

# The Canadian Entomologist.

VOL. XXXIV.

LONDON, JUNE, 1902.

No. 6

## CLASSIFICATION OF THE FOSSORIAL, PREDACEOUS AND PARASITIC WASPS, OR THE SUPERFAMILY VESPOIDEA.

BY WILLIAM H. ASHMEAD, A. M., ASSISTANT CURATOR, DIVISION OF INSECTS, U. S. NATIONAL MUSEUM.

(Paper No. 5.—Continued from Vol. XXXIV., p. 88.)

### SUBFAMILY IV.—Planicipinæ.

This subfamily comes nearest to the *Aporine*, and a few of the males are easily confused with and mistaken for some males in the latter group.

The head is, however, lenticular, very thin antero-posteriorly, the temples being very flat, while the antennæ are always placed much closer to the mouth, *on* or *below* an imaginary line drawn from the base of the eyes. These characters ought to enable the student to recognize readily a wasp falling in this group.

Some males in the subfamily *Aporine* have a lenticular head, but in these the antennæ are inserted *above* this imaginary line, never on or below it.

Two tribes may be recognized.

#### Table of Tribes.

- |  |                        |
|--|------------------------|
| 1. Apterous.....   | 3.                     |
| Winged.....  |                        |
| Front wings with <i>three</i> cubital cells.....   | 2.                     |
| Front wings with <i>two</i> cubital cells.....   |                        |
| Clypeus short, not much produced; front legs in ♀ greatly swollen, with tarsal joints 2-4 short, transverse or nearly, in ♂ normal.....                      | Tribe I., Planicipini. |
| 2. Clypeus much produced, flat or at most only slightly convex, projecting over the mandibles; front legs in ♀ usually normal, more rarely much swollen..... | Tribe II., Homonotini. |

3. Clypeus flat, much produced anteriorly, covering the mandibles; front femora swollen.....Tribe II., Homonotini (pars).

Tribe I.—Planicepini.

Nothing seems to be known positively of the habits of any species belonging to this group.

I hope, therefore, that some of our students will endeavour during the present summer to ascertain the life-history of one or more of our species.

Table of Genera.

1. Second cubital cell longer than wide (or high).....2.  
 Second cubital cell wider (or higher) than long.....3.  
 2. Second cubital cell receiving *both* recurrent nerves.....Planiceps, Latreille.  
 (Type *Pompilus planiceps*, Latr.)  
 Second cubital cell receiving *only one* recurrent nervure—the first, the second joining the cubitus *beyond* the second transverse cubitus; pronotum with the hind margin arcuately emarginate; submedian cell in front wings longer than the median, in hind wings shorter.....Melanaporus, Ashm., g. nov.  
 (Type *Planiceps euferratis*, Fox)  
 3. First and second cubital cells each receiving a recurrent nervure.....Hoploneurion, Kohl.  
 (Type *H. apagona*, Kohl.)

Tribe II.—Homonotini.

In this tribe the front wings have *three* distinct cubital cells, while the clypeus is flat or, at most, sub-convex, and produced anteriorly so as to cover the mandibles.

A single wingless genus is known, *Apteropompilus*, Brauns, recently discovered in Africa. It has the structural characters of other genera placed here, except in being without wings. I have not had a specimen for examination, but structurally it seems to come very close to *Pedinaspis*, Kohl, and I suspect it may ultimately prove to be a wingless species belonging to that genus.

*Meracus*, Tournier, judging alone from the description, is evidently synonymous with *Pedinaspis*, Kohl.

Table of Genera.

1. Winged.....2.  
 Wingless.

- Mesonotum very long ; front femora rather long and swollen, the tibia stout ; claws with one tooth beneath.....Apteropompilus, Brauns.  
(Type *A. tosquineti*, Brauns.)
2. Wings normal, when closed extending beyond the tip of the abdomen.....6.  
Wings more or less abbreviated, when closed *not* extending beyond the tip of the abdomen, especially in the females, in ♂ usually of normal length.....3.
3. Mesosternum emarginate at the middle ; second and third cubital cells very unequal, the third much the larger ; cubitus in hind wings originating *beyond* the transverse median nervure ; claws with a tooth near the middle beneath.....5.  
Mesosternum not emarginate at the middle ; second and third cubital cells large, nearly equal ; claws with a strong tooth at middle beneath.....4.
4. Transverse median nervure in front wings interstitial with the basal nervure ; cubitus in hind wings variable, usually originating *beyond* the transverse median ; clypeus separated at base by a delicate sutural line ; body not entirely black.....Parapompilus, Smith.  
= Micropteryx, Lepel.  
(Type *Pompilus brevipennis*, Fabr.)
- Transverse median nervure in front wings *not* distinctly interstitial, the submedian cell a little longer than the median ; cubitus in hind wings originating *beyond* the transverse median nervure ; clypeus very flat, polished and not separated at base by a delicate sutural line ; body entirely black or blue-black.....Pedinaspis, Kohl (pars.).
5. Eyes bare ; hind tibiae *not* spinous, pubescent, and not or scarcely longer than the tibiae ; transverse median nervure in front wings interstitial with the basal nervure.....Epipompilus, Kohl.  
(Type *Ferreola azteca*, Cress.)  
= *E. Maximiliani*, Kohl.
- Eyes pubescent ; hind tibiae unarmed ; front femora rather stout, the tarsal joints 2-4 short, not longer than thick. (♂ unknown.) (Peru.).....Aulocostethus, Ashm., g. nov.  
(Type *A. bifasciatus*, Ashm., MS.)
6. Metathorax posteriorly obliquely truncate, impressed, the angles more or less acute.....7.

- Metathorax flat, feebly rounded behind; scape as long as the first joint of the flagellum; clypeus rounded. . . . . *Ceropalioides*, Radoszk  
(Type *C. Komarousii*, Radoszk.)
- 7 Scape cylindrical, neither subcompressed nor longer than the pedicel and first joint of the flagellum united; clypeus flat, clothed with a silvery pubescence; pronotum not longer than the mesonotum. . . . . 8.  
Scape subcompressed, longer than the pedicel and first joint of the flagellum united; clypeus very flat, not separated at base by a delicate line; pronotum distinctly longer than the mesonotum.  
Submedian cell in front wings a little longer than the median, the second and third cubital cells subequal, the cubitus in the hind wings originating *beyond* the transverse median  
nervure. . . . . *Pedinaspis*, Kohl.  
(Type *Pompilus operculatus*, Kirby.)
8. Metathorax a little longer than wide, semicircularly impressed or emarginate posteriorly, but *without* a median impressed longitudinal line, the hind angles more or less acute; second cubital cell usually a little longer than the third or subequal; first joint of flagellum in ♀ as long as the second, in ♂ shorter. . . . . *Wesmaelinus*, Costa.  
(Type *Sphex sanguinolentus*, Fabr.)
- Metathorax not longer than wide, impressed posteriorly, but also with a distinct median longitudinal impressed line; body clothed with a silvery pubescence; second cubital cell smaller than the third; first joint of flagellum in ♂ as long as the second. . . . . *Homonotus*, Dahlbom.  
(Type *H. fusciventris*, Dahlb.)

SUBFAMILY V.—*Notocyphinae*.

This subfamily is quite distinct from all others, and is easily recognized by the characters made use of in my table of subfamilies, the large free labrum being found in no other group except the *Ceropalinae*; but from that group it is distinguished by the long pronotum, the curved, not straight, antennae, and by the non-emarginate eyes. The antennae are inserted some distance above the clypeus.

The habits of the group are unknown. I suspect, however, that, like the *Ceropalinae*, the species are either parasitic or inquilinous in the nests of other wasps, the *Pepsinae* and the *Aporinae*, for the structural characters of these wasps clearly show that they have different habits from those in the other subfamilies.

I have placed in this subfamily the very rare genus *Chirodamus*, Haliday, discovered by Charles Darwin, in South America, during his memorable voyage in the Beagle.

It was unknown to Kohl, while Dr. von Dalla Torre, evidently without an examination of a specimen, has placed it, in his Catalogus Hymenopterorum, as a synonym of *Pompilus*, Fabr.

