

A CONTRIBUTION TOWARD A MONOGRAPH OF THE HOMOPTEROUS INSECTS OF THE FAMILY DELPHACIDÆ OF NORTH AND SOUTH AMERICA.

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INTRODUCTION.

The family Delphacidæ was until quite recently and, in fact, by some authors, is yet considered as a subfamily of the larger group Fulgoridæ. By most students now, however, it is separated from its near relatives as a distinct family, chiefly on account of the large, movable spur, or calcar, at the base of the posterior tibiæ.

The most noticeable characteristic of the group as a whole is its homogeneity in general aspect and appearance. There are a few characters which are constant enough in subgroups to serve as diagnostic characters, and there are others which are too variable to serve that purpose. Some of the latter have, however, been used by many of the previous students with the result that genera and species have multiplied beyond reason and confusion has more and more crept in. This latter fact has been realized more strongly as my work on the group has progressed, and it has at last become necessary to rearrange the classification of the genera to some extent in order to avoid much of the prevalent confusion.

At the suggestion of Prof. C. F. Baker, of Pomona College, Claremont, California, the task of working over several collections of specimens of this family and naming the species was undertaken some months ago. His own collection of over 2,000 specimens, together with the United States National Museum collection of a still larger number, many of which, also, had been collected by Professor Baker, were placed before me for study. My original purpose, of course, was to classify the specimens before me according to the then accepted basis of classification. Much of the material had already been named authentically or else placed in the genus or subfamily where it would naturally fall. In the United States National Museum material were some paratypes and cotypes.

As the work progressed it became more evident that many of the characters used diagnostically were very superficial and subject to considerable variation. In many instances very closely related individuals had to be placed in widely distinct genera, and, again, several specimens placed in as many different genera by whomever had worked on the collection before me were found to belong without a doubt to the same species. Such instances as these naturally forced me to the conclusion that other characters must be found which are more constant.

I suppose that every careful student of this and related groups has been impressed with the same fact and several have attempted a solution of the difficulty, but most have merely followed along the same ruts and expressed the hope that somebody would take the time to work out the true relationships. Having these very extensive collections, which included many known and new species from North, South, and Central America, as well as a considerable number of determined species from Europe, I have been able to work out the relationships a great deal more accurately than one could with only a small collection representing a less extensive distribution. In view of this fact, I have ventured to rearrange the grouping of genera and species to a considerable extent, in the hope that it will prove to be more usable both by the expert and the beginner.

As was stated above, there is great homogeneity in the family and it is, therefore, difficult to find characters which are both constant in subgroups and at the same time usable generally. The trend of the lateral keels of the pronotum, for instance, has been used extensively to separate two large groups of genera, but this trend is variable in a great many of the species, and certainly in many genera at least, and, moreover, is very difficult to appreciate. At one angle they appear to have one trend and at another they have another trend. James Edwards, Mr. Distant, and the late Mr. Kirkaldy, I believe, were right in disregarding this as a good character. Again the shape of the outline of the vertex and frons has been used very extensively, but this, also, is difficult both to describe and to appreciate. The last-named characters, while they are in the main unsuited to generic separation, may in many cases be good secondary specific characters. The venation of the forewings (elytra) is so variable, even in the two wings of the same insect, that it can not be used with any certainty at all.

The object in view, of course, is to find characters which are constant within certain reasonable limits, and, also, may be appreciated by other students besides the one who first uses them. The form and relative lengths of the two antennal segments afford, within certain limits, a usable character. To distinguish genera, however, on a small difference in length of similarly shaped antennæ is wholly without

reason. In all this the personal element is very strong in deciding *what* constitutes a genus and what a species. The number of keels present on the head and thorax is a very reliable character. The form of the hind tibial spur (calcar) is also a constant and easily appreciated character, but unfortunately it has been overlooked by many and not described. The relative lengths of the tibiæ and tarsi was used by Ashmead as a generic character, but this is impossible. The number of lateral spiniform spurs or spines on the hind tibiæ, however, does afford a good character for separating some genera.

The female genitalia are very similar throughout the group, except in one genus, *Stenocranus*, but the genitalia of the male present good specific characters. No doubt the latter might be used for generic diagnosis, as Kirkaldy has done quite extensively, but I have hesitated to use them for such simply because of the difficulty of identifying an isolated female.

Coloration, when rightly used and ample allowance made for variation, is a good *accompanying* specific character, useful more for final identification than for synopses. Unfortunately, it has been used too commonly as an unaccompanied specific character, the result of which has been confused synonymy.

In the large group of genera more or less closely related to the old genus "*Delphax*" or *Liburnia* we find it still more difficult to discover good usable generic criteria. There are plenty of good variational characters which will distinguish species, but it is very difficult to resolve these into generic groupings. If one were working with a more limited collection, I have no doubt that he would easily be able to separate and relate subgroups, as has, in fact, been done already. But with a collection large both in species and in number of specimens in a species one is sure to find species and individuals which fall between two established genera in this group. The cause of this is evident. Genera have been established on characters which completely intergrade, and the dividing line has depended solely on the personal judgment of the various students. Furthermore, it is impossible for one man to convey to another, either by writing or illustration, exactly what he has in mind by such arbitrary ideas as "keels distinct" or "keels evanescent," and where he draws the line between the two.

There is such a thing, too, as "splitting hairs" when it comes to classification, that is, drawing the confining lines of generic groups and species so narrow that it precludes any variation and results in numerous genera and species with the minutest and often absurd differences separating them.

After a very careful study of the large series before me, and with the above ideas in mind, I have arrived at the only logical conclusion, namely, that many of the established genera are not warranted and

should be merged. The most important instance of this is the group of closely related genera *Liburnia*, *Kelisia*, and a few other smaller ones, which have been merged into one, *Megamelus*. True, this makes a very large number of species in one genus, but I maintain that it is easier to identify an unknown individual when these are all in one genus and fully keyed than when they are scattered through a number of genera which overlap and intergrade and only serve to confuse the student. It is true, also, that between the extremes of this large genus there is considerable variation, but unless satisfactory and appreciable lines of separation into genera can be drawn it is far better to consider the group as a whole a genus and treat it as such. A more detailed treatment of this matter will be found under the heading of *Megamelus*.

A description of a new species without figures to illustrate the more important details of structure is in most cases almost worthless—often worse than none at all. It seems to me that it would be better to let a Delphacid go undescribed until somebody could figure it as well as describe it, instead of publishing an inadequate description which might fit several species as well as the one for which it was intended, and thus establish a name of uncertain identity. Words may mean several things and may be interpreted in several ways, but an accurate figure can convey only the one image. Especially is this true of the male genitalia.

Accompanying and supplementing the following descriptions I have added many figures to illustrate exactly what was intended to be conveyed by the wording. These figures have mostly been drawn to scale, and will show the relative size of the insects. In most cases these are merely outline drawings.

In the collections are a number of female specimens which apparently belong to undescribed species, but I have chosen to leave most of these unnamed for the present until their males are found, for the description of a new species based only on the female is usually very unsatisfactory in many groups of the Homoptera.

#### EXPLANATION OF TERMS.

Perhaps a brief explanation of certain terms employed in the following descriptions would not be amiss here, especially of the male genitalia. *Pygofers* refers to the genital segment which usually is in the form more or less of a cylinder; the *anal tube* is the circular piece surrounding the *anal style*, which is usually the most posterior organ; the *genital styles* are the paired claspers within the aperture of the pygofers and are very variable in shape; the *penis* (so called), when visible, projects ventrad from below the lower margin of the anal tube. The other terms are easily understood.

I desire here to acknowledge with hearty thanks the constant assistance and advice which Prof. C. F. Baker has given to me in this work, as well as his kindness in placing all his collections before me. My thanks are, also, due to Dr. V. L. Kellogg, under whose supervision this work has been done at the university, and to Prof. R. W. Doane, also of this university. I wish to acknowledge, also, my thanks to Dr. L. O. Howard for his kindness in procuring for me the material from the United States National Museum for study.

#### DESCRIPTION OF FAMILY.

The following is a brief description of the principal characters of the family Delphacidae:

Small insects, varying from about 2 to 10 or 12 mm., rather elongate; eyes large, hemispherical, usually deeply emarginate below at base of antennæ; head and thorax conspicuously keeled, keels variable in number, extent, and prominence; frons usually longer than broad; clypeus triangular; rostrum long; antennæ always two-jointed, variable in form and length, with a long seta at tip of II; ocelli two, at base of each gena near lower margin of eye. Pronotum tricarinate, about as long as vertex, extending down on each side almost to base of forecoxæ; scutellum longer, acute between elytra, three to five carinate. Legs rather long and slender; fore and middle coxæ long, almost as long as femora; hind coxæ large, stout, with a small tooth posteriorly; hind tibiæ with two to five lateral spiniform spurs or spines, and a large, movable spur (calcar) at apex; latter variable in form from spiniform or cultrate to tectiform with margin dentate; tarsi three, basal one the longest. Elytra of two types, brachypterous and macropterous; former may reach less than halfway to tip of abdomen or more, truncate at apex, obscurely veined; latter longer than abdomen, often setigerous on veins, venation variable; clavus with two veins joined apically; corium with three at base, all but one usually branched apically; membrane with four to seven more or less branched veins. Wings sometimes wanting or reduced, usually nearly as long as elytra, hyaline and folded once. Abdomen about as long as thorax; male genital segment usually more or less cylindrical, truncate at apex, with a pair of claspers (genital styles) and anal tube within aperture. Female genitalia ventral, consisting of a long, usually cylindrical, acute, ovipositor sheath which reaches to the tip of the abdomen; anal tube at tip of abdomen.

The following synopses are not as complete and satisfactory as they ought to be, but in many cases I have had only the inadequate descriptions to base them on, and consequently they may be more or less imperfect. Some of the American species I have not been able



to see and the descriptions of some of them are so inadequate that they can not be included in the synopses. These, however, I have listed where they probably belong. It might be well to suggest that in using these keys it will be necessary to run down in both subheads where the characterization is rather variable or intergrades. In several cases the same species has been included in two places in the synopsis.

## KEY TO THE AMERICAN GENERA.

- a*<sup>1</sup>. Post-tibial spur (calcar) not foliaceous or bilaminate, usually spiniform or cultrate.
- b*<sup>1</sup>. Calcar without teeth, terete, spiniform, acute at tip.
- c*<sup>1</sup>. Antennæ very long, flattened, foliaceous, I nearly as long as II; scutellum tricarinate; elytra very conspicuously asperose; frons tricarinate.  
*Copicerus* Swartz.
- c*<sup>2</sup>. Antennæ shorter, terete, I distinctly shorter than II; frons with two median carinæ.
- d*<sup>1</sup>. Body large; frons very broad; scutellum 5-carinate; male genitalia terminal instead of subventral.....*Pentagramma* Van Duzee.
- d*<sup>2</sup>. Body slender, smaller; frons narrow, elongate; scutellum tricarinate.  
*Lepticus*, new genus.
- b*<sup>2</sup>. Calcar not spiniform, with or without teeth; frons tricarinate.
- c*<sup>1</sup>. Antennæ terete.
- d*<sup>1</sup>. Calcar subcultrate, triangular prismatic, without teeth, acute at tip; scutellum 5-carinate; elytra very asperose; hind tibiæ with 4 lateral spines.
- e*<sup>1</sup>. Elytra with a large stigma on margin of corium; frons rather narrow; eyes not emarginate beneath.....*Eucanyra*, new genus.
- e*<sup>2</sup>. Elytra without stigma; frons conspicuously broadened at clypeus.  
*Epibidis* Fowler.
- d*<sup>2</sup>. Calcar with a row of teeth posteriorly; hind tibiæ with less than 4 lateral spines; scutellum tricarinate; elytra without stigma.
- e*<sup>1</sup>. Antennæ very short, segments subequal; calcar with 3 long teeth, apparently trifid; hind tibiæ trispinose.....*Dichoneura* Lethierry.
- e*<sup>2</sup>. Antennæ longer, as long as frons, I shorter than II; calcar with a row of about 8 teeth; hind tibiæ bispinose; vertex produced in front.  
*Proterosydne* Kirkaldy.
- c*<sup>2</sup>. Antennæ compressed; head very broad, sometimes broader than thorax.
- d*<sup>1</sup>. Antennæ seldom longer than width between antennal insertions; median frontal carina forked at apex of head; calcar long, cultrate, with a row of 7 to 11 coarse teeth on margin.....*Stobaera* Stål.
- d*<sup>2</sup>. Antennæ distinctly longer than width between bases, carinately foliaceous; median frontal carina forked below apex of head, branches widely separated; genæ almost obsolete; calcar large and broad, three-sided, each side flat, not foliaceous, with a number of very minute spines, scarcely visible, on one edge.....*Cochise* Kirkaldy.
- r*<sup>2</sup>. Calcar bilaminate or tectiform, more or less foliaceous, with one face more or less concave, posterior margin usually finely or coarsely dentate.
- b*<sup>1</sup>. Basal antennal segment compressed, second compressed or terete; antennæ long, prominent; head transverse, at least as broad as pronotum.
- c*<sup>1</sup>. Basal antennal segment longer than second; anterior femora compressed; head not broader than prothorax; clypeus normal; frons tricarinate.  
*Delphax* Fabricius.

- c<sup>2</sup>. Basal antennal segment shorter than second; anterior femora normal; head broader than prothorax; clypeus with a cone-shaped process in front; frons with two median carinæ..... *Bostaera* Ball.
- b<sup>2</sup>. Both segments of antennæ terete, I shorter than II.
- c<sup>1</sup>. Frons, notum and abdomen with prominent pits.
- d<sup>1</sup>. Frontal carinæ forked near clypeus..... *Achorotile* Fieber.
- d<sup>2</sup>. Frontal carinæ forked at apex of head..... *Laccocera* Van Duzee.
- c<sup>2</sup>. Pits wanting, except obscurely present in some species of *Phyllodinus*.
- d<sup>1</sup>. Frons with two median carinæ over entire length, usually separating at or near clypeal margin, roundly arcuate outward; carinæ sometimes evanescent; head broad..... *Jassidaeus* Fieber.
- d<sup>2</sup>. Frons with one median carina, forked, if at all, at or somewhat below apex of head.
- e<sup>1</sup>. Anterior and intermediate femora and tibiæ greatly compressed and foliaceous; head broad; frontal carina forked a little below apex of head. *Phyllodinus* Van Duzee.
- e<sup>2</sup>. Anterior and middle femora and tibiæ normal.
- f<sup>1</sup>. Frontal carina percurrent to posterior margin of vertex without oblique transverse carinæ connecting it to lateral carinæ. *Liburniella*, new genus.
- f<sup>2</sup>. Frontal carinæ forked at or below apex of head and connected obliquely with lateral carinæ of vertex.
- g<sup>1</sup>. Carinæ of head subobsolete, often scarcely discernible; vertex very broad, rounded in front; frons broad..... *Kormus* Fieber.
- g<sup>2</sup>. Carinæ of head always visible, usually rather strong and prominent, sometimes evanescent on apex of head.
- h<sup>1</sup>. Vertex elongate, often twice as long as wide or more, produced at least one-third before eyes, sometimes greatly so; calcar seldom spoon-shaped, with margins usually rather close together and dense pubescence between; female ovipositor sheath often conspicuously broadened..... *Stenocranus* Fieber.
- h<sup>2</sup>. Vertex less or not elongate, produced only a little before eyes; calcar usually spoon-shaped, with margins more or less separated, with or without pubescence between.
- i<sup>1</sup>. Frons and vertex meeting at an acute angle at apex of head with a semblance of a transverse carina on apex.. *Megamelanus* Ball.
- i<sup>2</sup>. Head dorso-ventrally rounded, not acutely angled as above; carinæ sometimes evanescent on apex of head.
- j<sup>1</sup>. Median carina of frons forked distinctly below apex of head, from one-fourth to one-half its length below; vertex usually moderately broad.
- k<sup>1</sup>. Frons almost circular, short; genæ not plane, ridged transversely below ocelli; antennæ exceedingly short, stout; calcar very short, thick..... *Bakerella*, new genus.
- k<sup>2</sup>. Frons elongate, more or less rectangular, longer than broad; genæ plane; antennæ longer; calcar normal. *Dicranotropis* Fieber.
- j<sup>2</sup>. Median carina forked at or near apex of head (except in *L. albolineosa* often below); vertex usually rather narrow, sometimes broad; carinæ variable from very conspicuous and sharp to evanescent..... *Megamelus* Fieber.

## DESCRIPTION OF GENERA AND SPECIES.

## Genus COPICERUS Swartz.

*Jeralia* GUERIN.*Holatus* WALKER.

Body relatively large. Cephalic and thoracic carinæ not very strong; frons tricarinate, moderately broad between eyes; clypeus tricarinate; eyes deeply emarginate beneath. Antennæ very large, long, foliaceous, and thin, thinner on superior margin than below, coarsely pubescent; second segment longer than first; flagellum long. Pronotum moderately long. Scutellum tricarinate, long. Legs long; femora scarcely enlarged; calcar long, spiniform, terete, acute at tip, slightly pubescent; hind tibiæ with three lateral spines. Elytra long, more or less maculate, veins darkly setigerous on black tubercles; venation variable, with more veins in membrane than in most other genera.

*Type of genus.*—*Copicerus irroratus* Swartz.

This genus is easily distinguishable by its unusually large and foliaceous antennæ and large elytra. Its distribution seems to be entirely southern.

## COPICERUS IRRORATUS Swartz.

Plate 44, figs. A-F, H-K.

*Copicerus irroratus* SWARTZ '02: 81.—STÅL '57: 338.—VAN DUZEE '97: 230.—SWEZEY '04: 31.—FOWLER '81: 130.

*Jeralia singula* WALKER '85: 85.

*Copicerus swartzii* STÅL '57: 339.

Length of body 4.7 mm.; width of vertex between eyes 2.5; greatest width of frons 3.5; length of antennæ: I, 1.3; II, 1.8. General color brown to dark brown; frons with several black spots; antennæ and legs spotted with black; elytra black, setigerous-punctate.

Head moderately large, carinæ rather inconspicuous; vertex rather broad; frons broadest at apex; clypeus long. Eyes large, black, deeply emarginate beneath. Antennæ long, very prominent, more than half as long as entire body; I constricted at base and apex, II narrower apically, a little longer than I; flagellum almost as long as I.

Thorax broad, punctate; pronotum long with a shallow fovea on each side; lateral carinæ short, inconspicuous; scutellum long, more deeply and closely punctate laterad than dorsad. Legs long, banded with black; calcar long, very acute at tip, slightly pubescent. Elytra very long, large, brownish, with an oblique brown macula over apical cells and lighter area on costal margin midway between base and apex; veins set closely with setigerous tubercles and a small brown spot around each tubercle; corium lighter in color.

Abdomen long, depressed, oval.



Male pygofers large, aperture rather circular; anal tube enlarged apically; genital styles contiguous, or nearly so, on enlarged basal portion, apically slender, arcuate, acuminate, almost touching at tip.

Redescribed from numerous males and females from the following localities: Jamaica (Van Duzee), Mexico (Baker), Jalapa, Vera Cruz, Chiapas, Guadalajara, Mexico (Crawford), Belize, British Honduras (J. D. Johnson), Nicaragua (Baker), and St. Louis, Mo., (Baker). The specimens from Nicaragua had been determined by Melichar as *C. swartzii*. The specimens from Mexico are uniformly much darker than the rest, both on body surface and elytra. Throughout the series there is a gradual variation in the coloration of the frons from brownish with black dots and spots to entirely black with perhaps a few lighter spots very small in extent. The body surface, also, is widely but gradually variable, so that neither of these characters can be used to separate species, as was done by Stal in describing his species *swartzii*. This species, both according to authentically determined specimens and the original description, is not distinct in any way, and therefore becomes a synonym. The species is apparently limited to the Tropics and the southern portion of this country. In all the series there are no brachypterous specimens.

COPICERUS IRRORATUS THORACICUS Guerin.

*Copicerus thoracicus* GUERIN in literature.

Seven specimens from Havana and Cayamas, Cuba (Baker), have been determined as *C. thoracicus* Guerin, but are not specifically distinct from the above species. The following differences are constant enough to warrant its separation as a varietal form, however. Body uniformly smaller, more slender; median frontal carina rather conspicuously raised, much more so than in species.

COPICERUS INSIGNICORNIS Lethierry.

*Asiraca insignicornis* LETHIERRY '90: 150.

This species was described as belonging to the genus *Asiraca*, but by the description it is easy to recognize it as a *Copicerus*. Perhaps it is the same species as the tropical *irroratus*, but until further evidence is obtainable it will remain as a distinct species.

Locality: Venezuela, South America.

Genus PENTAGRAMMA Van Duzee.

Body robust, very large. Head large, broad, about as broad as prothorax; vertex longer than broad, produced a little before eyes, sides rather straight, subparallel, rounded in front; frons broadly ovate, broadest at ocelli, with two median carinæ over entire length passing separately onto vertex, diverging and following the curve of frontal sides; carinæ not sharp; apex of head tumid; face convex; clypeus long, large, convex; genæ large. Eyes large, not deeply

emarginate below. Antennæ rather long, terete, II much longer than I. Pronotum tricarinate, laterals extending outward behind eyes, not reaching hind margin; scutellum 5-carinate, carinæ not prominent. Legs large, long; hind tibiæ with three lateral spines; calcar terete, spiniform, acute at tip; hind tarsi long. Elytra reaching at least to tip of abdomen. Male genital segment elongate; genital styles peculiarly ventral instead of terminal, as in most genera; anal style in both sexes very elongate.

*Type of genus*—*Pentagramma vittatifrons* Uhler.

This genus differs markedly from the others of the subfamily in regard to the male genital characters. In the other genera the tip of the abdomen is broadly truncate vertically with the genital styles and other organs subvertical; in this genus the abdomen is not truncate but converges to the anal tube in a straight line, with the genital styles inferior and directed backward instead of upward.

PENTAGRAMMA BIVITTATA, new species.

Plate 44, figs. L, M, O.

Length of body, female 6.8 mm.; male 5.6; width of vertex between eyes 0.53; greatest width of frons 0.69; length of antennæ, I, 0.23; II, 0.55. General color green; frons greenish brown, with a light green band across clypeal margin and another arcuately across middle; inner face of forecoxæ and mesopleuræ with a black spot; a small brownish area sometimes present between antennæ and frons; antennæ and legs lineated with black.

Head very broad, slightly broader than prothorax; vertex very slightly longer than broad, produced slightly beyond eyes, rather straight in front, tumid; frons about one and a third times as long as broad, convex; median carinæ moderately prominent, not sharp, indistinct at apex of head, parallel with sides, a little broader at apical margin than at base. Eyes large, long, scarcely emarginate beneath but facets wanting on corresponding area. Antennæ terete, slightly pilose, I more than one-third as long as II.

Thorax very large, broad; pronotum rather deeply and angularly emarginate behind, straight in front, lateral carinæ not prominent; scutellar carinæ indistinct; tegulæ large, prominent. Legs long, large; tibial spines large, black; calcar long, acute. Elytra reaching slightly beyond tip of abdomen, especially in female, subhyaline, not maculated; outer cubital not forked at apex.

Abdomen long in both sexes, tapering uniformly to apex.

Male pygofers long, converging evenly to tip; anal tube long, open beneath; anal style long, acute; genital styles simple, stout, large at base, not very acute at apex, arched.

Described from 7 males and 18 females from Managua, Nicaragua (Baker). This species is closely allied to the more northern *vittati-*

*frons* Uhler, differing in the width of the head, the relative lengths of the antennal segments, the banding of the frons, etc. The geographical distribution seems to indicate a distinct species, also.

*Type-specimen*.—In collection of Pomona College.

PENTAGRAMMA MINORE, new species.

Plate 44, figs. P, Q.

Length of body, female 6.3 mm.; male 5.3; width of vertex 0.62; width of frons 0.75; antennæ, I, 0.16, II, 0.41. General color green, male lighter than female; black spots and lineations as in *bivittata*; frons with two narrow darker bands above middle, more conspicuous on male, with a prominent black spot between antennæ and frons as in *vittatifrons*.

General characters similar to *bivittata*, differing as follows: Body smaller; head not broader than pronotum; vertex somewhat longer than broad, more so than in related species; median carinæ less conspicuous at apex of head, almost obsolete; frons almost circular, as broad as long, clypeal margin but slightly broader than basal; antennæ, I about one-fourth as long as II. Pronotum almost half as long as scutellum; scutellar carinæ moderately prominent. Elytra relatively shorter, scarcely reaching to tip of abdomen, venation similar. Anal tube differing slightly in structure; anal style very long; genital styles smaller, more slender, acute at tip, smaller at base. Female ovipositor sheath more densely pubescent; anal tergite of abdomen conspicuously broader than genital segment.

Described from one male from Sheridan, Wyoming, and one female from Banner, Wyoming, coll. C. W. Metz.

*Type-specimen*.—In collection of Pomona College.

PENTAGRAMMA VITTATIFRONS Uhler.

*Pentagramma vittatifrons* VAN DUZEE '97:260.—SWEZEY '04:42.

*Locality*.—New Jersey, New York, Maryland, Illinois, Dakota, Montana.

Genus LEPTICUS, new genus (?)

Head long, about as broad as prothorax, quite strongly carinate; vertex very slender, at least twice as long as broad, narrowed in front, produced greatly beyond eyes; frons very broad in proportion to vertex and abruptly broadened, with two median carinæ subparallel to rounded sides and close above; eyes large, not emarginate below; antennæ moderately long, reaching beyond clypeal margin, terete, II at least three times as long as I. Thorax moderately broad, quite long; lateral carinæ of pronotum curved out, not reaching hind margin; legs moderately long; calcar rather short, terete, spiniform. acute; hind tibiæ with three lateral spines.

*Type of genus*.—*Lepticus oculatus*, new species.

This genus is erected, provisionally, for a species of which only one immature male is known. Although this may not ordinarily be good policy, yet in this instance it is justifiable for the reason that the specimen at hand is a nymph of a very late instar, and also because the principal generic characters used here happen to be about the same for adult and late nymph. This is made a doubtful genus because it is based upon an immature specimen.

