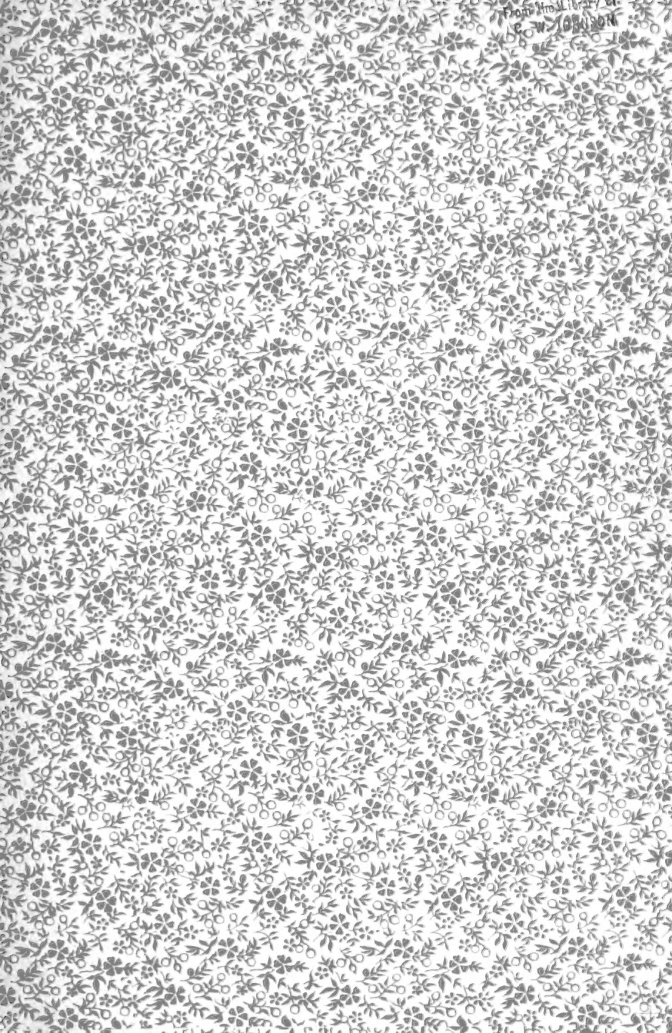


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Papers on Tipulidae

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Prof. C. W. Johnson,
with sincere regards
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Fulton County (New York) Tipulidae—I.

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

During the season of 1909, a large number of more or less interesting crane-flies were collected by the writer at various localities in Fulton County, N. Y. Of the great amount of material collected, comparatively few specimens have been determined, and these are mentioned herewith. The species, *Erioptera dulcis* O. S., *Limnophila lenta* O. S., *Hexatoma megacera* O. S., *Pachyrhina macrocera* Say, *Tipula trivittata* Say, and *T. flavicans* Fabr., are not recorded in Prof. Needham's list of the New York crane-flies (23d Report of New York State Entomologist, Bull. 124 of the State Museum). Many of the species are comparatively uncommon.

The New York Tipulidae have been sadly neglected by the majority of collectors. The two most important collections made in the State are those of Baron Osten Sacken and Professor Needham.

Fulton County, in which all of my collecting was done, contains about all of the varied situations in which the different crane-flies occur. The Adirondack Mountains, with their scores of little lakes, occupy the northern half of the county; a river flows through the northeast corner; while great tracts of marshland (the Vlei) lie in the eastern part. The altitude ranges from about 500 feet up to 2,700 feet. My main collecting grounds are as follows:

1. The Woodworth's Lake and Canada Lake country, in the central, or west central, portion of the county. Small mountain lakes, lying between 1,500 and 1,600 feet above sea level. The character of the fauna and flora is typically Canadian. Most of the species of Tipulidae secured by Osten Sacken at Trenton Falls, and by Needham at Old Forge, occur here.

2. The Sacandaga Park country, in the extreme northeast of the county, is on the Sacandaga River, a branch of the Hudson. Sport Island, in the river, is about half a mile in length, and several hundred feet in width. The ground is mostly low, with grassy fields in the center, the margins of the island being overgrown with rank shrubbery, ferns, etc., forming choice haunts for many insects. The island is connected with the mainland (Sacandaga Park) at the northwest end, by a large wooden bridge. There is a broad strip of low land bordering the northeast coast of the island for several hundred feet. On each side of the island is a dam of about six feet drop, skirting the east shore of the island from the dam ~~to~~ several hundred feet to the south, are broad, pebbly beaches. On the southeast side of the island is a deep indentation into the land, an offshoot of the main stream, but filled with quiet water; this is called the "bayou." The altitude of the island is about 875 feet. The fauna and flora shows an intermingling of Canadian and Transition forms.

3. Gloversville, N. Y., in south-central part of the county; altitude, 900 feet.

4. Johnstown, N. Y., in southern part of the county; altitude, 700 feet.

These last two localities are in the township of Johnstown. Both cities are situated on the Cayudetta Creek, and only three miles apart. The fauna is mainly Transition.

The determinations have all been made, or confirmed by, Professors C. W. Johnson and J. G. Needham, to whom my sincere thanks are due.

1. *Rhipidia maculata* Meigen.

Woodworth's Lake (Bleecker township); altitude 1,600 feet; August 24, 1909; a few specimens, hovering about the crevices in a small cliff.

2. *Discobola argus* Say.

Canada Lake (Caroga township); altitude 1,550 feet; July 10, 1909; one in a spider's web, still alive. Woodworth's Lake (Bleecker township), altitude about 1,625 feet, August 22, 1909; one specimen, swept from rank, palustral vegetation.

3. *Limnobia parietina* O. S.

One fine specimen, Woodworth's Lake, August 20, 1909, from a small cliff along the outlet. My field notebook says, "From a crevice high up on the face of the cliff, I drove out a large crane-fly. It flew out of the cranny with sluggish, lumbering flight and lit on the top of a hemlock tree a foot or two away. By jumping up, I managed to sweep the specimen into my net."

4. *Toxorrhina muliebris* O. S.

I swept one specimen from tall, rank vegetation at Sacandaga Park. It was taken along the railroad embankment, north of the railroad station, about sunset, July 5, 1909.

5. *Rhamphidia flavipes* Macq.

Two specimens at Mountain Lake Bog Pond (Johnstown township); altitude 1,580 feet, June 26, 1909. One specimen swept from rank grasses at Sport Island, Sacandaga River, June 20, 1909. One specimen, southeast of Johnstown, N. Y., September 6, 1909.

6. *Cladura indivisa* O. S.

Woodworth's Lake, August 24, 1909, two specimens flying about in the woods. Johnstown, N. Y., September 12, 1909.

one specimen. It was extraordinarily abundant in a woods near Gloversville, N. Y., on September 22, 1909. The following is from my field notes:

"I went to Simmon's Woods, southeast of Gloversville, N. Y., this afternoon, and was very agreeably surprised at the occurrence, in large numbers, of this usually uncommon insect. Near the entrance of the woods, where Simmon's Brook emerges, the insects were found in numbers.

"At each step they flew out of the bushes to others farther away. They are wary insects, and when sitting on the upper side of a leaf, slip over the edge and hang inverted from the lower side when alarmed by an observer.

"They present a very characteristic attitude, sitting on the leaf of a tree, with their wings folded flat over the abdomen, and the six long legs stretched out over the leaf. A few were taken in copulation; these were all hanging on the under side of a leaf. Their habit of clinging to the under surface of a leaf is quite remarkable and I found several by looking for them there.

"There were hundreds of specimens in the low bushes of the woods, usually on the broad leaves of deciduous trees at a height of two or three feet. Sometimes they would alight on hemlock, and, occasionally, in ferns near the ground. It was the only Tipulid observed here to-day."

7. *Rhypholophus monticola* O. S.

Woodworth's Lake (Bleecker township), August 24, 1909. Several specimens flying about a small cliff along the outlet.

8. *Rhypholophus rubellus* O. S.

Along the Mountain Lake Railroad track, about two miles north of Gloversville, N. Y. One specimen, July 3, 1909, swept from ferns, in a damp woodland (Power House Woods).

9. *Erioptera* (*Mesocyphona*) *caloptera* Say.

Very common about Johnstown, N. Y.; first taken on the evening of June 1, 1909, several specimens swept from tall meadow grass. Very common throughout the summer, into September, in similar habitats. Sacandaga Park (Northampton township), July 5, 1909, a few specimens taken.

10. *Erioptera (Mesocyphona) dulcis* O. S.

One specimen in company with the last, which it somewhat resembles.

11. *Erioptera (Hoplolabis) armata* O. S.

Not at all rare about Johnstown, N. Y., from May and June until September 12, 1909, when I took a few specimens. It frequents shady places, such as gullies. Power House Woods (see *R. rubellus*), July 3, 1909, a few. Sport Island, Sacandaga R., July 5, 1909, very common.

12. *Molophilus hirtipennis* O. S.

Johnstown, N. Y., June 30, 1909, at twilight; July 1, 1909, one flew to a lamp in my house; not rare during the summer months.

13. *Goniomyia subcinerea* O. S.

Taken at the same time and place as *Rhypholophus rubellus* O. S. (No. 8); two specimens.

14. *Trichocera frumalis* Fitch.

Very common at times during the winter months. During November and in February and March it is found on cellar windows and, on warm days, out of doors. In late March and April it occurs in small swarms in sunny places in woods and along the edges of brush lots. On May 12, 1909, a very large swarm was observed at Johnstown, N. Y., hovering over a large fallen beech trunk. My latest record is May 19, 1909, one specimen at Johnstown, N. Y.

15. *Limnophila macrocera* Say.

Sacandaga Park, very common on damp vegetation along the railroad embankment north of the station. It was taken in large numbers on June 20 and 21, 1909. One specimen was taken near the Johnstown cemetery on July 2, 1909, and another on September 12, 1909. These are my only records. The species is generally not very common.

16. *Limnophila adusta* O. S.

East of Johnstown, N. Y., June 20, 1909, one specimen.

17. *Limnophila lenta* O. S.

Woodworth's Lake (Bleecker township), August 24, 1909.

It was not uncommon in the cool woods along the outlet of the lake.

18. *Limnophila (Dactylolabis) montana* O. S.

On May 16, 1907, I found this species very abundant around a stone quarry near the Gloversville Reservoir. The flies lurked in the crevices of the rocks and large numbers were collected as they hung inverted from the roof of the crannies. This is the only *Limnophila* that I have taken in such a situation. (This is mentioned in Needham's list, quoted before.)

19. *Hexatoma megacera* O. S.

This remarkable little species was not at all rare on Sport Island, Sacandaga R., June 6, 1909. It occurred on semi-palustral grasses along the northeast coast of the island and along the "bayou." It was very sluggish and not at all difficult to capture. A large number were secured.

20. *Eriocera longicornis* Walker.

Of this remarkable species I secured a single male specimen on May 18, 1907, flying at twilight over a grassy field near Gloversville, N. Y. On June 6, 1909, it occurred in large numbers on Sport Island, Sacandaga River. In the late afternoon a few scattered individuals were observed. Just after sunset the insect became very abundant along the north end of the island, hovering in small swarms over the water's edge and dancing about like many of our smaller Tipulids. Toward dusk, many species of may-flies and caddice-flies joined the little companies of dancing flies. Of the specimens secured, the males slightly predominated in numbers.

21. *Tricyphona (Amalopsis) inconstans* O. S.

Canada Lake (Caroga township), July 10, 1909, two specimens. Not at all rare about Woodworth's Lake in August. Johnstown, N. Y., in June, July, August and, especially, early September.

22. *Liogma nodicornis* O. S.

Mountain Lake Bog Pond (Johnstown township), altitude 1,585 feet, June 26, 1909. It was very common toward sunset

on rank, semipalustral vegetation. One specimen in the cemetery gully, Johnstown, N. Y., June 15, 1909.

23. *Phalacrocera tipulina* O. S.

East end of Canada Lake (Caroga township), altitude 1,550 feet; one specimen only on July 10, 1909.

24. *Dolichopeza americana* Needham.

One specimen under the bridge at the outlet of the Mountain Lake Bog Pond (Johnstown township), altitude 1,585 feet. It was taken during a rainstorm, in company with *Bittacomorpha*, on June 13, 1909.

25. *Pachyrhina macrocera* Say.

One specimen in the gully on the north side of the Johnstown cemetery, June 30, 1909.

26. *Pachyrhina incurva* Loew.

Two specimens, male and female, in Johnstown cemetery gully on June 30, 1909.

27. *Pachyrhina ferruginea* Fabricus.

Two specimens near Johnstown, N. Y., June 24, 1909.

28. *Tipula abdominalis* Say.

Very common along the Park side of Sacandaga River from July 6 to 16, 1906. It was kindly determined by Prof. E. P. Felt.

29. *Tipula trivittata* Say.

Two specimens on Sport Island, Sacandaga River, June 12, 1909 (northeast coast). One specimen on Sport Island, June 20, 1909.

30. *Tipula flavicans* Fabr.

In early September this species became very common in most of the grassy fields and scanty brush lots about Johnstown, N. Y. Specimens were secured from September 3 until September 22, 1909, when I left that locality.

31. *Bittacomorpha clavipes* Fabr.

The phantom crane-fly is one of the most striking of our Tipuloidea. It is abundant and very widely distributed in the county. I have taken it in marshy woodland about Glovers-

ville (Cold Spring Woods) and near Johnstown, from June throughout August. It occurred at the Mountain Lake Bog Pond, June 13, 1909 (altitude 1,585 feet). It is a very common species at Sacandaga Park, frequenting the rank vegetation growing along the bottom of the railroad embankment. Specimens were observed June 20 to 22, 1909.

32. *Ptychoptera rufocincta* O. S.

One specimen in the Power House Woods near the government shooting range, north of Gloversville, N. Y., July 3, 1909.

33. *Idioplasta fitchii* O. S.

This was probably the most interesting species taken. Over half a century has elapsed since the discovery of this wonderful crane-fly by Asa Fitch.

I secured five specimens on Sport Island, Sacandaga River (Northampton township) from June 6 to 19, 1909. All five specimens were swept from the rank, tall vegetation along the northeast coast of the island, exactly opposite Wolf Island. The first two specimens were taken on June 6, two more on June 12, and the last on June 19. The beautiful ocellate markings on the wings are quite variable in shape and character. They are, however, generally arranged in three bands, a basal one, a medial one and a sub-terminal one, with a few scattered rounded apical marks. In one specimen the bands are almost complete, there being but one detached apical spot. In another specimen (June 12, 1909) the marks are separated, rounded spots, about three apical ones, five sub-apical ones, six medial ones, and three or four basal ones. These separated spots are usually contiguous but separable by their light color with a broad dark ring surrounding the marking.

The markings of the wings of my specimens are very conspicuous and, as Prof. Johnson suggests, bear a great superficial resemblance to those of *Epiphragma fascipennis*.

Fulton County (New York), Tipulidae (Dipt.).—II.

By CHAS. P. ALEXANDER, Cornell Univ., Ithaca, N. Y.

This is a continuation of the list in ENTOMOLOGICAL NEWS, June, 1910. Since the publication of that article, much of the undetermined 1909 collection has been worked over and an immense amount of new material collected. The total number of species definitely known from the county to date is about 125, which is more than is known from most States of the Union.

A few errors in the first part, most of which must be charged against the author, should be corrected: On page 248, thirteenth line in under 2, should read, "for several hundred feet." The altitude of the island is 750 feet (average), not 875 feet. On page 251, *Trichocera crumalis* should be *T. brumalis*.

New collecting grounds: Some of the new localities visited proved to have an extremely rich Tipulid fauna. The more notable of these are:

"Psocid Glen," on the west bank of the Cayudutta creek, between Johnstown and Sammonsville; a small creek flowing into the Cayudutta at the electric-light dam. Although at a low altitude (550 feet), the fauna is distinctly Canadian.

"Prairie Lake Bog" in Caroga Township (1,870 feet); a bog in the tertiary stage, supporting a perfectly normal oxylophytic type of vegetation, such as: *Solidago uliginosa*, *Gentiana linearis*, *Acer pennsylvanicum*, *A. rubrum*, *A. spicatum*, *Nemophanthus mucronata*, *Kalmia angustifolia*, *Andromeda polifolia*, *Chamaedaphne calyculata*, *Chiogenes hispidula*, *Vaccinium macrocarpon*, *Aronia melanocarpa*, *Sarracenia purpurea*, *Drosera rotundifolia*, *D. intermedia*, *Myrica gale*, and a variety of sedges.

Since the publication of the first part, the acceptance of Meigen's 1800 paper by most Dipterologists has changed many of the genera used in the *Tipulidae*. The names are given in Coquillett's "Type-Species of North American Diptera," but are widely scattered amongst the other genera of flies, so that

a compact record of the recent changes in nomenclature, as now held by many students of the family, may be of value.

Sub-fam. LIMNORINAE	AMPHINOMINAE
Tribe LIMNORINI	AMPHINOMINI
Genus <i>Limnobia</i> Meig. 1818	<i>Amphinome</i> Meig. 1800
Genus <i>Dicranomyia</i> Steph. 1829	<i>Furcomyia</i> Meig. 1818
Tribe ANTOCHINI, RHAMPHIDINI	MEGARHINI
Genus <i>Rhamphidia</i> Meig. 1830	<i>Megarhina</i> St. Farg. et Serv. 1828
Genus <i>Dicranoptycha</i> O. S. 1859	<i>Marginomyia</i> Meig. 1818
Tribe ERIOPTERINI	POLYMEDINI
Genus <i>Erioptera</i> Meig. 1803	<i>Polymeda</i> Meig. 1800
Genus <i>Rhypholophus</i> Kol. 1860	<i>Ormosia</i> Rond. 1856
Genus <i>Helobia</i> St. F. et S.; 1828; (preocc.)	<i>Symplecta</i> Meig. 1830
Tribe LIMNOPHILINI, TRICHOCERINI	PETAURISTINI
Genus <i>Trichocera</i> Meig. 1803	<i>Petaurista</i> Meig. 1800
Tribe ANISOMERINI	HEXATOMINI
Genus <i>Eriocera</i> Macq. 1838	<i>Caloptera</i> Guer. 1829
Genus <i>Analopis</i> Hal. 1856	<i>Tricyphona</i> Zett. 1837
Genus <i>Ctenophora</i> (of authors, non Meigen)	<i>Phorocema</i> Coq. 1910
Genus <i>Niphura</i> Brulle 1832; <i>Ctenophora</i> Meig. 1803.	
	<i>Flabellifera</i> Meig. 1830
Genus <i>Stygeropsis</i> Loew. 1863	<i>Prionocera</i> Loew. 1844
Family PTYCHOPTERIDAE	LIRIOPIDAE
Genus <i>Ptychoptera</i> Meig. 1803	<i>Liriopis</i> Meig. 1800
Genus <i>Idioplasta</i> O. S. 1878	<i>Protoplasa</i> O. S. 1860

The present paper deals with the tribe *Amphinomini*, and begins the *Polymedini*. The remainder of the *Polymedini*, and the *Megarhinini*, *Petauristini*, *Hexatomini*, and *Pedicini*, as well as the *Cylindrotominae*, *Tipulinae* and *Liriopidae* will be considered in succeeding parts. New stations and new records for the species included in Part I are here given, with the original number in parentheses.

As in the previous part, I must acknowledge the kind advice of Prof. Needham and Prof. Johnson upon certain difficult questions.

34. *Geranomyia canadensis* Westw.

Rare. Canada Lake; Caroga T'sh'p; one ♂ only, June 23, 1911.

35. *Geranomyia rostrata* Say.

Common and widely distributed. Sacandaga Park; several

along the R. R. embankment, June 21, 1911. On Aug. 24, 1910, the species occurred in extraordinary abundance. Thousands of specimens occurred here and I secured about a dozen at each sweep of the net. They are very active and usually fly directly from the bag, not making their way up the side of the net after the fashion of most crane-flies. Sport Island, N. E. Coast, Aug. 24, 1911; some ten specimens. Johnstown, N. Y.; Sept. 14, 1909. "Psocid Glen"; Aug. 24, 1910. VanDenburgs Pond; Bleecker T'sh'p; Aug. 30, 1909. "Camp Naturalist," alt. 1428 feet; Bleecker T'sh'p; Sept. 14, 1910.

36. *Rhipidia fidelis* O. S.

Rare. Sport Is.; Sacandaga R.; June 27, 1910; ♀.

(1) *Rhipidia maculata* Meig.

Pinnacle Mt.; Bleecker T'sh'p.; alt. 2000 feet; Sept. 15, 1910; ♀.

37. *Furcomya longipennis* Schum.

Common locally. Sacandaga R.; Sport Is. (bayou); Aug. 24, 1910. Hillside Park; Burrs Pond; abundant on marsh vegetation consisting of *Leersia*, *Bidens*, etc.; Aug. 4, 1909, and Sept. 9, 1910.

38. *Furcomya immodesta* O. S.

Commonly and widely distributed. Sacandaga R.; Sport Is.; Aug. 24, 1910; both sexes; on the mainland, along the R. R. embankment, common; June 21 and 28, 1911. Johnstown; common; June 10, 1910. Gloversville; Power House Woods; Sept. 23, 1910. Woodworth's Lake; Aug. 21, 1909.

39. *Furcomya gladiator* O. S.

Local. Extremely common in B. P. H. U. Swamp, Woodworth's Lake; Aug. 22, 1910; males were more common than females.

40. *Furcomya rostrifera* O. S.

Common, especially in late summer and autumn. Sacandaga Park; along the R. R. embankment; June 27, 1910; June 28, 1911; Aug. 28, 1911. Sammons ville; Sept. 22, 1910; common.

Gloversville; Power-house Woods, Sept. 23, 1910; very abundant on low vegetation. Prairie Lake Bog; Aug. 31, 1911.

41. *Furcomya liberta* O. S.

A well distributed species at low altitudes. Sacandaga R.; Sport Is.; June 17, 1910; a few, Aug. 24, 1910; June 21, 1911; rare. Johnstown; June 10, 1910, not rare; June 17, 1911.

42. *Furcomya stigmata* Doane.

Not uncommon about the face of cliffs. Gloversville; stone quarries near the reservoir; June 19, 1910, and June 16, 1911.

A species described from California. Neither Mr. M. D. Leonard nor I can separate the New York specimens off as distinct. It is possible that an actual comparison of specimens would reveal differences. *Stigmata* is distinguished from *haerctica*, O. S., by the shortness of Sc 1, a distinct stigmal spot, and the plain brown mesothoracic praescutum.

43. *Furcomya halterata* O. S.

Local and northern in distribution. Sacandaga Park; along the R. R. embankment; Aug. 24, 1910; ♀'s. Prairie Lake Bog; Aug. 31, 1911; a few. Woodworth's Lake; very common along B. P. H. U. Creek and in the bog-swamp at the head of the creek; Aug. 22, 1910.

44. *Furcomya badia* Walk.

Not common. "Psocid Glen," Aug. 31, 1910; a few only. Stone quarry on the mountain side, near the Gloversville reservoir; Aug. 29, 1910, and Sept. 7, 1910. Woodworth's Lake; B. P. H. U. Creek; Aug. 22, 1910.

45. *Furcomya morioides* O. S.

Common and widely distributed. Sacandaga Park; along the R. R. embankment; June 21, 1911. Hillside Park; Sept. 9, 1910. Johnstown; Aug. 6, 1909. "Psocid Glen," Aug. 26, 1910, a few; June 14, 1911, common, both sexes; Aug. 30, 1911, a few.

46. *Furcomya pubipennis* O. S.

Not rare; Canadian life-zone. Sacandaga Park; along the

R. R. embankment, June 21, 1911; VanDenburg's Pond, June 19, 1911; in a sphagnum bog. Mountain Lake, June 15, 1911; common around the bog-pond. Woodworth's Lake, Aug. 19, 1909; very common about cliffs; both sexes.

47. *Furcomya globithorax* O. S.

Rare; Canadian life-zone. One fine ♀ of this peculiar little species; Woodworth's Lake, along the outlet, Aug. 22, 1910.

48. *Furcomya simulans* Walk.

Not common. East Canada Creek, near Ingram's Mills, Sept. 11, 1911.

49. *Amphinome immatura* O. S.

Rare. Sammonsville, Sept. 22, 1910; a broken specimen in a spider's web. Pinnacle Mt.; near cliffs; ♀; Sept. 16, 1910.

50. *Amphinome solitaria* O. S.

A common species of the Canadian life-zone. "Psocid Glen," Aug. 26, 1910; four ♂'s; Aug. 30, 1911, common, both sexes. Woodworth's Lake; B. P. H. U. Swamp; Aug. 22, 1910.

51. *Amphinome triocellata* O. S.

Rare. Woodworth's Lake; B. P. H. U. Swamp, Aug. 22, 1910, one ♂ only.

52. *Amphinome indigena* O. S.

Common. Sacandaga Park; along the R. R. embankment, June 21, 1911. "Psocid Glen," Aug. 21, 1910. Canada Lake, June 24, 1911. Woodworth's Lake, Aug. 22, 1910; June 23, 1910.

53. *Amphinome tristigma* O. S.

Abundant, northern in distribution. Gloversville; Power-house Woods, common on ferns, etc., July 3, 1910. Woodworth's Lake, B. P. H. U. Swamp, Aug. 22, 1910.

54. *Cryptolabis paradoxa* O. S.

Abundant. Gloversville; Power-house Woods, July 3 and 17, 1909; abundant on low vegetation, such as ferns, etc. Sacandaga R.; Sport Is., July 5 and 25, 1909. Not rare on herb-

age growing amongst shrubbery. June 27, 1910, "Very common on the rank herbage of the northeast coast and specimens could be found in my net at every sweeping. Hundreds—if not thousands—of specimens about." June 21 and 28, 1911, common on Sport Is.

55. *Sacandaga flava* Alex.

Locally common.

Since describing the genus *Sacandaga* (Ent. News, Oct., 1911), I have come to the conclusion that the insect is most closely related to the genus *Rhabdomastix*, Skuse* of Australia. The differences between the two genera are rather numerous, but the resemblances, especially in the genitalia of the male and in the venation, are great, and it is possible that *Sacandaga* will, upon further study, be relegated to subgeneric rank. The genera should have been compared in the original description, but I was not in possession of Skuse's detailed description of *Rhabdomastix* at the time. This comparison is supplied in the following key:—

- A.—Antennae very long, filiform, nearly twice the length of entire body. Wings cuneiformly narrowed towards the base, with only a slight indication of an anal angle. Halteres, long, slender. Venation: Sc rather short, tip of Sc1 remote from the tip of R1; Sc beyond origin of Rs, twice the length of the cross-vein *r-m*. Sc2 absent or indistinct at tip of Sc1. R2+3 (petiole of second submarginal cell of Osten Sacken) one-half of cell R2. Cross-vein *r-m* as long as the basal deflection of Cu1. Second anal short, curved **Rhabdomastix** Skuse.
- AA.—Antennae normal reaching about to the root of the wings. Anal angle present and prominent. Halteres short, abruptly capitate. Venation: Sc long so that Sc1 and R1 are somewhat approximated at the tip; Sc long, beyond the origin of Rs, four times the length of the cross-vein *r-m*. Sc2 conspicuous, removed from the tip of Sc1. R2+3 equal in length to, or longer than, cell R2. Cross-vein *r-m* much shorter than the deflection of Cu1. Second anal prominent, bisinuate **Sacandaga** Alex.

*Diptera of Australia, by F. A. A. Skuse. Proc. of the Linnaean Society of New South Wales; vol. 4 (series 2nd) (25th Sept., 1889); P. 828, 829; Pl. 22, Fig. 15 (wing) Pl. 24, Fig. 57 (♂ genitalia).

Although the two species are almost antipodal in their respective ranges, it is not exceptionally remarkable to find such a distribution. Sport Island is the home of two other insects which are almost equally isolated from their near allies. The primitive crane-fly, *Protoplasa*, occurs here, and finds its only living relative (*Tanyderus*) in Chile and Australasia. The remarkable may-fly, *Siphonisca acrodromia* Ndm. described from this island, finds its near relative in *Oniscogaster wakefieldi*, McLach., of New Zealand. The present occurrence, therefore, merely adds one more difficulty to the explanation of the geographical distribution of animals and plants.

1909—June 12, not rare on Sport Island; July 5, a few.
1910—June 27, male; Aug. 24. 1911—June 21, one male;
June 28, several. Gloversville, Power-house Woods, July 3,
1909. Seasonal distribution, June 12-Aug. 24.

The species has been taken only on Sport Island, with the exception of a single specimen at Gloversville, and mainly on the east and northeast coasts, where it may be swept from rank herbage. The vegetation in the places where the species is commonest consists of a dense tangle of herbage, composed mainly of such plants as *Onoclea sensibilis*, *Osmunda claytoniana*, *Veratrum viride*, *Polygonatum biflorum*, *P. commutatum*, *Laportea canadensis*, *Actaea rubra*, *Cryptotaenia canadensis*, *Galium lanceolatum*, *Eupatorium urticacifolium*, *Solidago canadensis*, *S. rugosa*, *S. graminifolia*, *Rudbeckia laciniata* and *Helianthus decapetalus*. The whole undergrowth is thickly intertwined with creepers, such as *Smilax herbacea*, *Clematis virginiana*, *Menispermum canadensis*, *Celastrus scandens* and *Convolvulus sepium*. It is not common, as a rule, but in June several specimens can generally be taken by sweeping. On June 13, 1909, I found the species swarming and made the following observations:

The species came out at about 7.45 P. M. and at 7.51 P. M. began its flight in under an elm tree at the northeast end of the island. The flight was generally forward, but continually from side to side for a few inches. The flight was quite irregular, always toward the slight north breeze. The whole

swarm would often move away and return, a little later, to the first place. It swarmed within four feet of the ground, generally much lower, averaging, perhaps, two feet. The flight is so irregular that it is difficult to describe. The number of individuals participating in the swarm was about twenty. Other species swarming nearby at the same time were *Chironomus hyperboreus*, var. *meridionalis*, Joh., and the may-flies. *Ephemerella excrucians* Walsh, and *Siphonisca aerodromia* Ndm.

Prof. C. W. Johnson,
with the author's regards. ⁴

Notes on Two Tipulidae (Dipt.).

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

The following species were taken in Fulton County, New York, during 1909 and 1910. The first species is a novelty and cannot be referred to any of the known genera of crane flies. After a careful examination of the literature, I have decided to erect the following genus:

SACANDAGA gen. nov.

Subcosta, long; vein R^2 very short, oblique; no radial cross-vein; $M1+2$ fused to margin. Antennae of 16 segments; basal segment rather globular; second globular, cyathiform;



Fig. 1.—*Sacandaga flava*—dorsal aspect of head; Cotype No. 2.

first segment of the flagellum globular; second to ninth gradually cylindrical; tenth to fourteenth, elongate-cylindrical; all

of the segments of the flagellum armed with from two to four stiff hairs. Palpus of four segments; fourth segment irregularly cylindrical, longer than the third; second about as long as the fourth; first longest; all armed with many stiff hairs. Eyes large, rather approximated behind. Legs rather short, fore legs about 13.5 mm. long; middle, 10.5 mm. long; hind, 13.5 mm. long. Last four tarsal segments very slender at their point of attachment with the segment preceding. The last tarsal joint is small, irregular in shape, rather smooth on the outer face; inner face, concave, with slight convexities at each end, the proximal with from six to eight hairs, the distal one with a single conspicuous bristle on each side, the whole inner face being rather finely clothed with hair; at the base of the segment on the outer face, are about four stiff hairs. Penultimate segment generally similar to the fifth in shape and

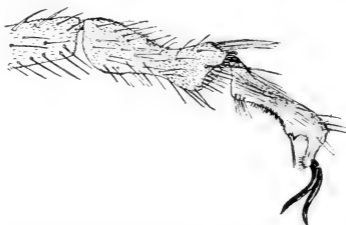


Fig. 2.—*Sacandaga flava*—middle leg, showing last two tarsal segments.

size, but more thickly covered with stout hairs. Claws long, slender, smooth, those of the posterior legs nearly two-thirds as long as the fifth tarsal segment.

This genus belongs to the tribe *Polymedini* (*Eriopterini* of authors.) It is most similar in venation to *Empeda* and *Goniomyia*, which it approaches in the shape of cell R^2 . It is easily distinguished by the much greater length of subcosta, lack of radial cross-vein, the deflection of Cu^1 fusing with M^3

under cell first M^2 (discal cell of Osten Sacken), not proximal to it, and the consequent insignificant fusion of Cu^1 with M^3 . The resemblance to these two genera is probably merely accidental, as, in general appearance, the flies are very different.

The type, and only known species, is:

Sacandaga flava sp. nov.

Type—Alcoholic ♀, in C. U. collection; Sport Is., Sacandaga River, June 12, '09. Cotypes; (1) Sport Island, July 5, '09 (collection Bost. Soc. Nat. Hist.). (2), ♂; June 27, '10; same locality. (3), ♂; June 12, '09; same locality. (4), Gloversville, N. Y., July 3, '09.

Length 5 mm.; wing, from 6 to 7 mm. See table of leg measurements at the end of description.

Antennæ blackish-brown; first segment, head and palpi, reddish-brown; eyes black.

Thoracic dorsum with a broad median stripe of reddish-brown on a more yellowish ground, beginning on the anterior margin of the præscutum, terminating within a short distance of the posterior margin. To the side of this, and more or less distinctly separated from it, is a broad stripe, beginning near the caudal end of the scutum and extending forwards on the side of the præscutum to near the middle of the latter. A narrow brown stripe extends from the anterior margin of the præscutum to the cephalic margin of the neck. Sides of the neck and thorax, honey-yellow, becoming infuscated toward the venter. Legs dusky yellow; halteres light yellow throughout. Abdomen dirty yellowish. Wings hyaline, opalescent; stigma somewhat distinct.

Details of venation of the species: Subcosta long, Sc_1 at least five times the length of Sc_2 . Radius quite long, parallel to subcosta till the latter ends, and then parallel to costa for a short distance, at its tip sharply turned upward. The radial sector arises near the middle of R . R_2 is very short, oblique, shorter than the cross-vein $r-m$ and only one quarter the length of R_3 . R_3 a trifle longer than R_2+3 . Basal deflection of R_4+5 as long as R_2 ; beyond the $r-m$ cross-vein, the vein runs nearly parallel between R_2+3 and M_1+2 .

Media: basal deflection of M_1+2 about one-half the length of R_2 ; thence, to the m cross-vein, twice the length of R_2 . Basal deflection of M_3 equals R_2 . Fused portion of M_3+C_{u1} equal to one and one-half R_2 . Second deflection of M_3 , two-thirds the length of R_2 .

Cubitus: Basal deflection of *Cu* (great cross-vein of Osten Sacken) two-thirds the length of *Cu*₂ or one and one-half *R*₂.

1st Anal, nearly parallel to cubitus, more divergent toward the wing-margin. 2nd Anal, gently bisinuate and diverging posteriorly, leaving cell 1st *A* very large.



Fig. 3.—*Sacandaga flava*—wing; Cotype No. 3.

Cell *R*₂ is triangular, small; cell 1st *M*₂ (discal cell of Osten Sacken) hexagonal, small. The proportions of the veins holds good in the specimens examined but may vary somewhat in a large series.

Leg measurements of cotype No. 2 (♂):

	FORE	MIDDLE	HIND
Femora	3.6 mm.	3.6 mm.	4.9 mm.
Tibia	4.8 "	3.7 "	4.5 "
Tarsus.....1	3.3 "	2.0 "	2.35 "
"2	1.0 "	.75 "	.90 "
"3	.3 "	.28 "	.35 "
"4	.14 "	.14 "	.14 "
"5	.13 "	.13 "	.13 "
Total.....	13.27 mm.	10.60 mm.	13.27 mm.

More complete notes on the habits and occurrence will be given in "Fulton Co. (New York) Tipulidæ; Pt. II."

Adelphomyia senilis.

A second species which deserves mention is a little crane-fly of the tribe *Limnophilini*. It belongs to the genus *Adelphomyia*, hitherto known only from the Old World, and is undoubtedly the same as the common European, *A. senilis* Haliday. The specimens at hand, over a hundred in number, agree

so closely with Loew's detailed description (as *Cladura fuscula*, Besch. Europ. Dipt. III, p. 65), that it must be referred to *senilis* until a comparison with European specimens proves it otherwise.

The fly is very common in Fulton County, New York, in late summer and early autumn, and with the exception of the all-predominant *Cladura flavoferruginea* O. S., is the most common *Amphinomine* (*Limnobia*) at this season.

The venation, as shown by figure 4, is, in general, similar to a *Phylidorea* (*Limnophila*), but Sc^1 is longer than in any of the species of this genus in Eastern America, at least. All of the distal cells possess long prominent hairs on the membrane. These hairs occur all over cells 2nd R^1 , R^2 , R^3 , R^5 , M^1 , M^2 ,



Fig. 4.—*Adelphomyia senilis*—wing.

M^3 , Cu^1 , a few in cell 2nd M^2 (discal cell of authors), and a few on the extreme distal edge of cells Cu , R and Sc^1 . There is never any of this hairiness on the proximal half of the wing as in *Ulomorpha* and the character of the hair is different in the two genera.

Adelphomyia senilis might be mistaken for a small *Phylidorea*, but it is smaller than any of the described Eastern species. From *Ulomorpha*, it readily separates by its smaller size, presence of cell M^1 and characters mentioned above.

In Fulton County, New York, the species is well distributed, as follows:

(1) Woodworth's Lake; alt. 1665 ft.; Aug. 21, 22, '09; Aug. 22, 1910.

(2) Sport Is.; Sacandaga R.; alt. 750 ft.; one only, Aug. 24, 1910.

(3) Johnstown; alt. 600 ft.; Aug. 31-Sept. 22, 1910.

(4) Gloversville; alt. 1000 ft.; Sept. 23, 1910.

Mr. M. D. Leonard, a most careful student of the family, took two specimens at Ridgewood, Bergen Co., N. J. (Brook, Ridgewood Heights, Sept. 16, 1910), thereby adding an interesting species to the New Jersey State list.

Besides receiving help from a number of students at Cornell, I wish, especially, to thank Dr. J. G. Needham for his very kind assistance throughout the course of this study.



Prof. C. W. Johnson,
with the author's regards. 3

NEW TIPULIDÆ (DIPTERA).

BY CHARLES P. ALEXANDER, ITHACA, N. Y.

The following crane-flies are believed to be new to science :

Adelphomyia minuta, sp. nov.

Antennæ, first segment light reddish-yellow, remainder light brown, with a thick, white pubescence; rostrum reddish-brown, palpi brown; front and vertex reddish-yellow, thinly grayish-pruinose; a row of pale yellow hairs along the inner margin of the eye; occiput reddish-yellow. Pronotum yellow; mesonotum, præscutum brownish-yellow, with a thin white bloom, a row of long yellow hairs on either side of the median line; scutum and scutellum pale yellow; metanotum almost white. Abdomen yellow, with a white pruinosity on the caudal margin and with long scattered yellow hairs; ovipositor brownish yellow. Halteres yellow, knob barely darker. Legs pale yellow, darker on the tibiæ and tarsi. Wings hyaline, stigma indistinct, yellowish; veins pale yellow, C, R and Cu somewhat brownish.

Subcosta quite long, extending almost to the anterior margin of cell R_3 ; Sc_2 far distant from the tip of Sc_1 , so that Sc_1 is four times the length of Sc_2 . Radius long, cross-vein r far back from tip, about four times its length and near to the anterior end of cell R_2 . R_s moderately long, arcuated at origin, about equal to R_3 ; R_{2+3} from one to one and one-half the length of the basal deflection of Cu_1 ; basal deflection of R_{4+5} about one-half of cross-vein $r-m$; $r-m$ usually about as long as the basal deflection of Cu_1 . Petiole of cell M_1 (M_{2+3}^2) usually long, two-thirds the radial sector. Cu_2 usually about twice the basal deflection of Cu_1 . Basal deflection of Cu_1 under the middle of the discal cell. In most specimens the cross-vein m is much reduced, or even lacking, due to the great length of the second deflection of M_3 .

Length, ♂, 3.3-4.4 mm.; average, 3.6 mm.; wing, 4.1-4.2 mm.

Length, ♀, 4.5-4.9 mm.; average, 4.7 mm.; wing, 4.6-4.7 mm.

Type.—♂, Coy Glen, Ithaca, N. Y., May 21, '11.

Co-types.—12 ♂s, 3 ♀s; same time and place as the type.

This tiny species is quite similar in venation to the species which I have determined, provisionally, at least, as *Adelphomyia senilis* Hal. In that species cross-vein m is always present in the scores of specimens examined.

The two species are of nearly the same size, with *minuta* averaging smaller. Although the distal cells of the wings of *senilis* are notably

pubescent, and of *minuta* entirely glabrous, except in a few abnormal specimens, I have no hesitation in referring both species to the same genus, because of the similarity of venation and genitalia of the ♂. The valves of the ovipositor of the ♀ are much more curved in *minuta* than in *senilis*.

The species was very common on rank vegetation near rapids in Coy Glen.

Phylôdorea subcostata, n. sp.

♂.—Eyes black, with a purple reflection. Antennæ, first segment, elongate-cylindrical, somewhat broader distally; second globular; third to last similar to one another in shape, cylindrical-ovate, with four or five long black hairs arranged in a partial verticil about the center; the last few joints are more slender and shorter than those preceding; antennæ black, with a thick gray pubescence throughout; the extreme base of segment three is brown in some specimens. Rostrum and palpi black. Entire head black, with a gray pruinosity. Pronotum light gray pruinose; mesonotum black, with a thin yellow bloom on the sides, middle of præscutum shiny black; postscutum gray-pruinose. Metanotum gray. Sides of thorax, including base of coxæ, thickly gray-pruinose. Fore leg, tip of coxa, trochanters and basal third of femur light yellow; remainder of femur, tibia and tarsus dark brownish-black; middle leg similar to fore, but apical half of femur dark coloured; hind leg similar to fore, but only the apical third of the femur is dark, tibia paler brown; tarsus as in fore leg. Halteres rather long, yellow throughout. Abdomen above black, the dorsum of each segment being paler in the basal two-thirds; genitalia black; beneath dirty blackish-yellow.

Wings hyaline, stigma rather indistinct, brown; veins at base of wing strongly yellow, giving this colour to the wing at this region; subcosta is yellow for its entire length, the other veins for a short distance only; radius and costa of a paler brown than the other veins.

♀.—Similar to ♂, but genital segment light brown.

Subcosta long, fork very close to tip, Sc_2 being about twice as long as Sc_1 , ending anterior to cell R_3 . Radius long, cross-vein r at tip; radial sector often angulate, with a spur at the angulation, rather short, longer than R_2 , but not as long as R_3 . Vein $R_{2,3}$ about equal to the basal deflection of Cu_1 . Basal deflection of $R_{4,5}$ shorter than $R_{2,3}$; cross-vein $r-m$ two-thirds the length of the basal deflection of Cu_1 . Petiole of cell M_7 (vein $M_{1,2}$), variable in length, from as long as the $r-m$ cross-vein, to

one and one-half the length of the basal deflection of Cu , or from two-fifths the length of cell M_1 to nearly twice as long as this cell. Very considerable variation occurs in the two wings of the same specimen. Basal deflection of Cu_1 , under the middle of cell 1st, M_2 . Cu_2 equal to, or very little longer than, the basal deflection of Cu_1 . $Cu_1 + M_3$ about equal to basal deflection of Cu_1 . Cells R_{2+3} , R_4 and 1st M_2 usually in one line.

Length, ♂, 5.9-6.3 mm.; ♀, 6.5-7.3 mm.; wings, ♂, ♀, 6.5 mm.

Type.—♂, Coy Glen, Ithaca, N. Y., May 21, '11.

Co-types.—♀ ♀, Coy Glen, May 21, '11; ♀, Six-Mile Creek, Ithaca, N. Y., May 21, '11. (Thompson and Rutherford.)

This species belongs to the *fratria* group, and appears to be closest to *costata* Coq. from New Mexico; from *fratria* and *costata* it differs in being much smaller and decidedly distinct in coloration.

masterly in execution, inspiring in word and deed; but in science—the pursuit of truth—it must not be done blindly, it is necessary to preserve an unbiased attitude and accept or reject conclusions independently.

Personally Mr. Scudder was the highest type of a scholarly gentleman: a broad-minded, dignified, cultivated, courteous savant, in whom were united the finest attributes of the scholar and man of science; yet genial withal, and most kind and helpful to the inquiring student. Well do I remember the cordial welcome he extended to me, an unknown quantity, in response to the rat-a-tat of his laboratory knocker,—that quaint conceit, a knocker in the form of a locust, beating upon the door with its hind legs!—when I first called upon him, as well as the many delightful hours spent there afterward in the study of his collection. His unrivaled library, rich in everything entomological and as complete as possible in his specialty; his collection, unequalled in America, containing specimens from the ends of the earth; and most of all the man himself, well-versed in many branches of the science, made his laboratory the Mecca of every entomologist, resident or migrant, native or foreign.

In those days (the 90's) the Cambridge Entomological Club met there, its members few but determined to keep the lamp alive and maintain the high traditions of an earlier time. Mr. Scudder was a host in himself; Roland Hayward, now with the great majority, was very regular in attendance; Mr. Henshaw came frequently, less often in the later years; Messrs. Bowditch and Emerton, still with us, occasionally appeared; rarely, birds of passage visiting the Museum of Comparative Zoölogy or Mr. Scudder himself, among them Dr. Geo. H. Horn, Prof. Lawrence Bruner, and other entomologists of note; and among the younger men, while resident in Cambridge, I recall especially J. W. Folsom and W. L. Tower, both of whom have since made their mark.

This period was at the flood tide of Mr. Scudder's productiveness on the orthoptera. Never a meeting passed but that he had something to communicate; additional or newly worked material, new discoveries based on his studies, or notes of interest gleaned from his wide reading of entomological literature. Those were indeed, golden days

"When every morning brought a noble chance,
And every chance brought out a noble"

theme from Mr. Scudder's pen.

In the spring of 1897 Mr. Scudder made a proposal which led to my spending the summer on the Pacific Coast in search of the Orthoptera of that region. On the way out I stopped for a few days in southern New Mexico with Professor Cockerell and collected there. The material thus secured, amounting to several thousand specimens, was shared between us, the bulk of it remaining in my collection, but was determined almost wholly by Mr. Scudder, though the *Xiphidiini* and *Tettiginæ* were worked up by me at his special request. No report on the collection as a whole has ever been prepared but upon it were based in large part a series of short papers by Mr. Scudder during the late 90's, papers which form a very considerable contribution to the knowledge of the orthoptera of that region. The weekly, sometimes daily, postal card bulletins which Mr. Scudder sent me during the process of identification, announcing progress and new discoveries, remain among my treasured mementoes of a delightful and all too brief association with one of the truly great men of his time.

SYNONYMICAL, AND OTHER NOTES ON THE TIPULIDÆ (DIPTERA).

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

The question as to whether, or not, the name *Limnophila*, Macquart (Nat. Hist. Dipt., Vol. I, p. 95, 1834) can be retained for the well-known genus of crane-flies, has faced every student of *Tipulidæ* since the time of Rondani. Rondani in his "Prodromus Dipterol. Italicæ" (Corrigenda, IV, 1861) stated that this generic name was preoccupied in the Mollusca and proposed the new name, *Limnomya*.

A careful study of conchological literature failed to find any mention of a *genus* *Limnophila*, but constant reference to a sub-order of that name. G. W. Tryon, Jr., "Structural and Systematic

Prof. C. W. Johnson,
with author's sincere regards.

Conchology" (Vol. III, p. 92, 1884), gives *Limnophila*, Hartmann, as a synonym of the suborder *Hygrophila*, Ferrusac (order *Basommatophora*). Dr. Paul Fischer in his great work, "Manuel de Conchylogie et de Paléontologie Conchyologique (Paris, 1887, p. 503) concerning the suborder *Hygrophila*, states that the suborder *Limnophila* is a synonym.

It is, of course, possible that a genus *Limnophila* was erected in the Mollusca in 1828, in which case the name of the Tipulid genus would become *Limnomya*, Rond., this being the first term applied to the genus as a whole, although the sub-genera *Elvophila*, Rondani ('56); *Lasiomaster*, O.S. ('60); *Prionolabis*, O.S. ('60); *Dactylolabis*, O.S. ('60) and *Dicranophragma*, O.S. ('60) were erected before this genus. One, *Idioptera*, Macq. (Nat. Hist. Dipt., I, p. 94) was proposed even before *Limnophila*. However, these names are used by many authorities as full genera, and by others as sub-genera, all applying to groups of species contained in the old genus *Limnophila*. If any change should have to be made, it would be better to use the name which first covers the genus as a whole.

If there is no genus *Limnophila* in the Mollusca prior to 1834, then the Tipulid name is perfectly valid because that section of the rules of nomenclature that deals with synonymy decrees that "the laws of synonymy appertain only to genera, subgenera, species and sub-species" and consequently the Suborder *Limnophila* is outside the field.

The late Mr. D. W. Coquillett on p. 590 of his invaluable publication, "The Type species of the North American genera of Diptera"¹ has placed the American species of the genus *Limnophila* in Bigot's genus *Phylidorea* (Bigot, Synoptic Table, etc., p. 456).² As explained by Osten Sacken (Studies on Tipulidæ, pt. II, p. 234, 235)³ the genus *Phylidorea* is merely a synonym of *Limnophila*.

Bigot, l. c., p. 456, states that "the species of *Limnophila*, Macq., provided with a discal cell are my true *Tipulidæ* and receive the new generic name, *Phylidorea*, Bigot." But Osten Sacken, l. c., p. 235, remarks, "what species Mr. Bigot places in

¹ Proc. U. S. Nat. Mus., Vol. 37, pp. 499-647 (1910).

² Bigot. Ann. Soc. Entom., France, pp. 447-482 (1854).

³ Osten Sacken, C. R., Berliner Entom. Zeitschr., Bd. XXXI, Heft II, pp. 163-242 (1897).

his genus *Limnophila* without discal cell is not explained in his paper and I am not aware of the existence of any such species."

Consequently, the species in the New World, as well as the Old, should be known as *Limnophila*, but it would be better to accept the prior name *Petaurista* (Meigen, 1800) as the tribal name, *i. e.*, *Petauristini* instead of *Limnophilini*.

There are a few corrections in synonymy to be made. *Tipula costalis*, Say of the Eastern United States (Jour. Acad. Nat. Sci. Philadelphia, III, 23.2, 1823) is preoccupied by *Macromastix costalis*, Swed. of Australia. (*Tipula costalis*, Swederus; Act. Holm, 286, 1787.) No other name seems to have been applied to the *costalis* of Say, and I propose the name *Tipula sayi*, nom. nov. (non *Oropeza sayi*, Johns). *Dicranomyia brunnea*, Grimshaw, of Hawaii (Fauna Hawaiiensis, III, 1901) is preoccupied by *D. brunnea* Doane (Eastern United States) (Jour. New York Ent. Soc. VIII, 1900) and its describer should propose a new name for the Hawaiian insect. In the "Type-species of Am. Dipt.," the late Mr. D. W. Coquillett states that the type of *Holorusia*, Loew, is *grandis*, Bergr. Bergroth (Ent. Tidskr, IX, 1888) proposed the name *grandis* to replace *rubiginosa*, preoc., on the grounds that *Holorusia* is not distinct from *Tipula*. If the genus *Holorusia* is to be considered as distinct as is done by Mr. Coquillett, the type is still *rubiginosa*, Loew, and not *grandis*, Bergr.

DESCRIPTIONS OF NEW SPECIES.

In the description of the following species of crane-flies, I have adopted many of the suggestions proposed by Mr. R. A. Muttowski in his splendid article "The Composition of Taxonomic Papers." (Ann. Ent. Soc. Amer., June, 1911; Vol. II, No. 2, pp. 194-217). Concerning the thoracic structure, the terminology given by Mr. R. E. Snodgrass, "The Thorax of Insects and the Articulation of the Wings" (Proc. U. S. Nat. Mus., XXXVI, pp. 568, 569; pl. 62; figs. 173, 174; pl. 63, figs. 175-178) is largely used. The best paper on crane-fly genitalia, is, without question, that by Mr. Snodgrass on "The Hypopygium of *Tipulidæ*." (Trans. Am. Ent. Soc., XXX, June, 1904; pp. 179-236, pl. VIII, XVIII.) The terminology used therein has been adopted in the present paper,

but it would be desirable could we have a common terminology for all of the Dipterous families, if not for all the orders of insects.

I wish to thank Dr. A. D. MacGillivray, of Illinois, for advise on certain points; Dr. J. C. Bradley, for the Georgia material herein included, and, especially, Dr. J. G. Needham for kind advice and assistance upon many points.

Limmophila similis sp. nov.

Male. Dark brownish-black; L. 7.5 mm.; wing, 9 mm. Rostrum brownish-yellow, darker at the tip; palpi dark brownish-black; front, vertex and genæ, light gray. Antennæ: first segment elongated, cylindrical, as long as segments two, three and four combined, brown; second segment, globular, reddish-brown; remaining segments generally similar to one another in shape, cylindrical, armed with long black verticils and clothed with a fine yellow pubescence.

Thorax: Pronotum, dark brown with a fine pubescence; mesonotum: anterior portion of the præscutum, glabrous, shining black; remainder with a yellowish-brown bloom; a regular V-shaped row of yellowish-brown hairs, extending from the caudal end of the naked patch described above, posteriorly to near the transverse suture; scutum, scutellum and postnotum with a gray bloom, the scutum with scattered hairs; scutellum with a transverse row of yellowish-hairs along the caudal margin. Metanotum gray. The pleuræ dull yellowish-brown; venter, pale yellow, its sides with a gray bloom. Halteres, pale yellow, the knobs darker, brown. Legs: coxæ, bright yellow; femora, yellow, tipped with brown; tibiæ, brownish-yellow, extreme tip darker; metatarsus yellowish-brown, the remainder of the tarsi, dark brown.

Abdomen, dark brown, densely covered with long, pale brown hairs, the genital segment brighter brown. Genitalia: the pleura is moderately long, thickly armed with very long dark brown hairs; these hairs as long as the apical appendages. The dorsal apical appendage, pointing meso-caudad, chitinized at the tip, toothed; the ventral appendage thickened at the base, the slender apical portion short, directed caudad. (See fig. 8.)

Wings of a whitish color; cells C and Sc tinged with yellow; stigma, brown; basal deflection of R_4+5 , base of R_8 and the deflection of Cu_1 with brown clouds; distal portion of cells 2d R_1 , R_2 , R_3 and R_5 , tinged with darker. Venation: almost exactly as in *L. adusta*, O.S., both agreeing in the following essentials: R_3 very short, arcuated at its origin; R_2 rather short, oblique, with the radial cross-vein near its middle and at the tip of R_1 ; 2d Anal similar in the two species. (See fig. 4.)

Female. Similar to the male; L. 8-9 mm.; w. 10-10.5 mm. Generally similar to the male, but the mesothoracic scutum and scutellum are covered with a yellowish-brown bloom; postnotum with a gray bloom; abdomen pale yellow with light brown apical rings on the segments; abdomen beneath, light yellow with brown caudal margins to the segments.

Limnophila similis is allied to *adusta*, O.S., but is much darker in coloration, dark brown, not red or yellow. In *adusta*, the ventral apical appendage of the male hypopygium (see fig. 9) is thickened on both sides of the base; in *similis* (see fig. 8) the thickening is all on one side (cephalic margin in the normal position of rest). The slender portion of this appendage is much longer than the thickened base in *adusta*, shorter than this base in *similis*. The dorsal appendage in *adusta* is long, slender, thickened on the inner margin of the chitinized tooth, in *similis* much shorter. The gonapophyses are much smaller in *similis* than in *adusta*, but have not yet been studied critically.

Holotype: male; Johnstown, N. Y. (Hale's Creek) June 10, '10.

Allotype: female; with the type.

Para-type: female; Johnstown, N. Y., June 26, '10.

Swept from vegetation near water; Coll. C. P. Alexander.

Limnophila noveboracensis sp. nov.

Male and female. Brownish-yellow; legs, yellow; L. male, 5.2-5.8 mm. Female 7-8 mm.; W. male, 6.5 mm.; female, 7-7.5 mm.

Rostrum, light brown; palpi with numerous long hairs, brown; front and vertex yellow with a light gray bloom, producing a silvery effect. Antennae: 1st segment, elongate, cylindrical; 2d, more globular, both segments brown, armed with scattered black hairs; segments of the flagellum becoming gradually more and more elongated and slender, yellowish-brown, with a rather short pubescence and long scattered verticils. Front, vertex and the prolonged occiput, thickly beset with long, brown hairs.

Thorax: surface opaque; Pronotum, brownish-yellow; the neck with a gray pubescence. Mesothorax: praescutum, yellowish-brown; a distinct humeral pit on the latero-anterior margin, brownish-black; no distinct thoracic stripes; a conspicuous double dot near the cephalic margin of the praescutum. Remainder of the mesothoracic and the metathoracic dorsums, light brownish yellow. Pleurae pale brownish-yellow. Halteres pale, the distal portion of the knob darker. Legs: coxae yellow; femora and tibiae pale yellow, the extreme tips barely darker; tarsal segments excepting the metatarsus, yellowish-brown.

Abdomen hairy, brownish above, paler, yellowish, beneath; genitalia, light.

Wings hyaline, or nearly so; stigma indistinct; veins pale brown. Venation: Sc long, extending almost to the inner margin of cell R_4 . Sc_1 about twice the length of Sc_2 . R long, the cross-vein r far from its tip, at least twice its own length. R_3 long, gently arcuated at its origin; petiole of cell R_2 , short, from one-fourth to two-fifths as long as vein R; R_1 long, sinuate; $R_4 + s$ between R_3 and the cross-vein $r-m$, longer than this cross-vein. M_1 beyond the cell 1st M_2 , longer than this cell.

Basal deflection of Cu_1 anterior to the middle of cell 1st M_2 . R_2+3 , so arcuated that R_3 is not in a direct line with R_2 . 2d Anal vein curved sharply inward at its tip. Cell R_4 is decidedly anterior to cell R_5 and about on a level with cell 1st M_2 . M_1+2 fused to the wing-margin, eliminating cell M_1 . (See fig. 3.)

Limnophila noreboracensis comes in the same category with *lenta*, O.S., *quadrata*, O.S.; *nigrilinea*, Doane and *antennata*, Coq. in that it lacks cell M_1 . It differs from these species as follows:

L. lenta, O.S. (fig. 1) (E. U. S.) has: Sc_1 , slightly longer than Sc_2 ; petiole of cell R_2 (R_2+3) rather long, two thirds the length of R_2 ; cross-vein r usually just beyond the fork; vein R_2 short, oblique; R_4 almost on a straight line with R_3 ; cells R_3 , R_5 and 1st M_2 all on a level; distal portion of vein M_3 rarely longer than cell 1st M_2 ; R_6 usually short, arcuated at origin; coloration, ochraceous-yellow.

L. quadrata, O.S. (fig. 2) (E. U. S.) has: Sc_2 longer than Sc_1 ; petiole of cell R_2 (R_2+3) nearly as long as R_2 ; the cross-vein r inserted just beyond the fork; vein R_2 short, oblique; R_4 in a straight line with R_3 ; cells R_3 , R_5 and 1st M_2 all on a level; distal portion of vein M_3 about as long as cell 1st M_2 ; R_6 long, gently arcuated near its origin; coloration yellowish-gray.

L. nigrilinea, Doane (Jour. N. Y. Ent. Soc., VIII, p. 190) (W. U. S.; Olympia, Wash.) has: Petiole of cell R_2 one and one half the length of the basal deflection of Cu_1 ; cross-vein r slightly removed from tip of R_1 ; cell R_3 slightly anterior to cell R_5 ; general color yellow, with a black dorsal band. L. (female) 12 mm.; distal portion of wings pubescent.

L. antennata, Coq. (Jour. N. Y. Ent. Soc., XIII, pp. 58, 59) (W. Am.; Brit. Col.) has: Petiole of cell R_2 obliterated or nearly so; cross-vein r at the tip of R_1 ; cell R_3 slightly anterior to cell R_5 ; general color black; antennæ of the male long, reaching the base of the 6th abdominal segment.

Although *noreboracensis* agrees, superficially, with *lenta* and *quadrata*, it belongs to a very different group of species. In all respects except the presence of cell M_1 , this species is a typical member of the *luteipennis* group of the genus. The four species, *luteipennis*, *contempta*, *inornata* and the present species, agree in possessing the following group characters: Structure of the head, narrowed and prolonged behind; neck produced forwards to

meet the caudal portion of the head; structure of the antennæ; the pronounced humeral pits, and the double dot on the mesothoracic præscutum; venation; cell R_3 longer than cell R_5 ; vein R_3 arcuated; 2d A strongly incurved at tip, etc.

Holotype: male. Sacandaga Park (Fulton Co.), N. Y., along the R. R. embankment, June 28, 1911.

Allotype: female; with the Holotype.

Para-types: 3, in the type-locality, June 21, '11.

Para-types: 10, in the type-locality, June 28, '11.

Para-types: 3, Coy Glen, Ithaca, N. Y.; July 11, '11.

Common on rank vegetation, usually near running water; Coll. C. P. Alexander.

L. noreboracensis is common, and apparently widely distributed in the North. The type locality is in the Southern Adirondack Mts. (N. Y.). The species is common about Ithaca, N. Y. (Coy Glen), and there are specimens in Dr. Needham's collection labelled "Walnut Lake, Mich., July 8, 1906." It has probably been confused with *L. quadrata* in collections. The figure in Dr. Needham's Report on the Crane-flies of New York (23d Rept. of the N. Y. State Entomol., pl. 18, fig. 6) is not *quadrata* but belongs to this new species. The specimen of *L. luteipennis*, mentioned by Osten Sacken (Monographs, etc., IV, p. 218) where he says "I possess a specimen without petiolated (second) posterior cell in both wings" may possibly belong to *noreboracensis*.

Limnophila (Prionolabis) simplex sp. nov.

Male. Dark brown; L. 11 mm.; w. 11.5 mm. Described from an alcoholic specimen. Rostrum pale; palpi brown; front, occiput and vertex, dark brown; antennæ, dark brown.

Thorax: pronotum, dark brown. Mesonotum, præscutum and scutum dark brown, the scutellum lighter brown. Metanotum dark brown. Pleuræ dark brown. Halteres uniformly pale. Legs: coxæ brown; trochanters brownish-yellow; base of femora, brownish-yellow, gradually darker to the tip; tibiæ, yellowish-brown, the tip suddenly darker; tarsi dark brown.

Abdomen: dorsum, light reddish-brown, the 8th segment rather darker; hypopygium, brown, the pleura medium-brown, paler mesally; apical appendages yellow with the tips chitinized, brownish-black. Genitalia: hypopygium, tergal portion rather deeply notched, the notch obtuse, the sides produced posteriorly into short blunt points; pleura, rather short, armed with long, numerous black hairs. The apical appendages two, the ventral one produced posteriorly, elongate,

toothed along the inner face of the tip; teeth relatively few, one tooth, near the middle, relatively larger than those below it. The anterior, or dorsal apical appendage is simple, unarmed, projecting mesally, curved so that the tip projects slightly caudad. The Anal tube is long, almost concealing the guard of the penis; the second gonapophyses are long and slender; the guard of the penis is bent strongly ventrad near its tip. (See fig. 10.)

Wings: light yellowish-gray, the cells all uniform in coloration; stigma rather indistinct, gray; a pale gray cloud at the base of R_6 ; pale clouds along R_1+2 , basal deflection of R_4+5 , cross-vein m , deflection of M_1+2 , and along the basal deflection of Cu_1 ; Cu tinged with brown. Venation as in *Limnophila rufibasis*, O.S. to which this species is related.

This species belongs to the sub-genus *Prionolabis*, O.S., and is closely related to *L. (P.) rufibasis*, O.S. of the Eastern States. It differs in the following respects: *L. rufibasis* has the costal and subcostal cells much richer yellow than the other cells of the wing; stigma clear-cut, dark brown; markings along the cord of the wing and along Cu , much darker. Base of the femora bright yellow, not tinged with brown. The deciding difference lies in the shape of the anterior apical appendage of the male genitalia, which, in *rufibasis* (See fig. 11) is bifurcated with the ventral arm toothed, whereas in *simplex* (see fig. 10), it is simple. The species, *L. munda*, O.S., which is also referred to the subgenus *Prionolabis* is very distinct from either of the above.

Holotype: male, Gainesville, Ga., April 2, 1911; Coll. J. C. Bradley.

It is probable that some of Osten Sacken's specimens of *rufibasis* (*Monographs*, etc., IV, p. 226) belong to this new species, as he says "the wings are more yellowish in the larger specimens and more grayish in the smaller ones." The drawing of the genitalia (id., pl. IV, fig. 27) is highly diagrammatic.

Polymera georgiæ sp. nov.

Male. Dark brownish black; L. 4.2-5 mm.; w. 5 mm., ant. 5.75 mm. Described from alcoholic specimens.

Rostrum and palpi, light brown; front and vertex, dark brown; eyes, black, the ommatidia large, few in number; antennæ: first segment, short, round, brown; second segment, rounded, brown; third, very elongated, cylindrical, brownish-yellow, the tip, pale, whitish; segment with short scattered hairs and a few long delicate ones; segment 4 to 16, generally similar to one another in shape, elongate-cylindrical, swollen near each end, the swellings armed with short, scattered hairs and on the third to fifth segments with scanty long delicate ones; segments brown, pale at the ends producing an annulated effect.

Thorax: pro-, meso-, and meta-nota, as well as the pleuræ, dark brownish-black. Halteres brownish-yellow, the knob large, darker. Legs: anterior pair, coxæ brown, trochanters light brown; femora, light brown, with a dark sub-apical ring,

the extreme tip yellowish white; extreme base of the tibiae, yellowish white, remainder of tibiae, brown; tarsus light yellow, the base of the metatarsus rather darker. Middle pair: femora brown, darkest before the tip; tip abruptly whitish yellow; tibiae and tarsi as in fore legs. Posterior pair: coxæ brown; femora brown, with a darker subapical band; tip yellowish-white; base of tibia yellow; remainder brown; tarsi, yellowish-white, the terminal segments somewhat darker.

Abdomen dark brownish-black with long conspicuous hairs.

Wings: grayish brown throughout; venation: quite similar to *P. albitarsis* Will. (Dipt. St. Vincent; P. 296, 297; Pl. 10, fig. 71) (Copied in Needham, Crane-flies (23d Rept. St. Ent. N. Y.; Pl. 21, fig. 2) and Williston, Manual of N. Am. Dipt. (1908); p. 85, fig. 28). However the longitudinal veins in the distal portion of the wing are much longer than there shown, the free portions of M_3 and Cu_1 longer, the basal deflection of Cu_1 beyond the fork of M , not at it, etc. (See fig. 5.)

This species differs from *P. albitarsis* Will. (Is. St. Vincent), in the conspicuous annulated antennæ, darker color of the thorax and other colorational differences. From the unsatisfactory description of *P. fusca*, Wied. (Brazil) (Wiedemann, Aussereuropäische zweifl. Insekt, Vol. I, p. 58, pl. VI b, figs. 3 and 4) it differs in the color of the antennæ and feet, and, if the drawing is accurate, in venation. *P. obscura*, Macq. is similar to *fusca* and considered a synonym by Kertész. *P. hirticornis*, Fabr. (S. America) has white bands on the wings.

The genus is new to the Nearctic fauna, having been recorded, hitherto, only from South America and the Lesser Antilles.

Holotype: male, St. Simon's Is., Ga., April-May, 1911. Coll. J. C. Bradley.

Para-types: 2 males, with the holotype.

Ormosia apicalis sp. nov.

Male. Yellow and brown; L. 4.5 mm.; w. 5.25 mm. Described from an alcoholic specimen.

Rostrum and palpi brown; front, vertex and occiput, yellowish-brown; antennæ: 1st segment of the antennæ, elongate, cylindrical; second globular; 3d to 8th oval, generally similar to one another in shape; remainder elongated, the segments covered with a short pubescence, and long, scattered hairs; antennæ, pale yellowish-white.

Thorax: Pronotum grayish-white. Mesonotum: præscutum yellow with two indistinct brown lines running forwards from the ends of the arms of the V-shaped suture; these lines with numerous black hairs which meet in front of the suture; an indistinct brown median line; scutum yellow with a row of hairs on either side leading from the ends of the V-shaped suture toward the wing-roots; scutellum whitish-yellow, thickly set with dark hairs; postnotum very pale, almost white.

Metanotum yellow; pleuræ whitish with a tinge of brown. Halteres, pale. Legs, brownish-yellow throughout.

Abdomen, dark brown, pleuræ somewhat paler; genital segment yellow, tinged with brown in the apical half.

Wings: hyaline, the costal margin somewhat darker. A large, dark spot above the base of the R_5 , a second surrounds Sc_2 and a third at the tip of Sc_1 , extending down over cross-vein r . The whole apical portion of the wing from the stigma down to the median veins is blackish. Dark clouds on the basal deflection of Cu_1 and cross-vein $r-m$; base of wing between R and Cu dark; veins brown; deflection of M_1+2 , very pale. Venation (see fig. 6): Sc long, Sc_1 ending at a point slightly anterior to the cross-vein r . Sc_2 remote from the tip of Sc_1 , about midway between that point and the base of R_5 . R_5 long, feebly arcuated. Cross-vein r far back from the tip of R_1 and just beyond the fork of R_2+3 . R_2+3 longer than the basal deflection of Cu_1 . Cell 1st M_2 closed. Basal deflection of Cu_1 anterior to the fork of M . (Most of the pubescence of the wing disc has become detached due to its being in alcohol with other specimens.)

This species does not seem very closely related to any of the described American forms. The three species with spots on bands on the wings, *innocens*, O.S., *fascipennis*, Zett., and *nubilus*, O.S. are quite distinct in that the spotted and banded effect is brought about by dark hairs, and not by the color of the membrane itself, as in *apicalis*. It agrees with *innocens* in the essential features of venation, closed cell 1st M_2 , divergent Anal veins, etc.

Holotype: male, Burton, Ga. (May 20, 1911); Coll. J. C. Bradley.

***Furcomyia monticola* sp. nov.**

Male and female. Light yellow and brown; L. male 6-6.5 mm.; female, 7.5-7.8 mm.; w. male, 6.5 mm.; female 7 mm.

Rostrum brownish-yellow; palpi brown, the first segment lighter colored. Front and vertex, brown. Antennæ: first segment, cylindrical, light yellow, with a few scattered black hairs; remaining segments rounded-oval, almost moniliform, brown.

Thorax: Dorsum light yellow, marked with brown. Pronotum, very light brown medially. Mesonotum: a straight band of brown beginning near the cephalic margin of the præscutum, running backward and expanding out over the caudal portion of the sclerite, in the middle ending just before the V-shaped suture on the sides running to the suture and meeting the mark on the scutum; scutum with two lunate brown marks on each side of the yellow median line; scutellum largely brown; postnotum brown, yellow on the cephalic margin. Metanotum brown. Pleuræ clear light yellow, unmarked. Halteres pale, knob slightly darker. Legs light yellow throughout, with numerous black hairs.

Abdomen: dorsum yellowish-brown, the joints of the sclerites darker. Ventral surface light yellow; genitalia brownish-yellow. Genitalia of male. (See figs.

12, 13.) The ventral soft fleshy lobes, very large, resembling boxing gloves in shape, covered with scattered hairs pointing posteriorly. From its inner margin, pointing inwards, is a slender arm, terminating in a stout chitinized tooth, armed with denticulæ along the cephalic margin; on the caudal margin of this arm, and pointing posteriorly, are two stout bristles. The dorsal arm is chitinized, rather slender, the free portion short, curved, pointing cephalad. The guard of the penis, when viewed from above, is almost straight, the second gonapophyses pointing inwards. Viewed from the side, the penis-guard is strongly decurved ventrally, with a protuberance beyond the middle on the ventral side; the second gonapophyses, conical, pointing ventrad and armed with numerous hairs at the tip.

Wings: hyaline; stigma light brown, distinct. Venation (see fig. 7); Sc moderately long, the fork at the origin of R_3 , or (usually) somewhat beyond it. Sc_1 , from one to two times as long as Sc_2 . Cross-vein r at the tip of R_1 . Deflection of R_{4+5} about one half as long as R_5 . Basal deflection of Cu_1 at the inner end of cell 1st M_2 . Cross-vein m present, closing cell 1st M_2 .

On some of the cotype males, the basal deflection of Cu_1 is anterior to the fork of M .

This species comes nearest to *F. moniliformis*, Doane (Jour. N. Y. Ent. Soc., 1900, p. 184, pl. VII, fig. 8) but differs in the following particulars: antennæ and palpi brown; markings on thoracic dorsum very different, as well as decided differences in color of legs, abdomen, wings, etc. Sc_1 ends beyond the origin of R_2 , never before it; no pubescence in distal portions of the wings, etc. The forceps of the male are notable and agree in some respects with the brief description of this part in *haeretica*, O.S. (Monographs IV, p. 70.)

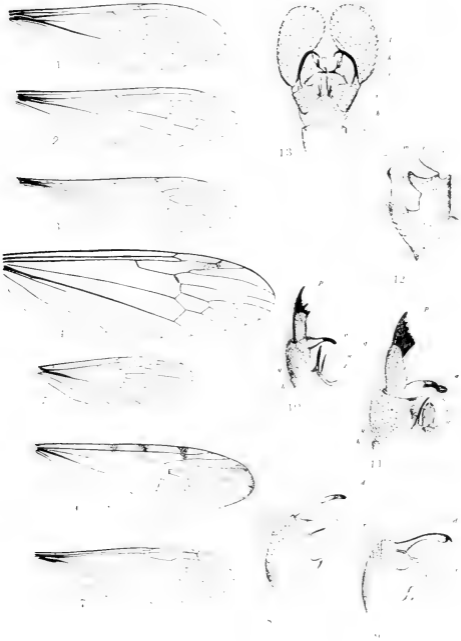
Holotype: male, Black Rock Mt. (Rabun Co.) Ga., alt. 3,000 ft., May 24, '11. Coll. J. C. Bradley.

Allotype: female; with the holotype.

Para-types: 7 males, 1 female, with the holotype.

EXPLANATION OF PLATE

1. *Limnophila lenta*, O.S.; wing. (Ithaca, N. Y., Aug. 12, '10.)
2. *Limnophila quadrata*, O.S.; wing. (Ithaca, N. Y., May 21, '11.)
3. *Limnophila noveboracensis* sp. nov. Para-type; wing. (Ithaca, N. Y., July 11, '11.)
4. *Limnophila similis* sp. nov. Para-type; wing. (Johnstown, N. Y., June 26, '10.)
5. *Polymera georgiæ* sp. nov. Para-type No. 2, wing. (St. Simon's Is.; Ga., April-May, '11.)
6. *Ormosia apicalis* sp. nov. Holotype, wing. (Burton, Ga., May 20, '11.)
7. *Furcomyia monticola* sp. nov. Para-type, wing. (Black Rock Mt., Ga., May 24, '11.)



ALEXANDER TIPULIDÆ

8. *Limnophila similis* sp. nov. Holotype, male genitalia. (Johnstown, N. Y., June 10, '10.)

Pleura of the hypopygium; left side; ventral aspect. d. dorsal apical append.; v. ventral ap. app.

9. *Limnophila adusta*, O.S. Male genitalia. (Ithaca, N. Y., July 16, '11.)

As in No. 8 (*similis*).

10. *Limnophila simplex* sp. nov. Holotype, male genitalia. (Gainesville, Ga., April 2, '11.)

Pleura of the hypopygium; right side; dorsal aspect. p. posterior, or ventral apical app.; a. anterior, or dorsal apical app.; g. 2d gonapophyses; h. hypopygium; w. anal tube; x. guard of the penis; y. pleura.

11. *Limnophila rufibasis*, O.S. Male genitalia. (Ithaca, N. Y., May 22, '11.)

As in No. 10 (*simplex*).

12. *Furcomyia monticola* sp. nov. Holotype, male genitalia. (Black Rock Mt., Ga., May 24, '11.)

Hypopygium, lateral aspect.

m. guard of the penis. j. 2d gonapophyses. l. ventral apical app.

13. *Furcomyia monticola* sp. nov. Holotype, male genitalia hypopygium; dorsal aspect.

h. hypopygium; i. pleura; j. 2d gonapophyses; k. dorsal apical app.; l. ventral apical app.; m. guard of the penis.

THREE NEW ANTS FROM MEXICO AND CENTRAL AMERICA.¹

BY WILLIAM MORTON WHEELER.

Pheidole tisiphone sp. nov.

Soldier. Length 5.6 mm.

Head large; from above subrectangular, longer than broad, a little broader in front than behind, with nearly straight sides and very feebly excised posterior broader and a short, shallow occipital groove; in profile truncated anteriorly, flattened above in front and feebly convex below, with a narrow and very deep scrobe on each side, running obliquely backward and downward just over the eye to the outer border of the gula and ending abruptly at the middle of the head. The edges of the scrobes are sharp and parallel, the upper edges passing anteriorly into the frontal carinae which are very widely separated. Frontal area small, deeply impressed, rounded behind. Frontal groove obsolete. Eyes small, about 1-6 the distance from the anterior to the posterior border of the head. Clypeus short and very convex, with a faint, median, longitudinal impression, and entire and deflected

¹Contribution from the Entomological Laboratory of the Bussey Institution, Harvard University, No. 51.

anterior border. Mandibles very convex, with two large, incurved apical teeth. Antennæ very short and slender, the scapes curved, but scarcely flattened, less than half as long as the scrobe; funicles longer than the scapes; all their joints longer than broad. Thorax robust, especially in front, without humeral callosities; pro- and mesonotum in profile forming a simple subangular convexity, without a constriction at the pro-mesonotal suture; mesoëpinotal constriction well-developed; epinotum small, its base and declivity sloping, not separated by an angle; spines short, slender and rather blunt, longer than broad at their bases, directed upward and slightly backward, less than half as long as the distance between their bases. Petiole from above about $1\frac{1}{2}$ times as long as broad, broadest behind, with concave sides, its node rather high, strongly compressed anteroposteriorly, in profile with concave anterior and posterior declivities and seen from behind with straight, entire upper border. Postpetiole $1\frac{1}{2}$ times as broad as the petiole, convex above, nearly twice as broad as long, with the sides projecting as blunt angles, which are rounded in front and slightly concave behind. Gaster smaller than the head, elliptical. Legs long and stout, with distinctly incrassated femora.

Whole surface, especially that of the gaster, shining. Mandibles coarsely striatopunctate. Clypeus transversely rugulose-punctate. Head in front longitudinally punctate, transversely and arcuately rugulose on the posterior two thirds except the posterior corners which are rather densely reticulate-rugose. Gular surface more shining, punctate. Thorax above, including the epinotal declivity, transversely rugose, pleuræ shining, more indistinctly rugose. Petiole and postpetiole rather smooth, the latter coarsely punctate on the sides. Gaster and legs glabrous, with small, indistinct, scattered piligerous punctures.

Body, legs and scapes covered with very long, suberect, golden yellow hairs, which are very abundant on the upper surface of the head and clypeus and sparser elsewhere. The hairs on the upper surface of the head are directed backward, those on the clypeus, mandibles and gula forward.

Ferruginous red; legs slightly paler and more yellowish; gaster, borders of mandibles, clypeus, gula and antennal scrobes, black.

Described from a single worker taken by Mr. Frederick Knab at Almoloya, Oaxaca, Mexico (Nat. Mus. Coll. Type No.). Two workers taken by the same collector in the same locality may belong to this species but they are so unlike the soldier that I deem it best not to describe them.

This extraordinary species is very distinct from all the species of the genus known to me. In the possession of deep antennal scrobes running obliquely downward to the sides of the head, it resembles *Ph. aberrans* Mayr of South America and *Ph. scrobifera* Emery of Costa Rica; but the head in these species is much shorter and of a very different shape, the scrobes are shallower and broader, and the pilosity and color are very different, and the latter species measures only 2.75 mm. *Ph. cavifrons* Emery of Uruguay seems

Prof. C. W. Johnson, 7
with author's sincere regards.

1909. Idem.—Genera Insectorum (dirigés par P. Wytzman), Bruxelles, 97 me fascicule, Family Chalcididae. pp. 427, 464, 465, 468.

Table to the genus as in Ashmead (1904); brief diagnosis of the genus, listing *colliguaya*, *melleus*, *persimilis* and *viridicyaneus*, *Euderus columbianus* (p. 427).

(See also Kieffer, bionomic note on *colliguaya*, Révista Chilena de Historia Natural. Organo del Museo de Valpaíso, VII, p. 111.)

NEW AFRICAN TIPULIDÆ.

BY C. P. ALEXANDER, ITHACA, N. Y.

The following species were given by Mr. Chas. W. Howard to Prof. Needham, and later turned over to me for examination. There were four specimens, representing three species, of which two are herein characterized as new. Mr. Howard's remark, that "the species were as thick as gnats," is interesting.

Styringomyia howardi, n. sp.

Holotype.—♂, brown and gray; length, 5.25 mm.; ^{wing} width, 4.75 mm.

Mouthparts dark brownish black; palpi, first segment very short; second segment large, oval, brown, apical third black; third more slender, brown, apical two-thirds black; terminal segment about as thick as the penultimate. Antennæ: first segment elongated, gray; second oval, enlarged at the distal end, remaining segments oval, gradually becoming more elongated to the tip; segments with a short pubescence and long irregular hairs, which are scarcely verticillate; first segment gray, second dark brown at tip, yellowish at base; remaining segments pale brownish yellow, the hairs darker; ommatidia large, coarse, black; front, vertex, genæ and occiput gray, with stout, scattered black bristles.

Pronotum large and prominent, showing an unusually generalized condition; the scutellum U-shaped, encircling the cephalic margin of the mesothoracic præscutum, with about three prominent bristles on the lateral margin; the scutum is narrower, running to an obtuse point cephalad, with a group of bristles along the lateral margin. Mesonotum: præscutum with a row of bristles along each side of the median line and a row along the lateral margin, this row incurving near the cephalic margin of the sclerite; scutum with four bristles on each half; the scutellum with a bristle on either side of the median line; postscutum and metanotum unarmed. Pronotum brown, pale apically, with an inverted U-shaped pale mark on the scutum; mesonotum præscutum, middle line pale, remainder

brown; scutum grayish brown, yellow along the cephalic margin passing around the black bristle; scutellum yellow medially, brown laterad of the bristle, postscutum brown; metanotum brown; sterna yellow; epimera and episterna reddish brown, forming a narrow longitudinal band.

Halteres pale brown, subapically darker brown; tip yellow. Legs short and stout, thickly covered with appressed hairs; coxæ short, cylindrical, in the fore leg about as long as the trochanter; in the middle leg shorter than the prominent trochanter; in the hind leg prominent, much exceeding the shorter and narrower trochanter. Femora rather short, slender proximally, soon thickening so as to become almost clavate distally; the fore femora have stout, long hairs, which are scattered irregularly amongst the appressed hairs, becoming very numerous near the apical portion of the lower surface of the segment. Tibiæ slender throughout, tibiæ and metatarsi with a few prominent hairs regularly disposed; the other tarsal segments with a single hair at the tip. The fore femora are as long as the succeeding segments combined; the hind legs are longer than the others. Fore legs lacking (in the holotype); middle leg, coxæ and trochanter light yellow; femora yellow, with a medial and subapical brown band; tibiæ yellow, with a dark band before the middle and at the tip; tarsi yellow-tipped with dark brown; fifth segment and claws dark brown. Hind legs, coxæ, trochanters and femora as in the fore leg; tibiæ and tarsi yellow, excepting the last tarsal segment, which is darker.

Abdomen with numerous scattered hairs, yellow; the apical margins of the segments brown.

Wings with a faint yellow tinge; costal border and radial veins yellow; remaining veins darker; a dark suffusion around cross-vein $r-m$, at the union of M_2 with M_{1+2} and along the basal deflection of Cu_1 . Venation (see fig. 2): S_c short, approximated with R basally; its tip opposite the origin of R_2 ; R short, the tip of R_1 before the middle of the



FIG. 2. *Styriogomyia laszari*, holotype.

wing, the sector originating a short distance back from the tip; R_2 straight, rather long; R_{2+3} very short, oblique; deflection of R_4 ; very short, scarcely equal to the $r-m$ cross-vein; R_{4+5} long. M forks anterior to the

fork of R_2 ; deflection of $M_{1,2}$ rather long; M_3 in a line with M_1 , strongly deflected cephalad toward $M_{1,2}$, nearly, if not quite, obliterating the cross-vein m . Basal deflection of Cu_1 under the middle of cell 1st M_2 . First anal fused with Cu at extreme base; 2nd anal strongly curved at tip with a spur at the curve, which may be a remnant of a forked anal.

Paratype.—♂. This specimen is much darker than the type; the first six antennal segments are dark, remainder yellowish; thoracic dorsum dark brown, where it is light brown in the type; yellow of abdomen replaced by dark brownish gray, etc. This is but an extreme in colour.

This species is remarkably similar to the species mentioned by Osten Sacken (Mon. Dipt. N. Am., IV, p. 102, 103). The main differences are in the venation, the elongated cell 1st M_2 and incurved second anal with a spur at the curve being peculiar to *S. howardi*.

Holotype.—♂, Queliniani, Zambesi R., Dec. 20, '08; coll. Mr. C. W. Howard.

Paratype.—♂, with the type.

The only species described from Africa is *S. cornigera* Speiser (Dipt. aus Deutschland Afrikanischen Kolonien, p. 130-132, fig. 1*). This insect differs so remarkably from the remaining species of the genus, which otherwise form a homogenous compact group, that I propose to set it off in a new subgenus.

Neostyringomyia, subgen. n.

Char.—Radius long, its tip beyond the middle of the wing; R_4 remarkably shortened, no longer than the $r-m$ cross-vein; $R_{2,3}$ sinuate, leaving cell R_1 very different in shape from that which obtains in the subgenus *Styringomyia*; cross-vein m long and prominent; basal fusion of Cu and 1st A very long; prothorax narrow, scarcely one-fourth as wide as the head; above the antennæ a short, bent spatulate horn.

Type.—*S. cornigera*, Speis.

Cornigera is obviously of more recent derivation than the members of the subgenus *Styringomyia*, and its venation is almost normal; the retreat of $R_{2,3}$ toward the base of the wing may give a hint to the manner in which the remarkable venation of *Toxorhina* came about, perhaps by the fusion of $R_{2,3}$ with some other vein, such as R_1 .

A species was described from the Pacific Islands by Grimshaw in 1901, as *S. didyma* (Fauna hawaiiensis, Vol. 3, pt. 1 (Dipt.), pl. 1, figs. 14-16), from Honolulu, Oahu De Meijere, in his recent paper, "Studien

*Berl. Ent. Zeitschr., 52 (1907).

uber Süd-ostasiat. Dipteren, V,"† records the species from much farther west (Batavia, Java, etc.). *Styringomyia didyma* belongs to the typical subgenus, and is extremely similar to the fossil species described by Löew** and Osten Sacken, as well as to the species under consideration. All of the species of the subgenus *Styringomyia*, as here limited, are very similar to one another in venation, and the coloration is inclined to be variable. *S. didyma* differs from the new species as follows: The wings are shorter in *didyma*; R_{4+5} is in a direct line with R_6 , whereas there is a deflection at the origin of R_{4+5} in *S. howardi*. *Didyma* has no spur at the curve of 2nd anal. The coloration of the thorax of the two species is different. The male genitalia of the species have not been studied critically, and must furnish the ultimate criterion. It is, of course, possible that when further collections are made, intermediate stations for the genus will be discovered, and then it may be proved that *S. howardi* is merely a variant of *S. didyma*. However, I prefer to describe it as distinct at present.

In the end of Vol. III of the Monograph, p. VII, Osten Sacken came forward with the surprising intelligence that the genus *Styringomyia* still existed. He says: "During my passage through Stockholm in 1872, I made the interesting discovery that the genus, besides its occurrence in amber and copal, is found living in Africa. I saw several specimens among the unnamed Diptera from Caffraria (from Wahlberg's voyage) in the Stockholm Museum. The species was apparently different from that included in the copal, which I possess." Later, in "Studies on Tipulidæ,"* he states, "This singular genus, originally described from specimens included in copal from Zanzibar, and also in amber, has been discovered since as still living in South Africa. In the museum in Stockholm I have seen recent specimens brought from Caffraria by Wahlberg."

Despite Prof. Speiser's statement (i.e., p. 132), that Osten Sacken probably referred to *Elephantomyia wahlbergi* Bergr., when he made the last-quoted statement, I have no doubt but that Osten Sacken saw specimens of a true *Styringomyia* in Stockholm; an error of this calibre was not customary with Osten Sacken.

Mongoma zambesie, n. sp.

Holotype.—♀, brown; length, 5.75 mm.; ^{cr. 2.59} ~~width~~, 5.5 mm.

Rostrum and palpi dark brown; antennæ, first two segments dark

† Tijdschr. voor Entomol., April, 1911, p. 40.

** Loew, H. — Dipterol Beiträge, I, p. 7, with f. (1847).

* Berl. Ent. Zeitschr., Bd. XXXI, 1887; Heft., II, pp. 185, 186.

brown, third light brown, remainder lacking. Front, vertex, genæ and occiput dark brown.

Thorax: Mesothoracic præscutum strongly produced cephalad, entirely covering the pronotum; cervical sclerite elongated, prominent; transverse suture scarcely V-shaped; mesothoracic præscutum, dark brown anteriorly, posteriorly with a pale brown median line, which extends back across the scutum, remainder of thoracic dorsum dark brown. Sterna, episterna and epimera brownish yellow; halteres pale; legs long, dull brown, at the joints somewhat darker; no processes on the fore femora, as described for *M. fragillima* and *M. curtipennis*.

Abdomen uniform brown.

Wings hyaline, costal margin yellow, stigma rather indistinct. Venation (see fig. 3), Sc very long, as in all members of the genus; R long, cross-vein *r* near its tip. R_8 gently arcuated, forking far before the tip



FIG. 3.—*Mongona zambezie*, holotype.

of Sc_1 and in a line with $R_{1,5}$; the cross-vein *r* far before the fork of $R_{2,3}$; R_2 short, oblique; R_3 long, in a line with $R_{2,3}$. $R_{4,5}$ fusing with $M_{1,2}$ to form the proximo-anterior border of cell M_2 , thus obliterating the *r-m* cross-vein. *M* forks at the lower corner of cell M_2 , $M_{1,2}$ departing cephalad, fusing with $R_{4,5}$ for a distance and finally separating, free at the margin; M_3 in a line with *M*. *Cu* short, its fork far back, the free position of Cu_1 very long, fusing with M_3 at the fork of *M*, and continuing to the margin so fused. Cu_2 fuses with 1st *A* far back from the wing-margin, so that 1st *A* + Cu_2 is over twice the length of the free portion of Cu_2 alone. 2nd *A* is very short, suggesting the condition found in *Petaurista*.

Holotype.—♀, Queliniani, Zambesi R., Dec. 20, '08; Mr. C. W. Howard.

The genus *Mongona*, of which ten species have been described, has a world-wide distribution in the tropics; two species have been described from the West Indies, five species from the East Indies and Australia, and three species from Africa. The genus is distinguished by the excessive length of *Sc*, the obliteration of the *radio-medial* cross-vein by the long

fusion of $R_{1,2}$ with $M_{1,2}$, and the decided tendency of Cu_2 to fuse with 1st A.

The West Indian species (*manca* and *pallida* Will., Dipt. St. Vincent, p. 291-293, figs. 6, 7, of *pallida*) and possibly *M. albitarsis* Dol. (E. Ind.), also, which I have not seen, are the most generalized members of the genus, in that Cu_2 and 1st A are distinct to the wing-margin. The intermediate group, containing *trentepohlii* Wied. (see Wiedemann, Aussereur. Zweifl. Insekt., I, 551; 18, tab. VIb, fig. 12; a better figure in De Meijere, Tijds. voor Ent., 1911, pl. IV, fig. 42); *fragillima* Westw. (see Westwood, Trans. Ent. Soc. Lond., 1881, pl. 17, fig. 1; also Needham, 23rd Rept., N. Y. St. Ent., pl. 21, fig. 6), and *exornata* Berg. (Bergr., Entomol. Tidskrift, 1888, opp. p. 130, fig. 3), has Cu_2 fused with 1st A for a short distance back from the tip (Cu_2 + 1st A less than one-half Cu_2). A third stage in the specialization of this part occurs in *M. pennipes* O. S. (E. Ind.) (See De Meijere, l.c., pl. IV, fig. 39.) The maximum of specialization, as far as I know, occurs in the present species, where the fusion of Cu_2 with 1st A is notable, and suggests the condition obtained in the families *Empididae* and *Dolichopodidae*.

Of the three described African species, *M. zambesie*, comes closest, apparently, to *exornata*. *M. fragillima* (and probably *M. curtipennis* also, according to Speiser, who compares it with *fragillima*), has vein M_2 separating from Cu_1 , and continuing distinct to the wing-margin: both of these species possess a curious spur-like structure at the base of the fore femora, which does not occur in *M. zambesie*.

I have a ♂ of *M. exornata* Berg., taken at Queliniani, Zambesi R., Dec. 20, '08, in which the fore legs are lacking, and I am unable to state whether or not this structure occurs there. *M. exornata* has been recorded from Delagoa Bay, Portuguese East Africa; Caffraria, E. Cape Colony, and Amani, German E. Africa. It is apparently widely distributed throughout Eastern Africa.

ON THE OCCURRENCE OF A EUROPEAN SPECIES OF MYMARIDÆ IN NORTH AMERICA.

BY A. ARSENE GIRAULT, BRISBANE, AUSTRALIA.

Up to the present I have been successful in finding but a single species of the family Mymaridæ, common to Europe and North America. This species is *Anaphes pratensis* Foerster, which I have captured in Illinois, and of whose characteristics I write of in a paper on Chalcidoidea, to be published soon in Germany; the species is recorded from America

March, 1912

A REVISION OF THE GENUS BRACHYPREMNA OSTEN SACKEN (TIPULIDÆ, DIPTERA).¹

BY CHAS. P. ALEXANDER,
ITHACA, N. Y.

The genus *Brachypremna* was erected by Osten Sacken in 1886.² for *Tipula dispellens* Walker; at the same time *Tipula brevicentris* Wiedemann was definitely referred to this genus. The following year,³ in part 2 of his "Studies on Tipulidæ," the same author described two new species, *pictipes* and *unicolor*, and gave a key (*l. c.*, p. 239) for the separation of the four known species. In 1900, Williston⁴ described the fifth species, *similis*. I have had for study some fifty specimens of *Brachypremna* received from the various Eastern Museums, and in this material I found all of the known forms excepting *pictipes*. There was also included a new species, hereinafter described, and a single specimen of the hitherto unrecognized *Tipula albimana* of Wiedemann. This name is preoccupied by *T. albimana* Fabricius (*Mantissa Ins.*, vol. 2, p. 232, 1787) and I propose the name *candida* for the South American species. The seven species at present known are separated by the included key. *Brachypremna cocconica* Meunier was recently⁵ described from the Baltic amber.

¹ Contribution from the Entomological Laboratory, Cornell University.

² Berl. Ent. Zeitschr., Vol. 30, p. 161.

³ Berl. Ent. Zeitschr., Vol. 31, pt. 2; pp. 239, 240.

⁴ *Biologia Centrali-Americana*, Dipt., Vol. 1, Supplement, p. 229.

⁵ Monograph of the Tipulidæ and Dixidæ in the Baltic Amber, *Ann. Sci. Nat. Zoöl.*, Vol. 4, p. 394; pl. 16, fig. 6. (Paris, 1906.)

I am under obligations to Mr. E. T. Cresson, Jr., for the loan of the material in the Academy of Natural Sciences, Philadelphia; to Mr. Grossbeck for the American Museum forms; to Mr. Samuel Henshaw for the especially desired specimens of *Brachypremna unicolor* from the Loew Collection, now in the Museum of Comparative Zoölogy, Cambridge; to Mr. Fred'k Knab for the extensive collections of the U. S. National Museum, collections which contained all of the six species that I have examined; to Dr. J. Chester Bradley for the Cornell University specimens, especially rich in *B. dispellens*, and to Mr. E. B. Williamson for some very interesting material, collected on the author's recent trip to British Guiana. I express my gratitude to all of the above gentlemen, and to others hereinafter mentioned.

CHARACTERS OF THE GENUS.

Head: rostrum elongated; nasus distinct, cylindrical, bearing a number of elongated hairs at its apex; maxillary palpi elongated; segments one and two short, subequal; segment three, half again as long as the second; last as long as two and three together; antennæ short; first segment cylindrical; second, globular; flagellar segments elongate-ovate, gradually more slender and elongated, bearing scattered hairs.

Thorax: pronotum and collare slender, distinct, so that the head is separated from the mesonotum; legs long and slender, the tarsi almost as long as the femora and tibiæ combined; hind tibiæ spurred; the fore and middle tibiæ apparently spurless.

Wing venation: *Sc* long, ending opposite (*unicolor*) or beyond the fork of *Rs*; *Rs* strongly arcuated at its origin, almost square but not spurred, longest in *unicolor*, shortest in *candida*; *R*₂₊₃ of varying length, shortest, relatively, in *unicolor*, longest, relatively, in *candida*; crossvein *r* long connecting *R*₂₊₃ at the fork; *R* very pale, vertical, basal deflection of *R*₁₊₅ prominent in all the species excepting *unicolor*; cross-vein *r-m*, when present, always short; cross-vein *m* very long, forming the distal face of cell 1st *M*₂; petiole of cell *M*₁ moderately long except in *unicolor* where it is very short; basal deflection of *Cu*₁ slightly beyond the fork of *M*₁ except in *unicolor* where it is located at, or proximad of, the fork; fusion of *M*₁ and *Cu*₁ short, almost *nil* in *unicolor*, moderate in most species, longest in

candida; cell 1st M_2 large, subquadrate in all the species, except *unicolor* where it is almost triangular; 2d anal very short, straight, leaving cell 2d A very long and narrow.

From the above it will be seen that *unicolor* is the most distinct species, venationally, with *candida* second. The other species show a great similarity as regards the course of the veins; a character that I have used, should be explained; in the comparison between the length of the sector, beyond the strong basal arcuation, the straight portion of the vein is compared with that portion of $M_{1,2}$ lying between the cross-veins $r-m$ and m , i. e., cephalic margin of cell 1st M_2 (discal).

Abdomen: rather long and narrow. Hypopygium (see text fig-



Hypopygium of *Brachypremna dispellens* Walk., dorsal aspect.

ure): margin of the 9th sternite convex with a broad, obtuse notch; pleural pieces elongate, cylindrical (in lateral outline, triangular); with a deep groove on the ventral face; outer face beset with long hairs; apical appendage, elongate, hairy, the basal half rather fleshy, the apical half chitinized; viewed from the side the chitinized tip is strongly curved with the tip flattened and rather expanded; on the outer side at the base of the chitin, is a stout conical tooth; on the inner face at the end of the fleshy portion of the arm is a fleshy,

elongated lobe, beset with stout hairs; the guard of the penis is short and stout; anal tube very short. In a position of rest, the appendages tightly fit into grooves on the ventral side of the pleural pieces.

Ovipositor of the female with the valves rather short, straight, pointed.

KEY TO THE SPECIES OF *Brachypremna* O. S.

1. Basal deflection of R_{4+5} obliterated, so that R_{2+3} and R_{4+5} arise directly from the end of the radial sector; R_8 elongate; cell 1st M_2 sub-triangular; legs uniform brown. (Antilles.).....*unicolor* O. S.
Basal deflection of R_{4+5} prominent; R_8 shorter; cell 1st M_2 sub-quadrangle; legs variegated with white or yellowish-white.....2
2. Femora with the tip dark, brownish-black.....3
Femora with the tip abruptly light-colored, white or yellowish-white.....5
3. Tibiæ uniformly pale, whitish. (East U. S.—Brazil.).....*dispellens* Walker.
Tibiæ more or less dark colored.....4
4. Tibiæ white at the extreme base only. (Guiana, Brazil, Bolivia.)
breviventris Wied.
Tibiæ white at the base and tip. (Guiana—Brazil.).....*williamsoni*, n. sp.
5. Tip of tibiæ broadly pale; tarsi pale.....6
Tip of tibiæ and the tarsi dark, concolorous with remainder of the legs. (Mexico—Panama.)*similis* Williston.
6. Tibiæ with a narrow dark band, three mm. broad, situated one and one half mm. from the base. (Brazil.).....*pictipes* O. S.
Tibiæ with the dark median band, broad, comprising about half the length of the segment. (Guiana—Brazil.).....*candida* n. n.

***Brachypremna dispellens* Walker.**

1860. *Tipula dispellens* Walker, Trans. Ent. Soc. Lond., Vol. 5, new series, p. 334. 1878. *Tipula dispellens* Osten Sacken, Cat. Dipt. N. Am., ed. 2, p. 39. 1886. *Brachypremna dispellens* Osten Sacken, Berl. Ent. Zeitschr., Vol. 30, p. 162. 1900. *Brachypremna dispellens* Williston, Biol. Cent.-Amer., Dipt., Vol. 1, suppl., p. 229. 1909. *Brachypremna dispellens* Johnson, Boston Soc. Nat. Hist. Proc., Vol. 34, p. 123.

Head: rostrum light brown, the nasus rather short, dark brown; palpi, basal segment dark brown; second, brown at the base, paler, yellowish-white, apically; third segment entirely pale; fourth segment dark brown. Antennæ, basal segments pale, flagellar segments light brown, the apices of the segments indistinctly paler. Front, vertex and occiput rather dark brown, except a very narrow, pale border adjoining the inner margin of the eye; center of the vertex clear-gray.

Thorax: prothoracic scutum pale, the lateral margins dark brown and two elongated spots on either side of the median line. Mesonotum, præscutum light brown, the extreme cephalic margin and the lateral edge, paler, whitish; a distinct narrow brown line, arcuated outwards at the cephalic margin of the sclerite,

thence continuing straight to the suture, the pale median line enclosed by them very narrow; sides of the sclerite dark brown, with an elongate, triangular, white mark, beginning on the lateral end of the suture before the wing-base, running inward; scutum light brown with three dark brown stripes, the median one broader; scutellum brown on the sides, in the middle silvery-white with an elongate brown median vitta; postnotum silvery-white, tri-vittate with dark brown, the pale stripes a trifle narrower than the dark median stripe. Pleurae dull silvery-white, less clear anteriorly, with narrow dark brown stripes, the most dorsal of which begins at the præscutal pseudosutures (humeral pits), runs very obliquely under the bases of the wings and halteres and ends in the abdominal sternites; the second stripe is interrupted and includes the outer face of most of the coxæ. Halteres: knob brown, stem pale. Legs: coxæ gray with a distinct brown stripe; trochanter pale; fore and middle femora dark brown; hind femur light brown, darkening to the tip; tibiæ and tarsi entirely pale yellowish-white.

Wings: subhyaline, costal cell light brown or gray; cell R_2 with the costal border brown; tip of cell R_3 narrowly brown on the caudal margin; veins conspicuously margined with brown; tips of the median veins and Cu_1 very pale; stigma pale brown, margined with blackish-brown. Venation (see Fig. b): R_2 rather long, beyond the arcuation a little longer than M_{1+2} between cross-veins $r-m$ and m ; $r-m$ short, but distinct, basal deflection of Cu_1 beyond the fork of M ; fusion of Cu_1 and M_3 rather extensive.

Abdomen: tergum dark brown with indications of a paler, median, dorsal stripe; sternum very pale, the basal segments with oval dark brown spots in the middle, these fading out caudad into a lighter brown; in the distal segments, the dark brown spots become much more elongated. Hypopygium, see the generic characterization.

♂♂ (Vienna, Georgia), length, 11.5–15.8 mm.; wing, 15.2–19.6 mm. Fore leg, femur, 11.8 mm.; tibia, 13.5 mm. Hind leg, femur, 11.6–15 mm.; tibia, 12.6–17.2 mm.

♂ (Igarape-Assu, Brazil), length, 13.8 mm.; wing, 18.1 mm. Fore leg, femur, 11.6 mm.; tibia, 13 mm. Hind leg, femur, 13.9 mm.; tibia, 15.5 mm.

♀ (Igarape-Assu, Brazil), length, about 15.8 mm.; wing, 16.8 mm. Fore leg, femur, 11.2 mm.; tibia, 12 mm. Hind leg, femur, 12.8 mm.; tibia, 14.1 mm.

Distribution.—United States: New Jersey, Shark River, Monmouth Co. (Johnson); District of Columbia, Washington (Osten Sacken); North Carolina, Pendleton, Northampton Co. (Johnson); Kentucky, in Mus. Comp. Zoöl. (Johnson); Georgia, Atlanta, Felton Co.; Vienna, Dooly Co., Albany, Dougherty Co., Bainbridge, Decatur Co. (Dr. J. C. Bradley), and Billy's Island, Okefinokee Swamp, Charleston Co. (Cornell University Exped. 1912); Florida, Tick Island, Volusia Co. (Johnson), Jacksonville, Duval Co. (Johnson); Texas, Dallas, Dallas Co. (Boll). Mexico: Tabasco, Teapa and

Frontero (H. H. Smith); Vera Cruz, Medellin (H. H. Smith); Isthmus of Tehuantepec (Sumichrast). Cent. Am.: Guatemala, Antigua (Eisen), Aguna (Eisen). Antilles: Trinidad (Busck), Cunapo River, Trinidad (Williamson). Dutch Guiana (authority Osten Sacken; Berl. Ent. Zeit., vol. 31, p. 239). Brazil: Para, Igarapé-Assú (Parish).

B. dispellens is readily distinguished from all of its allies by the uniform pale tibiae. Northern specimens (Georgia) seem to have the coloration clearer cut, the pattern more grayish. Specimens from Guatemala have the costal cell of the wings more yellowish-brown; cell *R*₂ brown in the middle, paler along the costal margin; the tibiae and tarsi more yellowish-white, etc. However, the Brazilian material shows almost the same type of coloration as the Georgia specimens and the discrepancy in color must be attributed to the age of the specimens and other factors.

Brachypremna breviventris Wiedemann.

1821. *Tipula breviventris* Wied., Dipt. Exot., Vol. 1, p. 43. 1828. *Tipula breviventris* Wied., Aussereur. Zweiff. Insekt., Vol. 1, p. 47. 1886. *Brachypremna breviventris* Osten Sacken, Berl. Ent. Zeit., Vol. 30, p. 161. 1900. *Brachypremna breviventris* Hunter, Trans. Am. Ent. Soc., Vol. 26, p. 285. 1902. *Brachypremna breviventris* Kertész, Cat. Dipt., Vol. 2, p. 264.

Head: rostrum brown, shiny; nasus black, tipped with yellow hairs; palpi, basal segment yellow; second dark brown, tipped with pale brown; remaining segments dark brown. Antennae, basal four or five segments light yellow; remainder gradually darker, brown. Front light cream-color, vertex and occiput brown with a sparse yellow bloom.

Thorax: light brown, mesothoracic præscutum with a narrow brown stripe on either side of the very narrow median pale stripe; a short broad dark stripe beginning just behind the proximal end of the pseudo-sutural fovea, broadening out behind, somewhat interrupted at the suture; scutum dark brown on the lobes, this color a continuation of the lateral præscutal stripes, scutum pale medially; scutellum pale with a short, double, brown median line; post-notum brown, with two narrow pale stripes on either side, these being a continuation of the pale vitte on the scutellum. Pleuræ brown anteriorly, the meso- and meta-pleuræ with a gray bloom; the sclerites with brown margins giving the pleuræ a spotted appearance. Halteres: stem pale, knob brown. Legs: coxæ dark brownish with a large pale spot on the outer face; trochanter yellow; femora light yellowish-brown, darkening at the tip to a brownish-black; tibia with the extreme base, abruptly yellowish-white; remainder of the tibiae dark brown; base of the metatarsus dark brown, concolorous with the tibia, the remainder of the tarsi brightening to a yellowish-brown.

Wings: costal cell brownish; remainder of the wing sub-hyaline; cell *R*₁

largely pale brown; cell R_2 with the extreme cephalic margin pale yellow, running down and ending at a drop in the end of cell R_3 ; cell R_2 brown, with the caudal margin sub-hyaline; end of cell R_3 dark with the yellowish spot above described; R_4 dark at tip with a hyaline drop in the outer caudal angle; cell M_1 almost hyaline; veins with narrow brown seams; stigma usually with a large sub-hyaline spot in under r , sometimes small or absent. Venation (see Fig. *d*): R_8 rather long, beyond the arcuation longer than M_{1+2} between cross-veins $r-m$ and m ; basal deflection of Cu_1 beyond the fork of M .

Abdomen: tergum brown, extreme bases of the segments, pale yellowish; sternum light brownish-yellow with a distinct elongate-ovate black spot in the middle of each segment.

♂, wing, 21 mm. Fore femur, 12.7 mm.; fore tibia, 14 mm.

♀, length, 17.4-17.9 mm.; wing, 18-18.8 mm.; fore leg, femur, 11.3-11.6 mm.; tibia, 13-14.5 mm.; hind leg, femur, 13.2-13.8 mm.; tibia, 13.6-14.9 mm.

Distribution.—Dutch Guiana: Cigi Makoc (H. Polak), Paramaribo (Miss Mayo). Brazil: Igarapé-Assú, State of Para (Parish), Rio Blanco (H. H. Smith).

B. breviventris may be readily distinguished by its dark femoral and tibial tips and pale basal tibial ring.

Brachypremna williamsoni, new species.

Tip of femur dark; base and tip of tibia abruptly light colored; wings tinged with darker.

♂, length, 11.3-15.7 mm.; wing, 14.8-19.3 mm. Fore leg, femur, 10 mm.; tibia, 11.4 mm. (paratype No. 1).

Head: rostrum brown; palpi, basal segment mostly black, second yellow at extreme base and tip, remaining segments brownish-black. Antennæ, basal segments, pale brown; second, light yellow; flagellar segments with the base brown, tip yellowish, the brown increasing on the outer segments. Front brown; vertex and occiput light brown, brighter colored adjoining the eye.

Thorax: rather similar to *breviventris*, the long intermediate brown stripes quite indistinct; post-notum with the median brown stripe divided by a pale median line. Pleuræ without distinct brown spots. Halteres: base of stem pale, thence gradually darkening to the brown knob. Legs: coxæ grayish-yellow, indistinctly spotted with brown; femora brown, not darkened at the tip as in *breviventris*; tibia dark brown, a narrow ring at base and tip, pale yellowish-white, tarsi brown, lighter colored toward the tip.

Wings: conspicuously tinged with darker; costal cells brown; cell R_2 with a brown cloud in cephalic portion and a hyaline droplet near outer end; R_3 dark at outer end with a sub-apical hyaline spot; R_5 similar with a conspicuous rounded drop; M_1 , cephalic margin of tip brown, caudal margin of tip with a hyaline drop; cell M_4 dark, not hyaline, as in *breviventris*; veins with narrow seams of darker brown; stigma brown, a pale spot in it just below cross-vein r ; (in the type ♂, stigma clear brown). Venation (see Fig. *e*): R_2 beyond

arcuation short, scarcely longer than M_{1+2} between cross-veins $r-m$ and m ; basal deflection of Cu_1 before the middle of cell 1st M_2 .

Abdomen: tergum brown, the base of the sclerite paler, more yellowish; sternum pale, the median markings pale brown, broadly ovate, not elongate or black.

Paratype No. 1 differs in having the tibiae unicolorous throughout, dark brown.

Paratype No. 2 has the tarsi much lighter, yellowish.

Paratype No. 3 is much larger (largest measurements given).

Holotype, ♂, Wismar, British Guiana. (Williamson, Coll.) Jan. 30, 1912.

Type in author's collection.

Paratype No. 1, ♂, with the type.

Paratype No. 2, Paramaribo, Dutch Guiana. (Miss Mayo.) (In Coll. Acad. Nat. Sci. Phil.)

Paratype No. 3. Manaus, State of Amazonas, Brazil. (Miss Merrill.) (In Coll. U. S. Nat. Mus.)

B. williamsoni is a small species finding its nearest relative, apparently, in *breviventris* Wied. It differs from this species in the pale tibial tips; the oval brown markings on the abdominal sternites (these being linear and brownish-black in *breviventris* and most other species), and in different wing-pattern. I take pleasure in naming this interesting form after Mr. E. B. Williamson, of Bluffton, Indiana, who collected the types while in Guiana in 1912, in search of Odonata.

Brachyremna similis Williston.

1900. *Brachyremna similis* Will., Biol. Cent.-Amer., Dipt. 1, Supplement, p. 229. 1902. *Brachyremna similis* Kertész, Cat. Dipt., Vol. 2, p. 265.

Head: rostrum, light brownish-yellow, darker on the side; nasus brown with brownish-yellow hairs; palpi mostly brown, in some specimens the two basal segments are light yellow. Antennæ with the basal segments pale, yellowish; segments three to five, brown at base, pale at apex; remainder of the antennæ brown. Front, vertex and occiput dark brown, except a narrow yellow margin immediately adjoining the eyes.

Thorax: præscutum usually with the pale narrow median stripe not distinct (in some specimens it is apparent behind, in the vicinity of the suture), the pale stripes separating the broad lateral stripes from the median vitta are narrow and ill-defined; scutum dark brown on the lobes, paler medially; postnotum with the median brown vitta broad, the adjoining pale stripes very narrow. Pleuræ pale, spotted with brown, these brown marks being on the margin of the sclerites. Halteres brown, the root of the stem paler. Legs:

coxae pale, yellowish-white; femora brown, darkening outwardly, the tip abruptly pale yellowish-white; tibiae with a basal ring, subequal in width and of the same color as the femoral band; remainder of the tibiae dark brown; tarsi brown, the apical segments becoming paler, yellowish-brown.

Wings: costal cell yellowish-brown; cell R_2 almost clear, more yellowish on the costal margin; outer end of cell R_3 narrowly blackish-brown on the caudal margin; cell R_5 dark brown with a rounded hyaline drop; cell M_1 almost hyaline, with a large oval, even clearer, drop at its end; veins very indistinctly margined with darker; stigma dark brown, paler in the center. Venation (see Fig. a): R_3 rather short, beyond the arcuation, a little longer than M_{1+2} between $r-m$ and m ; $r-m$ a little more distinct than is usual in the genus; basal deflection of Cu_1 just beyond the fork of M .

Abdomen: tergum dark brown, the extreme base of the segments paler, less distinct on the apical segments; sternum light brown with an elongate blackish spot in the middle of each segment; hypopygium rather browner than in related species.

♂, length, 15.2 mm.; wing, 18.4-20 mm. Fore leg, femur, 12.1 mm.; tibia, 14.3 mm. Hind leg, femur, 14.8 mm.; tibia, 15.9 mm.

♀, length about 15 mm.; wing, 16.6 mm. Fore leg, femur, 11 mm.; tibia, 13 mm. Hind leg, femur, 12.7 mm.; tibia, 14.6 mm.

Distribution.—Mexico, Teapa in Tabasco (H. H. Smith); Guatemala, Livingston (Schwarz-Barber); Nicaragua, Escondido R., 50 miles from Bluefields (Richmond); Panama, Gatun (Jennings), Porto Bello (Busck), Paraiso (Busck).

Distinguished from the other species with pale femoral tips, *candida* and *pictipes*, by the dark tibial apices.

Brachypremna candida, new name.

1830. *Tipula albimana* Wied., Aussereur Zweifl. Insekt., Vol. 2, p. 615. non *T. albimana* Fab. 1900. *Tipula albimana* Hunter, Trans. Am. Ent. Soc., Vol. 26, p. 286. 1902. *Tipula albimana* Kertész, Cat. Dipt., Vol. 2, p. 281.

Head: rostrum yellowish; nasus pale with pale hairs; palpi, first segment dark brown; second segment mainly yellowish; remainder black. Antennæ, first two segments yellowish, remainder dark brown. Front, vertex and occiput pale with a gray bloom.

Thorax: præscutal stripes about as in *breviventris*, but very indistinct; the usually distinct markings of the mesothoracic scutellum and postnotum not at all evident. Pleuræ brown, without distinct markings. Halteres brown, extreme base of the stem pale. Legs: femora brownish-yellow at base, gradually darkening to brown, with a rather broad, apical yellow ring; tibia with a basal yellow band about as wide as the femoral; apice of the tibia more or less yellowish-white, broadest on the hind leg, where it covers nearly one half of the segment; tarsi pale yellowish-white.

Wings: almost hyaline, cell *C* only a little more yellowish than the rest of

the wing; wing tip suffused with brown; inner end of cell R_2 , adjoining vein R_2 , pale, hyaline; remainder of cell R_2 , most of R_3 and outer end of R_5 , uniformly brown, without hyaline droplets as in most of the species; veins rather indistinctly seamed with darker color; stigma dark brown, uniform. Venation (see Fig. f): R_8 very strongly arcuated, beyond the arcuation, R_8 is shorter than M_{1+2} between the cross-veins $r-m$ and m ; fusion of M_3 and Cu_1 extensive, longer than R_2 .

Abdomen: tergum brown, segments paler basally, rather darker apically; 8th segment brownish-black; hypopygium pale; sternites not visible in the single specimen before me.

♂, length, 12 mm.; wing, 14.2 mm. Hind leg, femur, 13 mm.; tibia, 15.6 mm.

Distribution.—Dutch Guiana (Wiedemann's type); Brazil (Manaos, State of Amazonas) (Miss Merrill, Coll.). Specimen in U. S. Nat. Mus. Coll.

This small species is conspicuously different from the nearest related species in its wing and leg pattern. The lack of hyaline droplets in the ends of the radial cells distinguishes it from *similis*, *breviventris* and *williamsoni*. The leg pattern is closest to *pictipes*, but I cannot believe the two species to be conspecific. *Pictipes* is larger, and the dark tibial band in only 3 mm. broad; *candida* is our smallest species and the tibial band is broad, narrowest on the hind legs (6 mm.) and very wide on the fore legs (12 mm.).

Brachypremna pictipes Osten Sacken.

1887. *Brachypremna pictipes* O. S., Berl. Ent. Zeitschr., Vol. 31, pt. 2, p. 239.

1900. *Brachypremna pictipes* Hunter, Trans. Am. Ent. Soc., Vol. 26, p. 285.

1902. *Brachypremna pictipes* Kertész, Cat. Dipt., Vol. 2, p. 265.

♂.—Front and vertex brownish, paler in the middle; antennæ brownish, two basal segments yellow; rostrum yellowish above, brown below; palpi brown at base and tip but yellow in the middle. Ground color of thorax brownish-yellow; collare with a short double longitudinal stripe in the middle and a lateral brown spot on each side; mesonotum with a double brown intermediate stripe and short, broad lateral stripes; metanotum pale with three brown stripes; some brown spots on the pleuræ. Abdomen brown above, with a very faint longitudinal stripe on the basal segments; venter yellowish with a brown streak in the middle of each segment, forming an interrupted longitudinal stripe; male genitals, small, yellowish. Halteres brownish, paler at bases. Femora brownish, the tip yellowish-white for about 1.5 mm.; tibiæ and tarsi yellowish-white except a brown ring on the tibiæ, about 3 mm. broad placed at about 1.5 mm. from the knee, the interval being white. Wings with a uniformly pale brownish tinge, the stigma but slightly darker; venation like *B. brevisventris* Wied. L. 16-18 mm.

Hab. Cassapava, Brazil. (Sellow, Coll.)

"Type in Berlin Museum."

Adapted from Osten Sacken's original description, *l. c.*, p. 239.

Brachypremna unicolor Osten Sacken.

1887. *Brachypremna unicolor* O. S., Berl. Ent. Zeit., Vol. 31, pt. 2, pp. 239-240.

1900. *Brachypremna unicolor* Hunter, Trans. Am. Ent. Soc., Vol. 26, p. 285.

1902. *Brachypremna unicolor* Kertész, Cat. Dipt., Vol. 2, p. 265.

Head: rostrum light brown; nasus concolorous, with short hairs; palpi, basal segment, brownish at origin, paler apically; second segment pale; remaining segments brown. Antennæ, first segment brown; second segment much lighter colored, yellow; flagellar segments dark brown with the extreme tip yellow, producing an annulated appearance, this coloring becoming obsolete near the end of the flagellum. Front, vertex and occiput light yellowish-brown.

Thorax: præscutum light brown, the anterior portion of the sclerite suffused with brownish, concealing the usual stripes; two distinct brown dots on the extreme cephalic margin of the sclerite; on the caudal portion of the sclerite, the dark stripes become distinct; median dark stripe not double; scutum uniformly light brown with suggestions of darker lines; scutellum and postnotum pale, with a narrow brown median line and with the lateral edges of the sclerite indistinctly brown. Pleuræ uniformly pale without distinct darker marks. Halteres long, brown, pale at the base of the stem. Legs: coxæ pale, femora light brown passing into dark brown at the tip; tibia dark brown, the extreme base slightly paler, but not producing a ringed appearance; tarsi slightly lighter brown.

Wings: almost hyaline; cell *C* light yellowish-brown or yellow; cell *R*₂ tinged with yellow along the costal margin; cell *R*₃ tinged with yellow at the tip; veins narrowly margined with pale brown; darker brown clouds at the ends of the radial veins; stigma very pale brown with a narrow border of darker brown. Venation (see Fig. *c*): *R*₈ long, beyond the arcuation, about three times as long as *M*₁₊₂ between cross-veins *r-m* and *m*; basal deflection of *R*₄₊₅ none, so that *R*₄₊₅ is in a line with *R*₈ and *R*₂₊₃ and *R*₄₊₅ arise directly from the end of the sector; cross-vein *r-m* short but distinct, petiole of cell *M*₁ very short; cell 1st *M*₂ sub-triangular; fusion of *M*₂ and *Cu*₁ very slight; basal deflection of *Cu*₁ at, or before, the fork of *M*.

Abdomen: tergum dark brown, the bases and lateral margin of the segments indistinctly paler; sternum pale, with the median spots on the segments very elongate, black, forming an almost continuous line; lateral margins of the sclerites, darker, brownish.

♀, length, 16.5-18.6 mm.; wing, 18.5-20.1 mm. Fore leg, femur, 11.8 mm.; tibia, 13.3 mm. Hind leg, femur, 13.8-14 mm.; tibia, 15.4-16 mm.

Distribution.—Island of Cuba, Cayamas (E. A. Schwarz); Island of Porto Rico (Moritz) Osten Sacken's types; Island of Grenada, Lesser Antilles (Busck.)

This remarkably distinct species requires little comparison with the other forms at present known. The plain brown tibiae and the remarkable venation will serve to distinguish the species at a glance.

EXPLANATION OF PLATE XVI.

These figures show the venation, and the main features of color-pattern.

a, wing of *Brachyremna similis* Williston.

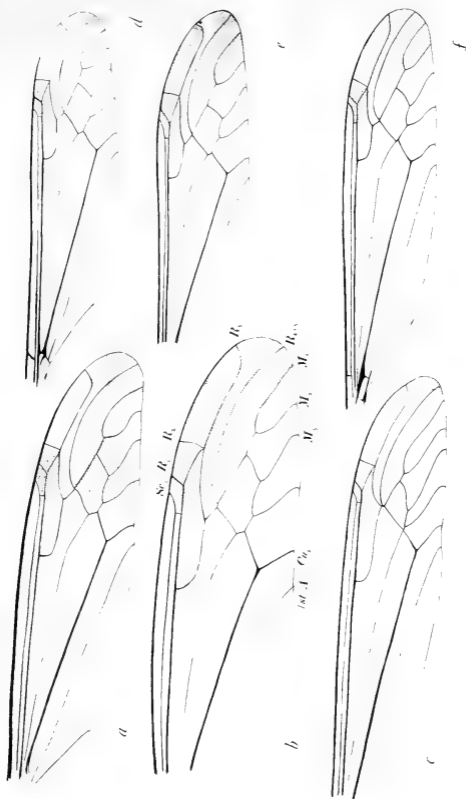
b, wing of *Brachyremna dispellens* Walker.

c, wing of *Brachyremna unicolor* Osten Sacken.

d, wing of *Brachyremna breviventris* Wiedemann.

e, wing of *Brachyremna williamsoni*, n. sp.

f, wing of *Brachyremna candida*, n. n.



Brachypremna

THE AMERICAN SPECIES OF ADELPHOMYIA BERGROTH (TIPULIDÆ DIPT.)

CHARLES P. ALEXANDER
ITHACA, NEW YORK*

The small size of the crane-flies constituting the genus *Adelphomyia* Bergr.¹ entitles them to the name of Microlimnophilini, the majority of the described forms being much smaller than members of allied genera.

Some confusion has arisen recently, regarding the identity of the most common of the three known American species and the purpose of the present article is to straighten out this imbroglio. The first mention of an American representative was in an article by the author² in which a new species (*minuta*) was described and a second species referred, provisionally, to the widely-distributed European form, *scnilis* Hal. This latter species was again mentioned, and its venation figured in a second article³ and here, also, was referred to *scnilis*. There has always been a question in my mind regarding the specific identity of the American and European forms and I have taken the opportunity to send specimens to Mr. F. W. Edwards, who kindly compared the American species with European specimens of *scnilis* in the British Museum collection and reports that the two forms are distinct. I give a key to the known American species and describe two new forms.

American Species of *Adelphomyia*

- | | |
|--|----------------------------------|
| 1. Wings with cell M1 absent. | <i>cayuga</i> sp. n. |
| Wings with cell M1 present. | 2 |
| 2. Pubescence in cells of wings lacking or sparse; cross-vein <i>r</i> not evident; cross-vein <i>m</i> short or obliterated; general color of body pale yellow. | <i>minuta</i> Alex. ² |
| Pubescence in cells of wings conspicuous; cross-veins <i>r</i> and <i>m</i> distinct; body color more brownish. | <i>americana</i> sp. n. |

Adelphomyia americana sp. n.

1911 *Adelphomyia scnilis* Alexander. Can. Ent.

1911 *Adelphomyia scnilis* Alexander. Ent. News.

Small species (length, ♀, 3.8-4 mm.); radial cross-vein present; cell M1 present; plurae almost unicolorous, dull yellow.

♂ Length, 3.2-3.5 mm.; wing, 4.3-4.6 mm.

Foreleg, femur, 3.7 mm.; tibia, 4.1 mm.; tarsus, 3.8 mm.

Middle leg, femur, 3.9 mm.

♀ Length, 3.8-4 mm.; wing, 5-5.3 mm.

Contribution from the Entomological Laboratory, Cornell University.

1 Bergröth; Mittheil. Naturf. Gesell. Bern; p. 134; 1891.

2 Alexander; Canad. Entom.; Aug. 1911.

3 Alexander; Entomol. News; Oct. 1911.

Rostrum and palpi light brownish-yellow; antennae light brown. Front vertex and occiput light brownish-yellow, with a sparse greyish bloom.

Thoracic praescutum dull yellow, rather shining, without apparent stripes, scutum, scutellum and postnotum similarly colored. Pleurae uniform dull yellow. Halteres pale, uniform throughout. Legs—Coxae and trochanters dull brownish-yellow; femora similar, slightly darkened apically; tibiae and tarsi uniform brownish-yellow. Wings almost hyaline, veins light brown. Venation (Figure 260, A, or Ent. News, l. c.)— Sc^1 very long, Sc^2 far removed from its tip; cross-vein r present, inserted on R2 about its own length beyond the form of R2+3; M1 much shorter than M1+2 beyond cross-vein m . Short hairs in most of the distal cells of the wing.

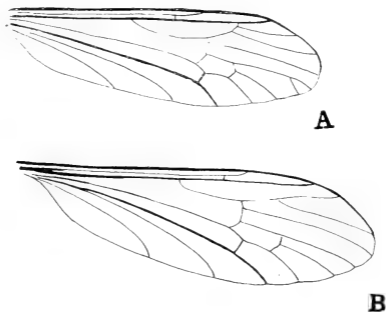


Figure 260

Abdominal tergum brown with a narrow, darker, median line and a narrow pleural band of the same color; sternum pale yellow, almost concolorous with the thoracic pleurae.

Holotype, ♂. Woodworth's Lake, Fulton Co., N. Y.; alt. 1650 ft.; Aug. 22, 1910. (Alexander, coll.)

Allotype, ♀, with the type.

Paratypes, 30, ♂ ♀. Sport Is., Sacandaga R., June 28, 1911; Woodworth's Lake, Gloversville and Johnstown, Fulton Co., N. Y.; Ithaca, Tompkins Co., N. Y.; September, 1911.

Types in Author's Collection

Paratypes in British Museum of Natural History, U. S. Nat. Mus., Cornell University and in author's collection.

I am indebted to Mr. Edwards for the following comparison of *americana* with the European *scuilis*:

1. The pleurae in *A. americana* are unicolorous ochreous; in *A. similis* they are reddish-brown above and below, more ochreous in the middle.
2. The marginal cross-vein is present in *A. americana*, absent in *A. similis*.
3. The genitalia are different in the two species but as we have only one male, I do not want to dissect it, without which I cannot properly make out the structure."

Adelphomyia cayuga sp. n.

Large species (length, ♀, 5 mm.); radial cross-vein indistinct; cell M1 absent.

♀, length 5 mm.; wing 5.1 mm.

Rostrum, palpi and antennae light brown. Front, vertex and occiput brown.

Thoracic praescutum uniform light brown without apparent dorsal stripes; scutum, scutellum and postnatum lighter-colored yellow. Pleurae light brownish-yellow, brighter colored on the metapleurae and on the posterior portions of the mesopleurae. Legs rather uniform light brown throughout. Wings rather uniformly suffused with dark, membrane distinctly darker colored than in *americana* or *minuta*; veins light brown. Venation (Figure 260. B — Sc1 rather long, about five times as long as Sc2; R2+3 in a line with R2; cross-vein *r* not evident; basal deflection of R4+5 in a line with cross-vein *r-m*; cell M1 absent, i. e., M1 and M2 fused to the wing-margin. A short pubescence in the apical portions of the wing, tips of cells R1, R2, R3, R5, M2 and M3 being included.

Abdominal tergum and sternum uniformly brown.

Holotype ♀ (balsam slide), Vanishing Brook, Ithaca, N. Y.: Aug. 16, 1912. (Alexander, coll.)

Type in author's collection.

On the tropical American Rhipidiae (Tipulidae, Dipt.)

By CHAS. P. ALEXANDER, Ithaca, N. Y.*

The genus *Rhipidia* Meigen, remarkable in the possession of strongly pectinated antennae in the males of many species, reaches its maximum of specific development in the tropics of the New World.

I have before me over fifty specimens of American *Rhipidiae*, referable to ten species, all of the described forms being included excepting *bipectinata* Will., *costalis* Will., *bryanti* Johns., *tabescens* End., and typical *subpectinata* Will. The types of *bryanti* are in Boston, and through the kindness of Mr. C. W. Johnson I was able to examine them in December, 1911. In addition to the hitherto known forms, I find among the material four new species and three additional varieties which are characterized in this paper.

All of the known *Rhipidiae* are referable to three main groups, which seem to be equivalent to subgenera, based on the structure of the male antennae.

(1) The subgenus *Rhipidia*, constituting the *maculata* group with bipectinate antennae, including the type of the genus, *maculata* Meig., and *bipectinata* Will., *costalis* Will., *calverti* sp. nov., *cramptoni* sp. nov., and probably *bryanti* Johns., and *tabescens* End., these latter known only from the females.

(2) The subgenus *Monorhipidia* subg. nov., constituting the *uniseriata* group, with unipectinate antennae, including *fidelis* Osten-Sacken, and *unipectinata* Will.

(3) The subgenus *Arhipidia* subg. nov., constituting the *domestica* group, with subpectinated antennae, including two subgroups,

*Contribution from the Entomological Laboratory, Cornell University.

subpectinata Will. and its allies, *annulicornis* End., and *schwarzi* sp. nov., and the *domestica* subgroup, with *multiguttata* sp. nov., and *domestica* and its races.

The material studied is the property of the United States National Museum, the American Museum of Natural History, the Entomological Society of Philadelphia, and Cornell University; and I am indebted to Mr. Frederick Knab, Mr. John A. Grossbeck, Mr. E. T. Cresson, Jr., and Dr. J. Chester Bradley for the loan of the material. I wish to further express my appreciation to Mr. Knab for kind advice and assistance in many matters.

Key to the American Rhipidiæ (males only.)

- | | |
|---|---|
| 1. Antennae of male bipectinated..... | 2 |
| Antennae of male unipectinated or subpectinated..... | 6 |
| 2. Flagellum with all except the last segment pectinated. (Wings with five costal spots; hind tarsi light yellow.) | |
| <i>calverli</i> , sp. n. (Costa Rica). | |
| Flagellum with the first segment simple; one or more terminal segments simple..... | 3 |
| 3. Wings nearly uniformly clouded with blackish; stigma dark. (Flagellar segments long, bipectinated; dorsal thoracic stripes not complete; pleural stripe distinct.) | |
| <i>bipectinata</i> Will. ¹ (Lesser Antilles). | |
| Wings variegated with spots and dots..... | 4 |
| 4. Wings with the spots confined to the vicinity of the veins. (Antennae black; terminal three or four segments simple.) | |
| <i>costalis</i> Will. ² (Lesser Antilles). | |
| Wings with numerous smaller spots and dots in all the cells..... | 5 |
| 5. Antennae with shorter pectinations; wings greyish with brown spots; several marks along costal margin. | |
| <i>maculata</i> Meig. ³ (Holarctic region). | |
| Antennae with longer pectinations; wings hyaline with reddish-brown dots sprinkled in all the cells; larger costal marks not present..... | |
| <i>cramptoni</i> sp. n. (North Brazil.) | |
| 6. Antennae of the male unipectinated (<i>uniseriata</i> group)..... | 7 |
| Antennae of the male subpectinated (<i>domestica</i> group)..... | 8 |
| 7. Thorax brown, gray pruinose; wings pale brownish, a whitish blotch in center of the disk; a round brown dot at origin of Rs, fork of Rs and tip of Sc; tarsi brown.... | |
| <i>fidelis</i> O-S. ⁴ (Eastern U. S.) | |
| Thorax yellow; wings with darker clouds along the anterior margin; apices of wings more clouded; posterior tarsi light yellow. | |
| <i>unipectinata</i> Will. ⁵(Central America; Lesser Antilles). | |

¹ Williston, Dipt. St. Vincent; Trans. Ent. Soc. Lond. (1896) 285, pl. 9, fig. 54.

² Williston, *l. c.*, 286, pl. 9, fig. 56.

³ Meigen, System Beschreib. (1818) I: 153, pl. 5, figs. 9-11.

⁴ Osten-Sacken. Proc. Acad. Nat. Sci. Phila. (1859) 209.

⁵ Williston, *l. c.* 286, pl. 9, fig. 55.

8. Mesonotal præscutum broadly edged with pale yellowish-white in front and on sides 9
 Mesonotal præscutum without a broad pale margin. 12
9. Wing membrane without numerous dots in the cells (*subpectinata*).. 10
 Wing membrane dotted with pale brown in all the cells. 11
10. Antennae yellow; head ochraceous-yellow pleural stripes narrow.
subpectinata subpectinata Will.⁶ (Lesser Antilles).
 Antennae blackish; segments 12, 13, pale; head gray; pleural stripes broad.
subpectinata pleuralis subsp. n. (Central America.)
11. Antennae pale, except segments 7, 8 and 14; a large oval brown spot at fork of media.
annulicornis End.⁷ (Trinidad, Colombia)
 Antennae dark brown, except segments 12-13; wings without a large blotch as described above.
schwarzi sp. n. (Greater Antilles)
12. Mesonotal præscutum without conspicuous dark brown marks, unicolorous except behind; wings abundantly dotted in all the cells.
multiguttata sp. n. (Central America).
 Mesonotal præscutum with darker longitudinal lines; wings with markings large, scanty, confined to the neighborhood of veins (*domestica*)..... 13
13. Thoracic præscutum with the middle stripes fused behind into a rectangular blotch.
domestica angustifrons subsp. n. (Ecuador).
 Thoracic dorsum with a narrow stripe on either side of the pale ground line. 14
14. Larger (wing of male 5.7-6.5 mm.); color darker; wings tinged with brown.
domestica amazonensis subsp. n. (East Brazil).
 Smaller (wing of male 5.4 mm.); color lighter; wings almost hyaline.
domestica domestica O-S.⁸ (Eastern U. S.; Central and Northern S. America).

The following species, known only from the females, could not be included in the above key: *R. bryanti* Johns.⁹ (Eastern U. S.), probably allied to *maculata*, but in its wing pattern suggesting members of the *domestica* group; deflection of Cu₁ unusually far distad. It is a large, vigorous species, quite distinct from any others that I have seen. *R. tabescens* End.¹⁰ (Western Brazil) has a wing pattern very much like *bryanti*. It is quite impossible to state with certainty the exact position of this insect.

Rhipidia calverti sp. n.

Antennae with first eleven flagellar segments long bipectinate; pedicels of segments pale, whitish; thoracic pleurae with a dark brown stripe; tip of hinder tarsi golden-yellow; wings subhyaline

⁶ Williston, *l. c.* 287, pl. 9, fig. 57, pl. 10, fig. 57a.

⁷ Osten-Sacken, *l. c.* 208; Monographs, 4, pl. 3 fig. 5.

⁸ Enderlein, Zool. Jahrb. (1912) 32: pt. 1, 80-81, fig. V 1.

⁹ Johnson. Proc. Bost. Soc. Nat. Hist. 35: no. 5, 123-124, pl. 16, fig. 20. April, 1909.

¹⁰ Enderlein, *l. c.* 81-82, fig. Z 1.

with five brown marks along costal margin.

Male: Length, 6.6 mm.; wing, 7.3 mm.; antennæ, about 3 mm.; Middle leg, tibia, 6 mm.; tarsus, 6.1 mm.; Hind leg, femur 6.8 mm.; tibia 7.5 mm.; tarsus 5.2 mm.

Head: Rostrum brown; palpi very dark brown, the last segment very slender. Antennæ (see fig. h), first segment long cylindrical, second short, oval, about equal in size to the swollen base of the first flagellar segment; segments 3-13 enlarged at base into an oval knob, the inner side of this knob produced into two long pectinations; on the third segment, the pectinations a trifle over twice the length of the pedicel of the segment; pectinations increasing in length to the 8th to 10th segments where the pectinations are about three and one-half times as long as the pedicel of the segment; from the 11th on gradually shortened to the 13th; 14th segment simple, enlarged medially; there are eleven pectinated segments, more than in *maculata*, *bipectinata* or *costalis*; the pectinations are slender, tapering gradually to the tip, which is not enlarged. Segments at the base with two long hairs on the side opposite from the pectination, and the pectinate arm is densely clothed with delicate pale hairs. Pedicels to the flagellar segments rather long, subequal, conspicuously more slender than the enlarged base. Segments brown on the knot and pectinate arm, the pedicel conspicuously white. Front and vertex extremely narrow between the eyes, practically divided at the narrowest point; front, vertex and occiput dark blackish-gray.

Thorax: Cervical sclerites brownish-yellow. Pronotum brown on dorsum, more yellowish-brown on sides. Mesonotum, præscutum, brownish-yellow with a broad rich reddish-brown dorsal stripe on each side of the narrow ground middle line, these diverging towards the suture; scutum dull yellow, very pale, whitish, in the middle, most of the lobes reddish-brown, these large spots being the caudal ends of the præscutal stripes; scutellum very pale, whitish; postnotum yellowish. Pleuræ light yellow, darkened on the ventral half; a broad, dark brown stripe from the pronotum across the pleuræ ending above the metacoxæ, where a less distinct band runs cephalad, traversing the sides of the sternum, including the outer faces of the coxæ. Halteres, extreme base and most of the knob, light yellow, stem

and base of knob dark brown. Legs: fore legs gone; middle leg coxae and trochanters yellowish, outer face of coxa darkened; femora dull yellow, rather darkened apically; tibiae dull brownish yellow; tarsi brown; hind leg similar to middle, but tarsal segments 2 to 4 conspicuously light golden yellow, the 5th black. Wings hyaline, costal margin with five grayish-brown marks, the third over the origin of *Rs*, the fourth at tip of *Sc*, the last, stigmal darkish; the interspaces between these marks cream colored; veins brown, darkest in the brown marks, lightest, cream colored on subcosta in the interspaces. Cord, outer end of cell 1st M_2 , and cell *R* in under the dark marks with scarcely visible darker clouds (see fig. d). Venation: *Sc* long, ending beyond the middle of *Rs*; *Sc*₂ at its tip; *Rs* long, basal deflection of M_{1+2} , less than one-half as long as the second section of M_{1+2} (between r-m and m); basal deflection of Cu_1 just before the fork of *M*.

Abdomen: Tergum brown; sternum lighter, yellowish-brown.

Holotype, male, Rio Surubres, Costa Rica. Bonnefil F'm. 800 ft. altitude, October 20, 1909. By sweeping, coll. Dr. P. P. Calvert. Type, coll. Am. Ent. Soc. Phila. Named in honor of the distinguished student of Odonata, Dr. P. P. Calvert, who collected the type in Costa Rica while securing material for the Biologia Centrali-Americana. It is a magnificent insect, nearest allied, perhaps, to *bipectinata* Will.

Rhipidia cramptoni sp. n.

Antennae with ten flagellar segments long bipectinated; antennae brownish; thoracic pleurae dark on the metapleurae and caudal portions of the mesopleurae; wings light yellow with numerous dots in almost all the cells; conspicuous costal blotches lacking.

Male: Length 5.3 mm.; wing, 7.1 mm.

Head: Rostrum light brown; palpi yellow. Antennae (see fig. i), first segment elongate-cylindrical; 2nd globular, its diameter greater than the first; 3rd segment subglobular basally with a very short pedicel, less than one-half the length of the swollen portion; 4th segment, base small, globular, produced into two pectinations on the under side, pectinations short, only a little longer than the segment itself, the dorsal pectination rather shorter, pedicel of the segment longer than the enlarged base; 5th segment, base subglobose, with the pectinations more elongate and slender, pedicel a little longer than that of the 4th segment; 6th

segment, base only a little enlarged, ovate, pectinations long, at least twice as long as the entire segment, pedicel longer than that of the 5th segment; segments 7 to 11 with the bases oval, pectinations very long, pedicels long and slender; 12th segment, with the swollen base elongate-ovate, pectinations and pedicel shorter than in the 11th segment; 13th segment, base elongate, pectinations short, about as long as those of segment 4 but more slender, pedicel short; 14th segment slender, more enlarged basally. Segments 1-2 dark brown; segment 3 and bases of succeeding segments light brown; pectinations dark brown with numerous pale hairs; pedicels very pale, almost white; two long hairs on side of each basal swelling, opposite to the pectinations. Front with a conspicuous tubercle in the middle; vertex between the eyes very narrow. Front, vertex and occiput very dark brown, sparsely gray pruinose.

Thorax: cervical sclerites dark brownish-black. Pronotum very dark brown. Mesonotum, praescutum, rich reddish-brown, darker brown dorsally, in front and on the caudal half; scutum, lobes dark brown with a large yellow spot in the center of each; scutellum yellowish-brown; postnotum dull yellow. Pleurae, propleurae dark brown on dorsal half, light yellow pollinose on ventral half; cephalic two-thirds of the mesopleurae light yellow; remainder of pleurae very dark brown. Halteres light yellow. Legs broken; fore coxa and trochanter light yellow; middle and hind coxae very dark brown basally; apically, and the trochanters, pale, whitish. Wing: light yellow, the cells *C* and *Sc* rather brighter; no large brown blotches along costa, as in *maculata*, *costalis* and *calverti*; a small brown spot at end of *Sc*, another on cross-vein *r*; a larger brown spot at origin of *Rs*; a large spot at tip of 2nd *A*. Faint narrow seams along the cross-veins and deflections of veins, especially on *Cu*, just above the fork of *Cu*. Numerous pale grayish-brown dots sprinkled in most of the cells (cells *Sc* and 1st *M*₂ excepted). (See fig. c). Venation: *Sc* rather long, ending before the middle of *Rs*; cell 1st *M*₂ small; basal, deflection of *Cu*, far before the fork of *M*.

Abdomen: Tergum dull yellow; segments 2 and 3 mostly dark brown; 4 to 7 dark brown apically; sternum dull yellow.

Holotype, male, North Brazil, August 17, 1911 (coll. H. E. Crampton). Type in coll. Amer. Mus. Nat. Hist. I take pleasure

in naming this fine insect after Professor H. E. Crampton, who collected the type on his recent trip with Dr. Lutz in British Guiana and Northern Brazil.

RHIPIDIA UNIPECTINATA Williston.

A female from the United States National Museum, determined by Coquillett as *unipectinata*, agrees well in most respects; however, the stem and knob of the halteres is deep black, not brown; wings with distinct costal blotches, etc. The coloration of the posterior tarsi is very similar to that of *R. calverti*, which has long, bipectinated male antennae, not long unipectinate antennae as described for *unipectinata*. The specimen is labelled "Patalue, Guatemala. 700 ft. (Dr. G. Eisen.) Received Jan. 6, 1903."

Rhipidia subpectinata pleuralis subsp. n.

