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Revision of the East Palaearctic species of the Leptocera (s. str.) fontinalis-group (Diptera, Sphaeroceridae)

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Abstract — *Leptocera* (s. str.) *fontinalis*-group comprises at least 8 species in the East Palaearctic. Two new species, viz., *L. vomerata* sp. n. and *L. dyscola* sp. n. (both from USSR: Amur area) are described; *L. equispina* L. PAPP, 1973, *L. parafinalis* L. PAPP, 1973 and *L. spinitarsata* L. PAPP, 1973 (all from Mongolia) are fully redescribed with figures of the male and female terminalia. New records of *L. finalis* (COLLIN, 1956) and *L. caenosa* (RONDANI, 1880) from the East Palaearctic are given and a key to the identification of the *L. fontinalis*-group of this area is presented. With 42 figures and an appendix recording *L. nigra* OLIVIER, 1813 from the East Palaearctic area.

The present study follows ROHÁČEK's (1982a) revision of the European species of the subgenus *Leptocera* (s. str.), but it is restricted to the *L. fontinalis*-group. This species-group comprises a number of closely related species (particularly in the East Palaearctic) that can hardly be recognized without knowledge of their male and female postabdominal structures. For this reason it appeared reasonable to redescribe the three Mongolian species described by L. PAPP (1973). A small number of additional specimens from Amur area (USSR, Far East) received from Dr. A. SHATALKIN (MGU) proved to be an extraordinarily useful contribution to our revision, containing two species new to science and some other species hitherto unrecorded from this area.

The *Leptocera fontinalis*-group was defined by ROHÁČEK (1982a) as follows: thorax without velvety spots; mid tibia with 2 posteroapical bristles subequal in length (either both short or both prolonged); some of the medial acrostichals more or less enlarged; male 5th sternum simple, without posterior lobes; telomere (surstylus) bipartite, with a characteristic anterior, finely haired projection and its hind part (see Fig. 2, HTE) with robust apical spines; postgonite angularly bent in proximal part (Fig. 3); female 8th sternum longer than wide; female 9th tergum not strikingly large compared to other parts of postabdomen; spermathecae not very elongate.

Defined in this way, the *L. fontinalis*-group includes 10 species in the Palaearctic Region, 8 of them occurring in the East Palaearctic. These are *L. fontinalis* (FALLÉN, 1826), *L. vomerata* sp. n., *L. equispina* L. PAPP, 1973, *L. parafinalis* L. PAPP, 1973, *L. finalis* (COLLIN, 1956), *L. spinitarsata* L. PAPP, 1973, *L. dyscola* sp. n. and *L. caenosa* (RONDANI, 1880). The remaining two species are known only from the West Palaearctic — *L. alpina* ROHÁČEK, 1982 and *L. oldenbergi* (DUDA, 1918)*. *Leptocera nigrolimbata* DUDA, 1925 (recorded from East Siberia by DUDA 1938) is considered a species belonging to a different species-group of Oriental origin (see ROHÁČEK 1982a) and is therefore excluded from the present revision.

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L. oldenbergi (DUDA) has been known only from North, West and Central Europe until now (ROHÁČEK 1982a). In TMB there is a male of this species from USSR (Georgia, Gulripsch, 1. V. 1975, K. SIN leg.) which is an important record, extending its known distribution eastwards.

— Hind part of telomere with long setiform hairs distributed along its whole length (i. e. also in distal part — Figs 8, 24) 8

7 (6) Anterior projection of fore part of telomere more slender, posterior lobe of this fore part longer, robust, rounded and bearing long bristles on ventral margin, terminated by a long and robust posterior bristle (ROHÁČEK 1982a: Figs 21, 22); male 5th sternum with longer haired posteromedial membraneous area (ROHÁČEK 1982a: Fig. 18)

L. fontinalis (FALLÉN)

— Anterior projection of fore part of telomere more robust, posterior lobe of this fore part very short and wide, characteristically shaped and bearing short setae on ventral margin and a very thick but short, spine-like posterior bristle arising on darkly pigmented projection (Fig. 2); male 5th sternum with shorter finely haired posteromedial membraneous area (Fig. 6)

L. vomerata sp. n.

8 (6) Mid basitarsus with a long and stout ventral bristle (Fig. 27). Fore part of telomere with robust and short anterior finely pubescent projection armed by strongly sclerotized anterior thorn-like corner; posterior lobe of this fore part also unusually bulky and characteristically shaped ventrally; hind part of telomere short and stout (Fig. 24)

L. spinitarsata L. PAPP

— Mid basitarsus with weaker ventral bristle (Fig. 11). Fore part of telomere with long and slender anterior finely pubescent projection without thorn-like corner; posterior lobe of this fore part anteriorly short, posteriorly rounded but of more subtle construction; hind part of telomere longer and slender (Fig. 8)

