

STATE OF ILLINOIS
DEPARTMENT OF REGISTRATION AND EDUCATION
DIVISION OF THE
NATURAL HISTORY SURVEY
STEPHEN A. FORBES, Chief

Vol. XIII.

BULLETIN

Article XIV.

FOREST INSECTS IN ILLINOIS

I. THE SUBFAMILY OCHTHIPHILINAE
(Diptera, Family Agromyzidae)

BY

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PRINTED BY AUTHORITY OF THE STATE OF ILLINOIS

URBANA, ILLINOIS

January, 1921

ERRATA

Page 97, line 17, for first *larval* read *pupal*.

Page 112, in legend, for *jonessi* read *jonesii*.

Page 114, in legend, for *or* read *of*.

Page 125, line 4, for *Bonosa* read *Bonaso*.

Page 131, in legend, for *hirundinaceus* read *hirudinaceus*.

Page 138, last line, for *cocoon* read *cocoon*.

Plate XII, explanation page, next to last line, for *acrivora* read *aerivora*.

Plate XIII, explanation page, next to last line, for *White-grubs* read *White-grub*.

Page 293, Figure 5*a* was reversed in printing, and the two items of the legend should change places.

Page 515, second table, for *Pelocoris femorata* read *Pelocoris femoratus*.

ARTICLE XIV.—*Forest Insects in Illinois. I. The Subfamily Ochthophilinae (Diptera, Family Agromyzidae).* BY J. R. MALLOCH.

This paper deals with a small group of two-winged flies, or Diptera, belonging to the subfamily Ochthophilinae, family Agromyzidae, and is intended to serve as an index both to the habits and the systematic relations of the species.

CHARACTERS OF SUBFAMILY

Costa complete, extending to apex of fourth vein; fifth vein not flexed proximad of outer cross-vein; anal vein incomplete; both basal cells present, sometimes the cross-vein at base of discal cell very weak; vibrissae absent; postvertical bristles absent or present, when present convergent; tibiae without preapical bristle; interfrontal bristles absent; orbits never with an anteriorly directed bristle; arista bare or pubescent; sternopleura with one or more bristles; propleural bristle absent; clypeus small.

DISTRIBUTION AND BIOLOGY OF GENERA

This subfamily contains only seven genera. Of these, four are known to occur in Illinois; the other three each contain only one North American species and are more southern in their known distribution. With the exception of the genus *Cryptochaetum* the genera have not been considered as of economic importance and but little has been published on the biology of the other genera, this paper containing the most complete series of records of the larval habits extant. The predaceous habits of the larvae, which so far as known feed upon aphids and scale insects, give to the species an economic status which does not belong to any other subfamily in the acalyprate Diptera, the only true aphidophagous larvae in the Cyclorrhapha occurring in the Syrphidae. All species of the genus *Leucopis* feed on aphids and scale insects, and it is possibly due to their small size that their importance as destroyers of these insects has not been more than casually mentioned in literature.

I present keys to the genera of the subfamily, including the larvae known to me, and keys to all the North American species of the genera *Pseudodinia* and *Leucopis sens. lat.*

The larvae of *Leucopis* are subject to attack by chalcid parasites, the imago of the parasite emerging through a ragged hole which it gnaws in the anterior portion of the dorsum of the puparium of the host.

KEYS TO GENERA

LARVAE AND PUPARIA

1. Anal respiratory processes thread-like, one of them at least ten times as long as body, coiled inside of body of host; both larva and puparium internal in host (*Icerya purchasi*).....*Cryptochaetum* Rondani
- Anal respiratory processes very short and stout, sometimes sessile, not thread-like, and not as long as body; larva and puparium not internal in host.....(*Leucopis*, sens. lat.) 2
2. Body almost cylindrical, not tapered posteriorly, with minute warty or setulose armature; anal respiratory processes sessile, situated much above level of venter and widely separated. Host, *Pulvinaria vitis* L.....*Leucopomyia*, subgen. n.
- Body distinctly flattened ventrally, tapered both anteriorly and posteriorly, usually with minute warty or setulose armature; anal respiratory processes stalked, usually lying close against the surface to which the larva or puparium is adhering.....*Leucopis* Meigen, sens. str.