Resembles *subpectinata* Will., of the Lesser Antilles, but is larger, the antennae dark brownish-black excepting the light yellow 12th and 13th segments; head brownish, gray pruinose, not "ochraceous yellow." Thorax: mesonotum, praescutum as described for *subpectinata* but with a broad median grayish stripe overlying the brownish dorsum; scutum and scutellum broadly whitish medially, brownish on the sides, a dark brown stripe on either side of the pale median stripe. Pleurae not "with a narrow black stripe" but with a broad black band, clearly defined on the dorsal margin, below suffusing the ventral pleural sclerites; an indistinct narrow stripe over the base of the coxae, almost confluent with the broad dorsal band. Halteres light yellow, knob a little darker. Legs: femora with an indistinct subapical brown band; wings as in *subpectinata*. Abdomen dark brown, tergites 8 and 9 light yellow; sternites yellowish.

Male: Length 4.8 mm.; wing, 5.7 mm. Female: length 4.9 mm.; wing, 5.8 mm.

Holotype, male, Trece Aguas, Cacao, Alta Vera Paz, Guatemala, March 28 (coll. Schwarz and Barber). Allotype, female, Bocas de Toro, Panama, 1905 (coll. McKenney). Types in coll. U. S. Nat. Mus.

It is probable that comparison with *subpectinata* will give this form specific rank. The description of *subpectinata* agrees closely with *annulicornis* End., except in the finely spotted wings of the latter. The pale antennae of these two forms is quite different from that of *pleuralis*, which agrees in this respect with *schwarzi*

or *domestica*. Whether the specimen listed from Mexico (Teapa in Tabasco) by Professor Williston (Biol. Cent. Amer. Diptera 1, Suppl. 226, Dec. 1900) refers to this variety or not is uncertain. *RHIPIDIA ANNULICORNIS* Enderlein.

I have four specimens that agree closely with Enderlein's description except in their smaller size. The female has never been described, and I make this the allotype.

Allotype, female, quite like the male in color; valves of the ovipositor are rather short, tergal valves very slender, arcuated; sternal valves bladelike, almost straight.

Male: Length, 4.1 mm.; wing, 5.2-5.4 mm. Female: 4.3-4.4 mm.; wing, 5.4-5.5 mm.

Allotype, female, Trinidad, June (Aug. Busck); three specimens, 2♂ 1♀ with the allotype. Allotype and 1♂ 1♀ in Coll. U. S. Nat. Mus.; 1♂ in author's collection. Some of the specimens are very pale as though newly transformed.

***Rhipidia schwarzi* sp. n.**

Antennae subpectinate; mesothoracic præscutum with a broad pale margin; wings with numerous dots in the cells; antennae mostly black.

Male: Length about 5.5 mm.; wing, 5.4-6.3 mm. (type). femora, 4.3 mm.; tibia, 5.2 mm.

Male: Head: rostrum and palpi dark brownish-black. Antennae, first segment elongate-cylindrical; flagellar segments strongly subpectinated, less marked on the apical segments. Antennae dark brown, segments 12-13 white. Front, vertex and occiput dark brown, thickly gray-pollinose, clearer gray behind.

Thorax: Pronotum above almost white, especially the scutellum. Mesonotum, præscutum, lateral and cephalic margin broadly pale yellow, very conspicuous, narrowest just before the wing root, broadest in front; remainder of the sclerite rich chestnut-brown, darkest brown just inside the pale lateral band; scutum, lobes dull chestnut, pale, grayish, medially and on sides. Pleurae brown, dorsal edge light yellow, continued back from the præscutal margin, becoming almost white behind the wing root, a dark brown stripe extending from the cervical sclerites caudad, running above the fore coxa, beneath the root of the halteres, fusing with the dark abdominal pleural stripe; ventral portions of pleurae and the sternum pale, grayish-pollinose. Halteres light yellow, knob a little

darker brown. Legs, coxae dark externally, pale on the inner face; trochanters and base of femora pale yellow; femora darker brownish apically, especially in the fore legs; tibiae and tarsi yellowish-brown. Wings hyaline or nearly so, brown spots at tip of Sc_1 , on cross-vein r , at origin of Rs ; cross-veins and deflections of veins seamed with pale brown; cells with large, pale brown spots scattered over their area (see fig. e). Venation: Sc rather long, ending about over the middle of Rs ; basal deflection of Cu_1 far before the fork of M .

Abdomen: Tergum light brown, extreme lateral edge dark brownish-black; sternum lighter colored, the lateral margins broadly brown.

Holotype, male, St. Domingo (F. E. Campbell). Paratype, male, Cayamas, Cuba, February 22 (E. A. Schwarz). Types in coll. U. S. Nat. Mus. (No. 15, 138). I take pleasure in naming this fine member of the *subpectinata* group after Dr. Eugene A. Schwarz, the distinguished coleopterist, who collected the Cuban specimen.

***Rhipidia multiguttata*, sp. n.**

Antennae subpectinate; mesothoracic præscutum not margined with pale and without conspicuous brown stripes; wings with numerous dots in the cells.

Male: Length, about 5.5 mm.; wing, 7.4-7.6mm. Fore leg, femur, 4.85 mm.; tibia, 5.4 mm. Hind leg, femur, 6.1 mm.; tibia, 6.5 mm.; tarsus, 5.8 mm. Female: Length, about 5.8 mm.; wing, 7.9 mm.

Male: Head: rostrum and palpi dark brown. Antennae, first segment elongate-cylindrical; 2nd oval, large, flagellar segments subpectinated, the distal ones less strongly. Antennae dark brown, the apical flagellar segments lighter brown, with dense whitish hairs. Front dark brown with a short blunt tubercle in the middle; vertex between the eyes rather broad (for males of this genus), light brownish-gray, pollinose; extreme hind margin of occiput brown.

Thorax: Pronotum, scutum dark brown; scutellum light yellow, raised above the level of the præscutum. Mesonotum, præscutum brown, more yellowish behind, medially light chestnut-brown, darkening to a deeper brown just before the suture; sides of the sclerite just before the suture so that the caudal half of the

præscutum appears trivittate; scutum yellowish-gray, clearest medially, a brown spot in the middle of each lobe; scutellum and postnotum brownish-gray pruinose, a narrow brown median stripe on the latter. Pleuræ brownish-gray with two narrow dark brown stripes traversing the pleural sclerites, the most dorsal beginning over the fore coxa, the ventral one behind the fore coxa. Halteres light yellow, knob a little browner. Legs: coxæ yellowish-brown; trochanters and femora light yellow, the latter with an indistinct brown subapical ring; tibiae and tarsi dull yellow, the last tarsal segments brown. Wings hyaline or nearly so; veins yellowish; a brown spot at origin of *Rs*, at tip of *Sc*, in cell *Sc* at about two-thirds its length; brown seam to cross-vein *r*, fork of *Rs*, cross-veins and deflections of veins; a series of larger pale brown spots in cell *M* along vein *Cu*; all cells thickly sprinkled with very pale brown dots (see fig. a). Venation: *Sc* rather short, ending before the middle of *Rs*; basal deflection of *Cu*, sometimes far before fork of *M*, sometimes closer to fork as in the paratype figured.

Abdomen: Tergites dull yellow, narrowly brown on the sides and on the caudal margin, indistinctly darker medially; sternites dull yellow, brownish on lateral edges.

Female: Quite as in male, in the allotype the brown marks on the caudal part of the præscutum not evident.

Holotype, male, Totonicipan, Guatemala, 1902 (Dr. G. Eisen). Allotype, female, with the type.

Paratype, female, Guatemala, July, 1902 (Dr. G. Eisen). Types in coll. U. S. Nat. Mus. (No. 15, 137).

RHIPIDIA DOMESTICA Osten-Sacken.

Head: Rostrum and palpi brown. Antennæ dark brownish-black; segments 12-13 almost white. Front, vertex and occiput light gray.

Thorax: Pronotum light brown with a dark brown median stripe. Mesonotum, præscutum golden-sericeous on sides and behind; a broad, clear median stripe with darker lines as follows: a conspicuous dark brown line on either side of the very narrow ground line, occupying the caudal two-fifths of the sclerite; two small dark brown spots in front of the anterior ends of these marks and two still smaller dots on the humeri; a narrow median brown line on the front of the sclerite, broadest in front; a broad lateral

stripe shorter than the caudal median stripe, running to the suture and overspreading the lobes of the scutum, making the sclerite bivittate; scutellum similar in color to the scutum; postnotum grayish. Pleurae light yellowish-brown with two narrow brown stripes. Halteres light yellow, knob not distinctly darker. Legs coxae traversed by the ventral pleural band; trochanters light yellow; femora yellow darkened toward the tip; tibiae and tarsi yellowish-brown. Wings almost hyaline; dark brown clouds at base of cell *Sc*, at three-fifths of the length of *Sc*, at origin of *Rs*; a pale, circular hyaline-centered cloud at the stigma; in center of cell 2nd *R*₁, along cord, in centers of radial cells, at tips of the veins, etc. Venation see fig. g.

Abdomen: Tergum brown, apices of the sclerites broadly darker brown; genitalia yellow; sternum yellowish-brown.

Male: Length, 5.3 mm.; wing, 5.4 mm. Female: 4.5-5.8 mm.; 6.1-7 mm.

The specimens that I have before me are as follows: (1) Baracoa, Cuba, September, 1901 (Aug. Busck), ♂, wing figured. (2) Balaclava, Jamaica (T. D. A. Cockerell), ♀. (3) Vera Cruz, Mexico, December 14, 1907 (Frederick Knab), ♀. (4) Cordoba, Mexico, December 25, 1907 (Frederick Knab), ♀. (5) Trinidad, June (Aug. Busck), ♂. (6) With the last, ♀.

All of the specimens are in coll. U. S. Nat. Mus., except No. 4, which I have retained for my cabinet.

Rhipidia domestica angustifrons subsp. n.

Like *domestica* Osten-Sacken, but coloration different. Eyes large, in dried specimens light gray, not black, possibly not normal; vertex between the eyes long and narrow; vertex with a large brown spot in the center. Thorax with the median stripes confluent forming a rectangular mark on the caudal portion of the sclerite; lateral præscutal stripes very broad, triangular, the usual dots in front of the median blotch are, as a rule, produced into long, narrow streaks, with a third one between them in the middle, making the cephalic half of the præscutum appear trivittate; lobes of the scutum mostly brown; scutellum very pale. Pleural stripes broader but ill-delimited. Wing, fig. f.

Male: Length, about 5 mm.; wing, 6 mm. Female: Length about 6.8 mm.; wing, 6.8 mm.

Holotype, male, Guayaquil, Ecuador (Francisco Campos).

Allotype, female, with the type. Paratypes, male and female, with the type. Types in coll. U. S. Nat. Mus. (No. 15136); one male paratype in author's collection.

***Rhipidia domestica amazonensis* subsp. n.**

Like *domestica* Osten-Sacken but much larger and darker in color, the thorax much browner, the lateral præscutal stripes curve distad at their ends, suffusing the lateral edge of the scutum with dark brown; postnotum not conspicuously gray-pollinose; fore femora very dark brown; wings distinctly tinged with brown, markings darker, better defined. Wing, fig. b.

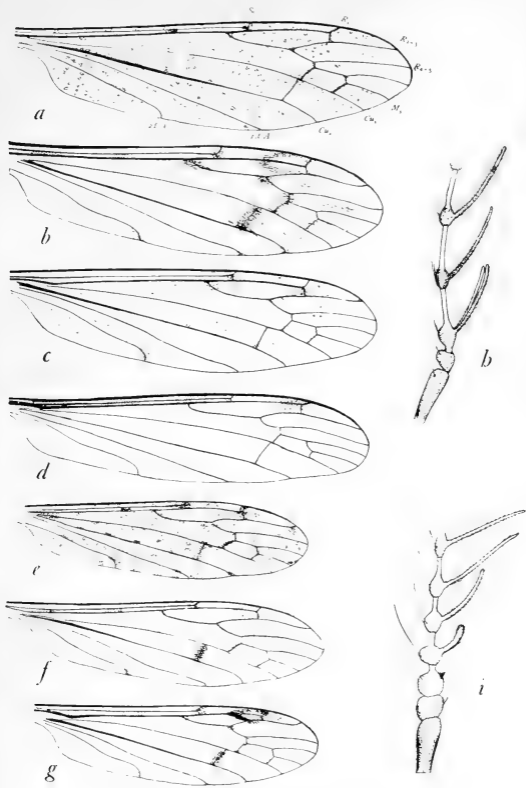
Male: Length, about 5.7-5.8 mm.; wing, 5.7-6.5 mm.
Female: Length, about 6.1-7.1 mm.; wing, 6-7.8 mm.

Holotype, male, Igarape-Assá, Para, Brazil, February 3, 1912 (H. S. Parish). Allotype, female, with the type, February 1, 1912. Paratypes, 9 ♂, 1 ♀, with the type, January 23rd to February 4, 1912. Types in coll. Cornell University; paratypes in coll. U. S. Nat. Mus. and in author's collection.

Explanation of Plate I.

(N. B. The wings are all drawn to scale by means of the Cornell projection lantern and show the relative size of the species.)

- | | |
|----|--|
| a— | Wing of <i>Rhipidia multiguttata</i> , sp. n. ♂. |
| b— | " " <i>domestica amazonensis</i> , subsp. n. ♂. |
| c— | " " <i>cramptoni</i> , sp. n. ♂. |
| d— | " " <i>calverti</i> , sp. n. ♂. |
| e— | " " <i>schwarzi</i> , sp. n. ♂. |
| f— | " " <i>domestica angustifrons</i> , subsp. n. ♂. |
| g— | " " <i>domestica domestica</i> O. S. |
| h— | Antenna of " <i>calverti</i> , sp. n. ♂. |
| i— | " " " <i>cramptoni</i> , sp. n. ♂. |



ALEXANDER—TROPICAL AMERICAN RHIPIDIAE.

A new Tropical *Gonomyia* (Tipulidae, Dipt.).

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

The species described herein is referable to the *manca* group of *Gonomyia* Meigen, which, in a more extensive discussion of the genus published elsewhere, I have recognized as belonging to the subgenus *Leiponeura* Skuse. This subgenus is represented in America by the following species: *manca* O. S.; *pleuralis* Will. (*Atarba*); *puella* Will. (*Atarba*); *alexanderi* Johns. (*Elliptera*), and the present species.

This form is closest to *pleuralis*,† from which it differs in coloration and, fundamentally, in hypopygial characters.

Gonomyia (*Leiponeura*) *amazona* sp. n.

Wings with cord margined with brown; legs black.

♀—Length, 5.4-5.5 mm.; wing, 3.8-3.9 mm. Fore leg, femur, 2.4-2.65 mm.; tibia, 4.2 mm. Hind leg, femur, 3-3.2 mm.; tibia, 4-4.05 mm.

♂—*Head*.—Rostrum and palpi dark brownish-black; antennæ, basal segments greatly swollen, orange; flagellum with the three or four basal segments almost white, apical flagellar segments dark brownish-black. Front, vertex and occiput, pale yellowish white.

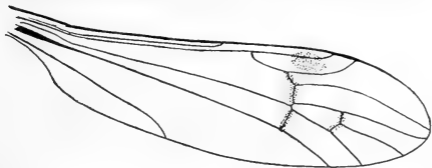


Fig 1

Wing of *Gonomyia* (*Leiponeura*) *amazona*, n. sp.

Thorax.—Mesonotum, præscutum very light yellowish orange; the lateral margins of the sclerite broadly whitish, separated from the bright color of the dorsum by an indistinct brownish line; scutum brownish-orange, almost concolorous with the præscutum, scutellum and postnotum very pale, almost white. Pleuræ almost white; a broad band extending across the pleural sclerites, beginning on the genæ of the head, continuing back to the abdomen; the dorsal and ventral margins of this band are darker, deep brown; the ventral mark runs through the halteres, the rest of the band suffusing the mesonotal præscutum with light brown; a narrow, more or less dark colored,

* Entomological Laboratory, Cornell University.

† Williston, Trans. Ent. Soc., Lond. (1896); p. 289; pl. 10; fig. 61.

brown band running across the pleuræ just over the bases of the coxæ; it is only about one-third as wide as the broad pale band separating the two dark pleural stripes. Halteres, basal half of the stem brown; remainder, including the knob, light yellow. Legs: coxæ white; trochanters and femora dark brownish-black, the extreme apices of the latter white; tibiae and tarsi dark brownish-black; the tarsi rather lighter.

Wings clear bluish-hyaline; veins light brown, C. and Sc. more yellowish; stigma large, rounded oval, dark brown; components of the cord and the outer end of cell 1st M² black, the membrane adjoining suffused with darker. All of the longitudinal veins are faintly margined with very pale brown. Venation as in *pleuralis*. (See fig. 1.)

Abdomen.—Tergum, light yellowish, especially bright on the lateral margins of the sclerites; apices of the sclerites dark brownish-black; sternum dull yellow, apices and lateral margins of the sclerites brown. Hypopygium (see fig. 2), described below, in key.

Holotype, male, Igarapé-assú, Pará, Brazil; February 1, 1912 (H. S. Parish).

Allotype, female, Igarapé-assú, Pará, Brazil; February 7, 1912 (H. S. Parish).

Paratype, 18 females, 2 males, Igarapé-assú, Pará, Brazil; January 25 to February 7, 1912 (H. S. Parish).

Types in Cornell University, except 5 female paratypes in author's collection and two in Coll. U. S. National Museum. Two females, in poor condition, are referred to this new species. They are from Paramaribo, Dutch Guiana (H. Polak, Coll.), and are in the U. S. Nat. Museum.

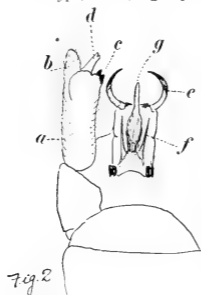


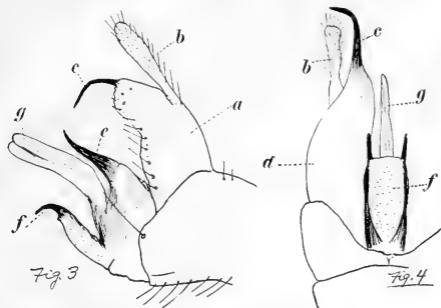
Fig. 2
Hypopygium of *Gonomyia (Leiponeura) amazona* n. sp. Ventral aspect. a, pleural pieces; b, dorsal apical appendage; c, ventral apical appendage; d, intermediate apical appendage; e, dorsal gonapophyse; f, ventral gonapophyse; g, guard of the penis.

The following comparison will point out the differences between the species:

***pleuralis* Will. (Antilles).**

Trochanter and femur light yellow, femur light yellowish, subapically brown, tip light yellow. Lower pleural stripe broad, more than one-half as wide as the pale one above it. Pleural stripe very dark brown, clear cut. Wings with uniform veins; cord not seamed with darker. Base of flagellum dark. Hypopygium: (See figs. 3, 4.) the eighth sternite convex; ninth sternite with each of the lateral

pieces triangular, almost or entirely united on the ventral aspect; pleural pieces elongate-cylindrical, bearing two appendages, the lower one (c), a long, chitinized hook bent strongly ventrad near its middle; the dorsal appendage (b), long, slender, fleshy, projecting caudad. Viewed from beneath, a short rectangular organ (f), ending in two short sharp-pointed, chitinized teeth which are curved ventrad; the organ rather chitinized basally and on the sides; behind the above described apophyse, an elongate-subchitinized organ (g), undoubtedly the penis guard; it is elongate-cylindrical and directed caudad; above this, a pair of sharp pointed chitinized teeth (e), directed caudad and slightly upward, their base thickened and with a dorsal notch. ♂, Baracoa, Cuba; Sept., 1901; Aug. Busch. (In Coll. U. S. Nat. Mus.)



Hypopygium of *Gonomyia (Leiponeura) pleuralis* Will. Fig. 3. Lateral aspect Fig. 4. Ventral aspect. Lettering as in Fig. 2.

amazona sp. n. (Surinam, E. Brazil).

Trochanter and femur dark brownish-black, extreme tip of latter white. Lower pleural stripe narrow, only about one-third as wide as the pale one above it. Pleural stripes usually light brown, not clear cut. Wings with cord and outer end of cell 1st M^2 dark brown, narrowly seamed with darker. Base of flagellum pale. Hypopygium (see fig. 2): the eighth sternite convex, basal piece of ninth sternite triangular; pleural pieces (a), cylindrical, with a short, fleshy dorsal lobe (b), clothed with long hairs at the tip; ventral lobe reduced to two blunt chitinized teeth (c); behind this a broad, less chitinized organ (d). Viewed from beneath, a short, broad, rectangular organ bearing at its apex at either angle, long curved horns (e), shaped like steer's horns, chitinized at the tip; ventrad of this organ, close to its lower face, two sharp needle-like appendages (f), and a sharp-pointed median organ which is presumably the guard of the penis (g). ♂, Igarapé-assú, Brazil, Jan. 26, 1912; H. S. Parish. (In Cornell University.)

A Bromeliad-Inhabiting Crane-fly (Tipulidae, Dipt.)

By CHAS. P. ALEXANDER, Ithaca, N. Y.*

To the rather long list of inhabitants of the Neotropical epiphytic, water-bearing Bromeliaceous plants, (as given by Dr. Calvert in ENTOMOLOGICAL NEWS, Nov., 1911, pp. 402-411), there should be added the family *Tipulidae*. I have recently received specimens of a Costa Rican *Mongoma* that were bred from Bromeliads by Sr. C. Picado. I am indebted to Mr. Frederick Knab, of the U. S. National Museum, for the privilege of examining these specimens.

Mongoma bromeliadicola sp. n.

Brown; thorax indistinctly striped; femora with a subapical black ring; apices of femora and tibiae and bases of the tibiae, white.

Length, ♂, 7.4 mm.; ♀, 8.4-9.2 mm.

Wing, ♂, 7.6 mm.; ♀, 8.5-9.2 mm.

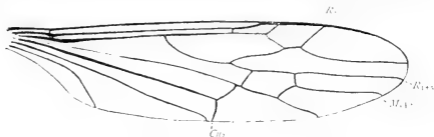
Legs all detached and almost impossible to separate; femora, 8.4-9.8 mm.; tibia, 7.6-10.1 mm.; tarsus, 7.2-8.9 mm. What is probably the fore-leg measures, femora, 8.4 mm.; tibia, 10.1 mm.; tarsus, 8.9 mm. Middle leg: supp. 9-9 mm., tibia 7.6-8.1 mm., tarsus 7.2-7.3 mm. Hind leg, supp., femora 9.6-9.8 mm., tibia 9.8-9.4 mm.

Head: rostrum and palpi yellowish-brown; antennae dark brown the basal segments rather paler; front vertex and occiput light brown.

*Contribution from the Entomological Laboratory of Cornell University.

ish yellow; a brown stripe along the inner margin of the eye, running from the narrowest portion of the front back to the genæ.

Thorax: mesothoracic præscutum light yellowish-brown with brown longitudinal stripes on either side of the narrow middle line; these stripes begin as two dark dots at a considerable distance caudad of the anterior margin of the sclerite, running backward to the suture and becoming more distinct behind; outer caudal margins of the sclerite rather dark brown, which color is continued backward onto



Wing of *Mongoma bromeliadicola* n. sp.

the sides of the scutum; middle line of the scutum yellowish-white; scutellum purplish-brown with a broad pallid caudal edge; post-notum deep purplish-brown; pleuræ dull pale whitish-brown; sclerite just anterior to the wing-basis darker, brownish. Halteres pale, whitish, throughout. Legs: coxæ and trochanters light brown; femora light yellowish-brown, darkening abruptly to form a sub-apical blackish ring; extreme tip abruptly cream-white in color; tibia: extreme base and tips, whitish, the tip being the broader; remainder of the tibiæ and the tarsi, dark brown. Wings faintly tinged with yellow; veins C, Sc and R brownish-yellow; remaining veins, brown; stigma somewhat triangular, dark brown; a distinct brown cloud at the origin of Rs; tip of wing indistinctly darker. Venation (See Figure). R^2 longer than that portion of R^{2+3} between cross-vein r and the fork of R^{2+3} ; cross-vein r longer than that portion of R^{2+3} beyond it; basal deflection of Cu^1 before the fork of M; Cu^2 close to 1st A at their tips, the distance separating the two veins at the wing margin being only about as great as Sc^2 .

Abdomen: tergum brown, the lateral and caudal margins of the two basal and the apical segments paler, yellow; in the ♂, the 8th and 9th segments are darker, blackish; the hypopygium brown. In the ♀, the last two segments of the abdomen are narrow, tubular with the valves of the ovipositor very long, slender, acicular. Sternum brown; the margins of the sclerites light colored.

The data for the specimens is a trifle confusing; the following localities were given by Sr. Picado:

Cartago, Costa Rica—1500 meters—Nov.-Feb.; Estrella,

Costa Rica—2000 meters—Sept.; Orosi, Costa Rica—1200 meters—Nov.-Feb.

It is difficult to say just where the specimens were taken. Holotype, ♂ — Costa Rica (Sr. Picado, coll.) Allotype, ♀ — with the type. Paratypes, 4 ♀'s—with the type.

All of the types in U. S. Nat. Mus. Coll. (Type No. 14,957). The species is conspicuously different from the six Neotropical species of *Mongoma* that are known to me in its striking leg-pattern. Whether or not the long ovipositor has a significance in the manner of egg-deposition is a question for the collector to verify; a similar condition exists in the females of other species and it is possible that these may, likewise, have this peculiar larval habitat. But one *Mongoma* has ever been reared hitherto. De Meijere has recently¹ described the larva and pupa of the East Indian *M. pennipes* O. S. (l.c.; p. 50, 51; fig. 41, pupa). He states that Mr. Jacobson found the larvæ at Semarang (Java), Jan., 1906, in decaying plant-stems.

In conclusion, I would mention the rearing from *Bromeliads* of one of the "false crane-flies" by Sr. Picado, and its recent characterization as *Anisopus picturatus*² by Mr. Knab.

NEW SPECIES OF *FURCOMYIA* (*TIPULIDÆ*).

BY CHAS. P. ALEXANDER, ITHACA, N. Y.¹

The crane-flies herein characterized as new are, with one exception, Neotropical forms. There have been described by previous writers 15 species of South American *Limnobiini* that I have no hesitation in referring to the genus *Furcomyia* (= *Dicranomyia* of authors). With the single exception of *F. muscosa* End. (Ecuador), the forms are Chilian or Patagonian, and are species named by Macquart,² Blanchard,³ Philippi⁴ and Bigot.⁵ No species have been mentioned from the various countries of Middle America, and it is probably because of this fact that so many of the forms received proved to be novelties.

The material included is the property of Eastern Museums, as follows : U. S. National Museum, received through Mr. Frederick Knab, and the American Museum of Natural History, received through Mr. J. A. Grossbeck. I express my sincere gratitude to both of these gentlemen for their kind help in this respect.

A Key to the spotted-winged Furcomyia.

(South America (northern portion), Central America and the Antilles.)

- 1. Sc short, ending before, or opposite, or only slightly beyond, the origin of Rs. 2.
Sc long, ending far beyond the origin of Rs. 5.
- 2. Wing-marking abundant, forming a network. 3.
Wing-marking scanty, confined to the neighbourhood of veins. 4.
- 3. Legs with the femora uniform brown apically; wing pattern
regular *reticulata*, sp. n.
(Cuba)
Legs with the femora yellowish apically with a broad gray subapical ring; wing pattern irregular. *muscosa* Enderl.
(Ecuador)
- 4. Legs black, a reddish annulus far before the tip of the femur; no supernumerary cross-vein in cell R₂; seam on cord of wing, dark brown, narrow; antennæ dark except at base. *osterhouti*, sp. n.
(Panama)

1. Contribution from the Entomological Laboratory, Cornell University.
 2. Macquart, Pierre Justin; Dipt. Exot., Vol. I, pt. 1, p. 72 (1838).
 3. Blanchard, Emile; in Historia física y política de Chili Zoologia, Tome 7, pp. 337-344, esp. pp. 340-343 (1852).
 4. Philippi, Rodolfo; Verhand. zool-bot. gesells. Wien., Vol. 15, pp. 597, 598, 602-617, 780, 781; esp. 612-614 (1865).
 5. Bigot, Jacques; Mission Scientifique du Cap Horn, 1882-1883; Tome 6, 2nd part, pp. 5-10; esp. pp. 8, 9, pl. 2, fig. 2 (1885).

- Legs with the femora dark brown at the tip with an indistinct sub-apical ring; a cross-vein in cell R_3 ; seam on cord pale brown, broad; antennæ pale.....*translucida*, sp. n.
(Panama)
5. Wings with an abundant pattern in the cells.....*gloriosa*, sp. n.
(Guatemala)
- Wings with the markings scanty and more or less confined to the neighbourhood of veins.....6.
6. Wing hyaline, with the markings brown; pleuræ with a brown band; tibiæ and tarsi uniform dark.....*eiseni*, sp. n.
(Guatemala)
- Wing dusky, with the markings dark brown; no pleural band; tibiæ at tip, and tarsi, orange brown.....*lutzi*, sp. n.
(Brit. Guiana)

Furcomyia reticulata, sp. n.

Antennæ brown; thorax yellow, with an irregular brown median stripe; legs yellow, darkening to brown apically; wings hyaline, reticulated with brown marks.

♀.—Length, 4.5–6 mm; wing, 5.3–5.4 mm.

♀.—Head: rostrum yellowish brown; palpi dark brownish black. Antennæ, basal segments pale, whitish; flagellum light brown, the segments rounded, becoming oval and then elongated toward the tip of the antennæ. Front, vertex and occiput dull yellow, the vertex and occiput prolonged caudad, with two brown stripes above and brown on the sides.

Thorax: pronotum brown, thickly yellow pollinose; a small brown median spot at the caudal margin of the scutum. Mesonotum, præscutum dull yellow sericeous, a broad, light brown median stripe, overlain by a dark brown stripe, whose margins are very irregular; two interrupted brown stripes on either side of the median mark, the outermost very pale on the margin of the sclerite; scutum dull brown, with four brown stripes, continuations of the lateral præscutal vittæ; the two stripes on each side unite at the caudal margin of the sclerite and run half across the scutellum; scutellum very pale, whitish yellow, sending a median prolongation cephalad onto the scutum; postnotum brown. Pleuræ light brown, thickly pale yellowish pollinose. Halteres very pale yellow, the knob brown. Legs: coxæ, trochanters and femora dull yellow, the femora darkening to brown apically; extreme base of the tibiæ whitish, rest of tibiæ and the tarsi dark brown. Wings, veins brown, except costa, which is light yellow and black alternated; membrane hyaline, costal cell with

small, equally-spaced brown marks; from the base to the tip of R_1 about 19, these marks a trifle narrower than the hyaline interspaces; five large brown blotches along the radial cells, the first at the base of vein M ; second in middle of cell R ; third just before the origin of Rs ; fourth over the fork of Rs , and the last at the tip of R_{2+3} , irregular; all the cells with narrow brown marks across them producing a net-work. Venation (see fig. p): Sc short, Sc_1 ending before the origin of Rs , Sc_2 about opposite it; Sc_2 longer than Sc_1 ; Rs angular at base; basal deflection of M_{1+2} long, so that the inner end of cell 1st M_2 is almost on a level with cell R_3 ; basal deflection of Cu_1 before fork of M , sometime; far before; cross-vein m far out, so that the deflection of M_3 is much longer than m .

Abdomen, tergum, segments brown, darkest on caudal margin, paler on the sides; sternum dull yellow; a dark brown median spot on caudal margin of each sclerite.

Holotype, ♀.—Pinar del Rio, Cuba; 1900 (Palmer and Riley).

Paratype, ♀.—Type locality, March 27, 1900 (Palmer and Riley).

Types in U. S. Nat. Mus. coll. (No. 15,133).

Furcomyia osterhouti, sp. n.

Whitish; mesothoracic præscutum with a broad median stripe and two short lateral ones; femora black, with a postmedian reddish annulus; wings with brown spots, bands and seams.

♀.—Length, 6.5 mm (about); wing, 5.7 mm.

♀.—Head: rostrum and palpi dark brownish black. Antennæ, basal segments yellowish brown, flagellum very dark brown, almost black. Front, vertex and occiput pale, whitish, tinged with brown.

Thorax: pronotum dark brown above, abruptly pale, yellowish white on the sides. Mesonotum pale yellowish white, the median stripe broad, dark brown; the lateral stripes appear on the hind margin of the præscutum and run back across the scutum and scutellum; at the caudal end of the latter sclerite they unite and form a very broad median band, which occupies the dorsum of the postnotum. Pleuræ pale, whitish. Halteres, knob and most of the stem dark brown. Legs: coxæ and trochanters yellowish brown; femora black, with a distinct reddish annulus at about three-fourths the length; tibiæ reddish at base, rest of tibiæ and tarsi shiny black. Wing with a slight yellowish tinge, especially in the cephalic cells; a very narrow brown mark from h caudad; a brown mark from the tip of Sc_1 down beyond Rs ; a brown mark at tip of R_1 and on r ; a narrow seam along the cord; outer end of cell 1st M_2 seamed with brown; most

of the veins seamed with brown; apical portions of the radial cells suffused with brown. Venation: (See fig. q.) Sc ends beyond origin of R_5 , Sc_2 at its tip; cross-vein r at tip of R_1 ; R_5 arcuated at origin; basal deflection of Cu_1 before the fork of M .

Abdomen, tergum yellowish, the apex of each sclerite brown, with a narrow brown median band; sternum, markings less clearly defined.

Holotype, ♀.—Bocas d'Toro, Panama; Sept. 28, 1903. (P. Osterhout, coll.)

Type in U. S. Nat. Mus. coll. (No. 15,130.)

Furcomyia translucida, sp. n.

Whitish; mesothoracic præscutum with a narrow median brown stripe; femora darkened at the tip, pale subapically; wings with brown spots and bands; a supernumerary cross-vein in cell R_3 .

♂.—Length, 5.8 mm.; wing, 6.9 mm.; middle leg, femur, 5.7 mm.; tibia, 5.2 mm.

♂.—Head: rostrum and palpi dark brown. Antennæ, basal segments brown, flagellum yellowish, the terminal three or four segments brown; segments of the flagellum short, globular, the apical segments more elongated. Front, vertex and occiput light yellow, the vertex with a large brown spot in the centre.

Thorax: pronotum dark brown, becoming paler, yellowish white on the sides; mesonotum, præscutum very pale, almost white, with a clearly-defined dark brown median stripe, rather narrow, ending at the suture; scutum and scutellum pale, whitish, with a dark brown stripe on each lobe, running backward and meeting on the caudal margin of the scutellum; postnotum with a very broad brown median mark resulting from the confluence of the scutellar stripes. Pleuræ very pale, whitish; a brownish mark on the propleuræ above the fore coxa. Halteres pale, knob dark brown. Legs: coxæ and trochanters whitish; femora yellowish brown; a clearer yellow subapical ring, tip broadly brown, the extreme apex again rather lightened; tibiæ and tarsi brown, gradually increasing to dark brown. Wings: subhyaline or very faintly yellowish; a brown mark at the humeral cross-vein extending down across the arculus; a second mark at tip of Sc_1 and down across R_5 almost to M ; a third, extending into a cross-band, from the stigma, where it is darkest, unbroken across the cord; a brown seam on the supernumerary cross-vein in cell R_3 ; outer end of cell 1st M_2 seamed with brown. Venation: (See fig. r.) Sc short, ending just beyond the origin of R_5 ; Sc_2 just opposite origin of R_5 ; R_1 extending beyond cross-vein $r-m$, r at its tip. R_5 square at its origin and

spurred, in a line with R_{2+3} ; a strong cross-vein in cell R_3 at about two-thirds of the length of the cell; cell 1st M_2 rather elongate; basal deflection of Cu_1 at the fork of M .

Abdomen: tergum pale yellowish white, apical fourth dark brown; apex sternum similar, but the dark apex not so clearly defined.

Holotype.—♂. Bocas d'oro, Panama; Sept. 28, 1903. (P. Osterhout, coll.)

Type in U. S. Nat. Mus. coll. (No. 15,129)

Furcomyia gloriosa sp. n.

Antennæ brown; thorax gray, dorsum striped with darker; legs, femora dark on apical half, with a subterminal yellow ring; wing spotted and suffused with brown.

♀.—Length about 6.5 mm.; wing, 8.4 mm.

♀.—Head: rostrum and palpi dark brown. Antennæ, basal segments very dark brown; basal five flagellar segments lighter brown, apical segments dark brown. Front, vertex and occiput dull gray, with a black mark on vertex along inner margin of the eye.

Thorax: pronotum dull greenish gray pollinose, with a broad black stripe on the side of the scutum. Mesonotum, præscutum dark brown, thickly grayish pollinose, with a black stripe on either side of the narrow median gray line, running from the anterior margin of the sclerite almost to the suture. Lateral stripes short, broad, beginning behind the pseudo-sutural fovea, running across the suture and covering most of the scutum; scutum in middle and along the caudal margin dark brown; scutellum and postnotum dark brown. Pleuræ black, greenish gray pollinose. Halteres, stem pale yellowish brown, knob dark brown. Legs, coxæ and trochanters dark brown, the former gray pollinose; femora light yellow, the apical quarter dark brown, with a subapical yellow ring. Wings: hyaline or nearly so; costal cell with four brown marks, the last at Sc , the 3rd over the origin of R_s ; a large square mark at the tip of R_1 (stigmal) extending down over the fork of R_s ; cells 2nd R_1 and R_3 with large brown spots filling most of the cells; cells R_5 to Cu_1 suffused with lighter grayish brown and with hyaline spots; basal and anal cells with smaller brown spots; a series of about four in cell 1st A . Ends of veins Cu_2 , 1st and 2nd A , with broad, grayish brown suffusions. Veins brown; Sc and R yellow, except where located in the brown markings, where they are black. Venation: (See fig. j) Sc long, ending far beyond the origin of R_s , but slightly before its middle; R_s long; basal deflection of Cu_1 far before the fork of M .

Abdomen, tergum dark brown; sternum lighter brown, extreme caudal margins of the sclerites light yellow.

Holotype.—♀. Totonicipan, Guatemala, Cent. Am., 1902. (Dr. G. Eisen.)

Type in U. S. Nat. Mus. coll. (No. 15,132.)

This insect agrees superficially with *muscosa* End.* of Ecuador, but has *Sc* much longer, legs very different in colour, and is a much smaller species. *Muscosa* has a supernumerary cross-vein in cell R_3 , but this may not be normal, as it is not mentioned in the specific description.

Furcomyia eiseni, sp. n.

Antennæ black throughout; body yellow; legs, femora yellow, passing into brown on the tibiæ and tarsi; wings hyaline, with six brown spots along costa, the second, largest, at origin of R_s .

♂.—Length, from 4.5–5 mm.; wing, 6.3–7.5 mm.

♀.—Length, from 4.5–6 mm.; wing, 5.7–7 mm.

Head: rostrum and palpi black. Antennæ black throughout in the ♂, with conspicuous long hairs, not so noticeable in the ♀. Front, vertex and occiput blackish, grayish pollinose in front.

Thorax: pronotum dull yellow; mesonotum dull reddish yellow, with a very indistinct darker median stripe and darker lateral stripes which are brownish, these continued back on the scutum, where they cover the lobes; scutellum and postnotum brownish. Pleuræ yellow, with a more or less conspicuous dark brown stripe running from the cervical sclerites to the postnotum. Halteres yellow at base; apical half of the stem and the knob brown. Legs: coxæ and trochanters light yellow; femora yellow at base, passing into brown; tibiæ and tarsi darker brown. Wings hyaline; cells *C* and *S*₂ slightly yellowish; six brown marks along the costal margin on the cross-veins, as follows: A brown mark at the wing base; a large brown rectangular mark at the origin of R_s ; a third at the tip of *Sc*, where it is continued down over the fork of R_s , here meeting the fourth blotch, located at the tip of R_1 ; the marks continuing across the cord; wing subapically largely dark; outer end of cell 1st M_2 seamed with brown; a brown mark in the end of cell 2nd R_1 and cell R_3 ; ends of veins Cu_1 , Cu_2 and 1st *A*, with small brown clouds; a large spot at end of 2nd *A*. Venation: (See fig. s.) *Sc* long, ending just before the fork of R_s , Sc_2 at its tip; $1R_s$ square at its origin; base of cell 1st M_2 arcuated, nearly on a level with the inner end of cell R_3 (as in *stulta* O. S.);

*1912. Zool. Jahrbuch.; pt. 1, pp. 75, 76; fig. W¹. (*Dicranomyia*.)

basal deflection of Cu_1 just beyond the fork of M; Cu_2 generally shorter than the deflection of Cu_1 .

Abdomen, tergum dark brown, the bases of the sclerites somewhat paler; sternum light yellow, the caudal and lateral margins conspicuously dark brown.

Holotype.—♂. Aguna, Guatemala, Cent. Am. (2,000 ft.); Sept., 1902. (Dr. G. Eisen, coll.)

Allotype.—♀. With the type.

Paratypes.—5, ♂ ♀. With the type.

Types in U. S. Nat. Mus. coll. (No. 15,131), except one paratype in author's collection.

Inocyti lutzii, sp. n.

Antennæ black; body orange; abdomen brown; legs black, tip of tibiæ and the tarsi pale, orange yellow; wings dusky, with brown marks.

♀.—Length about 6 mm.; wing, 7.3 mm.; middle leg, femur, 5.4 mm.; tibia, 5.8 mm.

Head: rostrum and palpi dark brownish black. Antennæ dark brownish black. Front thickly gray pollinose; vertex and occiput dark orange brown, brighter orange on the occiput.

Thorax: pronotum and mesonotal præscutum and scutum deep orange; scutellum and postnotum much lighter coloured, yellowish orange. Pleuræ orange yellow, lighter coloured ventrally. Halteres, stem yellowish basally, darkening to the blackish knob. Legs: coxæ and trochanters orange yellow, extreme base of femora yellow; remainder of femora and most of the tibiæ dark brownish black; tibiæ with the apical eight pale orange brown; tarsi orange brown. Wings suffused with dark brown, costal and subcostal cells and the radial cells very dark; dark brown spots arranged as follows: a rounded mark at the origin of Rs; one at fork of Rs, continued down the cord as a broken seam; a round spot at end of R_1 ; outer end of cell 1st M_2 seamed with dark brown. Venation: Sc long, ending nearer to the fork of Rs than to the origin, Sc_2 at tip of Sc_1 . Cross-vein r at the tip of Rs; deflection of R_{4+5} long; basal deflection of Cu_1 far before the fork of M.

Abdomen, tergum, segments dark brown; sternum light yellow.

Holotype.—♀. Tukeit, British Guiana; July 19, 1911. (F. E. Lutz, coll.)

Type in American Museum of Natural History.

Furcomyia omissa, sp. n.

Small; dark brown; wings dark, stigma present; Sc_1 short, Sc_2 apparently lacking.

♀.—Length, 3.7–4 mm.; wing, 4–4.2 mm.

♀.—Head: rostrum and palpi dark brownish black. Antennæ brownish black. Front, vertex and occiput brown.

Thorax: mesonotum, præscutum with a thick brownish pollen, becoming grayish on the sides of the sclerite; a dark brown median stripe beginning near the anterior end of the sclerite, becoming narrower and finally obsolete before the suture; scutum, scutellum and postnotum dark brown. Pleuræ dark brown, with a sparse gray bloom on the middle of the thorax. Halteres dark brown; remainder of femora, tibiæ and tarsi dark brown. Wings somewhat suffused with darker; a small oval brown stigma. Venation: (See fig. o.) Sc short, ending far before the origin of Rs , Sc_2 not evident. Rs rather short, about one and one-half times the length of the deflection of R_{4+5} ; cross-vein m present in the type, absent in the paratype.

Abdomen dark brown.

Holotype.—♀. Aguna, Guatemala, Cent. Am. (Dr. G. Eisen.)

Paratype.—♀. Same as the type.

Types in U. S. Nat. Mus. coll. (No. 15,139.)

Furcomyia knabi sp. n.

Like *liberta* O. S., but ventral lobe of ♂ hypopygium produced entrad in a long slender arm.

♂.—Length, 6.5–7 mm.; wing, 8.8–9.8 mm.

♀.—Length, 7 mm.; wing, 9 mm.

Head: rostrum and palpi dark brownish black; antennæ black. Front, vertex and occiput clear gray.

Thorax: dorsum of the mesonotal præscutum suffused with brown, general colour brownish gray, much browner than the clear gray of the head; stripes on thoracic dorsum ill-defined; scutum dull gray, the scutellum very light gray; postnotum gray. Pleuræ grayish. Halteres yellow, knob brown. Legs: coxæ and trochanters brown; femora, tibiæ and tarsi dark brown. Wings almost as in *liberta* O. S., not pallid at base; a faint stigma at the tip of R_1 . Venation: (See fig. m.)

Abdomen gray. Hypopygium: (See fig. w.) Dorsal aspect, 9th tergite very convex, ending in a small knob deeply bifid; pleuræ long, cylindrical, bearing two apical lobes; the dorsal lobe slender, chitinized, ending in an acute point; ventral lobe yellow, produced entrad

into a long arm chitinized, its apex blunt but slightly notched. Ventral aspect, 9th tergite almost straight on caudal margin; pleuræ short, the inner caudal angle produced into a long appendage, which is tufted with yellow hairs at its tip; guard of the penis long, enlarged basally, projecting slightly beyond the apices of the pleural appendage; ventrad of the pleural arm is a slender acicular appendage.

Holotype.—♂. Totonicipan, Guatemala, 1902. (Dr. G. Eisen.)

Allotype.—♀. Antigua, Guatemala. (Dr. G. Eisen.)

Paratypes.—♂♂. Totonicipan, Guatemala. (Dr. G. Eisen.)

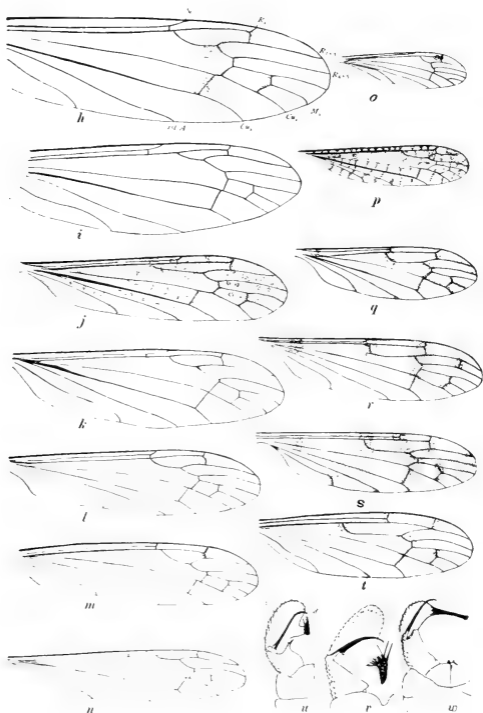
Types in U. S. Nat. Mus. coll. (No. 15,135). One paratype in author's collection.

Like *liberta* O. S. (Proc. Acad. Nat. Sci. Phil., 1859, p. 209; Monograph Dipt. N. Am., Vol. 4, p. 69), of the Eastern U. S., but larger, the mesothoracic præscutum browner and the stripes indistinct. In *liberta* the ♂ genitalia (fig. u) consists of short pleuræ, the swollen ventral lobes produced entad in a blunt knob, which bears two conspicuous caudad-projecting spines at its tip, the ventral one very stout, spine-like, the dorsal one more slender. In *knabi* the pleuræ are longer, the lobes short, the ventral one produced into a long arm, which is slightly notched apically.

EXPLANATION OF PLATE XI.

- Fig. h. Wing of *Furcomyia andicola*, sp. n.
 " i. " *F. insignifica*, sp. n.
 " j. " *F. gloriosa*, sp. n.
 " k. " *F. argentina*, sp. n.
 " l. " *F. liberoides*, sp. n.
 " m. " *F. knabi*, sp. n.
 " n. " *F. simillima*, sp. n.
 " o. " *F. omissa*, sp. n.
 " p. " *F. reticulata*, sp. n.
 " q. " *F. osterhouti*, sp. n.
 " r. " *F. translucida*, sp. n.
 " s. " *F. eiseni*, sp. n.
 " t. " ? *F. fumosa*, sp. n.
 " u. Hypopygium of *F. liberta* Osten Sacken.
 v = ventral apical appendage.
 d = dorsal apical appendage.
 " v. Hypopygium of *F. liberoides*, sp. n.
 " w. " *F. knabi*, sp. n.

(To be continued.)



FURCOMYIA (TIPULIDAE, DIPT.).

NEW SPECIES OF *FURCOMYIA* (*TIPULIDÆ*).

BY CHAS. P. ALEXANDER, ITHACA, N. Y.

(Continued from page 341.)

Furcomyia libertoides, sp. n.

Closest allied to *liberta* O. S. of the Eastern U. S., but differs as follows: The præscutal stripes are not clearly defined, the middle of the dorsum being suffused with bright brown; tergum of abdomen brownish, not clear gray; wings with the stigma conspicuous, rectangular, not a narrow seam to cross-vein *r*. Hypopygium from above—see fig. 5.). The pleural piece triangular, the ventral apical appendage fleshy, its inner margin produced into a point which is directed cephalad; two short spines about equal in size, projecting caudad on the middle of this appendage; dorsal arm, or apical appendage, rather short, gently curved. Venation, fig. 1.

Length about 6.5–7.5 mm.; wing, 8.7–8.8 mm.

Holotype.—♂. Marin Co., Cal.; March 23, 1897.

Paratypes.—♂ s 5. With the type.

The material is part of the Wheeler collection; one paratype in author's collection.

Furcomyia simillima, sp. n.

Yellowish thorax, with a dark brown median stripe; halteres very long.

♂.—Length about 5.5 mm.; wing, average, 6.8 mm.

♀.—Length about 5.8 mm.; wing, average, 7.4 mm.

Head: rostrum and palpi dark brown. Antennæ, first segment dark brown, thickly gray pruinose, remaining segments dark brownish black. Front, vertex and occiput brown, thickly gray pruinose, producing a gray effect.

Thorax: cervical sclerites dark, almost black; pronotum light dull yellow, dark brown along the dorsal median line. Mesonotum bright brownish yellow, becoming grayish on the sides; a broad dark brown median stripe continued from the pronotum, ending just before the suture; lateral stripes indistinct, grayish brown, beginning behind the pseudo-suture, continued across the suture and suffusing the lobes of the scutum; median line of the scutum and the scutellum paler yellowish white; postnotum brown; metanotum light yellow. Pleuræ light yellow, becoming grayish toward the metapleuræ. Halteres very long, extreme base yellowish, rest dark brown. Legs: coxæ and trochanters yellowish; femora yellow becoming somewhat darker apically; tibiæ and tarsi

yellowish brown. Wings subhyaline; no stigmal spot; veins yellowish brown. Venation: (See fig. n.) Sc ending before origin of R_s , Sc_2 far before tip so that Sc_1 is long, somewhat shorter than R_s ; basal deflection of Cu_1 before the fork of M.

Abdomen: tergum yellowish brown, apices of the sclerites narrowly paler; sternum light yellow.

Holotype.—♂. Tonicipan, Guatemala. (Dr. G. Eisen.)

Allotype.—♀. Antigua, Guatemala. (Dr. G. Eisen.)

Paratypes.—11 ♂s, 8 ♀s. Quichi (July, 1902); Antigua and Tonicipan (July, 1902); Guatemala.

Types in U. S. Nat. Mus. coll. (No. 15,134.) Paratypes in author's collection.

Resembles *particeps* Doane (Ent. News, Jan., '08, p. 7), from north-western U. S., but head is more gray, abdomen much lighter coloured and the thoracic stripes different.

Furcomyia andicola, sp. n.

Head gray; thorax brownish yellow; wings with scanty brown marks.

♀.—Length, 8.1 mm.; wing, 11.2 mm.

♀.—Head: rostrum and palpi dark brown. Antennæ, basal segments brown, flagellar segments very dark brown. Front, vertex and occiput gray.

Thorax: pronotum dull yellow, the dorsum indistinctly suffused with brown. Mesonotum dull brownish yellow, a broad brown median stripe and shorter, less distinct lateral ones; scutum reddish brown, suffused with darker brown; scutellum and postnotum brown, with a grayish brown bloom. Pleuræ dark brown. Halteres, stem greenish at base, darkening to brown at the tip. Legs: coxæ greenish, femora brownish yellow, the tip clearer yellow; tibiæ light brown, darkened at tip; tarsi brown. Wings subhyaline, veins brown, C, Sc and R, more yellowish; a large, rectangular brown stigma, which is continued back over the fork of R_s as a rounded spot; narrow brown seams on the cord and outer end of cell 1st M_2 . Venation (see fig. h.): Sc ending just beyond origin of R_s ; Sc_2 removed from the tip so that Sc_1 is rather more than half as long as R_s ; R_s about one and one-half the length of the deflection of R_{1-5} ; basal deflection of Cu_1 before the fork of M.

Abdomen: tergum and sternum brown, the apices of the sclerites yellowish. It is probable that, in life, the insect is quite greenish.

Holotype.—♀. San Antonio, Bolivia. (Received from Staudinger-Bang-Haas.)

Type in author's collection.

Agrees most closely with *phatta* Phil., which has the thorax gray and the wing-pattern very different, three black spots in cells 1st R₁ and 2nd R₁.

Furcomyia insignifica, sp. n.

Head brownish gray; thorax reddish brown, darker medially.

♀.—Length, 8.5 mm.; wing, 9.6 mm.; fore leg, femur, 5.9 mm.; tibia, 7.3 mm.

♀.—Head: rostrum, palpi and antennæ dark brown. Front, vertex and occiput brownish gray.

Thorax: pronotum yellowish brown. Mesonotum, præscutum reddish brown, darkest brown medially on præscutum; paler, yellowish, on the humeral angles; pleuræ brownish yellow, brightening to yellow on the sternum. Halteres long, slender, brown, brighter at the base. Legs long, slender; coxæ and trochanters yellowish; femora yellowish brown; tibiæ and tarsi brown. Wings hyaline, veins light brown; stigma barely indicated, rectangular, very pale. Venation (see fig. i.): Sc short, Sc₂ quite removed from the tip of Sc₁; Rs short, not much longer than the deflection of R₄₊₅; basal deflection of Cu₁ far before the fork of M.

Abdomen: tergum dark brown on the basal segments, lighter brown on the apical segments; sternum light brown.

Holotype.—♀. Iquico, Peru. (Received from Staudinger-Bang-Haas.)

Type in author's collection.

This species cannot be referred to *pallida* Macq., which has a triangular cell 1st M₂ which bears a spur, this character of an appendiculate cell also separating *elquiensis* Blanch. The other species with unspotted wings, *flavida* Phil. and *chlorotica* Phil., are quite different insects, specimens of which are before me, and will be redescribed in a later paper.

Furcomyia argentina, sp. n.

Head gray; thorax gray, darker on dorso-median line.

♀.—Length, 8 mm.; wing, 8.9 mm.; fore leg, femur, 6 mm.; tibia, 7 mm.; hind leg, femur, 7.1 mm.; tibia, 7.7 mm.

♀.—Head: rostrum and palpi dark brown. Antennæ dark brown, grayish pollinose; segments submoniliform. Front, vertex and occiput gray.

Thorax: pronotum brownish gray, the gray being pollen. Mesonotum, præscutum gray, with an indistinct, broad, brown, median stripe; scutum, scutellum and postnotum pale, with a gray pollen. Pleuræ pale

gray pollinose. Halteres short, stem dull yellow, knob brown. Legs : coxæ and trochanters dull yellow ; femora similar, rather darkened toward the tip ; tibiæ and tarsi light brown. Wings hyaline, veins dark brown, conspicuous ; stigma indistinct, brownish. Venation (see fig. k.) : Sc ends opposite the origin of Rs ; Sc₂ far retracted so that Sc₁ is almost as long as the stigma ; Rs only a little longer than the deflection of R_{1,5} ; basal deflection of Cu₁ at the fork of M.

Abdomen: tergum dull brown ; sternum yellowish brown.

Holotype.—♀. Neuquen, Argentina, 1907. (Dr. Adolf Lenol.)

Type in author's collection.

Differs from the hitherto described species by the characters given in under *insignifica*. From *insignifica* it differs in its wing venation, colour of veins, and body tone.

? *Furcomyia fumosa*, sp. n.

Wings infumed, with darker clouds.

♀.—Length about 5.5 mm ; wing, 6.3 mm.

♀.—Head : rostrum and palpi dark brown. Antennæ dark brownish black. Front, vertex and occiput brownish, with a grayish pubescence.

Thorax : pronotum dark brown. Mesonotum light brown, the postnotum darker. Pleuræ dark brown. Halteres dark brown, base of the stem light coloured. Legs : coxæ and trochanters dark brown, rest of legs broken. Wings infumed with brown, darker brown clouds arranged as follows : At origin of Rs, at tip of Sc, at tip of R₁, along cord ; most of veins and tip of wing clouded with dark brown. Venation (see fig. t.) : Sc long, Sc₁ ending slightly before the fork of Rs, Sc₂ at its tip ; R₁ bends down near its end and touches R₂₋₃, obliterating the cross-vein *r* ; basal deflection of Cu₁ beyond the fork of M.

Holotype.—♀. Amatuk, British Guiana ; July 14, 1911. (F. E. Lutz.)

Type in American Museum of Natural History.

This insect is closely allied to *Limnobia insularis* Will. (Dipt. St. Vincent, Trans. Ent. Soc. Lond., 1896, p. 287, pl. 10, fig. 58), but the wing has quite a different pattern, cell 1st M₂ less elongated, basal deflection of Cu₁ farther distad, etc. The two species are certainly as close to *Furcomyia* as they are to *Limnobia*, but seem to represent a peculiar group which needs further study with more material.

MR. EDWARD P. VAN DUZEE, of Buffalo, leaves early in December for a four months' vacation in California. His temporary address will be San Diego, Calif.

A NEW PALÆARCTIC *GERANOMYIA* (TIPULIDÆ,
DIPTERA).BY C. P. ALEXANDER AND M. D. LEONARD, ITHACA, N. Y.¹

The following species is described from material sent to the authors by Prof. Dr. M. Bezzi. It was received by him from a correspondent in Ile Djerba, off the northern coast of Africa. Our thanks are due to Dr. Bezzi, and we take pleasure in dedicating this interesting species to him.

Geranomyia bezzii, sp. n.

Male (alcoholic). Colour light yellow; proboscis with a brown sub-apical band; thoracic dorsum with four longitudinal brown stripes; pleuræ with a few dark brown spots. Wings hyaline with four rather indistinct spots.

Length, 7.2-7.5 mm.; wing, 6.3-6.4 mm.; head, total, 2.2 mm.; thorax, 1.7 mm.; hind femora, 5 mm.

Head: Proboscis light yellow, with a conspicuous, brown, subapical band; palpi brown; antennæ yellow. Front, vertex and occiput light brownish yellow.

Thorax: Ground colour yellow; dorsum with two median and two lateral brown stripes. Mesothoracic præscutum pale yellow, with two brown longitudinal bands, a little wider than the dividing median line, these bands darker on the outer margin; they begin near the cephalic margin of the sclerite and continue caudad, fading out at about two-thirds the length of the sclerite. Just cephalad of the end of the median stripes begin the dark brown lateral stripes; on the præscutum they are arcuated, continuing back onto the scutum, where they are also broader; end of the scutellum darker brown on either side of the pale median line; caudal edge of the postnotum dark brown. Pleuræ concolorous with the dorsum, lateral margin of the mesothoracic præscutum dark brownish black, most intense on the margin of the sclerite; an intense brown semibinar mark on the pronotal pleuræ, midway between the anterior coxæ and the dark mark on the edge of the mesothoracic præscutum; an irregular, interrogation-like mark below the wing root; ventral portion of the mesothoracic episternum and sternum brown. Halteres light yellow, knob clear yellow. Legs light brownish yellow, tips of the segments not appreciably darker.

Abdomen yellow, with a brown mark on the ventral edge of the tergites, the first elongate, expanded over two segments; behind this there

1. Contribution from the Entomological Laboratory of Cornell University.
July, 1912

are five marks on successive segments. On the dorsal edge of the sternites are six corresponding marks, rather less distinct than the tergal marks. Hypopygium light yellow, fleshy apical appendages almost white.

Wings: Hyaline or nearly so; veins light brownish yellow; very pale brown clouds around the base of R_s , around cross-vein r , and in the middle of cell Sc . Venation: Sc ending about opposite the origin of R_s ; Sc_2 slightly retracted proximad of the origin of R_s , about one-half the length



FIG. 6—Wing of *Geranomyia bezzii*, sp. n.

of Sc_1 . R_s moderately long, about twice the length of the basal deflection of R_{4+5} ; cross-vein r at the tip of R_1 , which is abruptly upcurved beyond it, very indistinct; R_{2+3} and R_{4+5} arcuated and parallel; cross-vein $r-m$ short, pale; basal deflection of Cu_1 about equal to Cu_2 ; Cu_1 fusing M distad of the fork M .

Holotype, ♂, Ile Djerba, Tunis. (Museo Torino.)

Paratype, 3 ♂s, Ile Djerba, Tunis. (One in Museo Torino, two in Cornell University.)

Remarks: Some venational variation occurs in the paratypes. In some Sc_2 is exactly opposite the origin of R_s , and Sc_2 is only a little shorter than Sc_1 ; basal deflection of Cu_1 at the fork of M , or even slightly proximad of it. (See figure.) The relative length of Cu_2 and the basal deflection of Cu_1 varies somewhat, Cu_2 , however, being generally a little the shorter.

Key to the Palearctic *Geranomyia*:

1. Wings unspotted.....(No Palearctic species),
Wings spotted.....2.
 2. Thoracic dorsum without distinct stripes.....3.
Thoracic dorsum with distinct stripes.....4.
 3. Antennae and palpi yellowish brown; femora and tibiae black at tip.....*at'ant'ia* Woll.¹
1. Wollaston—Ann. Mag. Nat. Hist., ser. 3, I, p. 115 (as *Limnobia*), (1858).

- Antennæ and palpi black; femora and tibiæ not black at tip..... *canariensis* Berg.²
4. Thoracic dorsum with two dark stripes..... *bivittata* Becker.³
 Thoracic dorsum with more than two dark stripes..... 5.
5. Costal margin of wings with six large equidistant brown spots..... *caloptera* Mik.⁴
 Costal margin of wings with four spots..... 6.
6. General colour yellowish brown; proboscis unicolorous..... *unicolor* Hal.⁵
 General colour light yellow; proboscis light yellow, with a dark sub-apical band..... *lezzii*, sp. n.

This key is based entirely on the published description of the species hitherto proposed. Some of these descriptions are very insufficient, for example, those of *atlantica* Wollaston and *unicolor* Haliday. One, *maculipennis* Curtis,⁶ is so brief and unsatisfactory that we have not attempted to include it in the above key. The complete description reads as follows: "Rather larger than *G. unicolor*, and is of a lurid ochre, the wings tinged with the same colour. It may be merely a variety, differing principally in colour, arising possibly from age.

Whether or not *Aporosa* Macq. (1838), in which Enderlein has placed *maculipennis* Macq. (= *canariensis* Berg.) and *vicina* Macq., is distinct from *Geranomyia* is uncertain. The character of a radial cross-vein should be sufficient to distinguish this group of species from the typical *Geranomyia* group. Enderlein⁷ states that *vicina* has but one marginal cell; however, Macquart (Diptères Exotiques, V, 1, pt. 1, p. 70), states clearly that there are two marginal cells. It is doubtful whether *vicina* is a *Geranomyia*; the statement of "rostre un peu alongé" being quite insufficient to give it a position in the genus *Geranomyia*.

Acknowledgements are made to Mr. Frederick Knab for his kindness in supplying a reference not otherwise obtainable.

The drawing of the wing was made by means of the projection microscope in the Entomological Laboratory.

2. Macquart—Diptères Exotiques, Vol. I, pt. 1, p. 63 (as *Aporosa maculipennis*) (1838); changed to *canariensis* by Bergroth, Wiener Entomol. Zeitung, Vol. 8, p. 118 (1889).

3. Becker—Berlin Mitt. Zool. Mus., Vol. 4, p. 187 (1908).

4. Mik—Verhandlungen Zool.-Bot. Gesellschaft Wien., Vol. 14, p. 791 (1864), as *maculipennis*, n. sp.; changed to *caloptera* Mik, Verh. Zool.-Bot. Gesellschaft Wien., Vol. 17, p. 423 (1867).

5. Haliday—Entomological Magazine, Vol. 1, p. 155 (1833); Curtis, Brit. Entomol., Vol. 12, p. 573 (excellent coloured figure); Macquart, Suit. à Buffon, Vol. 2, p. 652 (1835).

6. Curtis—Brit. Entomol., Vol. 12, p. 573 (1835).

7. Enderlein, G.—Zoologische Jahrbücher, Vol. 32, part 1, p. 79, 80 (1912).

DRAGON FLIES COLLECTED AT POINT PELEE AND PELEE ISLAND, ONTARIO, IN THE SUMMERS OF 1910 AND 1911.

BY F. M. ROOT, OBERLIN, OHIO.

- Lestes unguiculatus* Hagen.—Point Pelee. One specimen.
Lestes forcipatus Rambur.—Pelee Island. Very common.
Lestes vigilax Hagen.—Point Pelee. Common around ponds.
Enallagma carunculatum Morse.—Pt. Pelee. Fairly common near ponds.
Enallagma pollutum Hagen.—Pt. Pelee. Fairly common near ponds.
Ichnura verticalis Say.—Pt. Pelee and Pelee Island. Common.
Gomphus vastus Walsh.—Pelee Island. Five specimens taken near woods.
Anax junius Drury.—Pt. Pelee and Pelee Island. Common. (See note at end.)
Aeschna clepsydra Say.—Pelee Island. One specimen taken.
Aeschna constricta Say.—Pt. Pelee and Pelee Island. Fairly common. (See note.)
Epicordulia princeps Hagen.—Pt. Pelee. Fairly common about large ponds.
Pantala hymenaea Say.—Pelee Island. One taken, others seen. (See note.)
Tramea carolina Linné.—Pt. Pelee. Rare. (See note.)
Tramea lacerata Hagen.—Pt. Pelee and Pelee Island. Common. (See note.)
Celithemis eponina Drury.—Pt. Pelee. Common near ponds.
Celithemis elisa Hagen.—Pt. Pelee. Rare.
Leucorrhinia intacta Hagen.—Pelee Island. Common at swamps.
Sympetrum rubicundulum Say.—Pelee Island and Pt. Pelee. Fairly common.
Sympetrum vicinum Hagen.—Pelee Island and Pt. Pelee. Very common. (See note.)
Sympetrum corruptum Hagen.—Pt. Pelee. Rare. (See note.)
Erythemis simplicicollis Say.—Pt. Pelee and Pelee Island. Common near ponds. (See note.)
Pachydiplax longipennis Burm.—Pt. Pelee and Pelee Island. Common. (See note.)
Libellula basalis Say.—Pt. Pelee and Pelee Island. Fairly common near ponds.

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Libellula incesta Hagen.—Pt. Pelee. Common at the ponds.

Libellula pulchella Drury.—Pt. Pelee and Pelee Island. Common.
(See note.)

Plathemis lydia Drury.—Pt. Pelee. Rare, but seen regularly.

NOTE.—On Pelee Island in 1910, about the middle of August, or a little later, there were three days when dragon-flies of species hitherto not seen in large numbers swarmed around the end of the Point. Presumably they were migrating. The principal species concerned were *Anax junius*, *Aeschna constricta*, *Tramea lacerata* and *Pantala hymenaea*.

On Point Pelee in 1911, about the middle of August, the deer-flies became suddenly much more numerous, and on August 17 great numbers of dragon-flies appeared (perhaps following the deer-flies). The great bulk of these were teneral *Anax junius* (with reddish-purple abdomens), and towards evening they clustered so thickly on the cedars near the end of the Point that eight or ten could be captured any time by a single sweep of the net. With them were large numbers of *Sympetrum vicinum* (which preferred the low junipers to the cedars) and smaller numbers of *Tramea lacerata* and *Aeschna constricta*. There were also a few each of *Tramea carolina*, *Sympetrum corruptum*, *Erythemis simplicicollis*, *Pachydiplax longipennis* and *Libellula pulchella* with the flocks. They remained until August 20.

THREE DAYS IN THE PINES OF YAPHANK. RECORDS OF CAPTURES OF HEMIPTERA HETEROPTERA.

BY J. R. DE LA TORRE BUENO, WHITE PLAINS, N. Y.

The name Yaphank (with the stress on the "hank") has a truly barbarous cadence. It is an interesting relic, one of the few remaining vestiges of the great Shinnecock tribe, once Lords of Long Island. The place that bears this cacophonous name is, indeed, one of the very few regions near New York and its teeming millions not utterly spoiled to the lover of nature by the "improvements" of modern progress as exemplified by its advance agents, the real estate dealers. Here and there in this land of sand and pines and scrub-oak, are still to be found ancient trees that stood when Hendrick Hudson first sailed into the Narrows. The present holders of the land are descendants of original Royal Patentees, and they own great stretches of wilderness. So it comes about that insect life is abundant in numbers and rich in species, not the least among them being the

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Hemiptera. The chief collecting grounds are about two miles from the railroad station and the vegetation consists mainly of pine, scrub oak and along the roads, maple trees, and the weeds and shrubs common to this latitude.

Toward the end of September, 1911, I had the good fortune to spend three days there with Mr. G. B. Engelhardt, who was guide, philosopher and friend. We arrived about 11 a.m. the morning of the 23rd, and indulged in a little collecting before the noon-day meal, after which we went out and did some sweeping and beating with good results, one being the capture of a new *Corizus*, described elsewhere. In the evening, between 8 and 10, Engelhardt went sugaring, carrying a trap lantern, while I swept. The following day was rainy in the morning, but as soon as it cleared up sufficiently we took our way to the Carman River, a clear, shallow stream flowing over a bed of sand where a little dredging was done, which yielded among other things one specimen of *Belostoma lutarium* Stal. (taken by Engelhardt), which is the farthest Northern authentic record for the species known to me. In the afternoon sweeping and beating made up the programme, in the brush and trees about a cranberry bog and in the grasses growing in it. Night sweeping gave good results, no less than 16 species being taken in clearings in the woods, while *Ozophora picturata* Say flew to light, its great agility making it hard to catch. The morning of the 25th dawned grey and muggy, the day finally clearing in the late afternoon. Sunshine or rain being one to the waterbugs, Engelhardt and I betook ourselves to the lake, where wingless *Rheumatobates rileyi* Bergr. was far from uncommon, but only one *Trepobates pictus* H. S. was seen, although I was out in a boat looking for it. Here, in the floating duck-weed and algæ I secured what seems to be a new species of *Microvelia*, in goodly numbers. On the way to and from the lake sweeping and beating were done with good results, and this part of the programme repeated in the afternoon yielded among other things, no less than 11 specimens of the new *Corizus*, 2 being fully winged, the other brachypterous. In the evening our stay was wound up by Engelhardt visiting his sugared trees, while I watched the trap light and caught two *Ozophora*. Altogether, in the three days, in spite of unfavourable weather, we got between us some 300 specimens and 82 species of Hemiptera. The identified species are listed here-

after, with appropriate comment. Many of these are recorded from Long Island for the first time, and some of the other records are unusual or remarkable.

Apateticus (= *Podisus*) *cynicus* Say.—Was taken at sugar in the evening—a most unusual manner.

Apateticus maculiventris Say.

Apateticus serieiventris Uhler.

Apateticus modestus Dallas.

Apateticus placidus Uhler.

Halcostethus (= *Peribalus* M. & R.) *limbolarius* Stal.

Trichopepla semivittata Say.

Euschistus euschistoides Voll. (= *fissilis* Uhler.)

Euschistus variolarius P. B.

Thyanta custator Fabr.

Nezara hilaris Say.—At sugar, taken by Mr. Engelhardt.

Dendrocoris humeralis Uhler.

Brochymena arborea Say.

Tetyra bipunctata Fabr.—Was taken at light.

Aradus shermani Heid.—This species was taken under bark of dead pine tree, a few adults and a number of nymphs in various stages. Apparently first notice other than the type locality in Pennsylvania.

Aradus cinnamomeus Panz.

Mezira granulata Say.

Corynecoris typhaeus Fabricius.—Swept from weeds in a dry field.

This appears to be the preferred habitat of this species.

Alydus eurinus Say.

Alydus pilosulus H. S.

Megalotomus 5-spinosus Say.—Common on false indigo (*Baptisia tinctoria*). Some specimens were also swept at night.

Harmostes reflexulus Say.

Corizus lateralis Say.

Corizus hirtus Bueno.—In a sandy spot, in short grasses, by sweeping.

Jalysus spinosus Say.

Lygaeus kalmii Fabr.

Nysius providus Uhler.—Swept and taken at light.

Nysius thymi Wolff.

Ischnorhynchus geminatus Say.

Geocoris piceus Say.

Phlegyas abbreviata Uhler.—One long-winged specimen was swept.

Crophius disconotus Say.—Beaten from oak.

Ligyrocoris diffusus Uhler.

Pamera basalis Dallas.

Antilocoris (= *Cligenes*) *pilosulus* Uhler.—Taken by sweeping grasses in dry cranberry bog.

Pseudocnemodus bruneri Barber.—Two long-winged specimens were swept, one by daylight, the other at night. This is a pretty common and widespread species.

Carpilis ferruginea Stal.—Two specimens taken by sweeping in a marsh. This species has apparently not been recognized since Stal described it in 1874, in En. IV, pp. 144, 153. This is a notable addition to our fauna, and serves to show how little is known of the Hemiptera of any given region.

Ozophora picturata Uhler.—A number of specimens were taken at light and one was beaten from oak. This is a most agile species.

Drymus unus Say.

Corythuca juglandis Fitch.—Taken by beating.

Corythuca crataegi Morrill.—Taken by beating.

Corythuca pergandei Heidemann.

Physatocheila plexa Say.—Beaten from oak.

Reduviolus sordidus Rent.

Reduviolus fesus Linné.

Mesovelia bisignata Uhler.

Rhagovelia obesa Uhler.

Microvelia americana Uhler.—There are also 3 seemingly undescribed *Microvelia*ae.

Gerris marginatus Say.

Gerris remigis Say.

Trepobates pictus H. S.

Rheumatobates rileyi Bergroth.—Abundant on the lake.

Neogeus (= *Hebrus* Curtis) *concinuus* Uhl.—Quite abundant on the damp edges of a cranberry bog.

Pygolampis, sp.—Nymph.

Pseliopus (= *Milyas*) *cinctus* Fab.—Beaten and swept. Found mating.

Zelus luridus Stal.—Nymphs.

Fitchia aptera Stal.—One large fully-winged female was swept in a little meadow.

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NEW NEARCTIC TIPULIDAE (DIPTERA).¹

BY CHARLES P. ALEXANDER,

Ithaca, N. Y.

The following crane-flies, received from various correspondents during the past few months, are believed to be new to science.

Limnobia argenteiceps sp. nov.

Antennæ 15-segmented; pleuræ yellow, with a brown band; wings spotted; Sc short, ending before the origin of Rs.

♂, Length, 4.6 mm.; wing, 5.9 mm.

Head: rostrum and palpi black; antennæ 15-segmented, with the segments all black, flagellar segments rounded-ovate; front, vertex and occiput black with a conspicuous silvery-grey bloom; genæ darker.

Thorax: pronotum light brownish-yellow; mesonotum, præscutum: in front and on the lateral margin, rather bright yellow; an indistinct broad, brown, median stripe which spreads out behind and covers the entire sclerite before the suture; scutum brown, paler, yellowish, medially; scutellum and post-notum brown. Pleuræ yellow, with a broad brown band extending from the cervical sclerites back to the halteres and base of the abdomen. Halteres, pale at base; remainder, darker, brown. Legs: coxæ bright yellow; trochanters yellow; femora yellowish-brown, darker toward the tip; tibiæ and tarsi brown.

Wings: Sc: hyaline, veins brown; a brown spot at the tip of Sc, extending around the base of the sector; a large square stigmal spot; all cross-veins and deflections of veins, narrowly marginal with brown; tip of the wing and ends of all of the veins, faintly tinged with brown. Venation (See fig. 1): Sc short, Sc₂ at the tip, ending before the base of Rs; Rs rather square at its origin; basal deflection of Cu₁ before the fork of M.

Abdomen: tergum dark brown, the extreme apice of each sclerite and a broad median patch on the base of segments 1 to 6, yellow; sternum mostly pale yellow, the lateral margins and an indistinct, sub-apical, cross-band, brown. Hypopygium yellowish: margin of the 8th tergite almost straight; pleural pieces, cylindrical, thickly beset with stout hairs, bearing apically, a large pale segment which is likewise beset with hairs, and armed at its tip with a slender, chitinized projection, curved at its ends; guard of the penis long, prominent, enlarged apically and notched.

¹Contribution from the Entomological Laboratory, Cornell University.

Holotype, ♂, Huachuca Mts., Arizona; Aug. 1905 (H. Skinner, Coll.) Type in coll. Acad. Nat. Sci. Phil.

The reference of this insect to *Limnobia* is merely provisional; I do not care to add a new genus to our already too long list, nor do I know of any genus into which this species will accurately fit. It is remarkable in possessing antennæ which are 15-segmented. The hypopygium is more like that of *Limnobia* than it is like that of *Furcomyia*, still the appearance of the insect, and its venation, are strongly suggestive of the last-named genus. It may be well to compare it with this genus; in Doane's Key (Ent. News, Jan. '08; p. 5-7) it runs down to couplet 30, but runs out because of its spotted wings. It is related to *Furcomyia signipennis* Coq. of California (J. N. Y. Ent. Soc.; vol. 13; p. 56; (1905).

Eliiptera astigmatica sp. nov.

Wings without a stigmal spot.

♂ Length, 8.75 mm.; wing, 14 mm.

Head: rostrum and palpi brownish-black; antennæ, segment one, elongate-cylindrical; flagellar segments oval, similar to one another in shape, gradually smaller; antennæ black; front, vertex and occiput black; the occiput narrowed behind. (It is probable that the head is covered with a grey bloom in fresh specimens; the type is injured.)

Thorax: very convex, præscutum large, greyish-brown, clearer grey along the margins and on the pleuræ; the præscutum is very large, so that the meso-thoracic legs are very widely separated from the prothoracic pair, but close to the metathoracic; scutum, scutellum and post-notum dark grey, the caudal margin of the scutellum brown. Halteres light yellow, the knob brown. Legs: fore coxæ dark brown, yellowish at the tip; remainder lacking; middle and hind legs, coxæ yellowish-brown; femora and tibiæ obscure yellowish-brown; tarsi lacking.

Wings: hyaline, with a faint yellow suffusion in cells C, Sc, R₁ and anterior portions of R₂; stigma entirely absent; veins, brown, R₁ darker than the others; a brownish suffusion below Cu and 2nd Anal. Venation (See fig. 2.): Costa in vicinity of Sc bellied out cephalad and incrassated; Sc rather long, lying closer to C than to R; Sc₂ far retracted, so that Sc₁ is about equal to R₅; R long, ending before the wing-tip, strongly incrassated to near the origin of R₄₊₅; R₅ long, arising at an extremely acute angle, diverging only slightly from R₁; R₂₊₃ in a direct line with R₅; basal deflection of R₄₊₅ short, strongly arcuated, beyond cross-vein *r-m*, straight, parallel with R₂₊₃ to near the tip when it runs somewhat caudad; M weak, on a line with M₁ and Cu₁; deflection of M₁₊₂ almost as long as the cross-vein *r-m*; M₁₊₂ proximad of *m* longer than that portion beyond it, making cell 1st M₁ very elongate; Cu strong, Cu₁ about two-thirds as long as Cu₂; Cu₁ fuses with M just before the fork; 1st A very weak; 2nd A stronger, gently bisinuate; anal angle rather prominent.

Abdomen greyish on dorsum, pleuræ darker, blackish; sternum testaceous.

Holotype, ♂, Roger's Pass, British Columbia; July 30, 1908. (J. Chester Bradley, coll.)

Type in Cornell Univ. coll.

This species agrees with the other American species, *clausa* O. S. of California, in its possessing a median cross-vein. It differs in the entire absence of a stigmal spot. I have seen the types of *clausa* in Cambridge, thanks to the kindness of Mr. Henshaw, and find that that portion of R_1 , just underneath the stigma is bent caudad, and, beyond the stigma, regains its former level; no such condition exists in *astigmatica*.

Erioptera (Mesocyphona) distincta sp. nov.

Vertex variegated; mesonotum clear light grey; dorsal stripes rather broad, clear; pleural stripes very distinct, clear-cut; femora with two dark bands, excepting the middle pair which has one; wings greyish, spotted and dotted, on the veins and in the cells, with white.

♂, Length, 3.6—3.8 mm.; wing, 4.6 mm.

Head: palpi brown; antennæ light yellowish-brown; vertex with a large, clear grey, oval spot, surrounded by a brown border; the outer margins of the vertex, nearest the eyes, fawn-colored; occiput dark brown. Cervical sclerites pale yellow, dorsally with two dark spots.

Thorax: pronotum whitish, the scutellum interrupted medially with a dark pit; mesonotum, præscutum clear light grey, the lateral margins narrowly greyish; a brown stripe on either side, beginning near the caudal end of the pronotum, continuing backward; a brown stripe on either side of the grey median vitta. Pseudo sutural pits elongate-oval, pale; the space anterior to this fovea is pale, fawn-colored; præscutal, or tuberculate, pits, distinct, black, separated from one another by a distance equal to one and one-half the diameter of one; these pits are located in the median ground stripe near the proximal edge of the dark dorsal stripes; scutum, greyish, the vittæ of the præscutum continued backward onto this; scutellum light yellowish-brown, darker anteriorly; post-notum grey, tri-vittate with dark brown. Pleuræ dark brown; a narrow yellowish-white pale stripe running from the lateral margin of the cervical sclerites, caudad; broadening out above the fore coxa and continuing to the wing basis; a broad, clear, silvery-white stripe, narrowest anteriorly, beginning back of the fore coxa, running back to the base of the abdomen; sternum clear grey. The pleura has the appearance of having three dark and two pale bands. Halteres, stem white, knob pale brown. Legs: fore and hind femur, yellow with a broad sub-basal, and a narrower, sub-apical, brownish-black ring; tibiæ and tarsi whitish; extreme tarsal segments darker; middle leg, similar, but femur has only the sub-apical dark band.

Wings greyish, browner on the cephalic half, with numerous white spots and dots, these largest along the costa and on the cord; the cells are speckled with numerous fine dots.

Abdomen light brownish-yellow; a broad, brown, median stripe.

Holotype, ♂, Highrolls, New Mexico; May 31, 1902. Paratypes, 3 ♂'s; Highrolls, New Mexico; May 31, June 2, and June 10, 1902.

Types in coll. Acad. Nat. Sci. Phil.

This species differs from its nearest ally, *caloptera* Say, in its very clearcut pattern of coloration, clear grey with distinct pleural stripes, not yellowish with indistinct pleural stripes, etc.

Trimicra pygmæa sp. nov.

Small; brown; basal half of antennæ yellow, remainder brown; wings greyish with a short pubescence in all the cells.

♀, length, 3.2 mm.; wing, 3.5 mm.

Head: rostrum and palpi dark brown; antennæ, basal seven segments light yellow, terminal segments dark brown; front, vertex and occiput dark brown.

Thorax: dark brown, the lateral margin of the mesonotal præscutum dull yellowish; scutum, scutellum and post-notum dark brown, dark stripes not evident; pleuræ dark brown, more yellowish near the dorsal margin. Halteres yellow. Legs: coxæ and trochanters yellowish-brown; femora, tibiæ and tarsi brown.

Wings: hyaline with a slight greyish tinge; stigma indistinctly grey; veins brown, R more yellowish. Wing covered in all the cells with a thick short pubescence. Venation: (See fig. 3) Sc₂ retracted far back from the tip of Sc₁; Rs leaves R₁ at an acute angle; fork of R₂₊₃ deep, R₂₊₃ being a little shorter than the basal deflection of Cu₁; cross-vein τ just beyond the fork of R₂₊₃ and far removed from the tip of R₁. Abdomen: dark brown; in the ♀ with the valves of the ovipositor rather short, yellow.

Holotype: ♂, Woodworth's Lake, Fulton Co., N. Y. (alt. 1660 ft); Aug. 22, 1910 (Alexander, coll.). Allotype: ♀, with the type. Paratypes: ♀, Wooster, Ohio; Sept. 20, 1911, on grass-lands. (Houser, coll.) In coll. John Houser. ♂ Coy Glen, Ithaca, N. Y.; May 28, 1912; (Alexander and Sheffield.)

The types are mounted in balsam, in the author's collection. Related to *T. anomala* O. S. but much smaller and quite differently colored; Mexican specimens which I have determined as *T. anomala* may, or may not, be conspecific with *T. pilipes* Fabr. of Europe (Compare Osten Sacken, Western Dipt., p. 200.) If so, it is easily separated from *pygmæa* by its non-pubescent wings.

¹¹I have applied the term 'pseudosutural pits' to the deep impressions on the antero-lateral margins of the præscutum existing in many Tipulidæ (humeral pits of Osten Sacken). The 'double dots' of Osten Sacken are spoken of above as the 'tuberculate pits.'

Limnophila laricicola sp. nov.

Small; antennae of the ♂ elongate; color of the body light yellow; wings subhyaline.

♂, Length, uncertain, abdomen broken; wing, 5.4 mm.

Head: antennae elongate, the segments indistinct, twisted, elongate-ovate, narrowed at the ends, brownish in color; front, vertex and occiput light brown, but discolored, and possibly different in fresh material.

Thorax: pronotum brown; mesonotum, praescutum brown on the anterior margin; a dark brown spot on the frontal third of the sclerite in a median position; remainder of the sclerite light yellow, sub-shining, with a sparse pale bloom; scutum and post-notum light yellow, the latter with an indistinct narrow brown median stripe; pleurae yellow, darker near the dorsal margin. Halteres, stem pale, knob darker. Legs: coxae and trochanters light yellow; remainder of the legs brown, rather darker outwards.

Wings: subhyaline, stigma indistinct, brown. Venation (See fig. 4): Sc rather long, extending to beyond the fork of R_2 ; cross-vein r at the tip of R_1 ; R_3 short, less than M_1 or M_2 in length; R_{2+3} rather long, as long as R_3 , gently arcuated; R_4 rather oblique, cross-vein r near its middle; deflection of R_{4+5} about as long as cross-vein $r-m$; petiole of cell M_1 moderately long, about three-fifths of cell M_1 ; basal deflection of Cu_1 beyond the middle of cell 1st M_1 . Cell R_2 very acute at its proximal angle; cell 1st M_2 long and narrow.

Abdomen broken.

Holotype, ♂. Canada Lake, Fulton Co., N. Y.; June 20, 1911 (Alexander). Occurred in an extensive sphagnum bog, on vegetation growing underneath larch trees. (altitude 1550 feet)

Type in author's collection.

This species by its elongate antennae in the ♂, is allied to *poetica* O. S. I thought that it was a small ♂ of this species until I saw the types in Cambridge. *Poetica* is conspicuously larger, with quite different antennal structure. In *laricicola*, the antennal segments are twisted, and the sutures between them indistinct, producing an appearance quite different from that which obtains in the male sex of *poetica*, *tenuipes*, *niveitarsis*, etc. Venationally, this new species differs from *poetica* in its longer R_{2+3} , shorter petiole to cell M_1 , etc. Unfortunately my type, and only specimen, was recently accidentally damaged.

Eriocera albihirta sp. nov.

Antennae short in the ♂; cell M_1 present; body densely clothed with long white hairs.

♂ Length, 15 mm.; wing, 15.6 mm.; antenna, 4.5 mm.

Fore leg, fem. 8 mm.; tibia, 10 mm.

Middle leg, fem. 9.2 mm.; tibia, 8.4 mm.

Hind leg, fem. 12 mm.; tibia 12.6 mm.

Head: rostrum and palpi dark brown; antennæ, first segment large, cylindrical, brown; remainder of antennæ black with black hairs. Front wide, the frontal tubercle not prominent; front, vertex and occiput, medium brown densely clothed with long pale hairs; a spot on the front just behind the base of the antennæ, paler, golden-yellow.

Thorax: mesonotal præscutum dark dull black without apparent stripes (though these may have been destroyed by some means or another), the entire sclerite densely clothed with elongated white hairs, very conspicuous; those on the dorsum darker and shorter, those on the lateral margin of the sclerite exceedingly conspicuous; scutum dull black; scutellum dark brown, also with numerous pale hairs; post-notum black. Pleuræ light grey with dense white hairs; the light color of the pleuræ renders it probable that the dorsum is grey with darker stripes, in living material. Halteres, stem light brown, knob darker brown. Legs: coxæ brown, with a grey bloom; trochanter brown; fore femora, basal half brownish-yellow; apical half dark brown, uniform throughout; tibia and tarsi dark brown; middle leg, femora with rather more than the basal half light-colored; hind leg, femora with only the extreme base yellowish.

Wings: subhyaline or light brown, more brownish near the veins; cells C and Sc brownish-yellow; stigma small, oval; veins brown. Venation: (See fig. 6); Sc extending beyond the fork of R_{2+3} ; R long, cross-vein r about one-half as long as that portion of R_1 beyond it; r before the middle of R; cell M_1 present. Venation almost exactly like the eastern *E. brachycera* O. S.

Abdomen: tergum uniform dark brown, the lateral margin pale yellowish, and provided with long pale hairs, these longest on the basal segments; hypopygium yellowish-orange; sternum more greyish.

Holotype: The labels read '22 California. No. 846. Coll. H. Edwards.' Probably from Marin Co.

Related to *E. brachycera* O. S. but darker and clothed with long pale hairs much longer than in *brachycera*. The basal segments of the antennæ in *brachycera* are very light yellowish-red, not brown; the front of *brachycera* in the vicinity of the tubercle is uniformly pale; the thoracic dorsum may or may not be similarly colored in the two species (see statement, above, concerning the condition of the thorax in *albihirta*). In *brachycera* the legs are much lighter-colored with narrow blackish tips to all the femora; in *albihirta* the femoral tips are uniform brown and very broad.

Eriocera fultonensis sp. nov.

Antennæ short in both sexes; cell M_1 absent; body coloration dark brown; præscutum four-striped; wings light brown; cross-vein r far before the fork of R_{2+3} .

♂, Length, 9.6-10.2 mm.; wing, 9-10.4 mm.

♀, Length, 11.2-11.5 mm.; wing, 10.5-11.3 mm.

Head: palpi dark, blackish, rostrum much paler brown; antennæ short in both sexes; scapal segments dark above, reddish-yellow underneath; flagellar segments black. Front, vertex and occiput black with a grey pruinosity, most distinct behind the eyes.

Thorax: mesonotal præscutum light yellowish-brown with a dark brown stripe on either side of the paler median vitta, these stripes broadest in front, narrower behind, ending just before the suture; a shorter, curved, lateral stripe on the lateral edge of the sclerite, beginning just behind the pseudo-suture, continuing to the transverse suture; scutum, scutellum and post-notum blackish, scantily grey pruinose; pleuræ unicolorous greyish-black. Halteres, base of stem, pale, yellow; remainder of stem, and the knob, dark brown.

Legs: coxæ light brown; trochanters and basal three-fourths of the femora, light brownish-yellow; apical fourth of the femora, brown; in the fore-legs, the apical half of the femur is brown; tibia light brown, the tip black; tarsi brown.

Wings: veins dark brown; membrane rather uniformly tinged with light brown; stigma small, delimited externally by the radial cross-vein; extreme tip of the wing rather darker. Venation (See fig. 7): cross-vein r near the tip of R_1 , situated far before the fork of R_{2+3} ; R_2 much shorter than R_{2+3} ; cell M_1 absent; basal deflection of Cu_1 slightly before the fork of M .

Abdomen shiny black, including the large hypopygium; in the ♀, the valves of the ovipositor are likewise black.

Holotype, ♂, Sport Is; Sacandaga R; Fulton Co.; N. Y. June 28, 1911. (Alexander, coll.) Allotype, ♀, with the type. Paratypes, 5 ♂, 5 ♀, with the type.

Types in author's collection.

Nearest related to *E. fuliginosa* O. S. (East. U. S.), from which it is readily distinguished by the lack of a grey bloom on the thorax, the shiny jet black abdomen and genitalia, etc. In normal individuals of *fultonensis*, cross-vein r is far before the fork of R_{2+3} (See fig. 7). In rare instances, however, the cross-vein is much nearer to the fork though never quite at it. Specimens which I refer to *fuliginosa*, provisionally, show a venation similar to that described for the species (See fig. 8); the coloration is very dark, however, and comparison with the type may prove them to be novelties. *E. fultonensis* differs from *E. gibbosa* Doane¹ (Mich.) in the same venational peculiarity.

Eriocera cinerea sp. nov.

Cell M_1 absent; color of the thorax light grey; stripes on the mesothoracic præscutum indistinct; cross-vein r far beyond the fork of R_{2+3} .

♀, Length, 11.4 mm.; wing, 11.2 mm.

♀, Head: rostrum yellow; palpi yellowish-brown; antennæ, segments one

¹ Doane, Journ. N. Y. Ent. Soc.; vol. 8; p. 193; pl. 8, fig. 10. (1900)

and two, light orange-yellow beneath, light brown above; flagellar segments brown. Front and clypeus light orange-yellow; vertex and occiput light grey, more brownish medially, paler on the vertex behind the eyes, and on the genæ.

Thorax: prothorax, scutum dark brown with a grey bloom and prominent pale hairs; scutellum dark brown medially, the ends conspicuously orange-yellow. Mesothorax yellowish-grey, the præscutum with four very indistinct darker lines; the middle pair long, confluent or nearly so at their cephalic ends; lateral pair short, beginning behind the prominent rounded, black pseudo-sutural fovea; scutum and scutellum brown with a clear light grey bloom; post-notum dark brown. Pleuræ light grey; halteres, stem brownish-yellow, knob brown. Legs: coxæ and trochanters rich orange-yellow; femora light brownish-yellow, the extreme tip darker, brown; tibiæ, extreme base brown, remainder yellowish-brown, insensibly darker apically; tarsi brown.

Wings sub-hyaline or very pale brown; costal and subcostal cells light yellow; stigma ill-defined, yellowish-brown; veins brown. Venation (See fig. 9) Sc short, ending before the fork of R_{2+3} ; R_{7+8} slightly longer than that portion of R_1 before cross-vein r ; cross-vein r inserted near the tip of R_1 and far beyond the fork of R_{2+3} ; cell M_1 absent; cell 1st M_2 elongate.

Abdomen: tergum dark brown, the lateral margins of the sclerite broadly, the caudal margin narrowly, brownish-yellow; valves of the ovipositor brownish-orange; sternum greyish-brown.

Holotype. ♀, Boston, Massachusetts.

Type in author's collection.

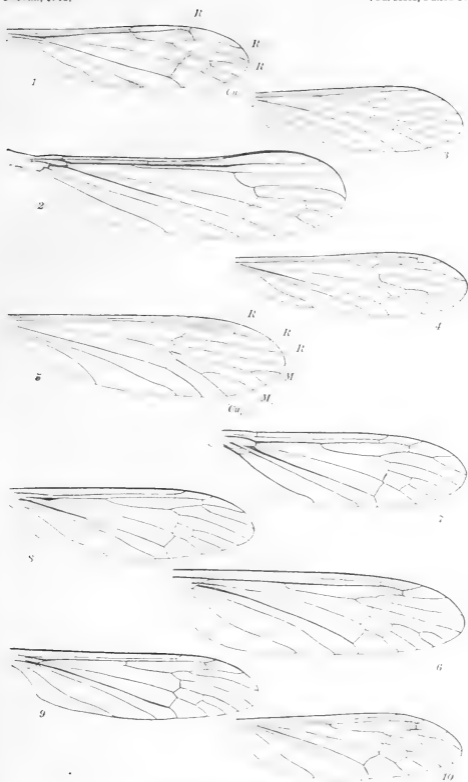
Related to *fuliginosa* O. S. but head and thorax conspicuously grey, not brown; abdomen not uniform brown; cross-vein r situated far beyond the fork of R_{2+3} , etc. The female of *E. wilsoni* O. S. (East U. S.), of which I have seen the types in Cambridge, is unknown. This new species cannot be that sex of *wilsoni* because of its totally different body-color. *E. longicornis* Walker is quite a different species; its venation seems never to have been figured (The figure in Needham's 23rd Rep't of the N. Y. State Entomologist, is not *longicornis*, but *spinosa*.) so I include a drawing. (See fig. 10.)

Rhaphidolabis neomexicana sp. nov.

Cross-vein m of the wings absent; wings pearly-white with a distinct dark brown stigmal spot.

♀, Length, 5.4 mm. wing, 7.6 mm.

Head: rostrum and palpi dark brownish-black, antennæ black; head dark brown, sparsely grey pruinose. Thorax: mesonotal præscutum dark brown, very sparsely grey pruinose without distinct darker stripes, though rather deeper-colored medially; scutum, scutellum and post-notum dark brown with a faint grey



Alexander—New Nearctic Tipulida



dust. Pleuræ dark brownish-black, grey-dusted. Halteres, stem pale, knob brown. Legs: coxæ brownish-yellow, more greyish anteriorly; trochanters brownish-yellow; femora and tibiae uniform medium brown; tarsi gone.

Wings: hyaline or sub-pearly; a prominent elongate dark brown stigmal spot; veins brown, the longitudinal veins rather paler at the wing-root. Venation: (See fig. 5): Sc long extending beyond the fork of R_{2+3} ; R_1 long, cross-vein r very near its tip; Rs short, oblique; R_{2+3} very short, only a little longer than cross-veins r or $r-m$; cross-vein r beyond the middle of R_1 ; M_1 about as long as Rs; no cross-vein m ; basal deflection of Cu; beyond the fork of M.

Abdomen: dark brown, the pleural sutures lighter brown; valves of the ovipositor light colored, brownish-yellow.

Holotype, ♀, Beulah, New Mexico: June 29, 1902.

Type coll. Acad. Nat. Sci. Phil.

Most closely allied to *R. tenuipes* O. S. of the Eastern United States, but differs in its wing coloration, apparent lack of thoracic stripes, dark stigmal spot and venational details, *i. e.*, more oblique Rs, shorter and more divergent M_1 and M_2 , etc.

R. debilis Will.¹ appears to be a *Tricyphona* by its venation (R_{2+3} fused and R_4 and R_5 separate). It agrees most closely with *T. vitripennis* Doane.

The members of this tribe, *Pedicini*, require careful study at the hands of some competent student who has access to an abundance of Western material. The West appears to be the center of distribution for the members of this group, which, in other parts of the continent, are represented only by a few species, or else, as in the tropics, quite lacking. I surmise that such a study, based on sufficient material, would show congenerousness of *Plectromyia* O. S. and *Rhaphidolabis* O. S., with *Dieranota* Zett.

Explanation of the Plate 13.

1. Wing of *Limnobia argenteiceps*, sp. n.
2. " " *Elliptera astigmatica*, sp. n.
3. " " *Trimicra pygmaea*, sp. n.
4. " " *Limnophila laricicola*, sp. n.
5. " " *Rhaphidolabis neomexicana*, sp. n.
6. " " *Eriocera albihirta*, sp. n.
7. " " *E. fullouensis*, sp. n.
8. " " *E. fuliginosa* O. S. (or related species)
9. " " *E. cinerea*, sp. n.
10. " " *E. longicornis* Walker.

¹ Williston, Kans. Univ. Quart.; vol. 2; p. 62; Oct. 1893.

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NEW NEOTROPICAL TIPULINÆ (TIPULIDÆ, DIPT.).

BY

CHARLES P. ALEXANDER, Ithaca, N. Y.

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200.000 (the 20,000)
of the author.

NEW NEOTROPICAL TIPULINÆ (TIPULIDÆ, DIPT.).

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

The following species are included in four collections that I have had for study, received from the following sources: The American Museum of Natural History, including the Williston collection, received through Mr. J. A. Grossbeck; the Cornell University Collections consisting of Mr. H. S. Parish's extensive Brazilian material, through Dr. J. C. Bradley; the United States National Museum Collections, through Mr. Frederick Knab, and a small lot received from Staudinger-Bang-Haas and now in my cabinet. I wish to thank the above named gentlemen for the loan of this and other interesting crane-fly material.

The *Tipulini*, containing the great genera *Tipula* and *Pachyrhina*, is, in any region, in a very chaotic condition. The genus *Tipula* with its hundreds of described species has become so unwieldy as to be almost unusable. In the Neotropical fauna there are described up to the date of this writing, 46 species of *Tipula* and 12 of *Pachyrhina*. Some of these, however, are undoubtedly synonymous (as *moniliformis* Röder and *ornaticornis* v. d. Wulp). The future student of the *Tipulini* should make it a point of obligation to his fellow students to describe in detail, and figure if possible, the genitalia of the male and female. Mr. R. E. Snodgrass (Trans. Am. Ent. Soc.; Vol. XXX, pp. 179-236) laid a firm foundation for the study of the male hypopygium, and American authors are using this character to some considerable extent. As an example of a splendid revision of a genus of this tribe, I will cite Mr. M. P. Riedel's excellent paper on the Palæarctic *Pachyrhinæ*.†

It is probable that hypopygial characters can never be made the main basis of subdivision into groups because of the great differences in closely-related species and the consequent tendency to separate forms that are closely allied. At present it seems as if Schummel's old division of species into groups on wing-pattern is the best for main group characters. Nevertheless, hypopygial characters are so constant and so extremely important that it would be impractical to ignore them.

*Entomological Laboratory, Cornell University.

†Deutschen Entomol. Zeitschr.; Vol. for 1910, p. 409-437, 4 fig.

I have before me male specimens of the following species which I expect to characterize more fully in the third part of my "Synopsis of the Neotropical Tipulidæ."

Pachyrhina nigrolutea Bellardi.

Macromastix chilensis Philippi.

Tipula albifasciata Macquart.

Tipula craveri Bellardi.

Tipula edwardsi Bellardi.

Tipula microcephala v. d. Wulp (which seems to belong to *Holorusia* Lw.).

This name is preoccupied by *T. microcephala* Big. (1858), and I rename the South American species, *Tipula vanderwulpi* n. n.

Tipula monilifera Loew.

Tipula moniliformis Röder.

Tipula subandina Philippi.

Tipula apterogyne Philippi.

Tipula rufostigmata Macquart.

Tipula variinervis Bigot. (= *picti-pennis* Walker.)

***Pachyrhina macrosterna*, sp. n.**

Thoracic stripes not complete, represented, when at all evident, only by spots at the margins of the præscutum; dorsal apical appendage of the ♂ genitalia prolonged, stylet-like.

♂ Length, 10.3—10.8 mm.; wing, 11.4—11.8 mm.

Middle leg, femur, 8 mm.; tibia, 8.9 mm.

♀ Length, 12.8 mm.; wing, 13.2 mm.

Fore leg, femur, 8.9 mm.; tibia, 10.7 mm.

Hind leg, femur, 9.3 mm.; tibia, 10.6 mm.

♂ Head: Anterior prolongation of the front brownish-yellow, clearer yellow beneath and on the sides; palpi brownish; antennæ, basal segments orange-yellow; 3d segment brownish-yellow; remaining segments dark brown basally, gradually fading into the yellowish-brown apical portion of the segment; terminal three or four segments uniform brown. Front, vertex and occiput yellow, more brownish in the middle of the vertex, very broadly shiny, this mark not clearly delimited but embracing most of the space between the eyes.

Thorax: Pronotum dull pale yellow; mesonotum, præscutum shiny, brownish-yellow, without clearly defined stripes; pleuræ dull with a pale yellowish bloom. Halteres, stem pale, knob brownish. Legs: coxæ and trochanters yellow; femora brownish-yellow, the extreme tip dark brown; tibiæ yellowish-brown, extreme tip indistinctly darker; tarsi brown. Wings hyaline or nearly so, cells *C* and *Sc* yellow, stigma pale. Venation: *Rs* short, a little longer than *R*₂; petiole of cell *M*₁ long, as long as the basal deflection of *R*₄₊₅.

Abdomen: Tergum, segments shiny, segment 1 yellow, narrowly margined with brown behind; segment 2, yellow, brown on the caudal half, a large rounded brown spot on the lateral margin; segments 3 and 4 mostly brown, more yellow basally, with a gradually smaller brown spot on the lateral margin of each of the sclerites; segments 5 and 6, brighter, more yellowish; segment 7 dark, almost black, margined with pale; hypopygium orange-yellow; sternum, yellowish. Hypopygium: 7th tergite, short, shorter than the tergites immediately preceding; 8th

tergite distinct, about as wide as the 7th, its caudal margin straight, its lateral corners evenly rounded; 7th sternite rather broad, broader than the sixth sternite; 8th sternite very large, longer than the three preceding segments combined and projecting caudad beyond the remaining appendages; its ventral face is evenly rounded, broad at the base, narrowing apically, at its tip turned abruptly dorsad and ending in two blunt teeth, these teeth bifid with the caudal denticulum rather the longer. Above the origin of the 8th sternite arises the 9th sternite: broad basally, rapidly narrowed toward the tip into a chitinous, spoon-like appendage, convex on its outer face, concave on its inner. 9th tergite with the caudal margin rather deeply incised medially, the adjacent lobes brown, chitinized, and bent ventrad at the tip. Two distinct sets of apical appendages arising from the genital chamber, which may, or may not, be connected with one another nearer their bases; first, a pair of dorsal-lying appendages which are bifid with the ventral tooth greatly prolonged, stylet-like (see Fig. k₁). Beneath these are two large complex appendages (see Fig. k) which may be described as being three-branched, the ventral branch is strongly chitinized and expanded, six-toothed, of which the most dorsad is the largest; the dorso-proximal branch (a) is flattened, its margin chitinized and somewhat reflexed, bearing a spine near its outer edge at the tip; the dorso-distal branch (b) is slender, more fleshy and bears scattered hairs at its apex. Between the ventral organs, just ventrad of the dorsal pair is a large, pale fleshy organ.

♀ Antennæ mostly yellowish excepting the apical segments which are brown. On the cephalic margin of the mesonotal præscutum is a dark brown spot on either side of the usual broad median stripe which is here not indicated; a large brown spot on the sides of the sclerite about at the anterior end of the usual lateral stripe. Ovipositor (see Fig. r) with the valves very short, blunt, evenly rounded on their lateral margin.

A paratype male shows the fore portion of a lateral stripe on the præscutum.

Holotype, ♂, Antigua, Guatemala. Sept., 1902 (Dr. G. Eisen).

Allotype, ♀, with the type.

Paratype, ♂, Aguna, Guatemala. (Dr. G. Eisen). (Received at U. S. National Museum, Jan. 6, 1903).

Types in U. S. Nat. Mus. Coll. (No. 15,072).

Paratype in author's collection.

Pachyrhina macrosterna, and the following species, *trinidadensis*, are closest allied to *circumscripta* Lw, *ferruginea* Fabr. and *elegantula* Will., in the respect that the thoracic stripes are not jet-black. The other nine Neotropical species are all black-striped species. These two species form a distinct group, (*macrosterna* group), differing from the species named above in their petiolate cell M₁ and powerful hypopygium. The petiolate cell M₁ suggests *collaris* Say of the Northeastern United States, a very different insect.

***Pachyrhina trinidadensis*, sp. n.**

Similar to *macrosterna* but antennæ darker; three distinct brown thoracic stripes; dorsal apical appendage of the ♂ genitalia chisel-shaped, sub-truncated at its apex.

♂ Length, 11 mm.; wing, 10.8 mm.; antennæ, about 4.5 mm.

♀ Length, 12—13.2 mm.; wing, 12.2—12.8 mm.

Fore leg, femur, 7.7—7.8 mm.; tibia, 9.4—9.8 mm.

Middle leg, femur, 8.5 mm.; tibia, 8.8 mm.

Hind leg, femur, 9 mm.; tibia, 9.9 mm.

♂ Head: Anterior prolongation of the front and the palpi brown. Antennæ, two basal segments light orange-yellow; 3d segment, basal half brown, apical half yellow, remaining segments brown, extreme apice of each segment yellowish, this yellow color becoming obsolete on the outer segments. Front, vertex and occiput brown, the center of the vertex broadly shiny and brighter brown.

Thorax: Pronotum very pale yellowish-white, not shining; mesonotum shiny, prescutum light yellow with three dark brown uniform stripes; the middle stripe is broadest on the anterior portion of the sclerite, rather narrower behind; the lateral stripes bent strongly ventrad at the pseudosuture (*humeral pit* or *dorso-pleural* suture of Osten Sacken); scutum yellowish with two dark brown spots on each lobe; scutellum lighter brown; post notum brownish-yellow, thinly pale pollinose; pleuræ pale with a sparse greyish pollen. Halteres pale, gradually darkening to the brown knob. Legs: coxæ and trochanters light clear yellow; femora brown, the tip narrowly dark brown; tibia and tarsi brownish. Wings: color and venation almost exactly as in *macrosterna* of Central America (see Fig. h.).

Abdomen: Tergum brownish, the lateral margins of the sclerites clearer yellow, not darker on segments 2 to 4; segment 7 with the basal half dark brown; remainder of tergum and the sternum, brownish-yellow. Hypopygium (see Fig. j); 7th and 8th tergites and 7th sternite as in *macrosterna*; 8th sternite with the caudal denticula (d) about equal to the cephalic one; 9th sternite (9s) viewed from the side with an obtuse notch on the ventral face. Apical appendages: The dorsal-lying appendage (c) projects straight backward, enlarged at the apex, chisel-shaped, the outer angles equal, the caudal margin gently concave (see Fig. j₂); the appendages lie in a vertical plane and side by side, separated from one another by a distance about equal to the width of one. The second, or ventral, appendage (see Fig. j₁) the ventral branch of *macrosterna* is, apparently, lacking; the dorso-proximal branch is chitinized and bears a sharp spine on the caudal margin, this spine being bent outward (a); on the sides of the appendage is a large prominent spine which projects ventrad and outward (x) toward the appendage of the 9th sternite which it almost touches; at its base, a small hair-bearing projection; the margin of the appendage below the large spine curves distad, is chitinized on the extreme edge and bears long hairs; I cannot perceive any structure corresponding to the dorso-distal branch of *macrosterna*; a large pale organ lying between these ventral appendages and just beneath the paired dorsal appendages.

♀ Quite similar to the ♂, the shiny spot on the vertex brown; the median præscutal stripe very broad, in front almost touching the anterior end of the lateral stripe; a brown spot on the mesopleuræ about midway between the coxa and the pseudo suture; ovipositor about as in *macrosterna*; upper valves tipped with black; lower valves, viewed from the side, broad at the base, the ventral margin concave, obtuse at the tip; viewed from beneath, flattened, bearing scanty long hairs on the outer face, the tips touching.

Holotype, ♂, Port of Spain, Trinidad, Sept. 25, 1901, (H. Carciniola).

Allotype, ♀, with the type.

Paratype 1, ♀, with the type.

Paratype 2, ♀, Trinidad, West Indies, (Aug. Busck).

Types in U. S. Nat. Mus. Coll. (No. 15,073) except paratype No. 2, in author's collection.

Tipula armatipennis, sp. n.

Color light yellow; wing unmarked; a distinct spur on the costa near the stigma in the ♂.

♂ Length, about 13.5 mm.; wing, 14.4 mm.; antennæ, about 6 mm.

♀ Length, about 15.5 mm.; wing, 14.8 mm.

♂ Head: Anterior prolongation of the front yellowish-brown; mouth-parts similar. Palpi light yellow, more brown apically, the last segment about as long as the basal three combined. Antennæ, scapal segments yellow, the first cylindrical, the second very short, broader than long, with a thick brush of stout black hairs on its inner face; flagellum, segments (except the first) more or less enlarged at the base and slightly constricted in the middle, the swollen base with a few long black hairs, the segment densely clothed with a pale pubescence; segments 3-4, yellowish, except at the black knot, this color passing into a uniform dark brown on the apical segments. Front, vertex and occiput pale brownish-yellow with a sparse greyish bloom.

Thorax: Pronotum light yellow; mesonotum, præscutum, light yellow without distinct stripes; scutum orange with indistinct darker spots; scutellum depressed on the sides, swollen medially, brownish-yellow; post-notum dull yellow. Pleuræ yellow, with a sparse greyish bloom. Halteres uniform yellow, knob brownish. Legs broken. Wings: subhyaline; stigma large, oval, brown; cells C and Sc tinged with yellow; the apices of cells R₂ and R₃ tinged with brown; veins brown. On the costal margin of the wing, above the middle of the stigma, is a distinct spine or spur. Venation (see Fig. 61) Sc long ending at the base of the stigma; Rs short, less than twice as long as the deflection of R₄₊₅; R₂₊₃ short, forming the caudal margin of the stigma; R₂ short, subperpendicular, basally forming the distal side of the stigma; cell 1st M₂ small, pentagonal.

Abdomen: Tergum, segment one dark brown, indistinctly black medially; remaining segments reddish-brown, darker basally. Hypopygium swollen. Sternum brownish-yellow; 7th segment black both on the sternite and pleurite. Hypopygium: (see Fig. o); 7th sternite, caudal margin almost straight; lateral margin impressed, wavy; 7th tergite, caudal margin straight; 8th sternite, (8s), broad at the base, narrowed apically, running caudad slightly beyond the remaining appendages; the base is shiny, the tip short-cylindrical, dull, opaque; the tip bent strongly dorsad and deeply notched at its base; the dorsal surface of the eighth sternite is deeply concave, hollowed-out; at the notch, on the dorsal margin, is a small flattened lobe (c), directed upward, its caudal margin narrowly chitinized, the tip densely fringed with long pale hairs. 8th tergite very narrow (8t.) represented only by a narrow strip, concave on its caudal margin and consequently even more reduced on the middle line. 9th sternite (9s) broad basally, the dorsal margin with a broad, obtuse notch; a blunt tooth on its caudal margin, ventrally the margin is rolled inward, forming a broad, obtuse notch on the margin; the inward-projecting arm is chitinized, its inner margin thinned and bearing a dense fringe of long pale hairs which overlap those of the opposite side and form a dense mat under the apical appendage and over the 8th sternite. 9th tergite (9t) moderate, medially with a deep notch on the caudal margin; the adjacent lobes being sharply pointed, bent ventrad at their tips, sub-chitinized and with hairs and minute denticule along the inner face; the latero-caudal margin of this sclerite is thinner and bears a fringe of sub-equal, pale hairs. The apical appendage (a) is dorsal, flattened, bearing two teeth, the most dorsal and innermost project inward, very sharp, slender, chitinized, almost touching its fellow on the middle line; the ventral tooth (a) longer, directed more caudad; the outer margin of this appendage clothed with long hairs; below the apical appendage, a flattened median organ (b), its caudal margin vertical, evenly convex, narrowly chitinized, and fringed with fine hairs. Below the 9th tergite and between its arms, in the specimen at hand, the penis (p.) projects; it is extremely elongated and if straightened would be considerably longer than one-half of the abdomen.

♀ Like the ♂ but the antennae short, the flagellar segments cylindrical, subequal, not swollen basally, basal half of each segment brown, apex yellow. Wing without a spur, but venation as in the ♂. Ovipositor: (v, v₁) 8th tergite, concave on the caudal margin; 9th tergite very narrow and not as wide as the rest of the abdomen, its caudal margin concave. Base of the ovipositor short, almost as broad as long, the valves short, their tips chitinized and sub-spatulate, viewed from the side (v₁), the valve is wider than its base narrowed near the tip, the tip again expanded; lower valve shorter than the upper, directed caudad and upward, the valves extremely high, blunt at the apex. The 9th sternite is very long.

Holotype, ♂, Chapada, Matto Grosso, Brazil (H. H. Smith, coll.)

Allotype. ♀, with the type.

Types in Am. Mus. of Nat. Hist., New York.

I know of no species of *Tipula* that even approaches this remarkable fly. No form in the American fauna has a spur on the wing.

***Tipula guato*, sp. n.**

Color light yellow; flagellum of antennæ bi-colored; wing subhyaline.

♂ Length, about 12 mm.; wing, 11.5 mm.

Fore leg, femur, 7.6 mm.; tibia, 9 mm.

Head: Anterior prolongation of the front rather short; nasus not distinct, but with a long brush of hairs in its normal position; dull yellow, brightest on the sides. Palpi, light yellow, short. Antennæ, basal segments yellow, second segment with a brush of hairs on the inner face; flagellum, segments swollen on the ends, narrowed medially; the basal knot blackish, and with a few prominent hairs; the entire segment clothed with dense pale hairs; basal segments of flagellum with apices yellow, this color gradually passing into the dark brown of the terminal segments. Front, vertex and occiput dull brownish-yellow.

Thorax: Mesonotum, præscutum dull yellow without apparent stripes; scutum, scutellum and post-notum similar but more or less suffused with brown. Pleuræ dull yellow, sparsely greyish pollinose. Halteres, stem yellow, knob brown. Legs: coxæ and trochanters light yellow gradually passing into the brown of the tarsi (only fore legs remain). Wings: Subhyaline; stigma oval, pale brown; cell C and apices of cells R_2 and R_3 tinged with yellow; veins brown. Sc more yellowish. Venation: (see Fig. e); Sc long ending far beyond R_s ; R_s short, about as long as M_{1+2} between cross-veins $r-m$ and m ; R_{2+3} in a line with R_3 ; R_2 oblique; cell 1st M_2 rather elongated; petiole of cell M_1 short; cross-vein $m-cu$ distinct.

Abdomen: Tergum light brown, almost uniform; 7th and 8th black; hypopygium yellow; sternites light brown; 7th and base of 8th black. Hypopygium: (see Fig. p); 7th sternite broad, its caudal margin almost straight; 7th tergite almost convex; 8th sternite (8s) broad at the base with a very obtuse tooth on its dorsal margin; produced behind into a blunt point which is broadly and obtusely notched at the tip; 8th tergite (St.) moderately broad, about one-third as wide as the 7th, rather widened at the ends, but the caudal margin almost straight; 9th sternite (9s) subquadrate, large, its dorsal margin straight; its caudal margin truncated; ventral margin with an obtuse ventral-projecting tooth; the inner margin is bent inward and has a dorsally-directed tooth; this inward projection of the 9th sternite fills a considerable portion of the genital chamber between the 9th sternites and just dorsad of the 8th sternite. Along the median line it is deeply notched, and the whole external face is densely covered with delicate, silvery-white, appressed hairs. 9th tergite (9t.) rather short with an obtuse median notch, the adjacent teeth broad, obtuse, projecting downward, densely covered with short, stout hairs, the extreme base of each tooth,

on either side of the median notch, produced ventrad into a small spine. The apical appendage is dorsal; the caudal margin is rather straight, the outer upper angle produced dorsad into a chitinized tooth which is slightly bifid at its apex, the chitin continuing down the anterior side of the appendage in a narrow line; the inner margin of the appendage straight, with scanty long hairs which cross over the median space and meet those of the other side. Between the chitinized teeth, on the median line, is a pale, horse-shoe shaped organ which probably surrounds the penis which is not exerted in my single specimen.

Holotype, ♂, Chapada, Matto Grosso, Brazil (H. H. Smith, coll.)

Type in Am. Mus. of Nat. Hist., New York.

The specific name is derived from a native tribe. "The central parts of Matto Grosso at the foot of the plateaux are occupied by the Guatos, some of whom are still in the wild state." Reclus, *Universal Geography*, Vol. XIX, p. 258. The latest and best account of this tribe is by Dr. Max Schmidt, "Reisen in Matto Grosso in Jahre 1910."*

***Tipula smithi*, sp. n.**

Light brownish-yellow; costal margin of wings brown.

♀ Length, about 13 mm.; wing, 12.8 mm.

Head: Anterior prolongation of the front, short, light greyish-brown; palpi light brown. Antennæ, first eight segments clear light yellow, the apical segments gradually suffused with brownish. Front, vertex and occiput greyish-brown. Thorax: Mesonotum, præscutum light brown without apparent stripes; scutum similarly brown; scutellum and post-notum light yellow. Pleuræ yellow with a pearly-grey bloom. Halteres light brown. Legs: coxæ yellowish with a grey bloom; trochanter light yellow; rest of legs gone. Wings: Nearly hyaline; stigma rounded, dark brown; the costal margin suffused with brown, the brown pattern including cells C, Sc, the cephalic half of R (where it becomes paler, more yellowish); basal third of cell 1st R₁; all of cell 2d R₁; cell R₂; cell R₃, except a hyaline spot in the proximal end and another over the middle of vein R₄₊₅; brown clouds at origin and tip of cell R₅; along basal deflection of Cu₁; along cross-vein *m*; at fork of M₁₊₂, and at the ends of the longitudinal veins. Venation: (see Fig. f); cross-vein *r* about as long as that portion of R₂ below it; R₃ short, about twice as long as R₂; basal deflection of R₄₊₅ long, almost obliterating cross-vein *r-m*; petiole of cell M₁ almost as long as that cell; fusion of M₃ and Cu₁ extensive, not quite as long as cross-vein *m*.

Abdomen: Tergites brownish-yellow; sternites clearer yellow; second segment very long, as long as 3 and 4 combined; 9th tergite with caudal margins concave (see Figs. w, w₁), the caudo-lateral angles

*Zeitschrift für ethnologie; vol. 44, pt. 1; p. 130-174; especially, p. 131-137; (1912).

produced into short obtuse points; valves of the ovipositor very short, divergent, the basal piece longer than the tips; lower valves (see Fig. w₁, D); very short, broad at the base, truncated at the tip.

Holotype, ♂, Chapada, Matto Grosso, Brazil (H. H. Smith).

Type in Am. Mus. of Nat. History.

This handsome species is named in honor of the pioneer collector, Mr. Herbert H. Smith.

Tipula inca, sp. n.

Grey; wings indistinctly spotted; legs short, stout.

♂ Length, 11.5 mm.; wing, 13.4 mm.; antennæ, about 8.5 mm.

Fore leg, 21 mm.; middle leg, fem. 6.8 mm.; tibia, 5.6 mm.; tarsus, 6.5 mm.; hind leg, fem. 7.8 mm.; tibia, 8.3 mm.; tarsus, 7.9 mm.

Head: Anterior prolongation of the front white, very pale, with numerous brown hairs on the distal half above; nasus not prominent; palpi brown, first segment light brown, shorter than the second, slender; second, paler brown basally, greatly thickened distally; 3d segment again slender except at the base; 4th very irregular, brown, except at the extreme base where it is yellowish; mouth parts dark brown. Antennæ, 1st segment short, much thickened distally; 2nd short; 3d one and one-half the length of the 1st; remainder very flexible, elongated, at the basis armed with four or five strong, black hairs, the whole surface covered with a fine pubescence. Basal segment light yellow, somewhat darker at tip; 2d brownish-yellow; 3d silvery greyish-brown; remainder light brown. Front pale silvery-white; vertex and occiput grey with a dark brown median line beginning between the antennæ, running caudad. Head closely applied to the prothorax.

Thorax: Pronotum silvery-grey, medially with a broad brown stripe. Mesonotum, grey with a very narrow dark brown median line, broadest before, gradually narrowing toward the suture, lateral margins of præscutum dark brown except extreme edge; between this brown and the median stripe, an indistinct pale brown stripe on the caudal half, ending at the suture; scutum, grey medially, yellowish on the sides; scutellum grey, a large flattened brown area on the sides above the wing-roots; post-notum grey, brownish medially and on the sides. Pleuræ and sterna silvery-whitish, tinged with grey. Halteres long, yellowish. Legs short, stout, femora somewhat incrassated at tip, pale yellowish-brown, tip rather darker; tibiæ and tarsi brown.

Wings: Hyaline, cells *C* and *Sc* tinged with yellow; stigmal area pale greyish; a vague grey suffusion around cross-vein *m* and on outer deflection of *M*₃; caudal third of cell *M* along vein *Cu*, grey, this also continuing onto *Cu*₁ and *Cu*₂ as a very narrow seam; cells of wing in vicinity of anterior (cephalic) half of the cord, greyish; two pale clouds in base of cell *Cu*; margin of anal angle grey. Venation as in Fig. c.

Abdomen: Pale brownish-yellow; middle of 1st tergite brown, which color continues back over the succeeding three segments as a narrow line; sternites brownish-yellow, the sclerites at pleural margin

deeply incurved, dusky, giving an indistinct lateral stripe. Hypopygium: (Fig. 1); 8th tergite, (St), moderately long, its caudal margin almost straight, its caudal margin very feebly concave medially; 8th sternite, (Ss) short and high, only about two-thirds as long as the 7th sternite, but very high at its base; viewed from the side, triangular, its tip turned dorsad and clothed with long hairs; 9th tergite (9t) broad, viewed from above, much broader than the 8th tergite, swollen basally, the caudal margin broadly concave, in the middle, feebly convex and here with a minute square median notch (Fig. 1_t); viewed from the side (l) the 9th tergite is truncated at its tip and broadly notched, its ventral-caudal margin gently concave; the suture separating the 9th tergite and sternite not complete. 9th sternite, viewed from the side (l, 9s), its dorsal margin about straight attached to the tergite on its cephalic or anterior portion; its caudal margin about straight; along its caudal face, an elongate body (y), convex outerly; its ventral margin applied to the caudal prolongation of the ventral face of the 9th sternite; at its dorsal end it is produced into a fleshy, feebly chitinized body (a), densely covered with pale hairs which are longest apically; viewed from the side, it is slender with a bump on the middle on its outer face. Proximal of this organ, in the notch of the ventral paired organ on the 9th sternite, is an elongate, slender organ (b) directed dorsad; its base is slightly enlarged, its stem very slender with long pale hairs on its inner face, these directed toward the median line; the tips of these organs are greatly produced on the proximal side, here sub-chitinous, the tip chitinized, black. In a position of rest, the inner edge of this organ is closely applied to its fellow at the median line; the caudal face of this broad expansion is provided with three or four transverse ridges and its ventral margin is fringed with long pale hairs; viewed from above this organ resembles Fig. 1_t; the outer tooth most chitinized, black; the inner, less chitinized except on its outer margin; recurved at the tip and directed cephalo-ventrad. Viewed from beneath, the 9th sternite has the caudal margin concave, a pair of elongate median organs directed caudad, these organs (c) slender, swollen at their tips, the tips closely applied, densely clothed with appressed, pale hairs.

Holotype, ♂, Callanga, Peru. (Rec'v'd from Staudinger-Bang-Haas).

Type in author's collection.

The specific name is derived from the great Indian nation formerly inhabiting Peru.

Closest related, apparently, to *glaphyoptera* Phil.; *subandina* Phil., and *apterogyne* Phil., of Chile in the greyish color. I have before me specimens of all of the above, excepting *glaphyoptera*, which differs widely from *inca* in *antennal* and *wing* characters.

Tipula aymara, sp. n.

Orange; costal margin of the wings dark; cross-veins not scamed with brown; radial cells light brown.

Length, ♂, 15 mm.; wing, 17 mm.; antennæ, about 7.6 mm.

Length, ♀, 13.8 mm.; wing, 14.6 mm.

Hind leg, ♂; fem. 10.4; tibia, 13.3; tarsus about 25.5 mm.

Hind leg, ♀; fem., 8; tibia, 9.6 mm.

♂ Head: Anterior prolongation of front short, light brown; palpi, segment one, shorter than two, brown; 3d about equal to 2d, dark brown at base; pale, yellowish, at tip; 4th, very long, lash-like, twice as long as the rest of the palpus together, yellow. Antennæ, segments 1 to 3 orange-yellow; remainder brown, with a fine white pubescence; three or four bristles at the base of each segment and a single one near the middle. Front and vertex brownish-orange; occiput brown; the vertex very thickly beset with numerous long hairs; this including the whole region bounding the eyes, both above and beneath.

Thorax: Collare orange. Pronotum orange-yellow. Mesonotum, præscutum and scutum orange without distinct markings; scutellum and postnotum yellow. Pleure and sternites clear yellowish-orange. Halteres yellow, knob darker. Legs: coxæ, trochanters and extreme base of femora light yellow; rest of femora, tibiæ and tarsi brown; all of the coxæ thickly beset with long yellow hairs. Wings (see Fig. b) with a pale brownish-grey tinge; cells C, Sc, most of 2d R₁ light brown; the distal half of cell 1st R₁ dark brown, forming the stigma; no brown seams on the cross-veins or deflections. Radial cells, indistinctly suffused with very light brown distally; cross-vein *r-m* slightly margined with brown.

Abdomen: Tergum, 1st segment, yellow; 2d brown; 3d, 4th, dark brown; 5th, 6th, lighter brown; 7th, 8th, black; the 1st to 5th tergites are very deep, so that viewed from the side, they conceal the sternites; the 6th sternite shows caudally, the 7th is one-third as high as the 7th tergite, the 8th sternite subequal to the 8th tergite. Sternum, segments one to five, invisible, 6, orange, 7—9, black. Hypopygium (Fig. m). 7th sternite almost straight along the caudal margin; 7th tergite, broad, its caudal margin almost straight, very feebly concave. 8th sternite (from beneath), broad, the caudal margin with an obtuse median notch, the adjacent lobes broadly rounded and clothed with a dense brush of long yellow hairs; (from the side) (8s) with the dorsal margin gently sloping; the tip truncated. 8th tergite, (8t) reduced to a mere strip, its caudal margin rather strongly concave so that the median portion is scarcely visible. 9th sternite (9s) appearing as the half of an oval, the outer face sub-shiny, convex, a small group of long hairs on its dorsal angle; the dorsal margin strongly bent entad, the proximal margin straight, almost in a line with the notch on the 8th sternite, the two together making a very deep V-shaped niche; the proximal-ventral side is strongly produced into a rectangular arm, projecting entad, its tip strongly truncated, almost touching its fellow of the opposite side. Looking into the end of the genital chamber (see Fig. m) there appear

to be an appendage to the 9th sternite, a semi-lunar, feebly-chitinized piece (z) flattened and the tip slightly expanded, bearing a fringe of long pale hairs on its proximal margin, these projecting inward; at the tip, the hairs become very stout, bristle-like, black, and the organ ends in two or three chitinized teeth which are directed dorsad and slightly outward; underneath the tip of this appendage is a rounded, chitinized organ (b) produced caudad into a long spine; it is black, very conspicuous, occupying the niche between the 9th sternite and tergite, its rounded face directed outward through the niche. 9th tergite (9t), rectangular, its sides square, its caudal angles almost right; on the caudal margin, a broad median lobe, very obtuse and enlarged at the apex, black and very densely clothed with short hairs; the very conspicuous lobe is concave at its tip, projects caudad, the tip very slightly ventrad. Apical appendages, from the genital chamber: dorsal lying, on either side of the median line, an elongate-triangular organ (w) broad at the base, directed dorsad and slightly caudad, the tips touching, the cephalic margin densely clothed with pale hairs; the opening between them (looking into the genital chamber) is elongate-oval and in it is a perforate membrane through which the penis is probably exerted. The ventral lying appendage (a) viewed from the side, roughly triangular, one angle directed caudad, another ventrad; caudal face gently concave; the whole organ densely clothed with long pale hairs, longest on the dorsal margin; viewed from above, it is seen that the dorsal edge is thickened, narrowing to the sharp ventral margin (Fig. m, a).

♀ Similar to the ♂, but antennæ much shorter, segments 1—5, yellow; abdomen, segments 1—2 yellow with lateral margin of tergum black; segments 2—6, black, yellowish in the middle of the lateral margin of tergites; 7—8 black; 9 yellow. Sternites 4—6 distended with eggs; shoved out of the tergal covering, black with a yellow wash. Genitalia: 9th tergite about as long as the 8th, its caudal margin broadly impressed medially; appendage to the 9th tergite broad basally, sub-shining, ending in a blunt lobe, its tip rounded, deeply notched, the lobes fringed on the inner edge with short pale hairs. From beneath, the 9th sternite is very long, its caudal margin deeply notched, the valves projecting from the middle of this notch, the lateral margins lobed and bent inward; 9th sternite very long. (See Figs. s, s₁).

Holotype, ♂, San Antonio, Bolivia (Recv'd from Staudinger-Bang-Haas).

Allotype, ♀, with the type.

Types in author's collection.

The specific name is that of a native tribe. "The Aymaras, who constitute the chief ethnical element of the Bolivian nation, are in almost exclusive possession of the plateau regions and their domain also encroaches northward on Peruvian territory. The true center of the race lies in the islands, headlands and shores of Lake Titicaca." Reclus, *Universal Geography*, Vol. XVIII, p. 368.

This species and the next, *parishi*, are members of the *longitarsis* Meq't group, possessing elongated antennae in the ♂; costal margin of wings darkened, with the remainder of the wings subhyaline, no white longitudinal stripe in under R, (*oleracea* group, as *virgo* O. S., *virgulata* Will.); ♀ ovipositor with remarkably shortened valves; color of the species yellow or orange with one or more subterminal abdominal segments black. Here belongs *longitarsis* Macquart, *tabida* End. (Peru) and *appendens* End. (which is certainly not a *Macromastix* as its describer believed) from Ecuador, as well as the two new species. *T. aymara* differs from *appendens* in being much larger; veins not seamed with brownish and distal ends of the radial cells uniformly suffused with darker. From *tabida*, it differs in wing coloration; not only the penultimate abdominal segment is black, but the antepenultimate as well (and most of the remaining tergites in the ♀). *T. longitarsis* has a large quadrangular brown spot in cell M₁ near the cubital vein.

Tipula parishi, sp. n.

Small; orange; costal margin of wings dark; veins in distal portion of the wing seamed with brown.

♂ Length, 11.9 mm.; wing, 11.8 mm.; antennae, about 8 mm. Middle leg, femur, 8.6 mm.; tibia, 8.8 mm.; tarsus, about 23 mm.

Head: Anterior prolongation of the front brown; palpi brown. Antennae, two basal segments yellow; 3d dull yellow; remainder, base black, tip dull yellow; on the 6th and following segments the yellow color is very much reduced. Antennal segments covered with a dense pale pubescence and a few long black hairs; the segments are all elongate-cylindrical, the base only a trifle more enlarged than the stem. Front, vertex and occiput dull brown; eyes metallic.

Thorax: Dull brownish-yellow without distinct prescutal stripes; the scutum, scutellum and postnotum even darker brown. Pleurae yellowish-brown, lighter ventrally, passing into the clear light yellow of the coxae. Halteres brown, stem a little paler. Legs: coxae, trochanters and femora yellow, the femora gradually becoming brownish-yellow apically; tibiae and tarsi brown. Wings: Subhyaline, cells C, Sc, extreme cephalic margin of R, base and tip of 1st R₁, 2d R₁ and tips of R₂, R₃ and R₅ brown, the stigmal area rather the darker. Brown seams along the cord, including a large seam on the basal deflection of Cu₁ near the fork of Cu; cross-vein *m* seamed with brown. Venation: Rs short, arcuated, about as long as the basal deflection of Cu₁; R₂₊₃ short, less than Rs, about equal to R₂; cross-vein *r-m* not reduced, about one-half as long as the deflection of R₁₊₅; fusion of Cu₁ and M₂ about as long as *r-m*.

Abdomen: Tergum, segments 1—3, yellow, the lateral margins of the sclerites broadly brown; on the 4th and succeeding tergites, the brown lateral margins of the sclerites are paler but suffuse the whole segment; 7th and 8th sclerites black; 9th yellow. Sternites, 7th black, 8th black basally; remainder of sternum yellow. Hypopygium: (see Fig. n). 7th sternite and tergite about as in *aymara*; 8th sternite rather short, its length scarcely more than the 7th, its caudal margin quite straight, as in the 7th. 8th tergite, broad on the sides, the caudal margin quite deeply concave, reducing the median portion very considerably. 9th sternite (see Fig. n, 9s); cylindrical, rather elongated; viewed from beneath (n_1) the whole caudal margin is squarely notched, this notch toothed and notched again. Viewed from the side, the dorsal margin is straight basally, then straight apically, the angle being about 150° ; near its tip, produced into a complex appendage (Fig. n, v) its cephalic arm conspicuously chitinized, black, its caudal margin conspicuously fringed with hair. 9th tergite (see n, 9t); caudal angles evenly rounded; caudal margin gently concave with a distinct blunt median tooth, which, on the ventral surface of the sclerite, is seen to be bent ventrad and continued cephalad, as an oval organ densely covered with minute chitinized teeth on the ventral surface, these denticles more numerous on the margins. Apical appendages; dorsal-lying, viewed laterally, (a), elongate, slender, projecting straight backward, the tips expanded, rounded; viewed from above, it is seen that this organ is median, but deeply bifid at its tip (n_2), giving the appearance of being a paired organ; the tips are divergent, enlarged apically into a rounded knob. Ventral-lying appendage, viewed laterally (b) subequal to the dorsal appendages in length, project caudad and slightly dorsad, the tips acutely pointed; from above, this organ is broad, slightly notched at the tip, and its dorsal surface appears to be concave.

Holotype, ♂, Igarapé-assú, Para, Brazil, Jan. 26, 1912, (H. S. Parish, coll.)

Type in Cornell University Collections.

I take pleasure in dedicating this interesting species to the well-known South American traveller and collector, Mr. H. S. Parish.

This little species is allied to *appendens* End. but differs considerably in coloration; the basal deflection of Cu₁ is distinctly seamed with brown. This insect bears a certain resemblance to *aymara* but is strikingly distinct in wing coloration and hypopygial characters. The flagellar segments in *aymara* are distinctly enlarged at the base; in *parishi* not at all swollen basally, the segments being uniformly cylindrical.

Tipula atacama, sp. n.

Small; yellow and brown; wings reddish-brown with hyaline spots; femora dark with a light subapical ring.

♀ Length, about 12 mm.; wing, 14.2 mm.

Fore leg, femur, 6.8 mm.; tibia, 7.6 mm.; tarsus, about 12.5 mm.

Head: Anterior prolongation of the front and palpi light yellowish-brown, the latter darker toward the tip. Antennae, segments 1—3, orange-yellow, remainder black. Front with a distinct protuberance just behind the antennae; front, vertex and occiput pale yellow.

Thorax: Pronotum light yellow, a brown transverse mark in front; a semi-lunar brown spot on either side behind. Mesonotum, praescutum dark brown behind, a broad dark liver-brown median stripe of this color beginning near the cephalic margin of the sclerite, broadest in front, narrowing behind, reaching the suture; the caudal half of the sclerite is thinly grey pruinose; cephalic half, on either side and in front, of the median stripe, bright orange; scutum dark brown, thickly grey pollinose; scutellum and postnotum dull yellow, brown on the sides. Pleurae, brown, more yellowish ventrally; sternum yellow. Halteres yellow, knob slightly darker. Legs (fore only remain): coxae and trochanter yellow; femur, light yellowish-brown, a dark brownish-black ring at the tip with a light yellow subapical ring; tibia and tarsus brown. Wings: suffused with pale reddish-brown, adorned with hyaline spots arranged about as follows: (1) the clearest fill most of cell 1st M_2 and extends down into the base of cell M_3 , the outer deflection of M_3 being whitened; (2) in cell $1R_1$ above the fork of R_s ; (3) In cell C above the tip of *Sc*. Less clear spots are in the center of cell R and, nearer the tip; a double spot near base of cells R_3 and R_4 ; one at base of M and cu; pale centers to cells M, Cu and 1st A. Venation as in Fig. d.

Abdomen: Tergum, light yellow, segments 3—8 slightly darker brown caudad; extreme ventral margin of tergites dark brownish-black. 8th tergite narrow, especially medially, due to the concave caudal margin. 9th tergite (see Fig. u) narrow, moderately long; base of the ovipositor cylindrical; the valves (u) broad at the base, rapidly narrowing to the slender, sub-spatulate tips. 9th sternite broad basally, conical, the valves (c) flattened, blade like, shorter than the upper valves.

Holotype, ♀, San Antonio, Bolivia, (Received from Staudinger-Bang-Haas).

Type in author's collection.

The specific name is that of a native tribe of Indians dwelling west of the Andes and south of the region inhabited by the Aymaras.

It may be allied to *decorata* Phil. and *frauenfeldi* Schin. (Chilian species) in the tuberculate front, but is little related in other respects. In wing-coloration, *atacama* shows some resemblance to *flavipennis* Phil. (Chile) but is only about half as large and shows conspicuous colorational differences.

Tipula maya, sp. n.

Large; thorax brownish-yellow, striped; wings brown; cross-vein *r* before the fork of R_{2+3} .

♀ Length, 28 mm.; wing, 27.6 mm.

Fore leg, femur, 14 mm.; tibia, 16.8 mm.

Middle leg, femur, 15.9 mm.; tibia, 15.4 mm.

Hind leg, femur, 16.2 mm.; tibia, 18.7 mm.; tarsus, seg. 1, 18 mm.; seg. 2, 4 mm.; seg. 3-5, 3.5 mm.

Head: Anterior prolongation of the front, and the palpi, dark brownish-black. Antennae, basal segments brown, flagellum broken. Front, vertex and occiput dark brown, occiput paler.

Thorax: Pronotum dull yellow, the scutum and caudal margin of the scutellum brown. Mesonotum, praescutum dull brownish-yellow, brighter, yellow, along the lateral margin of the sclerite; extreme cephalic margin of the sclerite dark brown, continued backward as a narrow median stripe broadening out in the middle but soon becoming faint and almost obsolete; the lateral stripe begins at the front angle, continues caudad; at about one-third the length of the sclerite it forks, the inner branch continuing directly caudad in a line with the main stem and running to the transverse suture; it is palest medially, the edges brown. The outer branch bends toward the edge of the sclerite and continues back to the side of the scutum; scutum brown, dark brown on the sides and on the caudal margin; scutellum dark brown medially, the sides light brown, a narrow yellow stripe on the cephalic margin; postnotum dark brown with a pale narrow, median vitta. Pleurae very pale brown except the dorsal edge which is yellow; a dark brown band extends from the cervical sclerites across the dorsal portions of the pleurae, under the root of the wing, fusing with the dark brown of the postnotum. Halteres dark brown. Legs: coxae and trochanters light yellow; femora light yellowish brown, tip broadly and abruptly dark brown; tibia light brown, the tip indistinctly darker; tarsi light brown, the tips of the individual segments dark brown. Wings: Uniformly suffused with brown; cells *C* and *Sc* more yellowish-brown; stigma brown; cell 2nd R_1 , R_2 and tip of R_3 darker brown; a brown seam on most of the veins and a brown cloud in cell *M* at about four-fifths the length of Cu_1 . Venation. (see Fig. a); R_s long, gently arcuated, twice as long as R_{2+3} before *r*; about as long as the basal deflection of Cu_1 ; R_{2+3} straight, R_2 about two-thirds as long as R_{2+3} . The radial cross-vein connects R_1 with R_{2+3} before its fork, this distance on R_{2+3} between *r* and the fork about equal to the cross-vein *r-m*. Basal deflection of R_{1+5} a trifle longer than *r-m*; cross-vein *m* about twice as long as *r-m*; cell 1st M_2 about pentagonal, its inner face (segment one, M_{1+2}) about as long as the cephalic face (segment two, M_{1+2}); cross-vein *m-cu* obliterated by fusion. Petiole of cell M_1 about as long as this cell. Cu_2 about as long as the deflection of Cu_1 .

Abdomen: Tergum, segment 1, yellowish on basal half, dark brown on caudal half and on the sides; segment 2 deep reddish-brown with an indistinct dark brown median stripe and lateral margins; in the

middle an interrupted narrow grey transverse stripe; segments 3-7 similar, but the transverse grey impression is close to the base of the sclerite; segment 8 narrow, its caudal margin with an obtuse median tooth and an obtuse notch on either side (see Fig. 1); 9th dark brown; sternites yellow, on segments 4-6 darker, brownish. Upper valves of the ovipositor (u) very slender, the tip not enlarged; 9th sternum long, its caudal margin deeply notched; valves short, acicular (1).

Holotype, ♀, Aguna, Guatemala, Cent. Am. (alt. 1030 ft.) Aug. 6, 1902, (Dr. G. Eisen, coll.)

Type in U. S. Nat. Mus. Coll. (No. 15,075).

The specific name is derived from an ancient tribe of Indians dwelling in Yucatan and the adjoining parts of Guatemala, famous for their high degree of culture and the wonderful structures that they built.

In the size and wing-coloration, this species suggests certain members of the *oblique-fasciata* group, (*oblique-fasciata* Mcqt.; *craveri* Bell.), but differs notably in venational- and leg-characters. In general color it resembles the next species, *fumipennis*, of Peru.

The venation is very like *Holorusia* Loew, and it is quite possible that *maya* may prove to belong to this genus. It is much smaller than *rubiginosa* Loew, which has the wings more uniform, dorsal thoracic stripes not clear, petiole of cell M₁ short, etc.

Tipula fumipennis, sp. n.

Large; thorax dark brown; wings brown; tarsi very long.

♀ Length, about 19 mm.; wing, 23 mm.

Fore leg, femur, 13.6 mm.; tibia, 14.5 mm.; tarsus, about 35 mm.

Hind leg, femur, 13 mm.; tibia, 15.3 mm.; tarsus, about 39 mm.

Head: Anterior prolongation of the front rich reddish-brown; palpi dark brown. Antennae basal segments reddish; flagellum broken. Front reddish; vertex rich reddish-brown, pale, almost white medially, this pale color including the occiput.

