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## CLASSIFICATION OF THE HORNTAILS AND SAWFLIES, OR THE SUB-ORDER PHYTOPHAGA.

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(Paper No. 4.)

### FAMILY VIII.—LOPHYRIDÆ.

The Swedish entomologist, C. G. Thomson, first separated this family as a tribe in 1871. It had been placed previously with the *Lydides*, with which it had no affinity whatever. In the structure of the head, thorax and abdomen the species approach closest to the *Hylotomidæ*, *Perreyiidæ* and the *Pterygophoridæ*. The multiarticulate antennæ, however, separate them at once from the former; the distinct anal cell in the hind wings separates them from the *Perreyiidæ*, which have none; while from the last, to which they are undoubtedly most closely allied, they are readily distinguished by having a distinct lanceolate cell in the front wings.

The larvæ are social in their habits and feed exclusively upon coniferous trees—the pines, firs and cedars. Only two or three species are known outside of the Palearctic and Nearctic regions.

But two genera are known, distinguished as follows:

#### Table of Genera.

Hind wings with two discal cells; front wings with the second and third submarginal cells each receiving a recurrent nervure.

Lanceolate cell with a straight or an oblique nervure; ♂ antennæ ramose.....*Lophyrus*, Latreille.

Lanceolate cell contracted at middle, closed; ♂ antennæ biramose.....*Monoctonus*, Dahlbom.

### FAMILY IX.—PERREYIIDÆ.

The absence of an anal cell in the hind wings readily separates this family from the *Lophyridæ*.

The group was first recognized by Cameron as a subfamily in 1883, who, however, placed in it only three genera, viz.: *Decameria*, *Lophy-*

*roides* and *Perreyia*. He says: "This group has usually been regarded as a section of the Lophyrina; but it differs in so many points not only from that group, but from all others, that I am justified, I think, in making a distinct section of it, and have given above the distinctive characters of the subfamily."\*

Below I have placed in the group several other genera placed elsewhere by Cameron and Kirby. No species is known in our fauna, and the group, as a whole, seems to be confined to the Neotropical and Australian regions.

The genera belonging to the family may be readily distinguished by the aid of the following table:

#### Table of Genera.

- Marginal cell simple, not appendiculate.....7.  
 Marginal cell appendiculate, the lanceolate cell petiolate.  
 Second and third submarginal cells each receiving a recurrent nervure, rarely with the first recurrent interstitial with the first transverse cubitus.....3.  
 Second submarginal cell receiving both recurrent nervures; antennæ 13-15-jointed.....2.  
 2. Hind wings without a discal cell, the marginal cell with an appendage; ♂ antennæ 15-jointed, biramose.....Lophyroides, Cameron.  
 (Type *L. ruficollis*, Cam.)  
 Hind wings with one discal cell, the marginal cell *without* an appendage; ♀ antennæ 14-jointed, ♂ 15-jointed; maxillary palpi 4-, labial palpi 3-jointed.....Lophyridea, Ashm., n. g.  
 (Type *L. tropicus*, Nort)\*\*  
 Hind wings with one discal cell, the marginal cell *with* an appendage; antennæ 15-jointed in both sexes; maxillary palpi 2-, labial palpi 1-jointed.....Perreyia, Brullé.  
 3. Hind wings *with* one discal cell (a closed submarginal).....4.  
 Hind wings *without* a discal cell.  
 ♀ antennæ 13-jointed, the third joint very long, the following gradually shortening.....Ancyloneura, Cameron.  
 4. Antennæ 16-jointed, longer than the body.....6.  
 Antennæ 9-11-jointed, shorter than the body.....5.

\*Biol. Centr. Am. Hym., Vol. I., p. 60.

\*\*Cameron placed this species in his genus *Lophyroides*.

5. Antennæ 9-jointed, the third joint as long as joints 4-6 united; second and third submarginal cells subequal, larger than the first.  
 ♀ ..... Eurys, Newman.  
 Antennæ 10-jointed, the third joint scarcely as long as joints 3-4 united; second submarginal cell twice as long as the third.  
 ♀ ..... Acherocerus, Kirby.  
 Antennæ 11-jointed, the third joint long, about as long as the three following joints united.  
 Second submarginal cell longer than either the first or third united; maxillary palpi 6-, labial palpi 4-jointed.  
 ♀ ..... Camptobrium, Spinola.  
 Second submarginal cell shorter than either the first or third.  
 Maxillary palpi 4-, labial palpi 3-jointed.  
 ♀ ..... Euryopsis, Kirby.  
 Maxillary palpi 3-, labial palpi 1-jointed.  
 ♀ ..... Decameria, Lepel.
6. Head subquadrate, the temples broad; flagellar joints long, each giving off a ramus from near the base. ♂ .... Cladomacra, Smith.
7. Antennæ 18-jointed, the flagellar joints scarcely longer than thick, each throwing off from near the extremity a long pilose ramus; hind wings with one discal cell; head transverse, the temples narrow. ♂ ..... Polyclonus, Kirby.

## FAMILY X.—PTERYGOPHORIDÆ.

This group by most authorities has been placed with the *Cimbicidæ*, possibly on account of some of the species possessing clavate antennæ, similar to *Cimbex*. The family is, however, structurally, totally different from them, and to me shows no affinity whatever with the *Cimbicidæ*; it is in every respect more closely allied to the *Lophyridæ*, *Perreyiidæ* and the *Selandriidæ*, from all of which it is readily distinguished by the absence of the lanceolate cell in the front wings.

It may be divided into three subfamilies, two of which, however, are not sharply separable, and I have had some difficulty in finding characters to distinguish them. The venation, especially in many of the genera in the subfamily *Pterygophorinæ*, has been most perplexing, since I find it totally different in the opposite sexes of the same species. Some of the females too have clavate antennæ, and thus closely mimic the females in the subfamily *Perginæ*.

It is believed, however, that these difficulties have been surmounted and that other students will now have no trouble in recognizing these subfamilies by the use of the following table :

Table of Subfamilies.

Cubitus originating from the subcostal vein beyond the apex of the basal nervure.....2.

Cubitus originating from the apex of the basal nervure or only a little away from it.

Costal vein slender towards base, but very much thickened or broadened at apical one-third; marginal cell not appendiculated and with no space between its apex and the costal margin; antennæ short, filiform in both sexes, from 6-10-jointed.....Subfamily I., *Lobocerinae*.

Costal vein not very much thickened and almost of a uniform thickness throughout; marginal cell at apex a little away from the costal margin, and appendiculated; first dorsal abdominal segment emarginate, or with a median slit; ♀ antennæ short clavate, 5-8-jointed, or filiform subdentate, 14-20-jointed; antennæ usually ramose or flabellate.....Subfamily II., *Pterygophorinae*.

