

## Studies on Nearctic species of *Leucopis* (Diptera: Chamaemyiidae). III. *L. annulipes* Zetterstedt and a new sibling species from the Nearctic

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Two sibling species of Chamaemyiidae are considered: a new species, *Leucopis decipiens* sp. n. from the Nearctic, and *L. annulipes* Zetterstedt, 1848, widespread in the Palaearctic and the Nearctic.

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This paper is the third in a cycle of works on the genus *Leucopis* of the Nearctic Region. The first paper was devoted to redescriptions of the Nearctic species of *Leucopis* described before 1965 (Tanasijtshuk, 2002), the second one, to descriptions of fifteen new species (Tanasijtshuk, 2003).

During studying the materials from Canadian National Collection of Insects, Ottawa (CNC), and National Museum of Natural History, Washington (NMNH), two interesting species of *Leucopis* have been found out. One of them is known for a long time, well investigated and widely distributed not only in the Palaearctic, whence it was described, but, as appeared, in the Nearctic. The second species, new to science, differs from the first one in small but very distinctive details and is met only in the Nearctic, where it is widely distributed. In this paper, both the species are considered, and distinctions between them are analyzed. Material and methods were described in the first article (Tanasijtshuk, 2002).

The Nearctic material is kept in CNC, unless otherwise stated. Dr. Gaimari informed me that the significant part of the material kept in CNC could be borrowed by Dr. McAlpine from various collections of the USA. Unfortunately, I have no possibility to specify it and thus indicate as depository the institute from which the material was received by me in 1994. This concerns also the material published by me earlier (Tanasijtshuk, 2003).

### *Leucopis annulipes* Zetterstedt, 1848

Zetterstedt, 1848: 2712; McAlpine, 1967: 599; Tanasijtshuk, 1986: 242. – *caucasica* Tanasijtshuk, 1961: 877; 1966a: 233; 1966b: 366; 1970: 214; 1973: 19; Vahidov, 1971: 43; Tanasijtshuk et al., 1976: 692; Papp, 1979: 85; Tanasijtshuk, 1986: 242; Raspi, 1996: 513.

*Lectotype* of *L. annulipes*. ♂, Sweden, Barsele, kept in Zoological Museum of Lund [see McAlpine (1967) for details; lectotype not examined by me].

*Holotype* of *L. caucasica*. ♂, Russia, Adygei Republic, Shuntuk, south of Maikop, 31.VII.1959 (Tanasijtshuk), kept in Zoological Institute, St.Petersburg.

*Other Palaearctic material examined*. About 500 specimens collected in the former Soviet Union, Sweden, France, Germany, Poland, Hungary, Bulgaria, Turkey, and Iran.

*Nearctic material examined* (kept in CNC, unless otherwise stated). **Canada**: *North-West Territories*: 1 ♂, Yellowknife, 5.VI.1953, J.G. Chilkott; 1 ♂, Saw Mill Bay, 17.VI.1948, D.F. Hardwick; *Yukon Territory*: 1 ♂, Watson Lake, 23.VI.1948, W.R. Mason (slide 7394); *British Columbia*: 18 ♂, Summit Lake, mile 392 of Alaska highway, 4200-5000r, 25.VI.-21.VII.1959, R.E. Leech (slides 7270, 7271, 7282, 7295, 7303, 7313, 7331, 7339, 7354, 7376); 1 ♂, same locality, 4700r, 15.VII.1959, E.E. MacDougall (slide 7316); 1 ♂, MacDonald R., mile 413 of Alaska highway, 4500r, 20.VII.1959, R.E. Leech; 1 ♂, Chilkott, 18.VI.1920, E.R. Bucknell (slide without number); 1 ♂, Altin, 2200r, 4.VII.1955, H.J. Huckel (slide 7372); 1 ♂, Lakelse L[ake], bog n[ea]r Terrace, 14.VI.1960, J.G. Chillcott; 2 ♂, Gagnon R[oad], 6 miles W of Terrace, 20.VI. and 8.VII.1960, J.G. Chilkott (slides 7360, 7269); 3 ♂, 32 miles SW of Terrace, 4-6.VI.1960, G.E. Shewell (slide 7268); 7 ♂, same locality, 8.VI.-6.VII.1960, C.H. Mann; **Alberta**: 1 ♂, Onefour, 6.VII.1955, A.R. Brooks; **Ontario**: 1 ♂, Blackburn, 13.VI.1951, J.F. McAlpine (slide 7460) [determined as *Leucopis annulipes* by McAlpine, 1977]; **Nova Scotia**: 1 ♂, Lockeport, 18.VII.1958, J.R. Vockeroth.

