

A SYNOPSIS OF PART OF THE NEOTROPICAL CRANE-FLIES OF THE SUBFAMILY LIMNOBINÆ.

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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 Limnophilini are included. A second part will include the tribes Limnobini, Antochini, and Hexatomini, completing the Limnobinæ, and a third will treat of the Tipulinæ.

In this paper the term Neotropical is used as synonymous with the Neogæa (in part), of Sclater (1858) and the Dendrogæa of Sclater (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 *Teucholabis*; Eriopterini numerous; Limnophilini common (*Limnophila*, *Polymera*, and *Epiphragma*), Hexatomini very numerous, almost all being Erioceræ; the Tipulinae are represented by an abundance of *Tipula*, *Pachyrhina*, *Brachyremna*, *Tanyremna*, 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 Taguary, 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 P. 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 *Tanypremna*; 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 *Geranomjia*; 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. *Otenacrosceelis* (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. *Icriomastax* (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. 1-88, fig. 51.

² Osten Sacken, Studies on Tipulidæ, pt. 2, Berlin. Ent. Zeitschr., vol. 31, p. 163.

3. *Stegasmonotus* (p. 11) equals *Tanypremna* Osten Sacken. (*Tipula longipes* Fabricius (p. 13) is certainly a *Tanypremna*.)

4. *Pehlkea* (p. 15), apparently a good genus, based, principally, on the strong supernumerary cross-vein in cell M.

5. *Phacelodocera* (p. 26) equals *Ptilogyne*. The differences between this and the Australian *Ptilogyne* are not sufficient for generic separation.

6. *Tipulodina* (p. 30), not a *Pedicine*, 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. *Pycnocrepis* (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 marmorata* 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 reciprocata 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 *Geranomyia*.

Gonomyia antarctica Walker is a *Limnophila*.

Ptilogyna simplex Walker. Fair condition; genus *Ozodicera*, as stated by O. S.

Tipula filigera Walker. Fair condition; certainly recognizable. I have not studied the Tipulinæ 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:

- Geranomyia 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. bipectinata Williston.
R. costalis Williston.
R. domestica Osten Sacken.
R. subpectinata Williston.
R. tabescens Enderlein.
R. unipectinata 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. elquiensis Philippi.
F. flavida Philippi.
F. infumata Philippi.
F. lineicollis 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.
Zabusa falklandica Enderlein.

Tribe 2.—ANTOCHINI:

- Rhamphidia albitalaris* 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.
Paratropeza collaris Osten Sacken.
P. fasciolaris Wiedemann.
P. præusta 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.) bicintipes, 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. reciproera 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.
Sigmatomera amazonica Westwood.
S. flavipennis Osten Sacken.
Lecteria armillaris 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. eutæniata Bigot.
L. flavicauda Bigot.
L. guttulatissima, new species.
L. lentoides, new species.
L. luteipennis Osten Sacken.
L. nacrea, new species.
L. stigmatica Philippi.
L. tenuipes Say.
L. undulata Bellardi.
L. venosa Philippi.
L. vercunda 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. erythræa 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. melanæra Wiedemann.
E. mesozantha Osten Sacken.
E. nigra Wiedemann.
E. obsoleta Williston.
E. ohausiana Enderlein.
E. pretiosa Osten Sacken.
E. tænioptera Wiedemann.
E. trifasciata Röder.
E. virgulativentris Enderlein.
E. willistoni, new name (for *fasciata* Williston).
E. zonata Osten Sacken.
?E. flaviceps Wiedemann.
?Penthoptera 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. R₈ with two branches reaching the margin. 2.
R₈ 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; tibiæ with spurs at the tip. CYLINDROTOMINI.
R₁ runs straight to the wing margin, not fusing with R₂₊₃; tibiæ 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 proximal of the origin of R₉. PEDICINI.
Sc₂ at the tip of Sc, or retracted backward (*Trichocera*), not proximal of the origin of R₉. 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 tibiæ whereas *L. armillaris* has naked, spurless tibiæ.

KEY TO THE GENERA OF THE ERIOPTERINI.

(Based largely on Needham's Key, 1907.)

1. Wings absent *Chionea* Dallman.
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.
Sc shorter; Sc₁ and R₁ distant at their tips..... *Cladura* Osten Sacken.
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.
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.
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.
Sc long ending near to the fork of Rs; anal angle of the wing prominent. *Sacandaga* Alexander.
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. Second fork of the radial sector on the posterior side, i. e., Rs ends in cell R₂. *Molophilus* Curtis.
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.
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.
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.
Antennal segments of the male not so..... 13.
13. Sides of cell first M₂ parallel; Sc₂ near tip of Sc₁..... *Gnophomyia* Osten Sacken.
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.
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* Kolenati.

