

Studies on Nearctic species of *Leucopis* (Diptera: Chamaemyiidae). IV. New species

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Six new species of *Leucopis* (Diptera: Chamaemyiidae) are described: *L. thecabii* sp. n., *L. griseostriata* sp. n., *L. pecania* sp. n., *L. spinifrons* sp. n., *L. priapophalla* sp. n., *L. aldrichi* sp. n. *L. priapophalla* is from S. America, other species are from N. America.

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The article is devoted to describing some of the new species of *Leucopis* Meigen (Diptera: Chamaemyiidae) deposited in the Canadian National Collection, Ottawa (CNC) and the National Museum of Natural History, Washington D.C. (NMNH). It is the fourth from the series of my papers on Nearctic *Leucopis* (see Tanasijtshuk, 2002, 2003, 2005).

Methods of dissection and clearing of the male genitalia of *Leucopis* are according to Tanasijtshuk (1986). Slides were studied and figured in glycerin. The terminology is used according to McAlpine (1981). OT (ocellar triangle) index refers to the ratio of the distance between posterior ocelli and the distance between any posterior ocellus and the anterior one.

Leucopis thecabii sp. n. (Figs 1-4)

Holotype. ♂, USA, California, "Deep Canyon Riv. Co. Cal. III-15-1963", "E.J. Schlinger Collector", "On Agure", "reared ex *Thecabius* sp. on balsam poplar", "VKR Ent. Mus. specimen 16117", "*Leucopis* sp. P2 (?) *pemphigus* grp", slide no. 7431; CNC.

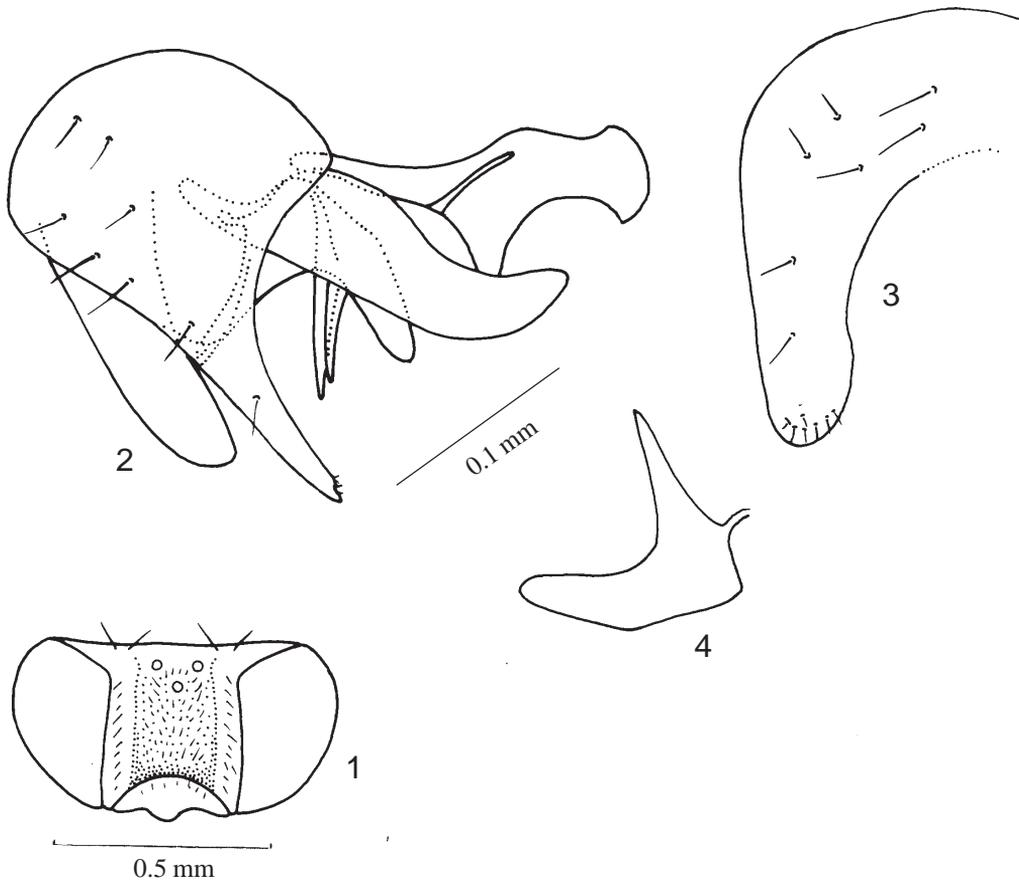
Description. *Male*. Body length 1.7 mm. Body grey. Head 1.5 times as high as long. Frons (Fig. 1) slightly widened anteriorly; head 2.6 times as wide as frons. Orbits light grey; frontal stripe nearly the same color, with darkening near lunule. Ocellar plate large, rounded, but not raised and noticeable only by viewing from above. Anterior ocellus as wide as posterior ones. OT index 1.5. First ocellus surrounded by small bristles; other such bristles present on frons, a row of such bristles present on each orbit. Lunule small, arch-shaped, with small bristles on its upper part. Scape and pedicel brown, basoflagellomere black, arista light brown. Eye height 5 times the vertical diameter of basoflagellomere. Third aristemere 4 times as long as 2nd. Eye 2.6

