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DESCRIPTIONS OF NEW NEUROPTEROID INSECTS.

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WITH FOUR PLATES.

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THE continued study of the Hagen collection, together with recent accessions, particularly from Mr. C. F. Baker from the Philippines and from Mr. H. O. Parish from South America, has resulted in the recognition of various new species. This article contains the descriptions of many of these forms.

EMBIIDAE.

OLIGOTOMA CALIFORNICA (Banks).

This was described from an immature male in the genus *Embia*, mature examples show it to belong to *Oligotoma*. Recently Mr. S. B. Reeborn and others have collected numerous specimens of female *embias* from California; these are much spotted as is the case with males of certain old-world species. These forms (Plate 1, fig. 11) are doubtless the previously unknown females of *O. californica*.

OLIGOTOMA INAEQUALIS, sp. nov.

TYPE.—M. C. Z. 14,878. St. Croix. (C. E. Wilson).

Brown, head in front of eyes more yellowish, femora and tibiae, except at joints, nearly black. Head hardly narrowed behind, as long behind eyes as width of head at antennae; pronotum plainly longer than broad, barely wider behind. Wings grey-brown, with five pale lines, one, broken, between radius and radial sector, several cross-veins between radius and radial sector, the first at fork of radial sector, none behind. The genitalia are similar to *O. sularis*, but the second joint of the left cercus is much longer than this joint of the right cercus.

Length of body 7.5 mm.; fore wing 6 mm.

Larger and darker than *O. cubana*, and with an extra pale line in wing.

OLIGOTOMA VENOSA, sp. nov.

TYPE.—M. C. Z. 14,879. Cuba: Santa Clara. (C. F. Baker).

Black, head back of eyes rather yellowish, wings brown, with four white spots. Head back of eyes about as long as width of head at antennae, but

plainly narrowed behind; pronotum plainly broader behind; the appendages broken. The wings are peculiar in having more cross-veins than in other species, besides several in radial area, there are one or two connecting radial sector to its fork, and in the fore wing one from lower branch of radial sector back to the median vein.

Length of fore wing 4 mm.

Differs from others of the West Indies in much darker color, as well as in venation and small size.

PSOCIDAE.

THRYSOPSOCUS STIGMATICUS, sp. nov.

TYPE.—M. C. Z. 14,877. Peru: Yurimaguas, April. (H. O. Parish).

Head reddish, antennae pale on base of first long joint, black beyond, first long joint distinctly densely black-haired, except toward base; prothorax and pleura reddish, anterior lobe of mesonotum black, rest pale; the abdomen brown; legs pale, femora more or less rufous. Wings hyaline, veins mostly black or dark, radius, lower side of cell and outer side of second cell and adjoining parts of veins pale; stigma brownish red, except a yellow spot at tip three small black spots before the middle; one in base of first cell, one above it and a curved one before cubitus; base of radial sector black, outer cell pale brown, which color extends outward in two parts, one obliquely below, and the other outward occupying two cells; hind wings hyaline, with dark veins. Wings with venation as in *T. bellus* but second cell is acute at base above and the stigma is very much produced behind, being nearly twice as wide (in proportion) as in that species.

Length of fore wing, 6.5 mm.

EIPSOCUS ANTILLANUS, sp. nov.

TYPE.—M. C. Z. 14,865. Jamaica.

Head red-brown; antennae and legs pale yellowish, hind tibia with dark band before tip; thorax yellowish above, more brown on sides; abdomen brown. Wings hyaline, with faint brown marks as follows:—an irregular band across wing from end of stigma, a narrow marginal band along outer edge, and a large spot just before fork of median and cubitus, ends of vein marked with small dark brown spots; venation largely pale. Stigma moderately deep, broadly rounded behind; radial sector forks just below end of stigma; median vein forks first near the same place, and each branch forks again half way to margin; areola postica about as long and as broad as the stigma. Hind wings with pale venation. Male with very large, prominent eyes, less than half their diameter apart in front.

Expanse 5.5 mm.

In Enderlein's table it would run out to *Xenopsocus*, on account of four branches to median, but these are differently arranged than in Kolbe's genus, which differs in various other venational points.

PSEUDOCAECILIUS WOLCOTTI, sp. nov.

TYPE.—M. C. Z. 14,866. Porto Rico. (G. R. Wolcott).

Body and legs whitish; a brown mark in front of each eye reaching to base of antennae, a median dark spot behind mesoscutellum, a few faint marks on mesonotum. Head with short fine hair on face, but on vertex with scattered erect hairs. Wings hyaline, venation mostly pale; a black dot on base of stigma, a brown spot in apical part (but not reaching apex) of stigma, and another across the middle of areola postica, extending above to the cubitus. The radial sector and median vein before they touch are plainly brown, and the apical branches of these veins are also brown; there is a faint dark mark before end of anal. Stigma very long and slender, the areola postica more than twice as long as broad, but hardly one half as long as the stigma. Hind wings hyaline, venation pale.

Expanse 6.5 mm.

PERIPSOCUS MINUTUS, sp. nov.

TYPE.—M. C. Z. 14,912. Porto Rico, San German, 18 April, on *Acacia farnesiana*. (G. R. Wolcott).

Nasus brown, vertex pale, sometimes with dark median spot, antennae brown; thorax brown, traces of pale median line and pale over base of fore wings, scutellum with a median branched spot; abdomen pale brownish, darker in middle; legs pale. Wings faintly brownish, more distinct toward tip, with paler areas in some of the cells, mostly behind stigma, but not forming bands. Venation very similar to that of *P. madidus*, the last forking of median and of radial sector are opposite each other, the first branch of median is more at right angle than in *madidus*. The stigma is rather broader and more truncate at tip than in *madidus*. It is hardly more than one half the size of that species.

Expanse 3.3 mm.

EPHEMERIDAE.

HAGENULUS EATONI, sp. nov.

TYPE.—M. C. Z. 14,867. Haiti, Diquini. (W. M. Mann).

In general the female is similar to *H. caligatus*, marked in the same general way, the legs and setae banded, the abdomen with black bands at ends of the segments, and many cross-veins in the wings are margined with brown. How-

ever, there are no margined cross-veins in the anal area of the wing, and those behind the radius are much larger, forming six or eight rounded or even elongate black spots. Besides the apical black band, each abdominal segment has an oblique mark on each side, and a trace of a median basal spot; a median and lateral black lines on the venter. The hind wings are almost equilaterally triangular, the costal edge being much longer than in *caligatus* and the lower lobe much shorter.

Expanse 18 mm.

The specimens that Eaton refers to at the end of his description of *caligatus* as four females with unmarked wings, are males, and probably the males of *caligatus*. All the specimens (mature) with spotted wings are females.

RHITHOGENA HESPERA, sp. nov.

TYPE.—M. C. Z. 14,917. Wash.: Pacoima. 31 March. (C. V. Piper).

♀ In the hind tarsi the first joint is a little longer than the second, and the second a little longer than the third; in the front tarsi the first joint is rather shorter than the second, which is barely longer than the third. Pale yellowish, scutelli rather darker; pleura unmarked except black spot in front of mid-coxae, and mark at base of mid and hind coxae; legs pale yellow, each femur with black spot at middle and a dark tip; abdomen pale, an oblique dark mark on lateral posterior side of each segment (except the last two); venter unmarked, last two segments fumose; ventral plate with a median notch. Wings hyaline, venation yellowish, the cross-veins more brownish; in costal area near base is a prominent black comma-shaped mark.

Length, body 10 mm., fore wing 12 mm., femur I 2.5 mm.

Readily recognized by black mark near base of wings.

EPEORUS MORRISONI, sp. nov.

TYPE.—M. C. Z. 14,918. Nev.: Reno. (H. K. Morrison).

♂ Joints of hind tarsi short, but little longer than broad, first joint a little longer than the second, the second scarcely longer than the third. In front tarsi the first joint is equal to the second, and the second plainly longer than the third.

Dark brown; pleura mostly dark, with several yellow spots; abdomen dull brown above, darker near tip, most of segments with a dark brown apical margin, lateral margins pale yellowish; venter dull yellowish, unmarked; front legs brown, rather darker at tips of the tibia, hind legs paler, the femora streaked with brown above; setae dull yellowish or brownish, the joinings hardly darker. Wings hyaline, venation fine, brown, pterostigmatic region

fumose, the veinlets there mostly forked or crossed. Forceps dark brown. Last ventral rather broadly emarginate in middle; the second joint of forceps is swollen on inner side.

Length, body 9 mm., wing 10.5 mm., femur I 2 mm.

EPEORUS UNDULATUS, sp. nov.

TYPE.—M. C. Z. 14,919. N. Mex.: Jemez Springs, 25 May. (John Woodgate).

♂ First joint of hind tarsi barely longer than the second, and second scarcely longer than the third; in front tarsi first joint as long as the second, and second plainly longer than the third.

Dark brown; pleura with some yellow spots, and dorsum of abdomen dark brown, venter very pale, the sides of dorsal segments very narrowly pale; forceps dark brown; setae paler brown; front legs brownish, darker at tips of tibia, hind legs pale, with dark streaks on femora. Wings hyaline, venation brown, pterostigmatic region rather fumose, veins here mostly simple. Last ventral segment shows an undulate margin.

Length, body 7.5 mm., wing 9 mm., femur I, 2 mm.

Similar to *E. morrisoni*, the tarsi being the same; the abdomen darker above, paler beneath, the last ventral segment shorter and the emargination more shallow and broader.

BAETIS LASALLEI, sp. nov.

TYPE.—M. C. Z. 14,914. Wisc: Milwaukee, 13 June.

Thorax brown, edge of mesonotum more yellow, abdomen pale whitish, with black dot on each side of each segment, last three segments above brown; setae pale, joinings not marked; legs pale. Wings hyaline, veins also, venation as usual, marginal intercalaries in pairs, and moderately long; hind wing rather large, reaching to middle of third abdominal segment, broad in the middle, narrowed toward each end, tip rounded, two longitudinal veins to tip, marginal vein behind, and two long intercalaries, the costal point strong and colored.

Fore wing 5 mm. long.

Distinct by broad hind wing; nearest to *B. phoebus* McDunnough, but broader hind wings, less pointed at tip.

BAETIS PARALLELA, sp. nov.

TYPE.—M. C. Z. 14,881. Nev.: Reno. (H. K. Morrison).

Pale brown, edge of mesonotum hardly more yellow, rest of mesonotum dark, shining brown, abdomen brownish, above darker brown on last three segments,

pale beneath, sternum partly brown; front legs pale brownish, others pale; setae pale, joinings dark. Wings hyaline, venation pale, marginal intercalaries in pairs, moderately long, venation as usual. Hind wings reaching just beyond the second abdominal segment, elongate, sides nearly parallel, costal point sharp, no cross-veins noticeable.

In the female the body, including the abdomen, above and below, deep shining brown, the legs brownish, and the cross-veins plainly brown.

Fore wing 8 mm. long.

CLOEON CAROLINA, sp. nov.

TYPE.—M. C. Z. 14,880. N. C.: Black Mts., May. (N. Banks).

Thorax, femora, and entire dorsum of the abdomen clear, polished, brown; venter of abdomen pale yellowish; setae pale whitish, joinings very slightly marked with brown. Wings hyaline, veins also hyaline, venation as usual, marginal intercalaries in pairs and moderately short.

Fore wing, 4 mm. long.

Related to *C. dubium* by the paired intercalaries, but separated by the entire dorsum of abdomen being brown.