L. equispina L. PAPP

9 (5) 7th tergum distinctly shorter; posterior margin of 7th sternum simple; 8th sternum with posterior corners less projected; spermathecae without thorn-like tubercles in proximal part of body (ROHÁČEK 1982a: Figs 42—45)

L. fontinalis (FALLÉN)

— 7th tergum distinctly longer (Fig. 12); 7th sternum posteromedially slightly, but distinctly, extended; 8th sternum with posterior corners more projected (Fig. 13); spermathecal body with thorn-like tubercles (Fig. 14)

L. equispina L. PAPP

Leptocera (Leptocera) fontinalis (FALLÉN, 1826)

For detailed redescription, figures of the male genitalia and female terminalia, synonymies, biology and distribution see ROHÁČEK (1982a). *L. fontinalis* has been recorded from the East Palaearctic only twice — by PETROVA (1968) from Far East and by L. PAPP (1974) from Mongolia. Unfortunately we were unable to examine these specimens to check their identification. We have not excluded the possibility that they (or some of them) might be *L. vomerata* sp. n. Although East Palaearctic records of *L. fontinalis* have not been confirmed, we have included this species in the key because its occurrence in this area is probable.

Leptocera (Leptocera) vomerata sp. n. ♂
(Figs. 1–6, 38)

Type material — Holotype ♂: USSR, Amurskaya obl., g. Zeya, 3 IX 1981, A. SHATALKIN leg. Deposited in MGU.

Description — ♂. Total body length 2.30 mm; general colour brownish black, brown pollinose but subshiny. — Frons brown anteriorly to blackish posteriorly, dull. Orbits and interfrontalia somewhat silvery grey pollinose; narrow frontal triangle somewhat shiny. Cephalic chaetotaxy robust, also postverticals well developed, crossed. 3 interfrontals becoming longer anteriorad and 1 small in front of the longest one; lateral to the small interfrontal an additional weak setula. About 6 small additional setulae inside and below orbitals but only 2–3 uppermost longer. Frontal

lunule brown, dull. Face narrow with some minute hairs. Facial cavity blackish brown and rather shiny, gena dusted and dull. Genal bristle rather strong, three times the length of the setulae behind it. Eye diameter about 2.8 times as long as the smallest genal width. — Antennae blackish, 3rd segment dark brown, shortly pilose. Arista about 3.9 times as long as antenna, relatively short haired (slightly longer than in L. fontinalis).

Thorax brownish black; mesonotum, despite greyish brown pollination, shining; pleurae dull. 2 humerals (also the internal rather long) and 1 microseta on humeral callus. 2 + 3 dorsocentrals, all directed posteriorly and becoming shorter anteriorad. 8–9 rows of acrostichal microsetae; 3(2 + 1) medial pairs of acrostichals distinctly enlarged though less than those of *L. fontinalis;* some small microsetae running between enlarged acrostichals also present. Scutellum large, long, with 4 pairs of

Figs 1–6. *Leptocera (s. str.) vomerata* sp. n. (holotype): 1 = male genitalia caudally (aedeagal complex omitted); 2 = telomere laterally; 3 = aedeagal complex laterally (right postgonite omitted); 4 = left mid tibia dorsally; 5 = apex of mid tibia and basitarsus posteriorly; 6 = 5th male sternum. — Abbreviations: AP = aedeagal apodeme, DP = distiphallus, EA = ejaculatory apodeme, FTE = fore part of telomere, HTE = hind part of telomere, IP = intraperiandrial sclerite, PC = pseudocercus, PG = postgonite, PP = phallophore. — Scales: Figs 1, 3 = 0.1 mm, Fig. 2 = 0.05 mm, Figs. 4–6 = 0.2 mm

marginal scutellar bristles, as usual. 2 sternopleurals, the posterior strong and long. — Legs blackish brown, except for the slightly paler trochanters, knees and tarsi. Chaetotaxy of mid tibia as in Figs 4, 5, thus with short posteroapical pair of bristles. Basitarsus with a strong ventral bristle. Ratio t_2: mt_2 (= mid tibia : mid basitarsus) = 1.97. — Wing (Fig. 38) with pale brownish membrane and brown veins. First costal sector sparsely haired. *C* hardly reaching beyond R_{4+5}. R_{2+3} long, very slightly bent up to *C*. R_{4+5} distinctly curved up to *C* but less than that of *L. fontinalis*. — Discal cell of medium length, tapered distally, with short pigmented processes of M_{1+2} and M_{3+4} beyond t_p, the latter being continued by a colourless venal fold. *A* long and sinuate. Alula large, broad, apically tapered. Wing measurements: length 2.30 mm, width 0.95 mm, *C*-index = 2.02, t_a–t_p : t_p = 3.00. Halteres dirty yellowish brown.