2. Submedian cell always shorter than the median, the transverse median nervure joining the median vein very much *before* the origin of the basal nervure; ♀ antennæ filiform, the flagellar joints subdentate beneath, or clavate; ♂ antennæ flabellate or ramose; first dorsal abdominal segment with a median slit.....Subfamily II., *Pterygophorinae*.

Submedian and median cells equal or nearly so, the transverse median nervure being interstitial with the basal nervure; antennæ short clavate in both sexes, 6- or 7-jointed; first dorsal abdominal segment entire.....Subfamily III., *Perginae*.

Subfamily I.—*LOBOCERINÆ*.

This group, but without proper characterization, was first recognized as a subfamily by Mr. W. F. Kirby, of the British Museum, who placed in it only three genera, viz.: *Perantherix*, Westw. (= *Acordulecera*, Say); *Loboceras*, Kirby. and *Aulacomeres*, Spinola. The other genera, recorded below, he placed with the *Cimbicidæ*.

The subfamily is very sharply separated from the other two subfamilies, here defined for the first time, by the characters made use of in my table.

The group is confined principally to the Neotropical region, no species being known outside of the American faunæ—North, Central and South America—*Acordulecera*, Say, being the only genus which has been enabled to extend its range into the Palearctic region.

The larvæ of at least one of the genera is known: *Acordulecera dorsalis*, Say, having been bred and described by Dr. H. G. Dyar.\*

The genera may be easily recognized by the use of the following table:

Table of Genera.

Hind wings with one closed submarginal cell.

Front wings with four submarginal cells, the second and third each receiving a recurrent nervure..... 2.

Front wings with three submarginal cells, the first and second each receiving a recurrent nervure.

Antennæ short, 6-jointed; middle and hind tibiæ with lateral spurs..... *Acordulecera*, Say (= *Perantherix*, Westw.).

2. Antennæ 8-jointed or more.. 3.

Antennæ 7-jointed.

First joint of flagellum not so long as joints 2-3 united; hind tibiæ without a lateral spur, the inner apical spur very

long..... *Loboceras*, Kirby.

First joint of flagellum longer than joints 2-3 united; hind tibiæ with a lateral spur..... *Incalia*, Cameron.

3. Antennæ 8-jointed; middle and hind tibiæ with lateral spurs .. *Paralyptia*, Cameron.

Antennæ 9-jointed; middle and hind tibiæ without lateral spurs..... *Aulacomereus*, Spinola.

Antennæ 10-jointed, the third joint about as long as joints 4-5 united, or a little longer, but slenderer; middle and hind tibiæ with lateral spurs..... *Cerealces*, Kirby.

Subfamily II.—*PTERYGOPHORINÆ*.

The credit for this subfamily should be given to Mr. Peter Cameron, who, in his Monograph of the British Phytophagous Hymenoptera, Vol. III., p. 72, remarks as follows: "*Pterygophorus* also belongs to a distinct subfamily, which differs both from the *Lophyrina* and *Perreyina* in the lanceolate cell being obsolete. The accessory nervure in the hind wings is also absent; the latter have only one middle cellule and the anterior are appendiculated."

The subfamily is apparently confined to the Neotropical and Australian regions, no species being known in our fauna north of Mexico.

The genera recognized may be tabulated as follows:

Table of Genera.

- Front wings with three submarginal cells.....2.
- Front wings with four submarginal cells, the hind wings with one closed submarginal cell (except in *Syzygonia*, Klug, which has two).
- Second and third submarginal cells each receiving a recurrent nervure .....4.
- Second submarginal cell receiving both recurrent nervures.....3.
2. First and second submarginal cells each receiving a recurrent nervure; hind wings with one closed submarginal cell; antennæ 6-jointed .....*Thulea*, Say.
- Second submarginal cell receiving both recurrent nervures; hind wings with one closed submarginal cell; scutellum rounded behind.
- Antennæ 17-20-jointed, the flagellar joints dentate or with short branches beneath.....*Lophyrotoma*, Ashm., n. g.  
(Type *P. interruptus*, Klug.)
- Antennæ 23-jointed, each flagellar joint with a very long branch.  
♂ .....*Pterygophorus*, Ashm., n. g.  
(Type *P. analis*.)
3. Scutellum with the hind angles dentate; antennæ 25-jointed, flabellate.  
♂ .....*Pterygophorus*, Klug.  
(Type *P. cinctus*, Klug.)
- Scutellum posteriorly rounded, not dentate; antennæ 17-20 jointed, biramose in ♂ ..... *Brachytoma*, Westw.  
(Type *B. fumipennis*, Westw.)
4. Middle and hind tibiæ with lateral spurs.....5.
- Middle and hind tibiæ without lateral spurs.
- Antennæ 5-jointed, ♀; hind wings with one closed submarginal and one closed discoidal cell.....*Syzygonia*, Klug.  
(Type *S. cyanocephala*, Klug.)
- Antennæ 6-jointed, ♀; hind wings with one closed submarginal cell, but *without* a closed discoidal cell..*Syzygonidea*, Ashm., n.g.  
(Type *S. cyanea*, Brullé.)
5. Scutellum rounded behind, unarmed.
- Antennæ 7-jointed.....*Corynophilus*, Kirby.  
(= *Cephalocera*, Klug.)

Antennæ 14-jointed, ♀; third submarginal cell very small, less than half the length of the second. . . . . *Brachytoma*, Westw.

Scutellum posteriorly bidentate.

Antennæ 8-jointed (or ? more), clavate. ♀. *Pterygophorus*, Klug.

Antennæ 18 jointed, in both sexes, filiform, subserrate, the third joint longer than the fourth. . . . . *Philomastix*, Froggatt.

#### Subfamily III.—*PERGINÆ*.

In this subfamily the antennæ are 6- or 7-jointed, clavate, and alike in both sexes; the cubitus always originates from the subcostal vein away from the apex of the basal nervure; the costal vein is considerably thickened; while the transverse median nervure is interstitial, or very nearly so, with the basal nervure.

These characters at once separate the group from the two preceding.

The larvæ too, judging from what has been published respecting them, are also quite different. Unfortunately, the published descriptions of them are very superficial and one can gain little information respecting their structure. Most of them seem to be black or brown, with yellow markings and clothed with short white hairs, which would indicate an affinity with the *Selandriidæ*. According to Mr. R. H. Lewis and Mr. W. W. Froggatt, they live on various species of gum trees belonging to the genus *Eucalyptus* — trees indigenous to Australia.

