3 with pedicel yellow, remainder brown; 4 darker than 3, yellowish brown at base; 5 darker than 4, yellowish brown at base; 6-8 blackish brown, but paler than segments 1 and 2.

Prothorax three-fourths as long as head and (inclusive of

coxæ) about 1.8 times as wide as long, surface smooth; anterior marginal bristles minute, barely distinguishable; midlaterals small but much longer than anterior marginals, pointed; the three remaining pairs of bristles blunt, anterior angulars shortest, twice the length of midlaterals; posterior marginals about three times as long as midlaterals, slightly shorter than posterior angulars. Wings distinctly narrowed at middle; fore wings clear, with a slight brownish cloud at extreme base and with about eight accessory hairs on posterior margin. Tarsal tooth short, slightly curved, arising at right angles.

Abdomen slightly wider than pterothorax; tergite 1 with about a dozen anastomosing lines converging to anterior margin; tergites 2-6 closely transversely striate, the distal tergites very indistinctly so. Tube slightly expanded basally, about five-eighths as long as head, twice as long as basal width, and twice as wide at base as at apex. Abdominal bristles pointed, colorless; terminal bristles brown, slightly longer than tube.

Measurements of holotype: Length 1.73 mm.; head, length 0.230 mm., width 0.187 mm.; prothorax, length 0.174 mm., width (inclusive of coxæ) 0.312 mm.; pterothorax, width 0.384 mm.; abdomen, width 0.420 mm.; tube, length 0.144 mm., width at base 0.072 mm., at apex 0.037 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	38	51	50	57	54	46	45	32
Width (μ).....	31	31	29	33	29	26	22	14
Total length of antenna, 0.373 mm.								

Male (macropterous).—Much like female but smaller (length about 1.5 mm.), and with more slender antennæ. Fore legs often swollen; tarsi strongly toothed, the stoutness of the tooth varying with the degree of enlargement of the fore leg.

Measurements of allotype: Length 1.51 mm.; head, length 0.210 mm., width 0.172 mm.; prothorax, length 0.150 mm., width (inclusive of coxæ) 0.312 mm.; pterothorax, width 0.329 mm.; abdomen, width 0.322 mm.; tube, length 0.127 mm., width at base 0.062 mm., at apex 0.034 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	35	46	46	53	52	47	41	27
Width (μ).....	28	29	26	29	26	23	20	12

Total length of antenna, 0.347 mm.

Nymph (in last instar).—Bright orange to reddish orange, with head, pronotum, legs, antennæ, abdominal segments 9 and 10, and the region of the spiracles on segment 8, nearly black; the hypodermal pigment becomes red in at least the last three abdominal segments and often also in the head and thorax.

Described from several adults of both sexes and 22 nymphs, taken at Bountiful, Utah, August 5 and 6, 1914, by Mr. Alex Wetmore, where they were abundant on the fruiting heads of a sedge, *Scirpus paludosus* A. Nelson, growing in the alkaline marshes at the mouth of the Jordan River.

The form of the third and seventh antennal segments should serve to distinguish this from the closely related *Haplothrips jonesii* Karny.

Liothrips tessariæ, new species.

Female (macropterous).—Length about 3.3 mm. Color dark blackish brown or black, with segments 3–5 of antennæ largely yellow; wings clear, the fore pair with a slight brown cloud in the region of the three basal spines.

Head about 1.75 times as long as wide, sides nearly parallel, slightly flaring just behind eyes, and a little concave to basal fourth, then roundly narrowing to base; vertex slightly produced, the anterior ocellus borne at its tip and overhanging, but not attaining frontal costa; dorsal and lateral surfaces closely transversely striate and with a few minute spines; postocular bristles one and one-half times the length of eyes, situated far back of them, about midway between front and hind margins of head; no other prominent cephalic bristles. Eyes not prominent nor enlarged, one-third as long as head and about as wide as their interval, inner margins gently rounded, not prolonged on ventral surface of head. Ocelli of posterior pair situated in front of middle of eyes. Antennæ slender, nearly 1.8 times as long as head, inserted on front of head and

of normal form; segment 1 broadened at base; 2 about twice as long as wide; 3 clavate, about 3.3 times as long as wide, inner surface slightly sinuate, outer surface nearly straight; 4 and 5 clavate, nearly three times as long as wide; 6 and 7 oblong, pedicellate, three times as long as wide; 8 three times as long as wide.

Prothorax about 0.45 as long as head and (inclusive of coxæ) about 2.6 times as wide as long; all usual bristles present, nearly pointed, midlaterals and the two pairs near the posterior angles subequal and as long as postoculars; others shorter, the anterior marginals distinctly longer than the anterior angulars. Fore wings with about 20 accessory hairs on posterior margin. Fore tarsi unarmed.

Abdomen about 1.3 times as wide as pterothorax. Tube 0.8 as long as head and about 3.4 times as long as basal width, which is about 1.75 times the apical, sides nearly straight. Terminal bristles about 0.8 as long as tube; bristles at apex of segment 9 nearly as long as tube.

Measurements of holotype: Length 3.26 mm.; head, length 0.426 mm., width 0.245 mm.; prothorax, length 0.192 mm., width (inclusive of coxæ) 0.504 mm.; pterothorax, width 0.588 mm.; abdomen, width 0.756 mm.; tube, length 0.342 mm., width at base 0.102 mm., at apex 0.058 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	72	81	129	120	115	106	86	53
Width (μ).....	51	39	39	42	39	35	30	18
Total length of antenna, 0.762 mm.								

Male (macropterous).—Much like female but smaller (length about 2.5 mm.) and with more slender antennæ.

Measurements of allotype: Length 2.49 mm.; head, length 0.384 mm., width 0.211 mm.; prothorax, length 0.174 mm., width (inclusive of coxæ) 0.379 mm.; pterothorax, width 0.450 mm.; abdomen, width 0.468 mm.; tube, length 0.307 mm., width at base 0.084 mm., at apex 0.049 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	66	72	117	108	107	99	82	51
Width (μ).....	45	35	35	35	34	31	26	17
Total length of antenna, 0.702 mm.								

Described from 3 females and 3 males taken on *Tecssaria* sp. at Lima, Peru, December 18, 1912, by Mr. E. W. Rust.

Liothrips tessariæ appears to approach most closely the *L. seticollis* Karny, from Paraguay, but may be separated by the absence of a brown, median, longitudinal streak on the wings as well as by the antennal coloration and the absence of a tarsal tooth.

Ommatothrips, new genus.

(ὄμμα, eye; θρίψ, a wood worm)

Head long, its length fully 1.5 times its greatest width, which is usually across eyes, with a pair of long bristles on vertex at inner angle of eyes. Eyes large, finely faceted, broadly rounded in front, on ventral surface of head narrowly prolonged posteriorly much beyond posterior dorsal margin. Vertex subconically produced, overhanging the frontal costa and bearing the anterior ocellus at its extremity. Antennæ eight-segmented, inserted very close together on ventral surface of head; intermediate segments (4-6) obliquely truncate on inner surface at base and outer surface at apex; segment 3 elongate. Prothorax about half as long as head. Legs slender; fore femora not enlarged; fore tarsi unarmed in both sexes. Wings strong, of equal width throughout. Tube only slightly longer than the preceding segment, about half as long as head.

Type.—*Ommatothrips gossypii* Hood.

To *Ommatothrips*, in addition to the type species, must be assigned *Liothrips elongatus* Bagnall and *L. intermedius* Bagnall. This Neotropical genus may at once be known from the allied *Liothrips* Uzel by the short tube, the prolongation of the eyes on the ventral surface of the head, the presence of distinct anteocular bristles, and the form of the intermediate antennal segments, which are obliquely truncate at both base and apex.

Ommatothrips gossypii, new species.

Female (macropterous).—Length about 3.2 mm. Color dark blackish brown, or black, with the second segment of

antennæ brown at apex and the third segment clear yellow tipped abruptly with black; wings clear, both pairs with a brown median streak in basal two-fifths.

Head about 1.6 times as long as broad, widest across posterior angles of eyes, narrowest at base, sides almost straight; vertex distinctly produced, the anterior ocellus prominently borne at its tip and overhanging; dorsal and lateral surfaces closely transversely striate and with a few minute spines; postocular bristles longer than eyes, pointed; antecular bristles stout, three-fifths as long as eyes, postocellars one-third as long as eyes. Eyes very large and prominent, on dorsal surface about 0.3 as long as head and 1.3 times as wide as their interval, inner margins sinuate and converging posteriorly; on ventral surface prolonged posteriorly fully two-fifths of distance to base of mouth cone. Ocelli of posterior pair set on a line through anterior half of eyes and close to their margins. Antennæ stout, nearly 1.7 times as long as head, inserted very close together directly below posterior ocelli; segment 1 about cylindrical, about one and three-fourths times as long as wide; 2 a little more than twice as long as wide; 3 about 3.7 times as long as greatest width, sides nearly straight, apex squarely truncate; 4 about three times as long as wide, base squarely truncate, apex truncate on outer surface at an angle of about 45° ; 5 elongate-fusiform, 2.5 times as long as wide, inner surface of base and outer surface of apex obliquely truncate; 6 similar in form to 5 but stouter, twice as long as wide; 7 twice as long as wide, almost squarely truncate at base and apex; 8 about twice as long as wide.

Prothorax half as long as head and (inclusive of coxæ) a little more than twice as wide as long; all usual bristles present, nearly pointed, the two pairs at the posterior angles much the longest, the inner pair slightly longer than the outer and about 0.8 as long as prothorax; midlaterals half as long; anterior angulars and anterior marginals successively shorter. Wings clear, both pairs with a brown median streak in basal two-fifths; fore pair with about 20 accessory hairs on posterior margin. Tarsi unarmed.

Abdomen slightly wider than pterothorax. Tube short, about half as long as head, not quite twice as long as basal width, about twice as wide at base as at apex, sides straight. Terminal bristles a little longer than tube; bristles at apex of segment 9 nearly twice as long as tube.

Measurements of holotype: Length 3.24 mm.; head, length 0.444 mm., width 0.276 mm.; prothorax, length 0.216 mm., width (inclusive of coxæ) 0.448 mm.; pterothorax, width 0.576 mm.; abdomen, width 0.612 mm.; tube, length 0.216 mm., width at base 0.120 mm., at apex 0.060 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	87	90	153	134	98	78	65	38
Width (μ).....	50	42	41	46	39	39	33	18

Total length of antenna, 0.743 mm.

Male (macropterous).—Much like female but smaller (length about 2.8 mm.). Head much broader across eyes, which are more enlarged and more prominent than in female and with a narrower interval.

Measurements of allotype: Length 2.80 mm.; head, length 0.444 mm., width 0.252 mm.; prothorax, length 0.190 mm., width (inclusive of coxæ) 0.388 mm.; pterothorax, width 0.480 mm.; abdomen, width 0.409 mm.; tube, length 0.240 mm., width at base 0.100 mm., at apex 0.059 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	72	78	156	135	105	82	62	36
Width (μ).....	44	37	36	40	35	35	31	19

Total length of antenna, 0.726 mm.

Described from 11 females and 5 males taken on cotton, Department of Piura, Peru, by Dr. Charles H. T. Townsend. They were transmitted to Mr. Paul R. Jones, who determined the species as new and later forwarded the material to the writer for naming and description.

O. gossypii, from the form of the head and antennæ, the presence of long anteocular bristles, and the short tube, is closely related to *O. elongatus* and *O. intermedius*. Both of these were described by Bagnall from Venezuela. It appears to be distinct from them, however, by the color of the third antennal segment, which is yellow, abruptly tipped with black,

as well as by the much longer posterior marginal bristle of the prothorax and the larger eyes, which are broader than their interval.

Dr. Townsend has kindly given me his notes on this insect, which I quote in full:

"May 27, 1911. Several large black thrips found in cotton squares at Catacaos.

"July 8, 1911. Many of this species issued from Catacaos squares of yesterday.

"July 29, 1911. All through this month hundreds of this thripid have issued from lots of squares and newly-set bolls from twenty localities in the Rio Piura and Rio Chira valleys. Must cause considerable injury by sucking the sap from the squares.

"August 6, 1911. Hundreds of this species in tubes of various lots of squares, especially when newly brought in. Very abundant today, for example, in Santa Clara squares of yesterday. Also in Cumbivira squares and newly-set bolls of yesterday."

Hoplandrothrips russelli, new species.

Female (macropterous).—Length about 2 mm. Color dark blackish brown (almost black) with tarsi, apical portion of fore tibiæ, and bases of intermediate antennal segments, yellow.

Head about 1.5 times as long as wide and about one and three-fourths times as long as prothorax, sides abruptly rounded to eyes and with a slight subbasal constriction, intermediate portion parallel, with six large prominent, spiniferous tubercles; entire dorsal and lateral surfaces closely and strongly reticulate except along median line, and with a few minute spines; vertex rounded, slightly produced, overhanging; postocular bristles alone prominent, two-thirds as long as eyes, expanded at apex. Eyes about one-third as long as head, about equal in width to their interval. Ocelli of posterior pair distinctly in advance of middle of eyes and somewhat larger than the anterior ocellus, which is slightly more distant. Antennæ about 1.6 times as long as head, slender; segment 1 distinctly longer than broad; 2 about twice

as long as broad; 3 clavate, fully 2.5 times as long as wide. sinuate on inner side, pedicel curved outward; 4 clavate, narrowed at apex, about equal in width to 3, broadest in advance of middle, about 2.4 times as long as wide; 5 similar in form to and slightly narrower than 4, about 2.7 times as long as wide; 6 truncate-fusiform, wider in apical third, about 2.75 times as long as wide; 7 slightly shorter and narrower than 6, wider toward base, about 2.6 times as long as wide; 8 subconical, truncate, slightly narrowed at extreme base, nearly three times as long as greatest width; segments 1 and 2 concolorous with body; 3 yellow, darker apically; 4-6 yellow, shaded with brown in apical half or two-thirds; 7 and 8 brown, the base of former pale; sense cones: 3, 1-2; 4, 2-2; 5, 1-1⁺; 6, 1-1⁺; 7 with one on dorsum near apex. Mouth cone long, pointed, attaining mesosternum, the acute labrum surpassing labium.

Prothorax slightly less than 0.6 as long as head and (inclusive of coxæ) about 2.3 times as wide as long; pronotum about as closely and strongly reticulate as the head, anterior and posterior margins concentric; all usual bristles present, dilated at tip, those at the posterior angles longest and about equal in length to postoculars. Pterothorax very slightly wider than prothorax. Wings slightly yellowish, darker at middle; fore pair with 15 or 16 accessory hairs. Legs slender; fore tarsus with a stout curved tooth which is slightly shorter than width of tarsus.

Abdomen very slightly broader than pterothorax. Tube about half as long as head, about 2.3 times as long as basal width, and a little more than half as wide at apex as at base, sides slightly concave. Lateral bristles knobbed, yellowish; segment 9 with the lower lateral pair pointed and the upper lateral and dorsal one dilated at apex; terminal bristles nearly 1.5 times as long as tube, brown.

Measurements of holotype: Length 1.99 mm.; head, length 0.355 mm., width 0.236 mm.; prothorax, length 0.202 mm., width (inclusive of coxæ) 0.464 mm.; pterothorax, width 0.480 mm.; abdomen, width 0.511 mm.; tube, length 0.180 mm., width at base 0.078 mm., at apex 0.044 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	53	71	102	95	85	74	61	40
Width (μ).....	45	36	40	39	31	27	23	14
Total length of antenna, 0.581 mm.								

Described from one female taken at Tempe, Arizona, May 12, 1913, by Mr. H. M. Russell.

The prominent genal tubercles and the deeply sculptured pronotum make this species unmistakable. It is dedicated to its collector in appreciation of his excellent biological work on Thysanoptera.

Hoplandrothrips mcateei, new species.

Female (macropterous).—Length about 2 mm. Color dark blackish brown (almost black) with tarsi and tip of tube paler and pedicels of antennal segments 3–6 yellowish.

Head about 1.3 times as long as wide and twice as long as prothorax, broadest at middle; cheeks rounded abruptly to eyes and gently to near base, thence slightly diverging, forming a neck-like constriction which is slightly wider than greatest distance across eyes or about 0.9 the greatest width of head, set with about five large spiniferous tubercles; entire dorsal and lateral surfaces closely and strongly reticulate except along median line, and with a few minute spines; vertex subconically produced, overhanging; postocular bristles alone prominent, two-thirds as long as eyes, expanded at apex. Eyes about one-third as long as head, slightly narrower than their interval. Ocelli of posterior pair distinctly in advance of middle of eyes and larger than the anterior ocellus, which is slightly more distant. Antennæ about 1.68 times as long as head, moderately slender; segment 1 very slightly longer than broad; 2 about 1.8 times as long as broad; 3 clavate, about 2.1 times as long as wide, sinuate on inner side, pedicel scarcely curved outward; 4 very slightly shorter than 3, clavate, pedicellate, narrowed at apex, about equal in width to 3, broadest in advance of middle, about 2.1 times as long as wide; 5 almost similar in form to but distinctly narrower and slightly shorter than 4, pedicellate, almost 2.2 times as long as wide; 6 clavate, more briefly pedicellate and less narrowed at apex

than 4 and 5, about 2.1 times as long as wide; 7 oblong, briefly pedicellate, truncate at apex, about twice as long as wide; 8 about 1.4 times as long and half as wide as 7, conical, nearly three times as long as greatest width; antennæ uniform dark blackish brown (nearly black) except pedicels of segments 3-6, which are yellowish; sense cones: 3, 1-2; 4, 2-2; 5, 1-1⁺; 6, 1-1⁺; 7 with one on dorsum near apex. Mouth cone long, pointed, attaining mesosternum, the acute labrum surpassing labium.

Prothorax about half as long as head and (inclusive of coxæ) about 2.7 times as wide as long; pronotum reticulate, less distinctly so in front of middle, the lines less heavy than on head, anterior and posterior margins concentric; all usual bristles present, expanded apically; anterior marginals shortest, half as long as the posterior angulars which are the longest; anterior angulars and posterior marginals about equal in length, slightly shorter than posterior angulars; coxal and mid-laterals about equal in length, longer than anterior marginals. Pterothorax very slightly wider than prothorax. Wings clouded with brown, more darkly at base and middle; fore pair with 12 or 13 accessory hairs. Legs moderately slender; fore tarsus with a long and nearly straight tooth.

Abdomen very slightly broader than pterothorax. Tube 0.6 as long as head, about 2.4 times as long as greatest sub-basal width, which is about 1.8 times the apical; sides diverging in basal sixth, thence abruptly converging for a short distance, concavely tapering to apical fourth, which tapers a little more distinctly to apex. Lateral bristles spatulate at apex, almost colorless; segment 9 with the lower lateral pair pointed and the upper lateral and dorsal ones dilated at apex; terminal bristles brown, nearly 1.5 times as long as tube.

Measurements of holotype: Length 2.04 mm.; head, length 0.331 mm., width 0.252 mm.; prothorax, length 0.168 mm., width (inclusive of coxæ) 0.456 mm.; pterothorax, width 0.480 mm.; abdomen, width 0.504 mm.; tube, length 0.198 mm., width near base 0.083 mm., at apex 0.046 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	51	69	93	91	82	68	59	42
Width (μ).....	48	39	44	43	38	32	30	15

Total length of antenna, 0.555 mm.

Male (macropterous).—Length about 1.8 mm. Color and structure almost as in female. Postocular bristles nearly as long as eyes. Pronotal reticulation indistinct; anterior marginal bristles almost obsolete, pointed; anterior angulars longest, expanded at apex, about equal in length to eyes; remaining bristles distinctly shorter than anterior angulars, subequal in length, expanded apically; coxal bristle still shorter. Fore wing with 10 or 11 accessory hairs. Fore tarsus with a strong, slightly curved tooth. Abdomen very slightly narrower than pterothorax. Tube a little more than half as long as head, about 2.2 times as long as greatest subbasal width, which is about 1.9 times the apical; sides very slightly sinuately converging to apex. Lateral abdominal bristles spatulate at apex; lower laterals of segment 9 long and pointed as in female; upper laterals very short (two-thirds as long as basal width of tube), stout, pointed, and dark in color; dorsals dilated at apex.

Measurements of allotype: Length 1.82 mm.; head, length 0.308 mm., width 0.226 mm.; prothorax, length 0.168 mm., width (inclusive of coxæ) 0.379 mm.; pterothorax, width 0.408 mm.; abdomen, width 0.403 mm.; tube, length 0.163 mm., width near base 0.075 mm., at apex 0.039 mm.

Antennal segments.....	1	2	3	4	5	6	7	8
Length (μ).....	47	63	88	82	75	65	57	39
Width (μ).....	43	36	40	40	35	30	27	14

Total length of antenna, 0.516 mm.

Described from one female and one male taken from leaves on a felled elder at Oyster Bay, Washington, December 9, 1914, by W. L. McAtee, whose name it bears in commemoration of his zeal in entomology.

The dark color of the antennæ and the large spiniferous tubercles on the cheeks readily distinguish this form from its North American congeners.

AN ACALYPTRATE GENUS OF MUSCOIDEA

(Diptera)

By CHARLES H. T. TOWNSEND

Eucordylidexia, new genus.Genotype, *Eucordylidexia ategulata* Townsend, new species.

This genus is remarkable for being practically a duplication of *Cordyligaster*, except that both scales of the tegulæ are atrophied to a mere doubled rim. It is the only member of the Muscoidea so far known with vestigial tegulæ. The petiole of the abdomen is more slender than that of *Cordyligaster septentrionalis* and the wings are usually wholly and deeply infuscate excepting only the glassy alula. The male forceps and claspers are much more delicate in structure than in that species.

Eucordylidexia ategulata, new species.

Length of body, 13 to 15 mm.; of wing, 9.5 to 11 mm. Fifteen specimens, 2 from Guatemala (Deam and A. P. Cockerell), 6 from Costa Rica (Schild and Burgdorf), and 7 from Panama (Busck and Jennings).

The descriptions by Wiedemann, Brauer and Bergenstamm, and Wulp of *C. petiolata* fit this species quite faithfully, and it agrees quite perfectly with *septentrionalis* in color. There is thus no necessity for color description. Comparison with *septentrionalis* shows no appreciable structural differences outside of the tegulæ and hypopygium.

Holotype, No. 19219, U. S. Nat. Mus., female, Puerto Barrios, Guatemala, February 24, 1905 (Chas. C. Deam). Allotype, male, San Carlos, Costa Rica (Schild and Burgdorf).

It is taken for granted that *petiolata*, the genotype of *Cordyligaster*, has well-developed tegulæ, since none of the authors just mentioned refers to this character and Wulp's figures all show normal tegulæ. One specimen from Acapulco (Baker), which I determine as *minuscula* Wulp, and 35 specimens of *septentrionalis* Townsend from District of Columbia all show fully developed tegulæ; these two species are congeneric with *nyomala* Townsend from Peru, which also has large tegulæ.

**GRACILARIA AZALEÆ BUSCK = G. ZACHRYSA
MEYRICK***(Lepidoptera, Gracillariidæ)*

BY AUGUST BUSCK

In January, 1914, the writer described *Gracilaria azaleæ* (Ins. Ins. Mens., vol. 2, p. 1, 1914), a small moth, which during the last few years has been repeatedly bred in this country from hot-house *Azalea* imported from Europe. It was surmised at the time that the moth also was imported and that it might be already described; but it could not be identified as any known European or American species and a name was desirable as a convenience.

A specimen was since sent to Mr. Edward Meyrick in England and he has kindly informed me (letter of December 29, 1914) that the species is identical with *Gracilaria zachrysa*, described by him from Ceylon (Journ. Bombay Nat. Hist. Soc., vol. 17, p. 983, 1907) and figured in his revision of the Gracillariidæ (Genera Insectorum, fig. 4, 1912). The name *G. azaleæ* Busck hence falls as a synonym. A good synonym is rather an advantage than otherwise, and I have no apology to offer for my failure to recognize a *Gracilaria* species from New Jersey as one described from Ceylon and known from only two specimens without biological notes. Even if the identity had occurred to me, it would have been preposterous to make such a determination, which could only be made by an examination of the type specimens in Mr. Meyrick's collection. The colored figure is a hindrance rather than a help in the identification.

This species was discovered in Boskoop, Holland, by Prof. Ritzema Bos in the fall of 1912, infesting in large numbers some young plants of *Azalea indica*, which had shortly before been imported from Japan. The larva first mines and later folds a leaf of *Azalea* and it appears to have done sufficient damage in Holland to be regarded as of some economic importance. It was pronounced by the Belgian specialists an undescribed species and was given the provisional name *G.*

azaleella Brants (Tidsch. voor Entomologie, vol. 56, p. lxxii, 1913).

Thus we have a definite record of how this frail little moth has come from Asia and within a few years has successfully established itself in Europe in such numbers that it repeatedly has been reshipped to this country and has at least temporarily survived also here. The record is of the more value because the species may possibly also reach this country direct from Japan, and if it should establish itself, might eventually readily have been considered an American indigenous species, as it is closely allied to an American group of the genus.

A POLISTIFORM GENUS OF MUSCOID FLIES

(*Diptera*)

BY CHARLES H. T. TOWNSEND

Polistiopsis, new genus.

Genotype, *Polistiopsis mima* Townsend, new species

Belongs in the *Penthosia* group₁ and strikingly counterfeits in both form and color the common reddish-brown forms of *Polistes*. Differs from *Penthosia* chiefly as follows: Second antennal joint of male decidedly more elongate, the third joint being less than three times as long as the second; proboscis beyond geniculation as long as lower border of head, corneous; palpi absent. Abdomen of male consisting of six segments visible from above, polistiform, the first segment short and narrowed, second segment elongate and narrowed on basal half, third segment about as long as second and widening gradually from the posterior width of latter, fourth segment about same length and gradually narrowing from posterior width of third to about the width of second segment on middle, fifth segment much shorter and narrowing rapidly, sixth and last segment rather pointed and about as long as its basal width; genitalia not prominent. A lateral marginal macrochæta on first and third segments, several on second segment including a lateral discal, and a pair of lateral marginal on fourth segment; a median

marginal pair on second and third segments, and a vestigial pair on fourth; fifth segment with some short marginal. Apical cell widely open considerably before wing tip; fourth vein rounded at bend, but bent rather sharply at a right angle; no appendage at bend of fourth vein, last section bent in; hind cross vein nearer bend, sinuate, its middle in line with last course of fourth. Hind scale of tegulæ much elongated posteriorly, thinly fringed with rather long hairs. Wing of male with front margin bulged on second costal cell. Legs moderately slender, the hind pair elongated; male claws of front and middle legs longer than last tarsal joint; those of hind legs about as long as last tarsal joint, all strongly bent at tip. Facial plate longitudinally arched, distinctly carinate, the crest of median line suturelike and similar to the crests of facialia. Front at vertex less than one-fifth head-width in male, epistoma prominent.

***Polistiopsis mima*, new species.**

Length of body 19 mm.; of wing, over 14 mm. One male, Tehuantepec (Sumichrast).

Head brown to blackish in ground color, the face and front varying from silvery white to velvet brown according to lights, frontalia dull brown; lunula and first two antennal joints rufous to brownish yellow, third antennal joint blackish, the arista concolorous with second joint; beard brassy grey. Thorax and abdomen reddish brown to brownish red, the pleuræ and coxæ thinly silvery; mesoscutum and scutellum thinly silvery, the former with two linear median vittæ and an outer anterior blotch ill-defined. Only a faint indication of silvery pollen on narrow basal margin of second and third segments. Legs brownish rufous, the tarsi darker. Wings deep brown on costal half from base to tip, the brown following fourth vein, while fifth vein and hind cross vein are bordered with yellowish; a light space in apical and discal cells. Tegulæ subhyaline.

Holotype, No. 19220, U. S. Nat. Mus.

A GENUS OF HYSTRICIINE FLIES WITH WHITE MAGGOTS

By CHARLES H. T. TOWNSEND

Peru, which is noted for its unique conditions and forms of life, affords us the following unique case of perfectly white first-stage maggots in a member of the tribe *Larvævorini*, from the Andean altitudes. This fly is closely similar in external characters to *Andinomyia* and *Vibrissomyia*, whose first-stage maggots are of the ordinary colored-platelet type, hitherto considered distinctive of the Hystriciinæ. It inhabits the same high puna region, and occurs in company with those genera, but appears to be comparatively rare.

Sorochemyia, new genus.

Genotype, *Sorochemyia oroya* Townsend, new species.

Differs from *Andinomyia* as follows: Third antennal joint of female about equal to the elongate second, or very slightly longer, moderately and evenly widened distally, truncate on apex but not strongly so; that of male more distinctly but yet only slightly longer than second, more widened distally, the upper edge not as long as under edge in profile, more rounded on corners, obliquely subtruncate. Parafacials nearly as broad as eye in female, rather less in male, the head rather higher in proportion to length and thus not so conspicuously elongate. Two rows of frontal bristles, all directed inward; three or rarely four facio-orbitals, better separated from lowest frontals; female with only two proclinate fronto-orbitals. Proboscis not quite so long, the part beyond geniculation scarcely equalling or at most not exceeding head-height. The two strong lateral scutellar macrochætæ reach beyond middle of third abdominal segment. Abdominal macrochætæ longer and stronger, the anal segment with discal, submarginal, and marginal rows. Bristly hairs of abdomen conspicuously longer in both sexes, especially so in male, more of the nature of pile. Male claws elongate, those of female much shorter. Front tarsi of female distinctly widened, but only slightly so.

Sorochemyia oroya, new species.

Length of body, 11 to 12 mm.; of wing, 9 to 9.75 mm. One

male and two females, Oroya, Peru, over 12,000 feet, May 7 and 8, 1914, on short herbage in Rio Mantaro valley bottoms above town (Townsend).

Black. Front with thin silvery pollen, tending to faint brassy shade. Face and cheeks with pale golden pollen. Occiput cinereous. Front, antennæ and occiput blackish, frontalia not so dark; face and cheeks yellowish in ground color. Moso-scutum thinly silvery, faintly showing four vittæ that are nearly equal. Scutellum dark testaceous, blackish on sides, tinged somewhat dark on disk. Abdomen wholly black, subshining, without trace of markings or pollen. The abdomen shows a faint metallic luster, a trace of which is also perceptible on the thorax. Front femora very faintly silvery on outside. Wings very dilute smoky throughout, no yellow but rather a blackish tinge on base, veins showing yellowish. Tegulæ deeply smoky.

Holotype, No. 19221, U. S. Nat. Mus., female (TD4268). Allotype, male (TD4269). Paratype, female (TD4270).

The male reproductive system shows the long *vasa deferentia* characteristic of the Larvævorini and allied tribes, with very long accessory glands. The female system is characteristic of the same groups, the uterus being very long and truly straplike with eggs and maggots up to eight and ten parallel rows. The paratype at time of pinning showed four extruded white maggots, with black cephalopharyngeal skeleton, attached to larvipositor. The preuterus is of regular form, but bears on dorsal surface near base a pair of unequal saclike vesicles, of which the larger one may exceed in size the preuterus itself. This structure is unique in the Muscoidea so far as yet known.

SOME WEST INDIAN DIPTERA

By FREDERICK KNAB

The following notes and descriptions of new species have resulted from determination work. They are offered as a slight contribution to our knowledge of the highly interesting but neglected dipterous fauna of the Antilles.

Mallophora macquartii Rondani.

Mallophora scopifer Macquart (not Wiedemann), Dipt. Exot., vol. I, pt. 2, p. 89 (1838).

- Mallophora macquartii* Rondani, Nuovi Annali Sci. Nat. Bologna, ser. 3, vol. 2, p. 367 (1850).
Mallophora scopifera Bigot (not Wiedemann), in: de la Sagra, Hist. fis. de la Isla de Cuba, Spanish edit., vol. 7, p. 331 (1856).
Mallophora scopipeda Rondani, Arch. per la Zool., vol. 3, p. 46 (1863).
Mallophora macquartii Osten Sacken, Cat. Dipt. No. Amer., 2 edit., p. 78, 233 (1878).
Mallophora macquarti Snow, Kans. Univ. Quart., vol. 4, p. 186 (1896).
Mallophora scopipeda Aldrich, Cat. No. Amer. Dipt., p. 279 (1905).

Macquart, as early as 1838, detected that Cuban specimens were specifically distinct from the *Mallophora scopifer* described by Wiedemann from Brazil, but he failed to propose a new name for the species. This was done by Rondani, who, twelve years later, proposed the name *macquartii* for the Cuban form. After a lapse of thirteen years Rondani proposed another name, *scopipeda*, for the same form, evidently having forgotten his previous action. Osten Sacken had the name *macquartii* from Loew and was under the impression that it was a manuscript name; hence we find *scopipeda* given priority in the Aldrich catalog.

Mallophora macquartii, thus far, is known only from Cuba. There are before me two females and a male, all taken at Cayamas by Mr. E. A. Schwarz. The species may be best compared with the North American *Mallophora orcina* of Wiedemann. It agrees with this in the yellow-haired head, scutellum and anterior margin of the thorax; as in that species the abdomen is dorsally yellow-haired, black at tip, the fifth to seventh segments being black-haired. The Cuban species differs by the absence of black bristles from the mystax; the femora and tibiæ are ferruginous instead of black, and are pale yellowish-haired, only the apices of the tibiæ black-haired; the venter on the first four segments shows a medium line of rather loose, long, erect yellowish hairs, while in *orcina* the venter is wholly densely black-haired. In the male *macquartii* the front tarsi are dorsally whitish haired, while in the female they are all black. *Mallophora orcina* shows an entirely different sexual dichroism. In the female all the legs are wholly black-haired, while in the male the hind tibiæ are white-haired over a considerable portion of the lower sur-

face and the hind tarsi have the last three joints dorsally white-haired.

Tabanus hookeri, new species.

Eyes bare in the female, hairy in the male. Abdomen dorsally with three longitudinal series of pale markings. Wings clear, the posterior cells all widely open, the upper branch of the third vein not appendiculate.

Female: General color brownish gray. Frons broad, narrowing gradually toward the antennæ, yellowish gray; frontal callosity brown, roughly quadrate, as broad as high and contiguous with eyes, a narrow connected line reaching about one-third the way to occiput. Antennæ bright ferruginous; first joint with the dorsal apex black and with many short black hairs; third joint dorsally with a prominent but obtuse basal process, its apex and the annulate part of the joint black. Palpi yellowish white, with a few scattered black hairs. Face and cheeks clothed with white pollen and hair. Thorax dorsally dark gray and yellowish brown, the latter color mostly laterally and in two narrow subdorsal stripes; scutellum yellow brown tinged with gray; pleuræ grayish white and clothed with white hair; disk of thorax and scutellum clothed with white hair scales and fine black hairs. Abdomen dorsally blackish brown, a median series of yellowish brown contiguous triangular spots, narrow on anterior margins and broadened to posterior margins; on each side, half-way toward lateral margins, a series of broad oblique bars of the same color, touching both anterior and posterior margins of the segments, but not the lateral margins; extreme lateral margins with a narrow continuous brownish yellow stripe; the pale markings are overlaid with whitish hair-scales; venter pale ferruginous, tinted with pale gray at the sides, the seventh segment with short erect black bristles. Legs pale ferruginous, with pale gray pruinosity and whitish down, the anterior and middle coxæ dark, the front tibiæ blackened from just beyond the middle; tarsi blackish. Wings hyaline, the stigma long and brownish yellow. Halteres pale ferruginous, with creamy white knobs. The eyes show traces of two transverse purplish stripes. Length: Body, about 11 mm.; wing 9 mm.

Male: Eyes with the small facets forming a dark band along the lower margin, very broad posteriorly and tapering to a point above antennæ. Third antennal joint with the basal process hardly larger than in the female, but distinctly acute. Abdomen with the dorsal markings less distinct, the median stripe obsolete. Length: Body, about 11 mm.; wing, 8.3 mm.

Mayaguez, Porto Rico, 1 female, January 9, 1912 (C. W. Hooker), 1 male, October 24, 1914 (R. H. Van Zwaluwenburg).

Type, Cat. No. 19354, U. S. Nat. Mus.

Named in memory of the late C. W. Hooker. The species agrees with none of the descriptions of species previously reported from the West Indies.

Hyperalonia gargantua, new species.

Antennæ deep reddish brown to black, the style slightly shorter than the third joint. Head with the vertex dull black, the frons clothed mostly with pinkish brown scales and fine black hairs; posterior eye-margins white-scaled. Thorax blackish brown, anteriorly with a collar of erect maroon red hair-scales, followed by black ones; a large tuft of maroon red scales before roots of wings and another beneath posterior angles; tufts of the same color upon the coxæ; disk of thorax clothed with small appressed blackish scales, becoming pinkish posteriorly, at the sides and upon the scutellum. Abdomen dorsally with the first segment black-scaled; second with a broad band of white scales anteriorly, slightly narrowed toward the middle, where it is about half the width of the segment; the succeeding segments wholly black-scaled, the scales at the posterior margins of the segments touched with dull pink, on the margin of the sixth segment a few white-tipped scales. Venter dark, with long maroon red hair-scales at the sides, longest and most dense anteriorly. Femora dark reddish brown tinged with black, the tibiæ and tarsi black. Wings with four submarginal cells and three blackish bands similar to those in *H. cerberus* but less extensive. The first band is basal and involves the bases of the second basal and anal cells; the second band crosses the wing over the anterior cross-vein, involves the base of the discal cell, the apices of

the second basal and anal cells and the bases of the third and fourth posterior cells; the third band involves the furcation of the second vein, the posterior cross-vein, and sends a branch to the apex of the first posterior cell; several small detached spots occur outwardly on the veins, but there is no spot at the apex of the upper branch of the third vein. Length: Body, about 20 mm.; wing, 24 mm.

St. Elizabeth, Santa Cruz Mountains, Jamaica, altitude 1,500 feet, 1 specimen, October 14, 1899 (C. B. Taylor).

Type, Cat. No. 19355, U. S. Nat. Mus.

Nearest to *Hyperalonia cerberus* Fabricius, but differs by its much larger size, the more restricted black fasciæ of the wings, black tibiæ, absence of white markings from the posterior portion of the abdomen and other details. The long red pubescence present at the sides of the venter in this species is absent in *cerberus*. In the wing of *gargantua* the clear spaces between the black fasciæ reach forward to the first vein, while in *cerberus* the black fasciæ are more or less confluent in the anterior region.

Heterostylum hæmorrhœicum (Loew).

Bombylius hæmorrhœicus Loew, Berl. Ent. Zeitschr., vol. 7, p. 300 (Centur. iv, species 46), 1863.

Bombylius semirufus Loew, Berl. Ent. Zeitschr., vol. 16, p. 78 (Centur. x, species 41), 1872.

A specimen in the U. S. National Museum collection bears the label "Grand Anse, Hayti, P. R. Uhler," and is evidently one of the original series from which the type of *Bombylius semirufus* was derived. The specimen is a typical *Heterostylum* in every respect; Loew compares the species with *Bombylius hæmorrhœicus*, which he had previously described from Cuba, and which therefore also belongs here. This view is supported by Loew's comparison of *hæmorrhœicus* with *Bombylius ferrugineus* Fabricius, which belongs to *Heterostylum*. In the descriptions of *hæmorrhœicus* and *semirufus* no tangible differences are apparent and both descriptions apply equally well to the specimen before me. While in the absence of Cuban material the synonymy cannot be made positive, it is at least highly probable and was already suspected by Loew himself.

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NEW SPECIES OF THE GENUS GRACILARIA AND NOTES ON TWO SPECIES ALREADY DESCRIBED

(*Lepidoptera, Gracilariidae*)

By CHAS. R. ELY

Gracilaria burgessiella Zeller.

(Verh. zool.-bot. Ges. Wien, xxiii, 307, 1873.)

This species was described by Zeller from a captured specimen from Beverley, Massachusetts.

During the latter part of July, 1912, the writer bred two specimens of this insect, and in July, 1914, four more, from typical *Gracilaria* cones in the leaves of *Cornus candidissima* Marsh. The imagoes emerged July 26-August 1.

The mine which the larva makes is on the under side of the leaf, narrow and winding at first, but quickly terminating in a small, elongated blotch, next to a rib or vein. After emerging from the mine the larva rolls the tip of the leaf downwards into a small cone. It leaves the cone to spin its cocoon, which is similar to those of our common maple and willow feeders.

On the same bushes, from which this material was collected, were found leaves which had been formed into cylindrical rolls, the leaf being rolled from the side. The inclosed larvæ were badly parasitized and no imagoes were reared. These rolls may also be the work of *burgessiella* Zell., but the author's experience would lead him to believe that another species is represented.

This insect is probably not very abundant. The numerous records of *burgessiella* Zell. in the various lists usually refer to the very common species which feeds on red maple.

The two species are, however, quite distinct. In *burgessiella* Zell. the costal spots are paler and the first one, as given in Zeller's description, and shown in his accompanying figure, is concave outwardly, ending in a point, and the second costal spot is greatly produced along the costa, being about three times as long as it is broad.

Gracilaria vacciniella, new species.

Face white, crown dark purplish, extending well over in front; labial palpi white, the terminal joint well shaded with black outwardly just before apex; maxillary palpi white; antennæ annulate with yellowish at the joints of the segments; thorax concolorous with the fore wings. Front and middle legs dark purplish, except the tarsi, which are white, with the joints tipped with black, the tibiæ tufted; the hind legs, with the basal portion of the femora, a shining, yellowish white, the apical portion quite dark; tibiæ and tarsi light yellow gray, the latter heavily shaded with brown on the upper side, especially near the tarsal joint. Abdomen yellow gray above, shining pale yellowish below. The fore wings dark purple with iridescence, with two bright, shining costal spots; the first spot triangular, with basal margin oblique and rounded, the posterior margin nearly perpendicular to the costa, the apex reaching the fold; the second spot, which is separated from the first one by a distance about equal to the width of the first costal spot, is broadest on the costa and is quite convex on the side directed toward the dorsum; base of wing below the fold yellow; cilia smoky gray, heavily shaded about the apex, almost concolorous with the wing, the usual lines in the apical cilia being very indistinct. Hind wings dark, smoky gray, with cilia somewhat paler. Expanse 11 mm. Described from one of a number of specimens, bred by W. G. Dietz on vaccinium at Hazleton, Pennsylvania, July 29, 1888.

Type, Cat. No. 19324, U. S. Nat. Mus.

This species is near *burgessiella* Zell., but may be separated from it by the shape and color of the costal spots and the presence of yellow at the base of the dorsal edge.

The species which feeds on the leaves of the red maple has long been known, but heretofore wrongly placed under *bur-*

gessiella Zell. The following name and description is therefore given.

Gracilaria bimaculatella, new species.

Face white; crown and thorax pale, mixed purplish and straw color; antennæ yellowish gray mixed with brown; labial and maxillary palpi white, the former shaded outwardly with dark brown just before tip of apical point. Joints of first and middle pairs of legs, except the tarsi, concolorous with wings, tibiæ tufted, tarsi white with a brown spot at the end of each joint; hind legs with tarsi and tibiæ yellow gray, the former shaded slightly at the joints, femora near basal joint pale yellow. Abdomen dark yellow gray above, bright lemon yellow below, anal tuft straw color. Fore wings purple, but appearing brownish in some lights; with two golden costal triangles, the first, extending from about the basal fourth to the middle of the costa, the indented apex reaching beyond the fold almost to the dorsal edge of the wing; the second costal spot is very close to the first one, the intervening space being somewhat darker along the costa, and is nearly semicircular in outline; between this spot and the apex are two or three small spots similar to the wings in color, but somewhat darker; the cilia about the apex are yellow gray with two distinct brownish lines, which begin just beyond the apex and end at a point which is directly beneath the posterior margin of the second costal spot. Hind wings yellow gray with paler cilia. Expanse, 11 mm.

Type, Cat. No. 19325, U. S. Nat. Mus.

Described from a specimen reared from a cone found on red maple, at East River, Connecticut. Adult emerged July 22, 1912.

Gracilaria cornusella, new species.

Face pale lemon yellow; crown purplish, with some straw-colored scales; thorax dark purple; labial palpi yellowish white annulate with black just before the apex which is whitish; maxillary palpi whitish; antennæ brown annulate with yellowish at the joints of the segments. Abdomen dark smoky gray above, bright lemon yellow below. Front and middle legs

with white tarsi, dark brown at the tips of the joints, middle tibiæ tufted; hind legs with tarsi and tibiæ dark yellow gray shaded with brown, femora yellow at base. Fore wings dark purple, with two, *widely separated*, shining golden spots, on the costal margin; the first spot extending to the fold, the costal edge of the triangle reaches from the basal fourth to nearly the middle of the costa; at a distance about as great as the width of the wing from the first spot is the second costal spot, very small and nearly semicircular in form; the cilia are dark gray, with two distinct black lines extending around the apex and well into the dorsal cilia. Hind wings dark smoky gray; cilia paler. Expanse, 10 mm.

Type, Cat. No. 19326, U. S. Nat. Mus.

The above description is taken from one of a series of about twenty-five specimens, reared by the writer at East River, Connecticut, from mines and rolls in the leaves of *Cornus stolonifera* Michx. The material was collected about the middle of July and adults emerged the last week in July and the first week in August.

The mine is short and winding, in the lower side of the leaf, ending in a somewhat elongated blotch about half an inch long, placed usually between and at the junction of two of the ribs or veins. After leaving the mine the larva rolls the leaf downward, from one side, into a cylindrical roll. The cocoon is of the usual boat-shaped form, and is made within the roll, near the first fold in the leaf.

The work of this insect closely resembles that of *Exartema punctanum* Wlsm., but the larva of the latter usually eats through the leaf forming the roll, in a number of places, while the *gracilaria* larva eats only one side of the leaf.

A series of ten specimens was also obtained from *Cornus alternifolia* L. In habits and appearance these correspond so closely to those reared from *Cornus stolonifera* that they are believed to represent the same species. Three specimens reared by A. Busck from *Cornus* species at Washington, D. C., April 2, 1900, are also included under this species.

This insect may be distinguished from its nearer relatives

By its dark color, wide separation of costal spots, yellow face and absence of yellow at base of dorsum.

Gracilaria glutinella, new species.

Face yellow; head and thorax reddish bronze; labial and maxillary palpi straw color, the labial palpi shaded with dark brown just before apex, darker outwardly. Antennæ brown annulate with yellowish at the joints of segments. Abdomen pale yellow gray above, pale yellow below. Front and middle legs with white tarsi very faintly touched with a few dark scales at the joints, tibiæ and femora reddish bronze; hind legs with tarsi and tibiæ pale yellowish gray, the tibiæ shaded with brown near the tarsal joint, femora and coxæ pale yellow at their juncture, elsewhere reddish bronze. Fore wings reddish bronze with some straw colored scales most abundant toward the apex, along the costa; a shining golden triangle on the costal margin reaching from the basal fourth to just beyond the middle of the costa, the apex extending to the fold where it is somewhat truncated; two dark lines in the cilia around the apex; the rest of cilia gray. Hind wings dark gray; cilia paler. Expanse, 12-13 mm.

Type, Cat. No. 19327, U. S. Nat. Mus.

The above description is taken from a specimen bred from a cone rolled in a leaf of *Alnus glutinosa*, collected July 3, 1912, in East River, Connecticut. Adult issued July 14th. Four others collected July 3 to 22, issued July 14 to August 4.

From material collected from the same food plant during August, 1914, imagoes appeared in September, which are believed to represent a later brood of *glutinella*. In this form the bright yellow is dulled to a yellow gray or straw color, and the dark brown assumes a deeper purplish tint. The general appearance of the insect is so different from the typical *glutinella* that a description is here given.

Face, and comb of scales over face, pale yellowish, edged with brown at the sides; crown darker, somewhat more straw colored. Labial palpi straw colored, shaded throughout with dark purple, terminal joint with heavy annulation of nearly black scales just before tip. Maxillary palpi straw colored,

shaded outwardly with dark purple, except at the base of the terminal joint. Antennæ dark brown annulate with whitish at the joints of the segments. Fore wings and thorax dark purplish, intermixed with straw-colored scales; a costal triangle similar in form to that of *coroniella* or *glutinella* is faintly discernible, with the help of a hand lens, the ground color pale straw, but almost completely overlaid with dark purple. Cilia gray, the apical cilia almost concolorous with the wings, with two dark lines about the apex. Hind wings smoky gray with paler cilia. Front and middle legs with nearly white tarsi, marked at the tips of the segments with dark purple, other joints dark purple, tibiæ tufted; hind legs straw color, heavily shaded with dark scales outwardly, femora concolorous with abdomen near coxal joint, the remaining portion shaded with dark purple outwardly. Abdomen straw color, somewhat shaded with dark scales above. Expanse, 13 mm.

The larva in the late form has the following habits. A winding linear mine is first made, on the under side of a leaf, ending in a small blotch which is generally near the edge of the leaf. After leaving the mine it turns the edge of a leaf downward, making a single elongated fold. Probably more than one of these folds may be made by the same larva. When nearly full grown it leaves this shelter and rolls the tip of a leaf downward into a rather long cone, which is abandoned when it is ready to spin its cocoon, which is of the usual form.

This insect is very near *coroniella*, from which it can be distinguished by its dark head and thorax and the darker ground color of the wings.

Gracilaria flavella, new species.

Face pale yellowish. Labial and maxillary palpi pale yellowish. Crown and thorax yellowish straw color with purplish iridescence. Antennæ yellow gray annulate with brown. Fore wings a yellowish tan color bordered on the costa with bright straw color. Cilia about the apex straw intermixed with tan, elsewhere yellow gray. Hind wings and cilia yellow gray. Abdomen yellow gray above, anal tuft and lower side

of abdomen pale straw. Front and middle legs dark brown, except the tarsi, which are white, dotted at the tip of each joint, with dark brown. Hind legs with yellow gray tarsi and tibiæ, femora straw color shaded with brown near base. Expanse, 10 mm.

Type. Cat. No. 19328, U. S. Nat. Mus.

Described from one of a series of four specimens reared from cones on *Myrica cerifera* L., collected on June 29, 1912. Adults emerged July 11 to 18.

The mines made by this species are on the under side of the leaf and are very small. There is first a narrow linear mine, a few millimeters long, ending in a blotch about 3 or 4 mm. in length by $1\frac{1}{2}$ to 2 mm. in breadth, usually near an edge of the leaf. The cones are made by rolling the tip of the leaf downward.

The general appearance of this species is that of a very small and pale form of *clongella* L.

Gracilaria flavimaculella, new species.

Face pale yellow brown, mixed with dark brown; head similarly marked, but with more dark brown; thorax pale yellowish brown with a few dark brown scales; antennæ pale yellow brown, ringed with dark brown between the joints; labial palpi straw color heavily shaded outwardly with brown, the terminal joint completely brown outwardly, except at the extreme base and apex; maxillary palpi straw colored shaded with brown; fore wings brown, with somewhat diffuse markings of pale yellow brown, the yellowish color being most evident along the fold, the dorsal margin, and the costal margin beyond the middle, where it has the appearance of two indistinctly outlined spots; abdomen dark brown above, with anal tuft and under side pale yellow brown tending toward straw color; front and middle legs with straw colored tarsi marked with brown at the joints, the tibiæ and femora dark brown; hind legs straw color, the tarsi and femora slightly shaded and the tibiæ almost completely covered with dark scales. Cilia gray with diffuse blackish lines toward the apex along the dorsal margin; hind wings dark smoky gray, with paler cilia. Expanse, 10 mm.

Type, Cat. No. 19329, U. S. Nat. Mus.

Described from one of a series of more than a dozen specimens taken at light in East River, Connecticut, from July 15 to September 5, 1912.

Gracilaria minimella, new species.

Venation: fore wings with 11 veins, 4 and 5 connate, 3 absent; hind wings 7 veins, 4 absent.

Face whitish; crown and thorax ochreous; antennæ ochreous with darker annulations; labial palpi yellowish, second joint black at apex and terminal joint annulate with black; maxillary palpi yellowish white, tipped with black; fore wings mixed dark brown and pale ochreous scales. There seems to be no definite pattern but the whole costal area of the wing is rather paler than the remaining portion. This gives the effect of a pale, somewhat obscure, ochreous band, within which there are a number of small scattered black spots. Cilia of fore wings gray, intermixed with black about the apex. Hind wings smoky gray, cilia paler; abdomen dark brown gray above, slightly lighter with yellowish scales below, with anal tuft a contrasting straw color. Front and middle legs with whitish tarsi, the joints tipped with brown, other joints dark brown; hind legs with yellowish tarsi and tibiæ, dark smoky above. Expanse, 9 to 9.5 mm.

Described from one of a series of about a dozen specimens taken at light in East River, Connecticut, during July and August, 1910.

Type Cat. No. 19330, U. S. Nat. Mus.

Gracilaria fraxinella, new species.

Face nearly white; crown and comb of scales over face gray, expansible tufts of scales on either side of crown; antennæ whitish annulate with black; labial palpi, with pronounced tuft on the second joint, gray in color shaded with black below and outwardly, apical joint much darker than second, except the extreme tip, which is white; maxillary palpi whitish, marked with black toward the tip of the second and in the middle of the terminal joint. The fore wings are a mottled gray in color. Under a hand lens the ground color is seen to consist

of a mixture of white and ochre, with irregular patches of black. There are three very indistinct and broken fasciæ of black, intermixed with white scales; the first extends obliquely inwardly nearly reaching the fold beyond which it continues half way to the costal margin; the second begins at the costa one-third from base and continues obliquely outwardly to near the fold beyond which there is a small patch of the same shading parallel to the first fascia; the third parallel to the second, and near the middle of the wing, consists of barely more than a patch on the costa and another slightly elongated spot along the fold. Beyond these dark areas the shading is irregularly distributed, giving a very mottled appearance. The apex of the wing is bordered with black extending around the apex and well into the dorsal cilia, there are two black lines in the apical cilia, elsewhere the cilia are gray. Hind wings dark smoky gray, cilia paler. Middle and front legs covered with mixed black and white scales, the tarsi more white inwardly. Hind legs yellow gray, heavily shaded with black. Abdomen smoky gray above, whitish below. Expanse, 13 to 14 mm.

This species is described from one of a series of more than a dozen specimens. Cones collected June 29, 1912, and imagoes issued July 13 to 21, 1912. On the leaves of *Fraxinus* species at East River, Connecticut.

This insect has been bred from ash by W. V. Slingerland, at Ithaca, N. Y. (Can. Ent., p. 96, 1893), and by Miss A. F. Braun, near Oxford, Ohio (Can. Ent., p. 160, 1912). In each of the above cases the insect was identified as *Coriscium culculipennellum* Hb., to which it is indeed very similar. The fasciæ are, however, much more broken in the case of *fraxinella* than in the European species, and lack the white shading, just before the fasciæ, which is usually quite evident in the case of the latter.

Although it is necessary to place this insect under the genus *Gracilaria*, as it is now defined by Meyrick, the genus *Coriscium* not being recognized, it should be noted that it differs very widely from our other species of *Gracilaria* in its habits in forming its cocoon. This is spun suspended within the

cone, long and spindle shaped, and near one end of the cone the leaf is prepared for the emergence of the adult. Upon emergence the pupa is thrust through the previously-prepared portion of the leaf, and the empty skin is left protruding from the cone. (See figure in Kellogg's American Insects, p. 378, 1908.)

Gracilaria quercinigrella, new species.

Venation: Fore wings 12 veins, all separate, 3, 4 and 5 somewhat approximate, 2 far from angle of cell; hind wings with 9 veins, 8 ending at the hump on costa and extra vein arising out of the base of 7 just below the hump.

Face pale gray. Crown somewhat roughened, expansible tufts above eyes. Labial and maxillary palpi white with a few dark scales which are more abundant outwardly and toward the tips of the joints; the second joint of the labial palpi with a distinct tuft. Thorax and fore wings with a white ground color overlaid by numerous yellowish and black-tipped scales, giving an ashy gray appearance; the markings very poorly defined, the basal area of the wing above the fold dark gray, below the fold much lighter, just beyond this dark area is a pale gray fascia which extends, slanting outwardly, clear across the wing, beyond this the pattern is indistinct, but there seems to be a faint indication of several concave, whitish fasciæ toward the tip of the wing. The cilia are white with two lines about the apex. Hind wings pale gray. On the under side the fore wings, a portion of the hind wings and the legs are heavily shaded with red-brown. The front and middle legs have whitish tarsi annulate with rusty brown at the tips of the segments, the tibiæ and femora nearly covered with red-brown, hind legs yellowish, tarsi and tibiæ unshaded, femora and coxæ shaded with red-brown. Abdomen yellow gray above, whiter on under side speckled with brown. Antennæ about as long as fore wings, pale yellow gray annulate with brown. Expanse, 10 mm.

Type, Cat. No. 19332, U. S. Nat. Mus.

Described from one of a series of four specimens, bred from cones on *Quercus nigra* L.; collected June 30 to July 1,

1912, at East River, Connecticut; adults emerged September 3 to 25, 1912.

This insect appears difficult to rear, the four specimens having been obtained from a large number of cones containing active and apparently healthy larvæ. A careful examination of the leaves on which the cones were found did not reveal anything which looked as if it might be the mine of this species. The cone is very peculiar. It is not made by rolling the leaf, but by bending under a single lobe and fastening down its edges to the flat surface of the under side of the main portion of the leaf. Along the margin where the cone is fastened together the leaf is eaten through in a row of small holes.

The larva is whitish in color, but appears brownish between the segments, giving it a ringed appearance. It seems to be more active than most other *Gracilaria* larvæ, and there is an unusually long interval between its early stages and the appearance of the imago. Larvæ which were apparently full grown the first week in July, wandered about the breeding jars for nearly a month before spinning their cocoons, and did not emerge as adults until September.

This species is probably also to be found on other oaks than *Q. nigra* L. Cones similar to those above described were found on red oak. None were, however, noticed on any of the white oak group.

***Gracilaria ostryaella* Chambers.**

In the Ent. News for April, 1912, Miss A. F. Braun notes that the single specimen which she reared from a larva mining the upper side of a leaf of *Ostrya*, was identical with those obtained from larvæ mining the under side of *Carpinus*. The writer was enabled through the abundance of the material afforded, during the summer of 1914, to obtain a series of 19 specimens from *Ostrya* and 25 from *Carpinus*. Although there was a great variation in the specimens, taken as a whole, it was not possible to find any satisfactory characters for separating the two series. It hardly seems possible that the same species should have such different habits when feeding

upon two closely allied food plants, but from the imagoes it is practically impossible to tell from which food plant they have been reared. No under side mines were found on *Ostrya*, such as Miss Braun describes, but a single mine was found on the *upper side* of *Carpinus*, which was in all respects like the typical mine on the upper side of *Ostrya*.

The writer wishes to here acknowledge his indebtedness to Mr. August Busck for his generous help and advice upon many occasions in the course of the preparation of this paper.

TWO NEW LEPIDOPTERA FROM THE ANTILLES

By HARRISON G. DYAR

Ctenucha hilliana, new species.

Black; occiput and palpi orange-red. Fore wing black with blue-green reflection, strongest at base; fringe narrowly white. Hind wing black with very bright blue reflection. Abdomen blue, last two segments above and half of venter orange-red. Expanse, 40 mm.

Type, male, No. 19321, U. S. Nat. Mus.; Columbia, Isle of Pines, April, 1914 (H. D. Hill).

Laetilia portoricensis, new species.

Gray; basal space light; inner line whitish, erect, inbent in cell, followed with deep black, which forms a patch in the indentation; a whitish subcostal stripe from beyond inner line to near outer, with a central black dash on costa and annular black discal spot in its lower edge; black streaks more or less distinct along discal and submedian folds; outer line pale, relieved by dark clouding, strongest subapically, gently outbent in middle third; margin light, with indistinct terminal dots. Hind wing dark fuscous. Expanse, 11 mm.

Type, female, No. 19323, U. S. Nat. Mus.; Rio Piedras, Porto Rico, November 23, 1913 (T. H. Jones).

NEW ANDEAN SPALLANZANIINE FLIES

By CHARLES H. T. TOWNSEND

Chætocnephalia, new genus.Genotype, *Chætocnephalia alpina* Townsend, new species.