**LEPTICUS OCULATUS**, new species.

Plate 45, fig. A.

Length of body, 3.5 mm.; width of vertex, 0.22; width of frons, 0.5; antennæ, I, 0.13; II, 0.28. General color light brown, eyes darker; frons dark reddish brown with a white band across clypeal margin and an arcuate band across midway; antennæ light brown with dark longitudinal stripes; legs lighter.

Head long, fully as broad as prothorax, strongly carinate; vertex about two and a half times as long as broad, apical half converging narrowly, nearly one-third its length beyond eyes; frons abruptly broadened, easily visible from above on each side of vertex, with two median carinæ well separated, close together above, parallel with sides; about two and a third times as long as broad, equally broad above and below, ovate; genæ small; clypeus large; eyes very large, long, bulging with no emargination nor absence of facets beneath; antennæ moderately long, terete, I short, about one-fourth as long as II.

Thorax quite long; pronotum extending well forward between eyes. Legs moderately long; hind tibiæ with three very short lateral spines; calcar a little more than half as long as basal tarsus. Abdomen long, genitalia immature.

Described from one male in a late nymphal instar, from Managua, Nicaragua (Baker). Being immature, it has numerous pits on the frons, notum, and abdomen, as in many immature Fulgorids, but whether or not the mature forms retain these is not known.

*Type-specimen*.—In collection of Pomona College.

After the last nymphal moult the thorax takes on a totally different aspect, so that the description of that had to be omitted from the above. The head, however, remains approximately the same, hence these characters are valid. In most nymphs of Delphacidæ the tarsi are all three-segmented as in the adults; in this species the first two pairs are two-segmented.

**Genus EUCANYRA**, new genus.

Vertex narrow, protruding beyond eyes; frons not broad, tricarinate, rather long; rostrum long; eyes large, entire, not emarginate beneath, but some facets wanting above antennal insertion; antennæ long, prominent, terete, second segment longer than first, often tuberculate. Prothorax short, tricarinate; scutellum large, broad,

5-carinate. Elytra large, often maculate, with a large black stigma between corium and membrane in front. Legs long; calcar very long, slender, triangular-prismatic, slightly pubescent, acute at tip; hind tibiæ with four lateral spines.

*Type of genus.*—*Eucanyra stigmata*, new species.

This genus is easily distinguishable by the large size and entire eyes, the terete antennæ, and stigmatic elytra.

EUCANYRA STIGMATA, new species.

Plate 44, figs. G, N, R, S.

Length of body, 3.4 mm.; length of elytra, 6.6; width of vertex, 0.26; width of frons, 0.60; antennæ, I, 0.65; II, 0.97. General color brown, usually dark, more or less variegated with yellowish brown on pleura. Body very large.

Head quite large, broad, carinæ very conspicuous; vertex narrow between eyes; frons long, narrowed above, broadest at apex; clypeus long; eyes very large, prominent; antennæ long, II about one and one-half times as long as I, very much roughened.

Thorax large, robust; pronotum short, especially so behind eyes, lateral carinæ flexed out behind eyes and extending nearly to hind margin; scutellum broad, long. Hind legs very long; calcar elongate. Elytra large, broad, somewhat coriaceous, rounded at apex, veins setigerous, maculate; membrane with eight veins, the third, fifth, and sixth once forked; with a large triangular pterostigma on front margin between corium and membrane.

Abdomen depressed, large.

*Male.*—Anal segment long, slender, cylindrical; anal tube tapering to apex; genital styles simple, arched laterally, subacute at tip, divergent somewhat.

Described from one macropterous male collected at Belize, British Honduras, by J. D. Johnson.

*Type-specimen*—In collection of Pomona College.

Genus EPIBIDIS Fowler.

This genus was described by Fowler as follows:

Body somewhat elongate, subparallel, with vertex narrow, distinctly longer than broad and produced in front of eyes (anterior margin viewed from above seems to be notched); forehead and clypeus long and narrow, broadest about the middle, carinate and plainly margined; antennæ elongate, with first joint long and smooth, second scarcely longer than first, asperate, with warty, white excrescences and very short and strong thick setæ; last joint setiform, longer than I and II together; pronotum obtusely produced between the eyes, carinate. Scutellum large, three times as long as pronotum, 5-carinate. Elytra rather long, veins rather fine, more or less strongly granulate, claval vein not reaching apex of clavus, but joining suture before it. Legs long, posterior tibiæ with 4 or 5 spines, 1 near the base.

*Type of genus.*—*Epididis godmani* Fowler.

This genus, according to Fowler, comes near *Bidis* Walker (*Hygyops* and *Ugyops*). The new genus *Eucanyra* is rather closely related to



this, but differs in the points mentioned in the synopsis of the genera. After an examination of the original specimens in the United States National Museum, I would add the following to the above description: Frons distinctly broadened above clypeus; median carinæ forked a little below apex of head. Calcar long, triangular-prismatic, faces flat, acute at tip, finely pubescent; hind tibiæ with four lateral spines. Male genitalia resembling somewhat *Eucanyra*, but narrower and longer.

EPIBIDIS GODMANI Fowler.

*Epibidis godmani* FOWLER '81: 131.

*Locality*.—Panama.

EPIBIDIS BRUNNEA Fowler.

*Epibidis brunnea* FOWLER '81: 132.

*Locality*.—Panama.

Genus DICHONEURA Lethierry.

Lethierry described this genus as follows:

Vertex triangular, as long as broad, produced in front before eyes, base and sides carinate, elevated, apex obtusely angled; frons three times as long as broad, tricarinate; lateral carinæ slender, sharp, median broad, convex. Antennæ very short, joints equal in length, each as thick as long, not extending beyond lateral frontal carina; terminal seta long. Elytra long, much longer than abdomen, apex rounded. Hind tibiæ trispinose and numerous setæ and spines between; calcar double, inner one small, trifid; the outer, simple and terminal.

*Type of genus*.—*Dichoneura simoni* Lethierry.

According to Lethierry this genus is "near *Delphax* Fabr." It differs sharply in the hind tibiæ, however, from *Liburnia*, having three lateral spines instead of two, and the calcar, according to the description, is quite unique. It is probably cultrate with three large teeth on hind margin, giving the appearance of being trifid. For the present, at least, I have related it to *Proterosydne*, another tropical genus.

DICHONEURA SIMONI Lethierry.

*Dichoneura simoni* LETHIERRY '90: 152.

*Locality*.—San Esteban, Venezuela.

Genus PROTEROSYDNE Kirkaldy.

Head rather narrow, more or less produced before eyes; vertex square or elongate, concave, median carina wanting or indistinct, laterals high; frons sometimes narrowed above, tricarinate; antennæ longer than frons, terete, I much longer than II. Pronotum long, lateral carinæ straight; scutellum tricarinate; legs long; hind tibiæ bispinose; calcar subterete, cultrate, with a row of about eight teeth on hind margin; basal tarsus very long. Elytra long, rather narrow.

*Type of genus*.—*Proterosydne arborea* Kirkaldy.

The one Hawaiian species, the type, does not agree in all details with the American species which I include in the genus, but there is such a marked relationship between the two that it does not seem necessary to erect a new genus for our species.

PROTEROSYDNE PICTIFRONS Stål.

Plate 45, figs. D-H; plate 49 M.

*Delphax pictifrons* STÅL '64: 50.—VAN DUZEE '97:261.

*Hyygops pictifrons* STÅL '70:747.

Length of body 4.8 mm.; width of vertex 0.25; width of frons 0.36; antennæ, I, 0.19, II, 0.45. General color light fulvous; frons with a broad white band, surrounded by red, very conspicuous; a similar spot on each side of pronotum just above base of coxæ.

Head with eyes fully as broad as prothorax; vertex elongate, narrow, subrectangular, produced two-sevenths of its length beyond eyes, with lateral carinæ strong behind eyes; median carina almost wanting; frons tricarinate, moderately long, narrow above, conspicuously broadened midway, somewhat bell-shaped, almost twice as broad at apex as at base; sides parallel on lower half; clypeus large, convex, weakly carinate. Eyes large, not deeply emarginate below. Antennæ at least as long as width of head between antennal sockets, I almost half as long as II.

Thorax rather slender; pronotum slightly more than one-third as long as scutellum, broadly emarginate behind; scutellum rather weakly carinate. Hind tibiæ with two short lateral spines; calcar half as long as elongate basal tarsus, coarsely 8-dentate, acute at tip. Elytra very elongate, narrow, subhyaline, veins somewhat setigerous but not conspicuously so.

Male genital segment large; viewed laterally, constricted midway and long above and below; with a tubular epiphysis at base of genital styles produced upward into a short acute style; sides of pygofer produced above into long, posterior projections more or less encircling anal tube; anal tube and style long; genital styles not long, stout, simple, acute, and incurved at apex.

Redescribed from one female from Belize, B. Honduras (Johnson), and a pair from Managua, Nicaragua (Baker). This was placed by Van Duzee<sup>1</sup> as a species of unknown position.

Genus STOBAERA Stål.

*Goniolecium* FOWLER, Biol. Centr. Amer., 1881, p. 132.

Head about as broad as pronotum, sometimes considerably broader or somewhat narrower, rather strongly carinate; vertex broad, seldom longer than broad, straight on front margin, slightly produced before eyes; frons longer than broad, sides straight or rounded, tricarinate; eyes deeply emarginate below; antennæ compressed, rather

<sup>1</sup> See 97: 261.

short, seldom longer than width of head between antennal sockets. Pronotum tricarinate, lateral carinæ flexed out behind eyes and abruptly angulate apically and reaching hind margin; scutellum tricarinate; elytra setigerous on veins, large, broad at apex. Legs long; calcar cultrate, with a row of 6 to 10 teeth on hind margin.

*Type of genus.*—*Stobaera tricarinata* Say.

Stal erected this genus in 1859 for the species *Delphax concinna*,<sup>1</sup> a Mexican species. This is beyond doubt identical with *Delphax tricarinata* Say (1829) and therefore, the type of *Stobaera* must be *tricarinata* Say. Van Duzee, in describing this genus, ascribed to it the character of the head being narrower than pronotum which is seldom the case in the type species and almost never in the southern forms previously known as *concinna* Stal. Stal's African genus, *Amblycotis*, is apparently closely related to some of the members of this genus, notably *S. pallida* Osborn.

Fowler's Central American genus, *Goniolcium*, is apparently identical with *Stobaera*, judging from his description.

KEY TO THE SPECIES.

- a*<sup>1</sup>. Frons rectangular, sides subparallel; vertex only slightly broader than long or square; antennæ compressed; carinæ strong; frons usually dark above and below, light between, markings variable.
- b*<sup>1</sup>. Elytra long, pale, with a brown, crescent-shaped band apically. . . . . *tricarinata* Say.
- b*<sup>2</sup>. Elytra short, entirely brown, except anterior margin narrowly hyaline. . . . . *nigripennis*, new species.
- a*<sup>2</sup>. Frons not rectangular, broadened midway; vertex broader than long.
- b*<sup>1</sup>. Antennæ compressed, short; frons considerably broadened, narrowed below, with numerous short, transverse, white markings; vertex much broader than long; head sometimes broader than mesothorax; carinæ strong; elytra long, square at apex. . . . . *pallida* Osborn.
- b*<sup>2</sup>. Antennæ only slightly compressed, almost terete; frons not greatly broadened, pale; vertex broader than long, weakly carinate; fourth abdominal tergite with two black tubercles on each side; elytra short, not covering abdomen. . . . . *quadripustulata* Van Duzee.

STOBAERA TRICARINATA Say.

Plate 45, figs. I-K, O; plate 49, fig. K.

*Delphax tricarinata* SAY '25: 337.—LECONTE '59: 255.—UHLER '75: 352.—VAN DUZEE '90: 389.—OSBORN '92: 127.

*Conomelus tricarinatus* VAN DUZEE '97: 191.

*Stobaera tricarinata* VAN DUZEE '97: 245.—SMITH '99: 89.—OSBORN '00: 64.—FORBES '00: 413.

*Stobaera bifasciata* PROVANCHER '90: 337.—VAN DUZEE '97: 244.

*Stobaera concinna* STÅL '59: 327.—VAN DUZEE '97: 246.

*Stobaera minuta* OSBORN '05: 376.

*Stobaera affinis* VAN DUZEE '08: 99.

Average length of body 3.4 mm.; width of vertex, 0.31; width of frons 0.26; length of antennæ, I, 0.22, II, 0.42. General color

<sup>1</sup> Berl. Ent. Zeit., vol. 3, 1859, p. 327.

variable from light brown to very dark brown or piceous; vertex, pronotum, scutellum between lateral carinæ usually lighter brown; frons brown above ocelli, light to whitish on middle third, usually brown or blotched on lower third, often whitish; genæ variable from mostly brown to blotched or almost white; abdomen dark; legs light, banded with black; elytra brownish, with a semicircular macula on posterior half of membrane, usually an oblique band on anterior half of membrane, and several spots extending obliquely across clavus and corium; this maculation is within certain limits rather constant and characteristic. Body moderately large, rather broad, variable from 3 to 5 mm. to tip of folded elytra.

Head rather short, with eyes about as broad as prothorax, sometimes slightly or distinctly narrower, oftener as broad or broader, strongly carinate; vertex as long as pronotum or slightly longer, as broad or broader than long, usually narrowed between eyes and somewhat produced before them; lateral carinæ often very much elevated with sharp carina behind eyes; front margin of vertex variable from almost straight to angulate; frons long, usually rather slender, varying from two to two and three-fourths times as long as broad, sometimes slightly broadened between eyes, converging slightly to apex; median carina forked at apex of head; eyes large, deeply emarginate beneath. Antennæ varying in length from one-half to one and a fourth times as long as width of head between antennal sockets; I compressed, broader than II, or fully as broad, from two-thirds to three-fourths as long; II subterete, somewhat compressed basally, very rough.

Thorax rather long, strongly carinate; pronotum from more than one-third to one-fifth as long as scutellum; posterior margin emarginate and sharply angled at center; lateral carinæ angled sharply apically and extending to posterior margin; scutellum long, acute; forefemora slender, subterete to angled; hind tibiæ slender, long; calcar from one-half to two-thirds as long as basal tarsus, hind margin coarsely 7 to 10 dentate. Elytra long, maculate, somewhat squared at apex.

Male pygofers broad, short; anal tube with an acute, recurved process on ventral margin, variable in length from one-third the diameter of anal tube to twice that length, and from slender to board and stout; anal style moderately long; genital styles variable in length, sinuate, usually enlarged subapically and often more or less compressed, constricted beyond subapical enlargement, apex broadened, compressed, produced on each side into an acute tooth; sometimes pulverulent; with a slender process at base of each style.

Redescribed from more than 200 males and females from the following widely separated localities: In the United States—Pennsylvania (Wirtner); Virginia, Illinois, Minnesota (Baker); Kentucky (Riley)

on *Monophylla* sp.; Arkansas (Hubbard); Missouri (Brown); Alabama (Baker); Colorado (Baker); Arizona (Baker); California (Baker). South of United States—Habana, Cuba (Baker); Guadaluajara, Jalapa, Orizaba, Puebla, Oaxaca, Cuernavaca, all Mexico (Crawford); Guatemala (Baker); and Nicaragua (Baker).

Apparently this species has a very wide distribution, and, as might be expected, more or less variation occurs within the species. Van Duzee retains as valid Stal's species *concinna* as distinct from the more northern form *tricarinata* Say. A careful and minute study has been made of the above series of over 200 specimens from the many and varied localities enumerated above, and curves plotted for all the variation characters, namely, the variations in the genital styles, the calcar, relative length and size of frons, vertex, pronotum, scutellum, and antennæ. If one were to study the forms from Pennsylvania and those from Nicaragua they would probably be separated as two distinct, though similar, species. With all the intermediate localities represented in the series, however, the curves become continuous, and it is at once impossible to recognize the southern forms as distinct.

There seems to be a general division, not at all sharp, of the series as represented here into three groups, falling geographically into the faunistic regions of the North and West of the United States and northern Mexico, the extreme Southeast of the United States and Cuba, and southern Mexico and Central America. In a very general and loose way it may be said that the individuals of the first region show a tendency toward the following groups of characters: Short-petioled, smaller, pulverulent genital styles, relatively longer pronotum, longer frons, long or short antennæ, larger calcar; those in the second region: styles as above, pronotum shorter, frons intermediate, antennæ shorter, calcar shorter; those in the far south region (formerly known as *concinna* Stal): longer-petioled, larger, nonpulverulent styles, shorter pronotum and frons, longer antennæ, smaller calcar. These divisions shade into each other very intricately and can not be called even varietally distinct. In the study of specimens in the future these geographic divisions may be borne in mind to some advantage. The most characteristic mark of the species is the maculation of the elytra, although to a certain extent this also is variable, and the form of the male genitalia.

The largest percentage of the specimens studied are macropterous; fourteen specimens from Kentucky (collected in May) and several from California are semibrachypterous, having the membrane about half the normal length and reaching only slightly beyond the anus. In these forms the relative measurements are slightly different, as is usually the case in brachypterous specimens. The scutellum is relatively shorter, vertex broader, head often a little narrower than prothorax. The short membrane may or may not be maculate. There are no really brachypterous specimens in the whole lot.



Previous students in this group have used coloration very largely in drawing the specific lines. As a matter of fact, this character is useless for that purpose, since any variation of pigmentation may be found among the immense series of specimens. The frons varies from almost entirely brown or dark colored with at least a narrow band across the middle lighter than the rest, through a long and gradual series in which the dark area is more and more replaced by light, often with the effect of blotching, to a condition wherein all the brown below the ocelli has disappeared, leaving the lower two-thirds and most of the genæ creamy white. I have no doubt that *S. bifasciata* Provancher is a part of this series, since it was separated chiefly on "the pale front."

Among the series is a lot of a score or more specimens collected in California (exact locality unknown) which, considered alone, might be placed in a distinct species because of the smaller size of the body, the shorter antennæ, and the absence of the lower band of brown on frons. But here, again, there is no possible line of division, as the curves show.

STOBAERA PALLIDA Osborn.

Plate 47, fig. C.

*Stobaera pallida* OSBORN '05:375, 47.—VAN DUZEE '08:200.

Length of body, 2.8 mm.; width of vertex, 0.38; width of frons, 0.38; antennæ, I, 0.16, II, 0.27. General color light brown; frons with several short white transverse markings; elytra light brown, maculated in male somewhat similarly to *tricarinata*. Body robust. Head very broad, sometimes broader than entire thorax, strongly carinate; vertex broader than long, square at apex, sides narrowed between eyes; frons widened to ocelli, then abruptly narrowed considerably to apex, narrower below than above, more than half as broad as long; antennæ reaching to clypeus, broad, II a little longer than I; eyes deeply emarginate beneath.

Pronotum moderately long, angulation of lateral carinæ rather prominent; hind margin crispate or crimped on lateral half of each side; scutellum broad. Legs rather short, stout; calcar more than half as long as basal tarsus. Elytra somewhat convex, square at apex.

Male pygofers similar to *tricarinata*; styles long, slender, acute, apex curved in sharply and hook shaped, with an inner needlelike process below hook.

Described from two males and two females, all macropterous, one female from Nassau, Florida (E. A. Schwarz), and the others from Bayville, New York, on *Baccharis halimifolia*. Osborn's specimens were from Delaware and Maryland on the same plant. This suggests somewhat Stal's African genus, *Amblycotis*.

## STOBAERA NIGRIPENNIS, new species.

Size and general appearance similar to the smaller individuals of *tricarinata*; coloration of body and legs quite similar; elytra short, reaching a little beyond tip of abdomen, dark brown or black, except on a narrow strip along anterior margin and on anterior half of membrane. Male genital styles relatively rather stouter; ventral process of anal tube scarcely acute.

Described from one male from Argus Mountains, California (Koebele). This may be only a varietal form, but it differs so sharply from the hundreds of other specimens that I choose to consider it another species.

*Type-specimen*.—Cat. No. 15975, U.S.N.M.

## STOBAERA QUADRIPUSTULATA Van Duzee.

*Stobaera quadripustulata* VAN DUZEE, '08:200.

*Locality*.—Estero, Florida (Van Duzee).

## STOBAERA GRANULOSUM (Fowler).

*Goniolcium granulorum* FOWLER '81:132.

Probably this is identical with the southern form of *tricarinata*.

*Locality*.—Orizaba, Vera Cruz, etc., Mexico (Fowler).

## STOBAERA TESTACEUM (Fowler).

*Goniolcium testaceum* FOWLER '81:133.

The exact relationship of this species to the other members of the genus is difficult to state at present.

*Locality*.—Guatemala, etc. (Fowler).

## Genus COCHISE Kirkaldy.

Kirkaldy's original description is as follows:

Vertex very transverse, keels obsolescent, impressed transversely on the basal margin, about one-fifth wider than the eye; with the eyes distinctly wider than the pronotum. Frons medianly impressed by a transverse line, the basal part with two widely separated keels (a puncture between them in the middle), uniting on the middle of the apical part, which narrows concavely toward the apex, where it is truncate. Genæ almost obsolete. Antennæ arising almost at the exterior apical ocular angle, flattened and carinately foliaceous, one-third longer than the maximum width of the frons, first segment wider apically than basally, second five-eighths longer than first. Clypeus rather swollen, carinate medianly. Pronotum scarcely longer medianly than the head, hind margin obtuse-angularly emarginate, median keel entire, a puncture on each side; lateral keels distant laterally and basally, arising anteriorly at the interior margin of the eye, curving at an acute angle near the hind margin to meet the eye again, inclosing a puncture. Scutellum with the lateral keels obsolescent. Legs simple. Tegmina with the radial forked nearer the base than is the brachial; 7 apical cells; the second and third apical veins have a common base, the third rejoining near the apex. Hind tibiæ with a small spine near the base, 4 uneven large spines at the apex; the spur large and broad, three-sided, each side flat, not foliaceous; there are a number of very minute spines, scarcely visible, on one edge. The first segment of the hind tarsi is longer than the others together and has about 6 spines.

## COCHISE APACHEANUS Kirkaldy.

*Cochise apacheanus* KIRKALDY, Bull. Hawaiian Sugar Planters Association, vol. 4, 1907, p. 64.

*Locality*.—Arizona, Nogales (Koebele).

## Genus DELPHAX Fabricius.

Syn. *Araeopus* SPINOLA.

Body large, stout; head large, about as broad as prothorax, rather weakly carinate; vertex broad, as broad as long, rounded in front, scarcely produced before eyes; frons broad, sides rounded or angulate longer than broad, tricarinate; antennæ long; I foliaceous, not flat, rounded outward along center, thin above and below; II nearly terete, asperose, a little shorter than I. Eyes large, deeply emarginate below. Pronotum long, lateral carinæ usually flexed outward; scutellum tricarinate. Elytra setigerous. Legs very elongate; forefemora compressed; hind tibiæ long, bispinose; calcar very large, tectiform, deeply concave on one surface, margin finely dentate.

*Type of genus*.—*Delphax crassicornis* Fabricius.

In the form of the antennæ this genus resembles *Asiraca*, but it is very distinct in the form of the calcar, as well as in some other characters. It is very apparent from the original description of this genus by Fabricius that his type-species is not congeneric with the large group of species which have been for a long time erroneously called *Delphax*, or *Liburnia* by others.<sup>1</sup> In 1839 Spinola erected a new genus, *Araeopus*, and indicated as its type-species Fabricius's old species, *Delphax crassicornis*. His species happened to be the type of *Delphax*, however, and therefore the latter must replace the other as the accepted name for those species related to *crassicornis*.<sup>2</sup>

The only American representative of this genus was described very briefly by Lethierry from South America. The description is so inadequate that it is impossible to determine with what genus it can be associated if it is not *Delphax*; therefore it must be retained here for the present.

## DELPHAX CONSPERSINERVIS Lethierry.

*Delphax conspersinervis* LETHIERRY '90: 151.

*Locality*.—Caracas, Venezuela.

## Genus BOSTAERA Ball.

According to Ball this genus has the following characteristics:

Resembling *Stobaera*, but a much broader vertex and front; vertex and front broader than in *Laccocera*, front bicarinate; head transverse, wider than pronotum; vertex

<sup>1</sup> See heading *Megamelus*.

<sup>2</sup> See Fabricius—Supplementum Ent. Systematicæ, 1798, p. 522.

parallel-margined, over three times as wide as long, not extending in front of eyes; front six-angled, widest at lower corner of eye, where it is a trifle wider than its median length, two and a half times as wide as at apex, median carina forking at one-fourth its length from apex and regularly diverging until its forks include over half the width at base; clypeus bearing an acutely tipped, cone-shaped tubercle in front; pronotum transverse, slightly angularly excavated behind; lateral carinæ curving around behind eyes, not reaching hind margin. Elytra about as in *Stobaera*, obliquely truncate behind, nervures with setigerous tubercles; tarsal spur broad, short, almost spoon shaped.

*Type of genus.*—*Bostaera nasuta* Ball.

The remarkably broad head, bicarinate front, and the "nose" on the clypeus render this a very distinct and easily recognized genus.

#### BOSTAERA NASUTA Ball.

*Bostaera nasuta* BALL '02:266.—SWEZEY '04:37.—VAN DUZEE '08:200.

*Locality.*—Holly, Antonito, and Fort Collins, Colorado (Ball).

#### Genus ACHOROTILE Fieber.

Frons, notum, and abdomen with numerous round pits; head about as broad as prothorax or slightly narrower, quite strongly carinate; vertex almost square, slightly broadening toward the front (in type species); frons with two median carinæ parallel with sides and percurrent through apex of head; eyes moderately large, not deeply emarginate below; antennæ short, terete, II at least twice as long as I. Pronotum quite long, lateral carinæ curved outward behind eyes, not reaching hind margin. Calcar foliaceous, stout; hind tibiæ bispinose.

*Type of genus.*—*Achorotile albosignata* Dahlbaum.