times as high as gena. Each gena with a few minute bristles; anterior bristle longest. Palpi yellow.

Mesonotum without stripes, with sparse longitudinal rows of small bristles. The fore bristle several times smaller than the hind one. Prescutellum absent. Femora black, with yellow apices; tibia yellow, with light darkening in the middle; tarsi yellow, with dark apices. Wing with veins *M* and *R*₄₊₅ slightly converging in distal half; distal section of *Cu* 1.5 times as long as *tp*. Abdominal tergites 1+2 and 3 dark and slightly shining, with very weakly distinguishable longitudinal touch in the middle of tergite 5.

Genitalia (Figs 2-4). Epandrium with rounded upper part, with 7-8 pairs of bristles on posterior surface; surstylar lobes in lateral view beak-shaped, medium-sized, in caudal view very wide, with rounded ends. Hypandrium almost straight, widened in posterior half. Aedeagus short, with characteristic "sack" in basal part.

Taxonomic notes. The species is characterized by several remarkable external features: brown scape and pedicel, yellow palpi, mesonotum without stripes, absence of dark fields of modified microtrichia on lower edge of anterior tergites in males and absence of prescutellum. The last character is present in *Leucopis solaris* Tanasijtshuk. In the description of this species (Tanasijtshuk, 1986), I did not notice this very important character. It is present only in two other genera of Leucopinae: *Lipoleucopis*, where it is accompanied by the vein *C* reaching to *R*₄₊₅, not *M*₁, and *Anchiroleucopis*, where it is accompanied by the presence of prescutellar bristles. Two species (*L. pemphigae* Malloch and *L. solaris*) are also characterized by the peculiar form of surstylar lobes viewed from behind. They are very wide and rounded at apices. I do not consider the absence of prescutellum and the form of surstylar lobes as a reason for description a separate genus



Figs 1-4. *Leucopis thecabii* sp. n., male: **1**, head, from above; **2-4**, genitalia of holotype: **2**, general view, from side; **3**, part of epandrium, from behind; **4**, aedeagus, from side. Scales: 0.5 mm (1), 0.1 mm (2-4).

for these species, but they constitute a very clear separate group of *Leucopis*. I separated formerly the “*solaris* group” for one species (Tanasijtshuk, 1986) and now add to this two other species. In all of them, the genitalia are similar to those described for *Leucopis pemphigae* (Tanasijtshuk, 2003). Unfortunately, I cannot examine *L. pemphigae* once again, but I assume that it also does not have prescutellum and belongs to *solaris* group.

The mode of life of these species is very interesting. The Palearctic *L. solaris* is known only from Georgia and Turkmenistan. The larvae of this species prey upon ovisacs of Coccidae. The larvae of two Nearctic species, *L. thecabii* and *L. pemphigae*, both prey upon galls of Aphididae on poplar.

Mode of life. Larvae prey upon *Thecabius* sp. in galls on *Populus balsamifera*.

Etymology. The name of the species is derived from the name of prey the of larvae.