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, Zoöl. 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 tibiæ; *Psaronius lituratus* Enderlein (= *Tipula obscura* Fabricius) and *Lecteria oblitterata*, new species, which have spurred tibiæ. 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 (antennæ with the basal segments yellow, flagellum black).....*oblitterata*, new species. (Guiana)
Wings with brown markings.....2.
2. Wings with abundant brown dots in all of the cells. *consersa* 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_8 , 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. 20, Mar., 1912, pp. 36-39, pl. 4.

² Zool. Jahrbuch., 1912, vol. 32, pt. I, Stud. über die Tipuliden, etc., pp. 49, 50 (fig. D¹) (as *Dactylolabis*).

³ Syst. Antl., 1805, p. 27 (as *Tipula*); Wiedemann, Auss. Zweifl. Ins., 1828, vol. I, 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_8 , at origin of the basal deflection of R_{4+5} , and at the tips of R_1 and R_2 ; 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_8 ; 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. Antl., 1805, p. 26 (as *Tipula*); Wiedemann, Auss. Zweifl. Ins., 1823, vol. 1, p. 13 (as *Limnobia*).

LECTERIA CONSPERSA Enderlein.

Dactylotabis 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 (Hemeroptera).

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.

Psaronius 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. Antennæ: 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; antennæ 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: præscutum, with a broad deep pseudosutural fovea on its antero-lateral margin; the caudal margin of the fovea gentle, cephalic margin precipitous, dark brown, conspicuous; præscutum 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 præscutal stripes. Pleuræ 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_1 , 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 Cu_1 slightly anterior to the fork of M. (See fig. 39.)

Habitat.—*Holotype*.—Corumba, Matto Grosso, Brazil, April (H. H. 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 postnotum 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_1 , 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, Zoöl. Jahrbuch, vol. 32, 1912, p. 61.

The genus *Mongoma* was erected by Westwood in 1881 with the African *fragillima* as type. No mention is made, in this paper, of the *Limnobia trentepohlii* Wiedemann which Bigot, in 1854, 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 *australasiæ* is a strict "*Mongoma*" (p. 291) and, a little later, that "The only Oriental species definitely referable to *Paramongoma* is *albitarsis* Doleschall, but *australasiæ* 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 *fragillima* and its allies, and has proposed the new name *Mongomella* for the *albitarsis* 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. 347.

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 Zoöl. 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. *niveitarsis*, 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.
longifuso, 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. Rs 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 long, 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, $2\frac{1}{2}$ lines; wing expanse, $6\frac{1}{2}$ 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.

Gonomyiæ 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 *Gonomyiæ*. I have had for examination all of the American *Gonomyiæ* excepting *G. galactoptera* Bergroth, of Alaska. (Aldrich gives also *G. caudata* Lundberg, but Kerteszi calls this an *Empeda*.)

The American species referable to the subgenus *Gonomyia* Meigen, (type *tenella* Meigen) are *blanda* Osten Sacken; *cognatella* 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, brownish-yellow.....*manca* Osten Sacken² (Eastern U. S.).

¹ Psyche, Feb., 1912, p. 3, fig. 6.

² Monographs, vol. 4, pp. 178, 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 anteapical 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.....*subcinerea* 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.—COQUILLET, Proc. U. S. Nat. Mus., 1900, p. 250.—KERTESZ, Cat. Diptorum, 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 Dipteroꝝ, 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 plumbous, 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, tibæ 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, tibæ 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 (2,000 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, pleuræ 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 R₄₊₅ 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 tibiae with long fringes of hairs.

thaumastopodus, new species (Brazil).

Color light grayish-brown; tibiae without conspicuous fringes of hairs.

guatemalensis, new species (Central America).

MOLOPHILUS THAUMASTOPODUS, new species.

Dull greyish-black; fore and hind tibiae 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.

MOLOPHILUS 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 MIK, *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, Prodrromus Dipt. Italicæ, vol. 1, 1856, p. 180.

Limnæa RONDANI, Prodrromus Dipt. Italicæ, vol. 1, 1856, p. 181.

Ilisia RONDANI, Prodrromus Dipt. Italicæ, vol. 1, 1856, p. 182.

Limnoica RONDANI, Prodrromus 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, Illigers 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 Dip-
 terorum, 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 Rs, at Sc₂, at tip of Sc₁, tip of R₁, and tip of R₂; 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. Mensonotu: 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. H¹.

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.

Furina JÆNNICKE, Abhandl. Senckenb. Ges., vol. 6, 1867, p. 318.—OSTEN SACKEN, Monographs, vol. 4, 1869, p. 172; Studies, etc., pt. 2, 1887, p. 193.

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 infused 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 Tipulidæ, 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.

Limnobia 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.