Abdomen dark brown, pollinose, subshiny. Terga finely and sparsely haired; 3rd–5th tergum with long bristles in posterior corners (becoming longer posteriorad). Sterna densely and shortly setulose. 5th sternum is the widest sternum (Fig. 6), rather densely setulose on disc, with some longer bristles at posterior margin and with small membraneous and finely pubescent posteromedial area which is smaller and with finer pilosity than that of *L. fontinalis*.

Genitalia. — Periandrium (Fig. 1) shortly and sparsely haired but with a long caudal bristle and dense micropubescence lateroproximaly. Hypandrium relatively long, Y-shaped. Intraperiandrial sclerite large, subanal plate absent. Pseudocerci relatively removed each from other and bearing comparatively short hairs and a slender ventral projection. Telomere (Fig. 2) bipartite. The fore part very wide and short (low), with long, bent, finely pubescent (particularly on inner side) anterior projection; its posterior lobe highly characteristic with respect to the shape and pigmentation, armed by short setulae and 1 robust posterior spine arising on darkly pigmented projection. Hind part of telomere bearing a group of long setiform hairs on proximal half (as in *L. fontinalis*) and 1 robust apical spine and 2 anterior bristles in distal half; also the external apical small pale projection developed as usual. Aedeagal complex (Fig. 3) most resembling that of *L. fontinalis* in having similarly shaped postgonite but the structure of distiphallus is slightly different (more curved dorsal sclerite, finely spinulose ventral part). Ejaculatory apodeme well developed.

♀ unknown.

Distribution — Known only from unique holotype male from the USSR: Far East, Amur area.

Discussion — *L. vomerata* sp. n. seems to be closely allied to *L. fontinalis* (FALLÉN) because it has similarly formed telomere (particularly its hind part) and aedeagal complex (especially postgonite). It can hardly be distinguished from the latter species by outer features (although R_{4+5} is somewhat less curved and acrostichal macrochaetae are shorter); the main differences can be found in the structure and armature of the fore part of telomere and male 5th sternum.

Leptocera (Leptocera) equispina L. PAPP, 1973
(Figs. 7—14, 49)

Leptocera (Leptocera) equispina L. PAPP, 1973, Acta zool. hung., 19: 423, ♂♀.

Type material — Holotype ♂: Mongolia, Central aimak, Ulan-Baator, Zaisan im Bogdo ul, 1600 m, Exp. DR. Z. KASZAB, 1966, 6 VI 1966 (Nr. 499). — Paratypes: 1 ♀: Mongolia, Bulgan aimak, zw. Somon Chischig-Öndör, 1390 m, Exp. DR. Z. KASZAB, 1968, 15 VI–23 VII 1968 (Nr. 965); 1 ♀: Bulgan aimak, 7 km NW von Somon Chanžargalant, 1350 m, Exp. DR. Z. KASZAB, 1968, 16 VI 1968 (Nr. 969). All in HNHM (examined).

Description: — ♂. Total body length 1.73 mm; general colour brownish black, dark greyish brown pollinose, subshiny. — Head brownish black; frontal triangle rather shining, interfrontalia and orbits silvery grey dusted and glittering; rest of frons blackish grey dusted, dull. Cephalic chaetotaxy as in *L. fontinalis*: postverticals weak but crossed. 3 stronger and 1 small interfrontals (recognized from basal scars); about 5 minute additional setulae inside and below orbitals. Carina brown, facial cavity blackish and rather shining. Carina somewhat prominent between antennal bases. Gena greyish dusted, genal bristle rather long but thin. Eye normal in size, its diameter about 3.5 times as long as the smallest genal width. Antennae blackish brown with paler 3rd segment. Arista about 3.6 times as long as antenna, short haired.

Thorax brownish black; mesonotum more shining despite brownish grey pollination; pleurae duller. 2 humerals plus 1 microseta on humeral callus. 5(2+3) dorsocentrals becoming shorter anteriorad; 8 rows of acrostichal microsetae in front of suture; medial acrostichals hardly enlarged,

andrial sclerite distinct. Pseudocerci robust including their long ventral projection. Telomere (Fig. 24) very bulky. Fore part of telomere with thick, short anterior ventral projection finely haired and bearing darkly pigmented apical thorn-like corner; posterior lobe of this fore part with 2 robust lobes; the anterior of them with only very short setulae, the other carrying a long bristle. Hind part of telomere also unusually robust (in contrast to all relatives) and armed by a robust spine and 2 anterior setae and by a row of long setae posteriorly. Aedeagal complex (Fig. 25) similar to those of *L. finalis* or *L. parafinalis* but slightly differing in shape of distiphallus and postgonite. Ejaculatory apodeme relatively large. ♀ unknown.