Differs from *Cnephalia* by the parafacial bristles being as strong as frontals and peristomals, and arranged in two irregular rows. Front tarsi of female not appreciably widened; head longer, parafacials about two-thirds width of eye; female with two proclinate outer and three or four reclinate inner orbital bristles, the latter closely approximated or bunched; second arisal joint about three times as long as wide, third antennal joint of female but little longer than the elongate second joint; two rows of inwardly directed frontal bristles on each side in the female; beside the two rows of strong parafacial bristles there is a third row of weak ones along orbit. Facialia not ciliate, a few bristles immediately next vibrissæ; proboscis horny, stout, slightly longer than head-height; palpi long, curved, a little thickened apically; post-vertical bristles small and short, normal, only one pair; only one occipitocentral bristle on each side. Four sternopleural and four postsutural bristles. Abdomen of female flattened, macrochætæ only marginal. Apical cell closed in border far before wing-tip, hind crossvein nearer bend, last section of fifth vein nearly or quite one-half as long as preceding section, costal spine quite long, third vein bristly only at base.

Chætocnephalia alpina, new species.

Length of body, 9.5 mm.; of wing, 8 mm. One female, Oroya, Peru, March 7, 1913 (Townsend). On short herbage.

Blackish in ground color, submarmorate with silvery white. Whole face and front strongly silvered, except the black ocellar area, the faintly silvery frontalia and the pale yellowish prominent epistoma; the varying incidence of light presents successively dark parafacials except a silvery fleck above and below on orbital margin, a broad transverse band of dark from eye to eye across antennal base extending broadly along orbits to vertex, and lastly a broad dark stripe taking up the pos-

terior two-thirds of each parafrontal except the narrow inner margin. Antennæ and palpi black; occiput silvery, with yellowish-white beard. Mesoscutum showing four broad black and nearly equal vittæ, leaving five nearly equal silvery vittæ, of which the middle one shows a decided yellow shade behind the suture; pleura very faintly silvery, showing principally as a spot on the front half of the pteropleura, another spot immediately below on the bristled area of the sternopleura, both of these with a faint golden shade in some lights, and a white fleck in front of the uppermost hypopleural bristles; also a large silvery spot on the mesopleura, whose lower posterior portion is deeply golden; humeri silvery; scutellum testaceous, blackish at lateral angles, faintly silvery. Abdomen rather shining on last two segments and middle of second, showing faintly silvery on first two segments except middle; narrow median stripe of dull golden pollen on second and third segments, four flecks of golden pollen on front border of third segment, four flecks of golden on front border of anal segment and a fifth rust-gold fleck on extreme tip; the flecks of third segment change to silvery in some lights and spread over all of segment except middle. Venter largely shining, silvery on first segment with golden anterior margins or flecks on the other segments. Legs black, the femora and tibiæ with a faint silvery bloom on the outside. Wings clear, the veins yellowish except apical and hind crossveins; extreme base faintly tinged with yellowish. Tegulæ white, narrowly bordered with pale yellowish.

Holotype, No. 19415, U. S. Nat. Mus.

Dolichocnephalia, new genus.

Genotype, *Dolichocnephalia puna* Townsend, new species.

Dolichocephalic type of the Spallanzaniine group. Head much elongated, the parafacials but little less than eye-width. Front tarsi of female noticeably widened. Claws of male greatly elongated, especially front and middle ones which are far longer than last tarsal joint, being sometimes nearly twice as long; the hind ones shorter. Apical cell open, or rarely closed in margin. Last section of fifth vein nearly or quite

half as long as preceding section. Second arisal joint only moderately elongate, rarely half as long as third joint even in male. Cilia of male facialia marked, always strong and quite thickly placed, ascending well over halfway; often weaker in female.

Male lacking outer proclinate fronto-orbitals, female with two. Both sexes with about three inner reclinate fronto-orbitals. Both verticals strong, inner ones a little convergent but not decussate, outer ones strongly divergent and shorter; same in both sexes. Two rows of convergent frontals on each side; two rows of convergent macrochætæ on parafacialia of equal strength with frontal rows. Third antennal joint of female only a little longer than the strongly elongate second, about one and one-third times as long; that of male about two and one-half times as long as the much less elongate second. Second arisal joint is usually conspicuously longer in male than in female, sometimes twice as long. Cilia of facialia wholly or partly doubled in male, single-rowed in female. Proboscis about one and two-thirds times head-height, slender; palpi slender, filiform, slightly thickened at extreme tip, distinctly shorter than front metatarsi. Cheeks about two-fifths eye-height in both sexes. Front of male but little narrower than that of female, the front very gradually narrowing from face to vertex, the face at root of antennæ about one-half head-width. Epistoma greatly and abruptly produced, subhorizontal or faintly sloping, wedgelike in profile, the lower edge oblique. Four sternopleurals; four postsuturals, but next to front one often atrophied. Scutellum with three strong laterals, an erect divergent shorter apical pair, and a still shorter discal pair. Abdominal macrochætæ only marginal. Costal spine vestigial. Apical cell ending far before wingtip. Hind crossvein near to bend, nearly parallel with apical, no stump but at most wrinkle at bend. Hind crossvein irregular. Abdomen with long bristly hairs, longest on anal segment. Macrochætæ very long, middle and hind tibiæ also with long ones. Female claws strong, but not over half as long as those of male. The frontal and peristomal profiles are subparallel in male, only slightly convergent anteriorly; in female they are

conspicuously convergent anteriorly, due to shorter face in female, which in turn is due to shorter antennæ. The genus may be distinguished at once from *Dolichogonia*, another dolichocephalic form of the same group, by the facialia being widened and flattened, and the palpi and postvertical bristles short.

***Dolichocnephalia puna*, new species.**

Length of body, 9 to 10 mm.; of wing, 7.5 to 8 mm. Five males and eight females, March 6 and 7, 1914; one female, May 7, 1914, Oroya, Peru, over 12,000 feet, on short herbage in Rio Mantaro Valley above town (Townsend), a pair in copula March 6.

Black, first two antennal joints rufous, palpi and epistoma fulvous. Face, cheeks, and front silvery-white burnished, the parafrontals showing the dark ground-color and a faint brassy tinge in oblique lights. Frontalia blackish. Mesoscutum pollinose with pale golden, leaving four heavy equal black vittæ, uninterrupted and all reaching scutellum; latter rufous to testaceous, narrowly blackish on base and sides. Abdomen showing silvery pollen on first three segments, the pollen fainter on third; with ill-defined median vitta of old-gold. Hind tibiæ testaceous. Wings nearly clear, faintly tawny on extreme base. Tegulæ nearly white, the narrow margins tawny.

Holotype, female; allotype, male, on same pin, being the pair in copula and still united. No. 19416, U. S. Nat. Mus.

***Germariopsis*, new genus.**

Genotype, *Germariopsis* Townsend, new species.

Differs from *Dolichocnephalia* as follows: Head only a little elongate, parafacialia only two-thirds eye-width. Front tarsi of female not widened. Claws of male no longer than last tarsal joint, but little longer than those of female, front ones a little longer than others. Apical cell rather long-petiolate to short-petiolate, rarely closed in margin. Last section of fifth vein almost always conspicuously less than one-half length of preceding section. Second arisal joint much longer, in male often nearly as long as third. Cilia of facialia in both sexes weak, often straggling and even vestigial.

Third antennal joint of female one and one-half times as long as second, that of male nearly or about three times as long as second. Two reclinate inner fronto-orbitals in female, one in male. Proboscis about twice head-height, or somewhat more. Epistoma not quite so strongly produced. Four post-sutural bristles. Bristly hairs of abdomen shorter, normal. Claws of female not as long as last tarsal joint, those of neither sex strong. Head profile more nearly alike in both sexes.

Germariopsis andina, new species.

Length of body, 8 to 10 mm.; of wing, 6 to 8 mm. Forty-three females and eight males, September 29 and 30, 1912; two females and one male, December 5, 1912, on herbage and flowers during cool moist season, upper slopes of San Cristobal Hill, Lima, Peru, and hills adjoining, about 800 to 1,200 feet (Townsend).

Black, silvery pollinose. Face, cheeks, and front silvery-white, parafrontals showing a decided golden shade, frontalia brown to blackish; first two antennal joints rufous, palpi fulvous, epistoma pale yellowish; occiput cinereous. Thorax silvery with faint golden shade; four equal broad black vittæ, the inner pair reaching not quite halfway between suture and scutellum, the outer pair stopping a little short of scutellum; latter testaceous, with silvery pollen, blackish on sides, dusky on base in middle. Abdomen silvery-white on narrow front margins of segments 2 to 4, widening a little on sides, the fasciæ connected by a median vitta of silvery, the fascia of anal segment with a faint brassy tinge; the rest of tergum with an obscure subopaque to subshining brassy covering producing a submetallic effect; venter thinly silvery. Hind tibiæ faintly reddish, rest of legs black. Wings nearly clear, faintly tawny at base. Tegulæ white, the hind scale pearly. Both sexes colored alike.

Holotype, No. 19417, U. S. Nat. Mus., female. Allotype, male.

Dolichogonia, new genus.

Genotype, *Dolichogonia aurca* Townsend, new species.

Differs from *Dolichocephalia* as follows: Arista shorter,

second joint only about twice as long as wide. Three outer or lower proclinate fronto-orbitals in female, two inner or upper reclinate. Postvertical bristles as long and strong as ocellars. Palpi long, curved, slender, very gradually thickening toward tip, distinctly longer than front metatarsi. Parafacials rather wider than the deep facial depression (equals facial plate plus facialia), the facialia on edge and not widened or flattened. About three irregular rows of macrochætæ on parafacials. Four strong sternopleurals and four postsuturals. Apical scutellar pair of bristles little longer than the discal pair. Hind crossvein not so close to bend, no wrinkle at latter.

Dolichogonia aurea, new species.

Length of body, 10 mm.; of wing, 8 mm. One female, Oroya, Peru, over 12,000 feet, March 7, 1913 (Townsend).

Black, golden on upper parts. Head silvery pollinose, parafrontals deep golden. Frontalia black, broad, equilateral. First two antennal joints rufous, palpi light rufous. Three golden vittæ on mesoscutum, also lateral vitta along edge golden, the golden humeri confluent with latter, and isolated golden spot on mesopleura; four broad black vittæ, equal and reaching scutellum; latter testaceous on disk, golden pollinose. Abdomen thickly and densely golden pollinose on tergum, leaving a faint median black vitta and black spots on origins of macrochætæ; anal segment black, with four large golden spots on front half which are confluent on extreme base of segment. Venter black, faint silvery bloom showing, with flecks of golden along incisures. Hind tibiæ dark rufous, front femora silvery on outside. Wings nearly clear, deep yellow on base. Tegulæ nearly white, margined with yellow.

Holotype, No. 19418, U. S. Nat. Mus. TD4118.

Chætocraniopsis, new genus.

Genotype, *Chætocraniopsis chilensis* Townsend, new species.

Allied to *Chætocrania*, from which it differs by the less prominent front, less swollen head, narrower parafrontals and parafacials, arista shorter and thickened evenly to tip. The apical cell ends unusually far before wing-tip, the fourth vein is bent at a right angle, its last section strongly bent in. The

bend of fourth vein is far removed from hind margin of wing, being almost as close to the front as to the hind margin.

Chætocraniopsis chilensis, new species.

Length of body, 10 mm.; of wing, 6.5 mm. One male, Chile (E. C. Reed).

Dark brown or blackish, parafrontals and parafacials silvery white pollinose, cheek grooves brownish rufous, palpi yellow, second antennal joint rufous, third antennal joint and fascial plate blackish with a faint silvery bloom, arista soft black. Mesoscutum thinly silvery, leaving four equal vittæ; scutellum pale fulvous, thinly silvery; abdomen rather thickly silvery pollinose on second and third segments except narrow hind margin. Legs wholly blackish, hind tibiæ with unequal bristles, claws slightly longer than last tarsal joint. Wings nearly clear, showing no yellowish at base; tegulæ white.

First and second abdominal segments of male with a median marginal pair of macrochætæ, the first segment with one lateral marginal, the second with two or three lateral marginal, the third and fourth with closely set marginal row. Apical pair of scutellar bristles rather short, erect; three long lateral pairs, and one shorter discal pair. Front of male about as wide as both eyes, face slightly wider; facial depression deeply excavated, about as wide as parafacials; cheeks of male a little less than one-half eye-height.

Holotype, No. 19419, U. S. Nat. Mus.

NEW PERUVIAN HYSTRICIINE FLIES

By CHARLES H. T. TOWNSEND

Neogymnomma, new genus.

Differs from *Gymnomma* as follows: Cheeks of female about two-thirds eye-height. Parafacials with bristly hairs, one facio-orbital bristle present. No ocellar bristles. Third antennal joint no longer than the elongate second, very wide and truncate at end. Second aristal joint very elongate. No palpi. Front tarsi of female widened. Abdomen thickly beset with slightly curved subspinelike macrochætæ, scutellum with same. Cubitus with wrinkle only.

Neogymnomma rufa, new species.

Length of body, 9.5 mm.; of wing, 9.5 mm. One female; Huariaca, Peru, high montanya of the Rio Huallaga Canyon, about 10,750 feet, December 21, 1913 (Townsend).

Rufous to lighter. Face and cheeks light in ground color, pale golden pollinose; parafrontals blackish, old-gold pollinose. Frontalia and first two antennal joints pale rufous, also a tinge of same on base of third, rest of third joint blackish. Occiput golden, with pale gold beard. Bristly hairs of parafacials, parafrontals and cheeks black, those of cheeks shorter. Mesoscutum old-gold pollinose; four narrow olive vittæ, the inner ones stopping a little behind suture, the outer ones interrupted and stopping short of scutellum. Mesopleuræ old-gold, rest of pleuræ paler golden. Scutellum light rufous, with pale golden pollen. Abdomen wholly rufous above and below, the tergum deeply colored and the venter paler, showing a very faint grayish bloom changing to pale golden along incisures, especially on base of anal segment. Legs pale rufous, about same as venter and hardly lighter than base of antennæ. Wings uniformly smoky, with a barely perceptible flavous element. Tegulæ smoky-blackish, with yellowish margins.

Holotype, No. 19420, U. S. Nat. Mus. TD4215.

Uruhuasiopsis, new genus.

Genotype, *Uruhuasiopsis analis* Townsend, new species.

Differs from *Uruhuasia* (Subgenus A) as follows: Male front at vertex decidedly less than eye width; a long hair-like proclinate pair of ocellar bristles; proboscis about one and three-fourths times head height; palpi slender, nipple-like, tipped by two hairs. Frontal bristles anteriorly in double row; five pairs back of root of antennæ not counting the strongly divaricate upper orbital pair in row with them. Three sternopleural, four postsutural, three postacrostichal, two preacrostichal, and three dorsocentral bristles. Abdomen no wider than thorax, narrow-oval; second segment with a median discal and a median marginal pair; third segment with median discal and marginal row; fourth with discal row, and submarginal and marginal

bristles. Apical cell not so elongate, ending one and one-half times as far from wing-tip as length of fourth vein between hind crossvein and bend, said length being hardly one-third of length between hind and small crossveins. Lateral discals of second and third segments weak, especially those of second. Apical decussate moderately strong pair of scutellar bristles, hardly one-half strength and length of the two lateral pairs, about same as the four discals which are set in a transverse row. Claws longer than last tarsal joint in male, especially front ones. Epistoma extremely developed, about as long as clypeus and of same size.

Uruhuasia (Subgenus B) has frontal bristles doubled anteriorly, but otherwise agrees in main with *Uruhuasia* (A) as opposed to *Uruhuasiopsis*.

***Uruhuasiopsis analis*, new species.**

Length of body, 9 mm., the abdomen being flexed; of wing, 8.5 mm. One male, Huariaca, Peru, about 10,725 feet, December 20, 1913 (Townsend).

Head silvery pollinose with a faint golden reflection which is most pronounced on cheeks, the ground color of face and cheeks being light; parafrontals dark in ground color, with golden pollen; frontalia and first two antennal joints fulvous, third joint and arista blackish, palpi fulvous. Beard deep brassy, extending over cheeks and parafacials; the hairs of parafrontals black. Mesoscutum and scutellum covered with a thick coat of golden pollen of the same dull shade as that of front, no distinct vittæ; pleuræ a little less thickly pollinose in an oblique band extending from the shoulder to the middle coxæ. Abdomen deep purplish black, subshining, anal segment with coat of golden ashy pollen except narrow anterior margin. Venter concolorous with tergum. Legs blackish, tibiæ except bases rufous. Wings evenly smoky throughout, slightly yellow on base; both scales of tegulæ rich brownish yellow.

Holotype, No. 19421, U. S. Nat. Mus.

***Pictoepalpus*, new genus.**

Genotype, *Pictoepalpus clarus* Townsend, new species.

Differs from *Chromoepalpus* by the second arisal joint being

very elongate; third antennal joint not rounded at tip, but truncate and subangular, much widened apically especially in male; wings shorter in proportion; apical cell not so elongate and not so widely open, ending farther before tip; apical cross-vein not bowed in conspicuously, a wrinkle at its origin which latter is not so close to hind margin; discal macrochætæ of second segment sparse, there being only a pair or two of discals the same as on third and anal segments. Anal segment with buttocks-bunches of macrochætæ in both sexes. Front tarsi of female much widened.

Pictoepalpus clarus, new species.

Length of body, 10 to 11 mm.; of wing, 9.5 to 10.5 mm. Three males, one taken at Tamboraque, Peru, about 9,000 feet, April 3, 1910; the others taken at Matucana, Peru, about 8,000 feet, August 16, 1913, and May 1, 1914, the last being TD4256 (Townsend).

Ground-color clear light yellow. Head with silvery pollen, that of facial plate white, the rest of head with a golden tinge even including front. Frontalia and first two antennal joints rufous, third joint and arista black. Mesoscutum and scutellum wholly clear testaceous, silvery pollinose with a faint golden tinge, leaving more or less distinct remnants of seven narrow vittæ; pleuræ, coxæ, and femora practically the same testaceous shade as mesoscutum; tibiæ rather more fulvous, metatarsi rufous, rest of tarsi black. Abdomen broadly light yellow on sides of first three segments, leaving a clear testaceous subtriangular marking on second and third segments, that of third segment larger than that of second, a small fleck of the same color on lateral hind angle of second segment, a patch of same color in middle of first segment beneath scutellum, the anal segment entirely the same color extending on hind lateral angles of third; the testaceous portions of abdomen are clothed with the same pollen as that of mesoscutum. Venter wholly clear light yellow, except anal segment and narrow hind corners of second and third segments. In some specimens the testaceous of thorax and abdomen is considerably darker, especially on median triangles of abdomen

and on buttocks spots of anal segment. Wings quite evenly smoky, a whitish oblique area extending from base of discal cell to end of first vein, sometimes invading the base of fourth posterior cell and most of second costal cell, often distinctly tinged with yellow; extreme base of wing yellowish, a blackish area immediately next to same. Tegulæ yellowish testaceous, matching the color of the thorax.

Holotype, No. 19422, U. S. Nat. Mus.

Two females, measuring 12 to 13 mm., taken with the above male at Tamboraque, resemble same in the darker coloration of abdomen and thorax, and are probably the females of this species. The light patch of the wings is only faintly evident in the female.

Vibrissoepalpus, new genus.

Genotype, *Vibrissoepalpus flavipes* Townsend, new species.

Differs from *Vibrissomyia* as follows: Female only described. Vertex one and one-fourth times eye-width. Cheeks about three-fourths eye-height. Two proclinate fronto-orbitals. No ocellar bristles. Only one row of frontals. No isolated facio-orbitals, but parafacials with a row of rather closely set fine bristles of same strength as those of cheeks. Third antennal joint hardly longer than second, straight on front border, moderately widened, truncate at tip but truncation very slightly oblique. Proboscis below geniculation a little less than head-height. Two strong lateral scutellar bristles, a long hair-like nondecussate apical pair; rest of scutellum with spines, in about four irregular rows, the hindmost row submarginal. Abdomen much wider than thorax, rounded short-oval; second segment with median discal patch of spines not quite so wide as scutellar patch, the anterior middle ones shortest; third segment with a smaller median discal patch; second and third segments with marginal row interrupted opposite the discal patches, and with patch of lateral discals; anal segment covered with spines except from margin. Venter with bunches of spinelike macrochætæ. The macrochætæ of abdomen are truly spine-like but not heavily so. Heavy long spines on middle and hind femora and tibiæ. Claws hardly

as long as last tarsal joint. Front tarsi of female widened.

Vibrissoepalpus flavipes, new species.

Length of body, 13 mm.; to end of spines, 15 mm.; of wing, 12 mm. One female, Pachacayo, Peru, about 12,000 feet, on flowers of *Viguiera* sp., March 27, 1913 (Townsend).

Whole face and cheeks deep buff-yellow, satiny, with gold pollen; parafrontals dark olive, produced by the thin gold pollen over black. Frontalia testaceous-brown; first two antennal joints nearly same shade of brown, third joint blackish. Occiput brassy pollinose, with brassy beard. Thorax about same as parafrontals, four dark olive vittæ faintly showing. Scutellum rufous, thinly silverly pollinose. Abdomen deeper rufous, with faint suggestion of silvery pollen on median line and along incisures. Legs bright fulvorufous, tarsi light lemon-yellow. Wings evenly light smoky, darker at base. Tegulæ deeply smoky.

Holotype, No. 19423, U. S. Nat. Mus. TD4137.

Eumelanepalpus, new genus.

Genotype, *Eumelanepalpus ruber* Townsend, new species.

Differs from *Melanepalpus* as follows: Proboscis beyond geniculation as long as head-height. Second abdominal segment with discal bunch of macrochætæ covering median space from front margin back to marginal row. Hind marginal rows of second and third segments not broken. The last character also distinguishes the genus from *Quadratosoma*. The abdominal macrochætæ are quite as in *Rhachoepalpus*, but the genus differs from latter in absence of ocellar bristles, and in the elongate proboscis. The form of abdomen is quite as in *Melanepalpus*; and also nearly like that of *Rhachoepalpus*, but not so widened behind as in females of latter.

Eumelanepalpus ruber, new species.

Length of body, 13 mm.; to end of spines, 14.5 mm.; of wing, 13 mm. One female, Uruhuasi Bridge, Peru, montanya of the Rio San Gaban Canyon, about 6,500 feet, February 3, 1910, on flowers of *Baccharis* sp. (Townsend).

Head dull yellowish, parafrontals black, whole head thinly

silvery pollinose. Frontalia brownish-rufous. Antennæ blackish. Thorax black, very thinly silvery, median pair of vittæ visible only in front. Scutellum wholly rufotestaceous. Abdomen deep rufous throughout above and below, segments 2 to 4 with median blackish triangle on base. Legs same rufous as abdomen, tarsi black. Wings deeply smoky throughout. Hind scale of tegulæ yellow-rufous, with short whitish fringe; front scale deep blackish-smoky, with long black fringe.

Holotype, No. 19424, U. S. Nat. Mus. TD3938.

Euquadratosoma, new genus.

Genotype, *Euquadratosoma rubrum* Townsend, new species.

Differs from *Eumelanepalpus* as follows: Female only described. No reclinate inner fronto-orbital immediately inside of the posterior proclinate one. Front at vertex occupying fully one-third head-width. Cheeks fully two-thirds eye-height. Proboscis beyond geniculation about two-thirds head-height. Marginal row of macrochætæ of second segment arcuate in middle, being bulged forward from hind margin on median line. Marginal row of third segment broadly interrupted on median line. Buttocks bunches of spines not continuous, well separated, the anal segment more deeply emarginate. Joints of all the tarsi rather wide, those of front and middle legs quite noticeably so. Apical cell much more widely open, ending a little nearer to wing tip.

Euquadratosoma rubrum, new species.

Length of body, 13 mm.; to end of spines, 14.5 mm.; of wing, 12.5 mm. One female, Ollachea, Peru, high montanya of the Rio San Gaban Canyon, about 9,500 feet, February 2, 1910, on flowers of an euphorbiaceous shrub (Townsend).

Differs in color from description of *Eumelanepalpus ruber* only as follows: Face and cheeks irregularly tinged with rufous or testaceous. Thoracic vittæ scarcely distinguishable. Scutellum narrowly edged with black on base. Abdomen with a broad blackish median vitta, broadest in front, gradually attenuate posteriorly. Femora black on basal half or

more, coxæ largely black. Wings and tegulæ practically same. Holotype, No. 19425, U. S. Nat. Mus.

Eusaundersiops, new genus.

Genotype, *Eusaundersiops notata* Townsend, new species.

Differs from *Saundersiops* as follows: Two short filiform palpal stubs, without bristlets. Proboscis one and one-half times head-height. Second aristal joint but little longer than wide. Abdominal macrochætæ practically spinelike, median discal patch on second segment but none on third, less than posterior half of anal segment spined. A few submarginal to discal lateral on second and third segments. Venter with spine bunches only on plates 1 and 2. Marginal rows of second and third segments continuous. A very weak hairlike proclinate pair of ocellar bristles. Parafacials and parafrontals thickly clothed with long hair.

Eusaundersiops notata, new species.

Length of body, 12 mm.; to end of spines, 13.5 mm.; of wing, 12.5 mm. Two males, east base of Huascaray Ridge, montanya of western edge of Jaen Province, Peru, about 7,000 feet, September 22, 1911, on foliage (Townsend).

Black. Face and cheeks silvery-gray, satiny. Parafrontals blackish, only faintly pollinose. Frontalia brown, showing pollen-bloom in oblique light. Antennæ wholly blackish, articulations faintly rufous. Palpi testaceous. Occiput ashy, beard quite gray. Thorax and scutellum shining greenish-black, very thinly dusted with pollen, latter showing mostly in front where the beginning of three narrow median vittæ is visible. Abdomen shining black, segments 1 to 4 broadly dark rufous on sides; segments 2 to 4 with pair of silvery pollinose spots on base, one on each side of median line, the pair on second segment small, those of anal segment extending over rufous lateral border on venter but appearing in certain lights to be interrupted by the rufous. Legs black, tibiæ tinged with rufous. Wings evenly smoky, darker at extreme base. Hind scale of tegulæ pure snow-white, with short white fringe; front scale deeply smoky, with long black fringe.

Holotype, No. 19426, U. S. Nat. Mus.

A NEW SIMULIUM FROM TEXAS

(*Diptera, Simuliidæ*)

By FREDERICK KNAB

Among the Diptera recently submitted by the Bureau of Entomology for determination occurred the following undescribed species from the vicinity of Dallas, Texas.

Simulium mediovittatum, new species.

Female: Occiput, frons, and face densely whitish gray pollinose, with numerous fine but long silvery hairs; frons broad, above about one-third the width of the head, strongly narrowed toward antennæ. Antennæ rather stout dull ferruginous, tinged with black beyond the second joint and with fine appressed white pubescence. Scutum short, convex, blackish, densely whitish gray pruinose, a median, rather broad, reddish brown stripe extending from anterior margin to posterior fourth; a pair of elongate whitish spots at anterior margin on either side of median stripe, indistinct and only visible in some lights; sublaterally a paler, indistinct brownish stripe, broad and nearly straight; vestiture of rather abundant, small and slender, evenly distributed, yellowish silvery hair-scales; antescutellar area triangularly produced into scutellum, strongly impressed each side of middle. Scutellum narrow, compressed, blackish, gray pruinose, concolorous with scutum, clothed with long, yellowish silvery hairs. Postnotum black, gray pruinose. Pleuræ gray with silvery luster. Abdomen dorsally yellowish gray marked with black; a median series of large, rounded, deep black spots on segments 2-6, touching bases of segments but pale margined at the sides and behind; laterally these segments are blackish with broad apical pale margins; distal segments gray; venter gray. Front legs with the coxæ brownish yellow, the femora blackish, yellowish at base and apex, tibiæ dull yellowish basally and with a white reflection, shading to black beyond the middle; tarsi wholly black. Middle legs with the femora dull ferruginous yellow; tibiæ similarly colored basally and with a whitish sheen, the distal half black-

ish to near apex; first tarsal joint pale, black at apex, second joint with the basal third pale. Hind legs with the femora mostly blackish, the tibiæ whitish to near the middle, black beyond; tarsi with the first joint white basally, black beyond the middle, the second and third joints basally white. Claws simple, slender. Wings hyaline, the venation normal, the coarse veins brownish yellow, the membrane slightly milky, iridescent, but without differentiated iridescent area in the anal field. Halteres pale yellow.

Length: Body about 2 mm., wing 2.3 mm.

Arlington, Texas, October 28, 1914 (F. C. Bishopp, No. 1938); 12 specimens.

Type: Cat. No. 19635, U. S. Nat. Mus.

Closely related to *Simulium griseum* Coquillett; that species differs, among other characters, in the ferruginous scutellum and in the paler legs, the femora and tibiæ of the middle pair being wholly yellow, those of the front legs with only the apices tinged with ferruginous. The male of *S. griseum* shows distinct broad blackish median and sublateral stripes on the scutum, but in a series of females before me (including the three type specimens from Colorado) the scutum is almost uniformly light gray, without trace of median pigmented stripe and only a median impressed line; only one specimen shows a faintly darker median stripe; there are broad whitish lateral margins, absent in *mediovittatum*; the two white spots on the anterior margin of the scutum are larger and more distinct in *griseum*.

Simulium mediovittatum shows considerable variation in the thoracic coloration. The ground-color of the scutum varies from a very pale gray to a darker gray with distinct bluish or greenish blue cast. The median stripe varies from reddish brown through deep brown to black, and is rather broad, although slightly variable in width. The sublateral stripes are obsolete in the darker specimens and in some lights the extreme lateral margins show broadly dark; the whitish anterior spots are also obsolete in the darker specimens.

NEW AMERICAN LEPIDOPTERA CHIEFLY FROM MEXICO

By HARRISON G. DYAR

Family AMATIDÆ (Syntomidæ)

Phoenicoprocta vacillans Walker.

Enomia vacillans Walker, Cat. Lep. Brit. Mus., vii, 1617, 1856. ♂

Phoenicoprocta metachrysa Druce, Ann. Mag. Nat. Hist., (7), i, 404, 1898. ♂

Phoenicoprocta chrysorrhoea Hampson, Cat. Lep. Phal. Brit. Mus., i, 196, 1898. ♂

Leucotmensis thoracica Schaus, Proc. U. S. Nat. Mus., xxix, 186, 1905. ♀

Leucotmensis albigutta Schaus, Proc. U. S. Nat. Mus., xxix, 185, 1905. ♀

The above synonymy appears from a remarkably variable series bred from larvæ by Mr. H. W. B. Moore in British Guiana.

Phoenicoprocta lydia Druce.

Dycladia lydia Druce, Ann. Mag. Nat. Hist., (6), iv, 84, 1889. ♂

Dycladia thera Druce, Ann. Mag. Nat. Hist., (6), iv, 85, 1889. ♂

Dycladia demona Druce, Biol. Cent.-Am., Lep. Het., ii, 347, pl. 71, fig. 29, 1897. ♀

I have no doubt of the correctness of this synonymy, judging from analogy with *P. vacillans*, quoted above.

Family SATURNIIDÆ

Hylesia euphemia Dyar.

Mr. W. Gugelmann reports that the larvæ of this species live in colonies in a common nest, but that they separate before spinning, forming their cocoons separately in angles of branches, among leaves, etc. He finds them on *Psidium pomiferum*.

Hylesia coinopus Dyar.

Mr. Gugelmann finds this species in colonies of 40 to 50, and they all form their cocoons within the communal nest. Also on *Psidium*.

Hylesia umbratula, new species.

Head and thorax ocher brown; abdomen lighter ocher. Wings rusty violaceous, lines brown, both broad and even; subterminal line wavy, irregular, narrow and subobsolete. Hind wing with inner line distinct, outer obsolete; discal dot moderate. Expanse, 38 mm.

Type, male, No. 19322, U. S. Nat. Mus.; Teapa, Tabasco, Mexico, August, 1914 (R. Müller).

Allied to *H. umbrata* Schaus, but lighter throughout, rosy instead of gray.

Family NOCTUIDÆ

Subfamily HADENINÆ

Nephelistis perfurva, new species.

Lilaceous brown; inner line represented by a broad, curved, dark brown shade, extending along median vein to reniform, followed below cell by bronzy to outer line; reniform narrow, oblique, dark filled, obscurely pale ringed; outer line slender, straight, oblique, curved only near costa, narrowly followed by white, then a black band, narrowing toward apex, bordered on its lower half by a narrow white line; terminal space bronzy, narrowing to apex. Hind wing sordid whitish, veins and termen gray powdered. Expanse, 28 mm.

Type, male, No. 19348, U. S. Nat. Mus.; Zacualpan, Mexico, September, 1914 (R. Müller).

Subfamily ACRONYCTINÆ

Chalcopasta ellica, new species.

Fore wing gray with patches of metallic greenish golden; base gray; a large golden area in inner space, running out through the cell, twice indented above, angled on submedian space; costa gray to basal third; a broad terminal golden area, its inner edge indented on the veins, running from before apex to near middle of inner margin. Hind wing powdered with dark gray, less heavily on disk; fringe pale. Expanse, 30 mm.

Type, male, No. 19346, U. S. Nat. Mus.; Mexico City, Mexico, September, 1914 (R. Müller).

Rolua, new genus.

Characters of *Chalcopasta* Hampson, but the frontal process has a central vertical plate instead of round process and has no rim on the upper side.

Type of the genus, *Rolua monetifera*, new species.

Rolua monetifera, new species.

Fore wing ocher straw-color obliquely at base below cell and in narrow terminal lunate spots, the rest shaded with dark brown, the veins darker; two large silver spots, one elliptical, oblique in cell and across median at vein 2, the other much larger, rounded triangular, over the discal venules from vein 1 to 4; outer line far out, slender, brown, parallel to margin to vein 5, then retreating to costa; a fine subterminal line forming festoons along the veins; a dark terminal line. Hind wing black. Thorax ocher-brown; abdomen black. Expanse, 25 mm.

Type, male, No. 19347, U. S. Nat. Mus.; Zacualpan, Mexico, September, 1914 (R. Müller).

Subfamily NOCTUINÆ

Eulepidotis columbrata, new species.

Deep brown, thickly shaded with black; three lines, the outer two convergent toward inner margin; inner line dark bronze, once waved, edged within by pale lilac; mesial line dark bronze, somewhat irregular, edged with black on both sides and followed by a narrow pale lilac line indented at vein 1; outer line of two dark bronze bands, separated by metallic bluish leaden; terminal space marbled with black; terminal line dark bronze, black on both sides and narrowly lilaceous within. Hind wing dark brown, markings in a line along submedian fold; a submarginal black spot with raised metallic center in a bronzy area, preceded by lilaceous irrorations, then a metallic lilaceous bar, preceded by black, and before this a long black bar bisected by a lilaceous spot. Expanse, 29 mm. Hind tibiæ strongly tufted.

Type, male, No. 19352, U. S. Nat. Mus.; Misantla, Vera Cruz, Mexico, September, 1914 (R. Müller).

Near *E. delecta* Schaus, but without white.

Family NOTODONTIDÆ

Olceclostera amelda, new species.

Fore wing gray, the veins lined in brown; faint brown shaded bands, inner, mesial across discal crossvein and outer; a trace of a fine subterminal line, waved on the veins; a quadrate, subhyaline white spot between veins 5-6 and a small one below it; margin notched below apex, entire below. Hind wing dark brown, with slender darker, submarginal, even line and dash at end of cell. Expanse, 34 mm.

Type, male, No. 19387, U. S. Nat. Mus.; Zacualpan, Mexico, June, 1914 (R. Müller).

Belongs with *O. amoria* Druce, *indentata* Schaus, *maya* Schaus, *castrona* Schaus, and allies.

Family GEOMETRIDÆ

Cænocharis imperdata, new species.

Markings of *Glaucina escaria* Grote, but smaller, the lines blackish, dentate, generally distinct and well separated. Hind wing uniform, the disk not lighter. Expanse, 24-28 mm.

Cotypes, one male, five females, No. 19546, U. S. Nat. Mus.; one male and three females from the old Belfrage collection, May 24, 25, and June 3; one female, August 10-28 and a large specimen, No. 117; one female, Kerrville, Texas, May 21, 1906 (F. C. Pratt).

This species I considered to be the true *Cænocharis elongata* Hulst (Journ. N. Y. Ent. Soc., xv, 106, 1907), but Grossbeck states (Bull. Amer. Mus. Nat. Hist., xxxi, 387, 1912) that all the types of *elongata* have tibial spurs and the name should be transferred to *Glaucina*. This present species is therefore nameless.

Cænocharis alboceptata, new species.

Light gray, generally overspread with whitish from base to just beyond outer line, but in two or three of the specimens nearly uniform gray; lines black, slender, generally distinct; inner line with a long angle in cell, another on submedian, the latter generally joining the outer line directly or by a bar along the fold; outer line oblique, parallel to margin, wavy and dentate, but without long teeth. Hind wing pale, whitish gray,

powdered along the inner margin, with inception of mesial line as usual. Expanse, 22–27 mm.

Cotypes, one male, nine females, No. 19547, U. S. Nat. Mus.; Sabinal, Texas, April, 1910 (F. C. Pratt); Cotulla, Texas, April 10–12, 1906 (Crawford and Pratt); Zavalla County, Nueces River, Texas, April 26–29, 1910 (F. C. Pratt); Kerrville, Texas, April 11, 1907 (F. C. Pratt).

Phibalapteryx magnitactata, new species.

Fore wing dark purplish brown through median space, termen grayer, costa pale brownish; inner line a straight pale band, bent and reflected on subcostal, but indistinctly, followed by blackish; discal dot round, black, in a pale ring; outer line whitish, far out, running from apex to outer fourth of inner margin, excurved at veins 3–5 and with a slender brown accompanying line that crosses at about vein 7 and is reflected to costa; subterminal line pale, dotted; a terminal dark line. Hind wing with six dark crenulate lines, separated by pale, from base to outer line; outer line similar, more distinct, followed by pale and four more lines to margin of whitish, the subterminal in a dark shade. Expanse, 24 mm.

Type, No. 19385, U. S. Nat. Mus.; Zacualpan, Mexico, August, 1914 (R. Müller); also two specimens in less perfect state, Popocatepetl Park, Mexico, 8,000–10,000 feet, July, 1906 (W. Schaus).

Near *P. affluata* Snellen, larger, the outer line more bent, the hind wing entirely gray.

Hydriomena leucosigna, new species.

Fore wing pale glaucous green, except a spot at end of cell, median vein narrowly and a narrow outer edge to inner line, which are white; lines black, distinct, checkered; a basal dot; subbasal line on costa and margin; inner line broad, quadrate across the cell, then narrow, double cuneiform, running out on vein 1 and bent to margin; two costal dashes over cell; outer line broad and quadrate on costa, narrow and bent in to end of cell, dislocated and appearing again erect on tornus; small terminal spots. Hind wing whitish, a small dark patch on apex and stains at tornus. Expanse, 28 mm.

Type, male, No. 19349, U. S. Nat. Mus.; Popocatepetl Park, Mexico, 9,500–11,500 feet, June, 1906 (W. Schaus).

Hydriomena tesellata, new species.

Fore wing pale green; marks black, checkered; a spot at base; three lines across median area, the inner oblique and broken into angular patches, the other two joined below cell into a broad band; outer line slender, straight, bent below vein 6, narrowing and broken below vein 3; a subterminal band of three blotches, costal small, central dentate, lower lunate; marginal black patch from apex to vein 4, irregularly angled; small spot at vein 3; slender one just before margin at veins 1–3. Hind wing whitish with narrow fuscous border. Expanse, 35 mm.

Type, female, No. 19350, U. S. Nat. Mus.; Guerrero Mill, Hidalgo, Mexico, 9,000 feet (Mann and Skewes, gift of B. Preston Clark).

Hydriomena oasis, new species.

Fore wing white with a faint reddish tinge, a little glaucous green between the more approximate markings; markings purplish black, checkered; a spot at base of costa at vein 1; inner line bent on subcostal, even, straight, forming lobes but not broken, bent outward below vein 1; two bands on costa, broken in cell, followed below by a broad lobed band with two narrow spots beyond it; outer band narrow, like the inner, bent at vein 6, broken between veins 2–3; submarginal marking double, a single spot on costa, two rows of subconfluent spots between veins 4–6, joined above to a long marginal patch; a mark erect from tornus, joining on one side the lower segment of outer line, on the other an oblique spot on margin; terminal spots in fringe. Hind wing dark fuscous, an extra-mesial curved dark line, separated by pale from a dark broad border. Expanse, 33 mm.

Type, female, No. 19351, U. S. Nat. Mus.; Zacualpan, Mexico, June, 1914 (R. Müller).

Family NOLIDÆ

Roeselia emissa, new species.

Fore wing dark gray; outer line single, distinct, strongly

excurved above vein 2, black, enclosing streaks on the veins; a triangular mark on middle of costa running along vein 3 nearly to outer line; a dark shade at base, beyond which is the fine, faint, inner line; traces of subterminal line, incurved above. Hind wing whitish, the veins dark outwardly and a narrow fuscous edge. Expanse, 23 mm.

Type, male, No. 19388, U. S. Nat. Mus.; Mexico, without exact locality, presumably Zacualpan.

Near *R. medioscripta* Schaus.

Family COCHLIDIIDÆ

Perola monomania, new species.

Rusty ocher-brown; veins on basal half of wing red-brown; outer line red-brown, single, slender, from costa before apex, curving nearly parallel to margin and inner margin to base at base of median vein, duplicated by a line below vein 1; on one wing the line is nearly even, on the other scalloped on the veins, and here the duplication is the continuation of the line at its basal termination. Hind wing uniform ocher-brown. Expanse, 44 mm.

Type, female, No. 19333, U. S. Nat. Mus.; Misantla, Vera Cruz, Mexico, September, 1914 (R. Müller).

Family HEPIALIDÆ

Phassus chrysodidyma, new species.

Light gray, almost whitish in a bent band below cell; markings with coarse strigæ, not reticulate; a dark band issues from base along vein 1 to one-third of the wing, curves at right angles up to vein 3, bent outward and diffused; it contains a narrow pale golden bar above vein 1, and a rather long angular one opposite cell; a subterminal and a terminal dark band, edged within by pale gray, coarse strigæ, a little dislocated below; four dark patches on costa. Hind wing dark gray, pale and subtranslucent except on costa. Expanse, 63 mm.

Type, male, No. 19334, U. S. Nat. Mus.; Zacualpan, Mexico, June, 1914 (R. Müller).

PYRALIDÆ OF BERMUDA

By HARRISON G. DYAR

The following Pyralidæ were collected in Bermuda by Mr. Frank Morton Jones and presented to the National Museum by Mr. W. D. Kearfott. Mr. Jones's notes, however, did not accompany the specimens.

PYRAUSTINÆ

- ✓ **Sufetula diminutalis** Walker.
Ten specimens. No. 26.
- Zinckenia fascialis** Cramer.
Three specimens. No. 12.
- ✓ **Syngamia florella** Cramer.
Four specimens. No. 1.
- ✓ **Glyphodes hyalinata** Linnaeus.
Four specimens. No. 11.
- ✓ **Glyphodes quadristigmalis** Guenée.
One specimen. No. 48.
- Hellula undalis** Fabricius.
Three specimens. No number; marked v-15 and SB.
- Terastia meticulosalis** Guenée.
One specimen. No label at all.
- ✓ **Nomophila noctuella** Denis and Schiffermiller.
Three specimens. No. 2.
- ✓ **Pachyzancla phaeopteralis** Guenée.
Fourteen specimens. No. 9.
- Eustixia pupula** Hübner.
One specimen. No number; marked May 18.
- ✓ **Phlyctaenodes similalis** Guenée.
Thirteen specimens. No. 37.
- ✓ **Pionea ferrugalis** Hübner.
Sixteen specimens. No. 37.
- ✓ **Pyrausta phoenicealis** Hübner.
Seventeen specimens. Nos. 39 and 52.

Pyrausta bermudalis, new species.

Straw-yellow or brownish, shaded with brown along costa, outer margin and in the excurve of outer line; lines brown, rather broad, very distinct; inner line nearly straight, curved a little at costa, upright or a little concave behind median vein; outer line oblique above, excurved between veins 5 and 2, running in along 2 to below discal dot, then slightly flexuous to margin; orbicular a dot near inner line; reniform elliptical, solid. Hind wing with single discal dot and outer line, similar to that on fore wing. Expanse, 22 mm.

In the male the anal segment is obliquely cut below with a lateral fringe of stiff straw-colored hairs which do not exceed the end of the segment. A short pencil of similarly colored hairs at the sides of the penultimate segment.

Type, male, No. 18241, U. S. Nat. Mus.; Bermuda, B. W. I., May 7 (F. M. Jones), No. 38. Allotype, female, May 3; paratypes, a, male, May 7, b, male, May 7, c, female, May 3, d, female, May 10, e, female, May 21.

NYMPHULINÆ

Piletocera bufalis Guenée.

Seventeen specimens. Nos. 10 and WHM. Six males and five females are small, taken May 15-17 and April 30; 6 females are larger, taken December 20, apparently indicating two broods under different climatic conditons.

CRAMBINÆ

Crambus hastiferellus Walker.

Thirteen specimens. Nos. 14 and SB.

Argyria gonogramma, new species.

Palpi brown and yellow, white-tipped; front white, a narrow brown line on each side. Fore wing silvery white; a slender brown-black line across middle, roundedly excurved from costa to median vein, slightly so from thence to margin, narrow or broken below median vein, distinct on margin; a short costo-subapical dash and yellow mark; a brown terminal line; fringe

dark. Hind wing white with small terminal dark dots. Expanse, 11 mm.

Type, male, No. 18244, U. S. Nat. Mus.; Bermuda, B. W. I., May 3 (F. M. Jones).

Near *A. diplomochlalis* Dyar, but with a complete line across the wing.

PYRALINÆ

Pyralis manihotalis Guenée.

Four specimens. No labels at all.

Herculia sp.

One specimen, a female, of which the determination is doubtful.

SCOPARIINÆ

Scoparia jonesalis, new species.

Near *S. basalis* Walker; smaller; the ground color nearly white, clear in basal space except for the basal dash; inner line curved, black, fused to claviform; median space with black irroration; orbicular a dot; reniform a bar joining two opposed cusps; outer line whitish, excurved above middle; terminal space black-powdered. Hind wing faintly fuscous tinged. Expanse, 13 mm.

Type, female, No. 18245, U. S. Nat. Mus.; Bermuda, B. W. I., March 10 (F. M. Jones). Also 3 males and 4 females, May 5 and 10. No. 42.

PHYCITINÆ

✓ *Cryptoblabes gnidiella* Millière.

Sixteen specimens, 1 male and 15 females. No. 18.

A well-known European species, injurious to raisins and other dried fruit, not hitherto recorded from America.

Elasmopalpus lignosellus Zeller.

Fourteen specimens. No. 45.

Homœosoma electellum Hulst.

Five specimens. No. 23.

Homœosoma mucidellum Ragonot.

Two specimens.

Ephestia cautella Walker.

Four specimens.

Ephestiodes indentella, new species.

Gray, the median space black-shaded more or less completely; inner line whitish, broad, oblique, defined by a darker basal area, forming a tooth in submedian fold, edged without by blackish, spreading into the median space; outer line whitish with distinct black inner edge, indented on discal fold and slightly on submedian fold; discal dots black, separate; a terminal shaded black line, not reaching apex or tornus. Hind wing fuscous shaded, base of fringe paler. Expanse, 15 mm.

Type, female, No. 18243, U. S. Nat. Mus.; Bermuda, B. W. I., April 24 (F. M. Jones). Also 4 females, paratypes, April 5, 6, 17, and 23, all smaller than the type; expanse, 13-14 mm., but otherwise similar.

A NEW SPECIES OF THE GENUS CHALCIS

(*Hymenoptera, Chalcididae*)

By J. C. CRAWFORD

Chalcis hammari, new species.

Female. Length, 4 mm. Black, tegulae, front tibiae, except brown spot on rear, apices of front and middle femora, bases and apices of mid tibiae, small spot on outer side of hind femora at apices, bases and apices of hind tibiae, all yellow; tarsi reddish yellow; face above rugoso-punctate, below finely rugose; clypeus with a smooth thickened apex wider medially; middle of face below antennal fovea smooth, bounded laterad by a vertical carina; carina along inner orbits very indistinct, short, not reaching to level of insertion of antennae; carina at front of malar space with a branch diverted backward just before reaching eye; this branch running diagonally entirely across malar space; pro- and mesonotum umbilicately punctured, the punctures separated by less than half a puncture width and the interspaces finely lineolated; the punctures finer at front of middle lobe of mesonotum and on parapsidal areas

and coarser on scutellum; wings hyaline; hind femora closely, finely punctured on outer side, and lineolate between punctures; lower margin with row of about 8 or 9 small teeth, the one basad no larger than others; inner side of hind femora finely punctured, smooth between punctures; inner side of hind femora without a tubercle, hind coxæ without a tubercle; first abdominal segment polished, minutely punctured, second segment closely and more coarsely punctured, with white hairs at sides; following segments similar but hairs extending all the way across segments, smooth basal portion of segments also usually showing more or less.

Male. Length, 3 mm. Similar to female.

Type locality, Roswell, New Mexico.

Type, Cat. No. 19639, U. S. Nat. Mus.

All specimens from Bureau of Entomology, under Quaintance number, the type female under No. 6200 from *Archips argyrospila*, "6/12"; allotype male under No. 6201, from "grape leaf roller"; four female paratypes under No. 6195.

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Nos. 8-10

NINE NEW TROPICAL AMERICAN GENERA OF MUSCOIDEA

By CHARLES H. T. TOWNSEND

Siphosturmiopsis, new genus.

Genotype, *Siphosturmiopsis rafacli* Townsend, new species.

Differs from *Siphosturmia* as follows: Proboscis stout, part below geniculation no longer than part above same, the whole extended scarcely equalling the height of head. Has same epistomal characters as *Siphosturmia*, *Masiphya*, and *Phasiopsis*, and same anal segment as *Siphosturmia*. Vertex of female scarcely as wide as one eye, front and face gradually widening from same. Ocellar bristles vestigial. Second antennal joint shorter, hardly half as long as third. Cubitus nearer to hind margin of wing, well rounded; apical cell more widely open, ending nearer to wingtip. Hind tibiae thickly short-ciliate in both sexes.

Siphosturmiopsis rafacli, new species.

Length of body, 9 to 10 mm.; of wing, 7 to 8 mm. Two females, San Rafael, near Jicaltepec, Veracruz, July 5 and 17, 1896, on flowers of *Cordia* sp.; and one male, same locality, March 27, 1896 (Townsend).

The coloration is practically the same throughout as in *Siphosturmia rostrata* Coq., the parafrontals being slightly more brassy, perhaps.

Holotype, No. 19957, U. S. Nat. Mus.

This species was determined by Coquillett as *Brachycoma ruficauda* Wulp and referred to *Atacta*.

Atactosturmia, new genus.

Genotype, *Blepharipa politana* Townsend, 1912, Proc. U. S. Nat. Mus., xliii, 340. Piura, Peru.

Differs from *Blepharipa* as follows: Female. Frontalia not over one-half as wide as one parafrontal. Parafacials more rapidly narrowed below. Facial plate scarcely at all sunken, facialia flattened; the clypeus, facialia, and epistoma all nearly in the same plane. Third antennal joint not over one and one-half times second. Cheeks about two-fifths eye-height. Median marginal macrochætæ of first and second abdominal segments absent or vestigial. Cubitus nearer to hind margin of wing; apical cell more widely open and ending nearer to wingtip. The facial and frontal characters considerably approach those of *Atacta*, but epistoma is less prolonged.

Minthoplagia, new genus.

Genotype, *Minthoplagia rafaeli* Townsend, new species.

Female. Venation practically like that of *Chatoplagia*; differs from that genus as follows: Head characters like *Voria* except eyes rather thickly hairy, parafacials bare of hairs and without the downwardly-directed macrochætæ at end of frontals, arista long and delicate, face slightly narrowed below, third antennal joint more than twice second. A strong anterior lateral scutellar bristle. Front margin of second abdominal segment strongly bulged in middle, forming an arcuate incisure. Abdomen somewhat compressed laterally, suggesting the form of *Mintho*.

Minthoplagia rafaeli, new species.

Length of body, 9 mm.; of wing, 7 mm. One female, San Rafael, near Jicaltepec, Veracruz, March 26, 1896 (Townsend).

Head silvery, frontalia brown, palpi pale yellowish, first two antennal joints and arista more or less rufous, third joint blackish with slight bloom. Thorax and scutellum black with silvery bloom; four vittæ, the inner ones narrower, a fifth heavy one in middle behind suture. Abdomen black, rather shining except the silvery pollinose front borders of second

to fourth segments, the pollen border narrowest on second segment. Legs black, front femora silvery on outside. Wings faintly smoky. Tegulæ whitish.

Holotype, No. 19958, U. S. Nat. Mus.

Phantasiosiphona, new genus.

Genotype, *Phantasiosiphona tropica* Townsend, new species.

Differs from *Crocota* as follows: Parafacials linear, greatly constricted. Facial length twice that of front. Third antennal joint enlarged in both sexes, but more so in male; its upper edge showing straight profile in both; its lower edge showing evenly rounded profile in female, but unevenly rounded in male due to the greater apical broadening of the joint in that sex. Second arisal joint very elongate, normally nearly half as long as final joint. The arista is thickened on hardly more than basal half. Head much higher than long, eyes elongated dorsoventrally. Approaches *Phasiostoma* in head characters, but differs markedly therefrom in the long and twice-geniculate proboscis.

Phantasiosiphona tropica, new species.

Length of body, 4 to 4.5 mm.; of wing, 2.5 to 3 mm. One male, San Rafael, Jicaltepec, Veracruz, March 11, 1896 (Townsend); one female, Granada, Nicaragua (Baker).

Face and cheeks silvery-white, frontalia subfulvous, parafrontals and thorax including scutellum cinereous with more or less of brassy tinge, first two antennal joints dull rufous, third joint and arista black, palpi light fulvous. Abdomen dull luteous, with pale brassy to whitish pollen; a broken median vitta of blackish, dilated posteriorly on second segment in a median pair of spots; third segment with four rather indefinite dark spots on hind border, anal segment dark posteriorly. Legs concolorous with abdomen, tarsi black. Wings evenly tinged with fuscous, both scales of tegulæ tawny-whitish. Proboscis fulvous at base and tip, broadly black at geniculation.

Holotype, No. 19959, U. S. Nat. Mus., male.

Tachina singularis Wd. (Auss. Zw. II, 335), indicated by Jaenicke as *Siphona* (Neue Ex. Dipt. 87:395), appears to be

long to this genus so far as the description goes. It is distinct from the present species, however, on its ferruginous antennæ, yellowish wings, and differently-marked abdomen. Wulp's *Biologia C.-A. species* (pp. 125-126) evidently do not belong here.

Apinocyptera, new genus.

Genotype, *Apinocyptera signata* Townsend, new species.

Differs from *Odontocyptera* as follows: Female. Second abdominal segment broadly beveled off posteriorly on its ventral face at an angle of about 45 degrees, after the manner of *Apinops*, the arcuate edge of the oblique surface thus formed being thickly studded with short spines. Ventral plates two to four not showing. Ventral aspect of third segment flattened to the level of hind margin of oblique area of second, the inner edges of tergal sclerites not flared but meeting. In *Odontocyptera* the inner edges of tergal sclerites of third segment are long and flared V-like with the opening behind, forming sides of a deep ventral cavity for reception of hypopygium. Hypopygial hooks proportionately longer than in latter genus, the same delicate chitinous piercer present.

Apinocyptera signata, new species.

Length of body, 11 mm.; of wing, 7.5 mm. One female, Gualan, Guatemala, on flowers of No. 9 (W. P. Cockerell).

Head silvery-white, the parafrontals with a faint brassy tinge. Frontalia brown, rufous on edges. First two antennal joints and base of third rufous, rest of third and all of arista black. Thorax blackish, thinly silvered; two narrow inner, two heavy outer vittæ. Scutellum and first abdominal segment concolorous with thorax, but the segment without bloom. Second segment brown or blackish, with broad semicircular rufous area on each side anteriorly, the two areas of rufous narrowly separated by black both above and below on median line. Rest of abdomen wholly dark rufous; the rufous areas of second segment, nearly all of third, and anterior part of fourth with silvery bloom. Legs black, the tibiæ brownish. Wings smoky-

yellow on costal half, merging into blackish outwardly along the veins. Tegulæ and extreme base of alukæ white.

Holotype, No. 19960, U. S. Nat. Mus.

Hystriciella, new genus.

Genotype, *Hystriciella aurifrons* Townsend, new species.

Male. Eyes thickly hairy. Whole abdomen bristled like *Hystricia*, *Euhystricia*, *Fabriciopsis*, and *Neojurinia*. Differs from *Hystricia* as follows: Proboscis below geniculation fully equal to head-height, more slender, horny. Palpi nearly three-fourths length of proboscis below geniculation, narrow on basal half, gently widened on apical half, sparsely short-bristled, with long hairs on outer or lower edge. First two aristal joints equally elongate. Third antennal joint strongly convex on upper border, a little longer than second. Epistoma strongly produced. Cubitus more removed from hind margin, with wrinkle. Cheeks about one-half eye-height. Close to *Pseudohystricia* in head characters, but palpi narrower, cheeks not so wide, eyes larger, abdomen thickly bristled.

Hystriciella aurifrons, new species.

Length of body, 11 mm.; of wing, 9.5 mm. One male, Jamaica, C. V. Riley coll., labeled "Jurinella B. B." but not in B. B.'s handwriting, bearing yellow label "30" of series sent by Riley to B. B. for determination.

Whole head light golden, palpi yellow, frontalia and antennæ brown, third antennal joint rufous on base and lower edge, arista black. Thorax blackish, mesoscutum with thin yellowish bloom, the usual four vittæ present. Scutellum and abdomen deep rufous-brown, shining. Legs dark reddish-brown, tarsi blackish. Wings lightly and evenly smoky, veins black especially basally. Tegulæ rather more deeply fuscous.

Holotype, No. 19961, U. S. Nat. Mus.

Camposiana, new genus.

Genotype, *Camposiana emarginata* Townsend, new species.

Differs from *Melanepalpus* as follows: Female. Third antennal joint evenly rounded-subtruncate apically, but little longer than second. Frontalia very narrow, impressed. Cheeks

about three-fourths of eye-height. Clypeus short; epistoma almost as long as clypeus and greatly produced, its profile bent at little more than a right angle from that of clypeus. Frontal and peristomal bristles weaker and more scanty. Three closely placed sternopleurals in line, three postsuturals. Macrochætæ practically continuous on hind margins of second and third segments. Anal segment very deeply emarginate, rather more so than in any other form yet known. All the segments strongly arcuate, the front border of anal segment especially so. Macrochætæ of abdomen not so heavy, tarsi more slender. Thorax shortened, and head narrowed.

Named in honor of Mr. F. Campos.

Camposiana emarginata, new species.

Length of body, 9 mm.; of wing, 9.5 mm. One female, Quito, Ecuador, 2,850 meters (9,262 feet); F. Campos, collector.

Dull fulvorufous, thinly tawny pollinose. Parafrontals and mesoscutum dull olive. Third antennal joint and arista blackish. Frontalia rufous. First two antennal joints, humeri, scutellum, and legs fulvous. Abdomen fulvous to pale rufous, anal segment with large patch of tawny pollen extending in attenuated line between buttocks and seen in some lights to extend over latter; other segments thinly pollinose. Wings lightly smoky, the costobasal area yellowish. Tegulæ tawny-whitish.

Holotype, No. 19962, U. S. Nat. Mus.

Austeniops, new genus.

Genotype, *Saundersia truncaticornis* Wulp, 1888, Biol. C.-A. Dipt. II, 26, pl. 2, fig. 4. Volcan de Chiriqui, 3,000 feet, Panama.

Differs from all other described genera of the *Epalpus* group by the presence of a strong facio-orbital bristle near lower end of eye. Third antennal joint a little longer than second, truncate apically. Arista with short basal joints. Scutellum without heavy spines. First abdominal segment with a median marginal pair of spines, second with marginal row, third with double row, fourth with irregular spines and hairs. Ventral plates spinose.