PERLIDAE.

PELTOPERLA MINDANENSIS, sp. nov.

TYPE.—M. C. Z. 14,806. Philippines: Mindanao, Surigao, and Kalambugan. (C. F. Baker).

Head and pronotum dark brown; thorax and abdomen yellowish, antennae, palpi, legs, and setae blackish, the bases of all pale. Wings blackish, venation black. Head short and broad; eyes of moderate size, finely hairy; ocelli small, remote, as near to eyes as to each other; lateral bosses small, situate near antennal carina, pronotum very much longer and broader than head, much broader than long, scarcely narrowed behind, straight across in front, sides rounded; setae no longer than width of abdomen; ventral plate very large and swollen, nearly reaching to tip of abdomen. Fore wings with four or five cross-veins beyond end of the subcosta; radial sector twice forked, seven to eight cross-veins in both median and cubital areas, no branches of cubitus to hind margin. In hind wing radial cell almost reaching base of wing; in fore wing discal long and slender.

Expanse 20 to 25 mm.

NEOPERLA BAKERI, sp. nov.

TYPE.—M. C. Z. 14,811. Philippines: Mindanao, Surigao, Mt. Maquiling, Los Baños. (C. F. Baker).

Head and pronotum pale brownish yellow; thorax, abdomen, legs, and setae pale yellowish, tibia and apical part of setae darker; antennae and palpi pale brown. Wings hyaline, venation mostly yellowish, the costal veins paler yellow. Head fairly broad, eyes of moderate size, ocelli fairly large, nearly two diameters apart, in male not twice as far from the eyes, in female fully twice as far from eyes. Lateral bosses small, rounded, far in front of ocelli, as far from ocelli as ocelli from each other, but close to the eyes. Pronotum much broader than long, but little narrowed behind, front margin slightly convex. Ventral plate straight across at tip. Fore wings with discal cell long, ending a little before median bends to radius; radial sector with one branch; five to seven median, and four cubital cross-veins. In the hind wings the radial cell is much shorter than its pedicel, and the median vein is strongly bent upward.

Expanse 21 to 24 mm.

Differs from *N. clarissa* in more widely separated ocelli and darker head and pronotum, and in the male genitalia.

NEOPERLA CONSIMILIS, sp. nov.

TYPE.—M. C. Z. 14,809. Philippines: Mindanao, Iligan, Surigao, Kalambugan. (C. F. Baker).

Closely related to *N. bakeri*, in color of head, thorax, etc., except that the tibia is scarcely if any infusate. On the head the ocelli are less than twice, hardly more than one diameter, apart, the lateral bosses are far forward as in *bakeri*, so that they are about three times as far from ocelli as ocelli from each other, the ocelli are about four times as far from eyes as from each other. Pronotum similar to that of *bakeri*, and the ventral plate straight across at tip. Venation much as in *bakeri*, yellowish, the costal veins paler, the radial sector with one branch.

Expanse 20 to 23 mm.

NEOPERLA HERMOSA, sp. nov.

TYPE.—M. C. Z. 14,810. Philippines: Mindanao, Surigao, Davao, Zamboanga. (C. F. Baker).

Pale yellowish; head and pronotum rather brownish, with indication of black spot in front of the ocelli; antennae brown, basal joints paler; palpi pale. Fore wings faintly infuscated, the veins slightly brown, but in the middle area beyond the anastomosis is a fairly large pale yellow spot, where the veins are also yellowish (resembling *N. fenestralis* of South America). Hind wings paler, with pale venation, setae pale yellow. Head fairly broad, the ocelli of moderate size, about two diameters apart, and plainly further from eyes; lateral bosses large, elongate, but little in front of ocelli, and plainly nearer to eyes than to ocelli. Pronotum plainly broader than long, front margin nearly

straight across, sides broadly rounded. Ventral plate straight across. Discal cell with base much beyond bend of median to radius; radial sector with two branches, first at anastomosis; five to seven median cross-veins, three to six cubital ones. In the hind wing the radial cell about equal to its pedicel, the median vein not strongly bent.

Expanse 22 to 26 mm.

NEOPERLA OCVLATA, sp. nov.

TYPE.—M. C. Z. 14,808. Philippines: Mindanao, Surigao. (C. F. Baker).

Head and pronotum brownish; thorax, abdomen, legs, and setae yellowish; antennae and palpi pale brownish; wings hyaline, costal veins yellowish, others brown; hind wing pale. Head much narrowed in front, eyes of male very large, ocelli large, but little more than diameter apart, hardly two diameters from the eye; lateral bosses large, transverse, not far in front of ocelli, closer to eyes than to ocelli; pronotum much broader than long, anterior margin convex, not much narrowed and broadly rounded behind. Discal cell of fore wings long and slender, it ends some distance in front of the bend of the median; cross-vein from radial sector to radius rather oblique; radial sector twice forked beyond anastomosis; five or six median cross-veins, four cubital cross-veins. In hind wings the radial cell is about as long as the pedicel, the median vein rather strongly curved.

Expanse 22 mm.

NEOPERLA (JAVANITA) ATROPENNIS, sp. nov.

TYPE.—M. C. Z. 14,807. Philippines: Mindanao, Surigao, Tangalan, Bukidnon. (C. F. Baker).

Head brown, more or less pale on sides, and on the bosses; antennae black; palpi brown; pronotum dark brown, thorax yellowish brown; abdomen yellowish; legs black, base of femora pale; setae dark brown. Wings black, faintly paler in the middle of cells. The head similar to *N. violacea*, but the lateral bosses are rather further forward, and as near to eyes as to ocelli; ocelli small, about two and a half diameters apart, about three times as far from the eyes. Pronotum plainly broader than long, much narrowed behind; front margin convex; eighth, ninth, and tenth ventral segments of female all straight across. Discal cell of fore wings long, its base almost back to where median bends to the radius; radial sector once or twice forked; seven to nine median cross-veins, six to eight cubital ones. In hind wing the radial cell is as long as its pedicel, and the median vein curves upward but little. In the male the last ventral segment is pointed in the middle.

Expanse 24 to 26 mm.

RAPHIDIDAE.

RAPHIDIA CROTCHI, sp. nov.

TYPE.—M. C. Z. 14,861. California. (G. R. Crotch).

By the dark basal joint of antennae, shape of head, by genital plates, and the superior appendages it is related to *R. oblita*; it differs in that each genital plate has a large lobe on the upper outer edge, directed toward each other; the superior appendages are yellow on outer edges. In this specimen the stigma, which is yellowish, is long and begins close to the base of the first discoidal cell, a condition not found in other American species, but possibly this point is not constant. The head is rather suddenly constricted behind; pronotum not bicolored; the abdomen has the apical margins of the segments narrowly pale; the wings have four discoidal cells, the second in one wing crossed, the third apical vein in all wings is simple.

Expanse 18 mm.

HEMEROBIIDAE.

HEMEROBIUS ALGONQUINUS, sp. nov.

TYPE.—M. C. Z. 14,862. N. Y.: Lake Placid, August. (E. P. Van Duzee). N. H.: Hampton, May. (L. A. Shaw).

Pale yellowish, cheeks dark, a dark stripe each side on pronotum. Wings pale, almost unmarked, a few scattered brown dots on the veins, and the gradates and some other cross-veins faintly brown. Three radial sectors, cross-vein from radius to median remote from radial sector, six inner, seven outer gradates, last of inner series a little before the next to last; wings moderately slender, costal area fairly broad at base. Male genitalia on the style of *H. castanae*, but the branches are less remote and less divaricate, and the upper not as long. Related by venation to *stigmaterus*, but the appearance is that of a small and pale *castanae*.

Length 7 mm.

HEMEROBIUS HESPERUS, sp. nov.

TYPE.—M. C. Z. 14,863. Two ♀♀. Calif.: Tahoe, Angora Park, 10 July. (E. O. Essig, E. P. Van Duzee Coll.).

Face brown, with four indistinct pale spots in front, vertex brownish, pronotum with a broad dark stripe each side, leaving a pale median stripe and the lower lateral edges pale, rest of thorax pale, with lateral brown spots; abdomen dark, legs pale, unmarked. Wings with pale venation with brown interruptions, the brown extended on the membrane so as to form about ten

more or less complete, narrow, transverse bands, those over the gradates scarcely more distinct than elsewhere, and sometimes beginnings of other bands, the gradates brown; six in inner series, seven in outer, last of inner series just before the next to last; three radial sectors at about equal distances apart; cross-vein between median and radius much more than its length before the radial sector; cross-vein from cubitus to anal about twice as long as that from cubitus to median; costal area not especially broad at base. In the hind wings the venation is pale, with cross-veins brown; both wings rather long and narrow.

Length 8 mm.

LOMAMYIA HUBBARDI, sp. nov.

TYPE.—M. C. Z. 14,864. Fla.: Cedar Keys; 4, 3; 75. (Hubbard and Schwarz).

Resembles *L. flavicornis*; the pronotum possibly a little longer and more narrowed in front. Wings strongly falcate, the outer point long and quite sharp, and the outer edge evenly concave (not irregularly as in *flavicornis*). The costal area at broadest part near the base is not twice as wide as before the stigma (in *flavicornis* about twice as wide). Head and antennae pale yellowish; thorax and legs less dotted than in *flavicornis*. Abdomen pale, with reddish brown marks on each segment, but the last dorsal segment is pale. Wings less marked than in *flavicornis*, the veins are faintly dotted with brown; no prominent dark marks in the costal area; the stigma is rufous and this color is continued to the tip and narrowly along the outer edge, no pale spot beyond the stigma.

Expanse 20 mm.

OSMYLIDAE.

SPILOSMYLUS FORMOSUS, sp. nov.

TYPE.—M. C. Z. 14,818. Philippines: Mindanao, Surigao. (C. F. Baker).

Pale yellowish, thorax and base of abdomen rather darker. Wings marked with brownish; a faint yellow-brown incomplete transverse band above the bulla, beyond and behind the radial sector is a row of cells very clear, then a distinct yellow-brown stripe to apex, sharply marked above, behind fading off; the hind margin rather brownish; between radius and the subcosta yellowish, with two large dark spots, one above the bulla, the other before stigma, each marking the veins adjoining, therefore but two dark lines on each radius and subcosta. In the costal area beyond the stigma are three oblique brown streaks, the last connecting to apex. The bulla is large and contains curved brown veins as in the figure, very different from *S. modestus*, *inquinatus*, etc. Venation pale yellowish. In the hind wings two faint dark lines on subcosta

and radius; venation pale. Pronotum slender, much longer than in *inquinatus*. Venation near base of radial sector as in *inquinatus* (section *Ostreomylus*); other venation closely similar to *inquinatus*.

Expanse 36 mm.

In venation related to *S. inquinatus*, but the markings and bulla are very different.

CHRYSOPIDAE.

NADIVA, GOLIVA, AND RAMETA.

These three genera of Navas are based on closely related and probably identical species, agreeing with *Nothochrysa panchlora* Gerstaecker. Typically *panchlora* has wholly green venation, and a red margined pronotum, and in the fore wing the branches from cubitus to margin are mostly simple, but specimens occur in which about half are forked, and others with the gradates more or less darkened, and the red margin of pronotum faint or absent. In a specimen from Pernambuco the third cubital cell on one side is as in *Chrysopa*, and in one Bolivian specimen both wings are also as in *Chrysopa*. The Bolivian specimens have most of the branches of the cubitus to margin forked. I doubt, however, if there is more than one species. It is not a typical *Nothochrysa*, and *Nadiva*, as the oldest name, may be used for the genus. The oblique base of the third cubital cell, and the fact that in the hind wing the first cross-vein from first anal is beyond that connecting to cubitus distinguish the genus; it is more primitive than *Nothochrysa*.