Thorax: Pronotum rich brownish-yellow with two parallel dark brown marks on either side of the median line. Mesonotum, pre-scutum dark chocolate brown without distinct stripes; scutum and scutellum gradually paler brown, the postnotum yellowish with a very narrow, indistinct median brown line. Pleurae, propodeum and cephalic portions of the mesopleurae dark brown, except a very broad, conspicuous, yellow band running across the dorsal portions of the pleurae from the pronotal scutellum back to under the wing-basis; remainder of pleurae yellow. Halteres brown, extreme base of stem yellowish. Legs: coxae, anterior and middle, dark brown, hind coxae lighter, yellowish-brown; femora, tibiae and tarsi brown. Wings: Infused with brown; cells C and Sc brighter, yellowish; above the stigma grey; stigma and cell

2d R_1 dark brown; a brown cloud at the origin of Rs; veins broadly margined with the dark-ground color leaving the centers of the cells pale. Venation: Rs rather long, somewhat angulated basally; R_{2+3} about one-third longer than R_2 ; cross-vein r connects R_2 far beyond the fork of R_{2+3} ; deflection of R_{4+5} and $r-m$ about subequal; sides of the elongate cell 1st M_2 parallel, petiole of cell M_1 short, only about one-third as long as the cell; cross-vein $m-cu$ indicated by a point. Cu_2 one-half longer than the basal deflection of Cu_1 .

Abdomen: Tergum, brown, 2d segment deeply impressed in the center, except at the median line; lateral margins of the sclerites with a basal yellow triangle; sternites yellow, caudal margins darker, brownish. Ovipositor: Segment 9 short, the valves slender, but flattened blade-like; lower valves, short, very high, blade-like; nearly twice as high as the tergal valves.

Holotype, ♀, Piches and Perene Vs., Peru, 2000-3000 feet, (Pres. by Soc. Geog. de Lima).

Coll. U. S. Nat. Mus. (No. 15,074).

Microtipula, gen. n.

Antennae elongated in the ♂ and apparently 12-segmented, the flagellar segments very elongated, clothed with a long, pale pubescence; two or three bristles at the base of each segment and, usually, one near the middle. Anterior prolongation of the front short; nasus not distinct. Wings: Sc long extending beyond the origin of Rs to a distance about equal to R_{2+3} ; Rs long, gently arcuated, not quite as long as R_2 ; cross-vein r at the fork. R_2 indicated only basally, *its tip atrophied*. Cross-vein $r-m$ short, about as long as r ; cross-vein m long, a little less than the basal deflection of M_{1+2} ; cross-vein $m-cu$ obliterated by the touching of Cu_1 and M_3 . Hypopygium complex, penis very long.

Type, *M. amazonica*, sp. n.

This genus is proposed for a tiny species from Eastern Brazil, which, by its combination of characters, will not fit into any of the existing genera. In its venation (i. e. obliteration of the terminal section of R_2) the species suggests certain *Dolichopezine* genera. In my key to the *Dolichopezini** it would not fit in either of the primary sections; in the *Megistocera* group because of its complex hypopygium or in the *Dolichopeza* group because of its 12-segmented antennae. It bears a slight resemblance to *Megistomastix* which has a very different hypopygium and 13-segmented antennae. I prefer to believe it to belong to the *Tipulini*. In Skuse's key† to the Tipuline genera it would run down to *Habromastix* of Australia. However, this genus as well as all the *Tipulini* known to me,

*Psyche; Vol. 19, p. 64 (April, 1912).

†Dipt. Austral.; pt. 8; Tipul. longipalpi (Proc. Linn. Soc. N. S. W.; Vol. 5, (2d series). Feb. 26, 1890; p. 78-81.)

has the terminal section of R_2 more or less preserved.† I prefer to believe that the species represents a new genus to which I have applied the above name from the small size of the included form.

Microtipula amazonica, sp. n.

Bluish grey; ♂ antennae elongated, ♀ short; wings hyaline with brown markings.

♂ Length, 6.2 mm.; wing, 7.2 mm.; antennae, about 5.5 mm.

Fore leg, femur, 4.4 mm.; tibia, 5.9 mm.; tarsus, 9.4 mm.

Middle leg, femur, 4.5 mm.; tibia, 5.3 mm.

♀ Length, about 6.8 mm.; wing, 7.4 mm.

Fore leg, femur, 4.9 mm.; tibia, 6 mm.

Middle leg, femur, 5.2 mm.; tibia, 5.3 mm.; tarsus, about 9.4 mm.

Hind leg, femur, 4.9 mm.; tibia, 5.4 mm.; tarsus, about 10 mm.

♂ Head: Anterior prolongation of the front short, dark brown; palpi, lighter, yellowish-brown. Antennae, segments 1—2, yellowish-brown; segment 3 brown; remaining segments dark brownish-black, the segments elongated, not enlarged basally, covered with a long pale pubescence; a few long dark basal bristles. Front brown; vertex and occiput clear bluish-grey.

Thorax: Cervical sclerites bluish-grey; pronotum clear light grey, unmarked. Mesonotum, praescutum greyish with a thick blue-grey bloom, especially thick on the sides and in front, leaving a cuneiform median mark, grey; scutum and scutellum grey; postnotum with a decided blue-grey bloom. Pleurae bluish-grey. Halteres brown, the knob dark brown. Legs: coxae yellow, greyish pruinose on the front; trochanters dull yellow; femora yellow, the tip broadly dark brown; tibiae yellowish brown, the tip darker; tarsi brown. Wings: Subhyaline; cells C and Sc dark brown; stigma oval, brown, filling in the tip of cell 1st R_1 and the extreme base of cell 2d R_1 . Tip of cell 2d R_1 , most of cell R_3 , cephalic portion of R ; median portion of M , and seams along most of the veins paler brown. Venation (see Fig. i) as in the genus.

Abdomen: Tergum, segments 1—2 yellow, dark brown apically and on the sides of the sclerites; 5th dark brown, except the basal third; 6th mostly yellow, darker, almost black, on the apical half and along the lateral margin of the sclerite; 7th black; base of 8th suffused, black. Hypopygium (see Fig. q): 8th sternite rather long, at least twice as long as the 7th and even higher; 8th tergite short, about two-thirds as long as the 7th and not as deep. 9th sternite, viewed from the side, rather short, the ventral margin about straight, the caudal end gently rounded, with an appendage (e); dorsal side with a rounded, chitinized black knob; appendage of the sternite broad, bi-lobed, the ventral lobe with a long flexible, finger-like tip projecting caudad and dorsad; the upper, or cephalic, lobe lying closely appressed to its dorsal margin, elongate-cylindrical, rather fleshy. 9th tergite (in the drawing, Fig. q, 9,

† *Pehlkea* End. show a species in which R_2 seems to be present; the venation, apparently, is misinterpreted in the figure. (Zool. Jahrb.; Vol. 32, pt. 1, p. 15.)

the 9th tergite is seen from a dorsal aspect) viewed from above, rectangular with a very deep oval notch, the lateral lobes squarely truncated at the tips, clothed with long hairs, these longest at the apex; a few hairs on the ventral face. Penis (p.) extremely long and slender projecting far beyond the genital chamber and is almost half as long as the whole abdomen.

♀ Like the ♂, but antennæ short; segments 1—5 light yellow, these gradually darkened; pleuræ lighter grey; dark femoral tips not so broad. Abdomen, tergum, segments 1—2, yellow, tip and margin darker; segment 3 almost all black except the base; segments 4—5, yellow except the black lateral margin; segments 6—7 black; tip of abdomen yellow; valves of the ovipositor quite short and blunt.

Holotype, ♂, Igarapé-assú, Para, Brazil, Jan. 29, 1912, (H. S. Parish, coll.)

Allotype, ♀, same locality and collector; Jan. 27, 1912.

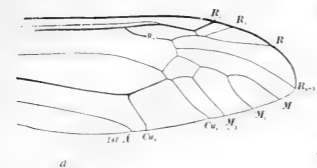
Type in Cornell University Collection.

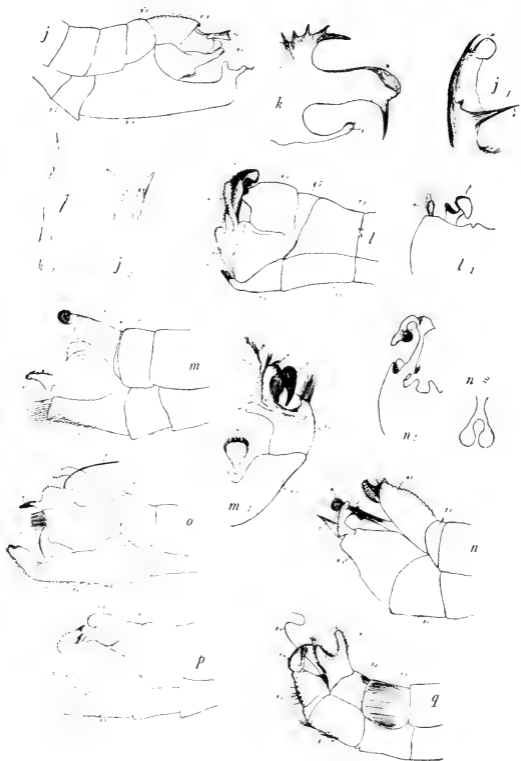
This insect differs considerably from all the described forms in its small size and blue-grey coloration.

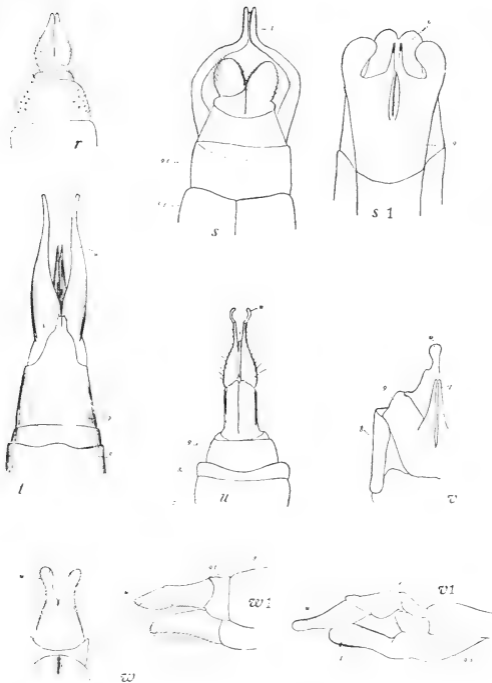
EXPLANATION OF PLATES XXIV, XXV, XXVI.

The wings are all drawn to scale by the projection microscope in Cornell University.

- Fig. a. Wing of ♀ *Tipula maya*, sp. n.
 Fig. b. Wing of ♀ *Tipula aymara*, sp. n.
 Fig. c. Wing of ♂ *Tipula inca*, sp. n.
 Fig. d. Wing of ♀ *Tipula atacama*, sp. n.
 Fig. e. Wing of ♂ *Tipula guato*, sp. n.
 Fig. f. Wing of ♀ *Tipula smithi*, sp. n.
 Fig. g. Wing of ♂ *Tipula armatipennis*, sp. n.
 Fig. h. Wing of ♂ *Pachyrhina trinidadensis*, sp. n.
 Fig. i. Wing of ♀ *Microtipula amazonica*, sp. n.
 Fig. j. Hypopygium of *Pachyrhina trinidadensis*. (lateral aspect). St, 9t=8th and 9th tergites; 7s, 8s, 9s=7th-9th sternites; c equals dorsal apical appendage. j 1=ventral apical appendage enlarged. j. 2 is tip of dorsal apical appendage enlarged.
 Fig. k. Hypopygium of *Pachyrhina macrosterna*, sp. n. The ventral apical appendage enlarged. k₁ tip of dorsal apical appendage, enlarged.
 Fig. l. Hypopygium of *Tipula inca* (lateral aspect); l₁, (dorsal aspect).
 Fig. m. Hypopygium of *Tipula aymara* (lateral aspect)
 m₁. Looking into the genital chamber.
 Fig. n. Hypopygium of *Tipula parishi*, sp. n. (lateral aspect).
 n₁, ventral aspect; n₂, tip of dorsal apical appendage.
 Fig. o. Hypopygium of *Tipula armatipennis*. (lateral aspect). p=part of the exerted penis.
 Fig. p. Hypopygium of *Tipula guato*. (lateral aspect.)
 Fig. q. Hypopygium of *Microtipula amazonica* (lateral aspect). (N. B.—The 9th tergite is shown from a dorsal aspect.)
 Fig. r. Ovipositor of *Pachyrhina macrosterna*. (dorsal aspect).
 Fig. s. Ovipositor of *Tipula aymara* (dorsal aspect). St, 9t=8th and 9th tergites. u=upper valve (tergal); l=lower valve (sternal). s₁=ventral aspect.
 Fig. t. Ovipositor of *Tipula maya*. (dorsal aspect).
 Fig. u. Ovipositor of *Tipula atacama* (dorsal aspect).
 Fig. v. Ovipositor of *Tipula armatipennis* (ventral aspect). v₁, lateral aspect, 9s=9th sternite.
 Fig. w. Ovipositor of *Tipula smithi*, (dorsal aspect). w₁, lateral aspect.







THE AMERICAN SPECIES OF ADELPHOMYIA BERGROTH (TIPULIDÆ DIPT.)

CHARLES P. ALEXANDER
ITHACA, NEW YORK⁶

The small size of the crane-flies constituting the genus *Adelphomyia* Berggr.¹ entitles them to the name of Micro-limnophilini, the majority of the described forms being much smaller than members of allied genera.

Some confusion has arisen recently, regarding the identity of the most common of the three known American species and the purpose of the present article is to straighten out this imbroglio. The first mention of an American representative was in an article by the author² in which a new species (*minuta*) was described and a second species referred, provisionally, to the widely-distributed European form, *senilis* Hal. This latter species was again mentioned, and its venation figured in a second article³ and here, also, was referred to *senilis*. There has always been a question in my mind regarding the specific identity of the American and European forms and I have taken the opportunity to send specimens to Mr. F. W. Edwards, who kindly compared the American species with European specimens of *senilis* in the British Museum collection and reports that the two forms are distinct. I give a key to the known American species and describe two new forms.

American Species of *Adelphomyia*

- | | |
|--|----------------------------------|
| 1. Wings with cell M1 absent. | <i>cayuga</i> sp. n. |
| Wings with cell M1 present. | 2 |
| 2. Pubescence in cells of wings lacking or sparse; cross-vein <i>r</i> not evident; cross-vein <i>m</i> short or obliterated; general color of body pale yellow. | <i>minuta</i> Alex. ² |
| Pubescence in cells of wings conspicuous; cross-veins <i>r</i> and <i>m</i> distinct; body color more brownish. | <i>americana</i> sp. n. |

Adelphomyia americana sp. n.

1911 *Adelphomyia senilis* Alexander. Can. Ent.

1911 *Adelphomyia senilis* Alexander. Ent. News.

Small species (length, ♀, 3.8-4 mm.); radial cross-vein present; cell M1 present; plura almost unicolorous, dull yellow.

♂ Length, 3.2-3.5 mm.; wing, 4.3-4.6 mm.

Foreleg, femur, 3.7 mm.; tibia, 4.1 mm.; tarsus, 3.8 mm.

Middle leg, femur, 3.9 mm.

♀ Length, 3.8-4 mm.; wing, 5-5.3 mm.

Contribution from the Entomological Laboratory, Cornell University.

1 Bergroth; Mittheil. Naturf. Gesell. Bern; p. 134; 1891.

2 Alexander; Canad. Entom.; Aug. 1911.

3 Alexander; Entomol. News; Oct. 1911.

Rostrum and palpi light brownish-yellow; antennae light brown. Front vertex and occiput light brownish-yellow, with a sparse greyish bloom.

Thoracic praescutum dull yellow, rather shining, without apparent stripes, scutum, scutellum and postnatum similarly colored. Pleura uniform dull yellow. Halteres pale, uniform throughout. Legs—Coxae and trochanters dull brownish-yellow; femora similar, slightly darkened apically; tibiae and tarsi uniform brownish-yellow. Wings almost hyaline, veins light brown. Venation (Figure 260, A, or Ent. News, l. c.)— Sc^1 very long, Sc^2 far removed from its tip; cross-vein *r* present, inserted on R2 about its own length beyond the form of R2+3; M1 much shorter than M1+2 beyond cross-vein *m*. Short hairs in most of the distal cells of the wing.

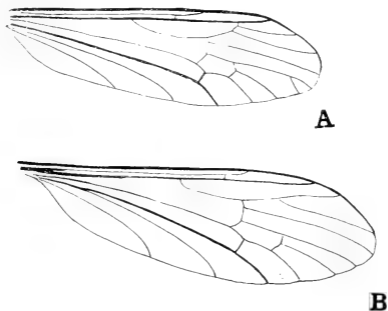


Figure 260

Abdominal tergum brown with a narrow, darker, median line and a narrow pleural band of the same color; sternum pale yellow, almost concolorous with the thoracic pleurae.

Holotype, ♂. Woodworth's Lake, Fulton Co., N. Y.; alt. 1650 ft.; Aug. 22, 1910. (Alexander, coll.)

Allotype, ♀, with the type.

Paratypes, 30, ♂ ♀. Sport Is., Sacandaga R., June 28, 1911; Woodworth's Lake, Gloversville and Johnstown, Fulton Co., N. Y.; Ithaca, Tompkins Co., N. Y.; September, 1911.

Types in Author's Collection

Paratypes in British Museum of Natural History, U. S. Nat. Mus., Cornell University and in author's collection.

I am indebted to Mr. Edwards for the following comparison of *americana* with the European *scutis*:

1. The pleurae in *A. americana* are unicolorous ochreous; in *A. senilis* they are reddish-brown above and below, more ochreous in the middle.
2. The marginal cross-vein is present in *A. americana*, absent in *A. senilis*.
3. The genitalia are different in the two species but as we have only one male, I do not want to dissect it, without which I cannot properly make out the structure."

Adelphomyia cayuga sp. n.

Large species (length, ♀, 5 mm.); radial cross-vein indistinct; cell M1 absent.

♀, length 5 mm.; wing 5.1 mm.

Rostrum, palpi and antennae light brown. Front, vertex and occiput brown.

Thoracic praescutum uniform light brown without apparent dorsal stripes; scutum, scutellum and postnotum lighter-colored yellow. Pleurae light brownish-yellow, brighter colored on the metapleurae and on the posterior portions of the mesopleurae. Legs rather uniform light brown throughout. Wings rather uniformly suffused with dark, membrane distinctly darker colored than in *americana* or *minuta*; veins light brown. Venation (Figure 260, B) —Sc1 rather long, about five times as long as Sc2; R2+3 in a line with R2; cross-vein *r* not evident; basal deflection of R4+5 in a line with cross-vein *r-m*; cell M1 absent, i. e., M1 and M2 fused to the wing-margin. A short pubescence in the apical portions of the wing, tips of cells R1, R2, R3, R5, M2 and M3 being included.

Abdominal tergum and sternum uniformly brown.

Holotype ♀ (balsam slide), Vanishing Brook, Ithaca, N. Y.: Aug. 16, 1912. (Alexander, coll.)

Type in author's collection.

A New Species of *Dixa* from Chile (Dixidae, Dipt.).

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

In a collection of Neotropical crane-flies belonging to the Hungarian National Museum and kindly sent to me for determination by Dr. Kertész, there was included a species of *Dixa* from Chile. This is the first record for a member of this family of flies from south of the Equator. Of the 21 described species, 12 are European, 8 are American and 1 is Chinese. Of the American species all are Nearctic with the exception of the widely distributed *Dixa clavulus* Williston† which was described from the Island of St. Vincent. Dr. Johannsen has examined this specimen and states that it is very different from

*Contribution from the Entomological Laboratory of Cornell University.

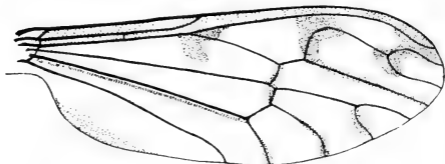
†Trans. Ent. Soc. Lond., 1896. Part 3, p. 298, fig. 73.

any of the American species, the types of which he has studied in Cambridge.

Dixa chilensis sp. n.

Male. Length about 3.5 mm.; wing 3.8 mm. Mouth parts and palpi dark brownish black; clypeus and front yellowish, suffused with brown on the sides; antennae dark brown, the third segment much paler, more yellowish; vertex and occiput pale yellowish-white.

Pronotum light chestnut brown; mesonotum, praescutum very pale, almost white with three dorsal stripes; the intermediate stripe is broader and begins just behind the cephalic margin of the sclerite; the lateral stripes are narrower, begin at about mid-length of the sclerite, continuing caudad and including the sides of the scutum; middle line of the scutum and the scutellum dull yellowish; post-notum dark brown. Pleurae with a broad silvery white band, delimited by two narrow dark brown stripes, the upper one beginning on the cervical sclerites and running to the base of the halteres; the lower stripe running above the bases of the coxae. Halteres pale, apices of the knobs dark brown. Legs, fore and middle coxae yellow, brownish in front, trochanters pale, whitish-yellow; femora and tibiae very light brown, narrowly tipped with dark brown; tarsi brown; hind legs, femora much brighter colored, yellowish, broadly tipped with brownish black; tibiae dark on basal half, passing into a broad, dull yellowish post-median band; tip of tibia swollen, black; tarsi brown. Wings, subhyaline, cells *C* and *Sc* more yellowish; an irregular brown mark at the origin of *Rs*, a second at the arcuation of *R* 2+3, a third at the top of *R* 1 extending down over the fork of *R* 2+3; cross veins and many of the longitudinal veins narrowly and indistinctly seamed with a lighter brown; anal cell a little brown



on the angle; venation (see figure), cross vein *r-m* far before fork of *Rs*; *R* 2+3 at origin perpendicular, extremely arcuated, fork of *R* 2+3 much shorter than the fused portion.

Abdomen brown.

Holotype, ♂, Concepcion, Chile; Aug. 23, 1904 (P. Herbst). Type in the Ungarisches National Museum.

The species differs from all of the known American forms in the extreme arcuation of *R* 2+3 and the shortness of the fork of this vein.

THE TIPULIDÆ IN BRUNETTI'S "FAUNA OF BRITISH INDIA; DIPTERA NEMATOCERA"

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

The publication of this great work (November, 1912) affords us an opportunity to investigate the rather numerous genera that the author has recently erected (*Records of the Indian Museum*, vol. 6, 1911). As was suspected at the time of their characterization, most of these genera are based upon too trivial structural features to warrant recognition while some are strict synonyms of older well-known genera and due either to carelessness on the part of the author or his lack of familiarity with the holarctic fauna. Some of the glaring specific errata that appear in this work are noticed at the end of the article. The magnificent drawings by Bagchi are the most valuable single feature of the volume, and it is upon these figures that the following criticisms are largely based.

Ceratostephanus Brun. (p. 406) undoubtedly equals *Rhipidia* Meigen.

Atypophthalmus Brun. (p. 408) is very doubtfully a valid genus based entirely on the holoptic condition of the eyes. A close approach to this is found in many *Rhipidiæ* where the space left on the vertex is exceedingly narrow.

Gymnastes Brun. (p. 432) equals *Teucholabis* Osten Sacken, the character of a clubbed femur and the venation being approached by several true species of *Teucholabis*.

Mongomioides Brun. (p. 481) and *Paramongoma* Brun. (p. 484) have been considered by the writer in another article (*Proc. U. S. Nat. Mus.*, vol. 44, p. 499).

Dasymallomyia Brun. (p. 494) equals *Gnophomyia* Osten Sacken. The venation of the type is similar to that of *G. aperta* Coq. (*non* Brunetti's *G. aperta* (p. 492), which, however, is a *Pedicine*, *Rhaphidolabis*) from British Columbia. The short, very hairy legs of which so much is made is characteristic of a group of tropical American species (*hirsuta* Alex., *pervicax* Alex., et al.).

Paracladura Brun. (p. 502), a valid genus and a very primitive one but not at all related to the American *Cladura* as stated.

Claduroides Brun. (p. 505), a strict synonym of *Rhaphidolabis* Osten Sacken, which belongs in a totally different tribe.

¹ Contribution from the Entomological Laboratory of Cornell University.

The following observations on certain of the species may be of value to workers on the Oriental fauna. They represent merely the personal opinions of the writer and whether these are right or wrong may be ascertained from an examination of the types.

Dicranomyia ornatipes Brun. (p. 380) is almost certainly an Eriopterine belonging to the subgenus *Leiponeura* Skuse of *Gonomyia* Meigen. A study of the genitalia of the type would settle the matter. The author merely remarks, "Genitalia yellowish brown, small, concealed, apparently normal."

Toxorhina incerta Brun. (p. 422). Brunetti states that there is no mention of an open discal cell in any of the living *Toxorhinae*. *T. muliebris* O. S. of the eastern United States normally has this cell open as shown by Needham (23d Rept. N. Y. State Ent., pl. 29, fig. 5) whose figure is cited by Brunetti! Moreover, on the page immediately preceding Brunetti states that *muliebris* has the discal cell coalescent with the second posterior. In such cases it is difficult to make out just what the author is attempting to discuss. The remarkable venation of *T. incerta* as shown twice in this volume is almost certainly an abnormality of the type.

Erioptera brevior Brun. (p. 452) and *Empeda inconspicua* Brun. (p. 475). In a recent article (Proc. U. S. Nat. Mus., vol. 44, p. 512) I relegated *Empeda* Osten Sacken to a subgenus of *Erioptera* Meigen and hesitated a long time before allowing it to stand at all. On plate 9, figure 2, Brunetti figures the *Erioptera* and in figure 10 the *Empeda*, and there is not one single point of difference between the two other than slight specific characters. *Empeda* is merely an *Erioptera* in which the fusion of R_{2+3} is a little longer than usual.

Gnophomyia Osten Sacken (p. 487). When we come to examine the species that the author has placed in this genus we are strongly reminded of the work of Walker or Philippi of a half century ago. By means of the author's own keys in this volume it would be impossible to run most of the species down to this genus or even to this tribe!

G. longipennis Brun. (p. 489) is a *Rhaphidolabis* and probably the same species as *Claduroides* and *Rhaphidolabis fascipennis*.

G. genitalis Brun. (p. 490) and *G. furcata* Brun. (p. 491) probably *Limnophila* but certainly not *Gnophomyia*.

G. aperta Brun. (p. 492) is a *Rhaphidolabis*.

G. incompleta Brun. (p. 493) equals a *Plectromyia* Osten Sacken, but this, in turn, should be relegated to the synonymy of *Rhaphidolabis*.

The lack of cell M_1 is not a generic character since it occurs in various species in genera of many tribes (*Limnophila*, *Polymera*, *Eriocera*, etc.).

G. nigra Brun. (p. 494) stated in a long text discussion to lack the radial crossvein, but this is very clearly shown in the figure (pl. 10, fig. 3).

Cladura flavescens Brun. (p. 501) is very probably a *Limnophilina*, strongly suggesting *Adelphomyia* Bergroth.

Claduroides fascipennis Brun. (p. 505), *Rhaphidolabis fascipennis* Brun. (p. 519), and *Gnophomyia longipennis* Brun. (p. 489) are almost certainly one and the same species.

[Reprinted from *Insector Inscitiæ Menstruus*, Vol. I, No. 11, 1913]

A NEW GERANOMYIA FROM THE PHILIPPINE ISLANDS¹

(*Diptera, Tipulida*)

By CHARLES P. ALEXANDER

In a collection of Philippine Chironomidæ and Culicidæ sent to Dr. O. A. Johannsen by Dr. C. S. Ludlow there was included a peculiar species of *Geranomyia*. Since this insect exhibits many structures that have not been recorded hitherto in this tribe, I am describing the species at this time. It will be figured in a later paper.

The presence of a prominent fleshy horn on the vertex, a rounded tubercle on the anterior margin of the mesonotal præscutum, and the apparent lack of vein Sc_2 of the wings at once separates this species off as unusual in the genus. I express my thanks to Dr. Johannsen and Dr. Ludlow for this material.

Geranomyia cornigera, new species.

♂ Length, 4.5–7 mm.; rostrum, additional, 1.6–2.2 mm. Wing, 5.7–7.8 mm.

Rostrum long, rather stout, dark brownish black, each tip ending in a

¹ Contribution from the Entomological Department, Cornell University, Ithaca, N. Y.

small pale greenish recurved hook; palpi apparently 4-segmented, black. Antennæ dark brown. Head light silvery gray with blackish reflections; a fleshy elongate lobe, black in color, on the vertex, extending cephalad to near the base of the antennæ.

Cervical sclerites and the pronotum dark brown. Mesonotum, præscutum with a small median brown knob on the cephalic margin. Lobes of the scutum dark brown, this color produced anteriorly in a long stripe which continues along the præscutum to the knob described above. Præscutum with a pale brown median stripe which continues back to the transverse suture; scutum with the median space pale. Scutellum pale yellowish, except a brown mark on the anterior part on either side, this being an elongation of the caudal lobe. Postnotum yellow with a broad transverse brown band. Pleuræ with two conspicuous transverse stripes, the upper one broadest, beginning above the fore coxæ, continuing backward, above the halter, to the postnotum where it fuses with the transverse brown band described above; a narrower brown band begins on the mesonotum just before the mesocoxæ and continues to the abdomen. Halteres dark brown. Legs, coxæ, and trochanters brownish yellow, femora light brown, tibiæ and tarsi brownish yellow. Wing, veins dark brown, cells C and Sc light brown, remainder of wings hyaline; narrow pale brown seams along Rs and the cross-veins and deflections of veins; there are three dark brown marks in cell Sc, the first at the base, the third at the tip of vein Sc, the second being midway between the other two and containing a supernumerary cross-vein as is usual in this genus. Venation, Sc ending just beyond the origin of Rs; cross-vein Sc₂ not evident; Rs long, about twice as long as the deflection of R₄₊₅; cell first M₂ very long, narrow, quadrangular or nearly so, the basal deflection of Cu₁ at its base; the veins issuing from cell first M₂ very short.

Abdomen, tergites dark brown; basal three or four sternites yellowish darkening into brown on the terminal segments.

Holotype, ♂, Petit Banks, Philippine Islands, October 23, 1912 (Dr. Ludlow). Paratypes, 7 ♂, with the type, taken at 1 p. m.; 4 ♂, type locality, between daylight and dark on October 22, 1912.

This species is closest to *G. notata* Meij. of Java in its striped pleuræ; it differs in the color of the thorax, wings, legs, and structural characters.

A key to the Oriental species of *Geranomyia* is given in Brunetti's Fauna of British India, p. 388, 1912. The East Indian species are considered by de Meijere in Tijdschrift voor Entomologie, vol. 54, p. 31,

1911. Palearctic species which may be regional are *G. annandalei* Edw. (Jour. and Proc. Asiatic Soc. Bengal (new series), vol. 9, no. 1, pp. 47, 48, 1913) from Palestine and *G. avocella* Alex. (Can. Ent., vol. 45, no. 7, pp. 205, 206, 1913) from Japan.



A REVISION OF THE SOUTH AMERICAN DIPTEROUS INSECTS OF THE FAMILY
PTYCHOPTERIDÆ

BY

CHARLES P. ALEXANDER

Of the Entomological Laboratory of Cornell University, Ithaca, New York

No. 1953.—From the Proceedings of the United States National Museum,
Vol. 44, pages 331-335

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A REVISION OF THE SOUTH AMERICAN DIPTEROUS INSECTS OF THE FAMILY PTYCHOPTERIDÆ.

By CHARLES P. ALEXANDER,

Of the Entomological Laboratory of Cornell University, Ithaca, New York.

The only genus of Ptychopteridæ as yet made known from the Neotropical regions is *Tanyderus* Philippi,¹ erected in 1865 to receive the then unique species, *pictus* Philippi, of Chile. Two New Zealand species, *forcipatus* Osten Sacken² and *annuliferus* Hutton,³ have been described. The *Cylindrotoma ornatissima*, described by Doleschall from the East Indies in 1858, was later found to be a true *Tanyderus*.⁴

I have given, below, a rather free translation of Philippi's original description of *T. pictus* and also add the description of a fifth species, the second from the American continent.

KEY TO THE AMERICAN SPECIES OF TANYDERUS.

- Anal angle of the wing very sharp; wing with two brown fasciæ which are almost unicolorous in all of the cells; antennæ with at least 25 segments.....*pictus*.
Anal angle of the wing less pronounced, square; wing with an irregular picture; dark along the cross-veins, much paler in the posterior cells of the wing; antennæ 17-segmented.....*patagonicus*.

TANYDERUS PICTUS Philippi.

Length body, 12 l.; wing expanse, 26 l.

Head quite black, only the antennæ are pale yellow, except the first two segments, which, however, are black. The long, slender neck-like prothorax is also black and there appears above in the cephalic half a caniculated excavation, which is run through by an elevated longitudinal line continuing to the posterior margin. The anterior portion of the mesothoracic præscutum is yellow with a black spot in the middle; the remainder of the mesothorax is, for the most part, black; on the pleuræ, in front of the wing basis, is a yellow

¹ R. A. Philippi. Aufzählung der Chilenischen Dipteren, Verh. der Zool.-bot. Ges., 1865, vol. 15, pp. 780, 781, pl. 29, fig. 57.

² Verh. Zool.-bot. Ges., 1879, p. 518.

³ Trans. New Zealand Institute, vol. 32, p. 48.

⁴ Osten Sacken, Studies on Tipulidæ, pt. 2, 1887, pp. 228-230.

spot, and the space before the scutellum is likewise yellow; remainder of the pleuræ yellow with black spots; metanotum is yellowish with four black spots on the caudal margin. The segments of the abdomen are yellow with black posterior edges and black longitudinal spots, of which there are four on the dorsum in two rows. The wings have yellow veins and a yellowish membrane, especially in the middle, and there are ramifying, yellow, black-bordered crossbands, which make this species one of our most beautiful Tipulids. The legs are yellowish with black coxæ and a blackish ring above and below the knee; they are rather strongly haired. Halteres are black with bright stem.

The species has an extremely sharp anal angle and possesses a supernumerary cross vein in cell R_4 of the wing.

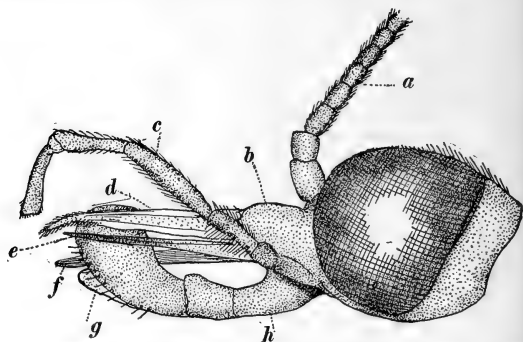


FIG. 1.—LATERAL ASPECT OF THE HEAD OF TANYDERUS PATAGONICUS. *a*, ANTENNA; *b*, CLYPEUS; *c*, MAXILLARY PALPUS; *d*, LABRUM; *e*, MAXILLA; *f*, HYPOPHARYNX (?); *g*, HYPOPHARYNX (?); *h*, LABIUM.

TANYDERUS PATAGONICUS, new species.

Antennæ 17-segmented; thorax gray with chestnut stripes; anal angle of the wings not prominent; supernumerary cross veins in cells R_3 and R_5 ; wings marked with brown and gray.

Female.—Length, 12.1 mm.; wing, 18.2 mm. Legs, posterior femora, 8.2 mm.; tibia, 9.8 mm.

Head.—Mouth parts, clypeus (*b*) rather quadrate, about as broad as long; the labrum closely applied to its cephalic margin. Labrum (*d*) elongate, depressed, flattened, its edges toward the tip, with numerous stout hairs; underneath the labrum is a pair (*e*) of elon-

gate, slender, extremely pointed stylets which I believe to be homologous with the maxillæ of certain other Diptera (Tabanidæ); at the base of the maxillæ, beneath the clypeus, arise the elongated maxillary palpi (*c*), which are almost as long as the antennæ; these palpi are 5-segmented; segment 1 short; 2 twice as long as 1; 3 longer than 1 and 2 combined; 4 and 5 subequal, longer than 2 but shorter than 3; palpi clothed with long appressed hairs; between the labrum and labium, there projects an elongated stylet, almost as broad as the labrum, which seems to be homologous with the hypopharynx (*f*); the possibility exists, however, that it may consist of the two mandibles closely applied to one another. The specimen is unique and I do not care to remove the mouth parts. The elongated labium (*h*) apparently 2-segmented, and bearing a pair of broad palpi at the tip, arises from the ventral surface of the head; viewed from beneath, the labium is seen to consist of a basal and apical piece, the latter deeply divided by a longitudinal furrow; the palpi divergent, their margins clothed with long, stout hairs; from between the palpi there projects outward a narrow compressed organ (*g*); this may (in case the organ (*f*) described above as possibly being the hypopharynx is not this) be the hypopharynx. In this case the mandibles would be present and accounted for in the organ described above as the hypopharynx.

Occipital region narrowed behind, broadening to the vertex; vertex narrowed between the eyes, its sides parallel; front encroaching onto the inner margin of the eye in a broad, shallow sinus, in which the antennæ (*a*) are located. Antennæ, 17-segmented; the scapal segments almost smooth or with very small hairs; both segments short, the first cylindrical, the second oval, its distal end more enlarged; the flagellar segments clothed with dense appressed hairs; basal flagellar segments almost subequal; apical segments more elongated. (See figs. 1 and 2.)

Mouth-parts yellow, the labium brown; maxillary palpi dark brown; clypeus dull brownish gray; antennæ dark brown, the clothing of hairs on the flagellum rather paler.

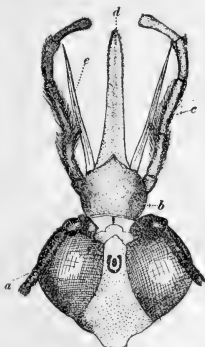


FIG. 2.—DORSAL ASPECT OF THE HEAD OF *TANYDERUS PATAGONICUS*. *a*, ANTENNA; *b*, CLYPEUS; *c*, MAXILLARY PALPUS; *d*, LABRUM; *e*, MAXILLA.

Front dark brown, black apically and with a narrow median stripe; vertex brown with a black U-shaped mark between the eyes; occiput and genæ brown.

Cervical sclerites prominent, transverse, deep velvety black on the dorsal mid line, grayish brown laterally.

Thorax.—Pronotum, the scutum projects on the dorsal surface of the insect, the scutellum is not visible from above, dark brown, paler on the sides. Mesonotum, præscutum gray, the extreme mid line narrowly black; on either side of this, extending from the cephalic margin of the sclerite backward to the transverse suture where they become confluent, a broad chestnut stripe; laterad of this, near the middle of the sclerite, a broad brownish-chestnut stripe runs backward, interrupted by the shallow, open, transverse suture. Scutum light brown mesially, caused by the spreading out of the central præscutal stripes; on the sides of the sclerite are the well-defined

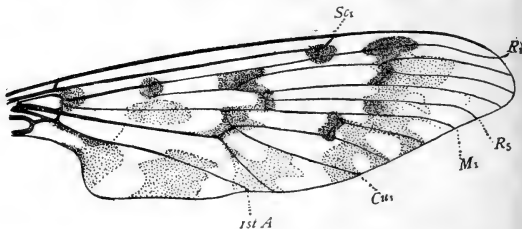


FIG. 3.—WING OF *TANYDERUS PATAGONICUS*. *Sc*₁, SUBCOSTA 1; *R*₁, RADIUS 1; *R*₅, RADIUS 5; *M*₁, MEDIA 1; *Cu*₁, CUBITUS 1; *1st A*, ANAL.

continuations of the brownish-chestnut lateral præscutal stripes; scutellum and post-notum rich brown; metanotum dull brown. Pleuræ, spiracles prominent, spongy in appearance, yellow; epipleuræ gray, sternal region more brown. Halteres brown, stem slightly paler. Legs, coxæ, and trochanters dull gray; femora rich brown; dark brown at the tip; tibia extreme base and tip brown, remainder yellow; tarsi dark brown.

Wings.—Venation, *Sc* long, its tip nearer the fork of *R*₂₊₃ than to the fork of *R*₄₊₅; a spur at the fork of *Sc*; a slight spur at the origin of *R*₅; an oblique supernumerary cross vein in cell *R*₃; a second one in cell *R*₅. Anal angle of the wing not especially prominent.

Wings (fig. 3) subhyaline, veins brown; cells *C* and *Sc* yellow; wings marked with gray and brown as follows: Brown; a rounded spot at the base of the wing under the cross vein *h*; a second at the origin of *R*₅; a third under the tip of *Sc*; a large irregular spot extending along the cord which is on the proximal half of the wing; a

brown seam on the two supernumerary cross veins and on *m*; stigma oval, lighter brown. The gray extends as an irregular band distad of the supernumerary cross veins; and as an interrupted band proximad of the cord; an isolated spot in the ends of the cells *Cu*₁ and *Cu*.

Abdomen.—Tergum light yellowish brown; a narrow brown median stripe; caudal edge of the sclerites gray, interrupted medially by the brown median line; lateral edge of the sclerites dark brownish black, narrowest caudally; segment eight dark brown; genital segment light brown. Sternum light yellowish white, a brown transverse sub-basal band; eighth segment dark brown.

I wish to thank Dr. W. A. Riley, of Cornell, for kind assistance with this paper.

Holotype.—Latitude Cove, Patagonia; United States Bureau of Fisheries; accession No. 21999.

Type.—Cat. No. 14919, U.S.N.M.





A SYNOPSIS OF PART OF THE NEOTROPICAL
CRANE-FLIES OF THE SUBFAMILY
LIMNOBINÆ

BY

CHARLES P. ALEXANDER

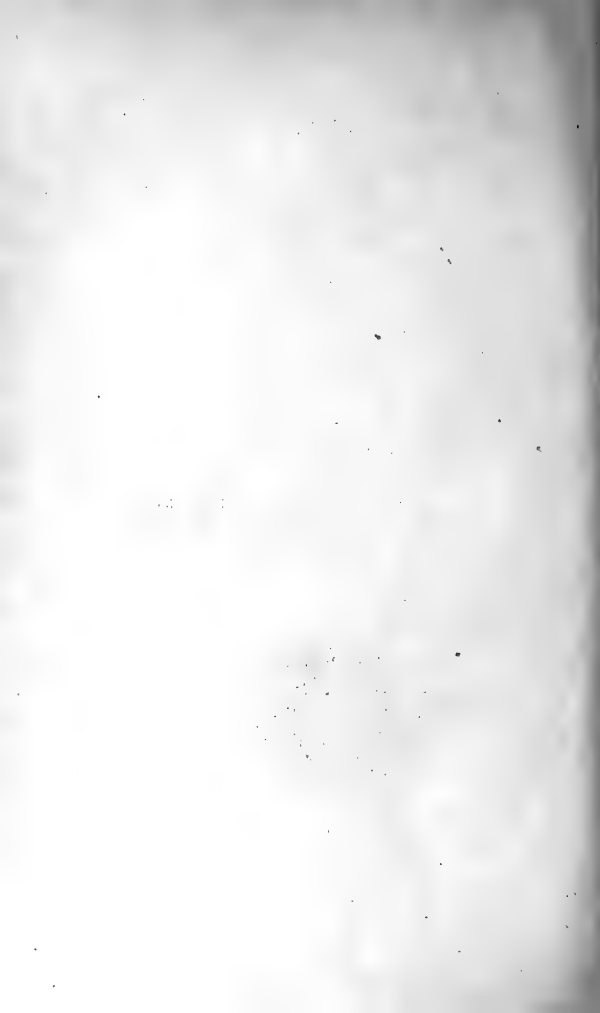
Of the Entomological Laboratory of Cornell University, Ithaca, New York

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By CHARLES P. ALEXANDER,

Of the Entomological Laboratory of Cornell University, Ithaca, New York.

INTRODUCTION.

The present paper is the partial result of the study of some extensive collections of tropical American Tipulidæ or crane-flies. In this paper the tribes Eriopterini and Limmophilini are included. A second part will include the tribes Linnobini, Antochini, and Hexatomini, completing the Linnobinæ, and a third will treat of the Tipulinæ.

In this paper the term Neotropical is used as synonymous with the Neogæa (in part), of Selater (1858) and the Dendrogæa of Selater (1874). It includes South America and the adjacent Falkland, South Georgia, Juan Fernandez, and Galapagoes Islands; the West Indies, or Antilles; Central America, Mexico, and the extreme southern portions of Florida and Texas.

Besides describing all new forms and redescribing such species as are inadequately handled in previous descriptions, I have thought it might be of some value to future students to include keys to the genera and species of the regional forms. It should be understood, however, that the difficulties in the way of such an attempt are such as to almost discourage one from undertaking it. One must remember that a very considerable number of the species have never been rediscovered since their original description; many of these descriptions are brief, vague, and altogether unsatisfactory. Those of Fabricius would be as bad as those of Walker if it were not for the work of Wiedemann, who had access to the Fabrician types. Philippi, who described a large number of Chilean species, was almost unacquainted with the work of European writers on the subject, and as a result committed some grievous errors, such as erecting the genus *Plettusa* for the well-known *Geranomyia* (and referring it to the Culicidæ), the genus *Idioneura* for the well-known and cosmopolitan *Helobia*; the genus *Polymoria*, based on the misconception that the insect possessed six posterior cells, etc. In addition to insufficient descriptions, a serious difficulty exists in the fact that several score of

species have been placed in wrong genera, and there many of them remain at the present writing. Until the type is studied, or the species rediscovered, the generic position of many species must be considered in doubt. I have studied this subject with considerable thoroughness and as a result have assigned each of these faulty species to its probable true generic position, and it is in this genus that the species will be considered. Future research will undoubtedly prove that many of the species were wrongly assigned, and the purpose of this introduction is to let the reader know of the difficulties in the way. Many of the keys are based entirely or in part upon the original descriptions, and for that reason it has been necessary to use superficial characters for the main subdivisions, such as "wings spotted," "wings not spotted," etc. This is of course unsatisfactory, but convenient and, under the circumstances, the only possible course.

As an example of the manner in which species are referred to the wrong genera, the case of the genus *Limnobia* is cited. This genus, erected by Meigen in 1803, has served as a storehouse, or junk heap, for species which are in reality referable to almost every genus of the Limnobiinæ. The numerous species of Fabricius and Wiedemann were described before the old genus *Limnobia* was split up. Macquart included everything in *Limnobia* that possessed but two branches to the radial sector. Philippi and Gay described a large number of species of what seem to be *Furcomyia*, as *Limnobia*. The notorious work of Francis Walker needs no comment here, most of his descriptions being absolutely unrecognizable and the types of many no longer in existence, many of the names are herein considered as unrecognizable species and dropped from consideration.

After this discussion of the difficulties encountered because of the work of pioneer students like Fabricius and Weidemann, or the miserably poor work of Walker, it is a pleasure to speak of the really monumental labors of Osten Sacken, who, having seen the types of many of the early writers, definitely and finally gave them a true generic position. Of the scores of species of New World crane-flies described by Osten Sacken and his fellow workers, Loew and Schiner, not one can be called "unrecognizable" from their descriptions. Osten Sacken did not describe an extraordinary number of new species, but whatever work he did was done thoroughly and accurately. The "Father of American Dipterology" now rests from his labors, having won the honor, respect, and the highest esteem of every student of his subject.

In studying the Neotropical Tipulidæ the student is struck by the abundance of certain genera and tribes, and the total absence of others. Of the hundreds of specimens examined by the writer not a single species of the *Cylindrotominæ* or *Pedicini* was encountered. Limnobiini are abundant (*Geranomyia*, *Furcomyia*, and *Rhipidia*);

Antochini common, especially *Rhamphidia* and *Tenocholabis*; Eriopterini numerous; Limnophilini common (*Limnophila*, *Polymera*, and *Epiphragma*). Hexatomini very numerous, almost all being Erioceræ; the Tipulinae are represented by an abundance of *Tipula*, *Pachyphinae*, *Brachypremna*, *Tanypremna*, and *Megistocera*.

GEOGRAPHICAL DISTRIBUTION.

Concerning the geographical conditions of the regions where certain of the included material was collected, the following are of interest:

BRITISH GUIANA.

Toomatoomari.—Cataracts on the Potaro River, 8 miles above the junction with the Essequibo.

Kaieteur (Falls).—Formed by the fall of the River Potaro, a tributary of the Essequibo, over an abrupt cliff of 741 feet. The width of the fall at times of high water is 370 feet while at low water it decreases to rather less than half that width.¹

The rainy season of November-January was entirely skipped. Ordinarily the lowest water stage of the year is in October, following the so-called long dry season. But in February, when we were there, the river captains and crews on both the Demerara and Essequibo Rivers reported that the water there was the lowest they had ever seen it at any season. Swamps which I made some effort to reach, and which I was assured I would find waist deep in water, were in every case entirely dry, and usually baked and cracked. * * * I believe the time of year to go after both of these groups (Tipulidæ and Syrphidæ) in the Tropics is August or the end of the long rainy season. The end of the short rainy season (December and January) would also be favorable, but this is an uncertain season and has failed in the past, as it did in 1911-12. In fact, the best time for collecting in either Trinidad or British Guiana is during your summer vacation—June, July, and August. It is rather strange that more students in the East, close to New York, do not go South during the summer.²

BRAZIL.

Chapada.—A small village of Matto Grosso, Brazil, about 25 miles ENE. of Cuyaba (the capital of Matto Grosso), on the plateau. The village itself is about 2,500 feet above sea level, or 1,800 feet above Cuyaba, but collections are from all the surrounding region as low as 1,500 feet. This is a country of mixed forest and campo, or grassland, with scattered trees; there are many streams—some small lakes or ponds and tracts of more or less boggy savanna where the streams rise. The name Chapada is really a generic application, applied to the plateau in general. The real name of this village is Santa Anna la Chapada, and in some maps it appears as Santa Anna, but in all that region it is known simply as Chapada, or the Chapada.

Corumba.—A town on the River Paraguay, near the junction of the Tagnary, the port of entry for Matto Grosso. There is a tract of dry rocky land, a kind of island, in the flood plain of the Paraguay, which is here very extensive. Collections were made principally on the flood plain; the waters were rising, but I used to wade about with a boy pushing a canoe through the grass behind me. These flood plains are mostly open grassland, with some forest along the river and channels.³ (H. H. Smith.)

¹ From *Among the Indians of Guiana*, by Everard F. Im Thurn, (1883).

² Letter from E. B. Williamson to J. G. Needham, April 23, 1912.

³ From *Contributions to a Knowledge of the Odonata of the Neotropical Region*, by T. P. Calvert, Ann. Carnegie Mus., vol. 6, No. 1, 1909.

Igarape Assú is about 120 miles from the city of Pará. It is situated about 1,000 feet above the sea level and in the heart of the forest. I arrived at my destination about the first of December, 1911, which is the latter part of the dry season. The rains did not start until about the middle of January, and from then on it rained almost every day for three or four hours. It was usually fine in the morning, but toward 12 o'clock clouds loomed up on the horizon. When these wet days come it is very hard to keep things from molding, especially insects. There were very few Tipulidæ to be had during the dry season, but they became more plentiful as the wet season advanced. I used to go out with a waterproof on and an umbrella in one hand and net in the other. The place where I stopped was right beside a swamp, so that it made it all the better for your material. At night I put a light, mounted on a chair, with a sheet behind it, and this had the desired effect.¹

It is not proposed nor intended to give the characters of any genus, except where such genera have been insufficiently described. In the case of monotypic genera, described in papers that are difficult of access to the student, the generic and specific descriptions are included. Under each genus is given references to the best characterizations of the genera that are available, some one or more of which will be accessible to the general student of the Diptera. As regards the synonymy of the species, it has been given complete in the case of purely Neotropical forms. In wide-ranging or cosmopolitan species, only the more important or significant changes are given.

For the information of the reader concerning any points of nomenclature that may be doubtful, I give the following bibliography of the systems adopted in this paper:

1. *Wing venation:*

COMSTOCK, J. H., and NEEDHAM, J. G.

The Wings of Insects.

American Naturalist, vol. 32, No. 373, pp. 43-48; No. 374, pp. 81-89; No. 376, pp. 231-257; No. 377, pp. 335-340; No. 378, pp. 413-424; No. 380, pp. 561-565; No. 382, pp. 769-777; No. 384, pp. 903-911; vol. 33, No. 386, pp. 117-126; No. 391, pp. 573-582; No. 395, pp. 845-860.

Published separately by the Comstock Publishing Company with the addition of a table of contents, 124 pp., 90 figs. The fourth part, No. 377, pp. 335-340, deals with the Diptera but makes no mention of the Tipulidæ in particular.

NEEDHAM, JAMES GEORGE.

Crane-flies, in the 23rd Report of the State Entomologist of New York, 1907, pp. 199-248, pls. 11-32. The most complete account and critical study of the venation of crane-flies ever published. The study of this paper is strongly recommended.

2. *Head sclerites:*

COMSTOCK, J. H., and KOCHI, C.

The Skeleton of the Head of Insects.

American Naturalist, vol. 36, No. 421, pp. 13-45.

COMSTOCK, J. H. and KELLOGG, V. L.

The Elements of Insect Anatomy.

Comstock Publishing Company, Ithaca, New York (1904), pp. 1-145.

¹ Letter from H. S. Parish, May 24, 1912.

3. *Thoracic sclerites:*

CRAMPTON, G. C.

A Contribution to the Comparative Morphology of the Thoracic Sclerites of Insects.
Proc. Acad. Nat. Sci. Philadelphia, Jan., 1909 (Feb. 22, 1909), pp. 3-54, pls. 1-4.

SNODGRASS, R. E.

The THORAX of Insects and the Articulation of the Wings.

Proc. U. S. Nat. Mus., vol. 36. pp. 511-595, pls. 40-69 (Nos. 1687, 1909).

4. *Abdominal sclerites:*

COMSTOCK, J. H., and KELLOGG, V. L.

The Elements of Insect Anatomy.

Ithaca, N. Y., 1904.

5. *Hypopygial characters:*

SNODGRASS, R. E.

The Hypopygium of the Tipulidæ.

Trans. Amer. Ent. Soc., vol. 30, pp. 179-236, pls. 8-18.

The above are, without much question, the best and are recommended to students of the family as standards to be followed in the describing of species.

Wherever I have asked for specimens, available material was very cheerfully given me for study. I wish to express my sincere gratitude to several gentlemen for their kindness in regard to this matter. These are Mr. Frederick Knab, of the United States National Museum; Mr. J. A. Grossbeck, especially for the loan of the Lutz-Crampton Guiana collection; Mr. S. H. Henshaw of the Museum of Comparative Zoology; Prof. C. F. Baker, Mr. C. W. Johnson, Mr. E. T. Cresson, jr., and others. Much of the work was done as research in the Systematic Entomological Laboratory of Cornell, under the direction of Dr. J. Chester Bradley, and to Doctor Bradley and Doctor Needham, my sincere thanks are due for continual help.

The following collections are embraced in the material studied:

1. United States National Museum, Washington, District of Columbia. A very extensive series of nearly 400 specimens representing about 90 species; received through Mr. Knab.

2. American Museum of Natural History, New York City. A collection embracing about 50 specimens in 37 species; received through Mr. Grossbeck.

3. Museum of Comparative Zoölogy, Cambridge, Massachusetts. A collection of six specimens, four species, but of especial interest as belonging to the Osten Sacken and Loew collections; received through Mr. S. H. Henshaw.

4. Boston Society of Natural History, Boston, Massachusetts. A specimen of *Tanypterna*; received through Mr. C. W. Johnson.

5. Academy of Natural Sciences, Philadelphia, Pennsylvania. A collection of about 25 specimens, 5 or 6 species; received through Mr. Cresson.

6. Cornell University, Ithaca, New York. The rather extensive collections made by Mr. Parish in the Province of Pará, Brazil, in January and February, 1912.

7. Pomona College, Claremont, California. A collection of 5 specimens, 3 species, from Mexico; received through Prof. C. F. Baker.

8. Museu Rocha, Ceara, Brazil. Ten specimens of a *Geranomysia*; received from Mr. P. Rocha.

9. Staudinger and Bang-Haas, Dresden, Germany. A collection of South American species; 22 specimens, 15 species; in author's collection.

10. Mr. E. B. Williamson, Bluffton, Indiana. Ten specimens, representing 3 species, collected by Mr. Williamson on his recent trip (see p. 483); in author's collection.

In a very recent paper,¹ Dr. G. Enderlein has added much to our knowledge of tropical crane-flies. The specific descriptions and the figures are excellent, but the very free erection of genera must be criticized. Of the 15 genera proposed in this paper, several are rank synonyms of older genera, while the majority of the others are based on trivial differences of venational or antennal characters. In regard to this subject it may be well to quote the words of Osten Sacken,² as follows:

To these successors I am free to give a piece of advice, as the result of more than 30 years' experience with the Tipulidæ, and this is not to introduce new genera prematurely. Large accessions of new forms, or of variations of already well-known forms, must be expected from as yet unexplored, principally tropical, regions; but these accessions although large will be slow in coming. Do not introduce new genera for every slight deviation from a well-known type, because you would soon have no end of new genera and a growing difficulty in discriminating between them. But do not hesitate to establish a new genus for a form that can not be forced into any of the existing genera and which shows distinctive characters in more than one organ of its body. Such forms are not very common.

The opinion that I have formed of Enderlein's genera, after a careful study of their characters, is given below. Mr. F. W. Edwards, the well-known British authority on the Limnobiinæ, writes me that, in his opinion also, most of the Enderlein genera rest on a very insufficient basis.

1. *Otenacroseelis* (p. 1) equals *Holorusia* Loew. (*H. rubiginosa* Loew has cross-vein *r* present in normal individuals, and connected with R_{2+3} instead of R_2 .)

2. *Ieriomastax* (p. 9) may be a valid genus, although the characters on which it is based are rather trivial.

¹ Günther Enderlein, Studien über die Tipuliden, Limnobiiden, Cylindrotomiden, und Ptychopteriden. Zoologische Jahrbücher. Abteilung für systematik, geographie und Biologie der Tiere, 1912, vol. 32, pt. 1, pp. 1-84, fig. 51.

² Osten Sacken, Studies on Tipulidæ, pt. 2, Berlin. Ent. Zeitschr., vol. 31, p. 163.

3. *Stegasmonotus* (p. 11) equals *Tanyproctus* Osten Sacken. (*Tipula longipes* Fabricius (p. 13) is certainly a *Tanyproctus*.)

4. *Pchikia* (p. 15), apparently a good genus, based, principally, on the strong supernumerary cross-vein in cell M.

5. *Phacelodocera* (p. 26) equals *Ptilogyna*. The differences between this and the Australian *Ptilogynæ* are not sufficient for generic separation.

6. *Tipulodina* (p. 30), not a *Pediciine*, but unquestionably a *Tipuline* as shown by the position of Sc_2 , shape of cell Cu_1 , etc.

7. *Androclosma* (pp. 34-37, 49); not different from *Arrhenica*, proposed by Osten Sacken for *A. spinosa* Osten Sacken. Mr. Edwards informs me that *A. ornatum* has a strange resemblance to a species of *Macromastix* from New Zealand.

8. *Psaronius* (p. 50) equals *Lecteria* Osten Sacken. I have both of Enderlein's species, *Dactylolabis conspersa* (p. 49) and *Psaronius lituratus* (equals *Lecteria obscura* Fabricius). I believe that the presence or absence of tibial spurs is a character that is overdone, as closely related species tend to be separated by it.

9. *Aldrovandia* (p. 52), not Eriopterine, but undoubtedly a *Tipuline*.

10. *Clydonodozus* (p. 57). Mr. Edwards writes: "I should doubt very much if *Clydonodozus* can be retained as distinct from *Conosia*."

11. *Mongomella* (p. 61) equals *Mongoma* Westwood. The following errata in venational interpretation: *M. cariniceps* (p. 60, fig. L¹), vein R_{2+3} should be R_2 ; vein M_1 should be R_{4+5} ; M_2 should be M_{1+2} ; the same applies to *M. gracilis* (p. 62, fig. M₁), which is closely related to *M. zambesizæ* Alexander from East Africa.

12. *Pycnocepis* (p. 65) equals *Styringomyia* Loew.

13. *Stibadocera* (p. 83) is very doubtfully *Cylindrotomine*; the presence of Sc_2 and obliteration of Sc_1 is a *Tipuline* character. The wide separation at the wing-margin of R_1 and R_{2+3} is not at all *Cylindrotomine*. The position of this very curious genus must remain in doubt until related forms, or more material, are discovered. An examination of the male genitalia would tell whether or not the species belong to the *Cylindrotominae*.

New names proposed.—The following new names are given to certain of the species occurring in the list in part 2. The same combination of generic and specific terms necessitates the renaming of the later species.

Geranomyia enderleini, new name for *G. annulata* Enderlein (1912); not *G. annulata* Skuse (1888) (Dipt. Aust., pt. 7, p. 70).

Geranomyia philippii, new name for *G. virescens* Philippi (1865); not *G. virescens* Loew. (1851).

Furcomyia chilensis, new name for *Limnobia guttata* Philippi (1865); not *L. guttata* Meigen (1838) (= *Linnophila narmmorata* Meigen).

Furcomyia bigoti, new name for *Limnobia longicollis* Bigot (1888); not *L. longicollis* Macquart (1846).

Furcomyia blanchardi, new name for *Limnobia stictica* Blanchard (1852); not *L. stictica* Meigen (1818).

Furcomyia subandina, new name for *Limnobia stigmatica* Blanchard (1852); not *L. stigmatica* Meigen (1830).

Epiphragma fabricii, new name for *Tipula maculata* Fabricius (1805); not *T. maculata* Linnæus (1758); not *T. maculata* Meigen (1804).

Eriocera willistoni, new name for *E. fasciata* Williston (1900); not *E. fasciata* Guerin (1830).

Eriocera longistyla, new name for *Tipula erythrocephala* Fabricius (1805); not *T. erythrocephala* De Geer (1776).

I wish, in closing this introductory statement, to express my thanks to Mr. F. W. Edwards, of the British Museum of Natural History, for the following information regarding Walker's South American Tipulidæ:

Limnobia calopus Walker. Types ♂ ♀ in very good condition, only one leg missing from each. Osten Sacken has a note attached, "Comp. this to *Limnobia armillaris* Wied. (O. Sack)." Certainly belongs to the genus *Lecteria*, but there is no cross vein in the second submarginal cell.

Limnobia reciproca Walker. Bad condition; no legs. Genus *Trimicra* (close to *T. pilipes* Fabr.).

Limnobia chrysoptera Walker. No legs, but recognizable by wings, easily I should say. Genus *Eriocera*.

Limnobia tenebrosa Walker. Good condition; genus *Eriocera*.

Gonomyia variegata Walker is a *Geronomyia*.

Gonomyia antarctica Walker is a *Limnophila*.

Ptilogyia simplex Walker. Fair condition; genus *Ozodicera*, as stated by O. S.

Tipula filigera Walker. Fair condition; certainly recognizable. I have not studied the Tipulidæ and am not sure of the genus of this. The legs are very long and slender, but the venation is like *Tipula*, the anterior branch of the second vein (R_2) being oblique. Antennæ, 10-jointed?

The other species you ask about I can not trace in our collection, so their existence is doubtful.

A LIST OF THE NEOTROPICAL TIPULIDÆ (LIMNOBINÆ).

Tribe 1.—LIMNOBINI:

- Geronomyia brasiliensis* Westwood.
- G. enderleini*, new name (for *annulata* Enderlein).
- G. fulvithorax* Philippi.
- G. insignis* Loew.
- G. intermedia* Walker.
- G. leucomelanopus* Enderlein.
- G. lineata* Enderlein.
- G. mexicana* Bellardi.
- G. pallida* Williston.

Tribe 1.—LIMNOBINI—Contd.

- G. philippii*, new name (for *virescens* Philippi).
- G. pilipes* Walker.
- G. rostrata* Say.
- G. rufescens* Loew.
- G. stigmatica* Philippi.
- G. testacea* Philippi.
- G. tibialis* Loew.
- G. tristis* Loew.
- G. valida* Loew.

Tribe 1.—LIMNOBINI—Contd.

- G. variegata* Walker.
G. virescens Loew.
Rhipidia annulicornis Enderlein.
R. bipunctinata Williston.
R. costalis Williston.
R. domestica Osten Sacken.
R. subpunctinata Williston.
R. tabescens Enderlein.
R. unipunctinata Williston.
Peripheroptera aberrans Schiner.
P. incommoda Osten Sacken.
P. nitens Schiner.
P. schineri Osten Sacken.
Discobola argus Say.
Furcomyia bigoti, new name (for *longicollis* Bigot).
F. blanchardi, new name (for *stictica* Blanchard).
F. chilensis, new name (for *guttata* Philippi).
F. chlorotica Philippi.
F. cluicensis Philippi.
F. flavida Philippi.
F. infumata Philippi.
F. lincicollis Blanchard.
F. muscosa Enderlein.
F. ornatipennis Blanchard.
F. pallida Macquart.
F. phatta Philippi.
F. polysticta Philippi.
F. subandina, new name (for *stigmatica* Blanchard).
F. vernalis Philippi.
Limnobia ocellata Röder.
 †*L. diva* Schiner.
 †*L. insularis* Williston.
 †*L. longimana* Fabricius.
Zalusa falklandica Enderlein.

Tribe 2.—ANTOCHINI:

- Rhamphidia albitarsis* Osten Sacken.
Teucholabis annulata Williston.
T. chalybeiventris Loew.
T. complexa Osten Sacken.
T. flavithorax Wiedemann.
T. gracilis Osten Sacken.
T. melanocephala Fabricius.
T. molesta Osten Sacken.
T. morionella Schiner.
T. polita Osten Sacken.
T. rostrata Enderlein.
T. scapularis Macquart.
T. schineri Enderlein.
T. simplex Wiedemann.

Tribe 2.—ANTOCHINI—Contd.

- T. spinigera* Schiner.
T. trifasciata Enderlein.
T. venezuelensis Macquart.
Toxorhina brasiliensis Westwood.
T. fragilis Loew.
Elephantomyia meridionalis, new name (for *longirostris* Williston), preocc. fossil.
Diotrepha concinna Williston.
D. mirabilis Osten Sacken.
Paratropiza collaris Osten Sacken.
P. fasciolaris Wiedemann.
P. pumila Osten Sacken.
P. singularis Schiner.

Tribe 3.—ERIOPTERINI:

- Molophilus guatemalensis*, new species.
M. thaumastopodus, new species.
Eroptera (Mesocyphona) caloptera Say.
E. (M.) c. var. *femoranigra*, new subspecies.
E. (M.) annulipes Williston.
E. (M.) bicinctipes, new species.
E. (M.) costalis, new species.
E. (M.) eiseni, new species.
E. (M.) immaculata, new species.
E. (M.) knabi, new species.
E. (M.) parva Osten Sacken, *brasiliensis*, new subspecies.
E. (M.) splendida, new species.
E. (Empeda) nigrolineata Enderlein.
E. (E.) n. var. *pubescens*, new subspecies.
 †*E. longipes* Philippi.
 †*E. pallida* Philippi.
 †*E. uniformis* Blanchard.
Trimicra anomala Osten Sacken.
T. reciproca Walker (= *anomala* Osten Sacken?).
Symplecta macroptera Philippi (= *hybrida* Meigen?).
S. hybrida Meigen.
Gnophomyia caloptera Osten Sacken.
G. ferruginea Williston.
G. hirsuta, new species.
G. luctuosa Osten Sacken.
G. magnifica, new species.
G. nigrina Wiedemann.
G. osten-sackeni Skuse.
G. rufithorax Wiedemann.
G. subhyalina, new species.
Gonomyia (Gonomyia) delicata, new species.

Tribe 3.—ERIOPTERINI—Contd.

- G. (Leiponeura) pleuralis* Williston.
G. (L.) puella Williston.
G. (L.) puer, new species.
G. (Gonomyia) unicolor, new species.
Sacandaga parva, new species.
Mongoma disjuncta, new species.
M. extensa, new species.
M. longifusa, new species.
M. manca Williston.
M. niveitarsis, new species.
M. pallida Williston.
Cryptolabis tropicalis, new species.
Signatamera amazonica Westwood.
S. flavipennis Osten Sacken.
Lecteria annularis Fabricius.
L. conspersa Enderlein.
L. matto grossæ, new species.
L. obliterated, new species.
L. obscura Fabricius.

Tribe 4.—LIMNOPHILINI:

- Epiphragma adspersa* Wiedemann.
E. buscki, new species.
E. circinata Osten Sacken.
E. delicatula Osten Sacken.
E. fabricii, new name (for *maculata* Fabricius).
E. histrio Schiner.
E. imitans, new species.
E. nebulosa Bellardi.
E. punctatissima Wiedemann.
E. pupillata, new species.
E. sackeni Williston.
E. varia Wiedemann.
Limnophila apocila Philippi.
L. chilensis Philippi.
L. cineracea Philippi.
L. epiphragmoides, new species.
L. eutaniata Bigot.
L. flavicauda Bigot.
L. guttulatissima, new species.
L. lentoides, new species.
L. luteipennis Osten Sacken.
L. nacreæ, new species.
L. stigmatica Philippi.
L. tenuipes Say.
L. undulata Bellardi.
L. venosa Philippi.
L. verecunda Philippi.
 ?*L. cinerea* Philippi.
 ?*L. decasbila* Wiedemann.
 ?*L. irrorata* Philippi.
 ?*L. lutea* Philippi.
 ?*L. multipunctata* Fabricius.
 ?*L. pallens* Philippi.

Tribe 4.—LIMNOPHILINI—Contd.

- ?*L. punctipennis* Philippi.
 ?*L. tenella* Philippi.
 ?*L. trichopus* Philippi.
L. antarctica Walker.
Ctedonia bicolor Philippi.
C. bipunctata Philippi.
C. flavipennis Philippi.
C. fusca Jænnicke (= *flavipennis* Philippi?).
C. pictipennis Philippi.
Polymera albitarsis Williston.
P. conjuncta, new species.
P. fusca Wiedemann.
P. georgiæ Alexander.
P. grisea, new species.
P. hirticornis Fabricius.
P. inornata, new species.
P. niveitarsis, new species.
P. obscura Macquart.
P. pleuralis, new species.
P. superba, new species.
P. thoracica, new species.
Ischnothrix ætherea Bigot.

Tribe 5.—HEXATOMINI:

- Eriocera braconides* Enderlein.
E. brunneipes Williston.
E. caminaria Wiedemann.
E. chrysoptera Walker.
E. erythraea Osten Sacken.
E. fasciata Guérin.
E. flavida Williston.
E. gracilis Osten Sacken.
E. hæmorrhœa Osten Sacken.
E. lessepsi Osten Sacken.
E. longistyla, new name (for *erythrocephala* Fabricius).
E. macquarti Enderlein.
E. melanacra Wiedemann.
E. mesoxantha Osten Sacken.
E. nigra Wiedemann.
E. obsoleta Williston.
E. ohausiana Enderlein.
E. pretiosa Osten Sacken.
E. tanioptera Wiedemann.
E. trifasciata Röder.
E. virguliventris Enderlein.
E. willistoni, new name (for *fasciata* Williston).
E. zonata Osten Sacken.
 ?*E. flaviceps* Wiedemann.
 ?*Pentoptera fuliginosa* Schiner.

Tribe 6.—PEDICINI:

- ?*Tricyphona pusilla* Bigot.

CHARACTERIZATIONS OF NEW SPECIES AND KEYS TO THE FORMS.

KEY TO THE SUBFAMILIES OF TIPULIDÆ.

1. Terminal segment of the maxillary palpi very long, whip-lash shaped, much longer than all of the preceding segments combined; Sc ends in R, Sc₁ being obliterated; fusion of Cu₁ on M usually slight, often punctiform; cell Cu₁ of the wings usually broader at the base than at the middle. Antennæ 13-segmented. TIPULINÆ.
- Terminal segment of the maxillary palpi short, scarcely longer than the two preceding combined; Sc ends in C, Sc₁ being present; fusion of Cu₁ on M usual long; cell Cu₁ of the wings usually only as broad at the base as at the middle. Antennæ 14 or 16 segmented. LIMNOBINÆ.

The exceptions to the above characterizations are numerous, but the majority should hold. *Pedicia*, a Limnobiine, has long maxillary palpi like the longipalpous Tipulinæ; the Dicranotæ (*Pedicini*) have 13-segmented antennæ, etc.

KEY TO THE TRIBES OF LIMNOBINÆ.

1. R₂ with two branches reaching the margin. 2.
R₂ with three branches reaching the margin. 4.
2. Antennæ 14-segmented. LIMNOBINI.
Antennæ 16-segmented. 3.
3. R₁ usually incurved toward R₂₊₃ at the wing margin and fused backward with it; tibiae with spurs at the tip. CYLINDROTOMINI.
R₁ runs straight to the wing margin, not fusing with R₂₊₃; tibiae spurless. ANTOCHINI.
4. Tibiæ spurred at the tip. 5.
Tibiæ without spurs at the tip. ERIOPTERINI.
5. Antennæ with from 6 to 10 segments. HEXATOMINI.
Antennæ with from 13 to 39 segments. 6.
6. Sc₂ retracted far toward the base of the wing so that it is proximad of the origin of R₂. PEDICINI.
Sc₂ at the tip of Sc, or retracted backward (*Trichocera*), not proximad of the origin of R₂. LIMNOPHILINI.

The tribes herein considered, Eriopterini and Limnophilini, are exceedingly closely allied to one another, and the character of the tibial spurs can not, apparently, be depended upon in critical cases. The members of these tribes require further study at the hands of some student who has access to collections where a majority of the forms are contained. If these tribes are valid (and no one disputes the point as to whether they are convenient to use or not), then other characters will be found to separate them. I have included the genus *Lecteria* in both tribes, as *L. obscura* has spurred tibiae whereas *L. armillaris* has naked, spurless tibiae.

KEY TO THE GENERA OF THE ERIOPTERINI.

(Based largely on Needham's Key, 1907.)

1. Wings absent *Chionea* Dallman. 2.
Wings present..... 2.
2. Three branches of M reach the wing-margin..... 3.
Two branches of M reach the wing-margin..... 4.
3. Sc very long; Sc₁ and R₁ approximated at their tips..... *Lecteria* Osten Sacken. 4.
Sc shorter; Sc₁ and R₁ distant at their tips..... *Cladura* Osten Sacken. 5.
4. R₂ shorter than R₂₊₃..... 5.
R₂ longer than R₂₊₃..... 8.
5. Cross vein *r-m* absent; Sc₁ very long, approximating R₁ at their tips; cross vein *r* present..... *Mongoma* Westwood. 6.
Cross vein *r-m* distinct; Sc₁ short; no cross vein *r*¹..... 6.
6. Antennæ of the male as long as the body, prominently haired. *Lachnocera* Philippi. 7.
Antennæ of the male short, normal..... 7.
7. Sc short ending opposite, or anterior to, the origin of Rs; anal angle of the wing not prominent..... *Gonomyia* Megerle. 8.
Sc long ending near to the fork of Rs; anal angle of the wing prominent. *Sacandaga* Alexander. 9.
8. Rs long, normal in position; cell first R₁ elongated..... 9.
Rs shortened, its first fork angulated; cell first R₁ equilateral or nearly so. *Cryptolabis* Osten Sacken. 9.
9. Second fork of the radial sector on the posterior side, i. e., Rs ends in cell R₂. *Molophilus* Curtis. 10.
Second fork of the radial sector on the anterior side, i. e., Rs ends in cell R₃..... 10.
10. A supernumerary cross vein in cell R₂; second anal vein strongly bisinuated. *Helobia* Le Peletier. 11.
No supernumerary cross vein in cell R₂; second anal not bisinuated..... 11.
11. Cu₁ tending to turn toward the apex of the wing..... *Erioptera* Meigen. 12.
Cu₁ tending to turn away from the wing apex..... 12.
12. Antennal segments (male) subreniform, nodose; fourth antennal segment like a recumbent S..... *Sigmatomera* Osten Sacken. 13.
Antennal segments of the male not so..... 13.
13. Sides of cell first M₂ parallel; Sc₂ near tip of Sc₁..... *Gnophomyia* Osten Sacken. 14.
Sides of cell first M₂ divergent distad; Sc₂ retracted toward the wing basis..... 14.
14. The deflected base of Cu₁ meets M far before the fork; Rs long and straight at its origin; second fork of Rs skewed forward; terminal 3 segments of the antennæ usually abruptly smaller..... *Trimicra* Osten Sacken. 15.
The deflected base of Cu₁ meets M usually at the fork; Rs shorter, straight; second fork of Rs usually symmetrical; flagellar segments of the antennæ uniform. *Rhypholophus* Kolonati. 15.

I have omitted *Polymoria* Philippi from this key as it is very probably a *Limnophila* (See *Limnophilini*).

¹ Subgenus *Empeda* (genus *Erioptera*) would run down here, but has cross vein *r* present.

DESCRIPTIONS OF GENERA AND SPECIES.

Genus *LECTERIA* Osten Sacken.

Lecteria OSTEN SACKEN, Studies, etc., 1887, pt. 2; Berl. Ent. Zeitschr., vol. 31, p. 206.

Psaronius ENDERLEIN, Zool. Jahrb., vol. 32, 1912, pt. 1, pp. 50, 51.

I have included in this genus *Limnobia armillaris* Fabricius, made the type of this genus by Osten Sacken, and which has spurless tibiae; *Psaronius lituratus* Enderlein (= *Tipula obscura* Fabricius) and *Lecteria obliterata*, new species, which have spurred tibiae. As I have stated in a later paragraph, I believe that the tibial spur character has been overdone. The venation of these three species is so remarkably similar that I have no hesitation, in view of the existing data, in referring all three species to the genus *Lecteria*.

Lecteria is sufficiently well distinguished, venationally, in the extreme length of subcosta, the long radial sector, strongly arcuated at its origin and thence running parallel with radius, the tendency for R_2 to shorten and disappear, etc. The described species are all Neotropical, but Mr. Edwards informs me that the British Museum possesses three undescribed species from Africa. I believe that the presence or absence of spurs, in this group of species, has the tendency to separate from one another species that are in reality closely allied. Thus Enderlein described as *Limnophilini* two species which possessed tibial spurs. The type of the genus *Lecteria*, *armillaris* Fabricius, seems to vary considerably in venation. The specimens upon which Osten Sacken based his genus possessed a supernumerary cross vein in cell R_3 , and in some specimens another in cell R_5 . The types of *Limnobia calopus* Walker in the British Museum, as well as the three specimens I possess, entirely lack these cross veins. It is probably a case comparable to the related genus *Cladura* Osten Sacken where cross veins may occur almost anywhere on the wing disk.¹

KEY TO THE SPECIES OF LECTERIA.

1. Wings without distinct markings (antennae with the basal segments yellow, flagellum black).....*obliterata*, new species. (Guiana)
Wings with brown markings.....2.
2. Wings with abundant brown dots in all of the cells. *conspersa* Enderlein² (Brazil).
Wings with the markings larger and confined to the neighborhood of the veins....3.
3. Wing markings confined to a spot at the base of R_5 , along deflection of R_{4+5} , and in cell second R_1 ; cell first M_2 is hexagonal, the fusion of Cu_1 and M_2 slight, less than cross vein $r-m$*obscura* Fabricius³ (Guiana-Brazil).
Wing-marking more extensive.....4.

¹ See Alexander and Leonard, Venational Variation in *Cladura*, Jour. N. Y. Ent. Soc., vol. 29, Mar., 1912, pp. 34-39, pl. 4.

² Zool. Jahrbuch., 1912, vol. 32, pt. 1, Stud. über die Tipuliden, etc., pp. 43, 50 (fig. D1) (as *Dactylobasis*).

³ Syst. Antl., 1865, p. 27 (as *Tipula*); Wiedemann, Auss. Zweifl. Ins., 1828, vol. 1, p. 24 (as *Limnobia*).

KEY TO THE SPECIES OF LECTERIA—continued.

4. Wing-markings present as a narrow seam along the cord; at fork of M_{1+2} , R_{2+3} , at origin of R_s , at origin of the basal deflection of R_{4+5} , and at the tips of R_1 and R_5 ; cell first M_2 pentagonal; basal deflection of Cu_1 before fork of M ; basal deflection of R_{4+5} long, longer than M_1 *matto-grossæ*, new species (Brazil).
 Wing markings more extensive; a transverse band across the wing in the neighborhood of the cord; an interrupted band beginning at origin of R_s ; tip of wing dark; basal deflection of Cu_1 beyond fork of M ; basal deflection of R_{4+5} short; arcuated, less than M_1 *armillaris* Fabricius¹ (Costa Rica-Brazil).

LECTERIA OBLITERATA, new species.

Small, slender; basal antennal segments yellow; flagellum black; general color of the body dull black; legs brown; wings dark-colored, gray.

Male.—Length, 14.4 mm; wing, 11 mm. Head: Rostrum and palpi dark brown; antennæ, basal segments elongate-cylindrical, stout, second rounded; flagellum, segments rapidly becoming smaller toward the tip; basal segments light yellow; flagellar segments abruptly dark, black. Front dark brown, shiny; vertex black, pollinose on the sides; one or two hairs on the sides of the vertex behind the eyes, occiput with a brown bloom; genæ more yellowish.

Thorax: pronotum, scutum and scutellum visible from above, dull brownish-black. Mesonotum, præscutum with the pseudo-sutural fovea shallow, but prominent, shiny black; præscutum, extreme cephalic margin with a yellowish bloom which is continued backward on the sides of the sclerite; dorsum of the sclerite velvety-black at the anterior prominence; dull black back to the suture; scutum, scutellum, and post-notum black, rather dusted with light gray. Pleuræ light gray; prothoracic pleuræ somewhat darker, blackish; an indistinct brown stripe across the pleuræ from the fore-coxa to the base of the halteres. Halteres short, stem pale, knob brown. Legs: coxæ and trochanters light brownish-yellow; femora dark brown, more yellow basally; tibiæ and tarsi dark brown. Wings dull brownish-gray; cells C and Sc yellow; veins Sc and R yellow; remaining veins dark brown. Venation (see fig. 41).

Abdomen very elongate; tergum brownish; segments dull yellow at the base and tip, remainder dark grayish-brown; basal sternites yellow, apical ones concolorous with the tergites.

Habitat.—*Holotype*.—Male, Tukeit, British Guiana, July 21, 1911 (Lutz, coll.). *Paratype*.—Male, Kaieteur Falls, British Guiana, Aug. 10, 1911 (Lutz, coll.).

Types.—In American Museum of Natural History.

¹ Syst. Antil., 1865, p. 26 (as *Tipula*); Wiedemann, Auss. Zweifl. Ins., 1828, vol. 1, p. 13 (as *Limnobia*).

LECTERIA CONSPERSA Enderlein.

Daetylolabis conspersa ENDERLEIN, Zool. Jahrb., pt. 1, 1912, pp. 49, 50.

I have seen a single specimen, taken at Rio de Janeiro in November. (Probably by H. H. Smith.) It forms part of the Williston collection in the American Museum of Natural History in New York.

The wing seems to be of a different shape from that shown in Enderlein's figure, almost *Drepanopteryx* or *Osmylus*-like (Hemero-biidae, Neuroptera).

LECTERIA OBSCURA Fabricius.

Tipula obscura FABRICIUS, Syst. Antl., 1805, p. 27.

Limnobia obscura WIEDEMANN, Dipt. Exot., vol. 1, 1821, p. 12; Auss. Zweifl. Ins., vol. 1, 1828, p. 24.—HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 289.—KERTESZ, Cat. Dipt., vol. 2, 1902, p. 175.

Psearonius lituratus ENDERLEIN, Zool. Jahrb., 1912, pp. 50, 51, fig. E₁.

Female.—Length, 23.4 mm.; wing, 15.8 mm.; abdomen, 18.6 mm.; legs, fore, femora 8.8 mm.; tibia 10 mm.; tarsus 1, 5.5 mm.; tarsus 2-5, 3.6 mm.; middle, femora 10.1 mm.; tibia 10.1 mm.; tarsus 1, 4.8 mm.; tarsus 2-5, 3.2 mm.; hind, femora 11.2 mm.; tibia 11.4 mm.; tarsus 1, 3.6 mm.; tarsus 2-5, 3.2 mm.

Head: rostrum and palpi dark brown; palpal segments short; clypeus yellowish-brown, with two long hairs on either side. Antennae: first segment much elongated, cylindrical, longer than the following three combined; second segment short, rounded-oval, truncated at its apical end; segments of the flagellum gradually more slender and more elongated, clothed with dense, appressed downy hairs and with long hairs which are shortest on the proximal segments; antennae yellowish-brown; flagellum darker, brown. Front brown; vertex yellowish-brown, rather darker in places; a patch of long hairs on either side of the eye.

Thorax: pronotum brown; mesonotum: praescutum, with a broad deep pseudosutural fovea on its antero-lateral margin; the caudal margin of the fovea gentle, cephalic margin precipitous, dark brown, conspicuous; praescutum light brownish-yellow with indistinct brown stripes: two parallel ones on either side of the pale narrow median stripe, becoming indistinct near the transverse suture; the shorter, but broader, lateral stripes begin just behind the fovea and run backward across the suture; scutum, scutellum, and postnotum dull yellowish-brown, the color of the scutum near the center brought about by the spreading out of the lateral praescutal stripes. Pleurae dull yellow, a darker spot on the mesothoracic epipleura. Halteres, stem yellow, gradually darkening to the brown knob. Legs: light yellow; femora dark brown at the tip; tibia brown at the extreme base and tip; tarsal segments dull yellow, darker at the tip of each segment; segments four and five brown.

Wings: cells C and Sc light yellow, remainder subhyaline; veins brown except where covered by spots; brown spots located as follows: a rounded oval spot at base of Rs, a spot in stigmal area in cell second R_{11} , a triangular spot along the deflection of R_{4+5} . Venation: Sc, long, as in the subgenus; space on costa between Sc_1 and R_1 shorter than the crossvein $r-m$. Rs extremely arcuated at its origin, then running parallel with R_1 and in a direct line with R_3 ; R_2 short, tending to be abortive; basal deflection of M_{1+2} shorter than the basal deflection of M_3 ; M_3+Cu_1 shorter than $r-m$.

One female, Savannah, North Brazil; Aug. 23, 1911 (Crampton, coll.). (Amer. Mus. of Nat. Hist. Coll.)

Two males, Igarape-Assú, Pará, Brazil; Feb. 4, 1912 (Parish, coll.).

One male, one female, Igarape-Assú, Pará, Brazil; Jan. 29, 1912 (Parish, coll.).

Specimens in Cornell University collection; one in author's collection.

LECTERIA MATTO-GROSSÆ, new species.

Head grayish; thorax with three dark brown stripes; pleuræ gray, with a brown stripe; abdomen light brown, with brown edges to the sclerites.

Length (abdomen broken) of head and thorax, 4.8 mm.; wing 13 mm.

Head: rostrum and palpi dark brown; antennæ, first segment, elongate-cylindrical, second, globular, cyathiform; remainder, short, oval, gradually more slender and cylindrical, armed with long hairs, brown. Front and vertex with a greyish-yellow bloom, clearer gray on the occiput; vertex armed with numerous prominent brown hairs, scanty or wanting along the median line.

Thorax: pronotum pale whitish-yellow, the anterior border of the scutum rather more brownish; mesonotum: præscutum, pseudosuture reduced to a narrow impressed line, shaped somewhat like an interrogation point, anteriorly brown, posteriorly, and a rounded area near the pseudosuture greyish-yellow, extreme cephalic margin of the sclerite gray; a narrow dark brown median stripe; a broader brown lateral stripe, anteriorly close to the median vitta, beyond the pseudosuture divergent toward the lateral margin of the sclerite; scutum light grayish-brown, lateral margin dark chestnut-brown, a continuation of the broad lateral præscutal stripes; scutellum and postnotum dull yellow, with a narrow, indistinct brown median stripe. Pleuræ yellowish, with a gray bloom; a dark brown stripe extending from the sternal region of the head across the pleuræ, encroaching on the base of the fore coxa, and extending to beneath the wing-basis. Halteres short, stem yellowish, knob rather browner. Legs, coxæ pale whitish-yellow; trochanters yellow (rest of legs missing).

Abdomen: tergum dull yellow, tip of each segment light brown; lateral margin of the sclerites broadly dark brown. (Terminal segments broken.) Sternum pale whitish, a narrow yellow median stripe, which sub-apically broadens out over the entire sclerite.

Wings: subhyaline with a faint yellow tinge; brown clouds at end of R_1 , R_2 , around cross vein r , at fork of R_{2+3} , at origin of R_{4+5} , along remainder of the cord, along cross vein m and the deflection of M_3 . Venation: Sc long, approximating R_1 at the tip as in the genus; r nearer to tip of R_1 than to the fork of R_{2+3} ; Rs long, strongly arcuated at its origin, then running parallel to R_1 ; R_{2+3} in a line with Rs and R_2 ; R_2 strongly curved cephalad at its tip; R_3 strongly curved caudad at its tip, so that cell R_2 is very broad on its distal portion; deflected portion of R_{4+5} very long, so that cell R_5 is much nearer the base of the wing than cells R_5 or first M_2 . M in a direct line with M_3 ; M_{1+2} fused for a long distance beyond m . Basal deflection of Cu₁ slightly anterior to the fork of M. (See fig. 39.)

Habitat.—*Holotype*.—Corumba, Matto Grosso, Brazil, April (II. II. Smith, coll.).

Type.—In American Museum of Natural History.

LECTERIA ARMILLARIS Fabricius.

Tipula armillaris FABRICIUS, Syst. Antl., 1805, p. 26.

Limnobia armillaris WIEDEMANN, Dipt. Exot., vol. 1, 1821, p. 13; Auss. zweif. Ins., vol. 1, 1828, p. 25.

Limnobia calopus WALKER, Ins. Saund., vol. 1, 1856; Dipt., p. 439.—HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 293.—KERTESZ, Cat. Dipt., vol. 2, 1902, p. 171.

Lecteria armillaris OSTEN SACKEN, Studies, etc., pt. 2, 1887, p. 206.—KERTESZ, Cat. Dipt., vol. 2, 1902, p. 218.

Male.—Length 9.2–17.8 mm.; wing, 10.2–12.8; abdomen 13 mm.; antennæ, 3 mm.; legs, hind, femora, 9.6–12.2 mm.; tibia, 9.3–11.6; tarsus, 6–8.9; middle, femora, 7.8–10.8; tibia, 7.4–10.2; tarsus, 6.4–9.4; fore, femora, 7.2–9.8; tibia, 8–10.4; tarsus, 6.9–10.4.

Head: rostrum and palpi dark brown; vertex and occiput dull blackish-gray with numerous long dark brown hairs; front dull gray. Antennæ rather short, dark brown, the flagellar segments with scattered long brown hairs and densely covered with shorter appressed hairs; genæ lighter brown.

Thorax: pronotum dark gray-brown; mesonotum, præscutum with an indentation on its margin above the spiracle; light gray with dark velvety blackish stripes, median one broadest near the center of the sclerite, extends back to the suture; on either side of the middle stripe is a lateral one which originates near the cephalic margin of the sclerite, forks at about one-third its length, the inner branch continuing directly back to the suture, the outer branch broadens out on the side of the sclerite, inclosing a rounded yellowish spot at its

caudal margin narrowly confluent with the inner branch. The space inclosed by the fork of this stripe, at its cephalic end, is glistening, mirror-like; behind this oval, glistening spot, a small cloud of chestnut-brown; a row of long hairs extending along the lateral branch and its fork, these hairs dark basally, paler brown at their tips; scutum dull blackish-gray; from both forks of the lateral præscutal stripes extends backward a narrow, velvety-black stripe, which meet in a triangle at the outer margin of the sclerite. Caudo-lateral margin of the sclerite produced into a blunt protuberance; scutellum and post-notum light gray, brown on the lateral margin above the base of the halteres. Pleuræ dull bluish-gray with indistinct black marks on some of the epipleural and sternal sclerites. Halteres light yellowish-brown, knob brown. Fore legs, coxæ yellow with a slight gray bloom on its external face; trochanter yellow; femur narrow at the base, soon thickened, clavate, its distal half with long outspread hairs; basal half of the femur pale whitish-yellow with light yellow hairs; a post-median brown ring with black hairs; a broad, bright yellow, sub-apical ring, and an apical ring with black hairs; tibia about uniform in diameter throughout its length, densely clothed with long prominent hairs, a broad basal ring dark brown with black hairs; a narrower, white, sub-basal ring with white hairs; a very broad, brown, median portion with black hairs; a broad white sub-apical ring with white hairs; a narrow apical ring with black hairs; tarsi with prominent hairs, first segment brown with brown hairs except at the tip, which is white with white hairs; segments two and most of three, white with white hairs; tip of three, and four and five, brown. Lower aspect of extreme tip of segment one, and extreme base of segment two, jet black, denticulate. Middle legs similar to fore, but post-median brown band on femur smaller and yellow sub-apical ring broader. Hind legs similar to fore, but the hairs even more conspicuous and showy; claws long, extended, smooth, or with mere indentations on the inner margin.

Wings: hyaline with brown veins; pale brown markings on the wing as follows: a large blotch at the origin of R_s , continuing across cell R ; a large row of markings at the tip of R_1 and along the cord; along the second deflection of M_3 and cross-vein m ; at tip of R_2 , apex of the wing, and a faint mark extending from the tip of second anal across cells second A and Cu . Venation (see fig. 42): Sc very long as in the genus; Sc_1 separated from R_1 at the tip by a space equal to the cross-vein $r-m$. R_s strongly arcuated at its origin, almost parallel with R_{11} , in a direct line with R_3 ; R_2 leaves R_3 shortly after the fork of R_s and is very strongly curved toward costa at its tip; R_{4+5} strongly arcuated on its deflection; basal deflection of M_{1+2} about four times as long as the basal deflection of M_3 ; M_3+Cu_1 longer than the basal deflection of Cu_1 ; Cu_2 equal to the basal deflection of Cu_1 .

Abdomen: tergum dark brown; apices of the segments yellowish; sternites dull yellow; hypopygium yellow.

Male, San Carlos, Costa Rica (coll. Schilde and Burgdorf). Male, Igarape-assú, Pará, Brazil (alcoholic, Jan. 30, 1912) (Parish, coll.). Female, same place and collector as last (pinned, Jan. 29, 1912).

Genus MONGOMA Westwood.

Mongoma WESTWOOD, Trans. Ent. Soc. Lond., 1881, p. 364.

Trentepohlia BIGOT, Ann. Soc. Ent. France, 1854, p. 474.

Paramongoma BRUNETTI, Rec. Ind. Mus., vol. 6, 1911, p. 295.

Mongomioides BRUNETTI, Rec. Ind. Mus., vol. 6, 1911, p. 296.

Mongomella ENDERLEIN, Zool. Jahrbuch, vol. 32, 1912, p. 61.

The genus *Mongoma* was erected by Westwood in 1881 with the African *fragillina* as type. No mention is made, in this paper, of the *Limnobia trentepohlii* Wiedemann which Bigot, in 1851, had made the type of his new genus *Trentepohlia*. Osten Sacken¹ uses the genus *Mongoma* but mentions that it is congeneric with *Trentepohlia*. Skuse² and Bergroth³ use the name *Trentepohlia*. Edwards⁴ uses *Trentepohlia* and writes that as Bigot definitely mentioned *trentepohlii* as type, the name can not be rejected. Brunetti⁵ splits the old genus *Mongoma* into three, proposing *Paramongoma* for the *albitarsis* group of the genus, and *Mongomioides* for *trentepohlii* and its allies. Brunetti's statement that *australasic* is a strict "*Mongoma*" (p. 291) and, a little later, that "The only Oriental species definitely referable to *Paramongoma* is *albitarsis* Doleschall, but *australasia* Skuse is certainly congeneric" (p. 296) is confusing.

Still more recently Enderlein⁶ has retained *Trentepohlia* for *trentepohlii* and its allies, as was suggested by Edwards,⁷ *Mongoma* for *fragillina* and its allies, and has proposed the new name *Mongomella* for the *albitarsis*'s group, with *pallida* Williston as type. The name is, of course, strictly synonymous with *Paramongoma* Brunetti.

I have recently shown⁸ that the species of the genus show a very gradual transition from one to another, and no division, not even subgeneric, can be accepted. For instance, the new species, *M. disjuncta* would represent another new group because of its two median branches that reach the wing margin, the *Paramongoma* group having but a single median vein. There is but one valid genus, with but a single subgenus, included in the *Mongoma* group and its species have an equatorial distribution (tropicopolitan).

¹ Studies on Tipulidæ, pt. 2, Berl. Ent. Zeitschr., vol. 31, p. 204.

² Dipt. Australia, p. 247.

³ Ent. Tidskr., vol. 9, p. 135.

⁴ Ann. and Mag. Nat. Hist., ser. 8, vol. 8, 1911, p. 63.

⁵ Rec. Ind. Mus., vol. 6, p. 291.

⁶ Zool. Jahrbuch, 1912, pp. 60-62.

⁷ Idem, p. 63.

⁸ Can. Ent., 1912, p. 88.

KEY TO THE SPECIES OF MONGOMA.

1. Veins Cu_1 and M_3 distinct at the wing margin. *disjuncta*, new species (Brazil).
Veins Cu_1 and M_3 not distinct at the wing margin. 2.
2. Tarsi of all the legs white. *nivitalarsis*, new species (Greater Antilles).
Tarsi of all the legs not white. 3.
3. Cell R_2 of the wings very long, much longer than cell R_5 4.
Cell R_2 of the wings short, about as long as cell R_5 5.
4. Larger species; length 7-8 mm. *manca* Williston¹ (Lesser Antilles).
Small species; length 5 mm. *extensa*, new species (Brazil).
5. No stigmal spot; ground color of the body yellow. *pallida* Williston² (Lesser Antilles).
Stigmal spot distinct; ground color of the body brown.
longifusa, new species (Panama).

MONGOMA DISJUNCTA, new species.

Antennæ brown; body and legs light brownish-yellow; veins M_3 and Cu_1 distinct at the wing margin.

Female.—Length, 11.6 mm.; wing, 10.2 mm; fore leg, femur 11.8 mm.; tibia 14; tarsus 12.6; hind leg, femur 12.4 mm; tibia 12.4; tarsus 9.6. Head: rostrum and palpi brown, the terminal segment s rather darker; antennæ brown; front, vertex, occiput and genæ brownish-yellow.

Thorax: prothorax light brownish, its pleura darker brown. Mesonotum: praescutum dull yellow with a faint brownish tinge; scutum, scutellum, and post-notum brownish-yellow. Pleuræ uniform dull yellow, with no decided contrasts in coloration. Halteres brownish-yellow, the knob, basally, slightly darker. Legs: coxæ, trochanters, femora, and tibiæ dull yellow, tarsi rather lighter yellow.

Wing: dull yellowish-hyaline, darkest at the tip; stigma oval, brown; veins brown, C and Sc more yellowish. Venation: Sc very long, as in the genus; Sc_2 retracted rather far backward, so that Sc_1 is rather longer than R_2 . R long, cross vein r just before its tip, oblique. R_s rather long, gently arcuated, about equal to R_{2+3} , R_2 short, rather sinuated. R_{4+5} fused with M_{1+2} , obliterating the cross vein $r-m$, this fusion continuing for a short distance beyond the cross vein m , when the veins separate in a symmetrical fork. M in a line with M_3 and Cu_1 ; basal deflection of M_{1+2} very long, longer than R_2 . Cu_1 about equal to Cu_2 ; Cu_1 fuses with M just before the fork of M; at the lower distal angle of cell first M_2 the veins separate, Cu_1 continuing in a straight line with Cu_1+M_3 , M_3 arcuates cephalad to the cross vein m and continues thence straight to the wing margin. Cu_2 strongly divergent from Cu_1 , forming an angle of about 75° . Cu_2 and first A free at the tip; second anal rather long. (See fig. 22.)

Abdomen: tergum dark brown; sternum, segments 1-6 dull yellow, 7-8 dark brown; genital segment dull yellow; valves of the ovipositor not very elongate, dark brown, extreme tips paler, yellowish.

¹ Williston, Trans. Ent. Soc. Lond., 1896, p. 293.

² Idem, p. 293, pl. 101, fig. 67.

Habitat.—*Holotype.*—Female, Esperito Santo, Brazil. Received from Staudinger and Bang-Haas.

Type.—In author's collection.

MONGOMA NIVEITARSIS, new species.

Dark brown; all tarsi white; wings hyaline.

Female.—Length, 6.8–7 mm.; wing, 6.1–6.3 mm.; hind leg, femur 9 mm.; tibia and tarsus together, 15 mm.

Head: rostrum and palpi dark brown; antennæ moderately elongated, dark brown. Front, vertex, and occiput dark brown.

Thorax: pronotum largely concealed from above by the forward projecting mesonotum, viewed from the side, the prothoracic scutellum is high, bearing six prominent bristles on its margin; separated from the scutum by a deep notch; pronotum dark brown. Mesonotum very gibbous, very dark brown; scutum, scutellum, and postnotum dark brown; pleuræ yellowish brown. Halteres long, slender, brown, the stem palest. Legs: coxæ and trochanters dull yellowish-brown; femora dark olive-brown; tibia brown, extreme base pale; tarsus, segments one and two brownish-white; three to five white, except the claws, which are brown.

Wings: hyaline, slightly darker toward the tip; stigma brown; veins brown. Venation, (See fig. 13.)

Abdomen: tergum dark brown; sternum yellowish-brown; ovipositor, valves very long, slender, dark-brown basally, remainder lighter brown.

The paratype has the tip of the tibiæ and all of the tarsal segments white.

Habitat.—*Holotype.*—Female, El Yunque, Porto Rico, West Indies; 2,850 feet; Feb. 25, 1900 (Coll. C. W. Richmond). *Paratype.*—Female, with the type, Feb. 27, 1900.

Type.—In U. S. National Museum collection (No. 14920).

MONGOMA EXTENSA, new species.

Brown; small, cross vein *r* slightly before the fork of R_{2+3} .

Female.—Length, 5.1 mm.; wing, 4.9 mm. Head: rostrum pale; antennæ and palpi brown; front and vertex brown; occiput and cervical sclerites rather paler brown.

Thorax: dorsum brownish-yellow, the mesothoracic scutum pale yellow in the middle and on the sides. Halteres pale, whitish, knob rather brown. Legs brown, the feet rather lighter-colored, dull yellow.

Wings: subhyaline, a triangular, pale brown, stigmal spot. Venation: R_{2+3} in a line with R_2 , which is shorter than it; R_{4+5} leaving R_2 at an angle of about 60° , very long. Fork of R_{2+3} opposite the tip of R_1 . Cross vein *r* very indistinct, slightly before the fork of R_{2+3} . Cu_2 rather close to first anal at its tip, the distance separating them at the wing margin only as long as Sc_2 . (See fig. 11.)

Abdomen brown.

Habitat.—*Holotype*.—Female, Culebra, Panama.

Type.—In U. S. National Museum collection (No. 14921).

Related to *M. manca* Williston, but much smaller and colorational and venational details different.

MONGOMA LONGIFUSA, new species.

Brown; stigmal spot distinct; R_{2+3} longer than R_2 alone.

Length 4.4 mm; wing 4.2 mm.

Female.—Head: antennæ and palpi brown; front, vertex, occiput and cervical sclerites brown.

Thorax: Dorsum brownish-yellow; an indistinct, very narrow, brown median line; transverse suture interrupted medially and præscutum produced caudad into two obtuse denticulæ; pleuræ dull yellow. Halteres light yellowish-brown. Legs uniform brown.

Wings: subhyaline; cells C and Sc slightly more yellow, stigmal spot and extreme tip of the wing pale brown; veins light brown. Venation: Sc_2 retracted rather far toward the base of the wing; R_{2+3} between r and the fork, longer than R_2 alone. Basal deflection of Cu_1 before the fork of M. (See fig. 10.)

Abdomen: light brown; lateral line black; the apical segments of the abdomen slender, tubular, valves of the ovipositor very slender, arcuated.

Habitat.—*Holotype*.—Female, Igarape Assú, Pará, Brazil, Jan. 19, 1912 (Parish, coll.).

Type.—In Cornell University collection.

Related to *M. pallida* Williston, but differs as follows: darker in coloration; a distinct, though pale, oval stigma; longer fusion of R_{2+3} , etc.

Genus LACHNOCERA Philippi.

Lachnocera PHILIPPI, Verh. Zoöl.-bot. Ges. Wien, vol. 19, 1865, p. 615.—OSTEN SACKEN, Monographs, vol. 4, 1869, p. 335.

The following description is adapted from Osten Sacken:¹

Antennæ, at least those of the male, are as long as the body, 13 segmented (?); first segment cylindrical, stout, elongated; the second of the same length as the first, gradually attenuated; the following ones slender, stouter in the middle, on both sides with four, hirsute hairs; the last segments are rather indistinct. Rostrum short; fourth segment of the palpi equal to the third in length (?). Wings with two marginal cells; the first large; the second short, separated from the first by an oblique vein; a single submarginal cell; four posterior cells; discal cell pentagonal; basal cells elongated, the second longer. Feet slender.

LACHNOCERA DELICATULA Philippi.²

The following is translated from Philippi's original description:

First segment of the antennæ testaceous; remainder and palpi, grayish-brown; thorax testaceous with brown stripes; coxæ and

¹ Translation, Monographs, vol. 4, 1869, p. 335.

² Verh. Zool.-bot. Ges. Wien, vol. 19, 1865, pl. 23, fig. 5.

trochanters pale; abdomen and remainder of the feet, greyish-brown; wings little infuscated; stigma dusky.

Male.—Length, body, 2½ lines; wing expanse, 6½ lines.

Habitat.—Valdivia, Chile.

Genus GONOMYIA Meigen.

Gonomyia MEIGEN, Syst. Besch., vol. 1, 1818, p. 146.—OSTEN SACKEN, Studies, pt. 2, 1887, p. 200.

Taphrosia RONDANI, Prodr., vol. 1, 1856, p. 1820.

Gonomyia OSTEN SACKEN, Monographs, vol. 4, 1869, p. 177.

Gonomyia appear to be numerous in the Neotropical regions and many species are herein recorded. Some of the aberrant species that I have referred to the subgenus *Leiponeura* Skuse, have been placed in various genera of the Antochini, simply because of the lack of one branch of the radial sector. Thus *Atarba puella* Williston, *A. pleuralis* Williston, *Elliptera*, sp. (Williston); *Elliptera alexanderi* Johnson, and the two Australian species of *Leiponeura* are, apparently, all *Gonomyia*. I have had for examination all of the American *Gonomyia* excepting *G. galactoptera* Bergroth, of Alaska. (Aldrich gives also *G. caudata* Lundberg, but Kertész calls this an *Empoda*.)

The American species referable to the subgenus *Gonomyia* Meigen, (type *tenella* Meigen) are *blanda* Osten Sacken; *cognatilla* Osten Sacken; *subcinerea* Osten Sacken; *sulphurella* Osten Sacken; *virgata* Doane; *galactoptera* Bergroth; *delicata*, new species; and *unicolor*, new species.

Those species referable to *Leiponeura* Skuse (type *gracilis* Skuse) are *manca* Osten Sacken; *pleuralis* Williston; *puella* Williston; *alexanderi* Johnson; and *puer*, new species.

In the genus *Gonomyia* the prominent foveæ on the sides of the mesothoracic præscutum that I have called the "pseudosuture" are normal in position, but the tuberculate pits are far cephalad and small, located on the anterior margin of the sclerite.

KEY TO THE SUBGENERA OF GONOMYIA.

1. Radial sector with 3 branches reaching the wing margin.....*Gonomyia* Meigen.
Radial sector with but 2 branches reaching the wing margin...*Leiponeura* Skuse.

KEY TO THE SPECIES OF LEIPONEURA SKUSE.

1. Femora with a distinct brown band before the tip.....2.
Femora unicolorous, not banded at the tip.....3.
2. Hind legs with the tibia china-white; tibiæ tipped with dark brown,
alexanderi Johnson¹ (Eastern U. S.).
Legs uniform, browni-h-yellow.....*manca* Osten Sacken² (Eastern U. S.).

¹ Psyche, Feb., 1912, p. 3, fig. 6.

² Monographs, vol. 4, pp. 173, 179 (male, footnote).

KEY TO THE SPECIES OF LEIPONEURA SKUSE—continued.

3. Pleural stripes dark chestnut-brown and yellow, distinct; stigma clear cut, dark-brown.....: *pleuralis* Williston (Cuba—St. Vincent Is.).
Pleural stripes indistinct, or faintly indicated; stigma faint or lacking..... 4.
4. A faint blue tinge on pleuræ; no stripes; mesonotum light brown,
puella Williston (Lesser Antilles; Mexico).
Pleuræ plumbeous with a yellow stripe; mesonotum brownish-gray,
puer, new species (Greater Antilles).

KEY TO THE SPECIES OF GONOMYIA MEIGEN.

(Neotropical and Nearctic, excluding boreal forms.)

1. Wings spotted..... *blanda* Osten Sacken¹ (E. and SE. United States).
Wings unmarked (except stigmal spot in cases).....2.
2. Femora with a distinct brown antepical band,
sulphurella Osten Sacken² (E. United States).
Femora unicolorous, unbanded.....3.
3. Antennæ orange or yellow at the basis.....4.
Antennæ entirely brown or black.....5.
4. Pleural stripes dark brown; Sc very short.... *delicata*, new species (Guatemala).
Pleural stripes reddish; Sc longer, ending slightly before the origin of Rs.,
cognatella Osten Sacken³ (E. United States).
5. Pleuræ with a brown stripe running from collare to base of halteres,
virgata Doane⁴ (W. United States).
Pleuræ without distinct stripes.....6.
6. Pleuræ uniformly light yellow; basal deflection of Cu₁ at the inner end of the short cell first M₂..... *subcinerca* Osten Sacken⁵ (E. United States).
Pleuræ rich light brown; basal deflection of Cu₁, under the middle of the long cell first M₂..... *unicolor*, new species (Mexico and C. America).

GONOMYIA (LEIPONEURA) PLEURALIS Williston.

Atarba pleuralis WILLISTON, Trans. Ent. Soc. Lond., 1896, p. 289, pl. 10, fig. 61, male and female.—COQUILLETT, Proc. U. S. Nat. Mus., 1900, p. 250.—KERTESZ, Cat. Dipteriorum, vol. 2, 1902, p. 189.—ALDRICH, Cat. N. Amer. Dipt., 1905, p. 82.—WILLISTON, Man. N. Amer. Dipt., 1908, p. 85 (fig. 32).

Atabarba pleuralis HUNTER, Trans. Amer. Ent. Soc., 1900, p. 290.

Gonomyia pleuralis ALEXANDER, Ent. News, vol. 23, 1912, p. 419.

Male.—Length, 5.1 mm; wing, 3.4 mm.

Female.—Length, 6.4 mm; wing, 5 mm.

Head: rostrum and palpi dark brown; antennæ, basal two or three segments light yellow, remainder brown; front, vertex and occiput light yellow; a black spot on the vertex between the eyes.

Thorax: mesothoracic præscutum rich chestnut-brown, lateral and cephalic margin broadly light yellow, this bordered internally by a narrow line of darker brown; pseudosuture light brown, short, triangular; scutum like the præscutum; scutellum yellow with a narrow

¹ Monographs, vol. 4, pp. 182, 183, male and female.

² Idem, pp. 180, 181, male and female.

³ Idem., p. 181, male and female.

⁴ Journ. N. Y. Ent. Soc., 1900, p. 189, pl. 7, fig. 21.

⁵ Monographs, vol. 4, pp. 181, 182, male and female.

brown median line; post-notum light yellow with a transverse semi-lunar mark on the cephalic margin of the sclerite. Pleuræ light yellow; a broad chestnut band extending along the dorsal edge of the epipleuræ, becoming indistinct beyond the wing-basis. Two dark brown bands, one just under the chestnut epipleural band, the other near the venter traversing the coxæ, these inclosing between them a rather broad light yellow stripe; sternum light yellow. Halteres light brownish-yellow. Legs light yellow; femora and tibiæ indistinctly darker at their tips.

Wings hyaline; stigma distinct, oval, dark brown.

Abdomen: caudal margin of tergites brownish-black, remainder of the tergites dull yellow; sternites light brown, darker on the pleural region, especially the first two abdominal segments where they are blackish-brown, formed by the conjunction of the brown thoracic pleural stripes.

Distribution.—Aguadilla, Porto Rico; Jan., 1899, female (Aug. Busck, coll.), (see Coquillett). Baracoa, Cuba; Sept., 1901 male (Aug. Busck, coll.). St. Vincent, West Indies (H. H. Smith, coll.), Williston, male and female.

GONOMYIA (LEIPONEURA) PUELLA Williston.

Atarba puella WILLISTON, Trans. Ent. Soc. Lond., 1896, pp. 288, 289, pl. 10, fig. 60, male and female.—KERTESZ, Catalogus Dipteriorum, vol. 2, 1902, p. 189.—ALDRICH, Cat. N. Amer. Dipt., 1905, p. 82.—ENDERLEIN, Zool. Jahrbuch, 1905.

Atarba puella HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 290.

Female.—Length, 3.4–4 mm; wing, 3.8 mm. Head: rostrum light yellow; antennæ, first two segments brownish-yellow, flagellum brown; front and center of the vertex light yellow; sides of vertex and occiput grayish.

Thorax: mesonotum, præscutum light brown with a faint dark brown bloom; pseudosuture deep, short, triangular, reddish; lateral margin of the præscutum pale yellowish-white; scutum, scutellum and post-notum light brown; caudal margin of the scutellum brownish-yellow. Pleuræ light brown with a distinct pinkish-white tinge overspreading the sclerites; sternum dull brownish-yellow. Halteres light colored, knob slightly darker. Legs yellowish-brown throughout. Wings hyaline.

Abdomen: uniformly brown, the sternum and genital segment lighter, yellowish.

Redescribed from two females from San Rafael, Vera Cruz, Mexico (Townsend, coll.), and two of Williston's female paratypes, from St. Vincent, 1,000 feet.

Distribution.—Vera Cruz, Mexico; St. Vincent, Lesser Antilles.

GONOMYIA (LEIPONEURA) PUER, new species.

Brownish-gray; scutellum pale on caudal margin; pleuræ plumbeous, striped with yellow; wings hyaline.

Female.—Length, 4.5–5 mm; wing, 4–4.5 mm. Head: rostrum brownish-yellow; palpi dark brown; antennæ light brown; front whitish, flesh color, semituberculate; vertex and occiput bluish-gray pruinose; genæ brighter blue-gray.

Thorax: mesonotum, præscutum brownish-gray except the extreme lateral margin which is light yellow, broadest anteriorly; pseudosuture elongate-triangular, reddish-brown; scutum brownish-gray, paler medially and on the externo-caudal angles; scutellum yellow; post-notum brownish-gray, thickly blue pruinose. Pleuræ plumbeous with a yellow stripe beginning above the fore coxa, continuing caudad to below the halteres, brightest anteriorly; sternum yellowish. Halteres pale, knob slightly darker. Legs: coxæ and trochanters yellow; femora, tibiæ and tarsi yellowish-brown, uniform.

Wings: hyaline, stigma very faintly indicated. (See fig. 14.)

Abdomen: dorsum dark brown; genital segment dull reddish-yellow.

Type.—In U. S. National Museum collection (No. 14932).

Paratypes.—Females: mesonotum grayish-brown, the cephalic and lateral margins of the præscutum pale, cream-color; pale pleural stripes broader; lateral margins of the abdominal tergites pale on their basal half, giving a semiannulated appearance.

Habitat.—*Holotype*.—Female, Santo Domingo, West Indies (Aug., 1905), (Busck, coll.).

Paratypes.—Females, with the type (San Francisco Mountains; Sept., 1905).

GONOMYIA (GONOMYIA) DELICATA, new species.

Antennæ with two basal segments light yellow; head light yellow with a dark line on vertex; mesonotum brown; pleuræ yellow with distinct brown stripes; legs unicolorous, yellowish-brown; wings hyaline; stigma pale brown.

Female.—Length, 4.6 mm.; wing, 6 mm. Head: rostrum and palpi dark brownish-black; antennæ, two basal segments light yellow, remainder dark brownish-black; front and occiput light yellow; vertex light yellow with a linear dark brown medial stripe; genæ faintly tinged with darker.

Thorax: pronotum light yellow with a broad median grayish-brown stripe; mesonotum brown; pseudosuture elongate, triangular, deep, shiny reddish; a pale line from the mesal end of this fovea continuing back to the transverse suture. Lateral margin of the præscutum bright light yellow, broadest behind. Scutum brown, indistinctly paler medially; scutellum light brown; post-notum

light yellow, browner in front. Pleuræ light yellow with two narrow dark brown stripes, the upper continuing from the side of the pronotum, obliquely caudad to the base of the halteres; the lower short, beginning under the precoxa, running backward to the mesocoxa. Halteres, brownish-white. Legs: coxæ and trochanters light yellow; femora, tibiæ and tarsi yellowish-brown, uniform.

Wings: hyaline, stigma pale brown.

Abdomen: tergum dark brown, uniform; sternum uniform light yellow.

Habitat.—*Holotype.*—Female—Totonicipan, Guatemala, Central America (1902), (G. Eisen).

Type.—In U. S. National Museum collection (No. 14933).

Near *G. cognatella* Osten Sacken; differing in coloration, pleural stripes more distinct, etc.; venation (Sc very short, etc.). *Delicata* has Rs rather long, arcuated at its origin with a slight spur; the distance on R from tip of Sc to origin of Rs almost as long as Rs itself.

GONOMYIA (GONOMYIA) UNICOLOR, new species.

Head dark gray; antennæ blackish-brown; mesonotum brown; pleuræ light brown, not striped; legs uniform yellowish-brown; wings hyaline.

Male.—Length, 3.9 mm.; wing, 4.6 mm.

Female.—Length, 4.8 mm.; wing, 5 mm.

Head: rostrum and palpi brown; antennæ uniformly dark blackish-brown throughout; front, vertex and occiput uniform blackish-gray.

Thorax: mesonotum, præscutum medium brown; pseudosuture prominent, dark brown; scutum similar to the præscutum; scutellum pale, yellowish; post-notum medium brown. Pleuræ rich light brown, the sternum rather darker. Halteres brown, paler at the extreme base. Legs: coxæ, trochanters, femora, tibiæ and tarsi, yellowish-brown, unicolorous.

Wings: hyaline. (See fig. 15.)

Abdomen: tergum medium brown throughout; hypopygium slightly paler; sternum paler, yellowish.

Habitat.—*Holotype.*—Female, Aguna, Guatemala, Central America (2,600 feet), (G. Eisen). *Allotype.*—Male, with the type. *Paratype.*—Male and female, with the type.

Type.—In U. S. National Museum collection (No. 14934).

Three specimens, two from Totonicopan, Guatemala, July, 1902, female and male (G. Eisen), and one from Córdoba, Mexico (May 8, 1908) (F. Knab), are larger, mesonotum more greyish, pseudosuture and tuberculate pits black, conspicuous and venation slightly different. I believe them to be variations of the species. Length, male 6.1 mm.; female, 7 mm. I have labeled them *unicolor*, var.

Genus SACANDAGA Alexander.

Sacandaga ALEXANDER, Ent. News, 1910, pp. 349-352, figs. 1-3; Idem, 1911, pp. 71-73.

KEY TO THE SPECIES OF SACANDAGA.

1. Length, 5 mm.; wing, 6-7 mm.; color of the body, yellowish; wings, hyaline.
flava Alexander¹ (Eastern U. S.).
 Length, 2.9-4.5 mm.; wing, 4-5 mm.; color of the body, brown; wings, gray.
parva, new species (Greater Antilles).

SACANDAGA PARVA, new species.

Antennæ brown; color of body brown; wings gray.

Male.—Length, 2.9 mm.; wing, 4 mm. Head: rostrum and palpi dark brown; antennæ dark brown, the first flagellar segment elongated. Eyes widely separated by the very broad front and vertex; front, vertex, and occiput dark blackish-brown with an indistinct sparse gray bloom.

Thorax: pronotum barely visible from above, dark brown, the sides of the scutellum more yellowish; mesonotum, præscutum rather dark brown; space in front of the pseudosuture more yellowish; pseudo-sutural fovea deep, shiny, dark brownish-black, elongate semilunar; tuberculate pits dark brown, far cephalad, nearer the anterior margin of the sclerite than to the pseudo-suture, separated from one another by a distance equal to about one and one-half the diameter of either; scutum, scutellum, and post-notum dark brown, pleurae grayish-brown, region about the wing basis yellowish. Halteres yellow at basis, stem and knob brownish; stem with long brown hairs. Legs: coxæ and trochanters dull yellow; femora, tibia, and tarsi dark brown.

Wings: gray throughout, costal cell more brownish; veins brown. Venation (see fig. 9): Sc quite long, its distance beyond the origin of Rs about two and one-half times the length of cross vein *r-m*. Sc₂ rather indistinct, far removed from the tip of Sc₁. R rather long, however, the tips of R₁ and R₂ are much more widely separated than in *S. flava*. Rs long, gently arcuated; R₂₊₃ much longer than cell R₂; R₃ is missing in its distal portion (an abnormality rather than a specific character); R₂ short, almost perpendicular; cross vein *r-m* and the basal deflection of R₁₊₃ subequal. Basal deflection of M₁₊₂ practically gone, M being almost in a line with M₁₊₂; second anal long bisinuated. Cell first M₂ not so regularly hexagonal as in *flava*, anal angle very prominent.

Abdomen: tergum dark brown, sternum brownish-yellow on basal five segments.

Female.—Length, 4.6 mm.; wing, 5 mm. Similar but larger; abdominal sternum darker, brown; valves of the ovipositor yellowish.

¹ Ent. News, vol. 22, 1910, pp. 349-352, figs. 1-3, male and female.

Habitat.—*Holotype*.—Male, Yallahs Valley, Blue Mountains, Jamaica, Feb. 24, 1911. *Allotype*.—Female, San Francisco Mountains, Santo Domingo, Sept. 27, 1905 (Aug. Busck, coll.).

Holotype.—In American Museum of Natural History.

Allotype.—In U. S. National Museum collection. (No. 14,930).

The discovery of this tiny species in the Greater Antilles is interesting. Its only known relative, *S. flava*, was but recently described from the Eastern United States. The present insect is in perfect generic agreement with *flava* in its shortened antennæ, prominent anal angle, sinuosity of second anal, etc.

Genus CRYPTOLABIS Osten Sacken.

Cryptolabis OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila., 1859, p. 224; Monographs, vol. 4, 1869, p. 185; Studies, etc., pt. 2, 1887, p. 205.

KEY TO THE SPECIES OF CRYPTOLABIS.

1. Rs short, so that the cell first R_1 forms a rough equilateral triangle; Rs shorter than the free portion of M_3 beyond the deflection of Cu_12.
Rs long, so that the cell first R_1 forms a triangle that is not equilateral; Rs longer than the free portion of M_3 beyond the deflection of Cu_1
tropicalis, new species (Central America).
2. Thorax wholly grayish-brown; head dark brown; antennæ brown
bisinuata Doane¹ (West. U. S.).
Thorax pale but with three black stripes, the middle one double; head blackish; antennæ black.....*paradoxa* Osten Sacken² (East. U. S.).

CRYPTOLABIS TROPICALIS, new species.

Pale, yellowish-brown; radial sector elongate.

Male.—Length, 3–3.8 mm.; wing, 4.4 mm. Head: rostrum and palpi brown; basal segment of the antennæ brown, remainder of the antennæ dark brown; eyes elongate-ovate, rather approximated; front brown; vertex narrow between the eyes; vertex and occiput light yellow.

Thorax: pronotum light yellow; mesonotum: præscutum light yellowish-brown with an olive tinge; scutum, scutellum, and postnotum yellowish-brown. Pleuræ pale whitish-yellow with a light brown line extending from the prosternum obliquely to the base of the halteres. Halteres light yellowish. Legs: coxæ, trochanters, femora, tibiæ, light brownish-yellow, the hind femora lightest yellow; tip of the tibia darker; tarsi light yellowish; segments 4 and 5 darker, brown. Wings hyaline, veins brown, except C, Sc, and R, which are yellow. (See fig. 8.)

Abdomen: tergum brown; genital segment light yellow; sternum light yellow.

A paratype differs in having the rostrum, palpi and front more yellowish; thoracic dorsum more distinctly tinged with brown; the second paratype has a more reddish tinge to the præscutum.

¹ Journ. N. Y. Ent. Soc., vol. 8, pp. 189, 190, pl. 7, fig. 22, male.

² Monographs, vol. 4, p. 186, pl. 2, fig. 11, male and female.

Habitat.—*Holotype*.—Male, Trece Aguas, Cacao, Alta Vera Paz, Guatemala, April 23, 1906 (Barber and Schwarz, coll.). *Paratypes*.—Two, same locality and collector; April 27.

Type.—In U. S. National Museum collection (No. 14929).

Genus MOLOPHILUS Curtis.

Molophilus CURTIS, British Entomology, 1833, p. 444.—OSTEN SACKEN, Monographs, vol. 4, 1869, p. 162.

KEY TO THE NEOTROPICAL SPECIES OF MOLOPHILUS.

1. Color black; fore and hind tibiæ with long fringes of hairs.

thaumastopodus, new species (Brazil).

Color light grayish-brown; tibiæ without conspicuous fringes of hairs.

guatemalensis, new species (Central America).

MOLOPHILUS THAUMASTOPODUS, new species.

Dull greyish-black; fore and hind tibiæ with long fringes of hair; wings and halteres dark.

Female.—Length, 4.2 mm; wing, 4.1 mm.; fore leg, femur, 3 mm; tibia and tarsus, 5 mm.; middle leg, femur, 2.6 mm; tibia and tarsus, 3.7 mm.; hind leg, femur, 4.6 mm; tibia and tarsus, 6 mm.; head: rostrum and palpi brownish-black; antennæ dark brown, each segment somewhat paler at the base; antennæ rather long, the segments oval, with long blackish hairs. Front, vertex and occiput dull grayish-black.

Thorax: dorsum dull grayish-black throughout; pseudosuture black. Pleuræ uniform dull blackish. Halteres black, light brown at the base. Foreleg: coxæ and trochanters yellowish-brown; femur brown, paler on the basal half, slender basally, stout apically, with long dark brown hairs appressed internally, subappressed externally, tibia slender, dark, blackish, with a patch of white hairs near the base on the outer side; a long fringe of black hairs on the same side, four or five times as long as the diameter of the tibia; tarsus black, segment 1 with the basal half white on the external side; tarsus clothed with long appressed hairs. Middle leg: coxa and trochanter dull yellowish-brown; femora rather uniform dark brown, with long appressed hairs; tibia dark brownish-black, a small white spot on the side near the base; tarsi dark brownish-black, a few white hairs at the base of segment 1. Hind leg: coxa and trochanter dull yellowish-brown; femora paler basally, dark brownish-black on the apical half, very slender at origin, but stout at the tip, at the extreme tip, on the outer side, a patch of white hairs; tibia slender, dark brownish-black, hairs long, appressed on basal third; on apical two-thirds, the hairs stand out straight on four sides, being from seven to eight times as long as the diameter of the tibia; tarsus, segment 1 black, with long black hairs on the outer face, appressed internally; segments two to five with long white hairs externally, short black ones internally.

Wings blackish-gray; veins with long black hairs; venation (see fig. 12); wings metallic in lights.

Abdomen: tergum black except the genital segment, which is dark brown; tips of the ovipositor yellow; sternum dark brown.

Habitat.—*Holotype*.—Female, Pará, Brazil (No. 6316 on slip) (C. F. Baker, coll.).

Paratype.—Female, Igarape Assú, Pará, Brazil, Jan. 21, 1912. (H. S. Parish, coll.).

Holotype.—In U. S. National Museum collection. (No. 14927).

Paratype.—In Cornell University collection.

MCLOPHILUS GUATEMALENSIS, new species.

General color light grayish brown; antennæ rather short, dark brown; legs normal.

Male.—Length, 4.8 mm.; wing, 5 mm. Head: palpi and rostrum dark brownish black; antennæ dark brown, rather short; front, vertex, genæ, and occiput uniformly dull gray; hind margin of the head broadly rounded.

Thorax: light grayish-brown; mesonotum: præscutum with a row of brown hairs on either side of the median line; pseudo-suture elongate-triangular, dark brown, connected with the lateral margin of the sclerite by a narrow depressed line; tuberculate pits jet black, rather far forward, about midway between the pseudo-suture and the cephalic margin of the præscutum, closely approximated, the distance between them less than the diameter of either one. Scutum grayish; scutellum light yellowish-brown; post-notum grayish. Pleuræ grayish-blue, darkest on the mesoepipleuræ. Halteres light yellowish-brown.

Feet: coxæ and trochanters light yellowish-brown; femora light brown, darkest apically; tibiæ yellowish-brown, tip dark brownish-black; tarsi black.

Wings: tinged with brown.

Abdomen: tergum dark brown clothed with long yellowish hairs; genitalia paler, yellow.

Habitat.—*Holotype*.—Male, Guatemala (probably Guatemala City), Cent. Am.; Sept. 10, 1902 (G. Eisen, coll.).

Type.—In U. S. National Museum collection (No. 14928).

Genus HELOBIA Le Peletier.

Helobia LE PELETIER, *Encycl. Méth.*, Ins., vol. 10, 1825, p. 585.

Symplecta MEIGEN, *Syst. Besch.*, vol. 6, 1830, p. 282.

Idioneura PHILIPPI, *Verh. Zoöl.-bot. Ges. Wien*, vol. 15, 1865, p. 615.

Symplectomorpha MEX, *Wien. Ent. Zeitung*, vol. 5, 1886, p. 318.

In the material from the United States National Museum there were six specimens that I have determined as the almost cosmopolitan species, *H. hybrida* Meigen. It is very probable that *H. macroptera*

Philippi¹ will prove to be the same species. The data for this material are:

Totonicipan, Guatemala, Central America, 1902 (G. Eisen, coll.), 3 males, 2 females. Antigua, Guatemala, Central America, 1 female.

Genus ERIOPTERA Meigen.

Erioptera MEIGEN, Illiger's Magazine, vol. 2, 1803, p. 262.

Chemalida RONDANI, Prodrômus Dipt. Italicæ, vol. 1, 1856, p. 180.

Limnaa RONDANI, Prodrômus Dipt. Italicæ, vol. 1, 1856, p. 181.

Ilisia RONDANI, Prodrômus Dipt. Italicæ, vol. 1, 1856, p. 182.

Limnoica RONDANI, Prodrômus Dipt. Italicæ, vol. 4, 1861, Corrigenda, p. 11.

Trichosticha SCHINER, Wien. Ent. Monatschr., vol. 7, 1863, p. 221.

Erioptera OSTEN SACKEN, Monographs, vol. 4, 1869, p. 146.

The subgenera of the genus ERIOPTERA Meigen.

Erioptera MEIGEN, Illiger's Magazine, vol. 2, 1803, p. 262.

Cheilotrichia ROSSI, Verz. österreich. Dipt., 1848, p. 12.

Acyphona OSTEN SACKEN, Monographs, vol. 4, 1869, p. 151.

Hoplolabis OSTEN SACKEN, Monographs, vol. 4, 1869, p. 152.

Mesocyphona OSTEN SACKEN, Monographs, vol. 4, 1869, p. 152.

Empeda OSTEN SACKEN, Monographs, vol. 4, 1869, p. 183.

Of these subgenera, *Mesocyphona* and *Empeda* are the only ones definitely known to occur in the Neotropical fauna. The great majority of species fall within the *Mesocyphona* group, which, in the tropics, shows quite a diversity of wing and leg patterns. The genus will probably prove to be a very extensive one when more extended collections are made.

In his Catalogue, E. Lynch Arribalzaga gives *Erioptera* (*Mesocyphona*) *hirsutipes* Macquart, described from the Canary Islands, and which Osten Sacken placed in *Trimicra*. There is certainly an error in this determination, and I have omitted the species from the list.

KEY TO THE SPECIES OF MESOCYPHONA.

1. Wings with dark or light spots 2.
Wings unspotted, hyaline or nearly so 11.
2. Wings light colored with darker, more or less distinct spots 3.
Wings dark colored, at least on the cells C, Sc, and R, with lighter spots and dots 4.
3. Femora, tibiæ, and tarsi conspicuously annulated.
annulipes Williston (Lesser Antilles, Brazil).
Femora, with one subapical ring; tibiæ and tarsi unicolorous.
parva Osten Sacken² (East. U. S., Brazil).
4. Large species (wing 6 mm. in length) *splendida*, new species (C. Amer.).
Smaller species (wing 4 mm. or less) 5.
5. Centers of cells M, Cu, and A of the wings almost hyaline, colorless.
knabi, new species (Mexico).
Centers of cells M, Cu, and A of the wings, although paler than cells C, Sc, and R,
more or less tinged with gray or brown 6.

¹ Verh. Zool.-bot. Ges. Wien, vol. 15, 1865, p. 615, pl. 23, fig. 4.

² Monographs, vol. 4, p. 162, male and female.

KEY TO THE SPECIES OF MESOCYPHONA—continued-

6. Spots on the wings scanty, twenty or less..... *eiseni*, new species (C. Amer.).
Spots on the wing numerous..... 7.
7. Mesonotum with a dark line on either side of the pale median vitta; tuberculate pits between the dark lines..... 8.
Mesonotum with three very narrow dark lines; the median one passing between the tuberculate pits..... *costalis*, new species (C. Amer., Cuba).
8. Mesonotum clear gray; pleural stripes clear-cut, distinct.
distincta Alexander ¹ (Southwest. U. S.).
Mesonotum yellowish; pleural stripes not clear-cut; indistinct..... 9.
9. Spots on the wings not occurring in the cells; femora with a subapical brown band only..... *dulcis* Osten Sacken ² (West. U. S.).
Spots on the wings numerous inside the cells; femora with a medial and subapical brown band..... (*caloptera* group) 10.
10. Lighter colored northern form; hind femora with the post-medial yellow band as wide as the subapical dark band,
caloptera caloptera Osten Sacken ³ (East. U. S.).
Dark southern form; hind femora with the post-medial yellow band much narrower than the subapical dark band,
caloptera femoranigra, new subspecies (Cent. Amer.).
11. Femora with a single dark subapical band,
immaculata, new species (Mexico, Cent. Amer.).
Femora with two dark bands..... *bicinctipes*, new species (Brazil).

ERIOPTERA (MESOCYPHONA) ANNULIPES Williston.

Erioptera annulipes WILLISTON, Trans. Ent. Soc. Lond., 1896, p. 294, female—
HUNTER, Trans. Amer. Ent. Soc., 1900, p. 290.—KERTESZ, Catalogus Dipterorum, vol. 2, 1902, p. 200.—ALDRICH, Cat. N. Amer. Dipt., 1905, p. 84.—
ENDERLEIN, Zool. Jahrbuch, 1912, pp. 54, 55, fig. G1, female.

Male.—Head: rostrum and palpi brown; antennæ brown; front, vertex and occiput clear light gray.

Thorax: mesonotal præscutum light brown; dorsal stripes very indistinct, close together; pseudosuture shallow, elongate, pale, tuberculate tips black, close together, the space between them about equal to the diameter of one; scutum and post-notum similar to præscutum; scutellum pallid, yellowish, with two indistinct dorsal lines. Pleuræ light brown, stripes indistinct, the pale white band between the second and third dark stripe, indistinct, narrow; sternum whitish. Halteres white throughout. Hind leg: coxa and trochanter pale yellow; femur long, white, with four blackish-brown rings, sub-basal, premedian, post-median, and subapical, the last broadest; tibia white with three rings, subbasal, median, and subapical, the last narrowest; first tarsal segment black at base and tip; segments 3 to 5 all black. Middle leg similar to hind leg, but first femoral band is very small, indistinct, the others gradually wider. Fore leg, similar to hind leg, but only three femoral bands.

¹ Psyche, vol. 19, Dec., 1912, pp. 165, 166.

² Western Diptera, Bull. U. S. Geol. Surv., vol. 3, No. 2, pp. 198, 199 (April, 1877).

³ Monographs, vol. 4, pp. 161, 162, male and female.

Wings hyaline, costa and subcosta indistinctly dark above the origin of R_s , at Sc_2 , at tip of Sc_1 , tip of R_1 , and tip of R_2 ; veins composing the cord darker.

Abdomen: light brown, with a dark median tergal stripe.

Allotype.—Male, Aguna, Guatemala, Central America (G. Eisen).

One male with the allotype; one female taken at Igarape Assú, Pará, Brazil, January 19, 1912 (Parish, coll.).

Ranges from St. Vincent to Brazil.

ERIOPTERA (MESOCYPHONA) PARVA, var. BRASILIENSIS, new subspecies.

Similar to the typical *parva* of the eastern United States, but much darker in coloration. The color of the body is dark brown, not brownish-yellow, especially pronounced on the abdomen which is uniform in pattern (see fig. 27).

Habitat.—Fifty-five specimens taken at Igarape Assú, Pará, Brazil, from January 19–February 7, 1912 (Parish, coll.). All of this large series were females.

Holotype.—Cornell University collection.

Paratypes.—In author's collection, American Museum of Natural History, Academy of Natural Sciences, and U. S. National Museum collections.

ERIOPTERA (MESOCYPHONA) SPLENDIDA, new species.

Large species; wing 6 mm. long; vertex variegated; mesonotum pale brownish-gray, bi-vittate dorsally; wing grayish-brown, spotted and dotted with white.

Male.—Length, 4 mm.; wing 6 mm.

Female.—Length, 4.7 mm.; wing, 6.1 mm.

Male.—Head: rostrum and palpi dark brown; antennæ, second segment oval, tumid, two basal segments brown; flagellum, first five segments cream color; remainder darker, brown. Front brown; vertex pale cream color nearest the eyes, in the center dark brownish-black; occiput and extreme median portion of the vertex grayish-yellow; the dorsal aspect of the head appears to have a dark V on a light ground.

Thorax: pronotum broader behind, prolonged cephalad into a long point; scutellum narrow, interrupted medially by a shallow fovea, pale brownish-gray. Mesonotum: præscutum with the tuberculate pits separated from one another by a distance equal to from one to two times the diameter of either tubercle; pseudosuture present as a deep linear hollow extending from the lateral margin of the sclerite, just above the spiracle, toward the median line; this hollow is broadest at either end, constricted or interrupted near its middle. Præscutum pale brownish-gray; lateral margins dark brown, broadest caudad, confluent in front; a longitudinal

stripe on either side of the middle line, this stripe narrow in front, broader behind, continuing almost to the suture, not touching the tuberculate pits; on the side of the sclerite, anterior to the pseudosuture, the ground color is brighter, yellowish; scutum similar in ground color, a forked brown stripe on either side which is a prolongation of the median præscutal stripes; scutellum grayish, paler behind; post notum gray with a brown median stripe; tuberculate pits and pseudosuture dark brown. Pleuræ grayish with three oblique brown bands; one (dorsal) passing through the mesothoracic spiracle; the second from the foreleg to the meta-notum; between these two, a yellow line extending from the cervical sclerites caudad; third dark band passes just above the mesocoxa; the second and third stripes delimit a broad, conspicuous, silvery-white area; sternum gray. Halteres light yellow, the knob darker, brownish. Legs: coxa brown; trochanter, paler, yellow; femora yellow with a brown subapical ring; tibia and tarsus light yellow, the apical two tarsal segments darker, brown.

Wings: grayish-brown with numerous white spots and dots abundantly sprinkled in all the cells; the larger spots being (1) in base of cells R and M; (2) at the origin of Rs; (3) at Sc₂ extending from the costa to the sector; (4) at the tip of Sc₁ and (5) along the basal deflection of Cu₁, the veins brown except where the spots encroach upon them where they are yellowish-white. (See fig. 28.¹)

Abdomen: tergum yellowish-brown, with a narrow black median stripe and a broader lateral one; sternum yellowish.

Habitat.—*Holotype.*—Male, Totonicipan, Guatemala, C. Am.; 1902 (G. Eisen). *Allotype.*—Female, with the holotype. *Paratype.*—Male, with the holotype.

Type.—In U. S. National Museum collection (No. 14922).

ERIOPTERA (MESOCYPHONA) KNABI, new species.

Vertex grayish-brown, unicolorous; mesonotum dull gray, dorsal stripes very narrow; pleural stripes rather indistinct; apical half of femora dark; costal and sub-costal cells of wing dark with a few large spots.

Female.—Length, 4 mm; wing, 4.2 mm. Head: rostrum and palpi dark brown; antennæ uniformly brown; front, vertex and occiput grayish-brown with a darker linear brown spot on vertex.

Thorax: pronotum white, the scutellum pale brown on the middle line, giving the appearance of being divided. Mesonotum: præscutum dull gray; the extreme lateral margins narrowly white; continued caudad from the end of the prothoracic scutellum; a broad sublateral band beginning near the pseudosuture, continuing caudad, indistinct, brown. The lateral bands on either side of the broad

¹ In the figure, No. 28, the vein Sc was accidentally omitted.

medial ground band very narrow, far removed from the tuberculate pits. Tuberculate pits separated from one another by a distance equal to one and one-half the diameter of either; pseudosuture elongate, rather deep; pits and pseudosuture shiny black. The space in front of the pseudosuture pale, whitish. Scutum dull gray with two brown stripes on either side of the middle line, continuations of the præscutal stripes; scutellum pale, grayer anteriorly, a large oval brown medial spot; post-notum dull gray with a narrow black medial line. Pleural stripes rather indistinct; ground color whitish with two oblique brownish bands, one along the dorsal edge of the epipleural sclerites, the second along the ventral edge of these sclerites; sternum gray with two indistinct brown bands. Halteres pale, knob darker. Legs—Fore: brownish yellow; femora, apical half dark brown with a subapical band of pale yellow hairs; tibia dark basally, remainder of tibia and three basal tarsal segments whitish; two apical tarsal segments brown. Middle: femora, dull yellow with an apical brown band; tibia and tarsi as in the foreleg. Hind: femora, apical half dark brown with a very narrow yellow subapical band; tarsi and tibiæ as in the foreleg.

Wing: cells A, Cu, M and caudal half of R almost hyaline; cells C, Sc and cephalic half of R brown with large spots; one at the base, one at the origin of Rs, one at Sc₂, one at cross vein *r* and fork of R₂₊₃; apices of cells R₃, R₅, M₁, brown; also narrow margins along most of the veins in the caudal half of the wing. (See fig. 25.)

Abdomen: brown, apices of the tergal segments paler.

Male.—Similar to the female but has a narrow brown line running along the middle of the mesothoracic præscutum, making the thoracic dorsum tri-vittate; this stripe ends far before the suture; the brown on the wings is less extensive, producing a very pale picture. Legs rather darker, especially the middle femora.

Habitat.—*Holotype*.—Female, Salina Cruz, Oaxaca, Mexico (Fredk. Knab). *Allotype*.—Male, Vera Cruz, Vera Cruz, Mexico, December 14, 1907 (F. Knab). *Paratype*.—Sex (?), Acapulco, Mexico (F. Knab).

Type.—In U. S. National Museum collection (No. 14924).

ERIOPTERA (MESOCYPHONA) EISENI, new species.

Vertex variegated: mesonotum light brownish-yellow; pleural stripes rather distinct; wings brownish, the spots only on the veins, few in number (about 16) and subequal.

Male.—Length, 3.3–3.6 mm; wing, 3.1–3.2 mm.

Female.—Length, 3–3.3 mm; wing, 3.2–3.4 mm.

Head: rostrum and palpi dark brown; antennæ pale yellow throughout; outer margin of the front and vertex along the inner side of the eye, light yellow; rest of the head brown.

Thorax: pronotum, scutum light yellow; scutellum pale whitish. Mesonotum: præscutum light brownish-yellow, extreme lateral mar-

gins of the sclerite white, caudad of this broadly brownish, especially behind; the stripe confluent in front; a rather broad uniform stripe on either side of the middle line; tuberculate pits and pseudosuture very pale, reddish; the pseudo-suture very shallow, not prominent, located in the pale patch between the brown præscutal stripes. Scutum yellowish-brown with four stripes, continuations of the uninterrupted præscutal stripes; scutellum and post-notum yellowish-brown, the latter darker medially. Pleuræ light brown; a narrow white oblique stripe runs from the cervical region back toward the wing-basis; a very broad white area, originating behind the precoxa, running backward obliquely to the halteres, narrowest anteriorly. Sternum pale greyish-brown with a pale stripe across the post and meso coxæ. Halteres white except the knob, which is darker. Legs: coxæ and trochanters white; femora pale yellowish, palest at the extremities, with an indistinct brown subapical ring; tibiæ and tarsi pale yellowish-white, last two tarsal segments darker.

Wings: costal, subcostal, and radial cells brown; median, cubital and anal cells grey; about sixteen large rounded spots on the wing arranged about as follows: (1), in base of cell R; (2), under origin of Rs; (3), at Sc₂; (4), at tip of Sc₁; (5), at tip of R₁; (6), at fork of R₂₋₃; (7), several confluent along the cord; (8), at the tip of each of the longitudinal veins; (9), at fork of M₁₊₂, and (10), in cell R₅. (See fig. 26.)

Abdomen: brown with an indistinct darker median line on the tergum.

Habitat.—*Holotype*.—Male, Aguna, Guatemala, Central America (2,000 feet) (G. Eisen). *Allotype*.—Female, with the type. *Paratypes*.—Three males, three females with the type.

Type.—In U. S. National Museum collection (No. 14923).

ERIOPTERA (MESOCYPHONA) COSTALIS, new species.