A most remarkable habit of maternal insect in the female of *Perga Lewisii*, Westw., and the only case known among the Terebrant Hymenoptera, is recorded by Mr. Lewis.\* He says: "The larvæ when hatched are of a dirty green colour, with shining black heads, they keep together in the brood, arranging themselves in oval masses, their heads pointed outwards; but sometimes I have seen them arranged on both sides of the leaves, their heads pointed towards the edges. . . . The mother insect follows them, sitting with outstretched legs over her brood, preserving them from the heat of the sun, and protecting them from the attacks of parasites and other enemies with admirable perseverance. I endeavoured to drive some from their posts by pricking them with the point of a black-lead pencil; but they refused to leave, seizing whatever was presented to them in their mandibles, no doubt very formidable weapons when employed against their race. They never attempted to use their wings or move from the spot."

\*Trans. Ent. Soc., Lond., Vol. I., 1836, p. 232.



The genera are not numerous and may be separated as follows :

Table of Genera.

- Hind wings with one closed submarginal cell.
- Front wings with four submarginal cells..... 3.
- Front wings with three submarginal cells..... 2.
2. First submarginal cell receiving both recurrent nervures ; antennæ 6-jointed..... Paraperga, Ashm., n. g.  
(Type *P. jucunda*, Kirby.)
- First and second submarginal cells each receiving a recurrent nervure ; antennæ 7-jointed..... Pseudoperga, Ashm., n. g.  
(Type *P. polita*, Leach.)
3. Antennæ 6-jointed, joints 3 to 5 of an equal length or nearly so ; head subquadrate, scarcely so broad as the thorax ; first submarginal cell not unusually small..... Perga, Leach.
- Antennæ 7-jointed ; head very large quadrate, fully as broad or a little broader than the thorax ; first submarginal cell very small, half the length of the second, or smaller..... Neoperga, Ashm., n. g.  
(Type *P. amenaida*, Kirby.)

DIASPIS AMYGDALI IN MASSACHUSETTS

BY R. A. COOLEY, B. S., AMHERST, MASS.

In January of this year Mr. A. H. Kirkland sent me specimens of a scale insect he had taken from *Prunus mume* at the Arnold Arboretum, Jamaica Plain, Mass., which on examination proved to be *Diaspis amygdali*, Tryon. A little later Mr. Kirkland sent me more specimens which he had taken from *Prunus subhirtella* at the Arboretum. Specimens of the scale were sent to Dr. L. O. Howard, who confirmed my identification, stating also that he had asked Mr. Coquillett to examine the specimens and had received the report that he could find no difference between them and *Diaspis amygdali*. The infested trees came from Japan, the *Prunus mume* in the spring of 1894 and the *Prunus subhirtella* in the spring of 1897.

These specimens, with others of the same species received from various sources, have been compared with specimens of *Chionaspis prunicola*, Maskell, received from the author of the species, without finding the slightest difference. I therefore consider *Chionaspis prunicola* a synonym of *Diaspis amygdali*, which has priority.

## ADDITIONS TO MY SYNOPSIS OF THE TACHINIDÆ.

BY D. W. COQUILLET, WASHINGTON, D. C.

Since the publication of the above work several additional forms have been examined, the result of which is recorded herewith. Dr. S. H. Scudder kindly presented to the National Museum co-types of his *Tachina theclarum*, and of many of the species described in his work on the Butterflies of New England; in every case these conform to the positions assigned them in my Synopsis.

*Clistomorpha hyalomoides*, Townsend, is a synonym of *Nysta didyma*, Loew. It belongs to the genus *Clytiomyia*, of which *Clistomorpha* is therefore a synonym.

*Cistogaster pallasii*, Townsend, Proc. Ent. Soc., Washington, 1891, page 142. This reference was inadvertently omitted in the Synopsis. I have not seen a specimen which agrees with this description.

*Admontia hylotome*, n. sp.—♂. Black, the palpi and apex of proboscis yellow. Front at narrowest part two-thirds as wide as either eye, no orbital bristles, frontals descending to middle of second antennal joint, antennæ five-sevenths length of face, the third joint nearly twice as long as the second, arista thickened on the basal third, the penultimate joint broader than long; sides of face at narrowest part each nearly one-half as wide as the median depression, bearing numerous bristly hairs, cheeks one-third as broad as the eye-height, vibrissæ slightly above the oral margin, ridges bristly on the lowest third. Thorax gray pruinose, marked with four black vittæ; three postsutural and three sternopleural macrochaetæ, scutellum bearing three pairs of long marginal and a short apical pair. Abdomen polished, last three segments gray pruinose at their bases, bearing discal and marginal macrochaetæ. Wings hyaline, slightly tinged with yellow along the veins, third vein bearing two or three bristles near the base; calypteres whitish. Hind tibiæ outwardly subciliate, front pulvilli as long as the last tarsal joint, tarsi not dilated.

♀ Differs from the ♂ as follows: Front as wide as either eye, two pairs of orbital bristles, third segment of abdomen carinate on the under side, the carina thickly beset with short spines; front pulvilli one-half as long as the last tarsal joint.

Length, 6 to 9 mm. Woods Holl, Mass. Bred from *Hylotoma humeralis*, Beauv., by Dr. H. H. H. G. Dyar. Three males and five females. Type No. 4061, U. S. Nat. Museum.

*Admontia unispinosa*, n. sp.—♀. Differs from the ♀ of *hylotomæ* as follows: Apex of proboscis black. Front slightly wider than either eye, frontals descending only a short distance below base of second antennal joint, antennæ four-fifths as long as the face, the third joint from three to four times as long as the second, arista thickened on the basal half, sides of face each one-fifth as wide as the median depression, bearing a single row of bristly hairs, vibrissæ at the oral margin. Abdomen bearing only marginal macrochaetæ, destitute of spines on the under side. Wings not tinged with yellow along the veins, third vein bearing a single bristle near its base. Length, 4 to 6 mm. Opelousas, La. Eight specimens collected in June, 1897, by Mr. G. R. Pilate, and submitted by Dr. Garry de N. Hough. Type No. 4062, U. S. Nat. Museum.

*Admontia tarsalis*, n. sp.—♀. Differs from ♀ of *hylotomæ* as follows: Apex of proboscis brown, basal half of antennæ yellow. Front one-fifth wider than either eye, antennæ as long as the face, the third joint five times as long as the second, sides of face each one-fifth as wide as the median depression, bearing a row of macrochaetæ in continuation of the frontal row, vibrissæ on a level with front edge of oral margin, ridges bristly on the lower half. Abdomen destitute of spines on under side. Front tarsi toward the apex greatly dilated. Length, 5 to 6 mm. Opelousas, La. Two specimens collected in May and June, 1897, by Mr. G. R. Pilate, and submitted by Dr. Garry de N. Hough. Type No. 4063, U. S. Nat. Museum.