CHRYSOPA SIERRA, sp. nov.

TYPE.—M. C. Z. 14,858. Calif.: San Gabriel Mts., Sister Elsie Peak. 10 June. (F. Grinnell).

Pale yellowish, cheeks with a shining black stripe; all joints of palpi marked with black; pronotum with a brown spot, outwardly margined with reddish on each side; two large brown spots on front of mesothorax; fore wings with two dark brown dots at extreme base in front, and one on tip of basal branch of anal behind; costals and gradates dark, other cross-veins dark at ends, in hind wings less marked; stigma long, obscure. Pronotum about as wide as long, narrowed in front; wings moderately slender, almost acute at tips, costal area at widest not equal to radial area, five to seven gradates, third cubital as long as the second, the divisory vein ends plainly beyond the cross-vein; inner gradates nearer to outer than to radial sector.

Expanse 30 mm.

CHRYSOPA SEMINOLE, sp. nov.

TYPE.—M. C. Z. 14,859. Fla.: Marco.

Green, head unmarked, last joint of palpi black, pronotum with a broad red stripe each side, not, however, reaching to the lateral margin. Venation green, gradates and cross-veins almost entirely black, branches of radial sector black at bases, and the marginal forks dark; in hind wings the costals, gradates and radial cross-veins dark at ends. Pronotum about as broad as long, rounded in front, sides nearly parallel; wings rather narrow, acute at tips, inner gradates of three or four veinlets, outer series of six or seven, the inner row much nearer to outer than to the radial sector.

Expanse 22 mm.

CHRYSOPA SLOSSONAE, sp. nov.

TYPE.—M. C. Z. 14,860. N. C.: Hendersonville. (F. Sherman). N. H.: Franconia (Mrs. A. T. Slosson). Va.: Great Falls.

Pale yellowish (greenish olive), a broad reddish or brownish stripe on each cheek reaching to the eye; last joint of palpi reddish; pronotum as broad as long, rounded in front, sides parallel. Wings broad, hind pair narrower, scarcely pointed at tip, costal area at widest is as wide as radial area; about ten gradates in each series, the outer row about as close to outer margin as to the inner row. Venation green, many cross-veins black at ends, the gradates and several basal cross-veins black.

Expanse 32 mm.

A rather large, broad-winged species near to the western *C. majuscula*, but lacks spots on clypeus. This is the species which in my Revision of the Chrysopidae I identified with *emuncta* Fitch, but an examination of the Fitch type shows that *emuncta* is a female of *Meleoma slossonae*.

CHRYSOPA PETERSENI, sp. nov.

TYPE.—M. C. Z. 14,812. Solomons: Florida: Tulagi. (W. M. Mann).

A large heavy species related to *C. ruficeps*. Antennae dark, except pale basal joint, no marks on head which is reddish; pronotum with fine dark marks on sides and behind; faint, large dark marks on meso- and metanotum near base of wings; legs unmarked. Wings hyaline, venation pale yellowish, but cross-veins and gradates largely brown; costals brown except near costal vein; radial cross-veins wholly, divisory, branches of anal, and some other cross-veins partly brown; marginal forkings brown. Wings large and broad; venation rather dense, radial sector with seventeen branches (some only cross-

veins) eight inner, and eleven outer gradates, in subparallel series; the inner as near to radial sector as to outer row. Hind wings with gradates and some other veinlets dark. Divisory veinlet ends much beyond the cross-vein.

Expanse 32 mm.

Distinct from *C. ruficeps* and allies in more numerous gradates and darker venation.

CHRYSOPA BAKERI, sp. nov.

TYPE.—M. C. Z. 14,814. Borneo: Sandakan. Basilan. (C. F. Baker).

Pale yellowish. Brown mark under each eye; two red spots on vertex; antennae pale, first joint with red stripe on outer side; side margins of pronotum reddish; brown spot above bases of wings; abdomen with broad reddish dorsal stripe; tibia with a median brown spot, less distinct on the hind pair. Wings much marked, the outer margin being almost wholly infuscated; venation pale; gradates, some cross-veins wholly, others at ends dark, and veinlets in the dark tip are dark; stigma yellowish, brown at each end, two prominent brown spots, one on origin of radial sector, other on radial sector behind the base of stigma; fainter marks at end of anal vein, and two or three along hind border; in hind wings the stigma also yellowish, and brown at each end, and faint brown spots in apex over the brown apical veinlets, otherwise venation pale. Basal joint of antennae rather long and not swollen; pronotum much broader than long. Wings rather slender, acute; costal area moderately broad near base; gradates 4-4; third cubital cell elongate, the divisory veinlet ending much beyond the cross-vein.

Expanse 22 mm.

In one specimen the basal joint of antenna is only weakly marked with red, and no spots on the vertex.

CHRYSOPA VALDEZI, sp. nov.

TYPE.—M. C. Z. 14,815. Borneo: Sandakan. (C. F. Baker).

Pale yellowish. Dark spot below each eye, and one between antennae, red spot above on basal antennal joint; two reddish spots on vertex; palpi mostly dark; pronotum with long dark spot each side; dark spots at base of each wing, and in front and below each fore wing, also two spots on front of mesonotum. Wings with pale venation, only partly marked with dark, the gradates and some marginal veins wholly dark; stigma yellowish, a brown spot at base. Venation of hind wings mostly pale, gradates dark. Wings rather narrow, acute at tips; divisory ends just beyond cross-vein; gradates 5-5, each well separated from next, but in subparallel series; hind wings with two inner and four outer gradates.

Expanse 26 mm.

CHRYSOPA RIZALI, sp. nov.

TYPE.—M. C. Z. 14,813. Philippines: Mindanao, Dapitan. (C. F. Baker).

Pale yellowish. Black spot under each eye, palpi largely black, black spot between bases of antennae, dark spot each side on pronotum, one over base of wing and one under and in front of fore wing. Venation pale; costals, gradates, and cubital cross-veins wholly dark; most of the radial cross-veins, the branches of radial sector, the divisory, many branches of cubitus and anal veins, and the marginal forkings more or less dark; the forkings in some cases bordered with faint brown clouds. Stigma yellow, a large dark spot at base, and one on radial sector behind stigma also dark, and a dark spot at end of anal vein. In hind wings the gradates, costals, marginal veinlets and a few others dark; a large dark spot at base of the yellowish stigma. Basal joint of antennae swollen; pronotum very broad; wings rather narrow, acute at tips; five and six gradates, widely separated from each other, so that in some cases one of inner row is nearer next of outer row than to next of inner row; the divisory ends slightly beyond end of the cross-vein. In the hind wing two inner gradates, and five outer ones.

Expanse 26 mm.

ANKYLOPTERYX PERPALLIDA, sp. nov.

TYPE.—M. C. Z. 14,816. Philippines: Imugin, Nueva Vizcaya. (C. F. Baker).

Pale yellowish green throughout, no marks on body or wings. In fore wings the costal area is of moderate width, the radial sector strongly sinuate, eight inner and ten outer gradates in fairly even series, fore wings hardly acute at tips; hind wings plainly acute.

Expanse 26 mm.

Related to *A. polygramma*, but differs in the pale gradates, and in the more sinuate radial sector.

ANKYLOPTERYX OBLIQUA, sp. nov.

TYPE.—M. C. Z. 14,817. Philippines: Mindanao, Iligan. (C. F. Baker).

Pale yellowish or greenish, body without spots; basal joint of antennae with narrow dark line on outer side. Wings with yellowish veins, some costals at subcosta with dark dot; two radial cross-veins near middle of wing just as the radial sector bends upward are oblique and strongly marked with dark brown, and several veins behind them are marked with brown, and margined with

yellowish brown; nearly all of the apical veins are faintly margined with yellowish brown, and there is a large yellow-brown spot on the costal area before middle, and behind it are various veins broadly margined with yellowish brown; some basal cross-veins near middle and in costal area also yellow margined. In hind wings several longitudinal veins are marked with brown. In fore wings the costal area is very broad, and the radial sector strongly curved, five outer gradates, inner very irregular.

Expanse 25 mm.

Differs from *A. nervosa* in pale basal costal vein, and in the yellow-brown spots and veins.

LOYOLA TRIPUNCTATA, sp. nov.

TYPE.—M. C. Z. 14,829. Brazil: Tefe, 12 January. (H. O. Parish).

The entire insect is whitish, and finely white-haired. The head is with red in front of the antennae, and the pronotum is margined with red on the sides. There is an extremely small dark stigmal dot in each wing. The basal and discal bullae are in the same position as those of *L. beata*, and that of the hind wing is also as in *beata*; but in the fore wing beyond the discal bulla (about two cells length beyond) there is a smaller bulla, round in outline, and with four dark-tipped veins; the discal bulla has six dark-tipped veins, and the basal one nine, the latter is longer than in *beata* and curved. The costal area of the wing is broader than in *beata*, about as in *marionella*; the hind wing is also broader than in *L. beata*.

Expanse 48 mm.

MYRMELEONIDAE.

WEELIUS TRISERIATUS, sp. nov.

TYPE.—M. C. Z. 14,840. Fijis: Wainganiu. (W. M. Mann).

Face pale, a large black interantennal mark; vertex yellowish, with ten elongate black spots, four in middle are longitudinal, others transverse, two in front and four behind. Thorax black, pronotum with a pale median line and two pale spots each side; rest of thorax with traces of median line, and lateral spots; beneath spotted with pale. Abdomen black, last few segments with pale spot at base. Legs pale, femora dark toward tip, front and mid tibiae dark outside, and with a subbasal cross-line pale, hind tibiae with a black line within, tarsi largely dark. Antennae moderately long, vertex as much elevated as in *W. acutus*, pronotum once and a half as broad as long, sides parallel, spurs hardly equal to basal joint on hind legs, on front and mid legs equal to basal joint, latter about one half of the fifth joint; legs have few stout spines and long hairs.

Wings hyaline, venation black and pale in streaks, stigma pale, a dark spot basally, no other marks. Wings are slender, broadest near tip, hind wings fully as long as fore wings, latter much more bluntly pointed than in *acutus*. The fore wings have about seven cross-veins before radial sector, several of them crossed, in hind wings five before the radial sector, about 12 or 13 branches to radial sector. In the fore wing the costal area is divided nearly its entire length from base to stigma into three series of cells; no banksian line.

Expanse 67 mm.

Differs from *W. acutus* in blunt-tipped wings, in the three series of costals, in absence of marks on wings, and in the longer hind wings.

MYSTROLEON, gen. nov.

Wings slender, acute, hind pair much shorter. In fore wings the second anal is connected to first by a cross-vein, then bends down and unites with the third for some distance. The radial sector in fore wing arises much beyond the cubital fork, in hind wing before. In the fore wings are seven cross-veins before radial sector, in hind wings but one. In fore wings the cubital fork diverges and runs to margin, and the radius and subcosta beyond stigma bends back in a long swing making a wide area near tip of wing. In the fore wing there are, as Walker states, apparently three radial sectors, the first and second branches of the radial sector being so connected to radius as to appear distinct; this is less apparent in the hind wing. The pronotum is broader than long, the front legs rather short and stout, hairy, hind legs very long and slender; no spurs, the basal tarsal joint of all tarsi is elongated and equals the fifth, the front and mid tarsi longer than the tibiae.