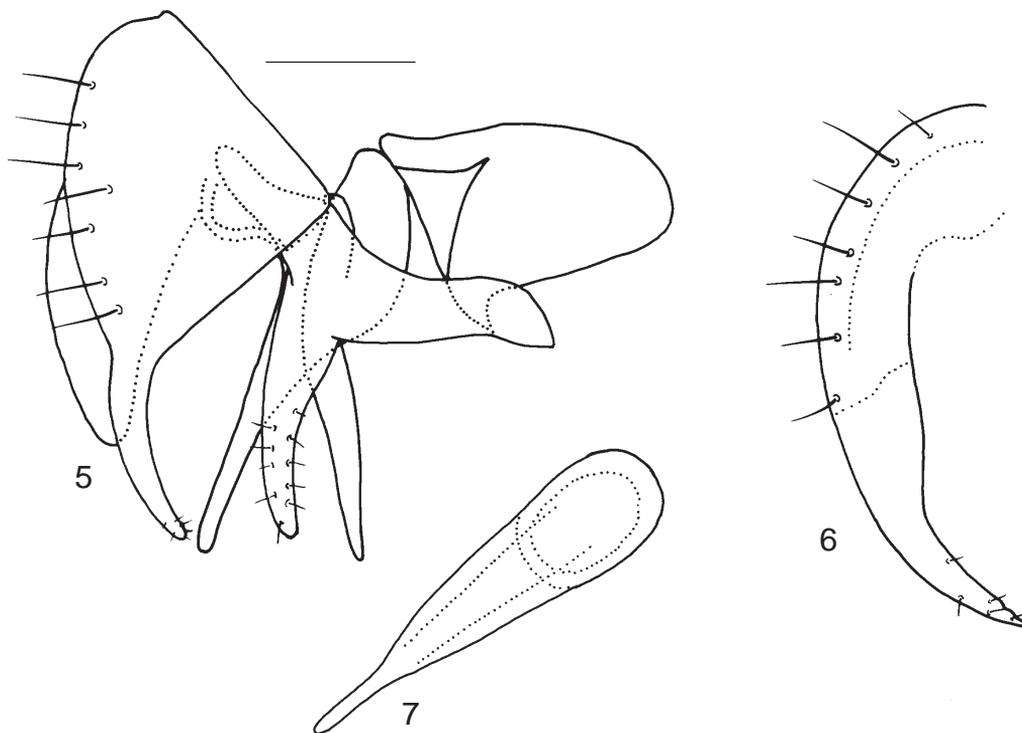
***Leucopis griseostriata* sp. n.**

(Figs 5-7)

Holotype. ♂, USA, New Hampshire, “Pike N.H.”, “7825 b”, slide # 7030, “USNM-NH 2016162”; NMNH.

Paratypes. 1 ♀, the same data as holotype; 1 ♂, USA, Louisiana, “Baton Rouge La, July 23-15”, “CE Smith coll”, “Chittenden No 4133-1”, slide # 6977, “USNM-NH 2016162”. (NMNH).

Description. *Male, female.* Body length 1.3-1.7 mm. Body light grey. Head 1.6-1.7 times as high as long. Frons slightly widened anteriorly; head 2.5-2.6 times as wide as frons. Orbital stripes grey, drop-form (N. Hampshire) or cardiform (Louisiana) in male, in female faintly marked. It is surrounded by two dark stripes ranged up to lunule; lighter area present between them. OT index 1.6. Lunule medium-sized, light grey, widely arch-shaped. Antenna and arista black. Eye height 2.8-3.0 times the vertical diameter of basoflagellomere. Third aristemere 3.7 times as long as 2nd. Gena angular in frontal



Figs 5-7. *Leucopis griseostriata* sp. n., male, genitalia of holotype: 5, general view, from side; 6, part of epandrium, from behind; 7, aedeagus, from side. Scale: 0.1 mm.

part; eye 3.3-3.5 times as high as gena. Each gena with group of minute bristles, one of them longer than others. Palpi black.

Mesonotum with grey lateral stripes reaching posterior dc; medial stripes of the same colour reaching last third of mesonotum. Areas between stripes without bristles. Three pairs of dorsocentral bristles present in N. Hampshire specimens, two – in Louisiana one. Femora black with yellow apices; tibiae black with yellow bases. In fore legs, only base of tarsomere 1 yellow; in middle and hind legs, tarsomeres 1 and 2 yellow. Wings with veins *M* and *R*₄₊₅ nearly parallel; distal section of *Cu* in N. Hampshire specimens 1.25 times as long as *tp*, in Louisiana one, 1.5 times.

Abdominal syntergite 1+2 having in basal part brown spot with wave border. Tergite 3 with two black or dark brown spots and dark touch between them; tergites 4 and 5 with short longitudinal black spots. Small chaetae on abdomen with black dots on thecae. In male, fore abdominal tergites without dark fields of modified microtrichia on lateral borders.

Genitalia (Figs 5-7). Epandrium in profile medium-sized, with relatively long beak-shaped surstylar lobes. Seven pairs of bristles present on posterior surface in N. Hampshire specimens,

three pairs, in Louisiana one. Hypandrium medium-sized, slightly curved and wider in Louisiana specimen than in N. Hampshire ones. Aedeagus widened in basal part, with narrow rounded apex. Aedeagal apodeme with sharp angular cut.

Taxonomic notes. The species is characterized by the grey lateral stripes of mesonotum and structure of genitalia, the latter resembling those of *L. atritarsis* Tanasijtshuk, but without characteristic crisscrossed form of hypandrium.

