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## New Species of *Leptocera* Olivier

In the Burrows of the Pocket Gopher, *Geomys Bursarius*

*Illinoensis* Komarek and Spencer, found in Illinois

(Diptera: Sphaeroceridae)

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I am much indebted to Dr. R. L. Wenzel of Chicago Natural History Museum for allowing me to examine these interesting specimens which raise some difficult but basic taxonomic problems.

**Leptocera (*Limosina*) *semiculata***, new species. Figures 26, *a*; 27, *a*; 28, *a-c*.

A male and a female (described from alcohol). Black or brown, halteres pale, knob a little darker in mature specimens. Wings hyaline.

Antennae with normal bristles and pubescence, arista four times as long as antennae with moderately long pubescence, first segment five times as long as broad. Eyes rather small, buccae at vibrissal angle half as wide as vertical diameter of eye, posteriorly as wide as this diameter. Head bristles normal, four pairs of interfrontal bristles of which the second pair is much larger and crosses, anterior orbital half the length of the posterior one. Mesoscutum with one humeral bristle, two pairs of posterior dorsocentrals between which are about eight rows of acrostichals. Scutellum not at all reduced, about as long as broad, with four bristles, apical pair much longer than the scutellum. Sternopleuron with one bristle and one or two minute setae. Wings with alula narrow,  $R_2+3$  very slightly sinuous, bending gradually onto the costa.  $R_4+5$  straight, not overpassed by the costa, ending just in front of the wing-tip, second costal sector scarcely longer than third, intermediate cell somewhat long and narrow, both issuing veinlets short, intermediate cross-vein well removed from r-m. Forelegs normal. Midlegs with tibia bearing an anterodorsal bristle at one-third with a minute bristle above it, a dorsal bristle surmounted by a minute seta at six-sevenths, somewhat above the dorsal bristle a rather smaller posterodorsal and just above that an anterodorsal, ventrally with a bristle at one-half and an apical bristle; basitarsus long, more than half as long as tibia, with short fine setulae beneath. Hind legs with no unusual

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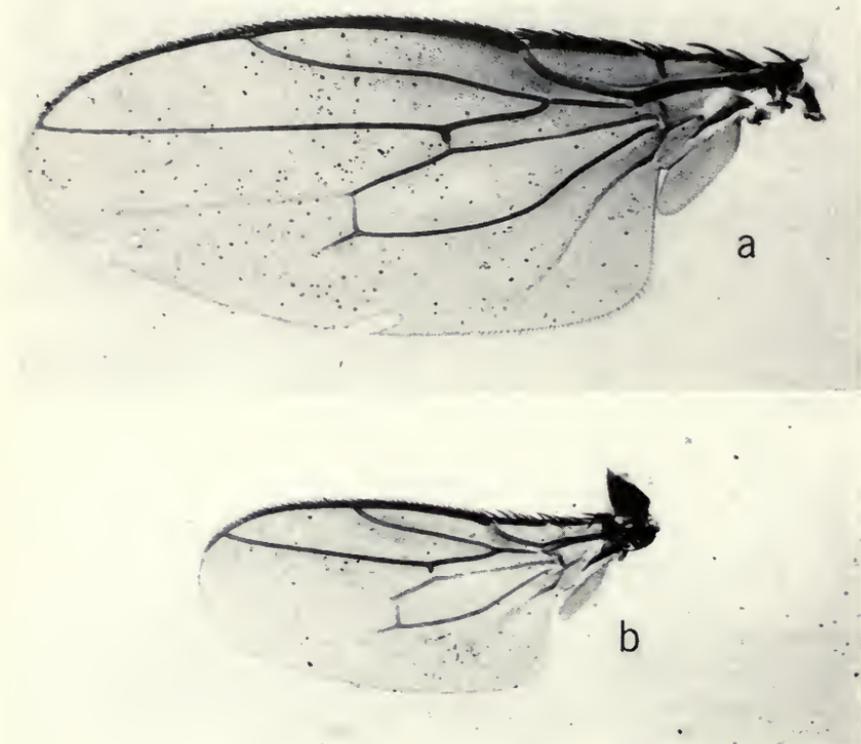