**USA**: *Alaska*: 2 ♂, Matanuska Flats, 17.VII.1971, T.P. Sluss (slides 7373, 7464); 1 ♂, Unalakleet, 3.VII.1961, B.S. Heming (slide 7332); *Washington*: 1 ♂, Mica, 14.VII.1918, A.L. Melander (slide 7465); 3 ♂, Mt. Rainier, Paradise Park, August 1917, A.L. Melander (slides 7167, 7379, 7545); 2 ♂, Mt. Rainier, Squaw Lake, 4.VIII.1922, A.L. Melander (slides 7475, 7546); *Oregon*: 1 ♂, Mt. Hood, 6000 ft., 30.VII.1921, A.L. Melander (slide without number); *Idaho*: 2 ♂, Moscow Mt., 7.VII.1918, A.L. Melander (slides 7181, 7408); *Nevada*: 1 ♂, Angel L[ake], 12 miles SW of Wells, 8400r, 11.VII.1961, B.H. Poole (slide 7169); *California*: 1 ♂, Siskiyou Co., road to Taylor Lake, 5750 ft., S of Sawyers Bar-Etna road,

28.VII.1968, Hugh B. Leech (slide 7454) [identified by McAlpine as "*Leucopis* 98a"]; 1 ♂, San Francisco, Lake Merced, 21.VI.1964, P.H. Arnaud (slide 7134) [determined by McAlpine as "*Leucopis* sp IV, 1975"]; *Arizona*: 1 ♂, Mt. Wrightson, Santa Rita Mts., 8000-9000r, 28.VII.1962, H.E. Milliron (slide 7304); 1 ♂, Goudy Creek, 9200r, Pinaleno Mts., Graham Co., 7.VII.1973, T.P. Sluss (slide 7276); *Colorado*: 1 ♂, Chicago Cr., 8800r, Clear Cr. Co., 5.VIII.1961, B.H. Poole; 1 ♂, Boulder, 6000r, 31.V.1961, B.H. Poole; 1 ♂, Gothic, 9500 ft, 28-31 [?] 1957, A.H. Sturtevant (slide 6990; kept in NMNH).

**Description.** *Male* and *female* (female examined only in Palaearctic material). Body length 2.0-2.6 mm. Body light grey. Head 1.7-1.9 times as high as long. Frons (Figs 1-2) widened anteriorly; head 2.5-3.1 times as wide as frons. Orbits light grey. Ocellar plate grey, heart-shaped or almost round, always rounded in front, sharply outlined and somewhat raised above the frontal surface. Ocellar plate variable in size, occupying a significant part of frontal stripe or almost entire frontal stripe; shape of ocellar plate constant. Head with narrow light, almost white stripe running over ocellar plate through anterior ocellus. Ocellar plate bordered by dark stripes fused dorsal of lunule. OT index 1.0-1.3. Lunule of moderate size, often with two dark grey spots as continuation of frontal stripes. Antenna and arista black. Eye height 2.8-3.4 times the vertical diameter of basoflagellomere. Third aristomere 2.5-3.4 times as long as 2nd. Gena wide; eye 2.3-3.0 times as high as gena. Gena with sparse row of minute bristles; anterior bristle the largest. Palpi black.