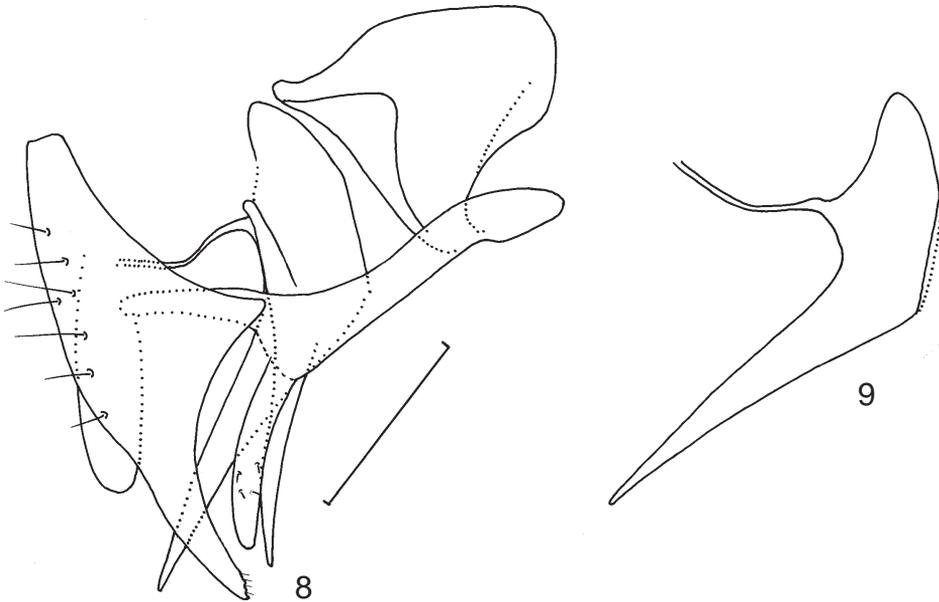
Mode of life. The larvae of the northern (New Hampshire) population probably prey on chermes from coniferous trees: all other specimens in NMNH collection with labels “Pike N.H.” and “7825 b” are belonging to *Neoleucopis pinicola* Malloch and *Leucopis argenticollis* Zetterstedt, both preying on chermes.

Etymology. The species name is formed from the Latin *griseus* (grey) and *stria* (stripe).

***Leucopis pecania* sp. n.**
(Figs 8-9)

Holotype. ♂, USA, Texas, “Victoria Tx 5-19-11”, “JD Mitchell collector”, “bred from Pecan gall”, slide # 6864; CNC.

Paratypes. 1 ♂, 2 ♀, the same data; CNC.



Figs 8-9. *Leucopis pecania* sp. n., male, genitalia of holotype: **8**, general view, from side; **9**, aedeagus, from side. Scale: 0.1 mm.

Description. *Male, female.* Body length 1.3-1.9 mm. Body grey. Head 1.6 times as high as long. Frons almost not widened anteriorly; head 3.0-3.2 times as wide as frons. Orbit grey, with rows of very small bristles; frontal stripe darker than orbits; details of its coloration are not clear in available specimens. Ocellar plate presumably not outlined. OT index 1.0-1.25. Lunule medium-sized, arch-shaped. Antenna and arista black. Eye height 2.7 times the vertical diameter of basoflagellomere. Third aristomere 2.5-3.5 times as long as 2nd. Gena angular in frontal part; eye 4.0-5.3 times as high as gena. Each gena with 3-4 bristles, one of which notably longer. Palpi black.

Mesonotum with dim brown lateral stripes reaching posterior dc; areas between stripes with rows of small bristles. Medial stripes virtually absent. Two or three pairs of dorsocentral bristles, diminishing anteriorly. Femora black; tibiae black, with brightening bases and apices; tarsi yellow, with black apices. Wings with veins *M* and *R*₄₊₅ parallel; distal section of *Cu* 1.6-2.0 times as long as *tp*.

Abdominal syntergite 1+2 brown at base and grey on posterior edge. Tergite 3 darkened in anterior part, looking as if smoked. Fore tergites without dark fields of modified microtrichiae on lower edges.

Genitalia (Figs 8-9). Epandrium in profile narrow, dorsoventrally elongated, with narrow beak-shaped surstylar lobes and narrow anterior edge finishing by sharp angle. Seven or eight pairs of

bristles on posterior surface. Hypandrium narrow, slightly widened behind the middle. Aedeagus slightly curved, smoothly tapering toward sharpened apex. Sharp bent on its lower side may evidently represent an artefact (these assumed outlines are shown by dashed lines on the drawing). Apodeme with rounded cut.

Taxonomic notes. All available specimens are faulty, moisten in glue, therefore coloration of frontal stripe remained unclear. The species is probably related to *L. simplex* Loew. The genitalia of these species have some common characters: angular end of fore edge of epandrium, thin hypandrium in profile, similar form of aedeagus. Both species do not have medial stripes on mesonotum and similar coloration of abdomen.