FIG. 26. *a*, *Leptocera semiculata* sp. nov., left wing (length 2.5 mm.); *b*, *L. nidicola* sp. nov., left wing (length 1.4 mm.).

bristles, basitarsus longer and narrower than usual, second segment of tarsus also rather long. Male with no special leg-bristles. Abdomen fully sclerotized without long bristles. Female abdomen with 6 normal transverse tergites after 1+2, ninth rounded triangular; cerci in dorsal view narrowly triangular with a long nearly straight apical bristle and a shorter one above it. First six visible sternites normal and transverse, apical ones beyond this interrupted centrally by membrane. Male abdomen with 4 normal tergal plates (1+2, 3-5), tergite 6 triangular and confined to the left side, tergite 7 large but not quite reaching the right side and without long bristles; genitalia with a long bristle on each side above the anal split which is wide, especially below, and is fringed with widely spaced bristles of moderate length. Fifth sternite with a more transparent semi-circular preapical area through which a dark longitudinal strut can be seen, beyond this a pair of transverse rectangular plates which project obliquely downward from the surface of the sternite and each bear 3-4 transverse rows of minute comb-like setae, sternite also with some longish bristles on the left side and also another semi-circular membranous patch in the posterior margin. Genitalia with genital forceps produced about half-way along its inner dorsal edge into a short black spike, edge beyond this emargi-

nate in dorsal view; apex of forceps truncate or feebly emarginate according to view. Posterior gonapophyses narrow, curved somewhat downward and inward. Aedeagus in dorsal view widened distally, with a central process and on each side two lateral processes.

Measurements.—Male, 2.3–2.7 mm. long; female, 2.1–2.3 mm. long.

*Holotype*.—A male from Illinois, Kankakee County, between Hopkins Park and St. Anne, collected from molasses trap in burrow of *Geomys bursarius illinoensis*, May 28, 1946 by R. L. Wenzel and H. S. Dybas.

*Allotype*.—A female, same data as holotype.

*Paratypes*.—1 male, 2 females, same data as holotype. Two males, 2 females, same data as holotype but collected May 28–29, 1946 by H. S. Dybas and R. L. Wenzel.

Types in Chicago Natural History Museum, some paratypes in my collection.

*Remarks*.—The species might also fall within Spuler's subgenus *Spelobia* but the eyes are somewhat larger. However, that subgenus should probably be sunk to *Limosina* Macquart (see p. 146). Spuler (1925, p. 70) lists four species of the subgenus *Limosina* Macquart (=his *Scotophilella* Duda) as having small eyes. These four differ from the present species as follows: *Leptocera varicosta* Malloch, 1914, has yellow antennae and a black second costal segment. *Leptocera mirabilis*, Collin, 1902, has a long curved spur on

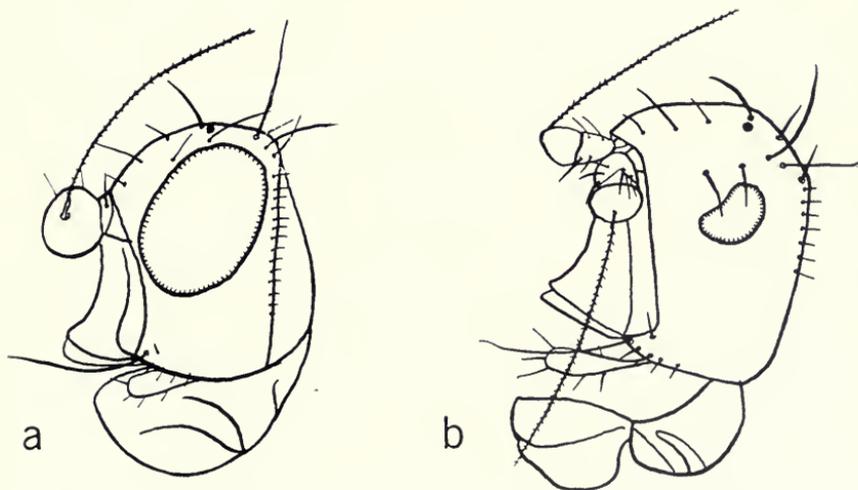


FIG. 27. Heads of (a) *Leptocera semioculata* sp. nov., from left; and (b) *L. typhlops* sp. nov.