Mesonotum light grey. Lateral stripes of mesonotum very variable in colour, from dark brown through goldish brown to goldish, almost sandy-yellow. They extending to posterior pair of dorsocentral bristles. Medial stripes grey or dark grey, extending to the middle of mesonotum. Areas between stripes devoid of bristles as far as the middle of mesonotum. Two pairs of dorsocentral bristles present. Scutellum light grey. Apices of femora and bases of tibiae yellow; tarsal segments from yellow with dark tips to entirely black, only 1st tarsomere with yellow base. Wing veins *M* and *R*<sub>4+5</sub> distinctly converging in distal half; distal section of *Cu* 1.2-1.4 times as long as *tp*. Syntergite 1+2 with wide dark brown spot having a posterior incision at the centre; tergite 3 with a pair of black or brown spots being paler in some specimens. Tergites 4-5 sometimes with elongate black touches or points in the middle. In male, abdomen with dark fields of modified microtrichia on inner borders of anterior tergites.

Male genitalia (Figs 3-9). Epandrium with 6-12 pairs of bristles on posterior surface, passing into surstilar lobes with noticeable constriction. Surstilar lobes in profile long and thin, beak-shaped, but rather massive as seen from behind.

Hypandrium slightly curved. Aedeagus strongly widened in basal half.

Female terminalia of *L. annulipes* from Europe described by Raspi (1996).

**Larva.** Larva of 3rd instar described by Tanasijtshuk (1961); its length before pupation amounted to 3.5-4.0 mm at 1.0-1.3 mm width. Feeding larva greenish white in colour, posterior spiracles darkened toward apices. Anterior spiracles each bearing 4 stigmal projections. Transverse circular rows of cuticular chaetoids faintly developed on anterior segments; they more developed on dorsal side of median and posterior segments. Ventral side with crawling ridges and welts bearing several large chaetoids; remaining surface of ventral side covered by minute chaetoids.

Puparium brownish red, somewhat flattened, 2.6-3.2 mm in length and 1.0-1.3 mm in width.

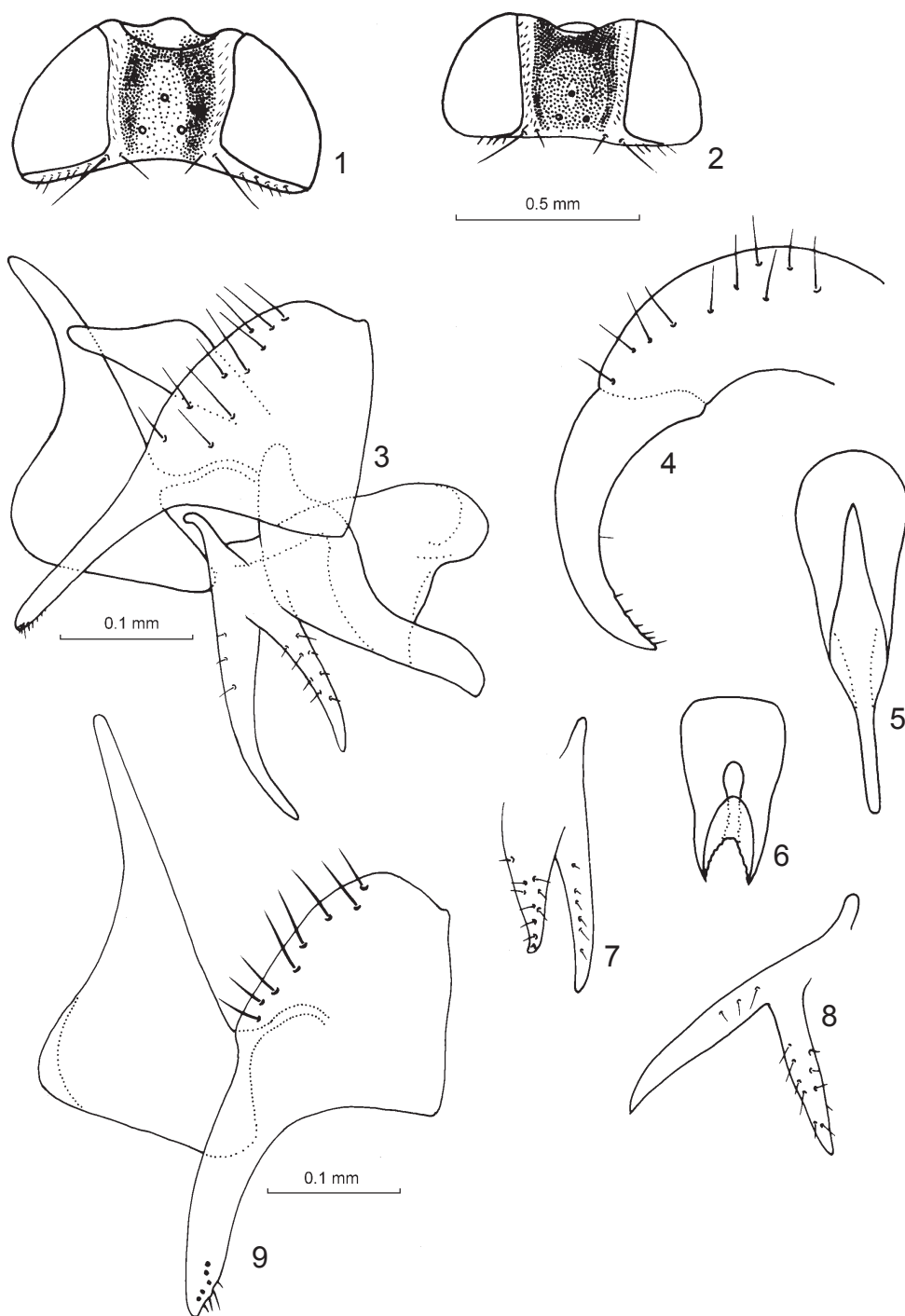
**Notes.** The species was briefly described by Zetterstedt (1848) from a mixed type series, resulting in that various species were misidentified for this one. This situation led to numerous errors in the literature. Having examined a large number of European collections, McAlpine (1967) failed to meet among the material designated as *L. annulipes* a single specimen corresponding to any of species from those placed by Zetterstedt in the type series. Finally, McAlpine has analyzed the type series of *L. annulipes*, which includes three females and one male, and designated the latter as lectotype.