The species is easily distinguishable by the appearance (medial stripe absent, evenly distributed bristles on mesonotum, 3 pairs of dorsocentral bristles, and specific coloration of abdominal tergites).

Mode of life. The type series was bred from galls on pecan (*Carya pecan*).

Etymology. The name is derived from the name of the plant.

***Leucopis spinifrons* sp. n.**

(Figs 10-16)

Holotype. ♂, **Canada, Manitoba**, "2 mi. W. Stockton, Man. 8.V.1958, J.F. McAlpine", "swept ex white spruce", "*Pemphigae* grp. det. McAlpine", slide no. 7548; CNC.

Description. Male. Body length 2.3 mm. Body grey. Head (Figs 10-11) 1.6 times as high as long, 2.6 times as wide as frons. Frons weakly widened anteriorly. Orbits grey; frontal stripe dark except frontal part, with darkening near lunule. Ocellar plate triangular, grey. Anterior ocellus as wide as posterior ones. OT index 1.3. Elongated fields of short, black and stiff bristles located on sides of anterior ocellus. Lunule medium-sized, arch-shaped, with small bristles in its upper part. Pedicel grey; basoflagellomere and arista black. Eye height 2.6 times the vertical diameter of basoflagellomere. Third aristomere 4 times as long as 2nd. Eye 2.4 times as high as gena; each gena with small group of small bristles and one large. Palpi black. Lateral stripes of mesonotum brownish, almost imperceptible; dark grey medial stripes extending to fore third of mesonotum; areas between stripes without bristles. Three pairs of dorsocentral bristles. Femora black with yellow apices, tibia and tarsi yellow. Wings with veins *M* and R_{4+5} parallel; distal section of *Cu* 1.3 times as long as *tp*. Abdomen (Fig. 12): sytergite 1+2 shining, dark, almost black; fore part of tergite 3 with grey indistinct spot; tergites 4 and 5 with small elongated touches. Abdomen covered with large bristles. Fore tergite with dark fields of modified microtrichiae on lower edges.

Genitalia (Figs 13-16). Epandrium rather large, with 7 pairs of bristles on posterior surface; surstyler lobes relatively small. Hypandrium z-shaped, curved, widened in central part. Aedeagus relatively thin, slightly widened in basal part. Length of gonopods and parameres nearly equal.

Taxonomic notes. The species is characterized by the stiff bristles on frons; this character is unique in *Leucopis*. Other remarkable characters: lateral stripes of mesonotum nearly absent; 3 pairs of dc; abdomen covered with large, strong bristles. I recognize the species as a separate group *spinifrons*.

Mode of life. Unknown.

Etymology. Spina (Latin) – thorn; the species with thorny frons.

***Leucopis priapophalla* sp. n.**
(Figs 17-21)

Holotype. ♂, **Brazil**, Porto Alegre, IV.1963, "F.D. Bennett Collector"; CNC.

Paratypes. 1 ♂ (slide 7421), 2 ♀ (one without head), the same data as holotype. The male "on waxy coccids on *Baccharis dracunculifolia*"; 1 ♂ (slide 7458), 2 ♀, **Uruguay**, Chu, V.1963, without name of collector, ex coccid on *Baccharis articulata* (CNC).

Description. Male, female. Body length 1.3-1.7 mm. Body light grey. Head 1.7-2.2 times as high as long, 2.6-2.9 times as wide as frons. Frons slightly widened anteriorly. Orbits silvery grey. Ocellar plate grey, long-triangular, elongated to

lunule, bordered by two dark stripes. OT index 1.3-1.6. Lunule high, with upper border almost straight. Pedicel yellow; flagellomeres yellow from outside, light brown, nearly yellow from inside, darkened in upper part. Eye height 2.3-3.0 times the vertical diameter of flagellomere. Arista brown. Third aristomere 3.5-4.5 times as long as 2nd. Eye 3.0-3.8 times as high as gena. Each gena with regular row of small bristles; anterior bristle longer than others. Palpi yellow.

Mesonotum light grey. Brown lateral stripes extending to posterior dc; dark grey medial stripes not extending to middle of mesonotum. Area between medial stripes devoid of bristles only in fore part of mesonotum; areas between lateral stripes and medial ones devoid of bristles to end of mesonotum. Two pairs of dorsocentral bristles. Femora grey; fore and middle tibia yellow, hind tibia grey; tarsi yellow with last tarsomere darkened. Wing vein *M* slightly converging with vein R_{4+5} in distal half; distal section of *Cu* 1.2-1.6 times as long as *tp*. Abdominal sytergite 1+2 black (or brown, according to direction of view), tergite 3 with two rather small lateral black spots and one elongate medial spot; tergites 4-5 each with single black spot on their bases. Fore tergite with dark fields of modified microtrichia on lateral edges.