Vertex unicolorous, clear brown; mesonotum clear brown, narrowly trivittate; pleural stripes indistinct. Legs pale except a narrow subapical band on femora; costal and subcostal cells of wings dark with a few small dots.

Male.—Length, 2.8 mm.; wing, 2.9 mm. Head: rostrum and palpi dark brown; antennæ, front, vertex and occiput clear light brown.

Thorax: pronotum light yellow, the scutellum rather darker medially. Mesonotu: præscutum uniformly light brown with three very narrow indistinct dark brown lines, the medial one beginning at the cephalic margin of the sclerite, continuing backward, passing between the tuberculate pits; lateral stripes indistinct at the ends, strongly bent proximad near the middle by the pseudosuture. Tuberculate pits separated from one another by a distance equal to one and one-half the diameter of either; pits black; pseudosuture elongate

deep, pale reddish; scutum grayish brown, trivittate; scutellum, gray, broadly two-striped; post-notum dark. Pleuræ uniformly light brown without conspicuous stripes. Halteres pale, knob brown. Legs: brownish yellow, a narrow dark subapical ring on the femora.

Wings: cells C and Sc rather dark brown, with a few small inconspicuous dots; caudal cells pale, subhyaline. The picture of the wing is that of a dark costal area and the remainder of the wing pale. (See fig. 24.)

Abdomen: yellowish brown, a median tergal stripe, broadest on the first segment; lateral margin of the tergites darker.

Female.—Length, 5.7 mm; wing, 4.3 mm. Larger, the caudal cells of the wing darker, numerous dotted and sprinkled with paler.

Habitat.—*Holotype*.—Male, Aguna, Guatemala, C. Am. (G. Eisen, coll.). *Allotype*.—Female, Cayamas, Cuba. March 18 (E. A. Schwarz); (in house).

Type.—In U. S. National Museum collection (No. 14925).

ERIOPTERA (MESOCYPHONA) CALOPTERA Say; **FEMORANIGRA**, new subspecies.

Like *caloptera* Say in its variegated vertex, yellowish mesonotum, wing pattern, etc., but much darker in coloration, especially in the posterior femora.

Præscutal pits separated by a distance not greater than the diameter of one; located on the proximal edge of the dorsal thoracic stripes, these stripes as wide as, or wider than, the pale dorsal median stripe; hind femora largely black, the yellow being confined to the extreme tip, the base, and a narrow post medial ring.

This subspecies is closely allied to the more northern *caloptera* in its coloration and structure; the indistinct brown pleural stripes, the shape and position of the præscutal stripes, the wing pattern, etc. A notable and apparently constant difference, however, is in the posterior femora which are mostly black in the tropical form, the antepenultimate (yellow) ring being narrower than the penultimate (black) ring, and other clearly defined differences. In some specimens the last black ring is continued to the tip of the femur, obliterating the yellow apex of the segment. This is apparently merely a dark southern form of the species.

Habitat.—*Holotype*.—Female, Juan Vinas, Costa Rica, May 2, 1910; (P. P. Calvert) (in house). *Paratypes*.—Three females, with the type.

Type.—In Philadelphia Academy of Natural Sciences.

ERIOPTERA (MESOCYPHONA) IMMACULATA, new species.

Vertex brown anteriorly, more yellow behind; mesonotum grayish-yellow, stripes broad; pleural stripes distinct; femora with a narrow sub-apical band; wings unspotted

Male.—Length, 2.3 mm; wing, 2.9 mm.

Female.—Length, 2.2–3.4 mm.; wing, 3.9–4 mm.

Head: rostrum and palpi brown; antennæ, two basal segments dark brown, flagellum brown with pale hairs; front and vertex brown, the caudal portion of the vertex and the occiput dull yellow.

Thorax: pronotum light yellow above, on sides deep brownish-black forming a U-shaped mark around the scutum. Mesonotum: extreme lateral edges of the præscutum pale white, pale median stripe rather broad, grayish-yellow, pale lateral stripes, strongly tinged with brown, the usual brown stripes, broad, distinct; scutum brownish-yellow with four brown stripes; scutellum pale; postnotum pale, darker caudad. Tuberculate pits dark brown, separated from one another by a distance equal to from one and one-half to two times the diameter of either. Pseudosuture rather deep, elongate, broadest at the proximal end, pale brown. Pleuræ with distinct alternate dark and pale stripes, there being three brown and two pale, the second pale band is broad, silvery white; sternum dull gray. Halteres pale, knob brown. Legs: coxa grayish; trochanter yellow; femora dark yellow with a narrow brown subapical ring; tibiæ and tarsi yellow, the tarsal segments 3 to 5 darker, brownish.

Wings: hyaline unmarked; veins brown; costa more yellowish; an indication of darker along vein Cu. (See fig. 20.)

Abdomen: tergum dark brown, with no distinct darker median stripe; sternum brown.

Habitat.—*Holotype*.—Male, Bluefield, Nicaragua, November, 1900 (L. A. Wailes). *Allotype*.—Female, Córdoba, Mexico, December 25, 1907 (F. Knab). *Paratypes*.—One female, one male, Aguna, Guatemala (D. G. Eisen); one female, Córdoba, Mexico, December 23, 1907 (F. Knab).

Type.—In U. S. National Museum collection (No. 14926).

The Guatemalan specimens are very small, but undoubtedly belong to the same species.

ERIOPTERA (MESOCYPHONA) BICINCTIPES, new species.

Resembles *E. immaculata* of Mexico and Central America in its unspotted wings. It differs as follows: Flagellum of the antennæ much lighter colored (yellow) than the brown scape. Thorax: pronotum light colored (whitish) with a V-shaped mark on the scutum, very conspicuous. Mesonotum: yellowish, brown stripes not clear cut. Femora with the usual subapical brown band and with a subequal post-median band, this latter marking less strongly indicated on the forelegs.

Ten specimens, one male, nine females.

Habitat.—*Holotype.*—Male, Igarape Assu, Pará, Brazil, January 25, 1912 (Parish Coll.). *Allotype.*—Female, with the type, February 7, 1912. *Paratypes.*—Eight females, with the type.

Type.—In Cornell University collection. *Paratypes* in author's collection.

ERIOPTERA (EMPEDA) NIGROLINEATA Enderlein.

Empeda nigrolineata ENDERLEIN, Zoöl. Jahrb., vol. 32, 1912, pp. 56, 57, fig. III.

The species is allied to *E. stigmatica* Osten Sacken, especially in the variety *pubescens*. This race differs in having the pubescence of the wing, lack of the stigmal spot, and in color. Typical *nigrolineata* can not be mistaken for *stigmatica* by its very striking coloration.

A redescription of typical *nigrolineata*, based on forty specimens, is as follows:

Male.—Length, 3–3.3 mm.; wing, 4.8–5 mm.

Female.—Length, 3.9–5 mm.; wing, 5.1–6 mm.

Head: rostrum and palpi dull yellow, the latter more brownish; antennæ brown; front, vertex, and occiput brown, the vertex paler, yellow, in the vicinity of the eyes.

Thorax: light reddish-brown with a dark brownish-grey median stripe, broadest on the pronotum, where the whole sclerite is included, narrowing behind, becoming indistinct before the suture. Tuberculate pits close together, separated by a distance about equal to the diameter of one; pseudo-suture pale, reddish, shiny. Lateral margins of the præscutum pale yellow, scutum, scutellum and post-notum light reddish-brown. Pleuræ yellow, with a faint bluish tinge; no stripes. Haltere light yellow, knob slightly darker, brownish. Legs dull yellow, the tarsi darker, yellowish-brown.

Wings hyaline; veins light brownish-yellow.

Abdomen: light yellowish-red, base darker, brown; hypopygium yellow.

I have had for study a series of 49 specimens from the United States National Museum collection. These were collected by G. Eisen, Totonicipan, Guatemala, Central America, July, 1902. Forty of these are referable to typical *nigrolineata*; nine are referable to the following variety:

ERIOPTERA NIGROLINEATA, var. PUBESCENS, new subspecies.

The head above is uniformly light grey, the dark stripe of the throacic dorsum broad, on the præscutum expanded out over the entire sclerite with the exception of the anterior margin and the space in front of the pseudo suture. Pleuræ greyish with an indistinct broad yellowish stripe above the foreleg and running caudad beyond the wing basis; wings strongly tinged with yellow at the bases; a distinct, though sparse, pubescence in all of the cells of the wings.

Genus SIGMATOMERA Osten Sacken.

Sigmatomera OSTEN SACKEN, Monographs, vol. 4, 1869, pp. 137, 138.

1. Cell first M_2 distinct; brown crossband on the wing narrow, confined to the cord (Mexico)..... *flavipennis* Osten Sacken.¹
2. Cell first M_2 not distinct (cross vein *m* obliterated); brown crossband broad; base and tip of the wing brown (Brazil)..... *amazonica* Westwood.²

No representatives of this genus were included in the material studied.

Genus GNOPHOMYIA Osten Sacken.

Gnophomyia OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila., 1859, p. 223.

Farina JENNICKE, Abhandl. Senckenb. Ges., vol. 6, 1867, p. 318. OSTEN SACKEN, Monographs, vol. 4, 1869, p. 172; Studies, etc., pt. 2, 1887, p. 198.

KEY TO THE SPECIES OF GNOPHOMYIA.

1. Cross vein *m* absent..... *aperta* Coquillett³ (S. W. Canada).
- Cross vein *m* present..... 2.
2. Wings uniform in coloration without dark fasciæ..... 3.
- Wings light colored with dark fasciæ, or dark colored with white fasciæ..... 9.
3. Wings strongly tinged with blackish or dark brown, uniform..... 4.
- Wings subhyaline, or very slightly darker..... 8.
4. Halteres with the knob yellow..... *tristissima* Osten Sacken⁴ (Eastern U. S.).
- Halteres entirely dark colored..... 5.
5. Thorax black..... 6.
- Thorax orange..... 7.
6. Small species (length about 4 mm); wings inimed with violaceous; stigma brown..... *nigrina* Wiedemann⁵ (Brazil).
- Larger species (length about 6-7 mm); wings nearly black; costal cell darker; no distinct stigma..... *luctuosa* Osten Sacken (E. U. S.; Cent. Am.).
7. Abdomen black..... *rufithorax* Wiedemann (Brazil).
- Abdomen orange..... *magnifica*, new species (Mexico).
8. Dark rust red; wings uniformly tinged with brown. *ferruginea* Williston⁶ (Mexico).
- Greyish brown; wings very faintly tinged with brown; an indistinct hyaline cross band beyond the cord..... *subhyalina*, new species (Cent. Am., Brazil).
9. Wings subhyaline with two brown fasciæ..... 10.
- Wings brown with two subhyaline crossbands.
- caloptera* Osten Sacken⁷ (Brazil, probably).
10. Body, halteres and legs altogether black..... *osten sackeni* Skuse⁸ (Brazil).
- Body light yellow, with brown marks..... *hirsuta*, new species (Brazil).

I have not included in the above table, *Gnophomyia* (?) *stupens* Walker⁹ on the grounds that it is unrecognizable. In the original description, the venation is compared to a *Tricyphona*, but Osten Sacken says that it is a *Gnophomyia*. No species known to me has

¹ Monographs, Dipt. N. Amer., vol. 3, p. ix (supplement, Smiths. Misc. Coll., No. 256 (1873)).

² Trans. Ent. Soc. Lond., 1881, p. 366, pl. 17, fig. 3.

³ Journ. N. Y. Ent. Soc., 1905, p. 58.

⁴ Monographs, vol. 4, p. 175, pl. 2, fig. 5 (wing); male and female.

⁵ Auss. Zweifl. Ins., 1828, vol. 1, p. 37 (*Limnobia*).

⁶ Biologia Centrali-Americana, Diptera, vol. 1 (supplement), Dec., 1900, p. 226, female.

⁷ Studies on Tipulidae, pt. 2, Berl. Ent. Zeit., 1887, pp. 199, 200, male and female.

⁸ Osten Sacken, Idem, p. 200, female.

⁹ Trans. Ent. Soc. Lond., new ser., vol. 5, 1860, p. 333 (*Limnobia*).

brown on the costa and along the veins, and at the same time is large enough (12 mm) to answer this description. It agrees very well with the Mexican *Trimicræ*.

GNOPHOMYIA LUCTUOSA Osten Sacken.

Gnophomyia luctuosa OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila., 1859, p. 224, male; Monographs, vol. 4, 1869, p. 174; Cat. Dipt. N. Amer., 1878, p. 30; Berl. Ent. Zeit., vol. 31, 1887, p. 198.—JOHNSON, Proc. Acad. Nat. Sci. Phila., 1895, p. 320.—KERTESZ, Cat. Dipt., vol. 2, 1902, p. 210.—ALDRICH, Cat. N. Amer., Dipt., 1905, p. 87.

Linnobia nigricola WALKER, Trans. Ent. Soc. Lond., 1860, p. 333.

One female from Guatemala, Central America (Sept., 1902) (Coll. G. Eisen.).

Length, 6 mm.; wing, 6.3 mm.

Specimen in U. S. National Museum collection. (See fig. 29.)

GNOPHOMYIA RUFITHORAX Wiedemann.

Linnobia rufithorax WIEDEMANN, Auss. Zweifl. Ins., vol. 1, 1828, p. 548, male.
Furina rufithorax JENNIEKE, Abhandl. Senckenber. Ges., vol. 6, 1867, p. 318, pl. 43, fig. 1.

Gnophomyia rufithorax OSTEN SACKEN, Berl. Ent. Zeit., vol. 31, 1887, p. 198.—HUNTER, Trans. Amer. Ent. Soc., 1900, p. 291.—KERTESZ, Cat. Dipt., vol. 2, 1902, p. 211.

Male.—Somewhat injured, head missing.

Thorax: pronotum black, reddish along the caudal margin. Mesonotum: yellowish-orange, darker, brownish, behind. Pleuræ orange, the meso- and meta-coxæ orange at the bases. Legs black.

Wings brown, posterior cells paler. (See fig. 32.)

Abdomen black.

Male, wing 11.5 mm.

Chapada, Matto Grosso, Brazil (March) (H. H. Smith, coll.) (specimen in American Museum of Natural History).

GNOPHOMYIA MAGNIFICA, new species.

Head, legs and wings black; thorax and abdomen orange-yellow.

Female.—Length 14 mm.; wing, 13 mm.

Head: rostrum and palpi dark brownish-black. Eyes rather approximated; antennæ entirely black. Front, vertex and genæ black, occiput dull orange-yellow; front shiny.

Thorax: pronotum, scutum bright orange-yellow, darker in front, paler behind; scutellum narrow, transverse, pale yellow. Mesonotum: præscutum deep orange-yellow without stripes, a row of hairs along either side of the middle prominence, passing mesad of the pseudosutural fovea, a rounded whitish spot occupying the region of the pseudo-suture, lateral margins of the sclerite paler, light yellow; scutum, scutellum and post-notum orange-yellow, the latter slightly suffused with brown, especially medially. Pleuræ

orange-yellow, darker near the sternum and on the coxæ. Halteres black, brown at the extreme bases. Legs: coxæ yellowish-brown; trochanters, femora, tibiæ and tarsi jet black.

Wings deep shiny-black throughout. (See fig. 31.)

Abdomen: deep orange throughout.

Holotype.—Female, Cuernavaca, Mexico (D. L. Crawford, coll.).

Type.—In collection of Prof. C. F. Baker, Pomona College.

GNOPHOMYIA SUBHYALINA, new species.

Grayish-brown; legs unicolorous, except tarsi; wings subhyaline, very pale brown with a hyaline cross-band.

Male.—Length, 4.8–6 mm; wing, 4.8–6.1 mm.

Female.—Length, 5.2–7 mm; wing, 5–6.8 mm.

Head: palpi and rostrum dark brown; antennæ, basal segments yellowish-brown, flagellum medium brown, the segments covered with a dense pale pubescence. Front, vertex and occiput gray, tinged with brown.

Thorax: pronotum: scutum grayish-brown; scutellum light yellow, brightest laterally. Mesonotum: grayish-brown, without stripes; pseudo-suture prominent, triangular, with a prolongation extending lateral to the caudal end of the prothoracic scutellum, dark brown. Scutum grayish-brown, more yellowish on the sides nearest the wing bases; scutellum and post-notum medium brown. Halteres brownish-yellow, knob pale. Legs: coxæ and trochanters pale yellow; femora, tibiæ and most of tarsal segments one and two brown; remainder of the tarsi brownish-black.

Wings: subhyaline, veins dark brown; wings very faintly tinged with brown; a broad hyaline band which crosses the wing distad of the cord is broadest posteriorly; venation (see fig. 23).

Abdomen: tergum dark brown; sternum lighter yellowish-brown.

The paratypes are rather smaller, but undoubtedly belong to the same species.

Habitat.—*Holotype*.—Cacao, Trece Aguas, Alta Vera Paz, Guatemala, April 2 (Schwarz and Barber, coll.). *Allotype*.—Same place as the type, April 20. *Paratypes*.—Male, Montserrat, Trinidad, West Indies, June, 1897 (Aug. Busek, coll.). Three males, seven females, Aguma, Guatemala, Central America (G. Eisen, coll.). One female, Igarape Assú, Pará, Brazil (H. S. Parish, coll.).

Types.—In U. S. National Museum collection (No. 14931).

GNOPHOMYIA HIRSUTA, new species.

Thorax light yellow with four stripes; legs with dark tips to the femora, tibiæ and tarsi; wings hyaline with two conspicuous brown bands.

Female.—Length, 7 mm.; wing, 6.6 mm. Head: rostrum and palpi yellowish-brown; antennæ, basal segments brownish-yellow, flagellum

lighter yellow, segments with numerous long black hairs. Front, vertex and occiput dull yellow with a brown tinge; genæ clearer brown.

Thorax: pronotum light yellow. Mesonotum: præscutum covered with a thick pubescence, light yellow with two brown stripes on either side of the median line, these stripes pale, yellowish-brown in front; a large rounded brown spot on the sides of the sclerite before the pseudosuture; scutum, scutellum and post-notum brown, the latter darker. Pleuræ light yellow with a broad brown band running from the side of the pronotum, backward under the wing-bases to the post-notum; sternum light brown. Halteres broken, stem yellow. Legs light yellow, a light brown ring at the tip of the femora, a darker one at the tip of the tibiæ; tarsi, tip of segment 2, all of 3 to 5 dark brown; legs densely hairy.

Wings: hyaline with two brown bands, one traversing the wing-basis, extending from near the humeral cross vein to the origin of the sector, narrower in the anal cells. The second band is in the vicinity of the cord, cells second R_1 almost all included, base of cell R_3 , tip of cell R , base of cells R_3 and first M_2 ; a prominent brown cloud at the basal deflection of Cu_1 and along the second deflection of M_3 and cross vein m (outer end of cell first M_2); a very pale brown cloud extends across the cells R_2 , R_3 , R_4 , and M_2 . Venation (see fig. 30).

Abdomen: tergum light yellow; all except segment 5 with the sclerite largely brown, especially caudally and laterally; segment 5 clear yellow; sternum light yellow.

Holotype.—Female, Rio de Janeiro, Brazil (November) (coll. H. H. Smith).

Type.—In American Museum of Natural History.

Genus TRIMICRA Osten Sacken.

Trimicra OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila., 1861, p. 290; Monographs, vol. 4, 1869, p. 165; Studies, etc., pt. 2, 1887, p. 195.

Ilisia RONDANI, Prodr., vol. 1, 1856, p. 182.

KEY TO THE AMERICAN SPECIES OF TRIMICRA.

1. Antennæ uniformly brown; wings not pubescent; large species, length, 7 mm. or over.....*anomala* Osten Sacken.¹
- Antennæ with the basal segments yellow; wings pubescent; small species, length, 5 mm. or less.....*pygmaea* Alexander.²

In the United States National Museum collection is a series of specimens from Mexico which agree very well with the description of *T. anomala*, and I have determined them as such. As to whether or not this species is conspecific with the European *Trimicra pilipes* Fabricius, as given by Osten Sacken in his Western Diptera, page 200,

¹ Proc. Acad. Nat. Sci. Phila., 1861, p. 290; Monographs, vol. 4, p. 167.

² Psyche, vol. 19, Dec., 1912, p. 166, pl. 13, fig. 3.

I will not attempt to decide without having European material for comparison. The data for the Mexican specimens are as follows:

Córdoba, Mexico, December 18, 1907, male and female; February 11, 1908, male and female; February 16, 1908, two females; March 12, 1908, three females; March 16, 1908, male. Orizaba, Mexico, March 13, 1908, male and female (Fred. Knab, coll.).

KEY TO THE GENERA OF THE LIMNOPHILINI.

(Based largely on Needham's key, 1907.)

1. Ocelli present.....2.
- Ocelli absent.....3.
2. Cell M_1 present; basal deflection of Cu_1 near the outer margin of cell first M_2 (i. e., fusion of Cu_1 and M_1 very slight).....*Trichocera* Meigen.
- Cell M_1 absent; basal deflection of Cu_1 at, or near, the fork of M (i. e., fusion of Cu_1 and M extensive).....*Ischnothrix* Bigot.
3. Radial cross vein absent.....*Phyllolabis* Osten Sacken.
- Radial cross vein present.....4.
4. Cross vein m absent; fusion of M_3 and Cu_1 long and ending in a symmetrical fork.....*Polymera* Wiedemann.
- Cross vein m present; fusion of M_3 and Cu_1 usually short; fork not symmetrical.....5.
5. Wings pubescent; two branches of M*Utomorpha* Osten Sacken.
- Wings glabrous (usually); if pubescent, three branches of M at the wing margin.....6.
6. A supernumerary cross vein in cell C*Epiphragma* Osten Sacken.
- No supernumerary cross vein in cell C7.
7. Antennæ of male with long pectinations; usually with more than 16 segments.
Ctedonia Philippi.
- Antennæ of male of various shapes, but never pectinate; 16-segmented.....8.
8. Sc very long, approximating R_1 at wing-margin.....*Lecleria* Osten Sacken.
- Sc shorter, always distant from R_1 at the tip.....*Limnophila* Macquart.

Genus ISCHNOTHRIX Bigot.

Ischnothrix BIGOT, Miss. Sci. Cape Horn, Zoöl., pt. 6, 1888, pp. 7, 8, pl. 2.

Male.—Related to the genus *Trichocera*. Antennæ hair-like, two or three times as long as the body, with 13 or 14 (?) segments, segment 1 short, stout, second scarcely visible, the remainder elongated, cylindrical, attenuated apically; rostrum almost as long as the head, horizontal, abruptly truncated at the tip; palpi 5 segmented, the fifth not much longer than the others, indistinctly furrowed; three ocelli; feet very long, smooth, not swollen; wings margined with short hairs, twice as long as the abdomen: first and second longitudinal (Rondani) veins separate at their tips: three veins emerge from the pentagonal discal cell, widely separated basally, not forked: from the first basal cell, two veins, the outer forked; hypopygium small, clasping; abdomen scantily clothed with fine hairs on both sides. (Bigot).

ISCHNOTHRIX ÆTHEREA (Bigot).

Male.—Eight mm. Antennæ testaceous, broadly infuscated at the tip; palpi black; rostrum brown, tip tinged with black; head

brown, front with a median brown vitta; thorax reddish, tinged with dull brown; halteres whitish; abdomen testaceous, incisures infuscated; feet testaceous; wings almost hyaline, in the middle slightly tinged with whitish; stigma small, black; transverse veins and the third longitudinal vein at the base margined with brown.

Translated from Bigot's original description. His figure shows an insect with a moderately long Sc_1 ; Sc_2 not far from the tip of Sc_1 ; R_{2+3} long fused, much longer than either R_2 or R_3 , which are subequal; M_{1+2} fused to the wing margin; the outer deflection of M_3 about equal to the cross-vein m ; basal deflection of Cu_1 at the fork of M . The anal angle of the wing is prominent.

Genus *POLYMERA* Wiedemann.

Polymera WIEDEMANN, Dipt. Exot., vol. 1, 1821, p. 40.—OSTEN SACKEN, Monographs, vol. 4, 1869, p. 335; Studies, etc., pt. 2, 1887, p. 215.

The genus *Polymera* is a very characteristic one in the Neotropical regions. Almost every collection brought from South or Central America includes specimens of this interesting group, and it is very probable that it will ultimately prove to be one of the largest genera of the tropical crane-fly fauna. One species, *Polymera magnifica* Meunier,¹ has been described as fossil.

The recent species hitherto described, five in number, range from Brazil to the southeastern United States. I have had for study about 25 specimens which included all of the known species, excepting *fusca* Wiedemann and *albitarsis* Williston, as well as seven new forms. The males, as now known, are all characterized by extremely elongated antennæ, at least as long as the body, and usually clothed with long delicate, outstretched hairs. The antennal segments may be elongate-cylindrical and not constricted (*niveitarsis* and possibly *fusca*), or they may be constricted once, producing a bi-nodose effect (most of the species), or constricted twice, producing a tri-nodose appearance (*pleuralis*). Specialization in wing venation is also evident, ranging from a generalized form like *niveitarsis* with deep forks, through *pleuralis* which has lost one of the forks (M_{1+2} fused to the margin) but still has a deep medio-cubital fork, to *conjuncta*, which shows a decided tendency for Cu_1 and M_3 to fuse to the wing-margin.

Wiedemann does not say that the antennæ of the female *fusca* are elongated like those of the male (as described by Williston, Dipt. St. Vincent, p. 297). The sex of the specimen that he figures is not given, but it is undoubtedly a male. The venation and antennæ are so similar to *niveitarsis* that it would not be surprising if the second specimen that Wiedemann possessed² from the Frankfort Museum proved to belong to that species.

¹ Ann. Sci. Nat. Zool., vol. 4, p. 385, pl. 14, figs. 11, 12; pl. 15, fig. 2; pl. 16, fig. 1.

² Auss. Zweifl. Ins., vol. 1, p. 554.

Antennæ: first segment broadly oval-cylindrical; second short, oval-cylindrical, much narrower than the first; third segment elongate-cylindrical, not constricted, with long delicate hairs; segments 4 to the end, constricted at the ends, and constricted once or twice medially, producing a bi-nodose or tri-nodose appearance. As previously stated, some (as *niveitarsis*) have simple flagellar segments; at the nodes, the segments are clothed with long outstretched hairs which are much longer than the segments which bear them; interspersed with these are very short, prominent bristles, and over the whole segment is a fine delicate pubescence.

Palpi: first segment very short, second and third subequal in diameter and length; fourth about as long as 2 and 3 together, narrower than either.

Venation: Sc_2 at, or near, the tip of Sc_1 ; R long, R_1 usually far back from its tip; M_1 and M_3 usually separate at the wing-margin; M_2 and Cu_1 fused for a considerable distance, when separating, the fork symmetrical; cross vein *m* absent.

Genitalia: male (*obscura*); pleuræ very long, cylindrical, thickly clothed on the external facies with long hairs; two apical appendages; anal tube broad, distinct; guard of the penis scarcely visible from the exterior.

KEY TO THE SPECIES OF POLYMERA.

1. Cell M_1 entirely absent.....2.
Cell M_1 present.....3.
2. Large species (wing 6.2-6.8 mm.); Cu_1+M_3 shorter than M_3 alone; pleuræ dark; tarsi white.....*pleuralis*, new species (Brazil).
Small species (wing 3-3.5 mm.); Cu_1+M_3 longer than M_3 alone; pleuræ not dark; tarsi not white.....*conjuncta*, new species (Brazil).
3. Wings not uniform in coloration.....4.
Wings uniform in coloration.....6.
4. Wings dark colored with lighter spots or fasciæ.....5.
Wings hyaline, or nearly so, with small brown spots at the forks of most of the veins.....*obscura* Macquart (Brazil).
5. Wings with white or whitish spots.....*superba*, new species (Costa Rica, Brazil).
Wings with a light yellow cross-band.....*horticornis* Fabricius (Brazil).
6. Flagellar segments of the antennæ elongate-cylindrical, not noticeably constricted.....7.
Flagellar segments of the antennæ constricted once or twice, giving a multi-segmented appearance to the antennæ.....8.
7. Tarsi of all the legs white.....*fusca* Wiedemann¹ (Brazil).
Only tarsi of hind legs white.....*niveitarsis*, new species (Guat., Brazil).
8. Fore and middle tarsi more or less yellowish-white or white.....9.
Fore and middle tarsi dark, about concolorous with the tibiæ.....11.
9. Antennæ conspicuously annulated, rather short (about as long as the body).
georgiæ Alexander² (Southeast U. S.).
Antennæ not conspicuously annulated, much longer than the body.....10.

¹ Auss. Zweifl. Ins., vol. 1, pp. 53 and 554, pl. 6b, figs. 3-4. Original description in Dipt. Exot., vol. 1, p. 44.

² Psyche (Dec., 1911), pp. 199, 200, fig. 5.

KEY TO THE SPECIES OF POLYMERA—continued.

10. Thorax light-colored; brownish-yellow with a narrow dark pleural stripe; wings brown..... *albitarsis* Williston¹ (Lesser Antilles).
 Thorax uniform in color, dark brown; wings gray... *thoracica*, new species (Brazil).
11. Large species; length (male) 4.5 mm.; wing 4.7 mm.; distance of R_1 beyond r equal to that space between Sc_2 and r ; wings yellowish.
inornata, new species (Brit. Guiana).
 Small species; length (male) 3 mm.; wing 4.6 mm.; distance of R_1 beyond r much less than that space between Sc_2 and r ; wings gray.
grisea, new species (Panama).
 (Probably here; see description.)

POLYMERA PLEURALIS, new species.

Size medium; flagellar segments of the antennæ tri-nodose; wing with cell M_1 absent; $M_3 + Cu_1$ much shorter than M_3 alone; tarsi white or whitish; thoracic pleuræ with a broad black stripe.

Length, male, 5 mm.; female (to tip of ovipositor), 6.6–6.8 mm.; wing, male, 6.4 mm.; female, 6.2–6.8 mm.; antennæ, male (about), 8.5 mm.; hind leg, female, femur, 5.4 mm.; tibia + tarsus, 8.6 mm.

Male.—Palpi and rostrum light brown, the latter more yellowish; eyes large, conspicuous, leaving the vertex narrow between the eyes; vertex grayish; occiput brownish-gray. Antennæ, basal segment dark brown, second lighter brown, third elongate-cylindrical fifth to near the end (most noticeable in the region of the tenth segment) constricted twice, producing a tri-nodose effect, segments brown, the extreme base and tip paler, yellowish, giving an annulated appearance to the antennæ.

Thorax: dorsum uniform light brown; pleuræ very broadly dark brownish-black, extending from the cervical sclerites to the abdomen, this color encroaching on the fore coxa; sterna pale whitish-yellow. Halteres light brown, the knob rather dark. Legs: coxæ, trochanters and extreme base of the femora pale whitish-yellow, remainder of the femora and the tibiæ pale brown, darker at the extreme tip; tarsi yellowish-white, except the last segment, which is brown.

Wings: uniformly tinged with light brown. Venation: Sc rather long, ending about opposite the fork of R_{2+3} ; Rs not gently arcuated at its basis, but rather square; R_1 beyond the cross-vein r about two-fifths the distance from Sc_2 to r ; R_{2+3} short, shorter than the basal deflection of Cu_1 ; basal deflection of R_{1+5} longer than $r-m$. M_{1+2} fused to the wing-margin. $M_3 + Cu_1$ short, only about two-fifths as long as Cu_1 beyond the fork. (See fig. 17.)

Abdomen blackish, sternum little, if any, paler.

Female.—Quite similar to the male, but antennæ short, normal in appearance, not annulated; if bent backward, would extend about to the base of the abdomen. In color and venation, as in the male.

¹ Trans. Ent. Soc. Lond., 1896, p. 296, pl. 10, fig. 71.

Habitat.—*Holotype*.—Male, Igarape Assú, Pará, Brazil; February 4, 1912 (Parish). *Allotype*.—Female, Igarape Assú, Pará, Brazil; February 7, 1912 (Parish). *Paratype*.—Female, Igarape Assú, Pará, Brazil; January 19, 1912 (Parish).

Types.—In Cornell University collection.

Paratype.—In author's collection.

POLYMERA CONJUNCTA, new species.

Size small; flagellar segments of the antennæ bi-nodose; wing with cell M_1 absent; $M_2 + Cu_1$ longer than M_2 alone; tarsi not lighter colored than the tibiae; thoracic pleuræ unicolorous with the dorsum.

Male.—Length (abdomen unbroken); female, 2.8 mm.; wing, male, 3.5 mm.

Female.—Length, 3 mm.; antennæ, male, 4.4 mm.

Male.—Antennæ dark brownish-black, not annulated, the flagellar segments bi-nodose, deeply but broadly constricted medially; a group of outstretched hairs extending from each node.

Thorax light brown, rather yellowish; mesothoracic postnotum dark colored; pleuræ not clearly darker than the rest of the thorax. Halteres pale. Legs brown, the tarsi not paler, excepting the posterior tarsi, which are rather paler brown.

Wings light brownish-grey. Venation: Sc short, Sc_1 ending slightly before, or opposite to, the fork of R_s ; R_s rather square at its origin; R_{2+3} long; basal deflection of R_{2+3} long. M_{1+2} fused to the wing margin. $Cu_1 + M_2$ much longer than M_2 alone. Basal deflection of Cu_1 slightly before, or opposite to, the fork of M_1 . (See fig. 7.)

Abdomen brown, darker than the thorax.

Female.—Antennæ short, segments simple, brown; coloration as in the male. Venation as in the male, but cross vein r inserted nearer to the fork of R_{2+3} and R_2 is almost at a right angle to R_2 at its origin.

Habitat.—*Holotype*. Male, Igarape Assú, Pará, Brazil, Feb. 4, 1912 (Parish). *Allotype*.—Female Igarape Assú, Pará, Brazil, Feb. 4, 1912 (Parish).

Types.—In Cornell University collection.

POLYMERA OBSCURA Macquart.

Polymera obscura MACQUART, Dipt. Exot., vol. 1, pt. 1, 1833, p. 65, pl. 8.—WILLISTON, Trans. Ent. Soc. Lond., 1896, p. 297.—HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 232.—ALEXANDER, Psyche, 1911, p. 200.

Polymera fusca KERTESZ, Cat. Dipt., vol. 2, 1902, p. 242.

Male.—Length, 5.2 mm.; wing, 5.8 mm.; antenna, 7.5 mm. (about); hind leg, femur, 4.6 mm.; tibia, 4.8 mm.; middle leg, femur, 4.8 mm.; tibia, 5.3 mm.

Head: rostrum and palpi dark brown; vertex brown, more yellowish anteriorly; occiput light brown. Antennæ, basal segment of the scape brown, second yellowish, third light brown, whitish apically, darker brown subapically, each succeeding segment of the antennæ bi-nodose, dark brown on the nodes, lighter brown at the constriction, and pale, almost white, at the ends.

Thorax: pronotum pale yellow; mesonotum, praescutum very light brownish-yellow with two broad dark brown stripes recurrent along the lateral margin of the sclerite; a broad lateral stripe extending from behind the pseudosuture to the transverse suture; pseudo-suture black, scutum light brownish-yellow medially with a dark brown line on either side; scutellum and postnotum brown, dusted with yellow. Pleuræ: dorsal portions of the epipleuræ dark brown, remainder of the epipleuræ brownish-black, deepest medially. Halteres light brown. Legs: coxæ and trochanters dull yellow; femora light brown, extreme tip light yellow, sub-apical ring black; tibia light brown, tip broadly black; tarsi white, the hindmost pair clearest white, anterior pair has the extreme tips of the segments indistinctly brown.

Wings: light gray, indistinct rounded clouds at the origin of Rs; along the cord; at the fork of R_{2+3} ; at cross vein r ; at the fork of M_{1+2} , and at the fork of M_3 and Cu_1 . Venation: Sc rather long, Sc_1 ending rather nearer to the fork of R_{2+3} than Rs. Rs evenly arcuated at its origin, in a line with R_{2+3} ; basal deflection of R_{4+5} arcuated; basal deflection of Cu_1 at the fork of M; $M_3 + Cu_1$ longer than M_3 alone. (See fig. 18.)

Abdomen brown; sternum dark.

Hypopygium: posterior margin of the ninth tergite (d) produced caudad into a blunt, obtuse tooth; pleuræ (c) very long, cylindrical, thickly clothed on the external facies with long hairs, bearing two apical appendages, the upper one (a) is chitinized, cylindrical, blunt at the apex and there armed with a sharp, recurved hook; the lower appendage (b) is not chitinized, or only feebly so at its tip, rather shorter than the upper apical appendage and more pointed at its tip. On the ventral aspect, the ninth sternite is broadly concave; the anal tube (e) broad, distinct; guard of the penis entirely hidden from the ventral aspect, scarcely apparent from the dorsal aspect. (See fig. 1.)

Igarape Assú, Pará, Brazil (Parish), Jan. 19, 1912 (1 male); Jan. 30, 1912 (2 males); Feb. 4, 1912 (3 males).

Specimens in Cornell University collection and in author's collection.

POLYMERA SUPERBA, new species.

Size, medium; flagellum of the antennæ bi-nodose; cell M_1 present; wing dark-colored with white spots.

Male.—Length, 5.8 mm.; wing, 5.8 mm.; antennæ (about), 7.8 mm. Head: vertex dark chestnut-red, paler, yellowish, on the occiput;

front brown; rostrum reddish; palpi dark brown; antennae: basal segments reddish-brown, third segment dull yellow at the base, remainder brown, paler, light yellow, at the tip, other segments constricted in the middle, with the extreme base and tip light yellow, producing an annulated effect.

Thorax: pronotum obscure yellow. Mesonotum: praescutum with the anterior half shining dull yellow; tuberculate pits large, comma-like, located well toward the cephalic margin of the sclerite; remainder of the sclerite black; scutum, scutellum and post-notum black; pleurae: prothoracic obscure shining yellow; remainder of the pleurae black. Halteres, stem and tip of the knob, yellow; remainder of the knob, brown. Legs: coxae and trochanters dull yellow; fore leg broken. Middle leg: femora brown, the tip yellow or whitish-yellow, a broad black sub-apical band; tibia, basis yellow, remainder dark brown; tarsi, dark brown. Hind leg: femora yellowish-brown; tip whitish-yellow; a broad black subapical band; tibia, brown, paler at the extreme base; tarsi, base of segment 1 and segments 4 and 5 brown, remainder white, or whitish.

Wings: veins dark brown; cells C and Sc dull yellow; remainder of the wing subhyaline with brown markings; the whole apical third of the wing, a large spot connected with it and embracing the stigmal region and the cord, a large, interrupted basal blotch extending from the wing base to beyond the base of the sector, paler in the anal cells, a large spot in the ends of cells Cu and first A. Venation: Sc long, ending beyond the origin of Rs; r inserted far back from the tip of R_1 so that R_1 beyond r is about two-fifths of the distance on R_1 between Sc_2 and r . Rs rather square at its origin; R_{2+3} short, about as long as the basal deflection of Cu_1 . Basal deflection of Cu_1 opposite the fork of M; $M_3 + Cu_1$ equal to M_3 alone. (See fig. 2.)

Abdomen: tergum dark shining black; apical half of each segment paler, brown; hypopygium light reddish-yellow, the tips of the apical appendages brown; sternum, apical two-thirds of each segment brown, basal third black.

Allotype.—Female, length, 6.3 mm.; wing, 5.9 mm. Very similar to the male, the costal and subcostal cells of the wings are not yellowish but brown. The fore legs are present; apical two-thirds of the femora dark brownish-black; tibiae and tarsi blackish.

Habitat.—*Holotype*.—Male, Tabernilla, Canal Zone, Panama (Aug. Busek).

Allotype.—Female, Igarape Assú, Pará, Brazil, January 24, 1912 (Parish).

Holotype.—In U. S. National Museum collection (No. 14935).

Allotype.—In Cornell University collection.

POLYMERA HIRTICORNIS Fabricius.

Chironomus hirticornis FABRICIUS, Syst. Antliar, 1805, p. 46.—WIEDEMANN, Dipt. Exot., vol. 1, 1821, p. 37, fig.

Polymera hirticornis WIEDEMANN, Auss. Zweifl. Ins., 1828, vol. 1, p. 57.—MACQUART, Suite à Buffon, vol. 1, 1834, p. 113.—HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 292.—KERTESZ, Catalogus Dipterozum, vol. 2, 1902, p. 242.—ALEXANDER, Psyche, 1911, p. 200.

Male.—Length, 7.6 mm.; wing, 7 mm.; antenna, 8 mm. (about). Head: rostrum and palpi, genæ and occiput, orange-yellow; vertex brown, the anterior portion paler yellowish; front yellow. Antennæ, basal segments, brownish-yellow, segment 3 dark brown, yellowish basally, remaining segments bi-nodose, dark brown.

Thorax: pronotum yellow; mesonotum: præscutum, anterior half bright yellow with a brown spot in the middle at the cephalic end, remainder of the præscutum brown, much darker anteriorly near the pseudosuture; scutum, scutellum and postnotum dark brown; pseudosuture black. Pleuræ: prothoracic, yellow; meso- and meta-pleuræ dark brownish-black. Halteres light brownish-white. Legs: coxæ and trochanters light yellow; femora light yellow, darkening to form a brown subapical ring, a broad yellow apical band; tarsi yellowish; the posterior pair white.

Wings: brown with a broad pale yellow band across the disk, just distad of the cord and proximad of the fork of M_3 and Cu_1 ; a pale yellow spot around Rs , and one at end of second A ; costal cell and base of wing light yellow; veins brown, yellow where traversed by the yellow markings. Venation: Sc very long, extending far beyond the fork of Rs ; cross-vein r far back from the tip of R_1 so that R_1 beyond r is only a little shorter than R_1 between Sc_2 and r ; R_{2+3} very short, less than the basal deflection of Cu_1 . $Cu_1 + M_3$ much shorter than M_3 alone; basal deflection of Cu_1 beyond the fork of M . (See fig. 3.)

Abdomen: tergum black, extreme tip of segments 2-5 brownish-yellow; remainder entirely black; hypopygium orange-yellow; sternum: segment 2, black; 3, tip orange; 4-6, orange-yellow; 7-8, black.

Igarape Assú, Pará, Brazil, January 23, 1912 (coll. Parish).

Specimen in Cornell University collection.

POLYMERA NIVEITARSIS, new species.

Size, large; flagellum of the antennæ almost simple; posterior tarsi, only, white; basal deflection of R_{1+2} not evident; cell M_1 present.

Male.—Length, 6.2 mm.; wing, 7.3-7.4 mm.; antennæ (about), 12.5 mm. Head: palpi brown; rostrum yellowish brown; antennæ with the two basal segments and the proximal end of the third dull yellow; remainder of the antennæ dark brownish-black, clothed with

long black hairs; no distinct constrictions on the flagellum of the antennæ. Front dull yellowish-brown; vertex dark brown; occiput paler.

Thorax: mesonotum dark brown, uniform, dull opaque throughout; pleuræ light grayish-brown. Halteres brown. Legs: coxæ, trochanters, femora, tibiæ and tarsi yellowish-brown; posterior legs with the apical half of tarsal segments 1, and 2, 3, and 4, white.

Wings uniformly tinged with yellowish; veins brown. Venation: Sc long, Sc_1 ending beyond the fork of R_{2+3} ; cross-vein r far out toward the tip of R_1 , so that R_1 beyond r is only about one-fifth the distance on R_1 from Sc_2 to r ; R_s gently arcuated at its origin, in a direct line with R_{4+5} , consequently no basal deflection to R_{4+5} is present; R_{2+3} short, a little longer than the basal deflection of Cu_1 ; $Cu_1 + M_3$ shorter than M_3 alone; basal deflection of Cu_1 at the fork of M . (See fig. 16.)

Abdomen: tergum dark brown; sternum yellowish; hypopygium brown.

Female.—Length, 5.9 mm.; wing, 7 mm. Flagellum of the antennæ broken; vertex more grayish; ovipositer very long and pointed; coloration and venation as in the male.

Paratypes.—Males, specimens 1 and 3 (Surinam) (Brazil). Similar to the type, but the head darker brown with no yellowish tinge. Venation of Surinam specimen: $r-m$ at the fork of R_s ; basal deflection of Cu_1 at the fork of M . Brazilian specimen: R_1 beyond r about one-fourth of the distance on R_1 between Sc_2 and r ; basal deflection of Cu_1 beyond the fork of M . Specimen 2 (Surinam) is more intermediate between the holotype and paratypes 1 and 3.

Habitat.—*Holotype*.—Male, Bocas del Toro, Panama, September 28, 1903 (P. Osterhout). In U. S. National Museum collection (No. 14926).

Allotype.—Female, Patuluc, Guatemala, Central America (700 feet) (G. Eisen) (received Jan. 6, 1903) (U. S. National Museum collection). *Paratypes 1-2*. Two males, Surinam (H. Polak) (U. S. National Museum collection). *Paratype 3*.—Male Igarape Assú, Pará, Brazil, January 29, 1912 (Parish), (Cornell University collection).

If the specimen figured by Wiedemann¹ was really a specimen of his *fusca*, then this species is undoubtedly closely allied to *fusca*. It is readily distinguished by its dark brown fore and middle tarsi.

POLYMERA THORACICA, new species.

Size, medium; flagellar segments of the antennæ bi-nodose; wing with cell M present; tarsi white; thorax dark brown, pleural stripe not conspicuous.

Male.—Length, 4.8 mm.; wing, 5.3 mm.; antennæ (about), 7.5 mm. Rostrum and palpi brown; antennæ: basal segment dark brown, segment 2 and the flagellum light brown, the base and tip of the seg-

¹ Auss. Zweifl. Ins., vol. 1, pl. vii, figs. 3, 4.

ments light yellow, this annulated effect most noticeable on segments 4-8; a group of wide, outspread hairs extending from each node. Front, vertex and occiput grayish-brown, a black spot in the center of the vertex.

Thorax: dark brown; pseudo-sutural spots, deep, prominent, black; pleuræ, brownish-black; the sternum nearly as dark; halteres light brown, the knob darker. Legs: coxæ and trochanters light yellowish, basis of former, brown; femora brown, more yellowish basally, subapically somewhat darker brown; tibiæ brown, tip dark; tarsus, segment 1 light brown, tip whitish; segments 2-4 white; 5 more brownish.

Wings: slightly tinged with gray. Venation: Sc rather long, Sc₁ nearer to the fork of R₂₊₃ than fork of Rs; R₁ beyond *r* about one-third the distance of R₁ between Sc₁ and *r*. Basal deflection of R₄₊₅ very long, twice as long as *r-m*; M₃+Cu₁ about equal to M₂. Basal deflection of Cu₁ beyond the fork of M. (See fig. 4.)

Abdomen dark brown.

Habitat.—*Holotype*.—Male, Igarape Assú, Pará, Brazil, February 7, 1912 (Parish).

Type.—In Cornell University collection.

Differs from *albitarsis* Williston in the darker coloration throughout; Sc longer, extending much beyond the fork of Rs; basal deflection of Cu₁ beyond the fork of M, not at it, etc. It comes close to *fusca* Wiedemann, but differs in several details of coloration, and, if Wiedemann's figure represents true *fusca*, as I suppose it does, in venational and antennal characters.

POLYMERA INORNATA, new species.

Size, small; flagellar segments of the antennæ bi-nodose; wing with cell M₁ present; R₁ beyond *r* equal to R₁ between Sc₂ and *r*.

Male.—Length, 4.4 mm.; wing, 4.8 mm.; antenna (about), 6.5 mm. Head: rostrum and palpi light brown; front, vertex, and occiput dark brown, bloom destroyed by mucilage; antennal segments dark brown, somewhat paler at the base and apex of each segment, but not producing an annulated effect.

Thorax: notum light chestnut-brown; pleuræ similar but paler, without any distinct darker pleural stripe, sternal region dull yellow. Halteres very pale yellow, the knob light brown. Legs: fore and middle, only, remain; light yellowish-brown, the coxæ and trochanters being more yellow; it is very probable that the posterior tarsi are whitish.

Wings uniformly tinged with yellow; veins brownish-yellow. Venation: Sc long, ending about opposite to the fork of R₂₊₃; cross-vein *r* far removed from the tip of R₁, so that R₁ beyond this cross-vein is equal to that section of R₁ between Sc₂ and cross-vein *r*;

R_{2+3} short but longer than M_1 ; basal deflection of R_{4+5} distinct, as long as $r-m$; basal deflection of Cu_1 slightly beyond the fork of M ; $Cu_1 + M_3$ about equal to Cu_1 beyond M_3 . (See fig. 5.)

Abdomen: tergum, dark brown; sternum, lighter colored.

Habitat.—*Holotype*.—Male, Tukeit, British Guiana. July 20, 1911 (coll. Lutz).

Type.—In American Museum of Natural History.

Differs from all of the known species in the extreme recession of the cross-vein r .

POLYMERA GRISEA, new species.

Size, small; flagellar segments of the antennæ bi-nodose; cell M_1 present; dark pleural stripe narrow, distinct; wings gray.

Male.—Length, 3–3.5 mm. (about); wing, 4.6; antenna, 7.5 (about).

Related to *albitarsis* Williston in its general coloration and venation but very much smaller. In the dark narrow pleural stripe it agrees well with Williston's description.¹ The wings are slightly grayish, not brown; basal segments of the antennæ dark brown; the legs are lacking excepting one of the fore pair. (See fig. 6.)

Habitat.—*Holotype*.—Male, Ancon. Canal Zone, Panama (A. H. Jennings coll.).

Type.—In U. S. National Museum collection (No. 11937).

Genus EPIPHRAGMA Osten Sacken.

Epiphragma OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila., 1859, p. 238; Monographs, vol. 4, 1869, p. 193; Studies, etc., pt. 2, 1887, p. 208.

This well-defined genus reaches its maximum of species in tropical America. Several of the species that have until now been characterized as "*Limnobia*" are undoubtedly *Epiphragmæ* and I treat them as such in this paper.

KEY TO THE SPECIES OF EPIPHRAGMA.

1. Wings with complete unicolorous fasciæ, brown or white, extending across the wing.....2.
- Wings with ocellate marks, or pale-margined spots, or incomplete fasciæ.....3.
2. White fasciæ about three; brown fasciæ, as a rule, not connected; tip of tibiæ dark.....*fascipennis* Say² (East. U. S.).
A single white fasciæ across the middle of the wing, owing to the confluence of the two brown fasciæ on either side; tip of tibiæ light yellow,
imitans, new species (Bolivia).
3. Ground color of the wing dark brown or rusty-brown.....4.
- Ground color of the wing pale brown, gray, subhyaline or hyaline.....6.
4. Thoracic dorsum velvety black, with a bright yellow, very conspicuous, spot,
histrion Schiner³ (Colombia).
- Thoracic dorsum not velvety-black and yellow.....5.

¹ Dipt. St. Vincent, Trans. Ent. Soc. Lond., 1896, pp. 296, 297.

² Osten Sacken, Monographs, vol. 4, 1869, p. 194, male and female.

³ Reise Norara, Dipt., 1863, p. 41; male.

KEY TO THE SPECIES OF EPIPHRAGMA—continued.

5. Antennal segments 3 and 4, yellow, remainder brown or black; tarsi brown; head black, opaque, yellowish-gray pollinose. *sackeni* Williston¹ (Lesser Antilles).
Antennal segment 3, only, reddish yellow, remainder brown or black; tarsi yellow; head ochraceous brownish-yellow. *fabricii*, new name (Brazil).
6. Wing markings few, mostly reduced to ocellate or semiocellate markings. 7.
Wing markings ocellate or dark-centered with pale margins; wing margin either abundantly spotted, or with incomplete bands. 8.
7. Mesonotum with a grayish triangle in the middle; sides yellowish-red; legs pale yellow. *delicatula* Osten Sacken² (Colombia).
Mesonotum without gray; pleuræ with dark brown stripes; femora with a brown band. *pupillata*, new species (S. Brazil).
8. Ground-color of the wings hyaline. *buscki*, new species (Greater Antilles).
Ground-color of the wings not hyaline. 9.
9. Antennæ of male long, reaching to the second abdominal segment.
circinata Osten Sacken³ (Costa Rica).
Antennæ of male short, reaching to the wing-root. 10.
10. Legs mostly dark brown; femora and tibia with two pale bands; anterior margin of wing with eight larger spots. *adspersa* Wiedemann (Guiana; Brazil).
Legs mostly yellow; wings without eight larger spots on costal margin. 11.
11. Legs yellow throughout; four large sub-costal spots, the largest at the stigma.
punctulatissima Wiedemann⁴ (Brazil).
Legs yellow; femora with a brown band before the tip; wings with an irregular picture. *solatrix* Osten Sacken⁵ (East. U. S.).

Species not included in the above key, because of insufficient description:

Epiphragma varia Wiedemann (Brazil).⁶ Wiedemann says:

It must not be confused with *Limnobia maculata* F. (= *fabricii*, n. n.), which it closely resembles, but still in respect to the wing pattern is quite different. Venation as in *L. maculata*. Color of body, brownish all over; of the feet, only one, without tarsi, remaining; this is deep brown, only the tip of the tibia yellow.

Epiphragma nebulosa Bellardi (Mexico).⁷

The description calls for a very large species (male, length, 15 mm.; wing-expanse, 33 mm.); antennæ yellowish throughout, the basal segments paler; mesonotum with a subrotund black spot, fading out behind; halteres brown with the knob black; feet brown, the femora somewhat reddish-brown; feet with three black, equidistant bands, the first in the middle of the femur, the second at the knee; wings that are pale reddish-brown in the middle of the cells, hyaline at the veins.

EPIPHRAGMA IMITANS, new species.

Femora with the apices pale yellow; wings with two complete double fasciæ.

Female.—Length, 11 mm.; wing, 10 mm.; fore leg, femur, 6.5 mm.; tibia, 8 mm.; tarsus, 8.5 mm.; middle leg, femur, 6.4 mm.; tibia, 7.6

¹ Dipt. St. Vincent, Trans. Ent. Soc. Lond., 1896, pp. 294, 295, fig. 63.

² Studies on Tipulidæ, vol. 2, 1887, p. 208, male.

³ Biologia Centrali-Americana, vol. 1, 1886, pp. 9, 10, pl. 1, fig. 1, male.

⁴ Auss. Zweifl. Ins., vol. 1, 1828, p. 301.

⁵ Monographs, vol. 4, 1869, pp. 195, 196, male and female.

⁶ Auss. Zweifl. Ins., vol. 1, 1828, p. 573 (as *Limnobia*).

⁷ Ditterologia Mexicana, pt. 1, 1876; p. 266, 267, pl. 1, fig. 4 (as *Tipula*).

mm.; hind leg, femur, 7.2 mm.; tibia, 8.5 mm.; head: rostrum and palpi dark brown; antennae: two basal segments dark brown-black, third segment bright yellow, fourth darker, brownish-yellow, remainder dark brown; front, vertex, and occiput brown, deeper, more richly colored behind, yellow immediately surrounding the eyes.

Thorax: pronotum brown; mesonotum: præscutum, anterior half deep chestnut-brown, the extreme cephalic margin darker brown, the posterior half with a tawny yellow bloom and with four brown spots; scutum pale yellow on the anterior half, rich brown behind, connected along the lateral edge of the sclerite with the brown of the anterior part of the præscutum; scutellum dark brown; postnotum light brown. Pleuræ pale silvery with four rich brown stripes, the most dorsal of which begins on the dorsum of the pronotum, runs obliquely around to the scutellum, the second, or epipleural, begins on the venter of the pronotum, continues caudad, obliquely, to the postnotum, where it spreads over the sclerite, the third, or episternal, band runs above the coxæ; sternum dark brown, constituting the fourth stripe. Halteres pale yellowish-brown, knob rather darker basally. Legs: coxæ brown medially, paler at the ends; trochanters yellow. Legs all similar to one another in coloration; femora light brownish-yellow with a conspicuous pale yellow apical band; tibiæ pale yellow throughout; tarsi pale yellow, the terminal segments yellowish-orange.

Wings hyaline, with two irregular brown bands across the wing; the proximal one more regular on its outer margin; the distal band has three finger-like projections on its inner margin along Rs, M, and Cu, respectively; the bands are more or less distinctly margined with darker. (See fig. 35.)

Abdomen: Tergum light brown, the apices of the segments very light yellow, this color continuing back along the lateral edge; a dark brown median line; ninth segment yellow; valves of the ovipositor reddish; sternum pale brown, very pale along the lateral edge.

Habitat.—*Holotype*.—Female, San Antonio, Bolivia (received from Staudinger and Bang-Haas, Germany).

Type.—In author's collection.

EPIPHRAGMA FABRICII, new name.

Tipula maculata FABRICIUS, Syst. Arth., 1805, p. 39, not *T. maculata* Linnaeus nor *T. maculata* Meigen (1804).

Limnobia maculata WIEDEMANN, Dipt. Exot., vol. 1, 1821, p. 16; Auss. Zweifl. Ins., vol. 1, 1823, p. 29.—HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 289.—KERTESZ, Catalogus Dipterorum, vol. 2, 1902, p. 174.

Male.—Length, 10–11.5 mm; wing, 14 mm.

Head: rostrum light brown, palpi blackish-brown; clypeal region and anterior portion of the front to just behind the origin of the

antennæ dark colored; antennæ: segment one dark, blackish, covered with a thick light-colored pubescence, second segment dark brown, third segment conspicuously orange-red, remainder dark brownish-black. Front (behind), vertex and occiput dull tawny-yellow, darker behind and underneath on the genæ; a conspicuous brown line on the head, anteriorly enlarged into a conspicuous spot running back toward the collare. Front nearly as wide as the first antennal segment is long.

Thorax: pronotum dark brown; mesonotum, rich reddish-brown, in front a narrow dark brown margin which continues back toward the lateral margins of the sclerite; medially a narrow brown line runs back for a short distance, but fades out at about one-third the length of the sclerite; scutum brown, darker caudally. On the lateral margins of these two sclerites (scutum and præscutum) is a large buff spot, hemmed in above by a fuscous line running cephalad from the suture for one-third the length of the præscutum and then bent strongly laterad and recurved, to form a deep chocolate-brown spot occupying the lateral margins of both sclerites. Scutellum and postnotum dusky brownish-black, paler at the sutures; metanotum brownish-black. Pleuræ and sterna very dark brown, almost uniform except a darker black band which begins on the prosternum and continues back across the epipleuræ. Halteres yellowish, a little darker toward the knob. Legs: coxæ and trochanters brown, slightly paler toward the tips (rest of legs gone, but probably with more or less dark color).

Wings light yellow with about eight brown spots along the anterior margin of the wing, of which the second is located on the cross-vein *h*; fourth and sixth larger, at base of *Rs* and tip of *Sc*; irregular light brown bands lead from these spots across the wing, each spot and band being separated from the ground-color of the wing by a subhyaline margin. First anal cell with three subequal brown marks at its tip, second anal cell with about five at its tip. (Venation as in fig. 33.)

Abdomen: tergum dark brown, apices of segments more or less paler; sterna paler, more yellowish-brown, especially on the caudal margins of the segments; hypopygium light yellowish-brown beneath.

A second specimen has the rostrum reddish-brown; the third antennal segment still more conspicuous, orange; the lateral marks on the mesothoracic præscutum and scutum much paler brown; pleuræ paler brown.

Two specimens (males) from Chapada, Matto Grosso, Brazil (Coll. H. H. Smith).

In American Museum of Natural History.

EPIPHRAGMA PUPILLATA, new species.

Pale yellow; a narrow brown median line on head; thoracic pleuræ with broad brown bands; fore femora with a pale brown subapical band; wings subhyaline with about nine darker spots along the costal margin and a few pale brown spots over the rest of the wing; an ocellate mark at the origin of the sector.

Male.—Length, 7 mm.; wing, 9–9.5 mm.; fore leg, femora, 6 mm.; tibia, 7.25 mm.; head: rostrum and palpi brown; antennæ yellow; first segment elongate-cylindrical, second rounded-oval, remainder lacking; front, vertex and occiput light yellow, somewhat darker posteriorly with a rather narrow dark brown median line beginning at the narrowest portion of the front, continued caudad; front narrow, about three-fourths of the first antennal segment.

Thorax: pronotum, yellow, brownish medially, with three dark brown rounded spots, the median one in front on the scutum, the lateral ones larger on sides of the scutellum. Mesonotum: præscutum, pale brownish-yellow, the lateral and cephalic margins of the sclerite broadly brown, continuing back to the wing-bases, a similarly colored, very narrow median line begins at the cephalic margin of the præscutum, continues backward with more or less distinctness to the suture; scutum yellowish, brownish medially, this color broadened out on the caudal margin; scutellum pale yellow; post-notum, brownish-yellow. Metanotum darker, brown. Pleuræ: a narrow oblique brown band running from the collare caudad to the wing bases, inclosing the mesothoracic stigma, bounded on either side by a very narrow pale line; remainder of pleuræ and sterna dark brown. Halteres light yellow, the apical half of the stem and base of the knob slightly infuscated. Legs: coxæ yellow, brown basally; fore leg, only, remains; femur light yellow with a pale brown subapical band; tibia light yellow throughout; tarsi lacking.

Wings (see fig. 37) subhyaline, nine brown spots along the anterior margin, the second being at the humeral cross-vein, fourth over the origin of R_2 , fifth, at the supernumerary cross-vein, sixth, at the tip of Sc_1 , seventh, at tip of R_1 , eighth and ninth, at tips of R_2 and R_3 , respectively. A distinct eye-like spot, its pupil at the angulation of R_5 , pale brown. Three dark brown spots in cell Sc_1 , under the third to fifth costal spots described above. Other pale brown marks on the wing disk, as follows: semicircular extending from the third costal spot backward across the base of cells R and M ; a row of seven in cell second anal; one at tip of vein second anal; two at the end of cell first anal; four in the distal half of cell Cu ; one at end of cell M , in cell Cu and in cell M_3 ; two in cell M_2 , two or three in cell R_3 ; a large one about the stigma, extending down into cells first R_1 , P_1 , and base of R_3 ; a semicircular one in cells first R_1 and end of R_1 crossing the end of the sector; this last, with the stigmal spot, forms

an incomplete ocellus in this region of the wing. Venation (see fig. 37).

Abdomen: terga dark brown on segments 1 to 4; segments 5 to 8 paler brown; sterna, first dark brown, remainder paler brown; hypopygium pale yellow.

The paratype differs as follows:

Similar to the type, but shows the pleural markings better. The brown stripe inclosing the anterior stigma is here pale in front but darker near the wing-bases, and surrounded by the pale lines described above. Below this is a broad dark brown stripe, beginning on the ventral side of the pronotum, separating at the fore coxæ and continuing back across the epipleuræ as a broad, deep chocolate-brown band which becomes more indistinct in the vicinity of the metapleuræ. Ventrad of this band on the lateral margins of the mesosterne is a pale silvery bloom, with a dark brown spot above almost continuous with the epipleural band and below changing to the dusky brown of the venter.

Wings about as in the holotype, but three spots in the end of cell first anal and a few of the other spots encroaching into various cells of the wing, but the size of these spots seems to be only relative and the number is generally probably as given in the type description.

Habitat.—*Holotype.*—Male, Chapada, Matto Grosso, Brazil (H. H. Smith, coll.). *Paratype.*—Male, same locality and collector.

Type.—In American Museum of Natural History.

EPIPHGRAMMA BUSCKI, new species.

Related to *E. solatrix* and *E. sackeni*; differs from both species in its different wing-picture; from *solatrix* in leg-coloration, etc.

Male.—Length, 8 mm.; wing, 8.2 mm.; head: rostrum yellow; palpi dark brown; antennæ with the two basal segments dark brownish-black; remainder broken; vertex and occiput brownish-gray, clearer gray nearest the eyes; a brown mark connecting the eyes back of the front; front gray; cervical sclerites and genæ blackish.

Thorax: pronotum dark brown, the scutellum lighter; mesonotum: proscutum anteriorly light brown with five narrow brown lines running from the cephalic margin backward, the median one is broadest in front and continues farthest caudad; caudal margin of the sclerite with a thick whitish-yellow bloom, in front of which is a dark brown band extending from the ends of the transverse suture across the sclerite; the space between the lateral stripes is filled with brown, giving the appearance of but three longitudinal stripes of which the lateral ones are broad; scutum light yellow with an indistinct brown transverse band; scutellum brown caudally; postnotum light ochraceous-yellow with a brown base and tip; metanotum light yellow. Pleurae light silky yellow, with an interrupted dark brown band extending from near the caudal margin of the pronotum back across

the epipleura to the base of the abdomen. Halteres long, slender, stem yellow, knob brown with the extreme margin paler. Legs: coxae and trochanters dull yellow; middle coxa with a broad triangular black mark on its caudal aspect; posterior coxae dark brownish. Hind leg only remains; femora brown except the base, a post-medial and a sub-apical band, yellow; tibiae dark brown; tarsi light yellowish-brown.

Wings clear hyaline with an irregular brown picture; the brown markings not edged with lighter as in *sackeni*, and no tawny as in *solatrix*. Venation (see fig. 36).

Abdomen: first segment light yellow; tergites dark brown, the basal half clearer, darker brown, the apical half more indistinct; hypopygium dull yellow; sternites light yellow.

Habitat.—*Holotype*.—Male, San Francisco Mountains, Santo Domingo, West Indies, Sept., 1905 (Aug. Buseck, coll.).

Type.—In U. S. National Museum collection (No. 14938).

EPIPHGRAMMA ADSPERSA Wiedemann.

Limnobia adspersa WIEDEMANN, Auss. Zweifl. Inskt., vol. 1, 1823, p. 550—HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 238.—KERTÉSZ, Cat. Dipt., vol. 2, 1902, p. 169.

Length, male, 8.25 mm.; wing, 10.2 mm.

Head: rostrum and palpi brown; antennae: first segment dark brown with a gray bloom, second dark, brownish-black, third light yellow, fourth pale brownish-yellow, remainder dark brownish-black. Front rather broad tawny yellow, a median brown line only on the occiput and caudal end of the vertex.

Thorax: pronotum, yellow with an indistinct darker median line, enlarged behind; mesonotum yellow anteriorly, the sclerite is narrowly brownish, with a very narrow brown line running backward toward the suture; on the sides of the proscutum the brown is broader and clearer except anteriorly, where it is paler; scutum with a depressed area at the point of the suture; scutum, scutellum, postnotum and meta-notum dull yellowish-brown. Pleurae pale brown with the usual dusky epipleural stripe leading from the prosternum backward, and the dusky color on the venter. Halteres long, pale brown, knob not conspicuously brighter. Legs: middle pair; coxae pale, whitish; trochanters brown; femora dark brown, a narrow yellow band beyond the middle and a broader one at the tip; tibia, base broadly yellow, middle tip of tibia yellow; tarsi conspicuously light yellow, the last segment more brown. Hind legs: coxae pale; trochanters brown; femora dark, the band beyond the middle broader than in the middle pair, tip of femora and base of tibia with subequal bands of pale yellow; tibia almost all light yellow with a broad brown subapical band; tarsi, basal two-thirds of the metatarsus pale yellow, rest of the tarsi dark brown.

Wings: hyaline or nearly so; anterior margin with about eight large brown spots along the margin, the fifth being at the tip of Sc; between the large spots are scattered smaller dots. The whole disk of the wing is covered with pale greyish-brown spots distributed as in the figure. Venation as in fig. 34.

Abdomen: tergum brown; sterna brown; apices of segments paler; hypopygium dark brown.

One male from "Forest, British Guiana; Aug. 5, 1911 (Crampton coll.). Specimen in the American Museum of Natural History.

Genus CTEDONIA Philippi.

Ctedonia PHILIPPI, Verh. Zool.-bot. Ges. Wien, vol. 15, 1865, p. 602.—OSTEN SACKEN, Monographs, vol. 4, 1869, p. 334; Studies on Tipulidæ, pt. 2, 1887, p. 213.

The following description is translated from Philippi's original characterization of the genus¹ by Osten Sacken. I have adopted this translation² almost as it stands:

Head small, globose, attenuated behind, produced anteriorly into a stout horizontal rostrum. Eyes globose, rather remote. No ocelli. The antennæ in length are equal to about three-quarters of the head and the thorax taken together; from 15 to 24 segmented; first segment cylindrical, stout; the second equal to one-third of the first, subglobular; the following eight (to 12), cylindrical, subequal, emitting a filament and thus forming a comb; the projection of the third segment is on the external side and short; the fourth segment has one on the inside and another on the outside; the segments 5, 6, 7, 8, 9, 10 and beyond, have on the inside a long projection; segment 11 has a short one on the inside; the nine following segments are cylindrical and difficult to distinguish. Palpi 4-segmented, segments cylindrical, the fourth stout, rather short, although a little longer than the third. The tibiæ have two spurs at the tip.

The genus was not represented in any of the material that I received for examination.

KEY TO THE SPECIES OF CTEDONIA.

1. Antennæ with only 15 segments; wings hyaline with two black spots, the large one extending from cell first M_2 to the stigma. *bipunctulata*³ Philippi (Chile).
Antennæ with 22 or more segments.....2.
2. Wings almost unicolorous.....3.
Wings with brown clouds, on a limpid ground....*pietipennis*⁴ Philippi (Chile).
3. Body gray; head blackish; wings yellowish with a pale brown stigmal spot; feet yellowish, the tip of the fore femur with a brown band; antennæ with 22 segments.....*flavipennis*⁵ Philippi (Chile).
Body yellow except the head, antennæ, palpi, sternum of thorax including the coxæ; tip of abdomen; tibiæ and tarsi, which are black; wings somewhat yellowish-brown; femora luteus; antennæ with 24 segments.
*bicolor*⁶ Philippi (Chile).

¹ Verh. Zool.-Bot. Ges. Wien, vol. 15, 1865, p. 602.

² Monographs, vol. 4, p. 334.

³ Verh. Zool.-Bot. Ges. Wien, 1865, p. 603, male and female (?).

⁴ Idem, p. 603, female.

⁵ Idem, pp. 602, 603, female.

⁶ Idem, p. 603, male.

I have not included *C. fusca* Jaenn., as it is probably synonymous with *flavipennis*, above.

Genus LIMNOPHILA Macquart.

Limnophila MACQUART, Hist. Nat. Dipt., Suite à Buffon, vol. 1, 1834, p. 95.—

OSTEN SACKEN, Monographs, vol. 4, 1869, pp. 196-202.

Phylidorea BIGOT, Ann. Soc. Ent. France, 1854, p. 456.

Limnomya RONDANI, Prodrromus Dipt. Italicæ, vol. 4, 1861, p. 11.

Pilaria SINTENIS, Sitzgsber. Naturf. Ges. Dorpat, vol. 8, 1888, p. 398.

The subgenera of the genus LIMNOPHILA Macquart.

Idioptera MACQUART, Hist. Nat. Dipt., Suite à Buffon, vol. 1, 1834, p. 94.

Limnophila MACQUART, Hist. Nat. Dipt., Suite à Buffon, vol. 1, 1834, p. 95.

Lasiomastix OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila., 1859, p. 233.

Prionolabis OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila., 1859, p. 239.

Dicranophragma OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila., 1859, p. 240.

Dactylolabis OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila., 1859, p. 240.

Ephelia SCHINER, Wien. Ent. Monatschr., vol. 7, 1863, p. 222.

Poecilostola SCHINER, Wien. Ent. Monatschr., vol. 7, 1863, p. 222.

Rhinoptila NOWICKY, Verh. Zool.-bot. Ges. Wien, vol. 17, 1867, p. 337.

Eutonia v. d. WULF, Tijdschr. voor Entomol, vol. 17, 1874, p. 147.

I have refrained from giving a key to the included forms because the numerous species described by Blanchard and Philippi are almost certainly a mixture of several genera, and until more of these species are rediscovered it would be foolhardy to attempt a key in this group.

I am including in *Limnophila* the species described as *Polymoria* Philippi. The only species I have ever seen, *P. lutea*, is represented by a single legless specimen, and I am unable to decide as to whether or not this insect has spurred tibiæ.

LIMNOPHILA EPIPHRAGMOIDES, new species.

Light brown and yellow; halteres extremely long; wings hyaline, with a brown picture. Venation: Petiole of cell M_1 very short; basal deflection of Cu_1 far before the fork of M .

Female.—Length, 12.4 mm.; wing, 10.6 mm.; abdomen, 10 mm.; halteres, 2.3 mm. Legs: fore, femora, 7.1 mm.; tibia and tarsus gone; middle, femora, 7.1 mm.; tibia and tarsus gone; hind, femora, 8.2 mm.; tibia, 10 mm.; tarsus, 8.7 mm.

Alcoholic specimen—Head: rostrum and palpi brownish-yellow; antennæ, first segment elongated, cylindrical, brown, second oval, yellow; flagellum broken. Eyes oval, large; front and vertex very narrow between the eyes, yellowish-brown.

Thorax: brown; stripes on the mesothoracic præscutum ill-defined; the post-notum rather more yellow. Pleuræ light yellow, a brown linear mark above the base of the halteres and a small brown spot above the base of each coxa. Halteres extremely long, much longer than the thorax, stem yellow, the knob brown, clothed with fine papillæ. Legs: coxæ yellow, apically with a narrow ring of brown;

femora yellow, gradually darker, more brownish, toward the tip of the segment; remainder of the legs light yellow.

Wings hyaline; cells C, Sc, Sc₁, first R₁, second R₁, R₂ and the anterior border of R light brown; a light yellow spot near the distal end of cells C and Sc; a clear yellow spot on the basal third of cell Sc₁, at end of cells second R₁ and R₂; a dark brown suffusion at the end of veins Sc and Sc₂, R₂, R₃ and a very large one at the end of R₁. Remainder of the wing with light brown markings as follows: along the cord, in cell R₃, excepting three hyaline spots at the base, at the first quarter, and a rectangular spot at the middle, cell R₅, apex and middle brown; a brown cloud along the cross-vein *m* and second deflection of M₃, a continuation of the medial band in cell R₅; brown marks in base and apex of cell M₁, apex of cell second M₂; apex and middle of M₃; a large cloud at the end of Cu₂ and first A; around the basal deflection of Cu₁, at the fork of R₅, and two eye-like spots in the middle of cell Cu and above the end of second anal. Venation: Sc rather long, extending to opposite the fork of R₂₊₃; Sc₂ at the tip of Sc₁; *r* far removed from the tip of R₁; R₂₊₃ short, rather longer than the basal deflection of Cu₁; basal deflection of R₄₊₅ arcuated, nearer the base of the wing than the rest of the cord; M₁₊₂ beyond *m* (i. e., petiole of cell M₁) very short, shorter than the cross-vein *r*; basal deflection of Cu₁ far anterior to the fork of M, the distance that M is fused with Cu₁ greater than the deflection of Cu₁ alone. (See fig. 40.)

Abdomen: tergum brown, bases and apices of segments yellow; a narrow, transverse, yellow band near the middle of each segment interrupted medially, forming two rectangular spots; on segments 5-8 the yellow bases to the segments are not evident, but are replaced by small, square or rounded dots at the latero-cephalic margin of the sclerites; ovipositor with short yellowish valves; sternum, yellow, with a broad, brown subbasal blotch on each sclerite, triangular on its anterior margin.

Habitat.—*Holotype*.—Female, Igarape Assú, Pará, Brazil; January 30, 1912 (Parish, coll.).

Type.—In Cornell University collection.

LIMNOPHILA NACREA, new species.

Color, silvery gray, antennæ white, excepting segments 1, 2, and 16, which are dark.

Female.—Length, 8.2 mm.; wing, 8.4 mm. Head: rostrum and palpi dark brown; antennæ: first segment short, cylindrical, second of the same diameter, short, flagellar segments elongate, gradually shorter to the end, with a few long hairs on the basal half of each segment, each segment being covered with a dense pubescence, two scapal segments dark brown, third segment brownish at base,

whitish-yellow apically, remaining segments, except the last, white, ultimate segment black. Front rather broad; head triangular behind; eyes conical, with coarse ommatidia; front, vertex, and occiput light silvery gray.

Thorax: pronotum white; mesonotum: præscutum pearl gray, whitish along the lateral margin; no evidence of a pseudo sutural pit or fovea; scutum gray, yellower caudad; post-notum dull gray. Pleuræ light brownish-yellow, the sternum clear light yellow. Halteres long, slender, light brown. Legs long, slender; coxæ light yellow; remainder of the legs light brownish-yellow, the apical segments darker.

Wings pearly white; stigma pale brown; veins light brownish-yellow. Venation: Sc long, Sc₁ ending about opposite to the fork of the sector; Sc₂ near its tip; R₁ long, rather close to R₂. R₅ short, gently arcuated; R₂₊₃ gently arcuated, short, equal to R₂; R₂ short, oblique; R₃ long, feebly sinuated. M₁₊₂ fused to the wing margin; cross-vein *m* obliterated; fusion of Cu₁ with M₃ about equal to M₃ before the basal deflection of Cu₁, both shorter than the deflection; second anal long, gently sinuated. (See fig. 19.)

Abdomen brown, the ovipositor yellow.

Habitat.—*Holotype*.—Female, Cinchona, Jamaica, West Indies, Feb. 24, 1911.

Type.—In American Museum of Natural History.

The open cell first M₂ may be an abnormality of the specimen; if not, the insect may be the representative of a new subgenus.

LIMNOPHILA LENTOIDES, new species.

Male.—Length, 5.2–5.4 mm; wing, 6.9–7 mm. Head: Rostrum and palpi brown; antennæ: basal segment elongate-cylindrical, second globular, cyathiform, dull yellow; flagellar segments rather regularly oval, clothed with a fine pubescence, dark brownish-black. Front and anterior portion of the vertex gray; caudal portion of the vertex, and the occiput, gradually darker brown.

Thorax: pronotum distinct, brown with a grey bloom. Mesonotum brown with a yellowish-grey bloom; pseudosutural pit on the præscutum, small, semilunate, black. Pleuræ light gray. Halteres long, light brown. Legs: coxæ and trochanters light yellow; femora yellowish-brown; tibiæ and tarsi light brown.

Wings subhyaline, with brownish-yellow veins. (See fig. 21.)

Abdomen: tergites brown; sternites dull yellow.

Female.—The female is larger and has the wings strongly tinged with yellow (length, 8.8 mm.; wing, 8.8 mm.). This specimen lacks a cell first M₂ in both wings.

Paratype No. 1 is like the type but the mesothoracic præscutum shows four indistinct brown stripes, two long, narrow ones on either

side of the median line, and a broader one extending from behind the pseudosuture back to the transverse suture. The venation seems to be almost as variable as in the northern *L. lenta* Osten Sacken.

Habitat.—*Holotype.*—Male, Totonicipan, Guatemala, Central American, 1902 (G. Eisen). *Allotype.*—Female with the type. *Paratypes.*—Three males with the type.

Type.—In U. S. National Museum collection (No. 14939).

LIMNOPHILA CINERACEA Philippi

Limnophila cineracea PHILIPPI, Verh. Zool. Bot. Ges. Wien., vol. 15, 1865, p. 611.—HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 292.—KERTESZ, Cat. Dipt., vol. 2, 1902, p. 228.

Male.—Length, 6.5 mm.; wing, 7.6 mm.

Head: rostrum black; antennæ short, the segments rounded or subglobular, black; front, vertex and occiput brown with a light gray bloom; numerous long, scattered hairs behind the eyes.

Thorax: pronotum: scutum gray, strongly suffused with brown in the middle; scutellum gray, more brownish on the lateral margins; mesonotum: præscutum pale brown with a light gray bloom, a more or less distinct brown stripe along the middle, extending from the transverse suture almost to the cephalic margin of the sclerite; pseudo-suture black, comma-shaped; tuberculate pits not visible; scutum, scutellum and post-notum black, dusted with light gray; pleuræ dark, dusted uniformly with light gray. Halteres pale throughout. Legs: coxæ gray; trochanters yellowish-brown; femora brown, more yellowish basally; tibiæ and tarsi brown.

Wings whitish, subhyaline; veins brown; a very pale, ill-defined, brown stigma. Venation: Sc. long, extending almost to the fork of Rs.; cross vein *r-m* very strongly arcuated, U-shaped; cell first M_2 long and narrow; deflection of M_3 longer than the cross vein *m*; basal deflection of Cu_1 in under cell first M_2 .

Abdomen: tergum brown; lateral margins of the sclerites paler, yellowish; hypopygium reddish brown.

"Chile," E. C. Reed, coll.

Specimen in U. S. National Museum collection.

The species belongs to the *lenta* group of the genus, in which cell M_1 is entirely lacking.

LIMNOPHILA GUTTULATISSIMA, new species.

Light brown, the thorax with darker spots; legs yellow; wings subhyaline, with abundant brown dots.

Male.—Length, 8.2 mm.; wing, 10 mm.; hind leg, femur, 7.5 mm.; tibia, 8.4 mm.; tarsus, 6.6 mm.

Head: rostrum and palpi dark brownish-black; antennæ, basal segment black, remainder broken. Front and vertex gray with a

triangular black mark between the eyes and a brown margin on the inside of the eye; vertex thickly dotted with brown; occiput gray.

Thorax: pronotum gray; mesonotum: præscutum, pale brown with a grayish bloom in front, with indistinct darker brown spots on the caudal half of the sclerite; scutum, light brownish-yellow, with a large rounded dark brown spot on either side of the median line and a smaller lateral spot which is continued cephalad upon the caudal portion of the præscutum; scutellum gray, suffused with brown anteriorly, a blackish edging along the caudal margin; post-notum grey. Pleuræ brown, with a decided gray bloom. Halteres light yellow. Legs: anterior: coxæ and trochanters light yellow, remainder broken; middle and hind: coxæ and trochanters brownish-yellow; femora yellowish-brown; tibiæ and tarsi similar, the three apical tarsal segments brown.

Wings: subhyaline, veins yellow, especially in the cephalic portion of the wing; all the cells with numerous fine dots of light brown, these dots assuming a reticulated appearance in the caudal cells, confluent, forming large brown blotches about the base of Rs, along the cord and running cephalad over the fork of R_{2+3} , and the apical portions of cells second R_1 , R_2 , and R_3 . Venation (see fig. 38, from which the wing pattern has been omitted): Sc rather short, ending just beyond the fork of R_{2+3} ; Sc_2 at the tip of Sc_1 , slightly longer than Sc_1 ; Sc_1 remote from the tip of R_1 . Rs long, arcuated at its origin; R_{2+3} short; R_2 strongly arcuated at its origin; r far back from the tip of R_1 ; M_{1+2} beyond m longer than either M_1 or M_2 , which are subequal. Basal deflection of Cu_1 in under the middle of cell first M_2 .

Abdomen: tergum brown, the lateral margins of the sclerites yellow; hypopygium reddish-yellow; sternum yellow, the sixth and seventh segments more brownish.

Habitat.—*Holotype*.—Male, Totonicipan, Guatemala, Central America (Eisen, coll.).

Type.—In U. S. National Museum collection (No. 14940).

? LIMNOPHILA LUTEA Philippi.

Polymoria lutca PHILIPPI, Verh. Zoöl-bot. Ges. Wien, vol. 15, 1865, p. 609.—HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 290.—KERTESZ, Cat. Dipt., vol. 2, 1902, p. 198.

Male.—Length, 10.7 mm; wing, 12–12.2 mm.

Head: rostrum and palpi dark brown; antennæ brown, the flagellar segments rather brighter; front, vertex and occiput dark brown.

Thorax: præscutum reddish-yellow with indistinct reddish stripes on either side of the middle line; scutum deep brownish-red; scutellum reddish-yellow; postnotum brown; pleuræ brown, the propleuræ lighter, yellowish. Halteres, stem and knob light yellow.

Legs: coxæ and trochanters yellow, the former obscured; remainder of legs gone.

Wings strongly tinged with yellow; costal cell light yellowish-brown; extreme base of cell second R_1 and tip of cell first R_1 brown; a rounded white mark in cell first R_1 just above the fork of R_{2+3} ; most of cell second R_1 white; tips of cells R_3 and R_5 very pale, subhyaline; veins yellow, C, Sc and R more brownish. Venation: Rs very long, almost straight at its origin and about in a line with R_{2+3} and R_3 ; R_{2+3} very short, shorter than the cross vein $r-m$; R_2 strongly arcuated at its origin; M_{1+2} beyond cross vein m shorter than either M_1 or M_2 alone; basal deflection of Cu_1 beyond the middle of cell first M_2 ; second anal elongate sinuated.

Abdomen: tergum light yellow, especially along the lateral margins of the sclerites; along the mid-dorsal line, darker, brown. Hypopygium reddish-yellow. The genitalia suggest *L. adusta* Osten Sacken and its allies, and also *Polymera*, consisting of elongate, cylindrical pleural pieces set with long pale hairs and bearing apically appendages which are dark colored, chitinized and denticulate on their outer face.

"Chile" (E. C. Reed, coll.).

Specimen in U. S. National Museum collection.

EXPLANATION OF THE PLATES.

PLATE 65.

- Fig. 1. Hypopygium of *Polymera obscura*.
 2. Wing of *Polymera superba*.
 3. Wing of *Polymera hirticornis*.
 4. Wing of *Polymera thoracica*.
 5. Wing of *Polymera inornata*.
 6. Wing of *Polymera grisea*.
 7. Wing of *Polymera conjuncta*.
 8. Wing of *Cryptolabis tropicalis*.
 9. Wing of *Sacandaga parva*.
 10. Wing of *Mongoma longifusa*.
 11. Wing of *Mongoma extensa*.
 12. Wing of *Molophilus thaumastopodus*.
 13. Wing of *Mongoma niveitarsis*.

PLATE 66.

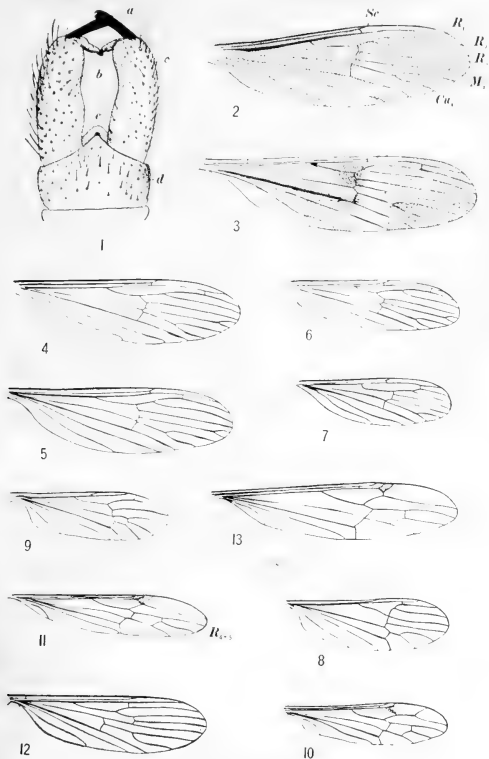
- Fig. 14. Wing of *Gonomyia puer*.
 15. Wing of *Gonomyia unicolor*.
 16. Wing of *Polymera niveitarsis*.
 17. Wing of *Polymera pleuralis*.
 18. Wing of *Polymera obscura*.
 19. Wing of *Limnophila nacreæ*.
 20. Wing of *Erioptera immaculata*.
 21. Wing of *Limnophila lentoides*.
 22. Wing of *Mongoma disjuncta*.
 23. Wing of *Gnophomyia subhyalina*.

PLATE 67.

- Fig. 24. Wing of *Erioptera costalis*.
 25. Wing of *Erioptera knabi*.
 26. Wing of *Erioptera eiseni*.
 27. Wing of *Erioptera parva brasiliensis*.
 28. Wing of *Erioptera splendida* (vein *sc.* accidentally omitted).
 29. Wing of *Gnophomyia luctuosa*.
 30. Wing of *Gnophomyia hirsuta*.
 31. Wing of *Gnophomyia magnifica*.
 32. Wing of *Gnophomyia rufithorax*.

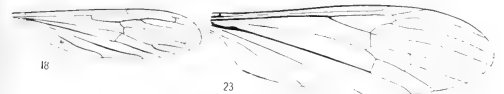
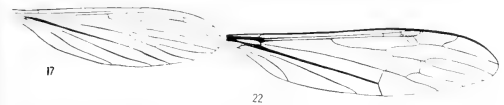
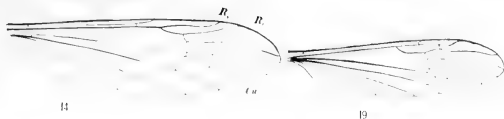
PLATE 68.

- Fig. 33. Wing of *Epiphragma fabricii*.
 34. Wing of *Epiphragma adspersa*.
 35. Wing of *Epiphragma imitans*.
 36. Wing of *Epiphragma buscki*.
 37. Wing of *Epiphragma pupillata*.
 38. Wing of *Limnophila guttulatissima* (pattern omitted).
 39. Wing of *Lecteria matto-grossz*.
 40. Wing of *Limnophila epiphragmoides*.
 41. Wing of *Lecteria obliterated*.
 42. Wing of *Lecteria armillaris*.



VENATION OF NEOTROPICAL CRANE FLIES.

FOR EXPLANATION OF PLATE SEE PAGE 548.



VENATION OF NEOTROPICAL CRANE FLIES.

FOR EXPLANATION OF PLATE SEE PAGE 548.

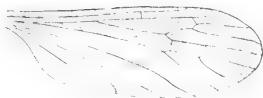




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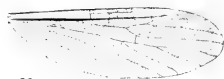
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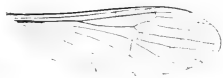
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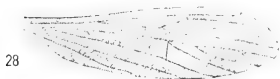
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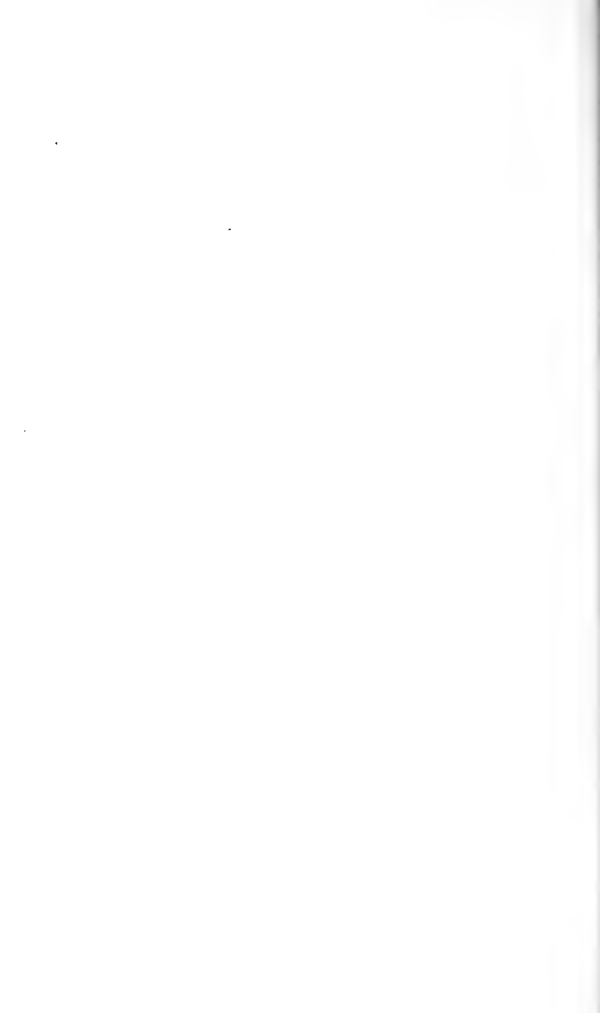
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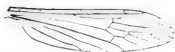
VENATION OF NEOTROPICAL CRANE FLIES.

FOR EXPLANATION OF PLATE SEE PAGE 549.

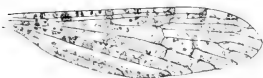




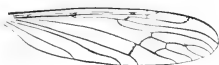
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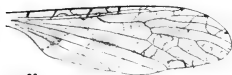
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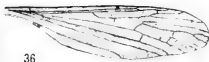
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VENATION OF NEOTROPICAL CRANE FLIES.

FOR EXPLANATION OF PLATE SEE PAGE 549.





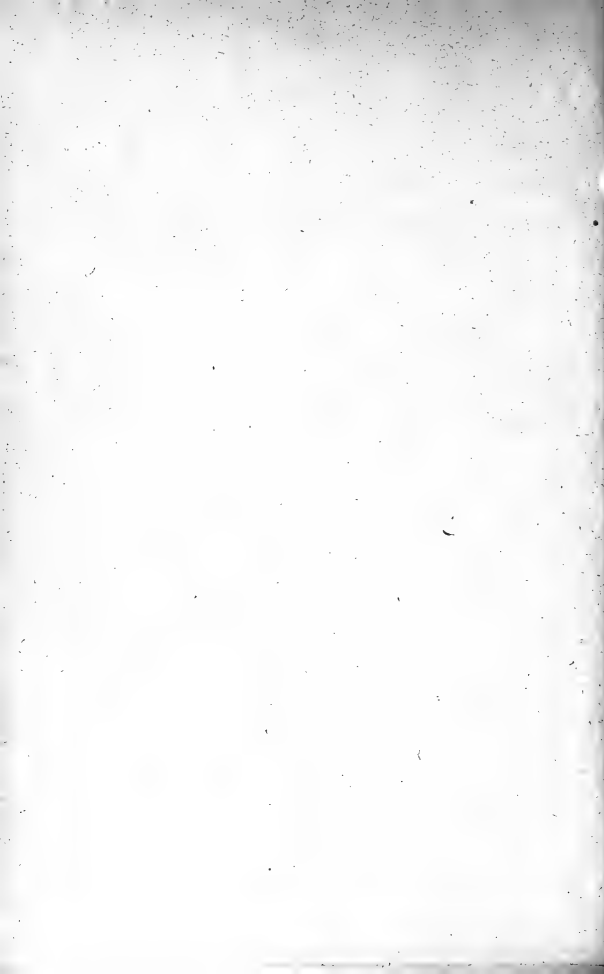
CRANE-FLIES OF JAPAN

(Reprinted from the Canadian Entomologist)

REPORT ON A COLLECTION OF JAPANESE CRANE-FLIES (TIPULIDAE) WITH A KEY TO THE SPECIES OF PTYCHOPTERA

CHARLES P. ALEXANDER
ITHACA, N. Y.

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REPORT ON A COLLECTION OF JAPANESE CRANE FLIES (TIPULIDÆ), WITH A KEY TO THE SPECIES OF PTYCHOPTERA.

BY CHARLES P. ALEXANDER, ITHACA, N.Y.*

An extensive collection of Japanese crane-flies, taken by Dr. S. I. Kuwana and assistant entomologists in the vicinity of Nishigahara, Tokio, Japan, during the season of 1912, was forwarded to me for examination. The material, alcoholic, is contained in 62 vials, very carefully prepared and with complete data. I express my sincere thanks to Dr. Kuwana and his assistants for this fine representation of Japanese Tipulidæ and Ptychopteridæ.

Family Ptychopteridæ

Genus Ptychoptera Meigen.

Key to the species of Ptychoptera.

1. Wings with a distinct brown cross-band along the cord 2
Wings hyaline or subhyaline without a distinct brown cross-band along the cord.
2. Radial sector more than twice as long as the radio-median cross-vein. (Europe) *contaminata* L.
Radial sector rarely longer than the radio-median cross-vein. 3
3. Posterior metatarsus conspicuously white.
(Europe) *albimana* Fabr.
Posterior metatarsus not white.
4. Pleuræ reddish yellow; a short brown cross-band near the middle of the radial cell. (East. U.S.) *rufocincta* O.S.
Pleuræ black; no brown cross-band near the middle of the radial cell. 5
5. All coxæ yellow or reddish-yellow; scape of antennæ brownish-yellow or yellow. 6

* Contribution from the Entomological Laboratory of Cornell University.

- Fore coxae yellowish, other coxae black; scape of antennae black.
(Japan).....*japonica*, sp. n.
6. Scutellum yellow. (Europe).....*lacustris* Meig.
Scutellum black.....7
7. Abdomen with the basal third of the second segment and the
basal one-half of the third segment reddish orange.
(India).....*distincta* Brun.
Abdomen entirely black. (Europe).....*paludosa* Meig.
8. Femora and tibiae bright orange-yellow, tarsi coal-black.
(Abdomen orange-yellow, tergites with blackish borders to
the segments; sternites orange-yellow.)
(India).....*atrirtarsis* Brun.
Femora and tibiae more or less black or brown; tarsi not coal-
black.....9
9. Pleurae silvery-white.....10
Pleurae not white. Thorax different in colour in the two sexes;
femora bright yellow, hind pair black on the basal two-thirds
except the extreme base. (India).....*tibialis* Brun.
10. Hind coxae black except at tip; femora brown at tip; scutellum
reddish; hypopygium large, reddish; first segment of the
antennae reddish. (West. U.S.).....*lenis* O. S.
Coxae and femora yellow, the latter black at the tip; scutellum
yellow; hypopygium small, mostly blackish; antennal scape
black. (Europe).....*scutellaris* Meig.

Ptychoptera japonica, sp. n.

Wings banded; radial sector very short; antennae of the male very long, about as long as the body; abdomen with little reddish or yellowish colour.

Male.—Length, 8.5 mm; wing, 8.9 mm; antennae, 8.4 mm.; fore leg, femur, 5.4 mm.; tibia, 5.4 mm.; tarsus, 8 mm.; middle leg, femur, 5.4 mm.; tibia, 5.1 mm.; tarsus, 7 mm. Hind leg, femur, 6.1 mm.; tibia, 6.8 mm.; tarsus, 6.3 mm.

Female.—Length, 11.5–13.5 mm.; wing, 10.7–10.8 mm. Fore leg, femur, 5.6–5.8 mm.; tibia, 5.1–5.4 mm.; tarsus, 7 mm. Middle leg, femur, 5.4 mm.; tibia, 5.4 mm.; tarsus, 6.8 mm. Hind leg, femur, 6.2 mm.; tibia, 6.8 mm.; tarsus, 6.2 mm.

Male.—Rostrum and palpi light brownish-yellow; front and vertex very dark coloured, occiput similar. Antennae, segment one black, segment two black at base, brown apically, segment three yellowish on basal half, black apically, remainder of antennae black; antennae very long, as long as the body; segments one and two short, the third segment very long, segments 4 to 15 long, gradually shortening, terminal segment very short.

Thoracic pronotum deep bluish-black; mesonotum, including the pleurae similar. Halteres rather pale dull whitish. Fore legs with yellow coxa, dark at base, yellow trochanter, yellow femur broadly tipped with blackish, yellow tibia narrowly tipped with blackish, metatarsus yellowish-brown darkened into brownish-black at the tip, remaining tarsal segments brownish black; middle and hind legs similar, but their coxae blackish and the black femoral tips narrower. Wings with cell C yellowish brown, Sc and R more yellowish, remainder of wing hyaline or nearly so, a brown mark at the base of the wing in the neighbourhood of cross-vein h, a cross-band at the cord, often irregular, often a rounded brown spot on vein Cu₁ midway between cross-vein m-cu and the tip of the vein, brown marks at end of vein R₁, fork of R₄₊₅ and fork of M. Venation (see plate III., fig. 7); Rs very short, much shorter than cross-vein r-m, basal deflection of R₄₊₅ short but distinct, about one-half as long as Rs, cross-vein m-cu long, curved, longer than the basal deflection of Cu₁, placed opposite or very slightly beyond cross-vein r-m.

Abdomen, 1st segment very short, 2nd a little longer than the 4th, 3rd very long, as long as the succeeding 4 segments combined, segments 4 - 8 successively shorter. Abdomen dark brownish black, basal half of segment 4 orange. Hypopygium, 8th tergite narrow, short, widely separated from the somewhat broader 8th sternite, 9th tergite viewed from above very deeply incised, this incision rectangular, the caudad projecting lateral lobes are somewhat swollen basally, narrowed behind, slightly enlarged at the tips, densely clothed with long black hairs, between the lateral arms is a small rounded lobe, directed caudad; the 9th pleurite reaches the 8th tergite, the 9th tergite and 9th sternite being more widely separated; the 9th tergite is triangular,

its apex rounded, bearing a long slender appendage at its tip on the inner side, this appendage long, slender and curved proximad so that each touches its mate of the opposite side, these appendages thickly clothed with long black hairs. The 9th sternite is very high at its base, extending up beyond the ventral level of the 8th tergite, its caudal ventral margin strongly chitinized, produced caudad and dorsad into a long slender arm, just dorsad of which is a shorter, strongly chitinized arm, with five or six blunt teeth on the ventral face. The guards of the penis are separated except at the base, divergent, chitinized, slender, rather blunt at the end, but the outer angle produced distad into a long slender arm. (See pl. IV., fig. 12-16).

Female.—Similar to the male, with the following exceptions: Antennae short; black on tips of femora even more extensive, in fore femur covering almost one-half of the segment; tibiae almost uniformly brown. Abdomen, tergites 1 to 6 dark brown; segment 7 brown, apical third white; 8th tergite mostly whitish; sternum lighter brown. 9th tergite, blade-like, pointed; 9th sternite short, produced into a short lobe on its dorsocaudal angle; ovipositor chestnut-brown. (See pl. IV.; fig. 11.)

Vial No. 29, Tokyo, Japan; May 7, 1912. 1 ♂, 5 ♀.

Holotype. —Male, Tokyo, Japan; May 7, 1912.

Allotype.—Female, with the type.

Paratypes.—Four females, with the type.

Types in the author's collection.

Paratypes in the U. S. National Museum and Cornell University collections.

Family Tipulidae

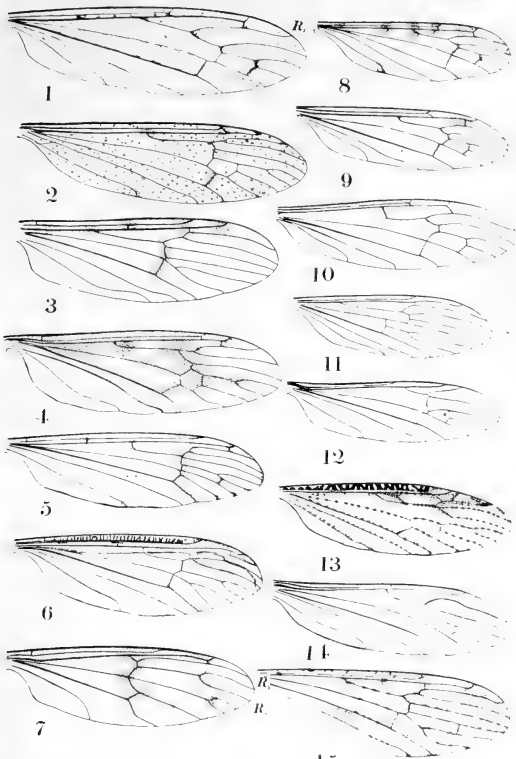
Tribe Limnobiini.

Genus Dicranomyia Stephens.

DICRANOMYIA JAPONICA, sp. n.

Subcosta long; wings with a distinct stigma and faint clouds along the cord; femora tipped with brown.

Male.—Length, 9-9.4 mm; wing, 9.4-10 mm; antennae 3.2 mm. *Female*: Length, 10.2-11.4 mm; wing, 9.3-10.6 mm.



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JAPANESE CRANE-FLIES (ALEXANDÉR).

Male.—Rostrum and palpi brown; antennæ, segments 1 and 2 pale whitish yellow; segment 3 yellowish basally, brown at tip; remainder of antennæ dark brown. Antennæ long; flagellar segments long, cylindrical, subequal in length. Front, vertex and occiput, dark brown; genæ lighter colored, more yellowish.

Pronotum dark brown medially, yellowish on sides; mesonotal præscutum light yellow, with a broad, conspicuous median brown stripe; scutum with the lobes dark brown, paler medially; scutellum dark brown, except the narrow median incision on the anterior margin; post-notum largely dark brown. Pleuræ dull light yellow, the mesopleuræ suffused with brownish. Halteres rather long, pale, knob a little darker. Legs, coxæ and trochanters light yellow, femora dull yellow, the tip brown; tibiæ dull yellow, tip scarcely darker; tarsi, segment 1 dull brownish yellow basally, darkening to brown on apical third; remainder of tarsi brown. Wing pale brownish yellow, costal and subcostal cells rather clearer yellowish; veins brown; a conspicuous brown stigma; very pale grey clouds along the cord, outer end of cell 1st M_2 , and at origin of Rs. Venation see fig; Sc long, ending before fork of Rs, Sc_2 longer than Sc_1 , at the tip; Rs long arcuated at origin sometimes with a spur. (See pl. III.; fig. 9.)

Abdomen, tergites largely brown, usually with a yellow triangle on the anterior portion of the sides of the sclerites; sternite yellow; 8th and 9th, brown; 8th tergite, with caudal margin pale, straight; 9th tergite, with caudal margin strongly convex; with a brown median mark. Pleural pieces short, triangular, very broad at base, narrowed apically; dorsal apical appendage short, cylindrical, narrowed at tip, its inner or caudal margin provided with 4-5 rounded teeth. Ventral arm a small, rounded, little chitinized lobe, covered with long hairs; guard of the penis very long, pale, projecting beyond the apical appendages, bifid at tip with 2 slightly chitinized divergent horns, these horns directed ventrad; 2nd gonapophyses, slender, much shorter than the penis guard, scarcely enlarged at end, but inner face produced into a short, indistinct tooth. (See pl. IV.; fig. 10.)

Female about as in the male; valves of the ovipositor rather long, the tergal valves much longer than the sternal valves.

Variations: In some specimens the basal 4 or 5 segments are pale; yellow triangles on sides of abdominal tergites vary in distinctness.

Vial No. 4.—Tokyo, Japan; April 25, 1912. 1 ♂.

Vial No. 14.—Tokyo, Japan; April 25, 1912. 1 ♀.

Vial No. 15.—Tokyo, Japan; April 25, 1912. 4 ♂s, 2 ♀s.

Vial No. 24.—Tokyo, Japan; April 27, 1912. 7 ♂s, 6 ♀s.

Vial No. 32.—Tokyo, Japan; May 7, 1912. 3 ♀s.

Vial No. 33.—Tokyo, Japan; May 7, 1912. 2 ♂s.

Vial No. 37.—Tokyo, Japan; May 7, 1912. 1 ♂.

Vial No. 38.—Tokyo, Japan; May 7, 1912. 1 ♀.

Holotype.—♂, Tokyo, Japan; April 27, 1912. (Vial 24).

Allotype.—♀, with the type (Vial 24).

Paratypes.—14 ♂s; 12 ♀s; Tokyo, Japan; April 25–May 7, 1912.

Types in author's collection.

Paratypes in U.S. National Museum and Cornell University collections.

D. japonica resembles *umbrata* Meij. from Java (1) but the legs are much paler, wing-pattern and venation different, and it is a much larger species (wing, 9–10 mm.; in *umbrata*, 5 mm.).

Dicranomyia nebulosa, sp. n.

Subcosta long; wings clouded with grey; femora pale apically, with a dark subterminal ring.

Male.—Length, 5.4 mm.; wing, 5.8 mm.

Male.—Rostrum and palpi dark brown; antennæ, 1st segment brown at base, more yellowish at the tip, succeeding segments brown; flagellar segments rounded, short-pedicellate, these pedicels being whitish; front, vertex and occiput, very dark blackish.

Pronotum brownish-yellow, darker brown medially above. Mesonotum rather gibbous, brown, a narrow, darker brown, median line on the præscutum; lateral margin of this sclerite with a rounded dark brown spot which is connected with short lateral stripes nearer to the median vitta; scutum light brown, lobes margined with dark brown; scutellum with a dark brown median mark; postnotum brown. Pleuræ brown, almost uniform, paler near the

(1) (Tijd voor Entomol.; Vol. 44; p. 25; pl. 1, f. 7.; 1911.)

sternum. Halteres pale. Legs, coxae and trochanters light yellow; femora light brown, becoming light yellow on the apical sixth and with a conspicuous, dark-brown, subapical ring; tibiae dark brown; tarsi broken. Wings, whitish or subhyaline; costal cell slightly more yellowish; grey clouds as follows: At origin of Rs (largest), at stigma, at tip of Sc, along cord, along outer end of cell 1st M₂ and in the center of most of the cells. Venation, (see pl. III.; fig.10); Sc long, extending far beyond the origin of Rs, Sc₂ at the tip of Sc₁, Rs almost square at its origin and spurred (in the types), cell R₂ almost as far proximad as cell 1st M₂ (as in *F. stulta* O.S.), cell 1st M₂ long, longer than the veins issuing from it, basal deflection of Cu₁ at the fork of M.

Abdomen, tergum dark brown; caudal margins of the 7th, 8th and 9th segments more yellowish; sternum dull yellow. Hypopygium (see figs. 8, 9; pl. IV.); 9th tergite short, its cephalic and caudal margin convex, its caudal half provided with a number of long hairs. Pleurae very long, cylindrical, the tips produced into a slender lobe on the ventral side; two apical appendages, which are very short and inconspicuous, being scarcely one-third as long as the plura; dorsal appendage simple, short, slender and subchitinized, not exceeding the ventral appendage; ventral appendage double, its dorsal arm being small, triangular and with the caudal or outer face bearing a chitinized tooth, its tip produced entad and cephalad into a blunt lobe; the ventral arm is produced entad into a small lobe, with the tip evenly rounded. Viewed from the side, the pleura is broad, its ventral margin rounded at the base, at the middle of its length produced into a spatulate fleshy lobe which is directed caudad. The guard of the penis is long (extending about to the extreme tip of the pleura), and slender, broad at the base, narrowed toward the tip, the end little, if any, enlarged; the apex is very slightly notched; viewed from the side, it is seen that the extreme tip is bent ventrad; viewed from above, the guard seems to be concave, its lateral margins being more strongly chitinized. The second gonapophyses are rather long, dark brown, subrounded or scarcely pointed at the apex; at their base they are about as broad as the base of the penis guard; the lateral margin of the apophyse is produced dorsad into an incurved, chitinized flap or

margin, which, on the sides, protects the short, slightly emarginate anal tube.

Vial No. H.—Tokyo, Japan; Aug. 1912. 1 ♂.

Holotype, ♂.—Tokyo, Japan; Aug. 1912.

Type in the author's collection.

D. nebulosa resembles *unibrata* Meij. (Java), but the leg-pattern and venation are quite different.

Genus *Geranomyia* Haliday.

Geranomyia avocetta, sp. n.

Wings spotted; thoracic dorsum brown, the humeral portions of the præscutum yellow; tibial apices not blackened.

Male.—Length, excluding the proboscis, 7.5–7.7 mm.; proboscis, 3–3.6 mm.; wing, 7.8–7.9 mm.

Male.—Proboscis and palpi dark brown, the former more yellowish basally; antennæ, basal segments dark brown, flagellar segments somewhat lighter brown, segments rounded-oval; front, vertex and occiput dark-colored, almost black.

Pronotum dark brown; in the paratypical specimen, the caudal margin of the scutum and the scutellum, yellowish. Mesonotal præscutum with a broad, dark brown, median line, widened behind; humeral angles conspicuously light yellow, behind darkening into brown of a lighter shade than the broad median vitta; scutum with the lobes dark brown, median line paler; scutellum and postnotum brown. Pleuræ dull brownish-yellow, clearer below. Halteres pale, knob a little browner. Legs: Coxæ and trochanters light yellow, the latter margined with black at the tip; femora and tibiae light brown, scarcely darkened at their tips; terminal tarsal segments darker brown. Wings, hyaline or nearly so, the costal cells and veins more tawny; veins light brown, darker brown where traversed by dark markings; seven brown marks along the costal margin, the third at the origin of Rs extending down almost to vein M; the fourth at the tip of Sc extending down into cell 1st R₁; the 5th (stigmatal) spot, largest, rectangular; the sixth and seventh spots at ends of veins R₂₊₃ and R₄₊₅; cord and outer end of cell 1st M₂ seamed with brown; a brown spot at ends of most of the veins, most distinct and largest at the 2nd anal vein. Venation (see pl. III.; fig. 8): Sc long, ending nearer to the fork of Rs than to

its origin; Sc₂ at tip of Sc₁; Rs long, nearly three times as long as the basal deflection of R₄₊₅; basal deflection of Cu₁ at fork of M.

Abdominal tergum brown, anterior margins of the basal segments somewhat more yellowish; sternum pale whitish-yellow. Hypopygium (see figs. 5-7; pl. IV.): 8th tergite short, consisting only of a narrow ring, almost straight on its cephalic margin, concave on the caudal margin; 9th tergite convex anteriorly, concave on caudal margin. Pleural pieces very short, cylindrical, not more than twice as long as wide, bearing two apical appendages. The dorsal appendage is a short, slender, strongly curved hook, sharp pointed and more chitinized at its tip; it is directed entad, cephalad and dorsad. The ventral lobes are long, fleshy, between two and three times as long as the pleura and much thicker; at their base, on the inner side, is a short, fleshy tooth, more chitinized at its tip, directed cephalad and dorsad and meeting its mate of the opposite side on the median line; near the tip, on the outer or caudal face, are two, long, slender, subequal bristles, directed caudad. The ventral side of the pleura is produced into a lobe, enlarged apically and directed entad and slightly caudad. The guard of the penis is short, extending slightly beyond the most caudad-projecting portion of the pleura; it is swollen at the base, less so in the middle of its length, its tip small, chitinized, bifid at apex, the tip directed slightly ventrad. The second gonapophyses are very short, and, viewed from above, barely project beyond the fleshy lobe lying between them.

Vial No. 8.—Tokyo, Japan; April 25, 1912. 1 ♂.

Vial No. 49.—Tokyo, Japan; August, 1912. 1 ♂.

Holotype, ♂.—Vial No. 8.

Paratype, ♂.—Vial No. 49.

Types in the author's collection.

G. avocetta, compared with the four Javan species described by de Meijere, agrees most closely with *G. montana*, which, however, has the wing-pattern much less distinct. From the North American *G. rostrata* Say, it differs conspicuously in its unicolorous tibiae.

Genus Rhipidia Meigen.

Rhipidia pulchra septentrionis, subsp. n.

This subspecies differs from typical *pulchra* Meij.* (Java) in

*Neue und bekannte sudasiatische Dipteren; p. 92, fig. 7. Bijdragen tot de Dierkunde, vol. 17, 1904.

antennal coloration, the flagellar segments being alternately dark and light-coloured; segments, 4, 6, 8, 10 and 12 are whitish, the remainder of the antennae brown. The wings have a large spot at the base of Cu and the venation is not as figured by de Meijere. (Compare fig. 1; pl. III.)

Female.—Length, 7.6–8.6 mm.; wing, 7.4 mm.

Vial No. 10.—Tokyo, Japan; April 25, 1912. 2 ♀s.

Holotype and Paratype in author's collection.

In *Tijd Voor Entomol.*, Vol. 44, p. 27, figs. 14–16, de Meijere refers this to *Dicranomyia*. However, I believe his original reference of the species to be the correct one—this belief based on venational hypopygial characters.

Tribe Antochini

Genus Rhamphidia Meigen.

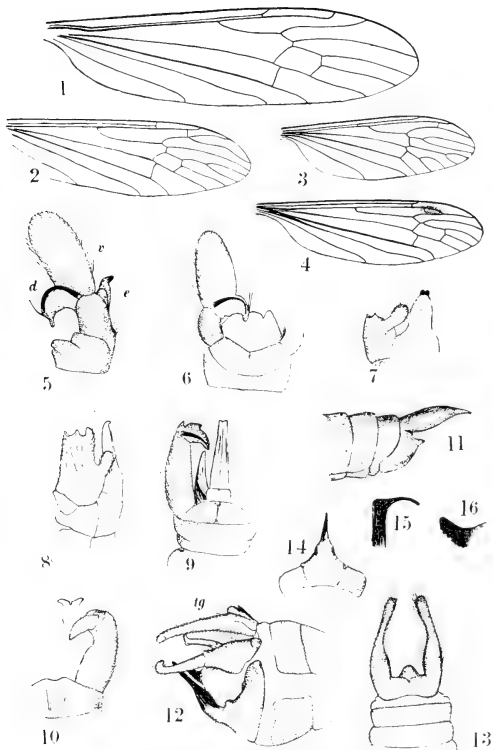
Rhamphidia nipponensis, sp. n.

Rostrum short; palpi pale; wings hyaline without darker marks.

Female.—Length, 8.9 mm.; wing, 7.8 mm.; middle leg, femur, 6.6 mm.; tibia, 7 mm.; tarsus, 6.7 mm.

Female.—Rostrum light brown; labrum light yellow; palpi light brownish-yellow; antennae brown, flagellar segments cylindrical with short black bristles not exceeding the segment in length, the outer segments not conspicuously narrowed; front, vertex, occiput and genae dark brown.

Pronotum dark brown, mesonotal praescutum light brown, with three broad, darker brown stripes, the median one longest, broadest, very dark brown in front; the lateral stripes begin behind the pseudosutural fovea and cross the suture, suffusing the lobes of the scutum; scutum medially light brown, on margins yellowish-brown; scutellum brown, margined with yellowish; postnotum brown. Pleurae brownish-yellow, suffused with brown on portions of the mesopleurae; mesosternum brown. Halteres light yellow, knob slightly darker, brown. Legs: coxae light yellow, tipped with pale brown; trochanters yellow; femora yellowish-brown, rather clearer yellowish basally; tibiae brown, tarsi brown, terminal segments rather darker. Wings, hyaline or nearly so; veins brownish



CHINESE CRICKETS (ALEXANDER)

yellow, stigma not indicated. Venation (see fig. 1; plate IV.); cross-vein r-m distinct; basal deflection of Cu; beyond the fork of M.

Abdomen, tergum and sternum dark brown; ovipositor light yellow.

Vial No. 28.—Tokyo, Japan; April 26, 1912. 1 ♀.

Holotype, ♀.—Vial No. 28, in author's collection.

This species differs from the European *R. longirostris* by its shorter rostrum, cylindrical flagellar segments with short bristles; pale maxillary palpi and other colorational differences, which may, of course, vary in series.

EXPLANATION OF THE PLATES.

PLATE III.

Fig. 1. Wing of *Rhipidia pulchra septentrionis*, sub sp. n.

Fig. 2. Wing of *Limnophila japonica*, sp. n.

Fig. 3. Wing of *Erioptera elegantula*, sp. n.

Fig. 4. Wing of *Limnophila satsuma* Westwood.

Fig. 5. Wing of *Tricyphona vetusta*, sp. n.

Fig. 6. Wing of *T. kuwanai*, sp. n.

Fig. 7. Wing of *Ptychoptera japonica*, sp. n.

Fig. 8. Wing of *Geranomyia avocetta*, sp. n.

Fig. 9. Wing of *Dicranomyia japonica*, sp. n.

Fig. 10. Wing of *D. nebulosa*, sp. n.

Fig. 11. Wing of *Molophilus pegasus*, sp. n.

Fig. 12. Wing of *Gonomyia insulensis*, sp. n.

Fig. 13. Wing of *Conosia irrorata* Wiedemann.

Fig. 14. Wing of *Gonomyia superba*, sp. n.

Fig. 15. Wing of *Erioptera asymmetrica*, sp. n.

PLATE IV.

Fig. 1. Wing of *Rhamphidia nipponensis*, sp. n.

Fig. 2. Wing of *Limnophila inconcussa*, sp. n.

Fig. 3. Wing of *Tricyphona insulana*, sp. n.

Fig. 4. *Liogma kuwanai*, sp. n.

Fig. 5. Hypopygium of *Geranomyia avocetta*; lateral aspect. e—penis guard; d—dorsal apical appendage; v—ventral apical appendage.

Fig. 6. Hypopygium of *Geranomyia avocetta*; dorsal aspect.

Fig. 7. Hypopygium of *Geranomyia avocetta*; ventral aspect, showing a portion of the *hypopygium*.

Fig. 8. Hypopygium of *Dicranomyia nebulosa*; lateral aspect. The apical appendages are not included.

Fig. 9. Hypopygium of *Dicranomyia nebulosa*; dorsal aspect.

Fig. 10. Hypopygium of *Dicranomyia japonica*; dorsal aspect.

Fig. 11. Ovipositor of *Ptychoptera japonica*; lateral aspect.

Fig. 12. Hypopygium of *Ptychoptera japonica*; lateral aspect. tg—9th tergite.

Fig. 13. Hypopygium of *Ptychoptera japonica*; 9th tergite, dorsal aspect.

Fig. 14. Hypopygium of *Ptychoptera japonica*; 9th sternite, ventral aspect.

Fig. 15. Hypopygium of *Ptychoptera japonica*; guard of the penis (?).

Fig. 16. Hypopygium of *Ptychoptera japonica*; ventral appendage.

(TO BE CONTINUED.)

DONACIA EMARGINATA KIRBY (COLEOPTERA.)

A BIOGRAPHIC NOTE.

BY L. B. WOODRUFF, NEW YORK CITY.

Donacia emarginata Kirby may gain its sustenance from various water-loving plants, but that which it seems to find superlatively to its taste near New York City is the Marsh-marigold, *Caltha palustris*. In a certain wooded swamp just outside the city limits, always wet under foot and in April excessively "soft," grow and bloom great masses of these glorious golden flowers; and when they reach the zenith of their splendor, in almost every clump, half buried under their stamens, are from one to several of these graceful metallic beetles. The sturdy crowfoot cup gives them secure support, and in them throughout the flowering period they are to be found in breeding pairs. On the stems just above the roots the pupal cocoons are attached, sometimes several in a row; but when the swollen buds expand the beetles emerge, leave their lowly dwellings, and, climbing up the stems, attain the scene of

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BY CHARLES P. ALEXANDER, ITHACA, N.Y.

(Continued from Page 210.)

Gonomyia (Gonomyia) superba, sp. n.

Antennæ, brown; color, brown and yellow; vein, *Sc* ends slightly beyond the origin of *Rs*.

Male.—Length, 5–5.5 mm.; wing, 4.9 mm.

Female.—Length, 5.9 mm; wing, 5.2–5.5 mm.

Male.—Rostrum yellow, palpi brown; antennæ brown, including the basal segments; front, vertex and occiput dull yellow, the vertex clearer yellow behind.

Pronotum, clear light yellow above; on the sides, a short, dull brown stripe from the cervical sclerites down to above the fore coxa. Mesonotum, præscutum very light yellowish brown, with rich chestnut-brown stripes, a median stripe, broad and dark in front, narrow behind, and again enlarged at its end divided by a pale, narrow, median stripe; lateral stripes short, beginning behind the pseudosutural pits crossing the transverse suture and suffusing the lobes of the scutum; lateral edge of the præscutum, in front, yellowish; behind, brown; scutellum pale, whitish; the base and lateral edges tinged with brownish, post notum brown. Pleuræ clear yellowish white, an irregular dark brown mark behind and above the base of the coxa; sternum yellow, the sides of the mesosternum, between the fore and middle legs, brown, separated by a broad median pale mark; the propleural stripe begins on the prosternum as a rounded mark which sends out a narrow caudal prolongation. Halteres light yellow. Legs: coxæ and trochanters light yellow, margins of the segments more or less brown; femora and tibiæ light brown; tarsi somewhat darker brown. Wings, hyaline or nearly so; veins brown, costa more yellowish. Venation (see fig. 14, pl. III): *Sc* ending slightly beyond the origin of *Rs*; basal deflection of *Cu*¹ about at the fork of *M*.

Abdomen, tergum, light yellow, each segment with a large brown mark on basal half, the caudal margin of this mark much

rounded; sternum light yellow. Hypopygium (see fig. 1 and 2, plate X). Pleurites short and broad, the caudal end produced into one fleshy and three chitinized appendages, as follows: Viewed from above, a fleshy lobe in front, the inner dorsal margin produced entad and dorsad into a slightly curved slender spine; behind the fleshy lobe arises a stout hook, very strong at the base, constricted before the middle, the tip slender and pointed, this hook directed entad and caudad; from the outer ventral angle of the pleurite arises a long, straight chitinized appendage, directed entad and caudad, narrow basally and more enlarged apically. The guard of the penis is long, pale, ending in a long, slender, tube-like point. On either side of the penis guard arises an elongate, very slender, chitinized hook, which is straight for about three-fifths its length and then bent strongly inward; viewed from the side, these hooks are bent very strongly ventrad and then caudad. Summarized, the hypopygium bears eight chitinized slender arms, all except two (which are probably homologous with the second gonapophyses) being borne by the pleurites.

Female.—Very similar to the male, but larger.

Vial No. 1.—Tokio, Japan; Aug. 1912. One ♂.

Vial No. 5.—Nishigahara, Japan; Apr. 25, 1912; 5 ♂, 4 ♀.

Holotype, ♂; Vial No. 1.

Allotype, ♀; Vial No. 5.

Paratypes, 5 ♂, 3 ♀; Vial No. 5.

Types in author's collection; Paratypes in U.S. National Museum and Cornell University Collections.

G. superba differs from *nubeculosa* Meij. (Java). (Tijd. voor Entomol., vol. 44, p. 48, 49; fig. 36, 1911) in the unspotted wings; from *metatarsata*, (l.c., p. 48, fig. 35) in its closed cell 1st M₂, etc.

Gonomyia (Leiponeura) insulensis, sp. n.

Pleurae without longitudinal stripes; vein *Sc* ends far before the origin of *Rs*.

Female.—Length, 3.9–4 mm.; abdomen, 2.6 mm.; wing, 4 mm.

Female.—Rostrum yellow, palpi brown; antennae, segment one yellowish, remainder dark brown; front, vertex and occiput yellow, the vertex suffused with dark colored.

Mesonotal præscutum yellowish, with three brown stripes, the median one broad, not divided by a pale median vitta, extending to the suture, the lateral stripes are broad, narrow, uniform in width until they cross the suture (not expanded behind), lateral margin of the sclerite dull yellow, the ground color between the brown stripes is very reduced; scutum, lobes dark brown, median line yellowish; scutellum yellow, a brown median spot in front; postnotum brown. Pleurae, mesopleurae brown in front, extending from the lateral margin of the præscutum down to and suffusing the mesosternum on the sides; metasternum pale brown. Halteres dull yellow. Legs: coxæ and trechanters yellow, suffused with brown in front; femora, tibiæ and tarsi brown, a little darker toward the tip. Wings subhyaline, veins brown. Venation (see fig. 12, plate III); Sc. ending far before the origin of Rs; R^{2+3} almost parallel to R^1 .

Abdominal tergites yellowish-brown; sternites light yellow.

Vial No. F.—Tokio, Japan; August, 1912; 1 ♀.

Holotype, ♀; in Vial F.

Type in author's collection.

The three species of *Gonomyia* described by de Meijere as *Atarba* (Tijd. voor Entomol.; vol. 44, 1911) are all members of the subgenus *Leiponeura* Skuse. These species are *Gonomyia nebulosa* (l.c., p. 42, fig. 25); *pilifera* (l.c.; p. 43, fig. 26) and *diffusa* (l.c.; p. 43, 44). They have nothing in common with *Atarba* and are quite distinct from any members of the *Leiponeura* group, that I know of, in their clouded wings. *G. insulensis* differs from all of the above species in its unmarked wings.

Genus *Erioptera* Meigen.,

Subgenus *Acyphona* Osten-Sacken.

Of this subgenus, two species were included, both of which are herein characterized as new. The only described Palearctic species, *Acyphona maculata* Meigen, of Europe, differs from the Japanese species, as follows: Wing pattern, in *maculata* large, rounded brown markings mostly with grey centers; the body-shade is much lighter in *maculata* and there are several important differences in hypopygial characters, these being shown by the following key:

1. 9th tergite broad and thin, at its apex deeply notched; two chitinized teeth at the base of the pleura on the ventral side 2.
- 9th tergite provided with two chitinized hooks at its apex; no chitinized teeth at the base of the pleura on the ventral side; [horns of the second gonapophyses long, widely separated at the base] (Japan) *asymmetrica*, sp. n.
2. Base of pleura on sternal side provided with a chitinized plate which is bidentate, the proximal tooth free, the distal one joined to the pleura; 2nd gonapophyses short, chitinized at tip and on sides; apex merely notched.
(Europe) *maculata* Meigen.
- Base of pleura on sternal side provided with a small chitinized tooth, minutely denticulate; 2nd gonapophyses long, the tips long and widely separated (Japan) *incongruens*, sp. n.

Erioptera (Acyphona) incongruens, sp. n.

Small species; light brown, with narrow dark brown pleural stripes; wings thickly spotted with brown.

Male.—Length, 5 mm.

Male.—Rostrum and palpi brown. Antennae long, segment one brownish-yellow; segments two to eight light yellow; remainder with increasing amounts of brown at their tips, the apical segments all brownish. Front, vertex and occiput dark brown.

Thoracic pronotum brownish-yellow, brown on the sides. Praescutum reddish-brown, with a double median brown stripe; humeral region brighter yellow; sides of the sclerite darkened; scutum, scutellum and postnotum brown. Pleurae reddish-brown with narrow dark-brown lines, the most dorsal one continuing from behind the fore coxa underneath the wing to the postnotum; the second beginning on the mesosternum running above the middle coxa, becoming very narrow and indistinct before the root of the halter; the last stripe on the metasternum over the hind coxa. Halteres light yellow. Legs: coxa brown; trochanters brownish-yellow. (The legs are all detached and loose in the vials; most of these have the femora largely brown, basal third mostly paler, yellowish; a post median yellow ring, tip usually pale; tibiae and

tarsi clear light yellow, sometimes infuscated at the tips; tibiae often with a sub-basal annulus. In the vial were several specimens of *E. asymmetrica*, a closely allied form, and most of the legs evidently belong to that species. Two legs in the vial are very different and may belong to this little species, this being rendered probable by the size; in these the entire legs are clear, light yellow, the femora with a rather narrow subapical dark brown ring).

Wings spotted with brown.

Abdomen: Tergum dull brownish yellow, apex and lateral margins of the sclerites brown. Hypopygium unsymmetrical as in the genus, the 9th abdominal segment being twisted one-half around. Suture between the 9th tergite and the 9th sternite not indicated. The 9th tergite is broad and long, its hind margin produced caudad in a wide, thin plate which is broadly and rather deeply notched at its middle; no chitinized hooks at its apex. The pleurites are convex laterally produced into two apical appendages, the base dorsally produced antad and cephalad in a long, chitinized hook; the ventral edge of the pleura near the sternum possesses a small chitinized organ which is directed caudad and is provided with two or three denticulae; of the two apical appendages, the ventral one is chitinized, the dorsal one is fleshy, the second gonapophyses are close together, the chitinized tips rather long and deeply divided. (See plate X, figs. 5 and 6).

Holotype, ♂. Vial 6, April 25, 1912; Tokio, Japan.

Erioptera (Acyphona) asymmetrica, sp. n.

Resembles *incongruens* closely, but is larger, the coloration darker, especially on the pleurae and usually on the abdomen. Wings hyaline, spotted with brown, varying considerably in the intensity and size of the markings; in some the dots are small, not confluent, in the darker specimens the spots on the costal half of the wing tend to flow together to form large blotches. The male genitalia of the two species is remarkably different. (See plate III, fig. 15, wing.)

The hypopygium is, as in the genus, asymmetrical, the usual dorsal portions of the 9th sclerites being switched around on a level with the pleural sutures of the remaining segments. (See fig. 7-9, plate X), suture between 9th tergite and sternite obliterated, 9th

tergite broad and long with a cross-shaped mark; near its tip set with two small, semicircular, chitinized pieces which are produced into sharp points on the proximal ends. Pleurites short and stout, at the base on the dorsal side, produced into a long, slender, chitinized arm which is directed entad, two apical appendages, the more ventrad being chitinized, especially at the tips, the dorsal apical appendage fleshy. Between the tergite and the unarmed sternite, nearly in the median plate, is a rectangular, subchitinized organ, bearing at its outer angles chitinized hooks, bent ventrad and inward, these hooks minutely denticulated at tip.

♂.—Length, 5.8 mm.; wing, 6.3 mm.

♀.—Length, 6.4–7.1 mm.

Holotype.—Vial 6, April 25, 1912; Tokio, Japan.

Allotype.—Vial 6, April 25, 1912; Tokio, Japan.

Paratypes.—Vial 6 and L; 4 ♀, 2 ♂, April 25, 1912; Aug. 1912, Tokio, Japan.

Subgenus Erioptera, Meigen.

Erioptera (Erioptera) elegantula, sp. n.

Wings with brown spots.

Male.—Length, 5.4 mm.; wing, 7.7–7.9 mm.

Female.—Length, 6–6.5 mm.; wing, 7–8.3 mm.

Male.—Rostrum and palpi dark brown, antennae with basal segments brown, flagellar segments short, dark brown; front, vertex and occiput dark brown.

Pronotum dark brown above, lighter colored on the sides. Mesonotum dark brown, the region before the pseudosutural pits more yellowish; scutum, scutellum and postnotum dark brown. Pleurae dark brown. Halteres pale. Legs: coxae dark brown; trochanters brown; femora dark brown; tibiae dark brown, a little paler at the extreme base; tarsi dark brown. Wings subhyaline with greyish-brown marks, as follows: A large rounded spot at origin of Rs, a second at Sc², a third at end of Sc¹ running down over cross-vein r; a fourth spot at tip of R¹ and a smaller one at tip of R²; cord broadly margined with the same color; less distinct clouds at ends of the other veins and along most of these veins. Venation, (see fig. 3, plate III.)

Abdomen dark brown, densely clothed with long whitish hairs. Hypopygium. 9th tergite broad at base, narrowed at the middle,

the tip rather expanded with a deep V-shaped incision, the lobes rounded. Pleurites long, cylindrical, not very convex on outer face; three apical appendages, the more dorsal being somewhat fleshy, brown, elongate-cylindrical, narrowed basally, provided with long hairs, and, at its tip, with a slender hook directed cephalad; the median apical appendage is longest, chitinized, very strongly so at its tip; tip broadly expanded and concave, this concavity provided with minute denticulae; the ventral apical appendage is shorter than the median one, fleshy, cylindrical, narrowed at base. Viewed from beneath, the 9th sternite is straight on its caudal margin, pleurites very broad at base, produced antad and almost meeting on the median line on the sternum; second gonapophyses long, slender, acicular, the tips barely projecting beyond the caudal level of the 9th sternite.

Female.—Similar, but averages larger in size.

Vial No. 1.—Tokio, Japan; 2 ♂, 2 ♀.

Vial No. 16.—Tokio, Japan; 2 ♀ (small, but apparently of the same species.)

Holotype.—♂. Vial No. 1, I.

Allotype.—♀. Vial No. 1.

Paratypes.—1 ♂, 3 ♀, Vials I and 16.

Types in author's collection.

E. elegantula differs from *E. javensis* Meij. (Tijd voor Entomol., vol. 44, p. 45, 46, fig. 28, 1911) and *E. notata* Meij. (l.c., p. 46, figs. 29-31) in its spotted wings.

Genus Molophilus Curtis.

Molophilus pegasus, sp. n.

Antennae of the male short; color of body brown.

Male.—Length, 4.2 mm.; wing, 4.3 mm.

Female.—Length, 4.9 mm.; wing, 5.1 mm.

Male.—Rostrum and palpi dark brown; antennae light yellow, the flagellar segments with the exception of the first, a little more brownish; antennae short, extending about to the base of the wings, segments of flagellum cylindrical; front, vertex and occiput brown.

Pronotum above, light yellow, darker on the sides. Mesonotal praescutum reddish-brown, with a broad, dark brown median stripe, and less distinct but broader lateral stripes, which begin

behind the pseudosuture, broaden out behind and fuse with the median stripe near the transverse suture; scutum, lobes brown, median line paler; scutellum lighter colored, yellowish medially, brown on the sides; postnotum brown. Pleuræ brown except dorsally, where there is a pale band running from the pronotum back to the wing basis. Halteres light yellow. Legs: coxæ and trochanters pale yellow, femora short, incrassated beyond the base, brown, paler basally; tibiæ and tarsi brown. Wings slightly tinged with yellowish-grey; veins yellow. Venation (see fig. 11, plate III).

Abdomen, tergites dark brown; sternites rather lighter brown, extreme apices of the sclerites pale. Hypopygium (see figs. 3 and 4, plate X); 9th tergite and sternite completely fused so that no pleural suture remains; viewed from beneath, the 9th sternite projects backward, its caudal margin rather squarely truncated; the outer ventral pleural arm is straight, fleshy, rather thickly covered with long hairs; just entad of the outer arm and nearer to the base of the pleurite, arises the inner ventral pleural arm, which is elongate, slender, its tip strongly chitinized and denticulated at the extreme end and bent inward; the guard of the penis is a pointed, chitinized organ, nearly as long as the outer pleural arm. Viewed from the side, outer ventral arm of the pleurite directed caudad; inner ventral arm with the tips conspicuously arcuated and bent ventrad; just above the base of the inner arm arises the dorsal pleural appendage, very broad at the base, its tip chitinized and directed slightly dorsad, on the dorsum of the pleurite are two protuberances clothed with long hairs. Viewed from above, the pleurites are very broad, so that the space between them on the median line is narrow; about midway of their length, on the inner face, is a strong protuberance, directed inward; it is strongly chitinized and almost touches its mate of the opposite side.

Female. Similar, but larger; the abdomen is dark brown, the genital segment much brighter, yellowish-brown.

Vial No. 19.—Tokio, Japan; June 25, 1912; 1 ♀.

Vial No. 20.—Tokio, Japan; June 25, 1912; 1 ♀.

Vial No. K.—Tokio, Japan; Aug. 1912; 1 ♂.

Holotype.—1 ♂, Vial K.

Allotype.—1 ♀, Vial 20.

Paratype.—1 ♀, Vial 19.

Types in author's collection; paratype in U.S. National Museum collection.

M. pegasus differs from *bicolor* Meij. (Java) (Tijd. voor Entomol.; vol. 44, p. 45, fig. 27) in its darker brown body-color and darker legs.

Genus Conosia Van der Wulp.

Conosia irrorata Wiedmann.

The following papers since Kertesz (1902) may be cited:

1904.—*Conosia irrorata* de Meij; Bijdragen tot de Dierkunde; p. 92.

1911.—*Conosia irrorata* de Meij; Tijdschrift voor Entomologie; vol. 44, p. 51.

1911.—*Conosia irrorata* Brun.; Rec. Indian Museum; vol. 6, part. 5, p. 283.

1912.—*Conosia irrorata* Brun.; Fauna Brit. India, Dipt. Nemat., p. 497.

One female in vial 47; Tokio, Japan. The wing pattern is figured on pl. III; fig. 13.

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EXPLANATION OF PLATE X.

Fig. 1.—Hypopygium of *gonomyia superba*; dorsal aspect; x, y, z = chitinized pleural appendages.

Fig. 2.—Hypopygium of *gonomyia superba*; lateral aspect, sternum uppermost; lettering as in fig. 1.

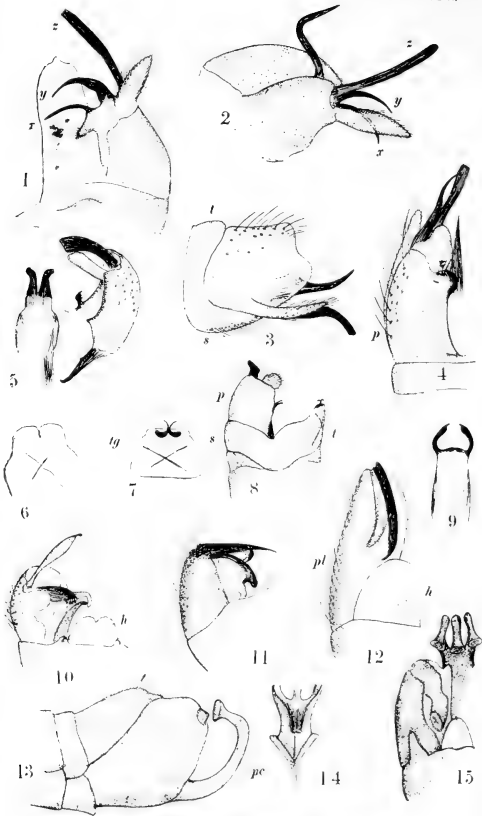
Fig. 3.—Hypopygium of *Molophilus pegasus*; lateral aspect; t = 9th tergite; s = 9th sternite.

Fig. 4.—Hypopygium of *Molophilus pegasus*; dorsal aspect; p = pleura.

Fig. 5.—Hypopygium of *Erioptera (Acyphona) incongruens*, sp. n.; dorsal aspect.

Fig. 6.—Hypopygium of *Erioptera (Acyphona) incongruens*; 9th tergite, dorsal aspect.

Fig. 7.—Hypopygium of *Erioptera (Acyphona) asymmetrica*; 9th tergite, dorsal aspect.



EXPLANATION OF PLATE X.—Continued.

Fig. 8.—Hypopygium of *Erioptera (Acyphona) asymmetrica*; lateral aspect; p = pleura; s = 9th sternite; t = 9th tergite.

Fig. 9.—Hypopygium of *Erioptera (Acyphona) asymmetrica*; dorsal aspect; gonapophyse.

Fig. 10.—Hypopygium of *Limnophila japonica*; dorsal aspect; h = anal tube.

Fig. 11.—Hypopygium of *Limnophila satsuma*; ventral aspect.

Fig. 12.—Hypopygium of *Limnophila inconcussa*; dorsal aspect; h = anal tube; pl = pleura.

Fig. 13.—Hypopygium of *Liogma kuwanai*; lateral aspect; t = 9th tergite; pc = penis-guard.

Fig. 14.—Hypopygium of *Liogma kuwanai*; ventral aspect of the base of the tripartite penis-guard.

Fig. 15.—Hypopygium of *Liogma kuwanai*; dorsal aspect.

(TO BE CONTINUED.)

A NEW PYROMORPHID FROM TEXAS.

BY WM. BARNES, M.D., AND J. McDUNNOUGH, PH.D., DECATUR, ILL.

Acoloitilus novaricus, sp. nov.

Very similar to *falsarius* Clem., having the wings of the same dull black colour. The distinguishing feature is that the collar is unbroken reddish-orange, whereas in *falsarius* this colour is confined to the lateral areas, the centro-dorsal portion being black. Expanse, 14 mm.

Habitat: Kerrville, Texas; Shovel, Mt. Texas (July), 2 ♂'s. Type and cotype coll. Barnes. 4 ♂'s (Texas). Cotypes, Tring Museum, England.

Dr. K. Jordan, with whom we have recently had some correspondence concerning this group, has called our attention to this species and expressed the desire that we describe it. We take pleasure in doing so, as the characteristic feature seems very constant.

FURTHER NOTES ON ALBERTA LEPIDOPTERA.

BY F. H. WOLLEY DOD, MIDNAFORE, ALTA.

(Continued from page 244.)

423. *S. athabasca* Neum.—The only locality given for this species in Smith's Catalogue is "British Columbia," presumably on the strength of the description, which I have not seen: But I have seen the type, a male, in the Neumagen collection, and it is labelled "Belly River," which is in Southern Alberta, and no portion of it in B.C. I have seen the species fairly swarming around Gleichen, and on the Blackfoot Indian Reserve near there. It is almost or quite exclusively a day flier, and revels in hot sunshine, usually accompanied, in far fewer numbers, by *Melicliptera septentrionalis* and *Melaporphyria oregonica*. The Laggan specimens I referred to as having orange secondaries are *petricola* Walker, described from Rocky Mountain specimens taken by Lord Derby's collectors. A prairie and a mountain series of these respectively might easily give every impression of two species, especially if the series were short ones. Mountain specimens are usually a trifle more robust and larger, have yellowish or orange secondaries and ochreous tinted primaries, the depth of this tint varying as the depth of color of the secondaries. In size, my prairie specimens vary from about 28 to 31 mm., smaller specimens being uncommon. Mountain specimens seen to average scarcely more than 1 mm. larger, but my largest specimen, a handsome female from Field, B.C., expands very nearly 35 mm. My darkest and most richly coloured example is from Windermere, also in B.C. But an orange-tinted form is rare on the prairie, and a form with creamy white ground is equally rare in the mountains. Each of these grades through to the predominating form in their respective districts, and the extremes in each overlap those in the other. I regret to say that my entire series of these at present consists only of twenty-five specimens, but I have examined a good many more, both dried and in nature, and after years of deliberation have come to the conclusion that the balance of evidence is strongly in favor of there being only one species.

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No. 10

REPORT ON A COLLECTION OF JAPANESE CRANE-FLIES (TIPULIDÆ), WITH A KEY TO THE SPECIES OF PTYCHOPTERA.

BY CHARLES P. ALEXANDER, ITHACA, N. Y.*

(Continued from page 295).

Tribe *Limnophilini*.

Genus *Limnophila* Macquart.

KEY TO THE JAPANESE LIMNOPHILÆ.

1. Wings unspotted (subgen. *Limnophila*) *inconcussa*, sp. n.
Wings marked with brown (subgen. *Pacilostola*) 2.
2. Large species (male, length 22-25 mm.; wing over 15 mm.);
wings with a few large seams or blotches. *satsuma* Westw.
Small species (male, length 10-13 mm.; wing under 12 mm.)
wings with abundant dots in the cells. 3.
3. Legs and abdomen yellow throughout; petiole of cell M_1 as
long as cell 1st M_2 *varicornis* Coq.
Legs with segments tipped with brown; abdomen yellow and
brown; petiole of cell M_1 longer than cell
1st M_2 *japonica*, sp. n.

Limnophila inconcussa, sp. n.

Wings unspotted; cross-vein r far from tip of R_1 .