An analysis of McAlpine's drawings and his description proved the identity between *L. annulipes* and *L. caucasica* Tanasijtshuk, 1961 (see Tanasijtshuk, 1986).

According to my data, *L. annulipes* is a species very widely distributed and heavily variable throughout the distribution area, especially in external morphology, particularly in coloration. The coloration of lateral stripes of the mesonotum, legs, abdominal spots is subject to wide variation. Ratios between arisal segments and the ratio of cheek height to eye height are variable. The male genitalia vary to a much less degree, but this variability is still notable in the shape of the aedeagus, surstilar lobes and hypandrium. However, *L. annulipes* displays a number of stable characters, such as the shape of ocellar plate, long and narrow (in profile) surstilar lobes, the shape of aedeagus heavily widened in basal part.

*L. kerzhneri* and several other species are close to *L. annulipes*. They are distinguished easily by the genitalia. In large series, they may also be identified by appearance, with mandatory examination of the genitalia from selected specimens.

**Distribution.** Palaearctic Region: european part of Russia (reaches Karelia on the north), south of West Siberia, Kemerovo Province and Yaku-



**Figs 1-9.** *Leucopis annulipes* Zetterstedt, male: 1-2, head, from above; 3-8, genitalia, specimen from Washington State (3, general view, from side; 4, part of epandrium, from behind; 5, aedeagus, from below; 6, aedeagus, from behind; 7, 8, paramere and gonopod, in two aspects); 9, epandrium and aedeagus of specimen from Alaska (general view, from side). Scales: 0.5 mm (1-2), 0.1 mm (3-9).

tia; the Ukraine, Lithuania, Moldova, Transcaucasia (Georgia, Armenia), Kazakhstan, Turkmenistan, Uzbekistan, Tadjikistan, Sweden, France, Germany, Poland, Hungary, Romania, Bulgaria, Italy, Turkey, Iran. Nearctic Region: Canada (North-West Territories, Yukon Territory, British Columbia, Ontario, Nova Scotia) and USA (Alaska, Washington, Oregon, Wyoming, Idaho, Nevada, Colorado, California, Arizona).