#### ACHOROTILE ALBOSIGNATA Dahlbaum.

Plate 45, figs. L, M, W.

*Delphax fuscineris* SCOTT '71:196.

*Ditropis albosignata* SAHLBERG '71:472.

*Achorotile albosignata* EDWARDS '85:67.—VAN DUZEE '97:259.—SWEZEY '04:42.—OSHANIN '07:334.

Length of body 3.2 mm.; width of vertex 0.24; width of frons 0.41; antennæ, I, 0.14; II, 0.28. General color shining black; vertex, dorsum of thorax medially and abdomen on two basal tergites and along median line yellowish brown; sternum slightly lighter in color. Body not large.

Head slightly narrower than prothorax, strongly carinate; vertex slightly broader than long, a little broader in front than behind, projecting a little before eyes, with one or two pits near front margin outside of median carinæ; frons oval, almost as broad below as above with median carinæ well separated, parallel with sides, confluent at clypeus; with seven pits in each lateral compartment; clypeus convex. Antennæ short, not reaching to clypeus, I slightly less than half as long as II, very short.

Thorax short, broad; pronotum about half as long as scutellum, not deeply emarginate behind, with about six pits on posterior incline of lateral carinae. Legs rather stout; calcar about half as long as basal tarsus, stout, briefly pubescent.

Abdomen pitted dorsally irregularly; median line almost carinal in prominence.

Male pygofers with aperture margin elongate-ovate, with sides protruding a little below middle; anal tube short, with two very long ventral processes; anal style short; genital styles short, simple, largest at base.

Redescribed from one male and two females from Finland (Reuter), determined by the latter as *Ditropis albosignata*.

Reported from Buffalo, East Concord, and New York (Van Duzee).

ACHOROTILE FOVEATA Spooner.

*Achorotile foveata* SPOONER '12:241.

This is very closely related to *albosignata*, but seems to be distinct in a few minor characters. I have examined the type-specimen, a macropterous female, and believe it to be distinct, although I have seen only two specimens of *albosignata* and both of those European. More specimens should be compared before a final judgment is made. Spooner says, "This species may be told from *A. albosignata* by the deeper vertex, the different coloration, and by the presence of four instead of two pustules on each side of the abdominal segments." The latter character in *albosignata* is not constant, however.

*Locality*.—Felton, Santa Cruz Mountains, California; May, 1907.

Genus LACCOCERA Van Duzee.

Head large, about as broad as prothorax, more or less angulate dorso-ventrally at apex; vertex relatively quite broad, more or less pentangular or quadrangular, with anterior margin roundly convex; several pits (pustula of some authors) near eyes; frons large, broad, more or less obcordate, narrower below than above, with median carina forked at apex of head, several pits in each lateral fovea. Pronotum shorter than vertex, deeply excavated behind, with lateral carinae curved outward, and several pits on posterior incline, as in *Achorotile*; scutellum tricarinate, somewhat pitted. Elytra often brachypterous; anterior and middle tibiae slightly flattened. Abdomen pitted on the sides.

*Type of genus*—*Laccocera vittipennis* Van Duzee.

The peculiar pitted surface of the head, thorax, and abdomen of this genus and *Achorotile* has been believed to indicate that these genera are at the bottom of the scale of development, since this same character is common among nymphs. However that may be, the genera in question are very easily distinguished from the others by



this character. Cross sections were made of the pits and the sections examined microscopically, but they seem to be only simple pits without any glandular connection.

## KEY TO THE SPECIES.

*a*<sup>1</sup>. Legs lineated with black or brown.

*b*<sup>1</sup>. Vertex considerably broader than long; genital styles of male long, as long as to processes of anal tube, rather slender, pygofer with a carina below and between styles.....*vittipennis* Van Duzee.

*b*<sup>2</sup>. Vertex only slightly broader than long or square; genital styles about half as long as above, stout; pygofers without carina.....*obesa* Van Duzee.

*a*<sup>2</sup>. Legs not lineated, unicolorous; vertex nearly square.

*b*<sup>2</sup>. Anal tube of male with ventral processes very short; clypeus and labrum black or brown; legs brown to flavous.

*c*<sup>1</sup>. General color yellow and black rather sharply contrasted....*zonata* Van Duzee.

*c*<sup>2</sup>. General color dull flavous, abdomen with brown markings.

*zonata flava*, new variety.

*b*<sup>2</sup>. Anal tube of male with two very long, horn-like processes on ventral margin; clypeus and labrum yellow; legs yellow.....*bicornata*, new species.

## LACCOCERA VITTIPENNIS Van Duzee.

Plate 45, figs. N. Q.

*Laccocera vittipennis* VAN DUZEE '97:242.—SWEZEY '04:36.

*Delphacinus vittatus* GILLETTE and BAKER '95:69.

Length of body 3 mm.; width of vertex 0.38; width of frons 0.38; antennæ, I, 0.17, II, 0.28. General color brown, variable in shade; vertex and tergum between lateral carinæ yellowish; frons brownish or brown with yellow intermixed to some extent, with carinæ always yellow; clypeus dark brown to black with carinæ pale; eyes brown to black; genæ and antennæ dark brown; pleura brown and yellow; elytra pale brown, with darker brown vitta on each margin; legs yellow, banded with black; abdomen dark, with yellow on dorsal portion of first three segments and narrower area along dorsum of rest of segments, and on lateral margin of tergites; ovipositor sheath more or less yellowish brown.

Head broad, with eyes fully as broad as or broader than prothorax, very broad between eyes, relatively short; vertex subrectangular, considerably broader than long, converging a little toward front, produced a little beyond eyes; with two small pits in each lateral fovea; frons large, rather six-sided, broadest about at ocelli, broader above than below; with four pits on each side of median carina and three (or more) next to each lateral carina on inside. Antennæ moderately long, slender, terete, I not quite half as long as II.

Thorax broad; pronotum considerably shorter than vertex, deeply and broadly emarginate behind; lateral carinæ prominent, extending to lateral margin, pitted closely on posterior incline for fully two-thirds its length from apex. Legs long, slender; anterior and middle femora and tibiæ very slightly compressed; calcar thick at base, not

very large. Elytra long, slender; brachypterous forms predominate in both sexes.

Abdomen large, broad.

Male genital segment large, conspicuous, margin of aperture deeply emarginate at base of styles; anal tube short, with two short processes on ventral margin; genital styles long, strongly diverging, straight, three-faced, acute at tip, about as long as to tip of anal tube processes.

Redescribed from one macropterous female from Mount Washington, New Hampshire (a paratype of the original specimen?), 5 macropterous females, 19 brachypterous males and over 50 brachypterous females all from Colorado (Baker), and several from Ormsby County, Nevada (Baker).

LACCOCERA ZONATA Van Duzee.

*Laccocera zonata* VAN DUZEE '97:243.—SWEZEY '04:36.

*Delphacinus zonatus* GILLETTE '95:69.

Length of body, female, 4 mm.; male, 2.9; width of vertex, 0.35; width of frons, 0.39; antennæ, I, 0.10, II, 0.22. General color yellow and black; head except clypeus, prothorax and scutellum entirely bright yellow; elytra, clypeus, venter, and abdomen shining black except a conspicuous yellow spot on base of abdomen above extending to tip in a more or less continuous stripe; legs flavous brown throughout.

Quite similar in general characters to *vittipennis*, differing as follows: Head not broader than prothorax, sometimes slightly narrower; vertex more nearly square, not broader than long or even slightly longer than broad, pitted as in *vittipennis*; frons similar in shape, basal and clypeal margins subequal; eyes quite compressed anteriorly; first antennal joint relatively shorter, only about one-third as long as II. Pronotum longer, not so deeply emarginate behind; legs not striped; hind tibiæ very stout, especially distad; male genital segment similar; processes of anal tube longer; genital styles equally long, large at base, abruptly slender and flexed inward midway, quite different in appearance from *vittipennis*.

Redescribed from many brachypterous specimens of both sexes from Ormsby County, Nevada (Baker); one macropterous female from Nevada, but elytra broken.

LACCOCERA ZONATA FLAVA, new variety.

Very similar in all characters, except color, to the species. Color almost uniform light flavous, with faint brown markings on abdomen and venter. Three females out of more than 100 specimens show this character with almost no intergradation. Very probably this is not more than a varietal form of the species—scarcely a seasonal variation, however, as all the specimens were apparently taken at the same time of the year.

*Type-specimen*.—In collection of Pomona College.

## LACCOCERA OBESA Van Duzee.

Plate 45, figs. R, V.

*Laccocera obesa* VAN DUZEE '97:244.—SWEZEY '04:36.*Delphacinus obesus* GILLETTE '95:69.

Very similar in general size and proportions to *zonata*; color characters similar but less marked, yellow more flavous, and black often reduced to brown or even light brown; clypeal carinæ often yellow, as in *vittipennis*. Head relatively short, with eyes almost or quite as broad as prothorax, occasionally slightly broader; vertex almost square, very slightly broader than long, sides quite parallel, produced somewhat before eyes, less pitted than in congeners; frons similar in shape, scarcely angulate; roundly obpyriform, narrower below than above. Thorax similar in structure to *vittipennis*. Legs somewhat striped brown and light flavous. Male pygofers shorter, margin but slightly emarginate at base of genital styles; processes of anal tube exceedingly short; genital styles very short and stout, scarcely half as long as in *vittipennis* without median carina below and between styles which is present in other two species.

Redescribed from two macropterous and many brachypterous females from Ormsby County, Nevada (Baker), and Colorado (Baker), and one brachypterous male from Nevada. This species is quite closely related to its congeners, but differs markedly in male genital characters and to a less extent in cephalic characters; the coloration is more or less a combination of the two species.

## LACCOCERA BICORNATA, new species.

Plate 45, fig. P.

Size and general proportions similar to *zonata*; black and yellow, as in that species, but clypeus and labrum, also, bright yellow; legs yellow instead of flavous. Principal differences are in color and male genitalia; head and thoracic structure similar.

Genital segment similar; anal tube very large, projecting caudad more than in *zonata*, with ventral processes extremely long and acute, resembling two recurved horns, extending fully two-thirds of distance toward base of genital styles; styles shorter and much stouter, more terete than in *vittipennis*, not flexed as in *zonata*, longer than in *obesa*, with carina very conspicuous below and between styles.

Described from two males (brachypterous), from Colorado (Baker). The female is unknown or else indistinguishable from *zonata*, although the color should be rather constant.

*Type-specimen*.—Cat. No. 15976, U.S.N.Mus.

## Genus JASSIDAEUS Fieber.

Syn. *macrotomella* VAN DUZEE.

This genus, not represented in the material before me, is characterized by the two median carinæ of the frons; vertex and frons broad, latter more or less pentagonal; antennæ reaching about to

clypeus, sometimes slightly compressed. Pronotum moderately long; lateral carinæ straight or more or less curved outward behind eyes. Scutellum tricarinate.

*Type of genus.*—*Jassidaeus lugubris* Signoret.

Van Duzee's genus, *Macrotomella*, seems to be so similar to this European genus that it ought to be merged into it. The differences upon which it was erected are not constant enough and of sufficient generic value to warrant its maintenance as a distinct genus.

JASSIDAEUS CARINATUS Van Duzee.

*Macrotomella carinata* VAN DUZEE '07:44.—'08:197.

This species apparently belongs to the European genus *Jassidaeus*, although there are a few minor differences.

*Locality.*—Jamaica and Florida (Van Duzee).

JASSIDAEUS INCONSPICUUS Uhler.

*Stiroma inconspicua* UHLER '77:458.—VAN DUZEE '97:260.

This apparently belongs in the genus *Jassidaeus*, although I have not seen specimens of the species.

*Locality.*—Colorado (Uhler).

Genus PHYLLODINUS Van Duzee.

Head about as broad as pronotum, or narrower, carinæ moderately distinct; vertex rather broad, scarcely produced before eyes; frons longer than broad, tricarinate, sides straight or rounded, sometimes indistinctly pitted as in *Achorotile*; antennæ rather long, I shorter than II. Pronotal carinæ usually curved out behind eyes, sometimes with indistinct pits behind. Fore- and middle femora and tibiæ conspicuously compressed and foliaceous; calcar tectiform, margin coarsely or finely dentate; hind tibiæ bispinose.

*Type of genus.*—*Phyllodinus nervatus* Van Duzee.

The occasional pits on the frons and pronotum suggest a possible relationship with *Laccocera* and *Achorotile*, but apparently all the species with the flattened femora and tibiæ are not so pitted.

KEY TO THE SPECIES.

- a*<sup>1</sup>. Head about as broad as prothorax; frons and pronotum with indistinct pits; elytra without white apical margin.....*nervatus* Van Duzee.  
*a*<sup>2</sup>. Head distinctly narrower than prothorax; frons and pronotum without pits; elytra margined apically with white.  
*b*<sup>1</sup>. Frons with transverse white bands; tibiæ and femora of equal width; scutellum and part of pronotum white.  
*c*<sup>1</sup>. Frons with a very indistinct carina between median and each lateral.  
*c*<sup>2</sup>. Frons without intermediate carinæ.....*flabellatus* Ball.  
*b*<sup>2</sup>. Frons unicolorous, without white bands; foretibiæ wider than femora; scutellum not white.....*nitens* Van Duzee.

*koebeli* Osborn.

## PHYLLODINUS NERVATUS Van Duzee.

Plate 47, fig. F.

*Phyllodinus nervatus* VAN DUZEE '97: 241.—WIRTNER '04: 215.—SWEZEY '04: 36.  
*Euryrsa nervata* VAN DUZEE '94: 191.

Average length, 2.3 mm.; width of vertex, 0.29; width of frons, 0.33; antennæ, I, 0.18, II, 0.29. General color brown to dark brown; vertex pale, dark apically in middle and dark spotted next to eyes; frons dark with a double row of light spots on each side (pits); clypeus black; pronotum pale between lateral carinæ and at lateral margins; scutellum yellow on carinæ, dark between; antennæ brown; legs dark, hind legs more or less banded with yellow; elytra (brachypterous) smoky brown, veins lighter. Body stout.

Head about as broad as prothorax, seldom broader; vertex square in front, broader than long, scarcely produced before eyes; frons a little broader than long, sides rounded, with a double row of indistinct pits on each side appearing as yellow spots; median carina forked at apex of head; antennæ reaching considerably beyond clypeus, I more than half as long as II.

Pronotum moderately long, with a row of indistinct pits behind lateral carinæ; fore and middle tibiæ and femora of about equal width; hind legs rather long; calcar thick, stout, not very long, margin scarcely dentate.

Male pygofer moderately broad, aperture elliptical, long, sides quite regular; anal tube large, produced ventrad into two stout acute processes; styles slender, arched apically, tips narrowed, slightly flattened, scarcely acute.

Redescribed from eleven brachypterous males and females from Colorado (Baker).

## PHYLLODINUS FLABELLATUS Ball.

Plate 47, fig. G.

*Phyllodinus flabellatus* BALL '02: 232.—SWEZEY '04: 36.—WIRTNER '04: 216.

Length of body, 2.7 mm.; width of vertex, 0.20; width of frons, 0.28; antennæ I, 0.17, II, 0.33. General color reddish brown; posterior half of pronotum and all of scutellum white; vertex dark with narrow posterior margin, a long transverse band subapically and a shorter one at apex white; frons reddish, with four white transverse bands, two white spots midway on each side, and apical margin white; abdomen with white spots; elytra black, except apical margin broadly white, band broadest on costal margin; legs brown; tarsi white except at tip.

Head small, considerably narrower than prothorax; vertex a little longer than broad, somewhat rounded in front; frons twice as long as broad, sides subparallel, without pits; median carina forked at apex of head; antennæ reaching beyond clypeus; pronotum without pits. Elytra short, broad. Legs as in *nervatus*.



Male pygofers large, aperture very small, narrow, with a pair of long, slender processes ventrally; margin of aperture sinuate, with a prominent fossa ventrally on each side; anal tube large, open below, produced ventrally into two acute teeth; genital styles very slender, scarcely visible below ventral processes of pygofers.

Redescribed from five males and females from Greensburg, Pennsylvania (Wirtner), and one female from Alabama (Baker). Reported from Washington, District of Columbia, and New Jersey (Ball).

PHYLLODINUS KOEBELEI Osborn.

*Phyllodinus koebelei* OSBORN '03:46, 100.

Very similar in all respects to *P. flabellatus* and reported also from Washington, District of Columbia. Probably this is identical with *flabellatus*, and I would not hesitate to make it synonymous except for the fact that Osborn mentions the presence of a very indistinct carina between the median frontal carina and the laterals. It was described only a short time after *flabellatus*, and perhaps Osborn had not been aware of the latter description. For the present it is included in the synopsis, as a distinct species.

*Locality*.—Columbus, Ohio (Osborn).

PHYLLODINUS FUSCUS Osborn.

*Phyllodinus fuscus* OSBORN '03:46, 100.

Very similar to the foregoing species, and Osborn states that it may be a variation form of it. Probably both of these should be synonyms of *flabellatus*.

*Locality*.—Columbus, Ohio (Osborn).

PHYLLODINUS NITENS Van Duzee

*Phyllodinus nitens* VAN DUZEE '07:198.

*Locality*.—Jamaica (Van Duzee).

LIBURNIELLA, new genus.

Similar in the general aspect of the individuals to *Megamelus*; head rather strongly carinate; median carina of frons percurrent to base of vertex unforked except a slight furcation on vertex, the branches of which diverge slightly and very soon reunite, thus enclosing a small areolet on vertex; transverse carinæ of vertex wanting, as in *Tropidocephala*. Antennæ rather long. Lateral pronotal carinæ usually forked, one branch curving out behind eyes. Elytra maculate. Legs as in *Megamelus*.

*Type of genus*.—*Liburniella ornata* Stål.

This genus is related somewhat to *Tropidocephala* but is distinct both from that and from *Megamelus*, also.

## LIBURNIELLA ORNATA Stål.

Plate 45, fig. T.; plate 47, fig. E; plate 49, fig. N.

*Delphax ornata* STÅL '62:315.

*Liburnia ornata* OSBORN '92:127.—VAN DUZEE '94:191; '97:247.—SMITH '99:89.—FORBES '00:413.—OSBORN '01:36.

Average length of body 2.1 mm.; to tip of folded elytra 3.9; width of vertex 0.19; width of frons 0.20; antennæ, I, 0.15, II, 0.31. General color light brown, abdomen dark brown to black with whitish markings; frons and clypeus between carinæ and breast black or dark, frontal carinæ pale; with a conspicuous white stripe along median carina of vertex, pronotum and scutellum lined on each side narrowly with black; legs and antennæ pale brown, latter black at tip of I and a black stripe above on II; elytra ornamented conspicuously with brown maculæ across apex of corium and around posterior portion of membrane. Body slender.

Head about as broad as prothorax, strongly carinate; vertex slightly longer than broad, slightly narrowed anteriorly; frons elongate, narrow, sides subparallel; antennæ longer than to clypeus, I half as long as II. Pronotum moderately long, roundly emarginate behind, carinæ strong; legs typical; hind tibiæ longer than femora; calcar small, margin scarcely dentate.

Male pygofers somewhat compressed, aperture elliptical; anal tube large, short; genital styles rather long, approximate at base, then slightly divergent, acute at tip, cultrate.

Redescribed from numerous specimens of both sexes from Mississippi (Weed), Alabama (Baker), Louisiana, Texas (Tucker), Missouri (Baker), Kansas, Pennsylvania, Washington, District of Columbia, Massachusetts, Nebraska, Iowa.

## Genus KORMUS Fieber.

Related to *Megamelus* at the "*Kelisia*" end of the series. Head as broad as prothorax; with all carinæ and thorax obsolete, or scarcely visible; vertex broad, rounded in front, slightly produced before eyes; frons broad; antennæ terete, as long as to clypeus, I shorter than II. Thorax broad. Calcar thick, tectiform, margin scarcely dentate.

*Type of genus*.—*Kormus artemisiæ* Fieber.

Some species in *Megamelus* at one end of the series resemble somewhat this genus, but they have the carinæ still easily visible.

## KORMUS CALIFORNICUS, new species.

Length of body 3.1 mm.; width of vertex 0.36; width of frons 0.50; antennæ, I, 0.11; II, 0.23. General color dark chocolate brown; apex of head, tip of abdomen, legs and breast paler; brachypterous elytra dark brown. Body robust.

Head about as broad as prothorax, rounded in front; vertex as broad as long; frons a little longer than broad, convex, sides evenly

rounded, broadest midway; antennæ reaching to clypeus, I scarcely half as long as II. Lateral carinæ of pronotum very slightly visible, flexed out behind eyes. Legs stout; hind tibiæ slightly longer than femora; calcar pubescent, more than half as long as basal tarsus.

Described from one brachypterous female from Claremont, California (Baker).

*Type-specimen*.—In collection of Pomona College.

Genus *STENOCRANUS* Fieber.

Body slender, rather long; head with eyes narrower than prothorax, sometimes greatly so; vertex more or less elongate, slightly converging to apex, somewhat rectangular, projecting from one-third to two-thirds its length beyond eyes; median carina strong or weak; frons long and narrow, slightly broader at apex than at base, tricarinate. Eyes more or less compressed, not deeply emarginate below; antennæ rather short, terete, I much shorter than II. Thorax slender; lateral carinæ usually reaching hind margin; scutellum tricarinate. Calcar tectiform, the margins usually rather close together with pubescence between. Female ovipositor sheath often broadened or foliaceous and appressed to genital segment.

*Type of genus*.—*Stenocranus minutus* Fabricius (probably).

KEY TO THE SPECIES.

- a*<sup>1</sup>. Calcar unusually large and foliaceous; vertex rather long in front of eyes; frons pale, with a brown band below antennæ; basal antennal joint only a little shorter than II. . . . . *palaetus* Van Duzee.
- a*<sup>2</sup>. Calcar not unusually large, seldom foliaceous, margins usually close together and pubescent; antennæ with I much shorter than II.
- b*<sup>1</sup>. Female ovipositor sheath broadened conspicuously, not styliform or cylindrical.
- c*<sup>1</sup>. Frons narrowed above, sides subparallel from odelli to apex; vertex not produced more than one-third its length beyond eyes.
- d*<sup>1</sup>. Vertex not more than one and a half times as long as broad posteriorly; frons usually less than three times as long as broad.
- e*<sup>1</sup>. Female ovipositor sheath broadly elliptical, broadest midway, usually black between carinæ. . . . . *dorsalis* Fitch.
- e*<sup>2</sup>. Female ovipositor sheath broadest apically, pyriform; frons pale brown between carinæ; vertex and frons relatively shorter. . . . . *felti* Van Duzee.
- d*<sup>2</sup>. Vertex at least twice as long as broad; frons narrow, fully three times as long as broad, or more, black between carinæ. . . . . *angustus*, new species.
- c*<sup>2</sup>. Frons broadest at apex, sides uniformly diverging from base; female ovipositor sheath less foliaceous, narrower.
- d*<sup>1</sup>. Vertex produced nearly one-half its length before eyes, narrow, about two and a half times as long as broad. . . . . *saccharivorus* Westwood.
- d*<sup>2</sup>. Vertex produced considerably more than half its length before eyes, beak-shaped, fully four times as long as broad. . . . . *rostrifrons*, new species.
- b*<sup>2</sup>. Female ovipositor sheath cylindrical at least on apical three-fourths.
- c*<sup>1</sup>. Ovipositor sheath broadened somewhat at base; vertex produced about one-third its length before eyes; antennæ with II four times as long as I.  
*similis*, new species.
- c*<sup>2</sup>. Ovipositor sheath only slightly broadened at base; vertex produced less than one-third its length before eyes; antennæ with II less than four times as long as I.  
*croceus* Osborn and Ball.

## STENOCRANUS DORSALIS Fitch.

Plate 46, figs. C, E, F, O; plate 49, fig. J.

*Delphax dorsalis* FITCH '51:46.—LINTNER '93:386.*Delphax unipuncta* PROVANCHER '89:244.*Liburnia dorsalis* VAN DUZEE '90:28.*Stenocranus dorsalis* VAN DUZEE '90:390.—OSBORN '92:127.—VAN DUZEE '97:231.*Stenocranus lautus* VAN DUZEE '97:231.—OSBORN '00:64.

Length of body 4 mm.; width of vertex 0.29; width of frons 0.31; antennæ, I, 0.08, II, 0.28. General color light yellowish brown to brown; dorsum usually with a long whitish vitta extending from vertex to tip of scutellum and appearing to be continued on to the whitish margin of clavus when elytra are closed; vitta variable in distinctness, often rather broad; frons and clypeus usually black between carinæ; femora and tibiæ striped with black; elytra usually light brown, occasionally darker, with a more or less prominent brown macula along membrane slightly behind middle and often extending somewhat on to corium.

Head narrower than prothorax, strongly carinate, projecting beyond eyes at apex for about one-third its length; vertex long, narrow, about one and a half times as long as broad posteriorly; frons narrowed above, slightly but quite abruptly broadened to ocelli, thence parallel to apex; median carina sometimes forked a little below apex of head. Antennæ rather short, II three times as long as I.

Thorax long; pronotum moderately long, scarcely as long as vertex, lateral carinæ arcuate. Legs slender; calcar large, half as long as basal tarsus, pubescent. Elytra narrow, long, subhyaline.

Male pygofer large; anal tube with two long, acute processes on ventral margin; genital styles large at base, abruptly narrowed midway, thence deeply emarginate, sinuate, acute at tip.

Female ovipositor sheath greatly broadened, foliaceous, closely appressed to and entirely covering genital segment, elevated on margins, and often covered with floccose secretion.

Redescribed from numerous males and females, from the following localities: Michigan; Polk County, Wisconsin (Baker); Illinois; Pennsylvania (Wirtner); Massachusetts; Maryland; Virginia (one of the two type-specimens of Van Duzee's species *lautus*); Canada and Colorado (Baker).