Rostrum brownish yellow beneath, brown above, palpi brown; antennæ dark brown, the third segment more yellowish at its base; antennæ short, reaching about to the wing basis; front, vertex and occiput dark brown, dusted with grey.

Mesonotum greyish with a median brown stripe; pseudo-sutural fovea and tuberculate pits very distinct, black; scutum, scutellum and postnotum brown, pleuræ dark brown (probable that the body, in dried specimens, is grey). Halteres pale. Legs: coxæ and trochanters dull yellow; femora yellow, a little darkened

*Contribution from the Entomological Laboratory of Cornell University.

before the tip; tibiae yellow, brown at tip; first tarsal segment yellow, brown at tip, remainder of tarsi brown. Wings with a brownish yellow tinge; stigma indistinct, brown; veins Sc and R yellow, remainder brown. Venation (see fig. 2, pl. II): R_{2+3} arcuated, long, cross-vein r almost at its fork; Rs long; cross-vein r-m more distad than fork of cell; basal deflection of Cu₁ at or slightly beyond the fork of M.

Abdomen: tergites light brown; sternites much paler, yellowish. Hypopygium (see fig. 12, pl. X): pleurites elongate, slender, cylindrical, clothed with long hairs; two apical appendages, elongated, the outermost longest, more slender, chitinized, directed cephalad, its tip produced into a slender spine and its inner or cephalic edge near the tip armed with blunt denticulae; inner appendage shorter, a little stouter and more fleshy, clothed with long hairs, especially on the inner face; the anal tube prominent, oval.

Vial No. 2.—Tokyo, Japan; 1 ♂, 1 ♀.

Vial No. 9.—Tokyo, Japan; April 25, 1912; 2 ♂, 2 ♀.

Vial No. 17.—Tokyo, Japan; April 25, 1912; 3 ♂, 7 ♀.

Vial No. 27.—Tokyo, Japan; April 25, 1912; 4 ♀.

Holotype.—♂, Vial 2.

Allotype.—♀, Vial 2.

Paratypes.—5 ♂, 13 ♀, in Vials 9, 17 and 27.

Types in author's collection; paratypes in U. S. National Museum and Cornell University collections.

Of the American species, *inconcussa* is most like *toxoneura* O. S. (East. U. S.), but the cross-vein r is removed from the tip of R_1 , fusion of R_{2+3} is longer, etc.; the coloration of the two species is quite different. In Verrall's key to the British species (Ent. Mo. Mag., April, 1887, p. 264, 265), it runs down to *lucorum* Meig., which has a dark brown abdomen, brown legs, etc.

Limnophila (Pacilostola) satsuma Westwood.

1876.—*Limnobia satsuma* Westwood, Trans. Ent. Soc. Lond., p. 504, pl. 3, fig. 5a, 5b.

1881.—*Limnobia satsuma* Westwood, Trans. Ent. Soc. Lond., p. 383.

1888. ?*Epiphragma satsuma* Bergroth, Ent. Tidskrift, p. 138.

1902.—*Limnobia satsuma* Kertész, Cat. Dipt., Vol. 2, p. 177.

Male—Length 22.6 mm.; wing 16.8 mm.; hind leg, femur 14.1 mm.; tibia 12.2 mm.

Male—Rostrum and palpi brown, the apical segment of the latter darker; antennæ, segments one and two dark brown, flagellum yellow except the two last segments which are brown; front dark brown, vertex and occiput reddish brown, a narrow median streak continued back from the front.

Pronotum with the scutum dark brown, scutellum yellowish. Mesonotal præscutum rich reddish brown, the lateral margins of the sclerite more greyish, a darker brown median triangle, broadest in front, narrowed to a point at the suture, lateral stripes similar in colour to the median stripe; scutum, lobes dark brown, median line yellowish, dark brown on caudal portion; scutellum and postnotum dark brown. Pleuræ light brownish yellow; propleuræ and dorsal portions of the mesopleuræ up to the wing; root dark brown; mesostigma very large, conspicuous, situated just behind and under the pronotal scutellum. Halteres short, stem yellow, knob brown. Legs: coxæ light yellow; trochanters reddish yellow; femora yellow, tip brown, with a still darker subapical ring; tibiæ slightly darkened at the extreme base, a whitish sub-basal annulus, tip narrowly dark brown; tarsi brownish yellow, tips of the segments darker; legs conspicuously hairy. Wings (see fig. 4, pl. III.): cephalic third deep yellow, caudal portions yellowish grey; surface with conspicuous brown marks: a large blotch at base of M; at origin of Rs; at the cord; a narrow seam to cross-vein r; paler crown margins to Cu and the veins in the vicinity of cell 1st M₂ (discal). Venation (See fig. 4).

Abdomen: tergites rich yellow, extreme apical margin of the sclerites darker; a brown lateral line; sternites lighter yellow, apices, especially of the terminal segments, darker. Hypopygium (See fig. 11, plate X.): viewed from beneath, 9th sternite with caudal margin straight, the sides oblique; pleuræ very short, stout; dorsal apical appendage directed inward, cylindrical, chitinized, its tip with a sharp recurved hook; ventral apical appendages, two, the outermost chitinized, broad at base, rapidly tapering to a sharp point, directed inward, the lower appendage

is fleshy at the base, more chitinized at the tip, its caudal or outer margin grooved to receive the outer appendage. Viewed from above, 9th tergite concave, with a projecting median lobe; anal tube conspicuous, more pointed at upper end than in *japonica*.

One male (Vial No. C; Tokyo, Japan; August, 1912); I give the above description to supplement Westwood's brief characterization. The species agree with *barbipes* Meigen (Europe) in its conspicuously hairy legs.

Limnophila (Pacilostola) japonica, sp. n.

Wings spotted; tibiae and femora tipped with brown.

Male.—Length 10-13 mm.; wing 9.8 mm. Female, length 15 mm.; wing, 11-12.3 mm.

Male.—Rostrum and palpi dark brown; antennae dark brownish black, except segment three, which is pale yellow basally, the tip brown; antennae short, if extended backward it would barely reach the wing basis; segment one elongate, as long as the succeeding three combined; segments 2-5 broad, oval-pyriform, gradually becoming more cylindrical; segments 6-16 cylindrical more elongate toward the end; front, vertex and occiput dark brown.

Pronotum and mesonotum dark brown. Pleurae dark brown. Halteres long, stem yellow, knob brown. Legs: coxae and trochanters dull brownish yellow; femora light yellowish brown, the tip broadly brownish black; tibiae with base narrowly dark brown, remainder yellow, except the broad dark brown tip; tarsi dark brownish black. Wings tinged with brownish, cells C and Sc rather brighter; veins yellowish brown; wing spotted with brown, varying greatly in the size of the markings; in one (♀, Vial A), there are large brown spots at origin of Rs, tip of Sc and fork of R_{2-a}, and abundant pale brown dots over the wing surface; in a second specimen (♂) the wing disk is heavily marked with brown, a series of brown marks in the costal cell, a large square blotch at origin of Rs, another at tip of Sc₁ extending partly down across the cord; others at tips of R₁, R₂ and R₃; large, paler brown dots in all the cells of the wing. Venation (see fig. 2, pl. III).

Abdomen: tergites brownish; sternites dull yellow, apical third of each sclerite brown. Hypopygium (see fig. 10, pl. X): viewed

from above, 9th tergite, caudal margin almost straight with a little rounded knob or hook on either side of the median line; pleurites very short and stout, with three apical appendages, the more dorsal being the longest, slender at base, swollen subapically, the extreme tip slightly hooked and strongly chitinized, this appendage directed caudad and entad; two ventral appendages, the more dorsal being short, blunt, very strongly chitinized at its tip and with numerous, triangular denticule, closely and regularly set; ventral appendage slender, curved at a right angle, its tip directed cephalad. Anal tube very conspicuous, pale whitish, slightly notched at its tip. Second gonapophyses rather slender, tips expanded, the organs directed caudad. Viewed from beneath, the 9th sternite has a rectangular median protuberance.

Female.—Similar, larger; the dark apices of the abdominal sternites not well marked.

Vial No. A.—Tokyo, Japan; April 25, 1912; 1 ♀.

Vial No. 7.—Tokyo, Japan; April 25, 1912; 2 ♂, 1 ♀.

Vial No. 18.—Tokyo, Japan; June 26, 1912; 4 ♀.

Vial No. 23.—Tokyo, Japan; June 25, 1912; 3 ♂.

Vial No. 48.—Tokyo, Japan; August, 1912; 1 ♂.

Holotype.—♀. Vial 48.

Allotype.—♀. Vial A.

Paratypes.—5 ♂, 5 ♀. Vials 7, 18, 23.

Types in author's collection; paratypes in U. S. National Museum and Cornell University Collections,

This species differs from *L. varicornis* Cog. (Japan)* in its shorter antennæ; legs not all yellow, but the segments conspicuously tipped with darker; abdomen not yellow; wings with petiole of cell M₁ much longer than cell 1st M₂, etc. *L. varicornis* also, is probably a *Pæcilostola*.

Tribe Pedicini.

Genus Tricyphona Zetterstedt.

KEY TO THE JAPANESE TRICYPHONE.

1. Wings hyaline or nearly so, not spotted or striped; cross-veins r-m connected with vein R₁₊₂ beyond the fork of
Rs. *insulana*, sp. n.

*Proc. U.S. Nat. Mus. vol. 21, p. 331 (1893).

- Wings spotted or striped with brown or yellow; cross-vein r-m connected with the radial sector at or before its fork. . . . 2.
2. Wings with a broad, yellow subcostal streak, extending from the base of the wing to the apex; median cross-vein absent. *kuwanai*, sp. n.
- Wings with a narrow brown seam along the cord, and rounded brown spots on most of the cross-veins and at the ends of most of the longitudinal veins; median cross-vein present. *velusta*, sp. n.

Tricyphona kuwanai, sp. n.

Color yellow; mesonotum with black markings; wings with a conspicuous yellow longitudinal streak.

Female.—Length 15.8 mm.; wing 12.2 mm.; abdomen 12.4 mm.

Female.—Rostrum and palpi brown; antennæ, segment 1 brown, segments 2 to 16 light yellow, the terminal flagellar segments more brown; front and vertex brown, the hind part of the vertex, the occiput and the genæ clearer reddish brown.

Pronotum light yellow, brown medially. Mesonotal præscutum light brownish yellow, darkest medially, the sclerite with four rounded, velvety-dark brownish black spots as follows: a small rounded spot on either side of the median line, about mid-length of the sclerite; an oval spot on the sides of the sclerite, about midway between the pseudosuture and the transverse suture; a small triangular black spot on the middle of the transverse suture; scutum light yellow, with velvety-black marks as follows: a double, semilunar transverse mark on the cephalic portions of the sclerite, caudad of these marks are four small dots, the outermost larger, rounded, occupying the middle of the scutal lobes, the inner small and oval, on either side of the median line; a small elongate black mark on the suture, between the scutum and scutellum; scutellum and postnotum brown. Pleuræ light brownish yellow. Halteres light yellow. Legs: coxæ and trochanters light yellow; femora and tibiæ yellow, tip of the latter narrowly dark brown; first three tarsal segments light yellow, narrowly tipped with dark brown; segments 4 and 5 dark brown. Wings hyaline or nearly so, a broad yellow streak running from the base of the wing

around to beyond the apex, embracing the caudal portion of cell C, cell Sc, cephalic portion of cell R and 1st R₁, caudal portion of cell 2nd R₁ and outer half of cell R₂; cell C is hyaline with small, rather evenly spaced dark brown cross stripes; the margin of the wing from the end of cell C around to end of cell R₅ is light brown; the caudal margin of the longitudinal yellow streak above described is narrowly brown at the deflection of R₂, a slender brown streak runs caudad and outward along R₁₊₂, ending opposite the fork of R₁₊₂; Cu and 2nd anal margined with bright yellow. Venation (see fig. 6, plate III), R₅ beyond the cross-vein r-m short, a little shorter than r-m; R₂, R₃ and R₄₊₅ all originate at a common point; R₂ at origin is perpendicular; cross-vein m lacking; basal deflection of Cu₁ at fork of M.

Abdomen: tergites light brownish yellow, with numerous slender black hairs; segment 2 with a short black-sub-basal streak on the margin; segments 3 to 6 with longer marginal streaks, which cover almost the basal half of the sclerite; sternites light yellow, with black marks on the sides remote from the margin of sclerite, that on the second oblique, meeting its mate on the venter, the others longitudinal.

Vial No. 31.—Tokyo, Japan; May 7, 1912; 1 ♀.

Holotype.—♀, in Vial 31.

Type in author's collection.

Tricyphona insulana, sp. n.

Brown; wings hyaline without a stigma; no median cross-vein; legs largely yellow.

Female, length 9.6 mm.; wing 9.4 mm.

Female.—Rostrum and palpi dark brown apices of the palpal segments a little paler; antennæ, basal segments pale brown, flagellum dark brown; front, vertex and occiput dark brown, probably with a grey bloom in dry specimens.

Pronotum dark brown. Mesonotum dark brown with indications of stripes near the median line; it is probable that the thorax is covered with a grey bloom; scutum dark brown; scutellum brownish yellow; postnotum brown. Pleuræ brown. Halteres light yellow. Legs: coxæ yellow, more brown basally;

trochanters yellow; femora yellow, darkening to light brown at the tip; tibia light yellow, brown at tip; tarsi brown. Wings hyaline; veins light brown. Venation (see fig. 3, plate IV) cross-vein r-m connects R_{4+5} ; no cross-vein m.

Abdomen: tergum reddish brown, segments with a dark brown apical ring; pleural line yellow; sternites brown, ovipositor with yellow valve.

Vial No. 27.—Tokyo, Japan; April 25, 1912; 1 ♀.

Holotype, ♀, Vial No. 27.

Type in author's collection.

Related to *T. vitripennis* Doane (West. U.S.) but lacks a brown stigma, has no median cross-vein, etc. From *T. immaculata* Meigen (Europe) it differs in having cross-vein r farther removed from the tip of R_1 , cross-vein r-m far beyond the fork of R_s , not at it; the legs much more yellow, not mostly brown; ovipositor of the female yellow, not patch brown, etc.

Tricyphona vetusta, sp. n.

Wings spotted with brown; cross-vein m-cu of the wings present; cross-vein m present.

Female.—Length 16 mm.; wing 14.8 mm.; hind legs femora 8.4 mm.; tibia 10.3 mm.; tarsus 8.9 mm.

Female.—Rostrum light brownish yellow; palpi with segments dark brown, the apical ones with bases yellow; antennæ, base light brown, flagellum dark brown; front, vertex and occiput dark brown.

Pronotum dark brown. Mesonotum, præscutum, greyish with four brown stripes, the median one double, narrowed behind; scutum dark brown, the lobes paler brown; scutellum dark brown, much lighter on the sides; postnotum dark brown with a large oval spot behind on either side of the median line. Pleuræ dark brown, indistinctly variegated with darker. Halteres light yellow, the knob light brown. Legs: Coxæ, especially the fore and middle, brownish at the base, remainder light yellow; trochanters yellowish; femora yellow, darkening into brown at the tip; tibia yellowish brown, rather darker apically; tarsi dark brown. Wings, tinged with light yellow, cells C and Sc a little brighter, with

brown marks as follows: a rounded spot at Sc_2 , a larger one at origin of Rs , a crossband on the cord running from the tip of Sc_1 , down to fork of Cu and thence to the wing-margin along Cu_2 ; a round spot at cross-vein r , apical margin of the wing brown, a brown seam on cross-vein m , brown dots at ends of all the longitudinal veins; veins yellowish brown. Venation (see fig. 5, plate III); Rs in a line with R_{4+5} ; R_{2+3} short, gently arcuated; crossvein r very far distad so that R_1 beyond it is about equal to it in length; cross-vein m present, connecting M_2 with M_3 ; cross-vein $m-cu$ present.

Abdomen: Tergites, segment one brown, segments two and six dull yellow, an indistinct median brown stripe becoming more plainly defined behind until on the 8th and 9th tergites it abruptly suffuses the entire sclerites; pleural stripe broad, dark brown, extending the length of the abdomen as a conspicuous lateral line; sternites light yellow, a rounded ill-defined brown mark on the 8th sternite.

Vial No. 26.—Tokyo, Japan; April 25, 1912; 1 ♀.

Holotype, ♀, in Vial 26.

Type in author's collection.

Related to *T. constans* Dcone (West. U.S.) but is much smaller with a very different wing pattern. In venation, suggesting *T. vernalis* Osten-Sacken of the Eastern United States.

Tribe *Cylindrotomini*.

Genus *Liogma* Osten-Sacken.

Liogma kuwanai, sp. n.

Resembles *L. nodicornis* O. S., of the United States, but the tripartite penis-guard is very much longer and directed dorsad.

Male.—Length 15.9 mm.; wing 11.4 mm.; antennae 3.8-3.9 mm.

Male.—Rostrum and palpi light brown, remaining segments dark brown; flagellar segments slender at base, the inner face produced into a subtriangular tooth, making the flagellum strongly serrate; front, vertex and occiput dull dark brown, very rugulose, the vertex broad.

Mesonotum dark brown, a lighter brown line extending from the median line of the scutum, branching Y-shaped and extending

to the pseudosuture, this pale line being somewhat impressed; scutum, scutellum and postnotum brown, the latter rather darker. Pleuræ, propleuræ and cephalic and dorsal portions of the mesopleuræ, up to the wing-root, yellowish; remainder of the pleuræ brownish. Halteres pale, yellow. Legs: coxæ suffused with brown; trochanters light yellow; femora yellow basally, becoming brown at the tip. Wings tinged with grey, stigma elongate-oval, brown, distinct. Venation (see fig. 4, plate IV).

Abdomen light brownish yellow, the caudal half of the 7th, 8th and 9th tergites brown. Hypopygium (see figs. 13-15, plate X): 9th tergite, viewed from above, with the lateral ears or lobes prominent, the interval between them almost straight, not deeply notched as in *nodicornis*; 9th sternite and its pleurite fused, massive, as in the genus, the apical appendate stout, directed cephalad, flattened at its apex. Viewed from the side, the penis-guard is conspicuous, tripartite as in the tribe, it is very long, arising from the ventral wall, directed caudad and thence dorsad, almost attaining the level of the dorsal edge of the 9th sternite, toward their end, directed cephalad, the tip flattened; anal tube conspicuous. Viewed from beneath, the massive sterno-pleurites meet in a straight median suture, which is membranaceous; the tripartite penis-guard is deeply concave below the forking.

Vial No. E.—Tokyo, Japan; Aug., 1912; 1 ♂.

Holotype.—♂, Vial E.

Type in author's collection.

The difference between the American and Japanese species are shown by the following key:

1. Abdomen brown; ♂ hypopygium, 9th tergite with a deep median notch; guard of the penis short, directed caudad. (East. U. S.).....*nodicornis* O. S.
- Abdomen reddish brown; ♂ hypopygium, 9th tergite without a deep median notch between the prominent lateral ears; guard of the penis elongate, conspicuous, directed caudad and dorsad, almost attaining the dorsal level of the abdomen. (Japan).....*kuwanai*, sp. n.

The succeeding parts dealing the Tipulinæ will conclude the Tipulidæ.

REPORT ON A COLLECTION OF JAPANESE CRANE-FLIES (*TIPULIDÆ*; *DIPTERA*).

(Continued from Vol. XLV., p. 322).

BY CHARLES P. ALEXANDER, ITHACA, N. Y.

Subfamily: *TIPULINÆ*.Tribe: *DOLICHOPEZINI*.Genus: **Nesopeza**, gen. n.

Antennæ 13-segmented, segment 1 cylindrical with a few long hairs; segment 2 oval-cylindrical; segment 3 very long, cylindrical; the succeeding segments gradually shorter, the last very slender. Palpi with the apical segment slender, as long as all of the preceding segments combined. Legs excessively long and slender. Wing-venation as in *Dolichozeza* Curtis (lack of cell 1st M₂, basal deflection of Cu far before the fork of M, etc.), but the radial sector is very elongate, angulated at origin, almost as long as R₃ beyond the fork, R₅ not short and simulating a cross-vein.

Type of the genus: *Dolichozeza gracilis*, de Meij.**Nesopeza gracilis** de Meijere.1911.—*Dolichozeza gracilis* de Meijere; Tjds. voor Ent., vol. 51, p. 60, 61; pl. 4, fig. 46.

One ♀ from Tokyo, Japan; August, 1912. (Vial D.)

This new genus represents one extreme of the *Dolichozeza* group and *Scamboneura* Osten Sacken, the other. In this genus the radial sector is extremely elongated, in *Dolichozeza* Curtis almost transverse and simulating a cross-vein, while in *Scamboneura* the origin of the sector is farther distad than the tip. See my key to the Dolichozezini, Psyche, vol. 19, p. 64. (April, 1912.)

Genus: **Dictenidia** Brullé.Tribe: *CTENOPHORINI*.*Dictenidia fasciata* Coquillett.1898.—*Dictenidia fasciata* Coquillett; Proc. U. S. Nat. Mus., vol. 21, p. 304, 305.1902.—*Dictenidia fasciata* Kertész; Cat. Dipt., vol. 2, p. 266.

One ♂ from Tokyo, Japan, Aug. 1912 (Vial 39). It agrees very closely with Coquillett's description. The specimen offers the following measurements:

May, 1914 ½

Length 12 mm.; wing 10.2 mm.; antennæ 5 mm.

Fore leg femur 6.7 mm.; tibia 7.4 mm.

Middle leg femur 7 mm.; tibia 6.4 mm.; tarsus 6.9 mm.

Hind leg femur 8.8 mm.; tibia 10.4 mm.; tarsus 6 mm.

I supply a figure of the wing of this beautiful crane-fly, it never having been figured. (See Plate XII, fig. 8).^{*}

Tribe: TIPULINI.

Genus: **Pachyrhina** Macquart.

Key to the Japanese Pachyrhinæ.

1. Thoracic markings brown or black, distinct.....2.
Thoracic markings very pale, ill-defined.....*flavonota*, sp. n.
2. Mesonotal stripes pale brown; tip of wing narrowly and regularly bordered with dark brown; [scutellum and postnotum mostly yellowish; abdominal tergites trivittate].....*palloris* Coq.
Mesonotal stripes black; tip of wing hyaline or irregularly suffused with darker.....3.
3. Mesonotal stripes very broad, almost concealing the pale ground colour; tip of the wing clouded with darker....*pullata*, sp. n.
Mesonotal stripes narrower, so that the yellow ground colour is well defined; tip of the wing clear.....4.
4. Scutellum and postnotum unmarked with darker.....*repanda*, sp. n.
Scutellum black; postnotum with a dark median vitta.....*virgata* Coq.

***Pachyrhina flavonota*, sp. n.**

Head yellow, shining, without a distinct darker spot; mesonotum orange-yellow with well defined darker stripes.

Male.—Length 12 mm.; wing 10.6 mm.; antennæ 3.8 mm.

Female.—Length 14.6 mm.; wing 14 mm.

Male.—Palpi light brown; frontal prolongation of the head yellow, nasus brown, with a tuft of brown hairs; antennæ, scapal segments yellow, first flagellar segment yellow, on its inner face at three-fourths its length with a wart-like knob, remaining flagellar segments brown, the enlarged bases darker brown, inner face of the

^{*}Plate XII will appear in the next issue.

intermediate flagellar segments not very deeply incised; front, vertex and occiput shining yellow, no distinct mark on the vertex.

Pronotum yellowish; mesonotal praescutum orange-yellow with faint indications of darker stripes; a small brown mark in the notch of the transverse suture; scutum, scutellum and postnotum without distinct marks. Pleura light yellow. Halteres brownish yellow, the knobs yellow. Legs, coxae and trochanters yellow, femora and tibiae dull yellow, the tips darker, tarsi brown. Wings subhyaline, the tip broadly but indistinctly suffused with darker; stigma oval, brown; cells C and Sc. a little yellowish. Venation, see pl. XI, fig. 5.

Abdomen with the tergites yellowish, slightly darker medially and laterally; segments 8 and 9 brown; sternites yellowish. The male hypopygium with the 9th tergite from above (plate XI, fig. 6) with the caudal margin four-lobed, the central lobes on either side of the shallow median notch, these lobes provided with numerous black denticule; the 9th sternite from below with a broad and deep V-shaped median notch. Outer apical appendages narrow, tapering to a very long point; inner appendage with the usual cephalad prolongation, beneath which is a small, chitinized tooth. (See plate XI, fig. 15.)

Female.—Larger, the abdominal tergites with distinct brown blotches on each segment, these broadest behind, narrowed to a point in the front.

Holotype, ♂, Tokyo, Japan, August, 1912 (Vial K).

Allotype, ♀, Tokyo, Japan, August, 1912 (Vial 42).

***Pachyrhina palloris* Coquillett.**

1898.—*Pachyrhina palloris* Coquillett, Proc. U. S. Nat. Mus., vol. 21, p. 306.

1902.—*P. palloris* Kertész, Cat. Dipt., vol. 2, p. 321.

1910.—*P. palloris* Riedel, Deutsch. Ent. Zeitschr., p. 436.

Two females agreeing rather well with Coquillett's description, but showing the following differences: The median thoracic vitta is bisected from the front by a pale line, making this stripe double; sides of the scutellum brown; the antennae, broken in the type, may be thus described: four basal segments yellow, remaining

segments with the enlarged basal third dark brownish black, the remainder of each segment dull yellow. The venation is shown in plate XI, figure 2. Vial K. Tokyo, Japan; August, 1912; 2 ♀.

***Pachyrhina pullata*, sp. n.**

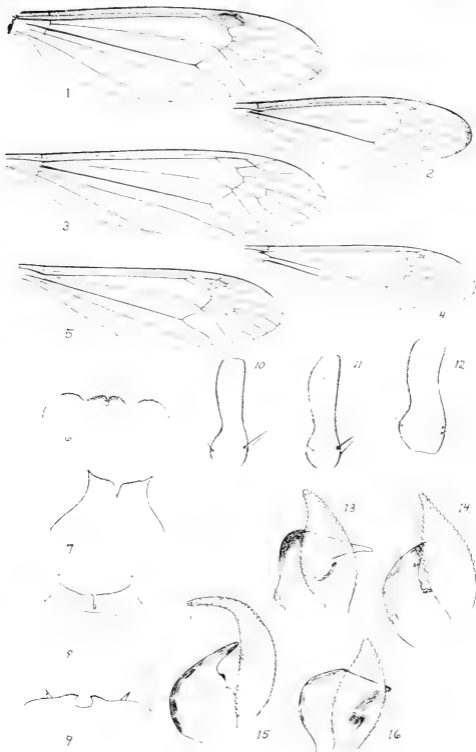
Thoracic dorsum mostly black; wings with the apex brownish.

Male.—Length 17.4 mm.; wing 12.9 mm.; antennæ 4.6 mm.†

Male.—Palpi brown, the third segment yellow; frontal prolongation of the head shiny black; antennæ with the first segment brown, paler apically, second segment yellow, third segment pale brown at the base, dark brown at tip, remaining segments dark brownish black. (See plate XI, fig. 12, for outline of the sixth antennal segment); vertex brownish yellow, darkening to the brown on the occiput and genæ.

Pronotum light yellow above; mesonotum dull yellow with three jet black stripes, the median stripe very broad and narrowed behind, the lateral stripes short, broad, straight, the space between these three stripes very narrow and greatly reduced; scutum with the median depression pale in front; behind and on the lobes black; scutellum and postnotum broadly black medially, paler on the lateral margin of the sclerites. Pleura yellow, with dark brownish black blotches as follows: An elongate, vertical mark on the propleura; mesopleura with a large blotch on the ventral portions of the episternum and the sternum; caudal edge of these two sclerites with an elongate vertical blotch extending from the wing-root to mesocoxa, the portion of the postnotum between the base of the wings and the halteres brown; metepimeron brown. Halteres pale, knobs whitish at the tips. Legs, fore coxæ brown, trochanter light yellow, femora yellow basally, browner at tip; other coxæ more yellowish, femora darkening to brown at tip, tibiæ brown, lighter basally; tarsi dark brownish-black. Wings hyaline or nearly so, cells C and Sc. yellowish; stigma brown, distinct; cord margined with brown; apex of wing brownish. Venation as in plate XI, fig. 1.

Abdomen with the first tergite brown, except on the side in front; segments 2 to 5 brown on the caudal half; segment 6 with the caudal half dark brown; segments 7 to 9 dark brown; sternites yellow; caudal half of the 7th to 9th segments dark brown.



JAPANESE CRANE-FLIES

Male.—Hypopygium, with the 9th tergite (pl. XI, fig. 7) from above, narrow with deep median notch on the caudal margin, and with the outer angles of the lobes produced into sharp points, which are directed caudad and laterad, the caudal margin of these lobes with fine denticulae, 9th sternite from beneath with the caudal margin gently concave, pleural suture very strongly arcuated; apical appendages, outer one rather broad and pointed, inner appendage with a long curved point below which are three chitinized teeth. (See plate XI, fig. 14).

Holotype, ♂. Tokyo, Japan; May 7, 1912. (Vial 30.)

***Pachyrhina repanda*, sp. n.**

Head yellow, with a small rounded brown spot on vertex; mesothorax with black stripes, scutellum and postnotum unmarked.

Male.—Length 12.9 mm.; wing 13.4 mm.; antennae 5.2 mm.

Male.—Palpi yellow; frontal prolongation of the head yellow except the nasus, which is brownish and provided with a tuft of long brown hairs; antennae with segments 1 to 3 yellowish, the third a little brown on the lower surface; remainder of antennae dark brownish black; the intermediate flagellar segments rather deeply incised on the lower face at the basal third (see plate XI, figure 11, showing the outline of the sixth antennal segment); front, vertex and occiput yellow, the vertex with a small rounded dark brown median spot behind.

Pronotum light yellow; mesonotal praescutum light yellow, with dark brownish black stripes as follows: A broad median stripe which is widest in front, slightly narrowed behind and running the length of the sclerite; a shorter lateral stripe on either side, this stripe curved laterad before the pseudosuture; scutum, lobes with a prominent oblique stripe running across them; a small triangular median blotch on the anterior half of the sclerite; scutellum and postnotum light yellow, unmarked. Pleura pale yellowish white. Halteres light coloured, the knob a little suffused with brown. Legs, coxae and trochanters light yellow, femora and tibiae yellowish brown, passing into brown at the tip of the latter; tarsi brown. Wings subhyaline, cells C and Sc. a little brighter, yellowish; stigma small, brown, tip of the wing a little suffused with darker; veins brown, vein Sc. yellow. Venation as in plate XI, figure 3.

Abdomen, tergites yellow with an indistinct light brown blotch in the middle of each sclerite; lateral sutures darker; sternites yellow; segments 7 to 9 dark brown. Male hypopygium with the 9th tergite (see plate XI, fig. 8) from above with the caudal margin concave, with a deep, parallel-sided, median notch, the lateral angles produced into points which are directed caudad the caudal margin with small, black denticule and points; 9th sternite from below with the caudal margin about straight with a rounded median protuberance. Apical appendages, the outer fleshy lobe rather broad, the point moderately long and rather obtuse; the inner appendage is strongly chitinized, rounded-oval, on the cephalic face produced into a long point which is directed forward; below this point, very strongly chitinized and deeply incised. (See plate XI, fig. 16.)

Holotype, ♂, Tokyo, Japan; August, 1912. (Vial 43.)

***Pachyrhina virgata* Coquillett.**

1898.—*Pachyrhina virgata* Coquillett, Proc. U. S. Nat. Mus., vol. 21, p. 306.

1902.—*P. virgata* Kertész, Cat. Dipt., vol. 2, p. 325.

1910.—*P. virgata* Riedel, Deutsch. Ent. Zeitschr., p. 436.

Several specimens of this interesting species were included in the collection.

Male.—Length 10.8—11.8 mm.; wing 10.2—12.4 mm.; antennæ 4.6—4.9 mm.

Female. Length 14.4 mm.; wing 13 mm.

I give a figure of the sixth antennal segment in plate XI, figure 10, and of the wing-venation in plate XI, figure 4. The male hypopygium may be described as follows: The 9th tergite from above (plate XI, figure 9) with the caudal margin having a broad rounded median notch into which the tips of the apical pleural appendages fit, the inner edge of the adjacent lobe produced into chitinized lobules which are provided with denticule; each lobule with a sharp chitinized point on its caudal margin, these points directed caudad. In a small ♂ (Vial 46) the median notch is not so rounded, more oval, the sharp caudal points are longer. Apical appendages, the outer fleshy lobe rather broad and pointed, inner lobe with a

long, cephalad-directed point which is provided with a few hairs on its lower face, with a deep notch beneath its base and a strongly chitinized protuberance. (See plate XI, fig. 13).

Vial 22; Tokyo, Japan; April 26, 1912; 1 ♂, 1 ♀.

Vial 35; Tokyo, Japan; May 7, 1912; 1 ♀.

Vial 43; Tokyo, Japan; Aug. 1912; 2 ♂.

Vial 44; Tokyo, Japan; Aug. 1912; 1 ♀.

Vial 46; Tokyo, Japan; Aug. 1912; 2 ♂.

Vial K; Tokyo, Japan; Aug. 1912; 1 ♀.

(To be continued.)

THE PRESENCE OF RING-JOINTS IN AUSTRALIAN *SCELIONIDÆ*.

BY ALAN P. DODD, NELSON, N. Q., AUSTRALIA.

Quite recently while examining the antennæ of a Scelionid, *Gryonella reticulata* Dodd, I was somewhat surprised to find that two small ring-joints were present. As ring-joints have not been recorded in this family, I had never searched for them, and it was only accidentally that their presence in this species was noticed. This discovery caused me to examine the antennæ of numerous Scelionids in my collection. I found that in some cases there were obviously no ring-joints present; in others there appeared to be minute ring-joints, but I could not make sure of the fact, while in a few cases the ring-joints were distinct, though small. The following species possessed obvious ring-joints: Subfamily *Teleasinae*; *Gryonella reticulata* Dodd; Subfamily *Balinae*, *Acolomorpha minuta* Dodd; Subfamily *Scelioninae*, *Hadronotus nigriceps* Dodd, *Opisthacantha giraulti* Dodd, *Scelicanthella parvipennis* Dodd, *Leptoteleia aurea* Dodd, *Baryconus exsertus* Dodd, *B. longipennis* Dodd, and *B. trispinosus* Dodd.

The species, *Opisthacantha giraulti*, possessed apparently one ring-joint, but under high-power magnification there appeared to be three excessively thin ring-joints. *Gryonella reticulata* had two ring-joints, while the other species mentioned possessed but one each. This discovery is of considerable interest.

Hydromanicus, *Antarctopsyche*, *Symphitopsyche* and *Stenopsyche*. This latter genus has been placed in the Philopotamidae since it has ocelli, but is more allied to *Hylropsyche* by all other characters.

The *Psychomyiini* will include, besides the usual genera, *Ecnomus*; it was also placed here by MacLachlan. *Tinodes* is removed to the next tribe.

The *Polycentropini*, besides the usual genera, includes *Tinodes*; this move is also warranted by the structure of the male genitalia.

The *Philopotamini* has the usual genera, as placed by Dr. Ulmer, but without *Stenopsyche*.

(To be continued.)

REPORT ON A COLLECTION OF JAPANESE CRANE-FLIES (*TIPULIDÆ*, *DIPTERA*).

BY CHARLES P. ALEXANDER, ITHACA, N. Y.

(Continued from p. 164.)

Genus: **Tipula** Linnaeus.

Key to the Japanese Tipulæ.

1. Large species (over 30 mm. in length) 2
 Smaller species (less than 25 mm. in length) 4
2. Wings ochre-brown, the cross-veins darker, the stigma bright yellow [abdomen ochraceous-brown, the sternum paler] *præpotens* Wied. (1)
 Wings not ochre-brown with a yellow stigma 3
3. Abdominal tergites with the apices brown; hypopygium pale dull fulvous brown, thoracic dorsum blackish with two rusty lines *mikado* Westw. (2)
 Abdomen with three dorsal longitudinal stripes, the median one indistinct on the basal segments *coquilletti* End.
4. Wings hyaline or subhyaline, with the costal region darker . . 5
 Wings either subhyaline without a dark costal border, or else variegated hyaline, gray and brown 6
5. Thoracic notum yellowish; abdomen without a distinct stripe on either side *yamata*, sp. n.

1 *Præpotens* Wiedemann; Aussercur. Zweifl. Ins., vol. 1, pp. 40, 41 (1828).

2 *Mikado* Westwood; Trans. Ent. Soc. Lond., for 1876, p. 534.

- Thoracic præscutum and scutum dark; abdomen yellow, with a broad brown stripe on either side of the yellow median vitta.....*aino*, sp. n.
6. Abdomen with the segments having a dark caudal margin...7
Abdomen lined with dark stripes.....8
7. Caudal margin of the abdominal segments very narrow; wings light yellow without darker markings, except the prominent stigma.....*insulicola*, sp. n.
Caudal margin of the abdominal segments broad, comprising at least two-thirds of the length of the sclerite; wings light gray with hyaline blotches.....*nipponensis*, sp. n.
8. Head yellowish.....9
Head black or dark brown.....10
9. Abdomen with a median stripe; flagellum of antennæ black.....*japonica* Loew⁽¹⁾
Abdomen with three stripes, one median and two lateral: two basal flagellar segments yellow, remainder brown at base, yellow at tip.....*serricauda*, sp. n.
10. Large species (length, ♂, 15 mm.; wing, 19 mm.).....*yusou*, sp. n.
Small species (length, ♂, 10 mm.; wing, 13-5 mm.).....*parva* Loew⁽²⁾

***Tipula coquilletti* Enderlein.**

1898 *Tipula nubifera* Coquillett; Proc. U.S. Nat. Mus., vol. 21, p. 305.

1902 *Tipula nubifera* Kertess; Cat. Dipt., vol. 2, p. 299.

1912 *Tipula coquilletti* Enderlein; Zoöl. Jahrb., vol. 32, pl. 1, p. 7.

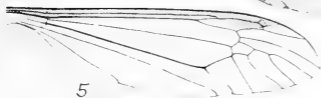
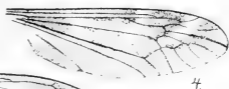
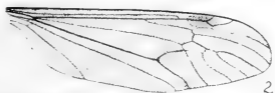
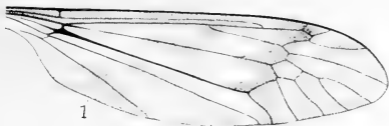
A male and female; the following a *klenda* to Coquillett's description may be of value:

The legs in my specimens have the femora and tibiæ almost uniformly dark brown; abdomen very long for a *Tipula*. The wing is shown in plate 16, figure 7. Male hypopygium: 8th tergite rather broad, its caudal margin almost straight; 8th sternite (see plate ⁽³⁾ figure 17), much produced caudad into a scoop-like lobe which is very deeply notched medially, the tips of the lobes directed

1 *Japonica* Loew; Wiener Ent. Monatschr., Vol. 2, p. 101, 102 (1858).

2 *Parva* Loew; Wiener Ent. Monatschr., vol. 2, p. 102 (1858).

3 Plate 17 will appear in the next issue.



JAPANESE CRANE-FLIES

inward; 9th tergite rather small (see plate 17, figure 8), viewed from above, the caudal margin is narrowed and evenly concave, the whole caudal end being covered densely with small black spicules; suture between the sternum and tergum not clear; 9th sternite (plate 16, figure 7), broad, its caudal margin concave. Pleural appendage, a large flattened lobe (see plate 17, figure 10), on the inside (plate 17, figure 9), with the dorsal outer angle densely provided with short black spicules, with numerous other spicules down the inner face.

Female (allotypic): tergal valves of the ovipositor long and slender, heavily chitinized, not so deep as the high sternal valves.

Vial 13; Tokyo, Japan; April 25, 1912; 1♂, 1♀.

Tipula yamata, sp. n.

Head blackish; thoracic notum yellowish; anterior half of the pleura dark brown; abdomen without distinct longitudinal stripes; wings with a pale brown suffusion, the costal region a little darker.

Male, length 12 mm.; wing 16.6 mm.

Female, length 19.2 mm.; wing 16.8 mm.

Male.—Palpi dull yellow; frontal prolongation of the head rather short, dull yellow; antennæ light yellow, the flagellar segments passing into brown; front, vertex and occiput dark brown passing into yellow on the genæ.

Pronotum brown. Mesonotum light coloured, yellowish, with indistinct, narrow, darker stripes on the præscutum. Pleura, propleura and anterior half of the mesopleura and the metapleura, pale, whitish. Halteres long, slender, pale. Legs: fore and middle coxæ dark brown; trochanters and femora yellow, light brown at tip; tibiae yellowish, brown darker at the tip; tarsi brown. Wings with a pale brown suffusion; costal border darker brown, this colour including cells C and Sc.; stigma greyish brown. Venation, see plate 16, figure 5.

Abdominal tergites 1-4 yellowish, 5-9 darkened, brownish; sternites 1-6 yellow, 7 yellow with a brown median line, 8 brown basally, yellow at the tip. Male hypopygium: 9th tergite from above with a prominent median chitinized protuberance, its caudal margin gently concave and with short bristles and chitinized points. Pleural suture incomplete; pleural appendages as follows: outermost (see plate 17, figure 3), a broad, flattened lobe quite

densely covered with long hairs, these hairs rather stout except along the caudal margin where they are delicate, fringe-like; just inside this appendage is a cylindrical, chitinized arm directed toward the end of the 9th tergite, the apex evenly rounded; the largest of the pleural appendages is a flattened arm whose apex is notched and crenulated and fits into the notch of the 9th tergite; the penis is very long and slender, the central vesicle large and rounded.

Female.—About as in the ♂, the flagellar segments subannulate, the apical three-fifths of each segment being much paler than the basal portion; abdominal tergites 5-7 with a dark brown basal mark, segments 8 to the end brown; valves of the ovipositor short and sharply pointed. In one ♀, the entire tergum beyond segments 1-3 is almost entirely dark brown but this may be caused by the gravid condition of the abdomen which is greatly distended with eggs.

Holotype, ♂, Tokyo, Japan; August, 1912 (Vial 42).

Allotype, ♀, Tokyo, Japan; August, 1912 (Vial K).

Paratypes, 2 ♀, Tokyo, Japan; May 7, 1912 (Vial 34).

The specific name is that of an aboriginal Japanese race inhabiting the southern and central portions of the southern half of Nippon, facing the Pacific Ocean.

Tipula aino, sp. n.

Head blackish; præscutum and scutum dark coloured; abdomen yellow with two dorsal brown lines, one on either side of the broad ground stripe; wings with a slight gray tinge, costal region brown.

Male.—Length 16 mm.; wing 16.5-18.4 mm.

Female.—Length 19.4 mm.; wing 20.5 mm.

Male.—Palpi and the frontal prolongation of the head brown; antennæ with the three basal segments orange, segments 4 and 5 orange at the extreme base, entire remainder of the antennæ black; front, vertex and occiput dark coloured, blackish.

Mesonotum with the præscutum and most of the scutum uniformly dark brown with narrow darker stripes, one median and one on either side; scutum pale medially, lobes very dark; scutellum and postnotum dull yellow, the latter a little brown on the sides and in some specimens entirely dark. Pleura dull yellow

with a brown tinge on the propleura and anterior portions of the mesopleura. Halteres rather long, pale. Legs: coxæ and trochanters light yellow; femora orange-yellow the tip brown; tibiae yellowish on the basal half, thence passing into brown; tarsi brown. Wings with a dark brown costal border, this including cells C, Sc., and the cephalic halves of cells R and 1st R₁; stigma even darker; most of cells R and M and the bases of cells R₂, R₃ and R₄ hyaline; remainder of the wings with a brownish-gray tinge. Venation as in plate 16, figure 3.

Abdominal tergites yellow with a broad brown stripe on each side, these stripes becoming confluent on segments 7 and 8; caudal margin of segments 3-6 narrowly brown; sternites dull yellow, the caudal margins of the segments a little darker. Male hypopygium: 9th tergite from above (see plate 16, figure 4), with the latero-caudal angles produced into strong spines between which is a small rounded lobe covered with hairs; suture between the tergum and sternum not clear; appendages of the pleural region viewed from the side (see plate 17, figure 5), two in number, the more ectad of which is a large, oval lobe, somewhat chitinized on its edges, its ventro-cephalic margin on the inside with a small oval knob provided with hairs; inner lobe very large, its caudal edge thickened and here provided at its tip with a comb of bristles directed caudad and an apical bunch directed dorsad; inner face of this appendage near its tip with a group of about 14 sharp points.

Female.—Ovipositor with the sternal valves very high, blade-like, the tips subacute; tergal valves very slender apically, the tip scarcely enlarged.

Holotype, ♂, Tokyo, Japan; April 13, 1912 (Vial 12).

Allotype, ♀, Tokyo, Japan; April 13, 1912 (Vial 12).

Paratypes, 5 ♂, 5 ♀; as follows:

Vial J; 1 ♀, Tokyo, Japan; August, 1912 (Cornell).

Vial 12; 2 ♂, 2 ♀, Tokyo, Japan; April 13, 1912 (Cornell).

Vial 40; 3 ♂, 2 ♀, Tokyo, Japan, August, 1912 (U. S. Nat. Mus.).

The specific name is that of an aboriginal Japanese race formerly occupying the northern half of Nippon, now confined to Yesso and the islands to the northward.

***Tipula insulicola*, sp. n.**

Antennæ annulated black and yellow; thorax without indistinct brown stripes; wings light yellow with a prominent oval brown stigma; abdominal segments with a dark caudal margin.

Female.—Length 11.2 mm.; wing 11.3 mm.

Female.—Palpi and frontal prolongation of the head brown, the latter short and stout; antennæ with the three basal segments yellow, remaining segments with the basal two-fifths dark brown, the apices light yellow, these colours abruptly contrasted; front, vertex and occiput brown.

Præscutum dull yellow with three indistinct brown stripes of which the median one is broad, the lateral ones shorter and narrower; scutum with the lobes reddish; scutellum and postnotum dull yellow. Pleura dull yellow. Halteres dull yellow. Legs: coxæ, trochanters and femora light yellow; tibiæ brownish yellow, a little darkened at the tip; tarsi brown. Wings light yellow, cells C and Sc. a little brighter; stigma prominent, oval; an indistinct hyaline stripe across the wing beginning before the stigma and including cell 1st M₂. Venation, see plate 16, figure 6.

Abdominal tergites dull yellow, each segment narrowly but distinctly margined with dark brown all around, sternites very pale, almost white, each segment with the caudal margin narrowly brown; genital segment reddish yellow. Ovipositor with the tergal valves having a stout, enlarged base, the valves produced caudad into exceedingly slender points which are slightly expanded at their tips; tergal valves much shorter than the elongate, blade-like sternal valves which are directed caudad.

Holotype, ♀, Tokyo, Japan; August, 1912 (Vial K).

(To be continued.)

**TWO NEW CALIFORNIA THAMNOTETTIX
(HOMOPTERA).**

BY E. D. BALL, LOGAN, UT.

While collecting in California, several years ago, a single specimen of a beautiful *Thamnotettix* was captured, but escaped from the net; not, however before its characters were pretty defi-

nately fixed in mind. While collecting in another locality last year the same species was found and instantly recognized, and, like the former one, lost. This now became the chief object of search, and later it was captured in several different places. Its remarkable agility in escaping from a net probably being a reason it has not been captured before.

Thamnotettix pasadena, n. sp.

Size and form of *ursina* nearly, colour pattern resembling *collaris*, but still more highly ornamented. Rich brown, with head, saddle and antepical band yellow. Length ♀ 6.5mm; ♂ 6mm.; width 1.5mm.

Vertex definitely obtusely angled, almost two-thirds as long as its basal width, slightly shorter than the pronotum, one-half longer at apex than against the eye, disc flat, the margins rounding to the front except at the conical apex, front broadly wedge-shaped, the lateral margins nearly straight, clypeus broad, slightly constricted. Elytra moderately long, strongly flaring behind. Venation weak, often obscure, with irregular reticulations in the antepical cells, often especially emphasized along the claval and costal margins.

Colour—Vertex and face light yellow to yellowish ivory, eyes reddish or reddish brown, pronotum rich brown, the anterior submargin rich brown, with a row of irregular coalescing black spots, on either side a transverse median ivory mark; scutellum rich brown, sometimes with a medium light shield ornamented with two round dots. Elytra with the anterior two-thirds of claval areas rich yellowish ivory, the remainder brown, corium yellowish subhyaline, a brown cloud along the claval suture abruptly terminating just before the apex of clavus, where it expands and, uniting with the claval markings, forms a transverse brown band which narrows toward the costa and becomes slightly oblique, the reflexed apices of the elytra, including most of the apical areas smoky brown.

Genitalia—Female ultimate segment three or four times as long as the preceding, deeply angularly excavated from the lateral angles two-thirds of its depth, the bottom of the notch broadly

DIRECTIONS FOR SENDING LIVING APHIDS.

It is desirable, in sending aphids for determination, that living individuals be submitted when possible. We have found the following method to be the most satisfactory of several tried:

Place a portion of the plant bearing the aphids in a glass vial and with it a strip of filter paper, the size depending on the size of vial and quantity of foliage placed within it. The vial is then tightly stoppered with a cork and placed in a mailing tube or substantial box for mailing. Always have the stem of the plant and the end of the filter paper sufficiently long so that they will be held by the cork; otherwise the loose foliage and twigs will shake about and may crush the aphids. By this method we have shipped living specimens 1,700 miles and had them reach their destination in excellent shape. Tin salve boxes also make excellent shipping boxes for living aphids. Shipments of this nature should always be accompanied by full data, such as name of food plant, locality, date, part of plant affected, and collector.

All of the illustrations in this paper are by Dr. Henry Fox, excepting figures 10, 21, and 22, which are by Mr. W. R. Walton and figures 43 and 45 to 48 inclusive of plate VII and all of plate XVIII, which are the author's.

EXPLANATION OF PLATES.

Plate II. *Macrosiphum creelii* n. sp.—Figure 1 antenna, and 2 cornicle of wingless viviparous female; 3 head and 4 antenna of winged viviparous female.

Macrosiphum coryli n. sp.—5 head, 6 antenna and 7 cauda of wingless viviparous female; 8 antenna, 9 wing, and 10 cornicle of winged viviparous female.

Plate IV. *Macrosiphum venafusca* n. sp.—11 head, 12 antenna and 13 cauda of wingless viviparous female, 14 head, 15 antenna, 16 wing, and 17 cornicle of winged viviparous female; 18 antenna of winged male; 19 antenna and 20 hind tibia of wingless oviparous female.

Plate V. *Macrosiphum tiliae* Monell.—21 head, 22 antenna and 23 cornicle of wingless viviparous female; 24 antenna of winged male; 25 hind tibia of wingless oviparous female.

Myzus lycopersici Clarke.—26 antenna of wingless viviparous female; 27 antenna, 28 head, 29 cornicle and 30 cauda of winged viviparous female; 31 antenna of winged male; 32 antenna of oviparous female.

Plate VII. *Myzus lycopersici* Clarke.—33 hind tibia of wingless oviparous female.

Rhopalosiphum howardii Wilson.—34 antenna of wingless viviparous female; 35 head, 36 wing, 37 cornicle, 38 cauda and 39 antenna of winged viviparous female; 40 antenna of winged male.

Eulachnus rileyi Williams.—41 antenna of wingless viviparous female; 42 head, 43 antenna, 44 beak, 45 wing and 46 hind tarsus of winged viviparous female; 47 antenna of winged male, 48 hind tibia of wingless oviparous female.

Plate XVIII. *Symdobius albasiphus* n. sp.—49 antenna, 50 cornicle and 51 cauda and anal plate of wingless viviparous female; 52 head, 53 antenna and 54 cauda and anal plate of winged viviparous female; 55 antenna and 56 wing of winged male; 57 antenna and 58 hind tibia of wingless oviparous female.

REPORT ON A COLLECTION OF JAPANESE CRANE-FLIES (*TIPULIDÆ*, *DIPTERA*).

BY CHARLES P. ALEXANDER, ITHACA, N. Y.

(Continued from p. 211.)

***Tipula nipponensis*, sp. n.**

Head yellowish; thorax yellow with brown stripes; abdomen with the caudal margin of the segments broadly brown; wings variegated gray, brown and hyaline.

Male: Length 12.8 mm.; wing 13.6 mm.; antennæ about 4 mm.

Female: Length 13-14.1 mm.; wing 14.2-15.2 mm.

Male: Palpi brown, the terminal segment very long and pale; frontal prolongation of the head very short and stout, yellowish; antennæ, segments 1 and 2 yellow, flagellar segments with the somewhat enlarged base dark brown, the remainder of each segment dull yellow; front, vertex and occiput dull yellow, the sides of the vertex and the genæ dark brown.

Pronotum pale; mesonotum dull yellow with dark brown stripes, the median one bisected by a pale line, lateral stripes short,

very close to the median stripe; scutum with the lobes brown; scutellum and postnotum yellowish medially, the sides dark brown, a narrow indistinct median line. Pleura yellowish with brown blotches as follows: On sides of the propleura; a large blotch on the mesoepisternum and mesosternum; a very dark spot on the dorsocephalic angle of the mesepimerum, a dark blotch at the base of the halteres. Halteres paler. Legs, coxæ dull yellow with the base on the outer side tinged with brown; trochanters yellow; femora yellow, the tip brown; tibiae light brown, tarsi dark brown. Wings with a light gray suffusion, cells C and Sc a little lighter, yellowish; stigma brown; hyaline spots as follows: In front of and beyond the stigma, cell 1st M₂, a large blotch in the end of cell M and a spot in cell 1st A near the end of vein 2nd A; veins Cu and 2nd A narrowly seamed with brownish. Venation (see plate XVI, figure 2).

Abdominal tergites with the basal third yellowish, apical two-thirds brown; pleural line conspicuously dark brown; sternites light yellow, each segment with a narrow, transverse subbasal brown band. Male hypopygium: 9th tergite from above narrow, not nearly as wide as the 8th tergite, its lateral angles rounded, its caudal margin deeply and broadly notched. Pleural appendages from the side (see plate XIX, fig. 2). A more dorsal and cephalic fleshy lobe which is directed backward, this lobe cylindrical, tapering, provided with sparse long hairs; entad and ventrad of this lobe is a large bifid appendage whose caudal arm is feebly chitinized, pale, with abundant hairs, the inner or cephalic arm is chitinized, and with strong teeth which approach the caudal margin of the 9th tergite. Penis with the central vesicle large, its convex side directed dorsad, the penis proper, long and slender.

Female.—Almost as in the ♂, the antennæ shorter; ovipositor with the tergal valves much more slender than the high sternal valves.

Holotype, ♂, Tokyo, Japan; April 26, 1912 (Vial 25).

Allotype, ♀, Tokyo, Japan; April 26, 1912 (Vial 25).

Paratype, ♀; Tokyo, Japan; April 26, 1912 (Vial 25).

Tipula serricauda, sp. n.

Head with a brown median stripe; thorax with three brown stripes; abdomen trivittate with brown; female ovipositor with the

sternal valves exceedingly short, tergal valves long, serrated on the outer margin; wings clouded brown, gray and hyaline.

Female.—Length about 23 mm.; wing 18-18.8 mm.

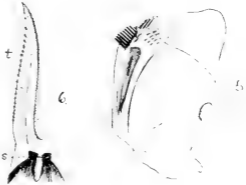
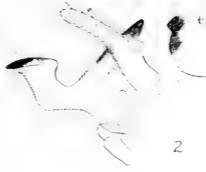
Female.—Palpi with the base dark, the apical segments pale; frontal prolongation of the head rather short, dark above, pale beneath; antennae, four basal segments light yellow, the remaining segments a little brown at the base, yellow apically; front, vertex and occiput dull yellow, the head with an elongate brown median stripe.

Mesonotal præscutum light brown, with three broad dark brown stripes of which the median one is very broad and is bisected by a pale line, lateral stripes close to the median one; scutum dull brownish yellow, the lobes mostly dark brown; scutellum brownish yellow; postnotum light brown, with three dark brown longitudinal stripes. Pleura brown, much darker on the mesosterna. Halteres rather short, dull yellow, the knob a little brown. Legs, coxæ with the externo-cephalic face brown; trochanters dull yellow, femora and tibiae yellow, the tips brown; tarsal segment I brownish yellow, brown at the tip; segments 2-5 brown. Wings gray, cells C and Sc yellowish brown; dark brown blotches as follows; At base of vein M, in middle of cell M₁ adjoining vein Cu, at origin of Rs, stigmal region including the cephalic portion of the cord. Hyaline blotches scattered over the wing, the largest beyond the stigma, extending obliquely across the wing to cell 1st M₂; a large blotch in cells R and M near the basal third, another in cell M near the tip; others before the stigma and in the anal cells. Venation (see plate XVI, fig. 4).

Abdominal tergites brownish yellow, with three indistinct dark brown longitudinal stripes which extend the length of the abdomen. Ovipositor of a remarkable structure; viewed from beneath (see plate XIX, fig. 6), the sternal valves are remarkably short, not even attaining the base of the upper valves; upper valves parallel on a horizontal plane, slightly curved, the inner margin smooth, the outer margin with numerous saw-like teeth. Sternites dull yellow, a broad brown longitudinal median stripe rather indistinct on segments 1-3 but becoming darker and better defined on the apical segments.

Holotype, ♀, Tokyo, Japan; August, 1912; vial 41.

Paratype, ♀, Tokyo, Japan; August, 1912; vial 41.



JAPANESE CRANE-FLIES

Tipula yusou, sp. n.

Head and thorax blackish; postnotum blackish; abdomen yellow with three dorsal brown longitudinal lines and one median stripe; wings pale greyish brown variegated with hyaline.

Male: length 15 mm.; wing 19.2 mm.; antennæ 4-5 mm.

Female: length 23 mm.; wing 21 mm.

Male: Palpi and frontal prolongation of the head dark brown, the latter very long; antennæ, segment 1 very long; scapal segments yellow, segment 3 yellow basally darkening into brown at the tip, remaining segments dark brown, the enlarged base even darker, front, vertex and occiput dark brown.

Pronotum dull yellowish brown. Mesonotal præscutum light brown with three darker brown stripes of which the median one is elongate cuneiform, its narrowed point ending just before the suture; scutal lobes dark brown; scutellum dull yellow with an indistinct, narrow darker line; postnotum dark brown. Pleura dark brown. Halteres pale, the stem browner before the knob. Legs, coxæ brown on the outer face, the tips yellow; trochanters yellow; femora yellow, becoming brown at the tip; tibiæ and tarsi brown. Wings, basal half pale yellowish, apical half more brown, cells C and Sc yellowish; stigmal blotch darker brown, irregular; hyaline blotches as follows: a large blotch across the wing before the cord; a narrower one beyond the cord; a large blotch in the caudal portions of cells 1st A and 2nd A; cell M pale in the middle. Venation, see plate XVI, figure 1.

Abdominal tergites 1-7 dull yellow with a narrow dark brown median stripe; segments 3-7 with a shorter and narrower stripe near the lateral margin of each sclerite; segments 8-9 dark brown; sternites dull yellow, also with a distinct, narrow median vitta. Male hypopygium (Lateral aspect, see plate XIX, figure 1): 9th tergite from above, with the caudal margin deeply and broadly rounded, the edge with abundant chitinized teeth, the lateral angles notched; 8th sternite, viewed from the side triangular, the caudal end with a dense bunch of orange coloured hairs; 9th sternite rather large, oval, bearing on its pleural region a group of appendages as follows: the more dorsal a large, fleshy, sigmoid lobe, very densely clothed with long delicate hairs, ventrad and entad of this a large bifid appendage whose caudal branch ends in

a cylindrical chitinized arm, and whose cephalic branch is produced dorsal into a spoon-shaped appendage whose concavity is directed toward the chitinized portion of the 9th tergite; entad of these appendages is a large lobe whose point is chitinized and directed cephalad, the sides with deep parallel grooves. The penis is rather short and very stout; just underneath its tip inside the pleura are a pair of apophyses (shown in the figure), these strongly chitinized and ending in two sharp spines of which the caudal one is the larger.

Female.—Like the ♂, but the dorsal abdominal stripe is much broader, lateral stripes also much broader; on the caudal half of the 7th tergite and on the 8th tergite, all three of the dorsal vittæ unite and cover the segment; the sternal vitta is very broad, but is interrupted at the end of the 6th segment; segments 7 and 8 with a small brown median spot near the caudal margin, and the anterior and posterior edges of the sclerite a little darker; genital segment dull yellow.

Holotype, ♂, Tokyo, Japan; May 7, 1912; vial 36.

Allotype, ♀, Tokyo, Japan; April 26, 1912; vial 21.

Paratypes, 2 ♀, Tokyo, Japan; April 23, 1912; vial 3.

The specific name is that of an aboriginal Japanese race formerly occupying the north-west shores of the southern half of Nippon facing the Sea of Japan.

EXPLANATION OF PLATES.

PLATE XI.

- Fig. 1. Wing of *Pachyrhina pullata*, sp. n.
 Fig. 2. " *P. palloris* Coquillett.
 Fig. 3. " *P. repanda*, sp. n.
 Fig. 4. " *P. virgata* Coquillett
 Fig. 5. " *P. flavonota*, sp. n.
 Fig. 6. Dorsal aspect, 9th tergite, of *P. flavonota*, sp. n.; ♂.
 Fig. 7. " " " *P. pullata*, sp. n.; ♂.
 Fig. 8. " " " *P. repanda*, sp. n.; ♂
 Fig. 9. " " " *P. virgata* Coquillett; ♂.
 Fig. 10. Sixth antennal segment, *P. virgata* Coquillett; ♂.
 Fig. 11. " " " *P. repanda*, sp. n.; ♂.
 Fig. 12. " " " *P. pullata*, sp. n.; ♂.

Fig. 13. Pleural appendages, ♂ hypopygium, *P. virgata* Coquillett.

Fig. 14. Pleural appendages, ♂ hypopygium, *P. pullata*, sp. n.

Fig. 15. " " " " *P. flavonota*, sp. n.

Fig. 16. " " " " *P. repanda*, sp. n.

PLATE XVI.

Fig. 1. Wing of *Tipula yusou*, sp. n.

Fig. 2. " *T. nipponensis*, sp. n.

Fig. 3. " *T. aino*, sp. n.

Fig. 4. " *T. serricauda*, sp. n.

Fig. 5. " *T. yamata*, sp. n.

Fig. 6. " *T. insulicola*, sp. n.

Fig. 7. " *T. coquilletti* Enderlein.

Fig. 8. " *Dictenidia fasciata* Coquillett

PLATE XIX.

Fig. 1. Hypopygium of *Tipula yusou*, sp. n.

Lateral aspect; t = 9th tergite; pl = pleura.

Fig. 2. Hypopygium of *T. nipponensis*, sp. n.

Lateral aspect; t = 9th tergite.

Fig. 3. Hypopygium of *T. yamata*, sp. n.

Lateral aspect; t = 9th tergite.

Fig. 4. Hypopygium of *T. aino*, sp. n.

Dorsal aspect of the 9th tergite.

Fig. 5. Hypopygium of *T. aino*, sp. n.

Pleural appendages, lateral aspect.

Fig. 6. Ovipositor of *T. serricauda*, sp. n.

Ventral aspect; t = tergal valve; 5 = sternal valve.

Fig. 7. Hypopygium of *T. coquilletti* End.

Ventral aspect; 8s = 8th sternite; 9s = 9th sternite.

Fig. 8. Hypopygium of *T. coquilletti* End.; 9th tergite from above.

Fig. 9. Hypopygium of *T. coquilletti* End.; pleural appendage from the inside.

Fig. 10. Hypopygium of *T. coquilletti* End.; pleura and its appendage from the outside.





NEOTROPICAL CRANE-FLIES

(Reprinted from *Entomological News*)

THE NEOTROPICAL TIPULIDAE IN THE HUNGARIAN NATIONAL MUSEUM (DIPTERA)

CHARLES P. ALEXANDER
ITHACA, N.-Y.

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The Neotropical Tipulidae in the Hungarian National Museum (Diptera).—I.

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

(Plate XIV.)

Through the kindness of Dr. Coloman Kertész, I have been able to examine and study the South and Central American crane flies in the collection of the Hungarian National Museum at Budapest. This collection of Tipulidæ, although not containing an unusual number of specimens, included a considerable number of interesting species which will be discussed in this and succeeding papers.

Subfamily LIMNOBINÆ.

Tribe 1—LIMNOBINI.

Genus *Dicranomyia* Stephens.

1829. *Dicranomyia* Stephens; Catal. Brit. Ins.; vol. 2, p. 243.

Dicranomyia subdola, sp. n. (Pl. XIV, Fig. 1).

Wings hyaline, veins of the wing margined with brown; tips of the femora yellow; abdomen annulated brown and yellow.

Females.—Length, 7.8 mm.; wing, 10.6 mm.

Rostrum and palpi dark brown; antennæ greyish brown, the flagellar segments much darker, brown; front, vertex and occiput greyish brown with numerous black hairs.

Pronotum brownish yellow, dark brown medially. Mesonotal præscu-

*Contribution from the Entomological Laboratory, Cornell University.

tum yellowish brown, a broad dark brown median stripe extending the length of the sclerite; scutum with the lobes brown, median space brighter, more yellowish; scutellum brown broadly margined with yellowish; postnotum dark brown. Pleuræ broadly dark brown becoming much lighter colored on the sternum. Halteres rather long, base of the stem pale, darkening into brown.

Legs, coxæ and trochanters light yellow, femora yellowish brown darkening toward the tip, the apex broadly yellow, tibiæ and tarsi brown.

Wings subhyaline, a brown quadrangular stigma, narrow brown seams along the cord, at the tip of *Sc* and along *Rs*, on the outer deflection of cell 1st *M*₂ and less distinctly along most of the longitudinal veins. Venation, (see plate XIV, fig. 1) *Sc*₁ ending beyond the origin of *Rs*, *Sc*₂ also beyond *Rs*, its length about equal to *Sc*₁, basal deflection of *Cu*₁ about at the fork of *M*.

Abdomen, tergites with the basal half of each segment dark brown, the apical half abruptly yellow; sternites similar beyond the first segment.

Holotype, ♀, Callanga, Peru, in the Hungarian National Museum.

Closely related to *andicola* Alexander, of Bolivia (Can. Ent.; vol. 44, pp. 362, 363; pl. 11, fig. h), differing in the lack of lateral præscutal stripes, much more extensive brown pattern on the wings, position of *Sc*₂, etc.

***Dicranomyia tricincta*, sp. n.**

Wings with a reticulated pattern, a supernumerary cross vein in cell *R*₃; femora with three subequal, equidistant brown rings.

Male.—Length, about 7-7.5 mm.; wing, 10.3 mm. Hind leg, femur, 8.8 mm.; tibia, 9 mm.; tarsus, 5.7 mm.

Closely related to *D. muscosa* End.¹ of Ecuador, differing as follows: Head rich brown without a yellowish tinge; legs with the femora light yellow with three broad equidistant brown bands, the first premedian, the second postmedian, the last subapical, these annulations occurring on all the legs, tibiæ a little darker at the tip, two terminal tarsal segments brownish. In *muscosa*, the legs are bright greenish yellow, the apical third of the femora yellowish, before the tip with a broad pale grey ring, tibiæ and tarsi bright brownish yellow. With *muscosa* it agrees in its irregularly reticulated wing pattern, presence of a supernumerary cross vein in cell *R*₃, green cast to the body, etc.

Holotype, ♂, Callanga, Peru, in the Hungarian National Museum.

(1) Enderlein, Zool. Jahrbuch., vol. 32, pt. 1, pp. 75, 76, fig. W¹; 1912.

Genus *Rhipidia* Meigen.

1818. *Rhipidia* Meigen, System. Besch., vol. 1, p. 153.

Rhipidia domestica angustifrons Alexander (1912).

Alexander, Bull. Brook. Ent. Soc., vol. 8, pp. 16, 17; pl. 1, fig. ♀.

One ♀ from Callanga, Peru.

***Rhipidia*, sp.**

One ♀ from San Bernardino, Paraguay. Fiebrig, 1908. It is allied to *domestica* but the antennæ are entirely lacking and closer identification is impossible.

***Rhipidia*, sp.**

One ♀ from Asuncion, Paraguay. Vezényi, 1904.

Genus *Geranomyia* Haliday.

1833. *Geranomyia* Haliday; Entomol. Magaz., vol. 1, p. 154.

Geranomyia valida Loew. (Pl. XIV, Fig. 2).

1851. *Aporosa valida* Loew.; Linnæa Entomologica, vol. 5, p. 398.

One ♀, Concepcion, Chile, 1903; P. Herbst, coll.

A few additional details to Loew's characterization may be given. Proboscis split at tip, each lip recurved, the palpi very short and stout. Legs stout, coxæ, trochanters and femora yellowish, not darkened; tibiæ yellowish brown; tarsi, segments 1-3, brownish yellow, narrowly brownish at the tip of each, segments 4 and 5, brown. Wing venation (see plate XIV, fig. 2). Length, about 6.5 mm.; wing, 9.6 mm.; rostrum, 2.2 mm.

***Geranomyia numenius*, sp. n.** (Pl. XIV, Fig. 3).

Rostrum long, thorax reddish brown, the præscutum with three pale vittæ and a dark brown median stripe; femora with a dark subapical ring; wings spotted, *Sc* long.

Female.—Length (excluding rostrum), 9.3 mm.; wing, 9.2 mm.; proboscis, 6.2 mm.

Proboscis dark brownish black; antennæ almost black, the flagellar segments elongate-cylindrical; front, vertex and occiput grey.

Pronotum light grey with a broad dark brown median vitta. Mesonotal præscutum rich reddish brown divided by three pale longitudinal whitish grey stripes, the median one broad and bisected by a narrow dark brown line which begins just behind the front margin of the sclerite and runs to the suture, the pale lateral vittæ narrow, enlarged at their anterior end before the pseudosutural fovea and run to the suture; scutum, scutellum and postnotum rich reddish brown, the latter with a paler median line. Pleuræ pale testaceous brown, darker

on the mesopleuræ, more greyish behind. Halteres, stem pale, knob brown.

Legs, coxæ and trochanters dull yellow, femora light brownish yellow with a rather broad subapical ring, tibiae light brown, the tip a little darker; tarsi brown.

Wings slightly infuscated with four brown marks along the costal region, the second at the origin of *Rs*, the third at the tip of *Sc*, the fourth at the stigma; pale greyish seams along the cord and along the outer end of cell 1st *M*₂. Venation (see plate XIV, fig. 3); *Sc* long, ending opposite or beyond the middle of *Rs*; *Sc*₂ equal to *Sc*₁; *Rs* rather long, strongly arcuated at its origin. There is a supernumerary cross vein in cell *Sc* between the base of the wing and the origin of the sector, such a condition being rather frequent in this genus.

Abdominal tergites dark brown, sternites much paler, yellowish.

Holotype, ♀, Callanga, Peru.

Paratype, ♀, Callanga, Peru.

Types in the Hungarian National Museum.

The paratype lacks the blackish median præscutal vitta.

G. numenius is allied to *insignis* Loew (1), but the antennal flagellum is black, not brown; thorax without three clear opaque brownish black stripes, etc.

***Geranomyia cinereinota*, sp. n.** (Pl. XIV, Fig. 4).

Rostrum short; thoracic notum grey with a well defined blackish median stripe; femora uniform in color, wings subhyaline.

Male, length (excluding rostrum), 5.1 mm.; wing, 6.8 mm.; rostrum, 1.8 mm. Female, length (excluding rostrum), 5.2 mm.; wing, 7 mm.

Male.—Proboscis short, scarcely extending beyond the wing basis, dark brownish; antennæ dark brown; head grey densely clothed with long, black hairs.

Cervical sclerites blackish with a little greyish bloom. Mesonotal præscutum grey with a broad brownish black median stripe, the sides of the sclerite darkened, almost black, the ground color brightest in front on either side of the median vitta, more suffused with brownish behind; scutum, scutellum and postnotum light grey. Pleuræ grey suffused with darker. Halteres short, yellowish, the knob brown.

Legs, coxæ and trochanters yellowish, femora dull yellow, tibiae light brown, tarsi brown.

Wings subhyaline, iridescent, veins *C*, *Sc* and *R* more yellowish, remaining veins brown. Venation (see Plate XIV, fig. 4).

Abdominal tergites dark brown, sternites dull yellowish.

In the *female* the rostrum is even shorter, scarcely exceeding the antennæ in length.

1. Loew, H.—*Linnaea Entomologica*, vol. 5, p. 395, (1851).

Holotype, ♂, Coroico, Bolivia.

Allotype, ♀, with the type.

Paratypes, 40 ♂ ♀, Bartica, Brit. Guiana (H. S. Parish, coll.).

Types in the Hungarian National Museum; paratypes in author's collection.

G. cinereinota is allied to *diversa* O. S. of the Eastern U. S., but has a long *Sc.*, and a different thoracic- and wing-pattern.

***Geranomyia scolopax*, sp. n.**

Rostrum short, barely exceeding the antennæ in length; thoracic notum greyish brown with dark brown stripes; legs uniform; wings hyaline with three brown costal spots.

Male.—Length, 5.3 mm.; wing, 7 mm.

Proboscis short, scarcely longer than the antennæ, dark brown; antennæ dark brownish black; head grey.

Mesothoracic præscutum greyish brown, with an ill-defined, darker median stripe and the lateral margin of the sclerite dark brown, this color being the continuation of the dark propleuræ, scutum dark brown; scutellum and postnotum a little lighter. Pleuræ light brown with a broad greyish brown band extending the length of the thorax above the base of the halteres and below the wing root, becoming confluent with the postnotum. Halteres pale, the knob a little brown.

Legs, coxæ and trochanters yellow, fore femora dull yellow, tibiæ and tarsi brown; middle and hind legs brown excepting the coxæ and trochanters which are yellow.

Wings hyaline, or nearly so, with a distinct oval, brown stigma, a brown cloud at the fork of *Sc* including the base of *Rs*, cell *Sc* with a brown cloud at one-half its length. Venation: *Sc* rather short, ending a little beyond the origin of *Rs*; *Sc*₂ at the tip of *Sc*₁; basal deflection of *Cut* at the fork of *M*.

Abdominal tergites rich brown, the extreme base of each segment pale; the lateral edge and an indistinct median vitta brown; sternites brown.

Holotype, ♂, Callanga, Peru, in the Hungarian National Museum.

Closest to *cinereinota*, sp. n., but with distinct spots on the wing and with the median præscutal stripe ill-defined.

Genus ***Peripheroptera*** Schiner.

1866. *Peripheroptera* Schiner; Verh. Zool. bot. ges. Wien; vol. 16, p. 933.

This remarkable genus of flies is apparently confined to the tropics of South America. Specimens are rare in collections and the few that have been taken are all contained in European museums. The peculiar characters of the genus, for the most part alar and venational, are thoroughly discussed by Osten Sacken in the second part of his "Studies on Tipulidæ" (Berl. Ent. Zeitschr., vol. 31, pp. 174-177). The present collection contained specimens of four species of which three are herein considered as new.

Key to the Species of Peripheroptera.

1. Cell 1st *M*₂ open; [thorax black shining; inner end of cell *R*₃ anterior to that of cell *R*₅] (Brazil, Bolivia).

incommoda O. S. (1)

Cell 1st *M*₂ closed, i. e., crossvein *m* present 2
2. Body color shining pitch black 3

Body color more or less reddish or yellowish 4
3. Inner ends of cells *R*₃, *R*₅ and 1st *M*₂ about in a straight line; femora yellow basally darkening into brown at the tip. (South America) *aberrans* Schin. (2)

Inner ends of cells *R*₃ and 1st *M*₂ much farther proximad than the inner end of cell *R*₅; legs black. (Peru).

teucholaboides sp. n.
4. Wings conspicuously margined with brown all around; a broad brown seam along the cord; [cell 1st *M*₂ elongated; inner ends of cells *R*₃, *R*₅ and 1st *M*₂ in a line.] (Peru).

cuadorac sp. n.

Wings hyaline or suffused with yellowish; no distinct brown caudal margin to the wing 5
5. Inner ends of cells *R*₃, *R*₅ and 1st *M*₂ nearly in a line. (Brazil).

schineri O. S. (3)

Inner ends of cells *R*₃, *R*₅ and 1st *M*₂ not in a line, that of *R*₅ being much farther distad 6
6. Abdomen entirely light brownish yellow; triangular basal cell (♀) very much shorter than cell *R*. (Peru) ... *arcuata* sp. n.

Abdomen darkened toward the tip; triangular basal cell (♂ ♀) almost as long as cell *R*. (Colombia) ... *nitens* Schin. (4)

(1) Osten Sacken, Berl. Ent. Zeitschr.; vol. 31, p. 176 (1887).

(2) Schiner, Novara Reise, Dipt., p. 43 (1868) (as *Rhamphidia*).

(3) Osten Sacken, Berl. Ent. Zeitschr.; vol. 31, p. 177 (1887).

(4) Schiner, Novara Reise, Dipt., p. 47, pl. 2, fig. 3 (1868) (type of the genus).

Peripheroptera incommoda Osten Sacken (Pl. XIV, Fig. 5).

One male from Coroico, Bolivia, agrees very well with the original description of this species. It measures 3.5 mm. in length of body and 5.4 mm. in wing length. I include a figure of its venation. (See Plate XIV, fig. 5).

Peripheroptera teucholaboides, sp. n. (Pl. XIV, Fig. 6).

Head dull brown; thorax shining black; wings hyaline with a small brown stigma.

Male.—Length, 4.8 mm.; wing, 6 mm.

Rostrum and palpi dark brown; antennæ dark brownish black, the flagellar segments short, rounded; front, vertex and occiput dull reddish brown.

Thoracic dorsum shining black; pleuræ black, with a bluish grey bloom on the mesopleuræ. Halteres brown, the base of the stem lighter.

Legs long and slender, entirely black.

Wings hyaline, a small dark brown stigma and a narrow seam of the same color on the deflection of *R* 4 plus 5; veins brown. Venation (see Plate XIV, fig. 6), triangular basal cell very short and small; *Sc*₁ ends just before the origin of *Rs*; deflection of *R* 4 plus 5 a little shorter than *Rs* but strongly arcuated; inner end of cell *R*₅ farther distad than those of *R*₃ and 1st *M*₂; basal deflection of *Cu*₁ at fork of *M*. Anal angle of the wing feebly indicated.

Abdomen shiny black.

Holotype, ♂, Callanga, Peru, in the Hungarian National Museum.

P. teucholaboides bears a strong superficial resemblance to *Dicranomyia moriodes* O. S. (East. U. S.) and to certain of the tropical forms of *Teucholabis*. It is much nearer to the normal Linnobine type than any of the other known species of the genus in that the male venation and alar characters are about as in the females of the other species, i. e., small triangular basal cell, small stigma, indication of an anal angle to the wing, etc.

Peripheroptera eudorae, sp. n. (Pl. XIV, Fig. 7).

Thorax reddish; wings margined all around with brown, a broad brown seam along the cord.

Male.—Length, 5.4-6 mm.; wing, 8.2-10.1 mm.

Rostrum and palpi reddish brown; antennæ, first segment brown, remaining segments dark brownish black; front, vertex and occiput shiny reddish chestnut, the occiput rather narrowed caudad to meet the elongated cervical sclerites, genæ yellowish brown.

Pronotum shiny chestnut; mesonotal præscutum rich yellowish chestnut, very shiny, in front much darker, brownish, this brown mark ill-delimited; scutum reddish brown, blackened on the outer cephalic angles of the lobes; scutellum and postnotum liver brown. Pleuræ deep yellowish chestnut without markings. Halteres short, brown.

Legs, coxæ and trochanters brownish yellow, base of femora yellowish, soon darkened into brown, tibiæ and tarsi brown.

Wings, yellowish, with distinct brown markings, the whole margin of the wing is brown, rather interrupted at the distal ends of the radial cells where the yellow ground color continues to the wing margin; cord broadly margined with brown. The yellow color is distributed as follows: Most of cells *R* and *M*, tip of cell 2nd *R*₁, most of cell *R*₃, basal half of *R*₅, middle of 1st *M*₂, indistinct spots in the bases of *M*₁ and *M*₃, and a patch in cell *Cu*₁. Venation: Costa strongly incrasated near the end of *Sc*₁; *Sc*₁ ends opposite the origin of *Rs*; *Rs* short, about equal to the deflection of *R* 4 plus 5; inner ends of cells *R*₃, *R*₅ and 1st *M*₂ in a line (see Plate XIV, fig. 7).

Abdominal segments almost black, each sclerite with a broad pale silvery apex.

Holotype, ♂, Callanga, Peru.

Paratype, ♂, Callanga, Peru.

Types in the Hungarian National Museum.

***Peripheroptera arcuata*, sp. n. (Pl. XIV, Fig. 8).**

Thorax yellowish, a dark brown median mark on the præscutum, wings with the deflection of *R* 4 plus 5 strongly arcuated and not in a line with the inner end of cell *R*₅.

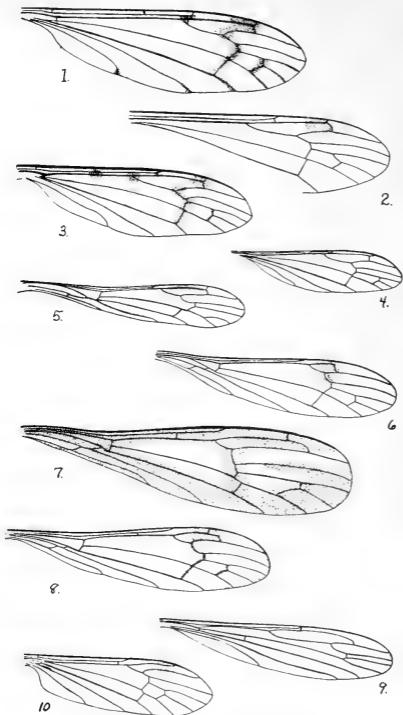
Female.—Length, 5.6 mm.; wing, 6.8-7.8 mm.

Rostrum and palpi brown; antennæ, basal segments dull yellow, flagellar segments brown; front and vertex grey, this color continued caudad along the inner margin of the eye, caudal portions of the vertex and the occiput brownish yellow, head not shiny.

Thorax rich brownish yellow, a little shining, a conspicuous, elongate oval, dark brown stripe on the præscutum, this mark truncated in front, more pointed behind; scutum, scutellum and postnotum dull yellow, not shiny. Pleuræ dull yellow. Halteres light yellowish brown, knobs dark brown.

Legs, coxæ and trochanters light yellow, femora yellowish darkening into brown toward the tip, tibiæ and tarsi brownish.

Wings with a faint yellow tinge, most intense along cells *C* and *Sc*; stigma indistinct rather small, cord and tip of the wing very indistinctly suffused with brown. Venation (see Plate XIV, fig. 8), cross vein *r* angulated near its middle, strongly arcuated and with indications of a spur; *Rs* rather long, not so arcuated as the deflection of *R* 4 plus 5 which is bent almost at a right angle and is much proximad of the



NEOTROPICAL TIPULIDAE ALEXANDER.

inner end of cell *R*₅ though about on a line with the inner end of cell 1st *M*₂.

Abdomen brownish yellow without dark markings.

Holotype, ♀, Callanga, Peru.

Paratype, ♀, Callanga, Peru.

Types in the Hungarian National Museum.

EXPLANATION OF PLATE XIV.

- Fig. 1. Wing of *Dicranomyia subdola* sp. n.; ♀.
Fig. 2. Wing of *Geranomyia valida* Loew.; ♀.
Fig. 3. Wing of *Geranomyia numenius* sp. n.; ♀.
Fig. 4. Wing of *Geranomyia cinerincta* sp. n.; ♂.
Fig. 5. Wing of *Periphroptera incommoda* Osten Sacken; ♂.
Fig. 6. Wing of *Periphroptera teucholaboides* sp. n.; ♂.
Fig. 7. Wing of *Periphroptera eudorae* sp. n.; ♂.
Fig. 8. Wing of *Periphroptera arcuata* sp. n.; ♀.
Fig. 9. Wing of *Diotrepha omissinervis* sp. n.; ♀.
Fig. 10. Wing of *Atarba varicornis* sp. n.; ♀.

The Neotropical Tipulidae in the Hungarian National Museum (Diptera).—II.

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

(Plate XVI.)

Tribe 2—ANTOCHINI.

Genus **Teucholabis** Osten Sacken.

1859. *Teucholabis* Osten Sacken; Proc. Acad. Nat. Sci. Phila.; p. 223.

Teucholabis is the dominant Antochine genus in the tropics of the New World. Many species were included in the collection and are considered in the following pages.

Teucholabis flavithorax Wiedemann.

Two specimens, ♂ ♀, from Callanga, Peru.

Teucholabis tristis, sp. n. (Pl. XVI, Fig. 1).

Head and thorax shining black; wings infumed with brown; *Rs* long, only slightly arcuated.

Female.—Length, 5.6 mm.; wing, 6 mm.

Rostrum and palpi dark brown; antennæ dark brownish black; front, vertex and occiput dark shining black.

Thoracic dorsum shining black, the pronotum dull yellowish, this color continued caudad as a narrow stripe along the lateral margin of the præscutum to the wing root; pleuræ black. Halteres brown, knob yellow.

Legs, coxæ and trochanters brown, femora yellowish brown, the tip

*Contribution from the Entomological Laboratory, Cornell University.

broadly dark brown; tibiae and tarsi dark brown; the brown femoral apices are broadest on the fore femora, narrower on the hind femora.

Wings with a light brown suffusion, a little more hyaline in cells 1st *R*₁, tip of cell *R* and in cell 1st *M*₂; stigma dark brown, oval. Venation (see Plate xvi, fig. 1): *R*₅ long, almost straight; cell 1st *M*₂ short; basal deflection of *Cu*₁ at the fork of *M*.

Abdomen moderately long, dark brownish black.

Holotype, ♀, Callanga, Peru, in the Hungarian National Museum.

***Teucholabis fulgens*, sp. n. (Pl. XVI, Fig. 2).**

Head reddish; pronotum yellow; mesonotal præscutum reddish yellow with three dark spots; posterior coxæ similar in color to the other coxæ; wings hyaline with no dark brown basal spot, tip infuscated.

Female.—Length, 5 mm.; wing, 5.8 mm.

Rostrum and palpi brown; antennæ brown; front, vertex and occiput reddish.

Pronotum yellow. Mesonotal præscutum rich orange yellow, a small rounded, dark brown median spot near the cephalic margin; an oblong transverse mark of the same color on the caudal region of the præscutum; scutum yellow, the lobes more orange; scutellum light yellow; postnotum reddish orange. Pleuræ reddish orange, a rounded black spot midway between the root of the wings and the base of the halteres. Halteres brown, the knob orange yellow.

Legs, coxæ and trochanters reddish yellow, fore femora with the basal fifth yellow, remainder brownish black, tibiae and tarsi brownish black, middle and hind femora yellow with the tip broadly dark brown, tibiae dark brown, lightest medially, tarsi dark brownish black.

Wings subhyaline, tip slightly infuscated; a triangular brown stigma and a very narrow brown seam on the cord down to cell 1st *M*₂. Venation (see Plate xvi, fig. 2): *R*₅ rather strongly arcuated, its origin slightly anterior to *Sc*₂.

Abdomen with the six basal tergites dark brown, apical tergites and the valves of the ovipositor rich reddish yellow; sternites light reddish yellow.

Holotype, ♀, Callanga, Peru, in the Hungarian National Museum.

***Teucholabis jocosa*, sp. n. (Pl. XVI, Fig. 3).**

Head grey; pronotum inconspicuous, yellow; mesonotal præscutum reddish yellow with three dark spots; all coxæ reddish; wings hyaline with a pale brown rounded stigma.

Female.—Length, 5.2 mm.; wing, 5 mm.

Rostrum and palpi dark brownish black; antennæ dark brownish black; front, vertex and occiput grey.

Pronotum not conspicuous, dull yellow; præscutum orange medially, lighter colored, yellowish, on the sides, a brown median stripe broadest in front near the cephalic margin of the sclerite, becoming indistinct behind at about midlength of the sclerite, a rounded brownish black spot on the sides of the præscutum near the suture; scutum, scutellum and postnotum dull brownish yellow, not brightly colored. Pleuræ dull yellow. Halteres pale yellowish brown, knob and stem almost unicolorous.

Legs, coxæ and trochanters dull yellow, femora dull yellow, the tips broadly dark brown, tibiæ yellowish brown, the tips broadly darker brown, tarsi dark brown; the brown femoral and tibial apices are subequal in length on all the legs.

Wings hyaline, with a pale brown rounded stigma. Venation (see Plate xvi, fig. 3): *Rs* long and almost straight.

Abdomen dark brownish black, the extreme apices of segments 1 to 6 indistinctly dull yellow; apical segments dull yellow, the base of the 7th tergite blackish.

Holotype, ♀, Coroico, Bolivia, in the Hungarian National Museum.

***Teucholabis jucunda*, sp. n. (Pl. XVI, Fig. 4).**

Head black; pronotum light yellow; mesonotum light yellow with dark brown spots; pleuræ with a large blotch; hind legs blackish; halteres dark throughout; wings brown with two large enclosed subhyaline blotches.

Female.—Length, 6 mm.; wing, 8.3 mm.

Rostrum and palpi black, the former elongated; antennæ dark brownish black; front, vertex and occiput black.

Pronotum elongate, conspicuous, light yellow. Mesonotal præscutum light reddish yellow or orange yellow, a shining brownish black triangular spot on the middle of the sclerite, its anterior end broadest, its apex directed caudad and becoming much paler behind, spreading out over this part of the sclerite, a large rounded dark brown spot on the sides of the sclerite behind; scutum, lobes dark brownish black, median line and margins of the sclerite reddish yellow; scutellum and postnotum yellowish. Pleuræ light dull yellow with a very large conspicuous brownish black mark on the mesopleuræ. Halteres brownish black throughout.

Legs, fore coxæ and trochanters yellowish, rest of fore legs missing; middle coxæ and trochanters brown, base of the femora yellowish brown soon passing into the dark brown of the tip, tibiæ and tarsi dark brown; hind coxæ and trochanters black, femora, tibiæ and tarsi dark brownish black.

Wings hyaline or subhyaline, with conspicuous brown markings on the tip, along the cord and sub-basal, so that of the ground color only the following remains: A large blotch distad of the cord extending from cell *2nd R1* caudad into cell *Cu1* including most of cell *1st M2*; the median blotch is irregular, embracing the middle of cells *R*, *M*, and *Cu* and the tips of the anal cells; the anal angle of the wing is pale. Venation (see Plate xvi, fig. 4): *Sc* long, *Sc1* ending nearer to the fork of *Rs* than to its origin.

Abdomen with three basal tergites dark brown, the remaining similar in color with broad pale yellowish brown apices; sternites dark brownish black with very broad yellowish apices to the sclerites except the apical segments which are uniformly dark; ovipositor, base blackish, tip yellowish.

Holotype, ♀, Callanga, Peru, in the Hungarian National Museum.

In my key to *Teucholabis* (*Psyche*, vol. 20, No. 1, pp. 43, 44, 1913) *jucunda* would run down to *pulchella* Alexander, from Eastern Brazil. From this species it differs in the increase in brown markings on the thorax and the much darker wing pattern. It is much more closely related to *T. laeta* described below.

***Teucholabis laeta*, sp. n. (Pl. XVI, Fig. 5).**

Head reddish brown; pronotum yellow; mesonotum reddish yellow with dark brown spots; pleuræ uniform; halteres dark throughout; wings with broad dark brown fasciæ, basal cells almost clear of dark color.

Male.—Length, about 4.1 mm.; wing, 5.3 mm.

Rostrum, palpi and antennæ dark brownish black. Front, vertex and occiput very deep reddish brown.

Pronotum yellow. Mesonotal præscutum rich reddish yellow with a large oval, median, dark brown blotch on the anterior portion of the sclerite, larger more rounded spots of the same color on the sides of the sclerite behind; scutum reddish, the lateral cephalic edge of the lobes with a brown blotch; scutellum and postnotum reddish yellow. Pleuræ uniform reddish yellow without black markings. Halteres uniformly dark color.

Legs, coxæ and trochanters dull yellow, fore femora with the basal third yellowish passing into dark brown, tibiæ base and tip dark, the intermediate portion somewhat lighter, yellowish; remaining femora with the dark tip narrower.

Wings subhyaline with the tip dark brown, a broad seam of the same

dark color along the cord, these two bands cutting off a large oval blotch of the ground color, base of the wing almost free from brown markings, except at the tips of the anal veins. Venation (see Plate xvi, fig. 5): *Sc* long, origin of *Rs* far before its tip.

Abdomen with the tergites dark shiny black, the fifth much paler, yellowish, basally and apically; sternites reddish yellow, uniform.

Holotype, ♂, Songo, Bolivia, in the Hungarian National Museum.

Closely allied to *jucunda* but much smaller, the thoracic coloration especially in the pleuræ different and wing-pattern and venational details quite distinct. It should be noted that in the genus *Teucholabis*, the males are invariably larger than the females, a condition that is quite different from what occurs in most crane flies.

***Teucholabis hilaris*, sp. n. (Pl. XVI, Fig. 6).**

Head reddish; pronotum yellow; mesonotal præscutum yellow with three broad brown stripes confluent behind; scutellum yellow; posterior coxæ dark; wings hyaline with the tip infuscated.

Male.—Length, 5 mm.; wing, 5.5 mm. *Female*.—Length, 4 mm.; wing, 4.8-5 mm.

Rostrum and palpi brownish yellow; antennæ basal segment orange yellow, flagellum black; front, vertex and occiput orange yellow.

Pronotum conspicuous, rich orange yellow, very shiny. Mesonotal præscutum yellow with three very broad dark brown stripes which almost conceal the ground color, these stripes confluent behind near the transverse suture; scutum yellow, each lobe with a large dark brown rounded spot in the center; scutellum light yellow; postnotum brownish black. Pleuræ, propleuræ yellow; meso- and metapleuræ dark shining black. Halteres, stem brown, knob bright orange yellow.

Legs, fore and middle coxæ and trochanters light orange yellow, fore femora yellowish on basal fourth, remainder dark brown, tibiæ and tarsi brown, the former a little brighter medially; middle femora light yellow with a rather broad dark brown tip, tibiæ with the base and tip dark brown, the medial portion yellowish brown; tarsi dark brown; hind leg, coxæ and trochanters dark brownish black, femora light yellow with the tip broadly dark brown, tibiæ yellow with the base narrowly dark brown, the tip broadly of the same color, tarsi dark brownish black.

Wings, hyaline, the tip broadly infuscated with light brown; a dark brown basal spot in the region of the arculus; a dark brown triangular stigma which sends a narrow brown seam down along the cord to cell 1st *M*₂. Venation (see Plate xvi, fig. 6): Origin of *Rs* opposite *Sc*₂.

Abdomen dark brownish black, the extreme tergal apices yellow; sternites yellow with brownish black rings.

Female.—Similar, the ovipositor and a ring on the 8th abdominal segment, yellow.

Holotype, ♂, Callanga, Peru.

Allotype, ♀, Callanga, Peru.

Paratype, ♀, Callanga, Peru.

The two types in the Hungarian National Museum, the paratype in the author's collection.

This handsome species agrees most closely with *simplex* Wied. [Aussereur Zweifl. Ins., vol. 1, pp. 549, 550; (*Limnobia*)] but is much smaller, antennæ not yellowish brown and the leg-pattern quite different. From *molesta* O. S. (Biologia Cent. Amer.; vol. 1, pp. 6, 7), it differs in its reddish head; from *gracilis* O. S. (l. c., p. 7), it differs in its thoracic pattern and much smaller size.

Teucholabis munda, sp. n. (Pl. XVI, Fig. 7).

Head dark brown above; pronotum yellow; thorax shiny black; wings hyaline with a broad brown apex and brown marks along the cord; *Rs* very short, arcuated, its origin opposite the tip of *Sc1*.

Male.—Length, 5.5 mm.; wing, 5.8 mm.

Rostrum yellow, palpi brown; antennæ with the basal segment yellow, remaining segments rounded oval, dark brownish, front yellowish, vertex and occiput very dark brown becoming lighter and brighter on the genæ.

Pronotum very light yellow, not very shining. Mesonotum entirely dark shiny black. Pleuræ black. Halteres, stem dark brownish black, the knob light yellow.

Legs, fore coxæ and trochanters light yellow, femora with the basal third yellowish darkening into brownish black apically, tibiæ and tarsi dark brownish black; middle coxæ brown, trochanters yellow, femora brownish yellow, the tip darker, tibiæ and tarsi dark brown; hind coxæ black, trochanters brownish yellow, femora brownish yellow gradually darkening to the brown tip, tibiæ and tarsi dark brownish black.

Wings subhyaline, the whole tip of the wing infuscated with light brown, the inner margin of this infuscation including the extreme tip of cell 1st *M2*; stigma large, dark brown, sending a narrow brown seam along the cord; an indistinct light brown suffusion in cell *M1*, and tips of the two anal cells. Venation (see Plate xvi, fig. 7): *Rs* short and very arcuated at its origin, its base opposite the tip of *Sc1*.

Abdomen with the tergites black, sternites black, the tips of the apical sclerites broadly yellowish.

Holotype, ♂, Callanga, Peru, in the Hungarian National Museum.

T. munda differs from all of the species known to me in the great arcuation of the radial sector.

***Teucholabis paradoxa*, sp. n. (Pl. XVI, Fig. 8).**

Head reddish brown; thorax reddish, unspotted; wings subhyaline with numerous brown spots and dots; cross vein *r-m* not present.

Male.—Length, 5 mm.; wing, 6.6 mm. *Female*.—Length, 6 mm.; wing, 6 mm.

Male and *Female*.—Rostrum reddish, palpi brown; antennæ dark brownish black throughout; front, vertex and occiput shining reddish brown.

Pronotum reddish. Mesonotum and pleuræ reddish yellow without dark markings. Halteres light brown throughout.

Legs, coxæ and trochanters brownish yellow, femora brownish yellow, the tip rather broadly dark brown, tibiæ brown darkest at the tip, tarsi dark brown; fore tibiæ almost uniformly dark brown; the dark femoral apices subequal on all the legs.

Wings, shiny, light yellowish hyaline, with numerous dark brown spots and dots as follows: Cell *C* is brown except for a space near cross vein *h*; *Sc*₂ brown with a space over the middle of cell 1st *R*₁. Four large brown blotches, one at the base of the wing, a second at the origin of *Rs*, a third near the stigma and the last at the end of *R*₁ in cell 2nd *R*₁. Anal angle of the wing dark, a large blotch in the end of cell 1st *A*; smaller blotches at the ends of the longitudinal veins; all of the cells of the wings with abundant rounded brown dots. Venation (see Plate xvi, fig. 8): *Sc* long, *Rs* rather long and rather strongly arcuated so that cell *R* is narrowest at its middle; cross vein *r-m* obliterated by the fusion of *R*₄ plus 5 on *M*₁ plus 2 at the proximal end of cell 1st *M*₂; cell 1st *M*₂ much longer than the veins issuing from it.

Abdomen, base yellowish, in the female tergites 2 to 5 light brown with dark apices; sternites brownish yellow; in the male, several of the basal tergites yellow, the abdomen expanded before the hypopygium, several segments being involved.

Holotype, ♂, Callanga, Peru.

Allotype, ♀, Callanga, Peru.

Types in the Hungarian National Museum.

The only species of *Teucholabis* that I know of with this type of wing-pattern. The obliteration of the *radio-median*

cross-vein by the fusion of *R* 4 plus 5 on *M* 1 plus 2, is a new venational feature for the genus although long known in the related genus *Paratropeza* Schiner.

Genus **Paratropeza** Schiner.

1866. *Paratropeza* Schiner; Verh. Zool. bot. Ges. Wien; vol. 16, p. 932.

A very interesting group of Neotropical crane flies remarkable in the presence of cell *R*2 in the wings, *Paratropeza* being the only genus in the tribe that possesses this character (compare my key to the Antochini, Psyche, vol. 20, No. 1; pp. 40, 41; 1913).

Key to the Species of *Paratropeza*.

1. Cross vein *r-m* obliterated by the fusion of *R* 4 plus 5 on *M* 1 plus 2 2
 Cross vein *r-m* present 4
2. Entire thorax blue black; [head dark purplish; wings with three dark brown bands, one near the wing base, one along the cord and the last on the wing tip; abdomen black, margins of the segments yellowish.] (Brazil, Peru). *collaris* O. S. (1)
 Thorax with at least the scutellum yellowish 3
3. Thoracic præscutum entirely shiny black; wings with a narrow brown seam along the radial cross vein; [head yellow; abdomen rust yellow except the base which is black.] (Colombia). *singularis* Schin. (2)
 Thoracic præscutum reddish yellow with three broad black stripes; wings with a narrow seam along the cord, tip of the wing faintly infuscated; [head reddish yellow.] (Mexico). *præusta* O. S. (3)
4. Cell 1st *M*2 of the wings open, due to the atrophy of the outer deflection of *M*3; wings with two distinct dark brownish bands; tip of the wing infuscated. (Brazil)... *fasciolaris* Wied. (4)
 Cell 1st *M*2 closed; wings with a narrow brown seam along the cord; tip of the wing not infuscated. (Brazil). *jaclans* sp. n.

(1) Osten Sacken, Berl. Ent. Zeitschr.; vol. 31, p. 190 (1887).

(2) Schiner, Novara Reise, Dipt., p. 46, pl. 2, fig. 2 (1868). (Type of the genus).

(3) Osten Sacken, Biol. Cent. Amer., vol. 1, pt. 1, p. 8 (1886).

(4) Wiedemann, Ausser. Zweifl. Insect, vol. 1, suppl., p. 552, pl. 6b, fig. 11 (1828), (as *Limnobia*).

Paratropeza collaris Osten Sacken (Pl. XVI, Fig. 9).

One ♂, from Callanga, Peru. Venation (see Plate xvi, fig. 9); *Rs* very strongly arcuated at its origin; deflection of *R* 4 plus 5 and cross vein *r* almost in a line; cross vein *r-m* obliterated by the fusion of *R* 4 plus 5 on *M* 1 plus 2; basal deflection of *Cu*1 just beyond the fork of *M*.

Paratropeza jactans, sp. n. (Pl. XVI, Fig. 10).

Thoracic præscutum yellowish with broad brown stripes; scutellum yellow; postnotum black; wings with a narrow brown seam along the cord; cross vein *r-m* present; cell 1st *M*2 closed.

Male.—Length, 6 mm.; wing, 6.8 mm.

Rostrum yellow, palpi brown; antennæ with the basal segment brownish yellow, the remaining segments brown; front and vertex brown, darkest on the vertex; occiput reddish brown.

Pronotum yellowish brown. Mesonotal præscutum dull yellow with three broad dark brown stripes confluent behind, the median stripe broad, its sides subparallel, the lateral ones very large, occupying most of the caudo-lateral portions of the sclerite; scutum dull yellow, the lobes with a large rounded dark brown spot; scutellum dull yellow; postnotum dark brownish black. Pleuræ rich reddish yellow, this color including the sternum. Halteres brownish black, the knob light yellow.

Legs, coxæ and trochanters dull yellow, rest of the legs broken.

Wings broadest in the region of the cord, subhyaline with a broadly triangular dark brown stigma, a narrow brown seam along the cord and on the outer end of cell 1st *M*2; an indistinct brown suffusion from the origin of *Rs* caudad across the wing to the tip of 2nd *A*. Venation (see Plate xvi, fig. 10): *Rs* long, very gently arcuated; deflection of *R* 4 plus 5 anterior to the cross vein *r*; cross vein *r-m* present, rather long; cell 1st *M*2 closed; basal deflection of *Cu*1 just beyond the fork of *M*.

Abdominal tergites dark brownish black with a broad yellowish apex to the sclerites; sternites yellowish.

Holotype, ♂. Theresopolis, Brazil, in the Hungarian National Museum.

Genus **Diotrepha** Osten Sacken.

1878. *Diotrepha* Osten Sacken; Cat. Dipt. N. Am.

Diotrepha omissinervis, sp. n. (Pl. XIV, Fig. 9).

Wings uniformly grey, *Sc* long, ending opposite the middle of *Rs*, tip of *R*1 atrophied; femoral and tibial apices dark brown.

Female.—Length, 8.8 mm.; wing, 6 mm.; abdomen, 7.2 mm. Hind leg, femur, 5.8 mm.; tibia, 6.3 mm.; tarsus, 4.6 mm.

Rostrum and palpi dark brown; antennæ with the two basal seg-

ments dark brown, the flagellar segments much paler, whitish; front, vertex and occiput light greyish brown, darker behind.

Mesonotal præscutum light brown, unmarked; scutum, scutellum and postnotum of about the same color, the latter a little darker. Pleuræ uniformly brown. Halteres brown, the base of the stem paler.

Legs, coxæ and trochanters dull yellow, femora almost white with the tip broadly dark brown, tibiæ whitish with the tip very narrowly dark brown; tarsi whitish, the two terminal segments becoming more infuscated.

Wings with a grey suffusion, veins rather pale. Venation (see Plate xiv, fig. 9): *Sc* long, ending about opposite the middle of *Rs*, *Sc2* at its extreme tip, the terminal portion of *R1* beyond the cross vein *r*, atrophied.

Abdomen long, uniform dark brown, the sternites rather brighter.

Holotype, ♀, Songo, Bolivia, in the Hungarian National Museum.

From *mirabilis* Osten Sacken (1), the only described species with dark femoral and tibial apices, this species differs as follows: *Sc* much longer, ending near the middle of *Rs* instead of just beyond its origin; the atrophy of the tip of *R1* distinguishes *omissinervis* from all of the described forms.

Genus *Toxorhina* Loew.

1851. *Toxorhina* Loew.; Linnæa Entomologica, vol. 5, p. 400.

Toxorhina brasiliensis Westwood.

One ♀ from San Bernadino, Paraguay. Fiebrig, 1908.

Genus *Atarba* Osten Sacken.

1869. *Atarba* Osten Sacken; Monographs of the Dipt. of N. Am., vol. 4, pp. 127, 128.

Atarba varicornis, sp. n. (Pl. XIV, Fig. 10).

Antennæ very long, annulated dark brown and yellowish; femora unicolorous; wings without a stigmal spot; valves of the ovipositor very powerful; abdominal tergites dark brown.

Female.—Length, 4.2 mm.; wing, 4.9 mm.

Rostrum yellowish, the palpi a little darker; antennæ with the scapal segments dull yellow, flagellum with the basal half of each segment light yellow, the apical half abruptly dark brown, the terminal two or three segments uniformly brown; front and occiput dull brownish yellow, the vertex a little darker brown.

(1) Osten Sacken, Cat. Dipt. N. Am., p. 220 (1878); Williston, Trans. Ent. Soc. Lond., pt. 3, p. 291, fig. 65 (1896).

Thoracic dorsum dull rich yellow, the postnotum a little more greyish. Pleuræ dull yellowish with a faint greyish bloom. Halteres light yellowish brown.

Legs, coxæ and trochanters yellow, femora, tibiæ and tarsi dull yellow, the latter passing into brown beyond the metatarsus.

Wings with a faint yellowish tinge, stigma very feebly indicated; venation (see Plate xiv, fig. 10.)

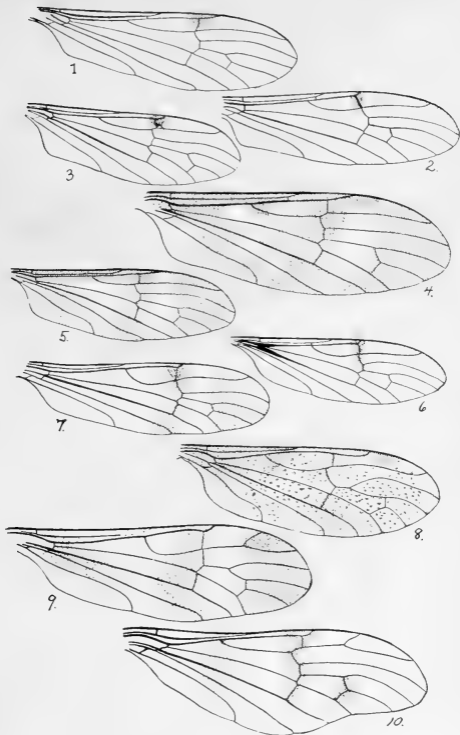
Abdomen brown, valves of the ovipositor very large, powerful, yellow, sternum light yellow, the sides of the sclerites broadly margined with brown.

Holotype, ♀, Callanga, Peru, in the Hungarian National Museum.

This is the third true *Atarba* described since the erection of the genus in 1869. It is closely allied to *picticornis* O. S., of the Eastern United States but is much smaller (wing of ♀; under 5 mm.; in *picticornis*, over 6 mm.); valves of the ovipositor very long, stout, the upper valve with the basal two-thirds enlarged, the apical third slender, acicular, lower valves flattened, blade-like; upper valves much longer than the lower valves; the abdominal tergites dark brown, in *picticornis*, the tergites dull yellow.

EXPLANATION OF PLATE XVI.

- Fig. 1. Wing of *Teucholabis tristis* sp. n.; ♀.
 Fig. 2. Wing of *Teucholabis fulgens* sp. n.; ♀.
 Fig. 3. Wing of *Teucholabis jocosa* sp. n.; ♀.
 Fig. 4. Wing of *Teucholabis jucunda* sp. n.; ♀.
 Fig. 5. Wing of *Teucholabis laeta* sp. n.; ♂.
 Fig. 6. Wing of *Teucholabis hilaris* sp. n.; ♀.
 Fig. 7. Wing of *Teucholabis munda* sp. n.; ♂.
 Fig. 8. Wing of *Teucholabis paradoxa* sp. n.; ♀.
 Fig. 9. Wing of *Paratropeza collaris* Osten Sacken; ♂.
 Fig. 10. Wing of *Paratropeza jactans* sp. n.; ♂.



NEOTROPICAL TIPULIDAE—ALEXANDER

The Neotropical Tipulidae in the Hungarian National Museum (Diptera)—III.

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

(Plate IX.)

Tribe 3—ERIOPTERINI.

Genus *Erioptera* Meigen.

1803. *Erioptera* Meigen; Illiger's Magaz., vol. 2, p. 262.

Erioptera (*Mesocyphona*) *annulipes* Williston.¹

One female from San Bernardino, Paraguay, Fiebrig, 1908; one female from Callanga, Peru.

Erioptera (*Mesocyphona*) sp.

One female from Paraguay, taken by Fiebrig. It is closely allied to *immaculata* Alexander.²

Erioptera (*Mesocyphona*) sp.

One male from Coroico, Bolivia. Closely allied to *caloptera* Say.³

Genus *Molophilus* Curtis.

1833. *Molophilus* Curtis; Brit. Entomol., p. 444.

Molophilus flavidus sp. n. (Pl. IX fig. 2).

Color yellowish; male antennæ elongate; ventral appendage of the male hypopygium deeply bifid.

Male.—Length, about 4.1 mm.; wing, 5.6 mm. Palpi brown; antennæ elongate, the segments covered with a dense pubescence, antennæ very light brown; head dull yellow.

Pronotum pale yellow without apparent stripes, the lateral margin of the sclerite and the sides of the pronotal scutellum very light yellow; scutum, scutellum and postnotum light brownish yellow. Pleuræ light yellow. Halteres, stem yellow, knob broken.

Legs, coxæ and trochanters yellow; femora yellow basally darkened into brownish on the apical half; tibiæ and tarsi brown.

Wings pale yellowish, veins light yellow, indistinct. Venation: basal deflection of *R*₄ plus 5 very reduced, or, in other words, the veins *R*₂ plus 3 and *R*₄ arise almost directly from the end of *R*₅.

Abdomen light yellowish brown. Hypopygium with the ventral appendage (see Plate IX, fig. 2) very deeply bifid, the inner branch shorter, at its tip slightly denticulated, the outer branch very long, bearing

¹ Williston, Trans. Ent. Soc. Lond., p. 294 (1806).

² Alexander, Proc. U. S. Nat. Mus., vol. 44, No. 1966, p. 518; pl. 66, fig. 20.

³ Say, Journ. Acad. Nat. Sci. Phila., vol. 3, p. 17 (1823).

along its ventral face a row of spine-like teeth, the tip flattened and provided with a few appressed teeth. The dorsal lobe at its dorso-apical angle provided with the usual curved hook-like appendage, the lobe densely clothed with long, pale hairs; the tip of the lobe ventrad of the hook-like appendage is produced into a short, sharp spine.

Holotype, male, Concepcion, Chile (P. Herbst, coll.), 1904, in the Hungarian National Museum.

The ? *Erioptera uniformis* Blanchard⁴, ? *longipes* Philippi⁵ and ? *pallida* Philippi⁶ may possibly be *Molophilus*. Philippi's description would seem to indicate rather unusual insects, *longipes* being described as having an elongate rostrum. In our present state of knowledge of Chilean Tipulidae, I cannot determine any of the forms before me as Blanchard's or Philippi's species.

***Molophilus taurus* sp. n.** (Pl. IX, fig. 1.)

Color brown; male antennæ short, ventral appendage of the male hypopygium deeply bifid.

Male.—Length, about 4.6 mm.; wing, 6.2 mm. Palpi dark brown; antennæ short, the flagellar segments oval to elongate-oval, brown; head blackish gray.

Pronotum narrow, the scutum yellow, with a brown tinge, a bunch of long black hairs at each outer angle; scutellum light yellow. Mesonotal præscutum light grayish brown; scutum and scutellum light brown; postnotum very dark grayish brown. Pleuræ brownish gray, more yellowish around the wing-root. Halteres pale yellowish brown.

Legs brown. Wings subhyaline, the veins distinct, brown. Venation: *R*₄ plus 5 rather long, longer than the cross-vein *r*.

Abdomen dark brown, densely clothed with long pale hairs. Hypopygium with the ventral appendage (see Plate IX, figure 1) very deeply bifid, the inner branch short bearing on its inner face a number of blunt teeth, including a bunch of about three near the middle, the tip sharp; outer branch long, slender, directed caudad and entad, crossing its mate of the opposite side like a rapier, long, cylindrical, tapering to the sharp point. Dorsal lobe and its appendages about as in *flavidus*.

Holotype, male, Rancagua, Chile. December, 1904 (P. Herbst, coll.), in the Hungarian National Museum.

⁴ Blanchard, Gay, in Hist. fis. y polit. de Chile; Zool., vol. 7, p. 343 (1852).

⁵ Philippi, Verb. Zool-bot. Ges. Wien, vol. 15, p. 616 (1865).

⁶ Philippi, *l. c.*

Molophilus sagittarius sp. n. (Pl. IX, fig. 4.)

Color brown; male antennæ short; ventral appendage of the male hypopygium simple, its caudal margin with about six long serrations.

Male.—Length, about 3.8 mm.; wing, about 6 mm. Palpi dark brown. antennæ brown, short, the flagellar segments oval; head grayish brown.

Pronotum enormously enlarged, fitting around the cephalic margin of the mesonotum like a life belt, bright yellow. Præscutum and scutum dark brown; scutellum yellowish brown; postnotum dark brown. Pleuræ dark brown. Halteres entirely light yellow.

Legs, coxæ and trochanters brownish yellow; femora yellowish brown; tibiæ and tarsi brown.

Wings subhyaline, veins brown, rather distinct.

Abdomen dark brown. Hypopygium with the ventral appendage (See Plate IX, figure 4) simple, flattened, its outer margin with about six long serrations.

Female.—About as in the male but the pronotum is not conspicuously swollen and is not yellow; the thoracic præscutum has indications of three darker dorsal stripes; wings a little browner.

Holotype, male, Coroico, Bolivia. *Allotype*, female, Callanga, Peru. *Paratype*, female, Cillutincara, Bolivia.

Allied to *M. perseus* Alexander⁷, of Colombia, but the ventral appendage of the male hypopygium is much less regularly serrated on its outer margin and the teeth are fewer (about 6 instead of 10 or 12) and longer; dorsal lobe very small and narrow. The hypopygium of *M. guatemalensis* Alexander⁸ has never been described and so I figure the ventral hypopygial appendage (see Plate IX, fig. 3); the appendage is simple, sickle-shaped, on the outer side near the base with a sharp point.

Genus **Gnophomyia** Osten Sacken.

1859. *Gnophomyia*. Osten Sacken; Proc. Acad. Nat. Sci., Phila., p. 223.

Gnophomyia luctuosa Osten Sacken.

One female from the Sierra, San Lorenzo, Colombia; Ujehyi, collector.

⁷ Alexander, Journ. N. Y. Ent. Soc., vol. 21, pp. 201, 202; pl. 6, figs. 4, 5 (1913).

⁸ Alexander, Proc. U. S. Nat. Mus., vol. 44, No. 1966, p. 511 (1913).

Gnophomyia maestitia sp. n. (Pl. IX, fig. 8.)

Color black; a yellow spot on the caudal end of the pronotum; wings dark colored with a darker brown cross band near the cord; halteres black; antennæ of the ♂ elongate. Male, length 5.5 mm.; wing, 5.8 mm. Female, length 5.5 mm.; wing, 5.8 mm.

Male.—Palpi black; antennæ long, extending beyond the base of the wing; flagellar segments elongate, black; head black.

Pronotal scutellum largely light yellow, the median portion dark. Mesonotal præscutum deep black; scutum, scutellum and postnotum black, the scutellum shiny and with a pearly lustre. Pleuræ black; a narrow, light yellow mark extending from the end of the pronotal scutellum almost to the wing-root; a yellow blotch between the middle and hind coxæ.

Halteres black. Legs black. Wings dark colored, a broad, irregular dark band in the vicinity of the cord; cells *R* and *M* almost hyaline. Venation (see Plate ix, figure 8): Cross-vein *r* connecting with *R*₂; *R*₂ very long; *R*_s short, straight.

Abdominal tergites dark brownish black; sternites a little paler.

Female.—Yellow color of the thorax reduced, the pronotal pattern confined to a small rounded spot underneath the pseudosutural fovea; yellow on the mesosternum not indicated; antennæ rather shorter.

Holotype, male, Vilcanota, Peru; *Allotype*, female, Callanga, Peru; *Paratypes*, 1 male, Vilcanota, Peru; 3 males, 2 females, Callanga, Peru; in the Hungarian National Museum; 1 male, 1 female, paratypes, in author's collection.

Most closely allied to *nigrina* Wied.¹⁰ from which it differs in its slightly larger size, difference in body coloration and in wing pattern; *luctuosa* O. S.¹¹ and *tristissima* O. S.¹² are the only other species with which it could be confused, differing from the former by its long antennæ, non-pubescent wings, etc., and from the latter by its black halteres, short and straight radial sector, etc.

Gnophomyia pervicax sp. n. (Pl. IX, fig. 7.)

Shiny yellowish; thoracic dorsum with three brown stripes; pleuræ yellow with a dorsal brown band; wings hyaline with a narrow brown seam along the cord; vein *R*₂ short. Male, length 6 mm.; wing, 6.4 mm. Female, length 4.5 mm.; wing, 6 mm.

Female.—Palpi dark brown, the basal segment a little lighter; an-

¹⁰ Wiedemann, *Aussereur-Zweifl. Ins.*, vol. 1, p. 37 (1828).

¹¹ Osten Sacken, *Proc. Acad. Nat. Sci., Phila.*, p. 224 (1859).

¹² Osten Sacken, *l. c.*

tennæ brown; front yellow; vertex brownish; occiput and genæ dull yellow.

Pronotum light dull yellow. Mesonotal præscutum shiny, dull yellow with three very broad brown stripes which are confluent behind, the middle stripe beginning at the cephalic margin of the sclerite; scutum light brown, the middle of the lobes dark brown; scutellum light brown; postnotum light brown, the sides very dark, almost black, especially behind. Pleuræ yellowish, the mesopleuræ tinged with brown; a large rounded dark brown spot between the bases of the halteres and the wings. Halteres light yellow, knob brown.

Legs, coxæ and trochanters yellowish, femora and tibiæ dull yellow, tarsi dull yellow becoming brown on the apical segments.

Wings subhyaline, a brown band extending from the tips of *Sc* and *R* down across the cord to cell *1stM2*; veins brown. Venation (see Plate IX, figure 7): *Sc* long, extending beyond the cross-vein *r*; cross-vein *r* connecting with *R2* plus 3 nearer to its origin than its tip; *R2* very short.

Abdomen with the four basal tergites yellow with a broad, dark brown, lateral margin; remaining tergites dull brown; sternites, basal ones dull yellow, terminal four sclerites suffused with brown.

Male.—This sex shows a dark brown pleural band across the sclerites; femora with a light brown tip, tibiæ with a distinct brown tip; cross-vein *r* about midlength of *R2* plus 3 and a faint brown seam along the outer end of cell *1stM2*.

Holotype, male; *Allotype*, female, Callanga, Peru, in the Hungarian National Museum.

G. pervicax is allied to *G. hirsuta* Alex.¹³ (Brazil) in its peculiar venation but has only a single narrow alar cross-band.

Genus *Trimicra* Osten Sacken.

1861. *Trimicra* Osten Sacken; Proc. Acad. Nat. Sci., Phila., p. 290.

Trimicra sp.

One male from Asuncion, Paraguay, June, 1905. Vezenyi.

Genus *Sigmatomera* Osten Sacken.

1869. *Sigmatomera* Osten Sacken; Mon. Dipt. N. Am., vol. 4. p. 137.

Sigmatomera occulta sp. n. (Pl. IX, fig. 5.)

Wings without dark cross bands; cell *1stM2* closed.

Female.—Length, 13.5 mm.; wing, 14.3 mm. Rostrum and palpi

¹³ Alexander, Proc. U. S. Nat. Mus., vol. 44, No. 1966, p. 523, plate 67, fig. 30 (1913).

light yellow, the terminal palpal segments a little more brown; antennæ with the two basal segments dull yellow, flagellum black; head dull greenish brown (greasy in the type).

Thoracic dorsum dull brownish yellow without well defined stripes; caudo-lateral angles of the præscutum brown; scutum and scutellum brown; postnotum greenish brown. Pleuræ dull yellow. Halteres yellow.

Legs light yellow, the tibiæ a little darkened at the tip, tarsi brown.

Wings hyaline, cells *C* and *Sc* yellow; veins *C*, *Sc* and *R* yellow, other veins dark brown. Venation (see Plate IX, figure 5): Deflection of *R*₂ plus 3 with a spur at midlength; cell *1stM*₂ closed.

Abdominal tergites rich brown with a blackish median blotch; sternites brownish.

Holotype, female, Ascuncion, Villa Morra, Paraguay, Vezenyi, in the Hungarian National Museum.

S. occulta differs from *S. flavipennis* O. S.¹⁴, the only described species with a closed cell *1stM*₂, in its lack of dark crossbands on the wing.

Genus *Rhabdomastix* Skuse.

1889. *Rhabdomastix* Skuse; Proc. Linn. Soc. N. S. Wales, ser. 2, vol. 4, p. 828.

Rhabdomastix (Rhabdomastix) illudens sp. n. (Pl. IX, fig. 6.)

Antennæ of the ♂ between four and five times as long as the body; a dark brown stigmal spot.

Male.—Length, 7.4 mm.; wing, 7.7 mm.; antennæ, 33 mm. Palpi very short, the first segment light brown, the apical segments almost black; antennæ with the basal segment enormously enlarged, barrel-shaped, the second segment small, rounded, flagellar segments successively elongated, the apical segments very long, the whole antennæ almost five times as long as the body; scapal segments brown, flagellar segments very pale, the extreme tip of each segment narrowly dark brownish black, the apical antennal segments more brown; the whole head underneath the swollen scapal segment is very deep and stout; head light gray.

Thorax brown with a light gray bloom; pseudosutural fovea large, prominent, black; tuberculate pits rather far cephalad, black; scutum and postnotum grayish, scutellum rich brown. Pleuræ pale brownish with a sparse gray bloom. Halteres short, yellowish.

Legs, coxæ and trochanters yellowish; fore and middle trochanters long and slender, the hind trochanter shorter; femora and tibiæ yellowish brown becoming browner on the tarsi.

¹⁴ Osten Sacken, Smithson. Miscell. Coll., vol. 11, No. 256 (1873).

Wings subhyaline; a brown stigmal spot; veins pale brownish yellow. Venation (see Plate IX, figure 6) almost as in *R. (Sacandaga) flava* Alex.¹⁵ but the cross-vein *m*, here, is much longer.

Abdominal tergites yellowish brown, sternites paler, yellowish.

Holotype, male, Coroico, Bolivia, in the Hungarian National Museum.

From *R. (R.) ostensackeni* Skuse¹⁶ (Australia) it differs in the much greater length of the antennae which is here more than four times as long as the body, in *ostensackeni* not quite twice as long. From the members of the subgenus *Sacandaga*, it differs in the elongate male antennae. The discovery of a member of this subgenus in the New World is of exceptional interest.

Genus *Lecteria* Osten Sacken.

1887. *Lecteria* Osten Sacken; Berl. Entomol. Zeitschr., vol. 31, p. 206.

Lecteria armillaris Fabr.¹⁷

One female from Espirito Santo, Brazil; one specimen, sex uncertain, from Callanga, Peru.

Lecteria abnormis sp. n. (Pl. IX, fig. 9.)

Tibiae spurred; color grayish with a narrow dorsal brown median line extending from the head to the mesonotal scutellum; wings subhyaline with a brown costal margin; vein *R*₂ obliterated.

Sex, (?) (probably a ♀). Head and thorax, 4.5 mm.; wing, 12.8 mm. Rostrum and palpi dark brown; antennal segments 1 and 2 dull yellow, the first segment very long, the second very short, globular; flagellar segments brownish; front, vertex and occiput yellowish gray with a narrow dark brown median vitta originating between the antennae and running to the caudal margin.

Pronotum gray with a narrow dark brown median stripe. Mesonotal praescutum brownish, more grayish behind and on the sides, with a dark brown median line; scutum and scutellum light gray, the dark brown median vitta ending on the scutellum; postnotum gray. Pleurae very light gray. Halteres dull yellow, the knob dark brown.

Legs, coxae light gray, trochanters dull yellow, femora dull brownish yellow with a dark brown subapical ring close to the tip, tibiae spurred, dull yellow, brown at the tip; tarsi brownish yellow, the apices of the segments darker, brown.

¹⁵ Alexander, Ent. News, vol. 22, pp. 351, 352 (1911).

¹⁶ Skuse, Proc. Linn. Soc. N. S. Wales, vol. 4, second series, p. 829, pl. 22, fig. 15 (1889).

¹⁷ Fabricius, Syst. Antl., p. 26 (1805).

Wings subhyaline, cells *C* and *Sc* brown, veins brown. Venation (see Plate IX, figure 9) vein *R*₂ entirely obliterated and only two branches of the sector attain the margin.

Abdomen broken.

Holotype, Paraguay, Fiebrig, coll., in the Hungarian National Museum.

L. abnormis belongs to *Psaronius* Enderlein, if this be admitted as a valid genus or subgenus.

We have here a venational phenomenon which is comparable to that in the subgenus *Leiponeura* of *Gonomyia* Meigen, that is, the total obliteration of one of the branches of the radial sector. This condition is presaged by *L. obliterata* Alex.¹⁸ (British Guiana) but in this new species the loss of *R*₂ is complete. In keys to the Tipulid tribes this would run down to the Antochini and students of the family should exercise care in the study of this interesting group of species.

Tribe 4—LIMNOPHILINI.

Genus *Limnophila* Macquart.

1834. *Limnophila* Macquart; Suit. à Bffon, vol. I, p. 95.

Limnophila kerteszi sp. n. (Pl. IX, fig. 10.)

Thorax grayish without distinct stripes; wings long and narrow with brown markings, these largest along the costal border.

Female.—Length, 8.8 mm.; abdomen, 7.6 mm.; wing, 8.6 mm. Rostrum and palpi very dark brown; antennæ dark brownish black; head grayish brown.

Thoracic præscutum yellowish brown without apparent stripes; scutum gray, the lobes dark brown; scutellum and postnotum light gray. Pleuræ brown with a dull gray bloom. Halteres long, very pale, almost whitish, the knob a little brown.

Legs, coxæ brownish, trochanters dull yellow, femora dull yellow with an indistinct brown subapical ring, tibiæ brown, tarsi brown.

Wings whitish with brown marks as follows: Cell *C* brown except the outer quarter; cell *Sc*₁ except the tip; a brown mark at the base of cell *R*, another at the origin of *Rs*; an irregular brown seam along the cord; a large brown blotch occupying the end of cell *R*₂ and the middle of cell *R*₃; a rounded spot in the middle of cell *R*₅; marks on the forks of veins, cross-veins and deflections of veins and at the ends of the longitudinal veins; gray clouds along the anal angle of the wing. Venation (see Plate IX, figure 10): *Sc*₂ longer than *Sc*₁; *Rs* very long, straight in a line with *R*₂ plus 3; cell *M*₁ present.

¹⁸ Alexander, Proc. U. S. Nat. Mus., vol. 44, No. 1966, p. 494, plate 68, figure 41 (1913).

Abdomen long, tergites dark brown; sternites dark brown on the basal third and along the sides; remainder of each segment yellow.

Holotype, female, Sao Paulo, Brazil, in the Hungarian National Museum.

***Limnophila conspersa* Enderlein.¹⁹**

One female from Espirito Santo, Brazil. More properly referred to *Limnophila* than *Lecteria* or *Psaronius*.

Genus **Epiphragma** Osten Sacken.

1859. *Epiphragma* Osten Sacken; Proc. Acad. Nat. Sci., Phila., p. 238.

Epiphragma cordillerensis Alexander.²⁰

One female, Callanga, Peru; one, sex uncertain, from San Antonio, Bolivia.

Tribe 5—HEXATOMINI.

Genus **Eriocera** Macquart.

1838. *Eriocera* Macquart; Dipt. Exot., vol. I, pt. I, p. 74.

Eriocera perdecora sp. n. (Pl. IX, fig. 11.)

Head black; thoracic dorsum reddish; abdomen black; wings brown with a broad yellow cross band and yellowish anal cells.

Female.—Length, about 18.5 mm.; wing, 14.4 mm. Rostrum and palpi black; antennæ black; head black.

Pronotum black; mesonotum entirely light orange-yellow, the extreme lateral margin of the sclerites dark brown. Pleuræ dark brownish black. Halteres black.

Legs, coxæ and trochanters dark brown; femora brown, darker at the tip; tibiæ and tarsi dark brown; middle and hind femora with the basal half brighter, brownish yellow.

Wings dark brown, cells *C* and *Sc* yellow; a broad yellow band across the wing mostly before the cord; anal cells largely yellowish. Venation, see Plate IX figure 11.

Abdominal tergites dark brownish black, the last segments more reddish, valves of the ovipositor dark brown; sternites, basal segments a little brighter, the last segment reddish.

Holotype, female, Callanga, Peru, in the Hungarian National Museum.

In my key to the Neotropical *Eriocerae* (*Psyche*, vol. 21, pp. 34-37. 1914.) *perdecora* would run down to the couplet con-

¹⁹ Enderlein, Zool. Jahrbuch, vol. 32, pt. 1, pp. 49, 50 (fig. D1) (1912). (as *Dactylolabis*).

²⁰ Alexander, Journ. N. Y. Ent. Soc., vol. 21, pp. 202, 203, pl. 5, fig. 8 (1913).

taining *braconides* End.²¹ and *magnifica* Alex.²², species with the head black. It differs from both of these species and from all other banded winged species, in its reddish thoracic dorsum.

Eriocera sublima sp. n. (Pl. IX, fig. 12.)

Head red; thorax black; abdomen black, the last segment orange; wings dark brown with a very narrow white cross band at the cord.

Female.—Length, 13.2 mm.; wing, 11.4 mm. Rostrum and palpi dark brown; antennæ with the scapal segments deep orange-red, flagellar segments dark brown; front, vertex and occiput fiery orange, the genæ darker.

Thorax dark brownish black, the mesonotum without well defined stripes. Halteres black.

Legs very dark brownish black, the tips of the tibiæ and the tarsi much paler, light brown.

Wings dark brown, the alar band white and very narrow, of about the same width as the cell *1stM2*; anal cells of the wing scarcely paler. Venation, see Plate IX, figure 12.

Abdominal segments dark brown, the last segment abruptly fiery orange.

Holotype, female, Minas Geraes, Brazil, 1897. Ex Coll. Fruhstorfer, in the Hungarian National Museum.

This species differs from all of the forms with banded wings in the very narrow, white alar band, and in its very dark brownish coloration.

Eriocera chrysoptera Walker. (Pl. IX, fig. 13.)

1856. *Limnobia chrysoptera* Walker; Ins. Saunders, vol. 1, Dipt., p. 438.

1902. *L. chrysoptera* Kertész; Cat. Dipt., vol. 2, p. 171.

1913. *Eriocera chrysoptera* Alexander; Proc. U. S. Nat. Mus.; vol. 44, No. 1966, p. 490.

1914. *Eriocera chrysoptera* Alexander; Psyche, vol. 21, p. 37.

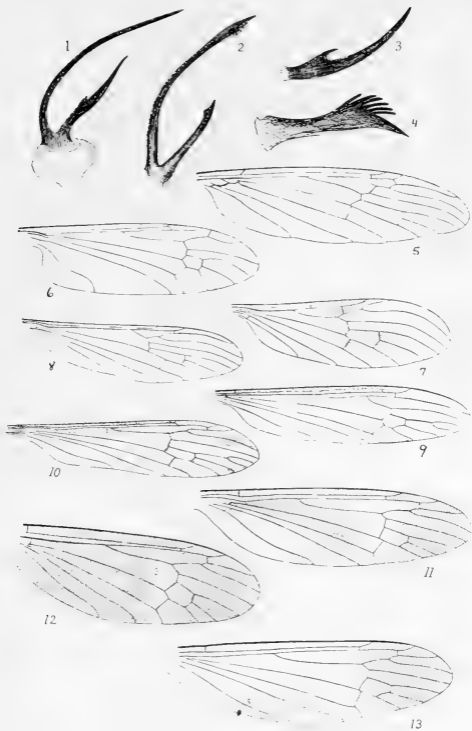
Female.—Length, 18.8 mm.; wing, 13.6 mm. Rostrum, palpi, antennæ and head very deep black.

Thorax black. Halteres short, black.

Legs, coxæ and trochanters black, basal portion of femora dark brownish black, this dark base narrowest on the fore legs, broadest on the hind legs where it covers almost one-third of the segment, tip of femora black, the middle portion bright yellow; tibiæ and tarsi very dark brown.

²¹ Enderlin, Zool. Jahrb., vol. 32, pt. 1, p. 47, fig. B1 (1912).

²² Alexander, Psyche, vol. 21, pp. 37, 38; pl. 4, fig. 7 (1914).



Wings bright golden yellow, the anal cells gray; tip of the wing from the cord outward dark brown. Venation, see Plate IX, figure 13. Abdomen black.

Two specimens, one a female, one with the abdomen broken, from Coroico, Bolivia. I have but little doubt that this is Walker's *chrysoptera*; the type in the British Museum has lost all the legs, which are quite distinctive in this species.

***Eriocera ohausiana* Enderlein.**

1912. *Eriocera ohausiana* Enderlein; Zool. Jahrb., vol. 32, pt. 1, pp. 45, 46, fig. A1.

1913. *Eriocera ohausiana* Alexander; Proc. U. S. Nat. Mus., vol. 44, No. 1966, p. 490.

1914. *Eriocera ohausiana* Alexander; Psyche, vol. 21, p. 36.

One male, Sierra, San Lorenzo, Colombia; Ujhelyi, coll. One male, one female, Callanga, Peru. One female from Songo, Bolivia. One female from Coroico, Bolivia.

These specimens vary much in intensity of the wing-pattern and in coloration, but I cannot find characters which will justify specific separation. The two females from Bolivia lack the dark femoral apices and have the abdominal tergites 5-7 blackish, the wing much more uniform in coloration, etc. The female from Peru has the legs dark brown and lacks black coloration on the abdomen. I have retained one male, one female, for my collection.

EXPLANATION OF PLATE IX.

Figure 1. Hypopygium of *Molophilus taurus* sp. n.; ventral apical appendage from beneath.

Figure 2. Hypopygium of *M. flavidus* sp. n.; ventral apical appendage from beneath.

Figure 3. Hypopygium of *M. guatemalensis* Alexander; ventral apical appendage from beneath.

Figure 4. Hypopygium of *M. sagittarius* sp. n.; ventral apical appendage from beneath.

Figure 5. Wing of *Sigmatomera occulta* sp. n.

Figure 6. Wing of *Rhabdomastix illudens* sp. n.

Figure 7. Wing of *Gnophomyia pervicax* sp. n.

Figure 8. Wing of *G. maestitia* sp. n.

Figure 9. Wing of *Lecteria abnormis* sp. n.

Figure 10. Wing of *Limnophila kerteszi* sp. n.

Figure 11. Wing of *Eriocera perdecora* sp. n.

Figure 12. Wing of *E. sublima* sp. n.

Figure 13. Wing of *E. chrysoptera* Walker.

The Neotropical Tipulidae in the Hungarian National Museum (Diptera).—IV.

By CHAS. P. ALEXANDER, Ithaca, New York.

(Plate XV.)

Sub-family TIPULINAE, Tribe TIPULINI.

Genus *Macromastix* Osten Sacken.

Macromastix pygmaea sp. n. (Pl. XV, fig. 1).

Size small (wing of ♂ about 10.5 mm.); wings with *R*₂ obliterated; halteres very long and slender.

Male.—Length 8 mm.; wing, 10.3 mm.; antennae about 9.5-10 mm.

Palpi dark brown; frontal prolongation of the head brown, antennae a little longer than the body, the flagellar segments being greatly elongated, antennae densely clothed with rather short delicate hairs; fore part of the vertex produced into a prominent conical tubercle; front and vertex gray, occiput brownish.

Mesonotal praescutum light brown somewhat darker in front and on the sides, but without apparent stripes; scutum with the lobes brown; scutellum and postnotum light brownish yellow. Pleurae, mesopleurae darker brown than the yellowish metapleurae. Halteres very long and slender, yellowish at base, the remainder brown.

Legs, coxae and trochanters dull yellow; femora dull yellow basally soon passing into brown; tibiae and tarsi brown.

Wings subhyaline, cells *C* and *Sc* more yellowish; stigma scarcely indicated; veins brown. Venation, *R*_s very short, *R*₂ obliterated. (See Plate XV, figure 1).

Abdomen with the two basal segments light brown; remainder of abdomen dark brown; hypopygium simple.

Holotype.—Male, Callanga, Peru, in the Hungarian National Museum.

The reference of this species to *Macromastix* is somewhat provisional. It agrees with *M. chilensis* Philippi¹ in its antennae and simple hypopygium, but the obliteration of vein *R*₂ is a character suggesting certain of the *Dolichopezini*. I do not care to erect a new genus upon a single specimen. As I have shown before,² Enderlein's *M. appendens* (Zool. Jahrb., Vol. 32, pt. I, pp. 14, 15) is not a *Macromastix* at all, but a true *Tipula*.

¹Philippi, Verh. Zool. bot. Gesell. Wien. Vol. 15, p. 617 (1865).

²Alexander, Ann. Ent. Soc. Am., Vol. 5, No. 4, p. 355 (1912).

Genus *Holorusia* Loew.*Holorusia flavicornis* sp. n. (Pl. XV, fig. 2).

Antennæ of ♂ elongate, without bristles; thoracic dorsum rich chestnut; pleuræ yellow above, paler beneath, a dark lateral stripe; wings pale brown.

Male.—Length, 13.2 mm.; wing, 19.3 mm.; antennæ, about 7.5 mm. Fore leg, femur, 10.8 mm.; tibia, 12.3 mm.; tarsus, segment 1, 21.4 mm.

Palpi rather short, dark brownish black, the frontal prolongation of the head rather long, the nasus very long and sharply pointed, the prolongation is brown, rather darker on the sides; antennæ elongate, scapal segments very small, the first only a little longer than the second, the flagellar segments elongate cylindrical, not incised, without bristles but densely clothed with very short pale hairs; antennæ light yellow, the apical flagellar segments a little darker; head with a light brown median stripe, the sides behind the eyes rich chestnut brown.

Pronotum rich chestnut medially, light yellow on the sides, this color being the anterior end of a broad pale stripe underneath the mesonotal præscutum. Mesonotal præscutum rich chestnut brown, stripes not very distinct, the lateral margins of the sclerite rather darker; scutum dark brown; scutellum brown; postnotum dark brown in front, light dull yellow behind. Pleuræ rather pale; a yellow stripe, described above, running from the pronotum almost to the wing root; ventrad of this, a dark brown stripe running from the cervical sclerites almost to the wing root; ventral pleural sclerites brownish yellow. Halteres rather short, brown.

Legs, coxæ and trochanters dull yellow; femora yellowish brown, passing into brown, the tip dark brown; tibiæ brown, the extreme base pale, almost white; tarsi brown; legs long and slender.

Wings with a pale brown suffusion, cell *C* more yellowish, stigmal region dark brown; a brown cloud at the origin of *R*₅; subhyaline droplets in cell *1stR*₁, end of *R*₅, *M*₁, base of *M*₂ and tip of *1stA* near the vein *2ndA*. Venation, see Plate XV, figure 2. The wing figured shows an adventitious crossvein in cell *R*₃ dividing this into two cells the other wing being normal.

Abdominal tergites brown, the genitalia more yellowish, sternites a little more yellowish. Hypopygium small, 8th tergite rather narrow, especially medially; 8th sternite rather short, produced caudad into a very short sheath for the 9th sternite. Ninth tergite rather square, the caudal margin deeply concave, the latero-caudal angles produced into prominent lobes which are somewhat divergent, the tips and caudal margin provided with numerous black bristles. Ninth sternite rather large, pleura not distinct, near the base of the sclerite on the

ventro-median line underneath the protecting sheath of the 8th sternite is a median lobe directed ventrad, deeply divided medially to form two cylindrical lobes which are densely clothed with long, appressed silky hairs. Pleural region with the following appendages: a large pale external appendage, directed dorsad in a position of rest, its tip rather sharp-pointed, on its outer margin near the middle, with a prominent chitinized tooth, the whole appendage clothed with long pale hairs; inner appendage smaller, flattened, fleshy, pale, clothed with abundant pale hairs. Inside of the genital chamber, just beneath the lobes of the 9th tergite is a pair of irregular appendages very densely provided with small, rounded chitinized tubercles.

Holotype.—Male, Venezuela, ex. Coll. H. Fruhstorfer, in the Hungarian National Museum.

From the species of what seem to be *Holorusia pallidivervis* Mcqt. (Dipt. Exot., Suppl. I, p. 16) and *albocostata* Mcqt. (l. c., pp. 15, 16), this differs in its wing-pattern and long pale yellow antennae. From *H. maya* Alex. (Ann. Ent. Soc. Am., Vol. 5, p. 358, 1912) it differs in its much smaller size and quite different color.

Holorusia laevis, sp. n. (Pl. XV, figs. 8, 15).

Flagellum of antennæ without bristles; antennæ of ♂ moderately long, flagellum bicolored; mesonotum reddish brown with indistinct darker lines; wings light brown, a square spot in cell *M* near the middle of its length.

Male.—Length, 13.4 mm.; wing, 18 mm.; fore leg, femur, 11 mm.; tibia, 11.5 mm.; tarsus, segment I, 10 mm.

Palpi moderate in length, dark brown; frontal prolongation of the head rather short, nasus very long and prominent, front light brown; antennæ moderately long, if bent back, extending a little beyond the wing root, segment I rather short, about one-half as long as the third segment, flagellar segments cylindrical, not constricted, unarmed with bristles except a small pair at the tip, segments 1 and 2 light brown, 3 dark brown, 4 to 8 dark brown, yellowish at the tip, 9 to the end dark brown, the entire flagellum densely covered with white downy hairs; head rich brown. (See Plate XV, fig. 15).

Pronotal scutum reddish brown, scutellum almost white. Mesonotal præscutum reddish brown with very narrow indistinct darker lines; scutum reddish brown; scutellum and postnotum pale yellowish white. Pleuræ uniform pale yellowish. Halteres rather long, brown.

Legs, coxæ and trochanters light yellow, femora light yellowish brown, dark brown at the tip; tibiæ brown, scarcely darker at the tip; tarsi brown.

Wings subhyaline, cells *C* and *Sc* brownish, stigmal region brown, a brown cloud at the origin of *Rs*, a square patch in the middle of cell *M* over the vein *Cu*; base of cell *M* dark.

Abdominal tergites 1-5 dull yellowish, 6-8 dark brown, 9 yellowish, pale; segments 3-6 pale on the lateral margin; apical sternites dark brown; 9th and caudal part of the 8th light yellow. Hypopygium: 9th tergite from above, rather quadrate, the caudal margin with a median notch, the whole posterior face provided with numerous black bristles as in this group of species (*flavicornis*, et al). Eighth sternite short, dark basally, pale reddish yellow apically; 9th sternite very elongate giving the caudal margin of the hypopygium an oblique appearance when viewed from the side, pleural suture incomplete; outer pleural appendage long, flat and tapering to a point, fleshy, pale, clothed with long hairs. (See Plate XV, fig. 8). Inner appendage short, fleshy, concave on the outer face.

Holotype.—Male, Asuncion, Paraguay, May 5, 1904 (Vezényi), in the Hungarian National Museum.