I examined material from all regions listed except Romania and Italy, from which the species was recorded by Teodorescu (1975) and Raspi (1996), respectively.

**Bionomics.** *L. annulipes* is one of the most widely distributed and polyphagous aphid-feeders among *Leucopis* in the Palaearctic. Larvae of this species have been reared from 38 species of aphids (Tanasijtshuk, 1986).

### ***Leucopis decipiens* sp. n.**

**Holotype.** ♂, USA, Washington, "Wawai Wash. 20.V.[19]11", "AL Melander Collection 1961" (slide 6904; kept in NMNH).

**Paratypes** (kept in CNC, unless otherwise stated).

**Canada:** *North-West Territories:* 1 ♂, Yellowknife, 6.VI.1953, J.G. Chillcott (slide 7547); *Yukon Territory:* 1 ♂, Whitehorse, 26.VIII.1959, R. Madge; 1 ♂, Dowson, 6.VII.1949, W.W. Judd (slide 7463); *British Columbia:* 2 ♂, Kaslo, 7.VII [year not specified], R.P. Currie (slides 6913, 6923; kept in NMNH); 9 ♂, Summit Lake, Mi[le] 392 [of] Alaska Hwy, 4200-5400r, R.E. Leech (slides 7227, 7308, 7344, 7377, 7478); 2 ♂, Robson, 9 and 20.VII.1949, H.R. Foxlee (1 slide without number); 2 ♂, 32 m.[iles] SW [of] Terrace, 8 and 6.VII.1960, C.H. Mann (slide 7358); 2 ♂, same locality, 3.VII and 17.VII.1960, B. Heming (slide 7318); 1 ♂, 40 Mi[les] W [of] Terrace, 9.VII.1960, J.G. Chillcott; 1 ♂, Terrace, airport, 3.VII.1960, B. Heming; *Alberta:* 1 ♂, Lethbridge, 1.VI.1956, O. Peck (slide 7470); 1 ♂, Onefour, 13.VI.1956, O. Peck (slide 7389); 1 ♂, Frank, 18.VI.1962, K.C. Herrmann (slide 7299); 1 ♂, Banff Nat[ional] Park, Eisenhower junction, 4710 feet, 6.VII.1955, J.R. McGillis (slide 7196); *Ontario:* 1 ♂, Minklake, n[ear] Maynoot, 28.VII.1955, J.F. McAlpine (slide 7199).

**USA:** *Alaska:* 1 ♂, Palmer, 13.VIII.1964, K. Sommerman (slide 6969; kept in NMNH); 2 ♂, Matanuska, 6-7.VI.1944, J.C. Chamberlin (slides [68]84, 6916; kept in NMNH); 1 ♂, Mile 236 [of] Richard Hwy, 10.VI.1951, J.R. McGillis (slide 7207); 1 ♂, 20 Mi[les] SW [of] Tok Junction, 14.VII.1971, T.P. Sluss (slide 7166); 1 ♂, Unalakleet, 15.VI.1961, R. Madge; 1 ♂, Umiat, 11.VII.1959, J.E.R. Martin (slide 7328); *Washington:* 1 ♂, Mt. Rainier, Longmire Spr[ing], 14.VIII.1917, A.L. Melander (slide 7371); 1 ♂, Mt. Rainier, Paradise Park, August 1917, A.L. Melander (slide 7545); *Idaho:* 2 ♂, Viola, 26.VI.[19]12, J.M. Aldrich (slides 6985, 6989; kept in NMNH); 7 ♂, Moscow Mt., 29.VI-7.VII.1918, A.L. Melander (slides 7206, 7378, 7416, 7461, 7462, 7468, 7477); *Wyoming:* 1 ♂, Union Pass Road, Fremont Co., 8500r, 17.VII.1961, B.H. Poole (slide 7338); 1 ♂, Teton Pass, E side, 74[00]-8400r, 16.VII.1961, J.G. Chillcott (slide 7449); 1 ♂, Yellowst[one]. Park, Lewis Lake, 17.VII.1923, A.L. Melander (slide 7286); *Colorado:* 2 ♂, Doolittle Ranch, M[t]. Evans, 9800r, 27 and 31.VII.1961, C.H. Mann (slides 7364, 7385); 1 ♂, Echo L[ake], Mt. Evans, 10600r,