Fortunately, I have recognized this rare genus among some material collected in 1888 by the U. S. Fish Commission steamer, Albatross, in South America, in the same locality, Strait of Magellan, in which Darwin took his single specimen 87 years ago.

The U. S. Fish Commission took three perfect specimens, and this seems to be the first time it has been taken since the single specimen taken by Darwin.

#### Table of Tribes.

1. Wings extending to or beyond the tip of the abdomen, the cubitus in hind wings originating *before* the transverse median nervure . . . . . 2.  
Wings somewhat abbreviated, hardly extending to the tip of the abdomen, the cubitus in hind wings interstitial with the transverse median nervure.  
Eyes not extending to the base of the mandibles, a wide space between; front femora *abnormally* swollen, with fascicles of hairs beneath, the tarsi short . . . . . Tribe I., Chirodamini.
2. Eyes long, extending to the base of the mandibles or very nearly, at most with only a linear space between; front femora normal, not much swollen, the tarsi long . . . . . Tribe II., Notocyphini.

#### Tribe I.—Chirodamini.

To this tribe belongs but a single genus—*Chirodamus*, Haliday. It may be recognized by the characters made use of in defining the tribe, but I add a few more:

Labrum prominent, subconvex, semicircular, front tarsal joints 2-4 very short; the hind tarsi very long, much longer than their tibiae, mandibles long, pointed, edentate; scape of antennae stout, as long as the first joint of the flagellum; prothorax rather long and wide; metathorax short, truncate posteriorly; claws with a median tooth beneath, ciliate; maxillary palpi 6-, labial palpi 4-jointed . . . . . *Chirodamus*, Haliday.  
(Type *C. Kingii*, Haliday.)

## Tribe II.—Notocyphini.

Differs from the *Chirodamini* by the different shaped head, the long eyes, which extend to or nearly to the base of the mandibles, by the long tarsi, by the slenderer anterior femora, and by the different venation of the wings.

In the insertion of the antennæ the group comes nearest to the *Aporinæ*, to which it is unquestionably closely allied, but from that group it is at once separated by the prominent, free labrum and by the absence of a tarsal comb in the females.

The group is evidently parasitic, and possibly some of the genera defined in the *Aporinæ*, without a tarsal comb, will ultimately be removed to this tribe.

## Table of Genera.

1. Third cubital cell very large, and along the cubitus very long, longer than the second; labrum long, trapezoidal, much longer than wide; ♂ antennæ normal..... Notocyphus, Smith.  
(Type *N. laevissimus*, Smith.)

- Third cubital cell triangular, smaller than the second; labrum semi-circular, wider than long; ♂ antennæ crenulate..... Allocyphonyx, Ashmead, g. nov.  
(Type *Pompilus maurus*, Cresson.)

## SUBFAMILY VI.—Ceropalinæ.

The Russian hymenopterologist, Gen. O. Radoszkowsky, was the first to correctly define the group. He called it a family in 1888.

In 1894, Mr. Wm. J. Fox, of the Philadelphia Academy of Sciences, probably from ideas derived from Radoszkowsky, treated it as a tribe.

It is unquestionably a natural group, differing in habits and many salient characteristics from all of the groups here recognized. The emarginate eyes, free labrum, straight antennæ, short pronotum, etc., as well as the characters of the male genitalia, as figured by Radoszkowsky, readily distinguish the group.

The species are parasitic in the nests of other Ceropalids or Pompilids. Benjamin D. Walsh was the first to demonstrate the parasitic

habits of these wasps. In June, 1868, he bred *Ceropales rufiventris*, Walsh, from the mud cells of *Agenia bombycina*, Cresson.

Table of Genera.

1. Cubitus in hind wings originating *before* the transverse median nervure .....2.  
Cubitus in hind wings originating *behind* the transverse median nervure.....3.
2. Metathorax posteriorly rounded, not obliquely truncate; clypeus anteriorly subarcuate; submedian cell in front wings *shorter* than the median; pronotum with the hind margin angularly emarginate.....Agenioxenus, Ashm., g. nov.  
(Type *Ceropales rufiventris*, Walsh.)
3. Metathorax posteriorly obliquely truncate or depressed; clypeus anteriorly truncate; submedian cell in front wings never shorter than the median; pronotum with the hind margin arcuate or arcuately emarginate, not angularly emarginate.. *Ceropales*, Latreille.  
(Type *C. maculatus*, Latr.)

ENTOMOLOGICAL RECORD.

An interesting contribution by Dr. Fletcher, entitled "Entomological Record, 1901," has just appeared in the 32nd Annual Report of the Entomological Society of Ontario. This, besides giving a list of the active workers in Canada, includes careful notes on rarities, etc., taken during the year. It is the intention of the Society to continue this Record from year to year, and as this will undoubtedly prove useful to entomologists throughout Canada, it is hoped that collectors in the Dominion will try to make it as complete as possible. Records of interesting specimens captured, either from the standpoint of distribution or rarity, will be acceptable, and should be sent to Dr. James Fletcher, Central Experimental Farm, Ottawa. Specimens unknown to collectors will gladly be identified.

## NEW DIURNAL LEPIDOPTERA FROM BOLIVIA.

BY A. G. WEEKS, JR., BOSTON, MASS.

*(Continued from Vol. XXXIII., page 324.)**Pamphila barbara*, sp. nov.

Habitat: Bolivia. Expanse: 1 1/2 inches.

Head, thorax and abdomen above, dark brown; below, gray. Antennæ dark brown, with white annulations at base of each joint. Club brown, white near base.

General colour of upper surface blackish brown. Hind marginal fringe of ground colour.

Upper side of fore wing has an indistinct white dot in apical area. Near centre of wing, under the end of discoidal space, are two prominent white dots, the upper being under median, the other being in next lower interspace, larger than the first and somewhat nearer base.

Upper side of hind wing without markings.

The hind marginal fringe of lower side of fore wing tends to grayish with a white thread. The ground colour is dead blackish brown. The costal area and apex are gray somewhat tinged with blue. There are three subcostal white dots. The gray apical area is crossed by a series of dots of the ground colour, parallel to hind margin and one-sixteenth inch within it. The inner marginal area tends to grayish. The rest of the wing is of ground colour, the two prominent white spots of upper side being repeated.

Under side of hind wing is gray, or, perhaps, dark brown, very heavily dusted with gray scales. Across the centre of the wing, running from centre of costa across to centre of hind margin and following contour of hind margin, is a series of six interspatial bluish marks of considerable prominence and bordered with a dark thread. The one bordering the end of discoidal space has a distinct black border at its basal side, giving the appearance of a black mark in centre of wing. The hind margin has a band of the same blue shade, one-sixteenth inch wide and edged on both sides by a blackish brown thread. Inner marginal area is gray and not encroached upon by dark markings. Hind marginal fringe gray, showing darker at ends of nervures.

Described from one specimen taken five days' travel north from Cochabamba, September 12, 1899.



NOTES ON THE EARLY STAGES OF CORETHRA  
BRAKELEYI, Coq.

BY JOHN B. SMITH, SC. D.

On June 1st, 1901, while on a mosquito hunt with Mr. J. Turner Brakeley, at Lahaway, we investigated the little pools around the head of a swamp spring. The water was very cold, and our object was, mainly, to ascertain whether *Aedes* larvæ occurred in such localities, where pitcher plants were in the vicinity.

In the course of our dipping I found a very odd little wriggler, altogether different from anything I had ever seen before, and soon Mr. Brakeley found the same thing. We took only a few of them at that time, and from their minute size I assumed they must be very young. I afterward sent a specimen to Dr. Howard, and he appeared as much at sea concerning its location as I was. It seemed to be a Culicid larva, without much doubt; but that was as far as we could get. The specimens were about an eighth of an inch in length, light reddish in colour, and very hairy in appearance. The head was very broad, and from it the body tapered gradually to the short obtuse anal siphon. Mr. Brakeley christened them "bull-heads," and I called them "triangles." They were kept alive a short time only, and during that period proved very sluggish.