IMAGINES

1. Orbits with one or more pairs of distinct bristles.....2
- Orbits without bristles.....4
2. Head pointed at base of antennae, the face almost horizontal; wings distinctly spotted.....*Acrometopia* Schiner
- Head not pointed at base of antennae, face short and nearly or quite vertical (Pl. XLVI, Fig. 5, 6, 9, 10); wings unspotted.....3
3. Thoracic dorsum with four pairs of bristles (Pl. XLVI, Fig. 2); mesopleura bare; ocellar bristles absent.....*Chamaemyia* Panzer
- Thoracic dorsum with three pairs of bristles (Pl. XLVI, Fig. 1); mesopleura bare; ocellar bristles present.....*Ochthiphila* Fallen
- Thoracic dorsum with two pairs of bristles (Pl. XLVI, Fig. 3); mesopleura with one strong bristle; ocellar bristles present but weak.....*Pseudodinia* Coquillett
4. Arista absent.....*Cryptochaetum* Rondani
- Arista present5
5. Costa with small setulae on under surface; species glossy blue-black.....*Paraleucopis* Malloch
- Costa not setulose; species densely gray pruinulent.....*Leucopis* Meigen

ACROMETOPIA Schiner

The only described North American species of this genus, *punctata* Coquillett, has been recorded only from Georgia.

Larval habits unknown.

CHAMAEMYIA Panzer

This genus has usually been considered as a synonym of *Ochthiphila* but it is readily separated by means of the characters cited in the above key to genera.

The only species, *elegans* Panzer, occurs in Europe and has been recorded from New Jersey. There are two specimens in our collection from Illinois: Champaign, July 25, 1889, and Mayview, July 31, 1891 (Terrill).

Larval habits unknown.

OCHTHIPHILA Fallen

There is but one species of this genus in our collection from Illinois, *polystigma* Meigen. It is generally distributed throughout the state, and is apparently as common in this country as in Europe.

I know nothing of the larval habits.

PSEUDODINIA Coquillett

KEY TO SPECIES

1. Frons anterior to ocelli, distinctly longer than wide (Pl. XLVI, Fig. 7, 11); tibiae and tarsi yellow.....*polita* Malloch
- Frons anterior to ocelli at least as wide as long; apices of tibiae and the tarsi yellow.....2
2. Frons anterior to ocelli much wider than long; apices of third and fourth veins divergent.....*varipes* Coquillett
- Frons anterior to ocelli as wide as long; apices of veins 3 and 4 not divergent3
3. Thorax and abdomen polished, almost without pruinescence; last section of fourth vein more than twice as long as preceding section.....*nitida* Melander
- Thorax and abdomen shining, with distinct pruinescence; last section of fourth vein twice as long as preceding section.....*pruinosa* Melander

PSEUDODINIA NITIDA Melander

Three specimens with data as follows, from Illinois: Urbana, August 30, 1914, and September 3, 1916; and White Heath, July 11, 1915. Taken by the writer.

Larval habits unknown.

PSEUDODINIA POLITA Malloch

A common species in some parts of Illinois. Our specimens are from Centerville, August 16, 1914, 5 specimens; White Heath, May 30,

1915, 3 specimens; Muncie, June 3, 1917, and August 15, 1917, two specimens; Augerville, June 6, 1915, 1 specimen; Dubois, May 24 and 25, 1917, 4 specimens; and Carbondale May 15, 1910, 1 specimen. All except the last specimen taken by the writer.

Larval habits unknown.

CRYPTOCHAETUM Rondani

The only species of this genus in North America, *iceryae* Williston, does not occur in Illinois. The species was introduced into California from Australia to control the mealy citrus-bug in which the larvae are parasitic. In being an internal parasite the species differs from those of *Leucopis*, the larvae of the latter being predaceous.

PARALEUCOPIS Malloch

This genus contains but one species, *corvina* Malloch, which does not occur in Illinois so far as we are aware.

Larval habits unknown.

LEUCOPIS Meigen, *sens. lat.*

There are at present in the list of North American Diptera seven species of the genus *Leucopis*. A key to six of these was published by Dr. A. L. Melander in 1913.* Subsequently Dr. J. M. Aldrich described the seventh species†.