*Stenocranus lautus* was separated by Van Duzee from the present species entirely on color characters, all of which are variable and completely intergrade when a large series is examined. The type male of this species from Virginia, in the United States National Museum, is identical with the numerous specimens of *S. dorsalis*. The name *S. lautus* Van Duzee, therefore, becomes synonymous with *dorsalis*.

This species is distributed over the north and west of the United States, and in the south another species occurs, quite distinct from the northern form.

**STENOCRANUS ANGUSTUS, new species.**

Length of body, 3.1 mm.; width of vertex, 0.20; width of frons. 0.22; antennæ, I, 0.05; II 0.22. General color brown or dark brown, dorsum with conspicuous white vitta; frons black between carinæ; femora striped black; elytra mostly dark brown except outer antepical and costal cell and small part of membrane light.

Vertex about as long as in *dorsalis*, projecting about one-third its length before eyes, about twice as long as broad; frons one-third as broad as long, slightly narrowed at ocelli.

Thorax slender; prothorax not much broader than head; scutellum long. Calcar slender. Elytra long and very slender.

Male genitalia somewhat similar to *dorsalis*; styles more slender and delicate, very acute and slender distad.

Described from one male, taken at Belize, British Honduras, by J. D. Johnson. This species is similar in many respects to the northern *S. dorsalis*.

*Type-specimen*.—In collection of Pomona College.

**STENOCRANUS SACCHARIVORUS Westwood.**

Plate 46, figs. G, I; plate 49, fig. L.

*Delphax saccharivora* WESTWOOD '83: 413.

*Stenocranus?* *saccharivorus* VAN DUZEE '97:232; '07:43; '08:196.—KIRKALDY '06:409.

Length of body, female 3.8 mm.; male, 2.7; width of vertex, 0.18; width of frons, 0.18; antennæ I, 0.09; II, 0.24. General color yellowish orange, head occasionally darker; antennæ with black stripe longitudinally. Body very slender.

Head moderately long, narrower than prothorax; vertex long, slightly narrowed at apex, projecting at least two-fifths of its length beyond eyes, median carina almost wanting, laterals high; frons elongate, narrow above, diverging to apex, not strongly carinate. Eyes moderately large, somewhat emarginate below; antennæ similar to *rostrifrons*.

Thorax long, narrow, somewhat compressed, not strongly carinate; pronotum short, quite deeply emarginate behind; scutellum almost four times as long as pronotum; calcar as in *rostrifrons*. Elytra long, slender, attenuate at base, not maculate.

Male genital segment moderately broad; anal tube without ventral processes; anal style long, slender, concave beneath; pygofer produced caudad somewhat below anal tube; genital styles stout, simple, widespread, apex constricted slightly, recurved, acute.



Female ovipositor sheath somewhat similar to *rostrifrons*, narrower than in *dorsalis*.

Redescribed from three males and four females from Habana and Cayamas, Cuba (Baker). This species in some respects resembles *S. rostrifrons*. They correspond very closely with Westwood's original description.

STENOCRANUS ROSTRIFRONS, new species.

Plate 46, fig. J; plate 49, fig. P.

Length of body, 3.6 mm.; width of vertex, 0.20; length to apex of head, 0.72; width of frons, 0.21; antennæ I, 0.07; II, 0.21. General color yellowish orange; frons with a slender black stripe near apex of head above; antennæ lineated narrowly with black beneath or in front.

Head long, narrower than prothorax, strongly carinate between eyes, produced almost two-thirds of its length beyond eyes, curved down somewhat and resembling very closely a bird's beak, acute at apex; vertex very elongate, narrow, about four times as long as broad, narrowed anteriorly; median carina almost wanting; frons elongate, broadest below, not strongly carinate; eyes rather small; ocelli conspicuous. Antennæ not as long as width of head between antennal sockets, II about three times as long as I.

Thorax slender, long, not strongly carinate; pronotum about two and a half times as long as scutellum, broadly emarginate behind. Calcar typical, pubescence slight. Elytra long, strongly attenuate at base, more rhomboidal apically than in congeners, maculate on membrane veins; venation somewhat different from that of congeners.

Female ovipositor sheath somewhat broadened, about midway between foliaceous and cylindrical.

Described from one female from Habana, Cuba (Baker).

*Type-specimen*.—In collection of Pomona College.

STENOCRANUS SIMILIS, new species.

Plate 46, figs. D, H.

This species is about the same size throughout as *S. dorsalis*, and superficially resembles it very closely. The dorsal white vitta is seldom or indistinctly present; general color similar; frons less black between carinæ.

Vertex relatively shorter than in *dorsalis*, projecting a little less before eyes; antennæ longer, II almost four times as long as I. Prothorax about as long as vertex; calcar large; elytra similar except that macula covers posterior half entirely or nearly so, not extending on to corium.

Male pygofers large; anal tube long; produced ventrad into two much longer processes than in *dorsalis*; anal style short; genital styles large, constricted one-third of length from base, distal third converging to acute apex.

Female genital segment longer and narrower than in *dorsalis*; ovipositor sheath not foliaceous, cylindrical and extending almost to tip of abdomen.

Described from one female and four males from Alabama (Baker), labeled *S. lautus* Van Duzee. These are entirely distinct from the type-specimen of this species. The characters most widely differing from the other species are the genitalia of both sexes.

*Type-specimen*.—Cat. No. 15977, U.S.N.M.

**STENOCRANUS CROCEUS** Osborn and Ball.

Plate 46, fig. M; plate 49, fig. O.

*Stenocranus croceus* OSBORN and BALL '96:233.

*Kelisia crocea* VAN DUZEE '97:233.—OSBORN '97:235.

Length of body, 3.4 mm.; width of vertex, 0.24; width of frons, 0.28; antennæ, I, 0.06, II, 0.22. General color light yellow, with some whitish areas; vertex and dorsum between lateral carinæ whitish, venter pale. Body rather large.

Head moderately long, relatively quite broad, distinctly narrower than prothorax, rather strongly carinate; vertex broad, subrectangular, produced only about a fourth of its length before eyes, distinctly longer than broad; frons long, narrowed between eyes, sides subparallel below ocelli; antennæ rather short, II three times as long as I, or more.

Thorax long, not broad; pronotum two-thirds as long as vertex, one-third as long as scutellum, long behind eyes, rather strongly carinate; calcar typical, rather large, finely dentate. Elytra long, subhyaline, quite broad.

Female ovipositor sheath cylindrical, not expanded.

Redescribed from three females, two from Kansas and the other from Massachusetts. This species was placed in the genus *Kelisia* by Van Duzee, but I can see no justification for such a disposition of it, since it is manifestly more closely related to members of the genus *Stenocranus* than to *Kelisia*, although the vertex is rather broader than usual in the genus.

**STENOCRANUS FELTI** Van Duzee.

*Stenocranus felti* VAN DUZEE '10:88.

*Locality*.—New Hampshire (Van Duzee), New York (Felt).

**STENOCRANUS PALAETUS** Van Duzee.

*Stenocranus palaetus* VAN DUZEE '97:232; '08:196.

*Locality*.—Florida (Van Duzee).

**STENOCRANUS MACULIPES** Berg.

*Stenocranus maculipes* BERG '79:223; '84:142.

*Locality*.—Argentine, South America.

I have been unable to include this species in the foregoing synopsis.

## STENOCRANUS VITTATUS Stål.

*Delphax vittata* STÅL '62:315—VAN DUZEE '97:261.

This is apparently identical with *S. dorsalis* Fitch, but it is hardly advisable to make it synonymous until further evidence is obtainable. It is without doubt a *Stenocranus*.

*Locality*.—Carolina and Pennsylvania.

## Genus MEGAMELANUS Ball.

Similar in general appearance to *Megamelus*, differing chiefly in cephalic characters. Head scarcely narrower than pronotum, sharply angled dorso-ventrally at apex at union of vertex and frons, produced distinctly beyond eyes; vertex rather pentangular, appearing often to be triangular because of prominent lateral carinæ, with an oblique carina (or semblance of one) on extreme apex extending from median carina toward eyes; frons as broad above as below, sides arcuate; clypeus convex, not or very feebly carinate; antennæ usually shorter than frons, terete; eyes emarginate beneath. Lateral carinæ of pronotum extending to hind margin or nearly so. Legs rather short; hind tibiæ usually about as long as femora; calcar thicker and less foliaceous than in *Megamelus*.

*Type of genus*.—*Megamelanus bicolor* Ball.

This genus differs from *Delphacinus* in having the notum and frons strongly carinate, while in the type species of *Delphacinus*, *D. mesomelus* Boheman, the carinæ are almost obsolete.

## KEY TO THE SPECIES.

- a*<sup>1</sup>. Vertex very long, length beyond eyes greater than long diameter of eye; apex of head very acute. . . . . *elongatus* Ball.  
*a*<sup>2</sup>. Vertex acute at apex, but not extending beyond eyes to such a length.  
*b*<sup>1</sup>. Dorsal surface of body with a red stripe on each side outside of lateral carinæ, extending entire length of body; body very long, more than 4 mm. . . . . *rufivittatus* Ball.  
*b*<sup>2</sup>. Body without red stripes on dorsal surface.  
*c*<sup>1</sup>. Frontal carinæ margined with brown; clypeus with traces of median carina. . . . . *frontalis*, new species.  
*c*<sup>2</sup>. Frontal carinæ without brown margins; clypeus without carinæ.  
*d*<sup>1</sup>. Head, pronotum, scutellum and elytra yellowish, abdomen and venter black; body small. . . . . *bicolor* Ball.  
*d*<sup>2</sup>. Color mostly black, not white as above. Body not small. . . . . *spartini* Osborn.

## MEGAMELANUS BICOLOR Ball.

Plate 45, figs. S, U; plate 46, fig. A.

*Megamelanus bicolor* BALL '02: 265.

Length of body, 2 mm.; width of vertex, 0.21; length to apex, 0.27; width of frons, 0.24; antennæ, I, 0.05, II, 0.13. General color black and yellowish white, as follows: Frons, vertex, antennæ, eyes, pronotum, scutellum, and elytra (brachypterous), yellow; clypeus, venter, abdomen, legs (except tarsi and tips of femora and tibiæ), black. Body small.

Head almost as broad as pronotum; vertex longer than pronotum, pentangular, with the prominent lateral carinæ giving it the appearance of being triangular, acutely angled at apex; frons about twice as long as broad, sides arcuate, broadest across middle; antennæ about half as long as frons, I half as long as II. Pronotum as long as scutellum; latter small. Legs short; hind tibiæ about as long as femora; calcar short, thick, finely pubescent.

Male pygofers moderately large, subglobular, excised sinuately beneath; genital styles short, cultrate, rather spatulate; anal style scarcely exerted.

Redescribed from one brachypterous male from Arizona (Baker).

MEGAMELANUS FRONTALIS, new species.

Length of body, 2.9 mm.; width of vertex, 0.24; length to apex of head, 0.32; width of vertex, 0.29; antennæ, I, 0.07, II, 0.15. General color, soiled yellowish brown throughout; frontal carinæ margined with brown; elytra yellowish; body moderately long.

Head a little narrower than prothorax, longer than pronotum; vertex similar in appearance to *bicolor*; frons a little more than half as broad as long, sides arcuate, acutely angled above; clypeus with median carina feebly present; antennæ slightly more than half as long as frons. Thorax typical; legs short, stout; calcar thick, finely pubescent. Elytra long, rather slender, finely pulverulent-yellow.

Described from one macropterous female from Colorado (Baker).

*Type-specimen*.—Cat. No. 15978, U.S.N.M.

MEGAMELANUS ELONGATUS Ball.

*Megamelanus elongatus* BALL '05: 118.—VAN DUZEE '08: 196.

*Locality*.—Florida.

MEGAMELANUS RUFIVITTATUS Ball.

*Megamelanus rufivittatus* BALL '05: 119.

*Locality*.—Thompsonville, Georgia (Ball).

MEGAMELANUS SPARTINI Osborn.

*Megamelanus spartini* OSBORN '05: 375.—VAN DUZEE '08: 197.

*Locality*.—Ohio, Florida.

Genus DICRANOTROPIS Fieber.

*Pissonotus* VAN DUZEE.—*Peregrinus* KIRKALDY.

Head not as broad as prothorax, strongly to weakly carinate; median carina forked distinctly below apex of head, from one-fourth to one-half its length below, branches usually well separated, sometimes closely approximated; antennæ as in *Megamelus*, usually a little longer. Lateral carinæ of pronotum usually straight, sometimes curved out behind eyes, often not reaching hind margin. Legs and elytra as in *Megamelus*. Body often robust.

*Type of genus.*—*Dicranotropis beckeri* Fieber.

This genus is related rather closely in many respects to *Megamelus*. I include in it Van Duzee's genus *Pissonotus*, which has some fairly good group characters but not enough to warrant the erection of a separate genus. *Peregrinus* Kirkaldy, erected for *maidis* Ashmead, is not maintained but merged into this genus, which formerly contained that species.

## KEY TO THE SPECIES.

- a*<sup>1</sup>. Frons and clypeus similar in color, or nearly so, latter not darker; usually macrop-  
terous.
- b*<sup>1</sup>. Body large; vertex rather broad; branches of frontal carina well separated;  
membrane veins maculated at apex; male genital styles large, hook-shaped.  
*maidis* Ashmead.
- b*<sup>2</sup>. Body smaller, slender; vertex narrow; branches of frontal carina rather close  
together; elytra maculate at apex; genital styles short, cultrate.  
*cubanus*, new species.
- a*<sup>2</sup>. Clypeus and forecoxæ black, making a dark band across breast; brachypterous  
forms common; antennæ rather elongate.
- b*<sup>1</sup>. Branches of median carina well separated from point of furcation.
- c*<sup>1</sup>. General color black or very dark.
- d*<sup>1</sup>. Carinæ almost obsolete on apex of head; frons moderately broad.  
*marginatus* Van Duzee.
- d*<sup>2</sup>. Carinæ distinct on apex of head; frons narrow.
- e*<sup>1</sup>. Pronotum entirely black; elytra brown.....*ater* Van Duzee.
- e*<sup>2</sup>. Pronotum white posteriorly; elytra whitish hyaline.  
*delicatus* Van Duzee (dark form).
- c*<sup>2</sup>. General color brown to light brown or honey yellow; genital styles very small,  
slender; anal tube with two long ventral processes.
- d*<sup>1</sup>. Frons with more or less conspicuous white, transverse markings, otherwise  
brown; body brown.
- e*<sup>1</sup>. Genital styles broadened, flexed and square at apex; frontal markings  
obscured.....*frontalis*, new species.
- e*<sup>2</sup>. Genital styles linear, slightly arched, acute at apex; anal tube processes  
very long; frontal markings conspicuous.....*aphidioides* Van Duzee.
- d*<sup>2</sup>. Frons without such transverse markings, flavous except apically white;  
body honey yellow to brown, sometimes black; genital styles as in  
*aphidioides*.....*delicatus* Van Duzee.
- b*<sup>2</sup>. Branches of frontal carina closely approximated, sometimes almost contiguous.
- c*<sup>1</sup>. Lateral carinæ of pronotum extending to hind margin or very nearly so.
- d*<sup>1</sup>. Pronotum usually more or less white posteriorly, often almost entirely so;  
carinæ distinct at apex of head; head very narrow.
- e*<sup>1</sup>. Body not large; vertex narrow; pronotum seldom entirely white.  
*bakeri*, new species.
- e*<sup>2</sup>. Body rather large, broad; vertex broader than above species; pronotum  
often almost entirely white; genital styles smaller.  
*bakeri abdominalis*, new variety.
- d*<sup>2</sup>. Pronotum not whitish posteriorly; carinæ indistinct on apex of head; head  
broader.....*pallipes* Van Duzee.
- c*<sup>2</sup>. Lateral carinæ of pronotum becoming obsolete before reaching hind margin,  
often considerably before; clypeus and frons only slightly differentiated in  
color.
- d*<sup>1</sup>. Color piceous brown throughout.....*brunneus* Van Duzee.
- d*<sup>2</sup>. Color soiled yellowish brown throughout.....*dorsalis* Van Duzee.



## DICRANOTROPIS MAIDIS Ashmead.

Plate 47, figs. A, B.

*Delphax maidis* ASHMEAD '90:323.*Dicranotropis maidis* VAN DUZEE '97:240.—VAN DINE '11:34.*Peregrinus maidis* KIRKALDY '06:407; '07:132.—VAN DUZEE '07:43; '08:197.*Pundaluoya simplicia* DISTANT '06:468.

Average length of body, 3.2 mm.; width of vertex, 0.22; width of frons, 0.26; antennæ I, 0.15, II, 0.26. General color light yellowish brown to brown; frons, both antennæ joints apically, femora and venter brown to black; venter of abdomen black, connexivum whitish; tibiæ pale; elytra hyaline, maculate apically on membrane veins. Body moderately large.

Head small, considerably narrower than prothorax, rather strongly carinate; vertex moderately broad, almost square, produced a little before eyes; frons rectangular, median carina forked about opposite ocelli. Antennæ rather long, stout, I more than half as long as II; II rather asperose. Pronotum rather long, broad, lateral carinæ straight, often not reaching hind margin; scutellum long; legs long, hind tibiæ longer than femora; calcar about half as long as basal tarsus, margin very finely dentate.

Male pygofers moderately large, aperture relatively small, margin sinuate; genital styles occupying most of aperture, hook-shaped, acute, and almost touching at tip.

Redescribed from numerous males and females from Habana, Cuba (Baker); Alabama, Acapulco, Mexico (Baker), Chiapas, Mexico (Crawford); Nicaragua (Baker); Campinas and Para, Brazil (Baker); and Kohala, Hawaii (Van Dine).

## DICRANOTROPIS CUBANUS, new species.

Average length 2 mm.; width of vertex, 0.15; width of frons, 0.18; antennæ I, 0.09, II, 0.18. General color brown, with whitish vitta on dorsum between lateral carinæ; pronotum and scutellum darker outside of lateral carinæ, sometimes almost black; lateral margin of pronotum whitish; vertex whitish; frons brown between carinæ, latter white or pale; abdomen usually light brown; legs and antennæ light brown; elytra hyaline, black at tip of clavus and with a brown crescent-shaped macula on apical margin. Body slender.

Head short, narrower than prothorax, moderately produced before eyes; vertex about square, narrow; frons about twice as long as broad, or more, narrowed between eyes, sides nearly straight or slightly diverging; median carina forked at or slightly above ocelli; antennæ reaching about to clypeus, I half as long as II, or less.

Thorax rather slender; lateral pronotal carinæ usually flexed outward or subobsolete before hind margin, sometimes percurrent to margin. Legs rather long; hind tibiæ longer than femora; calcar long, large, thin, margin finely dentate. Elytra rather long.

Male genitalia similar to *Megamelus approxima*, but genital styles about half as long, scarcely divergent.

Described from more than 150 specimens of both sexes, macropterous and brachypterous, from Habana, Cuba (Baker).

*Type-specimen*.—In collection of Pomona College.

*Paratype*.—No. 15979, U.S.N.M.

DICRANOTROPIS MARGINATUS Van Duzee.

Plate 46, figs. P, Q.

*Pissonotus marginatus* VAN DUZEE '97:236; '08:198.—OSBORN '97:235.

Length of body, 2.6 mm.; width of vertex, 0.21; width of frons, 0.26; antennæ I, 0.13, II, 0.37. General color dark, abdomen and notum black, elytra (brachypterous) red with apical margin white, vertex and frons red, clypeus black, pleura brown to black, sternum yellowish, legs brown.

Head narrower than prothorax; vertex a little longer than broad, weakly carinate; frons subrectangular, twice as long as broad, slightly narrowed above; median carina forked a little below apex of head; genæ broad; antennæ about as long as frons, I fully one-third as long as II. Lateral carinæ of pronotum extending to hind margin. Legs rather stout; foretibiæ somewhat compressed; hind tibiæ longer than femora; calcar half as long as basal tarsus.

Male genitalia somewhat obscured; genital styles short, appressed to pygofers; with a yellow ellipse near base of pygofers beneath.

Redescribed from two males and two females (brachypterous) from Greensburg, Pennsylvania (Wirtner). The male genital segment is somewhat different from that of the other species, being more evenly rounded and the styles less conspicuous.

DICRANOTROPIS DELICATUS Van Duzee.

*Pissonotus delicatus* VAN DUZEE '97:237; '07:44; '08:198.

*Pissonotus basalis* VAN DUZEE '97:238; '08:198.

Length of body, 2.7 mm.; width of vertex, 0.23; width of frons, 0.26; antennæ I, 0.20, II, 0.38. General color reddish brown to dark reddish brown; brachypterous elytra margined apically with white more or less completely; pronotum occasionally with a narrow white margin posteriorly; frons narrowly margined with white at apex; clypeus and forecoxæ black; tarsi and basal antennal joint black; legs reddish with black stripes. Body rather small.

Head smaller, narrow, short, not strongly carinate; vertex short, slightly longer than broad; frontal carina forked a little below apex of head, indistinct at apex; antennæ about as long as frons, I half as long as II. Lateral carinæ of pronotum percurrent to hind margin. Elytra usually truncate, short, sometimes macropterous. Legs rather short, hind tibiæ scarcely longer than femora, calcar a little more than half as long as basal tarsus.

Male genitalia similar to *bakeri*, with genital styles smaller, less prominent, more slender; processes of anal tube very small, blunt, not prominent.

Redescribed from three macropterous females from Alabama (Baker), one macropterous male from Columbus, Texas, 46 brachypterous males and females from Colorado and Alabama (Baker), and one brachypterous female from Mexico (Baker).

The one male from Columbus, Texas, is one of the two specimens upon which Van Duzee based his original description of *Pissonotus basalis*. *P. delicatus* he first described from a single brachypterous female, so that it is not surprising that he did not recognize the two as identical, as they surely are.

DICRANOTROPIS FRONTALIS, new species.

Plate 46, fig. L.

Length of body, 2.6 mm.; width of vertex, 0.22; width of frons, 0.27; antennæ I, 0.18, II, 0.32. General color brown; abdomen brown, with light blotches, lighter at base; elytra light brown, veins light; scutellum brown, pronotum dirty white with brown blotches; vertex dirty white with a black spot in each fovea; frons light brown with several transverse white bands, as in *aphidioides*; clypeus black; forecoxae black, femora and tibiæ light brown striated with black.

Somewhat similar to *aphidioides*. Head short; vertex weakly carinate, rather broad in female, as broad as long, but in male slightly longer than broad; frontal carina forked well down from apex of head, indistinct on apex; antennæ as long as frons, I half as long as II. Lateral carinæ of pronotum disappearing near hind margin. Hind tibiæ longer than femora (one abnormal tibia has three lateral spines); calcar more than half as long as basal tarsus, margin finely dentate. Male genitalia in general similar to *bakeri*, but with genital styles sinuate, clavate-spatulate at tip; pygofer at base of styles with one pair of short, rounded processes; anal tube produced ventrad into a pair of very long, acute processes, extending almost to base of styles.

Described from one brachypterous pair, the male from Claremont, California, and the female from Oregon (Baker).

*Type-specimen*.—Cat. No. 15980, U.S.N.M. (female); (male), in collection of Pomona College.

DICRANOTROPIS APHIDIOIDES Van Duzee.

*Pissonotus aphidioides* VAN DUZEE '97:239.—OSBORN '97:235; '04:100.

Average length of body, 2.9 mm.; width of vertex, 0.20; width of frons, 0.30; antennæ I, 0.12, II, 0.34. General color dull brown, rather conspicuously blotched with white and black; sides of abdomen irregularly black; pronotum and scutellum pale between lateral carinæ, brown outside; frons and apex of vertex mottled, dark brown

except a broad white band across apex of frons and genæ and several partially transverse white bands on frons—two near base, one midway, another not continuous near margin of apical white margin; several white spots besides on vertex and frons; clypeus and forecoxæ black; antennæ black at base, paler apically; legs pale, lineated with brown; elytra (brachypterous) brown, veins whitish. Body stout.

Head almost as broad as prothorax, carinæ rather weak; vertex longer than broad, rounded in front; frons subrectangular, median carina forked about opposite ocelli. Antennæ rather long, I less than half as long as II. Lateral carinæ of pronotum often curved out behind eyes, not reaching hind margin. Elytra reaching to second abdominal segment, veins prominent. Male genitalia similar to *bakeri*; styles blunt at tip; anal tube processes very long.

Described from one male and five females (brachypterous) from Massachusetts and one macropterous male from Arizona, one macropterous female from Colorado (Cockerell), and two brachypterous females from Santa Clara County, California (Baker). The genital characters of the western forms are slightly different from the eastern specimens, but I believe it is all the same species nevertheless. The frons in the two California specimens is uniformly lighter in color, though somewhat obscured. In most respects this corresponds very closely with Van Duzee's brief description and I have no doubt it is the same.

DICRANOTROPIS BAKERI, new species.

Plate 46, fig. N.

Very similar to *D. delicatus* in proportions and color, differing chiefly in male genitalia; processes of anal tube rather long, thick, rounded at tip, directed outward; with a pair of slender acute stylets between processes; genital styles larger and thicker than in *delicatus*.

Described from a brachypterous pair from San Marcos, Nicaragua (Baker), and seven brachypterous females from Habana, Cuba (Baker). This is very closely related to *delicatus* and further collecting in intermediate localities may show that it is not specifically distinct.

*Type-specimen*.—In collection of Pomona College.

DICRANOTROPIS BAKERI ABDOMINALIS, new variety.

Body a little larger than in species; vertex a little broader; frontal carinæ more distinct on apex of head; pronotum often nearly entirely white or whitish, with median portion of scutellum concolorous with it; elytra (macropterous) with a small black or brown area near tip of clavus. Abdomen large, with a lighter and variegated area on median two-thirds of dorsum, the rest brown. Male genitalia as in species, except genital styles distinctly smaller and shorter, more slender and acute.

Described from two brachypterous males and one brachypterous and four macropterous females from Belize, British Honduras (Johnson), and three macropterous and seven brachypterous females from Managua, Nicaragua (Baker).

*Type-specimen*.—In collection of Pomona College.