TYPE.—*Myrmeleon praedator* Walker.

A specimen from Obydos, Brazil (H. O. Parish). The vertex is much elevated; the hind legs are pale, the tips of femora broadly black, the mid legs much spotted, the front femora and tibiae mostly black, thickly black-haired.

ABATOLEON, gen. nov.

Differs from *Austroleon* in the absence of tibial spurs; abdomen of female shorter than the hind wings.

ABATOLEON DEPRIVATUM, sp. nov.

TYPE.—M. C. Z. 14,841. Argentina: Mendoza. (A. C. Jensen-Haarup).

Face pale, a large black interantennal mark, emarginate below, and containing a minute pale dot between antennae, vertex with a pale line across in front, above brownish, behind with a black mark each side; pronotum black, with a pale median line and a shorter one on each lower side behind the furrow, rest of thorax dark, with a few pale spots; abdomen dull blackish, unmarked, densely clothed with white and some shorter black hair; legs pale, spotted and dotted with dark, front femora largely dark on the outer side, all with long hairs and bristles, some white hairs of front femora are especially long; basal joint of tarsus about two thirds of the fifth joint, no spurs; wings moderately broad at stigma, venation black and white in streaks, a dark spot at stigma, one behind it, one at end of cubitus, and another at end of anal vein, and one above and just beyond the fork of cubitus, stigma whitish; hind wings much less marked. In fore wing three cross-veins before radial sector, two in the hind wing, six or seven branches to radial sector.

Expanse 28 mm.

In markings and even in venation this is practically a duplicate of *Austroleon frontalis*; it differs in the absence of spurs, in the rather shorter abdomen, and in the shorter and slightly stouter legs, especially in the shorter hind tibiae.

ASCALAPHIDAE.

HAPLOGLENIUS EXTENSUS, sp. nov.

TYPE.—M. C. Z. 14,827 ♀. Bolivia: Sara. (J. Steinbach).

In the shape of the anal angle it agrees with *H. peruvianus* and *handlirschi*. It differs at once from them in having the wings, especially the hind wings more slender, and in that the dark of the costal area extends behind the radius to the width of a cell (or half a cell toward base). The hind wings are not so short in proportion to the front wings as in *peruvianus*. The thorax shows two pale stripes from pronotum back toward abdomen; the stigma is large and yellow, with a slight extension outward along radial side.

Fore wings 44 mm. long, 10 mm. wide.

Hind wings 41 mm. long, 8 mm. wide.

Haploglenius eurypterus Navas, according to description, does not differ from specimens of *luteus*.

ULULODES SINUATUS, sp. nov.

TYPE.—M. C. Z. 14,828. Ecuador: Guayaquil, San Raphael. (Francisco Campos).

Belongs to the group of *U. quadrimaculatus* with broad wings, yellowish stigma, and the female with spotted wings. The species differs from all others

of this section in that the outer margin of all wings just before tip is plainly sinuate and that the cross-veins before radial sector number five in fore wing and two in hind wing. Face densely clothed with black hair; thorax brown-haired, scutellum with large tuft of upright black hair; legs dark, tips of tibiae paler; abdomen dull blackish, each segment with a large triangular yellowish spot on posterior half. Wings hyaline or slightly smoky, venation dark, stigma pale, barely marked, only a couple of veinlets yellowish, apical area with three or four series of cells; five branches to radial sector in fore wings, six in hind wings; hind wings but little shorter, and nearly as broad as the fore wings.

Female similar to the male, but each hind wing has three large dark spots, one behind the stigma, one on hind margin just before this, and one behind the curve of anal vein.

Length of fore wing 29 mm., of hind wing 25 mm.

EREMOPHANES, gen. nov.

A schizophthalmous Ascalaphid of the tribe Suhpalascini; antennae bare, except on the basal joint, about two thirds the length of the fore wings; all tibiae with spurs equal to two tarsal joints; wings long and slender, their sides nearly parallel, the hind pair much shorter than the front pair; stigma short, two or three series of cells beyond the radius; abdomen of male not very elongate, with short appendages.

The male has a high ridge or lamella over the base of each fore wing, the female has each lateral corner of the anterior lobe of the mesothorax conically elevated.

EREMOPHANES BICRISTATUS, sp. nov.

TYPE.—S. African Mus. PARATYPE.—M. C. Z. 14,920. Southern Rhodesia: Sawmills, 28 October.

Yellowish; face with yellowish hair, darker around the base of antennae and on vertex; prothorax with white hair; mesothorax with mostly black hair above, pale on sides, below, and on the metathorax; legs pale, with white hair and black bristles, tarsi darker near tip; antennae pale on base, brown beyond, knob large. Wings hyaline; subcosta and radius and the area between them plainly yellowish, the median and part of anal veins pale, rest of venation dark, stigma brownish yellow, seven or eight cross-veins before radial sector in the fore wing, four before the cubital fork, five branches to radial sector; at costal base are long, erect black spines.

Expanse ♀ 67 mm.; ♂ 64 mm.

LIMNEPHILIDAE.

COLPOTAULIUS MINUSCULUS, sp. nov.

TYPE.—M. C. Z. 14,842. Colo.: Tolland. (Dodds).

Body brown, head and thorax with yellowish hair, antennae yellowish, basal joint black, legs yellowish, spines black, anterior femora and tibiae black on inner side, the tibia slightly curved, outside without spines, first tarsal joint very short, only one half as long as the second, which is scarcely longer than the third. Wings yellowish brown, scarcely mottled. Venation similar to other species, the discal cell no longer than its pedicel. The male genitalia seen from the side show very long and slightly curved superior appendages, within they are dentate near tip.

Expanse 14 mm.

LIMNEPHILUS TOUSSIANI, sp. nov.

TYPE.—M. C. Z. 14,868. Haiti: Port au Prince. (W. M. Mann).

In general similar to *L. submonilifer*. Yellowish with yellow hair and black bristles. Fore wings pale, venation interruptedly brown, membrane (except costal area) with faint brown irroration fairly distinct behind discal cell, more so in cubital area, and still darker in anal region; hyaline white mark on the thyridium. Front tibia faintly curved, a black line beneath and beneath femur, basal joint of tarsi equal to next, hind tibia rather strongly curved. In the fore wing the discal cell is very long, as long as its pedicel, its upper side straight; fork 1 scarcely reaches back on cell, forks 2 and 3 both equally sessile. In hind wing the discal cell is much shorter, forks 1 and 2 broad at base, fork 3 acute at base, but not pedicellate; no brand in wing.

Expanse 26 mm.

This is probably the form Walker recorded as *L. griseus*.

LIMNEPHILUS FORCIPATUS, sp. nov.

TYPE.—U. S. Biol. Survey. PARATYPE.—M. C. Z. 14,843. Alberta: Lobstick Island, Ft. Chippewyan, 1 September. (F. Harper).

Black, with mostly yellow hair; palpi and legs pale, tibia with very few black spines, femora especially the hind pair more or less infuscated, in male the first joint of front tarsus is very much longer than the second; antennae brownish, basal joint black, tubercles of vertex and thorax yellowish, ocellar macrochaetae situated behind ocelli. Fore wings nearly hyaline, sparsely marked with brown in posterior half. The male genitalia appear as two pairs

of claspers; the superior appendages with an inner apical tooth, the lower appendages with an upper apical tooth; the intermediate appendages small and scarcely visible.

Expanse 26 mm.

LIMNEPHILUS (GONIOTAULIUS) CLAUSA, sp. nov.

TYPE.—M. C. Z. 14,844. Colo.: Long Lake, August. (Cockerell). Colorado. (C. F. Baker).

Black, legs pale, femora black, and in the male the basal third of hind tibia black, tarsi partly black, head and thorax with much yellowish and some black hair; basal joint of antennae densely black-haired. Wings brownish yellow, apical part of stigma dark, apical parts of third and fourth apical and second and third subapical cells sometimes darker, few if any other dark marks, the oblong pale mark sometimes traceable. Venation similar to others of this section, but discal cell is as short as its pedicel; no brand in hind wings. The male genitalia are quite different from allied forms, the superior appendages are large triangular plates, within concave and enclose a pair of jet black processes.

Expanse 20 mm.

ECCLISOMYIA COMPLICATA, sp. nov.

TYPE.—M. C. Z. 14,845. Ontario: Go Home Bay, Inland Lake. 21 June. (E. M. Walker).

Body yellowish, vertex rather more brown, antennae narrowly annulate with brown, head and thorax with mostly grey hair, ocellar macrochaetae prominent, behind, but closer together than ocelli; abdomen dull brown above; legs with black spines, tibia of front legs spined to base and three on tip of femur, spurs 1, 3, 4. Wings a yellowish grey, with yellowish and grey hair, paler than in *E. conspersa*, the pale spots mostly not distinct, some more distinct near outer margin. Discal cell nearly one and a half times longer than its pedicel, the first fork reaches back before the middle of discal cell (proportionally farther than in other species). The male genitalia are very complicated; from the side are seen two long superior processes, the upper down-curved, the lower longer and incurved; a long median process enlarged and bristly toward tip, and a pair of much shorter lower appendages.

Expanse 24 mm.

ANISOGAMUS ATRIPENNIS, sp. nov.

TYPE.—M. C. Z. 14,846. California. (James Behrens).

Head and thorax black, with erect black and some pale bristles, antennae black, palpi paler, abdomen yellowish, legs blackish, tarsi rather paler, spurs

1, 3, 4. Wings black, with erect black, and appressed yellowish hair, pale mark on thyridium and at arculus. Wings more narrow and pointed than in most species, venation about as usual, discal cell rather more narrow, fully three times as long as its pedicel. Hind wings blackish, with black fringe and hair, the discal cell is more than twice as long as its pedicel, but the fork of median is as far back as base of discal cell, both apical and subapical cells being very long. The superior appendages of the female are pointed processes. Expanse 40 mm.

CHILOSTIGMA SUBBOREALIS, sp. nov.

TYPE.—M. C. Z. 14,847. Alaska. B. Col.: Wellington. Utah: Logan, near Alta. Alberta: Lake Minnewanka.

In markings close to *C. alascensis*; the wings are more strongly marked with dark, the anterior part of the fore-wing dark and the silvery white stripe more distinct, the silvery extension into the base of fifth apical cell is isolated, the stigma is reddish brown, and very strongly chitinized. The fore wings are more narrow than in *alascensis*, and the costal margin less strongly convex, in shape more like *Hesperophylax*. The male genitalia are on the plan of *alascensis*; in side view the upper outer corner of the lower appendages is not as extended as in *alascensis*, and above on the last segment are two black spots; the intermediate appendages are upcurved, but not nearly as stout, and approximated. From behind there is seen above the lower edge a median forked process, snow-white (in *alascensis* simply two lobes).

Expanse 26 to 34 mm.

NEOPHYLAX OCCIDENTIS, sp. nov.

TYPE.—M. C. Z. 14,848. Nev.: Reno. (H. K. Morrison).

Body dark brown, basal joint of antennae dark brown, beyond yellowish, palpi and legs yellowish, a small wart between ocelli and posterior warts. Wings brown, more or less faintly mottled with pale, most noticeable in bases of apical cells and along outer margins and cubital and anal veins; fringe brown, interrupted with whitish, hind wings pale brown, fringe brown. In fore wings forks 1, 2, 3 all scarcely reach before anastomosis, discal cell extremely long as in other species, radius much bent at stigma; spines of legs black, spurs, 1, 3, 3. In hind wings (σ^7) are two forks distinct as usual, from base of second a cross-vein goes to what appears as fork 3, but in reality no more veins than in other species.