Dr. E. P. Felt recently submitted to me for identification several specimens which belong to an undescribed species which is represented also in the collection of the Natural History Survey, and herein I am presenting a key to all the North American species in the hope that by so doing I may make it possible for students to identify their specimens with more certainty than is possible by using the previously published keys.

I find that there are certain very important chaetotaxic differences between some of the species which warrant me in erecting two new subgenera for the reception of two species. It may be that other systematists will consider these segregates entitled to generic rank, but they very closely resemble the species of *Leucopis* in habits and markings as well as in larval habits and structure, so that from my point of view the placing of the species in subgenera is more appropriate than either placing them in the same genus or erecting genera for them.

KEY TO SUBGENERA

1. Thorax with a pair of strong bristles between the posterior pair of dorso-centrals (Pl. XLVI, Fig. 4).....2

* Jour. N. Y. Ent. Soc., Vol. 21, p. 232.

† Jour. Econ. Ent., Vol. 7, p. 404. 1914.

- Thorax without any bristles between the posterior pair of dorsocentrals; ocellar bristles absent.....*Leucopis* Meigen
- 2. Ocellar bristles absent.....*Leucopomyia*, subgen. n.
- Ocellar bristles present (Pl. XLVI, Fig. 8).....*Neoleucopis*, subgen. n.

LEUCOPIS Meigen, *sens. str.*

KEY TO SPECIES

1. Third antennal segment yellow; thorax and abdomen without black or brown stripes or spots, basal segment of the latter blackened except on posterior margin..... *flavicornis* Aldrich
- Third antennal segment black.....2
2. Basal two antennal segments yellow, contrasting conspicuously with the black third segment; mesonotum without distinct vittae, usually with 4 pairs of weak dorsocentrals; legs yellow, femora darkened in middle...*pemphigae*, sp. n.
- Basal two antennal segments not conspicuously paler than third; species in other respects not as above.....3
3. Frontal lunule transverse on its upper margin; thorax and abdomen dark gray, thorax not vittate, and with four series of acrostichal setulae between the dorsocentrals, abdomen with basal tergite almost entirely and the second largely fuscous, slightly shining; last section of fourth vein five or six times as long as preceding section; last section of fifth vein almost or quite twice as long as outer cross-vein; male hypopygium with a very long curved central process.....*piniperda*, sp. n.
- Frontal lunule arcuate on upper margin, almost transverse in *simplex*; thorax with more than four series of acrostichal setulae between dorsocentrals; male hypopygium without a long curved central process...4
4. Abdomen with a small central spot and a larger one on each side of it on each of segments two to four inclusive black.....5
- Abdomen with or without a small black central spot on segments two to four inclusive, but without the lateral spots except on second segment..6
5. Thorax with two brown vittae.....*bellula* Williston
- Thorax not vittate.....*maculata* Thompson
6. Frontal orbits well differentiated from interfrontalia, each orbit wider than the latter, the entire frons pale gray, not vittate; genal bristle long; wing-veins 3 and 4 parallel apically, not convergent; tibiae and tarsi yellowish, the former slightly darkened in middle...*orbitalis*, sp. n.
- Frontal orbits poorly defined, not at all differentiated from interfrontalia, and not as wide as the latter, the frons usually distinctly vittate.....7

7. Several minute setulae in front of genal bristle (Pl. XLVI, Fig. 12); penultimate section of fourth vein at least as long as, generally longer than, ultimate section of fifth (Pl. XLVII, Fig. 1); usually one and sometimes two long setulae in front of anterior dorsocentral bristle; fore tibiae and tarsi yellow.....*major*, sp. n.
- No setulae anterior to genal bristle.....8
8. Fore tarsi largely or entirely yellow.....9
- Fore tarsi largely or entirely black.....10
9. Large species, 2 mm. or over in length; thorax with two faint brown vittae; basal abdominal tergite black except along posterior margin, second with two small round black spots, third and fourth each with a central black spot on anterior margin.....*bella* Loew
- Smaller species, less than 2 mm. in length; thorax without distinct vittae; basal abdominal tergite bronzy fuscous except laterally, second with two large poorly defined bronzy fuscous submedian spots on anterior margin*simplex* Loew
10. Entire fore metatarsus yellow; genal bristle very short; frontal lunule setulose; abdomen marked as in *simplex*; veins 3 and 4 parallel apically*parallela*, sp. n.
- At most only the base of fore metatarsus yellow.....11
11. Small species, barely over 1 mm. in length; thorax and abdomen lead-gray pruinulent; fore tarsi entirely, mid and hind pairs except base of metatarsi, black.....*minor*, sp. n.
- Larger species, averaging 2 mm. in length, thorax and abdomen whitish gray pruinulent; fore metatarsus yellow at extreme base, the other tarsi with at least the basal two segments yellowish.....*americana*, sp. n.