July 27th, Mr. Brakeley was at Lahaway, and put in an hour dipping for mosquito larvæ in a lily pond at the foot of the garden. The pond is full of fish, but in the grassy shallows around the edge Culicids breed to a limited extent. Here he struck a little nest of the "bull-heads," and secured two dozen, which he carried to his town house in Bordentown. The little creatures remained almost motionless for hours, some at the surface, some below it at various points. Some had the anal siphon at the surface and the head a little below, the position being intermediate between that assumed by *Anopheles* and that assumed by *Culex*. Two of these little larvæ pupated on July 28th and others on the 29th, 30th, and 31st. On August 1st I went to Bordentown and took charge of the culture, expecting to get out almost anything rather than a Culicid.

The pupa was just as odd as the larva, and reminded me of a Lycænid chrysalis with a pair of breathing tubes. These pupæ were at the surface, and seemed to have little power of motion. They were easily submerged and easily drowned. Though I was as careful as I could well be, the jarring between Bordentown and New Brunswick meant death to several of them.

The first adult emerged August 2nd, a period of  $4\frac{1}{2}$  days from the first pupation, and this proved to be very close to the average period.

The insect was a male, very pretty, and utterly unknown to me; certainly not a long-billed mosquito. Mr. C. W. Johnson, to whom I submitted a specimen, made it Culicid on venation, but could not identify it with any described form.

Later Mr. Coquillett pronounced it a new species of *Corethra*, and, at my request, named it *Brakeleyi*, the description appearing in a recent number of the *Entomological News*.

August 13th, Mr. Brakeley sent me another lot of the larvæ, taken at the same place as the last lot, and stated that some very minute examples occurred, evidently babes.

Other collections were made September 17th, October 14th and October 20th. The latter was made after a heavy frost (min.  $21^{\circ}$  on the bog close by), and in each case half-grown to full-grown examples were found. No pupæ were found with the larvæ at any time, and no adults were collected.

The life-history is very imperfect: the egg stage is not known, nor the duration of the larval stage. We know that the larva occurs very late in the fall and quite early in spring, and I am inclined to believe that hibernation is in the larval stage; but I have no proof more positive than I have stated.

The larva was submitted to Dr. Dyar, who separates it from all other Culicid larva because it has the antennæ arising from the dorsal aspect of the head, close together, above the mouth. There is no mouth brush, the eyes are rounded, and the abdominal hairs are unequal.

The pupa is brown in colour, and floats parallel to the surface, with the long slender air tubes slightly projecting. It is entirely different from that of any other Culicid known to me.

The adult has mouth-parts similar to those of some Simuliids that I have seen; but I have not yet studied them closely.

The larva of this species is not in the least like the descriptions or figures of *Corethra* heretofore published, nor does it accord in any way with what Theobald says of the early stages of this genus. It agrees much better with *Mochlonyx*, except for the unusual position of the antennæ; but in the pupal stage it is utterly and completely unlike any other Culicid known to me or described by Theobald.

Based upon the early stages, *Corethra Brakeleyi* should form a distinct generic type.

## NOTES ON SOME SOUTHERN CALIFORNIAN ORTHOPTERA.

BY JAMES A. G. REHN, PHILADELPHIA.

The following specimens were collected at San Diego, California, during the year 1901 by Mr. G. W. Dunn, and are now in the collection of the Academy of Natural Sciences of Philadelphia. The terms used in the descriptions are those adopted by Comstock and Kellogg in their recent work, "Elements of Insect Anatomy."

## Family MANTIDÆ.

LITANEUTRIA OBSCURA. Scudder.

One immature male, November 13, 1901.

## Family PHASMIDÆ.

SERMYLE ARBUSCULA.\* n. sp.

Type, ♀; San Diego, California, May 7, 1901.

This species does not seem to be very closely related to any of the previously-known species of the genus. From *azteca*, Saussure, it is differentiated by having the femora carinate and striate; from *Saussurii*, Stal, by the non-ampliate sixth abdominal segment; and from *strigata*, Scudder, by the more robust limbs and the less strongly striate body. With *Mexicana* and *linearis*, Saussure, no affinity exists.

General form slender, the thoracic portion rather robust. Head rather elongate, bearing two central longitudinal rugæ, which become obscure caudad, the whole surface of the head rather tuberculate, the tubercles being longitudinally disposed; eyes subspherical, slightly exserted; antennæ longer than cephalic femora, the proximal segment large and broad, with the distal section contracted, this segment over twice as large in bulk as the next. Pronotum, mesonotum and metanotum tuberculate, the tubercles resolving into longitudinal series, this being more apparent on the metanotum, the mesonotum and metanotum being centrally carinate; pronotum rather narrow, not quite equalling the head in length; mesonotum long (with pronotum equalling the cephalic femora), the lateral margins slightly tuberculate; metanotum very considerably shorter than the mesonotum, comparatively robust, expanding in the caudal portion. Abdomen rather slender, multistrigate, none of the segments exhibiting any special ampliation; ventral surface between the sixth and seventh segments exhibiting a pair of flattened longitudinal processes. Cephalic femora heavy, with the proximal diastema (found in

---

\*In relation to the twig-like appearance of the insect.

many representatives of this family) rather well marked, the remaining section of the segment being inflated and with three prominent angles; tibiæ as long as the femora, quadrate, slightly tapering; first tarsal joint about as long as the succeeding ones. Intermediate femora short, triangular in section, equalling the metanotum (and median segment) in length; tibiæ depressed, about equalling the femora in length; first tarsal joint considerably less than the succeeding joints in length. Caudal femora short, reaching the middle of the third abdominal segment, roughly triangular in section; tibiæ rather longer, reaching to the apex of the first segment. General colour reddish brown, washed with ashy gray on the cephalic limbs.

Measurements:

Length of body .....	54 mm.
Length of pronotum .....	3 "
Length of mesonotum .....	12 "
Length of metanotum (with median segment) ..	8.7 "
Length of abdomen .....	28 "
Length of cephalic femora .....	14 "
Length of intermediate femora .....	7.5 "
Length of caudal femora .....	8.7 "

Family ACRIDIDÆ.

*ARPHIA RAMONA*, n. sp.

Types: ♂ and ♀; San Diego, California, April 4 (♂) and 30 (♀), 1901.

Allied to *A. Behrensi*, Saussure, but much larger, with the pronotal carinæ slightly arcuate and very slightly incised; the frontal costa is suddenly constricted superiorly and not tapering, while the posterior margin of the pronotum is rectangular, with the angles more or less rounded instead of acute angulate. With *nietanna*, Saussure, the species needs no comparison.

♂. Size rather small. Head with the fastigium gently rounded, merging into the frontal costa with a slightly perceptible angle; vertex decidedly longer than broad, rather deeply excavated, the lateral margins subacuminate cephalad; frontal costa decidedly constricted dorsad, rather broad ventrad, slightly expanded at the ocellus, the dorsad section bearing a central low ridge, broadly sulcate at and ventrad to the ocellus; eyes sub-elliptical, equal to the ventro-ocular portion of the genæ; antennæ short, slightly expanded distad. Pronotum rugose, moderately

expanded caudad; cephalic margin obtuse-angulate, caudal margin rectangulate; median carina rather low, slightly arcuate, very slightly incised; lateral lobes subquadrate, rugose on the metagonal portion, cephalic and caudal margins parallel, ventral margin obtusely trimmed cephalad. Tegmina rather long, considerably exceeding the hind femora, broadly rounded proximad. Posterior femora stout, with prominent dorsal and ventral keels.

General colour blackish-brown, the dorsal aspect of the tegmina with a longitudinal bar of brownish ochraceous; abdomen dull yellow; posterior tibiæ deep cobalt blue, with a lighter subproximal ring, spines black.

♀. Size large. Head with the vertex cordiform, the cephalic portion completely closed; frontal costa considerably constricted superiorly, subequal at and below the ocellus, supplementary intermediate ridge sub-obsolete; eyes elliptical, considerably shorter than the ventro-ocular portion of the genæ; antennæ moderately long, slightly expanded distad. Pronotum essentially as in the male. Tegmina rather long, slightly exceeding the body, considerably exceeding the hind femora. Wings rather large, equal to the tegmina in length.