Expanse 21 mm.

In appearance it is a *Neophylax*, but on account of venation of hind wings and spur formula will doubtless form a new genus. It cannot be an *Oligophlebodes* on account of fork 2 in hind wing, wart behind ocelli, longer discal cell, etc.

APOLOPSYCHE PALLIDA, sp. nov.

TYPE.—M. C. Z. 14,849. Manitoba: Winnipeg Lake. (Robert Kennicott).

Body yellowish, vertex, palpi, and dorsum of abdomen more brown, legs pale yellowish, spines black, antennae yellowish. Wings whitish hyaline, clothed with fine white hair, wholly without marks. Fore wings moderately long and slender, discal cell rather longer than its pedicel, fork 1 hardly its width back on discal cell, fork 3 narrower at base than fork 2, fork of median vein with nearly acute base. In the hind wings the end of the discal cell is beyond the dot in the base of the second fork; maxillary palpi of male not especially long. Male genitalia not prominent, an oval piece each side above.

Expanse 17-19 mm.

APATANIA CANADENSIS, sp. nov.

TYPE.—M. C. Z. 14,851. Manitoba: Winnipeg. 1 October. (J. B. Wallis).

Body, legs, and antennae black, tibiae and tarsi paler. Wings pale grey, more hyaline in the middle, especially so in the fourth apical cell, venation dark, stigma fairly prominent. In both wings the fifth apical cell is long, petiolate, in hind wings the petiole much longer than the fork, in the fore wings about one half as long as fork, in some cases the fork is absent in hind wings; discal cell rather longer than its pedicel, fork 1 more than its width back on discal cell. Last joint of maxillary palpi slightly enlarged toward tip. Male genitalia show a pair of short upcurved superior appendages (much shorter than in *A. nigra*).

Expanse 19 mm.

I had formerly considered this the *A. pallida* Hagen, but the type of Hagen has male genitalia very similar to *stigmatella*.

APATANIA SHOSHONE, sp. nov.

TYPE.—M. C. Z. 14,850. Wy.: Yellowstone National Park. (H. M. Smith).

Body black, head and thorax with mostly grey hairs, palpi brown, antennae black, femora black, rest of legs pale. Wings pale brownish, uniform, a large dark spot over the stigmal area, venation dark brown. In color and venation very similar to *A. stigmatella* and the male genitalia are on the same plan, but the apical part of the lateral appendage is much larger, and with a much stouter point, the superior appendages have a longer free point than in *stigmatella*, these parts are pale yellow; in the female the last abdominal segment and its tubercles is wholly golden yellow.

Expanse 16 mm.

RHYACOPHILIDAE.

ATOPSYCHE BOLIVARI, sp. nov.

TYPE: M. C. Z. 14,839. Colombia: Tolima, Monte Socorro, Tohecito Quindini. (Eduard Fassl).

Similar in general to the other species; marked with brown, black, and yellowish hairs which form patches of erect hairs, but without definite pattern; anterior tibia dark, with pale spot in middle, tips of tarsal articles pale; antennae usually largely pale, but sometimes pale only on base. Wings slender, elongate, anterior wing with venation much as in *A. longipenne*; in the hind wings the first and second anal veins are united before the tip in the male, not in the female. In male the spines and genitalia are similar to *longipenne*, but the apical joint of the lower appendage is very much more slender.

Expanse ♀ 25 mm., ♂ 20 mm.

RHYACOPHILA ROTUNDA, sp. nov.

TYPE.—M. C. Z. 14,856. Nev.: Reno. (H. K. Morrison).

Body black; head and thorax with some black but more yellow hair; middle of face below antennae with a silvery spot; palpi black; antennae brown; legs pale yellowish, anterior and mid femora mostly brown; genitalia mostly yellowish. Wings dark brown, with numerous small whitish or grey spots, a larger one from thyridium to end of anal vein, and several nearly confluent below stigma, the latter very dark brown. Hind wings brown. Fork 1 as far back as fork 2, the pedicel more than width of cell, fork 3 fully as long as fork 4, the latter shorter than its pedicel, first anal cell not twice as long as second. The male genital parts have the lower appendages heavy, with a short oblique second joint; the superior median plate is greatly enlarged and rounded.

Expanse 22 mm.

RHYACOPHILA NEVADENSIS, sp. nov.

TYPE.—M. C. Z. 14,855. Nev.: Reno. (H. K. Morrison). Colo.: Tolland. (G. S. Dodds).

Generally pale, similar to *R. hyalinata*, but smaller. Palpi dark brown; antennae brown; head and thorax with yellow hair, legs very pale, unmarked, except the tarsi are darker. Wings yellowish hyaline, faint yellow spots along outer margin between the veins, clothed with fine short yellow hair, outer fringe brown, venation brown. Fork 1 reaches nearly as far back as fork 2, its pedicel twice the width of a cell, fork 4 a little longer than pedicel, fork 3 as long as fork 4, first anal cell twice the second. Lower male appendages long,

similar to *acropedes*, but the second joint is not so foot-like, and the "sole" confined to the inner apical part.

Expanse 22 mm.

RHYACOPHILA ANOMALA, sp. nov.

TYPE.—M. C. Z. 14,854. Colo.: Tolland. (G. S. Dodds).

Head and thorax black, with black and some pale yellowish hair; abdomen brown; palpi and antennae brown, latter faintly annulate and basal joints darker; legs yellowish, front femora blackish on the inner side toward base, tips of the tibia and tarsal joints dark, mid legs similar, hind legs with tips of tibia and the whole of tarsal joints (except the last) dark; wings dark, heavily maculate with pale, the stigma long and very dark, beyond middle of wing the pale spots tend to form cross-bands, in anal and cubital area the spots are more or less united into larger pale areas; hind wings dark, stigma long and very dark. Venation typical of genus, fork 1 as far back as fork 2, the pedicel longer than width of cell. Male genitalia are very different from usual *Rhyacophila*, but on the plan of those of *R. bifila*. There is a large ventral plate, emarginate at tip, and two large, elongate pieces above, the internal parts obscure.

Expanse 22 mm.

RHYACOPHILA MINORA, sp. nov.

TYPE.—M. C. Z. 14,857. N. H.: White Mts. (H. K. Morrison).

Head and thorax brown, with some yellowish hair; palpi and antennae brown; abdomen dark brown; appendages yellowish brown; legs yellowish. Wings brown, unmarked, except stigma very dark, and a pale spot at thyridium; fork 1 not quite as far back as fork 2, its pedicel twice the width of a cell, fork 3 nearly as long as fork 4, the latter about equal to its pedicel, first anal cell twice as long as the second. Male genitalia are very short; above are two approximate plates, hollowed and sculptured above, the lower appendages have the second joint narrowed from base to tip.

Expanse 15 mm.

SERICOSTOMATIDAE.

GOERA FIJIANA, sp. nov.

TYPE.—M. C. Z. 14,819. Fijis: Viti Leon, Nadarivatu. (W. M. Mann).

Yellowish, clothed with yellowish grey hair, on face more brownish, antennae beyond base very pale. Wings infuscate, clothed with appressed golden hair, and some more erect brown hair, anal margin with a narrow strip of pale

yellowish; fringe brown; hind wings uniform brownish, with brown fringe, and darker venation. Basal joint of antennae about as long as vertex, rest of antennae rather heavy, but little longer than the wings. Discal cell of fore wings moderately short, fork 1 one half way down on the discal cell, fork 2 sessile, fork 3 about as far back as 2, fork 5 narrowed at base by the swollen area behind. In the hind wings fork 1 is a trifle farther basad than fork 2; sixth ventral abdominal segment with a long curved, flattened, but not spatulate, median spine, seventh segment with a similar but shorter spine.

Expanse 15 mm.

GANONEMA FURCATUM, sp. nov.

TYPE.—M. C. Z. 14,820. Philippines: Mindanao, Surigao. (C. F. Baker).

Pale yellowish, abdomen rather darker above. Head, thorax, and palpi with long yellow hair; tips of antennal joints dark; legs pale yellowish, hind tibia of male with a long fringe behind, the basal hairs nearly as long as the tibia itself. Fore wings yellowish on base, but brownish beyond; hind wings brown. Fore wings clothed with yellowish hair, on outer part the marginal fringe is brown. The fore wings are broad, even broader than *G. brevipenne*; the venation very similar to that species, but in the fore wing the radius near tip forks, the lower branch going to the radial sector (as normal in genus) but the upper branch continuing the vein out to margin (as in *Ascalaphomerus*), and fork 5 is almost as far back as fork 4. In hind wing fork 2 is rather shorter than in *brevipenne*, and the free space behind fork 5 is even broader than in that species.

Expanse 21 mm.

PHYLLOICUS CUBANUS, sp. nov.

TYPE.—M. C. Z. 14,869. Cuba. (Johannes Gundlach).

Pale yellowish, with sparse yellow hair; abdomen more yellow-brown; antennae brown, except near base. Fore wings brown, with brown hair, and two broad pale bands with yellow hair. The first band obliquely across before origin of radial sector and base of fork 5, hardly distinct in the costal area; the second band is nearly as broad, covering the stigma, runs obliquely outward, then turns and runs toward anal angle of wing, each side of the stigma the brown is darker than elsewhere; fringe brown; hind wings faintly brownish, rather darker at tips, fringe brownish; hind tibiae and base of tarsus brownish. Basal joint of antennae has a rounded swelling above at tip, and the vertex is elevated medially. In fore wing the discal cell is much shorter than its pedicel, fork 1 extends but a short distance, the base of fork 5 is connected by cross-vein to median just before origin of fork 4, fork 3 does not extend back on median cell. In hind wing venation much like *P. assimilis*.

Expanse 19 mm.

MARILIA SCUDDERI, sp. nov.

TYPE.—M. C. Z. 14,872. Isle of Pines. (S. H. Scudder). Cuba. (Charles Wright).

Yellowish, with much white and grey hair. The apex of the fore wings of male are marked with black, especially behind; the stigma is dark, beyond it is a large white area, hyaline spot on the thyridium and base of fork 2. Hind wings with mostly brown or yellow-brown hair and fringes; tarsi marked with brown; antennae brown, white-ringed. Eyes of male touching; spurs 2-4-4. In fore wings the apical part is rather shortened; the discal cell hardly if any longer than its pedicel; fork 5 not as far back as fork 1. The male appendages have the second joint slender, and the clavate upper appendages are very long. Expanse 13 mm.

MARILIA WRIGHTI, sp. nov.

TYPE.—M. C. Z. 14,873. Cuba. (Charles Wright).

Yellowish, clothed with white or greyish white hair. Black spot behind thyridium and with black hair nearly to the hind margin, some black hair on base of fork 2 and over the cross-vein behind. Eyes of male large, but still nearly diameter apart, further than in *M. major*. Venation much as usual; the discal cell extremely long and slender, much longer than pedicel, fork 2 very short pedicellate, fork 5 scarcely reaching before fork 1; in the hind wings the discal cell is fully twice as long as its pedicel; spurs 2-4-4. The male appendages are forcipate, the second joint swollen slightly beyond its base; the darker upper appendages are very short.

Expanse 24 mm.

Easily recognized by large size and the widely separated eyes.