DESCRIPTIONS AND RECORDS OF ILLINOIS SPECIES

LEUCOPIS PEMPHIGAE, sp. n.

Male and Female.—Black, opaque, densely whitish gray pruinulent, Frons slightly rufous anteriorly, but only noticeably so when the surface has been wet, in well-preserved specimens densely whitish gray pruinulent; basal two antennal segments yellow, third deep black, slightly gray pruinulent; palpi black. Thorax not distinctly vittate, the areas occupied by the lateral vittae in other species a little darker gray than the remainder of disc. Abdomen slightly testaceous at apex; hypopygium testaceous; basal tergite with two large, rounded, poorly defined brownish fuscous spots, third and fourth sometimes with a small linear dark spot in center at base, second with two small round fuscous spots. Legs testaceous yellow, femora usually darkened on middle. Wings white, veins brownish except at bases. Calyptreae white. Halteres cream-colored.

Frons almost parallel-sided, sparsely hairy, over one third of the head-width at anterior margin; orbits narrower than interfrontalia; third antennal segment higher than long; genal bristle slender. Mesonotum with three or four dorsocentral bristles; about six series of setulae between the dorsocentrals, median setulae not forming stripes except near anterior margin. Hypopygium as in Plate XLVII, Figures 7, 11, and 12. Veins 3 and 4 distinctly convergent at apices; penultimate section of fourth vein about one third as long as ultimate, and longer than last section of fifth vein.

Length, 2 mm.

Type, male, allotype, and five paratypes, Carbondale, Ill., July 6, 1909, reared from larvae from Pemphigus gall. The species is evidently predaceous on the gall-maker.

Specimens emerged as adults July 15 and 27, 1909.

LEUCOPIS PINIPERDA, sp. n.

Male and Female.—Black, opaque, densely gray pruinulent. Frons unicolorous pale gray pruinulent; antennae and palpi black, second segment of former pale gray pruinulent. Thorax not vittate. Abdomen slightly shining; basal tergite almost entirely brownish fuscous, second less broadly fuscous, the dark parts of tergites more distinctly shining than remainder of dorsum; hypopygial forceps testaceous. Legs black, bases of mid and hind tarsi and sometimes the knees in male testaceous, base of fore tarsus and apices of tibiae pale in female. Wings clear, veins fuscous. Calyptae and halteres yellowish.

Frons a little over one third of the head-width, with sparse, short, erect hairs; orbits almost uniformly wide for their entire length, each about half as wide as interfrontalia; ocelli in an almost equilateral triangle; lunule broadly transverse on its upper margin, nearly bare; third antennal segment higher than long; second segment of arista about four times as long as thick. Thorax with two or three pairs of dorsocentrals; dorsal setulae sparse, about four series between the dorsocentrals, some lying between the posterior pair. Hypopygium small with a very long curved central process, as in Plate XLVII, Figure 2. Wing-veins 3 and 4 almost parallel on their apical portions; last section of fourth vein five or six times as long as preceding section, the latter very much shorter than last section of fifth vein.

Length, 1—1.5 mm.

Type, male, Urbana, Ill., April 29, 1916, in forestry of University of Illinois. Allotype, Urbana, Ill., July 5, 1915, on tree-trunk. Paratype, male, Boulder, Col., August 19, 1918, reared from needles of *Pinus scapularum* (E. Bethel).

The type and allotype were collected by the writer in the vicinity of pine trees. The larvae are very probably predaceous on aphids occurring on pine.