Holorusia orophila sp. n. (Pl. XV, fig. 14).

Flagellum of antennæ without bristles; antennæ short, the flagellum bicolored; mesonotum light brown with about five narrow darker lines; wings with a square spot in cell *M* near the middle of its length.

Male.—Length, 13.5 mm.; wing, 16.8 mm. Fore leg, femur, 9.6 mm.; tibia, 10.8 mm.

Palpi rather short, dark brown; frontal prolongation of the head short, nasus very long and prominent, brown; antennæ short, if bent backward, not attaining the wing root; the first segment elongate as long as the succeeding three segments combined; flagellar segments short-cylindrical, without bristles; first three antennal segments dull yellow; segments 4-10 dark brown basally, yellow apically, terminal antennal segments dark brown; head dark brown, narrowly paler behind adjoining the eyes. (See Plate XV, figure 14).

Thoracic notum, præscutum light brown with about five narrow darker lines, one median and with two indistinct lateral stripes on either side; scutum and scutellum light brown, the latter paler, yellowish; postnotum dull yellow, darker on the sides. Pleuræ pale dull yellow, unmarked. Halteres rather long, brown, a little paler basally.

Legs, coxæ dull light yellow; trochanters and femora yellowish brown, the latter a little darker at the tip, tibiæ and tarsi brown.

Wings subhyaline; cells *C* and *Sc* brown; stigma brown; a brown spot in cell *M* near the middle of the length of *Cu*; cells *R* and *M* brown at the base.

Abdomen with the basal tergites dull yellow; 5-6 with a broad brown median stripe; 7 with the caudal margin dark brown; 8 en-

tirely dark brown; 9 yellowish. Sternites 1-6 dull brownish yellow, the apical sternites dark brown.

Holotype.—Male, San Lorenzo, Sierra, Colombia (Ujhelyi), in the Hungarian National Museum.

***Holorusia peruviana* sp. n.**

Flagellum of antennæ without bristles; antennæ dark brown; mesonotum light brown with broad brown stripes; wings without well defined markings.

Male.—Length, 13.3 mm.; wing, 17.1 mm.; fore leg, femur, 7.8 mm.; tibia, 8.9 mm.; tarsus, 14.2 mm.

Palpi short, dark brown; frontal prolongation of the head very short and stout, brown, nasus distinct, large; antennæ, scapal segments short, brown, flagellar segments elongate-cylindrical, dark brown, without bristles, but clothed with a dense, fine pubescence; head brown, a median line and the region adjoining the eyes very dark brown.

Mesonotal præscutum pale with three broad brown stripes, the median one very broad, bisected by a dark brown line; scutum brownish gray; scutellum and postnotum light gray with a narrow indistinct brown median line. Pleuræ with a broad light band across the dorsal sclerites extending from the pronotum to the wing root; median pleural sclerites light gray with three oval dark brown spots which form an interrupted lateral band; mesosternum gray with a light brown suffusion. Halteres rather long, brown, pale at the extreme base.

Legs, coxæ light gray; trochanters dark brown; femora brown, darker at the tip; tibiæ and tarsi brown.

Wings with a light gray suffusion; stigma light brown; a rounded gray cloud at the origin of *Rs*; a subhyaline blotch in cell *1stA* at the margin. Venation: Cell *1stM2* very long, petiole of cell *M1* short or lacking.

Abdominal tergites light brown, a slightly darker median stripe; segments 6-8 dark brown; sternites, segment 1 dark brown, 2-5 light yellow, dark brown medially, 6-8 dark brown.

Holotype.—Male, Callanga, Peru, in the Hungarian National Museum.

The reference of some of the above species to *Holorusia* is doubtful, but they agree better with that genus than with the typical *Tipula* and so I describe them as species of *Holorusia*.

Genus *Tipula* Linnaeus.*Tipula gladiator* sp. n. (Pl. XV, figs. 6, 7).

Antennæ of the male elongate, basal segments yellow, flagellum dark brown; thorax dark grayish brown; wings dull yellowish; 8th sternite of the ♂ genitalia produced caudad into a long curved sabre-like appendage.

Male.—Length, 16.2 mm.; wing, 14 mm.

Palpi with the basal segments a little darker than the dull yellow apical segments; frontal prolongation of the head short, nasus distinct, darker brown above, more yellowish beneath and on the sides; antennæ elongate, if bent backward extending about to the 3rd abdominal segment; segments 1 and 2 light yellow, flagellar segments dark brown covered with short pale hairs; the segments not cylindrical, but feebly incised on the lower face; head gray, a little clearer on the occiput.

Pronotal scutum dark brown bordered with gray. Mesonotal praescutum brown with indistinct darker brown stripes of which the median one is double; scutum brownish gray; scutellum brown; postnotum light gray. Pleuræ pale with a clear light gray bloom on the mesopleuræ. Halteres brown, pale at the base.

Legs, coxæ pale yellow with a sparse grayish bloom, most pronounced on the fore coxæ; trochanters dull yellow; remainder of legs broken.

Wings with a brownish yellow suffusion; stigma oval, brown. Venation as in Plate XV, figure 6.

Abdominal tergites dark brown; a large triangular yellow blotch on the sides of the second segment on the caudal half; genitalia yellowish; two basal sternites dull yellow, 3-7 dark brown. Hypopygium: Eighth tergite broad; 8th sternite with the caudal margin produced backward in a long curved appendage, much exceeding the remaining parts of the hypopygium; its dorsal face concave, the appendage sparsely clothed with short appressed hairs. Ninth tergite with a blunt lobe on the caudal margin on either side of the concave median portion, the latero-caudal angles produced backward into long, slender, chitinized spines which are directed caudad and slightly ventrad; 9th sternite small. Appendages which seem to come from the pleural region are: first, a ventral appendage, irregular, rather chitinized apically, its dorsal margin near the tip with a rounded notch; second appendage, above the first, a sharp, heavily chitinized spine directed caudad; third appendage, large, feebly chitinized, its apex notched (possibly median in position as it seems to be unpaired); fourth, dorsad of these three appendages and just underneath the spines of the 9th tergite is a sub-fleshy lobe more chitinized apically, clothed with long delicate hairs (not shown in the figure). Lateral aspect of the hypopygium shown in Plate XV, figure 7.

Holotype.—Male, Theresopolis, Brazil, in the Hungarian National Museum.

The remarkable hypopygium of the male at once separates it off from the other species in the Neotropical fauna.

Tipula guarani sp. n.

Antennæ brownish yellow; thorax brownish gray with brown stripes; femora brownish yellow, tip broadly brown; wings hyaline with brown spots and gray clouds.

Femalc..—Length, 33 mm.; wing, 23.2 mm.; fore leg, femur, 11.6 mm.; tibia, 14.4 mm.

Palpi rather long, the three basal segments rather stout, the last segment slender, palpi dark brown; frontal prolongation of the head rather long, brown; antennæ, segment 1 elongate, first flagellar segment rather stout, antennæ brownish yellow; head pale yellowish brown with a narrow stripe of dark brown.

Thoracic pronotum pale gray, dark brown medially. Mesonotal præscutum light brownish-gray with dark brown stripes, the median stripe broadest in front, a little narrowed behind, the thoracic stripes contrasting strongly against the pale ground color; scutal lobes largely brown with an isolated rounded brown spot on the cephalic margin of each lobe, this being the caudal end of the lateral præscutal stripe; median portion of the scutum brown; scutellum and postnotum grayish brown medially. Pleuræ dull gray with brown spots on the mesopleuræ. Halteres rather long, brown, the knob darker.

Leg, coxæ grayish brown; trochanters dull yellow; femora brownish yellow, the tip broadly dark brown; the fore legs, especially, show a broad yellow subapical ring; tibiæ brownish yellow, the tip indistinctly darker; tarsi brown.

Wings hyaline with brown spots and gray clouds, as follows: Brown spots at the base of the wing, midlength of the distance between the base of *R*₁ and the origin of the sector; at origin of *R*₅, stigmal region, brown seam to vein *Cu* and most of the crossveins and deflections of veins; tip of cells *R*₂ and *R*₃ grayish brown; gray clouds in all the caudal cells of the wing. Venation: *R*₅ long, slender, lying rather close to *R*₁; crossvein *m-cu* present.

Abdominal tergite 1 brownish gray; 2-8, dull orange-yellow, a little suffused with darker; segment 9 and ovipositor brown; sternites yellow, median line brown. Ovipositor, tergal valves very long, very slender and straight, the margins smooth, tips scarcely expanded, sternal valves short.

Holotype.—Female, Rio Grande, Brazil, in the Hungarian National Museum.

The specific name is that of a native Indian tribe.

Tipula oblique-fasciata Macquart.

One female from Chiriqui, Central America.

Tipula sp.

One female, *monilifera* group, Mexico.

Tipula apterogyne Philippi.

Three males, Concepcion, Chile; P. Herbst, 1903, 1904.

Tipula abortiva sp. n.

Female with rudimentary wings; wings black with a whitish cross-vein in the neighborhood of the cord.

Female.—Length, 16 mm.; wing, 8 mm.; fore leg, femur, 5.3 mm.; tibia, 5.4 mm.; tarsus, 6.1 mm.

Palpi short, dark brownish black; frontal prolongation of the head brown, the nasus rather prominent; antennæ, segments 1 and 2 brown; flagellum brownish black; head light brown, more gray on the occiput, with a very indistinct, narrow brown median line best indicated on the occiput.

Pronotal scutum dark brownish black, a little paler on either side behind; scutellum pale grayish with three brown marks. Mesonotal præscutum suffused with dark brownish black in front, light gray with three very pale brown stripes, the median one broadest, the lateral ones very indistinct. Scutum, scutellum and postnotum dull gray, the two latter with an indistinct median brown mark. Pleuræ mostly dark brown. Halteres rather short, brown.

Legs, coxæ grayish brown; trochanters brownish yellow; femora, tibiæ and tarsi dark brown.

Wings very short, dark brown with a faint white crossband across the cell *1st.M2* extending from the end of cell *R* to the middle of cell *M3*.

Abdominal tergites with segment 1 brown, segments 2-8 reddish brown, the lateral margins suffused with brown; sternites reddish brown, the segments with an indistinct median brown mark; segments 8-9 dark brown; caudal segments of body and ovipositor shiny; tergal valves of the ovipositor long, slender, straight; sternal valves much shorter.

Holotype.—Female, Callanga, Peru, in the Hungarian National Museum.

Tipula camp sp. n. (Pl. XV, figs. 5, 9-12, 18).

Color of the thorax light gray; basal abdominal segments orange-yellow; subterminal segments dark brown; antennæ of the ♂ very long.

Male.—Length about 11 mm.; wing, 14.4 mm.; fore leg, femur, 8 mm.; tibia, 8.6 mm.; tarsus, 11 mm.

Palpi very short, dark brown; frontal prolongation of the head short, light gray; antennæ very long, if bent backward extending about to the eighth abdominal segment, scapal segments light brown, flagellar segments very dark brown; after the first, each segment is swollen at its base and less so before its tip, provided with a few black bristles and abundant long pale hairs. (See Plate XV, figure 18). Front with a well defined tubercle which is bisected by a deep median furrow; head gray.

Pronotum dark brown, bordered with gray; mesonotal præscutum very light gray with four bright brown stripes, one on either side of the median line, pale and indistinct in front, clearer behind; lateral stripes short, lateral margin of the sclerite of the same color; scutum gray, the anterior end of each lobe with a rounded chestnut brown spot; scutellum and postnotum light gray, the latter dusky on the sides. Pleuræ clear light gray. Halteres light brownish yellow basally, passing into brown.

Legs, coxæ light gray, trochanters yellow; femora light brown, dark brown at the tip; tibiæ and tarsi brown.

Wings subhyaline, cells *C* and *Sc* pale brown, a brownish tinge in the vicinity of the stigma, at ends of cells *R*₂ and *R*₃; hyaline blotches well defined. Venation, see Plate XV, figure 5.

Abdomen, tergites 1-4 bright yellow, 5-8 passing into brown; 9 light yellow; sternites yellowish; the lateral margins of the tergites are broadly dark brown. The male genitalia with the 8th tergite broad, dark colored, except at the base where it is reddish; 9th tergite very pale yellow, viewed from above (see Plate XV, figure 11), large, subquadrate, the outer lateral angles rounded, caudal margin with a very deep median notch; viewed from the side the caudo-lateral margin with a rather sharp protuberance. Eighth sternite (Plate XV, figure 10) with the caudal margin rounded and with a prominent median protuberance. Ninth sternite (from beneath, see Plate XV, figure 12) with the caudal margin produced backward as a prominent, sub-lyriform appendage; viewed from the side, the 9th sternite is small, the pleural piece complete, almost oval, its ventro-caudal margin applied closely to the caudal appendage of the 9th sternite. Pleural appendages two, the more cephalic and dorsal being a long, cylindrical fleshy appendage, pale, clothed with long hairs, directed dorsad; the second appendage is large, viewed from behind (see Plate XV, figure 9); it is slender basally, with the inner part of the base clothed with long pale hairs, the tip expanded out like a knife blade, meeting its mate of the opposite side on the median line, the caudal face of this blade with a few transverse ridges, the outer face somewhat chitinized, in contact with a chitinized appendage having the same general blade-like shape which lies between the caudal appendage and the 9th tergite.

Holotype.—Male, Callanga, Peru, in the Hungarian National Museum.

The specific name, *campa*, is that of a native Indian tribe living in eastern Peru.

This species and the two following belong to the same group of species as *inca* Alexander,³ possessing short palpi, short legs, and the peculiar genitalia of the male as described above. These three species are closely related to one another and differ from *inca* in the bright orange-yellow color of the abdominal tergites, in the structure of the antennae, etc.; they are separable amongst themselves by very striking differences in the antennae of the male and in the details of the male hypopygium.

***Tipula piro* sp. n.** (Pl. XV, figs. 4, 13, 17).

Color of the thorax light gray; basal abdominal segments orange yellow; subterminal segments dark brown; antennae of ♂ moderate in length.

Male.—Length, 12.3 mm.; wing, 15.5 mm.; fore leg, femur, 8.4 mm.; tibia, 9.6 mm.; tarsus, 13 mm.

Palpi very short, dark brown; frontal prolongation of the head moderate in length, grayish, tinged with brown on the sides; antennae moderately long, if bent back they would extend about to the base of the fourth abdominal segment, the scapal segments light brown, flagellum dark brown, the ventral face of each flagellar segment very deeply incised (see Plate XV, figure 17); head gray tinged with brownish.

Thorax light gray; pronotum with a short, dark brown median line; mesonotal praescutum light gray with a very narrow, indistinct median brown line, and, behind, with indications of a pale brown stripe on either side of the middle; lateral margin of the sclerite and a short lateral stripe brown, the latter much lighter and brighter; scutum light gray with two bright brown rounded spots on each lobe; scutellum and postnotum light gray suffused with dusky on the sides. Pleurae light gray, a large brown spot on the mesoepisternum and another on the mesoepimerum. Halteres rather long, brown, paler at the base.

Legs, coxae gray, trochanters and femora brown; tibiae and tarsi darker brown.

Wings with a faint brown tinge, cells *C* and *Sc* yellowish; hyaline

³ Ann. Ent. Soc. Am., Vol. 5, pp. 351, 352; pl. 24, fig. c.; pl. 25, fig. 1, (1912).

spots on the wing disk, one being in cell *1st.M2*, another in the middle of cell *M*, etc. Venation as in Plate XV, figure 4.

Abdomen with the first tergite gray; 2-4 bright yellow, remainder brown, including the genitalia; lateral margins of the tergites broadly dark brown; sternites dull yellow. The genitalia agree with *T. campa*, differing as follows: Ninth tergite (see Plate XV, figure 13) with the caudal margin more tuberculate, on either side of the elongate-oval median notch is a short, cylindrical lobe, the caudo-lateral angles slender and reflexed; 8th sternite dark brown, only the median lobe being paler; the second pleural appendage, viewed from behind, has the narrowed base very elongate, the blade relatively small, the whole appendage being hidden beneath the 9th tergite.

Holotype.—Male, Callanga, Peru, in the Hungarian National Museum.

The specific name, *piro*, is that of a native Indian tribe of eastern Peru.

Tipula curinao sp. n. (Pl. XV, figs. 3, 16).

Color of the thorax light gray; basal abdominal segments orange yellow, subterminal segments dark brown; antennae short.

Male.—Length, 12 mm.; wing, 15.5 mm.; fore leg, femur, 8.1 mm.; tibia, 9 mm.

Palpi very short; frontal prolongation of the head moderate, grayish brown; antennae short, if bent backward, extending about to the base of the halteres, dark brownish black, the scapal segments alone a little paler, flagellar segments short, cylindrical, the base enlarged (see Plate XV, figure 16); frontal tubercle rather prominent; head dull yellow, more brownish in the middle of the vertex and on the occiput.

Pronotum dark brown; mesonotal præscutum light gray, the lateral margin of the sclerites very dark brown, a very broad light brown median stripe, broadest in front, narrowed behind, partially bisected from behind by a pale line, lateral stripes of the same color; scutum light gray with two light brown spots on each lobe; scutellum and postnotum light gray with a brown median vitta and with the sides of the sclerites tinged with dusky. Pleurae brown with a sparse gray bloom. Halteres rather long, brown.

Legs, coxae and trochanters brown; femora reddish brown passing into brown at the tip, and with an indistinct yellowish brown annulus before the tip; tibiae and tarsi dark brown.

Wings light brown, cells *C* and *Sc* a little brighter; a dark brown spot at the origin of *Rs* and others in the stigmal area; a hyaline spot in cell *1st.M2* and a smaller one in cell *M*. Venation as in Plate XV, figure 3.

Abdomen, tergites 1-7 orange yellow, the lateral margins broadly brownish black, segments 8-9 dark brown; sternites orange, apical sternites more brownish. The genitalia agree with *T. campa*, differing as follows: Ninth tergite without a median incision on the caudal margin; 8th sternite about as in *campa* but the lobe larger and more pronounced; 9th sternite with a great median notch which divides the segment into two except behind; the inner angles of each of the lobes thus formed is a rounded ball densely clothed with long hairs; the second pleural appendage has the blade very small and inconspicuous, the appendage being mostly stem.

Holotype.—Male, Callanga, Peru, in the Hungarian National Museum.

The specific name, *curinao*, is that of a native Indian tribe of eastern Peru and western Bolivia.

Genus *Microtipula* Alexander.

Microtipula amazonica Alexander.⁴

One male from Surinam (Michaelis).

Genus *Pachyrrhina* Macquart.

Pachyrrhina consularis Osten Sacken.

Seven specimens in the collection that agree sufficiently with *consularis*; that this last named species is specifically distinct from *P. elegans* Fabricius, as stated by Osten Sacken, is by no means certain. The present material is as follows:

Bolivia, Coroico, 1 female; Peru, Vilcanota, 1 male; Brazil, Rio Grande, 1 female; Paraguay, San Bernardino, March, 1908 (Fiebiger), 2 females, 1 male; Argentina (Vezényi), 1 male. The Peruvian specimen and one of the San Bernardino females have been retained; the remainder of the material is in the collection of the Hungarian National Museum.

EXPLANATION OF PLATE XV.

Figure 1. Wing of *Macromastix pygmaea*, sp. n.

Figure 2. Wing of *Holorusia flavicornis*, sp. n.

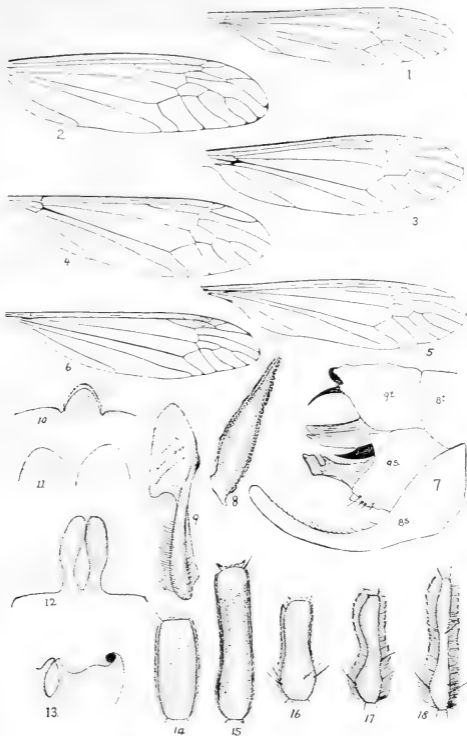
Figure 3. Wing of *Tipula curinao*, sp. n.

Figure 4. Wing of *Tipula piro*, sp. n.

Figure 5. Wing of *Tipula campa*, sp. n.

Figure 6. Wing of *Tipula gladiator*, sp. n.

⁴ Ann. Ent. Soc. Am., Vol. 5, pp. 361, 362; pl. 24, fig. i; pl. 25, fig. q (1912).



NEOTROPICAL TIPULIDAE, IV.—ALEXANDER.

Figure 7. Hypopygium of *Tipula gladiator*. Lateral aspect; *8s*, *9s*, equal 8th and 9th sternites; *8t* and *9t* equal 8th and 9th tergites.

Figure 8. Hypopygium of *Holorusia lacvis*, sp. n. Lateral aspect of the pleural appendage.

Figures 9-12 Hypopygium of *Tipula campa*, sp. n. 9. 2nd pleural appendage from behind; 10. 8th sternite, ventral aspect; 11, 9th tergite, dorsal aspect; 12, 9th sternite, ventral aspect.

Figure 13. Hypopygium of *Tipula piro*, sp. n., 9th tergite, dorsal aspect.

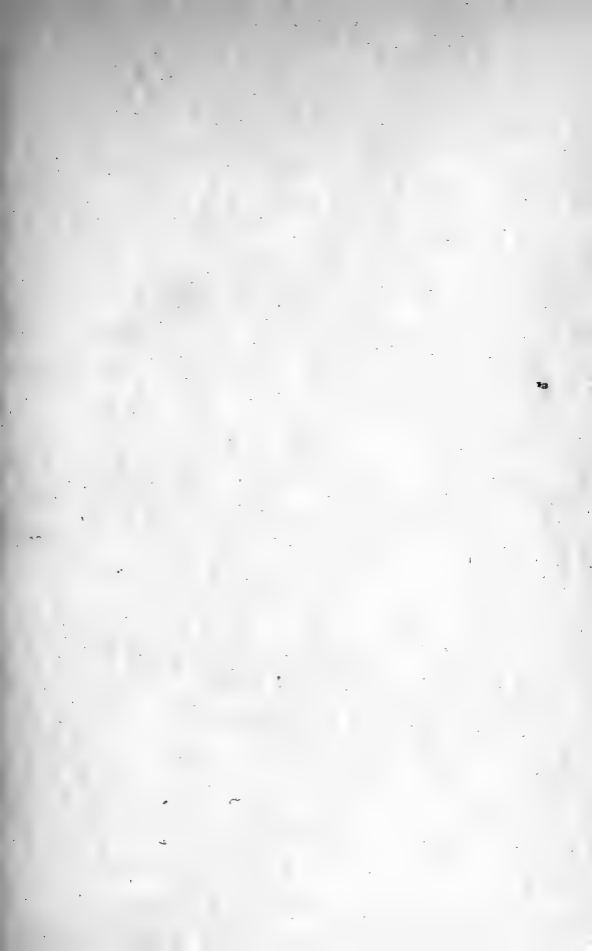
Figure 14. Sixth antennal segment of ♂ *Holorusia orophila*, sp. n.

Figure 15. Sixth antennal segment of ♂ *Holorusia lacvis*, sp. n.

Figure 16. Sixth antennal segment of ♂ *Tipula curinao*, sp. n.

Figure 17. Sixth antennal segment of ♂ *Tipula piro*, sp. n.

Figure 18. Sixth antennal segment of ♂ *Tipula campa*, sp. n.





NEW NEOTROPICAE ANTOCHINI (*TIPULIDÆ*
DIPTERA)

By CHARLES P. ALEXANDER

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NEW NEOTROPICAL ANTOCHINI (*TIPULIDÆ* *DIPTERA*).

BY CHAS. P. ALEXANDER,¹

Ithaca, N. Y.

This paper considers only the members of the Limnobiine tribe *Antochini*, a rather extensive group in the tropics. The genera have an almost Cosmopolitan distribution, occurring in both the Old and New Worlds, exceptions existing in *Styringomyia*, *Paratropeza*, *Thaumastoptera*, *Diotrepha* and *Atarba*. The material studied herein, is, for the most part, the property of Cornell University and the U. S. National Museum and to Dr. J. Chester Bradley and Mr. Frederick Knab, I am indebted for the privilege of examining these collections.

A KEY TO THE ANTOCHINE GENERA.¹

1. Cell R₂ present (Central and South Amer.) *Paratropeza* Schiner.
Cell R₂ absent. 2
2. Rostrum prolonged, at least as long as the head. 3
Rostrum shorter than the head. 6
3. Rostrum about as long as the head. (Eur.; N. and C. Am.; Austral.)
Rhamphidia Meigen.
Rostrum about as long as the body. 4
(*Toxorrhina* group)
4. Radial sector two-branched 5
Radial sector unforked (N. and S. Am.; Africa) *Toxorrhina* Loew.
5. Anterior branch of Rs (R₂₊₃) long, as long as the posterior branch
(R₁₊₂) (Eur.; N. and C. Am.; East Ind.) *Elephantomyia* Osten Sacken
Anterior branch of Rs (R₂₊₃) very short, oblique, tending to disappear.
(Africa, America; tropics) *Ceratocheilus* Wesche
6. Cu₁ at least 4 times as long as the deflection of Cu₂; deflection of
Cu₁ tending to retreat toward the wing basis. . . . 7 (*Thaumastoptera* group)
Cu₂ not much more than twice as long as the basal deflection of
Cu₁; Cu₁ (deflection) remaining at, or near, the fork of M. 9
7. M₁₊₂ free at the wing-tip. (M₁ fused with Cu₁ obliterating cell M₂.)
(Europe; Seychelles Is) *Thaumastoptera* Mik
M₁₊₂ fused to the wing-tip 8
8. M₂ distinct from Cu at its tip forming a cell M₂; basal deflection of
Cu₁ under the base of Rs. (Eur.; N. and C. Am.; Austral.)
Orimarga Osten Sacken

¹Contribution from the Entomological Laboratory, Cornell University.

- M_2 fused with Cu to the tip, obliterating cell M_1 ; basal deflection of Cu_1 retreated far toward the base of the wing. (N. and S. Amer.) *Diotrepha* Osten Sacken
9. R_1 very short, ending before the middle of the wing, the sector originating near its tip. (Australasia to Africa) *Styringomyia* Loew.
 R_1 ending beyond the middle of the length of the wing, the sector remote from the tip. 10
10. Radial cross-vein present. 11
 Radial cross-vein absent. 12
11. R_s very long, straight, but diverging from R_1 ; basal deflection of R_{4+5} twice as long as cross-vein $r-m$; basal deflection of Cu_1 before the fork of M ; radial cross-vein usually in a direct line with $r-m$; anal angle of the wing very prominent. (Eur.; N. Amer.)
Antocha Osten Sacken
- R_s shorter, more arcuated; basal deflection of R_{4+5} about as long as $r-m$; basal deflection of Cu_1 at, or beyond, the fork of M ; radial cross-vein usually slightly distad of the level of $r-m$; anal angle of the wing feeble. (N. and S. Am.; Asia; Australia)
Trecholabis Osten Sacken
12. R_s short, not much more than twice as long as the deflection of R_{4+5} ; cell R_1 broader at base than at tip (*Atarba*) or else R_s gently arcuated and the veins issuing from cell 1st M_2 twice as long as that cell (*Dicranoptycha*). 13
 R_s long, and very straight, close to R_1 leaving cell R_1 extremely narrow; deflection of R_{4+5} very short, almost perpendicular to R_s at its origin; cross-vein m present in New World species. (Eur.; N. Amer.) *Elliptera* Schiner.
13. R_s originating opposite to the end of Sc ; cell 1st M_2 short, almost as broad as long. (Eastern U. S.) *Atarba* Osten Sacken
 R_s originating far before the end of Sc ; cell 1st M_2 elongate, twice as long as broad. (Eur.; N. Am.; Africa; East Ind.)
Dicranoptycha Osten Sacken

Ellipteroides Becker², erected in 1907 for the new species, *piccus*, is almost certainly *Eriopterine*. The presence of a cell R_2 is a tribal character, not generic as considered by Becker. But one genus, *Paratropeza* Schin., occurs in the Antochine series that possesses cell R_2 , but this genus, in all other respects is a true member of that series. *Ellipteroides* is not, but seems, rather, to be a generalized form allied to *Gonomyia*. It is not at all related to *Elliptera* Schin., as Becker states, and this reference was probably made chiefly on the lack of cell 1st M_2 (discal), a very unimportant

¹*Ellipteroides*, Becker is omitted; see discussion at the end of this key.

² Becker, T. Die Ergebnisse meiner Dipterologischen Frühjahr-reise nach Algier un Tunis 1906. (Zeitschr. für Syst. Hymenopt. und Dipterol.; vol. 7, p. 239; figure) (1907).

character in this genus. The insect, *piccus*, from Algiers, N. Africa, is blackish with yellow spots; cross-vein *r* absent; cell 1st M_2 open, the outer deflection of M_3 being obliterated; Rs rather straight, but diverging strongly from R_1 , etc. *Gymnastes* Brunetti; not distinct from *Teucholabis*, the opinion of Mr. F. W. Edwards who is well acquainted with the Old World Fauna.

Teucholabis Osten Sacken

The number of species belonging to this genus now known from the American Continent is 21, of which I have seen 12.

Teucholabis venezuelensis Macq.¹ and *T. melanocephala* Fabr.² have not hitherto been recognized as belonging to this genus but there can be no question as to their position. Both species are described as having pale clouds on the wings, not distinct brown bands as in the *polita* group.

The *Limnobia bifasciata* Fabr.³ is likewise a *Teucholabis* and conspecific with *trifasciata* End.⁴ however the Fabrician name is preoccupied⁵ and so Enderlein's name is valid.

Rhamphidia scapularis Macq.⁶ is a *Teucholabis* as was indicated by Osten Sacken in 1869; still Kertész (1902) retains it under *Rhamphidia*; the same statement applies to *Limnobia simplex* Wied⁷ which is retained in *Limnobia*.

Teucholabis sackeni sp. nov.

Wings banded; thorax with a chestnut dorsal stripe; femora yellow with the tip black.

♀. Length, 4-4.5 mm; wing, 5 mm.

Fore leg, femur, 3.4 mm; tibia, 3.4 mm; tarsus, 3 mm.

Middle leg, " 3 mm; " 2.6 "

Hind leg, " 3.8 mm; " 3.1 " tarsus, 2.5 mm.

Head: rostrum, palpi and antennæ dark brown. Front, vertex and occiput rather dark brown.

Thorax: collare orange-yellow; prothorax very light yellow; mesothorax, bright yellowish-brown; præscutum with a dark brown median mark, broadest anteriorly, narrowed behind, beginning rather far behind the anterior margin of the sclerite,

¹ Macquart, Dipt. Exot.; supplément, 1, p. 19; (1816), (*Limnobia*)

² Fabricius, Entomol. Syst.; vol. 4, p. 241; (1794); (*Tipula*)

³ Fabricius, Syst. Antl.; p. 31; (1805); (*Tipula*)

⁴ Enderlein, Zool. Jahrbuch Abth. F. Syst.; vol. 32, pt. 1, p. 69, 70 (1912)

⁵ Schrank, Enum. Ins. Austr.; p. 428 (1781) (*Tipula*)

⁶ Macquart, Dipt. Exot.; vol. 1, pt. 1, p. 73 (1838) (*Rhamphidia*)

⁷ Wiedemann, Aussereur. Zweifl. Insekt.; vol. 1; p. 549 (1828) (*Limnobia*)

running caudad; sides of the sclerite between the pseudosutural foveae (humeral pits) and the transverse suture, almost filled with a large rounded dark brown spot, this mark not touching the dark median vitta (as in *melanocephala*); scutum, with the exterior front angles darkened; scutellum and post-notum very dark chestnut-brown. Pleurae, propleurae yellowish; mesopleurae very dark brown, almost black. Halteres pale at base, stem brown, knob bright yellow. Legs: coxae and trochanters bright yellow, abruptly contrasted with the dark pleural and sternal coloring; femora light yellow, the apical portions abruptly dark brownish-black, these dark tips rather broadest on the fore-femora; tibia dull yellow, the extreme tip brown, broadest again on the fore-tibia; tarsi dark brown. Wings: hyaline, stigma dark brown, square; wings broadly banded with pale greyish-brown, the innermost band extending from the origin of Rs to the end of 2nd Anal, almost diamond-shaped, the breadth sub-equal to the length; the middle fascia is a paler continuation of the stigma, across the cord of the wing and ending at 1st Anal, rather narrowest near the fork of M; the apical band is rather darker and fills out the wing tip, its inner margin straight and embracing the outer end of cell 1st M₂. Venation: (See fig. a.): Cell 1st M₂ very elongate, rather square at its inner end; veins beyond cell 1st M₂ (discal) short, so that that portion of M₁₊₂ between cross-veins *r-m* and *m*, is longer than the distal segment of M₁₊₂. The type has the cell 1st M₂ open, confluent with cell M₁, due to the disappearance of the outer deflection of vein M₁.

Abdomen: tergum dark brownish-black, the apices of the segments broadly paler; 7th tergite orange-yellow; 8th blackish; valves of the ovipositor pale, orange-yellow; sternum similar, but the pale apical margin even broader, embracing the apical half of the sclerite.

Holotype, ♀, Sonsonate, Salvador, Cent. Am. (Frederick Knab, Coll.) Paratypes, ♀♀. Aguna, Guatemala, Cent. Am. (alt. 2000 ft.) (Dr. G. Eisen, coll.) Type and one paratype in U. S. Nat. Mus. Coll. (No. 15,124).

One paratype in author's collection. I take pleasure in naming this handsome species after the "Father of American Dipterology," Baron C. R. von Osten Sacken.

This species falls in the *polita* group, the species of which may be separated by the following key:

1. Thoracic praescutum entirely shiny black. 2
 Thoracic praescutum more or less orange-yellow or brownish. 4
2. Pronotum yellowish. (Colombia) *trifasciata* End.
 Pronotum black. 3
3. Small species (♂, length, 2.5-3 mm.); legs with the basal two-thirds
 yellowish-tawny. (Brazil) *polita* O. S.¹
 Larger species (♀, length, 5 mm.); leg dark brown. (Costa Rica) . . . *rostrata* End.²

¹Enderlein, Zoölog. Jahrbuch abth. f. Syst.; vol. 32, pt. 1; p. 69, 70; fig. R₁ (1912).

²Osten Sacken, Berl. Ent. Zeitschr.; vol. 32, pt. 2; p. 189 (1887).

³Enderlein, Zoölog. Jahrbuch abth. f. Syst.; vol. 32, pt. 1; p. 68, 69; fig. Q₁ (1912).

4. Mesonotum mostly orange; a black spot on the præscutum. (Eastern Brazil)..... *pulchella*, sp. n.
 Mesonotum chestnut in the middle, black on the sides of the præscutum. (Guat.—Salvador)..... *sackeni*, sp. n.

***Teucholabis pulchella* sp. nov.**

Wings banded, thorax yellowish with a large black spot on the mesonotum; femora brown.

♂. Length, 8.3 mm.; wing, 7 mm.

Fore leg, femur, 3.4 mm.; tibia, 4.1 mm.; tarsus, 4.6 mm.; (alcoholic) ♂.

Head: rostrum and palpi brown, the apices of the segments of the latter very narrowly paler; antennæ brown. Front, vertex and occiput brown.

Thorax: pronotum light yellow; mesonotum entirely clear light yellow, except the middle of the præscutum which has a prominent rounded, transverse, brown mark extending from the level of the pseudosutural fovea back to near the suture, the caudal margin of the mark produced backward in two small lobes, one on either side of the median line. Pleuræ clear light yellow. Halteres brown, extreme base of stem pale; knob less dark than the stem. Legs: coxæ and trochanters light yellow; femora, basal half light brown, apical half dark brownish-black; tibiæ and tarsi dark brownish-black. Wings: hyaline or nearly so; an indistinct brown band across the wing from the base of Rs to the end of 2nd Anal; a much darker brown band, broadest in front begins over the cross-vein r and extends back to Cu; outer end of cell 1st M; margined with brown; tip of wing brown, the inner end of this band distant from the outer end of cell 1st M. Venation, as figured (Fig. b.)

Abdomen, dark brown, the genitalia swollen. Hypopygium: (See fig. 1.) 9th tergite, caudal margin strongly convex; pleural pieces very stout, at the apex with two short teeth; the inner margin produced caudad and entad in an obtuse tooth; viewed from the ventral aspect, with a stout apical appendage (a) inserted on the side of the pleura, below the apical teeth described above; it is narrowed at the ends, swollen on the inner face in the middle and bears numerous hairs at its tip; just entad of the base of the apical appendage is a rounded lobe (b); between the pleuræ arises what is apparently the guard of the penis, dark brown basally, apparently less chitinized apically (c), shaped as in the figure.

Holotype, ♂, Igarape-assu, Para, Brazil; Jan. 30, 1912. (H. S. Parish, coll.)

Type in Cornell University Museum.

It is probable that the body-colors, described above as brown are, in fresh specimens, jet black and presumably shiny.

The species belongs to the *polita* group and may be separated from its allies by the key under *sackeni*.

***Teucholabis audax* sp. nov.**

Wings unbanded; body-color yellow; large, ♂, wing, 9.5-10 mm.

♂. Length, 11.3 mm.; wing, 9.7 mm.

Fore leg, femur, 8.2 mm.; tibia, 9.6 mm.; tarsus, 8.6 mm.

Middle leg, femur, 7.4 mm.; tibia, 7.4 mm.; tarsus, 5.6 mm.

Hind leg, " 8.1 mm.; " 8.2 mm.; " 6.7 mm.

Head: rostrum yellowish-brown; palpi black; antennæ, first segment bright honey-yellow at the base, abruptly light brown; remainder of the antennæ dark brownish-black. Front very narrow, the eyes almost contiguous at the narrowest portion: front dark brown; the caudal portion of the vertex, and the occiput lighter, more yellowish.

Thorax: cervical sclerites elongated, brown. Prothorax very long, about as long as the mesonotal præscutum and cylindrical, broadest basally, narrowing cephalad to meet the narrow cervical sclerites; pronotum brownish-yellow. Mesothorax, præscutum medially bright orange-yellow; on the sides brown; in the middle of the sclerite, beginning near the anterior margin, broadest in front, narrowed to a point behind, is a dark brown mark; scutum pale yellow, a continuation of the præscutal pale median vitta, lobes brown, darkest laterally; scutellum bright orange; post-notum yellowish with indistinct brown stripes; pleuræ shiny orange-yellow with patches of grey bloom (possibly not normal). Halteres brown. Legs: coxæ and trochanters light yellow; femora pale yellow with the tip broadly brown, and with a brown post-medial annulus, most prominent on the hind legs; tibia dull yellow, indistinctly darker at the extreme tip; tarsi brownish-black; legs densely covered with long black hairs. Wings: hyaline, veins brown; veins C, Sc and R bright yellow; stigma rounded, dark brown, large; an indistinct brown cloud around the deflection of R_{4+5} . Venation, see figure d.

Abdomen: tergum light yellow, apical segments more brownish, hypopygium brown.

Holotype, ♂, Canal Zone, Panama, Central America. (C. H. Bath, coll.)

Type in U. S. National Museum Coll. (No. 15,126).

This vigorous species is the largest member of the genus in the American fauna. It may be readily recognized by its general yellow color (including abdomen) and its large size.

Teucholabis pleuralis sp. nov.

Wings unbanded: thorax light yellow with a dark, narrow pleural stripe; abdomen without metallic reflexions; femora yellow, brown at the tip.

♂ Length, 5 mm.; wing, 5.3 mm.

Middle leg, femora, 3 mm.; tibia, 2.7 mm.

Hind leg, " 4 mm.; " 3.8 mm.

Head: rostrum and palpi dark brownish-black. Antennæ very dark brown. Front, vertex and occiput dark brown.

Thorax: prothorax light yellow; mesothorax: præscutum orange-yellow with a dark brown median mark, broadest anteriorly, beginning near the cephalic margin, becoming obsolete at about one-half the length of the sclerite; scutum and scutellum orange-yellow, the lobes of the scutum brownish on the antero-exterior angles; post-notum brownish-yellow with an indistinct brown median line. Pleuræ and sternum light honey-yellow, the former with a rather broad, dark brown band beginning on the cervical sclerites, running obliquely above the base of the fore coxæ, through the halteres, and becoming confluent with the dark color of the

abdomen. Halteres dark brown. Legs: coxæ and trochanters light yellow; femora light yellow, the apices broadly dark brown; tibia and tarsi brownish-black. Wings, subhyaline, with a distinct dusky tinge; stigma round, brown, its posterior margin not touching R_{2+3} . Venation: Sc rather long, that portion beyond the origin of R_s slightly longer than cell 1st M_2 (discal); cross-vein r close to the tip of R_1 ; space on R_{2+3} before r , as long as the basal deflection of Cu_1 ; cell 1st M_2 very elongated, narrowed anteriorly; outer deflection of M_3 longer than cross-vein m (these two components making up the distal end of cell 1st M_2); basal deflection of Cu_1 slightly beyond the fork of M .

Abdomen: dark brown, not at all with metallic reflexions; two basal sternites yellowish.

Holotype, ♂, Aguna, Guatemala, Central America (Dr. G. Eisen, coll.)

Type in U. S. Nat. Mus. coll. (No. 15,125).

T. pleuralis is closest to *chalybeiventris* Loew¹ from the island of Cuba; it differs in its lack of metallic reflexions on the head and abdomen; prothorax yellow, not brownish; mesothorax with a conspicuous pleural stripe; femora not brownish-black except at the extreme tip; wings not pure hyaline, but distinctly suffused with darker. It is even more closely akin to the specimen which Williston² doubtfully referred to *chalybeiventris*, but no mention is made, in this description, of a pleural stripe. It is very probably the same species; Williston's specimen was from Cuernavaca, Morelos, Mexico.

Teucholabis parishi sp. nov.

Wings unbanded; color light yellow throughout; venation not like typical *Teucholabis*.

♂ Length, 5.2 mm.; wing, 4.1 mm.

Middle leg, femora, 2.6 mm.; tibia, 2.5 mm.

Hind leg, " 3.4 mm.; " 3.5 mm.

(Alcoholic) ♂.

Head: rostrum very short, pale; palpi also very short, the segments subequal, only about twice as long as broad, pale yellow. Antennæ, 16-segmented, segments 1 and 2 short, the second only a little more globular than the third, light yellowish; the apical segments apparently paler. Front broad; broader than the diameter of one eye; ommatidia of the eye large, coarse.

Thorax: light yellow, mesonotal præscutum with darker, orange, stripes (possibly brown in dry fresh specimens); the middle stripe is double, begins at the cephalic margin of the sclerite, ends just before the suture; the lateral stripes begin just behind the pseudo-sutural fovea, run caudad, crossing the suture, on the suture represented by two spots on each lobe, the posterior one triangular; post-

¹Loew; Wiener Entomol. Monat.-chr., vol. 5, no. 2; p. 33, 34, (Feb. 1861) (*Rhamphidia*)

²Williston; Biología Central-Americana; Diptera, vol. 1, supplement; p. 226 (Dec. 1900).

notum rather darker yellowish. Pleura, light yellowish, a dark spot under the base of the halteres, above the hind coxa; a clearer-defined, though smaller, spot on the propleura in the vicinity of the anterior spiracle; sternum light orange-yellow. Halteres, stem short, knob large; pale yellow. Legs, pale yellow; only the two terminal tarsal segments slightly darker. Fore legs very widely separated from the middle legs as in the *Antochini*. Wings: light yellowish; veins brown, those in the costal region rather brighter-colored, stigma very indistinct. Venation: (See fig. c.): Sc short ending before the fork of Rs; what seems to be a branch of R_{2+3} arises from R_1 ; I regard it as cross-vein r , although it is not complete and is very oblique in position such as in *Paratropeta*. If this is regarded as a vein, R_1 then the radial cross-vein is absent and the genus would run down into the *Eriopterini*; I know of no genus, at present, that can receive it.

Abdomen: light yellow; on the sides of the 6th segment rather dark brown, and here with a conspicuous widened enlargement (possibly not normal). Hypopygium: (See fig. k, ka), 8th tergite short, narrower than either the 7th or 9th; 9th (a) tergite convex on the caudal margin, with a deep median notch. Pleural pieces (b) rather narrow, cylindrical, with the appendages at the end or on the ventral face; the outer angle of the pleura produced into a blunt knob (c); apical appendages two, the dorsal one (d), fleshy, inserted near the apex of the sclerite; the ventral one (e) arising from the ventral side, far down near the base of the pleura; the base strongly swollen, the tip chitinized bearing on the inner face, a strong tooth, swollen at the base and projecting inward; the tip, slender, bent inward. What seems to be the guard of the penis (f) is elongated, slender, not swollen, but pseudo-segmented near the tip.

Holotype: ♂, Igarape-assu, Para, Brazil. Jan. 30, 1912. (H. S. Parish, coll.)
Type in Cornell University Museum.

The reference of this curious species to *Teucholabis* is provisional, only. It seems to me as though it might be considered one of the primitive forms of the genus. I take pleasure in naming this insect after its discoverer, Mr. H. S. Parish, the well-known collector and traveller.

Orimarga Osten Sacken

The following species is the second American form to be made known. The two species may be separated by the following key.

1. Thoracic pleura without silvery band; legs pale yellow; tip of femora, base and tip of tibia black; wings hyaline, extreme base dark yellow. (Southwest U.S.).....*arizonensis* Coquillett¹
- Thoracic pleura with a broad silvery-blue band; legs dark brown, uniform, wings suffused with darker. (Guatemala, Cent. Am.).....*argenteopleura*, sp. n.

¹Coquillett, "New Dipt. from N. Am.;" Proc. U. S. Mus.; vol. 25; no. 1280; p. 83, 84 (1902)

Orimarga argenteopleura sp. nov.

Dark brownish black; pleurae with a silvery-blue band; legs uniform dark brown.

♂, Length, 8.8 mm.; wing, 6.4 mm.; abdomen, 6.8 mm.

Fore leg, femur, 5 mm.; tibia, 5.3 mm.; tarsus, 5.1 mm.

Hind leg, " 5.4 mm.; " 5.5 mm.; " 4.2 mm.

♀ Length, 6.2 mm.; wing, 4.9 mm.

♂ Head: rostrum and palpi dark brownish-black; antennae, basal segments dark, silvery-greyish pollinose; flagellar segments dark brownish-black. Front very pale blue, the vertex and occiput brown with a sparse bluish bloom; back of the eye, on the vertex, seven or eight very long dark hairs.

Thorax: mesonotum very dark brown without apparent dorsal stripes; a narrow bright silvery-blue stripe running along the extreme lateral edge of the thorax, beginning on the end of the prothoracic scutellum, continuing to above the wing-basis. Pleurae dark brownish-black with a much broader silvery band extending from above the fore coxa back to above the hind coxa. Halteres, stem light brown, knob dark brown. Legs: coxae, trochanters and extreme base of the femora light brown, the remainder of the legs dark brown. Wings: uniformly suffused with dark; veins almost black; extreme apice of the wings, in the ends of the radical cells, still darker brown. Venation: (See fig. f.): Rs angulated at its origin; cross-vein *r* at the tip of R₁; cross-vein *r-m* distad of the level of *r*; basal deflection of Cu at about one-third the length of Rs.

Abdomen very elongated, dark brownish-black.

♀ Almost exactly like the ♂, but much smaller.

Holotype, ♂ Trece Aguas, Cacao, Alta V Paz, Guatemala, April 24.

(Barber and Schwarz, coll.) Allotype, ♀. Type-locality, April 26, (Barber and Schwarz).

Types in the U. S. National Museum coll. (Cat. No.)

Ceratocheilus Wesché

1910. *Ceratocheilus* Wesché; Journ. Linn. Soc. Zool.; vol. 30; p. 358.

1912. *Neostyringomyia* Alexander; Canad. Ent.; vol. 44; p. 85.

The genus *Ceratocheilus* was erected by the late Mr. Wesché for a species which he described as new (*winningsampsoni*), but which Mr. F. W. Edwards has since determined as being conspecific with the *Styringomyia cornigera* of Speiser. Neither Mr. Wesché's paper, nor Mr. Edwards' extremely valuable article (Annals and Magazine Nat. Hist.; series 8, vol. 8, p. 279-283; Aug. 1911) were available to me until after my paper was issued, wherein I erected the subgenus *Neostyringomyia*, using exactly the same type, *cornigera* Speis; consequently my name falls as a rank synonym of

Ceratocheilus. All of the species hitherto described are African. *C. cornigerum* Speiser has spotted wings but *C. gilesi* Edwards has hyaline wings like the New World form.

The discovery of this genus in America is very interesting and we may likewise expect *Styringomyia* to turn up in the Neotropical fauna, when further collections are made.

***Ceratocheilus americanum* sp. nov.**

Wings unspotted; thorax with dorsal stripes.

♀. Length, 10.5 mm. (excluding rostrum); wing, 5.3–6.2 mm.; rostrum, 5.6 mm.

Fore leg, femur, 5.5 mm.; tibia, 5.7 mm.; tarsus, 5.2 mm.

Middle leg, “ 5.4 mm.; “ 6 mm.; “ 4.8 mm.

Hind leg, “ 5.8 mm.; “ 6 mm.; “ 4.5 mm.

The measurements of the legs and body appertain to the ♀ with the largest wing (6.2 mm.), the paratype.

Head: rostrum and palpi dark brown; antennæ dark brown; front brown; vertex and occiput brown, with a greyish bloom behind; genæ grey. Eyes brilliant metallic green. The *corniculus* represented by a rounded plate above the base of the antennæ.

Thorax: collare very dark brown; prothorax concealed from above by the over-projecting mesonotum, only the lateral ends of the scutellum, which shows above the humeri as a rather square brown knob on either side. Mesothorax, præscutum very light buff-colored with dark brown longitudinal stripes; the middle one is broad, begins at the cephalic margin of the sclerite and continues back almost to the suture: on its caudal portion it is indistinctly divided by a pale median vitta; lateral stripes begin behind the pseudosutural foveæ, continue back to the suture where they cover the lobes; extreme lateral edge of the præscutum buff-colored; scutum dark brown except the pale median depression; scutellum pale greyish-buff; post-notum thinly greyish with indistinct brown stripes on the sides. Pleuræ greyish with brown patches on the sides of the sternum; on the mesopleuræ, just before the wing basis and another just behind the fore coxæ; sternum buffy-grey. Halteres, stem light-colored, knob dark brown. Legs: coxæ and trochanters yellowish-brown; femora light brown; tibiæ and tarsi darker brown. Wings: subhyaline, unspotted; veins dark brown. Venation: (See fig. e.); Sc ending just beyond the origin of Rs; Rs oblique, about as long as R_{3+4} ; R₁ beyond Rs about as long as the deflection of R_{4+5} . Basal deflection of Cu_1 before the fork of M.

Abdomen: tergum, sclerites dark brown, from the third outward with the basal-fourth light yellowish; valves of the ovipositor long and slender (See fig. j.). Sternites dull yellow, the extreme tip of segments one to four brown; a narrow, indistinct, linear, brown, median stripe.

Holotype: ♀. Culebra, Panama, Central America. Feb. 16, 1902. (W. M. Black, coll.) Paratype, ♀, Igarape-assu, Pará, Brazil. Jan. 30, 1912 (H. S. Parish, coll.)

Type in U. S. Nat. Mus. coll. (No. 15,127). Paratype, (alcoholic), Cornell University Museum.

The paratype does not differ except in such respects as might be caused by its immersion in alcohol.

Toxorrhina Loew

The Neotropical material that I have before me numbers 30 specimens referable to four species. *T. brasiliensis* Westwood is well-defined, but no specimens in the collection agree with Loew's description of *fragilis*. It is probable that it is an insular form, limited to the Antilles; it will be easy to recognize by its light-colored legs with darker femoral and tibial apices. My material is all continental and ranges from Mexico to Eastern Brazil.

Of the Nearctic species, I have taken *muliebris* O. S. by the hundreds, and have seen several specimens of *magna* O. S. from Georgia. The coloration of these two species is very constant and it is for this reason that I do not hesitate to describe three new tropical forms based largely on color-characters. Venation in the genus is rather inconstant, especially as regards the position of the basal deflection of Cu_1 (*pars ascendens* of Bergroth; *great cross-vein* of Osten Sacken).

In the vicinity of Para, Brazil, Mr. H. S. Parish took four species of *Toxorrhina*, including the large *brasiliensis* Westw. It would seem from this, that the tropics is the principal home of the members of this genus.

KEY TO THE NEOTROPICAL TOXORRHINE.

1. Tibiæ darker at the tip. 2
 Tibiæ uniform in color throughout. 3
2. Femora uniform throughout; tibiæ *black* at the tip. (Eastern Brazil)
 brasiliensis Westw.¹
 Femora darkened at tip; tibiæ (probably) not *black* at tip. (Porto Rico). *fragilis* Loew.²
3. Color light yellow; basal segments of antennæ lighter than the flagellum; abdominal sclerites dark at tip, except the sternites which are uniform yellow. (Eastern Brazil). *flavida*, sp. n.
 Color brown; antennæ unicolorous; abdominal sclerites uniform or dark at base and tip. 4

¹ Westwood, Ann. Soc. Entomol. France; vol. 4, p. 683 (as *Limnobia rhynchus*) (1835)

² Loew, Linnæa Entomol.; vol. 5, p. 401; pl. 2; f. 16, 17, 18, 22. (1851)

4. Small species (Length, ♂ 5 mm.; wing less than 5; rostrum less than 4 mm.); abdominal sclerites uniform throughout, the apices not darkened. (Eastern Brazil).....*meridionalis*, sp. n.
 Larger species (Length, ♂, 6-6.5 mm.; wing more than 5; rostrum over 5 mm.); abdominal sclerites pale in the middle but dark at the bases and apices of the sclerites; apice of the sternites narrowly darkened. (Mexico—Eastern Brazil.).....*centralis* sp. n.

***Toxorhina flavida* sp. nov.**

Light yellow; basal segments of the antennae paler than the flagellum; ♀ ovipositor with very slender acicular valves; basal approximation of Cu and 1st A slight.
 ♀. Length, 6, 6.7, 8.2 mm. Wing, 4.8, 5, 5.4 mm. Rostrum, 3.4, 3.7, 3.8 mm.
 Fore leg, femur, 3.4, 3.8, 4 mm.; tibia, 4, 4.2, 4.5 mm.
 Middle leg, " 3.6, 4, — mm.; tibia, 4.5, 3.6, — mm.
 Hind leg, " 3.3, 3.6, 4.2 mm.; tibia, 3.5, 3.8, 4 mm.
 Upper valve of ♀ ovipositor, 1.9, 2.0 mm.

Head: rostrum rather short, medium brown; antennae, basal segments varying from light yellow to yellowish-brown; flagellar segments dark brownish-black. Front, vertex and occiput yellowish-grey.

Thorax: cervical sclerites rather dark brown; mesonotum, praescutum rich yellowish-brown, with an indistinct narrow paler median line which becomes obsolete before the suture and in some specimens is bordered on either side by a very narrow brown line; lateral margins of the sclerite dull yellowish, especially bright in front of the pseudosuture; scutum, lobes brownish-yellow, median line greyish; scutellum greyish-white suffused with brown, post-notum dull yellow tinged with brown caudally. Pleurae uniformly dull orange-yellow. Halteres, stem yellow, knob slightly darker, tinged with brown. Legs: coxae and trochanters yellow, the latter rather tinged with brown; femora dull brownish-yellow, not darkened at the tip; tibiae uniform yellowish-brown; tarsi brown. Wings, veins light brown, in costal region more yellowish, subhyaline. Venation (See fig. h.) Sc_1 ending about opposite the origin of R_2 ; deflection of M_2 : much shorter than that segment of M_{1+2} between cross-veins $r-m$ and m ; cell 1st M_2 elongated; basal deflection of Cu_1 rather near the fork of M . Basal approximation of Cu and 1st A slight, about one-fourth of Cu beyond the arculus.

Abdomen: tergum rich dull yellow, the caudal margin of each sclerite broadly slender; sternum uniform light yellow. Ovipositor of the ♀, upper valve, base slender, tip acicular, very elongate; lower valves likewise very slender.

Holotype, ♀ Igarape-assu, Para, Brazil, Feb. 1, 1912. (H. S. Parish, coll.) Paratype, ♀ Igarape-assu, Para, Brazil, Feb. 3, 1912. (H. S. Parish, coll.) Paratype, ♀ Igarape-assu, Para, Brazil; Feb. 7, 1912. (H. S. Parish, coll.) Paratype, ♀ Igarape-assu, Para, Brazil; Feb. 4, 1912. (H. S. Parish, coll.)

Types in Cornell University, except paratype No. 3, in author's collection.

***Toxorhina meridionalis* sp. nov.**

Brown; antennae uniform in color; abdomen uniformly light brown; ♀ ovipositor with the lower valves stout, blade-like; basal, approximation of Cu and 1st A more extensive.

♂. Length, 4.8 mm.; wing, 4.6-4.8 mm.; rostrum, 3.7 mm.

Fore leg, femur, 3-3.25 mm.; tibia, 3.85-4 mm.

Middle leg, " 3.2-3.4 mm.; tibia, 3.5-3.6 mm.

Hind leg, " 3.5-4 mm.; " 3.8 mm.

♀. Length, 6 mm.; wing, 5.1 mm.; rostrum, 4.2 mm.

Fore leg, femur, 3.2 mm.; tibia, 4.1 mm.

Hind leg, " 3.5 mm.; " 3.6 mm.

Upper valve of ♀ ovipositor, 1.3 mm.

Head: rostrum brown; antennae dark brownish-black, including the basal segments. Front, vertex and occiput greyish, with two indistinct brown lines on the sides of the vertex.

Thorax: cervical sclerites dark brown; mesonotum, prescutum, dark brown darkest medially, paler, almost yellow, before the pseudosuture and along the margins of the sclerite; in some, the median stripe is separated from the lateral by paler; near the suture, with the appearance of two narrow, dark brown lines; scutum, lobes dark brown, the depression between them greyish; scutellum and post-notum brown with a sparse grey bloom. Pleurae dark brown with a sparse greyish bloom, the extreme dorsal portions of the pleurae are darker, producing an indistinct dorsal pleural stripe. Halteres brown, extreme base of stem rather paler. Legs: coxae and trochanters, brown; femora, tibiae and tarsi dark brown, not darker at the tips.

Wings: subhyaline, veins brown: Venation (See fig. g.): Sc_1 ending opposite the origin of R_s ; deflection of M_{1+2} a little shorter than that segment of M_{1+2} between cross-veins $r-m$ and m ; basal deflection of Cu_1 situated far before the fork of M ; basal approximation of Cu and 1st A rather extensive, about two-fifths the length of Cu beyond the arculus.

Abdomen: segments dark brown without distinct darker markings on the incisures. Ovipositor of the ♀, upper valve, base not strong, the tip slender but relatively short; lower valve, very broad, almost as wide as the base of the upper valve.

Holotype, ♂ Igarape-assu, Para, Brazil; Jan. 26, 1912 (H. S. Parish). *Allotype*, ♀, Igarape-assu, Para, Brazil, Feb. 1, 1912 (H. S. Parish). *Paratype 1*; ♂ Igarape-assu, Para, Brazil; Feb. 4, 1912 (H. S. Parish). *Paratype 2*; ♂ Igarape-assu, Para, Brazil; Feb. 4, 1912 (H. S. Parish).

Types in Cornell University, except paratype No. 2, in author's collection.

Toxorhina centralis sp. nov.

Brown; antennae uniform in color; abdomen with base and tip of each sclerite dark; ♀ ovipositor with long slender valves; basal approximation of Cu and 1st A moderate.

♂ Length, 6.6-7.2 mm.; wing, 6.2 mm.; rostrum, 5.1 mm.

Fore leg, femur, 4.8 mm.; tibia, 5.3 mm.

♀ Length, 7.2-8 mm.; wing, 5.1-6.3 mm.

Middle leg, femur, 4.1 mm.; tibia, 4.6 mm.

Hind leg, femur, 3.8-4.7 mm.; tibia, 4.2-4.5 mm.

Upper valve of ♀ ovipositor, 2.0 mm.

Head: rostrum dark brown; antennæ uniform dark brown. Front, vertex and occiput light grey, suffused with brown.

Thorax: pronotum rich light brown without apparent paler stripes; sides of the sclerite broadly pale buff; scutum similar, brown; scutellum and post-notum with a sparse greyish bloom. Pleuræ light brown. Halteres light brown, stem paler. Legs uniform light brown.

Wings subhyaline, veins light yellowish-brown. Venation: See fig. 1. : Scending opposite origin of Rs, basal deflection of M_{2+3} about equal to that segment of M_{1+2} between cross-veins $r-m$ and m ; basal deflection of Cu_1 usually at, or very close to, the fork of M ; basal approximation of Cu and 1st A moderate, about one-third of the length of Cu beyond the arculus.

Abdomen, tergum, sclerites light brownish-yellow, the apice and basis of each sclerite broadly brown, each band as broad as the median pale band; sternum light yellow, the apical fifth of each sclerite brown. Ovipositor of the ♀, upper valve, very long and slender, lower valve also slender, but stouter than the upper valve.

Holotype: ♂ Surinam (H. Polah). Allotype, ♀ Surinam, (H. Polah). Paratype 1, sex? Cordoba, Mexico; April 1, '08 (Fred'k Knab). Paratype 2 ♀, Cordoba, Mexico; May 8, '08 (Fred'k Knab). Paratype 3, ♀, Cordoba, Mexico, May 8, '08 (Fred'k Knab). Paratype 4, ♂, Rio Dulce, Guatemala; Mar. 21, '06 (Schwarz and Barber). Paratype 5, ♀, Cacao, Trece Aguas, Alta V. Paz, Guatemala; April 14, '06 (Schwarz and Barber). Paratype 6, ♂, Steamship "Algiers," second day out from Port Limon, Costa Rica; June 20, 1903 (Dr. J. B. L. Layton). Paratype 7, ♀, Bocas del Toro, Panama; Sept. 28, '03. (P. Osterhout). Paratype 8, Paramaribo, Dutch Guiana (Miss K. Mayo). Paratype 9, ♀ Igarape-assu, Para, Brazil (H. S. Parish).

Types in the U. S. Nat. Mus. coll. (No. 15,128).

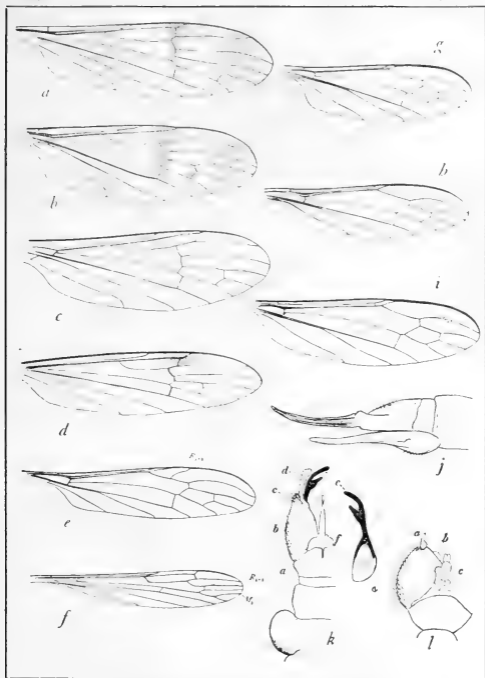
Paratypes in U. S. N. M., except No. 4 in author's collection, No. 8, in Acad. Nat. Sci. Phil. and No. 9 in Cornell University.

This species exhibits some differences in coloring and other variations from the type-description but I am quite certain that but one species is included. Most of the specimens show clearly the dark basis and apice of the abdominal tergites. Some variation exists in the position of the basal deflection of Cu_1 , in relation to the fork of M . In most specimens it is close to, or at, the fork; in some rather far proximad of the fork; in paratype No. 9 it is distad, underneath cell 1st M_2 . A few examples show an open 1st M_2 , occasionally one wing exhibiting this character while the opposite wing is quite normal.

Explanation of the Plate 2.

- Fig. a. Wing of *Teucholabis sackeni*, sp. n.
 " b. " " *Teucholabis pulchella*, sp. n.
 " c. " " *Teucholabis parishii*, sp. n.

- Fig. d. Wing of *Teucholabis audax*, sp. n.
" e. " " *Ceratocheilus americanum*, sp. n.
" f. " " *Orimarga argenteopleura*, sp. n.
" g. " " *Toxorrhina meridionalis*, sp. n.
" h. " " *Toxorrhina flavida*, sp. n.
" i. " " *Toxorrhina centralis*, sp. n.
" j. Ovipositor of *Ceratocheilus americanum*, sp. n.
" k. Hypopygium of ? *Teucholabis parishi*, sp. n.
Dorsal aspect. (a) 9th tergite; (b) pleura; (c) apice of pleura; (d) dorsal apical appendage; (e) ventral apical appendage; (f) guard of the penis.
ka Ventral apical appendage, (enlarged).
" l. Hypopygium of *Teucholabis pulchella*, sp. n. Dorsal aspect. (a) apical appendage; (b) lobe; (c) guard of the penis.



ALEXANDER—NEW NEOTROPICAL ANTOCHINI.

REPORT ON A COLLECTION OF CRANEFIES
(TIPULIDÆ, DIPT.) FROM THE COLOMBIAN
ANDES, TAKEN BY MR. JOHN
THOMAS LLOYD.

BY CHARLES P. ALEXANDER,

ITHACA, N. Y.¹

A rather extensive collection of craneflies taken by Mr. John Thomas Lloyd on the central chain of the Andes in southwestern Colombia, March, 1912, was handed to me for study. The types have been deposited in the Cornell University collection, where the remainder of the Andean insects are preserved; certain of the paratypes are in the author's cabinet. Mr. Lloyd and Dr. A. A. Allen, whose bird collections have been considered in a recent paper by Frank M. Chapman,² undertook this trip along the Cordillera Central in the spring of 1912. The itinerary of the expedition as originally planned was much more extensive, but serious illness in the party prevented collecting after leaving the "Valle de las Papas."

The collection embraces some 125 specimens referable to 22 species, of which 15 are herein described as new. The only published paper which considers craneflies from this altitude of the Andes is by von Röder, "Dipteren von der Cordilleren in Columbien."³

The following data regarding the localities collected in was furnished by Mr. Lloyd and Dr. Allen.

¹ Contribution from the Entomological Laboratory, Cornell University.

² Bull. Am. Mus. Nat. Hist., Vol. 31, Art. 16, pp. 139, 140.

³ Victor von Röder, Stett. Ent. Zeit., Vol. 47, pp. 257-270 (1886).

Valle de las Papas, "the valley of potatoes," on the Cordillera Central of the Andes near the summit at an altitude of about 10,000 feet. The Rio Caqueta, one of the principal tributaries of the Upper Amazon, flows through the valley. The valley spreads out as a flat expanse several miles in width, the surface sparsely overgrown with a tall grass suggesting prairie grass, in the wet places replaced by rushes closely allied to *Scirpus*; bog mosses, *Sphagnum* sp., occurs abundantly almost everywhere except in the wooded places. At various spots, especially in the neighborhood of the river, clumps of scattered trees occur, with numerous bushes in between; these trees resemble mesquite and have comparatively little moss. It was from amongst these tree clumps that most of the craneflies labelled "Valle de las Papas" were taken. It is possible that some came from the "cloud" or "moss" forest on the slopes above the valley, as in a few places the edge of the "cloud" forest came close up to the tree clumps, though in most instances it was at least one eighth of a mile away.

The floral, avifaunal and climatic conditions of the valley are almost exactly the same as those occurring above tree line in the true paramo; however, it is at a much lower altitude (10,000-10,300 feet) than the true paramo (12,600 feet and over) and is separated from the latter by a cloud forest belt of varying width. Ecologically the flora of the paramo is a psychrophytic or cold soil formation;¹ it is described as being a subglacial fell field "supporting a typical, open vegetation, the individuals of which are scattered in small tufts, and display growth-form exactly corresponding to those in northern fell-fields; cushion-like growth is perhaps more common. . . . Despite great humidity, frequent rain and mist, which the sun may suddenly dissipate, the vegetation is xerophytic, as Göbel's descriptions demonstrate; many plants occur with pinoid, cupressoid, juncooid or woolly-haired leaves." Besides a large number of Holarctic genera of plants, there are many genera peculiar to the region; the most notable single plant of the paramo is probably the "great frailejon," *Espeletia grandiflora* Humb. et Bonpl., a remarkable Composite plant growing 6 to 8 feet in height; a good figure of *Espeletia* is shown in Engler und Prantl² and in Plate I of this article.

The "cloud" forest or "moss" forest which surrounds the valley

¹ Eug. Warming, *Ecology of Plants*, Sec. 9, pp. 258-259, 1909.

² Die Natürlichen Pflanzenfamilien, Vol. 4, Pt. 4, p. 217, Fig. 109.

is always overhung by clouds; it is a region of very heavy and almost constant precipitation; during the time when the collection was made it rained almost continuously every day. Trees are abundant and thickly draped with a dense covering of moss, with an abundance of ferns and vines and many orchids, the whole composing a dense tangle through which passage must be cut with a knife. (See Plate IV, lower figure.)

Almaguer, 20 miles west of the "Valle de las Papas"; the village of that name is at an altitude of about 7,500 feet, but the craneflies so labelled were taken in the vicinity of a camp on the mountain ridge west of the village, at an altitude of 10,500 feet. This is in the "moss" forest and most of the insects were obtained along a trail cut through the forest; in the open places *Sphagnum* grows commonly and blue-berries with non-edible woody fruit occur in abundance along the trail wherever trees have been removed.

Popayan, 40 miles N.N.E. of Almaguer, at an altitude of 6,500 feet; this is below the level of the "cloud" forest and is largely open country with savannah conditions, open hills with little woods except along the rivers.

The collection by species is as follows:

Subfamily LIMNOBINÆ.

Tribe LIMNOBINI.

Genus DICRANOMYIA Stephens.

1. *Dicranomyia elegantula* new species.

Allied to *gloriosa* Alex.; wings dark brown on anterior half, with large white spots, posterior half almost clear.

Male, wing, 7.5 mm.

Female, length, 6.8 mm.; wing, 8.4 mm.

Rostrum and palpi dark brown; antennæ dark brownish black, the segments of the flagellum rounded; front, vertex and occiput yellowish brown, the median line a little darker, the region adjoining the eye a little brighter, yellowish.

Mesonotal præscutum medially dark brown, a broad triangular patch of yellowish gray bloom on the sides of the sclerite just behind the pseudosuture, the point of the triangle directed inward, on the sides of the sclerite in front of the pseudosuture the color in certain lights is very dark, velvety black, in

other lights almost white; scutum dark brown with a paler bloom along the front margin; scutellum dark brown with a diamond-shaped patch of gray bloom in the middle; postnotum brown. Pleuræ black, the mesopleuræ largely covered with a silvery white bloom, a narrow brown stripe cuts across this patch from the cervical sclerites to the scutellum. Halteres whitish, with the knob brown. Legs with the coxæ and trochanters brown, femora light yellow, rest of the legs gone. Wings with the anterior half brown with rounded white spots, a series of about eight in the radial cell, a large spot at the end of *Sc*, extending caudad to the radial sector, other spots in cell *2nd R*₁ and *R*₂. The caudal cells of the wings are almost hyaline with scattered brown markings, a brown suffusion along *Cu* and its fork, in cell *1st A* and on the anal angle of the wing. Venation: *Sc* long, *Sc*₂ at its tip; *Rs* long, much longer than the very long deflection of *R*₁₊₂; inner ends of cells *R*₃ and *Cu*₁ almost in a line. (See Pl. 2, fig. 2.)

Abdomen brown.

Holotype, ♀, Almaguer, March 11, 1912.

Allotype, ♂, with the type.

The allotype has the femora much darker, brown, narrowly tipped with yellowish.

D. elegantula approaches *gloriosa* Alex.¹ (Guatemala) in its long *Sc* and general coloration; the venation, especially as regards the long deflection of *R*₁₊₂, is very different; the pale color of the anal cells is a conspicuous character.

In regard to the patches of pollen occurring on the thorax of this group of species, it should perhaps be stated that this varies considerably in different lights and the student must take this factor into account.

2. *Dicranomyia cordillerensis* new species.

Subcosta long, thorax brownish yellow, wings pale brownish with scanty brown spots.

Female, length, somewhat shrunken, 7.6 mm.; wing, 11.2 mm.

Rostrum and palpi dark brownish black; antennæ dark brownish black, the flagellar segments oval, gradually more elongated toward the tip; head gray.

Mesonotal præscutum shiny brownish yellow, becoming more brownish behind; scutum, scutellum and postnotum dark brown. Pleuræ dull brownish yellow. Halteres long, pale, knob darker. Legs, coxæ and trochanters dull light yellow, remainder of the legs broken. Wings, pale brownish, cells *C* and *Sc* rich yellow; a conspicuous brown spot at the origin of *Rs*, a smaller one at the tip of *Sc*, a very large stigmal blotch, indistinct seams on the crossveins

¹ C. P. Alexander, Canadian Entomologist, November, 1912, pp. 337, 338; Pl. 11, fig. j.

and deflections of veins which make up the cord and the outer end of cell *1st M*₂. Venation: *Sc* long, extending far beyond the origin of *Rs*, *Rs* angular and spurred at origin, almost straight beyond the angulation, deflection of *R*₁ short. (See Pl. 2, fig. 1.)

Abdominal tergites brown, sternites yellowish, the sclerites suffused with brown behind and on the sides.

Holotype, ♀, Valle de las Papas, March 29, 1912.

Agrees most closely with *D. ornatipennis* Blanchard (Chile), but the wing pattern, as described for the latter, is different, the crossveins not margined with darker. *D. lincicollis* Blanchard is a much smaller species, with a dark lateral, thoracic stripe.

3. *Dicranomyia andicola* Alexander.

1912. *Furcomyia andicola* Alexander, Can. Ent., December, 1912, p. 362; Pl. 11, fig. h.

Three males and one female from Almaguer, March 11, 1912.

The ventral lobes of the male hypopygium are conspicuous, yellow, produced into a short, rounded protuberance near the base on the inside and here with two long slightly curved, pointed spines; lower or cephalic side of this protuberance with a comb of long bristles. Ventral projections of the pleura very elongate, cylindrical, the base narrowed. Dorsal apical appendage of the pleura very stout, short, strongly curved. Caudal margin of the 9th tergite concave.

4. *Dicranomyia insignifica* Alexander.

1912. *Furcomyia insignifica* Alexander, Can. Ent., December, 1912, p. 363; Pl. 11, fig. i.

About 40 specimens, both sexes, from Almaguer, March 11, 1912, and Valle de las Papas, March 22 to 29, 1912.

The 9th tergite of the male hypopygium has a deep median notch on the caudal margin; pleuræ very short, the inner face beset with stout spines, near the middle produced into a chitinized arm which is provided with spines at short intervals and is tipped with long hairs; pleura with two apical appendages, the dorsal one very short, about as long as the pleura and strongly curved; the ventral appendage very large, fleshy, very much larger than the pleura, its inner margin near the base with a small protuberance bearing two stout spines, on the ventral margin cephalad of these spines are three large bristles; pleura with a large rounded lobe on the ventral side. (See Plate 3, fig. 1.)

5. *Dicranomyia longiventris* new species.

Male, length, 7.3 mm.; wing, 8 mm.; abdomen, 6.8 mm.

Rostrum yellowish, palpi pale brown; antennæ dark brownish black, flagellar segments oval, more elongated toward the tip of the organ; head gray.

Mesonotal præscutum light yellowish brown, a broad brown median stripe with a narrower lateral stripe on either side behind joined to the caudal end of the median stripe; scutum with the lobes dark brown, median line whitish; scutellum and postnotum yellowish brown. Pleuræ pale, dull whitish. Halteres very long, brown, the knob a little darker. Legs long, brownish. Wings subhyaline, stigma feebly indicated; venation (see Pl. 2, fig. 3): Sc_1 very long, R_5 short, about as long as the deflection of R_{4+5} , but much more arcuated.

Abdomen very long and slender, tergites dark brown, the lateral and caudal margins of the sclerites narrowly pale, yellowish; sternites pale, dull yellowish. Hypopygium with the 9th tergite oval, the latero-caudal angles broadly rounded, the caudal margin slightly concave. Pleuræ short and stout, the dorsal apical appendage long, slender, simple, ending in a sharp curved point; the ventral appendage is a fleshy lobe much longer than the pleura; from the base of this lobe is borne another chitinized appendage which is enlarged at its base, deeply bifid at its tip, one of the two teeth obtuse and ending in long hairs, the other shorter and pointed; midlength of this arm are two pointed spines; this appendage is apparently borne by the base of the fleshy ventral lobes. From the ventral side of the pleura projects a conspicuous fleshy lobe bearing long hairs; guard of the penis uniform in width, a little pointed at the tip. (See Pl. 3, fig. 2.)

Holotype, ♂, Valle de las Papas, March 29, 1912.

Allotype, ♀, with the type.

Paratypes, 6 ♂, 2 ♀, Valle de las Papas, March 22 to 29, 1912.

D. longiventris belongs to the *halterata* group (*halterata* O. S., *particeps* Doane, *simillima* Alex., et al.) with very long Sc_1 and exceedingly long halteres. The extremely long abdomen easily separates it from these allied forms.

Genus GERANOMYIA Haliday.

6. *Geranomyia* sp.

One specimen from Almaguer, March 11, 1912, in too poor condition to determine. It belongs to the group of species containing *rostrata* Say, *insignis* Loew, etc.

Tribe ANTOCHINI.

Genus **ATARBA** Osten Sacken.7. *Atarba columbiana* new species.

General color yellow, wings broad with the stigma indistinct, femora with a brown subapical ring.

Male, length about 6 mm.; wing, 7.8 mm.

Female, length, 5.5 mm.; wing, 7.4-7.8 mm.

Rostrum brownish yellow, palpi very dark brown; antennæ elongated, the segments of the flagellum elongate-oval, antennæ light yellowish brown, with a dense white pubescence; head light yellowish gray.

Mesonotal præscutum rather shiny, dull yellow, without apparent stripes, sometimes with a brown suffusion; remainder of the mesonotum similar. Pleuræ light yellow. Halteres short, stem pale, knob darker. Legs bright yellow, femora with a conspicuous brown ring just before the tip, tarsi with segments 2 to 5 and the tip of segment 1 brown. Wings subhyaline, iridescent, stigma indistinct, veins in the costal region yellow, others brown. Venation (see Pl. 2, fig. 4): *Sc* short, *Sc*₁ ending opposite the origin of *Rs*; *Sc*₁ about five times as long as *Sc*₂; cell 1st *M*₂ about square; basal deflection of *Cu*₁ beyond the fork of *M*.

Abdominal tergites dark brown, the hypopygium a little brighter colored, sternites yellowish brown.

Holotype, ♂, Almaguer, March 11, 1912.

Allotype, ♀, with the type.

Paratypes, 1 ♂, 1 ♀, with the type.

A. columbiana differs from all of the known species of the genus in its brown femoral rings. As I have indicated in previous papers, the species of *Atarba* described by de Meijere, Williston and others are not members of this genus but aberrant species of the Eriopterine genus *Gonomyia*.

Tribe ERIOPTERINI.

Genus **GONOMYIA** Meigen.8. *Gonomyia andicola* new species.

Basal flagellar segments swollen, thoracic dorsum dark clove brown, pleuræ with a broad yellowish band, wings tinged with darker.

Male, length, 5 mm.; wing, 6.6 mm.

Female, length, 5.5 mm.; wing, 7.3 mm.

Rostrum and palpi dark brownish black; antennæ dark brownish black, scapal and four basal segments of the flagellum enlarged, oval, the remaining flagellar segments abruptly becoming elongate-oval; head dark brownish gray.

Mesothoracic dorsum dark clove brown without distinct darker stripes, lateral margin of the sclerite narrowly bright yellow, extending from one wing-base to the other, broadest in front; scutum dark brown; scutellum dull yellow, postnotum brown. Pleuræ dark brownish gray, with a broad oblique band, yellowish in some lights, whitish in others, extending from above and behind the posterior coxæ towards the cervical sclerites, ending on the mesopleuræ. Halteres pale, knob brown. Legs, coxæ light brown, darker basally, remainder of the leg dark brown. Wings suffused with darker, veins dark brown. Venation (see Pl. 2, fig. 6): *Sc* long, ending rather far beyond the origin of *R*₅, fork of *R*₂₊₃ long, about as long as its petiole, veins issuing from cell 1st *M*₂ long, basal deflection of *Cu*₁ before the middle of cell 1st *M*₂.

Abdomen dark grayish brown. Male hypopygium (see Pl. 3, fig. 3) with the 9th tergite produced into a prominent median lobe which is deeply notched. Pleural pieces elongate-cylindrical, the dorsal inner angle produced entad into a short subchitinized arm; from the end of the pleura is a strong, curved, chitinized hook, directed entad and cephalad, a few short hairs at intervals along this hook; behind the chitinized hook is a straight fleshy appendage directed caudad; gonapophyses long, straight, directed caudad, at the tip somewhat twisted and strongly chitinized, before the tip on the inner face, with a strong curved spine; guard of the penis long and slender, scarcely enlarged at the tip, which is truncated.

Holotype, ♂, Valle de las Papas, March 29, 1912.

Allotype, ♀, with the type.

Paratypes, 13 males, 4 females, with the type.

Genus **ERIOPTERA** Meigen.

Subgenus **MESOCYPHONA** Osten Sacken.

9. **Erioptera (Mesocyphona) sp.**

Two specimens, ♂, ♀, from the Valle de las Papas, March 29, 1912, not in proper condition to determine more accurately.

Subgenus **ERIOPTERA** Meigen.

10. **Erioptera (Erioptera) andina** new species.

Brown, the pronotal scutellum light yellow, legs brown, wings suffused with brown, halteres brown at the tip, the stem pale.

Male, length, about 4 mm.; wing, 6 mm.

Female, length, 4.7 mm.; wing, 6.3 mm.

Rostrum, palpi and antennæ dark brown; front, vertex and occiput dark brownish.

Pronotal scutellum light yellow, showing off conspicuously against the dark brown of the rest of the thorax. Mesonotal præscutum dark brown, lateral edges of the sclerite paler, occupying the region before the pseudosutural fovea; remainder of the mesonotum dark brown. Pleuræ dark plumbeous brown. Halteres large, stem pale yellowish, knob brown. Legs, coxæ and trochanters dull yellow, remainder of the legs brown. Wings with a faint brown suffusion, stigmal region elongate, brown, veins brown. Venation (see Pl. 2, fig. 5).

Abdomen dark brown. Male hypopygium (see Pl. 3, fig. 6). The 9th tergite is a quadrate plate with its caudal margin broadly emarginate, the edge with small teeth. Pleural pieces rather long, cylindrical, the inner ventral angle produced into a lobe, the tip of the pleurites bearing long hairs; two apical appendages, both chitinized, the ventral one slender basally, more enlarged and irregularly spatulate at the tip; the dorsal appendage long, slender and acutely pointed at the tip. The apophyses consist of a median quadrate plate with its caudal margin straight or nearly so, produced into indistinct points at the lateral angles; on either side of this plate is a slender chitinized rod directed caudad.

Holotype, ♂, Valle de las Papas, March 29, 1912.

Allotype, ♀, with the type.

Paratype, ♂, with the type.

This is the first neotropical species of the subgenus to be described.

Genus **MOLOPHILUS** Curtis.

11. **Molophilus perseus** new species.

Male antennæ short, thorax light yellowish brown, wings nearly hyaline, veins light yellow, male hypopygium with the lower pleural lobe provided with a strong chitinized appendage which is serrated on the caudal margin.

Male, length, 4.8 mm.; wing, 6.2 mm.

Female, length, 5-5.3 mm.; wing, 6.8-7.6 mm.

Rostrum and palpi dark brown; antennæ with the basal segment yellow, the remainder of the antennæ dark brown, the flagellar segments elongated; head dark brown.

Thoracic dorsum light yellowish brown without distinct stripes, extreme margin of the præscutum pale yellowish white; scutum and scutellum brown, postnotum dark brown. Pleuræ dark brown. Halteres light yellow. Legs light yellow, hind and middle tarsi darker. Wings subhyaline, veins light yellow, especially bright along the costa and at the base of the wing.

Abdomen dark brown. Male hypopygium (see Pl. 3, figs. 4 and 5) with the pleural pieces very short and broad, divided by a membranous notch into two lobes; viewed from above with an oval lobe projecting caudad, this lobe concave on its dorsal inner face and here provided with a strong chitinized

U-shaped hook, the inner edge of the lobe produced into a less chitinized hook. Viewed from beneath, the pleura has a lower lobe separated from the dorsal one by membrane; this lower lobe is provided with a powerful chitinized appendage ending in a long straight point, the caudal or outer edge with prominent, regular teeth, the inner or cephalic margin of this appendage with a few long bristles near the base.

Holotype, ♂, Valle de las Papas, March 29, 1912.

Allotype, ♀, with the type.

Paratypes, 1 ♂, 2 ♀, with the type.

Genus **TRIMICRA** Osten Sacken.

12. **Trimicra** sp.

One female from the Valle de las Papas, March 29, 1912; it is in too poor condition to determine beyond the genus.

Tribe **LIMNOPHILINI**.

Genus **EPIPHRAGMA** Osten Sacken.

13. **Epiphragma cordillerensis** new species.

Thorax with five dark lines, one being median, femora with a conspicuous subapical brown ring with indications of a second, postmedian ring, wings light brown with darker ocellate markings.

Male, length, 7.2-8 mm.; wing, 9-9.4 mm.

Female, length, 10-10.8 mm.; wing, 10.3-12.8 mm.

Rostrum and palpi dark brown; antennæ with the scapal segments dark brownish black, the rather enlarged first segment of the flagellum bright orange-yellow, remaining segments of the flagellum dark brownish black; front, vertex and occiput dark brown, a pale buff margin along the eyes and two buff spots on the occiput.

Præscutum with a broad brown median stripe, which continues to the suture; sides of the sclerite a little darker, region between these brown markings with a golden yellow bloom; scutum light yellow, the center of each lobe and the median depression brown; scutellum grayish brown with a median brown stripe; postnotum gray with a brown median stripe and a rounded brown spot on either side near the end of the basal half. Pleuræ grayish, a dark brown stripe extending from the head across the cervical and pronotal sclerite to the metathorax. Halteres rather long, pale, the knobs a little darker. Legs with the coxæ yellowish, the extreme base traversed by a dark brown band, trochanters brownish yellow, femora yellowish, darkening to brown before the tip, a subapical or apical ring of yellow, tibiæ brownish yellow, tarsi brown. Wings with a dull yellow suffusion and with abundant brown ocellate

markings, the largest at the origin of *Rs*, with numerous other marks in all the cells; a series of five subequal oval spots in cell *2nd A*. Venation as in Pl. 2, fig. 8.

Abdominal tergites brown, sternites dull yellow, the extreme lateral margin brown.

In some specimens the only mark on the yellow femora is the broad subapical brown band.

Holotype, ♂, Popayan, March 1, 1912 (by sweeping).

Allotype, ♀, Valle de las Papas, March 22, 1912.

Paratypes, 3 ♂, 1 ♀, with the allotype.

In my key to the American species of *Epiphragma*¹ this would run down to *solatrix* Osten Sacken of the eastern United States, from which it differs in the much more ocellate character of the wing pattern and other characters.

Genus **OROMYIA** new genus.

(non *Oreomyza* Pokorny, Wien. Ent. Zeit., Vol. 6, 1887).

Antennæ of the male elongated, the scapal segments greatly swollen, globular, the elongate first segment of the flagellum arising abruptly from the last scapal segment, flagellar segments much elongated, the whole antennæ about as long as the body; there are only 12 antennal segments in my unique specimen, but the total number is very probably 16. Tibiæ with two long, slender spurs. Wings with subcosta short, ending opposite the origin of the radial sector; the sector is short, arcuated; *R*₂ short, oblique, crossvein *r* lacking. Male genitalia with the 9th sternite produced caudad into a conspicuous lyri-form plate.

Type of the genus, *Oromyia lloydi* new species.

In my key to the Limnophilina genera² *Oromyia* would run down to *Phyllolabis* Osten Sacken³ of the western Nearctic fauna, which is presumably its nearest ally, both genera agreeing in the lack of crossvein *r* and cell *M*₁. They may be separated by the following key:

1. Subcosta very long, ending opposite the fork of *Rs*; *R*₂ not oblique and as long as *R*₂₊₃; crossvein *m* prominent as long as *r-m*; basal deflection of *Cu*₁ very far distad, so that *Cu* and *M* do not fuse. Male genitalia with the 8th sternite bearing a pale foliaceous appendage, broad at the base.

¹ C. P. Alexander, Proc. U. S. Nat. Mus., Vol. 44, No. 1966, p. 535.

² Alexander, Proc. U. S. Nat. Mus., Vol. 44, No. 1966, p. 525.

³ Osten Sacken, Western Diptera, Bull. U. S. Geol. Survey, Vol. 3, pp. 202, 203 (1877).

narrower on the apical half and very deeply split medially. Male antennæ of the normal Limnophiline type, the flagellar segments not elongated, the antennæ reaching about to the wing-base.

Phyllolabis Osten Sacken.

Subcosta short, ending opposite the origin of R_s ; R_2 very short, oblique, simulating a crossvein; crossvein m short, tending to be obliterated by the long second deflection of M_3 ; basal deflection of Cu_1 under the middle of the square cell 1st M_2 . Male genitalia with the 9th sternite produced caudad into a conspicuous lyriform plate. Male antennæ elongated, as long as the body *Oromyia* new genus.

14. *Oromyia lloydi* new species.

Thorax dull yellow; wings subhyaline with a large stigma.

Male, length, 5.5 mm.; wing, 6.8 mm.; antennæ, about 6 mm.

Hind leg, femur, 5.6 mm.; tibia, 5.2 mm.; tarsus, 4.2 mm.

Rostrum and palpi dark brown; antennæ with the scape and the extreme base of the first flagellar segment reddish yellow, remainder of the antennæ dark brownish black; front and clypeus brown, with a gray bloom; front, vertex and occiput gray.

Thoracic dorsum dull yellow without distinct stripes; pleuræ more brownish yellow. Halteres yellow, knob broken. Legs, coxæ and trochanters light yellow, femora light yellow at base, darkening rather abruptly into brown; tibiæ and tarsi brown. Wings subhyaline, stigma rather square, brown; veins dark brown. Venation as in the genus. (See Pl. 2, fig. 7.)

Abdomen with the two basal tergites dark brown, 3d to 5th yellowish basally, brown apically; remaining segments brown. Sternites with the second segment brown with a rounded yellowish median spot; segments 3 to 6 brown, the basal portion yellowish, this covering about one half on segment 3 and about one fourth on segment 6; remaining sternites dark brownish black. Hypopygium with the 8th sternite produced caudad into a long cylindrical protuberance which is thickly covered with long hairs; 9th sternite broad at the base, at the tip produced into a chitinized lyriform appendage, this appendage directed caudad, at the apex of each arm bearing a dorsally directed slender hair-like point. Pleural pieces broad at the base, narrowed and truncated at apex, clothed with long dense hairs; two chitinized apical appendages, the dorsal one cylindrical, somewhat enlarged at the tip; ventral appendage stouter, produced into a long hook at the apex, on the lower face with numerous appressed teeth. (See Pl. 3, figs. 7-9.)

Holotype, ♂, Valle de las Papas, March 29, 1912.

The type of this new genus is named in honor of the collector, Mr. J. T. Lloyd.

Genus *LIMNOPHILA* Macquart.15. *Limnophila lloydi* new species.

Color of the head and thorax light gray, wings hyaline, with four costal blotches of brown, the largest near the tip of the wing, other cells of the wing with scattered brown dots.

Male, length, 8.2 mm.; wing, 9.6 mm.

Rostrum and palpi dark brown; antennæ with the scapal segments dark brown with a gray bloom, flagellar segments brown; front, vertex and occiput with a broad light gray median stripe, the region adjoining the eye rich yellowish brown.

Pronotum light gray; mesonotal præscutum light gray, with a linear rich rust brown streak on either side of the median line near the pseudosuture, two brown spots on either side near the transverse suture; scutum, scutellum and postnotum light gray, the latter broadly margined with dark brown behind. Pleuræ, propleuræ brown with a yellow bloom, mesopleuræ dark brown, the metapleuræ even darker. Halteres light yellow throughout. Legs, fore coxæ yellowish with a slightly darker bloom, trochanters yellow above, brown beneath, femora yellowish becoming browner before the tip, tibiæ yellow, brown at the tip, tarsi yellowish, each segment tipped with brown; middle and hind legs similar but the coxæ and trochanters are brown. Wings long and narrow, rather pointed at the tip, hyaline with yellow veins; conspicuous brown marks as follows: one at the base of cell *R*, a second at the origin of *R*₅, a third, larger, including the tip of *Sc*, the fork of *R*₂₊₃, and down the cord to cell *1st M*₂; a fourth, very large blotch, occupying the ends of cells *2d R*₁, *R*₂ and *R*₃; a few scattered dots at the ends of the veins and in most of the cells. Venation, see Pl. 2, fig. 9.

Abdominal tergites yellowish brown, brightest medially, the apical sclerites rather darker; sternites yellowish brown.

Holotype, ♂, Valle de las Papas, March 29, 1912.

This species is dedicated to the collector, Mr. J. T. Lloyd.

This species suggests *Lecteria conspersa* Enderlein¹ (Brazil) in its wing pattern but in all other respects is quite different. It also bears a resemblance to *Limnophila guttulatissima* Alexander (Guatemala),² in which the thorax is pale brown spotted with darker brown and the wings with a greater abundance of brown dots.

16. *Limnophila orophila* new species.

Blackish, wings dull yellowish, crossveins *r* and *m* lacking.

Male, length, 5-5.2 mm.; wing, 5.3-5.7 mm.

Rostrum and palpi dark brownish black; antennæ black, the 2d segment

¹ Gunther Enderlein, Zoöl. Jahrb., Vol. 32, Pt. 1, pp. 49, 50 (1912).

² C. P. Alexander, Proc. U. S. Nat. Mus., Vol. 44, No. 1966, p. 546.

large, rounded, flagellar segments rounded oval, gradually decreasing in size to the tip; front, vertex and occiput dull black with a sparse grayish bloom.

Thorax black with a sparse brownish bloom on the sides of the præscutum adjoining the pseudosuture, scutum, scutellum and postnotum black with a brownish bloom. Pleuræ black with a brown bloom. Halteres, stem light brown, knob darker. Legs, coxæ and trochanters dull brownish yellow, remainder of the legs dark brownish black. Wings with a dull yellow suffusion, no stigmal spot, veins yellow. Venation, crossveins r and m obliterated, cell M_1 gone by the fusion of M_1 and M_2 , basal deflection of Cu_1 beyond the fork of M .

Abdomen black, the hypopygium a little browner. Male genitalia with the pleural lobes rather stout, with two apical appendages, the more dorsal, fleshy basally and here with long hairs, chitinized on the apical half, the tip deeply bifid; the ventral appendage is subchitinized, cylindrical, simple, the tip rounded.

Holotype, ♂, Almaguer, March 11, 1912.

Paratypes, 2 ♂, with the type.

Subfamily TIPULINÆ.

Tribe TIPULINI.

Genus PACHYRHINA Macquart.

17. *Pachyrhina alleni* new species.

Head black, reddish around the base of the antennæ; thorax with the predominating color black with narrow yellow lines and spots; abdomen with the basal half yellowish red, the tip black; wings with a pale brown suffusion.

Male, length, 10.6–11.2 mm.; wing, 11–12 mm.; antennæ, about 3.5–4 mm.

Rostrum and palpi dark brownish black; antennæ short, blackish, the flagellar segments very short, cylindrical, scarcely concave on the inner face, terminal antennal segments shorter and more slender; frontal tubercle and region around the base of the antennæ dull orange-yellow, frontal prolongation of the head, vertex and occiput dark brownish black, genæ provided with abundant long black hairs.

Pronotum dark brownish black, the scutum broadly bright yellow above. Mesonotal præscutum orange-yellow, with three very broad black stripes which almost conceal the ground color, the median one very broad in front, narrowed to a point behind at the suture, the lateral stripes begin behind the conspicuous straight pseudosuture and run caudad, interrupted by a dull yellow patch on the lateral angles behind; the yellow ground color of the præscutum is broadest in front before the pseudosuture, almost obliterated behind; scutum dull yellow, each lobe with a conspicuous black blotch, these being caudal extensions of the

lateral præscutal stripes; scutellum dull brown, darker, blackish, anteriorly brighter, yellowish on the sides, this color continued cephalad onto the lateral margins of the scutum; postnotum dark brownish black with a dull yellow blotch on the cephalic margin, one on either side of the median line. Pleuræ brownish black, paler dorsally, an elongate yellow blotch on the extreme lateral edge of the præscutum, appearing pleural in position, just above the anterior spiracle; tegula conspicuous, bright yellow; a conspicuous yellow stripe on the side of the postnotum, also appearing to be pleural in position, this stripe being cephalad of the base of the halteres and cephalo-dorsad of the mesospiracle. Halteres light brown. Legs, coxæ and trochanters light brown, the former darker basally, femora light brownish yellow, the fore femora darker, brownish, tibiæ brown, tarsi broken. Wings with a uniform pale brownish tinge, cells *C* and *Sc* a little brighter, stigma brown, veins dark brown. Venation (see Pl. 4, fig. 5); *Cu*₁ fuses with *M* for a distance about equal to the crossvein *r-m* and breaks away before the fork of *M*.

Abdominal tergites 1 and 2 reddish brown, 3 reddish yellow with a brown blotch near the base, 4 reddish yellow, 5 to 9 dark brownish black; sternites 1 to 4, reddish yellow, 5 to 6 similar, the caudal margins of the sclerites broadly blackish, segments 7 and 8 dark brownish black, the latter at the tip densely clothed with bright orange hairs. Hypopygium with the 9th tergite having an oval notch, the caudal margin with abundant chitinized points and denticule. Pleural suture long, prominent; pleura bearing two lobes, the outer lobe fleshy, very broad and flat, provided with dense hairs, its tip pointed; the inner lobe is large, chitinized, especially on the cephalic margin, where it is produced into a large appressed tooth. (See Pl. 4, fig. 8.)

Holotype, ♂, Valle de las Papas, March 29, 1912.

Paratype, ♂, with the type.

This species is named in honor of Dr. A. A. Allen of Cornell University.

P. alleni is allied to *usta* Osten Sacken of Costa Rica (Biol. Cent. Amer. Dipt., Vol. 1, pp. 17, 18) in the predominance of the black color on the thorax. It differs in many respects, having much more dark color on the head, abdomen with the basal half reddish yellow, not black, etc.

18. *Pachyrhina nigrolutea* Bellardi.

1859. *Tipula nigrolutea* Bellardi, Ditterologia Messicana, Vol. I, p. 11.

One female from Popayan, March 1, 1912, by sweeping.

Genus *TIPULA* Linnæus.19. *Tipula carizona* new species.

Monilifera group; wings light brown, subhyaline markings scanty; abdomen yellowish brown, trivittate with darker brown.

Male, length, 11.4-13.2 mm.; wing, 13.3-14.5 mm.; antennæ, 9 mm.

Palpi dark brown; antennæ of the *monilifera* type of structure, scapal segments light yellowish brown, third segment with the basal half yellowish brown, passing into dark brown at the tip, remainder of the antennæ dark brown; frontal prolongation of the head brown with a gray bloom; front, vertex and occiput light gray with three longitudinal brownish stripes, one median and one along either inner margin of the eye.

Pronotum light gray, with a very narrow and indistinct median brown mark, sides of the sclerites darker. Mesonotal præscutum light gray, with darker longitudinal stripes as follows: a very narrow brown median stripe extending the length of the sclerite, on either side of this, narrowly separated by a strip of the ground color, is a gray band, behind the pseudosutural or humeral region begin the abbreviated grayish lateral stripes, sides of the sclerite brown, much of the gray ground color is speckled with dark brown; scutum gray, with the lobes brown, a dark brown median spot on the caudal margin of the sclerite, this running back across the scutellum as a median vitta; scutellum very pale gray, with the caudal margin broadly dark brown; postnotum clear gray, with a conspicuous dark brown median stripe and a spot of the same color on the sides of the basal half of the sclerite. Pleuræ light gray, with large indistinct markings of brown. Halteres light brown, the knob a little darker. Legs, coxæ light brown, with a gray bloom, trochanters and femora light brown, the latter broadly dark brown apically, tibiæ brown, the dark tip still broader, tarsi dark brown. Wings with a rather uniform light brown suffusion, stigma a little darker brown, a subhyaline spot beyond the stigma in cell *2d R*₁, a second along the cord, most noticeable in cells *1st M*₂ and base of *M*₃. Venation as in Pl. 4, fig. 7.

Abdominal tergites yellowish brown, with a dark brown median stripe extending to the 8th segment, lateral margins of the sclerites dark brown; sternites yellowish, becoming much more infuscated along the apical segments. Male hypopygium: 9th tergite from above with the caudal margin deeply and broadly incised, this broad notch with a median protuberance which is again incised by a triangular cut, ventral margin of the 9th tergite produced entad into a rounded lobe. 8th sternite produced caudad into a long flat point, which is densely clothed with long hairs, viewed from beneath this appendage is seen to be constricted at the extreme base, soon widening. 9th sternite rather large, the pleural piece complete, oval, bearing three appendages, the more dorsal being long, slender, fleshy and directed dorsad, clothed with long pale hairs; the more ventral appendage projecting caudad from the ventro-caudal angle of the sclerite, short, densely clothed with short appressed hairs; the median appendage is largest and longest, its base about as wide as the length of the pleura, the appendage narrowed before the enlarged axe-like tip,

which is chitinized on its apical margin. Central vesicle small with a prominent apophyse directed dorsad and cephalad; the penis is short and proportionately thick, its walls with numerous transverse lines, the base of the penis scarcely anterior to the central vesicle. Other prominent appendages of the genital chamber are a pair of chitinized flattened pieces on either side of the penis, on the dorsal margin produced dorsad into spoonlike points. (See Pl. 4, figs. 2-4.)

Holotype, ♂, Valle de las Papas, March 29, 1912.

Allotype, ♀, with the type.

Paratypes, 10 ♂, March 22 to 29, 1912, with the type. One ♂ from Almaguer, March 11, 1912.

Variations: in some specimens, the shaft of each of the flagellar segments is much paler, yellowish brown, than the swollen base. In many individuals the thorax lacks the gray bloom which produces this body color but this is probably due to the condition of the specimens. The wings of some with an indistinct subhyaline band beginning before the stigma and running obliquely toward the base of the wing.

The specific name is that of a native Indian tribe; spelled also "carijona." They inhabit the banks of the upper Yapura River.

T. carizona is related to *moniliformis* Röder¹ but I cannot identify this as Röder's species. *Moniliformis* is described as having yellowish and hyaline conspicuously diversified wings, whereas in *carizona* the wings are pale brown with the whitish or subhyaline markings very reduced. The thorax in *moniliformis* is brown without distinct stripes, in *carizona* gray, vittate with darker; no mention is made in the description of *moniliformis* of the conspicuous trivittate condition of the abdominal tergum. In *monilifera* Loew the wing pattern is also conspicuously diversified brown and white; here the caudal prolongation of the 8th sternite is much shorter, the penis much longer and more slender, the shapes of the 9th tergite and the median pleural appendage quite different and the 9th sternite produced into a conspicuous median lobe.

20. *Tipula monilifera* Loew.

1851. *Tipula monilifera* Loew, Linnæa Entomol., Vol. 5, p. 404; Pl. 2, figs. 26-27.

One male from Popayan, March 1, 1912, and another male from the Valle de las Papas, March 29, 1912.

¹ Victor von Röder, Stett. Ent. Zeit., 1886, pp. 259, 260.

21. *Tipula mocoa* new species.

Size medium (wing, ♀, 20 mm.); color light brown, thorax with five darker brown lines, the median one narrowest, femora brown, with a conspicuous yellow subapical ring, wings hyaline variegated with numerous gray and brown blotches.

Female, length, about 18 mm.; wing, 20.8 mm.

Palpi and frontal prolongation of the head dark brown; antennæ with the scapal segments yellowish, first flagellar segment with the basal two thirds light brown, remainder yellow, next five segments with the basal third black, rest yellow, apical flagellar segments dark brownish black; vertex and occiput dark grayish brown, the region adjoining the eye paler, yellowish.

Pronotum dark brown, darkest medially. Mesonotal præscutum light brown, with darker brown stripes, the median one very narrow and runs the length of the sclerite; on either side of it is a broader brown stripe which bends slightly distad near the middle of the sclerite and then becomes confluent with the median stripe near the suture, in front spreading out and occupying the region in front of the pseudosuture, lateral stripes rather short surrounded by the pale ground color of the præscutum, sides of the sclerite behind rather bright yellowish; scutum gray, the lobes with two dark brown spots of which the anterior one is the smaller; scutellum and postnotum dull yellow with a narrow brown median line. Pleuræ grayish with two large blotches on the mesepipleuræ. Halteres brown, the knob a little yellowish. Legs, coxæ brownish yellow, gray pellinose, trochanters dull yellow, femora dull yellow basally, soon darkening to the tip with a broad yellow subapical ring, tibiæ and tarsi brown. Wings hyaline, cell *C* pale yellowish brown, wings with numerous gray and brown clouds on the disc as follows: a large one at the stigma, at the fork of *Cu*, in the anal cells, in the middle of cell *M*, at the origin of *R*₅ and in the middle of cell *R*; a gray blotch in the radial cell and clouds at the ends of the longitudinal veins. Venation as in Pl. 4, fig. 6.

Abdominal tergites rich brown with indications of a darker dorsal stripe, pleural region a little browner, especially on the basal segments, sternites yellowish brown. Ovipositor with the tergal valves very long and slender, the tips rather obtuse, sternal valves rather long, slender, extending about one half the length of the upper valves.

Holotype, ♀, Valle de las Papas, March 29, 1912.

The specific name is that of a native Indian tribe, dwelling on the banks of the upper Caqueta.

22. *Tipula miranha* new species.

Size large (wing, ♀, 25 mm. or over); color yellowish, thorax with three brown stripes, the median one bisected, abdomen brown or yellowish brown, with three darker brown lines on the tergum and a median one on the sternum, wings infused with brownish yellow.

Female, length, 20-22 mm.; wing, 25-26.5 mm.

Palpi brown, frontal prolongation of the head rich orange yellow, brownish beneath; antennæ with the scapal segments very small, dull yellow, flagellum broken; front, vertex and occiput orange yellow with a narrow, indistinct brown median line, sides of the vertex and the genæ a little suffused with brown.

Pronotum dull yellow, a little brown on the sides and on the median line. Mesonotal præscutum dull brownish yellow with three dark brown lines, of which the median one is double, being bisected by a pale line, the median stripe is broadest in front, where it spreads out over the sclerite, narrowed behind, the lateral stripes are much shorter, elongate oval; scutum dull brownish yellow, each lobe with two large brown spots; scutellum dull yellow, pale brown on the sides; postnotum dull yellow with a moderately broad pale brown median line and a rounded pale brown spot on either side in front. Pleuræ dull brownish yellow, becoming more brownish on the mesasternum. Halteres brown, paler at the extreme base. Legs, coxæ yellowish brown, trochanters similar, femora light brownish yellow, the tip narrowly brown, tibiæ brown, the tips scarcely darker, tarsi brown. Wings with a pale brown suffusion, costal and subcostal cells more yellowish, stigma brown, veins yellowish brown. Venation as in Pl. 4, fig. 7.

Abdominal tergites yellowish brown, with a moderately broad median brown stripe which spreads out on the 6th and 7th segments, a broad, irregular lateral band near the margin of the tergites; sternites dull yellow, with a broad brownish median stripe. Ovipositor with the tergal valves very long and slender, flattened and rather gradually narrowed to the rather acute tips; sternal valves very short, extending only beyond the base of the tergal valves, the tips, viewed from the side, obtusely rounded.

Holotype, ♀, Valle de las Papas, March 29, 1912.

Paratype, ♀, with the type.

The specific name is that of a native Indian tribe, dwelling on the middle Putumayo River.

T. miranha is allied to *T. paucisani* Philippi (Chile) in its unmarked wings, color of the antennæ, etc.; the thorax and abdomen are not gray or grayish, however.

EXPLANATION OF PLATES.

PLATE IV.

Upper figure, view in the Valle de las Papas, Colombia, showing the 'paramo' conditions.

Lower figure, view in the 'cloud' forest, near the Valle de las Papas.

Photos by John Thomas Lloyd.

PLATE V.

- Fig. 1. Wing of *Dicranomyia cordillerensis* n. sp.
 Fig. 2. Wing of *D. elegantula* n. sp.
 Fig. 3. Wing of *D. longiventris* n. sp.
 Fig. 4. Wing of *Atarba columbiana* n. sp.
 Fig. 5. Wing of *Erioptera andina* n. sp.
 Fig. 6. Wing of *Gonomyia andicola* n. sp.
 Fig. 7. Wing of *Oromyia lloydi* n. sp.
 Fig. 8. Wing of *Epiphragma cordillerensis* n. sp.
 Fig. 9. Wing of *Limnophila lloydi* n. sp.

PLATE VI.

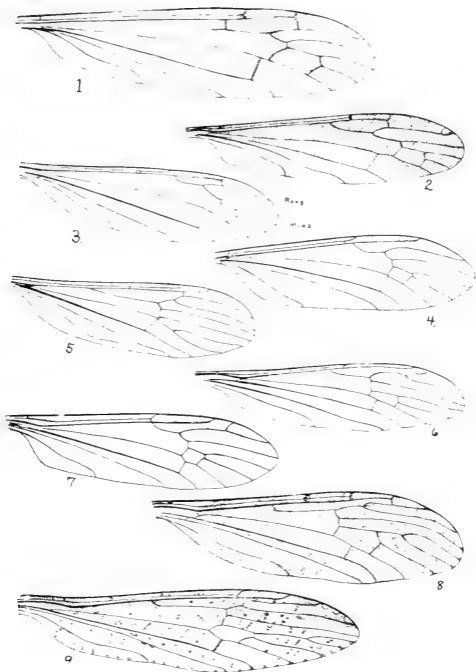
- Fig. 1. Hypopygium of *Dicranomyia insignifica* Alexander. Ventral aspect.
 Fig. 2. Hypopygium of *Dicranomyia longiventris* n. sp. Ventral aspect. *v* = ventral pleural lobe; *p* = guard of the penis; *t* = 9th tergite from beneath.
 Fig. 3. Hypopygium of *Gonomyia andicola* n. sp. Dorsal aspect. *t* = 9th tergite from above; *pl* = pleura.
 Fig. 4. Hypopygium of *Molophilus perseus* n. sp. Ventral aspect, showing the ventral edge of the pleura.
 Fig. 5. Hypopygium of *Molophilus perseus* n. sp. Ventral aspect, showing the dorsal edge of the pleura.
 Fig. 6. Hypopygium of *Erioptera andina* n. sp. Dorsal aspect. *t* = 9th tergite from above.
 Fig. 7. Hypopygium of *Oromyia lloydi* n. sp. Ventral aspect. *8s* = 8th sternite; *9s* = 9th sternite.
 Fig. 8. Hypopygium of *Oromyia lloydi* n. sp. Lateral aspect. *9s* = 9th sternite; *pl* = pleura.
 Fig. 9. Hypopygium of *Oromyia lloydi* n. sp. Pleura and appendages.

PLATE VII.

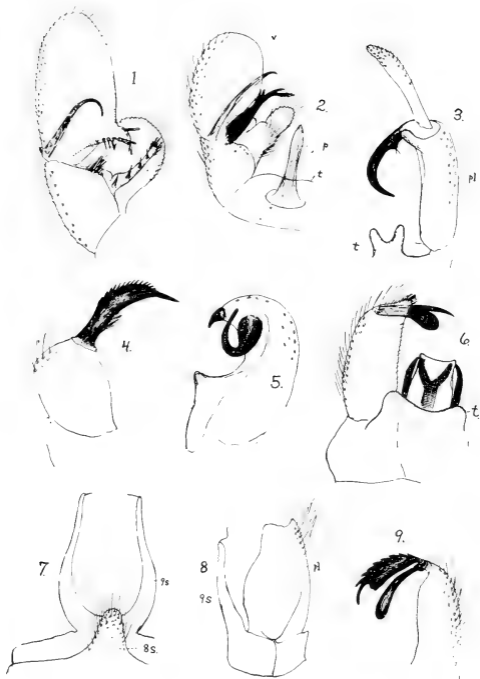
- Fig. 1. Wing of *Tipula miranha* n. sp.
 Fig. 2. Hypopygium of *Tipula carizona* n. sp. Lateral aspect. *8s* = 8th sternite; *9s* = 9th sternite; *pl* = pleura; *9t* = 9th tergite.
 Fig. 3. Hypopygium of *Tipula carizona* n. sp. The penis and its vesicles.
 Fig. 4. Hypopygium of *Tipula carizona* n. sp. The pleura and its appendages from a ventro-lateral aspect.
 Fig. 5. Wing of *Pachyrhina alleni* n. sp.
 Fig. 6. Wing of *Tipula mocoa* n. sp.
 Fig. 7. Wing of *Tipula carizona* n. sp.
 Fig. 8. Hypopygium of *Pachyrhina alleni* n. sp. Pleural appendages; *o* = outer appendage.



Tipulidæ

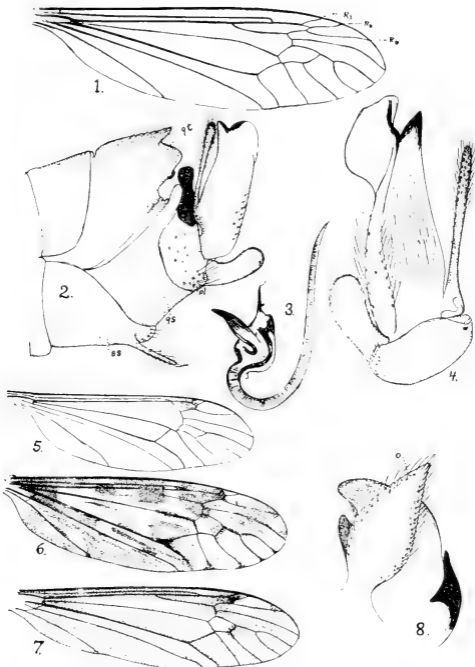


Tipulidæ



Tipulidæ





Tipulidae

NEW OR LITTLE-KNOWN NEOTROPICAL HEXATOMINI
(*TIPULIDÆ*, *DIPTERA*.)

By CHAS. P. ALEXANDER,
Ithaca, N. Y.¹

The following species were included in collections received for study from the American Museum of Natural History (Mr. Grossbeck); United States National Museum (Mr. Knab); Cornell University (Dr. Bradley); and the Museu Rocha (Señor Rocha). I express my sincere thanks to the above-named gentlemen for this and other favors received from them. The present paper deals with the *Hexatomini*, an extensive tribe of crane-flies, which reaches its maximum of specific development in the tropics. The study of these forms was conducted as research in Systematic Entomology at Cornell University under Dr. J. Chester Bradley, to whom I am indebted now, as before, for advice and many valuable suggestions.

¹ Entomological Laboratory, Cornell University.

Eriocera Macquart.

1830. *Caloptera* Guerin; Voyage de la Coquille; Zool.; pl. 20; f. 2.
 1838. *Eriocera* Macquart; Dipt. Exot.; vol. I, pt. 1; p. 74.
 1838. *Eranioptera* Guerin; Voyage d' la Coquille; Zool.; vol. 2, pt. 2; p. 287.
 1848. *Pterocasmus* Walker; List Dipt. Brit. Mus.; vol. I, p. 78.
 1850. *Allarithmia* Loew.; Bernstein und Bernsteinfauna, p. 38.
 1857. *Oligomera* Doleschall; Naturk. Tijds. v. Nederl. Ind.; vol. 14, p. 11.
 1859. *Arrhenica* Osten Sacken; Proc. Acad. Nat. Sci. Phil.; p. 242.
 1859. *Physecrania* Bigot; Ann. Soc. Ent. Fr.; p. 123; pl. 3, fig. 1.
 1912. *Androclosma* Enderlein; Zool. Jahrb; vol. 32, pt. 1, p. 34, fig. U, V.

Eriocera is one of the dominant genera of the crane-fly fauna in Neotropical countries. The key given below is based on a study of specimens of many of the species and a careful consideration of the original descriptions. It should, however, be supplemented by the original description wherever this is possible.

A Key to the Neotropical Species of *Eriocera*.

1. Wings dark colored with hyaline or yellowish cross-bands, or wings light colored with dark cross-bands. 2
 - Wings, whether dark colored or not, uniform, or nearly so, in color, not cross-banded. 13
2. Wings light-colored with three dark cross-bands, [small species; length, ♀, 8 mm.]. (Porto Rico.) *trifasciata* Röder¹
 - Wings dark colored with hyaline or yellowish cross-bands. 3
3. Head dark colored, not red or yellow. 4
 - Head yellowish or reddish. 5
4. Base of the wings pale; femora with the basal third and a ring at the second third yellow; first four abdominal segments bright yellow; head with a yellowish-grey bloom. (Colombia.) *braconides* End.²
 - Base of the wings dark; legs, abdomen (with the exception of the apical segments of the ♀) and head entirely black. (Guatemala.) *magnifica*, sp. n.
5. Tip of the wing dark colored. 6
 - Tip of the wing pale giving the wing the appearance of having an apical yellow cross-band. (North Brazil.) *perpulchra*, sp. n.
6. Wings pale brown with a moderately narrow, hyaline band, whose distal edge is limited by the cord; a small brownish stigmal spot [antennæ bright brownish-yellow; thoracic dorsum brownish-yellow with three greyish brown stripes; femora with middle third and apical quarter brown on a ochraceous-yellow ground]. (Colombia.) *virgulativentris* End.²
 - Wings darker brown with the cross-band usually wider; stigma not distinct . . . 7

¹ Röder, V. von; Stett. Entomol. Zeitung; vol. 46, p. 338; 1885.

² Enderlein, G.; Zool. Jahrbuch; vol. 32, pt. 1; p. 47, (f. B); 1912.

³ Enderlein, G.; l. c.; p. 47, 48; (f. c¹); 1912.

7. Legs with the tibiae, at least the posterior ones, with a broad white ring. 8
 Legs without white bands 9
8. Thorax uniformly black; [head and base of antennae uniformly fiery reddish-yellow; wing band yellow; anal cells a little less brown than rest of the brown band]. (Brazil). *tenioptera* Wied.⁴
 Thorax not uniformly black, dorsum very faintly striped, pleurae sooty-brown; [abdomen black; a scoriaceous, bluish-black band at the base of each segment]. (Brazil). *caminaria* Wied.⁴
9. Femora banded with yellow rings on a darker ground; [large, ♀, length, 18 mm.; head yellowish-orange; first antennal segment brown; abdomen with segments 2, 3, 4 and the terminal ones yellowish-orange, the others black]. (Brazil). *fasciata* Guer.⁵
 Femora not banded with yellow rings; legs yellow, brown or black usually darkening toward the tips of the segments. 10
10. Antennae entirely orange; [larger; ♀, length 15 mm.; wing-bands pale yellow]. (Brazil). *ruficornis* Macq.⁷
 Antennae with only the scape orange, flagellum brown; [smaller; ♀ less than 12 mm.] 11
11. Thoracic dorsum blackish-grey trivittate with black; [wing band and anal cells yellowish]. (Brazil). *melanura* Wied.⁴
 Thoracic dorsum neither grey, nor trivittate with black. 12
12. Abdomen black, at base of each segment a shining, scoriaceous, bluish-black band. [This species is also included in couplet 8; Wiedemann does not mention white tibial bands, but specimens which Schiner determined as being *caminaria* had white on the tibiae]. (Brazil). *caminaria* Wied.⁴
 Abdominal segments 2, 3, and sometimes 4, with at least the caudal margins whitish; bases of the segments usually reddish. (Northern S. America). *longistyla* Alex. (= *erythrocephala* Fabr.) prooc.⁴
13. Abdomen mostly yellowish or yellowish-brown, usually with a black band before the tip. 14
 Abdomen mostly black or blackish. 26
14. Frontal tubercle black or blackish 15
 Frontal tubercle yellowish or reddish. 18
15. Thorax red between the pronotum and the suture, with a dark median line; [abdominal segments 6 and 7 black; wings pale brownish; ♂, length, 15 mm.]. (Mexico). *mesoxantha* O. S.¹⁰
 Thorax yellow or reddish-yellow, without a dark median line. 16

⁴Wiedemann, J.; *Aussereur. zweifl. Insekt.*; vol. I, p. 28; (*Limnobia*); 1828.

⁵Wiedemann, J.; l. c.; vol. I, p. 31; (*Limnobia*); 1828.

⁶Guerin, F. C.; *Voyage de la Coquille*; *Zoöl.*; vol. 2, pt. 2; p. 287; pl. 20, f. 2; (*Eca nioptera*); 1830.

⁷Macquart, J.; *Dipt. Exot.*; vol. 1, pt. 2; p. 176, 177; (*Cylindrotoma*); 1838.

⁸Wiedemann, J.; *Aussereur. zweifl. Insekt.*; vol. I, p. 548; (*Limnobia*); 1828.

⁹Fabricius, J.; *Syst. Antliar.*; p. 31; (*Tipula*); 1805

¹⁰Osten Sacken, C. R. R.; *Biologia Centr. Americana*; *Dipt.*; vol. I; p. 10; 1886.

16. Antennæ with flagellum light yellow; thorax uniformly yellow; [abdomen with segments 3-7 with brown spots; wings brownish, lighter-colored in the interior of the cells]. (Mexico)..... *flavida* Will.¹¹
 Antennæ brown or black; thorax yellow with black lateral spots or stripes. 17
17. Antennæ black; a large black spot on mesonotum above each wing; abdomen black excepting segments 1-4 and 9. (Mexico)..... *brunneipes* Will.¹²
 Antennæ brown; a short black stripe on each side of the mesonotum; abdominal segments 1-4 with a narrow posterior black band; remaining segments black excepting their yellowish bases. (Mexico.)
 *willistoni* Alex. (= *fasciata* Will.) preocc.¹³
18. Cell 1st M_2 far out toward the wing-margin, so that Cu_1 beyond this cell is shorter than $Cu_1 + M_3$; that portion of R_1 between cross-vein r and Sc_2 , very thin, indistinct; [antennæ of the σ^7 very long, filiform, twice as long as the body]. (Eastern Brazil)..... *macrocera*, sp. n.
 Cell 1st M_2 nearer to the wing root, so that Cu_1 beyond this cell is as long or longer than $Cu_1 + M_3$; R_1 between r and Sc_2 equal to the remainder of R_1 in thickness; [antennæ of the known σ^7 's short]..... 19, 23
19. Males with the frontal tubercle produced into slender horn-like points which are directed laterad; [abdomen with a subterminal black band]. (Bolivia.)
 *cornigera*, sp. n.
 Males (as known) with the frontal tubercle normal. 20
20. No conspicuous black subapical band on the abdomen; stigmal spot conspicuous; [length about 19 mm; wing 17 mm.]. (British Guiana—Eastern Brazil.)
 *kaïtorensis*, sp. n.
 A conspicuous sub-apical dark brown or black band on the abdomen. 21
21. Larger species; [length, 20 mm.; wing, 18 mm.; [Sc_2 longer than Sc_1]]. (Ecuador.)
 *ohausiana* End.¹⁴
 Smaller species [length, 15 mm. or less]..... 22
22. Antennæ brown; body coloration dull brownish-yellow. (Peru.)
 *peruviana*, sp. n.
 Antennæ yellow; body coloration yellow and black. (Mexico—Costa Rica.)
 *anata* O. S.¹⁵
23. Females (as known) without a subapical black band on the abdomen; [length 25-28 mm.; wing, 20-21 mm.]. (British Guiana—Eastern Brazil.)
 *kaïtorensis*, sp. n.
 Females (as known) with a subapical black or blackish band on the abdomen. . 24
24. Mesonotum uniformly reddish-yellow; [antennæ brown; wings tinged with brownish]. (Honduras.)..... *obsolata* Will.¹⁶
 Mesonotum longitudinally striped. 25
25. Scape of the antennæ yellow; legs yellow, segments tipped with black; Sc_2 longer and more conspicuous than Sc_1 . (Mexico—Costa Rica.) *zonata* O. S.¹⁵

¹¹ Williston, S.; *Biologia Centr. Americana*; (suppl.; Dipt.; vol. I); p. 227; 1900.

¹² Williston, S.; l. c., p. 227; pl. 4, fig. 5; 1900.

¹³ Williston, S.; l. c., p. 226; pl. 4, fig. 10; 1900.

¹⁴ Enderlein, G.; *Zool. Jahrbuch.*; vol. 32, pt. 1; p. 45, 46; fig. A¹; 1912.

¹⁵ Osten Sacken, C. R. R.; *Biologia Cent. Amer.*; Dipt., vol. I, p. 10; 1886.

¹⁶ Williston, S.; *Biologia Cent. Amer.*; Dipt.; vol. I (suppl.); p. 227; 1900.

- Scape of the antennæ brownish-black; legs blackish-brown except base of fore femur; Sc_2 shorter than Sc_1 . (Mexico).....*townsendi*, sp. n.
26. Color metallic blue with head orange-red. (Panama).....*lessepsi* O. S.¹⁷
Color not metallic blue 27
27. Thoracic praescutum red. 28
Thoracic praescutum black 29
28. Frontal tubercle red; scutellum black. (Mexico).....*hemorrhoea* O. S.¹⁸
Frontal tubercle black; scutellum red. (Guatemala).....*erythraa* O. S.¹⁹
29. Frontal tubercle orange 30
Frontal tubercle black 31
30. Abdominal segments 3-5 with bases red dish. (Mexico).....*gracilis* O. S.²⁰
Abdominal segments altogether black. (Colombia).....*macquarti* End.²¹
31. Wings luteous, blackish toward the tips. (South America).....*chrysoptera* Walk.²²
Wings mostly blackish 32
32. Wings brown, darker along costa; cells uniform; wings not reddish-yellow at basis. (Mexico).....*pretiosa* O. S.²³
Wings brown, either reddish-yellow at base or else with hyaline in some of the cells 33
33. Wings a little reddish-yellow at base. (Brazil).....*nigra* Wied.²⁴
Wings blackish, some of the cells with nearly hyaline streaks. (South America).....*trabeosa* Walk.²⁵

The following species are not included in the above key:

Pentoptera fuliginosa Schiner; Colombia, shining pitch-black; femora with a broad yellowish-red ring immediately beyond the base; head, antennæ and palpi black; wings tinged with brown, more saturated on costal margin. Osten Sacken, (Studies on Tipulidæ, pt. 2, p. 224), suggests that this is an *Eriocera*.

Limnobia flaviceps Wied.;²⁷ Brazil, thorax and abdomen black, forehead fiery yellow; antennæ black. Venation (Pl. 6 b; fig. 10) like *Eriocera* but cell R_2 very short.

Eriocera magnifica sp. nov.

Dark brownish-black including the head; wings dark with a broad pale yellow postmedian band.

¹⁷ Osten Sacken, C. R.; Biologia Cent. Amer.; Dipt.; vol. I, p. 13; 1886.

¹⁸ Osten Sacken, C. R.; *ibid.*; p. 11.

¹⁹ Osten Sacken, C. R.; l. c.

²⁰ Osten Sacken, C. R.; l. c.; p. 12.

²¹ Enderlein, G.; Zool. Jahrb.; vol. 32, pt. I; p. 45; 1912.

²² Walker, F.; Insecta Saundersiana; vol. I; p. 438; (*Limnobia*); 1856.

²³ Osten Sacken, C. R. R.; Biol. Cent.-Amer.; Dipt.; vol. I, p. 12; 1886.

²⁴ Wiedemann, J.; Aussereur. zweif. Insekt.; vol. I, p. 27; (*Limnobia*); 1828.

²⁵ Walker, F.; Insecta Saundersiana; vol. I, p. 439, 440; (*Limnobia*); 1856.

²⁶ Schiner; Reise Novara; p. 42. (*Pentoptera*); 1868.

²⁷ Wiedemann, Aussereur. zweif. Insekt.; vol. I, p. 550; (*Limnobia*); 1828.

- ♂, Length, 14 mm.; wing, 12.4 mm.; antennae about 3.8 mm.
 Fore leg, fem. 7.6 mm.; tibia, 9.7 mm.; tarsus 1, 4.9; 2-5, 4.1 mm.
 Middle leg, fem. 9 mm.; tibia, 9.6 mm.
 Hind leg, fem. 9.8 mm.; tibia, 11.8 mm.
- ♀, Length, 21 mm.; wing, 16.3 mm.; antennae about 5 mm.
 Fore leg, fem. 9.9 mm.; tibia, 10.6 mm.; tarsus, 8.4 mm.
 Middle leg, fem. 11.4 mm.; tibia, 10.9 mm.
 Hind leg, fem. 12.8 mm.; tibia, 13 mm.

♂, Rostrum and palpi dark brown; antennae, two basal segments brown; flagellum very dark brownish-black. Front, vertex and occiput deep brown. Frontal tubercle moderately broad, deeply notched.

Thoracic dorsum dark brownish-black without distinct stripes; pleurae more brownish. Legs and halteres dark brownish-black.

Wings (fig. 7) brown with a broad light yellow band slightly beyond the middle, its outer margin just distad of the cord.

Abdominal tergum, basal half shiny, apical half dull black. ♀, similar to ♂ but larger and the genital segment reddish. Paratype paler and evidently newly-emerged; same place and date as the allotype.

Holotype, ♂. Trece Aguas, Cacao, Alta Vera Paz, Guatemala. April 5. (Schwarz and Barber.) Allotype, ♀ same locality and collector as the ♂, April 9. Paratype, ♀ with the allotype. Types in the U. S. Nat. Mus. Coll. Paratype in the author's collection.

In its blackish head, *magnifica* agrees most closely with *braconides* Enderlein (Zoöl. Jahrb., vol. 32, pt. I; p. 47; fig. B¹; 1912) of Colombia; the remaining species with banded wings have the head conspicuously orange or yellow. *Braconides* differs very notably in its pale wing-basis, light bloom on the head, different leg-pattern, etc.

Eriocera perpulchra sp. nov.

Head reddish; frontal tubercle notched; wings yellow with two brown bands.

- ♂, Length, 20.8 mm.; wing, 16.6 mm.; abdomen about 16 mm.;
 Antennae 3.2 mm.
 Middle leg, femora, 10.4 mm.; tibia 11 mm.; tarsus 8.3 mm.
 Hind leg, femora, 11.8 mm.; tibia 13.6 mm.; tarsus about 8 mm.

♂, Rostrum and palpi dark brown. Antennae, segments 1-2, orange-yellow; segment 3, yellow basally, passing into dark brown at the tip; remaining segments dark brownish-black. Front, vertex and occiput bright orange, rather obscured posteriorly. Frontal tubercle very broad, truncated in front and broadly notched.

Pronotum very dark brown. Mesonotum, praescutum, medially broadly dull chocolate-brown with three narrow darker lines, one median, the other two on the sides of the broad median band, these dark vittae becoming indistinct behind; sides of the sclerite anterior to the pseudosuture brighter, orange; sides of the praescutum behind, dark colored; scutum, scutellum and postnotum dark brownish-black. Pleurae dark brown, rather lighter colored on the ventral sclerites. Halteres, stem

brown, basally, darkening to brownish-black on the knob. Legs: coxæ and trochanters dark brown; femora dull brownish-yellow, tip broadly dark brown, an indistinct broad darker median band; tibiae and tarsi brown, the former lighter colored basally.

Wings: pale light yellow; a broad brown basal band filling in the space from slightly beyond cross-vein *b* to beyond the origin of R_1 ; a second brown band filling in the space from the cord to the tip of R_1 , down to the end of Cu_1 . Venation (see fig. 8): *Sc* rather short, ending opposite cross-vein *r-m* before the middle of R_{2+3} ; cross-vein *r* about equal to that portion of R_2 proximal of it; R_3 long.

Abdominal tergites reddish-brown, segments 6-7 rather darker, brown; segments 8-9, reddish. Sternites reddish-brown.

Holotype, Savannah, North Brazil. August 22, 1911. (Crampton.) Type in American Museum of Natural History.

Eriocera longistyla Alex.

1805. *Tipula erythrocephala* Fabricius; Syst. Antliar.; p. 31 (non *T. erythrocephala* DeGeer. 1776).

1821. *Limnobia erythrocephala* Wiedemann; Dipt. Exot.; vol. 1, p. 17.

1828. *Limnobia erythrocephala* Wiedemann; Aussereur. zweif. Ins.; vol. 1, p. 30.

1838. *Cylindrotoma erythrocephala* Macquart; Dipt. Exot.; vol. 1, pt. 1., p. 67.

1866. *Eriocera erythrocephala* Schiner; Verh. Zoöl. bot. Ges. Wien.; vol. 16, p. 929.

1868. *Eriocera erythrocephala* Schiner; Novara Reise; Dipt.; p. 41.

1869. *Eriocera erythrocephala* Osten Sacken; Monographs Dipt. N. Am.; vol. 4; p. 248.

As I have shown elsewhere, the *Tipula erythrocephala* of Fabricius is homonymous with DeGeer's species and I have renamed it as above.

I have before me five specimens of this handsome little form, as follows:

(1) ♂, Waratuk, Upper Potaro R.; July 15, 1911. (Crampton.)

(2) ♂, Upper Potaro R.; July 17, 1911. (Crampton.)

(3) ♂ ♀, Tukeit, Upper Potaro R.; July 24, 1911. (Lutz.) (in cop.)

(5) ♀, Tukeit, Upper Potaro R.; July 24, 1911. (Lutz.)

I am including a few additional details in regard to measurements and coloration:

♂, Length, 9.1-10.3 mm.; wing, 9.9-10.4 mm.

♀, Length, 10.8-11 mm.; wing, 10.3-10.9 mm.

First and second antennal segments of the same bright orange color as the dorsum of the head; flagellum of antennæ and the palpi dark brown.

Mesonotal prescutum dark brown covered with a thick yellowish bloom which is less intense on the cephalic margin of the sclerite; three broad dorsal stripes, very indistinct. The thoracic dorsum, viewed with the naked eye, appears pearly-yellow; scutum and scutellum similar to the prescutum; postnotum darker brown, less pruinose. Wing shown in fig. 6.

Abdominal tergites, segment 1 very dark brown, only the extreme margin orange; segment 2 light orange-yellow, with a dark brown postmedian band; segment 3 orange, more yellowish on the anterior and posterior margins; segment 4, dark brownish-black, anterior quarter orange; segments 5-7 deep black, 8 and hypopygium orange. Sternites about as in the tergites; the lateral line dark on 2nd and

3rd segments. The last specimen listed above (♀) is similar but the abdominal tergum has the basal three-fourths of segments 1-3 almost black, the apical quarter yellowish. The ♀, in cop, has the first abdominal tergite black.

The specimens are in the American Museum of Natural History with the exception of specimen No. 2, in the author's collection.

Eriocera macrocera sp. nov.

Head reddish-yellow; antennæ of the ♂ twice as long as the body; the section of Cu_1 beyond the outer end of cell 1st M_2 is shorter than the fused portion of Cu_1 and M_3 .

♂, Wing, length, 8.3 mm.; breadth at widest point, 2.5 mm. Front, vertex and occiput bright orange-yellow; antennæ very long, brown.

Thorax and abdomen, brown. Wings with a slight brownish tinge; stigma darker brown, large but ill-defined; veins C , Sc and R rather yellowish; remaining veins brown. Venation (see fig. 4). Costa incrossated between ends of Sc_1 and R_1 ; Sc_2 near the tip of Sc_1 ; the portion of R_1 between Sc_2 and cross-vein r , delicate, indistinct; R_3 strongly arcuated at origin; R_{2-3} nearly twice as long as that portion of R_2 before cross-vein r ; the portion of Cu_1 beyond the outer end of cell 1st M_2 is shorter than the fused portion of Cu_1 and M_3 ; instead of distinctly longer as in all short-antennated forms known to me; in other words, cell 1st M_2 (discal) is very far out toward the wing margin.

Holotype, ♂, Igarapé-assú, Pará, Brazil. January 30, 1912. (H. S. Parish.) Type in Cornell University Collection.

The only South American *Eriocera*, so far described, with elongate antennæ in the male. From the related Northern species, *E. longicornis* Walk., it differs in its reddish head and body-color. The type-specimen is not at hand and a more detailed description will be given later.

Eriocera cornigera sp. nov.

Frontal tubercle of the male produced into long, slender points; abdomen with a subterminal black band; general color yellow.

♂, Length, 12.8 mm.; wing 11.6 mm.; antennæ nearly 4 mm.

Middle leg, femora, 8.2 mm.; tibia, 8.8 mm.

Hind leg, femora, 9.4 mm.; tibia, 10.7 mm.

Rostrum and palpi dark, blackish; antennæ, first two segments brownish-yellow; third bright yellow; remaining segments dark brownish-black. Front brownish-yellow; vertex and occiput brownish-yellow, greyish near the eyes; frontal tubercle brighter, orange-yellow. Frontal tubercle extended into two elongate, pointed tubercles.

Pronotum prolonged into rather long obtuse points at the antero-lateral angles, brown. Mesonotum, præscutum, median line tawny; a large, dark brown stripe beginning near the cephalic margin, narrowing behind and gradually converging to near the suture. To either side of this, near the middle of the sclerite, begins a broad stripe which runs to the suture; ground color of the sclerite yellow. Scutum

largely brown, tawny in the middle; scutellum and post-scutum tawny; postnotum tawny. Pleuræ yellowish-tawny; sternum light yellow. Halteres tawny, knobs rather darker. Legs brownish-yellow, scarcely darker at the apices of the segments.

Wings: cells *C* and *Sc* tinged with yellow, rest of wing greyish; stigma very indistinct, rounded. Venation (see fig. 3.). *Sc* rather long, ending just beyond the level of cross-vein *r-m*; *Sc*₂ longer and much stronger than *Sc*₁ which is reduced in size and simulates a cross-vein (as in *zonata* O. S.); *R*₁ very long, nearly straight; *R*₂₊₃ long; cross-vein *r* oblique, inserted on *R*₂ just beyond the fork.

Abdominal segments 1-5, light yellow; 6-7 deep brownish black; hypopygium broken.

Holotype ♂. Songo, Bolivia. (Received from Staudinger-Bang-Haas). Type in author's collection.

Eriocera kaieturensis sp. nov.

Large species (wing 17-21 mm.); head yellow; thoracic dorsum striped; legs with a broad subapical yellow band; wings with an indistinct yellowish band before the cord, stigma distinct.

♂, Length, about 19 mm.; wing, 17 mm.; antennæ about 4 mm.

Hind leg, femur, 11.4 mm.; tibia, 11.5 mm.; tarsus, 7.4 mm.

♀, Length, about 25 mm.; wing, 20.8 mm.

Middle leg, femur, 11 mm.; tibia, 10.9 mm.; tarsus, 8.9 mm.

Hind leg, femur, 14.3 mm.; tibia, 14.8 mm.; tarsus, 8.3 mm.

♂, Rostrum and palpi brown; antennæ short, segments 1 and 2 bright orange, remaining segments brown. Front, vertex and occiput bright orange-yellow.

Mesonotal præscutum light yellowish-brown pollinose with a broad darker brown median stripe, broadest in front, narrowed to a point near the suture, this broad band including a narrow, dark brown, median line; two broad lateral stripes of the same brown color on either side, beginning behind the pseudo-suture, continuing back across the suture onto the scutal lobes; scutum light yellowish-brown, each lobe brown medially, a continuation of the lateral præscutal stripes; scutellum light brownish-yellow. Pleuræ darker brown dorsally, beneath much paler, yellowish. Halteres, stem dull yellow, knob brown. Legs: coxæ and trochanters orange-yellow, the latter with a narrow black line; femora yellow, darkened at the tip and indistinctly and broadly darker beyond the middle producing a yellow subapical band; tibiæ dull yellow; tarsi dull yellow, each segment tipped with brown. Wings: of a pale yellow color, this color rather darker, more greyish, beyond the cord and near the base of the wing; stigma conspicuous, but not dark, brown, occupying the end of cell 1st *R*₁; veins brownish-yellow. Venation as in figure 1.

Abdominal tergum, segments rich yellowish-brown, darker apically; segments 5 and 6 darker; lateral margin of the tergites dark brownish-black, producing a dark lateral abdominal line; sternum yellow.

♀, Quite as in the ♂, but larger.

Holotype, ♂. Kaietur Falls, Potaro R.; British Guiana. August 8, 1911. (F. E. Lutz.) Allotype, ♀. Savanna, North Brazil. August 20, 1911. (Crampton.) Paratype, ♀. Ceara, East Brazil. (Senor D. Rocha.) Holotype and Allotype in American Museum of Natural History. Paratype in Museu Rocha, Ceara, Brazil.

The paratype differs from the type ♂ and ♀ in having the first flagellar segment of the antennæ tipped with black, the wings more unicolorous; and femora without the broad indistinct yellow band. I believe that the specimen is merely a variant of the typical species. (Length, almost 28 mm.; wing, 21 mm.)

Eriocera peruviana sp. nov.

General color dull brown; frontal tubercle orange.

♂, Length, 11.8 mm.; wing, 11.2 mm.; antennæ about 2 mm.

Middle leg, fem., 8 mm.; tibia, 8.8 mm.

Hind leg, fem., 8.9 mm.; tibia, 10.2 mm.

Rostrum and palpi yellowish, the latter rather more brownish. Antennæ very short, brown; basal segments lighter colored. Frontal tubercle and region immediately behind it rich orange-yellow; frontal tubercle deeply furrowed. Remainder of front, vertex and occiput rich brown.

Pronotum dark brown. Mesonotum, præscutum, ground color light brownish-yellow; cephalic margin dark brown, continued backward as a stripe on either side of the narrow median line; a short brownish stripe on sides; scutum, scutellum and postnotum brownish-yellow. Pleuræ yellowish-white, a broad darker band extending from the root of the wings to the cervical sclerites. Halteres light brown. Legs: light brown, uniform. Wings: cells *C* and *Sc* brownish-grey, remainder of wings clearer grey. Venation (see fig. 5): *Sc* strong, *Sc*₂ remote from tip of *Sc*₁; *R*₂₊₃ more or less on a level with *Rs*.

Abdomen dull yellowish brown; sub-terminal three segments darker; hypopygium reddish-brown.

Holotype, ♂. Callanga, Peru. (Received from Staudinger-Bang-Haas). Type in author's collection.

Eriocera townsendi sp. nov.

Frontal tubercle orange-yellow; scape of antennæ dark brown; legs black.

♀, Length, 18 mm.; wing, 13.6 mm.

Fore leg, femora, 6.3 mm.; tibia, 7.3 mm.

Middle leg, femora, 7.8 mm.; tibia, 7.2 mm.

Hind leg, femora, 9.1 mm.; tibia, 9.5 mm.

Rostrum and palpi dark brown; scape of the antennæ dark brown, apice of segment one pale, silvery; segments 3 to 5, yellowish-orange; remaining antennal segments darkening to brown. Frontal tubercle moderately prominent and rather deeply notched, rich orange-yellow; sides of the vertex behind the eyes brown.

Mesonotal præscutum with a broad deep brown median stripe, margined with a narrow deep black line and divided by a narrow median line of the same black color; the lateral black stripe is forked near the pseudo-suture, the caudal branch ending at the pseudosutural fovea; sides of the sclerite somewhat brighter brown; scutum, lobes brown, blacker on the cephalic margin; scutellum and middle line of the scutum orange; postnotum dark brown laterally, broadly dull yellow medially. Pleuræ dark brown. Halteres deep brown, base of the stem a little paler. Legs: coxæ and trochanters deep brown except the fore trochanter which is dull yellow;

fore leg with basal quarter of femur conspicuously yellow, abruptly darkening to brownish-black; tibiae and tarsi dark brownish black; middle and hind legs uniformly very dark brown. Wings almost uniformly brown; cells *C* and *Sc* a little darker colored. Venation: *Sc* long, *Sc*₁ much longer and more distinct than *Sc*₂; *R*₁₊₂ rather long, a little longer than *R*₂ beyond cross vein *r* and about three times as long as *R*₂ between the fork of *R*₂₊₃ and *r*.

Abdominal tergum, segments 1-4, orange-yellow; 5, extreme base orange-yellow; remainder of 5th and 6 and 7, deep velvety-black; genital segment orange. Sternum similarly colored but duller.

Holotype, ♀. Sierra Madre, Chihuahua, Mexico. Hd. R. Piedras Verdes. Alt. about 7,300 ft. (Coll. C. H. T. Townsend.) Type in U. S. Nat. Mus. Coll.