Genitalia (Figs 17-21). Epandrium with 4-5 pairs of bristles on posterior surface, passing into extremely short surstyler lobes. Cerci relatively small. Hypandrium long, uniformly narrow. Aedeagus nearly evenly thickened, and with wide rounded apex in profile, widened in basal part and narrowed to apex in dorsoventral projection. Gonopods slightly larger than parameres; aedeagal apodeme elongate.

Taxonomic notes. The species can be readily distinguished by external characters: yellow pedicel, partly yellow flagellomere and yellow palpi (the last character is very rare in *Leucopis*). The genitalia have very short surstyler lobes (also a rare character) and specific shape of aedeagus. The species belongs to a separate *priapophalla* group.

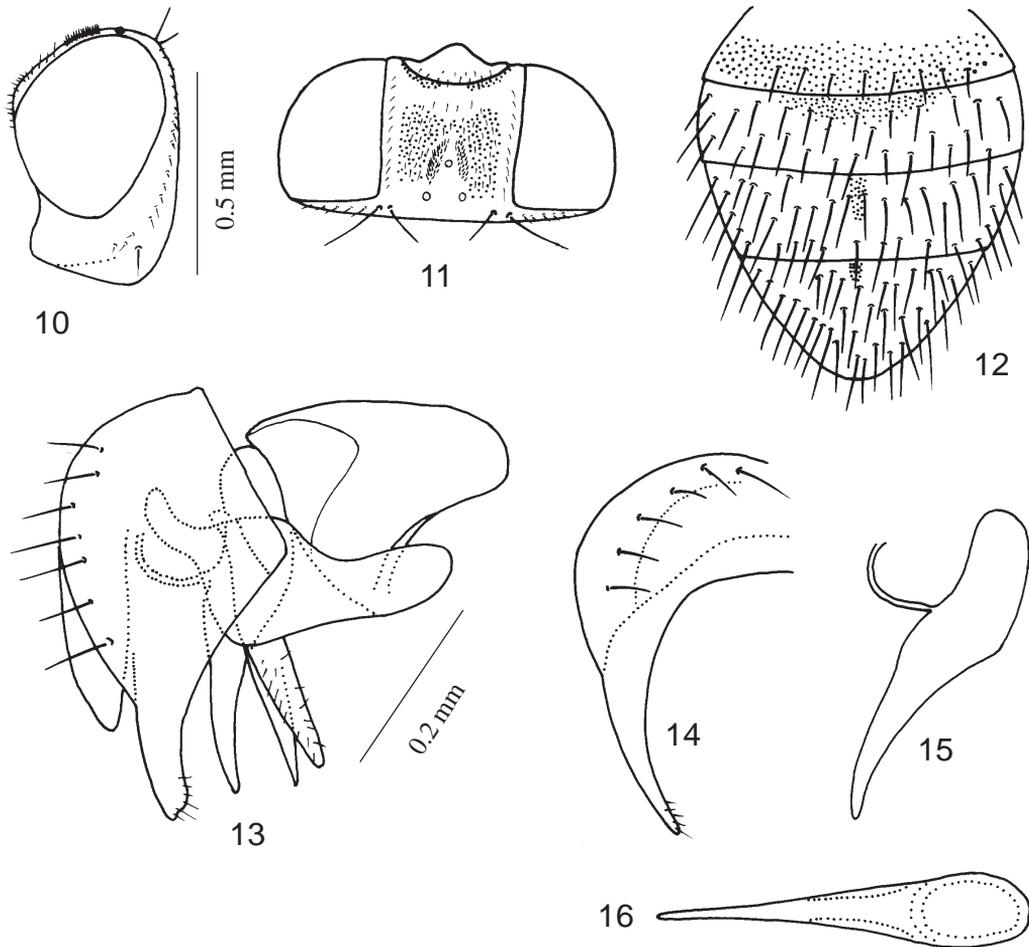
Mode of life. Collected from coccids (Homoptera: Coccinea) on *Baccharis dracunculifolia* (Brazil) and *B. articulata* (Uruguay).

Etymology. Priapus (Greek) – god of reproduction, phallus (Greek) – penis.

***Leucopis aldrichi* sp. n.**
(Figs 22-25)

Holotype. ♂, **USA**, Indiana, "Lafayette, Ind. May 11, 1918", "J.M. Aldrich coll.", "*Leucopis ocellaris* grp. Det. J.F. McAlpine 1981", slide # 6821, "USNM-NH 2016162"; NMNH.