LEUCOPIS ORBITALIS, sp. n.

Female.—Black, opaque, densely pale gray pruinulent. Orbits darker than interfrontalia, the latter slightly testaceous; antennae black, second segment conspicuously whitish pruinulent; palpi black. Thorax not vittate. Basal abdominal tergite brownish fuscous except on posterior and lateral margins, second with a pair of large, poorly defined, round fuscous spots, the dark parts slightly shining. Legs yellowish testaceous, coxae and femora largely fuscous, apices of tarsi infuscated. Wings clear, veins brown, pale basally. Calyptres white. Halteres pale yellow.

Frons flattened, parallel-sided, a little over one third as wide as head, with sparse microscopic hairs; lunule rounded above; each orbit wider than interfrontalia, anteriorly; antennae as in *pemphigae*; palpi smaller than usual; genal bristle long, the area surrounding it nearly bare. Mesonotum with three or four pairs of dorsocentrals, the anterior two or three pairs weak; setulae between dorsocentrals sparse, three or four series, extending to level of posterior dorsocentrals, but irregularly; dorsal setulae not in stripes anteriorly. Third and fourth veins parallel on apical portions, penultimate section of fourth vein about one fourth as long as ultimate, and shorter than last section of fifth.

Length, 2 mm.

Puparium.—Reddish testaceous, slightly shining.

Distinctly flattened on venter, tapered slightly at both ends, depressed at anterior extremity and slightly so at posterior, though convexly so; surface with minute setulose armature, most distinct on anal segments. Anterior respiratory processes minute, black, with about four branches; anal respiratory processes stout, closely adherent to surface of leaf, armed with microscopic setulae, separated by about twice the basal diameter of one process, each less than twice as long as thick.

Length, 2.5 mm.; diameter at middle, .75 mm.

Type and paratype, Dundee, June 7, 1916. Reared from pine twig infested by *Kermes*.

LEUCOPIS MAJOR, sp. n.

Male and Female.—Black, densely whitish gray pruinulent. Interfrontalia when seen from behind dark gray, the orbits almost white; antennae black, basal two segments paler, the second whitish pruinulent; palpi black. Dorsum of thorax with a brown vitta on each side along the lines of dorsocentrals, which extend to posterior margin; no other markings present. Abdomen with first tergite black except laterally, and narrowly so on posterior margin, second tergite with two large round submedian black spots, and a much less distinct dark streak between them which does not extend to posterior margin; third and fourth tergites

with only the central streak. Legs yellowish testaceous, coxae, and femora except their apices fuscous, tibiae in middle and the apical tarsal segment sometimes slightly darkened. Wings clear, costal and first to fifth veins brown. Calyptrae white. Halteres yellow.

Eyes bare; frons distinctly narrowed posteriorly, at vertex less than one third of the head-width, both orbits and interfrontalia with numerous microscopic pale hairs; lunule large, exceeding in size the third antennal segment, regularly rounded above, its upper half hairy; third antennal higher than long; second segment of arista at least three times as long as thick; face concave, receding below; several short setulae anterior to the genal bristle; palpi broad. Dorsum of thorax with rather dense short setulae, the median line almost obliterated; usually three and sometimes four dorsocentrals present, and between them 8 or more series of short setulae which extend almost to posterior margin; scutellar bristles equal in length. Abdominal tergites 1 to 4 in female subequal, fifth short; ovipositor as in Figure 6, Plate XLVII; hypopygium of male as in Figures 4, 8, and 10, Plate XLVII. Legs normal. Wings broad; veins 3 and 4 distinctly convergent apically; penultimate section of fourth vein usually longer than ultimate section of fifth.

Length, 2.5—3 mm.

Type, female, allotype, and four female paratypes, St. Joseph, Ill., May 3, 1914 (J. R. Malloch).

Larval host unknown.

LEUCOPIS SIMPLEX Loew

I have before me a series of 6 specimens of this species which I took at Dubois, Ill., May 21—25, 1917, and one from Muncie, Ill., May 24, 1914.

The characters cited in the key to species should serve to distinguish this species from its allies. Male hypopygium as in Plate XLVII, Figure 9.

The larval host is unknown to me.

LEUCOPIS PARALLELA, sp. n.