The distinctness of this form has been pointed out by Austen (Ann. Mag. N. H., ser. 7, xix, 333), who states that *Echinomyia iudens* Walker, of Brazil, belongs to the same genus.

Named in honor of Mr. E. E. Austen, F. E. S., F. Z. S., of the British Museum of Natural History.

Parapyrellia, new genus.

Genotype, *Musca violacea* Fabricius, 1805, Syst. Antl., 288. — Wiedemann, 1830, Auss. Zw. Ins. II, 409–410. Brazil.

Differs from *Pyrellia* as follows: Head like *Lucilia*, not like *Promusca* and *Stomorxys*. Facial plate conspicuously longer than broad; cheeks broader, eyes not nearly reaching level of oral margin; face narrower; female front not over two-thirds eye-width; hind crossvein much nearer to small crossvein than to cubitus; no prominent bristle on flexor surface of middle tibia. Differs from *Morellia* as follows: Head more prolonged downward at epistoma; face and parafacials not so wide; ocellars vestigial or weak; abdomen less hairy and bristly; hind crossvein nearer to small crossvein.

NEW GENERA OF MUSCOID FLIES FROM THE MIDDLE ATLANTIC STATES

By CHARLES H. T. TOWNSEND

The following are descriptions of five new muscoid genera and their genotypes, occurring in the region from New Jersey to Virginia, which are of especial interest on account of their relationships and aberrant characters. To these is added description of the female of *Tachinomyia* Towns.

Eumicrophthalma, new genus.

Genotype, *Eumicrophthalma shannoni* Townsend, new species.

Differs from *Microphthalma* as follows: Female. Whole form narrowed. Epistoma broader, vertex only a little over one-third head-width. Peristomal profile scarcely bulged. Palpi very short, but slightly hairy. Only two lateral scutellar pairs of macrochætæ. Apical cell closed in border, hind crossvein conspicuously out of line with apical crossvein.

Differs from *Perua* as follows: No ocellar bristles. Epistoma fully as long as the clypeus. Cheeks quite equalling eye-height. Protoscis much shorter, palpi less developed. Front less projected, head much shorter throughout. Antennæ shorter.

***Eumicrophthalma shannoni*, new species.**

Length of body, 6.5 mm.; of wing, 5.5 mm. One female, Eastern Branch, District of Columbia, October 22, 1914 (R. C. Shannon).

Black. Frontalia, first two antennal joints, and most of cheeks and parafacials deep rufous; palpi paler. Parafrontals, mesoscutum, and scutellum cupreous-golden pollinose. Four vittæ on thorax, three others showing behind suture in some lights. Abdomen rather shining, thinly silvery; the pollen dense on narrow bases of last three segments, and in a narrow median vitta. Legs black, tibiæ brownish-rufous. Wings lightly infuscate. Tegulæ whitish.

Holotype, No. 19619, U. S. Nat. Mus.

Named in honor of Mr. Raymond C. Shannon.

***Elephantocera*, new genus.**

Genotype, *Elephantocera greeni* Townsend, new species.

Differs from *Calpodomyia* as follows: Male. Front prominently produced in profile; eyes large but not descending as low as vibrissæ; cheeks very short but of good width, nearly twice as wide as length of second antennal joint. Front almost equilateral, vertex but little less than eye-width; face considerably widened, much wider below than one eye; facial carina broadened and rounded, not conspicuous below; oral margin broad, subarcuate, about even with vibrissal insertion. Third antennal joint greatly enlarged, much broadened, rather thick-phylliform, suggestive of that of *Phytomyptera*, reaching about as low as lower border of eyes, the broadening effected by a prolongation of lower edge, about one and one-half times as long as wide, oblong-rounded, straight on upper edge, evenly rounded apically and on lower edge. Arista much longer than third antennal joint, thickened on about basal half. Frontalia narrower anteriorly than one parafrontal, widening posteriorly. Facial profile not bulged, quite strongly receding, vibrissal axis

of head only one-half of antennal axis. Ocellar area very restricted, ocellars quite strong. No proclinate fronto-orbitals. Frontals descending below base of third antennal joint. Facialia with bristles about one-third way up. Very weak discal pair of scutellars, and a hairlike nondecussate short apical pair. Abdominal macrochætæ discal and marginal on last three segments, a median marginal pair on first segment. Legs longer, claws short. Apical cell open, ending immediately before exact wingtip; cubitus subangular, somewhat rounded; third vein bristled halfway to small crossvein. Costal spine small, but distinct. At once distinguished from *Phytomyptera* by the large eyes and small cheeks. The genus is related to *Oxynops*.

Elephantocera greenei, new species.

Length of body, 3 mm.; of wing, about 3 mm. One male. Wenonah, New Jersey, October 2, 1910 (C. T. Greene).

Shining brownish-black. Antennæ, frontalia, and palpi dark brown or blackish; face, cheeks, and parafrontals lightly silvery, the rest of mesoscutum and scutellum more shining but still with thin bloom in certain lights. Abdomen very shining, with faint bloom in oblique light. Legs dark brown or blackish. Wings clear. Teguke watery-whitish.

Holotype, No. 19612, U. S. Nat. Mus. Labeled "*Hypostena magnicornis* Coq." in Coquillett's hand but evidently never published.

Named in honor of Mr. Charles T. Greene.

Hypertrophomma, new genus.

Genotype, *Hypertrophomma opaca* Townsend, new species.

Female. Form short and broad. At once distinguished from all other muscoid genera known to me by the combination of hypertrophied eyes and almost naked pollinialike palpi, the latter character being shared by *Lispidea*. Head much broader than high, nearly half again as broad as height, its profile subsemicircular, the vibrissal axis little over one-half the antennal axis. Front and face absolutely equal in width throughout, the vibrissæ inserted at extreme edge of the cut-off epistoma, the eyes extending exactly from vertex to vibrissal angles, and the antennæ inserted just halfway between these two points.

The eyes each show in front view almost as great width as the front and face, these being nearly as wide as one-half their combined height; the wide eyes, of the full height of the head, separated by the wide front and face, give a striking effect of hypertrophied eye-surface when viewed from in front, which is not shared by any other known muscoid form even though it may possess proportionately to its size as great ocular area. Facial plate deeply sunken, broad below, subtriangular, facialia bare; parafacialia bare, very narrowed below. One strong decussate pair of frontals about even with base of antennæ, a weak bristle above and below it; two proclinate and three reclinate fronto-orbitals, outer vertical only a little shorter than inner one, strong pair of divaricate-proclinate ocellars. Frontalia not as wide as parafrontals. Second antennal joint short, third joint reaching exactly to oral margin; arista thickened slightly on less than basal half, basal joints very short. Proboscis very short and fleshy; mouth subatrophied, the oral opening apparently non-functional; palpi about as long as the proboscis, greatly enlarged on distal two-thirds, bowed, fat, swollen, smooth, pollinialike, their surface practically absolutely bare even of microscopic hairs (only one or two were unmistakably made out with great difficulty). Cheeks extremely narrow, same width as lower end of parafacialia. Abdomen vaulted, short-ovate, first segment without median marginal macrochætæ, second with a median marginal pair and a lateral marginal pair, third and fourth segments with marginal row. Tarsi very short, the metatarsi about as long as the other joints combined. Hind tibiæ very loosely subpectinate. Third vein bristled to small crossvein. Costal spine vestigial. Apical cell open, ending very distinctly before wingtip. Cubitus rounded, without wrinkle or stump. Hind crossvein straight, nearer to cubitus, at an angle of about 45 degrees to hind margin of wing. Small crossvein opposite end of auxiliary vein. *Houghia* approaches this genus in a number of characters.

***Hypertrophomma opaca*, new species.**

Length of body, 4.75 mm.; of wing, 3.75 mm. One female, Iona, New Jersey, October 2, 1910.

Ground color of head and abdomen pale rufous. Face silvery, same bloom apparent on frontalia. Parafrontals ashy-golden. Antennæ black, base rufous. Palpi light fulvous. Thorax, scutellum, and abdomen obscure ashy-golden; two narrow median thoracic vittæ, two heavier interrupted outer ones; scutellum pale testaceous on border. First abdominal segment blackish above except on sides; rest of tergum evenly pollinose, with a dot for each hair; venter wholly light rufous. Legs blackish, but femora and tibiæ with a distinct rufous tinge. Wings clear. Tegulæ yellowish-white, the borders more yellowish.

Holotype, No. 19567, U. S. Nat. Mus. This specimen bears label "*Hypostena opaca* Coq." in Coquillett's hand, but so far as I can find no description of it was published by him.

Metavoria, new genus.

Genotype, *Metavoria orientalis* Townsend, new species.

Differs from *Metaplagia* as follows: Clypeus much shorter, broadened below; epistoma broader, well prolonged below the vibrissal angles, the vibrissæ set well above oral margin. Third antennal joint of male about two and one-half times the rather elongate second joint, that of female hardly or about twice second. Arista not thickened to tip, tapered on apical third, second joint not elongate. Palpi well developed. Eyes descending nearly to vibrissæ in male, not so low in female. Male front at vertex not over one-third head-width, that of female wider. Hind and apical crossveins not nearly in line, the former about in middle between cubitus and small crossvein, cubitus a little nearer to hind than to front margin of wing, hind crossvein nearly in middle between the two margins.

Metavoria orientalis, new species.

Length of body, 8 to 8.5 mm.; of wing, 5 to 5.5 mm. Two females, Arlington, Virginia, taken in flytrap, June 7, 1914 (Bureau of Entomology; R. H. Hutchison, coll.), and Kansas City, Missouri, June 19; one male, Baton Rouge, Louisiana (H. A. Morgan, labeled "Expt. 18, sub. 5").

Black, silvery pollinose. Head wholly silvery, including occiput and in one female the frontalia; palpi and first two anten-

nal joints rufous, third antennal joint and arista black, frontalia brownish-rufous to brown. Thorax and scutellum silvery; four thoracic vittæ, the inner pair linear. Abdomen silvery on last three segments except broad hind borders, the anal segment being rather more than half black. Legs black. Wings clear, bases narrowly tawny. Tegulæ white. The pollen of thorax and abdomen has a bluish tint, sometimes shared by that of head.

Holotype. No. 19618, U. S. Nat. Mus., female, Arlington, Virginia. Allotype, male.

Torynotachina, new genus.

Genotype, *Torynotachina quinteri* Townsend, new species.

Runs to Coquillett's *Hypostena barbata*. Differs from *Methypostena* as follows: Female. Facial profile about as long as frontal. Antennæ inserted well above eye-middle. Third antennal joint long, three and one-half times second or about that. Facialia ciliate fully half way up. Ocellars very small, short, weak, vestigial, a still shorter pair behind them. Three reclinate inner orbitals, two proclinate outer; outer vertical well developed. Front at vertex over one-fourth head-width. Arista thickened almost halfway, second joint round and distinct. Frontals descending about to end of second antennal joint. Head length at vibrissæ fully four-fifths that at base of antennæ. Hindmost postsutural stronger, nearly as strong as the middle supraalar and hind postalar. Two anterior marginal scutellar bristles stronger, discal abdominal bristles much stronger. Apical crossvein not markedly bent in. Apical cell narrowly open, ending just before wingtip. Hind crossvein slightly nearer to apical than to small crossvein. Ovipositor chitinous, about as broad as long, rather spoon-shaped.

Torynotachina quinteri, new species.

Length of body, 4.5 to 5.5 mm.; of wing, 3.75 to 4 mm. Two females, Cabin John Bridge, Maryland, June 7, 1915, on herbage (G. E. Quinter).

Black, shining, silvery-pollinose. Frontalia black. Parafrontals and all of face silvery-white, changing to dark with light incidence. Cheek grooves dark. Occipito-orbits silvery-

white. Presutural mesoscutum silvery-white, with two heavy median vittæ and two heavier outer ones, all confluent anteriorly, forming a marking with arcuate front border and indented behind with the silvery-white. Rest of mesoscutum showing some silvery behind, but mostly shining. Scutellum shining black, not pollinose. Abdomen shining black, with silvery-white pollen showing narrowly on bases of second to fourth segments, broadening laterally. Legs, antennæ, and palpi black. Wings clear. Tegulæ tawny-whitish.

Holotype, No. 19573, U. S. Nat. Mus., TD4466.

Named in honor of Mr. George E. Quinter.

Tachinomyia Townsend, 1892, Trans. Am. Ent. Soc., xix, 96-97.

Genotype, *Tachinomyia robusta* Townsend, l. c.

Only the male was described. The female differs from female of *Macromeigenia* as follows: More robust in form, the head, thorax, and abdomen widened and of equal width. Frontal profile straight. Parafacial profile not so bulged, nearly straight. Facialia evenly diverging inferiorly, the clypeus subtriangular. Epistoma produced. Facialia sparsely ciliate halfway up. Vibrissæ situated not as far from oral margin as length of second antennal joint. Antennæ broader; second joint elongate, third about one and three-fifths times as long as second. Palpi heavy from base to tip. Front at vertex over one-third head-width. Cheeks about two-fifths eye-height. Parafacials bare. Eyes with short, sparse hairs. Parafacials very broad, of equal width, but only one-half as broad as lower part of facial depression. Four heavy lateral macrochætæ on scutellum. Strong but short median marginal pair of macrochætæ on first abdominal segment, stronger pair on second, no discal on first three segments, marginal row of ten on third; anterior discal row of eight or ten on anal segment, which is cleft behind on median line, the entire edge armed with closely-set short spines. Costal spine developed.

Tachinomyia floridensis Townsend, l. c.

Length of body, 12.5 to 14 mm.; of wing, 11 to 12 mm. Two females, Washington, District of Columbia (A. A. Doo-

little), and Chevy Chase, Maryland, May 25, 1915, TD4456 (G. E. Quinter); male and female in copula, Cropley, Maryland, May 1, 1904 (F. Knab); and one male, St. Louis, Missouri, May 1, 1904 (W. V. Warner).

Female. Whole head silvery burnished, with faint shade of golden, especially noticeable on parafrontals. Frontalia brown, but covered with the golden pollen. Antennæ rufous, third joint largely blackish. Palpi fulvorufous. Beard brassy-gray. Thorax and scutellum pollinose, two narrow vittæ and two wider outer ones; scutellum rufotestaceous apically. Abdomen thinly silvery above except the very densely pollinose narrow bases of second and third segments and whole of fourth. Venter thinly pollinose. In oblique lights the thin pollen appears thicker. Legs black, femora silvery on outside. Wings clear, tegulæ tawny-white.

TWO NEW CRANE-FLIES FROM PORTO RICO¹

(*Tipulidæ*, *Diptera*)

By CHARLES P. ALEXANDER, Ithaca, N. Y.

The following insects are included in the collection of the United States National Museum and were kindly handed to me for identification by Mr. Frederick Knab, the custodian of the Diptera. These new forms may be characterized as follows:

Eriocera ocellifera, new species.

Antennæ pale; head dark; body orange, the tip of the abdomen black; wings light yellow with a rather sparse brown pattern including an ocellate mark having the origin of the radial sector as its center.

Male. Length, 10.5 mm.; wing, 9.8 mm.

Rostrum and palpi light brown, the latter a little more yellowish. Antennæ short, the scapal segments dark brown, the first flagellar segment pale dull yellow, a little darker at the

¹Contribution from the Entomological Laboratory of Cornell University.

base; the second flagellar segment dull yellow, the remainder of the flagellum sparsely hairy. Frontal tubercle broad and low. Head dark brown with a sparse grayish bloom on the occiput and sides of the vertex.

Thorax clear light orange without stripes or darkening of any kind. Halteres short, the stem pale yellow, the knob dark brown. Legs with the coxæ and trochanters bright orange, concolorous with the pleura; femora dull yellow, the apex narrowly dark brown; tibiæ and tarsi black, the claws yellow. Wings with a light yellow suffusion, the costal cell dark brown: a brown ocellate mark around the base of the radial sector: a semilunar mark across the basal cells midway between the arculus and the origin of the sector, the concavity toward the wing-base; an interrupted band along the cord; stigma large, subquadrate, brown; the wing-apex narrowly margined with brown; the apical cells of the wings with pale grayish brown clouds in the neighborhood of the crossveins and deflections of veins; the anal and cubital cells slightly grayish. Venation: Cell M_1 absent; crossvein r inserted on R_2 at a distance beyond the fork of $R_2 + 3$ about equal to one and one-half of r ; cell 1st M_2 large, the basal deflection of Cu_1 inserted before the middle of the cell.

Abdomen bright orange, darkening toward the apex, on segments 8 and 9 shiny black.

Holotype, male, Mayaguez, Porto Rico, December 4, 1913 (R. H. Van Zwaluwenburg).

Type, Cat. No. 19660, U. S. Nat. Mus.

The only species with which *E. ocellifera* will be confused is *Eriocera trifasciata* Röder,¹ likewise from Porto Rico. The two flies may be separated by means of the following key:

1. Wings with three bands, the first at the wing-root, the second at the origin of the radial sector extending across the wing and connected with the basal band in the anal cells; wing-apex largely dark, the cells R_3 , R_5 , M_1 and M_3 grayish hyaline at their middle; thorax yellowish with a grayish blue bloom especially on the pleura and coxæ, abdomen with blackish bands on the anterior margins of the segments, the incisures yellowish.....*trifasciata* Röder

¹Röder, V. von. Dipteren von der Insel Portorico; Stett. entomol. Zeit., vol. 46, p. 338, 1885.

Wings with an interrupted brown pattern which is ocelliform at the base of the sector; thorax orange, unmarked; abdomen without blackish bands on the anterior margins of the segments,

ocellifera, new species

Polymera geniculata, new species.

Size medium; flagellar segments of the male antennæ binodose; wings with cell M_1 present; tarsi uniformly brown, similar in color to the rest of the legs; thoracic pleura without a distinct stripe.

Male. Length, about 4 mm.; wing, 4.8 mm.; antennæ, about 7-8 mm.

Rostrum and palpi light yellowish brown, the latter more infuscated. Antennæ very long and slender, at least half again as long as the body, the flagellar segments with the long outstretched hairs as usual in the males of this genus; flagellar segments binodose; first segment dark brown, second segment conspicuously light yellow; third segment dark brown, light yellow at the extreme base only; remainder of the flagellum dark brownish black, the tips of segments 4 to 8 very indistinctly yellowish, this color becoming obsolete on the apical segments. Head dark gray. Eyes dull silvery gray, the ommatidia large.

Thoracic dorsum dull light yellowish brown without markings. Pleura similar in color with a broad indistinct suffusion of brownish on the mesopleura, this not being in the form of a stripe. Halteres pale. Legs with the coxæ and trochanters pale, whitish; femora pale brown, darkened toward the apex, quite broadly and distinctly tipped with yellowish; tibiæ brown with the extreme base pale; tarsi dark brown, the posterior tarsi of a slightly lighter shade of brown. Wings subhyaline with a very slight grayish suffusion; veins dark brown, the costa more yellowish. Venation: Crossvein r far out toward the tip of R_1 so that it is about one-half of that portion of R_1 beyond it; basal deflection of $R_4 +_5$ slightly arcuated, a little longer than the crossvein $r-m$; basal deflection of Cu_1 just beyond the fork of M ; fork of $M_1 +_2$ shallow.

Abdomen dark brown, the lateral margin still darker, blackish; hypopygium dusky yellow including the pleurites which are elongated and darkened on their outer half.

Holotype, male, Carolina, Porto Rico, altitude 100 feet. Crab-holes in under rocks, September 11, 1914. Through Dr. C. S. Ludlow.

Type, No. 19661, U. S. Nat. Mus.

This interesting fly agrees most closely with *P. grisea* Alexander¹ from Panama from which it differs in the venation, the lack of a distinct narrow pleural stripe, and in having the scapal segments of the antennæ quite distinct in color; the color of the posterior legs of *grisea* is still unknown. *P. pulchricornis* Alexander² from British Guiana is likewise allied to *geniculata* in the uniform brown tarsi but differs in the possession of a broad pleural stripe, the darker wings with the radial crossvein set far back from the tip of R_1 , etc.

NEW NORTH AMERICAN HYMENOPTERA

By J. C. CRAWFORD

Superfamily CHALCIDOIDEA

Halticoptera goodi, new species.

Female. Length about 3.5 mm. Bright green, head and thorax coarsely reticulated, the reticulations coarsest in middle of mesonotum and becoming finer laterad; those on outer margins of parapsidal areas and axillæ finest; antennæ dark brown, scape metallic; clypeus with two blunt teeth near middle, pedicel slightly longer than first joint of funicle; scutellum near apex with a rather indistinct transverse furrow, the sculpture running across furrow; propodeum with a strong median and lateral carinæ and basad with a few short longitudinal rugæ; pitted between the rugæ; rest of propodeum between lateral carinæ finely indistinctly reticulated; coxæ green, femora, except apices, dark brown with a greenish tinge; tibiæ testaceous, medially slightly tinged with reddish; tarsi reddish-testaceous; abdomen short, ovate, first segment occupying about half the abdomen, incised at apex medially.

Male. Length about 3.4 mm. Similar to the female; basal

¹Alexander, C. P. Proc. U. S. Nat. Mus., vol. 44, p. 535, 1913.

²Alexander, C. P. Trans. Am. Ent. Soc., vol. 40, p. 251, 1914.

half of scape yellow, rest of antennæ reddish-testaceous; legs, except coxæ, yellow; mandibles, except apices, yellow.

Habitat: Smith's Cove, Nova Scotia.

Type, Cat. No. 19761, U. S. Nat. Mus.

Described from two of each sex received from Mr. C. A. Good, the two males with the date July 31, 1915, the type female August 7, 1915, the paratype female August 11, 1915.

Superfamily APOIDEA

Cœlixys cockerelli, new species.

C. alternata, Cwfd. not Say, Ann. Ent. Soc. Amer., vii, 148, 149, 1914.

Female. Distinguished by the characters given in the table cited above, to which may be added that it closely resembles *C. hunteri* Cwfd. especially in the shape of the last dorsal and ventral segments, but it is less closely punctured, especially on the abdomen, and the next to last ventral on the apical half is sparsely finely punctured (densely so in *hunteri*); impunctate areas along inner margins of eyes and around ocelli are less swollen and distinct.

Described from one female labeled "Colo. 1462," collection C. F. Baker.

Type, Cat. No. 19963, U. S. Nat. Mus.

Named after Prof. T. D. A. Cockerell in recognition of the valuable work done by him on the North American Apoidea.

Perdita bruneri Ckll.

P. bruneri Ckll. male not female, Ent. News, viii, 23, 1897.

P. cockerelli Cwfd. male and female, Can. Ent., xxxviii, 282, 1906.

Professor Cockerell has recently presented the types of about 80 species of bees to the National Museum, among them the types of this species, and I am able to establish the above synonymy.

In describing this species he has incorrectly associated the sexes and called both "type." I herewith select the male as the type of the species since it has place priority. The error in later determinations came about through my sending only females to Professor Cockerell for naming and having the

female, which did not belong to this species, called *bruneri*. Later when I had both sexes of the two species involved I described the second one, so that what I formerly called *bruneri* is still without a name.

Perdita swenki, new species.

P. bruneri authors, not of Ckll.

P. bruneri Ckll., female not male.

Male. Similar to *bruneri* male, but smaller, the yellow on base extending some distance above insertion of antennæ; hind femora brown with a yellow stripe above; hind tibia brown, the base yellow. Length about 5 to 5½ mm.

Female. Similar to *bruneri* female, but smaller, supraclypeal mark present, complete or at most slightly notched above, labrum entirely yellow, apical margin of clypeus light, abdominal markings whiter, separated medially by only a narrow space. Length about 6½ to 7 mm.

Type locality: West Point, Nebraska.

Type, Cat. No. 19964, U. S. Nat. Mus.

Described from three pairs taken in copula, the type pair and one paratype pair taken September 11, 1901, on *Solidago rigida*; the other paratype pair taken September 6, 1912; all collected by the author.

NEW CERATOPOGONINÆ FROM PERU

(Diptera, Chironomidæ)

By FREDERICK KNAB

The following species are described in order that their names may be available in a forthcoming paper by Dr. C. H. T. Townsend on the transmission of "uta," a little known disease peculiar to certain parts of Peru. While ordinarily the describing of isolated species in a difficult group would be undesirable, their special interest in this case compels it. Furthermore, the species are well marked and will be recognizable without difficulty.

Forcipomyia utæ, new species.

Female. Occiput black, with a few long, coarse, pale yellow hairs. Antennæ yellow-brown, darker distally. Palpi

blackish. Mesonotum rather dark brown, on the disk dusted with gray and with three indistinct brown longitudinal lines; humeri and lateral margins creamy yellow; scutellum brown; vestiture of rather sparse, long, pale yellow hairs; pleuræ blackish, some of the sutures broadly pale margined; postnotum black. Abdomen elongate, depressed, nearly straight-sided, the fifth, sixth, and seventh segments distally broadened; color dull black, with narrow whitish bands at the bases of the segments; vestiture of short pale hairs and scattered long whitish hairs laterally and distally. Wings smoky gray, clothed with dark brown hairs, the extreme base and a small spot on the costa before apex of first vein whitish; costa clothed with dense black hairs to wing-tip; first vein ending in the costa slightly before middle of wing. Halteres dull black. Coxæ yellowish; legs yellowish, the anterior pair without pronounced infuscations and with the first tarsal joint about two-fifths the length of the second; middle and hind legs with the apices of the femora and the bases of the tibiæ broadly blackened; hind tarsi with the first joint hardly more than half as long as the second; all the tarsi somewhat infuscated; all the legs clothed rather densely with short and moderately long pale hairs, some very long scattered ones on the tibiæ and hind tarsi. Claws long and slender. Length: Body about 2 mm., wing 2 mm.

Male. Differs from the female in the usual sexual characters. The mesonotum shows a more pronounced pruinose median zone, bounded by more distinct dark stripes at lateral thirds; hairs shorter and finer. Scutellum with a fringelike row of very long pale yellowish hairs. Abdomen long, narrow, the second, third, and fourth segments with very broad whitish apical bands, the succeeding segments wholly black. Legs longer and more slender than in the female and with much more numerous very long hairs, almost forming a fringe on the hind tibiæ. Wings much narrower than in the female. Length: Body about 2.5 mm., wing 2 mm.

Matucana, Peru, 1 female, 1 male, April 22, 1914 (C. H. T. Townsend).

Type, Cat. No. 19955, U. S. Nat. Mus.

Forcipomyia townsendi, new species.

Female. Occiput black, clothed with fine, rather short, yellow hairs. Antennæ rather short and stout, brown basally, blackish distally. Palpi black. Mesonotum dark reddish brown, dusted with dull brown, the humeri and lateral margins pale yellowish; vestiture of long, coarse, shining yellow hairs. Scutellum broadly margined with pale yellow and with very long brown marginal hairs. Pleuræ light brown, pale at the sutures and broadly so beneath roots of wings. Postnotum blackish. Abdomen moderately long, broad, strongly depressed, tapered at tip, wholly black, subshining; dorsal vestiture inconspicuous, lateral hairs, coarse and long, brown with golden lustre, the distal ones still longer. Wings broad, gray, whitish at extreme base, the surface clothed with rather long blackish hairs, a series of six opaque white bare spots on the margin, two large ones on the costal margin, the others smaller and less distinct, one each between veins 2 and 3, 3 and 4, 4 and 5, and between the forks of the fifth vein; the first costal spot is largest, is situated just beyond the end of the first vein and extends inward to the second vein; the second costal spot is at the tip of the second vein; the costal region, except where interrupted by these spots, is broadly darkened and much more heavily haired. Halteres with large white knobs. Coxæ pale; legs yellowish brown, the hind femora infuscated distally; hind tarsi with the first joint about two-thirds the length of the second; femora, tibiæ, and tarsi, especially the hind ones, with many very long brown hairs. Claws long and slender. Length: Body about 1.5 mm., wing 1.8 mm.

Matucana, Peru, 1 female, April 22, 1914 (C. H. T. Townsend).

Type, Cat. No. 19956, U. S. Nat. Mus.

This species shows a striking departure from the prevalent generic type in the pigment spots of the wing membrane. It gives me pleasure to dedicate this handsome species to Dr. Townsend, whose work in Peru has been fruitful of so many interesting results.

NOTES ON THE SPECIES OF CULEX OF THE BAHAMAS

By HARRISON G. DYAR and FREDERICK KNAB

Dr. Dyar visited the Island of New Providence in the Bahamas for his health early in 1915. A few observations that he was able to make seem worthy of record.

The two species of mosquitoes commonly associated with man in the tropics, *Culex quinquefasciatus* Say and *Aedes calopus* Meigen, were abundant and troublesome. They bred together in artificial receptacles, such as rain-barrels and tubs and other collections of water, but not in any of the cisterns or wells. They were found only in the towns. With them was a psychodid, *Psychoda albipunctata* Will., its black larvæ occurring associated in nearly every culture. Outside of the towns, in holes in coral rock containing water, three species of *Culex* were found breeding:

Culex similis Theobald.

The larvæ occurred in every pool, including wells in rock, drainage ditches from the road, and puddles in mud in a mangrove swamp, all, however, permanent water in an essentially natural condition. Females came to bite in the immediate vicinity of the pools, but were not taken in town. This species and *C. quinquefasciatus* did not occur in the same water in any instance under observation, as has elsewhere been observed to be the case (See Howard, Dyar and Knab, Mosq. No. and Centr. Amer. and W. Ind., iii, p. 342, 1915), nor was the water in any case foul, but frequently perfectly clear and cold. It would appear that *C. similis* prefers such clear natural pools and is only forced into foul water and an association with *C. quinquefasciatus* by scarcity of its preferred breeding places.

Culex aseyehæ, new species.

Female. Proboscis moderately long, nearly uniform, brownish black scaled throughout. Palpi short, black scaled. Occiput black, clothed with rather sparse, narrow curved, creamy yellow scales, denser along median line, and two patches of

upright forked black scales; ocular margins and cheeks clothed with broad white scales. Mesonotum dark brown, clothed with rather coarse, narrow curved, shining yellowish brown scales, much paler ones along margins and about antescutellar bare space; bristles rather sparse, long and black. Scutellum clothed with fine pale scales; median lobe with six or seven long brown bristles, the lateral lobes with four bristles. Postnotum luteous brown. Pleuræ pale brownish luteous, with patches of broad white scales. Abdomen depressed, blunt at tip; dorsal vestiture of dull black scales, each segment with a broad, creamy white basal band becoming narrower toward the sides; large triangular white patches laterally at bases of segments, not visible from above; venter entirely soiled white scaled. Wings hyaline, moderately broad; fork of second vein nearly twice as long as its stem; scales along the veins blackish, the outstanding ones linear; third and fifth veins with dense, rather broad, truncate appressed scales which give these veins a distinctly blacker appearance. Halteres pale, with blackened knobs. Legs rather long and slender, black scaled, the tarsi unbanded; front femora with a broad white line along the whole length on outer side. Claws simple. Length: Body about 3 mm., wing 3.3 mm.

Male. Proboscis straight, slightly enlarged toward apex, black scaled. Palpi exceeding the proboscis by nearly the length of the last joint, black scaled; end of long joint and last two joints slightly thickened and bearing many rather long black hairs; last two joints subequal and with some pale scales at base. Antennæ loosely plumose, the shortened joints slender and longer than usual; hairs of whorls blackish. Abdomen long, depressed, rather narrow, slightly broadened beyond middle; dorsal white bands broad, transverse, occupying nearly the basal halves of the segments. Wings narrower than in the female; second vein with the fork and stalk subequal in length. Claws unequal; formula: 1.1-1.1-0.0. Length: Body about 3.5 mm., wing 3 mm.

Type: Cat. No. 19978, U. S. Nat. Mus.

The larvæ occurred rarely in rock pools associated with the

two species here discussed. They were not found in the deep rock pools nor in the mangrove swamp.

The female, unfortunately represented by but a single specimen, presents a characteristic appearance in the abdominal banding, all the bands being nearly equally developed, broad and medianly produced. The peculiar scaling of the wing-veins will facilitate the recognition of this species.

Culex sphinx Howard, Dyar and Knab.

Larva: Head large, broad, rounded; antennæ large and prominent, rather slender, with a long hair-tuft at apical third, the part beyond attenuated and infuscated, the basal two-thirds spinose, three long bristles and a long spine apically; dorsal head-tufts four-haired. Skin of body nearly smooth, on thorax finely spinulose; lateral hairs of abdomen in twos on segments 3 to 6. Lateral comb of eighth segment of many small scales in a large patch. Air-tube rather stout, subfusiform, about six times as long as width at base; pecten of 17 to 20 rather long teeth, occupying basal two-fifths of tube; three pairs of long tufts composed of two or three hairs, the basal one just beyond end of pecten, the intermediate one near middle of tube and out of line. Anal segment slightly longer than broad, ringed by the plate; lateral hair single; ventral brush well developed; and gills four, leaf-like, shorter than the segment, subequal.

The larvæ occur in rock pools associated with the two preceding species. They are very different from those of *Culex territans*, with which this species was identified by the late D. W. Coquillett (see Coffin, in Shattuck, The Bahama Islands, 1905, p. 288). In the present species the breathing tube is rather stout and convex, while in the other it is slender and somewhat concave on the distal half; furthermore, in that species the dorsal head-hairs are normally single or double, while the tracheæ are very slender, these latter being broad in *sphinx*.

Culex bahamensis Dyar and Knab.

This species is known only from the peculiar larvæ. Dr. Dyar was not fortunate enough to rediscover them. The habits

and the exact habitat of the original specimens remain unknown.

Culex species.

Dr. Dyar found some little larvæ allied to *C. reductor* D. and K. and *C. floridanus* D. and K., but was not able to rear them. They occurred in a fresh-water swamp on coral rock.

SYNONYMICAL NOTES ON MUSCOIDEA

By CHARLES H. T. TOWNSEND

The following notes are offered at this time as a matter of record and for the purpose of aiding in the elucidation and synonymy of the various forms.

Parabengalia Roubaud, 1913, Bull. Sc. Fr. and Belg., XLVII, 114 equals *OCHROMYIA* Mcq. (1835). Has same genotype.

Calliphora R. D., 1830, Myod., 433-4 equals *MUSCA* L. (1758). Vide Townsend, Jour. Wash. Acad. Sci., V, 433-4. Genotypes strictly congeneric.

Trichocalliphora Townsend, 1915, Proc. Biol. Soc. Wash., XXVIII, 20 equals *NEOPOLLENIA* Brauer, 1899, Sitz. M.-N. Cl. Akad. Wiss., CVII, 496. Brauer (ibid. 524) confirms Schiner's belief (Novara Dipt. 309) that *Calliphora villosa* R. D., type of *Trichocalliphora*, equals *Musca stygia* Fab., type of *Neopollenia*, recorded from Newfoundland apparently in error for New Holland.

Compsomyia Rdi., 1875, Ann. Mus. Civ. St. Nat. Genova, VIII, 425 equals *CHRYSOMYA* R. D. (1830). Vide Townsend, Jour. Wash. Acad. Sci., V, No. 20. The genotypes are apparently strictly congeneric.

Opsophasiops Townsend, 1915, Proc. Biol. Soc. Wash., XXVIII, 22 equals *PALPOSTOMA* R. D., 1830, Myod. 429. *Myiophasia flava* Coq., 1900, Proc. Linn. Soc. N. S. W. for 1900, 390 equals *PALPOSTOMA TESTACEA* R. D. (l. c.). A most remarkable character is present in this form, being nothing less than a supplementary pair of palpi developed on and articulated with the labella. This character was pointed out by Desvoidy in 1830 (l. c.). It is unique, so far as known.

Euaraba Townsend, 1915, Proc. Biol. Soc. Wash., XXVIII, 20 equals ARABA R. D. (1830). Coquillett (Proc. U. S. Nat. Mus., XXXVII, 509) cites designation of R. D. for ARGYRIA R. D. (Posth., II, 83) as applying to ARABA R. D., under which ruling the latter genus would become a synonym of *Metopia* Meigen (1803). It was to fill the place which would be left vacant by the deposition of *Araba* that *Euaraba* was erected. Coquillett's ruling, however, can not hold, and B. B.'s designation of *fastuosa* Meig. as type of *Araba* must be accepted (Musc. Schiz., II, 359; III, 168). Since *tergata* Coq., type of *Euaraba*, appears to be strictly congeneric with *fastuosa* Mg., the above synonymy results.

Neophyto nocturnalis Walton, 1915, Proc. Ent. Soc. Wash., XVII, 162 equals NEOPHYTO ANOMALA Townsend (1908). The wing-veins are normally deeply colored, and may be narrowly edged with smoky, especially in the female.

Neophorichata johnsoni H. E. Smith, June, 1915, Psyche, XXII, 100 equals *Tricogena* SETIPENNIS Coq., 1897, Rev. Tach., 130, which is type of EUTRICOGENA Townsend, February, 1915, Proc. Biol. Soc. Wash., XXVIII, 23.

Laccoprosopa Townsend, 1891, Trans. Am. Ent. Soc., XVIII, 365 equals BRACHICOMA Rdi. (1856). Genotypes strictly congeneric.

Sarcotachinella Townsend, 1892, Trans. Am. Ent. Soc., XIX, 110-11. Dr. J. M. Aldrich has called my attention (in litt. Sept. 16, 1915) to this form and states: "I have examined your type of *Sarcotachinella intermedia* and spread its genitalia. It is nothing but the European *Sarcophaga sinuata* Mg." In reply to my query as to probable differences in male genitalia of *sinuata* and *carnaria*, Dr. Aldrich writes (in litt. Sept. 30, 1915): "*Sarcophaga carnaria* and *sinuata* are closely allied in most respects, differing most obviously in that the former has four, the latter three, postsutural dorsocentrals, and *sinuata* also has generally a very distinct patch of yellow tomentum on the front side of the middle femur near apex in both sexes (which, however, is bleached and rather pale in your type of *Sarcotachinella*). I do not think there is any generic difference between them." The genus may rest on the known characters, however,

until its status can be definitely determined. It would appear to mark a good division of the old genus *Sarcophaga*.

Carcinomyia Townsend, 1915, Proc. Biol. Soc. Wash., XXVIII, 21 equals *CYNOMYA* R. D. (1830). This genus was founded on the male forceps being nearly as long as middle femora, the second hypopygial segment greatly enlarged and elongated, and the very marked hairiness of the body; male *Cynomyia cadaverina* R. D., in absence of male *mortuorum*, being taken for comparison as typical of *Cynomyia*. Dr. Aldrich advises me (in litt. Sept. 30, 1915): "I find that Hough was in error when he stated that the terminal chitinous hooks in *hirta* are much smaller than in *mortuorum*; they are of approximately the same size and shape. The other characters exist as stated, (1) hairiness in the male, (2) slight chætotactic characters in the female, but are purely specific in my opinion." I agree with Dr. Aldrich on this point, after examining male *mortuorum* sent me by him. Moreover, *mortuorum* shares with *hirta* the hairy character of the male, which is merely less developed in the former than in the latter.

The differences between *hirta* and *cadaverina* exist, nevertheless, as I saw them, and mark two valid groups. It only remains to name the *cadaverina* group, which is truly intermediate between *Cynomyia* and *Musca*. I agree with Hough that *Cynomyia* and its close relatives belong with *Musca* (Calliphora). Male reproductive-system characters prove this, the vasa deferentia being short and moderately slender in *Musca* (TD-4338) and the *cadaverina* group (TD4497), but long and microscopically slender on basal half or more in *Sarcophaga* and relatives (TD4190, 4482, 4503, 4527). The characters of the four genera of the *Cynomyia-Musca* group are given below.

Musca L.—Hind tegulæ hairy in both sexes. Front femora not swollen in either sex. Male with legs and body not long-hairy; second hypopygial segment extremely short, not longer than first or but little longer, hypopygium small; forceps elongate, but not enlarged. Abdomen broadly rounded anally in both sexes.

Cynomyopsis, new genus.

Genotype, *Cynomya cadaverina* R. D., 1830, Myod., 365. Hind tegulæ hairy in both sexes. Front femora swollen in both sexes in the genotype, but only in the male in certain closely allied species. Abdomen subpointed anally in both sexes, usually more so in the male. Male with legs and body not long-hairy, the femora without thick hair-brushes, femora and tibiæ not bowed; second hypopygial segment short, not over twice the first, hypopygium prominent and conspicuous; forceps elongate and enlarged.

To this genus must be referred *Calliphora texensis* Townsend, *C. popoffana* Townsend, and *Cynomya elongata* Hough, all of which have the front femora swollen in male but not in female.

Cynomya R. D.—Hind tegulæ hairy in both sexes. Front femora slightly swollen in female, considerably so in male. Male with legs and body long-hairy, femora with hair-brushes but tibiæ without, none of femora or tibiæ bowed, hind and middle femora a little swollen; second hypopygial segment much enlarged and elongated, normally nearly or quite three-fourths the length of middle femora, the hypopygium thus being especially massive and conspicuously developed; forceps extremely elongate and heavy, nearly as long as middle femora.

Peckia R. D.—Hind tegulæ bare in both sexes. Femora of female hardly swollen. Male femora greatly swollen, the hind pair especially so; hind tibiæ and hind femora strongly bowed, front metatarsi more or less bowed; both femora and tibiæ with thick hair-brushes; second hypopygial segment short. *Phrissopodia* Mcq. has same genotype and is thus a synonym.

This genus belongs with *Cynomya* in the Muscidæ (Calliphoridae). The frontal and facial characters show this relationship conclusively. The following Sarcophagid form is here defined to distinguish it from *Peckia*, with which it has been confused:

Paraphrissopoda, new genus.

Genotype, *Peckia lamanensis* R. D., 1830, Myod., 335-6. Hind tegulæ bare in both sexes. Male with all femora swollen,

but front pair more swollen than hind pair; hind femora and tibiæ slightly arcuate; hair-brushes of middle and hind tibiæ extremely long; first and second hypopygial segments about equal in length, both rather elongate.

The generic name has been on labels in the U. S. Nat. Mus. collection for many years, and is adopted as very appropriate.

Tricharca Thomson, 1868, Dipt. Eug. Resa, 541. To this genus belongs *Dexia albicans* Walker, 1858, Trans. Ent. Soc. Lond., n. s., IV, 204, Amazon valley. Austen has examined the type and indicated it as Gen. Nov. aff. *Sarcophaga*, overlooking Thomson's description (Ann. Mag. Nat. Hist., ser. 7, XIX, 344). Walker's species appears to be distinct from Thomson's *T. scatophagina*, Rio Janeiro.

Oxynops serratus Townsend, 1912, Journ. N. Y. Ent. Soc., XX, 110-11 equals *Hypostena nitens* Coq., 1897, Rev. Tach. 63. External characters are given in a forthcoming paper.

Schizotachina vitinervis Thompson, 1911, Can. Ent., XLIII, 268. It is extremely doubtful that this is distinct from *S. convecta* Wlk. There is absolutely no constant structural difference outside of the obliteration of the fourth vein. Males of *convecta* with entire fourth vein show third arisal joint no longer than second, and in one case it is shorter; also the facialia are ciliate only on lower fourth in some specimens with complete fourth vein. Some specimens, as noted by Thompson (ibid., 271), show the apical crossvein much fainter than the rest of the veins, indicating a stage in process of obliteration.

Dichatoneura Johnson, 1907, Psyche, XIV, 9 equals PHYTO-MYPTERA Rdi. (1845). Genotypes congeneric.

Eucordylidexia Townsend, 1915, Insec. Inscit. Menstr., III, 41. To this genus evidently belongs *Cordyligaster tipuliformis* Walker, 1858, Trans. Ent. Soc. Lond., n. s., IV, 205-6, So. America. It is a striking fact that Walker noticed the atrophied tegulæ in this form, as witness his statement "alulæ whitish, very small (alulis albidis minimis)," which should vindicate him from the charge of careless observation. The color description given by Walker indicates either a distinct species or a very pale and immature specimen of *E. ategulata* Townsend. One of the Guatemalan specimens mentioned in

the description of the latter was taken at Gualan, by W. P. Cockerell, who has published a vividly interesting account of her visits to that semidesert region (Can. Ent., XLIV, 277-81).

Zygobothria Mik (B. B.) equals *SCHAUMIA* R. D. (1863). Genotypes apparently strictly congeneric.

Atropharista Townsend, 1892, Trans. Am. Ent. Soc., XIX, 92. In addition to the antennal and macrochætal characters, this form lacks the "short erect abundant black pile" of abdomen and thinner pile of mesoscutum described by Williston for male of *Melanophrys* (Trans. Am. Ent. Soc., XIII, 306).

Dejeania plumitarsis Wulp, 1888, Biol. C.-A. Dipt., II, 10, pl. 1, ff. 5a, 5b equals *Dejeania* *CORPULENTA* Wd., Mcq., Sch., B. B. (non Wulp) equals *ECHINOTACHINA* Townsend, 1913, Psyche, XX, 104-5. The revised characters are as follows: Third antennal joint much enlarged apically (R. D. calls attention to this character as being of generic value—Posth., I, 655); female front tarsi widened; male front tarsi with row of long black hairs on inside of joints 2 to 4; anal segment of male with long black bristly hairs extending beyond the rufous pile and black spines.

Dejeania corpulenta Wulp (non Wied. et al.), 1888, Biol. C.-A. Dipt., II, 9-10, pl. 1, f. 4 equals *Dejeania* *VEXATRIX* O.-S. equals *TRICHODEJEANIA* Townsend, 1913, Psyche, XX, 104-5. Characters are: Third antennal joint not enlarged at tip, convex on upper edge; female front tarsi not widened; male front tarsi without inside row of long hairs, and anal segment without the longer bristles.

Chatotachina B. B., 1889, Musc. Schiz., I, 98 equals *ERIBEA* R. D. (1863). Has same genotype.

NEOTHELAIIRA dexina Townsend, 1912, Jour. N. Y. Ent. Soc., XX, 109-10 equals *Masicera* *AURIFRONS* Coq., 1897, Rev. Tach. 115. External adult characters will appear in forthcoming paper.

Coquilletina Walton, 1915, Proc. Ent. Soc. Wash., XVII, 104, stands solely on the character of the obliterated apical crossvein, and evidently equals *EUACEMYIA* Townsend, 1912, Proc. Ent. Soc. Wash., XIV, 163-4. It is doubtful if the obliteration of fourth vein carries specific value (vide *Schizo-*

tachina vitinervis above), much less generic. The forms agree closely in all other structural characters. The second arisal joint is no longer than wide in any of the specimens including the *tibialis* holotype, and a suggestion of the indentation of tip of third antennal joint occurs in both sexes of *tibialis*. A specimen from Colorado with obliterated fourth vein is otherwise absolutely identical structurally with the *tibialis* series in the U. S. Nat. Mus. collection.

EUZENILLIA aurea Townsend, 1912, Jour. N. Y. Ent. Soc., XX, 111-12 equals *Hypostena VARIABILIS* Coq., 1895, Jour. N. Y. Ent. Soc., III, 57. External adult characters to appear in forthcoming paper.

Clytia atra R. D., 1830, Myod., 288. Coquillett (Proc. U. S. Nat. Mus., XXXVII, 572) has indicated this as one of the *Myiophasia* group. This is highly improbable, since Desvoidy defines his genus *Clytia* on preceding page as having front broad in both sexes and records his specimen as male in description of *atra*, whose form he characterizes as cylindrical. Desvoidy cannot be considered as having mistaken a myiophasiine female for the male in this case, since the female can not be described as cylindrical; and the male in all of the *Myiophasia* group has the eyes nearly contiguous. Moreover, it is practically inconceivable that Desvoidy should have referred a myiophasiine fly to his genus *Clytia*. The cylindrical form, broad male front, and shining metallic coloring strongly suggest *Lydina* (*Polidea* Mcq., *Somoleja* Rdi., B. B.), but the shorter antennæ preclude this reference.

Polistomyia Townsend, 1908, Tax. Musc. Flies, 132-3. In 1913 (Jour. N. Y. Ent. Soc., XXI, 147-8) I accepted Coquillett's designation of *Thereva plumipes* Fab. as type of *Trichiopoda* Latr. (Proc. U. S. Nat. Mus., XXXVII, 616). It appears, however, that the type selections made by Brauer and Bergenstamm in their classical work, "Vorarbeiten zu einer Monographie der MUSCARIA SCHIZOMETOPA (exclusive Anthomyidae)" (Parts I to IV, Wien, 1889-1894), must hold as valid designations, provided only that the selected species are among those originally included in each case, and that no

valid previous designation exists. The authors of this work state on page 5 of their introduction in part I: "In Betreff der Gattungsnamen war für uns massgebend, jenen Namen zu belassen, welcher der ältesten Art einer Gattung als Type zukommt."¹ This statement clearly announces their intention and practice to cite type species for their generic concepts. In order to interpret the *motif* of this statement, we must understand the authors' conceptions of genera and genotype fixation. They were that the earliest described species currently and by common usage referred to a given genus, and necessarily agreeing with it in general characters, must stand as the genotype and carry with it the generic name applied to it, regardless of considerations of priority. In other words, their concept of a genus took the name that went with the oldest species included in that concept, which automatically became the type, regardless of priority in generic names. Thus they meant to maintain the proper genotypes of the genera defined by them, and they did maintain and cite what they considered as such. When their action does not conflict with established procedure, as above noted, their citations appear to be valid designations under the International Code regulations.

In 1889-1893 (I, 147; III, 67) these authors designated *Thereva lanipes* Fab. as type of *Trichiopoda* Latr. The second reference is to be interpreted by the first. This is the logical genotype, since it embodies the prevalent sense of the genus, while *plumipes* does not. *Polistomyia* thus stands with *Trichiopoda trifasciata* Loew as type, which species appears to be congeneric with *plumipes* Fab.

Galactomyia Townsend, 1908, Tax. Musc. Flies, 135-6 equals TRICHIPODA Latr. (1829), since its genotype, *radiata* Loew, is quite clearly congeneric with *lanipes* Fab.

¹"With regard to generic names, it was incumbent upon us to retain that name which falls to the oldest species of a genus as type."

THE BEE GENUS *HOLCOPASITES* ASHMEAD

By J. C. CRAWFORD

This genus was established by Dr. Ashmead in Trans. Amer. Ent. Soc., vol. 26, p. 82, 1899, but no species was included. The material on which he based his description is in the U. S. National Museum and bears his manuscript name *H. pratti*. This, however, is the species described by Robertson as *Phileremus illinoiensis*, which species I select as the genotype. To this genus also belong *Phileremus pulchellus* Cresson, *P. heliopsis* Robert., and *Neopasites robertsoni* Cwfd. as well as the new species described below.

In this genus the mandibles are not dentate, and Ashmead's generic description is erroneous in stating that the pygidium has a median carina. The labrum is rostriform and truncate at apex.

The venation is quite variable in this genus, the transverse median vein in the same species being interstitial or received beyond the basal vein; the first recurrent vein will be either some distance before the apex of the first cubital cell or exactly at apex. In the specimen of *illinoiensis* from Mississippi the first recurrent of the left wing is branched before reaching the discoidal vein, making a large extra complete cell; in the right wing there is a minute stub on the recurrent at about the same distance from the discoidal. In a specimen of the species from Washington, D. C., the outer transverse-cubital of the right wing is branched before reaching the cubitus, making a minute longly petiolate third cubital cell. In the paratype male of *stevensi* from Bismarck, North Dakota, the first transverse-cubitus is missing in both wings, showing only a minute stub on the marginal vein, so that there is only one cubital cell.

KEY TO THE SPECIES

FEMALES

- | | |
|--|--------------------------|
| 1. Abdomen red | 2 |
| Abdomen dark | 5 |
| 2. Last ventral segment deeply widely emarginate..... | <i>pulchellus</i> Cress. |
| Last ventral segment not deeply widely emarginate..... | 3 |

3. Labrum medially near base with a thornlike projection,
acanthochilus, new species
 Labrum without such a thorn..... 4
4. Joint 3 of antennæ as long as 4 + 5; punctures of front, clypeus,
 mesonotum, and mesopleuræ separated, the interspaces shiny,
illinoiensis Robt.
 Joint 3 of antennæ shorter than 4 + 5, mesonotum and mesopleuræ
 rugoso-punctate, punctures of clypeus and front, coarse, close,
stevensi, new species
5. Pleuræ rugoso-punctate, with a lunule of white pubescence,
heliopsis Robt.
 Pleuræ punctured, with a large patch of white pubescence, below
 this more finely punctured.....*robertsoni* Cwfd.

MALES.

1. Abdomen red 2
 Abdomen dark 4
2. Sixth dorsal segment at apex medially with a triangular pygidium-
 like projection*texanus*, new species
 Sixth dorsal segment without such a projection..... 3
3. Joint 3 of antennæ as long as 4 + 5; labrum with hardly a trace
 of a median carina.....*illinoiensis* Robt.
 Joint 3 of antennæ shorter than 4 + 5, labrum medially carinate
 for two-thirds its length.....*stevensi*, new species
4. Pleuræ rugoso-punctate, with a white lunule; truncation of basal
 segment of abdomen not sharply defined, laterally the punctures
 extending onto truncation.....*heliopsis* Robt.
 Pleuræ punctured, with a large white patch, below this more finely
 punctured; truncation of basal segment sharply defined, subcarinate
 above; laterally angulate, without punctures on truncation,
robertsoni Cwfd.

Neopasites eamia Ckll., which I do not know, is omitted from the above table. From its original description it does not appear to be any of the new species described in this paper.

Holcopasites illinoiensis (Robt.).

Specimens in the collection of the American Entomological Society from Robertson which are probably paratypes but are not labeled as such, show the following characters: Third antennal joint as long as 4 + 5; punctures on disk of mesonotum near middle well separated, the interspaces shiny; fifth ventral segment quite deeply but narrowly emarginate.

The specimens from the vicinity of Washington, D. C., which Ashmead had under the manuscript name *pratti* agree

perfectly with this. There is also in the collection a specimen from Louisiana and one from Agri. Coll., Miss., collected May 24, 1901, on *Erigeron annuus* by W. Dwight Pierce.

Holcopasites acanthochilus, new species.

Female. Length 6.5 mm. Head and thorax black with appressed white pubescence, face closely rather coarsely punctured, punctures of clypeus finer, on each side of face above clypeus a smooth shiny area with a few large punctures; labrum near base medially with a short spine-like projection; mandibles red, lighter medially; antennæ reddish, brownish above, most of scape dark brown; mesonotum closely punctured, the punctures somewhat coarser than on face; scutellum slightly bilobed, almost rugoso-punctate; tubercles and tegulæ reddish, coxæ and basal half of femora dark, tibiæ reddish, apical half of the mid and hind tibiæ and all of tarsi brown; tibial spurs whitish; first recurrent received by the second cubital very near base; abdomen red, truncation of first segment poorly defined, covered with appressed white pubescence; first four segments with a pair of basal spots of appressed white pubescence and a similar spot on lateral apical margins; last ventral segment apically slightly emarginate.

Type locality: Clarendon, Texas.

Type, Cat. No. 19968, U. S. Nat. Mus.

One specimen from the type locality with the record of June 11, 1910, on *Monarda citriodora*, F. C. Bishopp, collector; also one female from Cypress Mills, Texas.

Holcopasites stevensi, new species.

Neopasites illinoiensis auct. not Robertson.

Female. Length about 6 mm. Black, abdomen red; very similar to *illinoiensis* but larger, face above, mesonotum and mesopleuræ coarsely rugoso-punctate; joint 3 of antennæ not as long as 4+5; last ventral segment very slightly emarginate.

Male. Length about 6 mm. Similar to the female except in secondary sexual characters.

Type locality: Bismarck, North Dakota.

Type female, allotype male and one male paratype from the type locality with the record August 6, 1913, on *Grindelia*

squarrosa, O. A. Stevens, collector. Other localities in North Dakota (all taken by Mr. Stevens and all on *G. squarrosa*) are McKenzie, August 5, 1913, 1 female; Minot, August 22, 1915, 3 females; Drake, August 24, 1915, 3 males; Williston, August 9, 1915, 1 female, 1 male. From Nebraska: West Point, September 6, 1900, on *Solidago rigida*, 1 female; Lincoln, September 2, 1901, on *G. squarrosa*, 1 male; both collected by the author. From Alberta, Canada: Medicine Hat, one pair, J. R. Malloch, collector.

Type, Cat. No. 19969, U. S. Nat. Mus.

This is the species which I and others have recorded from the above-mentioned localities as *Neopasites illinoiensis*.

I take great pleasure in naming this species after Mr. O. A. Stevens, in recognition of his interest in the Apoidea.

Holcopasites texanus, new species.

Male. Length 5.5 mm. Head and thorax black, abdomen red, legs brown, darker basally; tibial spurs whitish; antennæ brown, darker above and more reddish beneath toward base; tegulæ and tubercles ferruginous; head and thorax closely rather coarsely punctured; labrum with a thorn-like projection medially near base; sixth dorsal abdominal segment medially on apical margin with a pygidium-like projection; transverse median vein interstitial; first recurrent vein received by first cubital cell near apex.

Type locality, Cotulla, Texas.

Type, Cat. No. 19970, U. S. Nat. Mus.

Type taken May 10, 1906, on *Verbesina encelioides*; paratype taken May 9, 1906, on *Monarda punctata*, both by F. C. Pratt.

While this species resembles *acanthochilus* in having a spine on the labrum, I do not think they can possibly be the same species, especially since the location of the first recurrent vein is different and in this character I have found no such variation, although the venation of the different species is quite variable.

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Insecutor Inscitiae Menstruus

Vol. III

NOVEMBER-DECEMBER, 1915

Nos. 11-12

NEW NEARCTIC CRANE-FLIES IN THE UNITED STATES NATIONAL MUSEUM

(*Diptera, Tipulidæ*)

By CHARLES P. ALEXANDER, Ithaca, N. Y.¹

The following species of crane-flies are for the most part contained in the collection of the National Museum. The species will be figured in reports by the author now in course of completion. I am indebted to Mr. Frederick Knab for the privilege of studying the crane-flies of the National Collection.

A number of the names of crane-flies of the genus *Tipula* of the eastern United States and Canada are preoccupied by earlier names in this genus and are renamed below. There is considerable difference of opinion as to what constitutes a preoccupied name, but the rules of the nomenclatural codes are clear upon this point, and if we are ever to have stability we must conform to these rules. In the International Code of Zoological Nomenclature (1905), article 35, is stated, "A specific name is to be rejected as a homonym when it has previously been used from some other species of the same genus." The Entomological Code (1912), paragraph 61, is as follows: "In case of primary homonyms the later name shall be changed, no matter to what genus they are now referred." The papers cited below are Gmelin's "System"² and de Villers' "Entomologia."³

¹Contribution from the Entomological Department of Cornell University.

²Gmelin. *Systema Naturæ* von C. Linnæus. Edition 13, Tom. 1, pars. 5, 1792.

³de Villers, Carolus. *Caroli Linnæi Entomologia Faunæ Suevicæ descriptionibus aucta*, vol. 3, 1789.

Tipula illinoicensis, n.n., for *T. versicolor* Loew (1863), non *T. versicolor* Gmelin (1792), p. 2819.

Tipula ignota, n.n., for *T. discolor* Loew (1863), non *T. discolor* Gmelin (1792), p. 2819.

Tipula iroquois, n.n., for *T. cincta* Loew (1863), non *T. cincta* Gmelin (1792), p. 2820.

Tipula labradorica, n.n., for *T. tessellata* Loew (1863), non *T. tessellata* de Villers (1789), p. 397.

Tipula senega, n.n., for *T. pallida* Loew (1863), non *T. pallida* de Villers (1789), p. 389.

Tipula ultima, n.n., for *T. flavicans* Fabricius (1805), non *T. flavicans* de Villers (1789), p. 403.

***Stygeropsis unimicra*, new species.**

Male.—Length, 10 mm.; wing, 12.3 mm.

Palpi dark brownish black. Frontal prolongation of the head short, light gray, the nasus long, slender. Antennæ rather long, the basal segments dull yellow soon passing into dark brown; the third to fifth segments are produced apically to give a subserrate effect; terminal segment tiny, attenuated. Head dull, dusky gray, narrowly lined with black, clearer on the sides of the occiput; a shallow depression behind the antennal bases; front produced cephalad between the antennal bases as a slender tongue.