Limnobia 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. Busck, coll.). Three males, seven females, Aguna, 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_5 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_5 , 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.....*pygmæa* 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*Ulomorpha* 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.....*Lecteria* 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. Zoöl., 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_3 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* Macquert (Brazil).
5. Wings with white or whitish spots.....*superba*, new species (Costa Rica, Brazil).
- Wings with a light, yellow cross-band.....*hirticornis* 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. 58 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_{4+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; $M_3 + Cu_1$ longer than M_3 alone; tarsi not lighter colored than the tibiæ; 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-gray. 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_{4+5} long. M_{1+2} fused to the wing margin. $Cu_1 + M_3$ much longer than M_3 alone. Basal deflection of Cu_1 slightly before, or opposite to, the fork of M . (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_3 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, 1838, p. 65, pl. 8.—

WILLISTON, Trans. Ent. Soc. Lond., 1896, p. 297.—HUNTER, Trans. Amer.

Ent. Soc., vol. 26, 1900, p. 292.—ALEXANDER, Psyche, 1911, p. 200.

Polymera fusca KERTESZ, Cat. Dipt., vol. 2, 1902, p. 242.

Male.—Length, 5.2 mm.; wing, 5.8 mm.; antennæ, 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 R_s ; 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 R_s . R_s 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 (e) 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; antennæ: 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: præscutum 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; pleuræ: prothoracic obscure shining yellow; remainder of the pleuræ black. Halteres, stem and tip of the knob, yellow; remainder of the knob, brown. Legs: coxæ 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; tibiæ and tarsi blackish.

Habitat.—*Holotype*.—Male, Tabernilla, Canal Zone, Panama (Aug. Busck).

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 Dipteriorum, 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_{4+5} 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, Sc₁ ending beyond the fork of R₂₊₃; cross-vein *r* far out toward the tip of R₁, so that R₁ beyond *r* is only about one-fifth the distance on R₁ from Sc₂ to *r*; Rs gently arcuated at its origin, in a direct line with R₄₊₅, consequently no basal deflection to R₄₊₅ is present; R₂₊₃ short, a little longer than the basal deflection of Cu₁; Cu₁ + M₃ shorter than M₃ alone; basal deflection of Cu₁ 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; ovipositor 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 Rs; basal deflection of Cu₁ at the fork of M. Brazilian specimen: R₁ beyond *r* about one-fourth of the distance on R₁ between Sc₂ and *r*; basal deflection of Cu₁ 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, Patulue, 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. vrb, 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 M₃. 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. 14937).

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 fasciæ3.
2. White fasciæ about three; brown fasciæ, as a rule, not connected; tip of tibiæ dark.....*fascipennis* Say² (East. U. S.).
A single white fascia 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 Novara, Dipt., 1868, 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. 68.

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 Messicana, pt. 1, 1859, pp. 206, 207, pl. 1, fig. 4 (as *Tipula*).

mm.; hind leg, femur, 7.2 mm.; tibia, 8.5 mm.; head: rostrum and palpi dark brown; antennæ: two basal segments dark brownish-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. Antl., 1805, p. 30 (not *T. maculata* Linnæus nor *T. maculata* Meigen) (1804).

Limnobia maculata WIEDEMANN, Dipt. Exot., vol. 1, 1821, p. 16; Auss. Zweifl. Ins., vol. 1, 1828, p. 29.—HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 289.—KERTESZ, Catalogus Dipteroium, 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 *R*s 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_5 , 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 , 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_5 ; a large one about the stigma, extending down into cells first R_1 , R_2 , 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.

EPIPHRAGMA 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: præscutum 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. Pleuræ light silky yellow, with an interrupted dark brown band extending from near the caudal margin of the pronotum back across

the epipleuræ to the base of the abdomen. Halteres long, slender, stem yellow, knob brown with the extreme margin paler. Legs: coxæ and trochanters dull yellow; middle coxa with a broad triangular black mark on its caudal aspect; posterior coxæ dark brownish. Hind leg only remains; femora brown except the base, a post-medial and a sub-apical band, yellow; tibiæ 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. Busck, coll.).

Type.—In U. S. National Museum collection (No. 14938).

EPIPHRAGMA ADSPERSA Wiedemann.

Limnobia adpersa WIEDEMANN, Auss. Zweifl. Inskt., vol. 1, 1828, p. 550—HUNTER, Trans. Amer. Ent. Soc., vol. 26, 1900, p. 288.—KERTESZ, Cat. Dipt., vol. 2, 1902, p. 169.

Length, male, 8.25 mm.; wing, 10.2 mm.

Head: rostrum and palpi brown; antennæ: 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 præscutum 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. Pleuræ 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; coxæ 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: coxæ 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. Zoöl-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. *pictipennis*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. Zoöl-Bot. Ges. Wien, vol. 15, 1865, p. 602.

² Monographs, vol. 4, p. 334.