Distribution — Known only from unique holotype male from Mongolia (Chentej aimak) (L. Papp 1973).

Discussion — *L. spinitarsata* undoubtedly belongs to *L. finalis*-subgroup (cf. the formation of the aedeagal complex and telomere). It can be best recognized by its strongly upcurved R_{4+5}, long and stout ventral bristle on mid basitarsus and distinctive male genitalia (robust pseudocerci, telomere bulky and characteristically formed).

Leptocera (Leptocera) dyscola sp. n. ♂ ♀
(Figs 28–37, 42)

Type material — Holotype ♂: USSR, Amurskaya obl., g. Zeya, 25 VIII 1981, A. SHATALKIN leg. — Allotype ♀ with same data but collected 25 VII 1981; paratypes: 1 ♂, 1 ♀: same locality, 15 VIII and 28 VIII 1981 respectively, both A. SHATALKIN leg.; 1 ♂: same locality, 5 VII 1981, A. OZEROV leg. — Holotype, allotype and 1 ♀ paratype in MGU, 1 ♂ paratype in HNHM and 1 ♂ paratype in SMO.

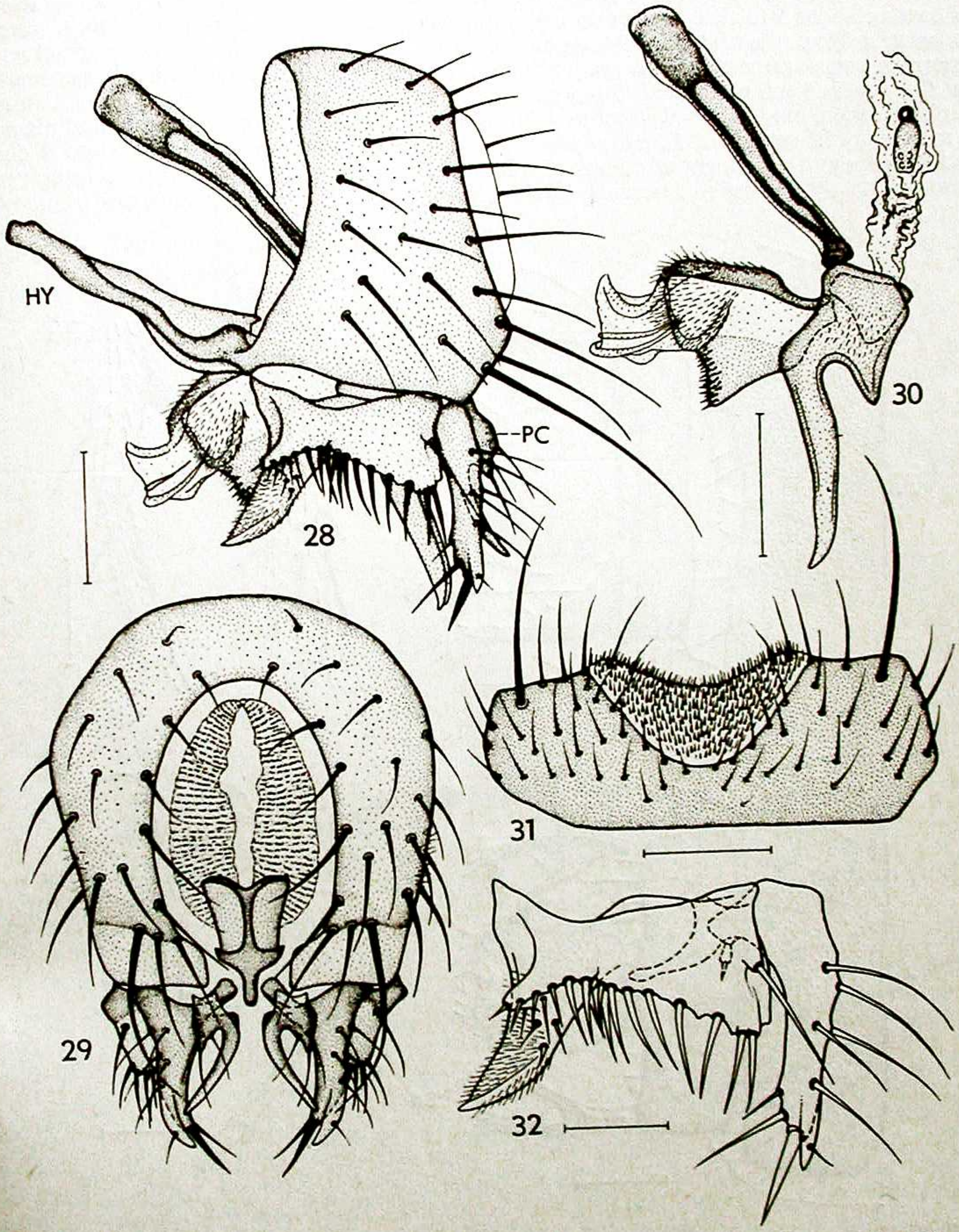
Description — ♂. Total body length 2.18–2.38 mm; general colour brownish black, subshiny. — Head almost black, dull. Frons anteriorly brown, posteriorly black. Frontal and ocellar triangle, orbits and interfrontalia silvery grey pollinose and glittering. Cephalic bristles robust but postverticals rather small though with apices crossing. 3 interfrontals becoming longer anteriorad and 1 very minute seta in front of them; 1–2 microsetae laterad to the latter small interfrontal also present. 4–5 small additional setulae inside and below orbitals; 2 uppermost somewhat stronger. Frontal lunule pale greyish pollinose; facial cavity black and rather shining despite some brown pollination; gena black but densely greyish dusted and dull. Genal bristle of medium length. Eye normal, its diameter about 3.1 times as long as the smallest genal width. Antennae black with brown 3rd segment. Arista rather long haired (but shorter than that of *L. caenosa*) and about 4.4–4.6 times as long as antenna.