Mesonotal præscutum dull grayish brown with three dark brown stripes, the middle one of which is indistinctly bisected by a gray line; scutum with the lobes gray marked with brown; scutellum and postnotum gray. Pleura clear light gray with the dorso-pleural membranes brownish yellow. Halteres short, light yellow, the knobs elongated, brown. Legs with the coxæ pale, densely gray pruinose; trochanters yellow; femora dull yellow, the apical half browner; tibiæ dull yellow passing into brown toward the tip; tarsi brown. Wings brownish gray, the costal region slightly brighter; stigma brown; veins dark brown; a broad vitreous band before the cord extending into the base of cell M_4 .

Abdominal tergites dark brown with a sparse gray bloom; segments 3 to 9 with the caudal margin narrowly ringed with silvery yellow; lateral margins of the segments almost white; sternites light gray, broadly ringed with paler caudally. Hy-

hypopygium with the ninth tergite very reduced, hidden, the lateral margins pale, the median area dark brown, shiny; eighth sternite unarmed.

Holotype, male, Colorado. (From the collection of C. V. Riley.)

Type, Cat. No. 19979, U. S. Nat. Mus.

Tipula satyr, new species.

Male.—Length, 13 mm.; wing, 15.3 mm.

Palpi short, dark brown. Frontal prolongation of the head short, light brown, the dorsal surface light gray, the nasus prominent. Antennæ with the first segment brown; the second segment brighter, more yellowish; flagellum with the segments almost unicolorous, dark brown, the basal enlargement a little darker. Head light gray with a distinct frontal tubercle that is indistinctly impressed medially.

Mesonotal præscutum very dull yellow with three broad dark brown stripes; pseudosutural foveæ low down on the lateral margin of the sclerite; thoracic interspaces with abundant long pale hairs; scutum, scutellum, and postnotum dull gray. Pleura gray, the dorso-pleural membranes more yellowish. Halteres brown, the knobs darker. Legs with the coxæ light gray provided with abundant long pale hair; trochanters brownish gray; femora yellow at the base, soon passing into dark brown; tibiæ and tarsi brown. Wings light brownish gray, the costal cells similar, not brightened; stigma brown; veins dark brown; a broad vitreous band before the cord extending into the base of cell M_4 .

Abdominal tergites hairy, dull orange with three brown stripes, the lateral pair clearer; segments 2 to 8 broadly ringed with silvery around the caudal margin, broadest and clearest on the second to fourth segments. Hypopygium with the ninth tergite having the lateral angles prominent, obliquely truncated, the outer lobe subacute, the inner lobe much shorter, blunt; the angles separated by a double median notch; from the outer margin of the base of the produced angles arises a prominent, acute, conical, orange-colored horn that is directed

caudad; ninth pleurite and sternite largely concealed by the prominent eighth sternite; eighth sternite prominent, the dorsal surface with a flesh lobe on each side near the apex, densely white pubescent, bearing at the apex sharp, reddish spines.

Holotype, male, Colorado. (From the collection of C. V. Riley.)

Type, Cat. No. 19980, U. S. Nat. Mus.

***Tipula pleuracicula*, new species.**

Male.—Length, 11.3 mm.; wing, 13 mm.

The type is teneral and the colors are not deep. Palpi light brown. Frontal prolongation of the head rather short, dull yellow, the extreme base with a slight gray bloom; the nasus prominent, upturned. Antennæ dull yellow, the flagellar segments probably darkened at the base in fully-colored specimens. Head light gray with a delicate interrupted median line.

Thoracic dorsum dull yellow without distinct darker stripes. Pleura with a sparse grayish bloom. Halteres long, slender, light brown, the base more yellowish. Legs with the coxæ and trochanters dull yellow; femora yellowish brown; tibiæ and tarsi brown. Wings subhyaline; costal region and the stigma darker; veins brown.

Abdomen brownish yellow, the segments narrowly ringed with silvery around the caudal margin. Ninth tergite of the hypopygium broad, conspicuous, the caudal margin subtransverse, the sublateral angles prominent, short, directed caudad and strongly ventrad, the apices truncated and sparsely toothed; ninth pleurite small, complete, produced caudad as a long needle-like point; eighth sternite prominent, the caudal margin almost straight across and with a broad fringe of coarse golden hairs.

Holotype, male, Colorado. (From the collection of C. V. Riley.)

Type, Cat. No. 19981, U. S. Nat. Mus.

***Tipula stalagmites*, new species.**

Male.—Length, 14 mm.; wing, 15.5 mm.

Palpi with the first segment dull yellow; the second segment

light brown; the two distal segments dark brown. Frontal prolongation of the head rather elongated, light brown, the nasus prominent. Antennæ with the first two segments light yellow; the third segment light brown; remainder of the antennæ black, the segments slightly excised. Head pale brownish yellow with a sparse blue-gray bloom, less distinct on the sides of the occiput; an indistinct brown median vitta.

Pronotal scutum yellowish gray with a brown median spot. Mesonotal præscutum light gray with four narrow dark brown stripes, the middle pair divided by a subequal vitta of the ground-color and beginning behind the anterior margin of the sclerite; a yellowish spot before the pseudosutural foveæ; scutum with the lobes gray, indistinctly marked with brown; scutellum pale brown, the postnotum gray, both with a very indistinct median brown vitta. Pleura with a light gray bloom, the dorso-pleural membranes and a blotch before the base of the halteres yellow. Halteres yellowish brown, the knobs darker. Legs with the coxæ light gray; trochanters dull yellow; femora and tibiæ yellow, the apices indistinctly darkened; tarsi brown. Wings subhyaline to grayish, the costal region more yellowish; stigma indistinct; veins dark brown; a vitreous band before the cord extending into the base of cell M_4 .

Abdominal tergites dull yellow, indistinctly trivittate with brown, the sclerites narrowly ringed with yellowish silvery on the caudal margin; ninth tergite light brown narrowly margined with yellow; sternites dull yellow with the median area darker, this pattern broadest on the terminal sclerites. Hypopygium with the ninth tergite large, transverse, with short, subacute, lateral lobes, the caudal margin with three notches, the median one shallowly concave, the lateral notches deeper, subrectangular; ninth pleurite complete; ninth sternite deeply notched medially beneath, the base of the notch on either side with a sharp, elongated appendage that is directed dorsad; eighth sternite with prominent fleshy lobes directed proximad, provided with finger-like projections that almost meet on the median line beneath; the caudal margin with a median submembranaceous shield bearing a weak tuft of pale hairs.

Holotype, male, Dripping Spring, Organ Mountains, New Mexico, April 23, 1898 (T. D. A. Cockerell); at light.

Type, Cat. No. 19982, U. S. Nat. Mus.

This species suggests *T. subtilis* Doane, *T. flavicoma* Doane, and related species, but is readily separated by the structure of the male genitalia.

Tipula rotundiloba, new species.

Male.—Length, 12 mm.; wing, 14 mm.

Palpi dark brown. Frontal prolongation of the head dull yellow with a sparse grayish bloom; nasus short but distinct. Antennæ with the three basal segments yellow, the third a little darkened at the tip; flagellar segments quite elongated, very slightly excised beyond the basal enlargement, dark brown passing into brownish yellow at the tip of each segment, the terminal segments more uniformly dark brown. Head dull gray with an indistinct median line.

Thoracic dorsum with the præscutum dull gray with four dark brown stripes, the lateral pair shorter, the middle pair narrowly bisected by a gray line; pseudosutural foveæ a dusky point; scutum grayish brown; scutellum and postnotum light gray. Pleura yellow with a dull gray bloom. Halteres pale brownish yellow, the knob darker brown. Legs with the coxæ light gray; trochanters light yellow; femora and tibiæ dull yellow, narrowly tipped with brown; tarsi brown. Wings with a strong grayish yellow tinge, the costal area dull yellow, the stigmal area brown; vein *Cu* yellowish, the remaining veins brown; a broad vitreous band before the cord, largest before the stigma in cell *1st R*₁ and as a conspicuous blotch at the tip of cell *R* and base of cell *1st M*₂, extending into the base of cell *M*₄; in the left-hand wing of the type, the base of vein *M*₃ persists as a slight spur.

Abdominal tergites dull brownish yellow with a dark brown dorsal line that broadens out at the end of the second segment so as to cover most of the sclerite; segments 3 to 6 dark brown, narrowly margined caudally, and broadly laterally, with dull brownish yellow, this margin becoming still broader on the

terminal segments so as to include most of segments 7 and 8; sternites with segment 2 yellowish and having a dark brown subterminal ring; segments 4 to 6 dark brown basally, the caudal margin broadly dull yellow, this area becoming broader on the terminal segments so as to include most of segments 7 and 8. Hypopygium with the ninth tergite rather extensive, the lateral lobes very broad, rounded, the caudal margin chitinized, shiny; the median notch is very deep and narrow, U-shaped; ninth pleurite complete; the outer pleural appendage subspatulate, enlarged distally; eighth sternite broad, rather narrowed toward the apex, the caudal margin slightly concave, bearing a dense tuft of short, golden hairs on each side of the median line and a few scattered hairs on the short, lateral lobes.

Holotype, male, College Station, Texas, March 16, 1908 (E. S. Tucker).

Type, Cat. No. 19983, U. S. Nat. Mus.

Tipula georgiana, new species.

Male.—Length, 11.8–14 mm.; wing, 11.5–15.3 mm.

Palpi dull brownish yellow, the two terminal segments a little darker. Frontal prolongation of the head dull yellow with a sparse yellowish bloom; nasus obliterated. Antennæ comparatively short, the scapal segments yellow; third segment dull yellow, the apical portion infuscated; remainder of the organ brown, the flagellar segments with the basal enlargement a little darker, the pedicel lighter brown; flagellar segments rather short, slightly constricted beyond the basal enlargement. Head light brown, the front and a narrow margin adjoining the eyes pale whitish gray.

Thoracic dorsum very light brownish yellow, the præscutal stripes only a little darker, pale brown, the median vitta bisected by a delicate dark brown line; lateral stripes indistinct; pseudosutural foveæ reduced to small colorless pits; scutum, scutellum, and postnotum dull yellow with a sparse whitish gray bloom. Halteres pale yellow, the base of the knobs brown. Legs with the coxæ dull yellow, slightly gray pruinose; trochanters and femora dull yellow, the latter passing into

brown; tibiæ and tarsi brown. Wings hyaline or nearly so, the costal region and the stigma light yellow; veins brown; a vitreous band before the cord, extending from the end of vein *Sc*, brightest and largest before the stigma, passing into the basal portion of cell M_4 ; very little or none of the vitreous area beyond the stigma.

Abdominal tergites yellow without distinct darker markings, the caudal margins of the segments narrowly ringed with silvery; sternites bright yellow, on segments 6 to 8 rather more brownish. Hypopygium with the ninth tergite moderate in size, the lateral angles conspicuous, directed caudad and slightly proximad, the apices bluntly rounded and the margin narrowly chitinized; the median lobe broad, highly convex to obtusely pointed, shiny chestnut brown to yellow; ninth pleurite large, complete; outer pleural appendage somewhat spatulate with a very narrow base, the knobs clothed with sparse elongate hairs; eighth sternite rather extensive, the caudal margin broadly concave with a brush of long golden hairs on each side of the base of the concavity and slightly smaller tufts behind them, these hairs concealing a very long, delicate, decussate, reddish bristle.

Holotype, male, Georgia.

Paratype, male, topotypic; male, New Rochelle, New York; male, Cambridge, Massachusetts.

Type, Cat. No. 19984, U. S. Nat. Mus.

The topotypic and the New York paratypes are in the collection of the author. The Massachusetts paratype is in the collection of the Museum of Comparative Zoology. The New York specimen appeared in the Loew collection of the Museum of Comparative Zoology under the manuscript name of "*inornata*" in Loew's writing; the specimen has the antennal flagellum very pale, more yellowish than the type. The Massachusetts specimen is the largest and here the antennal flagellum is a very dark brown.

Tipula catawba, new species.

Male.—Length, 12.8 mm.; wing, 12.7 mm.

Palpi with the first segment pale brownish testaceous, the

apical segments dark brown. Frontal prolongation of the head dull light yellow with a sparse pale whitish bloom. Antennæ short, the first scapal segment elongate, dull yellow; second segment very short, brownish yellow; flagellar segments very short, dark brown, little constricted beyond the basal enlargement which occupies about a third to a quarter of the total length of the segment. Head light gray, the occiput browner, a very indistinct, narrow, median, brown line.

Pronotum dull brownish yellow. Mesonotal præscutum light gray with three very broad brown stripes which suffuse most of the dorsum, the lateral margins clear light gray; pseudosutural fovea a semilunar subshiny pit; scutum clear light gray throughout; scutellum and postnotum dull brownish yellow with a sparse grayish bloom. Pleura pale brownish yellow with a clear light gray bloom. Halteres brownish yellow, the knobs dark brown. Legs with the coxæ dull yellow, sparse-gray pruinose; trochanters light yellow; femora brownish yellow becoming darker toward the tip; tibiæ and tarsi dark brown. Wings grayish subhyaline, the costal area and stigma brownish yellow; a slight yellowish suffusion along vein *Cu*; veins dark brown; a narrow vitreous band before the cord extending from the end of vein *Sc*, largest and brightest before the stigma, passing into the base of cell M_4 .

Abdominal tergites with the first two segments yellowish, the remaining tergites darker brownish; the sclerites with the caudal margin ringed with silvery; sternites brownish yellow, their caudal margins very narrowly silvery. Hypopygium rather enlarged, the ninth tergite quite similar to that of *T. georgiana*, the lateral angles produced caudad and slightly proximad into truncated lobes whose inner margin is subacutely angular, not evenly rounded; the median convexity rounded, shiny; ninth pleurite rather large, complete; the inner pleural appendage produced caudad in an elongate, subacute, pale, fleshy lobe, somewhat as in *translucida* Doane; eighth sternite with a broad median membranaceous shield on the caudal margin, the lateral angles produced proximad into fleshy lobes which bear dense tufts of rather coarse golden-yellow

hairs and including one very long slender bristle on each side.

Holotype, male, North Carolina. (From the collection of C. V. Riley.)

Type, Cat. No. 19985, U. S. Nat. Mus.

***Tipula winnemana*, new species.**

Male.—Length, 19.5 mm.; wing, 22.8 mm.

Female.—Length, 20 mm.; wing, 20.5 mm.

Palpi dark brown, the tips of the segments somewhat paler. Frontal prolongation of the head quite short, light brown. Antennæ rather short, the two basal segments dull yellow; the third segment light brown, passing into dark brown at the apex; remainder of the antennæ dark brownish black. Head yellowish brown, the inner margin of the eyes narrowly grayish; a delicate, indistinct, brown median vitta.

Pronotum light gray, the scutum with three broad brownish stripes; scutellum light grayish white. Mesonotal præscutum dull brownish yellow with three indistinct stripes, the median one very broad, narrowed behind, indistinctly bisected by a paler vitta; lateral stripes more grayish, reduced in area; the thoracic interspaces with abundant long yellow hairs; scutum yellowish brown with a slight grayish bloom, densely provided with long yellow hairs and with two small areas unfurnished with hairs; scutellum and postnotum brownish yellow. Pleura pale with a sparse grayish white bloom. Halteres yellow, the knobs dark brown. Legs with the coxæ pale, whitish pollinose; trochanters dull yellow; femora yellowish brown, the apex narrowly dark brown; tibiæ and tarsi brown. Wings light gray, the costal region and seams along veins *Cu* and *2nd Anal* yellow; stigma and the veins dark brown; a broad vitreous band before the cord extending into the base of cell M_4 .

Abdominal tergites dull brownish yellow, indistinctly and narrowly trivittate with dark brown; sternites yellowish brown. Hypopygium with the ninth tergite black, deeply notched medially, in the type-specimen the lateral angles bent strongly ventrad; ninth pleurite complete; ninth sternite bearing a subpendulous lobe which is practically hairless, tapering toward

the apex and bearing on the ventral inner side a chitinized knob; guard of the penis and the subtending gonapophyses remarkably developed, the latter appearing as widely spreading arms, densely pale-hairy on the outer face, the apex cylindrical, naked; the penis-guard long, needle-like, extending dorsad into the notch of the ninth tergite; eighth sternite with the broad median lobe abruptly truncated, chitinized, bearing beneath two tufts of long whitish hairs; lateral lobes short, bearing a small tuft of long whitish hairs and two or three long, curved, reddish bristles, one of which is more powerful than the others.

The female is referred to this species with considerable doubt because of the very different color of the wings. The specimen is, in general, similar to the male, the antennæ shorter, the flagellar segments paler brown but unicolorous as in the male; wings strongly yellowish including the veins; stigma dark brown, prominent; valves of the ovipositor extremely shortened, the tergal valves chitinized, short and broad, blunt, the sternal valves longer, broad, acutely pointed.

Holotype, male, Plummers Island, Maryland, June 13, 1914 (W. L. McAtee).

Allotype, female, topotypic, June 7, 1914 (W. L. McAtee).

The type is in the collection of the author, the allotype in the collection of the United States Biological Survey.

Tipula costaloides, new species.

Male.—Length, 11.5 mm.; wing, 12 mm.

Female.—Length, 12.8–13 mm.; wing, 12.5–12.8 mm.

Palpi dark brown. Frontal prolongation of the head light brown, the dorsal surface with a clear blue-gray bloom, the nasus elongate, distinct. Antennæ with the three basal segments dull yellow, remainder of the flagellum with the segments rather short, the basal enlargement dark brown, the remainder of each segment brown, on the terminal segments becoming darker, the sclerites unicolorous. Head light gray, on the occiput more suffused with brown; an indistinct delicate brown median line.

Thoracic dorsum with the præscutum dull light gray with a very broad brown median stripe, broadest in front, narrowed behind; lateral stripes indistinct; a few scattered brown spots on the interspaces indicating the position of hairs; scutellum light gray, the middle of each lobe indistinctly brown; scutellum and postnotum light gray. Pleura clear blue-gray with the dorso-pleural membranes dull yellow. Halteres pale with the knobs brown. Legs with the coxæ light gray; the trochanters pale; femora yellowish brown, scarcely darkened at the tip; tibiæ yellowish brown, the apices narrowly dark brown; tarsi dark brown. Wings subhyaline, the costal area dark brown; the stigma and a small spot at the origin of *Rs* brown; veins brown; a broad vitreous band from before the stigma, including the cord and extending into the base of cell M_4 .

Abdominal tergites dark brown, the caudal and lateral margins paler, on the sixth to ninth segments brighter, more yellowish; the eighth segment and the apices of the lobes of the ninth segment rather bright yellow; sternites dull yellowish brown. Hypopygium with the ninth tergite rather conspicuous, the lateral angles prominent, these lobes narrowed to the blunt apex, the median notch U-shaped and bearing a slender, subacute, median lobe which is directed caudad; ninth pleurite complete, moderate in size; eighth sternite with the caudal margin shallowly concave, the tiny lateral lobes bearing three to four stout, reddish, decussate bristles.

The female is similar to the male, with the flagellar segments not excised, the segments ranging from the yellow scape through two or three basal segments of the flagellum which are light yellowish brown to the dark brown of the terminal segments. Ovipositor with the tergal valves transverse form an opaque subrectangular plate, the blades acutely pointed, the dorsal surface with a prominent ridge extending from the apex backward; the sternal valves are very slender, not reaching the tips of the tergal valves, bent strongly outward at about midlength, the tips bent inward and approximated.

Holotype, male, Wolfe City, Texas, April 12, 1906 (F. C. Bishopp).

Allotype, female, topotypic.

Paratype, female, topotypic.

This insect bears a remarkable superficial resemblance to *Tipula sayi* Alex., but the subunicolorous antennæ, the obliteration of the lateral præscutal stripes, and the very different structure of the hypopygium of both male and female offer abundant points of difference.

The type and paratype are in the collection of the United States National Museum, Cat. No. 19986; the allotype is in the collection of the author.

Tipula megalabiata, new species.

Male.—Length, 11 mm.; wing, 13.5 mm.

Palpi pale brown. Frontal prolongation of the head brownish yellow with a very sparse grayish bloom toward the base; nasus distinct. Antennæ pale yellow, the first flagellar segment a little darker; remaining segments dark brown at the base, dull yellow beyond, the apical segments more brownish. Head light gray, the front more whitish.

Thoracic dorsum light brown with the præscutal stripes dull gray, not clear-cut; the scutellum slightly brownish on the sides. Pleura light yellow with a sparse whitish bloom. Halteres light brown, the knobs darkened. Legs with the coxæ yellow with a sparse whitish bloom; trochanters light yellow; remainder of the legs broken. Wings with a gray tinge, darkest at the apex; costal area light brown; a large brown stigmal spot; smaller brown spots at the base of *Rs* and the tip of *Sc*; a broad vitreous band before the cord, extending from before the stigma into the base of cell M_4 ; no vitreous spot beyond the stigma.

Abdomen with the tergites rather bright yellow, the terminal segments more brownish yellow; a broad dark brown dorsal line, narrowest anteriorly, broadened out on the posterior segments; tergites narrowly ringed caudally with silvery; segments 2 to 5 with a large rounded dark brown spot on each side, on the last three segments basal in position, on the second segment at about midlength; first sternite dark brown; re-

remaining segments dull brownish yellow without darker markings. Hypopygium with the ninth tergite rather small and restricted, the narrow median area membranaceous; the lateral angles of the tergite produced into enormous finger-like lobes which extend caudad, the apices bent inward and slightly ventrad, the tips truncated; eighth sternite with the caudal margin produced into two elongate fleshy lobes, the median area with a tuft of elongate reddish hairs.

Holotype, male, Ormsby County, Nevada, July 6 (C. F. Baker), No. 961.

Type, Cat. No. 19987, U. S. Nat. Mus.

Tipula bigeminata, new species.

Male.—Length, 17 mm.; wing, 19 mm.

Palpi very dark brown. Frontal prolongation of the head elongated, light brown, the impressed lateral line slightly darker brown; nasus very small, subobsolete. Antennæ with the first segment brownish yellow; second segment bright yellow; flagellar segments with the basal enlargement slight, dark brown; the remainder of the segments almost concolorous or a little lighter. Head light gray with a delicate, subimpressed, median line.

Thoracic dorsum light gray, the præcutum with four dark brown stripes, the lateral stripes a little broader than the very narrow median stripes which are indistinct in front but clear-cut posteriorly; an indistinct brown cloud on the sides of the sclerite just back of the pseudosutural foveæ; scutum clear light gray with three brown marks on each lobe, a small rounded spot on the anterior lateral portion of the lobe, and two elongate marks, one of which adjoins the median area of the sclerite; scutellum and postnotum brown with a sparse light gray bloom. Pleura light gray. Halteres brown, the base yellowish, the knob dark brown with a pale apex. Legs with the coxæ yellow, sparsely light gray pruinose; trochanters dull yellow; femora brownish yellow, the apex narrowly dark brown; tibiæ dull yellow, the apex narrowly dark brown; tarsi dark brown. Wings light gray; a dark brown spot at the

arculus; brown spots at the stigma and end of vein *Sc*; base of *Rs* and the apex of vein *Cu* and vein *Cu*₂ seamed with brown; costal area not brighter; a broad vitreous band before the cord extending from before the stigma including the base of cells *1st M*₂ and *M*₄; a small vitreous spot at the apex of cell *1st A* near the vein *2nd A*.

Abdomen brown, indistinctly trivittate, the lateral stripes being the more distinct; caudal margins of the segments paler, this color becoming broader and clearer on the terminal segments; it is probable that fresh specimens exhibit a sparse gray bloom on the segments; sternites brown, segments 4 and 5 broadly ringed with paler on the caudal margin, segments 6 and 7 much more narrowly ringed. Hypopygium powerful, compressed; ninth tergite very small and long; a deep dorsal median groove; lateral angles produced caudad into long, subacute lobes which lie parallel, narrowly separated by a very deep U-shaped notch; eighth sternite with the lateral lobes bent strongly dorsad, at the apex with a strong, matted bunch of reddish bristles which are directed proximad and are decussate; a median lobe directed caudad and bearing at the apex a dense, rather short, fringe of golden hair.

Holotype, male, Ormsby County, Nevada, July 6 (C. F. Baker), No. 960.

Type, Cat. No. 19988, U. S. Nat. Mus.

Tipula alticola, new species.

Male.—Length, 15.5 mm.; wing, 16.8 mm.

Palpi short, black. Frontal prolongation of the head black with a dark blue-gray bloom; nasus distinct, hairy. Antennæ black, the second segment a little paler; flagellar segments exceedingly deeply incised, the distal enlargement of each segment only a little smaller than the basal swelling. Head dark blue-gray, more brownish on the sides of the occiput and vertex behind the eyes; a narrow median brown line.

Thoracic dorsum light gray with three very broad, dark blue-gray stripes, the median broadest, narrowly bisected by a delicate brown line; præscutal interspaces with abundant

brown dots surrounding the bases of the numerous long pale hairs; scutum blue-gray; scutellum and postnotum gray with a narrow dark brown median line. Pleura dark blue-gray, the dorso-pleural membranes dark brown; sternites a little more brownish. Halteres pale at the base, the stem brown, the knob darker. Legs with the coxæ dark, blue-gray pruinose; trochanters dark colored with a sparse blue-gray bloom; femora deep brownish yellow passing into dark brown on the apical third; tibiæ and tarsi dark brownish black. Wings light gray, the costal area brownish yellow, the membrane of the disk with dark brown and subhyaline blotches, arranged as follows: dark brown at the stigma, along the cord, along vein *Cu* and at the base of *Rs*; subhyaline blotches near the base of cells *M*, *Cu* and *1st A*; near the tip of cell *M*, most of cell *R*, a large blotch in the middle of cell *1st R*₁; beyond the cord in cell *2nd R*₁, base of *R*₂, *R*₃, *R*₅, and in *1st M*₂.

Abdominal tergites dull orange-yellow, trivittate with slate-gray to dark brown, the orange colors brightest on segments 2 to 4 and the base of 5; extreme lateral margins of the segments paler; caudal margins of segments 3 and 4 pale yellow except along the median area; segments 6 to 8 dark brown; sternites with segments 2 to 4 dull orange, on the terminal segments passing into dark brown. Hypopygium with the ninth tergite reduced to a narrow, transverse, chitinized band whose caudal margin is heavily chitinized, smooth, black, and very shallowly concave; eighth sternite subcarinate, unarmed.

Holotype, male, Baldy Mountain, Boulder County, Colorado, July 24, 1915 (T. D. A. Cockerell); above timber line.

Paratype, male, Manitou Pass, Colorado (F. H. Snow); from the S. W. Williston collection.

The type is in the collection of the United States National Museum, Cat. No. 19989; the paratype is in the collection of the American Museum of Natural History.

TWO NEW SPECIES OF COLEOPHORA

(Lepidoptera, Coleophoridae)

By CARL HEINRICH

The two following species were reared by the writer in connection with the work of the Branch of Forest Insects, U. S. Bureau of Entomology, at the eastern station.

Coleophora lentella, new species.

Palpi yellowish, slender; third joint little more than half as long as second; very slight tuft on second joint. Antennæ whitish yellow, annulated with light golden brown; basal joint tufted above with pale ochreous scales. Face, head and thorax, pale ochreous. Forewings light golden brown, shading to darker brown in apical portion, with white costal streak from base to costo-apical cilia; cilia golden brown. Hindwings brownish gray; cilia very light golden brown. Underside of fore and hind wings lead colored. Legs ochreous, dusted with dark brown on outer sides; tarsi faintly annulated with light brown. Anal tuft light ochreous. Alar expanse, 8 mm.

Habitat: Great Neck, Long Island.

Food Plant: *Betula lenta* (Sweet-birch).

Type, Cat. No. 19897, U. S. Nat. Mus.

Described from moth reared June 22, 1915, from larva mining leaves of "sweet birch." This species is nearest to *C. alniella* Heinrich and belongs to the *caryæfoliella* group.

The larval case is quite characteristic, being shorter and broader in proportion than that of any other species in this group. It is light brown, smooth; $4\frac{1}{2}$ to 5 mm. long by $1\frac{1}{2}$ mm. wide; a slightly flattened cylinder in form, the posterior end not so wide as middle of case and flattened to a straight edge; mouth deflected to 45 degrees.

Coleophora gaylussaciella, new species.

Palpi creamy white, slender; third joint as long as second; second joint but slightly tufted. Antennæ white, annulated with light brown; conspicuous tuft of creamy white scales above basal joint. Face, head, and thorax creamy white. Forewings light buff shading to white at extreme base; apex

of wing and apical cilia golden; underside of forewings brownish gray. Hind wings grayish; cilia grayish white shading to yellow at apex. Underside of body, femora, and fore tibiæ white; tarsi, hind tibiæ, and anal tuft light buff. Alar expanse, 10 mm.

Habitat: Falls Church, Virginia.

Food Plant: *Gaylussacia baccata*.¹

Type, Cat. No. 19898, U. S. Nat. Mus.

Described from a single adult reared June 27, 1914, under Hopk. U. S. No. 12130*d* from larva found feeding on huckleberry.

The larval case is light brown, 8 mm. long by 1 mm. thick; cylindrical with widest portion just beyond the middle and tapering slightly to both ends; posterior end rounded and flatly compressed; mouth deflecting to 90 degrees.

A NEW EASTERN BRACHYOPA

(*Diptera, Syrphidæ*)

By RAYMOND C. SHANNON

Brachyopa flavescens, new species.

Male. Rather robust, small, yellowish. Eyes strongly contiguous; vertex yellowish gray, with pale, very short pile; vertical triangle narrow and acute, reaching forward to about the middle of the eyes; frontal triangle yellow, bare. Antennæ orange-yellow; third joint ovate, longer than broad; arista darkened distally and with very fine microscopic pubescence along its entire length. Face moderately produced, light yellow, dusted with white and with fine light hairs; concave below antennæ, the lower half produced and truncate, its upper angle slightly acute. Mesonotum dark ocher yellow, dusted with brownish gray, at the sides and behind broadly ferruginous and more shining; two narrow and approximated dark stripes medianly on anterior two-thirds, two broad, anteriorly and posteriorly abbreviated stripes outwardly; hairs rather short

¹Food plant determined by Mr. F. V. Coville of the U. S. Bureau of Plant Industry.

and dense, yellow. Pleuræ brown and black, thickly dusted with gray; mesopleuræ with somewhat longer hairs than those on mesonotum. Scutellum convex, broadly rounded, much broader than long, shining, ocher yellow, rather evenly punctured, with light yellow hairs and a few bristle-like ones on the posterior margin. Abdomen much broader than thorax, broadest at posterior margin of second segment; color light yellow, more or less stained with dark by body contents; second segment more or less translucent. Coxæ yellow. Anterior and middle pairs of legs yellow, with white pile. Hind pair somewhat darker, the femora distally tinged with brown and with minute black spines along ventral surface; tibiæ tinged with brown on distal half; first tarsal joint grayish brown, paler distally and ventrally. Wings hyaline, faintly smoky, without trace of maculation, slightly darkened distally along anterior margin; stigma yellow. Halteres pale yellow. Length about 3.75–5 mm.; wing 3.75–5 mm.

Dead Run, Fairfax County, Virginia, May 23 and June 9, 1915. Six males (R. C. Shannon).

Type, Cat. No. 19681, U. S. Nat. Mus.

This species is very distinct from the other North American species; it is much smaller and different in general coloration. From *notata* O. S. it is easily distinguishable by the short scutellum and the clear wings; the fourth vein is much less sinuate and its last section shows very shallow angulations, with very slight stumps in some specimens. The resemblance with *vacua* O. S. is more close, but, aside from the lighter coloration, the scutellum is shorter, the eyes more broadly contiguous, and the third antennal joint more ovate. Perhaps the resemblance is closest with *media* Will., known only from a single female from California, which is now before me. This has the mesonotum black, gray pruinose, only the humeri and narrow lateral margins yellow, the pile whitish. The scutellum is more prominent and flattened. The penultimate section of the fourth vein is more sinuate, the last section without pronounced angulations. All specimens were taken hovering near a chestnut log on a hillside with a northern exposure.

A NEW AMERICAN FRUIT-FLY

(Diptera; Trypetidæ)

By FREDERICK KNAB

Anastrepha sylvicola, new species.

Female. Body-color dull ocher-yellow; bristles dark brown with yellow luster; pubescence yellow. Frons and face unspotted; three pairs of fronto-orbital bristles; antennæ short, their apices not reaching oral margin; palpi brownish yellow, with short brown bristles. Wings hyaline, with a deep yellow pattern clouded with brown on distal portions; second basal cell hyaline, a clear streak extending forward from it into first basal cell; a clear spot beyond apex of first vein and extending from costa to third vein, not continuous with streak in first basal cell; a yellow mark in the shape of an inverted "V," its inner arm following the posterior crossvein, the outer arm terminating marginally in the second posterior cell, this V-shaped mark broadly separated from the anal streak; costal region deep yellow, along first vein extending inward to third vein and also occupying basal half of first basal cell. Halteres brown. Ovipositor long and rather slender, slightly longer than abdomen. Proportions of ovipositor and wing, 1:2.3. Length: Body (without ovipositor) about 8 mm., ovipositor 3.5 mm., wing 8.5 mm.

Trinidad, West Indies, June, 1914; a series of 17 specimens of both sexes reared from an unknown fruit found in the forest (F. W. Urich).

Type: Cat. No. 20025, U. S. Nat. Mus.

This species resembles *Anastrepha fraterculus* Wied. in the wing-pattern, which varies in the same manner as in that species. The V-shaped mark is sometimes connected with the large S-shaped streak, although usually free; rarely the clear streak extending forward from the second basal cell is confluent with the spot on the costal margin.

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FOUR EUROPEAN DIPTERA ESTABLISHED IN NORTH AMERICA

BY FREDERICK KNAB

The following species of European Diptera appear to be unrecorded for North America, although they are well established and common under suitable conditions. All of them may be confidently considered introduced species rather than members of the holarctic series.

Pegomyia hyoscyami Panzer.

Numerous specimens of this species, reared from a number of different food plants, were submitted to the writer for identification by Mr. E. N. Cory, of the Maryland Agricultural College. As this species had not been previously recorded from America, and no European specimens were available for comparison, a male and female were sent to Dr. J. Villeneuve, the well-known French specialist in Cyclorhapha. He confirmed the determination, writing under date of June 15, 1915: "In my opinion it is surely *Pegomyia hyoscyami* that you have sent. I have carefully compared your specimens with those in my collection and I do not find any difference whatever."

Further investigation tends to show that *Pegomyia vicina* Lintner is a synonym of *hyoscyami*. Specimens determined by the late D. W. Coquillett as *vicina* are certainly identical, and there is every reason to believe that Lintner had before him the same species. Lintner sent specimens to Meade in England for identification, who pronounced them a species distinct from *beta* Curtis (now recognized as a mere color-variety of *hyoscyami*), although closely related. Meade's opinion ap-

pears to have been based upon differences in coloring, principally of the legs, which have since been shown to occur in the one species.

Pegomyia hyoscyami appears to be widely distributed in North America. In the East it occurs at least as far south as the city of Washington; in the West it ranges well down into southern California, occurring probably wherever the sugar beet is cultivated. Western specimens are before me from Colorado, San Mateo County, California, Monterey, California, and Oxnard, Ventura County, California.

Hydrotæa meteorica Linné.

A series of this species, taken in Montana, was sent for identification in 1914 by Prof. R. A. Cooley. The specimens agree closely with European specimens from the vicinity of Berlin and with others of uncertain age from Colorado, determined by Coquillett as this species. Recently specimens have come to hand taken by Prof. W. B. Bell at Neche, North Dakota, August 10, 1915.

Professor Cooley stated that in Montana the species is abundant and troublesome to cattle. Little appears to have been published concerning its habits. Linnæus noted, in connection with the original description, that the flies swarm about the mouths of horses just before a storm and the specific name was evidently given in allusion to this habit. De Geer described the fly as *Musca vaccarum* and has the following observation on the habits:

“These little flies, which are of the size and figure of small house-flies, would not merit being distinguished from the many other species which also partake of sombre colors, black or brown, if one did not see them fly in such large numbers in the month of July and if they were not so annoying to men and beasts. It is they which then flutter in great swarms about the heads of horses and horned cattle, seeking ceaselessly to enter their eyes and ears, to nourish themselves with the moisture found there, in such fashion that they torment them continuously without allowing them the least repose. Persons

are no more protected from their obstinate pursuit. They fly continually around the head, doing all possible to enter the eyes, in such manner that these pitiless flies disturb equally the pleasures of the promenader in the woods and fields."

Leptocera sylvatica Meigen.

A specimen of this European borboid was submitted for determination by R. H. Hutchison. It was taken at Arlington, Virginia, October 11, 1914, on a compost heap. The specimen agrees in every detail with one collected in London, England, by E. Brunetti.

Lynchia maura Bigot.

This hippoboscid is a common parasite of the domestic pigeon in the Mediterranean region. Specimens taken from domestic pigeons at Key West, Florida, were forwarded to the Bureau of Entomology for determination by Dr. J. Y. Porter in February, 1915. Attention had been attracted to the parasites by the occurrence of a fatal disease among the pigeons. A specimen was sent to Prof. Dr. Bezzi, of Turin, who confirmed the determination of the writer.

It appears that this species is widely distributed in America, although still unrecorded for the northern continent. The late D. W. Coquillett had determined the species as "*Lynchia brunnea* Oliv.," and in consequence the species figures in the Brazilian literature under this name. According to Speiser, our best student of the Hippoboscidae, Olivier's *Ornithomyia brunnea* is unrecognizable. Specimens of *Lynchia maura* in the national collection show the following records, in addition to the one from Key West already mentioned:

Ames, Iowa; Savannah, Georgia, 28 Sept. 1896, on pigeon (W. Duncan); Havana, Cuba, on pigeon (J. R. Taylor); Ceará, Brazil, 1904 (F. D. da Rocha); S. Paulo, Brazil, on pigeon (A. Lutz); Campinas, Brazil, on domestic pigeon (A. Hempel). Dr. R. Gonzalez Rincones informs me that the species is an abundant parasite of the domestic pigeon at Caracas, Venezuela.

Recently this species has made its appearance in the Hawaiian Islands. According to Mr. O. H. Swezey, from whom I have

received specimens, it was first noted in Honolulu on domestic pigeons in October, 1910 (Proc. Hawaiian Ent. Soc., vol. 2, 1912, p. 188). Mr. E. M. Ehrhorn reported that the species had become very common on the pigeons in Honolulu by December, 1911 (l. c., p. 206).

DESIGNATIONS OF MUSCOID GENOTYPES, WITH NEW GENERA AND SPECIES

BY CHARLES H. T. TOWNSEND

The writer has recently completed a critical catalogue of all the generic names that have been proposed in the Muscoidea, embracing the world's fauna, recent and fossil, with validly designated genotype for each. Although the subject has been fully elaborated to include, among other things, the actual sense of the authors concerned so far as possible to determine same, ascertained at a cost of great labor, especially translating Brauer and Bergenstamm's sense throughout, and would thus be very useful for reference, yet its publication at this time would avail comparatively little else on account of the large number of nomenclatorial cases involved for which there are as yet no rules or decisions of the International Commission to cover, and which must be left open for future ruling. The designations of genotypes for those genera with status as yet unsettled will occupy but little space; they are given in the present paper, together with a few new genera and species that are necessary in order to validate certain designations and establish the sense of authors concerned.

The great majority of muscoid genera are monobasic, and a very large part of the remainder already possess validly designated genotypes. Less than 140 muscoid generic names remain without designations or with designations whose validity is at all doubtful. The writer has personally verified all the genotype designations of Latreille (1810), Curtis (1826-38), Macquart (1834-43), Westwood (1840), Blanchard (1840), Zetterstedt (1844), Rondani (1856), Desvoidy (1863), Brauer and Bergenstamm (1889-94), Brauer (1893),

Townsend (1908-15), and Coquillett (1910). A designation has been considered invalid, or at least doubtful, (*a*) when no originally included specific name is used to designate the genotype, unless the name used is indicated in the context as equal to one of the originally included names; (*b*) when two or more of the originally included specific names are so used, or indicated in the context as equal to the name used.

When a designation of a previous author by a name not originally included is quoted in a purported list of genotypes, and one of the originally included names is mentioned as synonymous with that name, the quoting author, though not specifically stating his intention to make a genotype designation, may reasonably be considered as doing so; yet, since some doubt may arise on this point, I have repeated the designations below in such cases.

As to Brauer and Bergenstamm's designations, the writer holds that they are valid when not conflicting with the established procedure (vide *Ins. Ins. Mens.*, III, 121-122); but, pending decision by the International Commission on this point, their designations are here repeated in cases not otherwise covered, in order to secure immediate finality for the same. In this connection, Coquillett has quoted a few of Brauer and Bergenstamm's designations because they used the word "Type" in connection with an originally included species, not understanding that in nearly all cases holotype (or paratype) was meant by them, as is evident from the context and the statements made by them in their introduction.

DESIGNATIONS

In order to economize space, only the essentials are given in the following list of genotype designations, the names of the authors of genera and species being intelligibly abbreviated, and the word genotype being understood to precede the species designated. No synonymy is indicated, either generic or specific. This is all recorded in the literature, so far as determined. A few cases are covered by new specific names at the end. The sense of previous authors is preserved so far as

possible, giving preference to that of Brauer and Bergentamm. Those genera marked with an asterisk are considered in the notes at the end.

- Acrophaga BB (1891) *Acrophaga stelviana* BB.
 Agria RD (1830) *Agria punctata* RD.
 Alophora RD (1830) *Phasia hemiptera* Mg.
 Ananta Mg. (1838) *Phasia lateralis* Mg.
 Aplomya RD (1830) *Aplomya nitens* RD.*
 Araba RD (1830) *Tachina fastuosa* Mg.
 Argyrella RD (1863) *Argyrella dissimilis* RD.
 Bengalia RD (1830) *Bengalia labiata* RD.
 Blissonia RD (1863) *Blissonia cæsia* RD.
 Blondelia RD (1830) *Blondelia pallidipalpis* RD.
 Bonellia RD (1830) *Bonellia tessellans* RD.
 Bonnetia RD (1830) *Bonnetia cenanthis* RD.
 Calcager Hutton (1901) *Calcager apertum* Htt.
 Callitroga Brauer (1883) *Musca dux* Eschsch.*
 Calyptia RD (1863) *Calyptia carceli* RD.*
 Carcelia RD (1830) *Carcelia bombylans* RD.
 Cerosomyia Htt. (1901) *Mono-basic*.*
 Chætophthalmus BB (1891) *Micropalpus brevigaster* Mcq.
 Chætoštenia Br. (1893) *Stevenia partenopea* Rdi.
 Chæromyia Roub. (1911) *Chæromyia chærophaga* Roub.
 Chrysomya RD (1830) *Chrysomya regalis* RD.
 Clytho RD (1830) *Clytho aurulenta* RD.
 Comyops Wulp (1891) *Comyops nigripennis* Wp.
 Cosmina RD (1830) *Cosmina fuscipennis* RD.
 Craticula Pand. (1895) *Craticula frontale* Pd.
 Ctenocnemis Kowarz (1873) *Masicera major* Mcq.
 Ctenophorocera BB (1891) *Ctenophorocera experta* BB.
 Cylindrosoma Rdi. (1856) *Mono-basic*.*
 Cytoria RD (1863) *Nyctia servillei* RD.
 Dasyphora RD (1830) *Dasyphora agilis* RD.
 Dexia Mg. (1826) *Musca volvulus* F.*
 Dinera RD (1830) *Dinera grisea* RD.
 Disjunctio Pd. (1894-6) *Sarcophaga tetripunctata* Duf.
 Duponchelia RD (1863) *Duponchelia silvestris* RD.
 Elachipalpus Rdi. (1850) *Mono-basic*.*
 Elomya RD (1830) *Elomya claripennis* RD.
 Elophoria RD (1830) *Elophoria myoidea* RD.
 Empheremyia Bisch. (1904) *Empheremyia atra* Bschr.
 Entomobia Lioy (1864) *Tachina festiva* Mg.
 Epineura BB (1891) *Phasia helva* Wd.

- Erycia* RD (1830) *Erycia grisea* RD.
Estheria RD (1830) *Estheria imperatoriae* RD.
Etheria RD (1863) *Etheria pedicellata* RD.
Eugenia RD (1863) *Eugenia fugax* RD.
Euphoria RD (1863) *Euphoria nitidula* RD.
Eurychæta BB (1891) *Mono-basic*.*
Fausta RD (1830) *Fausta nigra* RD.
Feria RD (1830) *Feria rubescens* RD.
Gesneria RD (1830) *Gesneria erythroceræ* RD.
Gesneriella Villve. (1912) *Gesneriella unicolor* Vve.
Glossidionophora Bgt. (1885) *Glossidionophora nigra* Bgt.
Gymnodexia BB (1891) *Dexia triangulifera* Ztt.
Gymnostylia Mcq. (1835) *Macromyia depressa* RD.
Halidaya Egg. (1856) *Halidaya aurea* Egg.
Harrisia RD (1830) *Harrisia scutellaris* RD.
Harrisia Mg. (1838) *Tachina ænea* Mg.
Hermya RD (1830) *Hermya afra* RD.*
Himera RD (1863) *Himera scutellaris* RD.
Homodexia Bgt. (1885) *Homodexia obscuripennis* Bgt.
Homogenia Wp. (1892) *Homogenia rufipes* Wp.
Icelia RD (1830) *Icelia flavescens* RD.
Idia Wd. (1820) *Musca lunata* F.
- Illigeria* RD (1830) *Illigeria atra* RD.
Ismenia RD (1863) *Erycia villica* RD.
Javetia RD (1863) *Macquartia germanica* RD.
Kirkia Gdlst. (1914) *Kirkia blanchardi* Gdlst.
Labidogyne BB (1889) *Tachina forcipata* Mg.
Leptotachina BB (1891) *Mono-basic*.*
Leschenaultia RD (1830) *Leschenaultia cilipes* RD.
Lilæa RD (1863) *Lilæa aurozonata* RD.
Lissoglossa Villve. (1913) *bequærti* Vve.
Macquartia RD (1830) *Macquartia rubripes* RD.*
Macromyia RD (1830) *Macromyia depressa* RD.
Marshamia RD (1830) *Marshamia analis* RD.
Marsilia Moncx. (1863) *Onesia floralis* RD.*
Marsillia Rdi. (1861) *Marsillia collina* Rdi.
Megistogaster Mcq. (1851) *Megistogaster fuscipennis* Mcq.
Melinda RD (1830) *Melinda cærulea* RD.
Metallea Wp. (1880) *Metallea notata* Wp.
Metopodia BB (1891) *Milto-gramma grisea* Mg.
Micropalpus Mcq. (1834) *Bonetia œnanthis* RD.
Mintho RD (1830) *Musca compressa* F.
Minthodexia BB (1891) *Minthodexia gravipes* BB.
Mollia RD (1863) *Mollia obscura* RD.

- Morellia RD (1830) *Morellia agilis* RD.
 Mormonomyia BB (1891) *Mormonomyia laniventris* BB.
 Myiophasia BB (1891) *Momyiophasia* basic.*
 Myobia RD (1830) *Myobia fragilis* RD.
 Myocera RD (1830) *Myocera longipes* RD.
 Nemoræa RD (1830) *Nemoræa bombylans* RD.
 Neocalliphora BB (1891) *Calliphora ochracea* Sch.
 Neomintho BB (1891) *Tachina macilenta* Wd.
 Nyctia RD (1830) *Nyctia carceli* RD.
 Occisor Htt. (1901) *Occisor inscitus* Htt.
 Oestroides Gdlst. (1912) *Oestrus macdonaldi* Gdlst.
 Omalogaster Mcq. (1834) *Billaea grisea* RD.
 Omalostoma Rdi. (1862) *Omalostoma fortis* Rdi.
 Omotoma Liroy (1864) *Tachina amœna* Mg.
 Onesia RD (1830) *Onesia floralis* RD.
 Opesia RD (1863) *Opesia gagatea* RD.
 Ophelia RD (1830) *Ophelia gracilis* RD.
 Orizia RD (1863) *Orizia conjuncta* RD.
 Orthellia RD (1863) *Orthellia rectinervis* RD.
 Pachygraphia BB (1891) *Dexia virgata* Wd.
 Pachymyia Mcq. (1843) *Momyiophasia* basic.*
 Pales RD (1830) *Pales florea* RD.
 Parachæta Cqt. (1897) *Monobasic*.*
 Paralucilia BB (1891) *Monobasic*.*
 Peremptor Htt. (1901) *Peremptor egmonti* Htt.
 Pexomyia BB (1891) *Masicera rubifrons* Perr.
 Phænicia RD (1863) *Phænicia concinna* RD.
 Phryno RD (1830) *Phryno agilis* RD.
 Phumosa RD (1830) *Phumosa abdominalis* RD.
 Phyto RD (1830) *Phyto nigra* RD.
 Pierretia RD (1863) *Pierretia præcox* RD.
 Podotachina BB (1891) *Tachina sorbillans* Wd.
 Pæcilometopa Vllve. (1913) *Sarcophaga spilogaster* Wd.
 Proscissio Htt. (1901) *Proscissio montana* Htt.
 Ptilocera RD (1830) *Ptilocera palpalis* RD.
 Ptilops Rdi. (1857) *Ptilops adolescens* Rdi.
 Pyrellia RD (1830) *Pyrellia vivida* RD.
 Rhamphina Mcq. (1835) *Stomoxys pedemontana* Mg.
 Rhinophora RD (1830) *Rhinophora gagatea* RD.
 Rœselia RD (1830) *Rœselia arvensis* RD.
 Rutilia RD (1830) *Rutilia vivipara* RD.
 Scotiptera Mcq. (1835) *Sophia punctata* RD.
 Senometopia Mcq. (1834) *Carcelia aurifrons* RD.
 Sepimentum Htt. (1901) *Sepimentum fumosum* Htt.

- Sericocera Mcq. (1834) *Musca volvulus* F.
 Silbomyia Mcq. (1843) *Musca fuscipennis* F.
 Solieria RD (1848) *Solieria brunnicosa* RD.
 Sophia RD (1830) *Sophia filipes* RD.
 Spathipalpus Rdi. (1863) *Spathipalpus philippii* Rdi.
 Sphixapata Rdi. (1859) *Sphixapata albifrons* Rdi.
 Sphora RD (1830) *Sphora nigricans* RD.
 Syntomogaster Sch. (1861) *Tachina singularis* Egg.
 Telothyria Wp. (1890) *Telothyria cupreiventris* Wp.
 Thelaira RD (1830) *Thelaira abdominalis* RD.
 Thelairodes Wp. (1891) *Homodexia vittigera* Bgt.
- Thelesina* Moncx. (1863) *Onesia floralis* RD.*
 Theone RD (1863) *Theone trifaria* RD.
 Thereuops BB (1891) *Miltogramma brevipennis* Sch.
 Trichodischia Bgt. (1885) *Trichodischia soror* Bgt.
 Tripanurga BB (1891) *Sarco-phaga albicans* Wd.
 Tryphera Mg. (1838) *Tachina lugubris* Mg.
 Urophylla BB (1889) *Urophylla leptotrichopa* BB.
 Velocia RD (1863) *Velocia cursoria* RD.
 Walkeria RD (1863) *Walkeria lauta* RD.
 Zaida RD (1830) *Zaida agilis* RD.
 Zophomyia Mcq. (1835) *Musca temula* Scop.

NOTES, NEW NAMES AND NEW GENERA

Aplomya RD.—Desvoidy's designation is invalid as not originally included, being *Phryxe zonata*, Myod., 159 (not *Aplomya zonata*, Myod., 185).

Callitroga Br.—On page 645, Journ. Wash. Acad. Sci., V, the writer stated that the publication of this name did not validate it for use, since it was cited in synonymy. It has nomenclatorial standing, but was published as a synonym of *Compsomyia* minus the *Calliphora* element. As such, it takes same genotype as *Compsomyia* thus restricted.

Calyptia RD.—This genus is not to be confused with *Calyptidia* RD, misspelled on page 59, vol. II, Posth., and corrected in the errata at end of volume.

Cerosomyia Htt.—The holotype of *C. usitata* seems to be a fly whose ptilinum has dried while exerted. It may easily prove to be a previously described species.

Cylindrosoma Rdi.—Genotype, CYLINDROMYIOPSIS BEZZII Townsend, new name for *Tachina sanguinea* Rdi. (nec Mg.)

preocc., 1856, Prod. I, 79. Named in honor of Dr. M. Bezzi.

Dexia Mg.—Designation by Westwood, Intr. II, 139. BB's sense is *Dexilla* Westw. Introduced to point out Coquillett's misconstruction of Westwood. Changes the family name Minthoidae to Dexiidae.

Elachipalpus Rdi.—Genotype, ELACHIPALPUS RONDANII Townsend, new name for *Micropalpus longirostris* Rdi. (nec Mcq.) preocc., 1850, N. Ann. Sci. Nat. Bologna (3), II, 169. Named in honor of Camillo Rondani. It is to be noted that this species and the second preceding, also many others, will stand as genotypes only in case the sense of the author of the genus is adopted.

Eurychæta BB.—The publication of this MSS. name (Musc. Schiz. II, 63) as equal to *Theria* RD not only gave it nomenclatorial standing, according to Opinion 4 of the International Commission, but also validated it for use in place of the pre-occupied *Theria* RD, whose genotype it takes.

Hermya RD.—According to the sense of Opinion 6 of the International Commission, Brauer and Bergenstamm fixed *Hermya afra* as the genotype of *Hermya* by erecting *Paraphania* (1889) for *Ocyptera diabolus* Wd., of which *Hermya hottentota* RD (the only remaining originally included species) is a synonym. The literal construction of the opinion may not accord.

Leptotachina BB.—Genotype, LEPTOTACHINA BRAUERI Townsend, new name for *Tachina gratiosa* BB (nec Mg.) preocc., 1891, Musc. Schiz. II, 26. Named in honor of Friedrich Brauer.

Macquartia RD.—Rondani's designation (1856) of *chalconota* is invalid since he mentioned no originally included name. Coquillett's designation (1910) by quotation is at once excluded by his mention of two originally included names. The genotype designated in the present paper accords with Brauer and Bergenstamm's sense.

Marsilia Monceaux.—This MSS. name, first published in footnote to page 535, vol. II, Posth., can not be accredited to Desvoidy but only to Monceaux, since the footnote was writ-

ten by the editor of the work. Being published as equal to an indeterminate part of *Onesia* RD, it must take same genotype.

Myiophasia BB.—Genotype, MYIOPHASIA AUSTRALIS Townsend, new name for *Tachina ænea* Wd. (nec Mg.) preocc., 1830, Auss. Zweifl. Ins. II, 298.

Pachymyia Mcq.—Genotype, PACHYMYIA MACQUARTII Townsend, new name for *Stomoxys vexans* Mcq. (nec Wd.) preocc., 1843, Dipt. Exot. II (3), 272, pl. 14, f. 3. Named in honor of Jean Macquart. Brauer and Bergenstamm examined the holotype of *Stomoxys vexans* Wd. and state that it is not Macquart's species.

Parachæta Coq.—Genotype, PARACHÆTA FUSCA Townsend, new name for *Blepharipeza bicolor* Coq. (nec Mcq.) preocc., 1897, Rev. Tach. 123; equals *Blepharipeza inermis* Coq. (nec Bigot), 1897, l. c., and 1910, Proc. U. S. Nat. Mus., XXXVII, 583. Holotype, No. 20107, U. S. Nat. Mus., male, labeled "N. Y." and bearing Coquillett's label "Parachaeta inermis Bigot." Does not agree at all with Bigot's description.

Paralucilia BB.—Genotype, PARALUCILIA BRAUERI Townsend, new name for *Calliphora fulvipes* BB (nec Mcq.) preocc., 1891, Musc. Schiz. II, 87. Named in honor of Brauer, who has explained (Sitz. Ak. Wiss. CIV, 599) how the misidentification occurred. The holotype is a female on same pin with a male of *Calliphora fulvipes* Mcq., in the Vienna Museum. The statement on page 645, Journ. Wash. Acad. Sci., V, needs revision.

Thelesina Monceaux.—What is said above under *Marsilia* Monceaux applies here word for word.

Chrysosomopsis, new genus.

Genotype, *Tachina aurata* Fall., 1820, Dipt. Suec. Musc. 25, 52.—Europe. This is Brauer and Bergenstamm's sense of *Chrysosoma*, fig. 251 (1889). For characters, see Musc. Schiz. I, 66.

Discochætopsis, new genus.

Genotype, *Discochata incana* BB., 1891, Musc. Schiz. II, 51; and 1893, Ibid. III, 63.—Austria. This is Brauer and Ber-

genstamm's sense of *Discochæta* p. p. (1891-93, not 1889). For characters, see BB., 1. c.

Eumedoria, new genus.

Genotype, *Tachina digramma* Mg., 1824, S. B. IV, 346.—Europe. This is Brauer and Bergenstamm's sense of *Medoria*; also Meigen's sense S. B. VII, 203, sect. b, p. p. (not Desvoidy's sense). For characters, see BB., Musc. Schiz. I, 41; III, 78.

Euphania, new genus.

Genotype, *Phania vittata* Mg., 1824, S. B. IV, 219.—Europe.—This is Brauer and Bergenstamm's sense of *Phania*, fig. 291 (1889). For characters, see BB., Musc. Schiz. I, 75.

Hineomyia, new name.

Genotype, *Nemoræa setigera* Coq. Proposed in place of *Hinea* Townsend, January, 1916, Proc. U. S. Nat. Mus., XLIX, 629, preocc. by Adams, 1905, in Tabanidae.

Prohypostena, new genus.

Genotype, PROHYPOSTENA BRAUERI Townsend, new name for *Tachina procera* Rdi. (nec Mg.) preocc., 1859, Prod. IV, 84.—Europe. Named in honor of Brauer. This is Brauer and Bergenstamm's sense of *Hypostena*, fig. 100 (1889); also Rondani's and Macquart's sense. For characters, see BB., Musc. Schiz. I, 37; III, 63.

NOTES ON THE LIFE HISTORY OF ECPANTHERIA ERIDANUS CRAMER

BY R. H. VAN ZWALENBURG

This arctiid is fairly common throughout the island of Porto Rico and has a wide variety of host plants. Food plants on which the larva has been taken are: orange, *Erythrina micropteryx* ("bucare," "madre de cacao"), *Ipomæa* sp., vanilla, banana, *Cissus* (?) *sicyoides* and *Panicum* sp. At the experiment station the larvæ have done some damage by feeding on the blossom-buds of vanilla. "Malojilla" grass (*Panicum*

sp.) is probably only an accidental food plant, for larvæ in cages at once deserted it for orange foliage.

It is of interest to note that the synonymy of *Ecpantheria eridanus* Cram. and *E. icasia* Cr. has been substantiated by breeding both forms from the same egg cluster at Mayaguez. Dr. H. G. Dyar had previously expressed the opinion to the late Dr. C. W. Hooker of the Mayaguez Station that the two species were the two sexes of one insect, *eridanus* being known only in the female and *icasia* only in the male form. Fabricius in 1798 (?) described the synonymous *Ecpantheria lantana*, but whether from male or female the writer does not know.

DESCRIPTION OF ADULT

Male.—Antennæ with short serrations formed by slightly curved bars attached transversely by their centers to the underside of the flagellum. The ends of these serrations with a clothing of fine white pile which is more dense on the ends farther from the body. Face brown irregularly marked with white; eyes black. A pair of steel blue circular markings on the rear of the thorax, dorsal. Abdomen with long white hairs on first segment and on dorsum of second segment; other abdominal segments on dorsum and sides varying in color from light orange to reddish-brown; usually a pair of subdorsal transverse black lines on all segments but the first two. Clothing of white hairs on lower part of last segment. Ventral coloration generally white, with occasional orange on abdominal segments. Femora white edged with steel-blue; tarsi steel-blue to brown.