³ Verh. Zoöl-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, Prodrömus Dipt. Italicæ, vol. 4, 1861, p. 11.

Pilaria SENTENIS, 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.

Rhincoptila NOWICKY, Verh. Zoöl.-bot. Ges. Wien, vol. 17, 1867, p. 337.

Eutonia v. d. WULP, 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 palé 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 lutea 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: R_s 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.

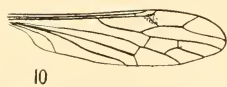
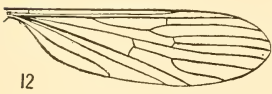
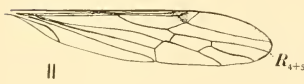
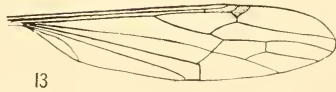
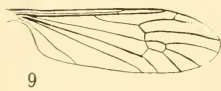
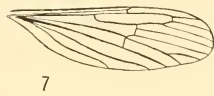
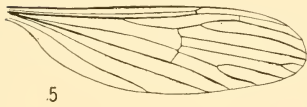
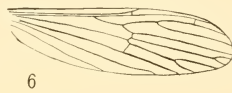
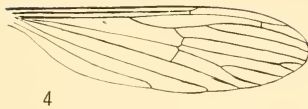
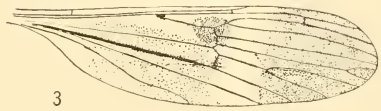
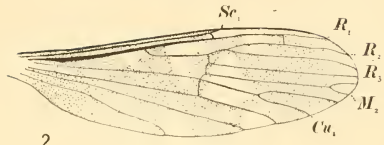
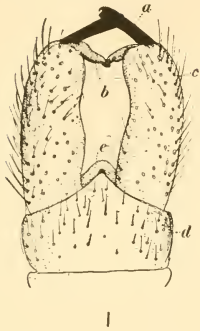
- Fig. 14. Wing of *Gonomyia puer*.
 15. Wing of *Gonomyia unicolor*.
 16. Wing of *Polymera niveitarsis*.
 17. Wing of *Polymera pleuralis*.
 18. Wing of *Polymera obscura*.
 19. Wing of *Limnophila nacrea*.
 20. Wing of *Erioptera immaculata*.
 21. Wing of *Limnophila lentoides*.
 22. Wing of *Mongoma 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*.

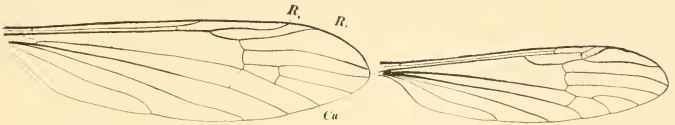
PLATE 68.

- Fig. 33. Wing of *Epiphragma fabricii*.
34. Wing of *Epiphragma adpersa*.
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-grossæ*.
40. Wing of *Limnophila epiphragmoides*.
41. Wing of *Lecteria obliterated*.
42. Wing of *Lecteria armillaris*.



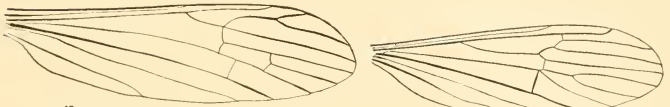
VENATION OF NEOTROPICAL CRANE FLIES.

FOR EXPLANATION OF PLATE SEE PAGE 548.



14

19



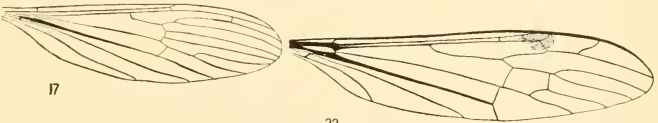
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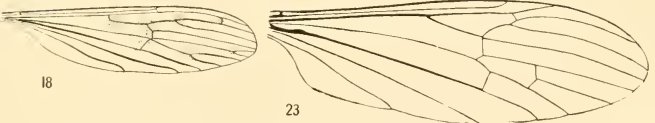
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VENATION OF NEOTROPICAL CRANE FLIES.

FOR EXPLANATION OF PLATE SEE PAGE 548.



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VENATION OF NEOTROPICAL CRANE FLIES.

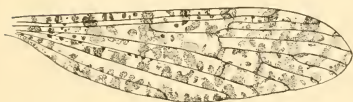
FOR EXPLANATION OF PLATE SEE PAGE 549.



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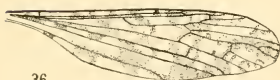
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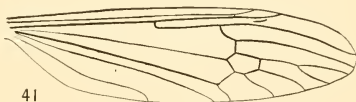
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VENATION OF NEOTROPICAL CRANE FLIES.

FOR EXPLANATION OF PLATE SEE PAGE 549.