Thorax brownish black, grey to greyish brown pollinose. Mesonotum somewhat shining, scutellum and pleurae more heavily dusted and dull. 2 humerals (the external very long) and 1 microseta on humeral callus. 5(2+3) dorsocentrals becoming shorter anteriorad, the most posterior longer than scutellum. 2–3 (1+1 or 2+1) pairs of medial acrostichals only slightly enlarged and 1–2 rows of acrostichal microsetae running between them. 8–10 rows of acrostichal microsetae between dorsocentrals on suture. Scutellum large and long, rounded triangular, with 2 very long and 2 short bristles as usual. 2 sternopleurals, the anterior small, the posterior very long. — Legs blackish, only trochanters, knees and tarsi brown to yellowish brown. Chaetotaxy of mid tibia (Figs 35, 36) with a small dorsal seta above the distal robust bristle, 3 anteroapical bristles subequal in length and 2 slightly longer posteroapical ones; mid basitarsus with robust ventral bristle. Ratio $t_2 : mt_2 = 1.84–1.97$. — Wing (Fig. 42) with unusually pale greyish (not brownish) membrane and pale brown veins. *C* not extended beyond R_{4+5}. First costal sector long and sparsely setulose. R_{2+3} rather straight, apically slightly bent up to *C*. R_{4+5} also comparatively slightly curved up to *C*. Discal cell medium-sized, distally tapered, with very short pigmented process of M_{1+2} and usually longer one of M_{3+4} beyond t_p. Alula large, broad, apically tapered. Wing measurements: length 2.14–2.30 mm, width 0.91–0.98 mm, *C*-index = 1.51–1.79, $t_a–t_p : t_p = 2.86–3.33$. Halteres yellow to dirty orange.

Abdomen blackish brown, greyish brown pollinose, subshiny. Terga and sterna rather densely setulose. Syntergum 1+2 with large pale pigmented mediobasal area. 3rd-5th tergum with long bristles in posterior corners besides short setae on disc. Sterna becoming wider posteriorad and densely setulose. 5th sternum (Fig. 31) rather densely and shortly setulose but with a very long (longer than length of 5th sternum) bristle in posterior corners. Membraneous, finely spinulose posteromedial area largest among relatives, almost as large as that of *L. oldenbergi*.

Genitalia — Periandrium (Figs 28,29) rather densely and long setose compared to that of allied species, with a long caudal bristle; also some bristles adjacent to it relatively long. Hypandrium robust, Y-shaped. Intraperiandrial sclerite large, subanal plate not developed. Pseudocerci

slender, their proximal part distinctly pointed and with 3 usual setae; their distal projection very slender. Telomere (Fig. 32) with hind part similar to that of *L. finalis* and related species but its fore part highly characteristic, with pointed but not very long anterior projection and with flat posterior lobe richly armed by relatively long and thick bristles on ventral margin and with a long posterior bristle. Aedeagal complex (Fig. 30) similar to that of species belonging to *L. finalis*-subgroup, but its distiphallus distinctly spinulose on ventral lobe. Postgonite large, strongly angular, with slightly bent and apically pointed distal part; its proximal part with fine pubescence in the middle