Primaries white with five irregularly curving rows of dark brown loops running transversely across the wing and varying considerably in position. Generally these rows are approximately equidistant, the first row always near the base of the wing. Often, however, the other four may be crowded on the apical two-thirds of the wing. Hind wings white with two, and sometimes three, rows of fuscous spots running backward from the costa for a short distance. Anal angle of the secondaries drawn out, and bearing a fuscous spot

which may vary to a streak more or less broken, running from the anal angle for some millimeters toward the humeral angle. In both wings the markings of the upper surface are duplicated beneath. Expanse of primaries 47-52 mm.

NOTE.—Since writing the following paragraph a female has been bred bearing rows of fuscous loops on primaries and secondaries situated as in the male. These loops are pale brown in color.

Female.—Antennæ filiform, covered on dorsal surface with white scales. Eyes black, entire head and thorax white. Abdomen white beneath; dorsum from yellow to red-brown, except first segment, which is covered with long white hairs as is the thorax. Small patch of white on center of dorsum of second abdominal segment. Succeeding segments with a pair of short subdorsal transverse white lines, except last segment which is entirely white but for yellow or red-brown laterals. Legs entirely white except claws. Wings white without any markings above or beneath; rub very easily, the principal light brown veins often showing rather conspicuously. The primaries in proportion to the size of the secondaries are somewhat longer than in the male. Expanse of primaries, 55-73 mm.

DESCRIPTIONS OF IMMATURE STAGES

Egg.—The egg is subspherical, being slightly flattened on side of attachment. The shell is covered with fine, irregular reticulations and the color, when the egg is first laid, is greenish yellow with a pearly iridescence. Color changes to steel gray shortly before hatching. Size, about 0.50-0.75 mm. in diameter, slightly less in height.

Larval Stage I.—Head, lemon-yellow, width about 0.25 mm.; clypeus rather narrow; setæ light brown, ocelli black. Body subcylindrical, colored as follows: Thoracic segments orange, first two abdominal segments reddish-brown; third and fourth, orange; fifth, sixth, and seventh, reddish-brown; eighth and ninth, orange to yellow. All dorsal and dorsolateral hairs black and plumose; sublateral hairs white and plumose; all hairs long. Thoracic legs and prolegs pale yellow.

Stage II.—Head bilobed, yellow, width about 0.50 mm.; ocelli black. Body subcylindrical, general color “chrome orange”; warts “chrome orange” on all segments except on the first two abdominal, and on the fifth, sixth, and seventh abdominal, where they are a dark brown. Black hairs in this instar more prominent than the white ones.

Stage III.—Head bilobed, orange, width about 0.80 mm. General body color “burnt sienna” with warts of same color on thoracic segments and on abdominal segments 3 and 4, and 8 and 9. On the other segments the tubercles are black. Body densely clothed with black hairs except on third and fourth abdominal segments, which bear light brown hairs arising from the dorsal tubercles. A few short inconspicuous white hairs arise from the dorsal and lateral warts, excepting on the black-tubercled segments.

Stage IV.—Head reddish brown, width about 1.25 mm. Clothing of thoracic segments, reddish brown; of abdominal segments 1–7, inclusive, black, except for light brown arising from dorsal warts on abdominal segments 3 and 4. Last two abdominal segments clothed with reddish-brown hair.

Stage V.—Head dark reddish brown, width about 1.5 mm. First two abdominal segments brown, with darker coloring around the bases of the warts. Hairs all black except those arising from the dorsal and subdorsal warts of abdominal segments 3 and 4. Tubercles of last two segments, yellowish brown.

Stage VI.—Head broader than high, “Indian red,” width about 2.25 mm. A distinct inverted “Y” in pink on the face, clypeus small. Cephalic hairs coarse and light brown. Body black, tubercles “Indian red,” all hairs black except a few dark-brown ones on the thoracic segments. A rather conspicuous lemon-yellow spiracle surrounded by a black ring on all segments but the last two thoracic and the last abdominal. Thoracic legs reddish brown, prolegs dark.

Stage VII.—No noticeable difference between this and previous instar. Width of head about 2.75 mm.

Stage VIII.—Width of head about 3.8 mm. Out of 15 maturing larvæ only three reached this instar.

Pupa.—The pupa is formed in a loose tough web of brown silk in which the larva molts for the last time, partially throwing the cast skin off the pupa.

Rounded, elliptical, obtected; dark mahogany brown. Cremaster consisting of a group of short hairs each bearing a knob of spines at its tip. Female pupa 22 mm. long, 9 mm. broad, 14 mm. from tip of head to end of wing cases; male pupa somewhat smaller.

(Color names are according to Smith's Glossary.)

LIFE HISTORY AND HABITS

The laying of an egg cluster may take considerable time. An adult female taken laying on orange in the field was observed 45 hours later to be still laying, and the number of eggs in the cluster was then about three times as large as when the insect was first observed. The eggs are piled in a large irregular cluster on the upper leaf-surface. Unfertilized females in captivity have each laid over 500 sterile eggs, beginning oviposition within 24 hours of emergence. In the case of fertilized females oviposition began about two days after emergence.

Once the larvæ began to emerge it required about three days for all the eggs to hatch. The egg stage varies from six to eight days.

The young larva eats a portion of its shell and after a short time begins feeding, usually on the under leaf-surface. During the first two instars the larva does not bite through the upper leaf tissue; when disturbed it rolls itself into a ball and drops on a silk thread. From the fourth instar on, the larva is very active and a voracious eater.

The instar of 15 larvæ averaged as follows:

First instar, 6 + days. Variations, 5-8 days.

Second instar, 3.5 days. Variations, 3-8 days.

Third instar, 4 + days. Variation, 3-6 days.

Fourth instar, 4 + days. Variation, 3-5 days.

Fifth instar, 7 days. Variation, 4-17 days.

Sixth instar, 9 + days. Variation, 6-18 days.

Some larvæ had one, and a few even two, molts after the sixth instar.

When ready to pupate the larva spins up a cluster of leaves, or a roll, if on banana, and spins a loose, tough web of brown silk, within which it undergoes its last molt. Males averaged 18.5 days for the pupa stage with a variation of 17–20 days; females averaged 16.5 days with a variation of 15–18 days.

ENEMIES

The Ichneumon *Eremotylus angulatus* Hooker is a parasite of the larva. Dead larvæ are often found with a strong growth of what is apparently a species of *Empusa*.

ELUCIDATIONS OF NEW ENGLAND MUSCOIDEA

BY CHARLES H. T. TOWNSEND

Certain forms that have been confused specifically, or wrongly referred generically, are elucidated in this paper. Various other forms, believed to be undescribed, are added. External adult-character descriptions are included of several forms that have thus far stood on reproductive and early-stage characters only.

Family CALIRRHOIDÆ

Ochrocera, new genus.

Genotype, *Ochrocera vaginalis* Townsend, new species.

Allied to *Arctophyto*, from which it differs as follows: Female. All the macrochætæ strong, body not hairy; no facial carina, the antennæ not widely separated; frontal bristles closely placed, about 10 on each side; front more produced, the parafacials broader; cheeks about three-fifths of eye-height; three proclinate fronto-orbitals; two or three extra pairs of ocellars, shorter than front pair; palpi well dilated at tip; cubitus rectangular, with a strong stump; abdomen scarcely widened, with strong erect discals and marginals, including median marginal pair on first segment, otherwise with only short appressed microchætæ and no hairs. Bears a strong resemblance to *Paramacronyhia*, from which it may be distinguished by the bare parafacials and the discal abdominal macrochætæ.

Ochrocera vaginalis, new species.

Length of body, 11 to 11.5 mm.; of wing, 9.5 mm. Two females, Base Station, Mount Washington, New Hampshire, August 27 and 31, 1914, on flowers of *Solidago canadensis* (Townsend).

Black, rather shining. Third antennal joint and tips of palpi ochereous or clear light orange; the first two antennal joints, arista, and rest of palpi rufotestaceous. Frontalia black, cheek grooves brown; rest of head silvery-white, shading to blackish with incidence of light, leaving a rectangular dark patch on parafacials in direct view and the posterior half of parafrontals dark except the inner edge. Thorax and scutellum silvery, with three heavy equal uninterrupted black vittæ. Abdomen silvery submarmorate, shining, the only tangible marking being a more or less defined median vitta. Legs black. Wings clear. Tegulæ white.

Holotype, No. 19595, U. S. Nat. Mus. Paratype, TD4332.

Family SARCOPHAGIDÆ

Protodexia Townsend.

Ann. Ent. Soc. Amer. IV, 139, 151 (June, 1911)—As TD354, without name.

Journ. N. Y. Ent. Soc. XX, 117-118 (June, 1912).

Genotype, *Protodexia synthetica* Townsend, 1912, l. c.

Differs from *Ravinia* as follows: Female. Front equilateral, hardly over two-sevenths of head-width; frontalia a little narrower than one parafrontal, very slightly narrowing posteriorly to divergence at ocellar area; two proclinate fronto-orbitals, one reclinate behind and in line with them; anterior pair of frontals slightly diverging from line of others. Parafacials very narrow, distinctly narrower than length of second antennal joint, with irregular row of fine hairs. Cheek grooves subtriangular, well impressed, the upper and outer angles sharply pointed and elongate; cheeks much narrower, distinctly less than half eye-height. Face widens abruptly and rapidly from front, distance between lower ends of eyes being more than twice frontal width. Facial depression very rounded, widened

below, but little higher than broad, the outer bowed edge of facialia with minute bristles half way up; vibrissæ inserted distinctly above the oral margin, the epistoma appreciably constricted by the vibrissal angles. Third antennal joint about twice the length of the rather elongate second. Only three postsuturals, only two preacrostichals and one postacrostichal; three sternopleurals; second abdominal segment with closely-set marginal row of short appressed bristles, third segment with marginal row of erect short ones, anal segment with only row of erect short microchætæ representing the usual marginal bristles. Front tarsi slender; the front claws much shorter, weaker and more curved than the others. Third vein with four or five bristles at base reaching nearly halfway to small cross-vein, strongly bowed upward on distal half.

Protodexia synthetica Townsend.

Length of body, 6 mm.; of wing, 4.75 mm. One female, Melrose Highlands, Massachusetts, August 14, 1908 (D. H. Clemons).

Blackish, pale golden pollinose all over, the parafrontals and parafacials more deeply golden, the occiput ashy. Three fairly distinct vittæ extending over thorax and abdomen. Legs thickly pollinose, except tarsi which are deep black. Wings clear. Tegulæ whitish, with yellowish margins. Palpi and most of antennæ light rufous. Frontalia brown.

Holotype, No. 19476, U. S. Nat. Mus. TD354.

Eubrachycoma, new genus.

Genotype, *Brachycoma apicalis* Coquillett, 1897, Rev. Tach. 131.

Differs from *Brachycoma* as follows: Male. Parafacials finely hairy, the hairs not disposed in rows. Palpi not appreciably enlarged apically. Cheeks about one-half of eye-height. About 16 bristles on hind margin of third abdominal segment. Scutellar bristles not so strong; abdomen rather more hairy. Claws very strongly elongate. Hind crossvein not quite parallel with apical crossvein, not at all in line with same. Vibrissæ on or close to oral margin.

The holotype is a male from Connecticut.

Family SALMACIIDÆ

Euceromasia Townsend.

Ann. Ent. Soc. Amer. IV, 146 (June, 1911)—As TD390, without name.

Journ. N. Y. Ent. Soc. XX, 112-113 (June, 1912.)

Genotype, *Euceromasia spinosa* Townsend, 1912, l. c.

Runs to *Masicera myoidæa* in Coquillett's Rev. Tach. Differs from *Paraphorocera radialis* T. (subgenus B) as follows: Female. Front at vertex less than one-fourth of head-width, face below about one-half same. Outer vertical vestigial, not at all developed. Antennæ slightly more slender, relative length of joints same; second arisal joint not elongate. Cheeks a little narrower, parafacials narrower and more rapidly narrowed below; eyes with faint hairs that are a little more easily distinguished. Front not so produced in profile; frontalia averaging as wide as one parafrontal. Practically the identical chætotaxy of thorax, scutellum, and abdomen; second segment without discals, the discals of third segment rather weak, anal segment with a scattering of short erect microchætæ. Abdomen deep, tip rather rounded. Apical cell ends a little nearer wing-tip, and the cubitus is well approximated to margin. Two to three bristles on base of third vein.

Euceromasia spinosa Townsend.

Length of body, 7.5 mm.; of wing, 6.25 mm. One female, North Andover, Massachusetts, August 20, 1908 (Clemons).

Differs in coloration from *Paraphorocera radialis* as follows: Palpi are obscure rufous, with black on tips and sides. Frontalia are rich brown. All other coloration, including the distribution of pollen, agrees perfectly except only that the tegulæ are more nearly white.

Holotype, No. 19471, U. S. Nat. Mus. TD390.

Family CROCUTIDÆ

Anthomyiopsis, new genus.

Genotype, *Anthomyiopsis cypseloides* Townsend, new species.

Female. Tegulæ small, the hind scale not twice as large as

the front one. Apical crossvein pushed close to margin of wing. Macrochætæ bristlelike. Front at vertex about equal to one eye, slightly widening anteriorly, the face widening therefrom at about same angle. Two proclinate orbitals, one reclinate one; both verticals developed, proclinate ocellars present. Parafrontals each a little over half as wide as frontalia. Frontals stopping close to base of antennæ. Parafacials narrowed below. Cheeks about one-fourth or one-fifth of eye-height. Epistoma cut off, vibrissæ nearly level with oral margin. Facialia bare. Second antennal joint short, third hardly over twice length of second. Arista pubescent, thickened on basal third, basal joints short. Proboscis short and fleshy, palpi well thickened apically. Abdomen broad, short-ovate; second segment with weak marginal macrochætæ and a median discal, third and fourth segments covered with same moderately thickly and evenly disposed. Legs normal. Wings elongate, rather narrow. Costal spine very small, the costa well bulged basad of same. Apical cell very narrowly open, ending in exact wing-tip. Hind crossvein straight, at right angle to fourth vein, slightly nearer to small crossvein than to cubitus, latter rounded and much approximated to wing-margin; apical crossvein subparallel with margin.

Anthomyiopsis cypseloides, new species.

Length of body, 3.5 mm. (abdomen flexed); of wing, 4 mm. One female, Franconia, New Hampshire (Mrs. A. T. Slosson).

Shining black. Face silvery; frontalia dark brown, with slight bloom; parafrontals thinly silvery. Antennæ and palpi light rufous. Thorax and scutellum very thinly dusted with silvery, thoracic vittæ obsolete. Abdomen without bloom. Legs black. Wings nearly clear, veins yellowish. Tegulæ yellowish-tawny, the front scale more whitish.

Holotype, No. 19569, U. S. Nat. Mus.

Psalidopteryx, new genus.

Genotype, *Psalidopteryx slossonæ* Townsend, new species.

Female. Head in profile subhemispherical, lower and frontal

profiles curved. Front view shows head to be much broader than high. Front almost equilateral, wider at vertex than one eye. Antennal and vibrissal axes about equal. Facial plate short, broad below, subtriangular, epistoma cut off, the vibrissæ about level with oral margin. Facialia bare. Proboscis short, fleshy; palpi subfiliform, slightly thickened at tip. Antennæ inserted well above eye-middle, second joint short, third joint only slightly longer than second. Arista thickened on basal third, basal joints very short. Eyes bare, descending a little short of the vibrissal level. Frontals few, descending but little below base of antennæ; both verticals developed; two proclinate fronto-orbitals, and one reclinate; proclinate pair of ocellars. Frontalia narrowing posteriorly, at widest much narrower than parafrontals. Parafacials much narrowed below, bare. Cheeks about two-fifths eye-height. Sternopleurals, 1:0:1, some very weak hairlike bristles between them; post-suturals, 3; preacrostichals, 3 weak; postacrostichals, 4, but all except the hind one are weak. Three lateral scutellars, an equally long decussate apical pair, and a weak approximated discal pair. Abdomen almost perfectly ovate in outline from above, very bristly; first segment with only a very weak median marginal pair of bristles and some stronger marginal ones laterally; second with a long median discal, some lateral discals, and a marginal row of which the median pair is strongest; third and fourth segments with complete discal and marginal rows, the fourth segment being very convex and with extra bristles between the discal and marginal rows. All the macrochætæ are erect or suberect. Costal spine small. Venation like *Psalida*, petiole of apical cell about as long as hind cross-vein, latter about in middle between cubitus and small cross-vein, cubitus almost but not quite evenly rounded. No veins bristled, except third at base. Tegulæ normal. Claws short.

***Psalidopteryx slossonæ*, new species.**

Length of body, 3.75 mm.; of wing, nearly 3.5 mm. One female, Mount Washington, New Hampshire (Mrs. A. T. Slosson).

Blackish, cinereous pollinose. Antennæ, frontalia, palpi, and legs black. First two abdominal segments subshining brownish-black; the second rather broadly pollinose on base except on median line, the pollen area of each side distended posteriorly next median line. All other parts thickly pollinose, the bristle origins of last two abdominal segments marked with black dots. Wings clear. Tegulæ watery-whitsh. Thoracic vittæ practically obsolete.

Holotype, No. 19566, U. S. Nat. Mus.

Named in honor of Mrs. A. T. Slosson.

Family DEXIIDÆ

Spathidexia Townsend.

Genotype, *Spathidexia clemonsi* Townsend, 1912, Journ. N. Y. Ent. Soc., XX, 110.

Differs from *Thelairoides* as follows: Both sexes with two proclinate fronto-orbitals. Hind claws of male about as long as others, all thickly pubescent. Costal spine vestigial, or slightly developed. Arista short-hairy above and below. Femora not modified, tibiæ not hairy. Male front at vertex about two-thirds of eye. Palpi of male short, small, little swollen apically. Third antennal joint of male bulged on upper border.

Female claws short. Female front and face about same width, as wide as one eye or slightly wider. Palpi of female elongate, much enlarged apically. Long heavily-chitinized blade-like larvipositor present, projecting posteriorly and not downward. This larvipositor can not be used for piercing skin of host, since there are no heavy muscles in connection with it.

Spathidexia clemonsi Townsend.

Length of body, 6.5 to 7.5 mm.; of female wing, 5.5 mm.; of male wing, 6 mm. Three females, Lexington, Kentucky; Melrose Highlands, Massachusetts (Clemons); Rock Creek Park, District of Columbia, May 23, 1915 (Townsend); one male, Riverton, New Jersey, May 30 (C. W. Johnson).

Black, with silvery-white pollen. Inner edge of parafrontals, vertex, ocellar area, mesoscutum, and scutellum light golden. Pleuræ, coxæ, outside of front femora, rest of head, and broad bases of abdominal segments 2 to 4 silvery-white. Palpi and labella pale yellow. End of second antennal joint and base of third pale rufous. Unpollinose parts of abdomen polished black. Legs black. Wings clear. Squamæ and squamulæ watery-white. The silvery-white pollen is seen in oblique view to cover the blackish frontalia.

Male with abdomen broadly yellow on base, showing in tergal lunule on each side extending back to front corner of third segment, and including whole venter to middle of same segment. Front tibiæ of male are testaceous, those of female hardly less so.

Holotype, No. 19467, U. S. Nat. Mus., female, TD371. Allotype, male. Paratypes include TD4453, female.

Family LARVÆVORIDÆ

Larvævoropsis new genus.

Genotype, *Echinomyia dakotensis* Townsend, 1892, Trans. Am. Ent. Soc. XIX, 94.

Differs from *Larvævora* as follows: Whole body much narrower, the abdomen not especially broadened, form *Peleteria*-like. Second antennal joint of female hardly more than one and one-fourth times the third, that of male shorter. Front of male at vertex about two-thirds eye-width, that of female about equal to eye-width. Third antennal joint of male not strongly broadened apically. Cheeks of male about one-half of eye-height, those of female a little broader. Parafacials with sparse bristly hairs, not pilose. Strong apical decussate pair of scutellar macrochætæ; four laterals, the alternating ones weak, especially so in female; two discal pairs, the anterior pair widely separated and forming with the other pair an arcuate row. No median marginal bristles on first abdominal segment, only a median marginal pair on second, a loose marginal row on third, loose marginal and discal on fourth segment. Abdominal macrochætæ not nail-like or truly spine-

like. Anal segment not noticeably emarginate. Cubitus farther removed from hind margin of wing, almost as near front margin.

Larvævoropsis orientalis Townsend, new name.

Larvævoropsis orientalis Townsend new name for *Echinomyia florum* Coquillett, 1897, Rev. Tach. 144, Franconia, New Hampshire (nec *Tachina florum* Walker, 1849, List IV, 722). Holotype male, allotype female, on same pin. Type, No. 19596, U. S. Nat. Mus.

Differs from *dakotensis* by the face and cheeks being golden pollinose. The female has the abdomen wholly black except anal segment.

May be known from *Fabriciodes montana* by the anal segment of male being rufous or yellowish-rufous with only a little black on median line basally. Macrochætæ strong, body not long-hairy. Scutellum dark testaceous apically, the base broadly black. First arisal joint short in both sexes. TD4365, 4378, both male.

A common species in New England.

Echinomyodes, new genus.

Genotype, *Echinomyodes piceifrons* Townsend, new species, for *Echinomyia algens* Coquillett, 1897, Rev. Tach. 144, pt., holotype labeled "Vermont," det. BB. as *algens* (nec *Tachina algens* Wiedemann, 1830, Auss. Zweifl. II, 285). Holotype, No. 19597, U. S. Nat. Mus., female.

Differs from *Larvævora* as follows: Form a little less heavily widened. Third antennal joint longer. Front of female at vertex conspicuously greater than eye-width, that of male a little less than eye-width. Ocellar area and parafrontals of both sexes heavily polished, black, without bloom in any light. Cheeks also with polished black area. Frontal profile hardly longer than facial. Frontalia broader, shorter, equilateral. Cheeks of female about one-half eye-height, those of male less than that. Third antennal joint of male not so broadened, longer than wide. Only two strong lateral scutellars, no thick discal pile. First abdominal segment without median macro-

chætæ in either sex; second with a median marginal pair normally; third with a loose marginal row. Second segment heavily arcuate on middle of anterior border, bulged forward. Anal segment not emarginate. Marginal row of macrochætæ of anal segment not sagittate. Hypopygium of male much narrower. Second to fourth front tarsal joints of female more heavily widened.

A female of *E. piceifrons*, collected by the writer at Melrose Highlands, Massachusetts, September 13, 1914, disclosed a uterus 70 mm. in length which was estimated to contain over 13,000 eggs and maggots. The eggs occurred in as many as 24 rows abreast. TD4377.

Jurinia nitida Wulp, 1882, Notes Leyd. Mus. IV, 82, is a closely allied western form.

Fabriciodes, new genus.

Genotype, *Fabriciodes montana* Townsend, new species, for *Echinomyia florum* Coquillett, 1897, Rev. Tach. 144, pt., holotype labeled White Mts., N. H. (nec *Tachina florum* Walker, 1849, List IV, 722). Holotype, No. 19598, U. S. Nat. Mus.

Differs from *Larvævoropsis* as follows: Male. All macrochætæ weak, body long-hairy. Third antennal joint broadly rounded, nearly as long as second. First arisal joint may be somewhat elongate. Parafacials and parafrontals with hairs that are not bristly. Sternopleurals mixed with pile. Five lateral scutellars, with pile. Median marginal pair of bristles on first abdominal segment; discals and subdiscals on intermediate segments, but all weak; abdomen with long pile posteriorly and shorter pile anteriorly. Hypopygium heavier; claws not so elongate.

The genotype is distinguished by the wide black vitta of abdomen being spread over whole of anal segment, and the scutellum being wholly light testaceous.

Rhachogaster Townsend, 1915, Can. Ent. XLVII, 291.

Genotype, *Rhachogaster kermodei* T., l. c.

The species may be distinguished from *Echinomyodes piceifrons* T. as follows: Form much less broadened; distinctly nar-

rowed, especially in male. Male vertex little over one-fifth head-width, that of female about eye-width. Ocellar area and posterior half of female parafrontals polished black, without pollen in any light; the male showing bloom almost to vertex. Proboscis longer, palpi heavily thickened apically. Cheeks nearly three-fifths eye-height in female, one-half same in male. Anal segment with only marginal and submarginal macrochætæ. Male hypopygium large, with comb-toothed flanges. Brush of heavy spines on sides of venter of anal segment of male, less marked in female but present. Male ventral plates 2 and 3 spined as described and ventral profile deeply hollowed. Male tarsi much shortened.

The specimens referred to by Coquillett, 1897, Rev. Tach. 144, White Mountains, New Hampshire (pt.), both sexes; Oswego, New York, two females, and (Camel's Hump) Vermont, male, are this species.

Eularvævora, new genus.

Genotype, *Tachina algens* Wiedemann, 1830, Auss. Zweifl. II, 285.

Differs from *Rhachogaster* as follows: Second antennal joint of female longer and third somewhat smaller. Parafrontals pollinose in both sexes; palpi less thickened at tip; cheeks rather over one-half eye-height; both sexes with two to five median marginal macrochætæ on first segment and six to seven on second. Abdomen rather long-hairy in male, short-pilose in female. Macrochætæ somewhat weaker. Abdomen of female distinctly broadened, that of male a little less so. Male hypopygium much smaller and of distinct character, ventroanal spine-brushes not developed. Male tarsi not shortened. Second and third ventral plates of male with long bristles instead of spines, the ventral profile not deeply hollowed. Differs from *Fabriciella* by lack of ventroanal spine-brushes.

Wiedemann evidently had a female with dark or discolored antennæ.

The specimens referred to by Coquillett, 1897, Rev. Tach. 144, Franconia, New Hampshire, male, and White Mountains,

New Hampshire (pt.), both sexes, are this species. The male abdomen is more or less reddish on sides, the palpi and first two antennal joints are yellowish to rufous. Otherwise fits Wiedemann's description. No other species known to me fits as well. It is quite probable that *T. algens* Wd. was a composite species, including the female of the present form and the male of the preceding, for the author probably had several specimens. In such case the species must stand restricted as above.

Family EXORISTIDÆ

Trisisyroa, new genus.

Genotype, *Trisisyroa vesiculata* Townsend, new species.

Differs from *Winthemia* as follows: Female. Much narrower in form, the entire length conspicuously over three times the greatest width. The whole head and appendages are so similar to those of *Winthemia* as to defy exact verbal differentiation, but the front is more prominent in profile, the frontalia are nearly or quite as wide as one parafrontal, and the bristles of head are in general stronger. Anal segment practically without hairs among the bristles both above and below. Abdomen narrowed, long-ovate. Hind tibiæ not ciliate, only very loosely-pectinate with longer bristles present. Small crossvein opposite point halfway between end of auxiliary and end of first vein or nearer to latter. Cubitus considerably greater than a right angle, the apical crossvein less bent in. No median marginal macrochætæ on first abdominal segment. Has a pair of large inflatable uterovaginal pouches in common with *Winthemia*.

Trisisyroa vesiculata, new species.

Length of body, 8.5 mm.; greatest width, 2.5 mm.; length of wing, 6 mm. One female, Lakehurst, Sebago Lake, Maine, September 6, 1914, on foliage (Townsend).

Frontalia black, antennæ blackish with some rufous on inside of third joint, palpi pale rufous, face wholly silvery-white, parafrontals golden. Thorax shining black, with silvery pollen which is thinnest on disk, leaving five inconspicuous vittæ.

Scutellum testaceous, except the black base, thinly silvery. Abdomen shining black, thickly silvery-white pollinose on bases of last three segments, the rest of surface showing thin bloom in oblique light, anal segment bright rufous on posterior half, a patch of obscure rufous on sides of second segment. Venter wholly blackish, except the pale testaceous hind borders of segments. Legs black. Wings clear. Tegulæ white.

Holotype, No. 19600, U. S. Nat. Mus. TD4355.

Neothelaira Townsend.

Journ. N. Y. Ent. Soc. XX, 109-110 (June, 1912).

Genotype, *Masicera aurifrons* Coquillett, 1897, Rev. Tach. 115 (Syn. *Neothelaira dexina* Townsend, 1912, l. c., holotype, No. 19466, U. S. Nat. Mus., TD427).

Front of female slightly exceeding one-third head-width at vertex, widening rather evenly into face; that of male hardly one-third same, with parallel sides on nearly posterior half; face about one and three-fourths times vertex in female, that of male nearly twice vertex. Frontalia in middle a little narrower than one parafrontal at same point. Parafacials broad, averaging wider than length of second antennal joint. Front well produced in profile, facial profile equal to or slightly longer than frontal; epistoma normally weakly prominent, not cut off, slightly constricted, the vibrissæ inserted a little above the extreme oral margin. Vibrissal axis of head only a little shorter than antennal axis, due to the strong bulging of occiput below; the face very receding. Facialia practically bare, only a few short bristles next vibrissæ; facial depression not broad, rather long, shallow. Cheeks in both sexes nearly to fully one-half eye-height. Outer verticals but slightly developed, strong pair of proclinate ocellars; two proclinate and two reclinate fronto-orbitals in female, three or four reclinate in male; five pairs of frontals in female, seven or eight in male, which descend to point below root of arista. Second antennal joint moderately elongate; third narrow, about two and one-half to three times second; arista not longer than third antennal joint, well thickened on over basal half, tapered rapidly, sharply pointed, basal joints short. Proboscis about

head-height, stout; palpi rather stout, a little shorter than third antennal joint, thickened distally. Sternopleurals, post-suturals, and postacrostichals all three in number. Scutellum with four laterals, the front and hind ones longest, latter reaching to base of third segment; a weak erect decussate apical pair, and an approximated weak discal pair, with some additional discals in male. Whole form narrowed, abdomen about same width as head and thorax. Venter of female is not carinate (stated by Coquillett to be carinate, l. c.). Abdominal macrochætæ discal and marginal, the latter long, the discals short, all erect; median marginal pair on first segment; no marginals on anal segment of female, except short ones like the discals, but anal segment of male is well covered with strong ones. Hind tibiæ not ciliate or pectinate. Apical cell ending well before wing-tip, closed or narrowly open; cubitus angular, with faint wrinkle; apical crossvein only slightly bent in and subparallel with hind one, which is nearer to cubitus; strong costal spine. Third vein spined nearly halfway or almost to small crossvein, other veins bare. Last section of fifth vein is almost half as long as preceding section. Legs of moderate length; claws of female nearly or quite as long as last tarsal joint, those of male distinctly more elongate.

Neothelaira aurifrons Coquillett.

Length of body, 9 mm. (females rather flexed); of wing, 6.5 mm. One female, holotype of *dexina*, TD427, Lynn, Massachusetts, August 28, 1908 (F. B. Lowe); holotype of *aurifrons*, female, Mount Washington, New Hampshire (Slosson); allotype, male, White Mountains, New Hampshire (Morrison).

Entire parafacials, cheeks, occipito-orbits, vertex, and parafrontals deep rich gold in female, the whole facial plate and facialia gold to gray-golden; in male more obscurely golden, the parafrontals largely blackish; frontalia and arista dark brown; antennæ blackish, the first two joints and base of third rufous; palpi pale rufous. Occiput silvery-cinereous. Thorax, scutellum, and abdomen shining black, silvery pollinose; mesoscutum with four vittæ, the outer

ones of the semicolon type, the inner ones sublinear and reaching well behind suture, a fifth vitta showing in middle behind suture. First abdominal segment black, the broad hind borders of second to fourth shining black and without pollen. The silvery of bases of last three segments is narrower in the male. Legs black, femora pollinose, tibiæ with a rufous-brown tinge. Wings clear. Tegulæ nearly white. The anal segment of female may be slightly or broadly tipped with rufous.

Masicera chatoneura Coquillett, 1897, Rev. Tach. 115, from the White Mountains, New Hampshire, belongs to this genus.

Hylotomomyia, new genus.

Genotype, *Admontia hylotomæ* Coquillett, 1898, Can. Ent. XXX, 233.

Differs from allied genera with piercer as follows: Lateral edges of tergal sclerite of third segment in female meeting on median ventral line and set with row of closely-placed very short spines, forming a weak ventral carina when venter is not collapsed; a short piercer present in female. Parafacials with an area of fine hairs on lower portion. Facialia ciliate one-fourth to one-third way up. Vibrissæ inserted above oral margin. Head subtriangular in profile, the lower border very short and rather rounded. Parafacial profile faintly convex. Antennæ shortened, not reaching vibrissæ in either sex; second joint elongate. Cheek grooves ascending broadly behind eyes. Strong discal bristles in male, weak ones in female. Abdomen rather thickly clothed with bristly hairs, especially in male. Costal spine present. Cubitus broadly rounded, the hind crossvein a little nearer to same than to small crossvein. Apical cell open to almost closed, ending a little before wing-tip. Allied to *Spathimeigenia*, from which it may be at once known by the lack of short spines on ventral edges of anal segment.

The holotype is a male, Woods Hole, Massachusetts.

Euzenillia Townsend.

Ann. Ent. Soc. Amer., IV, 148 (June, 1911).

Journ. N. Y. Ent. Soc., XX, 111-112 (June, 1912).

Genotype, *Hypostena variabilis* Coquillett, 1895, Journ. N. Y. Ent. Soc., III, 57 (Syn. *Euzenillia aurea* Townsend, 1911-

12, l. c., holotype, No. 19469, U. S. Nat. Mus., TD350).

Differs from *Tachinophyto* as follows: Female. Vertex scarcely or well under one-third head-width. Head not so triangular in profile, the vibrissal axis longer. Front widening very gradually anteriorly, the face widening more rapidly. Facial depression wider, the parafacials narrower. Second antennal joint only slightly elongate; the third over three times as long as second, broader and stouter. Short median discals on intermediate abdominal segments, and a median marginal pair on first segment. Wings not so broad, longer; costal spine small; apical cell open, ending distinctly before wing-tip; hind crossvein a little nearer to cubitus. No piercer to larvipositor. TD4470, topotype of *variabilis*, shows same maggots as TD350.

Male has second antennal joint very short; third being very long, about six times second. The claws are not elongate, the front is about same as that of female, and there are two proclinate fronto-orbitals. There are no median discals on intermediate abdominal segments. These characters are drawn from a specimen, Bureau Ent. No. 153°, reared by Koebele in Sonoma County, California, from *Carpocapsa pomonella*. It may be only a western subspecies of *variabilis*.

The arista is thickened on basal third in both sexes, the facialia are bare save for a few bristles next vibrissæ, and the legs are longer than in *Tachinophyto*.

NOTE.—The original description of *Tachinophyto* is of the male. Both sexes have two proclinate orbitals and short claws. The male front is but little narrower than that of the female. The facialia may be ciliate more than one-third way up, and the apical cell is often open. The female is provided with a piercer. These characters are drawn from two specimens which I identify as *Tachinophyto floridensis* T., being a male from southern Florida (Robertson, No. 12384), and a female from the District of Columbia, July.

Family RHODOGYNIDÆ

Neocyptera, new genus.

Genotype, *Ocyptera dosiades* Walker, 1849, List IV, 695.

Differs from *Cylindromyia* by the swollen abdomen, and venter of second and third segments of female covered with very short sharp tubercle-like spines directed backward. Facial plate with very prominent carinal tubercle on upper part. Claws of male long. Hind crossvein oblique, sinuate. Arista not incrassate at tip in either sex. Second aristal joint slightly elongate in male.

The holotype was from Nova Scotia, and the species is moderately common in New England.

TANYPEZIDÆ IN THE UNITED STATES

(*Diptera acalyptrata*)

BY FREDERICK KNAB AND R. C. SHANNON

As far as we are aware, this interesting group of acalyptrate Diptera has not hitherto been reported from temperate North America. Two species from this region, both new to science, are described in the following. The group is of special interest to systematists on account of the somewhat obscure relationship and consequent difference of opinion as to the correct position in the system. Most frequently the genus *Tanypeza* appears as a member of the family Micropezidæ, where we find it in the Aldrich catalog (1905). Williston, in his Manual of North American Diptera (3d edit., 1908, p. 264), treats *Tanypeza* together with the Micropezidæ, but insists that it represents a separate family, without, however, entering into the question of relationships. In 1903 Friedrich Hendel discussed the Tanypezidæ and showed that the resemblances with the Micropezidæ are purely superficial.¹ He assigns the group to the Ortalidæ, giving it the same rank as the other subfamilies.² We believe that Mr. Hendel's opinion is well

¹Ueber die systematische Stellung von *Tanypeza* Fall. Wien. Ent. Zeit., vol. 22, pp. 201-205.

²Mr. Hendel considers the Ortalidæ as of merely subfamily rank in the "Muscaria," and adopts the term "section" for our customary subfamilies.

founded, although we consider the tanypezines less closely related than are the other ortaline groups to each other.

Among the peculiar tanypezine characters that seem to have been overlooked thus far is a series of bristles on the halteres, along the dorsal side of the stem. The males of several species show on the hind legs small groups of spinelike bristles, on the inner side of the trochanters and basally on the femora.

Tanypeza luteipennis, new species.

Shining black. Antennæ black, the third joint broadly ovate, pruinose. Proboscis yellow. Palpi black. Mesonotum with a broad, weakly differentiated, pruinose median stripe which involves the scutellum, the humeri and sides to roots of wings bright silvery pruinose; hairs yellowish, rather dense and coarse, particularly on posterior half; bristles black. Pleuræ with a broad silvery sericeous stripe from before roots of wings onto upper part of mesosternum. Postnotum gray-pruinose. Abdomen shining black, the hairs rather coarse, yellowish, those at the sides, particularly on second segment, black. Front coxæ yellow, the others piceous on proximal two-thirds. Legs yellow, the front femora somewhat infuscated dorsally on distal half; front tibiæ whitish; tarsi blackish, brown at base, those of front legs with the proximal half of the first joint whitish. Wings tinged with yellow, the venation normal. Halteres white.

Male.—Frons nearly one-fourth the width of head, broadening slightly on distal half. Abdomen with the hairs coarser, more extensively black, the seventh segment dorsally silvery pruinose. Hind femora near base with a small group of short, black, spinelike bristles dorsally on inner aspect, a similar group on inner side of trochanters.

Female.—Frons one-fourth the width of head, parallel-sided. Abdomen with the apical margin of the sixth segment broadly whitish.

Length: Body about 5.5 mm., wing 5 mm.

Algonquin, Illinois, 6-7-'95, 1 male, 1 female (collection Coquillett); Franconia, New Hampshire, 1 male, 2 females

(Mrs. A. T. Slosson); Oswego, New York, July 14, 1895, 1 female.

Type, Cat. No. 20188, U. S. Nat. Mus.

Closely related to the European *Tanypeza longimana* Fallén, of which a pair are before us collected by Dr. M. Bezzi in Sondrio, Italy. This latter species is slightly less in stature and more slender, the hairs of the mesonotum are finer, more sparse, and black. The hairs of the abdomen are black throughout. The front femora are heavily marked with piceous brown, this color spreading out to a broad diffused ring on the distal half. The wings are clear and are distinctly shorter and broader than in the American species.

Tanypeza picticornis, new species.

Male.—Frons narrowed to a point a short distance in front of anterior ocellus, where it is about one-seventh the width of the head. Vertex with a large silvery pubescent patch reaching forward to ocelli and laterally almost touching eye-margins. Genovertical plates silvery pubescent, produced and broadened to a short distance above antennæ, where they almost touch, then tapering to narrowest part of frons. Two pairs of stout fronto-orbital bristles, the pair of ocellar bristles very minute; postvertical bristles nearly as well developed as the other pair of verticals. Antennæ with the first two joints black, covered with numerous short stout black setæ, the second with a longer bristle; third joint bright yellow, broad, bluntly rounded at tip, covered with white silky pubescence; arista rather long, black, pubescent. Face dull ferruginous, with black median and lateral stripes, silvery pollinose along oral margin, eyes and facialia. Occiput not visible on upper half of head, below inflated and silvery pubescent and with short black marginal hairs; cheeks narrow, with a silvery white beard. Proboscis yellow; palpi black. Mesonotum shining black, the humeri with silvery pubescence, the disk dusted with gray, anteriorly forming three indistinct stripes which become confluent posteriorly. Scutellum black, gray pruinose; a pair of long apical bristles, a smaller pair on the

sides of the dorsum. Pleuræ shining black, a silvery band extending upward from sternopleura, across mesopleura, and joining a large triangular patch on mesonotum just in front of the transverse suture. Abdomen shining black, with black hairs; seventh segment silvery pollinose; hypopygium small but prominent. Front legs with the coxæ bright yellow, elongate, with a few black bristles distally, well separated; trochanters yellow; femora yellow, somewhat darkened beyond basal third; tibiæ and bases of the first tarsal joints yellow, the rest of the tarsi darkened. Middle legs with the coxæ blackish, trochanters yellow, femora yellow, darkened at the middle exteriorly; tibiæ yellow, the tarsi wholly dark. Hind legs with the coxæ blackish, the trochanters yellow, femora yellow with a darkened band about the middle; tibiæ slightly darkened; tarsi wholly dark, the first joint with a small tuft of yellow bristles at the base on under side. On the hind legs the trochanters and bases of the femora on the inner side each bear a distinct row of small but stout black bristles. Wings hyaline, the veins yellowish brown, the venation normal; fourth vein with the last section about twice the length of the penultimate. Squamæ yellowish, with very long white ciliation. Halteres darkened at base, the knobs whitish, the dorsal margin of the stem with small black bristles. Length: Body about 7 mm., wing 7 mm.

Great Falls, Virginia, July 20, 1913 (F. Knab); near Plummer's Island, Maryland, May 27, 1915 (R. C. Shannon).

Type, Cat. No. 20189, U. S. Nat. Mus.

Described from two males. This species can be distinguished at once from *luteipennis* and *longimana* by its larger size and the bright yellow third antennal joint. The wings are less broadly rounded apically and the alulæ and anal lobes much more developed. The ocellar bristles are very weak, as in Hendel's genus *Neotanypeza*, while the postverticals are fairly well developed. Some of our neotropical material shows intermediate conditions in the development of these bristles.

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Insecutor Inscitiae Menstruus

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Nos. 4-6

A SYNOPSIS OF THE GENUS OXYTHRIPS UZEL (Thysanoptera)

BY J. DOUGLAS HOOD

By way of introduction to this brief review of our present knowledge of a small genus of Thysanoptera, the writer wishes to express his deep obligations to Mr. C. B. Williams, of Merton, England, for his assistance in sending European material for study.

GENUS OXYTHRIPS UZEL, 1895

1895. *Oxythrips* Uzel, Monogr. d. Ordn. Thys., p. 133.

1899. *Oxythrips*, Reuter, Acta Soc. Fauna Flora Fennica, Vol. XVII, No 2, pp. 37, 46.

1911. *Oxythrips*, Bagnall, Journ. Econ. Biol., Vol. VI, pp. 4, 10.

Type: Oxythrips ajugæ Uzel, by present designation.

Dr. Karny has expressed the opinion¹ that this genus, as at present defined, may really comprise two distinct genera, whose separation might be based upon the number of prominent bristles borne on the posterior angles of the prothorax, a character used by Uzel as long ago as 1895 for his primary division of the genus. In the key below the writer has preferred to treat them, at least for the present, as subgenera only.

KEY TO THE KNOWN SPECIES OF OXYTHRIPS

- I. Posterior angles of prothorax with one pair of long bristles,
(Subgenus OXYTHRIPS in sp.)
 - a. Tenth abdominal segment fully twice as long as segment 9,
almost cylindrical *bicolor* (Reuter)

¹Zool. Anz., Vol. XLIII, 1913, p. 136.

- aa. Tenth abdominal segment less than twice as long as segment 9, conical.
- b. Sixth antennal segment with a transverse suture on lower surface; tenth abdominal fully 1.5 times as long as median dorsal length of ninth.....*divisus* Hood
- bb. Sixth antennal segment not divided; tenth abdominal segment subequal in length to ninth.
- c. Segments 1 and 2 of antennæ pale, 3 slightly darker*ajugæ* Uzel
- cc. Segment 1 of antennæ pale, 2 much darker, 3 pale*ulmi* (Bagnall)
- II. Posterior angles of prothorax with two pairs of long bristles,¹
(Subgenus *CÆNOTHRIPS* nov.)
- d. Head narrowed anteriorly.
- e. "End of second and whole of third antennal joint yellowish, fourth greyish yellow"...*firmus* (Uzel)
- ee. "Antennal joints 3 to 8 uniform dark grey or greyish-black"*brevicollis* Bagnall
- dd. Head narrowed posteriorly.....*ericæ* (Haliday)

Oxythrips bicolor (Reuter), 1878.

1878. *Thrips* (*Belothrips*) *bicolor* Reuter, Öfv. Finska Vetensk.-Soc. Förh., Vol. XXI, p. 221.
1895. *Belothrips brevistylis* Trybom, Ent. Tidskr. [Vol. XVI], p. 185.
1895. *Oxythrips hastata* Uzel, Monogr. d. Ordn. Thys., pp. 134, 455, Pl. V, fig. 66.
1895. *Oxythrips hastata* var. *bicolor*, idem, ibidem.
1899. *Oxythrips brevistylis*, Reuter, Acta Soc. Fauna Flora Fennica, Vol. XVII, No. 2, p. 46.
1911. *Oxythrips brevistylis*, Bagnall, Journ. Econ. Biol., Vol. VI, pp. 5, 10.
1912. *Oxythrips brevistylis*, Bagnall, Journ. Econ. Biol., Vol. VII, p. 191.
1912. *Oxythrips hastata* var. *bicolor*, Schille, Ent. Zeitschr., Jahrg. XXV, p. 236.
1914. *Oxythrips brevistylis*, Priesner, Wien. Ent. Zeit., XXXIII Jahrg., p. 190.
1914. *Oxythrips brevistylis* var. *hastatus*, idem, ibidem.

Distribution: Finland, Sweden, Austria, England.

European students have uniformly disregarded Reuter's name *bicolor*, which has priority over both *brevistylis* and

¹The key to the species of this subgenus is based on those of Uzel (l. c.) and Bagnall (l. c.), one species only (*ericæ*) being known to the author.

hastatus. Professor Reuter himself, in 1899, used Trybom's name *brevistylis*, notwithstanding his own statement in the same paper that Uzel "should have adopted for the present species my name *bicolor*, instead of a new one."

A female of this species, sent to me several years ago by Professor Reuter, was taken at Pargas, the type locality, and is labeled "*Oxythrips bicolor* Reuter," in his own handwriting.

Oxythrips divisus, new species.

Female (macropterous).—Length about 1.0 mm. Color bright lemon yellow, with fore wings and antennal segments 3–8 gray-brown.

Head about 1.25 times as wide as median dorsal length, broadest behind eyes, cheeks arcuate; occiput with a few faint, anastomosing lines; interocellar bristles alone prominent, pale, about two-thirds as long as eyes; other bristles minute, pale, inconspicuous. Eyes setose, a little more than 0.4 as long as head, slightly more than half as wide as their interval. Ocelli of posterior pair distinctly behind middle of eyes, their interval nearly twice their distance from anterior ocellus; pigment orange-red. Antennæ twice as long as head, of normal form and structure for the genus, except that the sixth segment is divided at the apical fourth of lower surface by a distinct transverse suture; segment 1 clear pale yellow, lighter than head; 2 infuscate laterally and apically, about as dark as head; 3–8 gray-brown, concolorous, except pedicel of 3 which is yellow. Mouth cone about attaining base of prosternum; maxillary palpi three-segmented.

Prothorax about equal in length to head and about one and two-thirds times as wide as long, slightly broader posteriorly, sides slightly rounded; pronotum smooth; posterior angles with one pair of prominent pale bristles about equal in length to interocellars. Wings of fore pair nearly uniform gray-brown, darker at tip; costa with about 22 bristles; principal vein with a basal group of four bristles, a group of three at the fork, and three spaced evenly in apical three-fifths; posterior vein with a series of about ten, beginning just before the second group of the principal vein, these being closer to-

gether toward base of wing. Legs moderately slender; fore tarsus on outer lower surface of tip with a distinct curved tooth.

Abdomen slightly wider than pterothorax, smooth; segment 10 long, acute, fully 1.5 times as long as 9, not divided above; bristles moderately long, pale.

Measurements of holotype: Length 0.996 mm.; head, length 0.105 mm., width 0.131 mm.; prothorax, length 0.105 mm., width 0.175 mm.; pterothorax, width 0.216 mm.; fore wing, length 0.648 mm., width near base 0.063 mm., at middle 0.040 mm.; abdomen, width 0.252 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	24	36	38	31	29	40	7	14
Width (μ)	27	24	20	20	19	20	8	6

Male (macropterous).—Length about 0.9 mm. Color and structure essentially as in female; ninth abdominal tergite with two pair of short, stout, approximate spines close to posterior margin; posterior pair about half the length of anterior pair, much more slender, and very slightly more widely separated.

Measurements of allotype: Length 0.90 mm.; head, length 0.102 mm., width 0.124 mm.; prothorax, length 0.099 mm., width 0.168 mm.; pterothorax, width 0.215 mm.; fore wing, length 0.624 mm., width near base 0.054 mm., at middle 0.033 mm.; abdomen, width 0.210 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	24	36	41	36	29	38	7	12
Width (μ)	28	23	21	21	18	20	9	6

Total length of antenna, 0.223 mm.

Described from 26 females and 20 males, from Branchville (type locality), Beltsville, and Cabin John, in Maryland; and from Four Mile Run, Great Falls, and Vienna, in Virginia. All the specimens were collected from *Pinus virginiana* and *P. taeda* in April and May, by R. A. Cushman, W. L. McAtee, L. O. Jackson, and the author.

The divided sixth antennal segment and the elongate terminal segment of the abdomen serve to separate it from the allied *O. ajugæ* Uzel, from Europe, with which it has been compared.

***Oxythrips ajugæ* Uzel, 1895.**

1895. *Oxythrips ajugæ* Uzel, Monogr. d. Ordn. Thys., p. 136, Pl. V, fig. 67.
 1895. *Oxythrips ajugæ* var. *bicolor*, idem, ibidem.
 1908. *Oxythrips ajugæ*, Bagnall, Ent. Mo. Mag., 2d Ser., Vol. XIX, p. 5.
 1911. *Oxythrips ajugæ*, Bagnall, Journ. Econ. Biol., Vol. VI, pp. 5, 10.
 1912. *Oxythrips ajugæ* var. *bicolor*, Schille, Ent. Zeitschr., Jahrg. XXV, p. 236.
 1912. *Oxythrips ajugæ*, Bagnall, Journ. Econ. Biol., Vol. VII, p. 191.
 1913. *Oxythrips ajugæ*, Williams, Journ. Econ. Biol., Vol. VIII, p. 220.
 1913. *Oxythrips ajugæ*, Bagnall, Journ. Econ. Biol., Vol. VIII, p. 234.
 1914. *Oxythrips ajugæ*, Priesner, Wien. Ent. Zeit., XXXIII Jahrg., p. 190.

Distribution: Austria, England.

I am indebted to Mr. Williams for my material of this species.

***Oxythrips ulmi* (Bagnall), 1913.**

1913. *Scirtothrips ulmi* Bagnall, Journ. Econ. Biol., Vol. VIII, pp. 232, 233.

Distribution: England.

The writer has elsewhere ¹ pointed out the diagnostic characters of the genus *Scirtothrips* Shull. The present species is apparently a true *Oxythrips*. Authentic topotypic material is before me.

***Oxythrips firmus* Uzel, 1895.**

1895. *Oxythrips firma* Uzel, Monogr. d. Ordn. Thys., p. 138, Pl. V, figs. 68, 69; Pl. VI, fig. 71.
 1911. *Oxythrips firmus*, Bagnall, Journ. Econ. Biol., Vol. VI, p. 5.

¹Proc. Ent. Soc. Wash., Vol. XVI, 1914, p. 37.

1912. *Oxythrips firma*, Schille, Ent. Zeitschr., Jahrg. XXV, p. 236.

1914. *Oxythrips firmus*, Priesner, Wien. Ent. Zeit., XXXIII Jahrg., p. 190.

Distribution: Austria.

Unknown to the writer.

Oxythrips brevicollis Bagnall, 1911.

1911. *Oxythrips brevicollis*, Bagnall, Journ. Econ. Biol., Vol. VI, pp. 5, 6, 10.

Distribution: England.

Unknown to the writer; described from a unique female. Very close to the following species, and perhaps merely a somewhat immature specimen, slightly flattened by pressure of the cover glass.

Oxythrips ericæ (Haliday), 1852.

1836. *Thrips ericæ* Haliday, Ent. Mag., Vol. III, p. 448 (*nomen nudum*).

1843. *Thrips ericæ*, Amyot and Serville, Hist. Nat. Ins. Hemip., p. 644 (*nomen nudum*).

1852. *Thrips ericæ* Haliday, Walker: List Hom. Ins. Brit. Mus., Pt. IV, p. 1114 (*original description*).

1895. *Oxythrips parviceps* Uzel, Monogr. d. Ordn. Thys., p. 139, Pl. VI, fig. 72.

1895. *Thrips ericæ*, idem, ibidem, p. 216.

1896. *Thrips ericæ*, Trybom, Öfv. Vetensk.-Akad. Förh., Vol. 53, p. 614.

1898. *Oscythrips (lapsus) parviceps*, Coesfeld, Abh. Nat. Ver. Bremen, Vol. XIV, p. 472.

1899. *Thrips piceicornis* Reuter, Acta Soc. Fauna Flora Fennica, Vol. XVII, No. 2, pp. 57, 60.

1899. *Physopus ericæ*, idem, ibidem, p. 66.

1908. *Oxythrips parviceps*, Bagnall, Ent. Mo. Mag., 2d Ser., Vol. XIX, p. 5.

1909. *Oxythrips parviceps*, "Evans, Proc. Roy. Phys. Soc., XVII, p. 55."

1909. *Euthrips ericæ*, Bagnall, Journ. Econ. Biol., Vol. IV, p. 40.

1911. *Euthrips ericæ*, idem, ibidem, Vol. VI, pp. 4, 10.

1911. *Oxythrips parviceps*, idem, ibidem, pp. 4, 5, 10.

1912. *Oxythrips parviceps*, Schille, Ent. Zeitschr., Jahrg. XXV, p. 236.

1912. *Physothrips erica*, Karny, Zool. Ann., Vol. IV, p. 340.
 1912. *Oxythrips parviceps*, Bagnall, Journ. Econ. Biol., Vol. VII,
 p. 191.
 1913. *Oxythrips parviceps*, Bagnall, Scot. Nat., 1913, p. 38.
 1913. *Oxythrips erica*, Karny, Zool. Anz., Bd. XLIII, p. 136.
 1913. *Oxythrips parviceps*, Bagnall, Journ. Econ. Biol., Vol. VIII,
 p. 234.
 1914. *Oxythrips parviceps*. Priesner, Wien. Ent. Zeit., XXXIII
 Jahrg., p. 190.

Distribution: Britain, Austria, Germany, Sweden, Finland.

This species has had an unfortunate nomenclatorial history: For seventeen years it was a *nomen nudum*, after which it was described under three species names and successively assigned to five different genera. *Thrips picicornis* Reuter has been united with *erica* only after careful comparison. Their identity is clearly shown by their coloration, structure, and the measurements given below. The first column represents a female specimen of *Oxythrips erica* from Britain, received from Mr. Williams, while the second is of a topotypic female of *Thrips picicornis*, determined and labeled by Reuter himself:

	<i>Oxythrips erica</i> (Female from Britain)	<i>Thrips picicornis</i> (Female from Finland, topotypic)
Length	1.030 mm.	0.990 mm.
Head, length	0.099 mm.	0.090 mm.
width	0.141 mm.	0.141 mm.
Antennæ, length	0.232 mm.	0.226 mm.
Segment 1, length	0.018 mm.	0.018 mm.
width	0.026 mm.	0.026 mm.
Segment 2, length	0.033 mm.	0.033 mm.
width	0.025 mm.	0.024 mm.
Segment 3, length	0.040 mm.	0.039 mm.
width	0.021 mm.	0.020 mm.
Segment 4, length	0.041 mm.	0.040 mm.
width	0.020 mm.	0.018 mm.
Segment 5, length	0.031 mm.	0.029 mm.
width	0.017 mm.	0.017 mm.
Segment 6, length	0.046 mm.	0.044 mm.
width	0.018 mm.	0.018 mm.

Segment 7, length	0.009 mm.	0.009 mm.
width	0.006 mm.	0.006 mm.
Segment 8, length	0.014 mm.	0.014 mm.
width	0.005 mm.	0.005 mm.
Prothorax, length	0.120 mm.	0.114 mm.
width	0.204 mm.	0.198 mm.
Pterothorax, width	0.258 mm.	0.248 mm.
Abdomen, width	0.312 mm.	0.304 mm.

Professor Reuter's failure to recognize *O. erica* (then commonly known as *O. parviceps*) among the specimens before him, and his assignment of *piceicornis* to the genus *Thrips* (which has only seven segments in the antennæ) finds a ready explanation in his method of preserving material dry, fastened to small cards on insect pins, instead of on microscope slides. Dried specimens are frequently collapsed or otherwise distorted, and the antennal segments are almost invariably more or less telescoped, one within another.

ON AUSTRALIAN MUSCOIDEA, WITH DESCRIPTION OF NEW FORMS

BY CHARLES H. T. TOWNSEND

Eumusca australis Mcq.—Specimens of both sexes from Narrabeen and Bourke, New South Wales (Froggatt), as well as numerous specimens from Guam (D. T. Fullaway), I identify as Macquart's *Musca australis*, which is evidently *Eumusca*. This is the species mentioned and figured by Froggatt (Agric. Gaz. N. S. W. XVI, 19, f. 5) as *Musca corvina*.

Pseudorthellia, new genus.

Genotype, *Lucilia viridiceps* Mcq., 1851, Dipt. Ex. Suppl. IV (2), 222. East coast of Australia.

Differs from *Orthellia* as follows: Male eyes nearly or quite contiguous. Female parafrontals and parafacials narrow, front less than eye-width. Male parafrontals and parafacials linear. Apical crossvein not bent in near origin.

A pair, male and female, Buderim Mountain, Queensland, December, 1889; and Glass Mountains, Queensland, September, 1889 (Dept. Mines and Agric.).

Ornithomusca, new genus.

Genotype, *Ornithomusca victoria* Townsend, new species.

Male.—Venation of *Muscina*, but heavier in build. Front prominent, broader than one eye; frontalia very broad. Eyes thickly hairy. Third antennal joint about seven times as long as the very short second joint. No abdominal macrochætæ.

Ornithomusca victoria, new species.

Length of body, 8.5 to 9 mm.; of wing 7 mm. Two males, in nest of *Pardalotus* sp., evidently issued from puparia therein, Victoria, 1905 (Barrett).

Differs from Macquart's description of *Cyrtonaura longicornis*, Dipt. Ex. Suppl. IV (2), 228, as follows: Whole front, face and cheeks deep old-gold, including frontalia. Palpi rufous. Scutellum narrowly fulvous on posterior margin. Tegulæ watery-whitish. Wings scarcely yellowish at base. Body hairs black.

Holotype, No. 20128, U. S. Nat. Mus.

Cyrtonaura analis Mcq., l. c., probably belongs to this genus, as well as *C. longicornis* Mcq.

Austrophasia, new genus.

Genotype, *Hyalomyia rufiventris* Mcq., 1851, Dipt. Ex. Suppl. IV (2), 188-9, pl. 20, f. 3.—Tasmania.

Differs from *Hyalomya* as follows: Petiole of apical cell shorter than posterior crossvein, bent upward. Posterior crossvein nearer to bend of fourth vein than to small crossvein, its posterior end close to wing margin. Curve of fourth vein approximated to wing margin. Wings not so broadened basally. The wing has much the form of that of *Hyalomyodes*, but the venation does not agree. Large species.

MOSQUITOES AT SAN DIEGO, CALIFORNIA

By HARRISON G. DYAR

Under directions of Dr. L. O. Howard, of the Bureau of Entomology, U. S. Department of Agriculture, the writer spent seven weeks in San Diego, California, in the spring of 1916, to determine whether *Aedes calopus*, the yellow fever mosquito, was present in that city. Exact observations were desired, although general conditions indicated that the species did not occur. These indications were borne out by the examination; *Aedes calopus* was not found.