General colour grayish brown, the tegmina sprinkled with spots of darker brown, giving a "salt-and-pepper" appearance to the latter parts; outer face of the posterior femora obscurely washed with hoary; posterior tibiæ ultramarine blue with a sub-proximal ring of dull pinkish, the spines black. Wings with the disc and the greater part of the cephalic margin reddish orange, the ulnar stigma and the periphery dull blackish brown, the distal portion of the humeral field smoky hyaline.

Measurements:	♂.	♀.
Length of body . . . . .	22.5 mm.	37.5 mm.
Length of pronotum . . . . .	5 "	7.5 "
Length of tegmina . . . . .	22 "	32 "
Length of hind femora . . . . .	13 "	19 "

The total number of specimens of this species examined was eleven—four males, seven females.

*ARPHIA HESPERIPHILA*, n. sp.

Types: ♂ and ♀; San Diego, California, April 4 and October 30, 1901.

Allied to *A. arcta* and *A. conspersa*, Scudder, but distinguished from the former by the higher pronotal crest, by the more robust posterior femora, the shorter ulnar stigma, and the more definite wing arc; from

*conspersa* it is distinguished by the sub-rotundate vertex, the more uniformly-coloured pronotum, and the colour of the disc of the wings and of the hind femora.

♂. Size very small (for this genus). Head rugulose; vertex elongate, rather deeply excavated, fastigium foveolate; frontal costa constricted dorsad, gently expanded ventrad, shallowly sulcate in the vicinity of the ocellus; eyes slightly prominent, elliptical, not equalling the ventro-ocular portion of the genæ; antennæ short, distal section gradually enlarged. Pronotum rugose on the prozona, punctate on the metazona, slightly constricted centrally; cephalic margin finely obtuse-angulate, caudal margin rectangulate; median carina moderately high, arcuate on the prozona, narrowly cut by the transverse sulcus; lateral carina marked in the metazona, obscure and sinuous on the prozona; lateral lobes deep, the ventral margin sinuate cephalad. Tegmina rather long, distal extremity truncate. Caudal femora heavy, genicular region only slightly enlarged. General colour wood brown, varied and sprinkled with black; the distal portion of the tegmina black, which tint also suffuses the pleuræ and genicular lobes and outer face of the caudal femora; caudal tibiæ ultramarine blue, the genicular portion black, the usual proximal ring greenish white.

♀. Size small. Head with the fastigium shallowly foveolate; frontal costa expanded at the ocellus, shallowly sulcate in the portion cephalad to this point; eyes rather small, considerably smaller than the infra-ocular portion of the genæ. Pronotum with cephalic margin of the lateral lobes subarcuate.

General colour wood brown, the genicular portion of the caudal femora suffused with blackish, which tint also forms several indistinct transverse bars on the tegmina. Wings with the disc sulphur yellow; the arc pale blackish brown, not evanescent and not reaching completely around the caudal margin of the wing or to the anterior margin, stigma short, cephalic margin obscurely with blackish brown distad, proximal area (except the above-mentioned margin) hyaline.

Measurements:

	♂.	♀.
Length of body.....	14 mm.	22.5 mm.
Length of pronotum.....	3.5 "	4.7 "
Length of tegmina.....	16 "	19.5 "
Length of hind femora.....	9.5 "	11.5 "

Five specimens examined, two males, three females.

*CHIMAROCEPHALA PACIFICA* (Thomas).

Three females; March 23 and 24, and April 10, 1901.

*STICTHIPPIUS CALIFORNICUS* (Scudder).

Two females; June 14 and August 13, 1901.

An examination of these two specimens shows that *marmosatus*, Scudder (Psyche, VI., p. 318), is probably only a variation of this form, one of the specimens having the anal vein free on one tegmen and entangled on the other, this character being used by Scudder as a differential one, while the maculations of the tegmina seem of no greater value.

*SPHARAGEMON VENUSTUM* (Stal).

Four males and three females; May 18, 20, 25 and 28, and June 5, 1901.

These specimens have the hind tibiæ glaucous or dull lutescent instead of blue.

*DEROTMEMA SAUSSUREANUM*, Scudder.

One immature female and one male; July 17, 1901.

*CONOZOA BEHRENSI*, Saussure.

Six specimens: four males, two females; September 22 and October 3, 1901.

*TRIMEROTROPIS REBELLIS* (Saussure).

*Trimerotropis cristata*, Rehn (not of McNeill), Trans. Amer. Ent. Soc., XXVII., p. 333.

Four specimens: three males, one female; April 14 and May 18 and 28, 1901.

*TRIMEROTROPIS VINCULATA*, Scudder.

Twenty-nine specimens: ten males, 19 females; March 23, April 4, 11, 17, 22 and 30, May 9, 15, 18, 25, 28 and 31, June 5, July 25, and October 22 and 30, 1901.

*HELIASTUS CALIFORNICUS* (Thomas).

One female; March 29, 1901.

*DRACOTETTIX MONSTROSUS*, Bruner (?).

One immature female; May 4, 1901.

This specimen differs somewhat from Bruner's figure of *D. monstrosus* (Proc. U. S. Nat. Mus., XII., pl. 1, fig. 1), mainly in the form

of the lobes of the median carina and of the lower part of the face. As the specimen is immature, these differences may be those of immaturity. No relationship exists with *D. plutonius*, Bruner (North Amer. Fauna No. 7, p. 267).

*SCHISTOCERCA VAGA* (Scudder).

Two females; April 24 and July 17, 1901.

*ÆOLOPLUS CHENOPODII ARCUATUS*, n. subsp.

Type: ♂ and ♀; San Diego, California, May 18 and 28, 1901.

Very closely allied to *Æ. chenopodii* from Grand Mesa, Colorado, but differing in the rotundate caudal margin of the subgenital plate, this region in *chenopodii* being acuminate (see Scudder, Proc. U. S. Nat Mus., XX., pl. V., fig. 9), and in the more apparent prozonal median carina, this section being "wanting or rarely indicated" in *chenopodii*.

Size medium. Pronotum with the pronotal carina quite distinct, except on the caudal portion of the prozona, where it is obsolete. Subgenital plate of the male with the caudal margin rotundate; cerci tapering to a very fine point.

Colour apparently the same as true *chenopodii*.

Measurements:

	♂.	♀.
Length of head and body . . . . .	15.5 mm.	22 mm.
Length of pronotum . . . . .	4.2 "	6 "
Length of tegmina . . . . .	4.2 "	5.5 "
Length of posterior femora . . . . .	11.5 "	14 "

Four specimens of this species have been examined: two males, two females.

*MELANOPLUS RILEYANUS*, Scudder.

One female; April 10, 1901.

Family TETTIGONIDÆ.

*CONOCEPHALUS MEXICANUS*, Saussure.

One female; May 13, 1901.

Family GRYLLIDÆ.

*GRYLLUS ASSIMILIS* (Fabricius).

One male; July 28, 1901.

This is much smaller than Mexican specimens of *assimilis*, but it is clearly the same species.



## SOME NEW NORTH AMERICAN FULGORIDÆ.

BY E. D. BALL, FORT COLLINS, COLORADO.

Some time ago, when about to publish a synopsis of the genus *Scolops*, the writer discovered that Dr. Uhler had the same genus in hand and his MSS. ready for the press. As the result of the correspondence, the writer dropped his work for the time, and Dr. Uhler promised to send his types as soon as his paper was published. (Proc. Md. Acad. Sc., p. 401, 1900.) With his usual thoughtfulness, the Doctor sent on the types, and with the aid of these and a fine series of eastern forms received from Mr. Otto Heidemann the author has been able to definitely place all the described species and recognize a number of new ones.

The genus is found in its greatest abundance in the border line of plain and mountain region, and so many new forms have been found here in the past few years that there are no doubt many more to be found on further search.

All but one or two of the species have been found to occur in two wing lengths; one in which the elytra are about the length of the abdomen and the under wings very short and probably not functional; the other in which the elytra are long and flaring, the wings well developed.

On account of the curved or angled nature of the cephalic process, the measurement of its length is a somewhat difficult matter. In the present paper the length given has been measured in a straight line from the tip to the middle of the eye.