Description. Male. Body length 2.85 mm. Body grey. Head (Fig. 22) 1.6 times as high as long,



Figs 10-16. *Leucopis spinifrons* sp. n., male: **10-11**, head (10, from side; 11, from above); **12**, abdomen; **13-16**, genitalia of holotype (13, general view, from side; 14, part of epandrium, from behind; 15, aedeagus, from side; 16, aedeagus, from below). Scales: 0.5 mm (10-11), 0.2 mm (13-16).

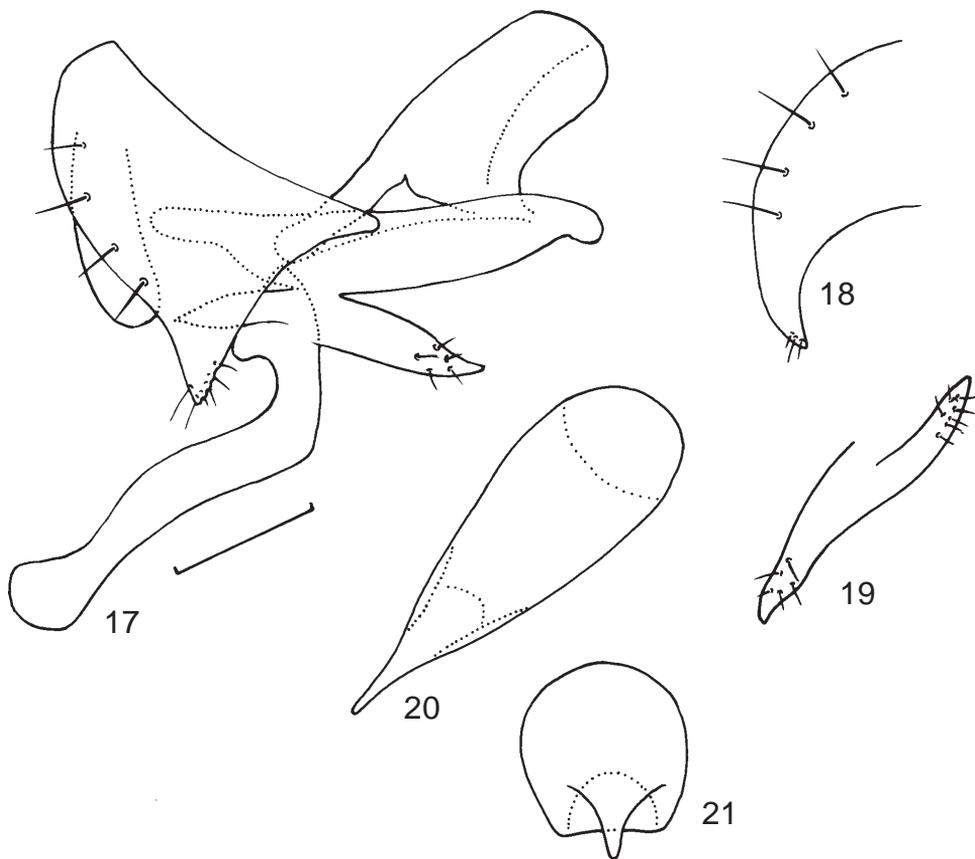
3.0 times as wide as frons. Frons widened anteriorly. Orbits silvery grey, covered with small delicate hairs. Ocellar plate oval, with indistinct borders, surrounded by dark oval area with two indistinct dark stripes reaching up to lunule; between them, a lighter spot present. OT index 1.6. Lunule grey, arch-shaped. Internal vertical bristles medium-sized, outer vertical bristles broken, but their thecae are distinctly noticeable. Antenna and arista black. Eye height 2.8 times the vertical diameter of basoflagellum. Third aristomere 2.75 times as long as 2nd one. Gena angular in frontal part; eye 3 times as high as gena. Each gena with group of minute bristles; the middle one longer than others. Palpi black.

Mesonotum with brown lateral stripes reaching posterior dc; medial stripes reaching the middle of

mesonotum. Areas between stripes without bristles to the middle of mesonotum. Three pairs of dorso-central bristles, diminishing anteriorly.

Femora black, with light brown apices; tarsi light brown, nearly yellow, with dark apices. Wing veins *M* and *R*₄₊₅ clearly converging in apical half; distal section of *Cu* 1.25 times as long as *tp*. Abdominal syntergite 1+2 brown. Tergite 3 with two large dark spots; longitudinal black touches present in the middle of tergites 3-5. Presence or absence of dark fields of modified microtrichia on lower edges of fore tergites not clarified.