In general it may be said that San Diego is not infested by mosquitoes. Occasional single specimens of *Aedes squamiger* may be found biting and one *Culiseta incidens* was taken hovering suspiciously about the person; *Culex comitatus*, also, may be troublesome in unscreened houses; a gorged female was taken on the ceiling of a bedroom. But, in general, mosquitoes are seldom met with. The main residential part of the city lies high and is continually swept by cold sea breezes, conditions unfavorable for abundance of mosquitoes. The following species were taken in the environs of the city.

Culex tarsalis Coquillett.

This species is not particular about its breeding places, the larvæ being found in all sorts of natural pools and even in salt-marsh pools, where permanent. The larvæ are transparent and colorless and develop very slowly.

Culex stigmatosoma Dyar.

This species breeds naturally in pools in stream-beds left by high water, when these have become sufficiently stale, these pools being without vegetation. Consequently, it takes readily to artificial puddles, ponds and fountains. An egg-boat was taken from the fish pond in the square in Old Town and bred to maturity. An accidental pool on the grounds of the Theosophical Homestead at Point Loma was stocked with larvæ of this species.

Culex comitatus Dyar and Knab.

Males were taken swarming in daisy bushes just before and after dusk, in the city. No definite swarm was seen, the males flying in and over the flowers rather independently of each other. They did not congregate over the bushes, nor in connection with prominent objects, an adjoining fence being higher than the bushes, but neglected by the mosquitoes. Apparently they swarmed about the flowers, to which the females may possibly be attracted. The natural breeding places of this species are unknown. Larvæ have been taken only in artificial receptacles, such as water barrels.

Culex erythrothorax Dyar.

This species is closely confined to permanent ponds containing cat-tails. The adults rest in the reeds and only bite persons coming close to or in the water. The bite is not painful, but leaves an unsightly red blotch that lasts for several days, without swelling. Most of the breeding places of this species had been washed out and destroyed by the unusual floods of the preceding winter, but one undisturbed pool was found near the mouth of the San Diego River. The pool was about 50 by 300 feet in size, the water deep, the cat-tails growing in a fringe along the shore at a depth of about three feet. Masses of *Lemna* were lodged in the reeds, though the main part of the pond was open. Fish were present, the pond being occasionally visited by fishermen with hook and line. Red-winged blackbirds frequented the reeds, which held many of their nests with eggs and young. These birds doubtless furnish the normal blood supply to the mosquitoes and must be seriously annoyed by them.

In the *Lemna*, among the cat-tails, the larvæ of *erythrothorax* occurred in numbers. Eggs were obtained in the pool and from captured females that had bitten. The egg-boat is rather small, of usual shape, more pointed at one end than the other, containing from 80 to 100 eggs. The mature larva has a very long tube and is deeply pigmented, distinctly blackish. Young larvæ appear banded, the central pigment being

absent from the fourth abdominal segment, though the side patches are present. The banding is not as marked as in *C. territans*.

The statement on page 317 of the *Carnegie Monograph*, vol. III, part i, that "the larvæ are translucent," should be corrected, as this description applies to *tarsalis*, not to *erythrothorax*.

Culex territans Walker.

The larvæ occurred abundantly in some pools in the San Diego River valley. The pools had been washed out by the flood, but were regaining normal conditions. There was a slight current of water through the pools and many small slender reeds. The form of *territans* occurring here is very small, the larvæ strongly banded, due to the absence of pigment in the fourth abdominal segment. There is no general pigment in these larvæ, but the lateral patches are present, except in the fourth segment. Only very few *tarsalis* were present in these pools. *Territans* occurred also in the large pool described under *C. erythrothorax*. These larvæ were darker, having deep body pigment besides the lateral spots, but the fourth segment was colorless. The banding was, therefore, even more prominent.

Culex species.

A single female, bred from a pupa taken in the large pond mentioned under *C. erythrothorax*, comes very close to *derivator* Dyar and Knab (a Mexican species), and from the one specimen I do not venture to separate it. It is smaller and probably distinct, as Mr. Knab suggests to me, but a good series will be necessary to differentiate it properly.

Culex anips, new species.

Male.—Proboscis long, moderately slender, scarcely at all swollen apically, smoothly black-scaled, the labellæ paler and brownish, smooth, without setæ. Palpi long, slender, smooth, far exceeding proboscis, the first joint reaching nearly to end of palpi, with a few stiff black setæ at its tip; second and

third joints slender, smooth, upturned, the third with a few short setæ, all black-scaled. Antennæ plumose, the last two joints long and slender. Occiput clothed with appressed blackish scales, the margins of the eyes broadly white-scaled; erect forked scales on the nape brownish. Mesonotum dark brown, thickly clothed with narrow curved bronzy-brown scales, the submedian rows of black setæ forming two darker lines. Pleuræ dull greenish with a few white scales. Coxæ pale, a little greenish. Abdomen subcylindrical, flattened, expanded at tip; dorsal vestiture deep black, slightly bluish, no dorsal bands, a series of rounded white lateral spots, basally on the segments, faint on the first four segments, distinct on the next three; ventral segments broadly black-scaled at apices, dull whitish at bases, the colors suffused, not sharply banded; lateral ciliation of weak, short recurved hairs, very slight. Wing-scales black, the stems of the fork-cells short. Legs rather long and slender, clothed with black scales; femora white beneath, narrowly so nearly to apex, no knee-spots; femora and tibiæ with a very few black bristles.

Length: Body, about 3 mm.; wing, 2.5 mm.

Female.—As in the male except palpi short, about three times as long as the clypeus; antennæ with the joints subequal; abdomen with the white lateral spots larger, subtriangular, venter sordid white-scaled, only the last segment marked with black.

Length: Body, about 3 mm.; wing, 2.8 mm.

Type, Cat. No. 20304, U. S. Nat. Mus.

Occurring rarely in the large pool described under *erythrothorax*. The pupæ are very minute, even smaller than those of *Uranotania anhydor*. The larva was not found.

Culiseta incidens Thompson.

The larvæ were found in drainage pools in a canyon at the north end of town. An egg-boat, taken from such a pool, was bred to maturity. The males all emerged first, then the females. There were about twice as many females as males bred from this boat.

***Aedes squamiger* Coquillett.**

This species breeds in the salt marshes. The adults are found sparingly in the canyons along the bluff at the north end of town and occasionally bite in the city in evening or morning. Eggs obtained from captured females were of the usual shape, rather thickly fusiform, one side flattened, micropylar end rounded and with a small annular cushion; white when deposited, turning deep black; smooth. The eggs are laid singly.

***Aedes tæniorhynchus* Wiedemann.**

Found breeding on the salt marshes in 1906 by Mr. Caudell and the writer. No specimens were taken about town and the species cannot be considered as troublesome.

***Uranotænia anhydor* Dyar.**

Described from a single larva found in a pool in Sweetwater Valley in 1906. The larvæ occurred in fair numbers in the large pool described under *Culex erythrothorax*. The adult has black legs and a violet line on each side of the disk of the thorax, but no central line, thus easily differentiating it from other known species. Only bred specimens were obtained, the adults not coming to bite even in the pool itself. Their habits may be nocturnal. The larvæ lie quietly in the masses of dead and living reeds among the *Lemna* and *Spirogyra*, the tube at the surface, the mouth biting hold of a root of *Lemna* or similar object below the surface, the body oblique, the head often bent at an angle. They feed only at infrequent intervals.

***Anopheles pseudopunctipennis* Theobald.**

The larvæ occurred in the large pool mentioned under *Culex erythrothorax* and in a pool in the Sweetwater Valley that had been damaged by the floods, but was returning to normal conditions. This species seems to favor these permanent reedy pools.

Anopheles punctipennis Say.

Bred in 1906 from a pool in the Sweetwater Valley by Mr. Caudell and the writer. It was not met with in 1916.

Anopheles occidentalis Dyar and Knab.

Breeding commonly in the river pools mentioned under *Culex territans* and also in the large pool with *A. pseudopunctipennis*. No *Anopheles* adults were taken in the residential portion of the city, though undoubtedly houses situated in the river bottoms will be visited by them.

MUSCOID FLIES FROM THE SOUTHERN UNITED STATES

By CHARLES H. T. TOWNSEND

The present paper gives diagnoses of external adult characters of certain forms, which have so far mainly stood on early-stage and reproductive characters, belonging to the fauna of the Southern States.

Eutheresia Townsend.

Ann. Ent. Soc. Amer. IV, 149 (June, 1911).

Jn. N. Y. Ent. Soc. XX, 117 (June, 1912).

Genotype, *Eutheresia monohammi* Townsend, l. c.

Differs from *Theresia* as follows: Female. Form much more narrowed, the abdomen oval and no wider than the thorax. Vertex less than one-fourth head-width, parafacials narrower; cheeks normally hardly or little over one-half eye-height, exceptionally wider. Antennæ reaching almost to vibrissæ; second joint more elongate, third joint from two to two and one-half times second. Arista only short-plumose. Facial carina vestigial; epistoma less produced; the vibrissæ inserted but little above oral margin. Only two sternopleurals, four postsuturals; only two lateral scutellars; only a marginal row of macrochætæ on anal segment, the submarginal row wanting; marginal row of third segment not so thickly placed,

numbering only about eight. Hind tibiæ not ciliate, at most weakly subpectinate. Wings narrower, not broadened basally. Palpi often greatly enlarged apically.

Mole.—Differs as follows from female: Vertex hardly over one-seventh head-width; antennæ shorter, third joint hardly over one and one-half times second. Hind tibiæ evenly pectinate, without longer bristle. Wings slightly widened at base. Palpi very slender, faintly thickened apically.

Eutheresia monohammi Townsend.

Length of body, 11 mm.; of wing, 9 mm. One female, Georgia, labeled "Theresia analis Desv." in Coquillett's hand.

Rufotestaceous to brownish, silvery pollinose. Palpi, antennæ and femora rufous; frontalia brownish; face, cheeks, parafrontals and occiput silvery. Thorax, scutellum and abdomen ashy-silvery; five thoracic vittæ, the median one and outer pair equal, the inner pair linear and approximated to the median one. Pollen of abdomen thin, more distinct on bases of segments. Tibiæ brownish-rufous, tarsi brownish. Wings faintly tinged with smoky-yellowish along veins. Tegulæ white.

Holotype, No. 19475, U. S. Nat. Mus., TD1788. Not *Zelia analis* R. D., 1830, Myod. 315-316.

Eutheresia canescens Walker.

Dexia canescens Walker, 1856, Ins. Saund. Dipt. 310.

Length of body, 10 to 11 mm.; of wing, 8 to 9 mm. Ten females and six males, as follows: Eight females and four males reared from *Monohammus confusor*, being specimens previously referred to *E. monohammi* (l. c.), together with male labeled as parasitic on a cerambycid in chestnut; one male and one female, Springfield, Massachusetts, Dimmock's Ent. Notes, 1820-a and 1840-x; and one female, Pittsburgh, Pennsylvania (G. A. Ehrman).

Differs from *E. monohammi* chiefly in being deeply black or blackish, with legs wholly black or dark brown. The front and cheeks are broader than in the genotype, and the parafacials are proportionately rather wider. The male generic

characters above are drawn from this species. TD1415, female; TD1417, male.

Cnephalomyia Townsend.

Ann. Ent. Soc. Amer. IV, 132, 144-145 (June, 1911).

Jn. N. Y. Ent. Soc. XX, 113-114 (June, 1912).

Genotype, *Cnephalomyia floridana* Townsend, l. c.

Differs from *Cnephalia* (genotype *bucephala* Meigen) and *Spallanzania* (genotype *hebes* Fallen) as follows: Three rows of frontal bristles on each side in both sexes. Parafacials with bristles in two regular rows. Facial plate much wider than parafacials in both sexes, about twice as wide and same proportions in male and female. Third antennal joint of male about two and one-half or nearly three times second, that of female one and one-half to one and three-fourths times second. Second aristal joint varies but is always much longer than wide. Arista subgeniculate to geniculate. Facialia thickly ciliate to point above middle in male, thinly ciliate to point short of middle in female. Parafrontals and parafacials of practically same form in both sexes, the parafacials evenly narrowing below in conspicuous manner. Abdomen rounded subconical in both sexes, slightly flattened in male. From *Cnephalia* it differs further in having no median marginal macrochætæ on first segment even in male. From *Spallanzania* it differs further in facial plate being blackish in ground color. The hind tibiæ are quite evenly ciliate, with only one longer bristle below middle, thus differing from both the above genera. Face fully as long as front in male, slightly shorter than front in female.

Differs from *Acroglossa* (genotype *hesperidarum* Will.) only in front and face being proportionately slightly narrower, the eyes distinctly larger as compared with rest of head; bristles of parafrontals and parafacials a little stronger and more thickly placed; facial plate about same width but parafacials slightly narrower; and in the very contrasted egg and first-stage maggot. The genus appears not to enter the geographical range of *Acroglossa*.

Cnephalomysia floridana Townsend.

Length of body, 11 mm. or over; of wing, scant to full 8 mm. Two females, White Springs, Florida; 11 females and 19 males, Miami, Florida; October and November, 1908, on flowers of *Solidago* and on foliage (Townsend). One male, Tifton, Georgia (Morrison-Riley coll.), labeled *Spallanzania hesperidarum* by Coquillett.

Differs in coloring from *Acroglossa hesperidarum* only in the brassy pollen of front being rather fainter, wholly absent from anterior third or fourth of parafrontals, not reaching base of antennæ but falling well short of same in both sexes; males as a rule without any red on anal segment, females with very narrow rim of dark reddish behind roots of macrochætæ. The black of abdomen shows through the thin covering of pollen producing to the naked eye a soft color effect of dark and tawny-silvery that is peculiar to the species.

Holotype, No. 19473, U. S. Nat. Mus., female, TD877. Allotype, male. Paratypes include twelve TD females; and two males, TD4422, 4424.

Epidexia Townsend.

Jn. N. Y. Ent. Soc. XX, 112 (June, 1912).

Genotype, *Epidexia filamentosa* Townsend, l. c.

Female.—Form quite narrowed. Vertex about one-fourth head-width, front and face evenly widening from same, the face below being quite one-half head-width. Weak proclinate ocellars. Two proclinate and only one reclinate fronto-orbitals. Outer vertical short, but developed. Facialia ciliate nearly to root of arista. Frontalia equilateral, narrower than one parafrontal. Parafacials well narrowed below, cheeks nearly one-fourth eye-height. Epistoma quite cut off, the oral margin evenly concave in front view, vibrissæ on same. Antennæ reaching as far as clypeus, second joint moderately elongate; third joint extremely narrow, sharply chiseled, equilateral, about two and one-half times the second. Vibrissal axis of head much shorter than antennal. Eyes bare. Palpi filiform, proboscis short and fleshy. Two sternopleurals and three

postsuturals; three lateral scutellars, of which the hind ones reach to base of third segment; strong pair of discals, apical decussate pair suberect. First segment with short erect median marginal pair; second with weak median discal and long median marginal pairs; third with marginal row of long ones, and sometimes weak discal; anal segment with discal row, but only weaker ones between them and margin. Front claws shortened, microscopic; the front tarsal joints distinctly flattened. Strong costal spine; apical cell short-petiolate, ending well before wing-tip; hind crossvein a little nearer to cubitus, which is far from margin and without appendage.

***Epidexia filamentosa* Townsend.**

Length of body, 5.5 to 6 mm.; of wing, 4 to 4.5 mm. Several females, Ocean Beach, Miami, Florida (Townsend, vide l. c.).

Head silvery, frontalia brown; first two antennal joints, base of third and palpi light rufous. Parafrontals, occiput, thorax, scutellum and abdomen ashy pollinose; four subequal thoracic vittæ, the inner pair shorter; pollen of abdomen denser on narrow bases of segments, anal segment light rufous. Legs rufous, tarsi blackish. Wings slightly infusate, tegulæ white.

Holotype, No. 19470, U. S. Nat. Mus., TD747. Paratype, TD915.

Masicera pulverea Coquillett, 1897, Rev. Tach. 114-115, though of much stouter build, practically belongs to this genus. The holotype is a male from Florida, and shows the following characters: Vertex hardly over one-fifth of head-width, the posterior third of front about same width; face below about one-half head-width. No proclinate fronto-orbitals, only one reclinate. Third antennal joint about three times second, but of same narrowed type as in the female. Palpi slightly thickened at tip. Three sternopleurals; discals on intermediate abdominal segments. Form is rather broad, abdomen subconical. Apical cell closed in border.

A male from Tifton, Georgia, has the apical cell short-petiolate, agreeing otherwise with the holotype. The claws are long in both.

This form will probably best be treated as subgenus B of *Epidexia*.

Oxynops Townsend.

Jn. N. Y. Ent. Soc. XX, 110-111 (June, 1912).

Genotype, *Hypostena nitens* Coquillett, 1897, Rev. Tach. 63 (Syn. *Oxynops serratus* Townsend, 1912, l. c., holotype 19468, U. S. Nat. Mus., female, TD1282).

Small metallic flies. May be distinguished by the following characters: *Female*.—Vertex rather less than one-fourth head-width, the front and face very slightly widening therefrom, face below over one-third head-width. Eyes very faintly short-hairy. Facialia strongly ciliate. Parafacials very narrow, almost linear below. Cheeks narrow, the eyes descending nearly to vibrissæ. Facial depression sunken; the epistoma cut off, notched in middle. Frontalia wider than one parafacial. Antennæ reaching oral margin, second joint short. Arista thickened on less than basal half, the basal joints short. Proboscis short and fleshy, palpi enlarged at tip. Two proclinate and two reclinate fronto-orbitals, outer vertical developed but short, proclinate ocellars present, frontals reaching to base of third antennal joint. Vibrissæ on oral margin. Erect median marginal bristles on first abdominal segment, median marginal and discal on second and third segments, weaker marginal and discal on anal segment. Claws short. Larvipositor elongate, sheathed within a subconical base formed of broad upper and lower plates; no piercer. Apical cell open, ending almost in wing-tip; hind crossvein nearly in middle; third vein spined halfway or more to small crossvein, latter at end of auxiliary vein.

Male.—Differs from female as follows: Third antennal joint enlarged, rounded and bulged apically. No proclinate fronto-orbitals. No median discal macrochætæ on third abdominal segment, the marginal row of anal segment strong. Hypopygial forceps elongate and slender.

Plagiops Townsend.

Proc. U. S. Nat. Mus. XLIII, 303-304 (November 22, 1912).

As pointed out at the time of description, this genus is allied with *Plagiprospherysa*. The relationship is very close. The face, front and cheeks are narrower in *Plagiops*. The female of the latter has the front scarcely more than one-third head-width, and the face practically same, the parafacials being narrow. In *Plagiprospherysa* female the front is well over one-third head-width, and the face is almost one-half same, the parafacials being much wider. The cheeks of *Plagiops* female are scarcely wider than length of second antennal joint and the palpi are less developed, being shorter. The facial depression is narrower, and the frontalia are comparatively wider.

Tachinopsis Coquillett, 1897, Rev. Tach. 120, is identical with *Plagiprospherysa*. The holotype of *T. mentalis* Coq., male, is evidently conspecific with a male from San Bernardino County, California, bearing Coquillett's label *Plagiprospherysa parvipalpis* v. d. W. (Rev. Tach. 77). The last section of fifth vein is only a little shorter than the preceding section in both specimens, and cubitus bears a distinct wrinkle in both.

Plagiops littoralis Townsend.

Jn. N. Y. Ent. Soc. XX, 107-108 (June, 1912).

Length of body, 3 to 5.5 mm.; of wing, 2.5 to 3.5 mm. Numerous females taken at Ocean Beach, across landspit from Biscayne Bay, Florida (Townsend, vide l. c.).

Differs from description of *P. meridionalis* as follows: Female.—Parafrontals showing no golden. Pollen of thorax, scutellum and abdomen silvery-white, without any golden shade; fifth or median thoracic vitta absent. Scutellum without yellow. Tegulæ white.

Holotype, No. 19464, U. S. Nat. Mus., female, TD738. Paratypes include the TD numbers already mentioned (l. c.), all females.

Phasiopsis Townsend.

Jn. N. Y. Ent. Soc. XX, 108-109 (June, 1912).

Genotype, *Phasiopsis floridana* Townsend, l. c.

Differs from *Winthemia* as follows: Female. Form slightly narrower. Front equilateral, about three-fourths as wide as one eye; face widening therefrom, its lower portion being fully as wide as one eye. No ocellars, eyes and parafacials bare. Vibrissæ set farther above oral margin than length of second antennal joint; epistoma as long as wide, being half again as wide as cheeks, arcuate, suggestive of *Phasiid* type except that it is much narrower. Frontalia much narrower than one parafrontal. Antennæ short, third joint not over three times the short second. Palpi rudimentary, very short and slender, filiform. Cheeks about one-sixth of eye-height. Proboscis corneous but not longer than head-height. Three sternopleurals and three postsuturals; only two lateral scutellars, apical decussate pair suberect. Short and weak median marginal pair of bristles on first segment, stronger pair on second, both with the two bristles widely separated; marginal row of strong rather short ones on third segment, anal segment with discal and marginal rows. Hind tibiæ not ciliate, weakly subpectinate. Apical cell ending noticeably farther before wing-tip, cubitus more removed from margin, apical crossvein parallel with hind margin, hind crossvein not so approximated to cubitus.

Phasiopsis floridana Townsend.

Length of body, 6 to 7 mm.; of wing, 4.5 to 5.5 mm. Numerous females, Miami, Florida (Townsend).

Face and cheeks of the purest satin-white; parafrontals silvery well tinged with brassy. Occiput ashy, frontalia brown, first two antennal joints and palpi light rufous. Thorax brassy-ashy pollinose; four subequal vittæ, the outer ones interrupted, and a fifth one behind suture. Scutellum testaceous, blackish on basal border, with silvery bloom. Abdomen bright rufous in ground color; first segment mostly blackish; second and third with blackish median triangle, anal with base

blackish in middle; all silvery pollinose with a faint brassy tinge, most densely on narrow bases of segments. Legs blackish, tibiæ brownish. Wings clear, tegulæ white.

Holotype, No. 19465, U. S. Nat. Mus., TD663. Paratypes include many TD numbers (l. c.).

THE EARLIEST NAME OF THE YELLOW FEVER MOSQUITO

By FREDERICK KNAB

A single species of mosquito has been definitely connected with the propagation of yellow fever. This mosquito is well known and widely distributed; in fact, it occurs in association with man throughout the tropical and semitropical parts of the globe. Since the discovery that this mosquito is the vector of yellow fever, it has become the subject of a very extensive literature. Unfortunately there has been much disagreement about the scientific name of this species, it having been described independently by many entomologists, so that no less than 23 specific names are cited in synonymy (see the last volume of Howard, Dyar and Knab, *The Mosquitoes of North and Central America and the West Indies*, now in press). The names most frequently applied have been *Culex fasciatus*, *C. calopus*, *C. mosquito*, and *C. teniatus*. In 1901 the genus *Stegomyia* was introduced for this species and almost universally adopted, the species now becoming *Stegomyia fasciata*. A readjustment of generic values caused Dyar and Knab to sink the genus *Stegomyia* as a synonym of *Aedes*.¹ A strict application of the laws of priority made the Fabrician name *fasciata* (1805) untenable, the name having twice previously been applied to other species in the genus *Culex*, in 1764 by O. F. Mueller and in 1804 by Meigen.² This has caused the adoption, by those who adhere to the code of nomenclature,

¹The larvæ of Culicidæ classified as independent organisms. Journ. N. Y. Ent. Soc., vol. 14, pp. 169-230, pls. 4-16 (1906).

²Austen, E. E., Nomenclature of *S. fasciata*. Yellow Fever Bur. Bull., vol. 2, p. 3 (1912).

of the next oldest specific name, *calopus* Meigen (1818). But no stability has been reached, many holding that the wide use of the name *fasciatus* justifies its retention.

While engaged in bibliographic work, the writer made the discovery that there is a name for this mosquito which antedates any of those hitherto cited by systematists, and which, according to the laws of priority, will have to supplant the ones now in use. Under the name *Culex argenteus*, the Abbe Poiret, in 1787, in his "Memoire sur quelques insectes de Barbarie," gave a brief diagnosis of this insect. This, with the accompanying remarks, I quote herewith.

Culex argenteus, dorsum squamis argenteis exornatum, pedibus fasciatis.

"Quoique cet insecte ait été détruit dans ma collection, j'ai cru devoir en donner la description. C'est le cousin le plus commun en Barbarie. Il est de la grosseur du nôtre, mais si richement paré, que je lui ai souvent pardonné ses piquûres pour le plaisir de l'admirer. Tout son corps, particulièrement le dos, est couvert d'écaillés argentées, placées sur lui comme autant de paillettes orbiculaires & brillantes. Ses pattes sont ornées de bandes alternatives brunes & argentées."¹

There can hardly be a doubt that the insect thus described was the yellow fever mosquito; it was evidently already well established at that period in the coast towns of northern Africa. The ingenuous remark of the Abbe, that he was perfectly willing to tolerate its bite in order to be able to admire its beauty, is most interesting.

The name *Culex argenteus* seems to have altogether escaped modern catalogers. We find it in Gmelin's Thirteenth edition of the Linnean Systema Naturæ, vol. 1, part 5, p. 2888 (1792), and it is indicated in Hagen's Bibliotheca Entomologica. Much as another change is to be regretted, the yellow fever mosquito should now be called scientifically *Aedes argenteus* (Poiret).

¹Journ. de Physique, vol. 30, p. 245 (April, 1787).

EGGS AND OVIPOSITION IN CERTAIN SPECIES
OF *MANSONIA*

(*Diptera; Culicidæ*)

By HARRISON G. DYAR AND FREDERICK KNAB

The writers, in 1910, briefly reviewed what was then known concerning the developmental stages in the genus *Mansonia*.¹ Somewhat fuller data appear in a later work;² however, as far as the eggs are concerned, no new data have been made available within the last eight years. The eggs of but three American species, *fasciolatus* Arrib., *arribalzaga* Theob., and *perturbans* Walk., have been made known, the first two by Goeldi,³ the last by several North American writers.⁴ In these forms the eggs do not differ greatly in shape, arrangement, and manner of disposal from eggs of typical *Culex*. They are sub-cylindrical, slightly tapered toward one end and rounded at both extremities. They are placed upright, in contact along their sides and with the broader end downward, thus conditioning the convex lower surface of the egg-boat. These egg-boats float upon the surface of the water, one end usually resting against an aquatic plant.

There is some difference in the arrangement of the eggs in the three species. In *Mansonia perturbans* they form the usual roughly elliptical boat-shaped mass. In *M. fasciolatus* and *M. arribalzaga* the eggs, while placed upright and in contact as in *M. perturbans*, are arranged in a long double row consisting of about 120 eggs in all; this long band is gently convex on its lower surface, in consequence of the slight upward taper of the eggs.

The eggs of *Mansonia titillans*, the type of the genus, have

¹The genus *Mansonia*. Entom. News, xxi, 1910, 259-264.

²Howard, Dyar and Knab. The Mosquitoes of North and Central America and the West Indies, iii, 1915, p. 503 et seq.

³Os Mosquitos no Pará. Boll. Mus. Paraense, 1902, p. 27, and Mem. Mus. Goeldi, iv, 1905, p. 106, pl. G.

⁴Dyar and Currie. Proc. Ent. Soc. Wash., vi, 1904, 218-219. Smith, John B., Entom. News, xix, 1908, 22.

until now remained unknown.¹ It may be recalled that Prof. Harold W. B. Moore, of British Guiana, discovered the larvæ of this species, which live attached to the roots of the peculiar floating aquatic plant, *Pistia*. The adult *titillans* shows much specialization. This, together with the fact that Professor Moore, a most able observer, in a locality where the species abounded failed to find eggs in situations where they were to be expected, led to the conclusion that the eggs are disposed of in an unusual manner. Such has now proved to be the case.

Professor Moore at our solicitation continued the quest with most remarkable results. He has most liberally placed at our disposal his notes and the accompanying material. His first announcement to us, under date of January 2, 1915, was as follows:

"You will be glad to know I discovered the eggs of *Mansonia titillans* on the 21st of last month. I have also obtained them from a confined female. She sucked my hand at 4 p. m. on the 23d December and was kind enough to oviposit on the night of the 28th. These, as well as clusters found in nature, I shall send forward to you. The eggs are certainly unique and are placed on the under surface of the leaves of *Pistia*. They are deposited in a mass, generally between ribs of the leaves."

Details concerning the eggs came in a letter of January 30, 1915, and at the same time the promised material. Carrying the investigation a little farther, Professor Moore had brought to light a most unexpected complication. The egg-masses of *Mansonia* found attached to the under surface of the *Pistia* leaves were of two kinds, each composed of eggs of a very distinct type, and yet the parents appeared to be alike. In the one kind the thicker or free end of the egg is drawn out into a slender stalk. The other type has a body of similar shape, but the top is drawn out into a short neck like that of a bottle; from the end of this neck project laterally on four sides as

¹We have already pointed out that the eggs figured for this species by Goeldi (Mem. Mus. Goeldi, iv, 1905, pl. I) are those of a species of *Aedes*.

many pairs of chitinous horns. We quote from the letter:

"There appear to be two types of egg, one terminating in branched spines, the other in a single spine. So far I have had three clusters deposited by confined females and all were of the latter type, none of the branched or antlered type. Both types occur in nature, as you will see from the examples in the tubes, but the single-spined seems to be the less common. Apart from the difference in the spines the eggs seem the same. In tube (5) you will find newly-hatched larvæ from a cluster with the branched spines. They appear to be those of *M. titillans* and have the same habit of sticking their air-tubes into the tissues of the roots, stems and leaves of the *Pistia*. I shall endeavor to breed out adults from larvæ hatched from these branched-spined egg-masses, although I am certain there is in our canals no other mosquito besides *M. titillans* to which they are referable. I would also have the point settled if a confined female deposits a cluster of this type.

"In the act of hatching the end of the egg bearing the spine or spines breaks off like a cap and allows the young larva to escape. From the submerged position of one of the clusters laid in confinement, as well as of several found in nature, it would appear that *M. titillans* while ovipositing often immerses at least her abdomen in the water."

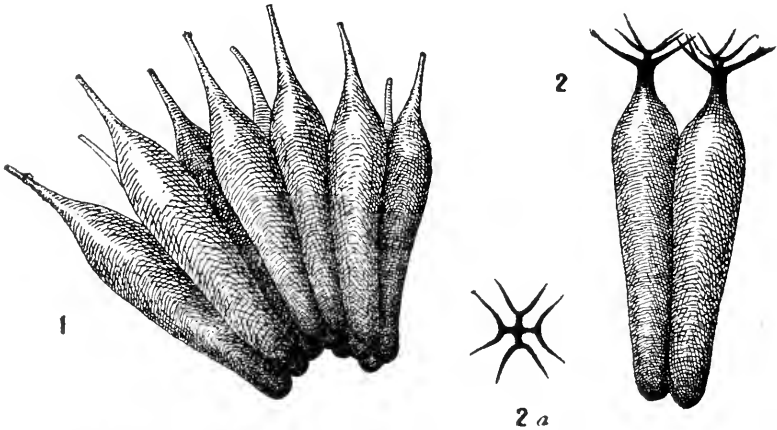
Professor Moore forwarded two female mosquitoes that had deposited eggs terminating in a single stalk. These proved to be *Mansonia titillans* beyond question, so that the simpler type of egg was now definitely associated with this species. These eggs may be described as follows:

Length from 1.0 to 1.1 mm.; greatest width, about 0.6 mm. from base, slightly less than 0.2 mm.; beyond this point the egg tapers to a very slender tube, which last takes up about 0.2 mm. of the total length. The attenuation toward the basal end is slightly greater than in eggs of the usual *Culex* type. The color is the usual pitchy brown, the distal fifth yellowish; the surface is smooth, without perceptible sculpture (Fig. 1).

The egg-mass is rounded and convex, giving the appearance

of a spiny cushion. The eggs are attached to the leaf with their bases very closely crowded together and apparently held in place by a cement secreted by the female. Owing to their tapering shape, the eggs radiate outward in all directions, the central ones being upright, the outermost ones pressed against the leaf-surface. The number of eggs in a cluster exceeds 150.

The second type of egg, only recently established as belonging to a distinct species described in the following as *Mansonia humeralis*, is also deposited in a round cushion-like mass, as



1. *Mansonia titillans*, small group of eggs.

2. *Mansonia humeralis*, two eggs; 2a, top view of terminal spines.

just described for *M. titillans*. The number of eggs appears to be about the same, but the individual eggs are very different and give the mass a very peculiar appearance.

The length of the single egg is about 1.2 mm.; its greatest width is nearer the apex, at about 0.9 mm. from base; beyond this it tapers to a short neck from the upper edge of which project four pairs of horns upon very short stalks; these horns appear to be solid chitin and taper to a sharp point. The distance from tip to tip of opposite horns is from 0.3 to 0.35 mm. The color of the egg is the same as in *titillans*, but the neck is much darker in color and the horns are black; the egg-surface

is without perceptible sculpture (Fig. 2). Actual count of the eggs in one cluster gave 182 eggs.

It may be pointed out that in both types of egg the free end, which, owing to the position of the egg-mass projects downward into the water, corresponds to that end of the ordinary *Culex* egg which is next the water when the egg-raft is afloat. It is the end of the egg which is burst open by the young larva in hatching, which thus gains direct access to its proper medium.

It has been already stated that the spiny type of egg belongs to a distinct species. Professor Moore finally succeeded in establishing this in December, 1915, by confining a female which laid eggs of this type. This female was sent to us and proved to be a species apparently new, described herewith:

***Mansonia humeralis*, new species.**

Female. Occiput deep brown, clothed anteriorly and in a median line with narrow-curved brownish-golden scales, the eye-margins and cheeks with small lanceolate white scales; upright forked scales rather sparse, very slender, black. Proboscis clothed with black and yellowish white scales intermixed, the white scales predominating at middle but not forming a distinct ring; scales roughened on basal half. Palpi over one-fourth the length of the proboscis, clothed with outstanding scales, black and yellowish white ones about evenly intermixed. Antennæ black, the joints with white basal rings; tori brown and black, with a few white scales; second joint with some outstanding white scales.

Mesonotum deep brown, laterally the integument from humeri to near roots of wings broadly yellow-brown, medianly deep brown and with three slightly pruinose depressed longitudinal stripes bounded by the seta-bearing ridges; vestiture of slender curved scales, the yellow-brown side-areas and slightly beyond them to roots of wings, as well as the antescutellar area, clothed rather densely with golden scales, the region above the roots of the wings with a patch of deep brown scales, a few fine golden scales on median zone; bristles coarse, black. Scutellum deep brown, clothed with golden

scales like those on the mesonotum. Pleuræ light gray-brown, with some small patches of whitish scales. Postnotum deep brown, nude, with a pair of very distinct, ovate pruinose-white spots.

Abdomen depressed, truncate at tip; dorsal vestiture of dull black scales, the posterior margins of the segments narrowly pale scaled, more broadly so at the angles, second and third segments with an indistinct median triangular patch of dull yellow-brown scales, its base at posterior margin of the segments; first segment sordid white scaled and with many fine yellowish hairs; hairs on the other segments brown; venter clothed with white and black scales intermixed.

Legs clothed with blackish and dull yellowish scales intermixed, the dark ones predominating; front tarsi narrowly marked with white at bases of first three joints, middle tarsi at bases of first four; hind tarsi with white rings at bases of all the joints, narrow on first and second, broad on the others, on the fourth joint occupying the basal half. Claws slender, simple.

Wings hyaline, the venation normal; vestiture of very broad, obliquely subtruncate scales overlying narrower ones, dull black and white intermixed, the black ones predominating. Fringe gray, unspotted. Halteres pale, with blackish knobs.

Length of body, about 6 mm.

Georgetown, British Guiana, December, 1915 (H. W. B. Moore).

Type, Cat. No. 20366, U. S. Nat. Mus.

This species is closely related to *Mansonia titillans*, but differs strikingly by the three large patches of golden scales upon the mesonotum, as well as in other details. Theobald's *M. amazonensis* and *M. pseudotitillans* are evidently closely related, but apparently distinct. Further collecting will be necessary to establish reliable differences between these three species.

Returning to *Mansonia titillans* and the question of oviposition, we have an interesting account of the process from Professor Moore, sent under date of April 17, 1915. It is as follows:

“On March 12, 1915, about 3 p. m., in one of the cane-fields of The Ogle, I was attacked by several *M. titillans*, of which I secured two. The day before I had also got one at the same estate. On the morning of the 17th one of those captured on the 12th oviposited between 6.20 and 6.35, and I was fortunate enough to witness the act. About 6 a. m. I looked through my three glass jars to ascertain if any of the mosquitoes had oviposited, but was unable to see properly, as the light was not yet strong enough. I again examined the glasses at 6.25, and, not finding one of the mosquitoes, began to think she might be lying dead upon the *Pistia* or upon the water, whither I then glanced and soon discerned her perched motionless upon a *Pistia* leaf which was resting upon the surface of the water. But where was her abdomen? Thrust beneath the leaf! In this way was confirmed my surmise that *titillans* submerges at least her abdomen when ovipositing. Again, how unwonted was her attitude! She was perched, or as it were, between two *Pistia* leaves, resting upon the one with her fore-legs, and upon the other with her mid and hind legs and also the tips of her wings. Her hind legs were extended well back, so that they practically lay along the surface of the leaf, and her wings were held somewhat apart, this mode of holding legs and wings enabling her to thrust her abdomen well under the leaf. When I first saw her she had deposited only the farther third of her egg-mass. The lower half of her abdomen was submerged and bent or curved back, the segments somewhat extended, and was being moved slowly from side to side, the eggs seeming to issue forth in rapid succession and to be as rapidly set each in its place. How the terminal organs manipulated the eggs I could not determine, owing to the insect being a little ill-placed for accurate observation in this direction, and to the large number of glistening air-bubbles entangled in the abdominal scales and on the leaf itself. According as the cluster enlarged in her direction, she drew her abdomen more and more up, so that when she finished at 6.35 not much more than the tip of it was curved under the leaf. When she first started more than half of her

abdomen would have been under the water. The freshly laid cluster was white and the individual eggs of the single-spined type. The surface of the cluster between the spines glowed with air-bubbles. The eggs darkened very slowly.

"I think it is quite possible that when ovipositing the abdomen of *titillans*, although thrust beneath a leaf resting upon the surface of the water, does not get wet. It is, perhaps, at work in a globule or a layer of air, for, owing to the dense pilosity of the *Pistia* leaf, the under-surface is simply aglow with air-bubbles, so that the leaf probably rests more on air than on water."

It is interesting to note in this connection that the abdomen of the female *Mansonia titillans* is unusually hairy, the hairs being well distributed and coarse. This is no doubt an adaptation that by entangling air prevents the body itself from becoming wet while immersed. The remarkable structure of the eggs, and their arrangement, no doubt serves the purpose of keeping them supplied with the necessary air in their submerged position. The difference in the eggs of the two species will be difficult to explain satisfactorily. Professor Moore suggests that the branched horns of the one type may be a protection against enemies. We are inclined to think that it is connected in some way with the problem of air-supply, the eggs of the two species perhaps being deposited in slightly different relation to the water.

Finally should be noted the fact brought out by Professor Moore's notes that in *Mansonia titillans* there is a very definite relation between blood-meals and oviposition. In four cases noted oviposition followed the blood-meal after an interval of from four to five days. One female laid two batches of eggs; she was fed on January 15 and oviposited on the night of the 19th; fed again on the 20th, she laid a second cluster on the 25th and died two days later.

TWO NEW NORTH AMERICAN DIPTERA

By R. C. SHANNON

Chrysops vitripennis, new species.

Small, black species with wings entirely clear except the costal cell and the stigma.

Female: Frons broad, at vertex about one-fourth the width of head, broadening slightly toward antennæ, moderately shining, black, with pale, short pile on posterior half and white pollen along the eyes and in front before the roots of antennæ; frontal callosity transverse, moderately convex and shining. Antennæ long and slender; first joint dull yellowish, the apical third black; the rest of antennæ black, slightly pruinose; face rather prominent, shining black. Palpi and proboscis black. Thorax and scutellum dark plumbeous, with scattered short whitish pile. Abdomen concolorous with thorax, with sparse short greyish pile anteriorly and longer and whitish pile posteriorly. Legs black, the middle and hind tarsi with the first two joints dull yellowish, black at their tips. Wings hyaline, the costal cell and stigma yellowish. Squamæ and halteres darkened.

Length, 5.5 mm.; wing, 5.5 mm.

Beltsville, Maryland, one female June 25, 1915 (R. C. Shannon); one female June 9, 1914 (N. Banks); and two females June 18, 1916 (W. L. McAtee).

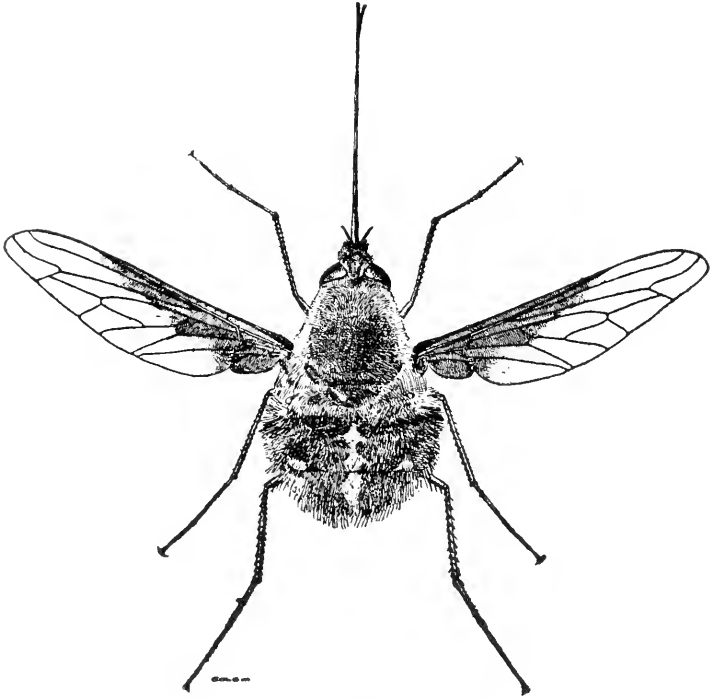
Type, Cat. No. 20301, U. S. Nat. Mus.

This species of *Chrysops* is the first without wing-pattern to be described in this country. It is evidently rare, only a few specimens having been taken. It occurs in a sphagnum swamp in which there are only a few scattered pine trees.

The patternless wings, the shining black face and almost entirely black legs makes this species very distinct. Apparently *C. nigribimbo* Whitney is its closest ally, but a comparison of the two shows that *nigribimbo* differs as follows: First antennal joint all yellow, second and third joints tinged with yellow; face ferruginous and less prominent; palpi yellowish brown; legs more generally tinged with yellowish; the

pleuræ with a distinct whitish pollinose band extending from base of fore coxæ to the abdomen (this is obsolete in *vitripennis*); the humeri whitish pollinose; wings with rather faint pattern, which Daecke has figured (Ent. News, 1907, Vol. 18, p. 144, pl. 6, fig. 9).

Chrysops vitripennis also has different habits from *C. nigri-*



Bombylius azaleæ, female

bimbo which is found in pine barrens. Mr. McAtee gives the following note: "The little *Chrysops*, that so far has been taken only in the peculiar sphagnum bogs that drain into Big Paint Branch, near Beltsville, Maryland, has distinct habits from other species now known to occur in this region. It perches on grass blades or other low vegetation only a few inches above the water or wet ground and when flushed flies

rather slowly and feebly only a short distance before alighting again."

Bombylius azaleæ, new species.

Male: Ocellar triangle with a tuft of long, black hairs; frontal triangle dull brownish grey pollinose, clothed rather sparsely with long black hairs. Antennæ black; third joint about one and a half times as long as the first and second together; first joint with black hairs as long as those on frontal triangle; second joint with short black hairs, longer ones on under side. Face yellowish brown, produced upward and forward to level of the top of head. In dorsal view the distance between the anterior point of contact of the eyes to the apex of the face is just a little greater than the length of the third antennal joint. The face is sparsely clothed with long black hairs; beard whitish. Occiput with pale yellowish pile, becoming brighter lower down. Proboscis very long, at least equal in length to the body; palpi with black hairs. Dorsum of thorax with dense dark yellowish pile, a patch of white pile at sides between the humeri and wing bases; anteriorly the pile about the humeri has a whitish reflection. Pleuræ with the pile brownish and black along the upper margin, below this a broad transverse stripe of white pile; sternum with grayish yellow pile. Abdomen dorsally clothed with dense pile, dull yellow, golden brown and black intermixed, the first and fourth segments with tufts of white pile on their sides; venter with brownish and black pile, the first and second segments with white pile. Fore coxæ with white pile; middle and hind coxæ with black hairs. Legs ocher yellow, the tarsi darkened distally; femora sparsely clothed with silvery scales, ventrally with a fringe of black hairs, on hind femora replaced by bristles; all the tibiæ bristly. Wings narrow, blackish brown basally and obliquely to outer margin as far as tip of first vein; costal cell ferruginous yellow; the rest of wing clear. Squamæ and halteres somewhat darkened.

Length, 9–11 mm.; wing, 9–11 mm.

Female: Ocellar region with black hairs; frons with dull yellow pile and hairs; hairs along eye margins long. Face with

black hairs, sometimes golden ones intermixed. Abdomen dorsally with a median row of white spots, formed by tufts of white pile, extending from the second segment to the last.

Length, about 11 mm.; wing, about 11.5 mm.

Described from 24 specimens.

Male type and female allotype, Surrattsville, Maryland, May 11, 1916, on flowers of *Azalea nudiflora* (J. C. Crawford); paratypes same locality and date (J. C. Crawford) and Beltsville, May 21, 1916 (L. O. Jackson); Hyattsville, Maryland, May, 1916 (W. R. Walton and A. H. Pottinger); North Carolina and southern Georgia (Morrison).

Type, Cat. No. 20302, U. S. Nat. Mus.

This species is readily recognized by its unusually long proboscis. It is near *varius*, but that species is much more robust, its face less produced, the pile on the front coxæ black and yellow and the pile between the humeri and wings concolorous with the rest of the pile on the dorsum.

It is very remarkable that this large *Bombylius* should have remained undescribed up to the present time, as it may be found in abundance at the proper place and season. It appears to be intimately associated with *Azalea nudiflora* and its unusually long proboscis appears to be an adaptation to the flowers of this plant.

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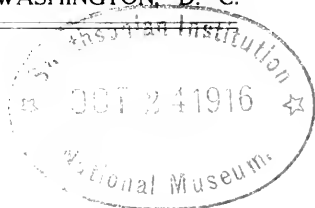
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Insecutor Inscitiae Menstruus

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SOME NEW NORTH AMERICAN MUSCOID FORMS

BY CHARLES H. T. TOWNSEND

A few forms of muscoid flies, mostly of direct economic importance, are characterized below. All are from the eastern and southern United States, one occurring in Cuba.

Juriniopsis, new genus.

Genotype, *Juriniopsis floridensis* Townsend, new name for *Musca hystrix* Williston (nec Fabricius) p.p., 1886, Trans. Am. Ent. Soc., XIII, 299, Florida. Holotype, No. 20307 U. S. Nat. Mus., female; TD1187, Miami, Fla. (Det. Coqt. as *Jurinia adusta*).

This form may be recognized by the following structural characters: Eyes bare. Male with two rows of frontal bristles, and with reclinate fronto-orbitals. Female with one row of frontals, and both proclinate and reclinate fronto-orbitals. Third antennal joint hardly as long as second. First arisal joint not elongate. No discal macrochætæ on intermediate abdominal segments; male with marginal row of second segment normally complete, female with same interrupted laterally; marginal rows very thickly set; anal segment covered with spines that are nearly as heavy. Female front tarsi greatly widened.

Owing to the fact that a number of closely similar forms exist in the eastern and southeastern United States, it is impossible to identify this species with any of the various superficial descriptions of Drury, Desvoidy, Macquart, or Jaennicke. Williston was the first to describe the form by recognizable

characters. The scutellum and abdomen, especially the latter, are polished rufocastaneous; mesoscutum blackish, subshining, thinly brassy pollinose; wings lightly infusate, blackish at base.

Okea, new genus.

Genotype, *Winthemia okefenokeensis* H. E. Smith, 1916, Proc. Ent. Soc. Wash., XVIII, 95, Okefenokee Swamp, Georgia.

Differs from *Winthemia* as follows: Male. Front broader; antennæ longer and more slender, the second joint well elongate. Venter of preanal segment with strongly marked pilose areas; the pile long, thick, and rather coarse. Second to fourth front tarsal joints each widened into oblique transversely elongated pieces, these joints being wider than their length, set obliquely and well separated. Hind tibiæ thickly ciliate, without conspicuous longer bristle in middle. There are normally no median macrochætæ on first two abdominal segments. Hypopygial forceps elongate and narrow.

Female.—Front broader than in the male but narrower than in *Winthemia* female; antennæ nearly same as in male. Front tarsi broadened, the last joint most distinctly so. Hind tibiæ not ciliate, at most subpectinate with a few bristles of unequal length. Second abdominal segment bears a median marginal pair of macrochætæ.

Ten males and one female of a form congeneric with the genotype received from Don Patricio Cardin, Estacion Exper. Agron. de Cuba, Santiago de las Vegas, Cuba, No. 8129.

Eubiomyia, new genus.

Genotype, *Pseudatractocera calosomæ* Coqt., 1897, Rev. Tach., 82, resurrected name for *Biomyia (Viviania) georgiæ* Coqt., 1897, l. c., p.p., Amherst, Massachusetts (not *Viviania georgiæ* B. B.) Holotype, No. 20202 U. S. Nat. Mus., male, reared by A. F. Burgess from adult *Calosoma calidum* at Amherst, Massachusetts.

Differs from *Biomyia* as follows: Female vertex about one-half eye-width. Parafacials, parafrontals, and frontalia all

much narrower. Antennæ not so elongate, more narrowed: third joint in both sexes about twice as long as second joint. Fronto-orbital bristles closely crowded against frontal bristles. Face more receding, the lower border of head much shorter. Front in both sexes nearly same width. Female without discal macrochætæ on intermediate abdominal segments, male with small ones. Metatarsi of male swollen, especially hind ones, agreeing in this character with *Pscudatractocera*. Apical cell closed, costal spine rather small.

Differs from *Pscudatractocera* as follows: Epistoma shorter and broader. Front less prominent. Parafacials narrower, bare. Hind crossvein nearly in middle between small crossvein and bend of fourth vein. Also in frontal and discal-macrochæta characters given above.

It may be noted here that *Viviania georgia* B. B. is a *Pscudatractocera*.

Ypophæmyia, new genus.

Genotype, *Ypophæmyia malacosomæ*, new species.

Differs from *Miamimyia* as follows: Male vertex wider than one eye, front and face gradually widening therefrom. Frontalia a little narrower than parafrontals. Female front a little broader than that of male. Parafacials and cheeks broad in both sexes. Antennæ enlarged in male, shorter in female. Female with two proclinate fronto-orbitals, male without such. Three lateral scutellar bristles, a short suberect decussate apical pair, and a discal pair. Median marginal macrochætæ of first two abdominal segments weak or vestigial, the first segment practically without macrochætæ. Hind tibiæ rather closely pectinate in both sexes, one longer bristle near middle. Apical cell ending well before tip, open. Cubitus rounded-subangular, without stump or wrinkle. Hind crossvein as far from cubitus as its own length. First vein bare, third vein with a few bristles at base only.

Ypophæmyia malacosomæ, new species.

Length of body, 6 to 7 mm.; of wing, 4.5 to 5.5 mm. Three males and one female, Raleigh, North Carolina, reared by Mr.

R. W. Leiby from pupæ of *Malacosoma americana* (Expt. No. 50-1).

Differs in coloration from description of *Meigenia websteri* Towns., 1891, Can. Ent., XXIII, 206-7, only as follows: Third antennal joint of female very largely reddish, that of male wholly black. Scutellum quite blackish, with only faint indication of lighter on margin. Blackish hind margin of intermediate abdominal segments very narrow.

Holotype, Cat. No. 20308, U. S. Nat. Mus., male.

A female specimen which I determine as *websteri* T. agrees with description, except that third antennal joint is broadly reddish basally, and appears to be congeneric. In fact, *mala-cosomæ* may prove to be only a subspecies of *websteri*.

This form is very apt to be confused with *Masicera pauciseta* Coq., 1897, Rev. Tach., 114, type of *Masiceropsis* T., and perhaps only a subspecies of *Phorocera promiscua* Towns., 1891, Psyche, VI, 84-5. It differs from *Masiceropsis* by broader front, longer antennæ of female, no well-developed macrochætæ on first abdominal segment, apical crossvein approximated to hind border of wing, hind crossvein farther from bend of fourth vein; and anal segment without true discals, but with only submarginal or subdiscal macrochætæ.

Euzenilliopsis, new genus.

Genotype, *Euzenilliopsis diatrææ*, new species.

Differs from *Euzenillia* as follows: Male without proclinate fronto-orbitals; male front on posterior half about three-fourths of one eye in width. No discal macrochætæ on intermediate abdominal segments in either sex. Apical cell very narrowly open, almost closed.

Euzenilliopsis diatrææ, new species.

Length of body, 5 to 6 mm.; of wing, 3.75 to 4 mm. Four males and three females reared by Mr. U. C. Loftin in Cuba from larvæ of *Diatræa saccharalis*, 1915; and one male, Audubon Park, Louisiana, issued January 25, 1916, from pupa found in cane December 8, 1915.

Face, front, cheeks, and occiput silvery, the parafrontals with a very faint tinge of brassy. Antennæ and frontalia wholly blackish. Palpi light fulvous. Thorax silvery, with four black vittæ, of which the outer ones are heavier and interrupted. Abdomen largely fulvous, sometimes in male wholly so except tergum of anal segment; a more or less distinct median vitta of darker; the vitta may spread out in black on hind margin of second segment in male, and cover all of third and anal segments, with silvery pollen on basal half of intermediate segments and nearly all of anal segment, the silvery dotted with black at origins of hairs. Female abdomen with more black as a rule; the base and sides of tergum more or less broadly fulvous, the venter fulvous on basal half or so. Legs blackish. Wings very lightly smoky. Tegulæ whitish, the hind scale of male lightly infusate on posterior half.

Holotype, Cat. No. 20309, U. S. Nat. Mus., male, Audubon Park, Louisiana.

Schizocerophaga, new genus.

Holotype, *Schizocerophaga leiby*, new species.

Differs from *Doryphorophaga* as follows: Male without proclinate orbitals. Eyes bare in both sexes. Female front nearly twice as long as wide. Ocellar bristles stronger. Parafacials and parafrontals not so wide. Facialia ciliate on lower one-third or so. No discal macrochætæ on intermediate abdominal segments in either sex. Apical cell widely to narrowly open a little before tip of wing. Tegulæ not enlarged.

From *Hylotomomyia* it differs by the parafacials being narrow and not hairy and the discals absent as above stated. From *Tachinophyto* it differs by the male being without proclinate orbitals, the front narrower, etc.

Schizocerophaga leiby, new species.

Length of body, 5 to 7 mm.; of wing, 3.5 to 4.75 mm. Two males and three females, Raleigh, North Carolina, reared by Mr. R. W. Leiby from pupæ of *Schizocerus privatus* Norton, July 31, 1915 (Éxpt. No. 61-6).

Head silvery-white, antennæ and frontalia black, parafrontals golden on inner posterior border; palpi fulvous. Thorax black, silvery pollinose; mesoscutum and scutellum with brassy tinge; four black vittæ. Abdomen black, shining except the silvery basal half of last three segments. Legs black. Wings clear. Tegulæ whitish.

Holotype, Cat. No. 20310, U. S. Nat. Mus., female.

A NEW PLECTROTHRIPS (THYSANOPTERA) FROM JAMAICA

By J. DOUGLAS HOOD

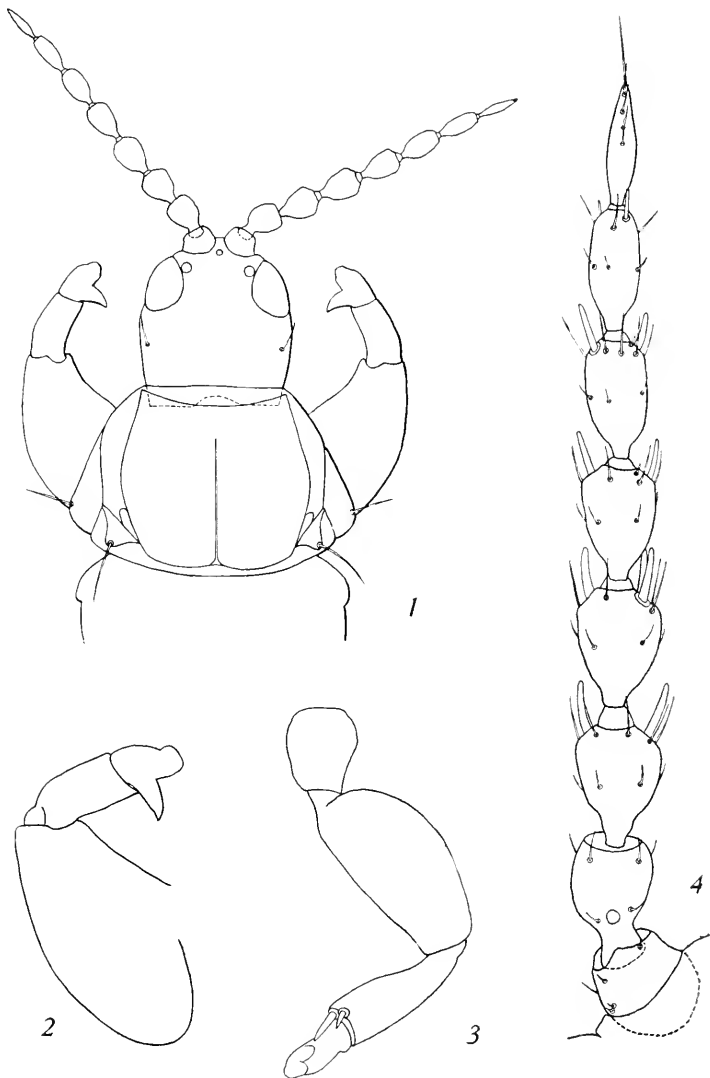
The genus *Plectrothrips* was erected by the author in 1908 for a new species of unknown habits taken in Illinois on a woodshed window. It was not known whether the specimens, of which there were seven, had flown onto the window during the warm sultry afternoon or whether they had come from the wood in the shed itself, about as many specimens having been found on the outside as on the inside of the window.

One year later, Mr. Bagnall made known a species of *Plectrothrips* from the Isle of Nias, in the Malay Archipelago, basing his description on a unique specimen without further data.

The third species of the genus, which is here described as new, is so closely related to the other two as to leave but little doubt that the habits of all are the same, and directly responsible for the interesting structural characters of the genus. The Jamaican species was taken in the burrows of a Cerambycid beetle in the wood and cambium of Pimento by Mr. Archibald H. Ritchie, Government Entomologist for Jamaica, to whom I am indebted for the types.

Plectrothrips pallipes, new species. (Pl. I, figs. 1-4.)

Female (macropterous).—Length about 1.4 mm. Color blackish brown, fading to brownish orange on abdomen; legs uniform orange yellow; segments 2 and 3 of antennæ largely yellow; fore wings yellowish at base.



Plectrothrips pallipes Hood.

- 1.—Head and prothorax, female, holotype.
- 2.—Left fore leg, female, holotype.
- 3.—Left hind leg (ventral surface), female, holotype.
- 4.—Right antenna, female, holotype.

Head smooth, 1.1 times as long as wide,¹ broadest behind eyes and roundly narrowed to base; postocular bristles pointed, shorter than eyes, almost lateral in position; other cephalic bristles minute. Eyes not protruding, slightly more than one-third as long as head and about 0.6 as wide as their interval. Ocelli anterior in position, the posterior pair widely separated and much larger than anterior ocellus. Antennæ of structure normal to the genus, the sense cones arranged as in the genotype; segment 1 concolorous with head; 2 and 3 orange, the latter lightly infusate in apical portion; 4-8 blackish brown, yellowish at base.