*Admontia polita*, n. sp.—♀. Differs from the description of *hylotomæ* ♀ as follows: Second joint of antennæ yellow, apex of proboscis brown. Frontal bristles descending only slightly below base of second antennal joint, antennæ almost as long as the face, the third joint three times as long as the second, sides of face each one-third as wide as the median depression, bearing a row of macrochaetæ, vibrissæ on a level with front edge of oral margin, only two or three bristles above each. Thorax polished, not pruinose except along the sides, scutellum destitute of a short apical pair of macrochaetæ. Abdomen not pruinose on the fourth segment, destitute of spines on the under side, discal macrochaetæ sometimes wanting. Length, 5 to 7 mm. Oswego, N. Y. (July 1 and 17, 1897; Prof. Chas. S. Sheldon), and Jacksonville, Fla. (Mrs. A. T. Slosson). Seven specimens.

*Dionea*, Desv. (Synonym, *Labidigaster*, Macq.)—This genus falls

in the last couplet in my synoptic table, and will be recognized by having a single bristle at base of the third vein, the head one and one-third times as high as long, and the proboscis only once geniculate.

*Dionea nitoris*, n. sp.—♂ ♀. Black, the palpi yellow. Front of male one-fifth, in the female four-fifths, as wide as either eye, frontal bristles not descending beneath the base of second antennal joint, two pairs of orbital bristles in the female, wanting in the male, antennæ three-fourths as long as the face, the third joint one and one-half times as long as the second, arista thickened on the basal third; vibrissæ slightly above the level of the front edge of the oral margin, one or two bristles above each. Thorax polished, a median vitta in front of the suture and the lateral margins, whitish pruinose, three postsutural and two sternopleural macrochaetæ, scutellum bearing three long marginal pairs. Abdomen polished, without a trace of gray or whitish pruinosity, first segment one and one-half times as long as the third, the first three bearing only marginal macrochaetæ, last segment in the female provided at its apex with a pair of curved appendages resembling a pair of pincers. Tarsi not dilated, front pulvilli of male slightly longer than, in the female scarcely one-half as long as, the last tarsal joint. Wings gray, toward the base yellowish, along the posterior margin subhyaline, calypteres white. Length, 5 mm. Corvallis, Oregon. A specimen of each sex collected July 16 and Sept. 16, 1896, by Mr. A. B. Cordley. Type No. 4065, U. S. Nat. Museum.

*Chetophleps rostrata*, n. sp.—♀. Black, the lower part of the face and apex of proboscis, yellow. Front slightly wider than either eye, two pairs of orbital bristles, frontals descending to middle of second antennal joint, antennæ nearly as long as the face, the third joint four times as long as the second, arista thickened almost to the middle, face in profile strongly concave, vibrissæ on a level with front edge of oral margin, two or three bristles above each, proboscis slender, the labella considerably prolonged backward. Thorax gray pruinose, marked with four black vittæ; three postsutural and two sternopleural macrochaetæ, scutellum bearing three marginal pairs. Abdomen polished, bases of last three segments gray pruinose, each segment bearing only marginal macrochaetæ, venter destitute of short, stout spines. Tarsi not dilated, hind tibiæ not ciliate. Wings hyaline, first vein bristly on its apical third, the third bearing three bristles near its base, calypteres white. Length, 3 mm. Biscayne Bay, Fla. (Mrs. A. T. Slosson), and Opelousas, La. (Mr. G. R. Pilate). Three specimens. Type No. 4066, U. S. Nat. Museum.

*Hypostena setinervis*, n. sp.—♀. Black, the palpi, apex of proboscis, abdomen, coxæ, femora and tibiæ, yellow, the last two segments of the abdomen partly tinged with brown. Front as wide as either eye, two pairs of orbital bristles, frontals descending to apex of second antennal joint, antennæ as long as the face, the third joint six times as long as the second, arista thickened almost to the middle, vibrissæ on a level with front edge of oral margin, ridges bristly on the lowest fourth. Thorax gray pruinose, marked with four black vittæ; four postsutural and two sternopleural macrochaetæ, scutellum bearing three pairs of long marginal and a short apical pair. Abdomen polished, bases of last three segments whitish pruinose, first three segments bearing only marginal macrochaetæ, venter destitute of short, stout spines. Tarsi not dilated, hind tibiæ subciliate. Wings hyaline, third vein bristly to slightly beyond the small cross-vein, hind cross-vein nearer to the small than to bend of fourth vein, calypteres white. Length, 5 mm. Biscayne Bay, Florida. A single specimen collected by Mrs. A. T. Slosson. Type No. 4067, U. S. Nat. Museum.

*Exorista dorsalis*, n. sp.—♀. Black, the palpi and sometimes the sides of the abdomen, except at each end, yellow. Front from three-fifths to two-thirds as wide as either eye, two pairs of orbital bristles, frontals descending to apex of second antennal joint, sides of face and of front in front of the orbitals silvery-white pruinose, antennæ nearly as long as face, the third joint from three to four times as long as the second, arista thickened on the basal two-fifths, the penultimate joint only slightly longer than broad, facial ridges bristly on the lowest two-fifths, cheeks one-sixth as broad as the eye-height. Thorax polished, having a strong brassy tinge, without a trace of light coloured pruinosity on the dorsum; three postsutural and three sternopleural macrochaetæ, scutellum bearing three pairs of long marginal and a short apical pair. Abdomen somewhat polished, thinly gray pruinose, last three segments bearing discal as well as marginal macrochaetæ. Hind tibiæ outwardly ciliate, middle tibiæ each bearing a single macrochaeta on the front side near the middle. Wings hyaline, third vein bearing from two to four bristles near its base, bend of fourth vein destitute of an appendage, calypteres whitish. Length, 6 to 7 mm. North Mt., Pa. (Sept. 2, 1897; Mr. C. W. Johnson), and Ga. Two specimens. Type No. 4068, U. S. Nat. Museum.

*Brachycoma Sheldoni*, n. sp.—♂ ♀. Black, a subtriangular spot outside of each vibrissa, brown, a yellow ring on the arista beyond the thickened base. Front of male one-fourth as wide as in the female, as wide as

either eye, two pairs of orbital bristles in the female wanting in the male, frontals descending almost to base of second antennal joint, sides of face bearing bristly hairs, and on the lower portion with several macrochaetæ, antennæ from slightly over two-thirds to three-fourths as long as the face, the third joint only slightly longer than the second, arista long pubescent on basal half, thickened on the basal fifth, vibrissæ on a level with front edge of oral margin, two or three bristles above each, cheeks three-fifths as broad as the eye-height. Thorax gray pruinose, marked with three black vittæ; three postsutural and three sternopleural macrochaetæ, scutellum bearing three long marginal pairs. Abdomen somewhat polished, gray pruinose and with darker reflecting spots, last three segments bearing only marginal macrochaetæ. Middle tibiæ each bearing two or three macrochaetæ on the front side near its middle, front pulvilli of male as long as the last tarsal joint. Wings hyaline, tinged with yellow at the base, costal spine longer than the small cross-vein, third vein bristly at least half-way to the small cross-vein, calypteres white. Length, 8 to 10 mm. Oswego, N. Y. One male and three females collected in July and August, 1895 and 1896, by Prof. Charles S. Sheldon, after whom the species is named. Type No. 4069, U. S. Nat. Museum.