DICRANOTROPIS PALLIPES Van Duzee.

Plate 46, fig. R.

*Pissonotus pallipes* VAN DUZEE '97:238.—SWEZEY '04:35.

Length of body, 3.1 mm.; width of vertex, 0.20; width of frons, 0.28; antennæ I, 0.18, II, 0.36. General color black or dark reddish brown, front, vertex, legs, and sternum reddish. Body surface polished.

Similar to *marginatus* in vertex and frons; head relatively a little narrower in brachypterous forms; macropterous form with thorax longer and narrower; scutellum more than twice as long as pronotum; carinæ more distinct on apex of head than in brachypterous forms; basal joint of antennæ half as long as II. White bands on elytra and pronotum wanting. Pygofer of male excavated on each side for reception of the anal tube processes; genital styles broad, short, cultrate, finely toothed on inner margin, without median ridge.

Redescribed from four females and one male, all brachypterous, from Greensburg, Pennsylvania (Wirtner), one macropterous male from Colorado (Baker) and one macropterous female from Alabama. The macropterous forms approach more closely to *Megamelus*.

DICRANOTROPIS BRUNNEUS Van Duzee.

Plate 46, fig. K.

*Pissonotus brunneus* VAN DUZEE '97:237; '08:198.—SWEZEY '04:35.

Length of body, 2.4 mm.; width of vertex, 0.18; width of frons, 0.24; antennæ, I, 0.24, II, 0.25. General color dark; head and thorax brown to reddish brown, lighter on frons; elytra with veins whitish or yellowish; abdomen black; legs brown.

Very similar to *pallipes*; carinæ on apex of head not entirely obsolete; basal antennal joint less than half as long as II; male genitalia similar to *pallipes*, but genital styles longer, more deeply sinuate on inner margin.

Redescribed from two males and one female (brachypterous) from Greensburg, Pennsylvania (Wirtner). This is very close to *pallipes*, and may best be distinguished from it by the male genitalia.

DICRANOTROPIS DORSALIS Van Duzee.

*Pissonotus dorsalis* VAN DUZEE '97:239.

Length of body, 3 mm.; width of vertex, 0.21; width of frons, 0.27; antennæ, I, 0.13, II, 0.30. General color dirty brown, vertex somewhat blotched, frons lighter, clypeus dark, elytra brown with veins light, legs brown with lighter areas. Body stout.



Vertex broad, relatively short, weakly carinate; frontal carina forked well below apex of head, subobsolete on apex; clypeus weakly carinate; antennæ not quite as long as frons, I nearly half as long as II. Thorax broad; lateral carinæ of pronotum disappearing before reaching hind margin. Legs long; hind tibiæ distinctly longer than femora; calcar about half as long as basal tarsus.

Redescribed from one female from Long Island, New York (Zabreske).

**DICRANOTROPIS ATER** Van Duzee.

*Pissonotus ater* VAN DUZEE '97:237; '08:198.—OSBORN '97:235; '00:65.

One female in the collection is labeled as this species, but it does not correspond with Van Duzee's description very closely.

*Locality*.—New York (Van Duzee), Washington, District of Columbia, Ohio (Hine), Iowa (Osborn).

After the preparation of this manuscript had been completed a paper by C. S. Spooner appeared,<sup>1</sup> describing several new species in this genus, as well as one species of *Liburnia* and one of *Achorotile*. There are no illustrations with the descriptions and, since there is such a variation in coloration of these insects and color characters are the ones given most fully by Mr. Spooner, I have not wished to attempt to include these in the synopsis of the species. These will be treated in a subsequent paper on the same group.

**DICRANOTROPIS GUTTATUS** Spooner.

*Pissonotus guttatus* SPOONER '12:233.

This is apparently a dark form of *D. delicatus*. The range of color in this species is quite large, as shown by the examination of a large series. A description of a species in this group based only on one female is not very satisfactory.

*Locality*.—Ithaca, New York, August, 1896.

**DICRANOTROPIS FOVEATUS** Spooner.

*Pissonotus foveatus* SPOONER '12:234.

This appears to be somewhat similar to *aphidioides* or *frontalis*.

*Locality*.—Corpus Christi, Texas, May, 1907.

**DICRANOTROPIS VARIEGATUS** Spooner.

*Pissonotus variegatus* SPOONER '12:235.

This, also, is described from a single female. Female characters alone are very inadequate for the determination of species.

*Locality*.—Corpus Christi, Texas, June, 1907.

**DICRANOTROPIS DIVARICATUS** Spooner.

*Pissonotus divaricatus* SPOONER '12:236.

*D. basalis*, which Mr. Spooner says this resembles, was merged with *delicatus*. Perhaps this is distinct, however.

*Locality*.—Middletown, New York, July, 1910.

<sup>1</sup> Can. Ent., vol. 44, Aug., 1912, pp. 233-242.

## DICRANOTROPIS BINOTATUS Spooner.

*Pissonotus binotatus* SPOONER '12:239.

Close to *D. marginatus*, according to Mr. Spooner.

*Locality*.—De Witt, Mitchell County, Georgia, April, 1912.

## DICRANOTROPIS(?) PICEUS Spooner.

*Pissonotus piceus* SPOONER '12:238.

This may not belong to this genus, because of the foliaceous tibiae. Judging from the description it seems to belong to *Phyllodinus*. Only the female is described.

There seems to be close relationship between the two genera, *Phyllodinus* and *Dicranotropis* in some characters, especially the male genitalia and the head. The foliaceous condition of the legs is variable in degree. It may be that further study will relate them even more closely.

## BAKERELLA new genus.

Allied to *Dicranotropis* and *Megamelus* but distinct from both. Head as broad as prothorax, strongly carinate, vertex rather broad, about square, slightly produced before eyes; frons very short and broad, almost round; median carina forked slightly above ocelli, strongly divergent; clypeus small, tricarinate; genæ following curve of frontal margin, abruptly angled below ocelli. Antennæ very short, not reaching to clypeus, I much shorter than II. Lateral carinæ of pronotum curved out, not reaching hind margin. Legs very short; calcar very short, thick, margin scarcely dentate. Elytra maculated.

*Type of genus*.—*Bakerella maculata*, new species.

I take pleasure in naming this genus for Prof. C. F. Baker.

## BAKERELLA MACULATA, new species.

Plate 47, fig. D.

Length of body, 2.4 mm.; width of vertex, 0.27; width of frons, 0.34; antennæ, I, 0.05, II, 0.15. General color dark brown, carinæ slightly pale, connexivum of abdomen white; frons with several white spots. Body medium in size.

Head broad; vertex strongly carinate, nearly square; frons only a little longer than broad, sides strongly rounded; lateral carinæ terminating well within laterals of clypeus; antennæ stout, I less than one-third as long as II. Pronotum moderately long; carinæ of scutellum evanescent. Legs very short; hind tibiae scarcely longer than femora; calcar only slightly longer than breadth at base; margin not dentate. Elytra typical, long, maculated dark brown quite similarly to *L. ornata*.

Male pygofers and apertures resembling *ornata*, latter elliptical, broadest sub-basally; anal tube projecting rather prominently, small,

with two elongate, very slender approximate processes on ventral margin; styles short, pincer-like, scarcely divergent, roundly acute at apex.

Described from a macropterous pair from Acapulco, Mexico (Baker). One broken female from Texas, in the United States National Museum collection, may belong to this genus, but it is too far gone to identify with certainty.

*Type-specimen.*—Cat. No. 15981, U.S.N.M.

#### Genus MEGAMELUS Fieber.

*Delphax* AUTHORS (Part).

*Liburnia* STÅL.

*Kelisia* FIEBER.

*Chloriona* FIEBER.

*Euidella* PUTON (*Euides* FIEBER).

*Prokelisia* OSBORN.

Body rather small to medium in size, seldom large; head with eyes usually narrower than prothorax, sometimes almost or quite as broad; vertex usually about as long as broad, more or less variable in shape, usually rather quadrate, seldom very broad, produced before eyes a little (sometimes almost one-third its length before, in which case it is longer than broad); carinæ variable in distinctness from very strong to rather evanescent, sometimes almost obsolete on apex of head; median carina of frons forked at or very near apex of head (below in *M. albolineosa* sometimes); frons variable in shape from one and a half to two and a half times as long as broad, usually narrowed between eyes; clypeus usually tricarinate. Antennæ terete, seldom longer than to clypeus, often shorter, I usually distinctly shorter than II. Eyes deeply emarginate beneath; ocelli near to or touching lower corner of eye.

Pronotum straight or slightly rounded on anterior margin; lateral carinæ variable in trend from straight and reaching hind margin to more or less curved out behind eyes and not reaching margin, sometimes straight and becoming obsolete before hind margin, or bifurcate with one branch extending to or toward hind margin and the other curved outward. Scutellum tricarinate. Legs variable in length; hind tibiæ usually a little longer than femora; calcar from one-half to fully as long as basal tarsus, more or less foliaceous, with posterior margin finely or coarsely dentate. Elytra (macropterous) longer than body; venation somewhat variable. Male genitalia variable; female genitalia quite constant throughout the group; ovipositor sheath cylindrical, extending to or nearly to tip of abdomen.

*Type of genus.*—*Megamelus notulus* Germar.

The generic name, *Megamelus* Fieber, is used here for the large group of species heretofore placed in several closely related genera, the largest of which was *Liburnia*, or *Delphax* of several authors.

These "genera," *Delphax*, *Liburnia*, *Megamelus*, *Kelisia*, *Chloriona*, *Euidella*, and *Prokelisia*, are so closely related and intergrade so completely that it is quite impossible to draw any generic line between the species constituting these groups. The principal characters heretofore used for this purpose have been the relative distinctness and the trend of the cephalic and notal carinæ, the shape of the vertex and frons, and the form of the forewings. All of these characters are very variable and inconstant, and any generic distinction between species based on them is purely arbitrary and very confusing, and, moreover, it is quite apparent that no two students would agree on the lines of division.

To a certain extent, however, these characters may be employed to divide very loosely the large genus *Megamelus* into a number of subgroups (not subgenera), which will intergrade and overlap to a certain extent. The recognition of these subgroups is solely for convenience in synoptical keys to the species, and in order to avoid error in the use of these keys, allowance must be made for a possible difference in the point of view between the author and the student.

Since there has been confusion existing so long in regard to the priority of generic names in this group, it seems necessary to present the entire case in order to clear it up:

*Delphax* was first used by Fabricius in 1798,<sup>1</sup> with a brief description as follows:

Os labio brevi conico. Antennæ compressæ, marginatæ, inocularum cantho inferiore insertæ.

This characterization could not include the species of the group with which we are dealing now, because of the form of the antennæ. The only two species mentioned under *Delphax* in this original description were *D. crassicornis* and *D. clavicornis*, in the order named, neither of which is congeneric with the species under our consideration. It is evident, therefore, that *Delphax* must be restricted to *crassicornis* and its cogeners, and can not be used for the present group of species, as has been most persistently done by several students. Spinola, in 1839, used this same species, *D. crassicornis* Fabricius, as the type for a new genus, *Araeopus*. This, of course, was impossible, and the latter must become a synonym of *Delphax*. Further reference is made to this under *Araeopus*.

In 1866 Stål<sup>2</sup> further complicated matters by restricting the name *Delphax* to *D. clavicornis*, which he erroneously supposed to be the type, and erected a new genus, *Liburnia*, for a number of species more or less related to the generic group in hand. Strangely enough, Stål used as the type of his genus *Liburnia* a species which in 1853<sup>3</sup> he

<sup>1</sup> Supplementum Ent. Systematicæ, p. 522.

<sup>2</sup> Hemipt. Africana, vol. 4, p. 178.

<sup>3</sup> I have not seen this original description. Stål treats the matter, however, in Hemiptera Africana, vol. 4, p. 179.

had used as the type of another new genus, *Embolophora monoceros*, an African species. Therefore *Liburnia* must be a synonym of *Embolophora*, and the present wide usage of the former for the large group of species is impossible.

Moreover, *Embolophora monoceros* is not congeneric with the group of species in hand, as is readily seen by a study of the description of the former. This name also must be dropped from our consideration as a possible name for this genus.

Among the names of the other "genera" merged with "*Liburnia*," the oldest tenable name is *Megamelus*, which Fieber erected in 1866 for a group of species which, in the estimation of some others besides myself, are not generically distinct from the "*Liburnia*" species. *Megamelus*, therefore, must become the name of the great group of species formerly known under the name of *Liburnia* or *Delphax*, and the type of the genus is *M. notulus* Germar, which Fieber considered the type of his genus.

Even supposing that *Liburnia* were not a synonym of *Embolophora*, it would be an open question whether or not it antedated *Megamelus*. The only known date of Stal's *Hemiptera Africana*, volume 4, in which he described *Liburnia*, is 1866, with no month given. The date of publication of the description of *Megamelus* is June 6, 1866. Perhaps the latter antedates the former, but the settlement of this point is wholly unnecessary.

The following keys are based on rather variable characters often and are intended only as guides in identification. Both alternatives in many cases should be followed through in order to avoid any error. Because of the meagerness of some descriptions and the lack of figures it is impossible to include all the described species in the keys. Those which are not included are, however, listed at the end of the descriptions, together with their bibliographical references.

KEY TO THE SPECIES.

- a*<sup>1</sup>. Lateral carinae of pronotum rather straight, extending toward and usually to hind margin.
- b*<sup>1</sup>. Carinae distinct on apex of head, not or scarcely evanescent; vertex somewhat produced before eyes.
- c*<sup>1</sup>. Frontal carinae whitish or yellowish, more or less completely margined with black or brown.
- d*<sup>1</sup>. Notum brown, with a whitish median vitta extending to base of elytra; latter with a brown area above apically; frontal black markings sometimes not prominent, or even subobsolete; median carina sometimes forked a little below apex of head.....*albolineosus* Fowler.
- d*<sup>2</sup>. Notum without median vitta; elytra (macropterous) without brown area apically; color pale.
- e*<sup>1</sup>. Frons conspicuously constricted above.
- f*<sup>1</sup>. Frons very narrow, angulate at apex of head, diverging uniformly toward clypeus, three times as broad below as above; body rather large, elongate, whitish.....*marginatus* Van Duzee.



- f*<sup>2</sup>. Frons about twice as broad below as above, sides not straight, bulging roundly.
- g*<sup>1</sup>. Hind wings not aborted, normal.
- h*<sup>1</sup>. Body moderately large, very light brown... *constrictus*, new species.
- h*<sup>2</sup>. Body rather small, slender, almost white.  
*constrictus minutus*, new variety.
- g*<sup>2</sup>. Hind wings aborted; elytra narrow, somewhat shortened.  
*setigerus* Osborn.
- e*<sup>2</sup>. Frons scarcely constricted above; abdomen of female light, dark in male.  
*salina* Ball.
- c*<sup>2</sup>. Frons of uniform color, carinæ not margined with black.
- d*<sup>1</sup>. Body at least above brown to black; genital styles of male not bifid.
- e*<sup>1</sup>. Frontal carinæ very sharply distinct at apex of head.
- f*<sup>1</sup>. Frons somewhat sinuate apically; elytra hyaline, brown at tip of clavus..... *scutellaris* Berg.
- f*<sup>2</sup>. Frons not sinuate at apex.
- g*<sup>1</sup>. Genital styles of male styliform, very slender, incurved, acute at tip.
- h*<sup>1</sup>. Calcar normal; ventral fossæ of pygofers very deep; macropterous elytra smoky with granulate nervures..... *piceus* Van Duzee.
- h*<sup>2</sup>. Calcar unusually large, foliaceous; ventral fossæ of pygofers shallow, nearly filled by processes of anal tube; elytra white.  
*davisi* Van Duzee.
- g*<sup>2</sup>. Genital styles of male cultrate, short, stout, straight on inner margin; vertex very narrow at apex.
- h*<sup>1</sup>. Body brown to dark brown; male pygofers only moderately stout; styles not prominent..... *notulus* Germar.
- h*<sup>2</sup>. Body light brown, abdomen light colored, broad; male pygofers broader transversely; genital styles rather prominent.  
*notulus flavus*, new variety.
- e*<sup>2</sup>. Frontal carinæ more roundly protruding at apex of head, not sharp in outline, pygofers of male short, broad, bulging on outside of ventral fossæ; genital styles very short, inconspicuous..... *metzaria*, new species.
- d*<sup>2</sup>. Body light brown to yellow.
- e*<sup>1</sup>. Male pygofers not bifurcate or abnormal; styles simple, cultrate, arched, not much divergent; body rather large; vertex and frons rather broad.  
*rectangularis*, new species.
- e*<sup>2</sup>. Male pygofers rather abnormally developed, produced conspicuously or bifurcate.
- f*<sup>1</sup>. Pygofers produced caudad on each side of anal tube into a very slender, long, bifurcate, process; styles linear, long, bifurcate at tip; notum with a light median vitta..... *bifurcatus*, new species.
- f*<sup>2</sup>. Aperture of pygofers with a long, incurved, spiniform process on margin on each side midway; styles slightly divergent, acute at tip; notum without vitta; color orange yellow..... *aurantii*, new species.
- b*<sup>2</sup>. Carinæ of head more or less evanescent, quite indistinct or subobsolete on apex; vertex often rather broad, rounded in front, only slightly produced before eyes.
- c*<sup>1</sup>. Elytra hyaline, or not maculated.
- d*<sup>1</sup>. Color dark reddish brown, pronotum white; antennæ longer than frons.  
*albicollis* Melichar.
- d*<sup>2</sup>. Color straw yellow, abdomen of male brown; antennæ shorter than frons.  
*parvulus* Ball.
- c*<sup>2</sup>. Elytra more or less extensively maculated.

- d*<sup>1</sup>. Elytra short, mostly brown, hyaline on both margins; body rather small, brown.....*axialis* Van Duzee.
- d*<sup>2</sup>. Elytra long, maculate only on part of membrane; body rather large, reddish.....*apicimaculatus* Fowler.
- a*<sup>2</sup>. Lateral carinæ of pronotum curved outward behind eyes, not reaching hind margin; curving often indistinct.
- b*<sup>1</sup>. Carinæ rather evanescent on head, indistinct or subobsolete on apex; vertex often rather broad, rounded in front, only slightly produced before eyes.
- e*<sup>1</sup>. General color brown to yellowish.
- d*<sup>1</sup>. Vertex and frons very broad, weakly carinate, approaching *Kormus*; genital styles relatively rather short, very stout, acute.
- e*<sup>1</sup>. Margin of pygofer aperture sinuate; ventral notch deep; styles bifurcate at apex.....*kormusi*, new species.
- e*<sup>2</sup>. Margin of aperture with a large, broad, subacute protuberance on each side near base of styles; styles very slightly bifurcate. .  
*magnifrons*, new species.
- d*<sup>2</sup>. Vertex and frons not unusually broad, sometimes weakly carinate.
- e*<sup>1</sup>. Genital styles of male more or less acute at apex, simple.
- f*<sup>1</sup>. Frontal carinæ pale; anal tube without processes; margin of pygofers not sinuate.
- g*<sup>1</sup>. Body rather large, over 2 mm.; frons black between carinæ; genital styles lanceolate.....*obscurellus* Boheman.
- g*<sup>2</sup>. Body about half as large; frontal carinæ brown margined; styles claw-like.....*lutulentus* Van Duzee.
- f*<sup>2</sup>. Frontal carinæ concolorous with foveæ; anal tube with one ventral process; margin of pygofers deeply sinuate.....*analis*, new species.
- e*<sup>2</sup>. Genital styles of male not acute, broad at least apically; frontal carinæ concolorous.
- f*<sup>1</sup>. Scutellum brown or black outside of lateral carinæ, pale between.
- g*<sup>1</sup>. Genital styles broad, spatulate, short, square at tip, roundly divergent above.....*campestris* Van Duzee.
- g*<sup>2</sup>. Genital styles arched, conspicuously constricted midway, apex broad and rounded; pronotum brown outside of lateral carinæ.  
*cayamensis*, new species.
- f*<sup>2</sup>. Dorsum entirely pale whitish; styles slender basally, broadened at apex; carinæ on head weak.....*rotundatus*, new species.
- c*<sup>2</sup>. General color black or very dark brown over most of body surface.
- d*<sup>1</sup>. Macropterous elytra mostly black or brown; genital styles flat, spatulate, square at tip.....*teapæ* Fowler.
- d*<sup>2</sup>. Elytra hyaline or scarcely browned.
- e*<sup>1</sup>. Genital styles broadened and square at apex; vertex and pronotum much lighter than scutellum and abdomen.....*indistinctus* new species.
- e*<sup>2</sup>. Genital styles acute at tip, simple; vertex and pronotum not lighter.
- f*<sup>1</sup>. Frons more than half as long as broad, sides rounded, carinæ pale; male pygofers normal, margin pilose; styles rather short, lanceolate.  
*occlusus* Van Duzee.
- f*<sup>2</sup>. Frons twice as long as broad, sides straight, somewhat constricted above, carinæ not pale; male pygofers very large, margin produced outward on each side broadly; styles very long, acuminate, twisted.  
*nigridorsum* new species.
- b*<sup>2</sup>. Carinæ distinct over apex of head; vertex usually rather narrow, sometimes broader.
- c*<sup>1</sup>. Frons not unicolorous, carinæ white or pale more or less broadly, brown or black between.

- d*<sup>1</sup>. Genital styles of male simple, acute to subacute at tip.
- e*<sup>1</sup>. General color brown to dark brown or black.
- f*<sup>1</sup>. Legs more or less distinctly lineated with brown or black.
- g*<sup>1</sup>. Genital styles of male long, extending nearly to anal tube; color of male black.
- h*<sup>1</sup>. Carinæ of head and dorsum broadly white, and quite prominent in spots; styles rather slender, straight. . . . *gillettei* Van Duzee.
- h*<sup>2</sup>. Carinæ of head and dorsum less conspicuously white; styles very long, large, pubescent; female brown. . . . *lineatipes* Van Duzee.
- g*<sup>2</sup>. Genital styles of male very short, tip remote from anal tube; abdomen black, thorax lighter with carinæ white; lineation of legs brown.
- nigrigaster*, new species.
- f*<sup>2</sup>. Legs not lineated with brown or black.
- g*<sup>1</sup>. Genital styles widely divergent; notum without median white vitta.
- h*<sup>1</sup>. Margin of pygofer aperture regular.
- i*<sup>1</sup>. Aperture large, broad; styles almost horizontal, sinuate, and flexed at tip. . . . . *pellucidus* Fabricius.
- i*<sup>2</sup>. Aperture rather small, circular; styles smaller, more slender, straight, not horizontal. . . . . *consimilis* Van Duzee.
- h*<sup>2</sup>. Margin of pygofer aperture irregular, with a white, rounded protuberance on each side of base of styles; styles slender, flexed out at tip. . . . . *albidens*, new species.
- g*<sup>2</sup>. Genital styles scarcely divergent, tips close together; notum with a broad white vitta between lateral carinæ.
- approximatus*, new species, and *sagatus* Fowler.
- e*<sup>2</sup>. General color light brown to yellow.
- f*<sup>1</sup>. Frons conspicuously narrowed between eyes, sides nearly straight below.
- g*<sup>1</sup>. Frons black with carinæ white; genital styles rather broad, narrowed suddenly at tip; anal tube with two ventral processes.
- foveatus*, Van Duzee.
- g*<sup>2</sup>. Frontal carinæ pale, margined broadly with brown or black; styles slender; anal tube without processes . . . . . *constrictus*, new species.
- f*<sup>2</sup>. Frons only slightly narrowed between eyes, sides not straight below.
- g*<sup>1</sup>. Styles long, sinuate, very horizontal; aperture of pygofers broad.
- pellucidus* Fabricius (light form).
- g*<sup>2</sup>. Styles arched, divergent in basal half, then convergent, apex flexed and subparallel; color whitish; frons yellow, slightly darker inside of lateral carinæ. . . . . *osborni* Van Duzee.
- d*<sup>2</sup>. Genital styles not acute at tip, but broadened or bifurcate.
- e*<sup>1</sup>. General color whitish or light yellow; frontal carinæ margined with black or brown; vertex rather long; pronotum unusually long; styles stout, broadened and truncate at apex. . . . . *circumcinctus* Van Duzee.
- e*<sup>2</sup>. General color brown to black, not whitish.
- f*<sup>1</sup>. Antennæ short, not reaching to clypeus; genital styles broadened and square at apex; color brown. . . . . *vanduzeei*, new species.
- f*<sup>2</sup>. Antennæ longer, reaching at least to clypeus.
- g*<sup>1</sup>. Male pygofer deeply notched above and produced caudad more or less slenderly around anal tube.
- h*<sup>1</sup>. Antennæ a little longer than to clypeus.
- i*<sup>1</sup>. Caudal prolongation of pygofers often more or less bifurcate at tip; styles stout, rounded or square at tip. . . . *terminalis* Van Duzee.
- i*<sup>2</sup>. Caudal prolongation less slender, rounded apically; styles very broad, flat, rounded or angulate on apical margin, inner margins arcuate, not far separated; with a light dorsal vitta on notum between carinæ. . . . . *laminalis* Van Duzee.