*Scolops Osborni*, n. sp.

Form and structure of *sulcipes*, but larger and with a stouter process. Colour pale yellow as in the lighter species of *hesperius*. Elytra light, sparsely dotted with fuscous. Length: macropterous examples 11 mm., brachypterous 9 mm.; length of horn 3 mm.; width 4 mm.

Cephalic process long and slightly bent at the sulcus, larger than in *sulcipes* and not constricted beyond the sulcus, as large as that of *hesperius*, but regularly tapering anteriorly. Elytra with the two inner nervures of corium forked well before the middle and one branch at least of each again forked before the apex of clavus, cross nervures not as numerous as in *sulcipes* and very faint except at apex.

Colour: cephalic process and face yellow, pronotum and scutellum straw colour, a pair of pitchy black spots on the sides of the pronotum

just back of the eyes, which they exceed in diameter; a pair of dots on the disc and four black dots on posterior margin of scutellum. Elytra pale, the nervures concolorous, margined with regularly-arranged pairs of black dots, the costal and apical margins with large quadrate black spots; cross nervures, except at apex, unmarked.

Described from seven specimens; three from Sioux City, Iowa (Osborn); three from Onaga, Kans. (Crevecoeur), and one from Effingham, Kans. (Van Duzee). The double furcation of the nervures will separate this from any but *sulcipes*, and the larger process and the lighter colour will readily differentiate it from this latter species.

*Scolops Uhleri*, n. sp.

Resembling *angustatus* and *perdix*, but much shorter-bodied and with a long straight process. Length 6.5-8 mm., process 2-3 mm.; width 2.5 mm.

Cephalic process long and straight, half longer than front, parallel margined, two-thirds the width of the vertex, vertex convex. Elytra straight and narrow as in *angustatus*, but much shorter, the middle sector forking farther back than the inner one.

Colour: face and apical process pale soiled yellow, the lateral margins of the latter dull brown, pronotum and scutellum pale, more or less clouded, a pair of rather large round spots on disc of pronotum and another pair near apex of scutellum. Elytra with the broad outer margin and most of the inner margin pale or milky white; just inside the outer sector is a broad smoky or dark brown stripe, very definite on the outer margin and fading out internally. This stripe is sparsely interrupted with light dots on the nervures.

Described from twenty-four examples from Grand Junction, Colo. The small, square-set body, together with the remarkably long, straight process, renders this a strikingly distinct form. The process is twice as long as in *angustatus* and considerably longer than in *perdix*. It is also stouter and strictly parallel-margined, while in those species it tapers.

*Scolops maculosus*, n. sp.

Form of *Uhleri* nearly, body distinctly oval, the process shorter and stouter, resembling *robustus* in shape and colour, but smaller. Length: ♀ 7 mm., ♂ 6 mm., process 2 mm.; width 2.75 mm.

Cephalic process stout, almost as wide as the vertex, a trifle enlarged at the apex, as long as the front, slightly curved upward. Elytra

rounding, but little longer than body, two inner sectors of corium usually forking together and about opposite where the claval nervures unite.

Colour: face and lower surface of process pale yellow, rest of process, except dorsal carinæ, deep brown. Pronotum and scutellum irregularly clouded, a pair of spots, each, on vertex, pronotum and scutellum. Tegulæ with the disc black. Elytra pale, the costal margins broadly light, rest of elytra with rather large light and dark spots along the nervures, usually a very definite light spot just before the forking of the ulnar nervures.

Described from twenty-four specimens, all from Colorado, where it is very generally distributed.

*Scolops viridis*, n. sp.

Form of *angustatus* nearly, but broader, as broad as *perdix*. Green, with pale smoky spots on elytra. Length: ♀ 8 mm., ♂ 7 mm., process 2 mm.; width 3.5 mm.

Cephalic process small, straight, parallel-margined, slightly longer than front, less than half the width of the broad vertex. Elytra rather broad, longer than body, the normal form very long and flaring in macropterous examples, two inner sectors forking just back of middle of elytra, the middle one usually a trifle in advance of the other.

Colour: light green, a pair of black spots on each, pronotum and scutellum. Elytra with a rather narrow light stripe on costal margin, the nervures bright green, alternately interrupted with light and margined with pale smoky yellow.

Described from twenty-four specimens from Grand Junction and Pueblo, Colo. The green colour renders this quite distinct and introduces a new feature into the genus.

*Scolops abnormis*, n. sp.

Form and general appearance of *grossus*, slightly lighter coloured and with a larger process and simpler venation. Length 8 mm., width 3.5 mm., process 3 mm.

Cephalic process upturned, much inflated, slightly wider than the vertex or the front between the eyes, median carinæ of front becoming obsolete on process, lateral carinæ slightly widening and dividing the width into three equal parts, process slightly longer than front, the sulcus indistinct, eyes rather prominent, head definitely constricted back of eyes so that they are remote from pronotum. Elytra moderately long, somewhat flaring behind, the middle sector simple.

Colour: cephalic process brown with small light maculations, the lower face between the carinae and the front pale. Body and elytra pale gray, a pair of black spots on scutellum and more or less of brownish maculation on pronotum and elytral nervures.

Described from two specimens from San Jose, Calif. (King). The immense size of the process will at once separate this from *pallidus*, which it resembles in venation and colour.

*Scolops Vanduzeei*, n. sp.

Form of *maculosus* nearly, but larger, resembling *abnormis*, but with much smaller process. Rusty straw-coloured. Length 7 mm., width 2.75 mm., process 2 mm.

Cephalic process not quite as wide as vertex, as long as front, strictly parallel-margined, lateral carinae of lower face parallel, not enclosing over one-third of its width, head not constricted behind the eyes. Elytra longer than the body and well rounded behind, resembling *hesperius*, venation distinct, veins strong, middle sector usually forked slightly behind the inner one.

Colour: process mottled with fuscous and pale shading out to greenish fuscous on face, vertex with a fuscous crescent interrupted by the median carinae, four fuscous spots in a transverse row on the pronotum and four more on the scutellum. Elytra pale smoky or grayish, the nervures light with light spots sparsely sprinkled along them, almost continuously margined with fuscous.

Described from eight examples from Kimball, Neb.

*Scolops robustus*, n. sp.

Resembling *maculosus*, but broader, stouter and with a cephalic process like *angustatus*. Length: ♀ 6 mm., ♂ 5.5 mm.; width 3 mm., process 1.25 mm.

Cephalic process very small and short, shorter than front, not over one-half the width of vertex, parallel-margined, vertex and eyes short and broad, head slightly constricted behind eyes, pronotum very short and broad, which gives the whole insect a broad, square-set appearance. Elytra either broad and square-set or very long and flaring, the middle sector usually forking slightly behind the inner one.

Colour: process greenish or smoky, the carinae pale, vertex with a pair of small fuscous points, pronotum distinctly lighter, appearing as a light "collar," a pair of large round spots on disc, a pair of smaller points

against the carinae outside, black. Tegulae smoky brown, scutellum brownish or pale, with four large fuscous-spots. Elytra milky white, clouded with brown along the light-dotted nervures, a pair of slightly oblique fuscous stripes towards the apex in the long winged examples.

Described from twenty-four examples from various points in Colorado. Readily separated from all other species by the broad form and short process.

*Cixius cultus*, n. sp.

Resembling *stigmatus* without basal band, smaller and narrower. Narrower than *pini*, with a longer vertex. Length: ♀ 6.75 mm., ♂ 5 mm.; width 2 mm. Vertex longer than breadth at base, acutely triangular at apex, with the bounding carinae distinct, apex distinctly overhanging front. Front rather narrow, enlarged over the antennae beyond the line of the marginal curve, median and lateral carinae distinct as in *colepeum*. Elytra very long and narrow, parallel-margined.

Colour: black, the carinae of front and vertex, all the pronotum except the area behind the eyes, the tegulae and the carinae of scutellum, light. Sometimes the carinae on front and scutellum are reddish. Elytra milky, sometimes slightly clouded with smoky and with a pair of smoky spots before the middle and another faint one inside the stigma. Stigma small and oblique.