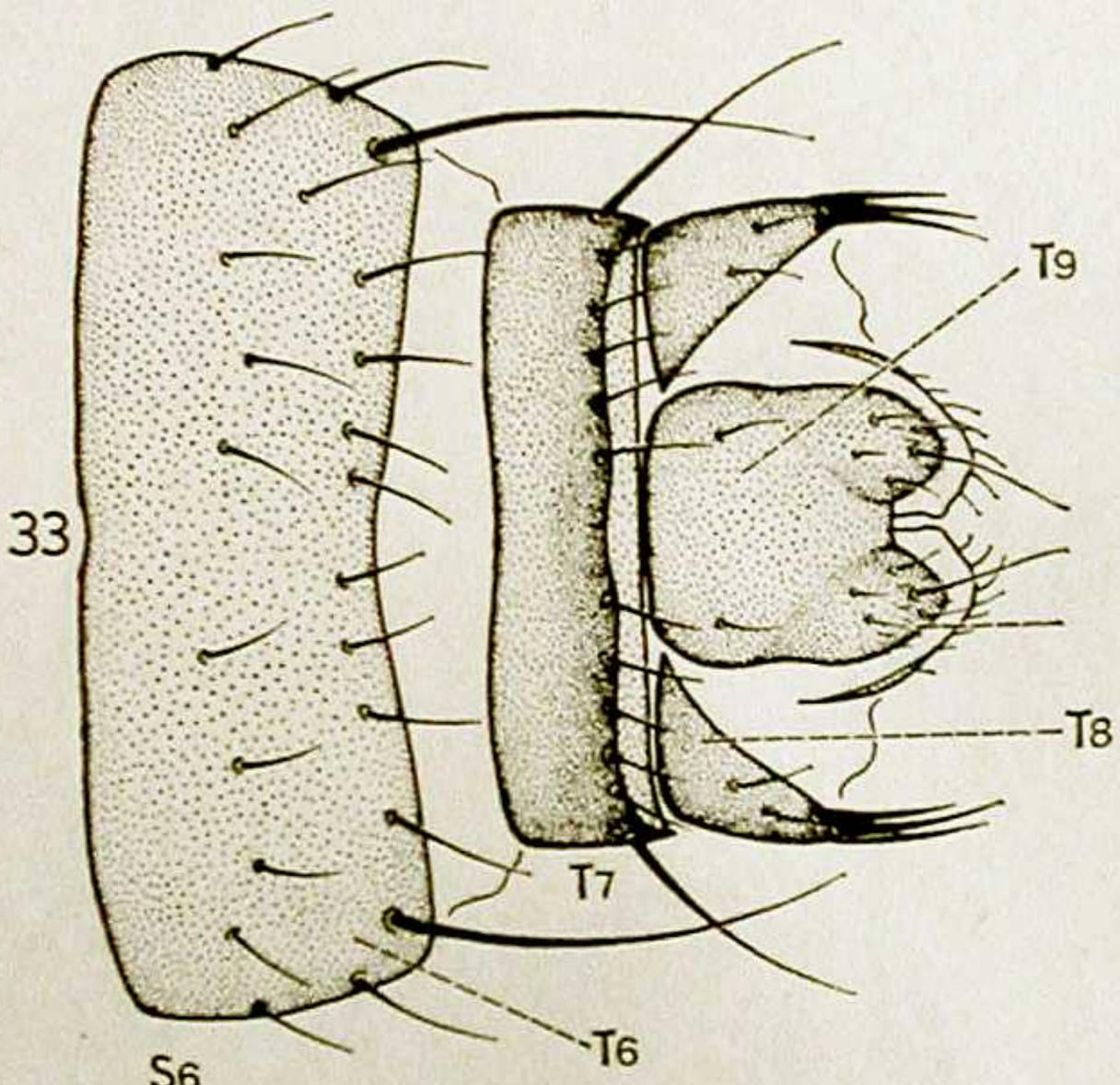


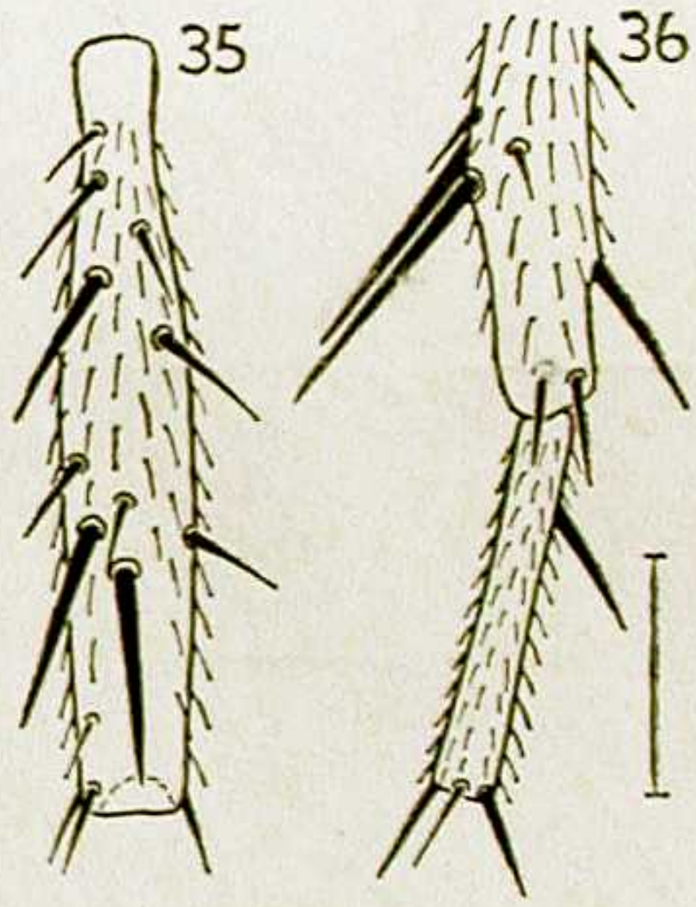
Figs 28–32. *Leptocera (s. str.) dyscola* sp. n. (paratype): 28 = male genitalia laterally; 29 = dtto caudally (aedeagal complex omitted); 30 = aedeagal complex laterally (right postgonite omitted); 31 = 5th male sternum; 32 = telomere laterally. — Abbreviations: HY = hypandrium, PC = pseudocercus. — Scales: Fig. 31 = 0.2 mm, Fig. 32 = 0.05 mm, others = 0.1 mm

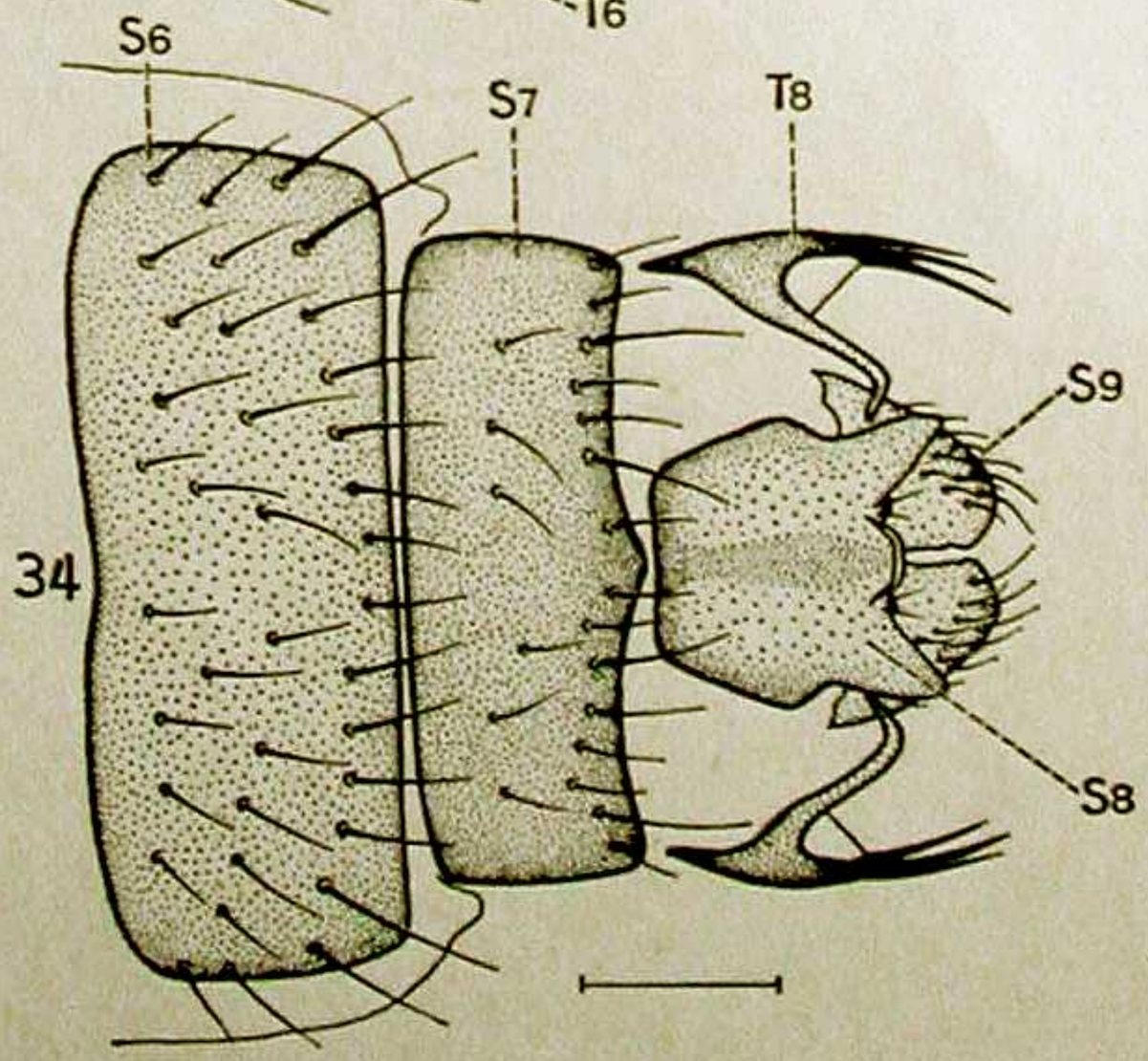
of external side (this micropubescence probably present in all related species, see e. g. also Fig. 3, but apparently overlooked previously). Ejaculatory apodeme present but rather small.