Prothorax about equal in length to head and (inclusive of coxæ) about 1.77 times as wide as long; one pair of long, pointed bristles at posterior angles, others minute. Pterothorax about as wide as prothorax. Fore wings with about seven accessory hairs and with the subbasal bristles very minute and pointed. Legs short and stout, uniform orange yellow; fore tibiæ not toothed on inner surface of apex; middle and hind tibiæ with spurs long and stout; fore tarsus with a large curved tooth.

Abdomen of normal structure; tube 0.7 as long as head and about twice as wide at base as at apex, sides sinuate and abruptly narrowed at apex; all bristles pointed; terminal bristles one and one-third times as long as tube.

Measurements of holotype: Length 1.43 mm.; head, length 0.198 mm., width 0.180 mm.; prothorax, length 0.192 mm., width (inclusive of coxæ) 0.340 mm.; pterothorax, width 0.336 mm.; abdomen, width 0.360 mm.; tube, length 0.140 mm., width at base 0.071 mm., at apex 0.035 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)...	42	51	49	48	47	48	48	49
Width (μ)...	40	34	36	35	30	26	21	13

Total length of antenna, 0.382 mm.

Male (macropterous).—Length about 1.3 mm. Smaller and

¹In the original description of *P. antennatus* the length of the head is erroneously given in the paragraph of measurements as 0.32 mm. instead of 0.22 mm. The proportionate length and width of the head given in the description proper is correct.

more slender than female, otherwise almost identical both in color and structure.

Measurements of allotype: Length 1.34 mm.; head, length 0.180 mm., width 0.156 mm.; prothorax, length 0.162 mm., width (inclusive of coxæ) 0.300 mm.; pterothorax, width 0.300 mm.; abdomen, width 0.288 mm., tube, length 0.120 mm., width at base 0.063 mm., at apex 0.030 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)...	39	46	44	42	41	42	43	45
Width (μ)...	36	30	31	31	27	24	18	12

Total length of antenna, 0.342 mm.

Described from 1 female and 1 male, taken by Mr. A. H. Ritchie in the burrows of a Cerambycid beetle in the bark and cambium of Pimento, in the northern part of Jamaica, in April, 1916.

Closely related to *P. antennatus*, which is known only from Illinois, but easily recognized by the pale legs, the differently colored antennæ, the absence of a fore-tibial tooth, the shorter head, and the shorter terminal bristles, which in *antennatus* are very nearly twice the length of the tube.

NEW AEDES FROM THE MOUNTAINS OF CALIFORNIA

(*Diptera, Culicida*)

By HARRISON G. DYAR

The following new species of *Aedes* were met with in an investigation of the mosquitoes inhabiting the Sierra Nevada Mountains of California. These species are all of the early spring group, breeding in the pools left by the melting snow, with a single annual generation. At an altitude of 6,000 feet, pupæ were abundant May 25, and by the first week in June the breeding was complete; even the pools that still contained water or had only just thawed out were empty. Adults appeared by the first of June, and by the 15th the woods were filled with them in all directions.

Speaking especially of the Fallen Leaf Lake region, a region in the heart of the Sierras to the north of the high peaks and on the eastern side of the divide, *A. tahoënsis* is the commonest and earliest species, found everywhere, both in the hills and the pines in level country. It breeds in the earliest pools of clear water held in rocky land, its home being in the mountains, but it soon spreads everywhere. It was common in the early pools at the head of Fallen Leaf Lake, being often the only species present. It also bred in wave-pools at the lower end of the lake. Dispersal of the adults was in general downward, they being abundant in the pines at Tallac on June 17, though no breeding places were near. *A. cataphylla* is less abundant and less widely dispersed at Fallen Leaf. It was commonest at the foot of the trail to Angora Lakes at the head of the lake, rare at the outlet of the lake and absent at Tallac on Lake Tahoe. *A. hexodontus* breeds in early pools, but especially those of a marshy character, larvæ being taken from hoof-prints of cattle in the edge of a marsh. The adults were well distributed and toward the end of June replaced *A. tahoënsis* as the dominant species. *A. ventrovittis* is a rare species, taken only at one place near the outlet of Fallen Leaf Lake and then in small numbers. It is presumably a marsh breeder, though the larvæ were not found. *A. palustris* breeds in open grassy marshes, not in large numbers. Dispersal was general, adults being taken everywhere, although seldom commonly. *A. increpitus* is the slowest breeder of any of the early species, the larvæ lingering after all the others are gone, frequently in the same pools. They were abundant at the outlet of Fallen Leaf Lake with a downward dispersal, the adults being common at Tallac, about 2 miles from the breeding places, while only found a quarter of a mile up the lake and many days later.

The seasonal appearance of these mosquitoes varies with the altitude in the ratio of about a month in time to 1,000 feet of elevation. At Yosemite, at about 5,000 feet, all the species were about a month earlier than at Lake Tahoe, at 6,000 feet, while at Summit, at 7,000 feet, they were still another month

later, larvæ and pupæ of *tahoënsis* and *hexodontus* being taken there on July 2, 1916, in about the same stage that they were taken at Fallen Leaf on June 1, 1916.

Aedes tahoënsis, new species.

Male.—Integument black. Occiput with flat yellowish white scales on the sides, narrow curved ones on the vertex, the erect forked scales on the nape also pale; bristles at vertex pale, those along the eye-margins black. Mesonotum with narrow curved scales rather sparse, pale yellow-brown, paler on the sides and around the antescutellar space; two bands of dark brown, narrower scales, separated by a double row of normal pale scales on each side of the median bare groove; two similar shorter bands posteriorly subdorsally. Abdomen black, with broad basal segmental white bands; venter white scaled, the apical halves of the segments black. Legs black, femora whitish within; tibiæ with some white scales, especially inwardly. Length of wing, 4.5 mm., the wing scales black.

Genitalia: Side pieces over three times as long as wide, rounded at the tip; apical lobe prominent, with a few short setæ; basal lobe fan-shaped, with a row of setæ, a stout spine on the dorsal aspect; clasp filament slightly fusiform, curved, with a terminal inserted spine. Harpagones arising ventrally, long, the basal half of shaft minutely pilose, curving dorsally, the apical part of shaft smooth; filament sickle-shaped, with a sharp point, at base a slight double membranous ridge.

Female.—Similar, the venter of abdomen entirely pale scaled.

Larva with the central spine of the comb scales not larger than the others, the scale quite evenly feathered; upper head hairs in threes, lower single; anal segment not ringed; pecten of tube evenly spaced, followed by an 8-haired tuft.

Egg: Narrowly fusiform, evenly margined, not angled, one side a little flattened; antemicropylar end blunt, the other shortly conical with an annular mucilaginous cushion, the tip truncate; black, smooth, laid singly.

Type, Cat. No. 20352, U. S. Nat. Mus.

Closely allied to *A. lazarensis* Felt and Young and possibly

only a race of it. The principal differences are the larval head hairs. The coloration of the mesonotum is not very variable, though the dark brown stripes vary in width and distinctness. The marking is easily abraded. The abdomen of the female beneath frequently has paired apical black spots or bands as in the male. The females as flying appear a somber colored mosquito without prominent markings, the dorsal bands not being conspicuous. They vary considerably in size. They come readily to bite by day in the woods and were frequent about camp in the evening. Though seemingly eager to bite they are rather deliberate in selecting a spot and easily disturbed.

Bred from early pools filled by melting snow, Fallen Leaf, Lake Tahoe, California, latter part of May and first of June, 1916. The pools were clear, cold, and very transitory.

This species occurs also in the Yosemite Valley, judging from males bred from pupæ taken in the Little Yosemite, May 18, 1916. No larvæ were found, all having transformed. Another locality, presumably of this species, is: Summit, Placer County, California, July 19, 1915 (H. G. Dyar).

***Aedes hexodontus*, new species.**

Male.—Integument black. Head with pale straw-yellow scales, flat and appressed on the sides, narrow curved on the vertex, the black ground showing; vertical bristles pale straw-color, those along the eye-margins black; erect forked scales low on the neck, black; median groove bare. Mesonotum with narrow curved pale straw-yellow scales; two brown bands about five scales wide, of smaller dark brown scales, separated by a space three scales wide of normal straw-colored scales on each side of the median bare groove; an angled lateral bare line shows as a black mark; no subdorsal brown stripes; scales about antescutellar space paler. Abdomen with narrow basal segmental white bands; venter white-scaled, apices of segments and median band black. Legs black, femora whitish beneath; tibiæ and tarsi largely whitish scaled within. Length of wing, 4.5 mm., the wing-scales black.

Genitalia: Side pieces over three times as long as wide,

rounded at tip; apical lobe large, prominent, with short curved setæ; basal lobe large, conical, evenly setose. Harpagones long, the basal part of shaft minutely setose, other half smooth; filament sickle-shaped, with an angular membrane at the base outwardly.

Female.—Similar, the mesonotum overspread with brown, but showing also subdorsal short posterior brown stripes; venter of abdomen nearly all pale scaled, showing only traces of black apical bands and median stripe.

Larva with the head-hairs double or the lower in threes; pecten of the tube even, followed by a tuft of five hairs; anal segment ringed by the plate; comb-scales six, each with a very sharp central spine and slight lateral fringes.

Egg: Narrowly fusiform, smooth, not angled, one side flattened, ends roundedly pointed, the micropylar end blunter, shortly conical at tip, which has a small mucilaginous cushion; sculpturing fine and obscure; black, shining, laid singly.

This species is quite distinct. The coloration of the mesonotum is variable, distinctly banded or all dark brown or all golden yellow. The banded form is similar to *tahoënsis*, *lazarænsis*, and *pullatus*, while the suffused brown form resembles *impiger*. Some specimens are very difficult to distinguish from *tahoënsis*, though in general the coloration is yellower. The venter of the abdomen is commonly all white or with paired apical black marks. The median black band is only very rarely present. The male genitalia resemble *campestris*, while the larva falls close to *abserratus*.

Type, Cat. No. 20353, U. S. Nat. Mus.

Bred from early spring pools in muddy hoof-marks in the edge of a marsh, in shallow grassy pools in a glade under poplar trees and, rarely, in pools along the lake filled by high waves and in mountain pools with *tahoënsis*. All these pools of a temporary character. Fallen Leaf, Lake Tahoe, California, last part of May and first of June, 1916.

Aedes ventrovittis, new species.

Female.—Integument black. Head with flat white scales low on the sides, all the vertex with very narrow curved sparse

white scales, denser along the eye-margins, brown low on the nape; vertical bristles pale, those along the eye-margins black. Mesonotum with dense narrow curved scales, brown and whitish intermixed, general effect lustrous pale yellow with an indistinctly double median brown band that becomes faint posteriorly; scutellum densely and continuously scaled with golden yellow, the antescutellar space not paler. First abdominal segment with golden yellow scales and bristles, the rest black, with rather narrow basal segmental white bands, widening on the sides and minutely incised on the dorsal line, broken on the last two segments; venter white-scaled, with a median black band, widening at apices of the segments; traces of sublateral subterminal patches. Wing-scales black, some patches of white ones at base of costa, discal and sixth veins, and outwardly a few of the outstanding ones on costa, first vein and upper edge of cell near its apex; outstanding scales numerous on upper edge of cell and second vein, sparse on third vein and upper fork of fourth, absent on fifth vein; length of wing, 4.5 mm. Legs black, the femora white beneath, knee-spots white; tibiæ and tarsi with many white scales intermixed, especially on the under side; tarsal claws toothed.

Type, Cat. No. 20355, U. S. Nat. Mus.

A captured female, Fallen Leaf, Lake Tahoe, California, June 2, 1916, taken biting by day under pines by a meadow at the north end of the lake by the sawmill.

In other specimens the venter of the abdomen has the black band crossed by transverse segmental subapical stripes. The white scales of the wings are principally confined to the long outstanding scales, the flat appressed scales being mostly black except at the base of the wing. The dorsal abdominal bands vary in the amount of incision, sometimes being broken on the dorsal line, sometimes scarcely indented.

This species is evidently of early occurrence and short lived. It was the first species flying at the north end of Fallen Leaf Lake (June 2) and was not taken after June 15. At Gold Lake, in Sierra County, altitude, 6,700 feet, Prof. W. B. Herms found *ventrovittis* on July 4, but two weeks later I was not

able to find any, although *tahoënsis* and *hexodontus* were out in swarms and *palustris* occasional.

Aedes cataphylla, new species.

Female.—Integument black. Head with flat white scales on the sides, narrow curved ones on the vertex but mixed with rather broad curved ones, the narrow scales brown, the broad ones white; on each side of vertex a spot of very narrow, sparse, dark brown scales; erect forked scales black; vertical bristles pale, those along margins of eyes black. Mesonotum with coarse, narrow curved scales, brown, sparsely intermixed with white; anterior edge and shoulders white; a white tuft subdorsally centrally on each side, from which a narrow line of scales runs backward; scales over antescutellar space white. Scutellum with some narrow curved white scales on each lobe and a group of brown and black bristles. Abdomen black, with broad white basal segmental bands, widening on the sides; penultimate segment with some apical white scales; last segment and cerci with white scales intermixed; venter white, rather sparsely scaled, with a medioventral row of oval black spots and subapical sublateral black patches. Wing-scales narrowly cuneiform, black, with many white ones intermixed along the costa and first vein, some of the flat appressed scales of the costa being white, forming a distinct patch just beyond base, some of the flat scales of vein 1 white and a few of the long outstanding scales of vein 2 white; third vein with dense short scales forming a spot at the base, but few or no long outstanding scales, contrasting with the second and fourth veins, which have numerous outstanding scales. Legs black, with many white scales intermixed, especially on the under side, but the tarsi without pale rings; femora white beneath and with white knee-spots, intensified by a small black area preceding each. Tarsal claws toothed. Length of wing, 4.5 mm.

Type, Cat. No. 20354, U. S. Nat. Mus.

A captured female, Fallen Leaf, Lake Tahoe, California, June 11, 1916, taken biting by day in the woods at the south end of the lake.

The egg is thickly fusiform, from side view flat below, roundedly angled dorsally, scarcely more pointed at one end than the other, from dorsal view, roundedly angled on both sides, the antemicropylar end longer and slenderer. Length about 0.7 mm. Black, smooth, the ends rounded, with gelatinous annular cushion at micropyle. Laid singly.

The females come readily to bite, but are deliberate in selecting a place and easily alarmed. Two specimens, although having inserted the proboscis, seemed unable to draw blood and were finally captured with the stomach empty.

Two specimens taken at Glenbrook, Nevada, June 5, 1916, are apparently of this species.

***Aedes increpitus*, new species.**

Male.—Integument black. Head with pale yellowish scales, flat on the sides, narrow curved on the vertex and shading to brownish there; vertical bristles pale, those along the margins of the eyes black. Mesonotum with coarse narrow curved scales, pale yellowish, broadly replaced by smaller dark brown ones in two contiguous dorsal bands and a broad subdorsal posterior one; the pale scales are left in a scattering dorsal line and in a distinct subdorsal one, beginning in a spot in the middle of the mesonotum and running to antescutellar space; scales about this space broadly pale. Abdomen with basal segmental white bands, rather broad; venter sparsely whitish scaled, with a median row of segmental ovate black patches and sublateral apical spots. Legs with black and white scales intermixed, femora whitish beneath; tarsi largely black after the first joint, each joint with a basal white ring except the last joint, which is wholly black. Length of wing, 4 mm., the wing scales black, but mixed with white along the costa and vein 1.

Genitalia: Side pieces over three times as long as wide, rounded at tip; apical lobe prominent with a few small setæ; basal lobe small, rounded, uniformly finely setose; harpagones moderately long, curved, minutely setose toward base, the filament long and curved, with a lateral expansion, like a slender foot with pointed heel.

Female.—Similar; head broadly brown at vertex, defining a white lateral spot; venter of abdomen whiter, the median spots and sublateral subapical black patches more distinct; last tarsal joint black as in the male; abdominal bands widening on the sides, on the penultimate segment running to the tip; last segment black.

Larva with the air tube thick and rounded, not over three times as long as wide, the pecten without detached teeth and followed by a 3-haired tuft; anal segment not ringed by the plate which is incised on the side; comb-scales in a large patch, the central spine longer than the others but not stouter, the scale rather evenly fringed; upper head hairs in twos or threes, lower single or double or both double.

Type, Cat. No. 20350, U. S. Nat. Mus.

In some specimens, especially the largest, earliest emerging ones, there is a small white ring or spot on the fifth tarsal joint. The white rings are generally broad, never very narrow.

The egg is narrowly fusiform, one side flattened, smooth, not angled, the ends roundedly pointed, the micropylar end shortly conical and with a mucilaginous cushion; black, shining, laid singly.

This species combines the male genitalia of *abfitchii* with the larva of *stimulans* and is thus a synthetic form. In *sonsoni* the genitalia are similar, but the larva also is that of *abfitchii*, having a long tube with detached pecten teeth. The coloration is practically identical in all of these forms. In the east there are three species of this, the *cantans* group, indistinguishable as adults. In the Sierras there are but two and they can generally be easily distinguished.

This species was very common in the Yosemite Valley in May, 1916. Males were seen swarming by day in dark woods or, in early morning, in camp or along the road. Usually no definite swarm was seen, but single males or in small numbers drifting and circling about, although sometimes in fairly definite clusters. The females are ready biters. Larvæ occurred in all the pools, preferring small detached ones, though they occurred even in large pools in old beds of the river where there was still a slight current. At Fallen Leaf Lake they

occurred in beach pools filled by high waves and seepage through the gravel, in marsh pools, but only very rarely in the clear cold mountain pools or the larger grassy marshes. The larvæ linger after the early snow-pool species have completely disappeared.

The following records also doubtless appertain to this species: Glenbrook, Nevada, August 25, 1915 (H. G. Dyar); Tahoe Tavern, Placer County, California, August 15, 1915 (H. G. Dyar); Eureka, California, May 22 to June 6, 1903 (H. S. Barber); Fieldbrook, California, May 26, 1903 (H. S. Barber).

Aedes palustris, new species.

Male.—Integument black. Head with flat yellowish white scales on the sides, narrow curved ones above, smaller, sparser, brown scales in a patch each side of vertex, the erect forked scales black in these patches, elsewhere white; median groove bare, with dense whitish scales on either side; vertical bristles whitish, those along ocular margins black. Mesonotum with narrow curved pale yellowish scales, narrower brown ones in two broad contiguous bands and two posterior short subdorsal stripes, the pale normal scales forming only subdorsal and lateral lines and a border around antescutellar space. Abdomen black, with broad, even, basal segmental white bands; venter with subapical black bands and a medioventral black line. Legs black; femora and tibiæ with white scales intermixed, the femora white beneath; tarsi with broad white rings at the bases of the joints, on the first three joints on front and mid legs, on all five joints on hind legs. Length of wing, 4.5 mm., the scales black except a few white ones along costa, first and fourth veins.

Genitalia: Side pieces over three times as long as wide, rounded at tip; apical lobe long, arm-shaped, with a few short setæ; basal lobe large, obtusely conical, densely setose. Harpagones moderate, the basal part of shaft minutely pilose, apical part smooth; filament sickle-shaped, without expansion.

Female.—Similar; mesonotum with rather broad areas of

pale narrow curved scales over the shoulders; posterior abdominal segments with white scales at both base and tip and a few scattered in the black area; wings brindled black and white, white scales on all the veins, about half as numerous as the black ones; femora with more white scales than black ones; tibiae with the scales about evenly divided; tarsi with the rings broad, the last hind tarsal joint half white.

The larva has the head with the upper tuft in threes or fours, lower single; pecten of the air-tube with long, well separated teeth, but perfectly even, followed by a 6-haired tuft, the tube over four times as long as wide, regularly tapered and a little curved. Comb a moderate patch of about 14 scales, the scale evenly fringed with spinules, the central spinule longest; lateral abdominal hairs double.

Egg: Fusiform, one side flattened; central third nearly cylindrical, antemicropylar end slenderly tapered, the other more abruptly conical with a nucilaginous cushion; black, smooth, laid singly.

Type, Cat. No. 20351, U. S. Nat. Mus.

Breeding in temporary open grassy pools, Little Yosemite Valley, larvæ and pupæ, May 18, 1916; marshes at north end of Fallen Leaf Lake and between Tallac and El Tahoe at the south end of Lake Tahoe, June 1-2, 1916.

The abdominal scales are mixed with brown. In a captured female the pale scales are very extensive, on the apices as well as the bases of the segments, and forming a diffused white dorsal band the whole length. In a bred female the pale scales are reduced, the basal white bands narrow and broken at the sides, separated from the lateral spots. No apical pale scales in this specimen except on the last two segments. Various intergrades occur.

This is a very distinct species of the *cantans* group, recognizable by the large number of white scales on the wing veins, some scales being present on every vein. Specimens with the white dorsal band well developed on the abdomen present a very unique appearance.

CRITICAL NOTES ON SYRPHIDÆ

BY FREDERICK KNAB

Baccha cylindrica Fabr.*Syrphus cylindricus* Fabricius, 1781, Spec. Ins., vol. 2, p. 429.*Baccha cylindrica* Fabricius, 1805, Syst. Antliat., p. 199.*Baccha cylindrica* Wiedemann, 1830, Aussereurop. zweifl. Ins., vol. 2, p. 92.*Ocyptamus conformis* Loew, 1866, Berlin. Ent. Zeitschr., vol. 10, p. 38.*Ocyptamus fuscipennis* V. d. Wulp (not Wiedemann, not Macquart), 1883, Tijdschr. v. Ent., vol. 26, p. 9.*Ocyptamus conformis* v. Roeder, 1885, Stettin. Ent. Zeit., vol. 46, p. 342.*Baccha fuscipennis* Williston (in part, not Say), 1886, Synopsis No. Amer. Syrph., p. 119.*Ocyptamus fuscipennis* Townsend (not Say), 1895, Trans. Amer. Ent. Soc., vol. 22, p. 39.

The synonymy above indicated shows that the status of this species is not clearly established. It is evident from the literature that *Baccha cylindrica* was not clearly differentiated from *B. fuscipennis*, recent authors considering them as conspecific. They are, however, abundantly distinct, although this is not apparent from the wing-pattern, the feature which has chiefly engaged systematists. The identity of the Fabrician species seems to have been neither suspected nor investigated, although Wiedemann gives an excellent description from the type.

Baccha cylindrica has the wings extensively deep blackish brown; there is a large purely hyaline spot apically, bounded anteriorly by the third vein and occupying the distal half of the subapical cell and the parts beyond; there is a large hyaline streak in the discal cell and a smaller clear spot at the distal end of the second basal cell; the axillary area is wholly clear. The face is wholly pale yellow, this color extending upward at the sides of the frons in long triangles. The third antennal joint is wholly black. The abdomen is steely blue, moderately shining, the second, third, and fourth segments with broad velvet-black bands, somewhat broader and more remote from hind margins than in *fuscipennis*, that on the fourth segment

very broad. Posterior third of fifth segment and all of sixth and seventh highly polished, bright steel-blue. Legs, including coxæ, deep black, the femora bright yellow at base, the hindmost pair narrowly so, the others to well beyond the middle.

Four specimens representing both sexes, two from Santo Domingo and two from Porto Rico, are before me. One female has the hyaline portion in the middle of the wing extending from the discal cell to the inner margin. In all other details the specimens agree closely.

Baccha cylindrica appears to be exclusively Antillean. Certain specimens from the southern United States closely approach it in wing-pattern and at first glance one would pronounce them conspecific; but other characters show that they really belong to *Baccha fuscipennis*. Typical specimens of this latter species have the wings heavily and uniformly infuscated, showing only a more or less clear apical spot in the position above described for *cylindrica*. In some Florida specimens the hyaline is still more extensive, being broadly continuous from the discal cell along the inner margin to the base of the wing. This is the form described and rudely figured by Macquart under the name *Ocyptamus fuscipennis* (Hist. Nat. Ins., Dipt., 1834, vol. 1, p. 554, pl. 12, fig. 13), from a specimen coming from Philadelphia.

Baccha fuscipennis, in spite of the variation in wing-pattern, may be readily distinguished from *cylindrica* by the following differences which a large series shows to be constant: The third antennal joint on its inner side has a yellow spot at base below. The legs are dull yellow shading to pale brown, the femora showing very faint subapical darker bands. The abdomen is yellow-brown, the second to fifth segments with subapical ill-defined dull black bands, that on the fourth segment less extensive than in *cylindrica*.

Eristalis meigenii Wied.

Eristalis meigenii Wiedemann, 1830, Aussereurop. zweifl. Ins., vol. 2, p. 177, pl. 10b, fig. 15.

Eristalis meigenii Arribáizaga, 1892, Anal. Soc. Cient. Argent., vol. 34, p. 115.

This species has been misidentified by North American systematists and is strictly South American. The peculiar distribution indicated by the records, the La Plata region and the sub-boreal portions of North America, appeared improbable and led the writer to look up the original description. It at once became clear that the true *meigenii*, although showing much the same general coloration as the North American species passing under this name, is amply distinct, being, indeed, more closely related to certain neotropical species.

This is apparent from Wiedemann's description of the scutellum of his *meigenii*: "Schildchen mitten breit wachsgelb, an den Seiten schwarz." (Scutellum broadly wax-yellow in the middle, black at the sides.) Now, by no stretch of the imagination can the scutellum of our species be called "wax-yellow," while the term would be very apt for such species as *scutellaris*, to which latter we find Wiedemann actually applying the same term. Nor is there any trace of black at the sides of the scutellum of *brousii* (for we might as well call our species by its correct name). The scutellum of *brousii* is brown, "subtranslucent yellowish or reddish on the outer part." It is thick and convex and its whole surface is rather densely clothed with fine long hairs. On the other hand, we have in the group of neotropical species above referred to a flat broad scutellum nearly bare on the disk. There is a whole series of such species with flat wax-yellow scutellum and with body coloration more or less resembling *meigenii*. *Eristalis scutellaris* Fabr. and *E. albifrons* Wied. are familiar examples of this group. Unfortunately the writer has been unable to procure specimens of the true *meigenii*, but if any doubt exists as to the above contention, the figure in Wiedemann's work, evidently generally overlooked, should prove convincing. Our North American species passing as *meigenii* will have to be known as *Eristalis brousii* Will.

***Volucella incommoda*, new species.**

Male.—Eyes contiguous, very shortly white-pilose. Face and frontal triangle pellucid brownish yellow, unmarked, moderately prominent. Antennæ dull reddish yellow, the third

joint over twice as long as broad; arista yellowish, blackish on distal half, long-plumose. Mesonotum shining yellow-brown with violaceous reflections and with five indistinct darker longitudinal stripes; pubescence fine, black. Scutellum large and very prominent, convex at base and apically with a deep transverse median impression; color darker than mesonotum and with stronger violaceous luster; a series of rather coarse and dense, but short, black bristles along posterior margin. Pleuræ yellow-brown, shining. Abdomen broad, rounded, about as wide as long, shining, brownish yellow at base, beyond deep brown stained with black and with faint violaceous reflections. Legs brownish black, the knees narrowly dull yellow, the tarsi tinged with yellow on basal portions, the hind pair with the first joint deep ocher-yellow and ventrally with cushion of golden pile. Wings hyaline, the costal and subcostal cells dull yellow, a small dark brown spot at tip of first vein; second vein ending in the costa just beyond tip of first vein. Halteres ivory white. Length: Body about 7 mm., wing 8 mm.

Female.—Coloration similar to male. Frons about one-sixth the width of the head, deep shining black, yellow at extreme apex, clothed with short fine pale pile along the sides. Wings slightly broader than in the male, the second vein terminating farther beyond tip of first vein.

Ancon, Canal Zone, Panama, November, 1915, 8 specimens reared by L. H. Dunn from larvæ in decaying contents of a calabash.

Type, Cat. No. 20646, U. S. Nat. Mus.

This species varies somewhat in coloration, some specimens showing a more yellowish ground color and more distinct thoracic stripes, while others are very dark and show hardly a trace of yellow on the tarsi. The most interesting variation, however, occurs in the wing-venation. In two of the males the second vein terminates in the costa just beyond the tip of the first vein; in the third male the second vein ends in the first vein distinctly before the latter reaches the costa. This specimen would naturally be referred to the genus *Phalacro-myia*, yet it is unquestionably conspecific with the other speci-

mens. In fact, the species in general habitus is distinctly a *Phalacromyia* rather than a *Volucella*, if, indeed, the two genera can be held separate. Unless the genera can be redefined on characters other than wing-venation, it would seem advisable, in view of this variation, which may also occur in other species, to merge the two genera.

WHAT IS TABANUS MEXICANUS?

(*Diptera, Tabanidæ*)

By FREDERICK KNAB

Under the name *Tabanus mexicanus* modern systematists have confused a number of distinct forms. Most of these were recognized and described as distinct by the early authors, but since then have been generally considered as variants of a single species. It is true, these forms agree closely in structural details and coloration, and a hasty examination would easily lead to the conclusion that they are conspecific. Nevertheless they are distinct, as the writer hopes to show.

A considerable material is before the writer and this represents three distinct forms, now confused under the oldest specific name, *mexicanus*. These three forms agree closely in size, in the pale green color of the body, legs and wing-stigma (usually changing to yellow or brown after death), the narrow frontal stripe without differentiated frontal callosity, the shape of the antennæ, and other details. The wing-venation also agrees very closely in the three forms, the first posterior cell being wide open and the upper branch of the third vein with a very short appendix, this latter altogether obsolete in many specimens of one of the species. The obvious differences are in the wing-coloration, two of the forms having the wings spotted in a different manner, while the third has them wholly unspotted.

The true *mexicanus* of Linnæus, described from South America, be it noted, has the wings mottled with sharply defined black dots disposed in the manner described below. A

second form, which takes the name *flavus* Macquart, has much fewer spots on the wings and they are paler and less sharply defined. This is the form which occurs in the southeastern United States. It might be considered as "intermediate" between the clear-winged form (*inanis*) and the heavily spotted one, as indeed appears to have been generally done, were not such an opinion controverted by the geographic distribution of the three forms. The heavily spotted *mexicanus* and the clear-winged *inanis* are both restricted to the strictly tropical portions of America, while the "intermediate" *flavus* occurs only in the southern United States, and, as far as our present information goes, does not anywhere occupy the same territory with the other two. The diagnostic characters, distribution, and principal synonymy of the three species follow.

Tabanus mexicanus L.

Tabanus mexicanus Linnæus, 1767, Syst. Nat., ed. 12, vol. 2, p. 1000.

Tabanus olivaceus De Geer, 1776, Mém. pour serv. à l'hist. d. Ins., vol. 6, p. 229, pl. 30, fig. 6.

Tabanus punctatus Fabricius, 1794, Ent. System., vol. 4, p. 386.

Tabanus mexicanus Fabricius (in part), 1805, Syst. Antliat., p. 98.

Tabanus mexicanus Wiedemann, 1821, Dipt. Exot., p. 76.

Tabanus mexicanus Wiedemann, 1828, Aussereurop. zweifl. Ins., vol. 1, p. 147.

Tabanus mexicanus (in part), *T. olivaceus* and *T. punctatus* Townsend, 1897, Ann. & Mag. Nat. Hist., ser. 6, vol. 20, pp. 22, 23.

Tabanus mexicanus Aldrich (in part), 1905, Cat. No. Amer. Dipt., p. 205.

Tabanus mexicanus Kertész (in part), 1908, Cat. Dipteroorum, vol. 3, p. 260.

This species is at once recognizable by the wing-maculation (see fig. 1). The veins at the bases of the submarginal and posterior cells are heavily marked with black; the axillary excision of the wing is marked with black along both margins; there is a large black dot at the apex of the second vein and at the apices of both branches of the third; there is a black spot on the outer branch of the fifth vein just beyond the discal cell; the anal cell is marked with black at its apex. Exception-

ally well marked specimens show black dots at the apices of all the veins terminating in the inner margin of the wing. All the spots are sharply defined and mostly round or quadrate. The upper branch of the third vein is short appendiculate, the spur not reaching beyond the black spot. All three pairs of tibiæ are narrowly ringed with black at their apices. The third joint

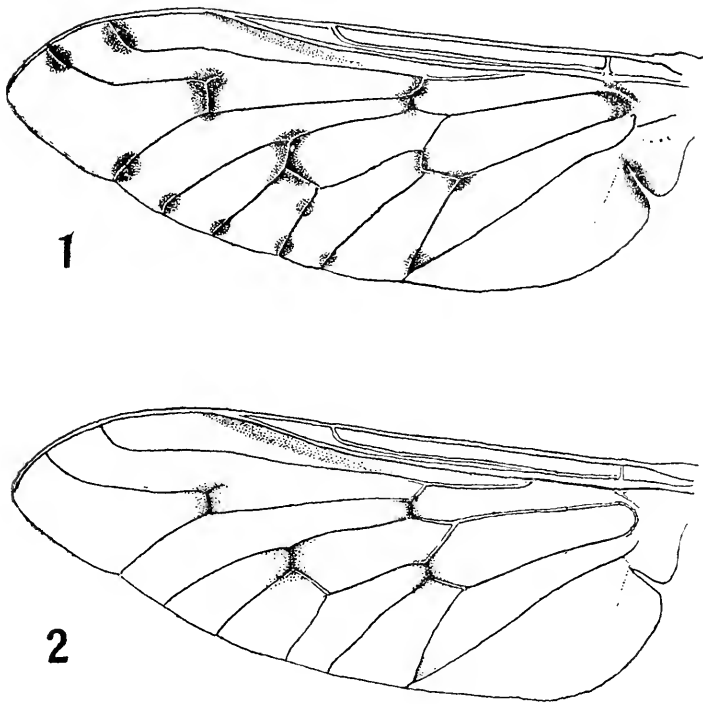


FIG. 1.—1. *Tabanus mexicanus* L.; 2. *Tabanus flavus* Macq.

of the antennæ is much shorter and broader than in *inanis* and the basal tooth is more strongly marked. The pile of the mesonotum is variable in color, being either dull white or pale yellow with silky luster.

Tabanus mexicanus is evidently widely distributed in the moist tropics, but appears to be absent from the Antillean re-

gion and the subtropical zone. Specimens before me show the following actual records:

"Mexico," 1 male; Cacao, Trece Aguas, Alta Vera Paz, Guatemala, 1 female, April 19 (Schwarz and Barber); Carillo, Costa Rica, 1 female (Schild and Burgdorf); Rio Trinidad, Panama, May 7, 1911, 1 female, June 4, 1913, 1 male (A. Busck); Island of Trinidad, 1 female (F. W. Urich).

Tabanus flavus Macquart.

Tabanus flavus Macquart, 1834, Hist. Nat. Ins., Dipt., vol. 1, p. 200.

Tabanus mexicanus Osten Sacken (in part, not Linn.), 1876, Prodrome Taban. U. S., part 2, p. 459.

Tabanus mexicanus Aldrich (in part, not Linn.), 1905, Cat. No. Amer. Dipt., p. 205.

Tabanus mexicanus Hine (not Linn.), 1907, 2d Rept. Horseflies La., p. 52.

Tabanus mexicanus Kertész (in part, not Linn.), 1908, Cat. Dipt., vol. 3, p. 260.

Tabanus mexicanus Smith (not Linn.), 1910, List Ins. New Jersey, p. 742.

This species, as here recognized, is very constant. This is shown by a series of 21 specimens before me. There are rather weak and narrow brown spots at the base of the second submarginal cell and at the bases of the first, second, and fourth posterior cells. The upper branch of the third vein shows a very short stump which appears to be constantly present. The spots at the apices of the longitudinal veins and the one on the outer branch of the fifth, so characteristic of *mexicanus*, are absent in this species. The pile of the mesonotum is either dull white or yellow.

Tabanus flavus appears to be restricted to the southeastern United States, occurring from New Jersey to Florida and westward to Missouri and Louisiana. Neither of the forms here treated as *mexicanus* and *inanis* occurs within this territory. The available actual records are as follows:

Polk County, Florida, May 5, 4 females (E. A. Schwartz); Grasmere, Florida, June 3, 1901, 2 females (C. H. Baker); Indian River, Florida, 1 female (H. G. Hubbard); St. Lucie (Capron), Florida, April 9, 1 female (Hubbard and Schwarz);

Enterprise, Florida, June 25, 1 female (Hubbard and Schwarz); Fort Myers, Florida, 2 females (W. P. Hazards); Mimsville, Georgia, June 14 and August 13, 20, and 31, 1906, 4 females; Norfolk, Virginia, June 21, 1910, 1 female (F. A. Johnson); Garrett Park, Maryland, July 9, 1899, 1 female (W. R. Maxon). The foregoing records are from the National Museum collection. Osten Sacken records the species from New Jersey, Missouri, and the Sea Islands of South Carolina; Smith records it from Da Costa, New Jersey, and Hine from Louisiana.

Tabanus inanis Fabr.

Tabanus inanis Fabricius, 1794, Ent. System., vol. 4, p. 368.

Tabanus ochroleucus Meigen, 1804, Klass. u. Besch. europ. Zweifl. Ins., vol. 1, p. 170.

Tabanus mexicanus Fabricius (in part, not Linn.), 1805, Syst. Antliat., p. 98.

Tabanus viridiflavus Walker, 1850, Newman's Zoologist, vol. 8, App. p. lxvi.

Tabanus mexicanus var. Bellardi, 1859, Saggio Ditt. Mess., part 1, p. 59.

Tabanus mexicanus Aldrich (in part, not Linn.), 1905, Cat. No. Amer. Dipt., p. 205.

Tabanus mexicanus Kertész (in part, not Linn.), 1908, Cat. Dipt., vol. 3, p. 260.

This species lacks the spots on the wings, although some specimens show darkening of the veins at the points where the spots occur in *flavus*. The wing-membrane is distinctly tinted with yellow throughout, while that of *mexicanus* is absolutely clear and that of *flavus* practically so. The upper branch of the third vein is more frequently without appendix than with it, and when it is present it is extremely short. The pile of the mesonotum shows the same colors and variation as in the two other forms. The third joint of the antennæ is distinctly more elongate than in either of the others, but subject to considerable individual variation. The tibiæ have no apical black rings.

Tabanus inanis occurs in the same region, the moist tropics, with the true *mexicanus*. No specimens occur in this territory which might be considered intergradients. The *Tabanus sul-*

phureus of Palisot de Beauvais, from the island of Santo Domingo, may be this species, but in the absence of Antillean material this question must remain undecided. The following localities are indicated on the specimens before me:

St. Jean, French Guiana, 1 female (W. Schaus); Cayenne, French Guiana, 1 female (Schaus); Maroni River, 60 miles up, British Guiana, 2 females (Schaus); Bejuco River, Panama, 1 male (Schaus); Cabima, Panama, May 19, 24, 26, 31, 1911, 4 females (A. Busck). Bartica, British Guiana, 2 females, and Caura Valley, Venezuela, 1 female (collection C. W. Johnson). Reported from Brazil by Walker and from Mexico by Bellardi.

***Tabanus luteoflavus* Bell.**

Tabanus luteoflavus Bellardi, 1859, Saggio Ditt. Mess., part 1, p. 60.

Tabanus mexicanus var. *limonus* Townsend, 1897, Ann. & Mag. Nat. Hist., ser. 6, vol. 20, p. 21.

There are no specimens of this species before me and it is treated here in order to establish the above synonymy. It evidently resembles the preceding species in coloration, but differs in the presence of a long appendix on the upper branch of the third vein, as indicated by both authors. Bellardi's specimen was a female, Townsend's a male, and both came from the same general region, the State of Vera Cruz in Mexico. Bellardi states that the frontal stripe of the female is broad, which should further serve to distinguish it from *inanis*. The wings are unspotted, as in the latter species. He makes no mention of a frontal callosity.

NINE NEW SPECIES OF HYMENOPTERA

By J. C. CRAWFORD

Superfamily CYNIPOIDEA

Hexaplasta minuta, new species.

Female.—Length 0.82 mm. Similar to *H. zigzag* but smaller and with darker legs and the antennæ with the pedicel and first joint of funicle subequal in length and joints 2 to 5 of funicle subglobose (see figure); elevation of scutellum long and narrow.

Type locality, Nashville, Tennessee.

Described from four specimens reared from a scavenger on *Leucania unipuncta* by W. H. Larrimer under Bureau of Entomology (Webster) No. 11332.

Type, Cat. No. 20473, U. S. Nat. Mus.



Hexaplasta minuta, antenna.

Superfamily CHALCIDOIDEA

Tetrastichus pyrillæ, new species.

Female.—Length 0.8 mm. Light brown, the pleuræ lighter in color, base of abdomen and legs testaceous; pedicel and first two joints of funicle subequal in length, third joint shorter; club three-jointed, about as long as joints 2 and 3 of funicle combined; one ring joint visible; head thin antero-posteriorly; mesoscutum anteriorly with many longitudinal rugæ; laterally and posteriorly smooth, the posterior portion sometimes wrinkled; scutellum smooth, without furrows.

Male.—Length 0.75 mm. Similar to the female, except in secondary sexual characters and lighter in color.

Type locality, Pusa, India.

Type, Cat. No. 20624, U. S. Nat. Mus.

Described from material received from the Imperial Bureau of Entomology of India, reared August 31, 1913, from eggs of *Pyrilla aberrans*.

On account of the lack of furrows on the mesonotum it is probable that a new genus will have to be erected for this species.

Ooencyrtus pyrillæ, new species.

Female.—Length 0.8 mm. Head brown, clypeal area reddish; antennæ light brown, the club darker; pedicel slightly longer than first three joints of funicle combined; first four joints of funicle somewhat broader than long, joints 5 and 6 subquadrate; club as long as funicle; thoracic notum orange; pronotum apically, mesonotum apically and axillæ white; pleuræ and legs very light yellowish, posterior femora slightly brownish; abdomen dark brown.

Type locality, Nagpur, India.

Type, Cat. No. 20625, U. S. Nat. Mus.

Received from the same source as the preceding and reared from the eggs of *Pyrilla aberrans* December 19, 1910.

Superfamily APOIDEA

Chelostoma minuta, new species.

Female.—Length 5 mm. Black, shiny, thinly clothed with long, slightly ochraceous pubescence; head closely and rather coarsely punctured, the punctures of the clypeus and supra-clypeal area much finer; clypeus strongly bulging centrally; whole central area of face from ocelli to clypeus strongly bulging; antennæ distinctly club-shaped, obscurely reddish beneath; second joint of labial palpi over three times as long as first; third and fourth subequal in length, together about as long as first; first joint of maxillary palpi subglobose, shorter than second; third as long as 1 and 2 combined; mesonotum with punctures about as on vertex, medially the punctures sparser; punctures of scutellum finer and closer; of metanotum crowded; propodeum at base irregularly longitudinally rugose, elsewhere with fine crowded punctures; punctures of mesopleuræ about as on notum; tegulæ dark brown; wings dusky, nervures dark; legs black; abdomen finely, rather sparsely punctured, apical margins of segments very narrowly obscurely reddish; venter coarsely punctured, scopa thin, dirty whitish.

Described from seven specimens collected in the Tuolumne Meadows, California, by Miss Frances Long.

Type, Cat. No. 20616, U. S. Nat. Mus.

Much smaller than any other American species, but closely resembles *C. campanularum* of Europe, differing in the more bulging center of face, much shorter and finer rugæ on propodeum, punctures of rest of propodeum much finer and closer, etc.

Hoplitina hesperia, new species.

Female.—Length 6.5 mm. Black, clothed with abundant white pubescence, abdominal tergites 1–3 red; head closely and rather coarsely punctured, pubescence densest on sides of face; clypeus projecting, anterior margin gently curved, more sparsely and coarsely punctured; facial quadrangle somewhat longer than broad; inner orbits subparallel; second joint of labial palpi twice as long as first; first joint of maxillary palpi short, stout, second about three-fifths as long as third, which is as long as 4 and 5 combined; thorax with punctures about as on head; propodeum shiny, smooth, finely rugulose at base; tegulæ reddish; wings dusky; first recurrent as far from base of second submarginal as second recurrent is from apex; legs black, pubescence slightly tinged with yellowish; tibial spurs white, first abdominal segment with punctures well separated, segments 2–3 with punctures successively closer, 4–6 with punctures crowded; segments 1–5 with apical bands of appressed densely plumose white hair, those on 1–3 interrupted medially (abraded); venter black, closely punctured, first segment red except a black blotch medially, following segments with obscurely reddish apical margins and 2 and 3 with a red blotch at each side; ventral scopa long, thin, whitish.

Type locality, Redlands, California.

Type, Cat. No. 20615, U. S. Nat. Mus.

Described from one specimen collected in 1913 by Mr. F. R. Cole.

Closely related to the genotype which is described from the opposite sex but smaller and with the relative lengths of the joints of the palpi different.

Greeleyella potentillæ, new species.

Male.—Length 5 mm. Black, head and thorax with rather abundant long whitish pubescence; clypeus, knees, anterior tibiæ in front and all tarsi, light yellow; process of labrum large, broadly rounded; clypeus with large scattered punctures, rest of head almost impunctate, except along lower inner orbits; head, except clypeus, finely lineolate, medially above antennæ almost granular; antennæ reaching beyond tegulæ, flagellum reddish, somewhat dusky above; mesothorax lineolated, the notum with fine scattered punctures; propodeum almost granular, basally with a few rugæ; tegulæ dark with a light spot; wings almost hyaline, stigma and nervures honey color, margin of stigma darker, the costa and subcosta dark brown; second submarginal about two-thirds as long as first; first recurrent interstitial (or slightly before or beyond base of second submarginal cell); legs black with white pubescence; abdomen finely lineolate, with scattered minute punctures, with scanty short, slightly ochraceous pubescence.

Female allotype.—Length 5.5 mm. Similar to male but without yellow markings; face below antennæ with large scattered punctures, above with fine scattered punctures; flagellum reddish, darker above, mesonotum with scattered rather large punctures; wings slightly dusky, nervures darker than in male; spot on knees yellow, tarsi testaceous; scopa slightly ochraceous; sculpture of abdomen as in male, hair at apex of abdomen yellow.

Type locality, Camp Springs, Maryland, May 11, 1916.

Other localities: Cabin John, Maryland, May 23, 1911 (two males, P. R. Myers, coll.); Accotink, Virginia, May 18 (one female, on *Potentilla*, S. A. Rohwer, coll.).

Type, Cat. No. 20621, U. S. Nat. Mus.

Described from 6 males and 17 females, the types a pair in coitu; 7 females and 1 male taken on *Potentilla pumila* by the author, 8 females on the same flower by Mr. A. H. Pottinger, the types and 2 males taken by the author without flower record.

Greeleyella occidentalis, new species.

Male.—Length 8.5 mm. Black, head and thorax with long slightly ochraceous pubescence; clypeus, except laterad, front knees, line on anterior tibiæ, and basal joint of tarsi, yellowish; head broad, face finely lineolate, clypeus and sides of face with scattered punctures; facial quadrangle slightly broader than long; inner orbits appearing to diverge very slightly beneath; cheeks broad, smooth, shiny and sparsely punctured; antennæ dark, obscurely reddish beneath, reaching to base of scutellum, the joints of flagellum longer than broad; mesonotum sparsely punctured, lineolate only along anterior margin; metanotum lineolate and with the punctures closer; propodeum granular; mesopleuræ lineolate and with scattered punctures; tegulæ dark, with an obscurely reddish spot; wings somewhat dusky, nervures brown, first recurrent some distance before base of second cubital cell; legs black, hind tibiæ brown, hind basitarsus tinged with reddish; abdomen finely lineolate, apical margins of segments reddish.

Female allotype.—Length 9 mm. Similar to the male; face medially with scattered punctures; antennæ dark beneath; first recurrent subinterstitial; scopa white; hair at apex of abdomen brown.

Described from one of each sex from Porcupine Flat, Mariposa County, California, 8,100 feet, July 1, 1915 (the types), and one female and two males from 3 miles northeast of Coulterville, Mariposa County, California, 3,200 feet, June 1, 1915.

Type, Cat. No. 20620, U. S. Nat. Mus.

G. beardleyi female, which is about the same size, is not lineolate, has a short propodeum which is smooth except at base; the male has the legs mostly yellow. *G. polytricha* is smaller, the female has the mesonotum more coarsely punctured and the mesoscutum and first abdominal segment are not lineolate; the male has the antennæ reddish beneath, reaching only to the tegulæ, the joints of the flagellum not longer than wide; in both sexes the wings and nervures are lighter in color.

Stelis coarctatus, new species.

Female.—Length about 6 mm. Black, with large yellow

spots on the sides of abdominal segments 1 to 3 and a minute spot on each side of the fourth segment; head with rather coarse crowded punctures, those on clypeus fine; head longer than broad, the inner orbits subparallel, the facial quadrangle subquadrate; mesoscutum as long as width at front end of tegulæ, closely and coarsely punctured; scutellum with similar punctures; tegulæ dark brown; wings dusky; second recurrent beyond apex of second submarginal cell; legs brown; abdomen closely, rather coarsely, punctured, segments 2 to 6 strongly constricted at base.

Type locality, Kansas.

Type, Cat. No. 20612, U. S. Nat. Mus.

Described from one female without further data. Similar to *lateralis* but easily distinguished by the longer head, subparallel inner orbits, longer mesoscutum, and strongly constricted abdominal segments.

Stelis diversicolor, new species.

Male.—Length about 7 mm. (but apex of abdomen incurved). Black, shiny, immaculate, with whitish pubescence, that on abdomen making thin bands on apical margins of segments, head closely and coarsely punctured, the punctures of the clypeus finer and closer, those on vertex coarser and not so close; punctures of mesoscutum coarser than those on vertex, close; those on scutellum somewhat more separated; no axillar teeth; row of pits on propodeum interrupted medially; wings dusky, more distinctly so along anterior margin; second recurrent vein received beyond apex of second submarginal cell; tegulæ dark; legs black; abdomen with segments 1–3 rather finely and closely punctured; segments 4–6 successively more closely and coarsely punctured; seventh rather finely rugosopunctate.

Type locality, Kerrville, Texas.

Described from two specimens collected April 11, 1907, on (?) *Tetraneuris linearifolia* by F. C. Pratt.

Type, Cat. No. 20613, U. S. Nat. Mus.

In habitus this species, which is the first black immaculate

species in North America, resembles *costalis* and allies. The paratype is somewhat smaller than the type.

Stelis perpulchra, new species.

Male.—Length about 6 mm. (but apex of abdomen strongly incurved). Black with the following light yellow markings: Inner orbits, broadened below, line on each side of anterior margin of mesoscutum, margin of axillæ and scutellum, the latter broadly interrupted medially, spot on tubercles, line on tegulæ, spot under insertion of posterior wings, spot on under side of front femora at apex, all knees, band on first abdominal segment, interrupted medially and emarginate behind on each side, four transverse spots on segments 2 to 4 and two transverse spots on disk of segment 5; head closely and coarsely punctured, more coarsely and sparsely so on vertex; apical margin of clypeus with two small tubercles on each side of middle, and between them a minute one; supraclypeal area with a median, slightly swollen, impunctate line; mandibles 3-dentate; mesoscutum coarsely punctured, the punctures separated by about half a puncture width; wings dusky, the anterior margin much more deeply so; second recurrent vein beyond apex of second submarginal cell; legs dark; punctures of first abdominal segment about as on mesoscutum; of segments 2 to 4 successively sparser; on fifth and sixth close; seventh finely rugosopunctate; segment 6 indistinctly medially carinate, more distinct apically, segment 7 with a strong median carina which projects slightly at apex.

Type locality, Yuma, Arizona, June, 1905, Herbert Brown, collector.

Type, Cat. No. 20614, U. S. Nat. Mus.

A paratype with only the label "Arizona" differs in having the impunctate line on supraclypeal area broader and more elevated; legs brown; segment 5 immaculate.

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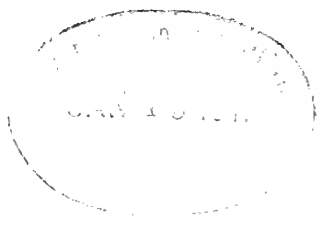
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Insecutor Inscitiae Menstruus

Vol. IV

OCTOBER-DECEMBER, 1916

Nos. 10-12

DESCRIPTIONS OF MISCELLANEOUS CHALCID-FLIES

By A. A. GIRAULT

Dinarmus arizonicus, new species.

Female.—Length, 2.30 mm. Dark metallic green, the wings hyaline, the coxæ, femora, and the middle tibiæ purplish; rest of legs and the scape yellowish-brown; venation yellowish. Thorax densely scaly punctate, the face with some larger punctures and with silvery hairs. Propodeum scaly, the abdomen subglabrous. Pedicel a little longer than funicle 1, which is a half longer than wide; ring-joints equal; funicle 6 quadrate, clypeus not striate, obtusely bidentate from a median obtuse incision, the mandibles tridentate, the third tooth truncate. Cephalic and caudal femora distinctly swollen, finely serrulate beneath. Propodeum with a median carina and no others, short at the meson, the spiracles round, no spiracular sulcus. Segments 2-4 of abdomen incised at meson caudad, 2 largest of the three, not occupying more than a sixth of the surface. Abdomen conic-ovate, much produced ventrad at base. Parapsidal furrows half-complete. Prothorax normal. Venation as in *Pteromalus*. Scape long. Scutellum simple.

From one female in the United States National Museum, labeled "*Tropidogastra arizonensis* Ashmead. Santa Rita Mts., Arizona (Hubbard and Schwarz)."

Type, Cat. No. 12728, U. S. Nat. Mus., the female on a tag, the head and caudal legs on a slide.

Entedon washingtoni, new species.

Female.—Length, 1.85 mm. Differs from *occidentalis* and the others in not having the apex of the caudal femur white

whereas the distal half of the caudal tibia is dull yellow (instead of the tip being abruptly white as in the other). Moreover, from *occidentalis* in that the funicle joints are much longer, 1 twice the length of the pedicel, 3 twice longer than wide. Also, the venation is more yellowish and the post-marginal vein is twice the length of the very short stigmal (as in *bigelovici-columbiana*). The caudal femora are not stout. Three ring-joints.

One female, Washington, District of Columbia.

Type, Cat. No. 20436, U. S. Nat. Mus., the female on a tag, an antenna, the caudal legs and a fore wing on a slide.

Eriglyptus robustus Crawford is congeneric and resembles *bigelovici* closely except that the caudal tibiæ are more broadly white at apex and funicle 1 is longer. *Entedonella* Girault is a synonym (yet differs in having the spiracle situated in a sulcus, not with a sulcus over and partly around it).

Tetrastichus malacosomæ, new species.

Female.—Length, 1.15 mm. Like *banksi* Howard but more slender and the caudal tibia at base is dark or submetallic. Differs notably from that species in having the propodeum at the meson very short, only a little longer than the postscutellum and there with a "median carina" in the shape of a slightly elevated, flat subquadrate area. Moreover, there is no lateral carina on the propodeum and the spiracle is round and near the cephalic margin and of moderate size. Funicle joints subequal, each somewhat longer than wide, the club with a terminal nipple. Pedicel somewhat longer than funicle 1. Scape pale but slightly dusky. Mandibles tridentate.

The male is the same except that its funicle is 4-jointed of which joint 1 is shortest, subquadrate, the others somewhat longer and subequal, the pedicel not so short as them. Male scape compressed, dusky above at middle.

The slender abdomen and very short propodeum are characteristic.

From many pairs reared from the eggs of *Malacosoma americana* and *M. disstria* at Berkeley, California (H. H. Severin).

Types, Cat. No. 20446, U. S. Nat. Mus., one male, four females on two tags plus a slide with antennæ of both sexes.

Also at Maxwell, New Mexico, May 8, 1916, from eggs of *Malacosoma fragilis* (D. J. Caffrey).

Epitetrastichus oviductus, new species.

Female.—Length, 2.50 mm. Abdomen acuminate, nearly twice the length of the thorax, the ovipositor extruded a short distance. Black and with the usual sculpture, the scape and the legs honey yellow except the coxæ (except at apex), the following parts of the body honey yellow: Distal half of scutum, lateral margins and median line (both narrowly) of cephalic half of scutum, scutellum, postscutellum, parapsides except cephalic and lateral thirds, caudo-mesal half of the axillæ, proximal half of the abdomen beneath except the margins, proximal two-thirds or more of same above except the margins, a stripe across at middle and a dot on meson midway between this stripe and the end of the yellow. Stigmal vein moderate, the fore wings large. Pedicel about twice longer than wide; funicle 1 somewhat over four times longer than wide, 2 and 3 subequal, each somewhat shorter and over twice the length of the pedicel; club 1 somewhat shorter again, 2 and 3 subequal, each a little shorter than 1, 3 with a distinct terminal nipple. Mandibles tridentate. Propodeum with a distinct median carina but no others, the spiracles long-elliptical. Scutum with four long setæ from minute punctures along its lateral margin. Postscutellum large.

One female, Cabin John, Maryland, August 12, 1916 (R. M. Fouts).

Type, Cat. No. 20447, U. S. Nat. Mus., the female on a tag, the head on a slide.

Eurytoma ctenodactylomyii, new species.

Female.—Length, 1 mm. Small species. Yellowish brown, the wings hyaline, the venation white, the tibiæ and tarsi also, the rest of the legs and the flagellum pale yellow. Abdomen at immediate base above slightly, at apex shortly and three narrow cross-stripes in the dorsal aspect of the proximal half

(somewhat less), black, the cross-stripes being the black distal margins of segments 2-4. Umbilicately punctate but not coarsely, the white pubescence not abundant, the cephalic scutum cross-striate. Propodeum semirugose, its median basin wide, globular, finely punctate, hollowed at base of meson, but there is no distinct median channel. Petiole transverse-linear, a tubercle from its lateral margin. Abdomen usual, nonstylate, segment 5 much the longest, occupying about half the surface, 4 not half its length, next longest. Abdomen glabrous dorsad. Caudal tibial spurs double, stout, the longest nearly as long as the first tarsal joint. Marginal vein over twice the length of the stigmal, the latter slightly shorter than the postmarginal. Funicle 1 nearly twice longer than wide, subequal to the pedicel, 5 somewhat shorter; club 2-jointed, 1 quadrate, 2 twice longer. Mandibles tridentate.

The male is the same but the petiole and abdomen, median line of propodeum and the thorax just above hind coxa, is black. The petiole is finely punctate, longer than the hind coxæ, over thrice longer than wide. Flagellum dusky pallid, the pedicel blackish above, globular. Funicle joints each with two scanty whorls of long hairs, twice longer than wide where widest. Club 1 somewhat shorter and not humped on one side, 2 and 3 subequal, a little shorter than 1.

One male, two females, reared from the galls of *Ctenodactylomyia watsoni* on sea grape (*Coccolobis uvifera*), May 6, 1916 (R. H. Van Zwalenburg).

Habitat, Joyudd, Porto Rico.

Types, Cat. No. 20475, U. S. Nat. Mus., the specimens on a tag, hind tibiæ and head of the female and male flagellum on a slide.

Neocatolaccus livii, new species.

Female.—Length, 1.10 mm. Dark metallic green, the wings hyaline, the venation dusky yellowish, the scape, tegulæ, and legs straw yellow except the coxæ. Head and thorax densely punctate, the propodeum scaly, also the abdomen distad of segment 2. Pedicel subequal to funicle 1, which is a third longer than wide, 5 quadrate. Scape slender, thicker distad.

Antennæ inserted a little below the middle of the face. Clypeus not produced, striate, its distal margin sinuate. Mandibles 4-dentate. Pronotum with an acute cephalic margin, linear (a little longer laterad), as wide as the mesonotum, the latter wider than long, constricted only at extreme cephalo-lateral angle. Parapsidal furrows very short. Scutellum large, simple, flat. Propodeum short (distinctly shorter than in *Pteromalus*), the neck a mere rim, the median carina absent, the lateral distinct, the spiracle elliptical, with a fovea just distad of it to represent the spiracular sulci (which are not present, truly). Abdomen as in *Pteromalus*, as is the venation, but the stigmal vein is not so long, the longer postmarginal not two-thirds the length of the marginal. Pubescence inconspicuous, quite normal.

One female reared from the galls of *Ctenodactylomyia watsoni* on *Coccolobis*, May 6, 1916 (R. H. Van Zwalenburg).

Habitat, Joyudd, Porto Rico.