This species is closest to *zonata* O. S. but I cannot make the two descriptions agree. The basal segments of the antennae in *townsendi* are very dark brown; there is more black on the abdomen; the legs are not yellow (except base of fore femora) but dark brown. The peculiar course of *Sc*₁ in *zonata*, apparently ending in radius rather than in costa does not obtain in the new species, where *Sc*₁ ends in costa, *Sc*₁ being about twice as long as *Sc*₂.

Eriocera erythræa Osten Sacken.

1886. *Eriocera erythræa* Osten Sacken; Biol. Cent. Amer.; Dipt. vol. I, p. 11.

One ♀ from Cacao, Alta Vera Paz. April 12, 1906. (Schwarz and Barber).

The mesonotal præscutum shows indications of darker brownish stripes of which the median is more double. Venation: *Sc* long, *Sc*₁ strong, ending about opposite the fork of *R*₂₊₃; *Sc*₂ weak, much shorter than *Sc*₁. *Rs* almost in a line with *R*₂₊₃; *R*₁ before cross-vein *r* a little less than one-half of *R*₂₊₃; cross-vein *r* a little more than one-half of *R*₂ before it; basal deflection of *Cu*₁ under the middle of cell 1st *M*₁. The specimen is in the U. S. Nat. Mus. Coll.

Eriocera gracilis Osten Sacken.

1886. *Eriocera gracilis* Osten Sacken; Biol. Cent. Amer.; Dipt. vol. I, p. 12.

One ♂, Sierra Madre, Chihuahua, Mexico. Hacienda R. Piedras Verdes. Alt. about 7,300 ft. Coll. C. H. T. Townsend. Specimen in U. S. Nat. Mus. Coll.

The mesonotal præscutal greyish on dorsum, with three black stripes of which the median one is broadest in front, narrowed to a point near the suture; the lateral stripes which lie on the sides of the dorsal triangle are connected on the anterior margin of the selerite with the median stripe; the sides of the præscutum are more yellowish than the grey dorsal triangle; scutum and scutellum, as well as the postnotum deep, rich brown. Venation: *Sc* rather short, ending far before the

fork of R_{2+3} ; Sc_2 much shorter than Sc_1 but strong, in a line with the cord of the wing; R_{2+3} long, as long as R_2 alone; cross-vein r about as long as that portion of R_2 between it and the fork of R_{2+3} ; basal deflection of Cu_1 as near to the fork of M as to the middle of cell 1st M_2 .

Pentoptera Schiner.

1863. *Pentoptera* Schiner; Wiener Entomol. Monatsschr.; vol. 7, p. 220.

1869. *Pentoptera* Osten Sacken; Monographs Dipt. N. Am.; vol. 4, p. 256.

A Key to the American Species of *Pentoptera*.

1. Small (wing less than 8 mm.); mesothoracic praescutum with the ground color obscured by a greyish or bluish pruinosity, dorsal stripes not distinct; metatarsi of the legs white; cell M_1 of the wings present, i. e., M_1 and M_2 separate at the wing-margin. (Eastern U. S.) *albitarsis* O. S.¹
- Large (wing more than 9 mm.); mesothoracic praescutum yellowish with four shining blackish marks; metatarsi of fore and middle legs more or less brown; cell M_1 of the wings lacking, i. e., M_1 and M_2 fused to the wing-margin. (Guatemala.) *conjuncta*, sp. n.

The new species described below is a typical member of the genus *Pentoptera* as defined by Osten Sacken (Monographs, l. c., p. 256, 257). It agrees with *albitarsis* O. S. of Eastern North America, and *chirothecata* Scop. of Central and Southern Europe, in its snowy-white tarsi, a character not yet found in *Eriocera*, so far as I can discover. It differs from these two species, and comes closest to *cimicoides* Scop. of Central and Southern Europe in the lack of cell M_1 of the wings; from the last-mentioned species, it differs in tarsal and body-coloration, etc.

Mr. F. W. Edwards, in his recent comprehensive paper on the Seychelles Tipulidae, has questioned the generic validity of *Pentoptera*. The group is, indeed, founded on rather trivial characters, but these, as defined by Osten Sacken, are numerous and apply very well to the typical group of species. *Pentoptera fuliginosa* Schiner, the only form ever described by the founder of the genus was considered by Osten Sacken to be a species of *Eriocera*. In case *Pentoptera* is reduced in rank, Schiner's *fuliginosa* will require renaming.

Pentoptera conjuncta sp. nov.

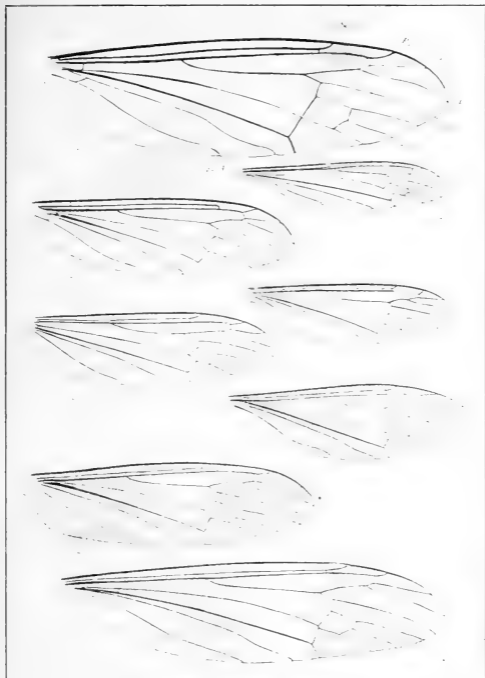
Thoracic dorsum yellowish with four dark marks; tarsi white; cell M_1 absent.

♂, Length, 9.5 mm.; wing, 9.8 mm.

♀, Length, 10.6 mm.; wing, 10 mm.

¹Osten Sacken, Monographs, vol. 4, p. 257, 258. See Needham, 23rd Rept., N. Y. State Entomologist for 1907, plate 12, figure 1, for photo of wing.

²Edwards, Trans. Linn. Soc. Lond.; 2nd series, Zoology; vol. 15, pt. 2; Sept. 1912. The Percy Sladen Trust Expedition to the Indian Ocean in 1905—No. 14—Diptera, Tipulidae; p. 195-214; pl. 10-11.



Alexander—Neotropical Hexatomini

Rostrum and palpi brown; scape of antenna light yellowish-brown, the basal segment slightly darker than the second segment; flagellum broken. Front, vertex and occiput dark-colored, thickly bluish-grey pruinose. Frontal tubercle prominent, not notched.

Mesonotum yellowish-brown, shiny, a narrow deep brown line on either side of the broad dorsal median portion, beginning above the pseudosutural region, narrowing behind and ending before the transverse suture; a large rounded brown spot on the sides of the sclerite before the transverse suture; scutum, scutellum and postnotum yellowish-brown with a faint greyish bloom; a rounded darker brown spot on the lateral lobes of the latter. Pleuræ very light yellow, a large rounded brown spot on the mesopleuræ underneath the wing-root and less distinct spots on the propleuræ and cervical sclerites forming an interrupted dorso-pleural band. Halteres deep brown. Legs: coxæ and trochanters light yellow; femora yellowish-brown, extreme tip darker brown; tibiæ brown; fore metatarsus brown on basal two-fifths, remaining portions of fore tarsi pure white except the last segment which is brownish; middle leg, with the basal third of the metatarsus brown; metatarsus of the hind legs entirely white. Wings: subhyaline or slightly tinged with darker, especially toward the tip; veins dark brown. Venation, see figure 2.

Abdominal tergum with the segments dark brown; segment I pallid at base, darker apically; extreme margin of segments 2-6 pallid; 7-8; not pale at tip; c^o hypopygium reddish-brown; sternites dull yellow.

Holotype, ♂. Pataluc, Guatemala, Central America. 700 ft. (Dr. G. Eisen.) Allotype, ♀, with the type. Received at the National Museum, January 6, 1903. Type in U. S. Nat. Mus. Coll.; allotype in author's collection.

EXPLANATION OF PLATE IV.

The figures are all drawn to scale by means of a projection microscope.

- Fig. 1. *Eriocera kaieturcensis* sp. nov.; wing.
- Fig. 2. *Penthoptera conjuncta* sp. nov.; wing.
- Fig. 3. *Eriocera cornigera* sp. nov.; wing.
- Fig. 4. *Eriocera macrocera* sp. nov.; wing.
- Fig. 5. *Eriocera peruviana* sp. nov.; wing.
- Fig. 6. *Eriocera longistyla* Alex; wing.
- Fig. 7. *Eriocera magnifica* sp. nov.; wing.
- Fig. 8. *Eriocera perpulchra* sp. nov.; wing.

THE CRANEFLIES COLLECTED IN COSTA RICA BY
DR. P. P. CALVERT. (TIPULIDÆ, DIPTERA).

BY CHARLES P. ALEXANDER,

ITHACA, N. Y.

While collecting the dragonfly material for the Biologia Centrali-Americana, Dr. P. P. Calvert secured a very considerable number of specimens of other orders of insects. A few of the crane-flies that were taken have been considered by the author in other papers.¹ The majority of the new forms have been left for this paper, however, and a complete list of the material secured is herein included. The crane-flies of the collection form a small but interesting lot and I am indebted to Dr. Calvert and to Mr. E. T. Cresson, Jr., for the privilege of studying these forms. The type-material is in the collection of the American Entomological Society at the Academy of Natural Sciences, Philadelphia.

¹ *Vide* Bull. Brook. Ent. Soc., Vol. 8, Oct., 1912; Proc. U. S. Nat. Mus., Vol. 44, No. 1966, Apr., 1913.

SUBFAMILY LIMNOBINÆ.

Tribe LIMNOBINI.

Genus **DICRANOMYIA** Stephens.**Dicranomyia omissa** Alexander.

One male and one female specimen from near Cartago, C. R., altitude 5,000 feet. They were taken on Dec. 15, 1909, over mud on the south slope of Irazu, by Dr. P. P. Calvert. One female from the Rio Siquiaries, Turrucare, C. R., on Dec. 19, 1909. The specimens from Irazu are much larger than the type but undoubtedly belong to this same species.

Genus **RHIPIDIA** Meigen.Subgenus **Conorhipidia** new subgenus.

I propose this new subgeneric term for those species of the genus in which the mesonotal præscutum is produced dorsad into a prominent conical protuberance. Two species are known to me, *conica* Alexander, which is the type of the subgenus, and the smaller form described below as *punctipennis*.

Rhipidia (Conorhipidia) punctipennis new species.

Thoracic mesonotum produced into a conical point; wings with dark markings small and sparse.

Female, length, 5.3-5.6 mm.; wing, 6.8 mm.

Female.—Rostrum and palpi dark brown; the antennæ light brown with pale hairs, the petioles of each segment pale. Head light gray.

Pronotum and cervical sclerites brown. Mesonotal præscutum with a conspicuous conical protuberance as in the subgenus; pale yellow in front, rich brown behind the conical point; scutum, scutellum and postnotum brown. Pleuræ light yellow, except the meso- and meta-pleuræ above the coxæ, which are brown; a shiny brown spot before the root of the wing and another near the stigma. Halteres pale, the knob scarcely darker. Legs, fore coxæ yellow, hind and middle coxæ brown; trochanters, femora and tibiæ light yellow, the tarsi a little more darkened. Wings pale yellowish hyaline with a few scattered brown dots as follows: one at the origin of *Rs*; one on crossvein *r*; one at the base of *R* 4 + 5; one at the fork of *Cu* on *Cu* 1, indistinct dots at the tips of the veins; a rounded brown spot before the tip of *2d anal*. Venation as in fig. 1.

Abdomen yellowish brown with a row of about five brown marks on the pleuræ, the most anterior of which is very small, rounded.

Holotype, ♀, Rio Siquiaries, Turrucare, C. R., alt., 2,200 ft.; Aug. 14, '09; (Dr. P. P. Calvert).

Paratype, ♀, with the type.

Type in the collection Acad. Nat. Sci. Phil.; the paratype in the author's collection. The shape of the thorax, from the side, is shown in Fig. 10.

Rhipidia (Arhipidia) domestica Osten Sacken.

One male and two females from near Cartago, C. R., altitude 5,000 ft.; Dec. 15, '09; they were taken on the south slope of Irazu, over mud. One male from Cartago, Oct. 27, '09.

Rhipidia (Rhipidia) calverti Alexander.

The type, a male, was taken at Bonnefil farm, Rio Surubres, C. R., alt. 700 feet; Oct. 29, '09, by Dr. Calvert.¹

Rhipidia (Rhipidia) costalis Williston.

One very small female of this species from Rio Siquiares, Turrucas, C. R., alt. 2,200 ft., Aug. 14, '09. This is the first representative of the species that I have seen and a figure of its venation is herein included (Fig. 2). The basal deflection of Cu_1 is at the fork of M as in this group of species.

Genus GERANOMYIA Haliday.

Geranomyia tristis Loew.

Two specimens, one of each sex, from Cache, C. R., Mar. 3, '10.

Geranomyia sp.

One female from Alajuela, C. R., alt. 3,100 ft., Sept. 15, '09. The specimen is of a small reddish form with hyaline wings but the condition of the material forbids closer determination.

Tribe ANTOCHINI.

Genus TEUCHOLABIS Osten Sacken.

Teucholabis trifasciata Enderlein.

One female of this species from Alajuela, C. R., alt. 3,100 ft., Sept. 15, '09. As I have indicated in another paper, this species is the same as the *Linnobia bifasciata* of Fabricius.

Genus TOXORHINA Loew.

Toxorhina centralis Alexander.

One female from Cache, C. R., near a stagnant pool, bank of the Rio Reventazon; Mar. 10, '10.

¹ See Bull. Brook. Ent. Soc., Vol. 8, Oct. 1912, p. 8-10, fig. *d* and *h*.

Tribe ERIOPTERINI.

Genus RHABDOMASTIX Skuse.

Subgenus Rhabdomastix Skuse.

Rhabdomastix (Rhabdomastix) septentrionalis, new species.

Antennæ of the male very long; color of the body dark brown; the stigmal spot of the wings pale.

Male, length, 6 mm.; wing, 7 mm.; antennæ (only twelve segments remaining) 15.5 mm.

Male.—Antennæ with the basal segment very large, light brown, flagellum yellowish brown. Head brown with a light gray bloom.

Mesonotum dark brown, the pseudosutural fovea not conspicuous; scutum, scutellum and postnotum light brown. Pleuræ light brown with a sparse grayish bloom. Halteres pale yellow. Legs, coxæ, brown with a sparse gray bloom, trochanters dull yellow, femora dull yellow, tibiæ light brown, tarsi brown. Wings light gray, stigma oval, gray, rather indistinct, veins dark brown. Venation (see fig. 3): $R\ 2 + 3$, long, rather longer than vein $R\ 2$ alone.

Abdomen dark brown, the apical margins of the sclerites paler, brown; hypopygium yellowish.

Holotype, male, Alajuella, C. R.: alt. 3,100 ft.; Sept. 15, '09 (Dr. P. P. Calvert).

Type in the collection Acad. Nat. Sci. Phil.

Related to *R. (R.) illudens* Alexander (Bolivia)¹ but much smaller and dark brown in color, the thorax not clear gray with prominent pseudosutural foveæ. This is the most northerly representative of the subgenus yet made known.

Genus GNOPHOMYIA Osten Sacken.

Gnophomyia subhyalina Alexander.

One female from Alajuella, C. R., alt., 3,100 ft., on Sept. 15, '09, by Dr. Calvert.

Genus MOLOPHILUS Curtis.

Molophilus orion, new species.

Antennæ of the male moderately long; ventral appendage of the hypopygium in the shape of a long, paddle-like arm densely clothed with a brush of hairs on its inner face.

Male, length, 3.8 mm.; wing 4.4 mm.

Female, length, 4.4 mm.; wing 5 mm.

Male.—Rostrum and palpi brown; antennæ rather short, if bent backward not extending beyond the wing-root; the flagellar segments oval; antennæ brown covered with a dense pale pubescence; head grayish brown.

¹ Ent. News, 1914, Vol. XXV, pp. 210, 211; pl. 9, fig. 6.

Mesonotal præscutum grayish brown, the pseudosutural foveæ prominent, elongate, reddish brown; scutum, scutellum, postnotum and pleuræ grayish brown. Halteres rather long, uniform light yellow. Legs, coxæ and trochanters yellowish brown, femora and tibiæ similar, the tips of the individual segments not infuscated, tarsi brown. Wings rather uniform light yellow, the veins pale. Venation as in fig. 4.

Abdomen brown. Hypopygium about as in other species of the genus except the ventral appendage (see fig. 9) which here is long and slender, chitinized heavily, and having its inner or cephalic margin provided with a long dense brush of hairs. The anal lobe is provided with a dense covering of long pale hairs.

Female, similar but larger.

Holotype, male, Alajuela, C. R., alt. 3,100 ft., Sept. 15, '09 (Dr. P. P. Calvert).

Allotype, female, with the type.

Types in the collection Acad. Nat. Sci. Phil.

The numerous species of *Molophilus* bear a great superficial resemblance to one another and most of the species can only be separated by a comparative study of the male genitalia. The ventral apical appendage is heavily chitinized and very various in shape in the different species and offers the best criterion for specific determination. The only other Central American *Molophilus* described is *M. guatemalensis* Alexander¹ which I have figured in Entomological News, Vol. XXV, pl. 9, fig. 3, 1914; as shown by the figure, the ventral appendages of the two species are entirely different.

Genus **ERIOPTERA** Meigen.

Subgenus **Mesocyphona** Osten Sacken.

Erioptera (Mesocyphona) parva Osten Sacken.

Two males and two females from Alajuela, C. R., Sept. 15, '09.

Erioptera (Mesocyphona) caloptera femoranigra Alexander.

Many specimens of both sexes, including the type material, from Juan Vinas, C. R., July 21, '09; they were attracted to a light on a rainy evening. Also from Cache, C. R., near the Rio Reventazon alt. 3,450 ft., Mar. 4, '10, and at Alajuela, C. R., alt., 3,100 ft., Sept. 15, '09, one female specimen. Eleven specimens from the type locality now before me have the dark bands on the femora much paler and less intense, but undoubtedly belong here.

¹ Proc. U. S. Nat. Mus., Vol. 44, p. 511, 1913.

Genus **GONOMYIA** Meigen.

Subgenus **Leiponeura** Skuse.

Gonomyia (Leiponeura) recurvata, new species.

Pleuralis group; male hypopygium having two chitinized points on the pleurites; dorsal gonapophyses long, slender, almost straight; ventral gonapophyses bent cephalad.

Male, length, 4.4 mm.; wing, 3.7 mm.

Female, length, 5.7 mm.; wing, 5 mm.

Male.—Rostrum and palpi brown; antennæ with the basal segments yellow with a faint brown suffusion, flagellum brown; head pale yellowish.

Mesonotal præscutum light brownish orange, the lateral margin very pale yellow separated from the orange by a very narrow dark brown line which is not apparent in front; scutellum pale, whitish, with a brown median line. Pleuræ having the pale line that is enclosed by the pleural stripes very pale, almost white, the lower dark pleural stripe broad. Halteres light brown. Legs, coxæ and trochanters very pale, femora light brown with a broad, indistinct subapical ring, the tip rather broadly pale; tibiæ and tarsi light brown. Wings subhyaline, the stigmal spot very large, rounded-oval, dark brown, veins brown.

Abdominal tergites light yellow, the extreme tip and base of each segment conspicuously dark brown; sternites more uniformly dark brown. Hypopygium with the pleural pieces rather stout, the dorsal fleshy appendage long, slender, very pale; the ventral appendage is enlarged at its base and near the tip bearing a prominent chitinized tooth which is directed outward; at the tip of the lobe are several bristles and before the chitinized portion there is a shorter conical tooth on the outer or caudal margin of the lobe, this tooth being very pale, subhyaline. The ventro-lateral margin of the pleurite is produced caudad into a long, slender chitinized rod which is directed toward the chitinized tooth described above. The dorsal gonapophyses (see Fig. 6, *e*): are very long, slender, straight, lying parallel to one another and diverging only at the tips which are more chitinized. The guard of the penis (*g*) is very long, slender, extending about to the point of divergence of the dorsal gonapophyses. The ventral gonapophyse (*f*) is rectangular with two short teeth at the tip. The whole organ is recurved cephalad and the tips lie against the flaring margin of the 9th sternite.

Female, similar to the male but larger, the yellow color of the abdominal tergites not so apparent.

Holotype, male, Alajuela, C. R.; alt. 3,100 ft.; Sept. 15, '09 (Dr. P. P. Calvert).

Allotype, female, near Cartago, C. R.; alt. 5,000 ft.; Dec. 15, '09; south slope of Irazu, over mud (Dr. P. P. Calvert).

Paratypes, male, with the holotype in the author's collection. Female, Laguna near Cartago; Feb. 26, '10.

Type in the collection Acad. Nat. Sci. Phil.

Gonomyia recurvata differs from its nearest described relatives, *amazona* Alexander and *pleuralis* Williston in the male hypopygium, the two chitinized appendages to the pleurites, the extremely elongate and straight dorsal gonapophyses and the remarkable recurved ventral gonapophyse.

Gonomyia (Leiponeura) calverti, new species.

Puella group; basal antennal segments tinged with brown; male hypopygium without a recurved ventral hook; ventral portion of the hypopygium with two rounded, flattened lobes each of which bear 8 or 9 chitinized teeth.

Male, length, 3.4 mm.

Male.—Rostrum and palpi brown; the enlarged basal segments of the antennæ brown, not orange, flagellum light brown.

Mesonotal præscutum very light grayish brown without distinct markings; the pronotum, a narrow lateral margin to the præscutum and the median line of the scutellum yellowish; scutum and postnotum light brown; scutellum yellow, more brown at the base. Pleuræ without distinct stripes. Halteres light brown, the knob yellow. Legs, light yellowish brown, the individual segments scarcely darkened at tip. Wings subhyaline with iridescent reflexions, veins brown, stigma lacking.

Abdomen light brownish yellow, the tergites rather darker than the sternites. Hypopygium having the pleural pieces (fig. 7) long, slender, slightly curved, clothed with sparse long hairs; the tip is suddenly narrowed, more chitinized and ending in two long curved bristles. Ventrad of the pleurites is an enlarged cylindrical tube which is produced dorsally into a long obtuse point, and ventrally into two hand-like flattened organs armed with 8 or 9 chitinized teeth as shown in fig. 8, *d*; these flattened organs are directed ventrad and entad. From inside this genital chamber, near the dorsal wall project two subchitinized elongate flattened appendages (*c*).

Holotype, male, Alajuela, C. R.; alt. 3,100 ft.; Sept. 15, '09 (Dr. P. P. Calvert).

Type in the collection Acad. Nat. Sci. Phil.

This species is similar to *puella* Williston in its pleural and wing patterns but the basal segments of the antennæ are suffused with brown and the hypopygium is very different from that shown in Williston's figure¹ which shows a prominent recurved ventral hook.

Tribe LIMNOPHILINI.

Genus LIMNOPHILA Macquart.

Limnophila guttulatissima Alexander.

One female from Cartago, C. R., along a ditch on Feb. 26, 1910.

¹ Trans. Ent. Soc. Lond., 1896, pp. 288, 289, pl. 10, fig. 60 a.

Tribe HEXATOMINI.

Genus **ERIOCERA** Macquart.**Eriocera exquisita** new species.

Wings uniform dark brown; color entirely reddish orange except the mesonotum which is dark brown; no black on abdomen.

Male, length, 11.6-13 mm.; wing, 11.5-12.4 mm.

Male.—Rostrum reddish brown; palpi short, basal segment orange, tip brown; first segment of the antennæ orange, second segment light reddish brown; flagellum dark brown; head orange, the frontal tubercle small, scarcely notched in front.

Pronotum light yellowish orange. Mesonotal præscutum dark chestnut brown on the sides, the middle line broadly paler, brightest, almost orange, in front, indistinctly divided by a median line; scutum dark brown; scutellum and postnotum yellowish orange. Pleuræ light orange yellow. Halteres black. Legs, coxæ yellow, trochanters, femora, tibiæ and tarsi brown. Wings uniform dark brown, veins brown. Venation as in fig. 5.

Holotype, male, Alajuela, C. R.; alt. 3,100 ft.; Sept. 9, '09 (Dr. P. P. Calvert).

Paratypes, 2 males, with the type.

Type in the collection Acad. Nat. Sci. Phil.; one paratype in the author's collection.

Subfamily TIPULINÆ.

Tribe DOLICHOPEZINI.

Genus **BRACHYPREMNA** Osten Sacken.**Brachypremna dispellens** Walker.

One male from Bonnefil farm, Rio Surubres, C. R.; alt. 700 ft.; Oct. 19, '09 (Dr. P. P. Calvert).

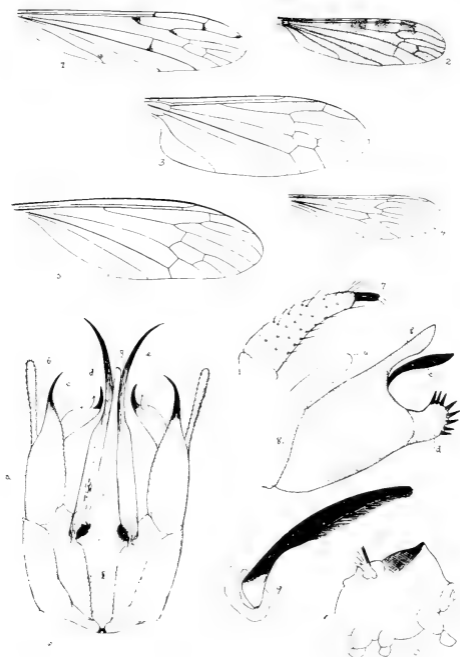
Tribe TIPULINI.

Genus **TIPULA** Linnæus.**Tipula obliquefasciata** Macquart.

One female from Cachi, C. R.; Mar. 8, '10.

EXPLANATION OF PLATE 2.

- Fig. 1. Wing of *Rhipidia* (*Conorhipidia*) *punctipennis* n. sp.
 Fig. 2. Wing of *R.* (*Rhipidia*) *costalis* Williston.
 Fig. 3. Wing of *Rhabdomastix* (*Rhabdomastix*) *septentrionalis* n. sp.
 Fig. 4. Wing of *Molophilus orion* n. sp.
 Fig. 5. Wing of *Eriocera exquisita* n. sp.



Costa Rican Tipulidae.

Fig. 6. Hypopygium of *Gonomyia (Leiponcurea) recurvata* n. sp. Ventral aspect; *a*, pleural pieces; *b*, dorsal apical appendage; *c*, ventral apical appendage; *d*, intermediate apical appendage; *e*, dorsal gonapophyse; *f*, ventral gonapophyse; *g*, penis-guard.

Fig. 7. Hypopygium of *G. (L.) calverti* n. sp. Dorsal aspect of the pleurite.

Fig. 8. Same as last. Lateral aspect of the end of the abdomen. *a*, pleurites from the side; *b*, dorsal wall of the genital chamber; *c*, gonapophyse; *d*, ventral arms.

Fig. 9. Hypopygium of *Molophilus orion* n. sp. Ventral aspect of the ventral apical appendage.

Fig. 10. Thorax of *Rhipidia (Conorhipidia) punctipennis* n. sp. Lateral aspect showing the conspicuous dorsal protuberance.

A REVISION OF THE AMERICAN SPECIES OF
TANYPREMNA OSTEN SACKEN AND MEGIS-
TOCERA WIEDEMANN. (TIPULIDÆ,
DIPTERA.)¹

BY CHARLES P. ALEXANDER,

ITHACA, N. Y.

This paper is presented in order to complete the American species of the Dolichopezini that are allied to *Megistocera* Wiedemann. These genera are *Brachypremna* Osten Sacken which has been taken up by the author in an earlier paper (Journ. N. Y. Ent. Soc., vol. XX, p. 225-236, 1912), *Tanypremma* Osten Sacken and *Megistocera* Wiedemann which will be considered in the present paper in the order named. A key to the Dolichopezine genera of the world is given in *Psyche*, vol. XIX, p. 64, 1912.

I am indebted to Mr. Frederick Knab for the loan of the material in the United States National Museum; to Mr. E. T. Cresson, Jr., for the specimens in the Philadelphia Academy of Sciences; to Mr. C. W. Johnson for a *Tanypremma* taken on the Mann expedition to Brazil; to Dr. F. H. Lutz for the material in the American Museum of Natural History; and to Mr. John Thomas Lloyd for the species of *Tanypremma* herein described as new.

¹Contribution from the Entomological Laboratory of Cornell University.

TANYPREMNA Osten Sacken.

1886. *Tanypremna* Osten Sacken; Biol. Cent. Am., Dipt., vol. 1, p. 19 (*opilio*).

1912. *Stegasmonotus* Enderlein; Zool. Jahrb., vol. 32, pt. 1, p. 11 (*longissimus*).

1912. *Pehlkea* Enderlein; l. c., p. 15 (*columbiana*).

The genus *Tanypremna* was erected in 1886 by Osten Sacken to receive the then unique species, *opilio*, of Guatemala. The following year the same author described *T. manicata* from Brazil. In a recent paper Dr. Enderlein has erected two new genera which must be considered synonymous with *Tanypremna* and the two types make the third and fourth American species. The *Tipula longipes* of Fabricius is now known to be a member of this genus, while the new form herein described as *Tanypremna regina* is the sixth species to be made known. The species most closely allied to the genotype, *opilio*, are *columbiana* which Enderlein made the type of a new genus, *Pehlkea*, and the new species, *regina*. *T. columbiana* Enderlein has a strong supernumerary cross-vein in cell *M*, this latter character being also found in *regina*, which, moreover, possesses a considerable series of such veins and spurs of veins in both of the basal cells. This character of supernumerary cross-veins is one which has been over-emphasized in the past in the formation of genera and it is doubtful whether even subgeneric rank should be given to the majority of such forms. The extreme plasticity of these characters is shown in such genera as *Cladura*, *Gnophomyia*, *Tricyphona*, and others, in which these supernumerary cross-veins may be present or absent in the two wings of a single specimen. In the various subgenera of *Limnophila* such as *Ephelia*, *Idioptera*, *Dicranophragma*, etc., which possess these supernumerary cross-veins in all specimens, it is known and appreciated that these groups are scarcely of subgeneric value. Considering the very close relationship existing between *opilio*, *columbiana* and *regina*, and taking into account the plasticity of the characters used in their diagnosis, I am unwilling to consider the forms as representing more than very well-defined species of this genus, *Tanypremna*.

The species of *Tanypremna* appear to be quite uncommon and not often picked up by collectors. This is well shown by the fact that each species was founded upon a single specimen and scarcely a dozen specimens are known to be in existence in the various museums.

CHARACTERS OF THE GENUS.

Frontal prolongation of the head very short and stout, about as deep as long; the nasus long and prominent, clothed at the tip with long hairs; palpi with the last segment longer than any of the others. Antennae very short, the basal segments larger, the flagellar segments oval, more elongated toward the end. Front very broad between the eyes with no protuberance.

Prothorax viewed from the side very narrow, the scutellum closely applied to the mesonotal præscutum and the head, in turn, closely applied to this. Mesonotal præscutum very gibbous, partly or almost entirely concealing the head when viewed from above. Halteres long and slender. Legs very long and slender, the tarsi especially being excessively elongated.

Wings with vein Sc long, Sc_1 persistent at the wing-margin and quite close to R_1 at its tip; Rs short, usually arcuated but sometimes straight though never so square at the origin as in *Brachypremna*; R_2 usually distinct, oblique, rarely vertical as in *Brachypremna*. Second anal vein usually long and not ending close in the anal angle of the wings. In *longipes* Fabricius, R_2 is swung proximad at its tip so that it is very close to R_1 at the wing-margin; Rs is oblique, straight and second anal is rather short. *T. columbiana* has a strong supernumerary cross-vein in cell M_1 and *T. regina* has this cross-vein and spurs of many other in the basal cells.

Abdomen elongated, in the females of some species, excessively long and slender.

Coloration.—Usually light yellow, the thoracic dorsum dark brown, the pleurae yellow with brown transverse bands. Legs brown, the segments having more or less white. Wings usually subhyaline with the veins indistinctly seamed with darker, rarely the whole disk marbled with darker.

A KEY TO THE AMERICAN SPECIES OF TANYPREMNA OSTEN SACKEN.

1. Tibiæ with more or less white before or at its tip.....2
 Tibiæ with the base abruptly white but the remainder of the segment dark colored4
2. First tarsal segment broadly white medially, dark at both ends; remaining tarsal segments entirely white; [radial sector of the wings short, straight, oblique, forming a V with the deflection of R_{2+3}]. (Guiana, Brazil.)
longipes Fabricius.
- Tarsal segments one and two tipped with white.....3

3. Wings hyaline with the apical veins seamed with brown; [abdomen very long, slender; length of the body of the female over 50 mm.]. (Brazil.)

longissima Enderlein.

Wings pale brown with a darker brown stigma; [body less elongate, the tip of the abdomen of the type and only known specimen is broken and the length can not be accurately determined; it was estimated to be 14 mm. by Osten Sacken; some brown on the third tarsal segment]. (Brazil.)

manicata Osten Sacken.

4. No supernumerary cross-vein in cell *M*. (Guatemala, Venezuela.)

opilio Osten Sacken.

A supernumerary cross-vein in cell *M*.....5

5. Wings with the seaming limited, confined to the cord and the supernumerary cross-vein in cell *M*; wing of the male 18.5 mm. (Colombia.)

columbiana Enderlein.

Wings heavily marbled with brown in almost all the cells; wing of the male 22 mm. (Colombia.).....*regina* n. sp.

Tanypremna longipes Fabricius.

1805 *Tipula longipes* Fabricius; Syst. Antl., p. 25. 1821 *Tipula longipes* Wiedemann; Dipt. exot., vol. 1, p. 37, 41. 1828 *Tipula longipes* Wiedemann; Aussereur. zweifl. Ins., vol. 1, p. 43. 1834 *Tipula longipes* Macquart; Suite à Buffon, vol. 1, p. 82. 1900 *Tipula longipes* Hunter; Trans. Am. Ent. Soc., vol. 26, p. 286. 1902 *Tipula longipes* Kertész; Cat. Dipt., vol. 2, p. 293. 1912 *Stegasmonotus longipes* Enderlein; Zool. Jahrb., vol. 32, pt. 1, p. 13. 1913 *Tanypremna longipes* Alexander; Proc. U. S. Nat. Mus., vol. 44, p. 487.

Female, length 24 mm.; wing, 12.6-12.8 mm.; abdomen, 20.1-20.2 mm.

Fore leg, femur, 9.6 mm.; tibia, 12.4 mm.; tarsus 1, 15.5 mm.; tarsus 2 to 5, 8.1 mm.

Hind leg, femur, 12 mm.; tibia, 13 mm.; tarsus 1, 16.4 mm.; tarsus 2 to 5, 10.6 mm.

Frontal prolongation of the head short, pale dull yellow, the nasus rather long with a brush of hairs at the tip; lower part of the rostrum dark, blackish; palpi with the two intermediate segments pale, the first and last being dark colored, the latter named segment very long. Antennæ short, the scapal segments and the base of the first flagellar segment pale, yellowish, remainder of the antennæ dark brownish black. Front pale yellowish white, on the vertex passing into brown, the occiput dark.

Pronotal scutum broadly dark brown medially, paler on the sides. Mesonotal præscutum dark brown, medially this color extending to the extreme cephalic margin which is darkest, the space in front of the dark mark on the pseudosuture described below is very pale, almost

white; the præscutum with deep impressed lines extending from the pseudosutural foveæ caudad to the transverse suture; a dark brownish black mark at the humeral angle of the sclerite extending ventrad onto the pleuræ; scutum dark brown, a little paler medially; scutellum and postnotum brown, the latter a little paler on the sides. Pleuræ pale, yellowish white, with a broad brown stripe extending from the humeral angle of the præscutum ventrad and caudad across the mesopleuræ, splitting near the base of the fore coxa, the anterior fork broad suffusing the sides of the mesosterna and the base of the mesocoxæ. Halteres long and slender, the stem pale brown, the knob dark. Legs with the coxæ pale except the mesocoxæ as described above; fore legs with the trochanters having a decided green cast, femora dark brown, the base pale, tibia with the base broadly pale, about equal in width to the black apical ring, a rather broad white subterminal band; metatarsus dark brown, the white medial band a little broader than the dark basal ring, remainder of the tarsi white. Hind legs with the femora brown, the tibiæ with the basal three-fifths dark brown, the remainder snowy white excepting a broad dark brown tip; metatarsus white except the broad brown base and apex; remainder of tarsi pure white. Wings usually with a light brown tinge, in some more nearly hyaline, and the costal cell brown; stigma dark brown, the cord more indistinctly seamed with brown. Venation as in fig. 1: R_s oblique, short and straight; the deflection of R_{2+3} arcuated, forming a V with the end of the sector; R_1 short and showing a tendency to atrophy; basal deflection of R_{4+5} lacking.

Abdominal tergites 2 to 4 brown with a broad white basal blotch on the sides and a broad white blotch on either side beyond the middle, the extreme lateral margin of the sclerite narrowly blackish brown; apical tergites uniformly dark brown. Sternites dull yellow, the ovipositor reddish brown.

Distribution.—British Guiana, Upper Potaro River, July 17, 1911. (Crampton.) Specimen, a female, in the collection of the American Museum of Natural History. Brazil, Manaus (Mann). Specimen a female in the collection of Mr. C. W. Johnson.

Tanypremna longissima Enderlein.

1912. *Stegasmonotus longissimus* Enderlein; Zool. Jahrb., vol. 32, pt. 1, p. 11, 12.

Female, length, 55 mm.; wing, 22.5 mm.; abdomen, 48.5 mm.

Fore leg, femur, 11.5 mm.

Middle leg, femur, 16 mm.; tibia, 18.5 mm.; tarsus 1, 22 mm.; 2, 10.75 mm.; 3, 6 mm.

Hind leg, femur, 19 mm.; tibia, 22 mm.; tarsus 1, 20 mm.; 2, 10.5 mm.; 3, 5.5 mm.

Head whitish; occiput for the most part blackish brown, vertex pale brownish. Prolongation of the frontal part of the head scarcely one-quarter as long as the remaining length of the head. Palpi greenish, the last segment greyish black. Antennæ short (2.25 mm. long) very thin and delicate, 13-segmented, pale, the tips of the very slender flagellar segments grey, the last five flagellar segments entirely grey; basal segments greenish; at the end of each flagellar segment rather long fine hairs, somewhat verticillate. Forehead broad; tubercle lacking.

Thorax gibbous, extending far forward and projecting over the head so that viewed from above nothing is to be seen of the latter. Thoracic dorsum dark brown, a broad seam in front; a narrower seam on the sides up to the wing-root yellowish white; the dark brown color extends to the cephalic margin as a moderately broad stripe. Praescutum with a somewhat elevated blackish-brown median line. Scutum brown, very level. Postnotum long, brown, whitish yellow on the sides with an impressed crossline on the middle which forms an obtuse angle medially (concave in front) and from this angle sends out an impressed longitudinal line backward. Metapleuræ greyish brown. Prothorax greyish brown medially, whitish elsewhere. Abdomen extremely long and slender, dark brown above, ochre-yellow beneath, on the middle of the tergites one to three there is a sharp pale crossline, on tergites four to seven a light spot on each side of the middle; eighth segment short, scarcely one and one-half times as long as broad; genital segment with the moderately elongated and rather powerful ovipositor reddish brown, polished, smooth, and 6 mm. long. Fore femora pale greyish green with a narrow brown ring before the tip. Middle legs blackish brown, the tibiæ with a very broad white ring before the tip; almost the apical half of tarsal segments one and two white, the third tarsal segment entirely white, remaining segments broken. Hind femora reddish yellow, darker brown at the tip; tibiæ blackish brown with a broad

white ring before the end; tarsal segments one and two blackish brown with somewhat more than the apical half white; remaining tarsal segments white. Claws small, reddish brown. Halteres with the pedicel long, yellowish brown, the knob brown. Wings hyaline, veins dark brown. All veins on the apical quarter of the wings seamed with pale brown, all of the cross-veins and deflections of veins brown and more broadly seamed. R_2 very short and ends close to R_1 (on the left wing R_2 is quite lacking); Cu_1 in punctiform contact with cell 1st M_2 ; R_s short, not longer than R_2 . Membrane very smooth but with greenish reflections only at the tip.

Distribution.—Brazil, Espiritu Santo.

Translated from the original description.

Tanypremna manicata Osten Sacken.

1887. *Tanypremna manicata* Osten Sacken; Berl. Ent. Zeitschr., vol. 31, pt. 2, p. 240.

1902. *Tanypremna manicata* Kertész; Cat. Dipt., vol. 2, p. 265.

Yellowish brown, thoracic dorsum with three almost confluent brown stripes; brown spots on the metanotum. Antennæ pale yellow, darker towards the tip; halteres brownish yellow; abdomen yellowish brown (tip broken). Legs dark brown, but femora paler; a small white ring before the tip of the tibiae; three successive white rings at the end of tarsal joints one, two and three. Wings with a pale brownish tinge; stigma brown.

Habitat.—Brazil (discoverer, Sellow); a single specimen in the Berlin Museum; sex uncertain, as the tip of the abdomen is broken off. The length, when the abdomen is entire, must be about 14 mm. The number of joints of the antennæ is certainly more than eleven (this number I counted in *T. opilio*).

The above is taken verbatim from Osten Sacken's original description; the type specimen seems to be the only one so far taken.

Tanypremna opilio Osten Sacken.

1886. *Tanypremna opilio* Osten Sacken; Biol. Cent. Amer., Dipt., vol. 1, p. 19, pl. 1, f. 2.

1887. *Tanypremna opilio* Osten Sacken; Berl. Ent. Zeitsch., vol. 30, pt. 2, p. 164.

1902. *Tanypremna opilio* Kertész; Cat. Dipt., vol. 2, p. 265.

Male, length, 23.4 mm.; wing, 18 mm.; abdomen, 20.4 mm.

Fore leg, femur, 12.8 mm.; tibia, 15.3 mm.; metatarsus, 24.2 mm.

Hind leg, femur, 14.5 mm.; tibia, 15 mm.

Female, length, 26.2 mm.; wing, 18.3 mm.; abdomen, 22.2 mm.

Hind leg, femur, 13.9 mm.; tibia, 13.8 mm.; metatarsus, 18.7 mm.

Frontal prolongation of the head yellow, the nasus long, clothed with dark hairs; the palpi and lips dark brown. Antennæ with the basal segments yellow, flagellum black, antennæ with thirteen segments (not eleven as given by Osten Sacken). Head light yellow except a linear brown blotch on the vertex along the inner margin of each eye.

Pronotal scutum brownish black, this color produced ventrad onto the propleuræ and including the anterior face of the pro-coxa. Mesonotal præscutum deep chocolate brown, darkest in front, with three very narrow darker lines, one median, the other two lateral. A yellow patch on the sides of the sclerite in front, before the pseudosutural fovea; a dark brownish black stripe begins at the pseudosuture and traverses the mesopleuræ, ending on the anterior face of the mesocoxa, scutum, scutellum and postnotum dark chocolate brown, the latter with a pale, narrow median line. Pleuræ light yellow with the vertical brown bands as described above; sides of the postnotum and the caudal face of the metacoxæ brownish black. Halteres very long, dull yellow, the knob brown. Legs with the coxæ as described above, trochanters greenish yellow, femora brownish black, tibiæ brownish black with the extreme base rather broadly white, tarsi white. Wings with a rather uniform light brown suffusion, stigma dark brown; the veins seamed with a light greyish brown. Venation as in fig. 2.

Abdominal tergites brown, the lateral margins of the sclerites rather broadly black which color runs across the dorsum as a sub-apical band; extreme apices of the basal tergites paler; the terminal tergites uniformly dark brown. Sternites dull yellow with an apical annulus of black and in the terminal segments a medial band also; the eighth segment black; hypopygium reddish.

Distribution.—Guatemala, Cacao, Alta, Vera Paz, April 23 (Schwarz and Barber); Purula, Vera Paz; altitude, 5,000 feet (Champion). Venezuela, Cariaquito, Jan. 22, 1911 (S. Brown).

The specimen from Cacao is a female in the U. S. National Museum collection. The Purula specimen is Osten Sacken's type. The Venezuela material consists of a fine pair in the collection of the American Entomological Society, Philadelphia.

This is the only species concerning which we have any ecological

data; the note by Champion who collected the type, tell us that the insect lives in the humid forest regions of the mountains (5,000 feet).

Tanypremna columbiana Enderlein.

1912. *Pehlkea columbiana* Enderlein; Zool. Jahrb., vol. 32, pt. 1, p. 15, fig. B.

Male, length, 27 mm.; wing, 18.5 mm.

Hind leg, femur, 15.75 mm.; tibia, 13 mm.

Head yellow; eyes very large, black, almost semicircular; occiput somewhat infumed. Front narrow, half as broad as the diameter of the eyes. Antennæ very small and short, about 1.75 mm. long, dark brown, the basal segments yellow. Palpi black, the apical segment with the exception of the base brownish yellow. Nasus long, pubescent at the end and somewhat propped.

Thoracic dorsum dark brown, sternites, pleuræ and coxæ bright brownish yellow; humeral angles of the præscutum bright brownish yellow; a similar spot before the wing-base. Before this latter a rather broad brown band extends from the margin of the thoracic dorsum through the middle of the mesopleuræ, ending on the meso-coxæ which are thus infumed on their outer face. The sides of the prothorax brown, fore coxæ browned on their outer face. Legs with the trochanters bright yellowish, hind femora dark brown, pale yellowish at the base; tibiæ dark brown, the basal eighth yellowish white; first tarsal segment black, the second yellowish white; the remaining segments as well as those of the fore and middle legs broken off. Abdomen long, brown, the tip somewhat enlarged and darkened, the incisures rather brightened. Halteres greyish black, pedicel very long, brownish yellow and with yellowish pubescence. Wings rather narrow at the base for a rather long space, very narrow; bright brownish, a brown spot at the base of the radial fork, a rounded blackish brown spot at the stigma, the caudal veins of cell $1st M_2$, the basal deflection of Cu_1 seamed with brown, the super-numerary cross-vein between M and Cu broadly seamed with brown; proxima of the base of M a small hyaline spot. Membrane strongly red to green iridescent.

Distribution.—Colombia, Hacienda Pehlkea.

Translated from the original description.

Enderlein's figure shows a typical *Tanypremna* with the exception that the tip of R_1 is omitted in the figure; whether it is also lacking

in the type is another question but if such is the case its disappearance may be accounted for by atrophy. In any case there is a considerable error in Enderlein's interpretation of the veins in the radial field of the wing; the vein labelled R_1 should, of course, be R_2 , the part spoken of as the radial cross-vein is the basal deflection of R_2 and the part called R_{2+3} is R_2 alone. The wing is shown in fig. 3, taken from Enderlein's original description of the species.

Tanypremna regina new species.

Large species, wing of the male, 22 mm.; wing heavily marked with brown; supernumerary cross-veins in the basal cells of the wing; tibiae white at the base.

Male, length, 28.2 mm.; wing, 22 mm.; abdomen, 23.5 mm.

Fore leg, femur, 12.7 mm.

Hind leg, femur, 15.7 mm.; tibia, 15.1 mm.; metatarsus, 24.8 mm.

Frontal prolongation of the head very short, the nasus long and slender, dark brown; sides of the rostrum more yellowish; palpi dark brownish black. Antennae with the two basal segments light yellow, the flagellum broken. Front light sulphur-yellow; vertex and occiput dark brown, paler along the inner margin of the eyes and with a narrow median line.

Pronotum with the scutum narrow and high, projecting dorsad as a sharp collar, the scutum dark brown, remainder of the pronotum yellow. Mesonotal præscutum light yellowish brown with four darker brown stripes, the middle pair being longest, narrowed in front and behind, very dark brownish black on the extreme cephalic margin; lateral stripes shorter, beginning at the pseudosutural foveæ and running caudad to the suture, connected with the middle stripes except behind; scutum and scutellum broken; postnotum dark brown, more yellowish medially behind. Pleuræ yellowish with a green caste, a small oval brownish black spot behind the head at the end of the pronotal scutum; a broader dark brown mark running from the base of the wing ventrad to the base of the mesocoxa whose posterior face it suffuses. Halteres long, slender, green in color. Legs with the coxæ light brownish yellow except the dark mark on the mesocoxa described above; trochanters greenish; femora brownish yellow, the tip broadly dark brown; tibiae (only the posterior pair remaining) with the extreme base white and having a decided green caste, remainder of the tibiae dark brown; the first tarsal segment pale, almost whitish, basally soon darkening to a light brown that includes the remainder of the tarsi. Wings subhyaline in the radial and medial cells, cell *C* brighter, more yellowish, the anal cells greyish brown, a row of brown blotches in cells *R* and *M*, each one surrounding the spur of a cross-vein, there being about five in cell *R* and three in cell *M*; the cord is seamed with darker brown as are also most of the veins and deflections of veins; stigmal spot a little darker brown. Venation as in figure 4; the presence of a supernumerary cross-vein in the basal cells is a feature that, in this subfamily of crane-flies, occurs only in the Dolichopezini; the numerous spurs of cross-veins in the basal cells is a very remarkable feature.

Abdominal tergites reddish brown, the apex of each segment narrowly paler, greenish white, the apical tergites darker brown; lateral margin of the tergites narrowly dark brown. Sternites light yellow, the extreme apices of the sternites darker, the apical sternites uniformly darker brown.

Distribution.—Colombia, Cordillera Central.

Holotype, female, near La Vega which is about 12 miles north of Almaguer, March 6, 1912, at an altitude of about 7,000 feet. (John Thomas Lloyd, coll.)

This species is part of the Lloyd collection of Andean insects; the craneflies of this collection have been discussed in an earlier paper (Journ. N. Y. Ent. Soc., vol. 21, Sept., 1913). This specimen was not included in that article because it was in papers with butterflies and so was overlooked until very recently.

There can be but little doubt but that this fly is quite greenish in its living state as shown by the presence of decided green tints on the halteres, legs and thorax. Other species of this genus suggest this same condition to a much less degree. This form is by far the most beautiful of all the species described and it is believed that the specific name is not inappropriate. The presence of the numerous spurs of veins in the basal cells of the wings is quite remarkable. Since these spurs are surrounded by dark markings in every case, I believe these remnants to be constant or nearly so, and Dr. Needham and Dr. Johannsen who examined the wing, are of the same opinion. This presence of a dark marking about a vein or spur seems at first glance to be a trivial character but it is my belief that it is a character upon which considerable stress must be laid,—that is, that dark markings when present on a wing nearly always surround veins and the presence of a brown blotch in a cell may well indicate the position once occupied by a vein.

MEGISTOCERA Wiedemann.

1821. *Machistocera* Wiedemann; Dipt. Exot., p. 41.

1828. *Megistocera* Wiedemann; Aussereur, zweifl. Ins., vol. 1, p. 55.

The genus *Megistocera* contains a small restricted group of flies having a tropicopolitan distribution. There are about three species in the Old World and these are remarkable in the possession of enormously elongated antennæ in the male sex so far as known; the single New World form has short antennæ in both sexes.

CHARACTERS OF THE GENUS.

Frontal prolongation of the head rather long, the nasus prominent, with a bunch of long hairs at the tip. Terminal segment of the palpus elongate, whiplash-like. Antennæ rather long, at least as long as the head, the scapal segments enlarged, the flagellar segments six in number, elongate-cylindrical; in the New World species the antennæ are about as long as the head, in the males of the Old World forms (this sex of *M. bicauda* Speiser of Africa not yet described) the antennæ are enormously elongated. Eyes with delicate ommatidia; the vertex rather approximated between the eyes.

Pronotum not produced dorsad into a narrow plate as in *Tanyproctus*. Mesonotal praescutum not exceedingly gibbous or projecting over the head. Halteres rather long, the knob small. Legs very long and slender, especially the tarsi. Wings with the cross-vein *m-cu* present and long; basal deflection of R_{2+3} assuming a position that is nearly vertical or perpendicular. The Old World *fuscana* Wiedemann has a venation that is quite similar to that of our American form except that the cell *1st M*₂ is much smaller and cell *2nd A* very much broader.

Abdomen rather short, the male hypopygium simple; the valves of the ovipositor powerful, the lower valve arcuated basally, the lower valves appressed against the upper pair.

Megistocera longipennis Macquart.

1838. *Tipula longipennis* Macquart; Dipt. Exot., vol. 1, pt. 1, p. 57, pl. 5, fig. 1.
 1878. ?*Longurio longipennis* Osten Sacken; Cat. Dipt. N. Am., Ed. 2, p. 37.
 1885. *Tipula longipennis* Röder; Stett. Ent. Zeit., vol. 46, p. 338.
 1885. *Tipula tenuis* v. d. Wulp; Notes Leyden Museum, vol. 7, p. 7.
 1885. *Tipula tenuis* v. d. Wulp; Tijdschr. voor Entom., vol. —, p. 85, pl. 4, fig. —.
 1886. *Megistocera longipennis* Osten Sacken; Berl. Ent. Zeit., vol. 30, p. 161.
 1902. *Megistocera longipennis* Kertész; Cat. Dipt., vol. 2, p. 264.
 1902. *Tipula tenuis* Kertész; l. c., p. 309.
 1907. *Megistocera tenuis* Needham; Rept. Soc. Ent. N. Y., p. 212.
 1909. *Megistocera longipennis* Johnson; Proc. Bost. Soc. Nat. Hist., vol. 34, p. 123.

Male, length, 10 mm.; wing, 15.6 mm.

Middle leg, femur, 11.2 mm.; tibia, 10.6 mm.; metatarsus about 26 mm.

Female, length, 14.3 to 15 mm.; wing, 16 to 16.4 mm.

Fore leg, femur, 7.7 mm.; tibia, 8.6 mm.; metatarsus, 8.1 mm.

Middle leg, femur, 11.5 mm.; tibia, 10.6 mm.; metatarsus, about 24 mm.

Hind leg, femur, 10.5 mm.; tibia, 8.8 mm.; metatarsus, about 25 mm.

Frontal prolongation of the head short, light brown, the nasus pale with the apical brush of hairs dark, palpi black. Antennæ with the basal segments light yellow, the flagellar segments brownish black. Front dull yellowish brown, the vertex and occiput grey.

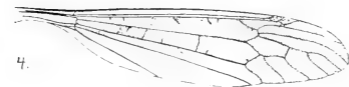
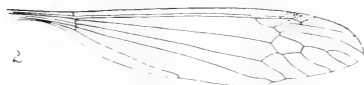
Mesonotum brownish grey, the lateral margin of the præscutum paler grey bordered interiorly by a narrow blackish line which is waved at the pseudosuture; scutum brownish grey with a brown blotch on each lobe; scutellum pale brown, on the sides dark brown and more shiny; postnotum light brown, more fuscous laterally. Pleuræ pale yellowish brown with a whitish bloom; a rounded shiny black spot at the dorso-cephalic angle of the mesoepisternum. Halteres pale brown, the knob dark brown. Legs with the coxæ pale, the outer faces somewhat browned. Wings whitish, veins brown; stigma conspicuous, oval, brown. Venation as in fig. 5.

Abdominal tergites dark brown, the extreme lateral margins broadly pale, the dorsum variegated with paler, the basal segments being paler medially, the apical four or five segments with the pale spots in two rows one on either side of the middle line; sternites pale.

Distribution.—Florida, Lake Okeechobee; reported^{ed} by Mr. C. W. Johnson from the Mus. Com. Zool. I have examined this same specimen on two different occasions and there can be no doubt as to the identity. Little River; Nov. 30, 1912, one male found in a spider's web by Mr. Knab. Cuba, Macquart's type. Porto Rico (Röder), Trinidad, June 13. Two males, three females, taken by August Busck; U. S. National Museum. British Guiana, Bartica, Dec. 5, 1912 to Jan. 18, 1913. Mallali on the Demerara R., Mar. 20, 1913 (Parish); collection of the author. Dutch Guiana, Van der Wulp's type of *tenuis*. Brazil, female from Ceara in Museu Rocha. Paraguay, Pedro Bay. April, H. H. Smith, collector; part of the Williston collection in the American Museum of Natural History in New York City.

EXPLANATION OF PLATE V.

- Fig. 1. Wing of *Tanypremna longipes* Fabricius.
Fig. 2. Wing of *Tanypremna opilio* Osten Sacken.
Fig. 3. Wing of *Tanypremna columbiana* Enderlein (after Enderlein).
Fig. 4. Wing of *Tanypremna regina* n. sp.
Fig. 5. Wing of *Megistocera longipennis* Macquart.



Tipulidæ.

The Biology of the North American
Crane-Flies (*Tipulidæ*,
Diptera)

I. THE GENUS *ERIOCERA* MACQUART

C. P. ALEXANDER AND J. T. LLOYD
ITHACA, N. Y.

The Biology of the North American Crane-Flies (*Tipulidæ*, *Diptera*)

I. THE GENUS *ERIOCERA* MACQUART

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INTRODUCTION

The tribe *Heratomyini*, one of the ten sections into which the Tipulid flies have been divided, is widely distributed in the north temperate and torrid zones. The dominant genus is *Eriocera*, containing nearly one hundred described species, most of which are tropical forms. No species have been described from Europe or the Australian region but elsewhere the genus is represented by a host of forms, the number of species becoming less as one goes north or south from the equator. The males of many of the species have the antennæ exceedingly elongated, extending backward twice the length of the body. The wing-coloration in the northern forms is sober, undiversified, but in the tropics the wings of many species take on a banded or spotted appearance that is quite unparalleled in any other group of crane-flies.

The immature stages of this remarkable group of insects were quite unknown hitherto. Van Roser (Verzeich. Wuerttemberg. Dipt., pt. 1, p. 262) states that the larva of *Heratomya* (= *Anisomya* of authors) live in the sand along the banks of streams.

The members of this tribe of insects seem to be easily recognized in all stages. The adult flies, although closely resembling the *Limnophilini* in venation, have the minimum number of antennal segments for the family, there being but six of these segments in *Heratomya* and not more than ten elsewhere in the

*Contribution from the Entomological Laboratory of Cornell University.

tribe. Other crane-flies have, as a rule, thirteen, fourteen or sixteen segments to the antennæ. The pupæ of the *Hexatomini* differ from all crane-fly pupæ known to the authors in the presence of six pairs of abdominal spiracles. The larvæ, in the powerful decussate mandibles, the great elongation of the maxilla and the feeble chitinization of the mental region present striking differences from other crane-fly larvæ.

Larval habitat—The larvæ and pupæ of the three forms reared occurred together in a gravelly sand-bank along Fall Creek near Forest Home, Ithaca, N. Y. The soil in which the species occurred varied from a gravel of rather coarse texture to a fine clay thickly penetrated by grass-roots. Earlier in the spring, full grown larvæ of *E. spinosa* have been found in Fall Creek, Coy Glen and other rapid streams about Ithaca, at which time they occurred beneath stones far out in the bed of the creek. It seems probable that most of the larvæ live in sand near the water's edge; that many could live beneath stones in the creek seems impossible considering the closeness of search by members of the Linnological classes during the past few years.

On the morning of April 30, 1913, Mr. Lloyd found adults of *E. longicornis* very common on the island in Fall Creek above the second bridge in Forest Home. They were swarming in numbers around the flowers of Willow (*Salix*), that grows commonly on the flat shore. On the morning of May 1, Dr. Needham and Mr. Alexander went up to this island to observe the feeding habits of the species. Very few of the adult flies were to be seen on the wing but the insect was emerging by the hundred, and pupæ, cast pupal skins and teneral adults were very common. The pupæ of *longicornis* occurred an inch or two beneath the surface of the gravel, projecting from one-third to one-half of their length above the soil level, the caudal end attached. A few specimens pushed up about two-thirds of their lengths and remained perfectly quiet in the hot sun, settling lower and lower in their cavities until almost hidden; it seems probable that such specimens would not transform as strong, healthy individuals even if they emerged at all. Most

of the pupæ project about half their length from the soil and, attached by the caudal end, sway back and forth rather actively. In none was the beginning of transformation observed; specimens partly out of the skin were several times noted. The male has difficulty in extricating the very long antennæ from the pupal sheath. A field sketch made of the closely-allied *E. spinosa* is herein given and shows the relative position of the



Adult male of *Eriocera spinosa* O. S. emerging from the pupal skin. The coloring and hair-characters are from a fully colored adult.

parts of the body that are used: the first flagellar segment of the antennæ is directed straight away from the body, the fourth segment (second flagellar) at an acute angle to the third and thence the antennæ continue straight back to the sheath. The numerous spines on the underside of the flagellum of the males of *E. spinosa* and *longicornis* have long been known and the fact that they pointed away from the body noted; any use for this curious development has not been suggested. We observed the males in the act of withdrawing their antennæ and the method of procedure was about as follows: The tips of the fore femora are placed underneath the sharp spines on the flagellum and by raising the leg the antenna is pulled upward slightly. These spines are regularly arranged and since both forelegs work in unison, the spines function as cogs and the whole organ is gradually forced from its pupal sheath. The

whole body is carried very straight and stiff during this operation, the abdomen, especially, being very long and pale. The drawing out of the extreme tips of the antennæ is usually accomplished by the bending backward of the whole body of the insect, but this is not always the case. When the antennæ are freed, the insect then walks a few steps from the skin, first withdrawing its abdomen from the case. It then waits quietly until it attains more strength and color. It is probable that this general condition of the insect is its most dangerous period as it is defenseless against all enemies. An account of the enemies of the species is given in a later paragraph.

A count of one square foot of normal gravel was made at this time and showed the following: Twenty-eight living pupæ of *longicornis*, two larvæ of *spinosa*, one pupa of *Tipula bella* Lw., one large Tabanid larva; forty-seven cast pupal skins of *longicornis*, as well as most of the natural beetle associates given in a later place. This infestation was merely normal and many square rods of ground along the south bank of Fall Creek were in almost the same condition. One small larva, almost certainly of this species and described hereinafter as such, was found but practically all of the larvæ had passed into the pupal stage; many of these pupæ were very pale and feebly colored and evidently but newly transformed.

The emergence of the adults of *E. longicornis* from the pupæ took place during the late hours of the morning, most numerous between ten a. m. and noon.

Natural enemies of the pupæ and the general imagoes were found to be medium-sized black *Lycosid* spiders which were preying on the weak, uncolored adults in numbers; dozens of the spiders were noted with individuals of the crane-flies in their grasp; these spiders when alarmed would run away very rapidly but only in exceptional cases would they release their victims. A few *Attid* spiders were also noted with Eriocera. A mound of gravel and sand containing many pupæ and skins was noted showing traces of a bird or mammal having preyed upon the pupæ.

Natural associates of *Eriocera* on these gravel beds were ground beetles of the genera *Omophron*, *Schizogenius*, *Dyschirius*, *Bembidium* and *Agonoderus*; click beetles, *Cryptolypnus*, and rove-beetles, of which *Paderus*, *Lathrobium* and *Cryptobium* were the commonest forms. A large larva of *Corydalis* about ready to pupate and an abundance of larvæ and pupæ of horse-flies, *Tabanidæ*, were taken.

The larvæ of *E. spinosa* were found in great numbers in these gravel-banks on May 1. They occurred with young and mature pupæ of *E. longicornis* which were emerging in great numbers at this time. On May 27, both larvæ and pupæ of *spinosa* were found to be very abundant, larvæ being more numerous in the wetter places, pupæ in the dryer spots. They occurred at various distances from the water's edge, from within a foot to as far back as eight or ten feet from the shore. The pupæ occur in short, more or less vertical burrows, from one to three inches below the surface. Not often were larvæ and pupæ found in close proximity to one another. Pupæ of *spinosa*, as well as all others of the tribe so far as known, are very active when removed from their burrows, wriggling rapidly to and fro, and are exceedingly tenacious of life. Larvæ, as found on May 27, were mostly contracted; a few, however, were expanded and had the subterminal segment of the abdomen swollen. In this regard it may be mentioned that almost all of the larvæ of crane-flies that live in the sand or mud along stream banks, have this power of inflating the end of the abdomen. Larvæ of *Eriopterini*, *Limnophilini*, *Pedicini* and *Hecatomini* have been observed with this conspicuous enlargement. It is apparently used to propel the larva through the soil by alternate expansion and contraction of the segment.

Larvæ of this species were placed in breeding-jars on May 13, and adult flies emerged on the 28th. It is probable that the pupal stage is not longer than ten to twelve days, but this was undoubtedly accelerated by the increased warmth of the laboratory. The natural pupal period may be as long as two weeks. On May 30, a large number of larvæ and pupæ were brought into the laboratory in a bucket of gravel. Some of the

fully-grown pupæ transformed in the pail while being brought into the laboratory. The larvæ are almost certainly carnivorous, their powerful sickle shaped mandibles inflicting a painful bite on tender parts of the hand.

The larvæ of *E. fulltonensis* were found in the same situations on May 30. They occurred in company with numerous *spinosa* larvæ and pupæ, a few large Tabanid larvæ, a small Tabanid pupa, and the following beetle associates: *Bembidium*, *Schizogenius*, *Tachys*, *Cryptobium bicolor*, etc. These larvæ were placed in breeding-jars on May 30. One of these larvæ pupated on June 1 and emerged as an adult on June 6. This gives a very short indoor pupal period of a trifle less than a week.

The habits of the adult flies are still not well known. At 5:00 p. m. on May 1, 1913, the swarming of the species was observed near the place described above. At 5:40 p. m. they were flying in some numbers, swarms averaging from thirty to forty individuals being the most common. They kept out in the open, away from trees or bushes, and maintained an average height of from thirty to forty feet above the ground. Most of the swarms were out above the creek-bed but others were above the banks of the stream. The entire swarm seemed to face the gentle easterly breeze (i. e., up-stream). They swarmed about on a horizontal plane, the motions of each individual being mostly like a figure 8. The swarm covered considerable space, being from eight to ten feet high and about one-half of that distance through, the swarm scarcely moving from its position. Individuals constantly leave and rejoin the swarms. The insects sit on the tops of the willow bushes before joining the swarms and at this time are very wary. They dart up into the air and far overhead at the first approach of a possible enemy. It is very hard to catch specimens from the ground, but by standing on the bridge, which is only a little lower than the level of the swarm, it is rather easy to capture departing and incoming individuals. The next night, May 2, at 5:30 p. m., the insects were again swarming in numbers; at this time the swarms were smaller, of from twenty-five to thirty individuals, and they swarmed quite low, ten to fifteen feet up, just out

of reach of a net. The motion of individual specimens in a swarm varies at different times, now being a slow S, now fast. One or two seemed to copulate in midair; this was done so rapidly, however, that it is not certain, the more so as it is so different from the mating habits of the closely related *Heccatoma*.

The rearing of this material to the adult stage was accomplished by Mr. Lloyd; the biological notes herein given, the technical descriptions and the figures are by Mr. Alexander.

We wish to express our sincere thanks for the kind help and advice given to us by Dr. Needham during the progress of this study.

DESCRIPTION OF THE SPECIES

Common characters of the larvæ—The body is rather stout, yellowish, with a conspicuous bronzy sheen. The head capsule (plate I, figure A) is long and narrow, and when retracted is completely concealed in the first thoracic segment, only the tips of the long apical maxillary lobe projecting. The mandibles are long, acutely pointed, decussate, provided with teeth on the inner basal half (a). One of the lobes of the maxillæ (c) is prolonged cephalad in a long, flat, blade like appendage. The antennæ (b) are rather long, cylindrical. The framework of the head consists of a broad plate on either side in front, herein described as the genal plate (e), and two long bars of chitin extending backward on either side, one of these bars occupying a dorsal position, the other constituting the lateral margin of the capsule. The entire mental region seems to lack chitinized parts. The cauda (plate I, figures I-L) has the stigmal field free from lobes in *longicornis* or with four lobes in the other species.

Common characters of the pupæ—The head is provided with a group of lobes herein spoken of as the cephalic crest (plate II, figure A, a). Spines or tubercles occur in the different species on the scape of the antenna, the tentorium, the clypeus, the eye, the thoracic scutellum, etc. Pronotal breathing horns short, cylindrical (*longicornis*), long, cylindrical (*fulvovensis*)

or acute and curving ventrad at apex (*spinosa*). Segments II to VII of the abdomen with a spiracle on either side.

KEY TO THE LARVÆ OF ERIOCERA

1. Head capsule long and narrow; lateral lobes of the fronto-labral sclerite not pronounced; labrum small. Caudal lobes not developed; hairs around the stigmal field very few (about twenty) but very long. (Genal plate produced into a lobe on the inner cephalic angle; a strong conical tooth on inner face of mandible at about midlength.)

longicornis Walk.

Head capsule broader; lateral lobes of the fronto-labral sclerite prominent; labrum well developed. Caudal lobes prominent, one pair being lateral and one pair ventral, bearing fringes of abundant long hairs. 2

2. Large larvæ (fully grown and extended, 40-45 mm. long, and 4-5 mm. in diameter); lateral lobes of fronto-labral sclerite not hairy; tubercles on labrum merely rounded; no strong, truncated tooth at mid-length of the mandible on the ventral face; hairs on caudal lobes prominent, reddish. Lateral lobe with a black line which is conspicuously enlarged at its inner end; ventral lobes with a black line which is forked, Y-shaped, at its inner end.

spinosa O. S.

Smaller, more slender larvæ (fully grown and extended, 18-26 mm. long, 2 mm. in diameter); lateral lobes of the fronto-labral sclerite clothed with abundant long hairs; tubercles on labrum cylindrical, truncated, chitinized; a strong, truncated tooth at mid-length of the mandible with a smaller one beside it; hairs on caudal lobes abundant but pale, indistinct. Lateral lobe with a black line which is not conspicuously enlarged at its inner end; ventral lobes with a black line which is enlarged at its inner end, not conspicuously forked.

fultonensis Alex.

KEY TO THE PUPÆ OF ERIOCERA

1. Size large (length 25 mm. or over); pronotal breathing horns tapering to the acute tip; cephalic crest small, reduced to four tubercles; cell M_1 on wing-pad present and usually evident; a strong spinous tubercle on either side of the median line at the base of the second abdominal tergite; a tubercle on the eye. (Mesonotal scutellar lobe, conspicuous, projecting). *spinosa* O. S.

Size small (length under 18 mm.); pronotal breathing horns about uniform in diameter throughout their length, blunt at apex; cephalic crest prominent, in some species so large as to conceal from beneath the pronotal breathing horns; cell M_1 on wing-pad absent; no spinous tubercle at base of second abdominal tergite; no tubercle on eye.₂

2. Antennæ of δ elongate, reaching almost to the tip of the wing-pad; lobes of the cephalic crest triangular, rather pointed at the apex, the lobes when viewed from beneath, tending to diverge apically; pronotal breathing horns short, not much longer than a single lobe of the crest; median scutellar lobe conspicuous, projecting; hind tarsi projecting considerably beyond the level of the inner two; wing-pads usually showing cross-vein r beyond the fork of R_{2+3} ; spine on antennal scape present.

longicornis Walk.

Antennæ of δ short like the φ , reaching just beyond the base of the wing-pad; lobes of the cephalic crest more rounded, thickly covered with rounded protuberances, the lobes when viewed from beneath, tending to converge apically; pronotal breathing horns long, exceeding the whole crest in length; median scutellar lobe not apparent; all the tarsi about on a level; wing-pads pale, showing cross-vein r before the fork of R_{2+3} ; spine on antennal scape absent.

fultonensis Alex.

ERIOCERA LONGICORNIS Walker

1848 *Anisomera longicornis* Walker; List Dipt. Brit. Mus.;
vol. I, p. 82.

LARVA

Length, not fully extended, 13-13.5 mm.; diameter, 2 mm.; at subterminal swelling, 2.4 mm.

Color of larva light yellowish; almost uniformly cylindrical; the prothorax a little shorter than the other two thoracic segments; first abdominal segment simple, a little shorter than the metathorax; remaining abdominal segments with a faint basal constriction, dividing the segment into two annulets; remaining segments gradually increasing in length toward the end; the tenth segment is capable of being enormously distended; the last segment is narrowed, tapering to an obtuse point; this segment is clothed with numerous appressed hairs and two or three long, delicate hairs on the side of the segment.

Head-capsule long and narrow, measuring 1.5 by .275 mm. On the antero-dorsal portion of the head-capsule are the two genal plates (Snodgrass terminology), these rather broad, separated from one another along the dorsal median line by a wide space; the cephalic inner angles produced entad into prominent lobes (plate I, E), the caudal margin of the plates produced caudad in a fringe-like comb of chitinized points; these genal plates (which presumably include the vertex and gena) are only about two-fifths the length of the head-capsule. Cephalad of the genal plates is a rounded median lobe (frons and clypeus) bearing at its apex a few small tubercles and a small quadrate projection (labrum); the lateral margins of this sclerite are gently rounded, not produced cephalad into prominent lobes. This plate consists of the fused frons, clypeus and labrum. Laterad of the genal plate is an elongate chitinized piece articulated with the base of the mandible on its dorso-lateral aspect, fused or closely applied to the genal plates for most of the length of the latter, thence articulated end-to-end with another elongated bar of chitin which extends caudad, expanding out at its tip and becoming approximated with its

fellow of the opposite side on the dorso-median line. This bar and the genal plates form the dorsal framework of the head capsule. From the ventro-lateral angle of the mandible there arises another long bar of chitin which runs caudad ending about on a level with the median dorsal bar, very little expanded at its tip; this bar forms the lateral framework of the head-capsule. *Antennae* (plate I, C, b) arising on the inner cephalic angle of the genal plate just dorsad of the base of the mandible. It consists of a one-segmented, cylindrical, slightly curved organ which bears a number of long hairs at its apex, almost as long as the segment itself. *Mandibles* (plate I, II) exceedingly powerful, decussate, ending in a long, sharp point, on its caudal or inner face bearing a prominent conical tooth at about mid-length, and with other blunt protuberances nearer the base; one of the ventral strands of muscle has an egg-shaped, chitinized piece isolated in it. *Maxilla* arising just ventrad of the mandibular base, articulated on its outer caudal angle with the lateral chitinized bar of the head; the palpus is very short, lying underneath the base of the mandible, short-cylindrical, ending in a small cylindrical tip which is enclosed in a rounded fleshy apex; one of the two apical lobes of the maxilla (galea or lacinia) persists as a very elongate, pale, blade-like organ projecting far beyond the other mouth-parts, on the cephalic inner face with a long supporting strand of chitin which is forked near the base. *Mental region* entirely lacking strongly chitinized parts, the only indication of chitinization being a pale yellow area continued from the tips of the mandibles caudad but completely disappearing in caustic potash (1% solution, 24 hours).

Stigmal field small, oval, at the caudal end of the body, the stigmata occupying the dorsal portion of the area (plate I, K, L). Stigmata small, oval, placed rather obliquely, their dorsal ends directed inward, the distance between them less than the length of one or about equal to the small diameter of one. A faint dusky mark from the dorsal margin of each stigma to the edge of the field; a faint vertical stripe lying between the stigmata. There are no distinct lobes around the

stigmal field; at about midlength and lying on the lateral margin of the field is an elongate triangular black mark, its point directed outward; from this point and the margin of the field just above its tip, arise three long curved hairs directed outward. The ventral marks are larger, brownish black, these marks three-pointed at their dorsal end, the innermost of these points connected with its fellow of the opposite side; just laterad of this mark is a slender brown line which bears at regular intervals, three long, slender, curved hairs directed caudad; at the caudal margin of the large mark arise three very large hairs directed ventrad and arising from a common point so that they appear coalesced at their origin. Just laterad of these three bristles is still another delicate hair; so that surrounding the stigmal area there are about twenty of these long hairs. Caudal gills four, very short and inconspicuous, hidden underneath the subterminal enlargement.

Described from one larva taken in company with abundant pupæ of the same species, Forest Home, Ithaca, New York, May 1, 1913.

PUPA, ♂

Antennal sheaths enormously enlarged, viewed from beneath, the swollen bases nearly contiguous on the median line; just above and entad of the cephalic inner margin of the eye, provided with a sharp, chitinized spine placed in an eye-like depression. The antennæ bend laterad and dorsad to near the pronotal breathing horns and then ventrad, running caudad, closely appressed to the ventral side of the body, lying just inside the inner margin of the wing-sheath and outside the second pair of legs; the tip of the antenna is just beyond the middle of the fourth tarsal segment of the middle legs. In older pupæ the spines on the ventral side of the adult organ are clearly apparent through the cuticle. *Cephalic crest* (plate III, E)—From between the bases of the antennæ arises a flattened crest directed cephalad, deeply bifid by a square median notch, each of the lateral lobes thus formed being provided with chitinized points which are beset with sparse hairs; on each

side at the base of the crest, just cephalad of the swollen antennal base is a small subchitinized tubercle bearing a bristle. *Eyes* moderately large, occupying the space between the scape of the antennae and the basal segments of the antennal flagellum. The anterior arms of the tentorium show through the cuticle, the arms rather short, elongate triangular, directed toward the caudal end of the eye. *Labrum* large, roughly triangular, transversely wrinkled and bearing a conspicuous tubercle on either side near the base (which probably represents on the ectal surface the propharynx underneath, according to Dr. MacGillivray). The lobes of the *labium* project caudad on either side of the labrum, occupying the space just cephalad of the fore coxa and proximad of the tip of the fore femur. The *maxilla* are represented by a quadrate plate on either side, lying just caudad of the eye, laterad of the clypeus and labium and cephalad of the knee-joint.

Thoracic notum quite convex, the *pronotal breathing horns* short, directed cephalad, dorsad and laterad, distinctly crenulated, not visible from beneath. The *mesonotal præscutum* delicately wrinkled medially, the V-shaped suture rather indistinct in young pupæ, clearer in darker, older pupæ. Median lobe of the mesonotal scutellum well indicated, projecting dorsad and caudad as a conspicuous point. *Wing-pad* attached opposite the basal quarter of the fore tibia, directed caudad, the tip of the pad lying opposite the ends of the second tarsal segments of the fore and middle legs and opposite the end of the second abdominal segment. *Halteres* originating on the side of the metanotum, hidden by the wing pad, the tip at the extreme base of the second abdominal segment and just before the apex of the hind tibia. *Fore legs* (plate II, A), viewed from beneath the fore coxæ (g) are seen lying just caudad of the lobes of the labium; the coxa, trochanter and extreme base of the femur lie in one straight piece contiguous on the median line. Just beyond the base of the femur the segment bends cephalad upon itself and lies parallel with the coxæ and trochanters (h) the tip of the femur lying laterad of the labial lobes and just caudad of the maxilla. At this point the tibia

(i) bend obliquely back across the body so that their tips are not distant from the middle line of the body; the legs touch the pair of the opposite side at the basal fourth of the metatarsus, the remaining tarsal segments running directly caudad and on either side of the middle line of the body. *Middle legs*—The coxæ and trochanters (j) occupy the sternal region of the pupa immediately behind the bend in the fore femur, the tip of the middle trochanter (j) corresponding closely to the tip of the fore tibia (i). The middle femur lies beneath (dorsad of) the fore tibia, the middle tibia being outside (laterad) of the fore tibia and lying parallel with them; the tip of the tibia is about opposite the basal third of the fore metatarsus; the tarsi run parallel with the hind tarsi and end on a level with them. *Hind legs*—Only the coxæ are visible, lying between the bases of the fore metatarsi; the remainder of the leg with the exception of the terminal tarsal segments is concealed by the sheaths of the fore and middle legs and the wings. The femur and tibia are very strongly bent, the tip of the tibia occupying a position that is exactly caudad of the tip of the femur, the tarsi running caudad. The tip of the metatarsus is seen just proximad of the radial region of the wing or just laterad of the antennæ. The hind tarsus projects conspicuously beyond the other tarsi, the tips of the two anterior pairs ending about opposite the middle of the fifth tarsal segment, which here bends strongly inward; tip of the tarsus ending before the caudal margin of the third abdominal segment.

First abdominal segment short, exceeded by the halteres; segments II to VII about equal in length, VIII very narrow, bearing the ninth segment on its caudal face. *Tergites*—First narrow, its caudal margin gently concave, not provided with spicules; segment II indistinctly divided into two approximately equal parts by a transverse false constriction, the caudal margin of the segment provided with about thirty-two chitinized spicules. Segments III to VII with the caudal half of a different texture from the basal half, being somewhat more chitinized, the basal half provided with feeble transverse wrinkles, the caudal margin of each segment provided with chitinized spicules which de-

crease in number toward the end of the body, there being about thirty-two on segment III and twenty-four on segments V and VI. Segment VII has the median line devoid of spicules, each side being provided with about seven arranged in a slightly curved line. Segment VIII very small, inconspicuous, the lateral angles of the caudal margin provided with a few weak hairs and the dorsal surface with several tubercles. Ninth segment bearing the hypopygium, the tergal plate small, ending in two chitinized cylindrical lobes, sharp-pointed, the points directed sharply dorsad. *Sternites*—Segments I and II pale, unarmed, hidden by the leg-sheaths; segments III to VII quite as in the tergites, the third segment with an interrupted row of spicules, about twelve in the middle and two larger ones on either side; in some specimens the row is complete and contains thirty to thirty-two spicules. Segments IV to V with complete rows of about twenty-four spicules; segment VI with a wavy, somewhat broken row of about twenty spicules; segment VII with about five feeble spicules on either side of the bare middle line; ninth sternite broader at base than at tip; tip truncate with the outer angles rounded with a very deep median split. *Pleurites*, non-chitinized, segments II to VII bearing spiracles, these spiracles located just caudad of the false transverse constriction and a little nearer to the sternites than the tergites.

Young pupæ, when alive, are very pale, the soft abdomen being almost white, the chitinized anterior portion very pale brown. Older pupæ are much darker, the chitinized parts becoming black with a bronzy reflexion, the abdomen much paler, of a dirty brownish-grey. The breathing horns are dark brown on the apical half. Young pupæ, in alcohol, are light yellowish brown, abdomen clear yellow, the pleurites a little darker.

Length, from crest to tip of abdomen—♂, 13.2-15.2 mm.; ♀, 14-15.4 mm.

Dextro-sinistral width at wing-pad—♂, 2.1-2.2 mm.; ♀, 1.8-1.9 mm.

Dorso-ventral depth at wing-pad—♂, 2.1-2.3 mm.; ♀, 2.2 mm.

PUPA, ♀

In this sex the crest is smaller (plate III, B), reduced to two triangular lobes with the notch between these lobes very deep; the antennal sheaths are not swollen basally so that the pronotal breathing horns are visible from beneath; antennæ short, extending to a point just beyond the base of the wing. Arrangement of the legs about as in ♂; in one specimen the two terminal tarsal segments of the hind legs project beyond the tips of the other feet; the base of the fore femur is not before the first bend but this segment of the leg is just at this bend. The ninth sternite of the abdomen (plate III, F) is triangular, quite pointed at the tip, with a deep median split; ninth tergite with a broad notch, the lobes small, triangular, divergent, not strongly chitinized and directed strongly dorsad. There is only a little difference in the shape of the ends of the abdomen in the ♂ and ♀ pupa of this species.

Both sexes of the pupæ described from numerous specimens, Fall Creek, Ithaca, New York, May 1, 1913.

ERIOCERA SPINOSA Osten Sacken

1859 *Arrhenica spinosa* Osten Sacken; Proc. Acad. Nat. Sci. Phil., p. 244.

LARVA

Fully grown, fully extended, 40-45 mm.; diameter, 4-5 mm.

Color of larva varies from very pale whitish to rather dark brown; the skin has conspicuous bronzy reflexions in life.

The larval head differs from that of *E. longicornis* Walker, as described before, in the following essentials. (See plate I, A).

Genal plates not ending in a sharp protuberance on their inner cephalic angle, the inner margin being almost straight. The lateral lobes of the frontal sclerite are very pronounced, longer than the labrum itself. The hairs at the tip of the antennæ are shorter, not more than one-third to one-fourth the length of the segment. The mandibles (plate I, F) lack the prominent conical tooth at midlength. The head-capsule is much broader in proportion to its length, measuring 3.5 to 3.8 mm. by 1.8 to 2 mm. (across the genal plates).

Stigmal field (plate I, figure 1) with the spiracles small, dorsal, rounded or rounded-oval, widely separated; four slender, elongate lobes around the stigmal field, one pair being lateral and the other ventral. Lateral lobes with the inner face having a narrow black line, this beginning as an enlarged black spot just ventrad of the spiracle, reaching the tip of the lobe; the dorsal outer edge of this lobe with a dense fringe of long conspicuous reddish hairs, the inner edge of the row beginning just laterad of the spiracle where the hairs are exceedingly short, gradually becoming longer to the tip where they are as long as the lobe itself. Ventral lobe with a narrow black line on the proximal face which divides at the base of the lobe, the ventral branch running along the ventral margin of the stigmal field, the dorsal branch paler, spreading out across the stigmal field and approaching its fellow of the opposite side on the middle line; a dense fringe of conspicuous reddish hairs on the tip of the lobe and continued on the outer dorsal side for a short distance toward the base. A few dusky brown spots on the stigmal field between the stigmata; two small hairs occupying the space between the stigmata. Underneath the caudal lobes and behind the swollen penultimate segment are the four caudal gills, short, stout, cylindrical, unbranched, the lateral pair directed outward, the inner pair directed caudad.

Described from abundant larvæ from along Fall Creek, Ithaca, New York, above the second bridge, in Forest Home, May 1, 1913.

PUPA, ♂

Antennal sheaths elongated (plate II, figure E, plate III, figure D), the tip of the sheath lying just before the end of the middle metatarsus, in a few specimens even reaching beyond the tip. *Cephalic crest* (plate II, E, b) very reduced, scarcely projecting beyond the front level of the antennæ; viewed from beneath (plate III, D), it is somewhat quadrate, the fore lateral angles produced into small pointed lobes bearing a long hair at the apex; viewed from the side (plate II, E, b) it is seen to be notched, there being a second lobe, subequal to the ventral one in size, immediately behind it, this also bearing a large hair.

Spine on the scape of the antennæ (plate II, E, c; plate III, D) enormous, somewhat curved, directed ventrad. The inner caudal surface of the eye also bears a conspicuous tubercle. The tentorium between the caudal ends of the antennal scapes is produced into a small median tubercle (plate II, E, d). The tubercles on the base of the labrum or end of the clypeus (plate II, E, e) are very large, close together, the tips strongly chitinized.

Pronotal breathing horns long, slender (plate II, E, a), broad at the base, tapering to a rather sharp point, the organ arcuated so that the point is bent strongly ventrad. Mesonotal scutellar lobe prominent, rather strongly projecting. Leg-sheaths with the terminal tarsal segments about on a common level and opposite the end of the third abdominal segment. Wing-pad light brown, the venation showing very clearly, the presence of cell M₁ in connection with the elongate antennæ being characteristic of this species alone in Eastern America.

Second abdominal tergite with a conspicuous basal tubercle on either side of the median line. Spicules very strong, almost spinous, about twenty to twenty-two on tergites II to V. Tergites VI and VII destitute of spicules but with four subapical setiferous tubercles. Tergites II to VII with a conspicuous setiferous tubercle on the ventro-cephalic angle of each caudal annulet. Eighth tergite concave on caudal margin (plate II, D) bearing a pair of strong apical tubercles on either side of the median line. *Sternites*—Segment III with two spicules on each outer angle; segments IV to VI with about sixteen spicules (sometimes as many as twenty); segment VII with about ten. Segments IV to VII with a small setiferous tubercle about midlength of the caudal annulet, widely separated. Segment VIII (plate II, C) without soft pleural region, bearing an apical row of strong spines which is broken only on the dorsum and for a small space on the median line of the venter, there being about twenty of these spines on the segment. Ninth sternite (plate II, C, a) rounded, swollen, with a deep median furrow bearing a small lobe on the ventral side at the end of this split. Ninth tergite (plate II, D, a) produced caudad into two strong

conical points with a V-shaped notch between them, these points directed caudad and slightly dorsad, each one a little split near the tip on the outer face and with a prominent lateral tooth at about mid-length.

Pleural region of abdomen rather restricted, longitudinally wrinkled. Spiracles large, elliptical, transverse, placed about mid length of the segment. About three small setiferous tubercles on each pleuron ventrad and caudad of the spiracle; another setiferous tubercle on the dorso-cephalic angle of each pleuron.

In life, pupæ vary from a very pale yellowish to dark, almost black, the deepest coloration being the head and thorax; the body often with bronzy reflexions.

Length, from crest to tip of abdomen—♂, 26.5-27 mm.; ♀, 25-28.5 mm.

Dextro-sinistral width at wing-pad—♂, 3.4-3.9 mm.; ♀, 3.4-4 mm.

Dorso-ventral depth at wing-pad—♂, 4-4.2 mm.; ♀, 3.5-4 mm.

PUPA, ♀

Quite like the ♂, the sheath of the antennæ short, reaching a point just beyond the end of the fore coxæ or some distance beyond the base of the wing. Ninth sternite (plate III, II) elongated, cylindrical, its tip rounded, feebly split underneath. Ninth tergite (plate III, I) very long, pointed, with a deep median split.

Numerous ♂ ♀ pupæ, Fall Creek, Ithaca, New York, May 27, 1913, taken from the gravelly beds along the creek above the second bridge in Forest Home.

ERIOCERA FULTONENSIS Alexander

1912 *Eriocera fultonensis* Alexander; Psyche, vol. 19, p. 168, 169.

LARVA

Fully grown, fully extended, 18-26 mm.; diameter, 2 mm.

Form long and slender. Color pale flesh color, the cephalic segments a little darker, brownish, the enlarged subterminal swelling almost transparent.

The larval head differs from that of *E. longicornis* Walker or *E. spinosa* O. S., as described before, in the following essentials:

Genal plates (plate I, D) at their inner cephalic angle evenly rounded, not produced into a prominent lobe. The *labrum* (plate I, B) is much more produced, conical, bearing a little tuft of hairs at the tip and a small, cylindrical, chitinized tubercle on either side of the tip; the lateral lobes are very prominent, cylindrical, densely clothed with long short hairs, the lobes bent prominently inward. *Antenna* (plate I, C, a) more club-shaped, the distal end being larger than the base; hairs at the apex short. *Mandibles* (plate I, G) with a prominent conical tooth at mid-length, this tooth squarely truncated at apex and bearing a smaller tooth at its side. Size of the head-capsule, 2.7 by 1.2 mm., across the genal plates.

Stigmal field (plate I, J) with the spiracles rounded-oval to rounded, placed obliquely, very widely separated from one another. Four conspicuous lobes surrounding the stigmal field, of which one pair are lateral and the other ventral. Each lateral lobe slender, with a narrow straight black mark on its inner face, at its inner end, this mark scarcely if at all enlarged; the lobe bears a dense fringe of long, delicate, pale brown hairs along its dorsal face, these hairs quite inconspicuous due to their pale color. Each ventral lobe very long and slender, the inner face with a narrow, straight black line which is expanded out at the base into a dark brown triangular mark which meets its fellow of the opposite side on the median line, the two enclosing a pale, oval area between them; a fringe of rather long pale hairs on the apical third of this lobe. A pale brown mark runs from each stigma dorsad. Stigmal field almost destitute of dark spots or marks.

Described from several larvæ taken in sandy banks of Fall Creek, Ithaca, New York, May 30, 1913.

PUPA, ♂

The male pupa is quite like the ♀ described below; the bristles on the lobes of the crest are very long, exceeding the

lobe itself, there being three of these elongated bristles on the dorsal lobe and one on the ventral lobe, it being directed caudad. In the ♂ the abdomen ends in a blunt, rounded lobe deeply divided into two parts, strongly suggestive of the powerful hypopygium of the adult male of this species. Total length of the ♂ pupa, 10-12 mm.

PUPA, ♀

Differs from the pupa of the same sex of *E. longicornis* (q. v.) in the following essentials:

The general form is much stouter and the body is covered with numerous appressed hairs. The sharp spine on the scape of the antenna is lacking; the lobes of the cephalic crest are small (see plate II, F, b; plate III, C) and tend to converge when viewed from beneath, and are covered with small, rounded warts or tubercles; in front, above the base of the antenna, are two more large lobes so that the crest is four lobed instead of bi-lobed as in *longicornis*; these anterior lobes are smaller, rounded, and usually end in an apical tip or spur directed ventrad. The pronotal breathing horns (plate II, F, a) are very long and rather slender; the mesonotum more convex than in *longicornis*; the wing-pad usually shows the venation clearly on the pale background and the presence of crossvein *r* connecting R_1 with R_2+ is distinctive of this species; the absence of cell M_2 separates this pupa from *E. brachycera* O. S., *spinosa* O. S., et al. The leg-sheaths end almost on a level, the outer or hind pair being but a trifle longer than the two inner pair. The spicules on the caudal margin of the abdominal segments are smaller and more numerous, on some of the segments (fifth and sixth tergites) averaging forty. The ninth abdominal segment (plate III, G) is much longer than in *longicornis*, the ninth tergite elongate, pointed, much longer than the ninth sternite and scarcely directed dorsad, being much more like a typical ovipositor than in *longicornis*.

Fully colored pupae are dark brown, the cephalic crest being paler, the pronotal breathing horn is pale yellow, darkening into brown at the tip. The wing pads are light yellow with the

venation showing clearly, dark brown. The pleurites of the abdomen are darker brown than the sternites or tergites; ninth segment dull yellow.

Length, from crest to tip of abdomen—♀, 14-16 mm.

Dextro-sinistral width at wing-pad—♀, 1.8-2 mm.

Dorso-ventral depth at wing-pad—♀, 2.5-2.7 mm.

These specimens were taken at Ithaca, New York, as larvæ on May 30, 1913; they were removed from the breeding jars as fully-colored pupæ on June 6, 1913. The single ♂ I possess is represented only by a cast skin, taken as a larva on May 30, and emerging as an adult fly on June 6.

EXPLANATION OF PLATES

PLATE I.

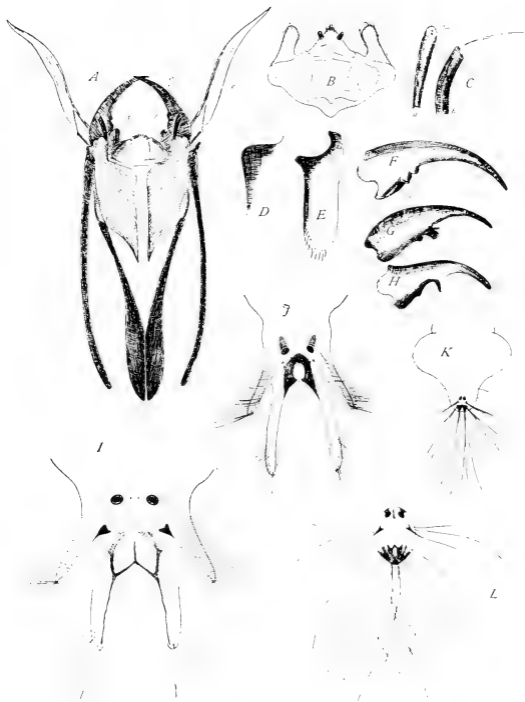
- A. Head-capsule of larva of *Eriocera spinosa* O. S., dorsal aspect, a little elongated to show the shape of the head of *fulltonensis* and *longicornis*. a, mandible; b, antenna; c, maxilla; d, labrum; e, genal plate.
- B. Clypeo-labral sclerite of *E. fulltonensis* Alex., dorsal aspect.
- C. Antennae of larvæ. a, *E. fulltonensis*; b, *E. longicornis*.
- D. Genal plate of *E. fulltonensis*, dorsal aspect.
- E. Same of *E. longicornis*.
- F. Mandible of larva of *E. spinosa*.
- G. Same of *E. fulltonensis*.
- H. Same of *E. longicornis*.
- I. Dorso-caudal aspect of end of the abdomen of *E. spinosa* larva.
- J. Same of *E. fulltonensis*.
- K. Same of *E. longicornis*.
- L. The stigmal field of the last-named, more enlarged.

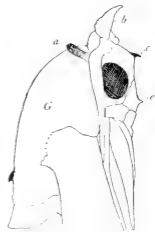
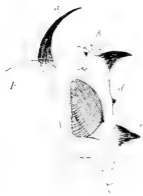
PLATE II.

- A. Ventral aspect of ♂ pupa of *E. longicornis*. a, cephalic crest; b, scape of antenna; c, anterior arms of the tentorium; d, maxilla; e, labrum; f, tibia; g, fore coxa; h, fore femur; i, fore tibia; j, middle coxæ; k, wing-pad; l, elongate antennal sheath; m, second abdominal segment, bearing spiracle.
- B. Dorsal aspect of ♂ pupa of *E. longicornis*. a, cephalic crest; b, enlarged base of antenna; c, pronotal breathing horns; d, mesonotal praescutum; e, mesonotal scutum; f, mesonotal postnotum.
- C. Ventral aspect of end of abdomen of ♂ pupa of *E. spinosa*. a, ninth sternite; b, ninth tergite.
- D. Dorsal aspect of same. a, ninth tergite; b, ninth sternite.
- E. Lateral aspect of ♀ pupa of *E. spinosa*. a, pronotal breathing horn; b, cephalic crest; c, spine on antennal scape; d, tubercle on tentorium; e, tubercle on clypeus.
- F. Same of *E. fulltonensis*.
- G. Same of *E. longicornis*.

PLATE III.

- A. Lateral aspect of ♂ pupa of *E. longicornis*.
- B. Ventral aspect of ♀ pupa of *E. longicornis*.
- C. Same of *E. fulltonensis*.
- D. Same of *E. spinosa*.
- E. Ventral aspect of head of ♂ pupa of *E. longicornis*.
- F. Lateral aspect of abdomen of ♀ pupa of *E. longicornis*.
- G. Same of *E. fulltonensis*.
- H. Ventral aspect of abdomen of ♀ pupa of *E. spinosa*.
- I. Dorsal aspect of the same.





Biology of the North American
Crane Flies (*Tipulidae* *Diptera*)

By

CHARLES PAUL ALEXANDER

Biology of the North American Crane Flies (Tipulidæ, Diptera)

II. *LIQGMA NODICORNIS* Osten Sacken

CHARLES PAUL ALEXANDER
ITHACA, N. Y.*

The genus *Liogma* belongs to the tribe *Cylindrotomini*, an interesting group of the Tipulidæ. Baron Osten Sacken in the Monographs of the North American Diptera speaks of them as a "small, but very remarkable group of species, occupying an isolated and intermediate position between the *Tipulida brevipalpi* and *longipalpi*." The structure of the adult flies, especially as regards certain details of the venation of the wings, is quite unique but it is in the immature stages of the different genera that the most interesting distinctions are found. The larva, instead of living in the mud along the banks of streams or in rotten wood as do the majority of the known crane-fly larvæ, dwell upon the leaves of various terrestrial and aquatic plants; instead of being brown or grey in color, they are bright green and usually resemble the leaves of their host-plants to a very remarkable degree.

The larva of *Cylindrotoma distinctissima* Meigen lives on the lower surface of the leaves of various plants (*Stellaria* L., *Anemone* (Tourn.) L., *Viola* (Tourn.) L.) and eats elongated holes in them. The larva before undergoing its transformations, leaves its host-plant and crawls to some grass-stalk, where it passes the pupal stage. The larva of *Triogma trisulcata* Schummel, is aquatic, living on the leaves of the submerged moss, *Fontinalis antipyretica* L., in small alpine streams where it was first found in Saeeingen at an altitude of nearly 4000 feet; it spends the winter as a larva, the first specimens being found by Prof. Steinmann at the end of April, fourteen days

* Contribution from the Limnological Laboratory of the Department of Entomology in Cornell University.

after the melting of the snow. The larva of *Phalacrocer* *replicata* L. has long been known to entomologists as it was first figured by Degeer in 1776. It lives in the water amongst the aquatic plants and mosses; Bengtsson and Mueggenburg believe that it has but one generation in a year, spending the entire winter in the larval state; Miall and Shelford, however, think that it is possible that there are two or more generations of *Phalacrocer* in a single season. The species of the genus *Liogma* O. S. are terrestrial, and live on mosses of the genus *Hypnum* Dill. They will be considered in detail in the remainder of the paper.

The genus *Liogma* was proposed in 1869 by Osten Sacken for the two species known at the time, *Cylindrotoma glabrata* Meigen of the western Palearctic region and *C. nodicornis* Osten Sacken of the eastern Neartic region. The erection of the genus at this time was merely tentative and neither species was designated as type; it was not until later that the American *nodicornis* was chosen. A third species, *Liogma kuranai* Alexander, has been described from the eastern Palearctic region but of this form only the adult fly is known.

The larva of the European species, *Liogma glabrata*, was first found by Mr. DeRossi in 1876, but its discoverer was quite at a loss to identify his remarkable insect. In 1878, Osten Sacken, using this short description of DeRossi, pointed out the affinities of this larva with the *Cylindrotomini* and suggested that it was the larva of *Triogma*, then unknown. In 1901, Dr. Mueggenburg's excellent paper on *Liogma glabrata* appeared and the larva and pupa are therein described in great detail. The larva of *glabrata* was found in the woods in the environs of Berlin, in grassy wet spots where the moss, *Hypnum squarrosum* Breh. & Schp., occurs. The following interesting details are taken from Dr. Mueggenburg's paper: the complete metamorphosis of the insect requires one year, of which time but a comparatively short period is occupied by the egg (8 to 10 days) and pupal state (11 to 12 days). The duration of the adult life is not known but it is certainly short and even in the male sex occupies but a few weeks at the

maximum. Near Berlin, the flies emerge during the first half of July. The males appear first, the females later, and these latter were always seized in copulation by the males just after they had forsaken the pupal skin and while still teneral and undeveloped. (In this regard compare also Mik (Entomol. Nachricht, p. 200, pp. 315, 316, 1886); and Caudell (Proc. Ent. Soc. Wash., pp. 45-46, 1913). Each female lays about sixty eggs (like *Phalacro-cera*, according to Miall and Shelford) and these are deposited singly on the leaves or branches or attached lightly to the axils of the leaves of *H. squarrosum*. The female dies soon after the accomplishment of oviposition. The larvæ when newly emerged, lack the beautiful moss-green color of the later stages and are ashy-grey. The animal grows very slowly in the autumn, and throughout the winter is still very small and difficult to detect. In the spring the growth is greatly accelerated and the larva becomes fully grown during the latter half of June. While growing, the animal molts several times, probably at least eight, the number determined for *Phalacro-cera* by Bengtsson. Pupation occurs in the moss where the larva happens to be. In its green color with brown blotches, the larva simulates remarkably the color of the host plant and the effect of the shadows cast by various foreign bodies such as plant-stems and leaves. As Mueggenburg says: "so completely does our larva harmonize with its environment that even a practiced eye succeeds only after long inspection in discovering it on the moss branches." The extreme sluggishness of the larva, so characteristic of the American *nodicornis*, is described for this form. Considering our very scanty knowledge of the immature stages of crane flies, Dr. Mueggenburg's statement that the distribution of the larva is restricted by the distribution of this one moss, *Hypnum squarrosum*, must be taken to be a little too extreme. I have but little doubt but that the larva of *glabrata* will be found on other related species of *Hypnum* when further collections are made.

The American species, *nodicornis*, is of especial interest since it is the genotype. The larva was first observed around Ithaca, N. Y., in the spring of 1913. On May 7, Miss Eudora

F. Tuttle found a large, nearly full-grown larva in moss, *Hypnum cupressiforme* L.* in Cascadilla gorge; the specimen was given to me on the 11th and placed in breeding-jars containing damp moss of the same species. On May 8th, I went to Coy Glen, near Ithaca, and there sifted a dead larva from another species of *Hypnum*; on May 11th I secured another larva from the moss in Cascadilla gorge, and this specimen was likewise transferred to my breeding-jars. On May 25th when these jars were examined, it was found that both specimens had pupated but were still very pale and uncolored. On May 30th, one female emerged from these pupæ and was identified as being this species.

The larvæ of *Liogma* are the most sluggish of any crane-flies known to me. They move only with great slowness and at most times appear to be quite dead. They crawl about amongst the stems of their host-plant and probably never leave it, not even to pupate.

At Orono, Maine, I sifted some *Hypnum* in Standpipe woods on June 16th and found two fully-colored pupæ, which were killed for specimens on June 17th; on the latter date I found a third pupa in the same woods.

In nature the insects probably emerge about the middle or latter part of June and adult flies may be found in June and July. The rapid development and early emergence of these flies in breeding-jars where they are influenced by artificial conditions of heat, light and moisture has been mentioned earlier by Dr. Mueggenburg and others. In our breeding-jars the length of the pupal stage was apparently not more than six days but in the field it is undoubtedly longer.

In the northern part of its range the adult flies probably do not appear before July (Kearner, Ont., July 9, '09; St. Johns, Queb., July 20, '01). In the northern United States the insects are on the wing in late June and early July. (Orono, Me., June 8, '13; Ellsworth, Me., June 15 to July 4, '13; Machias, Me., July 25, '07; Manchester, Vt., June 6, '10; Montpelier, Vt., June 25, '06). In New York state the flies are common in damp

* Determined by Mr. H. D. House and Prof. C. H. Peck of Albany, N. Y.

swampy woods supporting a Canadian fauna and flora. In Fulton county, N. Y., I have taken the form in the gorge of the Cayudutta creek at Johnstown on June 15, '09, which is the earliest date for the county. At Mountain Lake bog pond both sexes were found in abundance on June 26, '09. At Vandenburg's pond on June 19, 1911, I found the insect in numbers and a living female placed in a vial with a male *Phalacrocerca tipulina* was taken in copulation at once and remained "in coitu" for several hours. The last specimens for the year in this county were found at Sacandaga Park on June 27, 1911. As we approach the southern limit of their range they probably emerge in late April or early May. (Hazleton, Pa., June 8, '10; Wooster, Ohio, May 31, '12; Black Mountains, Buncombe county, N. C., May 23, '12). The adult insects are sluggish and do not fly readily and they may be swept from the vegetation that surrounds their haunts. They frequent the rank growth around small shaded ponds where they occur with numerous other crane-flies of the Canadian fauna. At Ithaca, this form is most common in the gorges and on the moist shaded hillsides to which little sunlight penetrates.

I am indebted to the following persons for the data on the geographical distribution of the adult flies: Mr. C. W. Johnson, Mr. M. C. VanDuzee, Miss C. J. Stanwood, Dr. W. G. Dietz, and Mr. J. H. Houser. And to Dr. Needham and Miss Tuttle for kind help in the securing of the immature stages.

This work has been done in the Limnological Laboratory of Cornell University under the direction of Dr. Needham, to whom my thanks are due for kind suggestions concerning many points.

A KEY TO THE KNOWN LARVÆ OF THE CYLINDROTOMINI

1. Body appendages long, filiform; aquatic or nearly so on *Fontinalis antipyretica*, *Hypnum elodes*, *H. exannulatum*, *Ranunculus fluitans*, etc.
(Palearctic) *Phalacrocerca replicata* L.
 2. Dorsal appendages all simple; terrestrial on *Viola biflora* V., *Stellaria nemoralis*, *Anemone nemorosa*, etc.
(Palearctic) *Cylindrotoma distinctissima* Meig.
- Some of the dorsal appendages bearing teeth on the anterior convex side. 3

3. Some of the dorsal appendages bearing four teeth on the anterior face; aquatic on *Fontinalis antipyretica*.
(Palearctic) *Triogma trisulcata* Schumm.
The dorsal abdominal appendages with not more than two teeth; terrestrial on *Hypnum*. 4
4. Most of the dorsal appendages bearing two teeth; on *Hypnum squarrosum*.
(Palearctic) *Liogma glabrata* Meig.
Most of the dorsal appendages bearing a single lateral tooth; on *Hypnum cupressiforme* and a related species.
(Nearctic) *Liogma nodicornis* O. S.

Larvæ of the *Cylindrotomini* may be distinguished from those of other crane flies by the following easily determined points: color green or greenish; the body provided with filiform or leaf-like appendages; larvæ living upon various Bryophytic or Spermatophytic plants.

A KEY TO THE KNOWN LARVÆ AND PUPÆ OF THE GENUS LIOGMA OSTEN SACKEN

LARVÆ

1. Prothoracic segment bearing four conspicuous dorsal projections about in a line. Meso- and metathoraces with two pairs of dorsal appendages, each bearing two lateral teeth in front. Second abdominal segment with four dorsal appendages of which the last two bear two teeth in front.
glabrata Meigen

Prothoracic segment bearing four inconspicuous dorsal tubercles. Meso- and metathoraces with two pairs of dorsal appendages, the anterior pair small, both pairs simple. Second abdominal segment with four dorsal appendages of which the last two bear a single small tooth in front.
nodicornis Osten Sacken

PUPÆ

1. Pronotal breathing horns directed cephalad and dorsal. Mesonotum bearing two pairs of spines, the more anterior being the smaller, situated just behind the breathing-horns, the posterior pair larger. Metanotum with two pairs of spines. Abdomen with the first tergite bearing two pairs of spines of which the first has two lateral branches, the second simple; the second tergite bears two

pairs of spines of which the first has two lateral branches, the second, one branch; the third tergite bears three pairs of spines of which the first is very short and simple, the second with two lateral branches, the third with one branch; tergites IV and V with three pairs of branches of which the first two are similar to those of the third segment, the last possessing two lateral branches.

glabrata Meigen

Pronotal breathing horns directed cephalad and ventrad. Mesonotum spineless. Metanotum with one pair of spines. Abdominal tergites bearing but a single pair of appendages which are unbranched and correspond in position to the last or more posterior of those of the European species.

nodicornis Osten Sacken

DETAILED CHARACTERIZATION OF THE IMMATURE STAGES OF *LIQGMA NODICORNIS* O. S.

LARVA (Plate I)

Fully grown, length, 14.5-15 mm.; maximum breadth, 3 mm.; maximum depth, 2.5 mm.

Color when living, light green, the numerous spines which cover the body are darker; sides with seven oblique marks, the first of which is on the first abdominal segment, the last on the seventh; the marks on the ends are the smallest and least distinct, the five intermediate marks being large and conspicuous; these marks of one side are all parallel to one another; the caudal face of the ventral lobes which protect the stigmal field, deep black.

Head retracted into the first thoracic segment. Antenna two-segmented, the basal segment elongate cylindrical, the tip very short, thimble shaped, its diameter less than that of the elongate basal segment. Maxilla with the palpi very short and broad, the basal segment chitinized, the tip narrow, pale; the shape of the maxilla and its palpus is shown in figure 3 of plate I. The mandible works vertically; many-toothed on the inner face at the tip as shown in figure 2 of plate I. The labium has about seven teeth on either side, the ones on either side of the median line being the larger (figure 4 of plate I).

Prothorax, in front, sloping from the anterior end, on the ventral slope provided with the lip-like lobes and the transverse slit through which the head-capsule is exerted. The upper lip is the higher, not strongly chitinized, provided with a few small scattered bristles which are more numerous on the sides of the lobe; lower lip not so high, with small scattered bristles that are not arranged in a row as in *glabrata*. At the angle of the slit is a small rounded lobe bearing a small bristle. Dorsal body appendages reduced to a pair of lobes in front separated by a space a little wider than one of them, and a pair of smaller ones behind very widely separated. Lateral body appendage long, conspicuous. Ventral body appendages not apparent.

Meso- and metathoraces swollen and arched ventrally like the prothorax. Dorsal appendages two, a small conical one in front and a much larger one behind which bears a small tooth in front and with its tip directed backward. Lateral appendages viewed from above, two in number, the anterior one larger, directed sharply backward, the second smaller, conical. Ventral appendages viewed from the side, two, of which the anterior one is the larger, the posterior pair small, slightly behind the others.

Abdominal segments, dorsal appendages: first segment with two pairs of appendages, the anterior shorter, conical, the tip strongly recurved and bearing a tiny tooth on its anterior face at about midlength; the posterior are much longer with the tip bent strongly backward, a small tooth on the anterior face at about one-third the length. Segments II to VII with four pairs of appendages, the first very small, conical; the second exactly similar but larger; the third and fourth similar to those appendages of the first abdominal segment; the tiny first appendage is largest on the second segment, becoming smaller toward the end of the body. Lateral appendages: first segment with three appendages, the first of which is directed laterad, the posterior two more recurved and directed caudad. Segments II to VII with four pairs of lateral appendages of which the first is very small, situated at the antero-lateral angle of the segment, the other three teeth are subequal and directed caudad. Ventral appendages, first segment with three pairs of appendages which

are successively larger, from the short anterior one to the large posterior one. Segments II to VII with five pairs of appendages of which the first three are small, the fourth intermediate between them and the enlarged fifth.

Eighth segment bearing the stigmal field and the caudal appendages. Dorsal side of this field with a pair of long slender lobes which are bent conspicuously cephalad. Stigmal field (figure 5 of plate I) very small, oval, the two rounded-oval stigmata are situated side by side and close to one another, facing one another and capable of being closely appressed. On the ventral side of the stigmal field are two lobes, directed ventrad, which Dr. Mueggenburg regards as being the ninth segment, the inner faces of these lobes with a conspicuous jet-black line, the tip ending in a sharp recurved hook. Ventral surface of the terminal segments with small protuberances.

PUPA (Plate II)

Length from head to the tip of the abdomen, ♂, 10.4-11.4 mm.; ♀, 10-13 mm.

Length from head to tip of tarsi, ♂, 5.2-5.3 mm.; ♀, 5.1-5.4 mm.

Dextro-sinistral width at the wing pad, ♂, 2.2-2.2 mm.; ♀, 2.2-2.6 mm.

Dorso-ventral depth at the wing-pad, ♂, 1.9-2.2 mm.; ♀, 2.1-2.5 mm.

Living pupæ have the breathing horns light yellow, the terminal half a little more brownish; a brownish black mark on the presentum; the abdomen is greenish, more yellow behind; the dorsal spines are clear light green throughout, occasionally the tips a little infuscated. Alcoholic pupæ—mesonotal presentum with a dark brownish-black mark, irregularly U-shaped, the arms of the U directed backward, the dark color produced caudad and cephalad along the middle line from this mark; a triangular or rounded black spot on either side of the scutellar lobe; metanotum with a large blackish median blotch which is continued cephalad onto the mesonotal postnotum. Abdomen with an interrupted brownish black longitudinal line along either side of the middle of the dorsum; the caudal margin

of each tergite suffused with brown. In old and fully colored pupæ, the bases of the dorsal spines are brown, the tips paler; the head and thorax with appendages brown, sometimes very dark; abdomen yellowish.

Male—Bases of the antennæ approximated on either side of the middle line of the venter lying between the cephalic half of the compound eyes; antennæ rather enlarged, directed cephalad, bending around the anterior margin of the eye and thence directed caudad; the antenna ends between the fore tibiae and femora just beyond the joint, the tip about on a level with the lobes of the labium; in older pupæ the peculiar nodose segments of the imago show through the sheath. Eyes rather large; labrum elongate, slender. Cephalic portion of the head very flat and broad without spines; a small blunt tubercle between the antennal bases.

Pronotal breathing horns large, conspicuous, directed dorsad and laterad, the apical half bent rather suddenly cephalad. Mesonotum feebly wrinkled. Metanotum with two long slender spines arising beyond midlength of the segment, directed caudad and scarcely dorsad, their tips parallel or slightly convergent. The fore femur is long, ending on a level with the caudal portion of the eye; the fore tarsi are shortest, the hind tarsi longest, this relation holding for all the tarsal segments throughout; the tip of the hind legs is just before the caudal margin of the third abdominal segment. Wings broad, reaching the caudal margin of the second abdominal segment.

Abdomen, viewed from above, with the first segment about one half as long as the second; segments II to VII subequal in length. Tergites I to VII bear a long slender spinous projection from either side of the median line, shortest on the anterior segments, longest on the seventh segment. These projections arise from near the caudal margin, those on the anterior segments more parallel, those on the rear segments becoming divergent; these projections are directed caudad and dorsad, those behind being almost perpendicular to the body. Segments II to VII have the lateral margins produced into three sharp spines, these spines being near the base, middle and caudal portion of

each segment. These spines are directed laterad and caudad, the terminal spine more sharply caudad than the other two. Sternites—Segment III with a small subapical spine on either side, these being very widely separated, about midway between the median line and the lateral margin of the segment; segment IV with the same spines but larger and more prominent; segments V to VII similar but with another pair of small spines about midlength of the segment and much nearer to the middle line of the body. Segments II to VII with a subbasal triangular pit or mark, widely separated. Eighth tergite with the caudal margin rounded, concave, the lateral angles produced backward, upward and slightly outward as strong spines; suture on the ventral surface incomplete; two small spines on either side of the middle line of the body. Ninth tergite produced caudad as two strong, parallel, spinous projections. Hypopygium from beneath, the lower valve very long, about concealing the dorsal valve, at its tip with four small spines directed outward and caudad, these spines on the caudo-lateral angle of the segment. (See figure 1 of plate II).

Female—Very similar to the male, the antennal sheaths smaller and not so closely approximated basally; the lower valve of the ninth segment slender, obtuse at apex, feebly notched; upper valves broader, longer, with a deep median split, the lobes rounded. (See figures 3 and 4 of plate II).

Larva described from one specimen taken in Coy Glen, Ithaca, N. Y., May 8, 1913.

Pupæ described from two females; Cascadilla creek, Ithaca, N. Y., killed on May 30, 1913. (One taken as a fully-grown larva, May 7, 1913, by Miss Eudora F. Tuttle; the other taken by the author as a larva on May 11).

Two pupæ from Orono, Maine, killed on June 17, 1913, and a third fully-colored specimen from the same place on June 19.

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EXPLANATION OF THE PLATES

PLATE I. THE LARVA.

- Figure 1. Dorsal aspect of the larva.
Figure 2. Mandible, lateral aspect.
Figure 3. Mandible, ventral aspect. *a*, mandible; *b*, antenna.
Figure 4. Mouthparts, ventral aspect. *a*, maxillary palpus; *b*, stipes; *c*, cardo;
d, labium.
Figure 5. Caudal end of the larva, caudal aspect, looking into the stigmal field.
Figure 6. Lateral aspect of the larva.

PLATE II. THE PUPA.

- Figure 1. Lateral aspect of the pupa; male.
Figure 2. Dorsal aspect of the pupa; male.
Figure 3. Dorsal aspect of the end of the abdomen; female.
Figure 4. Ventral aspect of the end of the abdomen; female.

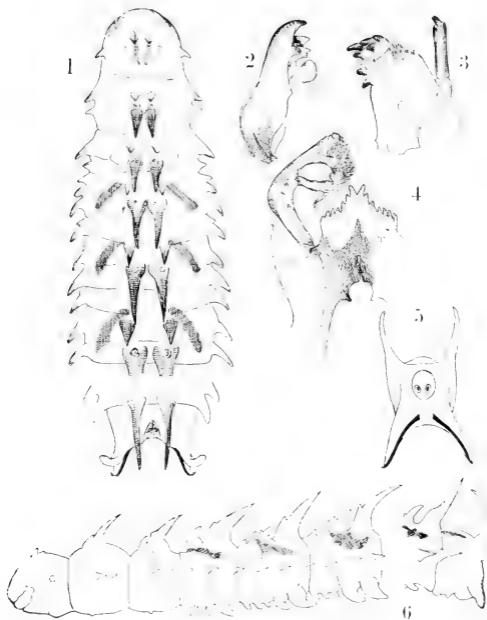


PLATE I

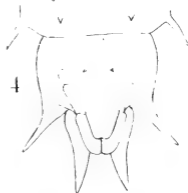
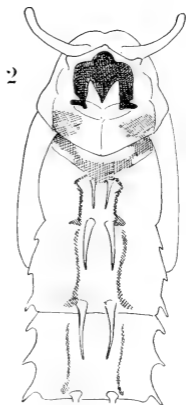
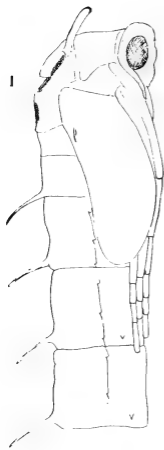


PLATE II

THE CRANE-FLIES OF THE FIJI ISLANDS

(Reprinted from the Annals of the Entomological Society of America)

ON A COLLECTION OF CRANE-FLIES (TIPULIDAE,
DIPTERA) FROM THE FIJI ISLANDS

CHARLES P. ALEXANDER

ITHACA, N. Y.

September, 1914

pages 239-246



ON A COLLECTION OF CRANE-FLIES (TIPULIDAE DIPTERA) FROM THE FIJI ISLANDS.

By CHARLES PAUL ALEXANDER, Ithaca, N. Y.*

The following crane-flies were included in material sent to Mr. Harry H. Knight by Dr. James F. Illingworth. The only published reference to the Tipulid fauna of these islands is included in Skuses Diptera of Australia (vol. IV, 2nd series, 1889) and his records are mentioned herewith. I am indebted to Dr. Illingworth and Mr. Knight for this material. The types are in the collection of the author.

Family **Tipulidae**. Subfamily **Limnobiinae**. Tribe **Limnobiini**.

Dicranomyia saltens Doleschall.

1857 *Limnobia saltens* Doleschall; Nat. Tijds. Ned. Ind., vol. 14, p. 390, pl. 2, fig. 3.

Two, a male and a female, from Nadi on July 27. This seems to be the most easterly station so far made known for this species; it has been recorded from southern India, Java, the Philippine Islands, etc.

Dicranomyia illingworthi, sp. n.

Wings hyaline with sparse brown markings; Sc short ending just beyond the origin of Rs.

Male, length, 4.6 --5 mm.; wing, 5.2 --6.8 mm.

Male: Rostrum and palpi brown. Antennæ dark brown, the flagellar segments globular in shape. Head dark brown.

Thorax rather uniformly dark brown, stripes on the praescutum not well-defined, lobes of the scutum a little darker. Pleurae uniform brown. Halteres pale, stem moderate in length. Legs, coxæ light brown, trochanters brown. Wings hyaline, veins brown; a small rounded brown stigmal spot; pale seams at Sc₂, base of Rs and on the cross-veins and deflections of veins along the cord and outer end of cell 1st M₂. Venation: (See fig. 1.) Sc short, ending just beyond the origin of Rs. Basal deflection of Cu₁ before the fork of M.

Abdominal tergites slightly darkened, the sternites pale, the abdomen rather transparent. Hypopygium with the pleurites short, cylindrical; dorsal appendage chitinized short, slightly curved and acute at apex; ventral appendage large, pale, almost white, with the outline rounded, the inner lobe produced mesad into a cylindrical, feebly chitinized, point that bears two bristles which are directed caudad. (See fig. 7.)

*Contribution from the Entomological Laboratory of Cornell University.

Holotype, ♂, Nadi, Fiji Is., 7-28, 13. Paratypes, 4 ♂s, with the type.

Libnotes strigivena Walker.

Limnobia strigivena Walker, Journ. Linn. Soc. Lond., V, 229, 1861.

This species is recorded by Skuse (Diptera of Australia, Proc. Linn. Soc. N. S. Wales, IV, series 2nd, 787, 1889).

Tribe **Antochini**.

Teucholabis fijiensis, sp. n.

Head dark; thorax with three brown stripes, pleuræ spotted with brown; wings yellowish with brown spots.

Male, length, 7 mm.; wing, 7.4 mm.

Male: Rostrum brown, palpi dark brown. Antennæ with the basal segments of the flagellum rounded, brown. Eyes large, contiguous on the vertex; head dark greyish black.

Pronotal scutum dull yellow, brown medially above; a brown spot on the lateral end. Mesonotal praescutum light yellow with three stripes of which the median one is longest and broadest, extending from the cephalic margin to the transverse suture. The lateral stripes are short and narrow, behind, crossing the transverse suture and ending on the anterior border of the scutal lobes; the lateral margin of the sclerite is suffused with dark brown. Scutum and scutellum brown except the median portion of the former which is pale. Postnotum dark brown. Pleuræ dull yellow, the episternites of the pro- and mesothoraces brown. Halteres pale. Legs, coxæ, fore and middle, brown, hinder pair paler; trochanters pale yellow; femora yellowish brown with a broad brown subapical ring; tibiæ and tarsi brown. Wings yellowish, stigmal spot large, prominent, a small seam on Sc₂; seams at the base of Rs, along the cord and on the outer end of cell 1st M₂. Venation: (See fig. 2.) cross-vein r at the tip of the long R₁ and so placed slightly beyond the middle of R₂₊₃.

Abdominal tergites dark brown, the caudal margin a little more yellowish; the basal two or three sternites yellowish, the others more brown. Hypopygium with the ninth tergite having the caudal margin rounded and very feebly notched medially. Pleuræ short, clothed with sparse long hairs. Dorsal appendage of the pleurite jointed at the base, pale, clothed with numerous long hairs at the base, at the tip slightly bifid underneath. The ventral appendage is a long elongation of the pleura, not jointed at its base, darker and more chitinized; toward the tip it is constricted, the actual apex expanded and bearing a few small hairs. (See fig. 8).

Holotype, ♂, Nadi, Fiji Is., 7-28, '13.

Tribe Eriopterini.

Gonomyia (Leiponeura) fijiensis, sp. n.

Thorax brown, lateral margin of the praescutum yellow; wings with the costal margin yellow, the membrane light brown and hyaline diversified, stigma lacking.

Male, length, 4.9 mm. Female, length, 4.8-5.1 mm.; wing, 4.3-4.4 mm.

Male: Rostrum and palpi dark brown. Antennae light sulphur yellow, the flagellar segments a little paler. The head bright sulphur yellow with three pale brown marks, a median one on the frontal tubercle and others on the sides of the vertex.

Pronotum light yellow. Mesonotal praescutum dark clove-brown the lateral margin between the pseudosuture and the transverse suture yellow, scutum, scutellum and postnotum dark brown. Pleurae light yellow, a broad brown lateral stripe, deepest ventrally fading into the yellow of the dorsal pleurites above, extending from the ventral surface of the cervical sclerites through the halteres to the posterior portion of the mesonotal postnotum; the area between this stripe and the praescutum is light yellow suffused with brown near this stripe; sternites dark brown. Halteres light sulphur-yellow. Legs, fore coxae light sulphur-yellow except the extreme tip which is dark brown; trochanters light brown; remaining coxae dark brown on the basal half, paler brown apically and on the trochanters; remainder of the legs broken off and confused in the vials with the legs of several other species, but they are probably uniform dark brown. Wings with the costa and the subcosta conspicuously bright sulphur-yellow, remaining veins brown; wing suffused with brown and variegated in places with hyaline, as in cell R_1 which completely lacks a stigma, in cell R , 1st M_2 and elsewhere. Venation as in figure 3.

Abdominal tergites brown, broadly edged with yellow on the caudo-lateral margins, the brown always continuing to the caudal margin as a narrow median line except in the 8th tergite where the lateral and caudal margin is broadly yellow all around; sternites brown, very narrowly edged with paler on the caudal margin; pleurites broadly and conspicuously yellowish. Hypopygium with the 9th tergite short, broadly concave, yellow. Pleurites rather short, cylindrical, yellow, clothed with long pale hairs, bearing at the tip two appendages; the dorsal appendage is entirely fleshy with two arms, the one directed caudad, the other cephalad, the caudal arm densely clothed with abundant pale hairs, the cephalic arm with a chitinated bristle at the tip and about four smaller bristles on either side, subequal in length and evenly spaced. The ventral appendage is a long simple curved hook, very strongly chitinated. The 9th sternite is very high, convex and bears at its tip two strongly chitinated forked appendages that are directed caudad, the outer fork being cylindrical, acute, the inner fork flattened, twisted and directed entad. The penis-guard viewed from above (fig. 9) is narrow at the base, broadening toward the tip, the lateral edges chitinated and

passing into two sharp chitinized points; viewed from the side (fig. 10) these sharp tips are directed strongly ventrad and viewed from beneath (fig. 12) they are seen to be decussate. Gonapophyses short, directed dorsad at the tip which is blunt and truncated.

Female: Similar to the male but the head of one specimen is entirely dark, the dorsal brown stripe on the pleuræ clearer and narrower not grading insensibly into the yellow of the dorsal pleurites.

Holotype, ♂, Nadi, Fiji Is., 7-28, '13. Allotype, ♀, and paratype, ♀, with the type.

Gonomyia (Gonomyia) varipes, sp. n.

Head yellow with a brown vertical spot; thoracic dorsum brown; legs banded brown and white; wings with the costal margin conspicuously bright yellow.

Female, length, 4.6 mm.; wing, 3.6 mm.

Female: Rostrum and palpi brown. Antennæ with the two basal segments light yellow above, brown on the under surface; the two or three basal flagellar segments are yellowish, the remainder brown. Head light yellow, a narrow transverse brown mark across the front behind the antennæ and a V-shaped brown mark on the vertex with its point directed cephalad.

Pronotum light brown except the scutellum which is very light yellow, a continuation of the dorsal pleural stripe. Mesonotal prae-scutum very dark clove-brown, uniform; scutum similar except the median portion and the outer caudal angles of the lobes which are paler; scutellum brown, the apical two-thirds pale; mesonotum light brown. Pleuræ and sterna brown except a broad yellow line extending from the wing-root along the dorsal pleurites to the pronotum and a second broad whitish yellow stripe extending from the fore coxæ, above the middle coxæ to underneath the halteres. Halteres uniform light sulphur yellow. Legs,—fore legs, coxæ light yellow at the base, the tip brown; trochanters brown; femora brown; tibiæ, extreme base and apical two-fifths brown, the remainder china-white; metatarsus with the basal half white, remainder of the tarsi brown. One other leg is loose in the vial and belongs to either the middle or hind legs,—here the base of the femur is yellowish passing into brown at the tip; the tibiæ all white except the very narrow base and slightly broader apex which are brown and the metatarsus is white except the tip which is broadly brown; remaining tarsal segments brown. Wings, costa very conspicuously pale sulphur-yellow, remaining veins brown; wing-membrane with a light brown suffusion; cell R_1 paler and containing the oval brown stigma. Venation as shown in figure 4.

Abdominal tergites and sternites dark brown, the pleural region paler.

Holotype, ♀, Nadi, Fiji Is., 7-28, '13.

Erioptera (Erioptera) oceanica, sp. n.

Halteres dark at tip; wings light brown; male hypopygium with the pleura bearing a chitinized knob at tip.

Male, length, 6.3 mm.; wing, 5.4 mm.

Male: Rostrum and palpi brownish yellow. Antennæ rather long, the flagellar segments rather elongate-oval; if bent backward the organ would extend beyond the wing-base; scape brown, the flagellar segments a little paler. Head dark brown and sparsely hairy.

Pronotum brown, clothed with brown hairs. Mesonotal praescutum light brownish yellow without apparent stripes but with a row of hairs on either side of the middle line; scutum, scutellum and postnotum brownish yellow, the latter with a narrow brown median line. Pleuræ light brownish yellow. Halteres rather long, pale, the knob dark. Legs pale yellow with the two apical tarsal segments brown. Wings with a pale brown tinge, the costal region a little more yellowish; veins brown. Venation as in figure 5.

Abdomen long and slender, pale yellow, the seventh sternite brown. Hypopygium with the pleurites very long and slender, densely clothed with long yellow hairs; at the tip of the pleurite are two appendages, the one a dorsal chitinized appendage, slender at the base, swollen at the tip and slightly roughened apically, and a ventral, flattened fleshy lobe that is rather truncate at the tip. (See fig. 13).

Holotype, ♂, Nadi, Eiji Is., 7-28, '13. Paratype, ♂, with the type.

Mongoma fijiensis, sp. n.

Trentepohlii group; wings subhyaline, indistinctly if at all marked; legs without white bands.

Male, length, 6.8 mm.; wing, 5.5-5.6 mm.

Female, length, 8-8.6 mm.; wing, 6.4-6.6 mm.

Male and female: Rostrum and palpi yellowish. Antennæ with the basal segments pale yellow, the flagellar segments brownish. Head dark brown. Neck elongate, brown dorsally, yellow beneath. Mesonotal praescutum light yellow with three elongate brown stripes, the median one broadest in front, narrowed behind and ending at the transverse suture; the lateral stripes are narrower, beginning just back of the pseudosutural foveæ and continue back to the scutum where they suffuse the lobes. Scutum yellow, except the central portions of the lobes which are brown; scutellum and postnotum dark brown except a narrow margin of yellowish. Pleuræ light yellow, the sterna a little suffused with brown. Halteres rather short, pale yellow. Legs, coxæ and trochanters pale yellow, femora, tibiæ and the first tarsal segment brown, the remainder of the legs broken off. Wings with a pale yellow suffusion; veins light brown; stigma rather pale; indications of slightly darker seams along the cord. Venation: (See figure 6). Fusion of 1st A and Cu₂ slight.

Abdominal tergites dark brown medially, this mark in the shape of a long triangle with its point directed cephalad; sternites pale yellow.

Holotype, ♂, Nadi, Fiji Is., 7-28, '13.

Allotype, ♀, and paratype, ♀, with the type.

Mongoma, sp.

A species belonging to the *fragillima* and *australasiae* group in the Macleay collection mentioned by Skuse (Dipt. Aust., vol. 4, series second; Proc. Linn. Soc. N. S. W., Sept. 25, 1889; p. 832, 833.)

Conosia irrorata, Wiedemann.

Sixteen females taken at a lamp at Nadi, Fiji Islands, July 28, 1913. This series shows a great difference in size in the different individuals. It was previously recorded from these islands by Skuse who noted a specimen in the Macleay collection. (l. c., p. 837, 838). The reason that this entire series consisted of females is undoubtedly due to the nocturnal oviposition in this species. Series of photophilous craneflies always show a preponderance of the female sex and many of these are gravid specimens ready to deposit their eggs, the others having laid the clutch earlier in the evening. When males occur at lamps or in trap-lanterns it is probable that copulation takes place in the twilight or early evening.

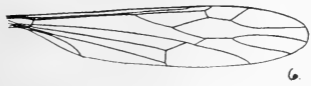
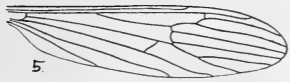
EXPLANATION OF THE PLATES.

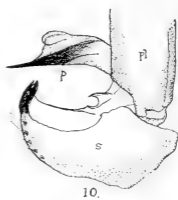
PLATE XXXIV.

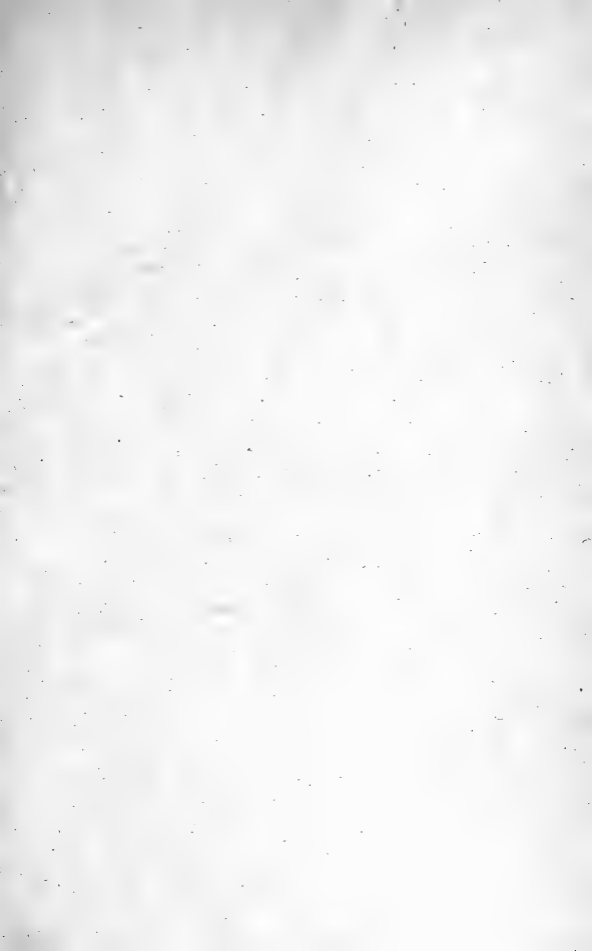
- Fig. 1. Wing of *Dicranomyia illingworthi*, sp. n.
 Fig. 2. Wing of *Teucholabis fijiensis*, sp. n.
 Fig. 3. Wing of *Gonomyia (Leiponeura) fijiensis*, sp. n.
 Fig. 4. Wing of *Gonomyia (Gonomyia) varipes*, sp. n.
 Fig. 5. Wing of *Erioptera (Erioptera) oceanica*, sp. n.
 Fig. 6. Wing of *Mongoma fijiensis*, sp. n.

PLATE XXXV.

- Fig. 7. Hypopygium of *Dicranomyia illingworthi*; dorsal aspect of the pleurite.
 Fig. 8. Hypopygium of *Teucholabis fijiensis*; dorsal aspect of the pleurite.
 Fig. 9. Hypopygium of *Gonomyia (Leiponeura) fijiensis*; dorsal aspect. d—dorsal appendage; v—ventral appendage; p—penis-guard.
 Fig. 10. Hypopygium of *Gonomyia (Leiponeura) fijiensis*; lateral aspect. p—penis-guard; pl—pleurite; s—9th sternite.
 Fig. 11. Hypopygium of *Gonomyia (Leiponeura) fijiensis*; ventral aspect of the 9th sternite.
 Fig. 12. Hypopygium of *Gonomyia (Leiponeura) fijiensis*; ventral aspect of the penis-guard.
 Fig. 13. Hypopygium of *Erioptera (Erioptera) oceanica*; pleurite, lateral aspect. d—dorsal appendage; v—ventral appendage.









ON A
COLLECTION OF CRANE-FLIES
FROM BRITISH GUIANA

Tipulidae, Diptera

By

CHARLES P. ALEXANDER

From the Transactions of the American Entomological Society, xl, 223-255

Issued September 25, 1914

ON A COLLECTION OF CRANE-FLIES FROM BRITISH GUIANA (TIPULIDAE, DIPTERA)¹

BY CHARLES P. ALEXANDER

Ithaca, New York

The present paper is the result of the study of an extensive series of crane-flies collected in British Guiana by the well-known entomologist, Mr. H. S. Parish, during 1912 and 1913. The material at hand consists of some 1200 specimens representing fifty-five species of which twenty-four are herein considered as new. Unless stated otherwise the specimens were taken at light as explained under Mr. Parish's account of his trip. The habit of many of the species of ovipositing at twilight or during the night explains why so many of the individuals secured at the lights were females.

The types and uniques are deposited in the collection of the author. Paratypes of several of the species have been placed in the collections of the United States National Museum, the Hungarian National Museum, the Academy of Natural Sciences of Philadelphia and the Museum of Comparative Zoology.

Mr. Parish's Account of the Trip:

I boarded my steamer at New York and after a journey lasting seventeen days I arrived at Georgetown, the capital of British Guiana, on November 28, 1912. On the second day after my arrival at Georgetown I caught the river boat that plies between there and Bartica, which latter place I reached after a pleasant trip of about 40 miles up the Essequibo River. Bartica is a pretty little village having a population of between 800 and 1000 including the Indians. The weather there is, on the whole, rather uncertain though one can generally depend on a little rain every day, excepting from September to November, during which months the rainfall is very slight. However, as I remarked above, one cannot place any dependance on the weather and it is well for the prospective collector to include in his impedimenta a good waterproof cape and an umbrella as a safeguard against fever and for his personal comfort.

¹ Contribution from the Entomological Laboratory of Cornell University.

This colony is thickly covered with forest, in the interior abounding in valuable hardwoods. The house at which I stopped while at Bartica was about 150 yards from the forest and formed an ideal location for one employed in my vocation. This house had two floors; the one on the second, facing the woods, was fitted with a gallery or balcony in which there were several windows. Darkness falls very quickly here, there being but little twilight, so that as soon as the sun set I would repair to the balcony I have described above and make preparations for the evening's work. The method I adopted was to hang a sheet under my oil-lamp that is provided with a reflector, thereby proving a great attraction for various insects. Then with net in hand and cyanide bottles within easy reach, I was ready for my evening's catch, that is to say as ready as is possible, for within an hour they were trooping in a good deal faster than I could handle them. Sometimes there would be as many as fifty or even one hundred crane-flies flying against the ceiling, besides numerous moths, beetles, etc. It was truly a happy hunting ground for the enthusiastic collector and one, much to the disgust of my landlord, from which I could hardly tear myself away.

My time for rising was six A. M. and from then on until eleven A. M. I would employ my time in drying, papering or pinning the specimens that I had captured on the previous day and night. From half past eleven until after five in the afternoon, I would go afield for specimens. My experience is, that for successful crane-fly collecting, one should select damp, shady spots, most of the species being found in such places though some are found on hilly ground. I never saw the crane-flies swarming as I have noticed them doing in Toronto, excepting at Mallali and then only three or four together.

After leaving Bartica I went back to Georgetown and from there took a steamer to Wismar which is the highest point at which the Demerara River is navigable by that steamer. I remained over night at this place and then took a smaller steamer for Mallali that is about 175 miles from the starting point. On steaming up the Demerara River, I noticed that almost all of the tall trees were dead, caused by the terrible forest fires that raged through the country a few years ago. These fires burned up everything, destroying all animal life for miles around and it is only now that the vegetation is springing up again. This was a great disappoint-

ment to me, as having visited this country before and having found a great variety of insect life, I had counted upon this to be so again. I had intended to push on further into the interior and I would have done so only for my becoming ill, which put an end to all my plans. In the meantime and before I was taken ill I captured a few interesting specimens in places where the ground was beginning to show green, but the variety of species was lacking.

Bartica.—Temperature in the sun, 110 to 120 degrees, in the shade, 80 to 84 degrees, during rain, 70 to 72 degrees. The ground is comparatively low, but a short distance back it rises into the hills.

Mallali.—Temperature in the sun, 110 to 120 degrees, in the shade, 80 to 84 degrees, during rain, 68 to 70 degrees. The altitude is from 75 to 100 feet above sea-level.

Family TIPULIDAE

Subfamily LIMNOBINAЕ

Tribe *Limnobiini*

Genus **DICRANOMYIA** Stephens

1829. *Dicranomyia* Stephens, Cat. Brit. Ins., ii, 243.

Dicranomyia eiseni Alexander

1912. *Furcomyia eiseni* Alexander, Canad. Entom., xlv, 338, pl. 11, fig. s.

Bartica, January 9, 3 males; February 5, 1 male, in swamps.
Mallali, March 13, 1 female; March 19, 1 male.

Dicranomyia apicata sp. n.

S: long; wings infumed at the tip; pleura without stripes.

Male,—length, 5-6.4 mm.; wing, 5.7-7 mm.

Female,—length, 7.1; wing, 6.4-6.9 mm.

Rostrum and palpi brown. Antennae brownish black throughout, flagellar segments rounded oval, more elongated distally. Head blackish with a light silvery gray bloom.

Mesonotal praescutum light brownish yellow with a very broad brown median stripe that is enlarged behind at the transverse suture; lobes of the scutum and the scutellum dark brown, remainder of these sclerites brownish yellow; postnotum lighter brown. Pleura light yellowish, not marked. Halteres moderately long, the base of the stem yellowish, the knob brown. Legs, coxae and trochanters yellow; base of the femora yellow soon passing into dark brown; tibiae and tarsi dark brown. Wings light brown, the stigma oval, dark brown; tip of the wing suffused with a paler brown. Venation:

(see pl. III, f. 1) Sc long extending far beyond the origin of the radial sector, Sc_2 near its tip; R_3 long, more than twice as long as the deflection of R_{4+5} ; basal deflection of Cu_1 at or before the fork of M .

Abdominal tergites dark brown, the ninth segment somewhat paler; sternites brown.

Habitat.—Bartica, December 24, 1912 to April 14, 1913.

Holotype, ♂, Bartica, February 21, 1913.

Allotype, ♀, topotypic, December 24, 1912.

Paratypes, 4♂, 7♀, topotypic, December 31, 1912, to April 14, 1913.

Easily separated from the other known species of the genus that have the long subcosta by its lack of distinct spottings on the wings, the stigmal blotch and a more or less distinct infuscation at the apex being the only marks on the wing-surface.

***Dicranomyia parishii* sp. n.**

Sc short, S_2 retracted far from the tip of Sc_1 , R_3 long; wings hyaline or nearly so; halteres rather short.

Male,—length, 5 mm.; wing, 6.2 mm.

Female,—length, 5–6.2 mm.; wing, 5.3–6.4 mm.

Rostrum, palpi and head light brown, the latter with an indistinct grayish bloom when seen in certain lights.

Mesonotal praescutum with a light golden bloom, the lateral margins narrowly brown, the sclerite with three dark brown stripes of which the median one is broadest, the short lateral stripes beginning back of the pseudosutural foveae and continuing on to the scutum where they suffuse the lobes; scutellum and postnotum light brown. Pleura pale, whitish, the mesosternum strongly suffused with brown. Halteres quite short, brown, the knob darker. Legs, coxae and trochanters brownish yellow; femora brown, paler at the extreme base; tibiae and tarsi brown. Wings hyaline, veins brown, stigma indistinct. Venation: S_1 ending opposite the origin of R_3 , Sc_2 retracted far back from its tip as in the *halterata* group; R_3 long, nearly twice as long as the deflection of R_{4+5} .

Abdominal tergites dark brown, the sternites paler.

Habitat.—Bartica, January 11, 1913 to February 27, 1913. Mallali, March 6, 1913 to March 31, 1913.

Holotype, ♂, Mallali, March 15, 1913.

Allotype, ♀, topotypic, March 6, 1913.

Paratypes, 3♀, Bartica, January 11, February 27. One♀, topotypic, March 31, 1913.