### ON SOME SMALL BEES FROM ARIZONA.

BY T. D. A. COCKERELL, MESILLA, N. M.

Some time ago Prof. C. F. Baker sent me a lot of small bees collected by Dr. R. E. Kunz at Phoenix, Arizona, May 12, 1897, "on willows and various low herbs." I have examined these with interest, as they belong to genera not recorded from that region; they prove to be as follows:

- (1.) *Perdita salicis*, Ckll., 1896.—♂. ♀. Very many specimens.
- (2.) *Prosapis mesilla*, Ckll., 1896.—A few, mostly males.
- (3.) *Halictus meliloti*, Ckll., 1895.—One ♀.
- (4.) *Halictus pseudotegularis*, Ckll., 1896.—On April 12, 1897, I took at flowers of *Sisymbrium*, in Mesilla, N. M., a single *Halictus* which differed decidedly from Illinois *H. tegularis*, but, to my surprise, almost agreed with the Mexican *H. pseudotegularis*, except that the wings were clear. Now, among the Arizona bees I find examples of *pseudotegularis* with slightly dusky wings, as in the type of that species; the second submarginal cell is noticeably smaller than in *tegularis*, and receives the recurrent nervure further from its end.

(5.) *Halictus Kunzei*, n. sp.—♀. Length hardly 5 mm.; head and thorax shining olive green, abdomen ferruginous, the apical two-fifths blackish. Head rather large, considerably broader than thorax, finely and rather closely punctured, facial quadrangle nearly as broad as long; face with only a few scattered hairs on its lower part; flagellum ferruginous beneath, except at base; clypeus with its apex darkened, its disc smooth, with only a few scattered punctures; mandibles ferruginous except at base; thorax almost entirely nude. Short white hairs on hind part of metathorax and lower part of pleura; mesothorax and scutellum very shiny, punctured at the sides, the punctures becoming scattered centrally, leaving the disc smooth, nearly impunctate; basal enclosure of metathorax semilunar, with fairly strong rugæ; pleura well punctured; tegulæ testaceous; wings hyaline, faintly yellowish, subcostal nervure black, other nervures and stigma honey-colour; third submarginal cell bulging outwardly, narrowed much less than one-half to marginal; legs piceous, with thin white pubescence, knees and tarsi somewhat paler and more ferruginous; spurs pallid, hind spur of hind tibiæ with large teeth; abdomen of the usual form, shining, impunctate, naked, with a very little pubescence at the end; ventral surface ferruginous, with very little hair. The cheeks are broad, but not produced below. One ♀. Known from the few species of similar coloration by the smooth, not granular, mesothorax, etc. It is perhaps nearest to *H. impurus*, Cr., but differs by the scanty pubescence of face, colour of nervures, etc.

(6.) *Ceratina arizonensis*, n. sp.—♂. Length about  $3\frac{1}{2}$  mm., shining black; face narrow, entirely ivory white up to level of antennæ, except the supra-clypeal area, which is black; lateral sutures of clypeus marked by a black line; anterior edge of clypeus with a dark spot on each side; labrum ivory-colour, with a dark spot on each side; mandibles black, ferruginous towards ends, but dark at tip; vertex smooth and impunctate, occiput with strong, large punctures; cheeks smooth and impunctate, except quite posteriorly; flagellum brown; mesothorax punctured in front and along hind margin, centrally impunctate; scutellum punctured; base of metathorax minutely striate-granular, more or less tessellate; tarsi pale ferruginous, anterior tarsi more or less white in front; anterior tibiæ white in front, brownish-ferruginous behind; anterior femora black, apex and a stripe beneath for the apical two-thirds, white; four hind knees white, the white continued as a stripe on the tibiæ; tubercles white; wings rather dull hyaline, strongly iridescent,

nervures and stigma piceous or dark brown; abdomen punctate, apex broadly truncate, the truncation slightly concave.

Several specimens. This species does not resemble any of those described from North America. In its black colour, and the truncate apex of the abdomen, it resembles the European *C. cucurbitina*, Rossi. In the pale face it resembles *C. Marawitzii*, Sickm., and *C. flavipes*, Sm., from China. It is therefore a species of unusual interest.

### A NEW SQUASH BUG.

BY F. H. CHITTENDEN, WASHINGTON, D. C.

In the course of an investigation of insects affecting cucurbits, begun in a preliminary way in the season of 1897, as a part of the official work of the Division of Entomology of the Department of Agriculture, it was found that we have in addition to the common squash bug, *Anasa tristis*, DeG., a second species sufficiently resembling it as to have readily escaped the notice of the average observer, but at the same time quite distinct in all its stages. This species is *Anasa armigera*, Say, and it was first observed on cucurbits by the writer July 12, near Colonial Beach, Va., where it occurred on cucumbers. Afterward it was taken by the writer and Mr. F. C. Pratt, of the Division of Entomology, who has assisted in field investigations and collections on different cucurbits, at Ballston, Va., Poolesville and Seat Pleasant, Md., and on the Conduit Road and at Tenleytown, D. C. At the last mentioned place it occurred in great abundance on a late crop of cucumbers and watermelons. As late as the 29th of September, all stages of the insect were found, including the egg. The present year the species was found to be nearly as abundant in some localities as the common squash bug. Such was the case at Marshall Hall, Md., and in one locality in the District of Columbia. It was also observed on squash at College Station and Kensington, Md., and on cucumber at Cabin John, Md.

*Anasa armigera* appears to have very much the same habits as its more common congener, preferring squash of all cultivated plants, but feeding on canteloupe and other cucurbits when squash is not available. It is noticeably more active than *tristis*, flying freely in the hot sunshine and exposing itself on the upper surface of the leaves in midday. It also has a later season, appearing three weeks later, according to recent observations, and remaining in the field after the common species has gone into hibernation. Evidently it is a southern form, and perhaps has



not till recently been present in such numbers as we now know it to be in and about the District of Columbia. It has not, to my knowledge, been taken in this neighbourhood prior to 1884, when a single individual was captured by Mr. Otto Heidemann, in the District of Columbia. Now it is present here wherever curcurbits are grown, and it has come to stay if the last two seasons are a criterion. A number of these bugs were placed on a squash plant on the Department grounds the 1st of October, 1897, and the following July several were collected there that had very evidently survived the winter from this lot, as there is little possibility that they flew in from some outside source.