LEPTOCERIDAE.

OECETINA PERUVIANA, sp. nov.

TYPE.—M. C. Z. 14,831. Peru: Iquitos. (H. O. Parish).

Brown; palpi, head, and basal joint of antennae with dark grey hair, apical joints of antennae narrowly marked with black; legs yellowish grey to brownish, femur I of male with row of very long hairs above, especially near base (not in *O. excisa*). Wings infumate, darker than in *excisa*, the venation generally pale, the anastomosis very prominent, black, veins with brown or rufous hair, marginal fringe brown, at anal margin very long and dense and blackish; at end of each vein on the outer margin is a black spot, seven in all; hind wings brownish, with brown fringe. Discal cell of fore wing a little longer than

pedicel, forks 1 and 3 acute at base, both just reaching to anastomosis, the three veins of latter nearly forming a straight line. Lower appendages of male genitalia heavier than in *excisa*, lateral appendages long, clavate at tip and with many long hairs.

Expanse 14 to 15 mm.

OECETINA AMAZONICA, sp. nov.

TYPE.—M. C. Z. 14,830. Brazil: Manáos, June. (W. M. Mann).
Argentina: Piedra Blanca, April. (H. H. Smith). Peru: Napo
River. (H. O. Parish).

Yellowish brown, sparingly clothed with grey-brown hairs; legs paler; lower genital appendages nearly white, broad and parallel-sided for some distance, and with a short curved extension from lower corner. Wings very long and slender; anastomosis scarcely distinctly marked, hardly more than *O. excisa*; discal cell about equal to its pedicel; fork 1 with a short pedicel, hardly as long as width of cell; fork 3 acute at base, end of discal cell much beyond rest of the anastomosis; hind wings with the three forks similar to *excisa*.

Expanse 17 mm.

SETODES PRETIOSELLA, sp. nov.

TYPE.—M. C. Z. 14,832. Peru: Yurimaguas, March. (H. O. Parish).

Pale yellowish, with yellowish grey hair. Antennae brown above, each joint with a white ring; legs very pale yellowish. Wings subhyaline, with pale venation, with much pale yellowish hair and numerous (about a hundred or more) minute dots or tufts of black hair, situated on or between, or at the junction of veins, those in the apical half arranged more or less definitely into about six transverse rows; fringe rather bright yellowish, except at anal angle where it is longer and grey. Hind wings pale, with whitish hair and fringe; abdomen green (♀). Wings slender as usual, in fore wings the discal cell nearly as long as its pedicel, fork 1 with a pedicel nearly its length, fork 3 wider, and with a pedicel about one half its length; in hind wings fork 1 is very small, fork 5 more than twice as long as fork 2, and very wide.

Expanse 9 mm.

Setodes 12-punctatus occurs at Iquitos, Peru, and Para, Brazil.

NOTANATOLICA GRISEA, sp. nov.

TYPE.—M. C. Z. 14,821. Philippines: Mt. Maquiling, Los Baños, Surigao, Mindanao. (C. F. Baker).

In color and markings very similar to the other species; the wings, however, darker than in *N. magna*. The palpi are not as densely haired as in other species, and the hairs are both black and white. The fore wings are very long and slender; the venation similar to *magna*, but fork 1 in both wings has a very short pedicel; the cross-vein from discal cell to radius is near end of discal cell.

Expanse 26 to 34 mm.

MYSTACIDES CANADENSIS, sp. nov.

TYPE.—M. C. Z. 14,832. Quebec: Lacolle, 22 July. Sherbrooke, July. (P. A. Begin).

Black; antennae pale, the basal joint and tips of others dark; legs pale; wings blackish, darker in stigmal and costal area, venation very similar to that of *M. sepulchralis*. The male differs strongly in genital parts; the inferior process is not furcate, but simply three very minute lobes at tip, the intermediate processes are very broad at base and taper outwardly to a sharp, hardly upcurved point; the lateral process has no lower tooth. Among European species it is nearest to *longicornis* but the tip of the intermediate appendages is not so slender as in that species.

Expanse 15 mm.

HYDROPSYCHIDAE.

CHIMARRHA MANNI, sp. nov.

TYPE.—M. C. Z. 14,825. Fijis: Somo-Somo, Taviuni. (W. M. Mann).

Black with black hair; vertex shining, legs and antennae dull black; abdomen tawny yellowish. Wings black, fore wings with several large bare areas in the basal part, which in certain lights are iridescent blue; a large spot over the discal cell, the area behind and part of the median cell, a rather smaller spot at origin of radial sector and fork of median, a small spot in costal area above the last, a long stripe behind base of median, and one behind apical half of cubitus. Two veins behind discal cell, fork at base of median and a longer line up from the arculus are white. The palpi are long, the second joint long and thick, the third rather longer and more slender, the fourth short, the fifth long and curved. Venation similar to *C. aterrima*, but the cross-vein from radius to radial sector is just beyond the end of discal cell in both wings; the radial sector at base of the discal cell is not curved, the upper anal cell extends nearly to tip of anal vein; in the hind wings fork 5 is back as far as fork of median and both are as far as base of the discal cell.

Expanse 14 mm.

CHIMARRHA OBSCURELLA, sp. nov.

TYPE.—M. C. Z. 14,824. Fijis: Somo-Somo, Taviuni. (W. M. Mann).

Brownish yellow, with mostly yellow hair; ocelli on black spot, wings dull pale brown, with blackish hair, arculus and end of median cell pale, a large bare spot behind base of discal cell; abdomen dull brown, legs pale. Palpi rather long and slender, second joint very long, with several golden bristles near inner tip, third hardly equal second, fourth about one half of third, fifth slender and curved. Venation much as in *C. aterrima*, discal cell blunt at base, the radial sector there curved upward; fork 5 back as far as base of the discal cell. In hind wings the discal cell is more slender, fork 5 not so far back as base of discal cell.

Expanse 10 mm.

CHIMARRHA (CURGIA) FRATERNA, sp. nov.

TYPE.—M. C. Z. 14,876. Cuba. (Charles Wright).

Body yellow, with mostly golden hair; abdomen with segments margined with brown, antennae, tarsi, and palpi blackish. Wings brown, with black hair; fore wing with several large, golden yellow spots reaching from base through middle of wing; a basal streak reaching one third way out, with an upward extension at tip, beyond an elongate streak, much larger at base, pointed at tip, beyond this a transverse spot covering the bases of apical cells; these marks are practically the streak of *C. pulchra*, broken into three parts. The last joint of palpi is rather larger than the third joint; in the fore wing the radial sector is not curved at base of discal cell; forks 1 and 2 not extending back on discal cell, fork 3 very much longer than its pedicel; in hind wing this fork equals its pedicel.

Expanse 16-19 mm.

CHIMARRHA (CURGIA) MOESTA, sp. nov.

TYPE.—M. C. Z. 14,871. Cuba. (Charles Wright).

Brownish to black; head with grey or yellowish hair; antennae yellowish brown, darker toward tip; palpi brown, second joint with cluster of bristles at tip; third joint but little shorter than second, fourth much shorter, fifth but little curved and about equal to the third; legs yellowish; thorax brown, with yellowish hair, and some black bristles. Wings brown, with darker veins, most of the hair brown or blackish, a patch of yellowish each end of the stigma in fore wing; anastomosis, thyridium, and arculus hyaline white; fringe blackish; hind wings colored as fore wings, but unmarked. In fore wings the radial sector is not curved at base of discal cell, forks 1 and 2 do not extend

back on discal cell, fork 3 is full as long as its pedicel, fork 5, median and discal cells all equally far back.

Expanse 16 mm.

PHILOPOTAMUS AEQUALIS, sp. nov.

TYPE.—M. C. Z. 14,853. Colo.: Tolland. (G. S. Dodds).

Body black, antennae and palpi brown, front and mid legs dark brown, hind legs with femora dark brown and a pale band in the middle, tibia pale yellowish, tarsi brown. Wings brown, stigma darker, thyridium, arculus, cross-vein closing median cell, and the cross-vein above it are hyaline white. Venation similar to other species, fork 1 scarcely as long as discal cell, forks 3 and 4 subequal in length. The male appendages have a basal part fully twice as long as broad, and a broad apical part nearly as long as the basal.

Expanse 16 mm.

Agrees with *P. americanus* in the black femora and in size; it differs in having the second joint of the male appendages broad and of even width throughout (in *americanus* narrower and tapering toward the tip).

DIPSEUDOPSIS MOROSA, sp. nov.

TYPE.—M. C. Z. 14,826. Philippines: Mindanao, Dapitan. Basilan. (C. F. Baker). Borneo: Talang.

Blackish; antennae, palpi, wings brown; legs reddish yellow. Wings with brown venation, radius black, a pale spot over forking of median and cross-vein behind, and along hind margin at end of anal; membrane with minute golden hairs. Inner spur of hind tibia scarcely larger than the outer, rather thickened beyond middle, the two claws (seen from end) curving the same way, from side view crossed, brush of long hairs toward tip forming two narrow tufts. Cross-vein from discal to radius more than its length before end of discal cell; fork 1 with pedicel three times length of fork; fork 3 very short pedicellate.

Expanse 34 mm.

HYDROMANICUS TRIFASCIATUS, sp. nov.

TYPE.—M. C. Z. 14,823. Philippines: Mindanao, Surigao. (C. F. Baker).

Related to *H. albofasciatus*, but the three pale bands are of about equal width throughout, and are at about equal distances apart, thus the third band is situated more basally and the second more apically than in *albofasciatus*, and the first and second are not widened behind, and the third is not narrowed in the middle; in the hind wing a pale spot near costal tip. Body dark;

antennae and palpi dark, basal antennal joints paler; vertex shining, faintly greenish; legs yellow-brown; Wings uniform dark brown; fore wings with three narrow white bands, the third not reaching across, and in the fourth apical cell, half-way out is a faint white spot; hind wing dark, with pale costal mark near the tip. Venation much as in *albofasciatus*, but fork 1 has a longer pedicel, fork 2 is also pedicellate, fork 5 is not quite as far back as fork 4.

Expanse 17 mm.

SMICRIDEA COMMA, sp. nov.

TYPE.—M. C. Z. 14,874. Cuba. (Felipe Poey).

Pale brown; face and legs yellowish, hind tibia dark brown, antennae annulate with white, head and thorax with mostly yellowish hair; wings with brown and yellow hair, of an even color throughout, except for a faint band before middle of whitish hair, and from the stigma a large comma-shaped white spot, the end of which reaches in a curve more than one half way across the wing, the costal part of this spot is rather elongate; apical fringe white; hind wings dark, with a brown fringe. Fork 1 about as long as pedicel; fork 2 very narrow at base, reaching a little before fork 3, both with pedicel nearly equal to the median cell, fork 4 very short pedicellate, fork 5 reaches hardly as far back as fork 4.

Expanse 13 mm.

MACRONEMA TRIPUNCTATUS, sp. nov.

TYPE.—M. C. Z. 14,822. Philippines: Mindanao, Surigao. (C. F. Baker).

Pale yellowish throughout. Extremely similar to *M. 5-punctatus* in general appearance and venation; it differs in having but three brown spots on each fore wing, those in front of the radial sector in *5-punctatus* being absent. The wing is much more densely clothed with short golden hair, the spots are located as follows:—one on cross-vein behind median cell, one in front of the anal vein, and one on the vein from median to cubitus near base.

Expanse ♂ 24, ♀ 20 mm.