the hind tibia. *L. gracilipennis* Spuler, 1925, has the cheeks at the vibrissal angle three-fourths as high as the eye, the median cell very long and narrow and the costa surpassing the third vein ( $R_{4+5}$ ). *L. cellularis* Spuler, 1925, has four pairs of interfrontal bristles none of which is cruciate; arista just over two not four times as long as the antenna; the second costal sector seems to be relatively longer compared with the third.

Among European species, *L. racovitzai* Bezzi var. *microps* (Duda) has reduced eyes and lives in underground mammal runs, but  $R_{4+5}$  is somewhat sinuous and the posterior corner of the intermedian cell is rounded. In Duda's key to the world species of *Leptocera* subg. *Limosina* (his *Scotophilella*) (1925, p. 153) it runs to couplet 64 but although the alula is narrow, the bristles on the lower part of the mid-tibia are not paired.

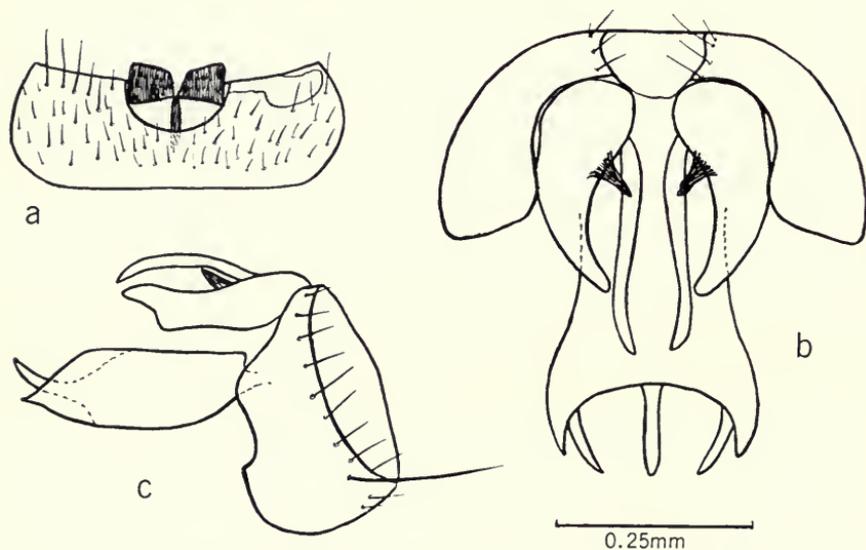


FIG. 28. *Leptocera semioculata* sp. nov., a, ♂ fifth sternite in ventral view; b, ♂ genitalia in dorsal view; c, ♂ genitalia from right.

**Leptocera (Limosina) typhlops**, new species. Figures 27, b; 29, a-c.

A male and a female (described from alcohol). Usually with rudimentary wings (shorter than the scutellum) and reduced halteres, but rarely fully winged. Reduced form described first. Light brown with a paler stripe down the center of the mesoscutum and scutellum but all specimens are perhaps immature. Halteres whitish.