20.VII.1961, B.H. Poole (slide 7254); 1 ♂, Saguache Co., Valley View Springs ca. 7 mi[les]. E of Mineral Hot Springs, on W foot of Sangre de Cristo Range, 8500 ft, 14.VIII.1965, Hugh B. Leech (slide 7954); *Ohio:* 1 ♂, Kent, pupa emerged 6.IV [year not specified], L.W. Knutson (slide 6893; kept in NMNH).

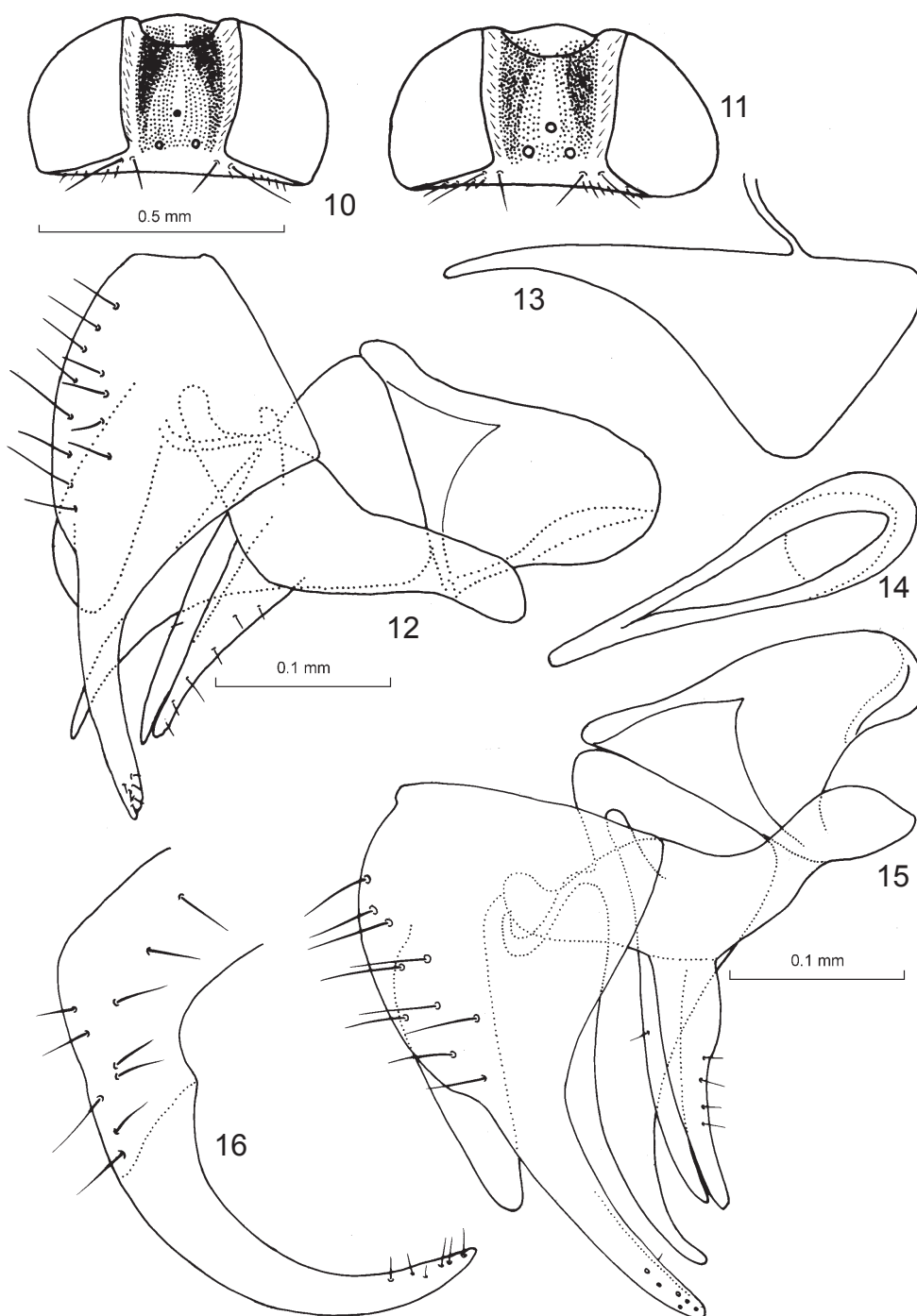
**Description. Male.** Body length 2.2-2.6 mm. Body light grey. Head 1.5-1.7 times as high as long. Frons (Figs 10-11) slightly widened anteriorly; head 2.4-2.8 times as wide as frons. Orbits light grey. Ocellar plate long, oval-triangular, often with dark (almost black) borders. Head with light stripe running over ocellar plate through anterior ocellus. Ocellar plate bordered by dark stripes often running to lunule. OT index equal to 1.0. Antenna and arista black. Eye height 2.6-3.3 times the vertical diameter of basoflagellomere. Third aristomere 3.3-4.0 times as long as 2nd. Gena wide; eye 2.7-3.3 times as high as gena. Gena with some minute bristles, anterior one the largest. Palpi black.