- h*<sup>2</sup>. Antennæ reaching only to clypeus; caudal prolongation square at tip, never bifurcate; styles slender, broadened at tip, apical margin straight or a little concave . . . . . *erectus niger*, new variety.
- g*<sup>2</sup>. Male pygofer not deeply notched above and not conspicuously produced caudad.
- h*<sup>1</sup>. Color black; frons narrow, sides rather straight; frontal carinæ white.
- i*<sup>1</sup>. Pronotum mostly white, scutellum dark; styles with a tooth on inner margin near apex. . . . . *puellis* Van Duzee.
- i*<sup>2</sup>. Pronotum white between carinæ, black without, and white on lateral margin; scutellum white between lateral carinæ; styles produced on inner margin into a long acute prolongation.  
*puellis mexicanus*, new variety
- h*<sup>2</sup>. Color brown, often rather light brown; pronotum very rarely lighter; carinæ very narrowly pale.
- i*<sup>1</sup>. Median frontal carina often forked below apex of head; carinæ sometimes scarcely lighter than foveæ; dorsum with median light vitta . . . . . *albolincosus* Fowler.
- i*<sup>2</sup>. Median frontal carina forked at apex of head; styles broadened suddenly at apex . . . . . *pacificus*, new species.
- c*<sup>2</sup>. Frons unicolorous, carinæ not or scarcely differentiated in color from foveæ.
- d*<sup>1</sup>. Genital styles simple, acute at tip.
- e*<sup>1</sup>. Color brown to black; body rather small; frons narrow, black.
- f*<sup>1</sup>. Carinæ prominent on vertex and frons; color fuscous to dark brown.  
*basivitta* Van Duzee.
- f*<sup>2</sup>. Carinæ rather weak, not prominent; color shining black, clypeus and venter yellow; styles arcuated at apex. . . . . *andromedus* Van Duzee.
- e*<sup>2</sup>. Color yellowish to light brown, abdomen darker.
- f*<sup>1</sup>. Elytra black; styles slender, acuminate. . . . . *kilmani* Van Duzee.
- f*<sup>2</sup>. Elytra pale, hyaline; styles very stout and thick, suddenly narrowed and flexed out at apex. . . . . *magnus*, new species.
- d*<sup>2</sup>. Genital styles not acute at tip, rounded or bifurcate.
- e*<sup>1</sup>. Styles broad at least apically, rounded or square at apex.
- f*<sup>1</sup>. Color light brown to yellowish.
- g*<sup>1</sup>. Frons rather narrow; pygofers of male with prominent tooth above in profile; styles broad, rounded at apex; calcar normal.  
*lateralis* Van Duzee.
- g*<sup>2</sup>. Frons moderately broad; pygofers without dorsal process; styles broad; calcar very large. . . . . *humulis* Van Duzee.
- f*<sup>2</sup>. Color mostly brown to black; male pygofers deeply notched above, produced caudad around anal tube.
- g*<sup>1</sup>. Frons conspicuously narrowed above, sides straight; styles long, broadened and spatulate at apex.
- h*<sup>1</sup>. Elytra slightly browned; color of body sometimes light brown.  
*erectus*, new species.
- h*<sup>2</sup>. Elytra glossy black; head and thorax yellowish.  
*erectus nigripennis*, new variety.
- g*<sup>2</sup>. Frons not conspicuously narrowed above; styles slender, dilated at apex, enclosing an oval space; color fuscous black.  
*basifuscatu*s Fowler.
- c*<sup>2</sup>. Styles large, conspicuously bifurcate at apex; anal tube toothed on ventral margin.
- f*<sup>1</sup>. Color shining black; styles rather straight, dilated and broadly bifurcate at apex; anal style large. . . . . *atrior* Fowler.
- f*<sup>2</sup>. Color reddish brown to dark; styles arcuate, stout, apex deeply bifurcate, with inner process again bifurcate; anal style short.  
*magnistylus*, new species.

## MEGAMELUS NOTULUS Germar.

Plate 46, fig. B; plate 47, figs. H-J.

*Delphax notulus* GERMAR '30 : 57.*Liburnia notula* EDWARDS '86 : 62; '96 : 38.—SCOTT '71 : 25.*Megamelus notulus* VAN DUZEE '97 : 233.—OSHANIN '07 : 300 (complete bibliography).*Delphax truncatipennis* BOHEMAN.*Delphax lineola* STÅL.

Length of body, 2.7 mm.; width of vertex, 0.18; width of frons, 0.20; antennæ I, 0.19, II, 0.32. General color dark brown to brown; vertex, pronotum, and scutellum between carinæ lighter than outside of carinæ; frons blotched; legs and venter lighter brown; abdomen lighter on median dorsal half.

Head narrow; vertex rather rectangular, distinctly longer than broad, strongly carinate; median carina of frons prominent on apex of head; frons narrowed above, about two-thirds as broad above as below; clypeus not strongly carinate; antennæ nearly as long as frons, I more than half as long as II, II thick. Scutellum a little longer than pronotum; legs stout; hind tibiæ a little longer than femora; calcar large, more than half as long as basal tarsus. Elytra (macropterous) somewhat smoky. Abdomen broad.

Male pygofers rounded caudad, with ventral fossa deep; anal tube not dorsal, rather large; genital styles short, inconspicuous, cultrate, blunt at tip, finely serrate on inner margin; not visible in profile (what appears to be the styles in the figure is one of the ventral processes within the fossæ).

Redescribed from one brachypterous pair from England and one macropterous female from Winchendon, Massachusetts. Reported from Ontario, Canada, New York, and New Hampshire.

## MEGAMELUS NOTULUS FLAVUS, new variety.

Similar to species in form and size; lighter in color, less blotched, median dorsal area of abdomen lighter relatively. Male pygofers very broad and thick transversely, more swollen laterad than in species; genital styles larger, rather prominent; anal tube larger, ventral process longer.

Described from three males and nine females, all brachypterous, from Colorado (Baker).

*Type-specimen*.—Cat. No. 15982, U.S.N.M.

## MEGAMELUS MARGINATUS, Van Duzee.

Plate 47, fig. Q.

*Megamelus marginatus* VAN DUZEE '97 : 234; '08 : 197.

Length of body, 3.2 mm.; width of vertex, 0.20; width of frons, 0.26; antennæ I, 0.08, II, 0.18. General color whitish to yellowish brown, usually the former; frontal carinæ margined with black or brown; pleuræ tinged with brown. Body rather long.



Head long, narrow; vertex converging to front, about a half longer than broad, strongly carinate; frons about half as wide above as below, with median carina distinct on apex of head, sides diverging rather evenly to near apex; eyes narrow; antennæ short, slightly more than half as long as frons, I scarcely half as long as II. Pronotum long, roundly excavate behind. Legs short; hind tibiæ not longer than femora; calcar large, nearly as long as basal tarsus. Elytra whitish, much longer than body.

Redescribed from six brachypterous females from Massachusetts.

**MEGAMELUS CONSTRICTUS, new species.**

Plate 48, figs. M, R.

Size a little smaller than *M. marginata*, but proportions similar. General color very light brown; frontal carinæ margined with black; pleuræ and venter of abdomen more or less brown.

Similar in most respects to *marginatus* and closely related to it, differing as follows: Frons more than half as broad above as below, sides roundly bulging midway instead of straight; antennæ a little more than half as long as frons. Legs more slender, shorter; hind tibiæ a little longer than femora; calcar small, scarcely more than half as long as basal tarsus, very finely dentate on margin. Elytra hyaline, scarcely white. Pygofer of male truncate, with a simple excision ventrad, without fossæ on each side of genital styles; latter long, slender, sinuate, not concealed as in many species; anal tube subdorsal, directed upward.

Described from four males and three females, macropterous, from Colorado (Baker). This species, though very similar to *marginatus*, seems to be distinct, without doubt.

*Type-specimen*.—Cat. No. 15983, U.S.N.M.

**MEGAMELUS CONSTRICTUS MINUTUS, new variety.**

Distinctly and uniformly smaller than species, but proportions similar; color as in *marginatus*, whitish, elytra whitish. Legs smaller, more slender and delicate. Male genitalia similar.

Described from ten macropterous males and females from California (Baker).

*Type-specimen*.—Cat. No. 15984, U.S.N.M.

**MEGAMELUS ALBOLINEOSUS Fowler.**

Plate 48, fig. N.

*Megamelus albolineosus* FOWLER '81: 135.—VAN DUZEE '07: 47; '08: 203.

Length of body, 1.9 mm.; width of vertex, 0.12; width of frons, 0.19; antennæ I, 0.08, II, 0.19. General color brown; pronotum and scutellum between lateral carinæ, vertex, clypeus, lateral portion of pronotum, antennæ, and legs light yellowish brown; the rest

brown; frons brown between carinæ, latter usually yellowish, sometimes light brown. Body medium to small.

Head narrow; vertex very narrow, almost rectangular, carinæ not very prominent at apex of head; frons narrowed above, about one-third broader below than above; median carina forked usually below apex of head, sometimes at apex. Antennæ not as long as frons, I nearly half as long as II; eyes relatively large. Lateral carinæ of pronotum percurrent almost to hind margin or more or less curved out behind eyes and not reaching margin. Legs slender, rather short; hind tibiæ a little longer than femora; calcar delicate, more than half as long as basal tarsus. Elytra slender, brown apically. Male pygofers somewhat similar to *M. constrictus*; genital styles distinctly different in shape, with two teeth on inner margin, stout, subcultrate.

Described from numerous males and females from many parts of Mexico (Crawford, Baker), Nicaragua (Baker), and Habana, Cuba (Baker). The Nicaragua specimens are somewhat lighter than the Mexican forms, but structurally are identical, except that the lateral pronotal carinæ are deflexed outward before reaching the hind margin, while in the Mexican forms they are to a less extent. There is more or less variation, too, in the point of furcation of the median frontal carina. Both of these latter facts have led to considerable confusion in classifying the specimens. Two of the Nicaragua specimens bore the name of *M. albolineosa*; the other Nicaragua specimens had been determined as a species of *Dicranotropis*, while the Mexican specimens were named *Megamelus* sp. This is one of the many illustrations of the superficiality of the former system of classification.

MEGAMELUS METZARIA, new species.

Length of body, 2.8 mm.; width of vertex, 0.19; width of frons, 0.23; antennæ, I 0.18, II 0.34. General color dark brown or black; vertex, frons, and pronotum reddish brown; clypeus black, margined with white above; forecoxæ black; antennæ and legs brown. Body medium to rather large.

Vertex rather rectangular, distinctly longer than broad, with carinæ not very distinct at apex, but not evanescent; frons long, narrow, diverging to apex; median carina forked slightly below apex of head; clypeus slender; antennæ about as long as frons, I half as long as II; eyes large. Thorax moderately broad. Legs rather short; hind tibiæ longer than femora; calcar not large. Elytra long, hyaline, transparent, with a brown spot at apex of clavus. Male pygofers broad, of typical shape, with ventral fossæ deep, and processes between fossæ and genital styles long, rather slender, and rounded at apex; genital styles short, styliform, inconspicuous, as in *Dicranotropis delicatus*.

Described from one macropterous male collected in Banner, Wyoming, by C. W. Metz, for whom the species is named. This resembles more or less certain species of *Dicranotropis*, and possibly additional material will show that it should be included with that genus instead of *Megamelus*.

*Type-specimen*.—In collection of Pomona College.

MEGAMELUS BIFURCATUS, new species.

Plate 47, fig. S.

Length of body, 2.2 mm.; width of vertex, 0.19; width of frons, 0.24; antennæ, I 0.08, II 0.20. General color light brown or yellowish brown throughout, with a lighter vitta on median portion of notum; elytra brownish. Body rather small.

Head almost as broad as prothorax; vertex almost rectangular, moderately broad, longer than broad, not strongly carinate; frontal carinæ indistinct on apex of head, though not greatly so; frons narrowed above distinctly; antennæ not as long as frons, I scarcely half as long as II. Thorax not broad; legs slender; hind tibiæ a little longer than femora; calcar more than half as long as basal tarsus, margin finely dentate. Elytra rather short, narrow.

Male pygofers unique; ventral pygofers produced laterally on each side into a slender process, bifid at apex; dorsal pygofer spatulate, apex broadly rounded, extending beyond and much outside of ventral plate; genital styles long, sinuate, bifid at tip; anal tube large, apical, and slightly subdorsal.

Described from seven macropterous males and one female from Para, Brazil (Baker). The genitalia of this species are very remarkable, and in some other respects also it differs from the typical *Megamelus* species.

*Type-specimen*.—In collection of Pomona College.

*Paratype*.—No. 15985, U. S. Nat. Mus.

MEGAMELUS RECTANGULARIS, new species.

Plate 48, fig. S.

Length of body, 2.6 mm.; width of vertex, 0.20; width of frons, 0.26; antennæ, I 0.07, II 0.22. General color orange-yellow, whitish on scutellar carinæ. Body medium in size.

Head narrower than prothorax, moderately long, rather strongly carinate; vertex longer than broad, rectangular, produced somewhat before eyes; carinæ distinct at apex; frons somewhat hexagonal, broadest at ocelli; genæ slightly pubescent; antennæ about reaching to clypeus. Lateral pronotal carinæ rather straight, almost reaching hind margin; scutellum long. Elytra flavous, with tips of membrane veins browned broadly. Legs typical.

Male pygofers long, somewhat pubescent, produced caudad roundly on each side of anal tube, apices close; styles cultrate, arched, tips acute, close together; aperture of pygofers elliptical.

Described from one male from Chinandega, Nicaragua (Baker).

*Type-specimen*.—In collection of Pomona College.

MEGAMELUS AXIALIS Van Duzee,

Plate 49, fig. A.

*Kelisia axialis* VAN DUZEE '97:232.—OSBORN '97:235; '04:100.

Length of body 2.4 mm.; width of vertex 0.22; width of frons 0.25; antennæ, I, 0.05, II, 0.21. General color brown to dark brown; dorsum and vertex between lateral carinæ whitish with vitta apparently extending onto anal angles of folded elytra; frons reddish brown; pronotum black at each lateral extremity; tarsi black. Body rather small.

Head broad, with eyes about as broad as prothorax, broadly rounded in front; vertex a little longer than broad, weakly carinate, slightly produced in front of eyes; frons roundly hexagonal, less distinctly so than in *guttula*; median carina almost obsolete at apex of head; clypeus small, flat; antennæ very short, II about four times as long as I.

Thorax short, broad; pronotum moderately long behind eyes; legs rather short; calcar typical, large. Elytra short, narrow, reaching a little beyond tip of abdomen, brownish except on both margins subhyaline; membrane small. Hind wings very small, vestigial.

Male pygofers rather short, typical; styles moderately stout, less acuminate and needle-like distally than in *guttula*.

Redescribed from one male and four females from Greensburg, Pennsylvania (Wirtner). This species in some respects is quite similar to the European *guttula* (*Kelisia*).

MEGAMELUS ALBICOLLIS Melichar.

*Megamelus albicollis* MELICHAR '03:99.—DISTANT '06:483.

Length of body 2.7 mm.; width of vertex 0.18; width of frons 0.23; antennæ, I, 0.26, II, 0.32. General color black with reddish tinge; pronotum wholly or partially white, vertex and frons reddish, clypeus black, tibiæ apically and tarsi basally whitish, rostrum light. Body moderately large, macropterous form predominating.

Head rather short, narrow; vertex narrow, a little longer than broad, carinæ indistinct on apex of head; frons variable, sides sometimes diverging toward apex, sometimes parallel on apical third or half, whitish on apical margin. Antennæ longer than frons, I almost as long as II, slender, terete. Thorax long; lateral carinæ of pronotum percurrent to hind margin. Legs long slender; hind tibiæ longer than femora; calcar long. Elytra longer than body, subhyaline.

Redescribed from nine females from Nicaragua—San Marcos, Granada, and Chinandega (Baker). It is possible that the male of this species will show it to be distinct from the oriental species to which I have referred it. Melichar considers it the same species.

MEGAMELUS CAYAMENSIS, new species.

Plate 49, fig. C.

Length of body 2.3 mm.; width of vertex 0.23; width of frons 0.26; antennæ, I, 0.09, II, 0.22. General color brown, with broad white vitta along median carina of pronotum and scutellum; elytra brown on posterior half of membrane and tip of corium. Body moderately small.

Head fully as broad as prothorax, weakly carinate; vertex about square, moderately broad; carinæ evanescent at apex; frons rectangular, not strongly carinate; antennæ reaching fully to clypeus; eyes large. Lateral carinæ of pronotum flexed out behind eyes. Elytra long, slender. Legs typical.

Male aperture of pygofers rather circular; anal tube large; styles arched, constricted midway, broadened and rounded at apex.

Described from one male from Cayamas, Cuba (Baker).

*Type-specimen*.—In collection of Pomona College.

MEGAMELUS KORMUSI, new species.

Very similar in size and general color and appearance to *M. magnifrons*, differing chiefly in the male genitalia, which resemble more *M. magna*. Margin of pygofer aperture less sinuate, lateral protuberances less marked, more rounded; styles not black, apex bifurcate, points rather acute; anal tube with two very long processes ventrally, reaching almost to tip of styles.

Described from one brachypterous pair from Ormsby County, Nevada (Baker). This species is very closely related to *M. magna*, and to *M. magnifrons*, but seems to be quite distinct from both in the male genitalia.

*Type-specimen*.—In collection of Pomona College.

MEGAMELUS MAGNIFRONS, new species.

Plate 48, figs. J, O.

Length of body 3.2 mm.; width of vertex 0.36; width of frons 0.40; antennæ, I, 0.10, II, 0.26. General color soiled yellow, with longitudinal brown markings on dorsum of abdomen; frontal carinæ narrowly margined with brown; pronotum with a brown spot on lateral margin; venter somewhat browned. Body large, robust.

Head about as broad as prothorax, rather weakly carinate; vertex broader than long, rounded in front, carinæ almost obsolete at apex of head; frons broadest above, sides not arcuate, considerably longer



than broad; carinæ moderately distinct; antennæ reaching about to clypeus, I nearly half as long as II. Eyes large.

Pronotum moderately long, straight in front, scarcely emarginate behind; lateral carinæ curved outward, not reaching hind margin. Legs rather stout, hind tibiæ a little longer than femora; calcar about three-fourths as long as basal tarsus, pubescent. Male abdomen stout, broad; pygofer large, aperture irregular on margin, produced on each side of base of styles into a large process, acute at tip; anal tube very large, produced ventrad into a pair of very long and acute processes, with the serrate tip of penis between them; genital styles stout, cultrate, roundly acute at tip, divergent strongly.

Described from one brachypterous male from Colorado (Baker).

*Type-specimen*.—Cat. No. 15986, U.S.N.M.

MEGAMELUS PELLUCIDUS Fabricius.

Plate 47, figs. N, O; plate 49, fig. I.

*Fulgora pellucida* FABRICIUS.

*Delphax pellucida* FABRICIUS '03:84.—FIEBER '66: fig. 8.—OSHANIN '07:342.

*Liburnia pellucida* FIEBER '71:5.—EDWARDS '96:58.—VAN DUZEE '97:247.—OSBORN '04:100.

*Liburnia arvensis* FITCH '93:386 (Lintner).—VAN DUZEE '97:248.

*Liburnia furcata* PROVANCHER '89:225.—VAN DUZEE '97:248.

*Liburnia detecta* VAN DUZEE '97:248.

Length of body, 2.9 mm.; width of vertex, 0.24; width of frons, 0.26; antennæ, I, 0.10, II, 0.24. General color black to brown, sometimes pale yellowish brown, males usually darker than females.

*Male*.—Frontal carinæ, most of pronotum, margin of scutellum, connexivum whitish or yellowish white; frons deep black; second antennal segment (sometimes part of I), tibiæ, tarsi, and sometimes femora light brown; elytra slightly browned, veins black, apical margin heavy, black.

*Female*.—Often pale yellowish brown, more variable than male.

Head narrower than prothorax; vertex short; frons subrectangular, broadest at middle, slightly constricted above, a little more than twice as long as broad; antennæ reaching about to clypeus, I nearly half as long as II. Scutellum long; hind tibiæ scarcely longer than femora; calcar large, often nearly as long as basal tarsus, margin finely but distinctly dentate. Macropterous forms predominating.

Male genital segment moderately large, rather broad, subcylindrical; aperture broad, pentagonal, broadest sub-basally, with a fossa beneath genital styles; ventral notch deep, prominent; styles long, simple, acuminate, inflexed at apex to fit angle of aperture; anal tube dorsal or subdorsal, with two short, slender, approximate processes on ventral margin; anal style short.

Redescribed from numerous specimens of both sexes from the following localities: Several males and females from Austria, deter-

mined by Melichar; in the United States: Pennsylvania (Wirtner), Massachusetts, New Hampshire, Wisconsin (Baker), Michigan, Illinois, Wyoming (Metz), Nevada (Baker), Colorado (Baker).

*Megamelus detectus* Van Duzee is apparently only a light-colored form of this species.

MEGAMELUS CONSIMILIS Van Duzee.

Plate 47, fig. M.

*Liburnia consimilis* VAN DUZEE '97:249.

Average length of body, 2.6 mm. General color black to light yellowish brown or even yellow; carinæ of head and pronotum whitish or yellowish; frons variable in color from almost uniform dark brown between carinæ (with a slightly lighter streak in each compartment) to yellow or yellowish brown between the brown or black margins of carinæ; apex of head usually entirely yellowish brown, giving frons the appearance of being more oval than it really is; antennæ light brown, with apex of I and base of II dark; pronotum more or less whitish; legs light brown, usually lineated with brown or black.

Very similar to *M. pellucida*, differing as follows: Vertex a little longer; frons relatively broader, more oval, often about twice as long as broad or even less; carinæ less distinct on apex of head, sometimes quite indistinct. Legs longer; hind tibiæ longer than femora; calcar shorter, less distinctly dentate. Male genital segment similar; aperture of pygofer distinctly smaller, more circular; styles shorter, more slender, not flexed at tip, less divergent.

Redescribed from more than 200 specimens of both sexes, about half of the macropterous, from Colorado, Nevada, and California (coll. Baker), and two females from Washington, District of Columbia. Since there are no males from the latter locality, the identity can not be certain, but the two specimens correspond very closely in all respects to the western forms.

MEGAMELUS GILLETTEI Van Duzee.

Plate 47, fig. L.

*Liburnia gillettei* VAN DUZEE '97:258.

Average length and proportions similar to *M. pellucida*, vertex and frons a little broader. General color black to brown or very light brown; carinæ of head and notum whitish or yellowish white; frons deep black between carinæ; vertex and pronotum blotched irregularly brown and yellowish; scutellum similarly blotched or often almost entirely black between carinæ; abdomen blotched, connexivum white; antennæ black to light brown, in latter case apex of I and base of II black; legs lineated with black or brown; elytra slightly browned.

Similar to *pellucida* but vertex and frons broader; latter rather conspicuously reticulate. Legs stout; hind tibiæ a little longer than femora; calcar a little more than half as long as basal tarsus, marginal dentation scarcely visible.

Male genitalia similar to *pellucida*, but styles shorter and more slender, not flexed at tip, much less divergent, parallel at base.

Redescribed from numerous males and females from Colorado and Nevada (Baker), and Wyoming (Metz). This species bears a close resemblance to both *pellucida* and *consimilis*, but seems to be quite distinct in the characters enumerated above.

MEGAMELUS CAMPESTRIS Van Duzee.

Plate 47, fig. P.

*Liburnia campestris* VAN DUZEE '97:254.

Length of body, 2.7 mm.; width of vertex, 0.26; width of frons, 0.28; antennæ, I, 0.09, II, 0.20. General color yellow to light brown; frons brown next to carinæ, lighter discally; genæ black; pronotum sometimes slightly brown; scutellum brown or black outside of lateral carinæ; meso and metapleuræ brown; venter of abdomen brown; legs light; elytra subhyaline or slightly brown.

Head almost as broad as prothorax; vertex moderately broad; carinæ indistinct on apex of head; frons subrectangular, less than twice as long as broad, not strongly carinate; antennæ reaching to clypeus, I half as long as II. Legs moderately long; hind tibiæ longer than femora; calcar thin, more than half as long as basal tarsus, margin very minutely dentate.

Aperture of male pygofer irregular, rather broad; genital styles approximate at base, in form of horseshoe, rather flat, broad, and truncate at tip.

Redescribed from numerous males and females (about 100) from New York, Pennsylvania (Wirtner), Washington, District of Columbia (Riley), Michigan, Colorado, Nevada, Arizona, California (coll. Baker and others). Some of the specimens were labeled *M. laminalis*, but that species is quite distinct from *campestris*.

MEGAMELUS LUTULENTUS Van Duzee.

Plate 49, fig. D.

*Liburnia lutulenta* VAN DUZEE '97:252.

Average length 2.4 mm.; width of vertex 0.26; width of frons 0.32; antennæ, I, 0.08, II, 0.19. General color dull brown, abdomen darker, often black; frontal carinæ obscurely margined with brown; elytra light brown to fuscous. Body small, robust.

Head almost as broad as prothorax; rather weakly carinate; frons suboval, carinæ almost obsolete above; eyes large. Dorsum moderately broad, not strongly carinate. Elytra short. Legs rather short;

hind tibiæ longer than femora; calcar small, marginal dentation indistinct. Abdomen short, carinate along median dorsal line.

Male pygofers short, more or less covered dorsally by pre-anal segment; aperture irregular in outline, somewhat triangular, ventral notch slight; styles short, slender, approximate at base, divergent apically, acute at apex; anal tube short.

Redescribed from two males from Chicopee, Massachusetts, one male from Minnesota, one female from Canada, and one male from Colorado (Baker).

MEGAMELUS ROTUNDATUS, new species.

Plate 48, figs. T, U.

Average length of body 2.3 mm.; width of vertex 0.18; width of frons 0.21; antennæ, I, 0.10, II, 0.19. General color soiled whitish on head, pronotum and scutellum; abdomen dark brown except rufous dorsad on middle of last three segments and pygofers; pleuræ and metanotum brown; legs, antennæ and venter of thorax light to whitish.

Head almost as broad as prothorax, somewhat roundly produced between eyes, indistinctly carinate at apex; vertex moderately broad, sides straight; frons at least twice as long as broad, narrowed above, broadest (about one-half broader than base) at apex, not strongly carinate; antennæ reaching a little beyond clypeus, I half as long as II. Pronotum moderately long, broadly emarginate behind. Elytra subhyaline, not reaching to tip of abdomen. Legs rather slender, hind tibiæ a little longer than femora; calcar rather thin, large, margin distinctly dentate.

Male pygofers rather long, horizontal; aperture irregularly circular or nearly so; styles broad, constricted midway, somewhat divergent, apex broad, spatulate, arcuate, square at tip; anal tube large, without processes, subhorizontal.

Described from one brachypterous male from Alabama (Baker).

*Type-specimen*.—Cat. No. 15987, U. S. Nat. Mus.