Antennae with normal bristles and pubescence, arista five times as long as antenna with moderately long pubescence, first segment five times as long as broad. Eyes very small, no larger than the silhouette of the third antennal segment, buccae at the vibrissal angle nearly twice as wide as the vertical diameter of the eye. Ocelli normal. Head bristles normal, three pairs of interfrontals of which the second is larger and cruciate, both orbitals of the same length, rather short. Mesoscutum not reduced, about as wide as the head, with one humeral bristle, two pairs of postsutural dorsocentrals, anterior pair very small, and about eight rows of acrostichal bristles between them. Scutellum not at all reduced, nearly as long as broad, with four bristles, apical pair much longer than the scutellum. Sternopleuron with one bristle and one small seta. Wings pad-like, from half as long to nearly as long as the scutellum with two short but quite stout costal bristles. Halteres short, appearing sessile, with rather irregular outline but stalk distinct in macerated specimen. Forelegs normal, tarsi rather elongate. Midlegs with tibia bearing an anterodorsal bristle at one-third with a minute one above it, a dorsal bristle surmounted by a minute seta at six-sevenths, somewhat above this bristle a rather smaller posterodorsal and just above that an anterodorsal, ventrally with a bristle at one-half and an apical bristle; basitarsus long, more than half as long as tibia, with short fine setulae beneath. Hind legs with no unusual bristles, basitarsus and second segment of tarsus both somewhat longer than usual. Male with no special leg bristles. Abdomen fully sclerotized, with two moderately long bristles at the sides of tergal plates 1+2 and 3, and one at the sides of 4-6. In female, tergite 7 normal, 8 gently emarginate posteriorly, 9+10 represented by a rounded triangular plate bearing two straight upright bristles, cerci elongate-triangular with one long and one shorter more dorsal bristle, both nearly straight; first six visible sternites normal and transverse, more apical ones centrally interrupted by membrane. Male abdomen generally very like that of *Leptocera semioculata* Rich. but differing as follows: plates at apex of central transparent area on sternite 5 much more transverse with only two rows of setae; genital forceps with inner black spikes smaller, apex of forceps not in any view emarginate. Aedeagus in dorsal view with the sides more rounded and convergent distally, central process transverse, lower of two lateral processes shorter. Long-winged form quite similar but wings and halteres normal, venation rather pale but exactly like *L. semioculata* Rich.

Measurements.—Male, 1.3–1.8 mm. long; female, 1.5–1.75 mm. long.

*Holotype*.—A male from Illinois, Kankakee County, 7 miles N.N.W. of Hopkins Park, in fecal chamber of *Geomys bursarius illinoensis*, May 20, 1948, collected by H. S. Dybas and R. Inger.

*Allotype*.—A female, same data as holotype.

*Paratypes*.—27 males, 21 females, 1 sex doubtful (no abdomen, long-winged), same data as holotype. 3 males, 1 long-winged male, 2 females from Kankakee County between Hopkins Park and St. Anne, collected from molasses trap in burrow of *G. bursarius illinoensis*, May 28–29, 1946, by H. S. Dybas and R. L. Wenzel. 20 males, 16 females (all but one male and one female very immature) from sandy area near Hopkins Park, collected from fecal chamber of *G. bursarius illinoensis*, May 21, 1951, by H. S. Dybas and R. L. Wen-

zel. Three males, 2 females from 0.8 miles north, 5.7 miles east of St. Anne, sand dunes area, fecal chamber of *G. bursarius illinoensis*, May 6, 1953, collected by H. S. Dybas, H. G. Nelson, R. Ward, and R. L. Wenzel.

Types in Chicago Natural History Museum, some paratypes in my collection.

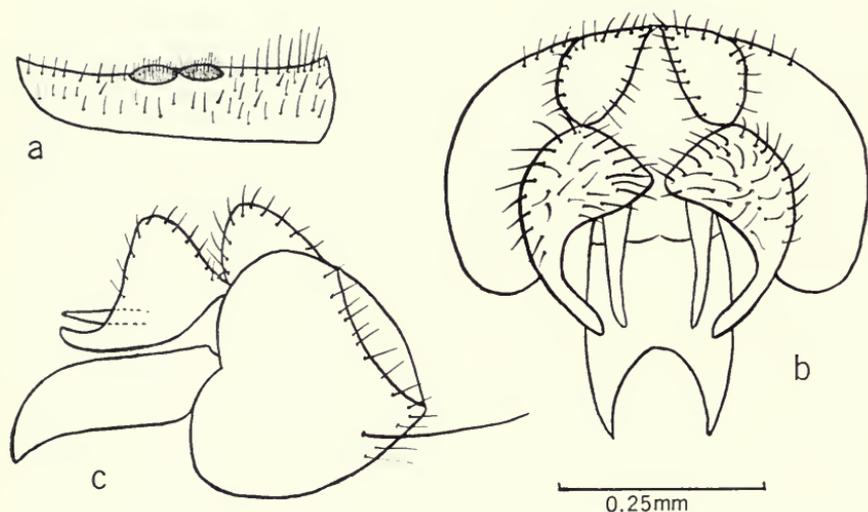


FIG. 29. *Leptocera typhlops* sp. nov., a, ♂ fifth sternite in ventral view; b, ♂ genitalia in dorsal view; c, ♂ genitalia in dorsal view.