Mesonotum light grey. Lateral stripes of mesonotum very variable in colour, from dark brown to sandy-yellow. Their coloration varied depending on latitude: in specimens from northern populations (Canada, northern states of USA) lateral stripes paler, in those from central and southern states, darker. Lateral stripes extending to posterior pair of dorsocentral bristles. Medial stripes grey, extending to the middle of mesonotum. Two pairs of dorsocentral bristles present. Scutellum light grey. Legs black; apices of femora and bases of tibiae yellow; 1st tarsomere of fore legs yellow; in middle and hind legs, two or three tarsomeres sometimes yellow. Wing veins *M* and *R*<sub>4+5</sub> distinctly converging in distal half; distal section of *Cu* 1.2-1.4 times as long as *tp*. Syntergite 1+2 with wide, brown or dark brown spot often having a posterior incision at the centre; tergite 3 with a pair of brown or black spots being paler in some specimens. In some specimens, tergites 3-4 with medial touches. In male, abdomen with dark fields of modified microtrichia on inner borders of anterior tergites.

Male genitalia (Figs 12-16). Epandrium of moderate size, bearing 8-12 pairs of large bristles on posterior surface, passing into surstilar lobes with a strong constriction. Surstilar lobes long and thin in profile, rather massive as seen from behind, sharply curved inside. Hypandrium widened behind the middle. Aedeagus strongly widened in basal half.

**Comparison.** The new species is similar to *L. annulipes* in many characters of external morphology. The genitalia of these species also do not differ significantly and vary within species (see Figs).

The main and most significant difference is the shape of ocellar plate. In *L. decipiens*, it is elongate-triangular and never rounded in front. In *L.*



**Figs 10-16.** *Leucopis decipiens* sp. n., male: **10-11**, head, from above (10, paratype from Washington State; 11, holotype); **12-14**, genitalia of holotype (12, general view, from side; 13, aedeagus, from side; 14, aedeagus, from below); **15-16**, genitalia of specimen from Idaho (15, general view, from side; 16, part of epandrium, from behind). Scales: 0.5 mm (10-11), 0.1 mm (12-16).



*annulipes*, ocellar plate is rounded in front, which is the main distinctive character of this species both in the Palaearctic and in the Nearctic. Undoubtedly, *L. decipiens* is a sibling species of *L. annulipes*. These species are partially sympatric and were collected in the Nearctic at the same localities and, probably, in similar habitats. The coloration of the mesonotum, legs and abdomen in *L. annulipes* and *L. decipiens* vary to a very high degree.

In future, a genetic analysis of both the species is of high interest, as well as the study of food links of *L. decipiens*.

**Distribution.** Canada (North-West Territories, British Columbia, Alberta, Ontario) and USA (Alaska, Washington, Idaho, Ohio, Colorado).

**Etymology.** From the Latin “decipio” – to deceive, to cheat. (The species that is deceptive similar to other ones.)

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