Male pygofers short, with the posterior margin deeply notched, the apex of the notch with a short tooth. Styles about equalling the pygofers, slender at base, broadening out into a slipper-shaped apex, with the toe out. Anal tube without teeth below. Entire genitalia black.

Described from ten specimens from Calif., two from Kans. and nine from Colo. The elongate vertex and narrow form will readily separate this from any other described species.

*Oliarus aridus*, n. sp.

Resembling *panzeri*, but more elongate, as large as *5-lineatus*, but with longer and narrower elytra. Length: ♀ 7.25 mm., ♂ 6.5 mm.; width 3 mm.

Vertex shorter and broader than in *5-lineatus*, but little longer than wide, parallel-margined on posterior half, then rounding to a blunt apex, posterior margin angularly notched, face much broader than in *5-lineatus*, nearly flat transversely, with distinct carinae. Elytra long and narrow, with a rather small stigma.

Colour: vertex fuscous, the carinæ light yellow, a definite light spot on the carinæ against the eyes, face testaceous, the carinæ slightly lighter, a larger light spot on each side below the antennæ. Pronotum dark, the carinæ and margins broadly light, scutellum testaceous, a dark stripe outside the carinæ. Elytra milky or hyaline, nervures very lightly marked, stigma and cross nervures fuscous.

Male pygofers long, ventral notch rather shallow, with a slender tooth, lateral margins of pygofers produced into a pair of teeth. Styles extending half their length beyond the pygofers, their inner margins appressed, narrow, nearly cylindrical at base, the apical half broad and obliquely truncate, together spear-shaped. Pygofers black, the posterior margins, tooth and styles, yellow.

Described from twenty-four specimens from Kans., Calif., and various parts of Colo.

*Oliarus complectus*, n. sp.

Form and general appearance of *aridus*, but much smaller. Smaller and narrower than *humilis*. Length: ♀ 5.5 mm., ♂ 4.5 mm.; width 1.75 mm.

Vertex nearly half longer than broad, narrowing from the base to the narrow truncate apex, lateral foveæ long and narrow. Vertex definitely produced in front of eyes and angulate with front, front narrower than in *aridus*. Elytra long and narrow, with a definite stigma.

Colour: vertex black, the carinæ light yellow; face, pronotum and scutellum varying from testaceous to black, the carinæ usually light. On very dark specimens those on scutellum often obscure. Elytra subhyaline, the nervures yellow and unmarked with black spots before the stigma. Back of this more or less smoky and black punctured.

Male pygofers rectangularly notched, with a long slender tooth. Styles extending one-third their length beyond the pygofers, then curving around and passing back under their margins again.

Described from twenty-four specimens from Hayti, W. I., Md., Kans., Ariz., and various places in the southern half of Colo. The small size and unmarked nervures will separate this species from any other described.

*Oliarus sementinus*, n. sp.

Short and robust, the elytra flaring as in *humilis*. Colour of *complectus* nearly. Length: ♀ 5 mm., ♂ 4.25 mm.; width 2.25 mm.

Vertex short and broad, nearly twice wider than long, the anterior margin roundly angulate, almost parallel with the emarginate posterior margin, vertex scarcely reaching the anterior margin of eyes, beyond which the gibbous front extends for about half the length of vertex. Face very broad and full, convex, with the median carina indistinct or wanting. Elytra broad and flaring, nervures strong, weakly black-punctured and beset with long white hairs.

Colour: vertex and front dark testaceous, the carinae light yellow, pronotum light, scutellum light testaceous. Elytra milky subhyaline, nervures brownish at the base, then smoky, the cross nervures and apex margined with fuscous, the nervures clothed with long white hairs.

Male pygofers long and slender, deeply angularly notched with a small tooth. Styles as in *complexus*, but longer and leaving a large open space in the curve.

Described from seventeen specimens from Las Animas, Colo. Easily distinguished by the short head.

*Myndus viridis*, n. sp.

Form of *impunctatus* nearly, but smaller and narrower. Length: ♀ 5 mm, ♂ 4.5 mm.; width 1.5 mm.

Vertex twice longer than wide, very slightly constricted before the middle, face as in *impunctatus*, the median carinae of clypeus indistinct. Elytra long and narrow, without a stigma.

Colour: bright grass green, fading to yellowish-green in old specimens. Elytra subhyaline.

Male pygofers almost truncate posteriorly, with a triangular median tooth. Styles moderately long, their enlarged oval apices slightly overlapping.

Described from fourteen examples from Grand Junction and a pair from Ames, Iowa. The green colour will at once separate this from any described species.

*Myndus impiger*, n. sp.

Form and general appearance of *impunctatus*. Smaller and less plainly marked. Length ♀ 4.5 mm.; width 1.5 mm.

Vertex rather broad, expanded at the base, where it is more than half as wide as its middle length, face broad, the median carinae of clypeus distinct throughout. Elytra similar in shape to those of *impunctatus*, broader than in *viridis* and with a distinct stigma.

Colour: vertex and face testaceous, usually a horseshoe-shaped light mark on front, pronotum fuscous in front, forming a collar behind the eyes, the posterior margin and broad lateral areas light, scutellum testaceous, the carinae rather lighter. Elytra subhyaline, the nervures brown or testaceous, sometime the apical ones clouded with fuscous.

Described from eight females from Palmer Lake, Ridgeway and Fort Collins, Colo. All taken in the mountains.

*Myndus Slossoni*, n. sp.

Short and stout. Black, with the margins of elytra and a median saddle light yellow. Length 4 mm., width 1.25 mm.

Vertex very broad, but slightly carinate, scarcely angled with front; front similar to *impiger*, eyes large, together with vertex nearly as broad as the pronotum. Pronotum very short, angulate behind, scutellum as in *impunctatus*, strongly tri carinate. Elytra shorter and broader than even in *impunctatus*.

Colour: vertex, face, legs and pronotum leather-brown, lighter below. Eyes, scutellum and elytra black, the costal margins of elytra with narrow white stripes extending back beyond apex of clavus, a pale yellow, illy-defined saddle occupying nearly all the claval areas back of the apex of scutellum in the female and extending nearly to the costal stripes in the male.

Male pygofer with a semicircular excavation bearing a minute knobbed median process. Styles long, touching in the middle, then obliquely divergent. Anal tube with an acute median ventral process.

Described from a single pair from Biscayne Bay, Fla. Collected by Mrs. Slosson and sent me by Mr. E. P. Van Duzee. The head is proportionally larger (broader) in this form than in any other of our species.

*Ecleus lineatus*, n. sp.

Resembling *decens*, but smaller and lighter coloured. Vertex narrow, right-angled. Length: ♀ 5.5 mm., ♂ 5 mm.; width 2.25 mm.

Vertex reduced to a line, over five times longer than wide, slightly wider in front than behind, projecting some distance in front of eye and meeting front in a right angle, the lateral carinae elevated and nearly meeting behind, forming a trough. Front concave, narrow, broadening out below the middle, where it is over three times as wide as at the base,



the median carinæ obsolete at base, pronotum short, scutellum with five carinæ.

Colour: vertex and front fuscous, the carinæ light, scutellum fuscous on disc, the carinæ and lateral margins light testaceous. Elytra hyaline, the nervures pale, rather sparsely dotted with fuscous, becoming thicker towards apex, legs and below mostly pale.

Male genital segment long and parallel margined, the ventral margin produced into a broad triangular tooth which is produced at apex into a short stout tooth. Styles in a horizontal plane, longer than the tooth, strap shaped, their outer margins rounded at apex, their inner ones produced into short reflexed hooks.

Described from one female and two males from Phoenix, Ariz. (Kunze.) The narrow produced vertex will at once distinguish this species.

*Ecleus excavatus*, n. sp.

Form and structure of *lineatus* nearly, narrower, darker, with a broader vertex. Length 5 mm.; width 1.75 mm.

Vertex parallel-margined, twice as wide as in *lineatus*, length three times its width, projecting in front of eyes as far as in *lineatus* and meeting the front in a still sharper angle, front broader above and narrower below than in *lineatus*, base over half as wide as the apex, the median carina extending to base. Elytra long, narrow, folded at rest.