Female.—Black, densely gray pruinulent, the color of the pruinescence of abdomen paler than that of thorax. Frons lead-gray, orbits paler; antennae black, second segment whitish pruinulent; palpi black. Thorax lead-gray pruinulent, not vittate. Abdomen whitish gray pruinulent, first tergite subshining fuscous except on lateral margins, second tergite with the usual fuscous spots very large, fused centrally and extending to anterior margin, the other tergites unmarked. Legs black, extreme apices of femora, bases and apices of tibiae, entire fore metatarsus, and the mid and hind tarsi except the apical segment yellow. Wings clear, veins brown. Calyptrae white. Halteres white.

Frons at vertex less than one third of the head-width, slightly widened anteriorly, the surface with microscopic hairs; lunule hairy, subtrans-

verse above, not as large as third antennal segment, the latter as long as high; face concave in center; genal bristle very short; palpi slightly broadened. Thoracic dorsum rather densely and evenly setulose on disc, with two pairs of dorsocentrals; basal pair of scutellar bristles shorter than apical pair. Fifth abdominal tergite about as long as fourth. Legs normal. Wings narrow; veins 3 and 4 parallel apically, penultimate section of fourth vein slightly longer than ultimate section of fifth, the latter longer than outer cross-vein.

Length, 1 mm.

Type, Muncie, Ill., July 5, 1914 (J. R. Malloch).

This species very closely resembles *simplex* Loew, but differs in color of legs, in having the third and fourth veins parallel, the fifth abdominal tergite longer, and the genal bristle shorter. Both species have the discal thoracic setulae continued to posterior margin between the dorsocentrals.

Larval host unknown.

LEUCOPIS MINOR, sp. n.

Male.—Differs from the preceding species in having the spots on second tergite small and widely separated, the posterior margin of first tergite gray pruinose, the legs black, with bases of all tibiae and of mid and hind tarsi yellowish.

Genal bristle larger than in *parallela*. Discal thoracic setulae discontinued proximad of posterior dorsocentral; basal scutellar pair of bristles slightly smaller than apical pair. Veins 3 and 4 subparallel apically; penultimate section of fourth vein distinctly shorter than ultimate section of fifth, the latter much longer than outer cross-vein.

Length, 1 mm.

Type, Dubois, Ill., August 9, 1917 (J. R. Malloch).

A female in poor condition but which appears to belong to this species was taken at Champaign, Ill., July 24, 1889 (Marten and Terrill).

Larval host unknown.

LEUCOPIS AMERICANA, sp. n.

Male and Female.—Black, densely grayish white pruinose, the abdomen in some specimens almost silvery. Frons with the interfrontalia darker than the orbits, appearing vittate; second antennal segment conspicuously whitish pruinose. Thorax with or without two brown vittae. Abdomen normally as in *major*, the central spots sometimes obsolete. Legs with a larger amount of yellow than in *minor*, the base of fore metatarsus nearly always yellowish.

Third antennal segment higher than long. Discal setulae as in *minor*. Fifth tergite in female very short. Legs normal. Veins 3 and 4 generally slightly but noticeably convergent apically; position of outer cross-vein variable; wing broader than in *minor*.

Length, 2—2.5 mm.

Type, male, allotype, and two female paratypes, Urbana, Ill., June, 1917. Reared from larvae found feeding on aphids on *Spirea vanhouttei* (J. R. Malloch). This series has the thorax vittate.

The puparia of this species, from which the type series emerged, differ from those of *orbitalis* in having the surface except on venter covered with wart-like protuberances which are tipped with minute spines or setulae. These protuberances are not serially arranged and are separated by a little wider space than the width of the base of one protuberance. The empty puparium is yellowish in color, slightly shining, with a pale brownish vitta between median line and dorsolateral margin. In form it is more robust than that of *orbitalis* and has a slight but evident longitudinal depression along each side, so that the portions dorsad and ventrad of the depression form rounded elevations. Anterior respiratory organs minute, with a few microscopic apical filaments; posterior respiratory organs pedunculate, about three times as long as their basal diameter, separated by a distance equal to their length, their surfaces warty, apical filaments very minute, apparently 4 or 5 in number.