The species has been sent in through correspondents of the Department but once. August 5, 1898, specimens were received from Mr. H. J. Gerling, with report that they were taken on cucumber at St. Charles, Mo.

For the identification of this species, it should be said that it is of nearly the same size as *tristis*, but may be easily distinguished by its broader prothorax and more prominent angles, the reflected sides of the abdomen, showing four prominent white marks on the hemelytra, and its armed femora, whence is derived its specific name. The upper surface is brown, the legs and first joints of the antennæ whitish, spotted and irrorated with black. In front of each eye is an acute porrect spine.

The egg is of nearly the same size and proportions as that of *tristis*, but it is much lighter in colour, being light golden bronze instead of dark bronzy brown, the normal colour of the latter. In its active stages, however, it is quite distinct, being lighter in colour, with the legs ornamented by alternate bands of red or black and white.

It is impossible at present to define the exact economic status of this species. Certainly it is not a first-class pest in its northern range, and, from its observed later appearance, hardly likely to become so. It is capable, however, of injuring late crops of all the curcurbits.

In addition to the localities mentioned, the species is known from Kansas, Western Iowa, and Florida.

It is hoped that the readers of this publication who have opportunity of observing curcurbit insects will keep a lookout for this squash bug, and send specimens, if they are successful in securing them, that we may be able to identify the species and thus learn more of its distribution. Specimens will be returned if desired.

## NEW SPECIES OF NORTH AMERICAN MYRMELIONIDÆ.

BY ROLLA P. CURRIE, WASHINGTON, D. C.

## III.

BRACHYNEMURUS HUBBARDII, new species.

*Male*.—Length, 46 mm.; expanse of wings, 49.5 mm.; greatest width of anterior wing, 6 mm.; length of antenna, 9 mm. Very slender; yellow, marked with dark fuscous; sparsely hairy, more thickly on abdomen.

Face scarcely convex, yellowish; above, a broad pitchy-black band, notched in middle below, extending around the antennæ on outer side; a faint fuscous line extends from centre of notch almost to clypeus; furrow between face and inner orbit of the eye, fuscous. Circumocular area yellowish, except along depressed portion of the vertex, where it is dark fuscous, and below, near maxillary palpiger, where there is a black spot. Clypeus yellowish, with a few coarse black hairs. Labrum transverse, rounded laterally and narrowed anteriorly, somewhat emarginate in front, yellowish, slightly tinged with rufous, several coarse dark hairs on anterior border. Mandibles piceous, black at tips; on inner edge, near apex, a tooth.

Maxillary palpi yellowish, slightly tinged with rufous apically; first two joints short, subequal, about as broad as long; third joint somewhat longer than first two together, perceptibly curved, enlarged apically; fourth joint straight, a little shorter than third; last joint somewhat longer than third, subcylindrical, truncate at tip, and slightly notched.

Labial palpi about same length as maxillary, yellowish; first joint not quite twice as long as broad, enlarged apically; second joint more than twice as long as first, slightly curved, strongly widened and thickened apically; third joint about same length as second, fusiform, faintly hairy, tinged with rufous around ocelloid spot and on tip; the latter fine, truncate, slightly notched.

Maxillary palpigers yellowish, with some dark fuscous spots. Labium, labial palpigers, mentum and gula yellowish, the latter clouded with fuscous; the mentum bears a long, coarse, black bristle and a few black hairs.

Antennæ clavate, longer than head and thorax; fuscous, articulations yellowish, more distinctly so on basal joints; clothed with very short,

stiff hairs; first and second antennal joints piceous, yellowish at bases and apices; a yellowish crescent bounds base of first joint in front. Between the antennæ posteriorly, a narrow transverse yellowish band.

Vertex elevated behind, rounded, yellowish; in front, on depressed portion and anterior part of elevated portion, dark fuscous; longitudinal median furrow and an irregular spot each side, behind, dark fuscous.

Pronotum as broad as long at base, somewhat narrowed anteriorly, yellowish; anterior angles rounded, front margin slightly emarginate; four longitudinal dark fuscous lines.\* Lateral carinæ yellowish. Below yellowish; on each side, at base of anterior legs, a dark fuscous spot, produced anteriorly along the carina.

Mesonotum yellowish; lobes moderately elevated, marked similarly to those of *B. 4-punctatus*.† Sides and beneath yellowish, marked with fuscous.

Metanotum yellowish, lobes less elevated than those of mesonotum; marked much as those of *B. 4-punctatus*; the two longitudinal lines which unite to form the "U" and heart-shaped markings in the latter, however, approach medially, but do not meet, in this species, giving the appearance of a letter "X" when viewed from a distance. Sides and beneath yellowish, marked with fuscous.

Abdomen longer than wings, yellowish, a fuscous stripe each side, on dorsum and venter; the dorsal stripe is separated from the ventral by the lateral suture only; a longitudinal median fuscous stripe on venter on basal segments. A longitudinal median fuscous line, also, on dorsum of apical segments. All markings of apical segments more extended so as to make these segments almost entirely fuscous.

Tip of abdomen luteous, clouded with fuscous; clothed with long dark hairs; appendages one-half the length of seventh segment, slender, somewhat flattened laterally, divergent on apical half; luteous, clouded with fuscous, clothed with coarse black bristles; between the appendages below, a short triangular fuscous plate.‡

Legs short and slender, yellowish, beset with numerous black hairs

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\*On the female specimen, the outer lines are nearly interrupted at the transverse furrow.

†CAN. ENT., XXX, 5, 1898, p. 138. These markings seem to be, in a rough way, continuations of the four longitudinal lines of the pronotum.

‡This seems to be the ventral projection of the short eighth segment.

and some coarse black spines (most of which latter are black, the rest luteous); tibiae each with a transverse piceous line on outer side near base; sometimes clouded with piceous at articulations with femora; ringed with piceous at their apices. Tibial spurs as long as first two tarsal joints, in anterior and middle legs (in posterior, somewhat shorter); slightly curved, rufo-piceous. Tarsal joints piceous at their apices; claws considerably more than half the length of last tarsal joint, moderately curved, rufo-piceous.

Wings of moderate size, hyaline, the posterior margins sinuate apically; venation hairy. Pterostigma small, luteous, reaching forward only half way to the costal margin. Intercostals in apical half of anterior wings forked, a somewhat less number forked in posterior wings. Veins luteous, interrupted, principally at junctures with other veins, with fuscous.