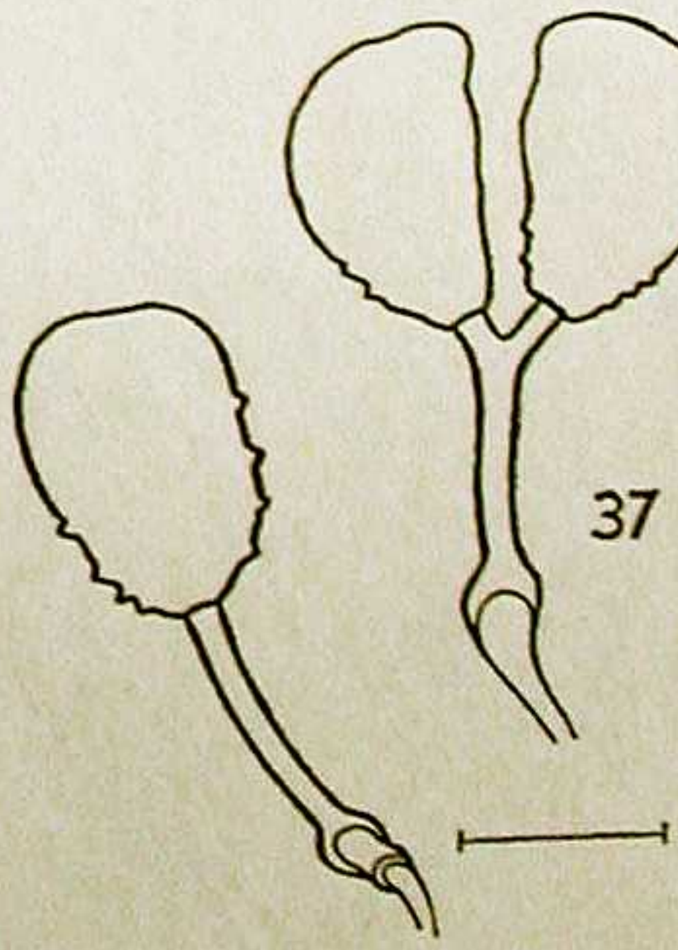
♀. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 2.06–2.58 mm. Ratio $t_2 : mt_2 = 1.85–1.91$. Wing measurements: length 2.10–2.38 mm, width 0.87–1.03 mm, C-index = 1.76–1.97, $t_a - t_p : t_p = 3.08–3.13$. Abdomen and preabdomen in particular, shorter setulose than in male but also 6th tergum with a long bristle in posterior corners.

Postabdomen (Figs 33, 34). 6th tergum simple oblong, with a long bristle in posterior corners. 7th tergum short, transverse, with membraneous posterior margin, with short setae arising on dark pigmented margin and with a long bristle on each side. 8th tergum divided into lateral sclerites, each bearing about 5 thicker bristles on posterior margin and a very slender projection reaching far on ventral side of postabdomen. 9th tergum fused with cerci and carrying 2 minute dorsal setulae. 6th sternum transversely oblong, densely setulose. 7th sternum slightly projecting posteromedially (as in *L. equispina*) and more densely haired only on posterior, darker pigmented margin. 8th sternum plate-shaped, long, of usual structure with projecting posterior corners, in form and pigmentation most resembling that of *L. parafinalis*. 9th sternum pale pigmented, divided into 2 densely haired sclerites and anteriorly of complex structure. Internal "spectacles-shaped" sclerite present but too poorly defined to be described. Spermathecae (Fig. 37) with some tubercles on body and









Figs 33–37. *Leptocera (s. str.) dyscola* sp. n. (paratypes): 33 = female postabdomen dorsally; 34 = dtto ventrally; 35 = left mid tibia dorsally; 36 = apex of mid tibia and basitarsus posteriorly; 37 = spermathecae. — Abbrevations: S = sternum, T = tergum. Scales: Figs 33. 34 = 0.1 mm, Figs. 35, 36 = 0.2 mm, Fig. 37 = 0.05 mm