Length, 3 mm.; greatest width, 1 mm.

This species is by far the commonest of the genus in the state, occurring in all the localities in which I have collected. It has previously been referred to in literature as *nigricornis* Egger, but I consider it inadvisable to use the name of a European species for one taken in this country until a very careful comparison of the American and European specimens has been made.

I have before me a very large number of specimens which I consider belong to this species. Those with larval data are as follows: 2 specimens, reared from larvae found feeding on aphids on black locust, Chicago, Ill., September 18, 1908 (J. J. Davis); 1 specimen, reared from a larva found feeding on aphids on *Spirea vanhouttei*, Urbana, Ill., June 25, 1916 (J. R. Malloch); 2 specimens, one with and one without vittae on thorax, reared from larvae found feeding on aphids on apple, America, Pulaski Co., Ill., June 30, 1916; 4 specimens, reared from larvae found feeding on *Aphis rumicis* on thistle, Chicago, Ill., August 30, 1908 (J. J. Davis).

The other specimens in our collection bear no data as to larval food-habits but are from the following localities: Urbana, Champaign, St. Joseph, Muncie, Monticello, Ashley, Meredosia, Algonquin, and Waukegan.

LEUCOPOMYIA, subgen. n.

This subgenus differs from *Leucopis* in the larval stage in having the body cylindrical and evenly rounded at the posterior end, the anal respiratory processes sessile, situated high above the ventral level and widely separated, and the surface of the body with but indistinct spinose armature. The adult differs in having praescutellar acrostichal and no ocellar bristles.

Genotype, *Leucopomyia pulvinariae*, sp. n.

LEUCOPOMYIA PULVINARIAE, sp. n.

Male and Female.—Black, opaque, densely pale gray pruinulent. Antennae black, basal two segments brownish, grayish pruinulent, third segment slightly brownish on inner side at base; palpi yellow; frontal triangle, orbits, and lunule whitish gray; ocelli reddish. Mesonotum with two broad brown sublateral vittae which do not extend to posterior margin, the submedian vittae pale gray and indistinct. Abdomen with basal tergite except its posterior margin black, second with a pair of black spots at base in center, third and fourth each with a rather indistinct black median spot at base in center. Legs yellowish testaceous, the femora except apices dark gray. Wings whitish, veins, except sixth, pale brown except at bases. Calyptae white. Halteres cream-colored.

Frons above antennae one third of the head-width, narrowed posteriorly, at vertex about two thirds as wide as at anterior margin; ocelli in an equilateral triangle; each orbit one third as wide as interfrontalia, densely hairy; ocellar triangle extending to anterior margin of frons, usually densely hairy; lunule large, rounded above, the surface with some minute hairs; third antennal segment not as long as wide; second segment of arista about four times as long as thick; face slightly receding; genal bristle strong. Thoracic dorsum rather densely setulose, at middle with about eight series of setulae between the vittae, the median setulae not forming two distinct stripes except near anterior margin; a very strong pair of praescutellars present; sometimes there are three pairs of dorsocentrals present, the anterior pair weak. Abdominal tergites subequal. Legs stout, without bristles except at apex of mid tibia on ventral surface; the fore femur of male with a rather dense fringe of minute setulae on anteroventral surface. Third and fourth veins with apices slightly convergent, penultimate section of latter nearly half as long as ultimate; outer cross-vein about three fourths as long as last section of fifth vein.

Length, 2.5 mm.

Puparium.—Reddish brown, opaque.

Almost cylindrical, very indistinctly flattened on ventral surface, tapered on thoracic segments, where it is depressed on dorsum. Surface with very minute setulose armature which is most noticeable, but only under a very high-power lens, at posterior extremity on dorsum. Anterior spiracles very small. Posterior spiracles sessile, distinguishable only under a strong magnification, situated well above the rounded caudal extremity, forming with the small anal orifice an almost equilateral triangle.

Length, 3 mm.; diameter, 1 mm.

Type, male, allotype, and 10 paratypes, Shushan, N. Y., July 6, 1916, No. a3076, New York State College. Paratypes: female, Chicago, Ill., spring, 1907; male, Algonquin, Ill., July 4, 1892. Both the New York specimens and the one from Chicago were reared from larvae found feeding on the cottony maple-scale (*Pulvinaria vitis* Linné).