Type, Cat. No. 20485, U. S. Nat. Mus., the female on a tag, the hind legs and a head on a slide.

Eutelus ruskini, new species.

Female.—Length, 1.50 mm. Similar to *betula* but the legs dull yellow except the coxæ and the caudal femur, the latter darker and submetallic; the clypeus is but slightly sinuate at apex; the median carina of the propodeum is distinct, the spiracle elliptical and larger; the antennæ are inserted on a line with the ventral ends of the eyes.

From three females on tags in the United States National Museum, Custer County, Colorado (T. D. A. Cockerell).

Types, Cat. No. 20652, U. S. Nat. Mus., the above specimens plus a slide bearing heads and a caudal leg.

Coelopisthia rotundiventris, new species.

Female.—Length, 1.60 mm. Differs from the typical form in that the antennæ are situated on a level with the ventral ends of the eyes or slightly above. Clypeus somewhat produced, its apical margin slightly concaved, a small sinus separating it laterad from the rest of the head. Mandibles 3- and 4-dentate.

Dark metallic green, the wings hyaline, the antennæ, legs (except coxæ), and the venation, reddish brown, the femora washed with metallic. Head and thorax densely punctate, the scutellum with a distinct cross-suture, the abdomen glabrous and with a short petiole. Propodeum tricarinate. Pedicel a half longer than wide at apex, much longer than any of the funicle joints, the latter subequal, twice wider than long. No spiracular sulcus.

From one female, Virginia, May 15, 1881.

Type, Cat. No. 20653, U. S. Nat. Mus., the female on a tag, the head and caudal legs on a slide.

Also from New Jersey (Paterson, Irvington), associated with *Plagioderia versicolora* on willow.

Euplectromorpha americana, new species.

Male.—Length, usual. Black, the scape, pedicel, legs and abdomen honey yellow with the following exceptions: Middle coxæ, hind coxæ, hind femur at distal third and a little over the proximal half of the abdomen above and below except the margins (very narrowly proximad, broader distad, the base narrowly black). Flagellum dusky, the joints yellow beneath. Funicle 1 twice longer than wide, 4 somewhat shorter, the club subacute and as long as funicle 1. Head and thorax scaly, the cephalic pronotum and scutum papillate or finely tuberculate, because of numerous setigerous papillæ. Propodeum and scutellum subglabrous, the former with a strong median carina. Scutellum naked except for four long setæ.

One male, woods, September 9, 1916, Glenn Dale, Maryland.

Type, Cat. No. 20471, U. S. Nat. Mus., the male on a tag, the head on a slide.

Mimatomus peltatus Cockerell.

This is a *Coccophagus* belonging to that section of the genus with a nonsessile stigmal vein and with this vein directed distad (that is, it is a *Prospaltella*). Types examined.

Elasmus mordax, new species.

Female.—Length, 1.80 mm. Dark metallic green, the scape except its bulla and its dorsal margin, white; legs pallid except

dorsal edge of caudal coxa at apex, same of hind femora for nearly their entire length and the tarsi. Abdomen orange yellow except at base above moderately narrowly, a narrow, dorsal metallic cross-stripe over halfway to middle from this, a short diamond-shaped spot at middle, a long-cuneate spot between this and apex and covering the dorsum, and the apex rather broadly. Propodeum orange yellow except the disk between the spiracles obtusely triangularly nearly to apex. Postscutellum and the scutellum lemon yellow but on the basal half of the latter is a metallic triangle whose apex is a little beyond the middle and whose base reaches from margin to margin at base of the scutellum. Thorax just cephalad of the caudal coxæ, lateral aspect, also orange as well as the sclerite laterad of the postscutellum. Scutellum with four large bristles, naked otherwise. Tegulæ lemon yellow. Black setæ on hind tibiæ (dorsal aspect) arranged in three wavy parallel lines but near apex, two come together. Fore wings subhyaline. Head with the usual punctures. Mandibles 6- and 7-dentate. Funicle 1 over twice longer than wide, longer than the body of the scape, 3 twice longer than wide. Abdomen acuminate.

One female reared from *Lithocolletis guttifimitella*, District of Columbia, August 28, 1898 (Aug. Busck).

Type, Cat. No. 20469, U. S. Nat. Mus., the female on a tag, a head on a slide.

A second female had the marking on the scutellum less acute at apex and the second marking on the abdomen absent. A third female from grass, Glenn Dale, Maryland, September, 1916, and several more some days later in a like situation. A common species, to all appearances.

Gonatocerus marilandicus, new species.

Female.—Of moderate size for the genus. Characterized by having the normal abdomen pale yellow marked with four distinct black cross-stripes above and a pair of dorsal dots near apex, the first cross-stripe well out from base, 4 as far from apex as 1 is from base, 3 and 4 closer together than 1 and 2; venter of abdomen distad on each side of meson black as are also the antennæ, the long bulla paler. Legs black except

knees, tips of tibiæ and four proximal tarsal joints and cephalic tibiæ and the distal half of cephalic femora. Neck of pronotum pale, the abdominal petiole dusky, somewhat longer than wide, thus distinct but much shorter than the hind coxæ. Thorax polished, simple, the axillæ subobsolete, very widely separated, the parapsidal furrows faint, the propodeum with a pair of separated median carinæ, otherwise plane, the scutellum plane or simple. Funicle 1 globular, not as large as the pedicel, not half the length of 2, which is somewhat over twice longer than wide, subequal to 3. Marginal fringes of fore wing short.

One female, Glenn Dale, Maryland, September 24, 1916.

Type, Cat. No. 20608, U. S. Nat. Mus., the specimen on a slide.

A somewhat common species in meadows.

Pachyneuron mucronatum, new species.

Female.—Similar to the species in general but at once distinguished by having the meson of the otherwise concaved clypeus armed with a distinct, acute tooth; the marginal vein is short, not twice longer than wide but only a half longer than wide; the scape is dusky except at base. Funicle 1 a little wider than long, somewhat shorter than the pedicel. Abdomen narrower than the thorax, its second segment longest, occupying a third of the surface. Propodeum without a median carina, the spiracular sulcus distinct, the lateral carinæ distinct, originating at a basal fovea. Petiole very short. Mandibles 4-dentate. Tibiæ blackish (except tips and most of cephalic tibiæ). Like the other species. Ring-joints equal.

One female reared from an aphid, Guanajuato, Mexico (T. D. A. Cockerell).

Type, Cat. No. 20654, U. S. Nat. Mus., the female on a tag, a head, a fore and hind leg and the wings on a slide.

The shortened marginal vein, narrowed, more conical abdomen with the longer segment 2 and the toothed clypeus are unique for North American species.

Elasmus missouriensis, new species.

Female.—Similar to *albicoxa* Howard but the scutellum is wholly metallic, the abdomen more or less reddish beneath at base, the caudal coxæ wholly metallic, the caudal femora so except at base; apex only of the middle coxæ white, the middle femur black. Mandibles 6-dentate. Setæ on caudal tibiæ in the dorsal aspect the same as in the named species.

From one female, Kirkwood, Missouri (M. E. Murtfeldt).

Type, Cat. No. 20454, U. S. Nat. Mus., the female on a tag, the head on a slide.

Elasmus aspidiscæ, new species.

Female.—Similar to *albicoxa* Howard but the abdomen orange yellow except the basal sixth, a round mesal dot just distad of this and the distal third except for an orange stripe at the apex of its basal third. Mandibles 6-dentate.

From one female reared from a cocoon of *Aspidisca splendoriferella* on *Crataegus*, August 30, 1873, District of Columbia.

Type, Cat. No. 20458, U. S. Nat. Mus., the female on a tag, the head on a slide.

Most probably *albicoxa* which was described from a fragment.

Elasmus borrowi, new species.

Female.—Similar to *aspidiscæ* but the scutellum more narrowly yellow at apex, only the distal third of the hind coxa is white, the middle coxa is black, the middle and caudal femora also except at each end; and the abdomen bears three metallic cross-stripes on the dorsal orange between the basal sixth and the distal third, the first longest, as long as the basal metallic and joined to it except laterad making two orange dots in a line on the margin, the other two subequal and separated by orange stripes which are nearly as long as themselves. Funicle joints over twice longer than wide. Mandibles 6- and 7-dentate.

One female, District of Columbia, October 5, 1879.

Type, Cat. No. 20459, U. S. Nat. Mus., the female on a tag, the head on a slide.

Isodromus abnormicornis, new species.

Female.—Somewhat smaller than *pulcher* and differing from it generically in that the antennæ bear a large ring-joint as in the Pteromalidæ (besides the extremely short one usually present), the funicle 5-jointed; also the teeth of the mandibles are spreading and larger, the middle the largest; the marginal vein is slightly longer than wide, the postmarginal only somewhat shorter than the stigmal, hence rather long.

Pale lemon yellow, the vertex and dorsal thorax orange yellow, the wings with a smoky band across from the side of the stigmal vein (but faint caudad). The following black parts: Face of pronotum, caudal margin of same except laterad (sometimes) mesal half of each axilla (brown), (sometimes) distal half of scutellum (brown), propodeum, mesopleurum and distal half of the abdomen; also the hind tibiæ. Tarsi white. Head densely, finely punctate, the dorsal thorax densely scaly and with moderately dense pubescence, the axillæ with a carina between them, the propodeum with three rather widely separated carinæ at the meson. Lateral ocellus just not reaching the eyes. Ovipositor free for its distal half, its valves apparently absent, the abdomen blunt at apex (tipped by the valves in *pulcher*). Funicle 1 subequal to the pedicel, somewhat longer than wide, 5 distinctly wider than long. Caudal tibial spur single, long and slender as in *pulcher*. Face not inflexed, the head lenticular, longer than wide (quite as in *pulcher*). Frons moderate.

The male is similar but the wings are hyaline, the cephalic third of the mesopleurum is yellow, the legs white except the purple hind tibiæ at base broadly and a little beyond the middle. Also the antenna is less capitate, the funicle filiform, its joints subequal, all a half longer than wide. Type of *pulcher* compared.

From several pairs reared from *Icerya brasiliensis*, Sao Paulo, Brazil (A. Hempel).

Types, Cat. No. 20606, U. S. Nat. Mus., two pairs on separate tags and a slide bearing male and female heads, female hind tibiæ, and a female fore wing.

Sympiesis marilandica, new species.

Female.—Somewhat of the same stature, etc., as *Sympiesis guttatipennis* but differing from the type of that species as follows: The last two pairs of coxæ are white and the last two pairs of femora are only dusky in the middle laterad; the dorsal aspect of the basal half of the abdomen is lemon yellow except across the base (broadest), along the margins, along the median line very delicately, a faint cross-stripe a little out from the base of the yellow; the ventral aspect is similarly yellow but without the internal markings (thus the direct lateral line is yellow, that is, the narrow space between the lateral margins of ventral and dorsal aspect). Also the propodeum bears a narrow median carina and the parapsidal furrows are complete but very narrow sutures. Club with a terminal spicule. Mandibles 6-dentate.

One female, Glenn Dale, Maryland, September 17, 1916, from the woods.

Type, Cat. No. 20605, U. S. Nat. Mus., the female on a tag, the head and a hind tibia on a slide.

Cerchysius marilandicus, new species.

Female.—Of the stature, etc., of *elasmoceri* Ashmead but differing as follows: The ovipositor is extruded for a somewhat greater length (three-fourths that of the abdomen); their valves are slightly compressed but not broadly so; the hind legs are entirely concolorous except the first three tarsal joints and the apex of the tibiæ narrowly; the middle legs are brownish yellow except for a cinctus just below the knee and the coxæ; while the fore coxæ and femora (except broadly distad) are concolorous; the venation is black, the marginal vein somewhat shorter (about twice longer than wide), somewhat shorter than the postmarginal, the latter intermediate between the former and the stigmal (in *elasmoceri* the marginal is nearly as long as the stigmal, somewhat longer than the postmarginal);

the frons is moderate, that is slightly broader here, the scape has a moderate ventral dilation (slender in the other); the pedicel is subequal to funicle 1, which is somewhat over twice longer than wide (6 quadrate). Mandibles tridentate, the middle tooth somewhat the longest. A further difference is that in *elasmoceri* the scutellum is densely, finely punctate while here it is but scaly like the rest of the thorax. Propodeum transverse-quadrate, plane, a little longer laterad than at the meson. Eyes longer than the cheeks. Scrobes short, forming a semi-circle. Hypopygium absent or nearly, reaching to the middle of the abdomen only. Like the Australian species. Compared with type of *elasmoceri*. Head scaly, with traces of obscure punctures. Hind tibial spurs double.

One female, woods, Glenn Dale, Maryland, September 21, 1916.

Type, Cat. No. 20607, U. S. Nat. Mus., the female on a tag, the head, a fore wing, and a hind tibia on a slide.

Sympiesis argenticoxæ, new species.

Female.—Similar to *meteyri* Girault (types compared) but the abdomen is not reddish beneath, there is no indication of a second spot (proximad) on the fore wing, the last two pairs of coxæ are silvery white, the tarsi also white (so in *meteyri* but joint 4 is black), the legs otherwise reddish yellow except the concolorous first two pairs of femora and the first coxæ. Moreover, the scape is not dusky above and the propodeal spiracle is round instead of oval. Parapsidal furrows complete in both. No lateral carina on the propodeum, no spiracular sulcus. Mandibles 7-dentate.

One female, woods, Glenn Dale, Maryland, September 23, 1916.

Type, Cat. No. 20609, U. S. Nat. Mus., the female on a tag, a head and the hind tibiæ on a slide.

Pseudomphale texana, new species.

Female.—Like *microgaster* Say but segment 2 of the abdomen somewhat less than half the surface and sculptured as in *sardus*; funicle 3 subquadrate, somewhat smaller than club 1,

the pedicel long, nearly as long as funicle 1; mandible tridentate. Median carina of propodeum as in *fraterna*. Types compared.

One female, College Station, Texas, September (Banks).

Type, Cat. No. 20661, U. S. Nat. Mus., the female on a tag, the head on a slide.

Close to the West Indian *nigrocyanea* but that species has the distal two funicle joints much wider than long.

MISCELLANEOUS MUSCOID NOTES AND DESCRIPTIONS

By CHARLES H. T. TOWNSEND

Acroglossa hesperidarum Will.—*Cnephaliopterus ruficauda* T. is evidently a synonym of this species, and the genus *Cnephaliopterus* T. falls to *Acroglossa* Will. In spite of the discrepancy in Williston's description and figure as to the ocellar bristles, there seems to be no other species in the New England fauna that so perfectly fits otherwise in all the minute details.

Actiopsis, new genus.

Genotype, *Actiopsis autumnalis*, new species.

Differs from *Actia* in possessing the proboscis of *Siphonopsis*, in the arista being slender and curved, and the face more elongate. Differs from *Siphonopsis* not only in the obliteration of the fourth vein but in the other *Actia* characters. Differs from *Gymnophthalma* in proboscis characters besides the obliteration of fourth vein. The extended proboscis measures little over head-height to second geniculation, the rostrum being about same length as haustellum. The third section of proboscis, being the modified labella, is half to two-thirds as long as haustellum according to state of contraction, slightly stouter than latter when contracted, and is either flexed straight back or curled. In some specimens a faint hairline may be seen by transmitted light marking the obliterated course of fourth vein, showing the apical cell to have been originally closed or very narrowly open in tip of wing. First, third, and fifth veins bristly; first throughout, third halfway, fifth halfway to hind crossvein.

Actiopsis autumnalis, new species.

Length of body, 3.5 to 4.5 mm.; of wing, 3 to 3.5 mm. Twelve females on flowers of *Aster* sp. as follows: One, Great Falls, Maryland, October 30; the rest Grove Hill, Maryland, two on October 30, one on October 31, six on November 2, and two on November 7, 1916 (Townsend).

Dark brown, silvery to pale yellowish pollinose. Head yellowish in ground color, the parafrontals and occiput darker. Pollen of face, cheeks, orbits, and front silvery with a slight golden sheen. Frontalia brownish-rufous. Palpi and antennæ deep fulvous. Third antennal joint except base brown, arista brown. Thorax and scutellum brassy-gray pollinose. Scutellum fulvous on apex. Abdomen dark chestnut brown, thinly silvery, the narrow bases of last three segments more thickly pollinose. Legs brownish to brownish-fulvous, tarsi dark. Wings nearly clear. Tegulæ pale yellowish-white.

Holotype, Cat. No. 20795, U. S. Nat. Mus. Paratypes include TD5067, 5074-5.

Cordyligaster petiolatus (Wied.) Macq., 1843 (fig. of female).

Dexia petiolata Wied., 1830.

Cordyligaster petiolatus Rdi., 1848; Walker, 1849, List; Schiner, 1868.

Megistogaster fuscipennis Macq., 1851 (fig. of male).

Cordyligaster tipuliformis Walker, 1858 (probably immature or bleached specimen).

Cordyligaster petiolata Wulp, 1885; B. B., 1889-93; Brauer, 1897.

Eucordylidexia ategulata Towns., 1915.

Repeated comparisons of specimens with the figures and descriptions has convinced me of the correctness of the above synonymy. Strange as it may seem, it is evident that Wiedemann, Rondani, Schiner, Wulp, and Brauer have overlooked the aborted tegulæ of this remarkable form. In his description of *Megistogaster*, Macquart mentions the very small tegulæ. Walker mentioned them in the description of his *tipuliformis*, a specimen which I consider could not have been in mature or normal color. It is likely that *Megist. analis* Macq.,

1851, was a similarly abnormal specimen. The descriptions of Wiedemann and Macquart, and especially the figures of the latter, make it clear that both had this form with the aborted tegulæ. Brauer's, Wulp's, and Schiner's notes and Brauer & Bergenstamm's descriptions, as well as Walker's 1849 description, also positively indicate this form. Only Macquart, Walker, and Townsend have noted the atrophied tegulæ.

Eucordyligaster, new genus.

Genotype, *Cordyligaster septentrionalis* Townsend, 1909, Ann. Ent. Soc. Amer., II, 250.

Differs from *Cordyligaster* by possessing well-developed tegulæ of the normal type, petiole of abdomen much stouter, female abdomen proportionately not so swollen, male abdomen not strongly compressed and not more elongate than that of female, front wider, and male forceps and claspers heavier. Wings normally much less infusate.

Cordyligaster minuscula Wulp and *C. nyomala* Towns. both belong to this genus.

Siphoplagiopsis, new genus.

Genotype, *Siphoplagiopsis similis* new species.

Differs from *Siphoplagia* as follows: Proboscis fully extended only a little exceeding the head height in length. Anal segment of female abdomen projected obliquely downward and backward, truncate-conical in form, more or less polished above, normally with pollen only at base, with few hairs and normally no macrochætæ, thus markedly contrasted with the other segments in vestiture as well as in form. Larvipositor telescoped, ending in two spatulate lobes, large, laterally compressed, projected downward from anal segment. First vein spined throughout, third nearly to end, fifth with none to four scattered bristles on or near base. In some cases the anal segment is almost wholly pollinose except the hind border and the microchætæ are almost as well developed as on the other segments; in other cases, macrochætæ are represented by two to four longer bristly hairs in an arcuate discal row; in all cases, marginal macrochætæ are lacking on anal segment.

Siphoplagiopsis similis, new species.

Length of body, 8 to 9 mm.; of wing, 5 to 5.5 mm. Fifteen females on flowers of *Aster* sp., Grove Hill, Maryland, October 30 to November 2, 1916 (Townsend); one male and one female, Bladensburg, Maryland, September 16, 1915 (R. C. Shannon), being respectively TD4566 and 4565.

Black, with silvery to golden pollen. Head golden; occiput, humeri, and pleuræ brassy. Facial plate silvery-white. First two antennal joints rufous. Palpi fulvous. Mesoscutum and scutellum thinly brassy pollinose. Abdomen with brassy-silvery pollen on intermediate segments, base or more of anal segment brassy pollinose. Ground color of abdomen, often shining through pollen, is polished black; that of anal segment often with a purplish tinge. The broad hind margins of intermediate abdominal segments, though revealing pollen in oblique view, normally appear shining black. Wings clear, yellowish on costobasal area. Tegulæ white.

Holotype, Cat. No. 20796, U. S. Nat. Mus., female. Allotype, male.

Erythroargyrops, new genus.

Genotype, *Erythroargyrops elegans*, new species.

Differs from *Argyreomyia* as follows: Male. Eyes practically bare, with only indistinct scattered hairs. No proclinate orbitals; only one reclinate, being the hind one and more approximated to vertex. Outer vertical about half as long as inner, which is weak. Frontalia not widened in the silvered posterior area. All macrochætæ weaker, but those of body longer. Hind laterals of scutellum extremely long, apical hair-like. No discals on abdomen, not even on anal segment. Median marginal of first segment hairlike, that of second segment strong. Third and anal segments with marginal row. Apical cell narrower, ending but little before wingtip.

Erythroargyrops elegans, new species.

Length of body, 8.5 mm.; of wing, 7.5 mm. One male, Huascaray Ridge, Province of Jaen, Peru, 7,000 feet, September 21, 1911 (Townsend).

Head silvery-white burnished. Mesoscutum burnished silvery-blue. Antennæ brown or black. Palpi rufous. Cheeks with a bluish-silvery pollen. Pleuræ bluish-silvery. Lateral edges of postsutural mesoscutum blackish. Scutellum blackish, with chocolate pollen, showing slightly bluish on edges. Abdomen rufous throughout, almost orange-red, only the median triangle of first segment and median vitta of second segment dark brown. A faint brown median vitta on third segment, but only the faintest trace of one on anal segment. Legs brown to blackish. Wings lightly fuscous, costal border more deeply tinged, anal angle less so. Tegulæ deep shining translucent-fulvous, the front angle of lower scale whitish; upper scale glassy, transparent.

Holotype, Cat. No. 20797, U. S. Nat. Mus.

Hemiargyra hauscaraya, new species.

Length of body, 7 to 9 mm.; of wing, 6.5 to 8 mm. Five males. Huascaray Ridge, Province of Jaen, Peru, 7,000 feet, September 21, 1911 (Townsend).

Differs from *H. nigra* T. as follows: Front broader; frontalia narrower, their width in middle being one-fourth to one-third of one parafrontal. Only one reclinate orbital bristle. Outer vertical bristle much stronger, well developed. Scutellum wholly black. Abdomen black, with thin coat of silvery pollen which is accentuated only on narrow bases of last three segments, is thinnest on sides of posterior portion of segments, and has a yellowish luster, especially on anal segment. A deeper yellowish luster of pollen can be seen also as a very thin layer on mesoscutum and scutellum in very oblique view. Tegulæ smoky-fulvous, translucent.

Holotype, Cat. No. 20798, U. S. Nat. Mus.

Xiphomyia, new genus.

Genotype, *Xiphomyia gladiatrix*, new species.

Differs from *Spathimyia* as follows: Female. Body and head wider. No ocellar bristles, only fine hairs in their stead. Facialia bare. Eyes bare. Palpi much enlarged apically, club-spatulate. Face widening at a greater angle than front. Fron-

talia narrower, hardly half as wide as one parafrontal. Two to four reclinate orbitals. Parafacials wider below, scarcely narrowed from the upper width. Four postsuturals. Hind scutellar bristles not so long. No discals on second or anal segments, only a short weak pair of discals on third segment. Piercer of extraordinary length, reaching forward to middle coxæ when unsheathed. Larvipositor half as long as piercer. Tarsi stout, no longer than tibiæ. Hind femora with row of bristles on lower outer edge, as well as on upper. Wings proportionately shorter. Tegulæ large.

Xiphomyia gladiatrix, new species.

Length of body, 8 mm.; of wing, 6 mm.; of piercer, 5 mm. One female, Cabima, Panama, May 17, 1911 (A. Busck).

Differs from *S. ferox* T. in coloration only as follows: Whole face and front deep golden. Palpi brown, lighter apically. Mesoscutum golden, with four black vittæ, the inner pair shorter. Scutellum golden pollinose, with narrow black base. Less than basal half of last three abdominal segments brassy-silvery pollinose; no interruption of pollen on the median line. Fuscous of wings slightly more diffused. Tegulæ nearly white, with only a faint tawny tinge.

Holotype, Cat. No. 20799, U. S. Nat. Mus.

The three genera *Xiphomyia*, *Spathimyia*, and *Incamyia* form a compact group of tropical American flies with exaggerated piercer, evidently to be referred to the family Dexiidae (Minthoidæ and Pseudodexiidae, syns.), and subfamily Macquartiinæ.

Hemithrixion oestriforme BB.—The characterization fits *Coquillettina plankii* Walt. perfectly. Walton's species is probably distinct, but congeneric with *oestriforme*. If the character of the obliterated fourth vein prove inconstant, *Euacemyia* will fall to *Hemithrixion*.

Xanthomelanodes arcuata Say.—*Wahlbergia atripennis* Towns. (nec *Phasia* id. Say) is a synonym of this species.

Xanthomelanopsis, new genus.

Genotype, *Xanthomelanodes peruanus* Townsend, 1912, Proc. U. S. Nat. Mus., XLIII, 302.

Differs from *Xanthomelanodes* as follows: Apical cell narrowed, closed in tip of wing. Apical crossvein bent in, not parallel with hind crossvein. Face and front narrower, parafacials narrower. Third antennal joint longer. Palpi longer and larger. Macrochætæ absent from middle of first abdominal segment in both sexes, and from anal segment of female.

Erythrophasia, new genus.

Genotype, *Erythrophasia atripennis*, new species.

Differs from *Trichiopoda* as follows: Female. Face much narrower, only a little widened from front. Frontalia but slightly widened anteriorly, the front at base of antennæ only a little wider than at vertex. Facialia not broadened, no bristles below vibrissæ. Abdomen cylindrical, not widened at base. Lobes of ovipositor terminating in a sharp clawlike spur. Hind tibiæ not ciliate. Wings narrow, apical cell petiolate, cubitus arcuate, hind crossvein farther from cubitus.

In general appearance and characters the genus agrees closely with *Xanthomelanodes*, with which it is very apt to be confused. It differs in the wider head, lack of macrochætæ on abdomen, wider frontalia, and the spurlike termination of ovipositor lobes.

Erythrophasia atripennis, new species.

Length of body, 8 mm.; of wing, 6 mm. One female, White Springs, Florida, October 17, 1908, on flowers of *Euthamia* sp. (Mrs. C. H. T. Townsend). It is practically certain that this is the long-lost *Phasia atripennis* Say, 1829, Compl. Writ., II, 363-4 (nec *Wahlbergia atripennis* Towns., 1891, Proc. Ent. Soc. Wash., II, 145-6, which see above).

Differs from Say's description of *Phasia atripennis* only as follows: The face, parafrontals, and orbits are silvery-white pollinose, laid over a pale yellowish ground-color except on occiput, which is blackish. Say's specimen was very probably greased, revealing the ground color and giving a golden sheen to the pollen, as is the case at this date on the left side of head of present specimen. The very narrow hind margins of all the abdominal segments are distinctly whitish pollinose. The

squamula and front half of squama are white rather than yellow. Agrees with description in having abdomen wholly ferruginous or rufous, with no black on median line or tip. Say's description applies so closely that I feel practically no doubt in the identification. But in order to avoid all future doubt as to the identity of the present genus, the species is described as new.

Holotype, Cat. No. 20800, U. S. Nat. Mus., TD499.

The holotype was opened in 1908 and the eggs removed. The latter are elongate, elliptical, fully two and one-half times as long as wide, thick, slightly flattened on one side, thus unlike those of *Trichiopoda* and *Xanthomelanopsis*.

Phorantha fenestrata Bigot.—*Phorantha bridwelli* Hine and *Phasia phasiatrata* H. E. Smith are synonyms of this species. The species appears to be, at least on the female, a true *Phorantha*, in which case *Paraphasia* falls to that genus.

Imitomyia sugens H. Loew.—*Saskatchewania canadensis* H. E. Smith is the long-lost *Himantostoma sugens* of Loew. The species seems to have become very scarce in the southern part of its original range, if it has not died out altogether there.

LITHOHYPODERMA, A NEW FOSSIL GENUS OF OESTRIDS

By CHARLES H. T. TOWNSEND

In 1877 Scudder, in the Bulletin of the U. S. Geological and Geographical Survey of the Territories, III, 756-8, described certain fossil muscoid maggots found by Mr. W. Denton in the White River shales of the Chagrin Valley, Colorado. Several forms were distinguished and names proposed for four of them, the most abundant form being named *Musca ascarides*. In 1890, in the Tertiary Insects of North America, 551-4, Pl. 5, Scudder quoted the original descriptions of these forms and figured them.

The United States National Museum collections contain a large series of these fossil maggots. The best of them are from the Roan Mountains, Colorado, collected by Scudder, and from

Hay Gulch, Colorado, collected by Mr. D. E. Winchester. In 1908 I examined the Roan Mountains material without being able to come to any definite conclusion as to the affinities of these maggots, other than that they were probably muscoid.

In 1916 Cockerell, in the Proceedings of the U. S. National Museum, LI, 91-2, Pl. 2, referred *Musca ascarides* to *Hypoderma*, gave additional details of its characters and figured it. He examined additional material from the Green River shales of eastern Utah. Credit is due him for first recognizing the undoubted œstrid affinities of this maggot. I have now made a careful study of the National Museum material, in the light of Cockerell's findings, and am forced to the conclusion that the form is markedly distinct from *Hypoderma*. The characters of the new genus can be well set forth in the maggot and puparium, and the genus may be advantageously recognized at this time.

Lithohypoderma, new genus.

Genotype, *Musca ascarides* Scudder, 1877, Bull. U. S. Geol. & Geogr. Surv. Terr., III, 756-7; and 1890, Tert. Ins. No. Amer., 551.

Differs from *Hypoderma* in the third-stage maggot possessing six subcircular spinuliferous pads on dorsal surface of intermediate segments, arranged as follows: Two pads occupy center of hind portion of segment, with two similar ones on each side a little in advance of the central pair, the six disposed in an irregular transverse band. These are figured by Cockerell, but are more nearly circular than shown in his figure. In front of the central pair is a transversely elongate pad bearing similar minute spines, which does not appear in Cockerell's figure. The segments bear in addition narrow transverse areas of small spines along hind margin, as in *Hypoderma*. The small polished dorsal tubercles of *Hypoderma*, two in middle and one on each side of segment, appear to be absent. Heavy short flattened spines with broad bases appear on the anterior segments, as in *Hypoderma*. The anal stigmata are of the same general plan as those of *Hypoderma*, but the sculpture is finer, the button is smaller, and the lines radiating from

the button appear to be absent. The cephalopharyngeal skeleton shows well in numerous specimens as a V-like mark with the hypostomal sclerite wedged in the base of the V. The details can not be made out satisfactorily, owing to the pressure that has been exerted on the skeleton, massing the sclerites together and distorting or obscuring their outlines. The pharyngeal sclerites are well elongated, and the hypostomal heavy. The two mandibular sclerites appear to be elongate, sharp, and nearly straight.

The pupa is distinguished from that of *Hypoderma* by the strongly tuberculate lateral borders, as photographed and figured by Cockerell.

The examination of the shales in the National Museum collection shows that anal stigmatal plates and cephalopharyngeal skeletons are numerous represented and scattered in various places among the remains. There are a few excellently preserved specimens of nearly the whole maggot. In at least two specimens of the latter, one being both figured (fig. 4) and photographed (fig. 6) by Cockerell, the two main tracheal trunks can be very clearly seen, and even the delicate spirals of chitin which supported the tracheal walls in life are plainly visible and perfectly preserved. In numerous cases the chitin of the maggot integument and puparium is preserved in the shales unchanged since the Eocene, during the lapse of a period of time probably not less than two million years.

It seems safe to assume that *Lithohypoderma* was a subcutaneous bot of some North American Eocene bovine, most probably the ancient progenitor of the modern bison. The large numbers in which the bots occur in the shales is easily explained by their dropping from the host at places where the latter congregated to water.

A PSYCHOLOGICAL LOCALITY

BY HARRISON G. DYAR

Some years ago I was asked by Sir George F. Hampson, of the British Museum, for my opinion of the identity of a white *Memileuca* which was being studied by Mr. J. H. Watson, of Manchester, England. I considered it to be the same as *H. neumogeni* of Arizona. However, Mr. Watson was not of my opinion and named the form as a species, *H. burnsi*, after the collector. The principal difference found consisted of the traces of hyaline discal spots in *H. neumogeni* which are absent in *H. burnsi*. I did not consider this an important difference; but when it was shown that the two forms apparently came from different faunal regions I was obliged to yield the point. *Neumogeni* is from Arizona, in a sagebrush country; *burnsi* is described from Truckee, California, in the pine forest. In Packard's Monograph (Mem. Nat. Acad. Sci., xii, part 1, 124, 1914), Dr. McDunnough enlarges on the supposed differences and gives the locality of *burnsi* as "Truckee Pass, Cal., 7,000 feet."

So the names would have gone down in history, except that recently I had the pleasure of a personal meeting with Mr. Burns, the collector, in Reno, Nevada. Our talk naturally drifted to his namesake, *burnsi*, and I inquired what was the food-plant of this strange *Hemileuca*, so unexpectedly at home in the boreal climate of Truckee. He replied: "It does not occur in Truckee. I take the larvæ right here in Reno on sagebrush." Further conversation developed the fact that the locality sent out by Mr. Burns had been "Truckee Basin," and here was where geography and psychology began their work.

The geography is this: The snows of the Sierras form on the east of the divide, a great lake in California, known as Lake Tahoe. It is at an altitude of 6,000 feet and has an outlet in a considerable stream, known as the Truckee River. This stream runs down into the arid plains of Nevada and ends, by evaporation, in a sink called Pyramid Lake. The Southern

Pacific Railroad, going west, strikes the Truckee River just above its end in Pyramid Lake and follows it through Reno and into California to the town of Truckee, where it leaves the river and plunges up the mountains to the summit. So much for the geography.

Now the psychology comes in. Mr. Burns should have given the locality as "Reno, Nevada;" but he evidently sought to improve a little on that, as befitted the importance of his discovery, and he invented the more general locality of "Truckee Basin," meaning the basin of the Truckee River as it flows through the sagebrush plains around Reno. Now "Truckee Basin" cannot be found on any map, and no one ever heard of the Truckee River; but the town of Truckee, California, is known to all as the place where you change cars to go to Lake Tahoe and familiar to entomologists by the name of McGlashan and his early discoveries. So Truckee, California, it must be, and the elevation was easily secured from the railroad folder and added—5,819 feet. But wait, here is something else. There is another word on the label after "Truckee" that looks like "Basin;" but that must be an error. What should it be? Why "Pass," of course; "Truckee Pass." And now we must increase the elevation by a thousand feet or so, say 7,000 feet in round numbers, corresponding with the elevation of the "Pass" above Donner Lake where the railroad goes through.

So, there we have *H. burnsi*, brought by a psychological process from the sagebrush plains of Reno, at 4,500 feet, to the summit of the Sierras at the old pass above Truckee where the Donner pioneers met such a tragic fate half a century or more ago among the inhospitable, pine-clad slopes of the great Sierras, and all this done without the knowledge of the insects in question. The poor *Hemileucas* never could live up there.

To return to prose. The locality of *H. burnsi* should be Reno, Nevada, and it should be classed as not more than a variety of *H. neumoegei*, inhabiting the same faunal region.

FURTHER NOTES ON SYRPHIDÆ

BY FREDERICK KNAB

Baccha fuscipennis Say.

This species was discussed by the writer in the last issue of this journal, page 92. In this connection should have been considered Loew's *Baccha lugens*, which, it seems, systematists have found much trouble in differentiating from *fuscipennis*. The reason for this difficulty lies in the fact that *lugens* was described from an immature specimen of *fuscipennis*. A number of such specimens before me answer perfectly to the description of Loew. The clear spots in the centers of the wing-cells appear to have been considered diagnostic for *lugens*, and this, precisely, is what is to be found in immature specimens of any species with infuscated wings. Freshly emerged specimens first show signs of pigmentation in a pale gray tint along the veins, this tint gradually becoming darker and spreading into the cells. When the coloring process is well advanced but still incomplete, we have the condition described by Loew for *lugens*—a dark wing with clear spots in the centers of the cells; with time these clear spots, too, assume the general dark tint.

This coloring process is beautifully illustrated in a series of reared specimens of *Ocyptamus latiusculus* Loew from Porto Rico in the national collection. This series contains all intergrades, from the very recent specimens with narrow streaks along the veins to the mature ones with uniformly tinted wings.

To the synonymy of *Baccha cylindrica*, page 91, should be added *Syrphus peas* Walker, 1849, List Dipt. Brit. Mus., pt. 3, p. 590. Although no locality is given, the identity is made certain by the indication of the contrastingly black and yellow femora.

Ocyptamus simplex (Loew).

Syrphus simplex Loew, Wien. Ent. Monatschr., v. 5, 1861, p. 40.

Syrphus simplex Loew, Centuries, vi, 1865, no. 43.

Syrphus simplex Williston, Synopsis N. A. Syrph., 1886, p. 87.

Originally described from a Cuban specimen and later reported by Williston from Santo Domingo. The latter specimen

is before me, and, like the type, is a female. The male remains unknown. Williston merely published a translation of Loew's description without further comment and it is remarkable that the relationship should have escaped him. While slightly larger and more robust than most species of *Ocyptamus*, it shows all the characteristics of the bacchine series. The frons of the female is narrow and converges evenly to the very narrow vertex. The face is flat, receding, and with a small rounded tubercle. The mouth-opening is narrow and the eyes crowd the cheeks to a narrow strip. With this is to be contrasted the typical *Syrphus*, with broad frons in the female, prominent face shallowly excavate below antennæ and with prominent tubercle.

It is doubtful that any *Syrphus* in the modern sense occur in the Antilles, the genus being one that has developed in boreal and temperate latitudes. The Bacchini, on the other hand, are of tropical origin and represented by but few species in our temperate zone. I do not doubt that all the species of Antillean origin described under *Syrphus* will ultimately prove to belong with the Bacchini. As to the status of the genus *Ocyptamus*, I quite agree with those authors who would fuse it with *Baccha* and at present retain it merely for convenience, pending a readjustment of generic values within the group.

Volucella and Phalacromyia.

On page 94 of the paper already referred to, in discussing *Volucella incommoda*, new species, the writer inadvertently reversed the characteristics of the genera *Volucella* and *Phalacromyia*. The error can be remedied by inserting in the line before the last, after the word "specimen," the words "falls into *Volucella*, while the others." The invalidity of *Phalacromyia* was already indicated by Josef Mik many years ago.¹ He found that of the specimens of *Volucella vaga* Wied. in the von Roeder collection part had the marginal cell of the wing open while others had it closed. I can confirm this observation from three specimens in the national collection. Of these,

¹Wien. Ent. Zeit., vol. 2, 1883, p. 284.

one female has the marginal cell open while another female and a male have this cell closed.

In the Ohio Naturalist, vol. 14, 1914, p. 340, Prof. Jas. S. Hine suggests that *Volucella ardua* Wied. might be a synonym of *V. tympanitis* Fabricius. I was inclined to the same view until I saw the paper by Mik quoted above. There the statement is made that the type of *ardua* (a female) is a *Phalacromyia*, in other words, has the marginal cell open. In five specimens of *tympanitis* before me, all females, the marginal cell is closed. The two species should therefore be held apart, at least until definite proof is forthcoming that the same variability occurs that has been indicated for *vaga* and *incommoda*.

SOME NEW AMERICAN HYMENOPTERA

By J. C. CRAWFORD

Below is given a table of the American genera, exclusive of *Calioxys*, assigned by Ashmead to his subfamily Cœlioxyinæ. As Prof. Cockerell has long ago pointed out, these are not all closely related and must be split up into several groups, so my table is one of convenience only.

Of the genera tabulated, *Dioxys* and *Neopasites* are closely related and the group easily recognized by the bidentate mandibles. *Neolarra* and *Phileremulus* are related and characterized by the narrow stigma and the very short marginal cell. The American species referred to *Phileremus* are, I think, not that genus and are true Epeolines with only two cubital cells. *Oreopasites* is unknown to me, but from the description it appears to be somewhat closely related to the true *Phileremus*. *Holcopasites* stands by itself and the coarse sculpture and rostriform labrum distinguish it from the other American genera. *Townsendiella*, new genus, also stands alone, in general habitus curiously resembling the *Neolarra* group.

TABLE OF GENERA

- | | |
|-------------------------------------|----|
| 1. Mandibles bidentate at apex..... | 2. |
| Mandibles acute at apex..... | 3. |

2. Metanotum medially spined; labrum rostriform.....*Dioxyx* Lep.
 Metanotum not spined; labrum not rostriform....*Neopasites* Ashm.
3. With one cubital cell and one recurrent vein.....*Phileremus* Ckll
 With two cubital cells and two recurrent veins..... 4.
4. Marginal cell hardly longer than the very narrow stigma, the
 metacarpus almost wanting.....*Ncolarra* Ashm.
 Marginal cell long, stigma broad, metacarpus long..... 5.
5. First recurrent vein subinterstitial or received by the first cubital
 cell 6.
 First recurrent vein received by the second cubital cell far from
 base 7.
6. Labrum rostriform; claws toothed near apex or simple,
Holcopasites Ashm.
 Labrum short, not rostriform; claws of female cleft, flattened,
Townsendiella new genus.
7. First cubital cell much shorter than the second, labrum elongate,
Orcopasites Ckll.
 Cubital cells nearly equal or the first longer.....*Phileremus* Latr.

Neopasites cressoni, new species.

Male.—Length, 5 mm. Black, head coarsely, closely punctured, more coarsely so on clypeus, clothed with white plumose hairs, those on vertex brown; side margins of clypeus reflexed and produced above surface to a sharp edge, laterad of this a smooth foveate space; mandibles red at apex; labrum rugose, medially near base with a short spicule; antennæ short, subclavate, 12-jointed, scape very short; labial palpi 4-jointed, joint 1 about as long as 2+4 combined, 2 slightly longer than 3+4; 4 twice as long as 3; maxillary palpi 3-jointed, first a mere tubercle, second and third subequal in length; third segment with a long large bristle at apex; vertex flattened; mesothorax closely, rather coarsely, punctured and with white plumose hair, that on disc of mesoscutum and on extreme anterior margin medially and on lobes of scutellum brownish; scutellum slightly bilobed; metanotum, sides of propodeum and pleuræ with pubescence dense; propodeum with a triangular rugose enclosed area extending into posterior face; the dorsal part of this enclosure rugose, with a very few of the rugæ longitudinal, the part on posterior face with much finer sculpture; below the enclosure the surface smooth, polished, sides of propodeum punctate; wings dusky, with a lighter area beyond second

cubital and second discoidal; tubercles and tegulæ reddish, legs black with white densely plumose hairs; knees and extreme bases and apices of tibiæ reddish, tarsi becoming somewhat reddish apically; claws toothed at base; abdomen closely punctured, the punctures almost as coarse as those on mesoscutum; apical margins of abdominal segments reddish; segments 2-4 with apical margins slightly emarginate medially; sixth segment with a pseudopygidium; abdomen with white densely plumose pubescence as follows: Sides of segments 1-6, apical margins of segments 1-2; a pair of spots on segments 3-5 extending to base of segment.

Type locality, La Quinta, California.

Type, Cat. No. 20830, U. S. Nat. Mus.

Described from one specimen collected by F. R. Cole and labeled 4.14.

Much smaller than *fulviventris* Cresson, from which it also differs in having the abdomen dark, first joint of flagellum only slightly longer than pedicel (it is twice as long in *fulviventris*), darker anterior and middle legs, etc.

Named in honor of Mr. E. T. Cresson, Sr.

Neopasites fulviventris Cresson.

When in Philadelphia recently I made a few notes on the type of this species which may aid in the identification of it. The mandibles are bidentate at apex; the labrum medially near base with a short spicule; scape very short, the relative lengths of the first few antennal joints can be expressed by the following figures: scape 11, pedicel 4, first joint of flagellum 8, second 5, third 4; first cubital very slightly longer than second; sixth abdominal segment with a pseudopygidial area.

Comparing these characters with the new species described shows that certain of them are generic instead of specific.

Dioxys martii Ckll.

The type, which is in the United States National Museum, is a male instead of a female as originally stated by Prof. Cockerell.

Townsendiella, new genus.

Mandibles simple, labrum triangular, wider than long; rear of occiput with a carina interrupted medially; labial palpi 4-jointed, the first joint over three times as long as the second and about twice as long as joints 2-4 combined; maxillary palpi 6-jointed, the first joint very short; the second longest; third and fourth subequal, shorter than second; fifth about half as long as fourth; sixth slightly shorter than fifth; tongue elongate, broadly linear, almost as long as the labial palpi; axillæ not toothed; scutellum slightly bilobed; marginal cell obliquely truncate at apex; first cubital cell one and one-half times as long as the second; first recurrent vein at base of second cubital cell (interstitial); second about one-third the length of second cubital cell from its apex; claws of female cleft, flattened.

Townsendiella pulchra, new species.

Female.—Length about 5.5 mm. Head and thorax black, abdomen red; head rather finely, closely punctured, the punctures on face crowded, those on clypeus becoming finer apically, the apical margin of clypeus smooth, reddish; labrum and mandibles, except apices, reddish; head covered with dense white, densely plumose pubescence, that on face above antennæ brownish; antennæ rather long, not thickened apically, reddish beneath; mesonotum closely punctured, covered with brownish plumose pubescence; pubescence on the margins of mesoscutum and of scutellum, that on metanotum, propodeum, pleuræ and a short median line on mesoscutum, together with two lateral lines at front of mesoscutum, white; propodeum with a delicate median carina; triangle at base of propodeum without pubescence and with an almost granular sculpture; tubercles and tegulæ reddish; wings dusky apically; veins brown, stigma darker; legs reddish, femora dusky at bases; coxæ brown; abdomen closely punctured, base of first segment and apical margins of first four segments with strong bands of appressed white pubescence; rest of surface of segments with short light golden hairs; fifth segment with apical margin smooth, brown; pygidial area sharply defined, broad, apex broadly rounded.

Type locality, Las Cruces, New Mexico.

Type, Cat. No. 20831, U. S. Nat. Mus.

Described from two females collected May 12, by Dr. C. H. T. Townsend, in honor of whom the genus is named, on flowers of *Dithyrea wislizeni*.

Phileremulus cockerelli, new species.

Female.—Length slightly over 3 mm. Head and thorax black, abdomen red, legs reddish, femora somewhat dusky at bases, coxæ darker; head rather coarsely and closely punctured, shiny, with white appressed pubescence, very dense on sides of face; clypeus finely closely, but faintly punctured, shiny, reddish apically; antennæ reddish, slightly darker above; mesoscutum and scutellum rather coarsely closely punctured; pleuræ, sides of mesoscutum and sides of scutellum with white densely plumose pubescence, that on rest of mesoscutum slightly brownish and not densely plumose; that on disk of scutellum brownish, more plumose than on mesoscutum; axillæ drawn out into long teeth; scutellum bilobed; metanotum with a strongly projecting, deeply bifid median process covered with white densely plumose pubescence; propodeum, except basal triangle, which has a strong median carina, covered with similar pubescence; apical margins of abdominal segments with bands of white plumose pubescence; apex of abdomen dusky.

Described from one specimen from Victoria, Texas, September 25, 1904, J. C. Crawford, collector.

Type, Cat. No. 20832, U. S. Nat. Mus.

Distinguished from *vigilans* and *nanus* by the strongly projecting, deeply bifid process on metanotum; *mallochi* has the clypeus rugoso-punctate, the coxæ and femora brown, pubescence of disk of mesoscutum white and densely plumose and the lateral margins of the clypeus strongly reflexed.

Named in honor of Prof. T. D. A. Cockerell.

Halictoides viridescens, new species.

Male.—Length, 5 mm. Head and thorax green, with white pubescence, dense on clypeus and below antennæ; propodeum black, abdomen brown, apical margins of segments 1–6 hyaline;

face with rather coarse well-separated punctures, closer above, those of clypeus finer and closer; clypeus not produced, the face below antennæ therefore very short; antennæ reaching about to posterior margin of tegulæ; scape very short, subglobose; first joint of flagellum only slightly longer than wide; second joint slightly longer than first; third slightly shorter than second; following joints subquadrate, subequal, nodose, the last slightly longer; apical end of second joint of flagellum reaching to anterior ocellus; mesoscutum with rather fine punctures separated by about a puncture width; propodeum with parallel longitudinal rugulæ; tegulæ and tubercles with a reddish spot; wings slightly dusky; veins honey color, the stigma along anterior margin and subcosta brown; femora and mid tibiæ somewhat thickened; hind tibiæ slightly thickened, broadest about the middle; first joint of hind tarsi flattened, rather broad; joints 2-4 of hind tarsi produced on one side; abdomen sparsely, rather coarsely punctured; fourth ventral segment with a slight elevation on each side near apical margin bearing a short slender spicule pointing inward; sixth sternite without processes, but deeply angularly emarginate on the sides, produced medially almost to a point and with a hyaline margin at apex.

Described from one specimen labeled "Los Angeles Co., Calif., collection Coquillett."

Type, Cat. No. 20833, U. S. Nat. Mus.

Easily distinguished by the greater amount of green color; from *oryx* by the much shorter antennæ, the subglobose scape, etc.; from *mulleri* by the less thickened legs, the less produced hind tibiæ, the shape of the scape, etc.

Cothonaspis gillettei Washburn.

Pseudeucoila gillettei Washb.

Trybliographa gillettei Ashm. Mss.

Eucoila anthomyia Ashm. Mss.

Although this species has been referred to in economic literature several times it was never described by Ashmead and the name must be credited to Washburn, Eleventh Report State Entomologist of Minn., 1906, frontispiece, fig. 7.

Genus FIDIOBIA Ashmead

The original description of this genus must be amended somewhat; the frons is not always smooth; the antennæ are 9-jointed in the female, the funicle being 4-jointed; the mesonotal furrows are visible posteriorly but are shallow wide gashes; the propodeum has two carinæ instead of foveolæ.

The new species described below is strictly congeneric with the genotype but is larger and its characters more easily discernible.

Fidiobia rugosifrons, new species.

Female.—Length, 0.8 mm. Black, antennæ, except the brown club, and legs, reddish testaceous; head and mesonotum with rather coarse almost thimble-like sculpture; scutellum smooth, polished; propodeum with two carinæ; apical margin testaceous and carinate.

• Type locality, Montoursville, Pennsylvania.

Type, Cat. No. 20786, U. S. Nat. Mus.

Described from two females with the additional data, "reared from egg in wheat stubble, P. R. Myers, Coll., emerged April 17, 1916."

Very similar to *flavipes* Ashm. but larger, more coarsely and strongly sculptured, the head completely covered with sculpture as is mesonotum except for broad furrows.

Microdontomerus fumipennis, new species.

Female.—Length, 3 mm., ovipositor about 1.25 mm. Differs from *anthonomi* by its bluer color, the face more produced below, first joint of funicle subquadrate instead of transverse, antennæ darker in color, wing distinctly dusky with a darker area back of stigmal vein; veins dark brown (instead of honey color); hairless line along postmarginal vein less distinct, extending only as far as point of stigmal knob instead of to apex of vein, and with some hairs along anterior side of stigmal vein; point on stigmal knob longer than width of knob instead of shorter.

Male.—Length about 2 mm. Agreeing with the female except for secondary sexual characters.

Type locality, Maxwell, New Mexico.

Described from a series reared from *Malacosoma fragilis* by D. J. Caffrey under Bureau of Entomology, Maxwell No. 16177.

Type, Cat. No. 20823, U. S. Nat. Mus.

Genus PTINOBIUS

P. dysphagæ Girault, known from the male only, appears to be *magnificus*.

TABLE OF FEMALES

- | | |
|---|----------------------------|
| 1. Propodeum covered with thimble-like punctures... | <i>magnificus</i> Ashm. |
| Propodeum smooth, polished..... | 2 |
| 2. Wings with a dusky band from near base of marginal to apex of stigmal | <i>californicus</i> n. sp. |
| Wings with a dusky band from base of marginal almost to apex of wing; a hyaline band, interrupted medially, across wing on apical three-fourths of marginal vein..... | <i>texanus</i> n. sp. |

Ptinobius californicus, new species.

Female.—Length about 3 mm. Dark green with varying shades of blue and purple especially on abdomen; face with fine crowded shallow punctures, rear of head with delicate irregular rugulæ; scape testaceous, dark at apex; flagellum brown; pronotum and mesonotum irregularly reticulated; median elevation of metanotum smooth; propodeum smooth, polished, with a row of pits at base and a strong median carina; wings subhyaline with a dusky band across forewing extending from just beyond base of marginal vein to apex of stigmal vein; postmarginal slightly less than half as long as marginal; stigmal somewhat shorter than postmarginal; coxæ and hind femora greenish, rest of legs reddish testaceous, fore and mid tibiæ with a violaceous sheen; abdomen with delicate rather large reticulations.

Described from one specimen from Los Angeles, California.

Type, Cat. No. 20820, U. S. Nat. Mus.

Ptinobius texanus, new species.

Female.—Length, 3.5 mm. Bronzy green, head and thorax rather finely reticulated with raised lines; antennæ reddish,

pedicel and club brown; first, second and third joints of funicle about as long as wide; fourth slightly longer than third; metanotum medially smooth, polished; propodeum with a median carina, with a basal row of pits and one along each side of median carina and a row replacing lateral folds; between these latter smooth; anterior half of mesopleuræ reticulated; posterior half smooth, polished, except below where a narrow line of reticulations extends almost across smooth portion from anteriorad; below this a few horizontal striæ; metapleuræ faintly reticulated; stigmal vein almost as long as postmarginal, the latter about three-fourths as long as marginal; legs, including coxæ, reddish-testaceous; posterior coxæ bronzy green, mid coxæ with an outward tinge of this color; mid tarsi and an annulus near base of hind tibiæ whitish; basal joint of hind tarsi dusky; forewings from base of marginal vein almost to apex of wing dusky and with dark cilia; a hyaline band from near base of marginal to base of stigmal, interrupted medially, extends across wings; extreme apex of wing hyaline; hind wings hyaline; stigmal vein almost as long as postmarginal; hind tibiæ exteriorly with a mid longitudinal row of small white spines and another row at rear; first abdominal segment smooth, rest of segments, except smooth apical margins, reticulated; first segment short; second and third segments shorter than first; fourth longer than second and third, its apical margin gently emarginate; fifth as long as second, third and fourth; sixth slightly shorter than fourth.

Male.—Length, 2.2 mm. Similar to male, except in secondary sexual characters, but blue-green in color; sculpture of head and thorax more delicate; wings hyaline; stigmal vein over half as long as postmarginal; all coxæ metallic blue-green; fore and mid femora and all tibiæ brown, with a slight metallic tinge; hind femora green; tarsi brown; no annulus on hind tibiæ.

Type locality, Dallas, Texas. Reared from *Otidocephalus carinicollis*.

Other localities: Victoria, Texas, from *Trichobaris texana* (J. D. Mitchell coll.), and from *Aræocerus fasciculatus* (Hallettsville, Texas).

Type, Cat. No. 20821, U. S. Nat. Mus.

P. magnificus, female, is much larger; its sculpture is more thimble-like; the metanotum is finely reticulated medially; the propodeum is covered with thimble-like punctures and without a row of pits along median carina; mesopleuræ and metapleuræ covered with strong reticulations; all coxæ green; rest of legs light ferruginous; hind tibiæ with medial spines not arranged in a straight row and toward apex of tibiæ often three abreast; hind femora beneath apically with a few short blunt teeth; hyaline band on forewing complete; stigmal vein short, about one-fourth as long as postmarginal, the latter about three-fourths as long as marginal. The male of *magnificus* has the spines on hind tibiæ as in the female and the stigmal vein is less than half as long as postmarginal.

Perilampus chrysopæ var. *lævicephalus*, new variety.

Female.—Length, 2 mm. Differs from *chrysopæ* in being blue, the mesonotum somewhat blue-green, the antennæ darker, being reddish only at tips; the face with the wrinkling above antennæ almost obsolete; the tibiæ entirely bluish, except that the anterior and middle have a little light color at apex.

Male.—Length, 2 mm. Resembles the female except that the face is more distinctly wrinkled, not as distinctly as in *chrysopæ* nor do the wrinkles extend downward so far, being obsolete below upper third of scape.

Described from 2 females and 1 male reared at the California State Insectary from *Chrysopa californica*.

Type, Cat. No. 20822, U. S. Nat. Mus.

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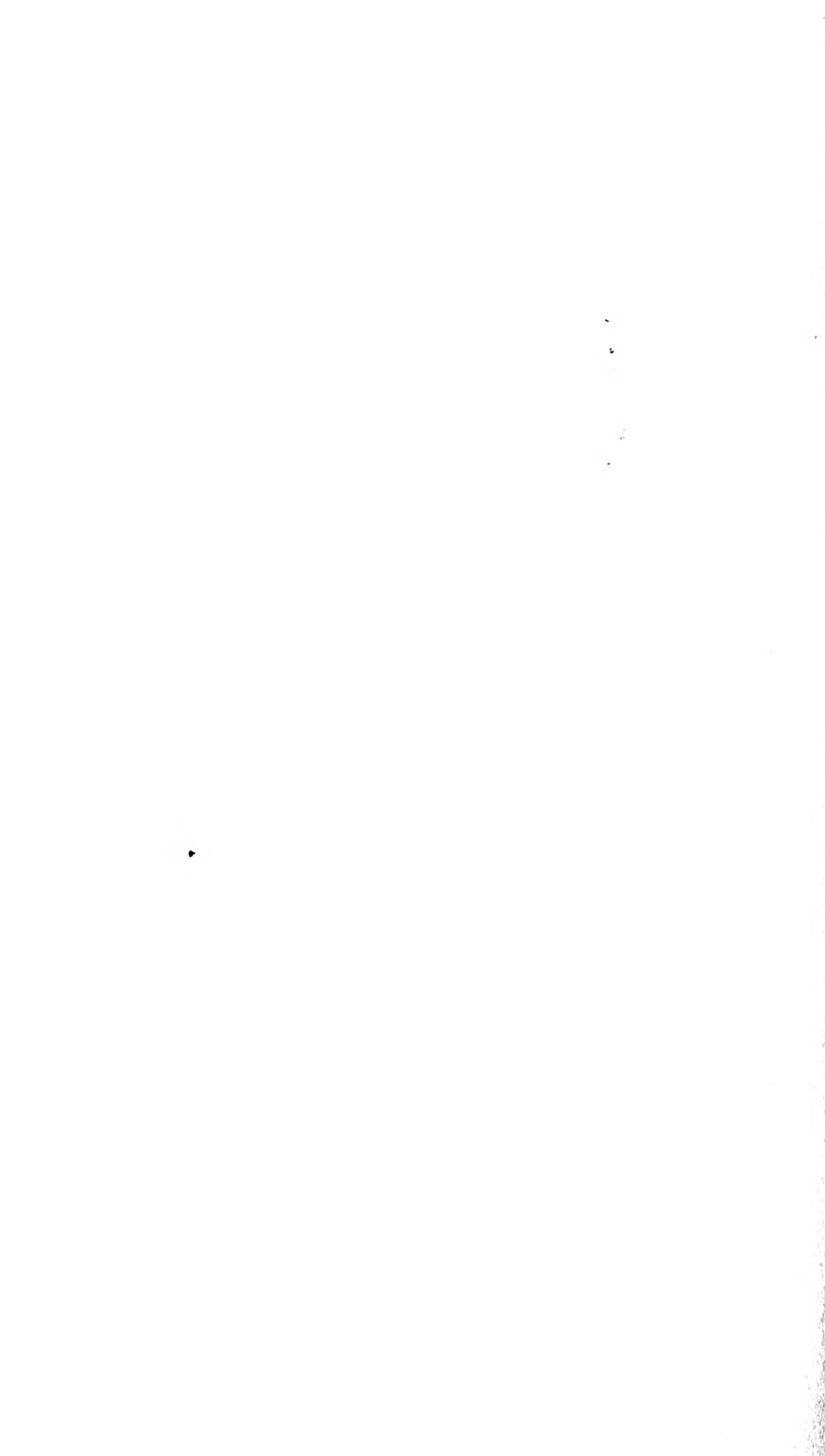
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