MACRONEMA PERTYI, sp. nov.

TYPE.—M. C. Z. 14,833. Brazil: Tapajos. 30 June. (H. O. Parish).

Brown, with the usual white mark on vertex and basal joint of antennae, and fine green hair on vertex and metanotum, and green hairs on basal two thirds of wing, and silvery costal streak, as in *M. hageni* and allies. At two thirds way out on the fore wing is a broad yellowish white band, broadest behind, and on costal part with a silvery mark; toward tip is a narrower oblique

band, and a row of connected spots along the margin, also yellowish; apical fringe pale yellowish. Hind wings dark, a pale spot on costa before the blackish tip.

Expanse 20 mm.

MACRONEMA HAGENI, sp. nov.

TYPE.—M. C. Z. 14,834. Brazil: Tapajos, June. Obidos, August. Corry River, July. British Guiana: Mallali, March. (H. O. Parish).

Black; wings blackish, palpi and antennae brownish, latter dark at tips of the joints, basal joint with a silvery mark above; vertex with white line each side, and green scale-like hairs between, metathorax with similar green hairs in middle, and two thirds way out on the fore wings; costal area with a silvery streak, hardly reaching the silvery band at two thirds way out; an apical white lunule, and behind it a preapical row of white spots, between these and the silvery band is a large golden spot, more or less in five scarcely separated parts. Apical fringe white; hind wings dark, especially at tip, fringe dark; legs yellowish to brown, darkest on the posterior tibiae and tarsi above.

Expanse 20 mm.

This is doubtless what Ulmer has figured as *M. lineatum*, which from Pictet's figure and description must be very different.

MACRONEMA LACHLANI, sp. nov.

TYPE.—M. C. Z. 14,835. Brazil: Teffe, 14 January. (H. O. Parish).

Brown; antennae and legs yellowish; vertex and metanotum with the white and green, and green scales on basal two thirds of fore wing as in *M. hageni*, etc. No silvery costal streak, faintly white at extreme base, and beyond rather yellowish; at two thirds way out is a broad band and another broad apical band, both yellowish, leaving the extreme apical margin dark; each band contains a narrow dark transverse streak, and the two bands are connected near middle by a longitudinal yellowish mark; all the yellowish parts have golden hair, and in the costal area between the two bands are two golden spots; the apical fringe, and the hind wing are blackish.

Expanse 20 mm.

MACRONEMA BURMEISTERI, sp. nov.

TYPE.—M. C. Z. 14,836. Peru: Yurimaguas, April. Brazil: Santa Felipe, June. N. Pablo, February. (H. O. Parish).

Brown. Antennae with dark mark on each joint, basal joint silvery white above; vertex with white hair line each side, and the usual fine green hairs

between, similar green hairs on metanotum and, on fore wings three fourths the way out, a long white streak in costal area to near middle, and beyond are two or three costal white spots; near tip is a broad band of yellowish or golden, and beyond are fine golden hairs in the black apical portion; fringe black, but yellowish at ends of the band; legs pale, darker on tibia and tarsi.

Expanse 20 mm.

MACRONEMA MÜLLERI, sp. nov.

TYPE.—M. C. Z. 14,837. Brazil: Flores, November. Teffe, December. (H. O. Parish).

Yellowish, also legs and antennae, basal joint of latter with silvery mark above; white line each side at eye, and between are faintly green hairs, and similar ones on the metanotum. Wings yellowish, with fine golden hair, the costal area with a silvery white streak to half way out, nearly two thirds way out is a silvery spot, and the costal margin beyond is blackish; near apical margin is a row of golden spots, and a little before, but much more than two thirds way out, is a narrow golden band; the apical fringe is pale yellowish. Hind wings hyaline, with yellowish fringe.

Expanse 20 mm.

Related to *M. lineatum* Pictet which is of the same yellow color, but with a silvery band at two thirds way out.

The South American Macronemas of the *lineatum* section can be separated as follows:—

1. Wings blackish, more or less evident green scales on basal part. 3
Wings yellowish, no green scales. 2
2. Silvery band at two thirds way out, and apical margin silvery. *lineatum*
Golden band nearer tip, and apical margin golden. *mülleri*
3. Two large yellow or golden bands connected in middle, each band with
a central dark mark. *lachlani*
Not as above. 4
4. A yellow band before tip, much beyond two thirds way out. *burmeisteri*
Two or more silvery bands. 5
5. Two complete bands and apical margin silvery, a golden or silvery spot
between the bands. 6
Without spot between bands. 7
6. Spot silvery; apical band, extending around outer edge. *argenti-lineatum*
Spot golden; apical band short, and before it a submarginal row of spots.
hageni
7. Silvery band two thirds way out, hardly complete, and short apical
lunule. *fraterna*
Yellowish white complete band two thirds way out, a narrow preapical
band, and apical margin pale. *pertyi*

MACRONEMA BRAUERI, sp. nov.

TYPE.—M. C. Z. 14,838. Brazil: Teffe, 30 June. (H. O. Parish).

Head, thorax, and legs yellowish, dark spot on face and one on clypeus, vertex with shining black band from eye to eye, middle of palpi black, ends pale; antennae black, except the yellow basal joint, abdomen yellow-brown. Wings yellowish, with fine yellow hair, more hyaline through the middle; with two cross-bands, near middle connected, and almost connected to a basal longitudinal stripe which ends in a subbasal half band; apical and outer margins narrowly black; fringe black. Hind wings blackish, the costal margin for three fourths the way out and some space behind it, yellowish; palpi short, third joint but little longer than the second, and scarcely longer than the fourth; vertex elevated in the middle; anterior tibia rather swollen and black, mid tarsi of female flattened, the last three joints dark. Discal cell much longer than broad, about as broad as median cell; fork 1 with a short pedicel; no costal cross-veins.

Expanse 20 mm.

In the apical mark of wing, structure of head, swollen metatarsi, color of front tibia, there is much resemblance to *Pseudamacronema arcuatum*, but fork 5 is present, and the discal cell closed.

MACRONEMA GUNDLACHI, sp. nov.

TYPE.—M. C. Z. 14,875. Cuba (Johannes Gundlach. Charles Wright).

Yellowish, clothed with very short grey and yellowish hairs; face grey-haired, a line of white hair each side on vertex by the eyes, rest of vertex, thorax, and wings with fine yellowish hair. Wings unmarked, venation fulvous, fringe brown; antennae pale, ends of joints narrowly dark; second joint of palpi two and a half times as long as third joint, last joint about equal to the others together. Vertex flat, with median suture, lateral warts reach about middle of eyes. Wings rather long; hind wings very broad. Discal cell about twice as long as wide at tip, fork 1 with a very short pedicel, fork 3 reaching one third back on median cell; cubital area before fork 5 is swollen above, the lower branch of the median being strongly upcurved toward the end; anal vein rather strongly sinuate, and uniting to second anal considerably before middle of wing; median cell three times as long as discal; in hind wings discal cell very minute.

Expanse 35 mm.

LEPTONEMA INSULANUM, sp. nov

TYPE.—M. C. Z. 14,870. Porto Rico: San Juan.

Pale yellowish, clothed with whitish or pale yellowish hair; antennae scarcely annulate at tips of joints; wings whitish, with pale greenish venation. Palpi slender, third joint slightly swollen, about three fourths length of the second, fourth about one half of the third. In general very similar to *L. albovirens* in appearance and in structure. In fore wing fork 1 has a shorter pedicel, hardly as long as discal cell, in hind wings fork 1 is scarcely as long as its pedicel. The appendages are similar to those of *albovirens*; the lower appendage, has the basal piece less swollen in the middle than in *albovirens*, the lateral superior appendages are deeply furcate at tip.

Expanse 32 mm.

PLATE 1.

PLATE 1.

- Fig. 1. *Macronema lachlani*, tip of fore wing.
- Fig. 2. *Macronema burmeisteri*, tip of fore wing.
- Fig. 3. *Macronema muelleri*, tip of fore wing.
- Fig. 4. *Macronema pertyi*, tip of fore wing.
- Fig. 5. *Macronema fraterna*, tip of fore wing.
- Fig. 6. *Macronema hageni*, tip of fore wing.
- Fig. 7. *Macronema braueri*, fore wing.
- Fig. 8. *Thysopsocus stigmaticus*, fore wing.
- Fig. 9. *Epipsocus antillanus*, fore wing.
- Fig. 10. *Oligotoma venosa*, fore wing.
- Fig. 11. *Oligotoma californica*, head and thorax.
- Fig. 12. *Anisogamus atripennis*, tip of abdomen.
- Fig. 13. *Oligotoma venosa*, hind wing.

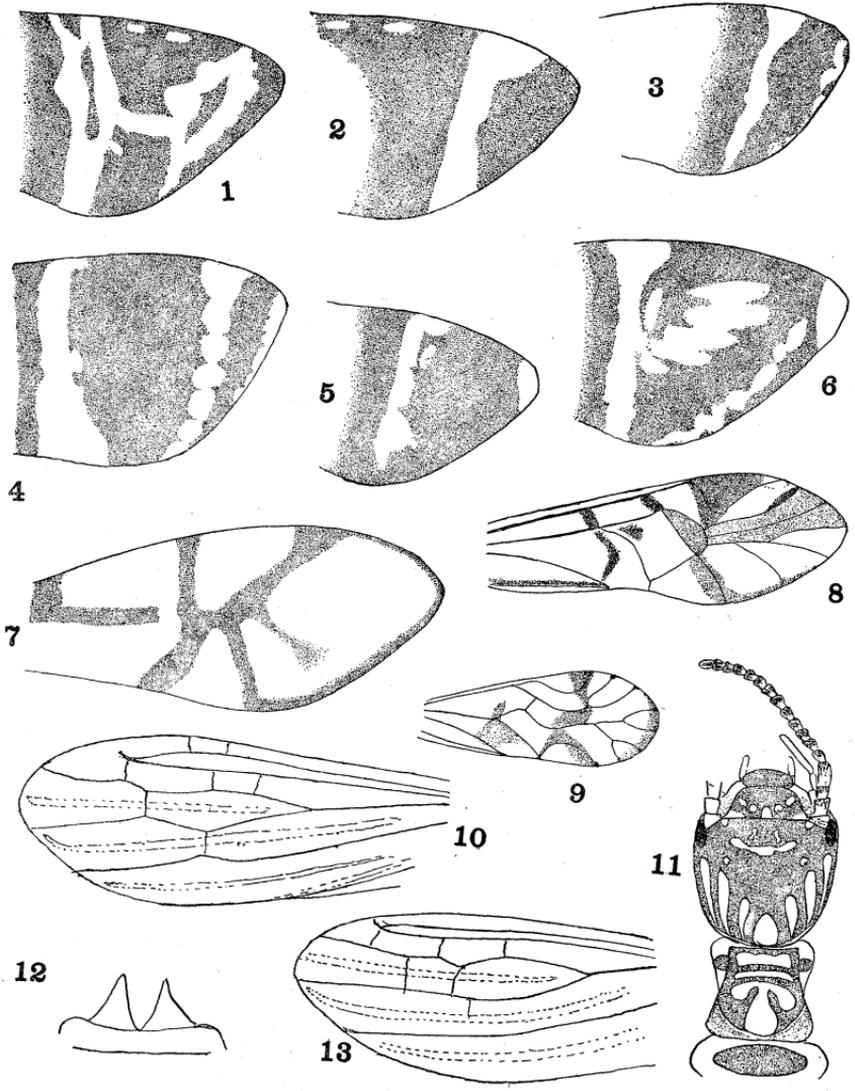


PLATE 2.