MEGAMELUS TEAPÆ Fowler.

Plate 49, fig. E.

*Liburnia teapæ* FOWLER '81:135.—VAN DUZEE '07:46.

Average length 2.4 mm.; width of vertex 0.17; width of frons 0.20; antennæ, I, 0.09, II, 0.19. General color glossy black to dark brown over entire body surface; genæ pale; antennæ and legs yellow; elytra black, except anterior corner of corium and anterior third of membrane yellow to hyaline.

Head short, narrower than prothorax, rather weakly carinate; vertex short; frons rather long, sides almost straight, rectilinear, more than twice as long as broad, rather weakly carinate; antennæ reaching to clypeus, I about half as long as II. Dorsum weakly cari-

nate; elytra rather glossy, veins distinctly setose, typical in venation. Legs moderately long, slender; hind tibiæ longer than femora; calcar long, acute at tip, margin finely dentate.

Male pygofers rather long, aperture subcircular or elliptical, not sinuate; styles short, flat, spatulate, apical half arcuate, broadened and square at tip; anal tube subdorsal, not projecting above dorsal notch of pygofers.

Described from about 90 specimens of both sexes from the following localities: Nicaragua (Baker), Belize, British Honduras (Johnson), Para, Brazil (Baker), Guadalajara and Jalapa, Mexico (Crawford), and Habana, Cuba (Baker). The latter, from Cuba, seem to be more uniformly brown rather than black, with the elytra correspondingly brown.

MEGAMELUS TEAPÆ ALBINOTATUS, new variety.

Differs from the species only in the pronotum being whitish at least on posterior half or more, male genital styles slightly longer and less spatulate at apex.

Described from two males from Jalapa, Mexico (Crawford).

*Type-specimen*.—Cat. No. 15988, U.S.N.M.

MEGAMELUS INDISTINCTUS, new species.

Plate 49, fig. B.

Average length 2.2 mm.; width of vertex 0.20 m.; width of frons 0.23.; antennæ, I, 0.08, II, 0.19. General color dark brown to black on scutellum and abdomen; pronotum and vertex light brown to yellow; frons brown; antennæ and legs yellow.

Head a little narrower than prothorax, carinæ not strong, evanescent at apex in brachypterous forms; vertex rather broad; frons more than half as broad as long, a little narrowed between eyes; antennæ reaching to clypeus, I half as long as II. Dorsal carinæ not strong, laterals of pronotum somewhat curved out behind eyes. Legs stout; hind tibiæ longer than femora slightly; calcar not large, marginal dentation fine. Elytra typical, hyaline.

Male pygofers typical, aperture somewhat five-sided, rather irregular; styles long, broadened and somewhat clavate-spatulate at apex; anal tube with two long processes ventrad outside of genital styles.

Described from two males (one brachypterous) and three females from Pagosa Springs, Colorado (Baker).

*Type-specimen*.—Cat. No. 15989, U.S.N.M.

MEGAMELUS OCCLUSUS, Van Duzee.

Plate 48, fig. Q.

*Liburnia oclusa* VAN DUZEE '97:256.

Length of body 2.1 mm.; width of vertex 0.28; width of frons 0.33; antennæ, I, 0.10; II, 0.18. General color black; carinæ of head, tip of antennæ, tibiæ and tarsi light brown to yellowish brown. Body rather small in both sexes, robust.



Head relatively rather large, fully as broad as prothorax, weakly carinate at apex; frons broad, oval, usually about two-thirds as broad as long (may be more or less than that), sometimes pale at base; antennæ reaching at least to clypeus, I scarcely half as long as II. Dorsum moderately broad, short, with a slight foveal impression between median and lateral carinæ of pronotum and scutellum; former only slightly concave behind. Legs typical; hind tibiæ only slightly longer than femora, large at tip; calcar small, margin indistinctly dentate. Elytra (brachypterous) black, usually glossy, not attaining to tip of abdomen; macropterous elytra brown to black, moderately long. Abdomen carinate along median dorsal line.

Male pygofers notched deeply and broadly above; ventral notch rather deep, narrower; aperture subcircular, margin pubescent; styles rather long, lanceolate, acute at tip, pubescent apically; anal tube obscurely bi-dentate ventrally.

Redescribed from 24 males and females from California, Nevada, Colorado, and Mexico (Acapulco), collection C. F. Baker. In the aspect of the frons this species bears some resemblance to *M. consimilis*.

MEGAMELUS ANALIS, new species.

Plate 49, fig. Ha.<sup>1</sup>

Length of body 1.9 mm.; width of vertex 0.21; width of frons 0.23; antennæ, I, 0.07, II, 0.20. General color orange yellow, abdomen brown to dark brown, or often light brown in female; legs and antennæ yellowish.

Head rather weakly carinate; vertex moderately broad, about square, scarcely produced in front before eyes; rounded in front; frons more than half as broad as long, broadest a little above ocelli. Antennæ reaching a little beyond margin of clypeus, II about three times as long as I. Thorax rather broad; lateral carinæ of pronotum flexed out behind eyes; legs short, rather stout; calcar very small. Elytra typical.

Male pygofers relatively large, aperture large; margin of aperture sinuate, with an acute prolongation over base of styles; dorsal notch slight; anal tube large, with one ventral process; styles short, cultrate, inner margin slightly sinuate, apex roundly acute.

Described from three brachypterous males and many brachypterous and macropterous females from Polk County, Wisconsin (Baker).

*Type-specimen*.—In collection of Pomona College.

MEGAMELUS NIGRIDORSUM, new species.

Plate 48, figs. A, I.

Length of body 2.7 mm.; width of vertex 0.19; width of frons 0.21; antennæ, I, 0.09, II, 0.21. General color black, usually glossy;

<sup>1</sup> See footnote beneath explanation of plate in Explanation of Plates, on page 637.

tips of pronotum laterad, antennæ, legs and rostrum light brown; posterior margin of two last tergites of abdomen white; elytra subhyaline, veins brown.

Head rather short, almost as broad as prothorax, weakly carinate at apex; vertex moderately broad, sides straight; frons subrectangular, slightly constricted above, about twice as long as broad; antennæ reaching about to clypeus, I half as long as II. Elytra typical. Hind tibiæ longer than femora; calcar rather small, scarcely more than half as long as basal tarsus, margin very finely dentate.

Male genital segment large, prominent; aperture of pygofer elongate, irregular, with a prominent, rounded flap projecting outward and back on each side; styles long, acuminate, stout and broad (in profile) basally, acute at apex, somewhat twisted, with a slender process at base of each; anal tube large, produced greatly ventrad and terminating in two long teeth which overlap styles; anal style horizontal.

Described from four males, one semibrachypterous, from Colorado (Baker). The genitalia of this species are very remarkable and easily recognizable at a glance.

*Type-specimen*—Cat. No. 15990, U.S.N.M.

MEGAMELUS NIGRIGASTER, new species.

Plate 47, fig. U.

Average length 2.8 mm.; width of vertex 0.25; width of frons 0.30; antennæ, I, 0.09, II, 0.19. General color abdomen black, thorax brown, lighter on dorsum between carinæ; frons and clypeus between carinæ black; carinæ of head and notum white, median scutellar carina broadly white; abdomen with several elongate rufous marks laterad on dorsum, and connexivum and margin of ventral preanal segment white; antennæ, I brown to black, II light; legs light brown, with more or less distinct brown lineations.

Head narrower than prothorax, rather strongly carinate; vertex rather broad, sides straight; frons less than twice as long as broad, constricted above and at apex, sides slightly sinuate; antennæ scarcely reaching to clypeus, I almost half as long as II. Notum broad; elytra subhyaline. Legs stout; hind tibiæ scarcely longer than femora; calcar robust, rather thick, dentation fine, obscured by pubescence.

Male pygofer moderately long, aperture rather elongate-ovate, irregular, deeply notched above; styles very short, thick, flexed outward and acute at tip, reaching scarcely one-third of length of aperture; anal tube large, subhorizontal; anal style very thick.

Described from two brachypterous males from Colorado (Baker).

*Type-specimen*.—Cat. No. 15991, U.S.N.M.

## MEGAMELUS ALBIDENS, new species.

Plate 49, fig. H.

Length of body 2 mm.; width of vertex 0.21; width of frons 0.20; antennæ, I, 0.09, II, 0.19. General color black, brown on dorsum of thorax; carinæ of head and pronotum pale; frons dark brown between carinæ; antennæ (except tip of I) and legs light; a white rounded process on each side of pygofer aperture at base of styles; elytra pale, nerves broadly brown on membrane. Body rather small, slender.

Similar to *M. puella* superficially in head and thorax. Veins of membrane broadly browned. Male pygofers moderately long, aperture subcircular, margin irregular and sinuate; with a conspicuous process outside of styles at base; anal tube short, subdorsal; genital styles long, acuminate, divergent, flexed out and acute at tip.

Described from one male from Campinas, Brazil (Baker).

*Type-specimen*.—In collection of Pomona College.

## MEGAMELUS ALBIDENS HAVANENSIS, new variety.

Similar in size and general appearance to the species, but distinctly lighter in color throughout, light brown; elytra slightly less browned on membrane veins. Male genital styles shorter, scarcely acuminate, flexed outward at tip but not acute.

Described from one male from Habana, Cuba (Baker). Perhaps this is a distinct species, but on account of its close resemblance to *albidens*, it seems more natural to consider it a varietal form only.

*Type-specimen*.—In collection of Pomona College.

## MEGAMELUS APPROXIMATUS, new species.

Plate 49, fig. F.

Size and general proportions very similar to *M. teapæ*. General color black, with a broad white vitta on dorsum between lateral carinæ from vertex to tip of scutellum and continued on to clavus; extreme lateral portion of pronotum also white; legs and antennæ yellow; frons black; elytra as in *teapæ*.

All variations from *teapæ* are slight, except male genitalia. Styles longer, simple, slightly arched and a little divergent, apices close.

Described from two males from Managua, Nicaragua (Baker). This species appears to be very similar to *M. sagata* Fowler, and may be only the macropterous form of it. Because of some apparent differences, however, it is described as a distinct species.

*Type-specimen*.—In collection of Pomona College.

## MEGAMELUS VANDUZEEI, new species.

Plate 48, fig. H.

Average length 2.5 mm.; width of vertex 0.21; width of frons 0.27; antennæ, I, 0.09, II, 0.18. General color brown to light brown; vertex,

pronotum, tip of scutellum, frontal carinæ, connexivum, femora (mostly) and antennæ light brown; frons dark between carinæ, often lighter on a discal streak; tibiæ lineated with brown.

Head as broad as prothorax, produced before eyes, strongly carinate; vertex straight behind, hind margin anterior to midpoint of eyes; frons fully twice as long as broad, broadest at ocelli, somewhat hexagonal, strongly carinate; antennæ short, not reaching to clypeus, I half as long as II. Pronotum rather long, with a foveal impression on each side of median carina. Elytra long, hyaline, sometimes faintly fumate, apical margin slightly darkened. Legs rather short; hind tibiæ slightly longer than short femora; calcar broad, nearly as long as basal tarsus, margin with a double row of teeth.

Male pygofers moderately long, aperture broad, transversely ovoid; styles rather long, approximate at base, divergent in apical two-thirds, broadened and square at tip, produced more outwardly than in; anal tube short, mostly covered by anal tergite, with two slender teeth on ventral margin.

Described from two males (one brachypterous) and eight females (three brachypterous) from Massachusetts.

*Type-specimen*—Cat. No. 15992, U.S.N.M.

MEGAMELUS TERMINALIS Van Duzee.

Plate 48, figs. F, K.

*Liburnia terminalis* VAN DUZEE '07:49.

Average length 2.5 mm.; width of vertex 0.18; width of frons 0.22; antennæ, I, 0.11, II, 0.22. General color light yellowish brown to brown, abdomen almost black except connexivum and preanal tergite white; dorsum light; frons brown between carinæ; antennæ brown, black at base of II and tip of I; legs light; elytra subhyaline, slightly browned. Body moderately large.

Head short, narrower than prothorax; vertex small, rather square, narrow; frons long, narrow, more than twice as long as broad, sides constricted a little between eyes, below subparallel, carinæ distinct. Antennæ reaching a little more than to clypeus, I fully or over half as long as II, sometimes three-fourths. Pronotum moderately long, dorsal carinæ not prominent. Legs moderately long, hind tibiæ longer than femora; calcar rather long, margin finely dentate.

Male pygofers rather long, produced caudad on each side of anal tube, as in *M. erecta*, but apex somewhat bifurcate, bifurcation more or less variable in extent; styles short, stout, ligulate, not divergent or scarcely so, blunt at apex; relative size of styles somewhat variable.

Described from 30 males and females from San Marcos, Nicaragua (Baker). It is possible that this is not identical with Van Duzee's West Indian species.

## MEGAMELUS LAMINALIS Van Duzee.

Plate 47, figs. R, T.

*Liburnia laminalis* VAN DUZEE '97:251; '08:201.

Length of body 2.8 mm.; width of vertex 0.20; width of frons 0.23; antennæ, I, 0.12, II, 0.25. General color soiled yellow to yellowish white; frons transversely blotched with brown, clypeus brown; pronotum and scutellum light brown laterad; mesopleuræ brown; legs light; elytra slightly brown; male pygofers whitish except laterally brown.

Vertex short; frons almost twice as long as broad, broadest a little above ocelli, slightly constricted between eyes; antennæ reaching beyond clypeus, I half as long as II. Legs moderately long; hind tibiæ longer than femora; calcar typical, marginal dentation scarcely visible; brachypterous elytra reaching almost to tip of abdomen. Male pygofers deeply notched above, produced on each side caudad; genital styles large, spatulate, not plane, apex rather angulately rounded; anal tube dorsal.

Redescribed from 4 males and 12 females from Pennsylvania (Wirtner) and Illinois.

## MEGAMELUS ERECTUS, new species.

Plate 48, figs. D, E.

Average length 2.1 mm.; width of vertex 0.16; width of frons 0.19; antennæ, I, 0.2, II, 0.23. General color light flavous to brown, darker on abdomen (often almost black), scutellum and metasternum.

Head short, not as broad as prothorax, distinctly carinate at apex; vertex small, narrow; frons over twice as long as broad, almost twice as broad at apex as base, sides nearly straight; antennæ reaching at least to clypeus, I half as long as II. Pronotum rather short; scutellum long; elytra typical, slightly browned; legs long; hind tibiæ considerably longer than femora, apical spines long; calcar moderately long, large, margin finely dentate.

Male pygofers broad, often erect, largely concealed in profile by pre-anal segment, produced dorsally caudad on each side of anal tube; styles long, divergent, enlarged and spatulate at tip, either square or slightly rounded on apical margin.

Described from 23 males and females from Jalapa, Mexico (Crawford), a pair from Acapulco, Mexico (Baker), four from Managua, Nicaragua (Baker), and over 100 from Habana, Cuba (Baker).

*Type-specimen*.—Cat. No. 15994, U.S.N.M.

## MEGAMELUS ERECTUS NIGER, new variety.

Similar to species in most characters, but differing in color and slightly in male genitalia. Color uniformly darker than average for species, scutellum, abdomen, frons between carinæ, antennæ except apex of II dark brown or black; remainder light brown; pronotum



lightest. Male genital styles more slender, not broad and truncate at tip but with a small tooth on inner margin near apex, giving the appearance of being slightly bifurcate.

Described from two males and one female from Acapulco, Mexico (Baker), one male from Jalapa, Mexico (Crawford), and one pair from Habana, Cuba (Baker).

*Type-specimen*.—Cat. No. 15993, U.S.N.M

MEGAMELUS ERECTUS NIGRIPENNIS, new variety.

Similar to species, except elytra (brachypterous) black, glossy, reaching to tip of abdomen, pale at extreme base; thorax yellowish; male genitalia similar, styles relatively a little stouter, apex somewhat rounded.

Described from one brachypterous male from Managua, Nicaragua (Baker). The specimen bears a label "*M. nigripennis* Mel.," apparently a manuscript name.

*Type-specimen*.—In collection of Pomona College.

MEGAMELUS PUELLIS Van Duzee.

Plate 47, fig. K.

*Liburnia puella* VAN DUZEE '97:250; '08:202.—OSBORN '97:235; '00:65.

Average length of body 2.2 mm.; width of vertex 0.15; width of frons 0.21; antennæ, I, 0.09, II, 0.20. General color black to brown; carinæ of head and pronotum white or pale; frons usually black between carinæ, sometimes brown or light brown; tip of scutellum and connexivum white; antennæ and legs light brown to yellowish; femora more or less brown; elytra transparent, with a brown spot at tip of clavus; body rather slender.

Similar in aspect to *M. pellucida*, but body more slender; frons narrow, more than twice as long as broad, sides nearly straight; antennæ reaching to clypeus, I nearly half as long as II; legs slender; hind tibiæ a little longer than femora; calcar thin, not as long as basal tarsus, margin finely dentate, black. Elytra similar to *pellucida*.

Male genital segment similar to *M. consimilis*; genital styles not simple, broadened at tip or with a tooth on inner margin near tip; with a process at base between styles.

Redescribed from about 40 specimens of both sexes from Pennsylvania (Wirtner, Klages); Massachusetts; Maryland; Illinois (Knab); Mississippi (Weed); Louisiana; Alabama; Habana; Cuba (Baker); Jalapa, Mexico (Crawford); and one male from Para, Brazil (Baker). The latter differs slightly in the shape of the genital styles, the inner tooth being longer and more acute than usual, but it seems to belong to this species nevertheless.

## MEGAMELUS PUELLIS MEXICANUS, new variety.

Similar in general size and appearance to the species, differing in color as follows: Pronotum and scutellum white between lateral carinæ, and former white on lateral margin behind eyes. Male genitalia similar but styles broadened at apex and extending on inner margin into a long acute prolongation.

Described from one male from Jalapa, Mexico (Crawford).

*Type-specimen*.—Cat. No. 15995, U.S.N.M.

## MEGAMELUS PACIFICUS, new species.

Plate 48, fig. L.

Proportions and size similar to *M. puellis*; general color light brownish to dark brown, abdomen darker; scutellum black or dark brown outside of lateral carinæ, latter pale yellowish; antennæ and legs yellowish; elytra brown.

Head narrow, short; vertex small, with a black fovea in each compartment; frons narrow, sides subparallel; carinæ of head and thorax moderately pronounced. Legs long, slender; hind tibiæ considerably longer than femora; calcar rather large, margin finely dentate. Elytra typical.

Male pygofers somewhat similar to *M. puellis*; styles stouter, broadened at apex, divergent; apical margin slightly concave.

Described from about 70 specimens, both sexes, from California (Baker), 2 males from Arizona (Baker), and 1 male from Mexico (Baker).

*Type-specimen*.—Cat. No. 15996, U.S.N.M.

## MEGAMELUS BASIVITTA Van Duzee.

Plate 49, fig. G.

*Liburnia basivitta* VAN DUZEE '09:202.

Average length 1.9 mm.; width of vertex, 0.15; width of frons, 0.20; antennæ, I, 0.08, II, 0.19. General color dark brown (sometimes black) to light brown; frons always a little darker than remainder of body, often black, with carinæ narrowly pale; second antennal segment usually lighter except at base; legs pale, abdomen often darker than thorax. Body rather small, slender.

Head distinctly narrower than prothorax; vertex narrow; nearly square; frons long, a little more than twice as long as broad, sides nearly straight, slightly constricted above; antennæ reaching to clypeus, I scarcely half as long as II. Pronotum moderately long; elytra (macropterous) heavily margined apically; (brachypterous) reaching nearly or quite to tip of abdomen, fulvous. Legs rather slender; hind tibiæ slightly longer than femora; calcar not long, margin very finely dentate, black.

Male pygofers moderately long, aperture ovoid; ventral notch not very deep; styles slender, divergent, curved outwardly near tip, acute; anal tube with two teeth ventrad, moderately close together.

Redescribed from about 25 males and females from Alabama, Mississippi (Weed), California, Colorado (Baker). Most of the specimens are from Alabama. The distribution is probably rather general throughout the Southern and Southwestern States.

MEGAMELUS MAGNUS, new species.

Plate 48, fig. P.

Average length, 3.4 mm.; width of vertex, 0.23; width of frons, 0.34; antennæ, I, 0.12, II, 0.25. General color soiled yellowish, abdomen brown on sides of tergum; a spot on metapleuræ and tips of tarsi black. Body large, robust.

Head a little narrower than prothorax, carinæ distinct but not sharp; vertex rather broad, about square; frons rather hexagonal, broadest at ocelli, about one and a half times as long as broad, carinæ rather distinct at apex of head; antennæ reaching about to clypeus. Lateral carinæ of pronotum flexed out quite strongly behind eyes, Legs stout; hind tibiæ a little longer than femora; calcar stout, pubescent.

Male pygofers large; margin of aperture sinuate, with a rounded protuberance about opposite tips of styles; latter large, black, stout, apex sharply flexed out and acute; anal tube large, without ventral processes; anal style thick.

Described from one brachypterous pair from Colorado (Baker).

*Type-specimen*.—Cat. No. 15997, U.S.N.M.

MEGAMELUS MAGNISTYLUS, new species.

Plate 48, fig. B.

Length of body, 2.6 mm.; width of vertex, 0.20; width of frons, 0.26; antennæ, I, 0.15, II, 0.26. General color reddish brown to brown; abdomen and mesopleuræ black or dark brown; legs lighter brown; elytra somewhat fumate.

Head short, broad, not quite as broad as prothorax; vertex moderately broad; sides straight; frons distinctly constricted above, broadest near apex, not quite twice as long as broad, strongly carinate; antennæ rather long, reaching beyond clypeus, I about two-thirds as long as II. Pronotum rather deeply emarginate behind. Elytra moderately long, veins dark. Legs stout; hind tibiæ a little longer than femora; calcar large, broad, as long as basal tarsus, margin with numerous rather large teeth.

Male pygofers long, aperture subcircular, broadest above, deeply notched above; styles long, prominent, arcuate, inner margin rather plane, apex deeply bifurcate with inner branch again bifurcate; anal

tube large, produced on each side ventrad into a long tooth, anal style small, short.

Described from four males and one female; one from Acapulco, Mexico (Baker), Arizona (Baker), and three from Jalapa, Mexico (Crawford). In some respects this resembles *M. atrior*, also a Mexican species, but it differs sharply in several characters from Fowler's description of that species.

*Type-specimen*.—Cat. No. 15998, U.S.N.M.

**MEGAMELUS AURANTII, new species.**

Plate 48, figs. C, G.

Average length, 2.4 mm.; width of vertex, 0.16; width of frons, 0.19; antennæ, I, 0.09, II, 0.20. General color orange yellow throughout, pronotum lighter; ocelli black; elytra flavous with tips of membrane veins brown. Body rather slender.

Head almost as broad as prothorax, carinæ rather pronounced; vertex slightly broader at base than beyond; frons rather narrow, constricted between eyes, sides subparallel, about twice as long as broad; antennæ reaching about to clypeus, I scarcely half as long as II, latter somewhat pubescent. Lateral carinæ of pronotum straight, usually extending nearly to hind margin. Legs moderately slender, hind tibiæ longer than femora; calcar rather long, thin, margin black, finely dentate. Elytra slender, typical in venation.

Male pygofers rather long, aperture elliptical, with a long, acute, spiniform process on each side a little basal of midpoint and curved inward over aperture; styles long, slender, enlarged at apex, not strongly divergent; anal tube prominent, protruding caudad, with one process on ventral margin.

Described from one male and six females from Para, Brazil (Baker). This is readily distinguished from related species by the long spiniform processes on the margin of the pygofer aperture.

*Type-specimen*.—In collection of Pomona College.

**MEGAMELUS ANDROMEDUS Van Duzee.**

*Liburnia andromeda* VAN DUZEE '07:46; '08:203.

One female of this species was collected in Belize, British Honduras, by J. D. Johnson. Since there is no male before me I will not redescribe the species.

*Locality*.—Jamaica, Florida (Van Duzee).

**MEGAMELUS CULTUS Van Duzee.**

*Liburnia culta* VAN DUZEE '07:47.

This appears to be identical with *pellucidus*, but it is rather difficult to be sure until the specimens have been examined. There is such a wide variation in this species that it is scarcely advisable to create a new species for two females only.

*Locality*.—Jamaica (Van Duzee).

## MEGAMELUS REDUCTUS Van Duzee.

*Liburnia* (?) *reducta* VAN DUZEE '07:49.

Apparently this is close to *M. albolineosa* Fowler, but only the female is known. The straight lateral carinæ are not uncommon in the specimens before me of *albolineosa*.

*Locality*.—Jamaica (Van Duzee).

## MEGAMELUS ANGULATUS Osborn.

*Megamelus angulatus* OSBORN '05:274.

This has not been included in the foregoing synopsis. It is probably most nearly related to *M. marginatus* Van Duzee, or *piceus* Van Duzee.

*Locality*.—St. Georges, Delaware (Osborn).

## MEGAMELUS LINEATIPES Van Duzee.

*Liburnia lineatipes* VAN DUZEE '97:255.—OSBORN '04:100.

*Locality*.—Ontario, New York (Van Duzee), Ohio (Swezey).

## MEGAMELUS FOVEATUS Van Duzee.

*Liburnia foveata* VAN DUZEE '97:257.

*Locality*.—Ontario, New York (Van Duzee).

## MEGAMELUS LATERALIS Van Duzee.

*Liburnia lateralis* VAN DUZEE '97:253.

*Locality*.—New York (Van Duzee).

## MEGAMELUS OBSCURELLUS Boheman.

*Delphax obscurella* BOHEMAN.—FIEBER '66: fig. 7.

*Liburnia obscurella* SCOTT '71:28.—EDWARDS '86:80; '96:60.—VAN DUZEE '97:252.

*Locality*.—New York (Van Duzee).

## MEGAMELUS OSBORNI Van Duzee.

*Liburnia osborni* VAN DUZEE '97:250.—OSBORN '03:100.