Anterior wings with series of small fuscous spots or cloudings, principally along anterior side of submedian vein and posterior side of the first longitudinal vein above it; a few spots and cloudings also at tip of submedian vein, at bases of smaller forks, and along veins near posterior border; posterior wings quite a little shorter than anterior, immaculate. Posterior borders of both wings fringed with fine hairs.

*Female*.—Length, 28 mm.; expanse of wings, 49.5 mm.; greatest width of anterior wing, 6.3 mm.; length of antenna, 6 mm.

Antennæ more clavate than in male. Abdomen a little shorter than wings; marked similarly to that of the male, but the mid-dorsal stripe exists on all the segments, while the mid-ventral stripe of basal segments is absent. Tip of abdomen luteous, clothed above with long black hairs; superior parts split; inferior part beset with coarse, blunt, black spines; below, two small cylindrical luteous appendages, three times as long as broad, with some very long, black hairs or bristles. Anterior wings almost immaculate, a few very small faint cloudings along submedian and post-costal veins.

*Type*.—No. 4070, U. S. National Museum. One male specimen collected at Fort Grant, Arizona, July 22, 1897, by Mr. Henry G. Hubbard.

No. 4070 a, U. S. National Museum. One female, with same locality and date, collected by Mr. Hubbard.

A handsome little species, resembling somewhat, in general appearance, *B. abdominalis* (Say).

## NEW COCCIDÆ.

BY EDW. M. EHRHORN, MOUNTAIN VIEW, CAL.

*Eriococcus adenostoma*, n. sp.

♀ enclosed in an oval (at one end more or less pointed) sac about 3 mm. long and  $1\frac{1}{2}$  mm. broad, woolly, snow-white, of uniform texture.

♀ oval, about half again as long as broad, dark purple, turning bright crimson when placed in K. H. O. Body about  $1\frac{1}{2}$  mm. long. Antennæ light brown, 7-jointed, formula: approximately (347) (12) 56, joint 3 equal 5 + 6. Most of the joints with hairs; joint 7 with several comparatively long hairs.

Legs light brown, large and stout. Each joint with one or more bristles. Femur quite swollen. Tarsus a trifle longer than tibia. Claw stout and curved. Both tarsus and claw with long filiform digitules.

Posterior tubercles short and rounded, with one very long, stout bristle and two shorter ones on their outer margin. Anal ring large, with eight long bristles. Derm colourless, with quantities of small spines and rounded glands distributed all over the dorsum.

Sac of ♂ smaller and narrower than that of the ♀, colour more creamy.

Hab.—On *Adenostoma fasciculatum*, in the mountains, near Mountain View, Cal.

*Lecanium pubescens*, n. sp.

♀ scale about 4 mm. long,  $2\frac{1}{2}$  mm. broad, and 2 mm. high, moderately soft, before gestation covered with very soft hair. Colour blackish-brown, more on the black, with a yellow longitudinal band on the dorsum. Dorsum pitted and margin slightly wrinkled. Some specimens show a lighter colour. When removed from twig the insect leaves a small amount of white powder.

Derm by transmitted light colourless, except margin, which is light brown, with numerous small round gland pores. Margin with a double row of minute simple spines, lateral incisions with one moderately stout spine and two short ones. Anal plates large, outer corner forming a right angle, with several hairs at tip and a long, stout hair on each plate. Anogenital ring with six long, stout hairs. Legs slender. Tibia and tarsus about equal. Femur a little longer than tibia. Coxa, trochanter and femur each with a hair. Claw curved, with slender

knobbed digitules. Tarsal digitules with very fine, long, knobbed hairs. Antennæ 7-jointed, formula: 43 (12) 7 (56). Joint 4 very little longer than 3. Joint, 1, 2, 4, 6 each with a hair; joint 7 with several hairs.

♂ scale glassy white with median ridge, about  $1\frac{1}{2}$  mm. long.

♂ body dark red-brown, legs and antennæ light brown. Wings extend  $1\frac{1}{2}$  beyond body, colour iridescent. Thorax with two elevated ridges much darker than body. Antennæ very hairy.

Hab.—On *Quercus sp.*, in the mountains, near Mountain View, Cal.

*Lecanium Crawii*, n. sp.

♀ scales not crowding each other; hemispherical, about 3 mm. long, 2 mm. broad and  $1\frac{1}{2}$  mm. high, oval, shiny, brown, getting darker with age. Margin generally lighter than dorsum.

♀ before gestation light brown, shiny. Derm. by transmitted light. brown, with numerous oval gland orifices. Marginal hairs very short and slender. Lateral incisions each with three stout but not long spines. Antennæ 7-jointed, 3 longest, twice as long as 4. Joints 5 and 6 very short. Joints 1 and 2 about equal. Formula: 347 (12) 56. Anal plates broad but not very large. Anogenital ring with six moderately slender hairs. Legs quite stout. Coxa and femur with stout hair. Femur very little longer than tibia. Tibia and tarsus about equally long. Claw stout and curved. Tarsal digitules moderately stout, knobbed hairs. Digitules of claw not stout, a little longer than claw, more or less club-shaped.

Larva light yellow, with distinct ridge on dorsum dividing scale lengthwise. Oval, about twice as long as broad. Rostral loop extending to third pair of legs.

Hab.—On *Acer macrophyllum*, in the mountains, near Mountain View, Cal.

*Comys fusca* was reared from this species.

*Lecanium ventrale*, n. sp.

♀ scale about  $4\frac{1}{2}$  mm. long, 3 mm. broad, 1 mm. high. Oval when seen from above. Soft texture, very much like *L. hesperidum*; light brown, not very convex, and a dark brown border near margin. Dorsum pitted and margin moderately wrinkled, an indistinct mesial ridge.

♀ colour greenish-yellow, with a brown longitudinal line on the dorsum, also two brown lines forming a double cross with the dorsal line, more or less wrinkled and pitted. Ventral view shows the abdomen

a dark purple-brown with very distinct segmentation. Viviparous.

After boiling in soda, derm colourless. Margin with small curved spines. Lateral incisions with long, stout, curved spine and two shorter ones. Anal plates large, with blunt tips, bearing several hairs and notched on outer margin, together forming a square. Each plate has a distinct brown projection into the body. Anogenital ring with six hairs, which are very long, extending  $2\frac{2}{3}$  over the plates. Legs stout, coxa and femur each with a stout hair. Femur  $\frac{1}{3}$  longer than tibia. Tarsal digitules long, knobbed hairs, digitules of claw broad and thick. Claw stout and curved. Antennæ 7-jointed, formula: 34721 (56). Joints 1 and 2 with two hairs each. Joints 4, 5, 6 and 7 with several hairs. Joint 3 very little longer than 4. Joints 5 and 6 equal. Larva lemon-yellow, very flat, shiny, oval, about twice as long as broad.