Colour: vertex and face black, the carinæ light, scutellum fuscous, the five carinæ and sometime the margin testaceous. Elytra milk-white, the sutural margins creamy, interrupted with black near the middle and again at apex of clavus, nervures pale, thickly beset with large black spots somewhat confluent towards apex. Below fuscous.

Male genital segment long cylindrical, the posterior margin ventrally produced into a long narrow tooth, constricted at the base. Styles long, the shape hidden by the wax with which they are coated.

Described from four specimens, three females and one male, from Wray, Lamar and Fort Collins, Colo.

*Ecleus obtusus*, n. sp.

Resembling *excavatus*, but stouter and with a shorter vertex. Length: ♀ 6 mm., ♂ 5 mm.; width 2 mm.

Vertex rather narrow, three and one-half times as long as its apical width, still narrower at base, extending scarcely more than the width of

the carinae in front of the eye and meeting the front in an obtuse angle. Face in profile rounding, about equally margining eye from the base to the ocelli, front constricted at base, where it is one-third the width between the antennae, the median carina obsolete at base. Pronotum roundly emarginate posteriorly, the lower posterior angle scarcely, if at all, inclined backwards.

Colour: vertex and front fuscous, the carinae light, scutellum testaceous, carinae testaceous. Elytra milky, the nervures smoky brown, with very faint punctures, sometimes light at base, the punctures slightly more distinct.

Posterior margin of male genital segment in the form of an equilaterally triangular tooth. Styles but little longer than the tooth, broad at base, narrowing down to just before the apex, where they are knobbed and produced into stout hooks on the inner margin.

Described from twenty-four specimens from Neb., Kans., Colo. and Utah.

*Ecleus campestris*, n. sp.

Form and general appearance of *obtusus*, slightly larger, darker and with a broader vertex and front. Length: ♀ 6 mm., ♂ 5 mm.; width 2.25 mm.

Vertex broad and short, but little over twice longer than wide, meeting the front in an obtuse angle, which is produced but a trifle in front of the eye. Front broad, rather flat, regularly widening from the broad base to just before the apex, where it is scarcely twice as wide as at the base, the median carina usually extending to base, pronotum longer than in *obtusus*, the posterior margin broadly angulate, the lower posterior angles acute and inclined backwards.

Colour: vertex and front black, the carinae light, scutellum brownish, with the five carinae testaceous and often another pair of testaceous lines outside these. Elytra hyaline, the nervures yellow, heavily marked with dark spots, the sutural margin light, often twice interrupted with fuscous and the stigma is often fuscous marked.

Male genital segment produced posteriorly in a rounding or obtusely triangular lobe, produced at the apex into an acutely triangular tooth. Styles long, set vertically, expanded towards the apex and bearing on their inner faces, at nearly one-third their length from the apex, rounding or cylindrical protuberances.

Described from twenty-four examples from Lamar, Colo.

*Æcleus fulvidorsum*, n. sp.

Form of *obtusus* nearly, but smaller and with a tricarinate scutellum. Colour pale yellow, scutellum fulvous. Length: ♀ 5 mm., ♂ 4 mm.; width 1.75 mm.

Vertex a little over three times longer than wide, parallel margined, meeting front in an obtuse angle as in *obtusus*, front short and broad at base, where it is half as wide as at apex. Pronotum angularly excavated posteriorly, scutellum tricarinate or with another pair of very faint carinæ.

Colour: pale creamy yellow, the clypeus and scutellum fulvous. Elytra pale creamy, the nervures concolorous, dotted with testaceous beyond the apex of clavus.

Male genital segment long, posterior margin produced in the form of a narrow finger-like process, slightly widest at base. Styles stout, subcylindrical, but little longer than the process, their apices nearly truncate, a pair of short stout processes on their inner faces just before the apex.

Described from twenty-three specimens from Grand Junction, Colo., and one from Phoenix, Ariz. The pale yellow colour and the tricarinate scutellum easily separate this species.

*Æcleus acutus*, n. sp.

Form of *lineatus* nearly, lighter coloured, with a narrower vertex and tricarinate scutellum. Length 5.5 mm.; width 2 mm.

Vertex very long, simply a line on the posterior half, widening out slightly beyond the eyes, extending nearly half its distance in front of eyes and meeting front in an acute angle, front very narrow, evenly rounding in profile. Pronotum long and shallowly excavated posteriorly, scutellum tricarinate, the two lateral carinæ very near the median one.

Colour: pale yellow, slightly washed with orange on disc of scutellum. Elytra subhyaline, the nervures light with very small fuscous punctures.

Male genital segment produced into a broad short tooth with an obtusely rounding apex. Styles narrow, twice as long as the tooth, broadened at the apex, before which there is a recurved tooth on the inner margin.

Described from two males from Port au Prince, Hayti. (R. J. Crew.)

A glance at the long vertex and the three close-set carinæ on the scutellum is all that is necessary to determine this species.

## COCCIDÆ OF BRITISH NORTH AMERICA.

BY GEORGE B. KING, LAWRENCE, MASS.

(Continued from Vol. XXXIII., page 336, 1901.)

*Eulecanium fraxini*, n. sp.—Adult ♀ scale 6 mm. long, 5 broad, 2 high; some individuals are practically circular in outline and variable in size. In July the scales are well covered with a grayish powdery secretion; this being removed they are reddish brown, considerably wrinkled and pitted, surface shiny, texture thick.

Boiled in potash the derm becomes very clear and transparent, showing some large gland-pits  $24\ \mu$  in diameter. Mouth-parts, legs and anal plates tinged with yellow. Antennæ practically colourless, of 7 joints, measuring in  $\mu$  as follows:

Joint 1	(32)	2	(48)	3	(60)	4	(36)	5	(28)	6	(20)	7	(40)	in $\mu$
"	24	"	44	"	64	"	40	"	24	"	20	"	36	
"	40	"	40	"	68	"	56	"	24	"	24	"	48	
"	40	"	44	"	68	"	56	"	24	"	24	"	52	

The last two lines of measurement seem to be of the normal type with a formula of 34721 (56).

Legs thin; front leg, coxa 84. Femur  $\times$  trochanter 180. Tibia 136. Tarsus 60 in length. Middle leg, coxa 108. Femur  $\times$  trochanter 176. Tibia 120. Tarsus 56. Hind leg, coxa 120. Femur  $\times$  trochanter 196. Tibia 132. Tarsus 64.

The average width of the legs, coxa 52, trochanter 52. Tibia 24. Tarsus 16. Spines of lateral clefts in threes, nearly of equal width and in length 36 and  $56\ \mu$ , respectively. Marginal spines  $24\ \mu$  long. Rostral loop long and stout.

Hab.—Ottawa, Ont., on twigs of white ash (*Fraxinus Americana*). Coll. Dr. Fletcher, November 2, 1901, and found by me at Andover, Mass., July 16, 1899, also on white ash. The slide mount which was prepared at that time does not show the derm gland-pits, but they were distinctly seen when the mount was made.

The scales have considerable superficial resemblance to *Eulecanium cerasifex*, Fitch, and *E. cynosbati*, Fitch. Structurally it differs from *Cynosbati* in not having  $7 \times 8$  jointed antennæ, and in the form of 7 joints which has a very long third joint.

Dr. Fletcher also sent some blackberry twigs infested with *Aulacaspis rosæ*, which he received from Mr. J. D. Evans, of Trenton, Ont. They seem to be particularly abundant on the lower branches of the bushes (as is usually the case with this species). The species are from the same plantation where *Eulecanium Fitchi* was so remarkably abundant last summer.

Just recently I have received from Rev. Dr. Fyles, *Aspidiotus hederae*, Vall., on ivy (*Hedera*); *Lecanium hesperidum*, L., on flowering maple (*Abutilon*) and on *Euonymus* sp., and *Dactylopius citri* on passion-flower, all found in a dwelling house at Levis, Quebec. The *Dactylopius* is new to the Canadian list and perhaps has been taken to be the very common pest of the greenhouse, *Dactylopius longispinus*, Targ. At this writing (February 24, 1902) there remain only two other species of *Coccidae* from British North America not studied and probably new, received from Mr. John Dearness.