I have figured the hypopygium of the male last mentioned, which appears to present in the shape of the dorsal plate, with the truncate notch at its apex, quite a different form from other species of the group (Pl. XLVII, Fig. 3, 5).

NEOLEUCOPIS, subgen. n.

Differs from *Leucopis* in having a moderately strong pair of prae-scutellar acrostichals, and a pair of reclinate ocellar bristles.

Genotype, *Neoleucopis pinicola*, sp. n.

NEOLEUCOPIS PINICOLA, sp. n.

Male and Female.—Black, densely gray pruinulent, thorax subopaque, dorsum of abdomen shining on fuscous portions. Head black, frons densely pale gray pruinulent; antennae and palpi black; second segment of former whitish pruinulent. Thorax not vittate. Abdomen with dorsum of basal and second tergites fuscous. Legs black, knees (narrowly) and bases of mid and hind tarsi in male and of all tarsi in female yellowish. Wings hyaline, veins fuscous. Calyptrae and halteres whitish.

Frons a little over one third of the head-width, with very short pale hairs; each orbit about one third the width of interfrontalia; ocelli forming an equilateral triangle; ocellar bristles moderately long; lunule rounded above; third antennal segment not as long as high; genal bristle not surrounded with hairs. Thorax with two or three pairs of weak dorsocentrals, the anterior pairs weakest; about four series of setulae between the dorsocentrals; basal scutellar bristles much shorter than apical pair. Third and fourth wing-veins very slightly convergent apically; penultimate section of fourth vein from one sixth to one fourth as long as ultimate and much shorter than last section of fifth.

Length, 1.25—1.75 mm.

Type and one male paratype, Stratford, Ill., June 22, 1917 (J. R. Malloch). Allotype, Urbana, Ill., May 23, 1885. Paratype, one male, Urbana, Ill., July 31, 1916 (J. R. Malloch).

The author's specimens were all taken on pine trees and the allotype, taken by some collector whose name is not on record, was beaten from pine also. Habits of larva unknown; probably predaceous on aphids on pine.

PLATE XLVI

Thoracic and Cephalic Chaetotaxy of Ochthiphilinae

- | | |
|--|---|
| FIG. 1. <i>Ochthiphila polystigma</i> , thorax, dorsal view. | FIG. 7. <i>Pseudodinia polita</i> , head, dorsal view. |
| FIG. 2. <i>Chamaemyia elegans</i> , same. | FIG. 8. <i>Neoleucopis pinicola</i> , same. |
| FIG. 3. <i>Pseudodinia polita</i> , same. | FIG. 9. <i>Ochthiphila polystigma</i> , head, lateral view. |
| FIG. 4. <i>Leucopomyia pulvinariae</i> , same. | FIG. 10. <i>Chamaemyia elegans</i> , same. |
| FIG. 5. <i>Ochthiphila polystigma</i> , head, dorsal view. | FIG. 11. <i>Pseudodinia polita</i> , same. |
| FIG. 6. <i>Chamaemyia elegans</i> , same. | FIG. 12. <i>Leucopis major</i> , same. |

PLATE XLVI



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PLATE XLVII

Wing Venation and Male and Female Genitalia of Ochthiphilinae

- FIG. 1. *Leucopis major*, wing.
FIG. 2. *L. piniperda*, male hypopygium, lateral view.
FIG. 3. *Leucopomyia pulvinariae*, same.
FIG. 4. *Leucopis major*, same.
FIG. 5. *Leucopomyia pulvinariae*, male hypopygium, caudal view.
FIG. 6. *Leucopis major*, female genitalia, lateral view.
FIG. 7. *Leucopis pemphigae*, hypopygium of male, lateral view.
FIG. 8. *Leucopis major*, same, caudal view.
FIG. 9. *L. simplex*, same, ventral view, one side.
FIG. 10. *L. major*, same.
FIG. 11. *L. pemphigae*, same, dorso-caudal view, one side.
FIG. 12. *L. pemphigae*, same, ventral view.



1



2



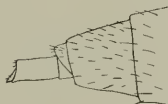
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