PLATE 2.

- Fig. 14. *Neoperla hermosa*, male genitalia, above.
- Fig. 15. *Neoperla consimilis*, male genitalia, above.
- Fig. 16. *Neoperla oculata*, male genitalia, above.
- Fig. 17. *Hemerobius algonquinus* male genitalia, side and tip.
- Fig. 18. *Baetis lasallei*, hind wing, and male appendage.
- Fig. 19. *Neoperla bakeri*, male genitalia, above.
- Fig. 20. *Peltoperla mindanensis*, male, ventral segment.
- Fig. 21. *Neoperla atripennis*, male genitalia, above.
- Fig. 22. *Oligotoma venosa*, appendages.
- Fig. 23. *Hagenulus eatoni*, hind wing.
- Fig. 24. *Raphidia crotchi*, male genitalia, below.
- Fig. 25. *Baetis parallela*, hind wing, and male appendage.
- Fig. 26. *Eremophanes bicristatus*, side of thorax.
- Fig. 27. *Oligotoma inaequalis*, appendages.

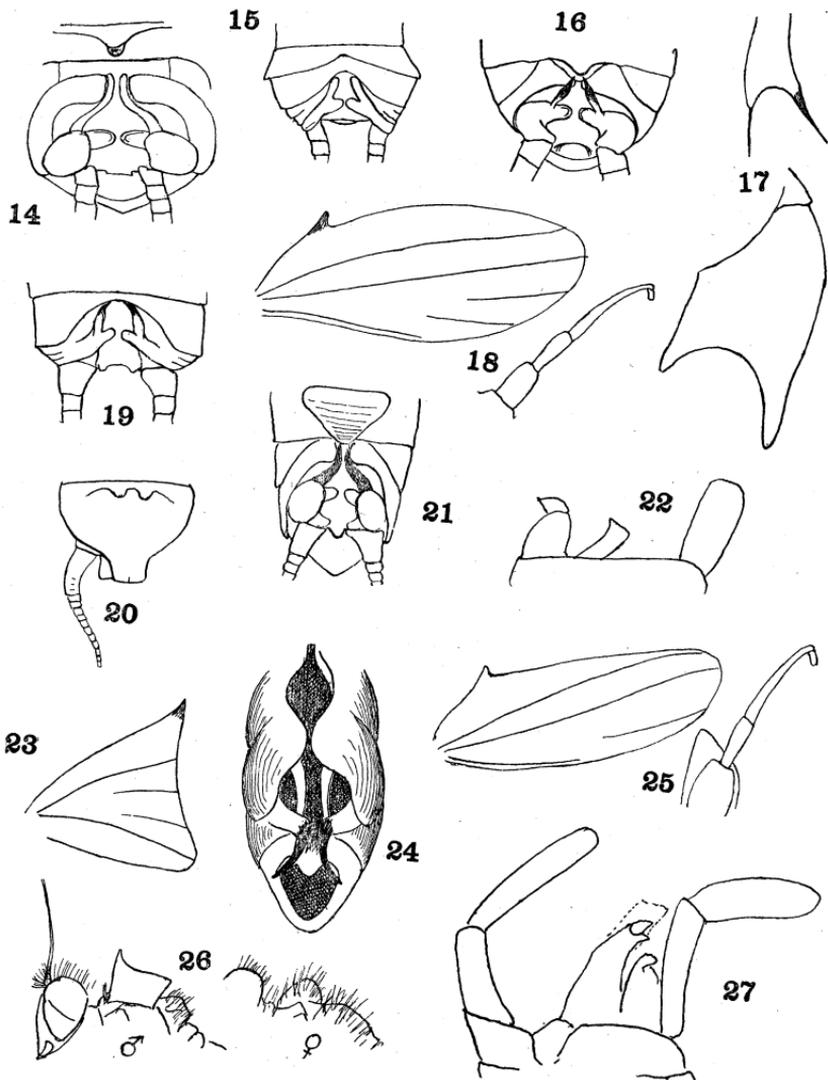


PLATE 3.

PLATE 3.

- Fig. 28. *Spilosmylus formosus*, wing spots, right above; left, below.
- Fig. 29. *Ecclisomyia complicata*, male genitalia, above.
- Fig. 30. *Ecclisomyia complicata*, male genitalia, side.
- Fig. 31. *Dipseudopsis morosa*, tibial spur.
- Fig. 32. *Chilostigma subborealis*, male genitalia, side.
- Fig. 33. *Rhyacophila rotunda*, male genitalia, side.
- Fig. 34. *Marilia scudderi*, male genitalia, above.
- Fig. 35. *Apatania shoshone*, male genitalia, side.
- Fig. 36. *Atopsyche bolivari*, male genitalia, side.
- Fig. 37. *Rhyacophila minora*, male genitalia, side.
- Fig. 38. *Notanatolica grisea*, male genitalia, side.
- Fig. 39. *Hydromanicus trifasciatus*, male genitalia, above.
- Fig. 40. *Oecetina peruviana*, male genitalia, side.
- Fig. 41. *Ganonema furcatum*, male genitalia, above.
- Fig. 42. *Marilia wrighti*, male genitalia, above.
- Fig. 43. *Apatania shoshone*, male genitalia, above.
- Fig. 44. *Raphidia crotchi*, tip of abdomen, side.
- Fig. 45. *Limnephilus forcipatus*, male genitalia, side and below.
- Fig. 46. *Oecetina amazonica*, male genitalia, side.

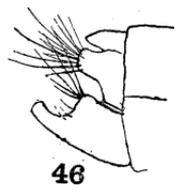
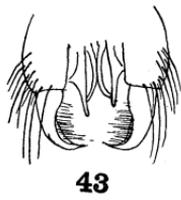
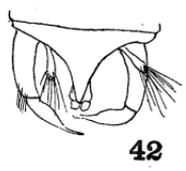
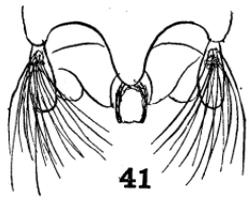
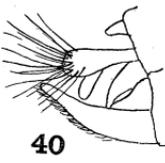
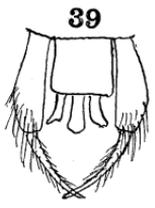
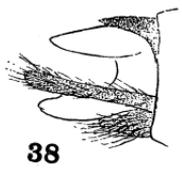
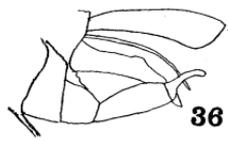
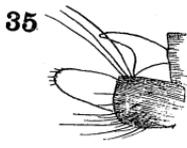
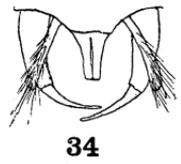
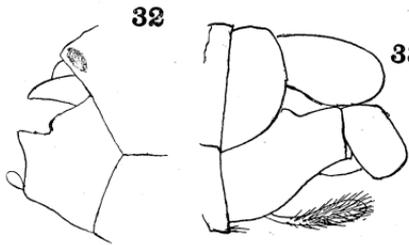
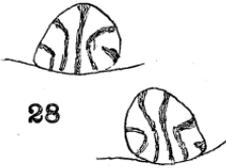
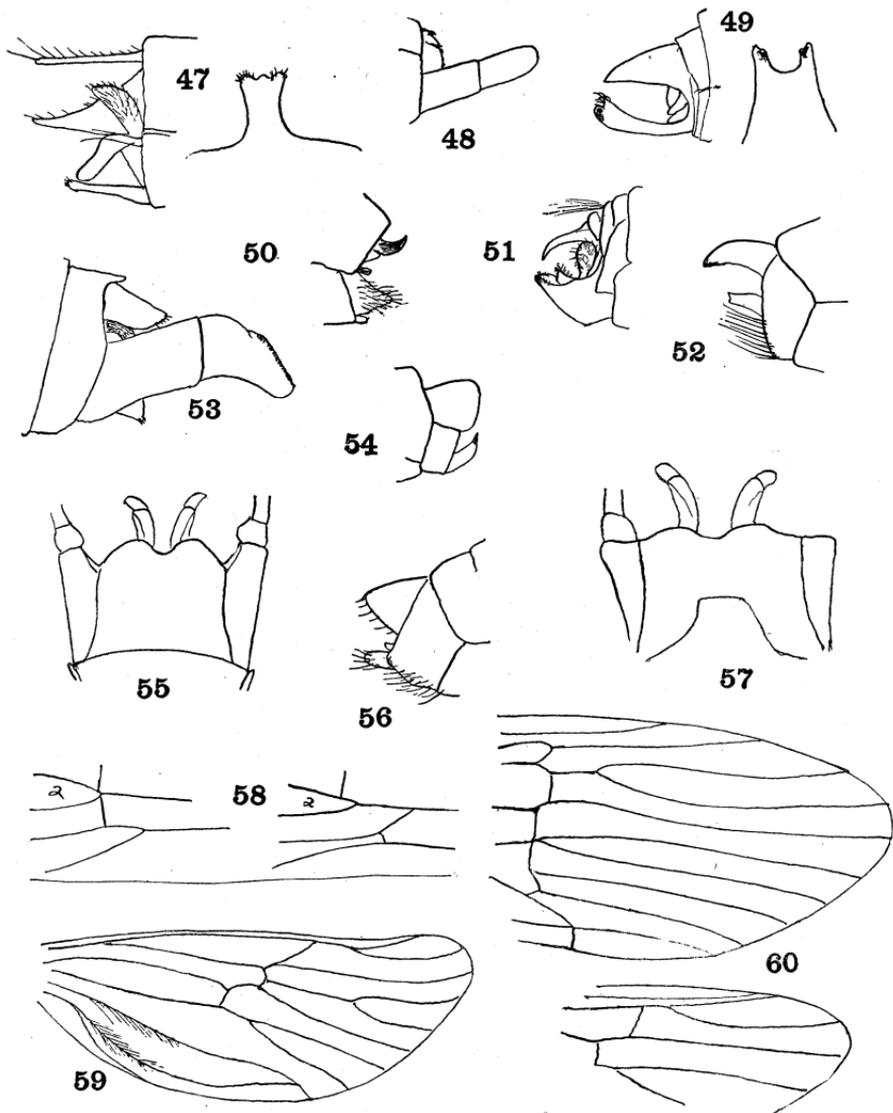


PLATE 4.

PLATE 4.

- Fig. 47. *Mystacides canadensis*, genitalia, side, ventral piece.
- Fig. 48. *Philopotamus aequalis*, genitalia, side.
- Fig. 49. *Rhyacophila anomala*, genitalia, side, ventral piece.
- Fig. 50. *Apatania canadensis*, genitalia.
- Fig. 51. *Neophylax occidentis*, genitalia.
- Fig. 52. *Colpotaulius minusculus*, genitalia.
- Fig. 53. *Rhyacophila nevadensis*, genitalia.
- Fig. 54. *Apolopsyche pallida*, genitalia.
- Fig. 55. *Epeorus morrisoni*, male, ventral plate.
- Fig. 56. *Limnephilus clausa*, male genitalia, side.
- Fig. 57. *Epeorus undulatus*, male, ventral plate.
- Fig. 58. *Neophylax*, venation, *occidentis* at left, *concinus* at right.
- Fig. 59. *Atopsyche bolivari*, hind wing.
- Fig. 60. *Notanatolica grisea*, apex of wings.



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