The only described regional species that can be confused with this form is *D. simillima* Alex. (Can. Ent., December 1912, 361,

pl. 11, fig. n; as *Furcomyia*), which has Sc_1 ending before the origin of R_s , R_s short, not much longer than the deflection of R_{4+5} , long slender halteres, etc.

Genus **RHIPIDIA** Meigen

1818. *Rhipidia* Meigen, System. Besch., i, 153.

Rhipidia domestica Osten Sacken

1859. *Rhipidia domestica* Osten Sacken, Proc. Acad. Nat. Sci. Phila., 1859, 208.

Bartica, six ♂, eight ♀, November 27, 1912 to February 5, 1913.

Mallali, one ♂, March 31, 1913.

Rhipidia annulicornis Enderlein

1912. *Rhipidia annulicornis* Enderlein, Zool. Jahrb., xxxii, pt. 1, 80, 81.

Bartica, two ♂, eight ♀ December 30, 1912 to April 14, 1913.

Mallali, a ♂ and a ♀, March 13 to 15, 1913.

Rhipidia conica sp. n.

Antennae black with the thirteenth segment pale; mesonotal praescutum produced into a high conical, somewhat spinous, tubercle; legs pale, the tarsi tipped with darker; wings with the costal margin yellow, remainder of the wing-membrane grayish with scattered brown markings.

Female,—length, 7.5 mm.; wing, 7.6 mm.

Rostrum and palpi dark brownish black. Antennae with the segments of the flagellum strongly serrated, the shafts of the segments short, antennae brownish black except segment thirteen which is abruptly yellow. Eyes almost contiguous on the vertex. A small median tubercle just behind the antennal bases. Head brown with golden yellow reflections in certain lights.

Pronotum reddish brown. Mesonotal praescutum produced dorsocephalad into a conspicuous conical spine; anterior half of the sclerite light reddish brown, dorsal posterior half, including the summit of the spine, rich dark brown except a pale median portion near the suture; scutum, scutellum and postnotum brown. Pleura light brownish yellow without any conspicuous markings. Halteres pale, the knob darker. Legs,—fore legs with the coxae and trochanters pale brownish yellow, femora yellowish brown passing into brown at the tip, tibiae and tarsi very pale yellow, excepting segments four and five and the posterior half of three of the tarsi which are dark brownish black; other legs similar but the middle femora are darker throughout and the posterior femora are lighter throughout and not darkened at the tip. Wings with the cephalic portion light cream yellow, the caudal portion including all of the cells behind M and much of the radial field grayish; dark marks on the wings as follows: a small brown blotch at the base of M ; a large blotch at the origin of R_s and a nearly subequal blotch midway between these two last; a small rounded blotch at the end of S_3 ; darker suffusions at the fork of R_s , tip of R_1 , end of

R_{2+3} , Cu_2 , and 2nd A and along most of the veins and deflections of veins. Venation: see pl. III, fig. 2.

Abdominal tergites dark brown, the valves of the ovipositor reddish yellow; sternites dull yellowish indistinctly marked with black; a greenish tinge at the base of the abdomen may, or may not, be natural.

Habitat.—Bartica, February 17, 1913.

Holotype,—♀, Bartica, February 17, 1913.

Rhipidia conica separates off from all the described forms, with the exception of *punctipennis* Alexander, in the remarkable tubercle on the mesonotum; to what extent this character is developed in the male sex is uncertain. In another paper (Journ. N. Y. Ent. Soc., XXII, 117; 1914), I have erected the subgenus *Conorhipidia* to receive these two species, *conica* being the type of the subdivision.

Genus GERANOMYIA Haliday

1833. *Geranomyia* Haliday, Entomol. Magaz., i, 154.

Geranomyia insignis Loew

1851. *Aporosa insignis* Loew, Linnæa Entom., v, 395.

Many specimens of both sexes; Bartica, November 26, 1912 to February 9, 1913, a few in the deep swamps but more attracted to lights in the evening; Mallali, March 18 to March 20, 1913.

Geranomyia pulchella sp. n.

Lobes of the scutum and posterior pleural sclerites black; wings clear on the costal third, gray at the tip and on the caudal two-thirds; four dark blotches on the costal margin; legs unbanded.

Male,—length, excluding the rostrum, 5.5–5.8 mm.; rostrum, 3–3.1 mm.; wing, 6.5–6.6 mm.

Female,—length, excluding the rostrum, 6.4–7 mm.; rostrum, 2.9–3.2 mm.; wing, 6.7–7 mm.

Rostrum and palpi dark brownish black, the former moderate in length, the latter two-segmented. Antennae dark brown throughout. Head black with a light gray bloom.

Pronotum reddish brown. Mesonotal praescutum rich reddish brown, a yellowish blotch on the sides of the sclerite in the neighborhood of the pseudosutural foveae, behind which the whole side of the sclerite is covered by a large blackish blotch; an indistinct dark median vitta on the anterior part of the sclerite; scutum with the lobes black, median and caudal portions paler, yellowish brown; scutellum brown; postnotum dark brownish black. Pleura largely black, except the region around the wing-root, the propleurae, and the sternal sclerites which are brown. Halteres light yellow, the knob brown. Legs, coxae and trochanters brown, femora yellowish brown throughout, tibiae yellowish brown, the tarsi brown. Wings with the anterior third yellowish hyaline with four dark brown blotches, the

basal two very small, the third, at the stigma, and the fourth, at cross vein r , very large and conspicuous; caudal half of the wings strongly infumed with gray, the tip darker. Venation: (see pl. III, fig. 3) *Sc* ending slightly beyond the origin of R_5 , Sc_2 at its tip; R_5 long, slightly angulated at origin, about four times as long as the deflection of R_{4+5} ; cell $1-M_2$ long and narrow as in *cinereinota* Alex.

Abdomen with the basal tergites dark brown, apical tergites reddish brown with a narrow indistinct darker median line; basal sternites yellowish, apical sternites brown, the hypopygium yellowish brown.

In the male paratype, the end of *Sc* is just beyond the origin of R_5 .

Habitat.—Bartica, January 8, 1913, to February 14, 1913.

Holotype, ♂, Bartica, January 22, 1913, in deep swamps.

Allotype, ♀, with the type.

Paratypes, 5 ♀, 1 ♂, topotypic, January 8 to February 14.

Geranomyia tibialis Loew

1851. *Aporosa tibialis* Loew, *Linnaea Entom.*, v, 397.

Eighteen specimens, from Bartica, January 4, 1913 to February 14, 1913, one taken in deep swamps, the others attracted to light at night.

Geranomyia cinereinota Alexander

1913. *Geranomyia cinereinota* Alexander, *Ent. News*, xxiv, 407, pl. 14, fig. 4.

Nearly two hundred specimens taken at Bartica from December 5, 1912 to April 14, 1913; Mallali, March 8 to 20, 1913. This form came in abundance to light and with *Gonomyia pleuralis* Williston is the most abundant form in the collection.

Geranomyia virescens Loew

1851. *Aporosa virescens* Loew, *Linnaea Entom.*, v, 398.

One dark female that I refer to this species taken at Bartica on December 31, 1912. One typical male, Bartica, January 23, 1913.

Geranomyia pallida Williston

1896. *Geranomyia pallida* Williston, *Trans. Ent. Soc. Lond.*, 1896, 284, pl. ix, fig. 53.

Three females at Bartica, December 19, 1912 to January 30, 1913, at light. One female from Bartica on February 5, 1913, in the swamps.

Tribe *Antochini*

Genus **RHAMPHIDIA** Meigen

1830. *Rhamphidia* Meigen, *System. Besch.*, vi, 150.

Rhamphidia albitarsis Osten Sacken1887. *Rhamphidia albitarsis* Osten Sacken, Berl. Ent. Zeitsch., xxi, 184.1896. *Rhamphidia albitarsis* Williston, Trans. Ent. Soc. Lond., 1896, 288, pl. 10, fig. 59.

One typical specimen, a ♂, from Bartica, November 26, 1912. A second specimen, ♀, from the same place on February 8, 1913, is quite normal but the tarsi are not whitish, being of a very light brown.

Rhamphidia uniformis sp. n.

Wings with crossvein *r-m* present; veins *Sc* and *R*₁ close together at their tips; inner end of cell *1st M*₂ about on a line with the base of *R*₂; tarsi light brown.

Female.—Length, 5–5.3 mm.; wing, 4.4–4.6 mm.

Rostrum rather long, slender, about as long as the head, dark brown, the palpi dark brownish black. Antennae short, very dark brown. Head very dark brown.

Pronotum and cervical sclerites dark brown. Mesonotum rather light brown, shining, the postnotum much paler, yellowish brown, this color suffusing the pleurites except the more dorsal ones which are brown; sternites pale like the ventral pleura. Halteres rather short, pale, the knob darker. Legs; coxae yellowish brown, the trochanters and femora dark brown, the latter a little paler at the base, tibiae dark brown, tarsi light brown, in some specimens quite pale. Wings almost hyaline, the veins brown, a faint brownish tinge in the region of the stigma. Venation: (see pl. III, fig. 4) *Sc*₁ and *R*₁ rather approximated at their tips; crossvein *r-m* present and distinct, situated far out toward the distal end of cell *1st M*₂ and in this respect suggesting the condition that obtains in the Old World *Cenosia*; cell *1st M*₂ unusually long, its inner end about on a line with the origin of the radial sector.

Abdomen dark brown, the genital segment elongate, the valves very slender, the upper pair acicular.

Habitat.—Bartica, January 28, 1913 to February 8, 1913.

Holotype, ♀, Bartica, February 1, 1913.

Paratypes, 2 ♀, topotypic, January 28, 1913; February 8, 1913.

Rhamphidia mirabilis sp. n.

Pale reddish yellow, the wings banded with brown.

Male.—Length, 5–5.6 mm.; wing, 5.1–5.3 mm.

Female.—Length, 5.8–6 mm.; wing, 4.8–5.3 mm.

Male: Rostrum elongate, much longer than the head, dark brown, the palpi brownish black. Antennae light brown, the verticils on flagellum long, black, conspicuous. Head blackish with a sparse gray bloom.

Pronotum light yellow. Mesonotal praescutum reddish yellow without apparent stripes; scutum with the outer cephalic half of each lobe dark

brown, scutellum and postnotum reddish yellow. Pleura light yellow, unmarked. Halteres pale throughout. Legs, coxae and trochanters yellow, the femora, tibiae and tarsi light brown. Wings yellowish hyaline with two broad dark brown bands, the first occupying the basal portion, the second the region of the cord and completely traversing the wing. Costa very strong, veins brown. Venation: see pl. III, fig. 5.

Abdomen reddish yellow, the seventh segment brownish black.

Female: Abdomen unicolorous; the dark brown spots on the scutal lobes not very evident.

Habitat.—Bartica, December 5, 1912 to February 20, 1913, the latter taken in deep swamps. Mallali, March 8 to 19, 1913. Described from 13 specimens, 6♂, 4♀, 3 broken.

Holotype, ♂, Mallali, March 14, 1913.

Allotype, ♀, topotypic, March 8, 1913.

Paratypes, 5♂ 3♀, 3 broken, Bartica, December 5, 1912 to February 20, 1913; Mallali, March.

Genus *STYRINGOMYIA* Loew

1845. *Styringomyia* Loew, Dipt. Beitr., i, 6.

Styringomyia americana sp. n.

Mesonotum pale medially, darker on the sides; fore legs banded, hind legs unbanded:

Male.—Length, 5 mm.; wing, 3.6–4.2 mm.

Rostrum and palpi yellowish brown. Antennae with the basal segments brown, the flagellum a little brighter colored. Head light reddish brown.

Pronotum pale on the dorsal median line, more brown laterally. Mesonotal praescutum rather pale medially, this mark broadest behind near the suture, sides of the praescutum and the scutum reddish brown, shining. Pleura dull yellowish. Halteres short, pale. Legs with the coxae and trochanters light yellow, the fore femora yellow with three brown bands, narrower subbasal and subapical ones and a broader medial one; tibiae yellow, broadly brownish beyond the base and before the middle, the tip narrowly browned; tarsi yellow, the last segment brown. Hind legs entirely light yellow, unmarked except the brown last tarsal segment. Wings tinged with light yellow, the crossvein *r-m* slightly suffused with brown. Venation: see pl. IV, fig. 1.

Abdominal tergites light yellowish, the apical fourth dark brown, the sternites yellow; hypopygium crushed.

Habitat.—Mallali, March 8, 1913.

Holotype, ♂, Mallali, March 8, 1913.

Paratype, sex? topotypic, on the same date.

Genus *ATARBA* Osten Sacken

1869. *Atarba* Osten Sacken, Mon. Dipt. N. Am., iv, 127.

Atarba varicornis Alexander

1913. *Atarba varicornis* Alexander, Ent. News, xxiv, 448, pl. xiv, fig. 10.

One male from Mallali, March 25, 1913.

This is the first male to be made known and I make it the allotype. The antennae in this sex are nearly as long as the rest of the body, the basal three-fifths of each segment blackish brown, the apical portions yellowish; the segments with long outspreading hairs.

Genus **CERATOCHEILUS** Wesche

1910. *Ceratocheilus* Wesche, Jour. Linn. Soc., Zool., xxx, 358.

Ceratocheilus americanum Alexander

1913. *Ceratocheilus americanum* Alexander, Psyche, xx, 49, 50, pl. 2, figs. e and j.

One typical dark female, Bartica, February 12, 1913.

Genus **TOXORHINA** Loew

1851. *Toxorhina* Loew, Linnaea Entom., x, 400 to 402.

Toxorhina centralis Alexander

1913. *Toxorhina centralis* Alexander, Psyche, xx, 52, 53, pl. 2, fig. i.

Three specimens from Bartica, December 10, 1912, a ♀, to February 28, 1913, a ♂.

A specimen of another species is represented by a single female from Bartica, December 12, 1912. It is allied to *brasiliensis* Westwood in the dark tibial apices, but it is very much smaller. I prefer to leave this form until more material becomes available.

Genus **TEUCHOLABIS** Osten Sacken

1859. *Teucholabis* Osten Sacken, Proc. Acad. Nat. Sci. Phila., 1859, p. 223.

Teucholabis annulata Williston

1896. *Teucholabis annulata* Williston, Trans. Ent. Soc. Lond., 1896, 290, pl. 10, f. 63.

One male from Bartica, November 30, 1912; females from Bartica, November 30, 1912 and January 14, 1913.

Teucholabis trifasciata Enderlein

1912. *Teucholabis trifasciata* Enderlein, Zool. Jahrb., xxxii, pt. 1, 69, fig. R1.

One specimen, sex undeterminable because the abdomen is broken, from Bartica, December 4, 1912.

Teucholabis melanocephala Fabricius1794. *Tipula melanocephala* Fabricius, Ent. Syst., iv, 241.1828. *Limn. his. melanocephala* Wiedemann, Ausserour. zweifl. Ins., i, 34.

Eight specimens, 4♂ and 4♀, Bartica, December 5, 1912 (♂) to April 14, 1913 (♂), a few in the swamps, the others attracted to light at night. Mallali, March 11, 1913, one large male.

I identify this large showy species as being the *Tipula melanocephala* of Fabricius described from Cayenne. My series do not agree in all respects with the rather detailed description given by Wiedemann but since they show considerable variation in color, I believe my determination of the form to be correct. The insect may be recharacterized as follows:

Male.—Length, 6.9 to 9.8 mm.; wing, 6.3 to 9.1 mm.

Female.—Length, 9 to 10.3 mm.; wing, 6.4 to 8 mm.

Male. Rostrum rather short, dark brownish black, the palpi black. Antennae dark brown. Head reddish yellow, in some specimens with a conspicuous dark brown blotch on the vertex.

Pronotum reddish yellow, black anteriorly. Praeseutum reddish with a broad dark brown mark extending from the lateral margin inward toward the median line; other specimens show a median dorsal stripe that is divided by a pale line; in some dark individuals the median line is dark brown and at its caudal end becomes confluent with the cephalic ends of the lateral stripes as described by Wiedemann; this leaves a large blotch of yellow on the sides of the sclerite in front of the pseudosuture and the median portion of the sclerite behind at the transverse suture. Lobes of the scutum largely dark brown; scutellum and postnotum pale, in dark individuals the caudal half of the latter very dark brownish black. Pleura largely blackish but this color largely concealed by a dense silvery pubescence; sternites reddish yellow. Halteres moderately long, the stem light brown, the knobs dark brown except their bases which are black. Legs, coxae and trochanters dull yellow, femora yellowish brown with a broad median and a subapical annulus of dark brown. Wings subhyaline with three brownish clouds, not strongly defined, the basal band irregular extending from the rounded blotch at the origin of *R*₅ to the end of *2nd A*₁*nd*; the middle band begins at the darker brown rounded stigma caudad across the wing, including the outer end of cell *1st M*₂; the third band embraces the wing-tip and is moderately broad. The venation is shown in plate III, fig. 7.

Abdomen with the first tergite black, the remaining tergites dull yellow; sternites with the lateral margins of the segment brown; sternite seven with a broad rounded dark brown median blotch at the caudal end; sternite eight with a row of about seven strong curved hairs on either side of the middle line, these hairs directed inwards.

Female.—Similar to the male but the size averages smaller as is the rule in this genus, but the very long, slender abdomen makes up the greater part of this length; abdomen dark brown.

Teucholabis stygica sp. n.

Black; wings hyaline with the tip infumed and a brown mark along the cord.

Female.—Length, 5.5 mm.; wing, 4.8 mm.

Rostrum very long and slender, much longer than the head, dark brownish black, the palpi black. Antennae black, the apical flagellar segments broken. Head black.

Thoracic dorsum deep shiny black, unmarked. Pleura black with a very sparse grayish bloom in oblique lights, not shining, Halteres black, the knobs pale, dull yellow. Legs black, the tibiae and tarsi brown. Wings hyaline, the apex infumed with brown; a very large triangular blotch in the region of the cord, broadest along costa, ending on the basal deflection of Cu_1 ; a faint brown seam along the outer end of cell $1st\ M_2$. Venation: see pl. III, fig. 6.

Abdomen short, black, the valves of the ovipositor reddish chestnut.

Habitat.—Bartica, February 8, 1913.

Holotype, ♀, Bartica, February 8, 1913.

Teucholabis lugubris sp. n.

Abdomen long and slender; head black; thorax black with scanty reddish markings; wings hyaline with a small pale stigmal spot.

Female.—Length, 7.8 mm.; abdomen, 6.1 mm.; wing, 5.9 mm.

Rostrum rather short and stout, about as long as the head, this and the palpi dark brownish black. Antennae dark brown. Head black.

Pronotum black. Mesonotal praescutum black with a linear yellowish stripe beginning near the pseudosutural fovea extending caudad toward the suture but not attaining this; a conspicuous yellow blotch occupying the caudo-median portion of the praescutum and the cephalo-median portion of the scutum; remainder to the scutum black; scutellum black except a rounded blotch on the sides of the sclerite, obscure yellow; postnotum black. Pleura black with a silvery gray pubescence. Halteres black, the knob large, obscure yellow. Legs with the fore coxae tipped with yellow, trochanters brown, femora dark brown, most intense at the tip, tibiae and tarsi brownish black. Wings hyaline or nearly so, veins brown, costa more yellowish; a small rounded stigmal spot, pale brown and confined to the vicinity of the crossvein r . Venation: see pl. IV, fig. 3.

Abdomen very long and slender; tergites black, shiny, apices of segments seven and eight reddish; sternites black, the valves of the ovipositor chestnut brown.

Habitat.—Bartica, January 4, 1913, in deep swamps.

Holotype, ♀, Bartica, January 4, 1913.

A key to the American species of this large and difficult genus is appended. I have seen the types of over half the described forms and specimens of many of the remaining species. The key should always be supplemented by reference to the original descriptions and figures.

As indicated in earlier papers, *bifasciata* Fabricius is the same as *trifasciata* Enderlein, the latter name being the correct one. *T. venezuelensis* Macquart² is omitted from the key as I believe it to be synonymous with *T. melanocephala* Fabricius, a variable species. *T. polita* Osten Sacken is either an exceptionally small species or else Osten Sacken's type is shrunken and no allowance was made by him for this change in condition. The species identified by Williston as *complexa* (Trans. Ent. Soc. Lond., 1896, 289) is not this, but represents an apparently undescribed species that is quite widely distributed in Middle America and the Antilles.

A KEY TO THE AMERICAN SPECIES OF TEUCHOLABIS
OSTEN SACKEN

1. Wings spotted; cross-vein *r-m* obliterated by fusion. (Peru)
paradoxa Alexander³
Wings hyaline or banded, not spotted; cross-vein *r m* present or lost by atrophy..... 2
2. Wings with the membrane hyaline or nearly so, unmarked except for the stigmal spot; in some species the membrane is slightly darkened but in such cases the stigmal spot is darker, distinct. 20
Wings with the membrane clouded or banded, or with a seam along the cord, or with the tip infumed or with the membrane darkened and the stigma indistinct..... 3
3. Wings with distinct bands .. 4
Wings with the darker markings reduced to very narrow seams along the cord or to indistinct clouding at the apex or else the whole wing is uniformly dark brown..... 12
4. Radial sector short, very arcuated, beginning opposite the tip of *Sc*₁ [head dark brown above; pronotum yellow; thorax shiny black; wings hyaline with a broad brown apex and brown markings along the cord.]. (Peru)..... **munda** Alexander⁴
Radial sector longer, less arcuated, beginning far before the tip of *Sc*₁..... 5
5. Thoracic praescutum shiny black, unmarked..... 6
Thoracic praescutum more or less orange-yellow or brownish. 8
6. Pronotum yellowish [head black; wings with the apical band including the distal end of cell *1st M*₂; basal band broadly diamond-shaped]. (Lesser Antilles, Colombia, French Guiana.)
trifasciata Enderlein⁵
= bifasciata Fabricius⁶

² 1846. *venezuelensis* Macquart. Dipt. Exot., suppl. 1, 19, pl. 2, fig. 7 (*Limnobia*).

³ 1913. *paradoxa* Alexander, Ent. News, xxiv, 445, 446, pl. 16, fig. 8.

⁴ 1913. *munda* Alexander, Ent. News, xxiv, 444, 445, pl. 16, fig. 7.

⁵ 1912. *trifasciata* Enderlein, Zool. Jahrb., xxxii, pt. 1, p. 69, 70, fig. R1.

⁶ 1805. *bifasciata* Fabricius, Syst. Antl., 31 (*Tipula*) = *trifasciata* Enderlein.

- Pronotum black. 7
7. Small species (σ^7 , length, 2.5-3 mm.); legs with the basal two-thirds yellowish-tawny [head black; halteres brown, knob yellow; apical band including the distal end of cell *1st M*₁]. (Brazil)
*polit*a Osten Sacken⁷
- Larger species (φ , length, 5 mm.); legs dark brown [head black; wings with the apical band not including the distal end of cell *1st M*₂ which is seamed with brown; basal band narrow, linear.]. (Costa Rica, Panama.).....*rostrata* Enderlein⁸
8. The apical band on the wings not including the distal end of cell *1st M*₂..... 9
- The outer band on the wings including the distal end of cell *1st M*₂..... 10
9. Basal band on the wings narrow, linear; mesothorax mostly yellow; femora without a medial band [thorax with a large black spot on the middle of the praescutum; pleura clear yellow; legs dark brownish black except the base of the femur which is paler]. (Brazil).....*pulchella* Alexander⁹
- Basal band on the wings broad, diffuse; mesothorax mostly dark; femora with a brown medial band [colors on the wing-disc much paler, less well defined; head yellowish usually with a dark brown mark on vertex]. (Guiana).....*melanocephala* Fabricius¹⁰
10. Wing markings not so extensive, the band along the cord narrow, not extending caudad of the basal deflection of *Cu*₁ and in no way connected with the apical band [head dark brown; pronotum very light yellow; mesonotum with a chestnut dorsal stripe; femora yellow with the tip black]. (Central America)
sackeni Alexander¹¹
- Wing markings extensive, the band along the cord broader, attaining the hinder margin of the wing and connected along the costal and caudal margins with the broad apical band and thus enclosing a large oval spot of hyaline..... 11
11. Head black; pleura with a large blotch; basal cells of the wing suffused with dark color; size larger (φ , 6.1 mm) [pronotum light yellow; hind legs blackish; halteres dark throughout]. (Peru)
jucunda Alexander¹²
- Head reddish brown; pleura unspotted; basal cells of the wings almost devoid of dark color; [pronotum yellow; halteres dark throughout]. (Bolivia).....*laeta* Alexander¹³

⁷ 1887. *polit*a Osten Sacken, Berl. Ent. Zeit., xxxi, pt. 2, 189.

⁸ 1912. *rostrata* Enderlein, Zool. Jahrb., xxxii, pt. 1, 68, 69, fig. Q1.

⁹ 1913. *pulchella* Alexander, Psyche, xx, 44, pl. 2, figs. b, l.

¹⁰ 1794. *melanocephala* Fabricius, Entomol. Syst., iv, 241 (*Tipula*).

¹¹ 1913. *sackeni* Alexander, Psyche, xx, 42, 43, pl. 2, fig. a.

¹² 1913. *jucunda* Alexander, Ent. News, xxiv, 441, 442, pl. 16, fig. 4

¹³ 1913. *laeta* Alexander; *ibid.*, 442, 443, pl. 16, fig. 5.

12. The wing membrane uniformly dark brown..... 13
 The wing membrane mostly hyaline, the darker markings small, limited or indistinct..... 14
13. Mesonotal praescutum in front with a longitudinal shining black median stripe; femora blackish with a rust-red band beyond the base. (South America)..... *schineri* Enderlein¹⁴
 Mesonotal praescutum entirely bright ochraceous yellow, unmarked with darker; femora uniformly yellowish without a rust-red ring. (Brazil, Peru)..... *flavithorax* Wiedemann¹⁵
14. Thoracic dorsum shiny black without markings [rostrum very long and slender; wings hyaline with the tip infused with brown, a conspicuous seam along the cord]. (British Guiana)
stygica sp.n.¹⁶
 Thoracic dorsum with more or less red or yellow..... 15
15. Femora brown with a yellowish annulus before the tip [thorax yellow with brown stripes; wings a little yellowish, the tip scarcely brown; abdomen brown and yellow; length of the ♂ about 7 mm.]. (Brazil)..... *simplex* Wiedemann¹⁷
 Femora without a yellow annulus before the tip; head reddish. 16
16. Thoracic dorsum reddish yellow without darker markings 17
 Thoracic dorsum more or less red but distinctly marked with dark brown stripes or spots..... 18
17. Large (♂, length, 10 mm. or over); legs pale yellow, the femora with a brown band beyond the middle [head dark in front, pale yellow behind; brown markings on the wing consisting of a large rounded dark brown stigma and an indistinct seam along the deflection of R_{4+5} ; abdomen light yellow]. (Panama)... *audax* Alexander¹⁸
 Small (♂, length, 4 mm.); legs uniformly brown beyond the base of the femur [head blackish brown; wings tinged with pale brown, the stigmal spot well-defined, brown; costa clouded with brown to the tip, some of the cord with brown seams; halteres brown; abdomen blackish brown, the male hypopygium with many thorn-like appendages]. (Colombia)..... *spinigera* Schiner¹⁹
18. Thoracic dorsum reddish yellow with three confluent black stripes that occupy nearly the whole mesonotum..... 19
 Thoracic dorsum reddish yellow with three dark spots [head reddish; pronotum yellow; hind coxae reddish yellow like the other coxae; wings hyaline without a dark basal spot; abdomen with the basal tergites dark brown, the apical tergites yellowish]. (Peru).
fulgens Alexander²⁰

¹⁴ 1912. *schineri* Enderlein, Zool. Jahrb., xxxii, pt. 1, 71, 72.¹⁵ 1821. *flavithorax* Wiedemann, Dipt. exot., i, 43, no. 3 (*Limnobia*).¹⁶ 1914. *stygica*, sp. n. this paper, pl. iii, fig. 6.¹⁷ 1830. *simplex* Wiedemann, Aussereur. zweiff. Ins., i, 549 (*Limnobia*).¹⁸ 1913. *audax* Alexander, Psyche, xx, 44, 45, pl. 2, fig. d.¹⁹ 1868. *spinigera* Schiner, Novara Reise, Dipt., p. 44.²⁰ 1913. *fulgens* Alexander, Ent. News, xxiv, 440, pl. 16, fig. 2.

19. Postnotum and scutellum black [front black, remainder of the head reddish; wings hyaline, rather narrow, stigma small, brown, bisected by cross-vein *r*, cord slightly clouded with brown; halteres brown; abdomen metallic black with the incisures reddish yellow]. (Mexico).....**gracilis** Osten Sacken²¹
 Postnotum brownish black, scutellum light yellow [head reddish; pronotum yellow; hind coxae dark; wings hyaline with a conspicuous brown spot at the base, the tip infuscated; abdomen dark brownish black with the tergal apices yellow]. (Peru)
hilaris Alexander²²
0. Head black not metallic; thoracic dorsum with the color mostly black, shining..... 21
 Head generally not black, if so with metallic reflections; the thoracic dorsum with the color largely yellowish or reddish with or without scanty darker markings..... 25
21. Legs brownish black..... 22
 Legs with the femora yellow, tipped with brown, the coxae brown... 23
22. Legs pitch black, coxae bright yellow; general color shining black, the margin of the praescutum yellow; scutellum yellow; postnotum and pleura black, the latter with a yellow spot above the mesocoxa and another under the wing-root [wings hyaline, stigma blackish brown]. (South America). **morionella** Schiner²³
 Legs dark brownish black; pleura black, unmarked [abdomen long and slender; wings hyaline, the stigmal spot small]. (British Guiana).....**lugubris**, sp.n.²⁴
23. A reddish mark on the humeral angles of the praescutum; legs brown, fore femora yellowish with two brown rings. (Brazil)
scapularis Macquart²⁵
 The reddish on the praescutum not in the shape of humeral marks; femora with only the apical brown annulus..... 24
24. Pronotum dull yellowish; pleura uniformly black; wings infused with brown, stigma dark brown, oval. (Peru). **tristis** Alexander²⁶
 Pronotum bright yellow; pleura with yellow spots; wings hyaline, stigma small, brown. (Mexico).....**molesta** Osten Sacken²⁷
25. Cross-vein *r* indistinct or lacking, tending to be oblique, the tip atrophied [color light yellow throughout]. (Brazil)
parishi Alexander²⁸
 Cross-vein *r* present, conspicuous, vertical..... 26

²¹ 1886. *gracilis* Osten Sacken, Biol. Cent. Am., Dipt., i, 7.

²² 1913. *hilaris* Alexander, Ent. News, xxiv, 443, 444, pl. 16, fig. 6.

²³ 1868. *morionella* Schiner, Novara Reise, Dipt., 47 (*Limnobia*).

²⁴ 1914. *lugubris*, sp. n., this paper, pl. iv, fig. 2.

²⁵ 1838. *scapularis* Macquart; Dipt. Exot., i, pt. 1, 73, pl. 10, fig. 1 (*Rhamphidia*).

²⁶ 1913. *tristis* Alexander, Ent. News, xxiv, 439, 440, pl. 16, fig. 1.

²⁷ 1886. *molesta* Osten Sacken, Biol. Cent. Am., Dipt., i, 6, 7.

²⁸ 1913. *parishi* Alexander, Psyche, xx, 46, 47, pl. 2, figs. c, k.

26. Thoracic dorsum with three complete dark brown stripes 27
 Thoracic dorsum without three dark brown stripes 28
27. Wings broader, the tip not infuscated; femora yellow tipped with brown. (Eastern United States) . . . **complexa** Osten Sacken²⁹
 Wings narrower, the tip narrowly infuscated; femora yellowish brown at the tip and with a postmedial brown annulus. (Lesser Antilles; Guiana) **annulata** Williston³⁰
28. Thorax light yellow with a dark narrow pleural stripe. (Central America) **pleuralis** Alexander³¹
 Thorax without a pleural stripe 29
29. Head and abdomen with metallic reflections; prothorax brownish; femora brownish black. (Cuba) **chalybeiventris** Loew³²
 Head gray without metallic reflections; prothorax dull yellow; femora yellow with the tips broadly brown. (Bolivia) **jocosa** Alexander³³

Genus **ORIMARGA** Osten Sacken1869. *Orimarga* Osten Sacken, Mon. Dipt. N. Am., iv, 120.**Orimarga punctipennis** sp. n.

Thorax and head bluish gray; legs very pale, almost whitish; wings spotted with brown.

Male.—Length, 7 mm.; wing, 4.4 mm.

Rostrum rather elongated, dark brown, the palpi brownish black. Antennae with the basal segments light brown, the flagellum broken. Head with a uniform light gray bloom.

Thoracic dorsum brown with a thick blue-gray bloom. Pleura yellowish brown. Halteres rather short, brown, more yellowish at the base. Legs with the coxae and trochanters yellowish brown, the remainder very pale whitish brown except the apical tarsal segments which are brown. Wings almost hyaline, the veins brown; dark brown dots as follows: the largest at the tip of *Sc*, others at the base of *Rs*, tip of *R*₁, and on cross-vein *r*, basal deflection of *R*₄₊₅ and cross-vein *r-m* and faint marks on the basal deflection of *Cu*₁ and at the fork of *Cu*₁ and *M*₃. Venation: see pl. IV, fig. 3.

Abdominal tergites dark brownish black, the sternites paler.

Habitat.—Bartica, February 11, 1913.

Holotype, ♂, Bartica, February 11, 1913.

²⁹ 1859. *complexa* Osten Sacken, Proc. Acad. Nat. Sci. Phila, 1859, 223. (GENOTYPE).

³⁰ 1896. *annulata* Williston, Trans. Ent. Soc. Lond., 1896, 290, pl. x, fig. 63.

³¹ 1913. *pleuralis* Alexander, Psyche, xx, 45, 46.

³² 1861. *chalybeiventris* Loew, Wien. Entomol. Monatschr., v, no. 2, 33, 34 (*Rhaphidia*).

³³ 1913. *jocosa* Alexander, Ent. News, xxiv, 440, 441, pl. 16, fig. 3.

This is the third American *Orimarga* to be described and it is easily distinguished from the related species in this genus, and in *Diotrepha*, by its spotted wings.

Genus **DIOTREPHA** Osten Sacken

1878. *Diotrepha* Osten Sacken, Cat. Dipt. N. Am., ed. 2, 27 and 219.

Diotrepha atribasis sp. n.

Large species (length 8 to 10 mm.); the femora and tibiae tipped with black and the base of the tibiae black; tip of R_1 obliterated.

Male.—Length, 9 mm.; wing, 5.5 mm.

Female.—Length, 8 to 9.8 mm.; wing 5 to 6.3 mm.

Male.—Rostrum and palpi dark brownish black. Antennae with the elongated basal segment and the second globular segment dark brownish black; flagellum much paler brown, in some specimens almost white. Head light brown with a grayish bloom, very pale on the front and anterior portions of the vertex.

Thoracic dorsum light brownish gray. Dorsal pleurites a little grayish, the ventral pleurites and the sternites light yellow. Halteres rather short, pale, the knob brown. Legs, coxae and trochanters light yellow; femora pale whitish broadly tipped with dark brown; tibiae with the extreme base and tip narrowly dark brown; tarsi white, the apical segments becoming a light brown. Wings light gray, the veins brown. Venation: see pl. iv, fig. 4.

Abdomen dark brownish black throughout.

Female.—Similar, the abdomen of a lighter brown, especially the sternites which are ringed with darker apically.

Habitat.—Bartica, December 10, 1912 to February 8, 1913.

Holotype, ♂, Bartica, January 28, 1913.

Allotype, ♀; topotypic, December 10, 1912.

Paratypes, ♀, topotypic, February 8, 1913; another specimen with the abdomen broken, topotypic, January 21, 1913, in deep swamps.

This species is the largest and most showy of the forms known to me. It may be easily recognized by the black tibial bases.

Tribe *Eriopterini*

Genus **GONOMYIA** Meigen

1818. *Gonomyia* Meigen, Syst. Besch., i, 146.

Subgenus *LEIPONEURA* Skuse

1889. *Leiponeura* Skuse, Proc. Linn. Soc. N. S. Wales, ser. 2, iv, 795.

This group was represented in the collection by a great number of specimens the majority of which were females. It is no longer possible to determine isolated females in this genus or in *Molophilus*

and so the list of species as given below may not indicate the full number of species represented. There are a large number of specimens of a small species with uniform pleura which are possibly *puella* Williston but I have never seen a male that answers the figure given by Williston in his original characterization of the form.

The best criteria for working upon these insects are the presence or absence of a stigmal spot, the length of subcosta of the wings, an open or closed cell *1st M*₂, pleurae striped or uniform, character of the genitalia of the males, such as the appendages of the pleurites, the structure and length of the gonapophyses and penis guard, etc.

The American forms may be provisionally divided into groups of species as follows:

1: *cinerea* group with the cell *1st M*₂ open, due to the obliteration of the outer deflection of *M*₃; this includes *cinerea* Doane and *alexanderi* Johnson.

2: *pleuralis* group with the cell *1st M*₂ closed, stigma distinct, pleura distinctly striped; this includes *pleuralis* Williston, *amazona* Alexander, *recurvata* Alexander and *sacandaga* Alexander.

3: *manca* group with the cell *1st M*₂ closed, stigma lacking. This group includes a heterogeneous collection of forms such as *manca* Osten Sacken, *puella* Williston, *puer* Alexander, *calverti* Alexander and the new forms described below as *extensa*, *inermis* and *scimitar*. The males known to me may be separated by the following key:

1. Hypopygium small, tubular, the pleural pieces not distinct. (Costa Rica).....*calverti* Alexander
Hypopygium with definite cylindrical pleurites which bear more or less prominent chitinized appendages..... 2
2. Pleurites not armed with a chitinized appendage; guard of the penis long, subcosta short..... 3
Pleurites armed with chitinized appendages..... 4
3. Pleurites long, slender, finger-like; ventral gonapophyses consisting of conspicuous divergent chitinized hooks. [Small species with uniform pleura.] (Eastern United States).....*manca* Osten Sacken
Pleurites shorter and stouter; ventral gonapophyse an oval lobe with a few rather stout hairs. [Large species with indistinct pleural stripes.] (British Guiana).....*inermis* sp. n.
4. Pleurites with the chitinized appendage almost straight beyond the base, expanded before the tip. [Pleura distinctly striped, *Sc* long, ending slightly before the origin of *Rs*.] (British Guiana)
extensa sp. n.

- Pleurites with the chitinized appendage curved, sickle-shaped, sharp at the tip..... 5
5. Both the dorsal and ventral gonapophyses distinct; penis guard not prominent. [*S*: long ending opposite or slightly beyond the origin of *R*_s; pleura distinctly striped.] (British Guiana)

scimitar sp. n.

The ventral gonapophyse an oval lobe with numerous slender hairs; penis guard long, extending far beyond the tips of the pleurites. [*S*: ending just before the origin of *R*_s; pleural stripes not clear-cut.] (Florida; Haiti; British Guiana)..... *puer* Alexander

I have not included *puella* Williston because the male is not known to me; it is figured (Trans. Ent. Soc. Lond., 1896, pl. 10, fig. 60) as having a conspicuous recurved ventral appendage.

Gonomyia (Leiponeura) alexanderi Johnson

1912. *Eliptera alexanderi* Johnson, Psyche, xix, 3, fig. 6.

A female specimen, taken in the swamps, December 31, 1912. One female at light, also at Bartica, February 4, 1913. One female at light, Mallali, March 11, 1913.

Gonomyia (Leiponeura) pleuralis Williston

1896. *Atarba pleuralis* Williston, Trans. Ent. Soc. Lond., 1896, 289, pl. 10, fig. 61.

About four hundred specimens of which some fifty are males. This large series was taken at light at Bartica from December 9, 1912 to February 26, 1913 and at Mallali on March 14, 1913.

Gonomyia (Leiponeura) inermis sp. n.

Rather large species (wing over 3.5 mm.); subcosta short; pleura indistinctly striped; pleural pieces of the male hypopygium without chitinized appendages.

Male.—Length, 3.9 to 4.1 mm.; wing, 3.7 to 3.9 mm.

Female.—Length, 4 mm.; wing, 3.8 mm.

Rostrum above bright orange, the palpi dark brown. Antennae brownish black. Head grayish.

Thoracic dorsum grayish plumbeous, the scutellum, only, pale yellowish white. Pleura pale silvery white, a broad indistinct plumbeous stripe begins on the side of the neck and ends beneath the wing-root; sternites plumbeous. Halteres dark brown, the knob, only, a little paler. Legs, coxae and trochanters dull brownish yellow, remainder of the legs brownish black. Wings subhyaline without a stigmal spot. Venation: (Plate iv, fig. 5) *Sc* ends far before the origin of *R*_s, this space about equal to the cross-vein *m*.

Abdominal tergites brown, sternites a little paler, hypopygium dull yellow. Hypopygium with the pleurites long, clothed rather densely with long hairs, at the tip narrowed into an arm which is truncated at the apex and

bears two rather strong bristles; no chitinized hooks on the pleurites. Ventral gonapophyse expanded into a flat oval surface on its ventral face and provided with abundant rather stout black hairs.

Holotype, ♂, Bartica, January 28, 1913.

Allotype, ♀, topotypic, January 28, 1913.

Paratypes, 30 ♂ ♀, topotypic, December 31, 1912 to February 13, 1913.

Gonomyia (Leiponeura) extensa sp. n.

Small species (wing less than 3 mm.); subcosta rather long, ending just before the origin of *Rs*; pleural stripes distinct; pleurites of the hypopygium bearing a strong, nearly straight, chitinized appendage.

Male.—Length, 3.2 to 3.3 mm.; wing, 2.5 to 2.7 mm.

Female.—Length, 3.6 mm.; wing, 2.7 to 2.8 mm.

Rostrum and palpi dark brown. Antennae with the first segment black, second yellow, black on the sides, flagellum brownish black. Head light yellow.

Thorax light brown without distinct darker markings; lateral margin of the praescutum yellow; scutellum brownish of the anterior half, yellow behind; postnotum yellow with a conspicuous semilunar brown mark just behind the scutellum. Pleura brown with a broad conspicuous yellow stripe beginning on the fore coxa and ending on the sternites of the abdomen. Halteres brown, knob yellow. Legs, coxae yellowish, trochanters and femora dark brown, tibiae and tarsi brown. Wings subhyaline, iridescent, no stigmal spot. Venation: *Sc* ending slightly before the origin of *Rs*.

Abdominal tergites brown, broadly yellow laterally; sternites yellowish; hypopygium yellow, the chitinized appendages black. Hypopygium with the pleurites moderately long, the fleshy dorsal appendage rather short, very pale, the chitinized arm strong and powerful, bent at a sharp angle just beyond the base, thence extended caudad and expanded near the tip, apically bearing a sharp point; dorsal gonapophyses small, inconspicuous, the tips black, chitinized; ventral gonapophyses not chitinized.

Holotype, ♂, Bartica, January 11, 1913.

Allotype, ♀, topotypic, January 28, 1913.

Paratypes, 1 ♂, 50 ♀, topotypic, December 27, 1912 to February 13, 1913.

Gonomyia (Leiponeura) scimitar sp. n.

Similar to *G. extensa*, differing chiefly in the male hypopygium and the venation.

Male.—Length, 3.3 mm.; wing, 2.8 mm.

This species presents a superficial appearance that is quite similar to *Gonomyia extensa*. In the present species subcosta ends opposite or slightly beyond the origin of the radial sector. The pleural pieces of the male hypopygium are short and stout, the fleshy dorsal appendage being

short, stout and cylindrical, sparsely clothed with long hairs; ventral appendage a long chitinized sickle-shaped arm which is directed ventrad and then caudad and mesad, at the tip directed outwards; gonapophyses moderately prominent, the penis-guard not conspicuous.

Holotype, ♂, Bartica, December 23, 1912.

Paratype, ♂, topotypic, December 23, 1912.

Gonomyia (Leiponeura) puer Alexander

1912. *Gonomyia (Leiponeura) puer* Alexander, Proc. U. S. Nat. Mus., xliv, 506, pl. 66, fig. 14.

Bartica, ten ♂, ♀, January 3, 1913 to January 10, 1913.

Genus **ERIOPTERA** Meigen

1803. *Erioptera* Meigen, Illiger's Magazine, ii, 262.

Subgenus **MESOCYPHONA** Osten Sacken

1869. *Mesocypfona* Osten Sacken, Monograph Dipt. N. Am., iv, 152.

Erioptera (Mesocypfona) parva Osten Sacken

1859. *Erioptera parva* Osten Sacken, Proc. Acad. Nat. Sci. Phila., 1859, 227.

Twenty-one, ♂, ♀, Bartica, December 10, 1912 to February 8, 1913.

Erioptera (Mesocypfona) immaculata Alexander

1913. *Erioptera (Mesocypfona) immaculata* Alexander, Proc. U. S. Nat. Mus., xlv, 518, 519, pl. 66, fig. 20.

One ♀, Bartica, January 28, 1913.

Erioptera (Mesocypfona) bicinctipes Alexander

1913. *Erioptera (Mesocypfona) bicinctipes* Alexander, Proc. U. S. Nat. Mus., xlv, 519.

Three ♀, Mallali, March 11, 1913 to April 5, 1913.

Genus **GNOPHOMYIA** Osten Sacken

1859. *Gnophomyia* Osten Sacken, Proc. Acad. Nat. Sci. Phila., 1859, p. 223.

Gnophomyia arcuata sp. n.

Grayish black without yellow markings; halteres dark throughout; wings with the membrane hyaline, cell R_2 very broad at the tip, veins R_2 and R_3 being divergent apically.

Female.—length 6 mm.; wings, 5.4 mm.

Female.—Rostrum and palpi dark brownish black. Antennae brownish black. Head brownish black.

Thorax rather uniformly dark grayish black without yellow markings. Halteres dark throughout. Legs dark brown. Wings hyaline, the stigmal spot quite indistinct, pale brown; veins dark brown. Venation: (see pl. IV, fig. 6) basal deflection of R_{2+3} very arcuated, sub-perpendicular, the cross-

vein r just before the fork of R_{2+3} , R rather long, running parallel to R_1 , R_2 with its tip swung caudad toward the wing-tip so that cell R_2 is very wide at its distal end; cell $1st M_2$ narrowed at its base; basal deflection of Cu_1 just before the fork of M .

Abdomen dark grayish black, the end of the abdomen and the ovipositor being drawn out into a long slender tube.

Habitat.—Bartica, January 4 to 28, 1913.

Holotype, ♀, Bartica, January 28, 1914.

Paratype, sex indeterminable, topotypic, January 4, 1913.

This species may be easily separated from the other black forms with dark halteres (*luctuosa* Osten Sacken, *maestitia* Alexander, et al) in the divergence of veins R_2 and R_3 at their tips, the former being considerably shorter than the latter vein and consequently cell R_2 is very wide at its outer end.

Gnophomyia subhyalina Alexander

1913. *Gnophomyia subhyalina* Alexander, Proc. U. S. Nat. Mus., xlv, 523, pl. 66, f. 23.

Fourteen specimens 6♂, 8♀, taken at Bartica, December 18, 1912 to February 25, 1913; mostly attracted to light, a few in the swamps.

Gnophomyia decisa sp. n.

Color black; legs light yellow; wings light brown diversified with hyaline and brown; a supernumerary cross-vein in cell R_2 .

Male.—Length, without the head, 3.9 mm.; wing, 4.7 mm.

Male.—Head lacking.

Thorax including the pleura black. Halteres rather slender, brown. Legs with the coxae bark brown, trochanters dull yellow, femora and tibiae dull yellow, the latter a little darkened toward the tip, the tarsi brown. Wings light brown, diversified with darker and lighter spots and drops as follows: a subhyaline patch in cell Sc_1 just at the end of vein S , other light marks in cell R , $2nd R_1$, at the end of vein R_1 , in cells $1st$ and $2nd M_2$, etc. Dark brown marks in the base of cell R , at the origin of R_s , end of Sc , around cross-vein r (stigmal), along the cord, at the tip of R_2 , and R_3 , a seam along the supernumerary cross-vein in cell R_2 , seams along the basal deflection of Cu_1 , base of the outer deflection of M_2 and on cross-vein m . Venation: (see pl. III, fig. 8) a supernumerary cross-vein in cell R_2 , cell $1st M_2$ very long and narrow so that cross-vein m is beyond the middle of the outer free portion of M_3 .

Abdomen dark brownish black, the hypopygium slightly brighter, more reddish.

Habitat.—Mallali, March 15, 1913.

Holotype, ♂, Mallali, March 15, 1913.

This species is not a typical member of *Gnophomyia* in the posi-

tion of Sc_2 , that is at the tip of Sc_1 and not retracted backward toward the wing-base to a greater or less degree. It seems to be most nearly allied to this genus, however, and it is better to refer it here than to create a new group on insufficient material.

Genus **SIGMATOMERA** Osten Sacken

1869. *Sigmatomera* Osten Sacken, Mon. Dipt. N. Am., iv, 137, 138.

Sigmatomera apicalis sp. n.

Color yellowish; wings yellow banded and tipped with brown.

Male.—Length, 13.6 mm.; wing, 12.8 mm.; antennae, 6 mm.

Male: Rostrum short, dark brown, the palpi yellowish brown. Antennae dark brownish black, the second segment slightly paler basally, segments three to nine (the first seven flagellar) with the extreme apex pale, almost whitish; the first four segments of the flagellum show the deep constrictions that give to the segments the S-shaped appearance, but beyond these first four this appearance is gradually lost and the apical segments are elongated and but little constricted. Eyes large, nearly approximated above, so that the space on the vertex between them is very narrow and reduced; head blackish in front, yellowish red behind.

Thoracic dorsum rather shining reddish yellow, without apparent darker stripes. Pleura yellowish brown. Halteres rather long, dull yellow. Legs reddish yellow, the femora rather broadly tipped with darker; tibiae light brown tipped with darker; tarsi dark brown. Wings rather uniform light yellow, a rather narrow darker band along the cord, an interrupted basal band and the apex of the wings lighter brown. Venation: (see pl. III, fig. 9) cell *1st M*₂ closed.

Abdomen brownish yellow, darker toward the tip, the hypopygium and segment eight dark brown.

Habitat.—Bartica, February 21, 1913.

Ho'totype, ♂, Bartica, February 21, 1913.

In its closed cell *1st M*₂ this agrees most closely with the type of the genus which has only a narrow brown seam to the cord. The color pattern of the wing agrees much more closely with *amazonica* Westwood, but here the thorax is blackish and cell *1st M*₂ is open by the lack of the outer deflection of *M*₃.

A KEY TO THE SPECIES OF SIGMATOMERA OSTEN SACKEN

1. Cell *1st M*₂ open; thorax black [apical band on the wings narrow, barely including the outer end of cell *2nd R*₁; middle crossband broad; basal band suffusing most of the anal lobe]. (Brazil)
amazonica Westwood³⁴
- Cell *1st M*₂ closed; thorax yellowish..... 2

³⁴ 1881. *amazonica* Westwood, Trans. Ent. Soc. Lond., 1881, 366, pl. 17, fig. 3.

2. Wings nearly hyaline, not banded, only the costal cells yellowish. (Paraguay).....*occulta* Alexander²⁶
 Wings yellowish, banded..... 3
3. Wings with the banding confined to a narrow mark along the cord. (Mexico).....*flavipennis* Osten Sacken²⁶
 Wings with the apex broadly banded, the middle crossband narrow, darker brown; the basal band not suffusing the anal angle of the wings. (British Guiana).....*apicalis* sp. n.²⁷

Genus **MONGOMA** Westwood

1881. *Mongoma* Westwood, Trans. Ent. Soc. Lond., 1881, 364.

Mongoma geniculata sp. n.

Cross-vein *r* just before the fork of R_{2+3} ; wings with the veins seamed with gray, tip not infuscated; legs black with the tip of the femur and the base of the tibia narrowly white, the tarsi brown.

Female.—Length, 10.8 mm.; wing, 7.7 mm.

Rostrum and palpi brown, the latter darker; Antennae dark brownish black. Head brown.

Praescutum dark brown without distinct darker markings; scutum with the lobes dark brownish black, the median area paler, more yellowish; scutellum and postnotum brownish black. Pleura pale yellowish, the mesopleura a little infumed with brown. Halteres brown. Legs with the coxae and trochanters yellowish brown; femora brownish black, the tip narrowly white; tibiae dark brown, the extreme base whitish; tarsi dark brown. Wings subhyaline, the stigma prominent, oval, dark brown; veins broadly seamed with gray, the tip not distinctly infuscated. Venation, see plate IV, fig. 7.

Abdominal tergites dark brown, the lateral margins yellow; sternites yellow.

Habitat.—Bartica, February 18, 1913.

Holotype, ♀, Bartica, February 18, 1913.

Mongoma pallipes sp. n.

Cross-vein *r* just before the fork of R_{2+3} ; tip of wing infuscated and the veins seamed with gray; legs with the tips of the femora broadly white, the extreme base of the tibiae similar; hind legs, only, with the tarsi and the tip of the tibiae white, the remaining tarsi brown.

Male.—Length, 9.4 mm.; wing, 7.3 mm.

Rostrum yellowish. Antennae broken. Head dark brown, more yellowish behind.

Praescutum light yellowish brown, more brownish behind near the suture; scutum with the lobes dark brown, the median space pale; scutellum and

²⁶ 1914. *occulta* Alexander, Ent. News, xxv, 209, pl. ix, fig. 5.

²⁶ 1873. *flavipennis* Osten Sacken, Mon. Dipt. N. Am., iii, ix (supplement).

²⁷ 1914. *apicalis*, sp. n., this paper, pl. iii, fig. 9.

postnotum brown. Pleura dull yellow. Halteres brown. Legs, the fore pair lacking; middle pair, coxae and trochanters pale dull yellow, femora brown the tip abruptly white, extreme base of the tibia white, the remainder brown, tarsi brown; hind pair with the coxae and trochanters dull yellow, femora brown with the tip broadly white, tibiae with the base narrowly and rather indistinctly white, the tip broadly white, tarsi white, the two terminal segments more browned. Wings subhyaline, the stigma dark brown; tip of the wing and most of the veins and deflections of veins and cross-veins seamed with gray. Venation, see plate IV, fig. 8.

Abdominal tergites dark brown; sternites pale yellowish brown.

Habitat.—Mallali, March 8, 1913.

Holotype, ♂, Mallali, March 8, 1913.

The described species of *Mongoma* belonging to the *bromeliadicola* group may be separated by the following key:

1. Femora not tipped with white. (For these species, see Proc. U. S. Nat. Mus., xlv, 500.)
 - Femora tipped with white..... 2
2. Wings without gray seams to the veins; cross-vein *r* rather far before the fork of *R*₂₊₃; tips of all the tibiae yellowish white, tarsi brown. (Costa Rica)..... *bromeliadicola* Alexander¹⁸
 - Wings with the veins seamed with gray; cross-vein *r* just before the fork of *R*₂₊₃; tibiae either uniformly brown beyond the base or else only the hind pair tipped with white..... 3
3. Wings infumed with gray at the apex; hind tarsi white; white tips to the light brown femora broad? (British Guiana)..... *pallipes* sp. n.
 - Wings not infumed at apex; all the tarsi brown; white tips to the dark brown femora narrow. (British Guiana)..... *geniculata* sp. n.

Tribe *Limnophilini*

Genus **PSARONIUS** Enderlein

1912. *Psaronius* Enderlein, Zool. Jahrb., xxxii, pt. 1, 50.

1913. *Lecteria* Alexander, Proc. U. S. Nat. Mus., xlv, 493.

In an earlier paper cited above I did not consider this genus as being distinct from *Lecteria* Osten Sacken. A very considerable amount of new material has since come to hand and it now appears as though the two genera are analogous forms of their respective tribes, *Lecteria* being an Eriopterine with spurless tibiae, while *Psaronius* is a Limnophiline with spurred tibiae. The venation of the members of these genera is very similar and their true relationships will only be explained when the immature stages are discovered and the forms reared; since *Lecteria armillaris* Fabricius

¹⁸ 1912. *bromeliadicola* Alexander, Entomological News, xxiii, 415 to 417.

and *Psaronius obscurus* Fabricius are common and widely distributed throughout the tropics of the New World, this work of breeding out the adults should not be very difficult.

The following corrections to my paper cited above should be made: *Lecteria conspersa* Enderlein is a *Limnophila* though not a member of the subgenus *Dactylobasis* as stated by its describer. *L. matogrossae* Alexander (ibid., 496, 497) and *armillaris* Fabricius (ibid., 497) are members of *Lecteria* as above restricted; the other species are *Psaronii* and may be separated by means of the key given later.

***Psaronius fuscipennis* sp. n.**

Wings dark fuscous with darker and paler markings in the radial cells.

Male.—Length, 27 mm.; wing, 18.8 mm.

Female.—Length, 24 to 25 mm.; wing, 16 to 16.2 mm.

Similar to *P. obscurus* in size and general structure but the body coloration is very much darker. The body markings are dark brown instead of the ochraceous brown of *obscurus*; the four terminal tarsal segments uniformly brown, not pale tipped with brown. The wings are distinctly dark brown with darker markings at the origin of *R*_s and at the stigmal spot; paler, subhyaline, blotches before and after the origin of *R*_s and beyond the stigma.

Habitat.—Bartica, February 26 to April 14, 1913.

Holotype, ♂, Bartica, April 14, 1913.

Allotype, ♀, topotypic, February 28, 1913.

Paratype, ♀, topotypic, February 26, 1913.

***Psaronius obscurus* Fabricius**

1885. *Tipula obscura* Fabricius, Syst. Antl., 27.

1912. *Psaronius lituratus* Enderlein, Zool. Jahrb., xxxii, 50, 51, fig. F₁.

Thirteen specimens, 7 ♂, 6 ♀, Bartica, January 21 to February 26, 1913; two females were taken in deep swamps, the remainder at lights.

***Psaronius pygmaeus* sp. n.**

Wings subhyaline with scanty darker markings; vein *R*₁ fusing with *R*₂ at its tip; metatarsus very pale, whitish.

Male.—Length, 21 to 22 mm.; wing, 13.5 to 14.4 mm.

Fore leg, femur, 9.4 mm.; tibia, 13.4 mm.; tarsus, 10.7 mm.

Hind leg, femur, 12.2 mm.; tibia, 12.4 mm.; tarsus, 7.9 mm.

Rostrum rather short, brown, palpi dark brown. Antennae with the elongated basal segment orange, remainder of the antennae dark brown. Head orange-brown, the margin adjoining the eyes narrowly silvery; sides of the vertex with abundant long hairs.

Thoracic notum light brown, dorsal stripes not apparent; the postnotum darker brown medially. Pleura rather pale, brownish yellow. Halteres brown, the extreme base pale. Legs with the coxae and trochanters rather bright yellow; femora brown, only the tips slightly darkened; tibiae brown, the tip narrowly dark brown; first tarsal segment very pale, almost white, remainder of the tarsus brown. Wings with a pale yellow suffusion, the costal cell brighter yellow; brown clouds at the origin of R_s , fork of R_{2+3} and the radial cross-veins and deflections of veins narrowly and indistinctly seamed with brown; cephalic half of the long cell R_2 infused. Venation: (see plate IV, fig. 9) R_2 tending to atrophy, its tip fused with R_1 at the wing-margin.

Abdominal tergites light brown, beyond the third segment darkening into a deeper brown; sternites yellow, the apical segments darker.

Habitat.—Bartica, January 30 to February 21, 1913.

Holotype, ♂, Bartica, February 21, 1913.

Paratype, ♂, topotypic, January 30, 1913.

This form is the smallest of the described species with the exception of *obliteratus* Alexander; the forms may be separated by the appended key.

A KEY TO THE SPECIES OF PSARONIUS ENDERLEIN

1. R_2 entirely atrophied; cell 2nd R_1 entirely obliterated. (Paraguay)
abnormis Alexander³⁹
 R_2 present, at least basally; the tip may be fused with R_1 at the wing margin..... 2
2. R_2 fused with R_1 at its tip so that cell 2nd R_1 is very tiny, pointed at its distal end which does not attain the wing-margin..... 3
 R_2 free for its entire length, running sub-parallel to R_1 and R_3 so that cell R_2 is long, slender, its distal end at least as broad as its proximal end and attaining the wing-margin..... 4
3. Smaller; wing of male less than 12 mm.; wing suffused with brown; body coloration dull black; antennal flagellum black, the scape orange. (British Guiana).....*obliteratus* Alexander⁴⁰
Larger; wing of male over 12 mm.; wing pale yellowish; body coloration orange-yellow; antennal flagellum brown, only the first segment orange. (British Guiana)..... *pygmaeus* sp. n.
4. Wings light yellow or brownish yellow; body coloration ochraceous yellow, the markings rather indistinct. (Guiana; Brazil)
obscurus Fabricius⁴¹
Wings dark brown; body coloration brown, the marking dark brown. (British Guiana)..... *fuscipennis* sp. n.

³⁹ 1914. *abnormis* Alexander, Ent. News, xxv, 211, pl. ix, fig. 9 (*Lecteria*).

⁴⁰ 1913. *obliterata* Alexander, Proc. U. S. Nat. Mus., xlv, 494 (*Lecteria*).

⁴¹ 1805. *obscura* Fabricius. Syst. Antl., 27 (*Tipula*).

Genus **POLYMERA** Wiedemann

1821. *Polymera* Weidemann, Dipt. Exot., i, 40.

The species of this interesting genus have been considered by the author in earlier papers; the student is referred to the Proceedings of the U. S. National Museum, xlv, 526 to 535.

Polymera hirticornis Fabricius

1805. *Chironomus hirticornis* Fabricius, Syst. Antliar., 46.

Bartica, one male on January 28, 1913; two females on February 11, 1913, March 1, 1913.

Polymera niveitarsis Alexander

1913. *Polymera niveitarsis* Alexander, Proc. U. S. Nat. Mus., xlv, 532.

Bartica, one female, February 14, 1913.

Polymera obscura Macquart

1838. *Polymera obscura* Macquart, Dipt. Exot., i, pt. 1, 65.

Bartica, one male, December 30, 1912. Mallali, one female, March 13, 1913.

Polymera conjuncta Alexander

1913. *Polymera conjuncta* Alexander, Proc. U. S. Nat. Mus., xlv, 529.

Bartica, one specimen, sex uncertain, January 13, 1913. Mallali, one female, March 15, 1913.

Polymera pulchricornis sp. n.

Size medium; flagellar segments of the male antennae bi-nodose; wing with cell M_1 present; tarsi uniformly brown, similar in color to the rest of the legs; thoracic pleura with a prominent black stripe.

Male.—Length, 4.4 to 4.5 mm.; wing, 4.6 to 4.7 mm.; antennae about 7 mm.

Female.—Length, 5.7 mm.; wing, 5.2 mm.

Male.—Rostrum and palpi brown. Antennae very long and delicate, about half as long again as the body; segments brown, darkest at the nodes which are provided with groups of long out-stretched hairs; flagellar segments bi-nodose. Head grayish.

Thoracic dorsum light brown, unmarked. Pleura with a very broad dark brown lateral stripe; sternites and coxae light yellow. Halteres brown. Legs with the coxae as described above; trochanters dull yellow; femora light brown; tibiae and tarsi of all the legs brown. Wings with a light grayish brown suffusion; stigma not present. Venation: (see plate IV, fig. 10) Cell M_1 present; cell M_3 as long as its petiole; the space on R_1 beyond r about one-half that of R_1 between Sc_2 and r .

Abdomen dark brown throughout; pleurites of the hypopygium very long and slender.

Female.—Similar to the male but the antennae short and simple, extending about to the base of the first abdominal segment.

Habitat.—Bartica, December 10, 1912 to February 17, 1913.

Holotype, ♂, Bartica, February 17, 1913.

Allotype, ♀, topotypic, December 10, 1912.

Paratype, ♂, topotypic, January 28, 1913.

In my key to the species of *Polymera* (ibid., 527, 528) this form would run down to *P. inornata* Alexander, also from British Guiana, in which the color of the hind tarsi is not known; in *inornata*, however, the cross-vein *r* is almost midway between *Sc*₂ and the tip of *R*₁ and there is no pleural stripe on the thorax. *P. pulchricornis* agrees with *thoracica* Alexander and *albitarsis* Williston in its dark pleural stripe, but differs in the dark color of the tarsi. *P. grisea* Alexander has the cross-vein *r* very far out toward the tip of *R*₁, the basal deflection of *Cu*₁ beyond the fork of *M*, pleural stripe narrow, etc.

Tribe *Hexatomini*

Genus **ERIOCERA** Macquart

1838. *Eriocera* Macquart, Dipt. Exot., i, 74.

Eriocera kaieturensis Alexander

1914. *Eriocera kaieturensis* Alexander, Psyche, xxi, 41, 42, pl. 4, fig. 1.

Bartica, ♀, February 26, 1913; Bartica, ♂, April 15, 1913; St. Edwards, ♀, December 2, 1912.

Eriocera speciosa sp. n.

Head reddish; thoracic dorsum grayish brown; wings brown with a broad whitish band lying before the cord; basal segments of the abdomen orange-yellow, tip black.

Male.—Length, 10.4 to 11.6 mm.; wing, 10.1 to 10.8 mm.

Female.—Length, 13.1 to 14 mm.; wing, 11.4 to 12.5 mm.

Rostrum and palpi dark brownish black. Antennae with the first segment brownish orange, remainder brownish black. Head fiery orange-yellow.

Thoracic dorsum brown with a yellowish bloom; postnotum lighter brown. Pleura light brown. Halteres short, brown, lighter at the base. Legs dark brown. Wings dark brown, the anal cells scarcely if at all paler; a broad whitish band across the wing, this band lying entirely before the cord. Venation, see plate III, fig. 10.

Abdominal tergites 1 to 5 orange, 6 velvety black, brownish orange around the margin, 7 and 8 velvety black; hypopygium grayish brown;

sternites 1 to 5 yellow, 6 to 8 black. In some specimens an oval black median spot on tergite 5 near the caudal margin.

Holotype, ♂, Bartica, January 30, 1913, in swamps.

Allotype, ♀, topotypic, February 5, 1913, in swamps.

Paratypes, 11♂, 2♀, topotypic, January 25, 1913 to February 11, 1913, in swamps.

E. speciosa is closest to *E. melanacra* Wiedemann of Brazil but the thoracic dorsum is without black stripes, base of the wing not conspicuously pale, wing band proximad of the cord, first abdominal segment not black, no dark stripes on the yellow of the basal abdominal segments, etc.

Subfamily TIPULINAE

Tribe Dolichopezini

Genus MEGISTOCERA Wiedemann

1828. *Megistocera* Wiedemann, Aussereur. zweifl. Ins., i, 55.

Megistocera longipennis Macquart

1838. *Tipula longipennis* Macquart, Dipt. Exot., i, pt. 1, 57, pl. 5, fig. 1.

Bartica, one ♂, December 5, 1912, one ♂, January 18, 1913. Mallali, one ♀, March 20, 1913.

Genus BRACHYPREMANA Osten Sacken

1886. *Brachypremna* Osten Sacken, Berlin. Entomol. Zeitschr., xxx, 161.

Brachypremna breviventris Wiedemann

1821. *Tipula breviventris* Wiedemann, Dipt. exot., i, 43.

Bartica, two ♀, January 16, 1913 to February 18, 1913; one ♂, January 31, 1913.

Tribe Tipulini

Genus OZODICERA Macquart

1834. *Ozodicera* Macquart, Histoire Naturelle des Insectes: Diptères, i, 92.

Ozodicera pectinata Wiedemann

1821. *Tipula pectinata* Wiedemann, Dipt. Exot., i, 24.

One female from Bartica, January 27, 1913.

Ozodicera noctivagans sp. n.

Very much smaller than any of the described species, length of wing under 12 mm.; thorax gray with four brown stripes; wings dusky, stigma brown.

Male.—Length, 12 to 12.1 mm.; wing, 10.8 to 0.9 mm.

Fore leg, femur, 7 mm.; tibia, 8.7 mm.; tarsal segment 1, 8.8 mm.; tarsal segments 2 to 5 about 7.5 mm.

Rostrum and palpi black. Frontal prolongation of the head yellow, the nasus very small, indistinct. Antennae with the scapal segments yellow, flagellum brownish black; segments 4 to 9 of the antennae unipectinate, the pectinations a little longer than the segment, except on the 9th where it is shorter, four apical segments simple. Head brownish gray, somewhat shiny around the base of the antennae.

Thoracic dorsum gray with four distinct brown stripes, the median pair longest, broad in front, ending in a point behind near the suture; lateral stripes short and broad, beginning behind the pseudosutural foveae, ending at the transverse suture; scutum gray, each lobe with a large brown blotch on the cephalic margin this being a continuation of the lateral praescutal stripe; scutellum gray, the caudal half dark brown; postnotum with a gray bloom showing brown in certain lights; this gray and brown pattern is variable in different lights. Pleura light brown with a gray bloom. Halteres rather long, dark brown, pale at the base. Legs, coxae and trochanters dull yellow, femora yellow narrowly dark brown at the tip, tibiae and tarsi brown. Wings with a slight dark suffusion; stigma brown; veins dark brown. Venation: cross-vein *r* connects with R_2 just beyond the origin of the latter; R_{2+3} longer than R_2 alone; cross-vein *r-m* short, punctiform; cell 1st M_2 large; cell M_1 broadly sessile, the portion of M_2 that makes up the outer end of cell 1st M_2 about one-third as long as cross-vein *m*; fusion of Cu_1 and M_3 slight equal to about one-third of the cross-vein *m*.

Abdominal tergite 2 with the basal half pale silvery gray, apical half black; tergite 3 brownish yellow indistinctly ringed with blackish before the middle and at the end of the segment, segments 4 to 6 brownish yellow tipped with black, apical abdominal segments rather uniformly dark; six basal sternites yellow, 7 and 8 brownish black, 9 yellow.

Holotype, ♂, Bartica, February 19, 1913, at light.

Paratype, ♂, topotypic, January 7, 1913, at light.

From the other species of *Ozodicera* with the antennae unipectinate, *pectinata* Wiedemann, *gracilis* Westwood, *griseipennis* Loew, *simplex* Walker and *bimaculata* Enderlein, this form differs conspicuously in its very small size and gray thoracic coloration. The species above listed have the wing over 15 mm. in length, *noctivagus* having it under 12 mm.

EXPLANATION OF THE PLATES

PLATE III

- FIG. 1.—Wing of *Dicranomyia apicata* sp. n.
FIG. 2.—Wing of *Rhipidia (Conorhipidia) conica* sp. n.
FIG. 3.—Wing of *Geranomyia pulchella* sp. n.
FIG. 4.—Wing of *Rhamphidia uniformis* sp. n.
FIG. 5.—Wing of *Rhamphidia mirabilis* sp. n.
FIG. 6.—Wing of *Teucholabis stygica* sp. n.
FIG. 7.—Wing of *Teucholabis melanocephala* Fabricius.
FIG. 8.—Wing of *Gnophomyia decisa* sp. n.
FIG. 9.—Wing of *Sigmatomera apicalis* sp. n.
FIG. 10.—Wing of *Eriocera speciosa* sp. n.

PLATE IV

- FIG. 1.—Wing of *Styringomyia americana* sp. n.
FIG. 2.—Wing of *Teucholabis lugubris* sp. n.
FIG. 3.—Wing of *Orimarga punctipennis* sp. n.
FIG. 4.—Wing of *Diotrepha atribasis* sp. n.
FIG. 5.—Wing of *Gonomyia (Leiponeura) incrimis* sp. n.
FIG. 6.—Wing of *Gnophomyia arcuata* sp. n.
FIG. 7.—Wing of *Mongoma geniculata* sp. n.
FIG. 8.—Wing of *Mongoma pallipes* sp. n.
FIG. 9.—Wing of *Psaronius pygmaeus* sp. n.
FIG. 10.—Wing of *Polymera pulchricornis* sp. n.



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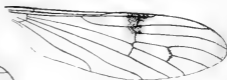
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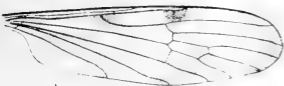
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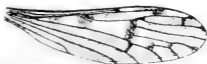
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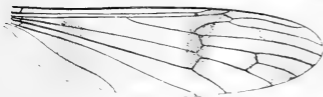
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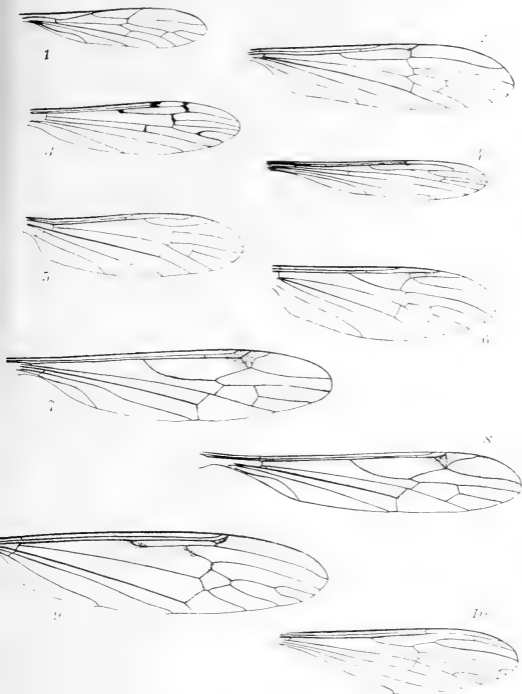
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New or little-known Craneflies from
the United States and Canada.
Tipulidæ, Diptera.

BY
CHARLES P. ALEXANDER.

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Mr. Charles W. Johnson
with the regards and thanks
of the author.

NEW OR LITTLE-KNOWN CRANEFLIES FROM THE UNITED STATES AND
CANADA. TIPULIDÆ, DIPTERA.

BY CHARLES P. ALEXANDER.

During the past few years the various collections of craneflies in the Eastern United States have been examined by the author and observations made upon the more uncommon and less-known species. The following paper deals with the new species discovered, the corrections in synonymy and the geographical distribution of insufficiently known forms. The collections examined are those of the United States National Museum through the kindness of Mr. Knab, The Academy of Natural Sciences of Philadelphia through Mr. Cresson, the Museum of Comparative Zoology at Cambridge through Mr. Henshaw, the Boston Society of Natural History through Mr. Johnson and the private collections of Dr. W. G. Dietz, Mr. C. W. Johnson, and Mr. M. C. Van Duzee.

The Loew and Osten Sacken types are in the Museum of Comparative Zoology (excepting *Triogma excuspta* Osten Sacken, which is in The Academy of Natural Sciences of Philadelphia). Coquillett's types and the Limnobiinæ described by Doane in his first paper are in the National Museum. The species described by Mr. Johnson are in The Academy of Natural Sciences of Philadelphia, the Boston Society of Natural History or in the private collection of the describer.

Family TIPULIDÆ.

Subfamily LIMNOBINÆ.

Tribe Limnobiini.

Genus DICRANOMYIA Stephens.

1829. *Dicranomyia* Stephens; Cat. Brit. Ins., vol. 2, p. 243.

Dicranomyia nelliana sp. n.

Color gray; wings with vein *Sc* short; membrane hyaline with abundant brown spots and dots.

Male, length, 5.5 mm.; wing, 7.5 mm.

Rostrum, palpi and antennæ dark brown, the segments of the antennal flagellum rounded oval. Head gray.

Thoracic dorsum gray, the præscutum with a large dark brown spot in front whose exact limits behind are uncertain, due to the

injury done to the thorax by the pin; scutum gray medially, the lobes yellow outwardly, black on the inner part of the lobe; scutellum gray medially, black on the sides; postnotum blackish gray. Pleurae gray. Halteres yellow, the knob darker. Legs, coxae and trochanters dull yellow, femora yellowish brown, the tip broadly dark brown, tibiae light brown, the tip narrowly dark brown, tarsal segments 1 and 2 light brown, the tips of the segments brown, segments 3 to 5 brown. Wings hyaline with abundant brown markings in all the cells including a series of four large marks along the costa, the third at the origin of *Rs* and the fourth at the stigma; venation (Pl. XXVII, fig. 22); *Sc* short ending opposite the origin of *Rs*, basal deflection of *Cu*₁ before the fork of *M*.

Abdomen with the basal tergites dull brownish yellow, dark brown laterally, segments 6 to 8 dark brown, the hypopygium yellow; sternites dull light yellow, the lateral margin of the sclerites brown, segments 6 to 8 uniformly darker.

Holotype, ♂, Colorado, in the U. S. National Museum.

This is the only North American species with the short subcosta that has the wings so spotted; superficially this insect resembles *simulans* Walker which has a long subcosta, but in the details it is quite a different fly.

Dicranomyia reticulata Alexander.

1912. *Furcomyia reticulata* Alexander; Canadian Entomologist, vol. 44, pp. 334, 335, pl. 11, fig. p.

One female from Biscayne Bay, Dade Co., Fla., taken by Mrs. Slosson, constitutes the first record for the United States.

Genus **RHIPIDIA** Meigen.

1818. *Rhipidia* Meigen; Syst. Besch., vol. 1, p. 153.

Rhipidia (*Rhipidia*) *bryanti* Johnson.

1909. *Rhipidia bryanti* Johnson; Proceedings of the Boston Society of Natural History, vol. 34, pp. 123, 124, pl. 16, fig. 20.

This showy *Rhipidia* has been bred from decaying wood underneath bark by Mr. R. C. Shannon at Washington, D. C. The male has never been described, but has been found several times; the antennae in this sex are bipectinate. The collections of Dr. Dietz, Mr. VanDuzee and the National Museum indicate a wide range for this species. Orono, Penobscot Co., Me., June 30, 1913 (Alexander). East Aurora, Erie Co., N. Y., June 15, 1912 (VanDuzee). Plummers Island, Md., September 4, 1904. Potomac Park, Washington, D. C., May 11, 1913 (Shannon). Black Mts., Buncombe Co., N. Car., June 16, 1912 (Beutenmuller). Braidentown, Manatee Co., Fla.,

March (Van Duzee). Clear Creek, Clear Creek Co., Col., June 10, 1912 (Osler). Kirbyville, Jasper Co., Tex., March 21, 1908 (E. S. Tucker).

Rhipidia (Arhipidia) schwarzi Alexander.

1912. *Rhipidia schwarzi* Alexander; Bulletin of the Brooklyn Entomological Society, vol. 8, pp. 13, 14, pl. 1, fig. c.

One female from Biscayne Bay, Dade Co., Fla., taken by Mrs. Slosson. Three females from Braidentown, Manatee Co., Fla., taken in March, 1913, by Mr. M. C. Van Duzee.

Rhipidia (Arhipidia) shannoni sp. n.

Antennæ subpectinate, black; thoracic dorsum without a broad pale margin in front; postnotum velvety black; wings with a few dark brown spots and with abundant gray dots in all the cells.

Male, length, 4.9–5.1 mm.; wing, 6.7–6.8 mm.

Female, length, 5.4–5.6 mm.; wing, 5.8–7.2 mm.

Rostrum, palpi and antennæ black. Head gray.

Mesonotal præscutum yellowish brown without distinct markings except behind near the suture where there are two brown spots on either side of the median line, narrowly separated from one another, a more linear mark on either side; scutum very light yellow medially, darker on the lobes with a dark brown ring on each lobe; scutellum light yellow with a dusky mark on either side of the middle line; postnotum with a deep velvety black triangle with its point behind, the sclerite pale on the sides. Pleuræ brown with a gray bloom with two narrow brown stripes, the more dorsal less clean-cut, the ventral one narrow, well-defined, beginning on the fore coxa traversing the bases of the other coxæ. Halteres brownish yellow. Legs, coxæ yellow, brown at the base on the outer face, trochanters dull yellow, femora yellowish brown, tibiae and tarsi yellowish brown, the two apical segments of the latter black. Wings light yellow with a few large brown spots as follows: a large one beyond the middle of vein *Sc*, smaller ones above the areculus, origin of *Rs*, tip of *Sc*, and a large rounded spot at the stigma; paler seams along the cord and outer end of cell *1st M*, abundant pale gray dots in all the cells; venation (Pl. XXVII, fig. 23).

Abdomen grayish brown, the pleural line narrowly dark.

Holotype, ♂, Plummers Island, Md., June 14, 1913 (R. C. Shannon).

Allotype, ♀, topotypic, August 18, 1912 (J. R. Malloch).

Paratype, ♂, Cabin John, Md., August 30 (Fred'k Knab); ♀, Gatun, Canal Zone, Panama, December 12, 1912, at light (J. Zetek).

Related to *R. multiguttata* Alexander (Guatemala) and in my key to the species of this genus¹ it would run down to this form. It differs widely in its wing-pattern which resembles that of certain members of the *subpectinata* group (*annulicornis* Enderlein, *schwarzi* Alexander) in the prominent rounded dark spots at the base of the sector and at the stigma. The thoracic pattern, especially the velvety black postnotum, separates this species off from any of the described forms.

This species is named in honor of Mr. Raymond C. Shannon, assistant to Mr. Knab in the Department of Dipterology at Washington, who collected the type and who has reared many interesting craneflies.

Tribe **Antochini**.

Genus **TEUCHOLABIS** Osten Sacken.

1859. *Teucholabis* Osten Sacken; Proc. Acad. Nat. Sci. Phila., p. 222.

Teucholabis rubescens sp. n.

Head and abdomen black; thorax red; wings dark colored; legs brownish black.

Male, length, 6.8-7 mm.; wing, 7.1-7.3 mm.

Rostrum short, dark brown; palpi dark brownish black. Antennae dark brownish black, the flagellar segments rounded. Head black.

Pronotum dark brown. Mesothorax reddish orange. Halteres brown, the knobs darker. Legs, coxae and trochanters dark brown, femora brownish yellow at base, darkening to the tip, tibiae and tarsi dark brownish black. Wings with a decided brown tinge, stigma rather distinct, small; veins dark brown; venation (Pl. XXVII, fig. 24).

Abdomen dark brownish black.

Holotype, ♂, Rio Ruidoso, White Mts., N. Mex., alt. about 3,500 feet, July 25 (hovering around trunks of mountain cotton-wood) (C. H. T. Townsend).

Paratype, ♂, topotypic.

Related to *T. flavithorax* Wiedemann in the bright colored thorax and dark wings; it is a smaller species with the wings much lighter colored, the stigma smaller and more distinct, the femora with the bases brighter colored, not entirely jet-black. In *flavithorax* the legs are stout and covered with long, conspicuous hairs, while in *rubescens* the hairs are not conspicuous; the basal tarsal segments of *flavithorax* are light yellow, conspicuously lighter colored than the

¹ *Bulletin of the Brooklyn Entomological Society*, vol. 8, pp. 7, 8; 1912.

tibiae, but in *rubescens* the tarsi are dark brown, concolorous with the tibiae.

Tribe **Eriopterini**.

Genus **ERIOPTERA** Meigen.

1803. *Erioptera* Meigen; Illiger's Magaz., vol. 2, p. 262.

Subgenus **MESOCYPHONA** Osten Sacken.

1869. *Mesocyphona* Osten Sacken; Mon. Dipt. N. Am., vol. 4, p. 152.

Erioptera (Mesocyphona) rubia sp. n.

Dark brownish black; wings dark brown with white spots and a white cross-band at the cord.

Female, length, 4 mm.; wing, 4.2 mm.

Rostrum, palpi and antennae black, flagellar segments rounded oval. Head black.

Thoracic dorsum dark brownish black with a sparse brown bloom, the area darker in front of the pseudosutural foveae. Pleurae dark brown with a sparse gray bloom. Halteres yellow, the knobs a little darker. Legs, coxae and trochanters very dark brown, femora dark brownish black, greatly enlarged at the tip, tibiae dark brown, the tip darker, tarsi with the basal half of the metatarsi dull brownish yellow, remainder of the feet dark brown. Wings dark brown with white marks as follows: a large rounded spot at Sc., a smaller rounded spot near the tip of 2d A, a broad white band at the cord entirely traversing the wings, tip of the wing white including the ends of cells R_1 , R_2 and parts of R_3 and M_1 ; it is probable that the base of the wing is also white, but this is not certain; veins dark brown except in the white markings, where they are china-white and difficult to detect; venation (Pl. XXVI, fig. 12).

Abdomen dark brownish black, valves of the ovipositor brownish yellow.

Holotype, ♀, Chiricahui Mts., Cochise Co., Ariz., June 24 (H. G. Hubbard).

Erioptera (Mesocyphona) immaculata Alexander.

1913. *Erioptera (Mesocyphona) immaculata* Alexander; Proceedings of the United States National Museum, vol. 44, pp. 518, 519, pl. 66, fig. 20.

One female from Denison, Grayson Co., Tex., June 22, 1904, taken by Mr. H. S. Barber.

o **Erioptera (Mesocyphona) eiseni** Alexander.

1913. *Erioptera (Mesocyphona) eiseni* Alexander; Proceedings of the United States National Museum, vol. 44, pp. 516, 517, pl. 67, fig. 26.

One male collected at La Cueva, Organ Mts., Donna Ana Co., N. Mex., alt., 5,300 feet, on September 1, by Prof. C. H. T. Townsend.

Subgenus ERIOPTERA Meigen.

1803. *Erioptera* Meigen; Illiger's Magazine, vol. 2, p. 262.**Erioptera (Erioptera) dorothea** sp. n.

Cell 1st M_2 closed, but without a spur as in *Hoplolabis*; wings spotted.

Female, length, 4.5-4.6 mm.; wing, 5.6-6.8 mm.

Rostrum and palpi dark brown. Antennæ with the basal segments brown, flagellar segments dull yellow, the apical segments brown. Head gray.

Thoracic dorsum light gray, the præcutum narrowly margined with pale in front, area in front of the pseudosutural foveæ pale, tuberculate pits dark brown. Pleuræ light gray. Halteres light yellow, the knob scarcely darker. Legs with the coxæ thinly dusted with gray, trochanters brownish yellow, femora dull yellow, the tip narrowly brown, tibiæ dull brownish yellow, the apex browned, tarsi brown. Wings light gray with brown markings as follows: a series of six large blotches along the costal margin, the second at the origin of R_s , third at Sc_2 , fourth, largest, at tip of Sc_1 and on cross-vein r , fifth at the tip of R_1 and the last at the tip of R_2 ; brown seams along the cord, outer end of cell 1st M_2 and at the ends of the longitudinal veins; venation (Pl. XXVI, fig. 13): cross-vein m present less than one-half as long as the outer deflection of M_2 .

Abdomen grayish brown, the apical tergites and the valves of the ovipositor reddish yellow; the apical margins of the sclerites pale.

Holotype, ♀, South Fork of Eagle Creek, White Mts., N. Mex., alt. 8,000 feet, August 16 (C. H. T. Townsend).

Paratype, ♀, topotypic.

The wing-pattern is very similar to *E. (Hoplolabis) armata* O. S. of the Eastern States, but the venation is quite different.

Erioptera (Erioptera) lucia sp. n.

Cell 1st M_2 closed and very small; pleurites of the male hypopygium bearing a triangular flattened lobe at the tip.

Male, length, 4.5 mm.; wing, 6 mm.

Female, length, 4.5 mm.; wing, 6.3 mm.

Rostrum light yellow, palpi brown. Antennæ light yellow, the flagellum broken. Head light gray.

Thoracic dorsum yellow without darker markings. Pleuræ yellow, the ventral sclerites darker and with a sparse grayish bloom. Halteres light yellow. Legs, coxæ and trochanters dull yellow, femora and tibiæ brownish yellow, tarsi brown. Wings hyaline or nearly so, the veins brown; venation (Pl. XXVI, fig. 14, which shows

the very similar *microcellula*): basal deflection of Cu_1 just before the fork of M , cell $1st\ M$, small, the outer deflection of M and cross-vein m subequal.

Abdomen brownish yellow, sternites yellow. Hypopygium with the pleurites rather long, slender with rather abundant long pale hairs, the dorsal appendage flattened (Pl. XXVI, figs. 19, 20), triangular, the base narrowed, the tip truncate, chitinized along the margin, at the apex finely denticulate; ventral appendage shorter, at the tip bearing a chitinized hook that is directed caudad and outward; gonapophyses sharp-pointed, chitinized, decussate.

Holotype, ♂, Colorado.

Allotype, ♀, Beulah, N. Mex., alt. 8,000 feet, August (T. D. A. Cockerell).

Differs from all of the described American species except *E. microcellula* sp. n., in the small closed cell $1st\ M$. From *microcellula* it can be easily separated by the male genitalia.

Erioptera (Erioptera) microcellula sp. n.

Very similar to *E. lucia* in all general features, but the male genitalia are conspicuously different. The pleurites are stouter and bear an irregular appendage shaped as in the figures (Pl. XXVI, figs. 16, 17 and 18). The ventral pleural appendage is not shown in the drawings; it consists of a cylindrical fleshy lobe, narrower at the base, very densely covered with long pale hairs. The gonapophyses seen from beneath are long chitinized hooks, slightly curved inward but their tips not meeting, along the sides with numerous appressed teeth.

The wing-venation is shown in Pl. XXVI, fig. 14.

Male, length, 4.8 mm.; wing, 6.8 mm.

Holotype, ♂, Colorado.

Subgenus *EMPEDA* Osten Sacken.

1869. *Empeda* Osten Sacken; Mon. Dipt. N. Am., vol. 4, p. 183.

Erioptera (Empeda) alicia sp. n.

Body coloration light yellow without darker markings; cell $1st\ M$, closed.

Female, length, 3.5 mm.; wing, 4.9 mm.

Rostrum light yellow, palpi brown. Antennae with the basal segments light yellow, flagellar segments light brown. Head light yellow.

Thorax light yellow without darker markings, the pleura of a lighter shade than the dorsum. Halteres light brown. Legs, coxae and trochanters yellow, femora brown, more yellowish at the base.

tibiae and tarsi light yellowish brown with abundant yellow hairs. Wings hyaline or nearly so, the veins light yellow; venation (Pl. XXVI, fig. 15) as in *stigmatica* O. S., but the cross-vein *m* is present, closing the cell *1st M*₂.

Abdomen brownish yellow.

Holotype, ♀, Scotia, Cal., May 20, 1903 (H. S. Barber).

This differs from the described American forms, *stigmatica* Osten Sacken and *nigrolineata* Enderlein by its closed cell *1st M*₂ and the uniform pale yellow coloration.

Genus **RHABDOMASTIX** Skuse. •

1889. *Rhabdomastix* Skuse; Proc. Linn. Soc. N. S. Wales, series 2, vol. 4, pp. 828, 829.

Subgenus **SACANDAGA** Alexander.

1911. *Sacandaga* Alexander; Entomological News, vol. 22, pp. 349-351.

Rhabdomastix (Sacandaga) caudata Lundbeck.

1898. *Goniomyia (Empeda) caudata* Lundbeck; Diptera gröenlandica, Vidensk. Meddel. fra den naturh. Foren., p. 267, pl. 6, fig. 18.

This curious fly was described from a single female taken at Permiliarsukfiord, 61°, 30' N. L., Greenland. It seems to me that the generic reference as given above is more nearly correct. The cross-vein *r* is shown in Dr. Lundbeck's figure and it is indicated in the material before me; it is probable that this species is an intermediate form in the Eriopterine series. The following material was studied: One female, Signuia, Baffin Land, August 2, 1897 (Schuchert and White). Several of both sexes, Kokanee Mt., Brit. Col., alt. 8,000 feet, August 11, 1903 (R. P. Currie).

I am greatly indebted to Dr. Lundbeck for a copy of the description and figure of this interesting fly.

Genus **GONOMYIA** Meigen.

Subgenus **GONOMYIA** Meigen.

1818. *Gonomyia* Meigen; Syst. Besch., vol. 1, p. 146.

Gonomyia (Gonomyia) obscura Doane.

1900. *Phyllolabis obscura* Doane; Journal of the New York Entomological Society, vol. 8, p. 192, pl. 8, fig. 7.

The type, a female, is No. 7,034, in the U. S. National Museum Collection; it was taken at Pullman, Wash., June 22, 1898.

Gonomyia (Gonomyia) blanda Osten Sacken.

1859. *Gonomyia blanda* Osten Sacken; Proceedings of the Academy of Natural Sciences of Philadelphia, p. 231.

The following records extend the range of the species: Peachland, B. Col., May 19, 1912. Blue Lake, Humboldt Co., Cal., June 24,

1903 (J. C. Bradley). Tex., one female in the C. V. Riley Collection in the National Museum.

Subgenus LEIPONEURA Skuse.

1889. *Leiponeura* Skuse; Proc. Linn. Soc. N. S. Wales, ser. 2, vol. 4, p. 795.

Gonomyia (Leiponeura) alexanderi Johnson.

1912. *Elliptera alexanderi* Johnson; Psyche, vol. 19, p. 3, fig. 6.

The following additional distribution in the United States: Black Mts., Buncombe Co., N. Car., June 13, 1912 (Beutenmüller). Plano, Collin Co., Tex., August (E. S. Tucker).

Gonomyia (Leiponeura) cinerea Doane.

1900. *Dicranomyia cinerea* Doane; Journal of the New York Entomological Society, vol. 8, pp. 182, 183, pl. 7, fig. 2.

The type, a female, is No. 7,005 in the U. S. National Museum Collection; it was taken at Pullman, Wash., August 10, 1898.

Gonomyia (Leiponeura) manca Osten Sacken.

1869. *Gonomyia manca* Osten Sacken; Monographs of the Diptera of North America, vol. 4, pp. 178, 179.

1908. *Dicranomyia carolinosa* Coquillett; Proceedings of the Entomological Society of Washington, vol. 9, p. 144.

Coquillett's types were examined in Washington and proved to belong to this species.

Gonomyia (Leiponeura) puer Alexander.

1913. *Gonomyia (Leiponeura) puer* Alexander; Proceedings of the United States National Museum, vol. 44, p. 506, pl. 66, fig. 14.

Miami, Dade Co., Fla., December 19, 1912 (Fred'k Knab). Billy's Island, Okefenokee Swamp, Charlton Co., Ga., June 25, 1912 (Bradley and Leonard); several specimens of both sexes.

Gonomyia (Leiponeura) sacandaga sp. n.

Coloration yellow and brown; pleurae striped; wings with the costa strongly yellow, stigma pale brown.

Male, length, 3.2-3.4 mm.; wing, 3.3-3.5 mm.

Rostrum and palpi dark brownish black. Antennae with the two basal segments light yellow, the flagellum brown. Head light yellow with a dark brown spot in the middle.

Mesonotal praescutum rather dark brown, narrowly edged around with light yellow; scutum pale yellow medially, the lobes brown margined with yellow behind; scutellum brown, broadly margined with yellow behind; postnotum brown. Pleurae striped brown and yellow; the dorsal pleurites light yellowish brown, limited above by the bright yellow margin of the praescutum, limited below by the dorsal pleural stripe which begins beneath the base of the halteres.

and goes to above the fore coxa: lower pleural stripe broader, traversing the coxæ, the yellow band between these dark stripes very clear, at the anterior end including most of the fore coxa. Halteres light yellow. Legs, coxæ as described above, trochanters dull yellow, femora brown broadly tipped with dark brown, tibiæ and tarsi dark brown. Wings light gray, the costal margin conspicuously light yellow; cells *C*, *Sc* and *R*₁ pale, almost hyaline; stigma pale brown, oval; veins brown; venation (Pl. XXVII, fig. 25): *Sc* ending far before the origin of *R*_s, the distance equal to two-thirds the length of the sector.

Abdominal tergites dark brown, the apical third of each sclerite yellow, the lateral margin narrowly yellowish; hypopygium reddish; sternites brown, the extreme apex of each sclerite yellowish. Hypopygium (Pl. XXVI, fig. 21) with the pleurites rather long, slender, with a few rather long hairs on the outer face near the tip, bearing two appendages; of these the more dorsal is stouter, paler and less chitinized on its basal two-thirds, the apex a strong chitinized tooth with numerous pale hairs around its base; this appendage is connected basally with the long, flattened basal appendage, which is a little truncated at its apex, shaped as in the figure. The ventral lobe of the pleura is produced into a short fleshy conical lobe provided with long hairs. The dorsal gonapophyses are short, curved, strongly chitinized beyond the curve, pointed at the tip, with two or three blunt teeth on the cephalic or under face of the hook.

Holotype, ♂, Sport Is., Sacandaga R., Fulton Co., N. Y., August 24, 1910 (Alexander).

Allotype, ♀, topotypic.

Paratypes, 50 ♂ ♀, topotypic, July 5 and July 27, 1909.

! *Gonomyia slossonæ* sp. n.

Cell 1st *M*₂ open by the atrophy of the outer deflection of *M*₃; cell *M*₁ absent.

Female, length, 6-7 mm.; wing, 6-6.8 mm.

Rostrum brown at the tip, yellowish at the base; palpi dark brown. Antennæ brown. Head light yellow.

Thoracic pronotum yellow with a brown spot on either side. Præscutum light yellow with dark brown stripes, the median one darker in front, behind somewhat divided by a pale line; the lateral stripes begin behind the pseudosutural foveæ and are entirely confluent with the middle stripe; pseudosutural foveæ chestnut, very far proximad; scutum yellow, the lobes largely dark brown; scutellum dull yellow; postnotum brown, yellowish on the sides in front.

Pleurae, dorsal pleurites purplish brown, sternum lighter grayish brown, the two enclosing a broad light yellow stripe beginning behind the fore coxa and ending above the hind coxa. Halteres pale brown, the knob a little darker. Legs with the coxae and trochanters dull yellow, femora and tibiae yellow, the latter a little darkened at the tip, tarsi dark brown. Wings light brown, stigma small, rather indistinct, veins brown; venation (Pl. XXVII, fig. 26); Sc_1 far removed from the tip of Sc_2 ; cross-vein r rather indistinct at the fork of R_1 ; cell M_1 absent; outer deflection of M_2 absent; basal deflection of Cu_1 at the fork of M .

Abdomen dark brown, the pleural line and the genital segment yellowish.

The paratype has the two basal segments of the antennae yellowish, the head behind gray, cross-vein r very indistinct, basal deflection of Cu_1 before the fork of M .

Holotype, ♀, Biscayne Bay, Dade Co., Fla. (Mrs. A. T. Slosson).

Paratype, ♀, Paraiso, Canal Zone, January 29, 1911 (Aug. Busck).

I was unable to detect tibial spurs on this insect. The general appearance is more like that of a *Limaophila* than any other form known to me and I refer it to *Gonomyia* with considerable doubt. The long Sc and cross-vein r are not typical of *Gonomyia*.

Genus **CLADURA** Osten Sacken.

1859. *Cladura* Osten Sacken; Proc. Acad. Nat. Sci. Phila., p. 229.

Cladura delicatula sp. n.

From the only described American species, *C. flavo-ferruginea* O. S. (= *indivisa* O. S.), this form differs in its very much smaller size and pale coloration. The specimens of *indivisa* mentioned by Osten Sacken,² where he states "some of the specimens, probably recently excluded, were pale and without spots," may have belonged to this form. There are no brown spots on the pleurae; the extreme lateral margin of the abdominal tergites is dark; the wings are hyaline and lack the dark markings on the cord, origin of the sector and on the outer deflection of cell *1st M*₂. I have compared this insect with the extensive series of *Cladura* studied by Mr. Leonard and myself³ and have no doubt of its specific distinctness. The wing is figured in Pl. XXVII, fig. 27.

Female, length, 4.6-4.7 mm.; wing, 5.6-5.7 mm.

²Mon. Dipt. N. Am., vol. 4, p. 189.

³Venational variation in *Cladura*, *Journ. N. Y. Entomological Society*, vol. 20, pp. 36-39, 1912.

Holotype, ♀, White Mts., N. Hamp. (H. K. Morrison).
Paratypes, 2 ♀, topotypic.

Tribe **Limnophilini**.

Genus **LIMNOPHILA** Macquart.

1834. *Limnophila* Macquart; Suit. a Buffon, vol. 1, p. 95.

Limnophila albipes Leonard.

1913. *Limnophila albipes* Leonard; Entomological News, vol. 25, pp. 248, 249, fig.

One male of this species was taken by Mr. S. Frost at Tarrytown, Westchester Co., N. Y., June 16, 1913. This constitutes the first record for the State.

Limnophila alleni Johnson.

1909. *Limnophila alleni* Johnson; Proceedings of the Boston Society of Natural History, vol. 31, pp. 126, 127, pl. 16, fig. 18.

This fine species was described from a single male. A male specimen was taken in Coy Glen, Ithaca, N. Y., June 20, 1910, by Miss Anna H. Morgan. Another male in Simmon's woods, Gloversville, N. Y., June 9, 1914, by the author. There is a badly injured female in the Cornell Collection, taken in North Carolina by H. K. Morrison; this specimen has a strong cross-vein in cell R_2 in both wings uniting R_{4+5} with M_1 . A second female was taken at Sugar Grove, Fairfield Co., O., May 19, 1901, by Prof. J. S. Hine; the female never having been described, I make this specimen the allotype and characterize this sex as follows:

Allotype, ♀: Head dark brown; abdominal segments 2 to 4 bright orange-yellow, the caudal median portion brown, smallest on segment 2, largest on segment 4; segments 5 to the end of the body brownish yellow with a narrow darker median stripe; sternites yellow with a narrow median brown stripe extending the length of the segment; no black band on the middle of the fore femora.

Female, length, 36 mm.; wing, 22 mm.

Specimen in the author's collection.

Limnophila subcostata Alexander.

1911. *Phylidorea subcostata* Alexander; Canadian Entomologist, vol. 43, pp. 288, 289.

Since this species was first described it was found to be rather common in the bogs, deep woods and gorges in May and early June. The species has not been figured hitherto and I show its venation in Pl. XXV, fig. 1. A male from Fall Creek, Ithaca, N. Y., May 7, 1913; a second male from the same place on May 13, 1913; a male from Bear Creek bog, Freeville, N. Y., May 29, 1913. Several females

swept from rank vegetation at Sacandaga Park, Fulton Co., N. Y., June 1, 1914. Three females taken in Simmon's woods, Gloversville, N. Y., June 3, 1914, in company with a cranefly fauna that is quite characteristic of northern woodlands that support a rich Canadian flora. *Dicranomyia pubipennis*, *Rhypholophus rubellus*, *Ectophasia stigmatica*, *Adelphomyia minuta*, *Limnophila caubasis*, *L. arcolata*, *Rhaphidolabis flavcola*, *Tricyphona calcar*, etc.)

Subgenus EPHELIA Schiner.

1863. *Ephelia* Schiner; Wien. Entomol. Monatschr., vol. 7, p. 222.

Limnophila (*Ephelia*) *johnsoni* sp. n.

Color yellow; wings hyaline, unmarked; a supernumerary cross-vein in cell *M*.

Male, length, 4 mm.; wing, 6.1 mm.

Female, length, 7.2 mm.; wing, 8.6 mm.

Rostrum pale brownish yellow; palpi and antennæ very pale yellowish-brown. Head yellow with a pale bloom, eyes conspicuously contrasting, black.

Pronotum pale yellow. Mesonotal præscutum pale yellow with four broad indistinct darker stripes, of which the median pair are the longest; scutum, scutellum and postnotum light yellow with a sparse pale gray bloom. Pleura yellowish. Halteres pale yellow. Legs yellow, the tibiae and tarsi a little suffused with brown. Wings pale yellow, the veins pale; venation (Pl. XXV, fig. 2; *R*₁ rather long, angulated at base, in a line with the deflection of *R*₂; cross-vein *r* not distinct; basal deflection of *R*₄₊₅ and *M*₁ strongly arcuated and in a line; a strong supernumerary cross-vein in cell *M*.

Abdomen very light brownish yellow.

Holotype, ♂, Mountain Lake, Fulton Co., N. Y., alt. 1,590 feet, June 17, 1914 (C. P. Alexander).

Allotype, ♀, Bretton Woods, N. H., June 23, 1913 (C. W. Johnson).

This interesting new species is named in honor of the well-known dipterologist, Mr. Charles W. Johnson, who collected the allotype. The only other species of *Ephelia* in America are *apileana* O. S. and *superlineata* Doane which have the wings heavily spotted with brown.

Subgenus DACTYLOLABIS Osten Sacken.

1859. *Dactylolabis* Osten Sacken; Proc. Acad. Nat. Sci. Phila., p. 240.

Limnophila (*Dactylolabis*) *hortensia* sp. n.

Wings subhyaline; color gray, hypopygium reddish.

Male, length, about 8 mm.; wing, 8.8 mm.

Female, length, 7.8-8.4 mm.; wing, 8.4-8.8 mm.

Rostrum and palpi brown. Antennae with the basal segment very elongate, dark brown, flagellum dark brown. Head gray.

Thoracic dorsum light gray, the præscutum with darker markings, a very indistinct stripe on either side of the middle line, a more distinct stripe on either side, narrowest in front. Pleura light gray. Halteres pale yellow. Legs, coxæ and trochanters yellow, femora yellow darkened at the tip, tibiae brownish yellow, brown at the tip, tarsi brown. Wings subhyaline or faintly yellowish, stigma indistinct, veins brown: venation (Pl. XXVII, fig. 29): R_{2+3} about as long as the basal deflection of Cu_1 ; cross-vein r at about two-thirds the length of R_2 .

Abdominal tergites gray, the hypopygium reddish yellow; sternites blackish gray, each segment with more or less yellow at the base.

Holotype, ♂, London Hill Mine, Bear Lake, Brit. Col., alt. 7,000 feet, July 29, 1903 (A. N. Caudell).

Allotype, ♀, topotypic.

Paratypes, 10 ♂ ♀, topotypic.

In the U. S. National Museum Collection this material was determined as *L. cubitalis* Osten Sacken, and by Osten Sacken's key⁴ it would run down to that species. The following differences suffice to separate the forms:

1. The extreme base of R_2 is perpendicular to the end of the sector; cell R_2 very long and narrow; wings more tinged with yellow; hypopygium concolorous with the rest of the abdomen; size larger (Eastern United States) *cubitalis* Osten Sacken.
 R_2 leaves the end of the sector at an angle; cell R_2 shorter, not so elongated; wings nearly hyaline; hypopygium reddish, conspicuously brighter than the rest of the abdomen; size smaller (British Columbia) *hortensia*, sp. n.

***Limnophila nigripleura* A. and L. sp. n.**

Belongs to the *luteipennis* Osten Sacken group; wings clear; pleura with a conspicuous dark brown stripe from the cervical sclerites to the postnotum.

Male, length, 4.8-5 mm.; wing, 5.8-6 mm.

Female, length, 6 mm.; wing 7 mm.

Palpi and antennae dark brownish black. Head light clear gray, provided with numerous hairs.

Pronotum dusted with gray. Mesonotal præscutum and scutum

⁴Mon. Dipt. N. Am., vol.4, pp. 202, 203.

light brown, rather darker medially; scutellum more yellow medially; postnotum gray. Pleurae dull light yellow with a broad dark brown stripe extending from the cervical sclerites to the postnotum; mesosternum suffused with brown. Halteres light yellow, the knobs darker. Legs, coxae and trochanters dull yellow, femora brownish yellow, tibiae similar, the tip narrowly brown, tarsi brown. Wings subhyaline, stigma indistinct, veins brown; venation (Pl. XXV, fig. 3).

Abdominal tergites dark brown, sternites much paler, yellowish white, hypopygium brown.

Holotype, ♂, Sacandaga Park, Fulton Co., N. Y., June 20, 1910.

Allotype, ♀, topotypic.

Paratypes, 50 ♂♂, topotypic; Mountain Lake, Fulton Co., N. Y., alt. 1,580 feet, June 15, 1911; Orono, Penobscot Co., Me., July 29, 1913; Ithaca, Tompkins Co., N. Y., July 7, 1911; Ridgewood, Bergen Co., N. J.

A common and widely distributed species in the Eastern United States; the material has been compared with the types of *contempta* in the Museum of Comparative Zoology, and the form differs as described above. The species has been in the collection of Mr. Leonard and myself for some years.

A key to the species of the *luteipennis* group in the Eastern United States.

- | | |
|---|--|
| 1. Cell <i>M</i> ₂ absent..... | <i>noveboracensis</i> Alex. ⁵ |
| Cell <i>M</i> ₂ present..... | 2. |
| 2. Wings with small brown dots on the cross-veins and at the forks..... | <i>luteipennis</i> O. S. ⁶ |
| Wings clear, un-spotted..... | 3. |
| 3. Thorax clear blue-gray..... | <i>inornata</i> O. S. ⁷ |
| Thorax brownish without gray color..... | 4. |
| 4. Larger species with the pleurae unmarked..... | <i>contempta</i> O. S. ⁸ |
| Smaller species: pleurae with a conspicuous dark brown stripe from the cervical sclerites to the postnotum, | <i>nigripleura</i> A. & L., sp. n. |

The members of the *luteipennis* group have the following characters in common: head narrow and prolonged behind; pronounced pseudosutural or humeral pits; conspicuous tuberculate pits on either side of the middle line of the prescutum in front. Venation

⁵ *noveboracensis* Alexander; *Pysche*, vol. 18, pp. 196 to 198; 1911.

⁶ *luteipennis* Osten Sacken; *Proc. Acad. Nat. Sci. Phila.*, p. 236; 1879.

⁷ *inornata* Osten Sacken; *Mon. Dipt. N. Am.*, vol. 4, pp. 219, 220; 1869.

⁸ *contempta* Osten Sacken; *l.c.*, pp. 218, 219; 1869.

of the wings, cells R_3 and $1st\ M_2$ longer than cell R_5 ; radial and medial veins long and slender; second anal vein incurved at the tip.

Limnophila novæ-angliæ sp. n.

Belongs to the *adusta* Osten Sacken group; wings hyaline; body coloration yellowish; abdomen of the male with a black subterminal ring.

Male, length, 6.8-7.5 mm.; wing, 5.8-7.2 mm.

Female, length, 8 mm.; wing, 7.5 mm.

Rostrum yellowish, palpi brown. Antennæ, basal segments brownish yellow, the first four or five flagellar segments with the extreme base yellowish, remainder of the antennæ brown. Head with a broad purplish brown band across the vertex from one eye to the other; occiput rather abruptly reddish yellow.

Thoracic notum reddish yellow without stripes. Pleuræ lighter yellow. Halteres short, rather pale, the knob only a little darker. Legs, coxæ and trochanters yellow, femora and tibiæ yellow, the tips narrowly brown; metatarsus dull yellowish basally, tipped with brown, remaining tarsal segments brown. Wings with a faint yellowish tinge, a pale brown, oval stigma, no infuscation at the tip of the wing; venation (Pl. 1, fig. 4).

Abdomen brownish yellow with a conspicuous subapical black ring including segments 8 and 9 and the caudal half of 7; hypopygium reddish yellow.

The female sex is similar, but the abdomen lacks the black subapical ring, and in some specimens the entire head is dark purplish brown.

Holotype, ♂, Ellsworth, Hancock Co., Me., August 10, 1913 (Miss Cordelia J. Stanwood).

Allotype, ♀, topotypic.

Paratypes, 1 ♂, 4 ♀, type-locality, July 9 to August 10, 1913.

A key to the species of the *adusta* group in the eastern United States.

1. Wings more or less clouded with brown apically; often with brown seams on the cross-veins..... 2.
- Wings uniform in coloration, the stigma indistinct..... 3.
2. Yellowish species, the thoracic notum light yellow.....*adusta* O. S.⁹
- Brown species, the thoracic notum dark brown.....*similis* Alex.¹⁰
3. Larger species (wing of male, 9.5 mm.); abdomen without a black subterminal ring in the male.....*lutea* Doane¹¹
- Smaller species—wing of male less than 7.5 mm.; abdomen of the male with a black subterminal ring.....*novæ-angliæ*, sp. n.

⁹ *adusta* Osten Sacken, *Proc. Acad. Nat. Sci. Phila.*, p. 235; 1859. Mon. Dipt. N. Am., vol. 4, pp. 215-217; 1869.

¹⁰ *similis* Alexander; *Psyche*, vol. 18, pp. 195, 196; 1911.

¹¹ *lutea* Doane; *Journ. N. Y. Ent. Soc.*, vol. 8, p. 191; 1900.

The members of the *adusta* group are distinguished by the following characters: radial sector short, arcuated; cross-vein r situated at about mid-length of R which is quite oblique. The species are yellowish or brown and specimens in a single species vary much in the intensity of their coloration.

The following species have been examined and prove to belong to this group of the genus:

L. macophila fulvicostalis Coquillett,¹² from Bering Islands, type 4,019 U. S. N. M.

L. macophila costata Coquillett,¹³ from New Mexico, type 5,318 U. S. N. M.

L. macophila insularia Johnson,¹⁴ from Bermuda, type in the collection of Mr. Johnson.

Limnophila stanwoodæ sp. n.

Belongs to the *quadrata* Osten Sacken group; body-coloration yellow; wings pale yellow; R s long, cell M_1 absent.

Male, length, 6.6-6.9 mm.; wing, 7.5-7.9 mm.

Female, length, 6.8-7.2 mm.; wing, 6.8-7.3 mm.

Rostrum yellowish, palpi with the basal segments light colored, terminal two brown. Antennæ with the scape yellow, flagellum brown, the proximal half of the first two flagellar segments yellowish. Head reddish yellow.

Thorax brownish yellow without distinct dark lines, the post-notum with a narrow indistinct median stripe of brown. Pleuræ, pro-pleuræ darker, the meso- and metapleuræ light yellow. Halteres pale yellow. Legs, coxæ and trochanters light yellow, femora brownish yellow darkening into brown at the tip, tibiae light brown darker at the tip, tarsi dark brown. Wings with a light yellow tinge, the stigma gray, oval, veins brown, the radial cross-vein mostly obscured by the stigma; venation (Pl. XXV, fig. 5).

Abdomen brownish yellow, the lateral line brownish; sternites a little brighter yellow; segment 8 and the caudal half of the 7th brown; hypopygium yellowish; valves of the ovipositor of the female long, acicular.

Holotype, ♂, Sacandaga Park, Fulton Co., N. Y., June 11, 1914.

Allotype, ♀, topotypic.

Paratypes, 3 ♂, 18 ♀, Ellsworth, Hancock Co., Me., June 21-July 23, 1913.

¹² Fur Seals and Fur-Seal Islands, vol. 4, p. 342; 1899.

¹³ *Psyche*, vol. 9, p. 149; 1901.

¹⁴ The Dipteran Fauna of Bermuda, *Annals of the Entomological Society of America*, vol. 6, pp. 443, 444, fig. 2; 1913.

The paratypes were collected by Miss Cordelia J. Stanwood, the well-known student of bird-life, in whose honor the species is named. Miss Stanwood has done much to discover the craneflies in the vicinity of her home city, and as a result of her careful observations our knowledge of the Hancock Co. Tipulidæ is remarkably complete and constitutes one of the most valuable lists of a restricted locality that has ever been secured.

Limnophila osborni sp. n.

Belongs to the *quadrata* Osten Sacken group; mesonotum rich brown; pleuræ with a conspicuous black dorsal stripe; wings with a brown tinge; cross-vein *r* at the fork of R_{2+3} ; R_s long, cell M_1 absent.

Male, length, 6.3-6.5 mm.; wing, 7.4-7.5 mm.

Rostrum a little reddish yellow, palpi and antennæ dark brownish black. Head dark brownish black.

Mesonotal præscutum rich yellowish brown with a very narrow black line on either side of the broad median space, a deep black spot on the anterior margin of the præscutum continued forward onto the pronotal sclerites, lateral stripes not clearly indicated; scutum yellowish brown with a darker brown suffusion on each lobe; scutellum dull yellow; postnotum clear light gray. Pleuræ pale yellowish with a broad deep black stripe extending from the cervical sclerites across the dorsal pleural sclerites to the abdomen; the pleuræ adjoining this broad conspicuous stripe very narrowly gray pruinose; sternal sclerites pale dull yellow. Halteres rather long, pale, the knob elongate, dark. Legs, coxæ and trochanters pale yellow, femora brownish yellow, the tip darker, tibiæ and tarsi dark brown. Wings with a brown tinge, veins dark brown; venation (Pl. XXV, fig. 6); cross-vein *r* at the fork of R_{2+3} .

Abdominal tergites shining black; sternites dark brownish black; basal sternites with some yellow; hypopygium reddish brown.

The paratype from Phair, Me., shows the mesonotal præscutum very dark brown medially, a little lighter behind, lobes of the scutum shiny black.

Holotype, ♂, Phair, Aroostook Co., Me., August 26, 1913 (Herbert Osborn).

Paratypes, 1 ♂ with the type; 2 ♂ from the Bangor Bog, near Orono, Penobscot Co., Me., August 30, 1913 (Herbert Osborn).

This interesting late summer member of the *quadrata* group is named in honor of Dr. Herbert Osborn, who collected the type material.

A key to the species of the *quadrata* group in the eastern United States,

1. Mesonotum and pleurae yellowish or brownish yellow; wings pale yellow; size small.....*stanwoodæ* sp. n.
 Mesonotum and pleurae not yellow; size larger..... 2.
2. Pleurae and mesonotum clear bluish black with a gray bloom, only the coxæ conspicuously light yellow; wings with a yellowish tinge; cross-vein *r* beyond the fork of R_2 on R_1 .
quadrata O. S.¹⁵
 Pleurae with a conspicuous black dorsal stripe; mesonotum rich brown; wings with a brown tinge; cross-vein *r* at the fork of R_{2+3}*osborni* sp. n.

The members of the *quadrata* group have the radial sector long and in a line with R_{2+3} ; cells R_1 , R_2 and 1st M_2 in a line or nearly so; cell M_1 absent.

Limnophila emmelina sp. n.

Brown, abdomen hairy; wings brown; cell R_2 sessile; cell M_1 absent.

Male, length about 7 mm.; wing, 8.9 mm.

Rostrum very short, reddish brown, the palpi brown. Antennae rather short, dull yellowish brown. Head reddish brown.

Thoracic dorsum yellowish brown without distinct darker markings. Pleurae dull yellow. Halteres yellow. Legs, coxæ and trochanters dull yellow, femora yellow, broadly tipped with brown, tibiae dull yellow, rather narrowly tipped with brown, tarsi brown, the base of the metatarsus a little paler. Wings with a slight brownish tinge, no stigmal spot, veins brown; venation (Pl. XXVII, fig. 28): R_1 arising from the sector so that the cell R_2 is sessile; cell M_1 absent.

Abdominal tergites dark brown, sternites lighter colored. Holotype, ♂, Great Falls, Va., April 20, 1913 (Fred'k Knab).

From other members of the genus in which cell M_1 is lacking this species is readily distinguished by the sessile cell R_2 .

Tribe **Pedicini**.

Genus **ORNITHODES** Coquillett.

1900. *Ornithodes* Coquillett; Proc. Wash. Acad. Sci., vol. 2, p. 400.

Ornithodes harrimani Coquillett.

1900. *Ornithodes harrimani* Coquillett; Proceedings of the Washington Academy of Science, vol. 2, p. 400.

The type is No. 5,203 in the U. S. National Museum. It is a male from Virgin's Bay, Alaska, June 26, 1899. This insect is very similar to *Triclyphona* in venation, but distinct in the curious

¹⁵*quadrata* Osten Sacken; Proc. Acad. Nat. Sci. Phila., p. 241; 1859; Mon. Dipt. N. Am., vol. 4, p. 230; 1869.

elongate rostrum, from which character Coquillett evidently derived the generic name.

Genus **TRICYPHONA** Zetterstedt.

1838. *Tricyphona* Zetterstedt: Ins. Lapponica, Dipt., p. 851.

Tricyphona katahdin sp. n.

Color light brown; wings light yellow with sparse brown seams and spots; cross-vein *m-cu* lacking.

Male, length, 6-7.6 mm.; wing, 6-6.9 mm.

Female, length, 8.8-9.5 mm.; wing, 7.5-9 mm.

Palpi dark brownish black, rostrum and head brownish gray, clearer gray on the vertex adjoining the eyes; first segment of the antennæ pale yellow, remainder of the antennæ dark brown.

Mesonotal præ-cutum light fawn-brown with an indistinct brownish stripe on either side of the middle line and shorter lateral pale brown stripes, these latter continued caudad onto the lobes of the scutum; scutellum grayish; postnotum light yellowish brown with a whitish bloom. Pleuræ light yellow. Halteres pale, the knob a little darker. Legs yellow, coxæ and trochanters brownish yellow, femora yellow darkening into brown on the apical half or more, tibiæ and tarsi dark brown. Wings light yellow, the veins yellow; small brown markings as follows: a rounded spot on Sc_2 continued up into the costal cell; an oval spot at Sc_3 ; brown seams at the base of R_s , base of R_{2+3} , cross-vein r , tip of R_{2+3} , fork of R_{4+5} , cross-vein $r-m$; venation (Pl. XXV, fig. 7): cell R_4 much shorter than cell R_5 , usually one-half as long; cell M_1 very short usually about equal to its petiole beyond cross-vein m or a little longer; cell *1st* M_2 very long, narrow; Cu_1 and M_2 fused for a distance obliterating cross-vein *m-cu*.

Abdominal tergites with the basal two-thirds brown, apical third yellowish; sternites dull brownish yellow, margined laterally with brown, the apical segments with the margin reduced or lacking; hypopygium pale.

The female is similar to the male, but larger, especially the abdomen; brown tips to the femora narrower; abdomen usually with more yellow color, often with a broad median patch of yellowish on the tergites.

In some of the males the scapal segments of the antennæ are dark brown, concolorous with the rest of the antennæ.

There is some variation in venation in the series, the fusion of M_2 and Cu_1 is sometimes lacking, the cross-vein *m-cu* being present as in *venalis* Osten Sacken; one female lacks cross-vein *m* in both wings.

Holotype, ♂, at the foot of Mt. Katahdin, Piscataquis Co., Me., along the Abol trail; altitude about 1,000 feet, August 22, 1913 (Alexander).

Allotype, ♀, topotypic.

Paratypes, 9 ♂, 5 ♀, topotypic (Morse and Alexander). 1 ♂, 1 ♀, Ellsworth, Hancock Co., Me., August 26 and September 1, 1913 (C. J. Stanwood).

Paratypes have been deposited in the Museum of Comparative Zoology (through Prof. Morse); Boston Society of Natural History, Maine Experiment Station, American Museum of Natural History, The Academy of Natural Sciences of Philadelphia, and the U. S. National Museum.

Related to *Tricyphona vernalis* Osten Sacken (Pl. XXV, fig. 8), but is a very different species. The size, sex for sex, is smaller; no sign of the gray coloration so characteristic of *vernalis*; wings much paler, yellowish, and the markings are reduced to mere spots and narrow seams as described above, not conspicuous rounded clouds. In normal individuals of both species, *vernalis* has cross-vein *m-cu* present and cell *M*₁ consequently very long; *katahdin* has *Cu*₁ and *M*₁ fused for a greater or less length; the forks of cell *M*₁ and *R*₁ are much shorter in *katahdin* than in *vernalis*.

Genus **POLYANGÆUS** Doane.

1900. *Polyangæus* Doane; Journ. N. Y. Ent. Soc., vol. 8, p. 196.

Polyangæus maculatus Doane.

1900. *Polyangæus maculatus* Doane; Journal of the New York Entomological Society, vol. 8, p. 197, pl. 8, fig. 20.

The type is apparently not in the collection of the U. S. National Museum with the remaining Doane types. There are a few specimens from Eureka, Humboldt Co., Cal., May 22, 1903, taken by Mr. H. S. Barber.

Genus **DICRANOTA** Zetterstedt.

1838. *Dicranota* Zetterstedt; Ins. Lapponica, Dipt., p. 851.

Dicranota pallida sp. n.

Size large, wing over 7 mm.; body coloration light yellow; cell *M*₁ present, deep; cross-vein *m* present.

Female, length, 8 mm.; wing, 8.1 mm.

Rostrum and palpi pale yellow. Antennæ with the two basal segments pale yellow, the flagellum broken. Head yellow.

Thoracic dorsum light yellow, lobes of the scutum, basal portion of the scutellum and the postnotum more brownish. Pleuræ dull yellow. Halteres broken. Legs, coxæ and trochanters dull yellow.

femora yellow, a little darker at the tip, tibiae and tarsi dull yellow, the tips of the individual segments a little darkened. Wings broad, hyaline, highly iridescent, veins brown; venation (Pl. XXVII, fig. 31): *Rs* long, angled and spurred near its origin; cell *1st M*₂ closed; cell *M*₁ present and very deep, its petiole very short so that the cell is almost sessile.

Abdomen dull yellow.

Holotype, ♀, White Mts., N. H. (H. K. Morrison).

This insect agrees with *argentea* Doane and *noveboracensis* sp. n., in the presence of cell *M*₁ of the wings. The pale coloration and the closed cell *1st M*₂ readily separate it from these species. The related *Rhaphidolabis flavicola* O. S. has the petiole of cell *M*₁ long, the radial sector short, no supernumerary cross-vein in cell *R*₁, etc.

Dicranota noveboracensis sp. n.

Body coloration gray; size small (length about 6 mm.); wings with cell *M*₁ present.

Male, length, 5.5-6.3 mm.; wing, 6.6-7.5 mm.

Female, length, 6-6.5 mm.; wing, 7.8-8 mm.

Rostrum, palpi and antennae dark brown, the flagellar segments short, oval. Head brownish gray, paler around the eyes, a very narrow dark brown median stripe.

Thoracic dorsum gray with three dark brown stripes on the dorsum, the middle stripe broadest, extending the length of the praescutum, faintly bisected by a narrow pale median line; lateral stripes short, beginning at about midlength of the praescutum, extending back onto the scutum where they suffuse the lobes; scutellum and postnotum light gray. Pleurae light gray. Halteres pale. Legs, coxae brown with a sparse gray bloom on the outer face, trochanters yellowish brown, remainder of the legs brown. Wings light gray, the stigmal spot pale brown, not completely filling the space between the cross-veins in the radial cells, veins dark brown; venation: *Rs* rather elongate, oblique; cell *M*₁ present. The venation is figured in Needham's paper, 23d Report of the N. Y. State Entomologist for 1907, pl. 19, fig. 1 (as *rivularis* Osten Sacken).

Abdomen light brownish gray.

Holotype, ♂, Fall Creek, Ithaca, N. Y., May 8, 1914.

Allotype, ♀, topotypic.

Paratypes, 4 ♂, 1 ♀, topotypic, 1 ♂, 1 ♀, Dolgeville, Fulton Co. N. Y., May 16, 1914.

The American species of *Dicranota* may be separated by the following key.

1. Cell M_1 absent..... 2.
Cell M_1 present..... 3.
2. Halteres with the knob darkened; antennae of the male much longer than the thorax (eastern United States)..... *caeca* O. S.¹⁶
Halteres pale; antennae of the male short (eastern United States),
rivularis O. S.¹⁷
3. Cell 1st M_2 present; body-coloration yellowish (eastern United States)..... *pallida* sp. n.
Cell 1st M_2 absent; body-coloration grayish..... 4.
4. Size large (length of female 9 mm.) (western United States),
argentea Doane¹⁵
Size small (length of the female 6 mm.) (eastern United States),
norboracensis sp. n.

Genus **RHAPHIDOLABIS** Osten Sacken.1869. *Rhaphidolabis* Osten Sacken; Mon. Dipt. N. Am., vol. 4, p. 284.**Rhaphidolabis polymeroides** sp. n.

Antennae elongated, much longer than the head and thorax together, the segments of the flagellum with abundant out-stretched hairs; wings with a brown suffusion.

Male, length about 6-6.5 mm.; wing, 7.4 mm.

Rostrum brown, palpi dark brownish black. Antennae elongated, if bent backward they would extend to the middle of the abdomen; flagellar segments very long, cylindrical, with abundant out-stretched hairs. Head gray.

Thoracic dorsum brown with three dark brown stripes, the median one longest and broadest, the lateral stripes short, narrowed in front, broader behind; scutum with the lobes dark brown these being continuations of the lateral praesutal stripes; scutellum and post-notum brown with a sparse gray bloom. Pleurae brownish gray. Halteres long, pale at the extreme base, knob dark brown. Legs, coxae brown, more yellowish at the tips, trochanters yellow, femora yellow darkening into brown beyond the base, tibiae and tarsi brown. Wings with a dark brown suffusion, stigma indistinct, veins dark brown with conspicuous hairs; venation (Pl. XXVII, fig. 30).

Abdominal tergites dark brown, the hypopygium lighter brown; sternites more yellowish.

Holotype, ♂, Eureka, Cal., May 22, 1903 (H. S. Barber).

This insect is conspicuously different from any of the described

¹⁵*caeca* Osten Sacken; Mon. Dipt. N. Am., vol. 4, pp. 281, 282; 1869.¹⁶*rivularis* Osten Sacken; *Proc. Acad. Nat. Sci. Phila.*, p. 249, pl. 2, fig. 16; 1859.¹⁷*argentea* Doane; *Journ. N. Y. Ent. Soc.*, vol. 8, p. 196, pl. 8, fig. 19; 1900.

Dieranotæ. The resemblance of this insect to species of *Polymera* is remarkable.

Tribe **Hexatomini.**

Genus **ERIOCERA** Macquart.

1838. *Eriocera* Macquart; Dipt. exot., vol. 1, No. 1, p. 74.

Eriocera tristis sp. n.

Abdomen shining black; wings with a blackish suffusion; cross-vein *r* at the fork of R_{2+3} .

Female, length, 12 mm.; wing, 10-10.8 mm.

Rostrum and palpi brown. Antennæ reddish brown. Head dark brownish black, much paler, yellowish, along the margin of the eye and a pale spot behind the frontal tubercle. Frontal tubercle conspicuous, shiny, without hairs, deep chestnut-brown with a V-shaped notch in front.

Thorax with the pronotum dark brownish black; mesonotum very dark brown with four indistinct blackish stripes, the middle pair longest, divergent in front, the lateral pair abbreviated; scutum and scutellum brown, the latter with a sparse gray bloom; postnotum black. Pleuræ dark brown. Halteres dark brownish black. Legs, coxæ brown, trochanters dull yellow, femora full yellow at base, darkening into brown at the swollen tips; tibiæ reddish brown, tarsi brown. Wings blackish brown, stigma oval, dark brown; venation: cross-vein *r* at the fork of R_{2+3} ; cell 1st M_2 small, almost square; basal deflection of Cu_1 beyond the fork of M . (The venation is figured in *Psyche*, vol. 19, pl. 13, fig. 8; 1912.)

Abdominal tergites dark shiny black, the terminal segment and the ovipositor reddish brown; sternites yellowish, apices of the segments dark brownish black, sometimes the yellow color indistinct.

Holotype, ♂, Fall Creek, Ithaca, N. Y., August 1, 1912 (Alexander).

Allotype, ♀, topotypic.

Paratypes, 1 ♀, topotypic, (Carl Hg). 2 ♀, topotypic (Carl Hg).

I examined the types of *fuliginosa* O. S. on September 11, 1913. The wing is suffused with rather light brown; stigma small, rounded, brown; cross-vein *r* just beyond the fork of R_{2+3} . *E. tristis* may be told by the very dark color of the wings and the deep black abdomen; this is the species mentioned by me in *Psyche*, December, 1912, p. 169, under the account of *E. fultonensis*.

Subfamily CYLINDROTOMINÆ.

Genus **CYLINDROTOMA** Macquart.1834. *Cylindrotoma* Macquart; Suit. a Buffon, vol. 1, p. 107.**Cylindrotoma splendens** Doane.1900. *Cylindrotoma splendens* Doane; Journal of the New York Entomological Society, vol. 8, p. 197, pl. 8, fig. 21.1900. *Cylindrotoma juncta* Coquillett; Proceedings of the Washington Academy of Sciences, vol. 2, p. 401.

Doane's type (No. 7,051 U. S. N. M., from Unalaska, August 24, 1897) was described three months before Coquillett's *juncta* (No. 5,204 U. S. N. M., Virgin's Bay, Alaska, June 26, 1899) appeared in press.

Cylindrotoma tarsalis Johnson.1912. *Cylindrotoma tarsalis* Johnson; Psyche, vol. 19, p. 2, fig. 4.1912. *Cylindrotoma* (?) *anomala* Johnson; Psyche, vol. 19, pp. 2, 3, fig. 3.

The two names given above represent one and the same species. I have found this insect commonly in various parts of Fulton County, N. Y.

Genus **PHALACROCERA** Schiner.1863. *Phalacrocera* Schiner; Wien. Ent. Monatschr., vol. 7, p. 224.**Phalacrocera neoxena** sp. n.

Wings dark-colored; vein R_1 persistent at the tip as in *replicata* Linnæus.

Male, length, 11.8–12 mm.; wing, 10.4–11 mm.

Female, length, 11.8 mm.; wing, 10.9–11.9 mm.

Rostrum and palpi dark brownish black. Antennæ dark brownish black. Head broad, black with a sparse grayish bloom.

Pronotum black with a gray bloom which is most intense on the sides of the sclerites. Mesonotal præscutum with a pale yellowish gray bloom; four indistinct darker stripes, the median pair long, the lateral pair short and broad; scutum, scutellum and postnotum with a pale grayish white bloom. Pleuræ black with a gray bloom which leaves patches of the ground color at intervals. Halteres long, brown. Legs, coxæ grey, trochanters and femora yellowish brown, brown at the tip, tibiæ light brown, darker brown at the tip, tarsi dark brown. Wings with a brown suffusion; stigma prominent, oval, brown; veins dark brown; venation (Pl. XXV, fig. 10: R_s very long, almost straight; cross-vein r short; R_1 beyond r persistent as in *replicata*, not atrophied as in *tipulina*; cross-vein r_m present as a short vein or else lost by the slight fusion of R_{1+2} on M_{1+2} ; cell 1st M_2 large, arcuated at the base.

Abdominal tergites brown with a dark brownish black median

line; lateral margins of the sclerites narrowly dark brownish black; sternites dark brown. Hypopygial sternites bright yellowish chestnut, tergites brown.

Holotype, ♂, Nipigon, Algona District, Ontario, June 17, 1913 (Dr. E. M. Walker).

Allotype, ♀, topotypic.

Paratype, No. 1, ♂, topotypic; No. 2, ♂, type locality, June 18, 1913; No. 3, ♀, North Fairhaven, Cayuga Co., N. Y., May 17, 1913, found dead in lake drift (Dr. J. G. Needham and Miss Emmeline Moore).

The type and paratype No. 1 is in the collection of the University of Toronto.

This insect is closest to *P. replicata* Linnæus of Europe, but the wings are darker colored, much more tinged with brown; the venation, although similar in the persistence of the tip of R_1 , shows a tendency to the reduction of the radio-median cross-vein, the base of cell $1st\ M_2$ more arcuated and other details. Grünberg's figure of the male hypopygium of *replicata*¹⁹ shows differences in the shape of the 9th tergite and the conspicuous appendages of the 9th sternite. The wing venation of the three known species of the genus are figured on Pl. XXV, *replicata*, fig. 9, *noxena*, fig. 10, *tipulina*, fig. 11.

At this point it may be mentioned that there is a great difference in the interpretation of the venation of the radial field of the wing in this tribe of craneflies. Most authors have considered the vein R_2 of the *Cylindrotominae* to represent a combined fusion of R_{1+2+3} from the tip of the wing backward. From a study of the venation of the known species of this tribe, about a dozen in all, it is seen that the above interpretation of a long backward fusion of R_{1+2+3} is impossible and two other possible explanations are here presented. Looking over the series of wings before me, it seems that the vein hitherto considered as R_{1+2+3} is, in reality, R_2 or R_{2+3} alone, R_1 becoming atrophied beyond the radial cross-vein rather than obliterating this cross-vein and fusing with R_3 . This is proved by the wings of *Phalacrocerus* shown in the plate, in *replicata* and *noxena*, R_1 being separated from R_{2+3} , whereas in *tipulina* the tip of R_1 is atrophied beyond cross-vein r . A second possible interpretation is that of considering the small cross-vein mentioned by Osten Sacken as occurring in the costal cell beyond the tip of Sc and present as a very indistinct vein in many specimens (*Liogma*) as being the

¹⁹ Süßwasserfauna Deutschlands, vol. 2A, pt. 1, p. 33; 1910.

tip of R_1 . In this case R_1 is quite short, extending only a slight distance beyond the fork of the radial sector, and the cross-vein r is very long and simulates a section of vein R , ending at the outer part of the stigma; according to this interpretation, R_1 would be separate, but usually very indistinct or lacking, R_2 is atrophied at its tip except in two species of *Phalacrocer* (*replicata* and *noxena*), whereas the vein hitherto considered as being R_{1+2+3} is really R_2 alone. This latter explanation of these veins of the radial field is probably the correct one.

Subfamily TIPULINÆ.

Tribe Tipulini.

Genus LONGURIO Loew.

1869. *Longurio* Loew; Berl. Ent. Zeitschr., vol. 13, p. 3.

Longurio minimus sp. n.]

Size small (wing under 18 mm.); wings with cell M_1 long-petiolate.

Male, length, 21 mm.; wing, 14.6 mm.; abdomen, 17.6 mm.

Female, length, 27 mm.; wing, 16.4 mm.; abdomen, 22 mm.

Frontal prolongation of the head very short, yellowish, the nasus elongate, prominent. Palpi and mouth parts brown. Antennæ short, light yellow, the flagellar segments gradually decreasing in size from the base outward. Eyes rather large, metallic, the front between them narrowed. Head yellowish brown.

Thoracic dorsum brownish yellow, the stripes indistinct in alcoholic material. Pleuræ dull yellow. Halteres yellow, the knob a little darker. Legs, coxæ and trochanters dull light yellow, femora and tibiæ brownish yellow broadly brown at the tip, tarsi brown. Wings with a pale brown suffusion, stigma prominent, a narrow brown seam along the cord; venation (Pl. XXVII, fig. 32); petiole of cell M_1 nearly as long as the cell itself.

Abdominal tergites dull yellow, 7 to 9 dark brown, sternites light yellow, each segment with an elongate brown subterminal median mark, on the 6th and 7th segments covering the caudal end of the segment, 8th sternite dark brown, paler caudally, hypopygium brown.

Holotype, ♂, Tallulah Falls, Rabun Co., Ga., June 17, 1910 (J. C. Bradley).

Allotype, ♀, topotypic.

Paratype, ♂, topotypic.

I am referring this insect to *Longurio*, although it does not agree with *Longurio testaceus* Loew, the genotype, in some respects. *L.*

*testaceus*²⁰ is a much larger insect (male, wing 25.5 mm., abdomen 36 mm.), the cell *1st M*₂ is much larger and the petiole of cell *M*₁ is very short. *Echnosoma rivertonensis* Johnson,²¹ a paratype of which is in my collection through the kindness of Mr. Johnson, is a large fly (male, wing 22 mm., abdomen 30 mm.) with cell *M*₁ entirely sessile.

EXPLANATION OF PLATES XXV, XXVI, XXVII.

PLATE XXV.—Fig. 1.—Wing of *Limnophila subcostata* Alexander.

Fig. 2.—Wing of *L. (Ephelia) johnsoni* sp. n.

Fig. 3.—Wing of *L. nigripleura* A. & L. sp. n.

Fig. 4.—Wing of *L. nova-angliæ* sp. n.

Fig. 5.—Wing of *L. stanwoodæ* sp. n.

Fig. 6.—Wing of *L. osborni* sp. n.

Fig. 7.—Wing of *Tricyphona katahdin* sp. n.

Fig. 8.—Wing of *T. vernalis* Osten Sacken.

Fig. 9.—Wing of *Phalacroccra replicata* Linnæus.

Fig. 10.—Wing of *P. neozena* sp. n.

Fig. 11.—Wing of *P. tipulina* Osten Sacken.

PLATE XXVI.—Fig. 12.—Wing of *Erioptera (Mesocyphona) rubia* sp. n.

Fig. 13.—Wing of *E. (Erioptera) dorothea* sp. n.

Fig. 14.—Wing of *E. (Erioptera) microcellula* sp. n.

Fig. 15.—Wing of *E. (Empeda) alicia* sp. n.

Fig. 16.—Hypopygium of *E. (E.) microcellula*; dorsal aspect of the pleurite and appendages. *d* = dorsal appendage.

Fig. 17.—Hypopygium of *E. (E.) microcellula*; ventral aspect of the dorsal apical appendage.

Fig. 18.—Hypopygium of *E. (E.) microcellula*; ventral aspect of the ventral gonapophyses.

Fig. 19.—Hypopygium of *E. (E.) lucia*; lateral aspect of the pleurite.

Fig. 20.—Hypopygium of *E. (E.) lucia*; dorsal aspect of the pleurite.

Fig. 21.—Hypopygium of *Gonomyia (Leiponeura) sacandaga*; dorsal aspect.

PLATE XXVII.—Fig. 22.—Wing of *Dicranomyia nelliana* sp. n.

Fig. 23.—Wing of *Rhipidia (Arhipidia) shannoni* sp. n.

Fig. 24.—Wing of *Teucholabis rubescens* sp. n.

Fig. 25.—Wing of *Gonomyia (Leiponeura) sacandaga* sp. n.

Fig. 26.—Wing of ? *Gonomyia slossonæ* sp. n.

Fig. 27.—Wing of *Cladura delicatula* sp. n.

Fig. 28.—Wing of *Limnophila emmelina* sp. n.

Fig. 29.—Wing of *L. (Dactylolabis) hortensia* sp. n.

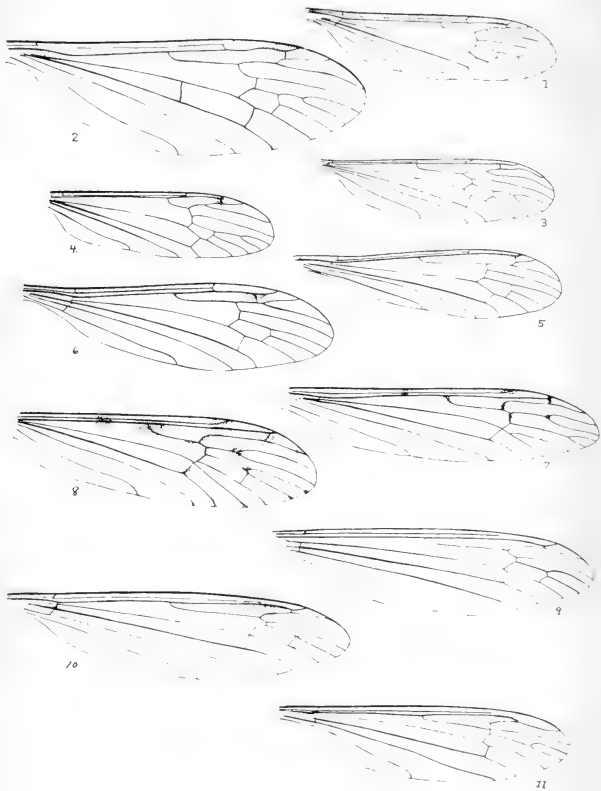
Fig. 30.—Wing of *Rhaphidolabis polymeroides* sp. n.

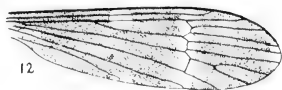
Fig. 31.—Wing of *Dicranota pallida* sp. n.

Fig. 32.—Wing of *Longurio mininus* sp. n.

²⁰ Berlin. Entomol. Zeitschr., vol. 13, p. 3; 1869.

²¹ Proceedings of the Boston Society of Natural History, vol. 34, p. 116, pl. 16, figs. 13-15; 1909.





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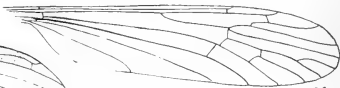
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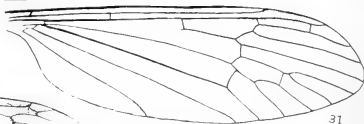
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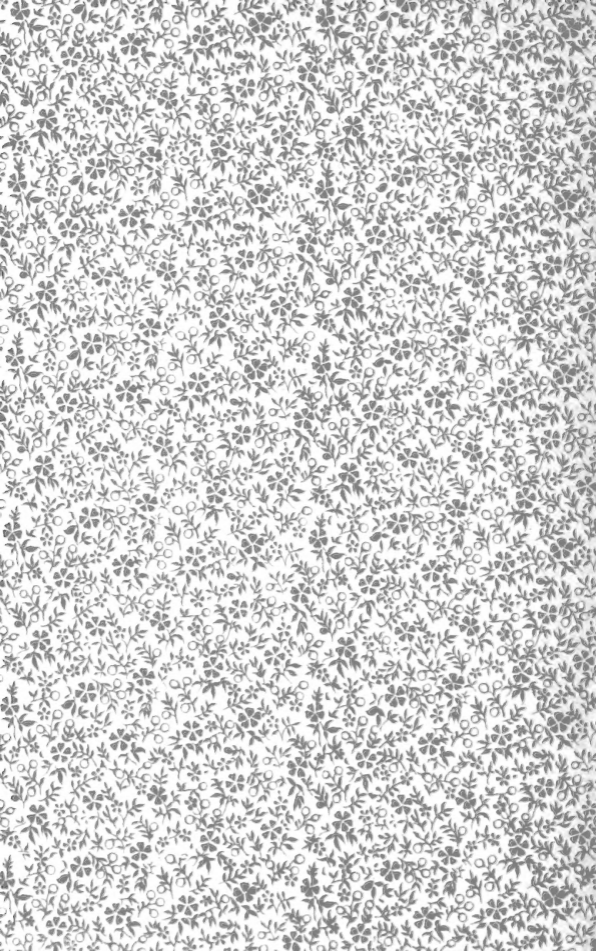


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