*Remarks.*—The form of the species with reduced wings would be placed in the subgenus *Americaptilotus* Richards, 1951 (= *Aptilotus* of American authors, not of Mik), but it now seems clear that this subgenus cannot be separated from the subgenus *Limosina* Macquart, 1835. In addition to the long and short-winged forms of *L. typhlops*, I have recently seen a similar dimorphism in Californian specimens of *Leptocera* (*Limosina*) *concava* Spuler. The small eyes and long arista would place the long-winged form of *L. typhlops* in the subgenus *Spelobia* Spuler, 1925, but this, too, is best regarded as a synonym of *Limosina* Macquart (*syn. n.*). The reduced eyes and elongate arista are adaptations seen in other pholeophiles (inhabitants of mammal runs, etc.), in particular in the European *Leptocera* (*Limosina*) *racovitizai* var. *microps* (Duda). The downwardly deflected male genitalia also given as a character by Spuler is seen in

such species as *L. (L.) schmitzi* (Duda) which is also a pholeophile. It may well be found that all brachypterous species in which the halteres have not been lost may at times have long-winged forms and should not have subgenera erected for them on the grounds of brachyptery (see also Richards, 1951, p. 849). Owing to the kindness of Mr. Curtis W. Sabrosky I have seen specimens of *L. (Spelobia) tenebrarum* (Aldrich). They are very close to *L. semioculata* described above but are larger, have slightly smaller eyes, have the postero-dorsal bristle of the midtibia relatively longer and the tarsi rather longer. In the male, the fifth sternite and genitalia seem to be very similar, as far as can be seen without dissection.

### **Leptocera (Limosina) nidicola**, new species. Figure 30 *a-c*.

A male and a female (described from alcohol). Black or brown, forecoxa, apex of forefemur and basal third of foretibia paler. Halteres pale, knob darker in one female. Wings hyaline.

Antennae with normal bristles and pubescence, arista rather more than three times as long as antenna with moderately long pubescence, first segment five times as long as broad. Eyes about normal size, buccae at vibrissal angle one-quarter as wide as vertical diameter of eye. Head bristles normal, three pairs of interfrontal bristles of which the second pair is large and crosses, anterior pair minute in the male. Mesoscutum with one humeral bristle, two pairs of postsutural dorso-centrals of which the anterior pair is hardly half as long as the other, six rows of acrostichals between the dorso-centrals. Scutellum about as long as broad, with four bristles, apical pair much longer than the scutellum. Sternopleuron with one bristle and one minute seta in front of it. Wings with a very narrow alula,  $R_{2+3}$  almost straight, joining costa at a somewhat acute angle,  $R_{4+5}$  nearly straight, slightly bent forward in distal quarter, ending well in front of wing-tip, distinctly though not greatly overpassed by the costa, second costal sector about the same length as the third, intermedian cell of average length and breadth, issuing veinlets short, intermedian crossvein well removed from *r-m*. Forelegs normal. Mid-legs with tibia bearing a dorsal bristle at one-quarter, a dorsal bristle at six-sevenths surmounted by a smaller posterodorsal and at a slightly higher level by an anterodorsal, a mid-ventral bristle in the female, and an apical ventral bristle which is rather short, especially in the male; basitarsus thin, about half as long as tibia, with fine setae beneath. Hind legs normal. Male with 5-6 short outstanding ventral bristles on the basal half of the mid and hind femur. Abdomen fully sclerotized without long bristles. Female abdomen with 6 normal transverse plates after 1+2, last one somewhat angularly emarginate, cerci small bearing a long, somewhat sinuous bristle and a shorter straighter one above it; first six visible sternites normal and transverse. Male abdomen without long bristles and with four normal tergal plates (1+2, 3-5), tergite 6 developed only on the left side and produced far downward, tergite 7 somewhat less than twice as broad as long, not quite reaching the right side, genitalia with a longish bristle on each side above the anal split which has a sparse fringe of moderate length. Fifth sternite at center of posterior margin with two small adjacent transversely oval plates bearing dense, short, outstanding bristles, other bristles longer on the right side. Genitalia with