Below is a check-list giving their geographical distribution throughout the provinces:

Eriococcus borealis, Ckll.	Yukon Territory (Dawson City).
Phenococcus Dearnessi, King.	Ontario (London).
Ripersia basi, Ckll.	Ontario (Toronto).
Dactylopius longispinus, Targ.	In all the provinces.
"    citri, Boisd.	There is little doubt but this can be found in all the provinces.
Kermes Pettiti, Ehrh.	Ontario (Rice Lake).
Orthezia Americana, Walk.	Ontario, Quebec.
Asterolecanium variolosum, Ratz.	Ontario (Niagara, Ottawa).
Lecanium hesperidum, L.	In all the provinces.
"    pseudhesperidum, Ckll.	Ontario (Ottawa).
"    pini, King.	Ontario (London).
Eulecanium pyri, Schn.	Prince Edward Island.
"    antennatum, var. Ckll.	Ontario, Quebec.
"    juglandis, Bouché.	Ontario, Nova Scotia.
"    quercitronis, Fitch.	Ontario (London).
"    Fitchi, Sign.	Ontario, Nova Scotia, Manitoba.
"    Canadense, Ckll.	Ontario (Ottawa, Arnstein), Nova Scotia, Manitoba.
"    Fletcheri, Ckll.	Ontario (Ottawa).

<i>Eulecanium macluratum</i> , Ckll.	Ontario (Niagara).
“ <i>caryarum</i> , Ckll.	Ontario (Niagara).
“ <i>nigrofasciatum</i> , Perg.	Ontario (St. Catharines).
“ <i>cerasifex</i> , Fitch.	Ontario (Niagara Peninsula).
“ <i>pruinatum</i> , Cqul.	Ontario (St. Catharines).
“ <i>Websteri</i> , Ckll. and King.	Ontario, Nova Scotia, Prince Edward Island.
“ <i>caryæ</i> , Fitch.	Ontario (St. Catharines).
“ <i>armeniaticum</i> , Craw.	Quebec (Sherbrooke).
“ <i>cynosbati</i> , Fitch.	Ontario.
“ <i>corylifex</i> , Fitch.	Ontario (Ottawa, Nepigon), Quebec (Aylmer).
“ <i>quercifex</i> , Fitch.	Quebec (Knowlton).
“ <i>rosæ</i> , King.	Quebec (Sherbrooke).
“ <i>capreæ</i> , L.	Nova Scotia (Dartmouth).
“ <i>persicæ</i> , Fabr.	Nova Scotia.
“ <i>vini</i> , Bouché.	Nova Scotia (Kentville).
“ <i>Guignardi</i> , King.	Ontario (Niagara).
“ <i>Lymani</i> , King.	Quebec (St. Hilaire, North Hatley).
“ <i>fraxini</i> , King, n. sp.	Ontario (Ottawa).
<i>Pulvinaria innumerabilis</i> , Rathv.	Ontario.
“ <i>brassicæ</i> (?), Ckll.	Ontario.
“ <i>occidentalis</i> , Ckll.	Nova Scotia (Dartmouth), Prince Edward Island, British Columbia.
“ <i>tiliæ</i> , King and Ckll.	Ontario.
“ <i>viburni</i> , King.	Ontario, Quebec (Aylmer).
<i>Eriopeltis festucae</i> , Fonsa.	Nova Scotia, abundant; Ontario (Ottawa, rare).
<i>Aspidiotus hederæ</i> , Vall.	Ontario, Prince Edward Island.
“ <i>Forbesi</i> , Johns.	Ontario, Quebec, Nova Scotia.
“ <i>ancylus</i> , Putn.	Ontario, Quebec, Nova Scotia.
“ <i>ostreæformis</i> , Curt.	British Columbia, Ontario, Prince Edward Island.
“ <i>perniciosus</i> , Comst.	Ontario.
“ <i>Dearnessi</i> , Ckll.	Ontario (London).
“ <i>diffinis</i> (?), Newst.	Ontario.
<i>Chrysomphalus dictyospermi</i> , Marg.	Ontario.
<i>Aulacaspis rosæ</i> , Bouché.	Ontario, Prince Edward Island.

* <i>Diaspis Boisduvalii</i> , Sign.	Ontario.
<i>Chionaspis pinifolii</i> , Fitch.	Ontario, Quebec, British Columbia.
“ <i>Lintneri</i> , Comst.	Ontario, Quebec, Prince Edward Island, Nova Scotia.
“ <i>corni</i> , Cooley.	Ontario.
“ <i>furfurus</i> , Fitch.	Ontario, Quebec, Prince Edward Island, Nova Scotia.
“ <i>salicis-nigræ</i> , Walsh.	Ontario.
<i>Hemichionaspis aspidistræ</i> , Sign.	Ontario.
<i>Mytilaspis ulmi</i> , L.	In all the provinces.

We have now 59 species of *Coccide* recorded from British North America; the two more, probably new, would make 61 species.

Distribution by provinces: Ontario has produced the largest portion, 48 species; Prince Edward Island and Nova Scotia with 13 each; Quebec next with 9; British Columbia with 6, and Manitoba, 5.

Ottawa seems to lead, with London next, and then Niagara and St. Catharines. Very few other places produce more than two or three species each, and many only one.

At present there are 37 native and 22 introduced species.

I shall be pleased to receive and determine any material in *Coccidæ* found in Canada. I would say in this connection that the last of May and June are the two best months to find the genus *Pulvinaria*, and collecting for other species can be done the year round.

---

#### BOOK NOTICE.

GENERA INSECTORUM.—Published by P. Wytsman, 108 Boulevard du Nord, Brussels, Belgium.

The third and fourth parts of this work have now been issued. Part 3 consists of 40 pages and one plate, and forms a monograph of the tribes and genera of the family *Lathridiide* (Coleoptera, Clavicornica); lists and bibliographical references of species are given. This is a very satisfactory study of these minute beetles by the Rev. R. P. Belon, of

---

\*This was cited as an *Aulacaspis*, but Mr. Newstead has shown it to belong to *Diaspis*. (Ckll. in litt.)

Lyons, France, who, with Mr. Fall, of Pasadena, California, is one of the few living entomologists who is thoroughly familiar with this family of Coleoptera. He divides it into five tribes and 22 genera, and recognizes about 440 species; the plate, which is clearly executed, gives the characters of all the genera.

Part 4 contains only three pages and a plate, and gives a description and illustrations, by Mr. P. Wytzman, of the genus *Leptocircus*, which forms the subfamily Leptocircinæ of the Papilionidæ (Lepidoptera, Rhopalocera). The plate gives excellent figures of each of the six species of these beautiful Oriental butterflies, with the venation and other details.

These two parts are in French, but we were in error in stating in our notice of Part 1 that French was to be the language employed in the work. Each contributor will write in English, French or German, whichever may be most convenient to him.

Parts 5 and 6, which are about to be issued, will be devoted to the Lepidoptera. In the former, Dr. A. Pagenstecher takes up the Libytheidæ and divides the family into three genera, *Libythea*, *Hypatus* and *Dichora*. He recognizes only ten species, all the others being considered to be varieties. The text (four pages) will be illustrated with a beautiful coloured plate.

Part 6 will contain a very extended study of the Ornithopterinae, the subfamily of the Papilionidæ which includes some of the most magnificent butterflies in the world, by Mr. Robert Rippon, of London, England, the author of the great work, "Icones Ornithopterorum." He has paid great attention to these "Butterflies of Paradise," as he calls them, and as the result of his studies divides the group into six genera: 1, *Drurya* (2 species); 2, *Schoenbergia* (4 sp. and 3 varieties); 3, *Ornithoptera* (11 sp. and 11 vars.); 4, *Etheoptera* (3 sp.); 5, *Trogonoptera* (2 sp.); 6, *Pompeoptera* (24 sp. and 16 vars.). The part will be illustrated with two beautifully-coloured plates.

The plan adopted for this great work is certainly excellent, as each family, or subfamily, will be treated by the best specialist known, in whatever part of the world he may be. It is an immense undertaking, and the enterprising publisher should receive the support of all the important libraries in every country.