*Locality*.—New York (Van Duzee), New Jersey (Smith), Michigan (Davis), Indiana, Ohio, Illinois (Swezey).

## MEGAMELUS KILMANI Van Duzee.

*Liburnia kilmani* VAN DUZEE '97:253.—OSBORN '03:100.

*Locality*.—New York (Van Duzee), Ohio (Swezey).

## MEGAMELUS HUMULIS Van Duzee.

*Liburnia humulis* VAN DUZEE '07:48; '08:202.

*Locality*.—Florida, Jamaica (Van Duzee).

## MEGAMELUS CIRCUMCINCTUS Van Duzee.

*Liburnia circumcincta* VAN DUZEE '08:203.

*Locality*.—Florida (Van Duzee).



## MEGAMELUS BASIFUSCATUS Fowler.

*Liburnia basifuscata* FOWLER '81:134.

*Locality*.—Guerrero, Mexico (Fowler).

## MEGAMELUS ATRIOR Fowler.

*Liburnia atrior* FOWLER '81:134.

*Locality*.—Teapa, Tabasco, Mexico.

## MEGAMELUS APICIMACULATUS Fowler.

*Liburnia apicimaculata* FOWLER '81:136.

*Locality*.—Guatemala.

## MEGAMELUS SAGATUS Fowler.

*Liburnia sagata* FOWLER '81:136.

*Locality*.—Vera Cruz, Mexico. May be identical with *M. approximatus*, which see on page 622.

## MEGAMELUS PALUDATUS Fowler.

*Liburnia paludata* FOWLER '81:137.

*Locality*.—Guatemala.

This seems to resemble in some respects *M. pellucidus*. Its real relationship with the other species is difficult to state with only the brief description and small figures by Fowler. Perhaps it may be close to *Dicranotropis bakeri abdominalis* Crawford.

## MEGAMELUS MARGINICORNIS Fowler.

*Liburnia marginicornis* FOWLER '81:135.

*Locality*.—Guerrero, Mexico (Fowler).

Judging from the shape of the head, the form of the antennæ and the elytra, this appears to be a *Stobaera*. I do not wish to place it with that genus, however, until I have further evidence.

## MEGAMELUS STEJNEGERI Ashmead.

*Delphax stejneri* ASHMEAD '99:340; '10:130.

I have not been able to see the original description of this species, but probably it must be included in the genus *Megamelus*.

*Locality*.—Bering Island, Sitka, Alaska.

## MEGAMELUS DOLERUS Spooner.

*Liburnia dolera* SPOONER '12:240.

This is closely related to *M. lineatipes* (See remarks under *Dicranotropis ater* on page 600).

*Locality*.—Ithaca, New York, 1908.

## MEGAMELUS DAVISI Van Duzee.

*Megamelus davisi* VAN DUZEE '97:235.

*Locality*.—Michigan (Davis).

## MEGAMELUS PICEUS Van Duzee.

*Megamelus piceus* VAN DUZEE, Exp. Sta. Record, 1894:792; '97:234.

*Locality*.—New York (Van Duzee), Michigan (Davis).

## MEGAMELUS SCUTELLARIS Berg.

*Megamelus scutellaris* BERG '84: 141.

*Locality*.—Argentine Republic.

## MEGAMELUS SEMINEGRA Stål (not Mellichar).

*Delphax seminegra* STÅL '58: 275.—VAN DUZEE '07: 45; '09: 203.

*Locality*.—Jamaica, Florida (Van Duzee).

## MEGAMELUS SLOSSONI Ball.

*Liburnia slossoni* BALL '03: 231.—VAN DUZEE '08: 201.

*Locality*.—Florida (Slosson). This and the following species are quite closely related, perhaps the same species. Both were described from females only and their relation to other species is rather difficult to state.

## MEGAMELUS DORSILINEA Van Duzee.

*Liburnia* (?) *dorsilinea* VAN DUZEE '07: 50.

*Locality*.—Jamaica.

## MEGAMELUS NIGRIFRONS Van Duzee,

*Chloriona nigrifrons* VAN DUZEE '07: 45.

*Locality*.—Jamaica (Van Duzee).

This apparently belongs to the genus *Megamelus*; described from a single brachypterous female.

## MEGAMELUS SETIGERUS Osborn.

*Prokelisia setigera* OSBORN '05: 373.

*Locality*.—Cameron, Louisiana (J. S. Hine).

## MEGAMELUS PARVULUS Ball.

*Kelisia parvula* BALL '02: 264.

*Locality*.—Kansas, Iowa (Ball).

As nearly as can be determined from Ball's description of this species it is most nearly related to *M. axialis*. I have seen no specimens of it, except one female from Maryland which corresponds to the description to a considerable extent.

## MEGAMELUS SALINA Ball.

*Kelisia salina* BALL '02: 264.

*Locality*.—Colorado (Ball).

The following species of *Megamelus* have been too inadequately described to be included in the synopses.

## MEGAMELUS BERGI Scott.

*Liburnia cognata* BERG '79: 224.

*Liburnia bergi* SCOTT '81: 156.—BERG '84: 143.

*Locality*.—Buenos Ayres (Berg).

## MEGAMELUS FUSCO-IRRORATUS Blanchard.

*Liburnia fusco-irrorata* BLANCHARD, Berg, Anal. de Soc. Cient. Argentina, vol. 12, p. 266, 1881.

## MEGAMELUS FUSCO-TERMINATA Berg.

*Megamelus fuscoterminata* BERG '79: 296.

## MEGAMELUS NIGRICULA Berg.

*Megamelus nigricula* BERG '79: 226.

## MEGAMELUS PATRUELIS Berg.

*Megamelus patruelis* BERG '79: 223.

## MEGAMELUS UNIVITTATA Berg.

*Megamelus univittata* BERG '79: 224.

## MEGAMELUS FUCATUS Berg.

*Euides fucata* BERG, An. Soc. Cient. Argentina, vol. 16, 1883, p. 236.

## MEGAMELUS FUSCO-VITTATA Scott.

*Euides fusco-vittata* SCOTT '81: 155.—BERG, An. Soc. Cient. Argentina, vol. 16, 1883, p. 236.

## UNCERTAIN GENERA.

The following genera I have been unable to include in the foregoing synopses because of incomplete descriptions:

## Genus BERGIA Scott.

Scott in 1881 described this genus as follows:

Head: Crown barely twice as long as broad, with a longitudinal central and two short keels in front, the latter almost joined in the middle of the anterior margin; face nearly equal in length to the width between antennæ, with two longitudinal keels slightly widening from the lower margin of the frons to the apex; clypeus about as long as broad, measured across the base, without a central longitudinal keel. Antennæ: First joint about half the length of second; eyes somewhat large. Pronotum with a central longitudinal and two side keels, posterior margin concave across the scutellum. Scutellum triangular, apex acute, with five longitudinal keels, the central one not reaching to the apex, and the side ones vanishing before reaching the side margins. Elytra as in *Cixius*, *Oliarus*, etc., but the furcate apical areas are longer than in these genera. Legs: Tibiæ, third pair with three spines on outer margin, nearly equidistant from each other, placed, one at the base, another before, and another beyond the middle; tarsi, third pair, first joint almost as long as the second. (Ent. Mon. Mag., vol. 18, 1881, p. 155.)

According to Scott it is somewhat related to *Ugyops* Stål.

## BERGIA NIMBATA Berg.

*Liburnia nimbata* BERG '79: 226.

*Bergia nimbata* SCOTT '81: 155.

*Locality*.—Buenos Ayres (Gunther).

## Genus IDIOSYSTATUS Berg.

*Idiosystatus* BERG, '84: 138.

This is apparently not distinct from *Bergia*. Berg separates it only on the following characters:

Body narrower; vertex longer and more triangular; frons broader; clypeus with a median carina; antennæ shorter. Carinæ of pronotum and scutellum stronger; two lateral carinæ on scutellum on each side, united posteriorly.

## IDIOSYSTATUS ACUTIUSCULUS (Spinola?) Berg.

*Idiosystatus acutiusculus* BERG '84: 134.

*Locality*.—Rio Santa Cruz, Patagonia.

## Genus IDIOSEMUS Berg.

*Idiosemus* BERG '84: 140.

Berg's description is as follows:

Body elongate, attenuate at both ends; vertex produced triangularly in front of eyes; vertex plane, twice as wide at base as length, acuminate, margins sharply carinate; median percurrent to base undivided; posterior margin sinuate; frons lanceolate, convex; median carina reduced, apex truncate, margins elevated sharply; clypeus tricarinate. Antennæ medium in length, terete, II four times as long as I. Eyes deeply emarginate beneath. Scutellum 4-carinate. Elytra oblong, apex scarcely rounded, venation as in *Bergia*. Legs short; hind tibiæ trispinose; tarsi much shorter than tibiæ.

*Type of genus*.—*Idiosemus xiphias* Berg.

## IDIOSEMUS XIPHIAS Berg.

*Idiosemus xiphias* BERG '84: 140.

*Locality*.—Uruguay and Patagonia, on *Baccharis cordifolia*.

This genus, Berg says, resembles *Tropidocephala*, but differs in the scutellum and hind tibiæ, and the absence of the median frontal carina. The genus seems to be quite distinct, but I have not placed it in the synopsis of genera because the form of the calcar is not given. All three of these last-named genera probably belong in the first group of genera with the spiniform or cultrate calcar.

## UNCERTAIN SPECIES.

## DELPHAX PRODUCTA Walker.

*Delphax producta* WALKER '50: 353.

*Locality*.—Jamaica.

## DELPHAX LUTEIVITTA Walker.

*Delphax luteivitta* WALKER '50: 354.

*Locality*.—United States.

## DELPHAX UNICOLOR Walker.

*Delphax unicolor* WALKER '50: 354.

*Locality*.—Hudson Bay.

## DELPHAX HEMIPTERA Germar.

*Delphax hemiptera* GERMAR, Stett. Ent. Zeit., vol. 19, p. 192.—ASHMEAD '10: 131.

*Locality*.—Sitka, Alaska.

## DELPHAX SENILIS Scudder.

*Delphax senilis* SCUDDER, Tert. Ins. N. America, vol. 2, p. 295.

*Locality*.—White River, Colorado (?), or Utah (fossil).

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## EXPLANATION OF PLATES.

## PLATE 44.

- Fig. A. *Copicerus irroratus*, elytra.  
 B, C, D. Same, showing variation in venation.  
 E. Hind wing of same.  
 F. Female, abdomen, ventral view.  
 G. *Eucanyra stigmata*, antenna.  
 H. *Copicerus irroratus*, antenna.  
 I. Same, head and prothorax laterally.  
 J. Same dorsally.  
 K. Male genitalia ventrally.  
 L. *Pentagramma bivittata*, head and thorax.  
 M. Male genitalia, laterally.  
 N. *Eucanyra stigmata*, head and thorax.  
 O. *Pentagramma bivittata*, male genitalia ventrally.  
 P. *Pentagramma minore*, genital styles.  
 Q. Male genitalia laterally.  
 R. *Eucanyra stigmata*, elytra.  
 S. Male genitalia ventrally.

## PLATE 45.

- Fig. A. *Lepticus oculatus*, head and prothorax.  
 B. Spiniform type of calcar (*Copicerus*).  
 C. Tectiform type of calcar (*Megamelus*).  
 D. Cultrate type of calcar (*Proterosydne*).  
 E. *Proterosydne pictifrons*, genital styles.  
 F. Male genital segment laterally.  
 G. Antenna of same.  
 H. Head and thorax dorsally.  
 I, J. *Stobaera tricarinata*, male genitalia ventrally, showing variation.  
 K. Same, antennæ.  
 L. *Achorotile albosignata*, frons and clypeus.  
 M. Head and thorax.  
 N. *Laccocera vittipennis*, head and thorax.  
 O. *Stobaera tricarinata*, head and thorax.  
 P. *Laccocera bicornata*, male genitalia ventrally.  
 Q. *Laccocera vittipennis*, frons.  
 R. *Laccocera obesa*, head and thorax.  
 S. *Megamelanus bicolor*, head and thorax.  
 T. *Liburniella ornata*, male genitalia ventrally.  
 U. *Megamelanus bicolor*, male genitalia.  
 V. *Laccocera obesa*, male genitalia.  
 W. *Achorotile albosignata*, male genitalia.

## PLATE 46.

- Fig. A. *Megamelanus bicolor*, head and pronotum.  
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 D. *Stenocranus similis*, male genitalia.  
 E. *Stenocranus dorsalis*, genitalia.  
 F. Head and thorax.  
 G. *Stenocranus saccharivorus*, head and thorax.  
 H. *Stenocranus similis*, male genital segment laterally.  
 I. *Stenocranus saccharivorus*, genitalia.  
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 K. *Dicranotropis brunneus*, genital style.  
 L. *Dicranotropis frontalis*, genital styles.  
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 N. *Dicranotropis bakeri*, genitalia.  
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 P. *Dicranotropis marginatus*, head and thorax.  
 Q. Male genitalia.  
 R. *Dicranotropis pallipes*, genitalia.

## PLATE 47.

- Fig. A. *Dicranotropis maidis*, head and thorax.  
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 D. *Bakerella maculata*, male genitalia.  
 E. *Liburniella ornata*, head and thorax.  
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 G. *Phyllodinus flabellatus*, genitalia.  
 H. *Megamelus notulus*.  
 I. Genitalia of same.  
 J. Same laterally.

- Fig. K. *Megamelus puellis*, genital styles.  
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- Fig. A. *Megamelus nigridorsum*, genital segment laterally.  
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 N. *Megamelus albolineosus*, genital style.  
 O. *Megamelus magnifrons*, genitalia.  
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 Q. *Megamelus oclusus*, genital styles.  
 R. *Megamelus constrictus*, genitalia.  
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## PLATE 49.

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 K. *Stobaera tricarinata*.  
 L. *Stenocranus saccharivorus*.  
 M. *Proterosydne pictifrons*.  
 N. *Liburniella ornata*.  
 O. *Stenocranus croceus*.  
 P. *Stenocranus rostrifrons*.

<sup>1</sup> By an unfortunate error this figure was not lettered. It is the one immediately to the right of the one designated as H.

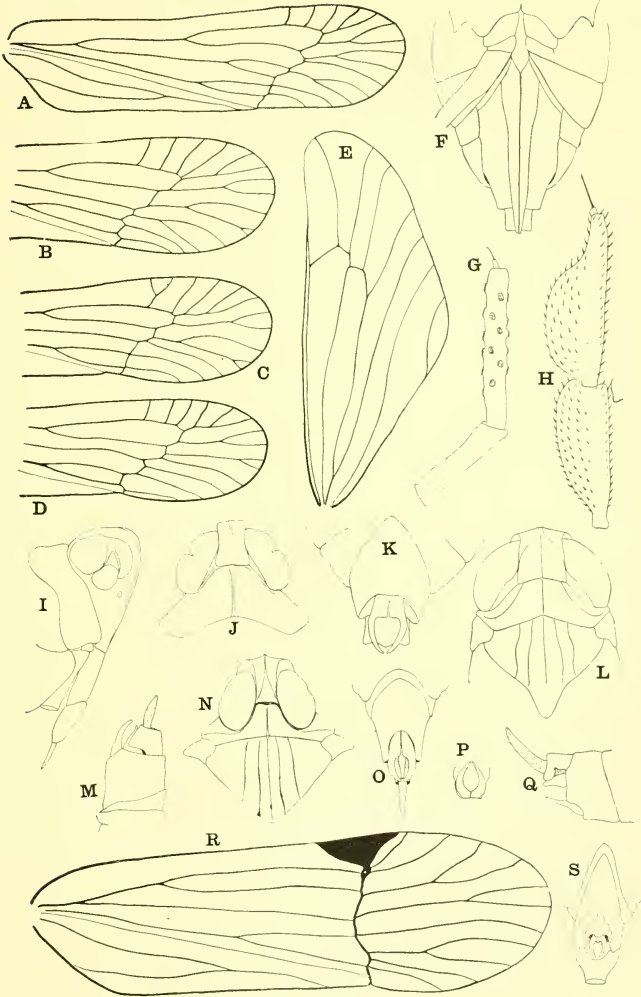
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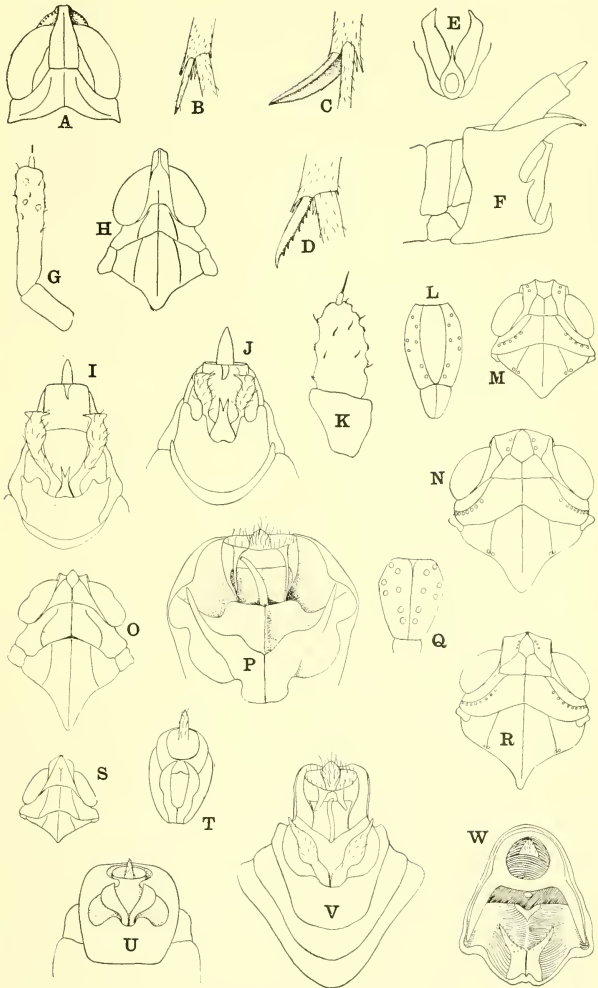
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DETAILS OF DELPHACIDÆ.

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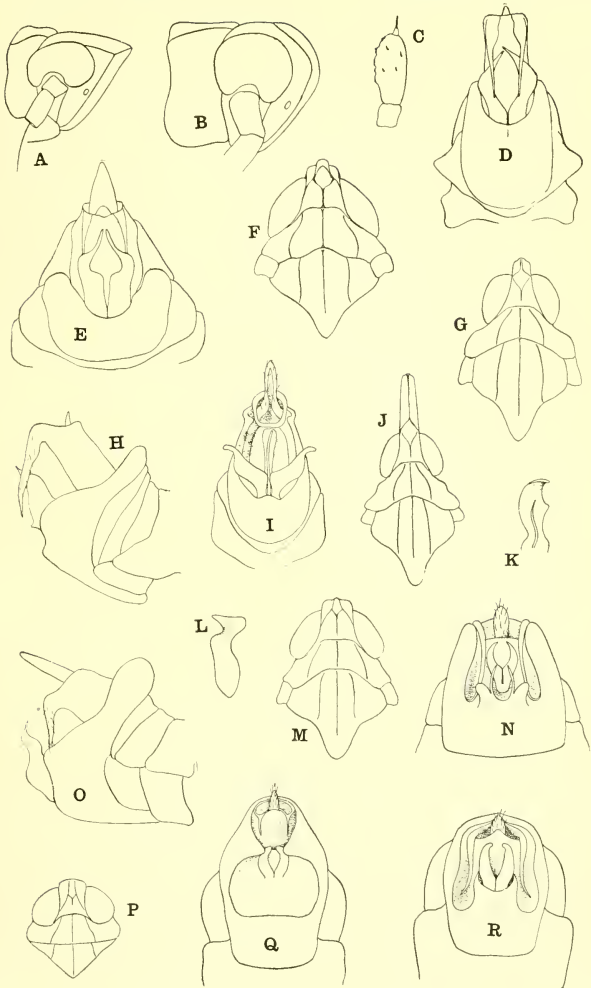


DETAILS OF DELPHACIDÆ.

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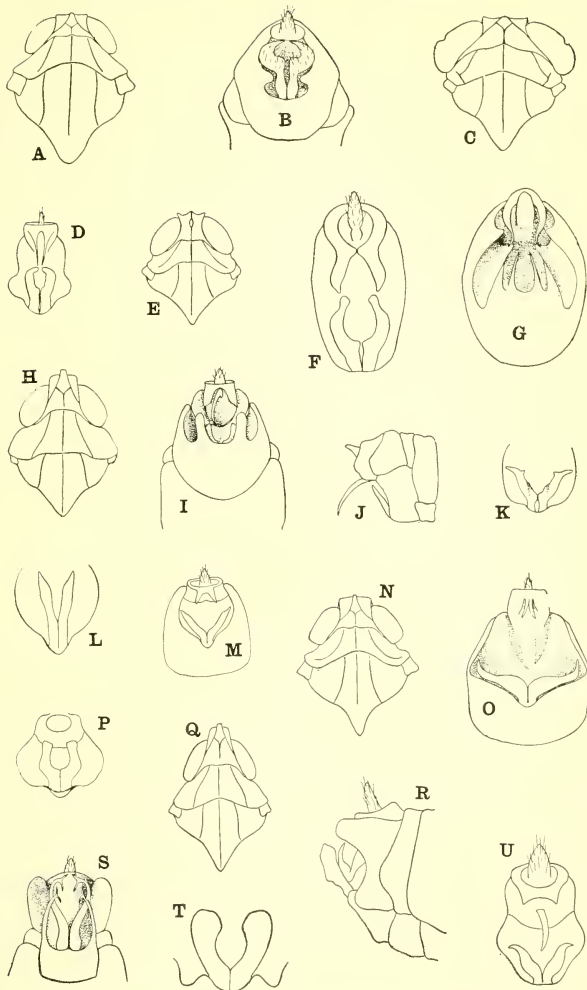




DETAILS OF DELPHACIDÆ.

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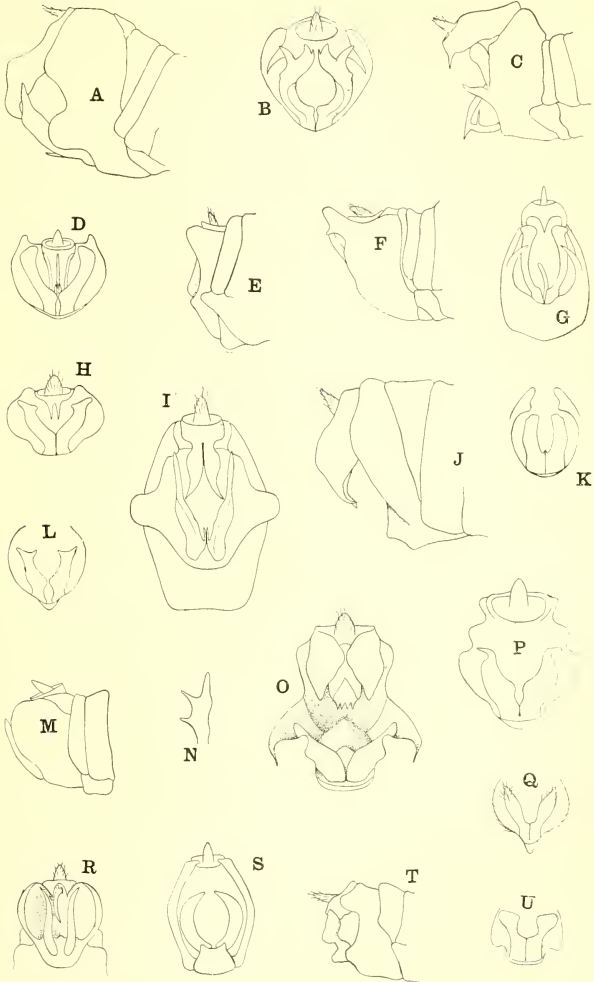




DETAILS OF GENITALIA AND HEAD OF DELPHACIDÆ.

FOR EXPLANATION OF PLATE SEE PAGES 636 AND 637.



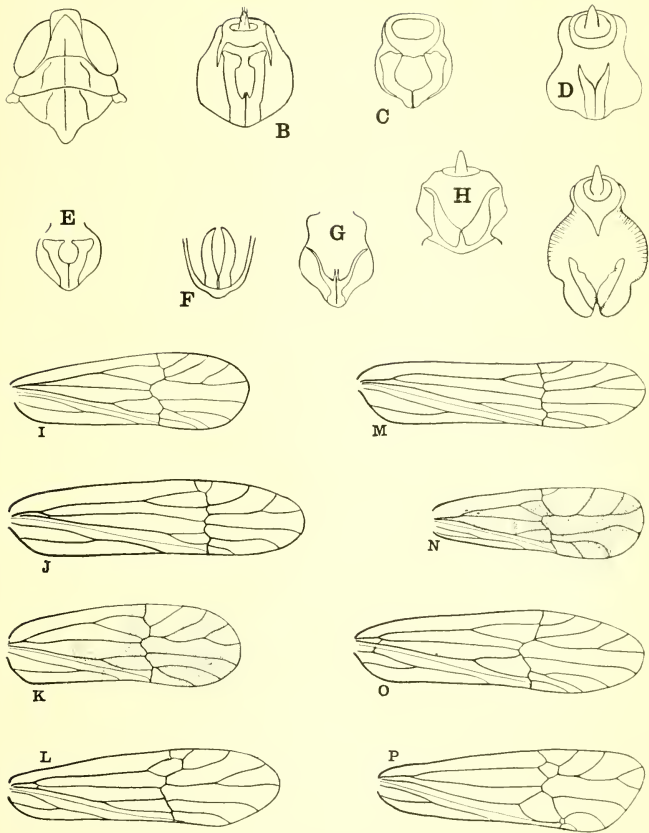


DETAILS OF MALE GENITALIA OF DELPHACIDÆ.

FOR EXPLANATION OF PLATE SEE PAGE 637.







DETAILS OF DELPHACIDÆ.

FOR EXPLANATION OF PLATE SEE PAGE 637.