genital forceps with a large angular projection on dorsal edge, apex hook-like, curved inward and downward. Posterior gonapophyses narrow, pointed, almost straight. Aedeagus in dorsal view with sides slightly convergent to apex, consisting of two plates which seen from above are narrow and pointed and from the side broad and obliquely truncate at the apex.

Measurements.—Male, 1.6 mm. long; female, 1.4 mm. long.

*Holotype*.—A male from Illinois, Kankakee County, between Hopkins Park and St. Anne, collected from molasses trap in burrow of *Geomys bursarius illinoensis*, May 28–29, 1946, by H. S. Dybas and R. L. Wenzel.

*Allotype*.—A female, same data as holotype.

*Paratype*.—A female, same locality given in holotype, collected from nest chamber of *G. b. illinoensis*, May 29, 1946, by R. L. Wenzel and H. S. Dybas.

Types in Chicago Natural History Museum, the paratype in my collection.

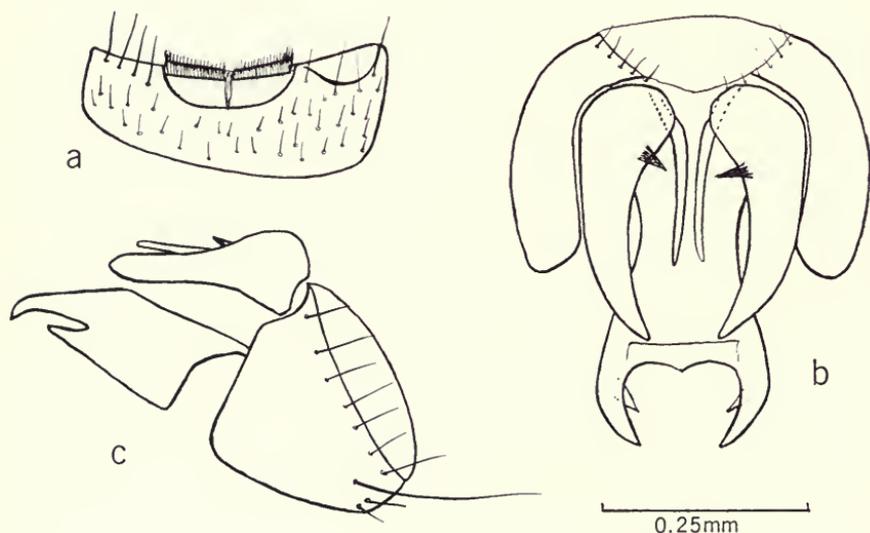


FIG. 30. *Leptocera nidicola* sp. nov., a, ♂ fifth sternite in ventral view; b, ♂ genitalia in dorsal view; c, ♂ genitalia from the right.

*Remarks*.—In Spuler's key (1925, p. 70) *Leptocera nidicola* runs to *L. longicosta* Spuler. I have seen one male and two female paratypes of that species from Potlatch and Priest Lake, Idaho, in the collection of the California Academy of Sciences. The wing-venation is similar to that of *nidicola* except that  $R_{2+3}$  is distinctly more

curved onto the costa. The male lacks the short bristles at the bases of the mid and hind femora; the genitalia are considerably larger than in *nidicola* but the details could not be made out. In Duda's key to *Leptocera* subgenus *Scotophilella* (1925, p. 153) *L. nidicola* might run to couplet 46 but in *L. beckeri* (Duda)  $R_{4+5}$  is not over-passed by the costa and the other species have a broad alula. If taken to couplet 72, *nidicola* runs to couplet 78 but differs from the species there in genitalia or colour.

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