Hab.—On *tuberous plant* in Japanese Nursery, at San José, Cal.

*Encyrtus flavus* and *Coccophagus lecanii* were reared from this species.

#### SUPPLEMENTARY NOTE, AND NOTICE OF A NEW ERIOCOCCUS.

BY T. D. A. COCKEREILL, N. M. AGR. EXP. STA.

Mr. Ehrhorn has been so kind as to send me examples of all his new species above described, and I have also been allowed to examine his type slides. The following remarks are offered as a result of the examination of this material. The measurements of antennæ and legs given are all in thousandths of a millimetre:

*Eriococcus adenostomæ*, Ehrh.—This is a distinct little species, with a pure white sac.

The following measurements will help to separate several of our species of *Eriococcus*:

Antennæ of adult female: Segments —	1	2	3	4	5	6	7	Formula.
<i>E. adenostomæ</i> , Ehrh.....	?	25.	33.	25.	16.	16.	31.	37(24)(56).
<i>E. neglectus</i> , Ckll.....	?	16.	33.	11.	14.	25.	..	36254.
<i>E. quercus</i> , Comst .....	?	47.	53.	50.	22.	25.	42.	342765.
<i>E. Tinsleyi</i> , Ckll., n. sp. (a)....	?	31.	45.	45.	25.	19.	25.	(34)2(57)6.
" " " (b)....	?	28.	101.	16.	14.	28.	..	3(26)45.

Of course there is considerable variation, and these figures merely represent average specimens selected. The first segment is more or less ringlike, and its length could not be well measured.

Anterior leg of adult female :	Tibia.	Tarsus (excl. claw).	Claw.
<i>E. adenostomæ</i> , Ehrh.....	84.	90.	28.
<i>E. neglectus</i> , Ckll.....	62.	76.	22.
<i>E. quercus</i> , Comst.....	155.	76.	28.
<i>E. Tinsleyi</i> , Ckll., n. sp. ....	98.	107.	33.

In *adenostomæ* the femur is very stout ; length 118, breadth 64.

The *E. quercus* studied was found by Mr. Quaintance on *Quercus aquatica*, at Lake City, Florida, Jan. 12.

*Eriococcus Tinsleyi*, Ckll., n. sp., was found by Prof. J. D. Tinsley, April 30th, 1898, on roots of *Atriplex canescens*, close to the Agricultural College at Mesilla Park, New Mexico. The sac is 4 mm. long, of the ordinary form and texture of the genus ; yellowish-white. Female removed from ovisac plump, 3 mm. long, nearly 2 broad, not tapering behind, delicately and very thinly pubescent, pale brown with a purple tinge, two purplish dorsal bands faintly indicated. Legs and antennæ light brown. Antennæ sometimes with 6, sometimes with 7, segments, as above. The ♀, placed in K. H. O., immediately turns brilliant crimson.

Larva pale sage green, naked. Immature ♀ purplish-gray, quite bristly with white filaments, or it may be better to say, thinly but conspicuously beset with short white bristles. Eggs pale lemon yellow. Allied to *E. dubius*, Ckll.

*Lecanium pubescens*, Ehrhorn, is a *Eulecanium* related to *L. quercifex*, Fitch, but differing in the smaller size, and the details of the legs and antennæ. Under a high power the skin is seen to be minutely tessellate, in the manner usual in the subgenus.

*L. Crawii*, Ehrh., is also a *Eulecanium*. It has a good deal of superficial resemblance to *L. nigrofasciatum*, Pergande, ined., being of about the same size and shape, though of a different colour.

*L. ventrale*, Ehrh., is related to *L. acuminatum*, Sign., but differs in the longer tarsus.

The following tables will assist in the recognition of these species :

Antennæ of adult female :	Segments—	1	2	3	4	5	6	7	Formula.
<i>L. pubescens</i> .....		45.	45.	64.	73.	33.	28.	47.	437(12)56.
<i>L. Crawii</i> .....		25.	31.	53.	67.	19.	16.	33.	4372156.
<i>L. ventrale</i> .....		28.	39.	64.	73.	22.	25.	45.	4372165.

  

Anterior leg of adult female :	Tibia.	Tarsus (excl. claw).	Claw.
<i>L. pubescens</i> .....	118.	84.	19.
<i>L. Crawii</i> .....	95.	70.	..
<i>L. ventrale</i> .....	104.	73.	16.



## CORRESPONDENCE.

## FOOD PLANT OF EUPHANESSA MENDICA.

On page 227, Vol. III., CANADIAN ENTOMOLOGIST, I find note of Mr. Saunders's unsuccessful endeavours to find the food plant of this species, and no record of the food plant is contained in Bulletin No. 35 of the United States National Museum, "Bibliographical Catalogue of the Described Transformations of North American Lepidoptera," by Henry Edwards. I offer the following information upon this matter. While picking the common violet, something dropped from one of the leaves, and as the leaf was considerably eaten I at once made careful search. I found a larva in the form of an eye (such as is used by dress makers) among and hardly distinguishable from dried grasses and twigs, except by its peculiar form. I gathered nine or ten of these, in different stages, and reared them to maturity. The larva, so far as I can remember, having made no notes, varies very little in form or colour in any of its stages. The larvæ are very easily reared. The chrysalis is formed between twigs or leaves knit together by several silken threads, in which state it remains about ten days. FRANK LUCOCK, Pittsburg, Pa.

DR. O. HOFMANN, Über die Anordnung der borstentragenden Warzen bei der Raupen der Pterophoriden.

Prof. Grote has kindly sent me a copy of this article by Dr. Hofmann, published in the "Illustrierte Zeitschrift für Entomologie." Dr. Hofmann gives figures showing the arrangement of the warts in the larvæ of certain Pterophoridae. He shows that the setæ may vary from single to multiple, that tubercles i. and ii. may be separate or united and that iv. and v. may be separate (fig. 7). On the basis of this variation, he criticises the value of the larval characters in classification, saying, "After we have seen how many modifications the normal type of wart formation may undergo in the small, well-limited family Pterophoridae, which is evidently a natural family, we cannot give the same high systematic value to it as Dyar does," etc. Dr. Hofmann has encountered an extreme case; but it does not invalidate my larval classification, as he seems to think. I have not contended that family characters were strongly marked in the larvæ, though they are often well indicated. My contention has been for the superfamily groups, and these are not in any way invalidated by Dr. Hofmann's facts, as a reference to my definitions will show.

HARRISON G. DYAR.