Genitalia (Figs 23-25). Epandrium in profile medium-sized, dorsoventrally elongated, with relatively small beak-shaped surstylar lobes. Posterior surface with 13-14 pairs of bristles. Hypandrium massive, Z-shaped. Aedeagus massive,



Figs 17-21. *Leucopis priapophalla* sp. n., male, genitalia of holotype: **17**, general view, from side; **18**, part of epandrium, from behind; **19**, gonopods and parameres, from below; **20**, aedeagus, from below; **21**, aedeagus, from side; **22**, aedeagus, from behind. Scale: 0.1 mm.

widened in the middle, with wide rounded apex. Aedeagal apodeme with angular cut.

Taxonomic notes. McAlpine did not notice broken thecae of outer vertical bristles and included this species in the “*ocellaris* group”, i.e. *Leucopina* Malloch (Tanasijtshuk & Gaimari, in press); really, the species belongs to *Leucopis* s. str. and differs from other species of the genus in the wide rounded apex of aedeagus that is very rare in *Leucopis*.

Mode of life. Unknown.

Etymology. The species is named after J.M. Aldrich, who collected the type specimen.

Acknowledgements

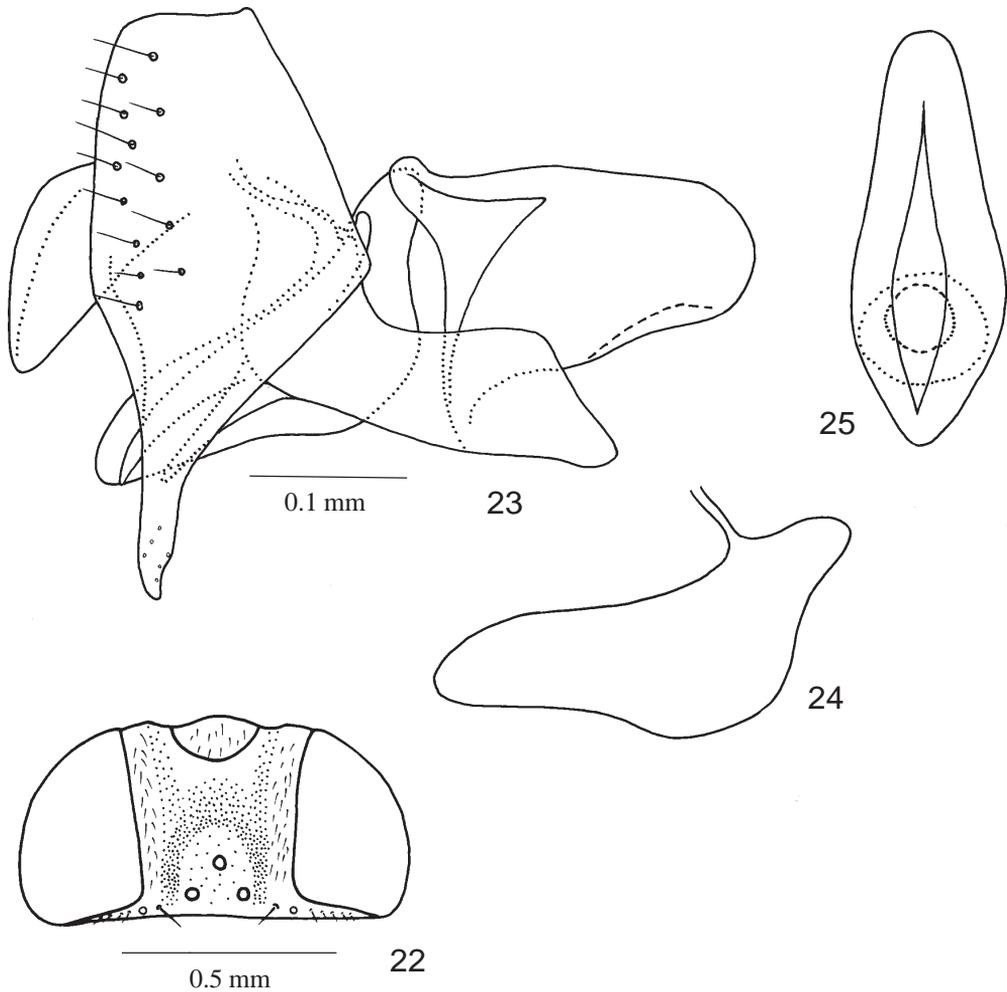
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Figs 22-25. *Leucopis aldrichi* sp. n., male: **22**, head, from above; **23-25**, genitalia of holotype (**23**, general view, from side; **24**, aedeagus, from side; **25**, aedeagus, from below). Scales: 0.5 mm (**22**), 0.1 mm (**23-25**).

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